FCC SAR Test Report

APPLICANT	:	Motorola Mobility LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola
MODEL NAME	:	XT1921-2
FCC ID	:	IHDT56XC4
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2013

We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA7D2018-02	Rev. 01	Initial issue of report	Feb. 23, 2018
FA7D2018-02	Rev. 02	Add sensor trigger test in the report	Mar. 26, 2018

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Motorola Mobility LLC, Mobile Cellular Phone, XT1921-2, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary			Highest Simultaneous Transmission 1g SAR (W/kg)
		Head (Separation 0mm)	Body-worn (Separation 5mm)	Hotspot (Separation 5mm)	
		1g SAR (W/kg)			
Licensed	GSM850	0.48	1.19	1.19	1.59
	GSM1900	0.26	0.72	0.72	
	WCDMA II	0.47	1.41	1.41	
	WCDMA IV	0.68	0.76	1.04	
	WCDMA V	0.68	1.13	1.13	
	LTE Band 2	0.45	1.33	1.33	
	LTE Band 4	0.66	0.85	1.05	
	LTE Band 5	0.80	1.05	1.15	
	LTE Band 12 / 17	0.36	0.77	0.77	
	LTE Band 14	0.69	1.19	1.19	
	LTE Band 30	0.53	0.81	0.81	
	LTE Band 66	0.44	1.08	1.18	
DTS	2.4GHz WLAN	1.35	0.99	0.99	1.58
NII	5GHz WLAN	1.42	1.15	1.35	1.59
DSS	Bluetooth	0.23	0.16	0.16	1.57
Date of Testing:		2018/1/9 ~ 2018/2/1			

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications

2. Administration Data

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978

Applicant	
Company Name	Motorola Mobility LLC
Address	222 W. Merchandise Mart Plaza, Chicago IL 60654, USA

Manufacturer	
Company Name	Motorola Mobility LLC
Address	222 W. Merchandise Mart Plaza, Chicago IL 60654, USA

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1921-2
FCC ID	IHDT56XC4
IMEI Code	351840090009816
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 14: 790.5 MHz ~ 795.5 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 30: 2307.5 MHz ~ 2312.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz : 802.11b/g/n HT20 WLAN 5GHz : 802.11a/n HT20/HT40 Bluetooth BR/EDR/LE
HW Version	DVT1B
SW Version	Sprint:fastboot_james_sprint_oem_sprint_userdebug_8.0.0_OCP27.62_1046_intcfg-test-keys_sprint.tar.gz TMO:fastboot_james_t_oem_t_userdebug_8.0.0_OCP27.62_942_intcfg-test-keys_t.tar.gz
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Identical Prototype

Remark:

1. The IHDT56XC4 has the identical design as IHDT56XC2 on GSM850 / 1900, LTE B12 / B17, 2.4GHz WLAN / Bluetooth and 5GHz WLAN. Therefore, these transmitters test result is used in this report to be performed simultaneous transmission analysis and spot checks these transmitters were performed on FCC ID: IHDT56CX4 to ensure that the SAR measurements for both devices are the same, the spot check result refer to section14.5
2. This device 2.4GHz / 5.8GHz WLAN supports Hotspot operation.
3. When operating in a call in talk position at the head, the device utilizes the At-Head power table. When operating in a body-worn condition, with proximity of the user's body at the front or back of the device, the device operates in the Body-Worn power table. If neither the At-Head or Body-Worn condition is detected, but the device is operating in WiFi Hotspot mode, the device utilizes the Hotspot power table. When operating in any other radiated condition, the device uses the Default power table.
4. The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. The control logic is such that, when this front or back body-worn condition is detected and the device is operating in a mode where on-body operation may be expected, the conducted power is applied in the Body-Worn power table. In this condition (user's body detected at front or back face of the device), the Body-Worn power table is applied regardless whether or not the Wi-Fi hotspot mode is active.
5. Note that the Body-Worn Reduced power tables and detection schemes described above are sufficient to assure that body-worn SAR limits are met, regardless whether the Wi-Fi hotspot feature is active or not. However, because FCC has an additional specific test definition and limit for Wi-Fi hotspot mode operation, the additional Hotspot power table is applied if hand-held operation is indicated (i.e., not At-Head or Body-Worn) when the Wi-Fi hotspot feature is active. This ensures the 4 edges of the device comply with the letter of the Wi-Fi Hotspot requirement.
6. Reduced power for different RF exposure conditions:
   Head: If audio is present at the earpiece, the device will reduce output powers on the WLAN transmitter for held-to-ear and detail descriptions of the power reduction mechanism are included in the operational description.
   Body worn: The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device, when operating in near-body condition by end user, the device will reduced maximum output powers on the GSM1900, WCDMA B2 / B4 / B5 and LTE B2 / B4 / B5 / B30 / B66 and 5GHz WLAN transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
   Hotspot: When the mobile hotspot session is turn on by end user, the device will reduced output powers on the GSM1900, WCDMA B2 / B4 / B5 and LTE B2 / B4 / B5 / B30 / B66 and 5GHz WLAN transmitter and detail descriptions of the power reduction mechanism are included in the operational description.

4.2 General LTE SAR Test and Reporting Considerations

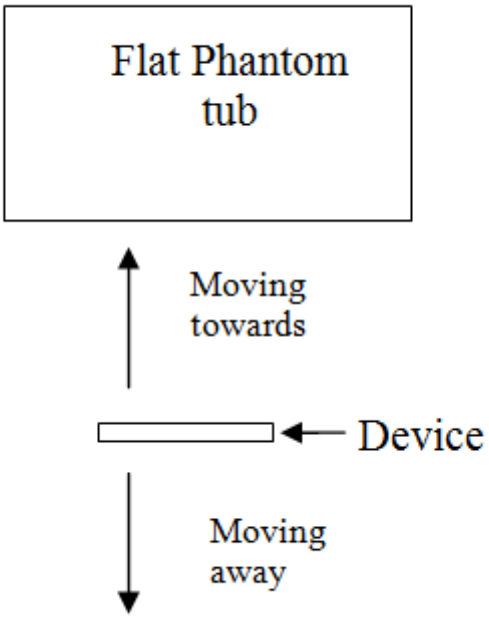
<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>IHDT56XC4</td></tr>
<tr><td>Equipment Name</td><td>Mobile Cellular Phone</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>LTE Band 2: 1850.7 MHz ~ 1909.3 MHz
LTE Band 4: 1710.7 MHz ~ 1754.3 MHz
LTE Band 5: 824.7 MHz ~ 848.3 MHz
LTE Band 12: 699.7 MHz ~ 715.3 MHz
LTE Band 14: 790.5 MHz ~ 795.5 MHz
LTE Band 17: 706.5 MHz ~ 713.5 MHz
LTE Band 30: 2307.5 MHz ~ 2312.5 MHz
LTE Band 66: 1710.7 MHz ~ 1779.3 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 02:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 04:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 05:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 14: 5MHz, 10MHz
LTE Band 17: 5MHz, 10MHz
LTE Band 30: 5MHz, 10MHz
LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz</td></tr>
<tr><td>uplink modulations used</td><td>QPSK / 16QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Voice and Data</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table>
</td></tr>
<tr><td>LTE A-MPR</td><td>In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, power reduction mechanisms applied to satisfy SAR compliance for LTE B2 / B4 / B5 / B30 / B66 power reduction applied to satisfy SAR compliance.</td></tr>
</table>

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844
LTE Band 12								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711
LTE Band 14				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23305	790.5	23330	793
M	23330	793		
H	23355	795.5		
LTE Band 17				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq. (MHz)
L	23755	706.5	23780	709
M	23790	710	23790	710
H	23825	713.5	23800	711
LTE Band 30				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	27685	2307.5	27710	2310
M	27710	2310		
H	27735	2312.5		
LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

4.3 Proximity Sensor Triggering Test

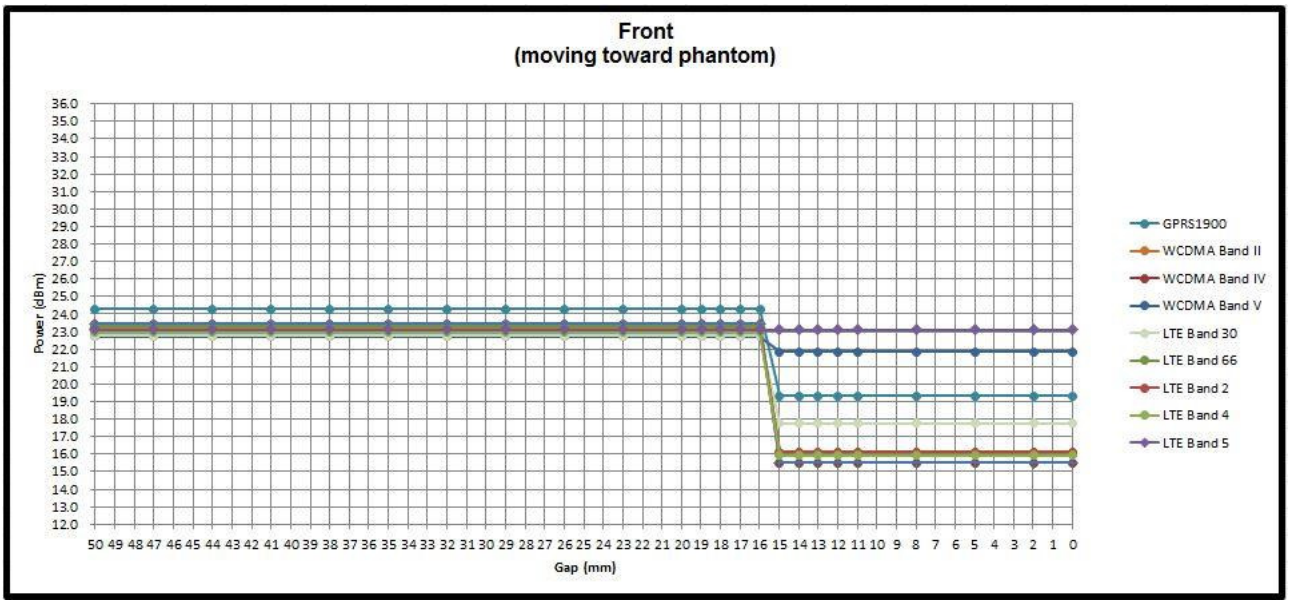
<Proximity Sensor Triggering Distance>:

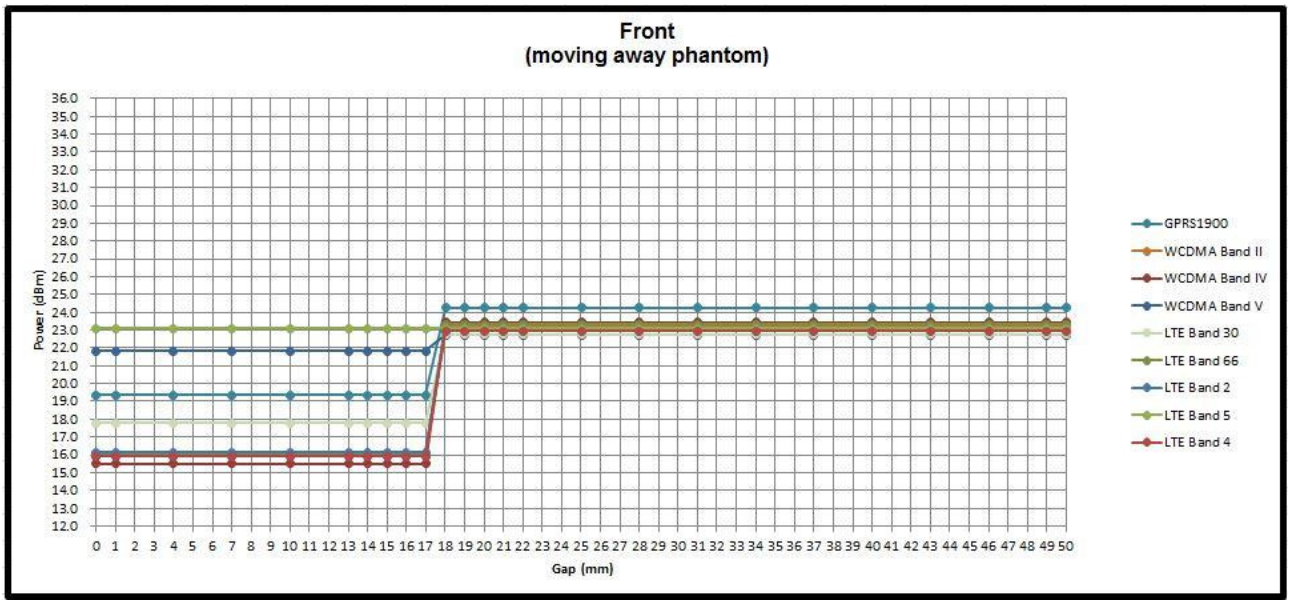
1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (2600MHz) and lowest (750MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the top and bottom ends of the phone are utilized to determine when the device comes in proximity of the user's body at the front or back of the device.
3. The output power will reduce to body worn power level when top and bottom sensor pad be detected.
4. The sensors used to detect the proximity of the user's body (Body-Worn condition) at the front or back surface of the device use a detection threshold distance. The data shown in the sections below shows the distance(s).
5. When the sensor is active, the device will reduced maximum output powers on the GSM1900, WCDMA B2 / B4 / B5 and LTE B2 / B4 / B5 / B30 / B66 transmitter.

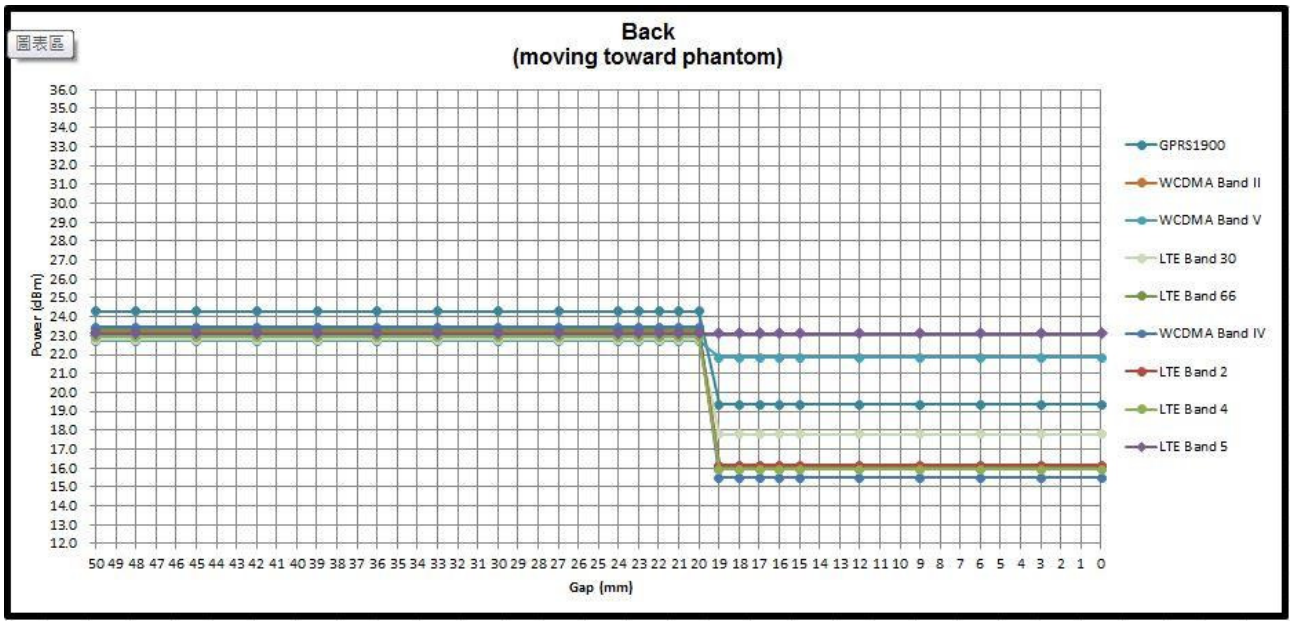


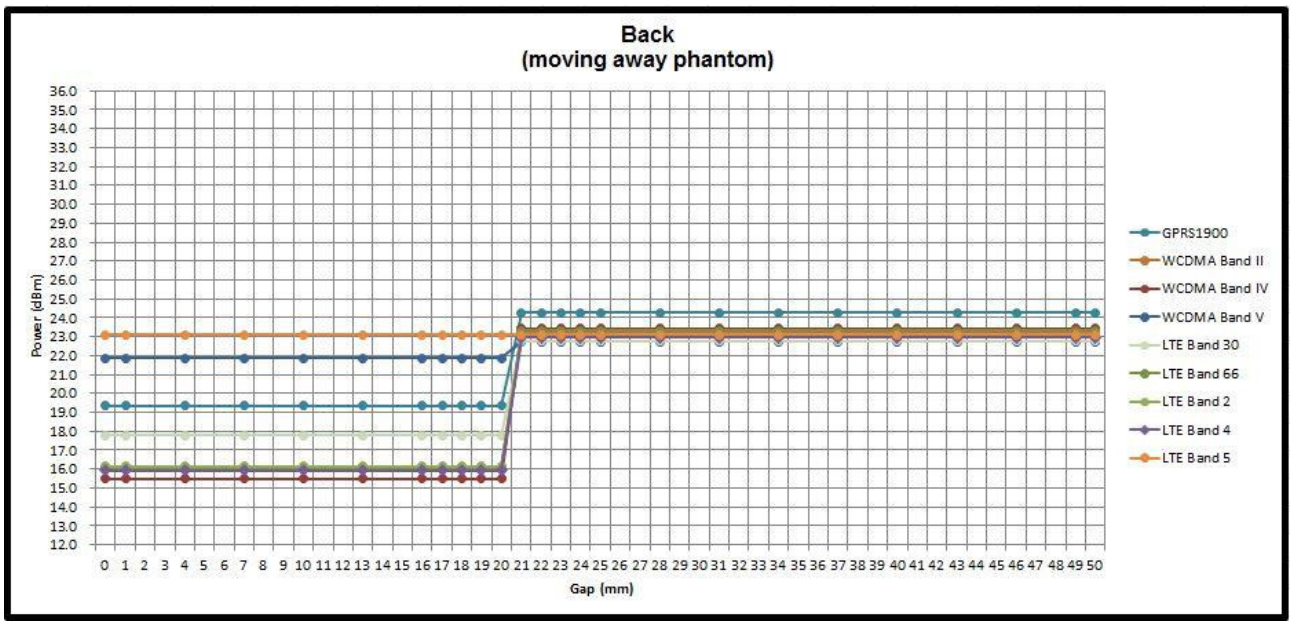
Proximity Sensor Trigger Distance (mm)				
Position	Front		Back	
Position	Moving towards	Moving away	Moving towards	Moving away
Minimum	15.0	17.0	19.0	20.0

<Sensor triggers distance V.S Measure power>






Back
(moving toward phantom)
Power (dBm)
Gap (mm)
GPRS1900
WCDMA Band II
WCDMA Band V
LTE Band 30
LTE Band 66
WCDMA Band IV
LTE Band 2
LTE Band 4
LTE Band 5


Back
(moving away phantom)
Power (dBm)
Gap (mm)
GPRS1900
WCDMA Band II
WCDMA Band IV
WCDMA Band V
LTE Band 30
LTE Band 66
LTE Band 2
LTE Band 4
LTE Band 5

5. RF Exposure Limits

5.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

5.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

6. Specific Absorption Rate (SAR)

6.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

6.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$\mathbf{SAR} = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\mathbf{dm}}\right) = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\boldsymbol{\rho}\mathbf{dv}}\right)$$

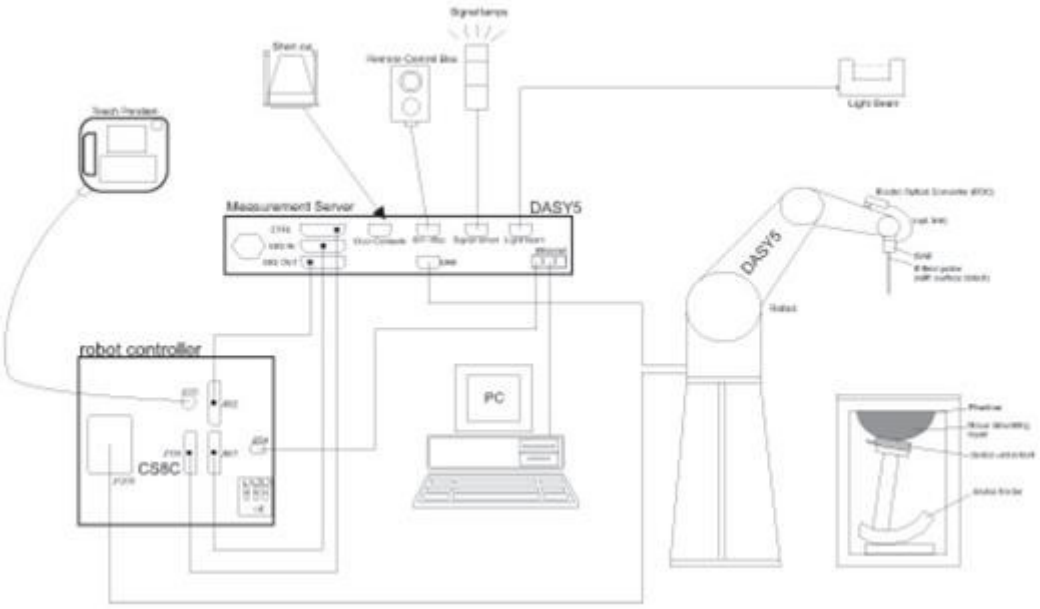
SAR is expressed in units of Watts per kilogram (W/kg)

$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}|\mathbf{E}|^2}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

7. System Description and Setup

The DASY 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.

7.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – 4 GHz; Linearity: ±0.2 dB (30 MHz – 4 GHz)	
Directivity	±0.2 dB in TSL (rotation around probe axis) ±0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 µW/g – >100 mW/g; Linearity: ±0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)	
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

7.2 Data Acquisition Electronics (DAE)

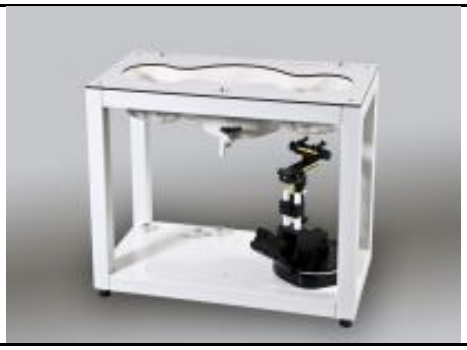
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

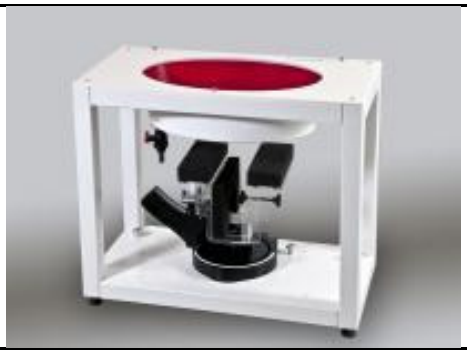
7.3 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

7.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Mounting Device for Laptops

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

8.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

8.2 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. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

8.3 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 found in the scanned area, within a range of the global maximum. The range (in dB0 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 FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

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

8.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes 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 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

8.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

8.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1012	May. 22, 2017	May. 21, 2018
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 21, 2017	Mar. 20, 2018
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 15, 2017	Nov. 14, 2018
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Sep. 28, 2017	Sep. 27, 2018
SPEAG	2300MHz System Validation Kit	D2300V2	1023	Aug. 17, 2017	Aug. 16, 2018
SPEAG	Data Acquisition Electronics	DAE4	1399	Nov. 16, 2017	Nov. 15, 2018
SPEAG	Data Acquisition Electronics	DAE4	854	May. 02, 2017	May. 01, 2018
SPEAG	Dosimetric E-Field Probe	ES3DV3	3270	Sep. 25, 2017	Sep. 24, 2018
SPEAG	Dosimetric E-Field Probe	EX3DV4	3931	Sep. 29, 2017	Sep. 28, 2018
Gencom	Thermometer	TE1	TM685-1	Mar. 21, 2017	Mar. 20, 2018
Gencom	Thermometer	TE1	TM685-2	Mar. 21, 2017	Mar. 20, 2018
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Apr. 20, 2017	Apr. 19, 2018
Agilent	Wireless Communication Test Set	E5515C	MY50266977	May. 30, 2017	May. 29, 2018
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Dec. 07, 2017	Dec. 06, 2018
Agilent	ENA Network Analyzer	E5071C	MY46104758	Aug. 24, 2017	Aug. 23, 2018
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 26, 2017	Sep. 25, 2018
LINE SEIKI	Digital Thermometer	LKMelectronic	DTM3000SPEZIAL	Sep. 06, 2017	Sep. 05, 2018
Anritsu	Power Meter	ML2495A	1419002	May. 15, 2017	May. 14, 2018
Anritsu	Power Sensor	MA2411B	1339124	May. 15, 2017	May. 14, 2018
Anritsu	Power Meter	ML2495A	1218006	Oct. 06, 2017	Oct. 05, 2018
Anritsu	Power Sensor	MA2411B	1207363	Oct. 06, 2017	Oct. 05, 2018
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 23, 2017	Aug. 22, 2018
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jun. 26, 2017	Jun. 25, 2018
Mini-Circuits	Power Amplifier	ZVE-8G+	D120604	Mar. 09, 2017	Mar. 08, 2018
Mini-Circuits	Power Amplifier	ZHL-42W+	QA1344002	Mar. 09, 2017	Mar. 08, 2018
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

10. System Verification

10.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.2.

