SAR EVALUATION REPORT

FCC 47 CFR § 2.1093
IEEE Std 1528-2013

For
GSM/WCDMA/LTE Tablet + BT/BLE and DTS/UNII a/b/g/n/ac & ANT+

FCC ID: A3LSMT819Y
Model Name: SM-T819Y

Report Number: 16K23303-S1V2
Issue Date: 5/13/2016

Prepared for
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ACCREDITED

TL-637

Revision History

Rev.	Date	Revisions	Revised By
V1	5/9/2016	Initial Issue	Sunghoon Kim
V2	5/13/2016	Added Sec 1.1, 1.2	Justin Park

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1. Attestation of Test Results

Applicant Name	SAMSUNG ELECTRONICS CO.,LTD.			
FCC ID	A3LSMT819Y			
Model Name	SM-T819Y			
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
Exposure Category	SAR Limits (W/Kg)			
	Peak spatial-average(1g of tissue)			
General population / Uncontrolled exposure	1.6			
RF Exposure Conditions	Equipment Class - Highest Reported SAR (W/kg)			
	Licensed	DTS	U-NII	DSS (BT)
Standalone	0.879	1.029	1.017	0.464
Simultaneous TX	1.590	1.578	1.590	1.343
Date Tested	Licensed, DTS and U-NII : 2/11/2016 to 3/14/2016, Bluetooth : 3/28/2016 Licensed (GSM1900, WCDMA Band II, IV) : 4/21/2016 to 4/30/2016			
Test Results	Pass			

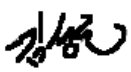
***Note:** The WWAN (GSM850, WCDMA Band V, LTE Band 2, 4, 5, 17), WLAN (DTS, U-NII) SAR measurement results from the original filling can be found in SAR test report 16K22867-S1V2, FCC ID A3LSMT819.

The Bluetooth SAR measurement results from the original filling can be found in SAR test report 16K23164-S1V1, FCC ID A3LSMT819N.(A3LSMT819N was progressed from A3LSMT819 using changed only Bluetooth target power.)

The WWAN, WLAN antennas and surrounding circuitry is the same between these two units, and tune up power targets are identical for WWAN, WLAN operations. Therefore, SAR data for WWAN, WLAN from the original filling was used for this model. Spot checks for WWAN, WLAN 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:
	
Justin Park Senior Engineer UL Korea, Ltd Suwon Laboratory	SungHoon Kim Laboratory Engineer UL Korea, Ltd Suwon Laboratory

1.1. Ineroduction Of Test Data Reuse

This report referenced from the FCC ID: A3LSMT819 (GSM850, WCDMA Band V, LTE Band 2, 4, 5, 17, DTS, U-NII), A3LSMT819N (BT) (FCC 47 CFR § 2.1093, IEEE 1528-2013).

And the applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID..

1.2. Difference

The WWAN (GSM850, WCDMA Band V, LTE Band 2, 4, 5, 17), WLAN (DTS, U-NII) SAR measurement results from the original filling can be found in SAR test report 16K22867-S1V2, FCC ID A3LSMT819.

The Bluetooth SAR measurement results from the original filling can be found in SAR test report 16K23164-S1V1, FCC ID A3LSMT819N.(A3LSMT819N was progressed from A3LSMT819 using changed only Bluetooth target power.)

The WWAN, WLAN antennas and surrounding circuitry is the same between these two units, and tune up power targets are identical for WWAN, WLAN operations. Therefore, SAR data for WWAN, WLAN from the original filling was used for this model. Spot checks for WWAN, WLAN were performed to ensure that the SAR measurements for both devices are the same.

1.3. Spot Check Verification Data

Band		Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	RB Allocation	RB offest	Original Model (FCC ID : A3LSMT819)				Spot Check Model (FCC ID : A3LSMT819Y)				Deviation
											Power (dBm)		1-g SAR (W/kg)		Power (dBm)		1-g SAR (W/kg)		
											Tune-up limit	Meas.	Meas.	Scaled	Tune-up limit	Meas.	Meas.	Scaled	
GSM	850	Main	Standalone	GPRS 2 slots	0	Rear	128	842.2	N/A	N/A	23.5	23.3	0.807	0.852	23.5	23.3	0.666	0.696	-18%
WCDMA	Band V	Main	Standalone	Rel 99 RMC	0	Rear	4183	836.6	N/A	N/A	15.5	14.4	0.396	0.513	15.5	15.5	0.465	0.468	-9%
LTE	Band 2	Main	Standalone	QPSK	0	Rear	19100	1900.0	1	49	14.5	14.2	0.811	0.879	14.5	14.2	0.875	0.929	6%
	Band 4	Main	Standalone	QPSK	0	Rear	20050	1720.0	1	49	14.5	14.0	0.694	0.775	14.5	14.5	0.816	0.825	7%
	Band 5	Main	Standalone	QPSK	0	Rear	20525	836.6	1	25	17.5	17.0	0.706	0.796	17.5	17.1	0.861	0.942	18%
	Band 17	Main	Standalone	QPSK	0	Edge 1	23790	710.0	1	25	18.5	18.4	0.777	0.795	18.5	18.2	0.873	0.942	18%
DTS	2.4GHz	Ant.1	Standalone	802.11b	4	Rear	1	2412.0	N/A	N/A	15.5	14.6	0.771	0.951	15.5	15.0	0.868	0.983	3%
		Ant.2	Standalone	802.11b	0	Rear	6	2437.0	N/A	N/A	11.0	10.8	0.976	1.029	11.0	10.2	0.851	1.018	-1%
U-NII-2A	5.3GHz	Ant.1	Standalone	802.11a	4	Rear	64	5320.0	N/A	N/A	11.5	11.2	0.358	0.384	11.5	10.7	0.330	0.397	3%
		Ant.2	Standalone	802.11a	4	Rear	56	5280.0	N/A	N/A	11.5	11.2	0.701	0.748	11.5	11.1	0.648	0.706	-6%
U-NII-2C	5.6GHz	Ant.1	Standalone	802.11a	4	Rear	100	5500.0	N/A	N/A	11.5	11.2	0.664	0.711	11.5	10.7	0.504	0.603	-15%
		Ant.2	Standalone	802.11a	4	Rear	112	5560.0	N/A	N/A	11.5	11.1	0.934	1.017	11.5	11.3	1.040	1.087	7%
U-NII-3	5.8GHz	Ant.1	Standalone	802.11a	4	Rear	165	5825.0	N/A	N/A	11.5	10.8	0.168	0.197	11.5	11.0	0.170	0.191	-3%
		Ant.2	Standalone	802.11a	4	Rear	149	5745.0	N/A	N/A	11.5	11.0	0.616	0.686	11.5	11.3	0.672	0.697	2%
Band		Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	RB Allocation	RB offest	Original Model (FCC ID : A3LSMT819N)				Spot Check Model (FCC ID : A3LSMT819Y)				Deviation
											Power (dBm)		1-g SAR (W/kg)		Power (dBm)		1-g SAR (W/kg)		
											Tune-up limit	Meas.	Meas.	Scaled	Tune-up limit	Meas.	Meas.	Scaled	
Bluetooth	2.4GHz	Ant.1	Standalone	GFSK	0	Rear	39	2441.0	N/A	N/A	11.5	11.1	0.425	0.464	11.5	11.3	0.505	0.527	14%

Note(s):

Fer KDB 865664 D01, The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2

1.4. Reference Detail

Reference application that contains the reused reference data.:

Equipment Class	Reference FCC ID	Type Grant/Permissive Change	Reference Application	Folder Test/RF Exposure	Report Tittle / Section
DTS	A3LSMT819	Grant	16K22867-E1V1	Test	FCC Report DTS WLAN / All sections
			16K22867-S1V2	RF Exposure	FCC Report SAR / Section 9.4, 10.9
DSS	A3LSMT819N	Grant	16K23164-E3V1	Test	FCC Report BT / All sections
			16K23164-S1V1	RF Exposure	FCC Report SAR / Section 9.6, 10.11
NII	A3LSMT819	Grant	16K22867-E4V1	Test	FCC Report UNII DFS WLAN / All sections
			16K22867-S1V2	RF Exposure	FCC Report SAR / Section 9.5, 10.10
DXX	A3LSMT819	Grant	16K22867-E5V1	Test	FCC Report ANT+ / All sections
PCB	A3LSMT819	Grant	16K22867-E6V1	Test	FCC Report WWAN / All sections for GSM850, WCDMA B5, LTE B2/B4/B5/B17
			16K22867-S1V2	RF Exposure	FCC Report SAR / Section for GSM850 (9.1, 10.1), WCDMA B5 (9.2, 10.4), LTE B2 (9.3, 10.5), LTE B4 (9.3, 10.6), LTE B5 (9.3, 10.7), LTE B17 (9.3, 10.8)

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 802.11 Wi-Fi SAR v02r02
- 447498 D01 General RF Exposure Guidance v06
- 616217 D04 SAR for laptop and tablets v01r02
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D06 Hotspot Mode v02r01

3. Facilities and Accreditation

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

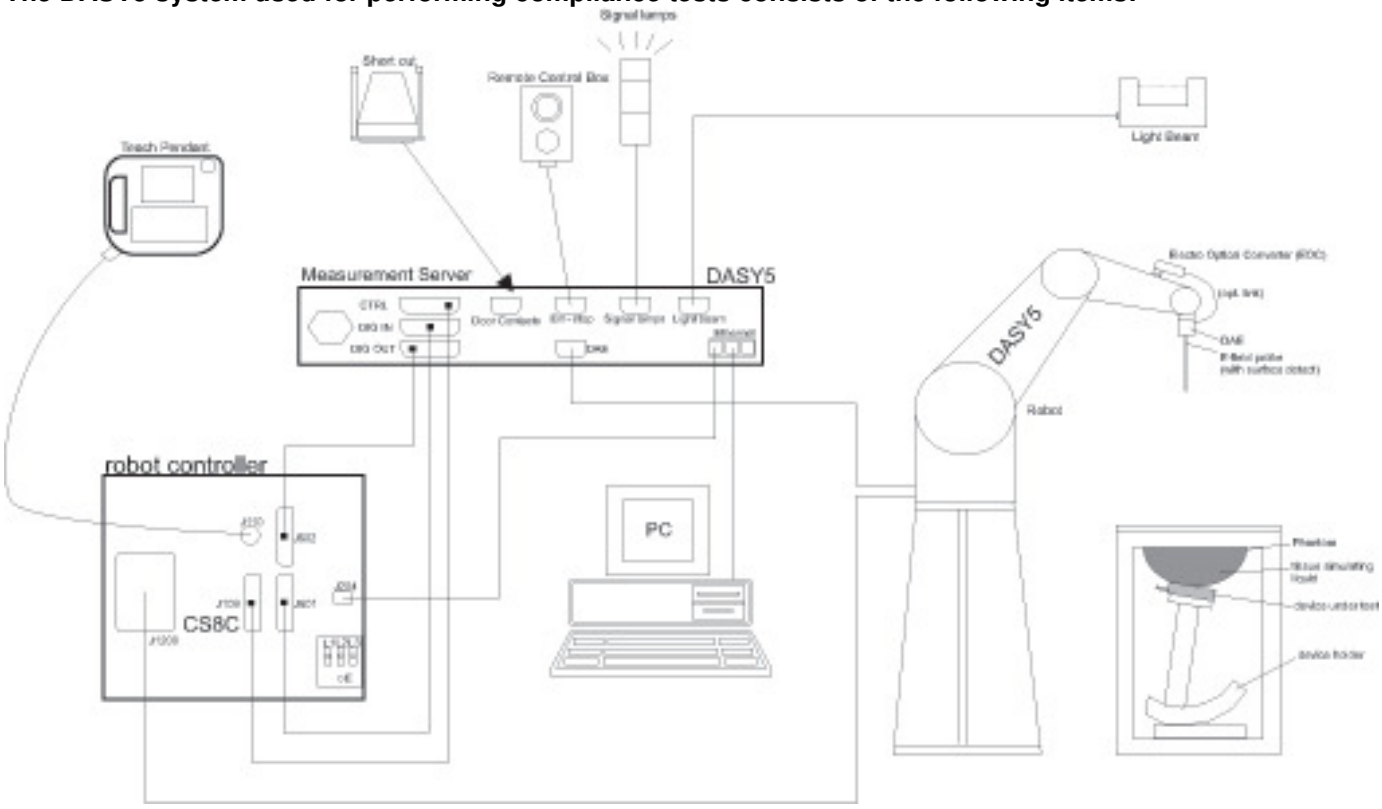
Suwon
SAR 1 Room
SAR 2 Room
SAR 3 Room

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

<table>
<tr><td></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td>Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td>Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
</table>

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	8-18-2016
Dielectric Assessment Kit	SPEAG	DAK-3.5	1196	8-4-2016
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	LKM	DTM3000	3424	8-19-2016
Thermometer	Lutron	MHB-382SD	AH.91478	8-12-2016

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Agilent	N5181A	MY50145882	8-18-2016
Power Sensor	Agilent	U2000A	MY54260010	8-18-2016
Power Sensor	Agilent	U2000A	MY54260007	8-18-2016
Power Amplifier	EXODUS	1410025-AMP2027-10003	10003	8-18-2016
Directional Coupler	Agilent	772D	MY52180193	8-18-2016
Directional Coupler	Agilent	778D	MY52180432	8-18-2016
Low Pass Filter	MICROLAB	LA-15N	03943	8-18-2016
Low Pass Filter	FILTRON	L14012FL	1410003S	8-18-2016
Low Pass Filter	MICROLAB	LA-60N	03942	8-18-2016
Attenuator	Agilent	8491B/003	MY39269292	8-18-2016
Attenuator	Agilent	8491B/010	MY39269315	8-18-2016
Attenuator	Agilent	8491B/020	MY39269298	8-18-2016
E-Field Probe (SAR1)	SPEAG	EX3DV4	7314	9-25-2016
E-Field Probe (SAR2)	SPEAG	EX3DV4	7376	9-2-2016
E-Field Probe (SAR3)	SPEAG	EX3DV4	7313	12-30-2016
Data Acquisition Electronics (SAR1)	SPEAG	DAE4	1447	9-23-2016
Data Acquisition Electronics (SAR2)	SPEAG	DAE4	1468	9-15-2016
Data Acquisition Electronics (SAR3)	SPEAG	DAE4	1494	11-11-2016
System Validation Dipole	SPEAG	D750V3	1122	8-17-2016
System Validation Dipole	SPEAG	D835V2	4d194	9-17-2016
System Validation Dipole	SPEAG	D1750V2	1125	8-20-2016
System Validation Dipole	SPEAG	D1900V2	5d190	9-29-2016
System Validation Dipole	SPEAG	D1900V2	5d199	2-19-2017
System Validation Dipole	SPEAG	D2450V2	939	9-28-2016
System Validation Dipole	SPEAG	D5GHzV2	1184	8-26-2016
Thermometer (SAR1)	Lutron	MHB-382SD	AH.91463	8-12-2016
Thermometer (SAR2)	Lutron	MHB-382SD	AH.50215	8-19-2016
Thermometer (SAR3)	Lutron	MHB-382SD	AH.50213	8-24-2016

Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	150313	8-18-2016
Base Station Simulator	R & S	CMW500	150314	8-18-2016
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	8-18-2016

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): 237.1 mm x 168.8 mm Overall Diagonal: 281.55 mm Display Diagonal: 246.3 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, Ch.149)		
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 (Wi-Fi 5 GHz, Ch. 36~48, Ch.149 ~165)		
Test sample information	**No.**	**S/N**	**Notes**
	1	3cdfac48	Main Conduction
	2	3cf39a48	Main Conduction
	3	R32H2002DMP	WiFi Conduction
	4	R32G600B78N	SAR
	5	R32G600B66D	SAR
	6	R32H200299P	SAR
	7	R32H20028DJ	SAR
	8	R32H3009NRP	Main Conduction (SM-T819Y)
	9	R32H3009N2E	Main Conduction (SM-T819Y)
	10	R32H3009N6P	SAR (SM-T819Y)
	11	R32H3009MSK	SAR (SM-T819Y)

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 - 1 Up, 4 Down ☐ Class 10 - 2 Up, 4 Down ☐ Class 12 - 4 Up, 4 Down ☒ Class 33 - 4 Up, 5 Down	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
	☒ Class B = GPRS connection interrupted during a GSM call, automatically resumed at end of call. 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. 8) HSUPA (Rel. 6)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 17	QPSK 16QAM ☒ Rel. 10 Does not support Carrier Aggregation (CA)		100% (FDD) 63.3% (TDD)
	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) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80)		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		76.88% (DH5)

6.3. Nominal and Maximum Output Power from Tune-up Procedure

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	
			Burst	Frame		Burst	Frame
GSM850	Voice/GPRS (1 slot)	32.0	**32.5**	**23.5**	25.0	**25.5**	**16.5**
	GPRS 2 slots	30.0	**30.5**	**24.5**	23.0	**23.5**	**17.5**
	GPRS 3 slots	28.0	**28.5**	**24.2**	20.5	**21.0**	**16.7**
	GPRS 4 slots	25.5	**26.0**	**23.0**	18.5	**19.0**	**16.0**
	EGPRS 1 slot	27.5	**28.0**	**19.0**	21.5	**22.0**	**13.0**
	EGPRS 2 slots	25.0	**25.5**	**19.5**	20.0	**20.5**	**14.5**
	EGPRS 3 slots	23.0	**23.5**	**19.2**	17.0	**17.5**	**13.2**
	EGPRS 4 slots	22.0	**22.5**	**19.5**	16.0	**16.5**	**13.5**
GSM1900	Voice/GPRS (1 slot)	30.5	**31.0**	**22.0**	19.5	**20.0**	**11.0**
	GPRS 2 slots	28.5	**29.0**	**23.0**	18.5	**19.0**	**13.0**
	GPRS 3 slots	26.5	**27.0**	**22.7**	15.5	**16.0**	**11.7**
	GPRS 4 slots	25.5	**26.0**	**23.0**	14.5	**15.0**	**12.0**
	EGPRS 1 slot	26.5	**27.0**	**18.0**	18.5	**19.0**	**10.0**
	EGPRS 2 slots	26.0	**26.5**	**20.5**	18.0	**18.5**	**12.5**
	EGPRS 3 slots	24.0	**24.5**	**20.2**	14.5	**15.0**	**10.7**
	EGPRS 4 slots	23.0	**23.5**	**20.5**	13.5	**14.0**	**11.0**

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
W-CDMA Band V	R99	23.0	**23.5**	15.0	**15.5**
	HSDPA	22.5	**23.0**	14.5	**15.0**
	HSUPA	21.5	**22.0**	13.5	**14.0**
W-CDMA Band IV	R99	22.0	**22.5**	12.0	**12.5**
	HSDPA	22.0	**22.5**	12.0	**12.5**
	HSUPA	22.0	**22.5**	12.0	**12.5**
W-CDMA Band II	R99	23.5	**24.0**	11.0	**11.5**
	HSDPA	23.0	**23.5**	10.5	**11.0**
	HSUPA	23.0	**23.5**	10.5	**11.0**
LTE Band 2	QPSK	22.5	**23.0**	14.0	**14.5**
	16QAM				
LTE Band 4	QPSK	21.5	**22.0**	14.0	**14.5**
	16QAM				
LTE Band 5	QPSK	23.0	**23.5**	17.0	**17.5**
	16QAM				
LTE Band 17	QPSK	23.0	**23.5**	18.0	**18.5**
	16QAM				

Upper limit (dB): ~ 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
WiFi 2.4 GHz (Ch. 1~11)	802.11b	15.0	**15.5**	10.5	**11.0**
	802.11g	15.0	**15.5**	10.5	**11.0**
	802.11n HT20	14.0	**14.5**	10.5	**11.0**
WiFi 2.4 GHz (Ch. 12/13)	802.11b	5.0	**5.5**	5.0	**5.5**
	802.11g	5.0	**5.5**	5.0	**5.5**
	802.11n HT20	5.0	**5.5**	5.0	**5.5**
WiFi 5 GHz	802.11a	11.0	**11.5**	7.0	**7.5**
	802.11n HT20	11.0	**11.5**	7.0	**7.5**
	802.11n HT40	10.0	**10.5**	7.0	**7.5**
	802.11ac VHT20	11.0	**11.5**	7.0	**7.5**
	802.11ac VHT40	10.0	**10.5**	7.0	**7.5**
	802.11ac VHT80	10.0	**10.5**	7.0	**7.5**
Bluetooth		11.0	**11.5**	N/A	
Bluetooth LE		3.5	**4.0**	N/A	

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>23780/ 709</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>23800/ 711</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 2 Main TX/RX antennas and 2 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</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

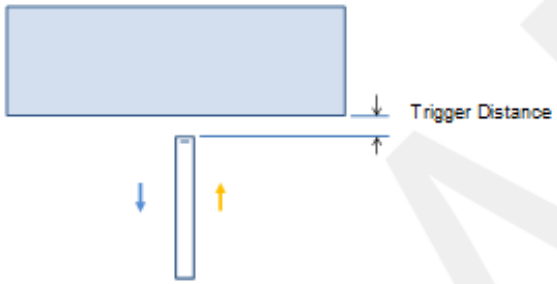
6.5.1. Proximity Sensor Triggering Distance (KDB 616217 §6.2)

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 1.

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 616219 §6.2, Edge 1

Proximity Sensor Trigger Distance Assessment
KDB 616219 §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 point0

Summary of Trigger Distances

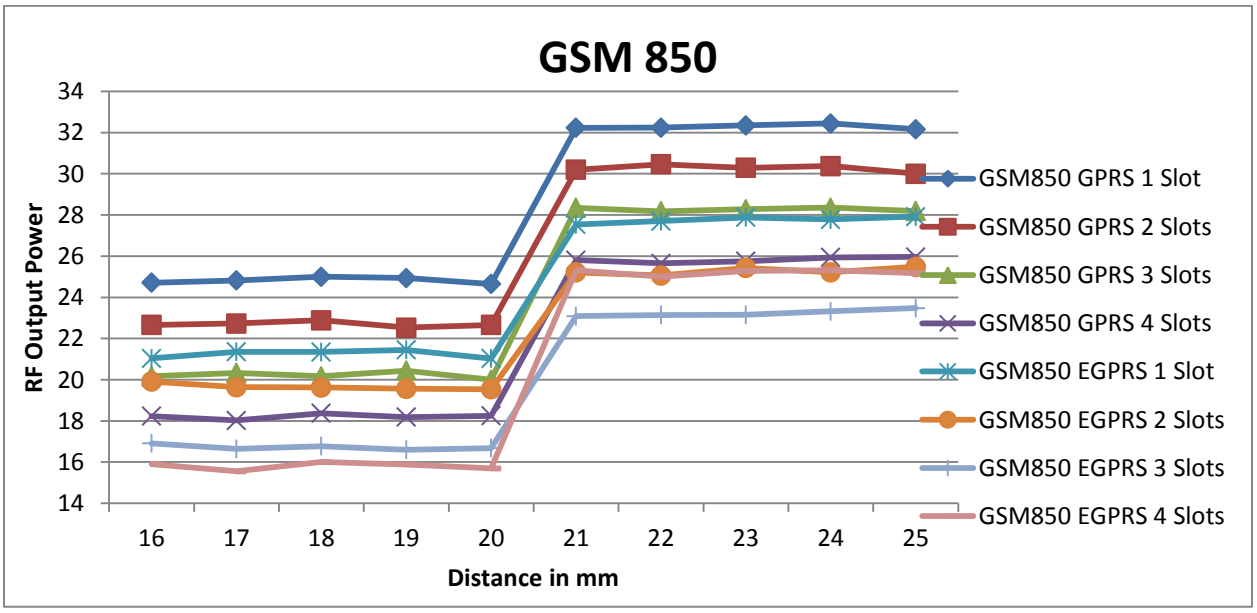
Tissue simulating liquid	Trigger distance - Edge 1		Trigger distance - Rear	
	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom
750 muscle	23 mm	23 mm	20 mm	20 mm
850 muscle	23 mm	23 mm	20 mm	20 mm
1900 muscle	23 mm	23 mm	20 mm	20 mm
2450 muscle	N/A	N/A	5 mm	5 mm
5000 muscle	N/A	N/A	5 mm	5 mm

Proximity Sensor Triggering Distance Measurement Results

GSM850

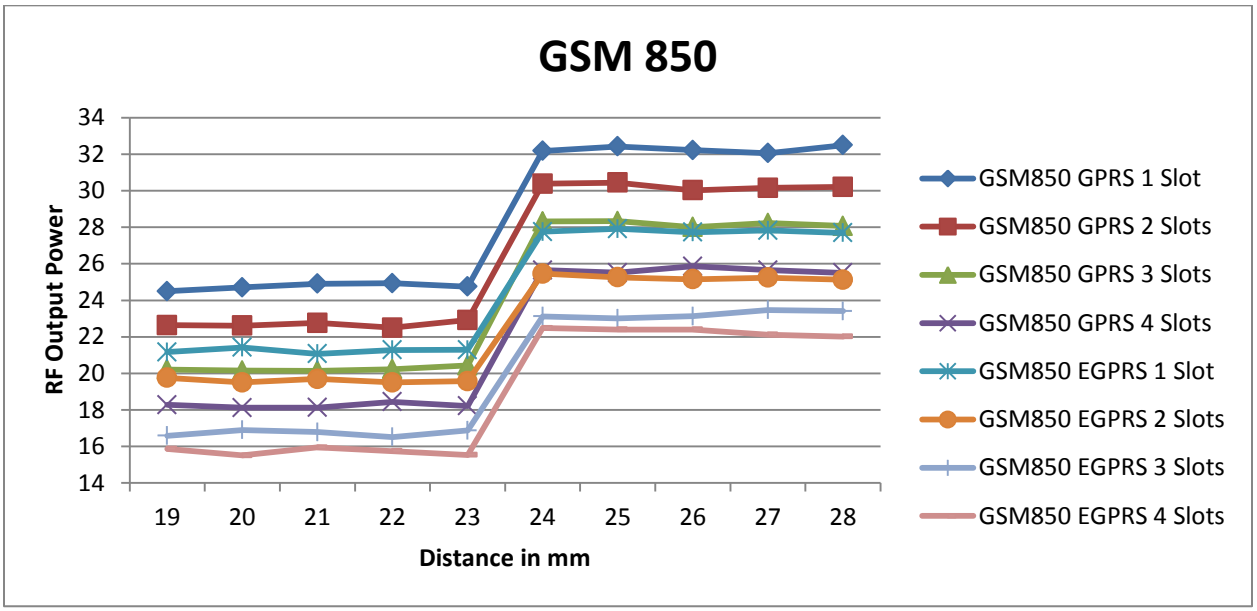
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	16	17	18	19	20	21	22	23	24	25
GSM850 GPRS 1 Slot	24.7	24.8	25.0	24.9	24.7	32.2	32.2	32.4	32.4	32.2
GSM850 GPRS 2 Slots	22.7	22.7	22.9	22.5	22.7	30.2	30.5	30.3	30.4	30.0
GSM850 GPRS 3 Slots	20.2	20.3	20.2	20.4	20.0	28.4	28.2	28.3	28.4	28.2
GSM850 GPRS 4 Slots	18.2	18.0	18.4	18.2	18.3	25.8	25.7	25.8	25.9	26.0
GSM850 EGPRS 1 Slot	21.0	21.4	21.4	21.5	21.0	27.5	27.7	27.9	27.8	27.9
GSM850 EGPRS 2 Slots	19.9	19.6	19.6	19.6	19.5	25.2	25.1	25.4	25.2	25.5
GSM850 EGPRS 3 Slots	16.9	16.6	16.8	16.6	16.7	23.1	23.1	23.2	23.3	23.5
GSM850 EGPRS 4 Slots	15.9	15.6	16.0	15.9	15.7	21.7	21.8	21.8	21.8	22.0



Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

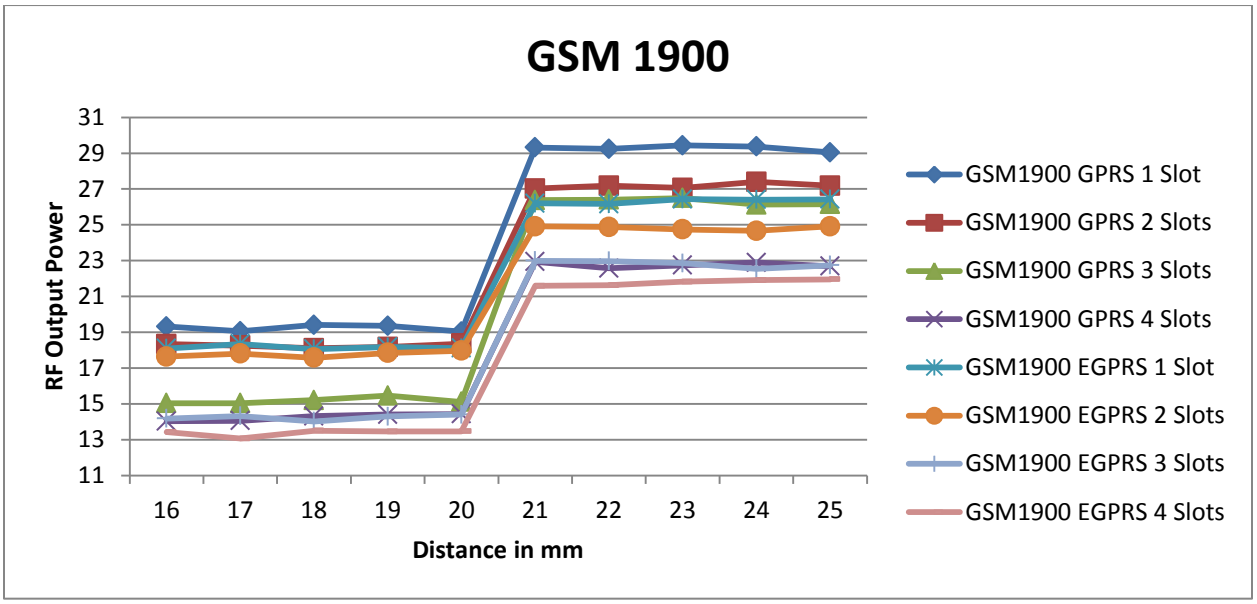
Distance to DUT vs. Output Power in dBm										
Distance (mm)	19	20	21	22	23	24	25	26	27	28
GSM850 GPRS 1 Slot	24.5	24.7	24.9	24.9	24.8	32.2	32.4	32.2	32.1	32.5
GSM850 GPRS 2 Slots	22.6	22.6	22.8	22.5	22.9	30.4	30.4	30.0	30.2	30.2
GSM850 GPRS 3 Slots	20.2	20.2	20.1	20.2	20.4	28.3	28.3	28.0	28.2	28.1
GSM850 GPRS 4 Slots	18.3	18.1	18.1	18.4	18.2	25.7	25.5	25.9	25.7	25.5
GSM850 EGPRS 1 Slot	21.2	21.4	21.1	21.3	21.3	27.8	27.9	27.7	27.8	27.7
GSM850 EGPRS 2 Slots	19.8	19.5	19.7	19.5	19.6	25.5	25.3	25.2	25.2	25.1
GSM850 EGPRS 3 Slots	16.6	16.9	16.8	16.5	16.9	23.1	23.0	23.1	23.5	23.4
GSM850 EGPRS 4 Slots	15.9	15.5	16.0	15.8	15.5	22.5	22.4	22.4	22.1	22.0



GSM1900

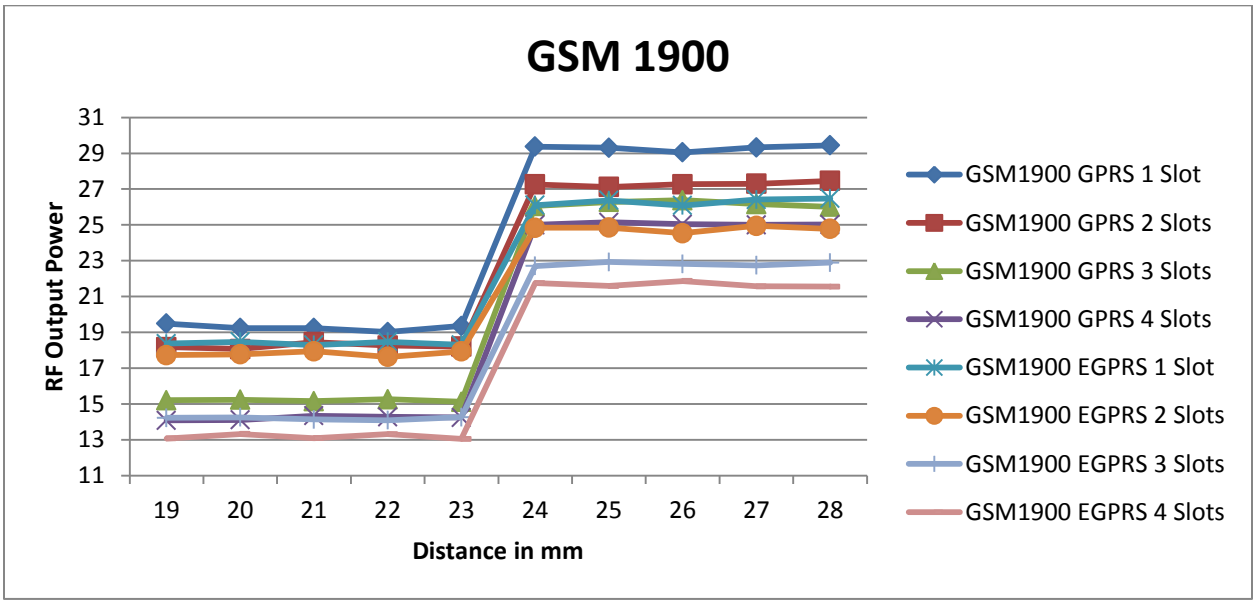
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	16	17	18	19	20	21	22	23	24	25
GSM1900 GPRS 1 Slot	19.3	19.1	19.4	19.4	19.0	29.3	29.2	29.4	29.4	29.0
GSM1900 GPRS 2 Slots	18.3	18.3	18.1	18.2	18.4	27.0	27.2	27.1	27.4	27.2
GSM1900 GPRS 3 Slots	15.0	15.0	15.2	15.5	15.1	26.4	26.4	26.5	26.1	26.2
GSM1900 GPRS 4 Slots	14.0	14.1	14.3	14.4	14.4	25.5	25.4	25.1	25.1	25.3
GSM1900 EGPRS 1 Slot	18.1	18.3	18.1	18.2	18.1	26.2	26.2	26.4	26.4	26.4
GSM1900 EGPRS 2 Slots	17.6	17.8	17.6	17.8	18.0	24.9	24.9	24.7	24.7	24.9
GSM1900 EGPRS 3 Slots	14.2	14.3	14.0	14.3	14.4	23.0	23.0	22.9	22.5	22.7
GSM1900 EGPRS 4 Slots	13.4	13.1	13.5	13.5	13.5	21.6	21.6	21.8	21.9	22.0



Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

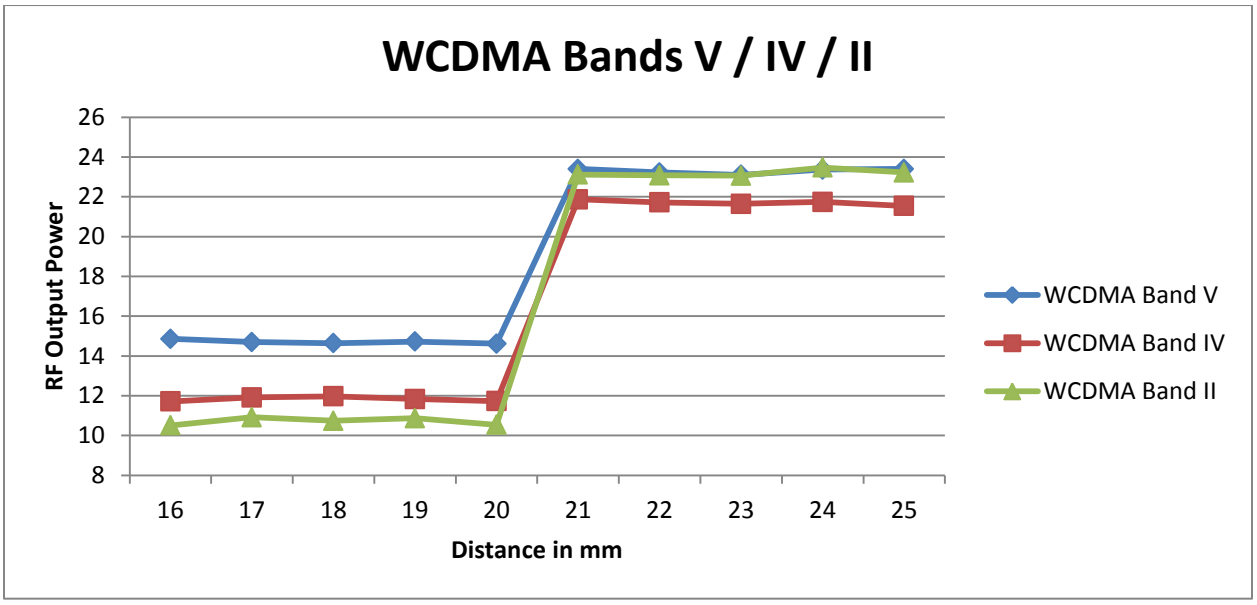
Distance to DUT vs. Output Power in dBm										
Distance (mm)	19	20	21	22	23	24	25	26	27	28
GSM1900 GPRS 1 Slot	19.5	19.2	19.2	19.0	19.4	29.4	29.3	29.1	29.3	29.4
GSM1900 GPRS 2 Slots	18.2	18.1	18.5	18.3	18.2	27.3	27.1	27.3	27.3	27.5
GSM1900 GPRS 3 Slots	15.2	15.2	15.2	15.3	15.1	26.1	26.3	26.4	26.2	26.0
GSM1900 GPRS 4 Slots	14.1	14.1	14.3	14.3	14.2	25.0	25.1	25.0	25.0	25.0
GSM1900 EGPRS 1 Slot	18.4	18.5	18.3	18.5	18.3	26.1	26.4	26.1	26.4	26.5
GSM1900 EGPRS 2 Slots	17.7	17.8	17.9	17.6	17.9	24.8	24.9	24.5	25.0	24.8
GSM1900 EGPRS 3 Slots	14.2	14.3	14.1	14.1	14.3	22.7	22.9	22.8	22.7	22.9
GSM1900 EGPRS 4 Slots	13.1	13.3	13.1	13.3	13.0	21.8	21.6	21.9	21.6	21.6



WCDMA Bands V & II

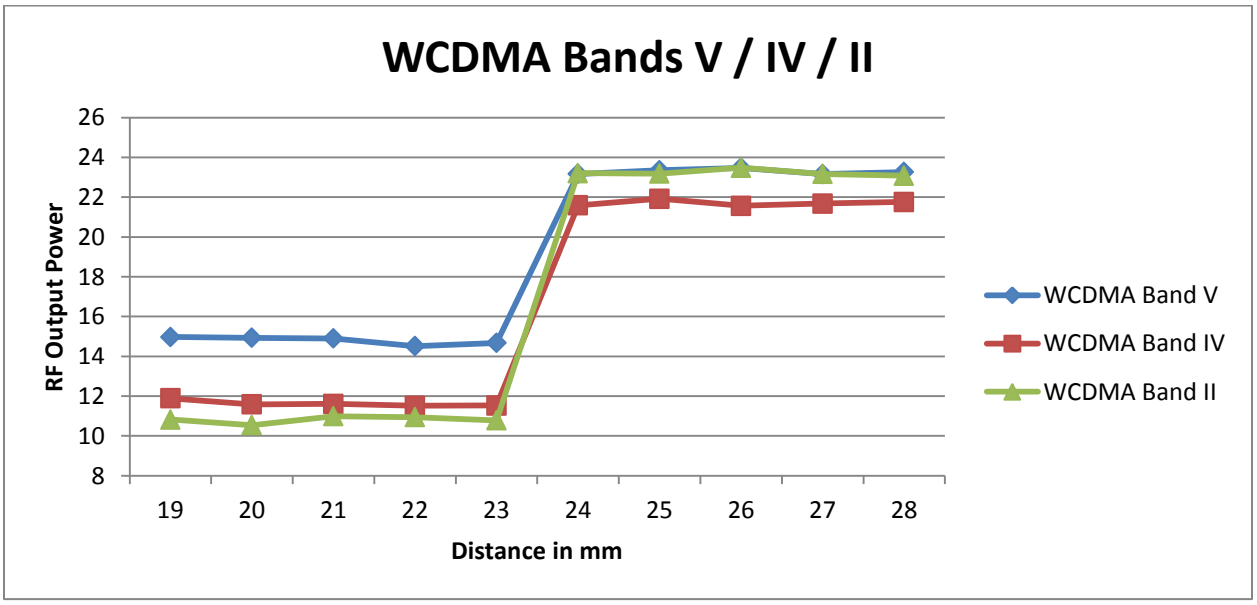
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	16	17	18	19	20	21	22	23	24	25
WCDMA Band V	14.9	14.7	14.6	14.7	14.6	23.4	23.2	23.1	23.4	23.4
WCDMA Band IV	11.7	11.9	12.0	11.8	11.7	21.9	21.7	21.7	21.7	21.5
WCDMA Band II	10.5	10.9	10.7	10.9	10.5	23.1	23.1	23.1	23.5	23.2



Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

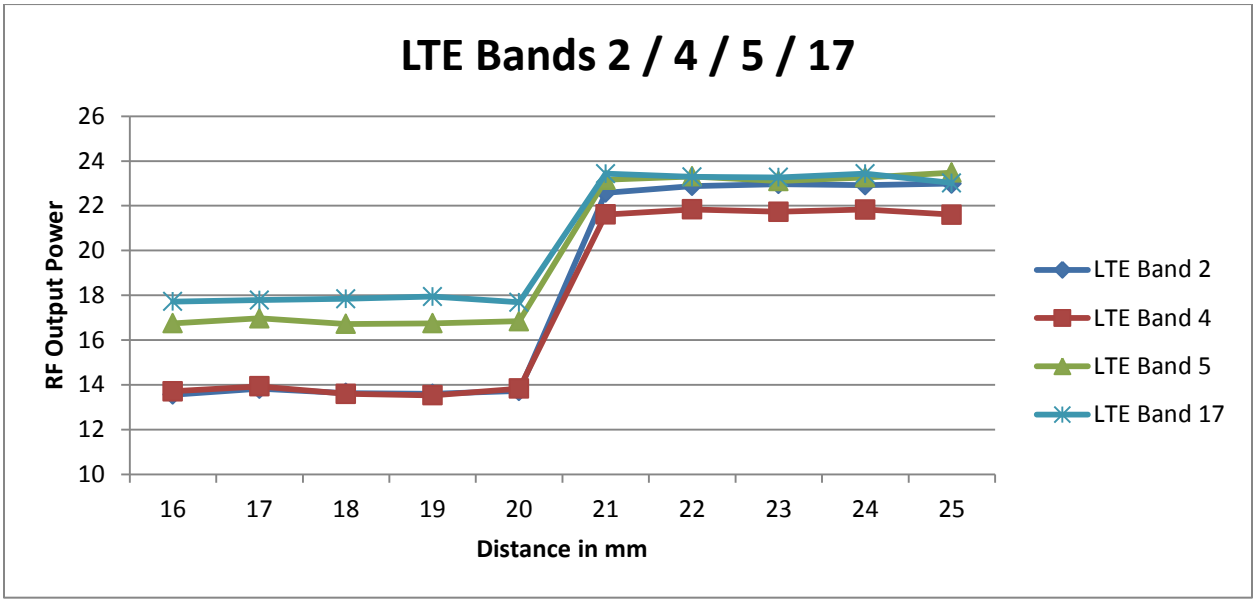
Distance to DUT vs. Output Power in dBm										
Distance (mm)	19	20	21	22	23	24	25	26	27	28
WCDMA Band V	15.0	14.9	14.9	14.5	14.7	23.2	23.4	23.5	23.2	23.3
WCDMA Band IV	11.9	11.6	11.6	11.5	11.5	21.6	21.9	21.6	21.7	21.8
WCDMA Band II	10.8	10.5	11.0	10.9	10.8	23.2	23.2	23.5	23.2	23.1



LTE Bands 2 / 4 / 5 / 17

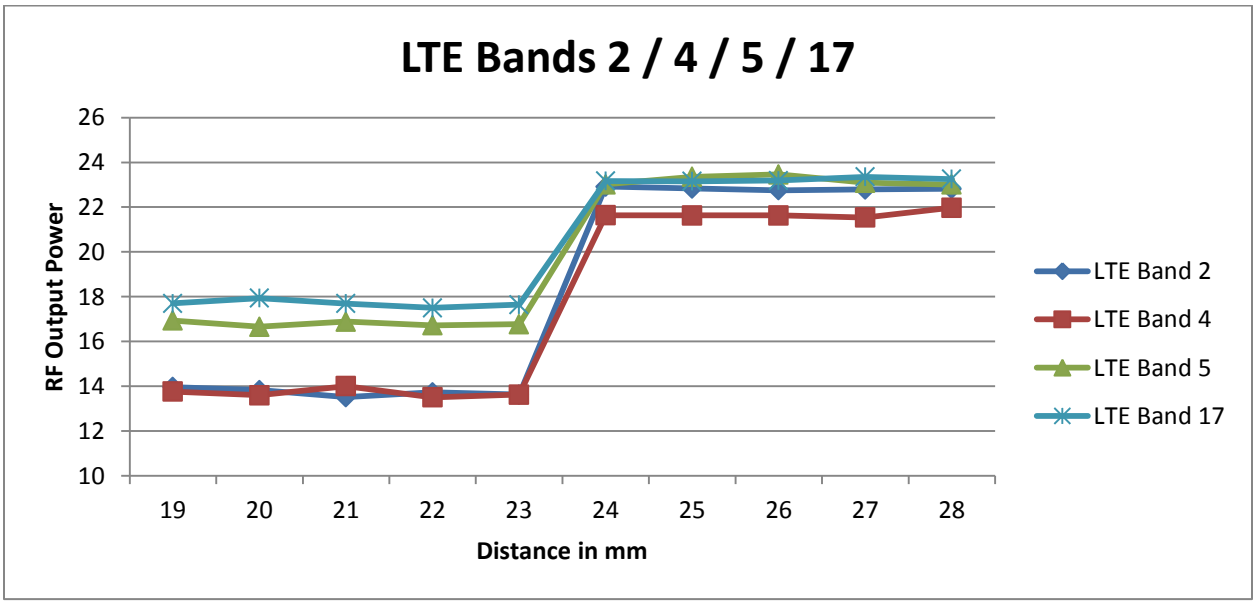
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	16	17	18	19	20	21	22	23	24	25
LTE Band 2	13.6	13.8	13.6	13.6	13.7	22.6	22.9	23.0	22.9	23.0
LTE Band 4	13.7	13.9	13.6	13.5	13.8	21.6	21.8	21.7	21.8	21.6
LTE Band 5	16.8	17.0	16.7	16.8	16.8	23.2	23.3	23.1	23.3	23.5
LTE Band 17	17.7	17.8	17.8	17.9	17.7	23.4	23.3	23.3	23.4	23.0



Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

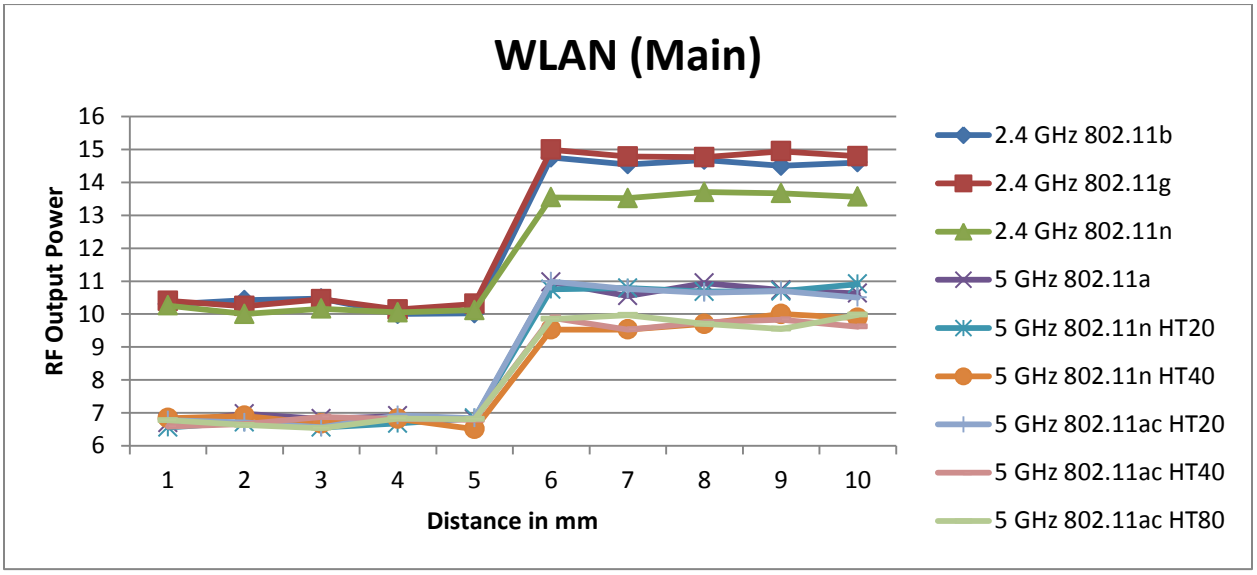
Distance to DUT vs. Output Power in dBm										
Distance (mm)	19	20	21	22	23	24	25	26	27	28
LTE Band 2	14.0	13.8	13.5	13.7	13.6	22.9	22.8	22.8	22.8	22.8
LTE Band 4	13.8	13.6	14.0	13.5	13.6	21.6	21.6	21.6	21.5	22.0
LTE Band 5	16.9	16.7	16.9	16.7	16.8	23.0	23.4	23.5	23.1	23.0
LTE Band 17	17.7	17.9	17.7	17.5	17.6	23.2	23.2	23.2	23.4	23.3



Wi-Fi 2.4GHz and 5GHz (Main)

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

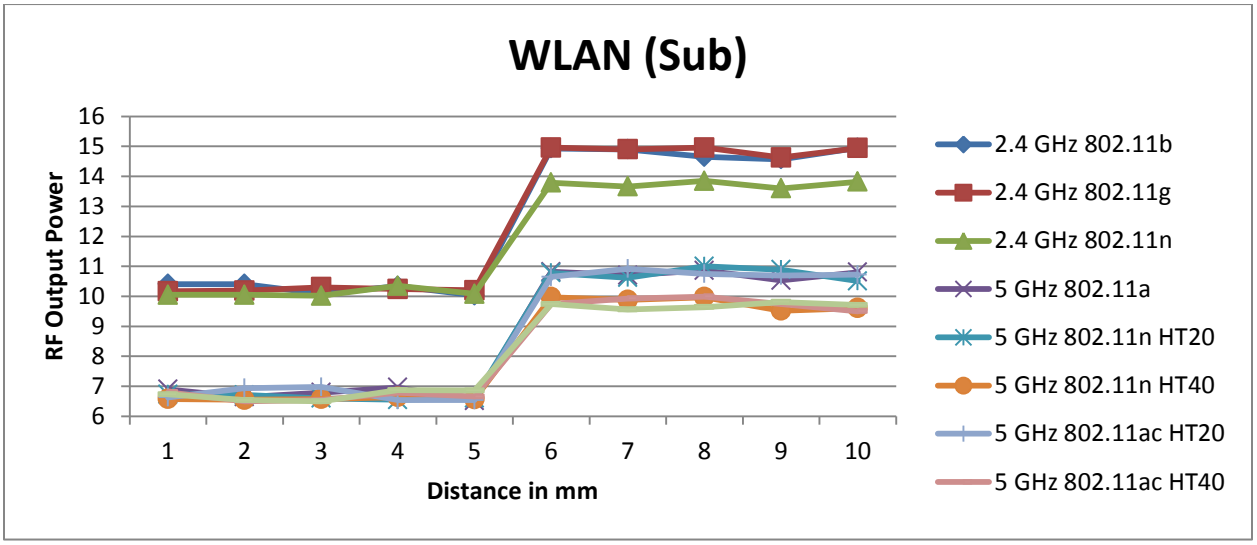
Distance to DUT vs. Output Power in dBm											
Antenna	Distance	1	2	3	4	5	6	7	8	9	10
Ant 1	2.4 GHz 802.11b	10.3	10.4	10.5	10.0	10.0	14.8	14.5	14.7	14.5	14.6
	2.4 GHz 802.11g	10.4	10.2	10.5	10.1	10.3	15.0	14.8	14.8	14.9	14.8
	2.4 GHz 802.11n	10.3	10.0	10.2	10.1	10.1	13.5	13.5	13.7	13.7	13.6
	5 GHz 802.11a	6.7	7.0	6.8	6.9	6.8	11.0	10.6	10.9	10.7	10.6
	5 GHz 802.11n HT20	6.6	6.7	6.6	6.7	6.8	10.8	10.8	10.7	10.7	10.9
	5 GHz 802.11n HT40	6.8	6.9	6.7	6.8	6.5	9.5	9.5	9.7	10.0	9.9
	5 GHz 802.11ac HT20	6.8	6.7	6.6	6.9	6.8	11.0	10.8	10.7	10.7	10.5
	5 GHz 802.11ac HT40	6.6	6.7	6.9	6.8	6.8	9.9	9.5	9.8	9.8	9.6
	5 GHz 802.11ac HT80	6.8	6.6	6.5	6.8	6.8	9.9	10.0	9.7	9.6	10.0



Wi-Fi 2.4GHz and 5GHz (Sub)

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

Distance to DUT vs. Output Power in dBm											
Antenna	Distance (mm)	1	2	3	4	5	6	7	8	9	10
Ant 2	2.4 GHz 802.11b	10.4	10.4	10.1	10.3	10.0	14.9	14.9	14.7	14.6	15.0
	2.4 GHz 802.11g	10.2	10.2	10.3	10.2	10.2	15.0	14.9	15.0	14.6	14.9
	2.4 GHz 802.11n	10.1	10.1	10.0	10.4	10.1	13.8	13.7	13.9	13.6	13.8
	5 GHz 802.11a	6.9	6.6	6.8	7.0	6.5	10.8	10.7	10.9	10.5	10.8
	5 GHz 802.11n HT20	6.7	6.7	6.6	6.6	6.6	10.8	10.6	11.0	10.9	10.5
	5 GHz 802.11n HT40	6.6	6.6	6.6	6.6	6.6	10.0	9.9	10.0	9.5	9.6
	5 GHz 802.11ac HT20	6.6	6.9	7.0	6.5	6.5	10.7	10.9	10.8	10.7	10.7
	5 GHz 802.11ac HT40	6.8	6.5	6.5	6.8	6.7	9.7	9.9	10.0	9.7	9.5
	5 GHz 802.11ac HT80	6.7	6.5	6.5	6.9	6.9	9.7	9.6	9.6	9.8	9.7



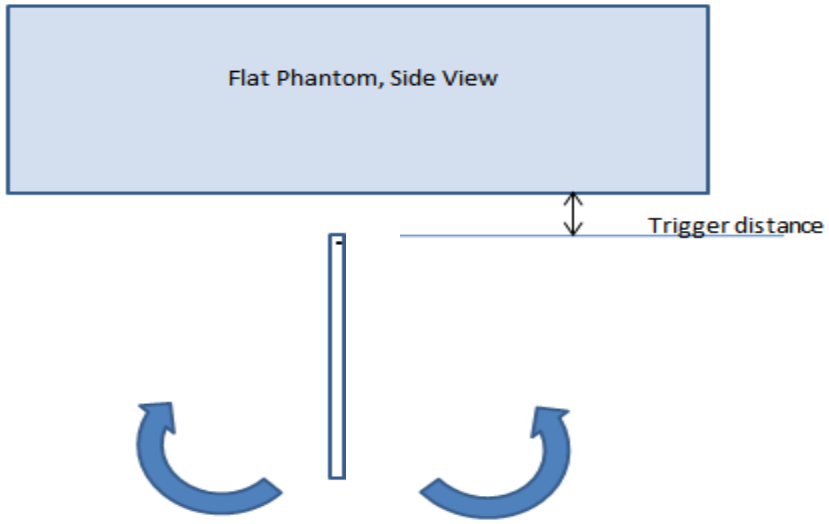
6.5.2. Proximity Sensor Coverage (KDB 616217 §6.3)

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

6.5.3. 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 1 parallel to the base of the flat phantom for each band.

