

FCC SAR Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT2521-3, XT2521-5
FCC ID : IHDT56AT2
STANDARD : FCC 47 CFR Part 2 (2.1093)

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has 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. (Shenzhen), the test report shall not be reproduced except in full.



Approved by: Si Zhang

Sporton International Inc. (Shenzhen)

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People's Republic of China**



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1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Cellular Phone, XT2521-3, XT2521-5**, are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 5mm)	Body-worn (Separation 5mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.42	1.26	1.26	1.59
		GSM1900	0.25	1.37	1.32	
	WCDMA	WCDMA II	0.46	1.37	1.43	
		WCDMA V	0.41	1.33	1.33	
	LTE	LTE Band 2	0.84	1.30	1.26	
		LTE Band 5	0.83	1.37	1.37	
		LTE Band 7	0.88	1.30	1.38	
		LTE Band 41/38	0.85	1.30	1.29	
DTS	WLAN	WLAN2.4GHz	1.26	0.86	1.34	1.59
NII		WLAN5GHz	1.19	0.63	1.19	1.59
DSS	Bluetooth	Bluetooth	0.15	0.18	0.18	1.59

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission 10g SAR (W/kg)
Licensed	GSM	GSM850	2.19	3.98
		GSM1900	2.88	
	WCDMA	WCDMA II	3.14	
		WCDMA V	1.75	
	LTE	LTE Band 2	3.21	
		LTE Band 5	1.82	
		LTE Band 7	2.71	
		LTE Band 41/38	2.57	
DTS	WLAN	WLAN2.4GHz	1.79	3.98
NII		WLAN5GHz	2.99	3.95
Date of Testing:			2024/9/24 ~ 2024/10/19	

Remark: This device supports LTE B38 and B41. Since the supported frequency span for LTE B38 falls completely within the supports frequency span for LTE B41, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B41.

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) 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 International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR05-SZ	CN1256	421272

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
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2521-3, XT2521-5
FCC ID	IHDT56AT2
IMEI Code	Sample 1: IMEI 1: 354293690013472 IMEI 2: 354293690013480 Sample 2: IMEI 1: 354293690015915 IMEI 2: 354293690015923 Sample 3: IMEI 1: 354293690019891 IMEI 2: 354293690019909 Sample 4: IMEI 1: 354403830013098 IMEI 2: 354403830013106 Sample 5: IMEI 1: 354403830019012 IMEI 2: 354403830019020 Sample 6: IMEI 1: 354403830019137 IMEI 2: 354403830019145
Frequency Band	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2535 MHz ~ 2655 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 NFC : 13.56 MHz
Mode	GSM/GPRS/EGPRS AMR / RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz : 802.11b/g/n HT20/ HT40 WLAN 5GHz : 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC:ASK
HW Version	DVT2
SW Version	VVTA35.44
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. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
3. This device 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WiFi Direct (GC/GO), and 5.3GHz / 5.5GHz supports WiFi Direct (GC only).
4. This device does not support DTM operation and supports GPRS/EGPRS mode up to multi-slot class 12.
5. For dual SIM card mobile has two SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 slot to perform all tests.
6. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). Details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
7. For WLAN transmitter, while the device WLAN is transmitting simultaneously with the WWAN/BT antenna, the device power will be reduced power at head exposure conditions. For WLAN transmitter, while the device WLAN is transmitting simultaneously with the WWAN/BT antenna and Proximity sensors trigger, the device power will be reduced power at body-worn and extremity exposure conditions.
8. There are six samples, the different between them refer to the XT2521-3, XT2521-5_ Operational Description of Product Equality Declaration which is exhibit separately. According to the differences, sample 1 was chosen to perform full SAR testing and sample 2/3/4/5/6 verified the worst case of sample 1, the detail samples list are as follows.

Sample 1	XT2521-3	1 st source
Sample 2	XT2521-3	2 nd source
Sample 3	XT2521-3	3 rd source
Sample 4	XT2521-5	1 st source
Sample 5	XT2521-5	2 nd source
Sample 6	XT2521-5	3 rd source



4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																															
FCC ID	IHDT56AT2																																																														
Equipment Name	Mobile Cellular Phone																																																														
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2535 MHz ~ 2655 MHz																																																														
Channel Bandwidth	LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz																																																														
Uplink Modulations used	QPSK / 16QAM / 64QAM																																																														
LTE Voice / Data requirements	Voice and Data																																																														
LTE Release Version	R9																																																														
CA Support	Not Supported																																																														
LTE MPR permanently built-in by design	<p>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</p> <table border="1"> <thead> <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> </thead> <tbody> <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" style="text-align: center;">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table>	Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
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256 QAM	≥ 1						≤ 5																																																								
LTE A-MPR	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)																																																														
Spectrum plots for RB configuration	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.																																																														
Power reduction applied to satisfy SAR compliance	Yes, when operating in Proximity sensors/receiver/hotspot detect mechanism, head/body -worn /hotspot/extremity will trigger reduced power for some bands applied to satisfy SAR compliance, the detail please referred to section 13.																																																														

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 5												
	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	20407	824.7	20415	825.5	20425	826.5	20450	829	20450	829	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844	20600	844	20600	844
LTE Band 7												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 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	20775	2502.5	20800	2505	20825	2507.5	20850	2510	20850	2510	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560	21350	2560	21350	2560

LTE Band 38								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	37775	2572.5	37800	2575	37825	2577.5	37850	2580
M	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610

LTE Band 41(2535~2655)								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	40065	2537.5	40090	2540	40115	2542.5	40140	2545
LM	40385	2569.5	40390	2570	40395	2570.5	40400	2571
HM	40705	2601.5	40690	2600	40685	2599.5	40670	2598
H	41215	2652.5	41190	2650	41165	2647.5	41140	2645

<For LTE Overlap Bands Description>

1) LTE Bands BW

Band	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
LTE Band 38			Yes	Yes	Yes	Yes
LTE Band 41			Yes	Yes	Yes	Yes

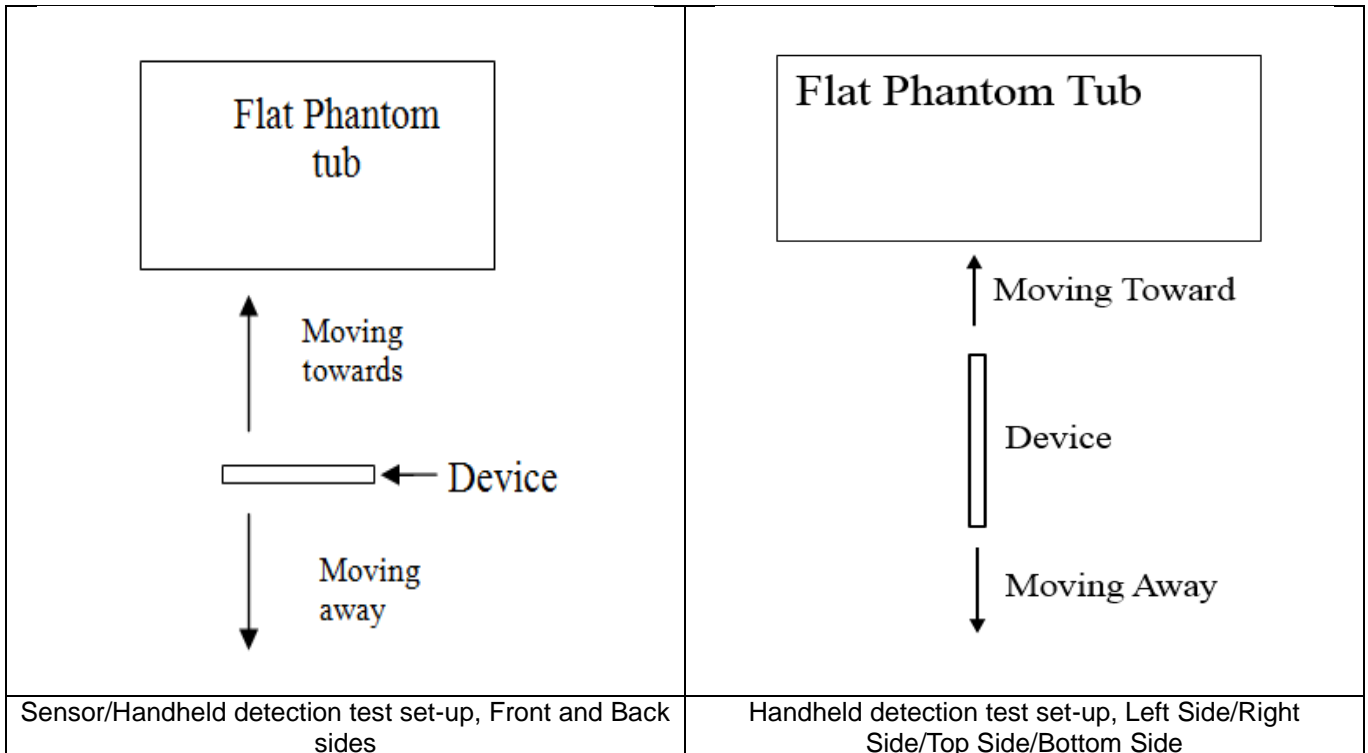
2) LTE Bands tune up:

Band	Ant	Full	ECI 2	ECI 3	ECI 6	ECI 7
		Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
LTE Band 38	Ant.0	24	24	17	20	16
LTE Band 41	Ant.0	24	24	17	20	16
LTE Band 38	Ant.3	24	19	18	22	17
LTE Band 41	Ant.3	24	19	18	22	17

5. 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 (5850MHz) and lowest (835MHz) 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 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). When front or back body worn condition is detected reduced power will be active.
5. The device employs proximity sensors also can detect the presence of the user's a finger or hand when handheld state at the front/back/left/right/top/bottom sides of the device. When front/back/left/right/top/bottom sides of handheld condition is detected reduced power will be active.
6. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1mm was performed.



<P-Sensor>

Proximity Sensor Triggering Distance (mm)				
Position	Front		Back	
	Moving towards	Moving away	Moving towards	Moving away
Minimum	17	19	28	29

<Handheld for Ant0>

Proximity Sensor Triggering Distance (mm)						
Position	Front		Back		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	6	7	12	14	12	13

<Handheld for Ant3>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Left Side		Top Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	5	6	11	12	6	7	7	8

<Handheld for Ant5>

Proximity Sensor Triggering Distance (mm)						
Position	Front		Back		Right Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	4	6	8	9	8	9

6. RF Exposure Limits

6.1 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.

6.2 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

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.

7. Specific Absorption Rate (SAR)

7.1 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.

7.2 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:

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

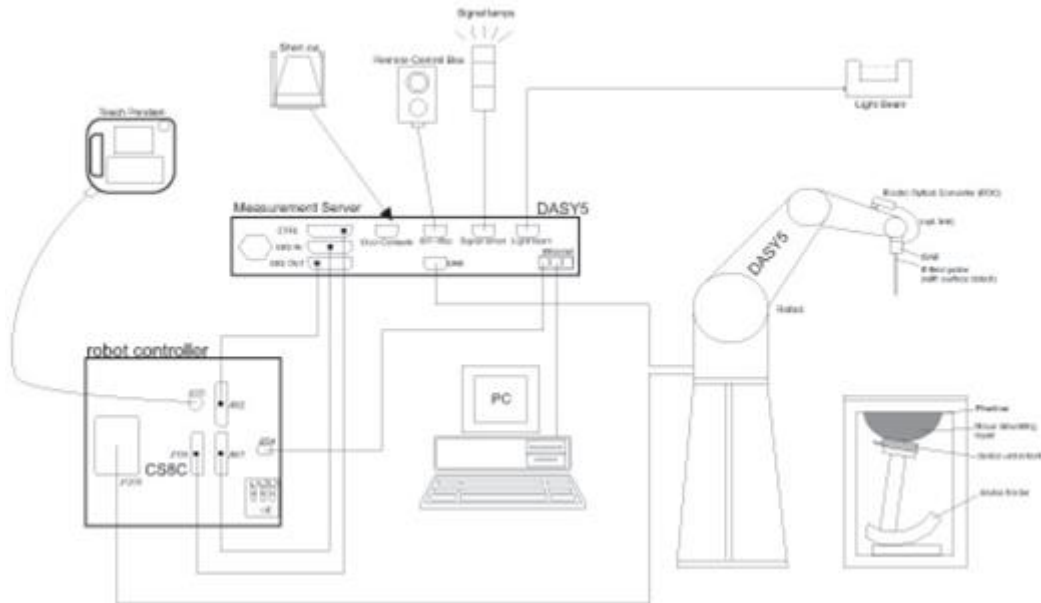
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. 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.

8.1 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.

<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	4 MHz – >10 GHz Linearity: ±0.2 dB (30 MHz – 10 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	

8.2 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.



Photo of DAE


8.3 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 or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

8.4 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

9. 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

9.1 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 from 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

9.2 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.

9.3 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.

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

9.4 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: $\Delta x_{Zoom}, \Delta y_{Zoom}$		≤ 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 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z	≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm	
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> 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.				

9.5 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.

9.6 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.



10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	4d162	Dec. 17, 2021	Dec. 15, 2024
SPEAG	1900MHz System Validation Kit	D1900V2	5d182	Dec. 20, 2021	Dec. 18, 2024
SPEAG	2450MHz System Validation Kit	D2450V2	924	Nov. 03, 2023	Nov. 02, 2024
SPEAG	2600MHz System Validation Kit	D2600V2	1070	Dec. 20, 2021	Dec. 18, 2024
SPEAG	5000MHz System Validation Kit	D5GHzV2	1341	Dec. 13, 2021	Dec. 11, 2024
SPEAG	Data Acquisition Electronics	DAE4	715	Jan. 25, 2024	Jan. 24, 2025
SPEAG	Dosimetric E-Field Probe	EX3DV4	7641	Jun. 03, 2024	Jun. 02, 2025
SPEAG	SAM Twin Phantom	QD 000 P41 AA	2033	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201563813	Dec. 28, 2023	Dec. 27, 2024
Anritsu	Radio communication analyzer	MT8821C	6262314715	Jul. 04, 2024	Jul. 03, 2025
Agilent	Wireless Communication Test Set	E5515C	MY50267224	Jul. 03, 2024	Jul. 02, 2025
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 16, 2023	Oct. 15, 2024
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 15, 2024	Oct. 14, 2025
Speag	Dielectric Assessment KIT	DAK-3.5	1071	Feb. 19, 2024	Feb. 18, 2025
Agilent	Signal Generator	N5181A	MY50145381	Dec. 28, 2023	Dec. 27, 2024
R&S	Signal Generator	SMB100A	175779	Dec. 28, 2023	Dec. 27, 2024
Anritsu	Power Sensor	MA2411B	1306099	Oct. 16, 2023	Oct. 15, 2024
Anritsu	Power Meter	ML2495A	1349001	Oct. 16, 2023	Oct. 15, 2024
Anritsu	Power Sensor	MA2411B	1306099	Oct. 15, 2024	Oct. 14, 2025
Anritsu	Power Meter	ML2495A	1349001	Oct. 15, 2024	Oct. 14, 2025
Anritsu	Power Sensor	MA2411B	1542004	Dec. 28, 2023	Dec. 27, 2024
Anritsu	Power Meter	ML2495A	1339473	Dec. 28, 2023	Dec. 27, 2024
R&S	Power Sensor	NRP50S	101254	Apr. 08, 2024	Apr. 07, 2025
R&S	Power Sensor	NRP8S	109228	Apr. 08, 2024	Apr. 07, 2025
R&S	CBT BLUETOOTH TESTER	CBT	100963	Dec. 28, 2023	Dec. 27, 2024
R&S	Spectrum Analyzer	FSP7	100818	Jul. 04, 2024	Jul. 03, 2025
TES	Hygrometer	1310	200505600	Jul. 08, 2024	Jul. 07, 2025
Anymetre	Thermo-Hygrometer	JR593	2020062101	Jul. 09, 2024	Jul. 08, 2025
AR	Amplifier	5S1G4	0333096	Note 1	
Mini-Circuits	Amplifier	ZVE-3W-83+	599201528	Note 1	
SPEAG	Device Holder	N/A	N/A	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
ET Industries	Dual Directional Coupler	C-058-10	N/A	Note 1	
Jinkexinhua	Attenuator	10db-8G	N/A	Note 1	

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.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

11. System Verification

11.1 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.

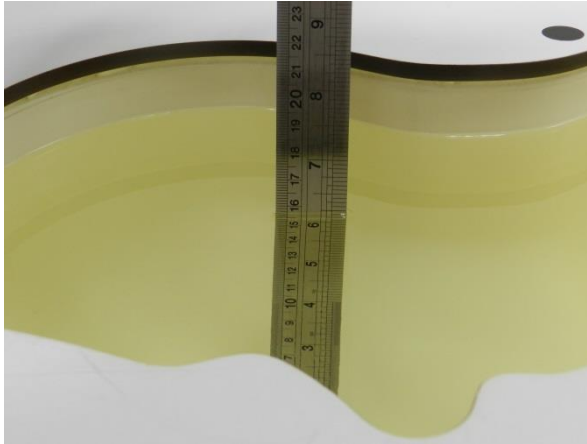


Fig 10.1 Photo of Liquid Height for Head SAR

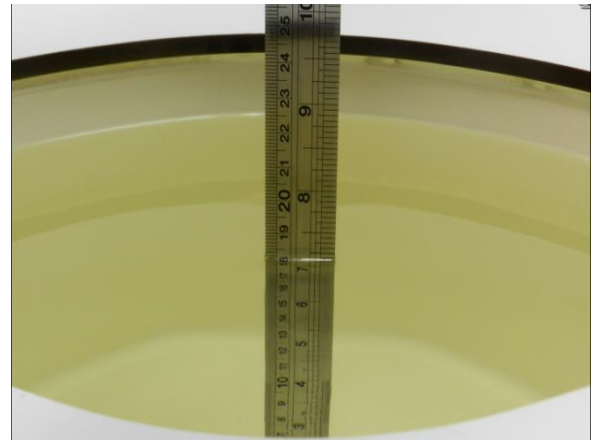


Fig 10.2 Photo of Liquid Height for Body SAR

11.2 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 (ϵ_r)
For Head								
835	40.3	57.9	0.2	1.4	0.2	0	0.90	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								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
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. (°C)	Conductivity (σ)	Permittivity (ε _r)	Conductivity Target (σ)	Permittivity Target (ε _r)	Delta (σ) (%)	Delta (ε _r) (%)	Limit (%)	Date
835	Head	22.8	0.935	43.311	0.90	41.50	3.89	4.36	±5	2024/9/24
835	Head	22.3	0.942	41.846	0.90	41.50	4.67	0.83	±5	2024/10/5
1900	Head	22.7	1.454	39.129	1.40	40.00	3.86	-2.18	±5	2024/9/28
1900	Head	22.5	1.453	41.261	1.40	40.00	3.79	3.15	±5	2024/10/6
2450	Head	22.5	1.816	38.596	1.80	39.20	0.89	-1.54	±5	2024/9/27
2450	Head	22.7	1.854	39.607	1.80	39.20	3.00	1.04	±5	2024/10/8
2600	Head	22.6	1.951	40.279	1.96	39.00	-0.46	3.28	±5	2024/9/25
2600	Head	22.3	1.935	38.536	1.96	39.00	-1.28	-1.19	±5	2024/10/17
5250	Head	22.5	4.544	37.238	4.71	35.95	-3.52	3.58	±5	2024/9/28
5250	Head	22.8	4.514	34.949	4.71	35.95	-4.16	-2.78	±5	2024/10/6
5600	Head	22.6	4.905	36.778	5.07	35.50	-3.25	3.60	±5	2024/9/27
5600	Head	22.4	4.855	34.483	5.07	35.50	-4.24	-2.86	±5	2024/10/8
5750	Head	22.7	5.066	36.594	5.22	35.35	-2.95	3.52	±5	2024/9/30
5750	Head	22.5	5.005	34.296	5.22	35.35	-4.12	-2.98	±5	2024/10/19

11.3 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.

<1g SAR>

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 (%)
2024/9/24	835	Head	250	4d162	7641	715	2.450	9.640	9.8	1.66
2024/10/5	835	Head	250	4d162	7641	715	2.490	9.640	9.96	3.32
2024/9/28	1900	Head	250	5d182	7641	715	10.200	39.600	40.8	3.03
2024/10/6	1900	Head	250	5d182	7641	715	10.100	39.600	40.4	2.02
2024/9/27	2450	Head	250	924	7641	715	13.400	52.300	53.6	2.49
2024/10/8	2450	Head	250	924	7641	715	12.700	52.300	50.8	-2.87
2024/9/25	2600	Head	250	1070	7641	715	14.700	56.200	58.8	4.63
2024/10/17	2600	Head	250	1070	7641	715	13.400	56.200	53.6	-4.63
2024/9/28	5250	Head	100	1341	7641	715	8.510	80.700	85.1	5.45
2024/10/6	5250	Head	100	1341	7641	715	8.340	80.700	83.4	3.35
2024/9/27	5600	Head	100	1341	7641	715	9.120	84.500	91.2	7.93
2024/10/8	5600	Head	100	1341	7641	715	8.950	84.500	89.5	5.92
2024/9/30	5750	Head	100	1341	7641	715	8.630	80.600	86.3	7.07
2024/10/19	5750	Head	100	1341	7641	715	7.910	80.600	79.1	-1.86

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2024/9/24	835	Head	250	4d162	7641	715	1.580	6.260	6.32	0.96
2024/10/5	835	Head	250	4d162	7641	715	1.610	6.260	6.44	2.88
2024/9/28	1900	Head	250	5d182	7641	715	5.200	20.200	20.8	2.97
2024/10/6	1900	Head	250	5d182	7641	715	5.390	20.200	21.56	6.73
2024/9/27	2450	Head	250	924	7641	715	6.330	24.500	25.32	3.35
2024/10/8	2450	Head	250	924	7641	715	5.890	24.500	23.56	-3.84
2024/9/25	2600	Head	250	1070	7641	715	6.390	24.600	25.56	3.90
2024/10/17	2600	Head	250	1070	7641	715	5.960	24.600	23.84	-3.09
2024/9/28	5250	Head	100	1341	7641	715	2.460	23.100	24.6	6.49
2024/10/6	5250	Head	100	1341	7641	715	2.390	23.100	23.9	3.46
2024/9/27	5600	Head	100	1341	7641	715	2.580	24.000	25.8	7.50
2024/10/8	5600	Head	100	1341	7641	715	2.530	24.000	25.3	5.42
2024/9/30	5750	Head	100	1341	7641	715	2.440	22.700	24.4	7.49
2024/10/19	5750	Head	100	1341	7641	715	2.210	22.700	22.1	-2.64

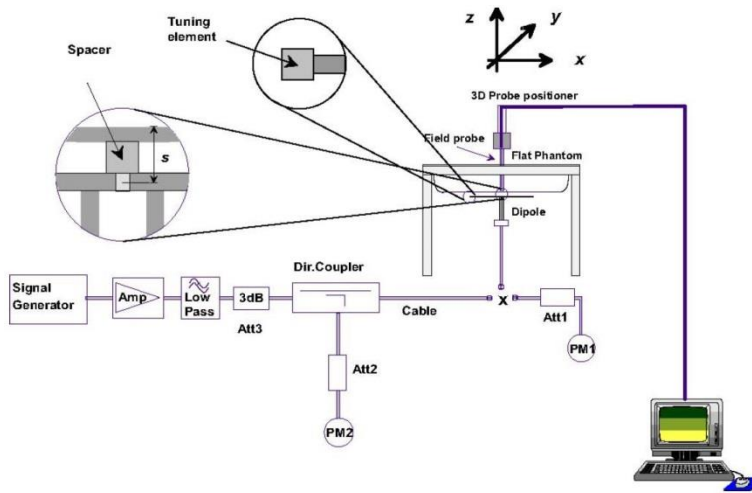


Fig 10.3.1 System Performance Check Setup



Fig 10.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

Figure 11.1.1 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 11.1.2 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 11.1.3). 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 11.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

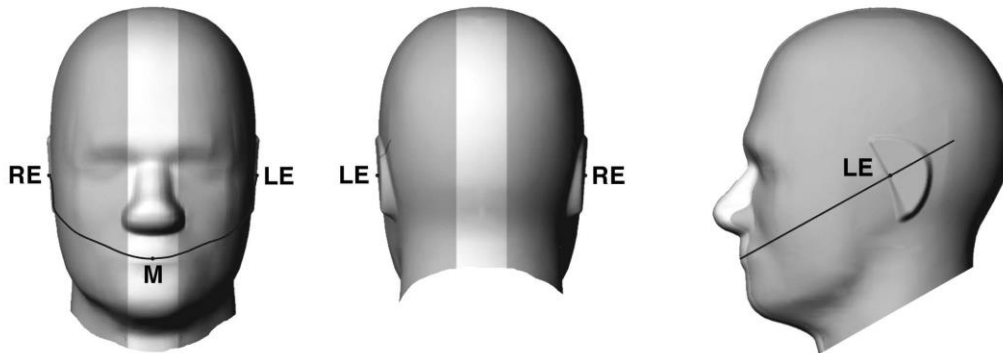


Fig 11.1.1 Front, back, and side views of SAM twin phantom

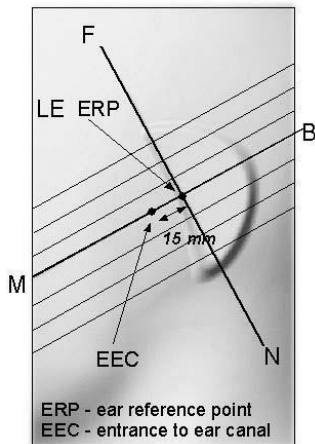


Fig 11.1.2 Close-up side view of phantom showing the ear region.

