FCC SAR Test Report

APPLICANT	: FCNT LLC.
EQUIPMENT	: Mobile cellular phone
BRAND NAME	: Raku-Raku smartphone
MODEL NAME	: F-53E
FCC ID	: 2BEPUFMP201
STANDARD	: FCC 47 CFR Part 2 (2.1093)

We, Sporton International Inc. (Kunshan), 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. (Kunshan), the test report shall not be reproduced except in full.

Approved by: Si Zhang

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA480803	Rev. 01	Initial issue of report.	Oct. 23, 2024
FA480803	Rev. 02	Revise Section 17 and 17.5 This report is an updated version, replacing the report issued on Oct. 23, 2024.	Oct. 24, 2024

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **FCNT LLC., Mobile cellular phone, F-53E,** are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 5mm)	Body-worn (Separation 5mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.90	1.19	1.19	1.58
		GSM1900	0.14	1.03	1.20	
	WCDMA	WCDMA V	0.88	0.85	0.85	
	LTE	LTE Band 5	0.88	0.84	0.84	
		LTE Band 12	0.88	**1.30**	**1.30**	
		LTE Band 41	0.27	1.28	1.29	
		LTE Band 42	0.89	0.62	0.89	
	5G NR	FR1 n78	0.89	0.62	0.89	
DTS	WLAN	2.4GHz WLAN	**1.38**	0.91	1.20	1.58
NII		5GHz WLAN	1.10		0.83	1.59
DSS	Bluetooth	2.4GHz Bluetooth	0.49	0.31	0.34	1.59

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission 10g SAR (W/kg)
Licensed	GSM	GSM850	2.49	3.14
		GSM1900	1.45	
	LTE	LTE Band 12	2.13	
		LTE Band 41	2.06	
		LTE Band 42	2.32	
	5G NR	FR1 n78	2.48	
DTS	WLAN	2.4GHz WLAN	**2.67**	3.14
NII		5GHz WLAN	2.25	3.14
Date of Testing:			2024/9/19 ~ 2024/9/30	

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. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR07-KS	CN1257	314309

Applicant	
Company Name	FCNT LLC.
Address	Sanki Yamato Bldg. 3F, 7-10-1, Chuorinkan, Yamato-shi, Kanagawa, 242-0007, Japan

Manufacturer	
Company Name	FCNT LLC.
Address	Sanki Yamato Bldg. 3F, 7-10-1, Chuorinkan, Yamato-shi, Kanagawa, 242-0007, Japan

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 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile cellular phone
Brand Name	Raku-Raku smartphone
Model Name	F-53E
FCC ID	2BEPUFMP201
IMEI Code	Sample 1 SIM1: 354413330041127 SIM2: 354413330041135 Sample 2 SIM1: 354413330055325 SIM2: 354413330055333
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3450 MHz ~ 3550 MHz 5G NR n78: 3450 MHz ~ 3550 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Mode	GSM/GPRS RMC/AMR 12.2Kbps HSDPA/HSUPA DC-HSDPA HSPA+(16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM, 256QAM(Downlink only) 5G NR : CP-OFDM / DFT-s-OFDM, PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC: ASK
HW Version	DVT2
SW Version	UUZ34.32
GSM /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, WCDMA, LTE and 5GNR (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
3. WLAN 5GHz has no hotspot function.
4. This device does not support DTM operation and supports GPRS mode up to multi-slot class 12.
5. This device supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active).
6. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the Qualcomm smart transmit will manage to ensure the power level not exceeding the associated power table. Details about the power management decision and sensor detection are provided in the operational description. And the device will invoke

corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.

7. For WLAN/BT when transmit simultaneous with WWAN/BT, power reduction will be activated to head exposure condition. For WLAN when transmit simultaneous with WWAN and Proximity sensors trigger, power reduction will be activated to body-worn and extremity exposure conditions.
8. For 5G NR bands test, using FTM (Factory Test Mode) with default 100% duty cycle transmission to perform SAR testing.
9. There are two samples, the differences could be referred to the F-53E _Operational Description of Product Equality Declaration which is exhibit separately. According to the differences, sample 1 was chosen to perform full SAR testing and sample 2 verified the worst case of sample 1.
10. This device has NFC function and the NFC SAR report will be separately submitted.
11. This device supports 5GNR FR1 bands as following table, only including SA mode. SA mode performed SAR separately.
12. 5G NR bands support SA and NSA mode for n78, but not EN-DC combinations applicable for FCC.

<5G NR>

Mode	Band	Duplex	SCS(KHz)	Bandwidths(BW)
SA	n78	TDD	30	20, 40, 80, 100

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	2BEPUFMP201
Equipment Name	Mobile cellular phone
Operating Frequency Range of each LTE transmission band	LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3450 MHz ~ 3550 MHz
Channel Bandwidth	LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 42: 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM / 64QAM / 256QAM(Downlink only)
LTE Voice / Data requirements	Voice and Data
LTE Release Version	R16
CA Support	Supported, Downlink only
LTE MPR permanently built-in by design	**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3** Modulation | Channel bandwidth / Transmission bandwidth (N_{RB}) 1.4 MHz | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | MPR (dB) 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 Proximity sensors/receiver/hotspot detect mechanism, head/body -worn /hotspot/extremity will trigger reduced power for some bands applied to satisfy SAR compliance, the detail please referred to section 14.
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power verification please referred to section 14.
LTE Carrier Aggregation Additional Information	1. This device supports maximum of 3 carriers in the downlink.

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

LTE Band 5

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

LTE Band 12

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 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 42								
	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	42115	3452.5	42140	3455	42165	3457.5	42190	3460
M	42590	3500	42590	3500	42590	3500	42590	3500
H	43065	3547.5	43040	3545	43015	3542.5	42990	3540

4.3 General 5G NR SAR Test and Reporting Considerations

5G NR Information	
Operating Frequency Range of each 5G NR transmission band	5G NR n78: 3450 MHz ~ 3550 MHz
Channel Bandwidth	The detail please refers to section 4.1 5GNR FR1 bands table.
SCS	TDD: SCS30KHz
uplink modulations used	DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM
A-MPR (Additional MPR) disabled for SAR Testing?	Yes

Transmission (H, M, L) channel numbers and frequencies in each 5G NR band								
NR Band 78								
	Bandwidth 20MHz		Bandwidth 40MHz		Bandwidth 80MHz		Bandwidth 100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	630668	3460.02	631334	3470.01	632668	3490.02		
M	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98
H	636000	3540	635334	3530.01	634000	3510		

5. Smart Transmit feature for RF Exposure compliance

Qualcomm® Smart Transmit™ 3.0 of Smart Transmit (GEN2) Feature operates based on pre-defined sub6 antenna groups (AG). This Device is enabled with the Qualcomm® Smart Transmit Gen2 feature. The RF exposure limit is defined based on time-averaged RF exposure. The product implements Qualcomm Smart Transmit feature which controls the instantaneous transmitting power for WWAN transmitter to ensure the product in compliance with RF exposure limit over a defined time window, for SAR (transmit frequency ≤ 6GHz). To control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is compliant to the regulation requirement.

Note that WLAN/BT operations are not enabled with Smart Transmit.

This report describes the procedures for the SAR char generation, and the parameters obtained from SAR characterization (referred to as SAR char, respectively) will be used as input for Smart Transmit. SAR char will be entered via the Embedded File System (EFS) version 20 to enable the Smart Transmit Gen2 Feature.

<Terminologies in this report>

P_{limit}	The time-averaged RF power which corresponds to SAR_design_target.
P_{max}	Maximum target power level
SAR_design_target:	The design target for SAR compliance. It should be less than regulatory SAR limit to account for all device design related uncertainty.
SAR char	P_{limit} for all the technologies/bands for all applicable DSI

<SAR Characterization>

SAR char must be generated to cover all radio configurations and usage scenarios that the wireless device supports for operating at 6 GHz or below. It will then be used as input for Smart Transmit to control and manage RF exposure for f < 6 GHz.