The EUT was rotated about Edge 1 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 4) KDB 616217 §6.4

Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering

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	23 mm	23 mm	On	On	On	On	On	On	On	On	On	On	On
850	23 mm	23 mm	On	On	On	On	On	On	On	On	On	On	On
1750	23 mm	23 mm	On	On	On	On	On	On	On	On	On	On	On
1900	23 mm	23 mm	On	On	On	On	On	On	On	On	On	On	On

6.5.1. 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	20 mm	N/A	N/A	19 mm
	Edge 1	23 mm	N/A	23 mm	22 mm
WLAN	Rear	5 mm	N/A	N/A	4 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 2 Slots	848.8	30.50	281	0	0	43	233	43		51.8 -MEASURE-	51.8 -MEASURE-	6 -MEASURE-	> 50 mm	6 -MEASURE-	
Cellular	GPRS 2 Slots	1909.8	29.00	199	0	0	43	233	43		55 -MEASURE-	55 -MEASURE-	6.4 -MEASURE-	> 50 mm	6.4 -MEASURE-	
Cellular	W-CDMA 5	846.6	23.50	224	0	0	43	233	43		41.2 -MEASURE-	41.2 -MEASURE-	4.8 -MEASURE-	> 50 mm	4.8 -MEASURE-	
Cellular	W-CDMA 4	1752.6	22.50	178	0	0	43	233	43		47.1 -MEASURE-	47.1 -MEASURE-	5.5 -MEASURE-	> 50 mm	5.5 -MEASURE-	
Cellular	W-CDMA 2	1907.6	24.00	251	0	0	43	233	43		69.3 -MEASURE-	69.3 -MEASURE-	8.1 -MEASURE-	> 50 mm	8.1 -MEASURE-	
Cellular	LTE Band 2	1900	23.00	200	0	0	43	233	43		55.1 -MEASURE-	55.1 -MEASURE-	6.4 -MEASURE-	> 50 mm	6.4 -MEASURE-	
Cellular	LTE Band 4	1754.3	22.00	158	0	0	43	233	43		41.9 -MEASURE-	41.9 -MEASURE-	4.9 -MEASURE-	> 50 mm	4.9 -MEASURE-	
Cellular	LTE Band 5	844	23.50	224	0	0	43	233	43		41.2 -MEASURE-	41.2 -MEASURE-	4.8 -MEASURE-	> 50 mm	4.8 -MEASURE-	
Cellular	LTE Band 17	710	23.50	224	0	0	43	233	43		37.7 -MEASURE-	37.7 -MEASURE-	4.4 -MEASURE-	> 50 mm	4.4 -MEASURE-	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 2 Slots	848.8	23.50	56	0	0	43	233	43		10.3 -MEASURE-	10.3 -MEASURE-	1 -EXEMPT-	> 50 mm	1 -EXEMPT-	
Cellular	GPRS 2 Slots	1909.8	19.00	20	0	0	43	233	43		5.5 -MEASURE-	5.5 -MEASURE-	1 -EXEMPT-	> 50 mm	1 -EXEMPT-	
Cellular	W-CDMA 5	846.6	15.50	35	0	0	43	233	43		6.4 -MEASURE-	6.4 -MEASURE-	1 -EXEMPT-	> 50 mm	1 -EXEMPT-	
Cellular	W-CDMA 4	1752.6	12.50	18	0	0	43	233	43		4.8 -MEASURE-	4.8 -MEASURE-	1 -EXEMPT-	> 50 mm	1 -EXEMPT-	
Cellular	W-CDMA 2	1907.6	11.50	14	0	0	43	233	43		3.9 -MEASURE-	3.9 -MEASURE-	0 -EXEMPT-	> 50 mm	0 -EXEMPT-	
Cellular	LTE Band 2	1900	14.50	28	0	0	43	233	43		7.7 -MEASURE-	7.7 -MEASURE-	1 -EXEMPT-	> 50 mm	1 -EXEMPT-	
Cellular	LTE Band 4	1754.3	14.50	28	0	0	43	233	43		7.4 -MEASURE-	7.4 -MEASURE-	1 -EXEMPT-	> 50 mm	1 -EXEMPT-	
Cellular	LTE Band 5	844	17.50	56	0	0	43	233	43		10.3 -MEASURE-	10.3 -MEASURE-	1 -EXEMPT-	> 50 mm	1 -EXEMPT-	
Cellular	LTE Band 17	710	18.50	71	0	0	43	233	43		12 -MEASURE-	12 -MEASURE-	1 -EXEMPT-	> 50 mm	1 -EXEMPT-	

Note(s):

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 2 Slots	848.8	30.50	281	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1198.3 mW -EXEMPT-	< 50 mm	
Cellular	GPRS 2 Slots	1909.8	29.00	199	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1938.5 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 5	846.6	23.50	224	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1195.9 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 4	1752.6	22.50	178	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1943.3 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 2	1907.6	24.00	251	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1938.6 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 2	1900	23.00	200	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1938.8 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 4	1754.3	22.00	158	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1943.3 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 5	844	23.50	224	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1193 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 17	710	23.50	224	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1044.2 mW -EXEMPT-	< 50 mm	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 2 Slots	848.8	23.50	56	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1198.3 mW -EXEMPT-	< 50 mm	
Cellular	GPRS 2 Slots	1909.8	19.00	20	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1938.5 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 5	846.6	15.50	35	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1195.9 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 4	1752.6	12.50	18	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1943.3 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 2	1907.6	11.50	14	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1938.6 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 2	1900	14.50	28	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1938.8 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 4	1754.3	14.50	28	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1943.3 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 5	844	17.50	56	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1193 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 17	710	18.50	71	0	0	43	233	43		< 50 mm	< 50 mm	< 50 mm	1044.2 mW -EXEMPT-	< 50 mm	

Note(s):

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

Main Antenna < 50mm to adjacent edges

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
Wi-Fi Main Antenna Max Power															
Wi-Fi 2.4 GHz	2462	15.50	35	0.9	180	5.1	28	160.3		11 -MEASURE-	> 50 mm	11 -MEASURE-	2 -EXEMPT-	> 50 mm	
Wi-Fi 5.2 GHz	5240	11.50	14	0.9	180	5.1	28	160.3		6.4 -MEASURE-	> 50 mm	6.4 -MEASURE-	1.1 -EXEMPT-	> 50 mm	
Wi-Fi 5.3 GHz	5320	11.50	14	0.9	180	5.1	28	160.3		6.5 -MEASURE-	> 50 mm	6.5 -MEASURE-	1.2 -EXEMPT-	> 50 mm	
Wi-Fi 5.5 GHz	5700	11.50	14	0.9	180	5.1	28	160.3		6.7 -MEASURE-	> 50 mm	6.7 -MEASURE-	1.2 -EXEMPT-	> 50 mm	
Wi-Fi 5.8 GHz	5825	11.50	14	0.9	180	5.1	28	160.3		6.8 -MEASURE-	> 50 mm	6.8 -MEASURE-	1.2 -EXEMPT-	> 50 mm	
Bluetooth	2480	11.50	14	0.9	180	5.1	28	160.3		4.4 -MEASURE-	> 50 mm	4.4 -MEASURE-	0.8 -EXEMPT-	> 50 mm	
Wi-Fi Main Antenna Reduced Power															
Wi-Fi 2.4 GHz	2462	11.00	13	0.9	180	5.1	28	160.3		4.1 -MEASURE-	> 50 mm	4.1 -MEASURE-	0.7 -EXEMPT-	> 50 mm	
Wi-Fi 5.2 GHz	5240	7.50	6	0.9	180	5.1	28	160.3		2.7 -EXEMPT-	> 50 mm	2.7 -EXEMPT-	0.5 -EXEMPT-	> 50 mm	
Wi-Fi 5.3 GHz	5320	7.50	6	0.9	180	5.1	28	160.3		2.8 -EXEMPT-	> 50 mm	2.8 -EXEMPT-	0.5 -EXEMPT-	> 50 mm	
Wi-Fi 5.5 GHz	5700	7.50	6	0.9	180	5.1	28	160.3		2.9 -EXEMPT-	> 50 mm	2.9 -EXEMPT-	0.5 -EXEMPT-	> 50 mm	
Wi-Fi 5.8 GHz	5825	7.50	6	0.9	180	5.1	28	160.3		2.9 -EXEMPT-	> 50 mm	2.9 -EXEMPT-	0.5 -EXEMPT-	> 50 mm	

Note(s):

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

Sub Antenna < 50mm to adjacent edges

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
Wi-Fi Sub Antenna Max Power															
Wi-Fi 2.4 GHz	2462	15.50	35	0.8	221	65.8	4.29	81		11 -MEASURE-	> 50 mm	> 50 mm	11 -MEASURE-	> 50 mm	
Wi-Fi 5.2 GHz	5240	11.50	14	0.8	221	65.8	4.29	81		6.4 -MEASURE-	> 50 mm	> 50 mm	6.4 -MEASURE-	> 50 mm	
Wi-Fi 5.3 GHz	5320	11.50	14	0.8	221	65.8	4.29	81		6.5 -MEASURE-	> 50 mm	> 50 mm	6.5 -MEASURE-	> 50 mm	
Wi-Fi 5.5 GHz	5700	11.50	14	0.8	221	65.8	4.29	81		6.7 -MEASURE-	> 50 mm	> 50 mm	6.7 -MEASURE-	> 50 mm	
Wi-Fi 5.8 GHz	5825	11.50	14	0.8	221	65.8	4.29	81		6.8 -MEASURE-	> 50 mm	> 50 mm	6.8 -MEASURE-	> 50 mm	
Wi-Fi Sub Antenna Reduced Power															
Wi-Fi 2.4 GHz	2462	11.00	13	0.8	221	65.8	4.29	81		4.1 -MEASURE-	> 50 mm	> 50 mm	4.1 -MEASURE-	> 50 mm	
Wi-Fi 5.2 GHz	5240	7.50	6	0.8	221	65.8	4.29	81		2.7 -EXEMPT-	> 50 mm	> 50 mm	2.7 -EXEMPT-	> 50 mm	
Wi-Fi 5.3 GHz	5320	7.50	6	0.8	221	65.8	4.29	81		2.8 -EXEMPT-	> 50 mm	> 50 mm	2.8 -EXEMPT-	> 50 mm	
Wi-Fi 5.5 GHz	5700	7.50	6	0.8	221	65.8	4.29	81		2.9 -EXEMPT-	> 50 mm	> 50 mm	2.9 -EXEMPT-	> 50 mm	
Wi-Fi 5.8 GHz	5825	7.50	6	0.8	221	65.8	4.29	81		2.9 -EXEMPT-	> 50 mm	> 50 mm	2.9 -EXEMPT-	> 50 mm	

Note(s):

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

Main Antennas > 50mm to adjacent edges

Interface	(MHz)	dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Main Antenna Max Power															
Wi-Fi 2.4 GHz	2462	15.50	35	0.9	180	5.1	28	160.3		< 50 mm	1395.6 mW -EXEMPT-	< 50 mm	< 50 mm	1198.6 mW -EXEMPT-	
Wi-Fi 5.2 GHz	5240	11.50	14	0.9	180	5.1	28	160.3		< 50 mm	1365.5 mW -EXEMPT-	< 50 mm	< 50 mm	1168.5 mW -EXEMPT-	
Wi-Fi 5.3 GHz	5320	11.50	14	0.9	180	5.1	28	160.3		< 50 mm	1365 mW -EXEMPT-	< 50 mm	< 50 mm	1168 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	11.50	14	0.9	180	5.1	28	160.3		< 50 mm	1362.8 mW -EXEMPT-	< 50 mm	< 50 mm	1165.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	11.50	14	0.9	180	5.1	28	160.3		< 50 mm	1362.2 mW -EXEMPT-	< 50 mm	< 50 mm	1165.2 mW -EXEMPT-	
Bluetooth	2480	11.50	14	0.9	180	5.1	28	160.3		< 50 mm	1395.3 mW -EXEMPT-	< 50 mm	< 50 mm	1198.3 mW -EXEMPT-	
Wi-Fi Main Antenna Reduced Power															
Wi-Fi 2.4 GHz	2462	11.00	13	0.9	180	5.1	28	160.3		< 50 mm	1395.6 mW -EXEMPT-	< 50 mm	< 50 mm	1198.6 mW -EXEMPT-	
Wi-Fi 5.2 GHz	5240	7.50	6	0.9	180	5.1	28	160.3		< 50 mm	1365.5 mW -EXEMPT-	< 50 mm	< 50 mm	1168.5 mW -EXEMPT-	
Wi-Fi 5.3 GHz	5320	7.50	6	0.9	180	5.1	28	160.3		< 50 mm	1365 mW -EXEMPT-	< 50 mm	< 50 mm	1168 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	7.50	6	0.9	180	5.1	28	160.3		< 50 mm	1362.8 mW -EXEMPT-	< 50 mm	< 50 mm	1165.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	7.50	6	0.9	180	5.1	28	160.3		< 50 mm	1362.2 mW -EXEMPT-	< 50 mm	< 50 mm	1165.2 mW -EXEMPT-	

Note(s):

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

Sub Antennas > 50mm to adjacent edges

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
Wi-Fi Sub Antenna Max Power															
Wi-Fi 2.4 GHz	2462	15.50	35	0.8	221	65.8	4.29	81		< 50 mm	1805.6 mW -EXEMPT-	253.6 mW -EXEMPT-	< 50 mm	405.6 mW -EXEMPT-	
Wi-Fi 5.2 GHz	5240	11.50	14	0.8	221	65.8	4.29	81		< 50 mm	1775.5 mW -EXEMPT-	223.5 mW -EXEMPT-	< 50 mm	375.5 mW -EXEMPT-	
Wi-Fi 5.3 GHz	5320	11.50	14	0.8	221	65.8	4.29	81		< 50 mm	1775 mW -EXEMPT-	223 mW -EXEMPT-	< 50 mm	375 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	11.50	14	0.8	221	65.8	4.29	81		< 50 mm	1772.8 mW -EXEMPT-	220.8 mW -EXEMPT-	< 50 mm	372.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	11.50	14	0.8	221	65.8	4.29	81		< 50 mm	1772.2 mW -EXEMPT-	220.2 mW -EXEMPT-	< 50 mm	372.2 mW -EXEMPT-	
Wi-Fi Sub Antenna Reduced Power															
Wi-Fi 2.4 GHz	2462	11.00	13	0.8	221	65.8	4.29	81		< 50 mm	1805.6 mW -EXEMPT-	253.6 mW -EXEMPT-	< 50 mm	405.6 mW -EXEMPT-	
Wi-Fi 5.2 GHz	5240	7.50	6	0.8	221	65.8	4.29	81		< 50 mm	1775.5 mW -EXEMPT-	223.5 mW -EXEMPT-	< 50 mm	375.5 mW -EXEMPT-	
Wi-Fi 5.3 GHz	5320	7.50	6	0.8	221	65.8	4.29	81		< 50 mm	1775 mW -EXEMPT-	223 mW -EXEMPT-	< 50 mm	375 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	7.50	6	0.8	221	65.8	4.29	81		< 50 mm	1772.8 mW -EXEMPT-	220.8 mW -EXEMPT-	< 50 mm	372.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	7.50	6	0.8	221	65.8	4.29	81		< 50 mm	1772.2 mW -EXEMPT-	220.2 mW -EXEMPT-	< 50 mm	372.2 mW -EXEMPT-	

Note(s):

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

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	Pwr Back-off	Rear	Edge 1 (Top Edge)	Edge 2 (Right Edge)	Edge 3 (Bottom Edge)	Edge 4 (Left Edge)
GSM850	Off	Yes	Yes	Yes	No	Yes
	On	Yes	Yes	No	No	No
GSM1900	Off	Yes	Yes	Yes	No	Yes
	On	Yes	Yes	No	No	No
WCDMA Band II	Off	Yes	Yes	Yes	No	Yes
	On	Yes	Yes	No	No	No
WCDMA Band V	Off	Yes	Yes	Yes	No	Yes
	On	Yes	Yes	No	No	No
LTE Band 2	Off	Yes	Yes	Yes	No	Yes
	On	Yes	Yes	No	No	No
LTE Band 4	Off	Yes	Yes	Yes	No	Yes
	On	Yes	Yes	No	No	No
LTE Band 5	Off	Yes	Yes	Yes	No	Yes
	On	Yes	Yes	No	No	No
LTE Band 17	Off	Yes	Yes	Yes	No	Yes
	On	Yes	Yes	No	No	No
Wi-Fi 2.4 GHz (Main Antenna)	Off	Yes	No	Yes	No	No
	On	Yes	No	Yes	No	No
Wi-Fi 2.4 GHz (Sub Antenna)	Off	Yes	No	No	Yes	No
	On	Yes	No	No	Yes	No
Wi-Fi 5 GHz (Main Antenna)	Off	Yes	No	Yes	No	No
	On	No	No	No	No	No
Wi-Fi 5 GHz (Sub Antenna)	Off	Yes	No	No	Yes	No
	On	No	No	No	No	No
Bluetooth	Off	Yes	No	Yes	No	No

Note(s):

Yes = Testing is required.

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 1 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
2-11-2016	Body 835	e'	57.5400	Relative Permittivity (ε_r):	57.54	55.20	4.24	5
		e"	20.7800	Conductivity (σ):	0.96	0.97	-0.54	5
	Body 820	e'	57.6200	Relative Permittivity (ε_r):	57.62	55.28	4.24	5
		e"	20.8600	Conductivity (σ):	0.95	0.97	-1.79	5
	Body 850	e'	57.3300	Relative Permittivity (ε_r):	57.33	55.16	3.94	5
		e"	20.7200	Conductivity (σ):	0.98	0.99	-0.80	5
2-15-2016	Body 835	e'	53.7200	Relative Permittivity (ε_r):	53.72	55.20	-2.68	5
		e"	21.5500	Conductivity (σ):	1.00	0.97	3.15	5
	Body 820	e'	53.8300	Relative Permittivity (ε_r):	53.83	55.28	-2.62	5
		e"	21.6900	Conductivity (σ):	0.99	0.97	2.12	5
	Body 850	e'	53.5700	Relative Permittivity (ε_r):	53.57	55.16	-2.88	5
		e"	21.4200	Conductivity (σ):	1.01	0.99	2.56	5
2-18-2016	Body 750	e'	54.4200	Relative Permittivity (ε_r):	54.42	55.55	-2.03	5
		e"	22.9300	Conductivity (σ):	0.96	0.96	-0.71	5
	Body 700	e'	55.0100	Relative Permittivity (ε_r):	55.01	55.74	-1.31	5
		e"	23.4400	Conductivity (σ):	0.91	0.96	-4.89	5
	Body 790	e'	54.0300	Relative Permittivity (ε_r):	54.03	55.39	-2.46	5
		e"	22.7400	Conductivity (σ):	1.00	0.97	3.39	5
2-25-2016	Body 750	e'	56.1100	Relative Permittivity (ε_r):	56.11	55.55	1.02	5
		e"	23.1100	Conductivity (σ):	0.96	0.96	0.07	5
	Body 700	e'	56.6000	Relative Permittivity (ε_r):	56.60	55.74	1.55	5
		e"	23.5700	Conductivity (σ):	0.92	0.96	-4.36	5
	Body 790	e'	55.7000	Relative Permittivity (ε_r):	55.70	55.39	0.56	5
		e"	22.8400	Conductivity (σ):	1.00	0.97	3.84	5
3-2-2016	Body 2450	e'	52.5000	Relative Permittivity (ε_r):	52.50	52.70	-0.38	5
		e"	14.6000	Conductivity (σ):	1.99	1.95	2.00	5
	Body 2410	e'	52.6400	Relative Permittivity (ε_r):	52.64	52.76	-0.23	5
		e"	14.4800	Conductivity (σ):	1.94	1.91	1.72	5
	Body 2475	e'	52.4300	Relative Permittivity (ε_r):	52.43	52.67	-0.45	5
		e"	14.7000	Conductivity (σ):	2.02	1.99	1.91	5
3-5-2016	Body 2450	e'	51.8500	Relative Permittivity (ε_r):	51.85	52.70	-1.61	5
		e"	14.2900	Conductivity (σ):	1.95	1.95	-0.17	5
	Body 2410	e'	51.9300	Relative Permittivity (ε_r):	51.93	52.76	-1.57	5
		e"	14.1600	Conductivity (σ):	1.90	1.91	-0.52	5
	Body 2475	e'	51.5800	Relative Permittivity (ε_r):	51.58	52.67	-2.07	5
		e"	14.3600	Conductivity (σ):	1.98	1.99	-0.45	5
3-28-2016	Body 2450	e'	51.0200	Relative Permittivity (ε_r):	51.02	52.70	-3.19	5
		e"	13.9600	Conductivity (σ):	1.90	1.95	-2.47	5
	Body 2410	e'	51.1300	Relative Permittivity (ε_r):	51.13	52.76	-3.09	5
		e"	13.7900	Conductivity (σ):	1.85	1.91	-3.12	5
	Body 2475	e'	50.9600	Relative Permittivity (ε_r):	50.96	52.67	-3.24	5
		e"	14.0800	Conductivity (σ):	1.94	1.99	-2.39	5
4-26-2016	Body 1750	e'	55.9800	Relative Permittivity (ε_r):	55.98	53.44	4.75	5
		e"	14.9000	Conductivity (σ):	1.45	1.49	-2.44	5
	Body 1710	e'	56.1400	Relative Permittivity (ε_r):	56.14	53.54	4.85	5
		e"	14.8300	Conductivity (σ):	1.41	1.46	-3.52	5
	Body 1755	e'	55.9500	Relative Permittivity (ε_r):	55.95	53.43	4.72	5
		e"	14.9100	Conductivity (σ):	1.45	1.49	-2.30	5
4-26-2016	Body 1900	e'	55.3300	Relative Permittivity (ε_r):	55.33	53.30	3.81	5
		e"	14.8900	Conductivity (σ):	1.57	1.52	3.49	5
	Body 1850	e'	55.5100	Relative Permittivity (ε_r):	55.51	53.30	4.15	5
		e"	14.9400	Conductivity (σ):	1.54	1.52	1.11	5
	Body 1910	e'	55.3000	Relative Permittivity (ε_r):	55.30	53.30	3.75	5
		e"	14.8900	Conductivity (σ):	1.58	1.52	4.04	5

SAR 1 Room (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4-30-2016	Body 1900	e'	52.0902	Relative Permittivity (ε_r):	52.09	53.30	-2.27	5
		e"	14.8789	Conductivity (σ):	1.57	1.52	3.41	5
	Body 1850	e'	52.2292	Relative Permittivity (ε_r):	52.23	53.30	-2.01	5
		e"	14.9709	Conductivity (σ):	1.54	1.52	1.32	5
	Body 1910	e'	52.0757	Relative Permittivity (ε_r):	52.08	53.30	-2.30	5
		e"	14.8658	Conductivity (σ):	1.58	1.52	3.87	5

SAR 2 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
2-22-2016	Body 835	e'	54.5400	Relative Permittivity (ε_r):	54.54	55.20	-1.20	5
		e"	21.5400	Conductivity (σ):	1.00	0.97	3.10	5
	Body 820	e'	54.6500	Relative Permittivity (ε_r):	54.65	55.28	-1.13	5
		e"	21.6300	Conductivity (σ):	0.99	0.97	1.83	5
	Body 850	e'	54.4400	Relative Permittivity (ε_r):	54.44	55.16	-1.30	5
		e"	21.4600	Conductivity (σ):	1.01	0.99	2.75	5
3-2-2016	Body 5180	e'	48.2200	Relative Permittivity (ε_r):	48.22	49.05	-1.69	10
		e"	17.8500	Conductivity (σ):	5.14	5.27	-2.47	5
	Body 5200	e'	48.1900	Relative Permittivity (ε_r):	48.19	49.02	-1.69	10
		e"	17.8800	Conductivity (σ):	5.17	5.29	-2.36	5
	Body 5600	e'	47.5400	Relative Permittivity (ε_r):	47.54	48.48	-1.93	10
		e"	18.2800	Conductivity (σ):	5.69	5.76	-1.20	5
	Body 5800	e'	47.2500	Relative Permittivity (ε_r):	47.25	48.20	-1.97	10
		e"	18.4900	Conductivity (σ):	5.96	6.00	-0.62	5
	Body 5825	e'	47.2100	Relative Permittivity (ε_r):	47.21	48.20	-2.05	10
		e"	18.5200	Conductivity (σ):	6.00	6.00	-0.03	5
3-6-2016	Body 5180	e'	48.0000	Relative Permittivity (ε_r):	48.00	49.05	-2.13	10
		e"	18.2500	Conductivity (σ):	5.26	5.27	-0.28	5
	Body 5200	e'	47.9500	Relative Permittivity (ε_r):	47.95	49.02	-2.18	10
		e"	18.2700	Conductivity (σ):	5.28	5.29	-0.23	5
	Body 5600	e'	47.2600	Relative Permittivity (ε_r):	47.26	48.48	-2.51	10
		e"	18.6300	Conductivity (σ):	5.80	5.76	0.69	5
	Body 5800	e'	46.9400	Relative Permittivity (ε_r):	46.94	48.20	-2.61	10
		e"	18.8000	Conductivity (σ):	6.06	6.00	1.05	5
	Body 5825	e'	46.8800	Relative Permittivity (ε_r):	46.88	48.20	-2.74	10
		e"	18.8500	Conductivity (σ):	6.11	6.00	1.75	5
3-9-2016	Body 1750	e'	53.7300	Relative Permittivity (ε_r):	53.73	53.44	0.54	5
		e"	14.8600	Conductivity (σ):	1.45	1.49	-2.70	5
	Body 1710	e'	53.7000	Relative Permittivity (ε_r):	53.70	53.54	0.29	5
		e"	14.8200	Conductivity (σ):	1.41	1.46	-3.59	5
	Body 1755	e'	53.7400	Relative Permittivity (ε_r):	53.74	53.43	0.58	5
		e"	14.8600	Conductivity (σ):	1.45	1.49	-2.63	5
4-21-2016	Body 1750	e'	53.8700	Relative Permittivity (ε_r):	53.87	53.44	0.80	5
		e"	14.7600	Conductivity (σ):	1.44	1.49	-3.36	5
	Body 1710	e'	53.9700	Relative Permittivity (ε_r):	53.97	53.54	0.80	5
		e"	14.7600	Conductivity (σ):	1.40	1.46	-3.98	5
	Body 1755	e'	53.8500	Relative Permittivity (ε_r):	53.85	53.43	0.79	5
		e"	14.7600	Conductivity (σ):	1.44	1.49	-3.28	5
4-21-2016	Body 1900	e'	53.4600	Relative Permittivity (ε_r):	53.46	53.30	0.30	5
		e"	14.9000	Conductivity (σ):	1.57	1.52	3.56	5
	Body 1850	e'	53.5600	Relative Permittivity (ε_r):	53.56	53.30	0.49	5
		e"	14.8500	Conductivity (σ):	1.53	1.52	0.50	5
	Body 1910	e'	53.4600	Relative Permittivity (ε_r):	53.46	53.30	0.30	5
		e"	14.9100	Conductivity (σ):	1.58	1.52	4.18	5