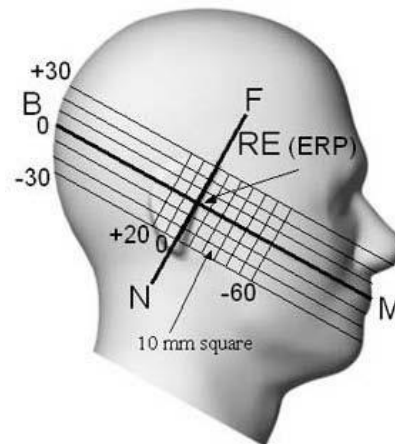


Fig 11.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 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 w_t of the handset at the level of the acoustic output (point A in Figure 11.2.1 and Figure 11.2.2), and the midpoint of the width w_b 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 11.2.1). 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 11.2.2), 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 11.2.3), 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 11.2.3. The actual rotation angles should be documented in the test report.

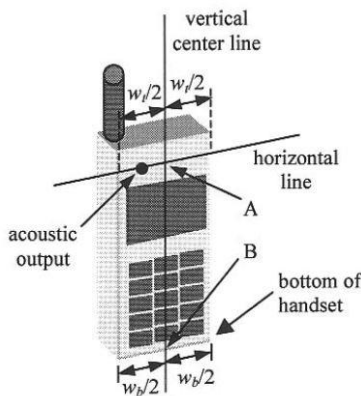


Fig 11.2.1 Handset vertical and horizontal reference lines—“fixed case”

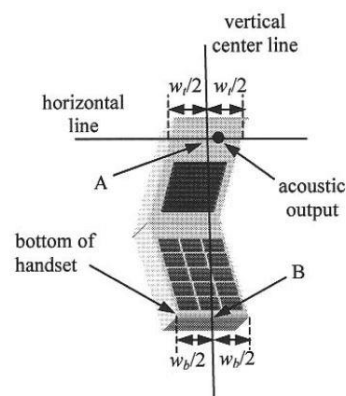


Fig 11.2.2 Handset vertical and horizontal reference lines—“clam-shell case”

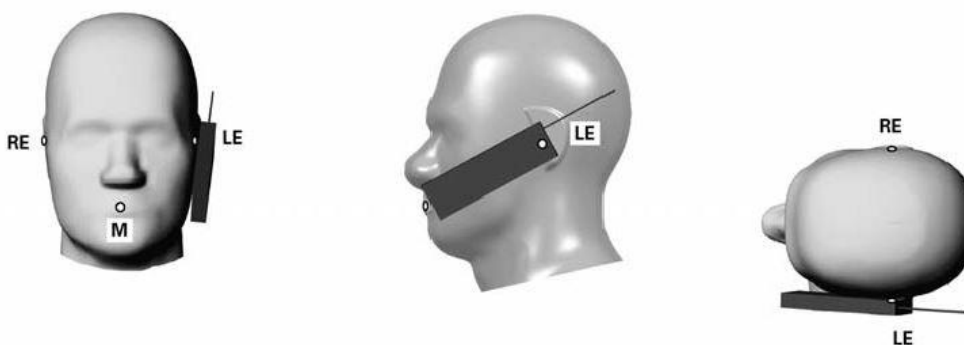


Fig 11.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 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 11.3.1. 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

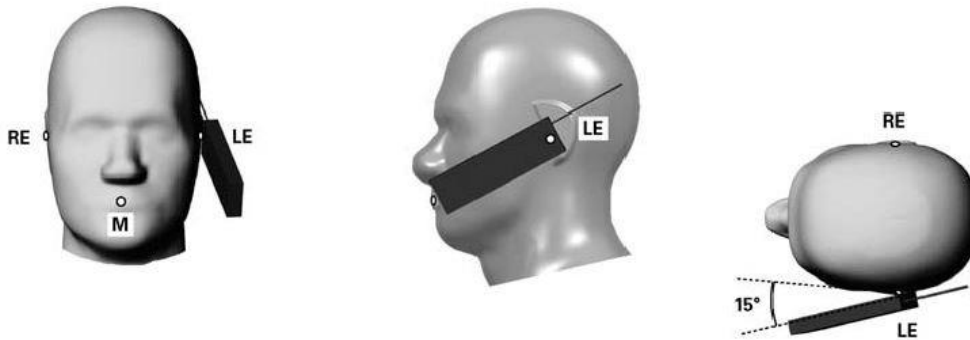


Fig 11.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 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 11.4). 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 $> 1.2 \text{ W/kg}$, 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. 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 tested 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.

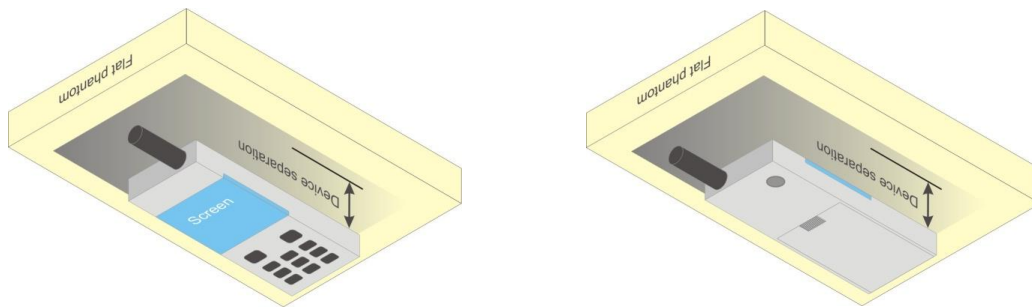


Fig 11.4 Body Worn Position



12.5 Product Specific 10g SAR Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, that can provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets and support voice calls next to the ear, according to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.
2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

12.6 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 ($L \times W \geq 9$ 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 from 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.

13. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<GSM Conducted Power>

General Note:

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

<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 HSPA+ devices supporting 16 QAM in the uplink, power measurements procedure is according to the configurations in Table C.11.1.4 of 3GPP TS 34.121-1.
4. 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} (Note 1, 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 $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

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 $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. 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 $\beta_c = 11/15$ and $\beta_d = 15/15$.

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-TFCl
 - viii. Confirm that E-TFCl is equal to the target E-TFCl of 75 for sub-test 1, and other subtest's E-TFCl
- 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-TFCl
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	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	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	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 $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{hs} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. 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 $\beta_c = 10/15$ and $\beta_d = 15/15$.

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: $\beta_c/\beta_d=2/15$
 - b). Subtest 2: $\beta_c/\beta_d=12/15$
 - c). Subtest 3: $\beta_c/\beta_d=15/8$
 - d). Subtest 4: $\beta_c/\beta_d=15/4$
 - 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	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

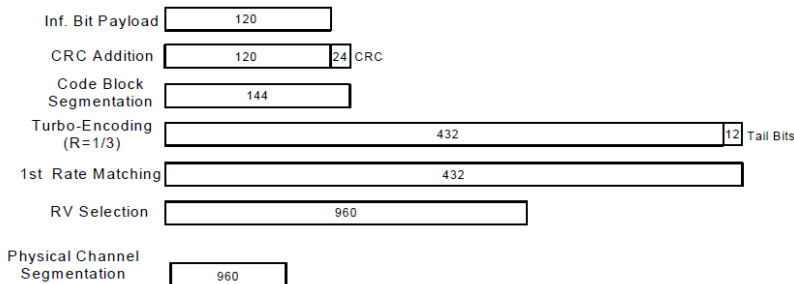


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

HSPA+ 3GPP release 7 (uplink category 7) 16QAM, 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 = 5.2E:HSPA+:UL with 16QAM
 - 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, C11.1.4, quoted from the TS 34.121-1 s5.2E
 - iii. Set Channel Params
 - iv. Set Cell Power = -86 dBm
 - v. Set Channel Type = HSPA
 - vi. Set UE Target Power =21 dBm
 - vii. Power Ctrl Mode= All Up Bits
 - viii. Set Manual Uplink DPCH Bc/Bd = Manual
 - ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 table C11.1.4 sub-test 1)
 - x. Set HSPA Conn DL Channel Levels
 - xi. Set HS-SCCH Configs
 - xii. Set RB Test Mode Setup
 - xiii. Set Common HSUPA Parameters
 - xiv. Set Serving Grant
 - xv. Confirm that E-TFCl is equal to the target E-TFCl of 105 for sub-test 1, and other subtest's E-TFCl
- d. The transmitted maximum output power was recorded.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note 3)	β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCl (Note 5)	E-TFCl (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105

Note 1: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default.

Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

Setup Configuration

<WCDMA Conducted Power>

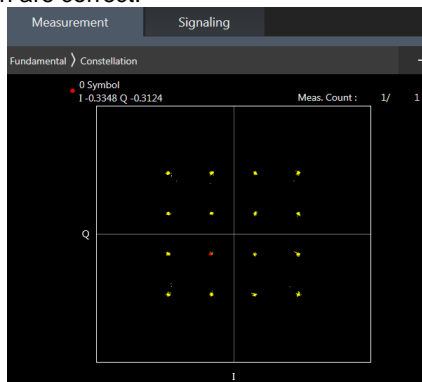
General Note:

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 / HSPA+ is $\leq 1/4$ 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 / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than $1/4$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

<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/64QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ 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/64QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ 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 B5 / B38 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.
9. LTE B38 SAR test was covered by B41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is \leq the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to May 2017 TCB workshop, for 16QAM and 64QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



16QAM



64QAM

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

- a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
- b. "special subframe S" contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS
- c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.

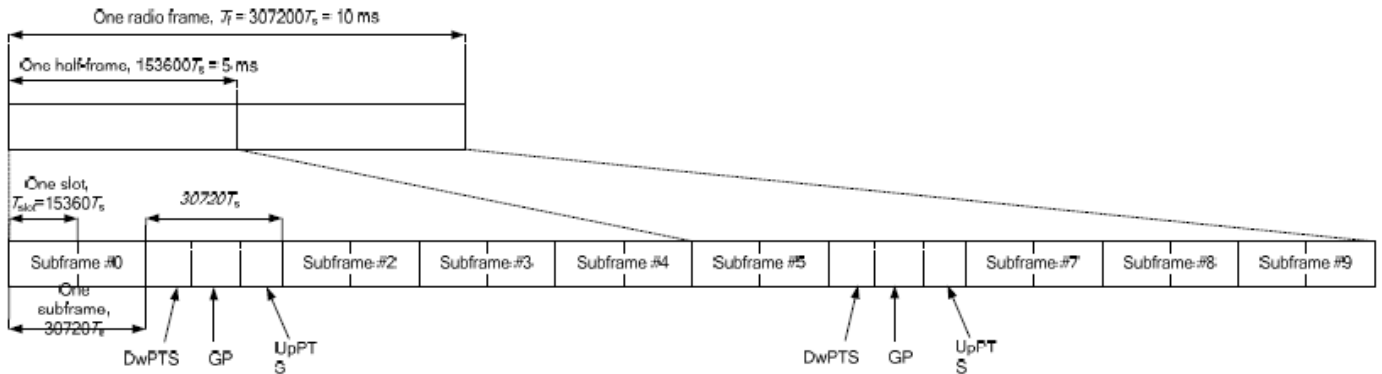


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

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

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

Special subframe (30720·T_s): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
Uplink duty factor in one special subframe	0~4	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe(30720·T_s): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
Uplink duty factor in one special subframe	0~3	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

For LTE TDD Power class 3

- i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.167)/5 = 63.3\%$
- iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.143)/5 = 62.9\%$
- v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.



<WLAN Conducted Power>

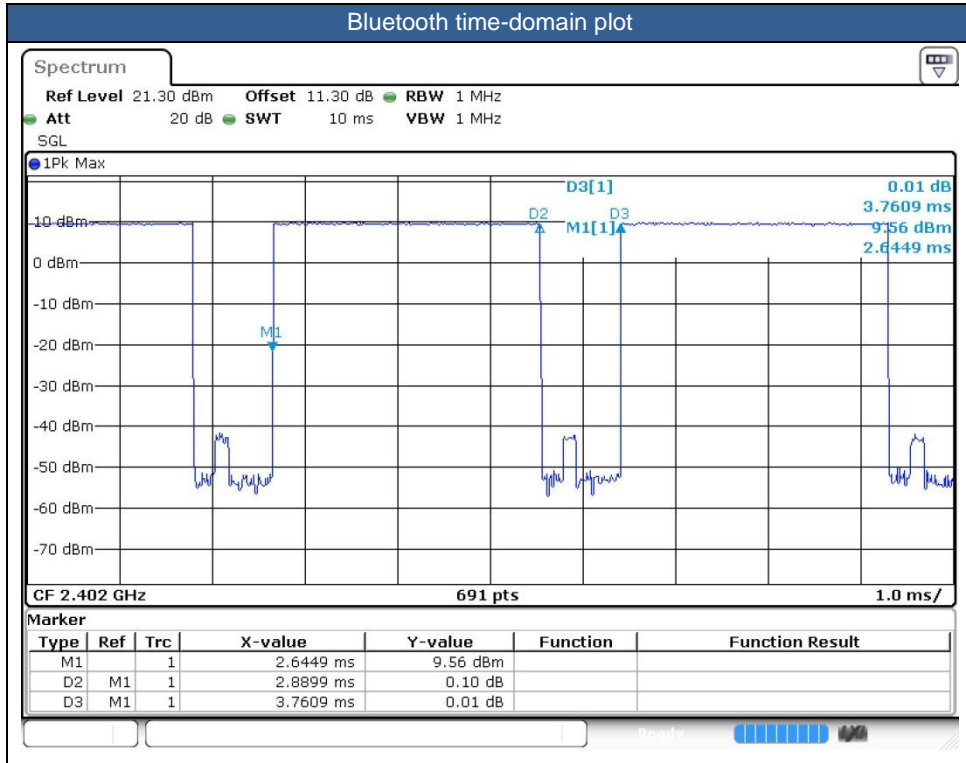
General Note:

1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration. Additional output power measurements were not necessary.
2. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
3. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
4. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
5. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
 - a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
 - b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
 - c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<2.4GHz Bluetooth>

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle is 76.84 % as following figure, according to Oct. 2016 TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 83.3%, therefore the actual duty cycle will be scaled up to 83.3% for Bluetooth reported SAR calculation.





14. Antenna Location

The detailed antenna location information can refer to SAR Test Setup Photos.

15. 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/Bluetooth 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 SAR testing of Bluetooth signal with 83.3% theoretical duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle) *83.3%".
 - d. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
 - e. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
 - f. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR (W/kg) = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix
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 ≥ 0.8 W/kg.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
5. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). Details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
6. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power (for handheld on state, the maximum full power means reduced power), including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
 - a. For this device SAR for WWAN/WLAN transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of GSM850/1900, WCDMA Band II/V, LTE Band 2/5/7/38/41 and WLAN 2.4GHz /WLAN 5.2/5.8GHZ therefore product specific 10g SAR is necessary.
 - b. WLAN 5.3/5.5GHZ tested the product specific 10g SAR since it has no hotspot mode.
 - c. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.
7. Although the headset SAR is greater than 0.8 W/kg, the headset SAR verified the worst of the non-headset SAR and less than non-headset SAR, so there is no need to be tested other channels.
8. The following table "n/a" in the result means the SAR cube is too small to be detected.
9. For Bluetooth distance SAR test at Front 16mm and Back 27mm is only for simultaneous transmission analysis with WWAN.
10. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hotspot SAR.
11. For Phablet devices, when hotspot mode is not supported, Product specific 10-g SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.

**GSM Note:**

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

WCDMA 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 / HSPA+ is $\leq \frac{1}{4}$ 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 / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

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/64QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ 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/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ 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 B5 / B38 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.
7. LTE B38 SAR test was covered by B41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is \leq the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band



WLAN/Bluetooth Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.



15.1 Head SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
835MHz																					
01	GSM850	-	-	-	-	GPRS 2 TX Slot	Right Cheek	0mm	Ant 0	ECI 2	189	836.4	1	30.24	31.50	1.337	-	-	0.13	0.315	0.421
	GSM850	-	-	-	-	GPRS 2 TX Slot	Right Cheek	0mm	Ant 0	ECI 2	189	836.4	4	30.24	31.50	1.337	-	-	0.06	0.254	0.339
	GSM850	-	-	-	-	GPRS 2 TX Slot	Right Tilted	0mm	Ant 0	ECI 2	189	836.4	1	30.24	31.50	1.337	-	-	-0.11	0.174	0.233
	GSM850	-	-	-	-	GPRS 2 TX Slot	Left Cheek	0mm	Ant 0	ECI 2	189	836.4	1	30.24	31.50	1.337	-	-	-0.01	0.288	0.385
	GSM850	-	-	-	-	GPRS 2 TX Slot	Left Tilted	0mm	Ant 0	ECI 2	189	836.4	1	30.24	31.50	1.337	-	-	-0.08	0.170	0.227
02	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI 2	4182	836.4	1	23.32	24.00	1.169	-	-	-0.03	0.346	0.405
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI 2	4182	836.4	4	23.32	24.00	1.169	-	-	0.13	0.331	0.387
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	ECI 2	4182	836.4	1	23.32	24.00	1.169	-	-	0.01	0.204	0.239
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 2	4182	836.4	1	23.32	24.00	1.169	-	-	0.16	0.319	0.373
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	ECI 2	4182	836.4	1	23.32	24.00	1.169	-	-	0.02	0.197	0.230
	LTE Band 5	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 0	ECI 2	20525	836.5	1	23.29	24.00	1.178	-	-	-0.06	0.300	0.353
	LTE Band 5	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 0	ECI 2	20525	836.5	4	23.29	24.00	1.178	-	-	0.02	0.257	0.303
	LTE Band 5	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 0	ECI 2	20525	836.5	1	23.29	24.00	1.178	-	-	0.08	0.181	0.213
	LTE Band 5	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 0	ECI 2	20525	836.5	1	23.29	24.00	1.178	-	-	0.01	0.276	0.325
	LTE Band 5	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 0	ECI 2	20525	836.5	1	23.29	24.00	1.178	-	-	-0.05	0.169	0.199
	LTE Band 5	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 0	ECI 2	20525	836.5	1	22.16	23.00	1.213	-	-	0.15	0.236	0.286
	LTE Band 5	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 0	ECI 2	20525	836.5	1	22.16	23.00	1.213	-	-	0.1	0.144	0.175
	LTE Band 5	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 0	ECI 2	20525	836.5	1	22.16	23.00	1.213	-	-	-0.07	0.221	0.268
	LTE Band 5	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 0	ECI 2	20525	836.5	1	22.16	23.00	1.213	-	-	-0.04	0.139	0.169
03	LTE Band 5	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 3	ECI 2	20525	836.5	1	20.65	22.00	1.365	-	-	-0.08	0.609	0.831
	LTE Band 5	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 3	ECI 2	20525	836.5	4	20.65	22.00	1.365	-	-	0.07	0.596	0.813
	LTE Band 5	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 3	ECI 2	20525	836.5	2	20.65	22.00	1.365	-	-	0.02	0.525	0.716
	LTE Band 5	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 3	ECI 2	20525	836.5	3	20.65	22.00	1.365	-	-	0.15	0.485	0.662
	LTE Band 5	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 3	ECI 2	20525	836.5	5	20.65	22.00	1.365	-	-	-0.03	0.475	0.648
	LTE Band 5	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 3	ECI 2	20525	836.5	6	20.65	22.00	1.365	-	-	0.07	0.458	0.625
	LTE Band 5	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 3	ECI 2	20525	836.5	1	20.65	22.00	1.365	-	-	-0.11	0.465	0.635
	LTE Band 5	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 3	ECI 2	20525	836.5	1	20.65	22.00	1.365	-	-	0.02	0.441	0.602
	LTE Band 5	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 3	ECI 2	20525	836.5	1	20.65	22.00	1.365	-	-	0.18	0.380	0.519
	LTE Band 5	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 3	ECI 2	20525	836.5	1	19.66	21.00	1.361	-	-	0.19	0.494	0.673
	LTE Band 5	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 3	ECI 2	20525	836.5	1	19.66	21.00	1.361	-	-	-0.05	0.379	0.516
	LTE Band 5	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 3	ECI 2	20525	836.5	1	19.66	21.00	1.361	-	-	-0.17	0.348	0.474
	LTE Band 5	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 3	ECI 2	20525	836.5	1	19.66	21.00	1.361	-	-	-0.15	0.315	0.429
	LTE Band 5	10M	QPSK	50	0	-	Left Tilted	0mm	Ant 3	ECI 2	20525	836.5	1	19.54	21.00	1.400	-	-	0.15	0.499	0.698
1900MHz																					
04	GSM1900	-	-	-	-	GPRS 2 TX Slot	Right Cheek	0mm	Ant 0	ECI 2	661	1880	1	27.27	28.50	1.327	-	-	-0.1	0.186	0.247
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Right Cheek	0mm	Ant 0	ECI 2	661	1880	4	27.27	28.50	1.327	-	-	0.08	0.171	0.227
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Right Tilted	0mm	Ant 0	ECI 2	661	1880	1	27.27	28.50	1.327	-	-	0.15	0.135	0.179
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Left Cheek	0mm	Ant 0	ECI 2	661	1880	1	27.27	28.50	1.327	-	-	0.01	0.156	0.207
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Left Tilted	0mm	Ant 0	ECI 2	661	1880	1	27.27	28.50	1.327	-	-	0.08	0.167	0.222
05	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI 2	9400	1880	1	23.29	24.00	1.178	-	-	0.01	0.392	0.462
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	ECI 2	9400	1880	4	23.29	24.00	1.178	-	-	0.03	0.385	0.453
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	ECI 2	9400	1880	1	23.29	24.00	1.178	-	-	0.06	0.277	0.326
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	ECI 2	9400	1880	1	23.29	24.00	1.178	-	-	0.05	0.347	0.409
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	ECI 2	9400	1880	1	23.29	24.00	1.178	-	-	-0.09	0.337	0.397
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 0	ECI 2	18900	1880	1	23.05	24.00	1.245	-	-	0.13	0.281	0.350
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 0	ECI 2	18900	1880	4	23.05	24.00	1.245	-	-	0.05	0.272	0.339
	LTE Band 2	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 0	ECI 2	18900	1880	1	23.05	24.00	1.245	-	-	0.02	0.195	0.243
	LTE Band 2	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 0	ECI 2	18900	1880	1	23.05	24.00	1.245	-	-	0.16	0.241	0.300
	LTE Band 2	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 0	ECI 2	18900	1880	1	23.05	24.00	1.245	-	-	0.04	0.240	0.299
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 0	ECI 2	18900	1880	1	21.93	23.00	1.279	-	-	-0.06	0.215	0.275
	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 0	ECI 2	18900	1880	1	21.93	23.00	1.279	-	-	-0.07	0.149	0.191



