



**FCC 47 CFR § 2.1093  
IEEE Std 1528-2013**

**SAR EVALUATION REPORT**

**FOR**

**GSM/WCDMA/LTE/5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac**

**MODEL NUMBER: SM-T736B**

**FCC ID: A3LSMT736B**

**REPORT NUMBER: 4789841420-S1V4**

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*Prepared for*  
**SAMSUNG ELECTRONICS CO., LTD.  
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,  
GYEONGGI-DO, 16677, KOREA**

*Prepared by*  
**UL Korea, Ltd.  
26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea**

**Suwon Test Site: UL Korea, Ltd. Suwon Laboratory  
218 Maeyeong-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16675, Korea  
TEL: (031) 337-9902  
FAX: (031) 213-5433**



**Testing Laboratory**

**TL-637**

**Revision History**

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### 1. Attestation of Test Results

Applicant Name	SAMSUNG ELECTRONICS CO.,LTD.			
FCC ID	A3LSMT736B			
Model Name	SM-T736B			
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
<b>SAR Limits (W/Kg)</b>				
Exposure Category	Peak spatial-average(1g of tissue)			
General population / Uncontrolled exposure	1.6			
<b>The Highest Reported SAR (W/kg)</b>				
<b>RF Exposure Conditions</b>	<b>Equipment Class</b>			
	<b>Licensed</b>	<b>DTS</b>	<b>U-NII</b>	<b>DSS(BT)</b>
Standalone	1.16	0.58	1.20	0.24
Simultaneous TX	1.59	1.50	1.59	1.59
Date Tested	2/26/2021 to 4/20/2021			
Test Results	Pass			
<p>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.</p> <p><b>Note:</b> 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.</p>				
Approved & Released By:		Prepared By:		
				
Justin Park Operations Leader UL Korea, Ltd. Suwon Laboratory		JeongYeon Won Senior Laboratory Technician UL Korea, Ltd. Suwon Laboratory		

**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	0.595
	GSM 1900	1.031
	WCDMA Band II	1.092
	WCDMA Band IV	0.803
	WCDMA Band V	0.673
	LTE Band 2	<b>1.157</b>
	LTE Band 5	0.765
	LTE Band 12	0.586
	LTE Band 13	0.490
	LTE Band 17	0.959
	LTE Band 25	<b>1.157</b>
	LTE Band 26	1.145
	LTE Band 41	0.855
	LTE Band 66	1.133
NR Band 5	0.806	
DTS	2.4GHz WLAN	<b>0.579</b>
UNII	5GHz WLAN	<b>1.197</b>
DSS	Bluetooth	<b>0.236</b>

## 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, 2014; Page 37, RF Exposure Procedures Update (Other LTE Considerations)
- [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))
- [TCB workshop](#) November, 2019 Page 5, RF Exposure Procedures (SPLSR Hotspot Combination)
- [TCB workshop](#) November, 2019 Page 3, RF Exposure Policy Updates (5G NR FR1 NSA EN-DC UE SAR Evaluations)

### 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 2 Room
SAR 3 Room
SAR 4 Room
SAR 5 Room

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637.

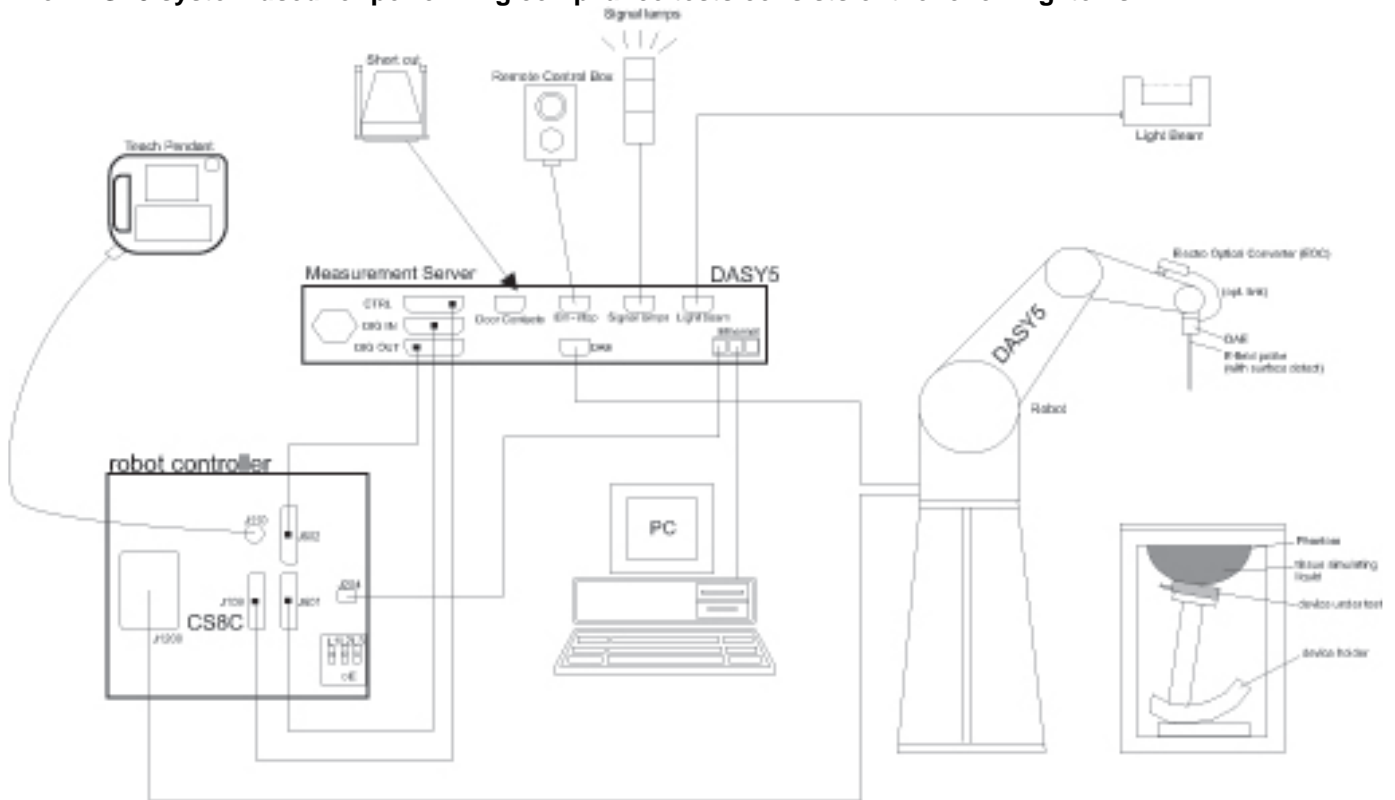
The full scope of accreditation can be viewed at <http://www.iasonline.org/PDF/TL/TL-637.pdf>.



## 4. SAR Measurement System & Test Equipment

### 4.1. SAR Measurement System

The DASY5 system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

## 4.2. SAR Scan Procedures

### Step 1: Power Reference Measurement

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

### Step 2: Area Scan

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

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

	$\leq 3$ GHz	$> 3$ GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	$5 \pm 1$ mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: $\Delta x_{Area}$ , $\Delta y_{Area}$	$\leq 2$ GHz: $\leq 15$ mm $2 - 3$ GHz: $\leq 12$ mm	$3 - 4$ GHz: $\leq 12$ mm $4 - 6$ GHz: $\leq 10$ 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 $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

**Step 3: Zoom Scan**

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

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

		$\leq 3$ GHz	$> 3$ GHz	
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$		$\leq 2$ GHz: $\leq 8$ mm 2 – 3 GHz: $\leq 5$ mm *	3 – 4 GHz: $\leq 5$ mm* 4 – 6 GHz: $\leq 4$ mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	$\leq 5$ mm	3 – 4 GHz: $\leq 4$ mm 4 – 5 GHz: $\leq 3$ mm 5 – 6 GHz: $\leq 2$ mm	
	graded grid	$\Delta z_{Zoom}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface	$\leq 4$ mm	3 – 4 GHz: $\leq 3$ mm 4 – 5 GHz: $\leq 2.5$ mm 5 – 6 GHz: $\leq 2$ 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	$\geq 30$ mm	3 – 4 GHz: $\geq 28$ mm 4 – 5 GHz: $\geq 25$ mm 5 – 6 GHz: $\geq 22$ mm	
Note: $\delta$ 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 <i>reported</i> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

**Step 4: Power drift measurement**

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

**Step 5: Z-Scan (FCC only)**

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

### 4.3. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

#### Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	E5071C	MY46522054	8-4-2021
Dielectric Assessment Kit	SPEAG	DAK-3.5	1196	7-17-2021
Shorting block	SPEAG	DAK-3.5 Short	SMDAK 200 BA	N/A
Thermometer	LKM	DTM3000	3424	8-11-2021

#### System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Agilent	N5181A	MY50145882	8-4-2021
Power Sensor	Agilent	U2000A	MY60180020	9-9-2021
Power Sensor	Agilent	U2000A	MY54260007	8-7-2021
Power Amplifier	EXODUS	1410025-AMP2027-10003	10003	8-4-2021
Directional Coupler	Agilent	772D	MY52180193	8-4-2021
Directional Coupler	Agilent	778D	MY52180432	8-4-2021
Low Pass Filter	MICROLAB	LA-15N	3943	8-4-2021
Low Pass Filter	FILTRON	L14012FL	1410003S	8-4-2021
Low Pass Filter	MICROLAB	LA-60N	3942	8-4-2021
Attenuator	Agilent	8491B/003	MY39271969	12-3-2021
Attenuator	Agilent	8491B/010	MY39271981	9-9-2021
Attenuator	Agilent	8491B/020	MY39271973	9-9-2021
E-Field Probe (SAR1)	SPEAG	EX3DV4	7376	7-31-2021
E-Field Probe (SAR2)	SPEAG	EX3DV4	7313	1-26-2022
E-Field Probe (SAR3)	SPEAG	EX3DV4	3871	8-28-2021
E-Field Probe (SAR4)	SPEAG	EX3DV4	7314	5-29-2021
E-Field Probe (SAR5)	SPEAG	EX3DV4	7545	11-23-2021
Data Acquisition Electronics (SAR1)	SPEAG	DAE4	1468	8-25-2021
Data Acquisition Electronics (SAR2)	SPEAG	DAE4	1343	8-25-2021
Data Acquisition Electronics (SAR3)	SPEAG	DAE4	1494	7-23-2021
Data Acquisition Electronics (SAR4)	SPEAG	DAE4	1380	8-19-2021
Data Acquisition Electronics (SAR4)	SPEAG	DAE4	912	11-24-2021
Data Acquisition Electronics (SAR5)	SPEAG	DAE4	1447	3-21-2021
Data Acquisition Electronics (SAR5)	SPEAG	DAE4	479	3-23-2022
System Validation Dipole	SPEAG	D750V3	1122	2-24-2022
System Validation Dipole	SPEAG	D835V2	4d194	3-20-2022
System Validation Dipole	SPEAG	D835V2	4d174	2-24-2022
System Validation Dipole	SPEAG	D1750V2	1125	2-21-2022
System Validation Dipole	SPEAG	D1900V2	5d199	3-19-2022
System Validation Dipole	SPEAG	D2450V2	939	7-25-2021
System Validation Dipole	SPEAG	D2600V2	1097	9-19-2021
System Validation Dipole	SPEAG	D5GHzV2	1209	2-27-2022
Thermometer (SAR1)	Lutron	MHB-382SD	AH.91463	8-11-2021
Thermometer (SAR2)	Lutron	MHB-382SD	AH.50215	8-11-2021
Thermometer (SAR3)	Lutron	MHB-382SD	AH.50213	8-11-2021
Thermometer (SAR4, 5)	Lutron	MHB-382SD	AH.45903	8-11-2021

#### Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	150313	8-4-2021
Base Station Simulator	R & S	CMW500	150314	8-4-2021
Base Station Simulator	R & S	CMW500	162790	8-4-2021
Wireless Connectivity Tester	R & S	CMW270	100982	8-3-2021

#### 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 : 5d199), D2450(SN : 939), D2600(SN : 1097) D5GHz(SN : 1209))

### 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  $\leq 30\%$ , 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	<input checked="" type="checkbox"/> The Back Cover is not removable.		
Battery Options	<input checked="" type="checkbox"/> The rechargeable battery is not user accessible.		
Accessory	Keyboard		
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> 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 <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 5 GHz : Ch.36 – Ch.48, Ch.149 – Ch.165))		
Test Sample Information	<b>No.</b>	<b>S/N</b>	<b>Notes</b>
	1	R32R2008TKD	Main Conducted
	2	R32R2009J9Y	Main Conducted
	3	R32R2009HKX	WI-FI & BT Conducted
	4	R32R2008RET	SAR
	5	R32R2008R4H	SAR
	6	R32R2009PFE	SAR
	7	R32R2009MCX	SAR
	8	R32R2009RHT	SAR
	9	R32R2009PQY	SAR
	10	R32R2009KLA	SAR
	11	R32R300FQ1B	SAR
	12	R32R300FSFR	SAR

## 6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK)	GPRS Multi-Slot Class:	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
		GPRS (GMSK)	<input type="checkbox"/> Class 8 - 1 Up, 4 Down	
		EGPRS (8PSK)	<input type="checkbox"/> Class 10 - 2 Up, 4 Down	
			<input type="checkbox"/> Class 12 - 4 Up, 4 Down	
			<input checked="" type="checkbox"/> Class 33 - 4 Up, 5 Down	
Does this device support DTM (Dual Transfer Mode)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
W-CDMA (UMTS)	Band II Band IV Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Category 24) HSUPA (Category 6) DC-HSDPA (Category 24) HSPA+ (DL Only)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 12 FDD Band 13 FDD Band 17 FDD Band 25 FDD Band 26 FDD Band 66 TDD Band 41	QPSK 16QAM 64QAM Rel. 15 Carrier Aggregation (1 Uplink and 3 Downlinks)		100% (FDD) 63.3% (TDD)
		Does this device support SV-LTE (1xRTT-LTE)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
5G NR	FDD Band n5	DFT-s-OFDM : $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM : QPSK, 16QAM, 64QAM, 256QAM		100% (FDD)
Wi-Fi	2.4 GHz	802.11b		98.9% (802.11b)
		802.11g		98.7% (802.11g)
		802.11n (HT20)		98.6% (802.11n 20MHz BW)
	5 GHz	802.11a		98.7% (802.11a SISO & MIMO)
802.11n (HT20)		98.6% (802.11n,ac 20MHz BW)		
802.11n (HT40)		98.5% (802.11n,ac 40MHz BW)		
802.11ac (VHT20)		98.6% (802.11ac 80MHz BW SISO)		
802.11ac (VHT40)		97.3% (802.11ac 80MHz BW MIMO)		
		802.11ac (VHT80)		
Does this device support bands 5.60 ~ 5.65 GHz? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Does this device support Band gap channel(s)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Bluetooth	2.4 GHz	Version 5.0 LE		77.1% (DH5)

**Notes:**

- The Bluetooth protocol is considered source-based averaging. Bluetooth GFSK (DH5) was verified to have the highest duty cycle of 77.1% and was considered and used for SAR Testing.
- Duty cycle for Wi-Fi is referenced from the DTS and UNII report.

### 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 back-off (dBm)	
				Tune-up Limit	Frame Pwr	Tune-up Limit	Frame Pwr
GSM850	Main Ant.	Voice	1	34.0	25.0	24.0	15.0
		GPRS	1	34.0	25.0	24.0	15.0
		GPRS	2	32.0	26.0	23.0	17.0
		GPRS	3	30.0	25.7	21.0	16.7
		GPRS	4	29.0	26.0	19.0	16.0
		EGPRS	1	29.0	20.0	19.0	10.0
		EGPRS	2	27.0	21.0	17.0	11.0
		EGPRS	3	25.0	20.7	15.0	10.7
GSM1900	Main Ant.	Voice	1	31.0	22.0	22.0	13.0
		GPRS	1	31.0	22.0	22.0	13.0
		GPRS	2	29.0	23.0	20.0	14.0
		GPRS	3	27.0	22.7	18.0	13.7
		GPRS	4	25.0	22.0	16.0	13.0
		EGPRS	1	27.0	18.0	19.0	10.0
		EGPRS	2	25.5	19.5	17.0	11.0
		EGPRS	3	23.0	18.7	15.0	10.7
W-CDMA Band II	Main Ant.	R99		23.5		13.5	
		HSDPA		22.5		12.5	
		HSUPA		22.5		12.5	
		DC-HSDPA		22.5		12.5	
W-CDMA Band IV	Main Ant.	R99		23.5		13.5	
		HSDPA		22.5		12.5	
		HSUPA		22.5		12.5	
		DC-HSDPA		22.5		12.5	
W-CDMA Band V	Main Ant.	R99		25.0		15.0	
		HSDPA		24.0		14.0	
		HSUPA		24.0		14.0	
		DC-HSDPA		24.0		14.0	
RF Air interface	Antenna	Mode		Max. RF Output Power (dBm)		Reduced. RF Output Power Proximity sensor Back-off (dBm)	
LTE Band 2	Main Ant.	QPSK		24.0		14.0	
LTE Band 4	Main Ant.	QPSK		24.0		14.0	
LTE Band 5	Main Ant.	QPSK		25.5		16.0	
LTE Band 12	Main Ant.	QPSK		25.0		15.0	
LTE Band 13	Main Ant.	QPSK		25.0		15.0	
LTE Band 17	Main Ant.	QPSK		25.0		17.0	
LTE Band 25	Main Ant.	QPSK		24.0		14.0	
LTE Band 26	Main Ant.	QPSK		25.5		17.5	
LTE Band 41	Main Ant.	QPSK		24.5		15.0	
LTE Band 66	Main Ant.	QPSK		24.0		14.0	
RF Air interface	Antenna	Mode		Max. RF Output Power (dBm)		Reduced. RF Output Power Proximity sensor Back-off (dBm)	
NR Band n5	Main Ant.	DFT-s-OFDM QPSK		25.0		17.0	

**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.1
WiFi 2.4 GHz (Ch.1)	802.11b	19.0	12.0
	802.11g	16.0	12.0
	802.11n HT20	16.0	12.0
WiFi 2.4 GHz (Ch.2~10)	802.11b	19.0	12.0
	802.11g	19.0	12.0
	802.11n HT20	18.0	12.0
WiFi 2.4 GHz (Ch11)	802.11b	19.0	12.0
	802.11g	16.0	12.0
	802.11n HT20	16.0	12.0
WiFi 2.4 GHz (Ch.12)	802.11b	5.0	5.0
	802.11g	5.0	5.0
	802.11n HT20	5.0	5.0
WiFi 2.4 GHz (Ch.13)	802.11b	2.0	2.0
	802.11g	2.0	2.0
	802.11n HT20	2.0	2.0
WiFi 5 GHz (UNII-1)	802.11a	17.0	9.5
	802.11n HT20	17.0	9.5
	802.11n HT40	14.0	9.5
	802.11ac VHT20	17.0	9.5
	802.11ac VHT40	14.0	9.5
WiFi 5 GHz (UNII-2A)	802.11ac VHT80	13.0	9.5
	802.11a	17.0	9.5
	802.11n HT20	17.0	9.5
	802.11n HT40	14.0	9.5
	802.11ac VHT20	17.0	9.5
WiFi 5 GHz (UNII-2C)	802.11ac VHT40	14.0	9.5
	802.11ac VHT80	13.0	9.5
	802.11a	17.0	9.5
	802.11n HT20	17.0	9.5
	802.11n HT40	14.0	9.5
WiFi 5 GHz (UNII-3)	802.11ac VHT20	17.0	9.5
	802.11ac VHT40	14.0	9.5
	802.11ac VHT80	13.0	9.5
	802.11a	17.0	9.5
	802.11n HT20	17.0	9.5
Bluetooth		18.0	10.0
Bluetooth-EDR		16.0	10.0
Bluetooth-LE_1Mbps		8.0	8.0
Bluetooth-LE_2Mbps		8.0	8.0

**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.



**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)	802.11g	16.0	16.0	19.0	12.0	12.0	15.0
	802.11n HT20	16.0	16.0	19.0	12.0	12.0	15.0
WiFi 2.4 GHz (Ch.2~10)	802.11g	19.0	19.0	22.0	12.0	12.0	15.0
	802.11n HT20	18.0	18.0	21.0	12.0	12.0	15.0
WiFi 2.4 GHz (Ch.11)	802.11g	16.0	16.0	19.0	12.0	12.0	15.0
	802.11n HT20	16.0	16.0	19.0	12.0	12.0	15.0
WiFi 2.4 GHz (Ch.12)	802.11g	5.0	5.0	8.0	5.0	5.0	8.0
	802.11n HT20	5.0	5.0	8.0	5.0	5.0	8.0
WiFi 2.4 GHz (Ch.13)	802.11g	2.0	2.0	5.0	2.0	2.0	5.0
	802.11n HT20	2.0	2.0	5.0	2.0	2.0	5.0
WiFi 5 GHz (UNII-1)	802.11a	17.0	17.0	20.0	9.5	9.5	12.5
	802.11n HT20	17.0	17.0	20.0	9.5	9.5	12.5
	802.11n HT40	14.0	14.0	17.0	9.5	9.5	12.5
	802.11ac VHT20	17.0	17.0	20.0	9.5	9.5	12.5
	802.11ac VHT40	14.0	14.0	17.0	9.5	9.5	12.5
	802.11ac VHT80	13.0	13.0	16.0	9.5	9.5	12.5
WiFi 5 GHz (UNII-2A)	802.11a	17.0	17.0	20.0	9.5	9.5	12.5
	802.11n HT20	17.0	17.0	20.0	9.5	9.5	12.5
	802.11n HT40	14.0	14.0	17.0	9.5	9.5	12.5
	802.11ac VHT20	17.0	17.0	20.0	9.5	9.5	12.5
	802.11ac VHT40	14.0	14.0	17.0	9.5	9.5	12.5
	802.11ac VHT80	13.0	13.0	16.0	9.5	9.5	12.5
WiFi 5 GHz (UNII-2C)	802.11a	17.0	17.0	20.0	9.5	9.5	12.5
	802.11n HT20	17.0	17.0	20.0	9.5	9.5	12.5
	802.11n HT40	14.0	14.0	17.0	9.5	9.5	12.5
	802.11ac VHT20	17.0	17.0	20.0	9.5	9.5	12.5
	802.11ac VHT40	14.0	14.0	17.0	9.5	9.5	12.5
	802.11ac VHT80	13.0	13.0	16.0	9.5	9.5	12.5
WiFi 5 GHz (UNII-3)	802.11a	17.0	17.0	20.0	9.5	9.5	12.5
	802.11n HT20	17.0	17.0	20.0	9.5	9.5	12.5
	802.11n HT40	14.0	14.0	17.0	9.5	9.5	12.5
	802.11ac VHT20	17.0	17.0	20.0	9.5	9.5	12.5
	802.11ac VHT40	14.0	14.0	17.0	9.5	9.5	12.5
	802.11ac VHT80	13.0	13.0	16.0	9.5	9.5	12.5

**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.

### 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/ 1860.0	18675/ 1857.5	18650/ 1855.0	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
	Mid	18900/ 1880.0	18900/ 1880.0	18900/ 1880.0	18900/ 1880.0	18900/ 1880.0	18900/ 1880.0
	High	19100/ 1900.0	19125/ 1902.5	19150/ 1905.0	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/ 1720.0	20025/ 1717.5	20000/ 1715.0	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/ 1745.0	20325/ 1747.5	20350/ 1750.0	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/ 829.0	20425/ 826.5	20415/ 825.5	20407/ 824.7
	Mid			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5
	High			20600/ 844.0	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/ 704.0	23035/ 701.5	23025/ 700.5	23017/ 699.7
	Mid			23095/ 707.5	23095/ 707.5	23095/ 707.5	23095/ 707.5
	High			23130/ 711.0	23155/ 713.5	23165/ 714.5	23173/ 715.3
	Band 13	Frequency range: 777 - 787 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low				23205/ 779.5		
Mid			23230/ 782.0	23230/ 782.0			
High				23255/ 784.5			
Band 17	Frequency range: 704 - 716 MHz						
	Channel Bandwidth						
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz	
Low			23780/ 709.0	23755/ 706.5			
Mid			23790/ 710.0	23790/ 710.0			
High			23800/ 711.0	23825/ 713.5			

**General LTE SAR Test and Reporting Considerations (Continued)**

Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 25	Frequency range: 1850 - 1915 MHz																																																																		
		Channel Bandwidth																																																																		
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																													
	Low	26140/ 1860.0	26115/ 1857.5	26090/ 1855.0	26065/ 1852.5	26055/ 1851.5	26047/ 1850.7																																																													
	Mid	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5																																																													
	High	26590/ 1905.0	26615/ 1907.5	26640/ 1910.0	26665/ 1912.5	26675/ 1913.5	26683/ 1914.3																																																													
	Band 26	Frequency range: 814 - 849 MHz																																																																		
		Channel Bandwidth																																																																		
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																													
	Low		26765/ 821.5	26740/ 819.0	26715/ 816.5	26705/ 815.5	26697/ 814.7																																																													
	Mid		26865/ 831.5	26865/ 831.5	26865/ 831.5	26865/ 831.5	26865/ 831.5																																																													
	High		26975/ 842.5	26990/ 844.0	27015/ 846.5	27025/ 847.5	27033/ 848.3																																																													
	Band 66	Frequency range: 1710 - 1780 MHz																																																																		
		Channel Bandwidth																																																																		
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																													
	Low	132072/ 1720.0	132047/ 1717.5	132022/ 1715.0	131997/ 1712.5	131987/ 1711.5	131979/ 1710.7																																																													
	Mid	132322/ 1745.0	132322/ 1745.0	132322/ 1745.0	132322/ 1745.0	132322/ 1745.0	132322/ 1745.0																																																													
	High	132572/ 1770.0	132597/ 1772.5	132622/ 1775.0	132647/ 1777.5	132657/ 1778.5	132665/ 1779.3																																																													
	Band 41	Frequency range: 1710 - 1780 MHz																																																																		
		Channel Bandwidth																																																																		
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																														
Low	39750 / 2506.0																																																																			
Low-Mid	40185 / 2549.5																																																																			
Mid	40620 / 2593.0																																																																			
Mid-High	41055 / 2636.5																																																																			
High	41490 / 2680.0																																																																			
LTE transmitter and antenna implementation	Refer to Appendix A.																																																																			
Maximum power reduction (MPR)	<p><b>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N<sub>RB</sub>)</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> </thead> <tbody> <tr> <td>QPSK</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 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>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 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>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table> <p>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</p>						Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						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
Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )							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																																																													
Power reduction	Yes																																																																			
Spectrum plots for RB configurations	A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																																			

**Notes:**

- SAR Testing for LTE was performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
- 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.

### 6.5. General 5G NR (FR1) SAR Test and Reporting Considerations

Item	Description				
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band n5	Frequency range: 824 - 849 MHz			
		Channel Bandwidth			
		20 MHz	15 MHz	10 MHz	5 MHz
	Low	166800/ 834.0	166300/ 831.5	165800/ 829.0	165300/ 826.5
	Mid	167300/ 836.5	167300/ 836.5	167300/ 836.5	167300/ 836.5
High	167800/ 839.0	168300/ 841.5	168800/ 844.0	169300/ 846.5	
SCS	15 kHz				
Modulations Supported in UL	DFT-s-OFDM : $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM : QPSK, 16QAM, 64QAM, 256QAM				
A-MPR (Additional MRP) disabled for SAR Testing?	Yes				
EN-DC Carrier Aggregation Possible Combinations					
LTE Anchor Bands for NR Band n5	LTE Band 66				

## 6.6 LTE (TDD) Considerations

According to KDB 941225 D05 SAR for LTE Devices, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

LTE TDD Bands support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$		
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-		
9	$13168 \cdot T_s$			-		

### Calculated Duty Cycle

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

Calculated Duty Cycle = Extended cyclic prefix in uplink x ( $T_s$ ) x # of S + # of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle =  $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

where

$T_s = 1/(15000 \times 2048)$  seconds

#### Note(s):

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used for SAR Testing: configuration 0 at 63.3% duty cycle. Only LTE Band 41 Power Class 2 was used configuration 1 at 43.3% duty cycle for SAR testing.

### 6.7 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-4A (0)(1)(2)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	40 MHz	Yes
	Band 4			Yes	Yes	Yes	Yes		
	Band 2			Yes	Yes			20 MHz	Yes
	Band 4			Yes	Yes				
	Band 2			Yes	Yes	Yes	Yes	40 MHz	Yes
	Band 4			Yes	Yes	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_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-66A (0)(1)(2)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	40 MHz	Yes
	Band 66			Yes	Yes	Yes	Yes		
	Band 2			Yes	Yes			20 MHz	Yes
	Band 66			Yes	Yes				
	Band 2			Yes	Yes	Yes	Yes	40 MHz	Yes
	Band 66			Yes	Yes	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-13A (0)(1)	Band 4			Yes	Yes	Yes	Yes	30 MHz	Yes
	Band 13				Yes				
	Band 4			Yes	Yes			20 MHz	Yes
	Band 13				Yes				
CA_4A-17A (0)	Band 4			Yes	Yes			20 MHz	Yes
	Band 17			Yes	Yes				

#### 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_2A-4A-13A (0)	Band 2			Yes	Yes	Yes	Yes	50 MHz	Yes
	Band 4			Yes	Yes	Yes	Yes		
	Band 13				Yes				
CA_4A-4A-12A (0)	Band 4	4A-4A BCS 0						50 MHz	Yes
	Band 12			Yes	Yes				
CA_41A-41C (0)	Band 41	41C BCS 1						60 MHz	No
	Band 41			Yes	Yes	Yes	Yes		

**DL Intra Band(non-contiguous)**

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
		5, 10	5, 10				20 MHz
CA_41A-41A (0)(1)	Band 41	10, 15, 20	10, 15, 20				40 MHz
		5, 10, 15, 20	5, 10, 15, 20				40 MHz
CA_66A-66A (0)	Band 66	5, 10, 15, 20	5, 10, 15, 20				40 MHz
CA_41A-41D (0)	Band 41	5, 10, 15, 20	41D BCS 0				80 MHz
		41D BCS 0	5, 10, 15, 20				80 MHz
CA_41C-41C (0)	Band 41	41C BCS 0	41C BCS 0				80 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_41C (0),(1),(2),(3)	Band 41	10	20				40 MHz
		15	15,20				
		20	10,15,20				
	Band 41	5,10	20				40 MHz
		15	15,20				
		20	5,10,15,20				
	Band 41	10	15,20				40 MHz
		15	10,15,20				
		20	10,15,20				
	Band 41	10	20				40 MHz
		20	20				
	CA_41D (0)	Band 41	10	20	15		
10			15, 20	20			
15			20	10, 15			
15			10, 15, 20	20			
20			15, 20	10			
20			10, 15, 20	15, 20			

**Note(s):**

For supported channels, please refer to §6.4

## 6.8. Dynamic Antenna tuner testing – For PAG REUSE

This Device applies Qualcomm chipset solution's Dynamic Antenna tuning technology to some 3G / 4G bands. (WCDMA BII/BIV/BV and LTE B2/B4/B5/B12/B13/B17/B25/B26/B66)

Dynamic Antenna tuning was tested in accordance with the April 2019 FCC TCBC Workshop notes.

Per 2019, April TCBC Workshop document

- SAR is measured according to required procedures with dynamic tuner active allowing device to automatically tune. Auto-tune state determined by device during normal SAR measurement verified and listed alongside the reported SAR results.
- Additional single point SAR (time-sweep) measurements were evaluated for other tuner states to determine that the other configurations would result in equivalent or lower SAR values.
- Single point measurements performed at the peak SAR location of the highest measured SAR configuration for each combination. SAR probe remains stationary throughout the entire series of single point measurements for each combination.
- Total number tuner states divided evenly among each supported band / air interface and exposure condition combination. If any single point SAR measurement result is  $> 1.2$  W/kg for a band / exposure condition combination set, all supported tuner states are evaluated with single point SAR measurements for the combination. Tuner state is established remotely so that the device is not moved for the entire series of single point SAR measurements for the tuner states in each combination.

The following test procedures were followed to demonstrate that the SAR results in Section 10 represented the appropriate SAR test conditions. For bands with dynamic tuning implemented, SAR was measured according to the required FCC SAR test procedures with the dynamic tuning active to allow the device to automatically to the antenna state for the respective RF exposure test configurations. Additional single point SAR time-sweep measurements were evaluated for other tuner states to determine that the other configurations would result in equivalent or lower SAR values. The additional tuner hardware has no influence on the antenna characteristics, other impedance matching.

To evaluate all the tuner states, the 144 tuner states were divided among the aggregate band, mode and exposure combinations so that each combination was evaluated for at least 24 tuner states and also so that at least 3 single point SAR measurements were made for every available tuner state. Single point time-sweep measurements were performed at the peak SAR location determined by the zoom scan of the configuration with the highest reported SAR for each combination. The tuner state was able to be established remotely so that the device was not moved for the entire series of single point SAR for the tuner states in each combination. The SAR probe remained stationary at the same position throughout the entire series of single point measurements for each combination. When the single point SAR or 1g SAR was  $> 1.2$  W/kg for a particular band / mode / exposure condition, point SAR measurements were made for all 144 states.

This Device supports LTE capabilities with overlapping transmission frequency ranges.

**LTE Band 4 (1710 MHz – 1755 MHz) is covered by LTE Band 66 (1710 MHz – 1780 MHz)**

**LTE Band 17 (704 MHz – 716 MHz) is covered by LTE Band 12 (699 MHz – 716 MHz) in Max Power**

Each both LTE bands share the same transmission path and signal characteristics. The Evaluation of Dynamic antenna tuner was only evaluated for the band with the larger transmission frequency range. The operational description contains more information about the design and implementation of the dynamic antenna tuning.



WCDMA Band II		WCDMA Band IV		LTE Band 2		LTE Band 5		LTE Band 12	
RMC		RMC		QPSK, 20MHz BW 50RB, 50RB Offset		QPSK, 10MHz BW 1RB, 0RB Offset		QPSK, 10MHz BW 1RB, 0RB Offset	
Test position	Edge 1	Test position	Edge 1	Test position	Edge 1	Test position	Edge 1	Test position	Edge 1
Specing	0mm	Specing	0mm	Specing	0mm	Specing	0mm	Specing	0mm
Frequency (MHz)	1852.4	Frequency (MHz)	1752.6	Frequency (MHz)	1880	Frequency (MHz)	836.5	Frequency (MHz)	707.5
Channel	9262	Channel	1513	Channel	18900	Channel	20525	Channel	23095
Measured 1g SAR (W/kg)	0.815	Measured 1g SAR (W/kg)	0.687	Measured 1g SAR (W/kg)	0.912	Measured 1g SAR (W/kg)	0.716	Measured 1g SAR (W/kg)	0.469
Average Value of Time Swwp (W/kg)		Average Value of Time Swwp (W/kg)		Average Value of Time Swwp (W/kg)		Average Value of Time Swwp (W/kg)		Average Value of Time Swwp (W/kg)	
Auto-tune (State 0)	2.374	Auto-tune (State 0)	1.907	Auto-tune (State 0)	2.436	Auto-tune (State 109)	1.351	Auto-tune (State 108)	1.230
State		State		State		State		State	
0	2.214	0	1.902	0	2.368	0	0.686	0	0.819
1	2.178	1	1.893	1	2.353	1	0.896	1	1.082
2	2.186	2	1.867	2	2.349	2	0.951	2	1.090
3	2.188	3	1.840	3	2.365	3	1.068	3	1.080
4	2.187	4	1.830	4	2.367	4	1.124	4	1.055
5	2.175	5	1.757	5	2.313	5	1.158	5	0.773
6	2.061	6	1.558	6	2.213	6	0.657	6	0.286
7	1.809	7	1.284	7	1.920	7	0.277	7	0.124
8	1.525	8	0.997	8	1.606	8	0.147	8	0.067
9	2.062	9	1.875	9	2.277	9	0.499	9	0.646
10	2.087	10	1.861	10	2.302	10	0.681	10	0.860
11	2.135	11	1.858	11	2.310	11	0.717	11	0.870
12	2.104	12	1.846	12	2.309	12	0.799	12	0.841
13	2.105	13	1.832	13	2.297	13	0.847	13	0.787
14	2.111	14	1.796	14	2.317	14	0.811	14	0.563
15	2.050	15	1.637	15	2.213	15	0.381	15	0.201
16	1.841	16	1.341	16	1.966	16	0.162	16	0.089
17	1.506	17	1.067	17	1.655	17	0.084	17	0.047
18	1.912	18	1.855	18	2.159	18	0.378	18	0.491
19	1.949	19	1.872	19	2.179	19	0.514	19	0.640
20	1.962	20	1.865	20	2.189	20	0.540	20	0.641
21	1.979	21	1.865	21	2.217	21	0.580	21	0.601
22	1.983	22	1.864	22	2.212	22	0.595	22	0.561
23	2.002	23	1.844	23	2.226	23	0.512	23	0.374
24	1.927	24	1.706	24	2.142	24	0.213	24	0.131
25	1.668	25	1.415	25	1.885	25	0.092	25	0.058
26	1.339	26	1.119	26	1.542	26	0.048	26	0.032
27	1.720	27	1.744	27	1.975	27	0.293	27	0.405
28	1.748	28	1.763	28	1.994	28	0.397	28	0.051
29	1.768	29	1.789	29	2.011	29	0.420	29	0.511
30	1.786	30	1.790	30	2.048	30	0.443	30	0.496
31	1.792	31	1.790	31	2.040	31	0.438	31	0.439
32	1.821	32	1.783	32	2.063	32	0.363	32	0.291
33	1.759	33	1.461	33	2.008	33	0.145	33	0.103
34	1.492	34	1.383	34	1.739	34	0.060	34	0.045
35	1.169	35	1.070	35	1.397	35	0.032	35	0.025
36	2.121	36	1.806	36	2.239	36	0.745	36	0.870
37	2.118	37	1.767	37	2.221	37	0.951	37	1.078
38	2.112	38	1.747	38	2.207	38	1.014	38	1.088
39	2.086	39	1.699	39	2.185	39	1.098	39	1.050
40	2.081	40	1.686	40	2.165	40	1.145	40	0.963
41	2.013	41	1.579	41	2.090	41	1.138	41	0.707
42	1.783	42	1.319	42	1.857	42	0.625	42	0.270
43	1.444	43	1.008	43	1.518	43	0.274	43	0.120
44	1.117	44	0.760	44	1.177	44	0.147	44	0.066
45	2.098	45	1.851	45	2.256	45	0.554	45	0.693
46	2.100	46	1.827	46	2.246	46	0.719	46	0.842
47	2.151	47	1.813	47	2.250	47	0.760	47	0.854
48	2.114	48	1.764	48	2.229	48	0.808	48	0.798
49	2.144	49	1.765	49	2.220	49	0.826	49	0.733
50	2.055	50	1.681	50	2.166	50	0.746	50	0.515
51	1.862	51	1.412	51	1.954	51	0.347	51	0.193
52	1.495	52	1.094	52	1.957	52	0.150	52	0.085
53	1.131	53	0.827	53	1.243	53	0.079	53	0.047
54	2.091	54	1.861	54	2.283	54	0.410	54	0.530
55	2.122	55	1.855	55	2.287	55	0.530	55	0.624
56	2.124	56	1.603	56	2.293	56	0.547	56	0.606
57	2.101	57	1.582	57	2.281	57	0.566	57	0.573
58	2.115	58	1.570	58	2.288	58	0.563	58	0.502
59	2.059	59	1.824	59	2.228	59	0.464	59	0.340
60	1.815	60	1.568	60	1.984	60	0.197	60	0.125
61	1.382	61	1.198	61	1.552	61	0.087	61	0.059
62	1.005	62	0.887	62	1.144	62	0.047	62	0.031
63	1.981	63	1.874	63	2.196	63	0.321	63	0.432
64	2.003	64	1.888	64	2.222	64	0.405	64	0.503
65	2.032	65	1.594	65	2.239	65	0.417	65	0.502
66	2.028	66	1.879	66	2.235	66	0.424	66	0.449
67	2.021	67	1.859	67	2.242	67	0.413	67	0.397
68	1.953	68	1.794	68	2.190	68	0.326	68	0.265
69	1.717	69	1.540	69	1.932	69	0.133	69	0.097

70	1.246	70	1.145	70	1.455	70	0.061	70	0.044
71	0.871	71	0.822	71	1.044	71	0.032	71	0.025
72	0.325	72	0.411	72	0.312	72	1.115	72	1.156
73	0.363	73	0.357	73	0.348	73	1.315	73	1.064
74	0.357	74	0.407	74	0.344	74	1.306	74	0.988
75	0.348	75	0.380	75	0.328	75	1.248	75	0.838
76	0.362	76	0.322	76	0.343	76	1.183	76	0.680
77	0.337	77	0.332	77	0.313	77	0.869	77	0.429
78	0.266	78	0.229	78	0.247	78	0.339	78	0.161
79	0.157	79	0.130	79	0.151	79	0.145	79	0.073
80	0.086	80	0.062	80	0.085	80	0.075	80	0.040
81	0.323	81	0.427	81	0.307	81	0.892	81	0.962
82	0.370	82	0.433	82	0.351	82	0.958	82	0.805
83	0.369	83	0.421	83	0.346	83	0.924	83	0.742
84	0.367	84	0.400	84	0.339	84	0.813	84	0.601
85	0.383	85	0.368	85	0.359	85	0.727	85	0.491
86	0.370	86	0.324	86	0.340	86	0.486	86	0.310
87	0.306	87	0.227	87	0.282	87	0.179	87	0.115
88	0.183	88	0.130	88	0.175	88	0.079	88	0.054
89	0.094	89	0.082	89	0.097	89	0.043	89	0.031
90	0.345	90	0.390	90	0.333	90	0.667	90	0.683
91	0.424	91	0.432	91	0.399	91	0.636	91	0.553
92	0.424	92	0.425	92	0.400	92	0.595	92	0.497
93	0.432	93	0.410	93	0.402	93	0.500	93	0.405
94	0.461	94	0.422	94	0.429	94	0.428	94	0.325
95	0.460	95	0.384	95	0.423	95	0.275	95	0.204
96	0.376	96	0.272	96	0.355	96	0.102	96	0.079
97	0.194	97	1.525	97	0.200	97	0.047	97	0.039
98	0.090	98	0.081	98	0.100	98	0.026	98	0.023
99	0.348	99	0.404	99	0.329	99	0.508	99	0.565
100	0.441	100	0.473	100	0.413	100	0.451	100	0.435
101	0.444	101	0.467	101	0.418	101	0.410	101	0.382
102	0.485	102	0.462	102	0.432	102	0.336	102	0.312
103	0.507	103	0.482	103	0.467	103	0.286	103	0.252
104	0.532	104	0.455	104	0.483	104	0.181	104	0.160
105	0.433	105	0.321	105	0.420	105	0.069	105	0.063
106	0.193	106	0.165	106	0.213	106	0.032	106	0.032
107	0.079	107	0.084	107	0.096	107	0.018	107	0.019
108	0.291	108	0.319	108	0.281	108	1.159	108	1.219
109	0.321	109	0.326	109	0.307	109	1.338	109	1.074
110	0.317	110	0.315	110	0.302	110	1.332	110	0.974
111	0.309	111	0.293	111	0.292	111	1.253	111	0.776
112	0.318	112	0.299	112	0.304	112	1.166	112	0.651
113	0.300	113	0.257	113	0.278	113	0.814	113	0.392
114	0.242	114	0.174	114	0.223	114	0.275	114	0.146
115	0.141	115	0.101	115	0.139	115	0.117	115	0.068
116	0.080	116	0.039	116	0.079	116	0.065	116	0.037
117	0.282	117	0.219	117	0.275	117	0.945	117	0.976
118	0.322	118	0.354	118	0.310	118	0.986	118	0.802
119	0.319	119	0.345	119	0.307	119	0.943	119	0.724
120	0.322	120	0.326	120	0.302	120	0.820	120	0.566
121	0.338	121	0.333	121	0.318	121	0.709	121	0.467
122	0.338	122	0.293	122	0.302	122	0.448	122	0.278
123	0.272	123	0.134	123	0.255	123	0.160	123	0.105
124	0.166	124	0.115	124	0.159	124	0.069	124	0.051
125	0.087	125	0.044	125	0.089	125	0.038	125	0.028
126	0.309	126	0.342	126	0.294	126	0.717	126	0.726
127	0.369	127	0.377	127	0.348	127	0.644	127	0.542
128	0.367	128	0.366	128	0.352	128	0.597	128	0.487
129	0.381	129	0.355	129	0.354	129	0.485	129	0.374
130	0.407	130	0.366	130	0.378	130	0.399	130	0.304
131	0.410	131	0.332	131	0.377	131	0.246	131	0.186
132	0.344	132	0.239	132	0.352	132	0.090	132	0.073
133	0.179	133	0.132	133	0.184	133	0.041	133	0.036
134	0.081	134	0.071	134	0.093	134	0.022	134	0.021
135	0.305	135	0.346	135	0.288	135	0.538	135	0.592
136	0.383	136	0.401	136	0.360	136	0.454	136	0.426
137	0.384	137	0.401	137	0.367	137	0.393	137	0.386
138	0.413	138	0.400	138	0.376	138	0.308	138	0.296
139	0.447	139	0.418	139	0.412	139	0.256	139	0.236
140	0.471	140	0.267	140	0.432	140	0.158	140	0.145
141	0.397	141	0.287	141	0.387	141	0.058	141	0.056
142	0.178	142	0.145	142	0.199	142	0.029	142	0.028
143	0.073	143	0.050	143	0.090	143	0.015	143	0.017

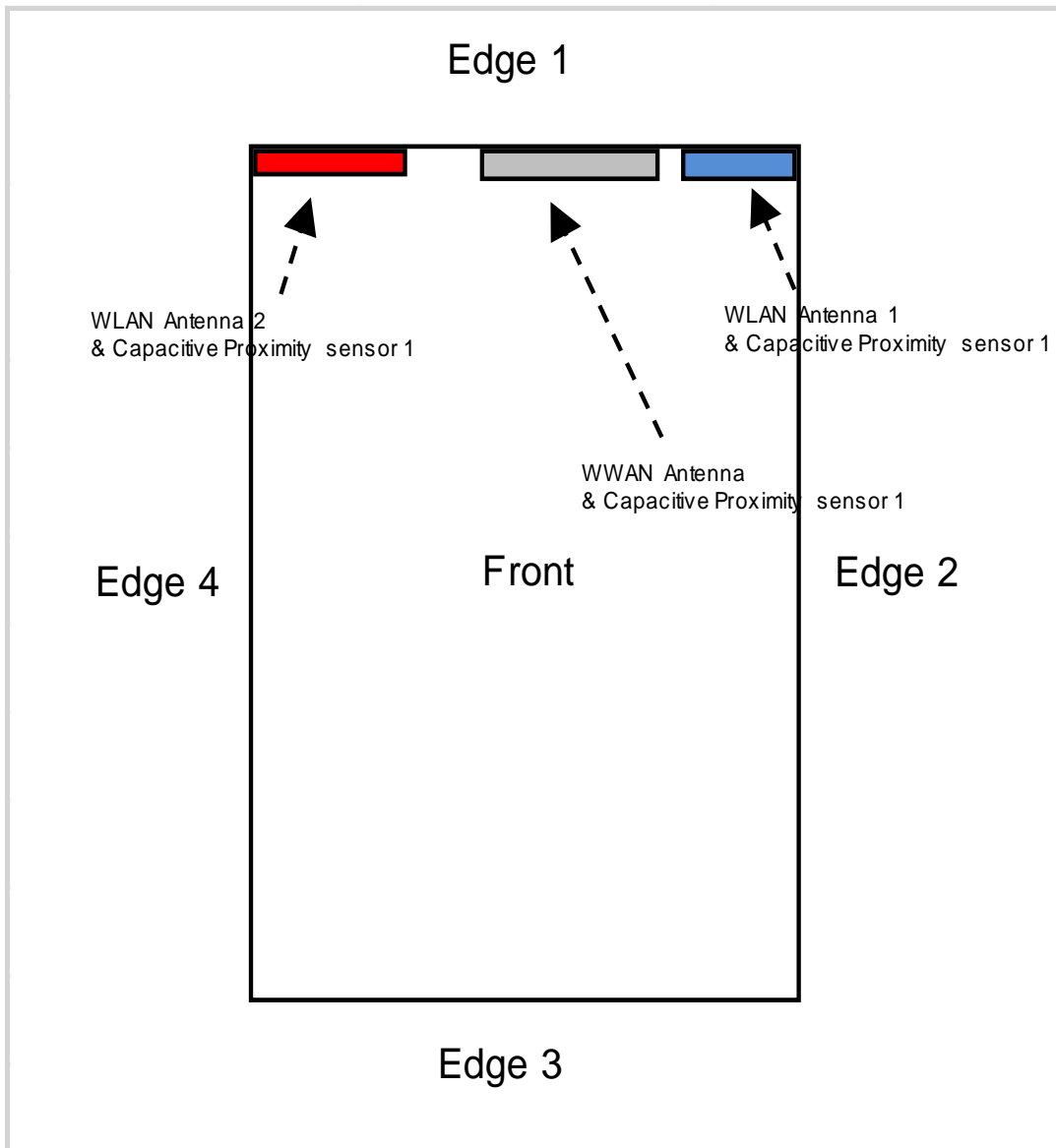
LTE Band 13		LTE Band 17		LTE Band 25		LTE Band 26		LTE Band 66	
QPSK, 10MHz BW 25RB, 25RB Offset		QPSK, 10MHz BW 50RB, 0RB Offset		QPSK, 20MHz BW 50RB, 50RB Offset		QPSK, 10MHz BW 75RB, 0RB Offset		QPSK, 20MHz BW 100RB, 0RB Offset	
Test position	Edge 1	Test position	Edge 1	Test position	Edge 1	Test position	Edge 1	Test position	Edge 1
Specing	0mm	Specing	0mm	Specing	0mm	Specing	0mm	Specing	0mm
Frequency (MHz)	782	Frequency (MHz)	710	Frequency (MHz)	1882.5	Frequency (MHz)	831.5	Frequency (MHz)	1745
Channel	23230	Channel	23790	Channel	26365	Channel	26865	Channel	132322
Measured 1g SAR (W/kg)	0.469	Measured 1g SAR (W/kg)	0.770	Measured 1g SAR (W/kg)	0.930	Measured 1g SAR (W/kg)	0.909	Measured 1g SAR (W/kg)	0.923
Average Value of Time Swpp (W/kg)		Average Value of Time Swpp (W/kg)		Average Value of Time Swpp (W/kg)		Average Value of Time Swpp (W/kg)		Average Value of Time Swpp (W/kg)	
Auto-tune (State 108)	1.301	Auto-tune (State 108)	1.509	Auto-tune (State 0)	2.706	Auto-tune (State 109)	2.188	Auto-tune (State 0)	1.606
State		State		State		State		State	
0	0.757	0	1.208	0	2.683	0	1.062	0	1.604
1	0.985	1	1.475	1	2.652	1	1.350	1	1.554
2	1.030	2	1.374	2	2.654	2	1.465	2	1.589
3	1.099	3	1.424	3	2.640	3	1.592	3	1.556
4	1.121	4	1.339	4	2.624	4	1.670	4	1.554
5	1.040	5	0.968	5	2.590	5	1.696	5	1.488
6	0.485	6	0.374	6	2.384	6	0.952	6	1.318
7	0.224	7	0.161	7	2.142	7	0.417	7	1.069
8	0.119	8	0.402	8	1.805	8	0.220	8	0.838
9	0.561	9	1.004	9	2.551	9	0.776	9	1.595
10	0.740	10	1.204	10	2.587	10	0.993	10	1.594
11	0.772	11	1.209	11	2.584	11	1.039	11	1.586
12	0.825	12	1.145	12	2.535	12	1.141	12	1.574
13	0.833	13	1.066	13	2.636	13	1.181	13	1.538
14	0.723	14	0.742	14	2.629	14	1.118	14	1.536
15	0.319	15	0.271	15	2.528	15	0.551	15	1.393
16	0.138	16	0.114	16	2.252	16	0.234	16	1.162
17	0.074	17	0.064	17	1.821	17	0.121	17	0.910
18	0.409	18	0.794	18	2.477	18	0.552	18	1.544
19	0.531	19	0.969	19	2.497	19	0.715	19	1.561
20	0.521	20	0.974	20	2.513	20	0.739	20	1.560
21	0.548	21	0.906	21	2.534	21	0.770	21	1.563
22	0.525	22	0.818	22	2.531	22	0.781	22	1.561
23	0.432	23	0.550	23	2.534	23	0.694	23	1.545
24	0.029	24	0.194	24	2.381	24	0.305	24	1.431
25	0.079	25	0.085	25	2.141	25	0.127	25	1.180
26	0.045	26	0.047	26	1.750	26	0.068	26	0.925
27	0.322	27	0.662	27	2.246	27	0.416	27	1.449
28	0.415	28	0.816	28	2.202	28	0.538	28	1.468
29	0.429	29	0.815	29	2.224	29	0.547	29	1.474
30	0.439	30	0.767	30	2.326	30	0.577	30	1.485
31	0.423	31	0.678	31	2.331	31	0.576	31	1.489
32	0.335	32	0.448	32	2.344	32	0.477	32	1.493
33	0.139	33	0.155	33	2.257	33	0.200	33	1.401
34	0.059	34	0.068	34	1.977	34	0.088	34	1.150
35	0.032	35	0.038	35	1.591	35	0.047	35	0.877
36	0.808	36	1.222	36	2.431	36	1.197	36	1.484
37	1.007	37	1.409	37	2.497	37	1.502	37	1.446
38	1.036	38	1.401	38	2.475	38	1.557	38	1.424
39	1.067	39	1.307	39	2.358	39	1.646	39	1.376
40	1.066	40	1.197	40	2.446	40	1.687	40	1.365
41	0.940	41	0.859	41	2.352	41	1.584	41	1.280
42	0.464	42	0.337	42	2.090	42	0.857	42	1.062
43	0.216	43	0.151	43	1.703	43	0.373	43	0.808
44	0.107	44	0.084	44	1.331	44	0.202	44	0.615
45	0.588	45	1.025	45	2.551	45	0.868	45	1.504
46	0.732	46	1.187	46	2.515	46	0.772	46	1.481
47	0.748	47	1.179	47	2.523	47	1.097	47	1.475
48	0.771	48	1.086	48	2.421	48	1.147	48	1.442
49	0.755	49	0.980	49	2.484	49	1.151	49	1.437
50	0.626	50	0.676	50	2.346	50	1.016	50	1.368
51	0.277	51	0.257	51	2.196	51	0.486	51	1.158
52	0.124	52	0.115	52	1.789	52	0.215	52	0.890
53	0.068	53	0.065	53	1.402	53	0.117	53	0.679
54	0.432	54	0.810	54	2.564	54	0.612	54	1.519
55	0.522	55	0.925	55	2.582	55	0.732	55	1.524
56	0.531	56	0.943	56	2.653	56	0.760	56	1.520
57	0.527	57	0.855	57	2.673	57	0.765	57	1.487
58	0.501	58	0.753	58	2.680	58	0.740	58	1.483
59	0.389	59	0.510	59	2.539	59	0.611	59	1.427
60	0.164	60	0.187	60	2.159	60	0.267	60	1.226
61	0.075	61	0.084	61	1.692	61	0.119	61	0.931
62	0.042	62	0.047	62	1.321	62	0.065	62	0.693
63	0.336	63	0.692	63	2.487	63	0.466	63	1.492
64	0.413	64	0.788	64	2.569	64	0.549	64	1.508
65	0.415	65	0.780	65	2.520	65	0.547	65	1.512
66	0.408	66	0.700	66	2.534	66	0.545	66	1.492
67	0.389	67	0.618	67	2.512	67	0.529	67	1.487
68	0.297	68	0.412	68	2.489	68	0.420	68	1.436
69	0.124	69	0.149	69	2.099	69	0.179	69	1.235

70	0.058	70	0.069	70	1.639	70	0.082	70	0.922
71	0.032	71	0.038	71	1.201	71	0.044	71	0.658
72	1.213	72	1.450	72	0.329	72	1.851	72	0.331
73	1.238	73	1.279	73	0.374	73	2.015	73	0.338
74	1.198	74	1.191	74	0.365	74	1.971	74	0.326
75	1.053	75	0.985	75	0.351	75	1.765	75	0.304
76	0.934	76	0.837	76	0.367	76	1.594	76	0.307
77	0.630	77	0.546	77	0.337	77	1.072	77	0.264
78	0.245	78	0.214	78	0.264	78	0.401	78	0.179
79	0.108	79	0.100	79	0.163	79	0.166	79	0.102
80	0.058	80	0.057	80	0.093	80	0.086	80	0.058
81	0.966	81	1.236	81	0.330	81	1.447	81	0.345
82	0.907	82	1.065	82	0.377	82	1.393	82	0.363
83	0.857	83	0.980	83	0.372	83	1.334	83	0.354
84	0.751	84	0.795	84	0.356	84	1.117	84	0.335
85	0.620	85	0.668	85	0.384	85	0.963	85	0.343
86	0.403	86	0.432	86	0.366	86	0.612	86	0.303
87	0.153	87	0.168	87	0.304	87	0.219	87	0.214
88	0.071	88	0.081	88	0.190	88	0.092	88	0.122
89	0.041	89	0.047	89	0.106	89	0.048	89	0.069
90	0.739	90	1.012	90	0.362	90	1.019	90	0.365
91	0.604	91	0.824	91	0.431	91	0.861	91	0.403
92	0.552	92	0.755	92	0.432	92	0.786	92	0.398
93	0.448	93	0.601	93	0.435	93	0.627	93	0.385
94	0.377	94	0.502	94	0.466	94	0.527	94	0.399
95	0.243	95	0.324	95	0.458	95	0.325	95	0.361
96	0.096	96	0.128	96	0.379	96	0.119	96	0.258
97	0.046	97	0.062	97	0.222	97	0.052	97	0.142
98	0.027	98	0.038	98	0.111	98	0.028	98	0.077
99	0.566	99	0.857	99	0.358	99	0.757	99	0.383
100	0.451	100	0.678	100	0.450	100	0.593	100	0.444
101	0.413	101	0.634	101	0.455	101	0.535	101	0.442
102	0.329	102	0.495	102	0.470	102	0.421	102	0.440
103	0.274	103	0.408	103	0.511	103	0.354	103	0.460
104	0.176	104	0.260	104	0.528	104	0.215	104	0.431
105	0.070	105	0.104	105	0.463	105	0.081	105	0.307
106	0.036	106	0.052	106	0.239	106	0.036	106	0.155
107	0.022	107	0.032	107	0.109	107	0.019	107	0.077
108	1.279	108	1.483	108	0.297	108	1.883	108	0.297
109	0.679	109	1.255	109	0.334	109	2.143	109	0.305
110	1.291	110	1.157	110	0.328	110	2.060	110	0.295
111	1.089	111	0.931	111	0.317	111	1.810	111	0.272
112	0.933	112	0.786	112	0.330	112	1.601	112	0.238
113	0.594	113	0.502	113	0.305	113	1.039	113	0.237
114	0.215	114	0.195	114	1.973	114	0.357	114	0.162
115	0.096	115	0.092	115	0.151	115	0.148	115	0.092
116	0.053	116	0.053	116	0.087	116	0.074	116	0.053
117	1.101	117	1.294	117	0.300	117	1.558	117	0.307
118	0.989	118	1.050	118	0.337	118	1.491	118	0.325
119	0.912	119	0.957	119	0.334	119	1.454	119	0.316
120	0.730	120	0.759	120	0.319	120	1.173	120	0.301
121	0.614	121	0.628	121	0.345	121	0.922	121	0.309
122	0.379	122	0.396	122	0.328	122	0.598	122	0.272
123	0.139	123	0.153	123	0.278	123	0.202	123	0.192
124	0.065	124	0.073	124	0.174	124	0.084	124	0.110
125	0.036	125	0.043	125	0.096	125	0.042	125	0.062
126	0.804	126	1.063	126	0.322	126	1.186	126	0.324
127	0.622	127	0.820	127	0.383	127	0.942	127	0.358
128	0.560	128	0.741	128	0.383	128	0.845	128	0.354
129	0.437	129	0.578	129	0.388	129	0.648	129	0.345
130	0.362	130	0.472	130	0.414	130	0.531	130	0.356
131	0.225	131	0.297	131	0.410	131	0.316	131	0.325
132	0.085	132	0.116	132	0.354	132	0.102	132	0.233
133	0.041	133	0.057	133	0.199	133	0.048	133	0.127
134	0.024	134	0.035	134	0.100	134	0.025	134	0.069
135	0.632	135	0.899	135	0.324	135	0.890	135	0.337
136	0.467	136	0.669	136	0.394	136	0.640	136	0.390
137	0.416	137	0.601	137	0.409	137	0.577	137	0.392
138	0.318	138	0.463	138	0.401	138	0.432	138	0.392
139	0.258	139	0.380	139	0.460	139	0.349	139	0.408
140	0.162	140	0.236	140	0.472	140	0.207	140	0.387
141	0.062	141	0.095	141	0.428	141	0.073	141	0.278
142	0.031	142	0.048	142	0.223	142	0.033	142	0.139
143	0.018	143	0.030	143	0.102	143	0.017	143	0.070

WCDMA Band V	
RMC	
Test position	Edge 1
Specing	0mm
Frequency (MHz)	836.6
Channel	4183
Measured 1g SAR (W/kg)	0.660
Average Value of Time Swwp (W/kg)	
Auto-tune (State 109)	1.076
State	
0	0.532
6	0.548
11	0.570
17	0.061
22	0.461
28	0.305
33	0.108
39	0.873
44	0.113
50	0.591
55	0.413
61	0.064
66	0.327
72	0.840
73	1.019
83	0.728
84	0.653
94	0.333
108	0.856
109	1.050
116	0.051
127	0.512
138	0.255
141	0.046

### 6.9 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.

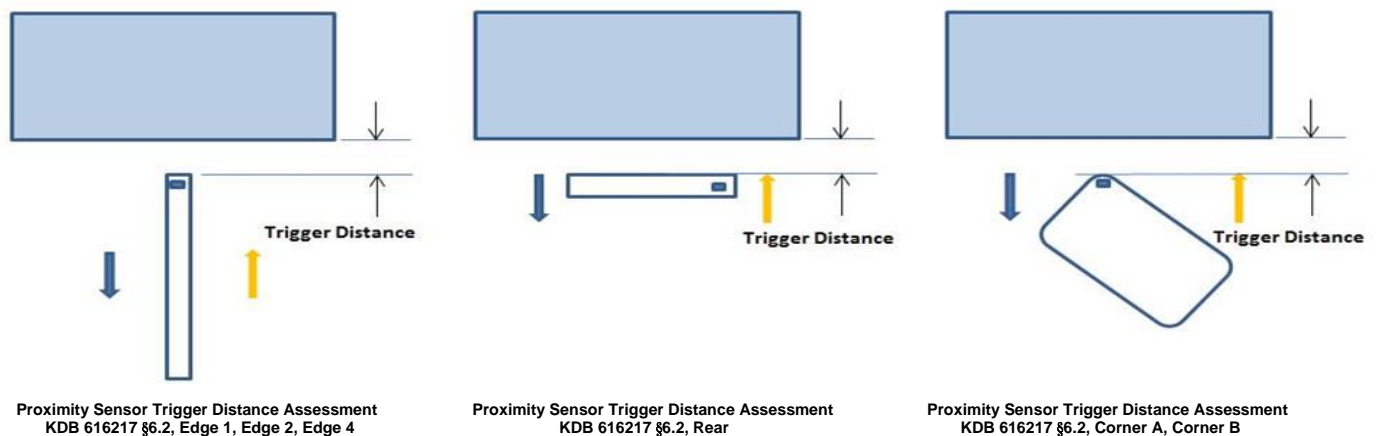


### 6.9.1 Proximity Sensor Triggering Distance (KDB 616217 §6.2)

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.



