SAR EVALUATION REPORT

FCC 47 CFR § 2.1093
IEEE Std 1528-2013

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

FCC ID: A3LSMT715Y
Model Name: SM-T715Y

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1. Attestation of Test Results

Applicant Name		SAMSUNG ELECTRONICS CO.,LTD.			
FCC ID		A3LSMT715Y			
Model Name		SM-T715Y			
Applicable Standards		FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
SAR Limits (W/Kg)					
Exposure Category		Peak spatial-average(1g of tissue)			
General population / Uncontrolled exposure		1.6			
The Highest Reported SAR (W/kg)					
RF Exposure Conditions		**Equipment Class**			
		Licensed	**DTS**	**U-NII**	**DSS (BT)**
Head		0.685	0.272	0.097	N/A
Body		1.080	0.746	1.049	0.234
Simultaneous TX	Head	0.957	0.957	0.782	N/A
	Body	1.593	1.487	1.593	1.160
Date Tested		4/7/2015 to 5/28/2015			
Test Results		Pass			

Note: The GSM 850/1900,WCDMA Band II/V, LTE Band 2/4/5, Wi-Fi (DTS/U-NII) and Bluetooth SAR measurement results from the original filling can be found in SAR test report 15K20515-S1D, FCC ID A3LSMT715. The GSM 850/1900, WCDMA Band II/V, LTE Band 2/4/5 and WLAN/BT antennas and surrounding circuitry is the same between these two units, and tune up power targets are identical for GSM 850/1900, WCDMA Band II/V, LTE Band 2/4/5 and WLAN/BT operations. Therefore, SAR data for GSM 850/1900, WCDMA Band II/V, LTE Band 2/4/5 and WLAN/BT from the original filling was used for this model. Spot checks for GSM 850/1900, WCDMA Band II/V, LTE Band 2/4/5 and WLAN/BT were performed to ensure that the SAR measurements for both devices are the same.

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

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

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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 v02
- 447498 D01 General RF Exposure Guidance v05r02
- 447498 D03 Supplement C Cross-Reference v01
- 616217 D04 SAR for laptop and tablets v01r01
- 648474 D04 Handset SAR v01r02
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
- 865664 D02 RF Exposure Reporting v01r01
- 941225 D01 3G SAR Procedures v03
- 941225 D05 SAR for LTE Devices v02r03
- 941225 D06 Hotspot Mode v02

3. Facilities and Accreditation

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

Suwon
SAR 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.

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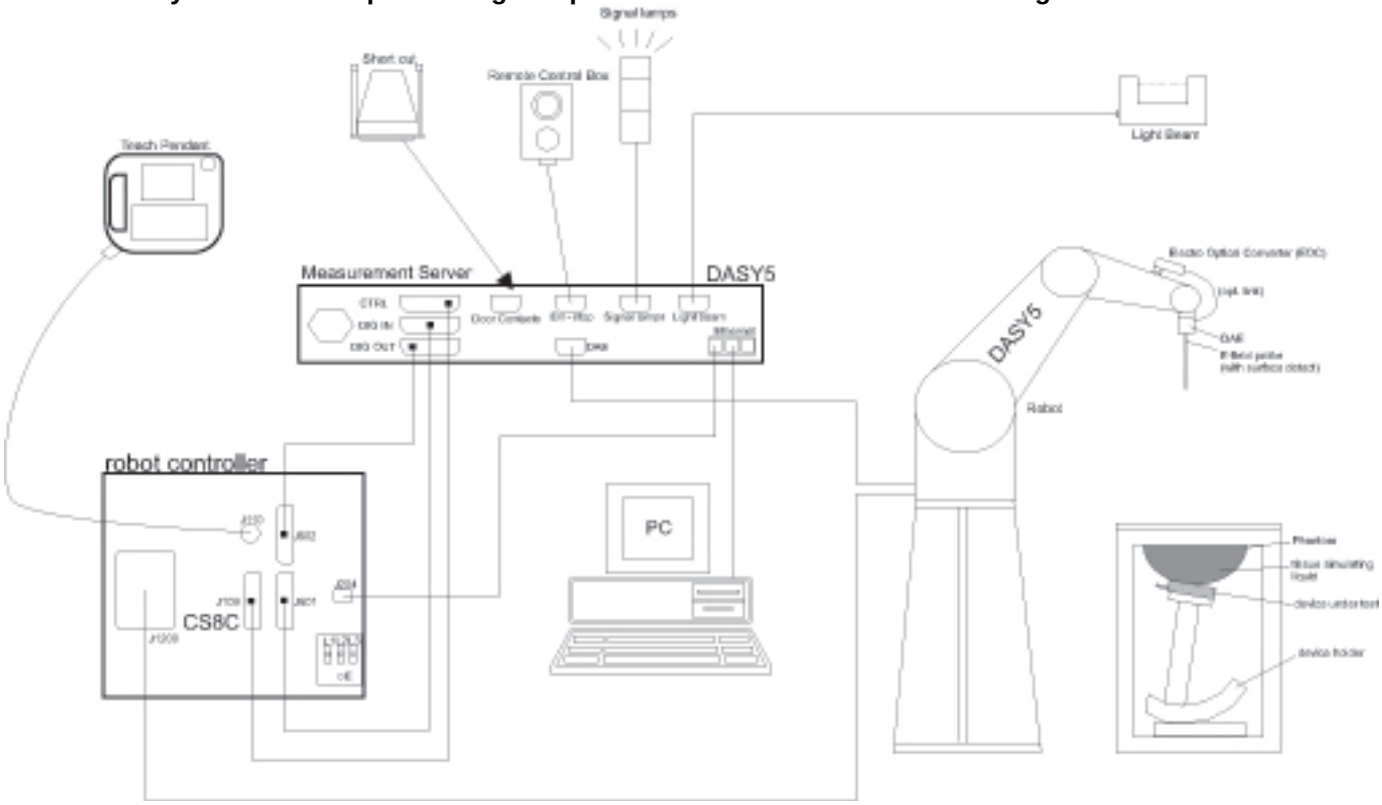
4. SAR Measurement System & Test Equipment

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.

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4.2. SAR Scan Procedures

Step 1: Power Reference Measurement

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

Step 2: Area Scan

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

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

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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	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
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.

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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	9-23-2015
Dielectronic Probe kit	SPEAG	DAK-3.5	1196	8-5-2015
Dielectronic Probe kit	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	LKM	DTM3000	3424	11-13-2015

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Agilent	N5181A	MY50145882	9-23-2015
Power Sensor	Agilent	U2000A	MY54260010	9-23-2015
Power Sensor	Agilent	U2000A	MY54260007	9-23-2015
Power Amplifier	EXODUS	1410025-AMP2027-10003	10003	11-7-2015
Directional Coupler	Agilent	772D	MY52180193	9-22-2015
Directional Coupler	Agilent	778D	MY52180432	9-22-2015
Low Pass Filter	MICROLAB	LA-15N	03943	11-4-2015
Low Pass Filter	FILTRON	L14012FL	1410003S	11-4-2015
Low Pass Filter	MICROLAB	LA-60N	03942	11-5-2015
Attenuator	Agilent	8491B/003	MY39269292	9-22-2015
Attenuator	Agilent	8491B/010	MY39269315	9-22-2015
Attenuator	Agilent	8491B/020	MY39269298	9-22-2015
E-Field Probe (SAR 1)	SPEAG	EX3DV4	7330	2-12-2016
E-Field Probe (SAR 2)	SPEAG	EX3DV4	7313	8-27-2015
E-Field Probe (SAR 3)	SPEAG	EX3DV4	7314	8-27-2015
E-Field Probe (SAR 3)	SPEAG	EX3DV4	7323	12-5-2015
Data Acquisition Electronics (SAR 1)	SPEAG	DAE4	1468	1-12-2016
Data Acquisition Electronics (SAR 2)	SPEAG	DAE4	1447	8-25-2015
Data Acquisition Electronics (SAR 3)	SPEAG	DAE4	1446	8-27-2015
System Validation Dipole	SPEAG	D750V3	1122	8-13-2015
System Validation Dipole	SPEAG	D835V2	4d174	8-13-2015
System Validation Dipole	SPEAG	D1750V2	1125	8-12-2015
System Validation Dipole	SPEAG	D1900V2	5d190	8-12-2015
System Validation Dipole	SPEAG	D1900V2	5d199	2-6-2016
System Validation Dipole	SPEAG	D2450V2	939	8-11-2015
System Validation Dipole	SPEAG	D5GHzV2	1184	8-22-2015
Thermometer (SAR 1)	Lutron	MHB-382SD	AH.53049	11-18-2015
Thermometer (SAR 2)	Lutron	MHB-382SD	AH.50215	11-18-2015
Thermometer (SAR 3)	Lutron	MHB-382SD	AH.50213	11-18-2015

Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	150313	8-13-2015
Base Station Simulator	R & S	CMW500	150314	8-13-2015
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	11-17-2015

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.

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6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Overall (Length x Width): 198.2 mm x 134.5 mm Overall Diagonal: 230 mm Display Diagonal: 203.5 mm
Back Cover	☒ The rechargeable battery is not user accessible.
Battery Options	☒ The rechargeable battery is not user accessible.
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. ☒ Mobile Hotspot (Wi-Fi 2.4 GHz) ☐ Mobile Hotspot (Wi-Fi 5 GHz)
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other ☒ Wi-Fi Direct (Wi-Fi 2.4 GHz) ☒ Wi-Fi Direct (Wi-Fi 5 GHz)

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK) GPRS (GMSK) EGPRS (8PSK)	GPRS Multi-Slot Class: ☐ Class 8 - 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. 5) HSUPA (Rel. 6) DC-HSDPA (Rel. 8)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 17	QPSK 16QAM		100% (FDD)
	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		77.5% (DH5)

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6.3. Nominal and Maximum Output Power

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

Upper limit (dB): -1.5 ~ 0.5		Max. RF Output Power (dBm)		Reduce RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit	Target	Max. tune-up tolerance limit
GSM850	Voice	33.0	**33.5**	26.0	**26.5**
	GPRS 1 slot	33.0	**33.5**	26.0	**26.5**
	GPRS 2 slots	31.5	**32.0**	23.5	**24.0**
	GPRS 3 slots	30.0	**30.5**	22.0	**22.5**
	GPRS 4 slots	28.5	**29.0**	20.5	**21.0**
	EGPRS 1 slot	27.0	**27.5**	19.0	**19.5**
	EGPRS 2 slots	25.5	**26.0**	17.5	**18.0**
	EGPRS 3 slots	24.0	**24.5**	16.0	**16.5**
	EGPRS 4 slots	22.5	**23.0**	14.5	**15.0**
GSM1900	Voice	29.5	**30.0**	24.0	**24.5**
	GPRS 1 slot	29.5	**30.0**	24.0	**24.5**
	GPRS 2 slots	28.5	**29.0**	22.5	**23.0**
	GPRS 3 slots	27.0	**27.5**	21.0	**21.5**
	GPRS 4 slots	25.5	**26.0**	19.5	**20.0**
	EGPRS 1 slot	26.0	**26.5**	19.5	**20.0**
	EGPRS 2 slots	24.5	**25.0**	18.0	**18.5**
	EGPRS 3 slots	23.0	**23.5**	16.5	**17.0**
	EGPRS 4 slots	21.5	**22.0**	15.0	**15.5**
W-CDMA Band V	R99	23.0	**23.5**	17.0	**17.5**
	HSDPA	23.0	**23.5**	17.0	**17.5**
	HSUPA	23.0	**23.5**	17.0	**17.5**
	DC-HSDPA	23.0	**23.5**	17.0	**17.5**
W-CDMA Band IV	R99	23.0	**23.5**	15.5	**16.0**
	HSDPA	23.0	**23.5**	15.5	**16.0**
	HSUPA	23.0	**23.5**	16.0	**16.5**
	DC-HSDPA	23.0	**23.5**	15.5	**16.0**
W-CDMA Band II	R99	23.0	**23.5**	17.0	**17.5**
	HSDPA	23.0	**23.5**	17.0	**17.5**
	HSUPA	23.0	**23.5**	17.0	**17.5**
	DC-HSDPA	23.0	**23.5**	17.0	**17.5**
LTE Band 2	QPSK,16QAM	23.0	**23.5**	16.0	**16.5**
LTE Band 4	QPSK,16QAM	23.0	**23.5**	17.0	**17.5**
LTE Band 5	QPSK,16QAM	23.0	**23.5**	17.0	**17.5**
LTE Band 17	QPSK,16QAM	23.0	**23.5**	15.0	**15.5**

Upper limit (dB): ~ 0.5		Max. RF Output Power (dBm)		Reduce RF Output Power (dBm)	
		Main, Sub Ant		Main, Sub Ant	
RF Air interface	Mode	Target	Max. tune-up tolerance limit	Target	Max. tune-up tolerance limit
WiFi 2.4 GHz	802.11b	16.0	**16.5**	11.0	**11.5**
	802.11g	13.0	**13.5**	11.0	**11.5**
	802.11n HT20	13.0	**13.5**	11.0	**11.5**
WiFi 5 GHz	802.11a	12.0	**12.5**	7.0	**7.5**
	802.11n HT20	12.0	**12.5**	7.0	**7.5**
	802.11n HT40	11.0	**11.5**	7.0	**7.5**
	802.11ac VHT20	11.0	**11.5**	7.0	**7.5**
	802.11ac VHT40	11.0	**11.5**	7.0	**7.5**
	802.11ac VHT80	10.0	**10.5**	7.0	**7.5**
Bluetooth		9.2	**9.7**	N/A	
Bluetooth LE		5.0	**5.5**	N/A	

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6.4. General LTE SAR Test and Reporting Considerations

Item	Description						
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Frequency range: 1850 - 1910 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	18700 /1860	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
	Mid	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880
	High	19100/ 1900	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19185/ 1908.5	19193/ 1909.3
	Band 4	Frequency range: 1710 - 1755 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20050/ 1720	20025/ 1717.5	20000/ 1715	19975/ 1712.5	19965/ 1711.5	19957/ 1710.7
	Mid	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5
	High	20300/ 1745	20325/ 1747.5	20350/ 1750	20375/ 1752.5	20385/ 1753.5	20393/ 1754.3
	Band 5	Frequency range: 824 - 849 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			20450/ 829	20425/ 826.5	20415/ 825.5	20407/ 824.7
	Mid			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5
	High			20600/ 844	20625/ 846.5	20635/ 847.5	20643/ 848.3
	Band 17	Frequency range: 704 - 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low				23755/ 706.5		
	Mid			23790/ 710	23790/ 710		
	High				23825/ 713.5		
LTE transmitter and antenna implementation	LTE has one (1) TX/RX antennas and one (1) RX antennas Refer to Appendix A...						
Maximum power reduction (MPR)	**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
	MPR Built-in by design A-MPR (additional MPR) was disabled during SAR testing						
Power reduction	Yes						
Spectrum plots for RB configurations	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.						

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6.5. Power Reduction by Proximity Sensing

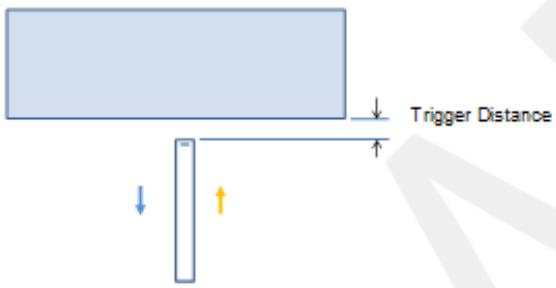
6.5.1. Proximity Sensor Triggering Distance (KDB 616217 §6.2)

Edge 1 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 Rear surface.

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 point

Summary of Trigger Distances

Tissue simulating liquid	Trigger distance - Edge 1		Trigger distance - Rear		Trigger distance - Front	
	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom
750 muscle	15 mm	15 mm	15 mm	15 mm	13 mm	13 mm
850 muscle	15 mm	15 mm	15 mm	15 mm	13 mm	13 mm
1700 muscle	15 mm	15 mm	15 mm	15 mm	13 mm	13 mm
1900 muscle	15 mm	15 mm	15 mm	15 mm	13 mm	13 mm
2450 muscle	N/A	N/A	10 mm	10 mm	N/A	N/A
5000 muscle	N/A	N/A	10 mm	10 mm	N/A	N/A

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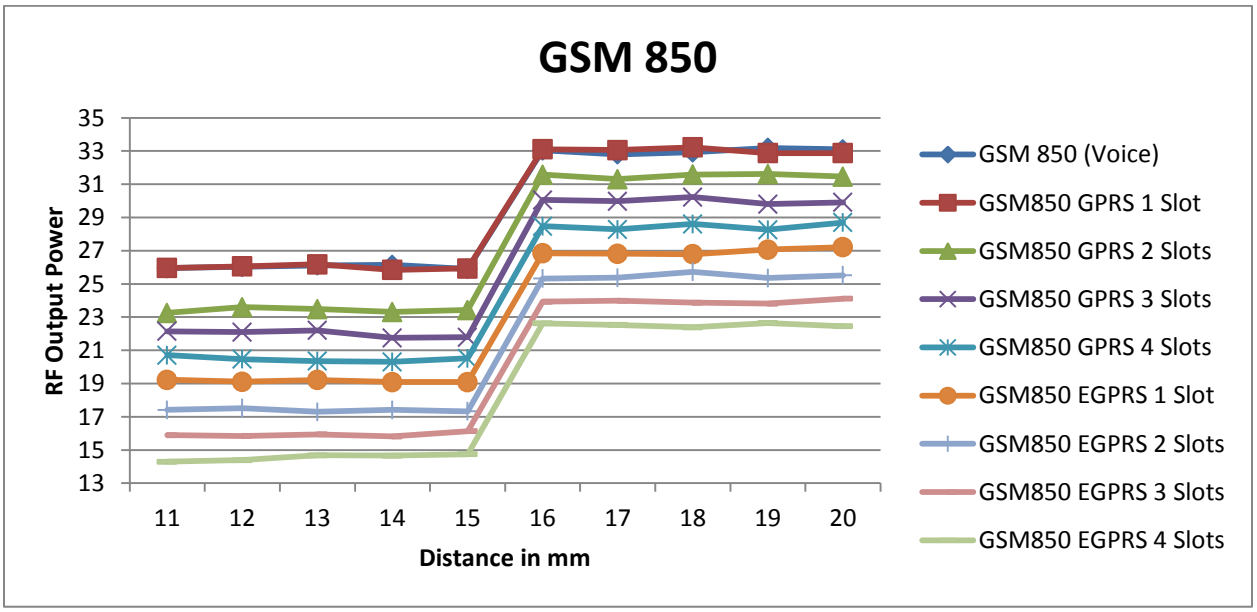
Proximity Sensor Triggering Distance Measurement Results

GSM850

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	11	12	13	14	15	16	17	18	19	20
GSM 850 (Voice)	26.0	26.0	26.1	26.1	25.9	33.0	32.8	32.9	33.2	33.1
GSM850 GPRS 1 Slot	26.0	26.1	26.2	25.9	25.9	33.1	33.1	33.2	32.9	32.9
GSM850 GPRS 2 Slots	23.3	23.6	23.5	23.3	23.4	31.6	31.3	31.6	31.6	31.5
GSM850 GPRS 3 Slots	22.2	22.1	22.2	21.8	21.8	30.1	30.0	30.2	29.8	29.9
GSM850 GPRS 4 Slots	20.7	20.5	20.4	20.3	20.5	28.5	28.3	28.6	28.3	28.7
GSM850 EGPRS 1 Slot	19.2	19.1	19.2	19.1	19.1	26.9	26.8	26.8	27.1	27.2
GSM850 EGPRS 2 Slots	17.4	17.5	17.3	17.4	17.3	25.3	25.4	25.7	25.4	25.5
GSM850 EGPRS 3 Slots	15.9	15.9	15.9	15.8	16.1	23.9	24.0	23.9	23.8	24.1
GSM850 EGPRS 4 Slots	14.3	14.4	14.7	14.7	14.8	22.6	22.5	22.4	22.7	22.5



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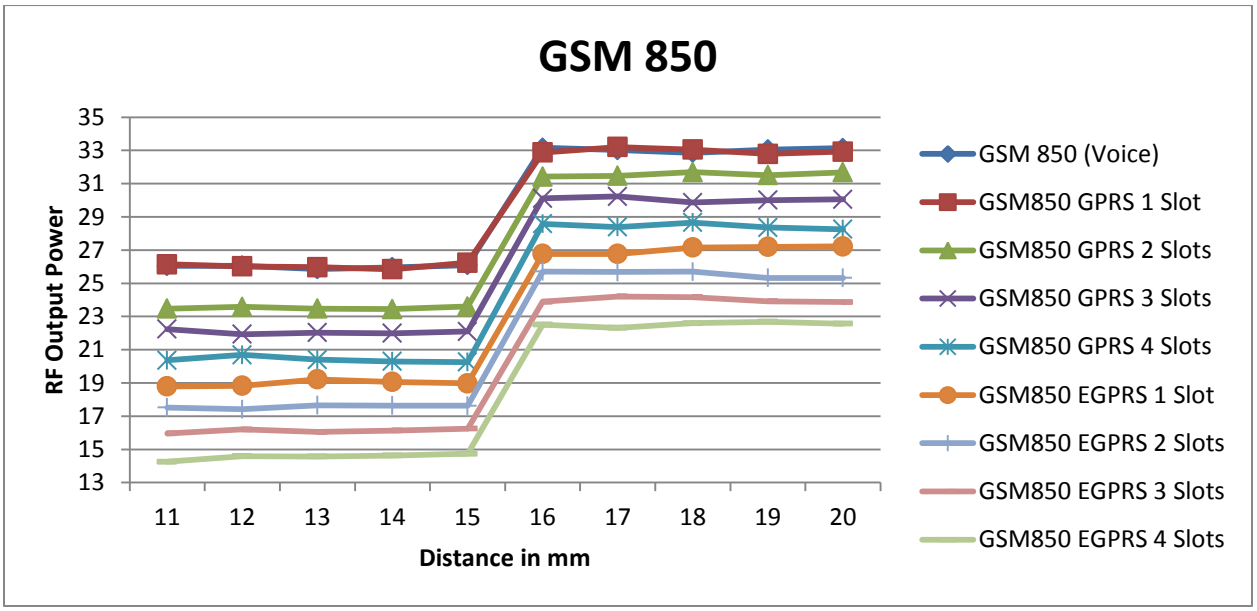
GSM850

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	11	12	13	14	15	16	17	18	19	20
GSM 850 (Voice)	26.1	26.1	25.9	26.0	26.1	33.2	33.0	32.9	33.1	33.1
GSM850 GPRS 1 Slot	26.1	26.0	26.0	25.9	26.2	32.9	33.2	33.1	32.8	32.9
GSM850 GPRS 2 Slots	23.5	23.6	23.5	23.5	23.6	31.4	31.5	31.7	31.5	31.7
GSM850 GPRS 3 Slots	22.2	21.9	22.0	22.0	22.1	30.1	30.2	29.9	30.0	30.1
GSM850 GPRS 4 Slots	20.4	20.7	20.4	20.3	20.3	28.6	28.4	28.7	28.4	28.3
GSM850 EGPRS 1 Slot	18.8	18.8	19.2	19.1	19.0	26.8	26.8	27.2	27.2	27.2
GSM850 EGPRS 2 Slots	17.5	17.4	17.7	17.6	17.6	25.7	25.7	25.7	25.3	25.3
GSM850 EGPRS 3 Slots	16.0	16.2	16.1	16.1	16.3	23.9	24.2	24.2	23.9	23.9
GSM850 EGPRS 4 Slots	14.3	14.6	14.6	14.6	14.7	22.5	22.3	22.6	22.7	22.6



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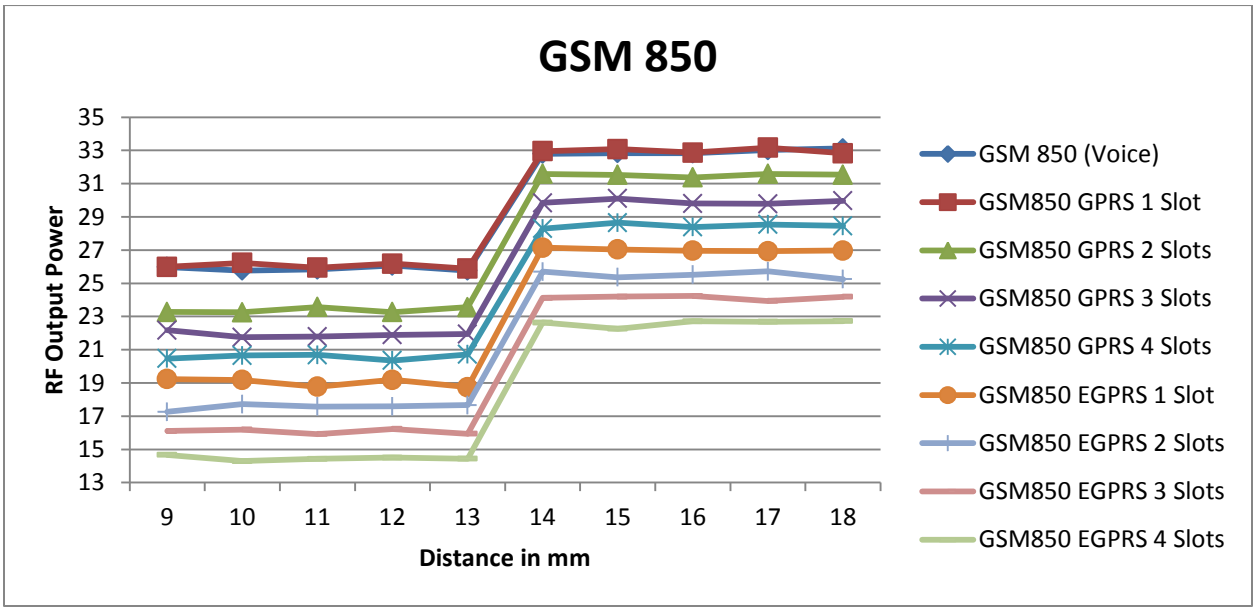
GSM850