Antenna Group:

Antenna Group 0 (AG0)	ANT4 & ANT5
Antenna Group 1 (AG1)	ANT0 & ANT1

<SAR design target and uncertainty>

Item	Uncertainty dB (k=2)
Total uncertainty	1.5

To account for total uncertainty, SAR_design_target should be determined as:

$$SAR\_design\_target < SAR_{regulatory\_limit} \times 10^{\frac{-total\ uncertainty}{10}}$$

The Smart Transmit algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of SAR_design_target, below the predefined time-averaged power limit, for each characterized technology and band.

Smart Transmit allows the device to transmit at higher power instantaneously, as high as Pmax, when needed, but enforces power limiting to maintain time-averaged transmit power to Plimit. Below table shows Plimit EFS settings and maximum tune up output power Pmax configured for this EUT for various transmit conditions (Device State Index DSI).

<P_{limit} for supported technologies and bands (P_{limit} in EFS file)>

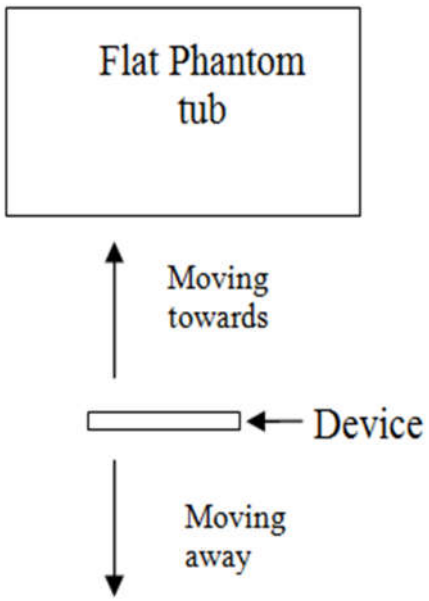
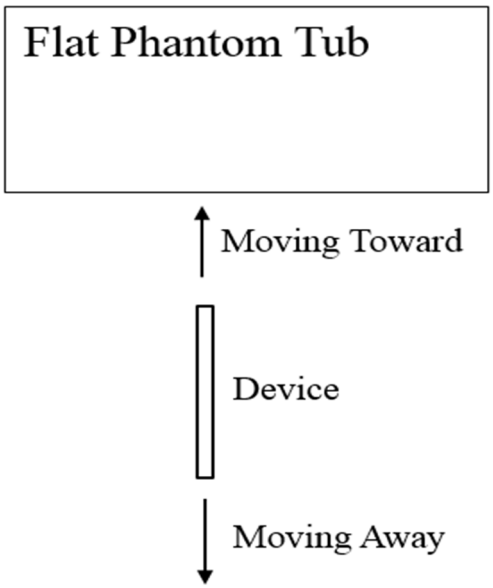
Band	Antenna	Head DSI 2	Body-worn DSI 3	Hotspot DSI 7	Extremity DSI 6	Sensor off DSI 4	Pmax*
GSM850	Ant 0	28.3	24.1	24.1	23.7	23.7	23.7
GSM850	Ant 4	17.8	24.8	23.7	23.7	25.0	25.0
GSM1900	Ant 1	29	19.8	20.3	22.9	19.5	19.5
WCDMA V	Ant 0	29.3	24.8	24.8	23.0	23.0	23.0
WCDMA V	Ant 4	19.5	23.3	21.7	22.0	22.0	22.0
LTE Band 5	Ant 0	30	24.8	24.8	23.0	23.0	23.0
LTE Band 5	Ant 4	18.6	24.4	22.9	22.0	22.0	22.0
LTE Band 12	Ant 0	29.8	23.0	23.0	23.0	23.0	23.0
LTE Band 12	Ant 4	19.2	23.4	22.5	22.0	22.0	22.0
LTE Band 41	Ant 1	27.8	20.9	20.6	22.9	21.0	21.0
LTE Band 42	Ant 5	17.3	19.2	17.7	21.3	21.0	21.0
FR1 n78	Ant 5	17.4	20.2	18.0	22.6	23.0	23.0

Note:
1) *Pmax is used for RF tune up procedure. The maximum allowed output power is equal to Pmax + 1.0 dB device uncertainty.
2) All Plimit power levels entered in the Table correspond to average power levels after accounting for duty cycle in the case TDD modulation schemes (for e.g., GSM & LTE TDD & NR TDD).
3) The max allowed output power is the Plimit + 1.0 dB device uncertainty, and if Plimit is higher than Pmax, the device output power will be Pmax instead.

6. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance>:

1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (5825MHz) and lowest (850MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the top and bottom ends of the phone are utilized to determine when the device comes in proximity of the user's body at the front or back of the device.
3. The output power will reduce to body worn power level when top and bottom sensor pad be detected.
4. The sensors used to detect the proximity of the user's body at the front or back surface of the device use a detection threshold distance. The data shown in the sections below shows the distance(s). When front or back body worn condition is detected reduced power will be active.
5. The device employs proximity sensors also can detect the presence of the user's a finger or hand when handheld state at the front/back/top /left/right sides of the device. When front/back/top /left/right sides of handheld condition is detected reduced power will be active.
6. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1mm was performed:

	
Sensor/Handheld detection test set-up, Front and Back sides	Handheld detection test set-up, Left Side, Right Side and Top Side

<P-Sensor>

Proximity Sensor Triggering Distance (mm)				
Position	Front		Back	
	Moving towards	Moving away	Moving towards	Moving away
Minimum	21	25	23	27

<Handheld for ANT 3>

Proximity Sensor Triggering Distance (mm)						
Position	Front		Back		Left Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	7	13	5	10	10	15

<Handheld for ANT 6>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Left Side		Top Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	21	26	18	22	16	21	18	23

<Handheld for ANT4&5>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Right Side		Top Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	14	18	16	20	8	13	15	20

7. RF Exposure Limits

7.1 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.

7.2 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.

8. Specific Absorption Rate (SAR)

8.1 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.

8.2 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:

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

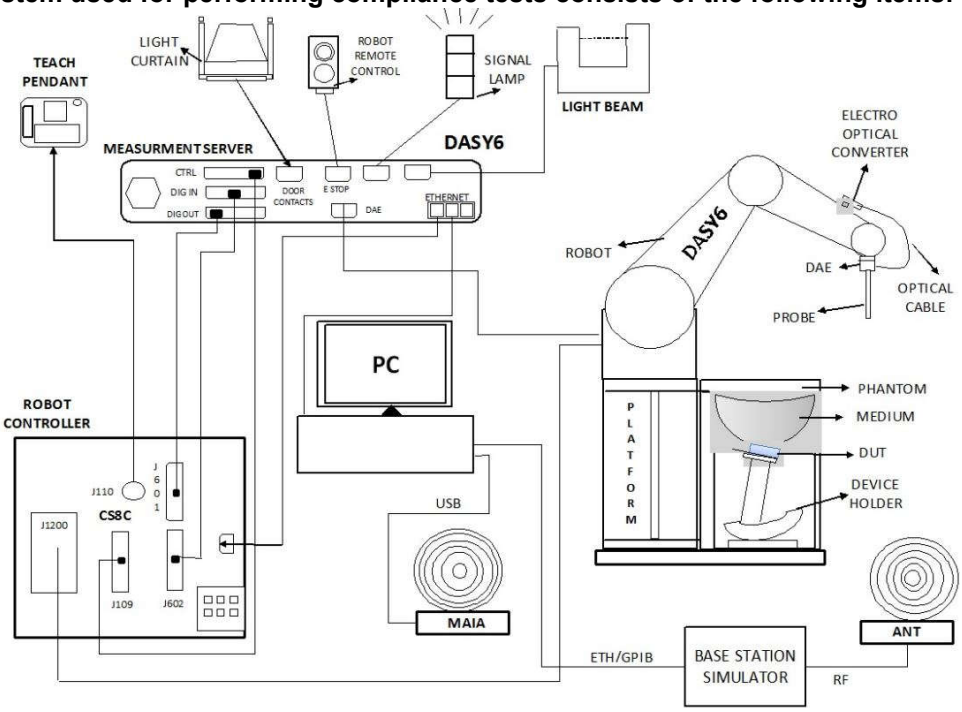
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

9. 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 Win7 or Win10 and the DASY5 or DASY6 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.