	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 0	ECI 2	18900	1880	1	21.93	23.00	1.279	-	-	-0.01	0.189	0.242
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 0	ECI 2	18900	1880	1	21.93	23.00	1.279	-	-	-0.11	0.188	0.241
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	18900	1880	1	15.42	17.00	1.439	-	-	-0.19	0.559	0.804
	LTE Band 2	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 3	ECI 2	18900	1880	1	15.42	17.00	1.439	-	-	0.14	0.504	0.725
	LTE Band 2	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 3	ECI 2	18900	1880	1	15.42	17.00	1.439	-	-	-0.11	0.288	0.414
	LTE Band 2	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 3	ECI 2	18900	1880	1	15.42	17.00	1.439	-	-	0.05	0.317	0.456
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	18700	1860	1	15.18	17.00	1.521	-	-	-0.06	0.463	0.704
06	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	19100	1900	1	15.27	17.00	1.489	-	-	-0.09	0.562	0.837
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	19100	1900	4	15.27	17.00	1.489	-	-	0.02	0.485	0.722
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	19100	1900	2	15.27	17.00	1.489	-	-	0.07	0.475	0.707
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	19100	1900	3	15.27	17.00	1.489	-	-	-0.05	0.498	0.742
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	19100	1900	5	15.27	17.00	1.489	-	-	0.03	0.431	0.642
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	19100	1900	5	15.27	17.00	1.489	-	-	0.11	0.445	0.663
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 3	ECI 2	18900	1880	1	14.30	16.00	1.479	-	-	0.09	0.419	0.620
	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 3	ECI 2	18900	1880	1	14.30	16.00	1.479	-	-	-0.04	0.414	0.612
	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 3	ECI 2	18900	1880	1	14.30	16.00	1.479	-	-	0.17	0.238	0.352
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 3	ECI 2	18900	1880	1	14.30	16.00	1.479	-	-	0.18	0.271	0.401
	LTE Band 2	20M	QPSK	100	0	-	Right Cheek	0mm	Ant 3	ECI 2	18900	1880	1	14.35	16.00	1.462	-	-	-0.18	0.423	0.619
2600MHz																					
	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 0	ECI 2	21100	2535	1	23.49	24.00	1.125	-	-	0.04	0.080	0.090
	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 0	ECI 2	21100	2535	4	23.49	24.00	1.125	-	-	0.02	0.068	0.076
	LTE Band 7	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 0	ECI 2	21100	2535	1	23.49	24.00	1.125	-	-	-0.08	0.040	0.045
	LTE Band 7	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 0	ECI 2	21100	2535	1	23.49	24.00	1.125	-	-	0.1	0.060	0.067
	LTE Band 7	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 0	ECI 2	21100	2535	1	23.49	24.00	1.125	-	-	0.08	0.048	0.054
	LTE Band 7	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 0	ECI 2	21100	2535	1	22.37	23.00	1.156	-	-	-0.04	0.065	0.075
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 0	ECI 2	21100	2535	1	22.37	23.00	1.156	-	-	-0.03	0.033	0.038
	LTE Band 7	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 0	ECI 2	21100	2535	1	22.37	23.00	1.156	-	-	0.12	0.047	0.054
	LTE Band 7	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 0	ECI 2	21100	2535	1	22.37	23.00	1.156	-	-	-0.05	0.040	0.046
07	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	21100	2535	1	16.21	17.50	1.346	-	-	-0.06	0.654	0.880
	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	21100	2535	4	16.21	17.50	1.346	-	-	0.07	0.525	0.707
	LTE Band 7	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 3	ECI 2	21100	2535	1	16.21	17.50	1.346	-	-	-0.14	0.555	0.747
	LTE Band 7	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 3	ECI 2	21100	2535	1	16.21	17.50	1.346	-	-	-0.08	0.196	0.264
	LTE Band 7	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 3	ECI 2	21100	2535	1	16.21	17.50	1.346	-	-	0.03	0.219	0.295
	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	20850	2510	1	16.04	17.50	1.400	-	-	0.14	0.563	0.788
	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	21350	2560	1	16.19	17.50	1.352	-	-	0.03	0.639	0.864
	LTE Band 7	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 3	ECI 2	21100	2535	1	14.98	16.50	1.419	-	-	-0.11	0.520	0.738
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 3	ECI 2	21100	2535	1	14.98	16.50	1.419	-	-	-0.19	0.449	0.637
	LTE Band 7	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 3	ECI 2	21100	2535	1	14.98	16.50	1.419	-	-	-0.14	0.154	0.219
	LTE Band 7	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 3	ECI 2	21100	2535	1	14.98	16.50	1.419	-	-	0.02	0.174	0.247
	LTE Band 7	20M	QPSK	100	0	-	Right Cheek	0mm	Ant 3	ECI 2	21100	2535	1	14.90	16.50	1.445	-	-	0.03	0.543	0.785
	LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 0	ECI 2	40400	2571	1	23.48	24.00	1.127	62.9	1.006	-0.11	0.057	0.065
	LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 0	ECI 2	40400	2571	4	23.48	24.00	1.127	62.9	1.006	0.05	0.052	0.059
	LTE Band 41	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 0	ECI 2	40400	2571	1	23.48	24.00	1.127	62.9	1.006	-0.11	0.029	0.033
	LTE Band 41	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 0	ECI 2	40400	2571	1	23.48	24.00	1.127	62.9	1.006	0.06	0.038	0.043
	LTE Band 41	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 0	ECI 2	40400	2571	1	23.48	24.00	1.127	62.9	1.006	0.08	0.019	0.022
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 0	ECI 2	40400	2571	1	22.44	23.00	1.138	62.9	1.006	-0.04	0.044	0.050
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 0	ECI 2	40400	2571	1	22.44	23.00	1.138	62.9	1.006	-0.14	0.022	0.025
	LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 0	ECI 2	40400	2571	1	22.44	23.00	1.138	62.9	1.006	-0.01	0.029	0.033
	LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 0	ECI 2	40400	2571	1	22.44	23.00	1.138	62.9	1.006	0.05	0.015	0.017
	LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	40400	2571	1	17.59	19.00	1.384	62.9	1.006	-0.19	0.558	0.777
	LTE Band 41	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 3	ECI 2	40400	2571	1	17.59	19.00	1.384	62.9	1.006	0.14	0.470	0.654
	LTE Band 41	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 3	ECI 2	40400	2571	1	17.59	19.00	1.384	62.9	1.006	0.05	0.164	0.228
	LTE Band 41	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 3	ECI 2	40400	2571	1	17.59	19.00	1.384	62.9	1.006	0.15	0.178	0.248
	LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	40140	2545	1	17.49	19.00	1.416	62.9	1.006	0.08	0.494	0.704
08	LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	40670	2598	1	17.43	19.00	1.435	62.9	1.006	0.08	0.587	0.848
	LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	40670	2598	4	17.43	19.00	1.435	62.9	1.006	-0.15	0.574	0.829



LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 3	ECI 2	41140	2645	1	17.28	19.00	1.486	62.9	1.006	0.09	0.549	0.821
LTE Band 41	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 3	ECI 2	40140	2545	1	17.49	19.00	1.416	62.9	1.006	-0.08	0.415	0.591
LTE Band 41	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 3	ECI 2	40670	2598	1	17.43	19.00	1.435	62.9	1.006	0.17	0.494	0.713
LTE Band 41	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 3	ECI 2	41140	2645	1	17.28	19.00	1.486	62.9	1.006	0.17	0.461	0.689
LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 3	ECI 2	40400	2571	1	16.56	18.00	1.393	62.9	1.006	-0.01	0.435	0.610
LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 3	ECI 2	40400	2571	1	16.56	18.00	1.393	62.9	1.006	-0.04	0.362	0.507
LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 3	ECI 2	40400	2571	1	16.56	18.00	1.393	62.9	1.006	-0.01	0.129	0.181
LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 3	ECI 2	40400	2571	1	16.56	18.00	1.393	62.9	1.006	0.04	0.139	0.195
LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 3	ECI 2	40140	2545	1	16.41	18.00	1.442	62.9	1.006	0.02	0.385	0.559
LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 3	ECI 2	40670	2598	1	16.30	18.00	1.479	62.9	1.006	0.17	0.464	0.690
LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 3	ECI 2	41140	2645	1	16.28	18.00	1.486	62.9	1.006	0.03	0.456	0.682
LTE Band 41	20M	QPSK	100	0	-	Right Cheek	0mm	Ant 3	ECI 2	40400	2571	1	16.48	18.00	1.419	62.9	1.006	0.1	0.448	0.640
LTE Band 41	20M	QPSK	100	0	-	Right Tilted	0mm	Ant 3	ECI 2	40400	2571	1	16.48	18.00	1.419	62.9	1.006	-0.16	0.380	0.542

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
2450MHz																	
	Bluetooth	DH5 1Mbps	Right Cheek	0mm	Ant 5	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	-0.02	0.044	0.069
	Bluetooth	DH5 1Mbps	Right Tilted	0mm	Ant 5	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	0.08	0.048	0.075
09	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Ant 5	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	-0.08	0.097	0.153
	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Ant 5	Full	78	2480	4	9.90	11.50	1.445	76.84	1.084	0.02	0.085	0.133
	Bluetooth	DH5 1Mbps	Left Tilted	0mm	Ant 5	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	0	0.062	0.097
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 5	Standalone	6	2437	1	16.00	17.50	1.413	100	1.000	0.12	0.342	0.483
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Ant 5	Standalone	6	2437	1	16.00	17.50	1.413	100	1.000	0.02	0.315	0.445
10	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 5	Standalone	6	2437	1	16.00	17.50	1.413	100	1.000	-0.13	0.889	1.256
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 5	Standalone	6	2437	4	16.00	17.50	1.413	100	1.000	0.05	0.825	1.165
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 5	Standalone	6	2437	2	16.00	17.50	1.413	100	1.000	0.08	0.725	1.024
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 5	Standalone	6	2437	3	16.00	17.50	1.413	100	1.000	0.03	0.731	1.033
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 5	Standalone	6	2437	5	16.00	17.50	1.413	100	1.000	-0.02	0.715	1.010
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 5	Standalone	6	2437	6	16.00	17.50	1.413	100	1.000	0.09	0.714	1.009
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 5	Standalone	6	2437	1	16.00	17.50	1.413	100	1.000	-0.1	0.571	0.807
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 5	Standalone	1	2412	1	15.80	17.50	1.479	100	1.000	-0.07	0.763	1.129
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 5	Standalone	11	2462	1	15.90	17.50	1.445	100	1.000	0.02	0.859	1.242
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 5	Standalone	1	2412	1	15.80	17.50	1.479	100	1.000	0.01	0.543	0.803
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 5	Standalone	11	2462	1	15.90	17.50	1.445	100	1.000	0.05	0.547	0.791
	WLAN2.4GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	6	2437	1	15.80	17.50	1.479	100	1.000	0.01	0.802	1.186
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 5	Simultaneous	6	2437	1	14.10	15.50	1.380	100	1.000	0.16	0.548	0.756
5000MHz																	
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 5	Standalone	54	5270	1	15.54	17.00	1.400	100	1.000	-0.07	0.275	0.385
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 5	Standalone	54	5270	1	15.54	17.00	1.400	100	1.000	-0.18	0.293	0.410
11	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	54	5270	1	15.54	17.00	1.400	100	1.000	0.07	0.848	1.187
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	54	5270	4	15.54	17.00	1.400	100	1.000	0.03	0.825	1.155
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	54	5270	2	15.54	17.00	1.400	100	1.000	-0.05	0.689	0.964
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	54	5270	3	15.54	17.00	1.400	100	1.000	0.13	0.666	0.932
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	54	5270	5	15.54	17.00	1.400	100	1.000	0.07	0.615	0.861
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	54	5270	6	15.54	17.00	1.400	100	1.000	0.03	0.635	0.889
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 5	Standalone	54	5270	1	15.54	17.00	1.400	100	1.000	-0.19	0.453	0.634
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	62	5310	1	14.73	16.00	1.340	100	1.000	0.05	0.512	0.686
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5	Simultaneous	58	5290	1	12.42	14.00	1.439	100	1.000	0.05	0.370	0.532
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 5	Standalone	122	5610	1	15.73	17.50	1.503	100	1.000	0.17	0.308	0.463
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 5	Standalone	122	5610	1	15.73	17.50	1.503	100	1.000	-0.17	0.333	0.501
12	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5	Standalone	122	5610	1	15.73	17.50	1.503	100	1.000	0.14	0.784	1.178
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5	Standalone	122	5610	4	15.73	17.50	1.503	100	1.000	0.02	0.719	1.081
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 5	Standalone	122	5610	1	15.73	17.50	1.503	100	1.000	-0.18	0.526	0.791
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5	Standalone	106	5530	1	15.21	17.00	1.510	100	1.000	0.09	0.714	1.078



	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5	Standalone	138	5690	1	15.68	17.50	1.521	100	1.000	-0.19	0.721	1.096
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5	Simultaneous	106	5530	1	13.77	15.00	1.327	100	1.000	0.05	0.487	0.646
	WLAN5.8GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 5	Standalone	159	5795	1	15.78	17.50	1.486	100	1.000	0.07	0.393	0.584
	WLAN5.8GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 5	Standalone	159	5795	1	15.78	17.50	1.486	100	1.000	0.13	0.449	0.667
13	WLAN5.8GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	159	5795	1	15.78	17.50	1.486	100	1.000	-0.17	0.798	1.186
	WLAN5.8GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	159	5795	4	15.78	17.50	1.486	100	1.000	0.07	0.735	1.092
	WLAN5.8GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 5	Standalone	159	5795	1	15.78	17.50	1.486	100	1.000	-0.08	0.472	0.701
	WLAN5.8GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 5	Standalone	151	5755	1	15.78	17.50	1.486	100	1.000	-0.04	0.778	1.156
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 5	Simultaneous	155	5775	1	13.24	15.00	1.500	100	1.000	0.08	0.447	0.670

15.2 Hotspot SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
835MHz																					
	GSM850	-	-	-	-	GPRS 2 TX Slot	Front	5mm	Ant 0	ECI 7	189	836.4	1	30.24	31.50	1.337	-	-	0.09	0.438	0.585
14	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	ECI 7	189	836.4	1	30.24	31.50	1.337	-	-	-0.07	0.940	1.256
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	ECI 7	189	836.4	4	30.24	31.50	1.337	-	-	0.03	0.886	1.184
	GSM850	-	-	-	-	GPRS 2 TX Slot	Left Side	5mm	Ant 0	ECI 7	189	836.4	1	30.24	31.50	1.337	-	-	-0.01	0.359	0.480
	GSM850	-	-	-	-	GPRS 2 TX Slot	Right Side	5mm	Ant 0	ECI 7	189	836.4	1	30.24	31.50	1.337	-	-	-0.14	0.478	0.639
	GSM850	-	-	-	-	GPRS 2 TX Slot	Bottom Side	5mm	Ant 0	ECI 7	189	836.4	1	30.24	31.50	1.337	-	-	-0.1	0.421	0.563
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	ECI 7	128	824.2	1	30.23	31.50	1.340	-	-	0.13	0.907	1.215
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	ECI 7	251	848.8	1	30.20	31.50	1.349	-	-	-0.01	0.925	1.248
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	ECI 7	4182	836.4	1	23.32	24.00	1.169	-	-	-0.19	0.597	0.698
15	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 7	4182	836.4	1	23.32	24.00	1.169	-	-	-0.16	1.140	1.333
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 7	4182	836.4	4	23.32	24.00	1.169	-	-	0.02	1.070	1.251
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	5mm	Ant 0	ECI 7	4182	836.4	1	23.32	24.00	1.169	-	-	0.03	0.391	0.457
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Side	5mm	Ant 0	ECI 7	4182	836.4	1	23.32	24.00	1.169	-	-	-0.19	0.568	0.664
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI 7	4182	836.4	1	23.32	24.00	1.169	-	-	-0.17	0.502	0.587
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 7	4132	826.4	1	23.26	24.00	1.186	-	-	0.1	1.060	1.257
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 7	4233	846.6	1	23.27	24.00	1.183	-	-	-0.13	1.050	1.242
	LTE Band 5	10M	QPSK	1	25	-	Front	5mm	Ant 0	ECI 7	20525	836.5	1	23.29	24.00	1.178	-	-	-0.12	0.562	0.662
16	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	ECI 7	20525	836.5	1	23.29	24.00	1.178	-	-	0.17	1.160	1.366
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	ECI 7	20525	836.5	4	23.29	24.00	1.178	-	-	0.05	1.030	1.213
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	ECI 7	20525	836.5	2	23.29	24.00	1.178	-	-	0.06	1.050	1.236
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	ECI 7	20525	836.5	3	23.29	24.00	1.178	-	-	0.17	1.030	1.213
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	ECI 7	20525	836.5	5	23.29	24.00	1.178	-	-	-0.14	0.994	1.171
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	ECI 7	20525	836.5	6	23.29	24.00	1.178	-	-	0.09	0.985	1.160
	LTE Band 5	10M	QPSK	1	25	-	Left Side	5mm	Ant 0	ECI 7	20525	836.5	1	23.29	24.00	1.178	-	-	-0.04	0.384	0.452
	LTE Band 5	10M	QPSK	1	25	-	Right Side	5mm	Ant 0	ECI 7	20525	836.5	1	23.29	24.00	1.178	-	-	-0.13	0.541	0.637
	LTE Band 5	10M	QPSK	1	25	-	Bottom Side	5mm	Ant 0	ECI 7	20525	836.5	1	23.29	24.00	1.178	-	-	-0.01	0.413	0.486
	LTE Band 5	10M	QPSK	25	0	-	Front	5mm	Ant 0	ECI 7	20525	836.5	1	22.16	23.00	1.213	-	-	0.18	0.456	0.553
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 0	ECI 7	20525	836.5	1	22.16	23.00	1.213	-	-	0.06	0.913	1.108
	LTE Band 5	10M	QPSK	25	0	-	Left Side	5mm	Ant 0	ECI 7	20525	836.5	1	22.16	23.00	1.213	-	-	-0.05	0.315	0.382
	LTE Band 5	10M	QPSK	25	0	-	Right Side	5mm	Ant 0	ECI 7	20525	836.5	1	22.16	23.00	1.213	-	-	0.04	0.441	0.535
	LTE Band 5	10M	QPSK	25	0	-	Bottom Side	5mm	Ant 0	ECI 7	20525	836.5	1	22.16	23.00	1.213	-	-	0.19	0.316	0.383
	LTE Band 5	10M	QPSK	50	0	-	Back	5mm	Ant 0	ECI 7	20525	836.5	1	22.11	23.00	1.227	-	-	0.14	0.898	1.102
	LTE Band 5	10M	QPSK	1	25	-	Front	5mm	Ant 3	ECI 7	20525	836.5	1	19.33	20.50	1.309	-	-	-0.05	0.197	0.258
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 3	ECI 7	20525	836.5	1	19.33	20.50	1.309	-	-	-0.19	0.510	0.668
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 3	ECI 7	20525	836.5	4	19.33	20.50	1.309	-	-	0.03	0.474	0.621
	LTE Band 5	10M	QPSK	1	25	-	Left Side	5mm	Ant 3	ECI 7	20525	836.5	1	19.33	20.50	1.309	-	-	0.15	0.155	0.203
	LTE Band 5	10M	QPSK	1	25	-	Top Side	5mm	Ant 3	ECI 7	20525	836.5	1	19.33	20.50	1.309	-	-	0.02	0.327	0.428
	LTE Band 5	10M	QPSK	25	0	-	Front	5mm	Ant 3	ECI 7	20525	836.5	1	18.22	19.50	1.343	-	-	0.06	0.156	0.209
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 3	ECI 7	20525	836.5	1	18.22	19.50	1.343	-	-	-0.04	0.440	0.591
	LTE Band 5	10M	QPSK	25	0	-	Left Side	5mm	Ant 3	ECI 7	20525	836.5	1	18.22	19.50	1.343	-	-	-0.1	0.123	0.165



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LTE Band	Modulation	Power	Bandwidth	Channel	Side	Antenna	Antenna Type	Frequency	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power		
LTE Band 5	10M	QPSK	25	0	-	Top Side	5mm	Ant 3	ECI 7	20525	836.5	1	18.22	19.50	1.343	-	-	0.02	0.258	0.346	
1900MHz																					
GSM1900	-	-	-	-	GPRS 2 TX Slot	Front	5mm	Ant 0	ECI 7	661	1880	1	24.31	25.50	1.315	-	-	-0.14	0.356	0.468	
GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	ECI 7	661	1880	1	24.31	25.50	1.315	-	-	-0.02	0.587	0.772	
GSM1900	-	-	-	-	GPRS 2 TX Slot	Left Side	5mm	Ant 0	ECI 7	661	1880	1	24.31	25.50	1.315	-	-	-0.06	0.266	0.350	
GSM1900	-	-	-	-	GPRS 2 TX Slot	Right Side	5mm	Ant 0	ECI 7	661	1880	1	24.31	25.50	1.315	-	-	0.08	0.107	0.141	
GSM1900	-	-	-	-	GPRS 2 TX Slot	Bottom Side	5mm	Ant 0	ECI 7	661	1880	1	24.31	25.50	1.315	-	-	-0.1	0.972	1.278	
GSM1900	-	-	-	-	GPRS 2 TX Slot	Bottom Side	5mm	Ant 0	ECI 7	512	1850.2	1	24.26	25.50	1.330	-	-	-0.18	0.807	1.074	
17	GSM1900	-	-	-	GPRS 2 TX Slot	Bottom Side	5mm	Ant 0	ECI 7	810	1909.8	1	24.15	25.50	1.365	-	-	0.09	1.000	1.365	
GSM1900	-	-	-	-	GPRS 2 TX Slot	Bottom Side	5mm	Ant 0	ECI 7	810	1909.8	4	24.15	25.50	1.365	-	-	0.03	0.952	1.299	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	ECI 7	9400	1880	1	17.73	18.50	1.194	-	-	-0.16	0.455	0.543	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 7	9400	1880	1	17.73	18.50	1.194	-	-	-0.15	0.679	0.811	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	5mm	Ant 0	ECI 7	9400	1880	1	17.73	18.50	1.194	-	-	0.19	0.222	0.265	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	5mm	Ant 0	ECI 7	9400	1880	1	17.73	18.50	1.194	-	-	-0.19	0.126	0.150	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI 7	9400	1880	1	17.73	18.50	1.194	-	-	-0.08	1.080	1.290	
18	WCDMA II	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI 7	9262	1852.4	1	17.51	18.50	1.256	-	-	0.1	1.090	1.369	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI 7	9262	1852.4	4	17.51	18.50	1.256	-	-	0.02	1.030	1.294	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI 7	9262	1852.4	2	17.51	18.50	1.256	-	-	0.08	0.980	1.231	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI 7	9262	1852.4	3	17.51	18.50	1.256	-	-	-0.12	0.925	1.162	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI 7	9262	1852.4	5	17.51	18.50	1.256	-	-	0.03	0.898	1.128	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI 7	9262	1852.4	6	17.51	18.50	1.256	-	-	0.14	0.952	1.196	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	ECI 7	9538	1907.6	1	17.72	18.50	1.197	-	-	0.03	1.020	1.221	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 7	9262	1852.4	1	17.51	18.50	1.256	-	-	-0.09	0.687	0.863	
WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 7	9538	1907.6	1	17.72	18.50	1.197	-	-	-0.11	0.643	0.770	
LTE Band 2	20M	QPSK	1	49	-	Front	5mm	Ant 0	ECI 7	18900	1880	1	17.21	18.00	1.199	-	-	-0.14	0.400	0.480	
LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	ECI 7	18900	1880	1	17.21	18.00	1.199	-	-	0.14	0.621	0.745	
LTE Band 2	20M	QPSK	1	49	-	Left Side	5mm	Ant 0	ECI 7	18900	1880	1	17.21	18.00	1.199	-	-	-0.16	0.221	0.265	
LTE Band 2	20M	QPSK	1	49	-	Right Side	5mm	Ant 0	ECI 7	18900	1880	1	17.21	18.00	1.199	-	-	0.11	0.116	0.139	
LTE Band 2	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	18900	1880	1	17.21	18.00	1.199	-	-	-0.09	1.040	1.247	
19	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	18700	1860	1	17.11	18.00	1.227	-	-	0.11	1.060	1.301
LTE Band 2	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	18700	1860	4	17.11	18.00	1.227	-	-	0.02	0.985	1.209	
LTE Band 2	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	19100	1900	1	17.09	18.00	1.233	-	-	-0.08	1.000	1.233	
LTE Band 2	20M	QPSK	50	0	-	Front	5mm	Ant 0	ECI 7	18900	1880	1	16.10	17.00	1.230	-	-	-0.1	0.310	0.381	
LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	ECI 7	18900	1880	1	16.10	17.00	1.230	-	-	0.05	0.484	0.595	
LTE Band 2	20M	QPSK	50	0	-	Left Side	5mm	Ant 0	ECI 7	18900	1880	1	16.10	17.00	1.230	-	-	0.01	0.179	0.220	
LTE Band 2	20M	QPSK	50	0	-	Right Side	5mm	Ant 0	ECI 7	18900	1880	1	16.10	17.00	1.230	-	-	0.07	0.090	0.111	
LTE Band 2	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI 7	18900	1880	1	16.10	17.00	1.230	-	-	-0.07	0.839	1.032	
LTE Band 2	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI 7	18700	1860	1	15.83	17.00	1.309	-	-	0.16	0.839	1.098	
LTE Band 2	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI 7	19100	1900	1	16.04	17.00	1.247	-	-	-0.15	0.813	1.014	
LTE Band 2	20M	QPSK	100	0	-	Bottom Side	5mm	Ant 0	ECI 7	18900	1880	1	15.96	17.00	1.271	-	-	0.19	0.839	1.066	
LTE Band 2	20M	QPSK	1	49	-	Front	5mm	Ant 3	ECI 7	18900	1880	1	14.49	16.00	1.416	-	-	0.06	0.160	0.227	
LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 3	ECI 7	18900	1880	1	14.49	16.00	1.416	-	-	-0.05	0.401	0.568	
LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 3	ECI 7	18900	1880	4	14.49	16.00	1.416	-	-	0.02	0.385	0.545	
LTE Band 2	20M	QPSK	1	49	-	Left Side	5mm	Ant 3	ECI 7	18900	1880	1	14.49	16.00	1.416	-	-	-0.12	0.078	0.110	
LTE Band 2	20M	QPSK	1	49	-	Top Side	5mm	Ant 3	ECI 7	18900	1880	1	14.49	16.00	1.416	-	-	-0.12	0.364	0.515	
LTE Band 2	20M	QPSK	50	0	-	Front	5mm	Ant 3	ECI 7	18900	1880	1	13.27	15.00	1.489	-	-	-0.17	0.143	0.213	
LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 3	ECI 7	18900	1880	1	13.27	15.00	1.489	-	-	-0.09	0.328	0.489	
LTE Band 2	20M	QPSK	50	0	-	Left Side	5mm	Ant 3	ECI 7	18900	1880	1	13.27	15.00	1.489	-	-	-0.19	0.071	0.106	
LTE Band 2	20M	QPSK	50	0	-	Top Side	5mm	Ant 3	ECI 7	18900	1880	1	13.27	15.00	1.489	-	-	-0.05	0.309	0.460	
2600MHz																					
LTE Band 7	20M	QPSK	1	49	-	Front	5mm	Ant 0	ECI 7	21100	2535	1	12.97	13.50	1.130	-	-	0.18	0.294	0.332	
LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	ECI 7	21100	2535	1	12.97	13.50	1.130	-	-	-0.13	0.873	0.986	
LTE Band 7	20M	QPSK	1	49	-	Left Side	5mm	Ant 0	ECI 7	21100	2535	1	12.97	13.50	1.130	-	-	-0.02	0.043	0.049	
LTE Band 7	20M	QPSK	1	49	-	Right Side	5mm	Ant 0	ECI 7	21100	2535	1	12.97	13.50	1.130	-	-	-0.03	0.033	0.037	
LTE Band 7	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	21100	2535	1	12.97	13.50	1.130	-	-	-0.06	1.070	1.209	
LTE Band 7	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	20850	2510	1	12.69	13.50	1.205	-	-	0.06	0.931	1.122	