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	9	10	11	12	13	14	15	16	17	18
GSM 850 (Voice)	26.0	25.8	25.8	26.1	25.8	32.8	32.8	32.8	33.0	33.1
GSM850 GPRS 1 Slot	26.0	26.2	25.9	26.2	25.9	33.0	33.1	32.9	33.2	32.8
GSM850 GPRS 2 Slots	23.3	23.3	23.6	23.3	23.6	31.6	31.5	31.4	31.6	31.5
GSM850 GPRS 3 Slots	22.2	21.8	21.8	21.9	21.9	29.8	30.1	29.8	29.8	30.0
GSM850 GPRS 4 Slots	20.5	20.7	20.7	20.4	20.7	28.3	28.7	28.4	28.5	28.5
GSM850 EGPRS 1 Slot	19.2	19.2	18.8	19.2	18.8	27.2	27.0	27.0	26.9	27.0
GSM850 EGPRS 2 Slots	17.3	17.7	17.6	17.6	17.7	25.7	25.4	25.5	25.7	25.3
GSM850 EGPRS 3 Slots	16.1	16.2	15.9	16.2	15.9	24.1	24.2	24.2	23.9	24.2
GSM850 EGPRS 4 Slots	14.7	14.3	14.4	14.5	14.4	22.6	22.3	22.7	22.7	22.7



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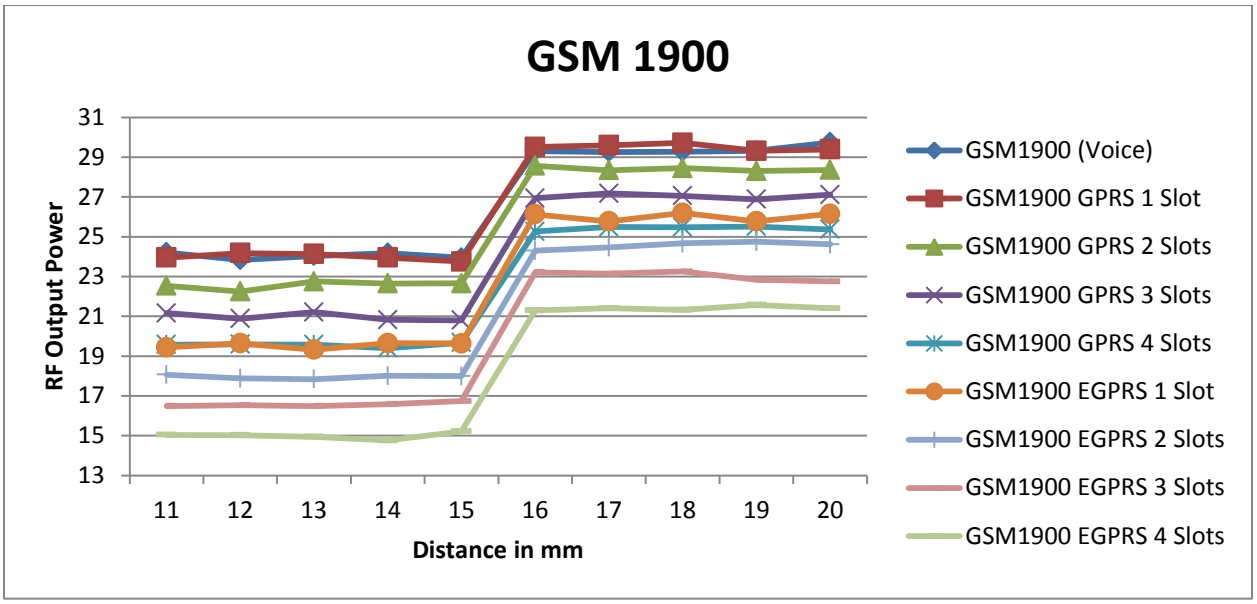
GSM1900

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	11	12	13	14	15	16	17	18	19	20
GSM1900 (Voice)	24.2	23.8	24.0	24.2	23.9	29.3	29.3	29.3	29.3	29.7
GSM1900 GPRS 1 Slot	24.0	24.2	24.1	24.0	23.8	29.5	29.6	29.7	29.3	29.4
GSM1900 GPRS 2 Slots	22.5	22.3	22.8	22.7	22.7	28.6	28.3	28.5	28.3	28.4
GSM1900 GPRS 3 Slots	21.2	20.9	21.2	20.8	20.8	26.9	27.2	27.1	26.9	27.1
GSM1900 GPRS 4 Slots	19.6	19.6	19.6	19.4	19.7	25.3	25.5	25.5	25.5	25.4
GSM1900 EGPRS 1 Slot	19.4	19.6	19.3	19.7	19.6	26.1	25.8	26.2	25.8	26.2
GSM1900 EGPRS 2 Slots	18.1	17.9	17.8	18.0	18.0	24.3	24.5	24.7	24.8	24.6
GSM1900 EGPRS 3 Slots	16.5	16.5	16.5	16.6	16.7	23.2	23.1	23.3	22.8	22.8
GSM1900 EGPRS 4 Slots	15.0	15.0	14.9	14.8	15.2	21.3	21.4	21.3	21.6	21.4



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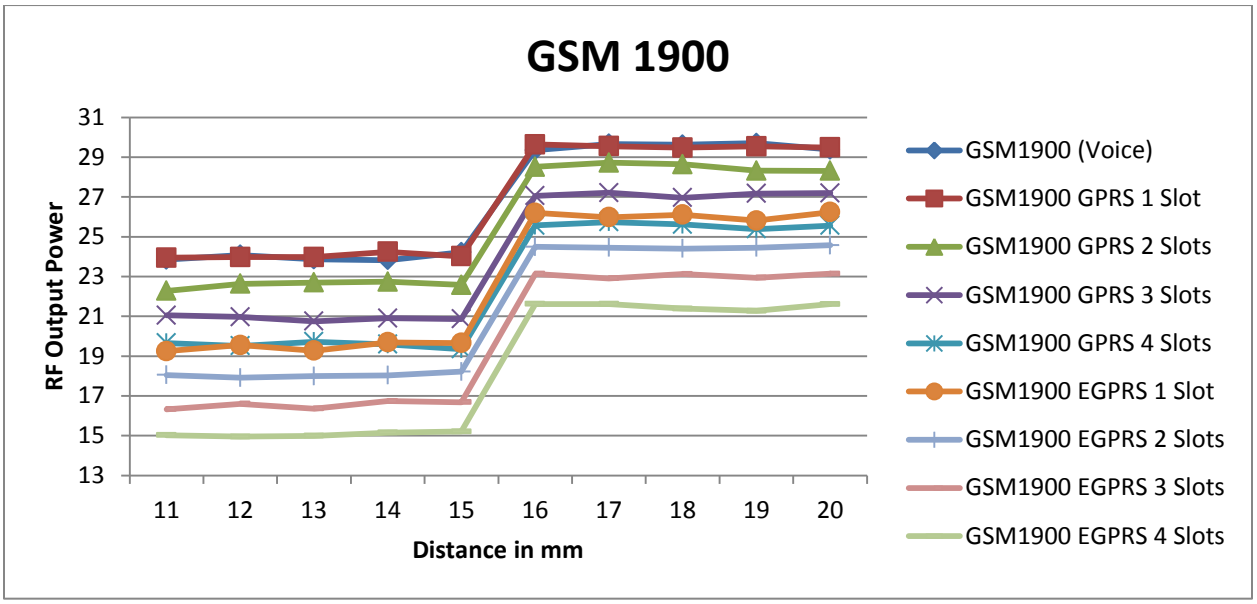
GSM1900

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	11	12	13	14	15	16	17	18	19	20
GSM1900 (Voice)	23.9	24.1	23.9	23.8	24.2	29.4	29.7	29.6	29.7	29.4
GSM1900 GPRS 1 Slot	23.9	24.0	24.0	24.2	24.0	29.6	29.6	29.5	29.5	29.5
GSM1900 GPRS 2 Slots	22.3	22.6	22.7	22.7	22.6	28.5	28.7	28.6	28.3	28.3
GSM1900 GPRS 3 Slots	21.1	21.0	20.8	20.9	20.9	27.1	27.2	27.0	27.2	27.2
GSM1900 GPRS 4 Slots	19.7	19.5	19.7	19.6	19.4	25.6	25.7	25.6	25.4	25.6
GSM1900 EGPRS 1 Slot	19.3	19.6	19.3	19.7	19.7	26.2	26.0	26.1	25.8	26.2
GSM1900 EGPRS 2 Slots	18.1	17.9	18.0	18.0	18.2	24.5	24.5	24.4	24.5	24.6
GSM1900 EGPRS 3 Slots	16.3	16.6	16.4	16.7	16.7	23.1	22.9	23.1	22.9	23.1
GSM1900 EGPRS 4 Slots	15.0	15.0	15.0	15.2	15.2	21.6	21.6	21.4	21.3	21.6



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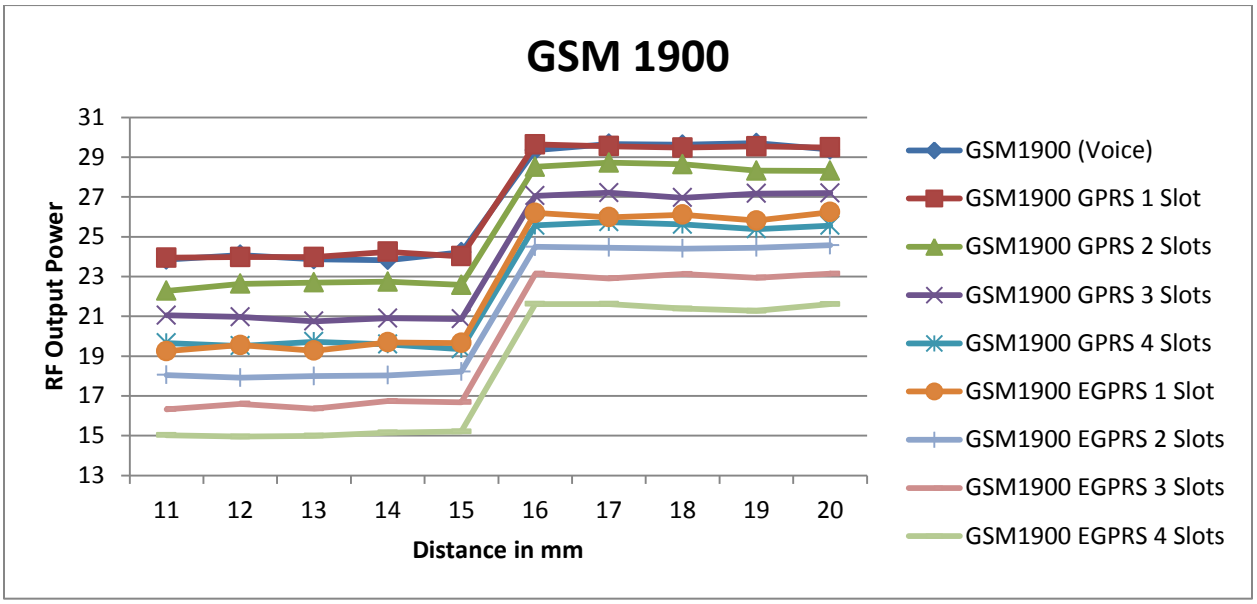
GSM1900

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	11	12	13	14	15	16	17	18	19	20
GSM1900 (Voice)	23.9	24.1	23.9	23.8	24.2	29.4	29.7	29.6	29.7	29.4
GSM1900 GPRS 1 Slot	23.9	24.0	24.0	24.2	24.0	29.6	29.6	29.5	29.5	29.5
GSM1900 GPRS 2 Slots	22.3	22.6	22.7	22.7	22.6	28.5	28.7	28.6	28.3	28.3
GSM1900 GPRS 3 Slots	21.1	21.0	20.8	20.9	20.9	27.1	27.2	27.0	27.2	27.2
GSM1900 GPRS 4 Slots	19.7	19.5	19.7	19.6	19.4	25.6	25.7	25.6	25.4	25.6
GSM1900 EGPRS 1 Slot	19.3	19.6	19.3	19.7	19.7	26.2	26.0	26.1	25.8	26.2
GSM1900 EGPRS 2 Slots	18.1	17.9	18.0	18.0	18.2	24.5	24.5	24.4	24.5	24.6
GSM1900 EGPRS 3 Slots	16.3	16.6	16.4	16.7	16.7	23.1	22.9	23.1	22.9	23.1
GSM1900 EGPRS 4 Slots	15.0	15.0	15.0	15.2	15.2	21.6	21.6	21.4	21.3	21.6



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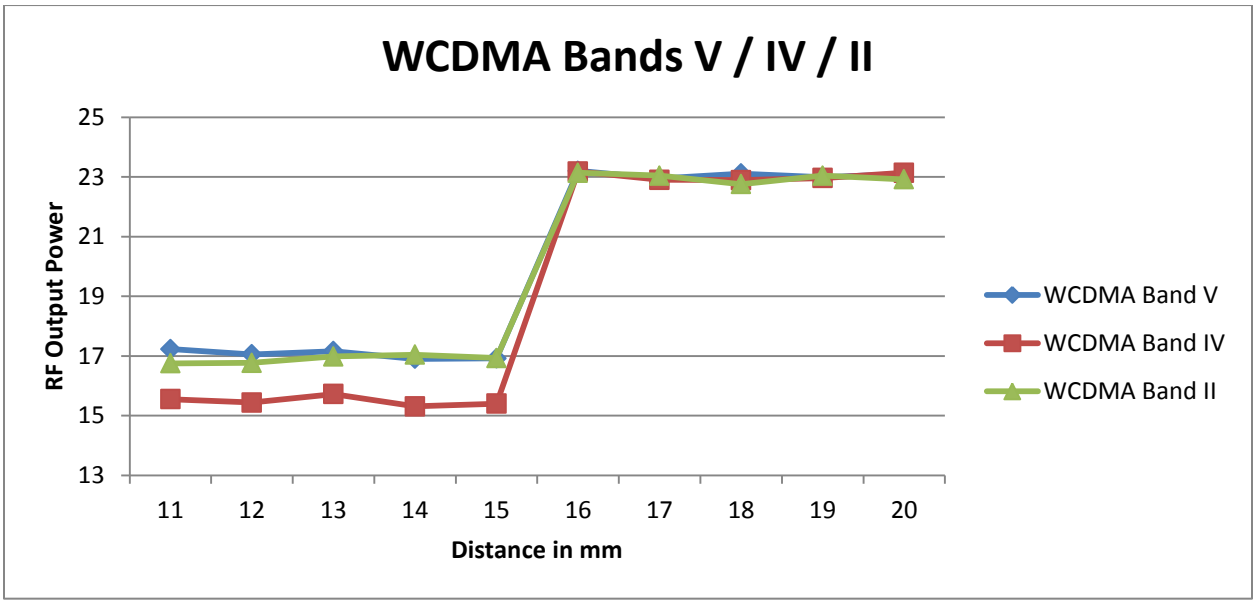
WCDMA Bands V / IV II

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

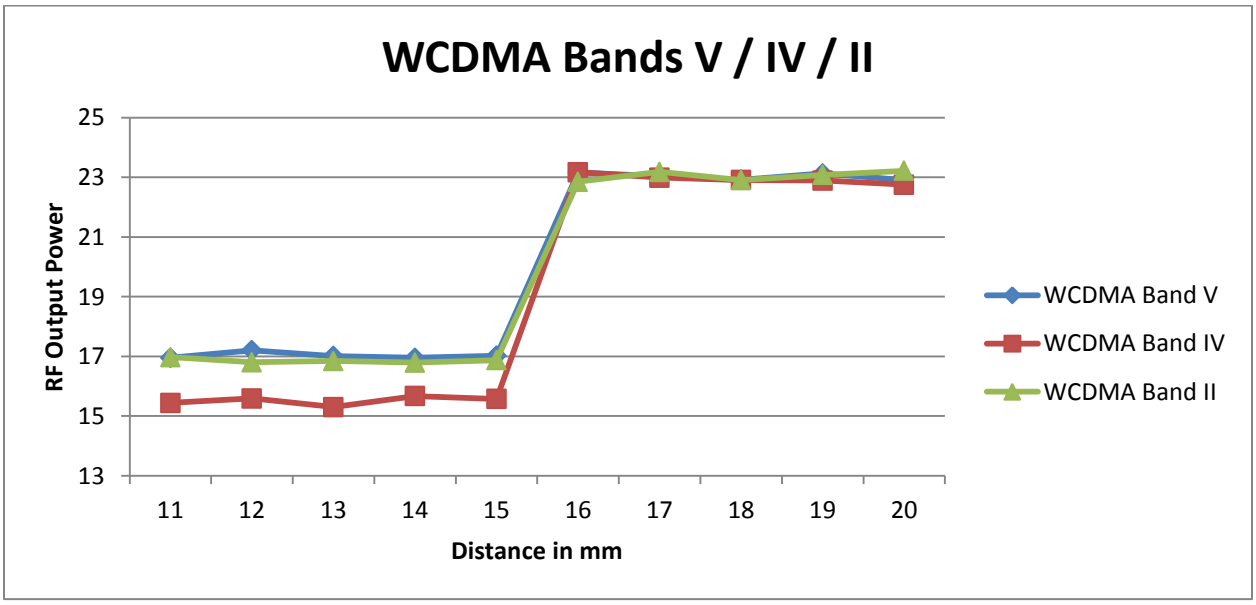
Distance to DUT vs. Output Power in dBm										
Distance (mm)	11	12	13	14	15	16	17	18	19	20
WCDMA Band V	17.2	17.1	17.2	16.9	16.9	23.2	23.0	23.1	23.0	23.1
WCDMA Band IV	15.6	15.4	15.7	15.3	15.4	23.2	22.9	22.9	23.0	23.1
WCDMA Band II	16.8	16.8	17.0	17.0	16.9	23.1	23.0	22.8	23.0	22.9



WCDMA Bands V & II

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	11	12	13	14	15	16	17	18	19	20
WCDMA Band V	17.0	17.2	17.0	17.0	17.0	23.2	23.0	22.9	23.1	22.9
WCDMA Band IV	15.4	15.6	15.3	15.7	15.6	23.2	23.0	22.9	22.9	22.8
WCDMA Band II	17.0	16.8	16.8	16.8	16.9	22.9	23.2	22.9	23.1	23.2



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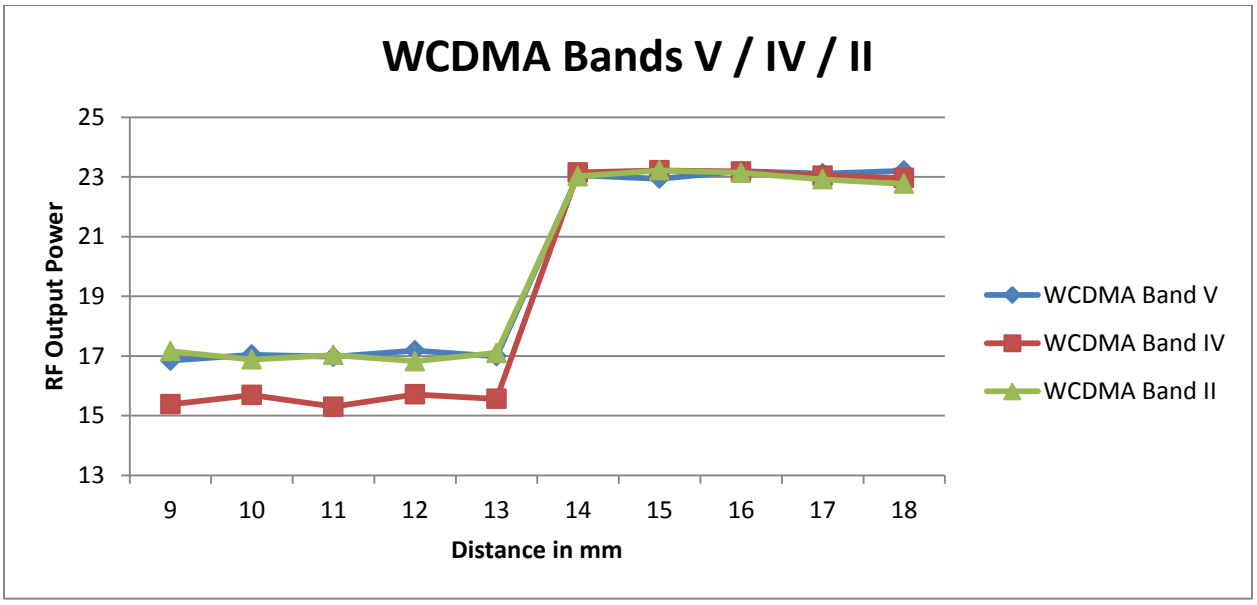
WCDMA Bands V & II

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	9	10	11	12	13	14	15	16	17	18
WCDMA Band V	16.8	17.0	17.0	17.2	17.0	23.1	22.9	23.2	23.1	23.2
WCDMA Band IV	15.4	15.7	15.3	15.7	15.6	23.2	23.2	23.2	23.0	23.0
WCDMA Band II	17.2	16.9	17.0	16.8	17.1	23.0	23.2	23.1	22.9	22.8



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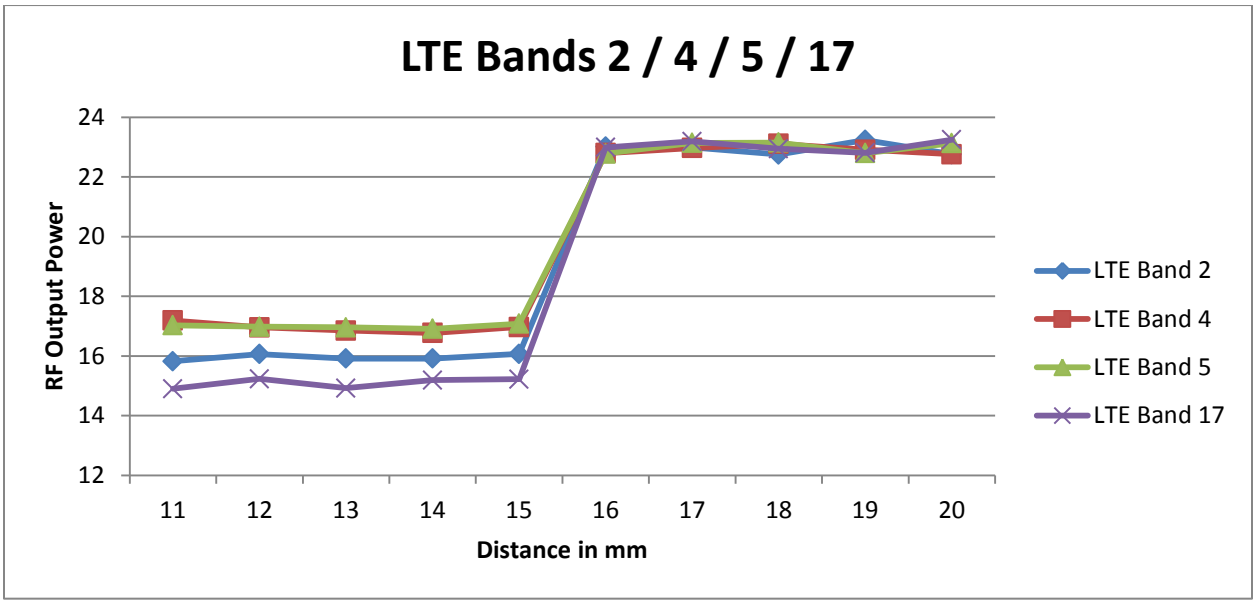
LTE Bands 2 / 4 / 5 / 17

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

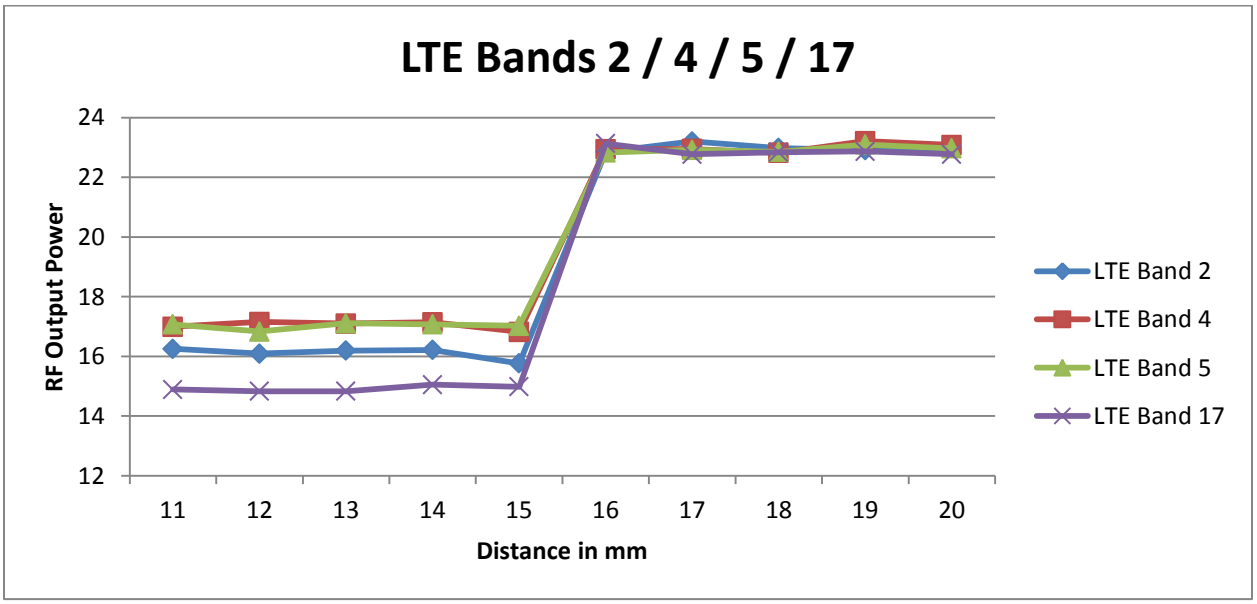
Distance to DUT vs. Output Power in dBm										
Distance (mm)	11	12	13	14	15	16	17	18	19	20
LTE Band 2	15.8	16.1	15.9	15.9	16.1	23.0	23.0	22.8	23.2	22.8
LTE Band 4	17.2	17.0	16.9	16.8	17.0	22.8	23.0	23.1	22.9	22.8
LTE Band 5	17.0	17.0	17.0	16.9	17.1	22.8	23.1	23.2	22.8	23.1
LTE Band 17	14.9	15.2	14.9	15.2	15.2	23.0	23.2	22.9	22.8	23.3



LTE Bands 2 / 4 / 5 / 17

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	11	12	13	14	15	16	17	18	19	20
LTE Band 2	16.3	16.1	16.2	16.2	15.8	22.9	23.2	23.0	22.9	23.0
LTE Band 4	17.0	17.2	17.1	17.1	16.8	22.9	23.0	22.8	23.2	23.1
LTE Band 5	17.1	16.8	17.1	17.1	17.0	22.8	22.9	22.9	23.1	23.0
LTE Band 17	14.9	14.8	14.8	15.1	15.0	23.1	22.8	22.8	22.9	22.8