**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

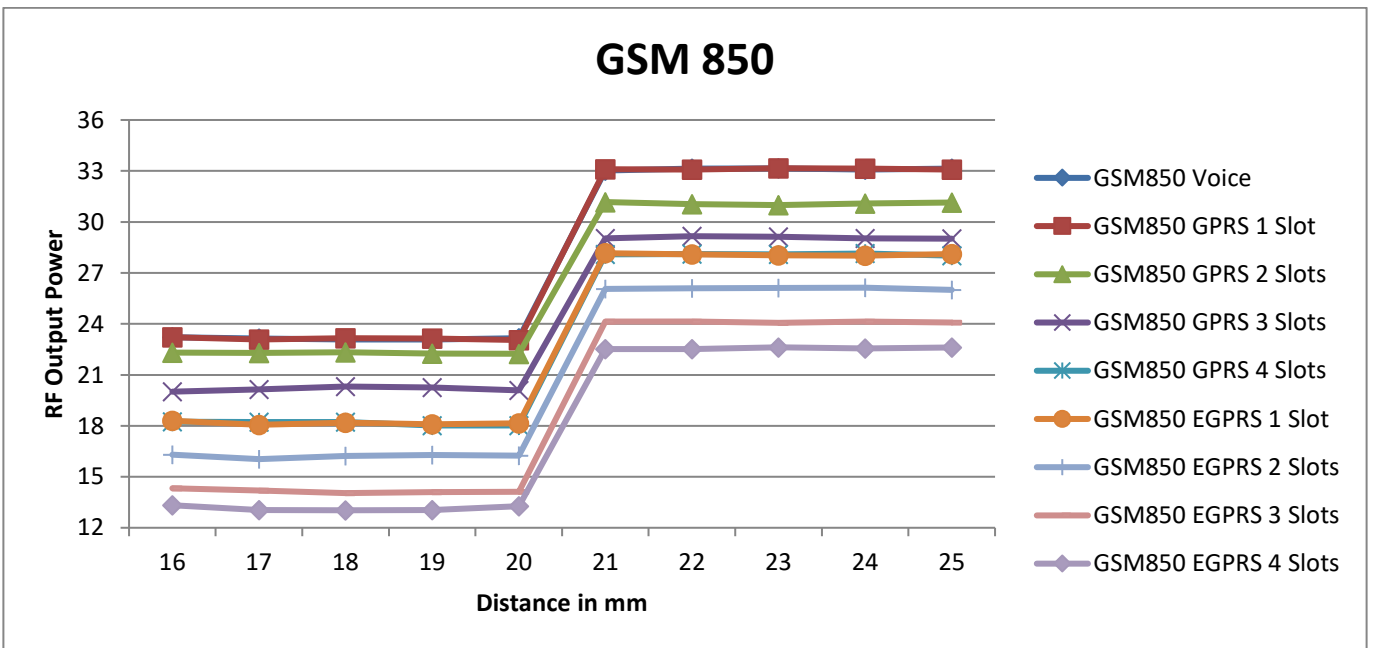
Antenna	Tissue simulating liquid	Trigger distance - Rear		Trigger distance - Edge 1		Trigger distance - Edge 2		Trigger distance - Edge 4		Trigger distance - Corner A		Trigger distance - Corner B	
		Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom	Moving toward phantom	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	20 mm	20 mm	24 mm	24 mm	10 mm	10 mm	N/A	N/A	N/A	N/A	N/A	N/A
	850 Head	20 mm	20 mm	24 mm	24 mm	10 mm	10 mm	N/A	N/A	N/A	N/A	N/A	N/A
	1750 Head	20 mm	20 mm	24 mm	24 mm	10 mm	10 mm	N/A	N/A	N/A	N/A	N/A	N/A
	1900 Head	20 mm	20 mm	24 mm	24 mm	10 mm	10 mm	N/A	N/A	N/A	N/A	N/A	N/A
	2600 Head	20 mm	20 mm	24 mm	24 mm	10 mm	10 mm	N/A	N/A	N/A	N/A	N/A	N/A
WLAN Ant.	2450 Head Ant 1	18 mm	18 mm	21 mm	21 mm	10 mm	10 mm	N/A	N/A	16 mm	16 mm	N/A	N/A
	2450 Head Ant 2	17 mm	17 mm	20 mm	20 mm	N/A	N/A	7 mm	7 mm	N/A	N/A	14 mm	14 mm
	5000 Head Ant 1	18 mm	18 mm	21 mm	21 mm	10 mm	10 mm	N/A	N/A	16 mm	16 mm	N/A	N/A
	5000 Head Ant 2	17 mm	17 mm	20 mm	20 mm	N/A	N/A	7 mm	7 mm	N/A	N/A	14 mm	14 mm

**Proximity Sensor Triggering Distance Measurement Results**

**GSM 850**

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

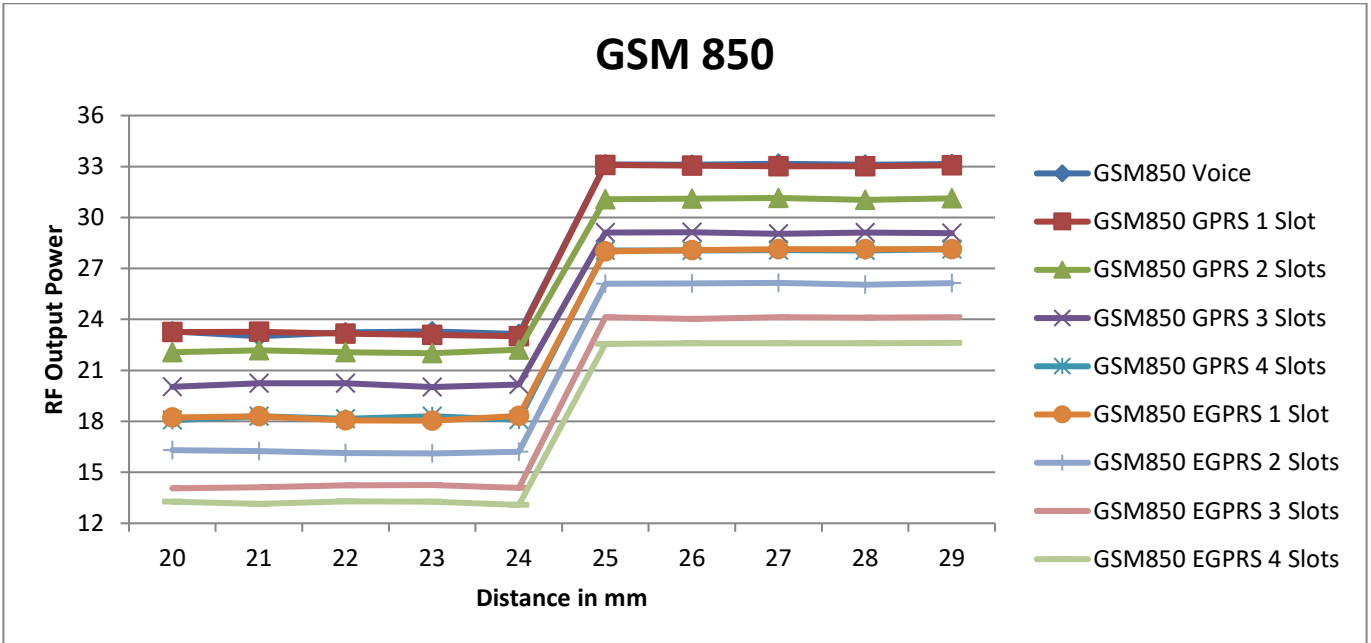
Distance to DUT vs. Output Power in dBm										
Distance (mm)	16	17	18	19	20	21	22	23	24	25
GSM850 Voice	23.2	23.1	23.1	23.1	23.2	33.0	33.1	33.2	33.1	33.1
GSM850 GPRS 1 Slot	23.2	23.1	23.2	23.1	23.1	33.1	33.1	33.2	33.1	33.1
GSM850 GPRS 2 Slots	22.3	22.3	22.3	22.3	22.2	31.2	31.0	31.0	31.1	31.1
GSM850 GPRS 3 Slots	20.0	20.1	20.3	20.3	20.1	29.0	29.2	29.1	29.0	29.0
GSM850 GPRS 4 Slots	18.2	18.2	18.2	18.0	18.0	28.1	28.1	28.1	28.1	28.0
GSM850 EGPRS 1 Slot	18.3	18.1	18.2	18.1	18.2	28.2	28.1	28.0	28.0	28.1
GSM850 EGPRS 2 Slots	16.3	16.0	16.2	16.3	16.2	26.1	26.1	26.1	26.1	26.0
GSM850 EGPRS 3 Slots	14.3	14.2	14.0	14.1	14.1	24.1	24.1	24.1	24.1	24.1
GSM850 EGPRS 4 Slots	13.3	13.0	13.0	13.0	13.3	22.5	22.5	22.6	22.6	22.6





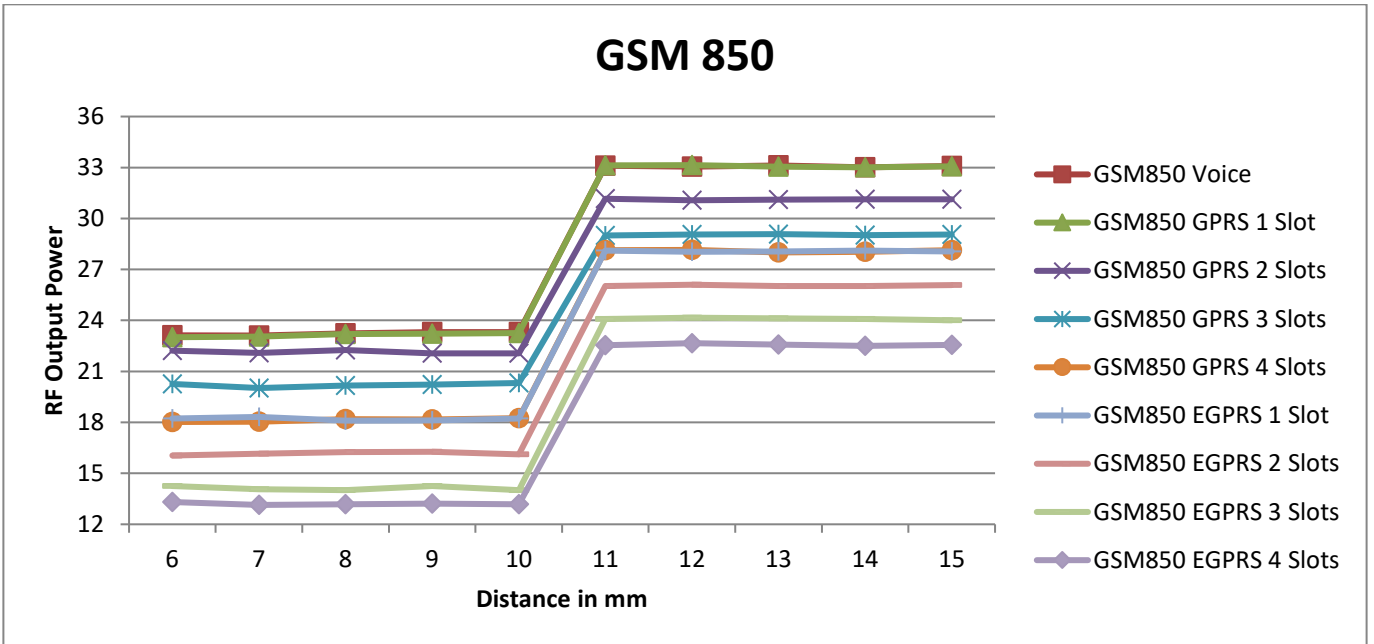
Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	20	21	22	23	24	25	26	27	28	29
GSM850 Voice	23.3	23.0	23.2	23.3	23.1	33.1	33.1	33.2	33.1	33.2
GSM850 GPRS 1 Slot	23.3	23.3	23.2	23.1	23.0	33.1	33.0	33.0	33.0	33.1
GSM850 GPRS 2 Slots	22.1	22.2	22.1	22.0	22.2	31.1	31.1	31.2	31.0	31.1
GSM850 GPRS 3 Slots	20.0	20.3	20.3	20.0	20.2	29.1	29.1	29.0	29.1	29.1
GSM850 GPRS 4 Slots	18.1	18.3	18.2	18.3	18.1	28.1	28.1	28.1	28.1	28.1
GSM850 EGPRS 1 Slot	18.2	18.3	18.1	18.0	18.3	28.0	28.1	28.1	28.1	28.1
GSM850 EGPRS 2 Slots	16.3	16.3	16.1	16.1	16.2	26.1	26.1	26.2	26.0	26.1
GSM850 EGPRS 3 Slots	14.1	14.1	14.2	14.3	14.1	24.1	24.0	24.1	24.1	24.1
GSM850 EGPRS 4 Slots	13.3	13.1	13.3	13.3	13.1	22.6	22.6	22.6	22.6	22.6



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

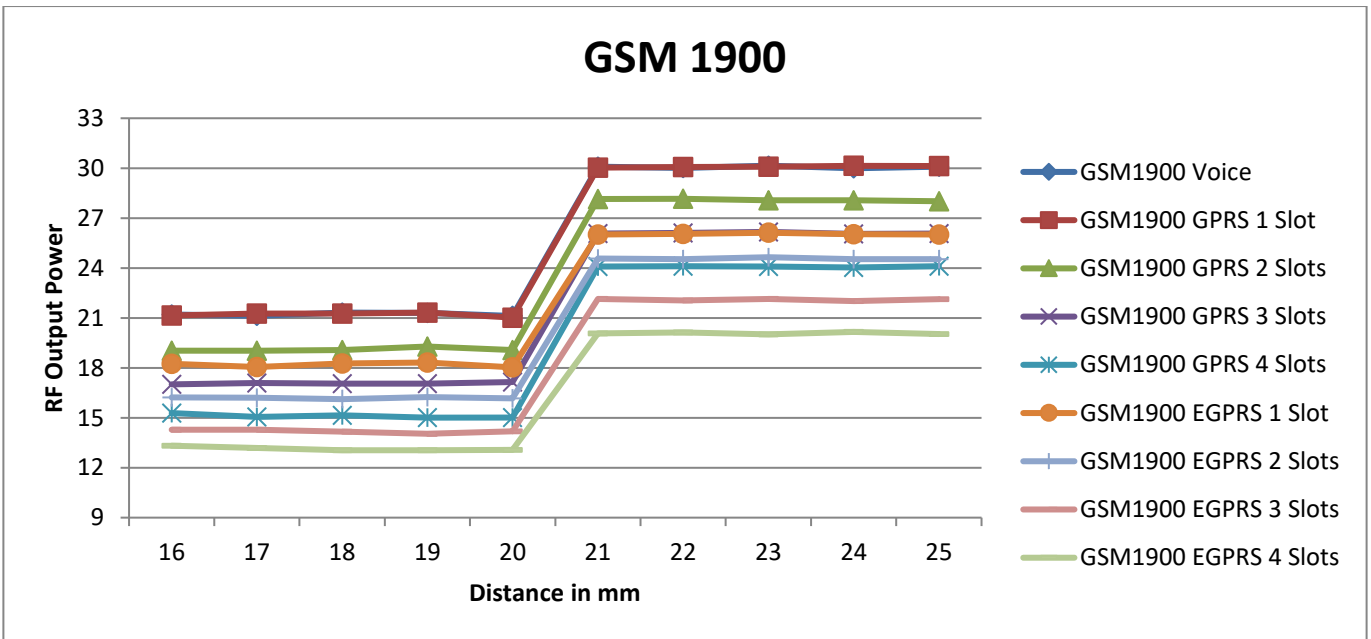
Distance to DUT vs. Output Power in dBm										
Distance (mm)	6	7	8	9	10	11	12	13	14	15
GSM850 Voice	23.1	23.1	23.2	23.3	23.3	33.1	33.1	33.1	33.0	33.1
GSM850 GPRS 1 Slot	23.0	23.0	23.2	23.2	23.3	33.1	33.1	33.1	33.0	33.1
GSM850 GPRS 2 Slots	22.2	22.1	22.3	22.1	22.1	31.2	31.1	31.1	31.1	31.1
GSM850 GPRS 3 Slots	20.3	20.0	20.2	20.2	20.3	29.0	29.1	29.1	29.0	29.1
GSM850 GPRS 4 Slots	18.0	18.0	18.2	18.2	18.3	28.1	28.2	28.0	28.0	28.1
GSM850 EGPRS 1 Slot	18.2	18.3	18.1	18.1	18.2	28.1	28.0	28.1	28.1	28.1
GSM850 EGPRS 2 Slots	16.1	16.2	16.2	16.3	16.1	26.0	26.1	26.0	26.0	26.1
GSM850 EGPRS 3 Slots	14.3	14.1	14.0	14.3	14.0	24.1	24.2	24.1	24.1	24.0
GSM850 EGPRS 4 Slots	13.3	13.1	13.2	13.2	13.2	22.5	22.7	22.6	22.5	22.6



**GSM 1900**

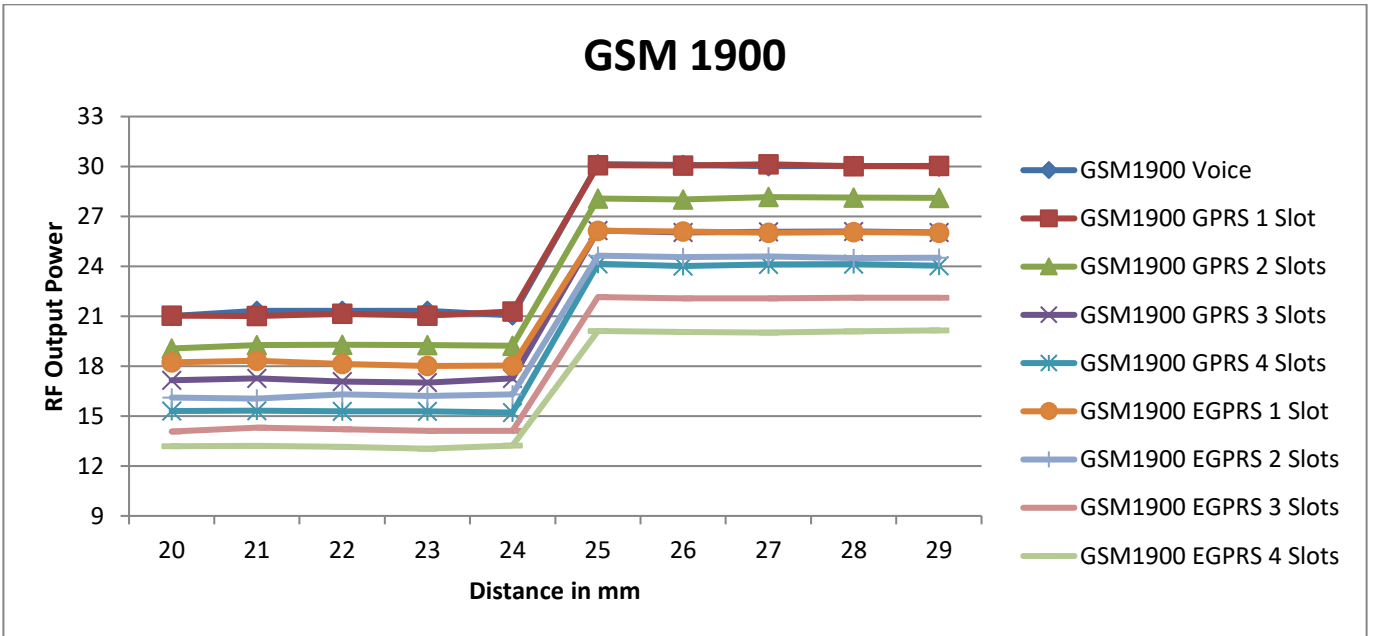
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	16	17	18	19	20	21	22	23	24	25
GSM1900 Voice	21.2	21.1	21.3	21.3	21.1	30.1	30.0	30.2	30.0	30.1
GSM1900 GPRS 1 Slot	21.1	21.3	21.3	21.3	21.0	30.0	30.1	30.1	30.1	30.1
GSM1900 GPRS 2 Slots	19.0	19.0	19.1	19.3	19.1	28.1	28.2	28.1	28.1	28.0
GSM1900 GPRS 3 Slots	17.0	17.1	17.1	17.1	17.1	26.1	26.1	26.2	26.1	26.1
GSM1900 GPRS 4 Slots	15.3	15.1	15.1	15.0	15.0	24.1	24.1	24.1	24.0	24.1
GSM1900 EGPRS 1 Slot	18.3	18.1	18.3	18.3	18.0	26.0	26.1	26.1	26.0	26.0
GSM1900 EGPRS 2 Slots	16.2	16.2	16.1	16.2	16.2	24.6	24.5	24.7	24.5	24.5
GSM1900 EGPRS 3 Slots	14.3	14.3	14.2	14.0	14.2	22.1	22.1	22.1	22.0	22.1
GSM1900 EGPRS 4 Slots	13.3	13.2	13.1	13.1	13.1	20.1	20.1	20.0	20.2	20.0



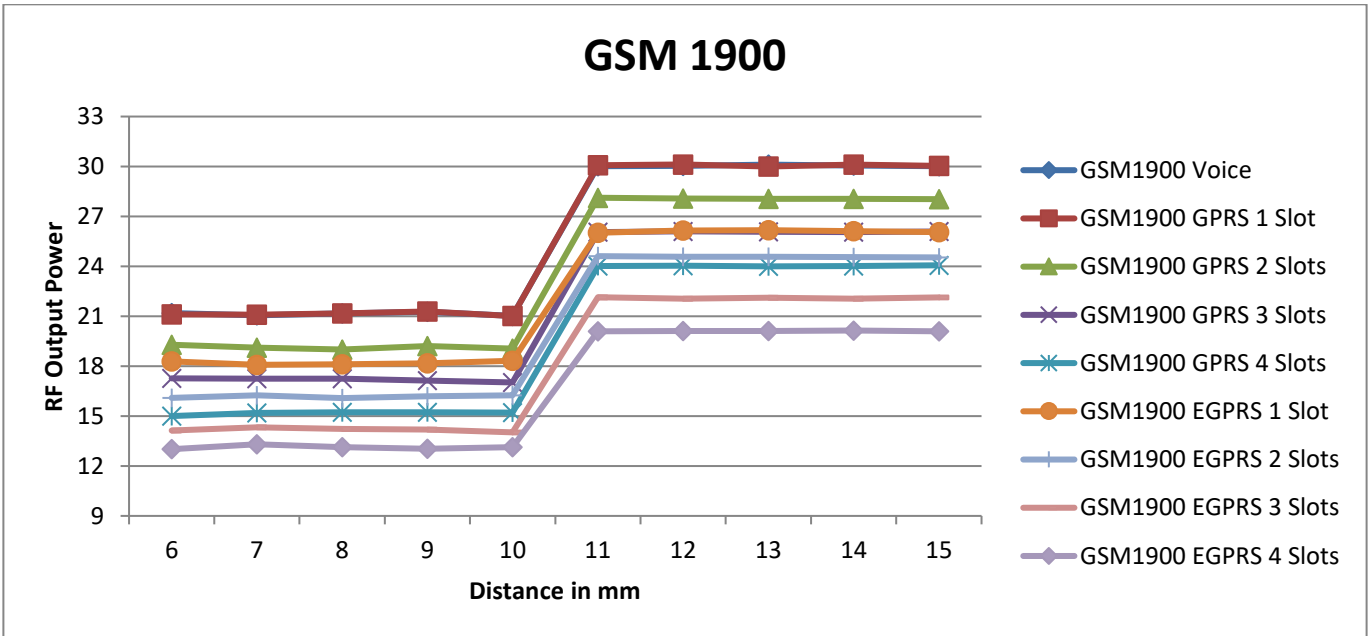
Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	20	21	22	23	24	25	26	27	28	29
GSM1900 Voice	21.0	21.3	21.3	21.3	21.1	30.1	30.1	30.0	30.0	30.0
GSM1900 GPRS 1 Slot	21.0	21.0	21.2	21.0	21.3	30.1	30.1	30.1	30.0	30.0
GSM1900 GPRS 2 Slots	19.1	19.3	19.3	19.3	19.2	28.1	28.0	28.2	28.1	28.1
GSM1900 GPRS 3 Slots	17.2	17.3	17.1	17.0	17.3	26.2	26.0	26.1	26.1	26.0
GSM1900 GPRS 4 Slots	15.3	15.3	15.3	15.3	15.2	24.2	24.0	24.1	24.1	24.0
GSM1900 EGPRS 1 Slot	18.2	18.3	18.1	18.0	18.0	26.1	26.1	26.0	26.1	26.0
GSM1900 EGPRS 2 Slots	16.1	16.1	16.3	16.2	16.3	24.6	24.6	24.6	24.5	24.5
GSM1900 EGPRS 3 Slots	14.1	14.3	14.2	14.1	14.1	22.2	22.1	22.1	22.1	22.1
GSM1900 EGPRS 4 Slots	13.2	13.2	13.2	13.0	13.2	20.1	20.1	20.0	20.1	20.2



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

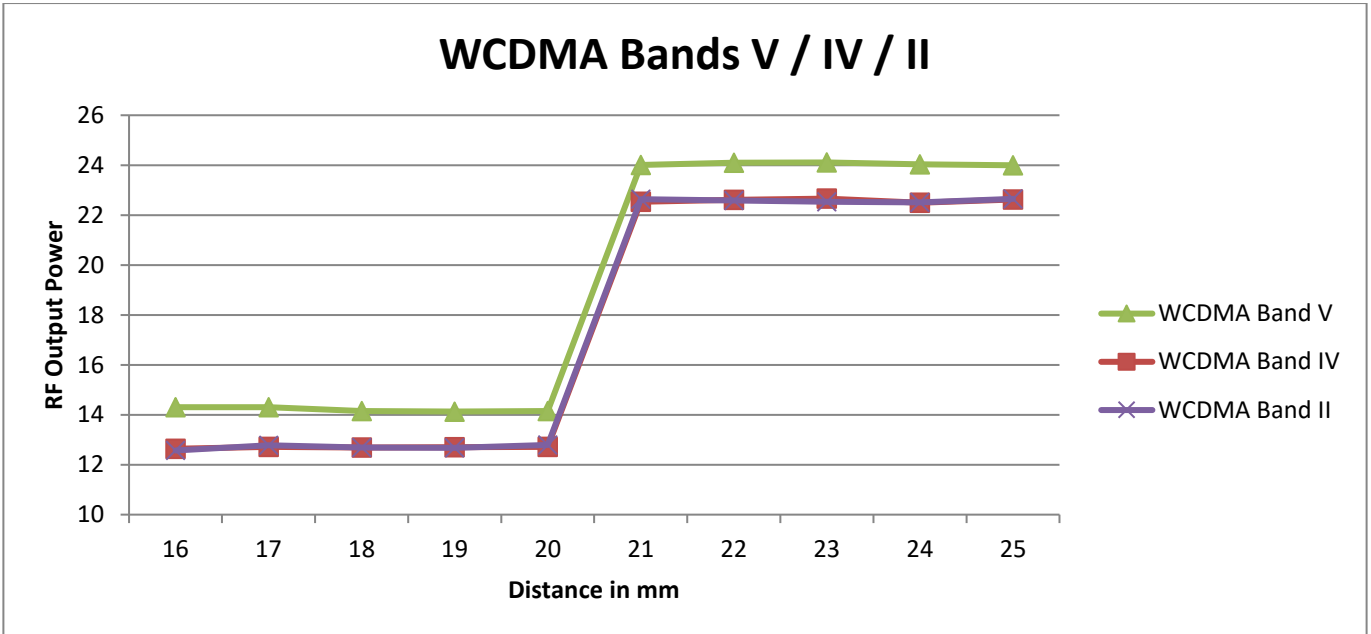
Distance to DUT vs. Output Power in dBm										
Distance (mm)	6	7	8	9	10	11	12	13	14	15
GSM1900 Voice	21.2	21.1	21.2	21.3	21.0	30.0	30.0	30.1	30.1	30.0
GSM1900 GPRS 1 Slot	21.1	21.1	21.2	21.3	21.0	30.1	30.1	30.0	30.1	30.0
GSM1900 GPRS 2 Slots	19.3	19.1	19.0	19.2	19.1	28.1	28.1	28.1	28.1	28.0
GSM1900 GPRS 3 Slots	17.3	17.2	17.3	17.1	17.0	26.1	26.1	26.1	26.1	26.1
GSM1900 GPRS 4 Slots	15.0	15.2	15.2	15.2	15.2	24.0	24.0	24.0	24.0	24.1
GSM1900 EGPRS 1 Slot	18.3	18.1	18.1	18.2	18.3	26.0	26.2	26.2	26.1	26.1
GSM1900 EGPRS 2 Slots	16.1	16.2	16.1	16.2	16.2	24.6	24.6	24.6	24.6	24.5
GSM1900 EGPRS 3 Slots	14.1	14.3	14.2	14.2	14.0	22.1	22.1	22.1	22.1	22.1
GSM1900 EGPRS 4 Slots	13.0	13.3	13.1	13.0	13.1	20.1	20.1	20.1	20.1	20.1



**WCDMA Band II/IV/V**

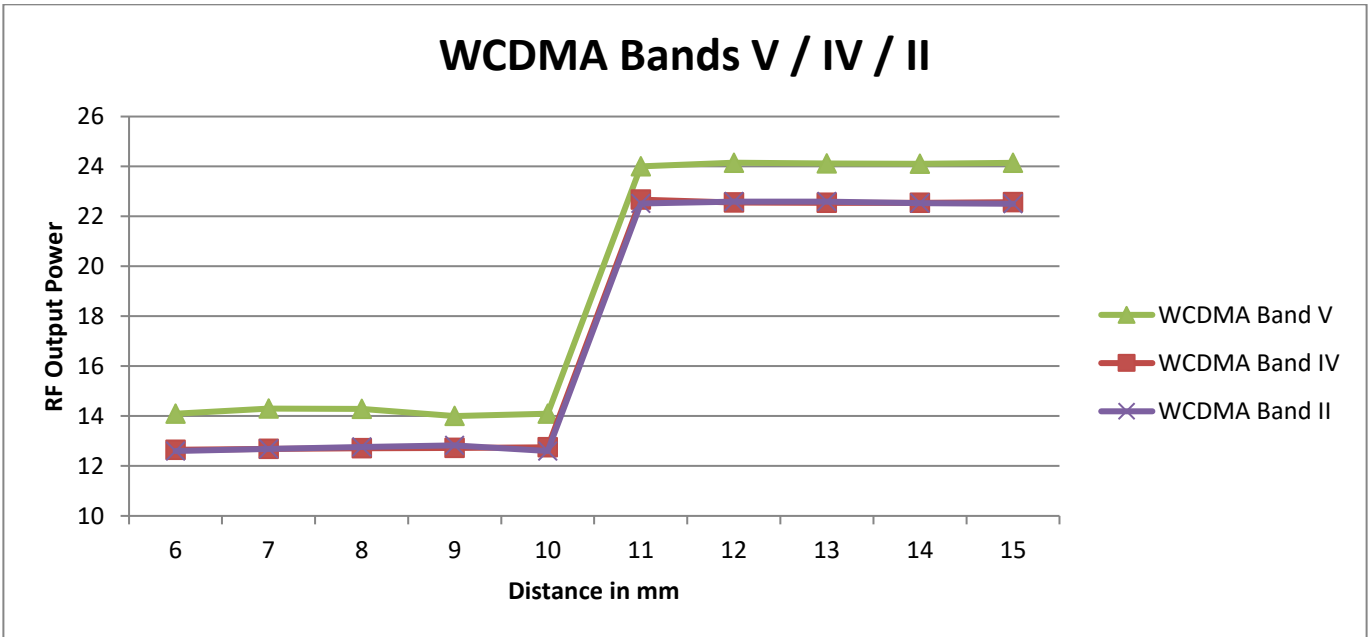
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	16	17	18	19	20	21	22	23	24	25
WCDMA Band V	14.3	14.3	14.2	14.1	14.2	24.0	24.1	24.1	24.0	24.0
WCDMA Band IV	12.6	12.7	12.7	12.7	12.7	22.5	22.6	22.7	22.5	22.6
WCDMA Band II	12.6	12.8	12.7	12.7	12.8	22.6	22.6	22.5	22.5	22.7



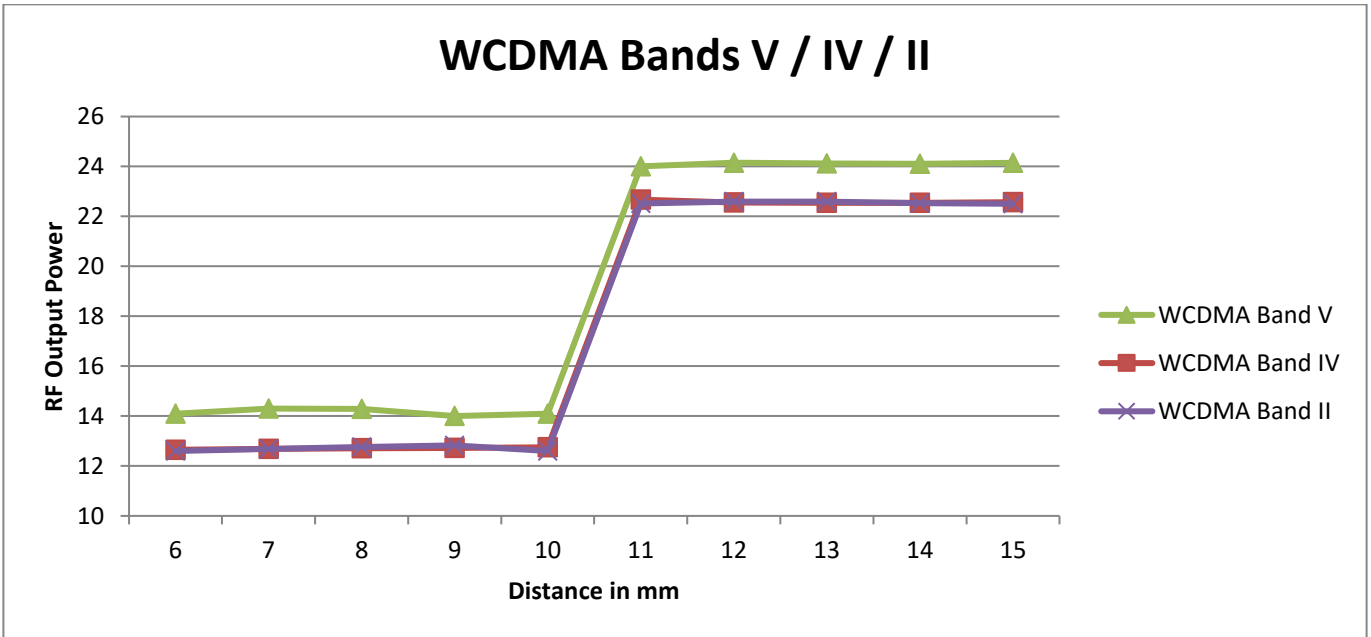
Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	20	21	22	23	24	25	26	27	28	29
WCDMA Band V	14.2	14.3	14.3	14.2	14.3	24.1	24.2	24.1	24.1	24.0
WCDMA Band IV	12.6	12.6	12.7	12.8	12.7	22.5	22.6	22.6	22.6	22.6
WCDMA Band II	12.7	12.6	12.8	12.6	12.5	22.6	22.7	22.6	22.6	22.5



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

Distance to DUT vs. Output Power in dBm										
Distance (mm)	6	7	8	9	10	11	12	13	14	15
WCDMA Band V	14.1	14.3	14.3	14.0	14.1	24.0	24.2	24.1	24.1	24.1
WCDMA Band IV	12.7	12.7	12.7	12.7	12.8	22.7	22.6	22.5	22.5	22.6
WCDMA Band II	12.6	12.7	12.8	12.8	12.6	22.5	22.6	22.6	22.5	22.5

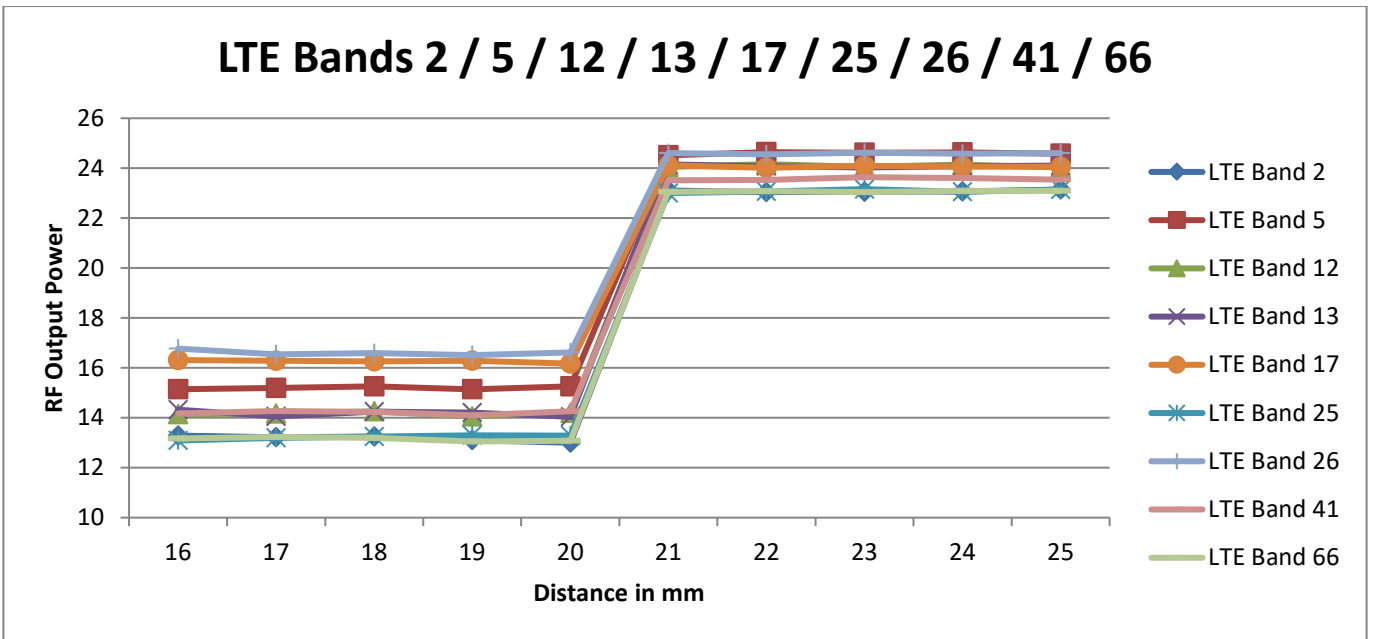




**LTE Band 2/ 5/ 12/ 13/ 17/ 25/ 26/ 41/ 66**

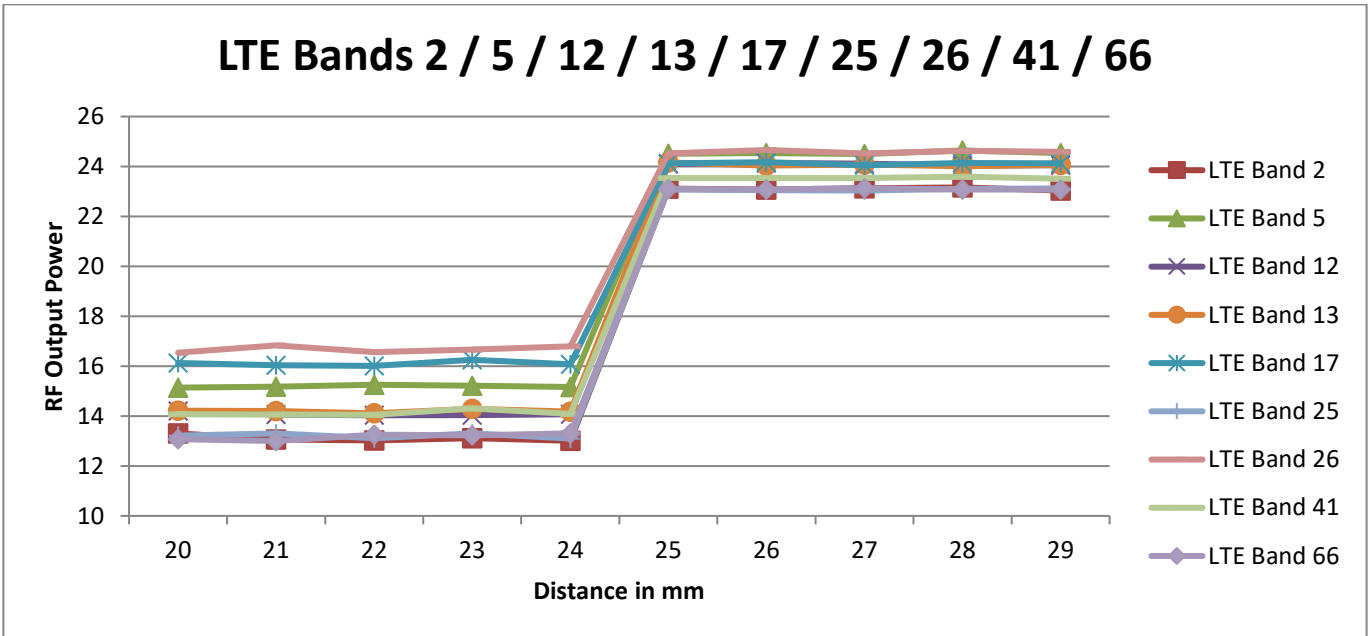
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	16	17	18	19	20	21	22	23	24	25
LTE Band 2	13.3	13.2	13.3	13.1	13.0	23.1	23.0	23.1	23.1	23.1
LTE Band 5	15.2	15.2	15.3	15.1	15.3	24.5	24.6	24.6	24.6	24.6
LTE Band 12	14.1	14.2	14.3	14.1	14.2	24.1	24.2	24.1	24.1	24.0
LTE Band 13	14.3	14.1	14.3	14.2	14.0	24.2	24.1	24.0	24.1	24.1
LTE Band 17	16.3	16.3	16.3	16.3	16.2	24.1	24.0	24.1	24.1	24.1
LTE Band 25	13.1	13.2	13.3	13.3	13.3	23.0	23.1	23.2	23.1	23.2
LTE Band 26	16.8	16.5	16.6	16.5	16.6	24.6	24.6	24.6	24.6	24.6
LTE Band 41	14.2	14.3	14.2	14.1	14.3	23.5	23.5	23.6	23.6	23.5
LTE Band 66	13.2	13.2	13.2	13.1	13.1	23.1	23.1	23.0	23.1	23.1



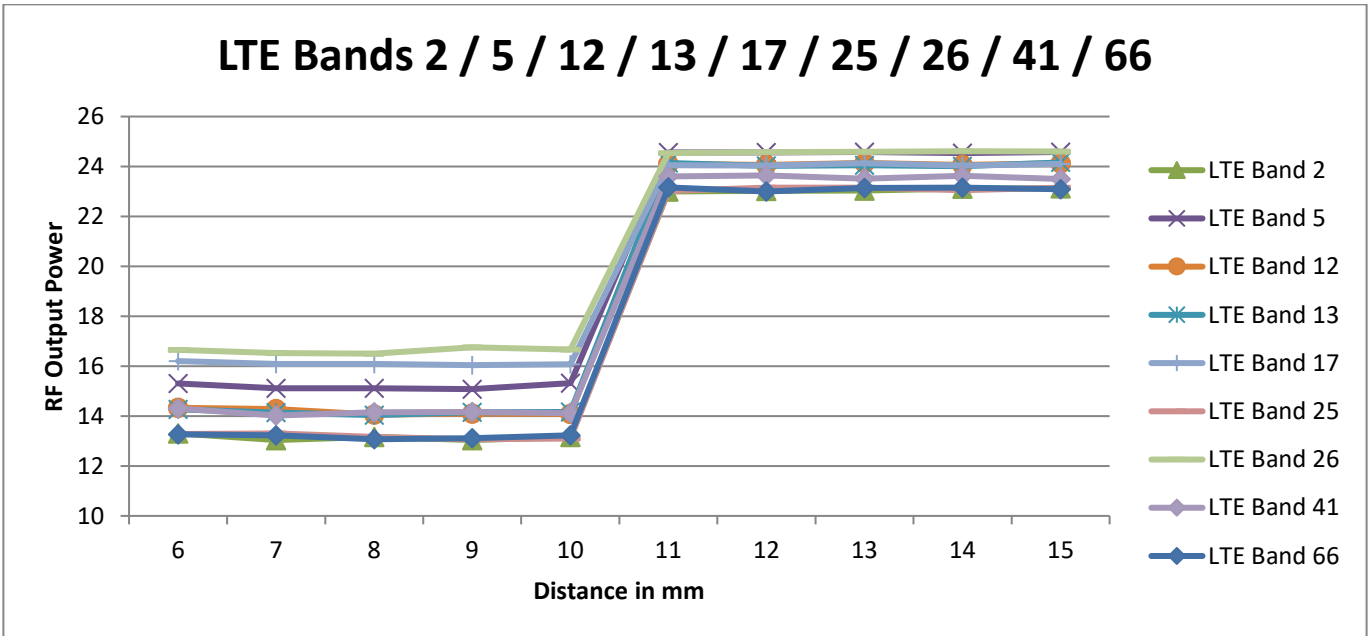
Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	20	21	22	23	24	25	26	27	28	29
LTE Band 2	13.3	13.1	13.0	13.1	13.0	23.1	23.1	23.1	23.2	23.0
LTE Band 5	15.1	15.2	15.3	15.2	15.2	24.5	24.5	24.5	24.6	24.5
LTE Band 12	14.2	14.1	14.0	14.0	14.1	24.1	24.1	24.1	24.0	24.1
LTE Band 13	14.2	14.2	14.1	14.3	14.2	24.2	24.0	24.1	24.0	24.1
LTE Band 17	16.1	16.0	16.0	16.3	16.1	24.1	24.2	24.1	24.1	24.1
LTE Band 25	13.2	13.3	13.1	13.3	13.1	23.1	23.1	23.0	23.1	23.1
LTE Band 26	16.5	16.8	16.6	16.7	16.8	24.5	24.7	24.5	24.6	24.6
LTE Band 41	14.1	14.1	14.1	14.3	14.1	23.5	23.5	23.5	23.6	23.5
LTE Band 66	13.1	13.0	13.3	13.2	13.3	23.1	23.1	23.1	23.1	23.1



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

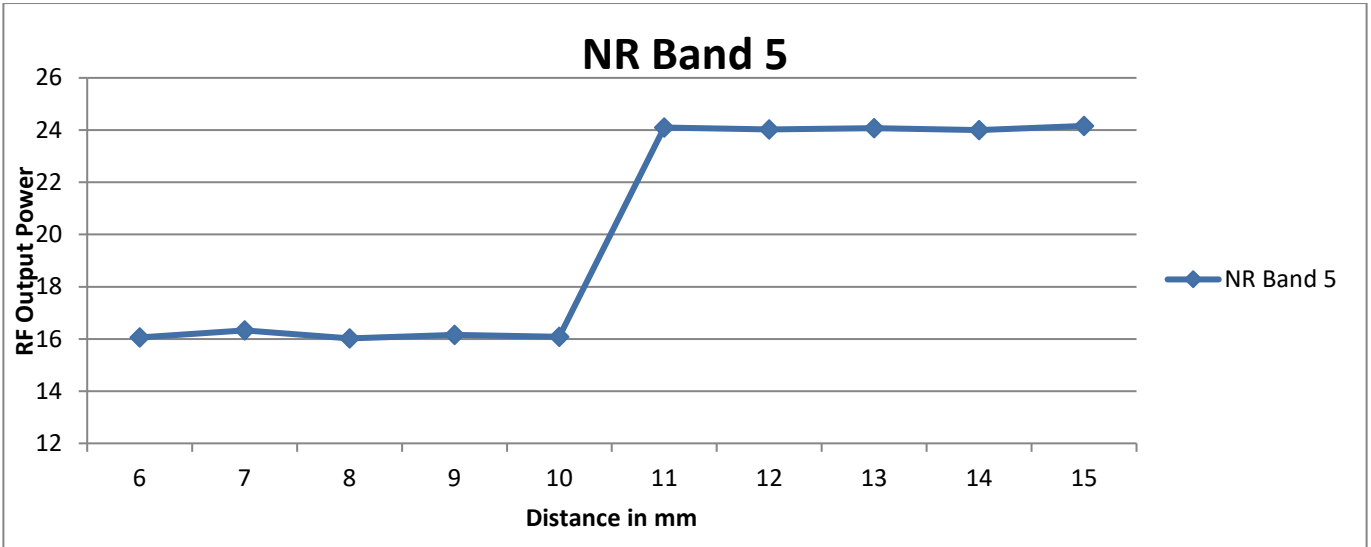
Distance to DUT vs. Output Power in dBm										
Distance (mm)	6	7	8	9	10	11	12	13	14	15
LTE Band 2	13.3	13.0	13.2	13.0	13.2	23.0	23.0	23.0	23.1	23.1
LTE Band 5	15.3	15.1	15.1	15.1	15.3	24.6	24.6	24.6	24.5	24.6
LTE Band 12	14.3	14.3	14.1	14.1	14.1	24.1	24.1	24.1	24.1	24.1
LTE Band 13	14.3	14.1	14.0	14.2	14.2	24.1	24.0	24.1	24.0	24.2
LTE Band 17	16.2	16.1	16.1	16.0	16.1	24.1	24.0	24.1	24.0	24.1
LTE Band 25	13.3	13.3	13.2	13.1	13.1	23.0	23.2	23.2	23.1	23.2
LTE Band 26	16.7	16.5	16.5	16.8	16.7	24.5	24.6	24.6	24.6	24.6
LTE Band 41	14.3	14.0	14.2	14.2	14.1	23.6	23.6	23.5	23.6	23.5
LTE Band 66	13.3	13.2	13.1	13.1	13.2	23.2	23.0	23.1	23.2	23.1



**NR Band 5**

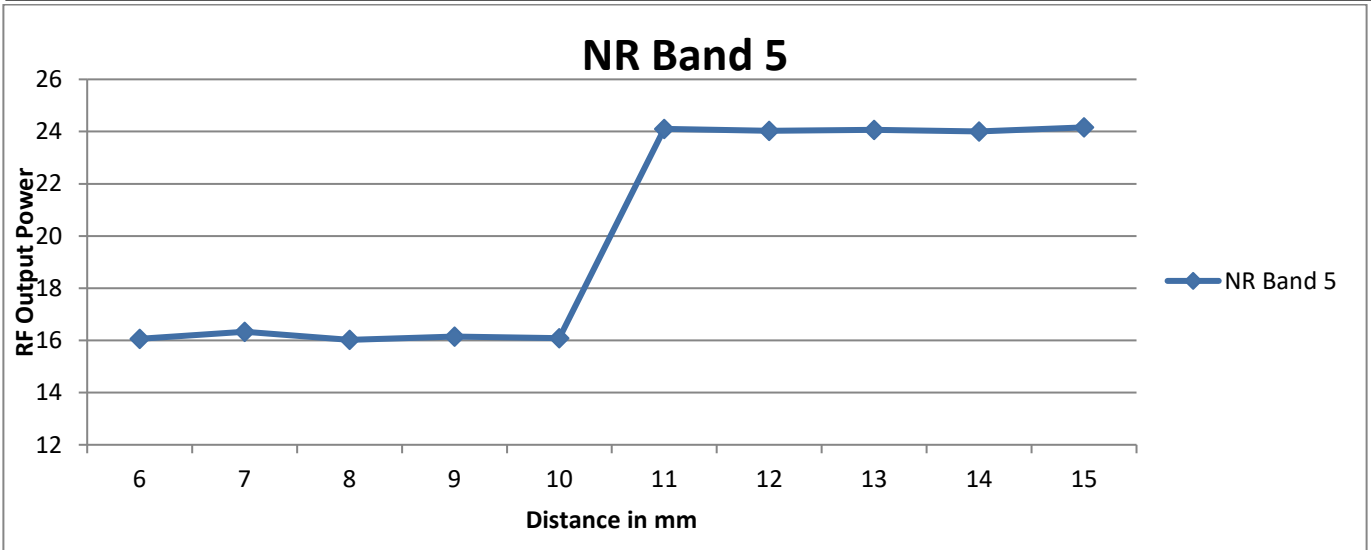
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	16	17	18	19	20	21	22	23	24	25
NR Band 5	16.0	16.2	16.1	16.1	16.1	24.0	24.1	24.0	24.0	24.0



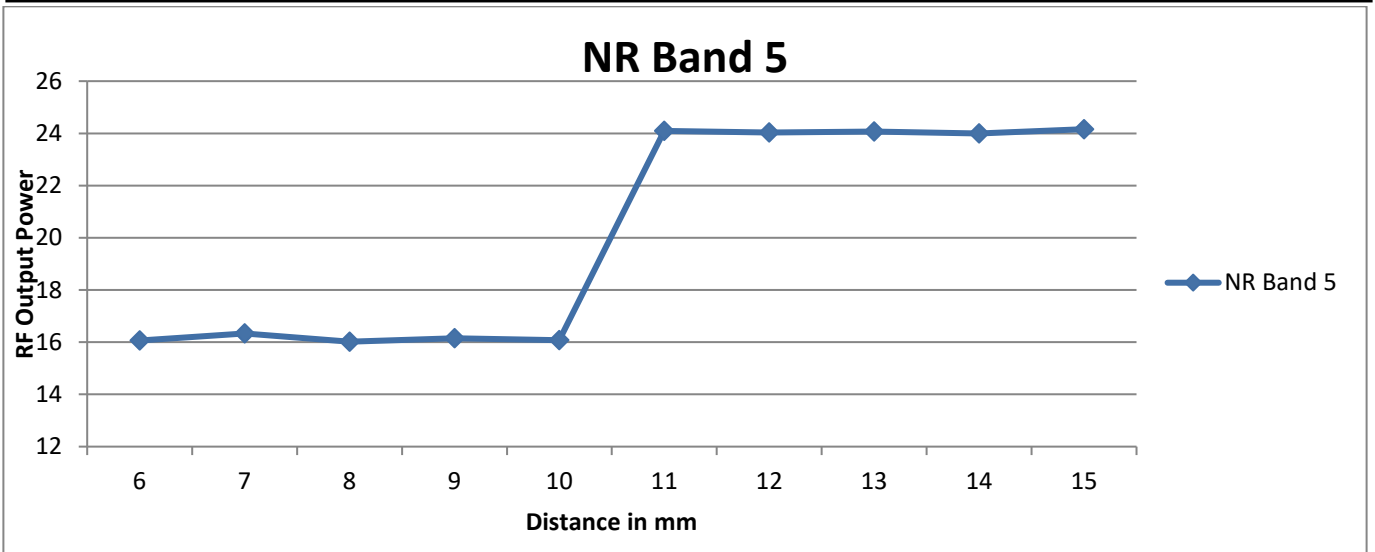
Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	20	21	22	23	24	25	26	27	28	29
NR Band 5	16.2	16.2	16.3	16.2	16.2	24.1	24.0	24.1	24.1	24.0



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

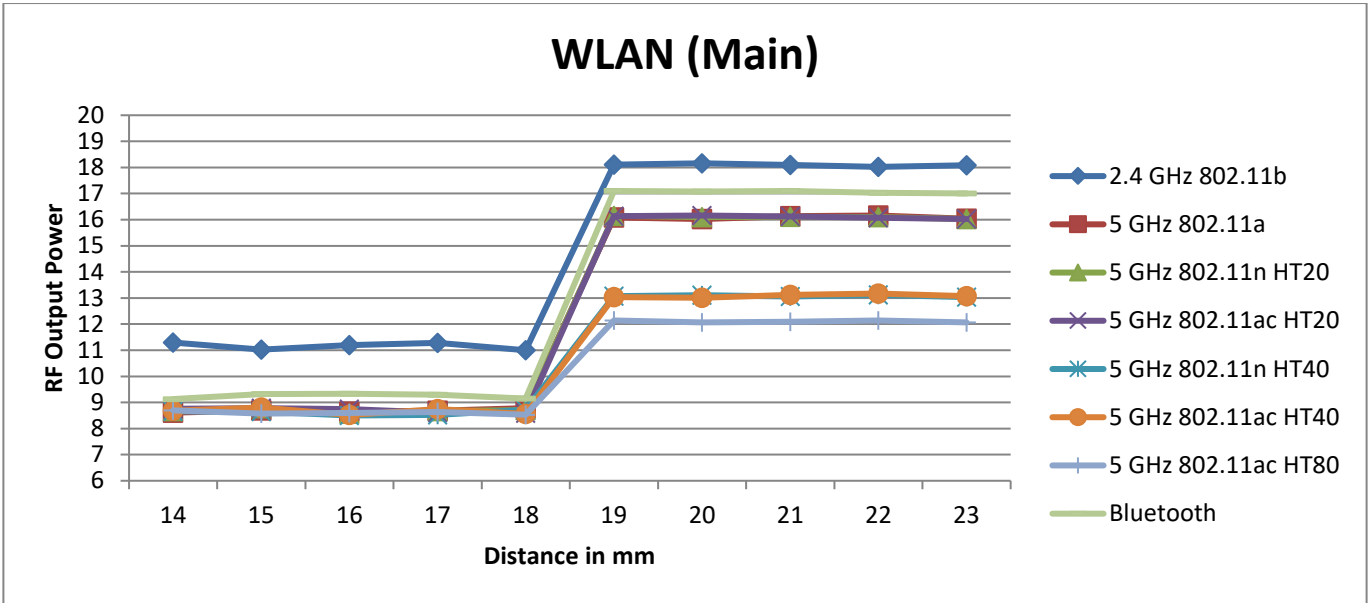
Distance to DUT vs. Output Power in dBm										
Distance (mm)	6	7	8	9	10	11	12	13	14	15
NR Band 5	16.1	16.3	16.0	16.2	16.1	24.1	24.0	24.1	24.0	24.2