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20	LTE Band 7	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	21350	2560	1	12.85	13.50	1.161	-	-	0.07	1.120	1.301
	LTE Band 7	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	21350	2560	4	12.85	13.50	1.161	-	-	0.03	1.070	1.243
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	ECI 7	20850	2510	1	12.69	13.50	1.205	-	-	-0.08	0.761	0.917
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	ECI 7	21350	2560	1	12.85	13.50	1.161	-	-	-0.06	0.931	1.081
	LTE Band 7	20M	QPSK	50	0	-	Front	5mm	Ant 0	ECI 7	21100	2535	1	11.85	12.50	1.161	-	-	-0.03	0.240	0.279
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 0	ECI 7	21100	2535	1	11.85	12.50	1.161	-	-	-0.08	0.721	0.837
	LTE Band 7	20M	QPSK	50	0	-	Left Side	5mm	Ant 0	ECI 7	21100	2535	1	11.85	12.50	1.161	-	-	0.09	0.035	0.041
	LTE Band 7	20M	QPSK	50	0	-	Right Side	5mm	Ant 0	ECI 7	21100	2535	1	11.85	12.50	1.161	-	-	-0.09	0.028	0.033
	LTE Band 7	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI 7	21100	2535	1	11.85	12.50	1.161	-	-	-0.1	0.881	1.023
	LTE Band 7	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI 7	20850	2510	1	11.58	12.50	1.236	-	-	0.16	0.731	0.903
	LTE Band 7	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI 7	21350	2560	1	11.63	12.50	1.222	-	-	0.1	0.931	1.137
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 0	ECI 7	20850	2510	1	11.58	12.50	1.236	-	-	0.05	0.600	0.742
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 0	ECI 7	21350	2560	1	11.63	12.50	1.222	-	-	-0.07	0.763	0.932
	LTE Band 7	20M	QPSK	100	0	-	Back	5mm	Ant 0	ECI 7	21100	2535	1	11.81	12.50	1.172	-	-	0.16	0.730	0.856
	LTE Band 7	20M	QPSK	100	0	-	Bottom Side	5mm	Ant 0	ECI 7	21100	2535	1	11.81	12.50	1.172	-	-	0.09	0.898	1.053
	LTE Band 7	20M	QPSK	1	49	-	Front	5mm	Ant 3	ECI 7	21100	2535	1	13.68	15.00	1.355	-	-	-0.11	0.141	0.191
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 3	ECI 7	21100	2535	1	13.68	15.00	1.355	-	-	0.07	0.501	0.679
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 3	ECI 7	21100	2535	4	13.68	15.00	1.355	-	-	0.02	0.475	0.644
	LTE Band 7	20M	QPSK	1	49	-	Left Side	5mm	Ant 3	ECI 7	21100	2535	1	13.68	15.00	1.355	-	-	-0.18	0.296	0.401
	LTE Band 7	20M	QPSK	1	49	-	Top Side	5mm	Ant 3	ECI 7	21100	2535	1	13.68	15.00	1.355	-	-	-0.03	0.292	0.396
	LTE Band 7	20M	QPSK	50	0	-	Front	5mm	Ant 3	ECI 7	21100	2535	1	12.46	14.00	1.426	-	-	-0.06	0.108	0.154
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 3	ECI 7	21100	2535	1	12.46	14.00	1.426	-	-	0.12	0.359	0.512
	LTE Band 7	20M	QPSK	50	0	-	Left Side	5mm	Ant 3	ECI 7	21100	2535	1	12.46	14.00	1.426	-	-	0.04	0.236	0.336
	LTE Band 7	20M	QPSK	50	0	-	Top Side	5mm	Ant 3	ECI 7	21100	2535	1	12.46	14.00	1.426	-	-	-0.1	0.234	0.334
	LTE Band 41	20M	QPSK	1	49	-	Front	5mm	Ant 0	ECI 7	40400	2571	1	15.46	16.00	1.132	62.9	1.006	0.07	0.302	0.344
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 0	ECI 7	40400	2571	1	15.46	16.00	1.132	62.9	1.006	-0.03	1.010	1.151
	LTE Band 41	20M	QPSK	1	49	-	Left Side	5mm	Ant 0	ECI 7	40400	2571	1	15.46	16.00	1.132	62.9	1.006	-0.1	0.039	0.044
	LTE Band 41	20M	QPSK	1	49	-	Right Side	5mm	Ant 0	ECI 7	40400	2571	1	15.46	16.00	1.132	62.9	1.006	-0.12	0.032	0.036
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	40400	2571	1	15.46	16.00	1.132	62.9	1.006	-0.07	1.110	1.265
21	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	40140	2545	1	15.43	16.00	1.140	62.9	1.006	0.03	1.130	1.296
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	40140	2545	4	15.43	16.00	1.140	62.9	1.006	0.09	1.080	1.239
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	40140	2545	2	15.43	16.00	1.140	62.9	1.006	0.04	1.060	1.216
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	40140	2545	3	15.43	16.00	1.140	62.9	1.006	0.12	1.020	1.170
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	40140	2545	5	15.43	16.00	1.140	62.9	1.006	-0.18	0.994	1.140
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	40140	2545	6	15.43	16.00	1.140	62.9	1.006	0.02	0.958	1.099
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	40670	2598	1	15.33	16.00	1.167	62.9	1.006	-0.13	0.966	1.134
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	ECI 7	41140	2645	1	15.40	16.00	1.148	62.9	1.006	0.05	0.702	0.811
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 0	ECI 7	40140	2545	1	15.43	16.00	1.140	62.9	1.006	-0.18	1.030	1.182
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 0	ECI 7	40670	2598	1	15.33	16.00	1.167	62.9	1.006	0.13	0.878	1.031
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 0	ECI 7	41140	2645	1	15.40	16.00	1.148	62.9	1.006	-0.11	0.638	0.737
	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 0	ECI 7	40400	2571	1	14.45	15.00	1.135	62.9	1.006	-0.19	0.238	0.272
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 0	ECI 7	40400	2571	1	14.45	15.00	1.135	62.9	1.006	0.02	0.766	0.875
	LTE Band 41	20M	QPSK	50	0	-	Left Side	5mm	Ant 0	ECI 7	40400	2571	1	14.45	15.00	1.135	62.9	1.006	-0.07	0.032	0.037
	LTE Band 41	20M	QPSK	50	0	-	Right Side	5mm	Ant 0	ECI 7	40400	2571	1	14.45	15.00	1.135	62.9	1.006	0	0.026	0.030
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI 7	40400	2571	1	14.45	15.00	1.135	62.9	1.006	0.06	0.909	1.038
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI 7	40140	2545	1	14.43	15.00	1.140	62.9	1.006	0.1	0.863	0.990
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI 7	40670	2598	1	14.23	15.00	1.194	62.9	1.006	0.03	0.786	0.944
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	ECI 7	41140	2645	1	14.38	15.00	1.153	62.9	1.006	0.07	0.558	0.647
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 0	ECI 7	40140	2545	1	14.43	15.00	1.140	62.9	1.006	0.11	0.799	0.917
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 0	ECI 7	40670	2598	1	14.23	15.00	1.194	62.9	1.006	-0.1	0.727	0.873
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 0	ECI 7	41140	2645	1	14.38	15.00	1.153	62.9	1.006	-0.18	0.517	0.600
	LTE Band 41	20M	QPSK	100	0	-	Back	5mm	Ant 0	ECI 7	40400	2571	1	14.42	15.00	1.143	62.9	1.006	0.02	0.740	0.851
	LTE Band 41	20M	QPSK	100	0	-	Bottom Side	5mm	Ant 0	ECI 7	40400	2571	1	14.42	15.00	1.143	62.9	1.006	-0.08	0.880	1.012
	LTE Band 41	20M	QPSK	1	49	-	Front	5mm	Ant 3	ECI 7	40400	2571	1	15.54	17.00	1.400	62.9	1.006	-0.18	0.141	0.199
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 3	ECI 7	40400	2571	1	15.54	17.00	1.400	62.9	1.006	0.04	0.449	0.632
	LTE Band 41	20M	QPSK	1	49	-	Left Side	5mm	Ant 3	ECI 7	40400	2571	1	15.54	17.00	1.400	62.9	1.006	0.12	0.268	0.377



LTE Band 41	20M	QPSK	1	49	-	Top Side	5mm	Ant 3	ECI 7	40400	2571	1	15.54	17.00	1.400	62.9	1.006	-0.09	0.255	0.359
LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 3	ECI 7	40140	2545	1	15.48	17.00	1.419	62.9	1.006	-0.12	0.417	0.595
LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 3	ECI 7	40670	2598	1	15.42	17.00	1.439	62.9	1.006	0.19	0.439	0.635
LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 3	ECI 7	40670	2598	4	15.42	17.00	1.439	62.9	1.006	0.07	0.431	0.624
LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 3	ECI 7	41140	2645	1	15.36	17.00	1.459	62.9	1.006	0.09	0.421	0.618
LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 3	ECI 7	40400	2571	1	14.55	16.00	1.396	62.9	1.006	0.11	0.122	0.171
LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 3	ECI 7	40400	2571	1	14.55	16.00	1.396	62.9	1.006	-0.01	0.402	0.565
LTE Band 41	20M	QPSK	50	0	-	Left Side	5mm	Ant 3	ECI 7	40400	2571	1	14.55	16.00	1.396	62.9	1.006	-0.19	0.262	0.368
LTE Band 41	20M	QPSK	50	0	-	Top Side	5mm	Ant 3	ECI 7	40400	2571	1	14.55	16.00	1.396	62.9	1.006	-0.16	0.253	0.355
LTE Band 41	20M	QPSK	100	0	-	Back	5mm	Ant 3	ECI 7	40400	2571	1	14.43	16.00	1.435	62.9	1.006	-0.16	0.414	0.598

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
2450MHz																	
	Bluetooth	DH5 1Mbps	Front	5mm	Ant 5	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	-0.01	0.036	0.056
22	Bluetooth	DH5 1Mbps	Back	5mm	Ant 5	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	0.17	0.116	0.182
	Bluetooth	DH5 1Mbps	Back	5mm	Ant 5	Full	78	2480	4	9.90	11.50	1.445	76.84	1.084	0.03	0.099	0.155
	Bluetooth	DH5 1Mbps	Right Side	5mm	Ant 5	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	0	0.054	0.085
	Bluetooth	DH5 1Mbps	Top Side	5mm	Ant 5	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	-0.05	0.054	0.085
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 5	Hotspot on	6	2437	1	14.50	16.00	1.413	100	1.000	0.14	0.281	0.397
23	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	Hotspot on	6	2437	1	14.50	16.00	1.413	100	1.000	0.13	0.606	0.856
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	Hotspot on	6	2437	4	14.50	16.00	1.413	100	1.000	0.04	0.575	0.812
	WLAN2.4GHz	802.11b 1Mbps	Right Side	5mm	Ant 5	Hotspot on	6	2437	1	14.50	16.00	1.413	100	1.000	-0.03	0.255	0.360
	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	Ant 5	Hotspot on	6	2437	1	14.50	16.00	1.413	100	1.000	-0.1	0.244	0.345
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	Hotspot on	1	2412	1	14.20	16.00	1.514	100	1.000	0.1	0.486	0.736
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	Hotspot on	11	2462	1	14.40	16.00	1.445	100	1.000	0.11	0.530	0.766
5000MHz																	
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 5	Hotspot on	42	5210	1	8.29	10.00	1.483	100	1.000	0.07	0.070	0.104
24	WLAN5.2GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	Hotspot on	42	5210	1	8.29	10.00	1.483	100	1.000	-0.03	0.420	0.623
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	Hotspot on	42	5210	4	8.29	10.00	1.483	100	1.000	0.15	0.385	0.571
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 5	Hotspot on	42	5210	1	8.29	10.00	1.483	100	1.000	-0.02	0.417	0.618
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 5	Hotspot on	42	5210	1	8.29	10.00	1.483	100	1.000	-0.02	0.130	0.193
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 5	Hotspot on	155	5775	1	6.31	8.00	1.476	100	1.000	0.1	0.039	0.058
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	Hotspot on	155	5775	1	6.31	8.00	1.476	100	1.000	-0.11	0.369	0.545
25	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 5	Hotspot on	155	5775	1	6.31	8.00	1.476	100	1.000	0.03	0.429	0.633
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 5	Hotspot on	155	5775	4	6.31	8.00	1.476	100	1.000	0.02	0.375	0.553
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 5	Hotspot on	155	5775	2	6.31	8.00	1.476	100	1.000	-0.16	0.211	0.311
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 5	Hotspot on	155	5775	3	6.31	8.00	1.476	100	1.000	-0.01	0.158	0.233
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 5	Hotspot on	155	5775	5	6.31	8.00	1.476	100	1.000	0.03	0.185	0.273
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 5	Hotspot on	155	5775	6	6.31	8.00	1.476	100	1.000	0.14	0.155	0.229
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 5	Hotspot on	155	5775	1	6.31	8.00	1.476	100	1.000	0.16	0.134	0.198



15.3 Body Worn Accessory SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
835MHz																						
26	GSM850	-	-	-	-	GPRS 2 TX Slot	Front	5mm	Ant 0	-	ECl 4	189	836.4	1	30.24	31.50	1.337	-	-	0.09	0.438	0.585
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	-	ECl 4	189	836.4	1	30.24	31.50	1.337	-	-	-0.07	0.940	1.256
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	Headset	ECl 4	189	836.4	1	30.24	31.50	1.337	-	-	0.05	0.927	1.239
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	-	ECl 4	189	836.4	4	30.24	31.50	1.337	-	-	0.12	0.912	1.219
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	-	ECl 4	128	824.2	1	30.23	31.50	1.340	-	-	0.13	0.907	1.215
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	-	ECl 4	251	848.8	1	30.20	31.50	1.349	-	-	-0.01	0.925	1.248
27	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	ECl 4	4182	836.4	1	23.32	24.00	1.169	-	-	-0.19	0.597	0.698
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 4	4182	836.4	1	23.32	24.00	1.169	-	-	-0.16	1.140	1.333
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Headset	ECl 4	4182	836.4	1	23.32	24.00	1.169	-	-	0.14	1.120	1.310
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 4	4182	836.4	4	23.32	24.00	1.169	-	-	0.04	1.050	1.228
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 4	4132	826.4	1	23.26	24.00	1.186	-	-	0.1	1.060	1.257
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 4	4233	846.6	1	23.27	24.00	1.183	-	-	-0.13	1.050	1.242
28	LTE Band 5	10M	QPSK	1	25	-	Front	5mm	Ant 0	-	ECl 4	20525	836.5	1	23.29	24.00	1.178	-	-	-0.12	0.562	0.662
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	-	ECl 4	20525	836.5	1	23.29	24.00	1.178	-	-	0.17	1.160	1.366
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	Headset	ECl 4	20525	836.5	1	23.29	24.00	1.178	-	-	0.17	1.070	1.260
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	-	ECl 4	20525	836.5	4	23.29	24.00	1.178	-	-	0.1	1.120	1.319
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	-	ECl 4	20525	836.5	2	23.29	24.00	1.178	-	-	0.18	0.970	1.142
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	-	ECl 4	20525	836.5	3	23.29	24.00	1.178	-	-	0.06	0.990	1.166
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	-	ECl 4	20525	836.5	5	23.29	24.00	1.178	-	-	0.1	1.020	1.201
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	-	ECl 4	20525	836.5	6	23.29	24.00	1.178	-	-	-0.11	0.940	1.107
	LTE Band 5	10M	QPSK	25	0	-	Front	5mm	Ant 0	-	ECl 4	20525	836.5	1	22.16	23.00	1.213	-	-	0.18	0.456	0.553
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 0	-	ECl 4	20525	836.5	1	22.16	23.00	1.213	-	-	0.06	0.913	1.108
	LTE Band 5	10M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECl 4	20525	836.5	1	22.11	23.00	1.227	-	-	0.14	0.898	1.102
	LTE Band 5	10M	QPSK	1	25	-	Front	5mm	Ant 3	-	ECl 3	20525	836.5	1	20.65	22.00	1.365	-	-	-0.15	0.238	0.325
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 3	-	ECl 3	20525	836.5	1	20.65	22.00	1.365	-	-	-0.1	0.616	0.841
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 3	-	ECl 3	20525	836.5	4	20.65	22.00	1.365	-	-	-0.16	0.585	0.798
	LTE Band 5	10M	QPSK	1	25	-	Front	16mm	Ant 0	-	ECl 4	20525	836.5	1	22.65	24.00	1.365	-	-	0.05	0.064	0.087
LTE Band 5	10M	QPSK	1	25	-	Back	27mm	Ant 0	-	ECl 4	20525	836.5	1	22.65	24.00	1.365	-	-	0.16	0.045	0.061	
LTE Band 5	10M	QPSK	25	0	-	Front	5mm	Ant 3	-	ECl 3	20525	836.5	1	19.66	21.00	1.361	-	-	0.06	0.188	0.256	
LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 3	-	ECl 3	20525	836.5	1	19.66	21.00	1.361	-	-	0.16	0.542	0.738	
LTE Band 5	10M	QPSK	50	0	-	Back	5mm	Ant 3	-	ECl 3	20525	836.5	1	19.54	21.00	1.400	-	-	-0.17	0.510	0.714	
1900MHz																						
29	GSM1900	-	-	-	-	GPRS 2 TX Slot	Front	5mm	Ant 0	-	ECl 3	661	1880	1	25.34	26.50	1.306	-	-	0.07	0.562	0.734
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	-	ECl 3	661	1880	1	25.34	26.50	1.306	-	-	-0.03	0.926	1.210
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	-	ECl 3	512	1850.2	1	25.18	26.50	1.355	-	-	0.07	0.767	1.039
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	-	ECl 3	810	1909.8	1	25.11	26.50	1.377	-	-	0.11	0.955	1.315
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	Headset	ECl 3	810	1909.8	1	25.11	26.50	1.377	-	-	0.08	0.914	1.259
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	5mm	Ant 0	-	ECl 3	810	1909.8	4	25.11	26.50	1.377	-	-	-0.18	0.895	1.233
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Front	16mm	Ant 0	-	ECl 4	661	1880	1	27.27	28.50	1.327	-	-	-0.04	0.192	0.255
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	27mm	Ant 0	-	ECl 4	661	1880	1	27.27	28.50	1.327	-	-	-0.02	0.100	0.133
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	ECl 3	9400	1880	1	19.38	20.00	1.153	-	-	0.19	0.769	0.887
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	ECl 3	9262	1852.4	1	19.00	20.00	1.259	-	-	0.19	0.770	0.969
30	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	ECl 3	9538	1907.6	1	19.08	20.00	1.236	-	-	-0.08	0.727	0.899
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 3	9400	1880	1	19.38	20.00	1.153	-	-	0.01	1.150	1.326
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 3	9262	1852.4	1	19.10	20.00	1.230	-	-	0.17	1.160	1.427
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Headset	ECl 3	9262	1852.4	1	19.10	20.00	1.230	-	-	-0.14	1.090	1.341
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 3	9262	1852.4	4	19.10	20.00	1.230	-	-	0.18	1.020	1.255
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 3	9262	1852.4	2	19.10	20.00	1.230	-	-	-0.01	1.110	1.366
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 3	9262	1852.4	3	19.10	20.00	1.230	-	-	-0.08	1.050	1.292
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 3	9262	1852.4	5	19.10	20.00	1.230	-	-	0.13	1.070	1.316
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECl 3	9262	1852.4	6	19.10	20.00	1.230	-	-	-0.08	1.050	1.292



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	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	ECI 3	9538	1907.6	1	19.08	20.00	1.236	-	-	0.11	1.090	1.347
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	16mm	Ant 0	-	ECI 4	9400	1880	1	23.29	24.00	1.178	-	-	0.02	0.416	0.490
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	27mm	Ant 0	-	ECI 4	9400	1880	1	23.29	24.00	1.178	-	-	-0.04	0.212	0.250
	LTE Band 2	20M	QPSK	1	49	-	Front	5mm	Ant 0	-	ECI 3	18900	1880	1	19.24	20.00	1.191	-	-	-0.11	0.633	0.754
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	18900	1880	1	19.24	20.00	1.191	-	-	-0.08	0.992	1.182
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	18700	1860	1	19.10	20.00	1.230	-	-	0.03	0.959	1.180
31	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	19100	1900	1	19.14	20.00	1.219	-	-	0.19	1.030	1.256
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	Headset	ECI 3	19100	1900	1	19.14	20.00	1.219	-	-	0.14	1.010	1.231
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	19100	1900	4	19.14	20.00	1.219	-	-	0.03	0.984	1.199
	LTE Band 2	20M	QPSK	1	49	-	Front	16mm	Ant 0	-	ECI 4	18900	1880	1	23.05	24.00	1.245	-	-	-0.09	0.209	0.260
	LTE Band 2	20M	QPSK	1	49	-	Back	27mm	Ant 0	-	ECI 4	18900	1880	1	23.05	24.00	1.245	-	-	0	0.163	0.203
	LTE Band 2	20M	QPSK	50	0	-	Front	5mm	Ant 0	-	ECI 3	18900	1880	1	18.11	19.00	1.227	-	-	-0.07	0.496	0.609
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECI 3	18900	1880	1	18.11	19.00	1.227	-	-	0.19	0.774	0.950
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECI 3	18700	1860	1	17.89	19.00	1.291	-	-	0.14	0.753	0.972
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECI 3	19100	1900	1	18.09	19.00	1.233	-	-	-0.15	0.824	1.016
	LTE Band 2	20M	QPSK	100	0	-	Back	5mm	Ant 0	-	ECI 3	18900	1880	1	17.98	19.00	1.265	-	-	-0.12	0.786	0.994
	LTE Band 2	20M	QPSK	1	49	-	Front	5mm	Ant 3	-	ECI 3	18900	1880	1	15.42	17.00	1.439	-	-	0.04	0.194	0.279
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 3	-	ECI 3	18900	1880	1	15.42	17.00	1.439	-	-	0.03	0.487	0.701
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 3	-	ECI 3	18900	1880	4	15.42	17.00	1.439	-	-	0.14	0.435	0.626
	LTE Band 2	20M	QPSK	1	49	-	Front	16mm	Ant 3	-	ECI 4	18900	1880	1	22.30	24.00	1.479	-	-	0.19	0.209	0.309
	LTE Band 2	20M	QPSK	1	49	-	Back	27mm	Ant 3	-	ECI 4	18900	1880	1	22.30	24.00	1.479	-	-	-0.01	0.163	0.241
	LTE Band 2	20M	QPSK	50	0	-	Front	5mm	Ant 3	-	ECI 3	18900	1880	1	14.30	16.00	1.479	-	-	-0.12	0.173	0.256
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 3	-	ECI 3	18900	1880	1	14.30	16.00	1.479	-	-	-0.05	0.398	0.589
2600MHz																						
	LTE Band 7	20M	QPSK	1	49	-	Front	5mm	Ant 0	-	ECI 3	21100	2535	1	13.88	14.50	1.153	-	-	-0.17	0.370	0.427
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	21100	2535	1	13.88	14.50	1.153	-	-	0.06	1.100	1.269
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	20850	2510	1	13.58	14.50	1.236	-	-	0.19	0.957	1.183
32	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	21350	2560	1	13.79	14.50	1.178	-	-	-0.01	1.170	1.378
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	Headset	ECI 3	21350	2560	1	13.79	14.50	1.178	-	-	0.14	1.080	1.272
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	21350	2560	4	13.79	14.50	1.178	-	-	0.09	1.080	1.272
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	21350	2560	2	13.79	14.50	1.178	-	-	0.1	1.030	1.213
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	21350	2560	3	13.79	14.50	1.178	-	-	-0.13	1.010	1.189
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	21350	2560	5	13.79	14.50	1.178	-	-	0.11	0.998	1.175
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	21350	2560	6	13.79	14.50	1.178	-	-	0.19	1.020	1.201
	LTE Band 7	20M	QPSK	1	49	-	Front	16mm	Ant 0	-	ECI 4	21100	2535	1	23.49	24.00	1.125	-	-	-0.02	0.141	0.159
	LTE Band 7	20M	QPSK	1	49	-	Back	27mm	Ant 0	-	ECI 4	21100	2535	1	23.49	24.00	1.125	-	-	-0.02	0.128	0.144
	LTE Band 7	20M	QPSK	50	0	-	Front	5mm	Ant 0	-	ECI 3	21100	2535	1	12.63	13.50	1.222	-	-	0.06	0.302	0.369
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECI 3	21100	2535	1	12.63	13.50	1.222	-	-	0.09	0.906	1.107
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECI 3	20850	2510	1	12.50	13.50	1.259	-	-	-0.14	0.754	0.949
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECI 3	21350	2560	1	12.60	13.50	1.230	-	-	0.13	0.959	1.180
	LTE Band 7	20M	QPSK	100	0	-	Back	5mm	Ant 0	-	ECI 3	21100	2535	1	12.60	13.50	1.230	-	-	-0.01	0.918	1.129
	LTE Band 7	20M	QPSK	1	49	-	Front	5mm	Ant 3	-	ECI 3	21100	2535	1	14.14	15.50	1.368	-	-	0.11	0.160	0.219
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 3	-	ECI 3	21100	2535	1	14.14	15.50	1.368	-	-	-0.19	0.572	0.782
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 3	-	ECI 3	21100	2535	4	14.14	15.50	1.368	-	-	-0.1	0.499	0.682
	LTE Band 7	20M	QPSK	1	49	-	Front	16mm	Ant 3	-	ECI 4	21100	2535	1	22.48	24.00	1.419	-	-	-0.08	0.062	0.088
	LTE Band 7	20M	QPSK	1	49	-	Back	27mm	Ant 3	-	ECI 4	21100	2535	1	22.48	24.00	1.419	-	-	0.04	0.043	0.061
	LTE Band 7	20M	QPSK	50	0	-	Front	5mm	Ant 3	-	ECI 3	21100	2535	1	12.97	14.50	1.422	-	-	0	0.123	0.175
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 3	-	ECI 3	21100	2535	1	12.97	14.50	1.422	-	-	-0.07	0.410	0.583
	LTE Band 41	20M	QPSK	1	49	-	Front	5mm	Ant 0	-	ECI 3	40400	2571	1	16.48	17.00	1.127	62.9	1.006	-0.16	0.327	0.371
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	40400	2571	1	16.48	17.00	1.127	62.9	1.006	-0.11	1.090	1.236
33	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	40140	2545	1	16.39	17.00	1.151	62.9	1.006	-0.18	1.110	1.285
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 0	Headset	ECI 3	40140	2545	1	16.39	17.00	1.151	62.9	1.006	0.14	1.090	1.262
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	40140	2545	4	16.39	17.00	1.151	62.9	1.006	-0.05	1.020	1.181
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	40670	2598	1	16.41	17.00	1.146	62.9	1.006	0.14	0.950	1.095
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	ECI 3	41140	2645	1	16.43	17.00	1.140	62.9	1.006	0.04	0.690	0.791
	LTE Band 41	20M	QPSK	1	49	-	Front	16mm	Ant 0	-	ECI 4	40400	2571	1	23.48	24.00	1.127	62.9	1.006	-0.07	0.300	0.340