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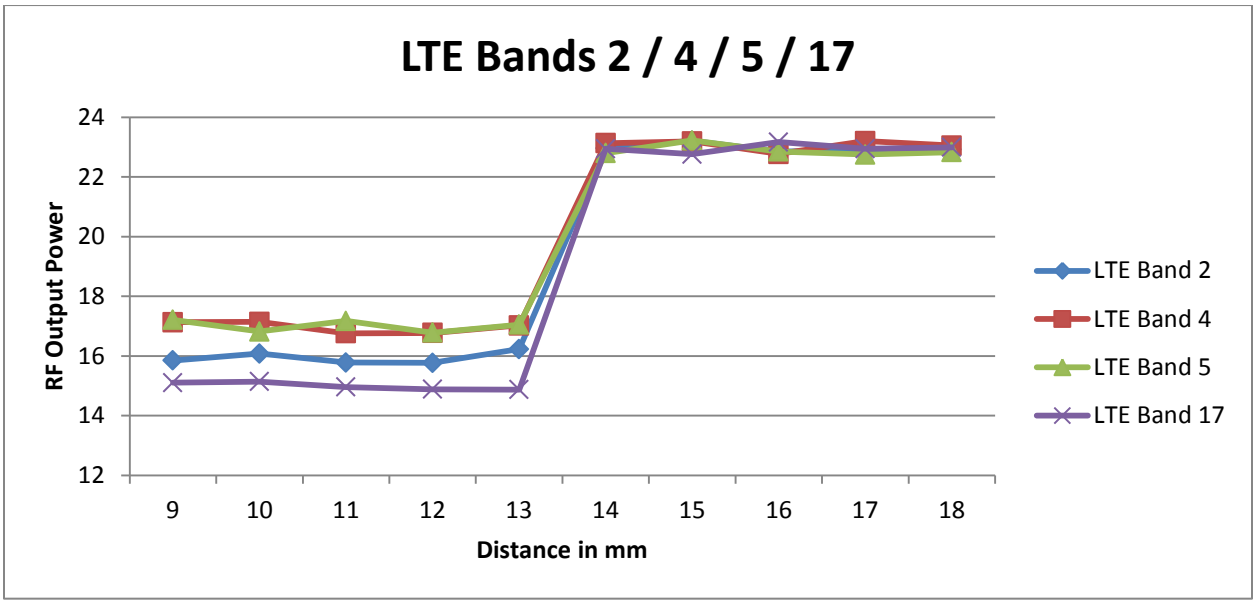
LTE Bands 2 / 4 / 5 / 17

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	9	10	11	12	13	14	15	16	17	18
LTE Band 2	15.9	16.1	15.8	15.8	16.2	23.0	23.2	22.9	22.9	22.9
LTE Band 4	17.1	17.1	16.8	16.8	17.0	23.1	23.2	22.8	23.2	23.1
LTE Band 5	17.2	16.8	17.2	16.8	17.1	22.8	23.2	22.9	22.8	22.8
LTE Band 17	15.1	15.1	15.0	14.9	14.9	22.9	22.8	23.2	22.9	23.0



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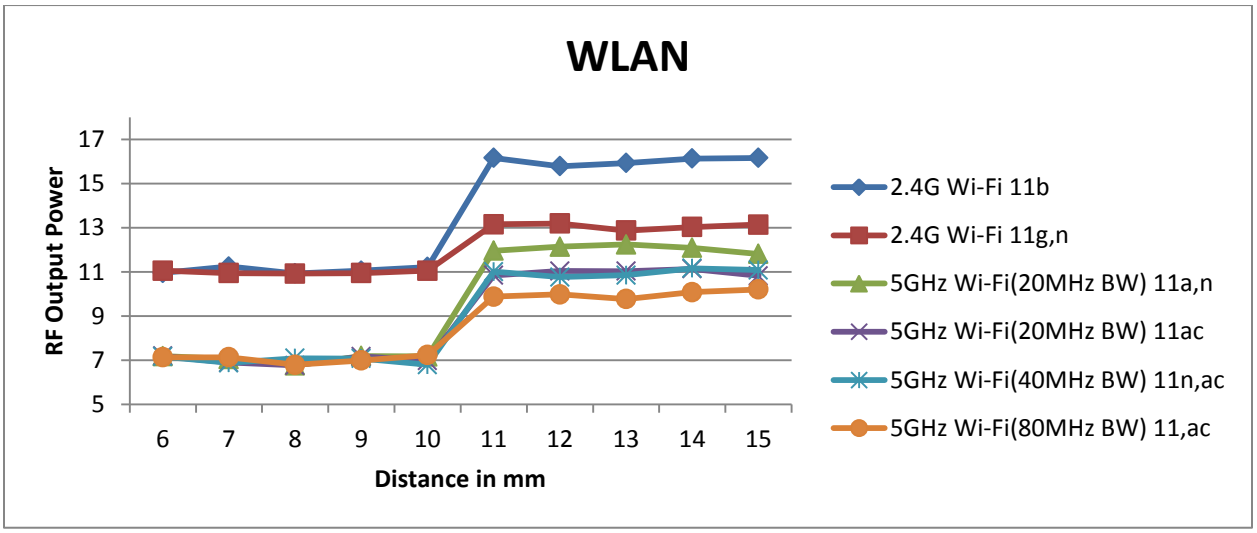
Wi-Fi 2.4GHz and 5GHz

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

Distance to DUT vs. Output Power in dBm										
Distance	6	7	8	9	10	11	12	13	14	15
2.4G Wi-Fi 11b	11.0	11.2	10.9	11.1	11.2	16.2	15.8	15.9	16.1	16.2
2.4G Wi-Fi 11g,n	11.1	10.9	10.9	10.9	11.1	13.2	13.2	12.9	13.0	13.1
5GHz Wi-Fi(20MHz BW) 11a,n	7.2	7.1	6.8	7.2	7.2	12.0	12.1	12.2	12.1	11.8
5GHz Wi-Fi(20MHz BW) 11ac	7.2	6.9	6.8	7.2	7.0	10.8	11.0	11.0	11.1	10.8
5GHz Wi-Fi(40MHz BW) 11n,ac	7.2	6.9	7.1	7.1	6.8	11.0	10.8	10.9	11.2	11.1
5GHz Wi-Fi(80MHz BW) 11,ac	7.1	7.1	6.8	7.0	7.2	9.9	10.0	9.8	10.1	10.2



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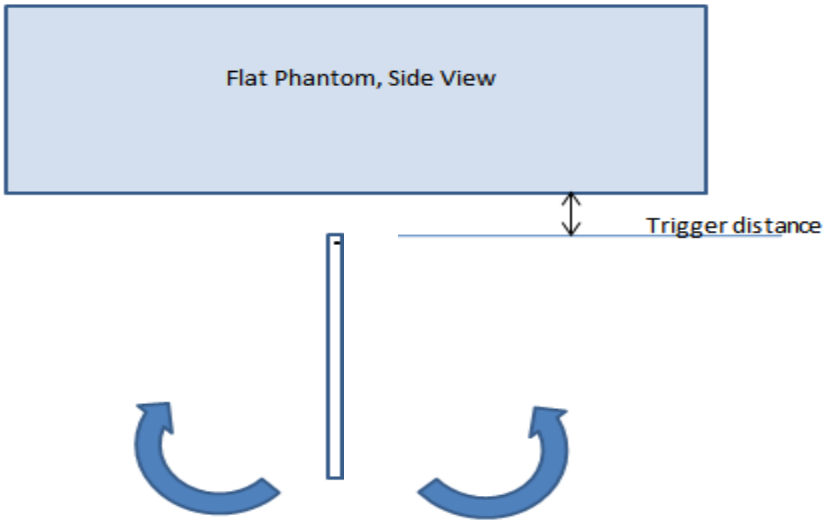
6.5.2. Proximity Sensor Coverage (KDB 616217 §6.3)

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 1) KDB 616217 §6.4

Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering for Edge 1

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	15 mm	15 mm	On	On	On	On	On	On	On	On	On	On	On
850	15 mm	15 mm	On	On	On	On	On	On	On	On	On	On	On
1700	15 mm	15 mm	On	On	On	On	On	On	On	On	On	On	On
1900	15 mm	15 mm	On	On	On	On	On	On	On	On	On	On	On

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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	32.00	396	0	0	37	194.2	34		73 -MEASURE-	73 -MEASURE-	9.9 -MEASURE-	> 50 mm	10.7 -MEASURE-	
Cellular	GPRS 3 Slots	1909.8	27.50	211	0	0	37	194.2	34		58.3 -MEASURE-	58.3 -MEASURE-	7.9 -MEASURE-	> 50 mm	8.6 -MEASURE-	
Cellular	W-CDMA 5	846.6	23.50	224	0	0	37	194.2	34		41.2 -MEASURE-	41.2 -MEASURE-	5.6 -MEASURE-	> 50 mm	6.1 -MEASURE-	
Cellular	W-CDMA 4	1752.6	23.50	224	0	0	37	194.2	34		59.3 -MEASURE-	59.3 -MEASURE-	8 -MEASURE-	> 50 mm	8.7 -MEASURE-	
Cellular	W-CDMA 2	1907.6	23.50	224	0	0	37	194.2	34		61.9 -MEASURE-	61.9 -MEASURE-	8.4 -MEASURE-	> 50 mm	9.1 -MEASURE-	
Cellular	LTE Band 2	1900	23.50	224	0	0	37	194.2	34		61.8 -MEASURE-	61.8 -MEASURE-	8.3 -MEASURE-	> 50 mm	9.1 -MEASURE-	
Cellular	LTE Band 4	1754.3	23.50	224	0	0	37	194.2	34		59.3 -MEASURE-	59.3 -MEASURE-	8 -MEASURE-	> 50 mm	8.7 -MEASURE-	
Cellular	LTE Band 5	844	23.50	224	0	0	37	194.2	34		41.2 -MEASURE-	41.2 -MEASURE-	5.6 -MEASURE-	> 50 mm	6.1 -MEASURE-	
Cellular	LTE Band 17	710	23.50	224	0	0	37	194.2	34		37.7 -MEASURE-	37.7 -MEASURE-	5.1 -MEASURE-	> 50 mm	5.6 -MEASURE-	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 2 Slots	848.8	24.00	63	0	0					11.6 -MEASURE-	11.6 -MEASURE-				
Cellular	GPRS 3 Slots	1909.8	21.50	53	0	0					14.6 -MEASURE-	14.6 -MEASURE-				
Cellular	W-CDMA 5	846.6	17.50	56	0	0					10.3 -MEASURE-	10.3 -MEASURE-				
Cellular	W-CDMA 4	1752.6	15.50	35	0	0					9.3 -MEASURE-	9.3 -MEASURE-				
Cellular	W-CDMA 2	1907.6	17.50	56	0	0					15.5 -MEASURE-	15.5 -MEASURE-				
Cellular	LTE Band 2	1900	16.50	45	0	0					12.4 -MEASURE-	12.4 -MEASURE-				
Cellular	LTE Band 4	1754.3	17.50	56	0	0					14.8 -MEASURE-	14.8 -MEASURE-				
Cellular	LTE Band 5	844	17.50	56	0	0					10.3 -MEASURE-	10.3 -MEASURE-				
Cellular	LTE Band 17	710	15.50	35	0	0					5.9 -MEASURE-	5.9 -MEASURE-				

Note(s):

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

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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	32.00	396	0	0	37	194.2	34		< 50 mm	< 50 mm	< 50 mm	978.8 mW -EXEMPT-	< 50 mm	
Cellular	GPRS 3 Slots	1909.8	27.50	211	0	0	37	194.2	34		< 50 mm	< 50 mm	< 50 mm	1550.5 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 5	846.6	23.50	224	0	0	37	194.2	34		< 50 mm	< 50 mm	< 50 mm	976.9 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 4	1752.6	23.50	224	0	0	37	194.2	34		< 50 mm	< 50 mm	< 50 mm	1555.3 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 2	1907.6	23.50	224	0	0	37	194.2	34		< 50 mm	< 50 mm	< 50 mm	1550.6 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 2	1900	23.50	224	0	0	37	194.2	34		< 50 mm	< 50 mm	< 50 mm	1550.8 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 4	1754.3	23.50	224	0	0	37	194.2	34		< 50 mm	< 50 mm	< 50 mm	1555.3 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 5	844	23.50	224	0	0	37	194.2	34		< 50 mm	< 50 mm	< 50 mm	974.6 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 17	710	23.50	224	0	0	37	194.2	34		< 50 mm	< 50 mm	< 50 mm	860.6 mW -EXEMPT-	< 50 mm	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 2 Slots	848.8	24.00	63	0	0					< 50 mm	< 50 mm				
Cellular	GPRS 3 Slots	1909.8	21.50	53	0	0					< 50 mm	< 50 mm				
Cellular	W-CDMA 5	846.6	17.50	56	0	0					< 50 mm	< 50 mm				
Cellular	W-CDMA 4	1752.6	15.50	35	0	0					< 50 mm	< 50 mm				
Cellular	W-CDMA 2	1907.6	17.50	56	0	0					< 50 mm	< 50 mm				
Cellular	LTE Band 2	1900	16.50	45	0	0					< 50 mm	< 50 mm				
Cellular	LTE Band 4	1754.3	17.50	56	0	0					< 50 mm	< 50 mm				
Cellular	LTE Band 5	844	17.50	56	0	0					< 50 mm	< 50 mm				
Cellular	LTE Band 17	710	15.50	35	0	0					< 50 mm	< 50 mm				

Note(s):

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

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SAR Test Exclusion Calculations for WLAN

Antennas < 50mm to adjacent edges

SISO

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
Ant 1	Full Power, Proximity Sensor Off															
	Wi-Fi 2.4 GHz	2462	16.50	45	0.3	180.2	30	9	91.5		14.1 -MEASURE-	> 50 mm	2.4 -EXEMPT-	7.8 -MEASURE-	> 50 mm	
	Wi-Fi 5.2 GHz	5240	12.50	18	0.3	180.2	30	9	91.5		8.2 -MEASURE-	> 50 mm	1.4 -EXEMPT-	4.6 -MEASURE-	> 50 mm	
	Wi-Fi 5.3 GHz	5320	12.50	18	0.3	180.2	30	9	91.5		8.3 -MEASURE-	> 50 mm	1.4 -EXEMPT-	4.6 -MEASURE-	> 50 mm	
	Wi-Fi 5.5 GHz	5700	12.50	18	0.3	180.2	30	9	91.5		8.6 -MEASURE-	> 50 mm	1.4 -EXEMPT-	4.8 -MEASURE-	> 50 mm	
	Wi-Fi 5.8 GHz	5825	12.50	18	0.3	180.2	30	9	91.5		8.7 -MEASURE-	> 50 mm	1.4 -EXEMPT-	4.8 -MEASURE-	> 50 mm	
	Bluetooth	2480	9.70	9	0.3	180.2	30	9	91.5		2.8 -EXEMPT-	> 50 mm	0.5 -EXEMPT-	1.6 -EXEMPT-	> 50 mm	
	Full Power, Proximity Sensor On															
	Wi-Fi 2.4 GHz	2462	11.50	14	0.3						4.4 -MEASURE-					
	Wi-Fi 5.2 GHz	5240	7.50	6	0.3						2.7 -EXEMPT-					
	Wi-Fi 5.3 GHz	5320	7.50	6	0.3						2.8 -EXEMPT-					
	Wi-Fi 5.5 GHz	5700	7.50	6	0.3						2.9 -EXEMPT-					
	Wi-Fi 5.8 GHz	5825	7.50	6	0.3						2.9 -EXEMPT-					
Ant 2	Full Power, Proximity Sensor Off															
	Wi-Fi 2.4 GHz	2462	16.50	45	0.3	149	84	17	11		14.1 -MEASURE-	> 50 mm	> 50 mm	4.2 -MEASURE-	6.4 -MEASURE-	
	Wi-Fi 5.2 GHz	5240	12.50	18	0.3	149	84	17	11		8.2 -MEASURE-	> 50 mm	> 50 mm	2.4 -EXEMPT-	3.7 -MEASURE-	
	Wi-Fi 5.3 GHz	5320	12.50	18	0.3	149	84	17	11		8.3 -MEASURE-	> 50 mm	> 50 mm	2.4 -EXEMPT-	3.8 -MEASURE-	
	Wi-Fi 5.5 GHz	5700	12.50	18	0.3	149	84	17	11		8.6 -MEASURE-	> 50 mm	> 50 mm	2.5 -EXEMPT-	3.9 -MEASURE-	
	Wi-Fi 5.8 GHz	5825	12.50	18	0.3	149	84	17	11		8.7 -MEASURE-	> 50 mm	> 50 mm	2.6 -EXEMPT-	3.9 -MEASURE-	
	Full Power, Proximity Sensor On															
	Wi-Fi 2.4 GHz	2462	11.50	14	0.3						4.4 -MEASURE-					
	Wi-Fi 5.2 GHz	5240	7.50	6	0.3						2.7 -EXEMPT-					
	Wi-Fi 5.3 GHz	5320	7.50	6	0.3						2.8 -EXEMPT-					
	Wi-Fi 5.5 GHz	5700	7.50	6	0.3						2.9 -EXEMPT-					
	Wi-Fi 5.8 GHz	5825	7.50	6	0.3						2.9 -EXEMPT-					

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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
Ant 1	Full Power, Proximity Sensor Off															
	Wi-Fi 2.4 GHz	2462	13.50	22	0.3	180.2	30	9	91.5		6.9 -MEASURE-	> 50 mm	1.2 -EXEMPT-	3.8 -MEASURE-	> 50 mm	
	Wi-Fi 5.2 GHz	5240	12.50	18	0.3	180.2	30	9	91.5		8.2 -MEASURE-	> 50 mm	1.4 -EXEMPT-	4.6 -MEASURE-	> 50 mm	
	Wi-Fi 5.3 GHz	5320	12.50	18	0.3	180.2	30	9	91.5		8.3 -MEASURE-	> 50 mm	1.4 -EXEMPT-	4.6 -MEASURE-	> 50 mm	
	Wi-Fi 5.5 GHz	5700	12.50	18	0.3	180.2	30	9	91.5		8.6 -MEASURE-	> 50 mm	1.4 -EXEMPT-	4.8 -MEASURE-	> 50 mm	
	Wi-Fi 5.8 GHz	5825	12.50	18	0.3	180.2	30	9	91.5		8.7 -MEASURE-	> 50 mm	1.4 -EXEMPT-	4.8 -MEASURE-	> 50 mm	
	Full Power, Proximity Sensor On															
	Wi-Fi 2.4 GHz	2462	11.50	11.5	0.3						3.6 -MEASURE-					
	Wi-Fi 5.2 GHz	5240	7.50	6	0.3						2.7 -EXEMPT-					
	Wi-Fi 5.3 GHz	5320	7.50	6	0.3						2.8 -EXEMPT-					
	Wi-Fi 5.5 GHz	5700	7.50	6	0.3						2.9 -EXEMPT-					
	Wi-Fi 5.8 GHz	5825	7.50	6	0.3						2.9 -EXEMPT-					
Ant 2	Full Power, Proximity Sensor Off															
	Wi-Fi 2.4 GHz	2462	13.50	22	0.3	149	84	17	11		6.9 -MEASURE-	> 50 mm	> 50 mm	2 -EXEMPT-	3.1 -MEASURE-	
	Wi-Fi 5.2 GHz	5240	12.50	18	0.3	149	84	17	11		8.2 -MEASURE-	> 50 mm	> 50 mm	2.4 -EXEMPT-	3.7 -MEASURE-	
	Wi-Fi 5.3 GHz	5320	12.50	18	0.3	149	84	17	11		8.3 -MEASURE-	> 50 mm	> 50 mm	2.4 -EXEMPT-	3.8 -MEASURE-	
	Wi-Fi 5.5 GHz	5700	12.50	18	0.3	149	84	17	11		8.6 -MEASURE-	> 50 mm	> 50 mm	2.5 -EXEMPT-	3.9 -MEASURE-	
	Wi-Fi 5.8 GHz	5825	12.50	18	0.3	149	84	17	11		8.7 -MEASURE-	> 50 mm	> 50 mm	2.6 -EXEMPT-	3.9 -MEASURE-	
	Full Power, Proximity Sensor On															
	Wi-Fi 2.4 GHz	2462	11.50	14	0.3						4.4 -MEASURE-					
	Wi-Fi 5.2 GHz	5240	7.50	6	0.3						2.7 -EXEMPT-					
	Wi-Fi 5.3 GHz	5320	7.50	6	0.3						2.8 -EXEMPT-					
	Wi-Fi 5.5 GHz	5700	7.50	6	0.3						2.9 -EXEMPT-					
	Wi-Fi 5.8 GHz	5825	7.50	6	0.3						2.9 -EXEMPT-					

Note(s):

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

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Antennas > 50mm to adjacent edges

SISO

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
Ant 1	Full Power, Proximity Sensor Off															
	Wi-Fi 2.4 GHz	2462	16.50	45	0.3	180.2	30	9	91.5		< 50 mm	1397.6 mW -EXEMPT-	< 50 mm	< 50 mm	510.6 mW -EXEMPT-	
	Wi-Fi 5.2 GHz	5240	12.50	18	0.3	180.2	30	9	91.5		< 50 mm	1367.5 mW -EXEMPT-	< 50 mm	< 50 mm	480.5 mW -EXEMPT-	
	Wi-Fi 5.3 GHz	5320	12.50	18	0.3	180.2	30	9	91.5		< 50 mm	1367 mW -EXEMPT-	< 50 mm	< 50 mm	480 mW -EXEMPT-	
	Wi-Fi 5.5 GHz	5700	12.50	18	0.3	180.2	30	9	91.5		< 50 mm	1364.8 mW -EXEMPT-	< 50 mm	< 50 mm	477.8 mW -EXEMPT-	
	Wi-Fi 5.8 GHz	5825	12.50	18	0.3	180.2	30	9	91.5		< 50 mm	1364.2 mW -EXEMPT-	< 50 mm	< 50 mm	477.2 mW -EXEMPT-	
	Bluetooth	2480	9.70	9	0.3	180.2	30	9	91.5		< 50 mm	1397.3 mW -EXEMPT-	< 50 mm	< 50 mm	510.3 mW -EXEMPT-	
	Power Back-off, Proximity Sensor On															
	Wi-Fi 2.4 GHz	2462	11.50	14	0.3						< 50 mm					
	Wi-Fi 5.2 GHz	5240	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.3 GHz	5320	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.5 GHz	5700	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.8 GHz	5825	7.50	6	0.3						< 50 mm					
Ant 2	Full Power, Proximity Sensor Off															
	Wi-Fi 2.4 GHz	2462	16.50	45	0.3	149	84	17	11		< 50 mm	1085.6 mW -EXEMPT-	435.6 mW -EXEMPT-	< 50 mm	< 50 mm	
	Wi-Fi 5.2 GHz	5240	12.50	18	0.3	149	84	17	11		< 50 mm	1055.5 mW -EXEMPT-	405.5 mW -EXEMPT-	< 50 mm	< 50 mm	
	Wi-Fi 5.3 GHz	5320	12.50	18	0.3	149	84	17	11		< 50 mm	1055 mW -EXEMPT-	405 mW -EXEMPT-	< 50 mm	< 50 mm	
	Wi-Fi 5.5 GHz	5700	12.50	18	0.3	149	84	17	11		< 50 mm	1052.8 mW -EXEMPT-	402.8 mW -EXEMPT-	< 50 mm	< 50 mm	
	Wi-Fi 5.8 GHz	5825	12.50	18	0.3	149	84	17	11		< 50 mm	1052.2 mW -EXEMPT-	402.2 mW -EXEMPT-	< 50 mm	< 50 mm	
	Power Back-off, Proximity Sensor On															
	Wi-Fi 2.4 GHz	2462	11.50	14	0.3						< 50 mm					
	Wi-Fi 5.2 GHz	5240	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.3 GHz	5320	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.5 GHz	5700	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.8 GHz	5825	7.50	6	0.3						< 50 mm					

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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
Ant 1	Full Power, Proximity Sensor Off															
	Wi-Fi 2.4 GHz	2462	13.50	22	0.3	180.2	30	9	91.5		< 50 mm	1397.6 mW -EXEMPT-	< 50 mm	< 50 mm	510.6 mW -EXEMPT-	
	Wi-Fi 5.2 GHz	5240	12.50	18	0.3	180.2	30	9	91.5		< 50 mm	1367.5 mW -EXEMPT-	< 50 mm	< 50 mm	480.5 mW -EXEMPT-	
	Wi-Fi 5.3 GHz	5320	12.50	18	0.3	180.2	30	9	91.5		< 50 mm	1367 mW -EXEMPT-	< 50 mm	< 50 mm	480 mW -EXEMPT-	
	Wi-Fi 5.5 GHz	5700	12.50	18	0.3	180.2	30	9	91.5		< 50 mm	1364.8 mW -EXEMPT-	< 50 mm	< 50 mm	477.8 mW -EXEMPT-	
	Wi-Fi 5.8 GHz	5825	12.50	18	0.3	180.2	30	9	91.5		< 50 mm	1364.2 mW -EXEMPT-	< 50 mm	< 50 mm	477.2 mW -EXEMPT-	
	Power Back-off, Proximity Sensor On															
	Wi-Fi 2.4 GHz	2462	11.50	14	0.3						< 50 mm					
	Wi-Fi 5.2 GHz	5240	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.3 GHz	5320	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.5 GHz	5700	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.8 GHz	5825	7.50	6	0.3						< 50 mm					
Ant 2	Full Power, Proximity Sensor Off															
	Wi-Fi 2.4 GHz	2462	13.50	22	0.3	149	84	17	11		< 50 mm	1085.6 mW -EXEMPT-	435.6 mW -EXEMPT-	< 50 mm	< 50 mm	
	Wi-Fi 5.2 GHz	5240	12.50	18	0.3	149	84	17	11		< 50 mm	1055.5 mW -EXEMPT-	405.5 mW -EXEMPT-	< 50 mm	< 50 mm	
	Wi-Fi 5.3 GHz	5320	12.50	18	0.3	149	84	17	11		< 50 mm	1055 mW -EXEMPT-	405 mW -EXEMPT-	< 50 mm	< 50 mm	
	Wi-Fi 5.5 GHz	5700	12.50	18	0.3	149	84	17	11		< 50 mm	1052.8 mW -EXEMPT-	402.8 mW -EXEMPT-	< 50 mm	< 50 mm	
	Wi-Fi 5.8 GHz	5825	12.50	18	0.3	149	84	17	11		< 50 mm	1052.2 mW -EXEMPT-	402.2 mW -EXEMPT-	< 50 mm	< 50 mm	
	Power Back-off, Proximity Sensor On															
	Wi-Fi 2.4 GHz	2462	11.50	14	0.3						< 50 mm					
	Wi-Fi 5.2 GHz	5240	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.3 GHz	5320	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.5 GHz	5700	7.50	6	0.3						< 50 mm					
	Wi-Fi 5.8 GHz	5825	7.50	6	0.3						< 50 mm					

