FCC SAR Test Report

APPLICANT	:	**vivo Mobile Communication Co., Ltd.**
EQUIPMENT	:	**Mobile Phone**
BRAND NAME	:	**vivo**
MODEL NAME	:	**V2310**
FCC ID	:	**2AUCY-V2310**
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.

Si Zhang

Approved by: Si Zhang

ilac-MRA

ACCREDITED Cert #5145.01

Sporton International Inc. (Shenzhen)
1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA370604	Rev. 01	Initial issue of report	Aug. 29, 2023

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **vivo Mobile Communication Co., Ltd., Mobile Phone, V2310,** are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 10mm)	Body-worn (Separation 15mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.54	0.29	0.19	1.39
		GSM1900	0.62	0.54	0.28	
	WCDMA	WCDMA II	**0.79**	0.47	0.27	
		WCDMA IV	0.61	0.37	0.20	
		WCDMA V	0.61	0.31	0.21	
	LTE	LTE Band 2	0.76	0.51	0.29	
		LTE Band 7	0.60	0.64	0.30	
		LTE Band 13	0.42	0.27	0.25	
		LTE Band 26/5/18/19	0.53	0.27	0.18	
		LTE Band 41/38	0.58	0.56	0.32	
		LTE Band 66/4	0.64	0.43	0.23	
DTS	WLAN	2.4GHz WLAN	0.59	0.25	0.10	1.09
NII		5GHz WLAN	0.73	**0.90**	**0.84**	1.39
DSS	Bluetooth	2.4GHz Bluetooth	0.18	<0.10	<0.10	1.39

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission 10g SAR (W/kg)
NII	WLAN	5GHz WLAN	**2.73**	-
Date of Testing:			2023/8/2 ~ 2023/8/15	

Remark:
1. This device supports LTE B4 / B38 and B66 / B41. Since the supported frequency span for LTE B4 /B38 falls completely within the supports frequency span for B66, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for B66 / B41.
2. This device supports LTE B5 / B18 / B19 and B26. Since the supported frequency span for LTE B5 / B18 / B19 falls completely within the supports frequency span for B26, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B26.

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.
	SAR04-SZ SAR05-SZ	CN1256	421272

Applicant	
Company Name	vivo Mobile Communication Co., Ltd.
Address	No.1, vivo Road, Chang'an, Dongguan, Guangdong, China

Manufacturer	
Company Name	vivo Mobile Communication Co., Ltd.
Address	No.1, vivo Road, Chang'an, Dongguan, Guangdong, China

3. Guidance Applied

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

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

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Phone
Brand Name	vivo
Model Name	V2310
FCC ID	2AUCY-V2310
IMEI Code	IMEI 1: 864799062003886 IMEI 2: 864799062003894
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 18: 815 MHz ~ 830 MHz LTE Band 19: 830 MHz ~ 845 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2535 MHz ~ 2655MHz LTE Band 66: 1710 MHz ~ 1780 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 ~ 5720MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is supported) LTE: QPSK/ 16QAM / 64QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11VHT20/VHT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	MP_0.1
SW Version	PD2317F_EX_A_13.0.4.3.W30
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 does not support DTM operation and support GRPS/EGRPS mode up to multi-slot class 12.
3. 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.
4. This device WLAN 2.4GHz supports hotspot operation and Bluetooth support tethering applications.
5. 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).
6. The device implements receiver/hotspot detect mechanism trigger reduced power for the power management for SAR compliance at different exposure conditions (head, hotspot, body, and extremity). It uses the receiver to indicate

whether the user is making a call in head scenario or not. The selection between head and body power levels is based on the receiver detection mechanism. It can determine proximity to head or body and set the relevant power level for 2G&3G&4G and Wi-Fi antennas accordingly. The device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to appendix E.

7. For WLAN transmitter, while the device WWAN is transmitting simultaneously with the WLAN/Bluetooth antenna, the device power will be reduced power at body-worn, hotspot and extremity conditions.

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	2AUCY-V2310
Equipment Name	Mobile Phone
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 18: 815 MHz ~ 830 MHz LTE Band 19: 830 MHz ~ 845 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 13: 5MHz, 10MH LTE Band 18: 5MHz, 10MHz, 15MHz LTE Band 19: 5MHz, 10MHz, 15MHz LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
Uplink Modulations used	QPSK / 16QAM / 64QAM
LTE Voice / Data requirements	Voice and Data
LTE Release Version	R11, Cat 5
CA Support	Not Supported
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

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

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

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 receiver/hotspot detect mechanism trigger reduction power applied to satisfy SAR compliance the detail please referred to section 12.

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 5								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 7								
	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	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

LTE Band 13				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5		
M	23230	782	23230	782
H	23255	784.5		

LTE Band 18						
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23875	817.5	23900	820		
M	23925	822.5	23925	822.5	23925	822.5
H	23975	827.5	23950	825		

LTE Band 19						
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	24025	832.5	24050	835		
M	24075	837.5	24075	837.5	24075	837.5
H	24125	842.5	24100	840		

LTE Band 26										
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5

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								
	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	39675	2498.5	39700	2501	39725	2503.5	39750	2506
LM	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2593	40620	2593	40620	2593
HM	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680

LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745

H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

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 4	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 66	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 5	Yes	Yes	Yes	Yes		
LTE Band 18			Yes	Yes	Yes	
LTE Band 19			Yes	Yes	Yes	
LTE Band 26	Yes	Yes	Yes	Yes	Yes	
LTE Band 38			Yes	Yes	Yes	Yes
LTE Band 41			Yes	Yes	Yes	Yes

2) LTE Bands tune up:

Band	Antenna	DSI 5	DSI 7	DSI 6	DSI 8	Default
LTE Band 4	Ant 13	15	13	19.5	17.5	24.5
LTE Band 66	Ant 13	15	13	19.5	17.5	24.5
LTE Band 5	Ant 13	22	20	25	24	25
LTE Band 18	Ant 13	22	20	25	24	25
LTE Band 19	Ant 13	22	20	25	24	25
LTE Band 26	Ant 13	22	20	25	24	25
LTE Band 38	Ant 13	19.5	17.5	22.5	20.5	24.5
LTE Band 41	Ant 13	19.5	17.5	22.5	20.5	24.5

Band	Antenna	DSI 5	DSI 7	DSI 6	DSI 8	Default
LTE Band 4	Ant 31	24.3	24.3	20.3	19.3	24.3
LTE Band 66	Ant 31	24.3	24.3	20.3	19.3	24.3
LTE Band 5	Ant 31	24.9	24.9	24.9	24.9	24.9
LTE Band 18	Ant 31	24.9	24.9	24.9	24.9	24.9
LTE Band 19	Ant 31	24.9	24.9	24.9	24.9	24.9
LTE Band 26	Ant 31	24.9	24.9	24.9	24.9	24.9
LTE Band 38	Ant 31	24.2	24.2	21.7	20.7	24.2
LTE Band 41	Ant 31	24.2	24.2	21.7	20.7	24.2

5. RF Exposure Limits

5.1 Uncontrolled Environment

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

5.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

6. Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

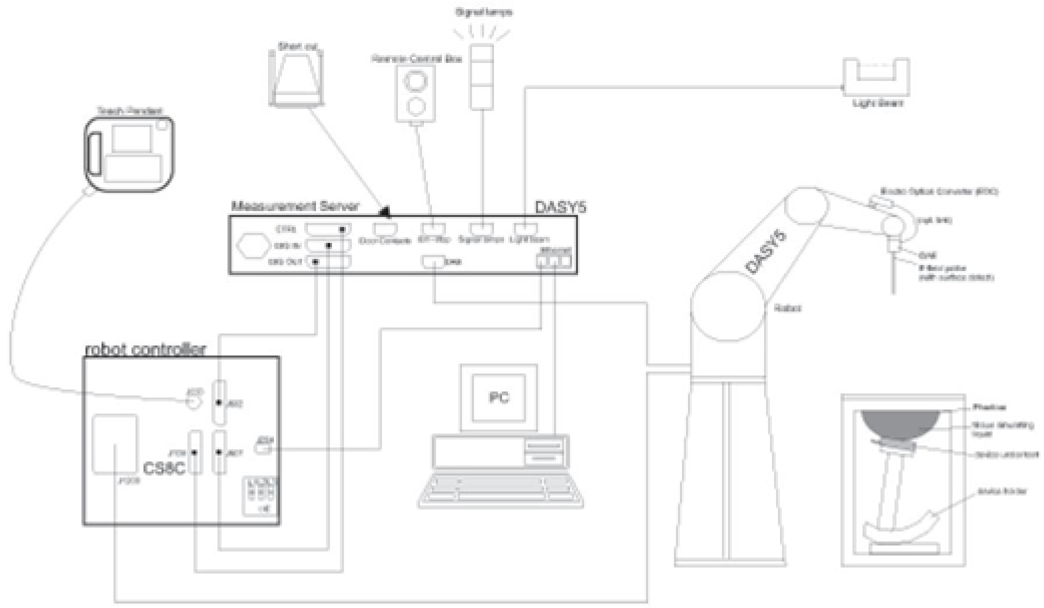
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



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

7.1 E-Field Probe

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

<EX3DV4 Probe>

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

7.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Photo of DAE

7.3 Phantom

<SAM Twin Phantom>

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

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

<ELI Phantom>

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

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

7.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

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

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

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

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

Mounting Device for Laptops

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

8.1 Spatial Peak SAR Evaluation

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

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

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

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

8.2 Power Reference Measurement

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

8.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

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

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

8.4 Zoom Scan

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

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

<table>
<tr><th colspan="3"></th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">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 <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

8.5 Volume Scan Procedures

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

8.6 Power Drift Monitoring

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

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1099	Dec. 15, 2021	Dec. 14, 2024
SPEAG	835MHz System Validation Kit	D835V2	4d162	Dec. 17, 2021	Dec. 16, 2024
SPEAG	1750MHz System Validation Kit	D1750V2	1137	Oct. 19, 2021	Oct. 18, 2024
SPEAG	1900MHz System Validation Kit	D1900V2	5d182	Dec. 20, 2021	Dec. 19, 2024
SPEAG	2450MHz System Validation Kit	D2450V2	924	Sep. 02, 2020	Aug. 31, 2023
SPEAG	2600MHz System Validation Kit	D2600V2	1070	Dec. 20, 2021	Dec. 19, 2024
SPEAG	5000MHz System Validation Kit	D5GHzV2	1341	Dec. 13, 2021	Dec. 12, 2024
SPEAG	Data Acquisition Electronics	DAE3	360	Dec. 28, 2022	Dec. 27, 2023
SPEAG	Data Acquisition Electronics	DAE4	1664	Jun. 06, 2023	Jun. 05, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7641	Apr. 24, 2023	Apr. 23, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	3819	Jun. 06, 2023	Jun. 05, 2024
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1500	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P41 AA	2035	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201341952	Dec. 27, 2022	Dec. 26, 2023
Anritsu	Radio communication analyzer	MT8821C	6262314715	Jul. 05, 2023	Jul. 04, 2024
Agilent	Wireless Communication Test Set	E5515C	MY50267224	Jul. 05, 2023	Jul. 04, 2024
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 17, 2022	Oct. 16, 2023
Speag	Dielectric Assessment KIT	DAK-3.5	1071	Feb. 20, 2023	Feb. 19, 2024
Agilent	Signal Generator	N5181A	MY50145381	Dec. 27, 2022	Dec. 26, 2023
Anritsu	Power Senor	MA2411B	1306099	Oct. 17, 2022	Oct. 16, 2023
Anritsu	Power Meter	ML2495A	1349001	Oct. 17, 2022	Oct. 16, 2023
Anritsu	Power Sensor	MA2411B	1542004	Dec. 27, 2022	Dec. 26, 2023
Anritsu	Power Meter	ML2495A	1339473	Dec. 27, 2022	Dec. 26, 2023
R&S	CBT BLUETOOTH TESTER	CBT	100963	Dec. 27, 2022	Dec. 26, 2023
R&S	Spectrum Analyzer	FSP7	100818	Jul. 05, 2023	Jul. 04, 2024
TES	Hygrometer	1310	200505600	Jul. 08, 2023	Jul. 07, 2024
Anymetre	Thermo-Hygrometer	JR593	2018100802	Oct. 19, 2022	Oct. 18, 2023
Anymetre	Thermo-Hygrometer	JR593	2020062101	Jul. 08, 2023	Jul. 07, 2024
AR	Amplifier	5S1G4	0333096	Note 1	
Mini-Circuits	Amplifier	ZVE-3W-83+	599201528	Note 1	
Mini-Circuits	Amplifier	ZVA-183W-S+	726202215	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	
Weinschel	Attenuator 1	3M-10	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.

10. System Verification

10.1 Tissue Simulating Liquids

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

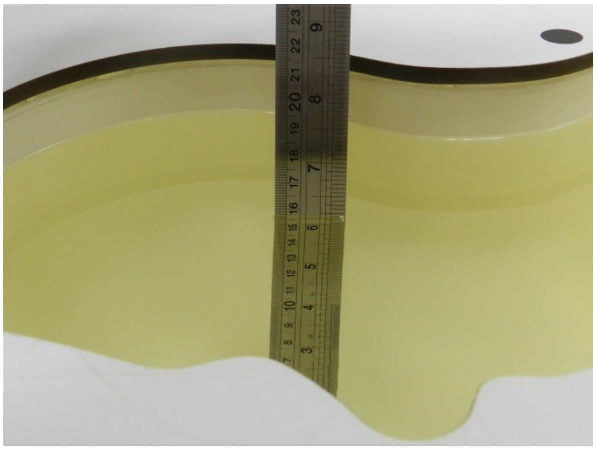


Fig 10.1Photo of Liquid Height for Head SAR

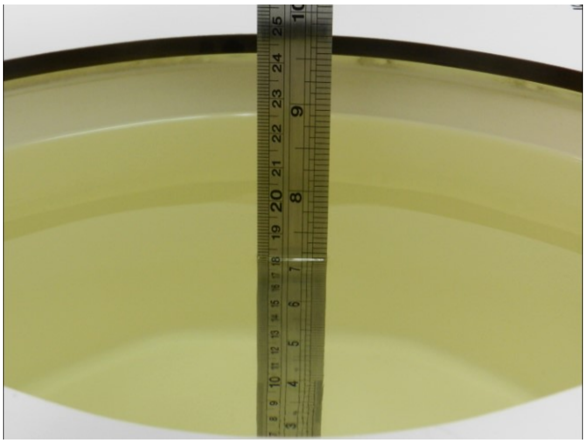


Fig 10.2 Photo of Liquid Height for Body SAR

10.2 Tissue Verification

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

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900	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