9.1 E-Field Probe

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

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	4 MHz – 10 GHz Linearity: ±0.2 dB (30 MHz – 10 GHz)
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

9.2 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

9.3 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

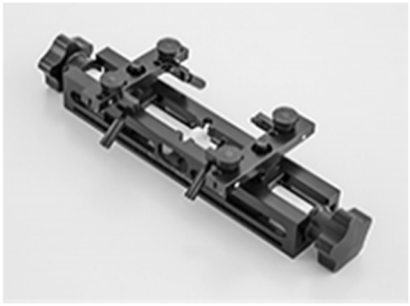
The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

9.4 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

10. 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

10.1 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

10.2 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.

10.3 Area Scan

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

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

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

10.4 Zoom Scan

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

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

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

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

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

10.5 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.

10.6 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.

11. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1087	2022/2/24	2025/2/22
SPEAG	835MHz System Validation Kit	D835V2	4d298	2024/1/26	2025/1/25
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	2022/3/30	2025/3/28
SPEAG	2450MHz System Validation Kit	D2450V2	1095	2024/2/8	2025/2/7
SPEAG	2600MHz System Validation Kit	D2600V2	1112	2023/12/18	2024/12/17
SPEAG	3500MHz System Validation Kit	D3500V2	1037	2023/11/20	2024/11/19
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	2022/9/23	2025/9/21
SPEAG	Data Acquisition Electronics	DAE4	1649	2024/7/3	2025/7/2
SPEAG	Dosimetric E-Field Probe	EX3DV4	7706	2024/1/24	2025/1/23
SPEAG	SAM Twin Phantom	SAM Twin	TP-2024	NCR	NCR
Testo	Thermo-Hygrometer	HTC-1	55011	2024/1/4	2025/1/3
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio Communication Analyzer	MT8821C	6262306175	2024/7/4	2025/7/3
Agilent	ENA Series Network Analyzer	E5071C	MY46112129	2024/7/4	2025/7/3
SPEAG	Dielectric Probe Kit	DAK-3.5	1071	2024/2/19	2025/2/18
Anritsu	Vector Signal Generator	MG3710A	6201682672	2024/1/2	2025/1/1
Rohde & Schwarz	Power Meter	NRVD	102081	2024/7/4	2025/7/3
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	2024/7/4	2025/7/3
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	2024/7/4	2025/7/3
R&S	BLUETOOTH TESTER	CBT	101246	2024/7/4	2025/7/3
Rohde & Schwarz	Spectrum Analyzer	FSV7	101631	2023/10/11	2024/10/10
TES	DIGITAC THERMOMETER	TYPE-K	220305411	2024/1/4	2025/1/3
ARRA	Power Divider	A3200-2	N/A	Note 1	
MCL	Attenuation1	BW-S10W5+	N/A	Note 1	
MCL	Attenuation2	BW-S10W5+	N/A	Note 1	
MCL	Attenuation3	BW-S10W5+	N/A	Note 1	
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note 1	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note 1	
Agilent	Dual Directional Coupler	778D	20500	Note 1	
Agilent	Dual Directional Coupler	11691D	MY48151020	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
2. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

12. System Verification

12.1 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. 11.1. 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. 11.2.

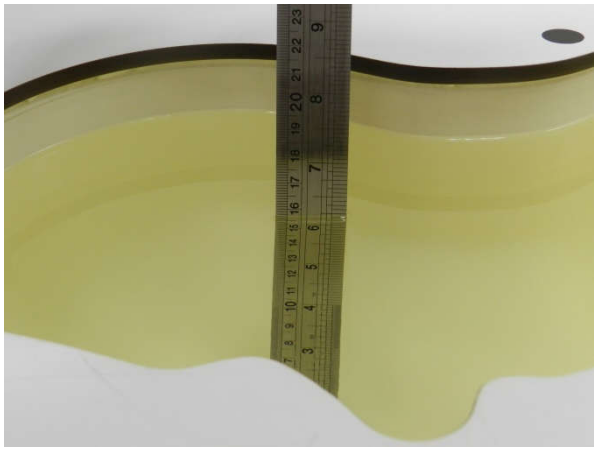


Fig 11.1 Photo of Liquid Height for Head SAR

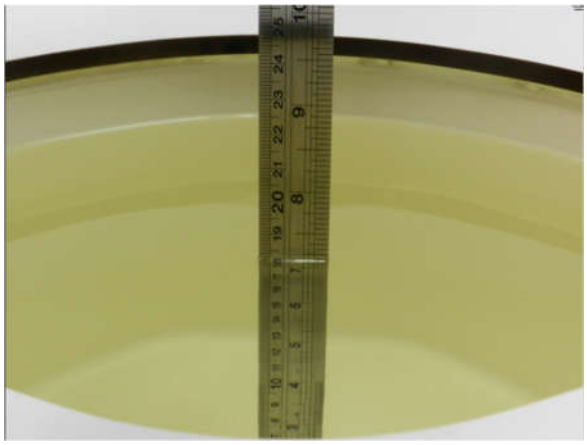


Fig 11.2 Photo of Liquid Height for Body SAR

12.2 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, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

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	22.9	0.925	42.4	0.89	41.90	3.93	1.19	±5	2024/9/19
835	Head	22.6	0.924	41.4	0.90	41.50	2.67	-0.24	±5	2024/9/21
1900	Head	22.8	1.43	39.8	1.40	40.00	2.14	-0.50	±5	2024/9/23
2450	Head	22.7	1.85	39.1	1.80	39.20	2.78	-0.26	±5	2024/9/25
2600	Head	22.9	1.98	39.0	1.96	39.00	1.02	0.00	±5	2024/9/27
3500	Head	22.7	2.80	39.0	2.91	37.90	-3.78	2.90	±5	2024/9/29
5250	Head	22.8	4.56	35.0	4.71	35.90	-3.18	-2.51	±5	2024/9/30
5600	Head	22.8	4.95	34.4	5.07	35.50	-2.37	-3.10	±5	2024/9/30
5750	Head	22.8	5.12	34.1	5.22	35.40	-1.92	-3.67	±5	2024/9/30

12.3 System Performance Check Results

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

<1g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2024/9/19	750	Head	50	1087	7706	1649	0.447	8.58	8.94	4.20
2024/9/21	835	Head	50	4d298	7706	1649	0.456	9.89	9.12	-7.79
2024/9/23	1900	Head	50	5d118	7706	1649	1.95	39.30	39	-0.76
2024/9/25	2450	Head	50	1095	7706	1649	2.72	52.60	54.4	3.42
2024/9/27	2600	Head	50	1112	7706	1649	2.91	55.10	58.2	5.63
2024/9/29	3500	Head	50	1037	7706	1649	3.19	65.40	63.8	-2.45
2024/9/30	5250	Head	50	1113	7706	1649	3.81	81.50	76.2	-6.50
2024/9/30	5600	Head	50	1113	7706	1649	4.08	82.60	81.6	-1.21
2024/9/30	5750	Head	50	1113	7706	1649	3.76	80.80	75.2	-6.93

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2024/9/19	750	Head	50	1087	7706	1649	0.302	5.65	6.04	6.90
2024/9/21	835	Head	50	4d298	7706	1649	0.304	6.45	6.08	-5.74
2024/9/23	1900	Head	50	5d118	7706	1649	1.05	20.40	21	2.94
2024/9/25	2450	Head	50	1095	7706	1649	1.31	24.70	26.2	6.07
2024/9/27	2600	Head	50	1112	7706	1649	1.31	24.80	26.2	5.65
2024/9/29	3500	Head	50	1037	7706	1649	1.22	24.70	24.4	-1.21
2024/9/30	5250	Head	50	1113	7706	1649	1.12	23.30	22.4	-3.86
2024/9/30	5600	Head	50	1113	7706	1649	1.18	23.70	23.6	-0.42
2024/9/30	5750	Head	50	1113	7706	1649	1.10	23.00	22	-4.35