SAR 3 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
2-11-2016	Body 1900	e'	51.2300	Relative Permittivity (ε_r):	51.23	53.30	-3.88	5
		e"	14.9500	Conductivity (σ):	1.58	1.52	3.91	5
	Body 1850	e'	51.3400	Relative Permittivity (ε_r):	51.34	53.30	-3.68	5
		e"	14.9000	Conductivity (σ):	1.53	1.52	0.84	5
	Body 1910	e'	51.2100	Relative Permittivity (ε_r):	51.21	53.30	-3.92	5
		e"	14.9800	Conductivity (σ):	1.59	1.52	4.66	5
2-11-2016	Body 1750	e'	51.5900	Relative Permittivity (ε_r):	51.59	53.44	-3.46	5
		e"	14.8900	Conductivity (σ):	1.45	1.49	-2.51	5
	Body 1710	e'	51.7100	Relative Permittivity (ε_r):	51.71	53.54	-3.42	5
		e"	14.8500	Conductivity (σ):	1.41	1.46	-3.39	5
	Body 1755	e'	51.5800	Relative Permittivity (ε_r):	51.58	53.43	-3.46	5
		e"	14.8900	Conductivity (σ):	1.45	1.49	-2.43	5
2-15-2016	Body 1900	e'	54.1400	Relative Permittivity (ε_r):	54.14	53.30	1.58	5
		e"	14.9700	Conductivity (σ):	1.58	1.52	4.05	5
	Body 1850	e'	54.2600	Relative Permittivity (ε_r):	54.26	53.30	1.80	5
		e"	14.9200	Conductivity (σ):	1.53	1.52	0.97	5
	Body 1910	e'	54.1000	Relative Permittivity (ε_r):	54.10	53.30	1.50	5
		e"	14.9800	Conductivity (σ):	1.59	1.52	4.66	5
2-19-2016	Body 1900	e'	53.7800	Relative Permittivity (ε_r):	53.78	53.30	0.90	5
		e"	14.9600	Conductivity (σ):	1.58	1.52	3.98	5
	Body 1850	e'	53.9100	Relative Permittivity (ε_r):	53.91	53.30	1.14	5
		e"	14.9100	Conductivity (σ):	1.53	1.52	0.90	5
	Body 1910	e'	53.7500	Relative Permittivity (ε_r):	53.75	53.30	0.84	5
		e"	14.9900	Conductivity (σ):	1.59	1.52	4.73	5
2-23-2016	Body 1750	e'	51.6100	Relative Permittivity (ε_r):	51.61	53.44	-3.43	5
		e"	14.8300	Conductivity (σ):	1.44	1.49	-2.90	5
	Body 1710	e'	51.7400	Relative Permittivity (ε_r):	51.74	53.54	-3.37	5
		e"	14.6800	Conductivity (σ):	1.40	1.46	-4.50	5
	Body 1755	e'	51.5900	Relative Permittivity (ε_r):	51.59	53.43	-3.44	5
		e"	14.8400	Conductivity (σ):	1.45	1.49	-2.76	5
2-23-2016	Body 1900	e'	50.9200	Relative Permittivity (ε_r):	50.92	53.30	-4.47	5
		e"	15.0100	Conductivity (σ):	1.59	1.52	4.33	5
	Body 1850	e'	51.1600	Relative Permittivity (ε_r):	51.16	53.30	-4.02	5
		e"	14.9900	Conductivity (σ):	1.54	1.52	1.44	5
	Body 1910	e'	50.8800	Relative Permittivity (ε_r):	50.88	53.30	-4.54	5
		e"	15.0100	Conductivity (σ):	1.59	1.52	4.87	5
3-7-2016	Body 5180	e'	49.4800	Relative Permittivity (ε_r):	49.48	49.05	0.88	10
		e"	18.0100	Conductivity (σ):	5.19	5.27	-1.59	5
	Body 5200	e'	49.4400	Relative Permittivity (ε_r):	49.44	49.02	0.86	10
		e"	18.0300	Conductivity (σ):	5.21	5.29	-1.54	5
	Body 5600	e'	48.8200	Relative Permittivity (ε_r):	48.82	48.48	0.71	10
		e"	18.3900	Conductivity (σ):	5.73	5.76	-0.60	5
	Body 5800	e'	48.5300	Relative Permittivity (ε_r):	48.53	48.20	0.68	10
		e"	18.6000	Conductivity (σ):	6.00	6.00	-0.03	5
	Body 5825	e'	48.4900	Relative Permittivity (ε_r):	48.49	48.20	0.60	10
		e"	18.6300	Conductivity (σ):	6.03	6.00	0.57	5
3-11-2016	Body 5180	e'	48.7500	Relative Permittivity (ε_r):	48.75	49.05	-0.60	10
		e"	18.4000	Conductivity (σ):	5.30	5.27	0.54	5
	Body 5200	e'	48.7000	Relative Permittivity (ε_r):	48.70	49.02	-0.65	10
		e"	18.4300	Conductivity (σ):	5.33	5.29	0.64	5
	Body 5600	e'	48.0100	Relative Permittivity (ε_r):	48.01	48.48	-0.96	10
		e"	18.8400	Conductivity (σ):	5.87	5.76	1.83	5
	Body 5800	e'	47.6700	Relative Permittivity (ε_r):	47.67	48.20	-1.10	10
		e"	19.0500	Conductivity (σ):	6.14	6.00	2.39	5
	Body 5825	e'	47.6300	Relative Permittivity (ε_r):	47.63	48.20	-1.18	10
		e"	19.0900	Conductivity (σ):	6.18	6.00	3.05	5

SAR 3 Room (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4-18-2016	Body 1900	e'	51.0600	Relative Permittivity (ϵ_r):	51.06	53.30	-4.20	5
		e"	14.4200	Conductivity (σ):	1.52	1.52	0.22	5
	Body 1850	e'	51.2300	Relative Permittivity (ϵ_r):	51.23	53.30	-3.88	5
		e"	14.2100	Conductivity (σ):	1.46	1.52	-3.83	5
	Body 1910	e'	51.0200	Relative Permittivity (ϵ_r):	51.02	53.30	-4.28	5
		e"	14.4600	Conductivity (σ):	1.54	1.52	1.03	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	8-17-2015	750	1g	8.23	8.6
				10g	5.37	5.67
D835V2	4d194	9-17-2015	835	1g	9.38	9.49
				10g	6.09	6.18
D1750V2	1125	8-20-2015	1750	1g	36.7	37.2
				10g	19.5	20.0
D1900V2	5d199	2-19-2016	1900	1g	39.8	39.5
				10g	20.7	20.9
D1900V2	5d190	9-29-2015	1900	1g	39.70	39.60
				10g	20.70	20.80
D2450V2	939	9-28-2015	2450	1g	51.6	50.7
				10g	23.9	23.7
D5GHzV2	1184	8-26-2015	5200	1g	79.6	76.1
				10g	22.7	21.2
D5GHzV2	1184	8-26-2015	5600	1g	82.8	80.5
				10g	23.6	22.3
D5GHzV2	1184	8-26-2015	5800	1g	80.3	78.7
				10g	22.8	21.7

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 1 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			
02-11-2016	D835V2	4d194	Body	1g	0.96	9.56	9.49	0.74	
				10g	0.63	6.28	6.18	1.62	
02-15-2016	D835V2	4d194	Body	1g	0.98	9.84	9.49	3.69	
				10g	0.65	6.47	6.18	4.69	
02-18-2016	D750V3	1122	Body	1g	0.83	8.26	8.60	-3.95	1,2
				10g	0.55	5.50	5.67	-3.00	
02-25-2016	D750V3	1122	Body	1g	0.85	8.45	8.60	-1.74	
				10g	0.56	5.63	5.67	-0.71	
03-02-2016	D2450V2	939	Body	1g	5.36	53.60	50.70	5.72	3,4
				10g	2.42	24.20	23.70	2.11	
03-05-2016	D2450V2	939	Body	1g	5.34	53.40	50.70	5.33	
				10g	2.46	24.60	23.70	3.80	
03-28-2016	D2450V2	939	Body	1g	5.06	50.60	50.70	-0.20	5,6
				10g	2.33	23.30	23.70	-1.69	
04-26-2016	D1900V2	5d199	Body	1g	4.18	41.80	39.50	5.82	
				10g	2.16	21.60	20.90	3.35	
04-26-2016	D1750V2	1125	Body	1g	3.80	38.00	37.20	2.15	7,8
				10g	2.02	20.20	20.00	1.00	
04-30-2016	D1900V2	5d199	Body	1g	4.05	40.50	39.50	2.53	
				10g	2.08	20.80	20.90	-0.48	

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			
02-22-2016	D835V2	4d194	Body	1g	0.99	9.92	9.49	4.53	9,10
				10g	0.65	6.53	6.18	5.66	
03-02-2016	D5GHzV2	1184	Body	1g	8.05	80.50	76.10	5.78	
				10g	2.27	22.70	21.20	7.08	
03-02-2016	D5GHzV2	1184	Body	1g	8.72	87.20	80.50	8.32	11,12
				10g	2.42	24.20	22.30	8.52	
03-02-2016	D5GHzV2	1184	Body	1g	7.59	75.90	78.70	-3.56	
				10g	2.13	21.30	21.70	-1.84	
03-06-2016	D5GHzV2	1184	Body	1g	8.14	81.40	76.10	6.96	
				10g	2.28	22.80	21.20	7.55	
03-06-2016	D5GHzV2	1184	Body	1g	8.65	86.50	80.50	7.45	
				10g	2.40	24.00	22.30	7.62	
03-06-2016	D5GHzV2	1184	Body	1g	7.89	78.90	78.70	0.25	
				10g	2.20	22.00	21.70	1.38	
03-09-2016	D1750V2	1125	Body	1g	3.70	37.00	37.20	-0.54	
				10g	1.95	19.50	20.00	-2.50	
04-21-2016	D1750V2	1125	Body	1g	3.72	37.20	37.20	0.00	
				10g	1.97	19.70	20.00	-1.50	
04-21-2016	D1900V2	5d199	Body	1g	4.17	41.70	39.50	5.57	13,14
				10g	2.14	21.40	20.90	2.39	

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			
02-11-2016	D1750V2	1125	Body	1g	3.67	36.70	37.20	-1.34	15,16
				10g	1.93	19.30	20.00	-3.50	
02-11-2016	D1900V2	5d190	Body	1g	4.11	41.10	39.60	3.79	
				10g	2.09	20.90	20.80	0.48	
02-15-2016	D1900V2	5d190	Body	1g	4.08	40.80	39.60	3.03	
				10g	2.07	20.70	20.80	-0.48	
02-19-2016	D1900V2	5d190	Body	1g	4.16	41.60	39.60	5.05	17,18
				10g	2.11	21.10	20.80	1.44	
02-23-2016	D1750V2	1125	Body	1g	3.70	37.00	37.20	-0.54	
				10g	1.94	19.40	20.00	-3.00	
02-23-2016	D1900V2	5d190	Body	1g	4.10	41.00	39.60	3.54	
				10g	2.08	20.80	20.80	0.00	
03-07-2016	D5GHzV2	1184	Body	1g	7.45	74.50	76.10	-2.10	
				10g	2.12	21.20	21.20	0.00	
03-07-2016	D5GHzV2	1184	Body	1g	8.23	82.30	80.50	2.24	
				10g	2.27	22.70	22.30	1.79	
03-07-2016	D5GHzV2	1184	Body	1g	7.74	77.40	78.70	-1.65	
				10g	2.16	21.60	21.70	-0.46	
03-11-2016	D5GHzV2	1184	Body	1g	7.44	74.40	76.10	-2.23	
				10g	2.09	20.90	21.20	-1.42	
03-11-2016	D5GHzV2	1184	Body	1g	8.60	86.00	80.50	6.83	
				10g	2.38	23.80	22.30	6.73	
03-11-2016	D5GHzV2	1184	Body	1g	7.55	75.50	78.70	-4.07	
				10g	2.09	20.90	21.70	-3.69	
04-18-2016	D1900V2	5d199	Body	1g	4.11	41.10	39.50	4.05	
				10g	2.14	21.40	20.90	2.39	

9. Conducted Output Power Measurements

9.1. GSM

Per KDB 941225 D01 3G SAR Procedures:

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

GSM850 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr		Reduced Pwr	
						Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)
850	GPRS (Voice)	CS1	1	128	824.2	32.3	23.3	24.5	15.5
				190	836.6	32.3	23.2	24.5	15.5
				251	848.8	32.3	23.3	24.5	15.5
	GPRS (GMSK)	CS1	1	128	824.2	32.3	23.3	24.5	15.5
				190	836.6	32.2	23.2	24.5	15.4
				251	848.8	32.2	23.2	24.4	15.4
			2	128	824.2	30.3	24.3	23.3	17.2
				190	836.6	30.3	24.3	23.3	17.3
				251	848.8	30.2	24.2	23.2	17.2
			3	128	824.2	28.2	23.9	20.6	16.4
				190	836.6	28.3	24.0	20.7	16.4
				251	848.8	28.2	23.9	20.9	16.7
			4	128	824.2	25.9	22.9	18.5	15.5
				190	836.6	26.0	23.0	19.0	16.0
				251	848.8	26.0	22.9	18.7	15.7
	EGPRS (8PSK)	MCS5	1	128	824.2	27.7	18.7	20.9	11.9
				190	836.6	27.5	18.5	20.9	11.9
				251	848.8	27.5	18.4	20.7	11.7
			2	128	824.2	25.4	19.4	19.6	13.6
				190	836.6	25.4	19.4	19.7	13.7
				251	848.8	25.3	19.3	19.6	13.6
			3	128	824.2	23.3	19.0	16.5	12.3
				190	836.6	23.3	19.0	16.4	12.2
				251	848.8	23.2	18.9	16.5	12.2
			4	128	824.2	22.5	19.5	15.3	12.3
				190	836.6	22.5	19.5	15.3	12.3
				251	848.8	22.5	19.5	15.3	12.3

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 2 time slots 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. Pwr		Reduced Pwr	
						Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)
1900	GPRS (Voice)	CS1	1	512	1850.2	30.8	21.8	19.8	10.7
				661	1880.0	30.7	21.7	19.7	10.7
				810	1909.8	30.9	21.9	19.5	10.5
	GPRS (GMSK)	CS1	1	512	1850.2	30.9	21.9	19.8	10.8
				661	1880.0	30.8	21.8	19.8	10.7
				810	1909.8	31.0	21.9	19.6	10.5
			2	512	1850.2	28.6	22.6	18.7	12.7
				661	1880.0	28.5	22.5	18.7	12.7
				810	1909.8	28.4	22.4	18.4	12.4
			3	512	1850.2	26.7	22.4	15.4	11.2
				661	1880.0	26.4	22.2	15.5	11.2
				810	1909.8	26.3	22.0	15.3	11.1
			4	512	1850.2	25.5	22.5	14.8	11.8
				661	1880.0	25.3	22.3	13.8	10.8
				810	1909.8	25.2	22.2	14.5	11.5
	EGPRS (8PSK)	MCS5	1	512	1850.2	26.9	17.9	18.5	9.5
				661	1880.0	26.7	17.6	18.5	9.5
				810	1909.8	26.6	17.5	18.4	9.4
			2	512	1850.2	26.3	20.3	18.0	12.0
				661	1880.0	26.0	20.0	17.8	11.7
				810	1909.8	25.9	19.9	17.6	11.6
			3	512	1850.2	24.2	20.0	14.3	10.0
				661	1880.0	24.0	19.7	14.2	9.9
				810	1909.8	23.8	19.5	14.0	9.8
			4	512	1850.2	23.1	20.1	13.4	10.4
				661	1880.0	22.8	19.8	13.2	10.2
				810	1909.8	22.7	19.6	13.1	10.1

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 2 time slots 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 5 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	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	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 Channelization Codes	2xSF2				SF4

W-CDMA Band II Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)	Reduced Pwr (dBm)
W-CDMA Band II	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	23.7	11.1
			9400	1880.0	N/A	23.3	10.9
			9538	1907.6	N/A	23.4	10.5
	HSDPA	Subtest 1	9262	1852.4	0	22.3	9.5
			9400	1880.0	0	21.8	9.3
			9538	1907.6	0	21.8	9.0
		Subtest 2	9262	1852.4	0	21.7	9.1
			9400	1880.0	0	21.7	9.0
			9538	1907.6	0	21.8	9.0
		Subtest 3	9262	1852.4	0.5	21.6	9.0
			9400	1880.0	0.5	21.3	8.8
			9538	1907.6	0.5	21.3	8.5
		Subtest 4	9262	1852.4	0.5	21.6	9.0
			9400	1880.0	0.5	21.3	8.8
			9538	1907.6	0.5	21.3	8.5
	HSUPA	Subtest 1	9262	1852.4	0	22.1	9.5
			9400	1880.0	0	21.9	9.3
			9538	1907.6	0	21.8	9.0
		Subtest 2	9262	1852.4	2	20.7	8.0
			9400	1880.0	2	20.3	7.9
			9538	1907.6	2	20.1	7.5
		Subtest 3	9262	1852.4	1	21.1	8.5
			9400	1880.0	1	20.8	8.3
			9538	1907.6	1	20.8	8.0
		Subtest 4	9262	1852.4	2	20.7	8.0
			9400	1880.0	2	20.4	7.9
			9538	1907.6	2	20.2	7.5
		Subtest 5	9262	1852.4	0	22.0	9.5
			9400	1880.0	0	21.9	9.3
			9538	1907.6	0	21.8	9.0

W-CDMA Band IV Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)	Reduced Pwr (dBm)
W-CDMA Band IV	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	22.2	12.3
			1413	1732.6	N/A	22.2	12.5
			1513	1752.6	N/A	22.1	11.5
	HSDPA	Subtest 1	1312	1712.4	0	22.2	12.4
			1413	1732.6	0	22.1	12.5
			1513	1752.6	0	22.1	11.5
		Subtest 2	1312	1712.4	0	20.9	12.0
			1413	1732.6	0	20.9	12.1
			1513	1752.6	0	20.8	11.1
		Subtest 3	1312	1712.4	0.5	20.7	11.9
			1413	1732.6	0.5	20.7	12.0
			1513	1752.6	0.5	20.6	11.0
		Subtest 4	1312	1712.4	0.5	20.7	11.9
			1413	1732.6	0.5	20.7	12.0
			1513	1752.6	0.5	20.6	11.0
	HSUPA	Subtest 1	1312	1712.4	0	21.4	11.4
			1413	1732.6	0	21.3	11.7
			1513	1752.6	0	21.5	10.7
		Subtest 2	1312	1712.4	2	19.2	10.4
			1413	1732.6	2	19.0	10.5
			1513	1752.6	2	19.0	9.5
		Subtest 3	1312	1712.4	1	20.2	11.4
			1413	1732.6	1	20.1	11.5
			1513	1752.6	1	20.1	10.5
		Subtest 4	1312	1712.4	2	19.2	10.4
			1413	1732.6	2	19.0	10.5
			1513	1752.6	2	19.0	9.5
		Subtest 5	1312	1712.4	0	22.2	12.3
			1413	1732.6	0	22.1	12.5
			1513	1752.6	0	22.1	11.4

W-CDMA Band V Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)	Reduced Pwr (dBm)
W-CDMA Band V	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	22.5	14.2
			4183	836.6	N/A	22.3	14.4
			4233	846.6	N/A	22.3	14.5
	HSDPA	Subtest 1	4132	826.4	0	21.4	13.3
			4183	836.6	0	21.3	13.4
			4233	846.6	0	21.3	13.6
		Subtest 2	4132	826.4	0	22.2	14.2
			4183	836.6	0	22.0	14.3
			4233	846.6	0	22.1	14.3
		Subtest 3	4132	826.4	0.5	22.5	14.5
			4183	836.6	0.5	22.3	14.5
			4233	846.6	0.5	22.3	14.5
		Subtest 4	4132	826.4	0.5	22.5	14.5
			4183	836.6	0.5	22.3	14.5
			4233	846.6	0.5	22.3	14.5
	HSUPA	Subtest 1	4132	826.4	0	21.4	13.3
			4183	836.6	0	21.4	13.4
			4233	846.6	0	21.3	13.5
		Subtest 2	4132	826.4	2	18.5	10.3
			4183	836.6	2	18.3	11.0
			4233	846.6	2	18.2	10.5
		Subtest 3	4132	826.4	1	19.5	11.2
			4183	836.6	1	19.4	11.4
			4233	846.6	1	19.4	11.4
		Subtest 4	4132	826.4	2	18.4	10.3
			4183	836.6	2	18.4	10.5
			4233	846.6	2	18.2	10.5
		Subtest 5	4132	826.4	0	21.4	13.3
			4183	836.6	0	21.4	13.4
			4233	846.6	0	21.3	13.6

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 Signaling 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	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						1860 MHz	1880 MHz	1900 MHz		1860 MHz	1880 MHz	1900 MHz
LTE Band 2	20	QPSK	1	0	0	22.7	22.9	22.8	0	14.0	14.2	13.0
			1	50	0	22.2	23.0	22.8	0	14.2	14.4	14.2
			1	99	0	22.4	23.0	22.4	0	14.0	14.3	13.0
			50	0	1	21.6	21.7	21.7	1	12.7	12.9	12.7
			50	25	1	21.7	21.7	21.6	1	13.1	12.9	13.0
			50	50	1	21.8	21.7	21.7	1	13.1	12.6	12.6
			100	0	1	21.7	21.8	21.6	1	12.9	12.6	12.6
		16QAM	1	0	1	21.4	21.5	21.5	1	12.9	13.2	12.4
			1	50	1	21.5	21.5	21.2	1	13.5	13.3	13.4
			1	99	1	21.5	21.3	20.8	1	13.4	12.9	12.5
			50	0	2	20.7	20.8	20.7	2	11.7	11.8	11.7
			50	25	2	20.8	20.8	20.7	2	12.2	12.0	12.0
			50	50	2	20.8	20.7	20.6	2	12.1	11.6	11.6
			100	0	2	20.7	20.8	20.7	2	11.9	11.6	11.7

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						1857.5 MHz	1880 MHz	1902.5 MHz		1857.5 MHz	1880 MHz	1902.5 MHz
LTE Band 2	15	QPSK	1	0	0	22.8	22.6	22.8	0	14.1	14.0	13.6
			1	36	0	22.8	22.8	22.7	0	14.1	14.2	13.9
			1	74	0	22.7	22.8	22.5	0	14.1	13.9	13.0
			36	0	1	21.7	21.7	21.6	1	12.7	12.8	12.8
			36	18	1	21.7	21.7	21.6	1	13.1	12.9	13.0
			36	37	1	21.7	21.6	21.6	1	13.0	12.5	12.6
			75	0	1	21.6	21.7	21.6	1	12.8	12.6	12.7
		16QAM	1	0	1	21.7	21.2	22.0	1	12.5	13.0	13.0
			1	36	1	22.0	21.2	22.0	1	12.9	13.2	13.3
			1	74	1	22.0	21.4	22.0	1	12.9	12.5	12.5
			36	0	2	20.6	20.7	20.7	2	11.7	11.9	11.8
			36	18	2	20.7	20.8	20.7	2	12.1	12.0	12.0
			36	37	2	20.6	20.6	20.6	2	12.0	11.6	11.6
			75	0	2	20.7	20.8	20.6	2	11.9	11.6	11.8

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						1855 MHz	1880 MHz	1905 MHz		1855 MHz	1880 MHz	1905 MHz
LTE Band 2	10	QPSK	1	0	0	22.9	22.7	22.6	0	14.1	14.1	13.8
			1	25	0	22.7	22.6	23.0	0	13.9	14.1	13.7
			1	49	0	22.5	22.5	22.7	0	14.1	14.0	13.2
			25	0	1	21.6	21.7	21.7	1	12.8	12.9	12.9
			25	12	1	21.7	21.7	21.7	1	13.0	12.9	12.8
			25	25	1	21.7	21.7	21.7	1	13.0	12.7	12.6
			50	0	1	21.6	21.8	21.7	1	12.9	12.7	12.7
		16QAM	1	0	1	21.7	21.5	21.6	1	12.8	13.2	12.9
			1	25	1	21.8	21.6	21.8	1	12.8	13.3	12.8
			1	49	1	21.3	21.4	21.4	1	13.0	12.7	12.3
			25	0	2	20.4	20.8	20.8	2	11.8	12.0	12.0
			25	12	2	20.4	20.9	20.8	2	12.0	12.0	11.9
			25	25	2	20.6	20.6	21.0	2	12.0	11.8	11.7
			50	0	2	20.6	20.8	20.8	2	11.9	11.7	11.8

LTE Band 2 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						1852.5 MHz	1880 MHz	1907.5 MHz		1852.5 MHz	1880 MHz	1907.5 MHz
LTE Band 2	5	QPSK	1	0	0	22.5	22.6	22.7	0	13.9	13.9	13.5
			1	12	0	22.7	22.8	22.8	0	14.1	14.2	13.5
			1	24	0	22.4	22.6	22.6	0	13.8	13.8	13.2
			12	0	1	21.6	21.8	21.7	1	12.9	12.8	12.5
			12	6	1	21.7	21.8	21.6	1	13.1	12.9	12.7
			12	11	1	21.6	21.8	21.5	1	13.0	12.8	12.6
			25	0	1	21.7	21.7	21.6	1	12.9	12.8	12.5
		16QAM	1	0	1	21.2	21.7	21.1	1	13.1	13.2	12.7
			1	12	1	21.4	21.8	21.1	1	13.1	13.4	12.7
			1	24	1	21.1	21.0	21.1	1	12.9	13.0	12.4
			12	0	2	20.5	20.8	20.7	2	12.0	11.9	11.6
			12	6	2	20.5	20.8	20.7	2	12.2	12.1	11.8
			12	11	2	20.6	20.7	20.6	2	12.1	11.9	11.7
			25	0	2	20.8	20.8	20.6	2	12.0	11.8	11.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						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	22.7	0	14.1	14.1	13.7
			1	7	0	22.7	22.9	22.7	0	14.1	14.3	13.5
			1	14	0	22.4	22.9	22.6	0	14.0	14.3	13.4
			8	0	1	21.6	21.8	21.6	1	12.9	12.9	12.6
			8	4	1	21.7	21.8	21.6	1	13.0	13.0	12.6
			8	7	1	21.6	21.8	21.7	1	13.0	13.0	12.6
			15	0	1	21.6	21.7	21.6	1	13.0	12.9	12.6
		16QAM	1	0	1	21.9	21.4	21.8	1	13.0	13.3	12.8
			1	7	1	21.8	21.5	21.6	1	13.0	13.3	12.6
			1	14	1	21.4	21.6	21.4	1	13.0	13.1	12.5
			8	0	2	20.4	20.4	20.7	2	12.1	11.8	11.8
			8	4	2	20.4	20.5	20.7	2	12.2	11.8	11.8
			8	7	2	20.4	20.5	20.8	2	12.2	11.8	11.8
			15	0	2	20.6	20.7	20.8	2	12.0	11.9	11.6
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						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	22.6	22.4	22.5	0	14.1	14.0	13.3
			1	2	0	22.5	22.5	22.8	0	14.2	14.1	13.5
			1	5	0	22.8	22.6	22.6	0	14.1	13.9	13.2
			3	0	0	22.5	22.6	22.8	0	14.0	14.1	13.4
			3	1	0	22.7	22.7	22.7	0	14.2	14.2	13.5
			3	2	0	22.5	22.8	22.8	0	14.2	14.1	13.4
			6	0	1	21.6	21.7	21.5	1	13.0	12.9	12.5
		16QAM	1	0	1	21.9	21.4	21.6	1	13.0	13.1	12.3
			1	2	1	22.0	21.4	21.7	1	13.1	13.3	12.5
			1	5	1	22.0	21.4	21.5	1	13.0	13.1	12.3
			3	0	1	21.9	21.3	21.7	1	13.0	13.1	12.6
			3	1	1	21.6	21.3	21.7	1	13.1	13.1	12.6
			3	2	1	21.4	21.4	21.5	1	13.0	13.1	12.6
			6	0	2	20.8	20.5	20.7	2	12.2	11.9	11.7