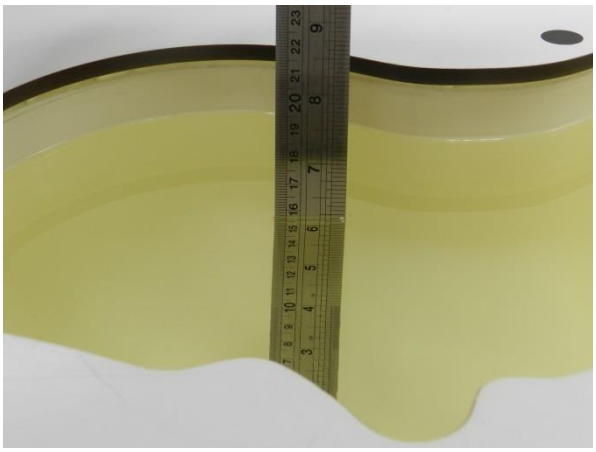


Fig 10.1Photo of Liquid Height for Head SAR

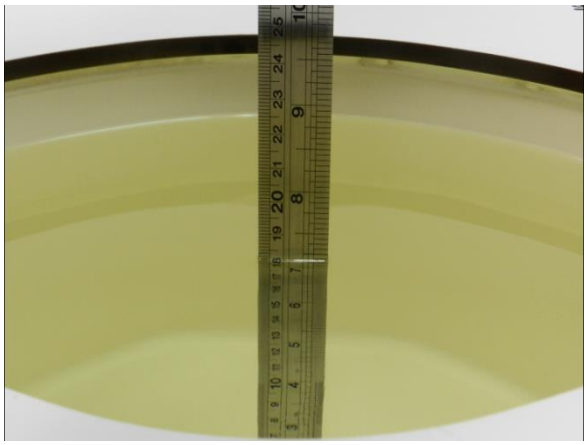


Fig 10.2 Photo of Liquid Height for Body SAR

10.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
900	40.3	57.9	0.2	1.4	0.2	0	0.97	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0
For Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
900	50.8	48.2	0	0.9	0.1	0	1.05	55.0
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	HSL	22.2	0.898	40.812	0.89	41.90	0.90	-2.60	±5	2018/1/9
750	MSL	22.5	0.965	56.454	0.96	55.50	0.52	1.72	±5	2018/1/10
750	MSL	22.5	0.972	53.878	0.96	55.50	1.25	-2.92	±5	2018/1/29
835	HSL	22.2	0.890	43.435	0.90	41.50	-1.11	4.66	±5	2018/1/9
835	MSL	22.1	0.964	55.740	0.97	55.20	-0.62	0.98	±5	2018/1/23
835	MSL	22.6	0.962	56.765	0.97	55.20	-0.82	2.84	±5	2018/1/29
1750	HSL	22.2	1.417	41.808	1.37	40.10	3.43	4.26	±5	2018/1/9
1750	MSL	22.4	1.461	55.079	1.49	53.40	-1.95	3.14	±5	2018/1/31
1900	HSL	22.2	1.404	38.980	1.40	40.00	0.29	-2.55	±5	2018/1/9
1900	MSL	22.4	1.550	51.600	1.52	53.30	1.97	-3.19	±5	2018/1/28
2300	HSL	22.4	1.659	39.613	1.67	39.50	-0.66	0.29	±5	2018/2/1
2300	MSL	22.4	1.742	55.257	1.81	52.90	-3.76	4.46	±5	2018/2/1

10.3 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2018/1/9	750	HSL	250	D750V3-1012	ES3DV3 - SN3270	DAE4 Sn854	2.09	8.22	8.36	1.70
2018/1/10	750	MSL	250	D750V3-1012	ES3DV3 - SN3270	DAE4 Sn854	2.20	8.71	8.8	1.03
2018/1/29	750	MSL	250	D750V3-1012	EX3DV4 - SN3931	DAE4 Sn1399	2.28	8.71	9.12	4.71
2018/1/9	835	HSL	250	D835V2-499	ES3DV3 - SN3270	DAE4 Sn854	2.35	9.45	9.4	-0.53
2018/1/23	835	MSL	250	D835V2-499	EX3DV4 - SN3931	DAE4 Sn1399	2.52	9.67	10.08	4.24
2018/1/29	835	MSL	250	D835V2-499	EX3DV4 - SN3931	DAE4 Sn1399	2.49	9.67	9.96	3.00
2018/1/9	1750	HSL	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn854	9.41	36.70	37.64	2.56
2018/1/31	1750	MSL	250	D1750V2-1068	EX3DV4 - SN3931	DAE4 Sn1399	9.40	37.20	37.6	1.08
2018/1/9	1900	HSL	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn854	9.68	40.50	38.72	-4.40
2018/1/28	1900	MSL	250	D1900V2-5d041	EX3DV4 - SN3931	DAE4 Sn1399	10.50	40.70	42	3.19
2018/2/1	2300	HSL	250	D2300V2-1023	EX3DV4 - SN3931	DAE4 Sn1399	12.40	47.20	49.6	5.08
2018/2/1	2300	MSL	250	D2300V2-1023	EX3DV4 - SN3931	DAE4 Sn1399	11.70	46.40	46.8	0.86

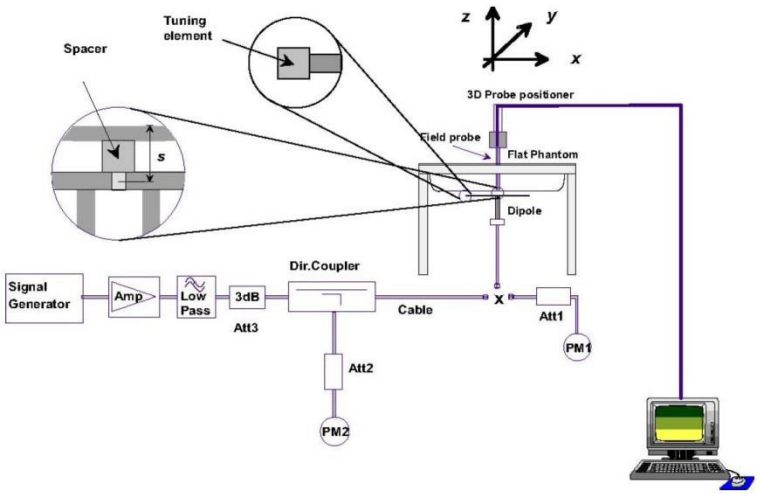


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

11. RF Exposure Positions

11.1 Ear and handset reference point

Figure 9.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M,” the left ear reference point (ERP) is marked “LE,” and the right ERP is marked “RE.” Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 9.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 9.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 9.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

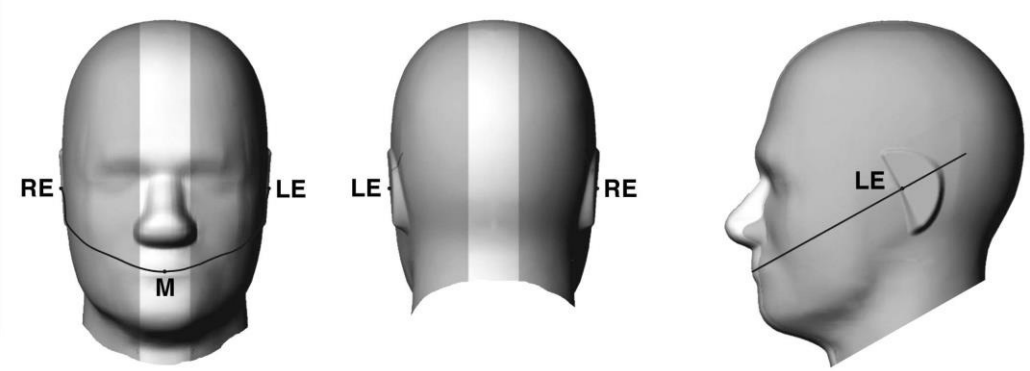


Fig 9.1.1 Front, back, and side views of SAM twin phantom

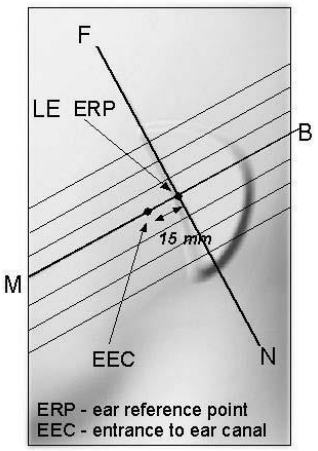


Fig 9.1.2 Close-up side view of phantom showing the ear region.

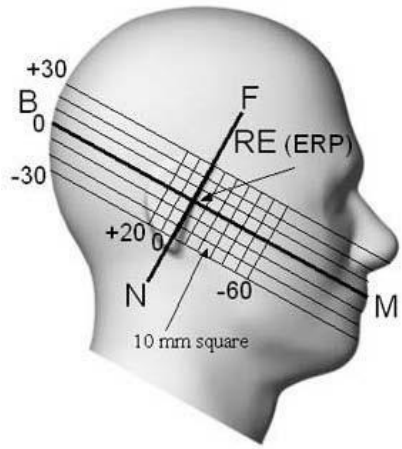


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Figure 9.2.1 and Figure 9.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 9.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 9.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 9.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 9.2.3. The actual rotation angles should be documented in the test report.

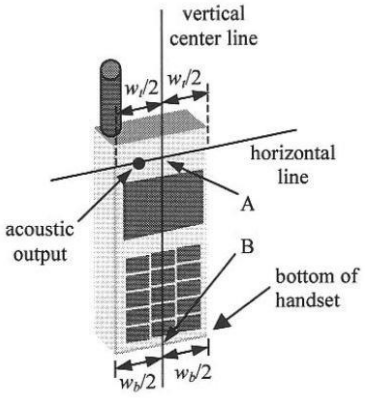


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

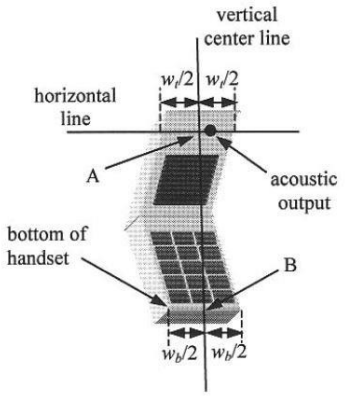


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

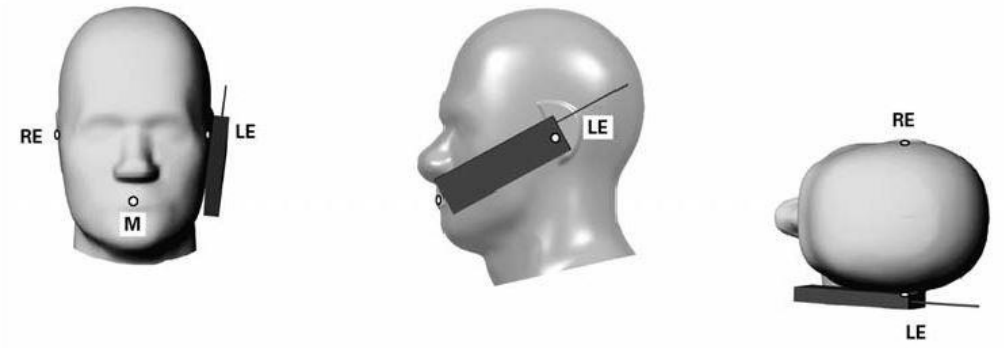


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 9.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

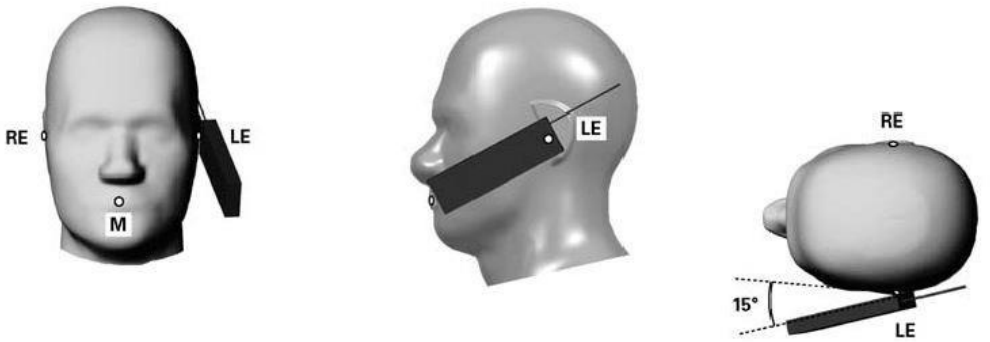


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

Accessories for body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

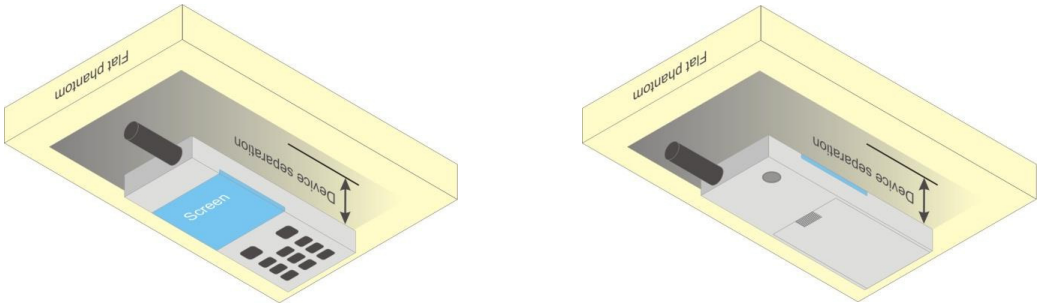


Fig 9.4 Body Worn Position

11.5 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

12. Conducted RF Output Power (Unit: dBm)

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set RMC 12.2Kbps + HSDPA mode.
   ii. Set Cell Power = -25 dBm
   iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
   iv. Select HSDPA Uplink Parameters
   v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
      a). Subtest 1: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_d=15/4
   vi. Set Delta ACK, Delta NACK and Delta CQI = 8
   vii. Set Ack-Nack Repetition Factor to 3
   viii. Set CQI Feedback Cycle (k) to 4 ms
   ix. Set CQI Repetition Factor to 2
   x. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
A summary of these settings are illustrated below:

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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	Proces ses	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.		

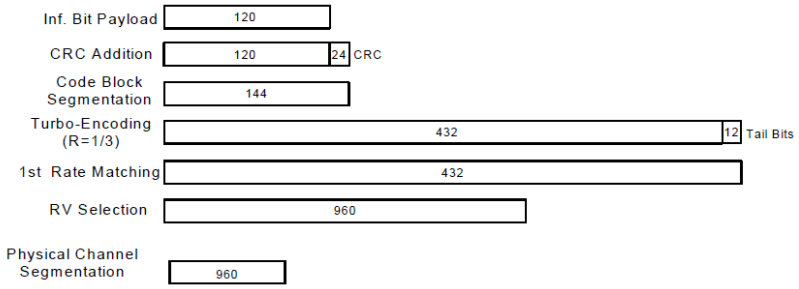


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

<Default Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	22.78	23.08	22.85	24.00	22.94	23.04	23.39	24.00	22.54	22.53	22.68	24.00
3GPP Rel 99	RMC 12.2Kbps	22.87	23.19	23.01	24.00	22.95	23.24	23.44	24.00	22.59	22.56	22.72	24.00
3GPP Rel 6	HSDPA Subtest-1	21.85	22.19	21.93	23.00	21.92	22.26	22.58	23.00	21.58	21.43	21.61	23.00
3GPP Rel 6	HSDPA Subtest-2	21.84	22.21	21.91	23.00	21.88	22.22	22.46	23.00	21.59	21.47	21.59	23.00
3GPP Rel 6	HSDPA Subtest-3	21.36	21.72	21.41	22.50	21.50	21.78	22.06	22.50	21.06	20.95	21.06	22.50
3GPP Rel 6	HSDPA Subtest-4	21.37	21.69	21.39	22.50	21.53	21.74	21.98	22.50	21.04	20.91	21.14	22.50
3GPP Rel 8	DC-HSDPA Subtest-1	21.79	22.10	21.88	23.00	21.88	22.18	22.59	23.00	21.55	21.36	21.53	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	21.75	22.17	21.87	23.00	21.86	22.13	22.48	23.00	21.52	21.42	21.59	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	21.36	21.69	21.34	22.50	21.40	21.78	22.04	22.50	21.01	20.93	21.01	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	21.29	21.67	21.36	22.50	21.40	21.65	22.02	22.50	21.04	20.82	21.07	22.50
3GPP Rel 6	HSUPA Subtest-1	21.83	22.18	21.90	23.00	21.85	22.21	22.03	23.00	21.58	21.47	21.60	23.00
3GPP Rel 6	HSUPA Subtest-2	19.83	20.19	19.94	21.00	19.93	20.25	20.08	21.00	19.57	19.49	19.61	21.00
3GPP Rel 6	HSUPA Subtest-3	20.86	21.16	20.91	22.00	20.91	21.21	21.02	22.00	20.62	20.45	20.58	22.00
3GPP Rel 6	HSUPA Subtest-4	19.78	20.20	19.94	21.00	19.88	20.23	20.13	21.00	19.60	19.44	19.63	21.00
3GPP Rel 6	HSUPA Subtest-5	21.80	22.20	21.90	23.00	21.90	22.20	22.10	23.00	21.60	21.50	21.60	23.00

<Hotspot and Near-body Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	15.98	16.34	16.12	17.00	14.77	15.11	15.48	15.50	21.76	21.71	21.83	22.50
3GPP Rel 99	RMC 12.2Kbps	16.00	16.36	16.13	17.00	14.78	15.13	15.50	15.50	21.74	21.70	21.85	22.50
3GPP Rel 6	HSDPA Subtest-1	15.02	15.35	15.13	16.00	13.79	14.14	14.50	14.50	20.73	20.69	20.85	21.50
3GPP Rel 6	HSDPA Subtest-2	14.98	15.36	15.12	16.00	13.78	14.13	14.50	14.50	20.75	20.65	20.85	21.50
3GPP Rel 6	HSDPA Subtest-3	14.49	14.86	14.63	15.50	13.27	13.66	14.00	14.00	20.25	20.18	20.36	21.00
3GPP Rel 6	HSDPA Subtest-4	14.50	14.85	14.63	15.50	13.29	13.63	13.98	14.00	20.24	20.18	20.35	21.00
3GPP Rel 8	DC-HSDPA Subtest-1	14.96	15.33	15.05	16.00	13.70	14.14	14.47	14.50	20.64	20.60	20.83	21.50
3GPP Rel 8	DC-HSDPA Subtest-2	14.97	15.36	15.04	16.00	13.75	14.04	14.47	14.50	20.71	20.65	20.80	21.50
3GPP Rel 8	DC-HSDPA Subtest-3	14.43	14.78	14.55	15.50	13.20	13.57	13.93	14.00	20.25	20.12	20.28	21.00
3GPP Rel 8	DC-HSDPA Subtest-4	14.45	14.78	14.56	15.50	13.27	13.59	13.98	14.00	20.16	20.18	20.35	21.00
3GPP Rel 6	HSUPA Subtest-1	14.94	15.29	15.00	16.00	13.84	14.14	14.02	14.50	20.52	20.47	20.51	21.50
3GPP Rel 6	HSUPA Subtest-2	12.93	13.32	13.05	14.00	11.91	12.25	11.99	12.50	17.52	17.47	17.56	19.50
3GPP Rel 6	HSUPA Subtest-3	13.98	14.30	14.11	15.00	12.86	13.16	12.98	13.50	19.55	19.42	19.55	20.50
3GPP Rel 6	HSUPA Subtest-4	12.92	13.33	13.06	14.00	11.84	12.15	12.06	12.50	17.53	17.41	17.54	19.50
3GPP Rel 6	HSUPA Subtest-5	14.98	15.33	15.00	16.00	13.89	14.11	14.00	14.50	19.50	19.45	19.55	21.50

<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, 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.

<Default Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	22.64	22.76	22.82	24	0
20	QPSK	1	49	22.92	23.10	22.95		
20	QPSK	1	99	22.59	22.68	22.61		
20	QPSK	50	0	22.01	22.15	22.03	23	1
20	QPSK	50	24	21.93	22.13	21.97		
20	QPSK	50	50	21.78	21.89	21.80		
20	QPSK	100	0	21.83	21.98	21.97		
20	16QAM	1	0	22.18	22.30	22.42	23	1
20	16QAM	1	49	22.07	22.32	22.29		
20	16QAM	1	99	21.87	21.96	21.84		
20	16QAM	50	0	20.81	21.09	21.03	22	2
20	16QAM	50	24	20.92	21.12	20.94		
20	16QAM	50	50	20.71	20.87	20.75		
20	16QAM	100	0	20.82	20.96	20.96		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.77	22.94	22.93	24	0
15	QPSK	1	37	22.76	23.05	22.57		
15	QPSK	1	74	22.91	23.01	22.93		
15	QPSK	36	0	21.82	22.11	21.98	23	1
15	QPSK	36	20	21.93	22.11	21.95		
15	QPSK	36	39	21.82	21.99	21.96		
15	QPSK	75	0	21.92	22.05	21.91		
15	16QAM	1	0	22.29	22.52	22.32	23	1
15	16QAM	1	37	22.17	22.27	22.06		
15	16QAM	1	74	22.22	22.37	22.16		
15	16QAM	36	0	20.80	21.08	20.96	22	2
15	16QAM	36	20	20.93	21.10	20.91		
15	16QAM	36	39	20.80	20.97	20.91		
15	16QAM	75	0	20.85	21.03	20.91		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.72	22.98	22.92	24	0
10	QPSK	1	25	22.85	23.05	23.02		
10	QPSK	1	49	22.98	23.02	22.95		
10	QPSK	25	0	21.84	22.16	21.96	23	1
10	QPSK	25	12	21.83	22.13	21.96		
10	QPSK	25	25	21.90	22.15	21.92		
10	QPSK	50	0	21.83	22.16	21.96		
10	16QAM	1	0	22.23	22.57	22.46	23	1
10	16QAM	1	25	22.15	22.44	22.24		
10	16QAM	1	49	22.21	22.40	22.25		
10	16QAM	25	0	20.90	21.18	20.94	22	2
10	16QAM	25	12	20.83	21.13	20.94		
10	16QAM	25	25	20.90	21.15	20.90		
10	16QAM	50	0	20.81	21.12	20.89		

Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.59	22.93	22.72	24	0
5	QPSK	1	12	22.76	23.07	22.86		
5	QPSK	1	24	22.84	23.04	22.87		
5	QPSK	12	0	21.91	22.19	22.04	23	1
5	QPSK	12	7	21.89	22.17	21.97		
5	QPSK	12	13	21.85	22.08	21.92		
5	QPSK	25	0	21.94	22.20	21.97		
5	16QAM	1	0	22.28	22.61	22.35	23	1
5	16QAM	1	12	22.12	22.38	22.20		
5	16QAM	1	24	22.11	22.44	22.27		
5	16QAM	12	0	20.96	21.23	21.07	22	2
5	16QAM	12	7	20.88	21.20	20.96		
5	16QAM	12	13	20.85	21.10	20.95		
5	16QAM	25	0	20.86	21.16	20.95		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.85	22.81	22.60	24	0
3	QPSK	1	8	22.81	23.09	22.86		
3	QPSK	1	14	22.75	23.02	22.80		
3	QPSK	8	0	21.86	22.12	21.89	23	1
3	QPSK	8	4	21.81	22.10	21.91		
3	QPSK	8	7	21.78	22.05	21.85		
3	QPSK	15	0	21.83	22.08	21.87		
3	16QAM	1	0	22.09	22.42	22.23	23	1
3	16QAM	1	8	22.08	22.42	22.15		
3	16QAM	1	14	22.00	22.28	22.14		
3	16QAM	8	0	20.89	21.20	20.92	22	2
3	16QAM	8	4	20.87	21.16	20.97		
3	16QAM	8	7	20.84	21.13	20.93		
3	16QAM	15	0	20.80	21.14	20.88		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.70	22.73	22.49	24	0
1.4	QPSK	1	3	22.76	23.04	22.85		
1.4	QPSK	1	5	22.69	23.05	22.75		
1.4	QPSK	3	0	22.72	23.00	22.75		
1.4	QPSK	3	1	22.75	23.05	22.77		
1.4	QPSK	3	3	22.71	22.99	22.73		
1.4	QPSK	6	0	21.71	22.00	21.79	23	1
1.4	16QAM	1	0	21.98	22.28	22.08	23	1
1.4	16QAM	1	3	22.04	22.32	22.10		
1.4	16QAM	1	5	21.99	22.29	22.10		
1.4	16QAM	3	0	21.74	22.06	21.83		
1.4	16QAM	3	1	21.78	22.11	21.88		
1.4	16QAM	3	3	21.71	22.05	21.86		
1.4	16QAM	6	0	20.76	21.07	20.88	22	2

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	22.26	22.37	22.40	24	0
20	QPSK	1	49	22.90	22.95	22.86		
20	QPSK	1	99	22.51	22.69	22.80		
20	QPSK	50	0	21.71	21.79	21.91	23	1
20	QPSK	50	24	21.67	21.83	21.96		
20	QPSK	50	50	21.62	21.70	21.92		
20	QPSK	100	0	21.68	21.72	21.87		
20	16QAM	1	0	21.74	21.66	21.82	23	1
20	16QAM	1	49	21.76	21.97	22.17		
20	16QAM	1	99	21.65	21.89	22.00		
20	16QAM	50	0	20.71	20.80	20.93	22	2
20	16QAM	50	24	20.72	20.81	20.97		
20	16QAM	50	50	20.63	20.72	20.98		
20	16QAM	100	0	20.68	20.74	20.90		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.47	22.49	22.78	24	0
15	QPSK	1	37	22.27	22.50	22.85		
15	QPSK	1	74	22.50	22.61	22.80		
15	QPSK	36	0	21.81	21.85	21.94	23	1
15	QPSK	36	20	21.79	21.88	22.04		
15	QPSK	36	39	21.72	21.73	21.91		
15	QPSK	75	0	21.68	21.81	22.02		
15	16QAM	1	0	21.94	21.88	22.17	23	1
15	16QAM	1	37	21.80	21.91	22.23		
15	16QAM	1	74	21.67	21.94	22.07		
15	16QAM	36	0	20.81	20.85	20.96	22	2
15	16QAM	36	20	20.68	20.82	21.06		
15	16QAM	36	39	20.71	20.73	20.92		
15	16QAM	75	0	20.70	20.79	20.96		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.66	23.17	23.00	24	0
10	QPSK	1	25	22.81	22.94	23.17		
10	QPSK	1	49	23.13	23.27	23.32		
10	QPSK	25	0	21.69	21.90	22.06	23	1
10	QPSK	25	12	21.80	21.91	22.14		
10	QPSK	25	25	21.88	22.05	22.24		
10	QPSK	50	0	21.86	21.92	22.20		
10	16QAM	1	0	22.22	22.25	22.49	23	1
10	16QAM	1	25	21.92	21.95	22.31		
10	16QAM	1	49	22.29	22.50	22.67		
10	16QAM	25	0	20.83	20.89	21.11	22	2
10	16QAM	25	12	20.80	20.86	21.15		
10	16QAM	25	25	20.90	21.02	21.15		
10	16QAM	50	0	20.91	20.98	21.22		

Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.56	22.53	22.93	24	0
5	QPSK	1	12	22.61	22.77	23.02		
5	QPSK	1	24	22.70	22.92	23.04		
5	QPSK	12	0	21.79	21.93	22.12	23	1
5	QPSK	12	7	21.70	21.88	22.09		
5	QPSK	12	13	21.79	21.91	22.07		
5	QPSK	25	0	21.74	21.87	22.08		
5	16QAM	1	0	22.05	22.02	22.44	23	1
5	16QAM	1	12	21.83	21.96	22.26		
5	16QAM	1	24	22.00	22.18	22.34		
5	16QAM	12	0	20.76	20.90	21.16	22	2
5	16QAM	12	7	20.73	20.93	21.12		
5	16QAM	12	13	20.77	20.87	21.10		
5	16QAM	25	0	20.65	20.88	21.10		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.35	22.44	22.75	24	0
3	QPSK	1	8	22.60	22.79	23.10		
3	QPSK	1	14	22.57	22.75	22.96		
3	QPSK	8	0	21.69	21.82	22.03	23	1
3	QPSK	8	4	21.68	21.81	22.04		
3	QPSK	8	7	21.64	21.81	22.02		
3	QPSK	15	0	21.63	21.80	22.02		
3	16QAM	1	0	21.93	22.21	22.29	23	1
3	16QAM	1	8	21.92	21.99	22.33		
3	16QAM	1	14	21.82	22.32	22.29		
3	16QAM	8	0	20.71	20.86	21.10	22	2
3	16QAM	8	4	20.72	20.87	21.10		
3	16QAM	8	7	20.66	20.85	21.07		
3	16QAM	15	0	20.63	20.83	21.04		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.31	22.60	22.68	24	0
1.4	QPSK	1	3	22.65	22.76	23.02		
1.4	QPSK	1	5	22.56	22.73	22.95		
1.4	QPSK	3	0	22.61	22.74	22.95		
1.4	QPSK	3	1	22.67	22.70	23.01		
1.4	QPSK	3	3	22.64	22.77	23.06		
1.4	QPSK	6	0	21.65	21.74	22.01	23	1
1.4	16QAM	1	0	21.86	21.90	22.47	23	1
1.4	16QAM	1	3	21.86	22.31	22.44		
1.4	16QAM	1	5	21.80	21.92	22.42		
1.4	16QAM	3	0	21.64	21.75	22.05		
1.4	16QAM	3	1	21.70	21.77	22.04		
1.4	16QAM	3	3	21.63	21.75	22.02		
1.4	16QAM	6	0	20.71	20.82	21.11	22	2

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.48	22.66	22.60	24	0
10	QPSK	1	25	22.63	22.78	22.76		
10	QPSK	1	49	23.13	23.10	23.06		
10	QPSK	25	0	21.71	21.72	21.95	23	1
10	QPSK	25	12	21.66	21.84	21.81		
10	QPSK	25	25	21.84	21.89	21.88		
10	QPSK	50	0	21.71	21.83	21.93		
10	16QAM	1	0	22.01	22.06	22.21	23	1
10	16QAM	1	25	21.85	22.10	21.96		
10	16QAM	1	49	22.16	22.35	22.27		
10	16QAM	25	0	20.71	20.75	20.94	22	2
10	16QAM	25	12	20.67	20.84	20.84		
10	16QAM	25	25	20.78	20.90	20.88		
10	16QAM	50	0	20.71	20.86	20.95		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.24	22.42	22.39	24	0
5	QPSK	1	12	22.74	22.74	22.71		
5	QPSK	1	24	22.70	22.77	22.67		
5	QPSK	12	0	21.66	21.75	21.81	23	1
5	QPSK	12	7	21.66	21.80	21.74		
5	QPSK	12	13	21.59	21.76	21.77		
5	QPSK	25	0	21.69	21.77	21.75		
5	16QAM	1	0	21.93	22.08	22.03	23	1
5	16QAM	1	12	21.81	22.09	21.93		
5	16QAM	1	24	22.07	22.06	22.01		
5	16QAM	12	0	20.67	20.77	20.81	22	2
5	16QAM	12	7	20.68	20.80	20.75		
5	16QAM	12	13	20.61	20.76	20.76		
5	16QAM	25	0	20.69	20.78	20.75		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.16	22.31	22.31	24	0
3	QPSK	1	8	22.62	22.75	22.72		
3	QPSK	1	14	22.59	22.62	22.60		
3	QPSK	8	0	21.60	21.67	21.68	23	1
3	QPSK	8	4	21.59	21.76	21.79		
3	QPSK	8	7	21.60	21.71	21.74		
3	QPSK	15	0	21.62	21.76	21.74		
3	16QAM	1	0	21.82	22.01	21.97	23	1
3	16QAM	1	8	22.19	22.05	22.05		
3	16QAM	1	14	21.93	21.92	22.02		
3	16QAM	8	0	20.68	20.71	20.74	22	2
3	16QAM	8	4	20.70	20.82	20.80		
3	16QAM	8	7	20.64	20.77	20.77		
3	16QAM	15	0	20.58	20.78	20.78		

Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.19	22.22	22.33	24	0
1.4	QPSK	1	3	22.64	22.76	22.77		
1.4	QPSK	1	5	22.56	22.76	22.66		
1.4	QPSK	3	0	22.64	22.61	22.69		
1.4	QPSK	3	1	22.59	22.78	22.72		
1.4	QPSK	3	3	22.62	22.72	22.68		
1.4	QPSK	6	0	21.64	21.76	21.72	23	1
1.4	16QAM	1	0	21.86	22.06	22.08	23	1
1.4	16QAM	1	3	21.85	22.06	22.05		
1.4	16QAM	1	5	21.86	21.96	21.96		
1.4	16QAM	3	0	21.61	21.71	21.72		
1.4	16QAM	3	1	21.70	21.83	21.78		
1.4	16QAM	3	3	21.62	21.78	21.74		
1.4	16QAM	6	0	20.70	20.81	20.77	22	2

<LTE Band 14>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23330				
Frequency (MHz)				793				
10	QPSK	1	0	22.64			24	0
10	QPSK	1	25	22.72				
10	QPSK	1	49	22.82				
10	QPSK	25	0	21.67			23	1
10	QPSK	25	12	21.55				
10	QPSK	25	25	21.47				
10	QPSK	50	0	21.62				
10	16QAM	1	0	22.14			23	1
10	16QAM	1	25	21.88				
10	16QAM	1	49	21.74				
10	16QAM	25	0	20.69			22	2
10	16QAM	25	12	20.45				
10	16QAM	25	25	20.59				
10	16QAM	50	0	20.59				
Channel				23305	23330	23355	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				790.5	793	795.5		
5	QPSK	1	0	22.24	22.20	22.17	24	0
5	QPSK	1	12	22.49	22.48	22.57		
5	QPSK	1	24	22.55	22.55	22.51		
5	QPSK	12	0	21.67	21.51	21.49	23	1
5	QPSK	12	7	21.58	21.56	21.57		
5	QPSK	12	13	21.60	21.53	21.55		
5	QPSK	25	0	21.62	21.54	21.60		
5	16QAM	1	0	21.91	21.89	21.83	23	1
5	16QAM	1	12	21.75	21.72	21.81		
5	16QAM	1	24	21.78	21.81	21.77		
5	16QAM	12	0	20.69	20.55	20.55	22	2
5	16QAM	12	7	20.61	20.58	20.60		
5	16QAM	12	13	20.63	20.54	20.58		
5	16QAM	25	0	20.59	20.51	20.60		

<LTE Band 30>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				27710				
Frequency (MHz)				2310				
10	QPSK	1	0	22.72			24	0
10	QPSK	1	25	22.72				
10	QPSK	1	49	22.77				
10	QPSK	25	0	21.73			23	1
10	QPSK	25	12	21.71				
10	QPSK	25	25	21.67				
10	QPSK	50	0	21.78				
10	16QAM	1	0	22.12			23	1
10	16QAM	1	25	22.04				
10	16QAM	1	49	22.06				
10	16QAM	25	0	20.72			22	2
10	16QAM	25	12	20.67				
10	16QAM	25	25	20.61				
10	16QAM	50	0	20.79				
Channel				27685	27710	27735	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2307.5	2310	2312.5		
5	QPSK	1	0	22.65	22.60	22.64	24	0
5	QPSK	1	12	22.70	22.76	22.64		
5	QPSK	1	24	22.63	22.58	22.54		
5	QPSK	12	0	21.82	21.76	21.82	23	1
5	QPSK	12	7	21.69	21.72	21.72		
5	QPSK	12	13	21.68	21.67	21.56		
5	QPSK	25	0	21.78	21.67	21.79		
5	16QAM	1	0	22.15	22.12	22.06	23	1
5	16QAM	1	12	21.97	22.05	21.94		
5	16QAM	1	24	21.97	22.03	21.87		
5	16QAM	12	0	20.85	20.81	20.82	22	2
5	16QAM	12	7	20.74	20.73	20.73		
5	16QAM	12	13	20.70	20.63	20.59		
5	16QAM	25	0	20.80	20.67	20.78		

<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	22.39	22.67	22.75	24	0
20	QPSK	1	49	22.53	22.96	22.83		
20	QPSK	1	99	23.24	23.14	23.34		
20	QPSK	50	0	21.62	21.82	21.87	23	1
20	QPSK	50	24	21.73	21.87	21.89		
20	QPSK	50	50	21.78	21.88	21.85		
20	QPSK	100	0	21.69	21.85	21.94		
20	16QAM	1	0	21.83	21.89	21.99	23	1
20	16QAM	1	49	21.78	22.12	22.00		
20	16QAM	1	99	22.04	22.30	22.29		
20	16QAM	50	0	20.70	20.82	20.90	22	2
20	16QAM	50	24	20.70	20.90	20.89		
20	16QAM	50	50	20.82	20.91	20.84		
20	16QAM	100	0	20.67	20.82	20.95		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	22.77	22.86	22.95	24	0
15	QPSK	1	37	22.58	22.61	22.74		
15	QPSK	1	74	22.57	22.89	23.02		
15	QPSK	36	0	21.76	21.93	21.96	23	1
15	QPSK	36	20	21.71	21.87	21.90		
15	QPSK	36	39	21.74	21.71	21.87		
15	QPSK	75	0	21.71	21.89	21.92		
15	16QAM	1	0	22.12	22.23	22.33	23	1
15	16QAM	1	37	21.76	21.97	22.08		
15	16QAM	1	74	21.83	22.15	22.14		
15	16QAM	36	0	20.76	20.84	20.97	22	2
15	16QAM	36	20	20.72	20.86	20.91		
15	16QAM	36	39	20.70	20.71	20.83		
15	16QAM	75	0	20.72	20.86	20.88		
Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	22.07	22.11	22.26	24	0
10	QPSK	1	25	22.59	22.79	22.86		
10	QPSK	1	49	23.09	23.23	23.33		
10	QPSK	25	0	21.63	21.75	21.85	23	1
10	QPSK	25	12	21.71	21.89	21.90		
10	QPSK	25	25	21.87	21.93	21.99		
10	QPSK	50	0	21.68	21.90	21.93		
10	16QAM	1	0	21.34	21.53	21.62	23	1
10	16QAM	1	25	21.82	22.07	22.16		
10	16QAM	1	49	22.19	22.52	22.36		
10	16QAM	25	0	20.70	20.75	20.93	22	2
10	16QAM	25	12	20.69	20.86	20.88		
10	16QAM	25	25	20.82	20.90	21.00		
10	16QAM	50	0	20.72	20.87	20.91		

Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	22.51	22.80	22.97	24	0
5	QPSK	1	12	22.53	22.84	22.98		
5	QPSK	1	24	22.57	22.81	22.81		
5	QPSK	12	0	21.65	21.91	21.95	23	1
5	QPSK	12	7	21.56	21.89	21.89		
5	QPSK	12	13	21.65	21.81	21.83		
5	QPSK	25	0	21.61	21.87	21.88		
5	16QAM	1	0	22.00	22.17	22.31	23	1
5	16QAM	1	12	21.79	22.03	22.09		
5	16QAM	1	24	21.90	22.09	22.03		
5	16QAM	12	0	20.69	20.95	21.04	22	2
5	16QAM	12	7	20.63	20.87	20.92		
5	16QAM	12	13	20.67	20.79	20.89		
5	16QAM	25	0	20.62	20.85	20.90		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	22.37	22.59	22.72	24	0
3	QPSK	1	8	22.49	22.79	22.85		
3	QPSK	1	14	22.59	22.73	22.81		
3	QPSK	8	0	21.61	21.85	21.83	23	1
3	QPSK	8	4	21.60	21.84	21.84		
3	QPSK	8	7	21.54	21.79	21.80		
3	QPSK	15	0	21.54	21.83	21.87		
3	16QAM	1	0	21.91	22.11	22.21	23	1
3	16QAM	1	8	21.86	22.08	22.06		
3	16QAM	1	14	21.92	22.09	22.04		
3	16QAM	8	0	20.63	20.88	20.94	22	2
3	16QAM	8	4	20.63	20.85	20.90		
3	16QAM	8	7	20.55	20.80	20.86		
3	16QAM	15	0	20.63	20.80	20.87		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	22.33	22.56	22.56	24	0
1.4	QPSK	1	3	22.64	22.84	22.76		
1.4	QPSK	1	5	22.49	22.73	22.67		
1.4	QPSK	3	0	22.60	22.84	22.77		
1.4	QPSK	3	1	22.58	22.81	22.82		
1.4	QPSK	3	3	22.56	22.79	22.73		
1.4	QPSK	6	0	21.56	21.78	21.73	23	1
1.4	16QAM	1	0	21.78	22.03	22.24	23	1
1.4	16QAM	1	3	22.08	22.21	22.20		
1.4	16QAM	1	5	21.75	22.00	22.01		
1.4	16QAM	3	0	21.64	21.80	21.80		
1.4	16QAM	3	1	21.63	21.86	21.81		
1.4	16QAM	3	3	21.57	21.76	21.79		
1.4	16QAM	6	0	20.60	20.83	20.83	22	2

<Hotspot and Near-body Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	16.13	16.28	16.49	16.5	0
20	QPSK	1	49	15.98	16.19	16.29		
20	QPSK	1	99	15.82	15.88	15.78		
20	QPSK	50	0	16.11	16.30	16.32	16.5	0
20	QPSK	50	24	16.06	16.29	16.29		
20	QPSK	50	50	15.94	16.06	16.12		
20	QPSK	100	0	16.02	16.17	16.29		
20	16QAM	1	0	16.31	16.31	16.41	16.5	0
20	16QAM	1	49	16.28	16.40	16.38		
20	16QAM	1	99	16.02	16.06	16.03		
20	16QAM	50	0	15.02	15.28	15.31	16.5	0
20	16QAM	50	24	15.15	15.29	15.27		
20	16QAM	50	50	15.00	15.04	15.10		
20	16QAM	100	0	15.04	15.20	15.27		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	16.22	16.28	16.29	16.5	0
15	QPSK	1	37	16.07	16.24	16.06		
15	QPSK	1	74	16.14	16.19	16.22		
15	QPSK	36	0	15.99	16.29	16.26	16.5	0
15	QPSK	36	20	16.10	16.30	16.23		
15	QPSK	36	39	16.04	16.22	16.25		
15	QPSK	75	0	16.11	16.23	16.22		
15	16QAM	1	0	16.44	16.38	16.44	16.5	0
15	16QAM	1	37	16.24	16.35	16.41		
15	16QAM	1	74	16.37	16.33	16.48		
15	16QAM	36	0	15.00	15.25	15.31	16.5	0
15	16QAM	36	20	15.10	15.25	15.21		
15	16QAM	36	39	15.02	15.18	15.22		
15	16QAM	75	0	15.06	15.19	15.18		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	16.02	16.11	16.13	16.5	0
10	QPSK	1	25	16.03	16.30	16.19		
10	QPSK	1	49	16.15	16.35	16.26		
10	QPSK	25	0	16.00	16.30	16.25	16.5	0
10	QPSK	25	12	16.00	16.32	16.24		
10	QPSK	25	25	16.10	16.33	16.20		
10	QPSK	50	0	16.03	16.32	16.21		
10	16QAM	1	0	16.41	16.41	16.43	16.5	0
10	16QAM	1	25	16.27	16.40	16.33		
10	16QAM	1	49	16.41	16.32	16.48		
10	16QAM	25	0	15.04	15.32	15.19	16.5	0
10	16QAM	25	12	15.02	15.31	15.23		
10	16QAM	25	25	15.07	15.29	15.18		
10	16QAM	50	0	15.00	15.29	15.24		

Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	16.11	16.28	16.24	16.5	0
5	QPSK	1	12	15.94	16.47	16.34		
5	QPSK	1	24	15.96	16.33	16.16		
5	QPSK	12	0	16.05	16.40	16.33	16.5	0
5	QPSK	12	7	16.03	16.37	16.25		
5	QPSK	12	13	16.01	16.29	16.21		
5	QPSK	25	0	16.07	16.31	16.22		
5	16QAM	1	0	16.42	16.39	16.28	16.5	0
5	16QAM	1	12	16.22	16.22	16.42		
5	16QAM	1	24	16.27	16.29	16.40		
5	16QAM	12	0	15.12	15.40	15.30	16.5	0
5	16QAM	12	7	15.02	15.34	15.24		
5	16QAM	12	13	15.00	15.29	15.20		
5	16QAM	25	0	15.05	15.30	15.24		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	16.04	16.27	16.18	16.5	0
3	QPSK	1	8	16.02	16.33	16.22		
3	QPSK	1	14	15.95	16.24	16.17		
3	QPSK	8	0	16.08	16.36	16.25	16.5	0
3	QPSK	8	4	16.05	16.37	16.21		
3	QPSK	8	7	16.03	16.33	16.18		
3	QPSK	15	0	16.01	16.36	16.22		
3	16QAM	1	0	16.35	16.41	16.48	16.5	0
3	16QAM	1	8	16.29	16.42	16.48		
3	16QAM	1	14	16.26	16.21	16.37		
3	16QAM	8	0	15.10	15.38	15.27	16.5	0
3	16QAM	8	4	15.07	15.41	15.30		
3	16QAM	8	7	15.03	15.36	15.22		
3	16QAM	15	0	15.05	15.36	15.26		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	15.99	16.19	16.08	16.5	0
1.4	QPSK	1	3	15.99	16.34	16.20		
1.4	QPSK	1	5	15.93	16.23	16.12		
1.4	QPSK	3	0	16.01	16.32	16.20		
1.4	QPSK	3	1	16.05	16.36	16.22		
1.4	QPSK	3	3	16.01	16.32	16.20		
1.4	QPSK	6	0	16.00	16.33	16.19	16.5	0
1.4	16QAM	1	0	16.29	16.28	16.45	16.5	0
1.4	16QAM	1	3	16.32	16.26	16.45		
1.4	16QAM	1	5	16.26	16.28	16.46		
1.4	16QAM	3	0	16.03	16.35	16.20		
1.4	16QAM	3	1	16.10	16.40	16.27		
1.4	16QAM	3	3	16.01	16.33	16.16		
1.4	16QAM	6	0	15.08	15.40	15.32	16.5	0

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	15.34	15.40	15.42	16.5	0
20	QPSK	1	49	16.05	15.94	15.88		
20	QPSK	1	99	15.45	15.72	15.78		
20	QPSK	50	0	15.79	15.78	15.92	16.5	0
20	QPSK	50	24	15.68	15.76	15.90		
20	QPSK	50	50	15.64	15.71	15.88		
20	QPSK	100	0	15.73	15.75	15.81		
20	16QAM	1	0	15.73	15.66	15.83	16.5	0
20	16QAM	1	49	15.69	15.96	16.08		
20	16QAM	1	99	15.72	15.83	15.98		
20	16QAM	50	0	15.24	15.33	15.41	16.5	0
20	16QAM	50	24	15.27	15.28	15.47		
20	16QAM	50	50	15.18	15.24	15.50		
20	16QAM	100	0	15.24	15.28	15.37		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	15.22	15.38	15.33	16.5	0
15	QPSK	1	37	15.40	15.81	15.84		
15	QPSK	1	74	15.59	15.69	15.91		
15	QPSK	36	0	15.82	15.83	15.93	16.5	0
15	QPSK	36	20	15.79	15.87	16.01		
15	QPSK	36	39	15.77	15.75	15.91		
15	QPSK	75	0	15.74	15.79	15.99		
15	16QAM	1	0	15.96	15.77	16.16	16.5	0
15	16QAM	1	37	15.48	15.85	15.99		
15	16QAM	1	74	15.66	15.94	16.09		
15	16QAM	36	0	15.38	15.38	15.44	16.5	0
15	16QAM	36	20	15.28	15.35	15.55		
15	16QAM	36	39	15.18	15.27	15.41		
15	16QAM	75	0	15.30	15.31	15.44		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	15.27	15.32	15.38	16.5	0
10	QPSK	1	25	15.83	15.96	16.16		
10	QPSK	1	49	16.17	16.21	16.50		
10	QPSK	25	0	15.85	15.86	16.15	16.5	0
10	QPSK	25	12	15.82	15.85	16.16		
10	QPSK	25	25	15.93	16.04	16.15		
10	QPSK	50	0	15.85	15.95	16.19		
10	16QAM	1	0	16.27	16.31	16.34	16.5	0
10	16QAM	1	25	15.79	15.99	16.26		
10	16QAM	1	49	16.25	16.49	16.42		
10	16QAM	25	0	15.30	15.40	15.60	16.5	0
10	16QAM	25	12	15.34	15.41	15.65		
10	16QAM	25	25	15.39	15.53	15.67		
10	16QAM	50	0	15.41	15.47	15.70		

Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	16.24	15.35	15.44	16.5	0
5	QPSK	1	12	15.70	15.88	16.05		
5	QPSK	1	24	15.80	15.88	16.07		
5	QPSK	12	0	15.82	15.89	16.09	16.5	0
5	QPSK	12	7	15.72	15.85	16.08		
5	QPSK	12	13	15.76	15.87	16.05		
5	QPSK	25	0	15.72	15.88	16.10		
5	16QAM	1	0	16.11	16.30	16.45	16.5	0
5	16QAM	1	12	15.86	16.08	16.27		
5	16QAM	1	24	16.03	16.16	16.30		
5	16QAM	12	0	15.30	15.41	15.63	16.5	0
5	16QAM	12	7	15.29	15.38	15.61		
5	16QAM	12	13	15.28	15.33	15.59		
5	16QAM	25	0	15.25	15.38	15.57		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	15.39	15.54	15.34	16.5	0
3	QPSK	1	8	15.74	15.89	16.11		
3	QPSK	1	14	15.64	15.89	16.07		
3	QPSK	8	0	15.76	15.90	16.13	16.5	0
3	QPSK	8	4	15.75	15.88	16.10		
3	QPSK	8	7	15.72	15.86	16.11		
3	QPSK	15	0	15.69	15.87	16.10		
3	16QAM	1	0	16.03	15.90	16.42	16.5	0
3	16QAM	1	8	15.96	16.07	16.29		
3	16QAM	1	14	15.88	15.98	16.37		
3	16QAM	8	0	15.32	15.36	15.64	16.5	0
3	16QAM	8	4	15.33	15.45	15.69		
3	16QAM	8	7	15.25	15.41	15.64		
3	16QAM	15	0	15.27	15.42	15.65		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	15.37	15.49	15.31	16.5	0
1.4	QPSK	1	3	15.71	15.78	16.08		
1.4	QPSK	1	5	15.65	15.80	16.06		
1.4	QPSK	3	0	15.73	15.84	16.10		
1.4	QPSK	3	1	15.74	15.88	16.10		
1.4	QPSK	3	3	15.71	15.84	16.09		
1.4	QPSK	6	0	15.72	15.83	16.09	16.5	0
1.4	16QAM	1	0	15.97	16.16	16.34	16.5	0
1.4	16QAM	1	3	16.05	16.05	16.41		
1.4	16QAM	1	5	15.90	16.19	16.27		
1.4	16QAM	3	0	15.74	15.85	16.12		
1.4	16QAM	3	1	15.81	15.86	16.10		
1.4	16QAM	3	3	15.71	15.86	16.05		
1.4	16QAM	6	0	15.30	15.51	15.72	16.5	0

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.42	22.54	22.60	23.5	0
10	QPSK	1	25	22.67	22.70	22.73		
10	QPSK	1	49	22.91	23.10	23.02		
10	QPSK	25	0	21.67	21.68	21.88	22.5	1
10	QPSK	25	12	21.65	21.78	21.82		
10	QPSK	25	25	21.75	21.89	21.84		
10	QPSK	50	0	21.66	21.83	21.90		
10	16QAM	1	0	21.95	22.02	22.20	22.5	1
10	16QAM	1	25	21.81	21.98	22.03		
10	16QAM	1	49	22.13	22.34	22.26		
10	16QAM	25	0	20.62	20.68	20.89	21.5	2
10	16QAM	25	12	20.66	20.79	20.79		
10	16QAM	25	25	20.79	20.82	20.82		
10	16QAM	50	0	20.67	20.84	20.93		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.24	22.42	22.39	23.5	0
5	QPSK	1	12	22.74	22.74	22.71		
5	QPSK	1	24	22.70	22.77	22.67		
5	QPSK	12	0	21.66	21.75	21.81	22.5	1
5	QPSK	12	7	21.66	21.80	21.74		
5	QPSK	12	13	21.59	21.76	21.77		
5	QPSK	25	0	21.69	21.77	21.75		
5	16QAM	1	0	21.93	22.08	22.03	22.5	1
5	16QAM	1	12	21.81	22.09	21.93		
5	16QAM	1	24	22.07	22.06	22.01		
5	16QAM	12	0	20.67	20.77	20.81	21.5	2
5	16QAM	12	7	20.68	20.80	20.75		
5	16QAM	12	13	20.61	20.76	20.76		
5	16QAM	25	0	20.69	20.78	20.75		
Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.16	22.31	22.31	23.5	0
3	QPSK	1	8	22.62	22.75	22.72		
3	QPSK	1	14	22.59	22.62	22.60		
3	QPSK	8	0	21.60	21.67	21.68	22.5	1
3	QPSK	8	4	21.59	21.76	21.79		
3	QPSK	8	7	21.60	21.71	21.74		
3	QPSK	15	0	21.62	21.76	21.74		
3	16QAM	1	0	21.82	22.01	21.97	22.5	1
3	16QAM	1	8	22.19	22.05	22.05		
3	16QAM	1	14	21.93	21.92	22.02		
3	16QAM	8	0	20.68	20.71	20.74	21.5	2
3	16QAM	8	4	20.70	20.82	20.80		
3	16QAM	8	7	20.64	20.77	20.77		
3	16QAM	15	0	20.58	20.78	20.78		

Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.19	22.22	22.33	23.5	0
1.4	QPSK	1	3	22.64	22.76	22.77		
1.4	QPSK	1	5	22.56	22.76	22.66		
1.4	QPSK	3	0	22.64	22.61	22.69		
1.4	QPSK	3	1	22.59	22.78	22.72		
1.4	QPSK	3	3	22.62	22.72	22.68		
1.4	QPSK	6	0	21.64	21.76	21.72	22.5	1
1.4	16QAM	1	0	21.86	22.06	22.08	22.5	1
1.4	16QAM	1	3	21.85	22.06	22.05		
1.4	16QAM	1	5	21.86	21.96	21.96		
1.4	16QAM	3	0	21.61	21.71	21.72		
1.4	16QAM	3	1	21.70	21.83	21.78		
1.4	16QAM	3	3	21.62	21.78	21.74		
1.4	16QAM	6	0	20.70	20.81	20.77	21.5	2

<LTE Band 30>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				27710				
Frequency (MHz)				2310				
10	QPSK	1	0	17.77			18	0
10	QPSK	1	25	17.55				
10	QPSK	1	49	17.64				
10	QPSK	25	0	16.66			17	1
10	QPSK	25	12	16.65				
10	QPSK	25	25	16.52				
10	QPSK	50	0	16.68				
10	16QAM	1	0	17.00			17	1
10	16QAM	1	25	16.90				
10	16QAM	1	49	17.00				
10	16QAM	25	0	15.62			16	2
10	16QAM	25	12	15.63				
10	16QAM	25	25	15.54				
10	16QAM	50	0	15.73				
Channel				27685	27710	27735	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2307.5	2310	2312.5		
5	QPSK	1	0	17.75	17.65	17.62	18	0
5	QPSK	1	12	17.76	17.73	17.64		
5	QPSK	1	24	17.71	17.73	17.60		
5	QPSK	12	0	16.90	16.84	16.89	17	1
5	QPSK	12	7	16.83	16.83	16.75		
5	QPSK	12	13	16.80	16.70	16.64		
5	QPSK	25	0	16.89	16.78	16.78		
5	16QAM	1	0	16.95	16.88	16.83	17	1
5	16QAM	1	12	16.97	16.76	16.94		
5	16QAM	1	24	16.77	16.73	16.90		
5	16QAM	12	0	15.90	15.89	15.92	16	2
5	16QAM	12	7	15.85	15.86	15.84		
5	16QAM	12	13	15.83	15.73	15.67		
5	16QAM	25	0	15.91	15.75	15.84		

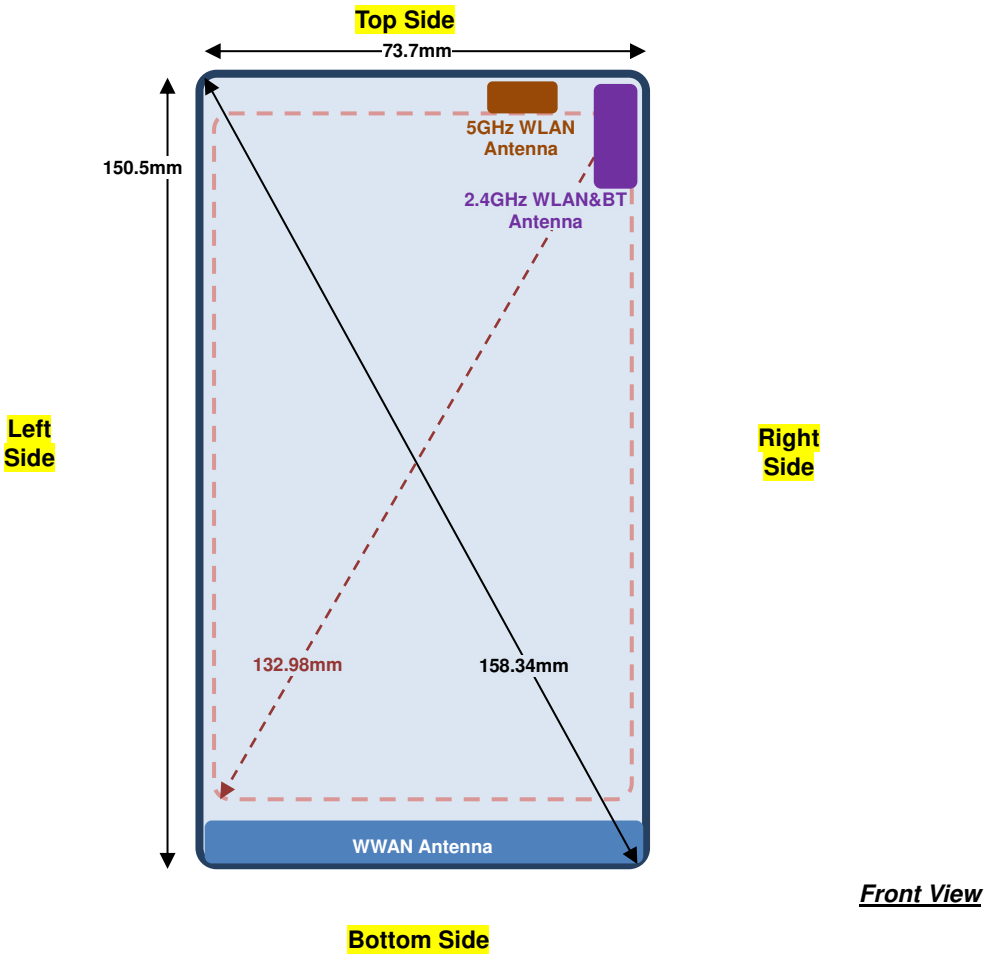
<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	15.64	15.70	15.76	17.5	0
20	QPSK	1	49	16.00	15.92	15.82		
20	QPSK	1	99	16.13	16.08	16.17		
20	QPSK	50	0	15.66	15.83	15.92	17.5	0
20	QPSK	50	24	15.80	15.94	15.93		
20	QPSK	50	50	15.69	15.87	15.86		
20	QPSK	100	0	15.71	15.82	15.93		
20	16QAM	1	0	15.73	15.88	16.00	17.5	0
20	16QAM	1	49	15.87	16.03	16.20		
20	16QAM	1	99	16.28	16.24	16.44		
20	16QAM	50	0	14.69	14.79	14.90	16.5	1
20	16QAM	50	24	14.76	14.88	14.89		
20	16QAM	50	50	14.76	14.92	14.91		
20	16QAM	100	0	14.76	14.85	14.94		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	15.82	15.63	15.74	17.5	0
15	QPSK	1	37	15.81	15.70	15.78		
15	QPSK	1	74	15.98	15.88	15.96		
15	QPSK	36	0	15.84	15.88	15.98	17.5	0
15	QPSK	36	20	15.77	15.90	15.92		
15	QPSK	36	39	15.75	15.75	15.91		
15	QPSK	75	0	15.76	15.89	15.94		
15	16QAM	1	0	16.16	16.22	16.41	17.5	0
15	16QAM	1	37	15.78	15.84	16.19		
15	16QAM	1	74	15.90	16.03	16.30		
15	16QAM	36	0	14.74	14.88	14.98	16.5	1
15	16QAM	36	20	14.75	14.81	14.94		
15	16QAM	36	39	14.71	14.71	14.88		
15	16QAM	75	0	14.74	14.84	14.90		
Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	15.63	15.62	15.66	17.5	0
10	QPSK	1	25	15.65	15.87	15.86		
10	QPSK	1	49	16.23	16.26	16.28		
10	QPSK	25	0	15.72	15.76	15.85	17.5	0
10	QPSK	25	12	15.77	15.91	15.92		
10	QPSK	25	25	15.91	15.94	16.02		
10	QPSK	50	0	15.69	15.90	15.90		
10	16QAM	1	0	15.50	15.54	15.68	17.5	0
10	16QAM	1	25	15.86	16.07	16.17		
10	16QAM	1	49	16.28	16.55	16.59		
10	16QAM	25	0	14.71	14.78	14.92	16.5	1
10	16QAM	25	12	14.74	14.94	14.95		
10	16QAM	25	25	14.88	14.91	15.00		
10	16QAM	50	0	14.75	14.88	14.96		

Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	15.63	15.61	15.64	17.5	0
5	QPSK	1	12	15.64	15.82	15.86		
5	QPSK	1	24	15.66	15.83	15.84		
5	QPSK	12	0	15.73	15.95	16.04	17.5	0
5	QPSK	12	7	15.66	15.86	15.92		
5	QPSK	12	13	15.69	15.85	15.87		
5	QPSK	25	0	15.69	15.89	15.96		
5	16QAM	1	0	16.05	16.18	16.44	17.5	0
5	16QAM	1	12	15.80	16.12	16.17		
5	16QAM	1	24	15.86	16.07	16.12		
5	16QAM	12	0	14.71	14.94	15.06	16.5	1
5	16QAM	12	7	14.66	14.89	14.95		
5	16QAM	12	13	14.70	14.82	14.91		
5	16QAM	25	0	14.71	14.90	14.95		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	15.66	15.68	15.62	17.5	0
3	QPSK	1	8	15.69	15.89	15.94		
3	QPSK	1	14	15.66	15.84	15.86		
3	QPSK	8	0	15.74	15.92	15.95	17.5	0
3	QPSK	8	4	15.68	15.91	15.96		
3	QPSK	8	7	15.65	15.89	15.91		
3	QPSK	15	0	15.65	15.87	15.92		
3	16QAM	1	0	15.99	16.14	16.37	17.5	0
3	16QAM	1	8	15.80	16.15	16.22		
3	16QAM	1	14	15.99	16.01	16.13		
3	16QAM	8	0	14.78	14.93	15.03	16.5	1
3	16QAM	8	4	14.77	14.92	15.04		
3	16QAM	8	7	14.69	14.89	14.96		
3	16QAM	15	0	14.67	14.86	14.97		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	15.62	15.63	15.60	17.5	0
1.4	QPSK	1	3	15.67	15.85	15.95		
1.4	QPSK	1	5	15.56	15.79	15.84		
1.4	QPSK	3	0	15.66	15.88	15.94		
1.4	QPSK	3	1	15.71	15.89	15.97		
1.4	QPSK	3	3	15.67	15.87	15.90		
1.4	QPSK	6	0	15.66	15.86	15.91	17.5	0
1.4	16QAM	1	0	15.89	16.13	16.18	17.5	0
1.4	16QAM	1	3	15.93	16.22	16.20		
1.4	16QAM	1	5	15.80	16.09	16.15		
1.4	16QAM	3	0	15.72	15.90	15.97		
1.4	16QAM	3	1	15.69	15.95	15.98		
1.4	16QAM	3	3	15.69	15.86	15.93		
1.4	16QAM	6	0	14.75	14.95	14.99	16.5	1

13. Antenna Location

<Mobile Phone>



Front View

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	≤ 25mm
BT&WLAN	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	Yes	Yes	No	Yes	Yes	Yes
BT&WLAN	Yes	Yes	Yes	No	Yes	No

General Note:

1. Referring to KDB 941225 D06 v02r01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.

14. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. Pre KDB648474 D04v01r03, when the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.
5. While operating in near to body exposure condition by end user, the device will limit different maximum output powers on the GSM1900, WCDMA B2 / B4 / B5 and LTE B2 / B4 / B5 / B30 / B66 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
6. While operating in body-adjacent exposure configuration during a mobile hotspot session, the device will reduced output powers on the GSM1900, WCDMA B2 / B4 / B5 and LTE B2 / B4 / B5 / B30 / B66 transmitter and detail descriptions of the power reduction mechanism are included in the operational description.
7. The device utilizes independent power reduction mechanisms for SAR compliance for the WLAN transmitter for held-to-ear, near to body and hotspot exposure conditions and detail descriptions of the power reduction mechanism are included in the operational description.

UMTS Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, 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.

14.1 Head SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Right Cheek	0mm	9400	1880	23.19	24.00	1.205	0.02	0.391	0.471
	WCDMA II	RMC 12.2Kbps	Right Tilted	0mm	9400	1950	23.19	24.00	1.205	0.06	0.219	0.264
01	WCDMA II	RMC 12.2Kbps	Left Cheek	0mm	9400	1880	23.19	24.00	1.205	0.05	0.393	0.474
	WCDMA II	RMC 12.2Kbps	Left Tilted	0mm	9400	1880	23.19	24.00	1.205	0.12	0.234	0.282
	WCDMA IV	RMC 12.2Kbps	Right Cheek	0mm	1513	1752.6	23.44	24.00	1.138	0.01	0.391	0.445
	WCDMA IV	RMC 12.2Kbps	Right Tilted	0mm	1513	1752.6	23.44	24.00	1.138	-0.14	0.314	0.357
02	WCDMA IV	RMC 12.2Kbps	Left Cheek	0mm	1513	1752.6	23.44	24.00	1.138	0.06	0.597	0.679
	WCDMA IV	RMC 12.2Kbps	Left Tilted	0mm	1513	1752.6	23.44	24.00	1.138	0.12	0.297	0.338
03	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	4233	846.6	22.72	24.00	1.343	-0.02	0.508	0.682
	WCDMA V	RMC 12.2Kbps	Right Tilted	0mm	4233	846.6	22.72	24.00	1.343	0.07	0.227	0.305
	WCDMA V	RMC 12.2Kbps	Left Cheek	0mm	4233	846.6	22.72	24.00	1.343	-0.16	0.467	0.627
	WCDMA V	RMC 12.2Kbps	Left Tilted	0mm	4233	846.6	22.72	24.00	1.343	0.06	0.225	0.302

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	49	Right Cheek	0mm	18900	1880	23.10	24.00	1.230	0.1	0.331	0.407
	LTE Band 2	20M	QPSK	50	0	Right Cheek	0mm	18900	1880	22.15	23.00	1.216	0	0.188	0.229
	LTE Band 2	20M	QPSK	1	49	Right Tilted	0mm	18900	1880	23.10	24.00	1.230	-0.15	0.320	0.394
	LTE Band 2	20M	QPSK	50	0	Right Tilted	0mm	18900	1880	22.15	23.00	1.216	0.18	0.089	0.108
04	LTE Band 2	20M	QPSK	1	49	Left Cheek	0mm	18900	1880	23.10	24.00	1.230	-0.05	0.368	0.453
	LTE Band 2	20M	QPSK	50	0	Left Cheek	0mm	18900	1880	22.15	23.00	1.216	0.06	0.171	0.208
	LTE Band 2	20M	QPSK	1	49	Left Tilted	0mm	18900	1880	23.10	24.00	1.230	0.04	0.228	0.281
	LTE Band 2	20M	QPSK	50	0	Left Tilted	0mm	18900	1880	22.15	23.00	1.216	-0.19	0.113	0.137
	LTE Band 4	20M	QPSK	1	49	Right Cheek	0mm	20175	1732.5	22.95	24.00	1.274	-0.12	0.361	0.460
	LTE Band 4	20M	QPSK	50	24	Right Cheek	0mm	20175	1732.5	21.83	23.00	1.309	0.11	0.194	0.254
	LTE Band 4	20M	QPSK	1	49	Right Tilted	0mm	20175	1732.5	22.95	24.00	1.274	0.05	0.297	0.378
	LTE Band 4	20M	QPSK	50	24	Right Tilted	0mm	20175	1732.5	21.83	23.00	1.309	0.09	0.198	0.259
05	LTE Band 4	20M	QPSK	1	49	Left Cheek	0mm	20175	1732.5	22.95	24.00	1.274	-0.04	0.518	0.660
	LTE Band 4	20M	QPSK	50	24	Left Cheek	0mm	20175	1732.5	21.83	23.00	1.309	0.05	0.256	0.335
	LTE Band 4	20M	QPSK	1	49	Left Tilted	0mm	20175	1732.5	22.95	24.00	1.274	-0.12	0.251	0.320
	LTE Band 4	20M	QPSK	50	24	Left Tilted	0mm	20175	1732.5	21.83	23.00	1.309	0.04	0.181	0.237

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 5	10M	QPSK	1	49	Right Cheek	0mm	20525	836.5	23.10	24.00	1.230	0.02	0.577	0.710
	LTE Band 5	10M	QPSK	25	0	Right Cheek	0mm	20525	836.5	21.72	23.00	1.343	0.07	0.345	0.463
	LTE Band 5	10M	QPSK	50	0	Right Cheek	0mm	20525	836.5	21.83	23.00	1.309	-0.07	0.335	0.439
	LTE Band 5	10M	QPSK	1	49	Right Tilted	0mm	20525	836.5	23.10	24.00	1.230	-0.12	0.404	0.497
	LTE Band 5	10M	QPSK	25	0	Right Tilted	0mm	20525	836.5	21.72	23.00	1.343	0.07	0.192	0.258
06	LTE Band 5	10M	QPSK	1	49	Left Cheek	0mm	20525	836.5	23.10	24.00	1.230	0.15	0.646	0.795
	LTE Band 5	10M	QPSK	25	0	Left Cheek	0mm	20525	836.5	21.72	23.00	1.343	0.11	0.321	0.431
	LTE Band 5	10M	QPSK	1	49	Left Tilted	0mm	20525	836.5	23.10	24.00	1.230	-0.04	0.392	0.482
	LTE Band 5	10M	QPSK	25	0	Left Tilted	0mm	20525	836.5	21.72	23.00	1.343	0.08	0.194	0.260
	LTE Band 14	10M	QPSK	1	49	Right Cheek	0mm	23330	793	22.82	24.00	1.312	0.13	0.501	0.657
	LTE Band 14	10M	QPSK	25	0	Right Cheek	0mm	23330	793	21.67	23.00	1.358	-0.06	0.280	0.380
	LTE Band 14	10M	QPSK	1	49	Right Tilted	0mm	23330	793	22.82	24.00	1.312	0.09	0.263	0.345
	LTE Band 14	10M	QPSK	25	0	Right Tilted	0mm	23330	793	21.67	23.00	1.358	0.17	0.149	0.202
07	LTE Band 14	10M	QPSK	1	49	Left Cheek	0mm	23330	793	22.82	24.00	1.312	0.1	0.523	0.686
	LTE Band 14	10M	QPSK	25	0	Left Cheek	0mm	23330	793	21.67	23.00	1.358	0.12	0.263	0.357
	LTE Band 14	10M	QPSK	1	49	Left Tilted	0mm	23330	793	22.82	24.00	1.312	0.02	0.278	0.365
	LTE Band 14	10M	QPSK	25	0	Left Tilted	0mm	23330	793	21.67	23.00	1.358	-0.01	0.150	0.204
08	LTE Band 30	10M	QPSK	1	49	Right Cheek	0mm	27710	2310	22.77	24.00	1.327	-0.16	0.400	0.531
	LTE Band 30	10M	QPSK	25	0	Right Cheek	0mm	27710	2310	21.73	23.00	1.340	-0.03	0.265	0.355
	LTE Band 30	10M	QPSK	1	49	Right Tilted	0mm	27710	2310	22.77	24.00	1.327	0.1	0.111	0.147
	LTE Band 30	10M	QPSK	25	0	Right Tilted	0mm	27710	2310	21.73	23.00	1.340	0.09	0.072	0.096
	LTE Band 30	10M	QPSK	1	49	Left Cheek	0mm	27710	2310	22.77	24.00	1.327	-0.04	0.269	0.357
	LTE Band 30	10M	QPSK	25	0	Left Cheek	0mm	27710	2310	21.73	23.00	1.340	0.11	0.166	0.222
	LTE Band 30	10M	QPSK	1	49	Left Tilted	0mm	27710	2310	22.77	24.00	1.327	0.1	0.196	0.260
	LTE Band 30	10M	QPSK	25	0	Left Tilted	0mm	27710	2310	21.73	23.00	1.340	0.15	0.123	0.165
	LTE Band 66	20M	QPSK	1	99	Right Cheek	0mm	132572	1770	23.34	24.00	1.164	0.04	0.283	0.329
	LTE Band 66	20M	QPSK	50	24	Right Cheek	0mm	132572	1770	21.89	23.00	1.291	0.06	0.163	0.210
	LTE Band 66	20M	QPSK	1	99	Right Tilted	0mm	132572	1770	23.34	24.00	1.164	-0.19	0.135	0.157
	LTE Band 66	20M	QPSK	50	24	Right Tilted	0mm	132572	1770	21.89	23.00	1.291	0.07	0.162	0.209
09	LTE Band 66	20M	QPSK	1	99	Left Cheek	0mm	132572	1770	23.34	24.00	1.164	0.19	0.377	0.439
	LTE Band 66	20M	QPSK	50	24	Left Cheek	0mm	132572	1770	21.89	23.00	1.291	0.12	0.234	0.302
	LTE Band 66	20M	QPSK	1	99	Left Tilted	0mm	132572	1770	23.34	24.00	1.164	-0.02	0.102	0.119
	LTE Band 66	20M	QPSK	50	24	Left Tilted	0mm	132572	1770	21.89	23.00	1.291	0.19	0.143	0.185

14.2 Hotspot SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	5mm	ON	9400	1880	16.36	17.00	1.159	0.02	0.620	0.718
	WCDMA II	RMC 12.2Kbps	Back	5mm	ON	9400	1880	16.36	17.00	1.159	-0.19	1.150	1.333
10	WCDMA II	RMC 12.2Kbps	Back	5mm	ON	9262	1852.4	16.00	17.00	1.259	-0.19	1.120	1.410
	WCDMA II	RMC 12.2Kbps	Back	5mm	ON	9538	1907.6	16.13	17.00	1.222	-0.18	1.150	1.405
	WCDMA II	RMC 12.2Kbps	Left Side	5mm	ON	9400	1880	16.36	17.00	1.159	-0.02	0.111	0.129
	WCDMA II	RMC 12.2Kbps	Right Side	5mm	ON	9400	1880	16.36	17.00	1.159	-0.01	0.117	0.136
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	ON	9400	1880	16.36	17.00	1.159	0.06	1.100	1.275
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	ON	9262	1852.4	16.00	17.00	1.259	0.05	1.100	1.385
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	ON	9538	1907.6	16.13	17.00	1.222	0.05	1.030	1.258
	WCDMA IV	RMC 12.2Kbps	Front	5mm	ON	1513	1752.6	15.50	15.50	1.000	0.02	0.491	0.491
	WCDMA IV	RMC 12.2Kbps	Back	5mm	ON	1513	1752.6	15.50	15.50	1.000	-0.11	0.761	0.761
	WCDMA IV	RMC 12.2Kbps	Left Side	5mm	ON	1513	1752.6	15.50	15.50	1.000	0.11	0.091	0.091
	WCDMA IV	RMC 12.2Kbps	Right Side	5mm	ON	1513	1752.6	15.50	15.50	1.000	0.16	0.051	0.051
	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	ON	1513	1752.6	15.50	15.50	1.000	0.1	0.916	0.916
11	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	ON	1312	1712.4	14.78	15.50	1.180	0.12	0.878	1.036
	WCDMA IV	RMC 12.2Kbps	Bottom Side	5mm	ON	1413	1732.6	15.13	15.50	1.089	0.13	0.896	0.976
	WCDMA V	RMC 12.2Kbps	Front	5mm	ON	4233	846.6	21.85	22.50	1.161	-0.12	0.723	0.840
	WCDMA V	RMC 12.2Kbps	Front	5mm	ON	4132	826.4	21.74	22.50	1.191	0.01	0.612	0.729
	WCDMA V	RMC 12.2Kbps	Front	5mm	ON	4182	836.4	21.70	22.50	1.202	-0.03	0.630	0.757
12	WCDMA V	RMC 12.2Kbps	Back	5mm	ON	4233	846.6	21.85	22.50	1.161	-0.14	0.970	1.127
	WCDMA V	RMC 12.2Kbps	Back	5mm	ON	4132	826.4	21.74	22.50	1.191	0.02	0.789	0.940
	WCDMA V	RMC 12.2Kbps	Back	5mm	ON	4182	836.4	21.70	22.50	1.202	-0.06	0.835	1.004
	WCDMA V	RMC 12.2Kbps	Left Side	5mm	ON	4233	846.6	21.85	22.50	1.161	0.04	0.680	0.790
	WCDMA V	RMC 12.2Kbps	Right Side	5mm	ON	4233	846.6	21.85	22.50	1.161	0.02	0.855	0.993
	WCDMA V	RMC 12.2Kbps	Right Side	5mm	ON	4132	826.4	21.74	22.50	1.191	0.04	0.924	1.101
	WCDMA V	RMC 12.2Kbps	Right Side	5mm	ON	4182	836.4	21.70	22.50	1.202	-0.06	0.864	1.039
	WCDMA V	RMC 12.2Kbps	Bottom Side	5mm	ON	4233	846.6	21.85	22.50	1.161	0.15	0.225	0.261