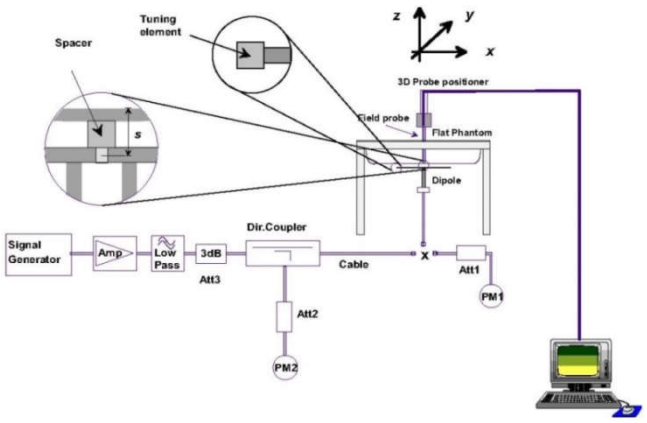


Fig 11.3.1 System Performance Check Setup

Fig 11.3.2 Setup Photo

13. RF Exposure Positions

13.1 Ear and handset reference point

Figure 12.1.1 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 12.1.2 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 12.1.3). 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 12.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

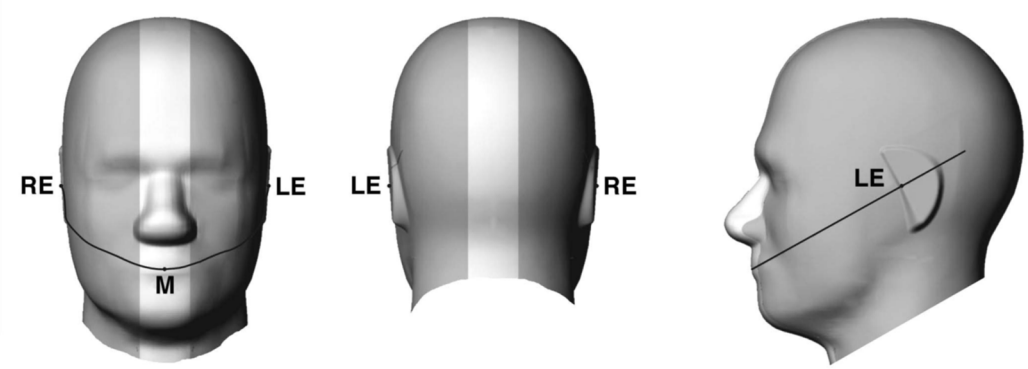


Fig 12.1.1 Front, back, and side views of SAM twin phantom

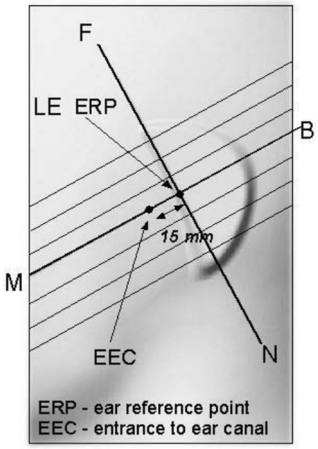


Fig 12.1.2 Close-up side view of phantom showing the ear region.

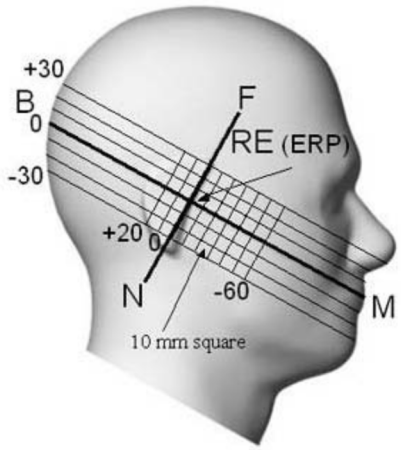


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

13.2 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 12.2.1 and Figure 12.2.2), 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 12.2.1). 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 12.2.2), 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 12.2.3), 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 12.2.3. The actual rotation angles should be documented in the test report.

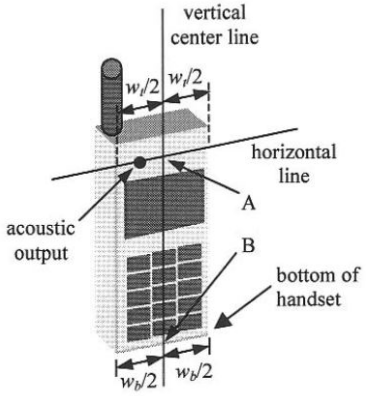


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case

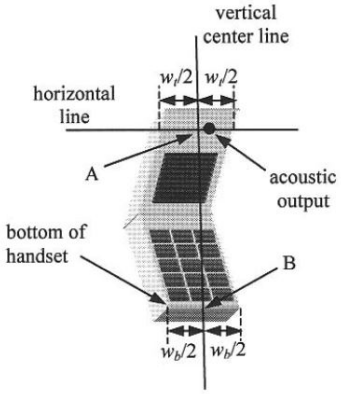


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

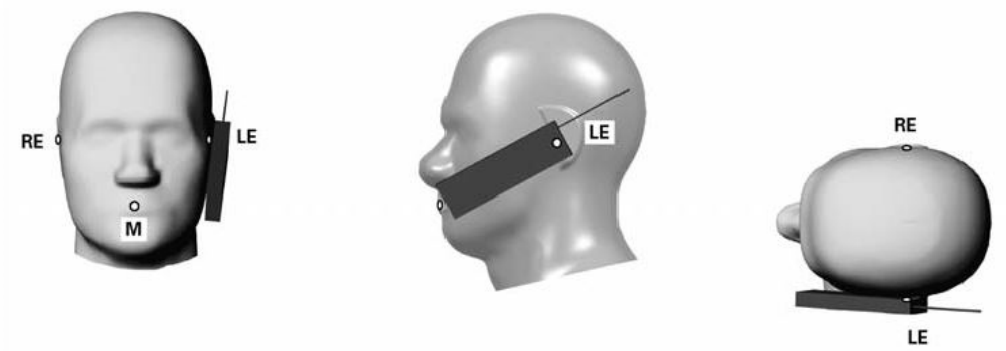


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

13.3 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 12.3.1. 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

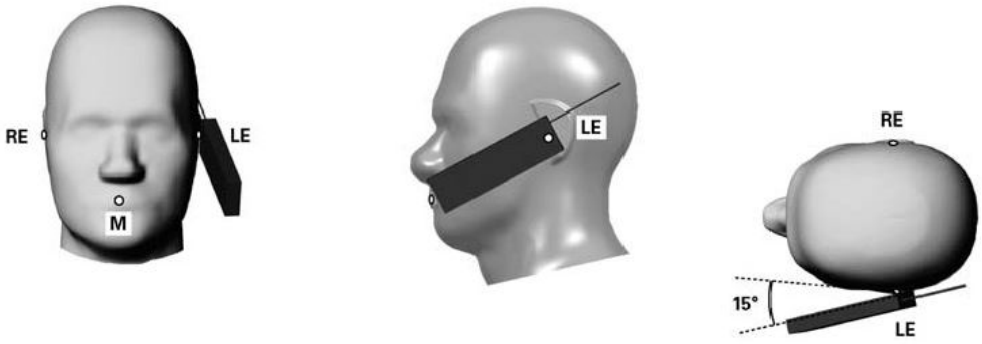


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

13.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 11.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is > 1.2 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.