LTE Band 4 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						1720 MHz	1732.5 MHz	1745 MHz		1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	0	21.5	21.3	21.2	0	14.0	13.3	13.6
			1	50	0	21.4	21.4	21.7	0	14.0	13.1	13.3
			1	99	0	21.1	21.3	21.5	0	13.0	12.8	13.5
			50	0	1	20.4	20.3	20.2	1	12.9	12.3	11.9
			50	25	1	20.3	20.2	20.4	1	13.0	12.1	12.3
			50	50	1	20.1	20.2	20.5	1	12.6	11.9	12.4
			100	0	1	20.3	20.2	20.4	1	12.6	12.0	12.2
		16QAM	1	0	1	20.7	20.6	20.0	1	12.9	12.7	11.8
			1	50	1	20.4	19.9	20.3	1	13.4	12.5	12.7
			1	99	1	19.9	19.7	20.5	1	12.5	12.2	13.0
			50	0	2	19.4	19.2	19.2	2	11.9	11.3	10.9
			50	25	2	19.2	19.2	19.3	2	12.1	11.2	11.4
			50	50	2	19.0	19.0	19.4	2	11.6	10.9	11.4
			100	0	2	19.2	19.1	19.3	2	11.7	11.0	11.2
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						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	21.5	21.2	21.2	0	14.0	13.2	12.7
			1	36	0	21.3	21.1	21.6	0	14.0	13.0	13.5
			1	74	0	21.1	21.0	21.4	0	13.4	12.6	13.6
			36	0	1	20.4	20.3	20.3	1	12.9	12.3	12.2
			36	18	1	20.3	20.1	20.6	1	13.0	12.2	12.5
			36	37	1	20.2	20.0	20.6	1	12.8	11.9	12.7
			75	0	1	20.2	20.2	20.5	1	13.0	12.1	12.6
		16QAM	1	0	1	20.0	19.8	20.6	1	12.6	12.6	12.1
			1	36	1	20.5	20.2	20.9	1	13.0	12.4	12.9
			1	74	1	20.0	19.8	20.8	1	12.3	12.0	13.0
			36	0	2	19.4	19.4	19.3	2	11.9	11.4	11.2
			36	18	2	19.2	19.2	19.4	2	12.0	11.3	11.5
			36	37	2	19.2	19.1	19.4	2	11.9	11.0	11.7
			75	0	2	19.4	19.1	19.5	2	12.0	11.2	11.6
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						1715 MHz	1732.5 MHz	1750 MHz		1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	21.5	21.1	21.3	0	13.9	13.1	13.3
			1	25	0	21.4	21.0	21.4	0	14.0	13.1	13.7
			1	49	0	21.2	21.0	21.3	0	13.8	12.8	13.8
			25	0	1	20.4	20.2	20.6	1	13.0	12.3	12.7
			25	12	1	20.4	20.1	20.5	1	13.0	12.1	12.8
			25	25	1	20.2	20.1	20.6	1	13.2	12.1	12.9
			50	0	1	20.4	20.2	20.6	1	13.1	12.2	12.7
		16QAM	1	0	1	19.9	20.0	20.3	1	12.8	12.5	12.5
			1	25	1	20.0	19.8	20.4	1	13.1	12.5	12.9
			1	49	1	19.8	19.5	20.3	1	12.7	12.2	12.8
			25	0	2	19.5	19.2	19.6	2	12.1	11.3	11.8
			25	12	2	19.4	19.0	19.5	2	12.1	11.2	11.9
			25	25	2	19.3	19.1	19.7	2	12.2	11.2	12.0
			50	0	2	19.4	19.2	19.5	2	12.2	11.2	11.8

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						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	21.3	20.9	21.4	0	13.9	13.2	13.8
			1	12	0	21.6	21.1	21.6	0	14.0	13.1	13.9
			1	24	0	21.6	21.0	21.4	0	13.9	12.9	13.9
			12	0	1	20.4	20.2	20.5	1	13.1	12.3	12.9
			12	6	1	20.5	20.1	20.5	1	13.0	12.2	12.9
			12	11	1	20.5	20.0	20.6	1	13.0	12.1	12.9
			25	0	1	20.5	20.1	20.5	1	13.1	12.2	12.9
		16QAM	1	0	1	20.4	20.1	20.1	1	13.1	12.7	13.0
			1	12	1	20.1	19.9	20.4	1	13.2	12.6	13.1
			1	24	1	20.2	19.6	20.0	1	13.3	12.5	13.1
			12	0	2	19.3	19.1	19.4	2	12.2	11.5	12.0
			12	6	2	19.4	19.1	19.4	2	12.1	11.3	11.9
			12	11	2	19.4	19.1	19.4	2	12.1	11.2	12.0
			25	0	2	19.5	19.2	19.4	2	12.1	11.2	11.9

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						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	21.3	21.1	21.5	0	14.0	13.3	14.0
			1	7	0	21.5	21.3	21.5	0	13.9	13.1	14.0
			1	14	0	21.5	21.1	21.4	0	14.0	13.1	14.1
			8	0	1	20.5	20.0	20.6	1	12.9	12.2	12.7
			8	4	1	20.5	20.1	20.6	1	12.9	12.1	12.9
			8	7	1	20.3	20.0	20.6	1	12.9	12.1	13.0
			15	0	1	20.5	20.0	20.5	1	12.9	12.1	12.9
		16QAM	1	0	1	20.6	20.0	20.4	1	13.0	12.7	13.0
			1	7	1	20.6	20.1	20.5	1	12.9	12.4	13.1
			1	14	1	20.2	19.9	20.6	1	13.0	12.5	13.1
			8	0	2	19.4	18.8	19.6	2	12.0	11.1	12.0
			8	4	2	19.4	18.8	19.6	2	12.1	11.1	12.2
			8	7	2	19.4	18.8	19.5	2	12.1	11.1	12.2
			15	0	2	19.4	19.0	19.3	2	12.0	11.1	11.9

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						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	21.5	20.8	21.4	0	13.9	12.9	13.8
			1	2	0	21.6	21.0	21.7	0	14.0	13.1	14.0
			1	5	0	21.4	20.9	21.5	0	13.9	12.9	13.9
			3	0	0	21.6	21.0	21.6	0	13.9	13.0	14.0
			3	1	0	21.5	21.1	21.6	0	14.0	13.1	14.0
			3	2	0	21.5	21.1	21.6	0	13.9	13.1	14.0
			6	0	1	20.5	20.1	20.7	1	12.9	12.1	12.9
		16QAM	1	0	1	20.4	19.9	20.4	1	13.0	12.3	12.9
			1	2	1	20.4	19.7	20.6	1	13.2	12.5	13.0
			1	5	1	20.2	19.5	20.6	1	13.0	12.3	12.9
			3	0	1	20.5	19.8	20.4	1	13.1	12.3	13.1
			3	1	1	20.4	19.8	20.4	1	13.1	12.3	13.2
			3	2	1	20.5	19.8	20.5	1	13.1	12.3	13.2
			6	0	2	19.6	18.8	19.7	2	12.2	11.0	12.1

LTE Band 5 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						829 MHz	836.5 MHz	844 MHz		829 MHz	836.5 MHz	844 MHz
LTE Band 5	10	QPSK	1	0	0	22.9	23.0	22.8	0	16.8	16.8	16.7
			1	25	0	23.1	23.3	22.8	0	16.9	17.0	16.9
			1	49	0	22.8	22.9	22.9	0	16.7	16.8	16.7
			25	0	1	21.9	22.0	21.9	1	16.0	16.0	16.0
			25	12	1	22.0	22.0	22.0	1	16.0	15.9	16.0
			25	25	1	21.9	21.9	21.9	1	16.0	15.9	15.8
			50	0	1	21.9	22.0	21.9	1	16.0	16.0	15.9
		16QAM	1	0	1	21.6	21.6	21.8	1	15.7	15.6	15.8
			1	25	1	22.4	21.8	22.0	1	15.7	15.7	15.9
			1	49	1	21.8	21.1	21.4	1	15.7	15.2	15.8
			25	0	2	21.0	21.1	20.9	2	15.0	15.0	14.9
			25	12	2	20.9	21.1	21.1	2	15.0	15.0	14.9
			25	25	2	21.0	21.1	20.9	2	14.9	14.9	15.0
			50	0	2	20.9	21.2	20.9	2	14.9	14.9	14.9

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						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	22.8	22.7	22.9	0	16.5	16.6	16.7
			1	12	0	23.3	23.2	23.1	0	16.9	17.0	16.9
			1	24	0	22.9	22.6	23.0	0	16.6	16.6	16.8
			12	0	1	21.9	21.9	21.9	1	15.9	16.0	15.9
			12	6	1	21.9	22.0	21.9	1	16.0	15.9	16.0
			12	11	1	21.8	21.9	21.8	1	16.0	15.9	15.9
			25	0	1	21.7	21.8	21.9	1	15.9	15.9	15.9
		16QAM	1	0	1	21.5	21.9	21.7	1	15.5	15.7	15.6
			1	12	1	21.8	22.3	21.5	1	16.0	16.0	15.9
			1	24	1	21.1	21.7	21.2	1	15.2	15.4	15.0
			12	0	2	20.7	20.8	20.7	2	14.7	14.9	14.9
			12	6	2	20.9	20.8	20.7	2	14.9	15.0	15.0
			12	11	2	20.7	20.8	20.7	2	14.9	14.9	14.9
			25	0	2	21.0	21.1	20.8	2	15.0	15.0	14.8

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						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	22.9	23.0	22.7	0	16.8	16.8	16.8
			1	7	0	23.1	23.1	22.9	0	16.9	16.9	16.8
			1	14	0	22.9	23.0	22.7	0	16.7	16.9	16.8
			8	0	1	21.9	21.9	21.8	1	15.9	15.9	16.0
			8	4	1	22.0	22.1	21.9	1	15.9	16.0	15.9
			8	7	1	21.9	22.0	21.9	1	15.9	16.0	15.9
			15	0	1	21.9	21.9	21.9	1	15.8	16.0	15.9
		16QAM	1	0	1	21.9	21.8	21.8	1	15.9	15.8	15.8
			1	7	1	22.0	22.1	21.9	1	16.0	16.0	15.8
			1	14	1	21.6	21.8	21.7	1	15.5	15.7	15.6
			8	0	2	21.2	20.6	20.9	2	14.8	14.6	15.0
			8	4	2	21.1	20.7	20.9	2	14.7	14.6	14.9
			8	7	2	20.9	20.7	20.9	2	14.7	14.9	14.9
			15	0	2	20.9	21.0	20.7	2	15.0	14.9	14.7

LTE Band 5 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)			Target MPR	Reduced Avg Pwr (dBm)		
						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	23.0	22.8	22.8	0	16.9	16.7	16.7
			1	2	0	23.0	23.0	22.8	0	16.8	16.9	17.0
			1	5	0	23.0	22.9	22.8	0	16.9	16.7	17.0
			3	0	0	22.9	22.9	23.0	0	16.8	16.9	16.9
			3	1	0	23.1	23.0	23.1	0	16.9	16.8	16.9
			3	2	0	23.0	23.0	23.0	0	16.8	16.9	16.9
			6	0	1	21.9	21.9	21.9	1	15.8	15.9	15.9
		16QAM	1	0	1	22.1	21.7	21.9	1	15.8	15.9	15.8
			1	2	1	22.3	21.9	21.9	1	15.9	15.9	15.9
			1	5	1	22.2	21.7	22.0	1	15.7	15.8	15.9
			3	0	1	22.1	21.7	21.7	1	15.6	15.5	15.9
			3	1	1	22.1	22.0	21.6	1	15.6	15.6	15.7
			3	2	1	22.0	22.0	21.7	1	15.8	15.9	15.7
			6	0	2	20.8	20.7	21.0	2	14.8	14.7	15.0

LTE Band 17 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)	Target MPR	Reduced Avg Pwr (dBm)
						710 MHz		710 MHz
LTE Band 17	10	QPSK	1	0	0	22.9	0	17.9
			1	25	0	23.1	0	18.4
			1	49	0	22.9	0	17.9
			25	0	1	22.1	1	17.2
			25	12	1	22.2	1	17.1
			25	25	1	22.1	1	17.0
			50	0	1	22.2	1	17.1
		16QAM	1	0	1	21.9	1	16.7
			1	25	1	22.0	1	16.9
			1	49	1	21.3	1	16.8
			25	0	2	21.2	2	16.0
			25	12	2	21.1	2	16.0
			25	25	2	21.2	2	16.1
			50	0	2	21.1	2	16.1
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)	Target MPR	Reduced Avg Pwr (dBm)
						710 MHz		710 MHz
LTE Band 17	5	QPSK	1	0	0	23.1	0	17.8
			1	12	0	23.2	0	18.0
			1	24	0	23.0	0	17.9
			12	0	1	22.2	1	17.0
			12	6	1	22.2	1	17.1
			12	11	1	22.1	1	17.0
			25	0	1	22.0	1	17.0
		16QAM	1	0	1	22.2	1	16.7
			1	12	1	22.1	1	17.1
			1	24	1	21.5	1	16.7
			12	0	2	21.0	2	16.0
			12	6	2	21.1	2	16.1
			12	11	2	21.0	2	16.0
			25	0	2	21.1	2	16.2

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

9.4. Wi-Fi 2.4GHz (DTS Band)

Measured Results (SISO)

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduced Pwr.		
					Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
SISO Main	802.11b	1 Mbps	1	2412	14.6	15.5	Yes	10.7	11	Yes
			6	2437	**14.6**			**10.8**		
			11	2462	14.6			10.8		
SISO Sub	802.11b	1 Mbps	1	2412	15.5	15.5	Yes	10.3	11	Yes
			6	2437	**15.5**			**10.8**		
			11	2462	15.2			10.3		

Measured Results (MIMO)

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduced Pwr.		
					Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
MIMO Main	802.11n (HT20)	1 Mbps	1	2412	14.0	15.5	Yes	11.0	11	Yes
			6	2437	**14.0**			**11.0**		
			11	2462	14.0			10.1		
MIMO Sub	802.11n (HT20)	1 Mbps	1	2412	14.0	15.5	Yes	10.9	11	Yes
			6	2437	**14.1**			**11.0**		
			11	2462	14.5			10.7		

Note(s):

1. Output Power and SAR is not required for 802.11g/n HT20 channels when the highest *reported* SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Additionally, SAR is not required for Channels 12 and 13 because the tune-up limit and the measured output power for these two channels are no greater than those for the default test channels.

9.5. Wi-Fi 5GHz (U-NII Bands)

Measured Results (SISO Max Pwr.)

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
SISO Main	5.2 (U-NII 1)	802.11a	6 Mbps	36	5180	11.3	11.5	No
				40	5200	11.3		
				44	5220	11.4		
				48	5240	11.3		
		802.11n (HT20)	6.5 Mbps	36	5180	11.0	11.5	No
				40	5200	11.1		
				44	5220	11.2		
				48	5240	10.9		
		802.11ac (VHT20)	6.5 Mbps	36	5180	10.6	11.5	No
				40	5200	10.7		
				44	5220	10.8		
				48	5240	10.6		
	5.3 UNII-2A	802.11a	6 Mbps	52	5260	11.0	11.5	Yes
				56	5280	11.1		
				60	5300	11.1		
				64	5320	11.2		
		802.11n (HT20)	6.5 Mbps	52	5260	10.8	11.5	No
				56	5280	10.9		
				60	5300	10.8		
				64	5320	10.8		
		802.11ac (VHT20)	6.5 Mbps	52	5260	10.3	11.5	No
				56	5280	10.3		
				60	5300	10.4		
				64	5320	10.5		
	5.5 UNII-2C	802.11a	6 Mbps	100	5500	11.2	11.5	Yes
				112	5560	11.1		
				116	5580	10.8		
				128	5640	10.7		
		802.11n (HT20)	6.5 Mbps	100	5500	11.0	11.5	No
				112	5560	10.9		
				116	5580	11.2		
				128	5640	11.1		
		802.11ac (VHT20)	6.5 Mbps	100	5500	10.6	11.5	No
				112	5560	10.9		
				116	5580	11.1		
				128	5640	11.0		
	5.8 UNII-3 or §15.247	802.11a	6 Mbps	132	5660	10.7	11.5	Yes
				149	5745	10.6		
				165	5825	10.8		
		802.11n (HT20)	6.5 Mbps	132	5660	10.6	11.5	No
				149	5745	10.7		
				165	5825	10.6		
		802.11ac (VHT20)	6.5 Mbps	132	5660	10.7	11.5	No
				149	5745	10.6		
				165	5825	10.7		

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
SISO Sub	5.2 (U-NII 1)	802.11a	6 Mbps	36	5180	11.1	11.5	No
				40	5200	11.1		
				44	5220	10.6		
				48	5240	11.0		
		802.11n (HT20)	6.5 Mbps	36	5180	10.9	11.5	No
				40	5200	10.9		
				44	5220	10.4		
				48	5240	10.9		
		802.11ac (VHT20)	6.5 Mbps	36	5180	11.0	11.5	No
				40	5200	11.0		
				44	5220	10.5		
				48	5240	11.0		
	5.3 UNII-2A	802.11a	6 Mbps	52	5260	11.1	11.5	Yes
				56	5280	11.2		
				60	5300	11.1		
				64	5320	10.7		
		802.11n (HT20)	6.5 Mbps	52	5260	11.0	11.5	No
				56	5280	11.2		
				60	5300	11.0		
				64	5320	10.5		
		802.11ac (VHT20)	6.5 Mbps	52	5260	10.9	11.5	No
				56	5280	11.1		
				60	5300	11.0		
				64	5320	10.6		
	5.5 UNII-2C	802.11a	6 Mbps	100	5500	10.8	11.5	Yes
				112	5560	11.1		
				116	5580	11.1		
				128	5640	11.0		
		802.11n (HT20)	6.5 Mbps	100	5500	10.8	11.5	No
				112	5560	10.9		
				116	5580	10.8		
				128	5640	10.7		
		802.11ac (VHT20)	6.5 Mbps	100	5500	10.9	11.5	No
				112	5560	11.0		
				116	5580	10.9		
				128	5640	10.8		
	5.8 UNII-3 or §15.247	802.11a	6 Mbps	132	5660	10.8	11.5	Yes
				149	5745	11.0		
				165	5825	10.7		
		802.11n (HT20)	6.5 Mbps	132	5660	10.6	11.5	No
				149	5745	10.8		
				165	5825	10.6		
		802.11ac (VHT20)	6.5 Mbps	132	5660	10.6	11.5	No
				149	5745	10.8		
				165	5825	10.5		

Measured Results (SISO Reduced Pwr.)

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Reduced Pwr.		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
SISO Main	5.2 (U-NII 1)	802.11ac (VHT80)	29.3 Mbps	42	5210	7.1	7.5	No
	5.3 UNII-2A	802.11ac (VHT80)	29.3 Mbps	58	5290	6.8	7.5	Yes
	5.5 UNII-2C	802.11ac (VHT80)	29.3 Mbps	106	5530	7.0	7.5	Yes
				122	5610	7.4		
	5.8 UNII-3 or §15.247	802.11ac (VHT80)	29.3 Mbps	155	5775	7.1	7.5	Yes
SISO Sub	5.2 (U-NII 1)	802.11ac (VHT80)	29.3 Mbps	42	5210	6.7	7.5	No
	5.3 UNII-2A	802.11ac (VHT80)	29.3 Mbps	58	5290	7.0	7.5	Yes
	5.5 UNII-2C	802.11ac (VHT80)	29.3 Mbps	106	5530	6.7	7.5	Yes
				122	5610	6.8		
	5.8 UNII-3 or §15.247	802.11ac (VHT80)	29.3 Mbps	155	5775	6.9	7.5	Yes

Note(s):

1. Output Power and SAR measurement is not required for 802.11n/ac HT20/HT40/VHT80 channels when the specified tune-up tolerances for 802.11n/ac HT20/HT40/VHT80 are lower than 802.11a by more than ½ dB and the measured SAR is ≤ 1.2 W/Kg.
2. When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n then ac) is selected.
3. When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest *reported* SAR for UNII band 2A is
   - ≤ 1.2 W/kg, SAR is not required for UNII band I
   - > 1.2 W/kg, both bands should be tested independently for SAR.

9.6. Bluetooth

Band (GHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Avg Pwr (mW)
2.4	V3.0 + EDR, GFSK	0	2402	11.0	12.65
		39	2441	11.1	12.95
		78	2480	9.9	9.76
	V3.0 + EDR, π/4 DQPSK	0	2402	7.9	6.20
		39	2441	8.0	6.38
		78	2480	6.7	4.67
	V3.0 + EDR, 8-DPSK	0	2402	7.9	6.24
		39	2441	8.1	6.43
		78	2480	6.7	4.71
	V4.0 LE, GFSK	0	2402	-2.9	0.51
		19	2440	-0.7	0.85
		39	2480	-2.7	0.54

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 v02r02:
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 2 Slots	ON	0	Rear	128	824.2	23.5	23.3	0.807	0.852	1
				190	836.6	23.5	23.3	0.780	0.815	
				251	848.8	23.5	23.2	0.736	0.789	
			Edge 1	190	836.6	23.5	23.3	0.698	0.730	
GPRS 2 Slots	OFF	19	Rear	190	836.6	30.5	30.3	0.325	0.339	
		22	Edge 1	190	836.6	30.5	30.3	0.323	0.336	
		0	Edge 2	190	836.6	30.5	30.3	0.316	0.329	
			Edge 4	190	836.6	30.5	30.3	0.117	0.122	

Note(s):

SAR data of GSM850 Band used in this report were taken from SAR report 16K22867-S1V2, submitted under FCC ID A3LSMT819.

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 2 Slots	ON	0	Rear	661	1880.0	19.0	18.7	0.582	0.627	2
			Edge 1	661	1880.0	19.0	18.7	0.239	0.258	
GPRS 2 Slots	OFF	19	Rear	661	1880.0	29.0	28.5	0.269	0.301	
		22	Edge 1	661	1880.0	29.0	28.5	0.203	0.227	
		0	Edge 2	661	1880.0	29.0	28.5	0.104	0.116	
			Edge 4	661	1880.0	29.0	28.5	0.146	0.163	

10.3. 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	9400	1880.0	11.5	10.9	0.343	0.391	
			Edge 1	9400	1880.0	11.5	10.9	0.172	0.196	
Rel 99 RMC	OFF	19	Rear	9400	1880.0	24.0	23.3	0.384	0.448	3
		22	Edge 1	9400	1880.0	24.0	23.3	0.327	0.382	
		0	Edge 2	9400	1880.0	24.0	23.3	0.134	0.156	
			Edge 4	9400	1880.0	24.0	23.3	0.191	0.223	

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	12.5	12.5	0.390	0.391	
			Edge 1	1413	1732.6	12.5	12.5	0.294	0.295	
Rel 99 RMC	OFF	19	Rear	1413	1732.6	22.5	22.2	0.280	0.298	
		22	Edge 1	1413	1732.6	22.5	22.2	0.269	0.287	
		0	Edge 2	1413	1732.6	22.5	22.2	0.149	0.159	
			Edge 4	1413	1732.6	22.5	22.2	0.588	0.626	4

10.5. 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	4183	836.6	15.5	14.4	0.396	0.513	5
			Edge 1	4183	836.6	15.5	14.4	0.349	0.452	
Rel 99 RMC	OFF	19	Rear	4183	836.6	23.5	22.3	0.259	0.338	
		22	Edge 1	4183	836.6	23.5	22.3	0.314	0.409	
		0	Edge 2	4183	836.6	23.5	22.3	0.275	0.359	
			Edge 4	4183	836.6	23.5	22.3	0.094	0.122	

Note(s):
SAR data of W-CDMA Band V used in this report were taken from SAR report 16K22867-S1V2, submitted under FCC ID A3LSMT819.

10.6. LTE Band 2 (20MHz Bandwidth)

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
QPSK	ON	0	Rear	18700	1860.0	1	49	14.5	14.2	0.802	0.861	
				18900	1880.0	1	49	14.5	14.4	0.829	0.856	
						50	24	13.5	12.9	0.679	0.778	
				19100	1900.0	1	49	14.5	14.2	0.811	0.879	6
			Edge 1	18900	1880.0	1	49	14.5	14.4	0.392	0.405	
						50	24	13.5	12.9	0.314	0.360	
QPSK	OFF	19	Rear	18900	1880.0	1	49	23.0	23.0	0.378	0.378	
						50	24	22.0	21.7	0.316	0.335	
		22	Edge 1	18900	1880.0	1	49	23.0	23.0	0.277	0.277	
						50	24	22.0	21.7	0.246	0.261	
		0	Edge 2	18900	1880.0	1	49	23.0	23.0	0.078	0.078	
						50	24	22.0	21.7	0.060	0.063	
			Edge 4	18900	1880.0	1	49	23.0	23.0	0.473	0.473	
						50	24	22.0	21.7	0.393	0.417	

Note(s):
SAR data of LTE Band 2 used in this report were taken from SAR report 16K22867-S1V2, submitted under FCC ID A3LSMT819.

10.7. LTE Band 4 (20MHz Bandwidth)

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
QPSK	ON	0	Rear	20050	1720.0	1	49	14.5	14.0	0.694	0.775	7
						50	24	13.5	13.0	0.575	0.641	
			Edge 1	20050	1720.0	1	49	14.5	14.0	0.348	0.389	
						50	24	13.5	13.0	0.285	0.318	
QPSK	OFF	19	Rear	20175	1732.5	1	49	22.0	21.4	0.222	0.255	
						50	0	21.0	20.3	0.190	0.223	
		22	Edge 1	20175	1732.5	1	49	22.0	21.4	0.165	0.190	
						50	0	21.0	20.3	0.136	0.160	
		0	Edge 2	20175	1732.5	1	49	22.0	21.4	0.107	0.123	
						50	0	21.0	20.3	0.093	0.109	
			Edge 4	20175	1732.5	1	49	22.0	21.4	0.520	0.598	
						50	0	21.0	20.3	0.421	0.494	

Note(s):
SAR data of LTE Band 4 used in this report were taken from SAR report 16K22867-S1V2, submitted under FCC ID A3LSMT819.

10.8. LTE Band 5 (10MHz Bandwidth)

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
QPSK	ON	0	Rear	20525	836.5	1	25	17.5	17.0	0.706	0.796	8
						25	0	16.5	16.0	0.551	0.618	
			Edge 1	20525	836.5	1	25	17.5	17.0	0.674	0.760	
						25	0	16.5	16.0	0.542	0.608	
QPSK	OFF	19	Rear	20525	836.5	1	25	23.5	23.3	0.426	0.445	
						25	12	22.5	22.0	0.350	0.392	
		22	Edge 1	20525	836.5	1	25	23.5	23.3	0.400	0.418	
						25	12	22.5	22.0	0.327	0.367	
		0	Edge 2	20525	836.5	1	25	23.5	23.3	0.123	0.129	
						25	12	22.5	22.0	0.099	0.110	
			Edge 4	20525	836.5	1	25	23.5	23.3	0.228	0.238	
						25	12	22.5	22.0	0.190	0.213	

Note(s):

SAR data of LTE Band 5 used in this report were taken from SAR report 16K22867-S1V2, submitted under FCC ID A3LSMT819.

10.9. LTE Band 17 (10MHz Bandwidth)

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
QPSK	ON	0	Rear	23790	710.0	1	25	18.5	18.4	0.422	0.432	
						25	0	17.5	17.2	0.331	0.355	
			Edge 1	23790	710.0	1	25	18.5	18.4	0.777	0.795	9
						25	0	17.5	17.2	0.630	0.676	
QPSK	OFF	19	Rear	23790	710.0	1	25	23.5	23.1	0.111	0.122	
						25	12	22.5	22.2	0.092	0.099	
		22	Edge 1	23790	710.0	1	25	23.5	23.1	0.074	0.081	
						25	12	22.5	22.2	0.061	0.066	
		0	Edge 2	23790	710.0	1	25	23.5	23.1	0.081	0.090	
						25	12	22.5	22.2	0.071	0.076	
			Edge 4	23790	710.0	1	25	23.5	23.1	0.061	0.068	
						25	12	22.5	22.2	0.047	0.050	

Note(s):

SAR data of LTE Band 17 used in this report were taken from SAR report 16K22867-S1V2, submitted under FCC ID A3LSMT819.

10.10. Wi-Fi (DTS Band)

Mode	Pwr. Back-off	Dist. (mm)	Antenna	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
802.11b 1 Mbps	On	0	SISO Main	Rear	6	2437.0	1.058	11.0	10.8	0.748	0.790	
					11	2462.0	0.970	11.0	10.8	0.733	0.768	
			SISO Sub	Rear	6	2437.0	1.663	11.0	10.8	0.976	1.029	10
					11	2462.0	1.124	11.0	10.31	0.867	1.016	
	Off	4	SISO Main	Rear	1	2412.0	1.018	15.5	14.6	0.771	0.951	11
					11	2462.0	0.904	15.5	14.62	0.694	0.850	
		0		Edge 2	11	2462.0	0.380	15.5	14.62	0.283	0.347	
		4	SISO Sub	Rear	1	2412.0	1.327	15.5	15.5	0.939	0.948	
					6	2437.0	1.242	15.5	15.49	0.981	0.983	
		0		Edge 3	6	2437.0	0.262	15.5	15.49	0.179	0.179	
802.11n HT20	On	0	MIMO (Main+Sub)	Rear	1	2412.0	1.672	11.0	10.9	0.946	0.966	
					6	2437.0	1.660	11.0	11.0	1.010	1.010	12
	Off	4	MIMO (Main+Sub)	Rear	11	2462.0	0.629	14.5	14.5	0.664	0.664	
		0		Edge 2	11	2462.0	0.295	14.5	13.99	0.226	0.254	
		0		Edge 3	11	2462.0	0.406	14.5	14.5	0.212	0.212	

Note(s):

1. Highest *reported* SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest *reported* SAR is > 0.4 W/kg. Due to the highest *reported* SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 W/kg was *reported*.
3. Testing for a second channel was required because the *reported* SAR for this test position was >0.8 W/kg.
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. SAR data of DTS Band used in this report were taken from SAR report 16K22867-S1V2, submitted under FCC ID A3LSMT819.