**WLAN 2.4GHz and 5GHz**

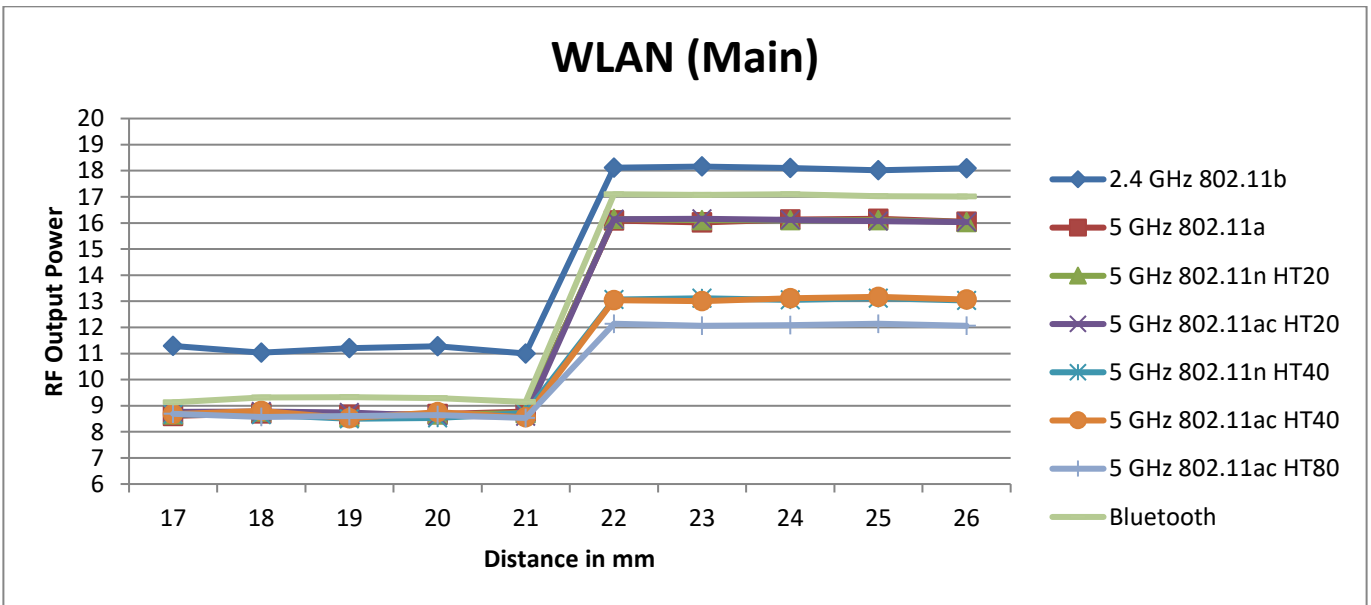
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

		Distance to DUT vs. Output Power in dBm										
Antenna	Distance	14	15	16	17	18	19	20	21	22	23	
Ant 1	2.4 GHz 802.11b	11.3	11.0	11.2	11.3	11.0	18.1	18.2	18.1	18.0	18.1	
	5 GHz 802.11a	8.6	8.7	8.7	8.7	8.8	16.1	16.0	16.1	16.2	16.0	
	5 GHz 802.11n HT20	8.7	8.8	8.6	8.7	8.7	16.2	16.1	16.1	16.1	16.0	
	5 GHz 802.11n HT40	8.7	8.7	8.5	8.5	8.7	13.1	13.1	13.1	13.1	13.0	
	5 GHz 802.11ac HT20	8.8	8.8	8.7	8.6	8.6	16.1	16.2	16.1	16.1	16.0	
	5 GHz 802.11ac HT40	8.7	8.8	8.5	8.8	8.6	13.0	13.0	13.1	13.2	13.1	
	5 GHz 802.11ac HT80	8.7	8.6	8.6	8.6	8.5	12.1	12.1	12.1	12.1	12.1	
	Bluetooth	9.1	9.3	9.3	9.3	9.2	17.1	17.1	17.1	17.0	17.0	



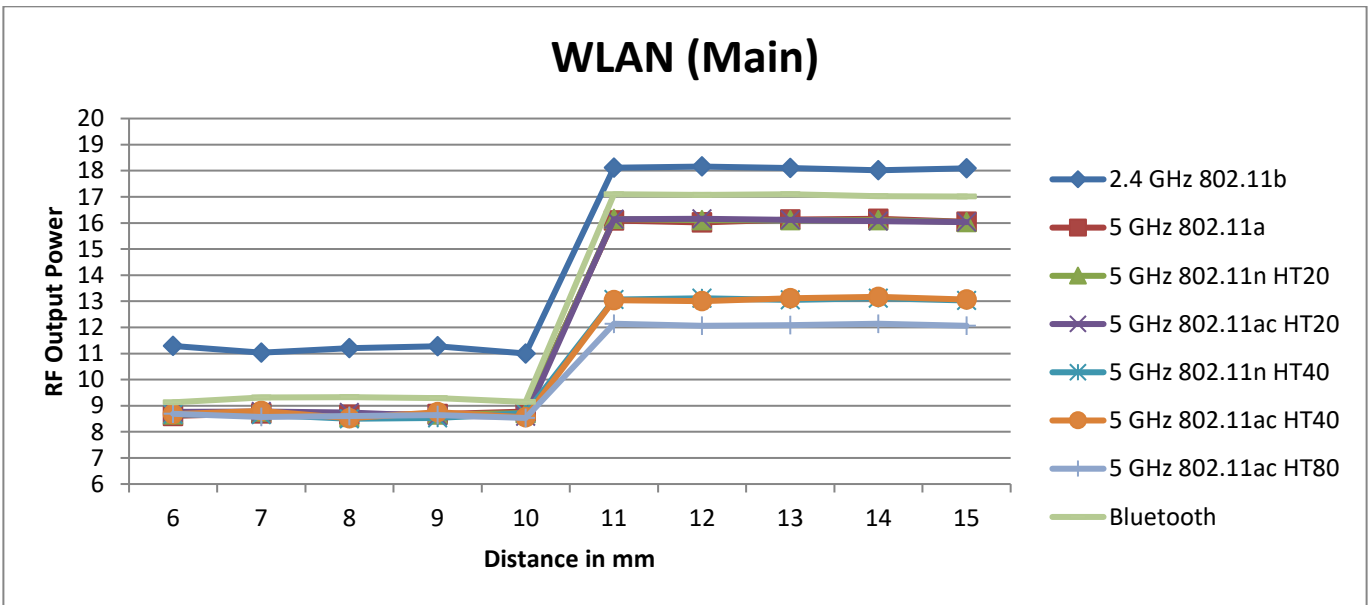
Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm											
Antenna	Distance	17	18	19	20	21	22	23	24	25	26
Ant 1	2.4 GHz 802.11b	11.0	11.3	11.0	11.1	11.1	18.1	18.1	18.0	18.0	18.1
	5 GHz 802.11a	8.8	8.6	8.8	8.8	8.6	16.0	16.0	16.1	16.1	16.0
	5 GHz 802.11n HT20	8.8	8.6	8.8	8.5	8.6	16.1	16.0	16.0	16.0	16.1
	5 GHz 802.11n HT40	8.6	8.6	8.6	8.6	8.6	13.1	13.1	13.1	13.1	13.0
	5 GHz 802.11ac HT20	8.7	8.8	8.8	8.8	8.6	16.2	16.1	16.1	16.1	16.0
	5 GHz 802.11ac HT40	8.5	8.5	8.6	8.6	8.6	13.1	13.0	13.1	13.0	13.2
	5 GHz 802.11ac HT80	8.8	8.8	8.7	8.7	8.7	12.1	12.0	12.0	12.0	12.0
	Bluetooth	9.1	9.0	9.2	9.2	9.1	17.0	17.0	17.1	17.2	17.1



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

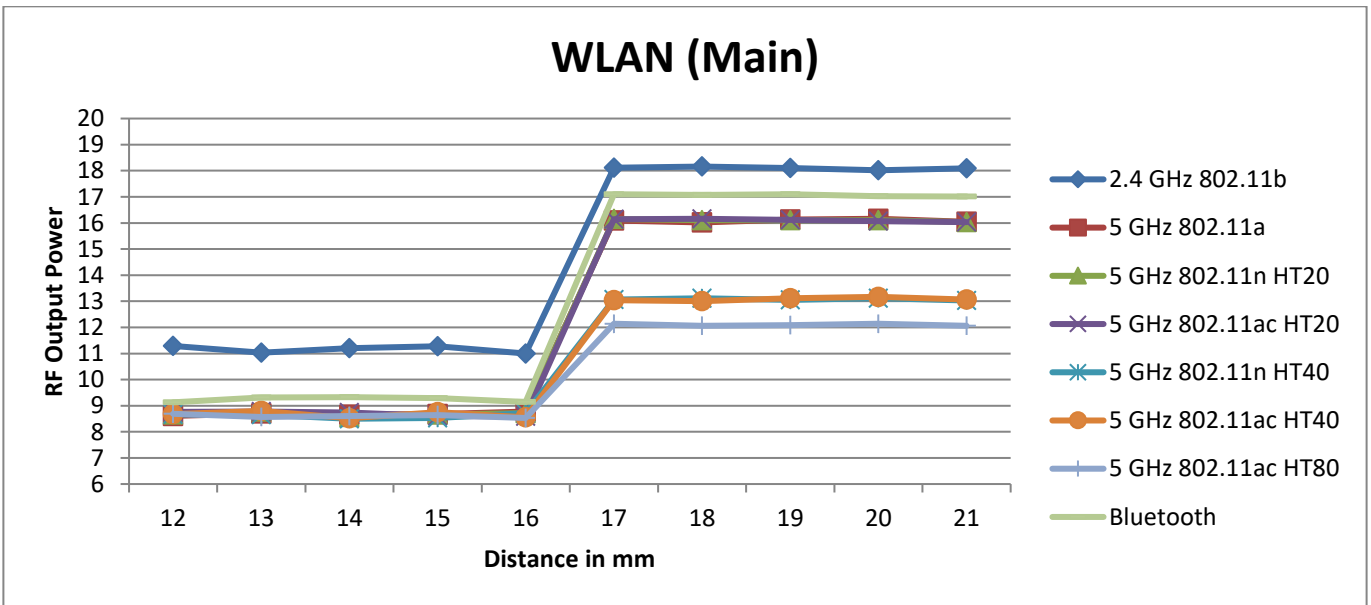
Distance to DUT vs. Output Power in dBm											
Antenna	Distance	6	7	8	9	10	11	12	13	14	15
Ant 1	2.4 GHz 802.11b	11.2	11.1	11.1	11.3	11.1	18.1	18.1	18.0	18.1	18.1
	5 GHz 802.11a	8.5	8.7	8.6	8.8	8.8	16.1	16.2	16.1	16.0	16.1
	5 GHz 802.11n HT20	8.8	8.7	8.5	8.6	8.7	16.2	16.0	16.1	16.1	16.0
	5 GHz 802.11n HT40	8.6	8.8	8.7	8.6	8.6	13.1	13.0	13.1	13.0	13.1
	5 GHz 802.11ac HT20	8.8	8.8	8.6	8.7	8.6	16.1	16.2	16.0	16.1	16.1
	5 GHz 802.11ac HT40	8.6	8.7	8.7	8.5	8.6	13.2	13.2	13.1	13.0	13.2
	5 GHz 802.11ac HT80	8.7	8.6	8.7	8.5	8.8	12.0	12.1	12.1	12.1	12.1
	Bluetooth	9.2	9.3	9.0	9.1	9.3	17.1	17.1	17.2	17.1	17.1





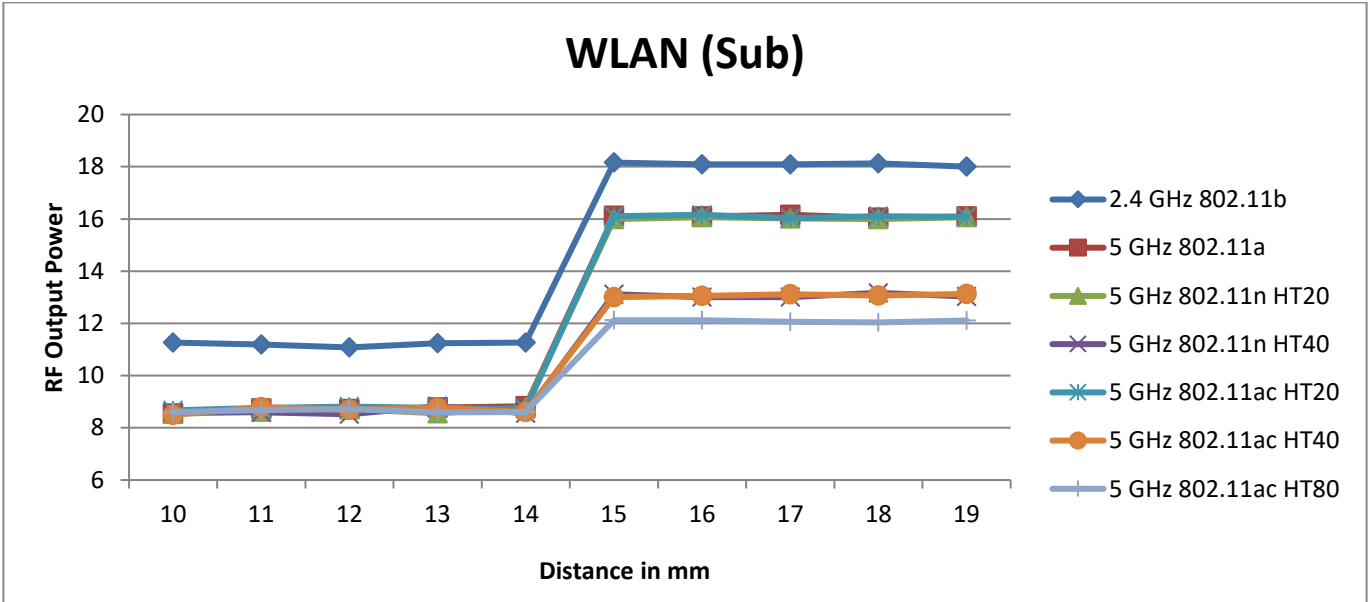
Corner A, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm											
Antenna	Distance	12	13	14	15	16	17	18	19	20	21
Ant 1	2.4 GHz 802.11b	11.2	11.2	11.0	11.0	11.3	18.0	18.0	18.1	18.1	18.1
	5 GHz 802.11a	8.8	8.7	8.8	8.6	8.5	16.1	16.0	16.1	16.1	16.1
	5 GHz 802.11n HT20	8.7	8.8	8.8	8.6	8.7	16.0	16.0	16.0	16.1	16.0
	5 GHz 802.11n HT40	8.6	8.6	8.5	8.8	8.6	13.1	13.1	13.1	13.1	13.0
	5 GHz 802.11ac HT20	8.8	8.6	8.6	8.6	8.6	16.0	16.1	16.2	16.2	16.1
	5 GHz 802.11ac HT40	8.7	8.8	8.7	8.5	8.8	13.0	13.1	13.1	13.1	13.1
	5 GHz 802.11ac HT80	8.8	8.6	8.7	8.8	8.6	12.1	12.1	12.1	12.1	12.2
	Bluetooth	9.3	9.2	9.3	9.2	9.1	17.1	17.0	17.1	17.1	17.1



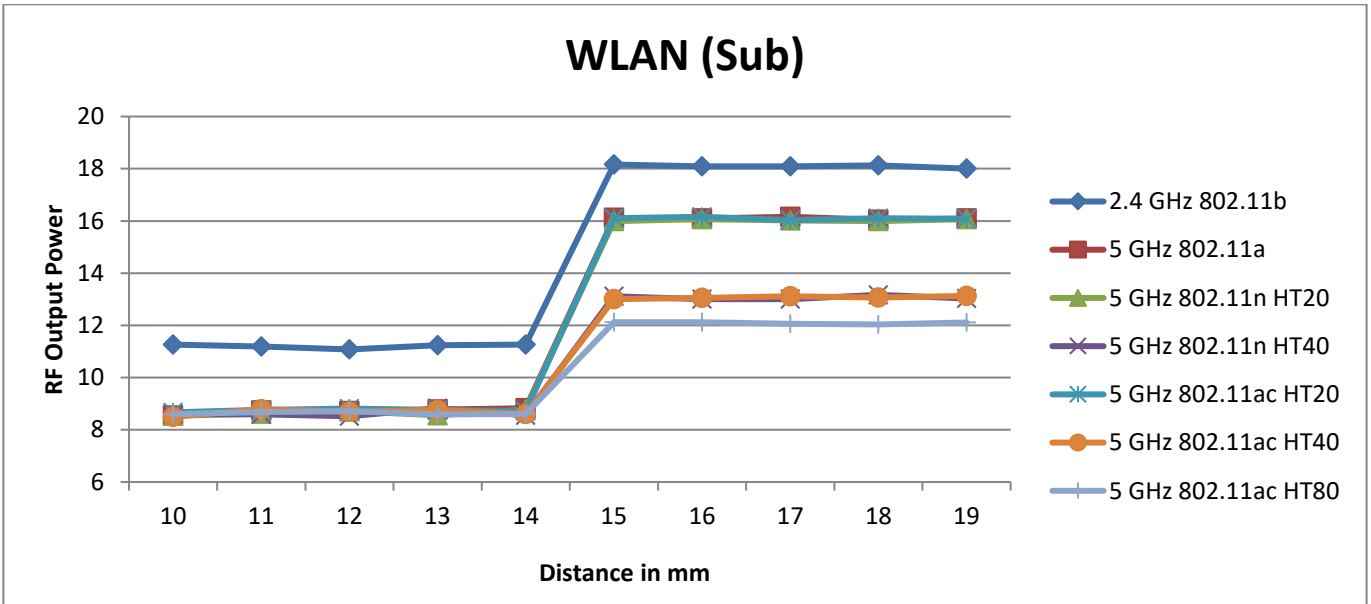
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm											
Antenna	Distance	13	14	15	16	17	18	19	20	21	22
Ant 2	2.4 GHz 802.11b	11.3	11.2	11.1	11.0	11.0	18.0	18.0	18.1	18.1	18.1
	5 GHz 802.11a	8.7	8.5	8.7	8.6	8.6	16.1	16.1	16.2	16.0	16.1
	5 GHz 802.11n HT20	8.8	8.7	8.6	8.6	8.6	16.1	16.1	16.1	16.1	16.1
	5 GHz 802.11n HT40	8.5	8.6	8.8	8.8	8.8	13.2	13.1	13.2	13.1	13.1
	5 GHz 802.11ac HT20	8.5	8.6	8.7	8.6	8.8	16.1	16.1	16.1	16.2	16.1
	5 GHz 802.11ac HT40	8.6	8.6	8.7	8.6	8.5	13.1	13.0	13.1	13.1	13.1
	5 GHz 802.11ac HT80	8.7	8.5	8.8	8.5	8.5	12.1	12.1	12.1	12.1	12.1



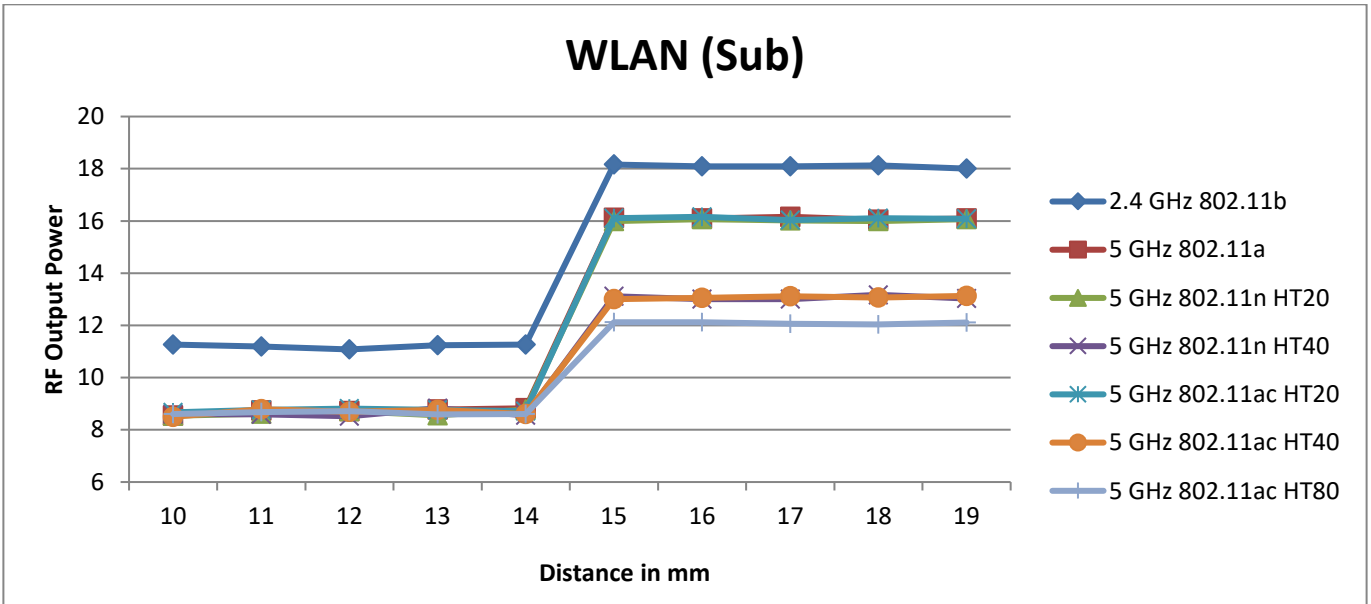
Edge 1, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm											
Antenna	Distance	16	17	18	19	20	21	22	23	24	25
Ant 2	2.4 GHz 802.11b	11.2	11.2	11.1	11.3	11.2	18.1	18.0	18.1	18.1	18.0
	5 GHz 802.11a	8.6	8.5	8.7	8.8	8.7	16.1	16.0	16.0	16.1	16.0
	5 GHz 802.11n HT20	8.7	8.6	8.7	8.6	8.8	16.1	16.1	16.0	16.1	16.1
	5 GHz 802.11n HT40	8.5	8.6	8.8	8.8	8.5	13.2	13.1	13.1	13.0	13.0
	5 GHz 802.11ac HT20	8.8	8.5	8.6	8.6	8.8	16.1	16.1	16.1	16.1	16.1
	5 GHz 802.11ac HT40	8.5	8.8	8.6	8.7	8.6	13.1	13.1	13.1	13.1	13.0
	5 GHz 802.11ac HT80	8.7	8.8	8.6	8.7	8.7	12.1	12.1	12.0	12.1	12.1



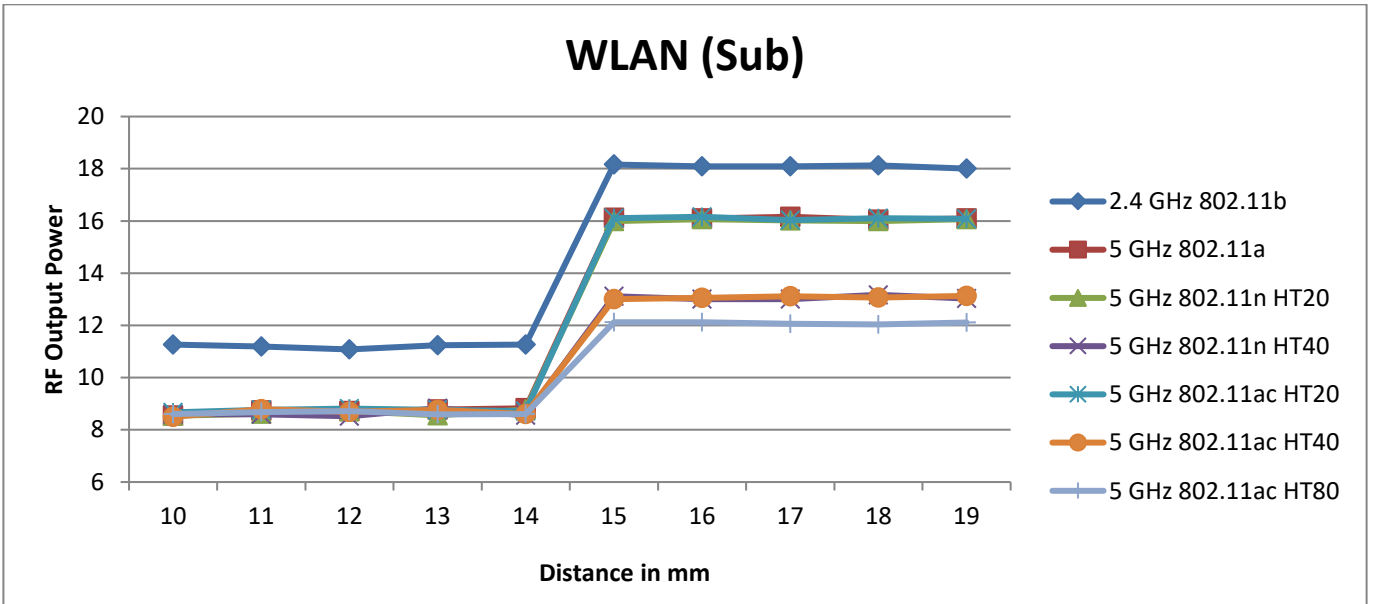
Edge 4, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm											
Antenna	Distance	3	4	5	6	7	8	9	10	11	12
Ant 2	2.4 GHz 802.11b	11.1	11.2	11.3	11.2	11.2	18.1	18.0	18.0	18.1	18.2
	5 GHz 802.11a	8.6	8.8	8.6	8.5	8.5	16.0	16.0	16.1	16.0	16.1
	5 GHz 802.11n HT20	8.8	8.7	8.8	8.8	8.5	16.1	16.0	16.0	16.1	16.2
	5 GHz 802.11n HT40	8.8	8.6	8.8	8.5	8.7	13.2	13.0	13.1	13.1	13.1
	5 GHz 802.11ac HT20	8.5	8.7	8.6	8.7	8.8	16.1	16.0	16.1	16.1	16.1
	5 GHz 802.11ac HT40	8.7	8.6	8.5	8.6	8.7	13.1	13.0	13.1	13.0	13.1
	5 GHz 802.11ac HT80	8.8	8.7	8.7	8.8	8.6	12.1	12.1	12.1	12.1	12.1



Corner B, 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	11.3	11.2	11.1	11.2	11.3	18.2	18.1	18.1	18.1	18.0
	5 GHz 802.11a	8.5	8.7	8.7	8.8	8.8	16.1	16.1	16.2	16.0	16.1
	5 GHz 802.11n HT20	8.5	8.6	8.7	8.6	8.8	16.0	16.1	16.0	16.0	16.1
	5 GHz 802.11n HT40	8.6	8.6	8.5	8.8	8.6	13.1	13.0	13.0	13.2	13.0
	5 GHz 802.11ac HT20	8.7	8.8	8.8	8.8	8.7	16.1	16.2	16.0	16.1	16.1
	5 GHz 802.11ac HT40	8.5	8.8	8.7	8.8	8.6	13.0	13.1	13.1	13.1	13.1
	5 GHz 802.11ac HT80	8.6	8.7	8.7	8.6	8.6	12.1	12.1	12.1	12.1	12.1



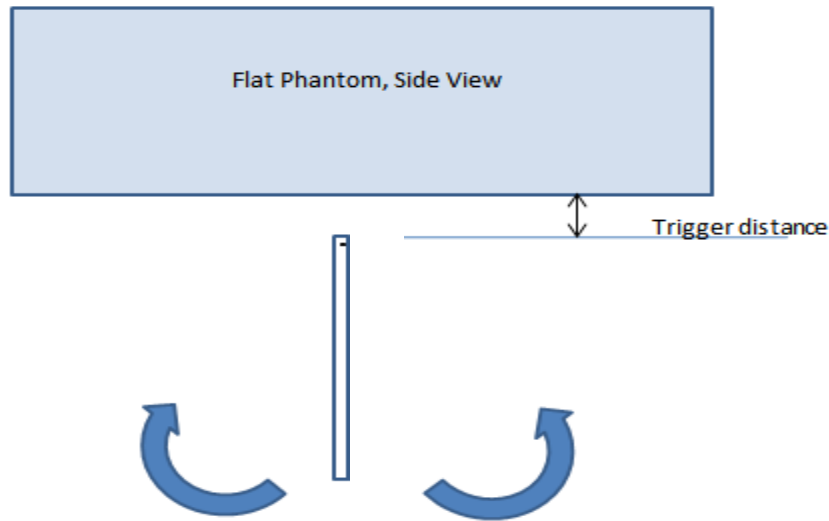
### 6.9.2 Proximity Sensor Coverage (KDB 616217 §6.3)

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

### 6.9.3 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	24 mm	24 mm	On	On	On	On	On	On	On	On	On	On	On
850	24 mm	24 mm	On	On	On	On	On	On	On	On	On	On	On
1750	24 mm	24 mm	On	On	On	On	On	On	On	On	On	On	On
1900	24 mm	24 mm	On	On	On	On	On	On	On	On	On	On	On
2450 Ant 1	21 mm	21 mm	On	On	On	On	On	On	On	On	On	On	On
2450 Ant 2	20 mm	20 mm	On	On	On	On	On	On	On	On	On	On	On
2600	24 mm	24 mm	On	On	On	On	On	On	On	On	On	On	On
5000 Ant 1	21 mm	21 mm	On	On	On	On	On	On	On	On	On	On	On
5000 Ant 2	20 mm	20 mm	On	On	On	On	On	On	On	On	On	On	On

**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°
750	10 mm	10 mm	On	On	On	On	On	On	On	On	On	On	On
850	10 mm	10 mm	On	On	On	On	On	On	On	On	On	On	On
1750	10 mm	10 mm	On	On	On	On	On	On	On	On	On	On	On
1900	10 mm	10 mm	On	On	On	On	On	On	On	On	On	On	On
2450 Ant 1	10 mm	10 mm	On	On	On	On	On	On	On	On	On	On	On
2600	10 mm	10 mm	On	On	On	On	On	On	On	On	On	On	On
5000 Ant 1	10 mm	10 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 Ant 2	7 mm	7 mm	On	On	On	On	On	On	On	On	On	On	On
5000 Ant 2	7 mm	7 mm	On	On	On	On	On	On	On	On	On	On	On

**6.9.4 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	20 mm	N/A	N/A	19 mm
	Edge 1	24 mm	N/A	24 mm	23 mm
	Edge 2	10 mm	N/A	10 mm	9 mm
WLAN Ant 1	Rear	18 mm	N/A	N/A	17 mm
	Edge 1	21 mm	N/A	21 mm	20 mm
	Edge 2	10 mm	N/A	10 mm	9 mm
	Corner A	16 mm	N/A	N/A	15 mm
WLAN Ant 2	Rear	17 mm	N/A	N/A	16 mm
	Edge 1	20 mm	N/A	13 mm	19 mm
	Edge 4	7 mm	N/A	7 mm	6 mm
	Corner B	14 mm	N/A	N/A	13 mm

## 7. RF Exposure Conditions (Test Configurations)

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

### 7.1 Standalone SAR Test Exclusion Considerations

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

- When the separation distance from the antenna to an adjacent edge is  $\leq 5$  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
<b>Full Power, Proximity Sensor Off</b>																
Cellular	GPRS 4 Slots	848.8	29.00	397	0	0	48.5	283.7	71		73.2	73.2	7.5	> 50 mm	> 50 mm	
Cellular	GPRS 2 Slots	1909.8	29.00	199	0	0	48.5	283.7	71		-MEASURE-55	-MEASURE-55	5.6	> 50 mm	> 50 mm	
Cellular	W-CDMA 5	846.6	25.00	316	0	0	48.5	283.7	71		58.2	58.2	5.9	> 50 mm	> 50 mm	
Cellular	W-CDMA 4	1752.6	23.50	224	0	0	48.5	283.7	71		59.3	59.3	6.1	> 50 mm	> 50 mm	
Cellular	W-CDMA 2	1907.6	23.00	200	0	0	48.5	283.7	71		55.2	55.2	5.6	> 50 mm	> 50 mm	
Cellular	LTE Band 2	1900	24.00	251	0	0	48.5	283.7	71		-MEASURE-69.2	-MEASURE-69.2	7.1	> 50 mm	> 50 mm	
Cellular	LTE Band 4	1745	24.00	251	0	0	48.5	283.7	71		66.3	66.3	6.8	> 50 mm	> 50 mm	
Cellular	LTE Band 5	844	25.50	355	0	0	48.5	283.7	71		65.2	65.2	6.7	> 50 mm	> 50 mm	
Cellular	LTE Band 12	711	25.00	316	0	0	48.5	283.7	71		53.3	53.3	5.4	> 50 mm	> 50 mm	
Cellular	LTE Band 13	782	25.00	316	0	0	48.5	283.7	71		55.9	55.9	5.7	> 50 mm	> 50 mm	
Cellular	LTE Band 17	710	25.00	316	0	0	48.5	283.7	71		53.3	53.3	5.4	> 50 mm	> 50 mm	
Cellular	LTE Band 25	1905	24.00	251	0	0	48.5	283.7	71		69.3	69.3	7.1	> 50 mm	> 50 mm	
Cellular	LTE Band 26	841.5	25.50	355	0	0	48.5	283.7	71		65.1	65.1	6.6	> 50 mm	> 50 mm	
Cellular	LTE Band 41	2680	24.50	282	0	0	48.5	283.7	71		92.3	92.3	9.4	> 50 mm	> 50 mm	
Cellular	LTE Band 66	1770	24.00	251	0	0	48.5	283.7	71		66.8	66.8	6.8	> 50 mm	> 50 mm	
Cellular	LTE Band n5	839	25.00	316	0	0	48.5	283.7	71		57.9	57.9	5.9	> 50 mm	> 50 mm	
<b>Power Back-off, Proximity Sensor On</b>																
Cellular	GPRS 2 Slots	848.8	23.00	50	0	0	48.5				9.2	9.2	1			
Cellular	GPRS 2 Slots	1909.8	20.00	25	0	0	48.5				-MEASURE-6.9	-MEASURE-6.9	1			
Cellular	W-CDMA 5	846.6	15.00	32	0	0	48.5				5.9	5.9	1			
Cellular	W-CDMA 4	1752.6	13.50	22	0	0	48.5				5.8	5.8	1			
Cellular	W-CDMA 2	1907.6	13.50	22	0	0	48.5				6.1	6.1	1			
Cellular	LTE Band 2	1900	14.00	25	0	0	48.5				6.9	6.9	1			
Cellular	LTE Band 4	1745	14.00	25	0	0	48.5				6.6	6.6	1			
Cellular	LTE Band 5	844	16.00	40	0	0	48.5				7.3	7.3	1			
Cellular	LTE Band 12	711	15.00	32	0	0	48.5				5.4	5.4	1			
Cellular	LTE Band 13	782	15.00	32	0	0	48.5				5.7	5.7	1			
Cellular	LTE Band 17	710	17.00	50	0	0	48.5				8.4	8.4	1			
Cellular	LTE Band 25	1905	14.00	25	0	0	48.5				6.9	6.9	1			
Cellular	LTE Band 26	841.5	17.50	56	0	0	48.5				10.3	10.3	1			
Cellular	LTE Band 41	2680	15.00	32	0	0	48.5				10.5	10.5	1			
Cellular	LTE Band 66	1770	14.00	25	0	0	48.5				6.7	6.7	1			
Cellular	LTE Band n5	839	15.00	32	0	0	48.5				5.9	5.9	1			

**Note(s):**

1. According to KDB 447498, if the calculated threshold value is  $>3$  then SAR testing is required.
2. For Edge 2, SAR measurement with back-off power due to the Proximity sensor back-off operation.



**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
<b>Full Power, Proximity Sensor Off</b>																
Cellular	GPRS 4 Slots	848.8	29.00	397	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	1485.2 mW -EXEMPT-	281.6 mW -MEASURE-	
Cellular	GPRS 2 Slots	1909.8	29.00	199	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	2445.5 mW -EXEMPT-	318.6 mW -EXEMPT-	
Cellular	W-CDMA 5	846.6	25.00	316	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	1482 mW -EXEMPT-	281.5 mW -MEASURE-	
Cellular	W-CDMA 4	1752.6	23.50	224	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	2450.3 mW -EXEMPT-	323.3 mW -EXEMPT-	
Cellular	W-CDMA 2	1907.6	23.00	200	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	2445.6 mW -EXEMPT-	318.6 mW -EXEMPT-	
Cellular	LTE Band 2	1900	24.00	251	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	2445.8 mW -EXEMPT-	318.6 mW -EXEMPT-	
Cellular	LTE Band 4	1745	24.00	251	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	2450.6 mW -EXEMPT-	323.3 mW -EXEMPT-	
Cellular	LTE Band 5	844	25.50	355	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	1478.2 mW -EXEMPT-	281.4 mW -MEASURE-	
Cellular	LTE Band 12	711	25.00	316	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	1285.6 mW -EXEMPT-	277.4 mW -MEASURE-	
Cellular	LTE Band 13	782	25.00	316	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	1388 mW -EXEMPT-	279.1 mW -MEASURE-	
Cellular	LTE Band 17	710	25.00	316	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	1284.2 mW -EXEMPT-	277.4 mW -MEASURE-	
Cellular	LTE Band 25	1905	24.00	251	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	2445.7 mW -EXEMPT-	318.7 mW -MEASURE-	
Cellular	LTE Band 26	841.5	25.50	355	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	1474.6 mW -EXEMPT-	281.3 mW -MEASURE-	
Cellular	LTE Band 41	2680	24.50	282	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	2428.6 mW -EXEMPT-	301.6 mW -EXEMPT-	
Cellular	LTE Band 66	1770	24.00	251	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	2449.7 mW -EXEMPT-	322.7 mW -EXEMPT-	
Cellular	LTE Band n5	839	25.00	316	0	0	48.5	283.7	71		< 50 mm	< 50 mm	< 50 mm	1470.9 mW -EXEMPT-	281.2 mW -MEASURE-	
<b>Power Back-off, Proximity Sensor On</b>																
Cellular	GPRS 2 Slots	848.8	23.00	50	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	GPRS 2 Slots	1909.8	20.00	25	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	W-CDMA 5	846.6	15.00	32	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	W-CDMA 4	1752.6	13.50	22	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	W-CDMA 2	1907.6	13.50	22	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band 2	1900	14.00	25	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band 4	1745	14.00	25	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band 5	844	16.00	40	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band 12	711	15.00	32	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band 13	782	15.00	32	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band 17	710	17.00	50	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band 25	1905	14.00	25	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band 26	841.5	17.50	56	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band 41	2680	15.00	32	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band 66	1770	14.00	25	0	0	48.5				< 50 mm	< 50 mm	< 50 mm			
Cellular	LTE Band n5	839	15.00	32	0	0	48.5				< 50 mm	< 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.

**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
<b>Wi-Fi Antenna 1</b>															
Wi-Fi 2.4 GHz	2462	19.00	79	0	0	0	272.1	138		24.8	24.8	24.8	> 50 mm	> 50 mm	
Wi-Fi 5.3 GHz	5320	17.00	50	0	0	0	272.1	138		23.1	23.1	23.1	> 50 mm	> 50 mm	
Wi-Fi 5.5 GHz	5700	17.00	50	0	0	0	272.1	138		23.9	23.9	23.9	> 50 mm	> 50 mm	
Wi-Fi 5.8 GHz	5825	17.00	50	0	0	0	272.1	138		24.1	24.1	24.1	> 50 mm	> 50 mm	
Bluetooth	2480	18.00	63	0	0	0	272.1	138		19.8	19.8	19.8	> 50 mm	> 50 mm	
<b>Wi-Fi Antenna 2</b>															
Wi-Fi 2.4 GHz	2462	18.00	63	0	0	138	272.1	0		19.8	19.8	> 50 mm	> 50 mm	19.8	
Wi-Fi 5.3 GHz	5320	17.00	50	0	0	138	272.1	0		23.1	23.1	> 50 mm	> 50 mm	23.1	
Wi-Fi 5.5 GHz	5700	17.00	50	0	0	138	272.1	0		23.9	23.9	> 50 mm	> 50 mm	23.9	
Wi-Fi 5.8 GHz	5825	17.00	50	0	0	138	272.1	0		24.1	24.1	> 50 mm	> 50 mm	24.1	

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
<b>Wi-Fi Antenna 1</b>															
Wi-Fi 2.4 GHz	2462	12.00	16	0	0	0				5	5	5			
Wi-Fi 5.3 GHz	5320	9.50	9	0	0	0				4.2	4.2	4.2			
Wi-Fi 5.5 GHz	5700	9.50	9	0	0	0				4.3	4.3	4.3			
Wi-Fi 5.8 GHz	5825	9.50	9	0	0	0				4.3	4.3	4.3			
Bluetooth	2480	10.00	10	0	0	0				3.1	3.1	3.1			
<b>Wi-Fi Antenna 2</b>															
Wi-Fi 2.4 GHz	2462	12.00	16	0	0			0		5	5			5	
Wi-Fi 5.3 GHz	5320	9.50	9	0	0			0		4.2	4.2			4.2	
Wi-Fi 5.5 GHz	5700	9.50	9	0	0			0		4.3	4.3			4.3	
Wi-Fi 5.8 GHz	5825	9.50	9	0	0			0		4.3	4.3			4.3	

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
<b>Wi-Fi Antenna 1</b>															
Wi-Fi 5.3 GHz	5320	17.00	50	0	0	0	272.1	138		23.1	23.1	23.1	> 50 mm	> 50 mm	
Wi-Fi 5.5 GHz	5700	17.00	50	0	0	0	272.1	138		23.9	23.9	23.9	> 50 mm	> 50 mm	
Wi-Fi 5.8 GHz	5825	17.00	50	0	0	0	272.1	138		24.1	24.1	24.1	> 50 mm	> 50 mm	
<b>Wi-Fi Antenna 2</b>															
Wi-Fi 5.3 GHz	5320	17.00	50	0	0	138	272.1	0		23.1	23.1	> 50 mm	> 50 mm	23.1	
Wi-Fi 5.5 GHz	5700	17.00	50	0	0	138	272.1	0		23.9	23.9	> 50 mm	> 50 mm	23.9	
Wi-Fi 5.8 GHz	5825	17.00	50	0	0	138	272.1	0		24.1	24.1	> 50 mm	> 50 mm	24.1	

MIMO 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
<b>Wi-Fi Antenna 1</b>															
Wi-Fi 5.3 GHz	5320	9.50	9	0	0	0		138		4.2	4.2	4.2		> 50 mm	
Wi-Fi 5.5 GHz	5700	9.50	9	0	0	0		138		4.3	4.3	4.3		> 50 mm	
Wi-Fi 5.8 GHz	5825	9.50	9	0	0	0		138		4.3	4.3	4.3		> 50 mm	
<b>Wi-Fi Antenna 2</b>															
Wi-Fi 5.3 GHz	5320	9.50	9	0	0	138		0		4.2	4.2	> 50 mm		4.2	
Wi-Fi 5.5 GHz	5700	9.50	9	0	0	138		0		4.3	4.3	> 50 mm		4.3	
Wi-Fi 5.8 GHz	5825	9.50	9	0	0	138		0		4.3	4.3	> 50 mm		4.3	

**Note(s):**

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

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
<b>Wi-Fi Antenna 1</b>															
Wi-Fi 2.4 GHz	2462	19.00	79	0	0	0	272.1	138		< 50 mm	< 50 mm	< 50 mm	2316.6 mW -EXEMPT-	975.6 mW -EXEMPT-	
Wi-Fi 5.3 GHz	5320	17.00	50	0	0	0	272.1	138		< 50 mm	< 50 mm	< 50 mm	2286 mW -EXEMPT-	945 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	17.00	50	0	0	0	272.1	138		< 50 mm	< 50 mm	< 50 mm	2283.8 mW -EXEMPT-	942.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	17.00	50	0	0	0	272.1	138		< 50 mm	< 50 mm	< 50 mm	2283.2 mW -EXEMPT-	942.2 mW -EXEMPT-	
Bluetooth	2480	18.00	63	0	0	0	272.1	138		< 50 mm	< 50 mm	< 50 mm	2316.3 mW -EXEMPT-	975.3 mW -EXEMPT-	
<b>Wi-Fi Antenna 2</b>															
Wi-Fi 2.4 GHz	2462	18.00	63	0	0	138	282.1	0		< 50 mm	< 50 mm	975.6 mW -EXEMPT-	2416.6 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.3 GHz	5320	17.00	50	0	0	138	282.1	0		< 50 mm	< 50 mm	945 mW -EXEMPT-	2386 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.5 GHz	5700	17.00	50	0	0	138	282.1	0		< 50 mm	< 50 mm	942.8 mW -EXEMPT-	2383.8 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.8 GHz	5825	17.00	50	0	0	138	282.1	0		< 50 mm	< 50 mm	942.2 mW -EXEMPT-	2383.2 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
<b>Wi-Fi Antenna 1</b>															
Wi-Fi 2.4 GHz	2462	12.00	16	0	0	0				< 50 mm	< 50 mm	< 50 mm			
Wi-Fi 5.3 GHz	5320	9.50	9	0	0	0				< 50 mm	< 50 mm	< 50 mm			
Wi-Fi 5.5 GHz	5700	9.50	9	0	0	0				< 50 mm	< 50 mm	< 50 mm			
Wi-Fi 5.8 GHz	5825	9.50	9	0	0	0				< 50 mm	< 50 mm	< 50 mm			
Bluetooth	2480	10.00	10	0	0	0				< 50 mm	< 50 mm	< 50 mm			
<b>Wi-Fi Antenna 2</b>															
Wi-Fi 2.4 GHz	2462	12.00	16	0	0			0		< 50 mm	< 50 mm			< 50 mm	
Wi-Fi 5.3 GHz	5320	9.50	9	0	0			0		< 50 mm	< 50 mm			< 50 mm	
Wi-Fi 5.5 GHz	5700	9.50	9	0	0			0		< 50 mm	< 50 mm			< 50 mm	
Wi-Fi 5.8 GHz	5825	9.50	9	0	0			0		< 50 mm	< 50 mm			< 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
<b>Wi-Fi Antenna 1</b>															
Wi-Fi 5.3 GHz	5320	17.00	50	0	0	0	272.1	138		< 50 mm	< 50 mm	< 50 mm	2286 mW -EXEMPT-	945 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	17.00	50	0	0	0	272.1	138		< 50 mm	< 50 mm	< 50 mm	2283.8 mW -EXEMPT-	942.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	17.00	50	0	0	0	272.1	138		< 50 mm	< 50 mm	< 50 mm	2283.2 mW -EXEMPT-	942.2 mW -EXEMPT-	
<b>Wi-Fi Antenna 2</b>															
Wi-Fi 5.3 GHz	5320	17.00	50	0	0	138	272.1	0		< 50 mm	< 50 mm	945 mW -EXEMPT-	2286 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.5 GHz	5700	17.00	50	0	0	138	272.1	0		< 50 mm	< 50 mm	942.8 mW -EXEMPT-	2283.8 mW -EXEMPT-	< 50 mm	
Wi-Fi 5.8 GHz	5825	17.00	50	0	0	138	272.1	0		< 50 mm	< 50 mm	942.2 mW -EXEMPT-	2283.2 mW -EXEMPT-	< 50 mm	
MIMO 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
<b>Wi-Fi Antenna 1</b>															
Wi-Fi 5.3 GHz	5320	9.50	9	0	0	0		138		< 50 mm	< 50 mm	< 50 mm		945 mW -EXEMPT-	
Wi-Fi 5.5 GHz	5700	9.50	9	0	0	0		138		< 50 mm	< 50 mm	< 50 mm		942.8 mW -EXEMPT-	
Wi-Fi 5.8 GHz	5825	9.50	9	0	0	0		138		< 50 mm	< 50 mm	< 50 mm		942.2 mW -EXEMPT-	
<b>Wi-Fi Antenna 2</b>															
Wi-Fi 5.3 GHz	5320	9.50	9	0	0	138		0		< 50 mm	< 50 mm	945 mW -EXEMPT-		< 50 mm	
Wi-Fi 5.5 GHz	5700	9.50	9	0	0	138		0		< 50 mm	< 50 mm	942.8 mW -EXEMPT-		< 50 mm	
Wi-Fi 5.8 GHz	5825	9.50	9	0	0	138		0		< 50 mm	< 50 mm	942.2 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. MIMO UNII SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.

## 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	Edge 2	Edge 3	Edge 4	Corner A	Corner B
			(Top Edge)	(Right Edge )	(Bottom Edge)	(Left Edge)	Note 2	Note 3
GSM 850	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	Yes	No	No		
GSM 1900	OFF	Yes	Yes	Yes	No	No		
	ON	Yes	Yes	Yes	No	No		
W-CDMA Band II	OFF	Yes	Yes	Yes	No	No		
	ON	Yes	Yes	Yes	No	No		
W-CDMA Band IV	OFF	Yes	Yes	Yes	No	No		
	ON	Yes	Yes	Yes	No	No		
W-CDMA Band V	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	Yes	No	No		
LTE Band 2	OFF	Yes	Yes	Yes	No	No		
	ON	Yes	Yes	Yes	No	No		
LTE Band 4	OFF	Yes	Yes	Yes	No	No		
	ON	Yes	Yes	Yes	No	No		
LTE Band 5	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	Yes	No	No		
LTE Band 12	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	Yes	No	No		
LTE Band 13	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	Yes	No	No		
LTE Band 17	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	Yes	No	No		
LTE Band 25	OFF	Yes	Yes	Yes	No	No		
	ON	Yes	Yes	Yes	No	No		
LTE Band 26	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	Yes	No	NO		
LTE Band 41	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	Yes	No	NO		
LTE Band 66	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	Yes	No	No		
LTE Band n5	OFF	Yes	Yes	Yes	No	Yes		
	ON	Yes	Yes	Yes	No	No		
Wi-Fi 2.4 GHz (Ant 1)	OFF	Yes	Yes	Yes	Yes	Yes	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 5 GHz (MIMO)	OFF	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	ON	Yes	Yes	Yes	No	Yes	Yes	Yes
Bluetooth	OFF	Yes	Yes	Yes	Yes	Yes	Yes	No
	On	Yes	Yes	Yes	No	No	Yes	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.
5. MIMO UNII SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.
6. SISO DTS Ant 1 & Bluetooth Edge 3,4 SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.
7. The laptop configuration with the accessory keyboard connected was not evaluated as this was considered to be covered by the edge 4 tests (edge 4 is the bottom surface in laptop mode).

## 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  $\pm 2^\circ\text{C}$  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	
	$\epsilon_r$	$\sigma$ (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

**Dielectric Property Measurements Results:**

**SAR 1 Room**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)		
3-29-2021	Head 5250	e'	37.0900	Relative Permittivity ( $\epsilon_r$ ):	37.09	35.93	3.22	5	
		e"	16.4300	Conductivity ( $\sigma$ ):	4.80	4.70	2.00	5	
	Head 5260	e'	37.1100	Relative Permittivity ( $\epsilon_r$ ):	37.11	35.92	3.31	5	
		e"	16.4400	Conductivity ( $\sigma$ ):	4.81	4.71	2.03	5	
	Head 5600	e'	36.4800	Relative Permittivity ( $\epsilon_r$ ):	36.48	35.53	2.66	5	
		e"	16.3200	Conductivity ( $\sigma$ ):	5.08	5.06	0.42	5	
	Head 5750	e'	36.0800	Relative Permittivity ( $\epsilon_r$ ):	36.08	35.36	2.03	5	
		e"	16.3900	Conductivity ( $\sigma$ ):	5.24	5.21	0.51	5	
	Head 5825	e'	35.9700	Relative Permittivity ( $\epsilon_r$ ):	35.97	35.30	1.90	5	
		e"	16.4800	Conductivity ( $\sigma$ ):	5.34	5.27	1.28	5	
	4-1-2021	Head 5250	e'	37.3100	Relative Permittivity ( $\epsilon_r$ ):	37.31	35.93	3.83	5
			e"	15.8100	Conductivity ( $\sigma$ ):	4.62	4.70	-1.85	5
Head 5260		e'	37.2800	Relative Permittivity ( $\epsilon_r$ ):	37.28	35.92	3.78	5	
		e"	15.8300	Conductivity ( $\sigma$ ):	4.63	4.71	-1.75	5	
Head 5600		e'	36.0800	Relative Permittivity ( $\epsilon_r$ ):	36.08	35.53	1.54	5	
		e"	16.4900	Conductivity ( $\sigma$ ):	5.13	5.06	1.47	5	
Head 5750		e'	36.1000	Relative Permittivity ( $\epsilon_r$ ):	36.10	35.36	2.08	5	
		e"	16.8500	Conductivity ( $\sigma$ ):	5.39	5.21	3.33	5	
Head 5825		e'	36.1000	Relative Permittivity ( $\epsilon_r$ ):	36.10	35.30	2.27	5	
		e"	16.6900	Conductivity ( $\sigma$ ):	5.41	5.27	2.57	5	
4-4-2021	Head 5250	e'	36.3600	Relative Permittivity ( $\epsilon_r$ ):	36.36	35.93	1.19	5	
		e"	16.0300	Conductivity ( $\sigma$ ):	4.68	4.70	-0.48	5	
	Head 5260	e'	36.3500	Relative Permittivity ( $\epsilon_r$ ):	36.35	35.92	1.19	5	
		e"	16.0500	Conductivity ( $\sigma$ ):	4.69	4.71	-0.39	5	
	Head 5600	e'	35.8500	Relative Permittivity ( $\epsilon_r$ ):	35.85	35.53	0.89	5	
		e"	16.1900	Conductivity ( $\sigma$ ):	5.04	5.06	-0.38	5	
	Head 5750	e'	35.6600	Relative Permittivity ( $\epsilon_r$ ):	35.66	35.36	0.84	5	
		e"	16.2600	Conductivity ( $\sigma$ ):	5.20	5.21	-0.29	5	
	Head 5825	e'	35.5200	Relative Permittivity ( $\epsilon_r$ ):	35.52	35.30	0.62	5	
		e"	16.3000	Conductivity ( $\sigma$ ):	5.28	5.27	0.18	5	
4-7-2021	Head 5250	e'	35.9000	Relative Permittivity ( $\epsilon_r$ ):	35.90	35.93	-0.09	5	
		e"	16.0700	Conductivity ( $\sigma$ ):	4.69	4.70	-0.23	5	
	Head 5260	e'	35.9300	Relative Permittivity ( $\epsilon_r$ ):	35.93	35.92	0.02	5	
		e"	16.1200	Conductivity ( $\sigma$ ):	4.71	4.71	0.05	5	
	Head 5600	e'	35.8600	Relative Permittivity ( $\epsilon_r$ ):	35.86	35.53	0.92	5	
		e"	15.6900	Conductivity ( $\sigma$ ):	4.89	5.06	-3.45	5	
	Head 5750	e'	35.3900	Relative Permittivity ( $\epsilon_r$ ):	35.39	35.36	0.08	5	
		e"	15.7100	Conductivity ( $\sigma$ ):	5.02	5.21	-3.66	5	
	Head 5825	e'	35.3500	Relative Permittivity ( $\epsilon_r$ ):	35.35	35.30	0.14	5	
		e"	15.9200	Conductivity ( $\sigma$ ):	5.16	5.27	-2.16	5	

**SAR 2 Room**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
4-12-2021	Head 5250	e'	35.7400	Relative Permittivity ( $\epsilon_r$ ):	35.74	35.93	-0.54	5
		e"	15.5000	Conductivity ( $\sigma$ ):	4.52	4.70	-3.77	5
	Head 5260	e'	35.7300	Relative Permittivity ( $\epsilon_r$ ):	35.73	35.92	-0.53	5
		e"	15.5100	Conductivity ( $\sigma$ ):	4.54	4.71	-3.74	5
	Head 5600	e'	35.2200	Relative Permittivity ( $\epsilon_r$ ):	35.22	35.53	-0.88	5
		e"	15.7200	Conductivity ( $\sigma$ ):	4.89	5.06	-3.27	5
	Head 5750	e'	35.0900	Relative Permittivity ( $\epsilon_r$ ):	35.09	35.36	-0.77	5
		e"	15.7500	Conductivity ( $\sigma$ ):	5.04	5.21	-3.42	5
	Head 5825	e'	35.0000	Relative Permittivity ( $\epsilon_r$ ):	35.00	35.30	-0.85	5
		e"	15.7600	Conductivity ( $\sigma$ ):	5.10	5.27	-3.14	5

**SAR 3 Room**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
3-10-2021	Head 1750	e'	41.1000	Relative Permittivity ( $\epsilon_r$ ):	41.10	40.08	2.53	5
		e"	14.4000	Conductivity ( $\sigma$ ):	1.40	1.37	2.35	5
	Head 1710	e'	41.1900	Relative Permittivity ( $\epsilon_r$ ):	41.19	40.15	2.60	5
		e"	14.4500	Conductivity ( $\sigma$ ):	1.37	1.35	2.04	5
	Head 1755	e'	41.1000	Relative Permittivity ( $\epsilon_r$ ):	41.10	40.08	2.55	5
		e"	14.3700	Conductivity ( $\sigma$ ):	1.40	1.37	2.22	5
3-15-2021	Head 835	e'	40.9700	Relative Permittivity ( $\epsilon_r$ ):	40.97	41.50	-1.28	5
		e"	19.2500	Conductivity ( $\sigma$ ):	0.89	0.90	-0.69	5
	Head 820	e'	41.0000	Relative Permittivity ( $\epsilon_r$ ):	41.00	41.60	-1.45	5
		e"	19.4900	Conductivity ( $\sigma$ ):	0.89	0.90	-1.09	5
	Head 850	e'	40.9600	Relative Permittivity ( $\epsilon_r$ ):	40.96	41.50	-1.30	5
		e"	19.0300	Conductivity ( $\sigma$ ):	0.90	0.92	-1.70	5
3-18-2021	Head 1750	e'	38.6100	Relative Permittivity ( $\epsilon_r$ ):	38.61	40.08	-3.68	5
		e"	14.1500	Conductivity ( $\sigma$ ):	1.38	1.37	0.58	5
	Head 1710	e'	38.7000	Relative Permittivity ( $\epsilon_r$ ):	38.70	40.15	-3.60	5
		e"	14.3100	Conductivity ( $\sigma$ ):	1.36	1.35	1.05	5
	Head 1755	e'	38.6100	Relative Permittivity ( $\epsilon_r$ ):	38.61	40.08	-3.66	5
		e"	14.1500	Conductivity ( $\sigma$ ):	1.38	1.37	0.66	5
3-29-2021	Head 1750	e'	38.7500	Relative Permittivity ( $\epsilon_r$ ):	38.75	40.08	-3.33	5
		e"	13.8500	Conductivity ( $\sigma$ ):	1.35	1.37	-1.56	5
	Head 1710	e'	38.7600	Relative Permittivity ( $\epsilon_r$ ):	38.76	40.15	-3.45	5
		e"	13.9300	Conductivity ( $\sigma$ ):	1.32	1.35	-1.63	5
	Head 1755	e'	38.7500	Relative Permittivity ( $\epsilon_r$ ):	38.75	40.08	-3.31	5
		e"	13.8300	Conductivity ( $\sigma$ ):	1.35	1.37	-1.62	5
3-31-2021	Head 1750	e'	39.0400	Relative Permittivity ( $\epsilon_r$ ):	39.04	40.08	-2.61	5
		e"	13.8100	Conductivity ( $\sigma$ ):	1.34	1.37	-1.84	5
	Head 1710	e'	39.1600	Relative Permittivity ( $\epsilon_r$ ):	39.16	40.15	-2.46	5
		e"	13.8700	Conductivity ( $\sigma$ ):	1.32	1.35	-2.05	5
	Head 1755	e'	39.0300	Relative Permittivity ( $\epsilon_r$ ):	39.03	40.08	-2.61	5
		e"	13.7900	Conductivity ( $\sigma$ ):	1.35	1.37	-1.90	5
3-31-2021	Head 1900	e'	38.8400	Relative Permittivity ( $\epsilon_r$ ):	38.84	40.00	-2.90	5
		e"	13.3900	Conductivity ( $\sigma$ ):	1.41	1.40	1.04	5
	Head 1850	e'	38.9000	Relative Permittivity ( $\epsilon_r$ ):	38.90	40.00	-2.75	5
		e"	13.5200	Conductivity ( $\sigma$ ):	1.39	1.40	-0.66	5
	Head 1910	e'	38.8200	Relative Permittivity ( $\epsilon_r$ ):	38.82	40.00	-2.95	5
		e"	13.3600	Conductivity ( $\sigma$ ):	1.42	1.40	1.35	5
4-4-2021	Head 1900	e'	38.5800	Relative Permittivity ( $\epsilon_r$ ):	38.58	40.00	-3.55	5
		e"	13.6700	Conductivity ( $\sigma$ ):	1.44	1.40	3.16	5
	Head 1850	e'	38.6400	Relative Permittivity ( $\epsilon_r$ ):	38.64	40.00	-3.40	5
		e"	13.7200	Conductivity ( $\sigma$ ):	1.41	1.40	0.81	5
	Head 1910	e'	38.5600	Relative Permittivity ( $\epsilon_r$ ):	38.56	40.00	-3.60	5
		e"	13.6600	Conductivity ( $\sigma$ ):	1.45	1.40	3.62	5
4-6-2021	Head 835	e'	42.6400	Relative Permittivity ( $\epsilon_r$ ):	41.16	40.08	2.68	5
		e"	19.5400	Conductivity ( $\sigma$ ):	1.32	1.37	-3.26	5
	Head 820	e'	42.6900	Relative Permittivity ( $\epsilon_r$ ):	41.30	40.15	2.87	5
		e"	19.8500	Conductivity ( $\sigma$ ):	1.30	1.35	-3.39	5
	Head 850	e'	42.6100	Relative Permittivity ( $\epsilon_r$ ):	41.15	40.08	2.68	5
		e"	19.2400	Conductivity ( $\sigma$ ):	1.33	1.37	-3.18	5
4-6-2021	Head 1750	e'	41.1600	Relative Permittivity ( $\epsilon_r$ ):	41.16	40.08	2.68	5
		e"	13.6100	Conductivity ( $\sigma$ ):	1.32	1.37	-3.26	5
	Head 1710	e'	41.3000	Relative Permittivity ( $\epsilon_r$ ):	41.30	40.15	2.87	5
		e"	13.6800	Conductivity ( $\sigma$ ):	1.30	1.35	-3.39	5
	Head 1755	e'	41.1500	Relative Permittivity ( $\epsilon_r$ ):	41.15	40.08	2.68	5
		e"	13.6100	Conductivity ( $\sigma$ ):	1.33	1.37	-3.18	5
4-6-2021	Head 2450	e'	40.2400	Relative Permittivity ( $\epsilon_r$ ):	40.24	39.20	2.65	5
		e"	13.0400	Conductivity ( $\sigma$ ):	1.78	1.80	-1.31	5
	Head 2400	e'	40.3200	Relative Permittivity ( $\epsilon_r$ ):	40.32	39.30	2.60	5
		e"	13.0100	Conductivity ( $\sigma$ ):	1.74	1.75	-0.88	5
	Head 2480	e'	40.2000	Relative Permittivity ( $\epsilon_r$ ):	40.20	39.16	2.65	5
		e"	13.0800	Conductivity ( $\sigma$ ):	1.80	1.83	-1.57	5