LTE Band 41	20M	QPSK	1	49	-	Back	27mm	Ant 0	-	ECl 4	40400	2571	1	23.48	24.00	1.127	62.9	1.006	-0.1	0.147	0.167
LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 0	-	ECl 3	40400	2571	1	15.44	16.00	1.138	62.9	1.006	0.15	0.257	0.294
LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECl 3	40400	2571	1	15.44	16.00	1.138	62.9	1.006	0.05	0.829	0.949
LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECl 3	40140	2545	1	15.38	16.00	1.153	62.9	1.006	-0.05	0.808	0.938
LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECl 3	40670	2598	1	15.30	16.00	1.175	62.9	1.006	0.14	0.792	0.936
LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	ECl 3	41140	2645	1	15.41	16.00	1.146	62.9	1.006	0.04	0.590	0.680
LTE Band 41	20M	QPSK	100	0	-	Back	5mm	Ant 0	-	ECl 3	40400	2571	1	15.34	16.00	1.164	62.9	1.006	0.19	0.800	0.937
LTE Band 41	20M	QPSK	1	49	-	Front	5mm	Ant 3	-	ECl 3	40400	2571	1	16.54	18.00	1.400	62.9	1.006	0.08	0.177	0.249
LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 3	-	ECl 3	40400	2571	1	16.54	18.00	1.400	62.9	1.006	-0.01	0.580	0.817
LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 3	-	ECl 3	40400	2571	4	16.54	18.00	1.400	62.9	1.006	-0.01	0.552	0.777
LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 3	-	ECl 3	40140	2545	1	16.53	18.00	1.403	62.9	1.006	-0.16	0.531	0.749
LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 3	-	ECl 3	40670	2598	1	16.42	18.00	1.439	62.9	1.006	-0.19	0.568	0.822
LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 3	-	ECl 3	41140	2645	1	16.28	18.00	1.486	62.9	1.006	0.16	0.539	0.806
LTE Band 41	20M	QPSK	1	49	-	Front	16mm	Ant 3	-	ECl 4	40400	2571	1	22.46	24.00	1.426	62.9	1.006	-0.04	0.090	0.129
LTE Band 41	20M	QPSK	1	49	-	Back	27mm	Ant 3	-	ECl 4	40400	2571	1	22.46	24.00	1.426	62.9	1.006	-0.15	0.050	0.072
LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 3	-	ECl 3	40400	2571	1	15.50	17.00	1.413	62.9	1.006	0.07	0.136	0.193
LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 3	-	ECl 3	40400	2571	1	15.50	17.00	1.413	62.9	1.006	0.13	0.450	0.639
LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 3	-	ECl 3	40140	2545	1	15.42	17.00	1.439	62.9	1.006	-0.03	0.434	0.628
LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 3	-	ECl 3	40670	2598	1	15.31	17.00	1.476	62.9	1.006	0.14	0.459	0.681
LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 3	-	ECl 3	41140	2645	1	15.29	17.00	1.483	62.9	1.006	0.16	0.448	0.668
LTE Band 41	20M	QPSK	100	0	-	Back	5mm	Ant 3	-	ECl 3	40400	2571	1	15.42	17.00	1.439	62.9	1.006	0.01	0.463	0.670



Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
2450MHz																			
	Bluetooth	DH5 1Mbps	Front	5mm	Ant 5	-	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	0.14	0.036	0.056	
34	Bluetooth	DH5 1Mbps	Back	5mm	Ant 5	-	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	0.17	0.116	0.182	
	Bluetooth	DH5 1Mbps	Back	5mm	Ant 5	-	Full	78	2480	4	9.90	11.50	1.445	76.84	1.084	-0.16	0.102	0.160	
	Bluetooth	DH5 1Mbps	Front	16mm	Ant 5	-	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	-	n/a	n/a	
	Bluetooth	DH5 1Mbps	Back	27mm	Ant 5	-	Full	78	2480	1	9.90	11.50	1.445	76.84	1.084	-	n/a	n/a	
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 5	-	Standalone	6	2437	1	15.50	17.00	1.413	100	1.000	-0.05	0.441	0.623	
35	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	-	Standalone	6	2437	1	15.50	17.00	1.413	100	1.000	0.08	0.950	1.342	
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	Headset	Standalone	6	2437	1	15.50	17.00	1.413	100	1.000	0.03	0.932	1.316	
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	-	Standalone	6	2437	4	15.50	17.00	1.413	100	1.000	0.16	0.925	1.307	
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	-	Standalone	1	2412	1	15.30	17.00	1.479	100	1.000	-0.02	0.762	1.127	
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	-	Standalone	11	2462	1	15.40	17.00	1.445	100	1.000	0.18	0.822	1.188	
	WLAN2.4GHz	802.11n-HT40 MCS0	Back	5mm	Ant 5	-	Standalone	6	2437	1	15.40	17.00	1.445	100	1.000	0.04	0.813	1.175	
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	-	Simultaneous	6	2437	1	13.00	14.50	1.413	100	1.000	0.08	0.518	0.732	
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 5	Headset	Simultaneous	6	2437	1	13.00	14.50	1.413	100	1.000	-0.04	0.505	0.713	
	WLAN2.4GHz	802.11b 1Mbps	Front	16mm	Ant 5	-	Full	6	2437	1	19.00	20.50	1.413	100	1.000	-0.13	0.173	0.244	
	WLAN2.4GHz	802.11b 1Mbps	Back	27mm	Ant 5	-	Full	6	2437	1	19.00	20.50	1.413	100	1.000	-0.14	0.084	0.119	
5000MHz																			
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 5	-	Standalone	58	5290	1	10.28	12.00	1.486	100	1.000	-0.02	0.104	0.155	
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Standalone	58	5290	1	10.28	12.00	1.486	100	1.000	0.03	0.685	1.018	
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Standalone	58	5290	4	10.28	12.00	1.486	100	1.000	0.02	0.635	0.944	
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Simultaneous	58	5290	1	6.79	8.50	1.483	100	1.000	0.05	0.297	0.440	
	WLAN5.3GHz	802.11a 6Mbps	Front	16mm	Ant 5	-	Full	56	5280	1	17.64	19.00	1.368	100	1.000	-0.06	0.201	0.275	
36	WLAN5.3GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	56	5280	1	17.64	19.00	1.368	100	1.000	-0.05	0.872	1.193	
	WLAN5.3GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	56	5280	4	17.64	19.00	1.368	100	1.000	-0.11	0.826	1.130	
	WLAN5.3GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	56	5280	2	17.64	19.00	1.368	100	1.000	0.14	0.429	0.587	
	WLAN5.3GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	56	5280	3	17.64	19.00	1.368	100	1.000	-0.12	0.321	0.439	
	WLAN5.3GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	56	5280	5	17.64	19.00	1.368	100	1.000	0.05	0.376	0.514	
	WLAN5.3GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	56	5280	6	17.64	19.00	1.368	100	1.000	-0.17	0.315	0.431	
	WLAN5.3GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	52	5260	1	17.60	19.00	1.380	100	1.000	0.09	0.841	1.161	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 5	-	Standalone	106	5530	1	9.19	11.00	1.517	100	1.000	-0.03	0.125	0.190	
37	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Standalone	106	5530	1	9.19	11.00	1.517	100	1.000	0.15	0.698	1.059	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Standalone	106	5530	4	9.19	11.00	1.517	100	1.000	-0.06	0.658	0.998	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Standalone	122	5610	1	9.16	11.00	1.528	100	1.000	0.14	0.683	1.043	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Standalone	138	5690	1	9.08	11.00	1.556	100	1.000	0.05	0.673	1.047	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Simultaneous	106	5530	1	6.26	8.00	1.493	100	1.000	0.12	0.346	0.517	
	WLAN5.5GHz	802.11a 6Mbps	Front	16mm	Ant 5	-	Full	116	5580	1	17.35	19.00	1.462	100	1.000	0.02	0.445	0.651	
	WLAN5.5GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	116	5580	1	17.35	19.00	1.462	100	1.000	0.14	0.686	1.003	
	WLAN5.5GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	132	5660	1	17.30	19.00	1.479	100	1.000	0.04	0.651	0.963	
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 5	-	Standalone	155	5775	1	8.72	10.50	1.507	100	1.000	0.13	0.097	0.146	
38	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Standalone	155	5775	1	8.72	10.50	1.507	100	1.000	-0.19	0.705	1.062	
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Standalone	155	5775	4	8.72	10.50	1.507	100	1.000	0.14	0.644	0.970	
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 5	-	Simultaneous	155	5775	1	5.73	7.50	1.503	100	1.000	0.05	0.353	0.531	
	WLAN5.8GHz	802.11a 6Mbps	Front	16mm	Ant 5	-	Full	157	5785	1	17.91	19.50	1.442	100	1.000	-0.06	0.141	0.203	
	WLAN5.8GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	157	5785	1	17.91	19.50	1.442	100	1.000	0.04	0.613	0.884	
	WLAN5.8GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	149	5745	1	17.33	19.00	1.469	100	1.000	0.05	0.592	0.870	
	WLAN5.8GHz	802.11a 6Mbps	Back	27mm	Ant 5	-	Full	165	5825	1	17.33	19.00	1.469	100	1.000	0.01	0.588	0.864	



15.4 Product specific 10g SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
835MHz																					
39	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	189	836.4	1	30.24	31.50	1.337	-	-	-0.13	1.640	2.192
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	189	836.4	4	30.24	31.50	1.337	-	-	0.03	1.550	2.072
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	189	836.4	2	30.24	31.50	1.337	-	-	0.04	1.490	1.992
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	189	836.4	3	30.24	31.50	1.337	-	-	-0.14	1.420	1.898
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	189	836.4	5	30.24	31.50	1.337	-	-	0.03	1.380	1.845
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	189	836.4	6	30.24	31.50	1.337	-	-	0.12	1.350	1.804
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	128	824.2	1	30.23	31.50	1.340	-	-	-0.18	1.590	2.130
	GSM850	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	251	848.8	1	30.20	31.50	1.349	-	-	-0.13	1.590	2.145
40	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI 4	4182	836.4	1	23.32	24.00	1.169	-	-	0.03	1.500	1.754
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI 4	4182	836.4	4	23.32	24.00	1.169	-	-	-0.05	1.450	1.696
	LTE Band 5	10M	QPSK	1	25	-	Back	0mm	Ant 0	ECI 4	20525	836.5	1	23.29	24.00	1.178	-	-	-0.03	1.290	1.519
	LTE Band 5	10M	QPSK	1	25	-	Back	0mm	Ant 0	ECI 4	20525	836.5	4	23.29	24.00	1.178	-	-	0.02	1.240	1.460
	LTE Band 5	10M	QPSK	25	0	-	Back	0mm	Ant 0	ECI 4	20525	836.5	1	22.16	23.00	1.213	-	-	-0.09	1.100	1.335
41	LTE Band 5	10M	QPSK	1	25	-	Back	0mm	Ant 3	ECI 4	20525	836.5	1	22.65	24.00	1.365	-	-	-0.09	1.330	1.815
	LTE Band 5	10M	QPSK	1	25	-	Back	0mm	Ant 3	ECI 4	20525	836.5	4	22.65	24.00	1.365	-	-	0.03	1.220	1.665
	LTE Band 5	10M	QPSK	25	0	-	Back	0mm	Ant 3	ECI 4	20525	836.5	1	21.62	23.00	1.374	-	-	-0.04	1.150	1.580
1900MHz																					
42	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	661	1880	1	27.27	28.50	1.327	-	-	0.14	2.170	2.880
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	661	1880	4	27.27	28.50	1.327	-	-	-0.04	2.050	2.721
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	512	1850.2	1	27.25	28.50	1.334	-	-	0.12	1.920	2.560
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Back	0mm	Ant 0	ECI 4	810	1909.8	1	27.19	28.50	1.352	-	-	0.01	1.910	2.582
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Bottom Side	0mm	Ant 0	ECI 4	661	1880	1	27.27	28.50	1.327	-	-	0.09	1.970	2.615
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Bottom Side	0mm	Ant 0	ECI 4	512	1850.2	1	27.25	28.50	1.334	-	-	-0.07	1.920	2.560
	GSM1900	-	-	-	-	GPRS 2 TX Slot	Bottom Side	0mm	Ant 0	ECI 4	810	1909.8	1	27.19	28.50	1.352	-	-	-0.06	1.910	2.582
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	0mm	Ant 0	ECI 6	9400	1880	1	20.77	21.50	1.183	-	-	0.09	1.030	1.219
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI 6	9400	1880	1	20.77	21.50	1.183	-	-	-0.12	2.320	2.745
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI 6	9262	1852.4	1	20.58	21.50	1.236	-	-	-0.16	2.380	2.942
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	ECI 6	9538	1907.6	1	20.54	21.50	1.247	-	-	0.05	2.210	2.757
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI 6	9400	1880	1	20.77	21.50	1.183	-	-	-0.04	2.470	2.922
43	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI 6	9262	1852.4	1	20.58	21.50	1.236	-	-	-0.17	2.540	3.139
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI 6	9262	1852.4	4	20.58	21.50	1.236	-	-	0.01	2.490	3.078
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	ECI 6	9538	1907.6	1	20.54	21.50	1.247	-	-	-0.08	1.440	1.796
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	ECI 4	9400	1880	1	23.29	24.00	1.178	-	-	0.16	0.885	1.042
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	11mm	Ant 0	ECI 4	9400	1880	1	23.29	24.00	1.178	-	-	0.11	2.100	2.473
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	11mm	Ant 0	ECI 4	9262	1852.4	1	23.01	24.00	1.256	-	-	0.19	2.150	2.700
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	11mm	Ant 0	ECI 4	9538	1907.6	1	23.13	24.00	1.222	-	-	0.01	2.000	2.444
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	11mm	Ant 0	ECI 4	9400	1880	1	23.29	24.00	1.178	-	-	0.09	2.240	2.638
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	11mm	Ant 0	ECI 4	9262	1852.4	1	23.01	24.00	1.256	-	-	-0.16	2.300	2.889
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	11mm	Ant 0	ECI 4	9538	1907.6	1	23.13	24.00	1.222	-	-	0.16	2.130	2.602
	LTE Band 2	20M	QPSK	1	49	-	Front	0mm	Ant 0	ECI 6	18900	1880	1	21.22	22.00	1.197	-	-	-0.16	0.988	1.182
	LTE Band 2	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECI 6	18900	1880	1	21.22	22.00	1.197	-	-	0.03	2.350	2.812
	LTE Band 2	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECI 6	18700	1860	1	21.09	22.00	1.233	-	-	0.08	2.420	2.984
	LTE Band 2	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECI 6	19100	1900	1	21.10	22.00	1.230	-	-	0.15	2.240	2.756
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	ECI 6	18900	1880	1	21.22	22.00	1.197	-	-	-0.07	2.520	3.016
44	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	ECI 6	18700	1860	1	21.09	22.00	1.233	-	-	0.04	2.600	3.206
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	ECI 6	18700	1860	4	21.09	22.00	1.233	-	-	0.15	2.470	3.046
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	ECI 6	18700	1860	2	21.09	22.00	1.233	-	-	-0.14	2.540	3.132
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	ECI 6	18700	1860	3	21.09	22.00	1.233	-	-	0.12	2.500	3.083
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	ECI 6	18700	1860	5	21.09	22.00	1.233	-	-	0.15	2.350	2.898
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	ECI 6	18700	1860	6	21.09	22.00	1.233	-	-	-0.05	2.290	2.824
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	ECI 6	19100	1900	1	21.10	22.00	1.230	-	-	0.05	1.420	1.747



LTE Band 2	20M	QPSK	1	49	-	Front	5mm	Ant 0	ECl 4	18900	1880	1	23.05	24.00	1.245	-	-	-0.02	0.860	1.070	
LTE Band 2	20M	QPSK	1	49	-	Back	11mm	Ant 0	ECl 4	18900	1880	1	23.05	24.00	1.245	-	-	0.16	2.010	2.501	
LTE Band 2	20M	QPSK	1	49	-	Back	11mm	Ant 0	ECl 4	18700	1860	1	22.93	24.00	1.279	-	-	-0.16	2.070	2.648	
LTE Band 2	20M	QPSK	1	49	-	Back	11mm	Ant 0	ECl 4	19100	1900	1	22.96	24.00	1.271	-	-	0.02	1.920	2.440	
LTE Band 2	20M	QPSK	1	49	-	Bottom Side	11mm	Ant 0	ECl 4	18900	1880	1	23.05	24.00	1.245	-	-	-0.13	2.110	2.626	
LTE Band 2	20M	QPSK	1	49	-	Bottom Side	11mm	Ant 0	ECl 4	18700	1860	1	22.93	24.00	1.279	-	-	0.06	2.180	2.789	
LTE Band 2	20M	QPSK	1	49	-	Bottom Side	11mm	Ant 0	ECl 4	19100	1900	1	22.96	24.00	1.271	-	-	0.09	2.020	2.567	
LTE Band 2	20M	QPSK	50	0	-	Front	0mm	Ant 0	ECl 6	18900	1880	1	20.02	21.00	1.253	-	-	0.12	0.770	0.965	
LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECl 6	18900	1880	1	20.02	21.00	1.253	-	-	0.02	1.900	2.381	
LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECl 6	18700	1860	1	19.95	21.00	1.274	-	-	0.07	1.850	2.356	
LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECl 6	19100	1900	1	19.98	21.00	1.265	-	-	-0.09	1.730	2.188	
LTE Band 2	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 0	ECl 6	18900	1880	1	20.02	21.00	1.253	-	-	0.06	2.110	2.644	
LTE Band 2	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 0	ECl 6	18700	1860	1	19.95	21.00	1.274	-	-	0.11	2.060	2.623	
LTE Band 2	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 0	ECl 6	19100	1900	1	19.98	21.00	1.265	-	-	0.16	1.930	2.441	
LTE Band 2	20M	QPSK	100	0	-	Back	0mm	Ant 0	ECl 6	18900	1880	1	19.93	21.00	1.279	-	-	-0.12	1.850	2.367	
LTE Band 2	20M	QPSK	100	0	-	Bottom Side	0mm	Ant 0	ECl 6	18900	1880	1	19.93	21.00	1.279	-	-	0.02	2.030	2.597	
LTE Band 2	20M	QPSK	1	49	-	Front	0mm	Ant 3	ECl 6	18900	1880	1	18.37	20.00	1.455	-	-	0.06	0.756	1.100	
LTE Band 2	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECl 6	18900	1880	1	18.37	20.00	1.455	-	-	-0.07	1.510	2.198	
LTE Band 2	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECl 6	18700	1860	1	18.25	20.00	1.496	-	-	-0.04	1.350	2.020	
LTE Band 2	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECl 6	19100	1900	1	18.31	20.00	1.476	-	-	0.09	1.490	2.199	
LTE Band 2	20M	QPSK	1	49	-	Top Side	0mm	Ant 3	ECl 6	18900	1880	1	18.37	20.00	1.455	-	-	-0.18	1.850	2.693	
LTE Band 2	20M	QPSK	1	49	-	Top Side	0mm	Ant 3	ECl 6	18700	1860	1	18.25	20.00	1.496	-	-	0.15	1.660	2.484	
LTE Band 2	20M	QPSK	1	49	-	Top Side	0mm	Ant 3	ECl 6	19100	1900	1	18.31	20.00	1.476	-	-	-0.19	1.830	2.701	
LTE Band 2	20M	QPSK	1	49	-	Top Side	0mm	Ant 3	ECl 6	19100	1900	4	18.31	20.00	1.476	-	-	0.11	1.750	2.582	
LTE Band 2	20M	QPSK	1	49	-	Front	4mm	Ant 3	ECl 4	18900	1880	1	22.30	24.00	1.479	-	-	-0.06	1.210	1.790	
LTE Band 2	20M	QPSK	1	49	-	Back	10mm	Ant 3	ECl 4	18900	1880	1	22.30	24.00	1.479	-	-	0.13	1.150	1.701	
LTE Band 2	20M	QPSK	1	49	-	Top Side	6mm	Ant 3	ECl 4	18900	1880	1	22.30	24.00	1.479	-	-	0.05	1.770	2.618	
LTE Band 2	20M	QPSK	1	49	-	Top Side	6mm	Ant 3	ECl 4	18700	1860	1	22.14	24.00	1.535	-	-	0.17	1.590	2.440	
LTE Band 2	20M	QPSK	1	49	-	Top Side	6mm	Ant 3	ECl 4	19100	1900	1	22.12	24.00	1.542	-	-	-0.14	1.750	2.698	
LTE Band 2	20M	QPSK	50	0	-	Front	0mm	Ant 3	ECl 6	18900	1880	1	17.31	19.00	1.476	-	-	-0.07	0.616	0.909	
LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Ant 3	ECl 6	18900	1880	1	17.31	19.00	1.476	-	-	-0.18	1.260	1.859	
LTE Band 2	20M	QPSK	50	0	-	Top Side	0mm	Ant 3	ECl 6	18900	1880	1	17.31	19.00	1.476	-	-	-0.13	1.410	2.081	
LTE Band 2	20M	QPSK	50	0	-	Top Side	0mm	Ant 3	ECl 6	18700	1860	1	17.17	19.00	1.524	-	-	0.13	1.330	2.027	
LTE Band 2	20M	QPSK	50	0	-	Top Side	0mm	Ant 3	ECl 6	19100	1900	1	17.28	19.00	1.486	-	-	0.05	1.460	2.169	
LTE Band 2	20M	QPSK	100	0	-	Back	0mm	Ant 3	ECl 6	18900	1880	1	17.21	19.00	1.510	-	-	0.17	1.200	1.812	
LTE Band 2	20M	QPSK	100	0	-	Top Side	0mm	Ant 3	ECl 6	18900	1880	1	17.21	19.00	1.510	-	-	0.15	1.400	2.114	
2600MHz																					
LTE Band 7	20M	QPSK	1	49	-	Front	0mm	Ant 0	ECl 6	21100	2535	1	16.91	17.50	1.146	-	-	0.08	1.310	1.501	
LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECl 6	21100	2535	1	16.91	17.50	1.146	-	-	-0.13	2.300	2.635	
45	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECl 6	20850	2510	1	16.82	17.50	1.169	-	-	0.08	2.320	2.713
LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECl 6	20850	2510	4	16.82	17.50	1.169	-	-	-0.14	2.150	2.514	
LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECl 6	20850	2510	2	16.82	17.50	1.169	-	-	0.12	2.250	2.631	
LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECl 6	20850	2510	3	16.82	17.50	1.169	-	-	-0.1	2.210	2.585	
LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECl 6	20850	2510	5	16.82	17.50	1.169	-	-	0.12	2.150	2.514	
LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECl 6	20850	2510	6	16.82	17.50	1.169	-	-	0.05	2.030	2.374	
LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECl 6	21350	2560	1	16.85	17.50	1.161	-	-	-0.14	2.290	2.660	
LTE Band 7	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	ECl 6	21100	2535	1	16.91	17.50	1.146	-	-	0.13	1.560	1.787	
LTE Band 7	20M	QPSK	1	49	-	Front	5mm	Ant 0	ECl 4	21100	2535	1	23.49	24.00	1.125	-	-	-0.19	1.590	1.788	
LTE Band 7	20M	QPSK	1	49	-	Back	11mm	Ant 0	ECl 4	21100	2535	1	23.49	24.00	1.125	-	-	0.09	2.050	2.305	
LTE Band 7	20M	QPSK	1	49	-	Back	11mm	Ant 0	ECl 4	20850	2510	1	23.33	24.00	1.167	-	-	-0.07	2.040	2.380	
LTE Band 7	20M	QPSK	1	49	-	Back	11mm	Ant 0	ECl 4	21350	2560	1	23.40	24.00	1.148	-	-	0.05	2.010	2.308	
LTE Band 7	20M	QPSK	1	49	-	Bottom Side	11mm	Ant 0	ECl 4	21100	2535	1	23.49	24.00	1.125	-	-	0.11	2.200	2.474	
LTE Band 7	20M	QPSK	1	49	-	Bottom Side	11mm	Ant 0	ECl 4	20850	2510	1	23.33	24.00	1.167	-	-	0.05	2.180	2.544	
LTE Band 7	20M	QPSK	1	49	-	Bottom Side	11mm	Ant 0	ECl 4	21350	2560	1	23.40	24.00	1.148	-	-	-0.05	2.160	2.480	
LTE Band 7	20M	QPSK	50	0	-	Front	0mm	Ant 0	ECl 6	21100	2535	1	15.79	16.50	1.178	-	-	0.1	1.080	1.272	
LTE Band 7	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECl 6	21100	2535	1	15.79	16.50	1.178	-	-	-0.19	1.970	2.320	