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Head	22.4	0.900	43.165	0.89	41.90	1.12	3.02	±5	2023/8/3
750	Head	22.3	0.901	43.837	0.89	41.90	1.24	4.62	±5	2023/8/2
835	Head	22.5	0.942	41.955	0.90	41.50	4.67	1.10	±5	2023/8/4
835	Head	22.4	0.918	42.844	0.90	41.50	2.00	3.24	±5	2023/8/4
1750	Head	22.6	1.349	40.211	1.37	40.10	-1.53	0.28	±5	2023/8/5
1750	Head	22.2	1.365	40.019	1.37	40.10	-0.36	-0.20	±5	2023/8/7
1900	Head	22.5	1.433	40.735	1.40	40.00	2.36	1.84	±5	2023/8/6
1900	Head	22.5	1.407	39.392	1.40	40.00	0.50	-1.52	±5	2023/8/8
2450	Head	22.2	1.826	39.430	1.80	39.20	1.44	0.59	±5	2023/8/8
2450	Head	22.6	1.870	38.672	1.80	39.20	3.89	-1.35	±5	2023/8/9
2600	Head	22.4	1.912	38.499	1.96	39.00	-2.45	-1.28	±5	2023/8/7
2600	Head	22.3	1.915	39.500	1.96	39.00	-2.30	1.28	±5	2023/8/10
5250	Head	22.3	4.498	35.960	4.71	35.95	-4.50	0.03	±5	2023/8/9
5250	Head	22.5	4.557	36.507	4.71	35.95	-3.25	1.55	±5	2023/8/13
5600	Head	22.6	4.843	35.495	5.07	35.50	-4.48	-0.01	±5	2023/8/10
5600	Head	22.4	4.902	36.045	5.07	35.50	-3.31	1.54	±5	2023/8/14
5750	Head	22.5	4.995	35.316	5.22	35.35	-4.31	-0.10	±5	2023/8/11
5750	Head	22.5	4.980	35.862	5.22	35.35	-4.60	1.45	±5	2023/8/15

10.3 System Performance Check Results

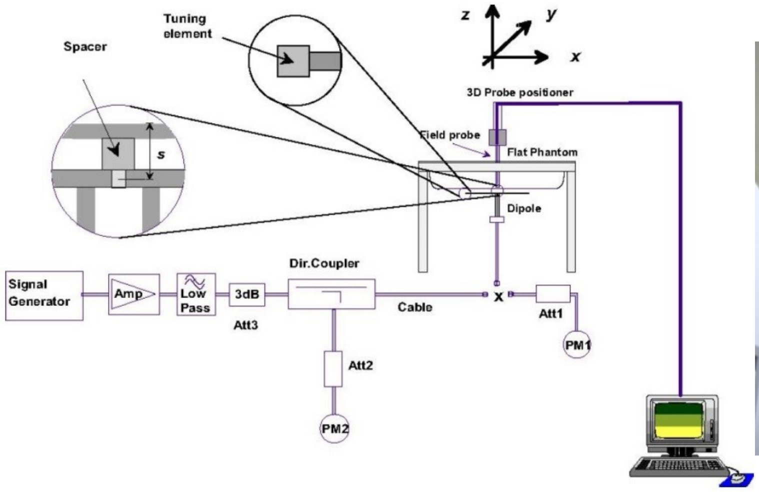
Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the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

<1g>

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 (%)
2023/8/3	750	Head	250	1099	3819	360	2.240	8.540	8.96	4.92
2023/8/2	750	Head	250	1099	7641	1664	2.140	8.540	8.56	0.23
2023/8/4	835	Head	250	4d162	3819	360	2.550	9.640	10.2	5.81
2023/8/4	835	Head	250	4d162	7641	1664	2.510	9.640	10.04	4.15
2023/8/5	1750	Head	250	1137	3819	360	8.510	36.500	34.04	-6.74
2023/8/7	1750	Head	250	1137	7641	1664	8.770	36.500	35.08	-3.89
2023/8/6	1900	Head	250	5d182	3819	360	9.860	39.600	39.44	-0.40
2023/8/8	1900	Head	250	5d182	7641	1664	10.200	39.600	40.8	3.03
2023/8/8	2450	Head	250	924	3819	360	13.200	51.400	52.8	2.72
2023/8/9	2450	Head	250	924	7641	1664	13.000	51.400	52	1.17
2023/8/7	2600	Head	250	1070	3819	360	14.200	56.200	56.8	1.07
2023/8/10	2600	Head	250	1070	7641	1664	12.800	56.200	51.2	-8.90
2023/8/9	5250	Head	100	1341	3819	360	8.700	80.700	87	7.81
2023/8/13	5250	Head	100	1341	7641	1664	7.560	80.700	75.6	-6.32
2023/8/10	5600	Head	100	1341	3819	360	9.100	84.500	91	7.69
2023/8/14	5600	Head	100	1341	7641	1664	8.090	84.500	80.9	-4.26
2023/8/11	5750	Head	100	1341	3819	360	8.610	80.600	86.1	6.82
2023/8/15	5750	Head	100	1341	7641	1664	7.580	80.600	75.8	-5.96

<10g>

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 (%)
2023/8/3	750	Head	250	1099	3819	360	1.490	5.650	5.96	5.49
2023/8/2	750	Head	250	1099	7641	1664	1.430	5.650	5.72	1.24
2023/8/4	835	Head	250	4d162	3819	360	1.630	6.260	6.52	4.15
2023/8/4	835	Head	250	4d162	7641	1664	1.650	6.260	6.6	5.43
2023/8/5	1750	Head	250	1137	3819	360	4.540	19.200	18.16	-5.42
2023/8/7	1750	Head	250	1137	7641	1664	4.820	19.200	19.28	0.42
2023/8/6	1900	Head	250	5d182	3819	360	5.160	20.200	20.64	2.18
2023/8/8	1900	Head	250	5d182	7641	1664	5.300	20.200	21.2	4.95
2023/8/8	2450	Head	250	924	3819	360	5.900	24.000	23.6	-1.67
2023/8/9	2450	Head	250	924	7641	1664	5.930	24.000	23.72	-1.17
2023/8/7	2600	Head	250	1070	3819	360	6.070	24.600	24.28	-1.30
2023/8/10	2600	Head	250	1070	7641	1664	5.560	24.600	22.24	-9.59
2023/8/9	5250	Head	100	1341	3819	360	2.410	23.100	24.1	4.33
2023/8/13	5250	Head	100	1341	7641	1664	2.180	23.100	21.8	-5.63
2023/8/10	5600	Head	100	1341	3819	360	2.550	24.000	25.5	6.25
2023/8/14	5600	Head	100	1341	7641	1664	2.190	24.000	21.9	-8.75
2023/8/11	5750	Head	100	1341	3819	360	2.410	22.700	24.1	6.17
2023/8/15	5750	Head	100	1341	7641	1664	2.100	22.700	21	-7.49



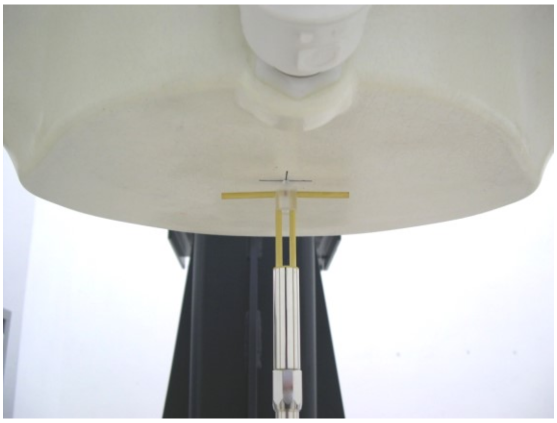


Fig 10.3.1 System Performance Check Setup

Fig 10.3.2 Setup Photo

11. RF Exposure Positions

11.1 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.

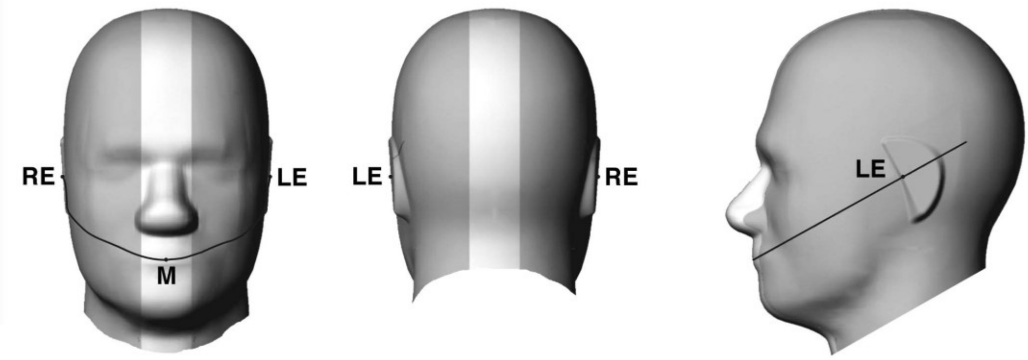


Fig 11.1.1 Front, back, and side views of SAM twin phantom

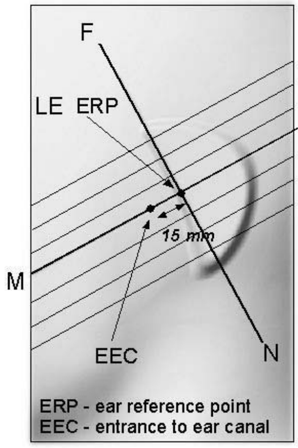


Fig 11.1.2 Close-up side view of phantom showing the ear region.

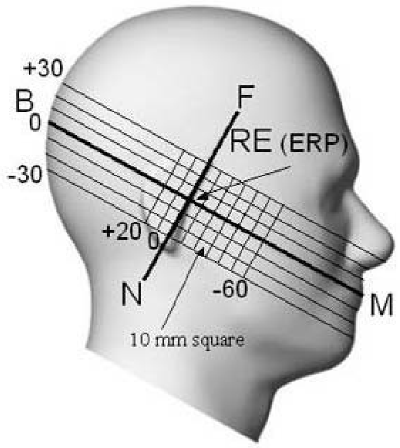


Fig 11.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Figure 11.2.1 and Figure 11.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 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.

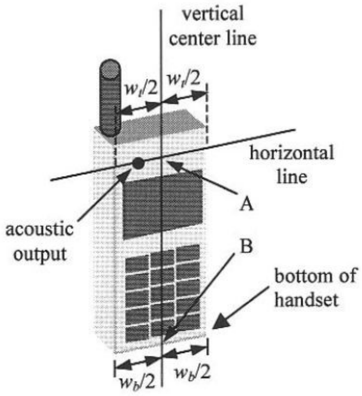


Fig 11.2.1 Handset vertical and horizontal reference lines—"fixed case

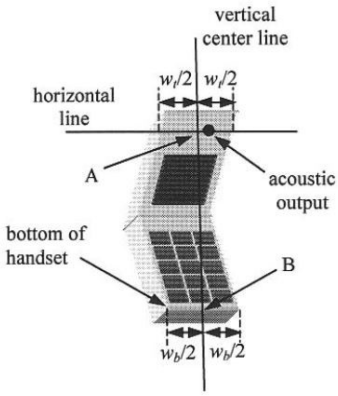


Fig 11.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

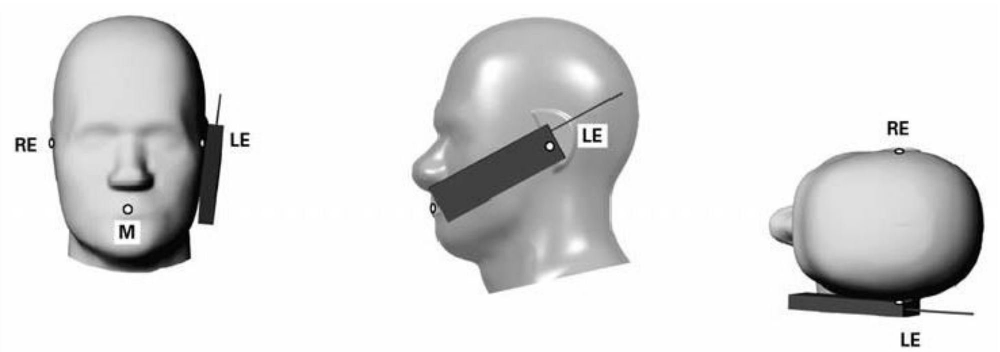


Fig 11.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3 Definition of the tilt position

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

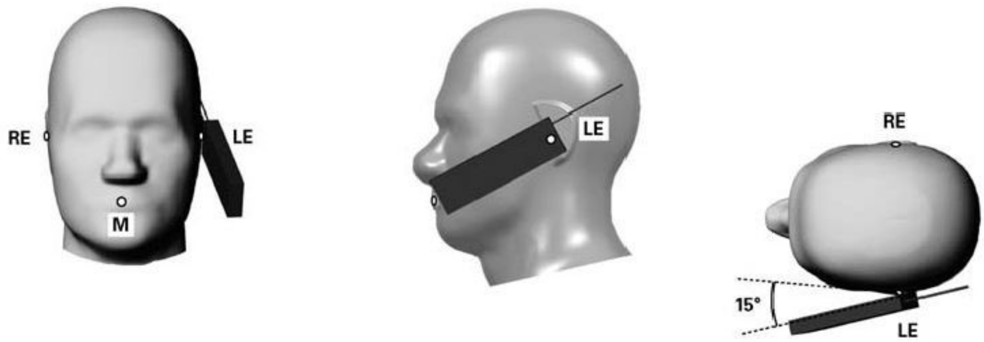


Fig 11.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 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 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

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

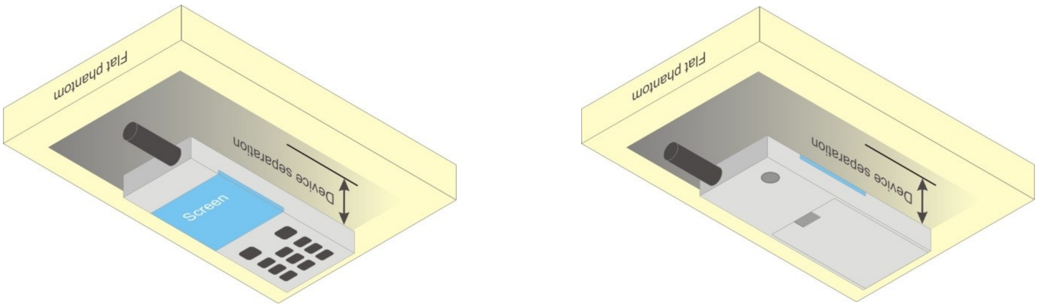


Fig 11.4 Body Worn Position

11.5 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.

11.6 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 x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

12. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<GSM Conducted Power>

General Note:

1. Per KDB 447498 D01, 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 ≤ ¼ 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} *(Note1, Note 2)*	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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

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

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

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

Setup Configuration

HSUPA Setup Configuration:

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

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

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

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with $\beta_{hs} = 5/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	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.		

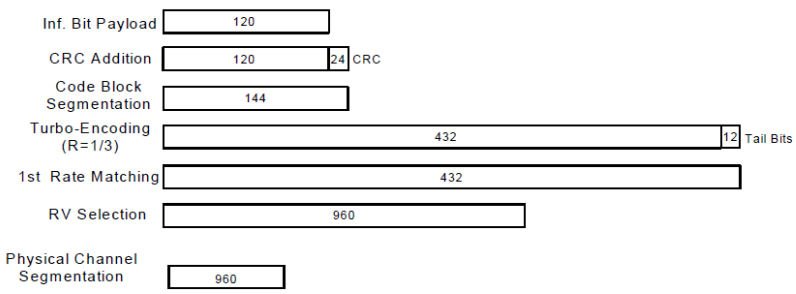


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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 Parms
   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-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
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 (Note3)	β_d	β_{HS} (Note1)	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-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

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

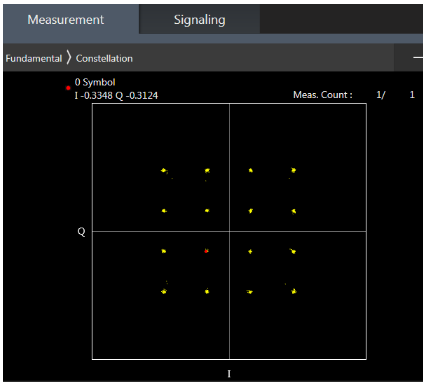
General Note:

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 ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / 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 ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

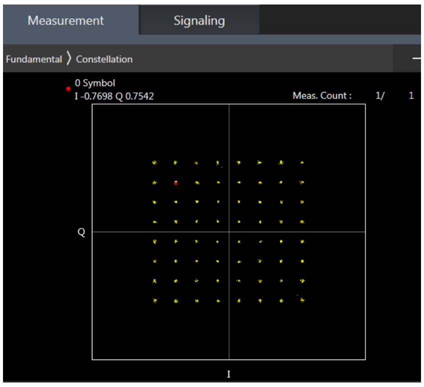
<LTE Conducted Power>

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/256QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/256QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B26 / 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 B4 / B5/ B18 /B19 SAR test was covered by B66 / B26; 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 ≤ 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.