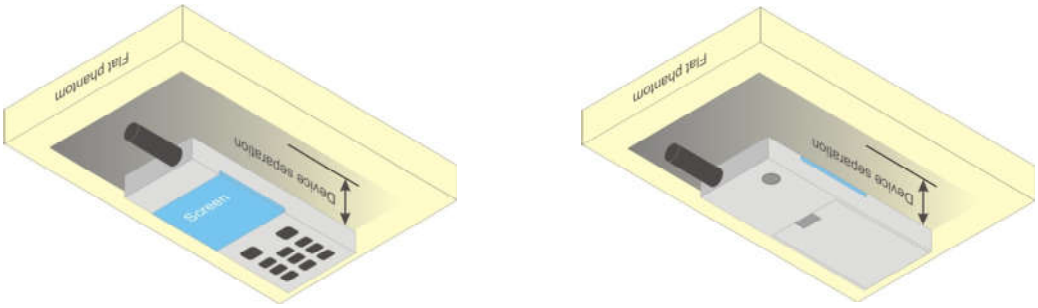


Fig 12.4 Body Worn Position

13.5 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.

13.6 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 D01v06 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

14. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<GSM Conducted Power>

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS 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 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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

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

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

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

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

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

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Proces ses	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

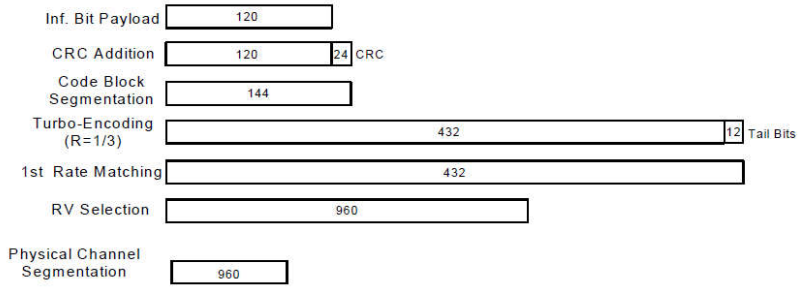


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

HSPA+ 3GPP release 7 (uplink category 7) 16QAM, Setup Configuration:

1. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
2. The RF path losses were compensated into the measurements.
3. 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
4. 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	$\beta_{ed}1$: 30/15 $\beta_{ed}2$: 30/15	$\beta_{ed}3$: 24/15 $\beta_{ed}4$: 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/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.
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 B5 / B12 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.

<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.

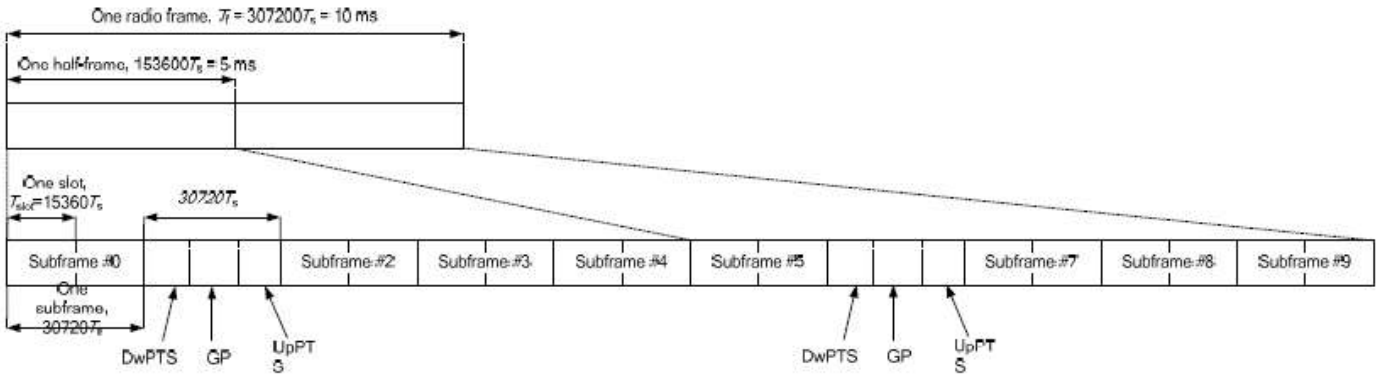


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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

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

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

The highest duty factor is resulted from:

For LTE TDD Power class 3

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

<LTE Carrier Aggregation>

The detailed LTE Carrier Aggregation conducted power table can refer to Appendix F.

General Note:

1. This device supports Carrier Aggregation on downlink for inter and intra band. For the device supports bands and bandwidths and configurations are provided as follow table was according to 3GPP.
2. In applying the existing power measurement procedures of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of frequency bands and CCs in each row need combination, and for this device that all the configurations were choose to power measurement.
3. The gray color table is covered by other combinations and no need to verify power.

2CC Downlink Carrier Aggregation			3CC Downlink Carrier Aggregation		
Number	Combination	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset
1	CA_41A-42A		1	CA_41A-42C	
2	CA_41C	3CC-2	2	CA_41C-42A	

LTE Carrier Aggregation Conducted Power (Downlink)

i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.

ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.

iii. The device supports downlink three carrier aggregation. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.

iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.

v. For inter-band CA, the SCC selected highest bandwidth and near the middle of its transmission band. For SCC DL RB size and offset will base on the PCC corresponding RB allocation.

vi. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.

vii. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

$$\text{Nominal channel spacing} = \left\lfloor \frac{BW_{Channel(1)} + BW_{Channel(2)} - 0.1\left|BW_{Channel(1)} - BW_{Channel(2)}\right|}{0.6} \right\rfloor 0.3 \ \ [\text{MHz}]$$

LTE 4x4 MIMO (Downlink)

This device supports downlink 4x4 MIMO operations for LTE Band 41/42 only. Uplink transmission is limited to a single output stream. Power measurements were performed with downlink 4x4 MIMO active for the configuration with highest measured maximum conducted power with 4x4 downlink MIMO inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.

Per FCC Guidance, SAR for downlink 4x4 MIMO was not needed since the maximum average output power in 4x4 downlink MIMO mode was not > 0.25 dB higher than the maximum output power with downlink 4x4 MIMO inactive. When carrier aggregation is applicable, power measurements were performed with the downlink carrier aggregation and 4x4 DL MIMO active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.

4X4 MIMO	Band
	LTE Band 41/42

5G NR Output Power (Unit: dBm)

General Note:

1. 5G NR n78 is SA mode.
2. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
   a. For DFT-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class2 and 3, the CP-OFDM mode will not higher than DFT-OFDM mode, therefore, similar FCC KDB 941225 D05 procedure for other modulation output power for each RB allocation configuration is > not ½ dB higher than the same configuration in DFT-s QPSK and the reported SAR for the DFT-s QPSK configuration is ≤ 1.45 W/kg; CP-OFDM testing is not required.
   b. For DFT-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class2 and 3, for 16QAM/64QAM/256QAM and smaller bandwidth output power will spot check largest channel bandwidth worst RB configuration to ensure the 16QAM/64QAM/256QAM and smaller bandwidth output power will not ½ dB higher than the same configuration in the largest supported bandwidth.
   c. SAR testing 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
   d. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
   e. 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
   f. PI/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not ½ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, PI/2 BPSK /16QAM/64QAM/256QAM SAR testing are not required.
   g. Smaller bandwidth output power for each RB allocation configuration for this device will 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, smaller bandwidth SAR testing is not required for this device
3. For 5G NR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.
4. 5G NR supports CP-OFDM and DFT-s-OFDM modulation, for DFT-s-OFDM power is higher than CP-OFDM, so only show DFT-s-OFDM power table and chose DFT-s-OFDM to perform SAR testing.
5. For DFT-s-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for the CP-OFDM mode will not higher than DFT-s-OFDM mode, therefore, CP-OFDM measurement is unnecessary.