	LTE Band 7	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECI 6	20850	2510	1	15.69	16.50	1.205	-	-	0.1	1.890	2.278
	LTE Band 7	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECI 6	21350	2560	1	15.76	16.50	1.186	-	-	0.18	1.930	2.289
	LTE Band 7	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 0	ECI 6	21100	2535	1	15.79	16.50	1.178	-	-	-0.18	1.300	1.531
	LTE Band 7	20M	QPSK	100	0	-	Back	0mm	Ant 0	ECI 6	21100	2535	1	15.73	16.50	1.194	-	-	0.15	1.920	2.292
	LTE Band 7	20M	QPSK	1	49	-	Front	0mm	Ant 3	ECI 6	21100	2535	1	18.68	20.00	1.355	-	-	0.1	0.684	0.927
	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECI 6	21100	2535	1	18.68	20.00	1.355	-	-	0.01	1.610	2.182
	LTE Band 7	20M	QPSK	1	49	-	Left Side	0mm	Ant 3	ECI 6	21100	2535	1	18.68	20.00	1.355	-	-	-0.08	1.400	1.897
	LTE Band 7	20M	QPSK	1	49	-	Top Side	0mm	Ant 3	ECI 6	21100	2535	1	18.68	20.00	1.355	-	-	-0.14	0.919	1.245
	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECI 6	20850	2510	1	18.43	20.00	1.435	-	-	0.11	1.670	2.397
	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECI 6	20850	2510	4	18.43	20.00	1.435	-	-	0.06	1.520	2.182
	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECI 6	21350	2560	1	18.55	20.00	1.396	-	-	0.15	1.330	1.857
	LTE Band 7	20M	QPSK	1	49	-	Front	4mm	Ant 3	ECI 4	21100	2535	1	22.48	24.00	1.419	-	-	-0.1	1.280	1.816
	LTE Band 7	20M	QPSK	1	49	-	Back	10mm	Ant 3	ECI 4	21100	2535	1	22.48	24.00	1.419	-	-	-0.17	1.710	2.427
	LTE Band 7	20M	QPSK	1	49	-	Back	10mm	Ant 3	ECI 4	20850	2510	1	22.40	24.00	1.445	-	-	-0.19	1.770	2.558
	LTE Band 7	20M	QPSK	1	49	-	Back	10mm	Ant 3	ECI 4	21350	2560	1	22.42	24.00	1.439	-	-	-0.12	1.620	2.331
	LTE Band 7	20M	QPSK	1	49	-	Left Side	5mm	Ant 3	ECI 4	21100	2535	1	22.48	24.00	1.419	-	-	-0.06	1.330	1.887
	LTE Band 7	20M	QPSK	1	49	-	Top Side	6mm	Ant 3	ECI 4	21100	2535	1	22.48	24.00	1.419	-	-	-0.05	1.140	1.618
	LTE Band 7	20M	QPSK	50	0	-	Front	0mm	Ant 3	ECI 6	21100	2535	1	17.42	19.00	1.439	-	-	0.02	0.552	0.794
	LTE Band 7	20M	QPSK	50	0	-	Back	0mm	Ant 3	ECI 6	21100	2535	1	17.42	19.00	1.439	-	-	0.07	1.260	1.813
	LTE Band 7	20M	QPSK	50	0	-	Left Side	0mm	Ant 3	ECI 6	21100	2535	1	17.42	19.00	1.439	-	-	0.11	1.170	1.683
	LTE Band 7	20M	QPSK	50	0	-	Top Side	0mm	Ant 3	ECI 6	21100	2535	1	17.42	19.00	1.439	-	-	-0.08	0.748	1.076
	LTE Band 7	20M	QPSK	100	0	-	Back	0mm	Ant 3	ECI 6	21350	2560	1	17.37	19.00	1.455	-	-	-0.03	1.300	1.892
	LTE Band 41	20M	QPSK	1	49	-	Front	0mm	Ant 0	ECI 6	40400	2571	1	19.47	20.00	1.130	62.9	1.006	0.17	1.170	1.330
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECI 6	40400	2571	1	19.47	20.00	1.130	62.9	1.006	-0.14	2.080	2.364
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECI 6	40140	2545	1	19.41	20.00	1.146	62.9	1.006	-0.08	2.160	2.489
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECI 6	40140	2545	4	19.41	20.00	1.146	62.9	1.006	0.07	2.140	2.466
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECI 6	40670	2598	1	19.34	20.00	1.164	62.9	1.006	0.03	1.860	2.178
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 0	ECI 6	41140	2645	1	19.45	20.00	1.135	62.9	1.006	-0.14	1.550	1.770
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	ECI 6	40400	2571	1	19.47	20.00	1.130	62.9	1.006	-0.02	1.500	1.705
	LTE Band 41	20M	QPSK	1	49	-	Front	5mm	Ant 0	ECI 4	40400	2571	1	23.48	24.00	1.127	62.9	1.006	-0.18	0.998	1.132
	LTE Band 41	20M	QPSK	1	49	-	Back	11mm	Ant 0	ECI 4	40400	2571	1	23.48	24.00	1.127	62.9	1.006	0.05	1.210	1.372
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	11mm	Ant 0	ECI 4	40400	2571	1	23.48	24.00	1.127	62.9	1.006	0.12	1.330	1.508
	LTE Band 41	20M	QPSK	50	0	-	Front	0mm	Ant 0	ECI 6	40400	2571	1	18.45	19.00	1.135	62.9	1.006	0.02	0.961	1.097
	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECI 6	40400	2571	1	18.45	19.00	1.135	62.9	1.006	-0.19	1.870	2.135
	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECI 6	40140	2545	1	18.36	19.00	1.159	62.9	1.006	-0.07	1.980	2.308
	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECI 6	40670	2598	1	18.26	19.00	1.186	62.9	1.006	0.05	1.660	1.980
	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 0	ECI 6	41140	2645	1	18.30	19.00	1.175	62.9	1.006	0.11	1.430	1.690
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 0	ECI 6	40400	2571	1	18.45	19.00	1.135	62.9	1.006	-0.04	1.240	1.416
	LTE Band 41	20M	QPSK	100	0	-	Bottom Side	0mm	Ant 0	ECI 6	40400	2571	1	18.39	19.00	1.151	62.9	1.006	-0.16	1.820	2.107
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECI 6	40400	2571	1	20.64	22.00	1.368	62.9	1.006	-0.04	1.720	2.367
46	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECI 6	40140	2545	1	20.60	22.00	1.380	62.9	1.006	-0.09	1.850	2.569
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECI 6	40140	2545	4	20.60	22.00	1.380	62.9	1.006	0.04	1.810	2.513
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECI 6	40670	2598	1	20.34	22.00	1.466	62.9	1.006	0.08	1.580	2.329
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 3	ECI 6	41140	2645	1	20.41	22.00	1.442	62.9	1.006	0.11	1.380	2.002
	LTE Band 41	20M	QPSK	1	49	-	Left Side	0mm	Ant 3	ECI 6	40400	2571	1	20.64	22.00	1.368	62.9	1.006	0.18	1.520	2.091
	LTE Band 41	20M	QPSK	1	49	-	Left Side	0mm	Ant 3	ECI 6	40140	2545	1	20.60	22.00	1.380	62.9	1.006	-0.06	1.630	2.264
	LTE Band 41	20M	QPSK	1	49	-	Left Side	0mm	Ant 3	ECI 6	40670	2598	1	20.34	22.00	1.466	62.9	1.006	0.04	1.400	2.064
	LTE Band 41	20M	QPSK	1	49	-	Left Side	0mm	Ant 3	ECI 6	41140	2645	1	20.41	22.00	1.442	62.9	1.006	-0.02	1.220	1.770
	LTE Band 41	20M	QPSK	1	49	-	Top Side	0mm	Ant 3	ECI 6	40400	2571	1	20.64	22.00	1.368	62.9	1.006	-0.1	1.030	1.417
	LTE Band 41	20M	QPSK	1	49	-	Back	10mm	Ant 3	ECI 4	40400	2571	1	22.46	24.00	1.426	62.9	1.006	0.09	1.130	1.621
	LTE Band 41	20M	QPSK	1	49	-	Left Side	5mm	Ant 3	ECI 4	40400	2571	1	22.46	24.00	1.426	62.9	1.006	0.09	0.898	1.288
	LTE Band 41	20M	QPSK	1	49	-	Top Side	6mm	Ant 3	ECI 4	40400	2571	1	22.46	24.00	1.426	62.9	1.006	-0.18	0.930	1.334
	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 3	ECI 6	40400	2571	1	19.42	21.00	1.439	62.9	1.006	0.1	1.410	2.041
	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 3	ECI 6	40140	2545	1	19.35	21.00	1.462	62.9	1.006	0.09	1.470	2.162
	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 3	ECI 6	40670	2598	1	19.26	21.00	1.493	62.9	1.006	-0.02	1.290	1.937
	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 3	ECI 6	41140	2645	1	19.29	21.00	1.483	62.9	1.006	-0.03	1.130	1.685



LTE Band 41	20M	QPSK	50	0	-	Left Side	0mm	Ant 3	ECl 6	40400	2571	1	19.42	21.00	1.439	62.9	1.006	-0.17	0.910	1.317
LTE Band 41	20M	QPSK	50	0	-	Top Side	0mm	Ant 3	ECl 6	40400	2571	1	19.42	21.00	1.439	62.9	1.006	0.05	0.875	1.267
LTE Band 41	20M	QPSK	100	0	-	Back	0mm	Ant 3	ECl 6	40400	2571	1	19.41	21.00	1.442	62.9	1.006	-0.1	1.400	2.031
LTE Band 41	20M	QPSK	100	0	-	Left Side	0mm	Ant 3	ECl 6	40400	2571	1	19.41	21.00	1.442	62.9	1.006	-0.05	1.010	1.465

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)	
2450MHz																		
47	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 5	Full	6	2437	1	19.00	20.50	1.413	100	1.000	0.06	1.270	1.794	
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 5	Full	6	2437	4	19.00	20.50	1.413	100	1.000	0.04	1.140	1.610	
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 5	Simultaneous	6	2437	1	16.40	18.00	1.445	100	1.000	0.01	0.692	1.000	
	WLAN2.4GHz	802.11b 1Mbps	Back	11mm	Ant 5	Full	6	2437	1	19.00	20.50	1.413	100	1.000	-0.14	0.400	0.565	
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 5	Full	6	2437	1	19.00	20.50	1.413	100	1.000	0.16	0.500	0.706	
5000MHz																		
	WLAN5.2GHz	802.11n-HT40 MCS0	Back	0mm	Ant 5	Standalone	46	5230	1	15.68	17.00	1.355	100	1.000	-0.14	1.180	1.599	
48	WLAN5.2GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 5	Standalone	46	5230	1	15.68	17.00	1.355	100	1.000	-0.06	1.930	2.616	
	WLAN5.2GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 5	Standalone	46	5230	4	15.68	17.00	1.355	100	1.000	0.03	1.630	2.209	
	WLAN5.2GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 5	Standalone	38	5190	1	14.31	16.00	1.476	100	1.000	-0.06	0.819	1.209	
	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Ant 5	Full	48	5240	1	17.73	19.00	1.340	100	1.000	0.02	0.877	1.175	
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 5	Simultaneous	42	5210	1	13.24	15.00	1.500	100	1.000	-0.14	0.739	1.108	
	WLAN5.2GHz	802.11a 6Mbps	Back	7mm	Ant 5	Full	48	5240	1	17.73	19.00	1.340	100	1.000	-0.1	1.900	2.545	
	WLAN5.2GHz	802.11a 6Mbps	Back	7mm	Ant 5	Full	44	5220	1	17.71	19.00	1.346	100	1.000	0.04	1.810	2.436	
	WLAN5.2GHz	802.11a 6Mbps	Right Side	7mm	Ant 5	Full	48	5240	1	17.73	19.00	1.340	100	1.000	-0.06	1.830	2.452	
	WLAN5.2GHz	802.11a 6Mbps	Right Side	7mm	Ant 5	Full	44	5220	1	17.71	19.00	1.346	100	1.000	0.01	1.740	2.342	
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Back	11mm	Ant 5	Simultaneous	42	5210	1	13.24	15.00	1.500	100	1.000	0.12	0.404	0.606	
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Back	10mm	Ant 5	Simultaneous	42	5210	1	13.24	15.00	1.500	100	1.000	0.16	0.468	0.702	
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	0mm	Ant 5	Standalone	54	5270	1	15.54	17.00	1.400	100	1.000	-0.15	0.503	0.704	
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	0mm	Ant 5	Standalone	54	5270	1	15.54	17.00	1.400	100	1.000	-0.11	1.130	1.582	
49	WLAN5.3GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 5	Standalone	54	5270	1	15.54	17.00	1.400	100	1.000	-0.15	1.990	2.785	
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 5	Standalone	54	5270	4	15.54	17.00	1.400	100	1.000	0.03	1.780	2.491	
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 5	Standalone	62	5310	1	14.73	16.00	1.340	100	1.000	0.07	1.510	2.023	
	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 5	Full	56	5280	1	17.64	19.00	1.368	100	1.000	-0.03	0.810	1.108	
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	0mm	Ant 5	Simultaneous	54	5270	1	13.75	15.00	1.334	100	1.000	-0.11	0.697	0.929	
	WLAN5.3GHz	802.11a 6Mbps	Front	3mm	Ant 5	Full	56	5280	1	17.64	19.00	1.368	100	1.000	0.11	0.831	1.137	
	WLAN5.3GHz	802.11a 6Mbps	Back	7mm	Ant 5	Full	56	5280	1	17.64	19.00	1.368	100	1.000	-0.05	1.980	2.708	
	WLAN5.3GHz	802.11a 6Mbps	Right Side	7mm	Ant 5	Full	56	5280	1	17.64	19.00	1.368	100	1.000	0.01	1.780	2.435	
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	5mm	Ant 5	Simultaneous	54	5270	1	13.75	15.00	1.334	100	1.000	0.11	0.233	0.311	
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	11mm	Ant 5	Simultaneous	54	5270	1	13.75	15.00	1.334	100	1.000	-0.05	0.417	0.556	
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	4mm	Ant 5	Simultaneous	54	5270	1	13.75	15.00	1.334	100	1.000	0.11	0.262	0.349	
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	10mm	Ant 5	Simultaneous	54	5270	1	13.75	15.00	1.334	100	1.000	-0.05	0.481	0.641	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	0mm	Ant 5	Standalone	106	5530	1	15.21	17.00	1.510	100	1.000	0.14	0.451	0.681	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 5	Standalone	106	5530	1	15.21	17.00	1.510	100	1.000	-0.1	1.320	1.993	
50	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	106	5530	1	15.21	17.00	1.510	100	1.000	-0.1	1.980	2.990	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	106	5530	4	15.21	17.00	1.510	100	1.000	0.09	1.950	2.945	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	106	5530	2	15.21	17.00	1.510	100	1.000	0.16	1.250	1.888	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	106	5530	3	15.21	17.00	1.510	100	1.000	-0.03	1.150	1.737	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	106	5530	5	15.21	17.00	1.510	100	1.000	0.16	1.050	1.586	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	106	5530	6	15.21	17.00	1.510	100	1.000	-0.12	1.060	1.601	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	122	5610	1	15.20	17.00	1.514	100	1.000	-0.03	1.580	2.391	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	138	5690	1	15.08	17.00	1.556	100	1.000	0.08	1.590	2.474	
	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 5	Full	116	5580	1	17.35	19.00	1.462	100	1.000	-0.19	0.695	1.016	
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 5	Simultaneous	106	5530	1	13.30	15.00	1.479	100	1.000	-0.1	0.810	1.198	
	WLAN5.5GHz	802.11a 6Mbps	Front	3mm	Ant 5	Full	116	5580	1	17.35	19.00	1.462	100	1.000	-0.01	0.678	0.991	
	WLAN5.5GHz	802.11a 6Mbps	Back	7mm	Ant 5	Full	116	5580	1	17.35	19.00	1.462	100	1.000	-0.04	1.670	2.442	
	WLAN5.5GHz	802.11a 6Mbps	Back	7mm	Ant 5	Full	132	5660	1	17.30	19.00	1.479	100	1.000	0.02	1.610	2.381	



	WLAN5.5GHz	802.11a 6Mbps	Right Side	7mm	Ant 5	Full	116	5580	1	17.35	19.00	1.462	100	1.000	0.05	1.800	2.632
	WLAN5.5GHz	802.11a 6Mbps	Right Side	7mm	Ant 5	Full	132	5660	1	17.30	19.00	1.479	100	1.000	0.01	1.730	2.559
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 5	Simultaneous	106	5530	1	13.30	15.00	1.479	100	1.000	0.05	0.188	0.278
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	11mm	Ant 5	Simultaneous	106	5530	1	13.30	15.00	1.479	100	1.000	0.12	0.374	0.553
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	4mm	Ant 5	Simultaneous	106	5530	1	13.30	15.00	1.479	100	1.000	-0.14	0.215	0.318
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	10mm	Ant 5	Simultaneous	106	5530	1	13.30	15.00	1.479	100	1.000	-0.08	0.427	0.632
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 5	Standalone	155	5775	1	15.28	17.00	1.486	100	1.000	-0.06	1.160	1.724
51	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	155	5775	1	15.28	17.00	1.486	100	1.000	-0.12	1.990	2.957
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	155	5775	1	15.28	17.00	1.486	100	1.000	0.02	1.950	2.898
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 5	Standalone	155	5775	4	15.28	17.00	1.486	100	1.000	0.03	1.750	2.600
	WLAN5.8GHz	802.11a 6Mbps	Top Side	0mm	Ant 5	Full	157	5785	1	17.40	19.00	1.445	100	1.000	-0.13	0.752	1.087
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 5	Simultaneous	155	5775	1	14.34	16.00	1.466	100	1.000	0.02	0.799	1.171
	WLAN5.8GHz	802.11a 6Mbps	Back	7mm	Ant 5	Full	157	5785	1	17.40	19.00	1.445	100	1.000	0.15	1.660	2.399
	WLAN5.8GHz	802.11a 6Mbps	Back	7mm	Ant 5	Full	149	5745	1	17.33	19.00	1.469	100	1.000	0.09	1.610	2.365
	WLAN5.8GHz	802.11a 6Mbps	Back	7mm	Ant 5	Full	165	5825	1	17.33	19.00	1.469	100	1.000	-0.02	1.630	2.394
	WLAN5.8GHz	802.11a 6Mbps	Right Side	7mm	Ant 5	Full	157	5785	1	17.40	19.00	1.445	100	1.000	-0.14	1.590	2.298
	WLAN5.8GHz	802.11a 6Mbps	Right Side	7mm	Ant 5	Full	149	5745	1	17.33	19.00	1.469	100	1.000	0.11	1.520	2.233
	WLAN5.8GHz	802.11a 6Mbps	Right Side	7mm	Ant 5	Full	165	5825	1	17.33	19.00	1.469	100	1.000	0.04	1.550	2.277
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	11mm	Ant 5	Simultaneous	155	5775	1	14.34	16.00	1.466	100	1.000	-0.14	0.444	0.651
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	10mm	Ant 5	Simultaneous	155	5775	1	14.34	16.00	1.466	100	1.000	0.16	0.508	0.744

15.5 Repeated SAR Measurement

<1g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	ECI 7	20525	836.5	1	23.29	24.00	1.178	-	-	0.17	1.160	1	1.366
2nd	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	ECI 7	20525	836.5	1	23.29	24.00	1.178	-	-	0.16	1.120	1.036	1.319
1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 3	9262	1852.4	1	19.10	20.00	1.230	-	-	0.17	1.160	1	1.427
2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	ECI 3	9262	1852.4	1	19.10	20.00	1.230	-	-	0.01	1.120	1.036	1.378
1st	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	ECI 3	21350	2560	1	13.79	14.50	1.178	-	-	-0.01	1.170	1	1.378
2nd	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 0	ECI 3	21350	2560	1	13.79	14.50	1.178	-	-	-0.1	1.110	1.054	1.307
1st	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Back	5mm	Ant 5	Standalone	6	2437	1	15.50	17.00	1.413	100	1.000	0.08	0.950	1	1.342
2nd	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Back	5mm	Ant 5	Standalone	6	2437	1	15.50	17.00	1.413	100	1.000	-0.07	0.944	1.006	1.333
1st	WLAN5GHz	-	-	-	-	802.11a 6Mbps	Back	27mm	Ant 5	Full	56	5280	1	17.64	19.00	1.368	100	1.000	-0.05	0.872	1	1.193
2nd	WLAN5GHz	-	-	-	-	802.11a 6Mbps	Back	27mm	Ant 5	Full	56	5280	1	17.64	19.00	1.368	100	1.000	-0.08	0.861	1.013	1.178

<10g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	LTE Band 2	20M	QPSK	1	49	Bottom Side	0mm	Ant 0	ECI 6	18700	1860	1	21.09	22.00	1.233	0.04	2.600	1	3.206
2nd	LTE Band 2	20M	QPSK	1	49	Bottom Side	0mm	Ant 0	ECI 6	18700	1860	1	21.09	22.00	1.233	0.02	2.520	1.032	3.107
1st	LTE Band 7	20M	QPSK	1	49	Back	0mm	Ant 0	ECI 6	20850	2510	1	16.82	17.50	1.169	0.08	2.320	1	2.713
2nd	LTE Band 7	20M	QPSK	1	49	Back	0mm	Ant 0	ECI 6	20850	2510	1	16.82	17.50	1.169	0.01	2.270	1.022	2.655

General Note:

- Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is $\geq 0.8W/kg$.
- 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.
- Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
- The ratio is the difference in percentage between original and repeated *measured* SAR.
- All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Mobile Cellular Phone			
		Head	Body	Hotspot	Product specific 10g SAR
1.	WWAN + WLAN2.4GHz	Yes	Yes	Yes	Yes
2.	WWAN + WLAN5GHz	Yes	Yes	Yes	Yes
3.	WWAN + Bluetooth	Yes	Yes	Yes	Yes
4.	WLAN5GHz + Bluetooth	Yes	Yes	Yes	Yes
5.	WWAN + WLAN5GHz + Bluetooth	Yes	Yes	Yes	Yes
6.	WWAN + WLAN2.4GHz + NFC				Yes
7.	WWAN + WLAN5GHz + NFC				Yes
8.	WWAN + Bluetooth + NFC				Yes
9.	WLAN5GHz + Bluetooth + NFC				Yes
10.	WWAN + WLAN5GHz + Bluetooth + NFC				Yes

General Note:

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), and LTE supports VoLTE function.
2. EUT will choose each GSM, WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. This device WLAN 2.4GHz supports hotspot operation and Bluetooth support tethering applications.
4. This device 2.4GHz WLAN/ 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WLAN Direct (GC/GO), and 5.3GHz / 5.5GHz supports WLAN Direct (GC only).
5. According to the EUT characteristic, WLAN 5GHz and Bluetooth can transmit simultaneously.
6. According to the EUT characteristic, WLAN 5GHz and WLAN 2.4GHz cannot transmit simultaneously.
7. WLAN 2.4GHz and Bluetooth share the same antenna and they cannot transmit simultaneously.
8. NFC can transmit simultaneously with other Radios in extremity exposure condition.
9. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
10. When stand-alone SAR is not required for a transmitter or antenna, its SAR is considered zero in the SAR summing process to assess Multi-band transmission SAR compliance.
11. The maximum SAR summation is calculated based on the same configuration and test position.
12. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
 - ii) $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$, 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 $SPLSR \leq 0.04$ for 1g SAR and $SPLSR \leq 0.10$ for 10g SAR, simultaneously transmission SAR measurement is not necessary.
 - iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.
 - v) The SPLSR calculated results please refer to section 16.5.