**SAR 3 Room continued**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)		
4-6-2021	Head 5250	e'	35.5200	Relative Permittivity ( $\epsilon_r$ ):	35.52	35.93	-1.15	5	
		e''	16.1700	Conductivity ( $\sigma$ ):	4.72	4.70	0.39	5	
	Head 5260	e'	35.5000	Relative Permittivity ( $\epsilon_r$ ):	35.50	35.92	-1.17	5	
		e''	16.1800	Conductivity ( $\sigma$ ):	4.73	4.71	0.42	5	
	Head 5600	e'	34.8100	Relative Permittivity ( $\epsilon_r$ ):	34.81	35.53	-2.04	5	
		e''	16.3700	Conductivity ( $\sigma$ ):	5.10	5.06	0.73	5	
	Head 5750	e'	34.4500	Relative Permittivity ( $\epsilon_r$ ):	34.45	35.36	-2.58	5	
		e''	16.5000	Conductivity ( $\sigma$ ):	5.28	5.21	1.18	5	
	Head 5825	e'	34.3400	Relative Permittivity ( $\epsilon_r$ ):	34.34	35.30	-2.72	5	
		e''	16.5400	Conductivity ( $\sigma$ ):	5.36	5.27	1.65	5	
	4-9-2021	Head 835	e'	40.6100	Relative Permittivity ( $\epsilon_r$ ):	40.61	41.50	-2.14	5
			e''	19.1600	Conductivity ( $\sigma$ ):	0.89	0.90	-1.16	5
Head 820		e'	40.6500	Relative Permittivity ( $\epsilon_r$ ):	40.65	41.60	-2.29	5	
		e''	19.4200	Conductivity ( $\sigma$ ):	0.89	0.90	-1.45	5	
Head 850		e'	40.5700	Relative Permittivity ( $\epsilon_r$ ):	40.57	41.50	-2.24	5	
		e''	18.9000	Conductivity ( $\sigma$ ):	0.89	0.92	-2.38	5	
4-12-2021	Head 835	e'	41.0900	Relative Permittivity ( $\epsilon_r$ ):	41.09	41.50	-0.99	5	
		e''	19.4700	Conductivity ( $\sigma$ ):	0.90	0.90	0.44	5	
	Head 820	e'	41.1000	Relative Permittivity ( $\epsilon_r$ ):	41.10	41.60	-1.21	5	
		e''	19.6900	Conductivity ( $\sigma$ ):	0.90	0.90	-0.08	5	
	Head 850	e'	41.0700	Relative Permittivity ( $\epsilon_r$ ):	41.07	41.50	-1.04	5	
		e''	19.2200	Conductivity ( $\sigma$ ):	0.91	0.92	-0.72	5	
4-15-2021	Head 2450	e'	37.6500	Relative Permittivity ( $\epsilon_r$ ):	37.65	39.20	-3.95	5	
		e''	13.3100	Conductivity ( $\sigma$ ):	1.81	1.80	0.73	5	
	Head 2400	e'	37.7700	Relative Permittivity ( $\epsilon_r$ ):	37.77	39.30	-3.89	5	
		e''	13.2900	Conductivity ( $\sigma$ ):	1.77	1.75	1.25	5	
	Head 2480	e'	37.5700	Relative Permittivity ( $\epsilon_r$ ):	37.57	39.16	-4.07	5	
		e''	13.3000	Conductivity ( $\sigma$ ):	1.83	1.83	0.09	5	
4-19-2021	Head 2450	e'	40.7200	Relative Permittivity ( $\epsilon_r$ ):	40.72	39.20	3.88	5	
		e''	13.2600	Conductivity ( $\sigma$ ):	1.81	1.80	0.35	5	
	Head 2400	e'	40.7700	Relative Permittivity ( $\epsilon_r$ ):	40.77	39.30	3.75	5	
		e''	13.2200	Conductivity ( $\sigma$ ):	1.76	1.75	0.72	5	
	Head 2480	e'	40.6900	Relative Permittivity ( $\epsilon_r$ ):	40.69	39.16	3.90	5	
		e''	13.2700	Conductivity ( $\sigma$ ):	1.83	1.83	-0.14	5	
4-19-2021	Head 5250	e'	36.1900	Relative Permittivity ( $\epsilon_r$ ):	36.19	35.93	0.71	5	
		e''	15.6000	Conductivity ( $\sigma$ ):	4.55	4.70	-3.15	5	
	Head 5260	e'	36.1700	Relative Permittivity ( $\epsilon_r$ ):	36.17	35.92	0.69	5	
		e''	15.5900	Conductivity ( $\sigma$ ):	4.56	4.71	-3.24	5	
	Head 5600	e'	35.5300	Relative Permittivity ( $\epsilon_r$ ):	35.53	35.53	-0.01	5	
		e''	15.9100	Conductivity ( $\sigma$ ):	4.95	5.06	-2.10	5	
	Head 5750	e'	35.3000	Relative Permittivity ( $\epsilon_r$ ):	35.30	35.36	-0.18	5	
		e''	16.0700	Conductivity ( $\sigma$ ):	5.14	5.21	-1.45	5	
	Head 5825	e'	36.1900	Relative Permittivity ( $\epsilon_r$ ):	36.19	35.30	2.52	5	
		e''	16.0900	Conductivity ( $\sigma$ ):	5.21	5.27	-1.11	5	



**SAR 4 Room**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
3-19-2021	Head 2600	e'	38.6000	Relative Permittivity ( $\epsilon_r$ ):	38.60	39.01	-1.05	5
		e"	14.0900	Conductivity ( $\sigma$ ):	2.04	1.96	3.81	5
	Head 2500	e'	38.9200	Relative Permittivity ( $\epsilon_r$ ):	38.92	39.14	-0.55	5
		e"	13.8400	Conductivity ( $\sigma$ ):	1.92	1.85	3.77	5
	Head 2700	e'	38.2400	Relative Permittivity ( $\epsilon_r$ ):	38.24	38.88	-1.66	5
		e"	14.3600	Conductivity ( $\sigma$ ):	2.16	2.07	4.13	5
3-29-2021	Head 2450	e'	38.4600	Relative Permittivity ( $\epsilon_r$ ):	38.46	39.20	-1.89	5
		e"	12.8200	Conductivity ( $\sigma$ ):	1.75	1.80	-2.98	5
	Head 2400	e'	38.6700	Relative Permittivity ( $\epsilon_r$ ):	38.67	39.30	-1.59	5
		e"	12.7400	Conductivity ( $\sigma$ ):	1.70	1.75	-2.94	5
	Head 2480	e'	38.3500	Relative Permittivity ( $\epsilon_r$ ):	38.35	39.16	-2.07	5
		e"	12.8800	Conductivity ( $\sigma$ ):	1.78	1.83	-3.07	5
3-31-2021	Head 2450	e'	37.8900	Relative Permittivity ( $\epsilon_r$ ):	37.89	39.20	-3.34	5
		e"	13.1400	Conductivity ( $\sigma$ ):	1.79	1.80	-0.55	5
	Head 2400	e'	38.1100	Relative Permittivity ( $\epsilon_r$ ):	38.11	39.30	-3.02	5
		e"	12.9600	Conductivity ( $\sigma$ ):	1.73	1.75	-1.27	5
	Head 2480	e'	37.7800	Relative Permittivity ( $\epsilon_r$ ):	37.78	39.16	-3.53	5
		e"	13.2400	Conductivity ( $\sigma$ ):	1.83	1.83	-0.37	5
3-31-2021	Head 2600	e'	37.3900	Relative Permittivity ( $\epsilon_r$ ):	37.39	39.01	-4.15	5
		e"	13.3800	Conductivity ( $\sigma$ ):	1.93	1.96	-1.42	5
	Head 2500	e'	37.7200	Relative Permittivity ( $\epsilon_r$ ):	37.72	39.14	-3.62	5
		e"	13.2900	Conductivity ( $\sigma$ ):	1.85	1.85	-0.36	5
	Head 2700	e'	37.0500	Relative Permittivity ( $\epsilon_r$ ):	37.05	38.88	-4.72	5
		e"	13.6600	Conductivity ( $\sigma$ ):	2.05	2.07	-0.94	5
4-5-2021	Head 2450	e'	37.7600	Relative Permittivity ( $\epsilon_r$ ):	37.76	39.20	-3.67	5
		e"	13.7000	Conductivity ( $\sigma$ ):	1.87	1.80	3.68	5
	Head 2400	e'	37.9500	Relative Permittivity ( $\epsilon_r$ ):	37.95	39.30	-3.43	5
		e"	13.6200	Conductivity ( $\sigma$ ):	1.82	1.75	3.76	5
	Head 2480	e'	37.6500	Relative Permittivity ( $\epsilon_r$ ):	37.65	39.16	-3.86	5
		e"	13.7300	Conductivity ( $\sigma$ ):	1.89	1.83	3.32	5
4-6-2021	Head 2600	e'	38.2800	Relative Permittivity ( $\epsilon_r$ ):	38.28	39.01	-1.87	5
		e"	13.8400	Conductivity ( $\sigma$ ):	2.00	1.96	1.97	5
	Head 2500	e'	38.6000	Relative Permittivity ( $\epsilon_r$ ):	38.60	39.14	-1.37	5
		e"	13.5800	Conductivity ( $\sigma$ ):	1.89	1.85	1.82	5
	Head 2700	e'	37.9000	Relative Permittivity ( $\epsilon_r$ ):	37.90	38.88	-2.53	5
		e"	14.0800	Conductivity ( $\sigma$ ):	2.11	2.07	2.10	5
4-12-2021	Head 2450	e'	38.6100	Relative Permittivity ( $\epsilon_r$ ):	38.61	39.20	-1.51	5
		e"	13.2100	Conductivity ( $\sigma$ ):	1.80	1.80	-0.02	5
	Head 2400	e'	38.8200	Relative Permittivity ( $\epsilon_r$ ):	38.82	39.30	-1.21	5
		e"	13.0600	Conductivity ( $\sigma$ ):	1.74	1.75	-0.50	5
	Head 2480	e'	38.5000	Relative Permittivity ( $\epsilon_r$ ):	38.50	39.16	-1.69	5
		e"	13.3000	Conductivity ( $\sigma$ ):	1.83	1.83	0.09	5
4-19-2021	Head 2600	e'	38.4100	Relative Permittivity ( $\epsilon_r$ ):	38.41	39.01	-1.54	5
		e"	13.3900	Conductivity ( $\sigma$ ):	1.94	1.96	-1.35	5
	Head 2500	e'	38.4700	Relative Permittivity ( $\epsilon_r$ ):	38.47	39.14	-1.70	5
		e"	13.3200	Conductivity ( $\sigma$ ):	1.85	1.85	-0.13	5
	Head 2700	e'	38.5500	Relative Permittivity ( $\epsilon_r$ ):	38.55	38.88	-0.86	5
		e"	13.4300	Conductivity ( $\sigma$ ):	2.02	2.07	-2.61	5

**SAR 5 Room**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
3-8-2021	Head 750	e'	42.0400	Relative Permittivity ( $\epsilon_r$ ):	42.04	41.96	0.19	5
		e"	20.8700	Conductivity ( $\sigma$ ):	0.87	0.89	-2.55	5
	Head 700	e'	42.6300	Relative Permittivity ( $\epsilon_r$ ):	42.63	42.22	0.98	5
		e"	21.9400	Conductivity ( $\sigma$ ):	0.85	0.89	-3.97	5
	Head 790	e'	42.3000	Relative Permittivity ( $\epsilon_r$ ):	42.30	41.76	1.30	5
		e"	20.5700	Conductivity ( $\sigma$ ):	0.90	0.90	0.83	5
3-8-2021	Head 835	e'	42.1100	Relative Permittivity ( $\epsilon_r$ ):	42.11	41.50	1.47	5
		e"	19.6400	Conductivity ( $\sigma$ ):	0.91	0.90	1.32	5
	Head 820	e'	42.2700	Relative Permittivity ( $\epsilon_r$ ):	42.27	41.60	1.60	5
		e"	20.0400	Conductivity ( $\sigma$ ):	0.91	0.90	1.70	5
	Head 850	e'	41.9200	Relative Permittivity ( $\epsilon_r$ ):	41.92	41.50	1.01	5
		e"	19.2200	Conductivity ( $\sigma$ ):	0.91	0.92	-0.72	5
3-11-2021	Head 1900	e'	39.2700	Relative Permittivity ( $\epsilon_r$ ):	39.27	40.00	-1.82	5
		e"	13.3900	Conductivity ( $\sigma$ ):	1.41	1.40	1.04	5
	Head 1850	e'	39.2600	Relative Permittivity ( $\epsilon_r$ ):	39.26	40.00	-1.85	5
		e"	13.3800	Conductivity ( $\sigma$ ):	1.38	1.40	-1.69	5
	Head 1910	e'	39.2700	Relative Permittivity ( $\epsilon_r$ ):	39.27	40.00	-1.82	5
		e"	13.4000	Conductivity ( $\sigma$ ):	1.42	1.40	1.65	5
3-14-2021	Head 1900	e'	39.6800	Relative Permittivity ( $\epsilon_r$ ):	39.68	40.00	-0.80	5
		e"	13.3500	Conductivity ( $\sigma$ ):	1.41	1.40	0.74	5
	Head 1850	e'	39.7000	Relative Permittivity ( $\epsilon_r$ ):	39.70	40.00	-0.75	5
		e"	13.4300	Conductivity ( $\sigma$ ):	1.38	1.40	-1.32	5
	Head 1910	e'	39.6800	Relative Permittivity ( $\epsilon_r$ ):	39.68	40.00	-0.80	5
		e"	13.3500	Conductivity ( $\sigma$ ):	1.42	1.40	1.27	5
3-17-2021	Head 1900	e'	38.5900	Relative Permittivity ( $\epsilon_r$ ):	38.59	40.00	-3.52	5
		e"	13.8900	Conductivity ( $\sigma$ ):	1.47	1.40	4.82	5
	Head 1850	e'	38.5800	Relative Permittivity ( $\epsilon_r$ ):	38.58	40.00	-3.55	5
		e"	13.5300	Conductivity ( $\sigma$ ):	1.39	1.40	-0.59	5
	Head 1910	e'	38.6000	Relative Permittivity ( $\epsilon_r$ ):	38.60	40.00	-3.50	5
		e"	13.3900	Conductivity ( $\sigma$ ):	1.42	1.40	1.57	5
3-31-2021	Head 750	e'	41.4000	Relative Permittivity ( $\epsilon_r$ ):	41.40	41.96	-1.34	5
		e"	20.5500	Conductivity ( $\sigma$ ):	0.86	0.89	-4.04	5
	Head 700	e'	41.7000	Relative Permittivity ( $\epsilon_r$ ):	41.70	42.22	-1.23	5
		e"	21.8200	Conductivity ( $\sigma$ ):	0.85	0.89	-4.49	5
	Head 790	e'	41.4100	Relative Permittivity ( $\epsilon_r$ ):	41.41	41.76	-0.83	5
		e"	19.9000	Conductivity ( $\sigma$ ):	0.87	0.90	-2.46	5
3-31-2021	Head 835	e'	41.5300	Relative Permittivity ( $\epsilon_r$ ):	41.53	41.50	0.07	5
		e"	19.3300	Conductivity ( $\sigma$ ):	0.90	0.90	-0.28	5
	Head 820	e'	41.4900	Relative Permittivity ( $\epsilon_r$ ):	41.49	41.60	-0.27	5
		e"	19.5300	Conductivity ( $\sigma$ ):	0.89	0.90	-0.89	5
	Head 850	e'	41.5500	Relative Permittivity ( $\epsilon_r$ ):	41.55	41.50	0.12	5
		e"	19.1100	Conductivity ( $\sigma$ ):	0.90	0.92	-1.29	5
4-6-2021	Head 835	e'	41.7500	Relative Permittivity ( $\epsilon_r$ ):	41.75	41.50	0.60	5
		e"	19.2700	Conductivity ( $\sigma$ ):	0.89	0.90	-0.59	5
	Head 820	e'	41.8100	Relative Permittivity ( $\epsilon_r$ ):	41.81	41.60	0.50	5
		e"	19.5300	Conductivity ( $\sigma$ ):	0.89	0.90	-0.89	5
	Head 850	e'	41.7000	Relative Permittivity ( $\epsilon_r$ ):	41.70	41.50	0.48	5
		e"	19.0100	Conductivity ( $\sigma$ ):	0.90	0.92	-1.81	5
4-6-2021	Head 1900	e'	39.6200	Relative Permittivity ( $\epsilon_r$ ):	39.62	40.00	-0.95	5
		e"	13.1400	Conductivity ( $\sigma$ ):	1.39	1.40	-0.84	5
	Head 1850	e'	39.6900	Relative Permittivity ( $\epsilon_r$ ):	39.69	40.00	-0.78	5
		e"	13.2900	Conductivity ( $\sigma$ ):	1.37	1.40	-2.35	5
	Head 1910	e'	39.6100	Relative Permittivity ( $\epsilon_r$ ):	39.61	40.00	-0.98	5
		e"	13.1200	Conductivity ( $\sigma$ ):	1.39	1.40	-0.47	5
4-14-2021	Head 2450	e'	39.5500	Relative Permittivity ( $\epsilon_r$ ):	39.55	39.20	0.89	5
		e"	13.3800	Conductivity ( $\sigma$ ):	1.82	1.80	1.26	5
	Head 2400	e'	39.6400	Relative Permittivity ( $\epsilon_r$ ):	39.64	39.30	0.87	5
		e"	13.4200	Conductivity ( $\sigma$ ):	1.79	1.75	2.24	5
	Head 2480	e'	39.5100	Relative Permittivity ( $\epsilon_r$ ):	39.51	39.16	0.89	5
		e"	13.3400	Conductivity ( $\sigma$ ):	1.84	1.83	0.39	5

## 8.2 System Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

### System Performance Check Measurement Conditions:

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness:  $2.0 \pm 0.2$  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  $\geq 15.0$  cm for SAR measurements  $\leq 3$  GHz and  $\geq 10.0$  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.

**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	2-24-2020	750	1g	8.54
				10g	5.59
D835V2	4d174	2-24-2020	835	1g	9.59
				10g	6.24
D835V2	4d194	3-20-2020	835	1g	9.76
				10g	6.42
D1750V2	1125	2-21-2020	1750	1g	36.50
				10g	19.20
D1900V2	5d199	3-19-2020	1900	1g	40.50
				10g	21.00
D2450V2	939	7-25-2019	2450	1g	53.20
				10g	25.10
D2600V2	1097	9-19-2019	2600	1g	57.30
				10g	25.70
D5GHzV2	1209	2-27-2020	5250	1g	79.90
				10g	22.60
			5600	1g	83.60
				10g	23.60
			5750	1g	80.20
				10g	22.60

**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 : 5d199), D2450(SN : 939), D2600(SN : 1097)  
D5GHz(SN : 1209))

**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 $\pm 10\%$	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
3-29-2021	D5GHzV2	1209	Head	1g	8.27	82.70	79.90	3.50	
				10g	2.32	23.20	22.60	2.65	
4-1-2021	D5GHzV2	1209	Head	1g	7.95	79.50	79.90	-0.50	
				10g	2.25	22.50	22.60	-0.44	
4-1-2021	D5GHzV2	1209	Head	1g	8.78	87.80	83.60	5.02	
				10g	2.47	24.70	23.60	4.66	
4-1-2021	D5GHzV2	1209	Head	1g	8.52	85.20	80.20	6.23	1, 2
				10g	2.38	23.80	22.60	5.31	
4-4-2021	D5GHzV2	1209	Head	1g	7.89	78.90	79.90	-1.25	
				10g	2.23	22.30	22.60	-1.33	
4-4-2021	D5GHzV2	1209	Head	1g	8.86	88.60	83.60	5.98	
				10g	2.50	25.00	23.60	5.93	
4-4-2021	D5GHzV2	1209	Head	1g	8.26	82.60	80.20	2.99	
				10g	2.31	23.10	22.60	2.21	
4-7-2021	D5GHzV2	1209	Head	1g	7.58	75.80	79.90	-5.13	
				10g	2.15	21.50	22.60	-4.87	
4-7-2021	D5GHzV2	1209	Head	1g	7.53	75.30	80.20	-6.11	
				10g	2.13	21.30	22.60	-5.75	

**SAR 2 Room**

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta $\pm 10\%$	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
4-12-2021	D5GHzV2	1209	Head	1g	8.09	80.9	80.20	0.87	3, 4
				10g	2.28	22.8	22.60	0.88	

**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				
3-10-2021	D1750V2	1125	Head	1g	3.48	34.8	36.50	-4.66	
				10g	1.87	18.7	19.20	-2.60	
3-15-2021	D835V2	4d174	Head	1g	1.00	10.0	9.59	4.28	5, 6
				10g	0.67	6.7	6.24	6.89	
3-18-2021	D1750V2	1125	Head	1g	3.52	35.2	36.50	-3.56	
				10g	1.89	18.9	19.20	-1.56	
3-29-2021	D1750V2	1125	Head	1g	3.66	36.6	36.50	0.27	
				10g	1.95	19.5	19.20	1.56	
3-31-2021	D1750V2	1125	Head	1g	3.43	34.3	36.50	-6.03	7, 8
				10g	1.83	18.3	19.20	-4.69	
3-31-2021	D1900V2	5d199	Head	1g	4.01	40.1	40.50	-0.99	
				10g	2.10	21.0	21.00	0.00	
4-4-2021	D1900V2	5d199	Head	1g	4.10	41.0	40.50	1.23	
				10g	2.15	21.5	21.00	2.38	
4-6-2021	D835V2	4d194	Head	1g	0.98	9.8	9.76	0.82	
				10g	0.65	6.5	6.42	1.40	
4-6-2021	D1750V2	1125	Head	1g	3.67	36.7	36.50	0.55	
				10g	1.97	19.7	19.20	2.60	
4-6-2021	D2450V2	939	Head	1g	5.72	57.2	53.20	7.52	
				10g	2.68	26.8	25.10	6.77	
4-6-2021	D5GHzV2	1209	Head	1g	7.74	77.4	79.90	-3.13	
				10g	2.22	22.2	22.60	-1.77	
4-6-2021	D5GHzV2	1209	Head	1g	8.52	85.2	83.60	1.91	
				10g	2.41	24.1	23.60	2.12	
4-6-2021	D5GHzV2	1209	Head	1g	8.45	84.5	80.20	5.36	
				10g	2.41	24.1	22.60	6.64	
4-9-2021	D835V2	4d194	Head	1g	0.90	9.0	9.76	-8.20	9, 10
				10g	0.59	5.9	6.42	-7.63	
4-12-2021	D835V2	4d194	Head	1g	0.96	9.6	9.76	-1.23	
				10g	0.64	6.4	6.42	-0.47	
4-15-2021	D2450V2	939	Head	1g	4.83	48.3	53.20	-9.21	11, 12
				10g	2.28	22.8	25.10	-9.16	
4-19-2021	D2450V2	939	Head	1g	5.48	54.8	53.20	3.01	
				10g	2.60	26.0	25.10	3.59	
4-19-2021	D5GHzV2	1209	Head	1g	8.04	80.4	79.90	0.63	
				10g	2.32	23.2	22.60	2.65	
4-19-2021	D5GHzV2	1209	Head	1g	8.75	87.5	83.60	4.67	
				10g	2.51	25.1	23.60	6.36	
4-19-2021	D5GHzV2	1209	Head	1g	8.14	81.4	80.20	1.50	
				10g	2.36	23.6	22.60	4.42	

**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				
3-19-2021	D2600V2	1097	Head	1g	5.78	57.8	57.30	0.87	
				10g	2.49	24.9	25.70	-3.11	
3-29-2021	D2450V2	939	Head	1g	5.35	53.5	53.20	0.56	
				10g	2.46	24.6	25.10	-1.99	
3-31-2021	D2450V2	939	Head	1g	5.37	53.7	53.20	0.94	
				10g	2.46	24.6	25.10	-1.99	
3-31-2021	D2600V2	1097	Head	1g	5.70	57.0	57.30	-0.52	
				10g	2.49	24.9	25.70	-3.11	
4-5-2021	D2450V2	939	Head	1g	5.29	52.9	53.20	-0.56	
				10g	2.42	24.2	25.10	-3.59	
4-6-2021	D2600V2	1097	Head	1g	5.34	53.4	57.30	-6.81	
				10g	2.34	23.4	25.70	-8.95	
4-12-2021	D2450V2	939	Head	1g	5.12	51.2	53.20	-3.76	
				10g	2.34	23.4	25.10	-6.77	
4-19-2021	D2600V2	1097	Head	1g	5.29	52.9	57.30	-7.68	13, 14
				10g	2.40	24.0	25.70	-6.61	

**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				
3-8-2021	D750V3	1122	Head	1g	0.79	7.9	8.54	-7.61	
				10g	0.52	5.2	5.59	-6.80	
3-8-2021	D835V2	4d174	Head	1g	1.00	10.0	9.59	4.28	
				10g	0.65	6.5	6.24	4.81	
3-11-2021	D1900V2	5d199	Head	1g	3.82	38.2	40.50	-5.68	
				10g	2.00	20.0	21.00	-4.76	
3-14-2021	D1900V2	5d199	Head	1g	4.16	41.6	40.50	2.72	
				10g	2.17	21.7	21.00	3.33	
3-17-2021	D1900V2	5d199	Head	1g	3.72	37.2	40.50	-8.15	15, 16
				10g	1.94	19.4	21.00	-7.62	
3-31-2021	D750V3	1122	Head	1g	0.79	7.9	8.54	-8.08	17, 18
				10g	0.52	5.2	5.59	-6.98	
3-31-2021	D835V2	4d194	Head	1g	0.95	9.5	9.76	-2.25	
				10g	0.63	6.3	6.42	-2.49	
4-6-2021	D835V2	4d194	Head	1g	0.91	9.1	9.76	-7.27	
				10g	0.59	5.9	6.42	-7.94	
4-6-2021	D1900V2	5d199	Head	1g	4.31	43.1	40.50	6.42	
				10g	2.25	22.5	21.00	7.14	
4-14-2021	D2450V2	939	Head	1g	5.22	52.2	53.20	-1.88	
				10g	2.45	24.5	25.10	-2.39	

## 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 Pw r	Frame Pw r	Burst Pw r	Frame Pw r	Burst Pw r	Frame Pw r	Burst Pw r	Frame Pw r
GSM (Voice)	CS1	1	128	824.2	32.9	23.9	34.0	25.0	23.0	14.0	24.0	15.0
			190	836.6	33.0	24.0			23.0	14.0		
			251	848.8	32.9	23.9			22.7	13.7		
GPRS (GMSK)	CS1	1	128	824.2	33.1	24.0	34.0	25.0	23.0	14.0	24.0	15.0
			190	836.6	32.8	23.8			23.0	13.9		
			251	848.8	32.7	23.7			22.7	13.6		
		2	128	824.2	31.6	25.6	32.0	26.0	22.0	15.9	23.0	17.0
			190	836.6	31.2	25.2			22.0	16.0		
			251	848.8	30.9	24.9			21.6	15.6		
		3	128	824.2	29.4	25.1	30.0	25.7	20.0	15.8	21.0	16.7
			190	836.6	29.2	25.0			19.9	15.7		
			251	848.8	28.9	24.6			19.6	15.4		
		4	128	824.2	28.2	25.2	29.0	26.0	18.1	15.1	19.0	16.0
			190	836.6	27.8	24.8			18.0	15.0		
			251	848.8	27.6	24.5			17.7	14.7		
EGPRS (8PSK)	MCS5	1	128	824.2	27.8	18.8	29.0	20.0	18.0	9.0	19.0	10.0
			190	836.6	27.9	18.8			18.1	9.1		
			251	848.8	27.6	18.5			17.8	8.7		
		2	128	824.2	26.5	20.5	27.0	21.0	16.3	10.2	17.0	11.0
			190	836.6	26.4	20.3			16.2	10.1		
			251	848.8	26.1	20.1			15.8	9.8		
		3	128	824.2	24.6	20.3	25.0	20.7	14.3	10.0	15.0	10.7
			190	836.6	24.5	20.2			14.1	9.9		
			251	848.8	24.3	20.0			13.8	9.5		
		4	128	824.2	22.7	19.6	23.5	20.5	13.1	10.1	14.0	11.0
			190	836.6	22.8	19.8			13.1	10.1		
			251	848.8	22.3	19.3			12.7	9.6		

#### 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 2 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.



**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	29.8	20.8	31.0	22.0	21.0	12.0	22.0	13.0
			661	1880.0	30.4	21.3			21.5	12.4		
			810	1909.8	30.4	21.4			21.2	12.2		
GPRS (GMSK)	CS1	1	512	1850.2	29.8	20.7	31.0	22.0	21.0	11.9	22.0	13.0
			661	1880.0	30.3	21.3			21.4	12.4		
			810	1909.8	30.5	21.5			21.2	12.1		
		2	512	1850.2	27.9	21.9	29.0	23.0	19.2	13.1	20.0	14.0
			661	1880.0	28.5	22.5			19.4	13.4		
			810	1909.8	28.2	22.2			19.2	13.2		
		3	512	1850.2	26.2	21.9	27.0	22.7	17.1	12.8	18.0	13.7
			661	1880.0	26.3	22.1			17.4	13.2		
			810	1909.8	26.2	21.9			17.3	13.0		
		4	512	1850.2	24.1	21.1	25.0	22.0	15.1	12.1	16.0	13.0
			661	1880.0	24.5	21.4			15.5	12.5		
			810	1909.8	24.3	21.3			15.4	12.4		
EGPRS (8PSK)	MCS5	1	512	1850.2	26.0	17.0	27.0	18.0	18.1	9.1	19.0	10.0
			661	1880.0	26.5	17.5			18.4	9.4		
			810	1909.8	26.4	17.3			18.6	9.5		
		2	512	1850.2	24.3	18.2	25.5	19.5	16.1	10.1	17.0	11.0
			661	1880.0	24.8	18.8			16.5	10.5		
			810	1909.8	24.6	18.6			16.3	10.3		
		3	512	1850.2	22.1	17.8	23.0	18.7	14.2	9.9	15.0	10.7
			661	1880.0	22.6	18.3			14.7	10.4		
			810	1909.8	22.5	18.2			14.5	10.2		
		4	512	1850.2	20.3	17.3	21.0	18.0	13.1	10.1	14.0	11.0
			661	1880.0	20.7	17.6			13.5	10.5		
			810	1909.8	20.5	17.5			13.5	10.5		

**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 and 2 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.

## 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
	$\beta_c/\beta_d$	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			
	$\beta_c$	2/15	11/15	15/15	15/15
	$\beta_d$	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	$\beta_c/\beta_d$	2/15	11/15	15/8	15/4
	$\beta_{hs}$	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			
	$A_{hs}=\beta_{hs}/\beta_c$	30/15			

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

The following 5 Sub-tests were completed according to Release 6 procedures in 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
	$\beta_c$	11/15	6/15	15/15	2/15	15/15
	$\beta_d$	15/15	15/15	9/15	15/15	0
	$\beta_{ec}$	209/225	12/15	30/15	2/15	5/15
	$\beta_c/\beta_d$	11/15	6/15	15/9	2/15	-
	$\beta_{hs}$	22/15	12/15	30/15	4/15	5/15
	$\beta_{ed}$	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				
	A <sub>hs</sub> = $\beta_{hs}/\beta_c$	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	

**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**

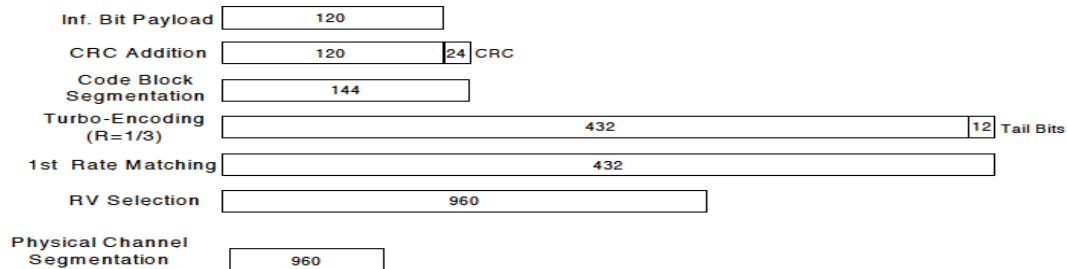
Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

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 1	HSDPA 2	HSDPA 3	HSDPA 4	
WCDMA General Settings	Subtest	1	2	3	4	
	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set 12				
	Power Control Algorithm	Algorithm2				
	$\beta_c$	2/15	11/15	15/15	15/15	
	$\beta_d$	15/15	15/15	8/15	4/15	
	$\beta_d$ (SF)	64				
	$\beta_c/\beta_d$	2/15	11/15	15/8	15/4	
$\beta_{hs}$	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				
	$A_{hs} = \beta_{hs}/\beta_c$	30/15				

**HSPA+**

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

**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	22.3	NA	23.5	12.2	NA	13.5
		9400	1880.0	22.8			12.7		
		9538	1907.6	22.6			12.6		
HSDPA	Subtest 1	9262	1852.4	21.4	0	22.5	11.4	0	12.5
		9400	1880.0	21.9			11.9		
		9538	1907.6	21.8			11.7		
	Subtest 2	9262	1852.4	21.5	0	22.5	11.5	0	12.5
		9400	1880.0	21.9			11.8		
		9538	1907.6	21.7			11.7		
	Subtest 3	9262	1852.4	21.0	0.5	22.0	11.0	0.5	12.0
		9400	1880.0	21.4			11.4		
		9538	1907.6	21.3			11.2		
	Subtest 4	9262	1852.4	20.9	0.5	22.0	10.9	0.5	12.0
		9400	1880.0	21.4			11.4		
		9538	1907.6	21.3			11.2		
HSUPA	Subtest 1	9262	1852.4	21.4	0	22.5	11.4	0	12.5
		9400	1880.0	21.9			11.8		
		9538	1907.6	21.7			11.7		
	Subtest 2	9262	1852.4	19.4	2	20.5	9.4	2	10.5
		9400	1880.0	19.9			9.8		
		9538	1907.6	19.7			9.7		
	Subtest 3	9262	1852.4	20.4	1	21.5	10.4	1	11.5
		9400	1880.0	20.9			10.8		
		9538	1907.6	20.7			10.7		
	Subtest 4	9262	1852.4	19.4	2	20.5	9.4	2	10.5
		9400	1880.0	19.9			9.8		
		9538	1907.6	19.8			9.7		
	Subtest 5	9262	1852.4	21.0	0	22.5	11.5	0	12.5
		9400	1880.0	21.4			11.9		
		9538	1907.6	21.3			11.7		
DC-HSDPA	Subtest 1	9262	1852.4	21.5	0	22.5	11.5	0	12.5
		9400	1880.0	21.9			12.0		
		9538	1907.6	21.8			11.7		
	Subtest 2	9262	1852.4	21.5	0	22.5	11.5	0	12.5
		9400	1880.0	21.9			12.0		
		9538	1907.6	21.7			11.8		
	Subtest 3	9262	1852.4	21.0	0.5	22.0	11.0	0.5	12.0
		9400	1880.0	21.4			11.5		
		9538	1907.6	21.3			11.3		
	Subtest 4	9262	1852.4	21.0	0.5	22.0	11.0	0.5	12.0
		9400	1880.0	21.4			11.4		
		9538	1907.6	21.3			11.3		

**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	22.3	N/A	23.5	12.3	N/A	13.5
		1413	1732.6	22.5			12.5		
		1513	1752.6	22.9			12.8		
HSDPA	Subtest 1	1312	1712.4	21.0	0	22.5	11.0	0	12.5
		1413	1732.6	21.3			11.2		
		1513	1752.6	21.7			11.7		
	Subtest 2	1312	1712.4	21.1	0	22.5	11.1	0	12.5
		1413	1732.6	21.3			11.2		
		1513	1752.6	21.7			11.6		
	Subtest 3	1312	1712.4	20.5	0.5	22.0	10.5	0.5	12.0
		1413	1732.6	20.8			10.7		
		1513	1752.6	21.2			11.1		
	Subtest 4	1312	1712.4	20.5	0.5	22.0	10.5	0.5	12.0
		1413	1732.6	20.8			10.7		
		1513	1752.6	21.2			11.1		
HSUPA	Subtest 1	1312	1712.4	21.0	0	22.5	11.0	0	12.5
		1413	1732.6	21.3			11.2		
		1513	1752.6	21.7			11.6		
	Subtest 2	1312	1712.4	19.0	1	21.5	9.0	2	10.5
		1413	1732.6	19.3			9.2		
		1513	1752.6	19.7			9.6		
	Subtest 3	1312	1712.4	20.0	0	22.5	10.5	1	11.5
		1413	1732.6	20.3			10.2		
		1513	1752.6	20.6			10.6		
	Subtest 4	1312	1712.4	19.0	1	21.5	9.0	2	10.5
		1413	1732.6	19.2			9.2		
		1513	1752.6	19.7			9.6		
	Subtest 5	1312	1712.4	20.6	0	22.5	11.5	0	12.5
		1413	1732.6	20.8			10.8		
		1513	1752.6	21.3			11.2		
DC-HSDPA	Subtest 1	1312	1712.4	21.1	0	22.5	11.0	0	12.5
		1413	1732.6	21.3			11.2		
		1513	1752.6	21.7			11.6		
	Subtest 2	1312	1712.4	21.1	0	22.5	11.5	0	12.5
		1413	1732.6	21.3			11.2		
		1513	1752.6	21.7			11.6		
	Subtest 3	1312	1712.4	20.5	0.5	22.0	11.0	0.5	12.0
		1413	1732.6	20.8			10.7		
		1513	1752.6	21.2			11.1		
	Subtest 4	1312	1712.4	20.5	0.5	22.0	11.0	0.5	12.0
		1413	1732.6	20.8			10.7		
		1513	1752.6	21.2			11.1		

**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	24.5	N/A	25.0	15.0	N/A	15.0
		4183	836.6	24.4			14.9		
		4233	846.6	24.1			14.6		
HSDPA	Subtest 1	4132	826.4	23.5	0	24.0	14.0	0	14.0
		4183	836.6	23.4			13.9		
		4233	846.6	23.1			13.5		
	Subtest 2	4132	826.4	23.5	0	24.0	14.0	0	14.0
		4183	836.6	23.4			13.9		
		4233	846.6	23.1			13.6		
	Subtest 3	4132	826.4	23.0	0.5	23.5	13.5	0.5	13.5
		4183	836.6	22.9			13.4		
		4233	846.6	22.6			13.1		
	Subtest 4	4132	826.4	23.0	0.5	23.5	13.5	0.5	13.5
		4183	836.6	22.9			13.4		
		4233	846.6	22.6			13.1		
HSUPA	Subtest 1	4132	826.4	23.5	0	24.0	14.0	0	14.0
		4183	836.6	23.4			13.9		
		4233	846.6	23.1			13.6		
	Subtest 2	4132	826.4	21.5	2	22.0	12.0	2	12.0
		4183	836.6	21.4			11.9		
		4233	846.6	21.1			11.6		
	Subtest 3	4132	826.4	22.5	1	23.0	12.9	1	13.0
		4183	836.6	22.4			12.9		
		4233	846.6	22.1			12.6		
	Subtest 4	4132	826.4	21.5	2	22.0	11.9	2	12.0
		4183	836.6	21.4			11.9		
		4233	846.6	21.1			11.6		
	Subtest 5	4132	826.4	23.0	0	24.0	13.5	0	14.0
		4183	836.6	23.0			13.4		
		4233	846.6	22.6			13.1		
DC-HSDPA	Subtest 1	4132	826.4	23.5	0	24.0	14.0	0	14.0
		4183	836.6	23.4			13.9		
		4233	846.6	23.1			13.5		
	Subtest 2	4132	826.4	23.5	0	24.0	14.0	0	14.0
		4183	836.6	23.4			13.9		
		4233	846.6	23.1			13.6		
	Subtest 3	4132	826.4	23.0	0.5	23.5	13.5	0.5	13.5
		4183	836.6	22.9			13.4		
		4233	846.6	22.6			13.0		
	Subtest 4	4132	826.4	23.0	0.5	23.5	13.5	0.5	13.5
		4183	836.6	22.9			13.4		
		4233	846.6	22.6			13.1		

### 9.3 LTE

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

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

**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 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 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) in Max Power

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.



**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 1860 MHz	18900 1880 MHz	19100 1900 MHz			18700 1860 MHz	18900 1880 MHz	19100 1900 MHz		
20 MHz	QPSK	1	0	22.4	22.7	22.7	0.0	24.0	12.5	12.6	12.7	0.0	14.0
		1	49	22.4	22.7	22.7	0.0	24.0	12.4	12.8	12.7	0.0	14.0
		1	99	22.5	22.7	22.6	0.0	24.0	12.6	12.8	12.7	0.0	14.0
		50	0	21.4	21.6	21.6	1.0	23.0	12.5	12.7	12.6	0.0	14.0
		50	24	21.6	21.8	21.8	1.0	23.0	12.6	12.8	12.8	0.0	14.0
		50	50	21.5	21.8	21.7	1.0	23.0	12.7	13.0	12.8	0.0	14.0
	16QAM	100	0	21.5	21.7	21.7	1.0	23.0	12.5	12.7	12.8	0.0	14.0
		1	0	22.0	22.2	22.1	1.0	23.0	12.9	13.2	13.2	0.0	14.0
		1	49	22.0	22.3	22.1	1.0	23.0	12.9	13.4	13.2	0.0	14.0
		1	99	22.1	22.3	22.0	1.0	23.0	13.1	13.4	13.2	0.0	14.0
		50	0	20.5	20.6	20.6	2.0	22.0	12.5	12.7	12.7	0.0	14.0
		50	24	20.6	20.8	20.8	2.0	22.0	12.6	12.9	12.9	0.0	14.0
	64QAM	50	50	20.5	20.8	20.7	2.0	22.0	12.6	12.9	12.8	0.0	14.0
		100	0	20.5	20.7	20.7	2.0	22.0	12.5	12.8	12.8	0.0	14.0
		1	0	20.9	21.3	21.0	2.0	22.0	13.4	13.4	13.1	0.0	14.0
		1	49	20.8	21.5	21.0	2.0	22.0	13.3	13.3	13.1	0.0	14.0
		1	99	20.9	21.4	20.9	2.0	22.0	13.1	13.2	13.0	0.0	14.0
		50	0	19.6	19.7	19.7	3.0	21.0	12.7	12.8	12.8	0.0	14.0
15 MHz	QPSK	50	24	19.7	19.8	19.8	3.0	21.0	12.8	13.0	12.9	0.0	14.0
		50	50	19.7	19.9	19.8	3.0	21.0	12.8	13.0	12.9	0.0	14.0
		100	0	19.5	19.7	19.8	3.0	21.0	12.7	12.9	12.9	0.0	14.0
		1	0	22.4	22.7	22.8	0.0	24.0	12.3	12.8	12.8	0.0	14.0
		1	37	22.5	22.8	22.8	0.0	24.0	12.5	12.8	12.7	0.0	14.0
		1	74	22.5	22.8	22.7	0.0	24.0	12.4	12.8	12.7	0.0	14.0
	16QAM	36	0	21.5	21.7	21.7	1.0	23.0	12.5	12.7	12.8	0.0	14.0
		36	20	21.6	21.8	21.7	1.0	23.0	12.5	12.8	12.8	0.0	14.0
		36	39	21.6	21.9	21.8	1.0	23.0	12.5	12.9	12.8	0.0	14.0
		75	0	21.5	21.7	21.7	1.0	23.0	12.5	12.8	12.8	0.0	14.0
		1	0	21.7	21.7	22.2	1.0	23.0	12.7	13.1	12.7	0.0	14.0
		1	37	21.9	21.8	22.1	1.0	23.0	12.8	13.3	12.7	0.0	14.0
	64QAM	1	74	21.9	21.8	22.1	1.0	23.0	12.8	13.2	12.6	0.0	14.0
		36	0	20.5	20.7	20.7	2.0	22.0	12.5	12.8	12.8	0.0	14.0
		36	20	20.6	20.8	20.8	2.0	22.0	12.6	12.8	12.8	0.0	14.0
		36	39	20.6	20.9	20.9	2.0	22.0	12.6	12.9	12.8	0.0	14.0
		75	0	20.6	20.8	20.7	2.0	22.0	12.5	12.8	12.8	0.0	14.0
		1	0	21.0	21.1	20.9	2.0	22.0	12.3	13.1	13.0	0.0	14.0
10 MHz	QPSK	1	37	21.2	21.2	20.9	2.0	22.0	12.5	13.2	13.0	0.0	14.0
		1	74	21.2	21.2	20.9	2.0	22.0	13.2	13.2	12.9	0.0	14.0
		36	0	19.6	19.8	19.8	3.0	21.0	12.6	12.9	12.9	0.0	14.0
		36	20	19.7	19.9	19.9	3.0	21.0	12.7	13.0	13.0	0.0	14.0
		36	39	19.7	20.0	19.9	3.0	21.0	12.7	13.1	13.0	0.0	14.0
		75	0	19.6	19.8	19.8	3.0	21.0	12.7	12.9	12.9	0.0	14.0
	16QAM	1	0	22.4	22.6	23.0	0.0	24.0	12.3	12.5	12.9	0.0	14.0
		1	25	22.7	23.0	22.9	0.0	24.0	12.7	13.0	12.9	0.0	14.0
		1	49	22.4	22.7	22.9	0.0	24.0	12.4	12.8	12.9	0.0	14.0
		25	0	21.6	21.8	21.7	1.0	23.0	12.6	12.9	12.7	0.0	14.0
		25	12	21.8	21.9	22.0	1.0	23.0	12.7	13.1	12.9	0.0	14.0
		25	25	21.7	22.0	21.9	1.0	23.0	12.6	13.0	12.9	0.0	14.0
	64QAM	50	0	21.7	21.9	21.9	1.0	23.0	12.6	12.9	12.8	0.0	14.0
		1	0	21.4	21.7	22.4	1.0	23.0	12.7	12.6	12.9	0.0	14.0
		1	25	21.7	22.1	22.3	1.0	23.0	13.1	13.1	12.9	0.0	14.0
		1	49	21.4	21.8	22.3	1.0	23.0	12.8	12.8	12.8	0.0	14.0
		25	0	20.8	20.9	20.8	2.0	22.0	12.6	13.0	12.9	0.0	14.0
		25	12	20.9	21.0	20.9	2.0	22.0	12.8	13.2	13.0	0.0	14.0
16QAM	25	25	20.8	21.0	20.9	2.0	22.0	12.7	13.1	12.9	0.0	14.0	
	50	0	20.7	20.9	20.9	2.0	22.0	12.7	12.9	12.8	0.0	14.0	
	1	0	20.7	21.0	21.1	2.0	22.0	12.4	13.0	13.2	0.0	14.0	
	1	25	21.0	21.4	21.1	2.0	22.0	12.7	13.4	13.2	0.0	14.0	
	1	49	20.7	21.1	21.1	2.0	22.0	12.7	13.2	13.1	0.0	14.0	
	25	0	19.9	19.9	20.0	3.0	21.0	12.9	13.1	13.0	0.0	14.0	
64QAM	25	12	19.9	20.1	20.1	3.0	21.0	13.0	13.2	13.1	0.0	14.0	
	25	25	19.7	20.0	20.0	3.0	21.0	12.8	13.1	13.1	0.0	14.0	
	50	0	19.7	19.9	20.0	3.0	21.0	12.8	13.0	13.0	0.0	14.0	

**LTE Band 2 Measured Results (continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pw r (dBm)			MPR	Tune-up Limit	Measured Pw r (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	22.7	22.9	22.9	0.0	24.0	12.6	12.9	13.0	0.0	14.0	
		1	12	22.8	23.0	22.9	0.0	24.0	12.7	13.1	13.0	0.0	14.0	
		1	24	22.7	23.0	22.8	0.0	24.0	12.5	13.0	12.9	0.0	14.0	
		12	0	21.8	22.0	22.0	1.0	23.0	12.7	13.0	13.0	0.0	14.0	
		12	7	21.8	22.0	22.0	1.0	23.0	12.7	13.1	13.0	0.0	14.0	
		12	13	21.8	22.0	21.9	1.0	23.0	12.7	13.1	12.9	0.0	14.0	
		25	0	21.7	22.0	21.9	1.0	23.0	12.7	13.0	13.0	0.0	14.0	
	16QAM	1	0	21.9	22.1	22.4	1.0	23.0	13.2	13.1	13.1	0.0	14.0	
		1	12	21.9	22.2	22.5	1.0	23.0	13.2	13.2	13.1	0.0	14.0	
		1	24	21.8	22.1	22.4	1.0	23.0	13.2	13.1	13.0	0.0	14.0	
		12	0	20.9	21.1	21.1	2.0	22.0	12.9	13.1	13.1	0.0	14.0	
		12	7	20.9	21.1	21.1	2.0	22.0	12.9	13.1	13.1	0.0	14.0	
		12	13	20.8	21.1	21.0	2.0	22.0	12.9	13.1	13.0	0.0	14.0	
		25	0	20.7	21.0	21.0	2.0	22.0	12.8	13.0	13.0	0.0	14.0	
	64QAM	1	0	21.0	20.9	21.3	2.0	22.0	13.1	13.0	13.3	0.0	14.0	
		1	12	21.1	21.1	21.2	2.0	22.0	13.0	13.2	13.3	0.0	14.0	
		1	24	21.0	20.9	21.2	2.0	22.0	13.0	13.0	13.3	0.0	14.0	
		12	0	19.9	20.1	19.9	3.0	21.0	13.0	13.2	13.0	0.0	14.0	
		12	7	19.9	20.1	20.0	3.0	21.0	13.0	13.2	13.0	0.0	14.0	
		12	13	19.9	20.1	19.9	3.0	21.0	12.9	13.2	13.0	0.0	14.0	
		25	0	19.8	20.0	19.9	3.0	21.0	12.9	13.1	13.0	0.0	14.0	
	3 MHz	QPSK	1	0	22.7	22.9	22.9	0.0	24.0	12.7	12.9	12.9	0.0	14.0
			1	8	22.6	22.9	22.9	0.0	24.0	12.7	12.9	12.8	0.0	14.0
			1	14	22.6	22.9	22.8	0.0	24.0	12.6	12.9	12.8	0.0	14.0
			8	0	21.8	22.0	21.9	1.0	23.0	12.7	13.0	13.0	0.0	14.0
8			4	21.8	22.0	22.0	1.0	23.0	12.7	13.0	13.0	0.0	14.0	
8			7	21.8	22.0	21.9	1.0	23.0	12.7	13.0	13.0	0.0	14.0	
15			0	21.8	22.0	21.9	1.0	23.0	12.7	13.0	13.0	0.0	14.0	
16QAM		1	0	21.8	21.9	22.3	1.0	23.0	13.1	13.1	12.9	0.0	14.0	
		1	8	21.7	22.0	22.3	1.0	23.0	13.1	13.1	12.8	0.0	14.0	
		1	14	21.7	21.9	22.3	1.0	23.0	13.1	13.1	12.8	0.0	14.0	
		8	0	20.9	21.1	21.0	2.0	22.0	12.8	13.1	13.1	0.0	14.0	
		8	4	20.9	21.1	21.0	2.0	22.0	12.9	13.1	13.1	0.0	14.0	
		8	7	20.9	21.1	21.0	2.0	22.0	12.8	13.1	13.1	0.0	14.0	
		15	0	20.7	21.0	21.0	2.0	22.0	12.8	13.0	13.0	0.0	14.0	
64QAM		1	0	21.1	21.4	21.1	2.0	22.0	13.2	13.4	13.4	0.0	14.0	
		1	8	21.0	21.4	21.1	2.0	22.0	13.3	13.3	13.3	0.0	14.0	
		1	14	21.0	21.4	21.0	2.0	22.0	12.9	13.3	13.3	0.0	14.0	
		8	0	19.8	20.1	20.1	3.0	21.0	12.9	13.1	13.1	0.0	14.0	
		8	4	19.8	20.1	20.1	3.0	21.0	13.0	13.1	13.2	0.0	14.0	
		8	7	19.8	20.1	20.1	3.0	21.0	12.9	13.1	13.2	0.0	14.0	
		15	0	19.9	20.0	20.0	3.0	21.0	12.9	13.2	13.1	0.0	14.0	
1.4 MHz		QPSK	1	0	22.7	22.9	22.9	0.0	24.0	12.6	12.8	12.8	0.0	14.0
			1	3	22.8	23.0	22.9	0.0	24.0	12.6	13.0	12.9	0.0	14.0
			1	5	22.7	22.9	22.8	0.0	24.0	12.6	12.9	12.8	0.0	14.0
			3	0	22.7	22.9	22.8	0.0	24.0	12.6	12.8	12.8	0.0	14.0
	3		1	22.7	22.9	22.9	0.0	24.0	12.6	12.9	12.8	0.0	14.0	
	3		3	22.7	22.9	22.9	0.0	24.0	12.6	13.0	12.8	0.0	14.0	
	6		0	21.7	21.9	21.9	1.0	23.0	12.7	12.9	12.9	0.0	14.0	
	16QAM	1	0	22.2	21.9	22.1	1.0	23.0	13.1	13.0	13.0	0.0	14.0	
		1	3	22.2	22.1	22.1	1.0	23.0	13.2	13.1	13.1	0.0	14.0	
		1	5	22.1	22.0	22.0	1.0	23.0	13.0	13.0	13.0	0.0	14.0	
		3	0	22.0	22.2	21.9	1.0	23.0	12.9	13.1	13.0	0.0	14.0	
		3	1	22.0	22.2	22.0	1.0	23.0	12.9	13.2	13.0	0.0	14.0	
		3	3	21.9	22.2	22.0	1.0	23.0	12.9	13.2	13.0	0.0	14.0	
		6	0	20.6	21.1	21.1	2.0	22.0	12.6	13.1	13.0	0.0	14.0	
	64QAM	1	0	21.2	21.1	21.2	2.0	22.0	13.1	13.2	13.1	0.0	14.0	
		1	3	21.3	21.2	21.2	2.0	22.0	13.1	13.3	13.2	0.0	14.0	
		1	5	21.2	21.1	21.2	2.0	22.0	13.0	13.3	13.0	0.0	14.0	
		3	0	21.1	21.1	20.9	2.0	22.0	12.8	13.4	13.1	0.0	14.0	
		3	1	21.1	21.2	20.9	2.0	22.0	12.8	13.4	13.2	0.0	14.0	
		3	3	21.1	21.2	20.9	2.0	22.0	12.8	13.2	13.2	0.0	14.0	
		6	0	19.7	20.3	20.0	3.0	21.0	12.9	13.1	13.3	0.0	14.0	

**LTE Band 4 Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm) Proximity sensor back-off				
				Measured Pw r (dBm)			MPR	Tune-up Limit	Measured Pw r (dBm)			MPR	Tune-up Limit
				20050	20175	20300			20050	20175	20300		
				1720 MHz	1732.5 MHz	1745 MHz			1720 MHz	1732.5 MHz	1745 MHz		
20 MHz	QPSK	1	0	22.1	22.2	22.4	0.0	24.0	12.2	12.3	12.4	0.0	14.0
		1	49	22.5	22.6	22.6	0.0	24.0	12.6	13.0	12.8	0.0	14.0
		1	99	22.3	22.5	22.3	0.0	24.0	12.4	12.6	12.7	0.0	14.0
		50	0	21.4	21.5	21.7	1.0	23.0	12.5	12.6	12.7	0.0	14.0
		50	24	21.6	21.7	21.9	1.0	23.0	12.7	13.0	13.0	0.0	14.0
		50	50	21.6	21.6	21.8	1.0	23.0	12.6	12.8	12.9	0.0	14.0
	16QAM	100	0	21.5	21.6	21.8	1.0	23.0	12.6	12.7	12.9	0.0	14.0
		1	0	21.7	21.7	21.8	1.0	23.0	12.6	12.9	12.9	0.0	14.0
		1	49	22.1	22.2	22.2	1.0	23.0	13.0	13.3	13.3	0.0	14.0
		1	99	21.9	22.1	22.1	1.0	23.0	12.8	13.2	13.3	0.0	14.0
		50	0	20.5	20.5	20.7	2.0	22.0	12.5	12.7	12.8	0.0	14.0
		50	24	20.6	20.7	20.8	2.0	22.0	12.7	12.9	13.0	0.0	14.0
	64QAM	50	50	20.6	20.7	20.8	2.0	22.0	12.6	12.8	13.0	0.0	14.0
		100	0	20.6	20.6	20.8	2.0	22.0	12.6	12.8	12.9	0.0	14.0
		1	0	20.5	20.9	20.6	2.0	22.0	15.2	13.0	20.6	0.0	14.0
		1	49	20.9	21.3	21.1	2.0	22.0	13.0	13.4	21.1	0.0	14.0
		1	99	20.7	21.2	21.0	2.0	22.0	20.8	13.2	21.0	0.0	14.0
		50	0	19.6	19.6	19.7	3.0	21.0	19.6	12.7	18.2	0.0	14.0
15 MHz	QPSK	50	24	19.7	19.8	19.9	3.0	21.0	19.7	12.8	13.0	0.0	14.0
		50	50	19.6	19.8	19.8	3.0	21.0	17.8	12.8	12.9	0.0	14.0
		100	0	19.6	19.6	19.8	3.0	21.0	12.7	12.4	19.8	0.0	14.0
		1	0	22.3	22.3	22.5	0.0	24.0	12.3	12.3	12.6	0.0	14.0
		1	37	22.5	22.6	22.7	0.0	24.0	12.5	12.6	12.8	0.0	14.0
		1	74	22.4	22.6	22.7	0.0	24.0	12.5	12.6	12.8	0.0	14.0
	16QAM	36	0	21.4	21.5	21.7	1.0	23.0	12.5	12.6	12.8	0.0	14.0
		36	20	21.6	21.6	21.8	1.0	23.0	12.6	12.7	12.9	0.0	14.0
		36	39	21.5	21.6	21.9	1.0	23.0	12.6	12.7	12.9	0.0	14.0
		75	0	21.5	21.6	21.7	1.0	23.0	12.5	12.7	12.8	0.0	14.0
		1	0	21.6	21.7	21.5	1.0	23.0	12.7	12.3	13.0	0.0	14.0
		1	37	21.9	22.0	21.8	1.0	23.0	12.9	12.6	13.2	0.0	14.0
	64QAM	1	74	21.8	21.9	21.8	1.0	23.0	12.9	12.5	13.2	0.0	14.0
		36	0	20.5	20.5	20.7	2.0	22.0	12.5	12.6	12.8	0.0	14.0
		36	20	20.6	20.6	20.8	2.0	22.0	12.6	12.7	12.9	0.0	14.0
		36	39	20.6	20.6	20.9	2.0	22.0	12.6	12.7	13.0	0.0	14.0
		75	0	20.5	20.6	20.7	2.0	22.0	12.6	12.7	12.9	0.0	14.0
		1	0	20.4	21.0	20.9	2.0	22.0	12.4	12.7	12.6	0.0	14.0
10 MHz	QPSK	1	37	20.7	21.2	21.2	2.0	22.0	12.7	13.0	13.5	0.0	14.0
		1	74	20.6	21.2	21.2	2.0	22.0	12.6	12.9	13.5	0.0	14.0
		36	0	19.6	19.6	19.8	3.0	21.0	12.6	12.6	12.8	0.0	14.0
		36	20	19.7	19.7	19.9	3.0	21.0	12.7	12.8	13.0	0.0	14.0
		36	39	19.7	19.7	19.9	3.0	21.0	12.7	12.8	13.0	0.0	14.0
		75	0	19.6	19.7	19.8	3.0	21.0	12.6	12.7	12.9	0.0	14.0
	16QAM	1	0	21.7	21.4	21.7	1.0	23.0	12.4	12.5	13.1	0.0	14.0
		1	25	22.1	21.8	22.1	1.0	23.0	12.7	12.8	13.4	0.0	14.0
		1	49	21.8	21.5	21.8	1.0	23.0	12.4	12.6	13.3	0.0	14.0
		25	0	20.5	20.7	20.9	2.0	22.0	12.7	12.8	13.0	0.0	14.0
		25	12	20.7	20.9	21.2	2.0	22.0	12.8	13.0	13.2	0.0	14.0
		25	25	20.7	20.8	21.0	2.0	22.0	12.7	12.9	13.1	0.0	14.0
	64QAM	50	0	20.6	20.7	21.0	2.0	22.0	12.7	12.8	13.0	0.0	14.0
		1	0	20.6	20.8	20.8	2.0	22.0	12.7	12.7	12.8	0.0	14.0
		1	25	20.9	21.2	21.3	2.0	22.0	13.1	13.0	13.2	0.0	14.0
		1	49	20.7	20.9	21.1	2.0	22.0	12.7	12.8	13.0	0.0	14.0
		25	0	19.7	19.8	20.0	3.0	21.0	12.7	12.8	13.0	0.0	14.0
		25	12	19.8	19.9	20.2	3.0	21.0	12.8	13.0	13.2	0.0	14.0
10 MHz	64QAM	25	25	19.7	19.8	20.2	3.0	21.0	12.7	12.9	13.1	0.0	14.0
		50	0	19.7	19.8	20.1	3.0	21.0	12.7	12.8	13.1	0.0	14.0