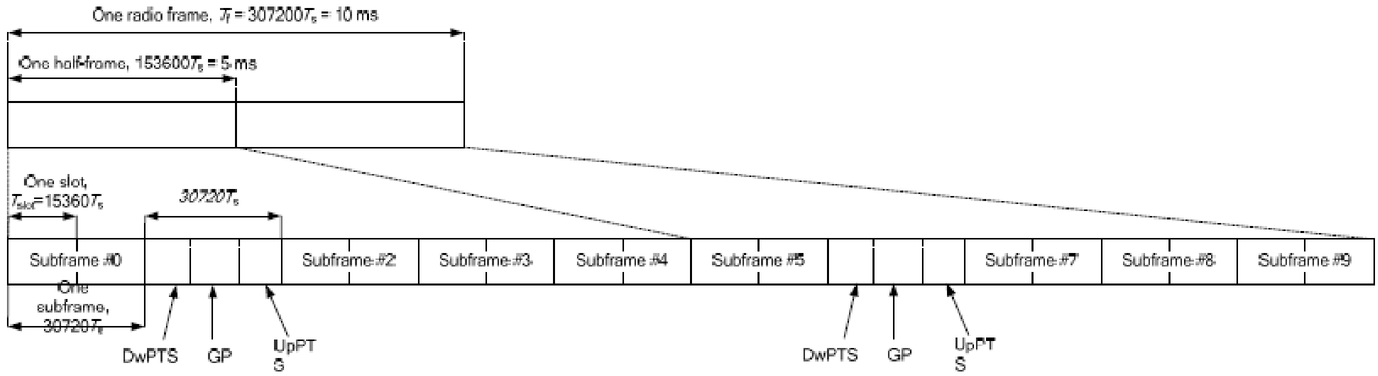


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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	$6592 \cdot T_s$			$7680 \cdot T_s$		
1	$19760 \cdot T_s$			$20480 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
2	$21952 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$		
5	$6592 \cdot T_s$			$20480 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

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:

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, 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:

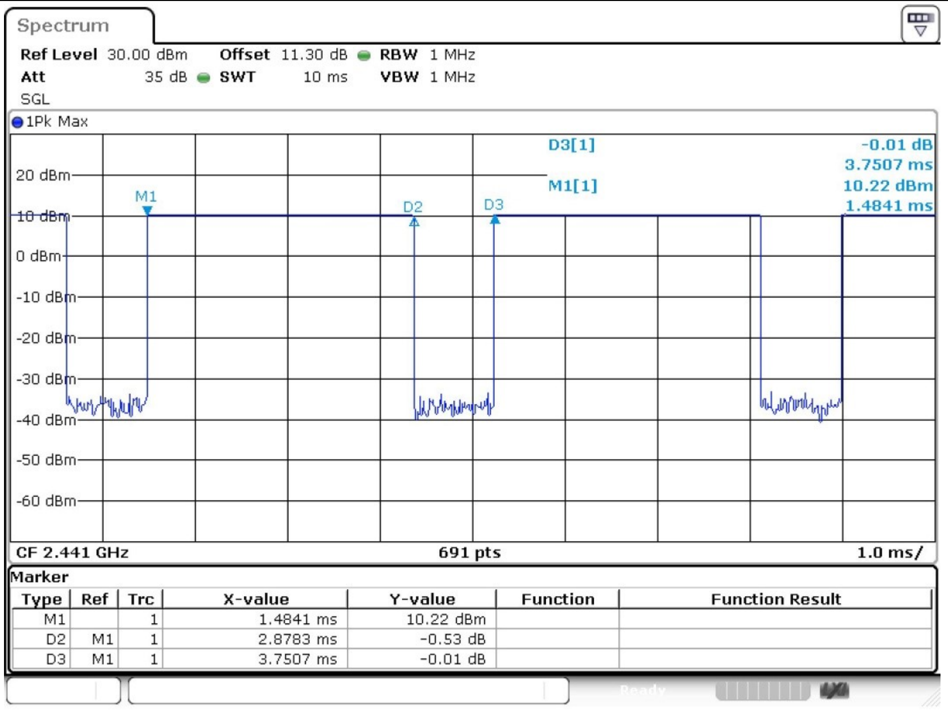
1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default 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 76.74% see as following figure, according to Oct. 2016 TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 100%, therefore the actual duty cycle will be scaled up to100% for Bluetooth reported SAR calculation.

Bluetooth Ant 22 time-domain plot



13. Antenna Location

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

14. SAR Test Results

General Note:

1. Per KDB 447498 D01, 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 WWAN: Reported SAR(W/kg) = Measured SAR(W/kg) *Tune-up Scaling Factor
   d. For WLAN/Bluetooth: Reported SAR(W/kg) = Measured SAR(W/kg) * Duty Cycle scaling factor * Tune-up scaling factor
   e. 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 D01, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   · ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   · ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   · ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. 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. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15cm or an overall diagonal dimension > 16cm, when hotspot mode applies, 10-g product specific SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, in this report all the hotspot mode results are < 1.2W/kg.
6. The device implements Proximity sensors/receiver/hotspot detect mechanism trigger reduced power for the power management for SAR compliance at different exposure conditions (head, hotspot, body, and extremity). It uses the receiver to indicate whether the user is making a call in head scenario or not. The selection between head and body power levels is based on the receiver detection mechanism. It can determine proximity to head or body and set the relevant power level for 2G&3G&4G and Wi-Fi antennas accordingly. 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 WWAN is transmitting simultaneously with the WLAN/Bluetooth antenna, the device power will be reduced power at body-worn and extremity conditions.
8. 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 transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of 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.
9. The following table “n/a” in the result means the 10g SAR is too small to be detected.

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 ≤ ¼ 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 ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / 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 ¼ 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 ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 / B26 / 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 B4 / B5/B18/B19 SAR test was covered by B66 / B26; 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 ≤ 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.

DSI status description:

The device has the following DSI state which used at different exposure condition.

DSI	Trigger Conditions	Antenna No.	Exposure conditions	
DSI5	Receiver on	Ant 13/31	Head Standalone	Head all Position
DSI6	Receiver off	Ant 13/31	Body Standalone	Body all Position
DSI7	Receiver on + WWAN/BT	Ant 13/31	Head Simultaneous	Head all Position
DSI8	Receiver off + WWAN/BT	Ant 13/31	Body Simultaneous	Body all Position
DSI8	Hotspot on	Ant 13/31	Hotspot	Body all Position

14.1 Head SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	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)
750MHz																				
01	LTE Band 13	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 13	DSI 5	23230	782	21.66	22.50	1.213	-	-	-0.07	0.344	0.417
	LTE Band 13	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 13	DSI 5	23230	782	21.66	22.50	1.213	-	-	-0.09	0.322	0.391
	LTE Band 13	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 13	DSI 5	23230	782	21.66	22.50	1.213	-	-	0.17	0.305	0.370
	LTE Band 13	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 13	DSI 5	23230	782	21.66	22.50	1.213	-	-	0.1	0.285	0.346
	LTE Band 13	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 13	DSI 5	23230	782	21.60	22.50	1.230	-	-	-0.03	0.330	0.406
	LTE Band 13	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 13	DSI 5	23230	782	21.60	22.50	1.230	-	-	-0.07	0.314	0.386
	LTE Band 13	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 13	DSI 5	23230	782	21.60	22.50	1.230	-	-	-0.13	0.296	0.364
	LTE Band 13	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 13	DSI 5	23230	782	21.60	22.50	1.230	-	-	-0.16	0.279	0.343
	LTE Band 13	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 13	DSI 7	23230	782	20.60	21.50	1.230	-	-	-0.12	0.273	0.336
	LTE Band 13	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 13	DSI 7	23230	782	20.60	21.50	1.230	-	-	0.16	0.257	0.316
	LTE Band 13	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 13	DSI 7	23230	782	20.60	21.50	1.230	-	-	0.16	0.241	0.296
	LTE Band 13	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 13	DSI 7	23230	782	20.60	21.50	1.230	-	-	-0.01	0.223	0.274
	LTE Band 13	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 13	DSI 7	23230	782	20.57	21.50	1.239	-	-	-0.15	0.260	0.322
	LTE Band 13	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 13	DSI 7	23230	782	20.57	21.50	1.239	-	-	0.08	0.245	0.304
	LTE Band 13	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 13	DSI 7	23230	782	20.57	21.50	1.239	-	-	-0.03	0.240	0.297
	LTE Band 13	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 13	DSI 7	23230	782	20.57	21.50	1.239	-	-	-0.12	0.222	0.275
	LTE Band 13	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 31	DSI 5/7	23230	782	23.25	24.40	1.303	-	-	-0.1	0.127	0.166
	LTE Band 13	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 31	DSI 5/7	23230	782	23.25	24.40	1.303	-	-	-0.11	0.080	0.104
	LTE Band 13	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 31	DSI 5/7	23230	782	23.25	24.40	1.303	-	-	-0.1	0.109	0.142
	LTE Band 13	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 31	DSI 5/7	23230	782	23.25	24.40	1.303	-	-	-0.18	0.061	0.079
	LTE Band 13	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 31	DSI 5/7	23230	782	22.24	23.40	1.306	-	-	0.1	0.104	0.136
	LTE Band 13	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 31	DSI 5/7	23230	782	22.24	23.40	1.306	-	-	0.13	0.064	0.084
	LTE Band 13	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 31	DSI 5/7	23230	782	22.24	23.40	1.306	-	-	-0.05	0.090	0.118
	LTE Band 13	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 31	DSI 5/7	23230	782	22.24	23.40	1.306	-	-	0.02	0.051	0.067
835MHz																				
02	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right Cheek	0mm	Ant 13	DSI 5	189	836.4	27.50	28.50	1.259	-	-	0.14	0.432	0.544
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right Tilted	0mm	Ant 13	DSI 5	189	836.4	27.50	28.50	1.259	-	-	0.05	0.412	0.519
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Left Cheek	0mm	Ant 13	DSI 5	189	836.4	27.50	28.50	1.259	-	-	0.01	0.355	0.447
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Left Tilted	0mm	Ant 13	DSI 5	189	836.4	27.50	28.50	1.259	-	-	0.03	0.343	0.432
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right Cheek	0mm	Ant 13	DSI 7	189	836.4	25.52	26.50	1.253	-	-	0.01	0.355	0.445
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right Tilted	0mm	Ant 13	DSI 7	189	836.4	25.52	26.50	1.253	-	-	0.08	0.341	0.427
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Left Cheek	0mm	Ant 13	DSI 7	189	836.4	25.52	26.50	1.253	-	-	0.09	0.274	0.343
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Left Tilted	0mm	Ant 13	DSI 7	189	836.4	25.52	26.50	1.253	-	-	0.15	0.231	0.289
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right Cheek	0mm	Ant 31	DSI 5/7	189	836.4	30.89	31.40	1.125	-	-	-0.13	0.093	0.105
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right Tilted	0mm	Ant 31	DSI 5/7	189	836.4	30.89	31.40	1.125	-	-	-0.05	0.032	0.036
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Left Cheek	0mm	Ant 31	DSI 5/7	189	836.4	30.89	31.40	1.125	-	-	0.08	0.072	0.081
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Left Tilted	0mm	Ant 31	DSI 5/7	189	836.4	30.89	31.40	1.125	-	-	-0.09	0.024	0.027
03	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 5	4182	836.4	21.01	22.00	1.256	-	-	-0.03	0.487	0.612
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 5	4182	836.4	21.01	22.00	1.256	-	-	0.01	0.433	0.544
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 13	DSI 5	4182	836.4	21.01	22.00	1.256	-	-	-0.11	0.382	0.480
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 13	DSI 5	4182	836.4	21.01	22.00	1.256	-	-	-0.09	0.356	0.447
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 7	4182	836.4	19.04	20.00	1.247	-	-	0.06	0.364	0.454
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 7	4182	836.4	19.04	20.00	1.247	-	-	0.02	0.337	0.420
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 13	DSI 7	4182	836.4	19.04	20.00	1.247	-	-	0.09	0.281	0.351
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 13	DSI 7	4182	836.4	19.04	20.00	1.247	-	-	0.08	0.264	0.329
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 31	DSI 5/7	4182	836.4	23.60	24.90	1.349	-	-	0.02	0.078	0.105
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 31	DSI 5/7	4182	836.4	23.60	24.90	1.349	-	-	-0.07	0.030	0.040
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	DSI 5/7	4182	836.4	23.60	24.90	1.349	-	-	0.03	0.060	0.081
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 31	DSI 5/7	4182	836.4	23.60	24.90	1.349	-	-	-0.03	0.020	0.027
	LTE Band 26	15M	QPSK	1	37	-	Right Cheek	0mm	Ant 13	DSI 5	26865	831.5	21.30	22.00	1.175	-	-	0.07	0.440	0.517
	LTE Band 26	15M	QPSK	1	37	-	Right Tilted	0mm	Ant 13	DSI 5	26865	831.5	21.30	22.00	1.175	-	-	0.01	0.434	0.510

