FCC 47 CFR § 2.1093
IEEE Std 1528-2013

SAR EVALUATION REPORT

FOR

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

MODEL NUMBER: SM-P615

FCC ID: A3LSMP615

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IAS ACCREDITED

Testing Laboratory

TL-637

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1. Attestation of Test Results

Applicant Name	SAMSUNG ELECTRONICS CO.,LTD.			
FCC ID	A3LSMP615			
Model Name	SM-P615			
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
SAR Limits (W/Kg)				
Exposure Category	Peak spatial-average(1g of tissue)			
General population / Uncontrolled exposure	1.6			
The Highest Reported SAR (W/kg)				
RF Exposure Conditions	**Equipment Class**			
	Licensed	**DTS**	**U-NII**	**DSS(BT)**
Standalone	1.04	0.64	0.78	0.20
Simultaneous TX	1.59	1.53	1.59	1.36
Date Tested	1/28/2020 to 3/4/2020			
Test Results	Pass			

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

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

Approved & Released By:	Prepared By:
Justin Park Operations Leader UL Korea, Ltd. Suwon Laboratory	JeongYeon Won Laboratory Technician UL Korea, Ltd. Suwon Laboratory

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1.1. The Highest Reported SAR for RF exposure conditions for each bands

Equipment Class	Band	The Highest Reported SAR (W/kg)
		1g of tissue
		Standalone Exposure condition
PCB	GSM 850	**1.039**
	GSM 1900	**0.983**
	WCDMA Band II	0.892
	WCDMA Band IV	**0.984**
	WCDMA Band V	0.787
	LTE Band 2	0.980
	LTE Band 5	0.922
	LTE Band 12	**0.695**
	LTE Band 66	0.772
DTS	2.4GHz WLAN	**0.637**
UNII	5GHz WLAN	**0.781**
DSS	Bluetooth	**0.195**

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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 v02r02
- 447498 D01 General RF Exposure Guidance v06
- 616217 D04 SAR for laptop and tablets v01r02
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r02
- 941225 D06 Hotspot Mode v02r01
- 971168 D01 Power Meas License Digital System v03r01

In addition to the above, the following information was used:

- TCB workshop October, 2014; Page 36, RF Exposure Procedures Update (Overlapping LTE Bands)
- TCB workshop October, 2016; Page 7, RF Exposure Procedures (Bluetooth Duty Factor)
- TCB workshop May, 2017; Page 6, RF Exposure Procedures (LTE Test Conditions)
- TCB workshop April, 2018; Page 3, RF Exposure Procedures (LTE DL CA SAR Test Exclusion Update)
- TCB workshop April, 2019 Page 19, RF Exposure Procedures (Tissue Simulating Liquids (TSL))

Additional Guidance: KDB inquiry

- Additional SAR test of corner side – KDB guidance to identify that SAR test when sensor and antenna is located near corner side.

3. Facilities and Accreditation

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

Suwon
SAR 1 Room
SAR 3 Room
SAR 4 Room
SAR 5 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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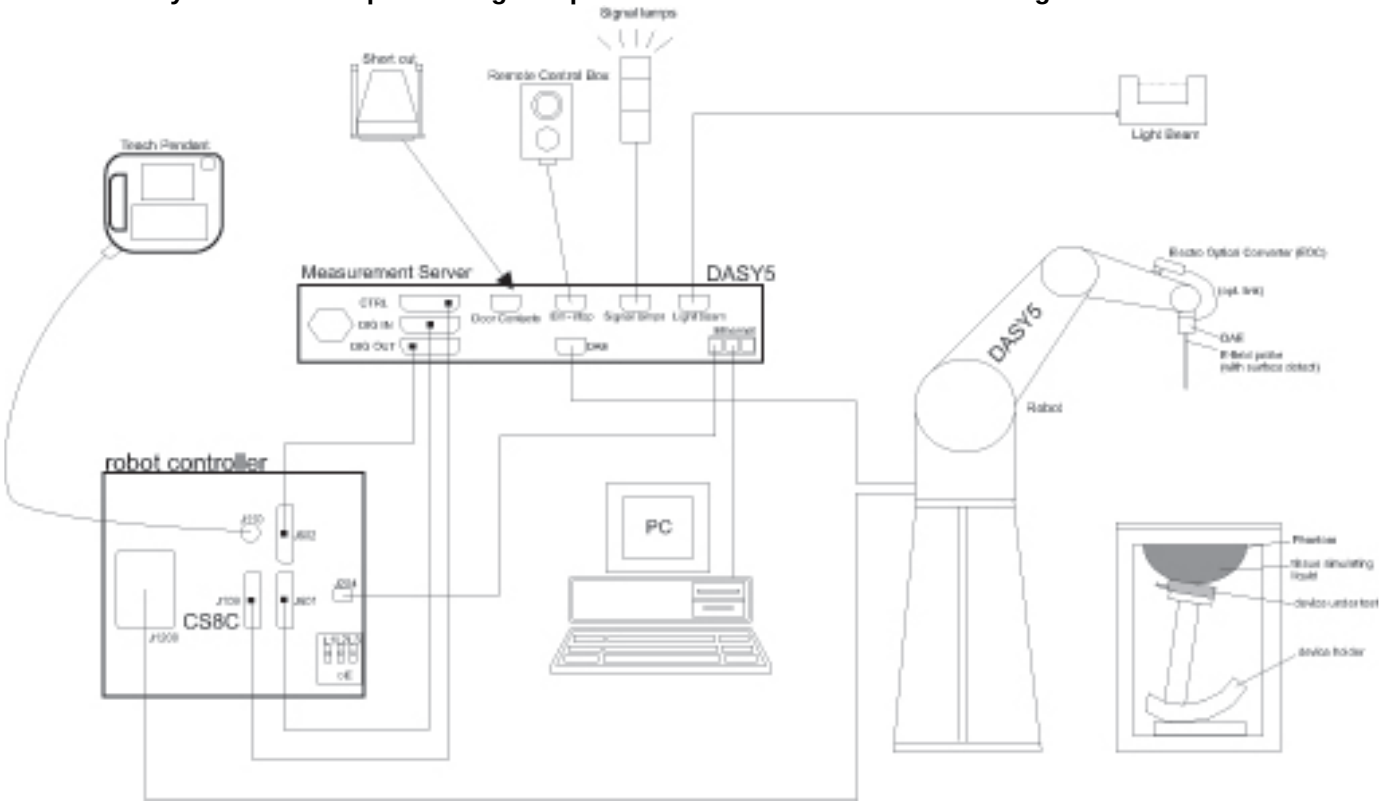
4. SAR Measurement System & Test Equipment

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	8-7-2020
Dielectric Assessment Kit	SPEAG	DAK-3.5	1196	6-18-2020
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	LKM	DTM3000	3424	8-9-2020

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Agilent	N5181A	MY50145882	8-6-2020
Power Sensor	Agilent	U2000A	MY54260010	8-9-2020
Power Sensor	Agilent	U2000A	MY54260007	8-9-2020
Power Amplifier	EXODUS	1410025-AMP2027-10003	10003	8-8-2020
Directional Coupler	Agilent	772D	MY52180193	8-7-2020
Directional Coupler	Agilent	778D	MY52180432	8-7-2020
Low Pass Filter	MICROLAB	LA-15N	03943	8-7-2020
Low Pass Filter	FILTRON	L14012FL	1410003S	8-7-2020
Low Pass Filter	MICROLAB	LA-60N	03942	8-7-2020
Attenuator	Agilent	8491B/003	MY39269292	8-7-2020
Attenuator	Agilent	8491B/010	MY39269315	8-7-2020
Attenuator	Agilent	8491B/020	MY39269298	8-7-2020
E-Field Probe (SAR1)	SPEAG	EX3DV4	7376	9-27-2020
E-Field Probe (SAR3)	SPEAG	EX3DV4	7314	8-29-2020
E-Field Probe (SAR4)	SPEAG	EX3DV4	7545	9-23-2020
E-Field Probe (SAR5)	SPEAG	EX3DV4	3871	8-29-2020
Data Acquisition Electronics (SAR1)	SPEAG	DAE4	1494	7-18-2020
Data Acquisition Electronics (SAR3)	SPEAG	DAE4	1468	9-20-2020
Data Acquisition Electronics (SAR4)	SPEAG	DAE4	1591	9-11-2020
Data Acquisition Electronics (SAR5)	SPEAG	DAE4	1343	8-27-2020
System Validation Dipole	SPEAG	D750V3	1122	2-19-2020
System Validation Dipole	SPEAG	D835V2	4d194	7-24-2020
System Validation Dipole	SPEAG	D835V2	4d174	1-23-2021
System Validation Dipole	SPEAG	D1750V2	1125	2-16-2020
System Validation Dipole	SPEAG	D1900V2	5d190	10-23-2020
System Validation Dipole	SPEAG	D2450V2	960	3-20-2020
System Validation Dipole	SPEAG	D2450V2	939	7-25-2021
System Validation Dipole	SPEAG	D5GHzV2	1184	8-20-2020
Thermometer (SAR1)	Lutron	MHB-382SD	AH.91463	8-8-2020
Thermometer (SAR3)	Lutron	MHB-382SD	AH.50213	8-8-2020
Thermometer (SAR4),(SAR5)	Lutron	MHB-382SD	AJ.45903	5-17-2020

Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	150313	8-8-2020
Base Station Simulator	R & S	CMW500	150314	8-8-2020
Base Station Simulator	R & S	CMW500	162790	8-9-2020
Wireless Connectivity Tester	R & S	CMW270	100982	8-5-2020
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	8-7-2020

Note(s):

Refer to Appendix F that mentioned about justification for Extended SAR Dipole Calibrations
(D750(SN : 1122), D835(SN : 4d194), D835(SN : 4d174), D1750(SN : 1125), D1900(SN : 5d190), D2450(SN : 960), D5GHz(SN : 1184))

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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 and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

5.1 DECISION RULE

Decision rule for statement(s) of conformity is based on Procedure 1, Clause 4.4.2 in IEC Guide 115:2007.

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Refer to Appendix A.
Back Cover	☒ The Back Cover is not removable.
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 5.8 GHz_UNII-3 (Ch.149(20Mhz)/Ch.151(40Mhz)))
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other ☒ Wi-Fi Direct (Wi-Fi 2.4 GHz) ☒ Wi-Fi Direct (Wi-Fi 5 GHz : Ch.36 – Ch.48, Ch.149 – Ch.165))
Test Sample Information	**No.** / **S/N** / **Notes** 1 / R32N1001XCD / Main Conducted 2 / R32N1004Z2N / Wi-Fi Conducted 3 / R32N1001WVD / SAR 4 / R32N1001VZF / SAR 5 / R32N1001WWH / SAR 6 / R32N1004YLK / SAR 7 / R32N1004YST / SAR 8 / R32N1003PQV / SAR 9 / R32N1003PZX / SAR

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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%
	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 (Category 24) HSUPA (Category 6) HSPA+(Release 9)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 12 FDD Band 17 FDD Band 66	QPSK 16QAM 64QAM Rel. 10 Carrier Aggregation (1 Uplink and 3 Downlinks)		100% (FDD)
	Does this device support SV-LTE (1xRTT-LTE)? ☐ Yes ☒ No			
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)		99.3% (802.11b) 95.8% (802.11g) 96.3% (802.11n 20MHz BW)
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80)		96.1% (802.11a) 97.7% (802.11n,ac 20MHz BW) 95.7% (802.11n,ac 40MHz BW) 92.5% (802.11ac 80MHz BW)
	Does this device support bands 5.60 ~ 5.65 GHz? ☒ Yes ☐ No			
	Does this device support Band gap channel(s)? ☒ Yes ☐ No			
Bluetooth	2.4 GHz	Version 5.0 LE		76.7% (DH5)

Notes:

1. The Bluetooth protocol is considered source-based averaging. Bluetooth GFSK (DH5) was verified to have the highest duty cycle of 76.7% and was considered and used for SAR Testing.
2. Duty cycle for Wi-Fi is referenced from the DTS and UNII report.

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6.3. Nominal and Maximum Output Power

KDB 447498 sec.4.1. 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

RF Air interface	Antenna	Mode	Time Slots	Max. RF Output Power (dBm)		Reduced. RF Output Power Proximity sensor & Ear jack back-off (dBm)	
				Tune-up Limit	Frame Pwr	Tune-up Limit	Frame Pwr
GSM850	Main Ant.	Voice	1	**34.0**	**25.0**	**24.5**	**15.5**
		GPRS	1	**34.0**	**25.0**	**24.5**	**15.5**
		GPRS	2	**31.5**	**25.5**	**22.5**	**16.5**
		GPRS	3	**30.5**	**26.2**	**21.5**	**17.2**
		GPRS	4	**30.0**	**27.0**	**20.0**	**17.0**
		EGPRS	1	**27.0**	**18.0**	**24.0**	**15.0**
		EGPRS	2	**26.0**	**20.0**	**22.5**	**16.5**
		EGPRS	3	**24.0**	**19.7**	**20.5**	**16.2**
		EGPRS	4	**23.0**	**20.0**	**19.0**	**16.0**
GSM1900	Main Ant.	Voice	1	**31.0**	**22.0**	**23.0**	**14.0**
		GPRS	1	**31.0**	**22.0**	**23.0**	**14.0**
		GPRS	2	**28.0**	**22.0**	**20.5**	**14.5**
		GPRS	3	**26.0**	**21.7**	**18.5**	**14.2**
		GPRS	4	**24.0**	**21.0**	**17.0**	**14.0**
		EGPRS	1	**25.5**	**16.5**	**22.5**	**13.5**
		EGPRS	2	**23.5**	**17.5**	**20.5**	**14.5**
		EGPRS	3	**22.5**	**18.2**	**19.0**	**14.7**
		EGPRS	4	**21.5**	**18.5**	**18.0**	**15.0**

RF Air interface	Antenna	Mode	Max. RF Output Power (dBm)	Reduced. RF Output Power Proximity sensor Back-off (dBm)	Reduced. RF Output Power Ear jack Back-off (dBm)
W-CDMA Band II	Main Ant.	R99	**24.5**	**14.0**	**14.5**
		HSDPA	**23.5**	**14.0**	**14.5**
		HSUPA	**23.5**	**14.0**	**14.5**
		DC-HSDPA	**23.5**	**14.0**	**14.5**
W-CDMA Band IV	Main Ant.	R99	**24.5**	**14.0**	**14.0**
		HSDPA	**23.5**	**14.0**	**14.0**
		HSUPA	**23.5**	**14.0**	**14.0**
		DC-HSDPA	**23.5**	**14.0**	**14.0**
W-CDMA Band V	Main Ant.	R99	**24.5**	**17.0**	**17.5**
		HSDPA	**24.0**	**17.0**	**17.5**
		HSUPA	**24.0**	**17.0**	**17.5**
		DC-HSDPA	**24.0**	**17.0**	**17.5**

RF Air interface	Antenna	Mode	Max. RF Output Power (dBm)	Reduced. RF Output Power Proximity sensor Back-off (dBm)	Reduced. RF Output Power Ear jack Back-off (dBm)
LTE Band 2	Main Ant.	QPSK	**24.5**	**14.5**	**14.5**
LTE Band 4	Main Ant.	QPSK	**24.5**	**14.0**	**14.5**
LTE Band 5	Main Ant.	QPSK	**24.5**	**17.0**	**17.5**
LTE Band 12	Main Ant.	QPSK	**24.5**	**18.5**	**18.5**
LTE Band 17	Main Ant.	QPSK	**24.5**	**18.5**	**18.5**
LTE Band 66	Main Ant.	QPSK	**24.5**	**14.0**	**14.5**

Notes:

1. LTE QPSK configuration has the highest maximum average output power per 3GPP standard.
2. WWAN bands has support to power reduction during triggering proximity sensor. So the Proximity sensor were verified according to KDB 616217 D04. Please refer to section 6.6.
3. WWAN bands has support to power reduction when ear-jack is connected to Tablet.
4. All Power reduction mechanisms are not work at the same time.
5. This device supports power reduction in the standalone mode with the ear-jack connected and in Proximity sensor mode for WWAN bands . As the power reduction is different for ear-jack connected versus proximity sensor mode for WWAN bands testing for the standalone exposure condition was performed at Proximity sensor reduced power and then scaled to ear-jack reduced power configuration to conservatively cover the possibility of Proximity sensor mode being enabled with the ear-jack connected. The level of power reduction for GSM 850, 1900, WCDMA Band IV, LTE Band 2, 12, 17 operations are the same for Grip and ear-jack configurations therefore, testing was done at the reduced power for Proximity sensor operations.

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WLAN SISO mode

RF Air interface	Mode	Max. RF Output Power (dBm)		Reduced. RF Output Power (dBm) -Proximity sensor back-off-	
		Wi-Fi Ant.1	Wi-Fi Ant.2	Wi-Fi Ant.1	Wi-Fi Ant.2
WiFi 2.4 GHz (Ch.1~11)	802.11b	19.0	18.0	13.5	13.5
	802.11g	16.0	15.0	13.5	13.5
	802.11n HT20	16.0	15.0	13.5	13.5
WiFi 2.4 GHz (Ch.12)	802.11b	16.0	18.0	13.5	13.5
	802.11g	11.0	15.0	11.0	13.5
	802.11n HT20	12.0	15.0	12.0	13.5
WiFi 2.4 GHz (Ch.13)	802.11b	13.0	15.0	13.0	13.5
	802.11g	8.0	11.0	8.0	11.0
	802.11n HT20	6.0	10.0	6.0	10.0
WiFi 5 GHz (UNII-1)	802.11a	14.5	13.0	9.0	9.0
	802.11n HT20	14.5	13.0	9.0	9.0
	802.11n HT40	10.5	9.5	9.0	9.0
	802.11ac VHT20	14.5	13.0	9.0	9.0
	802.11ac VHT40	10.5	9.5	9.0	9.0
	802.11ac VHT80	10.5	9.0	9.0	9.0
WiFi 5 GHz (UNII-2A)	802.11a	14.5	13.0	9.0	9.0
	802.11n HT20	13.0	13.0	9.0	9.0
	802.11n HT40	10.5	9.5	9.0	9.0
	802.11ac VHT20	13.0	13.0	9.0	9.0
	802.11ac VHT40	10.5	9.5	9.0	9.0
	802.11ac VHT80	10.5	9.0	9.0	9.0
WiFi 5 GHz (UNII-2C)	802.11a	13.0	13.0	9.0	9.0
	802.11n HT20	11.5	13.0	9.0	9.0
	802.11n HT40	9.5	9.5	9.0	9.0
	802.11ac VHT20	11.5	13.0	9.0	9.0
	802.11ac VHT40	9.5	9.5	9.0	9.0
	802.11ac VHT80	10.0	9.0	9.0	9.0
WiFi 5 GHz (UNII-3)	802.11a	14.5	13.0	9.0	9.0
	802.11n HT20	14.5	13.0	9.0	9.0
	802.11n HT40	10.5	9.5	9.0	9.0
	802.11ac VHT20	14.5	13.0	9.0	9.0
	802.11ac VHT40	10.5	9.5	9.0	9.0
	802.11ac VHT80	10.5	9.0	9.0	9.0
Bluetooth		9.0			
Bluetooth-EDR		5.0			
Bluetooth-LE_1Mbps		4.5			
Bluetooth-LE_2Mbps		4.5			

Notes:

1. WLAN bands has support to power reduction during triggering proximity sensor. So the Proximity sensor were verified according to KDB 616217 D04. Please refer to section 6.6.

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WLAN MIMO mode

RF Air interface	Mode	Max RF Output power (dBm			Reduced RF Output power (dBm) -Proximity sensor back-off-		
		Wi-Fi Ant.1	Wi-Fi Ant.2	Wi-Fi MIMO (Ant 1 + Ant 2)	Wi-Fi Ant.1	Wi-Fi Ant.2	Wi-Fi MIMO (Ant 1 + Ant 2)
WiFi 2.4 GHz (Ch.1~11)	802.11g	14.0	14.0	17.0	13.5	13.5	16.5
	802.11n HT20	14.0	14.0	17.0	13.5	13.5	16.5
WiFi 2.4 GHz (Ch.12)	802.11g	11.5	11.5	14.5	11.5	11.5	14.5
	802.11n HT20	11.0	11.0	14.0	11.0	11.0	14.0
WiFi 2.4 GHz (Ch.13)	802.11g	6.0	6.0	9.0	6.0	6.0	9.0
	802.11n HT20	4.0	4.0	7.0	4.0	4.0	7.0
WiFi 5 GHz (UNII-1)	802.11a	12.0	12.0	15.0	9.0	9.0	12.0
	802.11n HT20	12.0	12.0	15.0	9.0	9.0	12.0
	802.11n HT40	8.0	8.0	11.0	8.0	8.0	11.0
	802.11ac VHT20	12.0	12.0	15.0	9.0	9.0	12.0
	802.11ac VHT40	8.0	8.0	11.0	8.0	8.0	11.0
	802.11ac VHT80	6.5	6.5	9.5	6.5	6.5	9.5
WiFi 5 GHz (UNII-2A)	802.11a	12.0	12.0	15.0	9.0	9.0	12.0
	802.11n HT20	12.0	12.0	15.0	9.0	9.0	12.0
	802.11n HT40	8.0	8.0	11.0	8.0	8.0	11.0
	802.11ac VHT20	12.0	12.0	15.0	9.0	9.0	12.0
	802.11ac VHT40	8.0	8.0	11.0	8.0	9.0	12.0
	802.11ac VHT80	7.0	7.0	10.0	7.0	7.0	10.0
WiFi 5 GHz (UNII-2C)	802.11a	12.0	12.0	15.0	9.0	9.0	12.0
	802.11n HT20	12.0	12.0	15.0	9.0	9.0	12.0
	802.11n HT40	8.0	8.0	11.0	8.0	8.0	11.0
	802.11ac VHT20	12.0	12.0	15.0	9.0	9.0	12.0
	802.11ac VHT40	8.0	8.0	11.0	8.0	9.0	12.0
	802.11ac VHT80	7.0	7.0	10.0	7.0	7.0	10.0
WiFi 5 GHz (UNII-3)	802.11a	12.0	12.0	15.0	9.0	9.0	12.0
	802.11n HT20	12.0	12.0	15.0	9.0	9.0	12.0
	802.11n HT40	8.0	8.0	11.0	8.0	8.0	11.0
	802.11ac VHT20	12.0	12.0	15.0	9.0	9.0	12.0
	802.11ac VHT40	8.0	8.0	11.0	8.0	9.0	12.0
	802.11ac VHT80	7.0	7.0	10.0	7.0	7.0	10.0

Notes:

1. WLAN bands has support to power reduction during triggering proximity sensor. So the Proximity sensor were verified according to KDB 616217 D04. Please refer to section 6.6.
2. Each antennas has the different target power for SISO and MIMO mode, but Each antennas of MIMO mode has same or lower for maximum output power than SISO mode.

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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 12	Frequency range: 699 – 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			23060/ 704	23035/ 701.5	23025/ 700.5	23017/ 699.7
	Mid			23095/ 707.5	23095/ 707.5	23095/ 707.5	23095/ 707.5
	High			23130/ 711	23155/ 713.5	23165/ 714.5	23173/ 715.3
	Band 17	Frequency range: 704 - 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			23780/ 709	23755/ 706.5		
	Mid			23790/ 710	23790/ 710		
	High			23800/ 711	23825/ 713.5		
	Band 66	Frequency range: 1710 - 1780 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	132072/ 1720	132047/ 1717.5	132022/ 1715	131997/ 1712.5	131987/ 1711.5	131979/ 1710.7
	Mid	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745
	High	132572/ 1770	132597/ 1772.5	132622/ 1775	132647/ 1777.5	132657/ 1778.5	132665/ 1779.3

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General LTE SAR Test and Reporting Considerations (Continued)

<table>
<tr><td>LTE transmitter and antenna implementation</td><td>Refer to Appendix A.</td></tr>
<tr><td>Maximum power reduction (MPR)</td><td>

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table>

MPR Built-in by design
The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values.
A-MPR (additional MPR) was disabled during SAR testing

</td></tr>
<tr><td>Power reduction</td><td>Yes</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td>A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
</table>

Notes:

1. SAR Testing for LTE was performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
2. Maximum bandwidth 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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6.5. LTE Carrier Aggregation

DL Inter-Bnad (2CC)

E-UTRA CA configuration (BCS)	E-UTRA Band	Bandwidth						Max Aggregated BW	Reverse Y/N
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz		
CA_2A-12A (0)(1)(2)	Band 2			Yes	Yes	Yes	Yes	30 MHz	Yes
	Band 12			Yes	Yes				
	Band 2			Yes	Yes	Yes	Yes	30 MHz	Yes
	Band 12		Yes	Yes	Yes				
	Band 2			Yes	Yes			20 MHz	Yes
	Band 12			Yes	Yes				
CA_2A-17A(0)	Band 2			Yes	Yes			20 MHz	Yes
	Band 17			Yes	Yes				
CA_2A-5A(0)(1)	Band 2			Yes	Yes	Yes	Yes	30 MHz	Yes
	Band 5			Yes	Yes				
	Band 2			Yes	Yes			20 MHz	Yes
	Band 5			Yes	Yes				
CA_4A-5A(0)(1)	Band 4			Yes	Yes			20 MHz	Yes
	Band 5			Yes	Yes				
	Band 4			Yes	Yes	Yes	Yes	30 MHz	Yes
	Band 5			Yes	Yes				
CA_4A-12A (0)(1)(2)(3)(4)(5)	Band 4	Yes	Yes	Yes	Yes			20 MHz	Yes
	Band 12			Yes	Yes				
	Band 4	Yes	Yes	Yes	Yes	Yes	Yes	30 MHz	Yes
	Band 12			Yes	Yes				
	Band 4			Yes	Yes	Yes	Yes	30 MHz	Yes
	Band 12		Yes	Yes	Yes				
	Band 4			Yes	Yes			20 MHz	Yes
	Band 12			Yes	Yes				
	Band 4			Yes	Yes	Yes	Yes	30 MHz	Yes
	Band 12			Yes	Yes				
	Band 4			Yes	Yes	Yes		20 MHz	Yes
	Band 12			Yes					
CA_5A-66A(0)	Band 5			Yes	Yes			30 MHz	Yes
	Band 66			Yes	Yes	Yes	Yes		
CA_4A-17A(0)	Band 4			Yes	Yes			20 MHz	Yes
	Band 17			Yes	Yes				
CA_12A-66A (0)(1)(2)(3)(4)(5)	Band 12			Yes	Yes			20 MHz	Yes
	Band 66	Yes	Yes	Yes	Yes				
	Band 12			Yes	Yes			30 MHz	Yes
	Band 66	Yes	Yes	Yes	Yes	Yes	Yes		
	Band 12		Yes	Yes	Yes			30 MHz	Yes
	Band 66			Yes	Yes	Yes	Yes		
	Band 12			Yes	Yes			20 MHz	Yes
	Band 66			Yes	Yes				
	Band 12			Yes	Yes			30 MHz	Yes
	Band 66			Yes	Yes	Yes	Yes		
	Band 12			Yes				20 MHz	Yes
	Band 66			Yes	Yes	Yes			

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DL Inter-Bnad (3CC)

E-UTRA CA configuration (BCS)	E-UTRA Band	Bandwidth						Max Aggregated BW	Reverse Y/N
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz		
CA_4A-12A-12A(0)	Band 4			Yes	Yes	Yes	Yes	50 MHz	Yes
	Band 12	12A-12A BCS 0							
CA_2A-12A-66A(0)(1)	Band 2			Yes	Yes	Yes	Yes	50 MHz	Yes
	Band 12			Yes	Yes				
	Band 66			Yes	Yes	Yes	Yes		
	Band 2			Yes	Yes			40 MHz	Yes
	Band 12			Yes	Yes				
	Band 66			Yes	Yes	Yes	Yes		
CA_2A-12B(0)	Band 2			Yes	Yes	Yes	Yes	35 MHz	Yes
	Band 12	12B BCS 0							
CA_2A-66A-66A(0)	Band 2			Yes	Yes	Yes	Yes	60 MHz	Yes
	Band 66	66A-66A BCS 0							
CA_4A-4A-12A(0)	Band 4	4A-4A BCS 0						50 MHz	Yes
	Band 12			Yes	Yes				
CA_4A-12B(0)	Band 4			Yes	Yes	Yes	Yes	35 MHz	Yes
	Band 12	12B BCS 0							
CA_5A-66A-66A(0)	Band 5			Yes	Yes			50 MHz	Yes
	Band 66	66A-66A BCS 0							
CA_5A-66C(0)	Band 5			Yes	Yes			50 MHz	Yes
	Band 66	66C BCS 0							
CA_12B-66A(0)	Band 12	12B BCS 0						35 MHz	Yes
	Band 66			Yes	Yes	Yes	Yes		
CA_12A-66A-66A(0)	Band 12			Yes	Yes	Yes	Yes	50 MHz	Yes
	Band 66	66A-66A BCS 0							

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DL Intra Band(non-contiguous)2CC

E-UTRA CA configuration (BCS)	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)					Max Aggregated BW
		1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	5th Carrier	
CA_2A-2A(0)	Band 2	5,10,15,20	5,10,15,20				40 MHz
CA_4A-4A(0),(1)	Band 4	5,10,15,20	5,10,15,20				40 MHz
	Band 4	5,10	5,10				20 MHz
CA_5A-5A(0),(1)	Band 5	5,10	5,10				20 MHz
	Band 5	3	5				8 MHz
CA_66A-66A(0)	Band 66	5,10,15,20	5,10,15,20				40 MHz

DL Intra Band(contiguous)2CC

E-UTRA CA configuration (BCS)	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)					Max Aggregated BW
		1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	5th Carrier	
CA_2C (0)	Band 2	5	20				40 MHz
		10	15,20				
		15	10,15,20				
		20	5,10,15,20				
CA_66B(0)	Band 66	5	5,10,15				20 MHz
		10	5,10				
		15	5				
CA_66C(0)	Band 66	5	20				40 MHz
		10	15,20				
		15	10,15,20				
		20	5,10,15,20				
CA_5B(0),(1)	Band 5	5,10	10				20 MHz
		10	5				
		3	5				8 MHz
		5	3				
CA_12B(0)	Band 12	5	5,10				15 MHz

Note(s):

For supported channels, please refer to §6.4

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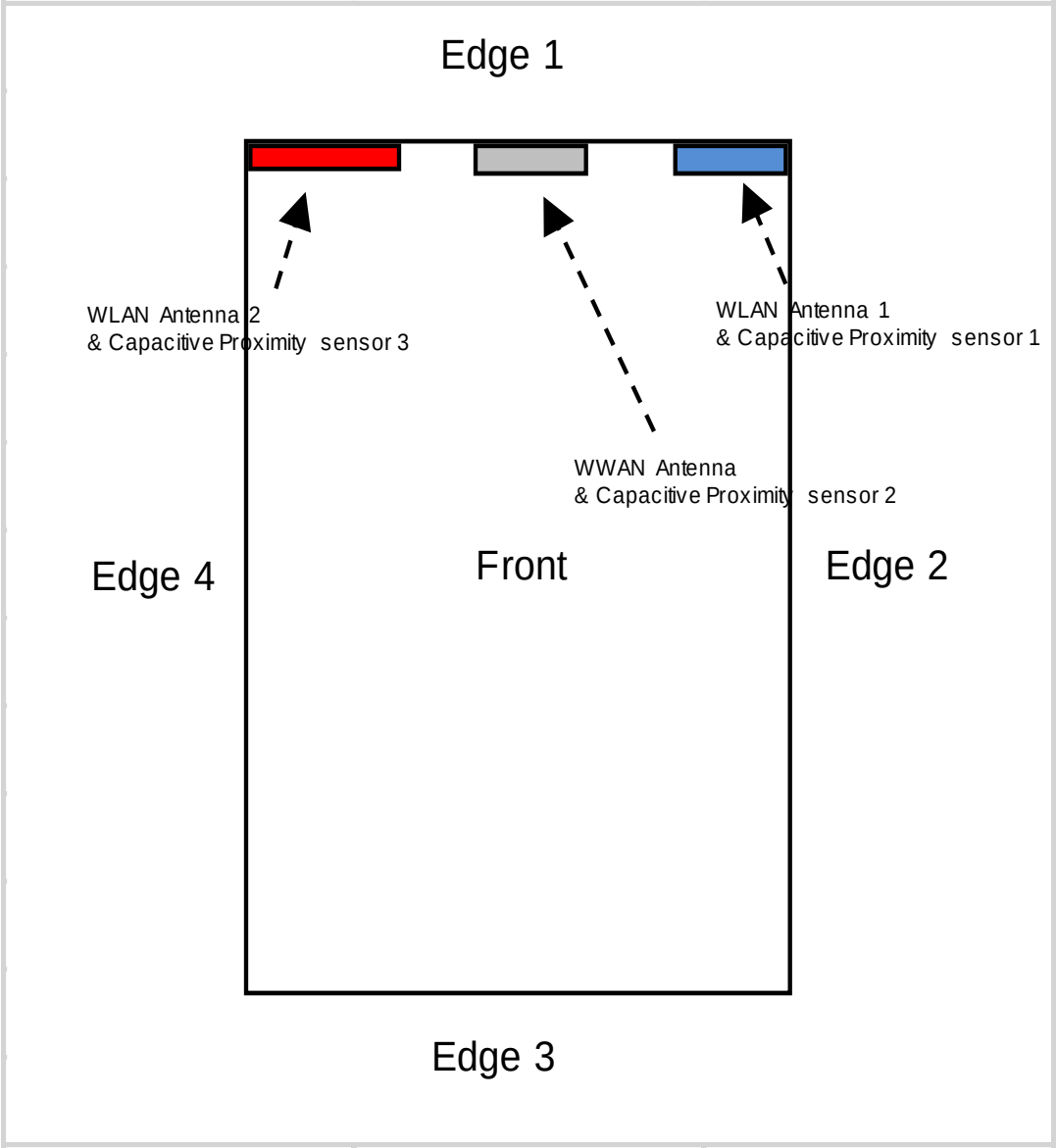
6.6 Proximity sensor feature

The DUT has three proximity sensors to reduce the output power. The position of the sensors and antenna are as shown in the graphic.



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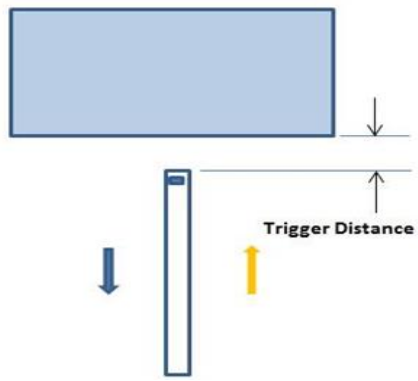
6.6.1 Proximity Sensor Triggering Distance (KDB 616217 §6.2)

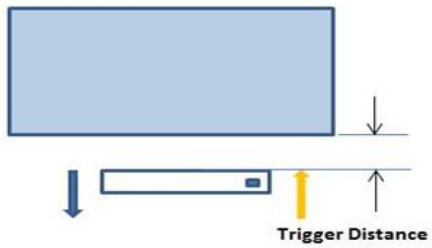
Rear, Edge 1, Edge 2, Edge 4, Corner A (Side of between Edge 1 and Edge 2), Corner B (Side of between Edge 1 and Edge 4) of the DUT was placed directly below the flat phantom. The DUT was moved toward the phantom in accordance with the steps outlined in KDB 616217 §6.2 to determine the trigger distance for enabling power reduction. The DUT was moved away from the phantom to determine the trigger distance for resuming full power.