10.11. Wi-Fi (U-NII Band)

Frequency Band	Mode	Pwr. Back-off	Dist. (mm)	Antenna	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
5.3 GHz U-NII 2A	802.11a 6 Mbps	Off	4	SISO Main	Rear	64	5320.0	0.869	11.5	11.2	0.358	0.384	13
			0		Edge 2	64	5320.0	0.235	11.5	11.2	0.164	0.176	
			4	SISO Sub	Rear	56	5280.0	0.701	11.5	11.2	0.701	0.748	14
			0		Edge 3	56	5280.0	0.313	11.5	11.2	0.170	0.181	
Frequency Band	Mode	Pwr. Back-off	Dist. (mm)	Antenna	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
5.5 GHz U-NII 2C	802.11a 6 Mbps	Off	4	SISO Main	Rear	100	5500.0	1.686	11.5	11.2	0.664	0.711	15
			0		Edge 2	100	5500.0	0.504	11.5	11.2	0.243	0.260	
			4	SISO Sub	Rear	112	5560.0	1.445	11.5	11.1	0.934	1.017	16
						116	5580.0	1.819	11.5	11.1	0.918	1.002	
			0		Edge 3	112	5560.0	0.519	11.5	11.1	0.226	0.246	
Frequency Band	Mode	Pwr. Back-off	Dist. (mm)	Antenna	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
5.8 GHz U-NII 3	802.11a 6 Mbps	Off	4	SISO Main	Rear	165	5825.0	0.427	11.5	10.8	0.168	0.197	17
			0		Edge 2	165	5825.0	0.133	11.5	10.8	0.086	0.101	
			4	SISO Sub	Rear	149	5745.0	0.865	11.5	11.0	0.616	0.686	18
			0		Edge 3	149	5745.0	0.377	11.5	11.0	0.188	0.209	

Note(s):

1. Highest *reported* SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest *reported* SAR is > 0.4 W/kg. Due to the highest *reported* SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 W/kg was *reported*.
3. Testing for a second channel was required because the *reported* SAR for this test position was >0.8 W/kg.
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. SAR data of U-NII Band used in this report were taken from SAR report 16K22867-S1V2, submitted under FCC ID A3LSMT819.

10.12. Bluetooth

Frequency Band	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
2.4 GHz	GFSK	0	Rear	39	2441.0	11.5	11.1	0.425	0.464	18
			Edge 2	39	2441.0	11.5	11.1	0.080	0.087	

Note(s):

SAR data of Bluetooth Band used in this report were taken from SAR report 16K23164-S1V1, submitted under FCC ID A3LSMT819N.

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)	First Repeated	
						Measured SAR (W/kg)	Largest to Smallest SAR Ratio
700	LTE Band 17	Standalone	Edge 1	No	0.777	N/A	N/A
850	GSM 850	Standalone	Rear	Yes	0.807	0.798	1.01
	WCDMA Band V	Standalone	Rear	No	0.396	N/A	N/A
	LTE Band 5	Standalone	Rear	No	0.706	N/A	N/A
1900	GSM 1900	Standalone	Rear	No	0.582	N/A	N/A
	WCDMA Band II	Standalone	Rear	No	0.384	N/A	N/A
	LTE Band 2	Standalone	Rear	Yes	0.829	0.903	1.09
1700	LTE Band 4	Standalone	Rear	No	0.694	N/A	N/A
	WCDMA Band IV	Standalone	Edge 4	No	0.588	N/A	N/A
2400	Wi-Fi 802.11b/g/n	Standalone	Rear	Yes	1.010	1.030	1.02
5300	Wi-Fi 802.11a/n/ac	Standalone	Rear	Yes	0.813	0.813	1.00
5500	Wi-Fi 802.11a/n/ac	Standalone	Rear	Yes	1.01	0.981	1.03
5800	Wi-Fi 802.11a/n/ac	Standalone	Rear	No	0.633	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

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

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

Where:

SAR_1 is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

SAR_2 is the highest measured or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$

In order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

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

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. DTS, U-NII supports Hotspot and Wi-Fi Direct.
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.

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:
   - 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.
   - 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.
   - 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 2 Slots	848.8	30.50	281	0	0	43	233	43		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	GPRS 2 Slots	1909.8	29.00	199	0	0	43	233	43		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	W-CDMA 5	846.6	23.50	224	0	0	43	233	43		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	W-CDMA 4	1752.6	22.50	178	0	0	43	233	43		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	W-CDMA 2	1907.6	24.00	251	0	0	43	233	43		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 2	1900	23.00	200	0	0	43	233	43		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 4	1754.3	22.00	158	0	0	43	233	43		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 5	844	23.50	224	0	0	43	233	43		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 17	710	23.50	224	0	0	43	233	43		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 2 Slots	848.8	23.50	56	0	0	43	233	43		-MEASURE-	-MEASURE-	0.160	0.400	0.160	
Cellular	GPRS 2 Slots	1909.8	19.00	20	0	0	43	233	43		-MEASURE-	-MEASURE-	0.086	0.400	0.086	
Cellular	W-CDMA 5	846.6	15.50	35	0	0	43	233	43		-MEASURE-	-MEASURE-	0.100	0.400	0.100	
Cellular	W-CDMA 4	1752.6	12.50	18	0	0	43	233	43		-MEASURE-	-MEASURE-	0.074	0.400	0.074	
Cellular	W-CDMA 2	1907.6	11.50	14	0	0	43	233	43		-MEASURE-	-MEASURE-	0.060	0.400	0.060	
Cellular	LTE Band 2	1900	14.50	28	0	0	43	233	43		-MEASURE-	-MEASURE-	0.120	0.400	0.120	
Cellular	LTE Band 4	1754.3	14.50	28	0	0	43	233	43		-MEASURE-	-MEASURE-	0.115	0.400	0.115	
Cellular	LTE Band 5	844	17.50	56	0	0	43	233	43		-MEASURE-	-MEASURE-	0.160	0.400	0.160	
Cellular	LTE Band 17	710	18.50	71	0	0	43	233	43		-MEASURE-	-MEASURE-	0.186	0.400	0.186	

Estimated SAR for WLAN

Main Antenna

Tx	Frequency	Output Power		Separation Distances (mm)						Estimated 1-g SAR Value (W/kg)					
Interface	(MHz)	dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Main Antenna Max.															
Wi-Fi 2.4 GHz	2462	15.50	35	0.9	180	5.1	28	160.3		-MEASURE-	0.400	-MEASURE-	0.262	0.400	
Wi-Fi 5.2 GHz	5240	11.50	14	0.9	180	5.1	28	160.3		-MEASURE-	0.400	-MEASURE-	0.153	0.400	
Wi-Fi 5.3 GHz	5320	11.50	14	0.9	180	5.1	28	160.3		-MEASURE-	0.400	-MEASURE-	0.154	0.400	
Wi-Fi 5.5 GHz	5700	11.50	14	0.9	180	5.1	28	160.3		-MEASURE-	0.400	-MEASURE-	0.159	0.400	
Wi-Fi 5.8 GHz	5825	11.50	14	0.9	180	5.1	28	160.3		-MEASURE-	0.400	-MEASURE-	0.161	0.400	
Bluetooth	2480	11.50	14	0.9	180	5.1	28	160.3		-MEASURE-	0.400	-MEASURE-	0.105	0.400	
Wi-Fi Main Antenna Reduced.															
Wi-Fi 2.4 GHz	2462	11.00	13	0.9	180	5.1	28	160.3		-MEASURE-	0.400	-MEASURE-	0.097	0.400	
Wi-Fi 5.2 GHz	5240	7.50	6	0.9	180	5.1	28	160.3		0.366	0.400	0.366	0.065	0.400	
Wi-Fi 5.3 GHz	5320	7.50	6	0.9	180	5.1	28	160.3		0.369	0.400	0.369	0.066	0.400	
Wi-Fi 5.5 GHz	5700	7.50	6	0.9	180	5.1	28	160.3		0.382	0.400	0.382	0.068	0.400	
Wi-Fi 5.8 GHz	5825	7.50	6	0.9	180	5.1	28	160.3		0.386	0.400	0.386	0.069	0.400	

Sub Antenna

Tx	Frequency	Output Power		Separation Distances (mm)						Estimated 1-g SAR Value (W/kg)					
Interface	(MHz)	dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Main Antenna Max.															
Wi-Fi 2.4 GHz	2462	15.50	35	0.8	221	65.8	4.29	81		-MEASURE-	0.400	0.400	-MEASURE-	0.400	
Wi-Fi 5.2 GHz	5240	11.50	14	0.8	221	65.8	4.29	81		-MEASURE-	0.400	0.400	-MEASURE-	0.400	
Wi-Fi 5.3 GHz	5320	11.50	14	0.8	221	65.8	4.29	81		-MEASURE-	0.400	0.400	-MEASURE-	0.400	
Wi-Fi 5.5 GHz	5700	11.50	14	0.8	221	65.8	4.29	81		-MEASURE-	0.400	0.400	-MEASURE-	0.400	
Wi-Fi 5.8 GHz	5825	11.50	14	0.8	221	65.8	4.29	81		-MEASURE-	0.400	0.400	-MEASURE-	0.400	
Wi-Fi Main Antenna Reduced.															
Wi-Fi 2.4 GHz	2462	11.00	13	0.8	221	65.8	4.29	81		-MEASURE-	0.400	0.400	-MEASURE-	0.400	
Wi-Fi 5.2 GHz	5240	7.50	6	0.8	221	65.8	4.29	81		0.366	0.400	0.400	0.366	0.400	
Wi-Fi 5.3 GHz	5320	7.50	6	0.8	221	65.8	4.29	81		0.369	0.400	0.400	0.369	0.400	
Wi-Fi 5.5 GHz	5700	7.50	6	0.8	221	65.8	4.29	81		0.382	0.400	0.400	0.382	0.400	
Wi-Fi 5.8 GHz	5825	7.50	6	0.8	221	65.8	4.29	81		0.386	0.400	0.400	0.386	0.400	

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

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		
	WWAN ①	DTS Main ②	DTS Sub ③	DTS MIMO ④	WWAN + DTS Main ① + ②	WWAN + DTS Sub ① + ③	WWAN + DTS MIMO ① + ④
Rear	0.852	0.951	1.029	1.010	1.803	1.881	1.862
Edge 1	0.730	0.400	0.400	0.400	1.130	1.130	1.130
Edge 2	0.329	0.347	0.400	0.254	0.676	0.729	0.583
Edge 3	0.400	0.262	0.179	0.212	0.662	0.579	0.612
Edge 4	0.122	0.400	0.400	0.400	0.522	0.522	0.522

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)			
	WWAN ①	U-NII Main ②	U-NII Sub ③	BT ④	WWAN + U-Nii Main ① + ②	WWAN + U-NII Sub ① + ③	WWAN + U-NII MIMO ① + ② + ③	WWAN + BT ① + ④
Rear	0.852	0.711	1.017	0.464	1.563	1.869	2.580	1.316
Edge 1	0.730	0.400	0.400	0.400	1.130	1.130	1.530	1.130
Edge 2	0.329	0.267	0.400	0.087	0.596	0.729	0.996	0.416
Edge 3	0.400	0.161	0.246	0.105	0.561	0.646	0.807	0.505
Edge 4	0.122	0.400	0.400	0.400	0.522	0.522	0.922	0.522

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② DTS Main	③ DTS Sub	④ DTS MIMO						
Rear	0.852	0.951			① + ②	1.803	205.0	0.01	No	1
	0.852		1.029		① + ③	1.881	224.6	0.01	No	2
	0.852			1.010	① + ④	1.862	222.8	0.01	No	3

Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII Main	③ U-NII Sub						
Rear	0.852	0.711	1.017	① + ② + ③	2.580				4
	0.852	0.711		① + ②	1.563	212.0	0.01	No	
	0.852		1.017	① + ③	1.869	230.0	0.01	No	
		0.711	1.017	② + ③	1.728	69.3	0.03	No	

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

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		
	WWAN ①	DTS Main ②	DTS Sub ③	DTS MIMO ④	WWAN + DTS Main ① + ②	WWAN + DTS Sub ① + ③	WWAN + DTS MIMO ① + ④
Rear	0.627	0.951	1.029	1.010	1.578	1.656	1.637
Edge 1	0.258	0.400	0.400	0.400	0.658	0.658	0.658
Edge 2	0.116	0.347	0.400	0.254	0.463	0.516	0.370
Edge 3	0.400	0.262	0.179	0.212	0.662	0.579	0.612
Edge 4	0.163	0.400	0.400	0.400	0.563	0.563	0.563

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)			
	WWAN ①	U-NII Main ②	U-NII Sub ③	BT ④	WWAN + U-Nii Main ① + ②	WWAN + U-NII Sub ① + ③	WWAN + U-NII MIMO ① + ② + ③	WWAN + BT ① + ④
Rear	0.627	0.711	1.017	0.464	1.338	1.644	2.355	1.091
Edge 1	0.258	0.400	0.400	0.400	0.658	0.658	1.058	0.658
Edge 2	0.116	0.267	0.400	0.087	0.383	0.516	0.783	0.203
Edge 3	0.400	0.161	0.246	0.105	0.561	0.646	0.807	0.505
Edge 4	0.163	0.400	0.400	0.400	0.563	0.563	0.963	0.563

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	③ DTS Sub	④ DTS MIMO						
Rear	0.627	1.029		① + ③	1.656	216.4	0.01	No	5
	0.627		1.010	① + ④	1.637	215.4	0.01	No	6

Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII Main	③ U-NII Sub						
Rear	0.627	0.711	1.017	① + ② + ③	2.355				7
	0.627	0.711		① + ②	1.338	212.9	0.01	No	
	0.627		1.017	① + ③	1.644	221.7	0.01	No	
		0.711	1.017	② + ③	1.728	69.3	0.03	No	

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

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		
	WWAN ①	DTS Main ②	DTS Sub ③	DTS MIMO ④	WWAN + DTS Main ① + ②	WWAN + DTS Sub ① + ③	WWAN + DTS MIMO ① + ④
Rear	0.448	0.951	1.029	1.010	1.399	1.477	1.458
Edge 1	0.382	0.400	0.400	0.400	0.782	0.782	0.782
Edge 2	0.156	0.347	0.400	0.254	0.503	0.556	0.410
Edge 3	0.400	0.262	0.179	0.212	0.662	0.579	0.612
Edge 4	0.223	0.400	0.400	0.400	0.623	0.623	0.623

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)			
	WWAN ①	U-NII Main ②	U-NII Sub ③	BT ④	WWAN + U-Nii Main ① + ②	WWAN + U-NII Sub ① + ③	WWAN + U-NII MIMO ① + ② + ③	WWAN + BT ① + ④
Rear	0.448	0.711	1.017	0.464	1.159	1.465	2.176	0.912
Edge 1	0.382	0.400	0.400	0.400	0.782	0.782	1.182	0.782
Edge 2	0.156	0.267	0.400	0.087	0.423	0.556	0.823	0.243
Edge 3	0.400	0.161	0.246	0.105	0.561	0.646	0.807	0.505
Edge 4	0.223	0.400	0.400	0.400	0.623	0.623	1.023	0.623

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII Main	③ U-NII Sub						
Rear	0.448	0.711	1.017	① + ② + ③	2.176				8
	0.448	0.711		① + ②	1.159	202.6	0.01	No	
	0.448		1.017	① + ③	1.465	217.3	0.01	No	
		0.711	1.017	② + ③	1.728	69.3	0.03	No	

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

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		
	WWAN ①	DTS Main ②	DTS Sub ③	DTS MIMO ④	WWAN + DTS Main ① + ②	WWAN + DTS Sub ① + ③	WWAN + DTS MIMO ① + ④
Rear	0.391	0.951	1.029	1.010	1.342	1.420	1.401
Edge 1	0.295	0.400	0.400	0.400	0.695	0.695	0.695
Edge 2	0.159	0.347	0.400	0.254	0.506	0.559	0.413
Edge 3	0.400	0.262	0.179	0.212	0.662	0.579	0.612
Edge 4	0.626	0.400	0.400	0.400	1.026	1.026	1.026

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)			
	WWAN ①	U-NII Main ②	U-NII Sub ③	BT ④	WWAN + U-Nii Main ① + ②	WWAN + U-NII Sub ① + ③	WWAN + U-NII MIMO ① + ② + ③	WWAN + BT ① + ④
Rear	0.391	0.711	1.017	0.464	1.102	1.408	2.119	0.855
Edge 1	0.295	0.400	0.400	0.400	0.695	0.695	1.095	0.695
Edge 2	0.159	0.267	0.400	0.087	0.426	0.559	0.826	0.246
Edge 3	0.400	0.161	0.246	0.105	0.561	0.646	0.807	0.505
Edge 4	0.626	0.400	0.400	0.400	1.026	1.026	1.426	1.026

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII Main	③ U-NII Sub						
Rear	0.391	0.711	1.017	① + ② + ③	2.119				9
	0.391	0.711		① + ②	1.102	217.0	0.01	No	
	0.391		1.017	① + ③	1.408	224.7	0.01	No	
		0.711	1.017	② + ③	1.728	69.3	0.03	No	

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

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		
	WWAN ①	DTS Main ②	DTS Sub ③	DTS MIMO ④	WWAN + DTS Main ① + ②	WWAN + DTS Sub ① + ③	WWAN + DTS MIMO ① + ④
Rear	0.513	0.951	1.029	1.010	1.464	1.542	1.523
Edge 1	0.452	0.400	0.400	0.400	0.852	0.852	0.852
Edge 2	0.359	0.347	0.400	0.254	0.706	0.759	0.613
Edge 3	0.400	0.262	0.179	0.212	0.662	0.579	0.612
Edge 4	0.122	0.400	0.400	0.400	0.522	0.522	0.522

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)			
	WWAN ①	U-NII Main ②	U-NII Sub ③	BT ④	WWAN + U-Nii Main ① + ②	WWAN + U-NII Sub ① + ③	WWAN + U-NII MIMO ① + ② + ③	WWAN + BT ① + ④
Rear	0.513	0.711	1.017	0.464	1.224	1.530	2.241	0.977
Edge 1	0.452	0.400	0.400	0.400	0.852	0.852	1.252	0.852
Edge 2	0.359	0.267	0.400	0.087	0.626	0.759	1.026	0.446
Edge 3	0.400	0.161	0.246	0.105	0.561	0.646	0.807	0.505
Edge 4	0.122	0.400	0.400	0.400	0.522	0.522	0.922	0.522

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII Main	③ U-NII Sub						
Rear	0.513	0.711	1.017	① + ② + ③	2.241				10
	0.513	0.711		① + ②	1.224	213.4	0.01	No	
	0.513		1.017	① + ③	1.530	231.5	0.01	No	
		0.711	1.017	② + ③	1.728	69.3	0.03	No	

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

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		
	WWAN ①	DTS Main ②	DTS Sub ③	DTS MIMO ④	WWAN + DTS Main ① + ②	WWAN + DTS Sub ① + ③	WWAN + DTS MIMO ① + ④
Rear	0.879	0.951	1.029	1.010	1.830	1.908	1.889
Edge 1	0.405	0.400	0.400	0.400	0.805	0.805	0.805
Edge 2	0.078	0.347	0.400	0.254	0.425	0.478	0.332
Edge 3	0.400	0.262	0.179	0.212	0.662	0.579	0.612
Edge 4	0.473	0.400	0.400	0.400	0.873	0.873	0.873

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)			
	WWAN ①	U-NII Main ②	U-NII Sub ③	BT ④	WWAN + U-Nii Main ① + ②	WWAN + U-NII Sub ① + ③	WWAN + U-NII MIMO ① + ② + ③	WWAN + BT ① + ④
Rear	0.879	0.711	1.017	0.464	1.590	1.896	2.607	1.343
Edge 1	0.405	0.400	0.400	0.400	0.805	0.805	1.205	0.805
Edge 2	0.078	0.267	0.400	0.087	0.345	0.478	0.745	0.165
Edge 3	0.400	0.161	0.246	0.105	0.561	0.646	0.807	0.505
Edge 4	0.473	0.400	0.400	0.400	0.873	0.873	1.273	0.873

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② DTS Main	③ DTS Sub	④ DTS MIMO						
Rear	0.879	0.951			① + ②	1.830	206.9	0.01	No	11
	0.879		1.029		① + ③	1.908	217.8	0.01	No	12
	0.879			1.010	① + ④	1.889	216.7	0.01	No	13

Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII Main	③ U-NII Sub						
Rear	0.879	0.711	1.017	① + ② + ③	2.607				14
	0.879	0.711		① + ②	1.590	213.8	0.01	No	
	0.879		1.017	① + ③	1.896	223.1	0.01	No	
		0.711	1.017	② + ③	1.728	69.3	0.03	No	

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

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		
	WWAN ①	DTS Main ②	DTS Sub ③	DTS MIMO ④	WWAN + DTS Main ① + ②	WWAN + DTS Sub ① + ③	WWAN + DTS MIMO ① + ④
Rear	0.775	0.951	1.029	1.010	1.726	1.804	1.785
Edge 1	0.389	0.400	0.400	0.400	0.789	0.789	0.789
Edge 2	0.123	0.347	0.400	0.254	0.470	0.523	0.377
Edge 3	0.400	0.262	0.179	0.212	0.662	0.579	0.612
Edge 4	0.598	0.400	0.400	0.400	0.998	0.998	0.998

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)			
	WWAN ①	U-NII Main ②	U-NII Sub ③	BT ④	WWAN + U-Nii Main ① + ②	WWAN + U-NII Sub ① + ③	WWAN + U-NII MIMO ① + ② + ③	WWAN + BT ① + ④
Rear	0.775	0.711	1.017	0.464	1.486	1.792	2.503	1.239
Edge 1	0.389	0.400	0.400	0.400	0.789	0.789	1.189	0.789
Edge 2	0.123	0.267	0.400	0.087	0.390	0.523	0.790	0.210
Edge 3	0.400	0.161	0.246	0.105	0.561	0.646	0.807	0.505
Edge 4	0.598	0.400	0.400	0.400	0.998	0.998	1.398	0.998

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② DTS Main	③ DTS Sub	④ DTS MIMO						
Rear	0.775	0.951			① + ②	1.726	204.9	0.01	No	15
	0.775		1.029		① + ③	1.804	217.1	0.01	No	16
	0.775			1.010	① + ④	1.785	216.0	0.01	No	17

Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII Main	③ U-NII Sub						
Rear	0.775	0.711	1.017	① + ② + ③	2.503				18
	0.775	0.711		① + ②	1.486	211.8	0.01	No	
	0.775		1.017	① + ③	1.792	222.5	0.01	No	
		0.711	1.017	② + ③	1.728	69.3	0.03	No	

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

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		
	WWAN ①	DTS Main ②	DTS Sub ③	DTS MIMO ④	WWAN + DTS Main ① + ②	WWAN + DTS Sub ① + ③	WWAN + DTS MIMO ① + ④
Rear	0.796	0.951	1.029	1.010	1.747	1.825	1.806
Edge 1	0.760	0.400	0.400	0.400	1.160	1.160	1.160
Edge 2	0.129	0.347	0.400	0.254	0.476	0.529	0.383
Edge 3	0.400	0.262	0.179	0.212	0.662	0.579	0.612
Edge 4	0.238	0.400	0.400	0.400	0.638	0.638	0.638

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)			
	WWAN ①	U-NII Main ②	U-NII Sub ③	BT ④	WWAN + U-Nii Main ① + ②	WWAN + U-NII Sub ① + ③	WWAN + U-NII MIMO ① + ② + ③	WWAN + BT ① + ④
Rear	0.796	0.711	1.017	0.464	1.507	1.813	2.524	1.260
Edge 1	0.760	0.400	0.400	0.400	1.160	1.160	1.560	1.160
Edge 2	0.129	0.267	0.400	0.087	0.396	0.529	0.796	0.216
Edge 3	0.400	0.161	0.246	0.105	0.561	0.646	0.807	0.505
Edge 4	0.238	0.400	0.400	0.400	0.638	0.638	1.038	0.638

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② DTS Main	③ DTS Sub	④ DTS MIMO						
Rear	0.796	0.951			① + ②	1.747	204.5	0.01	No	19
	0.796		1.029		① + ③	1.825	225.4	0.01	No	20
	0.796			1.010	① + ④	1.806	223.5	0.01	No	21

Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII Main	③ U-NII Sub						
Rear	0.796	0.711	1.017	① + ② + ③	2.524				22
	0.796	0.711		① + ②	1.507	211.6	0.01	No	
	0.796		1.017	① + ③	1.813	230.8	0.01	No	
		0.711	1.017	② + ③	1.728	69.3	0.03	No	

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

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		
	WWAN ①	DTS Main ②	DTS Sub ③	DTS MIMO ④	WWAN + DTS Main ① + ②	WWAN + DTS Sub ① + ③	WWAN + DTS MIMO ① + ④
Rear	0.473	0.951	1.029	1.010	1.424	1.502	1.483
Edge 1	0.795	0.400	0.400	0.400	1.195	1.195	1.195
Edge 2	0.090	0.347	0.400	0.254	0.437	0.490	0.344
Edge 3	0.400	0.262	0.179	0.212	0.662	0.579	0.612
Edge 4	0.068	0.400	0.400	0.400	0.468	0.468	0.468

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)			
	WWAN ①	U-NII Main ②	U-NII Sub ③	BT ④	WWAN + U-Nii Main ① + ②	WWAN + U-NII Sub ① + ③	WWAN + U-NII MIMO ① + ② + ③	WWAN + BT ① + ④
Rear	0.473	0.711	1.017	0.464	1.184	1.490	2.201	0.937
Edge 1	0.795	0.400	0.400	0.400	1.195	1.195	1.595	1.195
Edge 2	0.090	0.267	0.400	0.087	0.357	0.490	0.757	0.177
Edge 3	0.400	0.161	0.246	0.105	0.561	0.646	0.807	0.505
Edge 4	0.068	0.400	0.400	0.400	0.468	0.468	0.868	0.468

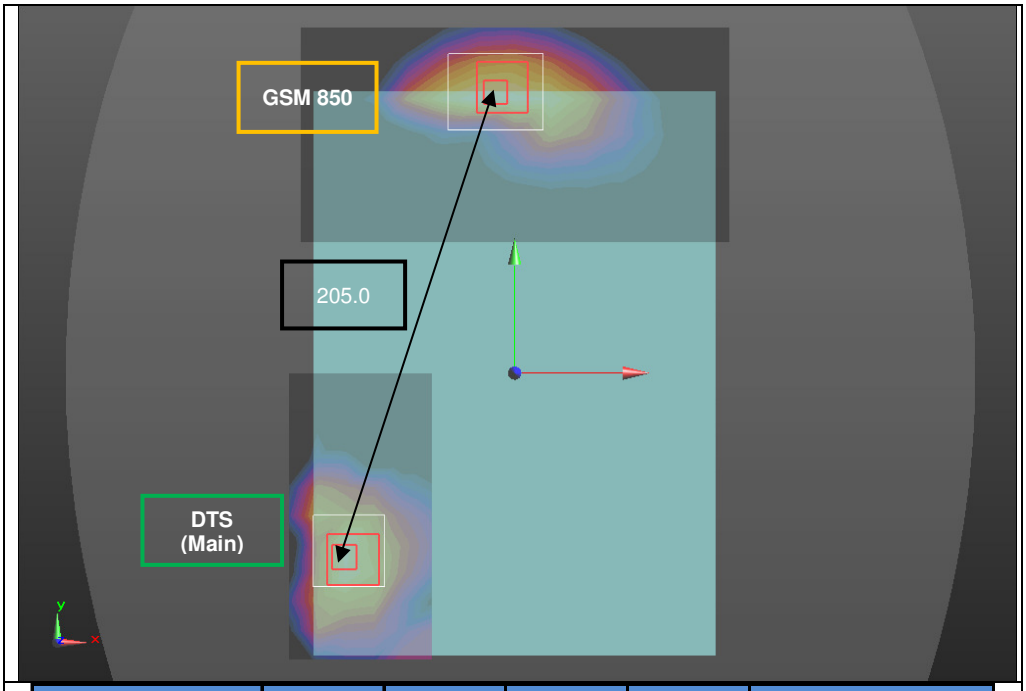
SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII Main	③ U-NII Sub						
Rear	0.473	0.711	1.017	① + ② + ③	2.201				23
	0.473	0.711		① + ②	1.184	208.1	0.01	No	
	0.473		1.017	① + ③	1.490	228.5	0.01	No	
		0.711	1.017	② + ③	1.728	69.3	0.03	No	