	LTE Band 26	15M	QPSK	1	37	-	Left Cheek	0mm	Ant 13	DSI 5	26865	831.5	21.30	22.00	1.175	-	-	-0.18	0.396	0.465
	LTE Band 26	15M	QPSK	1	37	-	Left Tilted	0mm	Ant 13	DSI 5	26865	831.5	21.30	22.00	1.175	-	-	-0.03	0.351	0.412
04	LTE Band 26	15M	QPSK	36	0	-	Right Cheek	0mm	Ant 13	DSI 5	26865	831.5	21.25	22.00	1.189	-	-	0.01	0.449	**0.534**
	LTE Band 26	15M	QPSK	36	0	-	Right Tilted	0mm	Ant 13	DSI 5	26865	831.5	21.25	22.00	1.189	-	-	-0.08	0.423	0.503
	LTE Band 26	15M	QPSK	36	0	-	Left Cheek	0mm	Ant 13	DSI 5	26865	831.5	21.25	22.00	1.189	-	-	-0.07	0.402	0.478
	LTE Band 26	15M	QPSK	36	0	-	Left Tilted	0mm	Ant 13	DSI 5	26865	831.5	21.25	22.00	1.189	-	-	0.03	0.345	0.410
	LTE Band 26	15M	QPSK	1	37	-	Right Cheek	0mm	Ant 13	DSI 7	26865	831.5	19.10	20.00	1.230	-	-	0.01	0.280	0.344
	LTE Band 26	15M	QPSK	1	37	-	Right Tilted	0mm	Ant 13	DSI 7	26865	831.5	19.10	20.00	1.230	-	-	0.14	0.259	0.319
	LTE Band 26	15M	QPSK	1	37	-	Left Cheek	0mm	Ant 13	DSI 7	26865	831.5	19.10	20.00	1.230	-	-	0.15	0.245	0.301
	LTE Band 26	15M	QPSK	1	37	-	Left Tilted	0mm	Ant 13	DSI 7	26865	831.5	19.10	20.00	1.230	-	-	-0.1	0.218	0.268
	LTE Band 26	15M	QPSK	36	0	-	Right Cheek	0mm	Ant 13	DSI 7	26865	831.5	19.08	20.00	1.236	-	-	0.05	0.282	0.349
	LTE Band 26	15M	QPSK	36	0	-	Right Tilted	0mm	Ant 13	DSI 7	26865	831.5	19.08	20.00	1.236	-	-	-0.16	0.270	0.334
	LTE Band 26	15M	QPSK	36	0	-	Left Cheek	0mm	Ant 13	DSI 7	26865	831.5	19.08	20.00	1.236	-	-	-0.14	0.255	0.315
	LTE Band 26	15M	QPSK	36	0	-	Left Tilted	0mm	Ant 13	DSI 7	26865	831.5	19.08	20.00	1.236	-	-	0.18	0.222	0.274
	LTE Band 26	15M	QPSK	1	37	-	Right Cheek	0mm	Ant 31	DSI 5/7	26865	831.5	23.88	24.90	1.265	-	-	-0.14	0.066	0.083
	LTE Band 26	15M	QPSK	1	37	-	Right Tilted	0mm	Ant 31	DSI 5/7	26865	831.5	23.88	24.90	1.265	-	-	0.01	0.039	0.049
	LTE Band 26	15M	QPSK	1	37	-	Left Cheek	0mm	Ant 31	DSI 5/7	26865	831.5	23.88	24.90	1.265	-	-	-0.03	0.058	0.073
	LTE Band 26	15M	QPSK	1	37	-	Left Tilted	0mm	Ant 31	DSI 5/7	26865	831.5	23.88	24.90	1.265	-	-	-0.06	0.022	0.028
	LTE Band 26	15M	QPSK	36	0	-	Right Cheek	0mm	Ant 31	DSI 5/7	26865	831.5	22.80	23.90	1.288	-	-	0.17	0.056	0.072
	LTE Band 26	15M	QPSK	36	0	-	Right Tilted	0mm	Ant 31	DSI 5/7	26865	831.5	22.80	23.90	1.288	-	-	-0.06	0.030	0.039
	LTE Band 26	15M	QPSK	36	0	-	Left Cheek	0mm	Ant 31	DSI 5/7	26865	831.5	22.80	23.90	1.288	-	-	0.05	0.044	0.057
	LTE Band 26	15M	QPSK	36	0	-	Left Tilted	0mm	Ant 31	DSI 5/7	26865	831.5	22.80	23.90	1.288	-	-	-0.08	0.016	0.021
1750MHz																				
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 5	1413	1732.6	14.10	15.00	1.230	-	-	-0.02	0.401	0.493
05	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 5	1413	1732.6	14.10	15.00	1.230	-	-	-0.04	0.495	**0.609**
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 13	DSI 5	1413	1732.6	14.10	15.00	1.230	-	-	-0.15	0.306	0.376
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 13	DSI 5	1413	1732.6	14.10	15.00	1.230	-	-	0.09	0.392	0.482
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 7	1413	1732.6	12.15	13.00	1.216	-	-	0.1	0.240	0.292
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 7	1413	1732.6	12.15	13.00	1.216	-	-	0.02	0.281	0.342
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 13	DSI 7	1413	1732.6	12.15	13.00	1.216	-	-	0.07	0.198	0.241
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 13	DSI 7	1413	1732.6	12.15	13.00	1.216	-	-	0.14	0.233	0.283
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 31	DSI 5/7	1413	1732.6	23.35	24.30	1.245	-	-	-0.01	0.150	0.187
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 31	DSI 5/7	1413	1732.6	23.35	24.30	1.245	-	-	0.14	0.133	0.166
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	DSI 5/7	1413	1732.6	23.35	24.30	1.245	-	-	-0.09	0.112	0.139
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 31	DSI 5/7	1413	1732.6	23.35	24.30	1.245	-	-	-0.1	0.114	0.142
	LTE Band 66	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 13	DSI 5	132322	1745	14.30	15.00	1.175	-	-	0.17	0.414	0.486
	LTE Band 66	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 13	DSI 5	132322	1745	14.30	15.00	1.175	-	-	0.16	0.479	0.563
	LTE Band 66	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 13	DSI 5	132322	1745	14.30	15.00	1.175	-	-	0.04	0.324	0.381
	LTE Band 66	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 13	DSI 5	132322	1745	14.30	15.00	1.175	-	-	0.12	0.363	0.426
	LTE Band 66	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 13	DSI 5	132322	1745	14.26	15.00	1.186	-	-	-0.04	0.423	0.502
06	LTE Band 66	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 13	DSI 5	132322	1745	14.26	15.00	1.186	-	-	0.03	0.540	**0.640**
	LTE Band 66	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 13	DSI 5	132322	1745	14.26	15.00	1.186	-	-	-0.17	0.335	0.397
	LTE Band 66	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 13	DSI 5	132322	1745	14.26	15.00	1.186	-	-	0.06	0.378	0.448
	LTE Band 66	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 13	DSI 7	132322	1745	12.36	13.00	1.159	-	-	0.03	0.257	0.298
	LTE Band 66	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 13	DSI 7	132322	1745	12.36	13.00	1.159	-	-	0.01	0.306	0.355
	LTE Band 66	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 13	DSI 7	132322	1745	12.36	13.00	1.159	-	-	0.16	0.194	0.225
	LTE Band 66	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 13	DSI 7	132322	1745	12.36	13.00	1.159	-	-	0.13	0.226	0.262
	LTE Band 66	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 13	DSI 7	132322	1745	12.32	13.00	1.169	-	-	0.15	0.274	0.320
	LTE Band 66	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 13	DSI 7	132322	1745	12.32	13.00	1.169	-	-	0.1	0.321	0.375
	LTE Band 66	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 13	DSI 7	132322	1745	12.32	13.00	1.169	-	-	0.15	0.211	0.247
	LTE Band 66	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 13	DSI 7	132322	1745	12.32	13.00	1.169	-	-	-0.14	0.239	0.280
	LTE Band 66	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 31	DSI 5/7	132322	1745	23.43	24.30	1.222	-	-	0.1	0.158	0.193
	LTE Band 66	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 31	DSI 5/7	132322	1745	23.43	24.30	1.222	-	-	-0.01	0.131	0.160
	LTE Band 66	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 31	DSI 5/7	132322	1745	23.43	24.30	1.222	-	-	0.1	0.111	0.136
	LTE Band 66	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 31	DSI 5/7	132322	1745	23.43	24.30	1.222	-	-	-0.15	0.114	0.139
	LTE Band 66	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 31	DSI 5/7	132322	1745	22.42	23.30	1.225	-	-	0.1	0.130	0.159

	LTE Band 66	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 31	DSI 5/7	132322	1745	22.42	23.30	1.225	-	-	-0.07	0.111	0.136
	LTE Band 66	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 31	DSI 5/7	132322	1745	22.42	23.30	1.225	-	-	-0.15	0.095	0.116
	LTE Band 66	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 31	DSI 5/7	132322	1745	22.42	23.30	1.225	-	-	-0.05	0.096	0.118
1900MHz																				
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Cheek	0mm	Ant 13	DSI 5	661	1880	20.13	20.80	1.167	-	-	0.02	0.400	0.467
07	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Tilted	0mm	Ant 13	DSI 5	661	1880	20.13	20.80	1.167	-	-	-0.13	0.534	**0.623**
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Cheek	0mm	Ant 13	DSI 5	661	1880	20.13	20.80	1.167	-	-	-0.07	0.289	0.337
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Tilted	0mm	Ant 13	DSI 5	661	1880	20.13	20.80	1.167	-	-	0.05	0.357	0.417
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Cheek	0mm	Ant 13	DSI 7	661	1880	18.09	18.80	1.178	-	-	-0.01	0.269	0.317
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Tilted	0mm	Ant 13	DSI 7	661	1880	18.09	18.80	1.178	-	-	0.03	0.319	0.376
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Cheek	0mm	Ant 13	DSI 7	661	1880	18.09	18.80	1.178	-	-	-0.06	0.199	0.234
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Tilted	0mm	Ant 13	DSI 7	661	1880	18.09	18.80	1.178	-	-	0.04	0.236	0.278
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Cheek	0mm	Ant 31	DSI 5/7	661	1880	27.78	28.30	1.127	-	-	-0.18	0.110	0.124
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Tilted	0mm	Ant 31	DSI 5/7	661	1880	27.78	28.30	1.127	-	-	-0.1	0.105	0.118
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Cheek	0mm	Ant 31	DSI 5/7	661	1880	27.78	28.30	1.127	-	-	0.02	0.142	0.160
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Tilted	0mm	Ant 31	DSI 5/7	661	1880	27.78	28.30	1.127	-	-	0.18	0.116	0.131
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 5	9400	1880	14.00	15.00	1.259	-	-	-0.16	0.479	0.603
08	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 5	9400	1880	14.00	15.00	1.259	-	-	0.04	0.627	**0.789**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 13	DSI 5	9400	1880	14.00	15.00	1.259	-	-	-0.08	0.357	0.449
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 13	DSI 5	9400	1880	14.00	15.00	1.259	-	-	0.02	0.456	0.574
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 13	DSI 7	9400	1880	12.14	13.00	1.219	-	-	0.08	0.297	0.362
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 13	DSI 7	9400	1880	12.14	13.00	1.219	-	-	-0.15	0.396	0.483
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 13	DSI 7	9400	1880	12.14	13.00	1.219	-	-	0.15	0.221	0.269
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 13	DSI 7	9400	1880	12.14	13.00	1.219	-	-	-0.15	0.284	0.346
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 31	DSI 5/7	9400	1880	23.21	24.30	1.285	-	-	-0.17	0.186	0.239
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 31	DSI 5/7	9400	1880	23.21	24.30	1.285	-	-	0.03	0.184	0.236
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 31	DSI 5/7	9400	1880	23.21	24.30	1.285	-	-	0.08	0.246	0.316
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 31	DSI 5/7	9400	1880	23.21	24.30	1.285	-	-	-0.01	0.204	0.262
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 13	DSI 5	18900	1880	14.25	15.00	1.189	-	-	0.17	0.474	0.563
	LTE Band 2	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 13	DSI 5	18900	1880	14.25	15.00	1.189	-	-	-0.05	0.616	0.732
	LTE Band 2	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 13	DSI 5	18900	1880	14.25	15.00	1.189	-	-	-0.04	0.343	0.408
	LTE Band 2	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 13	DSI 5	18900	1880	14.25	15.00	1.189	-	-	0.17	0.440	0.523
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 13	DSI 5	18900	1880	14.22	15.00	1.197	-	-	0.14	0.460	0.551
09	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 13	DSI 5	18900	1880	14.22	15.00	1.197	-	-	0.12	0.637	**0.762**
	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 13	DSI 5	18900	1880	14.22	15.00	1.197	-	-	0.02	0.348	0.416
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 13	DSI 5	18900	1880	14.22	15.00	1.197	-	-	-0.01	0.453	0.542
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 13	DSI 7	18900	1880	12.28	13.00	1.180	-	-	-0.15	0.292	0.345
	LTE Band 2	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 13	DSI 7	18900	1880	12.28	13.00	1.180	-	-	-0.08	0.385	0.454
	LTE Band 2	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 13	DSI 7	18900	1880	12.28	13.00	1.180	-	-	-0.12	0.214	0.253
	LTE Band 2	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 13	DSI 7	18900	1880	12.28	13.00	1.180	-	-	0.1	0.277	0.327
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 13	DSI 7	18900	1880	12.23	13.00	1.194	-	-	-0.13	0.286	0.341
	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 13	DSI 7	18900	1880	12.23	13.00	1.194	-	-	-0.09	0.399	0.476
	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 13	DSI 7	18900	1880	12.23	13.00	1.194	-	-	0.18	0.220	0.263
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 13	DSI 7	18900	1880	12.23	13.00	1.194	-	-	0.14	0.285	0.340
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 31	DSI 5/7	18900	1880	23.33	24.30	1.250	-	-	-0.08	0.175	0.219
	LTE Band 2	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 31	DSI 5/7	18900	1880	23.33	24.30	1.250	-	-	-0.04	0.166	0.208
	LTE Band 2	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 31	DSI 5/7	18900	1880	23.33	24.30	1.250	-	-	0.14	0.222	0.278
	LTE Band 2	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 31	DSI 5/7	18900	1880	23.33	24.30	1.250	-	-	-0.04	0.186	0.233
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 31	DSI 5/7	18900	1880	22.35	23.30	1.245	-	-	-0.07	0.149	0.185
	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 31	DSI 5/7	18900	1880	22.35	23.30	1.245	-	-	-0.05	0.137	0.170
	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 31	DSI 5/7	18900	1880	22.35	23.30	1.245	-	-	0.03	0.192	0.239
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 31	DSI 5/7	18900	1880	22.35	23.30	1.245	-	-	-0.17	0.159	0.198
2600MHz																				
	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 13	DSI 5	21100	2535	17.50	18.20	1.175	-	-	-0.16	0.471	0.553
	LTE Band 7	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 13	DSI 5	21100	2535	17.50	18.20	1.175	-	-	0.07	0.504	0.592
	LTE Band 7	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 13	DSI 5	21100	2535	17.50	18.20	1.175	-	-	0.06	0.180	0.211