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

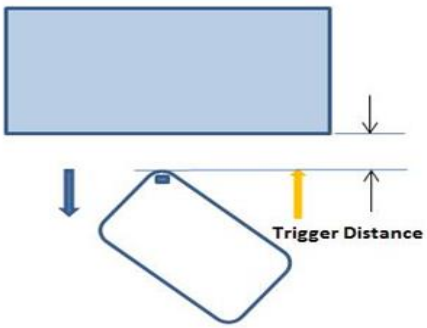
It was confirmed separately that the output power was altered according to the proximity sensor status indication. This was achieved by observing the proximity sensor status at the same time as monitoring the conducted power. Section 9 contains both the full and reduced conducted power measurements.



Proximity Sensor Trigger Distance Assessment KDB 616217 §6.2, Edge 1, Edge 2, Edge 4



Proximity Sensor Trigger Distance Assessment KDB 616217 §6.2, Rear



Proximity Sensor Trigger Distance Assessment KDB 616217 §6.2, Corner A, Corner B

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

Antenna	Tissue simulating liquid	Trigger distance - Rear		Trigger distance – Edge 1		Trigger distance – Edge 2		Trigger distance – Edge 4		Trigger distance – Corner A		Trigger distance – Corner B	
		Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom
WWAN Ant.	750 Head	17 mm	17 mm	22 mm	22 mm	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	850 Head	17 mm	17 mm	22 mm	22 mm	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1750 Head	17 mm	17 mm	22 mm	22 mm	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1900 Head	17 mm	17 mm	22 mm	22 mm	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WLAN Ant.	2450 Head Ant 1	14 mm	14 mm	13 mm	13 mm	8 mm	8 mm	N/A	N/A	9 mm	9 mm	N/A	N/A
	2450 Head Ant 2	14 mm	12 mm	13 mm	13 mm	N/A	N/A	7 mm	7 mm	N/A	N/A	8 mm	8 mm
	5000 Head Ant 1	14 mm	14 mm	13 mm	13 mm	8 mm	8 mm	N/A	N/A	9 mm	9 mm	N/A	N/A
	5000 Head Ant 2	14 mm	12 mm	13 mm	13 mm	N/A	N/A	7 mm	7 mm	N/A	N/A	8 mm	8 mm

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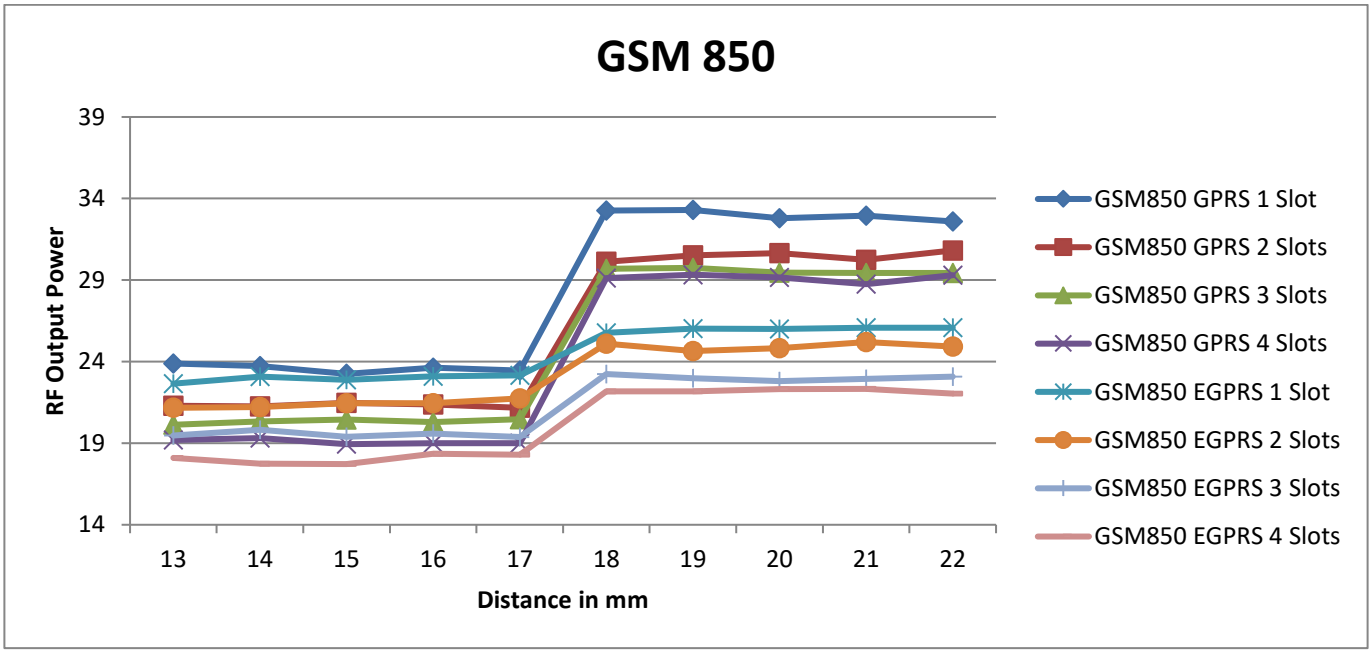
Proximity Sensor Triggering Distance Measurement Results

GSM 850

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	13	14	15	16	17	18	19	20	21	22
GSM850 GPRS 1 Slot	23.9	23.7	23.3	23.6	23.5	33.3	33.3	32.8	33.0	32.6
GSM850 GPRS 2 Slots	21.3	21.3	21.5	21.4	21.2	30.1	30.5	30.7	30.3	30.8
GSM850 GPRS 3 Slots	20.1	20.3	20.5	20.3	20.5	29.7	29.8	29.5	29.4	29.4
GSM850 GPRS 4 Slots	19.2	19.3	18.9	19.0	19.0	29.1	29.3	29.2	28.8	29.3
GSM850 EGPRS 1 Slot	22.7	23.1	22.9	23.1	23.2	25.8	26.0	26.0	26.1	26.1
GSM850 EGPRS 2 Slots	21.2	21.2	21.5	21.5	21.7	25.1	24.7	24.8	25.2	24.9
GSM850 EGPRS 3 Slots	19.5	19.8	19.4	19.6	19.4	23.2	23.0	22.8	22.9	23.1
GSM850 EGPRS 4 Slots	18.1	17.8	17.7	18.4	18.3	22.2	22.2	22.3	22.3	22.1



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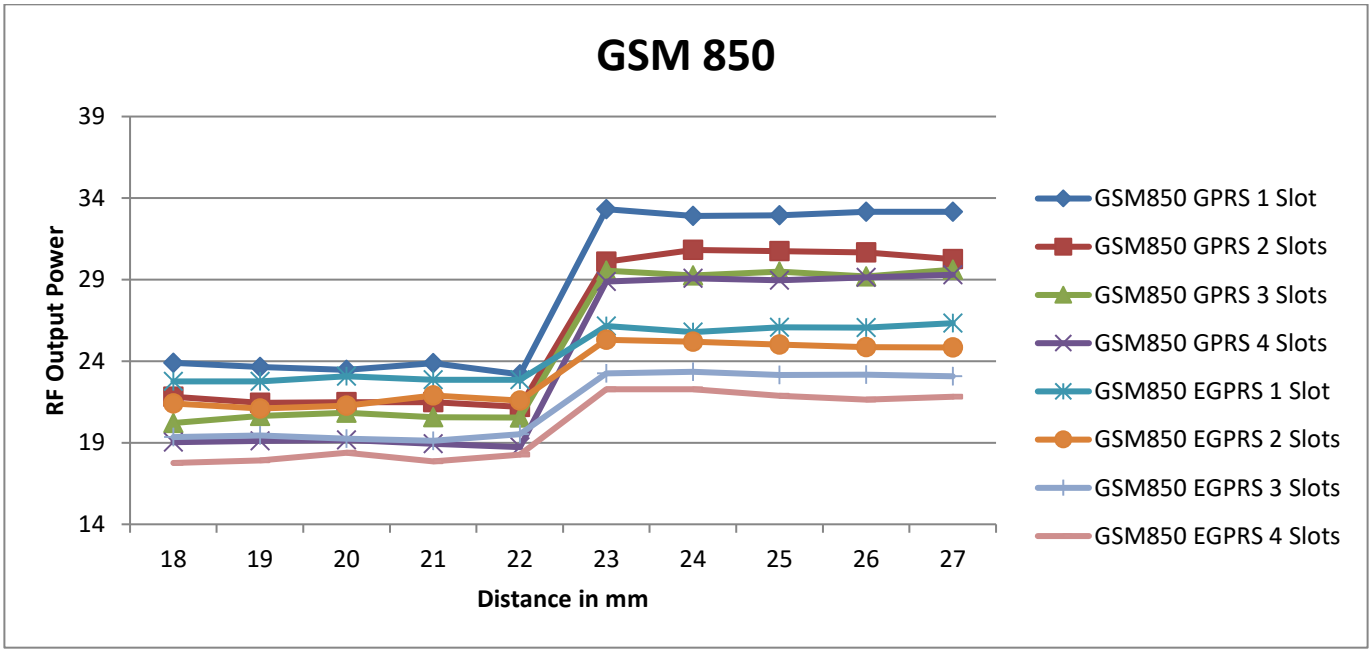
Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	18	19	20	21	22	23	24	25	26	27
GSM850 GPRS 1 Slot	23.9	23.7	23.5	23.9	23.2	33.3	32.9	33.0	33.2	33.2
GSM850 GPRS 2 Slots	21.8	21.5	21.5	21.5	21.2	30.1	30.8	30.8	30.7	30.3
GSM850 GPRS 3 Slots	20.2	20.6	20.8	20.6	20.6	29.6	29.3	29.5	29.2	29.6
GSM850 GPRS 4 Slots	19.0	19.1	19.2	18.9	18.7	28.9	29.1	29.0	29.1	29.3
GSM850 EGPRS 1 Slot	22.8	22.8	23.1	22.9	22.9	26.2	25.8	26.1	26.1	26.3
GSM850 EGPRS 2 Slots	21.4	21.1	21.3	21.9	21.6	25.3	25.2	25.0	24.9	24.8
GSM850 EGPRS 3 Slots	19.3	19.5	19.2	19.1	19.5	23.3	23.4	23.2	23.2	23.1
GSM850 EGPRS 4 Slots	17.8	17.9	18.4	17.9	18.3	22.3	22.3	21.9	21.6	21.8



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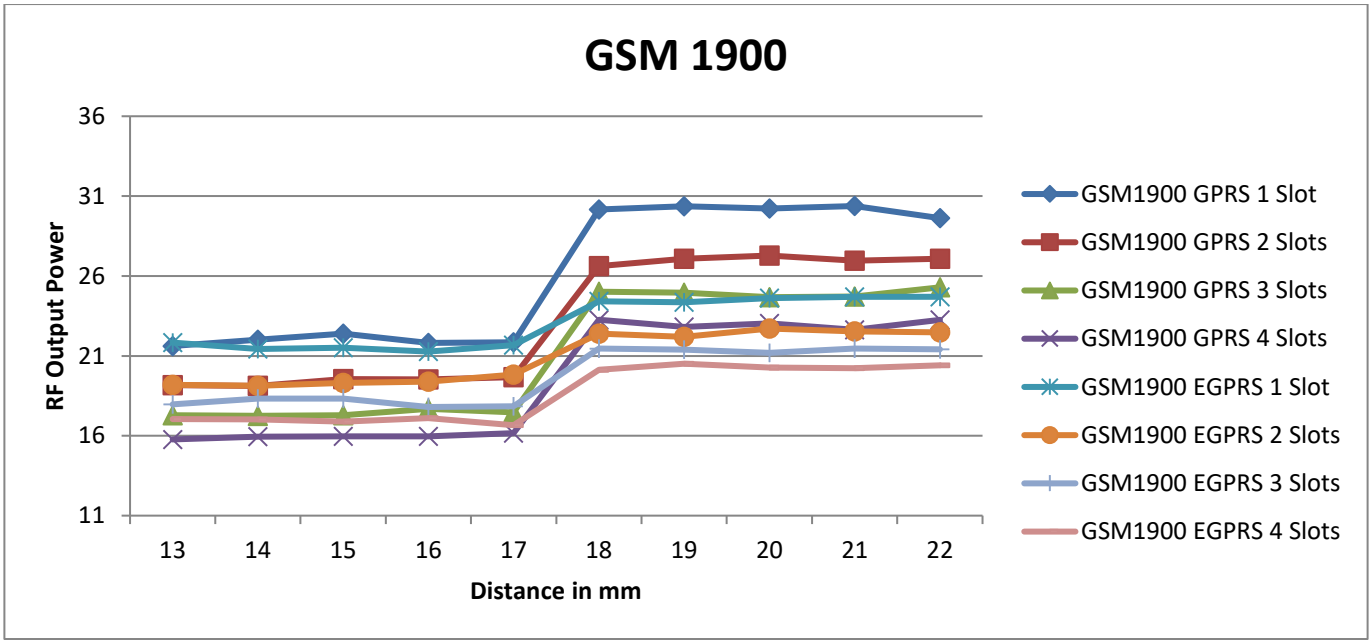
GSM 1900

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	13	14	15	16	17	18	19	20	21	22
GSM1900 GPRS 1 Slot	21.6	22.0	22.4	21.8	21.9	30.2	30.4	30.2	30.4	29.6
GSM1900 GPRS 2 Slots	19.2	19.1	19.5	19.5	19.7	26.6	27.1	27.3	27.0	27.1
GSM1900 GPRS 3 Slots	17.3	17.3	17.3	17.7	17.5	25.0	25.0	24.7	24.7	25.3
GSM1900 GPRS 4 Slots	15.8	15.9	16.0	16.0	16.2	23.3	22.8	23.0	22.6	23.3
GSM1900 EGPRS 1 Slot	21.8	21.4	21.5	21.3	21.7	24.4	24.4	24.6	24.7	24.7
GSM1900 EGPRS 2 Slots	19.2	19.1	19.3	19.4	19.8	22.4	22.2	22.7	22.5	22.5
GSM1900 EGPRS 3 Slots	18.0	18.3	18.3	17.8	17.9	21.5	21.4	21.2	21.5	21.4
GSM1900 EGPRS 4 Slots	17.0	17.0	16.9	17.1	16.7	20.1	20.5	20.3	20.2	20.4



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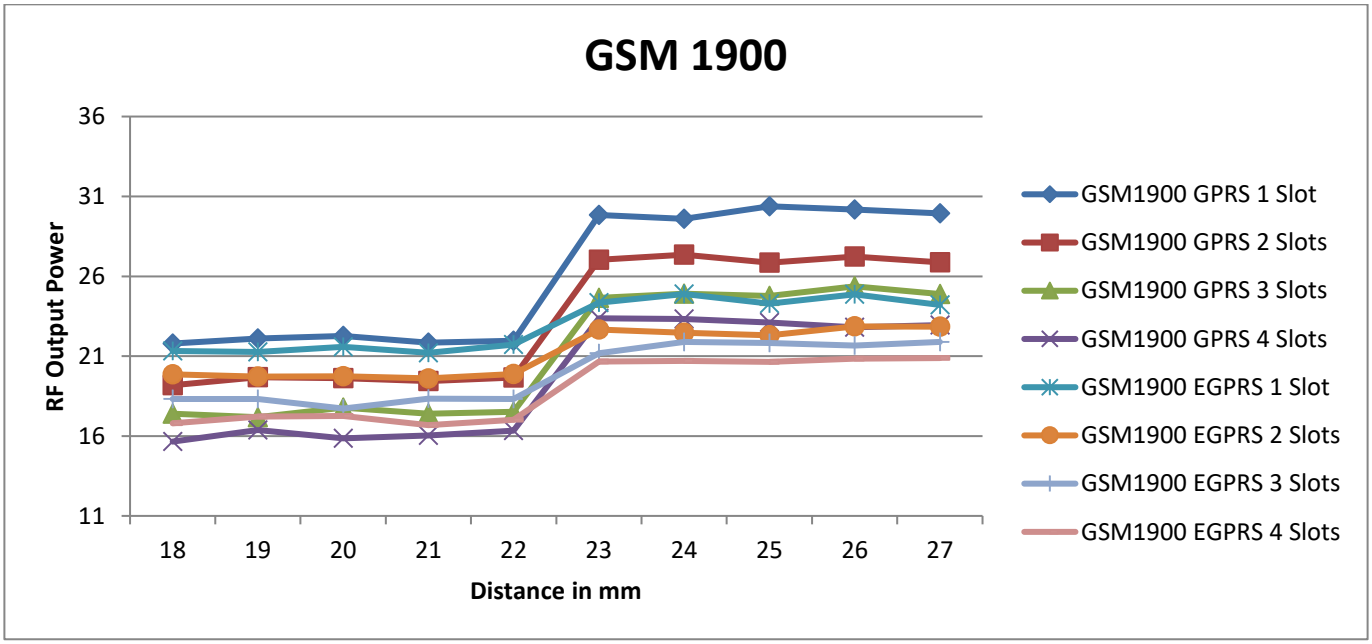
Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	18	19	20	21	22	23	24	25	26	27
GSM1900 GPRS 1 Slot	21.8	22.1	22.3	21.8	22.0	29.8	29.6	30.4	30.2	29.9
GSM1900 GPRS 2 Slots	19.2	19.7	19.6	19.4	19.7	27.0	27.4	26.9	27.2	26.9
GSM1900 GPRS 3 Slots	17.4	17.2	17.8	17.4	17.5	24.6	24.9	24.8	25.4	24.9
GSM1900 GPRS 4 Slots	15.7	16.4	15.9	16.0	16.3	23.4	23.3	23.1	22.8	23.0
GSM1900 EGPRS 1 Slot	21.3	21.3	21.6	21.2	21.7	24.4	24.9	24.3	24.9	24.2
GSM1900 EGPRS 2 Slots	19.9	19.7	19.7	19.6	19.9	22.7	22.5	22.3	22.9	22.9
GSM1900 EGPRS 3 Slots	18.3	18.3	17.7	18.3	18.3	21.2	21.9	21.8	21.7	21.9
GSM1900 EGPRS 4 Slots	16.8	17.2	17.3	16.7	17.0	20.7	20.7	20.6	20.8	20.9



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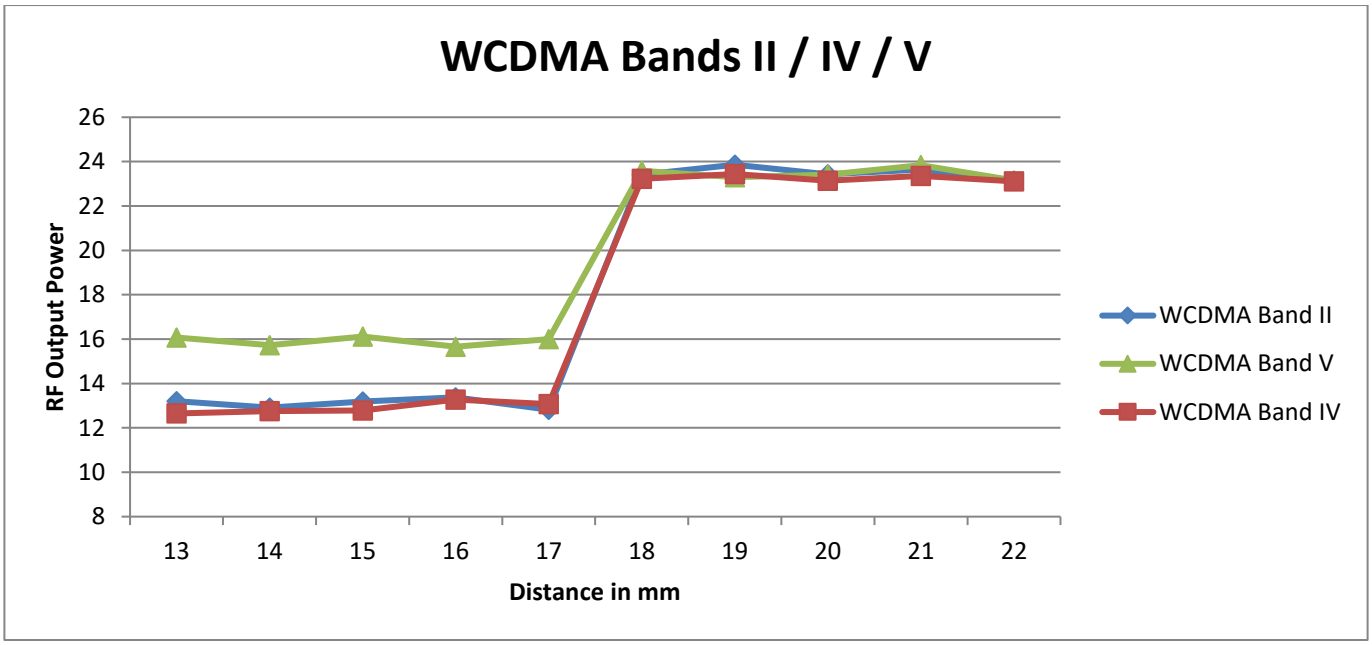
WCDMA Band II/IV/V

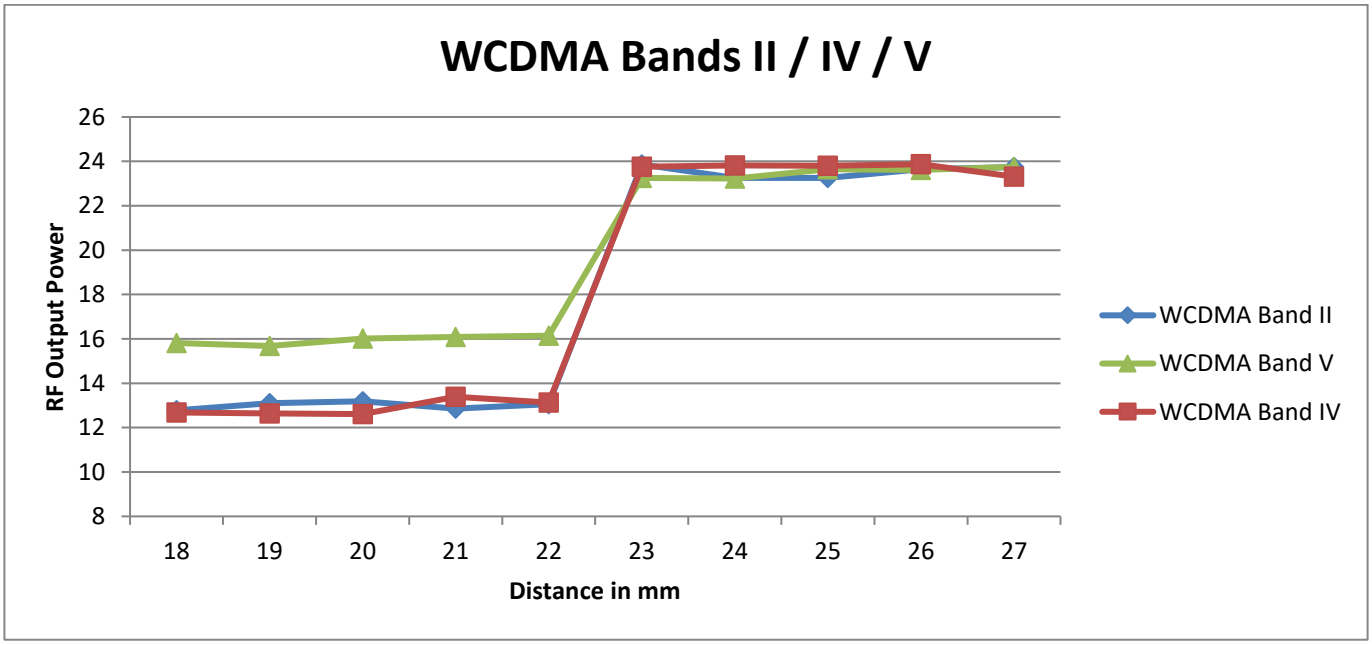
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	13	14	15	16	17	18	19	20	21	22
WCDMA Band II	13.2	12.9	13.2	13.4	12.8	23.4	23.9	23.4	23.7	23.1
WCDMA Band IV	12.7	12.8	12.8	13.3	13.1	23.2	23.4	23.1	23.4	23.1
WCDMA Band V	16.1	15.7	16.1	15.7	16.0	23.6	23.3	23.4	23.8	23.2



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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	18	19	20	21	22	23	24	25	26	27
WCDMA Band II	12.8	13.1	13.2	12.9	13.1	23.9	23.3	23.3	23.7	23.8
WCDMA Band IV	12.7	12.6	12.6	13.4	13.1	23.8	23.8	23.8	23.9	23.3
WCDMA Band V	15.8	15.7	16.0	16.1	16.1	23.3	23.2	23.7	23.6	23.8



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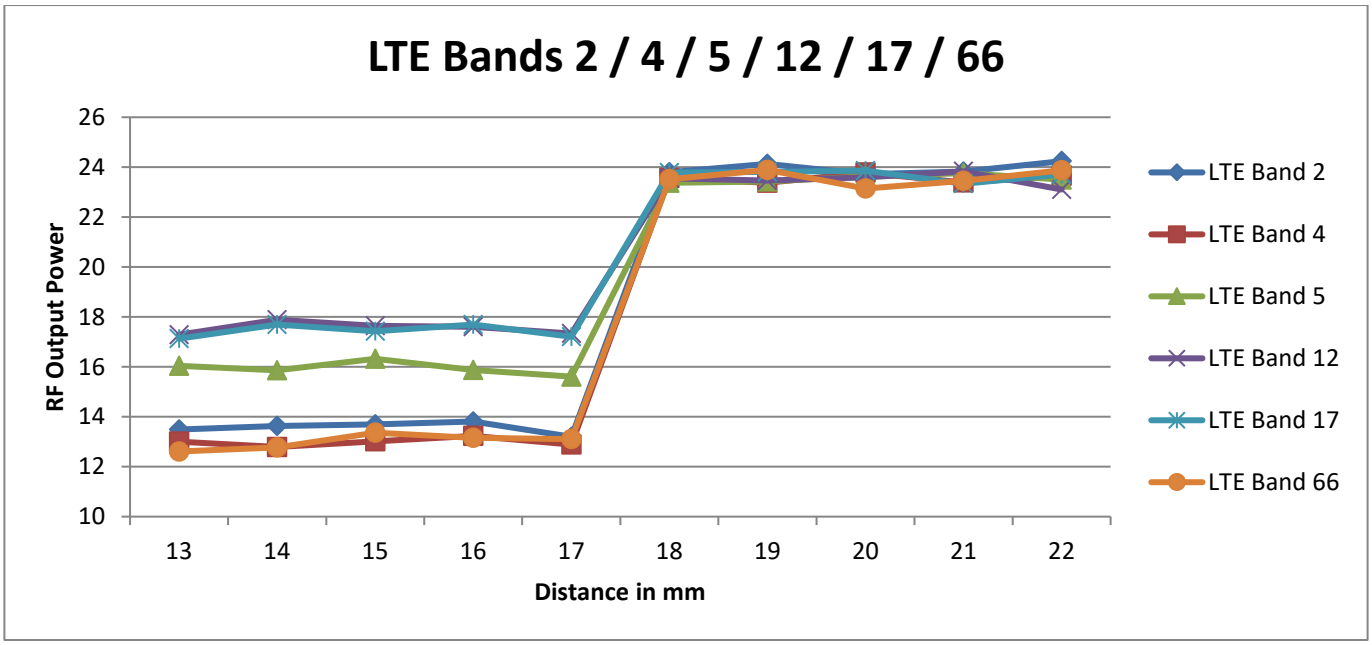
LTE Band 2/ 4/ 5/ 12 /17 /66

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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	13	14	15	16	17	18	19	20	21	22
LTE Band 2	13.5	13.6	13.7	13.8	13.2	23.8	24.1	23.7	23.8	24.2
LTE Band 4	13.0	12.8	13.0	13.2	12.9	23.6	23.4	23.8	23.4	23.7
LTE Band 5	16.0	15.9	16.3	15.9	15.6	23.4	23.4	23.6	23.8	23.5
LTE Band 12	17.3	17.9	17.6	17.6	17.3	23.6	23.5	23.6	23.8	23.1
LTE Band 17	17.1	17.7	17.4	17.7	17.2	23.8	23.8	23.9	23.3	23.7
LTE Band 66	12.6	12.8	13.4	13.2	13.1	23.5	23.9	23.2	23.5	23.9



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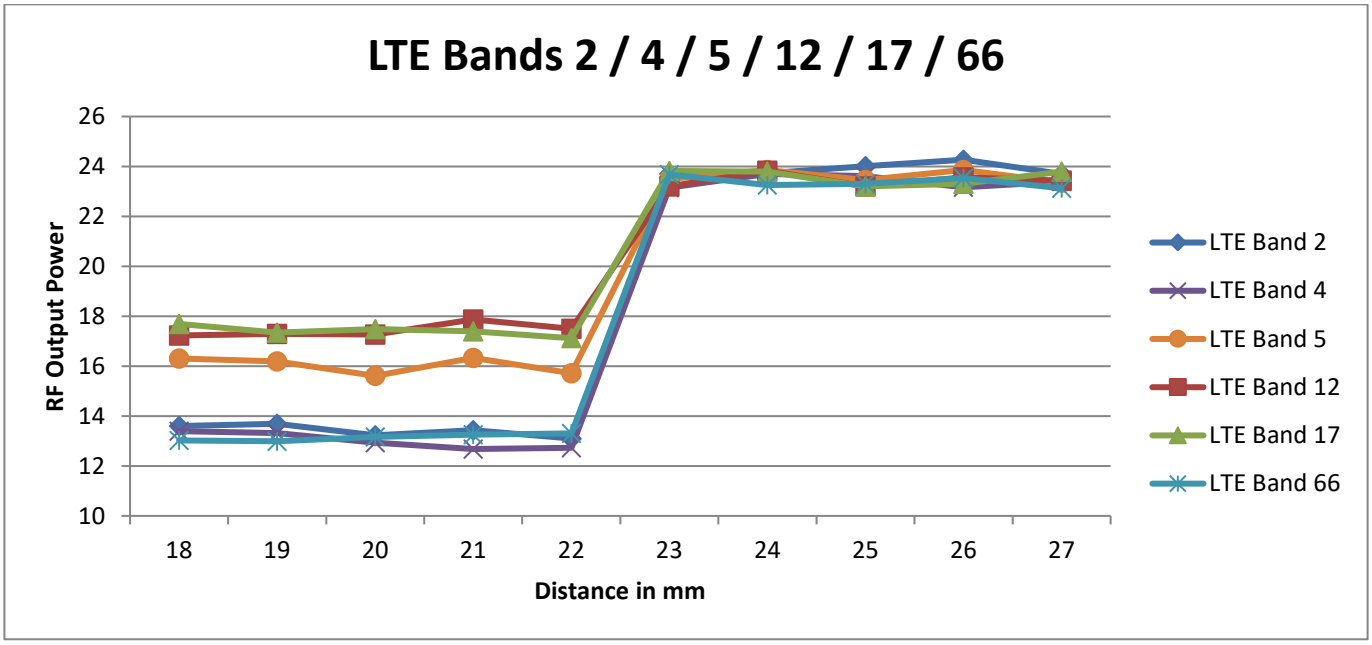
Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	18	19	20	21	22	23	24	25	26	27
LTE Band 2	13.6	13.7	13.2	13.4	13.1	23.7	23.7	24.0	24.3	23.7
LTE Band 4	13.4	13.3	12.9	12.7	12.7	23.2	23.7	23.6	23.2	23.4
LTE Band 5	16.3	16.2	15.6	16.3	15.7	23.5	23.9	23.5	23.9	23.4
LTE Band 12	17.2	17.3	17.3	17.9	17.5	23.2	23.8	23.2	23.6	23.4
LTE Band 17	17.7	17.4	17.5	17.4	17.1	23.8	23.8	23.2	23.3	23.8
LTE Band 66	13.0	13.0	13.2	13.3	13.3	23.7	23.3	23.3	23.5	23.1



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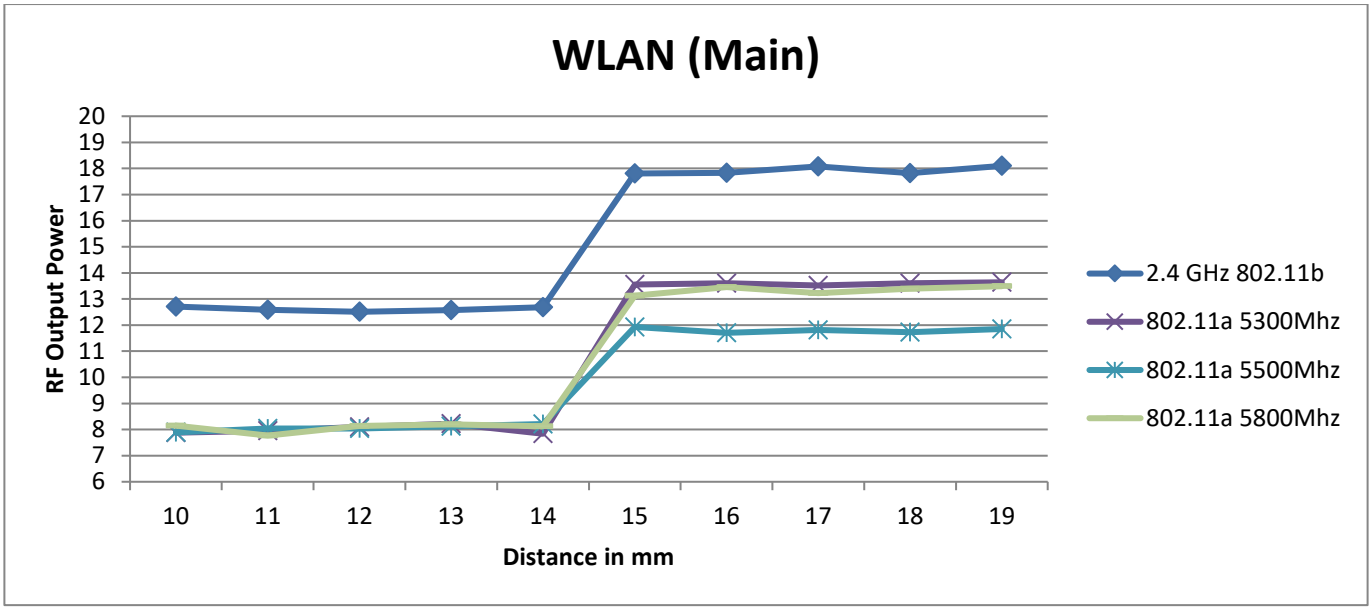
WLAN 2.4GHz and 5GHz