Note(s):

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

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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
W-CDMA Band 2	OFF	Yes	Yes	Yes	No	Yes
	ON	Yes	Yes	No	No	No
W-CDMA Band 4	OFF	Yes	Yes	Yes	No	Yes
	ON	Yes	Yes	No	No	No
W-CDMA Band 5	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 SISO (Antenna 1)	OFF	Yes	No	No	Yes	No
	ON	Yes	No	No	No	No
Wi-Fi 2.4 GHz SISO (Antenna 2)	OFF	Yes	No	No	Yes	Yes
	ON	Yes	No	No	No	No
Wi-Fi 2.4 GHz MIMO	OFF	Yes	No	No	Yes	Yes
	ON	Yes	No	No	No	No
Wi-Fi 5 GHz SISO (Antenna 1)	OFF	Yes	No	No	Yes	No
	ON	No	No	No	No	No
Wi-Fi 5 GHz SISO (Antenna 2)	OFF	Yes	No	No	No	Yes
	ON	No	No	No	No	No
Wi-Fi 5 GHz MIMO	OFF	Yes	No	No	Yes	Yes
	ON	No	No	No	No	No
Bluetooth	OFF	No	No	No	No	No

Note(s):

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

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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

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Dielectric Property Measurements Results:

SAR 1 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4-20-2015	Head 2450	e'	38.0900	Relative Permittivity (ε_r):	38.09	39.20	-2.83	5
		e''	13.5500	Conductivity (σ):	1.85	1.80	2.55	5
	Head 2410	e'	38.2600	Relative Permittivity (ε_r):	38.26	39.28	-2.59	5
		e''	13.4800	Conductivity (σ):	1.81	1.76	2.61	5
	Head 2475	e'	37.9900	Relative Permittivity (ε_r):	37.99	39.17	-3.01	5
		e''	13.6300	Conductivity (σ):	1.88	1.83	2.67	5
4-20-2015	Body 2450	e'	50.6400	Relative Permittivity (ε_r):	50.64	52.70	-3.91	5
		e''	14.8900	Conductivity (σ):	2.03	1.95	4.02	5
	Body 2410	e'	50.7900	Relative Permittivity (ε_r):	50.79	52.76	-3.73	5
		e''	14.8200	Conductivity (σ):	1.99	1.91	4.11	5
	Body 2475	e'	50.5600	Relative Permittivity (ε_r):	50.56	52.67	-4.00	5
		e''	14.9900	Conductivity (σ):	2.06	1.99	3.92	5
4-21-2015	Head 5180	e'	34.7900	Relative Permittivity (ε_r):	34.79	36.01	-3.40	5
		e''	15.3800	Conductivity (σ):	4.43	4.63	-4.33	5
	Head 5200	e'	34.7500	Relative Permittivity (ε_r):	34.75	35.99	-3.45	5
		e''	15.3900	Conductivity (σ):	4.45	4.65	-4.33	5
	Head 5600	e'	34.2400	Relative Permittivity (ε_r):	34.24	35.53	-3.64	5
		e''	15.5700	Conductivity (σ):	4.85	5.06	-4.19	5
	Head 5800	e'	33.9500	Relative Permittivity (ε_r):	33.95	35.30	-3.82	5
		e''	15.6400	Conductivity (σ):	5.04	5.27	-4.29	5
	Head 5825	e'	33.9300	Relative Permittivity (ε_r):	33.93	35.30	-3.88	5
		e''	15.6700	Conductivity (σ):	5.08	5.27	-3.69	5
4-22-2015	Body 5180	e'	48.0500	Relative Permittivity (ε_r):	48.05	49.05	-2.03	5
		e''	18.3100	Conductivity (σ):	5.27	5.27	0.04	5
	Body 5200	e'	48.0100	Relative Permittivity (ε_r):	48.01	49.02	-2.06	5
		e''	18.3500	Conductivity (σ):	5.31	5.29	0.21	5
	Body 5600	e'	47.4200	Relative Permittivity (ε_r):	47.42	48.48	-2.18	5
		e''	18.6500	Conductivity (σ):	5.81	5.76	0.80	5
	Body 5800	e'	47.1600	Relative Permittivity (ε_r):	47.16	48.20	-2.16	5
		e''	18.8900	Conductivity (σ):	6.09	6.00	1.53	5
	Body 5825	e'	47.0800	Relative Permittivity (ε_r):	47.08	48.20	-2.32	5
		e''	18.8700	Conductivity (σ):	6.11	6.00	1.86	5
4-28-2015	Body 5180	e'	48.3600	Relative Permittivity (ε_r):	48.36	49.05	-1.40	5
		e''	18.8700	Conductivity (σ):	5.44	5.27	3.10	5
	Body 5200	e'	48.3100	Relative Permittivity (ε_r):	48.31	49.02	-1.45	5
		e''	18.9000	Conductivity (σ):	5.46	5.29	3.21	5
	Body 5600	e'	47.5600	Relative Permittivity (ε_r):	47.56	48.48	-1.89	5
		e''	19.2400	Conductivity (σ):	5.99	5.76	3.99	5
	Body 5800	e'	47.1700	Relative Permittivity (ε_r):	47.17	48.20	-2.14	5
		e''	19.4000	Conductivity (σ):	6.26	6.00	4.27	5
	Body 5825	e'	47.1300	Relative Permittivity (ε_r):	47.13	48.20	-2.22	5
		e''	19.4500	Conductivity (σ):	6.30	6.00	4.99	5

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SAR 1 Room(Continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
5-26-2015	Body 5180	e'	48.5100	Relative Permittivity (ε_r):	48.51	49.05	-1.09	5
		e''	18.7100	Conductivity (σ):	5.39	5.27	2.23	5
	Body 5200	e'	48.4600	Relative Permittivity (ε_r):	48.46	49.02	-1.14	5
		e''	18.7300	Conductivity (σ):	5.42	5.29	2.28	5
	Body 5600	e'	47.7800	Relative Permittivity (ε_r):	47.78	48.48	-1.44	5
		e''	19.1300	Conductivity (σ):	5.96	5.76	3.40	5
	Body 5800	e'	47.4500	Relative Permittivity (ε_r):	47.45	48.20	-1.56	5
		e''	19.3300	Conductivity (σ):	6.23	6.00	3.90	5
	Body 5825	e'	47.4100	Relative Permittivity (ε_r):	47.41	48.20	-1.64	5
		e''	19.3600	Conductivity (σ):	6.27	6.00	4.51	5
5-27-2015	Head 5180	e'	36.9100	Relative Permittivity (ε_r):	36.91	36.01	2.49	5
		e''	15.9900	Conductivity (σ):	4.61	4.63	-0.54	5
	Head 5200	e'	36.8700	Relative Permittivity (ε_r):	36.87	35.99	2.44	5
		e''	16.0000	Conductivity (σ):	4.63	4.65	-0.53	5
	Head 5600	e'	36.3100	Relative Permittivity (ε_r):	36.31	35.53	2.18	5
		e''	16.1500	Conductivity (σ):	5.03	5.06	-0.62	5
	Head 5800	e'	36.0300	Relative Permittivity (ε_r):	36.03	35.30	2.07	5
		e''	16.2300	Conductivity (σ):	5.23	5.27	-0.68	5
	Head 5825	e'	35.9900	Relative Permittivity (ε_r):	35.99	35.30	1.95	5
		e''	16.2500	Conductivity (σ):	5.26	5.27	-0.13	5

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SAR 2 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4-16-2015	Body 835	e'	54.2700	Relative Permittivity (ε_r):	54.27	55.20	-1.68	5
		e"	21.4400	Conductivity (σ):	1.00	0.97	2.62	5
	Body 820	e'	54.4300	Relative Permittivity (ε_r):	54.43	55.28	-1.53	5
		e"	21.5200	Conductivity (σ):	0.98	0.97	1.31	5
	Body 850	e'	54.1600	Relative Permittivity (ε_r):	54.16	55.16	-1.81	5
		e"	21.3600	Conductivity (σ):	1.01	0.99	2.27	5
4-20-2015	Body 835	e'	53.1900	Relative Permittivity (ε_r):	53.19	55.20	-3.64	5
		e"	21.4400	Conductivity (σ):	1.00	0.97	2.62	5
	Body 820	e'	53.3400	Relative Permittivity (ε_r):	53.34	55.28	-3.50	5
		e"	21.5000	Conductivity (σ):	0.98	0.97	1.22	5
	Body 850	e'	53.0500	Relative Permittivity (ε_r):	53.05	55.16	-3.82	5
		e"	21.3700	Conductivity (σ):	1.01	0.99	2.32	5
4-20-2015	Head 1900	e'	38.1100	Relative Permittivity (ε_r):	38.11	40.00	-4.73	5
		e"	13.8300	Conductivity (σ):	1.46	1.40	4.36	5
	Head 1850	e'	38.3300	Relative Permittivity (ε_r):	38.33	40.00	-4.18	5
		e"	13.7700	Conductivity (σ):	1.42	1.40	1.18	5
	Head 1910	e'	38.0800	Relative Permittivity (ε_r):	38.08	40.00	-4.80	5
		e"	13.8400	Conductivity (σ):	1.47	1.40	4.99	5
4-24-2015	Body 835	e'	53.5700	Relative Permittivity (ε_r):	53.57	55.20	-2.95	5
		e"	21.7600	Conductivity (σ):	1.01	0.97	4.15	5
	Body 820	e'	53.7100	Relative Permittivity (ε_r):	53.71	55.28	-2.83	5
		e"	21.8300	Conductivity (σ):	1.00	0.97	2.77	5
	Body 850	e'	53.4300	Relative Permittivity (ε_r):	53.43	55.16	-3.13	5
		e"	21.6800	Conductivity (σ):	1.02	0.99	3.80	5
4-27-2015	Head 1750	e'	39.4000	Relative Permittivity (ε_r):	39.40	40.08	-1.71	5
		e"	13.6100	Conductivity (σ):	1.32	1.37	-3.26	5
	Head 1710	e'	39.5900	Relative Permittivity (ε_r):	39.59	40.15	-1.39	5
		e"	13.5500	Conductivity (σ):	1.29	1.35	-4.31	5
	Head 1755	e'	39.3700	Relative Permittivity (ε_r):	39.37	40.08	-1.76	5
		e"	13.6200	Conductivity (σ):	1.33	1.37	-3.11	5
4-27-2015	Head 1900	e'	38.8300	Relative Permittivity (ε_r):	38.83	40.00	-2.93	5
		e"	13.8000	Conductivity (σ):	1.46	1.40	4.14	5
	Head 1850	e'	39.2000	Relative Permittivity (ε_r):	39.20	40.00	-2.00	5
		e"	13.7500	Conductivity (σ):	1.41	1.40	1.03	5
	Head 1910	e'	38.8100	Relative Permittivity (ε_r):	38.81	40.00	-2.97	5
		e"	13.8200	Conductivity (σ):	1.47	1.40	4.84	5
5-19-2015	Body 1750	e'	52.3800	Relative Permittivity (ε_r):	52.38	53.44	-1.99	5
		e"	14.6800	Conductivity (σ):	1.43	1.49	-3.88	5
	Body 1710	e'	52.4900	Relative Permittivity (ε_r):	52.49	53.54	-1.97	5
		e"	14.6300	Conductivity (σ):	1.39	1.46	-4.82	5
	Body 1755	e'	52.3700	Relative Permittivity (ε_r):	52.37	53.43	-1.98	5
		e"	14.6900	Conductivity (σ):	1.43	1.49	-3.74	5
5-20-2015	Head 1750	e'	39.5600	Relative Permittivity (ε_r):	39.56	40.08	-1.31	5
		e"	13.6600	Conductivity (σ):	1.33	1.37	-2.90	5
	Head 1710	e'	39.6900	Relative Permittivity (ε_r):	39.69	40.15	-1.14	5
		e"	13.6200	Conductivity (σ):	1.30	1.35	-3.79	5
	Head 1755	e'	39.5400	Relative Permittivity (ε_r):	39.54	40.08	-1.34	5
		e"	13.6600	Conductivity (σ):	1.33	1.37	-2.77	5

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SAR 2 Room(Continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
5-26-2015	Body 5180	e'	47.1800	Relative Permittivity (ε_r):	47.18	49.05	-3.81	5
		e"	18.6000	Conductivity (σ):	5.36	5.27	1.63	5
	Body 5200	e'	47.1700	Relative Permittivity (ε_r):	47.17	49.02	-3.77	5
		e"	18.6100	Conductivity (σ):	5.38	5.29	1.63	5
	Body 5600	e'	46.4600	Relative Permittivity (ε_r):	46.46	48.48	-4.16	5
		e"	18.8700	Conductivity (σ):	5.88	5.76	1.99	5
	Body 5800	e'	46.2300	Relative Permittivity (ε_r):	46.23	48.20	-4.09	5
		e"	19.1200	Conductivity (σ):	6.17	6.00	2.77	5
	Body 5825	e'	46.1500	Relative Permittivity (ε_r):	46.15	48.20	-4.25	5
		e"	19.0900	Conductivity (σ):	6.18	6.00	3.05	5

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SAR 3 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4-16-2015	Body 1900	e'	55.3000	Relative Permittivity (ε_r):	55.30	53.30	3.75	5
		e"	14.9300	Conductivity (σ):	1.58	1.52	3.77	5
	Body 1850	e'	55.4700	Relative Permittivity (ε_r):	55.47	53.30	4.07	5
		e"	14.8900	Conductivity (σ):	1.53	1.52	0.77	5
	Body 1910	e'	55.2600	Relative Permittivity (ε_r):	55.26	53.30	3.68	5
		e"	14.9400	Conductivity (σ):	1.59	1.52	4.39	5
4-18-2015	Head 835	e'	42.5200	Relative Permittivity (ε_r):	42.52	41.50	2.46	5
		e"	19.6900	Conductivity (σ):	0.91	0.90	1.58	5
	Head 820	e'	42.6900	Relative Permittivity (ε_r):	42.69	41.60	2.61	5
		e"	19.7500	Conductivity (σ):	0.90	0.90	0.23	5
	Head 850	e'	42.3600	Relative Permittivity (ε_r):	42.36	41.50	2.07	5
		e"	19.6200	Conductivity (σ):	0.93	0.92	1.34	5
4-20-2015	Body 1900	e'	53.2400	Relative Permittivity (ε_r):	53.24	53.30	-0.11	5
		e"	14.9700	Conductivity (σ):	1.58	1.52	4.05	5
	Body 1850	e'	53.4100	Relative Permittivity (ε_r):	53.41	53.30	0.21	5
		e"	14.9500	Conductivity (σ):	1.54	1.52	1.17	5
	Body 1910	e'	53.2300	Relative Permittivity (ε_r):	53.23	53.30	-0.13	5
		e"	14.9800	Conductivity (σ):	1.59	1.52	4.66	5
4-20-2015	Body 1750	e'	53.6300	Relative Permittivity (ε_r):	53.63	53.44	0.35	5
		e"	14.8500	Conductivity (σ):	1.44	1.49	-2.77	5
	Body 1710	e'	53.7400	Relative Permittivity (ε_r):	53.74	53.54	0.37	5
		e"	14.8600	Conductivity (σ):	1.41	1.46	-3.33	5
	Body 1755	e'	53.6200	Relative Permittivity (ε_r):	53.62	53.43	0.36	5
		e"	14.8500	Conductivity (σ):	1.45	1.49	-2.69	5
4-24-2015	Body 1750	e'	54.8600	Relative Permittivity (ε_r):	54.86	53.44	2.66	5
		e"	14.8900	Conductivity (σ):	1.45	1.49	-2.51	5
	Body 1710	e'	54.9500	Relative Permittivity (ε_r):	54.95	53.54	2.63	5
		e"	14.8500	Conductivity (σ):	1.41	1.46	-3.39	5
	Body 1755	e'	54.8400	Relative Permittivity (ε_r):	54.84	53.43	2.64	5
		e"	14.8900	Conductivity (σ):	1.45	1.49	-2.43	5
4-24-2015	Body 1900	e'	54.4200	Relative Permittivity (ε_r):	54.42	53.30	2.10	5
		e"	15.0000	Conductivity (σ):	1.58	1.52	4.26	5
	Body 1850	e'	54.5700	Relative Permittivity (ε_r):	54.57	53.30	2.38	5
		e"	14.9800	Conductivity (σ):	1.54	1.52	1.38	5
	Body 1910	e'	54.4000	Relative Permittivity (ε_r):	54.40	53.30	2.06	5
		e"	15.0200	Conductivity (σ):	1.60	1.52	4.94	5
4-26-2015	Head 835	e'	41.6600	Relative Permittivity (ε_r):	41.66	41.50	0.39	5
		e"	19.6300	Conductivity (σ):	0.91	0.90	1.27	5
	Head 820	e'	41.8500	Relative Permittivity (ε_r):	41.85	41.60	0.59	5
		e"	19.6600	Conductivity (σ):	0.90	0.90	-0.23	5
	Head 850	e'	41.4800	Relative Permittivity (ε_r):	41.48	41.50	-0.05	5
		e"	19.6000	Conductivity (σ):	0.93	0.92	1.24	5
5-20-2015	Body 750	e'	55.7200	Relative Permittivity (ε_r):	55.72	55.55	0.31	5
		e"	23.3400	Conductivity (σ):	0.97	0.96	1.06	5
	Body 700	e'	56.2400	Relative Permittivity (ε_r):	56.24	55.74	0.90	5
		e"	23.7000	Conductivity (σ):	0.92	0.96	-3.83	5
	Body 790	e'	55.3000	Relative Permittivity (ε_r):	55.30	55.39	-0.17	5
		e"	23.0700	Conductivity (σ):	1.01	0.97	4.89	5
5-20-2015	Head 750	e'	41.7000	Relative Permittivity (ε_r):	41.70	41.96	-0.62	5
		e"	21.4300	Conductivity (σ):	0.89	0.89	0.07	5
	Head 700	e'	42.3400	Relative Permittivity (ε_r):	42.34	42.22	0.29	5
		e"	21.7700	Conductivity (σ):	0.85	0.89	-4.71	5
	Head 790	e'	41.1300	Relative Permittivity (ε_r):	41.13	41.76	-1.50	5
		e"	21.1900	Conductivity (σ):	0.93	0.90	3.87	5

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SAR 3 Room (Continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
5-26-2015	Body 2450	e'	52.0600	Relative Permittivity (ε_r):	52.06	52.70	-1.21	5
		e''	14.5600	Conductivity (σ):	1.98	1.95	1.72	5
	Body 2410	e'	52.2100	Relative Permittivity (ε_r):	52.21	52.76	-1.04	5
		e''	14.4300	Conductivity (σ):	1.93	1.91	1.37	5
	Body 2475	e'	51.9800	Relative Permittivity (ε_r):	51.98	52.67	-1.31	5
		e''	14.6700	Conductivity (σ):	2.02	1.99	1.70	5
5-27-2015	Head 2450	e'	38.8900	Relative Permittivity (ε_r):	38.89	39.20	-0.79	5
		e''	13.8500	Conductivity (σ):	1.89	1.80	4.82	5
	Head 2410	e'	39.0400	Relative Permittivity (ε_r):	39.04	39.28	-0.61	5
		e''	13.7200	Conductivity (σ):	1.84	1.76	4.44	5
	Head 2475	e'	38.7900	Relative Permittivity (ε_r):	38.79	39.17	-0.97	5
		e''	13.9200	Conductivity (σ):	1.92	1.83	4.85	5

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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.

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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	8-13-2014	750	1g	8.31	8.71
				10g	5.45	5.81
D835V2	4d174	8-13-2014	835	1g	9.32	9.62
				10g	6.09	6.37
D1750V2	1125	8-12-2014	1750	1g	36.6	36.7
				10g	19.5	19.7
D1900V2	5d190	8-12-2014	1900	1g	40.2	40.4
				10g	21.0	21.3
D1900V2	5d199	2-6-2015	1900	1g	41	40.6
				10g	21.4	21.6
D2450V2	939	8-11-2014	2450	1g	52.1	51.4
				10g	24.2	24
D5GHzV2	1184	8-22-2014	5200	1g	79.5	77.1
				10g	22.7	21.5
			5600	1g	83.3	82.7
				10g	23.5	22.8
			5800	1g	79.2	76.9
				10g	22.4	21.3

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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			
4-20-2015	D2450V2	939	Head	1g	5.36	53.60	52.1	2.88	
				10g	2.46	24.60	24.20	1.65	
4-20-2015	D2450V2	939	Body	1g	5.40	54.00	51.4	5.06	1,2
				10g	2.47	24.70	24.00	2.92	
4-21-2015	D5GhzV2 (5200)	1184	Head	1g	7.57	75.70	79.5	-4.78	
				10g	2.18	21.80	22.7	-3.96	
4-21-2015	D5GhzV2 (5600)	1184	Head	1g	7.80	78.00	83.3	-6.36	
				10g	2.22	22.20	23.5	-5.53	
4-21-2015	D5GhzV2 (5800)	1184	Head	1g	7.54	75.40	79.2	-4.80	
				10g	2.15	21.50	22.4	-4.02	
4-22-2015	D5GhzV2 (5200)	1184	Body	1g	7.84	78.40	77.1	1.69	
				10g	2.23	22.30	21.5	3.72	
4-22-2015	D5GhzV2 (5600)	1184	Body	1g	8.22	82.20	82.7	-0.60	
				10g	2.31	23.10	22.8	1.32	
4-22-2015	D5GhzV2 (5800)	1184	Body	1g	7.42	74.20	76.9	-3.51	
				10g	2.10	21.00	21.3	-1.41	
4-28-2015	D5GhzV2 (5200)	1184	Body	1g	7.50	75.00	77.1	-2.72	
				10g	2.12	21.20	21.5	-1.40	
4-28-2015	D5GhzV2 (5600)	1184	Body	1g	7.89	78.90	82.7	-4.59	
				10g	2.20	22.00	22.8	-3.51	
4-28-2015	D5GhzV2 (5800)	1184	Body	1g	7.32	73.20	76.9	-4.81	3,4
				10g	2.03	20.30	21.3	-4.69	
5-26-2015	D5GHzV2 (5200)	1184	Body	1g	8.11	81.10	77.1	5.19	
				10g	2.34	23.40	21.5	8.84	
5-26-2015	D5GhzV2 (5600)	1184	Body	1g	8.72	87.20	82.7	5.44	
				10g	2.48	24.80	22.8	8.77	
5-26-2015	D5GhzV2 (5800)	1184	Body	1g	7.89	78.90	76.9	2.60	
				10g	2.25	22.50	21.3	5.63	
5-27-2015	D5GHzV2 (5200)	1184	Head	1g	7.94	79.40	79.5	-0.13	
				10g	2.32	23.20	22.7	2.20	
5-27-2015	D5GhzV2 (5600)	1184	Head	1g	8.20	82.00	83.3	-1.56	
				10g	2.39	23.90	23.5	1.70	
5-27-2015	D5GhzV2 (5800)	1184	Head	1g	8.13	81.30	79.2	2.65	
				10g	2.35	23.50	22.4	4.91	

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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			
4-16-2015	D835V2	4d174	Body	1g	1.00	9.96	9.62	3.53	
				10g	0.66	6.56	6.37	2.98	
4-20-2015	D835V2	4d174	Body	1g	1.00	10.00	9.62	3.95	5, 6
				10g	0.66	6.60	6.37	3.61	
4-20-2015	D1900V2	5d199	Head	1g	4.08	40.80	41.00	-0.49	
				10g	2.11	21.10	21.40	-1.40	
4-24-2015	D835V2	4d174	Body	1g	1.03	10.30	9.62	7.07	
				10g	0.68	6.78	6.37	6.44	
4-27-2015	D1900V2	5d199	Head	1g	4.06	40.60	41.00	-0.98	
				10g	2.10	21.00	21.40	-1.87	
4-27-2015	D1750V2	1125	Head	1g	3.53	35.30	36.60	-3.55	
				10g	1.89	18.90	19.50	-3.08	
5-19-2015	D1750V2	1125	Body	1g	3.38	33.80	36.70	-7.90	
				10g	1.81	18.10	19.70	-8.12	
5-20-2015	D1750V2	1125	Head	1g	3.64	36.40	36.60	-0.55	7, 8
				10g	1.93	19.30	19.50	-1.03	
5-26-2015	D5GHzV2 (5200)	1184	Body	1g	8.18	81.80	77.1	6.10	
				10g	2.29	22.90	21.5	6.51	
5-26-2015	D5GhzV2 (5600)	1184	Body	1g	7.85	78.50	82.7	-5.08	
				10g	2.16	21.60	22.8	-5.26	
5-26-2015	D5GhzV2 (5800)	1184	Body	1g	7.92	79.20	76.9	2.99	
				10g	2.19	21.90	21.3	2.82	

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			
4-16-2015	D1900V2	5d190	Body	1g	3.74	37.40	40.4	-7.43	
				10g	1.95	19.50	21.30	-8.45	
4-18-2015	D835V2	4d174	Head	1g	0.96	9.63	9.32	3.33	
				10g	0.63	6.31	6.09	3.61	
4-20-2015	D1750V2	1125	Body	1g	3.72	37.20	36.70	1.36	
				10g	1.97	19.70	19.70	0.00	
4-20-2015	D1900V2	5d199	Body	1g	4.21	42.10	40.6	3.69	9,10
				10g	2.16	21.60	21.60	0.00	
4-24-2015	D1900V2	5d199	Body	1g	4.20	42.00	40.6	3.45	
				10g	2.16	21.60	21.60	0.00	
4-24-2015	D1750V2	1125	Body	1g	3.65	36.50	36.70	-0.54	
				10g	1.93	19.30	19.70	-2.03	
4-26-2015	D835V2	4d174	Head	1g	0.98	9.83	9.32	5.47	
				10g	0.65	6.48	6.09	6.40	
5-20-2015	D750V3	1122	Body	1g	0.82	8.21	8.71	-5.74	
				10g	0.55	5.48	5.81	-5.68	
5-20-2015	D750V3	1122	Head	1g	0.76	7.59	8.31	-8.66	11, 12
				10g	0.50	5.03	5.45	-7.71	
5-26-2015	D2450V2	939	Body	1g	5.30	53.00	51.40	3.11	
				10g	2.44	24.40	24.00	1.67	
5-27-2015	D2450V2	939	Head	1g	5.72	57.20	52.10	9.79	
				10g	2.64	26.40	24.20	9.09	