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	5mm	ON	19100	1900	16.49	16.50	1.002	0.02	0.633	0.634
	LTE Band 2	20M	QPSK	50	0	Front	5mm	ON	19100	1900	16.32	16.50	1.042	-0.01	0.556	0.580
	LTE Band 2	20M	QPSK	1	0	Back	5mm	ON	19100	1900	16.49	16.50	1.002	-0.09	1.180	1.183
13	LTE Band 2	20M	QPSK	1	0	Back	5mm	ON	18700	1860	16.13	16.50	1.089	-0.03	1.220	1.328
	LTE Band 2	20M	QPSK	1	0	Back	5mm	ON	18900	1880	16.28	16.50	1.052	-0.09	1.200	1.262
	LTE Band 2	20M	QPSK	50	0	Back	5mm	ON	19100	1900	16.32	16.50	1.042	-0.13	1.030	1.074
	LTE Band 2	20M	QPSK	50	0	Back	5mm	ON	18700	1860	16.11	16.50	1.094	-0.11	1.100	1.203
	LTE Band 2	20M	QPSK	50	0	Back	5mm	ON	18900	1880	16.30	16.50	1.047	-0.1	1.090	1.141
	LTE Band 2	20M	QPSK	100	0	Back	5mm	ON	19100	1900	16.29	16.50	1.050	-0.13	0.992	1.041
	LTE Band 2	20M	QPSK	1	0	Left Side	5mm	ON	19100	1900	16.49	16.50	1.002	-0.01	0.119	0.119
	LTE Band 2	20M	QPSK	50	0	Left Side	5mm	ON	19100	1900	16.32	16.50	1.042	0.01	0.102	0.106
	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	ON	19100	1900	16.49	16.50	1.002	-0.12	0.113	0.113
	LTE Band 2	20M	QPSK	50	0	Right Side	5mm	ON	19100	1900	16.32	16.50	1.042	-0.15	0.090	0.094
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	ON	19100	1900	16.49	16.50	1.002	0	1.060	1.062
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	ON	18700	1860	16.13	16.50	1.089	0.04	1.050	1.143
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	ON	18900	1880	16.28	16.50	1.052	0.14	1.010	1.062
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	ON	19100	1900	16.32	16.50	1.042	0.07	0.801	0.835
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	ON	18700	1860	16.11	16.50	1.094	0.02	0.832	0.910
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	ON	18900	1880	16.30	16.50	1.047	-0.04	0.820	0.859
	LTE Band 2	20M	QPSK	100	0	Bottom Side	5mm	ON	19100	1900	16.29	16.50	1.050	-0.11	0.761	0.799
	LTE Band 4	20M	QPSK	1	49	Front	5mm	ON	20175	1732.5	15.94	16.50	1.138	0.01	0.480	0.546
	LTE Band 4	20M	QPSK	50	0	Front	5mm	ON	20175	1732.5	15.78	16.50	1.180	0.08	0.442	0.522
	LTE Band 4	20M	QPSK	1	49	Back	5mm	ON	20175	1732.5	15.94	16.50	1.138	-0.12	0.744	0.846
	LTE Band 4	20M	QPSK	50	0	Back	5mm	ON	20175	1732.5	15.78	16.50	1.180	-0.07	0.644	0.760
	LTE Band 4	20M	QPSK	100	0	Back	5mm	ON	20175	1732.5	15.75	16.50	1.189	-0.08	0.620	0.737
	LTE Band 4	20M	QPSK	1	49	Left Side	5mm	ON	20175	1732.5	15.94	16.50	1.138	0.11	0.089	0.101
	LTE Band 4	20M	QPSK	50	0	Left Side	5mm	ON	20175	1732.5	15.78	16.50	1.180	-0.08	0.089	0.105
	LTE Band 4	20M	QPSK	1	49	Right Side	5mm	ON	20175	1732.5	15.94	16.50	1.138	0.12	0.050	0.057
	LTE Band 4	20M	QPSK	50	0	Right Side	5mm	ON	20175	1732.5	15.78	16.50	1.180	0.02	0.039	0.046
14	LTE Band 4	20M	QPSK	1	49	Bottom Side	5mm	ON	20175	1732.5	15.94	16.50	1.138	-0.19	0.922	1.049
	LTE Band 4	20M	QPSK	50	0	Bottom Side	5mm	ON	20175	1732.5	15.78	16.50	1.180	0.09	0.653	0.771
	LTE Band 4	20M	QPSK	100	0	Bottom Side	5mm	ON	20175	1732.5	15.75	16.50	1.189	0.05	0.616	0.732
	LTE Band 5	10M	QPSK	1	49	Front	5mm	ON	20525	836.5	23.10	23.50	1.096	-0.01	0.746	0.818
	LTE Band 5	10M	QPSK	25	25	Front	5mm	ON	20525	836.5	21.89	22.50	1.151	-0.01	0.378	0.435
	LTE Band 5	10M	QPSK	50	0	Front	5mm	ON	20525	836.5	21.83	22.50	1.167	0	0.371	0.433
	LTE Band 5	10M	QPSK	1	49	Back	5mm	ON	20525	836.5	23.10	23.50	1.096	0.08	0.954	1.046
	LTE Band 5	10M	QPSK	25	25	Back	5mm	ON	20525	836.5	21.89	22.50	1.151	0.04	0.493	0.567
	LTE Band 5	10M	QPSK	50	0	Back	5mm	ON	20525	836.5	21.83	22.50	1.167	0.09	0.483	0.564
	LTE Band 5	10M	QPSK	1	49	Left Side	5mm	ON	20525	836.5	23.10	23.50	1.096	0.11	0.904	0.991
	LTE Band 5	10M	QPSK	25	25	Left Side	5mm	ON	20525	836.5	21.89	22.50	1.151	0.04	0.474	0.545
	LTE Band 5	10M	QPSK	50	0	Left Side	5mm	ON	20525	836.5	21.83	22.50	1.167	0.01	0.471	0.550
15	LTE Band 5	10M	QPSK	1	49	Right Side	5mm	ON	20525	836.5	23.10	23.50	1.096	-0.18	1.050	1.151
	LTE Band 5	10M	QPSK	25	25	Right Side	5mm	ON	20525	836.5	21.89	22.50	1.151	-0.04	0.557	0.641
	LTE Band 5	10M	QPSK	50	0	Right Side	5mm	ON	20525	836.5	21.83	22.50	1.167	-0.08	0.555	0.648
	LTE Band 5	10M	QPSK	1	49	Bottom Side	5mm	ON	20525	836.5	23.10	23.50	1.096	0.06	0.209	0.229
	LTE Band 5	10M	QPSK	25	25	Bottom Side	5mm	ON	20525	836.5	21.89	22.50	1.151	0.06	0.092	0.106

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 14	10M	QPSK	1	49	Front	5mm	OFF	23330	793	22.82	24.00	1.312	0.17	0.565	0.741
	LTE Band 14	10M	QPSK	25	0	Front	5mm	OFF	23330	793	21.67	23.00	1.358	-0.19	0.298	0.405
16	LTE Band 14	10M	QPSK	1	49	Back	5mm	OFF	23330	793	22.82	24.00	1.312	0.17	0.903	1.185
	LTE Band 14	10M	QPSK	25	0	Back	5mm	OFF	23330	793	21.67	23.00	1.358	-0.14	0.461	0.626
	LTE Band 14	10M	QPSK	50	0	Back	5mm	OFF	23330	793	21.62	23.00	1.374	-0.11	0.449	0.617
	LTE Band 14	10M	QPSK	1	49	Left Side	5mm	OFF	23330	793	22.82	24.00	1.312	-0.1	0.789	1.035
	LTE Band 14	10M	QPSK	25	0	Left Side	5mm	OFF	23330	793	21.67	23.00	1.358	-0.1	0.473	0.642
	LTE Band 14	10M	QPSK	50	0	Left Side	5mm	OFF	23330	793	21.62	23.00	1.374	0.02	0.448	0.616
	LTE Band 14	10M	QPSK	1	49	Right Side	5mm	OFF	23330	793	22.82	24.00	1.312	0.14	0.899	1.180
	LTE Band 14	10M	QPSK	25	0	Right Side	5mm	OFF	23330	793	21.67	23.00	1.358	-0.02	0.536	0.728
	LTE Band 14	10M	QPSK	50	0	Right Side	5mm	OFF	23330	793	21.62	23.00	1.374	0.11	0.490	0.673
	LTE Band 14	10M	QPSK	1	49	Bottom Side	5mm	OFF	23330	793	22.82	24.00	1.312	-0.18	0.114	0.150
	LTE Band 14	10M	QPSK	25	0	Bottom Side	5mm	OFF	23330	793	21.67	23.00	1.358	0.14	0.062	0.084
	LTE Band 30	10M	QPSK	1	0	Front	5mm	ON	27710	2310	17.77	18.00	1.054	-0.07	0.552	0.582
	LTE Band 30	10M	QPSK	25	0	Front	5mm	ON	27710	2310	16.66	17.00	1.081	-0.05	0.340	0.368
17	LTE Band 30	10M	QPSK	1	0	Back	5mm	ON	27710	2310	17.77	18.00	1.054	0.09	0.766	0.808
	LTE Band 30	10M	QPSK	25	0	Back	5mm	ON	27710	2310	16.66	17.00	1.081	-0.12	0.479	0.518
	LTE Band 30	10M	QPSK	50	0	Back	5mm	ON	27710	2310	16.68	17.00	1.076	-0.18	0.472	0.508
	LTE Band 30	10M	QPSK	1	0	Left Side	5mm	ON	27710	2310	17.77	18.00	1.054	-0.02	0.064	0.067
	LTE Band 30	10M	QPSK	25	0	Left Side	5mm	ON	27710	2310	16.66	17.00	1.081	-0.14	0.039	0.042
	LTE Band 30	10M	QPSK	1	0	Right Side	5mm	ON	27710	2310	17.77	18.00	1.054	-0.02	0.140	0.148
	LTE Band 30	10M	QPSK	25	0	Right Side	5mm	ON	27710	2310	16.66	17.00	1.081	0.03	0.087	0.094
	LTE Band 30	10M	QPSK	1	0	Bottom Side	5mm	ON	27710	2310	17.77	18.00	1.054	0	0.706	0.744
	LTE Band 30	10M	QPSK	25	0	Bottom Side	5mm	ON	27710	2310	16.66	17.00	1.081	-0.02	0.433	0.468
	LTE Band 66	20M	QPSK	1	99	Front	5mm	ON	132572	1770	16.17	17.50	1.358	0.07	0.500	0.679
	LTE Band 66	20M	QPSK	50	24	Front	5mm	ON	132322	1745	15.94	17.50	1.432	0.06	0.448	0.642
	LTE Band 66	20M	QPSK	1	99	Back	5mm	ON	132572	1770	16.17	17.50	1.358	-0.11	0.775	1.053
	LTE Band 66	20M	QPSK	1	99	Back	5mm	ON	132322	1745	16.13	17.50	1.371	-0.06	0.758	1.039
	LTE Band 66	20M	QPSK	1	99	Back	5mm	ON	132072	1720	16.08	17.50	1.387	-0.07	0.779	1.080
	LTE Band 66	20M	QPSK	50	24	Back	5mm	ON	132322	1745	15.94	17.50	1.432	-0.07	0.652	0.934
	LTE Band 66	20M	QPSK	50	24	Back	5mm	ON	132072	1720	15.80	17.50	1.479	-0.18	0.645	0.954
	LTE Band 66	20M	QPSK	50	24	Back	5mm	ON	132572	1770	15.93	17.50	1.435	-0.05	0.633	0.909
	LTE Band 66	20M	QPSK	100	0	Back	5mm	ON	132572	1770	15.93	17.50	1.435	-0.03	0.646	0.927
	LTE Band 66	20M	QPSK	1	99	Left Side	5mm	ON	132572	1770	16.17	17.50	1.358	0.11	0.093	0.126
	LTE Band 66	20M	QPSK	50	24	Left Side	5mm	ON	132322	1745	15.94	17.50	1.432	-0.08	0.090	0.129
	LTE Band 66	20M	QPSK	1	99	Right Side	5mm	ON	132572	1770	16.17	17.50	1.358	0.16	0.052	0.071
	LTE Band 66	20M	QPSK	50	24	Right Side	5mm	ON	132322	1745	15.94	17.50	1.432	0.06	0.040	0.057
	LTE Band 66	20M	QPSK	1	99	Bottom Side	5mm	ON	132572	1770	16.17	17.50	1.358	0.1	0.763	1.036
	LTE Band 66	20M	QPSK	1	99	Bottom Side	5mm	ON	132072	1720	16.13	17.50	1.371	0.05	0.788	1.080
18	LTE Band 66	20M	QPSK	1	99	Bottom Side	5mm	ON	132322	1745	16.08	17.50	1.387	0.08	0.851	1.180
	LTE Band 66	20M	QPSK	50	24	Bottom Side	5mm	ON	132322	1745	15.94	17.50	1.432	0.09	0.662	0.948
	LTE Band 66	20M	QPSK	50	24	Bottom Side	5mm	ON	132072	1720	15.80	17.50	1.479	0.09	0.657	0.972
	LTE Band 66	20M	QPSK	50	24	Bottom Side	5mm	ON	132572	1770	15.93	17.50	1.435	0.05	0.628	0.901
	LTE Band 66	20M	QPSK	100	0	Bottom Side	5mm	ON	132572	1770	15.93	17.50	1.435	0.05	0.642	0.922

14.3 Body Worn Accessory SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	5mm	-	ON	9400	1880	16.36	17.00	1.159	0.02	0.620	0.718
	WCDMA II	RMC 12.2Kbps	Back	5mm	-	ON	9400	1880	16.36	17.00	1.159	-0.19	1.150	1.333
19	WCDMA II	RMC 12.2Kbps	Back	5mm	-	ON	9262	1852.4	16.00	17.00	1.259	-0.19	1.120	1.410
	WCDMA II	RMC 12.2Kbps	Back	5mm	-	ON	9538	1907.6	16.13	17.00	1.222	-0.18	1.150	1.405
	WCDMA II	RMC 12.2Kbps	Back	5mm	Headset	ON	9262	1852.4	16.00	17.00	1.259	-0.01	1.080	1.360
	WCDMA IV	RMC 12.2Kbps	Front	5mm	-	ON	1513	1752.6	15.50	15.50	1.000	0.02	0.491	0.491
20	WCDMA IV	RMC 12.2Kbps	Back	5mm	-	ON	1513	1752.6	15.50	15.50	1.000	-0.11	0.761	0.761
	WCDMA V	RMC 12.2Kbps	Front	5mm	-	ON	4233	846.6	21.85	22.50	1.161	-0.12	0.723	0.840
	WCDMA V	RMC 12.2Kbps	Front	5mm	-	ON	4132	826.4	21.74	22.50	1.191	0.01	0.612	0.729
	WCDMA V	RMC 12.2Kbps	Front	5mm	-	ON	4182	836.4	21.70	22.50	1.202	-0.03	0.630	0.757
21	WCDMA V	RMC 12.2Kbps	Back	5mm	-	ON	4233	846.6	21.85	22.50	1.161	-0.14	0.970	1.127
	WCDMA V	RMC 12.2Kbps	Back	5mm	-	ON	4132	826.4	21.74	22.50	1.191	0.02	0.789	0.940
	WCDMA V	RMC 12.2Kbps	Back	5mm	-	ON	4182	836.4	21.70	22.50	1.202	-0.06	0.835	1.004

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Headset	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	5mm	-	ON	19100	1900	16.49	16.50	1.002	0.02	0.633	0.634
	LTE Band 2	20M	QPSK	50	0	Front	5mm	-	ON	19100	1900	16.32	16.50	1.042	-0.01	0.556	0.580
	LTE Band 2	20M	QPSK	1	0	Back	5mm	-	ON	19100	1900	16.49	16.50	1.002	-0.09	1.180	1.183
22	LTE Band 2	20M	QPSK	1	0	Back	5mm	-	ON	18700	1860	16.13	16.50	1.089	-0.03	1.220	1.328
	LTE Band 2	20M	QPSK	1	0	Back	5mm	-	ON	18900	1880	16.28	16.50	1.052	-0.09	1.200	1.262
	LTE Band 2	20M	QPSK	50	0	Back	5mm	-	ON	19100	1900	16.32	16.50	1.042	-0.13	1.030	1.074
	LTE Band 2	20M	QPSK	50	0	Back	5mm	-	ON	18700	1860	16.11	16.50	1.094	-0.11	1.100	1.203
	LTE Band 2	20M	QPSK	50	0	Back	5mm	-	ON	18900	1880	16.30	16.50	1.047	-0.1	1.090	1.141
	LTE Band 2	20M	QPSK	100	0	Back	5mm	-	ON	19100	1900	16.29	16.50	1.050	-0.13	0.992	1.041
	LTE Band 2	20M	QPSK	1	0	Back	5mm	Headset	ON	18700	1860	16.13	16.50	1.089	-0.06	1.120	1.220
	LTE Band 4	20M	QPSK	1	49	Front	5mm	-	ON	20175	1732.5	15.94	16.50	1.138	0.01	0.480	0.546
	LTE Band 4	20M	QPSK	50	0	Front	5mm	-	ON	20175	1732.5	15.78	16.50	1.180	0.08	0.442	0.522
23	LTE Band 4	20M	QPSK	1	49	Back	5mm	-	ON	20175	1732.5	15.94	16.50	1.138	-0.12	0.744	0.846
	LTE Band 4	20M	QPSK	50	0	Back	5mm	-	ON	20175	1732.5	15.78	16.50	1.180	-0.07	0.644	0.760
	LTE Band 4	20M	QPSK	100	0	Back	5mm	-	ON	20175	1732.5	15.75	16.50	1.189	-0.08	0.620	0.737

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Headset	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 5	10M	QPSK	1	49	Front	5mm	-	ON	20525	836.5	23.10	23.50	1.096	-0.01	0.746	0.818
	LTE Band 5	10M	QPSK	25	25	Front	5mm	-	ON	20525	836.5	21.89	22.50	1.151	-0.01	0.378	0.435
	LTE Band 5	10M	QPSK	50	0	Front	5mm	-	ON	20525	836.5	21.83	22.50	1.167	0	0.371	0.433
24	LTE Band 5	10M	QPSK	1	49	Back	5mm	-	ON	20525	836.5	23.10	23.50	1.096	0.08	0.954	1.046
	LTE Band 5	10M	QPSK	25	25	Back	5mm	-	ON	20525	836.5	21.89	22.50	1.151	0.04	0.493	0.567
	LTE Band 5	10M	QPSK	50	0	Back	5mm	-	ON	20525	836.5	21.83	22.50	1.167	0.09	0.483	0.564
	LTE Band 14	10M	QPSK	1	49	Front	5mm	-	OFF	23330	793	22.82	24.00	1.312	0.17	0.565	0.741
	LTE Band 14	10M	QPSK	25	0	Front	5mm	-	OFF	23330	793	21.67	23.00	1.358	-0.19	0.298	0.405
25	LTE Band 14	10M	QPSK	1	49	Back	5mm	-	OFF	23330	793	22.82	24.00	1.312	0.17	0.903	1.185
	LTE Band 14	10M	QPSK	25	0	Back	5mm	-	OFF	23330	793	21.67	23.00	1.358	-0.14	0.461	0.626
	LTE Band 14	10M	QPSK	50	0	Back	5mm	-	OFF	23330	793	21.62	23.00	1.374	-0.11	0.449	0.617
	LTE Band 30	10M	QPSK	1	0	Front	5mm	-	ON	27710	2310	17.77	18.00	1.054	-0.07	0.552	0.582
	LTE Band 30	10M	QPSK	25	0	Front	5mm	-	ON	27710	2310	16.66	17.00	1.081	-0.05	0.340	0.368
26	LTE Band 30	10M	QPSK	1	0	Back	5mm	-	ON	27710	2310	17.77	18.00	1.054	0.09	0.766	0.808
	LTE Band 30	10M	QPSK	25	0	Back	5mm	-	ON	27710	2310	16.66	17.00	1.081	-0.12	0.479	0.518
	LTE Band 30	10M	QPSK	50	0	Back	5mm	-	ON	27710	2310	16.68	17.00	1.076	-0.18	0.472	0.508
	LTE Band 66	20M	QPSK	1	99	Front	5mm	-	ON	132572	1770	16.17	17.50	1.358	0.07	0.500	0.679
	LTE Band 66	20M	QPSK	50	24	Front	5mm	-	ON	132322	1745	15.93	17.50	1.435	0.06	0.448	0.643
	LTE Band 66	20M	QPSK	1	99	Back	5mm	-	ON	132572	1770	16.17	17.50	1.358	-0.11	0.775	1.053
	LTE Band 66	20M	QPSK	1	99	Back	5mm	-	ON	132322	1745	16.13	17.50	1.371	-0.06	0.758	1.039
27	LTE Band 66	20M	QPSK	1	99	Back	5mm	-	ON	132072	1720	16.08	17.50	1.387	-0.07	0.779	1.080
	LTE Band 66	20M	QPSK	50	24	Back	5mm	-	ON	132322	1745	15.94	17.50	1.432	-0.07	0.652	0.934
	LTE Band 66	20M	QPSK	50	24	Back	5mm	-	ON	132072	1720	15.80	17.50	1.479	-0.18	0.645	0.954
	LTE Band 66	20M	QPSK	50	24	Back	5mm	-	ON	132572	1770	15.93	17.50	1.435	-0.05	0.633	0.909
	LTE Band 66	20M	QPSK	100	0	Back	5mm	-	ON	132572	1770	15.93	17.50	1.435	-0.03	0.646	0.927

14.4 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 2	20M	QPSK	1	0	Back	5mm	ON	18700	1860	16.13	16.50	1.089	-0.03	1.220		1.328
2nd	LTE Band 2	20M	QPSK	1	0	Back	5mm	ON	18700	1860	16.13	16.50	1.089	-0.05	1.150	1.06	1.252
1st	LTE Band 4	20M	QPSK	1	49	Bottom Side	5mm	ON	20175	1732.5	15.94	16.50	1.138	-0.19	0.922		1.049
2nd	LTE Band 4	20M	QPSK	1	49	Bottom Side	5mm	ON	20175	1732.5	15.94	16.50	1.138	-0.02	0.898	1.03	1.022
1st	LTE Band 5	10M	QPSK	1	49	Right Side	5mm	ON	20525	836.5	23.10	23.50	1.096	-0.18	1.050		1.151
2nd	LTE Band 5	10M	QPSK	1	49	Right Side	5mm	ON	20525	836.5	23.10	23.50	1.096	0.08	0.984	1.07	1.079
1st	LTE Band 14	10M	QPSK	1	49	Back	5mm	OFF	23330	793	22.82	24.00	1.312	0.17	0.903		1.185
2nd	LTE Band 14	10M	QPSK	1	49	Back	5mm	OFF	23330	793	22.82	24.00	1.312	-0.12	0.881	1.03	1.156

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

14.5 Spot Check Verification Data

<Head Exposure Condition>

Band	Mode	Test Position	Antenna	Ch.	Freq. (MHz)	Original Model					Spot Check Mode					Deviation
						Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
GSM850	GPRS (4 Tx slots)	Left Cheek		251	848.8	26.34	27.50		0.366	0.478	26.33	27.50		0.355	0.465	-2.8%
GSM1900	GPRS (4 Tx slots)	Left Cheek		661	1880	24.27	25.00		0.220	0.260	24.14	25.00		0.181	0.221	-15.2%
LTE Band 12	10M_QPSK_1_49	Left Cheek		23095	707.5	23.07	24.00		0.288	0.357	23.07	24.00		0.309	0.383	7.3%
LTE Band 17	10M_QPSK_1_49	Left Cheek		23790	710	23.07	24.00		0.261	0.391	22.99	24.00		0.305	0.385	-1.6%
WLAN2.4GHz	802.11b 1Mbps	Left Cheek	Ant 1	1	2412	18.49	18.50	97.62	1.31	1.345	18.45	18.50	97.62	1.270	1.316	-2.2%
WLAN5GHz	802.11a 6Mbps	Left Cheek	Ant 1	52	5260	13.98	14.00	86.26	0.719	0.837	13.98	14.00	86.26	0.794	0.924	10.4%
WLAN5GHz	802.11a 6Mbps	Left Cheek	Ant 1	165	5825	13.76	14.00	86.26	1.16	1.420	13.76	14.00	86.26	1.160	1.420	0.0%
WLAN5GHz	802.11a 6Mbps	Left Cheek	Ant 1	144	5720	13.96	14.00	86.26	1.090	1.274	13.96	14.00	86.26	1.110	1.298	1.9%

<Hotspot Exposure Condition>

Band	Mode	Test Position	Antenna	Ch.	Freq. (MHz)	Original Model					Spot Check Mode					Deviation
						Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
GSM850	GPRS (4 Tx slots)	Back		251	848.8	26.34	27.5		0.910	1.189	26.33	27.50		0.760	0.995	-16.3%
GSM1900	GPRS (4 Tx slots)	Back		661	1880	19.34	19.50		0.689	0.715	19.39	19.50		0.700	0.718	0.4%
LTE Band 12	10M_QPSK_1_49	Back		23095	707.5	23.07	24.00		0.625	0.774	22.83	24.00		0.643	0.842	8.7%
LTE Band 17	10M_QPSK_1_49	Back		23790	710	23.07	24.00		0.647	0.802	22.99	24.00		0.681	0.859	7.2%
WLAN2.4GHz	802.11b 1Mbps	Back	Ant 1	1	2412	18.49	18.50	97.62	0.960	0.985	18.49	18.50	97.62	0.956	0.981	-0.4%
WLAN5GHz	802.11a 6Mbps	Top Side	Ant 1	149	5745	14.44	14.50	86.26	1.160	1.363	14.44	14.50	86.26	0.956	1.123	-17.6%

<Body-worn Exposure Condition>

Band	Mode	Test Position	Antenna	Ch.	Freq. (MHz)	Original Model					Spot Check Mode					Deviation
						Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
GSM850	GPRS (4 Tx slots)	Back		251	848.8	26.34	27.5		0.910	1.189	26.33	27.50		0.760	0.995	-16.3%
GSM1900	GPRS (4 Tx slots)	Back		661	1880	19.34	19.50		0.689	0.715	19.39	19.50		0.700	0.718	0.4%
LTE Band 12	10M_QPSK_1_49	Back		23095	707.5	23.07	24.00		0.625	0.774	22.83	24.00		0.643	0.842	8.7%
LTE Band 17	10M_QPSK_1_49	Back		23790	710	23.07	24.00		0.647	0.802	22.99	24.00		0.681	0.859	7.2%
WLAN2.4GHz	802.11b 1Mbps	Back	Ant 1	1	2412	18.49	18.50	97.62	0.960	0.985	18.49	18.50	97.62	0.956	0.981	-0.4%
WLAN5GHz	802.11a 6Mbps	Front	Ant 1	60	5300	14.92	15.00	86.26	0.963	1.136	14.92	15.00	86.26	1.050	1.239	9.0%
WLAN5GHz	802.11a 6Mbps	Back	Ant 1	144	5720	14.97	15.00	86.26	0.985	1.149	14.97	15.00	86.26	0.980	1.143	-0.5%
WLAN5GHz	802.11a 6Mbps	Back	Ant 1	165	5825	14.95	15.00	86.26	0.668	0.783	14.95	15.00	86.26	0.705	0.826	5.5%

15. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Portable Handset		
		Head	Body-worn	Hotspot
1.	GSM Voice + WLAN2.4GHz	Yes	Yes	
2.	GPRS/EDGE + WLAN2.4GHz	Yes	Yes	Yes
3.	WCDMA + WLAN2.4GHz	Yes	Yes	Yes
4.	LTE + WLAN2.4GHz	Yes	Yes	Yes
5.	GSM Voice + Bluetooth	Yes	Yes	
6.	GPRS/EDGE + Bluetooth	Yes	Yes	Yes
7.	WCDMA+ Bluetooth	Yes	Yes	Yes
8.	LTE + Bluetooth	Yes	Yes	Yes
9.	GSM Voice + WLAN5GHz	Yes	Yes	
10.	GPRS/EDGE + WLAN5GHz	Yes	Yes	Yes
11.	WCDMA + WLAN5GHz	Yes	Yes	Yes
12.	LTE + WLAN5GHz	Yes	Yes	Yes