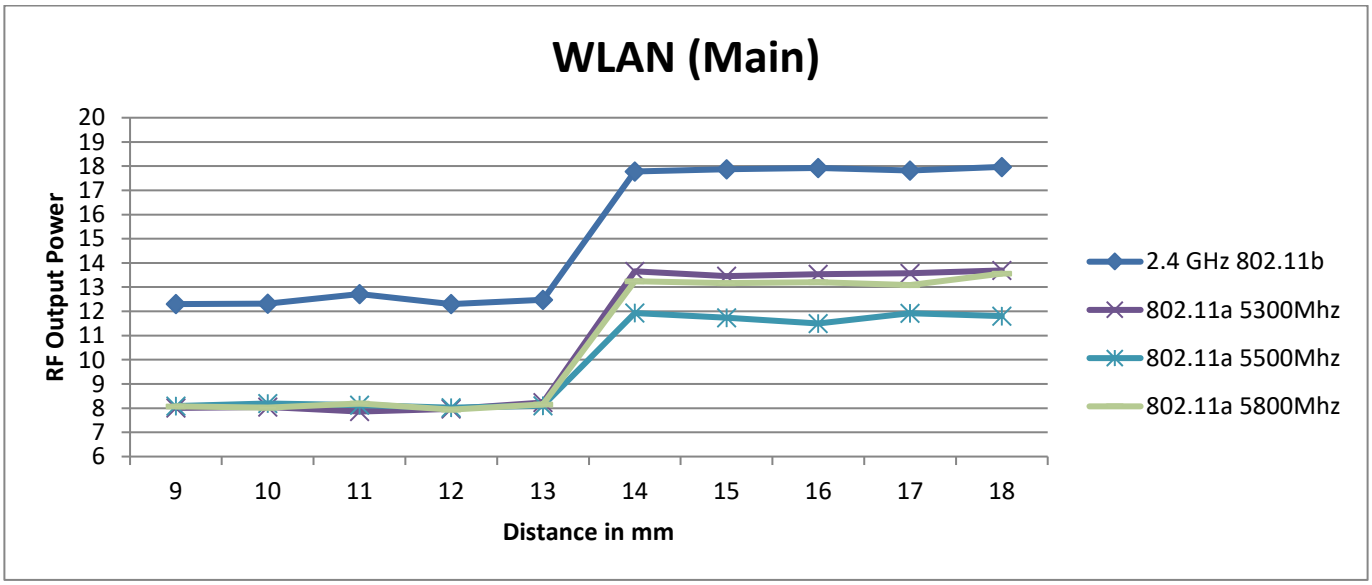
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm											
Antenna	Distance	10	11	12	13	14	15	16	17	18	19
Ant 1	2.4 GHz 802.11b	12.7	12.6	12.5	12.6	12.7	17.8	17.8	18.1	17.8	18.1
	802.11a 5300Mhz	7.9	8.0	8.1	8.2	7.8	13.6	13.6	13.5	13.6	13.6
	802.11a 5500Mhz	7.9	8.0	8.0	8.1	8.2	11.9	11.7	11.8	11.7	11.9
	802.11a 5800Mhz	8.2	7.8	8.1	8.2	8.1	13.1	13.5	13.2	13.4	13.5



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

Distance to DUT vs. Output Power in dBm											
Antenna	Distance (mm)	9	10	11	12	13	14	15	16	17	18
Ant 1	2.4 GHz 802.11b	12.3	12.3	12.7	12.3	12.5	17.8	17.9	17.9	17.8	18.0
	802.11a 5300Mhz	8.0	8.1	7.9	8.0	8.2	13.7	13.5	13.5	13.6	13.7
	802.11a 5500Mhz	8.1	8.2	8.1	8.0	8.1	11.9	11.7	11.5	11.9	11.8
	802.11a 5800Mhz	8.1	8.0	8.2	7.9	8.2	13.2	13.2	13.2	13.1	13.6



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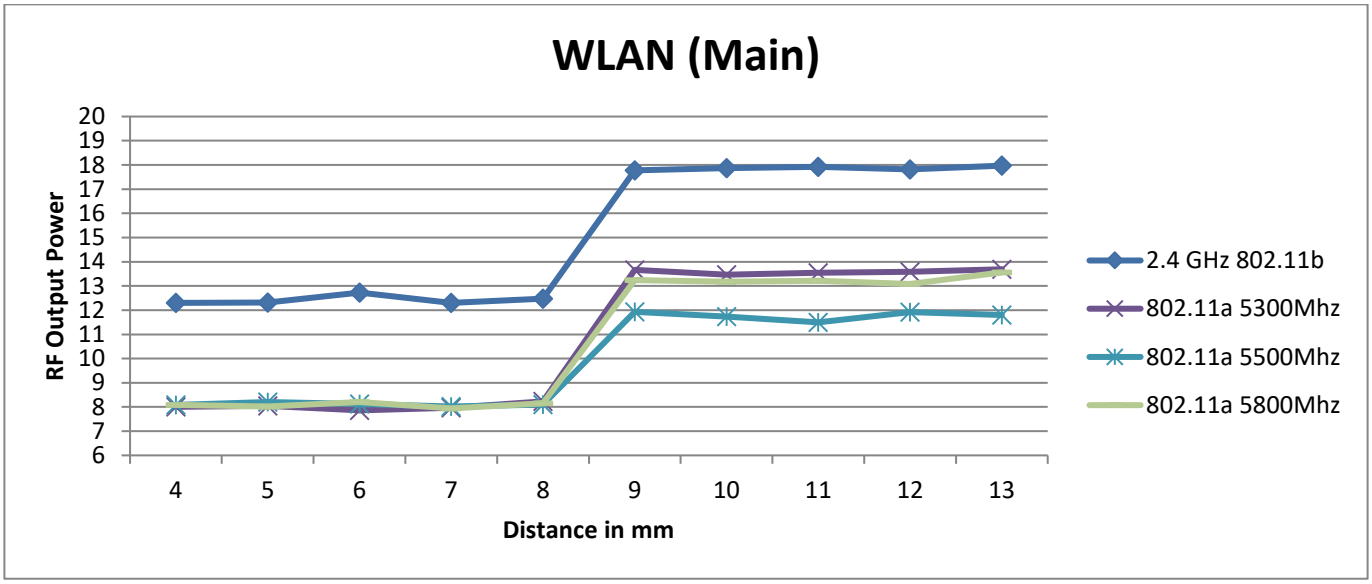
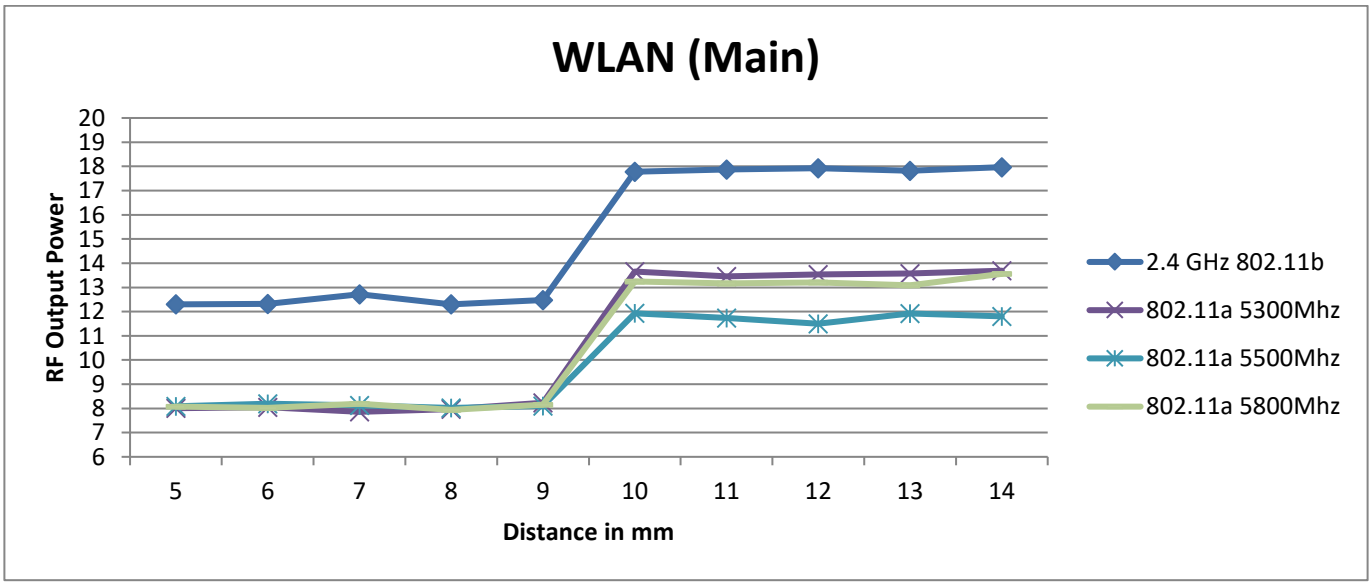
Edge 2, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm											
Antenna	Distance (mm)	4	5	6	7	8	9	10	11	12	13
Ant 1	2.4 GHz 802.11b	12.3	12.4	12.6	12.4	12.4	18.1	18.1	18.2	17.8	17.8
	802.11a 5300Mhz	7.9	8.2	7.9	8.1	8.2	13.5	13.3	13.3	13.6	13.4
	802.11a 5500Mhz	7.8	7.8	8.2	7.9	8.2	11.9	11.5	11.9	11.8	12.2
	802.11a 5800Mhz	7.8	7.9	7.9	8.0	8.1	13.0	13.0	13.2	13.2	13.7



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

Distance to DUT vs. Output Power in dBm											
Antenna	Distance (mm)	5	6	7	8	9	10	11	12	13	14
Ant 1	2.4 GHz 802.11b	12.4	12.7	12.3	12.5	12.3	18.2	18.1	18.1	18.0	18.1
	802.11a 5300Mhz	8.1	8.2	8.0	8.0	8.1	13.5	13.4	13.5	13.3	13.4
	802.11a 5500Mhz	7.8	7.9	8.2	7.8	8.0	12.0	12.2	12.2	11.9	12.0
	802.11a 5800Mhz	8.1	7.8	8.2	8.1	8.1	13.7	13.5	13.7	13.4	13.4



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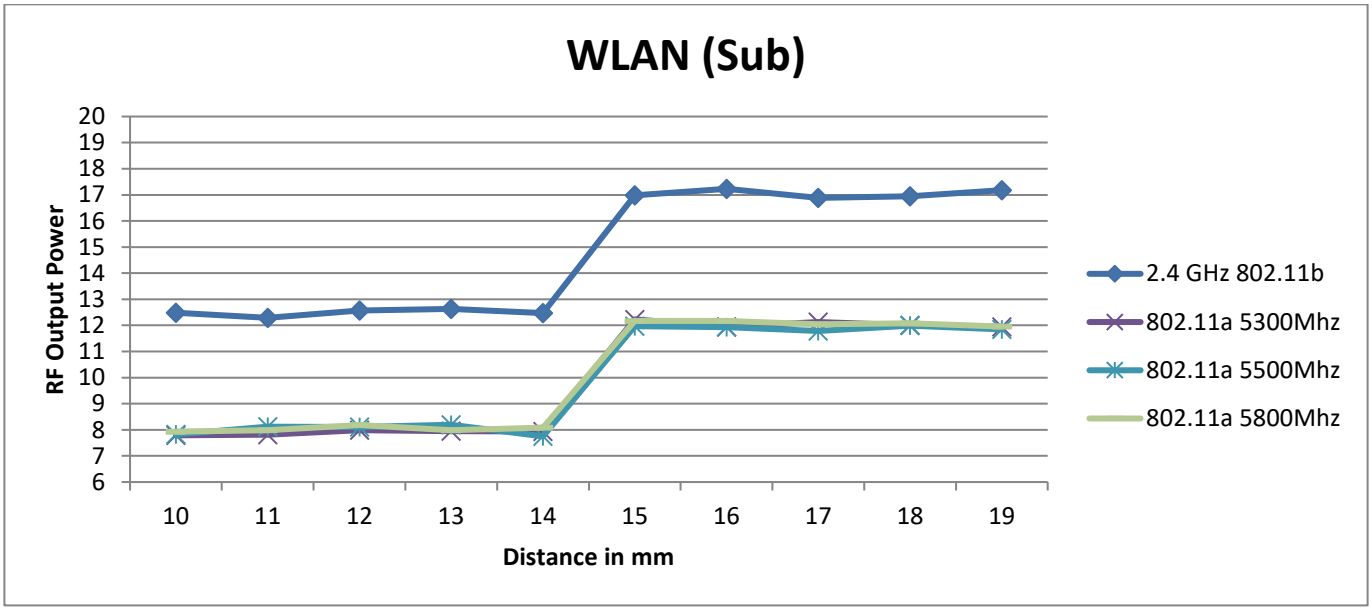
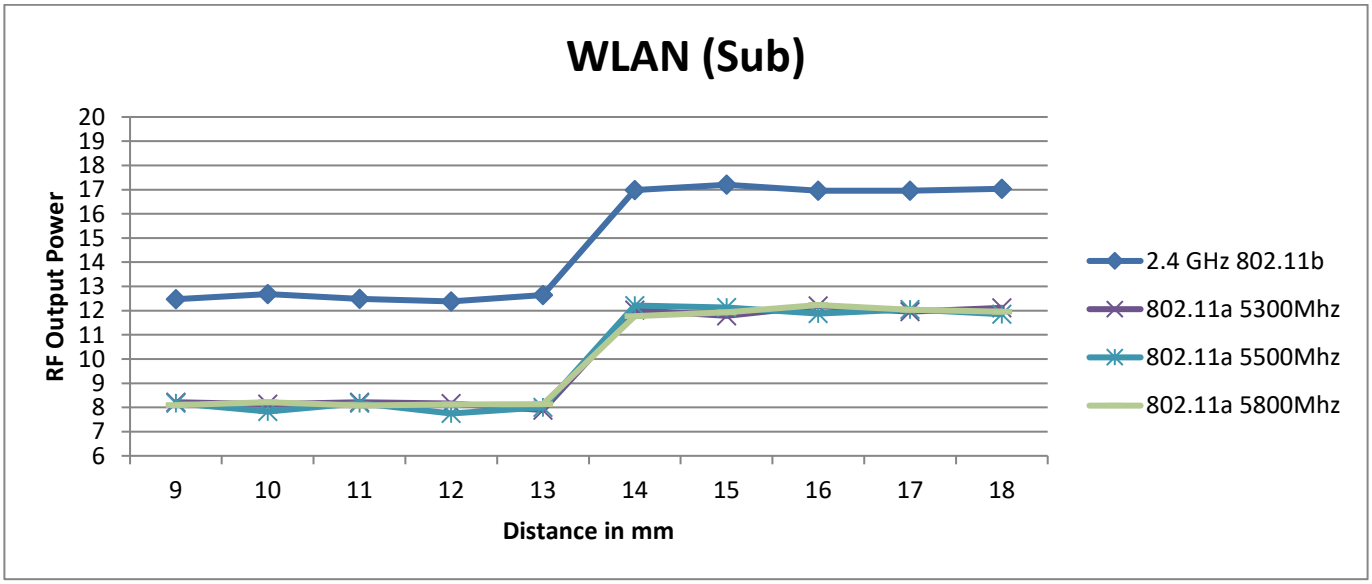
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm											
Antenna	Distance	10	11	12	13	14	15	16	17	18	19
Ant 2	2.4 GHz 802.11b	12.5	12.3	12.6	12.6	12.5	17.0	17.2	16.9	17.0	17.2
	802.11a 5300Mhz	7.8	7.8	8.0	8.0	7.9	12.2	12.0	12.1	12.0	12.0
	802.11a 5500Mhz	7.8	8.1	8.1	8.2	7.8	12.0	11.9	11.8	12.0	11.9
	802.11a 5800Mhz	7.9	8.0	8.2	8.0	8.1	12.2	12.2	12.0	12.1	12.0



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

Distance to DUT vs. Output Power in dBm											
Antenna	Distance (mm)	9	10	11	12	13	14	15	16	17	18
Ant 2	2.4 GHz 802.11b	12.5	12.7	12.5	12.4	12.7	17.0	17.2	17.0	17.0	17.0
	802.11a 5300Mhz	8.2	8.1	8.2	8.2	7.9	12.0	11.8	12.2	12.0	12.1
	802.11a 5500Mhz	8.2	7.8	8.2	7.8	8.0	12.2	12.1	11.9	12.1	11.9
	802.11a 5800Mhz	8.1	8.2	8.1	8.1	8.1	11.8	11.9	12.2	12.0	12.0



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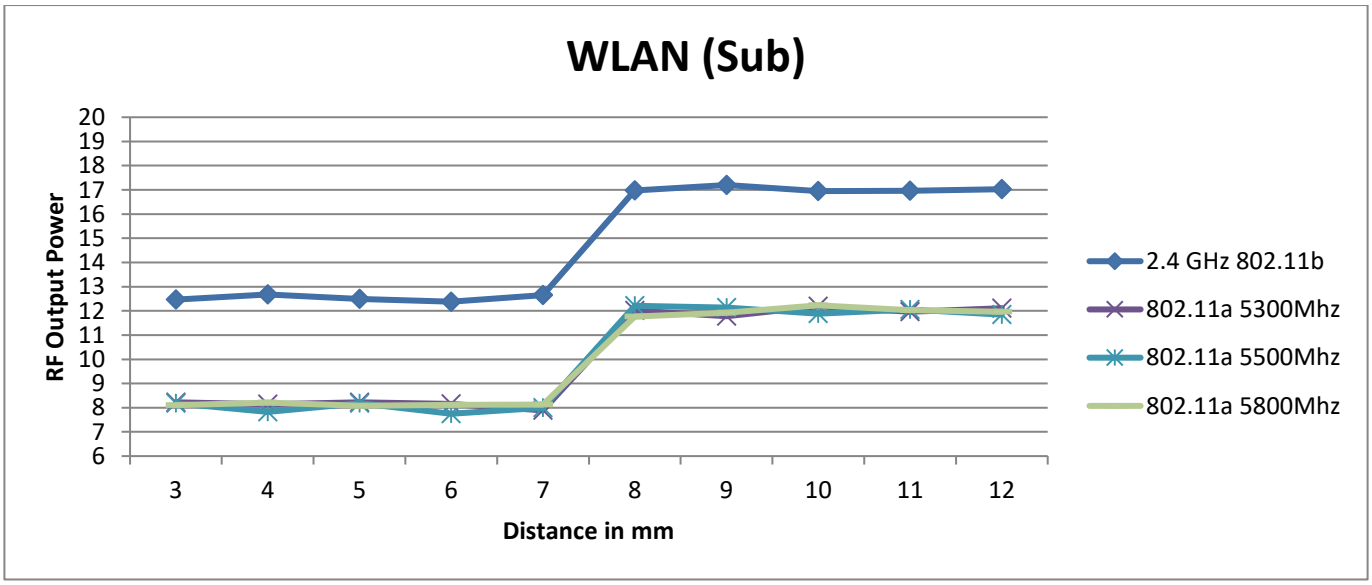
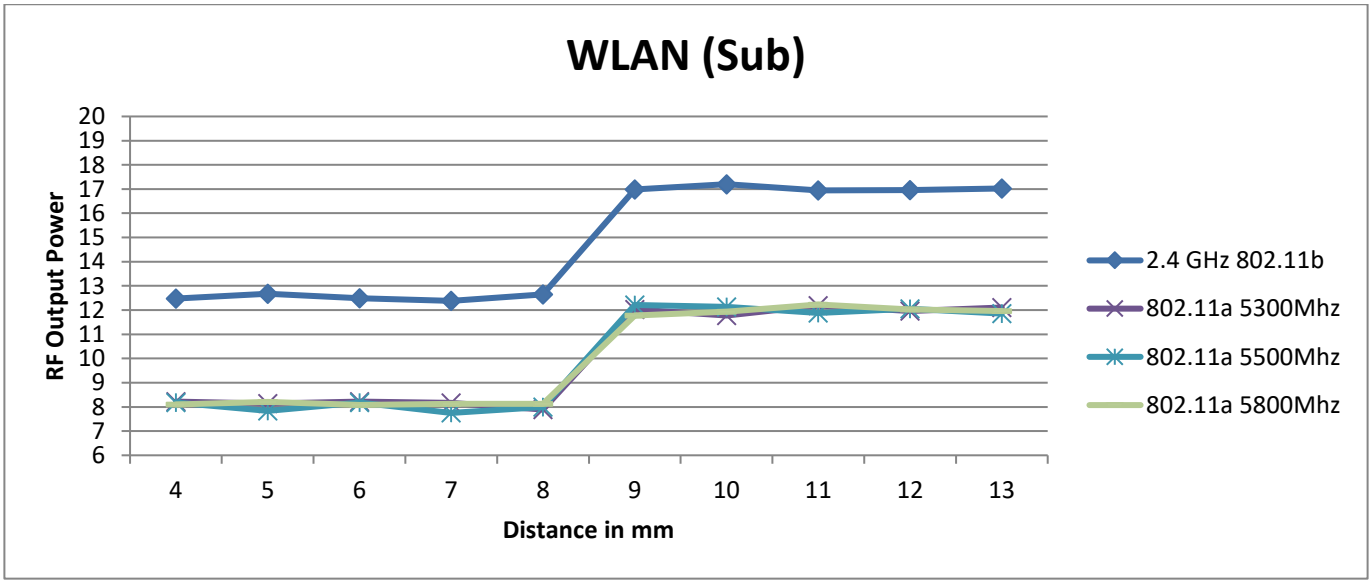
Edge 4, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm											
Antenna	Distance (mm)	3	4	5	6	7	8	9	10	11	12
Ant 2	2.4 GHz 802.11b	12.6	12.4	12.5	12.6	12.6	17.1	17.1	16.8	17.2	16.8
	802.11a 5300Mhz	7.9	7.8	8.1	8.1	8.2	12.0	12.0	12.2	12.1	12.0
	802.11a 5500Mhz	7.8	8.3	8.1	8.0	8.1	12.2	11.8	12.1	11.9	12.0
	802.11a 5800Mhz	8.1	8.0	7.9	8.2	7.8	12.1	11.9	12.2	12.1	11.9



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

Distance to DUT vs. Output Power in dBm											
Antenna	Distance (mm)	4	5	6	7	8	9	10	11	12	13
Ant 2	2.4 GHz 802.11b	12.4	12.5	12.6	12.7	12.5	16.9	17.1	17.2	17.2	17.2
	802.11a 5300Mhz	8.0	7.8	8.1	7.9	8.2	11.9	11.8	11.9	11.9	12.0
	802.11a 5500Mhz	8.1	8.2	8.1	8.2	8.1	12.0	11.9	11.8	12.1	12.0
	802.11a 5800Mhz	8.2	8.2	8.2	7.9	8.1	11.8	11.8	12.1	11.8	11.9



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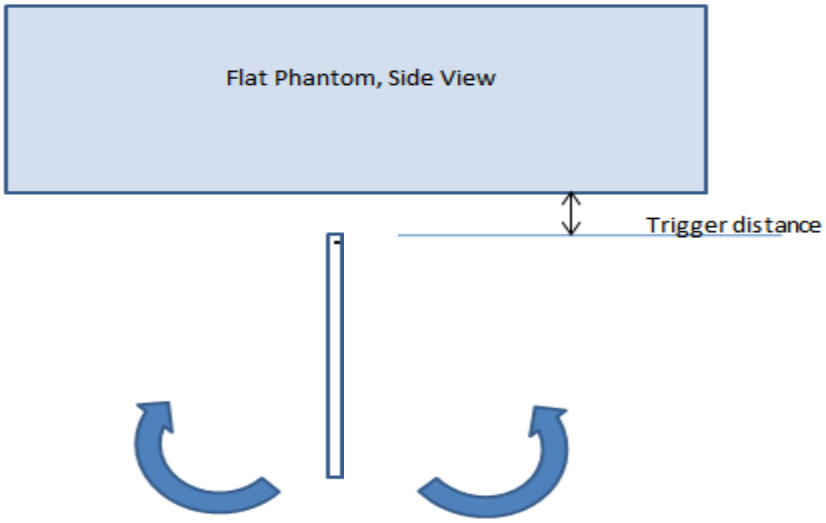
6.6.2 Proximity Sensor Coverage (KDB 616217 §6.3)

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

6.6.3 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, Edge 2, Edge 4 parallel to the base of the flat phantom for each band.

The EUT was rotated about Edge 1, Edge 2, Edge 4 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, Edge 2, Edge 4) KDB 616217 §6.4

Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering (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	22 mm	22 mm	On	On	On	On	On	On	On	On	On	On	On
850	22 mm	22 mm	On	On	On	On	On	On	On	On	On	On	On
1750	22 mm	22 mm	On	On	On	On	On	On	On	On	On	On	On
1900	22 mm	22 mm	On	On	On	On	On	On	On	On	On	On	On
2450	13 mm	13 mm	On	On	On	On	On	On	On	On	On	On	On
5000	13 mm	13 mm	On	On	On	On	On	On	On	On	On	On	On

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Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering (Edge 2)

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°
2450	8 mm	8 mm	On	On	On	On	On	On	On	On	On	On	On
5000	8 mm	8 mm	On	On	On	On	On	On	On	On	On	On	On

Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering (Edge 4)

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°
2450	7 mm	7 mm	On	On	On	On	On	On	On	On	On	On	On
5000	7 mm	7 mm	On	On	On	On	On	On	On	On	On	On	On

6.6.4 Resulting test positions for SAR measurements

Wireless technologies	Position	§6.6.1 Triggering Distance	§6.6.2 Coverage	§6.6.3 Tilt Angle	Worst case distance for SAR
WWAN	Rear	17 mm	N/A	N/A	16 mm
	Edge 1	22 mm	N/A	22 mm	21 mm
WLAN	Rear	14 mm	N/A	N/A	13 mm
	Edge 1	13 mm	N/A	13 mm	12 mm
	Edge 2	8 mm	N/A	8 mm	7 mm
	Edge 4	7 mm	N/A	7 mm	6 mm
	Corner A	9 mm	N/A	N/A	8 mm
	Corner B	8 mm	N/A	N/A	7 mm

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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 4 Slots	848.8	30.00	500	0	0	46	242	46		92.1 -MEASURE-	92.1 -MEASURE-	10 -MEASURE-	> 50 mm	10 -MEASURE-	
Cellular	GPRS 2 Slots	1909.8	28.00	158	0	0	46	242	46		43.7 -MEASURE-	43.7 -MEASURE-	4.7 -MEASURE-	> 50 mm	4.7 -MEASURE-	
Cellular	W-CDMA 5	846.6	24.50	282	0	0	46	242	46		51.9 -MEASURE-	51.9 -MEASURE-	5.6 -MEASURE-	> 50 mm	5.6 -MEASURE-	
Cellular	W-CDMA 4	1752.6	24.50	282	0	0	46	242	46		74.7 -MEASURE-	74.7 -MEASURE-	8.1 -MEASURE-	> 50 mm	8.1 -MEASURE-	
Cellular	W-CDMA 2	1907.6	24.50	282	0	0	46	242	46		77.9 -MEASURE-	77.9 -MEASURE-	8.5 -MEASURE-	> 50 mm	8.5 -MEASURE-	
Cellular	LTE Band 2	1900	24.50	282	0	0	46	242	46		77.7 -MEASURE-	77.7 -MEASURE-	8.5 -MEASURE-	> 50 mm	8.5 -MEASURE-	
Cellular	LTE Band 4	1745	24.50	282	0	0	46	242	46		74.5 -MEASURE-	74.5 -MEASURE-	8.1 -MEASURE-	> 50 mm	8.1 -MEASURE-	
Cellular	LTE Band 5	844	24.50	282	0	0	46	242	46		51.8 -MEASURE-	51.8 -MEASURE-	5.6 -MEASURE-	> 50 mm	5.6 -MEASURE-	
Cellular	LTE Band 12	711	24.50	282	0	0	46	242	46		47.6 -MEASURE-	47.6 -MEASURE-	5.2 -MEASURE-	> 50 mm	5.2 -MEASURE-	
Cellular	LTE Band 17	710	24.50	282	0	0	46	242	46		47.5 -MEASURE-	47.5 -MEASURE-	5.2 -MEASURE-	> 50 mm	5.2 -MEASURE-	
Cellular	LTE Band 66	1770	24.50	282	0	0	46	242	46		75 -MEASURE-	75 -MEASURE-	8.2 -MEASURE-	> 50 mm	8.2 -MEASURE-	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 3 Slots	848.8	21.50	53	0	0					9.8 -MEASURE-	9.8 -MEASURE-				
Cellular	GPRS 2 Slots	1909.8	20.50	28	0	0					7.7 -MEASURE-	7.7 -MEASURE-				
Cellular	W-CDMA 5	846.6	17.00	50	0	0					9.2 -MEASURE-	9.2 -MEASURE-				
Cellular	W-CDMA 4	1752.6	14.00	25	0	0					6.6 -MEASURE-	6.6 -MEASURE-				
Cellular	W-CDMA 2	1907.6	14.00	25	0	0					6.9 -MEASURE-	6.9 -MEASURE-				
Cellular	LTE Band 2	1900	14.50	28	0	0					7.7 -MEASURE-	7.7 -MEASURE-				
Cellular	LTE Band 4	1745	14.00	25	0	0					6.6 -MEASURE-	6.6 -MEASURE-				
Cellular	LTE Band 5	844	17.00	50	0	0					9.2 -MEASURE-	9.2 -MEASURE-				
Cellular	LTE Band 12	711	18.50	71	0	0					12 -MEASURE-	12 -MEASURE-				
Cellular	LTE Band 17	710	18.50	71	0	0					12 -MEASURE-	12 -MEASURE-				
Cellular	LTE Band 66	1770	14.00	25	0	0					6.7 -MEASURE-	6.7 -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 4 Slots	848.8	30.00	500	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	1249.3 mW -EXEMPT-	< 50 mm	
Cellular	GPRS 2 Slots	1909.8	28.00	158	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	2028.5 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 5	846.6	24.50	282	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	1246.7 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 4	1752.6	24.50	282	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	2033.3 mW -EXEMPT-	< 50 mm	
Cellular	W-CDMA 2	1907.6	24.50	282	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	2028.6 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 2	1900	24.50	282	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	2028.8 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 4	1745	24.50	282	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	2033.6 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 5	844	24.50	282	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	1243.6 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 12	711	24.50	282	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	1088 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 17	710	24.50	282	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	1086.8 mW -EXEMPT-	< 50 mm	
Cellular	LTE Band 66	1770	24.50	282	0	0	46	242	46		< 50 mm	< 50 mm	< 50 mm	2032.7 mW -EXEMPT-	< 50 mm	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 3 Slots	848.8	21.50	53	0	0					< 50 mm	< 50 mm				
Cellular	GPRS 2 Slots	1909.8	20.50	28	0	0					< 50 mm	< 50 mm				
Cellular	W-CDMA 5	846.6	17.00	50	0	0					< 50 mm	< 50 mm				
Cellular	W-CDMA 4	1752.6	14.00	25	0	0					< 50 mm	< 50 mm				
Cellular	W-CDMA 2	1907.6	14.00	25	0	0					< 50 mm	< 50 mm				
Cellular	LTE Band 2	1900	14.50	28	0	0					< 50 mm	< 50 mm				
Cellular	LTE Band 4	1745	14.00	25	0	0					< 50 mm	< 50 mm				
Cellular	LTE Band 5	844	17.00	50	0	0					< 50 mm	< 50 mm				
Cellular	LTE Band 12	711	18.50	71	0	0					< 50 mm	< 50 mm				
Cellular	LTE Band 17	710	18.50	71	0	0					< 50 mm	< 50 mm				
Cellular	LTE Band 66	1770	14.00	25	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 Max

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	19.00	79	0	0	0	242	110		24.8 -MEASURE-	24.8 -MEASURE-	24.8 -MEASURE-	> 50 mm	> 50 mm	
Wi-Fi 5.3 GHz	5320	14.50	28	0	0	0	242	110		12.9 -MEASURE-	12.9 -MEASURE-	12.9 -MEASURE-	> 50 mm	> 50 mm	
Wi-Fi 5.5 GHz	5700	13.00	20	0	0	0	242	110		9.5 -MEASURE-	9.5 -MEASURE-	9.5 -MEASURE-	> 50 mm	> 50 mm	
Wi-Fi 5.8 GHz	5825	14.50	28	0	0	0	242	110		13.5 -MEASURE-	13.5 -MEASURE-	13.5 -MEASURE-	> 50 mm	> 50 mm	
Bluetooth	2480	9.00	8	0	0	0	242	110		2.5 -EXEMPT-	2.5 -EXEMPT-	2.5 -EXEMPT-	> 50 mm	> 50 mm	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	18.00	63	0	0	110	242	0		19.8 -MEASURE-	19.8 -MEASURE-	> 50 mm	> 50 mm	19.8 -MEASURE-	
Wi-Fi 5.3 GHz	5320	13.00	20	0	0	110	242	0		9.2 -MEASURE-	9.2 -MEASURE-	> 50 mm	> 50 mm	9.2 -MEASURE-	
Wi-Fi 5.5 GHz	5700	13.00	20	0	0	110	242	0		9.5 -MEASURE-	9.5 -MEASURE-	> 50 mm	> 50 mm	9.5 -MEASURE-	
Wi-Fi 5.8 GHz	5825	13.00	20	0	0	110	242	0		9.7 -MEASURE-	9.7 -MEASURE-	> 50 mm	> 50 mm	9.7 -MEASURE-	

SISO Reduce

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	0		110		6.9 -MEASURE-	6.9 -MEASURE-	6.9 -MEASURE-		> 50 mm	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	0		110		3.7 -MEASURE-	3.7 -MEASURE-	3.7 -MEASURE-		> 50 mm	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	0		110		3.8 -MEASURE-	3.8 -MEASURE-	3.8 -MEASURE-		> 50 mm	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	0		110		3.9 -MEASURE-	3.9 -MEASURE-	3.9 -MEASURE-		> 50 mm	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	110		0		6.9 -MEASURE-	6.9 -MEASURE-	> 50 mm		6.9 -MEASURE-	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	110		0		3.7 -MEASURE-	3.7 -MEASURE-	> 50 mm		3.7 -MEASURE-	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	110		0		3.8 -MEASURE-	3.8 -MEASURE-	> 50 mm		3.8 -MEASURE-	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	110		0		3.9 -MEASURE-	3.9 -MEASURE-	> 50 mm		3.9 -MEASURE-	

MIMO Max

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	14.00	25	0	0	0	242	110		7.8 -MEASURE-	7.8 -MEASURE-	7.8 -MEASURE-	> 50 mm	> 50 mm	
Wi-Fi 5.3 GHz	5320	12.00	16	0	0	0	242	110		7.4 -MEASURE-	7.4 -MEASURE-	7.4 -MEASURE-	> 50 mm	> 50 mm	
Wi-Fi 5.5 GHz	5700	12.00	16	0	0	0	242	110		7.6 -MEASURE-	7.6 -MEASURE-	7.6 -MEASURE-	> 50 mm	> 50 mm	
Wi-Fi 5.8 GHz	5825	12.00	16	0	0	0	242	110		7.7 -MEASURE-	7.7 -MEASURE-	7.7 -MEASURE-	> 50 mm	> 50 mm	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	14.00	25	0	0	110	242	0		7.8 -MEASURE-	7.8 -MEASURE-	> 50 mm	> 50 mm	7.8 -MEASURE-	
Wi-Fi 5.3 GHz	5320	12.00	16	0	0	110	242	0		7.4 -MEASURE-	7.4 -MEASURE-	> 50 mm	> 50 mm	7.4 -MEASURE-	
Wi-Fi 5.5 GHz	5700	12.00	16	0	0	110	242	0		7.6 -MEASURE-	7.6 -MEASURE-	> 50 mm	> 50 mm	7.6 -MEASURE-	
Wi-Fi 5.8 GHz	5825	12.00	16	0	0	110	242	0		7.7 -MEASURE-	7.7 -MEASURE-	> 50 mm	> 50 mm	7.7 -MEASURE-	