16.1 Head Exposure Conditions

WWAN Band		Exposure Position	1	3	4	5	1+3	1+4+5
			WWAN	WLAN2.4GHz Ant 5	WLAN5GHz Ant 5	Bluetooth Ant 5	Summed	Summed
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
GSM	GSM850 Ant 0	Right Cheek	0.421	0.483	0.584	0.069	0.90	1.07
		Right Tilted	0.233	0.445	0.667	0.075	0.68	0.98
		Left Cheek	0.385	0.756	0.670	0.153	1.14	1.21
		Left Tilted	0.227	0.807	0.791	0.097	1.03	1.12
	GSM1900 Ant 0	Right Cheek	0.247	0.483	0.584	0.069	0.73	0.90
		Right Tilted	0.179	0.445	0.667	0.075	0.62	0.92
		Left Cheek	0.207	0.756	0.670	0.153	0.96	1.03
		Left Tilted	0.222	0.807	0.791	0.097	1.03	1.11
WCDMA	WCDMA II Ant 0	Right Cheek	0.462	0.483	0.584	0.069	0.95	1.12
		Right Tilted	0.326	0.445	0.667	0.075	0.77	1.07
		Left Cheek	0.409	0.756	0.670	0.153	1.17	1.23
		Left Tilted	0.397	0.807	0.791	0.097	1.20	1.29
	WCDMA V Ant 0	Right Cheek	0.405	0.483	0.584	0.069	0.89	1.06
		Right Tilted	0.239	0.445	0.667	0.075	0.68	0.98
		Left Cheek	0.373	0.756	0.670	0.153	1.13	1.20
		Left Tilted	0.230	0.807	0.791	0.097	1.04	1.12
LTE	LTE Band 2 Ant 0	Right Cheek	0.350	0.483	0.584	0.069	0.83	1.00
		Right Tilted	0.243	0.445	0.667	0.075	0.69	0.99
		Left Cheek	0.300	0.756	0.670	0.153	1.06	1.12
		Left Tilted	0.299	0.807	0.791	0.097	1.11	1.19
	LTE Band 2 Ant 3	Right Cheek	0.837	0.483	0.584	0.069	1.32	1.49
		Right Tilted	0.725	0.445	0.667	0.075	1.17	1.47
		Left Cheek	0.414	0.756	0.670	0.153	1.17	1.24
		Left Tilted	0.456	0.807	0.791	0.097	1.26	1.34
	LTE Band 5 Ant 0	Right Cheek	0.353	0.483	0.584	0.069	0.84	1.01
		Right Tilted	0.213	0.445	0.667	0.075	0.66	0.96
		Left Cheek	0.325	0.756	0.670	0.153	1.08	1.15
		Left Tilted	0.199	0.807	0.791	0.097	1.01	1.09
	LTE Band 5 Ant 3	Right Cheek	0.831	0.483	0.584	0.069	1.31	1.48
		Right Tilted	0.635	0.445	0.667	0.075	1.08	1.38
		Left Cheek	0.602	0.756	0.670	0.153	1.36	1.43
		Left Tilted	0.698	0.807	0.791	0.097	1.51	1.59
	LTE Band 7 Ant 0	Right Cheek	0.090	0.483	0.584	0.069	0.57	0.74
		Right Tilted	0.045	0.445	0.667	0.075	0.49	0.79
		Left Cheek	0.067	0.756	0.670	0.153	0.82	0.89
		Left Tilted	0.054	0.807	0.791	0.097	0.86	0.94
	LTE Band 7 Ant 3	Right Cheek	0.880	0.483	0.584	0.069	1.36	1.53
		Right Tilted	0.747	0.445	0.667	0.075	1.19	1.49
		Left Cheek	0.264	0.756	0.670	0.153	1.02	1.09
		Left Tilted	0.295	0.807	0.791	0.097	1.10	1.18
LTE Band 41 Ant 0	Right Cheek	0.065	0.483	0.584	0.069	0.55	0.72	
	Right Tilted	0.033	0.445	0.667	0.075	0.48	0.78	
	Left Cheek	0.043	0.756	0.670	0.153	0.80	0.87	
	Left Tilted	0.022	0.807	0.791	0.097	0.83	0.91	
LTE Band 41 Ant 3	Right Cheek	0.848	0.483	0.584	0.069	1.33	1.50	
	Right Tilted	0.713	0.445	0.667	0.075	1.16	1.46	
	Left Cheek	0.228	0.756	0.670	0.153	0.98	1.05	
	Left Tilted	0.248	0.807	0.791	0.097	1.06	1.14	

Exposure Position	4	5	4+5
	WLAN5GHz Ant 5	Bluetooth Ant 5	Summed
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Right Cheek	0.584	0.069	0.65
Right Tilted	0.667	0.075	0.74
Left Cheek	1.187	0.153	1.34
Left Tilted	0.791	0.097	0.89

16.2 Hotspot Exposure Conditions

WWAN Band	Exposure Position	1	3	4	5	1+3	1+4+5	SPLSR	
		WWAN	WLAN2.4GHz Ant 5	WLAN5GHz Ant 5	Bluetooth Ant 5	Summed	Summed		
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
GSM	GSM850 Ant 0	Front	0.585	0.397	0.104	0.056	0.98	0.75	
		Back	1.256	0.856	0.623	0.182	2.11	2.06	Case 1/9
		Left side	0.480				0.48	0.48	
		Right side	0.639	0.360	0.633	0.085	1.00	1.36	
		Top side		0.345	0.198	0.085	0.35	0.28	
		Bottom side	0.563				0.56	0.56	
	GSM1900 Ant 0	Front	0.468	0.397	0.104	0.056	0.87	0.63	
		Back	0.772	0.856	0.623	0.182	1.63	1.58	Case 2
		Left side	0.350				0.35	0.35	
		Right side	0.141	0.360	0.633	0.085	0.50	0.86	
		Top side		0.345	0.198	0.085	0.35	0.28	
		Bottom side	1.365				1.37	1.37	
WCDMA	WCDMA II Ant 0	Front	0.543	0.397	0.104	0.056	0.94	0.70	
		Back	0.863	0.856	0.623	0.182	1.72	1.67	Case 3/11
		Left side	0.265				0.27	0.27	
		Right side	0.150	0.360	0.633	0.085	0.51	0.87	
		Top side		0.345	0.198	0.085	0.35	0.28	
		Bottom side	1.369				1.37	1.37	
	WCDMA V Ant 0	Front	0.698	0.397	0.104	0.056	1.10	0.86	
		Back	1.333	0.856	0.623	0.182	2.19	2.14	Case 4/12
		Left side	0.457				0.46	0.46	
		Right side	0.664	0.360	0.633	0.085	1.02	1.38	
		Top side		0.345	0.198	0.085	0.35	0.28	
		Bottom side	0.587				0.59	0.59	
LTE	LTE Band 2 Ant 0	Front	0.480	0.397	0.104	0.056	0.88	0.64	
		Back	0.745	0.856	0.623	0.182	1.60	1.55	Case 5
		Left side	0.265				0.27	0.27	
		Right side	0.139	0.360	0.633	0.085	0.50	0.86	
		Top side		0.345	0.198	0.085	0.35	0.28	
		Bottom side	1.301				1.30	1.30	
	LTE Band 2 Ant 3	Front	0.227	0.397	0.104	0.056	0.62	0.39	
		Back	0.568	0.856	0.623	0.182	1.42	1.37	
		Left side	0.110				0.11	0.11	
		Right side		0.360	0.633	0.085	0.36	0.72	
		Top side	0.515	0.345	0.198	0.085	0.86	0.80	
		Bottom side					0.00	0.00	
	LTE Band 5 Ant 0	Front	0.662	0.397	0.104	0.056	1.06	0.82	
		Back	1.366	0.856	0.623	0.182	2.22	2.17	Case 6/13
		Left side	0.452				0.45	0.45	
		Right side	0.637	0.360	0.633	0.085	1.00	1.36	
		Top side		0.345	0.198	0.085	0.35	0.28	



	LTE Band 5 Ant 3	Bottom side	0.486				0.49	0.49	
		Front	0.258	0.397	0.104	0.056	0.66	0.42	
		Back	0.668	0.856	0.623	0.182	1.52	1.47	
		Left side	0.203				0.20	0.20	
		Right side		0.360	0.633	0.085	0.36	0.72	
		Top side	0.428	0.345	0.198	0.085	0.77	0.71	
		Bottom side					0.00	0.00	
	LTE Band 7 Ant 0	Front	0.332	0.397	0.104	0.056	0.73	0.49	
		Back	1.081	0.856	0.623	0.182	1.94	1.89	Case 7/14
		Left side	0.049				0.05	0.05	
		Right side	0.037	0.360	0.633	0.085	0.40	0.76	
		Top side		0.345	0.198	0.085	0.35	0.28	
		Bottom side	1.301				1.30	1.30	
	LTE Band 7 Ant 3	Front	0.191	0.397	0.104	0.056	0.59	0.35	
		Back	0.679	0.856	0.623	0.182	1.54	1.48	
		Left side	0.401				0.40	0.40	
		Right side		0.360	0.633	0.085	0.36	0.72	
		Top side	0.396	0.345	0.198	0.085	0.74	0.68	
		Bottom side					0.00	0.00	
	LTE Band 41 Ant 0	Front	0.344	0.397	0.104	0.056	0.74	0.50	
		Back	1.182	0.856	0.623	0.182	2.04	1.99	Case 8/15
		Left side	0.044				0.04	0.04	
		Right side	0.036	0.360	0.633	0.085	0.40	0.75	
		Top side		0.345	0.198	0.085	0.35	0.28	
Bottom side		1.296				1.30	1.30		
LTE Band 41 Ant 3	Front	0.199	0.397	0.104	0.056	0.60	0.36		
	Back	0.635	0.856	0.623	0.182	1.49	1.44		
	Left side	0.377				0.38	0.38		
	Right side		0.360	0.633	0.085	0.36	0.72		
	Top side	0.359	0.345	0.198	0.085	0.70	0.64		
	Bottom side					0.00	0.00		

Exposure Position	4	5	4+5
	WLAN5GHz Ant 5	Bluetooth Ant 5	Summed
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Front	0.104	0.056	0.16
Back	0.623	0.182	0.81
Left side			0.00
Right side	0.633	0.085	0.72
Top side	0.198	0.085	0.28
Bottom side			0.00

16.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1	3	4	5	1+3	1+4+5	SPLSR
			WWAN	WLAN2.4GHz Ant 5	WLAN5GHz Ant 5	Bluetooth Ant 5	Summed	Summed	
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
GSM	GSM850 Ant 0	Front	0.585	0.623	0.190	0.056	1.21	0.83	
		Back	1.256	0.732	0.531	0.182	1.99	1.97	Case 16/24
	GSM1900 Ant 0	Front	0.734	0.623	0.190	0.056	1.36	0.98	
		Back	1.315	0.732	0.531	0.182	2.05	2.03	Case 17/25
WCDMA	WCDMA II Ant 0	Front	0.969	0.623	0.190	0.056	1.59	1.22	
		Back	1.427	0.732	0.531	0.182	2.16	2.14	Case 18/26
	WCDMA V Ant 0	Front	0.698	0.623	0.190	0.056	1.32	0.94	
		Back	1.333	0.732	0.531	0.182	2.07	2.05	Case 19/27
LTE	LTE Band 2 Ant 0	Front	0.754	0.623	0.190	0.056	1.38	1.00	
		Back	1.256	0.732	0.531	0.182	1.99	1.97	Case 20/28
	LTE Band 2 Ant 3	Front	0.279	0.623	0.190	0.056	0.90	0.53	
		Back	0.701	0.732	0.531	0.182	1.43	1.41	
	LTE Band 5 Ant 0	Front	0.662	0.623	0.190	0.056	1.29	0.91	
		Back	1.366	0.732	0.531	0.182	2.10	2.08	Case 21/29
	LTE Band 5 Ant 3	Front	0.325	0.623	0.190	0.056	0.95	0.57	
		Back	0.841	0.732	0.531	0.182	1.57	1.55	
	LTE Band 7 Ant 0	Front	0.427	0.623	0.190	0.056	1.05	0.67	
		Back	1.378	0.732	0.531	0.182	2.11	2.09	Case 22/30
	LTE Band 7 Ant 3	Front	0.219	0.623	0.190	0.056	0.84	0.47	
		Back	0.782	0.732	0.531	0.182	1.51	1.50	
	LTE Band 41 Ant 0	Front	0.371	0.623	0.190	0.056	0.99	0.62	
		Back	1.285	0.732	0.531	0.182	2.02	2.00	Case 23/31
LTE Band 41 Ant 3	Front	0.249	0.623	0.190	0.056	0.87	0.50		
	Back	0.822	0.732	0.531	0.182	1.55	1.54		

Exposure Position	4	5	4+5
	WLAN5GHz Ant 5	Bluetooth Ant 5	Summed
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Front	0.190	0.056	0.25
Back	0.531	0.182	0.71

<Sensor off>

WWAN Band	Exposure Position	1	3	4	1+3	1+4
		WWAN	WLAN2.4GHz Ant 5	WLAN5GHz Ant 5	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
All Band Ant 0	Front	0.490	0.244	0.651	0.73	1.14
	Back	0.250	0.119	1.193	0.37	1.44
All Band Ant 3	Front	0.309	0.244	0.651	0.55	0.96
	Back	0.241	0.119	1.193	0.36	1.43



16.4 Product specific 10g SAR Exposure Conditions

Remark:

- For Bluetooth Product specific 10g stand-alone SAR is not required for a transmitter or antenna, due to 1g hotspot SAR is <1.2W/kg.

WWAN Band		Exposure Position	1	3	4	5	1+3+5	1+4+5	SPLSR
			WWAN	WLAN2.4GHz Ant 5	WLAN5GHz Ant 5	NFC	Summed	Summed	
			10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	
GSM	GSM850 Ant 0	Front			0.704		0.00	0.70	
		Back	2.192	1.000	1.198	0.038	3.23	3.43	
		Left side					0.00	0.00	
		Right side			2.990		0.00	2.99	
		Top side			1.175		0.00	1.18	
		Bottom side					0.00	0.00	
	GSM1900 Ant 0	Front			0.704		0.00	0.70	
		Back	2.880	1.000	1.198	0.038	3.92	4.12	Case 33
		Left side					0.00	0.00	
		Right side			2.990		0.00	2.99	
		Top side			1.175		0.00	1.18	
		Bottom side	2.615				2.62	2.62	
WCDMA	WCDMA II Ant 0	Front	1.219		0.704		1.22	1.92	
		Back	2.942	1.000	1.198	0.038	3.98	4.18	Case 34
		Left side					0.00	0.00	
		Right side			2.990		0.00	2.99	
		Top side			1.175		0.00	1.18	
		Bottom side	3.139				3.14	3.14	
	WCDMA V Ant 0	Front			0.704		0.00	0.70	
		Back	1.754	1.000	1.198	0.038	2.79	2.99	
		Left side					0.00	0.00	
		Right side			2.990		0.00	2.99	
		Top side			1.175		0.00	1.18	
		Bottom side					0.00	0.00	
LTE	LTE Band 2 Ant 0	Front	1.182		0.704		1.18	1.89	
		Back	2.984	1.000	1.198	0.038	4.02	4.22	Case 32/35
		Left side					0.00	0.00	
		Right side			2.990		0.00	2.99	
		Top side			1.175		0.00	1.18	
		Bottom side	3.206				3.21	3.21	
	LTE Band 2 Ant 3	Front	1.100		0.704		1.10	1.80	
		Back	2.199	1.000	1.198	0.038	3.24	3.44	
		Left side					0.00	0.00	
		Right side			2.990		0.00	2.99	
		Top side	2.701		1.175		2.70	3.88	
		Bottom side					0.00	0.00	
	LTE Band 5 Ant 0	Front			0.704		0.00	0.70	
		Back	1.519	1.000	1.198	0.038	2.56	2.76	
		Left side					0.00	0.00	
		Right side			2.990		0.00	2.99	
		Top side			1.175		0.00	1.18	
		Bottom side					0.00	0.00	
	LTE Band 5 Ant 3	Front			0.704		0.00	0.70	
		Back	1.815	1.000	1.198	0.038	2.85	3.05	
		Left side					0.00	0.00	
		Right side			2.990		0.00	2.99	
		Top side			1.175		0.00	1.18	
		Bottom side					0.00	0.00	
LTE Band 7 Ant 0	Front	1.501		0.704		1.50	2.21		

		Back	2.713	1.000	1.198	0.038	3.75	3.95	
		Left side					0.00	0.00	
		Right side			2.990		0.00	2.99	
		Top side			1.175		0.00	1.18	
		Bottom side	1.787				1.79	1.79	
	LTE Band 7 Ant 3	Front	0.927		0.704		0.93	1.63	
		Back	2.397	1.000	1.198	0.038	3.44	3.63	
		Left side	1.897				1.90	1.90	
		Right side			2.990		0.00	2.99	
		Top side	1.245		1.175		1.25	2.42	
	LTE Band 41 Ant 0	Bottom side					0.00	0.00	
		Front	1.330		0.704		1.33	2.03	
		Back	2.489	1.000	1.198	0.038	3.53	3.73	
		Left side					0.00	0.00	
		Right side			2.990		0.00	2.99	
	LTE Band 41 Ant 3	Top side			1.175		0.00	1.18	
		Bottom side	2.107				2.11	2.11	
		Front			0.704		0.00	0.70	
		Back	2.569	1.000	1.198	0.038	3.61	3.81	
		Left side	2.264				2.26	2.26	
	Right side			2.990		0.00	2.99		
	Top side	1.417		1.175		1.42	2.59		
	Bottom side					0.00	0.00		

<Sensor off>

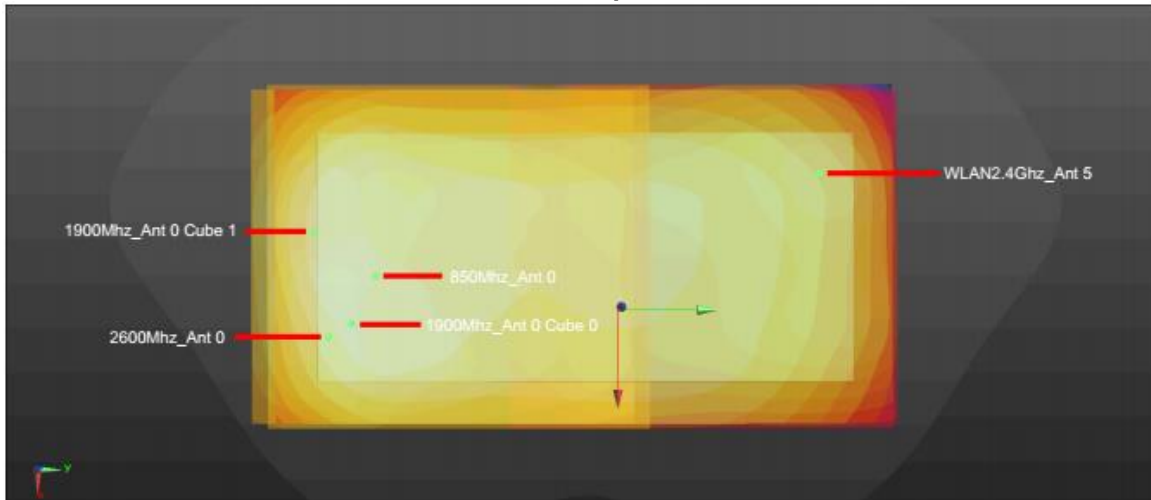
WWAN Band	Exposure Position	1	3	4	1+3	1+4
		WWAN	WLAN2.4GHz Ant 5	WLAN5GHz Ant 5	Summed	Summed
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)
All Band Ant 0	Front	1.788		0.311	1.79	2.10
	Back	2.700	0.565	0.651	3.27	3.35
	Left side				0.00	0.00
	Right side			2.990	0.00	2.99
	Top side			1.175	0.00	1.18
	Bottom side	2.889			2.89	2.89
All Band Ant 3	Front	1.816		0.318	1.82	2.13
	Back	2.558	0.706	0.744	3.26	3.30
	Left side	1.887			1.89	1.89
	Right side			2.990	0.00	2.99
	Top side	2.698		1.175	2.70	3.87
	Bottom side				0.00	0.00

16.5 SPLSR Evaluation and Analysis

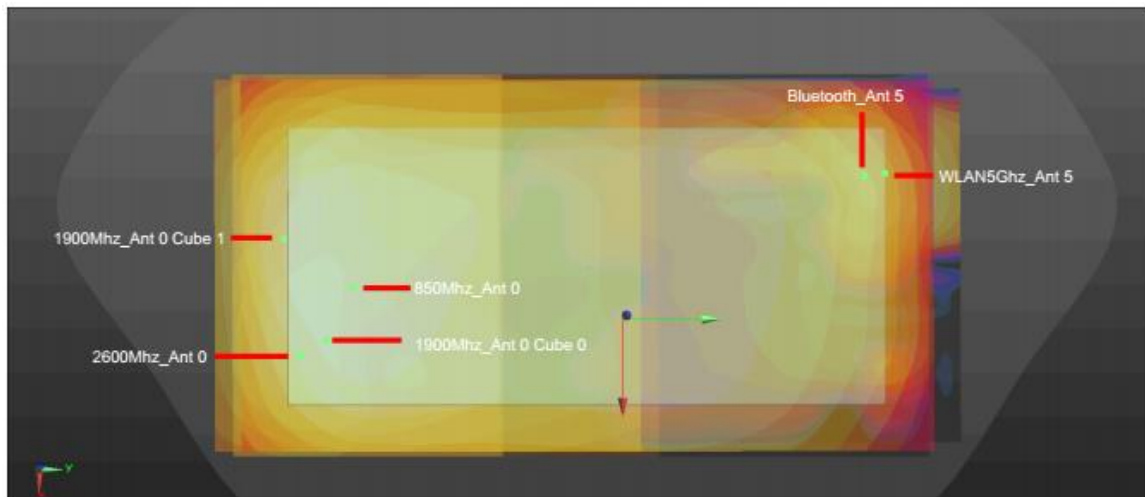
General Note:

1. When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where $(x1, y1, z1)$ and $(x2, y2, z2)$ are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
2. $SPLSR = (SAR1 + SAR2)1.5 / (\text{min. separation distance, mm})$. If $SPLSR \leq 0.04$ for 1g SAR and $SPLSR \leq 0.10$ for 10g SAR, simultaneously transmission SAR measurement is not necessary.
3. Per April 2022 TCB Workshop Notes, WLAN5GHz was summed algebraically with the BT for the purposes of hybrid SPLSR combination and they are located at the top of the device, and they are share the same antenna.
4. Per April 2022 TCB Workshop, instead of doing a small volume scan over a co-located antenna pair, used summing the SAR values of the co-located pair and using that value in SPLSR calculation. In the calculation used the minimum distance between the spatially separated antenna and the closest antenna of the co-located antenna pair to be conservative.