General Note:

1. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
2. The Scaled SAR summation is calculated based on the same configuration, test position and test distance. The worst SAR value for each configuration was used for summation, regardless of whether the transmitter is operation in difference power level. Therefore, the following summations represent the absolute worst cases for simultaneous transmission for the device.
3. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
   v) The SPLSR calculated results please refer to section 15.3

15.1 Head Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 5GHz WLAN 1g SAR (W/kg)	4 Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+2 SPLSR	1+2 Case No	1+3 SPLSR	1+3 Case No
GSM	GSM850	Right Cheek	0.477	0.631	1.383	0.108	**1.108**	**1.860**	**0.585**			0.04	Case 52
		Right Tilted	0.200	0.646	1.122	0.114	**0.846**	**1.322**	**0.314**				
		Left Cheek	0.478	1.345	1.420	0.225	**1.823**	**1.898**	**0.703**	0.03	Case 50	0.04	Case 53
		Left Tilted	0.221	0.916	1.195	0.165	**1.137**	**1.416**	**0.386**				
	GSM1900	Right Cheek	0.207	0.631	1.383	0.108	**0.838**	**1.590**	**0.315**				
		Right Tilted	0.149	0.646	1.122	0.114	**0.795**	**1.271**	**0.263**				
		Left Cheek	0.260	1.345	1.420	0.225	**1.605**	**1.680**	**0.485**	0.02	Case 51	0.02	Case 54
		Left Tilted	0.168	0.916	1.195	0.165	**1.084**	**1.363**	**0.333**				
WCDMA	WCDMA II	Right Cheek	0.471	0.631	1.383	0.108	**1.102**	**1.854**	**0.579**			0.03	Case 10
		Right Tilted	0.264	0.646	1.122	0.114	**0.910**	**1.386**	**0.378**				
		Left Cheek	0.474	1.345	1.420	0.225	**1.819**	**1.894**	**0.699**	0.03	Case 1	0.03	Case 11
		Left Tilted	0.282	0.916	1.195	0.165	**1.198**	**1.477**	**0.447**				
	WCDMA IV	Right Cheek	0.445	0.631	1.383	0.108	**1.076**	**1.828**	**0.553**			0.03	Case 12
		Right Tilted	0.357	0.646	1.122	0.114	**1.003**	**1.479**	**0.471**				
		Left Cheek	0.679	1.345	1.420	0.225	**2.024**	**2.099**	**0.904**	0.03	Case 2	0.04	Case 13
		Left Tilted	0.338	0.916	1.195	0.165	**1.254**	**1.533**	**0.503**				
	WCDMA V	Right Cheek	0.682	0.631	1.383	0.108	**1.313**	**2.065**	**0.790**			0.04	Case 14
		Right Tilted	0.305	0.646	1.122	0.114	**0.951**	**1.427**	**0.419**				
		Left Cheek	0.627	1.345	1.420	0.225	**1.972**	**2.047**	**0.852**	0.04	Case 3	0.04	Case 15
		Left Tilted	0.302	0.916	1.195	0.165	**1.218**	**1.497**	**0.467**				

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 5GHz WLAN 1g SAR (W/kg)	4 Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+2 SPLSR	1+2 Case No	1+3 SPLSR	1+3 Case No
LTE	LTE Band 2	Right Cheek	0.407	0.631	1.383	0.108	**1.038**	**1.790**	**0.515**			0.03	Case 16
		Right Tilted	0.394	0.646	1.122	0.114	**1.040**	**1.516**	**0.508**				
		Left Cheek	0.453	1.345	1.420	0.225	**1.798**	**1.873**	**0.678**	0.03	Case 4	0.03	Case 17
		Left Tilted	0.281	0.916	1.195	0.165	**1.197**	**1.476**	**0.446**				
	LTE Band 4	Right Cheek	0.460	0.631	1.383	0.108	**1.091**	**1.843**	**0.568**			0.03	Case 18
		Right Tilted	0.378	0.646	1.122	0.114	**1.024**	**1.500**	**0.492**				
		Left Cheek	0.660	1.345	1.420	0.225	**2.005**	**2.080**	**0.885**	0.04	Case 5	0.04	Case 19
		Left Tilted	0.320	0.916	1.195	0.165	**1.236**	**1.515**	**0.485**				
	LTE Band 5	Right Cheek	0.710	0.631	1.383	0.108	**1.341**	**2.093**	**0.818**			0.04	Case 20
		Right Tilted	0.497	0.646	1.122	0.114	**1.143**	**1.619**	**0.611**			0.03	Case 21
		Left Cheek	0.795	1.345	1.420	0.225	**2.140**	**2.215**	**1.020**	0.04	Case 6	0.04	Case 22
		Left Tilted	0.482	0.916	1.195	0.165	**1.398**	**1.677**	**0.647**			0.04	Case 23
	LTE Band 12	Right Cheek	0.334	0.631	1.383	0.108	**0.965**	**1.717**	**0.442**			0.03	Case 56
		Right Tilted	0.156	0.646	1.122	0.114	**0.802**	**1.278**	**0.270**				
		Left Cheek	0.357	1.345	1.420	0.225	**1.702**	**1.777**	**0.582**	0.03	Case 55	0.03	Case 57
		Left Tilted	0.240	0.916	1.195	0.165	**1.156**	**1.435**	**0.405**				
	LTE Band 14	Right Cheek	0.657	0.631	1.383	0.108	**1.288**	**2.040**	**0.765**			0.04	Case 24
		Right Tilted	0.345	0.646	1.122	0.114	**0.991**	**1.467**	**0.459**				
		Left Cheek	0.686	1.345	1.420	0.225	**2.031**	**2.106**	**0.911**	0.04	Case 7	0.04	Case 25
		Left Tilted	0.365	0.916	1.195	0.165	**1.281**	**1.560**	**0.530**				
	LTE Band 30	Right Cheek	0.531	0.631	1.383	0.108	**1.162**	**1.914**	**0.639**			0.03	Case 26
		Right Tilted	0.147	0.646	1.122	0.114	**0.793**	**1.269**	**0.261**				
		Left Cheek	0.357	1.345	1.420	0.225	**1.702**	**1.777**	**0.582**	0.03	Case 9	0.04	Case 27
		Left Tilted	0.260	0.916	1.195	0.165	**1.176**	**1.455**	**0.425**				
	LTE Band 66	Right Cheek	0.329	0.631	1.383	0.108	**0.960**	**1.712**	**0.437**			0.03	Case 28
		Right Tilted	0.209	0.646	1.122	0.114	**0.855**	**1.331**	**0.323**				
		Left Cheek	0.439	1.345	1.420	0.225	**1.784**	**1.859**	**0.664**	0.04	Case 8	0.03	Case 29
		Left Tilted	0.185	0.916	1.195	0.165	**1.101**	**1.380**	**0.350**				

15.2 Hotspot & Body-worn Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 5GHz WLAN 1g SAR (W/kg)	4 Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+2 SPLSR	1+2 Case No	1+3 SPLSR	1+3 Case No
GSM	GSM850	Front	0.590	0.848	0.607	0.091	**1.438**	**1.197**	**0.681**				
		Back	1.189	0.985	1.149	0.158	**2.174**	**2.338**	**1.347**	0.03	Case 58	0.03	Case 60
		Left side	0.674	0.039	0.048	0.007	**0.713**	**0.722**	**0.681**				
		Right side	0.728	0.395	0.038	0.073	**1.123**	**0.766**	**0.801**				
		Bottom side	0.148				**0.148**	**0.148**	**0.148**				
	GSM1900	Front	0.411	0.848	0.607	0.091	**1.259**	**1.018**	**0.502**				
		Back	0.715	0.985	1.149	0.158	**1.700**	**1.864**	**0.873**	0.02	Case 59	0.02	Case 61
		Left side	0.064	0.039	0.048	0.007	**0.103**	**0.112**	**0.071**				
		Right side	0.055	0.395	0.038	0.073	**0.450**	**0.093**	**0.128**				
		Bottom side	0.575				**0.575**	**0.575**	**0.575**				
WCDMA	WCDMA II	Front	0.718	0.788	0.607	0.091	**1.506**	**1.325**	**0.809**				
		Back	1.410	0.985	1.149	0.158	**2.395**	**2.559**	**1.568**	0.03	Case 30	0.03	Case 41
		Left side	0.129	0.039	0.048	0.007	**0.168**	**0.177**	**0.136**				
		Right side	0.136	0.395	0.038	0.073	**0.531**	**0.174**	**0.209**				
		Bottom side	1.385				**1.385**	**1.385**	**1.385**				
	WCDMA IV	Front	0.491	0.788	0.607	0.091	**1.279**	**1.098**	**0.582**				
		Back	0.761	0.985	1.149	0.158	**1.746**	**1.910**	**0.919**	0.02	Case 31	0.02	Case 42
		Left side	0.091	0.039	0.048	0.007	**0.130**	**0.139**	**0.098**				
		Right side	0.051	0.395	0.038	0.073	**0.446**	**0.089**	**0.124**				
		Bottom side	1.036				**1.036**	**1.036**	**1.036**				
	WCDMA V	Front	0.840	0.788	0.607	0.091	**1.628**	**1.447**	**0.931**	0.02	Case 32		
		Back	1.127	0.985	1.149	0.158	**2.112**	**2.276**	**1.285**	0.02	Case 33	0.02	Case 43
		Left side	0.790	0.039	0.048	0.007	**0.829**	**0.838**	**0.797**				
		Right side	1.101	0.395	0.038	0.073	**1.496**	**1.139**	**1.174**				
		Bottom side	0.261				**0.261**	**0.261**	**0.261**				

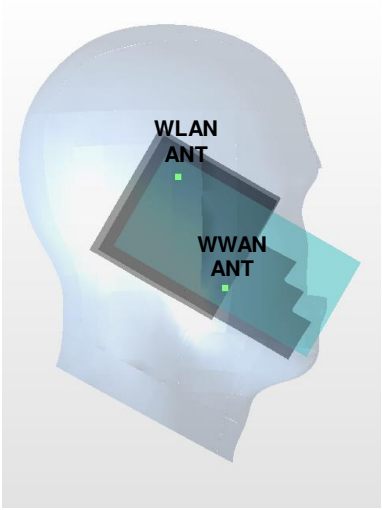
WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 5GHz WLAN 1g SAR (W/kg)	4 Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+2 SPLSR	1+2 Case No	1+3 SPLSR	1+3 Case No
LTE	LTE Band 2	Front	0.634	0.788	0.607	0.091	**1.422**	**1.241**	**0.725**				
		Back	1.328	0.985	1.149	0.158	**2.313**	**2.477**	**1.486**	0.03	Case 34	0.03	Case 44
		Left side	0.119				**0.119**	**0.119**	**0.119**				
		Right side	0.113	0.395	0.038	0.073	**0.508**	**0.151**	**0.186**				
		Bottom side	1.143				**1.143**	**1.143**	**1.143**				
	LTE Band 4	Front	0.546	0.788	0.607	0.091	**1.334**	**1.153**	**0.637**				
		Back	0.846	0.985	1.149	0.158	**1.831**	**1.995**	**1.004**	0.02	Case 35	0.02	Case 45
		Left side	0.105				**0.105**	**0.105**	**0.105**				
		Right side	0.057	0.395	0.038	0.073	**0.452**	**0.095**	**0.130**				
		Bottom side	1.049				**1.049**	**1.049**	**1.049**				
	LTE Band 5	Front	0.818	0.788	0.607	0.091	**1.606**	**1.425**	**0.909**	0.02	Case 36		
		Back	1.046	0.985	1.149	0.158	**2.031**	**2.195**	**1.204**	0.02	Case 37	0.02	Case 46
		Left side	0.991				**1.030**	**1.039**	**0.998**				
		Right side	1.151	0.395	0.038	0.073	**1.546**	**1.189**	**1.224**				
		Bottom side	0.229				**0.229**	**0.229**	**0.229**				
	LTE Band 12	Front	0.415	0.848	0.607	0.091	**1.263**	**1.022**	**0.506**				
		Back	0.774	0.985	1.149	0.158	**1.759**	**1.923**	**0.932**	0.02	Case 62	0.02	Case 63
		Left side	0.706				**0.706**	**0.706**	**0.706**				
		Right side	0.762	0.395	0.038	0.073	**1.157**	**0.800**	**0.835**				
		Bottom side	0.138				**0.138**	**0.138**	**0.138**				
	LTE Band 14	Front	0.741	0.788	0.607	0.091	**1.529**	**1.348**	**0.832**				
		Back	1.185	0.985	1.149	0.158	**2.170**	**2.334**	**1.343**	0.03	Case 38	0.03	Case 47
		Left side	1.035				**1.074**	**1.083**	**1.042**				
		Right side	1.180	0.395	0.038	0.073	**1.575**	**1.218**	**1.253**				
		Bottom side	0.150				**0.150**	**0.150**	**0.150**				
	LTE Band 30	Front	0.582	0.788	0.607	0.091	**1.370**	**1.189**	**0.673**				
		Back	0.808	0.985	1.149	0.158	**1.793**	**1.957**	**0.966**	0.02	Case 39	0.02	Case 48
		Left side	0.067				**0.106**	**0.115**	**0.074**				
		Right side	0.148	0.395	0.038	0.073	**0.543**	**0.186**	**0.221**				
		Bottom side	0.744				**0.744**	**0.744**	**0.744**				
	LTE Band 66	Front	0.679	0.788	0.607	0.091	**1.467**	**1.286**	**0.770**				
		Back	1.080	0.985	1.149	0.158	**2.065**	**2.229**	**1.238**	0.02	Case 40	0.02	Case 49
		Left side	0.129				**0.129**	**0.129**	**0.129**				
		Right side	0.071	0.395	0.038	0.073	**0.466**	**0.109**	**0.144**				
		Bottom side	1.180				**1.180**	**1.180**	**1.180**				

15.3 SPLSR Evaluation and Analysis

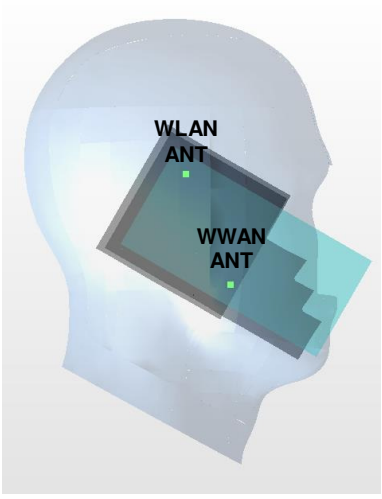
General Note:

1. SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*). If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary

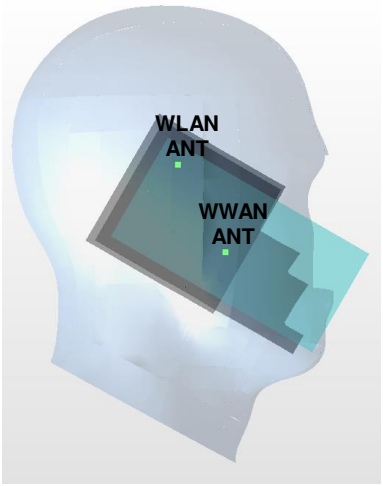
Case1	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA II	Left Cheek	0.474	0	52.08	-58.57	-1.57	89.1	1.82	0.03	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



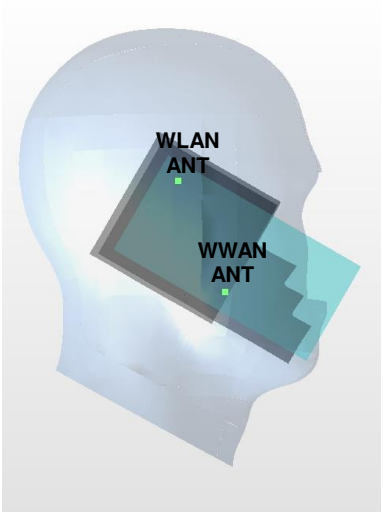
Case2	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA IV	Left Cheek	0.679	0	50.84	-57.81	-1.85	88.0	2.02	0.03	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



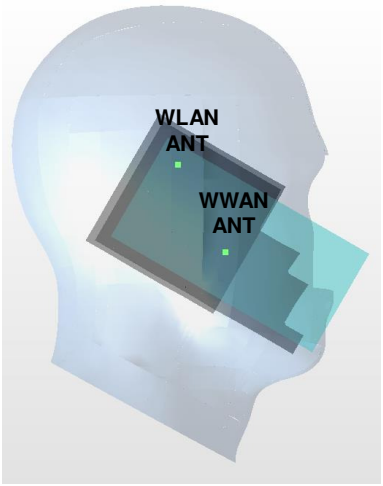
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case3	WCDMA V	Left Cheek	0.627	0	50.01	-34.39	-3.22	66.7	1.97	0.04	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



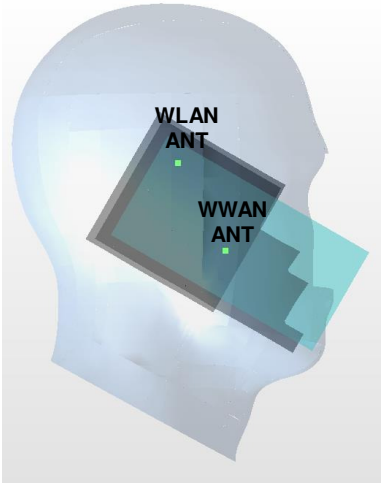
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case4	LTE B2	Left Cheek	0.453	0	52.17	-58.57	-1.5	89.2	1.80	0.03	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



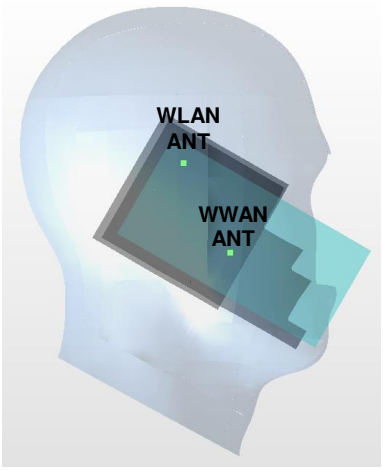
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case5	LTE B4	Left Cheek	0.66	0	46.52	-49.81	-3.31	78.9	2.01	0.04	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



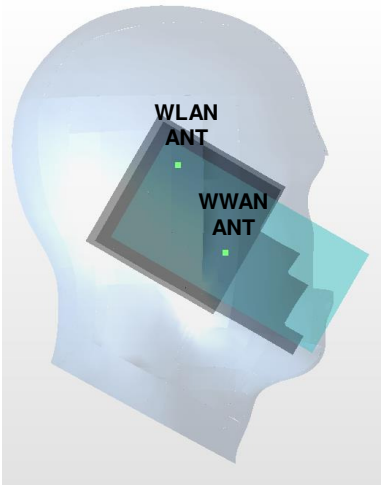
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case6	LTE B5	Left Cheek	0.795	0	51.63	-50.63	-1.93	81.7	2.14	0.04	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



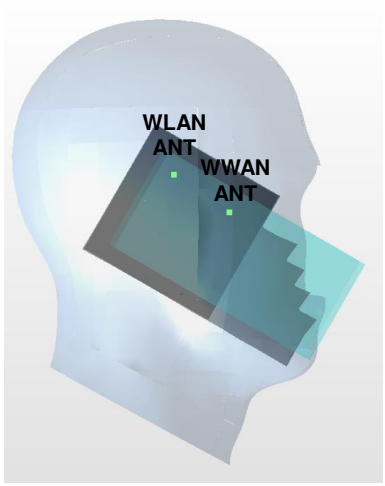
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case7	LTE B14	Left Cheek	0.686	0	53.98	-38.67	-3.51	72.4	2.03	0.04	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



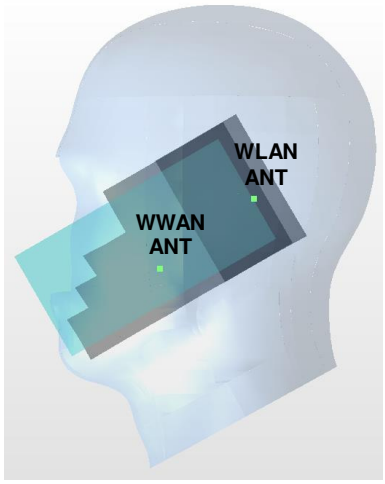
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case8	LTE B66	Left Cheek	0.439	0	50.83	-57.93	-1.79	88.1	1.78	0.03	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



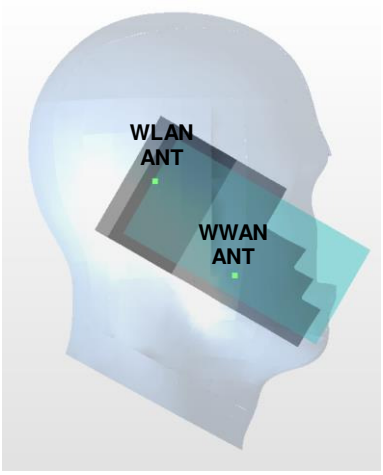
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case9	LTE B30	Left Cheek	0.357	0	59.67	-9.23	-2.37	54.1	1.70	0.04	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



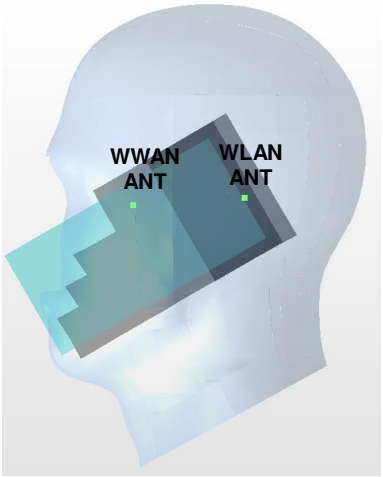
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case10	WCDMA II	Right Cheek	0.471	0	52.37	52.32	-2.39	79.0	1.85	0.03	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



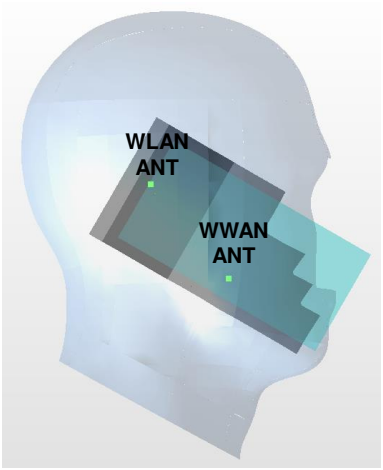
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case11	WCDMA II	Left Cheek	0.474	0	52.08	-58.53	-1.57	86.5	1.89	0.03	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



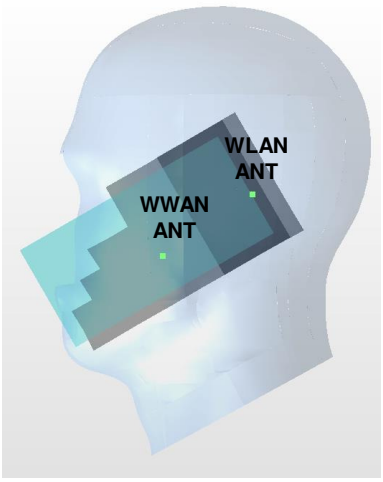
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case12	WCDMA IV	Right Cheek	0.445	0	60.63	4.39	-1.38	71.1	1.83	0.03	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



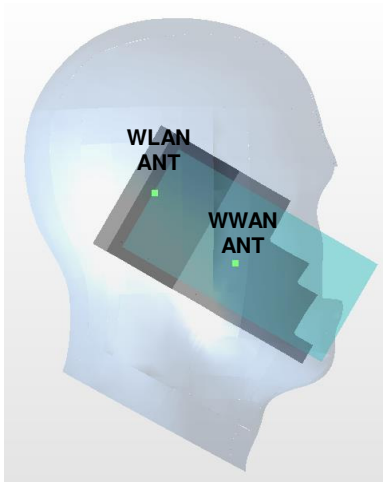
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case13	WCDMA IV	Left Cheek	0.679	0	50.84	-57.81	-1.85	85.1	2.10	0.04	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



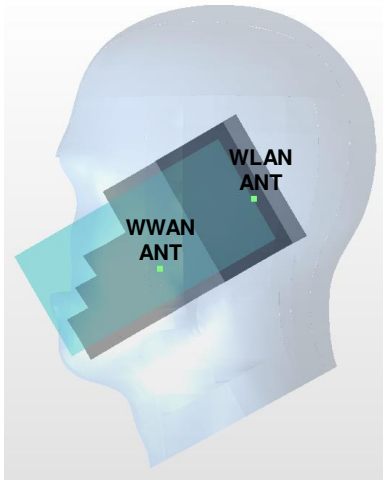
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case14	WCDMA V	Right Cheek	0.682	0	48.27	50.2	-3.39	74.5	2.07	0.04	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



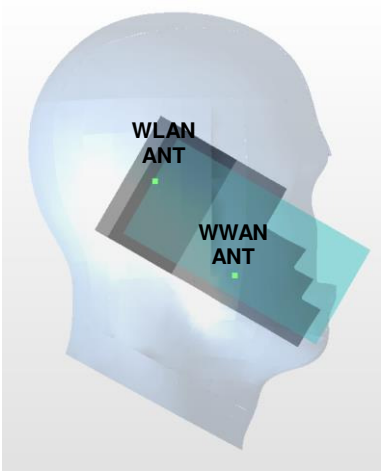
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case15	WCDMA V	Left Cheek	0.627	0	50.01	-34.39	-3.22	67.8	2.05	0.04	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



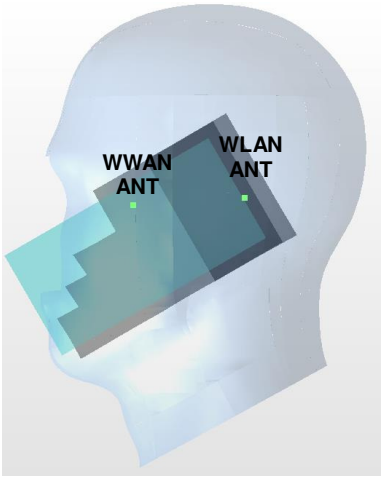
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case16	LTE B2	Right Cheek	0.407	0	52.31	55.63	-2.06	81.0	1.79	0.03	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