MIMO Max

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	0		110		6.9 -MEASURE-	6.9 -MEASURE-	6.9 -MEASURE-		> 50 mm	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	0		110		3.7 -MEASURE-	3.7 -MEASURE-	3.7 -MEASURE-		> 50 mm	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	0		110		3.8 -MEASURE-	3.8 -MEASURE-	3.8 -MEASURE-		> 50 mm	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	0		110		3.9 -MEASURE-	3.9 -MEASURE-	3.9 -MEASURE-		> 50 mm	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	110		0		6.9 -MEASURE-	6.9 -MEASURE-	> 50 mm		6.9 -MEASURE-	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	110		0		3.7 -MEASURE-	3.7 -MEASURE-	> 50 mm		3.7 -MEASURE-	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	110		0		3.8 -MEASURE-	3.8 -MEASURE-	> 50 mm		3.8 -MEASURE-	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	110		0		3.9 -MEASURE-	3.9 -MEASURE-	> 50 mm		3.9 -MEASURE-	

Note(s):

1. According to KDB 447498, if the calculated threshold value is >3 then SAR testing is required.
2. For Standalone exposure condition, Bluetooth SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

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Antennas > 50mm to adjacent edges

SISO Max

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	19.00	79	0	0	0	242	110		< 50 mm	< 50 mm	< 50 mm	2015.6 mW -EXEMPT-	695.6 mW -EXEMPT-	
Wi-Fi 5.3 GHz	5320	14.50	28	0	0	0	242	110		< 50 mm	< 50 mm	< 50 mm	1985 mW -EXEMPT-	665 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	13.00	20	0	0	0	242	110		< 50 mm	< 50 mm	< 50 mm	1982.8 mW -EXEMPT-	662.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	14.50	28	0	0	0	242	110		< 50 mm	< 50 mm	< 50 mm	1982.2 mW -EXEMPT-	662.2 mW -EXEMPT-	
Bluetooth	2480	9.00	8	0	0	0	242	110		< 50 mm	< 50 mm	< 50 mm	2015.3 mW -EXEMPT-	695.3 mW -EXEMPT-	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	18.00	63	0	0	110	242	0		< 50 mm	< 50 mm	695.6 mW -EXEMPT-	2015.6 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.3 GHz	5320	13.00	20	0	0	110	242	0		< 50 mm	< 50 mm	665 mW -EXEMPT-	1985 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.5 GHz	5700	13.00	20	0	0	110	242	0		< 50 mm	< 50 mm	662.8 mW -EXEMPT-	1982.8 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.8 GHz	5825	13.00	20	0	0	110	242	0		< 50 mm	< 50 mm	662.2 mW -EXEMPT-	1982.2 mW -EXEMPT-	< 50 mm	

SISO Reduce

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	0		110		< 50 mm	< 50 mm	< 50 mm		695.6 mW -EXEMPT-	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	0		110		< 50 mm	< 50 mm	< 50 mm		665 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	0		110		< 50 mm	< 50 mm	< 50 mm		662.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	0		110		< 50 mm	< 50 mm	< 50 mm		662.2 mW -EXEMPT-	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	110		0		< 50 mm	< 50 mm	695.6 mW -EXEMPT-		< 50 mm	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	110		0		< 50 mm	< 50 mm	665 mW -EXEMPT-		< 50 mm	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	110		0		< 50 mm	< 50 mm	662.8 mW -EXEMPT-		< 50 mm	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	110		0		< 50 mm	< 50 mm	662.2 mW -EXEMPT-		< 50 mm	

MIMO Max

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	14.00	25	0	0	0	242	110		< 50 mm	< 50 mm	< 50 mm	2015.6 mW -EXEMPT-	695.6 mW -EXEMPT-	
Wi-Fi 5.3 GHz	5320	12.00	16	0	0	0	242	110		< 50 mm	< 50 mm	< 50 mm	1985 mW -EXEMPT-	665 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	12.00	16	0	0	0	242	110		< 50 mm	< 50 mm	< 50 mm	1982.8 mW -EXEMPT-	662.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	12.00	16	0	0	0	242	110		< 50 mm	< 50 mm	< 50 mm	1982.2 mW -EXEMPT-	662.2 mW -EXEMPT-	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	14.00	25	0	0	110	242	0		< 50 mm	< 50 mm	695.6 mW -EXEMPT-	2015.6 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.3 GHz	5320	12.00	16	0	0	110	242	0		< 50 mm	< 50 mm	665 mW -EXEMPT-	1985 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.5 GHz	5700	12.00	16	0	0	110	242	0		< 50 mm	< 50 mm	662.8 mW -EXEMPT-	1982.8 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.8 GHz	5825	12.00	16	0	0	110	242	0		< 50 mm	< 50 mm	662.2 mW -EXEMPT-	1982.2 mW -EXEMPT-	< 50 mm	

MIMO Max

Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
		dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	0		110		< 50 mm	< 50 mm	< 50 mm		695.6 mW -EXEMPT-	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	0		110		< 50 mm	< 50 mm	< 50 mm		665 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	0		110		< 50 mm	< 50 mm	< 50 mm		662.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	0		110		< 50 mm	< 50 mm	< 50 mm		662.2 mW -EXEMPT-	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	110		0		< 50 mm	< 50 mm	695.6 mW -EXEMPT-		< 50 mm	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	110		0		< 50 mm	< 50 mm	665 mW -EXEMPT-		< 50 mm	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	110		0		< 50 mm	< 50 mm	662.8 mW -EXEMPT-		< 50 mm	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	110		0		< 50 mm	< 50 mm	662.2 mW -EXEMPT-		< 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.
2. For Standalone exposure condition, Bluetooth SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

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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)	Corner A Note 2	Corner B Note 3
GSM 850	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	No	No	No		
GSM 1900	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	No	No	No		
W-CDMA Band II	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	No	No	No		
W-CDMA Band IV	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	No	No	No		
W-CDMA Band V	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	No	No	No		
LTE Band 2	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	No	No	No		
LTE Band 4	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	No	No	No		
LTE Band 5	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	No	No	No		
LTE Band 12	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		
LTE Band 66	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	No	No	No		
Wi-Fi 2.4 GHz (Ant 1)	OFF	Yes	Yes	Yes	No	No	Yes	No
	ON	Yes	Yes	Yes	No	No	Yes	No
Wi-Fi 5 GHz (Ant 1)	OFF	Yes	Yes	Yes	No	No	Yes	No
	ON	Yes	Yes	Yes	No	No	Yes	No
Wi-Fi 2.4 GHz (Ant 2)	OFF	Yes	Yes	No	No	Yes	No	Yes
	ON	Yes	Yes	No	No	Yes	No	Yes
Wi-Fi 5 GHz (Ant 2)	OFF	Yes	Yes	No	No	Yes	No	Yes
	ON	Yes	Yes	No	No	Yes	No	Yes
Wi-Fi 2.4 GHz (MIMO)	OFF	Yes	Yes	Yes	No	Yes	Yes	Yes
	ON	Yes	Yes	Yes	No	Yes	Yes	Yes
Wi-Fi 5 GHz (MIMO)	OFF	Yes	Yes	Yes	No	Yes	Yes	Yes
	ON	Yes	Yes	Yes	No	Yes	Yes	Yes
Bluetooth	OFF	Yes	Yes	Yes	No	No	No	No

Note(s):

1. Yes = Testing is required. No = Testing is not required.
2. Corner A side is located between Edge 1 and Edge 2.
3. Corner B side is located between Edge 1 and Edge 4.
4. For Corner A and Corner B, Additional Corner side tests are evaluated for bands that support reduced power due to proximity sensor operation.

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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	
	ε_r	σ (S/m)
150	52.3	0.76
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
915	41.5	0.98
1450	40.5	1.20
1610	40.3	1.29
1800 – 2000	40.0	1.40
2450	39.2	1.80
3000	38.5	2.40
5000	36.2	4.45
5100	36.1	4.55
5200	36.0	4.66
5300	35.9	4.76
5400	35.8	4.86
5500	35.6	4.96
5600	35.5	5.07
5700	35.4	5.17
5800	35.3	5.27

SAR test were performed in All RF exposure conditions using Head tissue according to TCB workshop note of April. 2019.

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 ±(%)
1-28-2020	Head 1750	e'	41.4600	Relative Permittivity (ε_r):	41.46	40.08	3.43	5
		e''	13.5800	Conductivity (σ):	1.32	1.37	-3.47	5
	Head 1710	e'	41.5200	Relative Permittivity (ε_r):	41.52	40.15	3.42	5
		e''	13.6900	Conductivity (σ):	1.30	1.35	-3.32	5
	Head 1755	e'	41.4600	Relative Permittivity (ε_r):	41.46	40.08	3.45	5
		e''	13.5700	Conductivity (σ):	1.32	1.37	-3.47	5
1-28-2020	Head 1900	e'	41.3500	Relative Permittivity (ε_r):	41.35	40.00	3.38	5
		e''	13.4400	Conductivity (σ):	1.42	1.40	1.42	5
	Head 1850	e'	41.4100	Relative Permittivity (ε_r):	41.41	40.00	3.52	5
		e''	13.4300	Conductivity (σ):	1.38	1.40	-1.32	5
	Head 1910	e'	41.3400	Relative Permittivity (ε_r):	41.34	40.00	3.35	5
		e''	13.4500	Conductivity (σ):	1.43	1.40	2.03	5
1-29-2020	Head 835	e'	42.6600	Relative Permittivity (ε_r):	42.66	41.50	2.80	5
		e''	20.2100	Conductivity (σ):	0.94	0.90	4.26	5
	Head 820	e'	42.6900	Relative Permittivity (ε_r):	42.69	41.60	2.61	5
		e''	20.4600	Conductivity (σ):	0.93	0.90	3.83	5
	Head 850	e'	42.6300	Relative Permittivity (ε_r):	42.63	41.50	2.72	5
		e''	19.9700	Conductivity (σ):	0.94	0.92	3.15	5
1-30-2020	Head 1750	e'	39.7900	Relative Permittivity (ε_r):	39.79	40.08	-0.73	5
		e''	13.5000	Conductivity (σ):	1.31	1.37	-4.04	5
	Head 1710	e'	39.5800	Relative Permittivity (ε_r):	39.58	40.15	-1.41	5
		e''	13.4800	Conductivity (σ):	1.28	1.35	-4.81	5
	Head 1755	e'	39.8200	Relative Permittivity (ε_r):	39.82	40.08	-0.64	5
		e''	13.4900	Conductivity (σ):	1.32	1.37	-4.04	5
1-30-2020	Head 1900	e'	40.0900	Relative Permittivity (ε_r):	40.09	40.00	0.23	5
		e''	13.4900	Conductivity (σ):	1.43	1.40	1.80	5
	Head 1850	e'	40.0500	Relative Permittivity (ε_r):	40.05	40.00	0.12	5
		e''	13.5200	Conductivity (σ):	1.39	1.40	-0.66	5
	Head 1910	e'	40.0800	Relative Permittivity (ε_r):	40.08	40.00	0.20	5
		e''	13.5000	Conductivity (σ):	1.43	1.40	2.41	5
2-3-2020	Head 750	e'	43.3400	Relative Permittivity (ε_r):	43.34	41.96	3.29	5
		e''	20.7400	Conductivity (σ):	0.86	0.89	-3.15	5
	Head 700	e'	43.5100	Relative Permittivity (ε_r):	43.51	42.22	3.06	5
		e''	21.8000	Conductivity (σ):	0.85	0.89	-4.58	5
	Head 790	e'	43.2500	Relative Permittivity (ε_r):	43.25	41.76	3.58	5
		e''	20.0300	Conductivity (σ):	0.88	0.90	-1.82	5
2-3-2020	Head 835	e'	43.1600	Relative Permittivity (ε_r):	43.16	41.50	4.00	5
		e''	19.3000	Conductivity (σ):	0.90	0.90	-0.44	5
	Head 820	e'	43.1900	Relative Permittivity (ε_r):	43.19	41.60	3.82	5
		e''	19.5300	Conductivity (σ):	0.89	0.90	-0.89	5
	Head 850	e'	43.1200	Relative Permittivity (ε_r):	43.12	41.50	3.90	5
		e''	19.0700	Conductivity (σ):	0.90	0.92	-1.50	5
2-3-2020	Head 1750	e'	41.3900	Relative Permittivity (ε_r):	41.39	40.08	3.26	5
		e''	13.7700	Conductivity (σ):	1.34	1.37	-2.12	5
	Head 1710	e'	41.4200	Relative Permittivity (ε_r):	41.42	40.15	3.17	5
		e''	13.8400	Conductivity (σ):	1.32	1.35	-2.26	5
	Head 1755	e'	41.3800	Relative Permittivity (ε_r):	41.38	40.08	3.25	5
		e''	13.7600	Conductivity (σ):	1.34	1.37	-2.12	5
2-3-2020	Head 1900	e'	41.2400	Relative Permittivity (ε_r):	41.24	40.00	3.10	5
		e''	13.5900	Conductivity (σ):	1.44	1.40	2.55	5
	Head 1850	e'	41.3000	Relative Permittivity (ε_r):	41.30	40.00	3.25	5
		e''	13.6200	Conductivity (σ):	1.40	1.40	0.07	5
	Head 1910	e'	41.2200	Relative Permittivity (ε_r):	41.22	40.00	3.05	5
		e''	13.5900	Conductivity (σ):	1.44	1.40	3.09	5

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SAR 1 Room(Continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
2-10-2020	Head 1750	e'	39.9900	Relative Permittivity (ε_r):	39.99	40.08	-0.24	5
		e''	13.9500	Conductivity (σ):	1.36	1.37	-0.84	5
	Head 1710	e'	40.0600	Relative Permittivity (ε_r):	40.06	40.15	-0.21	5
		e''	14.0300	Conductivity (σ):	1.33	1.35	-0.92	5
	Head 1755	e'	39.9800	Relative Permittivity (ε_r):	39.98	40.08	-0.24	5
		e''	13.9300	Conductivity (σ):	1.36	1.37	-0.91	5
2-16-2020	Head 1900	e'	38.6200	Relative Permittivity (ε_r):	38.62	40.00	-3.45	5
		e''	13.8100	Conductivity (σ):	1.46	1.40	4.21	5
	Head 1850	e'	38.7200	Relative Permittivity (ε_r):	38.72	40.00	-3.20	5
		e''	13.8800	Conductivity (σ):	1.43	1.40	1.98	5
	Head 1910	e'	38.5900	Relative Permittivity (ε_r):	38.59	40.00	-3.52	5
		e''	13.8000	Conductivity (σ):	1.47	1.40	4.68	5

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SAR 3 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
2-18-2020	Head 835	e'	42.8400	Relative Permittivity (ε_r):	42.84	41.50	3.23	5
		e''	19.4500	Conductivity (σ):	0.90	0.90	0.34	5
	Head 820	e'	42.8700	Relative Permittivity (ε_r):	42.87	41.60	3.05	5
		e''	19.7100	Conductivity (σ):	0.90	0.90	0.02	5
	Head 850	e'	42.8200	Relative Permittivity (ε_r):	42.82	41.50	3.18	5
		e''	19.2400	Conductivity (σ):	0.91	0.92	-0.62	5
2-18-2020	Head 1900	e'	40.9500	Relative Permittivity (ε_r):	40.95	40.00	2.38	5
		e''	13.7100	Conductivity (σ):	1.45	1.40	3.46	5
	Head 1850	e'	41.0000	Relative Permittivity (ε_r):	41.00	40.00	2.50	5
		e''	13.7200	Conductivity (σ):	1.41	1.40	0.81	5
	Head 1910	e'	40.9300	Relative Permittivity (ε_r):	40.93	40.00	2.33	5
		e''	13.7200	Conductivity (σ):	1.46	1.40	4.08	5
2-21-2020	Head 5250	e'	36.5100	Relative Permittivity (ε_r):	36.51	35.93	1.61	5
		e''	16.1000	Conductivity (σ):	4.70	4.70	-0.05	5
	Head 5260	e'	36.4900	Relative Permittivity (ε_r):	36.49	35.92	1.58	5
		e''	16.1100	Conductivity (σ):	4.71	4.71	-0.01	5
	Head 5600	e'	35.9000	Relative Permittivity (ε_r):	35.90	35.53	1.03	5
		e''	16.3500	Conductivity (σ):	5.09	5.06	0.61	5
	Head 5750	e'	35.6500	Relative Permittivity (ε_r):	35.65	35.36	0.81	5
		e''	16.4600	Conductivity (σ):	5.26	5.21	0.94	5
	Head 5825	e'	35.5200	Relative Permittivity (ε_r):	35.52	35.30	0.62	5
		e''	16.5200	Conductivity (σ):	5.35	5.27	1.53	5
2-24-2020	Head 5250	e'	37.0500	Relative Permittivity (ε_r):	37.05	35.93	3.11	5
		e''	15.9400	Conductivity (σ):	4.65	4.70	-1.04	5
	Head 5260	e'	37.0200	Relative Permittivity (ε_r):	37.02	35.92	3.06	5
		e''	15.9500	Conductivity (σ):	4.66	4.71	-1.01	5
	Head 5600	e'	36.4900	Relative Permittivity (ε_r):	36.49	35.53	2.69	5
		e''	16.1400	Conductivity (σ):	5.03	5.06	-0.68	5
	Head 5750	e'	36.2700	Relative Permittivity (ε_r):	36.27	35.36	2.57	5
		e''	16.2300	Conductivity (σ):	5.19	5.21	-0.47	5
	Head 5825	e'	36.1500	Relative Permittivity (ε_r):	36.15	35.30	2.41	5
		e''	16.2700	Conductivity (σ):	5.27	5.27	-0.01	5
2-27-2020	Head 5250	e'	36.6700	Relative Permittivity (ε_r):	36.67	35.93	2.05	5
		e''	15.6200	Conductivity (σ):	4.56	4.70	-3.03	5
	Head 5260	e'	36.6600	Relative Permittivity (ε_r):	36.66	35.92	2.06	5
		e''	15.6200	Conductivity (σ):	4.57	4.71	-3.05	5
	Head 5600	e'	36.2800	Relative Permittivity (ε_r):	36.28	35.53	2.10	5
		e''	15.8200	Conductivity (σ):	4.93	5.06	-2.65	5
	Head 5750	e'	36.1100	Relative Permittivity (ε_r):	36.11	35.36	2.11	5
		e''	15.9300	Conductivity (σ):	5.09	5.21	-2.31	5
	Head 5825	e'	36.0200	Relative Permittivity (ε_r):	36.02	35.30	2.04	5
		e''	15.9700	Conductivity (σ):	5.17	5.27	-1.85	5
3-4-2020	Head 5250	e'	35.9900	Relative Permittivity (ε_r):	35.99	35.93	0.16	5
		e''	15.5400	Conductivity (σ):	4.54	4.70	-3.53	5
	Head 5260	e'	35.9600	Relative Permittivity (ε_r):	35.96	35.92	0.11	5
		e''	15.5500	Conductivity (σ):	4.55	4.71	-3.49	5
	Head 5600	e'	35.9300	Relative Permittivity (ε_r):	35.93	35.53	1.11	5
		e''	16.0100	Conductivity (σ):	4.99	5.06	-1.48	5
	Head 5750	e'	35.7700	Relative Permittivity (ε_r):	35.77	35.36	1.15	5
		e''	16.1700	Conductivity (σ):	5.17	5.21	-0.84	5
	Head 5825	e'	35.6600	Relative Permittivity (ε_r):	35.66	35.30	1.02	5
		e''	16.1900	Conductivity (σ):	5.24	5.27	-0.50	5

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SAR 4 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
2-17-2020	Head 2450	e'	38.6200	Relative Permittivity (ε_r):	38.62	39.20	-1.48	5
		e"	13.6400	Conductivity (σ):	1.86	1.80	3.23	5
	Head 2400	e'	38.6600	Relative Permittivity (ε_r):	38.66	39.30	-1.62	5
		e"	13.6400	Conductivity (σ):	1.82	1.75	3.91	5
	Head 2480	e'	38.5800	Relative Permittivity (ε_r):	38.58	39.16	-1.49	5
		e"	13.6700	Conductivity (σ):	1.89	1.83	2.87	5
2-20-2020	Head 835	e'	42.4300	Relative Permittivity (ε_r):	42.43	41.50	2.24	5
		e"	19.9300	Conductivity (σ):	0.93	0.90	2.81	5
	Head 820	e'	42.4300	Relative Permittivity (ε_r):	42.43	41.60	1.99	5
		e"	20.1600	Conductivity (σ):	0.92	0.90	2.31	5
	Head 850	e'	42.4200	Relative Permittivity (ε_r):	42.42	41.50	2.22	5
		e"	19.7000	Conductivity (σ):	0.93	0.92	1.76	5
2-20-2020	Head 1900	e'	39.2100	Relative Permittivity (ε_r):	39.21	40.00	-1.98	5
		e"	13.7000	Conductivity (σ):	1.45	1.40	3.38	5
	Head 1850	e'	39.2400	Relative Permittivity (ε_r):	39.24	40.00	-1.90	5
		e"	13.7700	Conductivity (σ):	1.42	1.40	1.18	5
	Head 1910	e'	39.2100	Relative Permittivity (ε_r):	39.21	40.00	-1.98	5
		e"	13.7000	Conductivity (σ):	1.45	1.40	3.93	5
2-26-2020	Head 2450	e'	39.4900	Relative Permittivity (ε_r):	39.49	39.20	0.74	5
		e"	13.7600	Conductivity (σ):	1.87	1.80	4.14	5
	Head 2400	e'	39.5600	Relative Permittivity (ε_r):	39.56	39.30	0.67	5
		e"	13.7400	Conductivity (σ):	1.83	1.75	4.68	5
	Head 2480	e'	39.4500	Relative Permittivity (ε_r):	39.45	39.16	0.73	5
		e"	13.7800	Conductivity (σ):	1.90	1.83	3.70	5
3-2-2020	Head 2450	e'	38.0400	Relative Permittivity (ε_r):	38.04	39.20	-2.96	5
		e"	12.9700	Conductivity (σ):	1.77	1.80	-1.84	5
	Head 2400	e'	38.0700	Relative Permittivity (ε_r):	38.07	39.30	-3.12	5
		e"	12.9900	Conductivity (σ):	1.73	1.75	-1.04	5
	Head 2480	e'	38.0000	Relative Permittivity (ε_r):	38.00	39.16	-2.97	5
		e"	12.9900	Conductivity (σ):	1.79	1.83	-2.25	5

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SAR 5 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
2-17-2020	Head 5250	e'	36.3800	Relative Permittivity (ε_r):	36.38	35.93	1.24	5
		e"	16.3300	Conductivity (σ):	4.77	4.70	1.38	5
	Head 5260	e'	36.3600	Relative Permittivity (ε_r):	36.36	35.92	1.22	5
		e"	16.3400	Conductivity (σ):	4.78	4.71	1.41	5
	Head 5600	e'	35.7800	Relative Permittivity (ε_r):	35.78	35.53	0.69	5
		e"	16.5300	Conductivity (σ):	5.15	5.06	1.72	5
	Head 5750	e'	35.5500	Relative Permittivity (ε_r):	35.55	35.36	0.53	5
		e"	16.6200	Conductivity (σ):	5.31	5.21	1.92	5
	Head 5825	e'	35.4200	Relative Permittivity (ε_r):	35.42	35.30	0.34	5
		e"	16.6700	Conductivity (σ):	5.40	5.27	2.45	5
2-20-2020	Head 5250	e'	35.7000	Relative Permittivity (ε_r):	35.70	35.93	-0.65	5
		e"	15.9100	Conductivity (σ):	4.64	4.70	-1.23	5
	Head 5260	e'	35.6800	Relative Permittivity (ε_r):	35.68	35.92	-0.67	5
		e"	15.9200	Conductivity (σ):	4.66	4.71	-1.19	5
	Head 5600	e'	35.1700	Relative Permittivity (ε_r):	35.17	35.53	-1.02	5
		e"	16.0400	Conductivity (σ):	4.99	5.06	-1.30	5
	Head 5750	e'	34.9400	Relative Permittivity (ε_r):	34.94	35.36	-1.20	5
		e"	16.1300	Conductivity (σ):	5.16	5.21	-1.09	5
	Head 5825	e'	34.8400	Relative Permittivity (ε_r):	34.84	35.30	-1.30	5
		e"	16.1500	Conductivity (σ):	5.23	5.27	-0.74	5
2-23-2020	Head 5250	e'	36.3800	Relative Permittivity (ε_r):	36.38	35.93	1.24	5
		e"	16.3100	Conductivity (σ):	4.76	4.70	1.26	5
	Head 5260	e'	36.3600	Relative Permittivity (ε_r):	36.36	35.92	1.22	5
		e"	16.3200	Conductivity (σ):	4.77	4.71	1.29	5
	Head 5600	e'	35.8100	Relative Permittivity (ε_r):	35.81	35.53	0.78	5
		e"	16.5100	Conductivity (σ):	5.14	5.06	1.59	5
	Head 5750	e'	35.5800	Relative Permittivity (ε_r):	35.58	35.36	0.61	5
		e"	16.6100	Conductivity (σ):	5.31	5.21	1.86	5
	Head 5825	e'	35.4600	Relative Permittivity (ε_r):	35.46	35.30	0.45	5
		e"	16.6500	Conductivity (σ):	5.39	5.27	2.33	5
2-26-2020	Head 5250	e'	35.5200	Relative Permittivity (ε_r):	35.52	35.93	-1.15	5
		e"	15.8700	Conductivity (σ):	4.63	4.70	-1.48	5
	Head 5260	e'	35.4900	Relative Permittivity (ε_r):	35.49	35.92	-1.20	5
		e"	15.8800	Conductivity (σ):	4.64	4.71	-1.44	5
	Head 5600	e'	35.0000	Relative Permittivity (ε_r):	35.00	35.53	-1.50	5
		e"	16.0400	Conductivity (σ):	4.99	5.06	-1.30	5
	Head 5750	e'	34.7700	Relative Permittivity (ε_r):	34.77	35.36	-1.68	5
		e"	16.1200	Conductivity (σ):	5.15	5.21	-1.15	5
	Head 5825	e'	34.6800	Relative Permittivity (ε_r):	34.68	35.30	-1.76	5
		e"	16.1700	Conductivity (σ):	5.24	5.27	-0.62	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 2.5 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 1.4 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
D750V3	1122	2-19-2018	750	1g	8.22
				10g	5.35
D835V2	4d174	1-23-2019	835	1g	9.28
				10g	6.04
D835V2	4d194	7-24-2018	835	1g	9.36
				10g	6.02
D1750V2	1125	2-16-2018	1750	1g	36.50
				10g	19.30
D1900V2	5d190	10-23-2018	1900	1g	39.10
				10g	20.40
D2450V2	960	3-20-2018	2450	1g	53.60
				10g	25.10
D2450V2	939	7-25-2019	2450	1g	53.20
				10g	25.10
D5GHzV2	1184	8-21-2018	5250	1g	81.10
				10g	23.40
			5600	1g	85.00
				10g	24.40
			5750	1g	82.60
				10g	23.70

Note(s):

Refer to Appendix F that mentioned about justification for Extended SAR Dipole Calibrations
(D750(SN : 1122), D835(SN : 4d194), D835(SN : 4d174), D1750(SN : 1125), D1900(SN : 5d190), D2450(SN : 960), D5GHz(SN : 1184))

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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			
1-28-2020	D1750V2	1125	Head	1g	3.47	34.70	36.50	-4.93	
				10g	1.85	18.50	19.30	-4.15	
1-28-2020	D1900V2	5d190	Head	1g	3.69	36.90	39.10	-5.63	1, 2
				10g	1.92	19.20	20.40	-5.88	
1-29-2020	D835V2	4d174	Head	1g	0.91	9.14	9.28	-1.51	
				10g	0.60	5.97	6.04	-1.16	
1-30-2020	D1750V2	1125	Head	1g	3.39	33.90	36.50	-7.12	3, 4
				10g	1.82	18.20	19.30	-5.70	
1-30-2020	D1900V2	5d190	Head	1g	4.04	40.40	39.10	3.32	
				10g	2.09	20.90	20.40	2.45	
2-3-2020	D750V3	1122	Head	1g	0.84	8.37	8.22	1.82	5, 6
				10g	0.56	5.59	5.35	4.49	
2-3-2020	D835V2	4d174	Head	1g	0.94	9.44	9.28	1.72	7, 8
				10g	0.62	6.23	6.04	3.15	
2-3-2020	D1750V2	1125	Head	1g	3.34	33.40	36.50	-8.49	
				10g	1.79	17.90	19.30	-7.25	
2-3-2020	D1900V2	5d190	Head	1g	3.79	37.90	39.10	-3.07	
				10g	1.97	19.70	20.40	-3.43	
2-10-2020	D1750V2	1125	Head	1g	3.59	35.90	36.50	-1.64	
				10g	1.91	19.10	19.30	-1.04	
2-16-2020	D1900V2	5d190	Head	1g	4.02	40.20	39.10	2.81	
				10g	2.09	20.90	20.40	2.45	

SAR 3 Room

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
2-18-2020	D835V2	4d194	Head	1g	0.95	9.54	9.36	1.92	
				10g	0.63	6.34	6.02	5.32	
2-18-2020	D1900V2	5d190	Head	1g	3.96	39.60	39.10	1.28	
				10g	2.07	20.70	20.40	1.47	
2-21-2020	D5GHzV2 (5750)	1184	Head	1g	8.32	83.20	82.60	0.73	
				10g	2.34	23.40	23.70	-1.27	
2-24-2020	D5GHzV2 (5250)	1184	Head	1g	8.05	80.50	81.10	-0.74	
				10g	2.25	22.50	23.40	-3.85	
2-24-2020	D5GHzV2 (5600)	1184	Head	1g	8.23	82.30	85.00	-3.18	
				10g	2.31	23.10	24.40	-5.33	
2-24-2020	D5GHzV2 (5750)	1184	Head	1g	8.22	82.20	82.60	-0.48	
				10g	2.29	22.90	23.70	-3.38	
2-27-2020	D5GHzV2 (5600)	1184	Head	1g	8.20	82.00	85.00	-3.53	9, 10
				10g	2.28	22.80	24.40	-6.56	
3-4-2020	D5GHzV2 (5750)	1184	Head	1g	8.45	84.50	82.60	2.30	
				10g	2.39	23.90	23.70	0.84	

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SAR 4 Room

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
2-17-2020	D2450V2	960	Head	1g	5.52	55.20	53.60	2.99	11, 12
				10g	2.57	25.70	25.10	2.39	
2-20-2020	D835V2	4d194	Head	1g	0.92	9.17	9.36	-2.03	13, 14
				10g	0.60	5.99	6.02	-0.50	
2-20-2020	D1900V2	5d190	Head	1g	3.98	39.80	39.10	1.79	
				10g	2.07	20.70	20.40	1.47	
2-26-2020	D2450V2	960	Head	1g	5.44	54.40	53.60	1.49	
				10g	2.54	25.40	25.10	1.20	
3-2-2020	D2450V2	939	Head	1g	5.09	50.90	53.20	-4.32	15, 16
				10g	2.38	23.80	25.10	-5.18	

SAR 5 Room

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
2-17-2020	D5GHzV2 (5250)	1184	Head	1g	8.39	83.90	81.10	3.45	
				10g	2.38	23.80	23.40	1.71	
2-17-2020	D5GHzV2 (5600)	1184	Head	1g	8.26	82.60	85.00	-2.82	
				10g	2.33	23.30	24.40	-4.51	
2-17-2020	D5GHzV2 (5750)	1184	Head	1g	7.63	76.30	82.60	-7.63	17, 18
				10g	2.17	21.70	23.70	-8.44	
2-20-2020	D5GHzV2 (5250)	1184	Head	1g	8.00	80.00	81.10	-1.36	
				10g	2.28	22.80	23.40	-2.56	
2-20-2020	D5GHzV2 (5600)	1184	Head	1g	9.05	90.50	85.00	6.47	
				10g	2.57	25.70	24.40	5.33	
2-20-2020	D5GHzV2 (5750)	1184	Head	1g	8.45	84.50	82.60	2.30	
				10g	2.41	24.10	23.70	1.69	
2-23-2020	D5GHzV2 (5250)	1184	Head	1g	7.96	79.60	81.10	-1.85	
				10g	2.26	22.60	23.40	-3.42	
2-23-2020	D5GHzV2 (5600)	1184	Head	1g	7.99	79.90	85.00	-6.00	
				10g	2.27	22.70	24.40	-6.97	
2-23-2020	D5GHzV2 (5750)	1184	Head	1g	7.74	77.40	82.60	-6.30	
				10g	2.20	22.00	23.70	-7.17	
2-26-2020	D5GHzV2 (5250)	1184	Head	1g	7.89	78.90	81.10	-2.71	
				10g	2.26	22.60	23.40	-3.42	
2-26-2020	D5GHzV2 (5600)	1184	Head	1g	8.34	83.40	85.00	-1.88	
				10g	2.37	23.70	24.40	-2.87	
2-26-2020	D5GHzV2 (5750)	1184	Head	1g	7.77	77.70	82.60	-5.93	
				10g	2.22	22.20	23.70	-6.33	

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9 Conducted Output Power Measurements

Conducted output power were measured according to guide of both ANSI C63.26-2015 & KDB 971168 D01 Power Meas License Digital System v03r01.

9.1 GSM

Per KDB 941225 D01 3G SAR Procedures:

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

GSM850 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)				Reduced Average Power (dBm) Proximity sensor back-off			
					Measured		Tune-up Limit		Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	128	824.2	32.1	23.1	34.0	25.0	23.4	14.4	24.5	15.5
			190	836.6	32.5	23.5			23.7	14.7		
			251	848.8	32.7	23.6			24.0	14.9		
GPRS (GMSK)	CS1	1	128	824.2	32.3	23.2	34.0	25.0	23.4	14.4	24.5	15.5
			190	836.6	32.5	23.5			23.7	14.6		
			251	848.8	32.8	23.7			24.2	15.2		
		2	128	824.2	30.5	24.4	31.5	25.5	21.2	15.2	22.5	16.5
			190	836.6	30.7	24.7			21.5	15.5		
			251	848.8	31.0	25.0			22.0	16.0		
		3	128	824.2	29.3	25.1	30.5	26.2	20.1	15.8	21.5	**17.2**
			190	836.6	29.4	25.1			20.4	16.1		
			251	848.8	29.8	25.6			20.9	16.6		
		4	128	824.2	28.8	25.7	30.0	**27.0**	18.4	15.3	20.0	17.0
			190	836.6	29.0	26.0			18.9	15.9		
			251	848.8	29.2	26.2			19.2	16.1		
EGPRS (8PSK)	MCS5	1	128	824.2	26.1	17.1	27.0	18.0	22.6	13.6	24.0	15.0
			190	836.6	26.3	17.3			22.8	13.8		
			251	848.8	26.5	17.5			23.3	14.2		
		2	128	824.2	25.0	19.0	26.0	20.0	21.3	15.3	22.5	16.5
			190	836.6	25.2	19.2			21.5	15.5		
			251	848.8	25.4	19.4			22.0	15.9		
		3	128	824.2	23.1	18.8	24.0	19.7	19.0	14.8	20.5	16.2
			190	836.6	23.4	19.1			19.2	14.9		
			251	848.8	23.6	19.4			19.7	15.4		
		4	128	824.2	21.7	18.7	23.0	20.0	17.6	14.5	19.0	16.0
			190	836.6	22.1	19.1			18.0	15.0		
			251	848.8	22.4	19.4			18.2	15.2		

Notes:

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

- GMSK (GPRS) mode with 4 time slots for Max power and 3 time slots for Reduced power, based on the Tune-up Procedure. Refer to §6.3.
- SAR is not required for EGPRS (8PSK) mode because the maximum output power and tune-up limit is ≤ 1/4dB higher than GMSK GPRS or the adjusted SAR of the highest reported SAR of GMSK GPRS is ≤ 1.2W/kg.