For Hotspot

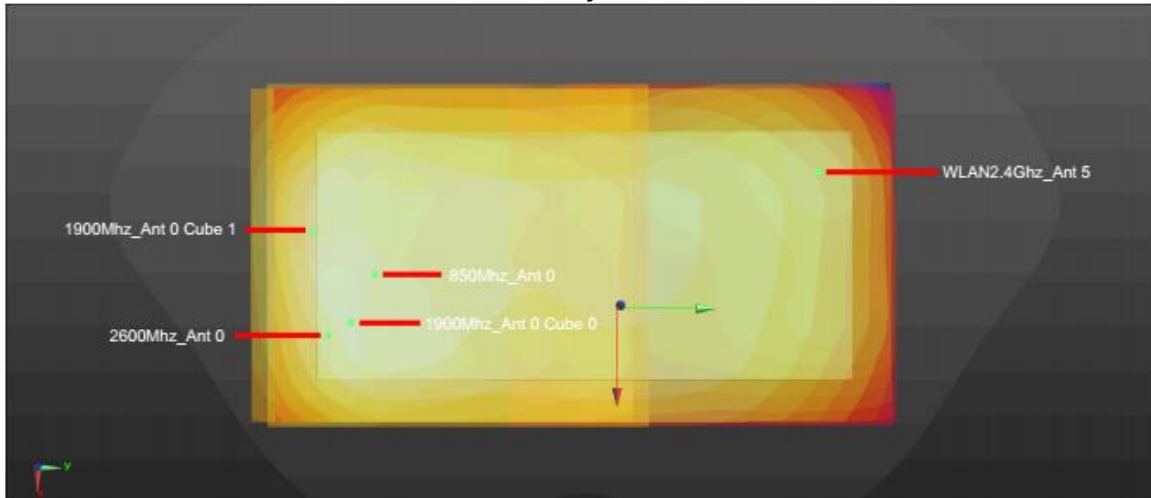


WWAN + WLAN 2.4GHz Back_5mm

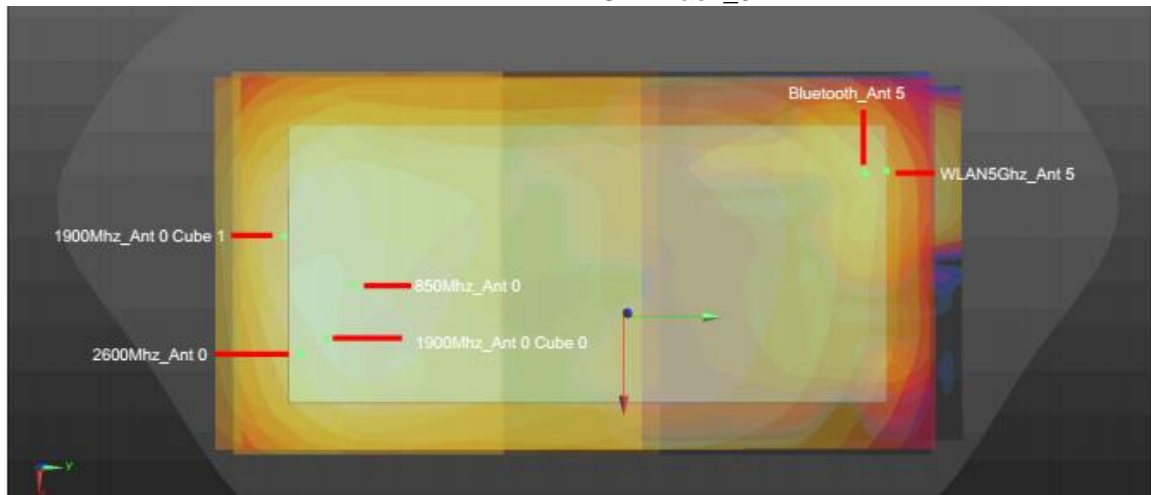


WWAN + WLAN 5GHz + Bluetooth Back_5mm

For Body-worn

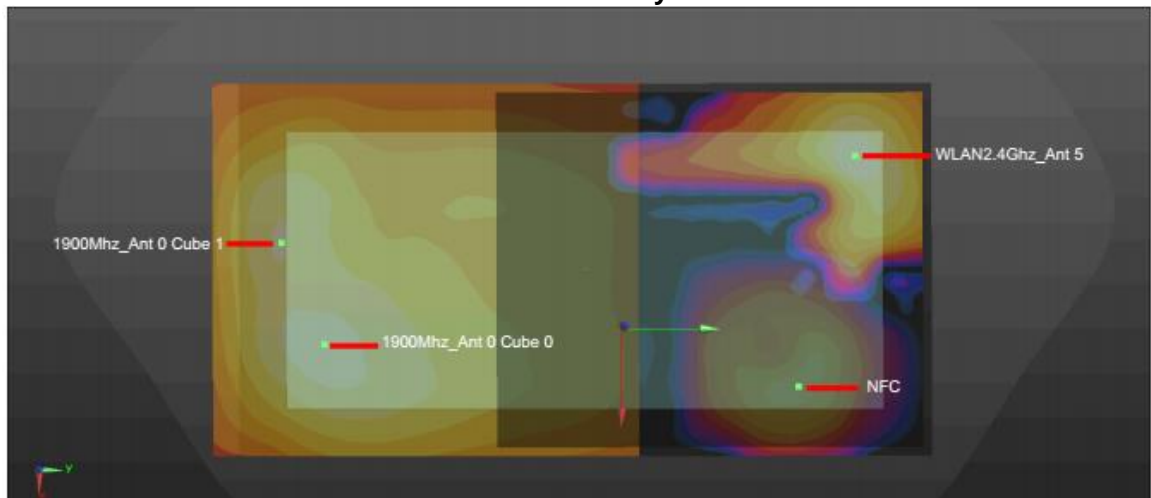


WWAN + WLAN 2.4GHz Back_5mm

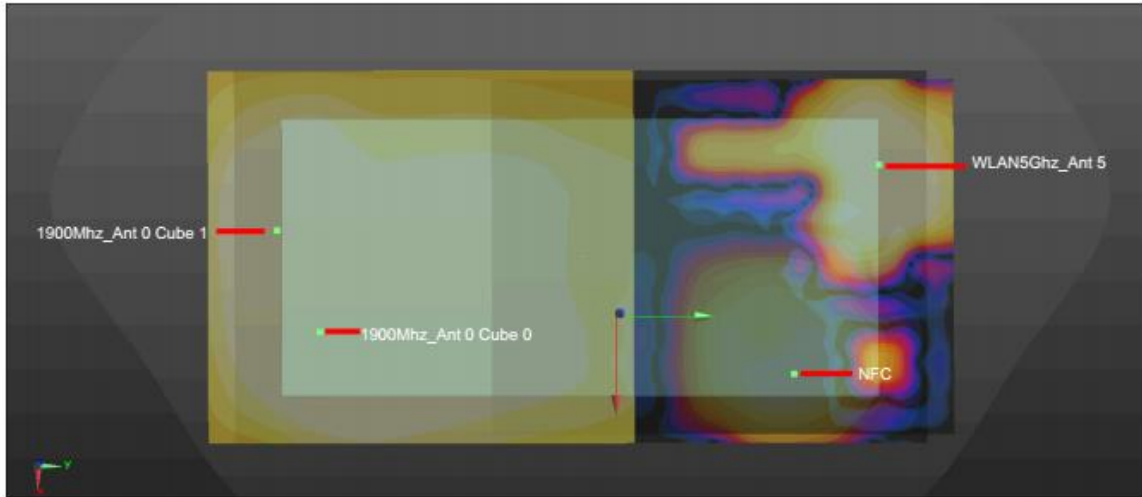


WWAN + WLAN 5GHz + Bluetooth Back_5mm

For Extremity



WWAN + WLAN 2.4GHz + NFC Back_0mm



WWAN + WLAN 5GHzGHz + NFC Back_0mm

For Hotspot

Case	Band	Position	SAR (W/kg)	SUM SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 1	GSM850 Ant 0	Back	1.256	1.256	5mm	-0.019	-0.066	-0.209	142.9	2.11	0.02	Not required
	WLAN2.4GHz Ant 5		0.856	0.856	5mm	-0.0514	0.0732	-0.208				
Case 2	GSM1900 Ant 0	Back	0.772	0.772	5mm	-0.0025	-0.08	-0.208	160.8	1.63	0.01	Not required
	WLAN2.4GHz Ant 5		0.856	0.856	5mm	-0.0514	0.0732	-0.208				
Case 3	WCDMA II Ant 0 Cube 0	Back	0.863	0.863	5mm	-0.004	-0.0815	-0.208	161.8	1.72	0.01	Not required
	WLAN2.4GHz Ant 5		0.856	0.856	5mm	-0.0514	0.0732	-0.208				
	WCDMA II Ant 0 Cube 1	Back	0.863	0.863	5mm	-0.0325	-0.0855	-0.208				
	WLAN2.4GHz Ant 5		0.856	0.856	5mm	-0.0514	0.0732	-0.208				
Case 4	WCDMA V Ant 0	Back	1.333	1.333	5mm	-0.0265	-0.063	-0.209	138.5	2.19	0.02	Not required
	WLAN2.4GHz Ant 5		0.856	0.856	5mm	-0.0514	0.0732	-0.208				
Case 5	LTE Band 2 Ant 0	Back	0.745	0.745	5mm	-0.004	-0.08	-0.208	160.4	1.60	0.01	Not required
	WLAN2.4GHz Ant 5		0.856	0.856	5mm	-0.0514	0.0732	-0.208				
Case 6	LTE Band 5 Ant 0	Back	1.366	1.366	5mm	-0.025	-0.063	-0.209	138.7	2.22	0.02	Not required
	WLAN2.4GHz Ant 5		0.856	0.856	5mm	-0.0514	0.0732	-0.208				
Case 7	LTE Band 7 Ant 0	Back	1.081	1.081	5mm	-0.001	-0.0832	-0.207	164.3	1.94	0.02	Not required
	WLAN2.4GHz Ant 5		0.856	0.856	5mm	-0.0514	0.0732	-0.208				
Case 8	LTE Band 41 Ant 0	Back	1.182	1.182	5mm	0.0002	-0.0808	-0.208	162.4	2.04	0.02	Not required
	WLAN2.4GHz Ant 5		0.856	0.856	5mm	-0.0514	0.0732	-0.208				
Case 9												



Case	Band	Position	SAR (W/kg)	SUM SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 11_Cube 0	GSM850 Ant 0	Back	1.256	1.256	5mm	-0.019	-0.066	-0.209	150.7	2.06	0.02	Not required
	Bluetooth Ant 5		0.182	0.805	5mm							
	WLAN5GHz Ant 5		0.623		5mm	-0.052	0.081	-0.209				
	GSM850 Ant 0	Back	1.256	1.256	5mm	-0.019	-0.066	-0.209	147.4	2.06	0.02	Not required
	Bluetooth Ant 5		0.182	0.805	5mm	-0.0502	0.078	-0.207				
	WLAN5GHz Ant 5		0.623		5mm							
Case 11_Cube 1	WCDMA II Ant 0	Back	0.863	0.863	5mm	-0.004	-0.0815	-0.208	169.4	1.67	0.01	Not required
	Bluetooth Ant 5		0.182	0.805	5mm							
	WLAN5GHz Ant 5		0.623		5mm	-0.052	0.081	-0.209				
	WCDMA II Ant 0	Back	0.863	0.863	5mm	-0.004	-0.0815	-0.208	166.1	1.67	0.01	Not required
	Bluetooth Ant 5		0.182	0.805	5mm	-0.0502	0.078	-0.207				
	WLAN5GHz Ant 5		0.623		5mm							
Case 12	WCDMA V Ant 0	Back	1.333	1.333	5mm	-0.0325	-0.0855	-0.208	167.6	1.67	0.01	Not required
	Bluetooth Ant 5		0.182	0.805	5mm							
	WLAN5GHz Ant 5		0.623		5mm	-0.052	0.081	-0.209				
	WCDMA V Ant 0	Back	1.333	1.333	5mm	-0.0325	-0.0855	-0.208	164.5	1.67	0.01	Not required
	Bluetooth Ant 5		0.182	0.805	5mm	-0.0502	0.078	-0.207				
	WLAN5GHz Ant 5		0.623		5mm							
Case 13	WCDMA V Ant 0	Back	1.333	1.333	5mm	-0.0265	-0.063	-0.209	146.2	2.14	0.02	Not required
	Bluetooth Ant 5		0.182	0.805	5mm							
	WLAN5GHz Ant 5		0.623		5mm	-0.052	0.081	-0.209				
	WCDMA V Ant 0	Back	1.333	1.333	5mm	-0.0265	-0.063	-0.209	143.0	2.14	0.02	Not required
	Bluetooth Ant 5		0.182	0.805	5mm	-0.0502	0.078	-0.207				
	WLAN5GHz Ant 5		0.623		5mm							
Case 14	LTE Band 5 Ant 0	Back	1.366	1.366	5mm	-0.025	-0.063	-0.209	146.5	2.17	0.02	Not required
	Bluetooth Ant 5		0.182	0.805	5mm							
	WLAN5GHz Ant 5		0.623		5mm	-0.052	0.081	-0.209				
	LTE Band 5 Ant 0	Back	1.366	1.366	5mm	-0.025	-0.063	-0.209	143.2	2.17	0.02	Not required
	Bluetooth Ant 5		0.182	0.805	5mm	-0.0502	0.078	-0.207				
	WLAN5GHz Ant 5		0.623		5mm							
Case 15	LTE Band 7 Ant 0	Back	1.081	1.081	5mm	-0.001	-0.0832	-0.207	171.9	1.89	0.02	Not required
	Bluetooth Ant 5		0.182	0.805	5mm							
	WLAN5GHz Ant 5		0.623		5mm	-0.052	0.081	-0.209				
	LTE Band 7 Ant 0	Back	1.081	1.081	5mm	-0.001	-0.0832	-0.207	168.5	1.89	0.02	Not required
	Bluetooth Ant 5		0.182	0.805	5mm	-0.0502	0.078	-0.207				
	WLAN5GHz Ant 5		0.623		5mm							
Case 15	LTE Band 41 Ant 0	Back	1.182	1.182	5mm	0.0002	-0.0808	-0.208	170.0	1.99	0.02	Not required
	Bluetooth Ant 5		0.182	0.805	5mm							
	WLAN5GHz Ant 5		0.623		5mm	-0.052	0.081	-0.209				
	LTE Band 41 Ant 0	Back	1.182	1.182	5mm	0.0002	-0.0808	-0.208	166.6	1.99	0.02	Not required
	Bluetooth Ant 5		0.182	0.805	5mm	-0.0502	0.078	-0.207				
	WLAN5GHz Ant 5		0.623		5mm							



For Body

Case	Band	Position	SAR (W/kg)	SUM SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
Case 16	GSM850 Ant 0	Back	1.256	1.256	5mm	-0.019	-0.066	-0.209	142.9	1.99	0.02	Not required
	WLAN2.4GHz Ant 5		0.732	0.732	5mm	-0.0514	0.0732	-0.208				
Case 17	GSM1900 Ant 0	Back	1.315	1.315	5mm	-0.0025	-0.08	-0.208	160.8	2.05	0.02	Not required
	WLAN2.4GHz Ant 5		0.732	0.732	5mm	-0.0514	0.0732	-0.208				
Case 18	WCDMA II Ant 0 Cube 0	Back	1.427	1.427	5mm	-0.004	-0.0815	-0.208	161.8	2.16	0.02	Not required
	WLAN2.4GHz Ant 5		0.732	0.732	5mm	-0.0514	0.0732	-0.208				
	WCDMA II Ant 0 Cube 1	Back	1.427	1.427	5mm	-0.0325	-0.0855	-0.208	159.8	2.16	0.02	Not required
	WLAN2.4GHz Ant 5		0.732	0.732	5mm	-0.0514	0.0732	-0.208				
Case 19	WCDMA V Ant 0	Back	1.333	1.333	5mm	-0.0265	-0.063	-0.209	138.5	2.07	0.02	Not required
	WLAN2.4GHz Ant 5		0.732	0.732	5mm	-0.0514	0.0732	-0.208				
Case 20	LTE Band 2 Ant 0	Back	1.256	1.256	5mm	-0.004	-0.08	-0.208	160.4	1.99	0.02	Not required
	WLAN2.4GHz Ant 5		0.732	0.732	5mm	-0.0514	0.0732	-0.208				
Case 21	LTE Band 5 Ant 0	Back	1.366	1.366	5mm	-0.025	-0.063	-0.209	138.7	2.10	0.02	Not required
	WLAN2.4GHz Ant 5		0.732	0.732	5mm	-0.0514	0.0732	-0.208				
Case 22	LTE Band 7 Ant 0	Back	1.378	1.378	5mm	-0.001	-0.0832	-0.207	164.3	2.11	0.02	Not required
	WLAN2.4GHz Ant 5		0.732	0.732	5mm	-0.0514	0.0732	-0.208				
Case 23	LTE Band 41 Ant 0	Back	1.285	1.285	5mm	0.0002	-0.0808	-0.208	162.4	2.02	0.02	Not required
	WLAN2.4GHz Ant 5		0.732	0.732	5mm	-0.0514	0.0732	-0.208				
Case 24	GSM850 Ant 0	Back	1.256	0.713	5mm	-0.019	-0.066	-0.209	147.4	1.97	0.02	Not required
	WLAN5GHz Ant 5		5mm									
	Bluetooth Ant 5		5mm		-0.0502	0.078	-0.207					
	GSM850 Ant 0	Back	1.256	0.713	5mm	-0.019	-0.066	-0.209	144.1	1.97	0.02	Not required
	WLAN5GHz Ant 5		5mm		-0.057	0.073	-0.209					
	Bluetooth Ant 5		5mm									
Case 25	GSM1900 Ant 0	Back	1.315	0.713	5mm	-0.0025	-0.08	-0.208	165.0	2.03	0.02	Not required
	WLAN5GHz Ant 5		5mm									
	Bluetooth Ant 5		5mm		-0.0502	0.078	-0.207					
	GSM1900 Ant 0	Back	1.315	0.713	5mm	-0.0025	-0.08	-0.208	162.4	2.03	0.02	Not required
	WLAN5GHz Ant 5		5mm		-0.057	0.073	-0.209					
	Bluetooth Ant 5		5mm									
Case 26_Cube 0	WCDMA II Ant 0	Back	1.427	0.713	5mm	-0.004	-0.0815	-0.208	166.1	2.14	0.02	Not required
	WLAN5GHz Ant 5		5mm									
	Bluetooth Ant 5		5mm		-0.0502	0.078	-0.207					



Case	Band	Position	SAR (W/kg)	SUM SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
	WCDMA II Ant 0	Back	1.427	1.427	5mm	-0.004	-0.0815	-0.208	163.3	2.14	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm	-0.057	0.073	-0.209				
	Bluetooth Ant 5		0.182		5mm							
Case 26_Cube 1	WCDMA II Ant 0	Back	1.427	1.427	5mm	-0.0325	-0.0855	-0.208	164.5	2.14	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm							
	Bluetooth Ant 5		0.182		5mm	-0.0502	0.078	-0.207				
	WCDMA II Ant 0	Back	1.427	1.427	5mm	-0.0325	-0.0855	-0.208	160.4	2.14	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm	-0.057	0.073	-0.209				
	Bluetooth Ant 5		0.182		5mm							
Case 27	WCDMA V Ant 0	Back	1.333	1.333	5mm	-0.0265	-0.063	-0.209	143.0	2.05	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm							
	Bluetooth Ant 5		0.182		5mm	-0.0502	0.078	-0.207				
	WCDMA V Ant 0	Back	1.333	1.333	5mm	-0.0265	-0.063	-0.209	139.4	2.05	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm	-0.057	0.073	-0.209				
	Bluetooth Ant 5		0.182		5mm							
Case 28	LTE Band 2 Ant 0	Back	1.333	1.333	5mm	-0.004	-0.08	-0.208	164.6	2.05	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm							
	Bluetooth Ant 5		0.182		5mm	-0.0502	0.078	-0.207				
	LTE Band 2 Ant 0	Back	1.333	1.333	5mm	-0.004	-0.08	-0.208	161.9	2.05	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm	-0.057	0.073	-0.209				
	Bluetooth Ant 5		0.182		5mm							
Case 29	LTE Band 5 Ant 0	Back	1.366	1.366	5mm	-0.025	-0.063	-0.209	143.2	2.08	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm							
	Bluetooth Ant 5		0.182		5mm	-0.0502	0.078	-0.207				
	LTE Band 5 Ant 0	Back	1.366	1.366	5mm	-0.025	-0.063	-0.209	139.7	2.08	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm	-0.057	0.073	-0.209				
	Bluetooth Ant 5		0.182		5mm							
Case 30	LTE Band 7 Ant 0	Back	1.378	1.378	5mm	-0.001	-0.0832	-0.207	168.5	2.09	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm							
	Bluetooth Ant 5		0.182		5mm	-0.0502	0.078	-0.207				
	LTE Band 7 Ant 0	Back	1.378	1.378	5mm	-0.001	-0.0832	-0.207	165.9	2.09	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm	-0.057	0.073	-0.209				
	Bluetooth Ant 5		0.182		5mm							
Case 31	LTE Band 41 Ant 0	Back	1.285	1.285	5mm	0.0002	-0.0808	-0.208	166.6	2.00	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm							
	Bluetooth Ant 5		0.182		5mm	-0.0502	0.078	-0.207				
	LTE Band 41 Ant 0	Back	1.285	1.285	5mm	0.0002	-0.0808	-0.208	164.1	2.00	0.02	Not required
	WLAN5GHz Ant 5		0.531	0.713	5mm	-0.057	0.073	-0.209				
	Bluetooth Ant 5		0.182		5mm							

For Extremity

Case	Band	Position	SAR (W/kg)	SUM SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
						X	Y	Z				
						(mm)	(mm)	(mm)				
Case 32	LTE Band 2 Ant 0	Back	2.984	2.984	0mm	-0.004	-0.08	-0.208	165.4	3.98	0.05	Not required
	WLAN2.4GHz Ant 5		1	1	0mm	-0.049	0.0792	-0.207				
	LTE Band 2 Ant 0	Back	2.984	2.984	0mm	-0.004	-0.08	-0.208	124.6	3.02	0.04	Not required
	NFC		0.038	0.038	0mm	0.008	0.044	-0.208				
	WLAN2.4GHz Ant 5	Back	1	1	0mm	-0.049	0.0792	-0.207	67.0	1.04	0.02	Not required
	NFC		0.038	0.038	0mm	0.008	0.044	-0.208				
Case 33	GSM1900 Ant 0	Back	2.88	2.88	0mm	-0.004	-0.083	-0.207	168.9	4.08	0.05	Not required
	WLAN5GHz Ant 5		1.198	1.198	0mm	-0.058	0.077	-0.209				
	GSM1900 Ant 0	Back	2.88	2.88	0mm	-0.004	-0.083	-0.207	127.6	2.92	0.04	Not required
	NFC		0.038	0.038	0mm	0.008	0.044	-0.208				
	WLAN5GHz Ant 5	Back	1.198	1.198	0mm	-0.058	0.077	-0.209	73.8	1.24	0.02	Not required
	NFC		0.038	0.038	0mm	0.008	0.044	-0.208				
Case 34	WCDMA II Ant 0 Cube 0	Back	2.942	2.942	0mm	-0.004	-0.0815	-0.208	167.4	4.14	0.05	Not required
	WLAN5GHz Ant 5		1.198	1.198	0mm	-0.058	0.077	-0.209				
	WCDMA II Ant 0 Cube 0	Back	2.942	2.942	0mm	-0.004	-0.0815	-0.208	126.1	2.98	0.04	Not required
	NFC		0.038	0.038	0mm	0.008	0.044	-0.208				
	WLAN5GHz Ant 5	Back	1.198	1.198	0mm	-0.058	0.077	-0.209	73.8	1.24	0.02	Not required
	NFC		0.038	0.038	0mm	0.008	0.044	-0.208				
	WCDMA II Ant 0 Cube 1	Back	2.942	2.942	0mm	-0.0325	-0.0855	-0.208	164.5	4.14	0.05	Not required
	WLAN5GHz Ant 5		1.198	1.198	0mm	-0.058	0.077	-0.209				
	WCDMA II Ant 0 Cube 1	Back	2.942	2.942	0mm	-0.0325	-0.0855	-0.208	135.7	2.98	0.04	Not required
	NFC		0.038	0.038	0mm	0.008	0.044	-0.208				
	WLAN5GHz Ant 5	Back	1.198	1.198	0mm	-0.058	0.077	-0.209	73.8	1.24	0.02	Not required
	NFC		0.038	0.038	0mm	0.008	0.044	-0.208				
Case 35	LTE Band 2 Ant 0	Back	2.984	2.984	0mm	-0.004	-0.08	-0.208	166.0	4.18	0.05	Not required
	WLAN5GHz Ant 5		1.198	1.198	0mm	-0.058	0.077	-0.209				
	LTE Band 2 Ant 0	Back	2.984	2.984	0mm	-0.004	-0.08	-0.208	124.6	3.02	0.04	Not required
	NFC		0.038	0.038	0mm	0.008	0.044	-0.208				
	WLAN5GHz Ant 5	Back	1.198	1.198	0mm	-0.058	0.077	-0.209	73.8	1.24	0.02	Not required
	NFC		0.038	0.038	0mm	0.008	0.044	-0.208				

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17. 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 $\leq 30\%$, for a confidence interval of $k = 2$. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.



18. 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.
- [13] FCC KDB 616217 D04 v01r02, "SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers", Oct 2015

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