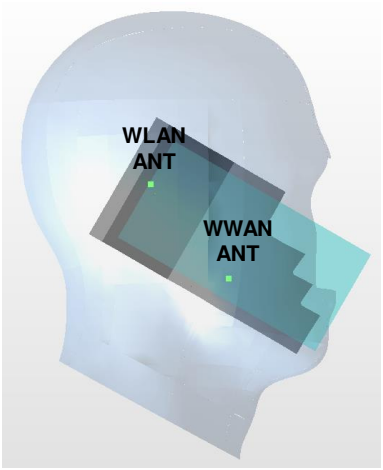
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case17	LTE B2	Left Cheek	0.453	0	52.17	-58.57	-1.5	86.5	1.87	0.03	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



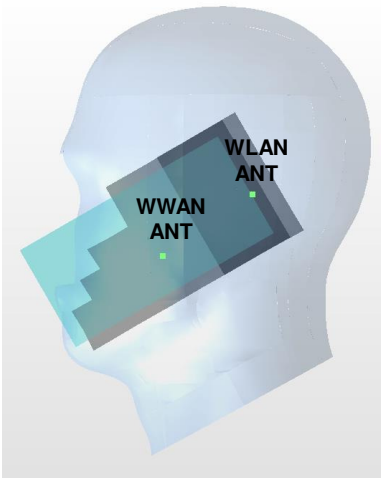
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case18	LTE B4	Right Cheek	0.46	0	61.79	3.65	-1.11	72.3	1.84	0.03	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



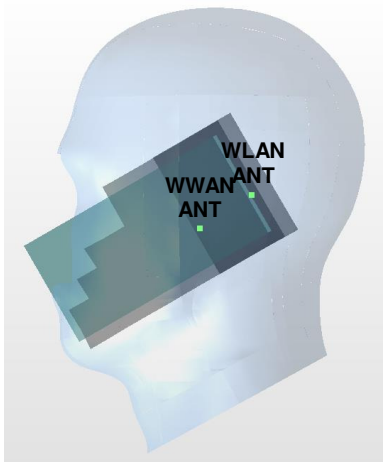
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case19	LTE B4	Left Cheek	0.66	0	46.52	-49.81	-3.31	76.3	2.08	0.04	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



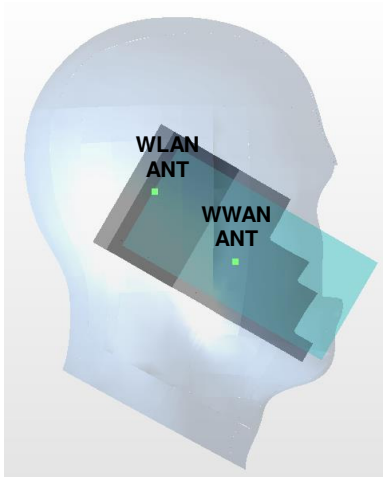
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case20	LTE B5	Right Cheek	0.71	0	49.04	35.7	-4.16	67.4	2.09	0.04	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



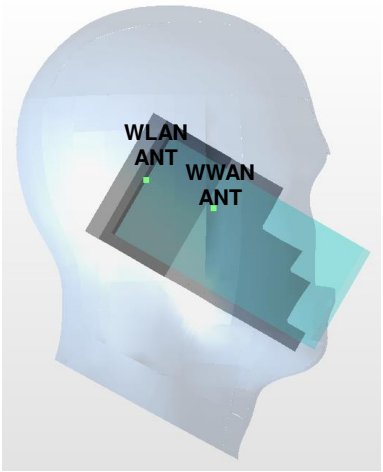
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case21	LTE B5	Right Tilted	0.497	0	53.17	17.6	-3.65	67.2	1.62	0.03	Not required
	WLAN5G		1.122	0	-12.39	3.95	1.73				



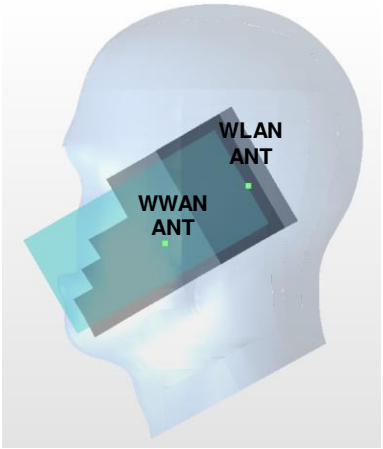
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case22	LTE B5	Left Cheek	0.795	0	51.63	-50.63	-1.93	80.2	2.22	0.04	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



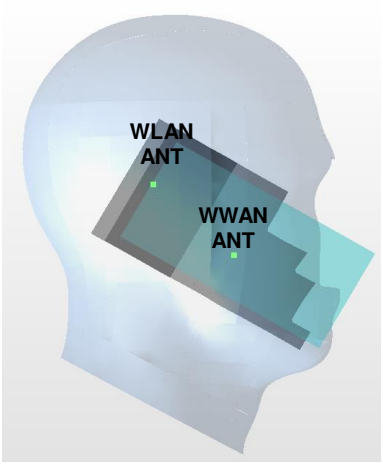
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case23	LTE B5	Left Tilted	0.482	0	38.84	-27.67	-4.11	56.0	1.68	0.04	Not required
	WLAN5G		1.195	0	-2.95	9.32	0.54				



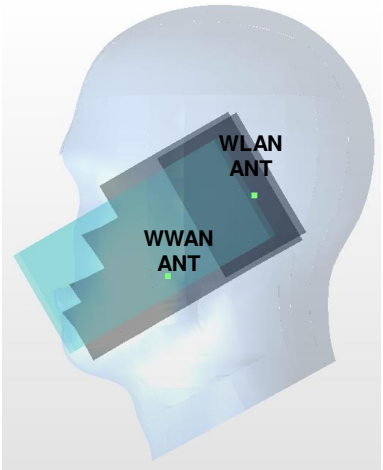
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case24	LTE B14	Right Cheek	0.657	0	48.54	37.3	-4.11	67.7	2.04	0.04	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



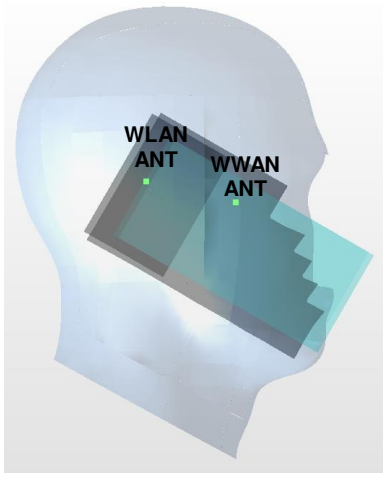
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case25	LTE B14	Left Cheek	0.686	0	53.98	-38.67	-2.3	73.5	2.11	0.04	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



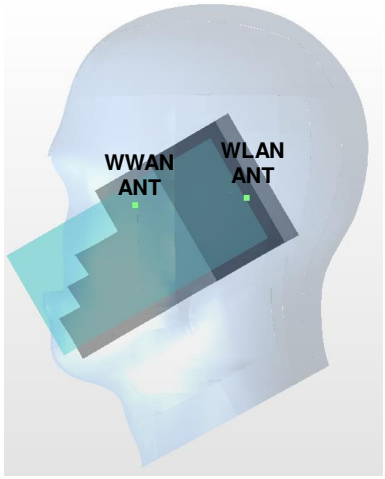
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case26	LTE B30	Right Cheek	0.531	0	44.12	59.36	-3.53	77.5	1.91	0.03	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



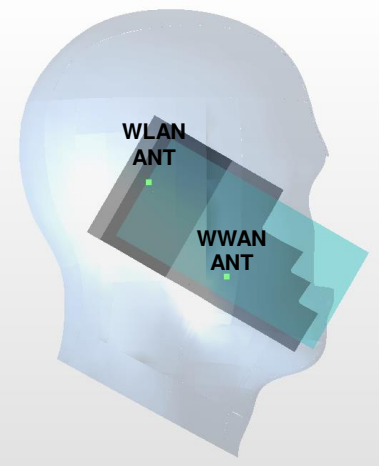
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case27	LTE B30	Left Cheek	0.357	0	59.67	-9.23	-2.37	64.4	1.78	0.04	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



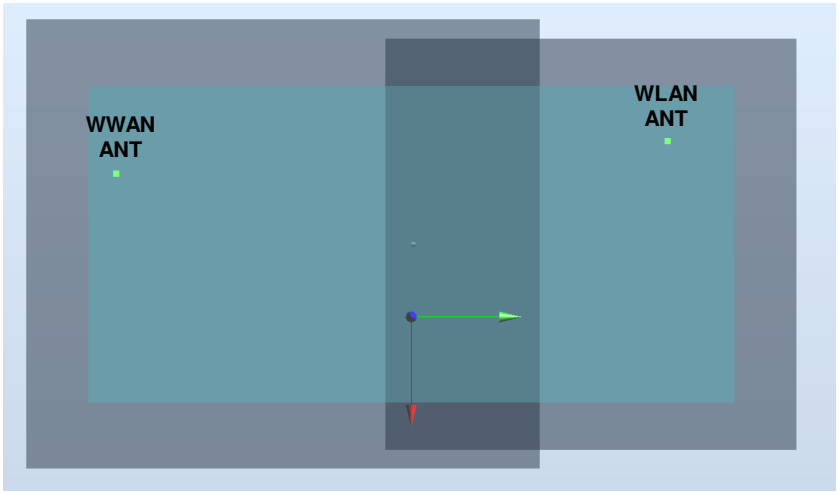
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case28	LTE B66	Right Cheek	0.329	0	59.15	7.16	-2.12	69.7	1.71	0.03	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



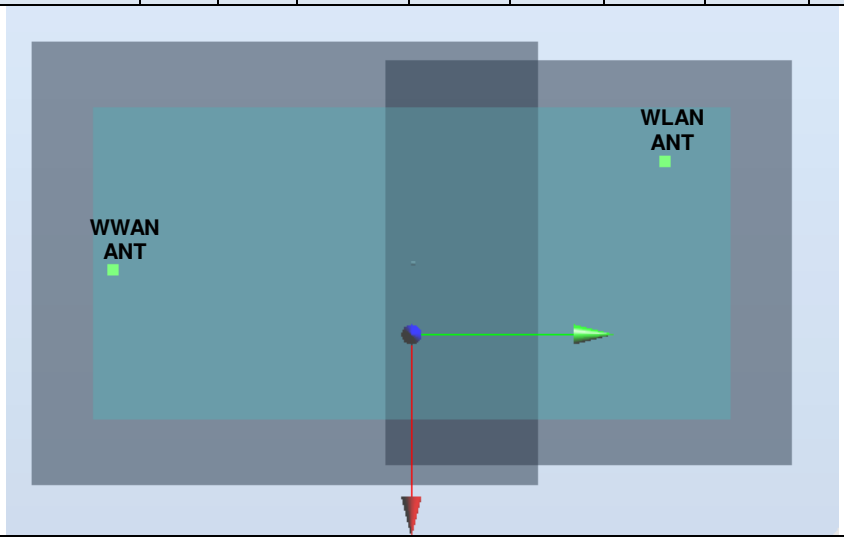
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case29	LTE B66	Left Cheek	0.439	0	50.83	-57.93	-1.79	85.2	1.86	0.03	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



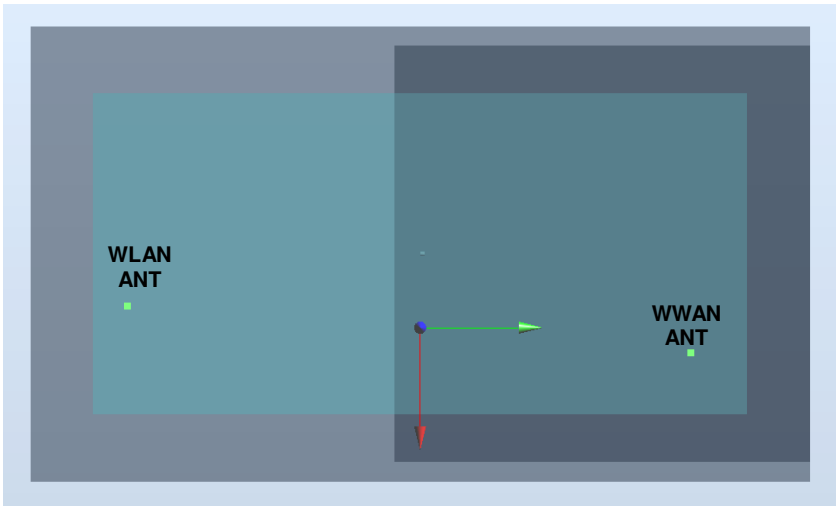
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case30	WCDMA II	Back	1.41	5	-17.5	-68	-4.59	127.4	2.40	0.03	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



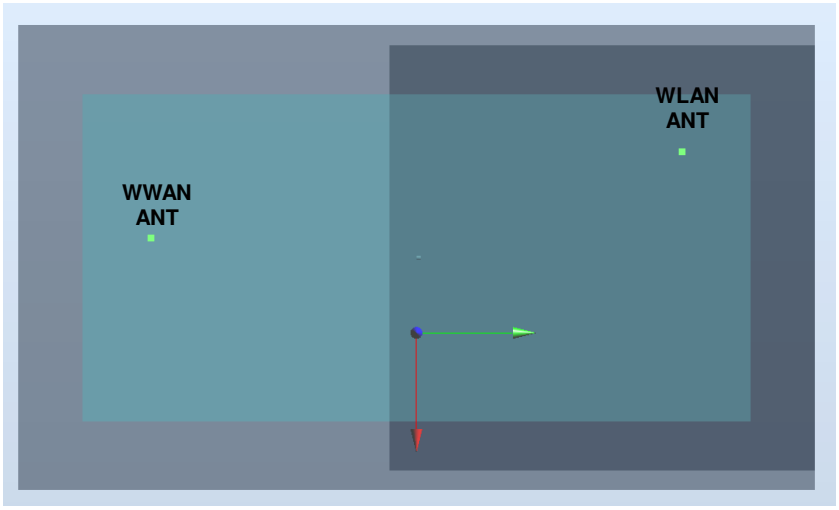
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case31	WCDMA IV	Back	0.761	5	-15.5	-69.5	-4.53	129.1	1.75	0.02	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



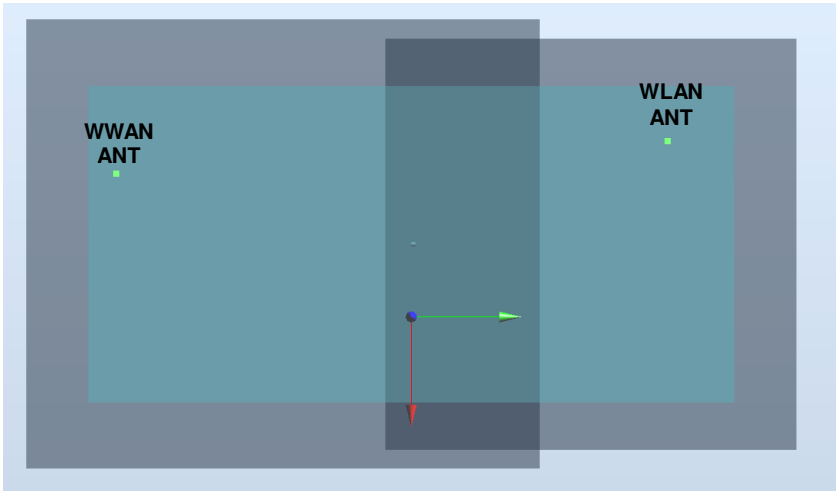
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case32	WCDMA V	Front	0.84	5	11	-66.5	-1.11	130.6	1.63	0.02	Not required
	WLAN2.4G		0.788	5	24.8	63.4	-0.54				



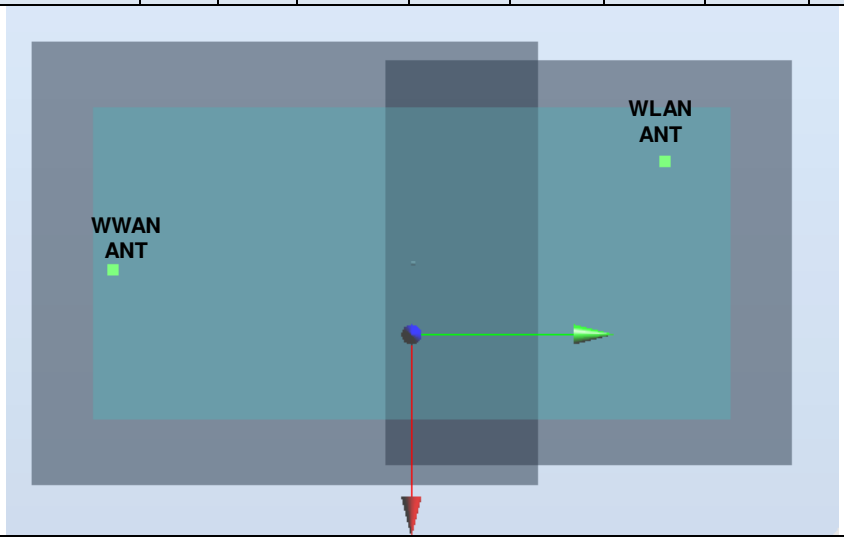
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case33	WCDMA V	Back	1.127	5	-5.5	-65.4	-1.15	126.2	2.11	0.02	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



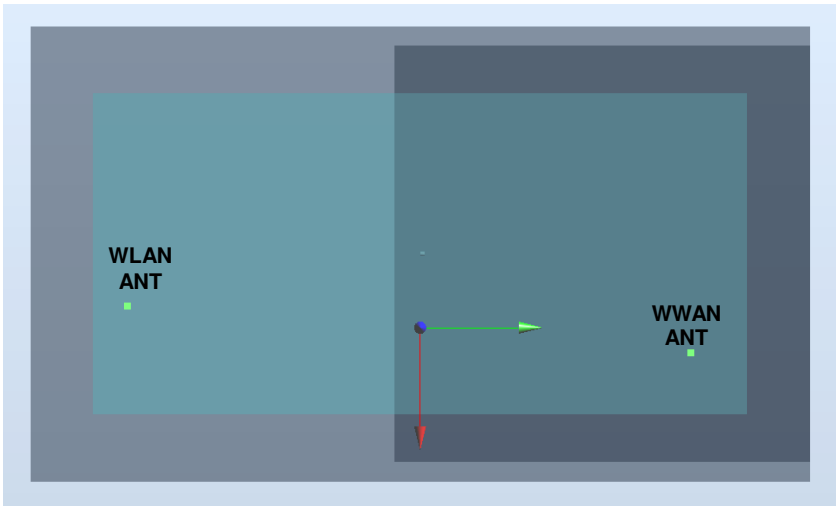
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case34	LTE B2	Back	1.328	5	-15.9	-68	-4.57	127.5	2.31	0.03	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



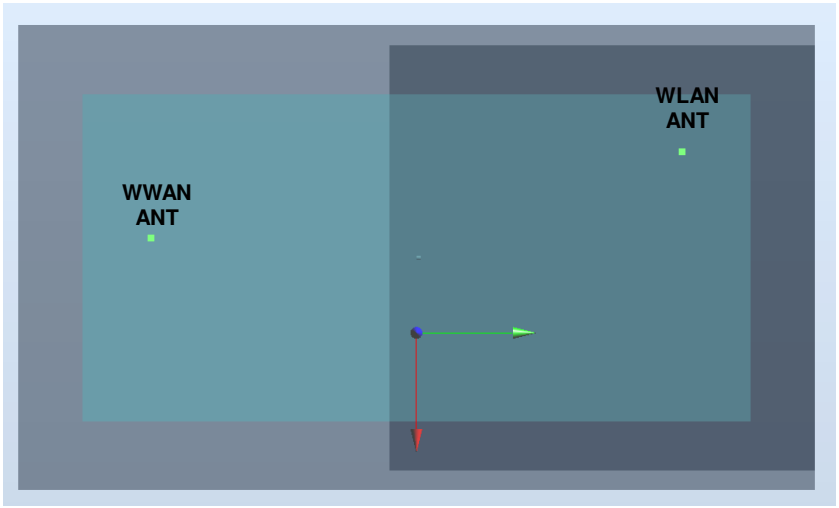
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case35	LTE B4	Back	0.846	5	-15.5	-69.5	-4.53	129.1	1.83	0.02	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



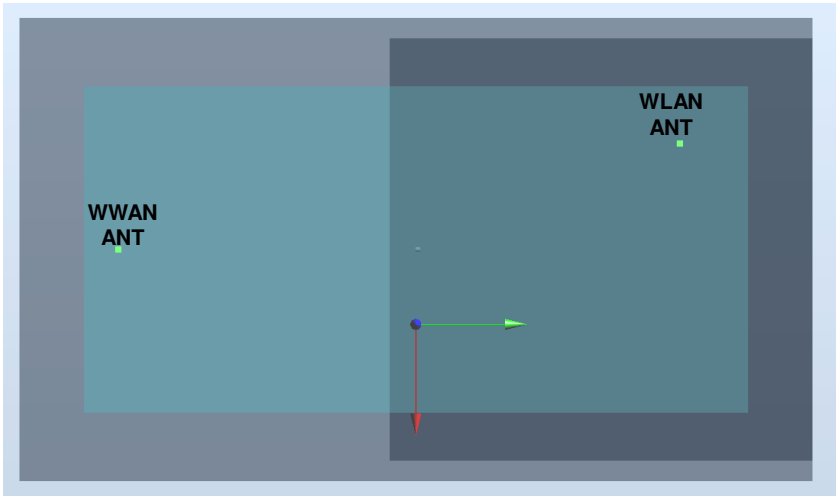
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case36	LTE B5	Front	0.818	5	11.3	-71.2	-4.76	135.3	1.61	0.02	Not required
	WLAN2.4G		0.788	5	24.8	63.4	-0.54				



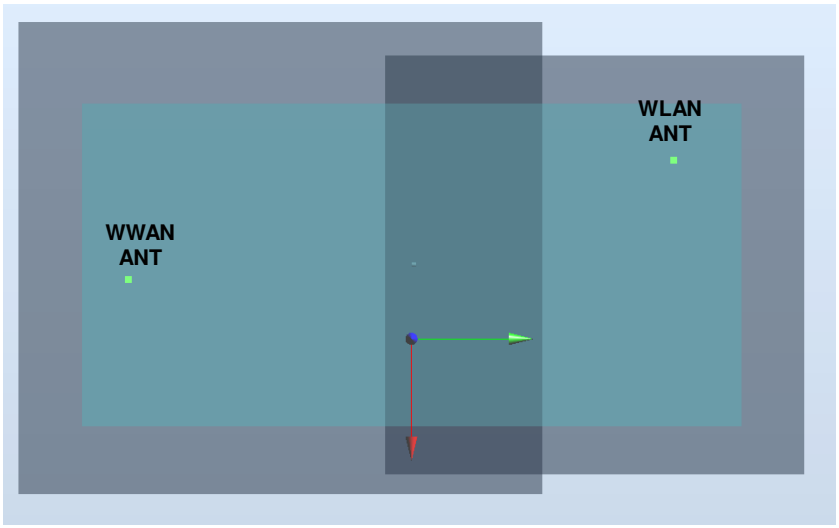
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case37	LTE B5	Back	1.046	5	-9.9	-63.9	-4.83	124.1	2.03	0.02	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



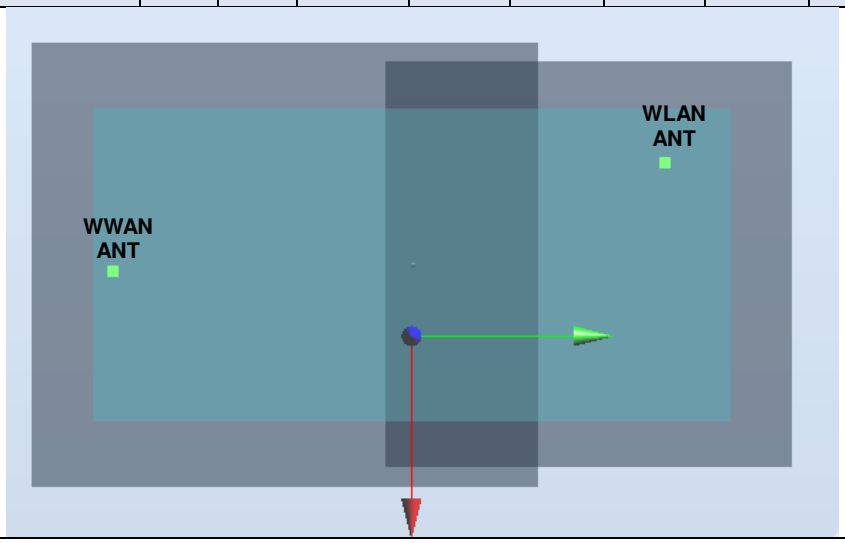
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case38	LTE B14	Back	1.185	5	-1	-61.7	-2.19	123.5	2.17	0.03	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



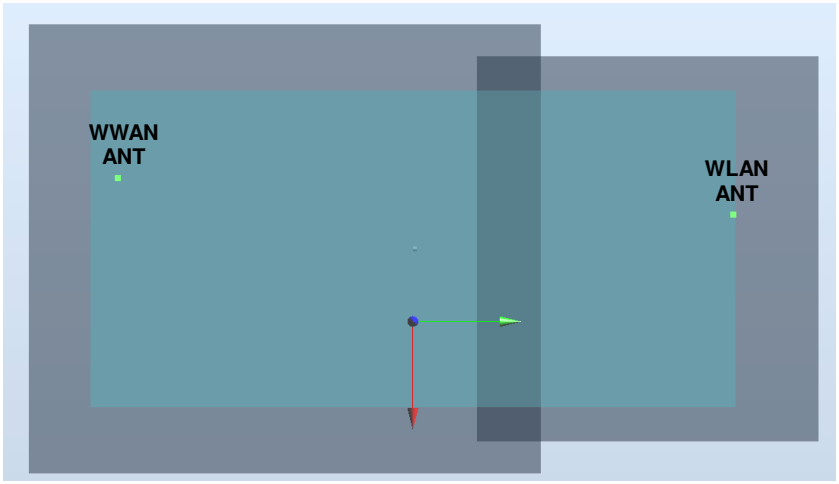
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case39	LTE B30	Back	0.808	5	5.3	-63.8	-2.36	127.0	1.79	0.02	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