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GSM1900 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)				Reduced Average Power (dBm) Proximity sensor back-off			
					Measured		Tune-up Limit		Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	512	1850.2	29.4	20.4	31.0	22.0	21.4	12.4	23.0	14.0
			661	1880.0	29.3	20.2			22.0	13.0		
			810	1909.8	29.0	19.9			22.2	13.2		
GPRS (GMSK)	CS1	1	512	1850.2	29.3	20.3	31.0	22.0	21.4	12.4	23.0	14.0
			661	1880.0	29.3	20.3			22.0	13.0		
			810	1909.8	28.9	19.9			22.2	13.1		
		2	512	1850.2	27.1	21.1	28.0	**22.0**	18.8	12.8	20.5	**14.5**
			661	1880.0	27.1	21.1			19.4	13.4		
			810	1909.8	26.9	20.9			19.6	13.6		
		3	512	1850.2	25.3	21.1	26.0	21.7	17.1	12.8	18.5	14.2
			661	1880.0	25.4	21.2			17.7	13.4		
			810	1909.8	25.3	21.0			17.9	13.6		
		4	512	1850.2	23.0	20.0	24.0	21.0	15.5	12.5	17.0	14.0
			661	1880.0	23.5	20.5			16.2	13.2		
			810	1909.8	23.8	20.8			16.3	13.3		
EGPRS (8PSK)	MCS5	1	512	1850.2	25.4	16.4	25.5	16.5	21.5	12.5	22.5	13.5
			661	1880.0	25.3	16.3			21.6	12.5		
			810	1909.8	25.3	16.2			21.4	12.3		
		2	512	1850.2	23.3	17.3	23.5	17.5	19.3	13.3	20.5	14.5
			661	1880.0	23.3	17.3			19.6	13.6		
			810	1909.8	23.3	17.3			19.8	13.8		
		3	512	1850.2	21.9	17.6	22.5	18.2	17.8	13.6	19.0	14.7
			661	1880.0	22.1	17.9			18.1	13.9		
			810	1909.8	21.9	17.6			18.3	14.0		
		4	512	1850.2	20.9	17.9	21.5	18.5	16.6	13.6	18.0	**15.0**
			661	1880.0	20.9	17.9			16.9	13.9		
			810	1909.8	20.7	17.6			17.3	14.3		

Notes:

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

- GMSK (GPRS) mode with 2 time slots for Max power, based on the Tune-up Procedure. Refer to §6.3.
- SAR is required for GMSK (GPRS) mode with 2 time slots for Reduced power, even if the target power is lower Because GMSK (GPRS) mode is the primary mode for EGPRS (8PSK) mode
- SAR is required for EGPRS (8PSK) mode with 4 time slots for Reduced power, Because EGPRS (8PSK) mode has higher Target than GMSK (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 5 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	11/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs=βhs/βc	30/15			

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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 table C,11.1.3 of 3GPP TS 34.121-1 v13.
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	-
	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-DPDCH	6	8	8	5	0
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	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.

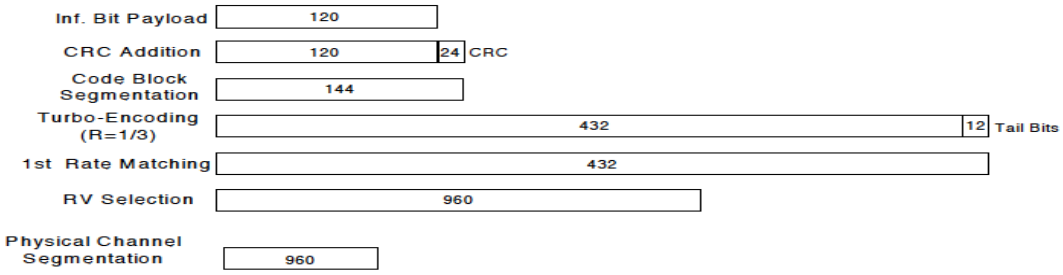

Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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 12			
	Power Control Algorithm	Algorithm2			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	11/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs = βhs/ βc	30/15			

HSPA+

HSPA+ is only support to down link. Therefore, the RF conducted power is not measured.

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WCDMA Band II Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			Reduced Average Power (dBm) Proximity sensor back-off		
				Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	23.1	N/A	24.5	13.1	N/A	14.0
		9400	1880.0	23.0			13.0		
		9538	1907.6	23.1			13.0		
HSDPA	Subtest 1	9262	1852.4	23.2	0	23.5	13.1	0	14.0
		9400	1880.0	23.0			12.9		
		9538	1907.6	23.1			13.0		
	Subtest 2	9262	1852.4	22.8	0	23.5	13.2	0	14.0
		9400	1880.0	22.6			13.0		
		9538	1907.6	22.7			13.1		
	Subtest 3	9262	1852.4	21.8	0.5	23.0	13.3	0	14.0
		9400	1880.0	21.6			13.0		
		9538	1907.6	21.7			13.1		
	Subtest 4	9262	1852.4	21.8	0.5	23.0	13.3	0	14.0
		9400	1880.0	21.6			13.1		
		9538	1907.6	21.7			13.2		
HSUPA	Subtest 1	9262	1852.4	22.3	0	23.5	13.3	0	14.0
		9400	1880.0	22.1			13.1		
		9538	1907.6	22.2			13.2		
	Subtest 2	9262	1852.4	20.8	2	21.5	13.3	0	14.0
		9400	1880.0	20.6			13.2		
		9538	1907.6	20.7			13.3		
	Subtest 3	9262	1852.4	21.8	1	22.5	13.3	0	14.0
		9400	1880.0	21.7			13.2		
		9538	1907.6	21.7			13.2		
	Subtest 4	9262	1852.4	20.8	2	21.5	13.4	0	14.0
		9400	1880.0	20.7			13.3		
		9538	1907.6	20.8			13.3		
	Subtest 5	9262	1852.4	23.2	0	23.5	13.2	0	14.0
		9400	1880.0	23.0			13.0		
		9538	1907.6	23.1			13.1		
DC-HSDPA	Subtest 1	9262	1852.4	22.9	0	23.5	13.2	0	14.0
		9400	1880.0	23.2			13.2		
		9538	1907.6	23.1			13.1		
	Subtest 2	9262	1852.4	22.7	0	23.5	12.9	0	14.0
		9400	1880.0	22.7			13.2		
		9538	1907.6	22.7			13.0		
	Subtest 3	9262	1852.4	21.7	0.5	23.0	13.0	0	14.0
		9400	1880.0	21.7			13.2		
		9538	1907.6	21.7			13.1		
	Subtest 4	9262	1852.4	21.7	0.5	23.0	13.0	0	14.0
		9400	1880.0	21.7			13.2		
		9538	1907.6	21.7			13.2		

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WCDMA Band IV Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			Reduced Average Power (dBm) Proximity sensor back-off		
				Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	1312	1712.4	23.1	N/A	24.5	12.7	N/A	14.0
		1413	1732.6	23.3			12.9		
		1513	1752.6	23.2			12.8		
HSDPA	Subtest 1	1312	1712.4	23.1	0	23.5	12.6	0	14.0
		1413	1732.6	23.3			12.9		
		1513	1752.6	23.2			12.8		
	Subtest 2	1312	1712.4	22.7	0	23.5	12.7	0	14.0
		1413	1732.6	22.9			12.9		
		1513	1752.6	22.9			12.8		
	Subtest 3	1312	1712.4	21.6	0.5	23.0	12.8	0	14.0
		1413	1732.6	21.9			13.0		
		1513	1752.6	21.9			12.9		
	Subtest 4	1312	1712.4	21.7	0.5	23.0	12.8	0	14.0
		1413	1732.6	21.9			13.0		
		1513	1752.6	21.9			12.9		
HSUPA	Subtest 1	1312	1712.4	22.2	0	23.5	12.8	0	14.0
		1413	1732.6	22.5			13.0		
		1513	1752.6	22.5			13.0		
	Subtest 2	1312	1712.4	20.9	2	21.5	12.9	0	14.0
		1413	1732.6	21.1			13.0		
		1513	1752.6	21.0			12.9		
	Subtest 3	1312	1712.4	21.7	1	22.5	12.7	0	14.0
		1413	1732.6	22.0			12.9		
		1513	1752.6	21.9			12.8		
	Subtest 4	1312	1712.4	20.8	2	21.5	12.8	0	14.0
		1413	1732.6	21.1			13.0		
		1513	1752.6	21.0			12.9		
	Subtest 5	1312	1712.4	23.0	0	23.5	12.7	0	14.0
		1413	1732.6	23.3			13.0		
		1513	1752.6	23.3			13.0		
DC-HSDPA	Subtest 1	1312	1712.4	23.0	0	23.5	12.7	0	14.0
		1413	1732.6	23.4			13.0		
		1513	1752.6	23.3			12.9		
	Subtest 2	1312	1712.4	22.6	0	23.5	12.7	0	14.0
		1413	1732.6	22.9			13.0		
		1513	1752.6	22.9			12.8		
	Subtest 3	1312	1712.4	21.6	0.5	23.0	12.7	0	14.0
		1413	1732.6	22.0			13.0		
		1513	1752.6	21.9			12.9		
	Subtest 4	1312	1712.4	21.6	0.5	23.0	12.7	0	14.0
		1413	1732.6	22.0			13.0		
		1513	1752.6	21.9			12.9		

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WCDMA Band V Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			Reduced Average Power (dBm) Proximity sensor back-off		
				Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	4132	826.4	23.3	N/A	24.5	15.8	N/A	17.0
		4183	836.6	23.5			16.0		
		4233	846.6	23.8			16.2		
HSDPA	Subtest 1	4132	826.4	23.3	0	24.0	15.7	0	17.0
		4183	836.6	23.5			16.0		
		4233	846.6	23.7			16.2		
	Subtest 2	4132	826.4	22.9	0	24.0	15.8	0	17.0
		4183	836.6	23.1			16.1		
		4233	846.6	23.2			16.3		
	Subtest 3	4132	826.4	21.8	0.5	23.5	15.8	0.5	16.5
		4183	836.6	22.1			16.1		
		4233	846.6	22.3			16.4		
	Subtest 4	4132	826.4	21.8	0.5	23.5	15.8	0.5	16.5
		4183	836.6	22.0			16.1		
		4233	846.6	22.3			16.4		
HSUPA	Subtest 1	4132	826.4	22.4	0	24.0	16.0	0	17.0
		4183	836.6	22.7			16.1		
		4233	846.6	22.8			16.2		
	Subtest 2	4132	826.4	21.0	2	22.0	16.0	0	17.0
		4183	836.6	21.2			16.3		
		4233	846.6	21.3			16.3		
	Subtest 3	4132	826.4	21.9	1	23.0	16.0	0	17.0
		4183	836.6	22.1			16.2		
		4233	846.6	22.3			16.4		
	Subtest 4	4132	826.4	21.0	2	22.0	16.1	0	17.0
		4183	836.6	21.2			16.3		
		4233	846.6	21.3			16.2		
	Subtest 5	4132	826.4	23.3	0	24.0	16.0	0	17.0
		4183	836.6	23.5			16.1		
		4233	846.6	23.7			15.9		
DC-HSDPA	Subtest 1	4132	826.4	23.4	0	24.0	15.7	0	17.0
		4183	836.6	23.7			16.2		
		4233	846.6	23.7			16.2		
	Subtest 2	4132	826.4	22.8	0	24.0	15.8	0	17.0
		4183	836.6	23.2			16.2		
		4233	846.6	23.1			16.2		
	Subtest 3	4132	826.4	21.7	0.5	23.5	15.9	0.5	16.5
		4183	836.6	22.2			16.2		
		4233	846.6	22.1			16.1		
	Subtest 4	4132	826.4	21.7	0.5	23.5	15.7	0.5	16.5
		4183	836.6	22.2			16.3		
		4233	846.6	22.1			16.2		

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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 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{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
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

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

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

Network Signalling value	Requirements (subclause)	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	N/A

Maximum Output Power (Tune-up Limit) for LTE

According to April 2015 TCB workshop, SAR test exclusion can be applied for testing overlapping LTE bands as follows :

a) The maximum output power, including tolerance, for the smaller band must be ≤ the larger band to qualify for the SAR test exclusion.
b) The channel bandwidth and other operating parameters for the smaller band must be fully supported by the larger band.

- LTE Band 2 (1850 – 1910 MHz) is covered by LTE Band 25 (1850 – 1915 MHz)
- LTE Band 5 (824 – 849 MHz) is covered by LTE Band 26 (814 – 849 MHz)
- LTE Band 4 (1710 – 1755 MHz) is covered by LTE Band 66 (1710 – 1780 MHz)
- LTE Band 17 (704 – 716 MHz) is covered by LTE Band 12 (699 – 716 MHz)
- LTE Band 38 (2570 – 2620 MHz) is covered by LTE Band 41 (2496 – 2690 MHz)

Maximum bandwidth 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.

LTE QPSK configuration has the highest maximum average output power per 3GPP standard.

SAR measurement is not required for Higher order modulations . When the highest maximum output power for Higher order modulations are ≤ 0.5 dB higher than the QPSK or when the reported SAR for QPSK configuration is ≤ 1.45 W/kg.

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LTE Band 2 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm) Proximity sensor back-off				
				Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18700	18900	19100			18700	18900	19100		
				1860 MHz	1880 MHz	1900 MHz			1860 MHz	1880 MHz	1900 MHz		
20 MHz	QPSK	1	0	22.6	22.6	22.7	0.0	24.5	13.6	13.6	13.8	0.0	14.5
		1	49	22.6	22.6	22.6	0.0	24.5	13.4	13.4	13.5	0.0	14.5
		1	99	22.4	22.1	22.6	0.0	24.5	13.3	13.3	13.5	0.0	14.5
		50	0	21.6	21.6	21.6	1.0	23.5	13.5	13.6	13.6	0.0	14.5
		50	24	21.6	21.6	21.6	1.0	23.5	13.3	13.4	13.4	0.0	14.5
		50	50	21.5	21.6	21.6	1.0	23.5	13.3	13.3	13.3	0.0	14.5
		100	0	21.6	21.6	21.6	1.0	23.5	13.3	13.3	13.5	0.0	14.5
	16QAM	1	0	21.5	21.3	21.5	1.0	23.5	13.2	13.4	13.2	0.0	14.5
		1	49	21.5	21.3	21.5	1.0	23.5	13.2	13.3	13.2	0.0	14.5
		1	99	21.4	21.2	21.4	1.0	23.5	13.2	13.4	13.1	0.0	14.5
		50	0	20.5	20.6	20.6	2.0	22.5	13.3	13.4	13.4	0.0	14.5
		50	24	20.5	20.6	20.7	2.0	22.5	13.3	13.3	13.4	0.0	14.5
		50	50	20.5	20.6	20.6	2.0	22.5	13.2	13.3	13.3	0.0	14.5
		100	0	20.5	20.6	20.6	2.0	22.5	13.3	13.4	13.4	0.0	14.5
	64QAM	1	0	20.6	20.8	20.6	2.0	22.5	13.6	13.7	13.6	0.0	14.5
		1	49	20.6	20.8	20.6	2.0	22.5	13.5	13.6	13.5	0.0	14.5
		1	99	20.5	20.7	20.5	2.0	22.5	13.5	13.6	13.4	0.0	14.5
		50	0	19.5	19.6	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		50	24	19.5	19.6	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		50	50	19.5	19.5	19.6	3.0	21.5	13.3	13.4	13.4	0.0	14.5
		100	0	19.5	19.5	19.5	3.0	21.5	13.3	13.4	13.4	0.0	14.5
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18675	18900	19125			18675	18900	19125		
				1857.5 MHz	1880 MHz	1902.5 MHz			1857.5 MHz	1880 MHz	1902.5 MHz		
15 MHz	QPSK	1	0	22.6	22.7	22.6	0.0	24.5	13.5	13.5	13.5	0.0	14.5
		1	37	22.6	22.7	22.6	0.0	24.5	13.4	13.4	13.4	0.0	14.5
		1	74	22.5	22.6	22.5	0.0	24.5	13.4	13.4	13.4	0.0	14.5
		36	0	21.6	21.6	21.6	1.0	23.5	13.4	13.3	13.3	0.0	14.5
		36	20	21.6	21.6	21.6	1.0	23.5	13.3	13.3	13.3	0.0	14.5
		36	39	21.6	21.6	21.6	1.0	23.5	13.3	13.3	13.3	0.0	14.5
		75	0	21.6	21.6	21.6	1.0	23.5	13.3	13.3	13.3	0.0	14.5
	16QAM	1	0	21.7	21.6	21.5	1.0	23.5	13.2	13.2	13.4	0.0	14.5
		1	37	21.7	21.5	21.5	1.0	23.5	13.2	13.2	13.4	0.0	14.5
		1	74	21.6	21.5	21.4	1.0	23.5	13.2	13.1	13.3	0.0	14.5
		36	0	20.6	20.6	20.6	2.0	22.5	13.3	13.3	13.4	0.0	14.5
		36	20	20.5	20.6	20.6	2.0	22.5	13.3	13.3	13.4	0.0	14.5
		36	39	20.5	20.6	20.6	2.0	22.5	13.3	13.3	13.4	0.0	14.5
		75	0	20.6	20.6	20.6	2.0	22.5	13.3	13.3	13.3	0.0	14.5
	64QAM	1	0	20.5	20.6	20.3	2.0	22.5	13.5	13.5	13.3	0.0	14.5
		1	37	20.4	20.6	20.3	2.0	22.5	13.5	13.5	13.3	0.0	14.5
		1	74	20.4	20.5	20.2	2.0	22.5	13.5	13.5	13.2	0.0	14.5
		36	0	19.5	19.6	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		36	20	19.5	19.6	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		36	39	19.4	19.5	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		75	0	19.5	19.5	19.5	3.0	21.5	13.4	13.4	13.4	0.0	14.5
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18650	18900	19150			18650	18900	19150		
				1855 MHz	1880 MHz	1905 MHz			1855 MHz	1880 MHz	1905 MHz		
10 MHz	QPSK	1	0	22.8	22.7	22.6	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		1	25	22.7	22.6	22.5	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		1	49	22.7	22.6	22.5	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		25	0	21.6	21.6	21.6	1.0	23.5	13.3	13.3	13.3	0.0	14.5
		25	12	21.6	21.6	21.6	1.0	23.5	13.3	13.3	13.3	0.0	14.5
		25	25	21.6	21.6	21.5	1.0	23.5	13.3	13.3	13.3	0.0	14.5
		50	0	21.6	21.6	21.5	1.0	23.5	13.3	13.3	13.3	0.0	14.5
	16QAM	1	0	21.5	21.5	21.5	1.0	23.5	13.3	13.2	13.5	0.0	14.5
		1	25	21.5	21.4	21.5	1.0	23.5	13.3	13.2	13.4	0.0	14.5
		1	49	21.5	21.4	21.5	1.0	23.5	13.2	13.2	13.4	0.0	14.5
		25	0	20.7	20.6	20.6	2.0	22.5	13.4	13.4	13.4	0.0	14.5
		25	12	20.6	20.6	20.6	2.0	22.5	13.4	13.4	13.3	0.0	14.5
		25	25	20.6	20.6	20.6	2.0	22.5	13.4	13.4	13.3	0.0	14.5
		50	0	20.5	20.6	20.5	2.0	22.5	13.4	13.4	13.3	0.0	14.5
	64QAM	1	0	20.3	20.6	20.5	2.0	22.5	13.2	13.5	13.4	0.0	14.5
		1	25	20.2	20.6	20.5	2.0	22.5	13.2	13.5	13.4	0.0	14.5
		1	49	20.2	20.6	20.5	2.0	22.5	13.2	13.5	13.4	0.0	14.5
		25	0	19.6	19.6	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		25	12	19.5	19.6	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		25	25	19.5	19.6	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		50	0	19.6	19.5	19.5	3.0	21.5	13.4	13.4	13.4	0.0	14.5

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LTE Band 2 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18650	18900	19150			18650	18900	19150		
				1855 MHz	1880 MHz	1905 MHz			1855 MHz	1880 MHz	1905 MHz		
10 MHz	QPSK	1	0	22.8	22.7	22.6	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		1	25	22.7	22.6	22.5	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		1	49	22.7	22.6	22.5	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		25	0	21.6	21.6	21.6	1.0	23.5	13.3	13.3	13.3	0.0	14.5
		25	12	21.6	21.6	21.6	1.0	23.5	13.3	13.3	13.3	0.0	14.5
		25	25	21.6	21.6	21.5	1.0	23.5	13.3	13.3	13.3	0.0	14.5
		50	0	21.6	21.6	21.5	1.0	23.5	13.3	13.3	13.3	0.0	14.5
	16QAM	1	0	21.5	21.5	21.5	1.0	23.5	13.3	13.2	13.5	0.0	14.5
		1	25	21.5	21.4	21.5	1.0	23.5	13.3	13.2	13.4	0.0	14.5
		1	49	21.5	21.4	21.5	1.0	23.5	13.2	13.2	13.4	0.0	14.5
		25	0	20.7	20.6	20.6	2.0	22.5	13.4	13.4	13.4	0.0	14.5
		25	12	20.6	20.6	20.6	2.0	22.5	13.4	13.4	13.3	0.0	14.5
		25	25	20.6	20.6	20.6	2.0	22.5	13.4	13.4	13.3	0.0	14.5
		50	0	20.5	20.6	20.5	2.0	22.5	13.4	13.4	13.3	0.0	14.5
	64QAM	1	0	20.3	20.6	20.5	2.0	22.5	13.2	13.5	13.4	0.0	14.5
		1	25	20.2	20.6	20.5	2.0	22.5	13.2	13.5	13.4	0.0	14.5
		1	49	20.2	20.6	20.5	2.0	22.5	13.2	13.5	13.4	0.0	14.5
		25	0	19.6	19.6	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		25	12	19.5	19.6	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		25	25	19.5	19.6	19.6	3.0	21.5	13.4	13.4	13.4	0.0	14.5
		50	0	19.6	19.5	19.5	3.0	21.5	13.4	13.4	13.4	0.0	14.5

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18625	18900	19175			18625	18900	19175		
				1852.5 MHz	1880 MHz	1907.5 MHz			1852.5 MHz	1880 MHz	1907.5 MHz		
5 MHz	QPSK	1	0	22.6	22.6	22.6	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		1	12	22.7	22.6	22.6	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		1	24	22.6	22.6	22.6	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		12	0	21.7	21.7	21.6	1.0	23.5	13.4	13.3	13.3	0.0	14.5
		12	7	21.7	21.6	21.6	1.0	23.5	13.4	13.3	13.3	0.0	14.5
		12	13	21.7	21.6	21.6	1.0	23.5	13.4	13.3	13.3	0.0	14.5
		25	0	21.7	21.6	21.6	1.0	23.5	13.4	13.3	13.3	0.0	14.5
	16QAM	1	0	21.4	21.4	21.6	1.0	23.5	13.4	13.1	13.3	0.0	14.5
		1	12	21.4	21.4	21.5	1.0	23.5	13.4	13.1	13.2	0.0	14.5
		1	24	21.4	21.3	21.5	1.0	23.5	13.4	13.1	13.2	0.0	14.5
		12	0	20.8	20.6	20.6	2.0	22.5	13.5	13.3	13.3	0.0	14.5
		12	7	20.7	20.6	20.6	2.0	22.5	13.4	13.3	13.3	0.0	14.5
		12	13	20.7	20.6	20.6	2.0	22.5	13.4	13.3	13.3	0.0	14.5
		25	0	20.7	20.7	20.6	2.0	22.5	13.5	13.3	13.3	0.0	14.5
	64QAM	1	0	20.8	20.4	20.3	2.0	22.5	13.8	13.5	13.2	0.0	14.5
		1	12	20.8	20.4	20.3	2.0	22.5	13.8	13.5	13.1	0.0	14.5
		1	24	20.8	20.4	20.3	2.0	22.5	13.8	13.5	13.1	0.0	14.5
		12	0	19.6	19.6	19.5	3.0	21.5	13.4	13.4	13.2	0.0	14.5
		12	7	19.6	19.6	19.5	3.0	21.5	13.5	13.3	13.2	0.0	14.5
		12	13	19.5	19.5	19.4	3.0	21.5	13.4	13.4	13.2	0.0	14.5
		25	0	19.6	19.5	19.5	3.0	21.5	13.5	13.4	13.3	0.0	14.5

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18615	18900	19185			18615	18900	19185		
				1851.5 MHz	1880 MHz	1908.5 MHz			1851.5 MHz	1880 MHz	1908.5 MHz		
3 MHz	QPSK	1	0	22.8	22.6	22.6	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		1	8	22.8	22.7	22.6	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		1	14	22.8	22.7	22.6	0.0	24.5	13.5	13.4	13.4	0.0	14.5
		8	0	21.8	21.7	21.6	1.0	23.5	13.4	13.3	13.3	0.0	14.5
		8	4	21.8	21.7	21.6	1.0	23.5	13.4	13.3	13.3	0.0	14.5
		8	7	21.8	21.7	21.6	1.0	23.5	13.4	13.3	13.3	0.0	14.5
		15	0	21.7	21.7	21.6	1.0	23.5	13.4	13.3	13.3	0.0	14.5
	16QAM	1	0	21.7	21.5	21.5	1.0	23.5	13.2	13.1	13.2	0.0	14.5
		1	8	21.6	21.5	21.6	1.0	23.5	13.1	13.1	13.2	0.0	14.5
		1	14	21.7	21.5	21.5	1.0	23.5	13.1	13.1	13.2	0.0	14.5
		8	0	20.7	20.7	20.6	2.0	22.5	13.4	13.4	13.4	0.0	14.5
		8	4	20.7	20.7	20.6	2.0	22.5	13.4	13.4	13.3	0.0	14.5
		8	7	20.7	20.7	20.6	2.0	22.5	13.4	13.4	13.3	0.0	14.5
		15	0	20.7	20.7	20.6	2.0	22.5	13.4	13.3	13.3	0.0	14.5
	64QAM	1	0	20.3	20.5	20.3	2.0	22.5	13.3	13.4	13.2	0.0	14.5
		1	8	20.3	20.5	20.3	2.0	22.5	13.2	13.5	13.2	0.0	14.5
		1	14	20.4	20.4	20.3	2.0	22.5	13.3	13.5	13.2	0.0	14.5
		8	0	19.6	19.5	19.5	3.0	21.5	13.3	13.4	13.3	0.0	14.5
		8	4	19.5	19.5	19.5	3.0	21.5	13.4	13.4	13.3	0.0	14.5
		8	7	19.6	19.5	19.5	3.0	21.5	13.3	13.4	13.3	0.0	14.5
		15	0	19.6	19.5	19.5	3.0	21.5	13.5	13.4	13.3	0.0	14.5

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LTE Band 5 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm) Proximity sensor back-off				
				Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				20450	20525	20600			20450	20525	20600		
				829 MHz	836.5 MHz	844 MHz			829 MHz	836.5 MHz	844 MHz		
10 MHz	QPSK	1	0	23.2	23.4	23.6	0.0	24.5	16.2	16.4	16.6	0.0	17.0
		1	25	23.2	23.3	23.6	0.0	24.5	16.1	16.3	16.6	0.0	17.0
		1	49	23.2	23.3	23.5	0.0	24.5	16.1	16.3	16.6	0.0	17.0
		25	0	21.9	22.2	22.6	1.0	23.5	16.0	16.2	16.5	0.0	17.0
		25	12	21.9	22.2	22.6	1.0	23.5	16.0	16.2	16.5	0.0	17.0
		25	25	21.9	22.2	22.5	1.0	23.5	16.0	16.2	16.5	0.0	17.0
		50	0	21.9	22.2	22.5	1.0	23.5	16.0	16.2	16.5	0.0	17.0
	16QAM	1	0	21.9	22.1	22.6	1.0	23.5	16.1	16.0	16.7	0.0	17.0
		1	25	21.9	22.0	22.5	1.0	23.5	16.0	15.9	16.7	0.0	17.0
		1	49	21.8	22.0	22.5	1.0	23.5	16.0	15.9	16.7	0.0	17.0
		25	0	21.0	21.2	21.5	2.0	22.5	16.1	16.2	16.6	0.0	17.0
		25	12	21.0	21.2	21.5	2.0	22.5	16.0	16.2	16.6	0.0	17.0
		25	25	21.0	21.2	21.5	2.0	22.5	16.0	16.2	16.5	0.0	17.0
		50	0	21.0	21.1	21.4	2.0	22.5	16.0	16.2	16.5	0.0	17.0
	64QAM	1	0	21.0	21.1	21.3	2.0	22.5	16.1	16.3	16.5	0.0	17.0
		1	25	21.0	21.1	21.3	2.0	22.5	16.0	16.3	16.5	0.0	17.0
		1	49	21.0	21.0	21.2	2.0	22.5	16.0	16.3	16.4	0.0	17.0
		25	0	19.9	20.2	20.5	3.0	21.5	16.0	16.3	16.6	0.0	17.0
		25	12	19.9	20.2	20.5	3.0	21.5	16.0	16.3	16.6	0.0	17.0
		25	25	19.9	20.2	20.5	3.0	21.5	16.0	16.3	16.6	0.0	17.0
		50	0	20.0	20.2	20.5	3.0	21.5	16.1	16.2	16.5	0.0	17.0
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				20425	20525	20625			20425	20525	20625		
				826.5 MHz	836.5 MHz	846.5 MHz			826.5 MHz	836.5 MHz	846.5 MHz		
5 MHz	QPSK	1	0	23.0	23.3	23.7	0.0	24.5	16.1	16.2	16.5	0.0	17.0
		1	12	23.0	23.3	23.6	0.0	24.5	16.1	16.2	16.5	0.0	17.0
		1	24	23.0	23.2	23.6	0.0	24.5	16.1	16.2	16.5	0.0	17.0
		12	0	21.9	22.2	22.5	1.0	23.5	16.0	16.2	16.5	0.0	17.0
		12	7	21.9	22.2	22.5	1.0	23.5	16.0	16.2	16.4	0.0	17.0
		12	13	21.9	22.2	22.5	1.0	23.5	16.0	16.2	16.4	0.0	17.0
		25	0	21.9	22.2	22.5	1.0	23.5	16.0	16.2	16.5	0.0	17.0
	16QAM	1	0	21.6	22.1	22.3	1.0	23.5	16.1	16.1	16.3	0.0	17.0
		1	12	21.6	22.1	22.4	1.0	23.5	16.1	16.1	16.3	0.0	17.0
		1	24	21.5	22.0	22.3	1.0	23.5	16.1	16.1	16.3	0.0	17.0
		12	0	21.0	21.2	21.4	2.0	22.5	16.0	16.2	16.5	0.0	17.0
		12	7	21.0	21.2	21.4	2.0	22.5	16.0	16.1	16.5	0.0	17.0
		12	13	21.0	21.2	21.4	2.0	22.5	16.0	16.1	16.5	0.0	17.0
		25	0	21.0	21.2	21.4	2.0	22.5	16.0	16.2	16.5	0.0	17.0
	64QAM	1	0	21.2	21.3	21.4	2.0	22.5	16.3	16.2	16.8	0.0	17.0
		1	12	21.2	21.2	21.4	2.0	22.5	16.3	16.1	16.8	0.0	17.0
		1	24	21.3	21.2	21.3	2.0	22.5	16.2	16.1	16.8	0.0	17.0
		12	0	19.9	20.2	20.4	3.0	21.5	16.0	16.2	16.4	0.0	17.0
		12	7	19.9	20.1	20.4	3.0	21.5	16.0	16.2	16.4	0.0	17.0
		12	13	19.9	20.1	20.4	3.0	21.5	16.0	16.2	16.4	0.0	17.0
		25	0	20.0	20.2	20.4	3.0	21.5	16.0	16.3	16.5	0.0	17.0

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LTE Band 5 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				20415	20525	20635			20415	20525	20635		
				825.5 MHz	836.5 MHz	847.5 MHz			825.5 MHz	836.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	23.1	23.3	23.6	0.0	24.5	16.1	16.3	16.6	0.0	17.0
		1	8	23.2	23.3	23.6	0.0	24.5	16.1	16.3	16.6	0.0	17.0
		1	14	23.2	23.3	23.5	0.0	24.5	16.0	16.3	16.6	0.0	17.0
		8	0	21.9	22.2	22.6	1.0	23.5	16.0	16.2	16.5	0.0	17.0
		8	4	21.9	22.2	22.6	1.0	23.5	16.0	16.2	16.5	0.0	17.0
		8	7	21.9	22.2	22.6	1.0	23.5	16.0	16.2	16.5	0.0	17.0
		15	0	21.9	22.2	22.6	1.0	23.5	16.0	16.2	16.5	0.0	17.0
	16QAM	1	0	21.8	22.1	22.6	1.0	23.5	15.9	16.1	16.5	0.0	17.0
		1	8	21.8	22.1	22.6	1.0	23.5	15.8	16.0	16.5	0.0	17.0
		1	14	21.8	22.1	22.5	1.0	23.5	15.8	16.0	16.4	0.0	17.0
		8	0	21.0	21.2	21.5	2.0	22.5	15.9	16.3	16.5	0.0	17.0
		8	4	20.9	21.2	21.5	2.0	22.5	15.9	16.3	16.5	0.0	17.0
		8	7	20.9	21.2	21.5	2.0	22.5	16.0	16.3	16.5	0.0	17.0
		15	0	20.9	21.2	21.4	2.0	22.5	15.9	16.2	16.5	0.0	17.0
	64QAM	1	0	20.8	21.3	21.2	2.0	22.5	15.9	16.2	16.4	0.0	17.0
		1	8	20.8	21.1	21.2	2.0	22.5	15.8	16.2	16.4	0.0	17.0
		1	14	20.7	21.1	21.2	2.0	22.5	15.7	16.1	16.4	0.0	17.0
		8	0	19.8	20.1	20.5	3.0	21.5	16.0	16.2	16.5	0.0	17.0
		8	4	19.8	20.1	20.5	3.0	21.5	15.9	16.2	16.5	0.0	17.0
		8	7	19.8	20.1	20.5	3.0	21.5	16.0	16.2	16.5	0.0	17.0
		15	0	19.9	20.1	20.5	3.0	21.5	16.0	16.2	16.6	0.0	17.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				20407	20525	20643			20407	20525	20643		
				824.7 MHz	836.5 MHz	848.3 MHz			824.7 MHz	836.5 MHz	848.3 MHz		
1.4 MHz	QPSK	1	0	23.2	23.3	23.7	0.0	24.5	16.1	16.2	16.5	0.0	17.0
		1	3	23.1	23.3	23.6	0.0	24.5	16.1	16.2	16.5	0.0	17.0
		1	5	23.1	23.3	23.7	0.0	24.5	16.0	16.3	16.5	0.0	17.0
		3	0	23.1	23.3	23.6	0.0	24.5	16.0	16.1	16.4	0.0	17.0
		3	1	23.1	23.3	23.6	0.0	24.5	16.0	16.1	16.4	0.0	17.0
		3	3	23.1	23.3	23.6	0.0	24.5	16.0	16.2	16.4	0.0	17.0
		6	0	22.0	22.2	22.6	1.0	23.5	16.0	16.2	16.5	0.0	17.0
	16QAM	1	0	21.7	22.1	22.4	1.0	23.5	16.0	16.0	16.3	0.0	17.0
		1	3	21.7	21.9	22.4	1.0	23.5	16.2	16.0	16.2	0.0	17.0
		1	5	21.7	21.9	22.5	1.0	23.5	16.1	16.0	16.3	0.0	17.0
		3	0	22.0	22.2	22.5	1.0	23.5	16.0	16.1	16.5	0.0	17.0
		3	1	21.9	22.2	22.5	1.0	23.5	15.9	16.1	16.5	0.0	17.0
		3	3	21.9	22.2	22.5	1.0	23.5	15.9	16.1	16.5	0.0	17.0
		6	0	21.1	21.1	21.5	2.0	22.5	15.9	16.3	16.6	0.0	17.0
	64QAM	1	0	20.8	21.1	21.8	2.0	22.5	15.9	16.3	16.4	0.0	17.0
		1	3	20.7	20.6	21.7	2.0	22.5	16.0	16.2	16.4	0.0	17.0
		1	5	20.7	21.3	21.5	2.0	22.5	16.0	16.1	16.4	0.0	17.0
		3	0	20.9	21.1	21.5	2.0	22.5	16.0	16.2	16.4	0.0	17.0
		3	1	20.9	21.1	21.4	2.0	22.5	16.0	16.2	16.4	0.0	17.0
		3	3	20.9	21.1	21.5	2.0	22.5	16.0	16.2	16.4	0.0	17.0
		6	0	20.0	20.1	20.4	3.0	21.5	15.9	16.4	16.5	0.0	17.0