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9. Conducted Output Power Measurements

9.1. GSM

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	GSM (Voice)	CS1	1	128	824.2	33.1	24.1	26.3	17.2
				190	836.6	33.2	24.2	26.1	17.0
				251	848.8	33.2	24.2	26.1	17.0
	GPRS (GMSK)	CS1	1	128	824.2	33.2	24.2	26.1	17.1
				190	836.6	33.3	24.2	26.1	17.1
				251	848.8	33.3	24.3	26.1	17.1
			2	128	824.2	32.0	26.0	23.6	17.5
				190	836.6	32.0	25.9	23.8	17.7
				251	848.8	32.0	26.0	23.8	17.8
			3	128	824.2	29.7	25.5	21.9	17.7
				190	836.6	29.7	25.5	21.9	17.7
				251	848.8	29.7	25.5	22.0	17.7
			4	128	824.2	28.5	25.5	20.5	17.5
				190	836.6	28.3	25.3	20.4	17.4
				251	848.8	28.5	25.5	20.6	17.6
	EGPRS (8PSK)	MCS5	1	128	824.2	26.8	17.8	19.5	10.5
				190	836.6	26.6	17.6	19.3	10.2
				251	848.8	26.9	17.8	19.3	10.3
			2	128	824.2	25.2	19.2	18.0	12.0
				190	836.6	25.2	19.2	17.9	11.9
				251	848.8	25.3	19.2	17.9	11.9
			3	128	824.2	24.3	20.0	16.3	12.0
				190	836.6	24.0	19.7	16.0	11.8
				251	848.8	24.0	19.8	16.2	12.0
			4	128	824.2	22.7	19.7	14.8	11.8
				190	836.6	22.3	19.3	14.6	11.6
				251	848.8	22.7	19.7	14.6	11.6

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

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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	GSM (Voice)	CS1	1	512	1850.2	29.5	20.5	24.3	15.3
				661	1880.0	29.6	20.6	24.4	15.3
				810	1909.8	29.8	20.8	24.5	15.4
	GPRS (GMSK)	CS1	1	512	1850.2	29.6	20.5	24.3	15.3
				661	1880.0	29.7	20.6	24.4	15.4
				810	1909.8	29.8	20.8	24.5	15.4
			2	512	1850.2	28.3	22.3	22.2	16.2
				661	1880.0	28.4	22.4	22.5	16.5
				810	1909.8	28.7	22.7	22.5	16.5
			3	512	1850.2	27.1	22.8	21.1	16.9
				661	1880.0	27.1	22.9	21.4	17.1
				810	1909.8	27.2	22.9	21.4	17.1
			4	512	1850.2	25.4	22.4	19.3	16.3
				661	1880.0	25.5	22.5	19.3	16.3
				810	1909.8	25.5	22.5	19.5	16.5
	EGPRS (8PSK)	MCS5	1	512	1850.2	26.4	17.4	19.6	10.5
				661	1880.0	26.2	17.2	19.6	10.6
				810	1909.8	26.0	17.0	19.9	10.8
			2	512	1850.2	24.9	18.9	18.1	12.1
				661	1880.0	24.7	18.7	18.4	12.3
				810	1909.8	24.8	18.7	18.3	12.3
			3	512	1850.2	23.3	19.0	16.8	12.5
				661	1880.0	23.1	18.8	16.8	12.5
				810	1909.8	23.1	18.8	17.0	12.7
			4	512	1850.2	21.9	18.9	14.9	11.8
				661	1880.0	21.7	18.6	14.9	11.8
				810	1909.8	21.4	18.4	15.1	12.1

Notes:

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

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

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9.2. W-CDMA

Release 99 Setup Procedures used to establish the test signals

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

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

HSDPA Setup Procedures used to establish the test signals

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

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

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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

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DC-HSDPA Setup Procedures used to establish the test signals

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

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

Table E.5.0: Levels for HSDPA connection setup

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

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

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

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

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

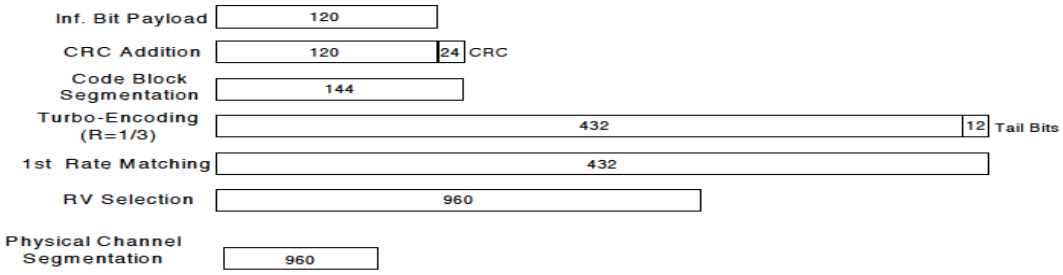

Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm2			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	11/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs = βhs/ βc	30/15			

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WCDMA Band V Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)	MPR (dB)	Reduced Pwr (dBm)
W-CDMA Band V	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	22.9	N/A	17.2
			4183	836.6	N/A	22.8	N/A	17.1
			4233	846.6	N/A	22.7	N/A	17.0
	HSDPA	Subtest 1	4132	826.4	0	23.1	0	17.4
			4183	836.6	0	23.1	0	17.2
			4233	846.6	0	23.0	0	17.3
		Subtest 2	4132	826.4	0	23.0	0	17.4
			4183	836.6	0	23.1	0	17.2
			4233	846.6	0	23.0	0	17.2
		Subtest 3	4132	826.4	0.5	22.6	0	17.3
			4183	836.6	0.5	23.0	0	17.1
			4233	846.6	0.5	22.8	0	17.2
		Subtest 4	4132	826.4	0.5	22.5	0	17.3
			4183	836.6	0.5	22.5	0	17.1
			4233	846.6	0.5	22.3	0	17.2
	HSUPA	Subtest 1	4132	826.4	0	22.4	0	16.2
			4183	836.6	0	22.5	0	16.0
			4233	846.6	0	22.3	0	16.1
		Subtest 2	4132	826.4	2	21.5	0	17.1
			4183	836.6	2	21.5	0	16.9
			4233	846.6	2	21.4	0	16.9
		Subtest 3	4132	826.4	1	22.4	0	17.2
			4183	836.6	1	22.4	0	17.0
			4233	846.6	1	22.2	0	17.0
		Subtest 4	4132	826.4	2	21.5	0	17.1
			4183	836.6	2	21.5	0	16.8
			4233	846.6	2	21.3	0	16.9
		Subtest 5	4132	826.4	0	23.1	0	17.3
			4183	836.6	0	23.1	0	17.2
			4233	846.6	0	23.1	0	17.2
	DC-HSPA	Subtest 1	4132	826.4	0	23.1	0	17.2
			4183	836.6	0	23.1	0	17.2
			4233	846.6	0	23.0	0	17.1
		Subtest 2	4132	826.4	0	23.1	0	17.3
			4183	836.6	0	23.1	0	17.1
			4233	846.6	0	23.1	0	17.2
		Subtest 3	4132	826.4	0.5	22.5	0	17.3
			4183	836.6	0.5	23.0	0	17.1
			4233	846.6	0.5	22.7	0	17.1
		Subtest 4	4132	826.4	0.5	22.5	0	17.3
			4183	836.6	0.5	22.5	0	17.0
			4233	846.6	0.5	22.3	0	17.1

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W-CDMA Band IV Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)	MPR (dB)	Reduced Pwr (dBm)
W-CDMA Band IIV	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	23.5	N/A	15.7
			1413	1732.6	N/A	23.5	N/A	15.9
			1513	1752.6	N/A	23.4	N/A	16.0
	HSDPA	Subtest 1	1312	1712.4	0	23.4	0	15.5
			1413	1732.6	0	22.8	0	15.2
			1513	1752.6	0	22.7	0	15.4
		Subtest 2	1312	1712.4	0	22.8	0	14.6
			1413	1732.6	0	22.4	0	14.2
			1513	1752.6	0	22.4	0	14.4
		Subtest 3	1312	1712.4	0.5	22.1	0.5	13.9
			1413	1732.6	0.5	22.4	0.5	14.3
			1513	1752.6	0.5	22.4	0.5	14.5
		Subtest 4	1312	1712.4	0.5	21.9	0.5	14.7
			1413	1732.6	0.5	21.5	0.5	14.3
			1513	1752.6	0.5	21.5	0.5	14.4
	HSUPA	Subtest 1	1312	1712.4	0	22.5	0	15.5
			1413	1732.6	0	22.0	0	15.2
			1513	1752.6	0	21.8	0	15.4
		Subtest 2	1312	1712.4	2	21.0	2	13.1
			1413	1732.6	2	20.6	2	12.8
			1513	1752.6	2	20.7	2	13.0
		Subtest 3	1312	1712.4	1	21.9	1	14.5
			1413	1732.6	1	21.5	1	14.2
			1513	1752.6	1	21.5	1	14.4
		Subtest 4	1312	1712.4	2	21.0	2	13.7
			1413	1732.6	2	20.5	2	13.3
			1513	1752.6	2	20.6	2	13.5
		Subtest 5	1312	1712.4	0	23.5	0	16.2
			1413	1732.6	0	22.9	0	16.0
			1513	1752.6	0	22.7	0	15.9
	DC-HSPA	Subtest 1	1312	1712.4	0	23.4	0	15.5
			1413	1732.6	0	22.8	0	15.1
			1513	1752.6	0	22.7	0	15.3
		Subtest 2	1312	1712.4	0	22.9	0	14.6
			1413	1732.6	0	22.3	0	14.2
			1513	1752.6	0	22.4	0	14.4
		Subtest 3	1312	1712.4	0.5	22.1	0.5	13.9
			1413	1732.6	0.5	22.4	0.5	14.3
			1513	1752.6	0.5	22.4	0.5	14.4
		Subtest 4	1312	1712.4	0.5	21.9	0.5	14.7
			1413	1732.6	0.5	21.5	0.5	14.2
			1513	1752.6	0.5	21.5	0.5	14.4

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W-CDMA Band II Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)	MPR (dB)	Reduced Pwr (dBm)
W-CDMA Band II	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	22.6	N/A	17.2
			9400	1880.0	N/A	22.8	N/A	17.4
			9538	1907.6	N/A	23.1	N/A	17.5
	HSDPA	Subtest 1	9262	1852.4	0	22.8	0	17.4
			9400	1880.0	0	23.3	0	17.1
			9538	1907.6	0	22.7	0	16.7
		Subtest 2	9262	1852.4	0	22.8	0	17.3
			9400	1880.0	0	23.3	0	17.0
			9538	1907.6	0	22.8	0	16.7
		Subtest 3	9262	1852.4	0.5	22.1	0	17.4
			9400	1880.0	0.5	23.0	0	17.0
			9538	1907.6	0.5	22.8	0	16.6
		Subtest 4	9262	1852.4	0.5	22.0	0	17.4
			9400	1880.0	0.5	22.4	0	17.0
			9538	1907.6	0.5	22.1	0	16.6
	HSUPA	Subtest 1	9262	1852.4	0	22.0	0	16.1
			9400	1880.0	0	22.3	0	15.6
			9538	1907.6	0	22.0	0	15.7
		Subtest 2	9262	1852.4	2	21.1	0	17.2
			9400	1880.0	2	21.3	0	16.7
			9538	1907.6	2	21.2	0	16.4
		Subtest 3	9262	1852.4	1	21.9	0	17.2
			9400	1880.0	1	22.3	0	16.8
			9538	1907.6	1	21.9	0	16.5
		Subtest 4	9262	1852.4	2	21.0	0	17.1
			9400	1880.0	2	21.3	0	16.7
			9538	1907.6	2	21.0	0	16.4
		Subtest 5	9262	1852.4	0	22.7	0	17.3
			9400	1880.0	0	23.1	0	17.0
			9538	1907.6	0	22.6	0	16.6
	DC-HSPA	Subtest 1	9262	1852.4	0	22.8	0	17.4
			9400	1880.0	0	23.1	0	17.1
			9538	1907.6	0	22.7	0	16.7
		Subtest 2	9262	1852.4	0	22.8	0	17.3
			9400	1880.0	0	23.2	0	17.0
			9538	1907.6	0	22.7	0	16.7
		Subtest 3	9262	1852.4	0.5	22.0	0	17.3
			9400	1880.0	0.5	23.0	0	17.0
			9538	1907.6	0.5	22.6	0	16.6
		Subtest 4	9262	1852.4	0.5	21.9	0	17.3
			9400	1880.0	0.5	22.1	0	16.9
			9538	1907.6	0.5	21.7	0	16.6

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9.3. LTE

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

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

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

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

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

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

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-
Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.					

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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	22.6	22.6	22.3	0	15.7	15.7	15.3
			1	50	0	22.8	22.7	22.5	0	15.8	15.9	15.4
			1	99	0	22.8	22.8	22.5	0	15.8	15.9	15.6
			50	0	1	21.5	21.3	21.2	0	15.7	15.6	15.3
			50	25	1	21.6	21.3	21.3	0	15.7	15.6	15.4
			50	50	1	21.6	21.3	21.2	0	15.8	15.6	15.5
			100	0	1	21.5	21.5	21.2	0	15.6	15.7	15.4
		16QAM	1	0	1	21.7	21.5	21.3	0	15.6	15.6	15.6
			1	50	1	21.7	21.4	21.5	0	15.6	15.7	15.7
			1	99	1	21.9	21.6	21.5	0	15.7	15.9	15.8
			50	0	2	20.4	20.3	20.1	0	15.7	15.7	15.3
			50	25	2	20.5	20.2	20.2	0	15.7	15.6	15.4
			50	50	2	20.5	20.3	20.2	0	15.8	15.7	15.4
			100	0	2	20.5	20.4	20.2	0	15.7	15.7	15.4

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	22.7	22.6	22.4	0	15.8	15.6	15.4
			1	36	0	22.9	22.6	22.5	0	15.8	15.8	15.5
			1	74	0	22.9	22.7	22.5	0	15.9	15.8	15.5
			36	0	1	21.6	21.4	21.3	0	15.7	15.6	15.4
			36	18	1	21.6	21.3	21.3	0	15.8	15.6	15.4
			36	37	1	21.6	21.4	21.3	0	15.8	15.6	15.4
			75	0	1	21.5	21.4	21.3	0	15.7	15.7	15.4
		16QAM	1	0	1	22.0	21.7	21.3	0	15.9	16.0	15.4
			1	36	1	22.1	21.7	21.2	0	15.9	16.0	15.4
			1	74	1	22.1	21.8	21.3	0	16.1	16.0	15.5
			36	0	2	20.4	20.3	20.2	0	15.7	15.6	15.4
			36	18	2	20.6	20.3	20.3	0	15.8	15.7	15.4
			36	37	2	20.6	20.3	20.2	0	15.7	15.7	15.3
			75	0	2	20.5	20.3	20.3	0	15.7	15.7	15.3

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	22.5	22.6	0	15.9	15.6	15.5
			1	25	0	22.9	22.5	22.5	0	15.9	15.7	15.6
			1	49	0	23.0	22.6	22.5	0	16.0	15.8	15.6
			25	0	1	21.5	21.4	21.3	0	15.7	15.6	15.4
			25	12	1	21.7	21.3	21.3	0	15.7	15.6	15.4
			25	25	1	21.7	21.4	21.3	0	15.9	15.6	15.5
			50	0	1	21.6	21.4	21.4	0	15.8	15.7	15.4
		16QAM	1	0	1	21.8	21.5	21.8	0	15.9	15.9	15.7
			1	25	1	21.6	21.5	21.7	0	15.9	15.8	15.7
			1	49	1	21.8	21.5	21.7	0	16.0	15.9	15.7
			25	0	2	20.5	20.2	20.3	0	15.7	15.7	15.4
			25	12	2	20.6	20.2	20.3	0	15.8	15.7	15.4
			25	25	2	20.6	20.3	20.3	0	15.9	15.7	15.5
			50	0	2	20.5	20.3	20.3	0	15.7	15.6	15.5

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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	22.9	22.6	22.4	0	16.0	15.8	15.5
			1	12	0	23.0	22.6	22.4	0	16.0	15.8	15.4
			1	24	0	23.1	22.7	22.5	0	16.1	15.8	15.5
			12	0	1	21.6	21.4	21.3	0	15.9	15.6	15.4
			12	6	1	21.7	21.3	21.2	0	15.9	15.6	15.4
			12	11	1	21.7	21.3	21.3	0	15.9	15.6	15.4
			25	0	1	21.6	21.4	21.3	0	15.9	15.7	15.4
		16QAM	1	0	1	22.2	21.8	21.5	0	16.2	16.0	15.5
			1	12	1	22.1	21.7	21.5	0	16.2	15.9	15.5
			1	24	1	22.2	21.8	21.6	0	16.3	16.0	15.5
			12	0	2	20.4	20.3	20.0	0	15.8	15.6	15.4
			12	6	2	20.5	20.2	20.1	0	15.9	15.5	15.4
			12	11	2	20.5	20.2	20.1	0	15.9	15.5	15.4
			25	0	2	20.6	20.3	20.2	0	16.0	15.5	15.4

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	23.0	22.7	22.5	0	16.1	15.8	15.6
			1	7	0	23.0	22.7	22.5	0	16.1	15.7	15.5
			1	14	0	23.0	22.7	22.5	0	16.2	15.8	15.5
			8	0	1	21.6	21.4	21.3	0	15.9	15.7	15.4
			8	4	1	21.7	21.3	21.2	0	15.9	15.6	15.3
			8	7	1	21.7	21.3	21.1	0	16.0	15.6	15.4
			15	0	1	21.7	21.3	21.2	0	15.9	15.6	15.4
		16QAM	1	0	1	22.0	21.8	21.8	0	16.1	15.9	15.7
			1	7	1	21.9	21.7	21.7	0	16.1	15.8	15.7
			1	14	1	21.9	21.8	21.8	0	16.1	15.8	15.7
			8	0	2	20.5	20.2	20.2	0	15.9	15.6	15.5
			8	4	2	20.6	20.2	20.1	0	15.9	15.5	15.4
			8	7	2	20.6	20.1	20.1	0	16.0	15.5	15.4
			15	0	2	20.6	20.2	20.1	0	15.9	15.6	15.2

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	22.8	22.6	22.6	0	16.2	15.8	15.6
			1	2	0	22.9	22.6	22.5	0	16.1	15.8	15.5
			1	5	0	22.9	22.6	22.6	0	16.1	15.8	15.6
			3	0	0	22.8	22.5	22.5	0	15.9	15.6	15.5
			3	1	0	22.8	22.5	22.4	0	16.0	15.6	15.5
			3	2	0	22.8	22.4	22.4	0	16.0	15.6	15.4
			6	0	1	21.7	21.3	21.3	0	16.0	15.6	15.4
		16QAM	1	0	1	22.0	21.8	21.8	0	16.2	15.9	15.9
			1	2	1	22.1	21.7	21.8	0	16.1	15.9	15.8
			1	5	1	22.1	21.8	21.7	0	16.1	15.9	15.9
			3	0	1	21.6	21.5	21.3	0	15.8	15.6	15.6
			3	1	1	21.7	21.4	21.3	0	15.9	15.6	15.6
			3	2	1	21.7	21.4	21.2	0	15.9	15.5	15.5
			6	0	2	20.7	20.3	20.1	0	16.0	15.5	15.5

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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	22.8	22.9	22.7	0	16.6	16.8	16.8
			1	50	0	23.0	23.1	22.9	0	16.8	16.9	16.9
			1	99	0	22.9	23.1	22.9	0	16.8	17.0	17.0
			50	0	1	21.7	21.6	21.6	0	16.6	16.7	16.8
			50	25	1	21.8	21.7	21.6	0	16.7	16.8	16.9
			50	50	1	21.7	21.8	21.7	0	16.6	16.8	16.8
			100	0	1	21.7	21.6	21.7	0	16.6	16.7	16.8
		16QAM	1	0	1	21.9	21.9	21.8	0	16.5	16.7	16.8
			1	50	1	22.0	22.0	21.9	0	16.6	16.8	16.9
			1	99	1	22.0	22.1	22.0	0	16.7	16.9	17.0
			50	0	2	20.7	20.6	20.5	0	16.6	16.7	16.7
			50	25	2	20.7	20.6	20.6	0	16.7	16.8	16.8
			50	50	2	20.6	20.5	20.6	0	16.6	16.8	16.7
			100	0	2	20.6	20.5	20.7	0	16.6	16.8	16.8

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	23.0	22.9	22.8	0	16.7	16.8	16.7
			1	36	0	23.1	23.0	22.8	0	16.7	16.9	16.8
			1	74	0	23.0	22.9	23.0	0	16.7	16.9	16.9
			36	0	1	21.8	21.6	21.6	0	16.5	16.7	16.7
			36	18	1	21.8	21.7	21.6	0	16.6	16.8	16.7
			36	37	1	21.7	21.7	21.6	0	16.6	16.8	16.7
			75	0	1	21.7	21.6	21.7	0	16.5	16.7	16.8
		16QAM	1	0	1	22.0	22.0	22.0	0	16.8	16.8	16.8
			1	36	1	22.0	22.1	21.9	0	16.8	16.9	16.8
			1	74	1	22.0	22.2	22.0	0	16.8	16.9	16.8
			36	0	2	20.8	20.5	20.6	0	16.5	16.8	16.7
			36	18	2	20.7	20.6	20.5	0	16.6	16.8	16.6
			36	37	2	20.8	20.7	20.5	0	16.6	16.9	16.7
			75	0	2	20.7	20.5	20.6	0	16.5	16.7	16.7

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	23.0	22.9	22.9	0	16.6	16.7	16.8
			1	25	0	23.1	23.0	23.0	0	16.8	16.9	16.9
			1	49	0	23.0	23.0	22.9	0	16.7	16.8	16.9
			25	0	1	21.8	21.6	21.6	0	16.5	16.6	16.6
			25	12	1	21.8	21.7	21.5	0	16.6	16.8	16.7
			25	25	1	21.7	21.7	21.6	0	16.5	16.8	16.6
			50	0	1	21.8	21.6	21.6	0	16.6	16.7	16.6
		16QAM	1	0	1	22.1	22.2	22.0	0	16.7	17.0	17.0
			1	25	1	22.1	22.2	22.0	0	16.6	17.1	17.1
			1	49	1	22.1	22.1	22.0	0	16.7	17.0	17.1
			25	0	2	20.7	20.6	20.6	0	16.6	16.7	16.8
			25	12	2	20.7	20.6	20.6	0	16.7	16.8	16.8
			25	25	2	20.7	20.7	20.6	0	16.6	16.8	16.7
			50	0	2	20.7	20.5	20.6	0	16.5	16.6	16.8

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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	23.0	23.0	22.8	0	16.8	16.9	16.6
			1	12	0	23.1	23.1	22.7	0	16.8	17.0	16.7
			1	24	0	23.1	23.0	22.8	0	16.8	17.0	16.7
			12	0	1	21.8	21.7	21.6	0	16.7	16.7	16.6
			12	6	1	21.7	21.6	21.5	0	16.7	16.7	16.5
			12	11	1	21.7	21.7	21.5	0	16.7	16.7	16.5
			25	0	1	21.7	21.6	21.6	0	16.6	16.7	16.5
		16QAM	1	0	1	22.3	21.9	21.8	0	17.0	16.9	16.5
			1	12	1	22.3	22.0	21.8	0	17.0	16.9	16.5
			1	24	1	22.3	21.9	21.9	0	17.1	16.9	16.5
			12	0	2	20.6	20.4	20.5	0	16.5	16.6	16.5
			12	6	2	20.6	20.4	20.4	0	16.5	16.7	16.5
			12	11	2	20.7	20.5	20.4	0	16.5	16.6	16.5
			25	0	2	20.7	20.4	20.4	0	16.6	16.7	16.5

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	23.1	23.0	22.9	0	16.8	16.8	16.7
			1	7	0	23.1	23.1	22.9	0	16.8	16.8	16.7
			1	14	0	23.1	23.0	23.0	0	16.9	16.9	16.7
			8	0	1	21.8	21.7	21.7	0	16.6	16.7	16.6
			8	4	1	21.8	21.7	21.6	0	16.6	16.7	16.5
			8	7	1	21.8	21.7	21.6	0	16.6	16.7	16.5
			15	0	1	21.8	21.7	21.6	0	16.6	16.7	16.5
		16QAM	1	0	1	22.1	22.2	22.1	0	17.1	17.1	17.0
			1	7	1	22.1	22.1	22.0	0	17.1	17.0	16.9
			1	14	1	22.1	22.1	22.1	0	17.1	17.1	17.1
			8	0	2	20.6	20.5	20.6	0	16.6	16.6	16.5
			8	4	2	20.6	20.4	20.5	0	16.6	16.6	16.4
			8	7	2	20.6	20.4	20.5	0	16.6	16.6	16.4
			15	0	2	20.6	20.5	20.4	0	16.6	16.6	16.5

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	23.1	23.1	22.9	0	16.8	16.9	16.7
			1	2	0	23.1	23.0	22.8	0	16.8	16.9	16.7
			1	5	0	23.1	23.0	22.9	0	16.8	16.9	16.7
			3	0	0	22.9	22.8	22.8	0	16.6	16.8	16.5
			3	1	0	22.9	22.8	22.8	0	16.6	16.7	16.6
			3	2	0	22.9	22.8	22.8	0	16.7	16.7	16.6
			6	0	1	21.8	21.7	21.6	0	16.6	16.7	16.6
		16QAM	1	0	1	22.1	22.1	22.0	0	16.9	17.2	16.9
			1	2	1	22.2	22.2	22.0	0	16.8	17.2	16.9
			1	5	1	22.2	22.2	22.1	0	16.9	17.3	17.0
			3	0	1	21.7	21.6	21.8	0	16.6	16.6	16.7
			3	1	1	21.8	21.6	21.8	0	16.6	16.6	16.5
			3	2	1	21.8	21.5	21.8	0	16.7	16.7	16.5
			6	0	2	20.7	20.4	20.6	0	16.5	16.5	16.5