**LTE Band 4 Measured Results (continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pw r (dBm)			MPR	Tune-up Limit	Measured Pw r (dBm)			MPR	Tune-up Limit	
				19975	20175	20375			19975	20175	20375			
				1712.5 MHz	1732.5 MHz	1752.5 MHz			1712.5 MHz	1732.5 MHz	1752.5 MHz			
5 MHz	QPSK	1	0	22.5	22.7	23.0	0.0	24.0	12.6	12.8	13.0	0.0	14.0	
		1	12	22.7	22.7	23.1	0.0	24.0	12.7	12.9	13.1	0.0	14.0	
		1	24	22.5	22.7	23.1	0.0	24.0	12.6	12.8	13.0	0.0	14.0	
		12	0	21.6	21.8	22.1	1.0	23.0	12.7	12.8	13.1	0.0	14.0	
		12	7	21.7	21.9	22.1	1.0	23.0	12.8	12.9	13.1	0.0	14.0	
		12	13	21.7	21.8	22.1	1.0	23.0	12.7	12.9	13.2	0.0	14.0	
		25	0	21.7	21.8	22.1	1.0	23.0	12.7	12.9	13.1	0.0	14.0	
	16QAM	1	0	22.1	21.8	22.1	1.0	23.0	12.7	13.0	13.6	0.0	14.0	
		1	12	22.2	22.0	22.3	1.0	23.0	12.8	13.1	13.7	0.0	14.0	
		1	24	22.1	21.9	22.2	1.0	23.0	12.8	13.0	13.6	0.0	14.0	
		12	0	20.8	20.8	21.1	2.0	22.0	12.7	12.9	13.2	0.0	14.0	
		12	7	20.9	20.9	21.2	2.0	22.0	12.8	13.0	13.3	0.0	14.0	
		12	13	20.8	20.9	21.2	2.0	22.0	12.8	13.0	13.3	0.0	14.0	
		25	0	20.8	20.8	21.1	2.0	22.0	12.7	12.9	13.2	0.0	14.0	
	64QAM	1	0	21.0	21.0	21.0	2.0	22.0	12.6	13.1	13.4	0.0	14.0	
		1	12	21.0	21.1	21.1	2.0	22.0	12.7	13.1	13.5	0.0	14.0	
		1	24	21.0	21.1	21.0	2.0	22.0	12.6	13.1	13.5	0.0	14.0	
		12	0	19.6	19.9	20.2	3.0	21.0	12.8	12.9	13.1	0.0	14.0	
		12	7	19.7	20.0	20.2	3.0	21.0	12.8	13.0	13.1	0.0	14.0	
		12	13	19.7	19.9	20.2	3.0	21.0	12.8	13.0	13.2	0.0	14.0	
		25	0	19.7	19.9	20.1	3.0	21.0	12.7	12.9	13.1	0.0	14.0	
	3 MHz	QPSK	1	0	22.6	22.7	23.0	0.0	24.0	12.6	12.7	13.1	0.0	14.0
			1	8	22.6	22.7	23.1	0.0	24.0	12.5	12.7	13.1	0.0	14.0
			1	14	22.6	22.7	23.0	0.0	24.0	12.5	12.8	13.1	0.0	14.0
			8	0	21.7	21.7	22.1	1.0	23.0	12.7	12.8	13.1	0.0	14.0
8			4	21.7	21.8	22.1	1.0	23.0	12.7	12.9	13.2	0.0	14.0	
8			7	21.7	21.8	22.2	1.0	23.0	12.7	12.9	13.2	0.0	14.0	
16QAM		15	0	21.7	21.8	22.1	1.0	23.0	12.7	12.9	13.1	0.0	14.0	
		1	0	22.0	21.8	22.0	1.0	23.0	12.7	12.8	13.5	0.0	14.0	
		1	8	22.1	21.8	22.1	1.0	23.0	12.7	12.8	13.5	0.0	14.0	
		1	14	22.1	21.8	22.0	1.0	23.0	12.7	12.8	13.6	0.0	14.0	
		8	0	20.8	20.8	21.2	2.0	22.0	12.7	12.9	13.2	0.0	14.0	
		8	4	20.8	20.9	21.2	2.0	22.0	12.8	13.0	13.3	0.0	14.0	
64QAM		8	7	20.8	20.9	21.3	2.0	22.0	12.8	13.1	13.3	0.0	14.0	
		15	0	20.7	20.8	21.2	2.0	22.0	12.7	12.9	13.2	0.0	14.0	
		1	0	20.8	21.1	21.5	2.0	22.0	13.0	13.1	13.3	0.0	14.0	
		1	8	20.8	21.1	21.5	2.0	22.0	13.0	13.1	13.3	0.0	14.0	
		1	14	20.8	21.2	21.5	2.0	22.0	13.0	13.1	13.3	0.0	14.0	
		8	0	19.8	19.8	20.2	3.0	21.0	12.8	12.9	13.2	0.0	14.0	
1.4 MHz	QPSK	8	4	19.8	19.9	20.2	3.0	21.0	12.8	12.9	13.3	0.0	14.0	
		8	7	19.8	19.9	20.3	3.0	21.0	12.8	12.9	13.3	0.0	14.0	
		15	0	19.8	19.9	20.2	3.0	21.0	12.7	12.9	13.3	0.0	14.0	
		1	0	22.5	22.7	23.0	0.0	24.0	12.5	12.7	13.0	0.0	14.0	
		1	3	22.6	22.8	23.1	0.0	24.0	12.7	12.8	13.1	0.0	14.0	
		1	5	22.5	22.7	23.0	0.0	24.0	12.6	12.7	13.1	0.0	14.0	
	16QAM	3	0	22.5	22.6	23.0	0.0	24.0	12.6	12.6	13.0	0.0	14.0	
		3	1	22.6	22.7	23.0	0.0	24.0	12.7	12.8	13.0	0.0	14.0	
		3	3	22.6	22.7	23.0	0.0	24.0	12.6	12.8	13.0	0.0	14.0	
		6	0	21.6	21.7	22.0	1.0	23.0	12.6	12.8	13.1	0.0	14.0	
		1	0	21.6	21.8	22.4	1.0	23.0	13.0	12.8	13.2	0.0	14.0	
		1	3	21.7	22.0	22.5	1.0	23.0	13.1	12.9	13.3	0.0	14.0	
64QAM	1	5	21.7	21.9	22.5	1.0	23.0	13.0	12.8	13.2	0.0	14.0		
	3	0	21.8	21.7	22.2	1.0	23.0	12.8	12.9	13.1	0.0	14.0		
	3	1	21.9	21.8	22.2	1.0	23.0	12.9	13.1	13.2	0.0	14.0		
	3	3	21.8	21.8	22.2	1.0	23.0	12.9	13.1	13.2	0.0	14.0		
	6	0	20.8	20.9	20.9	2.0	22.0	12.6	13.0	13.2	0.0	14.0		
	1	0	20.7	21.0	21.5	2.0	22.0	12.8	12.9	13.5	0.0	14.0		
64QAM	1	3	20.8	21.1	21.6	2.0	22.0	12.9	13.0	13.6	0.0	14.0		
	1	5	20.7	21.1	21.5	2.0	22.0	12.9	12.9	13.5	0.0	14.0		
	3	0	20.8	20.7	21.4	2.0	22.0	12.7	12.9	13.5	0.0	14.0		
	3	1	20.8	20.8	21.5	2.0	22.0	12.7	13.1	13.5	0.0	14.0		
	3	3	20.8	20.8	21.5	2.0	22.0	12.7	13.0	13.5	0.0	14.0		
	6	0	19.9	19.9	20.0	3.0	21.0	12.7	13.2	13.1	0.0	14.0		

**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
				20525	836.5 MHz				20525	836.5 MHz			
10 MHz	QPSK	1	0	24.6			0.0	25.5	15.7			0.0	16.0
		1	25	24.6			0.0	25.5	15.7			0.0	16.0
		1	49	24.5			0.0	25.5	15.7			0.0	16.0
		25	0	23.9			1.0	24.5	15.8			0.0	16.0
		25	12	23.9			1.0	24.5	15.8			0.0	16.0
		25	25	23.7			1.0	24.5	15.8			0.0	16.0
		50	0	23.7			1.0	24.5	15.8			0.0	16.0
	16QAM	1	0	23.9			1.0	24.5	15.8			0.0	16.0
		1	25	23.9			1.0	24.5	15.7			0.0	16.0
		1	49	23.7			1.0	24.5	15.7			0.0	16.0
		25	0	22.9			2.0	23.5	15.9			0.0	16.0
		25	12	22.9			2.0	23.5	15.9			0.0	16.0
		25	25	22.8			2.0	23.5	15.8			0.0	16.0
		50	0	22.7			2.0	23.5	15.7			0.0	16.0
	64QAM	1	0	23.0			2.0	23.5	15.9			0.0	16.0
		1	25	23.0			2.0	23.5	15.9			0.0	16.0
		1	49	23.0			2.0	23.5	15.8			0.0	16.0
		25	0	22.0			3.0	22.5	15.9			0.0	16.0
		25	12	22.0			3.0	22.5	15.9			0.0	16.0
		25	25	21.9			3.0	22.5	15.8			0.0	16.0
		50	0	21.8			3.0	22.5	15.6			0.0	16.0
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	24.8	24.7	24.6	0.0	25.5	15.9	15.7	15.5	0.0	16.0
		1	12	25.0	24.8	24.5	0.0	25.5	15.9	15.7	15.4	0.0	16.0
		1	24	24.9	24.7	24.5	0.0	25.5	15.8	15.7	15.3	0.0	16.0
		12	0	23.8	23.8	23.5	1.0	24.5	15.9	15.7	15.5	0.0	16.0
		12	7	23.9	23.9	23.5	1.0	24.5	16.0	15.8	15.5	0.0	16.0
		12	13	23.9	23.9	23.5	1.0	24.5	15.9	15.8	15.4	0.0	16.0
		25	0	23.9	23.9	23.6	1.0	24.5	15.9	15.7	15.5	0.0	16.0
	16QAM	1	0	24.3	23.9	23.7	1.0	24.5	15.9	15.9	15.6	0.0	16.0
		1	12	24.3	23.9	23.6	1.0	24.5	16.0	15.9	16.0	0.0	16.0
		1	24	24.3	23.9	23.6	1.0	24.5	15.9	15.8	15.9	0.0	16.0
		12	0	23.0	22.9	22.6	2.0	23.5	15.9	15.8	15.6	0.0	16.0
		12	7	23.1	22.9	22.6	2.0	23.5	15.8	15.9	15.6	0.0	16.0
		12	13	23.0	22.9	22.6	2.0	23.5	16.0	15.8	15.6	0.0	16.0
	64QAM	25	0	22.9	22.8	22.6	2.0	23.5	15.8	15.8	15.5	0.0	16.0
		1	0	23.1	23.0	22.7	2.0	23.5	15.7	15.6	15.9	0.0	16.0
		1	12	23.0	23.0	22.7	2.0	23.5	15.8	15.7	15.7	0.0	16.0
		1	24	23.0	23.0	22.7	2.0	23.5	15.7	15.6	15.7	0.0	16.0
		12	0	21.8	21.9	21.8	3.0	22.5	15.9	15.8	15.5	0.0	16.0
12		7	21.9	22.0	21.8	3.0	22.5	15.9	15.8	15.5	0.0	16.0	
12		13	21.9	21.9	21.7	3.0	22.5	16.0	15.8	15.4	0.0	16.0	
25	0	21.9	22.0	21.7	3.0	22.5	15.9	15.7	15.4	0.0	16.0		

**LTE Band 5 Measured Results (continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pw r (dBm)			MPR	Tune-up Limit	Measured Pw r (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	24.8	24.7	24.4	0.0	25.5	15.8	15.6	15.4	0.0	16.0
		1	8	24.8	24.7	24.3	0.0	25.5	15.7	15.6	15.4	0.0	16.0
		1	14	24.8	24.7	24.4	0.0	25.5	15.8	15.6	15.4	0.0	16.0
		8	0	23.9	23.8	23.5	1.0	24.5	15.9	15.7	15.4	0.0	16.0
		8	4	23.9	23.8	23.5	1.0	24.5	16.0	15.8	15.4	0.0	16.0
		8	7	23.9	23.8	23.5	1.0	24.5	16.0	15.8	15.5	0.0	16.0
	16QAM	15	0	23.9	23.8	23.5	1.0	24.5	15.9	15.8	15.4	0.0	16.0
		1	0	24.2	23.8	23.3	1.0	24.5	15.9	15.6	15.8	0.0	16.0
		1	8	24.1	23.8	23.3	1.0	24.5	15.9	15.6	15.7	0.0	16.0
		1	14	24.2	23.7	23.3	1.0	24.5	15.9	15.6	15.8	0.0	16.0
		8	0	22.9	22.9	22.6	2.0	23.5	16.0	15.8	15.5	0.0	16.0
		8	4	23.0	22.9	22.6	2.0	23.5	16.0	15.9	15.5	0.0	16.0
	64QAM	8	7	23.0	22.9	22.6	2.0	23.5	16.0	15.9	15.6	0.0	16.0
		15	0	22.9	22.8	22.6	2.0	23.5	15.9	15.8	15.5	0.0	16.0
		1	0	22.9	23.0	22.5	2.0	23.5	15.9	16.0	15.5	0.0	16.0
		1	8	22.9	23.0	22.5	2.0	23.5	16.0	16.0	15.5	0.0	16.0
		1	14	23.0	23.0	22.5	2.0	23.5	16.0	16.0	15.5	0.0	16.0
		8	0	22.0	22.0	22.5	3.0	22.5	15.9	15.8	15.5	0.0	16.0
		8	4	22.0	22.1	22.5	3.0	22.5	15.9	15.8	15.5	0.0	16.0
		8	7	22.0	22.0	22.5	3.0	22.5	15.9	15.8	15.5	0.0	16.0
		15	0	21.9	22.0	22.5	3.0	22.5	15.9	15.7	15.5	0.0	16.0
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pw r (dBm)			MPR	Tune-up Limit	Measured Pw r (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	24.8	24.7	24.4	0.0	25.5	15.7	15.7	15.3	0.0	16.0
		1	3	24.8	24.7	24.4	0.0	25.5	15.9	15.7	15.4	0.0	16.0
		1	5	24.8	24.8	24.4	0.0	25.5	15.8	15.7	15.3	0.0	16.0
		3	0	24.8	24.7	24.4	0.0	25.5	15.8	15.6	15.3	0.0	16.0
		3	1	24.8	24.8	24.4	0.0	25.5	15.9	15.6	15.3	0.0	16.0
		3	3	24.9	24.7	24.4	0.0	25.5	15.8	15.6	15.3	0.0	16.0
	16QAM	6	0	23.8	23.8	23.4	1.0	24.5	15.9	15.7	15.3	0.0	16.0
		1	0	24.0	24.1	23.4	1.0	24.5	15.8	15.7	15.7	0.0	16.0
		1	3	24.0	24.2	23.5	1.0	24.5	15.9	15.9	15.7	0.0	16.0
		1	5	24.1	24.1	23.5	1.0	24.5	15.9	15.8	15.7	0.0	16.0
		3	0	23.9	24.0	23.6	1.0	24.5	15.8	15.7	15.5	0.0	16.0
		3	1	23.9	24.0	23.7	1.0	24.5	15.9	15.8	15.6	0.0	16.0
	64QAM	3	3	23.9	24.0	23.7	1.0	24.5	15.8	15.8	15.6	0.0	16.0
		6	0	23.0	22.7	22.6	2.0	23.5	15.9	15.8	15.2	0.0	16.0
		1	0	23.0	23.2	22.2	2.0	23.5	15.9	15.8	15.5	0.0	16.0
		1	3	23.1	23.2	22.3	2.0	23.5	16.0	15.9	15.5	0.0	16.0
		1	5	23.0	23.2	22.3	2.0	23.5	15.9	15.8	15.5	0.0	16.0
		3	0	22.8	23.2	22.3	2.0	23.5	15.9	15.8	15.3	0.0	16.0
		3	1	22.8	23.2	22.3	2.0	23.5	16.0	15.8	15.3	0.0	16.0
		3	3	22.8	23.2	22.3	2.0	23.5	15.9	15.8	15.4	0.0	16.0
		6	0	22.0	21.9	22.3	3.0	22.5	15.8	16.0	15.4	0.0	16.0

**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
				23035	23095	23155			23035	23095	23155		
10 MHz	QPSK	1	0	23.9	23.7	23.5	0.0	25.0	14.4	14.2	14.0	0.0	15.0
		1	25	23.7	23.7	23.5	0.0	25.0	14.3	14.2	13.9	0.0	15.0
		1	49	23.6	23.6	23.4	0.0	25.0	14.1	14.0	13.8	0.0	15.0
		25	0	22.8	22.7	22.5	1.0	24.0	14.4	14.2	14.0	0.0	15.0
		25	12	22.8	22.6	22.5	1.0	24.0	14.4	14.2	14.0	0.0	15.0
		25	25	22.6	22.6	22.5	1.0	24.0	14.2	14.2	14.0	0.0	15.0
	16QAM	50	0	22.7	22.7	22.5	1.0	24.0	14.1	14.2	14.0	0.0	15.0
		1	0	22.7	22.6	22.5	1.0	24.0	14.2	14.2	14.0	0.0	15.0
		1	25	22.6	22.6	22.5	1.0	24.0	14.0	14.0	13.9	0.0	15.0
		1	49	22.6	22.6	22.4	1.0	24.0	13.9	14.0	13.8	0.0	15.0
		25	0	21.7	21.7	21.7	2.0	23.0	14.1	14.2	14.2	0.0	15.0
		25	12	21.8	21.8	21.7	2.0	23.0	14.2	14.2	14.1	0.0	15.0
	64QAM	25	25	21.5	21.7	21.7	2.0	23.0	14.0	14.2	14.1	0.0	15.0
		50	0	21.6	21.6	21.5	2.0	23.0	14.0	14.2	14.1	0.0	15.0
		1	0	22.1	22.1	21.6	2.0	23.0	14.4	14.0	14.2	0.0	15.0
		1	25	22.0	22.0	21.5	2.0	23.0	14.3	14.0	14.1	0.0	15.0
		1	49	21.8	21.7	21.6	2.0	23.0	14.2	13.9	14.0	0.0	15.0
		25	0	20.8	20.6	20.6	3.0	22.0	14.1	14.0	13.9	0.0	15.0
		25	12	20.8	20.6	20.6	3.0	22.0	14.1	14.0	13.9	0.0	15.0
		25	25	20.6	20.6	20.6	3.0	22.0	14.0	14.0	13.9	0.0	15.0
50	0	20.7	20.6	20.6	3.0	22.0	14.0	14.0	13.9	0.0	15.0		
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	23.9	23.8	23.5	0.0	25.0	14.4	14.2	14.0	0.0	15.0
		1	12	23.8	23.7	23.5	0.0	25.0	14.3	14.2	13.9	0.0	15.0
		1	24	23.7	23.6	23.4	0.0	25.0	14.1	14.0	13.8	0.0	15.0
		12	0	22.9	22.7	22.5	1.0	24.0	14.4	14.2	14.0	0.0	15.0
		12	7	22.9	22.6	22.5	1.0	24.0	14.4	14.2	14.0	0.0	15.0
		12	13	22.8	22.6	22.5	1.0	24.0	14.2	14.0	14.0	0.0	15.0
	16QAM	25	0	22.9	22.6	22.5	1.0	24.0	14.3	14.2	14.0	0.0	15.0
		1	0	23.0	22.9	23.1	1.0	24.0	14.5	14.3	14.5	0.0	15.0
		1	12	22.9	22.8	23.0	1.0	24.0	14.3	14.3	14.4	0.0	15.0
		1	24	22.9	22.7	22.9	1.0	24.0	14.3	14.2	14.3	0.0	15.0
		12	0	22.0	21.8	21.7	2.0	23.0	14.4	14.2	14.2	0.0	15.0
		12	7	21.9	21.7	21.7	2.0	23.0	14.4	14.2	14.1	0.0	15.0
	64QAM	12	13	21.8	21.7	21.6	2.0	23.0	14.3	14.1	14.1	0.0	15.0
		25	0	21.8	21.6	21.5	2.0	23.0	14.2	14.2	14.1	0.0	15.0
		1	0	22.2	22.1	21.6	2.0	23.0	14.5	14.0	14.2	0.0	15.0
		1	12	22.2	22.0	21.5	2.0	23.0	14.4	14.0	14.1	0.0	15.0
64QAM	1	24	22.0	21.9	21.4	2.0	23.0	14.3	13.9	14.0	0.0	15.0	
	12	0	20.8	20.7	20.7	3.0	22.0	14.3	14.1	13.9	0.0	15.0	
	12	7	20.8	20.6	20.6	3.0	22.0	14.3	14.0	13.9	0.0	15.0	
	12	13	20.7	20.6	20.6	3.0	22.0	14.2	14.0	13.9	0.0	15.0	
25	0	20.8	20.6	20.6	3.0	22.0	14.2	14.0	13.9	0.0	15.0		

**LTE Band 12 Measured Results (continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pw r (dBm)			MPR	Tune-up Limit	Measured Pw r (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	23.8	23.7	23.5	0.0	25.0	14.3	14.1	14.0	0.0	15.0	
		1	8	23.8	23.6	23.4	0.0	25.0	14.2	14.0	14.0	0.0	15.0	
		1	14	23.7	23.5	23.3	0.0	25.0	14.1	14.0	13.8	0.0	15.0	
		8	0	22.9	22.6	22.5	1.0	24.0	14.3	14.2	14.0	0.0	15.0	
		8	4	22.9	22.6	22.5	1.0	24.0	14.3	14.2	14.0	0.0	15.0	
		8	7	22.8	22.6	22.5	1.0	24.0	14.3	14.1	14.0	0.0	15.0	
	16QAM	15	0	22.8	22.6	22.5	1.0	24.0	14.3	14.1	14.0	0.0	15.0	
		1	0	22.9	23.1	22.6	1.0	24.0	14.5	14.0	14.3	0.0	15.0	
		1	8	22.8	23.0	22.5	1.0	24.0	14.3	13.9	14.2	0.0	15.0	
		1	14	22.7	23.0	22.4	1.0	24.0	14.2	13.9	14.2	0.0	15.0	
		8	0	22.0	21.7	21.5	2.0	23.0	14.4	14.2	14.0	0.0	15.0	
		8	4	22.0	21.7	21.5	2.0	23.0	14.3	14.2	14.0	0.0	15.0	
	64QAM	8	7	21.9	21.7	21.5	2.0	23.0	14.3	14.2	14.0	0.0	15.0	
		15	0	21.9	21.7	21.5	2.0	23.0	14.2	14.1	14.0	0.0	15.0	
		1	0	22.0	21.8	21.7	2.0	23.0	14.5	14.4	14.0	0.0	15.0	
		1	8	21.9	21.8	21.6	2.0	23.0	14.5	14.3	13.9	0.0	15.0	
		1	14	21.9	21.7	21.6	2.0	23.0	14.3	14.2	13.9	0.0	15.0	
		8	0	20.9	20.8	20.6	3.0	22.0	14.3	14.1	13.9	0.0	15.0	
	1.4 MHz	QPSK	8	4	20.9	20.7	20.6	3.0	22.0	14.3	14.1	14.0	0.0	15.0
			8	7	20.8	20.7	20.6	3.0	22.0	14.2	14.1	13.9	0.0	15.0
			15	0	20.8	20.7	20.6	3.0	22.0	14.2	14.0	13.9	0.0	15.0
1			0	23.7	23.6	23.3	0.0	25.0	14.3	14.1	13.8	0.0	15.0	
1			3	23.8	23.6	23.5	0.0	25.0	14.3	14.1	13.9	0.0	15.0	
1			5	23.7	23.5	23.3	0.0	25.0	14.1	14.0	13.8	0.0	15.0	
16QAM		3	0	23.8	23.5	23.3	0.0	25.0	14.2	14.0	13.8	0.0	15.0	
		3	1	23.8	23.5	23.4	0.0	25.0	14.2	14.0	13.8	0.0	15.0	
		3	3	23.8	23.5	23.4	0.0	25.0	14.2	13.9	13.8	0.0	15.0	
		6	0	22.8	22.5	22.4	1.0	24.0	14.3	14.0	13.9	0.0	15.0	
		1	0	22.8	22.7	22.8	1.0	24.0	14.3	14.2	14.2	0.0	15.0	
		1	3	22.9	22.8	22.9	1.0	24.0	14.4	14.2	14.2	0.0	15.0	
64QAM		1	5	22.8	22.7	22.7	1.0	24.0	14.3	14.1	14.1	0.0	15.0	
		3	0	23.0	22.6	22.6	1.0	24.0	14.4	14.1	14.0	0.0	15.0	
		3	1	23.1	22.6	22.6	1.0	24.0	14.5	14.1	14.0	0.0	15.0	
		3	3	23.0	22.6	22.6	1.0	24.0	14.5	14.1	14.1	0.0	15.0	
		6	0	22.0	21.7	21.3	2.0	23.0	14.4	14.1	13.7	0.0	15.0	
		1	0	22.1	22.0	21.5	2.0	23.0	14.4	14.3	13.9	0.0	15.0	
16QAM		1	3	22.2	22.1	21.6	2.0	23.0	14.4	14.4	14.0	0.0	15.0	
		1	5	22.0	22.0	21.4	2.0	23.0	14.3	14.2	13.8	0.0	15.0	
		3	0	21.8	22.0	21.6	2.0	23.0	14.2	14.3	13.9	0.0	15.0	
	3	1	21.8	22.0	21.6	2.0	23.0	14.2	14.3	14.0	0.0	15.0		
	3	3	21.8	22.0	21.6	2.0	23.0	14.2	14.3	14.0	0.0	15.0		
	6	0	20.9	20.5	20.7	3.0	22.0	14.3	13.9	14.1	0.0	15.0		



**LTE Band 13 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
				23230	782 MHz			23230	782 MHz		
10 MHz	QPSK	1	0	24.5		0.0	25.0	14.6		0.0	15.0
		1	25	24.5		0.0	25.0	14.6		0.0	15.0
		1	49	24.7		0.0	25.0	14.7		0.0	15.0
		25	0	23.5		1.0	24.0	14.7		0.0	15.0
		25	12	23.5		1.0	24.0	14.8		0.0	15.0
		25	25	23.6		1.0	24.0	14.8		0.0	15.0
	16QAM	50	0	23.5		1.0	24.0	14.7		0.0	15.0
		1	0	23.9		1.0	24.0	14.7		0.0	15.0
		1	25	23.9		1.0	24.0	14.6		0.0	15.0
		1	49	23.7		1.0	24.0	14.7		0.0	15.0
		25	0	22.6		2.0	23.0	14.8		0.0	15.0
		25	12	22.6		2.0	23.0	14.8		0.0	15.0
	64QAM	25	25	22.6		2.0	23.0	14.8		0.0	15.0
		50	0	22.5		2.0	23.0	14.7		0.0	15.0
		1	0	22.5		2.0	23.0	14.9		0.0	15.0
		1	25	22.4		2.0	23.0	14.7		0.0	15.0
		1	49	22.5		2.0	23.0	15.0		0.0	15.0
		25	0	21.6		3.0	22.0	14.8		0.0	15.0
5 MHz	QPSK	25	12	21.6		3.0	22.0	14.8		0.0	15.0
		25	25	21.7		3.0	22.0	14.8		0.0	15.0
		50	0	21.5		3.0	22.0	14.6		0.0	15.0
		1	0	24.4		0.0	25.0	14.6		0.0	15.0
		1	12	24.5		0.0	25.0	14.7		0.0	15.0
		1	24	24.6		0.0	25.0	14.7		0.0	15.0
	16QAM	12	0	23.5		1.0	24.0	14.7		0.0	15.0
		12	7	23.5		1.0	24.0	14.7		0.0	15.0
		12	13	23.6		1.0	24.0	14.7		0.0	15.0
		25	0	23.5		1.0	24.0	14.7		0.0	15.0
		1	0	23.4		1.0	24.0	14.6		0.0	15.0
		1	12	23.5		1.0	24.0	14.6		0.0	15.0
	64QAM	1	24	23.6		1.0	24.0	14.6		0.0	15.0
		12	0	22.6		2.0	23.0	14.8		0.0	15.0
		12	7	22.7		2.0	23.0	14.8		0.0	15.0
		12	13	22.7		2.0	23.0	14.8		0.0	15.0
		25	0	22.6		2.0	23.0	14.8		0.0	15.0
		1	0	22.9		2.0	23.0	15.0		0.0	15.0
64QAM	1	12	22.9		2.0	23.0	15.0		0.0	15.0	
	1	24	23.0		2.0	23.0	15.0		0.0	15.0	
	12	0	21.5		3.0	22.0	14.7		0.0	15.0	
	12	7	21.5		3.0	22.0	14.7		0.0	15.0	
	12	13	21.6		3.0	22.0	14.7		0.0	15.0	
	25	0	21.5		3.0	22.0	14.7		0.0	15.0	

**LTE Band 17 Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				Reduced Average Power (dBm) Proximity sensor back-off			
				Measured Pw r (dBm)		MPR	Tune-up Limit	Measured Pw r (dBm)		MPR	Tune-up Limit
				23790	710 MHz			23790	710 MHz		
10 MHz	QPSK	1	0	23.9	0.0	25.0	16.0	0.0	17.0		
		1	25	23.8	0.0	25.0	16.0	0.0	17.0		
		1	49	23.7	0.0	25.0	15.8	0.0	17.0		
		25	0	22.8	1.0	24.0	16.2	0.0	17.0		
		25	12	22.6	1.0	24.0	16.0	0.0	17.0		
		25	25	22.5	1.0	24.0	16.0	0.0	17.0		
	16QAM	50	0	22.6	1.0	24.0	16.0	0.0	17.0		
		1	0	22.7	1.0	24.0	16.1	0.0	17.0		
		1	25	22.6	1.0	24.0	16.0	0.0	17.0		
		1	49	22.4	1.0	24.0	15.9	0.0	17.0		
		25	0	21.7	2.0	23.0	16.2	0.0	17.0		
		25	12	21.7	2.0	23.0	16.1	0.0	17.0		
		25	25	21.6	2.0	23.0	16.0	0.0	17.0		
		50	0	21.6	2.0	23.0	16.0	0.0	17.0		
	64QAM	1	0	21.9	2.0	23.0	16.5	0.0	17.0		
		1	25	21.8	2.0	23.0	16.4	0.0	17.0		
		1	49	21.7	2.0	23.0	16.2	0.0	17.0		
		25	0	20.8	3.0	22.0	16.2	0.0	17.0		
		25	12	20.7	3.0	22.0	16.1	0.0	17.0		
		25	25	20.6	3.0	22.0	16.0	0.0	17.0		
50	0	20.7	3.0	22.0	16.0	0.0	17.0				
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pw r (dBm)		MPR	Tune-up Limit	Measured Pw r (dBm)		MPR	Tune-up Limit
				23790	710 MHz			23790	710 MHz		
5 MHz	QPSK	1	0	23.7	0.0	25.0	16.1	0.0	17.0		
		1	12	23.6	0.0	25.0	16.1	0.0	17.0		
		1	24	23.5	0.0	25.0	16.0	0.0	17.0		
		12	0	22.6	1.0	24.0	16.1	0.0	17.0		
		12	7	22.6	1.0	24.0	16.0	0.0	17.0		
		12	13	22.6	1.0	24.0	16.0	0.0	17.0		
	16QAM	25	0	22.5	1.0	24.0	16.0	0.0	17.0		
		1	0	22.8	1.0	24.0	16.3	0.0	17.0		
		1	12	22.8	1.0	24.0	16.2	0.0	17.0		
		1	24	22.7	1.0	24.0	16.1	0.0	17.0		
		12	0	21.7	2.0	23.0	16.1	0.0	17.0		
		12	7	21.7	2.0	23.0	16.1	0.0	17.0		
		12	13	21.6	2.0	23.0	16.1	0.0	17.0		
		25	0	21.6	2.0	23.0	16.1	0.0	17.0		
	64QAM	1	0	22.1	2.0	23.0	16.4	0.0	17.0		
		1	12	22.0	2.0	23.0	16.4	0.0	17.0		
		1	24	22.0	2.0	23.0	16.2	0.0	17.0		
		12	0	20.6	3.0	22.0	16.1	0.0	17.0		
		12	7	20.6	3.0	22.0	16.0	0.0	17.0		
		12	13	20.6	3.0	22.0	16.0	0.0	17.0		
25	0	20.6	3.0	22.0	16.0	0.0	17.0				













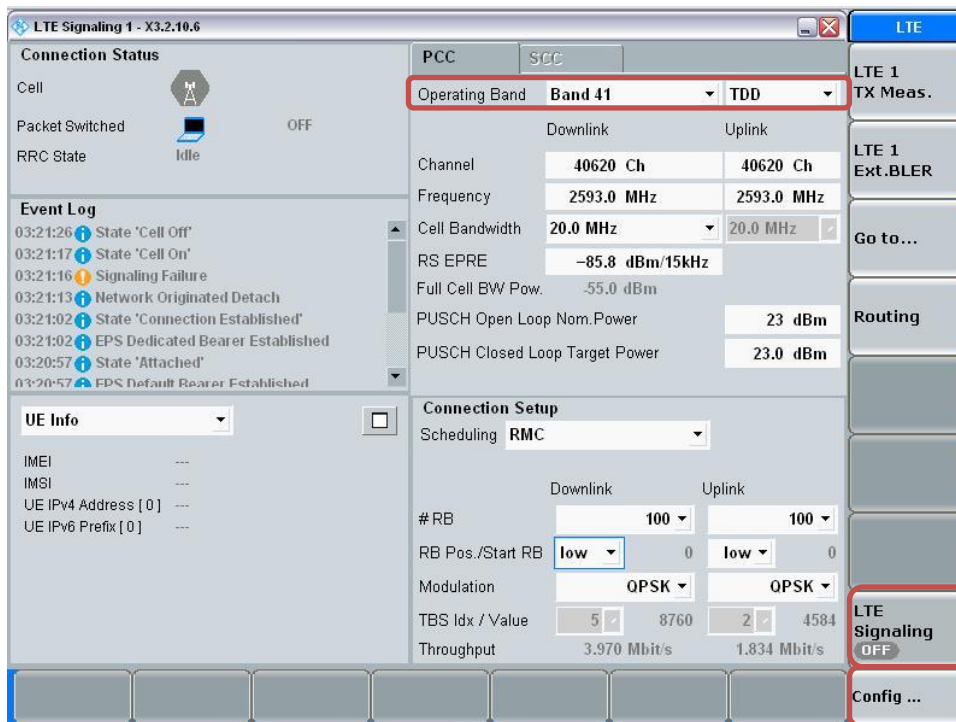


**LTE Band TDD Measured Results**

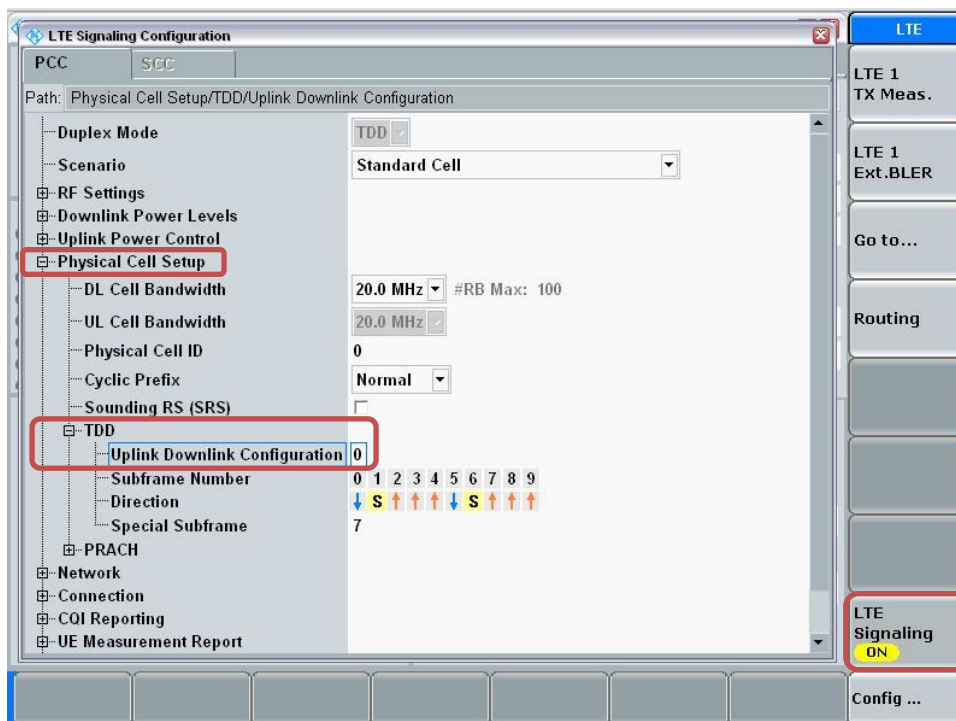
**Procedure used to establish SAR test signal for LTE TDD Band**

Set to CMW-500 with following parameters:

- Turn the LTE Signaling off using “ON | OFF” key
- Operating Band: Select Band 41 and TDD
- Go to “Config...”

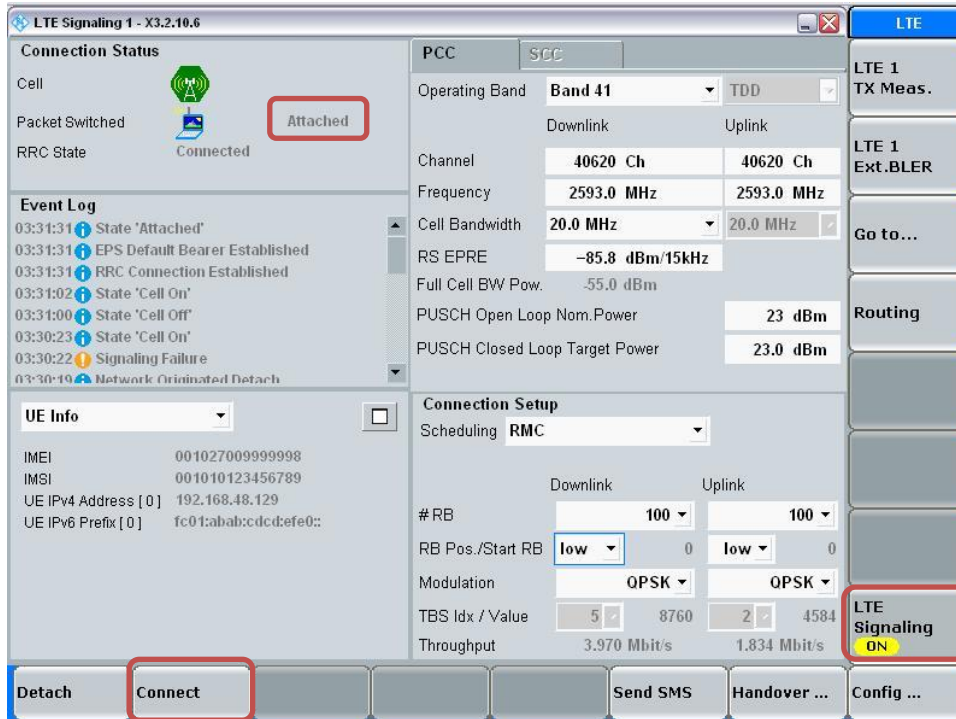


- Go to “Physical Cell Setup”
- Select “TDD” and Set “Uplink Downlink Configuration” to “0”
- Turn the cell on using “ON | OFF” key



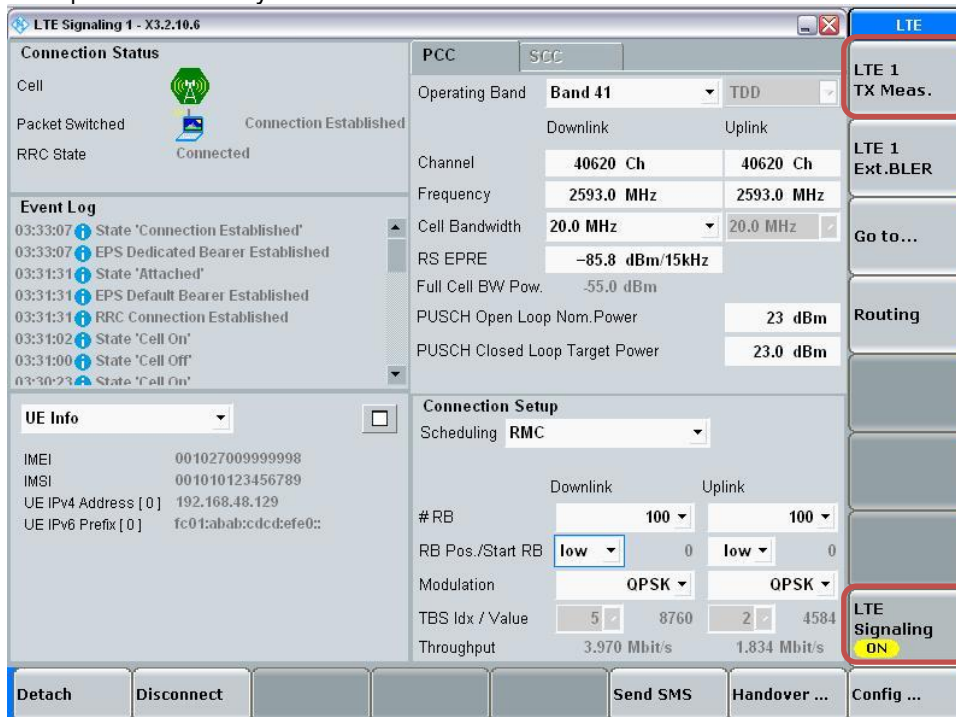
**Connect to EUT**

- Turn the cell on using “ON | OFF” key
- After EUT is Attached
- Select “Connect”

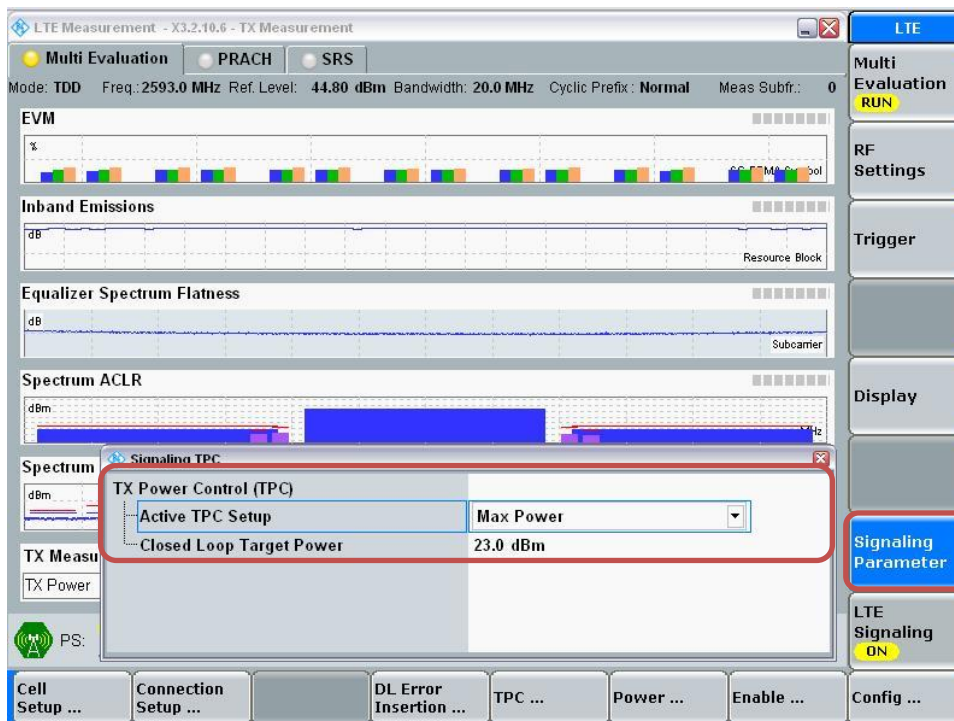


**Max Power Setting**

- Select “LTE 1 TX Meas.”
- Press “RESTART | STOP” Soft key

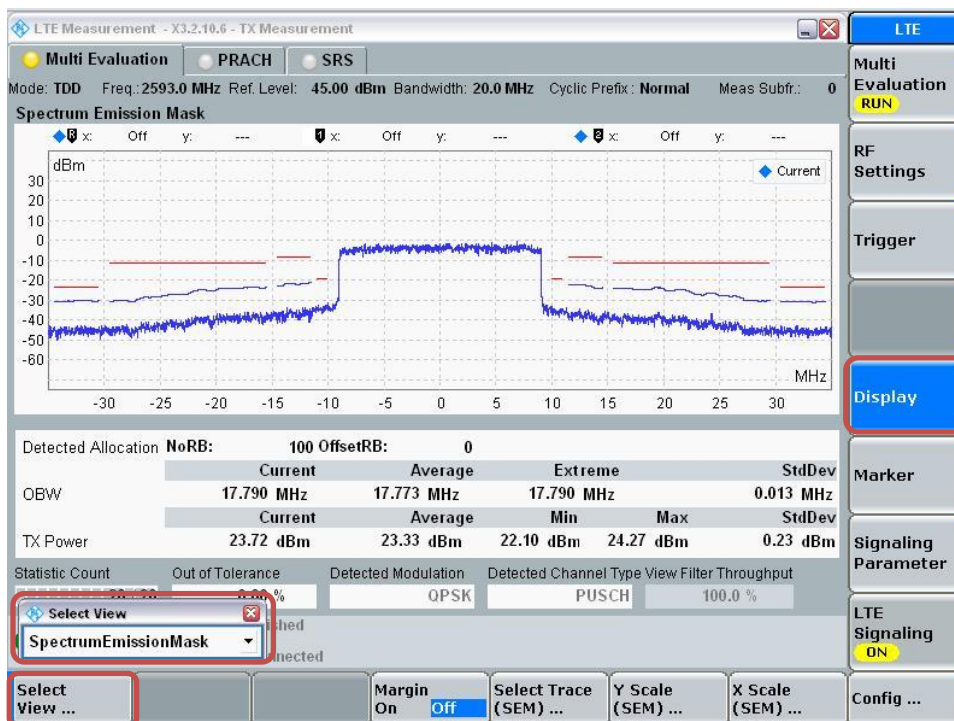


- Select “Signaling Parameter”
- Select “TX Power Control (TPC)” > Select “Active TPC Setup” to “Max Power” > Set “Closed Loop Target Power” to “23 dBm”



**View TX Power**

- Go to “Display”
- Select “Select View...”
- Select “Spectrum Emission Mask”



**LTE Band 41 Measured Results Max Power**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)							MPR	Tune-up Limit
				Measured Pw r (dBm)								
				39750 2506 MHz	40185 2549.5 MHz	40620 2593 MHz	41055 2636.5 MHz	41490 2680 MHz				
20 MHz	QPSK	1	0	23.5	23.4	23.1	23.6	23.4	0.0	24.5		
		1	49	23.4	23.4	23.5	23.9	23.2	0.0	24.5		
		1	99	23.4	23.4	23.3	23.4	23.0	0.0	24.5		
		50	0	22.4	22.4	22.3	22.8	22.5	1.0	23.5		
		50	24	22.5	22.4	22.5	22.9	22.3	1.0	23.5		
		50	50	22.5	22.4	22.4	22.8	22.1	1.0	23.5		
	16QAM	1	0	22.5	22.3	21.8	22.7	22.2	1.0	23.5		
		1	49	22.5	22.2	22.2	23.0	22.2	1.0	23.5		
		1	99	22.5	22.2	22.0	22.5	22.0	1.0	23.5		
		50	0	21.5	21.3	21.3	21.9	21.5	2.0	22.5		
		50	24	21.5	21.4	21.5	21.9	21.3	2.0	22.5		
		50	50	21.5	21.3	21.4	21.8	21.2	2.0	22.5		
	64QAM	1	0	21.4	21.3	21.4	21.8	21.4	2.0	22.5		
		1	0	21.7	21.2	21.2	22.0	20.9	2.0	22.5		
		1	49	21.8	21.1	21.3	21.8	20.3	2.0	22.5		
		1	99	21.7	21.1	21.2	21.8	20.1	2.0	22.5		
		50	0	20.5	20.3	20.3	20.5	19.6	3.0	21.5		
		50	24	20.5	20.4	20.5	20.4	19.4	3.0	21.5		
15 MHz	QPSK	1	0	23.4	23.1	23.1	23.8	23.4	0.0	24.5		
		1	37	23.4	23.3	23.3	23.9	23.1	0.0	24.5		
		1	74	23.4	23.1	23.3	23.6	22.9	0.0	24.5		
		36	0	22.4	22.3	22.4	22.9	22.3	1.0	23.5		
		36	20	22.5	22.4	22.5	22.9	22.1	1.0	23.5		
		36	39	22.5	22.3	22.5	22.9	22.1	1.0	23.5		
	16QAM	75	0	22.4	22.3	22.4	22.8	22.2	1.0	23.5		
		1	0	22.5	22.1	22.1	22.9	22.4	1.0	23.5		
		1	37	22.5	22.3	22.4	23.0	22.1	1.0	23.5		
		1	74	22.5	22.0	22.3	22.7	22.0	1.0	23.5		
		36	0	21.4	21.2	21.3	21.9	21.4	2.0	22.5		
		36	20	21.5	21.4	21.5	21.9	21.2	2.0	22.5		
	64QAM	36	39	21.5	21.3	21.5	21.9	21.2	2.0	22.5		
		75	0	21.4	21.3	21.4	21.8	21.3	2.0	22.5		
		1	0	21.1	20.8	21.4	21.5	20.4	2.0	22.5		
		1	37	21.1	20.8	21.7	21.2	20.0	2.0	22.5		
		1	74	21.1	20.6	21.6	21.2	20.0	2.0	22.5		
		36	0	20.3	20.4	20.4	20.4	19.6	3.0	21.5		
15 MHz	64QAM	36	20	20.4	20.5	20.5	20.3	19.4	3.0	21.5		
		36	39	20.4	20.4	20.5	20.3	19.4	3.0	21.5		
		75	0	20.4	20.3	20.4	20.4	19.4	3.0	21.5		

**LTE Band 41 Measured Results Max Power (continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pw r (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	23.5	23.2	23.1	23.7	23.6	0.0	24.5
		1	25	23.5	23.4	23.4	23.9	23.3	0.0	24.5
		1	49	23.5	23.2	23.2	23.6	23.4	0.0	24.5
		25	0	22.6	22.4	22.4	22.9	22.5	1.0	23.5
		25	12	22.6	22.6	22.6	23.0	22.3	1.0	23.5
		25	25	22.6	22.5	22.5	23.0	22.3	1.0	23.5
	16QAM	1	0	22.5	22.4	22.2	22.7	22.7	1.0	23.5
		1	25	22.4	22.5	22.4	22.9	22.4	1.0	23.5
		1	49	22.5	22.3	22.2	22.7	22.6	1.0	23.5
		25	0	21.5	21.4	21.4	21.9	21.5	2.0	22.5
		25	12	21.6	21.6	21.6	22.0	21.4	2.0	22.5
		25	25	21.6	21.5	21.5	22.0	21.4	2.0	22.5
	64QAM	1	0	21.5	20.6	21.5	21.8	20.4	2.0	22.5
		1	25	21.5	20.9	21.7	21.5	20.0	2.0	22.5
		1	49	21.6	20.8	21.5	21.7	20.1	2.0	22.5
		25	0	20.4	20.5	20.4	20.5	19.6	3.0	21.5
		25	12	20.4	20.6	20.5	20.4	19.5	3.0	21.5
		25	25	20.5	20.5	20.5	20.4	19.5	3.0	21.5
5 MHz	QPSK	1	0	23.4	23.5	23.4	23.8	23.9	0.0	24.5
		1	12	23.4	23.4	23.6	23.9	23.5	0.0	24.5
		1	24	23.5	23.5	23.5	23.9	23.6	0.0	24.5
		12	0	22.6	22.5	22.6	23.0	22.5	1.0	23.5
		12	7	22.6	22.6	22.6	23.0	22.4	1.0	23.5
		12	13	22.6	22.6	22.6	23.0	22.4	1.0	23.5
	16QAM	25	0	22.6	22.6	22.6	23.0	22.3	1.0	23.5
		1	0	22.4	22.6	22.5	22.9	22.7	1.0	23.5
		1	12	22.5	22.7	22.6	23.0	22.4	1.0	23.5
		1	24	22.5	22.6	22.5	22.9	22.6	1.0	23.5
		12	0	21.6	21.5	21.5	22.0	21.4	2.0	22.5
		12	7	21.6	21.6	21.5	22.1	21.4	2.0	22.5
	64QAM	12	13	21.6	21.6	21.5	22.1	21.4	2.0	22.5
		25	0	21.6	21.6	21.6	22.0	21.4	2.0	22.5
		1	0	21.2	22.2	21.6	21.3	21.1	2.0	22.5
		1	12	21.3	22.3	21.6	21.1	20.8	2.0	22.5
		1	24	21.2	22.1	21.7	21.3	21.0	2.0	22.5
		12	0	20.6	20.6	20.5	20.5	19.5	3.0	21.5
	12	7	20.6	20.7	20.5	20.4	19.5	3.0	21.5	
	12	13	20.6	20.6	20.5	20.4	19.5	3.0	21.5	
	25	0	20.7	20.5	20.5	20.5	19.4	3.0	21.5	

**LTE Band 41 Measured Results Proximity sensor back-off Power**

BW (MHz)	Mode	RB Allocation	RB offset	"Reduced Average Power (dBm) Proximity sensor back-off"							MPR	Tune-up Limit
				Measured Pwr (dBm)								
				39750 2506 MHz	40185 2549.5 MHz	40620 2593 MHz	41055 2636.5 MHz	41490 2680 MHz				
20 MHz	QPSK	1	0	13.6	13.6	13.3	13.8	13.5	0.0	15.0		
		1	49	13.6	13.5	13.7	14.0	13.9	0.0	15.0		
		1	99	13.5	13.6	13.5	13.5	13.7	0.0	15.0		
		50	0	13.6	13.4	13.5	14.0	13.7	0.0	15.0		
		50	24	13.6	13.5	13.7	14.1	13.8	0.0	15.0		
		50	50	13.6	13.5	13.7	13.9	13.8	0.0	15.0		
		100	0	13.6	13.4	13.6	13.9	13.8	0.0	15.0		
	16QAM	1	0	13.6	13.4	13.1	13.9	13.3	0.0	15.0		
		1	49	13.6	13.3	13.5	14.1	13.6	0.0	15.0		
		1	99	13.6	13.3	13.3	13.6	13.5	0.0	15.0		
		50	0	13.6	13.5	13.4	14.1	13.7	0.0	15.0		
		50	24	13.7	13.6	13.6	14.1	13.9	0.0	15.0		
		50	50	13.7	13.5	13.6	14.0	13.9	0.0	15.0		
		100	0	13.6	13.5	13.6	13.9	13.8	0.0	15.0		
	64QAM	1	0	13.4	13.5	13.5	13.6	13.5	0.0	15.0		
		1	49	13.5	13.5	13.9	13.9	13.9	0.0	15.0		
		1	99	13.5	13.5	13.8	13.5	13.7	0.0	15.0		
		50	0	13.6	13.6	13.5	14.0	13.8	0.0	15.0		
		50	24	13.7	13.6	13.7	14.1	13.9	0.0	15.0		
		50	50	13.7	13.6	13.6	14.0	13.9	0.0	15.0		
		100	0	13.6	13.5	13.5	13.9	13.9	0.0	15.0		
15 MHz	QPSK	1	0	13.6	13.2	13.4	13.9	13.5	0.0	15.0		
		1	37	13.5	13.4	13.6	14.0	13.7	0.0	15.0		
		1	74	13.5	13.2	13.5	13.7	13.7	0.0	15.0		
		36	0	13.6	13.4	13.6	14.0	13.8	0.0	15.0		
		36	20	13.7	13.6	13.7	14.0	13.9	0.0	15.0		
		36	39	13.7	13.5	13.7	14.0	13.9	0.0	15.0		
		75	0	13.6	13.5	13.7	14.0	13.8	0.0	15.0		
	16QAM	1	0	13.7	13.3	13.3	14.0	13.5	0.0	15.0		
		1	37	13.7	13.5	13.6	14.2	13.7	0.0	15.0		
		1	74	13.7	13.2	13.4	13.8	13.7	0.0	15.0		
		36	0	13.6	13.4	13.5	14.1	13.7	0.0	15.0		
		36	20	13.7	13.6	13.6	14.1	13.9	0.0	15.0		
		36	39	13.7	13.5	13.6	14.0	13.9	0.0	15.0		
		75	0	13.6	13.5	13.6	14.0	13.8	0.0	15.0		
	64QAM	1	0	13.1	13.1	13.6	13.5	13.5	0.0	15.0		
		1	37	13.2	13.3	13.8	13.6	13.7	0.0	15.0		
		1	74	13.1	13.1	13.8	13.3	13.6	0.0	15.0		
		36	0	13.7	13.4	13.5	14.1	13.7	0.0	15.0		
		36	20	13.7	13.5	13.7	14.1	13.8	0.0	15.0		
		36	39	13.7	13.5	13.7	14.1	13.8	0.0	15.0		
		75	0	13.6	13.5	13.6	13.9	13.8	0.0	15.0		

**LTE Band 41 Measured Results Proximity sensor back-off Power (continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	13.7	13.3	13.4	13.9	13.7	0.0	15.0
		1	25	13.6	13.6	13.6	14.1	13.8	0.0	15.0
		1	49	13.7	13.3	13.4	13.9	13.5	0.0	15.0
		25	0	13.7	13.6	13.6	14.1	13.9	0.0	15.0
		25	12	13.8	13.8	13.8	14.1	14.0	0.0	15.0
		25	25	13.8	13.7	13.7	14.1	13.9	0.0	15.0
	16QAM	1	0	13.8	13.3	13.3	14.0	13.6	0.0	15.0
		1	25	13.7	13.5	13.6	14.2	13.8	0.0	15.0
		1	49	13.8	13.3	13.4	14.0	13.6	0.0	15.0
		25	0	13.7	13.6	13.6	14.1	14.0	0.0	15.0
		25	12	13.8	13.8	13.7	14.2	14.0	0.0	15.0
		25	25	13.8	13.7	13.7	14.2	13.9	0.0	15.0
	64QAM	1	0	13.2	13.4	13.6	13.4	13.8	0.0	15.0
		1	25	13.2	13.6	13.9	13.7	14.0	0.0	15.0
		1	49	13.2	13.5	13.7	13.4	13.8	0.0	15.0
		25	0	13.8	13.5	13.6	14.1	13.9	0.0	15.0
		25	12	13.8	13.7	13.7	14.2	14.0	0.0	15.0
		25	25	13.8	13.6	13.6	14.2	13.8	0.0	15.0
5 MHz	QPSK	1	0	13.8	13.5	13.6	14.1	13.9	0.0	15.0
		1	12	13.5	13.5	13.8	14.0	13.8	0.0	15.0
		1	24	13.8	13.5	13.7	14.2	13.8	0.0	15.0
		12	0	13.8	13.7	13.8	14.1	14.0	0.0	15.0
		12	7	13.8	13.8	13.8	14.2	14.0	0.0	15.0
		12	13	13.8	13.7	13.8	14.2	14.0	0.0	15.0
	16QAM	25	0	13.8	13.7	13.8	14.2	14.0	0.0	15.0
		1	0	13.8	13.5	13.6	14.2	13.9	0.0	15.0
		1	12	14.0	13.7	13.8	14.4	13.9	0.0	15.0
		1	24	13.9	13.5	13.7	14.3	13.8	0.0	15.0
		12	0	13.8	13.7	13.7	14.2	14.0	0.0	15.0
		12	7	13.8	13.7	13.7	14.3	14.1	0.0	15.0
	64QAM	12	13	13.8	13.7	13.7	14.3	14.0	0.0	15.0
		25	0	13.8	13.7	13.8	14.2	14.0	0.0	15.0
		1	0	14.2	13.3	13.8	14.5	13.7	0.0	15.0
		1	12	14.2	13.4	13.8	14.6	13.7	0.0	15.0
		1	24	14.2	13.4	13.8	14.6	13.7	0.0	15.0
		12	0	13.9	13.7	13.7	14.2	14.0	0.0	15.0
	12	7	13.9	13.7	13.7	14.2	14.0	0.0	15.0	
	12	13	13.9	13.7	13.7	14.3	14.0	0.0	15.0	
	25	0	13.7	13.8	13.6	14.1	14.0	0.0	15.0	

### 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	CA_2A-2A			
2CC #2	CA_2C			
2CC #3	CA_2A-4A		3CC #1	O
2CC #4	CA_2A-5A			O
2CC #5	CA_2A-12A			O
2CC #6	CA_2A-66A			O
2CC #7	CA_4A-4A		3CC #2	
2CC #8	CA_4A-5A			O
2CC #9	CA_4A-13A		3CC #1	O
2CC #10	CA_4A-17A			O
2CC #11	CA_41A-41A			
2CC #12	CA_41C		3CC #3	
2CC #13	CA_66A-66A			
2CC #14	CA_66B			
2CC #15	CA_66C			

Index	3CC	Restriction	Covered By Superset	Reverse
3CC #1	CA_2A-4A-13A			O
3CC #2	CA_4A-4A-12A			O
3CC #3	CA_41A-41C			O
3CC #4	CA_41D		4CC #1	O

Index	4CC	Restriction	Completely Covered by Measurement	Reverse
4CC #1	CA_41A-41D			O
4CC #2	CA_41C-41C			

#### LTE Release 10 Carrier Aggregation with 4x4 MIMO

Index	2CC	Restriction	Completely Covered by Measurement Supersrt	Reverse
2CC #1	2A-[66A]			O
2CC #2	[41A]-[41A]			
2CC #2	[41C]		3CC #2	
2CC #2	[66A]-[66A]			
2CC #2	[66B]			
2CC #2	[66C]			

Index	3CC	Restriction	Completely Covered by Measurement Supersrt	Reverse
3CC #1	CA_[41A]-[41C]			O
3CC #2	CA_[41D]		4CC #1	

Index	4CC	Restriction	Completely Covered by Measurement Supersrt	Reverse
4CC #1	CA_[41A]-[41D]			O

**Note:**

Only yellow highlight cells need power measurement according to LTE DL CA SAR test Exclusion in TCB workshop (April.2018). [\*] is 4X4 MIMO configuration.