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LTE Band 12 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm) Proximity sensor back-off				
				Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				23060	23095	23130			23060	23095	23130		
				704 MHz	707.5 MHz	711 MHz			704 MHz	707.5 MHz	711 MHz		
10 MHz	QPSK	1	0	23.6	23.5	23.4	0.0	24.5	17.9	17.9	17.7	0.0	18.5
		1	25	23.5	23.5	23.3	0.0	24.5	17.9	17.8	17.7	0.0	18.5
		1	49	23.4	23.4	23.3	0.0	24.5	17.8	17.8	17.6	0.0	18.5
		25	0	22.4	22.4	22.2	1.0	23.5	17.8	17.8	17.6	0.0	18.5
		25	12	22.4	22.3	22.1	1.0	23.5	17.8	17.7	17.6	0.0	18.5
		25	25	22.4	22.3	22.1	1.0	23.5	17.8	17.7	17.6	0.0	18.5
		50	0	22.4	22.3	22.1	1.0	23.5	17.8	17.7	17.6	0.0	18.5
	16QAM	1	0	22.3	22.0	22.2	1.0	23.5	17.9	17.5	17.7	0.0	18.5
		1	25	22.3	21.9	22.3	1.0	23.5	17.8	17.5	17.7	0.0	18.5
		1	49	22.3	21.9	22.2	1.0	23.5	17.8	17.5	17.6	0.0	18.5
		25	0	21.4	21.2	21.1	2.0	22.5	17.9	17.8	17.6	0.0	18.5
		25	12	21.4	21.2	21.1	2.0	22.5	17.8	17.8	17.6	0.0	18.5
		25	25	21.4	21.3	21.1	2.0	22.5	17.8	17.8	17.6	0.0	18.5
		50	0	21.4	21.2	21.1	2.0	22.5	17.8	17.8	17.5	0.0	18.5
	64QAM	1	0	21.4	21.6	21.2	2.0	22.5	17.8	18.1	17.7	0.0	18.5
		1	25	21.3	21.5	21.1	2.0	22.5	17.7	18.1	17.7	0.0	18.5
		1	49	21.3	21.5	21.1	2.0	22.5	17.7	18.1	17.7	0.0	18.5
		25	0	20.4	20.2	20.1	3.0	21.5	17.9	17.9	17.7	0.0	18.5
		25	12	20.3	20.2	20.1	3.0	21.5	17.9	17.8	17.7	0.0	18.5
		25	25	20.3	20.3	20.1	3.0	21.5	17.8	17.8	17.7	0.0	18.5
		50	0	20.3	20.2	20.1	3.0	21.5	17.8	17.8	17.6	0.0	18.5
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				23035	23095	23155			23035	23095	23155		
				701.5 MHz	707.5 MHz	713.5 MHz			701.5 MHz	707.5 MHz	713.5 MHz		
5 MHz	QPSK	1	0	23.5	23.4	23.3	0.0	24.5	17.9	17.7	17.6	0.0	18.5
		1	12	23.4	23.3	23.2	0.0	24.5	17.9	17.7	17.5	0.0	18.5
		1	24	23.4	23.3	23.3	0.0	24.5	17.9	17.7	17.5	0.0	18.5
		12	0	22.5	22.3	22.1	1.0	23.5	17.9	17.7	17.6	0.0	18.5
		12	7	22.4	22.3	22.1	1.0	23.5	17.9	17.7	17.5	0.0	18.5
		12	13	22.4	22.3	22.1	1.0	23.5	17.8	17.7	17.5	0.0	18.5
		25	0	22.4	22.3	22.1	1.0	23.5	17.9	17.7	17.5	0.0	18.5
	16QAM	1	0	22.3	22.1	22.2	1.0	23.5	17.9	17.7	17.4	0.0	18.5
		1	12	22.3	22.1	22.1	1.0	23.5	17.8	17.6	17.3	0.0	18.5
		1	24	22.3	22.1	22.1	1.0	23.5	17.8	17.6	17.4	0.0	18.5
		12	0	21.3	21.3	21.1	2.0	22.5	17.8	17.7	17.6	0.0	18.5
		12	7	21.3	21.3	21.1	2.0	22.5	17.8	17.7	17.5	0.0	18.5
		12	13	21.3	21.3	21.1	2.0	22.5	17.8	17.7	17.5	0.0	18.5
		25	0	21.3	21.3	21.0	2.0	22.5	17.9	17.8	17.6	0.0	18.5
	64QAM	1	0	21.4	21.3	21.4	2.0	22.5	18.0	17.7	17.9	0.0	18.5
		1	12	21.4	21.3	21.4	2.0	22.5	17.9	17.7	17.9	0.0	18.5
		1	24	21.4	21.2	21.4	2.0	22.5	17.9	17.7	17.9	0.0	18.5
		12	0	20.3	20.2	20.0	3.0	21.5	17.9	17.7	17.6	0.0	18.5
		12	7	20.3	20.2	20.0	3.0	21.5	17.9	17.7	17.6	0.0	18.5
		12	13	20.3	20.1	20.0	3.0	21.5	17.9	17.7	17.5	0.0	18.5
		25	0	20.3	20.2	20.1	3.0	21.5	17.9	17.8	17.6	0.0	18.5

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LTE Band 12 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				23025	23095	23165			23025	23095	23165		
				700.5 MHz	707.5 MHz	714.5 MHz			700.5 MHz	707.5 MHz	714.5 MHz		
3 MHz	QPSK	1	0	23.6	23.4	23.2	0.0	24.5	17.9	17.8	17.6	0.0	18.5
		1	8	23.6	23.4	23.2	0.0	24.5	17.9	17.8	17.6	0.0	18.5
		1	14	23.5	23.4	23.2	0.0	24.5	17.9	17.8	17.5	0.0	18.5
		8	0	22.4	22.3	22.1	1.0	23.5	17.8	17.7	17.5	0.0	18.5
		8	4	22.4	22.3	22.1	1.0	23.5	17.8	17.7	17.5	0.0	18.5
		8	7	22.4	22.3	22.1	1.0	23.5	17.8	17.7	17.6	0.0	18.5
		15	0	22.4	22.3	22.1	1.0	23.5	17.8	17.7	17.5	0.0	18.5
	16QAM	1	0	22.2	22.1	22.0	1.0	23.5	17.7	17.3	17.6	0.0	18.5
		1	8	22.2	22.3	22.0	1.0	23.5	17.6	17.4	17.5	0.0	18.5
		1	14	22.0	22.3	21.9	1.0	23.5	17.6	17.3	17.6	0.0	18.5
		8	0	21.3	21.3	21.1	2.0	22.5	17.8	17.8	17.6	0.0	18.5
		8	4	21.3	21.3	21.1	2.0	22.5	17.9	17.8	17.6	0.0	18.5
		8	7	21.3	21.3	21.1	2.0	22.5	17.9	17.8	17.6	0.0	18.5
		15	0	21.3	21.2	21.0	2.0	22.5	17.8	17.7	17.6	0.0	18.5
	64QAM	1	0	21.3	21.4	20.9	2.0	22.5	17.9	17.5	17.2	0.0	18.5
		1	8	21.3	21.3	20.8	2.0	22.5	17.8	17.5	17.3	0.0	18.5
		1	14	21.4	21.4	20.7	2.0	22.5	17.9	17.7	17.2	0.0	18.5
		8	0	20.3	20.2	19.9	3.0	21.5	17.7	17.8	17.5	0.0	18.5
		8	4	20.2	20.2	20.0	3.0	21.5	17.7	17.8	17.5	0.0	18.5
		8	7	20.3	20.2	20.0	3.0	21.5	17.7	17.8	17.5	0.0	18.5
		15	0	20.3	20.2	20.0	3.0	21.5	17.9	17.7	17.6	0.0	18.5

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				23017	23095	23173			23017	23095	23173		
				699.7 MHz	707.5 MHz	715.3 MHz			699.7 MHz	707.5 MHz	715.3 MHz		
1.4 MHz	QPSK	1	0	23.6	23.4	23.1	0.0	24.5	18.0	17.8	17.6	0.0	18.5
		1	3	23.6	23.3	23.1	0.0	24.5	17.9	17.7	17.6	0.0	18.5
		1	5	23.5	23.4	23.1	0.0	24.5	17.9	17.7	17.5	0.0	18.5
		3	0	23.5	23.3	23.1	0.0	24.5	17.8	17.7	17.4	0.0	18.5
		3	1	23.5	23.3	23.1	0.0	24.5	17.8	17.7	17.5	0.0	18.5
		3	3	23.5	23.3	23.1	0.0	24.5	17.8	17.7	17.5	0.0	18.5
		6	0	22.5	22.3	22.0	1.0	23.5	17.9	17.7	17.5	0.0	18.5
	16QAM	1	0	22.3	22.2	22.2	1.0	23.5	17.7	17.8	17.3	0.0	18.5
		1	3	22.2	22.2	22.2	1.0	23.5	17.6	17.9	17.3	0.0	18.5
		1	5	22.2	22.2	22.3	1.0	23.5	17.6	17.8	17.4	0.0	18.5
		3	0	22.4	22.3	22.0	1.0	23.5	17.8	17.7	17.4	0.0	18.5
		3	1	22.4	22.3	22.0	1.0	23.5	17.8	17.7	17.4	0.0	18.5
		3	3	22.4	22.3	22.0	1.0	23.5	17.8	17.7	17.4	0.0	18.5
		6	0	21.4	21.3	20.9	2.0	22.5	17.9	17.6	17.7	0.0	18.5
	64QAM	1	0	21.6	21.0	20.7	2.0	22.5	18.1	17.7	17.7	0.0	18.5
		1	3	21.6	21.3	20.5	2.0	22.5	18.0	17.9	17.2	0.0	18.5
		1	5	21.6	21.1	20.6	2.0	22.5	17.9	17.6	17.3	0.0	18.5
		3	0	21.6	21.2	21.0	2.0	22.5	18.0	17.6	17.5	0.0	18.5
		3	1	21.6	21.2	21.0	2.0	22.5	18.0	17.6	17.5	0.0	18.5
		3	3	21.6	21.2	21.0	2.0	22.5	18.0	17.6	17.5	0.0	18.5
		6	0	20.4	20.4	19.9	3.0	21.5	17.9	17.8	17.5	0.0	18.5

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LTE Band 66 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm) Proximity sensor back-off				
				Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				132072	132322	132572			132072	132322	132572		
				1720 MHz	1745 MHz	1770 MHz			1720 MHz	1745 MHz	1770 MHz		
20 MHz	QPSK	1	0	23.1	23.4	22.7	0.0	24.5	13.3	13.6	13.1	0.0	14
		1	49	23.0	23.4	22.7	0.0	24.5	13.3	13.6	13.1	0.0	14
		1	99	22.9	23.3	22.7	0.0	24.5	13.3	13.6	13.1	0.0	14
		50	0	22.0	22.2	21.7	1.0	23.5	13.2	13.5	12.9	0.0	14
		50	24	21.9	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
		50	50	21.9	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
		100	0	21.9	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
	16QAM	1	0	22.0	22.3	21.4	1.0	23.5	13.1	13.6	12.7	0.0	14
		1	49	21.9	22.2	21.4	1.0	23.5	13.1	13.6	12.7	0.0	14
		1	99	21.8	22.0	21.3	1.0	23.5	13.1	13.5	12.7	0.0	14
		50	0	20.9	21.3	20.7	2.0	22.5	13.2	13.5	12.9	0.0	14
		50	24	20.9	21.2	20.6	2.0	22.5	13.2	13.5	12.9	0.0	14
		50	50	20.9	21.2	20.6	2.0	22.5	13.1	13.5	12.9	0.0	14
		100	0	20.9	21.3	20.6	2.0	22.5	13.2	13.5	13.0	0.0	14
	64QAM	1	0	21.0	21.3	20.5	2.0	22.5	13.4	13.5	13.1	0.0	14
		1	49	20.9	21.2	20.4	2.0	22.5	13.4	13.6	13.1	0.0	14
		1	99	20.8	21.1	20.4	2.0	22.5	13.3	13.6	13.1	0.0	14
		50	0	20.0	20.3	19.8	3.0	21.5	13.3	13.6	13.0	0.0	14
		50	24	19.9	20.3	19.7	3.0	21.5	13.3	13.6	13.0	0.0	14
		50	50	19.9	20.3	19.7	3.0	21.5	13.2	13.5	13.0	0.0	14
		100	0	20.0	20.3	19.7	3.0	21.5	13.2	13.5	12.9	0.0	14
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				132047	132322	132597			132047	132322	132597		
				1717.5 MHz	1745 MHz	1772.5 MHz			1717.5 MHz	1745 MHz	1772.5 MHz		
15 MHz	QPSK	1	0	23.0	23.4	22.7	0.0	24.5	13.3	13.6	13.0	0.0	14
		1	37	23.0	23.3	22.7	0.0	24.5	13.3	13.6	13.0	0.0	14
		1	74	22.9	23.3	22.6	0.0	24.5	13.3	13.6	13.0	0.0	14
		36	0	22.0	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
		36	20	21.9	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
		36	39	21.9	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
		75	0	21.9	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
	16QAM	1	0	21.9	22.0	21.8	1.0	23.5	13.2	13.3	13.0	0.0	14
		1	37	21.8	21.9	21.8	1.0	23.5	13.1	13.3	13.1	0.0	14
		1	74	21.8	21.8	21.8	1.0	23.5	13.1	13.2	13.0	0.0	14
		36	0	20.9	21.2	20.6	2.0	22.5	13.2	13.5	12.9	0.0	14
		36	20	20.9	21.2	20.6	2.0	22.5	13.2	13.5	12.9	0.0	14
		36	39	20.9	21.2	20.6	2.0	22.5	13.2	13.5	12.9	0.0	14
		75	0	20.9	21.2	20.6	2.0	22.5	13.2	13.5	12.9	0.0	14
	64QAM	1	0	21.1	21.3	20.5	2.0	22.5	13.4	13.7	13.0	0.0	14
		1	37	21.1	21.2	20.5	2.0	22.5	13.5	13.7	12.9	0.0	14
		1	74	21.0	21.1	20.4	2.0	22.5	13.4	13.7	12.9	0.0	14
		36	0	19.9	20.3	19.7	3.0	21.5	13.2	13.6	13.0	0.0	14
		36	20	19.9	20.3	19.7	3.0	21.5	13.2	13.6	13.0	0.0	14
		36	39	19.9	20.2	19.7	3.0	21.5	13.2	13.6	13.0	0.0	14
		75	0	19.9	20.2	19.7	3.0	21.5	13.3	13.5	13.0	0.0	14
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				132022	132322	132622			132022	132322	132622		
				1715 MHz	1745 MHz	1775 MHz			1715 MHz	1745 MHz	1775 MHz		
10 MHz	QPSK	1	0	23.2	23.4	22.7	0.0	24.5	13.4	13.6	13.0	0.0	14
		1	25	23.2	23.3	22.7	0.0	24.5	13.4	13.6	12.9	0.0	14
		1	49	23.1	23.3	22.6	0.0	24.5	13.4	13.6	13.0	0.0	14
		25	0	22.0	22.2	21.6	1.0	23.5	13.3	13.5	12.9	0.0	14
		25	12	22.0	22.2	21.5	1.0	23.5	13.3	13.5	12.8	0.0	14
		25	25	21.9	22.2	21.5	1.0	23.5	13.2	13.5	12.8	0.0	14
		50	0	22.0	22.2	21.6	1.0	23.5	13.2	13.5	12.8	0.0	14
	16QAM	1	0	21.9	21.9	21.8	1.0	23.5	13.2	13.3	12.9	0.0	14
		1	25	21.9	21.9	21.8	1.0	23.5	13.2	13.2	13.0	0.0	14
		1	49	21.8	21.9	21.8	1.0	23.5	13.2	13.2	12.9	0.0	14
		25	0	21.0	21.3	20.6	2.0	22.5	13.3	13.5	12.9	0.0	14
		25	12	21.0	21.3	20.6	2.0	22.5	13.3	13.5	12.9	0.0	14
		25	25	21.0	21.2	20.6	2.0	22.5	13.3	13.6	12.9	0.0	14
		50	0	21.0	21.2	20.5	2.0	22.5	13.3	13.5	12.9	0.0	14
	64QAM	1	0	20.9	21.3	20.3	2.0	22.5	13.0	13.7	12.9	0.0	14
		1	25	20.9	21.2	20.3	2.0	22.5	12.9	13.7	12.8	0.0	14
		1	49	20.8	21.2	20.3	2.0	22.5	12.9	13.7	12.9	0.0	14
		25	0	20.1	20.3	19.6	3.0	21.5	13.3	13.5	12.9	0.0	14
		25	12	20.0	20.3	19.6	3.0	21.5	13.3	13.5	12.9	0.0	14
		25	25	20.0	20.3	19.6	3.0	21.5	13.3	13.5	12.9	0.0	14
		50	0	20.0	20.3	19.6	3.0	21.5	13.3	13.6	12.9	0.0	14

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LTE Band 66 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				131997	132322	132647			131997	132322	132647		
				1712.5 MHz	1745 MHz	1777.5 MHz			1712.5 MHz	1745 MHz	1777.5 MHz		
5 MHz	QPSK	1	0	23.1	23.2	22.6	0.0	24.5	13.3	13.5	12.9	0.0	14
		1	12	23.1	23.2	22.6	0.0	24.5	13.3	13.5	12.9	0.0	14
		1	24	23.1	23.2	22.6	0.0	24.5	13.3	13.5	12.9	0.0	14
		12	0	22.0	22.2	21.6	1.0	23.5	13.3	13.5	12.9	0.0	14
		12	7	22.0	22.2	21.6	1.0	23.5	13.3	13.5	12.9	0.0	14
		12	13	22.0	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
		25	0	22.0	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
	16QAM	1	0	22.0	22.1	21.4	1.0	23.5	13.2	13.2	12.8	0.0	14
		1	12	22.0	22.1	21.3	1.0	23.5	13.1	13.1	12.8	0.0	14
		1	24	22.0	22.1	21.3	1.0	23.5	13.1	13.2	12.8	0.0	14
		12	0	21.0	21.2	20.5	2.0	22.5	13.2	13.5	12.9	0.0	14
		12	7	21.0	21.2	20.5	2.0	22.5	13.2	13.5	12.9	0.0	14
		12	13	21.0	21.2	20.5	2.0	22.5	13.2	13.5	12.9	0.0	14
		25	0	21.0	21.3	20.6	2.0	22.5	13.3	13.5	12.9	0.0	14
	64QAM	1	0	21.0	21.1	20.3	2.0	22.5	13.4	13.6	12.6	0.0	14
		1	12	21.0	21.1	20.3	2.0	22.5	13.4	13.6	12.6	0.0	14
		1	24	21.0	21.1	20.2	2.0	22.5	13.3	13.6	12.6	0.0	14
		12	0	20.0	20.3	19.6	3.0	21.5	13.2	13.5	12.8	0.0	14
		12	7	19.9	20.3	19.6	3.0	21.5	13.2	13.5	12.8	0.0	14
		12	13	19.9	20.3	19.6	3.0	21.5	13.2	13.5	12.8	0.0	14
		25	0	20.0	20.3	19.6	3.0	21.5	13.3	13.5	12.9	0.0	14
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				131987	132322	132657			131987	132322	132657		
				1711.5 MHz	1745 MHz	1778.5 MHz			1711.5 MHz	1745 MHz	1778.5 MHz		
3 MHz	QPSK	1	0	23.1	23.3	22.6	0.0	24.5	13.4	13.6	12.9	0.0	14
		1	8	23.1	23.3	22.6	0.0	24.5	13.4	13.5	12.9	0.0	14
		1	14	23.0	23.3	22.6	0.0	24.5	13.4	13.5	12.9	0.0	14
		8	0	22.0	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
		8	4	22.0	22.2	21.6	1.0	23.5	13.3	13.5	12.9	0.0	14
		8	7	22.0	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
		15	0	21.9	22.2	21.6	1.0	23.5	13.2	13.5	12.9	0.0	14
	16QAM	1	0	21.8	21.9	21.8	1.0	23.5	12.9	13.3	13.0	0.0	14
		1	8	21.8	21.8	21.8	1.0	23.5	13.0	13.3	12.9	0.0	14
		1	14	21.7	21.8	21.7	1.0	23.5	12.9	13.2	12.9	0.0	14
		8	0	20.9	21.3	20.6	2.0	22.5	13.2	13.6	13.0	0.0	14
		8	4	20.9	21.3	20.6	2.0	22.5	13.2	13.6	13.0	0.0	14
		8	7	20.9	21.3	20.6	2.0	22.5	13.2	13.6	13.0	0.0	14
		15	0	20.9	21.2	20.5	2.0	22.5	13.2	13.4	12.9	0.0	14
	64QAM	1	0	21.0	21.1	20.3	2.0	22.5	13.3	13.6	12.6	0.0	14
		1	8	21.0	21.1	20.4	2.0	22.5	13.2	13.5	12.6	0.0	14
		1	14	20.8	21.1	20.3	2.0	22.5	13.2	13.6	12.7	0.0	14
		8	0	19.9	20.3	19.5	3.0	21.5	13.1	13.6	12.8	0.0	14
		8	4	19.9	20.3	19.6	3.0	21.5	13.1	13.5	12.8	0.0	14
		8	7	19.9	20.3	19.5	3.0	21.5	13.1	13.5	12.8	0.0	14
		15	0	20.0	20.2	19.6	3.0	21.5	13.2	13.5	12.9	0.0	14
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				131979	132322	132665			131979	132322	132665		
				1710.7 MHz	1745 MHz	1779.3 MHz			1710.7 MHz	1745 MHz	1779.3 MHz		
1.4 MHz	QPSK	1	0	23.0	23.2	22.5	0.0	24.5	13.4	13.5	12.9	0.0	14
		1	3	23.0	23.1	22.5	0.0	24.5	13.3	13.4	12.9	0.0	14
		1	5	23.0	23.2	22.5	0.0	24.5	13.4	13.4	12.9	0.0	14
		3	0	22.9	23.2	22.5	0.0	24.5	13.4	13.5	12.8	0.0	14
		3	1	22.9	23.2	22.5	0.0	24.5	13.3	13.5	12.8	0.0	14
		3	3	22.9	23.2	22.5	0.0	24.5	13.3	13.5	12.8	0.0	14
		6	0	21.9	22.2	21.5	1.0	23.5	13.3	13.5	12.9	0.0	14
	16QAM	1	0	21.9	22.2	21.7	1.0	23.5	13.0	13.4	12.7	0.0	14
		1	3	21.9	22.1	21.6	1.0	23.5	13.5	13.6	12.7	0.0	14
		1	5	21.8	22.2	21.6	1.0	23.5	13.0	13.6	12.7	0.0	14
		3	0	21.9	22.2	21.5	1.0	23.5	13.3	13.5	12.9	0.0	14
		3	1	21.9	22.2	21.5	1.0	23.5	13.3	13.5	12.9	0.0	14
		3	3	21.9	22.2	21.5	1.0	23.5	13.3	13.5	12.9	0.0	14
		6	0	21.0	21.3	20.4	2.0	22.5	13.4	13.4	12.9	0.0	14
	64QAM	1	0	21.0	21.4	20.4	2.0	22.5	13.3	13.2	12.7	0.0	14
		1	3	20.8	21.2	20.4	2.0	22.5	13.3	13.6	13.0	0.0	14
		1	5	21.0	21.3	20.3	2.0	22.5	13.1	13.6	12.8	0.0	14
		3	0	21.0	21.3	20.5	2.0	22.5	13.4	13.5	12.7	0.0	14
		3	1	21.0	21.3	20.5	2.0	22.5	13.3	13.5	12.7	0.0	14
		3	3	21.0	21.3	20.5	2.0	22.5	13.3	13.5	12.7	0.0	14
		6	0	19.9	20.3	19.7	3.0	21.5	13.3	13.7	12.8	0.0	14

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9.3.1 LTE Rel. 10 Carrier Aggregation

LTE Carrier Aggregation Down Link Combinations;

The DL CA power measurement conditions for various CC's combinations were determined according LTE DL CA SAR Test Exclusion guidance in TCB workshop note (April 2018). Only yellow highlighted cells need power measurement. The following power measurements were performed with a single carrier uplink; CA for this particular project only supports one (1) uplink and up to four (3) downlinks.

LTE Release 10 Carrier Aggregation

Index	2CC	Restriction	Covered By Superset	Reverse
2CC #1	2C			
2CC #2	2A-2A			
2CC #3	2A-5A			O
2CC #4	2A-12A			O
2CC #5	2A-17A			O
2CC #6	4A-4A	3CC #4		
2CC #7	4A-5A			O
2CC #8	4A-12A	3CC #1		
2CC #9	4A-17A			O
2CC #10	5B			
2CC #11	5A-5A			
2CC #12	5A-66A	3CC #7		
2CC #13	12B	3CC #6		
2CC #14	12A-66A	3CC #10		
2CC #15	66A-66A	3CC #10		
2CC #16	66B			
2CC #17	66C	3CC #8		

Index	3CC	Restriction	Covered By Superset	Reverse
3CC #1	2A-12A-66A			O
3CC #2	2A-12B			O
3CC #3	2A-66A-66A			O
3CC #4	4A-4A-12A			O
3CC #5	4A-12A-12A			O
3CC #6	4A-12B			O
3CC #7	5A-66A-66A			O
3CC #8	5A-66C			O
3CC #9	12B-66A			O
3CC #10	12A-66A-66A			O

Note:

Only yellow highlight cells need power measurement according to LTE DL CA SAR test Exclusion in TCB workshop (April.2018).

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DL CA output power results

E-UTRA CA configutation (BCS)	Bands			UL					DL									LTE Rel 8 Tx. Power [dBm]	LTE Rel 10 Tx. Power [dBm]	Delta
	PCC	SCC1	SCC2	PCC					PCC			SCC1			SCC2					
	1st	2nd	3rd	Mode	BW (MHz)	Channel	Freq. (MHz)	RB/Offset	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)			
2A-5A	2A	5A		QPSK	20	19100	1900	1/0	20	1100	1980	10	2525	881.5				22.7	22.9	0.24
	5A	2A		QPSK	10	20525	836.5	1/0	10	2525	881.5	20	900	1960				23.4	23.3	-0.07
2A-12A	2A	12A		QPSK	20	19100	1900	1/0	20	1100	1980	10	5095	737.5				22.7	22.7	-0.02
	12A	2A		QPSK	10	23095	707.5	1/0	10	5095	737.5	20	900	1960				23.5	23.3	-0.24
2A-17A	2A	17A		QPSK	10	18650	1855	1/0	10	650	1935	10	5790	740				22.8	22.7	-0.08
	17A	2A		QPSK	10	23790	710	1/0	10	5790	740	20	900	1960				23.5	23.4	-0.04
4A-5A	4A	5A		QPSK	20	20175	1732.5	1/49	20	2175	2132.5	10	2525	881.5				23.1	23.1	-0.02
	5A	4A		QPSK	10	20525	836.5	1/0	10	2525	881.5	20	2175	2132.5				23.4	23.1	-0.21
4A-17A	4A	17A		QPSK	10	20350	1750	1/0	10	2350	2120	10	5790	740				23.3	23.3	0.06
	17A	4A		QPSK	10	23790	710	1/0	10	5790	740	10	2175	2132.5				23.5	23.1	-0.34
12A-66A	12A	66A		QPSK	10	23095	707.5	1/0	10	5095	737.5	20	66786	2145				23.5	23.2	-0.33
	66A	12A		QPSK	20	132322	1745	1/0	20	66786	2145	10	5095	737.5				23.4	23.2	-0.18
2A-12-66A	2A	12A	66A	QPSK	20	19100	1900	1/0	20	1100	1980	10	5095	737.5	20	66786	2145	22.7	22.7	-0.03
	12A	66A	2A	QPSK	10	23095	707.5	1/0	10	5095	737.5	20	66786	2145	20	900	1960	23.5	23.4	-0.12
	66A	2A	12A	QPSK	20	132322	1745	1/0	20	66786	2145	20	900	1960	10	5095	737.5	23.4	23.3	-0.14
2A-66A-66A	2A	66A	66A	QPSK	20	19100	1900	1/0	20	1100	1980	20	66786	2145	20	67036	2170	22.7	22.5	-0.20
	66A	66A	2A	QPSK	20	132322	1745	1/0	20	66786	2145	20	67036	2170	20	900	1960	23.4	23.2	-0.17
4A-4A-12A	4A	4A	12A	QPSK	20	20300	1745	1/0	20	2300	2145	20	2050	2120	10	5095	737.5	23.3	23.2	-0.08
	12A	4A	4A	QPSK	10	23095	707.5	1/0	10	5095	737.5	20	2300	2145	20	2050	2120	23.5	23.3	-0.18
4A-12A-12A	4A	12A	12A	QPSK	20	20175	1732.5	1/49	20	2175	2132.5	10	5060	734	10	5130	741	23.1	23.0	-0.07
	12A	12A	4A	QPSK	10	23060	704	1/0	10	5060	734	10	5130	741	20	2175	2132.5	23.6	23.3	-0.27
5A-66A-66A	5A	66A	66A	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	66786	2145	20	67036	2170	23.4	23.3	-0.10
	66A	66A	5A	QPSK	20	132322	1745	1/0	20	66786	2145	20	67036	2170	10	2525	881.5	23.4	23.3	-0.08
12A-66A-66A	12A	66A	66A	QPSK	10	23095	707.5	1/0	10	5095	737.5	20	66786	2145	20	67036	2170	23.5	23.5	0.02
	66A	66A	12A	QPSK	20	132322	1745	1/0	20	66786	2145	20	67036	2170	10	5095	737.5	23.4	23.4	-0.05
2A-12B	2A	12B	12B	QPSK	20	19100	1900	1/0	20	1100	1980	5	5035	731.5	10	5107	738.7	22.7	22.6	-0.10
	12B	12B	2A	QPSK	10	23060	704	1/0	10	5060	734	5	5132	741.2	20	900	1960	23.6	23.6	0.01
4A-12B	4A	12B	12B	QPSK	20	20175	1732.5	1/49	20	2175	2132.5	5	5035	731.5	10	5107	738.7	23.1	23.0	-0.06
	12B	12B	4A	QPSK	10	23060	704	1/0	10	5060	734	5	5132	741.2	20	2175	2132.5	23.6	23.6	0.01
5A-66C	5A	66C	66C	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	66786	2145	20	66984	2164.8	23.4	23.4	0.06
	66C	66C	5A	QPSK	20	132322	1745	1/0	20	66786	2145	20	66984	2164.8	10	2525	881.5	23.4	23.5	0.06
12B-66A	12B	12B	66A	QPSK	10	23060	704	1/0	10	5060	734	5	5132	741.2	20	66786	2145	23.6	23.5	-0.03
	66A	12B	12B	QPSK	20	132322	1745	1/0	20	66786	2145	5	5035	731.5	10	5107	738.7	23.4	23.3	-0.12
2A-2A	2A	2A		QPSK	20	19100	1900	1/0	20	1100	1980	20	700	1940				22.7	22.7	0.01
5A-5A	5A	5A		QPSK	10	20600	844	1/0	10	2600	889	10	2450	874				23.6	23.6	0.03
66A-66A	66A	66A		QPSK	20	132322	1745	1/0	20	66786	2145	20	67036	2170				23.4	23.3	-0.10
2C	2C	2C		QPSK	20	19100	1900	1/0	20	1100	1980	20	902	1960.2				22.7	22.7	0.04
5B	5B	5B		QPSK	10	20600	844	1/0	10	2600	889	10	2501	879.1				23.6	23.4	-0.17
12B	12B	12B		QPSK	5	23035	701.5	1/0	10	5035	731.5	10	5107	738.7				23.5	23.2	-0.28
66B	66B	66B		QPSK	15	132322	1745	1/0	15	66786	2145	5	66879	2154.3				23.4	23.3	-0.03

Note:

1_Per KDB 941225 D05A LTE Rel. 10 KDB Inquiry Sheet: SAR is excluded for Carrier Aggregation when measured power does not exceed LTE Release 8 by more than a 1/4 dB.