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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	23.3	23.1	23.1	0	16.9	16.7	16.8
			1	25	0	23.2	23.3	23.0	0	16.9	16.9	16.7
			1	49	0	23.2	23.1	23.0	0	16.8	16.8	16.8
			25	0	1	21.9	21.8	21.7	0	16.7	16.7	16.6
			25	12	1	21.8	21.9	21.6	0	16.7	16.7	16.5
			25	25	1	21.7	21.9	21.6	0	16.6	16.7	16.5
			50	0	1	21.9	21.8	21.7	0	16.7	16.7	16.6
		16QAM	1	0	1	22.2	22.4	22.2	0	17.1	17.2	16.9
			1	25	1	22.2	22.4	22.2	0	16.9	17.2	16.9
			1	49	1	22.1	22.3	22.1	0	16.9	17.1	16.9
			25	0	2	20.8	20.8	20.7	0	16.7	16.7	16.6
			25	12	2	20.7	20.8	20.7	0	16.7	16.7	16.6
			25	25	2	20.7	20.8	20.6	0	16.6	16.7	16.6
			50	0	2	20.7	20.7	20.6	0	16.7	16.7	16.7

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	23.0	23.2	22.9	0	16.9	17.0	16.6
			1	12	0	23.0	23.2	22.9	0	16.9	17.0	16.5
			1	24	0	23.0	23.2	22.9	0	16.9	17.0	16.6
			12	0	1	21.8	21.8	21.7	0	16.8	16.7	16.5
			12	6	1	21.7	21.9	21.6	0	16.8	16.7	16.4
			12	11	1	21.6	21.8	21.6	0	16.7	16.7	16.4
			25	0	1	21.8	21.7	21.7	0	16.7	16.7	16.5
		16QAM	1	0	1	22.0	22.0	22.3	0	17.2	17.0	16.6
			1	12	1	22.0	22.0	22.2	0	17.1	17.1	16.5
			1	24	1	21.9	22.1	22.2	0	17.1	17.1	16.6
			12	0	2	20.7	20.7	20.6	0	16.7	16.6	16.5
			12	6	2	20.7	20.7	20.6	0	16.7	16.6	16.4
			12	11	2	20.6	20.7	20.5	0	16.6	16.6	16.3
			25	0	2	20.6	20.7	20.7	0	16.8	16.7	16.4

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	23.1	23.1	23.1	0	16.9	16.8	16.7
			1	7	0	23.0	23.2	22.9	0	16.8	16.9	16.6
			1	14	0	23.1	23.2	23.0	0	16.8	16.9	16.6
			8	0	1	21.8	21.8	21.7	0	16.7	16.6	16.5
			8	4	1	21.7	21.9	21.6	0	16.6	16.6	16.5
			8	7	1	21.7	21.9	21.6	0	16.6	16.6	16.5
			15	0	1	21.7	21.9	21.6	0	16.6	16.6	16.5
		16QAM	1	0	1	22.1	22.1	22.2	0	17.1	17.1	16.9
			1	7	1	22.0	22.2	22.1	0	17.0	17.2	16.9
			1	14	1	22.1	22.2	22.2	0	17.0	17.1	16.9
			8	0	2	20.6	20.6	20.6	0	16.6	16.5	16.5
			8	4	2	20.6	20.5	20.5	0	16.5	16.6	16.4
			8	7	2	20.5	20.5	20.5	0	16.5	16.6	16.5
			15	0	2	20.6	20.7	20.6	0	16.6	16.7	16.4

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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	23.3	22.9	0	16.9	16.8	16.7
			1	2	0	23.0	23.3	23.0	0	16.8	16.8	16.6
			1	5	0	23.0	23.3	23.0	0	16.7	16.8	16.7
			3	0	0	22.9	23.0	22.9	0	16.6	16.7	16.6
			3	1	0	22.8	23.0	22.8	0	16.7	16.7	16.5
			3	2	0	22.8	23.0	22.7	0	16.6	16.7	16.4
			6	0	1	21.6	21.9	21.7	0	16.6	16.7	16.4
		16QAM	1	0	1	22.0	22.4	22.1	0	16.9	16.9	17.0
			1	2	1	22.1	22.3	22.1	0	16.9	16.9	17.0
			1	5	1	22.1	22.4	22.1	0	17.0	16.9	17.1
			3	0	1	21.6	21.8	21.7	0	16.7	16.7	16.5
			3	1	1	21.6	21.9	21.8	0	16.5	16.4	16.5
			3	2	1	21.6	21.9	21.7	0	16.5	16.6	16.4
			6	0	2	20.7	20.7	20.7	0	16.5	16.4	16.5

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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	23.1	0	15.0
			1	25	0	23.1	0	15.0
			1	49	0	23.1	0	15.0
			25	0	1	21.7	0	14.0
			25	12	1	21.8	0	13.9
			25	25	1	21.7	0	13.9
			50	0	1	21.8	0	13.9
		16QAM	1	0	1	22.3	0	14.1
			1	25	1	22.3	0	14.1
			1	49	1	22.2	0	14.1
			25	0	2	20.8	0	13.0
			25	12	2	20.7	0	13.0
			25	25	2	20.7	0	12.9
			50	0	2	20.8	0	13.0
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	23.2	0	15.0
			1	12	0	23.1	0	14.9
			1	24	0	23.0	0	14.9
			12	0	1	21.8	0	13.9
			12	6	1	21.7	0	14.0
			12	11	1	21.7	0	13.8
			25	0	1	21.7	0	13.9
		16QAM	1	0	1	22.2	0	14.1
			1	12	1	22.1	0	14.0
			1	24	1	22.1	0	14.1
			12	0	2	20.7	0	13.0
			12	6	2	20.7	0	12.9
			12	11	2	20.6	0	12.8
			25	0	2	20.6	0	12.9

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

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9.4. Wi-Fi 2.4GHz (DTS Band)

SISO

Antenna	Band (GHz)	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 Chain 0	2.4	802.11b	1 Mbps	1	2412	16.0	16.5	Yes	11.0	11.5	Yes
				6	2437	16.5			11.5		
				11	2462	16.5			11.0		
		802.11g	6 Mbps	1	2412	Not Required	13.5	No	11.3	11.5	No
				6	2437				11.0		
				11	2462				11.0		
		802.11n (HT20)	6.5 Mbps	1	2412		13.5	No	11.1	11.5	No
				6	2437				10.5		
				11	2462				11.3		
SISO Chain 1	2.4	802.11b	1 Mbps	1	2412	15.9	16.5	Yes	11.2	11.5	Yes
				6	2437	16.5			11.5		
				11	2462	16.0			11.3		
		802.11g	6 Mbps	1	2412	Not Required	13.5	No	10.5	11.5	No
				6	2437				10.5		
				11	2462				10.7		
		802.11n (HT20)	6.5 Mbps	1	2412		13.5	No	10.5	11.5	No
				6	2437				10.3		
				11	2462				10.5		

MIMO

Antenna	Band (GHz)	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)
MINO Chain 0	2.4	802.11n (HT20)	6.5 Mbps	1	2412	13.2	13.5	Yes	10.9	11.5	Yes
				6	2437	13.5			10.3		
				11	2462	13.2			11.3		
MINO Chain 1	2.4	802.11n (HT20)	6.5 Mbps	1	2412	13.1	13.5	Yes	10.4	11.5	Yes
				6	2437	13.3			10.1		
				11	2462	12.6			11.0		

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.

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

SISO Antenna 1

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduce Pwr		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
SISO Ant 1	5.3 (U-NII 2A)	802.11a	6 Mbps	52	5260	12.1	12.5	Yes	Not Required	7.5	No
				56	5280	12.4					
				60	5300	12.4					
				64	5320	12.4					
		802.11n (HT20)	6.5 Mbps	52	5260	12.1	12.5	No		7.5	No
				56	5280	12.2					
				60	5300	12.1					
				64	5320	12.3					
		802.11n (HT40)	13.5 Mbps	54 ~ 62	5270 ~ 5310	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	52 ~ 64	5260 ~ 5320		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	54 ~ 62	5270 ~ 5310		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	58	5290		10.5	No	7.5	7.5	Yes
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500	12.0	12.5	Yes	Not Required	7.5	No
				104	5520	12.3					
				108	5540	12.4					
				112	5560	12.4					
				116	5580	12.5					
				132	5660	12.4					
				136	5680	12.4					
				140	5700	12.2					
		802.11n (HT20)	6.5 Mbps	100	5500	12.1	12.5	No		7.5	No
				104	5520	12.4					
				108	5540	12.3					
				112	5560	12.5					
				116	5580	12.2					
				132	5660	12.2					
				136	5680	12.3					
				140	5700	12.2					
		802.11n (HT40)	13.5 Mbps	102 ~ 134	5510 ~ 5670	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	100 ~ 140	5500 ~ 5700		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	102 ~ 134	5510 ~ 5670		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	106	5530		10.5	No	7.5	7.5	Yes
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745	12.3	12.5	Yes	Not Required	7.5	No
				153	5765	12.4					
				157	5785	12.5					
				161	5805	12.4					
				165	5825	12.2					
		802.11n (HT20)	6.5 Mbps	149	5745	12.2	12.5	No		7.5	No
				153	5765	12.3					
				157	5785	12.4					
				161	5805	12.3					
				165	5825	12.4					
		802.11n (HT40)	13.5 Mbps	151 ~ 159	5755 ~ 5795	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	149 ~ 165	5745 ~ 5825		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	151 ~ 159	5755 ~ 5795		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	155	5775		10.5	No	7.3	7.5	Yes

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SISO Antenna 2

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduce Pwr		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
SISO Ant 1	5.3 (U-NII 2A)	802.11a	6 Mbps	52	5260	12.1	12.5	Yes	Not Required	7.5	No
				56	5280	12.3	12.5				
				60	5300	12.4	12.5				
				64	5320	12.4	12.5				
		802.11n (HT20)	6.5 Mbps	52	5260	12.1	12.5	No		7.5	No
				56	5280	12.1	12.5				
				60	5300	12.0	12.5				
				64	5320	12.0	12.5				
		802.11n (HT40)	13.5 Mbps	54 ~ 62	5270 ~ 5310	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	52 ~ 64	5260 ~ 5320		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	54 ~ 62	5270 ~ 5310		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	58	5290		10.5	No	7.5	7.5	Yes
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500	12.3	12.5	Yes	Not Required	7.5	No
				104	5520	12.4					
				108	5540	12.3					
				112	5560	12.3					
				116	5580	12.5					
				132	5660	12.5					
				136	5680	12.3					
				140	5700	12.3					
		802.11n (HT20)	6.5 Mbps	100	5500	12.2	12.5	No		7.5	No
				104	5520	12.0					
				108	5540	12.0					
				112	5560	12.1					
				116	5580	12.3					
				132	5660	12.2					
				136	5680	12.4					
				140	5700	12.2					
		802.11n (HT40)	13.5 Mbps	102 ~ 134	5510 ~ 5670	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	100 ~ 140	5500 ~ 5700		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	102 ~ 134	5510 ~ 5670		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	106	5530		10.5	No	7.5	7.5	Yes
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745	12.4	12.5	Yes	Not Required	7.5	No
				153	5765	12.5					
				157	5785	12.5					
				161	5805	12.4					
				165	5825	12.2					
		802.11n (HT20)	6.5 Mbps	149	5745	12.1	12.5	No		7.5	No
				153	5765	12.2					
				157	5785	12.1					
				161	5805	12.1					
				165	5825	12.2					
		802.11n (HT40)	13.5 Mbps	151 ~ 159	5755 ~ 5795	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	149 ~ 165	5745 ~ 5825		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	151 ~ 159	5755 ~ 5795		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	155	5775		10.5	No	7.5	7.5	Yes

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MIMO Antenna 1

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduce Pwr		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
MIMO Ant 1	5.3 (U-NII 2A)	802.11n (HT20)	6.5 Mbps	52	5260	12.3	12.5	Yes	Not Required	7.5	No
				56	5280	12.1	12.5				
				60	5300	12.2	12.5				
				64	5320	12.2	12.5				
		802.11n (HT40)	13.5 Mbps	54 ~ 62	5270 ~ 5310	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	52 ~ 64	5260 ~ 5320		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	54 ~ 62	5270 ~ 5310		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	58	5290		10.5	No	7.0	7.5	Yes
	5.5 (U-NII 2C)	802.11n (HT20)	6.5 Mbps	100	5500	12.5	12.5	Yes	Not Required	7.5	No
				104	5520	12.3					
				108	5540	12.4					
				112	5560	12.2					
				116	5580	12.1					
				132	5660	12.2					
				136	5680	12.1					
				140	5700	12.2					
		802.11n (HT40)	13.5 Mbps	102 ~ 134	5510 ~ 5670	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	100 ~ 140	5500 ~ 5700		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	102 ~ 134	5510 ~ 5670		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	106	5530		10.5	No	7.3	7.5	Yes
	5.8 (U-NII 3)	802.11n (HT20)	6.5 Mbps	149	5745	12.1	12.5	Yes	Not Required	7.5	No
				153	5765	12.1					
				157	5785	12.1					
				161	5805	12.2					
				165	5825	12.2					
		802.11n (HT40)	13.5 Mbps	151 ~ 159	5755 ~ 5795	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	149 ~ 165	5745 ~ 5825		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	151 ~ 159	5755 ~ 5795		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	155	5775		10.5	No	7.5	7.5	Yes

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MIMO Antenna 2

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduce Pwr		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
MIMO Ant 2	5.3 (U-NII 2A)	802.11n (HT20)	6.5 Mbps	52	5260	12.3	12.5	Yes	Not Required	7.5	No
				56	5280	12.1	12.5				
				60	5300	12.4	12.5				
				64	5320	12.2	12.5				
		802.11n (HT40)	13.5 Mbps	54 ~ 62	5270 ~ 5310	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	52 ~ 64	5260 ~ 5320		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	54 ~ 62	5270 ~ 5310		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	58	5290		10.5	No	5.6	7.5	Yes
	5.5 (U-NII 2C)	802.11n (HT20)	6.5 Mbps	100	5500	12.4	12.5	Yes	Not Required	7.5	No
				104	5520	12.2					
				108	5540	12.1					
				112	5560	12.2					
				116	5580	12.2					
				132	5660	12.4					
				136	5680	12.2					
				140	5700	12.1					
		802.11n (HT40)	13.5 Mbps	102 ~ 134	5510 ~ 5670	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	100 ~ 140	5500 ~ 5700		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	102 ~ 134	5510 ~ 5670		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	106	5530		10.5	No	6.5	7.5	Yes
	5.8 (U-NII 3)	802.11n (HT20)	6.5 Mbps	149	5745	12.2	12.5	Yes	Not Required	7.5	No
				153	5765	12.1					
				157	5785	12.1					
				161	5805	12.1					
				165	5825	12.3					
		802.11n (HT40)	13.5 Mbps	151 ~ 159	5755 ~ 5795	Not Required	11.5	No		7.5	No
		802.11ac (VHT20)	6.5 Mbps	149 ~ 165	5745 ~ 5825		11.5	No		7.5	No
		802.11ac (VHT40)	13.5 Mbps	151 ~ 159	5755 ~ 5795		11.5	No		7.5	No
		802.11ac (VHT80)	29.3 Mbps	155	5775		10.5	No	6.7	7.5	Yes

Note(s):

1. Output Power and SAR measurement is not required for 802.11n/ac (V)HT20/(V)HT40/VHT80 channels when the specified tune-up tolerances for 802.11n/ac (V)HT20/(V)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.

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9.6. Bluetooth

Band (GHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Avg Pwr (mW)
2.4	V3.0 + BDR, GFSK	0	2402	7.67	5.85
		39	2441	9.70	9.33
		78	2480	7.69	5.88
	V3.0 + EDR, π/4 DQPSK	0	2402	4.14	2.59
		39	2441	5.61	3.64
		78	2480	3.28	2.13
	V3.0 + EDR, 8-DPSK	0	2402	4.25	2.66
		39	2441	5.74	3.75
		78	2480	3.48	2.23
	V4.0 LE, GFSK	0	2402	2.44	1.75
		19	2440	4.87	3.07
		39	2480	3.52	2.25

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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 648474 D04 Handset SAR:
With headset attached, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

The normal tablet procedures in KDB 616217 are required when the over diagonal dimension of the device is > 20.0 cm. Hotspot mode SAR is not required when normal tablet procedures are applied. Extremity 10-g SAR is also not required for the front (top) surface of large form factor full size tablets. The more conservative tablet SAR results can be used to support the 10-g extremity SAR for phablet mode.

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

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

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.
- When the reported SAR is > 0.8 W/kg, testing for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

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

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

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- ≤ 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*.

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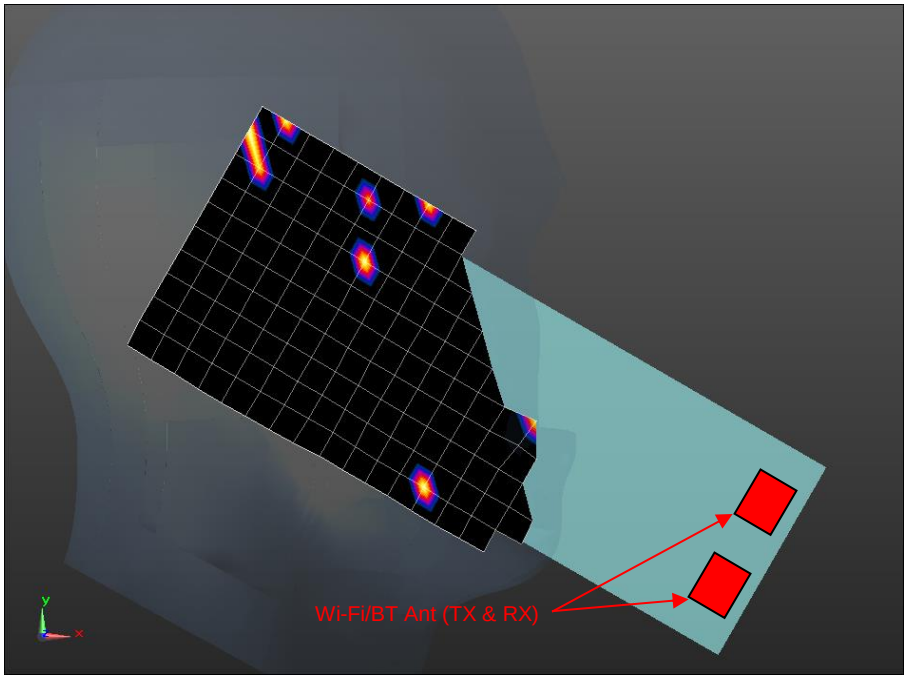
Justification for using Flat Phantom Measuring Head SAR

Due to the EUT with antenna located near the bottom and lower side edges near the mouth and jaw regions. The following head SAR plot is provided to show the measurements with truncated SAR distributions in the head measured with the SAM Phantom.



The following procedure was applied (KDB 648474 D04 Handset SAR):

- The phone was positioned with a separation distance of <4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell.
- While maintaining this distance at the ERP location of the phone, the low (bottom) edge of the phone is lowered from the phantom to establish the same separation distance at the peak SAR location identified by the truncated partial SAR distribution measured with the SAM phantom.
- The distance from the peak SAR location to the phone should be determined by the straight line passing perpendicularly through the phantom surface.

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10.1. GSM850

RF Exposure Conditions	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	
Head	Voice	On	0	Left Touch	190	836.6	26.5	26.1	0.293	0.321	
				Left Tilt	190	836.6	26.5	26.1	0.285	0.312	
				Right Touch	190	836.6	26.5	26.1	0.302	0.331	
				Right Tilt	190	836.6	26.5	26.1	0.294	0.322	
Head VoIP	GPRS 2 Slots	On	0	Left Touch	190	836.6	24.0	23.8	0.401	0.420	
				Left Tilt	190	836.6	24.0	23.8	0.391	0.409	
				Right Touch	190	836.6	24.0	23.8	0.438	0.459	1
				Right Tilt	190	836.6	24.0	23.8	0.403	0.422	
Body	GPRS 2 Slots	On	0	Rear	128	824.2	24.0	23.8	0.660	0.691	
				Edge 1	190	836.6	24.0	23.8	0.755	0.791	2
	GPRS 2 Slots	Off	14	Rear	190	836.6	32.0	32.0	0.648	0.648	
			14	Edge 1	190	836.6	32.0	32.0	0.609	0.609	
			0	Edge 2	190	836.6	32.0	32.0	0.255	0.255	
			0	Edge 4	190	836.6	32.0	32.0	0.413	0.413	

Note(s):

All GSM 850 SAR data- used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715. Both models share identical antennas and output power. Spot checks were performed on model SM-T715Y to ensure SAR values were the same between both models.

10.2. GSM1900

RF Exposure Conditions	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	
Head	Voice	On	0	Left Touch	661	1880.0	24.5	24.4	0.185	0.189	
				Left Tilt	661	1880.0	24.5	24.4	0.213	0.218	
				Right Touch	661	1880.0	24.5	24.4	0.309	0.316	
				Right Tilt	661	1880.0	24.5	24.4	0.333	0.341	
Head VoIP	GPRS 3 Slots	On	0	Left Touch	661	1880.0	21.5	21.4	0.257	0.263	
				Left Tilt	661	1880.0	21.5	21.4	0.282	0.289	
				Right Touch	661	1880.0	21.5	21.4	0.421	0.431	
				Right Tilt	661	1880.0	21.5	21.4	0.433	0.443	3
Body	GPRS 3 Slots	On	0	Rear	661	1880.0	21.5	21.4	0.532	0.544	
				Edge 1	661	1880.0	21.5	21.4	0.681	0.697	
	GPRS 3 Slots	Off	14	Rear	661	1880.0	27.5	27.1	0.259	0.284	
			14	Edge 1	661	1880.0	27.5	27.1	0.443	0.486	
			0	Edge 2	661	1880.0	27.5	27.1	0.111	0.122	
			0	Edge 4	661	1880.0	27.5	27.1	0.661	0.725	4

Note(s):

All GSM 1900 SAR data- used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715. Both models share identical antennas and output power. Spot checks were performed on model SM-T715Y to ensure SAR values were the same between both models.

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10.3. W-CDMA Band V

RF Exposure Conditions	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	
Head	Rel 99 RMC	On	0	Left Touch	4183	836.6	17.5	17.1	0.317	0.348	
				Left Tilt	4183	836.6	17.5	17.1	0.295	0.323	
				Right Touch	4183	836.6	17.5	17.1	0.372	0.408	5
				Right Tilt	4183	836.6	17.5	17.1	0.342	0.375	
Body	Rel 99 RMC	On	0	Rear	4183	836.6	17.5	17.1	0.530	0.581	
				Edge 1	4132	826.4	17.5	17.2	0.882	0.945	6
					4183	836.6	17.5	17.1	0.831	0.911	
					4233	846.6	17.5	17.0	0.826	0.927	
		Off	14	Rear	4183	836.6	23.5	22.8	0.351	0.412	
			14	Edge 1	4183	836.6	23.5	22.8	0.277	0.325	
			0	Edge 2	4183	836.6	23.5	22.8	0.121	0.142	
			0	Edge 4	4183	836.6	23.5	22.8	0.225	0.264	

Note(s):

All WCDMA Band V SAR data- used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715. Both models share identical antennas and output power. Spot checks were performed on model SM-T715Y to ensure SAR values were the same between both models.

10.4. W-CDMA Band IV

RF Exposure Conditions	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	
Head	Rel 99 RMC	On	0	Left Touch	1413	1732.6	15.5	15.4	0.291	0.298	
				Left Tilt	1413	1732.6	15.5	15.4	0.359	0.367	
				Right Touch	1413	1732.6	15.5	15.4	0.395	0.404	
				Right Tilt	1413	1732.6	15.5	15.4	0.439	0.449	7
Body	Rel 99 RMC	On	0	Rear	1413	1732.6	15.5	15.4	0.482	0.493	
				Edge 1	1413	1732.6	15.5	15.4	0.593	0.607	
		Off	14	Rear	1413	1732.6	23.5	23.5	0.410	0.410	
			14	Edge 1	1413	1732.6	23.5	23.5	0.664	0.664	
			0	Edge 2	1413	1732.6	23.5	23.5	0.183	0.183	
			0	Edge 4	1413	1732.6	23.5	23.5	0.713	0.713	8

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10.5. W-CDMA Band II

RF Exposure Conditions	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	
Head	Rel 99 RMC	On	0	Left Touch	9400	1880.0	17.5	17.4	0.354	0.362	
				Left Tilt	9400	1880.0	17.5	17.4	0.404	0.413	
				Right Touch	9400	1880.0	17.5	17.4	0.545	0.558	
				Right Tilt	9400	1880.0	17.5	17.4	0.622	0.636	9
Body	Rel 99 RMC	On	0	Rear	9400	1880.0	17.5	17.4	0.594	0.608	
				Edge 1	9400	1880.0	17.5	17.4	0.780	0.798	
		Off	14	Rear	9400	1880.0	23.5	22.8	0.279	0.328	
			14	Edge 1	9400	1880.0	23.5	22.8	0.421	0.495	
			0	Edge 2	9400	1880.0	23.5	22.8	0.166	0.195	
			0	Edge 4	9262	1852.4	23.5	22.6	0.766	0.942	
					9400	1880.0	23.5	22.8	0.850	0.999	
					9538	1907.6	23.5	23.1	0.985	1.080	10

Note(s):

All WCDMA Band II SAR data- used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715. Both models share identical antennas and output power. Spot checks were performed on model SM-T715Y to ensure SAR values were the same between both models.