	LTE Band 7	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 13	DSI 5	21100	2535	17.50	18.20	1.175	-	-	-0.08	0.257	0.302
	LTE Band 7	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 13	DSI 5	21100	2535	17.47	18.20	1.183	-	-	-0.03	0.472	0.558
10	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 13	DSI 5	21100	2535	17.47	18.20	1.183	-	-	-0.14	0.506	**0.599**
	LTE Band 7	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 13	DSI 5	21100	2535	17.47	18.20	1.183	-	-	-0.17	0.197	0.233
	LTE Band 7	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 13	DSI 5	21100	2535	17.47	18.20	1.183	-	-	0.06	0.276	0.327
	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 13	DSI 7	21100	2535	15.66	16.20	1.132	-	-	-0.16	0.228	0.258
	LTE Band 7	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 13	DSI 7	21100	2535	15.66	16.20	1.132	-	-	0.09	0.340	0.385
	LTE Band 7	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 13	DSI 7	21100	2535	15.66	16.20	1.132	-	-	-0.05	0.111	0.126
	LTE Band 7	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 13	DSI 7	21100	2535	15.66	16.20	1.132	-	-	-0.03	0.157	0.178
	LTE Band 7	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 13	DSI 7	21100	2535	15.60	16.20	1.148	-	-	0.14	0.281	0.323
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 13	DSI 7	21100	2535	15.60	16.20	1.148	-	-	-0.02	0.359	0.412
	LTE Band 7	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 13	DSI 7	21100	2535	15.60	16.20	1.148	-	-	-0.05	0.116	0.133
	LTE Band 7	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 13	DSI 7	21100	2535	15.60	16.20	1.148	-	-	0.13	0.165	0.189
	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 31	DSI 5/7	21100	2535	23.52	24.20	1.169	-	-	-0.03	0.121	0.142
	LTE Band 7	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 31	DSI 5/7	21100	2535	23.52	24.20	1.169	-	-	-0.16	0.061	0.071
	LTE Band 7	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 31	DSI 5/7	21100	2535	23.52	24.20	1.169	-	-	-0.08	0.159	0.186
	LTE Band 7	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 31	DSI 5/7	21100	2535	23.52	24.20	1.169	-	-	0.07	0.093	0.109
	LTE Band 7	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 31	DSI 5/7	21100	2535	22.50	23.20	1.175	-	-	-0.04	0.099	0.116
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 31	DSI 5/7	21100	2535	22.50	23.20	1.175	-	-	-0.17	0.050	0.059
	LTE Band 7	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 31	DSI 5/7	21100	2535	22.50	23.20	1.175	-	-	-0.12	0.130	0.153
	LTE Band 7	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 31	DSI 5/7	21100	2535	22.50	23.20	1.175	-	-	0.06	0.079	0.093
	LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 13	DSI 5	40640	2595	18.82	19.50	1.169	62.9	1.006	0.16	0.422	0.496
	LTE Band 41	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 13	DSI 5	40640	2595	18.82	19.50	1.169	62.9	1.006	0.12	0.477	0.561
	LTE Band 41	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 13	DSI 5	40640	2595	18.82	19.50	1.169	62.9	1.006	-0.02	0.178	0.209
	LTE Band 41	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 13	DSI 5	40640	2595	18.82	19.50	1.169	62.9	1.006	-0.02	0.272	0.320
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 13	DSI 5	40640	2595	18.78	19.50	1.180	62.9	1.006	0.09	0.433	0.514
11	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 13	DSI 5	40640	2595	18.78	19.50	1.180	62.9	1.006	0.18	0.489	**0.581**
	LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 13	DSI 5	40640	2595	18.78	19.50	1.180	62.9	1.006	-0.18	0.176	0.209
	LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 13	DSI 5	40640	2595	18.78	19.50	1.180	62.9	1.006	-0.16	0.270	0.321
	LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 13	DSI 7	40640	2595	16.80	17.50	1.175	62.9	1.006	-0.01	0.295	0.349
	LTE Band 41	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 13	DSI 7	40640	2595	16.80	17.50	1.175	62.9	1.006	0.01	0.342	0.404
	LTE Band 41	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 13	DSI 7	40640	2595	16.80	17.50	1.175	62.9	1.006	-0.11	0.114	0.135
	LTE Band 41	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 13	DSI 7	40640	2595	16.80	17.50	1.175	62.9	1.006	0.07	0.157	0.186
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 13	DSI 7	40640	2595	16.72	17.50	1.197	62.9	1.006	-0.09	0.227	0.273
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 13	DSI 7	40640	2595	16.72	17.50	1.197	62.9	1.006	-0.07	0.323	0.389
	LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 13	DSI 7	40640	2595	16.72	17.50	1.197	62.9	1.006	-0.14	0.110	0.132
	LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 13	DSI 7	40640	2595	16.72	17.50	1.197	62.9	1.006	-0.08	0.157	0.189
	LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 31	DSI 5/7	40640	2595	23.40	24.20	1.202	62.9	1.006	-0.16	0.075	0.091
	LTE Band 41	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 31	DSI 5/7	40640	2595	23.40	24.20	1.202	62.9	1.006	-0.1	0.044	0.053
	LTE Band 41	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 31	DSI 5/7	40640	2595	23.40	24.20	1.202	62.9	1.006	0.05	0.113	0.137
	LTE Band 41	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 31	DSI 5/7	40640	2595	23.40	24.20	1.202	62.9	1.006	0.09	0.059	0.071
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 31	DSI 5/7	40640	2595	22.30	23.20	1.230	62.9	1.006	0.09	0.061	0.075
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 31	DSI 5/7	40640	2595	22.30	23.20	1.230	62.9	1.006	0.06	0.033	0.041
	LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 31	DSI 5/7	40640	2595	22.30	23.20	1.230	62.9	1.006	0.04	0.092	0.114
	LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 31	DSI 5/7	40640	2595	22.30	23.20	1.230	62.9	1.006	0.18	0.047	0.058

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	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)
WLAN & BT																
	Bluetooth	DH5 1Mbps	Right Cheek	0mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	0.18	0.049	0.079
	Bluetooth	DH5 1Mbps	Right Tilted	0mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	-0.09	0.061	0.098
12	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	-0.02	0.113	**0.181**
	Bluetooth	DH5 1Mbps	Left Tilted	0mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	-0.01	0.080	0.128
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 22	Receiver on	11	2462	16.40	17.00	1.148	99.45	1.006	0.07	0.210	0.243
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Ant 22	Receiver on	11	2462	16.40	17.00	1.148	99.45	1.006	-0.13	0.261	0.301
13	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 22	Receiver on	11	2462	16.40	17.00	1.148	99.45	1.006	0.16	0.509	**0.588**
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 22	Receiver on	11	2462	16.40	17.00	1.148	99.45	1.006	-0.09	0.326	0.377
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 22	Receiver on	54	5270	13.21	15.00	1.510	93.13	1.074	0.06	0.105	0.170
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 22	Receiver on	54	5270	13.21	15.00	1.510	93.13	1.074	0.12	0.119	0.193
14	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 22	Receiver on	54	5270	13.21	15.00	1.510	93.13	1.074	-0.02	0.285	**0.462**
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 22	Receiver on	54	5270	13.21	15.00	1.510	93.13	1.074	0.17	0.244	0.396
	WLAN5.5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 22	Receiver on	110	5550	13.28	15.00	1.486	93.13	1.074	0.07	0.086	0.137
	WLAN5.5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 22	Receiver on	110	5550	13.28	15.00	1.486	93.13	1.074	0.14	0.089	0.142
15	WLAN5.5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 22	Receiver on	110	5550	13.28	15.00	1.486	93.13	1.074	0.06	0.272	**0.434**
	WLAN5.5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 22	Receiver on	110	5550	13.28	15.00	1.486	93.13	1.074	0.08	0.269	0.429
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 22	Receiver on	155	5775	13.25	15.00	1.496	87.84	1.138	0.07	0.128	0.218
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 22	Receiver on	155	5775	13.25	15.00	1.496	87.84	1.138	0.13	0.135	0.230
16	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 22	Receiver on	155	5775	13.25	15.00	1.496	87.84	1.138	-0.04	0.429	**0.730**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 22	Receiver on	155	5775	13.25	15.00	1.496	87.84	1.138	0.16	0.355	0.604

14.2 Hotspot SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	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)
										750MHz										
	LTE Band 13	10M	QPSK	1	25	-	Front	10mm	Ant 13	DSI 8	23230	782	22.60	23.50	1.230	-	-	-0.15	0.135	0.166
	LTE Band 13	10M	QPSK	1	25	-	Back	10mm	Ant 13	DSI 8	23230	782	22.60	23.50	1.230	-	-	-0.05	0.172	0.212
	LTE Band 13	10M	QPSK	1	25	-	Left Side	10mm	Ant 13	DSI 8	23230	782	22.60	23.50	1.230	-	-	-0.1	0.142	0.175
	LTE Band 13	10M	QPSK	1	25	-	Right Side	10mm	Ant 13	DSI 8	23230	782	22.60	23.50	1.230	-	-	0.06	0.126	0.155
	LTE Band 13	10M	QPSK	1	25	-	Top Side	10mm	Ant 13	DSI 8	23230	782	22.60	23.50	1.230	-	-	0.05	0.125	0.154
	LTE Band 13	10M	QPSK	25	0	-	Front	10mm	Ant 13	DSI 8	23230	782	22.58	23.50	1.236	-	-	-0.11	0.130	0.161
	LTE Band 13	10M	QPSK	25	0	-	Back	10mm	Ant 13	DSI 8	23230	782	22.58	23.50	1.236	-	-	0.07	0.166	0.205
	LTE Band 13	10M	QPSK	25	0	-	Left Side	10mm	Ant 13	DSI 8	23230	782	22.58	23.50	1.236	-	-	0.19	0.140	0.173
	LTE Band 13	10M	QPSK	25	0	-	Right Side	10mm	Ant 13	DSI 8	23230	782	22.58	23.50	1.236	-	-	0.03	0.120	0.148
	LTE Band 13	10M	QPSK	25	0	-	Top Side	10mm	Ant 13	DSI 8	23230	782	22.58	23.50	1.236	-	-	0.09	0.116	0.143
	LTE Band 13	10M	QPSK	1	25	-	Front	10mm	Ant 31	DSI 8	23230	782	23.25	24.40	1.303	-	-	-0.13	0.123	0.160
17	LTE Band 13	10M	QPSK	1	25	-	Back	10mm	Ant 31	DSI 8	23230	782	23.25	24.40	1.303	-	-	-0.07	0.207	**0.270**
	LTE Band 13	10M	QPSK	1	25	-	Left Side	10mm	Ant 31	DSI 8	23230	782	23.25	24.40	1.303	-	-	-0.14	0.087	0.113
	LTE Band 13	10M	QPSK	1	25	-	Right Side	10mm	Ant 31	DSI 8	23230	782	23.25	24.40	1.303	-	-	-0.02	0.186	0.242
	LTE Band 13	10M	QPSK	1	25	-	Bottom Side	10mm	Ant 31	DSI 8	23230	782	23.25	24.40	1.303	-	-	0.03	0.185	0.241
	LTE Band 13	10M	QPSK	25	0	-	Front	10mm	Ant 31	DSI 8	23230	782	22.24	23.40	1.306	-	-	0.13	0.093	0.121
	LTE Band 13	10M	QPSK	25	0	-	Back	10mm	Ant 31	DSI 8	23230	782	22.24	23.40	1.306	-	-	0.09	0.167	0.218
	LTE Band 13	10M	QPSK	25	0	-	Left Side	10mm	Ant 31	DSI 8	23230	782	22.24	23.40	1.306	-	-	0.02	0.078	0.102
	LTE Band 13	10M	QPSK	25	0	-	Right Side	10mm	Ant 31	DSI 8	23230	782	22.24	23.40	1.306	-	-	0.17	0.151	0.197
	LTE Band 13	10M	QPSK	25	0	-	Bottom Side	10mm	Ant 31	DSI 8	23230	782	22.24	23.40	1.306	-	-	-0.15	0.149	0.195
										835MHz										
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Front	10mm	Ant 13	DSI 8	189	836.4	29.51	30.50	1.256	-	-	-0.05	0.139	0.175
18	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	10mm	Ant 13	DSI 8	189	836.4	29.51	30.50	1.256	-	-	0.13	0.234	**0.294**
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Left Side	10mm	Ant 13	DSI 8	189	836.4	29.51	30.50	1.256	-	-	0.02	0.090	0.113
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right Side	10mm	Ant 13	DSI 8	189	836.4	29.51	30.50	1.256	-	-	-0.11	0.085	0.107
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Top Side	10mm	Ant 13	DSI 8	189	836.4	29.51	30.50	1.256	-	-	0.13	0.170	0.214
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Front	10mm	Ant 31	DSI 8	189	836.4	30.89	31.40	1.125	-	-	-0.06	0.154	0.173
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	10mm	Ant 31	DSI 8	189	836.4	30.89	31.40	1.125	-	-	-0.16	0.232	0.261
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Left Side	10mm	Ant 31	DSI 8	189	836.4	30.89	31.40	1.125	-	-	-0.18	0.089	0.100
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right Side	10mm	Ant 31	DSI 8	189	836.4	30.89	31.40	1.125	-	-	0.02	0.143	0.161
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Bottom Side	10mm	Ant 31	DSI 8	189	836.4	30.89	31.40	1.125	-	-	-0.12	0.176	0.198
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 13	DSI 8	4182	836.4	22.96	24.00	1.271	-	-	0.14	0.139	0.177
19	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 13	DSI 8	4182	836.4	22.96	24.00	1.271	-	-	0.14	0.242	**0.307**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 13	DSI 8	4182	836.4	22.96	24.00	1.271	-	-	-0.11	0.112	0.142
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 13	DSI 8	4182	836.4	22.96	24.00	1.271	-	-	-0.13	0.100	0.127
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 13	DSI 8	4182	836.4	22.96	24.00	1.271	-	-	-0.12	0.183	0.233
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 31	DSI 8	4182	836.4	23.60	24.90	1.349	-	-	-0.01	0.119	0.161
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 31	DSI 8	4182	836.4	23.60	24.90	1.349	-	-	-0.18	0.169	0.228
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 31	DSI 8	4182	836.4	23.60	24.90	1.349	-	-	-0.13	0.070	0.094
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 31	DSI 8	4182	836.4	23.60	24.90	1.349	-	-	0.17	0.116	0.156
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 31	DSI 8	4182	836.4	23.60	24.90	1.349	-	-	0.12	0.130	0.175
	LTE Band 26	15M	QPSK	1	37	-	Front	10mm	Ant 13	DSI 8	26865	831.5	23.10	24.00	1.230	-	-	-0.04	0.142	0.175
20	LTE Band 26	15M	QPSK	1	37	-	Back	10mm	Ant 13	DSI 8	26865	831.5	23.10	24.00	1.230	-	-	0.12	0.219	**0.269**
	LTE Band 26	15M	QPSK	1	37	-	Left Side	10mm	Ant 13	DSI 8	26865	831.5	23.10	24.00	1.230	-	-	0.13	0.092	0.113
	LTE Band 26	15M	QPSK	1	37	-	Right Side	10mm	Ant 13	DSI 8	26865	831.5	23.10	24.00	1.230	-	-	0.13	0.087	0.107
	LTE Band 26	15M	QPSK	1	37	-	Top Side	10mm	Ant 13	DSI 8	26865	831.5	23.10	24.00	1.230	-	-	-0.15	0.169	0.208
	LTE Band 26	15M	QPSK	36	0	-	Front	10mm	Ant 13	DSI 8	26865	831.5	23.02	24.00	1.253	-	-	-0.11	0.131	0.164
	LTE Band 26	15M	QPSK	36	0	-	Back	10mm	Ant 13	DSI 8	26865	831.5	23.02	24.00	1.253	-	-	0.06	0.194	0.243
	LTE Band 26	15M	QPSK	36	0	-	Left Side	10mm	Ant 13	DSI 8	26865	831.5	23.02	24.00	1.253	-	-	0.03	0.087	0.109
	LTE Band 26	15M	QPSK	36	0	-	Right Side	10mm	Ant 13	DSI 8	26865	831.5	23.02	24.00	1.253	-	-	0.09	0.081	0.102
	LTE Band 26	15M	QPSK	36	0	-	Top Side	10mm	Ant 13	DSI 8	26865	831.5	23.02	24.00	1.253	-	-	-0.01	0.160	0.201