Conclusion:

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

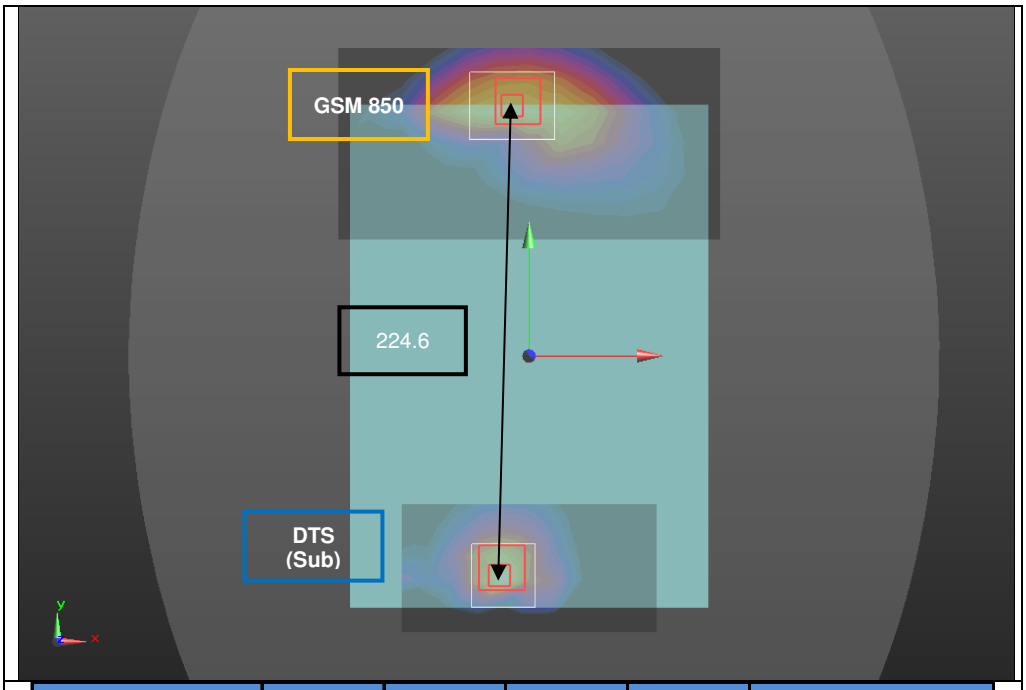
Figure (1)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
GSM 850	①	0.852	-0.0088	0.118	-0.0037	① + ②	205.0
DTS Main	②	0.951	-0.0738	-0.0764	-0.0033		

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

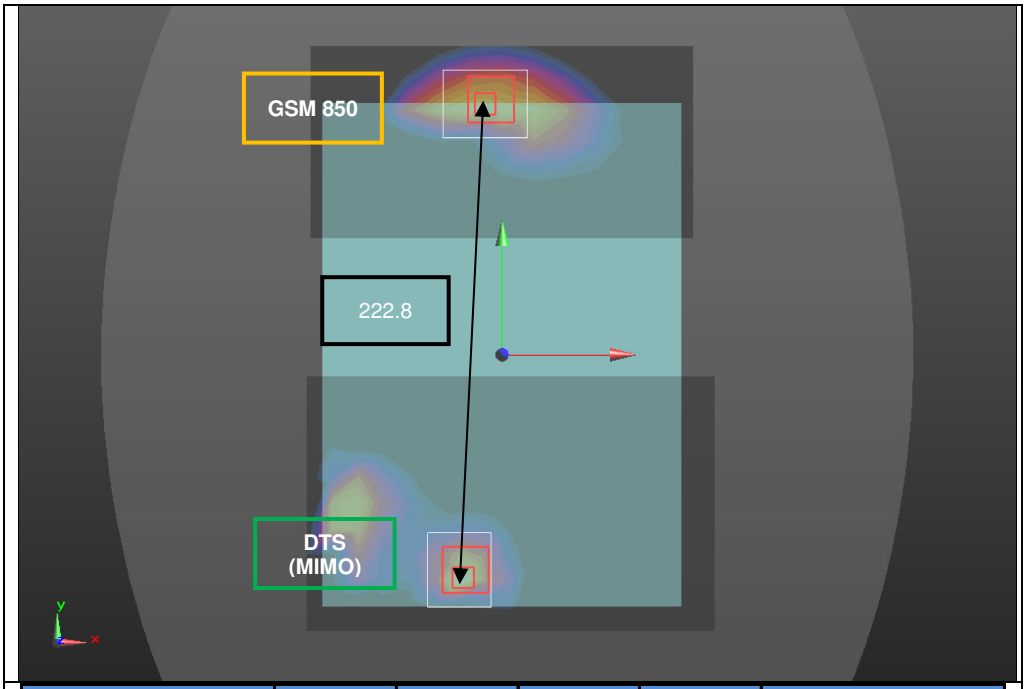
Figure (2)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
GSM 850	①	0.852	-0.0088	0.118	-0.0037	① + ②	224.6
DTS Sub	②	1.029	-0.013	-0.1066	-0.0036		

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

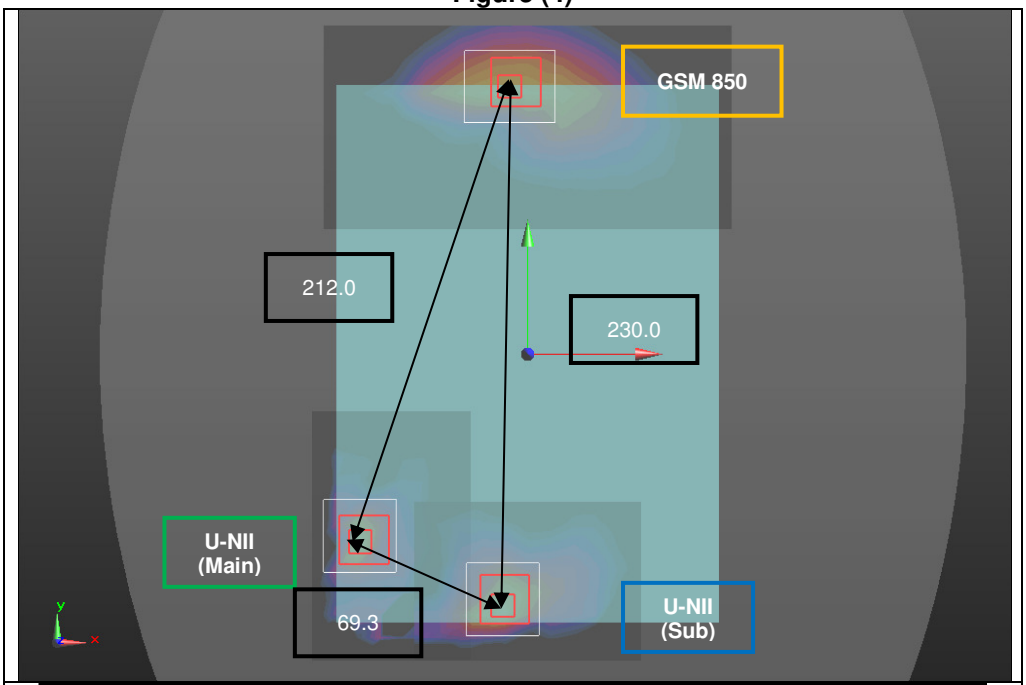
Figure (3)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
GSM 850	①	0.852	-0.0088	0.118	-0.0037	① + ②	222.8
DTS MIMO	②	1.01	-0.019	-0.1046	-0.0037		

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

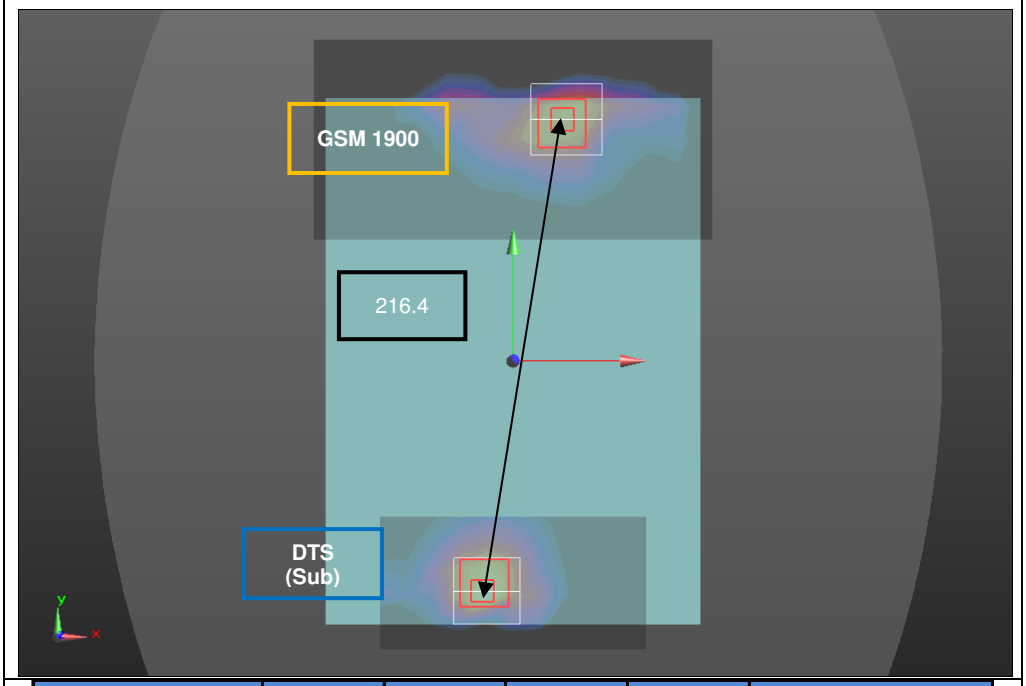
Figure (4)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
GSM 850	①	0.852	-0.0088	0.118	-0.0037	① + ②	212.0
U-NII Main	②	0.711	-0.0756	-0.0832	-0.0024	① + ③	230.0
U-NII Sub	③	1.017	-0.0126	-0.112	-0.0024	② + ④	69.3

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

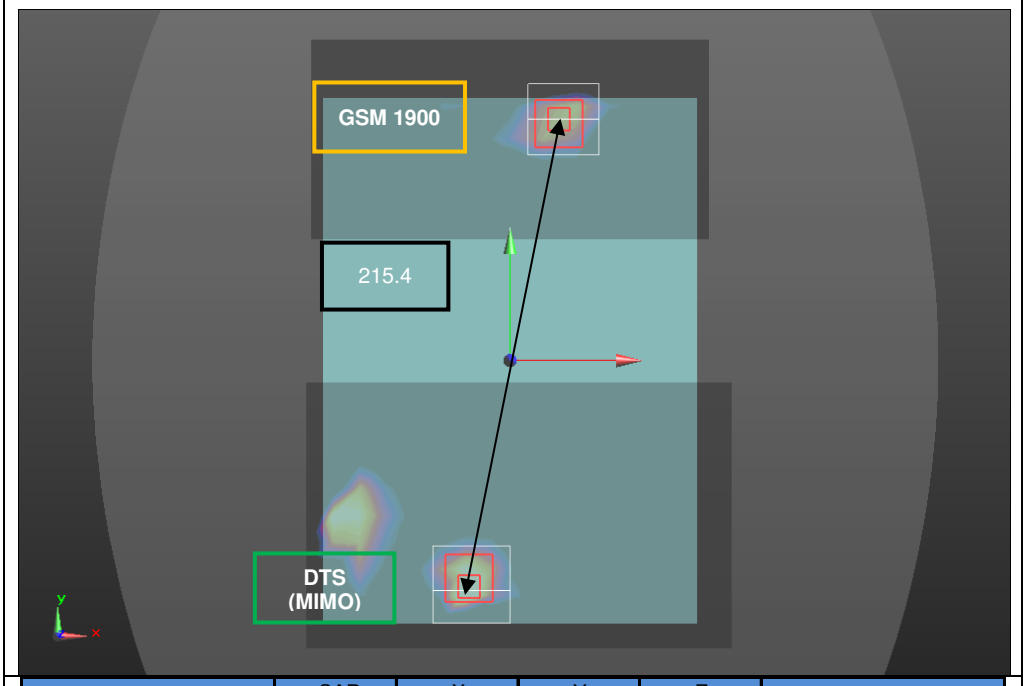
Figure (5)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
GSM 1900	①	0.627	0.0192	0.1074	-0.0029	① + ②	216.4
DTS Sub	②	1.029	-0.013	-0.1066	-0.0036		

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

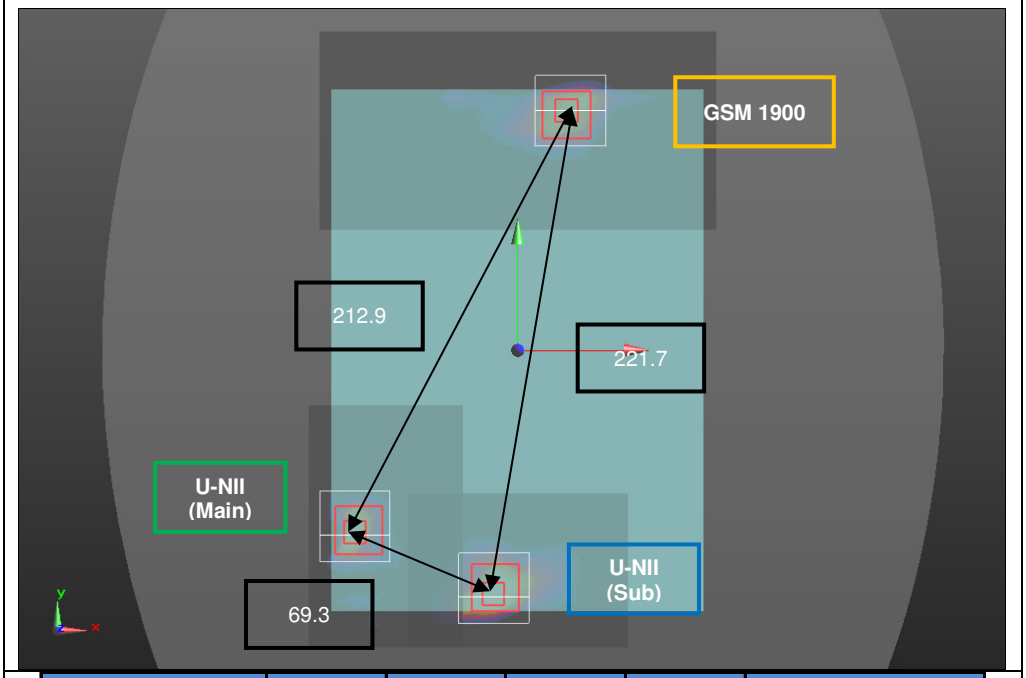
Figure (6)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
GSM 1900	①	0.627	0.0192	0.1074	-0.0029	① + ②	215.4
DTS MIMO	②	1.01	-0.019	-0.1046	-0.0037		

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

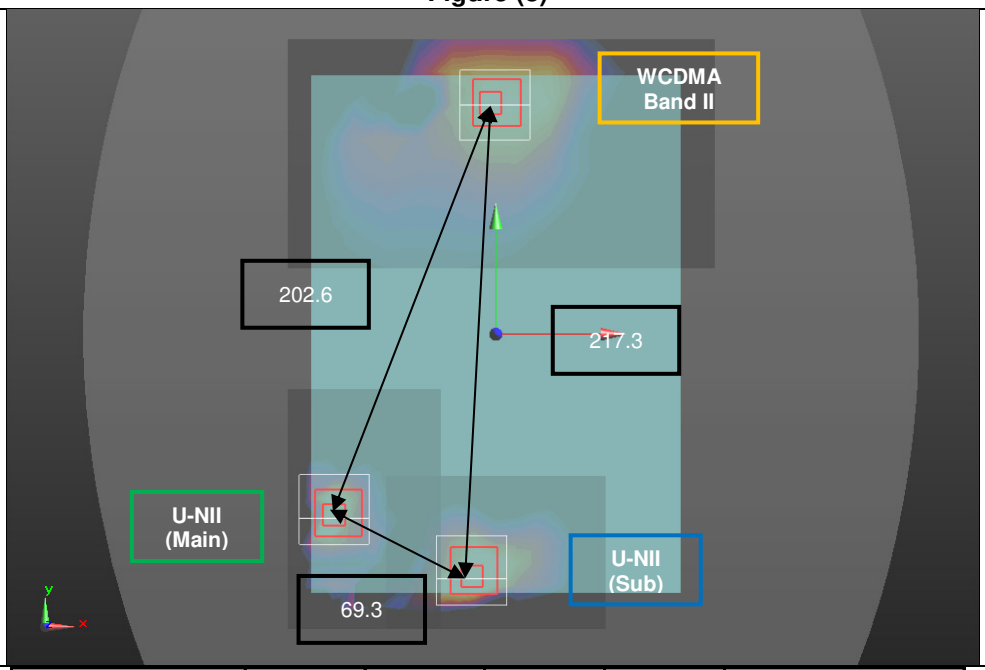
Figure (7)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
GSM 1900	①	0.627	0.0192	0.1074	-0.0029	① + ②	212.9
U-NII Main	②	0.711	-0.0756	-0.0832	-0.0024	① + ③	221.7
U-NII Sub	③	1.017	-0.0126	-0.112	-0.0024	② + ④	69.3

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

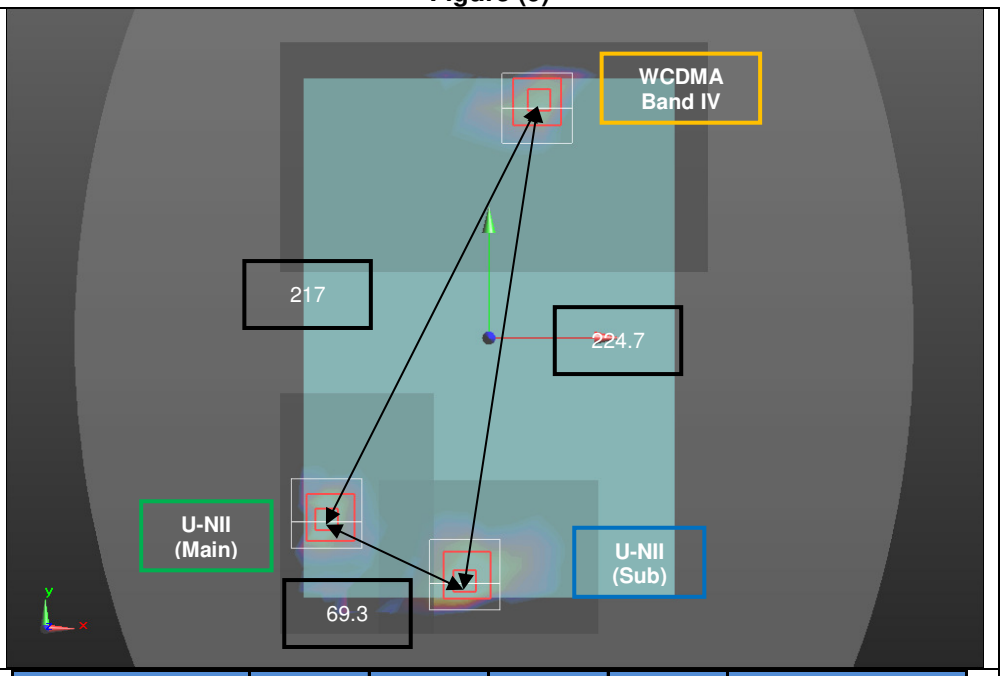
Figure (8)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
WCDMA Band II	①	0.448	-0.0005	0.105	-0.0043	① + ②	202.6
U-NII Main	②	0.711	-0.0756	-0.0832	-0.0024	① + ③	217.3
U-NII Sub	③	1.017	-0.0126	-0.112	-0.0024	② + ④	69.3

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

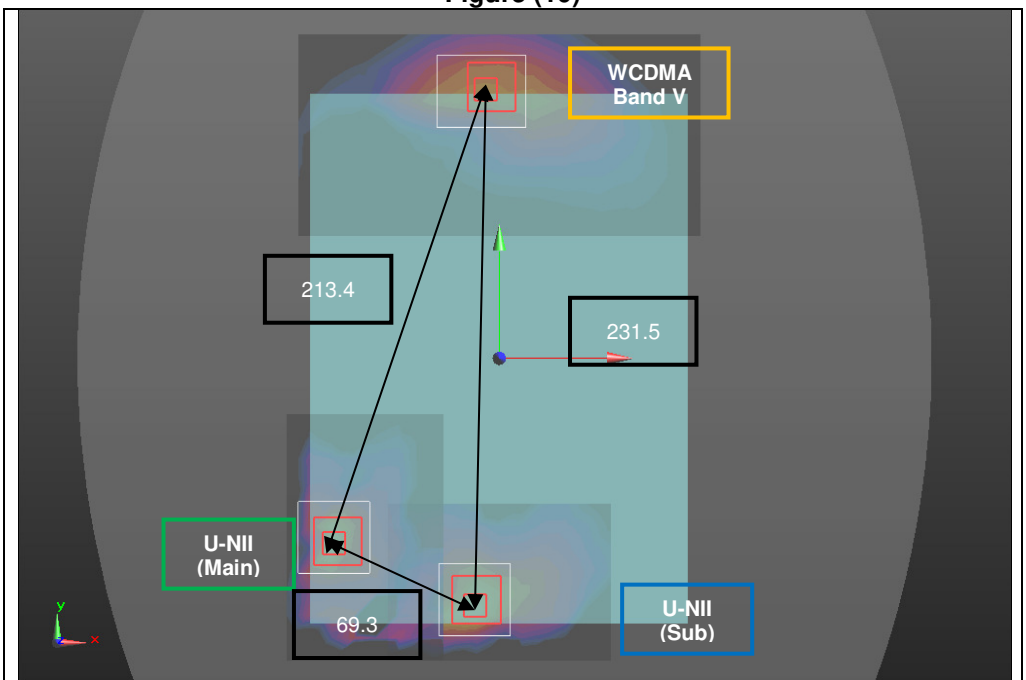
Figure (9)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
WCDMA Band IV	①	0.391	0.0236	0.1098	-0.004	① + ②	217.0
U-NII Main	②	0.711	-0.0756	-0.0832	-0.0024	① + ③	224.7
U-NII Sub	③	1.017	-0.0126	-0.112	-0.0024	② + ④	69.3

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

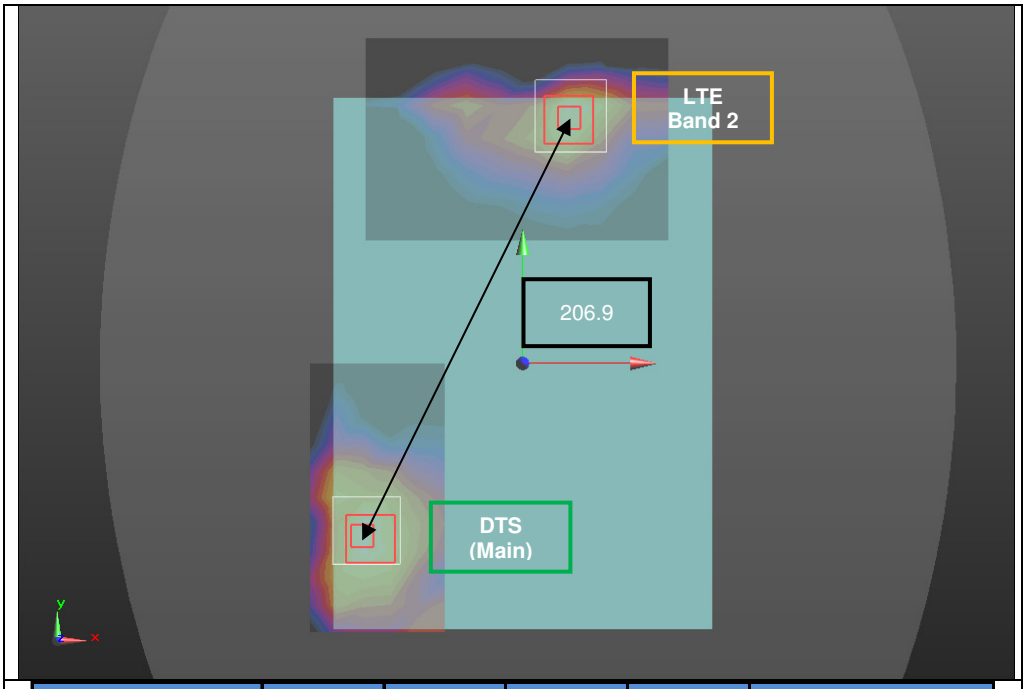
Figure (10)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
WCDMA Band V	①	0.513	-0.0088	0.1195	-0.0046	① + ②	213.4
U-NII Main	②	0.711	-0.0756	-0.0832	-0.0024	① + ③	231.5
U-NII Sub	③	1.017	-0.0126	-0.112	-0.0024	② + ④	69.3

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

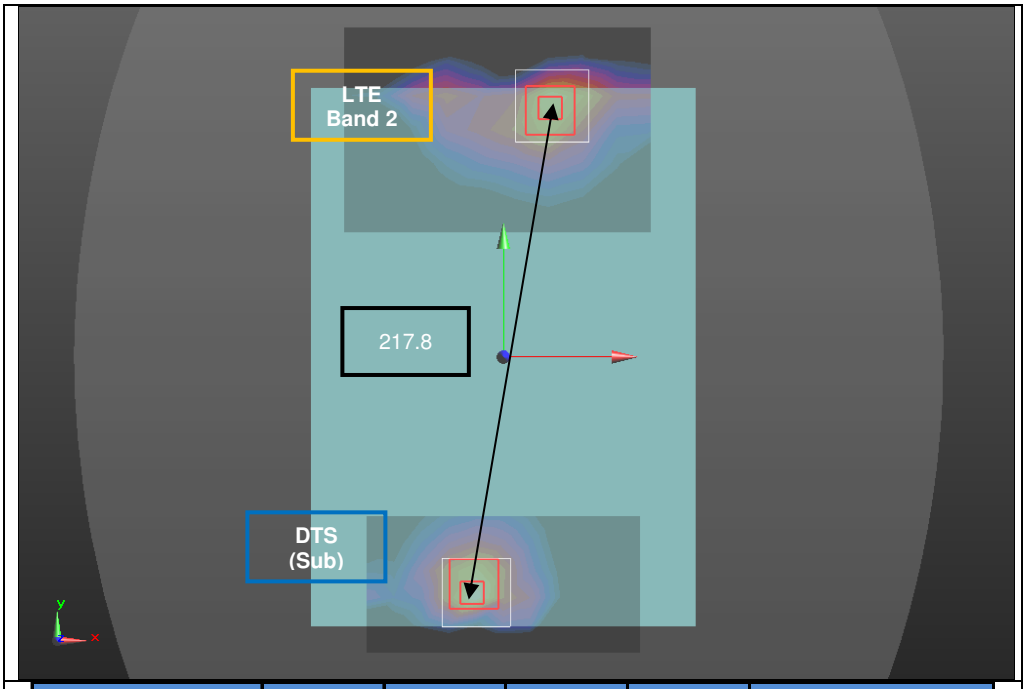
Figure (11)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 2	①	0.879	0.0183	0.1089	-0.003	① + ②	206.9
DTS Main	②	0.951	-0.0738	-0.0764	-0.0033		