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10.6. LTE Band 2 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Pwr Back Off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	On	0	Left Touch	18900	1880.0	1	99	16.5	15.9	0.201	0.230	
							50	50	16.5	15.6	0.200	0.244	
				Left Tilt	18900	1880.0	1	99	16.5	15.9	0.260	0.297	
							50	50	16.5	15.6	0.260	0.318	
				Right Touch	18900	1880.0	1	99	16.5	15.9	0.414	0.473	
							50	50	16.5	15.6	0.413	0.505	
				Right Tilt	18900	1880.0	1	99	16.5	15.9	0.452	0.517	
							50	50	16.5	15.6	0.454	0.555	11
Body	QPSK	On	0	Rear	18900	1880.0	1	99	16.5	15.9	0.512	0.585	
							50	50	16.5	15.6	0.516	0.630	
				Edge 1	18900	1880.0	1	99	16.5	15.9	0.641	0.733	
							50	50	16.5	15.6	0.654	0.799	12
		Off	14	Rear	18900	1880.0	1	99	23.5	23.3	0.311	0.325	
							50	0	22.5	22.9	0.238	0.215	
			14	Edge 1	18900	1880.0	1	99	23.5	23.3	0.518	0.541	
							50	0	22.5	22.9	0.390	0.352	
			0	Edge 2	18900	1880.0	1	99	23.5	23.3	0.127	0.133	
							50	0	22.5	22.9	0.097	0.087	
			0	Edge 4	18900	1880.0	1	99	23.5	23.3	0.640	0.669	
							50	0	22.5	22.9	0.473	0.427	

Note(s):

All LTE Band 2 SAR data- used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715. Both models share identical antennas and output power. Spot checks were performed on model SM-T715Y to ensure SAR values were the same between both models.

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10.7. LTE Band 4 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Pwr Back Off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	On	0	Left Touch	20175	1732.5	1	99	17.5	17.0	0.352	0.395	
							50	24	17.5	16.8	0.364	0.430	
				Left Tilt	20175	1732.5	1	99	17.5	17.0	0.424	0.476	
							50	24	17.5	16.8	0.423	0.499	
				Right Touch	20175	1732.5	1	99	17.5	17.0	0.508	0.570	
							50	24	17.5	16.8	0.517	0.610	
				Right Tilt	20175	1732.5	1	99	17.5	17.0	0.571	0.641	
							50	24	17.5	16.8	0.580	0.685	13
Body	QPSK	On	0	Rear	20175	1732.5	1	99	17.5	17.0	0.621	0.697	
							50	24	17.5	16.8	0.628	0.741	
				Edge 1	20050	1720.0	1	99	17.5	17.0	0.781	0.876	
							50	24	17.5	16.8	0.786	0.928	
							100	0	17.5	16.7	0.791	0.951	
					20175	1732.5	1	99	17.5	17.0	0.829	0.930	
							50	24	17.5	16.8	0.806	0.951	
							100	0	17.5	16.7	0.806	0.969	14
					20300	1745.0	1	99	17.5	17.0	0.840	0.942	
							50	24	17.5	16.8	0.820	0.968	
							100	0	17.5	16.7	0.800	0.962	
		Off	14	Rear	20175	1732.5	1	49	23.5	23.1	0.440	0.486	
							50	50	22.5	21.8	0.326	0.387	
			14	Edge 1	20175	1732.5	1	49	23.5	23.1	0.656	0.724	
							50	50	22.5	21.8	0.500	0.594	
			0	Edge 2	20175	1732.5	1	49	23.5	23.1	0.155	0.171	
							50	50	22.5	21.8	0.117	0.139	
			0	Edge 4	20050	1720.0	1	49	23.5	23.1	0.836	0.945	
					20175	1732.5	1	49	23.5	21.8	0.811	0.895	
							50	50	22.5	23.1	0.619	0.736	
					20300	1745.0	1	49	23.5	23.1	0.785	0.905	

Note(s):

All LTE Band 4 SAR data- used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715. Both models share identical antennas and output power. Spot checks were performed on model SM-T715Y to ensure SAR values were the same between both models.

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10.8. LTE Band 5 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Pwr Back Off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	On	0	Left Touch	20525	836.6	1	25	17.5	16.9	0.314	0.362	
							25	12	17.5	16.7	0.306	0.369	
				Left Tilt	20525	836.6	1	25	17.5	16.9	0.303	0.349	
							25	12	17.5	16.7	0.295	0.355	
				Right Touch	20525	836.6	1	25	17.5	16.9	0.366	0.422	15
							25	12	17.5	16.7	0.350	0.422	
				Right Tilt	20525	836.6	1	25	17.5	16.9	0.330	0.381	
							25	12	17.5	16.7	0.328	0.395	
Body	QPSK	On	0	Rear	20525	836.6	1	25	17.5	16.9	0.493	0.569	
							25	12	17.5	16.7	0.485	0.584	
				Edge 1	20450	829.0	1	25	17.5	16.9	0.734	0.847	
							25	12	17.5	16.7	0.724	0.862	
							50	0	17.5	16.7	0.737	0.880	16
					20525	836.6	1	25	17.5	16.9	0.720	0.830	
							25	12	17.5	16.7	0.721	0.859	
							50	0	17.5	16.7	0.711	0.849	
					20600	844.0	1	25	17.5	16.9	0.701	0.809	
							25	12	17.5	16.7	0.696	0.829	
							50	0	17.5	16.7	0.692	0.826	
		Off	14	Rear	20525	836.6	1	25	23.5	23.3	0.464	0.490	
							25	25	22.5	21.9	0.350	0.399	
			14	Edge 1	20525	836.6	1	25	23.5	23.3	0.365	0.386	
							25	25	22.5	21.9	0.281	0.320	
			0	Edge 2	20525	836.6	1	25	23.5	23.3	0.183	0.193	
							25	25	22.5	21.9	0.114	0.130	
			0	Edge 4	20525	836.6	1	25	23.5	23.3	0.275	0.291	
							25	25	22.5	21.9	0.195	0.222	

Note(s):

All LTE Band 5 SAR data- used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715. Both models share identical antennas and output power. Spot checks were performed on model SM-T715Y to ensure SAR values were the same between both models.

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10.9. LTE Band 17 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Pwr Back Off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	On	0	Left Touch	23790	710.0	1	0	15.5	15.0	0.088	0.099	
							25	0	14.5	14.0	0.066	0.074	
				Left Tilt	23790	710.0	1	0	15.5	15.0	0.078	0.087	
							25	0	14.5	14.0	0.059	0.066	
				Right Touch	23790	710.0	1	0	15.5	15.0	0.094	0.105	17
							25	0	14.5	14.0	0.072	0.081	
				Right Tilt	23790	710.0	1	0	15.5	15.0	0.082	0.092	
							25	0	14.5	14.0	0.062	0.069	
Body	QPSK	On	0	Rear	23790	710.0	1	0	15.5	15.0	0.164	0.184	
							25	0	14.5	14.0	0.121	0.136	
				Edge 1	23790	710.0	1	0	15.5	15.0	0.345	0.387	18
							25	0	14.5	14.0	0.265	0.298	
		Off	14	Rear	23790	710.0	1	0	23.5	23.1	0.119	0.130	
							25	12	22.5	21.8	0.094	0.111	
			14	Edge 1	23790	710.0	1	0	23.5	23.1	0.097	0.106	
							25	12	22.5	21.8	0.073	0.085	
			0	Edge 2	23790	710.0	1	0	23.5	23.1	0.069	0.076	
							25	12	22.5	21.8	0.051	0.060	
			0	Edge 4	23790	710.0	1	0	23.5	23.1	0.056	0.062	
							25	12	22.5	21.8	0.042	0.049	

10.10. Wi-Fi (DTS Band)

Frequency Band	Mode	Antenna	RF Exposure Conditions	Pwr Back-off	Dist. (mm)	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	
2.4GHz	802.11b	SISO Main	Head	Off	10	Flat	6	2437.0	0.340	16.5	16.5	0.272	0.272	19
			Body	Off	9	Rear	6	2437.0	0.434	16.5	16.5	0.346	0.346	
					0	Edge 3	6	2437.0	0.207	16.5	16.5			
				On	0	Rear	6	2437.0	0.823	11.5	11.5	0.746	0.746	20
		SISO Sub	Head	Off	10	Flat	6	2437.0	0.037	16.5	16.5	0.031	0.031	
			Body	Off	9	Rear	6	2437.0	0.055	16.5	16.5	0.052	0.052	
					0	Edge 3	6	2437.0	0.028	16.5	16.5			
					0	Edge 4	6	2437.0	0.038	16.5	16.5			
				On	0	Rear	6	2437.0	0.175	11.5	11.5	0.185	0.185	
	802.11n	MIMO Main	Head	Off	10	Flat	6	2437.0	0.082	13.5	13.5	0.070	0.070	
			Body	Off	9	Rear	6	2437.0	0.112	13.5	13.5	0.096	0.096	
					0	Edge 3	6	2437.0	0.093	13.5	13.5			
				On	0	Rear	11	2462.0	0.658	11.5	11.3	0.514	0.538	
		MIMO Sub	Head	Off	10	Flat	6	2437.0	0.082	13.5	13.3	0.037	0.038	
			Body	Off	9	Rear	6	2437.0	0.115	13.5	13.3	0.028	0.029	
					0	Edge 4	6	2437.0	0.028	13.5	13.3			
				On	0	Rear	11	2462.0	0.658	11.5	11.0	0.175	0.196	

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 Head 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. All Wi-Fi (DTS Band) SAR data- used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715. Both models share identical antennas and output power. Spot checks were performed on model SM-T715Y to ensure SAR values were the same between both models

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10.11. Wi-Fi (U-NII Band)

Frequency Band	Mode	Antenna	RF Exposure Conditions	Pwr Back-off	Dist. (mm)	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	SISO Main	Head	Off	10	Flat	60	5300.0	0.125	12.5	12.4	0.095	0.097	21
			Body	Off	9	Rear	60	5300.0	0.301	12.5	12.4	0.171	0.175	
					0	Edge 3	60	5300.0	0.228	12.5	12.4			
	802.11ac (VHT80)			On	0	Rear	58	5290.0	1.120	7.5	7.5	0.797	0.797	
	802.11a	SISO Sub	Head	Off	10	Flat	60	5300.0	<0.001	12.5	12.4	<0.001	<0.001	
			Body	Off	9	Rear	60	5300.0	0.007	12.5	12.4	0.001	0.001	
					0	Edge 4	60	5300.0	0.009	12.5	12.4			
	802.11ac (VHT80)			On	0	Rear	58	5290.0	0.083	7.5	7.5	0.037	0.037	
	802.11n	MIMO Main	Head	Off	10	Flat	52	5260.0	0.127	12.5	12.3	0.071	0.075	
			Body	Off	9	Rear	52	5260.0	0.210	12.5	12.3	0.154	0.161	
					0	Edge 3	52	5260.0	0.270	12.5	12.3			
	802.11ac (VHT80)			On	0	Rear	58	5290.0	1.010	7.5	7.0	0.935	1.049	22
	802.11n	MIMO Sub	Head	Off	10	Flat	52	5260.0	0.127	12.5	12.3	<0.001	<0.001	
			Body	Off	9	Rear	52	5260.0	0.210	12.5	12.3	0.034	0.035	
					0	Edge 4	52	5260.0	0.060	12.5	12.3			
	802.11ac (VHT80)			On	0	Rear	58	5290.0	1.010	7.5	5.6	0.068	0.106	
Frequency Band	Mode	Antenna	RF Exposure Conditions	Pwr Back-off	Dist. (mm)	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	SISO Main	Head	Off	10	Flat	116	5580.0	0.127	12.5	12.5	0.097	0.097	23
			Body	Off	9	Rear	116	5580.0	0.415	12.5	12.5	0.274	0.274	
					0	Edge 3	116	5580.0	0.196	12.5	12.5			
	802.11ac (VHT80)			On	0	Rear	106	5530.0	1.100	7.5	7.5	0.735	0.735	
	802.11a	SISO Sub	Head	Off	10	Flat	116	5580.0	<0.001	12.5	12.5	<0.001	<0.001	
			Body	Off	9	Rear	116	5580.0	0.041	12.5	12.5	0.031	0.031	
					0	Edge 4	116	5580.0	0.014	12.5	12.5			
	802.11ac (VHT80)			On	0	Rear	106	5530.0	0.146	7.5	7.5	0.073	0.073	
	802.11n	MIMO Main	Head	Off	10	Flat	100	5500.0	0.052	12.5	12.5	0.034	0.034	
			Body	Off	9	Rear	100	5500.0	0.490	12.5	12.5	0.305	0.305	
					0	Edge 3	100	5500.0	0.180	12.5	12.5			
	802.11ac (VHT80)			On	0	Rear	106	5530.0	1.624	7.5	7.3	0.963	1.008	24
	802.11n	MIMO Sub	Head	Off	10	Flat	100	5500.0	0.052	12.5	12.4	0.022	0.023	
			Body	Off	9	Rear	100	5500.0	0.490	12.5	12.4	0.033	0.034	
					0	Edge 4	100	5500.0	0.130	12.5	12.4			
	802.11ac (VHT80)			On	0	Rear	106	5530.0	1.624	7.5	6.5	0.057	0.072	

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Frequency Band	Mode	Antenna	RF Exposure Conditions	Pwr Back-off	Dist. (mm)	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	SISO Main	Head	Off	10	Flat	157	5785.0	0.065	12.5	12.5	0.034	0.034	
			Body	Off	9	Rear	157	5785.0	0.390	12.5	12.5	0.221	0.221	
					0	Edge 3	157	5785.0	0.209	12.5	12.5			
	802.11ac (VHT80)			On	0	Rear	155	5775.0	0.762	7.5	7.3	0.730	0.764	25
	802.11a	SISO Sub	Head	Off	10	Flat	157	5785.0	<0.001	12.5	12.5	<0.001	<0.001	
			Body	Off	9	Rear	157	5785.0	0.010	12.5	12.5	<0.001	<0.001	
					0	Edge 4	157	5785.0	0.012	12.5	12.5			
	802.11ac (VHT80)			On	0	Rear	155	5775.0	0.033	7.5	7.5	0.020	0.020	
	802.11n	MIMO Main	Head	Off	10	Flat	165	5825.0	0.057	12.5	12.2	0.048	0.051	26
			Body	Off	9	Rear	165	5825.0	0.260	12.5	12.2	0.154	0.165	
					0	Edge 3	165	5825.0	0.200	12.5	12.2			
	802.11ac (VHT80)			On	0	Rear	155	5775.0	0.925	7.5	7.5	0.592	0.592	
	802.11n	MIMO Sub	Head	Off	10	Flat	165	5825.0	0.057	12.5	12.3	0.022	0.023	
			Body	Off	9	Rear	165	5825.0	0.260	12.5	12.3	0.015	0.016	
					0	Edge 4	165	5825.0	0.030	12.5	12.3			
	802.11ac (VHT80)			On	0	Rear	155	5775.0	0.925	7.5	6.7	0.054	0.065	

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 Head 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. All Wi-Fi (U-NII Band) SAR data- used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715. Both models share identical antennas and output power. Spot checks were performed on model SM-T715Y to ensure SAR values were the same between both models

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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	9.7	9.7	0.234	0.234	25

Note(s):

All Bluetooth SAR data- used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715. Both models share identical antennas and output power. Spot checks were performed on model SM-T715Y to ensure SAR values were the same between both models.

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11. SAR Measurement Variability

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

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

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
700	LTE Band 17	Standalone	Edge 1	No	0.345	N/A	N/A
850	GSM 850	Standalone	Edge 1	No	0.755	N/A	N/A
	WCDMA Band V	Standalone	Edge 1	Yes	0.882	0.865	1.02
	LTE Band 5	Standalone	Edge 1	No	0.737	N/A	N/A
1900	GSM 1900	Standalone	Edge 1	No	0.681	N/A	N/A
	WCDMA Band II	Standalone	Edge 4	Yes	0.985	0.984	1.00
	LTE Band 2	Standalone	Edge 1	No	0.654	N/A	N/A
1700	LTE Band 4	Standalone	Edge 1	Yes	0.84	0.801	1.05
	WCDMA Band IV	Standalone	Edge 4	No	0.713	N/A	N/A
2400	Wi-Fi 802.11b/g/n	Standalone	Rear	No	0.746	N/A	N/A
	Bluetooth	Standalone	Rear	No	0.234	N/A	N/A
5300	Wi-Fi 802.11a/n/ac	Standalone	Rear	Yes	0.935	0.873	1.07
5500	Wi-Fi 802.11a/n/ac	Standalone	Rear	Yes	0.963	0.914	1.05
5800	Wi-Fi 802.11a/n/ac	Standalone	Rear	No	0.73	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.

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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:

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

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	GSM(GPRS/EDGE)	+	DTS	+	BT
	5	GSM(GPRS/EDGE)	+	U-NII	+	BT
	6	W-CDMA	+	DTS		
	7	W-CDMA	+	U-NII		
	8	W-CDMA	+	BT		
	9	W-CDMA	+	DTS	+	BT
	10	W-CDMA	+	U-NII	+	BT
	11	LTE	+	DTS		
	12	LTE	+	U-NII		
	13	LTE	+	BT		
	14	LTE	+	DTS	+	BT
	15	LTE	+	U-NII	+	BT

Notes:

1. DTS support Hotspot and Wi-Fi Direct
2. Only U-NII support Wi-Fi Direct
3. GPRS/EDGE, W-CDMA and LTE support Hotspot.
4. VoIP is supported in GPRS/EDGE, W-CDMA and LTE.
5. DTS Radio can transmit simultaneously w ith Bluetooth Radio.
6. U-NII Radio can transmit simultaneously w ith Bluetooth Radio.

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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	32.00	396	0	0	37	194.2	34		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	GPRS 3 Slots	1909.8	27.50	211	0	0	37	194.2	34		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	W-CDMA 5	846.6	23.50	224	0	0	37	194.2	34		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	W-CDMA 2	1907.6	23.50	224	0	0	37	194.2	34		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	W-CDMA 4	1752.6	23.50	224	0	0	37	194.2	34		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 2	1900	23.50	224	0	0	37	194.2	34		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 4	1754.3	23.50	224	0	0	37	194.2	34		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 5	844	23.50	224	0	0	37	194.2	34		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 17	710	23.50	224	0	0	37	194.2	34		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 4 Slots	848.8	24.00	126	0	0	37	194.2	34		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	GPRS 4 Slots	1909.8	21.50	71	0	0	37	194.2	34		-MEASURE-	-MEASURE-	0.354	0.400	0.385	
Cellular	W-CDMA 5	846.6	17.50	56	0	0	37	194.2	34		-MEASURE-	-MEASURE-	0.186	0.400	0.202	
Cellular	W-CDMA 4	1752.6	15.50	35	0	0	37	194.2	34		-MEASURE-	-MEASURE-	0.167	0.400	0.182	
Cellular	W-CDMA 2	1907.6	17.50	56	0	0	37	194.2	34		-MEASURE-	-MEASURE-	0.279	0.400	0.303	
Cellular	LTE Band 2	1900	16.50	45	0	0	37	194.2	34		-MEASURE-	-MEASURE-	0.224	0.400	0.243	
Cellular	LTE Band 4	1754.3	17.50	56	0	0	37	194.2	34		-MEASURE-	-MEASURE-	0.267	0.400	0.291	
Cellular	LTE Band 5	844	17.50	56	0	0	37	194.2	34		-MEASURE-	-MEASURE-	0.185	0.400	0.202	
Cellular	LTE Band 17	710	17.50	56	0	0	37	194.2	34		-MEASURE-	-MEASURE-	0.170	0.400	0.185	

Estimated SAR for WLAN

SISO (Main)

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															
Wi-Fi 2.4 GHz	2462	16.50	45	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.314	-MEASURE-	0.400	
Wi-Fi 5.2 GHz	5240	12.50	18	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.183	-MEASURE-	0.400	
Wi-Fi 5.3 GHz	5320	12.50	18	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.185	-MEASURE-	0.400	
Wi-Fi 5.5 GHz	5700	12.50	18	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.191	-MEASURE-	0.400	
Wi-Fi 5.8 GHz	5825	12.50	18	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.193	-MEASURE-	0.400	
Bluetooth	2480	9.70	9	0.3	180.2	30	9	91.5		0.378	0.400	0.063	0.210	0.400	
Power Back-off, Proximity Sensor On															
Wi-Fi 2.4 GHz	2462	11.50	14	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.098	0.325	0.400	
Wi-Fi 5.2 GHz	5240	7.50	6	0.3	180.2	30	9	91.5		0.366	0.400	0.061	0.203	0.400	
Wi-Fi 5.3 GHz	5320	7.50	6	0.3	180.2	30	9	91.5		0.369	0.400	0.062	0.205	0.400	
Wi-Fi 5.5 GHz	5700	7.50	6	0.3	180.2	30	9	91.5		0.382	0.400	0.064	0.212	0.400	
Wi-Fi 5.8 GHz	5825	7.50	6	0.3	180.2	30	9	91.5		0.386	0.400	0.064	0.215	0.400	

SISO (Sub)

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															
Wi-Fi 2.4 GHz	2462	16.50	45	0.3	149	84	17	11		-MEASURE-	0.400	0.400	-MEASURE-	-MEASURE-	
Wi-Fi 5.2 GHz	5240	12.50	18	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.323	-MEASURE-	
Wi-Fi 5.3 GHz	5320	12.50	18	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.326	-MEASURE-	
Wi-Fi 5.5 GHz	5700	12.50	18	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.337	-MEASURE-	
Wi-Fi 5.8 GHz	5825	12.50	18	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.341	-MEASURE-	
Power Back-off, Proximity Sensor On															
Wi-Fi 2.4 GHz	2462	11.50	14	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.172	0.266	
Wi-Fi 5.2 GHz	5240	7.50	6	0.3	149	84	17	11		0.366	0.400	0.400	0.108	0.166	
Wi-Fi 5.3 GHz	5320	7.50	6	0.3	149	84	17	11		0.369	0.400	0.400	0.109	0.168	
Wi-Fi 5.5 GHz	5700	7.50	6	0.3	149	84	17	11		0.382	0.400	0.400	0.112	0.174	
Wi-Fi 5.8 GHz	5825	7.50	6	0.3	149	84	17	11		0.386	0.400	0.400	0.114	0.176	

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MIMO (Main)

Tx Interface	Frequency (MHz)	Output Power dBm	Output Power mW	Separation Distances (mm) Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Estimated 1-g SAR Value (W/kg) Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off															
Wi-Fi 2.4 GHz	2462	13.50	22	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.153	-MEASURE-	0.400	
Wi-Fi 5.2 GHz	5240	12.50	18	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.183	-MEASURE-	0.400	
Wi-Fi 5.3 GHz	5320	12.50	18	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.185	-MEASURE-	0.400	
Wi-Fi 5.5 GHz	5700	12.50	18	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.191	-MEASURE-	0.400	
Wi-Fi 5.8 GHz	5825	12.50	18	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.193	-MEASURE-	0.400	
Power Back-off, Proximity Sensor On															
Wi-Fi 2.4 GHz	2462	11.50	14	0.3	180.2	30	9	91.5		-MEASURE-	0.400	0.098	0.325	0.400	
Wi-Fi 5.2 GHz	5240	7.50	6	0.3	180.2	30	9	91.5		0.366	0.400	0.061	0.203	0.400	
Wi-Fi 5.3 GHz	5320	7.50	6	0.3	180.2	30	9	91.5		0.369	0.400	0.062	0.205	0.400	
Wi-Fi 5.5 GHz	5700	7.50	6	0.3	180.2	30	9	91.5		0.382	0.400	0.064	0.212	0.400	
Wi-Fi 5.8 GHz	5825	7.50	6	0.3	180.2	30	9	91.5		0.386	0.400	0.064	0.215	0.400	

MIMO (Sub)

Tx Interface	Frequency (MHz)	Output Power dBm	Output Power mW	Separation Distances (mm) Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Estimated 1-g SAR Value (W/kg) Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off															
Wi-Fi 2.4 GHz	2462	13.50	22	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.271	-MEASURE-	
Wi-Fi 5.2 GHz	5240	12.50	18	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.323	-MEASURE-	
Wi-Fi 5.3 GHz	5320	12.50	18	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.326	-MEASURE-	
Wi-Fi 5.5 GHz	5700	12.50	18	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.337	-MEASURE-	
Wi-Fi 5.8 GHz	5825	12.50	18	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.341	-MEASURE-	
Power Back-off, Proximity Sensor On															
Wi-Fi 2.4 GHz	2462	11.50	14	0.3	149	84	17	11		-MEASURE-	0.400	0.400	0.172	0.266	
Wi-Fi 5.2 GHz	5240	7.50	6	0.3	149	84	17	11		0.366	0.400	0.400	0.108	0.166	
Wi-Fi 5.3 GHz	5320	7.50	6	0.3	149	84	17	11		0.369	0.400	0.400	0.109	0.168	
Wi-Fi 5.5 GHz	5700	7.50	6	0.3	149	84	17	11		0.382	0.400	0.400	0.112	0.174	
Wi-Fi 5.8 GHz	5825	7.50	6	0.3	149	84	17	11		0.386	0.400	0.400	0.114	0.176	

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

RF Exposure conditions	Test Position	① WWAN	② DTS (Main Ant)	③ U-NII (Main Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.420	0.272	0.097		0.692	No	0.517	No		
	Left Tilt	0.409	0.272	0.097		0.681	No	0.506	No		
	Right Touch	0.459	0.272	0.097		0.731	No	0.556	No		
	Right Tilt	0.422	0.272	0.097		0.694	No	0.519	No		
Body	Rear	0.691	0.746	0.797	0.234	1.437	No	1.488	No	0.925	No

RF Exposure conditions	Test Position	① WWAN	② DTS (Sub Ant)	③ U-NII (Sub Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ② + ④ WWAN + DTS + BT		① + ③ + ④ WWAN + U-NII + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.420	0.031	0.001		0.451	No	0.421	No				
	Left Tilt	0.409	0.031	0.001		0.440	No	0.410	No				
	Right Touch	0.459	0.031	0.001		0.490	No	0.460	No				
	Right Tilt	0.422	0.031	0.001		0.453	No	0.423	No				
Body	Rear	0.691	0.185	0.073	0.234	0.876	No	0.764	No	1.110	No	0.998	No

RF Exposure conditions	Test Position	① WWAN	② U-NII (Main + Sub Ant)	① + ② WWAN + U-NII (Main + Sub Ant)	
				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Body	Rear	0.691	1.049	1.740	Yes

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination		∑ 1-g SAR (mW/g)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII (Main + Sub Ant)						
Rear	0.691	1.049	① + ②	1.740	181.5	0.013	No	1

Note(s):

All GSM 850, Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715

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

RF Exposure conditions	Test Position	① WWAN	② DTS (Main Ant)	③ U-NII (Main Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.263	0.272	0.097		0.535	No	0.360	No		
	Left Tilt	0.289	0.272	0.097		0.561	No	0.386	No		
	Right Touch	0.431	0.272	0.097		0.703	No	0.528	No		
	Right Tilt	0.443	0.272	0.097		0.715	No	0.540	No		
Body	Rear	0.544	0.746	0.797	0.234	1.290	No	1.341	No	0.778	No