	LTE Band 26	15M	QPSK	1	37	-	Front	10mm	Ant 31	DSI 8	26865	831.5	23.88	24.90	1.265	-	-	-0.15	0.082	0.104
	LTE Band 26	15M	QPSK	1	37	-	Back	10mm	Ant 31	DSI 8	26865	831.5	23.88	24.90	1.265	-	-	-0.05	0.123	0.156
	LTE Band 26	15M	QPSK	1	37	-	Left Side	10mm	Ant 31	DSI 8	26865	831.5	23.88	24.90	1.265	-	-	-0.15	0.056	0.071
	LTE Band 26	15M	QPSK	1	37	-	Right Side	10mm	Ant 31	DSI 8	26865	831.5	23.88	24.90	1.265	-	-	0.1	0.078	0.099
	LTE Band 26	15M	QPSK	1	37	-	Bottom Side	10mm	Ant 31	DSI 8	26865	831.5	23.88	24.90	1.265	-	-	0.14	0.100	0.126
	LTE Band 26	15M	QPSK	36	0	-	Front	10mm	Ant 31	DSI 8	26865	831.5	22.80	23.90	1.288	-	-	0.16	0.065	0.084
	LTE Band 26	15M	QPSK	36	0	-	Back	10mm	Ant 31	DSI 8	26865	831.5	22.80	23.90	1.288	-	-	-0.16	0.097	0.125
	LTE Band 26	15M	QPSK	36	0	-	Left Side	10mm	Ant 31	DSI 8	26865	831.5	22.80	23.90	1.288	-	-	0.06	0.045	0.058
	LTE Band 26	15M	QPSK	36	0	-	Right Side	10mm	Ant 31	DSI 8	26865	831.5	22.80	23.90	1.288	-	-	0.14	0.062	0.080
	LTE Band 26	15M	QPSK	36	0	-	Bottom Side	10mm	Ant 31	DSI 8	26865	831.5	22.80	23.90	1.288	-	-	-0.02	0.079	0.102
1750MHz																				
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 13	DSI 8	1413	1732.6	16.75	17.50	1.189	-	-	0.04	0.197	0.234
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 13	DSI 8	1413	1732.6	16.75	17.50	1.189	-	-	0.01	0.237	0.282
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 13	DSI 8	1413	1732.6	16.75	17.50	1.189	-	-	-0.08	0.013	0.015
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 13	DSI 8	1413	1732.6	16.75	17.50	1.189	-	-	0.08	0.036	0.043
21	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 13	DSI 8	1413	1732.6	16.75	17.50	1.189	-	-	-0.08	0.312	**0.371**
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 31	DSI 8	1413	1732.6	18.50	19.30	1.202	-	-	0.11	0.133	0.160
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 31	DSI 8	1413	1732.6	18.50	19.30	1.202	-	-	0.08	0.233	0.280
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 31	DSI 8	1413	1732.6	18.50	19.30	1.202	-	-	-0.01	0.065	0.078
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 31	DSI 8	1413	1732.6	18.50	19.30	1.202	-	-	-0.07	0.023	0.028
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 31	DSI 8	1413	1732.6	18.50	19.30	1.202	-	-	-0.07	0.253	0.304
	LTE Band 66	20M	QPSK	1	49	-	Front	10mm	Ant 13	DSI 8	132322	1745	16.90	17.50	1.148	-	-	-0.02	0.211	0.242
	LTE Band 66	20M	QPSK	1	49	-	Back	10mm	Ant 13	DSI 8	132322	1745	16.90	17.50	1.148	-	-	0.13	0.239	0.274
	LTE Band 66	20M	QPSK	1	49	-	Left Side	10mm	Ant 13	DSI 8	132322	1745	16.90	17.50	1.148	-	-	-0.09	0.011	0.013
	LTE Band 66	20M	QPSK	1	49	-	Right Side	10mm	Ant 13	DSI 8	132322	1745	16.90	17.50	1.148	-	-	-0.13	0.037	0.042
	LTE Band 66	20M	QPSK	1	49	-	Top Side	10mm	Ant 13	DSI 8	132322	1745	16.90	17.50	1.148	-	-	0.16	0.329	0.378
	LTE Band 66	20M	QPSK	50	0	-	Front	10mm	Ant 13	DSI 8	132322	1745	16.87	17.50	1.156	-	-	0.1	0.215	0.249
	LTE Band 66	20M	QPSK	50	0	-	Back	10mm	Ant 13	DSI 8	132322	1745	16.87	17.50	1.156	-	-	0.01	0.245	0.283
	LTE Band 66	20M	QPSK	50	0	-	Left Side	10mm	Ant 13	DSI 8	132322	1745	16.87	17.50	1.156	-	-	-0.04	0.021	0.024
	LTE Band 66	20M	QPSK	50	0	-	Right Side	10mm	Ant 13	DSI 8	132322	1745	16.87	17.50	1.156	-	-	0.03	0.041	0.047
22	LTE Band 66	20M	QPSK	50	0	-	Top Side	10mm	Ant 13	DSI 8	132322	1745	16.87	17.50	1.156	-	-	0.16	0.371	**0.429**
	LTE Band 66	20M	QPSK	1	49	-	Front	10mm	Ant 31	DSI 8	132322	1745	18.44	19.30	1.219	-	-	0.13	0.131	0.160
	LTE Band 66	20M	QPSK	1	49	-	Back	10mm	Ant 31	DSI 8	132322	1745	18.44	19.30	1.219	-	-	-0.08	0.302	0.368
	LTE Band 66	20M	QPSK	1	49	-	Left Side	10mm	Ant 31	DSI 8	132322	1745	18.44	19.30	1.219	-	-	0.09	0.062	0.076
	LTE Band 66	20M	QPSK	1	49	-	Right Side	10mm	Ant 31	DSI 8	132322	1745	18.44	19.30	1.219	-	-	-0.03	0.050	0.061
	LTE Band 66	20M	QPSK	1	49	-	Bottom Side	10mm	Ant 31	DSI 8	132322	1745	18.44	19.30	1.219	-	-	0.1	0.323	0.394
	LTE Band 66	20M	QPSK	50	0	-	Front	10mm	Ant 31	DSI 8	132322	1745	18.40	19.30	1.230	-	-	0.17	0.135	0.166
	LTE Band 66	20M	QPSK	50	0	-	Back	10mm	Ant 31	DSI 8	132322	1745	18.40	19.30	1.230	-	-	0.04	0.300	0.369
	LTE Band 66	20M	QPSK	50	0	-	Left Side	10mm	Ant 31	DSI 8	132322	1745	18.40	19.30	1.230	-	-	0.01	0.082	0.101
	LTE Band 66	20M	QPSK	50	0	-	Right Side	10mm	Ant 31	DSI 8	132322	1745	18.40	19.30	1.230	-	-	-0.08	0.031	0.038
	LTE Band 66	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 31	DSI 8	132322	1745	18.40	19.30	1.230	-	-	0.12	0.313	0.385
1900MHz																				
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	10mm	Ant 13	DSI 8	661	1880	23.07	23.80	1.183	-	-	-0.09	0.200	0.237
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	10mm	Ant 13	DSI 8	661	1880	23.07	23.80	1.183	-	-	0.08	0.319	0.377
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Side	10mm	Ant 13	DSI 8	661	1880	23.07	23.80	1.183	-	-	0.03	0.041	0.049
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Side	10mm	Ant 13	DSI 8	661	1880	23.07	23.80	1.183	-	-	0.01	0.013	0.015
23	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Top Side	10mm	Ant 13	DSI 8	661	1880	23.07	23.80	1.183	-	-	-0.06	0.454	**0.537**
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	10mm	Ant 31	DSI 8	661	1880	25.79	26.30	1.125	-	-	-0.14	0.171	0.192
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	10mm	Ant 31	DSI 8	661	1880	25.79	26.30	1.125	-	-	-0.07	0.362	0.407
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Side	10mm	Ant 31	DSI 8	661	1880	25.79	26.30	1.125	-	-	0.1	0.124	0.139
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Side	10mm	Ant 31	DSI 8	661	1880	25.79	26.30	1.125	-	-	0.06	0.049	0.055
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom Side	10mm	Ant 31	DSI 8	661	1880	25.79	26.30	1.125	-	-	-0.01	0.329	0.370
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 13	DSI 8	9400	1880	15.66	16.50	1.213	-	-	-0.13	0.166	0.201
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 13	DSI 8	9400	1880	15.66	16.50	1.213	-	-	0.05	0.263	0.319
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 13	DSI 8	9400	1880	15.66	16.50	1.213	-	-	0.08	0.040	0.049
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 13	DSI 8	9400	1880	15.66	16.50	1.213	-	-	0.01	0.021	0.025

24	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	10mm	Ant 13	DSI 8	9400	1880	15.66	16.50	1.213	-	-	-0.11	0.390	0.473
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	10mm	Ant 31	DSI 8	9400	1880	18.32	19.30	1.253	-	-	-0.01	0.164	0.206
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	10mm	Ant 31	DSI 8	9400	1880	18.32	19.30	1.253	-	-	0.09	0.308	0.386
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	Ant 31	DSI 8	9400	1880	18.32	19.30	1.253	-	-	-0.04	0.119	0.149
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	10mm	Ant 31	DSI 8	9400	1880	18.32	19.30	1.253	-	-	0.11	0.044	0.055
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	10mm	Ant 31	DSI 8	9400	1880	18.32	19.30	1.253	-	-	0.19	0.295	0.370
	LTE Band 2	20M	QPSK	1	49	-	Front	10mm	Ant 13	DSI 8	18900	1880	15.70	16.50	1.202	-	-	0.07	0.195	0.234
	LTE Band 2	20M	QPSK	1	49	-	Back	10mm	Ant 13	DSI 8	18900	1880	15.70	16.50	1.202	-	-	0.15	0.275	0.331
	LTE Band 2	20M	QPSK	1	49	-	Left Side	10mm	Ant 13	DSI 8	18900	1880	15.70	16.50	1.202	-	-	0.06	0.039	0.047
	LTE Band 2	20M	QPSK	1	49	-	Right Side	10mm	Ant 13	DSI 8	18900	1880	15.70	16.50	1.202	-	-	-0.05	0.014	0.017
	LTE Band 2	20M	QPSK	1	49	-	Top Side	10mm	Ant 13	DSI 8	18900	1880	15.70	16.50	1.202	-	-	0.07	0.408	0.491
	LTE Band 2	20M	QPSK	50	0	-	Front	10mm	Ant 13	DSI 8	18900	1880	15.68	16.50	1.208	-	-	-0.04	0.198	0.239
	LTE Band 2	20M	QPSK	50	0	-	Back	10mm	Ant 13	DSI 8	18900	1880	15.68	16.50	1.208	-	-	-0.05	0.291	0.351
	LTE Band 2	20M	QPSK	50	0	-	Left Side	10mm	Ant 13	DSI 8	18900	1880	15.68	16.50	1.208	-	-	0.03	0.041	0.050
	LTE Band 2	20M	QPSK	50	0	-	Right Side	10mm	Ant 13	DSI 8	18900	1880	15.68	16.50	1.208	-	-	-0.06	0.024	0.029
25	LTE Band 2	20M	QPSK	50	0	-	Top Side	10mm	Ant 13	DSI 8	18900	1880	15.68	16.50	1.208	-	-	0.04	0.420	0.507
	LTE Band 2	20M	QPSK	1	49	-	Front	10mm	Ant 31	DSI 8	18900	1880	18.36	19.30	1.242	-	-	-0.06	0.160	0.199
	LTE Band 2	20M	QPSK	1	49	-	Back	10mm	Ant 31	DSI 8	18900	1880	18.36	19.30	1.242	-	-	-0.19	0.310	0.385
	LTE Band 2	20M	QPSK	1	49	-	Left Side	10mm	Ant 31	DSI 8	18900	1880	18.36	19.30	1.242	-	-	-0.19	0.110	0.137
	LTE Band 2	20M	QPSK	1	49	-	Right Side	10mm	Ant 31	DSI 8	18900	1880	18.36	19.30	1.242	-	-	-0.08	0.045	0.056
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	10mm	Ant 31	DSI 8	18900	1880	18.36	19.30	1.242	-	-	-0.1	0.307	0.381
	LTE Band 2	20M	QPSK	50	0	-	Front	10mm	Ant 31	DSI 8	18900	1880	18.28	19.30	1.265	-	-	-0.08	0.161	0.204
	LTE Band 2	20M	QPSK	50	0	-	Back	10mm	Ant 31	DSI 8	18900	1880	18.28	19.30	1.265	-	-	0.02	0.309	0.391
	LTE Band 2	20M	QPSK	50	0	-	Left Side	10mm	Ant 31	DSI 8	18900	1880	18.28	19.30	1.265	-	-	0.11	0.120	0.152
	LTE Band 2	20M	QPSK	50	0	-	Right Side	10mm	Ant 31	DSI 8	18900	1880	18.28	19.30	1.265	-	-	-0.02	0.050	0.063
	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 31	DSI 8	18900	1880	18.28	19.30	1.265	-	-	-0.08	0.300	0.379
	2600MHz																			
	LTE Band 7	20M	QPSK	1	49	-	Front	10mm	Ant 13	DSI 8	21100	2535	17.85	18.70	1.216	-	-	0.03	0.124	0.151
	LTE Band 7	20M	QPSK	1	49	-	Back	10mm	Ant 13	DSI 8	21100	2535	17.85	18.70	1.216	-	-	-0.13	0.325	0.395
	LTE Band 7	20M	QPSK	1	49	-	Left Side	10mm	Ant 13	DSI 8	21100	2535	17.85	18.70	1.216	-	-	-0.17	0.136	0.165
	LTE Band 7	20M	QPSK	1	49	-	Right Side	10mm	Ant 13	DSI 8	21100	2535	17.85	18.70	1.216	-	-	0.1	0.031	0.038
	LTE Band 7	20M	QPSK	1	49	-	Top Side	10mm	Ant 13	DSI 8	21100	2535	17.85	18.70	1.216	-	-	-0.17	0.320	0.389
	LTE Band 7	20M	QPSK	50	0	-	Front	10mm	Ant 13	DSI 8	21100	2535	17.73	18.70	1.250	-	-	0.17	0.133	0.166
	LTE Band 7	20M	QPSK	50	0	-	Back	10mm	Ant 13	DSI 8	21100	2535	17.73	18.70	1.250	-	-	-0.04	0.340	0.425
	LTE Band 7	20M	QPSK	50	0	-	Left Side	10mm	Ant 13	DSI 8	21100	2535	17.73	18.70	1.250	-	-	-0.16	0.154	0.193
	LTE Band 7	20M	QPSK	50	0	-	Right Side	10mm	Ant 13	DSI 8	21100	2535	17.73	18.70	1.250	-	-	-0.01	0.036	0.045
	LTE Band 7	20M	QPSK	50	0	-	Top Side	10mm	Ant 13	DSI 8	21100	2535	17.73	18.70	1.250	-	-	-0.15	0.335	0.419
	LTE Band 7	20M	QPSK	1	49	-	Front	10mm	Ant 31	DSI 8	21100	2535	18.55	19.20	1.161	-	-	0.15	0.215	0.250
	LTE Band 7	20M	QPSK	1	49	-	Back	10mm	Ant 31	DSI 8	21100	2535	18.55	19.20	1.161	-	-	0.18	0.391	0.454
	LTE Band 7	20M	QPSK	1	49	-	Left Side	10mm	Ant 31	DSI 8	21100	2535	18.55	19.20	1.161	-	-	0.18	0.061	0.071
	LTE Band 7	20M	QPSK	1	49	-	Right Side	10mm	Ant 31	DSI 8	21100	2535	18.55	19.20	1.161	-	-	-0.17	0.046	0.053
	LTE Band 7	20M	QPSK	1	49	-	Bottom Side	10mm	Ant 31	DSI 8	21100	2535	18.55	19.20	1.161	-	-	-0.08	0.471	0.547
	LTE Band 7	20M	QPSK	50	0	-	Front	10mm	Ant 31	DSI 8	21100	2535	18.42	19.20	1.197	-	-	0.17	0.233	0.279
	LTE Band 7	20M	QPSK	50	0	-	Back	10mm	Ant 31	DSI 8	21100	2535	18.42	19.20	1.197	-	-	0.11	0.415	0.497
	LTE Band 7	20M	QPSK	50	0	-	Left Side	10mm	Ant 31	DSI 8	21100	2535	18.42	19.20	1.197	-	-	-0.03	0.052	0.062
	LTE Band 7	20M	QPSK	50	0	-	Right Side	10mm	Ant 31	DSI 8	21100	2535	18.42	19.20	1.197	-	-	0.03	0.051	0.061
26	LTE Band 7	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 31	DSI 8	21100	2535	18.42	19.20	1.197	-	-	0.17	0.538	0.644
	LTE Band 41	20M	QPSK	1	49	-	Front	10mm	Ant 13	DSI 8	40640	2595	19.72	20.50	1.197	62.9	1.006	-0.18	0.149	0.179
	LTE Band 41	20M	QPSK	1	49	-	Back	10mm	Ant 13	DSI 8	40640	2595	19.72	20.50	1.197	62.9	1.006	-0.1	0.334	0.402
	LTE Band 41	20M	QPSK	1	49	-	Left Side	10mm	Ant 13	DSI 8	40640	2595	19.72	20.50	1.197	62.9	1.006	-0.15	0.197	0.237
	LTE Band 41	20M	QPSK	1	49	-	Right Side	10mm	Ant 13	DSI 8	40640	2595	19.72	20.50	1.197	62.9	1.006	-0.08	0.036	0.043
	LTE Band 41	20M	QPSK	1	49	-	Top Side	10mm	Ant 13	DSI 8	40640	2595	19.72	20.50	1.197	62.9	1.006	0.14	0.307	0.370
	LTE Band 41	20M	QPSK	50	0	-	Front	10mm	Ant 13	DSI 8	40640	2595	19.59	20.50	1.233	62.9	1.006	-0.01	0.149	0.185
	LTE Band 41	20M	QPSK	50	0	-	Back	10mm	Ant 13	DSI 8	40640	2595	19.59	20.50	1.233	62.9	1.006	-0.04	0.379	0.470
	LTE Band 41	20M	QPSK	50	0	-	Left Side	10mm	Ant 13	DSI 8	40640	2595	19.59	20.50	1.233	62.9	1.006	0.03	0.206	0.256
	LTE Band 41	20M	QPSK	50	0	-	Right Side	10mm	Ant 13	DSI 8	40640	2595	19.59	20.50	1.233	62.9	1.006	-0.04	0.023	0.029