### 9.4 5G NR (FR1)

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS 138.521-1 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 TS138.521-1.

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

Modulation	MPR (dB)		
	Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM Pi/2 BPSK	$\leq 3.5^1$	$\leq 1.2^1$	$\leq 0.2^1$
		$\leq 0.5^2$	$0^2$
DFT-s-OFDM QPSK	$\leq 1$		0
DFT-s-OFDM 16 QAM	$\leq 2$		$\leq 1$
DFT-s-OFDM 64 QAM		$\leq 2.5$	
DFT-s-OFDM 256 QAM		$\leq 4.5$	
CP-OFDM QPSK	$\leq 3$		$\leq 1.5$
CP-OFDM 16 QAM	$\leq 3$		$\leq 2$
CP-OFDM 64 QAM		$\leq 3.5$	
CP-OFDM 256 QAM		$\leq 6.5$	

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0dB MPR is 26dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 and if the IE *powerBoostPi2BPSK* is set to 0 and if more than 40% of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

The allowed A-MPR values specified below in Table 6.2.3.3.1-1 of 3GPP TS138.521-1 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 6.2.3.3.1-1: Additional maximum power reduction (A-MPR)

Network Signalling label	Requirements (subclause)	NR Band	Channel bandwidth (MHz)	Resources Blocks (N <sub>RB</sub> )	A-MPR (dB)
NS_01		Table 5.2-1	5, 10, 15, 20, 25, 30, 40, 50, 60, 80, 90, 100	Table 5.3.2-1	N/A

Uplink RB allocations were used to Table 6.1-1 of the 3GPP TS 138.521-1.

Channel Bandwidth	SCS(kHz)	OFDM	RB allocation							
			Edge_Full_Left	Edge_Full_Right	Edge_1RB_Left	Edge_1RB_Right	Outer_Full	Inner_Full	Inner_1RB_Left	Inner_1RB_Right
5MHz	15	DFT-s	2@0	2@23	1@0	1@24	25@0	12@6	1@1	1@23
		CP	2@0	2@23	1@0	1@24	25@0	13@6	1@1	1@23
	30	DFT-s	2@0	2@9	1@0	1@10	10@0	5@2 <sup>1</sup>	1@1	1@9
		CP	2@0	2@9	1@0	1@10	11@0	5@2 <sup>1</sup>	1@1	1@9
	60	DFT-s	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		CP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10MHz	15	DFT-s	2@0	2@50	1@0	1@51	50@0	25@12	1@1	1@50
		CP	2@0	2@50	1@0	1@51	52@0	26@13	1@1	1@50
	30	DFT-s	2@0	2@22	1@0	1@23	24@0	12@6	1@1	1@22
		CP	2@0	2@22	1@0	1@23	24@0	12@6	1@1	1@22
	60	DFT-s	2@0	2@9	1@0	1@10	10@0	5@2 <sup>1</sup>	1@1	1@9
		CP	2@0	2@9	1@0	1@10	11@0	5@2 <sup>1</sup>	1@1	1@9
15MHz	15	DFT-s	2@0	2@77	1@0	1@78	75@0	38@18	1@1	1@77
		CP	2@0	2@77	1@0	1@78	79@0	39@19 <sup>1</sup>	1@1	1@77
	30	DFT-s	2@0	2@36	1@0	1@37	36@0	18@9	1@1	1@36
		CP	2@0	2@36	1@0	1@37	38@0	19@9	1@1	1@36
	60	DFT-s	2@0	2@16	1@0	1@17	18@0	9@4	1@1	1@16
		CP	2@0	2@16	1@0	1@17	18@0	9@4	1@1	1@16
20MHz	15	DFT-s	2@0	2@104	1@0	1@105	100@0	50@25	1@1	1@104
		CP	2@0	2@104	1@0	1@105	106@0	53@26	1@1	1@104
	30	DFT-s	2@0	2@49	1@0	1@50	50@0	25@12	1@1	1@49
		CP	2@0	2@49	1@0	1@50	51@0	25@12 <sup>1</sup>	1@1	1@49
	60	DFT-s	2@0	2@22	1@0	1@23	24@0	12@6	1@1	1@22
		CP	2@0	2@22	1@0	1@23	24@0	12@6	1@1	1@22

**NR Band n5 Power Measured Results**

BW (MHz)	Waveform	Modulation	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
					167300	836.5 MHz			376000	836.5 MHz		
20 MHz	DFT-s OFDM	π/2 BPSK	1	1	24.6		0.0	25.0	14.8		0.0	15.0
			1	53	24.5		0.0	25.0	14.7		0.0	15.0
			1	104	24.3		0.0	25.0	14.7		0.0	15.0
			50	0	24.0		0.5	24.5	14.6		0.0	15.0
			50	28	24.5		0.0	25.0	14.7		0.0	15.0
			50	56	24.0		0.5	24.5	14.6		0.0	15.0
			100	0	23.8		0.5	24.5	14.7		0.0	15.0
		QPSK	1	1	24.7		0.0	25.0	14.8		0.0	15.0
			1	53	24.5		0.0	25.0	14.7		0.0	15.0
			1	104	24.4		0.0	25.0	14.7		0.0	15.0
			50	0	23.5		1.0	24.0	14.7		0.0	15.0
			50	28	24.5		0.0	25.0	14.7		0.0	15.0
			50	56	23.5		1.0	24.0	14.7		0.0	15.0
			100	0	23.4		1.0	24.0	14.7		0.0	15.0
		16QAM	1	1	23.6		1.0	24.0	14.7		0.0	15.0
		64QAM	1	1	22.1		2.5	22.5	14.7		0.0	15.0
256QAM	1	1	19.6		4.5	20.5	14.2		0.0	15.0		
CP-OFDM	QPSK	1	1	23.1		1.5	23.5	14.7		0.0	15.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				Measured Pwr (dBm)			
					167300		MPR	Tune-up Limit	167300		MPR	Tune-up Limit
					836.5 MHz	836.5 MHz						
15 MHz	DFT-s OFDM	π/2 BPSK	1	1	24.5		0.0	25.0	14.7		0.0	15.0
			1	39	24.4		0.0	25.0	14.7		0.0	15.0
			1	77	24.4		0.0	25.0	14.7		0.0	15.0
			36	0	23.9		0.5	24.5	14.7		0.0	15.0
			36	22	24.3		0.0	25.0	14.7		0.0	15.0
			36	43	23.9		0.5	24.5	14.7		0.0	15.0
			75	0	23.8		0.5	24.5	14.7		0.0	15.0
		QPSK	1	1	23.5		0.0	25.0	14.7		0.0	15.0
			1	39	24.5		0.0	25.0	14.6		0.0	15.0
			1	77	24.5		0.0	25.0	14.7		0.0	15.0
			36	0	23.5		1.0	24.0	14.7		0.0	15.0
			36	22	24.4		0.0	25.0	14.6		0.0	15.0
			36	43	23.5		1.0	24.0	14.7		0.0	15.0
			75	0	23.4		1.0	24.0	14.7		0.0	15.0
		16QAM	1	1	23.8		1.0	24.0	15.0		0.0	15.0
		64QAM	1	1	22.4		2.5	22.5	13.5		0.0	15.0
256QAM	1	1	19.4		4.5	20.5	14.3		0.0	15.0		
CP-OFDM	QPSK	1	1	23.0		1.5	23.5	14.6		0.0	15.0	



### 9.5 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	17.7	19.0	Yes	11.2	12.0	Yes
			6	2437	17.9	19.0		11.7	12.0	
			11	2462	17.8	19.0		11.3	12.0	
			12	2467	Not Require	5.0		Not Require	5.0	
			13	2472		2.0			2.0	
	802.11g	6 Mbps	1	2412	Not Require	16.0	No	Not Require	12.0	No
			6	2437		19.0			12.0	
			11	2462		16.0			12.0	
			12	2467		5.0			5.0	
			13	2472		2.0			2.0	
	802.11n (HT20)	6.5 Mbps	1	2412	Not Require	16.0	No	Not Require	12.0	No
			6	2437		18.0			12.0	
			11	2462		16.0			12.0	
			12	2467		5.0			5.0	
			13	2472		2.0			2.0	
2.4 SISO Ant 2	802.11b	1 Mbps	1	2412	17.8	19.0	Yes	10.9	12.0	Yes
			6	2437	18.3	19.0		11.6	12.0	
			11	2462	18.0	19.0		11.6	12.0	
			12	2467	Not Require	5.0		Not Require	5.0	
			13	2472		2.0			2.0	
	802.11g	6 Mbps	1	2412	Not Require	16.0	No	Not Require	12.0	No
			6	2437		19.0			12.0	
			11	2462		16.0			12.0	
			12	2467		5.0			5.0	
			13	2472		2.0			2.0	
	802.11n (HT20)	6.5 Mbps	1	2412	Not Require	16.0	No	Not Require	12.0	No
			6	2437		18.0			12.0	
			11	2462		16.0			12.0	
			12	2467		5.0			5.0	
			13	2472		2.0			2.0	

#### Note(s):

- SAR is not required for 802.11g/n modes when the adjusted SAR for 802.11b is < 1.2 W/kg.
- 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.

### 9.6 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 (U-NII 2A)	802.11a	6 Mbps	52	5260.0	16.3	17.0	Yes	Not Required	9.5	No	
				56	5280.0	16.2			Not Required			
				60	5300.0	16.0			Not Required			
				64	5320.0	15.9			Not Required			
		802.11n (HT20)	6.5 Mbps	52	5260.0	Not Required	17.0	No	Not Required	9.5	No	
				56	5280.0	Not Required			Not Required			
				60	5300.0	Not Required			Not Required			
		802.11n (HT40)	13.5 Mbps	54	5270.0	Not Required	14.0	No	Not Required	9.5	No	
				62	5310.0	Not Required			Not Required			
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	Not Required	17.0	No	Not Required	9.5	No	
				56	5280.0	Not Required			Not Required			
				60	5300.0	Not Required			Not Required			
		802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	14.0	No	Not Required	9.5	No	
				62	5310.0	Not Required			Not Required			
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	13.0	No	8.4	9.5	Yes	
		5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	16.0	17.0	Yes	Not Required	9.5	No
					120	5600.0	15.9			Not Required		
					124	5620.0	15.8			Not Required		
	144				5720.0	15.8	Not Required					
	802.11n (HT20)		6.5 Mbps	100	5500.0	Not Required	17.0	No	Not Required	9.5	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	14.0	No	Not Required	9.5	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	17.0	No	Not Required	9.5	No	
				120	5600.0	Not Required			Not Required			
				124	5620.0	Not Required			Not Required			
802.11ac (VHT40)	13.5 Mbps		102	5510.0	Not Required	14.0	No	Not Required	9.5	No		
			118	5590.0	Not Required			Not Required				
			126	5630.0	Not Required			Not Required				
802.11ac (VHT80)	29.3 Mbps		106	5530.0	Not Required	13.0	No	8.6	9.5	Yes		
			122	5610.0	Not Required			8.5				
			138	5690.0	Not Required			8.5				
5.8 (U-NII 3)	802.11a		6 Mbps	149	5745.0	16.0	17.0	Yes	Not Required	9.5	No	
				157	5785.0	15.7			Not Required			
				165	5825.0	15.9			Not Required			
	802.11n (HT20)	6.5 Mbps	149	5745.0	Not Required	17.0	No	Not Required	9.5	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	14.0	No	Not Required	9.5	No		
			159	5795.0	Not Required			Not Required				
	802.11ac (VHT20)	6.5 Mbps	149	5745.0	Not Required	17.0	No	Not Required	9.5	No		
			157	5785.0	Not Required			Not Required				
	802.11ac (VHT40)	13.5 Mbps	151	5755.0	Not Required	14.0	No	Not Required	9.5	No		
			159	5795.0	Not Required			Not Required				
802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	13.0	No	8.4	9.5	Yes			

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pw r.			Reduction Pw r.			
						Avg Pw r (dBm)	Max Output Pow er (dBm)	SAR Test (Yes/No)	Avg Pw r (dBm)	Max Output Pow er (dBm)	SAR Test (Yes/No)	
SISO Ant.2	5.3 (UNII 2A)	802.11a	6 Mbps	52	5260.0	16.0	17.0	Yes	Not Required	9.5	No	
				56	5280.0	16.1			Not Required			
				60	5300.0	16.0			Not Required			
				64	5320.0	15.9			Not Required			
		802.11n (HT20)	6.5 Mbps	52	5260.0	Not Required	17.0	No	Not Required	9.5	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	14.0	No	Not Required	9.5	No	
				62	5310.0	Not Required			Not Required			
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	Not Required	17.0	No	Not Required	9.5	No	
				56	5280.0	Not Required			Not Required			
				60	5300.0	Not Required			Not Required			
		802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	14.0	No	Not Required	9.5	No	
				62	5310.0	Not Required			Not Required			
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	13.0	No	8.6	9.5	Yes	
		5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	16.4	17.0	Yes	Not Required	9.5	No
					120	5600.0	16.6			Not Required		
	124				5620.0	16.5	Not Required					
	144				5720.0	16.3	Not Required					
	802.11n (HT20)		6.5 Mbps	100	5500.0	Not Required	17.0	No	Not Required	9.5	No	
				120	5600.0	Not Required			Not Required			
				124	5620.0	Not Required			Not Required			
	802.11n (HT40)		13.5 Mbps	102	5510.0	Not Required	14.0	No	Not Required	9.5	No	
				118	5590.0	Not Required			Not Required			
				126	5630.0	Not Required			Not Required			
	802.11ac (VHT20)		6.5 Mbps	100	5500.0	Not Required	17.0	No	Not Required	9.5	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	14.0	No	Not Required	9.5	No		
			118	5590.0	Not Required			Not Required				
			126	5630.0	Not Required			Not Required				
802.11ac (VHT80)	29.3 Mbps		106	5530.0	Not Required	13.0	No	8.4	9.5	Yes		
			122	5610.0	Not Required			8.6				
			138	5690.0	Not Required			8.5				
5.8 (U-NII 3)	802.11a		6 Mbps	149	5745.0	16.1	17.0	Yes	Not Required	9.5	No	
				157	5785.0	16.0			Not Required			
				165	5825.0	16.0			Not Required			
	802.11n (HT20)		6.5 Mbps	149	5745.0	Not Required	17.0	No	Not Required	9.5	No	
		157		5785.0	Not Required	Not Required						
	802.11n (HT40)	13.5 Mbps	151	5755.0	Not Required	14.0	No	Not Required	9.5	No		
			159	5795.0	Not Required			Not Required				
	802.11ac (VHT20)	6.5 Mbps	149	5745.0	Not Required	17.0	No	Not Required	9.5	No		
			157	5785.0	Not Required			Not Required				
	802.11ac (VHT40)	13.5 Mbps	151	5755.0	Not Required	14.0	No	Not Required	9.5	No		
			159	5795.0	Not Required			Not Required				
	802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	13.0	No	7.7	9.5	Yes		

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pw r.			Reduction Pw r.		
						Avg Pw r (dBm)	Max Output Pow er (dBm)	SAR Test (Yes/No)	Avg Pw r (dBm)	Max Output Pow er (dBm)	SAR Test (Yes/No)
MIMO Ant.1	5.3 (UNII 2A)	802.11a	6 Mbps	52	5260.0	16.3	17.0	Yes	Not Required	9.5	No
				56	5280.0	16.2			Not Required		
				60	5300.0	15.9			Not Required		
				64	5320.0	15.9			Not Required		
		802.11n (HT20)	6.5 Mbps	52	5260.0	Not Required	17.0	No	Not Required	9.5	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	14.0	No	Not Required	9.5	No
				62	5310.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	Not Required	17.0	No	Not Required	9.5	No
				56	5280.0	Not Required			Not Required		
	60			5300.0	Not Required	Not Required					
	802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	14.0	No	Not Required	9.5	No	
			62	5310.0	Not Required			Not Required			
	802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	13.0	No	8.8	9.5	Yes	
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	16.0	17.0	Yes	Not Required	9.5	No
				120	5600.0	15.9			Not Required		
				124	5620.0	15.7			Not Required		
				144	5720.0	15.6			Not Required		
		802.11n (HT20)	6.5 Mbps	100	5500.0	Not Required	17.0	No	Not Required	9.5	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	14.0	No	Not Required	9.5	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	17.0	No	Not Required	9.5	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	14.0	No	Not Required	9.5	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	13.0	No	8.5	9.5	Yes	
			122	5610.0	Not Required			8.6			
			138	5690.0	Not Required			8.3			
5.8 (U-NII 3)		802.11a	6 Mbps	149	5745.0	15.8	17.0	Yes	Not Required	9.5	No
	157			5785.0	15.5	Not Required					
	165			5825.0	15.7	Not Required					
	802.11n (HT20)	6.5 Mbps	149	5745.0	Not Required	17.0	No	Not Required	9.5	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	14.0	No	Not Required	9.5	No	
			159	5795.0	Not Required			Not Required			
	802.11ac (VHT20)	6.5 Mbps	149	5745.0	Not Required	17.0	No	Not Required	9.5	No	
			157	5785.0	Not Required			Not Required			
	802.11ac (VHT40)	13.5 Mbps	151	5755.0	Not Required	14.0	No	Not Required	9.5	No	
			159	5795.0	Not Required			Not Required			
802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	13.0	No	8.1	9.5	Yes		



Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pw r.			Reduction Pw r.		
						Avg Pw r (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pw r (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
MIMO Ant.2	5.3 (UNII 2A)	802.11a	6 Mbps	52	5260.0	16.1	17.0	Yes	Not Required	9.5	No
				56	5280.0	16.1			Not Required		
				60	5300.0	16.1			Not Required		
				64	5320.0	15.9			Not Required		
		802.11n (HT20)	6.5 Mbps	52	5260.0	Not Required	17.0	No	Not Required	9.5	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	14.0	No	Not Required	9.5	No
				62	5310.0	Not Required			Not Required		
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	Not Required	17.0	No	Not Required	9.5	No
				56	5280.0	Not Required			Not Required		
	60			5300.0	Not Required	Not Required					
	802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	14.0	No	Not Required	9.5	No	
			62	5310.0	Not Required			Not Required			
	802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	13.0	No	8.3	9.5	Yes	
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	16.4	17.0	Yes	Not Required	9.5	No
				120	5600.0	16.5			Not Required		
				124	5620.0	16.5			Not Required		
				144	5720.0	16.2			Not Required		
		802.11n (HT20)	6.5 Mbps	100	5500.0	Not Required	17.0	No	Not Required	9.5	No
120				5600.0	Not Required	Not Required					
124				5620.0	Not Required	Not Required					
802.11n (HT40)		13.5 Mbps	102	5510.0	Not Required	14.0	No	Not Required	9.5	No	
			118	5590.0	Not Required			Not Required			
			126	5630.0	Not Required			Not Required			
802.11ac (VHT20)		6.5 Mbps	100	5500.0	Not Required	17.0	No	Not Required	9.5	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	14.0	No	Not Required	9.5	No	
			118	5590.0	Not Required			Not Required			
			126	5630.0	Not Required			Not Required			
802.11ac (VHT80)		29.3 Mbps	106	5530.0	Not Required	13.0	No	8.1	9.5	Yes	
	122		5610.0	Not Required	8.2						
	138		5690.0	Not Required	8.1						
5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	15.9	17.0	Yes	Not Required	9.5	No	
			157	5785.0	16.0			Not Required			
			165	5825.0	16.0			Not Required			
	802.11n (HT20)	6.5 Mbps	149	5745.0	Not Required	17.0	No	Not Required	9.5	No	
			157	5785.0	Not Required			Not Required			
	802.11n (HT40)	13.5 Mbps	151	5755.0	Not Required	14.0	No	Not Required	9.5	No	
			159	5795.0	Not Required			Not Required			
	802.11ac (VHT20)	6.5 Mbps	149	5745.0	Not Required	17.0	No	Not Required	9.5	No	
			157	5785.0	Not Required			Not Required			
	802.11ac (VHT40)	13.5 Mbps	151	5755.0	Not Required	14.0	No	Not Required	9.5	No	
			159	5795.0	Not Required			Not Required			
	802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	13.0	No	7.5	9.5	Yes	

**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
  - $\leq 1.2$  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.

## 9.7 Bluetooth

### Average Power Measured Results

Band (GHz)	Mode	Ch #	Freq. (MHz)	Maximun Average Power (dBm)		Reduced Average Power (dBm)	
				Meas. Pwr	Tune-up Limit	Meas. Pwr	Tune-up Limit
2.4	GFSK	0	2402	16.0	18.0	9.3	10.0
		39	2441	17.3		9.9	
		78	2480	15.9		9.8	
	EDR, 8-DPSK	0	2402	13.6	16.0	8.3	10.0
		39	2441	15.5		9.4	
		78	2480	14.4		9.0	
	LE, GFSK-1M (37 pkt)	0	2402	6.6	8.0	6.6	8.0
		39	2441	7.5		7.5	
		78	2480	7.3		7.3	
	LE, GFSK-2M (37 pkt)	0	2402	6.5	8.0	6.5	8.0
		19	2440	7.3		7.3	
		39	2480	7.1		7.1	

#### Note(s):

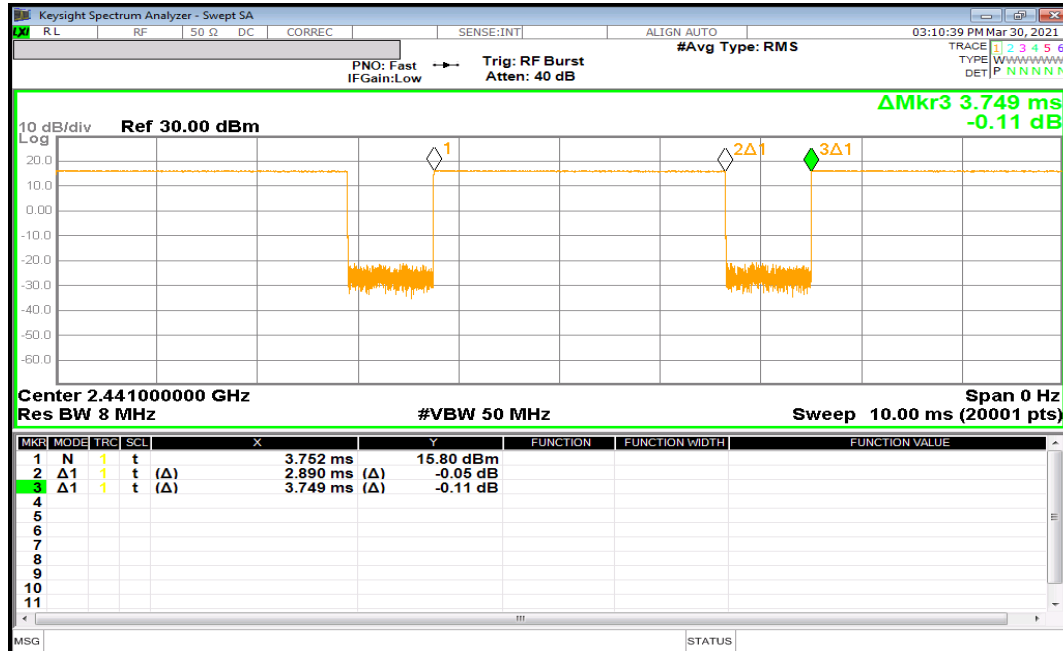
SAR test is evaluated at GFSK mode in Bluetooth

### Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
GFSK	DH5	2.890	3.749	77.1%	1.30

### Duty Cycle plots

#### GFSK



## 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:

- $\leq 0.8$  W/kg or  $2.0$  W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
- $\leq 0.6$  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
- $\leq 0.4$  W/kg or  $1.0$  W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  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  $\leq \frac{1}{4}$  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  $\leq 1.2$  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.

**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:

- $\leq 0.4$  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  $\leq 0.8$  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  $\leq 1.2$  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  $\leq 1.2$  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  $\leq 1.2$  W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

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

**10.1 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	19	Rear	128	824.2	29.0	28.2	0.495	0.595	1
			23	Edge 1	128	824.2	29.0	28.2	0.361	0.434	
			9	Edge 2	128	824.2	29.0	28.2	0.073	0.087	
			0	Edge 4	128	824.2	29.0	28.2	0.117	0.141	
	GPRS 2 Slots	On	0	Rear	190	836.6	23.0	22.0	0.362	0.456	
				Edge 1	190	836.6	23.0	22.0	0.428	0.540	
Edge 2				190	836.6	23.0	22.0	0.034	0.043		

**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	19	Rear	661	1880.0	29.0	28.5	0.161	0.181	
			23	Edge 1	661	1880.0	29.0	28.5	0.145	0.163	
			9	Edge 2	661	1880.0	29.0	28.5	0.076	0.086	
	GPRS 2 Slots	On	0	Rear	661	1880.0	20.0	19.4	0.434	0.493	
				Edge 1	512	1850.2	20.0	19.2	0.773	0.939	
					661	1880.0	20.0	19.4	0.908	1.031	2
					810	1909.8	20.0	19.2	0.851	1.015	
				Edge 2	661	1880.0	20.0	19.4	0.047	0.053	

**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	19	Rear	9400	1880.0	23.5	22.0	0.293	0.414	
			23	Edge 1	9400	1880.0	23.5	22.0	0.237	0.335	
			9	Edge 2	9400	1880.0	23.5	22.0	0.107	0.151	
	Rel 99 RMC	On	0	Rear	9400	1880.0	13.5	12.7	0.410	0.493	
				Edge 1	9262	1852.4	13.5	12.2	0.815	1.092	3
					9400	1880.0	13.5	12.7	0.864	1.039	
					9538	1907.6	13.5	12.6	0.823	1.017	
				Edge 2	9400	1880.0	13.5	12.7	0.032	0.039	

### 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	19	Rear	1513	1752.6	23.5	22.9	0.262	0.303	
			23	Edge 1	1513	1752.6	23.5	22.9	0.224	0.259	
			9	Edge 2	1513	1752.6	23.5	22.9	0.137	0.158	
	Rel 99 RMC	On	0	Rear	1513	1752.6	13.5	12.8	0.469	0.548	
				Edge 1	1312	1712.4	13.5	12.3	0.559	0.732	
					1413	1732.6	13.5	12.5	0.597	0.755	
					1513	1752.6	13.5	12.8	0.687	0.803	4
	Edge 2	1513	1752.6	13.5	12.8	0.040	0.047				

### 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	19	Rear	4183	836.6	25.0	24.4	0.278	0.319	
			23	Edge 1	4183	836.6	25.0	24.4	0.287	0.329	
			9	Edge 2	4183	836.6	25.0	24.4	0.089	0.102	
			0	Edge 4	4183	836.6	25.0	24.4	0.081	0.093	
	Rel 99 RMC	On	0	Rear	4183	836.6	15.0	14.9	0.446	0.455	
				Edge 1	4183	836.6	15.0	14.9	0.660	0.673	5
Edge 2	4183	836.6	15.0	14.9	0.018	0.018					

### 10.6 LTE Band 2 (20MHz Bandwidth)

RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Standalone	QPSK	Off	19	Rear	18900	1880.0	1	49	24.0	22.7	0.319	0.427	
							50	50	23.0	21.8	0.255	0.334	
			23	Edge 1	18900	1880.0	1	49	24.0	22.7	0.234	0.313	
							50	50	23.0	21.8	0.182	0.238	
			9	Edge 2	18900	1880.0	1	49	24.0	22.7	0.091	0.122	
							50	50	23.0	21.8	0.071	0.093	
	QPSK	On	0	Rear	18900	1880.0	1	49	14.0	12.8	0.460	0.602	
							50	50	14.0	13.0	0.457	0.580	
				Edge 1	18700	1860.0	1	49	14.0	12.4	0.719	1.030	
							50	50	14.0	12.7	0.737	1.005	
					18900	1880.0	1	49	14.0	12.8	0.878	1.150	
							50	50	14.0	13.0	0.912	1.157	6
				19100	1900.0	1	49	14.0	12.7	0.739	0.997		
						50	50	14.0	12.8	0.751	0.992		
						100	0	14.0	12.8	0.739	0.981		
						1	49	14.0	12.8	0.030	0.039		
Edge 2	18900	1880.0	50	50	14.0	13.0	0.023	0.029					

#### Additional Test Accessory SAR

RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Standalone	QPSK	On	0	Edge 1	18900	1880.0	50	50	14.0	13.0	0.372	0.472	

#### Note(s):

In the case of Accessory SAR, the highest reported SAR by frequency was further measured in the band.

### 10.7 LTE Band 5 (10MHz Bandwidth)

RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Standalone	QPSK	Off	19	Rear	20525	836.5	1	0	25.5	24.6	0.360	0.440	
							25	0	24.5	23.9	0.297	0.345	
			23	Edge 1	20525	836.5	1	0	25.5	24.6	0.285	0.348	
							25	0	24.5	23.9	0.243	0.282	
			9	Edge 2	20525	836.5	1	0	25.5	24.6	0.089	0.109	
							25	0	24.5	23.9	0.082	0.095	
			0	Edge 4	20525	836.5	1	0	25.5	24.6	0.092	0.112	
							25	0	24.5	23.9	0.074	0.086	
	QPSK	On	0	Rear	20525	836.5	1	0	16.0	15.7	0.401	0.429	
							25	0	16.0	15.8	0.428	0.444	
				Edge 1	20525	836.5	1	0	16.0	15.7	0.716	0.765	7
							25	0	16.0	15.8	0.601	0.623	
Edge 2	20525	836.5	1	0	16.0	15.7	0.034	0.037					
			25	0	16.0	15.8	0.035	0.036					

### 10.8 LTE Band 12 (10MHz Bandwidth)

RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Standalone	QPSK	Off	19	Rear	23095	707.5	1	0	25.0	23.9	0.286	0.372	
							25	12	24.0	22.8	0.226	0.296	
			23	Edge 1	23095	707.5	1	0	25.0	23.9	0.231	0.300	
							25	12	24.0	22.8	0.191	0.250	
			9	Edge 2	23095	707.5	1	0	25.0	23.9	0.038	0.050	
							25	12	24.0	22.8	0.028	0.037	
			0	Edge 4	23095	707.5	1	0	25.0	23.9	0.055	0.072	
							25	12	24.0	22.8	0.055	0.072	
	QPSK	On	0	Rear	23095	707.5	1	0	15.0	14.0	0.235	0.293	
							25	12	15.0	14.2	0.233	0.282	
				Edge 1	23095	707.5	1	0	15.0	14.0	0.469	0.586	8
							25	12	15.0	14.2	0.466	0.564	
Edge 2	23095	707.5	1	0	15.0	14.0	0.009	0.011					
			25	12	15.0	14.2	0.009	0.011					



**10.9 LTE Band 13 (10MHz Bandwidth)**

RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Standalone	QPSK	Off	19	Rear	23230	782.0	1	49	25.0	24.7	0.436	0.472	
							25	25	24.0	23.6	0.343	0.376	
			23	Edge 1	23230	782.0	1	49	25.0	24.7	0.292	0.316	
							25	25	24.0	23.6	0.222	0.243	
			9	Edge 2	23230	782.0	1	49	25.0	24.7	0.054	0.059	
							25	25	24.0	23.6	0.046	0.050	
	0	Edge 4	23230	782.0	1	49	25.0	24.7	0.095	0.103			
					25	25	24.0	23.6	0.072	0.078			
	QPSK	On	0	Rear	23230	782.0	1	49	15.0	14.7	0.408	0.434	
							25	25	15.0	14.8	0.410	0.428	
				Edge 1	23230	782.0	1	49	15.0	14.7	0.437	0.465	
							25	25	15.0	14.8	0.469	0.490	9
Edge 2				23230	782.0	1	49	15.0	14.7	0.014	0.015		
						25	25	15.0	14.8	0.015	0.016		

**10.10 LTE Band 17 (10MHz Bandwidth)**

RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.			
									Tune-up limit	Meas.	Meas.	Scaled				
Standalone	QPSK	On	0	Rear	23790	710.0	1	0	17.0	16.0	0.345	0.431				
							25	0	17.0	16.2	0.341	0.414				
				Edge 1	23790	710.0	1	0	17.0	16.0	0.655	0.819				
							25	0	17.0	16.2	0.661	0.803				
				Edge 2	23790	710.0	1	0	17.0	16.0	0.770	0.959	10			
							25	0	17.0	16.2	0.014	0.017				

**Additional Test Accessory SAR**

RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Standalone	QPSK	On	0	Edge 1	23790	710.0	50	0	17.0	16.0	0.448	0.558	

**Note(s):**

In the case of Accessory SAR, the highest reported SAR by frequency was further measured in the band.



### 10.13 LTE Band 41 (20MHz Bandwidth)

RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Standalone	QPSK	Off	19	Rear	41055	2636.5	1	49	24.5	23.9	0.133	0.153	
				50			24	23.5	22.9	0.104	0.121		
			23	Edge 1	41055	2636.5	1	49	24.5	23.9	0.128	0.147	
				50			24	23.5	22.9	0.105	0.122		
			9	Edge 2	41055	2636.5	1	49	24.5	23.9	0.124	0.142	
							50	24	23.5	22.9	0.096	0.111	
	QPSK	On	0	Rear	41055	2636.5	1	49	15.0	14.0	0.326	0.409	
							50	24	15.0	14.1	0.322	0.399	
				Edge 1	39750	2506.0	1	49	15.0	13.6	0.505	0.704	
							50	24	15.0	13.6	0.517	0.706	
					40185	2549.5	1	49	15.0	13.5	0.537	0.751	
							50	24	15.0	13.5	0.549	0.773	
				Edge 1	40620	2593.0	1	49	15.0	13.7	0.629	0.855	13
							50	24	15.0	13.7	0.630	0.849	
					41055	2636.5	1	49	15.0	14.0	0.509	0.638	
							50	24	15.0	14.1	0.517	0.641	
				41490	2680.0	100	0	15.0	13.9	0.506	0.651		
						1	49	15.0	13.9	0.449	0.585		
				Edge 2	41055	2636.5	50	24	15.0	13.9	0.466	0.607	
							1	49	15.0	14.0	0.046	0.057	
50	24	15.0	14.1	0.046	0.057								

#### Additional Test Accessory SAR

RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Standalone	QPSK	On	0	Edge 1	40620	2593.0	1	49	15.0	13.7	0.440	0.598	

#### Note(s):

In the case of Accessory SAR, the highest reported SAR by frequency was further measured in the band.





**10.17 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)		Note	Plot No.
									Tune-up limit	Meas.	Meas.	Scaled		
2.4GHz	GFSK	Standalone	Off	17	Rear	39	2441.0	77.1%	18.0	17.3	0.030	0.047		
				20	Edge 1	39	2441.0	77.1%	18.0	17.3	0.025	0.038		
				9	Edge 2	39	2441.0	77.1%	18.0	17.3	0.144	0.221		
				0	Edge 3	39	2441.0	77.1%	18.0	17.3	0.024	0.036	2	
				0	Edge 4	39	2441.0	77.1%	18.0	17.3	0.003	0.005	2	
				15	Corner A	39	2441.0	77.1%	18.0	17.3	0.034	0.052		
			On	0	Rear	39	2441.0	77.1%	10.0	9.9	0.179	0.236		18
				0	Edge 1	39	2441.0	77.1%	10.0	9.9	0.121	0.160		
				0	Edge 2	39	2441.0	77.1%	10.0	9.9	0.144	0.190		
				0	Corner A	39	2441.0	77.1%	10.0	9.9	0.085	0.113		

**Note(s):**

1. Bluetooth SAR test were additionally evaluated for determining simultaneous transmission SAR test exclusion.
2. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.









**Additional Test Accessory SAR**

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)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
5.3 GHz U-NII 2A SISO Ant 1	802.11ac (VHT80) MCS0	Standalone	On	0	Edge 2	58	5290.0	2.146	98.6%	9.5	8.4	0.884	1.155	
5.8 GHz U-NII 3 SISO Ant 2	802.11ac (VHT80) MCS0	Standalone	On	0	Rear	155	5775.0	0.450	98.6%	9.5	7.7	0.206	0.316	
5.5 GHz U-NII 2C MIMO Ant 1	802.11ac (VHT80) MCS0	Standalone	On	0	Edge 2	106	5530.0	2.152	97.3%	9.5	8.5	0.715	0.917	

**Note(s):**

1. In the case of Accessory SAR, the highest reported SAR by frequency was further measured in the band.

## 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  $\geq 0.80$  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  $\geq 1.45$  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  $\geq 1.5$  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	Edge 1	No	0.469	N/A	N/A
	LTE Band 13	Standalone	Edge 1	No	0.469	N/A	N/A
	LTE Band 17	Standalone	Edge 1	No	0.770	N/A	N/A
850	GSM 850	Standalone	Rear	No	0.495	N/A	N/A
	WCDMA Band V	Standalone	Edge 1	No	0.660	N/A	N/A
	LTE Band 5	Standalone	Edge 1	No	0.716	N/A	N/A
	LTE Band 26	Standalone	Edge 1	Yes	0.919	0.906	1.01
	Band n5	Standalone	Rear	No	0.577	N/A	N/A
1750	WCDMA Band IV	Standalone	Edge 1	No	0.687	N/A	N/A
	LTE Band 66	Standalone	Edge 1	Yes	0.923	0.923	1.00
1900	GSM 1900	Standalone	Edge 1	No	0.908	N/A	N/A
	WCDMA Band II	Standalone	Edge 1	No	0.864	N/A	N/A
	LTE Band 2	Standalone	Edge 1	No	0.912	N/A	N/A
	LTE Band 25	Standalone	Edge 1	Yes	0.930	0.907	1.03
2400	Wi-Fi 802.11b/g/n	Standalone	Edge 4	No	0.491	N/A	N/A
	Bluetooth	Standalone	Rear	No	0.179	N/A	N/A
2600	LTE Band 41	Standalone	Edge 1	No	0.630	N/A	N/A
5300	Wi-Fi 802.11a/n	Standalone	Edge 2	Yes	0.954	0.950	1.00
5500	Wi-Fi 802.11a/n	Standalone	Edge 2	Yes	0.933	0.909	1.03
5800	Wi-Fi 802.11a/n	Standalone	Edge 2	No	0.749	N/A	N/A

### Note(s):

Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not  $> 1.20$ .

## 12 Simultaneous Transmission SAR Analysis

### Simultaneous Transmission Condition

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

Notes:

1. DTS supports Wi-Fi Direct, Hotspot and VoIP.
2. U-NII supports Wi-Fi Direct, Hotspot and VoIP.
3. U-NII Radio can transmit simultaneously with Bluetooth Radio.
4. DTS Radio cannot transmit simultaneously with Bluetooth Radio.
5. NR Radio can transmit through EN-DC mode with LTE anchor bands. (Please refer to Sec.6.5)

### 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)

### Estimated SAR for Simultaneous Transmission SAR Analysis

#### Considerations for SAR estimation

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

### 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:

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

Where:

**SAR<sub>1</sub>** 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<sub>2</sub>** 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

**R<sub>i</sub>** 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:

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

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<sub>1</sub>** or **SAR<sub>2</sub>**. 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. 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 SPLSR 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 SPLSR 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.

## SPLSR Hotspot Combination

Per November 2019 TCB Workshop Notes, SPLSR Hotspot Combination procedure can be applied to evaluate to simultaneous transmission SAR analysis.

Hybrid SPLSR and enlarged zoom scan (Volume scan) can be applied when Simultaneous transmission SAR is over 1.6 or 4.0 W/kg (1-g or 10-g respectively), it does not meet SPLSR criteria, and antenna pair is co-located. Antenna co-location means that SAR distributions overlap because the antennas are not significantly spatially separated.

### Test procedure

**Step.1** Perform enlarged zoom scan (Volume scan) on the co-located antenna pair to determine 1g/10g aggregate SAR.

**Step.2** Apply SPLSR procedure for the spatially separated antenna and aggregate SAR distribution of the co-located antenna pair.

## 5G NR FR1 NSA EN-DC UE SAR

Per November 2019 TCB Workshop Notes, PAG requirements for both intra-band and inter-band NSA EN-DC are as follows:

**Case.1** If the single uplink 1-g SAR values for each band are both less than 0.8 W/kg and the algebraic summation of the 1-g SAR values are less than 1.45 W/kg, additional measurements are not needed.

**Case.2** If one of the single uplink 1-g SAR values is greater than 0.8 W/kg, instead of algebraically summing the 1-g SAR values, sum up the SAR distributions, similar to the enlarged zoom scan (volume scan) procedures KDB Pub.865664 D01.

**Case.3** If the algebraic sum of the 1-g SAR values is greater than 1.45 W/kg, additional measurements might be needed.







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

Test Position	Standalone SAR (W/kg)							$\Sigma$ 1-g SAR (W/kg)										
	WWAN	DTS Ant 1	DTS Ant 2	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO	
	1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7	
Rear	0.595	0.387	0.109	0.746	0.726	0.850	0.236	0.982	0.704	1.091	1.341	1.321	1.445	0.831	1.577	1.557	1.681	
Edge 1	0.540	0.266	0.042	0.276	0.401	0.450	0.160	0.806	0.582	0.848	0.816	0.941	0.990	0.700	0.976	1.101	1.150	
Edge 2	0.087	0.431	0.400	1.194	0.400	1.197	0.221	0.518	0.487	0.918	1.281	0.487	1.284	0.308	1.502	0.708	1.505	
Edge 3	0.400	0.431	0.400	0.400	0.400	0.077	0.036	0.831	0.800	1.231	0.800	0.800	0.477	0.436	0.836	0.836	0.513	
Edge 4	0.141	0.112	0.579	0.400	0.589	0.631	0.005	0.253	0.720	0.832	0.541	0.730	0.772	0.146	0.546	0.735	0.777	

#### SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)			$\Sigma$ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR ( $\leq 0.04$ )	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO	3 BT						
Rear	0.595	0.850	0.236	1 + 2 + 3	1.681			1	
	0.595	0.850		1 + 2	1.445	104.8	0.02		
	0.595		0.236	1 + 3	0.831	70.4	0.01		
		0.850	0.236	2 + 3	1.086	172.1	0.01		

**Note(s):**

- Green values are reference from highest SAR value of *initial test position* procedure in each RF exposure of each bands.

**Conclusion:**

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

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

Test Position	Standalone SAR (W/kg)							$\Sigma$ 1-g SAR (W/kg)										
	WWAN	DTS Ant 1	DTS Ant 2	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO	
	1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7	
Rear	0.493	0.387	0.109	0.746	0.726	0.850	0.236	0.880	0.602	0.989	1.239	1.219	1.343	0.729	1.475	1.455	1.579	
Edge 1	1.031	0.266	0.042	0.276	0.401	0.450	0.160	1.297	1.073	1.339	1.307	1.432	1.481	1.191	1.467	1.592	1.641	
Edge 2	0.086	0.431	0.400	1.194	0.400	1.197	0.221	0.517	0.486	0.917	1.280	0.486	1.283	0.307	1.501	0.707	1.504	
Edge 3	0.400	0.431	0.400	0.400	0.400	0.077	0.036	0.831	0.800	1.231	0.800	0.800	0.477	0.436	0.836	0.836	0.513	
Edge 4	0.400	0.112	0.579	0.400	0.589	0.631	0.005	0.512	0.979	1.091	0.800	0.989	1.031	0.405	0.805	0.994	1.036	

#### SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)			$\Sigma$ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR ( $\leq 0.04$ )	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO	3 BT						
Edge 1	1.031	0.450	0.160	1 + 2 + 3	1.641			2	
	1.031	0.450		1 + 2	1.481	93.2	0.02		
	1.031		0.160	1 + 3	1.191	47.7	0.03		
		0.450	0.160	2 + 3	0.610	140.2	0.00		

**Note(s):**

- Green values are reference from highest SAR value of *initial test position* procedure in each RF exposure of each bands.

**Conclusion:**

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

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

Test Position	Standalone SAR (W/kg)							$\sum$ 1-g SAR (W/kg)										
	WWAN	DTS Ant 1	DTS Ant 2	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO	
	1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7	
Rear	0.493	0.387	0.109	0.746	0.726	0.850	0.236	0.880	0.602	0.989	1.239	1.219	1.343	0.729	1.475	1.455	1.579	
Edge 1	1.092	0.266	0.042	0.276	0.401	0.450	0.160	1.358	1.134	1.400	1.368	1.493	1.542	1.252	1.528	1.653	1.702	
Edge 2	0.151	0.431	0.400	1.194	0.400	1.197	0.221	0.582	0.551	0.982	1.345	0.551	1.348	0.372	1.566	0.772	1.569	
Edge 3	0.400	0.431	0.400	0.400	0.400	0.077	0.036	0.831	0.800	1.231	0.800	0.800	0.477	0.436	0.836	0.836	0.513	
Edge 4	0.400	0.112	0.579	0.400	0.589	0.631	0.005	0.512	0.979	1.091	0.800	0.989	1.031	0.405	0.805	0.994	1.036	

#### SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)			$\sum$ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR ( $\leq 0.04$ )	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII Ant 2	3 BT						
Edge 1	1.092	0.401	0.160	1 + 2 + 3	1.653			3	
	1.092	0.401		1 + 2	1.493	97.5	0.02		No
	1.092		0.160	1 + 3	1.252	44.1	0.03		No
		0.401	0.160	2 + 3	0.561	140.2	0.00		No

Test Position	Standalone SAR (W/kg)			$\sum$ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR ( $\leq 0.04$ )	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO	3 BT						
Edge 1	1.092	0.450	0.160	1 + 2 + 3	1.702			4	
	1.092	0.450		1 + 2	1.542	97.5	0.02		No
	1.092		0.160	1 + 3	1.252	44.1	0.03		No
		0.450	0.160	2 + 3	0.610	140.2	0.00		No

#### Note(s):

- Green values are reference from highest SAR value of *initial test position* procedure in each RF exposure of each bands.

#### Conclusion:

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

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

Test Position	Standalone SAR (W/kg)							$\sum$ 1-g SAR (W/kg)										
	WWAN	DTS Ant 1	DTS Ant 2	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO	
	1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7	
Rear	0.548	0.387	0.109	0.746	0.726	0.850	0.236	0.935	0.657	1.044	1.294	1.274	1.398	0.784	1.530	1.510	1.634	
Edge 1	0.803	0.266	0.042	0.276	0.401	0.450	0.160	1.069	0.845	1.111	1.079	1.204	1.253	0.963	1.239	1.364	1.413	
Edge 2	0.158	0.431	0.400	1.194	0.400	1.197	0.221	0.589	0.558	0.989	1.352	0.558	1.355	0.379	1.573	0.779	1.576	
Edge 3	0.400	0.431	0.400	0.400	0.400	0.077	0.036	0.831	0.800	1.231	0.800	0.800	0.477	0.436	0.836	0.836	0.513	
Edge 4	0.400	0.112	0.579	0.400	0.589	0.631	0.005	0.512	0.979	1.091	0.800	0.989	1.031	0.405	0.805	0.994	1.036	

#### SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)			$\sum$ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR ( $\leq 0.04$ )	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO	3 BT						
Rear	0.548	0.850	0.236	1 + 2 + 3	1.634			5	
	0.548	0.850		1 + 2	1.398	110.3	0.01		No
	0.548		0.236	1 + 3	0.784	62.7	0.01		No
		0.850	0.236	2 + 3	1.086	172.1	0.01		No

#### Note(s):

- Green values are reference from highest SAR value of *initial test position* procedure in each RF exposure of each bands.

#### Conclusion:

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

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

Test Position	Standalone SAR (W/kg)							Σ 1-g SAR (W/kg)									
	WWAN	DTS Ant 1	DTS Ant 2	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO
	1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7
Rear	0.455	0.387	0.109	0.746	0.726	0.850	0.236	0.842	0.564	0.951	1.201	1.181	1.305	0.691	1.437	1.417	1.541
Edge 1	0.673	0.266	0.042	0.276	0.401	0.450	0.160	0.939	0.715	0.981	0.949	1.074	1.123	0.833	1.109	1.234	1.283
Edge 2	0.102	0.431	0.400	1.194	0.400	1.197	0.221	0.533	0.502	0.933	1.296	0.502	1.299	0.323	1.517	0.723	1.520
Edge 3	0.400	0.431	0.400	0.400	0.400	0.077	0.036	0.831	0.800	1.231	0.800	0.800	0.477	0.436	0.836	0.836	0.513
Edge 4	0.093	0.112	0.579	0.400	0.589	0.631	0.005	0.205	0.672	0.784	0.493	0.682	0.724	0.098	0.498	0.687	0.729

**Note(s):**

1. Green values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

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

Test Position	Standalone SAR (W/kg)							Σ 1-g SAR (W/kg)									
	WWAN	DTS Ant 1	DTS Ant 2	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO
	1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7
Rear	0.602	0.387	0.109	0.746	0.726	0.850	0.236	0.989	0.711	1.098	1.348	1.328	1.452	0.838	1.584	1.584	1.688
Edge 1	1.157	0.266	0.042	0.276	0.401	0.450	0.160	1.423	1.199	1.465	1.433	1.558	1.607	1.317	1.593	1.718	1.767
Edge 2	0.122	0.431	0.400	1.194	0.400	1.197	0.221	0.553	0.522	0.953	1.316	0.522	1.319	0.343	1.537	0.743	1.540
Edge 3	0.400	0.431	0.400	0.400	0.400	0.077	0.036	0.831	0.800	1.231	0.800	0.800	0.477	0.436	0.836	0.836	0.513
Edge 4	0.400	0.112	0.579	0.400	0.589	0.631	0.005	0.512	0.979	1.091	0.800	0.989	1.031	0.405	0.805	0.994	1.036

**SAR to Peak Location Separation Ratio (SPLSR)**

Test Position	Standalone SAR (W/kg)			Σ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO	3 BT						
Rear	0.602	0.850	0.236	1 + 2 + 3	1.688			6	
	0.602	0.850		1 + 2	1.452	116.8	0.01		
	0.602		0.236	1 + 3	0.838	56.4	0.01		
		0.850	0.236	2 + 3	1.086	172.1	0.01		

Test Position	Standalone SAR (W/kg)			Σ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII Ant 2	3 BT						
Edge 1	1.157	0.401	0.160	1 + 2 + 3	1.718			7	
	1.157	0.401		1 + 2	1.558	96.4	0.02		
	1.157		0.160	1 + 3	1.317	44.2	0.03		
		0.401	0.160	2 + 3	0.561	140.2	0.00		

Test Position	Standalone SAR (W/kg)			Σ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO	3 BT						
Edge 1	1.157	0.450	0.160	1 + 2 + 3	1.767			8	
	1.157	0.450		1 + 2	1.607	96.4	0.02		
	1.157		0.160	1 + 3	1.317	44.2	0.03		
		0.450	0.160	2 + 3	0.610	140.2	0.00		

**Note(s):**

1. Green values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

**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.



### 12.11 Sum of the SAR for LTE Band 25 & Wi-Fi & BT

Test Position	Standalone SAR (W/kg)							∑ 1-g SAR (W/kg)										
	WWAN	DTS Ant 1	DTS Ant 2	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO	
	1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7	
Rear	0.606	0.387	0.109	0.746	0.726	0.850	0.236	0.993	0.715	1.102	1.352	1.332	1.456	0.842	1.588	1.568	1.692	
Edge 1	1.157	0.266	0.042	0.276	0.401	0.450	0.160	1.423	1.199	1.465	1.433	1.558	1.607	1.317	1.593	1.718	1.767	
Edge 2	0.120	0.431	0.400	1.194	0.400	1.197	0.221	0.551	0.520	0.951	1.314	0.520	1.317	0.341	1.535	0.741	1.538	
Edge 3	0.400	0.431	0.400	0.400	0.400	0.077	0.036	0.831	0.800	1.231	0.800	0.800	0.477	0.436	0.836	0.836	0.513	
Edge 4	0.400	0.112	0.579	0.400	0.589	0.631	0.005	0.512	0.979	1.091	0.800	0.989	1.031	0.405	0.805	0.994	1.036	

#### 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	3 BT	1 + 2 + 3	1.692				
Rear	0.606	0.850	0.236	1 + 2 + 3	1.692			9	
	0.606	0.850		1 + 2	1.456	116.8	0.02		
	0.606		0.236	1 + 3	0.842	56.4	0.01		
		0.850	0.236	2 + 3	1.086	172.1	0.01		

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 Ant 2	3 BT	1 + 2 + 3	1.718				
Edge 1	1.157	0.401	0.160	1 + 2 + 3	1.718			10	
	1.157	0.401		1 + 2	1.558	97.8	0.02		
	1.157		0.160	1 + 3	1.317	43.6	0.03		
		0.401	0.160	2 + 3	0.561	140.2	0.00		

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	3 BT	1 + 2 + 3	1.767				
Edge 1	1.157	0.450	0.160	1 + 2 + 3	1.767			11	
	1.157	0.450		1 + 2	1.607	97.8	0.02		
	1.157		0.160	1 + 3	1.317	43.6	0.03		
		0.450	0.160	2 + 3	0.610	140.2	0.00		

**Note(s):**

1. Green values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

**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.

12.12 Sum of the SAR for LTE Band 26 & Wi-Fi & BT

Test Position	Standalone SAR (W/kg)							$\sum$ 1-g SAR (W/kg)										
	WWAN	DTS Ant 1	DTS Ant 2	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO	
	1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7	
Rear	0.818	0.387	0.109	0.746	0.726	0.850	0.236	1.205	0.927	1.314	1.564	1.544	1.668	1.054	1.800	1.780	1.904	
Edge 1	1.144	0.266	0.042	0.276	0.401	0.450	0.160	1.410	1.186	1.452	1.420	1.545	1.594	1.304	1.580	1.705	1.754	
Edge 2	0.130	0.431	0.400	1.194	0.400	1.197	0.221	0.561	0.530	0.961	1.324	0.530	1.327	0.351	1.545	0.751	1.548	
Edge 3	0.400	0.431	0.400	0.400	0.400	0.077	0.036	0.831	0.800	1.231	0.800	0.800	0.477	0.436	0.836	0.836	0.513	
Edge 4	0.156	0.112	0.579	0.400	0.589	0.631	0.005	0.268	0.735	0.847	0.556	0.745	0.787	0.161	0.561	0.750	0.792	

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Standalone SAR (W/kg)			$\sum$ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR ( $\leq$ 0.04)	Volume Scan (Yes/ No)	Volume Scan SAR (W/kg) <i>Note 1</i>	Figure
	1 WWAN	2 U-NII Ant 1	3 BT	1 + 2 + 3	1.800					
Rear	0.818	0.746	0.236	1 + 2 + 3	1.800					12, 13
Hybrid SPLSR <i>Note 2</i>	0.818	1.010		2 + 3	0.982	1.8	0.53	Yes	1.010	

Test Position	Standalone SAR (W/kg)			$\sum$ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR ( $\leq$ 0.04)	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII Ant 2	3 BT	1 + 2 + 3	1.780				
Rear	0.818	0.726	0.236	1 + 2 + 3	1.780				14
	0.818	0.726		1 + 2	1.544	81.7	0.02	No	
	0.818		0.236	1 + 3	1.054	90.1	0.01	No	
		0.726	0.236	2 + 3	0.962	170.9	0.01	No	

Test Position	Standalone SAR (W/kg)			$\sum$ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR ( $\leq$ 0.04)	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO	3 BT	1 + 2 + 3	1.904				
Rear	0.818	0.850	0.236	1 + 2 + 3	1.904				15
	0.818	0.850		1 + 2	1.668	82.9	0.03	No	
	0.818		0.236	1 + 3	1.054	90.1	0.01	No	
		0.850	0.236	2 + 3	1.086	172.1	0.01	No	

Test Position	Standalone SAR (W/kg)			$\sum$ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR ( $\leq$ 0.04)	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII Ant 2	3 BT	1 + 2 + 3	1.705				
Edge 1	1.144	0.401	0.160	1 + 2 + 3	1.705				16
	1.144	0.401		1 + 2	1.545	88.5	0.02	No	
	1.144		0.160	1 + 3	1.304	52.0	0.03	No	
		0.401	0.160	2 + 3	0.561	140.2	0.00	No	

Test Position	Standalone SAR (W/kg)			$\sum$ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR ( $\leq$ 0.04)	Volume Scan (Yes/ No)	Figure
	1 WWAN	2 U-NII MIMO	3 BT	1 + 2 + 3	1.754				
Edge 1	1.144	0.450	0.160	1 + 2 + 3	1.754				17
	1.144	0.450		1 + 2	1.594	88.5	0.02	No	
	1.144		0.160	1 + 3	1.304	52.0	0.03	No	
		0.450	0.160	2 + 3	0.610	140.2	0.00	No	

Note(s):

- SPLSR Hotspot Combination Step.1) Perform enlarged zoom scan (Volume scan) on the co-located antenna pair to determine 1g/10g aggregate SAR. Refer to the Sec.12.18 for detailed Volume Scan Result.
- SPLSR Hotspot Combination Step.2) Apply SPLSR procedure for the spatially separated antenna and aggregate SAR distribution of the co-located antenna pair. Hybrid SPLSR procedure was applied for the spatially separated main bands and unlicensed bands for Multi-band Combined results.
- Green values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

Conclusion:

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

### 12.13 Sum of the SAR for LTE Band 41 & Wi-Fi & BT

Test Position	Standalone SAR (W/kg)							∑ 1-g SAR (W/kg)										
	WWAN	DTS Ant 1	DTS Ant 2	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO	
	1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7	
Rear	0.409	0.387	0.109	0.746	0.726	0.850	0.236	0.796	0.518	0.905	1.155	1.135	1.259	0.645	1.391	1.371	1.495	
Edge 1	0.855	0.266	0.042	0.276	0.401	0.450	0.160	1.121	0.897	1.163	1.131	1.256	1.305	1.015	1.291	1.416	1.465	
Edge 2	0.142	0.431	0.400	1.194	0.400	1.197	0.221	0.573	0.542	0.973	1.336	0.542	1.339	0.363	1.567	0.763	1.560	
Edge 3	0.400	0.431	0.400	0.400	0.400	0.077	0.036	0.831	0.800	1.231	0.800	0.800	0.477	0.436	0.836	0.836	0.513	
Edge 4	0.400	0.112	0.579	0.400	0.589	0.631	0.005	0.512	0.979	1.091	0.800	0.989	1.031	0.405	0.805	0.994	1.036	

**Note(s):**

1. Green values are reference from highest SAR value of *initial test position* procedure in each RF exposure of each bands.