<3GPP 38.101 MPR for EN-DC>

Table 6.2.2-1 Maximum power reduction (MPR) for power class 3

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

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

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

Table 6.2.2-2 Maximum power reduction (MPR) for power class 2

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

<WLAN Conducted Power>

General Note:

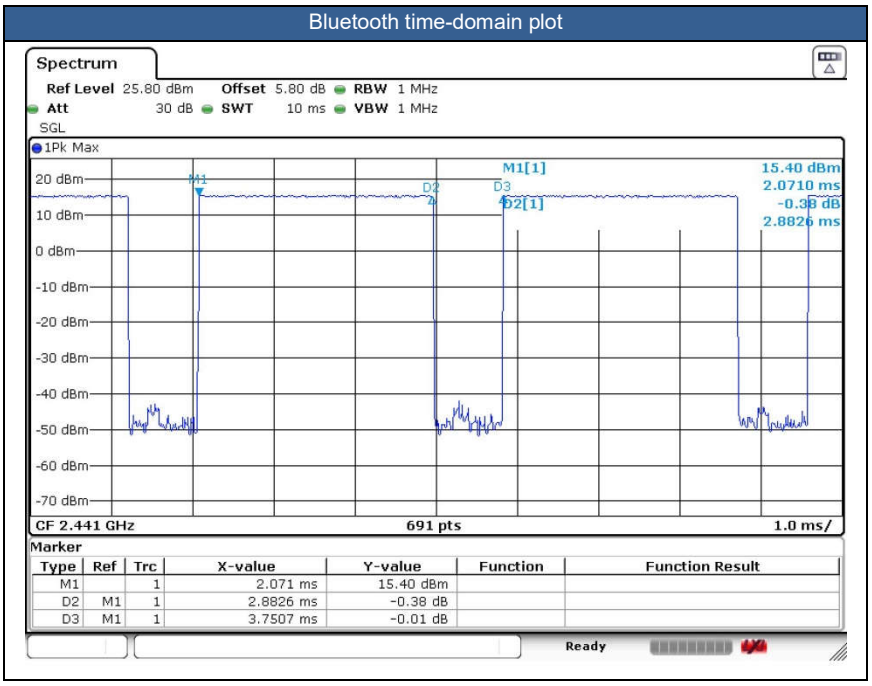
1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default 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 are 76.85% as following figure, for Bluetooth SAR scaling need further consideration and the theoretical duty cycle is 83.3%, therefore the actual duty cycle will be scaled up to 83.3% for Bluetooth reported SAR calculation

Bluetooth time-domain plot



15. Antenna Location

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

16. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For SAR testing of Bluetooth signal with 83.3% theoretical duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle) *83.3%".
   d. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   e. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   f. For TDD LTE SAR measurement of power class 3, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The reported TDD LTE SAR (W/kg) = Measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the Qualcomm smart transmit will manage to ensure the power level not exceeding the associated power table. Details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
5. For WLAN/BT when transmit simultaneous with WWAN/BT, power reduction will be activated to head exposure condition. For WLAN when transmit simultaneous with WWAN and Proximity sensors trigger, power reduction will be activated to body-worn and extremity exposure conditions.
6. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold. For this device with a display diagonal size <15.0 cm or a total diagonal size <16.0 cm, 10-g extremity SAR is also evaluated and is more conservative.
   a. For this device SAR for WWAN/WLAN transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of GSM850/GSM1900, LTE Band 12/41/42, 5GNR n78, WLAN2.4GHz, therefore product specific 10g SAR is necessary.
   b. WLAN 5GHz tested the product specific 10g SAR since it has no hotspot mode.
   c. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.
7. Although the headset SAR is greater than 0.8 W/kg, the headset SAR verified the worst of the non-headset SAR and less than non-headset SAR, so there is no need to be tested other channels.
8. According to Nov. 2017 TCB workshop, when the reported 1gSAR for UL CA configuration is <1.2 W/kg, UL CA 1gSAR is not required for all required test channels (PCC based).
9. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hotspot SAR.
10. For Phablet devices, when hotspot mode is not supported, Product specific 10-g SAR is required for all surfaces and edges with an antenna located at ≤ 25mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS 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 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 B5 / B12 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.

5G NR Note:

1. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
   a. SAR testing 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.
   b. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
   c. 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.
   d. PI/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not ½ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, PI/2 BPSK /16QAM/64QAM/256QAM SAR testing are not required.
   e. Smaller bandwidth output power for each RB allocation configuration for this device will 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, smaller bandwidth SAR testing is not required for this device

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.

This WWAN bands enabled with Qualcomm Smart Transmit feature which located at chapter 5. The default power is Pmax power, When Plimit power higher than Pmax power, the output power will be limited at Pmax, and so the SAR will use Pmax power to do the testing.

Exposure Condition	DSI	Trigger Conditions
Head SAR	DSI 2	Receiver on
Body worn SAR	DSI 3	Sensor On
Hotspot SAR	DSI 7	Hotspot On
Extremity (Handheld) SAR	DSI 6	Sensor On
Sensor Off SAR	DSI 4	Sensor Off