	LTE Band 41	20M	QPSK	50	0	-	Top Side	10mm	Ant 13	DSI 8	40640	2595	19.59	20.50	1.233	62.9	1.006	0.15	0.318	0.394
	LTE Band 41	20M	QPSK	1	49	-	Front	10mm	Ant 31	DSI 8	40640	2595	20.00	20.70	1.175	62.9	1.006	0.09	0.280	0.331
	LTE Band 41	20M	QPSK	1	49	-	Back	10mm	Ant 31	DSI 8	40640	2595	20.00	20.70	1.175	62.9	1.006	0.13	0.342	0.404
	LTE Band 41	20M	QPSK	1	49	-	Left Side	10mm	Ant 31	DSI 8	40640	2595	20.00	20.70	1.175	62.9	1.006	-0.08	0.042	0.050
	LTE Band 41	20M	QPSK	1	49	-	Right Side	10mm	Ant 31	DSI 8	40640	2595	20.00	20.70	1.175	62.9	1.006	0.09	0.065	0.077
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	10mm	Ant 31	DSI 8	40640	2595	20.00	20.70	1.175	62.9	1.006	-0.14	0.438	0.518
	LTE Band 41	20M	QPSK	50	0	-	Front	10mm	Ant 31	DSI 8	40640	2595	19.96	20.70	1.186	62.9	1.006	-0.06	0.284	0.339
	LTE Band 41	20M	QPSK	50	0	-	Back	10mm	Ant 31	DSI 8	40640	2595	19.96	20.70	1.186	62.9	1.006	0.19	0.347	0.414
	LTE Band 41	20M	QPSK	50	0	-	Left Side	10mm	Ant 31	DSI 8	40640	2595	19.96	20.70	1.186	62.9	1.006	0.09	0.042	0.050
	LTE Band 41	20M	QPSK	50	0	-	Right Side	10mm	Ant 31	DSI 8	40640	2595	19.96	20.70	1.186	62.9	1.006	0.04	0.074	0.088
27	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	10mm	Ant 31	DSI 8	40640	2595	19.96	20.70	1.186	62.9	1.006	-0.09	0.468	0.558

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	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)
WLAN & BT																
	Bluetooth	DH5 1Mbps	Front	10mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	0.17	0.020	0.032
28	Bluetooth	DH5 1Mbps	Back	10mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	0.18	0.042	0.067
	Bluetooth	DH5 1Mbps	Left Side	10mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	-	n/a	n/a
	Bluetooth	DH5 1Mbps	Right Side	10mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	-0.13	0.023	0.037
	Bluetooth	DH5 1Mbps	Top Side	10mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	-0.02	0.030	0.048
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Ant 22	Full	6	2437	17.40	18.00	1.148	99.45	1.006	-0.03	0.109	0.126
29	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 22	Full	6	2437	17.40	18.00	1.148	99.45	1.006	0.14	0.216	0.249
	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Ant 22	Full	6	2437	17.40	18.00	1.148	99.45	1.006	0.01	0.021	0.024
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Ant 22	Full	6	2437	17.40	18.00	1.148	99.45	1.006	-0.02	0.136	0.157
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Ant 22	Full	6	2437	17.40	18.00	1.148	99.45	1.006	-0.17	0.158	0.182
	WLAN5.2GHz	802.11n-HT40 MCS0	Front	10mm	Ant 22	Reduced	46	5230	14.05	16.00	1.567	93.13	1.074	0.01	0.106	0.178
	WLAN5.2GHz	802.11n-HT40 MCS0	Back	10mm	Ant 22	Reduced	46	5230	14.05	16.00	1.567	93.13	1.074	0.15	0.165	0.278
	WLAN5.2GHz	802.11n-HT40 MCS0	Left Side	10mm	Ant 22	Reduced	46	5230	14.05	16.00	1.567	93.13	1.074	-	n/a	n/a
30	WLAN5.2GHz	802.11n-HT40 MCS0	Right Side	10mm	Ant 22	Reduced	46	5230	14.05	16.00	1.567	93.13	1.074	-0.13	0.191	0.321
	WLAN5.2GHz	802.11n-HT40 MCS0	Top Side	10mm	Ant 22	Reduced	46	5230	14.05	16.00	1.567	93.13	1.074	0.01	0.164	0.276
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	10mm	Ant 22	Reduced	155	5775	13.25	15.00	1.496	87.84	1.138	0.11	0.165	0.281
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	10mm	Ant 22	Reduced	155	5775	13.25	15.00	1.496	87.84	1.138	-0.02	0.480	0.817
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Side	10mm	Ant 22	Reduced	155	5775	13.25	15.00	1.496	87.84	1.138	-	n/a	n/a
31	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	10mm	Ant 22	Reduced	155	5775	13.25	15.00	1.496	87.84	1.138	-0.16	0.531	0.904
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	10mm	Ant 22	Reduced	155	5775	13.25	15.00	1.496	87.84	1.138	0.08	0.228	0.388

14.3 Body Worn Accessory SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	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)
750MHz																				
	LTE Band 13	10M	QPSK	1	25	-	Front	15mm	Ant 13	DSI 6	23230	782	23.65	24.50	1.216	-	-	-0.16	0.170	0.207
32	LTE Band 13	10M	QPSK	1	25	-	Back	15mm	Ant 13	DSI 6	23230	782	23.65	24.50	1.216	-	-	-0.01	0.207	0.252
	LTE Band 13	10M	QPSK	25	0	-	Front	15mm	Ant 13	DSI 6	23230	782	22.66	23.50	1.213	-	-	-0.17	0.132	0.160
	LTE Band 13	10M	QPSK	25	0	-	Back	15mm	Ant 13	DSI 6	23230	782	22.66	23.50	1.213	-	-	0.16	0.159	0.193
	LTE Band 13	10M	QPSK	1	25	-	Front	15mm	Ant 31	DSI 6/8	23230	782	23.25	24.40	1.303	-	-	0.05	0.146	0.190
	LTE Band 13	10M	QPSK	1	25	-	Back	15mm	Ant 31	DSI 6/8	23230	782	23.25	24.40	1.303	-	-	-0.05	0.161	0.210
	LTE Band 13	10M	QPSK	25	0	-	Front	15mm	Ant 31	DSI 6/8	23230	782	22.24	23.40	1.306	-	-	0.17	0.107	0.140
	LTE Band 13	10M	QPSK	25	0	-	Back	15mm	Ant 31	DSI 6/8	23230	782	22.24	23.40	1.306	-	-	-0.12	0.127	0.166
835MHz																				
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Front	15mm	Ant 13	DSI 6	189	836.4	30.62	31.50	1.225	-	-	-0.05	0.143	0.175
33	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	15mm	Ant 13	DSI 6	189	836.4	30.62	31.50	1.225	-	-	-0.16	0.158	0.193
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Front	15mm	Ant 31	DSI 6/8	189	836.4	30.89	31.40	1.125	-	-	-0.01	0.113	0.127
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	15mm	Ant 31	DSI 6/8	189	836.4	30.89	31.40	1.125	-	-	-0.04	0.141	0.159
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 13	DSI 6	4182	836.4	23.83	25.00	1.309	-	-	0.06	0.132	0.173
34	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 13	DSI 6	4182	836.4	23.83	25.00	1.309	-	-	0.17	0.159	0.208
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 31	DSI 6/8	4182	836.4	23.60	24.90	1.349	-	-	-0.1	0.102	0.138
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 31	DSI 6/8	4182	836.4	23.60	24.90	1.349	-	-	0.11	0.129	0.174
	LTE Band 26	15M	QPSK	1	37	-	Front	15mm	Ant 13	DSI 6	26865	831.5	24.15	25.00	1.216	-	-	0.01	0.118	0.144
35	LTE Band 26	15M	QPSK	1	37	-	Back	15mm	Ant 13	DSI 6	26865	831.5	24.15	25.00	1.216	-	-	0.09	0.145	0.176
	LTE Band 26	15M	QPSK	36	0	-	Front	15mm	Ant 13	DSI 6	26865	831.5	23.03	24.00	1.250	-	-	-0.07	0.096	0.120
	LTE Band 26	15M	QPSK	36	0	-	Back	15mm	Ant 13	DSI 6	26865	831.5	23.03	24.00	1.250	-	-	0.03	0.103	0.129
	LTE Band 26	15M	QPSK	1	37	-	Front	15mm	Ant 31	DSI 6/8	26865	831.5	23.88	24.90	1.265	-	-	0.03	0.077	0.097
	LTE Band 26	15M	QPSK	1	37	-	Back	15mm	Ant 31	DSI 6/8	26865	831.5	23.88	24.90	1.265	-	-	-0.08	0.095	0.120
	LTE Band 26	15M	QPSK	36	0	-	Front	15mm	Ant 31	DSI 6/8	26865	831.5	22.80	23.90	1.288	-	-	0.19	0.058	0.075
	LTE Band 26	15M	QPSK	36	0	-	Back	15mm	Ant 31	DSI 6/8	26865	831.5	22.80	23.90	1.288	-	-	0.03	0.070	0.090
1750MHz																				
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 13	DSI 6	1413	1732.6	18.80	19.50	1.175	-	-	-0.17	0.156	0.183
36	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 13	DSI 6	1413	1732.6	18.80	19.50	1.175	-	-	-0.12	0.173	0.203
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 31	DSI 6	1413	1732.6	19.60	20.30	1.175	-	-	0.19	0.099	0.116
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 31	DSI 6	1413	1732.6	19.60	20.30	1.175	-	-	-0.08	0.168	0.197
	LTE Band 66	20M	QPSK	1	49	-	Front	15mm	Ant 13	DSI 6	132322	1745	18.80	19.50	1.175	-	-	-0.1	0.171	0.201
37	LTE Band 66	20M	QPSK	1	49	-	Back	15mm	Ant 13	DSI 6	132322	1745	18.80	19.50	1.175	-	-	0.17	0.198	0.233
	LTE Band 66	20M	QPSK	50	0	-	Front	15mm	Ant 13	DSI 6	132322	1745	18.70	19.50	1.202	-	-	-0.08	0.161	0.194
	LTE Band 66	20M	QPSK	50	0	-	Back	15mm	Ant 13	DSI 6	132322	1745	18.70	19.50	1.202	-	-	0.03	0.190	0.228
	LTE Band 66	20M	QPSK	1	49	-	Front	15mm	Ant 31	DSI 6	132322	1745	19.45	20.30	1.216	-	-	0.01	0.107	0.130
	LTE Band 66	20M	QPSK	1	49	-	Back	15mm	Ant 31	DSI 6	132322	1745	19.45	20.30	1.216	-	-	-0.02	0.181	0.220
	LTE Band 66	20M	QPSK	50	0	-	Front	15mm	Ant 31	DSI 6	132322	1745	19.42	20.30	1.225	-	-	0.09	0.104	0.127
	LTE Band 66	20M	QPSK	50	0	-	Back	15mm	Ant 31	DSI 6	132322	1745	19.42	20.30	1.225	-	-	-0.13	0.178	0.218
1900MHz																				
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	15mm	Ant 13	DSI 6	661	1880	25.11	25.80	1.172	-	-	0.12	0.151	0.177
38	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	15mm	Ant 13	DSI 6	661	1880	25.11	25.80	1.172	-	-	0.06	0.238	0.279
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	15mm	Ant 31	DSI 6	661	1880	26.83	27.30	1.114	-	-	0.19	0.118	0.131
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	15mm	Ant 31	DSI 6	661	1880	26.83	27.30	1.114	-	-	-0.02	0.243	0.271
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 13	DSI 6	9400	1880	17.70	18.50	1.202	-	-	-0.01	0.136	0.164
39	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 13	DSI 6	9400	1880	17.70	18.50	1.202	-	-	0.08	0.227	0.273
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	15mm	Ant 31	DSI 6	9400	1880	19.35	20.30	1.245	-	-	0.16	0.114	0.142
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	15mm	Ant 31	DSI 6	9400	1880	19.35	20.30	1.245	-	-	-0.07	0.198	0.246
	LTE Band 2	20M	QPSK	1	49	-	Front	15mm	Ant 13	DSI 6	18900	1880	17.72	18.50	1.197	-	-	-0.05	0.141	0.169
	LTE Band 2	20M	QPSK	1	49	-	Back	15mm	Ant 13	DSI 6	18900	1880	17.72	18.50	1.197	-	-	0.05	0.230	0.275
	LTE Band 2	20M	QPSK	50	0	-	Front	15mm	Ant 13	DSI 6	18900	1880	17.69	18.50	1.205	-	-	0.01	0.151	0.182