### 12.14 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	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO	
	1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7	
Rear	0.587	0.387	0.109	0.746	0.726	0.850	0.236	0.974	0.696	1.083	1.333	1.313	1.437	0.823	1.569	1.549	1.673	
Edge 1	1.133	0.266	0.042	0.276	0.401	0.450	0.160	1.399	1.175	1.441	1.409	1.534	1.583	1.293	1.569	1.694	1.743	
Edge 2	0.161	0.431	0.400	1.194	0.400	1.197	0.221	0.592	0.561	0.992	1.355	0.561	1.358	0.382	1.576	0.782	1.579	
Edge 3	0.400	0.431	0.400	0.400	0.400	0.077	0.036	0.831	0.800	1.231	0.800	0.800	0.477	0.436	0.836	0.836	0.513	
Edge 4	0.400	0.112	0.579	0.400	0.589	0.631	0.005	0.512	0.979	1.091	0.800	0.989	1.031	0.405	0.805	0.994	1.036	

### 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	3 BT						
Rear	0.587	0.850	0.236	1 + 2 + 3	1.673			18	
	0.587	0.850		1 + 2	1.437	112.0	0.02		
	0.587		0.236	1 + 3	0.823	61.4	0.01		
		0.850	0.236	2 + 3	1.086	172.1	0.01		

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 Ant 2	3 BT						
Edge 1	1.133	0.401	0.160	1 + 2 + 3	1.694			19	
	1.133	0.401		1 + 2	1.534	97.6	0.02		
	1.133		0.160	1 + 3	1.293	42.6	0.03		
		0.401	0.160	2 + 3	0.561	140.2	0.00		

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	3 BT						
Edge 1	1.133	0.450	0.160	1 + 2 + 3	1.743			20	
	1.133	0.450		1 + 2	1.583	97.6	0.02		
	1.133		0.160	1 + 3	1.293	42.6	0.03		
		0.450	0.160	2 + 3	0.610	140.2	0.00		

**Note(s):**

1. Green values are reference from highest SAR value of *initial test position* procedure in each RF exposure of each bands.

**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.

### 12.15 Sum of the SAR for EN-DC(LTE Band 66 & NR Band n5) & Wi-Fi & BT

Test Position	Standalone SAR (W/kg)							∑ 1-g SAR (W/kg)										
	WWAN		DTS Ant 1	DTS Ant 2	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 1	WWAN + BT + U-NII Ant 2	WWAN + BT + U-NII MIMO
	LTE anchor	NR	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+6	1+7	1+4+7	1+5+7	1+6+7
Rear	0.587	0.806	0.387	0.109	0.746	0.726	0.850	0.236	1.780	1.502	1.889	2.139	2.119	2.243	1.629	2.375	2.355	2.479
Edge 1	1.159	0.575	0.266	0.042	0.276	0.401	0.450	0.160	2.000	1.776	2.042	2.010	2.135	2.184	1.894	2.170	2.295	2.344
Edge 2 Max	0.161	0.141	0.431	0.400	0.850	0.400	1.053	0.221	0.733	0.702	1.133	1.152	0.702	1.355	0.523	1.373	0.923	1.576
Edge 2 Reduce	0.044	0.030	0.431	0.400	1.194	0.400	1.197	0.221	0.505	0.474	0.905	1.268	0.474	1.271	0.235	1.489	0.695	1.482
Edge 3	0.400	0.400	0.112	0.400	0.400	0.400	0.077	0.036	0.912	1.200	1.312	1.200	1.200	0.877	0.836	1.236	1.236	0.913
Edge 4	0.400	0.208	0.026	0.579	0.400	0.589	0.631	0.005	0.634	1.187	1.213	1.008	1.197	1.239	0.613	1.013	1.202	1.244

#### 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)	Volume Scan SAR (W/kg) <b>Note 1</b>	Figure
	1A WWAN	1B NR	2 DTS Ant 1	3 DTS Ant 2	1A + 1B + 2 + 3	1.889					
Rear	0.587	0.806	0.387	0.109	1A + 1B + 2 + 3	1.889				21, 22	
	0.587	0.806			1A + 1B	1.393	12.8	0.13	Yes		1.210
			0.387	0.109	2 + 3	0.496	170.0	0.00	No		
Hybrid SPLSR <b>Note 2</b>	1.210		0.387		(1A + 1B) + 2	1.597	50.7	0.04	No		
			0.109		(1A + 1B) + 3	1.319	121.3	0.01	No		

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Volume Scan SAR (W/kg) <b>Note 1</b>	Figure
	1A WWAN	1B NR	2 UNII Ant 1	3 BT	1A + 1B + 2 + 3	2.375					
Rear	0.587	0.806	0.746	0.236	1A + 1B + 2 + 3	2.375				23, 24, 25	
	0.587	0.806			1A + 1B	1.393	12.8	0.13	Yes		1.210
			0.746	0.236	2 + 3	0.982	1.8	0.53	Yes		1.010
Hybrid SPLSR <b>Note 2</b>	1.210		1.010		(1A + 1B) + (2 + 3)	2.220	60.1	0.06	Yes		
Volume Scan	1.210				(1A + 1B + 2 + 3)	1.210					

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Volume Scan SAR (W/kg) <b>Note 1</b>	Figure
	1A WWAN	1B NR	2 UNII Ant 2	3 BT	1A + 1B + 2 + 3	2.355					
Rear	0.587	0.806	0.726	0.236	1A + 1B + 2 + 3	2.355				26, 27	
	0.587	0.806			1A + 1B	1.393	12.8	0.13	Yes		1.210
			0.726	0.236	2 + 3	0.962	170.9	0.01	No		
Hybrid SPLSR <b>Note 2</b>	1.210		0.726		(1A + 1B) + 2	1.936	115.2	0.02	No		
			0.236		(1A + 1B) + 3	1.446	47.9	0.04	No		

Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Volume Scan SAR (W/kg) <b>Note 1</b>	Figure
	1A WWAN	1B NR	2 UNII MIMO	3 BT	1A + 1B + 2 + 3	2.479					
Rear	0.587	0.806	0.850	0.236	1A + 1B + 2 + 3	2.479				28, 29	
	0.587	0.806			1A + 1B	1.393	12.8	0.13	Yes		1.210
			0.850	0.236	2 + 3	1.086	172.0	0.01	No		
Hybrid SPLSR <b>Note 2</b>	1.210		0.850		(1A + 1B) + 2	2.060	117.2	0.03	No		
			0.236		(1A + 1B) + 3	1.446	47.9	0.04	No		



**SAR to Peak Location Separation Ratio (SPLSR)**

Test Position	Standalone SAR (W/kg)				Σ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Volume Scan SAR (W/kg) <i>Note 1</i>	Figure
	1A WWAN	1B NR	2 DTS Ant 1	3 DTS Ant 2							
Edge 1	1.133	0.575	0.284	0.042	1A + 1B + 2 + 3	2.034					30, 31 32
	1.133	0.575			1A + 1B	1.708	29.6	0.08	Yes	1.590	
			0.284	0.042	2 + 3	0.326	165.7	0.00	No		
Hybrid SPLSR <i>Note 2</i>	1.590		0.284		(1A + 1B) + 2	1.874	39.5	0.06	Yes		
				0.042	(1A + 1B) + 3	1.632	124.0	0.02	No		
Volume scan	1.580				(1A + 1B + 2)						

Test Position	Standalone SAR (W/kg)				Σ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Volume Scan SAR (W/kg) <i>Note 1</i>	Figure
	1A WWAN	1B NR	2 UNII Ant 1	3 BT							
Edge 1	1.133	0.575	0.276	0.160	1A + 1B + 2 + 3	2.144					33, 34 35
	1.133	0.575			1A + 1B	1.708	29.6	0.08	Yes	1.590	
			0.276	0.160	2 + 3	0.436	4.0	0.07	Yes	0.463	
Hybrid SPLSR <i>Note 2</i>	1.590		0.463		(1A + 1B) + (2 + 3)	2.053	54.4	0.05	Yes		
Volume scan	1.580				(1A + 1B + 2 + 3)	1.580					

Test Position	Standalone SAR (W/kg)				Σ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Volume Scan SAR (W/kg) <i>Note 1</i>	Figure
	1A WWAN	1B NR	2 UNII Ant 2	3 BT							
Edge 1	1.133	0.575	0.401	0.160	1A + 1B + 2 + 3	2.269					36, 37 38
	1.133	0.575			1A + 1B	1.708	29.6	0.08	Yes	1.590	
			0.401	0.160	2 + 3	0.561	104.2	0.00	No		
Hybrid SPLSR <i>Note 2</i>	1.590		0.401		(1A + 1B) + 2	1.991	99.9	0.03	No		
				0.160	(1A + 1B) + 3	1.750	56.7	0.04	Yes		
Volume scan	1.580				(1A + 1B + 3)	1.580					

Test Position	Standalone SAR (W/kg)				Σ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Volume Scan SAR (W/kg) <i>Note 1</i>	Figure
	1A WWAN	1B NR	2 UNII MIMO	3 BT							
Edge 1	1.133	0.575	0.450	0.160	1A + 1B + 2 + 3	2.318					39, 40
	1.133	0.575			1A + 1B	1.708	29.6	0.08	Yes	1.590	
			0.450	0.160	2 + 3	0.610	140.2	0.00	No		
Hybrid SPLSR <i>Note 2</i>	1.590		0.450		(1A + 1B) + 2	2.040	99.9	0.03	No		
				0.160	(1A + 1B) + 3	1.750	56.7	0.04	Yes		

**Note(s):**

- SPLSR Hotspot Combination Step.1) Perform enlarged zoom scan (Volume scan) on the co-located antenna pair to determine 1g/10g aggregate SAR. Refer to the Sec.12.18 for detailed Volume Scan Result.
- SPLSR Hotspot Combination Step.2) Apply SPLSR procedure for the spatially separated antenna and aggregate SAR distribution of the co-located antenna pair. Hybrid SPLSR procedure was applied for the spatially separated main bands and unlicensed bands for Multi-band Combined results.
- Green values are reference from highest SAR value of *initial test position* procedure in each RF exposure of each bands.
- The blue value is the Max Power measurement SAR value and the purple value is the Proximity sensor back-off Power measurement SAR value.
- Because of the same sensor operating distance for Edge 2, Max power and back-off power SAR values were divided to satisfy simultaneous transmission.

**Conclusion:**

Simultaneous Transmission SAR analysis results is satisfied the FCC Limit requirement according to follow procedures with "Sum of SAR" or "SPLSR" or "SPLSR Hotspot combination".

Figure (1)

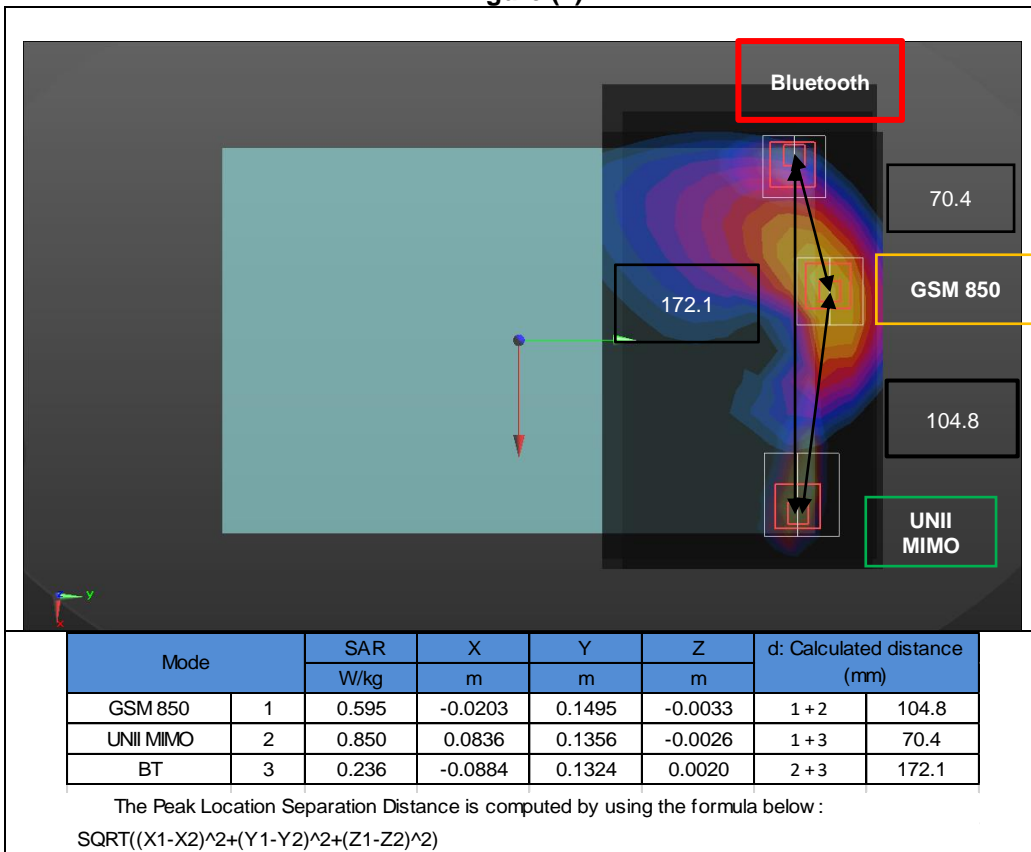


Figure (2)

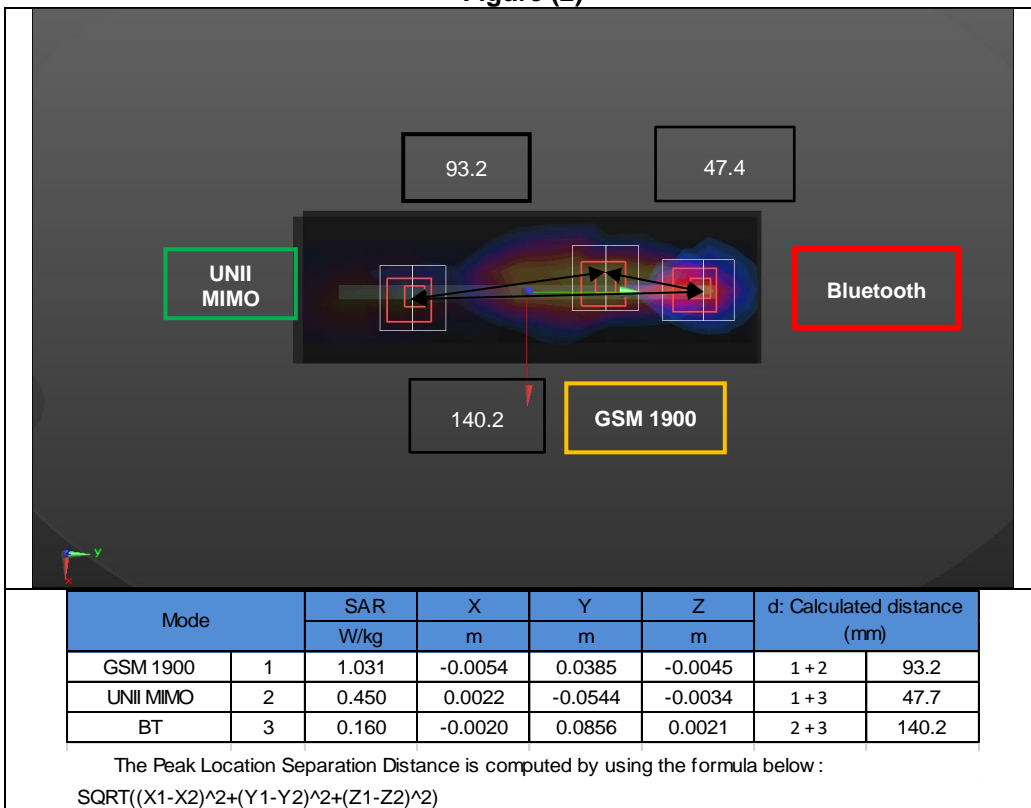


Figure (3)

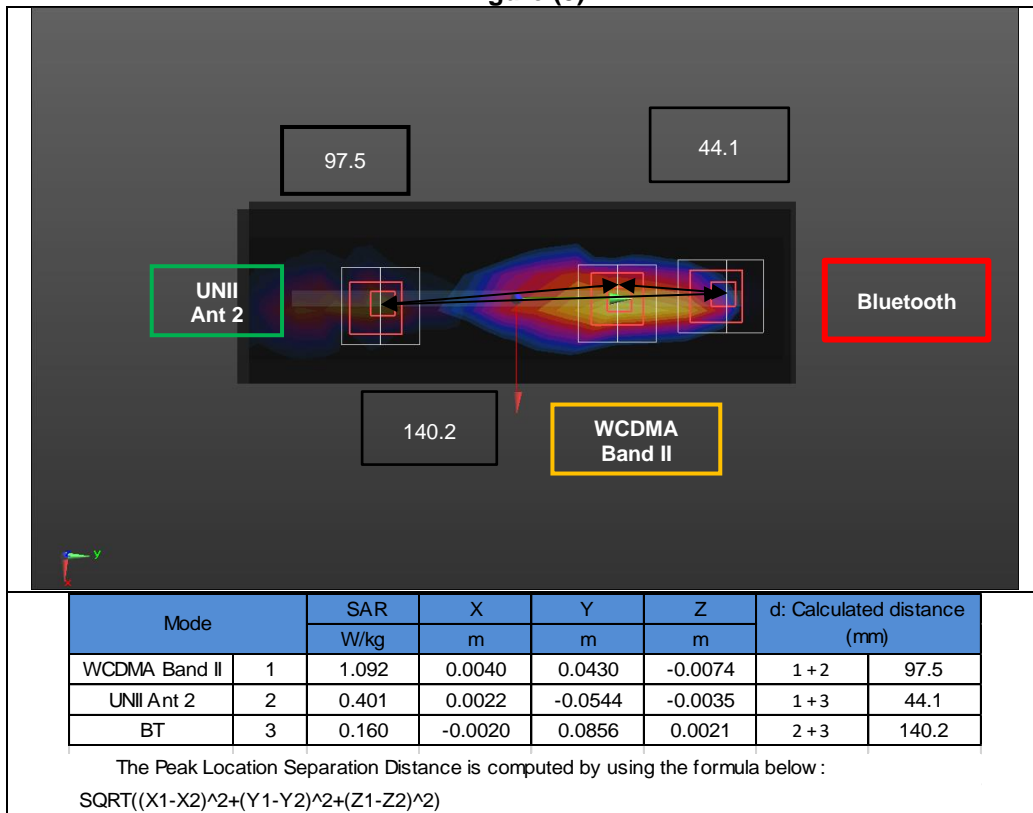


Figure (4)

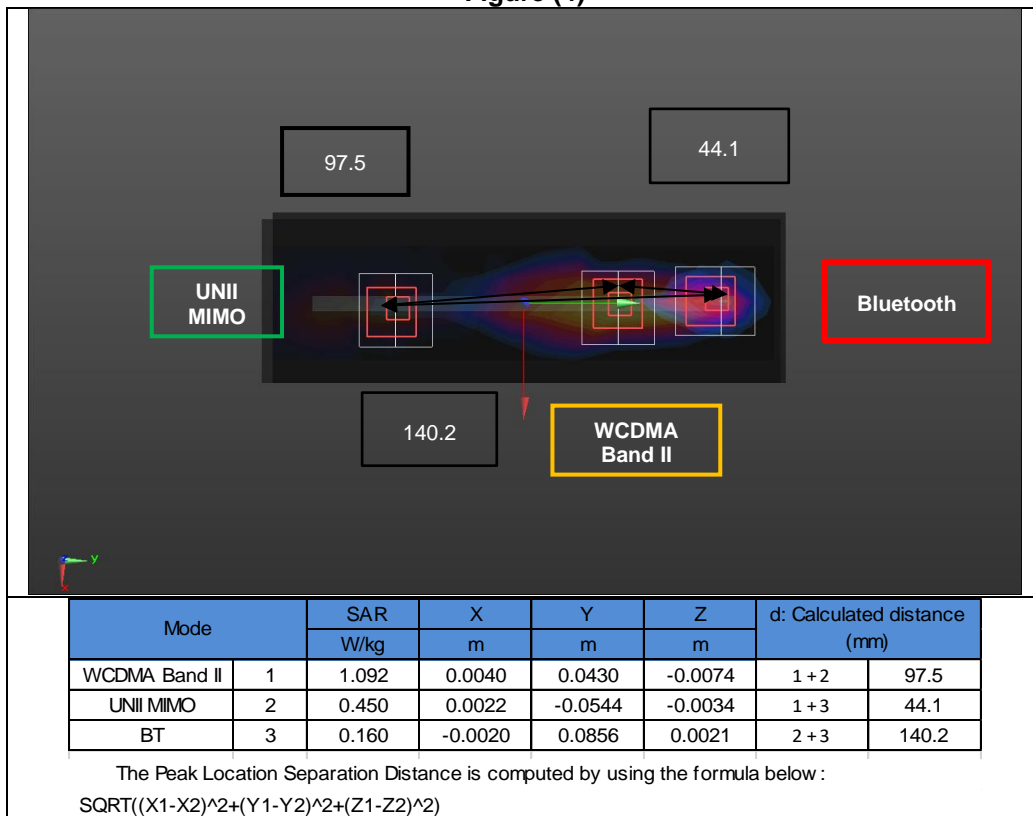


Figure (5)

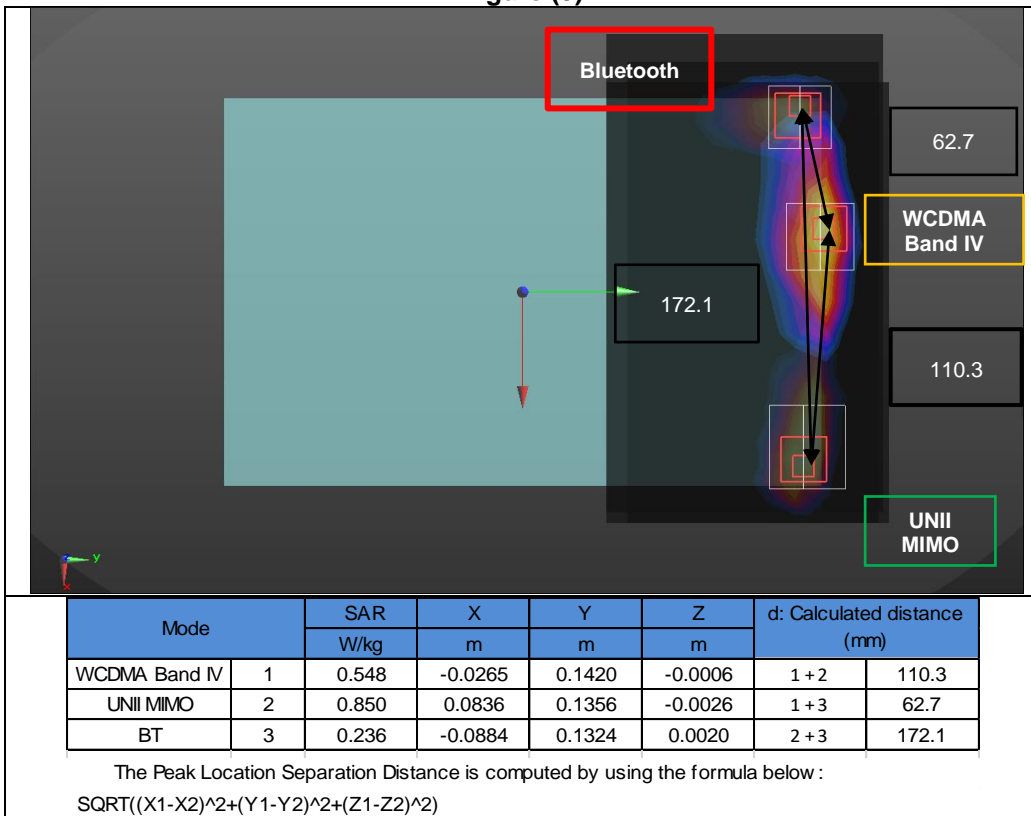


Figure (6)

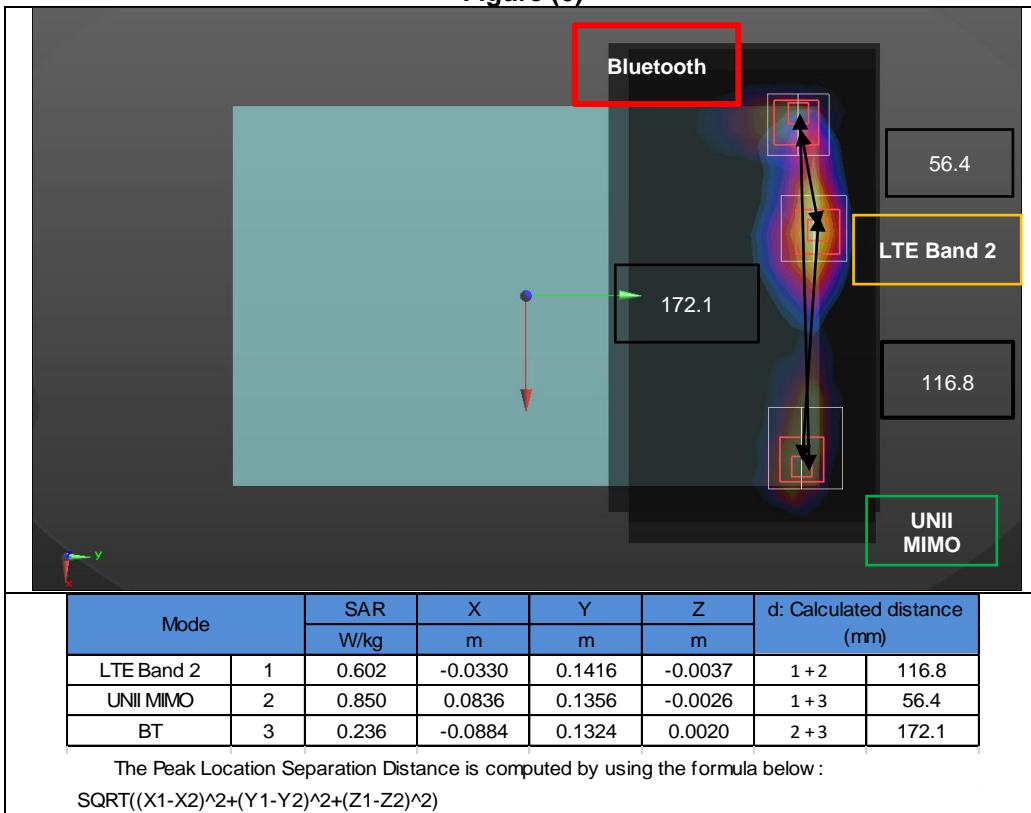


Figure (7)

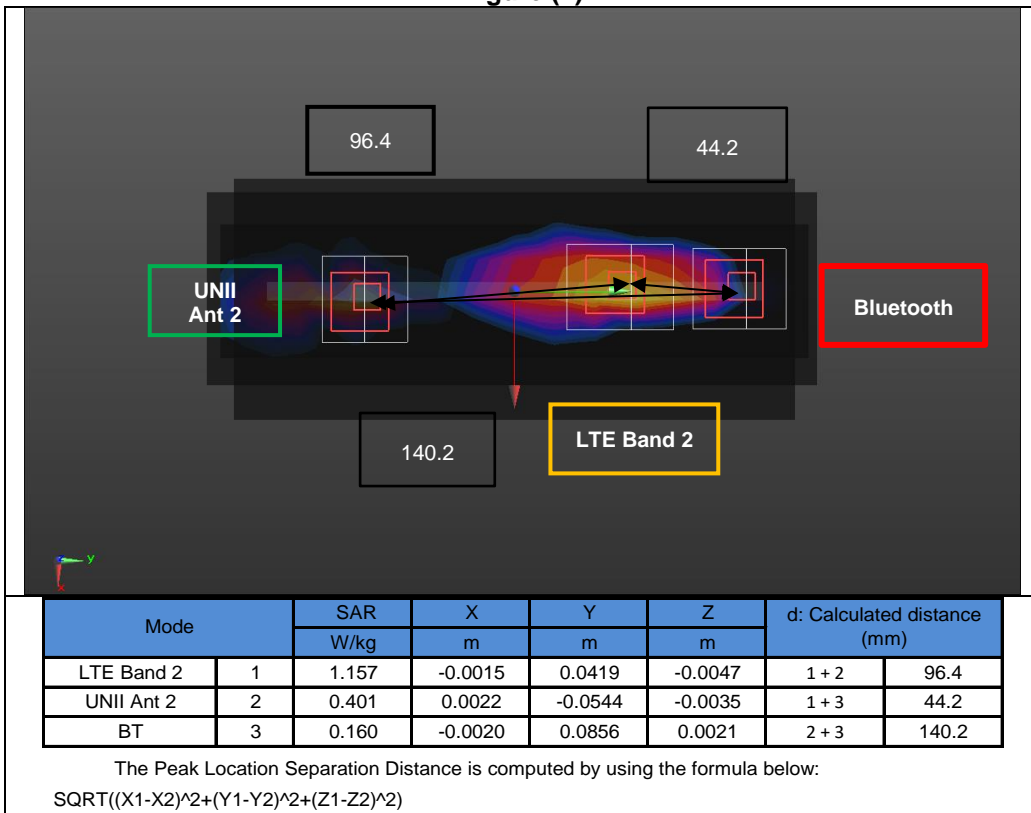


Figure (8)

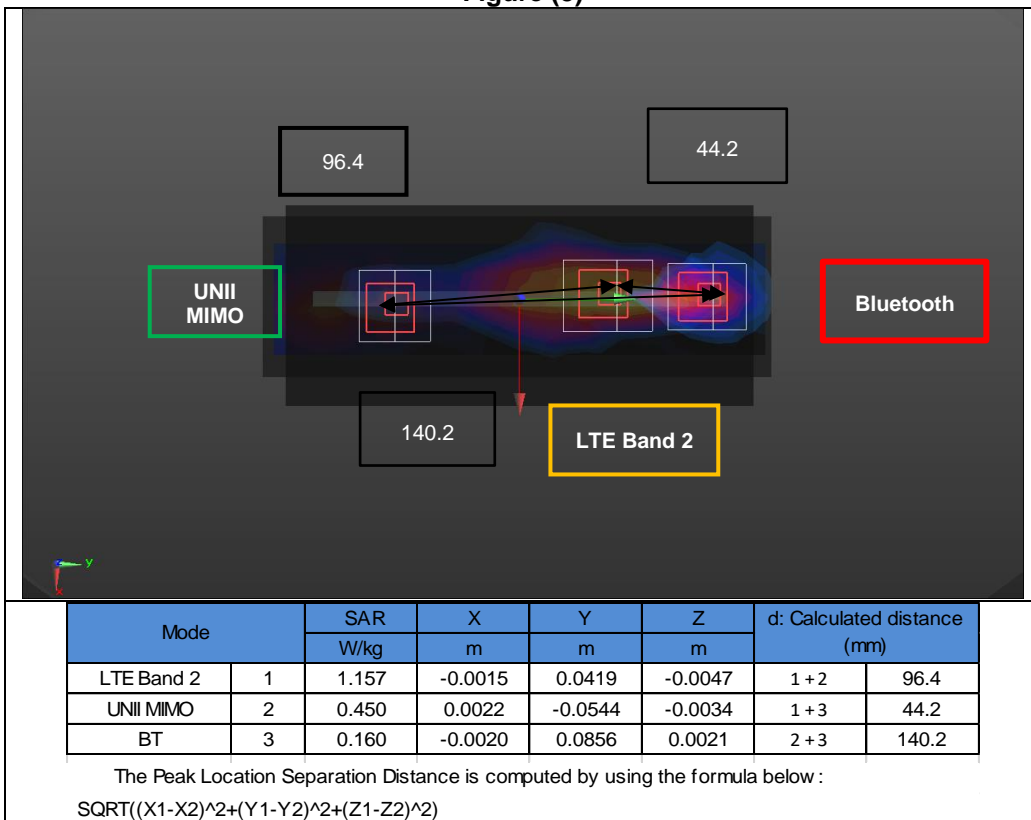


Figure (9)

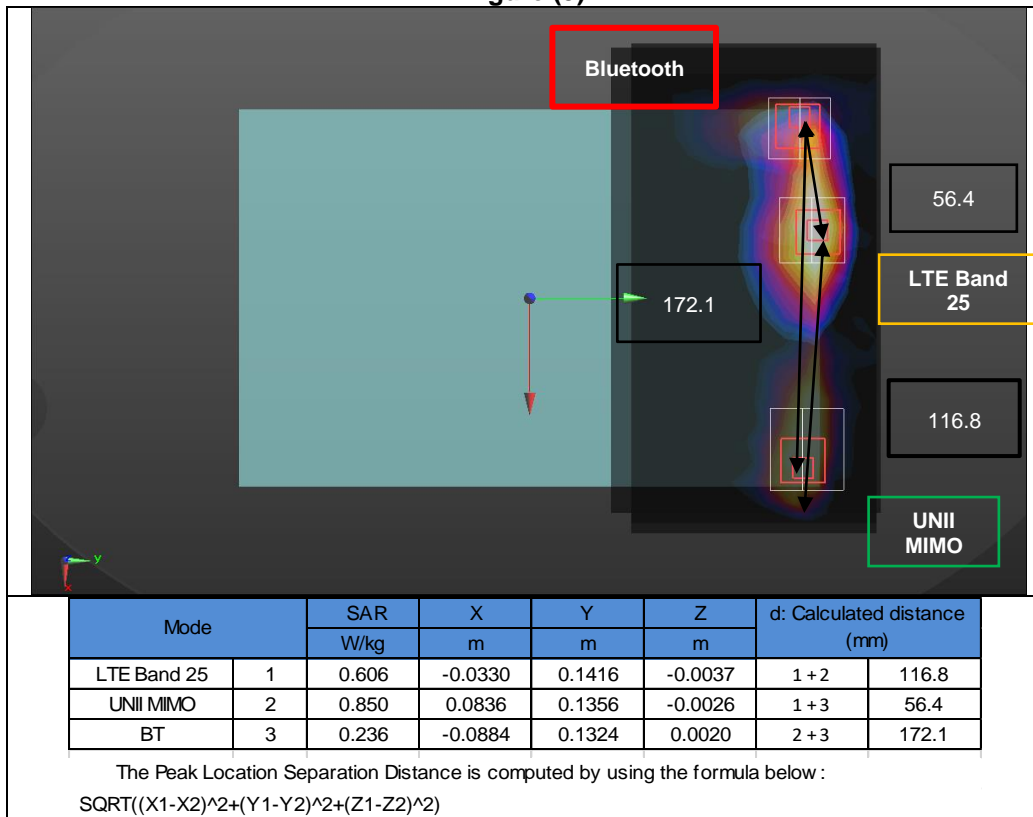


Figure (10)

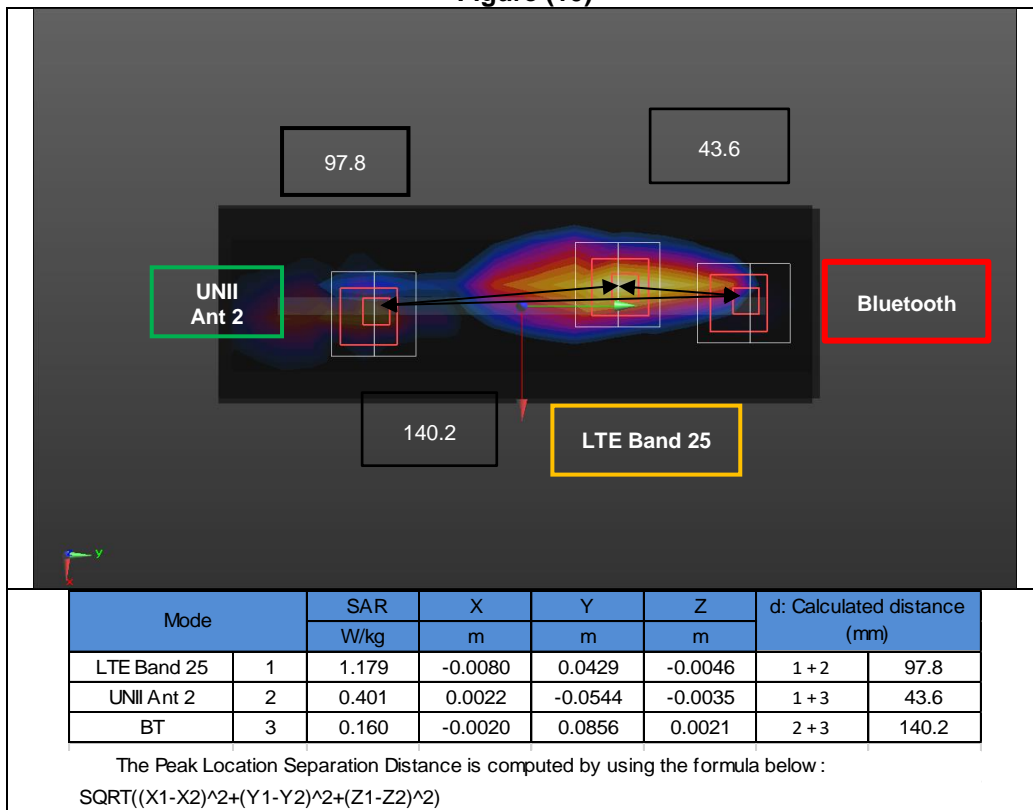


Figure (11)

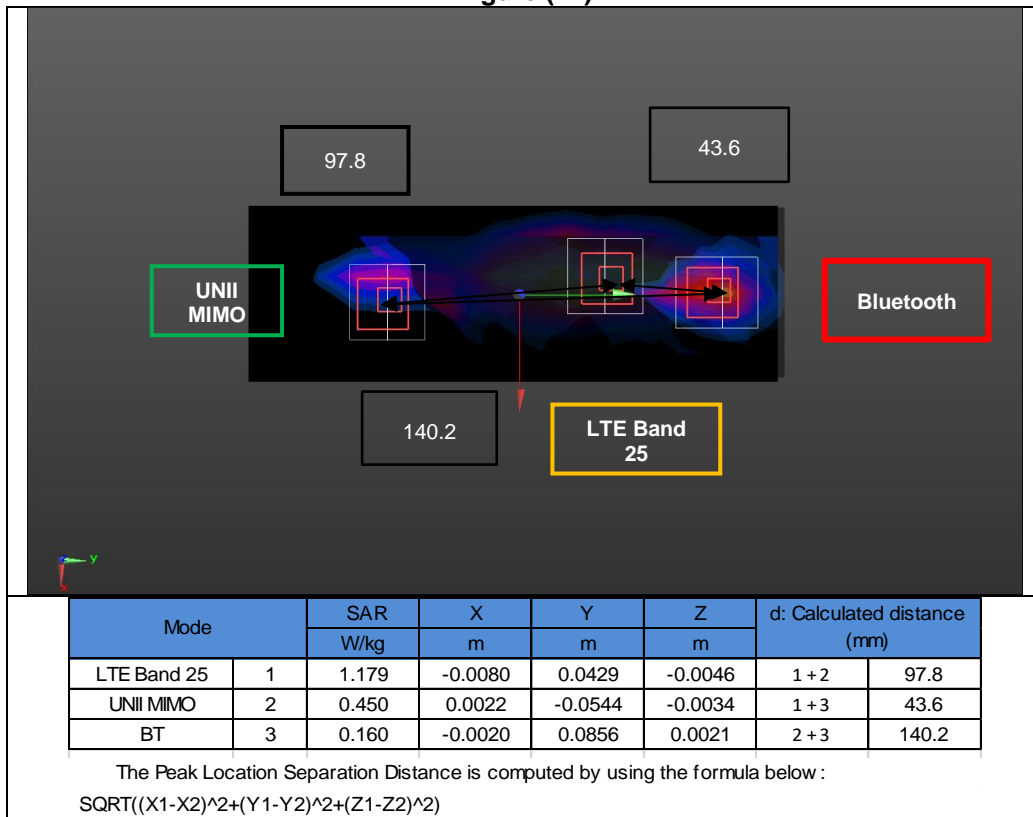


Figure (12)

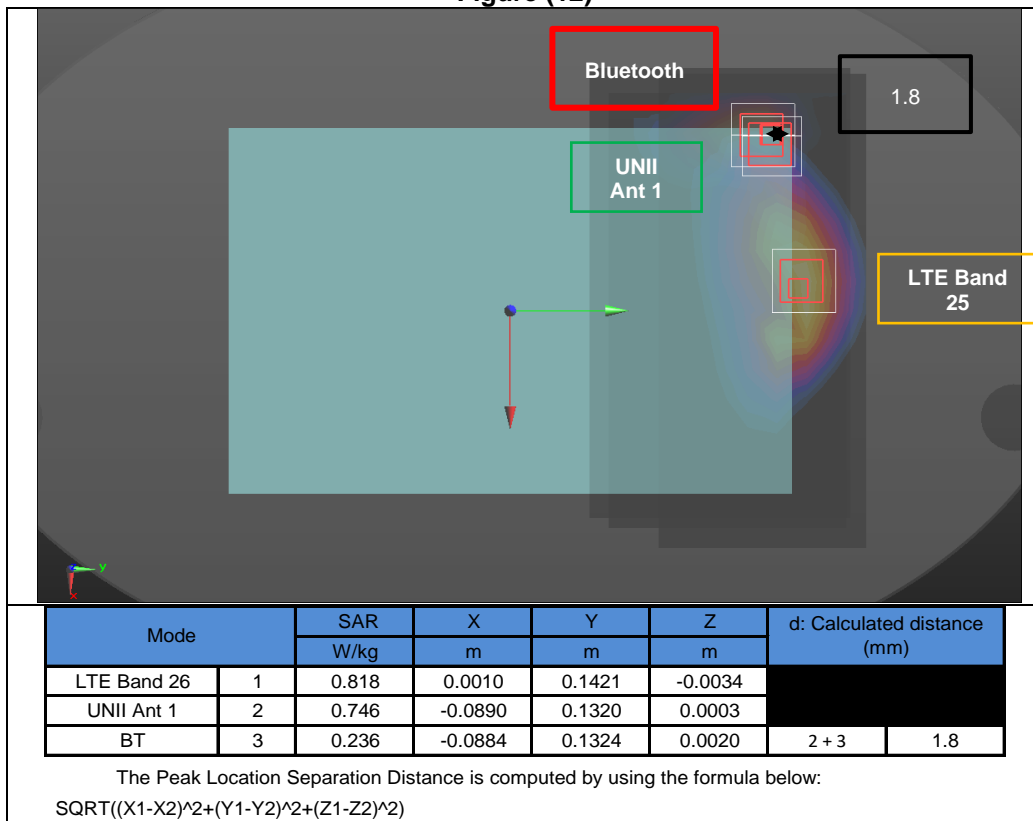


Figure (13)

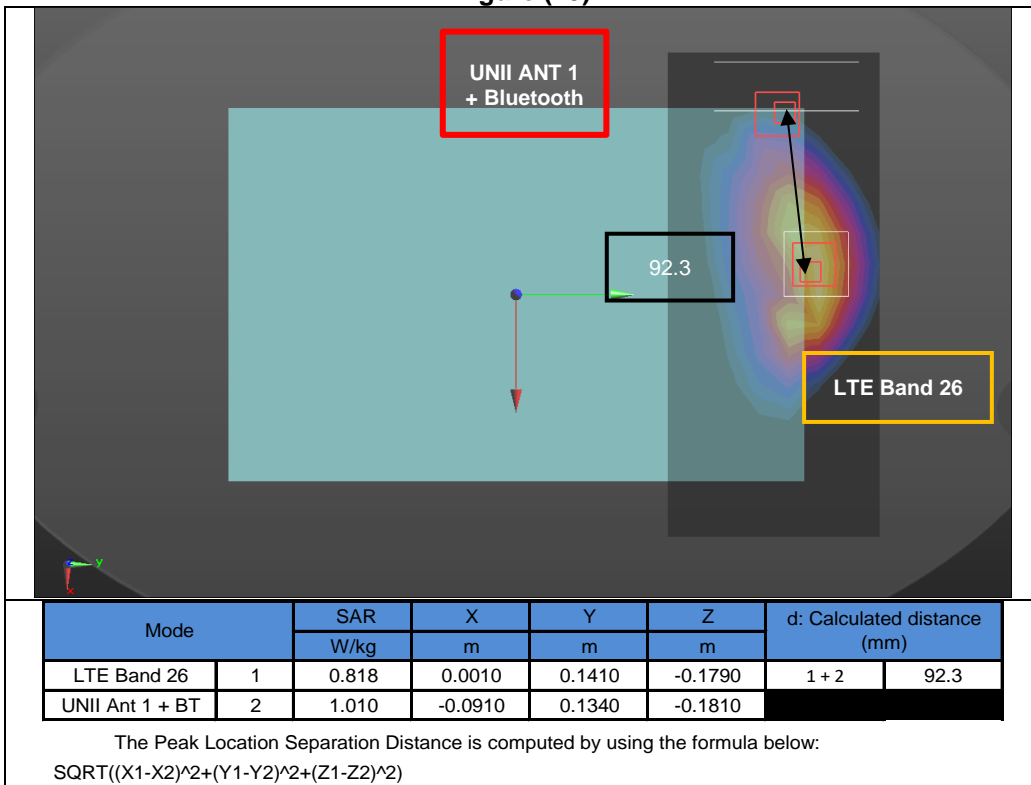


Figure (14)

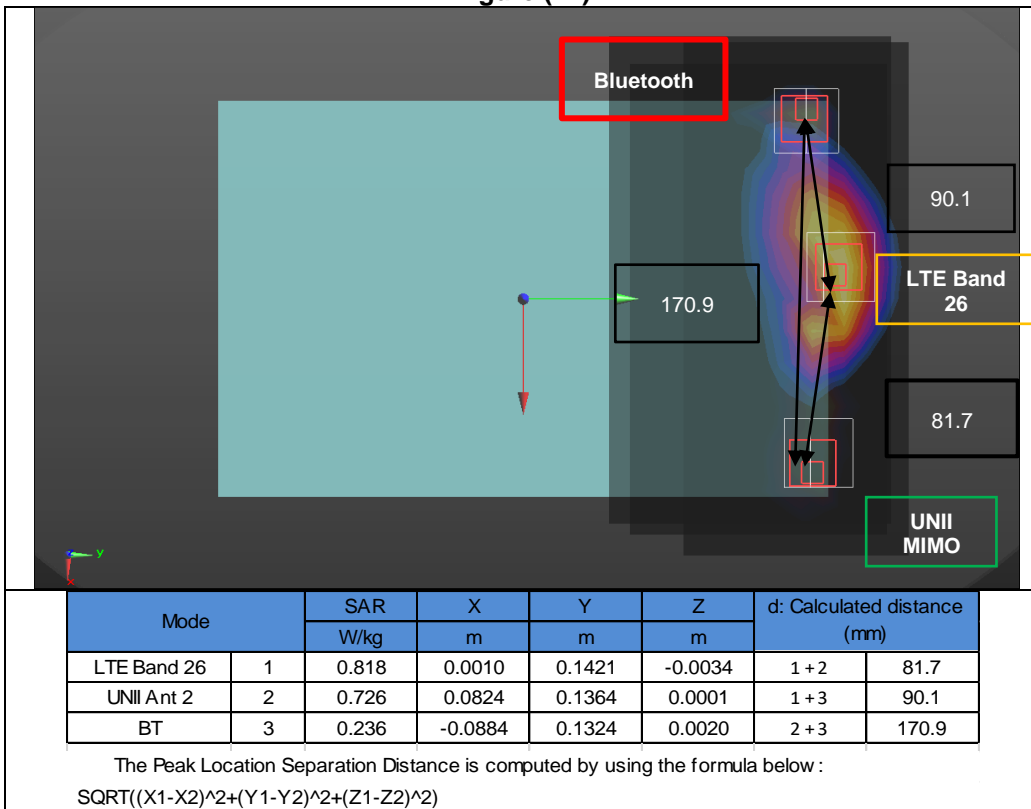




Figure (15)

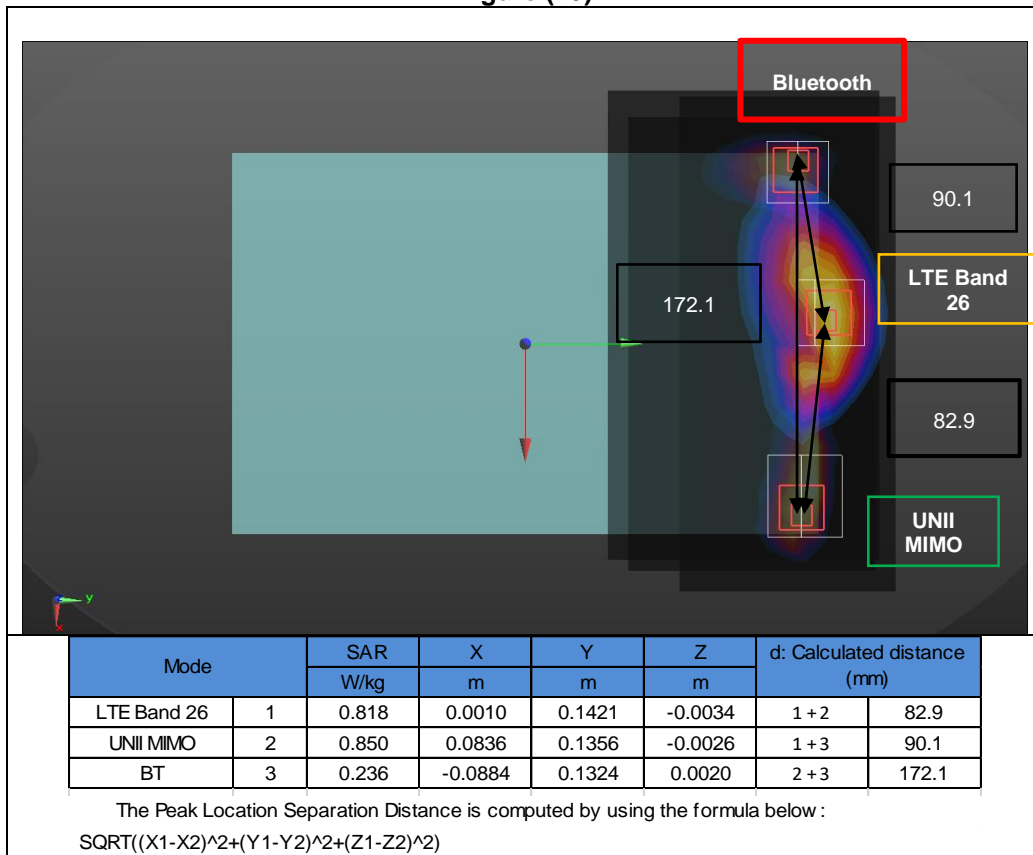


Figure (16)

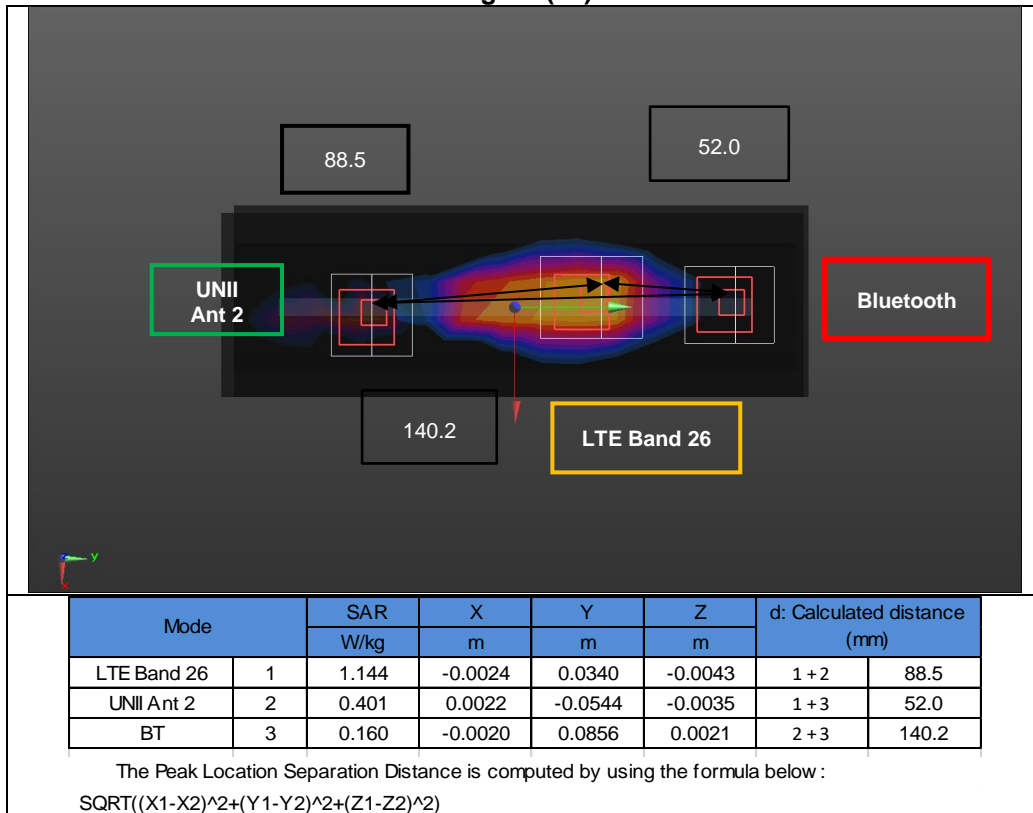


Figure (17)

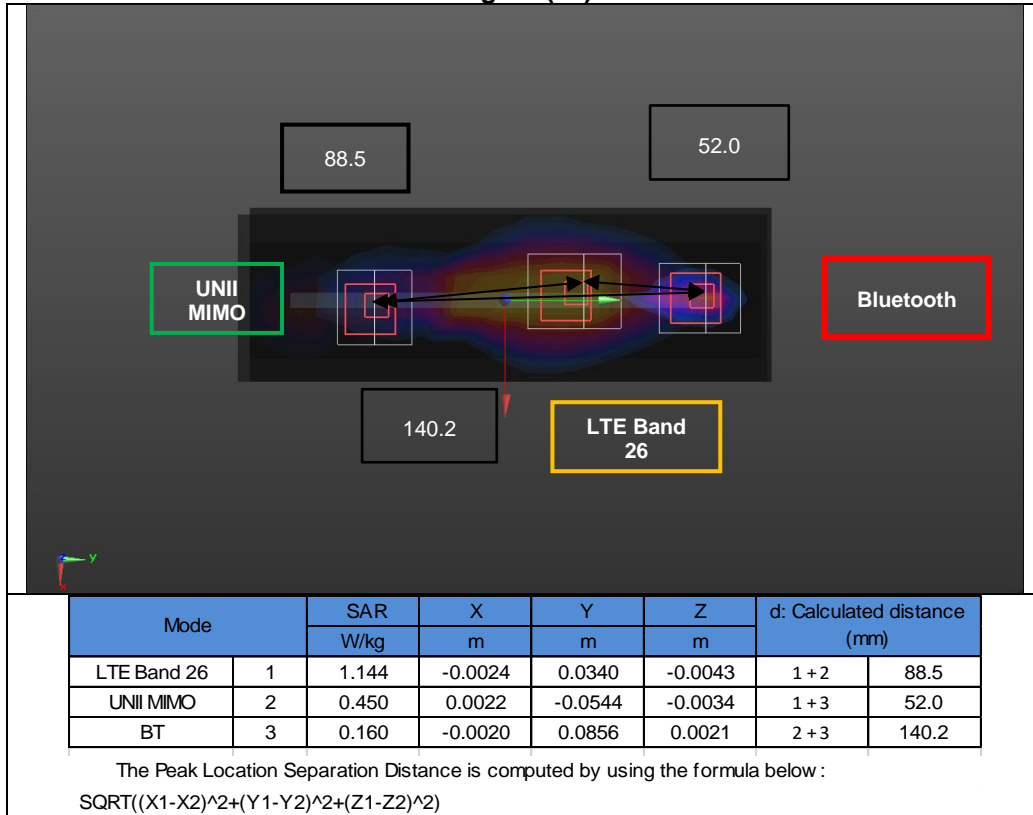


Figure (18)

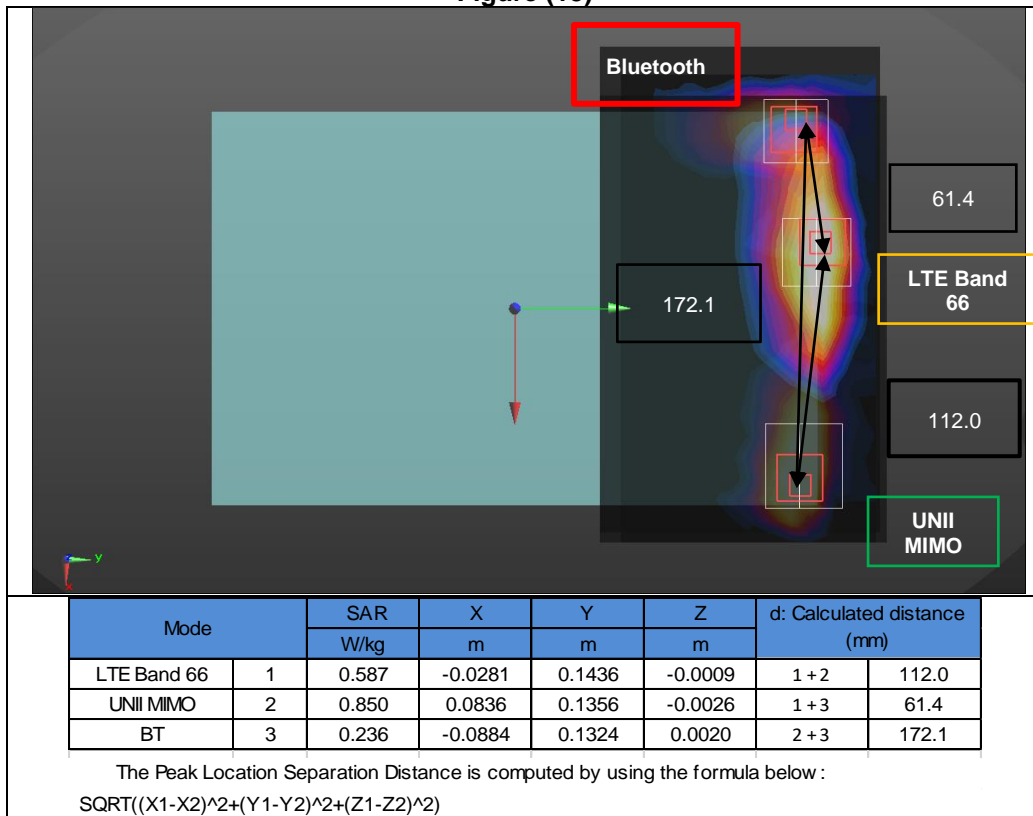


Figure (19)

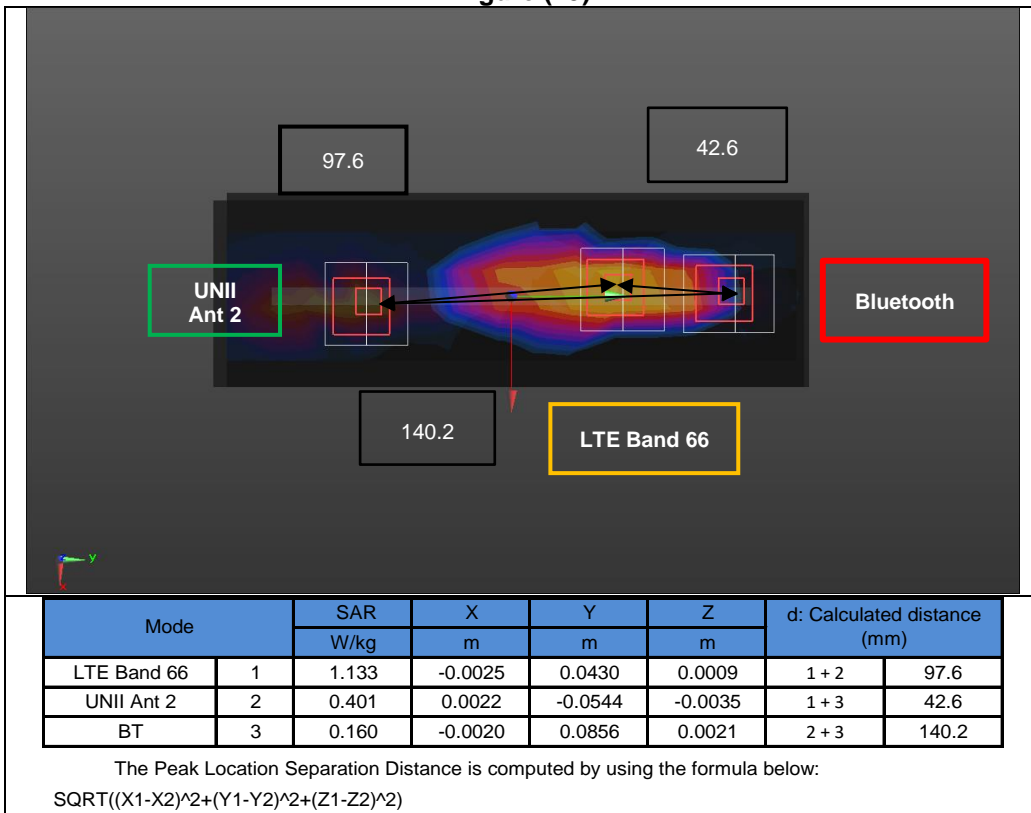


Figure (20)