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

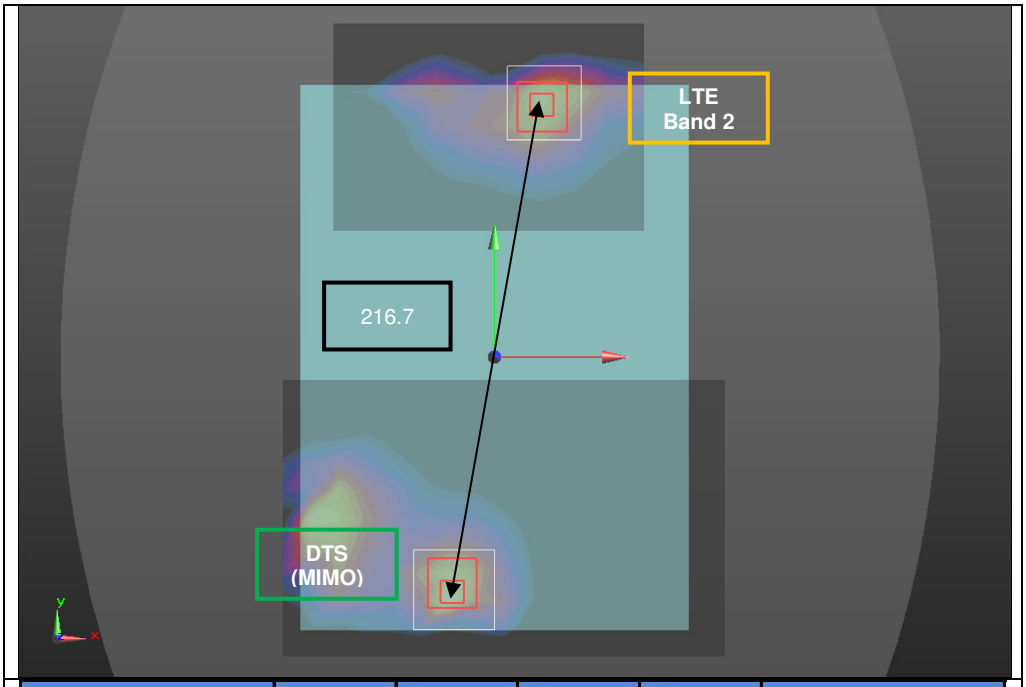
Figure (12)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 2	①	0.879	0.0183	0.1089	-0.003	① + ②	217.8
DTS Sub	②	1.029	-0.013	-0.1066	-0.0036		

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

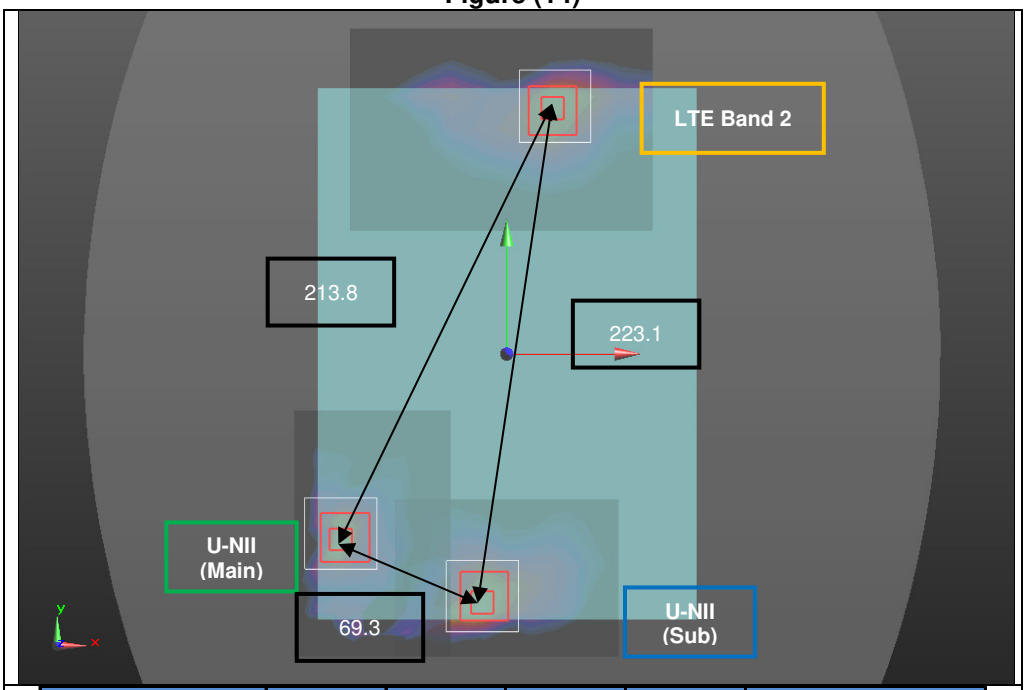
Figure (13)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 2	①	0.879	0.0183	0.1089	-0.003	① + ②	216.7
DTS MIMO	②	1.029	-0.019	-0.1046	-0.0037		

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

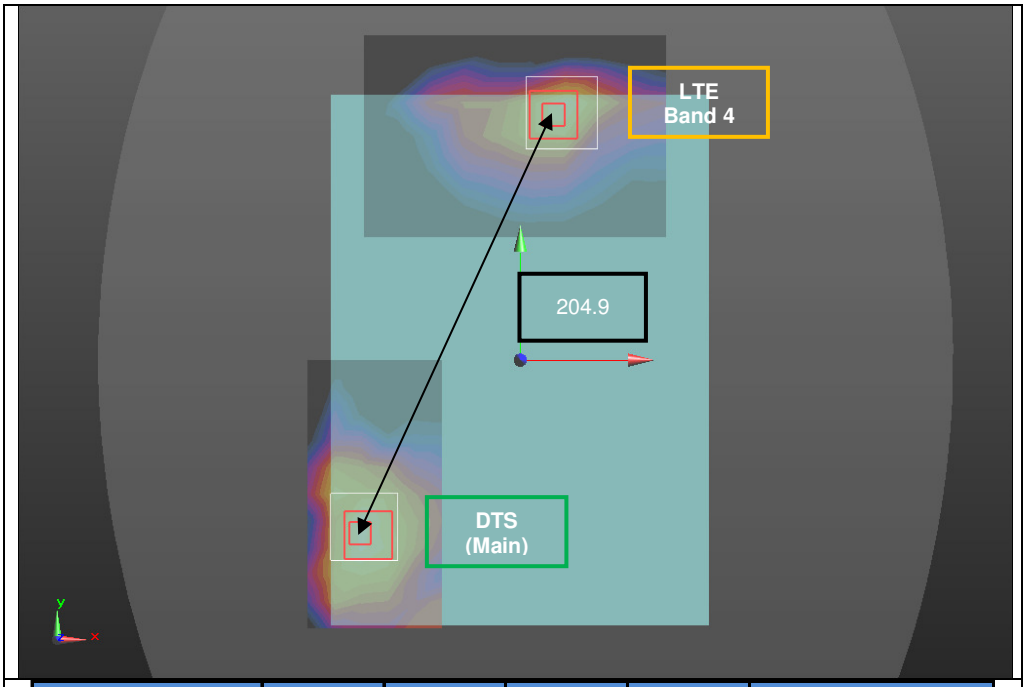
Figure (14)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 2	①	0.879	0.0183	0.1089	-0.003	① + ②	213.8
U-NII Main	②	0.711	-0.0756	-0.0832	-0.0024	① + ③	223.1
U-NII Sub	③	1.017	-0.0126	-0.112	-0.0024	② + ④	69.3

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

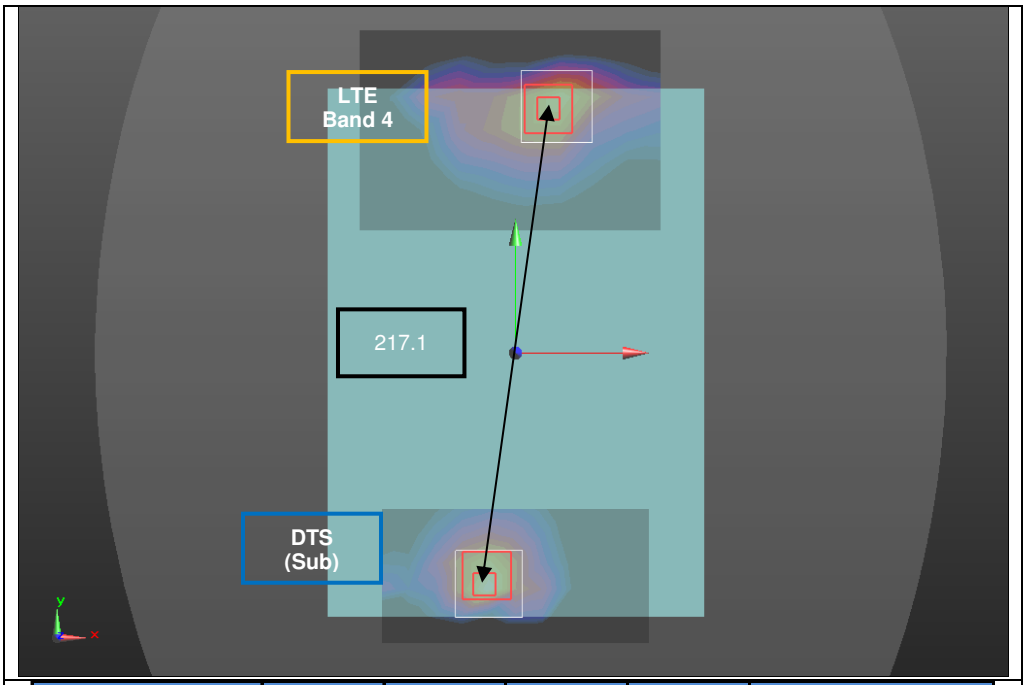
Figure (15)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 4	①	0.775	0.0137	0.1089	-0.0033	① + ②	204.9
Main	②	0.951	-0.0738	-0.0764	-0.0033		

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

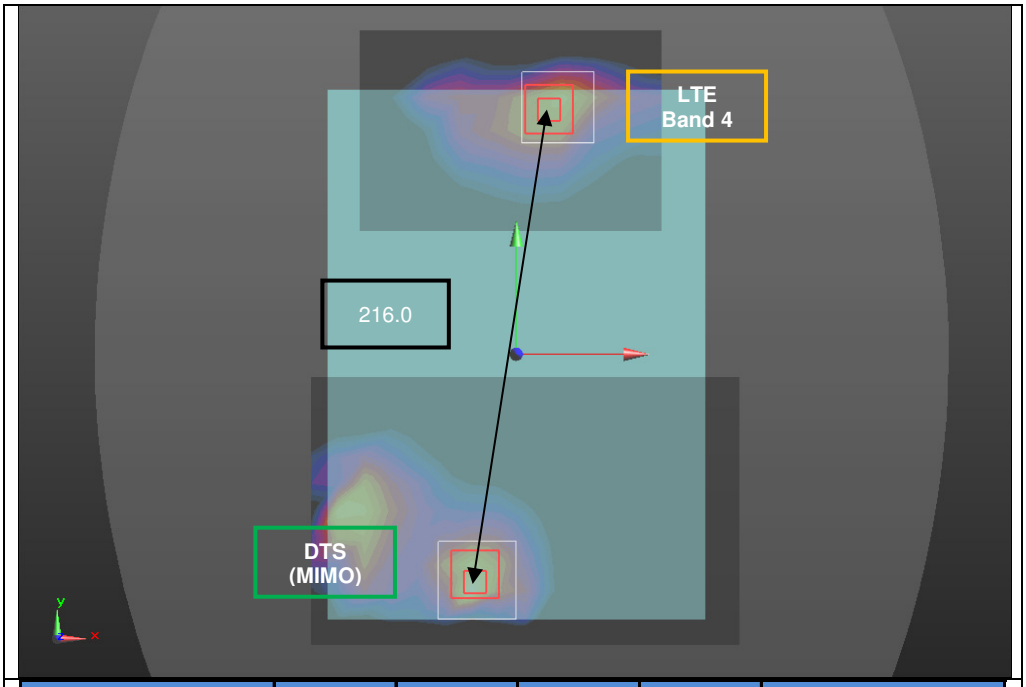
Figure (16)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 4	①	0.775	0.0137	0.1089	-0.0033	① + ②	217.1
DTS Sub	②	1.029	-0.013	-0.1066	-0.0036		

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

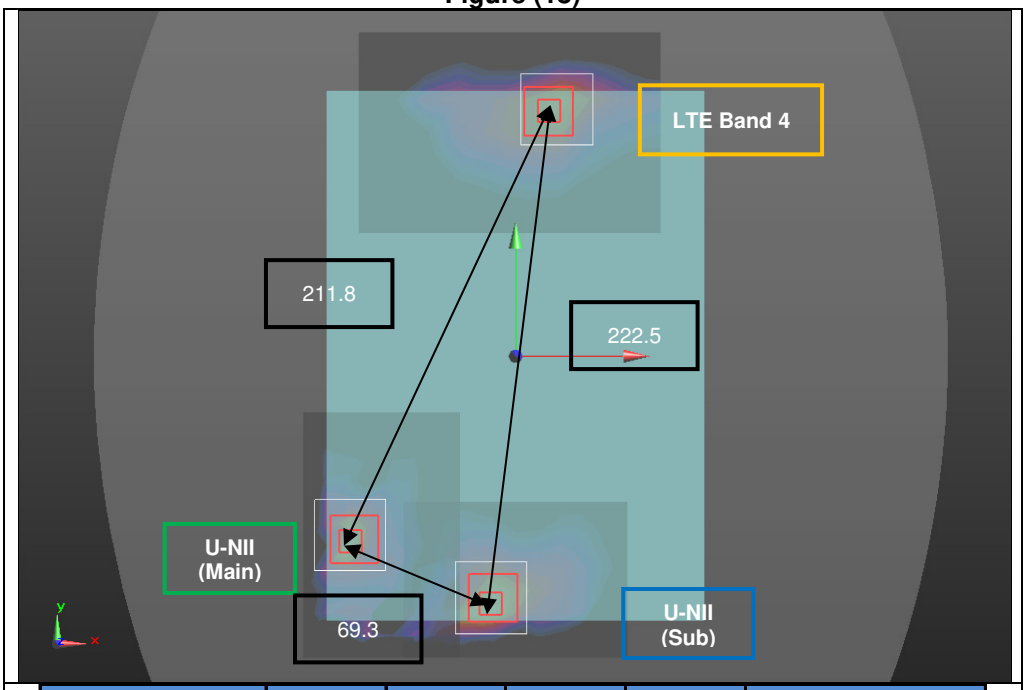
Figure (17)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 4	①	0.775	0.0137	0.1089	-0.0033	① + ②	216.0
Wi-Fi MIMO (2.4G)	②	1.029	-0.019	-0.1046	-0.0037		

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

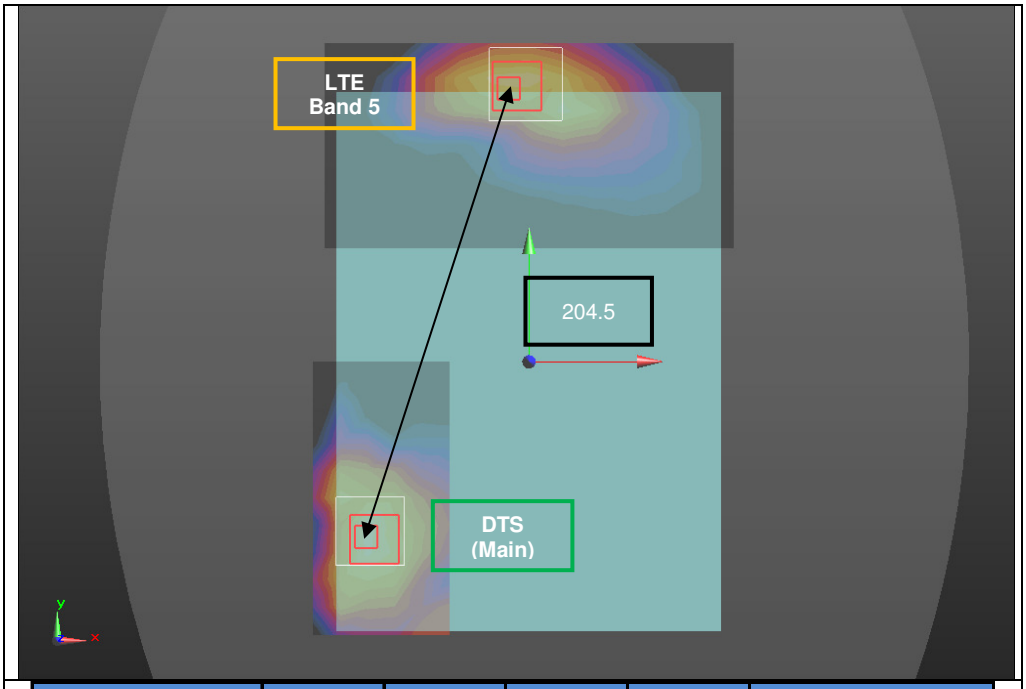
Figure (18)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 4	①	0.775	0.0137	0.1089	-0.0033	① + ②	211.8
U-NII Main	②	0.711	-0.0756	-0.0832	-0.0024	① + ③	222.5
U-NII Sub	③	1.017	-0.0126	-0.112	-0.0024	② + ④	69.3

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

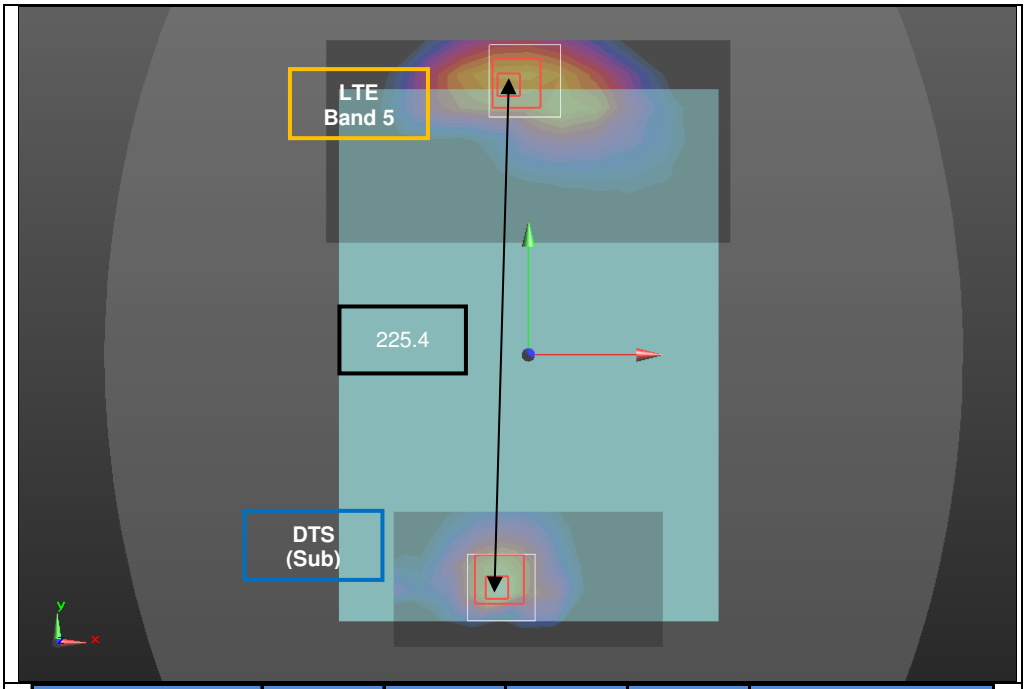
Figure (19)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 5	①	0.796	-0.0127	0.1188	-0.0044	① + ②	204.5
DTS Main	②	0.951	-0.0738	-0.0764	-0.0033		

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

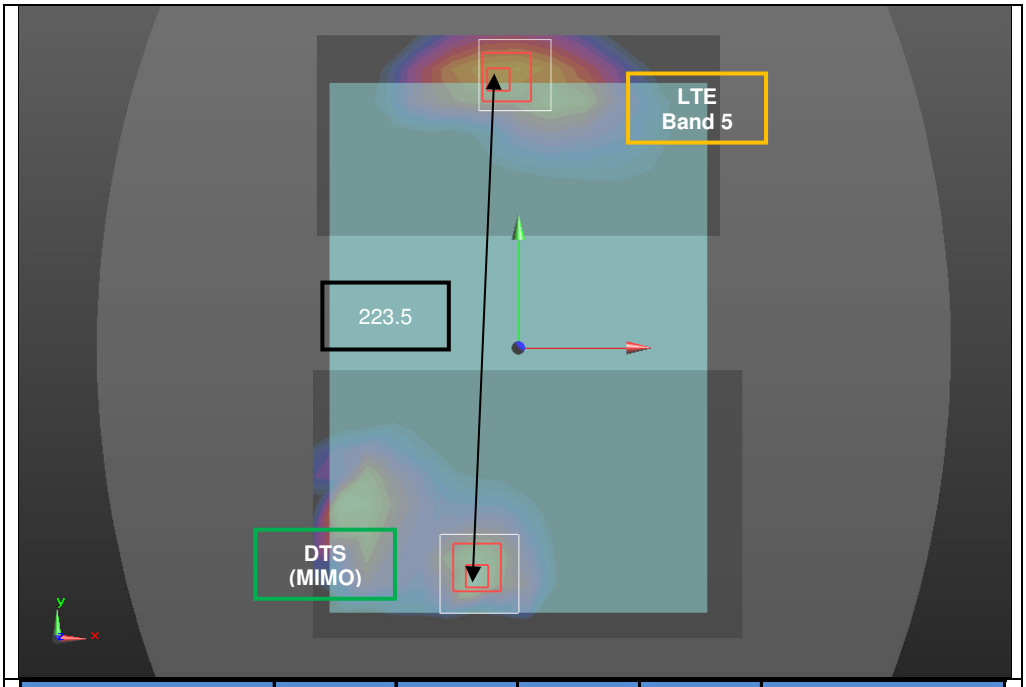
Figure (20)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 5	①	0.796	-0.0127	0.1188	-0.0044	① + ②	225.4
DTS Sub	②	1.029	-0.013	-0.1066	-0.0036		

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

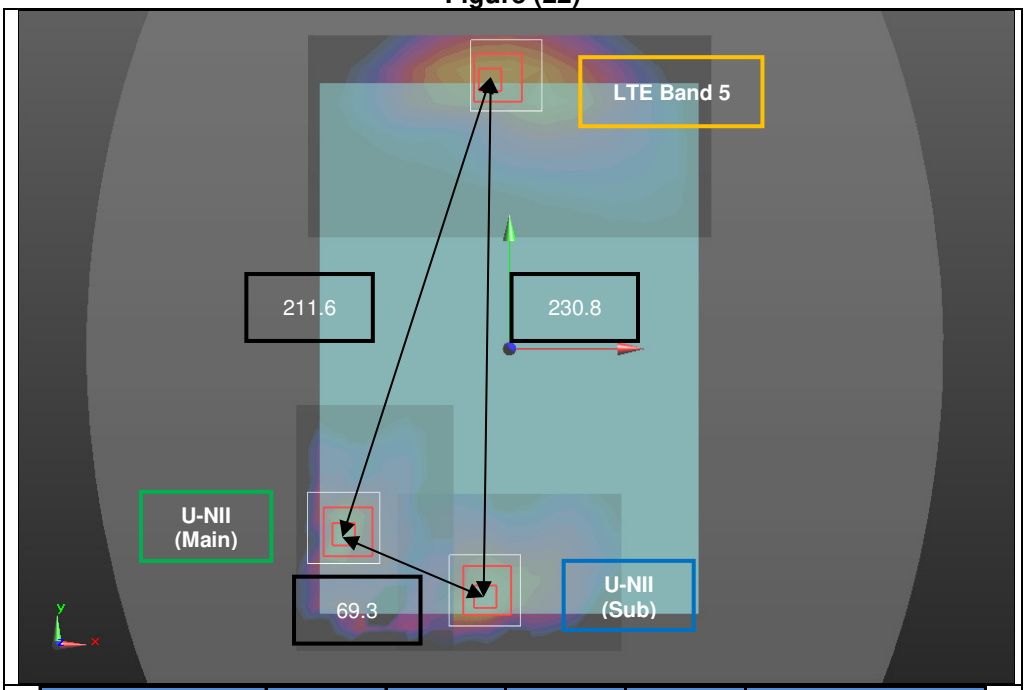
Figure (21)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 5	①	0.796	-0.0127	0.1188	-0.0044	① + ②	223.5
DTS MIMO	②	1.029	-0.019	-0.1046	-0.0037		

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

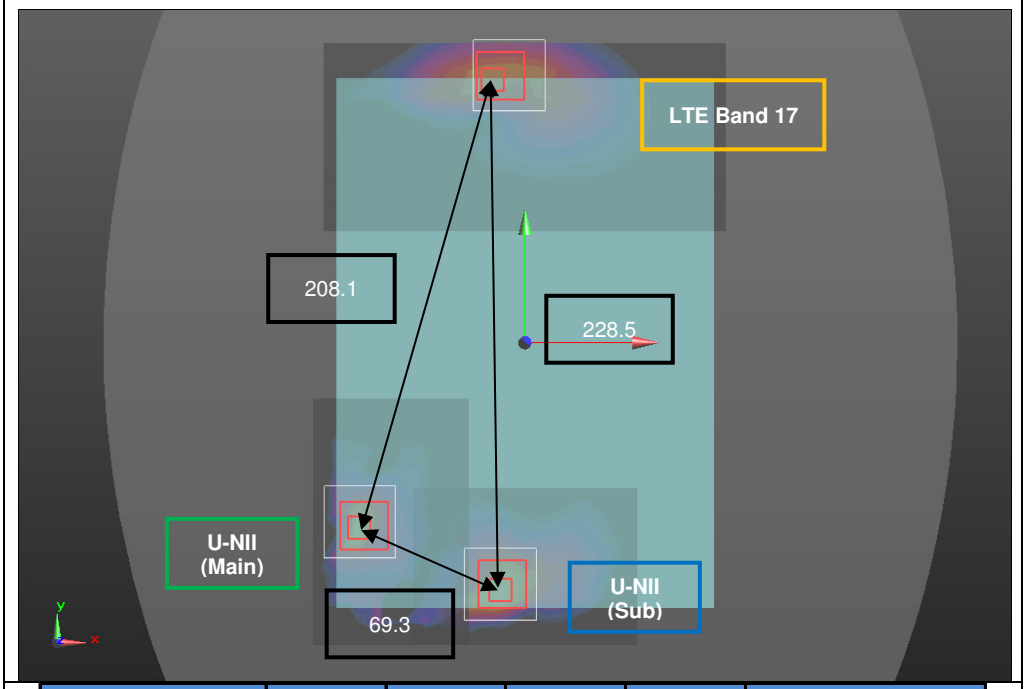
Figure (22)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 5	①	0.796	-0.0127	0.1188	-0.0044	① + ②	211.6
U-NII Main	②	0.711	-0.0756	-0.0832	-0.0024	① + ③	230.8
U-NII Sub	③	1.017	-0.0126	-0.112	-0.0024	② + ④	69.3

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

Figure (23)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 17	①	0.473	-0.0168	0.1164	-0.0048	① + ②	208.1
U-NII Main	②	0.711	-0.0756	-0.0832	-0.0024	① + ③	228.5
U-NII Sub	③	1.017	-0.0126	-0.112	-0.0024	② + ④	69.3

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

Appendixes

Refer to separated files for the following appendixes.

16K23303-S1V2 FCC Report SAR_App A_Photos & Ant. Locations

16K23303-S1V2 FCC Report SAR_App B_Highest SAR Test Plots

16K23303-S1V2 FCC Report SAR_App C_System Check Plots

16K23303-S1V2 FCC Report SAR_App D_SAR Tissue Ingredients

16K23303-S1V2 FCC Report SAR_App E_Probe Cal. Certificates

16K23303-S1V2 FCC Report SAR_App F_Dipole Cal. Certificates

END OF REPORT