40	LTE Band 2	20M	QPSK	50	0	-	Back	15mm	Ant 13	DSI 6	18900	1880	17.69	18.50	1.205	-	-	-0.11	0.241	**0.290**
	LTE Band 2	20M	QPSK	1	49	-	Front	15mm	Ant 31	DSI 6	18900	1880	19.37	20.30	1.239	-	-	0.05	0.125	0.155
	LTE Band 2	20M	QPSK	1	49	-	Back	15mm	Ant 31	DSI 6	18900	1880	19.37	20.30	1.239	-	-	0.1	0.201	0.249
	LTE Band 2	20M	QPSK	50	0	-	Front	15mm	Ant 31	DSI 6	18900	1880	19.33	20.30	1.250	-	-	-0.16	0.129	0.161
	LTE Band 2	20M	QPSK	50	0	-	Back	15mm	Ant 31	DSI 6	18900	1880	19.33	20.30	1.250	-	-	-0.09	0.202	0.253
2600MHz																				
	LTE Band 7	20M	QPSK	1	49	-	Front	15mm	Ant 13	DSI 6	21100	2535	19.90	20.70	1.202	-	-	0.1	0.111	0.133
	LTE Band 7	20M	QPSK	1	49	-	Back	15mm	Ant 13	DSI 6	21100	2535	19.90	20.70	1.202	-	-	-0.14	0.239	0.287
	LTE Band 7	20M	QPSK	50	0	-	Front	15mm	Ant 13	DSI 6	21100	2535	19.87	20.70	1.211	-	-	-0.08	0.113	0.137
41	LTE Band 7	20M	QPSK	50	0	-	Back	15mm	Ant 13	DSI 6	21100	2535	19.87	20.70	1.211	-	-	0.01	0.250	**0.303**
	LTE Band 7	20M	QPSK	1	49	-	Front	15mm	Ant 31	DSI 6	21100	2535	19.55	20.20	1.161	-	-	-0.15	0.158	0.184
	LTE Band 7	20M	QPSK	1	49	-	Back	15mm	Ant 31	DSI 6	21100	2535	19.55	20.20	1.161	-	-	-0.12	0.240	0.279
	LTE Band 7	20M	QPSK	50	0	-	Front	15mm	Ant 31	DSI 6	21100	2535	19.54	20.20	1.164	-	-	-0.1	0.163	0.190
	LTE Band 7	20M	QPSK	50	0	-	Back	15mm	Ant 31	DSI 6	21100	2535	19.54	20.20	1.164	-	-	0.06	0.244	0.284
	LTE Band 41	20M	QPSK	1	49	-	Front	15mm	Ant 13	DSI 6	40640	2595	21.69	22.50	1.205	62.9	1.006	-0.1	0.132	0.160
	LTE Band 41	20M	QPSK	1	49	-	Back	15mm	Ant 13	DSI 6	40640	2595	21.69	22.50	1.205	62.9	1.006	0.08	0.256	0.310
	LTE Band 41	20M	QPSK	50	0	-	Front	15mm	Ant 13	DSI 6	40640	2595	21.65	22.50	1.216	62.9	1.006	-0.06	0.136	0.166
42	LTE Band 41	20M	QPSK	50	0	-	Back	15mm	Ant 13	DSI 6	40640	2595	21.65	22.50	1.216	62.9	1.006	-0.05	0.263	**0.322**
	LTE Band 41	20M	QPSK	1	49	-	Front	15mm	Ant 31	DSI 6	40640	2595	20.93	21.70	1.194	62.9	1.006	-0.15	0.139	0.167
	LTE Band 41	20M	QPSK	1	49	-	Back	15mm	Ant 31	DSI 6	40640	2595	20.93	21.70	1.194	62.9	1.006	0.03	0.194	0.233
	LTE Band 41	20M	QPSK	50	0	-	Front	15mm	Ant 31	DSI 6	40640	2595	20.79	21.70	1.233	62.9	1.006	-0.08	0.143	0.177
	LTE Band 41	20M	QPSK	50	0	-	Back	15mm	Ant 31	DSI 6	40640	2595	20.79	21.70	1.233	62.9	1.006	-0.07	0.204	0.253

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	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)
WLAN & BT																
	Bluetooth	DH5 1Mbps	Front	15mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	-0.18	0.014	0.022
43	Bluetooth	DH5 1Mbps	Back	15mm	Ant 22	Full	78	2480	10.10	11.00	1.230	76.74	1.303	-0.05	0.017	**0.027**
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Ant 22	Full	6	2437	17.40	18.00	1.148	99.45	1.006	0.14	0.064	0.074
44	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 22	Full	6	2437	17.40	18.00	1.148	99.45	1.006	0.11	0.084	**0.097**
	WLAN5.3GHz	802.11a 6Mbps	Front	15mm	Ant 22	Standalone	52	5260	18.31	20.00	1.475	96.77	1.033	-0.12	0.210	0.320
45	WLAN5.3GHz	802.11a 6Mbps	Back	15mm	Ant 22	Standalone	52	5260	18.31	20.00	1.475	96.77	1.033	0.05	0.274	**0.417**
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	15mm	Ant 22	Simultaneous	54	5270	14.18	16.00	1.521	93.13	1.074	0.17	0.091	0.149
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	15mm	Ant 22	Simultaneous	54	5270	14.18	16.00	1.521	93.13	1.074	0.11	0.106	0.173
	WLAN5.5GHz	802.11n-HT40 MCS0	Front	15mm	Ant 22	Standalone	110	5550	16.21	18.00	1.510	93.13	1.074	-0.05	0.096	0.156
46	WLAN5.5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 22	Standalone	110	5550	16.21	18.00	1.510	93.13	1.074	0.11	0.229	**0.371**
	WLAN5.5GHz	802.11n-HT40 MCS0	Front	15mm	Ant 22	Simultaneous	110	5550	14.19	16.00	1.517	93.13	1.074	-0.16	0.017	0.028
	WLAN5.5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 22	Simultaneous	110	5550	14.19	16.00	1.517	93.13	1.074	-0.14	0.171	0.279
	WLAN5.8GHz	802.11n-HT40 MCS0	Front	15mm	Ant 22	Standalone	159	5785	16.20	18.00	1.514	93.13	1.074	-0.14	0.188	0.306
47	WLAN5.8GHz	802.11n-HT40 MCS0	Back	15mm	Ant 22	Standalone	159	5795	16.20	18.00	1.514	93.13	1.074	-0.02	0.519	**0.844**
	WLAN5.8GHz	802.11n-HT40 MCS0	Back	15mm	Ant 22	Standalone	151	5755	16.13	18.00	1.538	93.13	1.074	0.06	0.488	0.806
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	15mm	Ant 22	Simultaneous	155	5775	13.25	15.00	1.496	87.84	1.138	0.1	0.158	0.269
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 22	Simultaneous	155	5775	13.25	15.00	1.496	87.84	1.138	0.01	0.362	0.616

14.4 Product specific 10g SAR

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	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)
WLAN																
48	WLAN5.2GHz	802.11a 6Mbps	Right Side	0mm	Ant 22	Standalone	48	5240	18.23	20.00	1.502	96.77	1.033	0.17	1.430	2.219
	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Ant 22	Standalone	48	5240	18.23	20.00	1.502	96.77	1.033	0.02	1.030	1.598
	WLAN5.2GHz	802.11a 6Mbps	Right Side	0mm	Ant 22	Standalone	36	5180	12.79	14.50	1.482	96.77	1.033	0.17	0.438	0.670
	WLAN5.2GHz	802.11a 6Mbps	Right Side	0mm	Ant 22	Standalone	40	5200	12.67	14.50	1.524	96.77	1.033	0.06	0.426	0.671
	WLAN5.2GHz	802.11a 6Mbps	Right Side	0mm	Ant 22	Standalone	44	5220	12.77	14.50	1.489	96.77	1.033	-0.03	0.434	0.667
	WLAN5.2GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 22	Simultaneous	46	5230	14.05	16.00	1.567	93.13	1.074	0.17	0.653	1.099
	WLAN5.2GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 22	Simultaneous	46	5230	14.05	16.00	1.567	93.13	1.074	0.01	0.320	0.538
	WLAN5.3GHz	802.11a 6Mbps	Front	0mm	Ant 22	Standalone	52	5260	18.31	20.00	1.475	96.77	1.033	0.11	0.627	0.955
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Ant 22	Standalone	52	5260	18.31	20.00	1.475	96.77	1.033	-0.08	0.823	1.254
	WLAN5.3GHz	802.11a 6Mbps	Left Side	0mm	Ant 22	Standalone	52	5260	18.31	20.00	1.475	96.77	1.033	0.05	0.057	0.087
49	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Ant 22	Standalone	52	5260	18.31	20.00	1.475	96.77	1.033	0.05	1.390	2.118
	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 22	Standalone	52	5260	18.31	20.00	1.475	96.77	1.033	0.15	0.805	1.226
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Ant 22	Standalone	56	5280	18.12	20.00	1.542	96.77	1.033	0.09	0.604	0.962
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Ant 22	Standalone	60	5300	18.17	20.00	1.523	96.77	1.033	-0.08	0.535	0.842
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Ant 22	Standalone	64	5320	13.77	15.50	1.489	96.77	1.033	-0.02	0.218	0.335
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	0mm	Ant 22	Simultaneous	54	5270	14.18	16.00	1.521	93.13	1.074	0.04	0.241	0.394
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	0mm	Ant 22	Simultaneous	54	5270	14.18	16.00	1.521	93.13	1.074	-0.13	0.324	0.529
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 22	Simultaneous	54	5270	14.18	16.00	1.521	93.13	1.074	-0.06	0.025	0.041
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 22	Simultaneous	54	5270	14.18	16.00	1.521	93.13	1.074	0.11	0.667	1.089
	WLAN5.3GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 22	Simultaneous	54	5270	14.18	16.00	1.521	93.13	1.074	0.01	0.262	0.428
	WLAN5.5GHz	802.11n-HT40 MCS0	Front	0mm	Ant 22	Standalone	110	5550	16.21	18.00	1.510	93.13	1.074	0.16	0.504	0.817
	WLAN5.5GHz	802.11n-HT40 MCS0	Back	0mm	Ant 22	Standalone	110	5550	16.21	18.00	1.510	93.13	1.074	0.01	0.702	1.139
	WLAN5.5GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 22	Standalone	110	5550	16.21	18.00	1.510	93.13	1.074	-0.18	0.033	0.054
50	WLAN5.5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 22	Standalone	110	5550	16.21	18.00	1.510	93.13	1.074	-0.01	0.896	1.453
	WLAN5.5GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 22	Standalone	110	5550	16.21	18.00	1.510	93.13	1.074	0.16	0.753	1.221
	WLAN5.5GHz	802.11n-HT40 MCS0	Front	0mm	Ant 22	Simultaneous	110	5550	14.19	16.00	1.517	93.13	1.074	0.16	0.309	0.503
	WLAN5.5GHz	802.11n-HT40 MCS0	Back	0mm	Ant 22	Simultaneous	110	5550	14.19	16.00	1.517	93.13	1.074	0.02	0.573	0.934
	WLAN5.5GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 22	Simultaneous	110	5550	14.19	16.00	1.517	93.13	1.074	-	n/a	n/a
	WLAN5.5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 22	Simultaneous	110	5550	14.19	16.00	1.517	93.13	1.074	0.07	0.704	1.147
	WLAN5.5GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 22	Simultaneous	110	5550	14.19	16.00	1.517	93.13	1.074	0.18	0.491	0.800
	WLAN5.8GHz	802.11n-HT40 MCS0	Back	0mm	Ant 22	Standalone	159	5795	16.20	18.00	1.514	93.13	1.074	0.13	1.210	1.967
51	WLAN5.8GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 22	Standalone	159	5795	16.20	18.00	1.514	93.13	1.074	-0.02	1.680	2.731
	WLAN5.8GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 22	Standalone	151	5755	16.13	18.00	1.538	93.13	1.074	0.09	1.640	2.709
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 22	Simultaneous	155	5775	13.25	15.00	1.496	87.84	1.138	-0.13	0.811	1.381
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 22	Simultaneous	155	5775	13.25	15.00	1.496	87.84	1.138	0.12	1.120	1.907

15. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product specific 10g SAR
1.	WWAN + 2.4GHz WLAN	Yes	Yes	Yes	Yes
2.	WWAN + 5GHz WLAN	Yes	Yes	Yes	Yes
3.	WWAN + Bluetooth	Yes	Yes	Yes	Yes
4.	5GHz WLAN + Bluetooth	Yes	Yes	Yes	Yes
5.	WWAN + 5GHz WLAN + Bluetooth	Yes	Yes	Yes	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 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).
5. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
6. WLAN 2.4GHz and Bluetooth share the same antenna and cannot transmit simultaneously.
7. According to the EUT characteristic, WLAN 5GHz and Bluetooth can transmit simultaneously.
8. According to the EUT characteristic, WLAN 5GHz and WLAN 2.4GHz cannot transmit simultaneously.
9. For simultaneously analysis, since the SAR summation of 3 transmitters can cover others combination of 2 transmitters, therefore in this section did not additional to evaluate 2TX combination of simultaneously transmission.
10. For standalone WWAN, always choose the highest SAR among all WWAN bands within the selected antennas for each test exposure position to perform simultaneous transmission analysis with WLAN/BT together. This is the worst co-located analysis and can represent each band.
11. The reported SAR summation is calculated based on the same configuration and test position
12. Per KDB 447498 D01, 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 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
    iii) If SPLSR ≤ 0.04 for 1g SAR and SPLSR≤ 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.

15.1 Head Exposure Conditions

WWAN Band	Exposure Position	1	3	10	17	1+3	1+10+17
		WWAN	WLAN2.4GHz Ant 22	WLAN5GHz Ant 22	Bluetooth Ant 22	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)
All Bands Ant 13	Right Cheek	0.612	0.243	0.218	0.079	0.86	0.91
	Right Tilted	0.789	0.301	0.230	0.098	1.09	1.12
	Left Cheek	0.480	0.588	0.730	0.181	1.07	1.39
	Left Tilted	0.574	0.377	0.604	0.128	0.95	1.31
All Bands Ant 31	Right Cheek	0.239	0.243	0.218	0.079	0.48	0.54
	Right Tilted	0.236	0.301	0.230	0.098	0.54	0.56
	Left Cheek	0.316	0.588	0.730	0.181	0.90	1.23
	Left Tilted	0.262	0.377	0.604	0.128	0.64	0.99

15.2 Hotspot Exposure Conditions

WWAN Band	Exposure Position	1	3	10	17	1+3	1+10+17
		WWAN	WLAN2.4GHz Ant 22	WLAN5GHz Ant 22	Bluetooth Ant 22	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)
All Bands Ant 13	Front	0.249	0.126	0.281	0.032	0.38	0.56
	Back	0.470	0.249	0.817	0.067	0.72	1.35
	Left side	0.256	0.024			0.28	0.26
	Right side	0.155	0.157	0.904	0.037	0.31	1.10
	Top side	0.537	0.182	0.388	0.048	0.72	0.97
	Bottom side					0.00	0.00
All Bands Ant 31	Front	0.339	0.126	0.281	0.032	0.47	0.65
	Back	0.497	0.249	0.817	0.067	0.75	1.38
	Left side	0.152	0.024			0.18	0.15
	Right side	0.242	0.157	0.904	0.037	0.40	1.18
	Top side		0.182	0.388	0.048	0.18	0.44
	Bottom side	0.644				0.64	0.64

15.3 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	1+3	1+10+17
		WWAN	WLAN2.4GHz Ant 22	WLAN5GHz Ant 22	Bluetooth Ant 22	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)
All Bands Ant 13	Front	0.207	0.074	0.320	0.022	0.28	0.55
	Back	0.322	0.097	0.844	0.027	0.42	1.19
All Bands Ant 31	Front	0.190	0.074	0.320	0.022	0.26	0.53
	Back	0.284	0.097	0.844	0.027	0.38	1.16

Test Engineer : Hank Huang, Kevin Xu, David Dai, Bin He

16. Uncertainty Assessment

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

17. References

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

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

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

[4] SPEAG DASY System Handbook

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

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

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

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

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

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

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

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

------THE END------