2_ When the same frequency band is used for both contiguous and non-contiguous in DL CA Intra band, power was measured using the configuration with the largest aggregated bandwidth and maximum output power among the contiguous and non-contiguous in DL CA Intra band configurations

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9.4 Wi-Fi 2.4GHz (DTS Band)

Measured Results

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduction Pwr.		
					Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
2.4 SISO Ant 1	802.11b	1 Mbps	1	2412	18.2	19.0	Yes	13.2	13.5	Yes
			6	2437	18.4	19.0		13.3	13.5	
			11	2462	18.1	19.0		13.4	13.5	
			12	2467	Not Require	16.0		13.3	13.5	
			13	2472		13.0		Not Require	13.0	
	802.11g	6 Mbps	1	2412	Not Require	16.0	No	13.5	13.5	No
			6	2437		16.0		13.3	13.5	
			11	2462		16.0		13.2	13.5	
			12	2467		11.0		Not Require	11.0	
			13	2472		8.0			8.0	
	802.11n (HT20)	6.5 Mbps	1	2412	Not Require	16.0	No	13.4	13.5	No
			6	2437		16.0		13.0	13.5	
			11	2462		16.0		13.4	13.5	
			12	2467		12.0		Not Require	12.0	
			13	2472		6.0			6.0	
2.4 SISO Ant 2	802.11b	1 Mbps	1	2412	17.1	18.0	Yes	13.1	13.5	Yes
			6	2437	17.0	18.0		12.9	13.5	
			11	2462	16.6	18.0		13.3	13.5	
			12	2467	16.4	18.0		13.3	13.5	
			13	2472	Not Require	15.0		12.9	13.5	
	802.11g	6 Mbps	1	2412	Not Require	15.0	No	13.4	13.5	No
			6	2437		15.0		13.0	13.5	
			11	2462		15.0		13.3	13.5	
			12	2467		15.0		13.3	13.5	
			13	2472		11.0		Not Require	11.0	
	802.11n (HT20)	6.5 Mbps	1	2412	Not Require	15.0	No	13.1	13.5	No
			6	2437		15.0		13.1	13.5	
			11	2462		15.0		13.2	13.5	
			12	2467		15.0		13.2	13.5	
			13	2472		10.0		Not Require	10.0	
2.4 MIMO Ant 1	802.11g	6 Mbps	1	2412	13.2	14.0	Yes	12.7	13.5	Yes
			6	2437	13.9	14.0		13.4	13.5	
			11	2462	13.4	14.0		12.7	13.5	
			12	2467	Not Require	11.5		Not Require	11.5	
			13	2472		6.0			6.0	
	802.11n (HT20)	6.5 Mbps	1	2412	13.9	14.0	No	13.3	13.5	No
			6	2437	13.9	14.0		13.1	13.5	
			11	2462	13.7	14.0		13.1	13.5	
			12	2467	Not Require	11.0		Not Require	11.0	
			13	2472		4.0			4.0	
2.4 MIMO Ant 2	802.11g	6 Mbps	1	2412	12.3	14.0	Yes	12.0	13.5	Yes
			6	2437	12.3	14.0		11.9	13.5	
			11	2462	12.4	14.0		11.8	13.5	
			12	2467	Not Require	11.5		Not Require	11.5	
			13	2472		6.0			6.0	
	802.11n (HT20)	6.5 Mbps	1	2412	13.1	14.0	No	12.0	13.5	No
			6	2437	12.6	14.0		12.0	13.5	
			11	2462	12.5	14.0		12.3	13.5	
			12	2467	Not Require	11.0		Not Require	11.0	
			13	2472		4.0			4.0	

Note(s):

1. SAR is not required for 802.11g/n modes when the adjusted SAR for 802.11b is < 1.2 W/kg.
2. For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11n/g mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.
3. MIMO DTS SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

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

Measured Results

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduction 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 (UNII 2A)	802.11a	6 Mbps	52	5260.0	14.1	14.5	Yes	Not Required	9.0	No
				56	5280.0	14.2			Not Required		
				60	5300.0	14.1			Not Required		
				64	5320.0	13.9			Not Required		
		802.11n (HT20)	6.5 Mbps	52	5260.0	Not Required	13.0	No	Not Required	9.0	No
				56	5280.0	Not Required			Not Required		
				60	5300.0	Not Required			Not Required		
				64	5320.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	54	5270.0	Not Required	10.5	No	Not Required	9.0	No
				62	5310.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	Not Required	13.0	No	Not Required	9.0	No
				56	5280.0	Not Required			Not Required		
				60	5300.0	Not Required			Not Required		
				64	5320.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	10.5	No	Not Required	9.0	No
				62	5310.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	10.5	No	8.7	9.0	Yes
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	12.9	13.0	Yes	Not Required	9.0	No
				120	5600.0	12.7			Not Required		
				124	5620.0	12.5			Not Required		
				144	5720.0	12.7			Not Required		
		802.11n (HT20)	6.5 Mbps	100	5500.0	Not Required	11.5	No	Not Required	9.0	No
				120	5600.0	Not Required			Not Required		
				124	5620.0	Not Required			Not Required		
				144	5720.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	102	5510.0	Not Required	9.5	No	Not Required	9.0	No
				118	5590.0	Not Required			Not Required		
				126	5630.0	Not Required			Not Required		
				142	5710.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	100	5500.0	Not Required	11.5	No	Not Required	9.0	No
				120	5600.0	Not Required			Not Required		
				124	5620.0	Not Required			Not Required		
				144	5720.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	102	5510.0	Not Required	9.5	No	Not Required	9.0	No
				118	5590.0	Not Required			Not Required		
				126	5630.0	Not Required			Not Required		
				142	5710.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	10.0	No	8.7	9.0	Yes
				122	5610.0	Not Required			8.6		
				138	5690.0	Not Required			8.7		
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	13.3	14.5	Yes	Not Required	9.0	No
				157	5785.0	13.3			Not Required		
				165	5825.0	13.3			Not Required		
		802.11n (HT20)	6.5 Mbps	149	5745.0	Not Required	14.5	No	Not Required	9.0	No
				157	5785.0	Not Required			Not Required		
				165	5825.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	151	5755.0	Not Required	10.5	No	Not Required	9.0	No
				159	5795.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	149	5745.0	Not Required	14.5	No	Not Required	9.0	No
				157	5785.0	Not Required			Not Required		
				165	5825.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	151	5755.0	Not Required	10.5	No	Not Required	9.0	No
				159	5795.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	10.5	No	8.8	9.0	Yes

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Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduction 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.2	5.3 (UNII 2A)	802.11a	6 Mbps	52	5260.0	12.4	13.0	Yes	Not Required	9.0	No
				56	5280.0	12.7			Not Required		
				60	5300.0	12.5			Not Required		
				64	5320.0	12.7			Not Required		
		802.11n (HT20)	6.5 Mbps	52	5260.0	Not Required	13.0	No	Not Required	9.0	No
				56	5280.0	Not Required			Not Required		
				60	5300.0	Not Required			Not Required		
				64	5320.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	54	5270.0	Not Required	10.5	No	Not Required	9.0	No
				62	5310.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	Not Required	13.0	No	Not Required	9.0	No
				56	5280.0	Not Required			Not Required		
				60	5300.0	Not Required			Not Required		
				64	5320.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	10.5	No	Not Required	9.0	No
				62	5310.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	10.5	No	8.3	9.0	Yes
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	12.6	13.0	Yes	Not Required	9.0	No
				120	5600.0	12.9			Not Required		
				124	5620.0	12.7			Not Required		
				144	5720.0	12.6			Not Required		
		802.11n (HT20)	6.5 Mbps	100	5500.0	Not Required	13.0	No	Not Required	9.0	No
				120	5600.0	Not Required			Not Required		
				124	5620.0	Not Required			Not Required		
				144	5720.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	102	5510.0	Not Required	9.5	No	Not Required	9.0	No
				118	5590.0	Not Required			Not Required		
				126	5630.0	Not Required			Not Required		
				142	5710.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	100	5500.0	Not Required	13.0	No	Not Required	9.0	No
				120	5600.0	Not Required			Not Required		
				124	5620.0	Not Required			Not Required		
				144	5720.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	102	5510.0	Not Required	9.5	No	Not Required	9.0	No
				118	5590.0	Not Required			Not Required		
				126	5630.0	Not Required			Not Required		
				142	5710.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	9.0	No	8.8	9.0	Yes
				122	5610.0	Not Required			8.7		
				138	5690.0	Not Required			8.7		
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	12.7	13.0	Yes	Not Required	9.0	No
				157	5785.0	12.4			Not Required		
				165	5825.0	12.9			Not Required		
		802.11n (HT20)	6.5 Mbps	149	5745.0	Not Required	13.0	No	Not Required	9.0	No
				157	5785.0	Not Required			Not Required		
				165	5825.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	151	5755.0	Not Required	9.5	No	Not Required	9.0	No
				159	5795.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	149	5745.0	Not Required	13.0	No	Not Required	9.0	No
				157	5785.0	Not Required			Not Required		
				165	5825.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	151	5755.0	Not Required	9.5	No	Not Required	9.0	No
				159	5795.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	9.0	No	8.9	9.0	Yes

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Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduction 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 (UNII 2A)	802.11a	6 Mbps	52	5260.0	11.9	12.0	Yes	8.9	9.0	Yes
				56	5280.0	11.7			8.6		
				60	5300.0	11.7			8.7		
				64	5320.0	11.5			8.6		
		802.11n (HT20)	6.5 Mbps	52	5260.0	Not Required	12.0	No	Not Required	9.0	No
				56	5280.0	Not Required			Not Required		
				60	5300.0	Not Required			Not Required		
				64	5320.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	54	5270.0	Not Required	8.0	No	Not Required	8.0	No
				62	5310.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	Not Required	12.0	No	Not Required	9.0	No
				56	5280.0	Not Required			Not Required		
				60	5300.0	Not Required			Not Required		
				64	5320.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	8.0	No	Not Required	8.0	No
				62	5310.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	7.0	No	Not Required	7.0	No
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	11.5	12.0	Yes	8.7	9.0	Yes
				120	5600.0	11.6			8.6		
				124	5620.0	11.4			8.4		
				144	5720.0	11.3			8.4		
		802.11n (HT20)	6.5 Mbps	100	5500.0	Not Required	12.0	No	Not Required	9.0	No
				120	5600.0	Not Required			Not Required		
				124	5620.0	Not Required			Not Required		
				144	5720.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	102	5510.0	Not Required	8.0	No	Not Required	8.0	No
				118	5590.0	Not Required			Not Required		
				126	5630.0	Not Required			Not Required		
				142	5710.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	100	5500.0	Not Required	12.0	No	Not Required	9.0	No
				120	5600.0	Not Required			Not Required		
				124	5620.0	Not Required			Not Required		
				144	5720.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	102	5510.0	Not Required	8.0	No	Not Required	8.0	No
				118	5590.0	Not Required			Not Required		
				126	5630.0	Not Required			Not Required		
				142	5710.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	7.0	No	Not Required	7.0	No
				122	5610.0	Not Required			Not Required		
				138	5690.0	Not Required			Not Required		
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	11.1	12.0	Yes	8.3	9.0	Yes
				157	5785.0	11.2			8.2		
				165	5825.0	11.1			8.1		
		802.11n (HT20)	6.5 Mbps	149	5745.0	Not Required	12.0	No	Not Required	9.0	No
				157	5785.0	Not Required			Not Required		
				165	5825.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	151	5755.0	Not Required	8.0	No	Not Required	8.0	No
				159	5795.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	149	5745.0	Not Required	12.0	No	Not Required	9.0	No
				157	5785.0	Not Required			Not Required		
				165	5825.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	151	5755.0	Not Required	8.0	No	Not Required	8.0	No
				159	5795.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	7.0	No	Not Required	7.0	No

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Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduction 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 (UNII 2A)	802.11a	6 Mbps	52	5260.0	10.7	12.0	Yes	7.7	9.0	Yes
				56	5280.0	10.6			7.3		
				60	5300.0	10.5			7.1		
				64	5320.0	10.2			7.2		
		802.11n (HT20)	6.5 Mbps	52	5260.0	Not Required	12.0	No	Not Required	9.0	No
				56	5280.0	Not Required			Not Required		
				60	5300.0	Not Required			Not Required		
				64	5320.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	54	5270.0	Not Required	8.0	No	Not Required	8.0	No
				62	5310.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	Not Required	12.0	No	Not Required	9.0	No
				56	5280.0	Not Required			Not Required		
				60	5300.0	Not Required			Not Required		
				64	5320.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	8.0	No	Not Required	8.0	No
				62	5310.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	7.0	No	Not Required	7.0	No
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	10.1	12.0	Yes	7.1	9.0	Yes
				120	5600.0	11.1			8.4		
				124	5620.0	11.1			8.2		
				144	5720.0	10.8			8.1		
		802.11n (HT20)	6.5 Mbps	100	5500.0	Not Required	12.0	No	Not Required	9.0	No
				120	5600.0	Not Required			Not Required		
				124	5620.0	Not Required			Not Required		
				144	5720.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	102	5510.0	Not Required	8.0	No	Not Required	8.0	No
				118	5590.0	Not Required			Not Required		
				126	5630.0	Not Required			Not Required		
				142	5710.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	100	5500.0	Not Required	12.0	No	Not Required	9.0	No
				120	5600.0	Not Required			Not Required		
				124	5620.0	Not Required			Not Required		
				144	5720.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	102	5510.0	Not Required	8.0	No	Not Required	8.0	No
				118	5590.0	Not Required			Not Required		
				126	5630.0	Not Required			Not Required		
				142	5710.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	7.0	No	Not Required	7.0	No
				122	5610.0	Not Required			Not Required		
				138	5690.0	Not Required			Not Required		
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	11.8	12.0	Yes	8.6	9.0	Yes
				157	5785.0	11.4			8.4		
				165	5825.0	11.8			8.9		
		802.11n (HT20)	6.5 Mbps	149	5745.0	Not Required	12.0	No	Not Required	9.0	No
				157	5785.0	Not Required			Not Required		
				165	5825.0	Not Required			Not Required		
		802.11n (HT40)	13.5 Mbps	151	5755.0	Not Required	8.0	No	Not Required	8.0	No
				159	5795.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	149	5745.0	Not Required	12.0	No	Not Required	9.0	No
				157	5785.0	Not Required			Not Required		
				165	5825.0	Not Required			Not Required		
		802.11ac (VHT40)	13.5 Mbps	151	5755.0	Not Required	8.0	No	Not Required	8.0	No
				159	5795.0	Not Required			Not Required		
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	7.0	No	Not Required	7.0	No

Note(s):

1. For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power
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.
4. MIMO UNII SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

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9.6 Bluetooth

Average Power Measured Results

Band (GHz)	Mode	Ch #	Freq. (MHz)	Maximun Average Power (dBm)	
				Meas. Pwr	Tune-up Limit
2.4	GFSK	0	2402	7.3	9.0
		39	2441	8.0	
		78	2480	6.5	
	EDR, 8-DPSK	0	2402	4.1	5.0
		39	2441	4.7	
		78	2480	2.9	
	LE, GFSK-1M	0	2402	2.9	4.5
		39	2441	3.6	
		78	2480	1.5	
	LE, GFSK-2M	0	2402	2.8	4.5
		19	2440	3.4	
		39	2480	1.4	

Note(s):

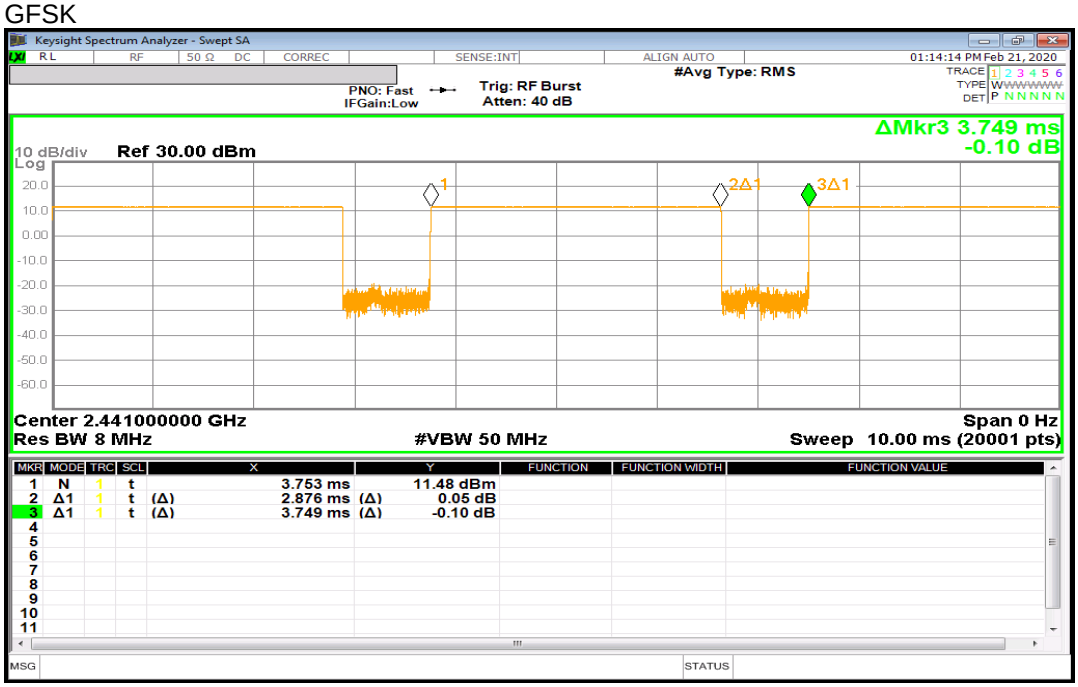
SAR test is evaluated at GFSK mode in Bluetooth

Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
GFSK	DH5	2.876	3.749	76.7%	1.30

Duty Cycle plots

GFSK



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10 Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for WWAN= Measured SAR *Tune-up Scaling Factor
- Reported SAR(W/kg) for Wi-Fi and Bluetooth= Measured SAR * Tune-up scaling factor * Duty Cycle scaling factor
- Duty Cycle scaling factor = 1 / Duty cycle (%)

KDB 447498 D01 General RF Exposure Guidance:

Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

KDB 941225 D01 SAR test for 3G devices:

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

KDB 941225 D05 SAR for LTE Devices:

SAR must be measured with the maximum TTI(transmit time interval) supported by the device in each LTE configuration.
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.
- For LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. 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; therefore, the requirement for H, M and L channels may not fully apply.

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KDB 248227 D01 SAR meas for 802.11:

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

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

- ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- > 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the *initial test position* to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the *reported* SAR is ≤ 0.8 W/kg or all required test positions are tested.
  - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
  - When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the *initial test position* and subsequent test positions, when the *reported* SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is ≤ 1.2 W/kg or all required test channels are considered.
  - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

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

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10.1 GSM 850

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	
Standalone	GPRS 4 Slots	Off	16	Rear	128	824.4	30.0	28.8	0.688	0.917	
					190	836.6	30.0	29.0	0.785	0.982	
					251	848.8	30.0	29.2	0.623	0.744	
			21	Edge 1	128	824.4	30.0	28.8	0.780	1.039	1
					190	836.6	30.0	29.0	0.734	0.919	
					251	848.8	30.0	29.2	0.589	0.704	
			0	Edge 2	190	836.6	30.0	29.0	0.336	0.420	
			0	Edge 4	190	836.6	30.0	29.0	0.242	0.303	
	GPRS 3 Slots	On	0	Rear	251	848.8	21.5	20.9	0.563	0.646	
				Edge 1	128	824.4	21.5	20.1	0.627	0.868	
					190	836.6	21.5	20.4	0.772	1.003	
					251	848.8	21.5	20.9	0.722	0.828	

10.2 GSM 1900

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	
Standalone	GPRS 2 Slots	Off	16	Rear	661	1880.0	28.0	27.1	0.247	0.303	
			21	Edge 1	661	1880.0	28.0	27.1	0.329	0.403	
			0	Edge 2	661	1880.0	28.0	27.1	0.261	0.320	
			0	Edge 4	661	1880.0	28.0	27.1	0.054	0.067	
	GPRS 3 Slots	On	0	Rear	512	1850.2	20.5	18.8	0.405	0.595	
					661	1880.0	20.5	19.4	0.551	0.703	
					810	1909.8	20.5	19.6	0.712	0.870	
				Edge 1	810	1909.8	20.5	19.6	0.231	0.282	
	EGPRS 4 Slots	On	0	Rear	512	1850.2	18.0	16.6	0.507	0.699	
					661	1880.0	18.0	16.9	0.617	0.790	
					810	1909.8	18.0	17.3	0.846	0.983	2
				Edge 1	810	1909.8	18.0	17.3	0.364	0.423	

Note(s):

EGPRS mode Were additionally evaluated due to higher maximum output power than GPRS mode (primary mode).

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10.3 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	
Standalone	Rel 99 RMC	Off	16	Rear	9400	1880.0	24.5	23.0	0.526	0.747	
			21	Edge 1	9262	1852.4	24.5	23.1	0.607	0.834	
					9400	1880.0	24.5	23.0	0.628	0.892	3
					9538	1907.6	24.5	23.1	0.570	0.791	
			0	Edge 2	9400	1880.0	24.5	23.0	0.366	0.520	
			0	Edge 4	9400	1880.0	24.5	23.0	0.073	0.103	
	Rel 99 RMC	On	0	Rear	9400	1880.0	14.5	13.0	0.490	0.699	
				Edge 1	9400	1880.0	14.5	13.0	0.223	0.318	

Note(s):

Standalone Exposure back-off mode was tested with Grip reduced power configuration and then scaled up to Ear-jack reduced power configuration in order to cover higher priority reduced power configuration mentioned in the operational description.

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	
Standalone	Rel 99 RMC	Off	16	Rear	1312	1712.4	24.5	23.1	0.647	0.889	
					1413	1732.6	24.5	23.3	0.685	0.905	
					1513	1752.6	24.5	23.2	0.696	0.930	
			21	Edge 1	1312	1712.4	24.5	23.1	0.650	0.893	
					1413	1732.6	24.5	23.3	0.711	0.939	
					1513	1752.6	24.5	23.2	0.736	0.984	4
			0	Edge 2	1413	1732.6	24.5	23.3	0.147	0.194	
			0	Edge 4	1413	1732.6	24.5	23.3	0.084	0.111	
	Rel 99 RMC	On	0	Rear	1413	1732.6	14.0	12.9	0.615	0.796	
				Edge 1	1413	1732.6	14.0	12.9	0.140	0.181	

10.5 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	
Standalone	Rel 99 RMC	Off	16	Rear	4183	836.6	24.5	23.5	0.535	0.676	
			21	Edge 1	4183	836.6	24.5	23.5	0.452	0.571	
			0	Edge 2	4183	836.6	24.5	23.5	0.273	0.345	
			0	Edge 4	4183	836.6	24.5	23.5	0.135	0.171	
	Rel 99 RMC	On	0	Rear	4183	836.6	17.5	16.0	0.552	0.787	5
				Edge 1	4183	836.6	17.5	16.0	0.374	0.533	

Note(s):

Standalone Exposure back-off mode was tested with Grip reduced power configuration and then scaled up to Ear-jack reduced power configuration in order to cover higher priority reduced power configuration mentioned in the operational description.

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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	
Standalone	QPSK	Off	16	Rear	19100	1900.0	1	0	24.5	22.7	0.427	0.647	
							50	0	23.5	21.6	0.343	0.527	
			21	Edge 1	18700	1860.0	1	0	24.5	22.6	0.561	0.874	
					18900	1880.0	1	0	24.5	22.6	0.585	0.899	
					19100	1900.0	1	0	24.5	22.7	0.562	0.852	
							50	0	23.5	21.6	0.477	0.733	
			0	Edge 2	19100	1900.0	1	0	24.5	22.7	0.277	0.420	
							50	0	23.5	21.6	0.213	0.327	
			0	Edge 4	19100	1900.0	1	0	24.5	22.7	0.081	0.123	
							50	0	23.5	21.6	0.057	0.087	
	QPSK	On	0	Rear	18700	1860.0	1	0	14.5	13.6	0.487	0.599	
							50	0	14.5	13.5	0.478	0.602	
					18900	1880.0	1	0	14.5	13.6	0.514	0.629	
							50	0	14.5	13.6	0.512	0.637	
					19100	1900.0	1	0	14.5	13.8	0.825	0.979	
							50	0	14.5	13.6	0.793	0.980	6
							100	0	14.5	13.5	0.780	0.972	
				Edge 1	19100	1900.0	1	0	14.5	13.8	0.338	0.401	
							50	0	14.5	13.6	0.330	0.408	

10.7 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	
Standalone	QPSK	Off	16	Rear	20525	836.5	1	0	24.5	23.4	0.551	0.717	
							25	0	23.5	22.2	0.445	0.599	
			21	Edge 1	20525	836.5	1	0	24.5	23.4	0.441	0.574	
							25	0	23.5	22.2	0.353	0.475	
			0	Edge 2	20525	836.5	1	0	24.5	23.4	0.260	0.339	
							25	0	23.5	22.2	0.211	0.284	
			0	Edge 4	20525	836.5	1	0	24.5	23.4	0.139	0.181	
							25	0	23.5	22.2	0.111	0.149	
	QPSK	On	0	Rear	20525	836.5	1	0	17.5	16.4	0.700	0.909	
							25	0	17.5	16.2	0.688	0.922	7
							50	0	17.5	16.2	0.671	0.903	
				Edge 1	20525	836.5	1	0	17.5	16.4	0.493	0.640	
							25	0	17.5	16.2	0.490	0.657	

Note(s):

Standalone Exposure back-off mode was tested with Grip reduced power configuration and then scaled up to Ear-jack reduced power configuration in order to cover higher priority reduced power configuration mentioned in the operational description.

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10.8 LTE Band 12 (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	
Standalone	QPSK	Off	16	Rear	23095	707.5	1	0	24.5	23.5	0.219	0.275	
							25	0	23.5	22.4	0.182	0.236	
			21	Edge 1	23095	707.5	1	0	24.5	23.5	0.097	0.122	
							25	0	23.5	22.4	0.081	0.105	
			0	Edge 2	23095	707.5	1	0	24.5	23.5	0.128	0.161	
							25	0	23.5	22.4	0.112	0.145	
			0	Edge 4	23095	707.5	1	0	24.5	23.5	0.064	0.080	
							25	0	23.5	22.4	0.051	0.066	
	QPSK	On	0	Rear	23095	707.5	1	0	18.5	17.9	0.580	0.667	
							25	0	18.5	17.8	0.587	0.695	8
				Edge 1	23095	707.5	1	0	18.5	17.9	0.345	0.397	
							25	0	18.5	17.8	0.357	0.422	

10.9 LTE Band 66 (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	
Standalone	QPSK	Off	16	Rear	132322	1745.0	1	0	24.5	23.4	0.546	0.704	
							50	0	23.5	22.2	0.437	0.586	
			21	Edge 1	132322	1745.0	1	0	24.5	23.4	0.599	0.772	9
							50	0	23.5	22.2	0.484	0.649	
			0	Edge 2	132322	1745.0	1	0	24.5	23.4	0.159	0.205	
							50	0	23.5	22.2	0.121	0.162	
			0	Edge 4	132322	1745.0	1	0	24.5	23.4	0.080	0.103	
							50	0	23.5	22.2	0.061	0.082	
	QPSK	On	0	Rear	132322	1745.0	1	0	14.5	13.6	0.604	0.743	
							50	0	14.5	13.5	0.600	0.757	
				Edge 1	132322	1745.0	1	0	14.5	13.6	0.426	0.524	
							50	0	14.5	13.5	0.442	0.558	

Note(s):

Standalone Exposure back-off mode was tested with Grip reduced power configuration and then scaled up to Ear-jack reduced power configuration in order to cover higher priority reduced power configuration mentioned in the operational description.

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10.10 Wi-Fi (DTS Band)

Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
2.4GHz SISO Ant 1	802.11b 1 Mbps	Standalone	Off	13	Rear	6	2437.0	0.142	99.3%	19.0	18.4	0.110	0.127	4	
				12	Edge 1	6	2437.0	0.225	99.3%	19.0	18.4	0.162	0.187	2	
				7	Edge 2	6	2437.0	0.513	99.3%	19.0	18.4	0.404	0.467		
				8	Corner A	6	2437.0	0.206	99.3%	19.0	18.4				
			On	0	Rear	11	2462.0	0.642	99.3%	13.5	13.4	0.536	0.547	2	
					Edge 1	11	2462.0	0.573	99.3%	13.5	13.4	0.453	0.462	4	
					Edge 2	11	2462.0	0.770	99.3%	13.5	13.4	0.617	0.630		10
					Corner A	11	2462.0	0.276	99.3%	13.5	13.4				
2.4GHz SISO Ant 2	802.11b 1 Mbps	Standalone	Off	13	Rear	1	2412.0	0.073	99.3%	18.0	17.1	0.057	0.070	4	
				12	Edge 1	1	2412.0	0.028	99.3%	18.0	17.1	0.023	0.029	4	
				6	Edge 4	1	2412.0	0.182	99.3%	18.0	17.1	0.138	0.170	1	
				7	Corner B	1	2412.0	0.051	99.3%	18.0	17.1				
			On	0	Rear	11	2462.0	0.648	99.3%	13.5	13.3	0.497	0.519	2	
					Edge 1	11	2462.0	0.225	99.3%	13.5	13.3	0.158	0.165	4	
					Edge 4	11	2462.0	0.734	99.3%	13.5	13.3	0.554	0.579		11
					Corner B	11	2462.0	0.110	99.3%	13.5	13.3				
2.4GHz MIMO	802.11g 6 Mbps	Standalone	Off	13	Rear	6	2437.0	0.048	95.8%	14.0	13.9	0.037	0.039	4, 5	
				12	Edge 1	6	2437.0	0.056	95.8%	14.0	13.9	0.051	0.055	4, 5	
				7	Edge 2	6	2437.0	0.235	95.8%	14.0	13.9	0.183	0.195	1, 5	
				6	Edge 4	6	2437.0	0.085	95.8%	14.0	12.3	0.064	0.099	4, 6	
				8	Corner A	6	2437.0	0.066	95.8%	14.0	13.9			5	
				7	Corner B	6	2437.0	0.020	95.8%	14.0	12.3			6	
			On	0	Rear	6	2437.0	0.578	95.8%	13.5	13.4	0.452	0.478	2, 5	
					Edge 1	6	2437.0	0.341	95.8%	13.5	13.4	0.391	0.414	4, 5	
					Edge 2	6	2437.0	0.807	95.8%	13.5	13.4	0.602	0.637	5	12
					Edge 4	6	2437.0	0.294	95.8%	13.5	11.9	0.336	0.513	4, 6	
					Corner A	6	2437.0	0.263	95.8%	13.5	13.4			5	
					Corner B	6	2437.0	0.067	95.8%	13.5	11.9			6	

Note(s):

1. Highest *reported* SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest *reported* SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest *reported* SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was *reported*.
3. Testing for a second channel was required because the *reported* SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. Zoom-scan was evaluated at WiFi Ant.1, when SAR test performed for WiFi MIMO mode
6. Zoom-scan was evaluated at WiFi Ant.2, when SAR test performed for WiFi MIMO mode
7. SAR testing is not required for OFDM mode(s) 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.
8. MIMO SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

10.11 Bluetooth

Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
2.4GHz	GFSK	Standalone	N/A	0	Rear	39	2441.0	76.7%	9.0	8.0	0.119	0.195	13
				0	Edge 1	39	2441.0	76.7%	9.0	8.0	0.077	0.127	
				0	Edge 2	39	2441.0	76.7%	9.0	8.0	0.111	0.182	

Note(s):

Bluetooth SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

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10.12 Wi-Fi (U-NII Band)

Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
5.3 GHz U-NII 2A SISO Ant 1	802.11a 6 Mbps	Standalone	Off	13	Rear	56	5280.0	0.111	96.1%	14.5	14.2	0.043	0.049	2	
				12	Edge 1	56	5280.0	0.098	96.1%	14.5	14.2	0.037	0.042	4	
				7	Edge 2	56	5280.0	0.483	96.1%	14.5	14.2	0.361	0.407		
				8	Corner A	56	5280.0	0.318	96.1%	14.5	14.2				
	802.11ac (VHT80) MCS0		On	0	Rear	58	5290.0	0.633	92.5%	9.0	8.7	0.377	0.439	2	
				0	Edge 1	58	5290.0	0.348	92.5%	9.0	8.7	0.143	0.166	4	
				0	Edge 2	58	5290.0	1.191	92.5%	9.0	8.7	0.671	0.781		14
				0	Corner A	58	5290.0	0.563	92.5%	9.0	8.7				
5.3 GHz U-NII 2A SISO Ant 2	802.11a 6 Mbps	Standalone	Off	13	Rear	64	5320.0	0.029	96.1%	13.0	12.7	0.003	0.003	4	
				12	Edge 1	64	5320.0	0.041	96.1%	13.0	12.7	0.011	0.012	4	
				6	Edge 4	64	5320.0	0.103	96.1%	13.0	12.7	0.056	0.062	1	
				7	Corner B	64	5320.0	0.040	96.1%	13.0	12.7				
	802.11ac (VHT80) MCS0		On	0	Rear	58	5290.0	0.341	92.5%	9.0	8.3	0.133	0.168	4	
				0	Edge 1	58	5290.0	0.389	92.5%	9.0	8.3	0.125	0.158	4	
				0	Edge 4	58	5290.0	0.451	92.5%	9.0	8.3	0.179	0.226	1	15
				0	Corner B	58	5290.0	0.086	92.5%	9.0	8.3				
5.3 GHz U-NII 2A MIMO	802.11a 6 Mbps	Standalone	Off	13	Rear	52	5260.0	0.041	96.1%	12.0	11.9	0.016	0.017	4, 5	
				12	Edge 1	52	5260.0	0.049	96.1%	12.0	11.9	0.026	0.027	4, 5	
				7	Edge 2	52	5260.0	0.337	96.1%	12.0	11.9	0.183	0.194	1, 5	
				6	Edge 4	52	5260.0	0.066	96.1%	12.0	10.7	0.024	0.033	4, 6	
				8	Corner A	52	5260.0	0.189	96.1%	12.0	11.9			5	
				7	Corner B	52	5260.0	0.018	96.1%	12.0	10.7			6	
			On	0	Rear	52	5260.0	0.545	96.1%	9.0	8.9	0.262	0.276	2, 5	
				0	Edge 1	52	5260.0	0.335	96.1%	9.0	8.9	0.146	0.154	4, 5	
				0	Edge 2	52	5260.0	0.783	96.1%	9.0	8.9	0.589	0.621	5	16
				0	Edge 4	52	5260.0	0.362	96.1%	9.0	7.7	0.170	0.239	4, 6	
				0	Corner A	52	5260.0	0.425	96.1%	9.0	8.9			5	
				0	Corner B	52	5260.0	0.052	96.1%	9.0	7.7			6	

Note(s):

1. Highest *reported* SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest *reported* SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest *reported* SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was *reported*.
3. Testing for a second channel was required because the *reported* SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. Zoom-scan was evaluated at WiFi Ant.1, when SAR test performed for WiFi MIMO mode
6. Zoom-scan was evaluated at WiFi Ant.2, when SAR test performed for WiFi MIMO mode
7. MIMO SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