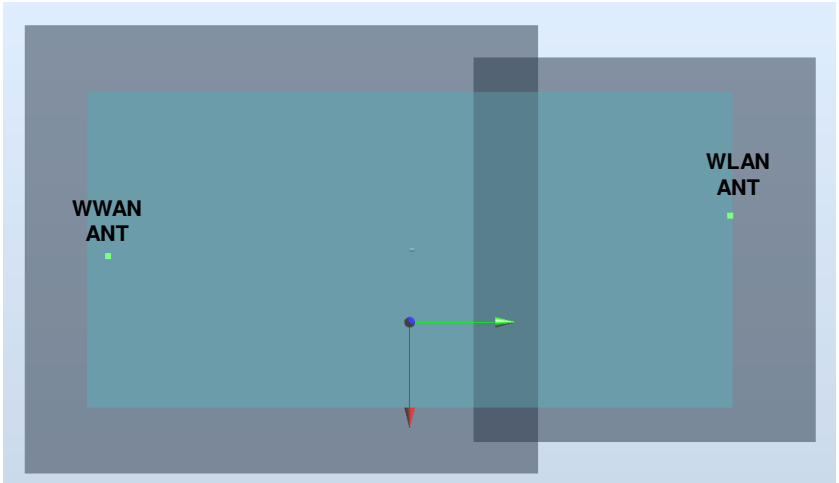
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case40	LTE B66	Back	1.08	5	-15.5	-69.5	-4.54	129.1	2.07	0.02	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



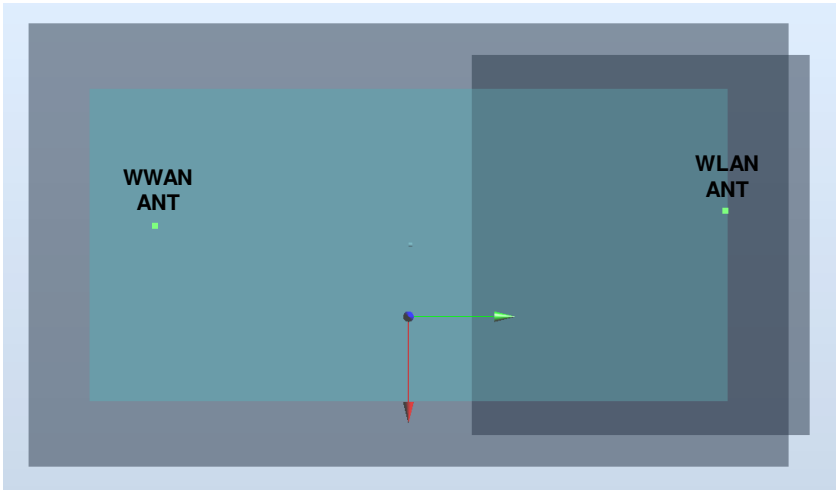
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case41	WCDMA II	Back	1.41	5	-17.5	-68	-4.59	142.8	2.56	0.03	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



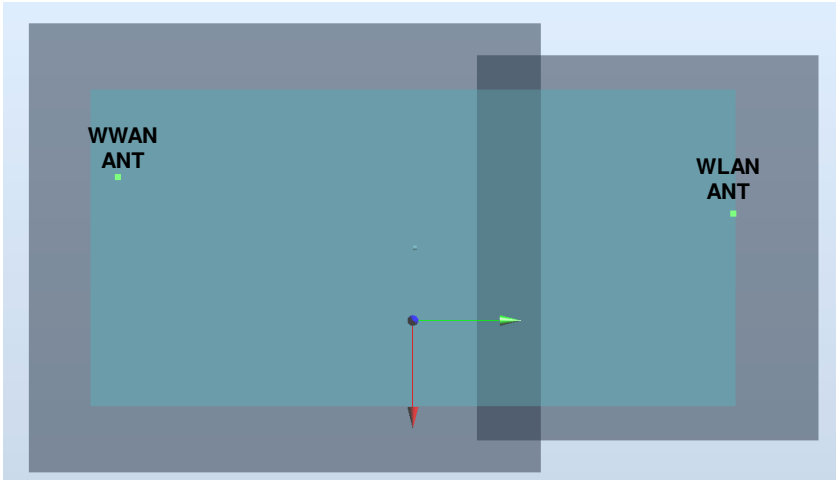
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case42	WCDMA IV	Back	0.761	5	-15.5	-69.5	-4.53	144.1	1.91	0.02	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



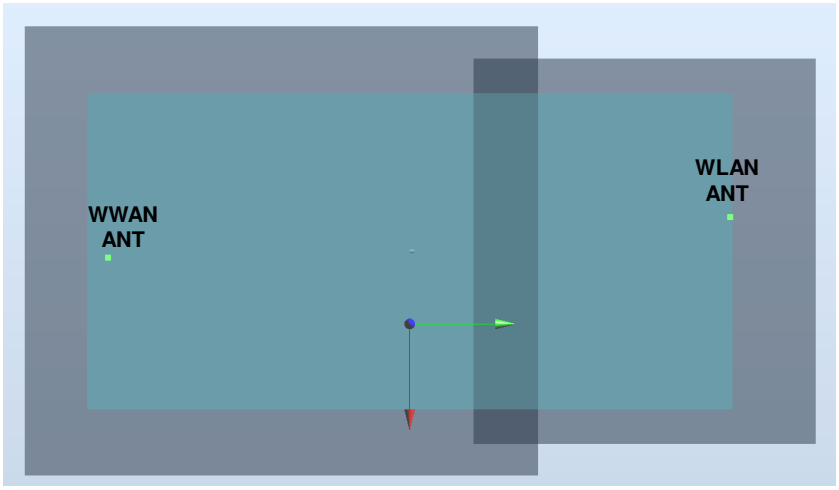
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case43	WCDMA V	Back	1.127	5	-5.5	-65.4	-1.15	139.8	2.28	0.02	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



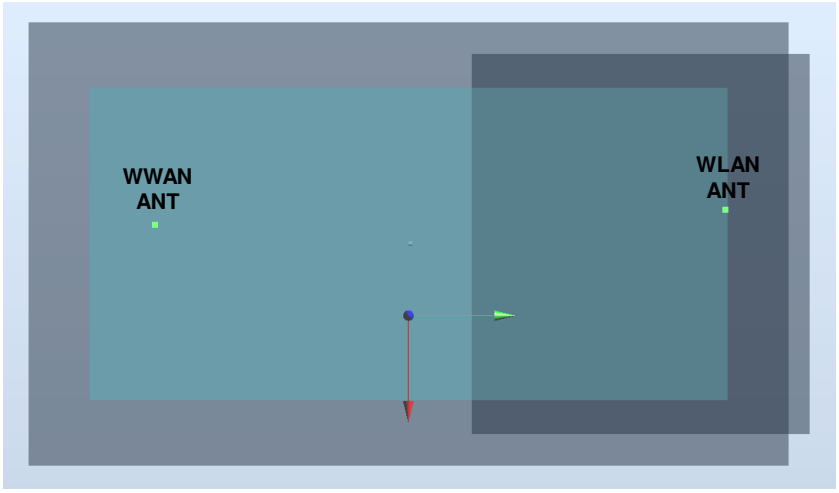
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case44	LTE B2	Back	1.328	5	-15.9	-68	-4.57	142.7	2.48	0.03	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



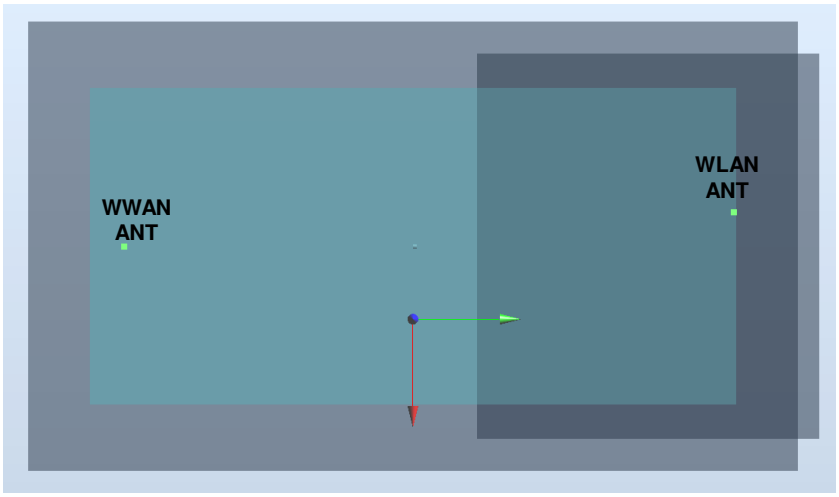
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case45	LTE B4	Back	0.846	5	-15.5	-69.5	-4.53	144.1	2.00	0.02	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



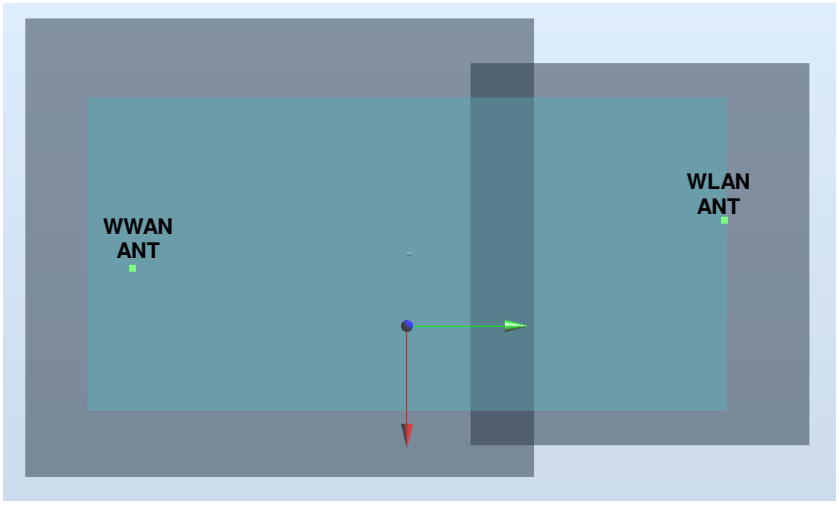
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case46	LTE B5	Back	1.046	5	-9.9	-63.9	-4.83	138.4	2.20	0.02	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



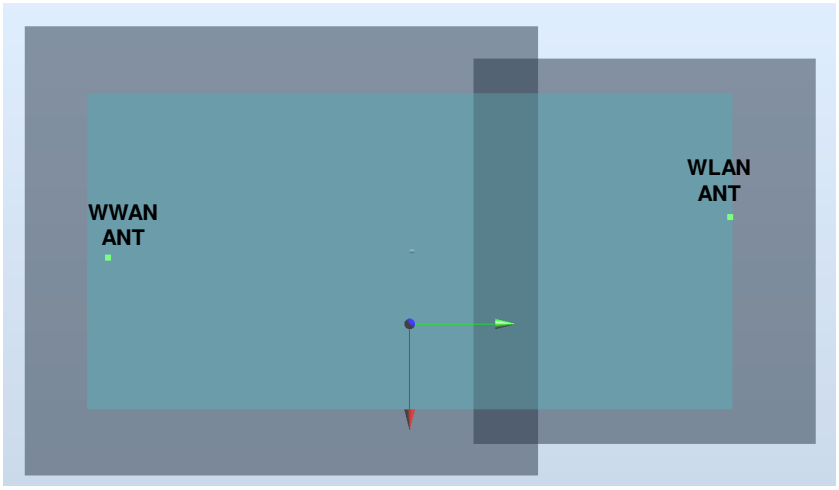
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case47	LTE B14	Back	1.185	5	-1	-61.7	-2.19	136.3	2.33	0.03	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



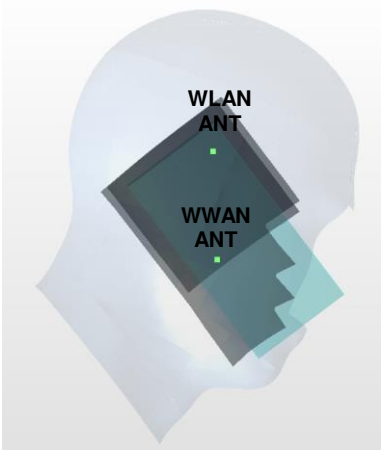
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case48	LTE B30	Back	0.808	5	5.3	-63.8	-2.36	138.9	1.96	0.02	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



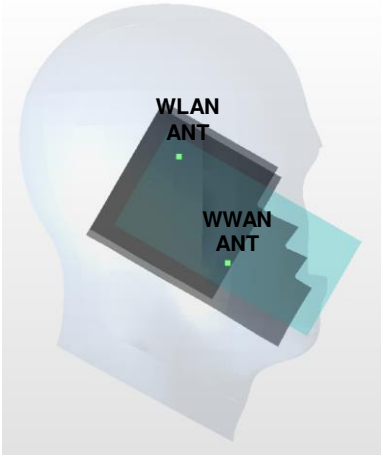
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case49	LTE B66	Back	1.08	5	-15.5	-69.5	-4.54	144.1	2.23	0.02	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



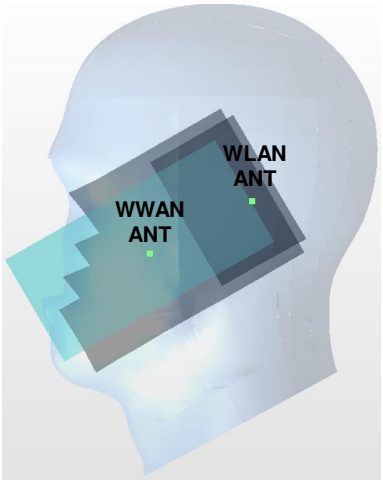
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case50	GSM850	Left Cheek	0.478	0	46.6	-44.72	-3.02	74.3	1.82	0.03	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



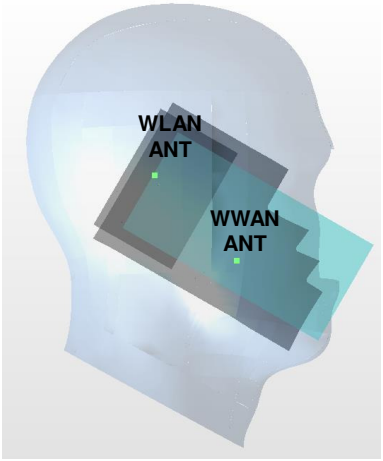
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case51	GSM1900	Left Cheek	0.26	0	49.27	-59.01	-1.53	88.5	1.61	0.02	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



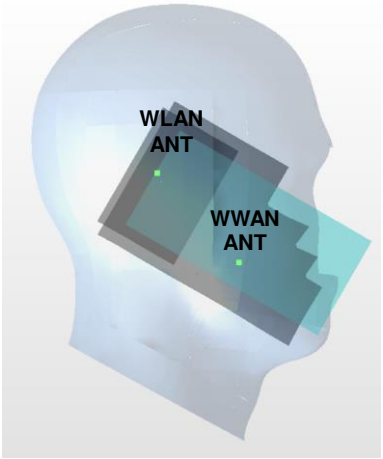
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case52	GSM850	Right Cheek	0.477	0	50.11	42.65	-2.77	71.6	1.86	0.04	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



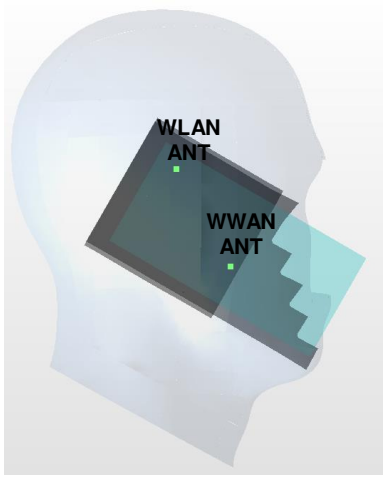
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case53	GSM850	Left Cheek	0.478	0	46.6	-44.72	-3.02	72.5	1.90	0.04	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



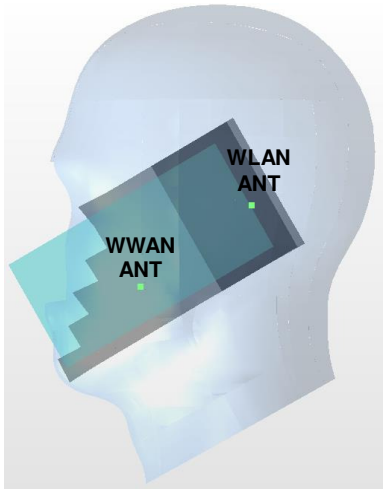
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case54	GSM1900	Left Cheek	0.26	0	49.27	-59.01	-1.53	87.3	1.68	0.02	Not required
	WLAN5G		1.42	0	-10.45	4.58	1.31				



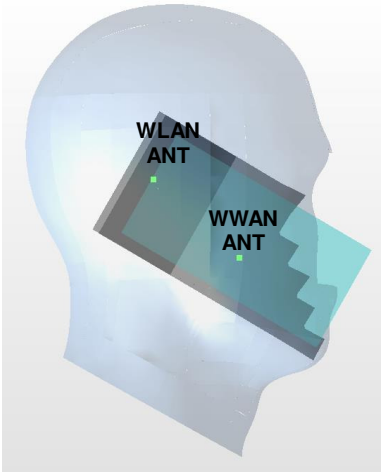
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case55	LTE Band 12	Left Cheek	0.357	0	50.67	-34.53	-3.04	67.1	1.70	0.03	Not required
	WLAN2.4G		1.345	0	16.33	23.08	-0.75				



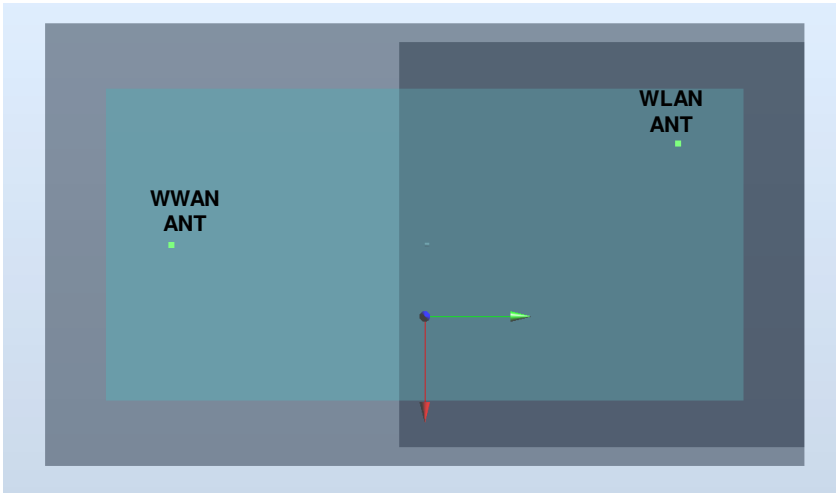
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case56	LTE Band 12	Right Cheek	0.334	0	53.28	32.41	-2.82	69.7	1.72	0.03	Not required
	WLAN5G		1.383	0	-10.45	4.58	1.31				



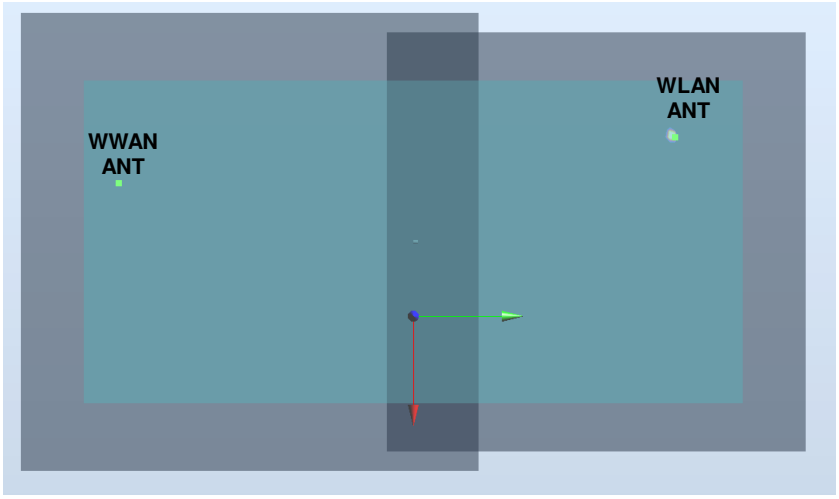
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case57	LTE Band 12	Left Cheek	0.357	0	50.67	-34.53	-3.04	68.4	1.78	0.03	Not required
	WLAN5G		1.42	0	-2.09	8.82	0.42				



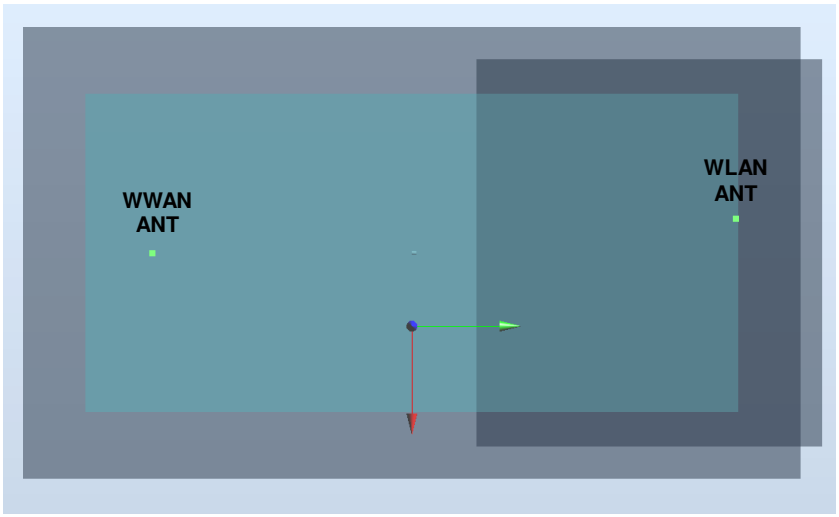
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case58	GSM850	Back	1.189	5	-4.2	-63.8	-1.54	124.9	2.17	0.03	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



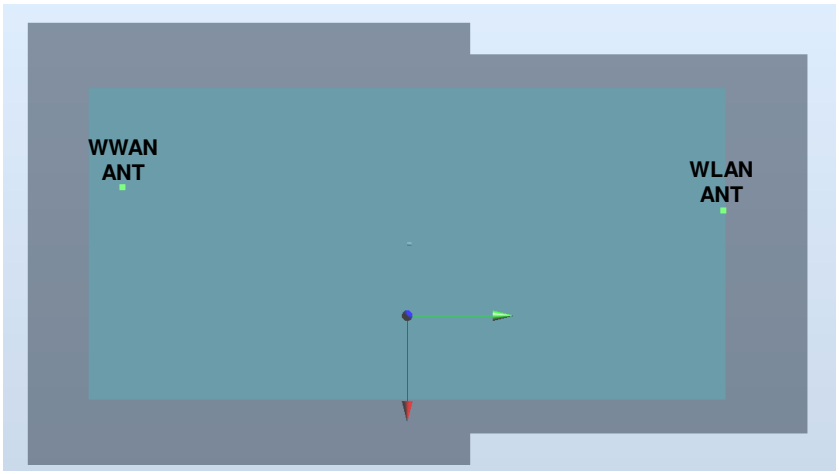
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case59	GSM1900	Back	0.715	5	-17.7	-66.5	-0.87	125.8	1.70	0.02	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



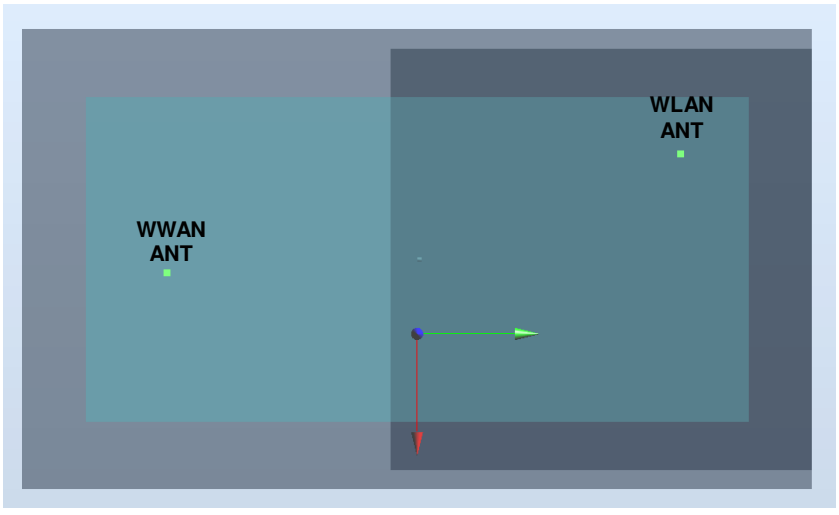
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case60	GSM850	Back	1.189	5	-4.2	-63.8	-1.54	138.3	2.34	0.03	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



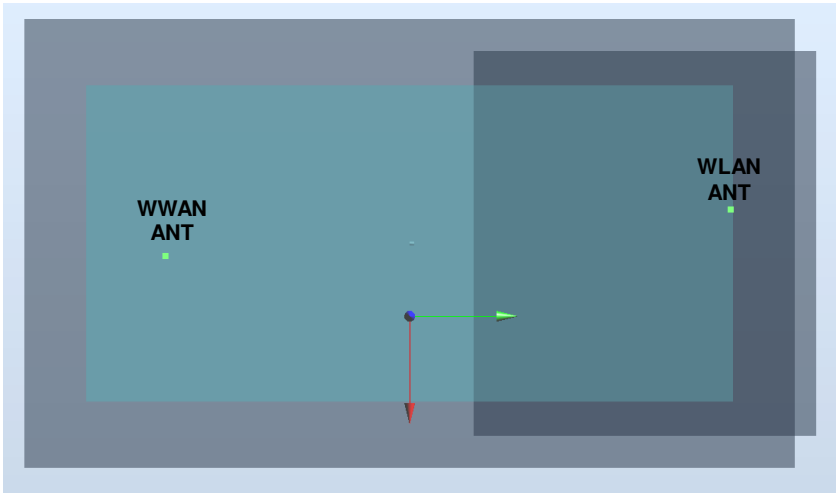
	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case61	GSM1900	Back	0.715	5	-17.7	-66.5	-0.87	141.2	1.86	0.02	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case62	LTE B12	Back	0.774	5	2	-62.4	-1.46	124.8	1.76	0.02	Not required
	WLAN2.4G		0.985	5	-27	59	-0.88				



	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case63	LTE B12	Back	0.774	5	2	-62.4	-1.46	137.2	1.92	0.02	Not required
	WLAN5G		1.149	5	-8.2	74.4	-0.79				



Test Engineer： James Chen Jay Jian Thomas Wang White Huang Wilson Lin Steven Chang Mood Huang and Bevis Chang

16. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg. Therefore, the measurement uncertainty table is not required in this report.

17. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[6] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[7] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.

[8] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

[9] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[10] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

[11] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[12] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.