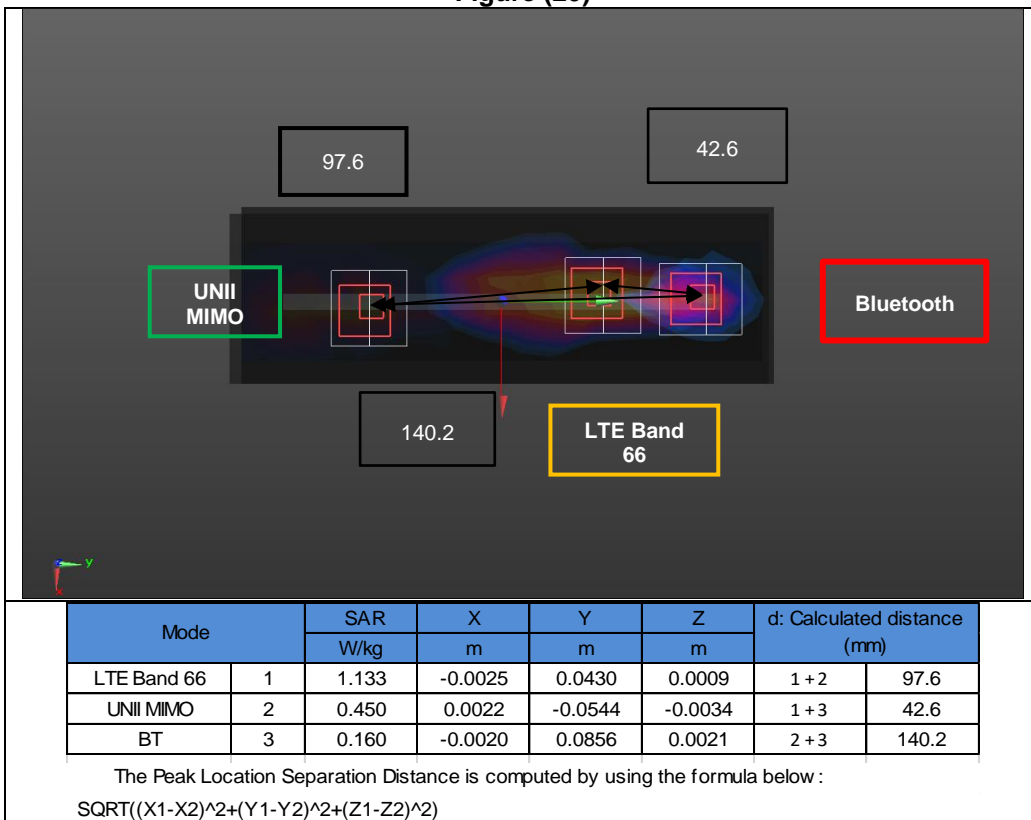


Figure (21)

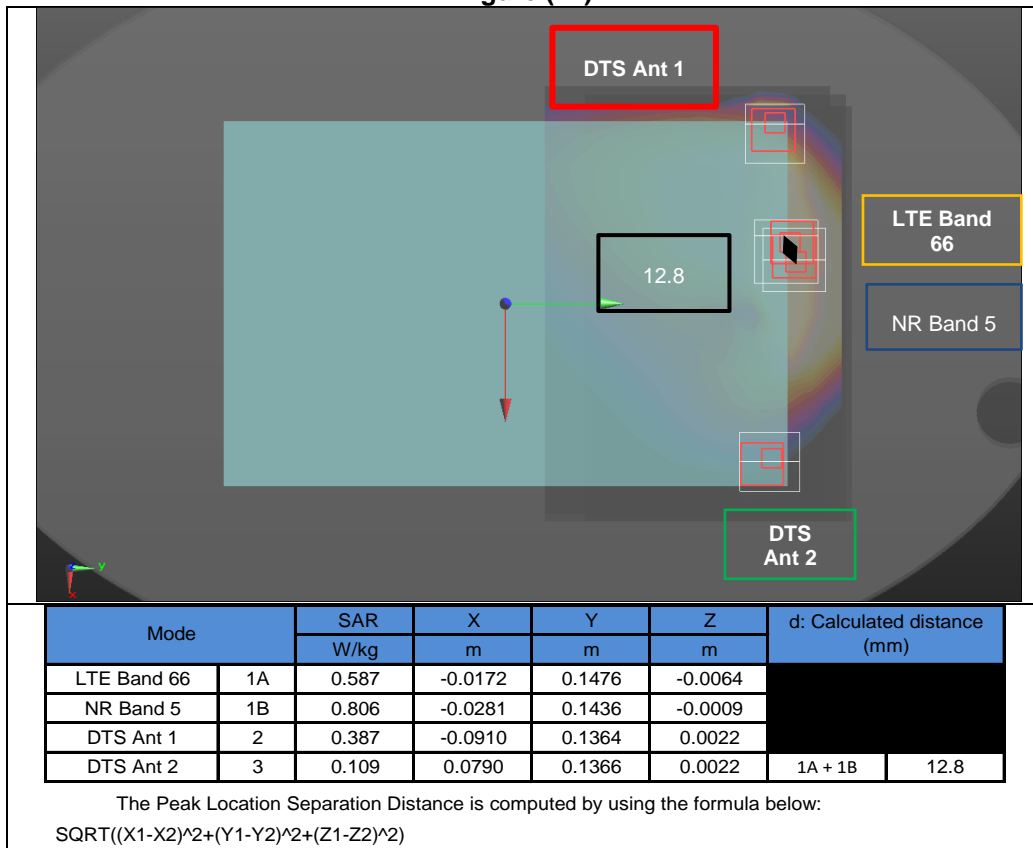


Figure (22)

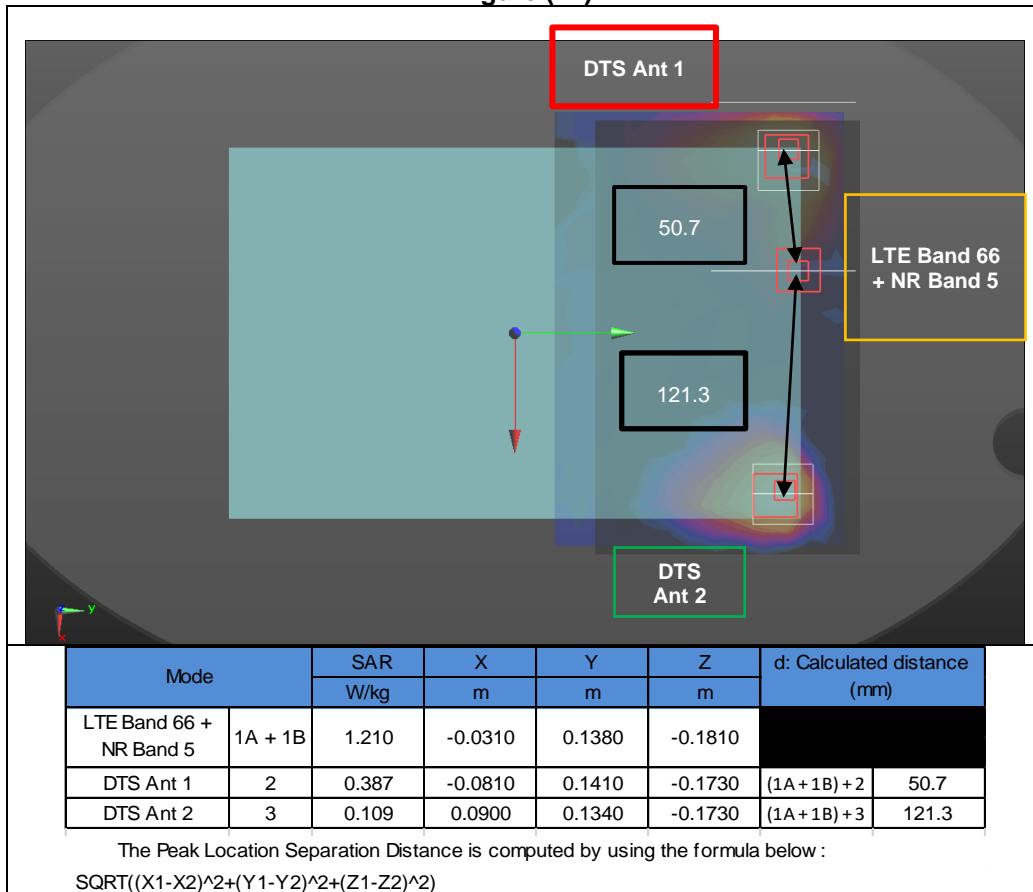


Figure (23)

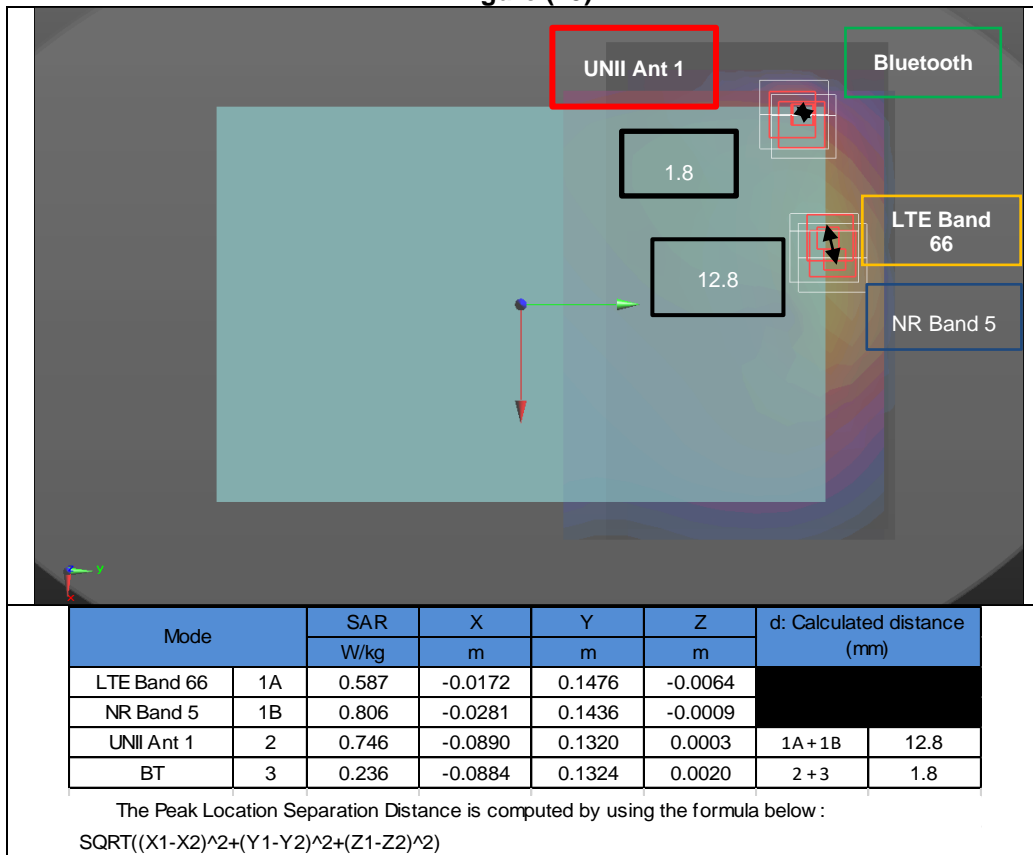


Figure (24)

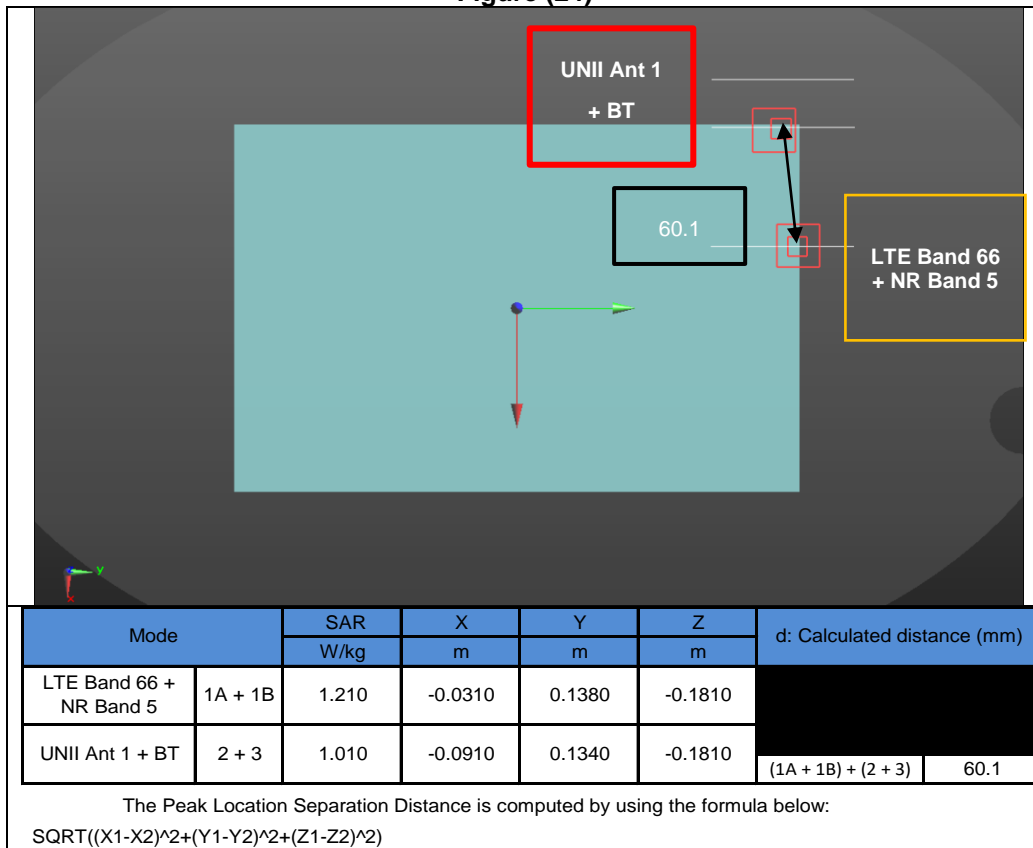


Figure (25)

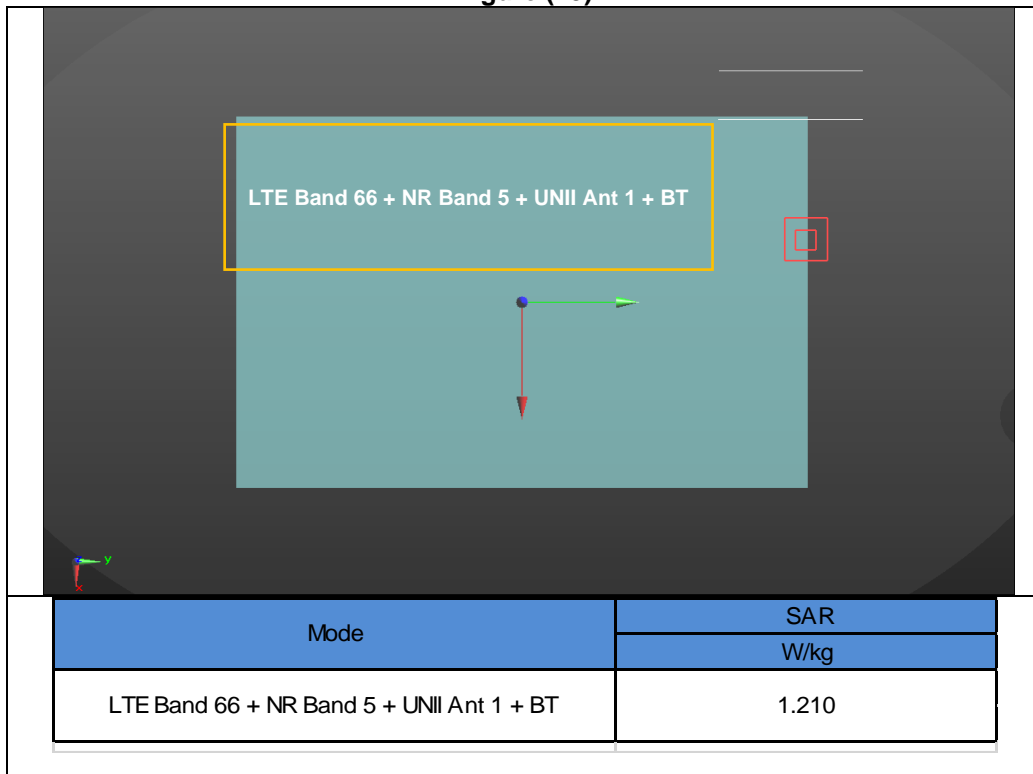


Figure (26)

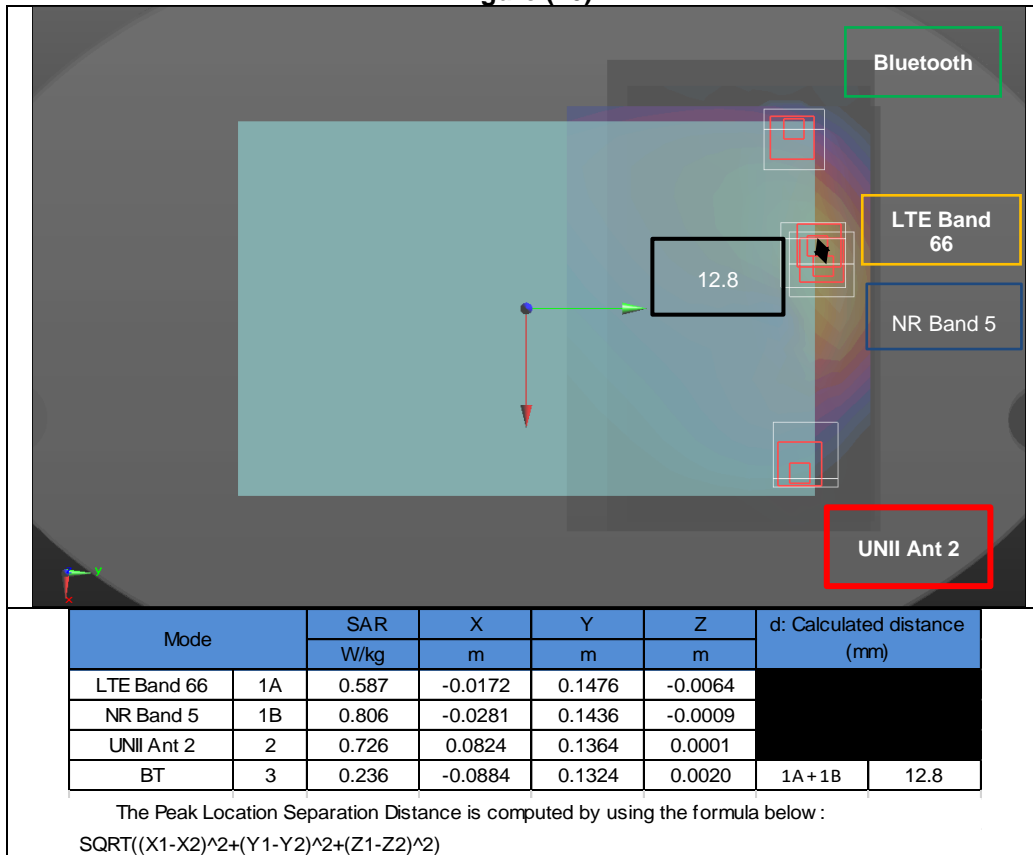


Figure (27)

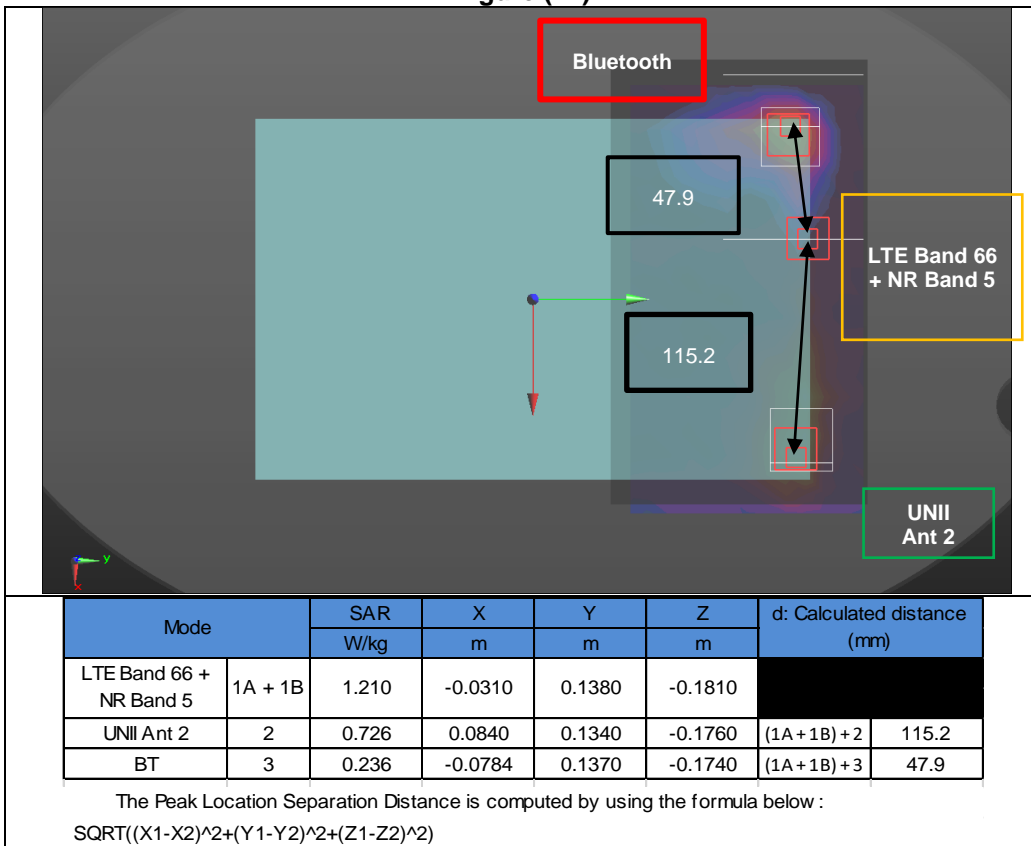
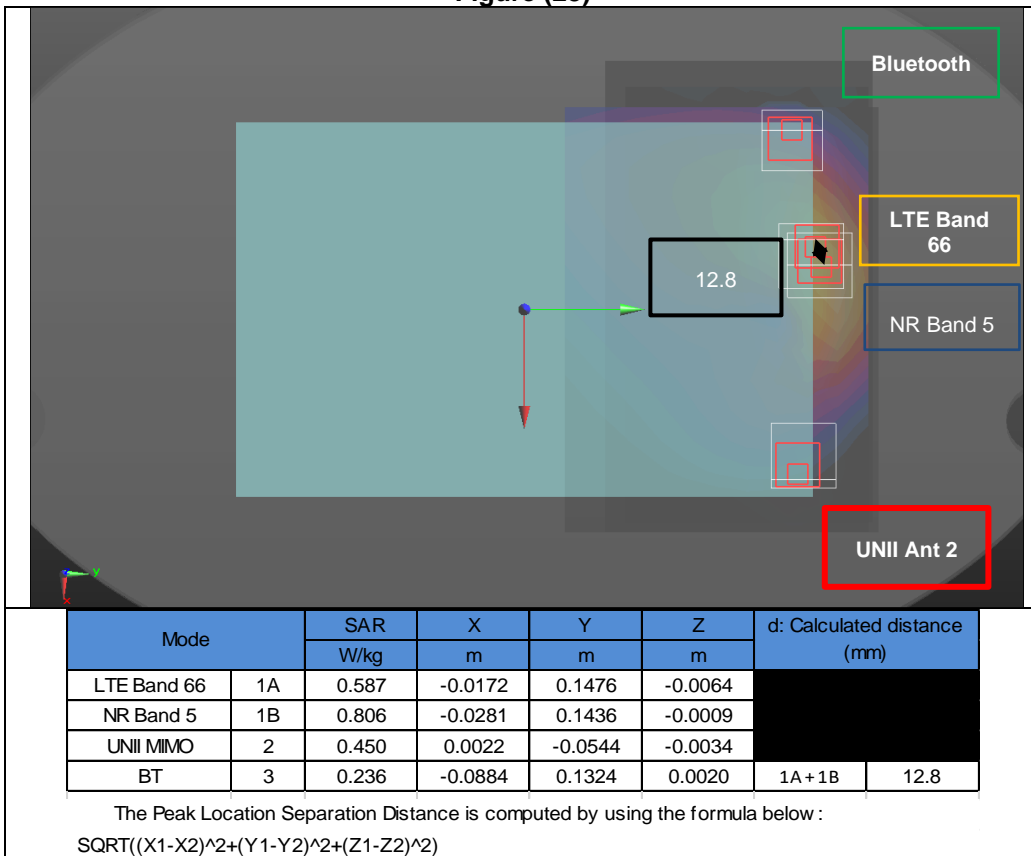
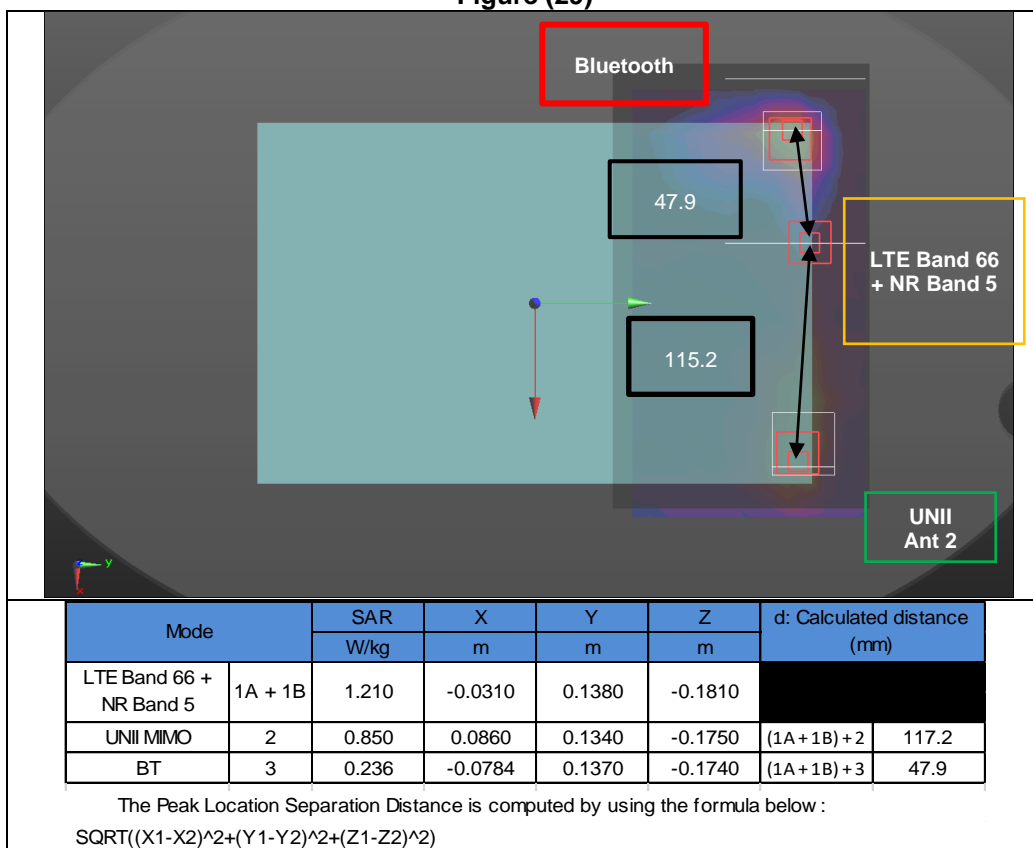


Figure (28)



**Figure (29)**



**Figure (30)**

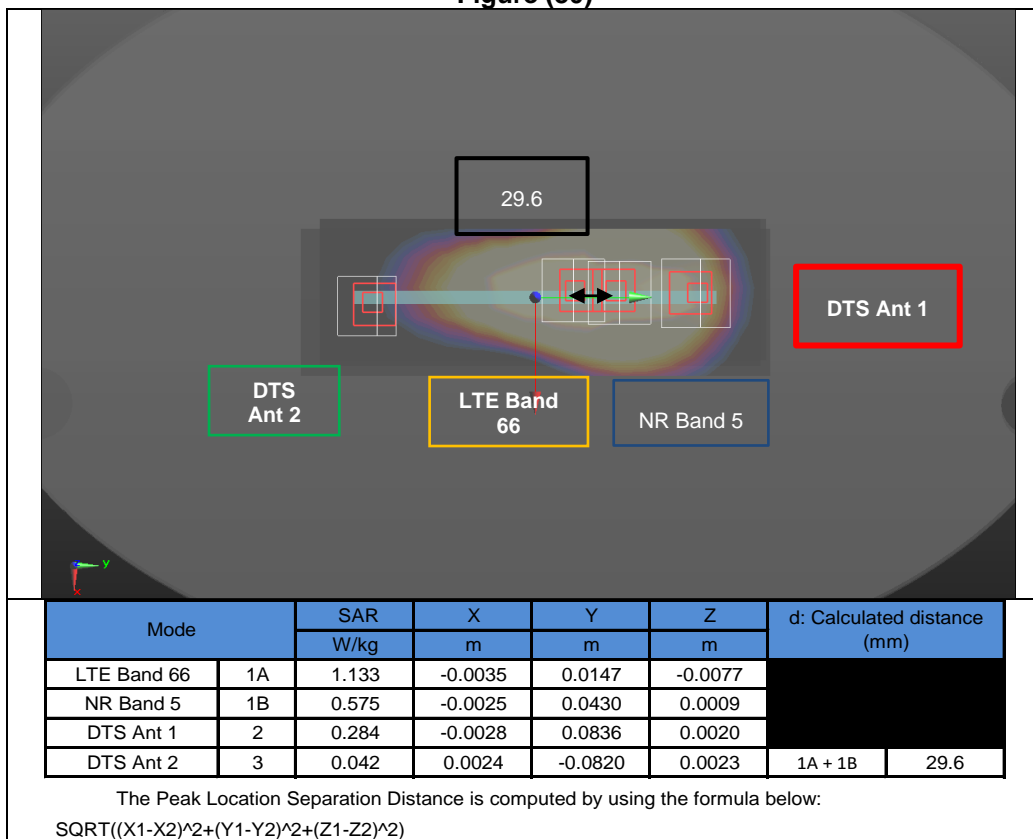




Figure (31)

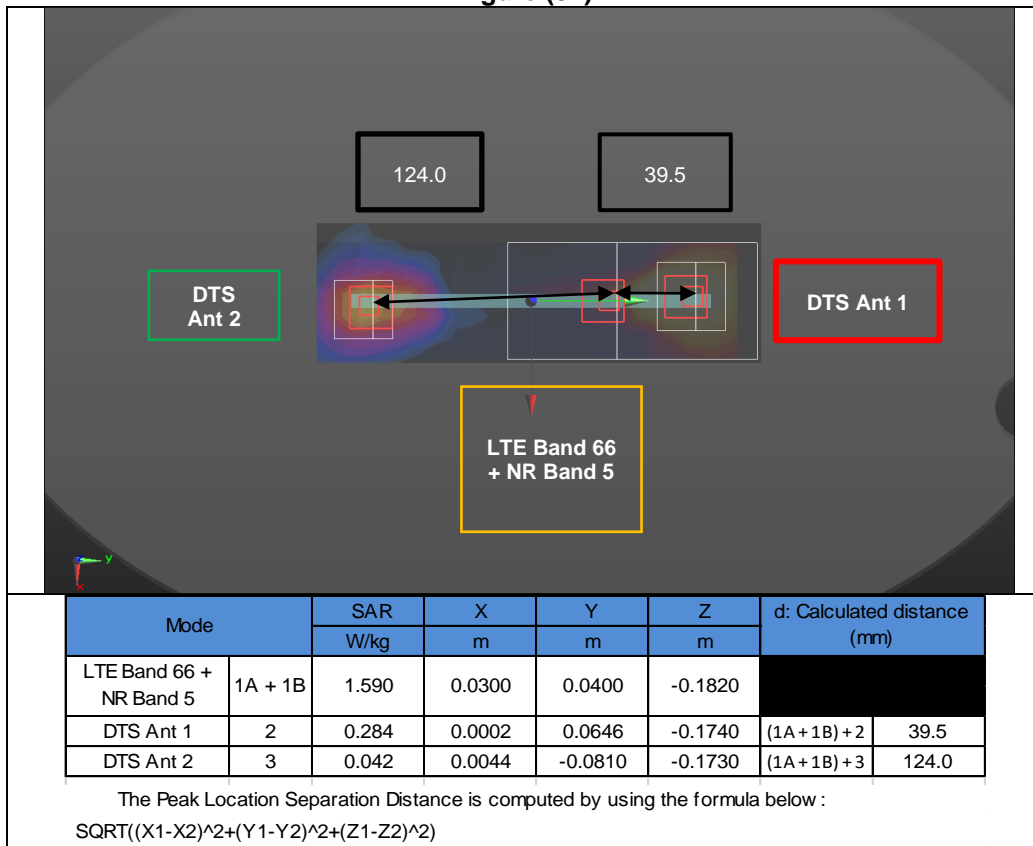


Figure (32)

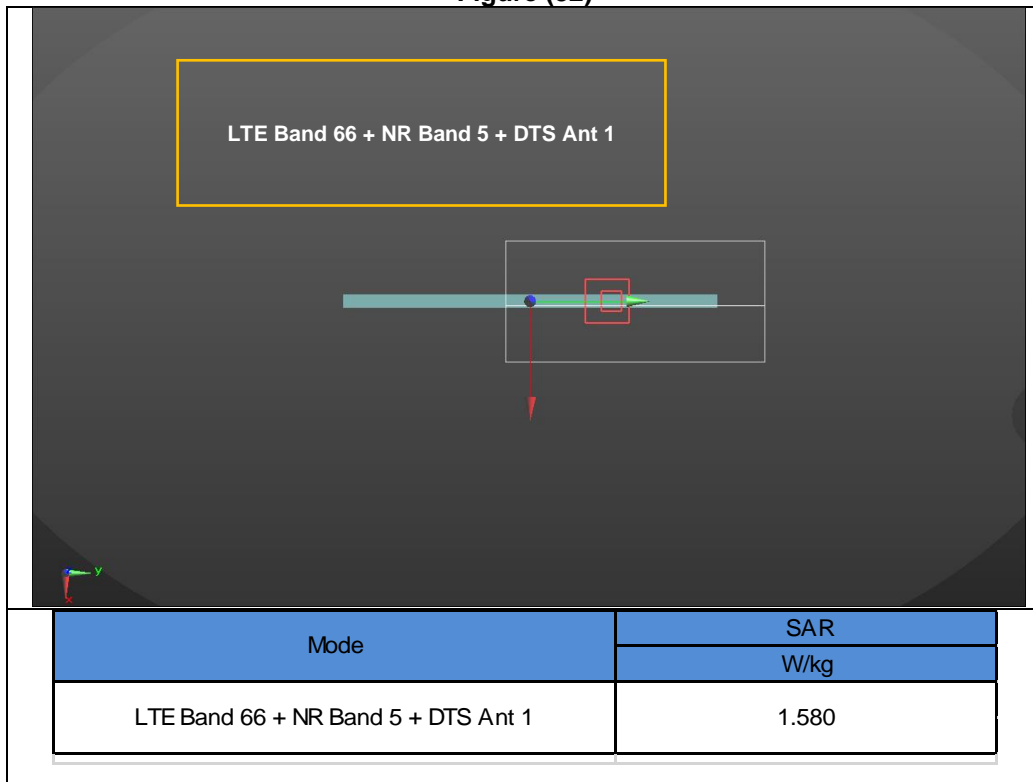


Figure (33)

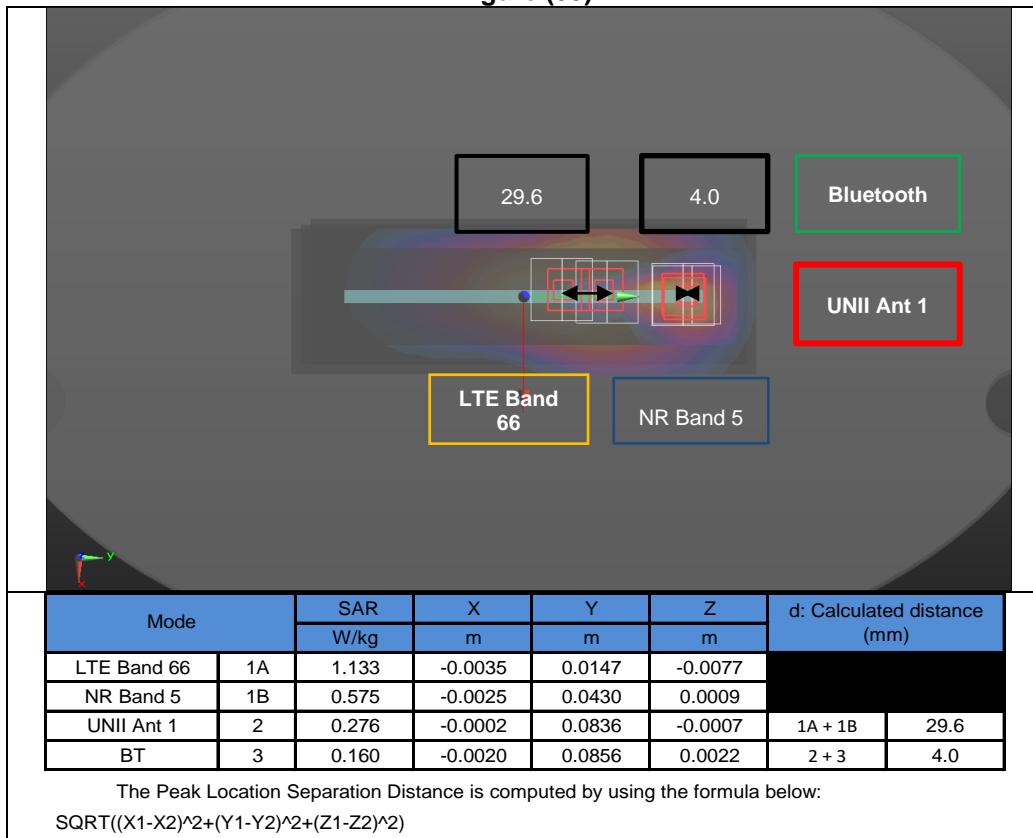


Figure (34)

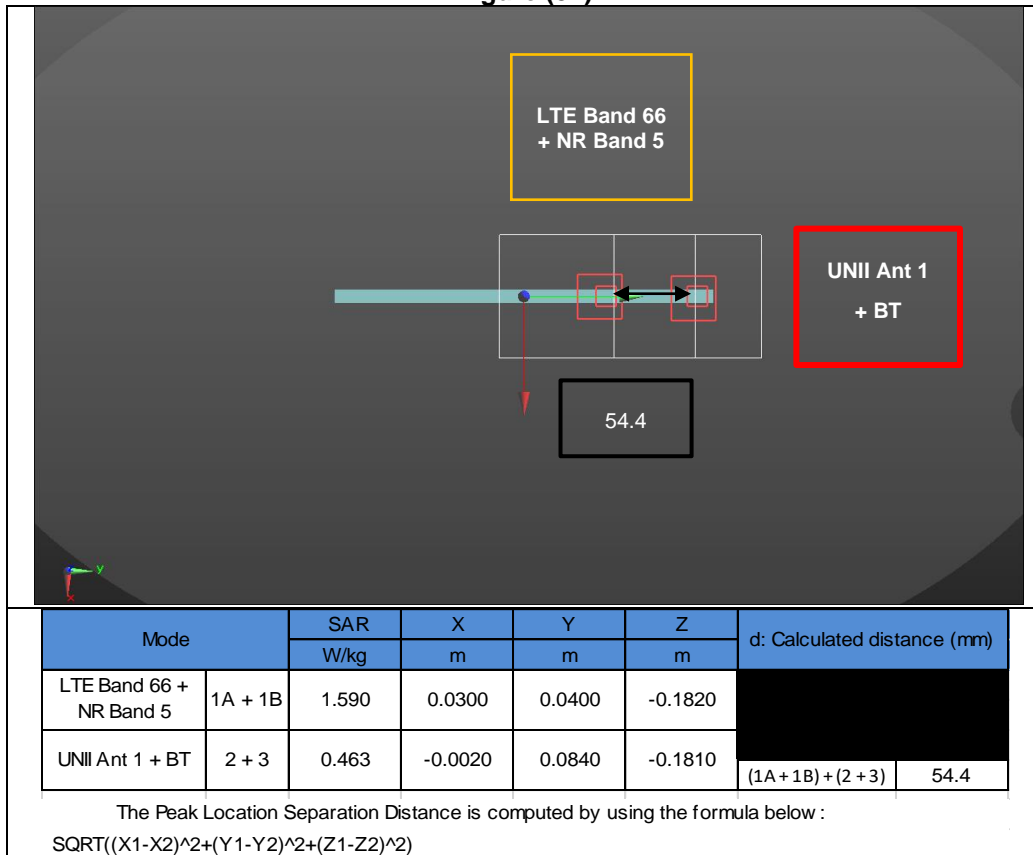


Figure (35)

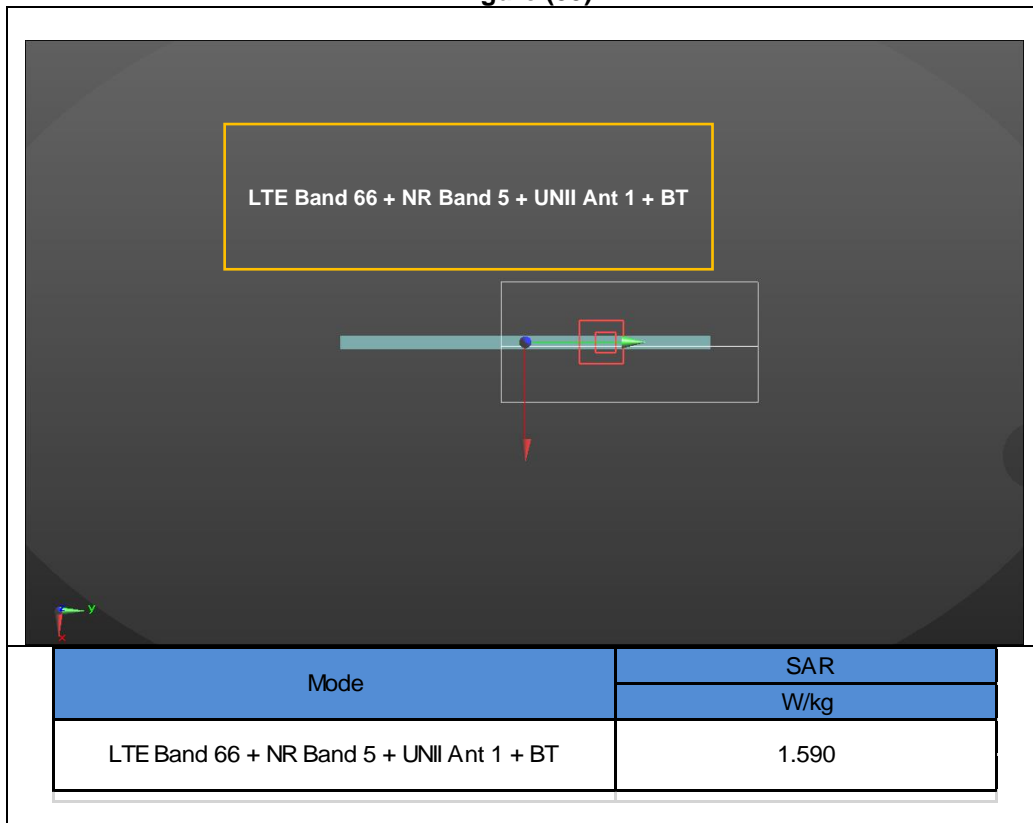


Figure (36)

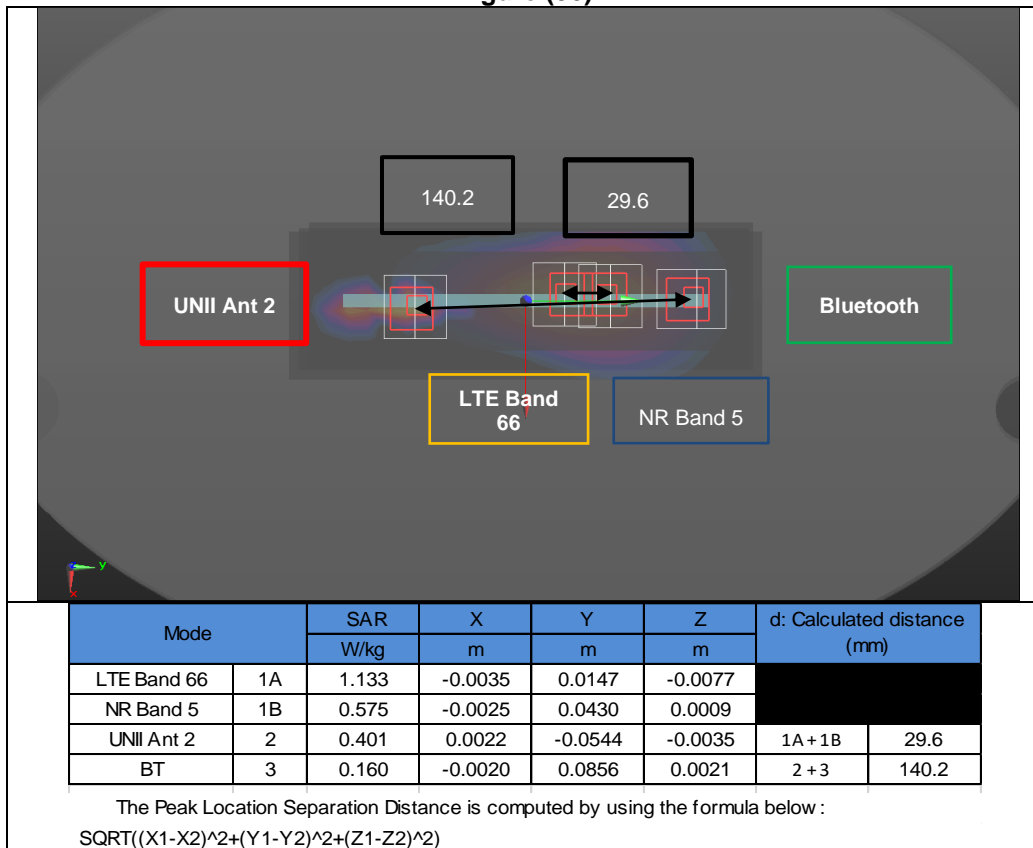


Figure (37)

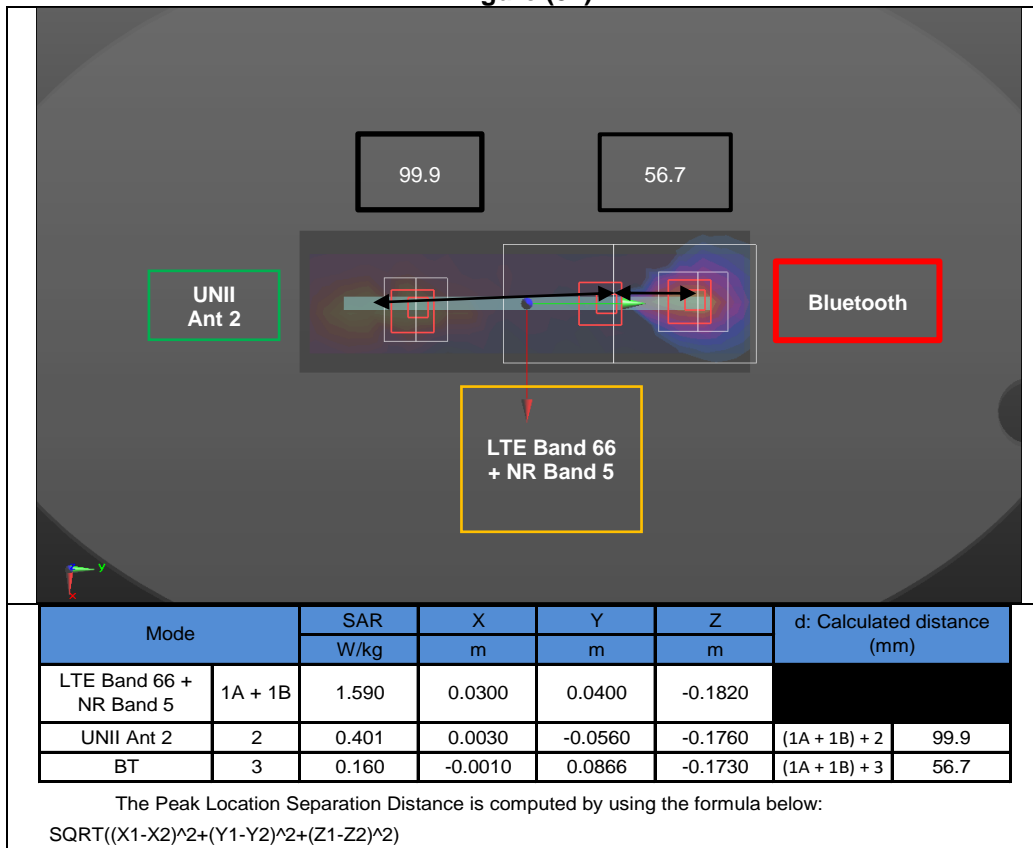


Figure (38)

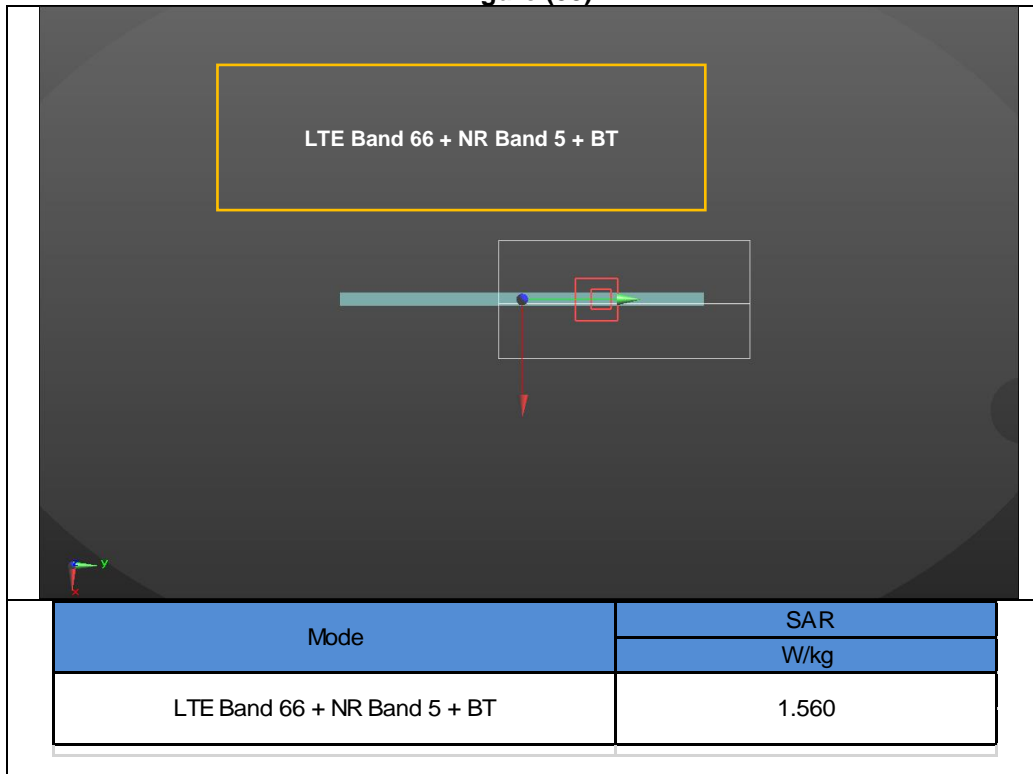


Figure (39)

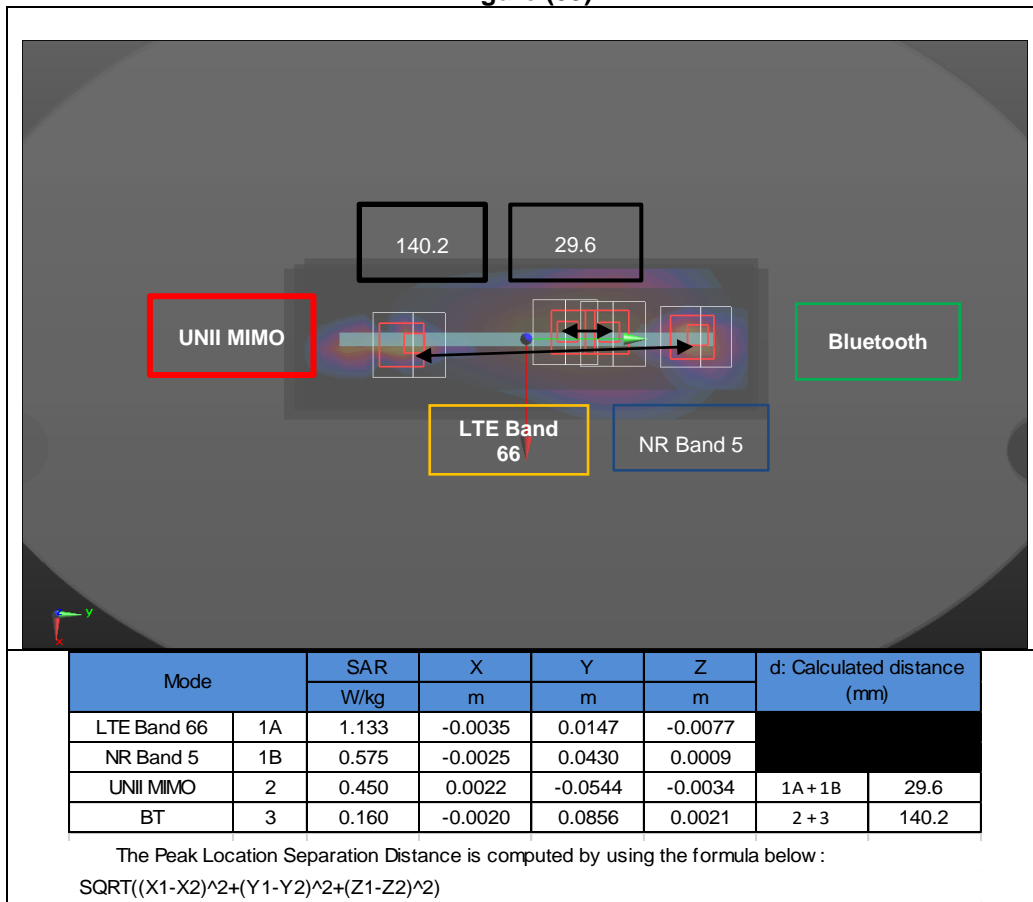
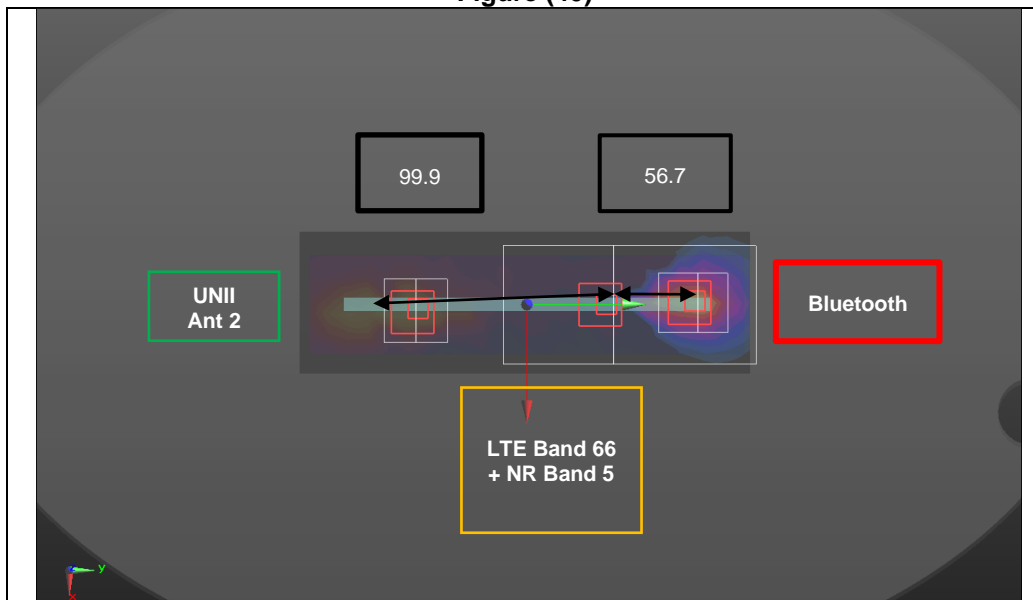


Figure (40)



Mode		SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 66 + NR Band 5	1A + 1B	1.590	0.0300	0.0400	-0.1820		
UNII MIMO	2	0.450	0.0030	-0.0560	-0.1760		
BT	3	0.160	-0.0010	0.0866	-0.1730		

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

### 12.16 Volume Scan Results

RF Exposure	Test Position	Configuration	Band	Original Measured SAR (W/kg)	Volume Scan Result	Plot No.	Multi-Band Combined factor	Multi-Band Combined Result	Plot No.
Standalone	Rear	LTE Band 66 + NR Band n5	LTE Band 66	0.471	0.500	1	1.245	1.210	10
			NR Band n5	0.573	0.432	2	1.406		
		UNII Ant 1 + Bluetooth	UNII Ant 1	0.571	0.693	3	1.307	1.010	11
			Bluetooth	0.179	0.161	4	1.321		
		LTE Band 66 + NR Band n5 + UNII Ant 1 + Bluetooth	LTE Band 66	0.471	0.500		1.245	1.210	12, 13
			NR Band n5	0.573	0.432		1.406		
			UNII Ant 1	0.571	0.693		1.307		
			Bluetooth	0.179	0.161		1.321		
	Edge 1	LTE Band 66 + NR Band n5	LTE Band 66	0.923	0.985	5	1.227	1.590	14
			NR Band n5	0.409	0.308	6	1.406		
		UNII Ant 1 + Bluetooth	UNII Ant 1	0.220	0.251	7	1.257	0.463	15
			Bluetooth	0.121	0.121	8	1.321		
		LTE Band 66 + NR Band n5 + DTS Ant 1	LTE Band 66	0.923	0.985		1.227	1.580	16, 17
			NR Band n5	0.409	0.308		1.406		
			Bluetooth	0.245	0.324	9	1.084		
		LTE Band 66 + NR Band n5 + Bluetooth	LTE Band 66	0.923	0.985		1.227	1.580	18, 19
			NR Band n5	0.409	0.308		1.406		
			Bluetooth	0.121	0.121		1.321		
		LTE Band 66 + NR Band n5 + UNII Ant 1 + Bluetooth	LTE Band 66	0.923	0.985		1.227	1.580	20, 21
			NR Band n5	0.409	0.308		1.406		
UNII Ant 1	0.220		0.251		1.257				
Bluetooth	0.121		0.121		1.321				

**Note(s):**

- Multi-band Combined factor is the compensation value of power and duty.
- For Volume Scan plot number in this section, please refer to the Appendix G.

## **Appendixes**

**Refer to separated files for the following appendixes.**

**4789841420-S1 FCC Report SAR\_App A\_Photos & Ant. Locations**

**4789841420-S1 FCC Report SAR\_App B\_Highest SAR Test Plots**

**4789841420-S1 FCC Report SAR\_App C\_System Check Plots**

**4789841420-S1 FCC Report SAR\_App D\_SAR Tissue Ingredients**

**4789841420-S1 FCC Report SAR\_App E\_Probe Cal. Certificates**

**4789841420-S1 FCC Report SAR\_App F\_Dipole Cal. Certificates**

**4789841420-S1 FCC Report SAR\_App G\_Volume Scan Results**

**END OF REPORT**