16.1 Head SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
750MHz																					
	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	DSI 2	23095	707.5	1	22.86	24.00	1.300	-	-	0.08	0.138	0.179
	LTE Band 12	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 0	DSI 2	23095	707.5	1	21.92	23.00	1.282	-	-	0.01	0.079	0.101
	LTE Band 12	10M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	DSI 2	23095	707.5	1	22.86	24.00	1.300	-	-	0.03	0.109	0.142
	LTE Band 12	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 0	DSI 2	23095	707.5	1	21.92	23.00	1.282	-	-	-0.08	0.064	0.082
	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	DSI 2	23095	707.5	1	22.86	24.00	1.300	-	-	0.02	0.206	0.268
	LTE Band 12	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 0	DSI 2	23095	707.5	1	21.92	23.00	1.282	-	-	-0.08	0.124	0.159
	LTE Band 12	10M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	DSI 2	23095	707.5	1	22.86	24.00	1.300	-	-	0.1	0.112	0.146
	LTE Band 12	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 0	DSI 2	23095	707.5	1	21.92	23.00	1.282	-	-	-0.18	0.066	0.085
	LTE Band 12	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	DSI 2	23095	707.5	1	19.42	20.20	1.197	-	-	0.1	0.401	0.480
	LTE Band 12	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 4	DSI 2	23095	707.5	1	19.39	20.20	1.205	-	-	0.12	0.272	0.328
	LTE Band 12	10M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	DSI 2	23095	707.5	1	19.42	20.20	1.197	-	-	-0.17	0.337	0.403
	LTE Band 12	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 4	DSI 2	23095	707.5	1	19.39	20.20	1.205	-	-	-0.03	0.228	0.275
01	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 4	DSI 2	23095	707.5	1	19.42	20.20	1.197	-	-	-0.01	0.734	**0.878**
	LTE Band 12	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 4	DSI 2	23095	707.5	2	19.42	20.20	1.197	-	-	0.03	0.608	0.728
	LTE Band 12	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 4	DSI 2	23095	707.5	1	19.39	20.20	1.205	-	-	0.11	0.684	0.824
	LTE Band 12	10M	QPSK	50	0	-	Left Cheek	0mm	Ant 4	DSI 2	23095	707.5	1	19.35	20.20	1.216	-	-	-0.05	0.666	0.810
	LTE Band 12	10M	QPSK	1	0	-	Left Tilted	0mm	Ant 4	DSI 2	23095	707.5	1	19.42	20.20	1.197	-	-	0.18	0.541	0.647
	LTE Band 12	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 4	DSI 2	23095	707.5	1	19.39	20.20	1.205	-	-	0.14	0.365	0.440
835MHz																					
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Right Cheek	0mm	Ant 0	DSI 2	189	836.4	1	27.80	29.00	1.318	-	-	0.17	0.215	0.283
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Right Tilted	0mm	Ant 0	DSI 2	189	836.4	1	27.80	29.00	1.318	-	-	-0.05	0.141	0.186
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Left Cheek	0mm	Ant 0	DSI 2	189	836.4	1	27.80	29.00	1.318	-	-	0.01	0.339	0.447
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Left Tilted	0mm	Ant 0	DSI 2	189	836.4	1	27.80	29.00	1.318	-	-	0.01	0.192	0.253
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Right Cheek	0mm	Ant 4	DSI 2	189	836.4	1	21.06	21.80	1.186	-	-	0.1	0.443	0.525
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Right Tilted	0mm	Ant 4	DSI 2	189	836.4	1	21.06	21.80	1.186	-	-	-0.01	0.344	0.408
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Left Cheek	0mm	Ant 4	DSI 2	189	836.4	1	21.06	21.80	1.186	-	-	0.06	0.715	0.848
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Left Cheek	0mm	Ant 4	DSI 2	128	824.2	1	20.94	21.80	1.219	-	-	-0.09	0.705	0.859
02	GSM850	-	-	-	-	GPRS (4 Tx slots)	Left Cheek	0mm	Ant 4	DSI 2	251	848.8	1	20.93	21.80	1.222	-	-	0.01	0.735	**0.898**
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Left Cheek	0mm	Ant 4	DSI 2	251	848.8	2	20.93	21.80	1.222	-	-	0.03	0.650	0.794
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Left Tilted	0mm	Ant 4	DSI 2	189	836.4	1	21.06	21.80	1.186	-	-	-0.08	0.459	0.544
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	DSI 2	4182	836.4	1	23.41	24.00	1.146	-	-	0.03	0.156	0.179
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	DSI 2	4182	836.4	1	23.41	24.00	1.146	-	-	0.18	0.101	0.116
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	DSI 2	4182	836.4	1	23.41	24.00	1.146	-	-	0.03	0.264	0.302
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	DSI 2	4182	836.4	1	23.41	24.00	1.146	-	-	0.16	0.153	0.175
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 4	DSI 2	4182	836.4	1	19.73	20.50	1.194	-	-	-0.1	0.486	0.580
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 4	DSI 2	4182	836.4	1	19.73	20.50	1.194	-	-	-0.1	0.389	0.464
03	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 4	DSI 2	4182	836.4	1	19.73	20.50	1.194	-	-	-0.04	0.736	**0.879**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 4	DSI 2	4132	826.4	1	19.70	20.50	1.202	-	-	0.19	0.724	0.870
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 4	DSI 2	4233	846.6	1	19.66	20.50	1.213	-	-	0.07	0.715	0.868
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 4	DSI 2	4182	836.4	1	19.73	20.50	1.194	-	-	-0.18	0.532	0.635
	LTE Band 5	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 0	DSI 2	20525	836.5	1	23.11	24.00	1.227	-	-	-0.15	0.120	0.147
	LTE Band 5	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 0	DSI 2	20525	836.5	1	22.16	23.00	1.213	-	-	0.11	0.108	0.131
	LTE Band 5	10M	QPSK	1	0	-	Right Tilted	0mm	Ant 0	DSI 2	20525	836.5	1	23.11	24.00	1.227	-	-	-0.08	0.074	0.091
	LTE Band 5	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 0	DSI 2	20525	836.5	1	22.16	23.00	1.213	-	-	-0.17	0.067	0.081
	LTE Band 5	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 0	DSI 2	20525	836.5	1	23.11	24.00	1.227	-	-	0.02	0.206	0.253
	LTE Band 5	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 0	DSI 2	20525	836.5	1	22.16	23.00	1.213	-	-	-0.08	0.199	0.241
	LTE Band 5	10M	QPSK	1	0	-	Left Tilted	0mm	Ant 0	DSI 2	20525	836.5	1	23.11	24.00	1.227	-	-	-0.04	0.127	0.156
	LTE Band 5	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 0	DSI 2	20525	836.5	1	22.16	23.00	1.213	-	-	-0.08	0.124	0.150
	LTE Band 5	10M	QPSK	1	0	-	Right Cheek	0mm	Ant 4	DSI 2	20525	836.5	1	18.62	19.60	1.253	-	-	0.17	0.453	0.568
	LTE Band 5	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 4	DSI 2	20525	836.5	1	18.56	19.60	1.271	-	-	0.18	0.353	0.449

	LTE Band 5	10M	QPSK	1	0	-	Right Tilted	0mm	Ant 4	DSI 2	20525	836.5	1	18.62	19.60	1.253	-	-	-0.08	0.355	0.445
	LTE Band 5	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 4	DSI 2	20525	836.5	1	18.56	19.60	1.271	-	-	-0.13	0.277	0.352
04	LTE Band 5	10M	QPSK	1	0	-	Left Cheek	0mm	Ant 4	DSI 2	20525	836.5	1	18.62	19.60	1.253	-	-	0.01	0.705	**0.883**
	LTE Band 5	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 4	DSI 2	20525	836.5	1	18.56	19.60	1.271	-	-	0.06	0.641	0.814
	LTE Band 5	10M	QPSK	50	0	-	Left Cheek	0mm	Ant 4	DSI 2	20525	836.5	1	18.51	19.60	1.285	-	-	-0.03	0.634	0.815
	LTE Band 5	10M	QPSK	1	0	-	Left Tilted	0mm	Ant 4	DSI 2	20525	836.5	1	18.62	19.60	1.253	-	-	-0.03	0.554	0.694
	LTE Band 5	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 4	DSI 2	20525	836.5	1	18.56	19.60	1.271	-	-	0.08	0.424	0.539
1900MHz																					
05	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Cheek	0mm	Ant 1	DSI 2	661	1880	1	26.09	26.50	1.099	-	-	-0.12	0.131	**0.144**
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Tilted	0mm	Ant 1	DSI 2	661	1880	1	26.09	26.50	1.099	-	-	0.05	0.054	0.059
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Cheek	0mm	Ant 1	DSI 2	661	1880	1	26.09	26.50	1.099	-	-	-0.11	0.087	0.096
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Tilted	0mm	Ant 1	DSI 2	661	1880	1	26.09	26.50	1.099	-	-	-0.12	0.063	0.069
2600MHz																					
06	LTE Band 41	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 1	DSI 2	40620	2593	1	22.95	24.00	1.274	62.9	1.006	-0.02	0.209	**0.268**
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	DSI 2	40620	2593	1	21.97	23.00	1.268	62.9	1.006	0.03	0.134	0.171
	LTE Band 41	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 1	DSI 2	40620	2593	1	22.95	24.00	1.274	62.9	1.006	-0.16	0.048	0.061
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	DSI 2	40620	2593	1	21.97	23.00	1.268	62.9	1.006	-0.02	0.030	0.038
	LTE Band 41	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 1	DSI 2	40620	2593	1	22.95	24.00	1.274	62.9	1.006	0.15	0.109	0.140
	LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 1	DSI 2	40620	2593	1	21.97	23.00	1.268	62.9	1.006	-0.09	0.068	0.087
	LTE Band 41	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 1	DSI 2	40620	2593	1	22.95	24.00	1.274	62.9	1.006	0.11	0.080	0.102
	LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 1	DSI 2	40620	2593	1	21.97	23.00	1.268	62.9	1.006	-0.05	0.054	0.069
3500MHz																					
	LTE Band 42	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 5	DSI 2	42590	3500	1	19.26	20.30	1.271	62.9	1.006	-0.08	0.657	0.840
07	LTE Band 42	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 5	DSI 2	42190	3460	1	19.22	20.30	1.282	62.9	1.006	-0.07	0.688	**0.888**
	LTE Band 42	20M	QPSK	1	0	-	Right Cheek	0mm	Ant 5	DSI 2	42990	3540	1	19.20	20.30	1.288	62.9	1.006	0.16	0.643	0.833
	LTE Band 42	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 5	DSI 2	42590	3500	1	19.22	20.30	1.282	62.9	1.006	0.05	0.656	0.846
	LTE Band 42	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 5	DSI 2	42190	3460	1	19.15	20.30	1.303	62.9	1.006	0.05	0.627	0.822
	LTE Band 42	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 5	DSI 2	42990	3540	1	19.08	20.30	1.324	62.9	1.006	-0.03	0.632	0.842
	LTE Band 42	20M	QPSK	100	0	-	Right Cheek	0mm	Ant 5	DSI 2	42590	3500	1	19.18	20.30	1.294	62.9	1.006	-0.15	0.643	0.837
	LTE Band 42	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 5	DSI 2	42590	3500	1	19.26	20.30	1.271	62.9	1.006	0.02	0.633	0.809
	LTE Band 42	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 5	DSI 2	42190	3460	1	19.22	20.30	1.282	62.9	1.006	0.07	0.657	0.848
	LTE Band 42	20M	QPSK	1	0	-	Right Tilted	0mm	Ant 5	DSI 2	42990	3540	1	19.20	20.30	1.288	62.9	1.006	0.16	0.622	0.806
	LTE Band 42	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 5	DSI 2	42590	3500	1	19.22	20.30	1.282	62.9	1.006	0.13	0.598	0.771
	LTE Band 42	20M	QPSK	100	0	-	Right Tilted	0mm	Ant 5	DSI 2	42590	3500	1	19.18	20.30	1.294	62.9	1.006	0.16	0.456	0.594
	LTE Band 42	20M	QPSK	1	0	-	Left Cheek	0mm	Ant 5	DSI 2	42590	3500	1	19.26	20.30	1.271	62.9	1.006	-0.03	0.570	0.729
	LTE Band 42	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 5	DSI 2	42590	3500	1	19.22	20.30	1.282	62.9	1.006	0.01	0.401	0.517
	LTE Band 42	20M	QPSK	1	0	-	Left Tilted	0mm	Ant 5	DSI 2	42590	3500	1	19.26	20.30	1.271	62.9	1.006	-0.09	0.531	0.679
	LTE Band 42	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 5	DSI 2	42590	3500	1	19.22	20.30	1.282	62.9	1.006	0.18	0.379	0.489
08	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Cheek	0mm	Ant 5	DSI 2	633332	3499.98	1	17.42	18.40	1.253	-	-	0.12	0.710	**0.890**
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Cheek	0mm	Ant 5	DSI 2	633332	3499.98	1	17.40	18.40	1.259	-	-	0.11	0.650	0.818
	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Right Cheek	0mm	Ant 5	DSI 2	633332	3499.98	1	17.35	18.40	1.274	-	-	-0.13	0.615	0.783
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Tilted	0mm	Ant 5	DSI 2	633332	3499.98	1	17.42	18.40	1.253	-	-	-0.01	0.630	0.789
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Tilted	0mm	Ant 5	DSI 2	633332	3499.98	1	17.40	18.40	1.259	-	-	-0.09	0.590	0.743
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Cheek	0mm	Ant 5	DSI 2	633332	3499.98	1	17.42	18.40	1.253	-	-	0.02	0.555	0.695
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Cheek	0mm	Ant 5	DSI 2	633332	3499.98	1	17.40	18.40	1.259	-	-	-0.13	0.555	0.699
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Tilted	0mm	Ant 5	DSI 2	633332	3499.98	1	17.42	18.40	1.253	-	-	0.06	0.520	0.652
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Tilted	0mm	Ant 5	DSI 2	633332	3499.98	1	17.40	18.40	1.259	-	-	-0.15	0.500	0.629