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Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
5.6 GHz U-NII 2C SISO Ant 1	802.11a 6 Mbps	Standalone	Off	13	Rear	100	5500.0	0.125	96.1%	13.0	12.9	0.052	0.055	4	
				12	Edge 1	100	5500.0	0.096	96.1%	13.0	12.9	0.040	0.043	4	
				7	Edge 2	100	5500.0	0.472	96.1%	13.0	12.9	0.335	0.355	1	
				8	Corner A	100	5500.0	0.394	96.1%	13.0	12.9				
	802.11ac (VHT80) MCS0		On	0	Rear	138	5690.0	0.754	92.5%	9.0	8.7	0.235	0.270	2	
				0	Edge 1	138	5690.0	0.250	92.5%	9.0	8.7	0.086	0.099	4	
				0	Edge 2	138	5690.0	0.712	92.5%	9.0	8.7	0.508	0.584	4	17
				0	Corner A	138	5690.0	0.811	92.5%	9.0	8.7	0.369	0.425		
5.6 GHz U-NII 2C SISO Ant 2	802.11a 6 Mbps	Standalone	Off	13	Rear	120	5600.0	0.027	96.1%	13.0	12.9	0.008	0.009	4	
				12	Edge 1	120	5600.0	0.035	96.1%	13.0	12.9	0.009	0.010	4	
				6	Edge 4	120	5600.0	0.270	96.1%	13.0	12.9	0.107	0.115	1	
				7	Corner B	120	5600.0	0.102	96.1%	13.0	12.9				
	802.11ac (VHT80) MCS0		On	0	Rear	106	5530.0	0.283	92.5%	9.0	8.8	0.116	0.130	4	
				0	Edge 1	106	5530.0	0.440	92.5%	9.0	8.8	0.135	0.152	4	
				0	Edge 4	106	5530.0	0.803	92.5%	9.0	8.8	0.252	0.283	1	18
				0	Corner B	106	5530.0	0.138	92.5%	9.0	8.8				
5.6 GHz U-NII 2C MIMO	802.11a 6 Mbps	Standalone	Off	13	Rear	120	5600.0	0.071	96.1%	12.0	11.6	0.033	0.038	4, 5	
				12	Edge 1	120	5600.0	0.046	96.1%	12.0	11.6	0.021	0.024	4, 5	
				7	Edge 2	120	5600.0	0.314	96.1%	12.0	11.6	0.161	0.186	1, 5	
				6	Edge 4	120	5600.0	0.097	96.1%	12.0	11.1	0.053	0.068	4, 6	
				8	Corner A	120	5600.0	0.243	96.1%	12.0	11.6			5	
				7	Corner B	120	5600.0	0.077	96.1%	12.0	11.1			6	
			On	0	Rear	100	5500.0	1.322	96.1%	9.0	8.7	0.600	0.664	5	19
				0	Edge 1	100	5500.0	0.362	96.1%	9.0	8.7	0.151	0.167	4, 5	
				0	Edge 2	100	5500.0	0.726	96.1%	9.0	8.7	0.473	0.524	4, 5	
				0	Edge 4	100	5500.0	0.320	96.1%	9.0	7.1	0.160	0.259	4, 6	
				0	Corner A	100	5500.0	0.886	96.1%	9.0	8.7	0.294	0.325	2, 5	
				0	Corner B	100	5500.0	0.095	96.1%	9.0	7.1			6	

Note(s):

1. Highest *reported* SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest *reported* SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest *reported* SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was *reported*.
3. Testing for a second channel was required because the *reported* SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. Zoom-scan was evaluated at WiFi Ant.1, when SAR test performed for WiFi MIMO mode
6. Zoom-scan was evaluated at WiFi Ant.2, when SAR test performed for WiFi MIMO mode
7. MIMO SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

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Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
5.8 GHz U-NII 3 SISO Ant 1	802.11a 6 Mbps	Standalone	Off	13	Rear	157	5785.0	0.067	96.1%	14.5	13.3	0.028	0.038	4	
				12	Edge 1	157	5785.0	0.053	96.1%	14.5	13.3	0.021	0.029	4	
				7	Edge 2	157	5785.0	0.527	96.1%	14.5	13.3	0.291	0.396	1	
				8	Corner A	157	5785.0	0.290	96.1%	14.5	13.3				
	802.11ac (VHT80) MCS0		On	0	Rear	155	5775.0	1.568	92.5%	9.0	8.8	0.543	0.609		20
				0	Edge 1	155	5775.0	0.234	92.5%	9.0	8.8	0.070	0.079	4	
				0	Edge 2	155	5775.0	0.896	92.5%	9.0	8.8	0.420	0.471	2	
				0	Corner A	155	5775.0	0.701	92.5%	9.0	8.8				
5.8 GHz U-NII 3 SISO Ant 2	802.11a 6 Mbps	Standalone	Off	13	Rear	165	5825.0	0.026	96.1%	13.0	12.9	0.011	0.012	4	
				12	Edge 1	165	5825.0	0.054	96.1%	13.0	12.9	0.022	0.023	4	
				6	Edge 4	165	5825.0	0.198	96.1%	13.0	12.9	0.109	0.117	1	
				7	Corner B	165	5825.0	0.177	96.1%	13.0	12.9				
	802.11ac (VHT80) MCS0		On	0	Rear	155	5775.0	0.582	92.5%	9.0	8.9	0.160	0.178	2	
				0	Edge 1	155	5775.0	0.273	92.5%	9.0	8.9	0.041	0.046	4	
				0	Edge 4	155	5775.0	1.330	92.5%	9.0	8.9	0.376	0.419		21
				0	Corner B	155	5775.0	0.549	92.5%	9.0	8.9				
5.8 GHz U-NII 3 MIMO	802.11a 6 Mbps	Standalone	Off	13	Rear	165	5825.0	0.024	96.1%	12.0	11.1	0.010	0.013	4, 5	
				12	Edge 1	165	5825.0	0.042	96.1%	12.0	11.1	0.011	0.014	4, 5	
				7	Edge 2	165	5825.0	0.294	96.1%	12.0	11.1	0.114	0.146	1, 5	
				6	Edge 4	165	5825.0	0.263	96.1%	12.0	11.8	0.084	0.091	4, 6	
				8	Corner A	165	5825.0	0.143	96.1%	12.0	11.1			5	
				7	Corner B	165	5825.0	0.187	96.1%	12.0	11.8			6	
			On	0	Rear	165	5825.0	0.985	96.1%	9.0	8.1	0.263	0.336	4, 5	
				0	Edge 1	165	5825.0	0.151	96.1%	9.0	8.1	0.077	0.098	4, 5	
				0	Edge 2	165	5825.0	1.119	96.1%	9.0	8.1	0.402	0.513	2, 5	
				0	Edge 4	165	5825.0	1.822	96.1%	9.0	8.9	0.530	0.559	6	22
				0	Corner A	165	5825.0	0.502	96.1%	9.0	8.1			5	
				0	Corner B	165	5825.0	0.488	96.1%	9.0	8.9			6	

Note(s):

1. Highest *reported* SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest *reported* SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest *reported* SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was *reported*.
3. Testing for a second channel was required because the *reported* SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. Zoom-scan was evaluated at WiFi Ant.1, when SAR test performed for WiFi MIMO mode
6. Zoom-scan was evaluated at WiFi Ant.2, when SAR test performed for WiFi MIMO mode
7. For Standalone exposure condition, MIMO SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

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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)	First Repeated	
						Measured SAR (W/kg)	Largest to Smallest SAR Ratio
750	LTE Band 12	Standalone	Rear	No	0.587	N/A	N/A
850	GSM 850	Standalone	Rear	No	0.785	N/A	N/A
	WCDMA Band V	Standalone	Rear	No	0.552	N/A	N/A
	LTE Band 5	Standalone	Rear	No	0.700	N/A	N/A
1750	WCDMA Band IV	Standalone	Edge 1	No	0.736	N/A	N/A
	LTE Band 66	Standalone	Rear	No	0.604	N/A	N/A
1900	GSM 1900	Standalone	Rear	Yes	0.846	0.842	1.00
	WCDMA Band II	Standalone	Edge 1	No	0.628	N/A	N/A
	LTE Band 2	Standalone	Rear	No	0.825	N/A	N/A
2400	Wi-Fi 802.11b/g/n	Standalone	Edge 2	No	0.617	N/A	N/A
	Bluetooth	Standalone	Rear	No	0.119	N/A	N/A
5300	Wi-Fi 802.11a/n	Standalone	Edge 2	No	0.671	N/A	N/A
5500	Wi-Fi 802.11a/n	Standalone	Rear	No	0.600	N/A	N/A
5800	Wi-Fi 802.11a/n	Standalone	Rear	No	0.543	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

Simultaneous Transmission Condition

RF Exposure Condition	Item	Capable Transmit Configurations				
Standalone	1	GSM(Voice/GPRS)	+	DTS_Ant.1	+	DTS_Ant.2
	2	GSM(Voice/GPRS)	+	U-NII_Ant.1	+	U-NII_Ant.2
	3	GSM(Voice/GPRS)	+	BT		
	4	GSM(Voice/GPRS)	+	U-NII_Ant.2	+	BT
	5	W-CDMA	+	DTS_Ant.1	+	DTS_Ant.2
	6	W-CDMA	+	U-NII_Ant.1	+	U-NII_Ant.2
	7	W-CDMA	+	BT		
	8	W-CDMA	+	U-NII_Ant.2	+	BT
	9	LTE	+	DTS_Ant.1	+	DTS_Ant.2
	10	LTE	+	U-NII_Ant.1	+	U-NII_Ant.2
	11	LTE	+	BT		
	12	LTE	+	U-NII_Ant.2	+	BT

Notes:
1. Only U-NII Ant.2 Radio can transmit simultaneously w ith Bluetooth Radio.
2. DTS Radio cannot transmit simultaneously w ith Bluetooth Radio.
3. DTS and UNII Radio can operating both SISO and MIMO modes.

Simultaneous transmission SAR test exclusion considerations

KDB 447498 D01 General RF Exposure Guidance provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR and SAR to Peak Location Ratio (SPLSR)

Sum of SAR

To qualify for simultaneous transmission SAR test exclusion based upon Sum of SAR the sum of the reported standalone SARs for all simultaneously transmitting antennas shall be below the applicable standalone SAR limit. If the sum of the SARs is above the applicable limit then simultaneous transmission SAR test exclusion may still apply if the requirements of the SAR to Peak Location Ratio (SPLSR) evaluation are met.

SAR to Peak Location Ratio (SPLSR)

KDB 447498 D01 General RF Exposure Guidance explains how to calculate 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 reported 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 reported or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of

$$[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$$

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

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

When an individual antenna transmits at on two bands simultaneously, the sum of the highest *reported* SAR for the frequency bands should be used to determine SAR_1.or SAR_2. When SPLSR is necessary, the smallest distance between the peak SAR locations for the antenna pair with respect to the peaks from each antenna should be used.

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The antennas in all antenna pairs that do not qualify for simultaneous transmission SAR test exclusion must be tested for SAR compliance, according to the enlarged zoom scan and volume scan post-processing procedures in KDB Publication 865664 D01

The antennas for the unlicensed transmitters are closely situated. As a result, the associated SAR hotspots are also closely situated. Some of the sum of SAR calculations yielded results over 1.6 W/kg. The SPSLR calculations for these situations were performed by treating the unlicensed SAR values as a single transmitter. The most conservative distance between all the unlicensed hotspots to the licensed hotspot was used for the value of *d* in the SPSLR calculation.

Simultaneous transmission SAR measurement

When simultaneous transmission SAR measurements are required in different frequency bands not covered by a single probe calibration point then separate tests for each frequency band are performed. The tests are performed using enlarged zoom scans which are processed, by means of superposition, using the DASY5 volume scan postprocessing procedures to determine the 1-g SAR for the aggregate SAR distribution.

The spatial resolution used for all enlarged zoom scans is the same as used for the most stringent zoom scans. I.E. the scan parameters required for the highest frequency assessed are used for all enlarged zoom scans. The scans cover the complete area of the device to ensure all transmitting antennas and radiating structures are assessed.

DASY5 provides the ability to perform Multiband Evaluations according to the latest standards using the Volume Scan job as well as appropriate routines for the Post-processing.

In order to extract and process measurements within different frequency bands, the SEMCAD X Post-processor performs the combination and subsequent superposition of these measurement data via DASY5= Combined MultiBand Averaged SAR.

Combined Multi Band Averaged SAR allows - in addition to the data extraction - an evaluation of the 1 g, 10 g and/or arbitrary averaged mass SAR.
Power Scaling Factor is used to allow the volume scans to be scaled by a value other than "1", this is important when the results need to be scaled to different maximum power levels. The Power Scaling Factor is applied to each individual point of the scan. When power scaling is used in multi-band combinations the scaling factor is applied to each individual point of the first scan, the second factor is then applied to each individual point of the second scan and so on. The scans are then combined.

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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. A sensor triggering of 14 mm is included for both Rear and Edge 1																
Cellular	GPRS 4 Slots	848.8	30.00	500	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	GPRS 2 Slots	1909.8	28.00	158	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	W-CDMA 5	846.6	24.50	282	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	W-CDMA 4	1752.6	24.50	282	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	W-CDMA 2	1907.6	24.50	282	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 2	1900	24.50	282	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 4	1745	24.50	282	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 5	844	24.50	282	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 12	711	24.50	282	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 17	710	24.50	282	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Cellular	LTE Band 66	1770	24.50	282	0	0	46	242	46		-MEASURE-	-MEASURE-	-MEASURE-	0.400	-MEASURE-	
Second Stage Power Back-off, Proximity Sensor On																
Cellular	GPRS 3 Slots	848.8	21.50	53	0	0	46	242	46		-MEASURE-	-MEASURE-	0.142	0.400	0.142	
Cellular	GPRS 2 Slots	1909.8	20.50	28	0	0	46	242	46		-MEASURE-	-MEASURE-	0.112	0.400	0.112	
Cellular	W-CDMA 5	846.6	17.00	50	0	0	46	242	46		-MEASURE-	-MEASURE-	0.133	0.400	0.133	
Cellular	W-CDMA 4	1752.6	14.00	25	0	0	46	242	46		-MEASURE-	-MEASURE-	0.096	0.400	0.096	
Cellular	W-CDMA 2	1907.6	14.00	25	0	0	46	242	46		-MEASURE-	-MEASURE-	0.100	0.400	0.100	
Cellular	LTE Band 2	1900	14.50	28	0	0	46	242	46		-MEASURE-	-MEASURE-	0.112	0.400	0.112	
Cellular	LTE Band 4	1745	14.00	25	0	0	46	242	46		-MEASURE-	-MEASURE-	0.096	0.400	0.096	
Cellular	LTE Band 5	844	17.00	50	0	0	46	242	46		-MEASURE-	-MEASURE-	0.133	0.400	0.133	
Cellular	LTE Band 12	711	18.50	71	0	0	46	242	46		-MEASURE-	-MEASURE-	0.174	0.400	0.174	
Cellular	LTE Band 17	710	18.50	71	0	0	46	242	46		-MEASURE-	-MEASURE-	0.173	0.400	0.173	
Cellular	LTE Band 66	1770	14.00	25	0	0	46	242	46		-MEASURE-	-MEASURE-	0.096	0.400	0.096	

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Estimated SAR for WLAN

SISO Max

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
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	19.00	79	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.3 GHz	5320	14.50	28	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.5 GHz	5700	13.00	20	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.8 GHz	5825	14.50	28	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Bluetooth	2480	9.00	8	0	0	0	242	110		0.336	0.336	0.336	0.400	0.400	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	18.00	63	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.3 GHz	5320	13.00	20	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.5 GHz	5700	13.00	20	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.8 GHz	5825	13.00	20	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	

SISO Reduce

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
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	

MIMO Max

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
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	14.00	25	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.3 GHz	5320	12.00	16	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.5 GHz	5700	12.00	16	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.8 GHz	5825	12.00	16	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	14.00	25	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.3 GHz	5320	12.00	16	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.5 GHz	5700	12.00	16	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.8 GHz	5825	12.00	16	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	

MIMO Reduce

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
Wi-Fi Antenna 1															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	0	242	110		-MEASURE-	-MEASURE-	-MEASURE-	0.400	0.400	
Wi-Fi Antenna 2															
Wi-Fi 2.4 GHz	2462	13.50	22	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.3 GHz	5320	9.00	8	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.5 GHz	5700	9.00	8	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	
Wi-Fi 5.8 GHz	5825	9.00	8	0	0	110	242	0		-MEASURE-	-MEASURE-	0.400	0.400	-MEASURE-	

Note(s):

Bluetooth SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

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12.1 Sum of the SAR for GSM 850 & Wi-Fi & BT

Test Position	Standalone SAR (W/kg)								∑ 1-g SAR (W/kg)							
	WWAN	DTS Ant 1	DTS Ant 2	DTS MIMO	U-NII Ant 1	U-NII Ant 2	U-NII MIMO	BT	WWAN + DTS Ant 1	WWAN + DTS Ant 2	WWAN + DTS MIMO	WWAN + U-NII Ant 1	WWAN + U-NII Ant 2	WWAN + U-NII MIMO	WWAN + BT	WWAN + BT + U-NII Ant 2
	1	2	3	4	5	6	7	8	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+6+8
Rear	0.982	0.547	0.519	0.478	0.609	0.178	0.664	0.195	1.529	1.501	1.460	1.591	1.160	1.646	1.177	1.355
Edge 1	1.039	0.462	0.165	0.414	0.166	0.158	0.167	0.127	1.501	1.204	1.453	1.205	1.197	1.206	1.166	1.324
Edge 2	0.420	0.630	0.400	0.637	0.781	0.400	0.621	0.182	1.050	0.820	1.057	1.201	0.820	1.041	0.602	1.002
Edge 3	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800	0.800	0.800	0.800	0.800	0.800	0.800	1.200
Edge 4	0.303	0.400	0.579	0.513	0.400	0.419	0.559	0.400	0.703	0.882	0.816	0.703	0.722	0.862	0.703	1.122

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)		∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO						
Rear	0.982	0.664	1 + 2	1.646	64.2	0.03	No	1

12.2 Sum of the SAR for GSM 1900 & Wi-Fi & BT

Test Position	Standalone SAR (W/kg)								∑ 1-g SAR (W/kg)							
	WWAN	DTS Ant 1	DTS Ant 2	DTS MIMO	U-NII Ant 1	U-NII Ant 2	U-NII MIMO	BT	WWAN + DTS Ant 1	WWAN + DTS Ant 2	WWAN + DTS MIMO	WWAN + U-NII Ant 1	WWAN + U-NII Ant 2	WWAN + U-NII MIMO	WWAN + BT	WWAN + BT + U-NII Ant 2
	1	2	3	4	5	6	7	8	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+6+8
Rear	0.983	0.547	0.519	0.478	0.609	0.178	0.664	0.195	1.530	1.502	1.461	1.592	1.161	1.647	1.178	1.356
Edge 1	0.423	0.462	0.165	0.414	0.166	0.158	0.167	0.127	0.885	0.588	0.837	0.589	0.581	0.590	0.550	0.708
Edge 2	0.320	0.630	0.400	0.637	0.781	0.400	0.621	0.182	0.950	0.720	0.957	1.101	0.720	0.941	0.502	0.902
Edge 3	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800	0.800	0.800	0.800	0.800	0.800	0.800	1.200
Edge 4	0.067	0.400	0.579	0.513	0.400	0.419	0.559	0.400	0.467	0.646	0.580	0.467	0.486	0.626	0.467	0.886

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)		∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO						
Rear	0.983	0.664	1 + 2	1.647	83.1	0.03	No	2

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

Test Position	Standalone SAR (W/kg)								∑ 1-g SAR (W/kg)							
	WWAN	DTS Ant 1	DTS Ant 2	DTS MIMO	U-NII Ant 1	U-NII Ant 2	U-NII MIMO	BT	WWAN + DTS Ant 1	WWAN + DTS Ant 2	WWAN + DTS MIMO	WWAN + U-NII Ant 1	WWAN + U-NII Ant 2	WWAN + U-NII MIMO	WWAN + BT	WWAN + BT + U-NII Ant 2
	1	2	3	4	5	6	7	8	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+6+8
Rear	0.747	0.547	0.519	0.478	0.609	0.178	0.664	0.195	1.294	1.266	1.225	1.356	0.925	1.411	0.942	1.120
Edge 1	0.892	0.462	0.165	0.414	0.166	0.158	0.167	0.127	1.354	1.057	1.306	1.058	1.050	1.059	1.019	1.177
Edge 2	0.520	0.630	0.400	0.637	0.781	0.400	0.621	0.182	1.150	0.920	1.157	1.301	0.920	1.141	0.702	1.102
Edge 3	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800	0.800	0.800	0.800	0.800	0.800	0.800	1.200
Edge 4	0.103	0.400	0.579	0.513	0.400	0.419	0.559	0.400	0.503	0.682	0.616	0.503	0.522	0.662	0.503	0.922

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

Test Position	Standalone SAR (W/kg)								∑ 1-g SAR (W/kg)							
	WWAN	DTS Ant 1	DTS Ant 2	DTS MIMO	U-NII Ant 1	U-NII Ant 2	U-NII MIMO	BT	WWAN + DTS Ant 1	WWAN + DTS Ant 2	WWAN + DTS MIMO	WWAN + U-NII Ant 1	WWAN + U-NII Ant 2	WWAN + U-NII MIMO	WWAN + BT	WWAN + BT + U-NII Ant 2
	1	2	3	4	5	6	7	8	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+6+8
Rear	0.930	0.547	0.519	0.478	0.609	0.178	0.664	0.195	1.477	1.449	1.408	1.539	1.108	1.594	1.125	1.303
Edge 1	0.984	0.462	0.165	0.414	0.166	0.158	0.167	0.127	1.446	1.149	1.398	1.150	1.142	1.151	1.111	1.269
Edge 2	0.194	0.630	0.400	0.637	0.781	0.400	0.621	0.182	0.824	0.594	0.831	0.975	0.594	0.815	0.376	0.776
Edge 3	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800	0.800	0.800	0.800	0.800	0.800	0.800	1.200
Edge 4	0.111	0.400	0.579	0.513	0.400	0.419	0.559	0.400	0.511	0.690	0.624	0.511	0.530	0.670	0.511	0.930

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

Test Position	Standalone SAR (W/kg)								∑ 1-g SAR (W/kg)							
	WWAN	DTS Ant 1	DTS Ant 2	DTS MIMO	U-NII Ant 1	U-NII Ant 2	U-NII MIMO	BT	WWAN + DTS Ant 1	WWAN + DTS Ant 2	WWAN + DTS MIMO	WWAN + U-NII Ant 1	WWAN + U-NII Ant 2	WWAN + U-NII MIMO	WWAN + BT	WWAN + BT + U-NII Ant 2
	1	2	3	4	5	6	7	8	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+6+8
Rear	0.787	0.547	0.519	0.478	0.609	0.178	0.664	0.195	1.334	1.306	1.265	1.396	0.965	1.451	0.982	1.160
Edge 1	0.571	0.462	0.165	0.414	0.166	0.158	0.167	0.127	1.033	0.736	0.985	0.737	0.729	0.738	0.698	0.856
Edge 2	0.345	0.630	0.400	0.637	0.781	0.400	0.621	0.182	0.975	0.745	0.982	1.126	0.745	0.966	0.527	0.927
Edge 3	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800	0.800	0.800	0.800	0.800	0.800	0.800	1.200
Edge 4	0.171	0.400	0.579	0.513	0.400	0.419	0.559	0.400	0.571	0.750	0.684	0.571	0.590	0.730	0.571	0.990

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

Test Position	Standalone SAR (W/kg)								∑ 1-g SAR (W/kg)							
	WWAN	DTS Ant 1	DTS Ant 2	DTS MIMO	U-NII Ant 1	U-NII Ant 2	U-NII MIMO	BT	WWAN + DTS Ant 1	WWAN + DTS Ant 2	WWAN + DTS MIMO	WWAN + U-NII Ant 1	WWAN + U-NII Ant 2	WWAN + U-NII MIMO	WWAN + BT	WWAN + BT + U-NII Ant 2
	1	2	3	4	5	6	7	8	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+6+8
Rear	0.980	0.547	0.519	0.478	0.609	0.178	0.664	0.195	1.527	1.499	1.458	1.589	1.158	1.644	1.175	1.353
Edge 1	0.899	0.462	0.165	0.414	0.166	0.158	0.167	0.127	1.361	1.064	1.313	1.065	1.057	1.066	1.026	1.184
Edge 2	0.420	0.630	0.400	0.637	0.781	0.400	0.621	0.182	1.050	0.820	1.057	1.201	0.820	1.041	0.602	1.002
Edge 3	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800	0.800	0.800	0.800	0.800	0.800	0.800	1.200
Edge 4	0.123	0.400	0.579	0.513	0.400	0.419	0.559	0.400	0.523	0.702	0.636	0.523	0.542	0.682	0.523	0.942

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)		∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO						
Rear	0.980	0.664	1 + 2	1.644	86.5	0.02	No	3

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

Test Position	Standalone SAR (W/kg)								∑1-g SAR (W/kg)							
	WWAN	DTS Ant 1	DTS Ant 2	DTS MIMO	U-NII Ant 1	U-NII Ant 2	U-NII MIMO	BT	WWAN + DTS Ant 1	WWAN + DTS Ant 2	WWAN + DTS MIMO	WWAN + U-NII Ant 1	WWAN + U-NII Ant 2	WWAN + U-NII MIMO	WWAN + BT	WWAN + BT + U-NII Ant 2
	1	2	3	4	5	6	7	8	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+6+8
Rear	0.922	0.547	0.519	0.478	0.609	0.178	0.664	0.195	1.469	1.441	1.400	1.531	1.100	1.586	1.117	1.295
Edge 1	0.657	0.462	0.165	0.414	0.166	0.158	0.167	0.127	1.119	0.822	1.071	0.823	0.815	0.824	0.784	0.942
Edge 2	0.339	0.630	0.400	0.637	0.781	0.400	0.621	0.182	0.969	0.739	0.976	1.120	0.739	0.960	0.521	0.921
Edge 3	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800	0.800	0.800	0.800	0.800	0.800	0.800	1.200
Edge 4	0.181	0.400	0.579	0.513	0.400	0.419	0.559	0.400	0.581	0.760	0.694	0.581	0.600	0.740	0.581	1.000

12.8 Sum of the SAR for LTE Band 12 & Wi-Fi & BT

Test Position	Standalone SAR (W/kg)								∑1-g SAR (W/kg)							
	WWAN	DTS Ant 1	DTS Ant 2	DTS MIMO	U-NII Ant 1	U-NII Ant 2	U-NII MIMO	BT	WWAN + DTS Ant 1	WWAN + DTS Ant 2	WWAN + DTS MIMO	WWAN + U-NII Ant 1	WWAN + U-NII Ant 2	WWAN + U-NII MIMO	WWAN + BT	WWAN + BT + U-NII Ant 2
	1	2	3	4	5	6	7	8	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+6+8
Rear	0.695	0.547	0.519	0.478	0.609	0.178	0.664	0.195	1.242	1.214	1.173	1.304	0.873	1.359	0.890	1.068
Edge 1	0.422	0.462	0.165	0.414	0.166	0.158	0.167	0.127	0.884	0.587	0.836	0.588	0.580	0.589	0.549	0.707
Edge 2	0.161	0.630	0.400	0.637	0.781	0.400	0.621	0.182	0.791	0.561	0.798	0.942	0.561	0.782	0.343	0.743
Edge 3	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800	0.800	0.800	0.800	0.800	0.800	0.800	1.200
Edge 4	0.080	0.400	0.579	0.513	0.400	0.419	0.559	0.400	0.480	0.659	0.593	0.480	0.499	0.639	0.480	0.899

12.9 Sum of the SAR for LTE Band 66 & Wi-Fi & BT

Test Position	Standalone SAR (W/kg)								∑1-g SAR (W/kg)							
	WWAN	DTS Ant 1	DTS Ant 2	DTS MIMO	U-NII Ant 1	U-NII Ant 2	U-NII MIMO	BT	WWAN + DTS Ant 1	WWAN + DTS Ant 2	WWAN + DTS MIMO	WWAN + U-NII Ant 1	WWAN + U-NII Ant 2	WWAN + U-NII MIMO	WWAN + BT	WWAN + BT + U-NII Ant 2
	1	2	3	4	5	6	7	8	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+6+8
Rear	0.757	0.547	0.519	0.478	0.609	0.178	0.664	0.195	1.304	1.276	1.235	1.366	0.935	1.421	0.952	1.130
Edge 1	0.772	0.462	0.165	0.414	0.166	0.158	0.167	0.127	1.234	0.937	1.186	0.938	0.930	0.939	0.899	1.057
Edge 2	0.205	0.630	0.400	0.637	0.781	0.400	0.621	0.182	0.835	0.605	0.842	0.986	0.605	0.826	0.387	0.787
Edge 3	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800	0.800	0.800	0.800	0.800	0.800	0.800	1.200
Edge 4	0.103	0.400	0.579	0.513	0.400	0.419	0.559	0.400	0.503	0.682	0.616	0.503	0.522	0.662	0.503	0.922

Conclusion:

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

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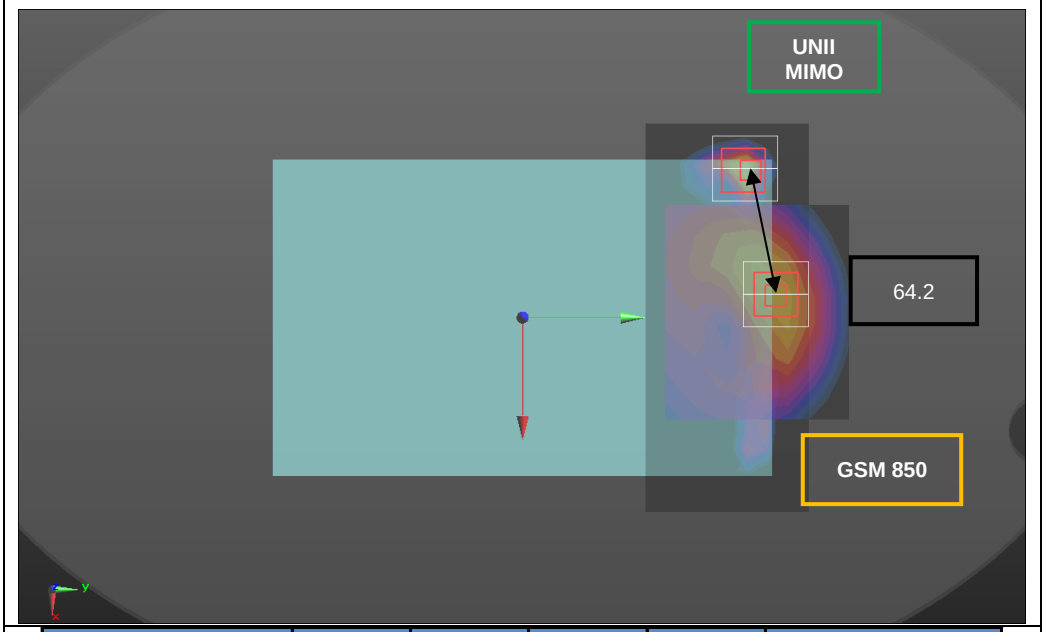
Figure (1)

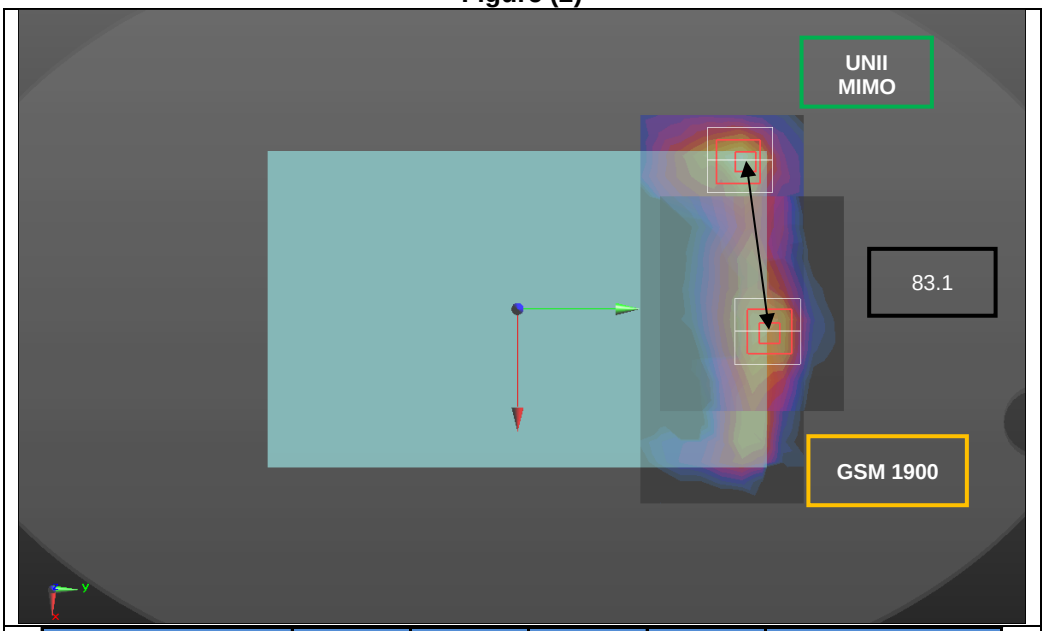


Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
GSM 850	1	0.982	-0.0083	0.1240	-0.0006	1 + 2	64.2
UNII MIMO	2	0.664	-0.0714	0.1122	-0.0012		

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

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

Figure (2)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
GSM 1900	1	0.983	0.0110	0.1225	0.0028	1 + 2	83.1
UNII MIMO	2	0.664	-0.0714	0.1122	-0.0012		

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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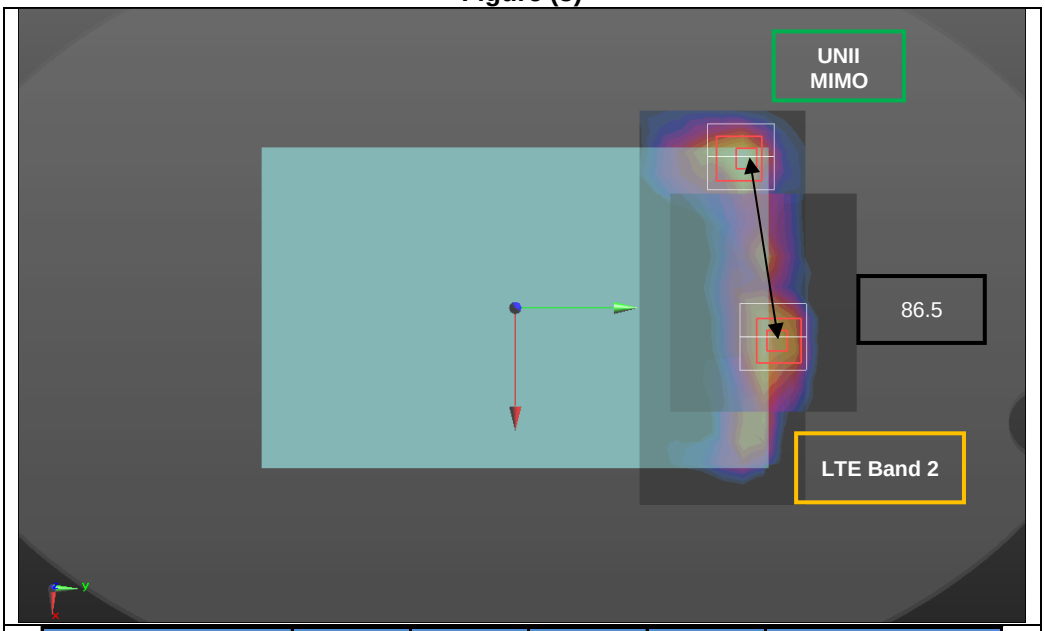
Figure (3)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 2	1	0.980	0.0140	0.1261	-0.0006	1 + 2	86.5
UNII MIMO	2	0.664	-0.0714	0.1122	-0.0012		

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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Appendixes

Refer to separated files for the following appendixes.

4789354096-S1V2 FCC Report SAR_App A_Photos & Ant. Locations

4789354096-S1V2 FCC Report SAR_App B_Highest SAR Test Plots

4789354096-S1V2 FCC Report SAR_App C_System Check Plots

4789354096-S1V2 FCC Report SAR_App D_SAR Tissue Ingredients

4789354096-S1V2 FCC Report SAR_App E_Probe Cal. Certificates

4789354096-S1V2 FCC Report SAR_App F_Dipole Cal. Certificates

END OF REPORT

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