RF Exposure conditions	Test Position	① WWAN	② DTS (Sub Ant)	③ U-NII (Sub Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ② + ④ WWAN + DTS + BT		① + ③ + ④ WWAN + U-NII + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.263	0.031	0.001		0.294	No	0.264	No				
	Left Tilt	0.289	0.031	0.001		0.320	No	0.290	No				
	Right Touch	0.431	0.031	0.001		0.462	No	0.432	No				
	Right Tilt	0.443	0.031	0.001		0.474	No	0.444	No				
Body	Rear	0.544	0.185	0.073	0.234	0.729	No	0.617	No	0.963	No	0.851	No

RF Exposure conditions	Test Position	① WWAN	② U-NII (Main + Sub Ant)	① + ② WWAN + U-NII (Main + Sub Ant)	
				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Body	Rear	0.544	1.049	1.593	No

Note(s):

All GSM 1900, Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715

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

RF Exposure conditions	Test Position	① WWAN	② DTS (Main Ant)	③ U-NII (Main Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.348	0.272	0.097		0.620	No	0.445	No		
	Left Tilt	0.323	0.272	0.097		0.595	No	0.420	No		
	Right Touch	0.408	0.272	0.097		0.680	No	0.505	No		
	Right Tilt	0.375	0.272	0.097		0.647	No	0.472	No		
Body	Rear	0.581	0.746	0.797	0.234	1.327	No	1.378	No	0.815	No

RF Exposure conditions	Test Position	① WWAN	② DTS (Sub Ant)	③ U-NII (Sub Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ② + ④ WWAN + DTS + BT		① + ③ + ④ WWAN + U-NII + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.348	0.031	0.001		0.379	No	0.349	No				
	Left Tilt	0.323	0.031	0.001		0.354	No	0.324	No				
	Right Touch	0.408	0.031	0.001		0.439	No	0.409	No				
	Right Tilt	0.375	0.031	0.001		0.406	No	0.376	No				
Body	Rear	0.581	0.185	0.073	0.234	0.766	No	0.654	No	1.000	No	0.888	No

RF Exposure conditions	Test Position	① WWAN	② U-NII (Main + Sub Ant)	① + ② WWAN + U-NII (Main + Sub Ant)	
				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Body	Rear	0.581	1.049	1.630	Yes

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination		∑ 1-g SAR (mW/g)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII (Main + Sub Ant)						
Rear	0.581	1.049	① + ②	1.630	187.5	0.011	No	2

Note(s):

All WCDMA Band V, Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715

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

RF Exposure conditions	Test Position	① WWAN	② DTS (Main Ant)	③ U-NII (Main Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.298	0.272	0.097		0.570	No	0.395	No		
	Left Tilt	0.367	0.272	0.097		0.639	No	0.464	No		
	Right Touch	0.404	0.272	0.097		0.676	No	0.501	No		
	Right Tilt	0.449	0.272	0.097		0.721	No	0.546	No		
Body	Rear	0.493	0.746	0.797	0.234	1.239	No	1.290	No	0.727	No

RF Exposure conditions	Test Position	① WWAN	② DTS (Sub Ant)	③ U-NII (Sub Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ② + ④ WWAN + DTS + BT		① + ③ + ④ WWAN + U-NII + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.298	0.031	0.001		0.329	No	0.299	No				
	Left Tilt	0.367	0.031	0.001		0.398	No	0.368	No				
	Right Touch	0.404	0.031	0.001		0.435	No	0.405	No				
	Right Tilt	0.449	0.031	0.001		0.480	No	0.450	No				
Body	Rear	0.493	0.185	0.073	0.234	0.678	No	0.566	No	0.912	No	0.800	No

RF Exposure conditions	Test Position	① WWAN	② U-NII (Main + Sub Ant)	① + ② WWAN + U-NII (Main + Sub Ant)	
				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Body	Rear	0.493	1.049	1.542	No

Note(s):

Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715

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

RF Exposure conditions	Test Position	① WWAN	② DTS (Main Ant)	③ U-NII (Main Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.362	0.272	0.097		0.634	No	0.459	No		
	Left Tilt	0.413	0.272	0.097		0.685	No	0.510	No		
	Right Touch	0.558	0.272	0.097		0.830	No	0.655	No		
	Right Tilt	0.636	0.272	0.097		0.908	No	0.733	No		
Body	Rear	0.608	0.746	0.797	0.234	1.354	No	1.405	No	0.842	No

RF Exposure conditions	Test Position	① WWAN	② DTS (Sub Ant)	③ U-NII (Sub Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ② + ④ WWAN + DTS + BT		① + ③ + ④ WWAN + U-NII + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.362	0.031	0.001		0.393	No	0.363	No				
	Left Tilt	0.413	0.031	0.001		0.444	No	0.414	No				
	Right Touch	0.558	0.031	0.001		0.589	No	0.559	No				
	Right Tilt	0.636	0.031	0.001		0.667	No	0.637	No				
Body	Rear	0.608	0.185	0.073	0.234	0.793	No	0.681	No	1.027	No	0.915	No

RF Exposure conditions	Test Position	① WWAN	② U-NII (Main + Sub Ant)	① + ② WWAN + U-NII (Main + Sub Ant)	
				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Body	Rear	0.608	1.049	1.657	Yes

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination		∑ 1-g SAR (mW/g)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII (Main + Sub Ant)						
Rear	0.608	1.049	① + ②	1.657	186.2	0.011	No	3

Note(s):

All WCDMA Band II, Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715

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

RF Exposure conditions	Test Position	① WWAN	② DTS (Main Ant)	③ U-NII (Main Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.244	0.272	0.097		0.516	No	0.341	No		
	Left Tilt	0.318	0.272	0.097		0.590	No	0.415	No		
	Right Touch	0.505	0.272	0.097		0.777	No	0.602	No		
	Right Tilt	0.555	0.272	0.097		0.827	No	0.652	No		
Body	Rear	0.630	0.746	0.797	0.234	1.376	No	1.427	No	0.864	No

RF Exposure conditions	Test Position	① WWAN	② DTS (Sub Ant)	③ U-NII (Sub Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ② + ④ WWAN + DTS + BT		① + ③ + ④ WWAN + U-NII + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.244	0.031	0.001		0.275	No	0.245	No				
	Left Tilt	0.318	0.031	0.001		0.349	No	0.319	No				
	Right Touch	0.505	0.031	0.001		0.536	No	0.506	No				
	Right Tilt	0.555	0.031	0.001		0.586	No	0.556	No				
Body	Rear	0.630	0.185	0.073	0.234	0.815	No	0.703	No	1.049	No	0.937	No

RF Exposure conditions	Test Position	① WWAN	② U-NII (Main + Sub Ant)	① + ② WWAN + U-NII (Main + Sub Ant)	
				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Body	Rear	0.630	1.049	1.679	Yes

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination		∑ 1-g SAR (mW/g)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII (Main + Sub Ant)						
Rear	0.630	1.049	① + ②	1.679	186.5	0.012	No	4

Note(s):

All LTE Band 2, Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715

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

RF Exposure conditions	Test Position	① WWAN	② DTS (Main Ant)	③ U-NII (Main Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.430	0.272	0.097		0.702	No	0.527	No		
	Left Tilt	0.499	0.272	0.097		0.771	No	0.596	No		
	Right Touch	0.610	0.272	0.097		0.882	No	0.707	No		
	Right Tilt	0.685	0.272	0.097		0.957	No	0.782	No		
Body	Rear	0.741	0.746	0.797	0.234	1.487	No	1.538	No	0.975	No

RF Exposure conditions	Test Position	① WWAN	② DTS (Sub Ant)	③ U-NII (Sub Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ② + ④ WWAN + DTS + BT		① + ③ + ④ WWAN + U-NII + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.430	0.031	0.001		0.461	No	0.431	No				
	Left Tilt	0.499	0.031	0.001		0.530	No	0.500	No				
	Right Touch	0.610	0.031	0.001		0.641	No	0.611	No				
	Right Tilt	0.685	0.031	0.001		0.716	No	0.686	No				
Body	Rear	0.741	0.185	0.073	0.234	0.926	No	0.814	No	1.160	No	1.048	No

RF Exposure conditions	Test Position	① WWAN	② U-NII (Main + Sub Ant)	① + ② WWAN + U-NII (Main + Sub Ant)	
				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Body	Rear	0.741	1.049	1.790	Yes

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination		∑ 1-g SAR (mW/g)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII (Main + Sub Ant)						
Rear	0.741	1.049	① + ②	1.790	187.2	0.013	No	5

Note(s):

All LTE Band 4, Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715

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

RF Exposure conditions	Test Position	① WWAN	② DTS (Main Ant)	③ U-NII (Main Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.369	0.272	0.097		0.641	No	0.466	No		
	Left Tilt	0.355	0.272	0.097		0.627	No	0.452	No		
	Right Touch	0.422	0.272	0.097		0.694	No	0.519	No		
	Right Tilt	0.395	0.272	0.097		0.667	No	0.492	No		
Body	Rear	0.584	0.746	0.797	0.234	1.330	No	1.381	No	0.818	No

RF Exposure conditions	Test Position	① WWAN	② DTS (Sub Ant)	③ U-NII (Sub Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ② + ④ WWAN + DTS + BT		① + ③ + ④ WWAN + U-NII + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.369	0.031	0.001		0.400	No	0.370	No				
	Left Tilt	0.355	0.031	0.001		0.386	No	0.356	No				
	Right Touch	0.422	0.031	0.001		0.453	No	0.423	No				
	Right Tilt	0.395	0.031	0.001		0.426	No	0.396	No				
Body	Rear	0.584	0.185	0.073	0.234	0.769	No	0.657	No	1.003	No	0.891	No

RF Exposure conditions	Test Position	① WWAN	② U-NII (Main + Sub Ant)	① + ② WWAN + U-NII (Main + Sub Ant)	
				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Body	Rear	0.584	1.049	1.633	Yes

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination		∑ 1-g SAR (mW/g)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② U-NII (Main + Sub Ant)						
Rear	0.584	1.049	① + ②	1.633	185.0	0.011	No	6

Note(s):

All LTE Band 5, Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715

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

RF Exposure conditions	Test Position	① WWAN	② DTS (Main Ant)	③ U-NII (Main Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.099	0.272	0.097		0.371	No	0.196	No		
	Left Tilt	0.087	0.272	0.097		0.359	No	0.184	No		
	Right Touch	0.105	0.272	0.097		0.377	No	0.202	No		
	Right Tilt	0.092	0.272	0.097		0.364	No	0.189	No		
Body	Rear	0.184	0.746	0.797	0.378	0.930	No	0.981	No	0.562	No

RF Exposure conditions	Test Position	① WWAN	② DTS (Sub Ant)	③ U-NII (Sub Ant)	④ BT (Main Ant)	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ② + ④ WWAN + DTS + BT		① + ③ + ④ WWAN + U-NII + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.099	0.031	0.001		0.130	No	0.100	No				
	Left Tilt	0.087	0.031	0.001		0.118	No	0.088	No				
	Right Touch	0.105	0.031	0.001		0.136	No	0.106	No				
	Right Tilt	0.092	0.031	0.001		0.123	No	0.093	No				
Body	Rear	0.184	0.185	0.073	0.378	0.369	No	0.257	No	0.747	No	0.635	No

RF Exposure conditions	Test Position	① WWAN	② U-NII (Main + Sub Ant)	① + ② WWAN + U-NII (Main + Sub Ant)	
				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Body	Rear	0.351	1.049	1.400	No

Note(s):

Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15K20515-S1D, submitted under FCC ID A3LSMT715

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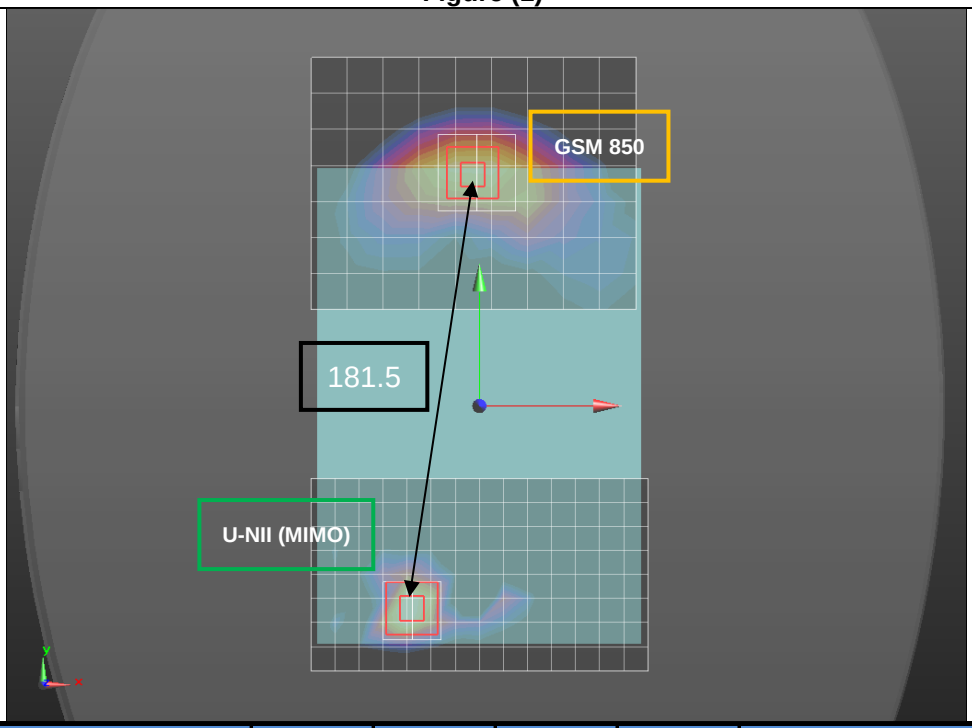
Figure (1)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
GSM 850	①	0.906	-0.003	0.095	-0.005	① + ②	181.5
U-NII (Main+Sub)	②	2.093	-0.029	-0.084	-0.003		

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

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

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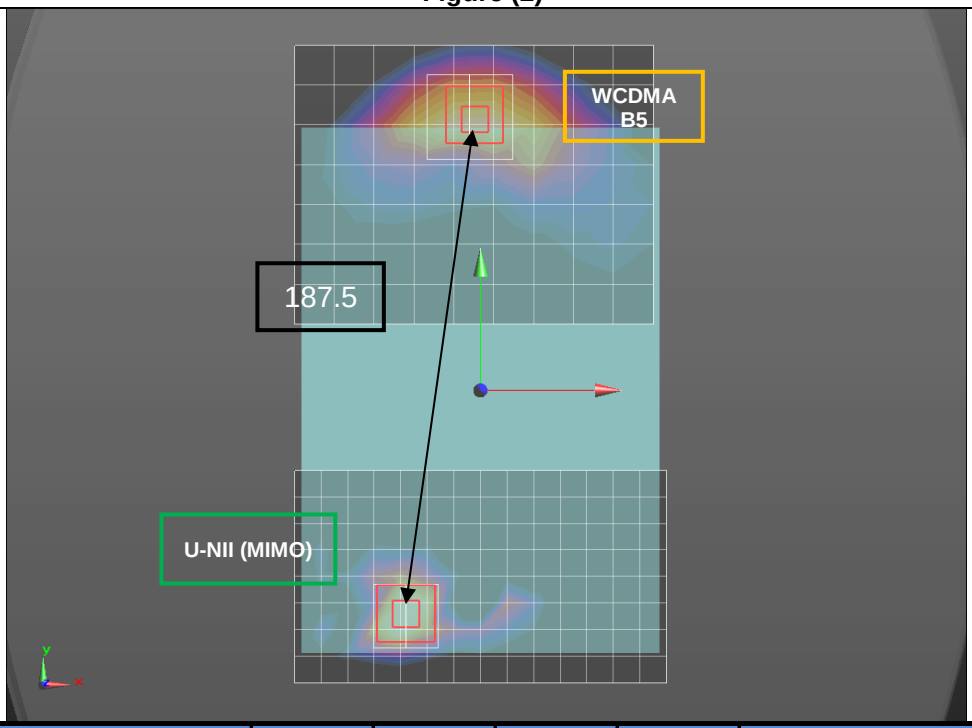
Figure (2)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
WCDMA B5	①	0.719	-0.002	0.101	-0.005	① + ②	187.5
U-NII (Main+Sub)	②	2.093	-0.029	-0.084	-0.003		

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

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

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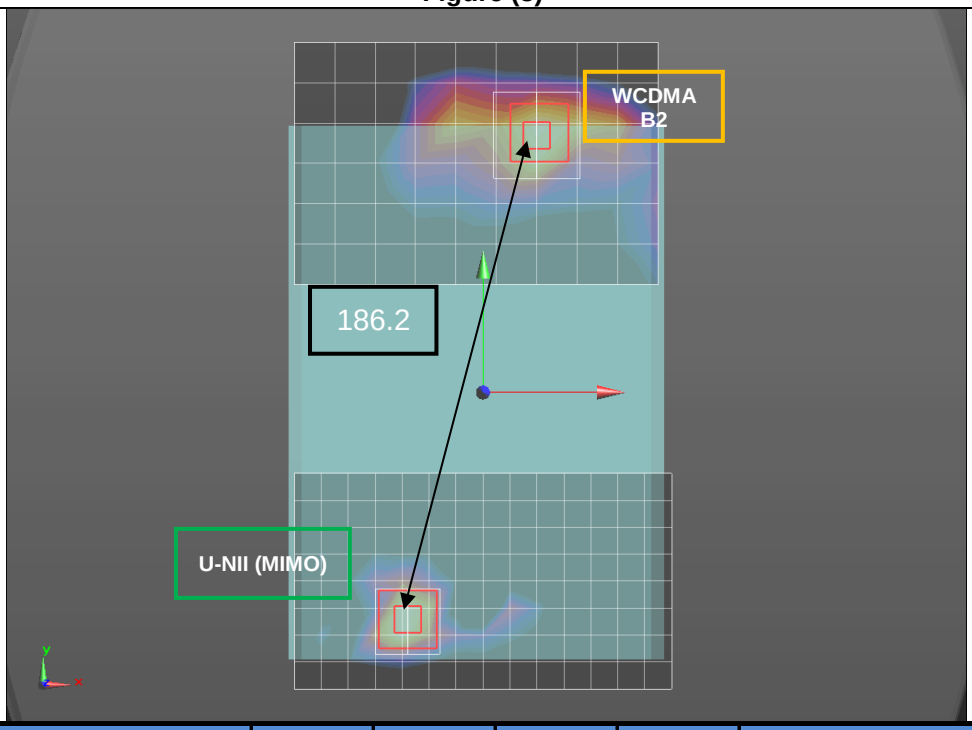
Figure (3)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
WCDMA B2	①	0.969	0.020	0.096	-0.002	① + ②	186.2
U-NII (Main+Sub)	②	2.093	-0.029	-0.084	-0.003		

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

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

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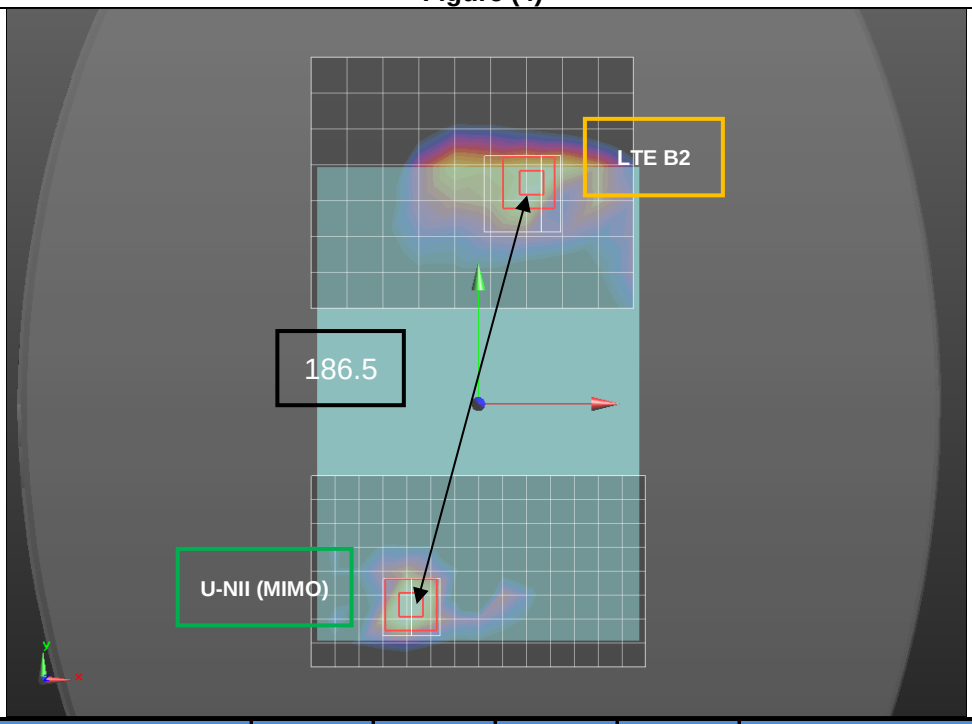
Figure (4)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
LTE B2	①	0.741	0.025	0.094	-0.002	① + ②	186.5
U-NII (Main+Sub)	②	2.093	-0.029	-0.084	-0.003		

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

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

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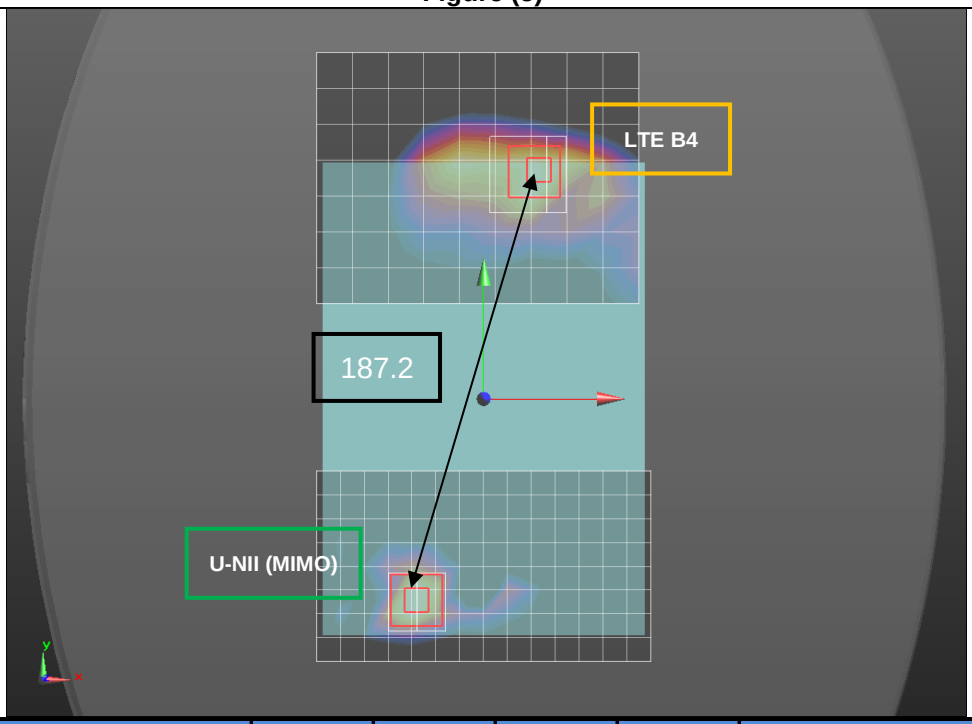
Figure (5)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
LTE B4	①	0.833	0.023	0.096	-0.002	① + ②	187.2
U-NII (Main+Sub)	②	2.093	-0.029	-0.084	-0.003		

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

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

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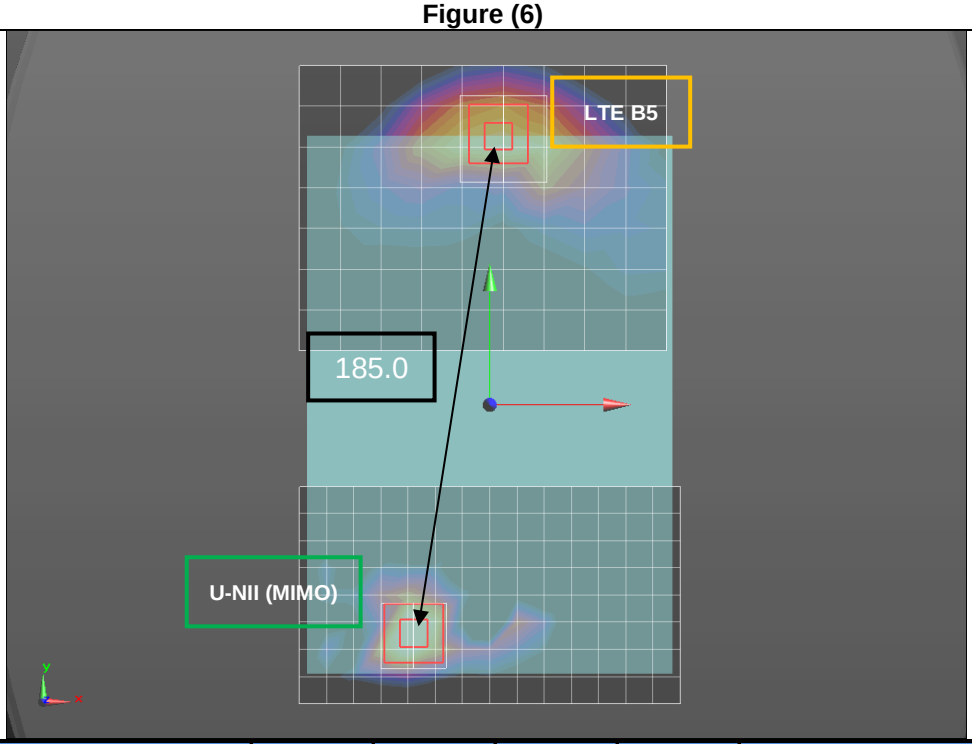
Figure (6)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
LTE B5	①	0.677	0.003	0.098	-0.005	① + ②	185.0
U-NII (Main+Sub)	②	2.093	-0.029	-0.084	-0.003		

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

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because 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.

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Appendixes

Refer to separated files for the following appendixes.

A_15K20726-S1_SAR Photos & Ant. Locations

B_15K20726-S1_SAR Highest Test Plots

C_15K20726-S1_SAR System Check Plots

D_15K20726-S1_SAR Tissue Ingredients

E_15K20726-S1_SAR Probe Cal. Certificates

F_15K20726-S1_SAR Dipole Cal. Certificates

END OF REPORT

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