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
2450MHz																	
09	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 6	Standalone	6	2437	1	15.30	16.50	1.318	98.6	1.014	0.01	1.030	**1.377**
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 6	Standalone	6	2437	2	15.30	16.50	1.318	98.6	1.014	-0.08	0.960	1.283
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 6	Standalone	1	2412	1	15.15	16.50	1.365	98.6	1.014	0.08	0.856	1.184
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 6	Standalone	11	2462	1	15.25	16.50	1.334	98.6	1.014	0.01	1.010	1.366
	WLAN2.4GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 6	Standalone	6	2437	1	15.08	16.50	1.387	94.82	1.055	0.02	0.812	1.188
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Ant 6	Standalone	6	2437	1	15.30	16.50	1.318	98.6	1.014	0.03	0.621	0.830
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Ant 6	Standalone	11	2462	1	15.25	16.50	1.334	98.6	1.014	-0.08	0.577	0.780
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 6	Standalone	6	2437	1	15.30	16.50	1.318	98.6	1.014	0.1	0.488	0.652
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 6	Standalone	6	2437	1	15.30	16.50	1.318	98.6	1.014	0.12	0.549	0.734
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 6	Simultaneous	6	2437	1	12.23	13.50	1.340	98.6	1.014	-0.09	0.508	0.690
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Ant 6	Simultaneous	6	2437	1	12.23	13.50	1.340	98.6	1.014	-0.08	0.306	0.416
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 6	Simultaneous	6	2437	1	12.23	13.50	1.340	98.6	1.014	0.13	0.241	0.327
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 6	Simultaneous	6	2437	1	12.23	13.50	1.340	98.6	1.014	0.12	0.271	0.368
10	Bluetooth	1Mbps	Right Cheek	0mm	Ant 6	Standalone	39	2441	1	13.36	14.00	1.159	76.85	1.084	0.08	0.390	**0.490**
	Bluetooth	1Mbps	Right Tilted	0mm	Ant 6	Standalone	39	2441	1	13.36	14.00	1.159	76.85	1.084	0.01	0.245	0.308
	Bluetooth	1Mbps	Left Cheek	0mm	Ant 6	Standalone	39	2441	1	13.36	14.00	1.159	76.85	1.084	0.03	0.187	0.235
	Bluetooth	1Mbps	Left Tilted	0mm	Ant 6	Standalone	39	2441	1	13.36	14.00	1.159	76.85	1.084	-0.08	0.212	0.266
	Bluetooth	1Mbps	Right Cheek	0mm	Ant 6	Simultaneous	39	2441	1	10.42	11.00	1.143	76.85	1.084	-0.11	0.239	0.296
	Bluetooth	1Mbps	Right Tilted	0mm	Ant 6	Simultaneous	39	2441	1	10.42	11.00	1.143	76.85	1.084	-0.05	0.148	0.183
	Bluetooth	1Mbps	Left Cheek	0mm	Ant 6	Simultaneous	39	2441	1	10.42	11.00	1.143	76.85	1.084	0.01	0.113	0.140
	Bluetooth	1Mbps	Left Tilted	0mm	Ant 6	Simultaneous	39	2441	1	10.42	11.00	1.143	76.85	1.084	0.1	0.128	0.159
5000MHz																	
11	WLAN5.3GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 3	Standalone	54	5270	1	15.59	17.00	1.384	96.24	1.039	-0.01	0.727	**1.045**
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 3	Standalone	62	5310	1	15.23	17.00	1.503	96.24	1.039	0.06	0.646	1.009
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 3	Standalone	54	5270	2	15.59	17.00	1.384	96.24	1.039	-0.09	0.701	1.008
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 3	Standalone	54	5270	1	15.59	17.00	1.384	96.24	1.039	-0.03	0.227	0.326
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 3	Standalone	54	5270	1	15.59	17.00	1.384	96.24	1.039	0.14	0.094	0.135
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 3	Standalone	54	5270	1	15.59	17.00	1.384	96.24	1.039	0.11	0.085	0.122
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 3	Simultaneous	58	5290	1	10.66	12.00	1.361	93.19	1.073	0.03	0.247	0.361
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 3	Simultaneous	58	5290	1	10.66	12.00	1.361	93.19	1.073	0.18	0.077	0.112
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 3	Simultaneous	58	5290	1	10.66	12.00	1.361	93.19	1.073	0.16	0.032	0.047
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 3	Simultaneous	58	5290	1	10.66	12.00	1.361	93.19	1.073	-0.1	0.029	0.042
12	WLAN5.5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 3	Standalone	134	5670	1	16.79	17.50	1.178	96.24	1.039	-0.06	0.896	**1.096**
	WLAN5.5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 3	Standalone	134	5670	2	16.79	17.50	1.178	96.24	1.039	0.03	0.843	1.031
	WLAN5.5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 3	Standalone	126	5630	1	16.68	17.50	1.208	96.24	1.039	0.18	0.651	0.817
	WLAN5.5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Ant 3	Standalone	134	5670	1	16.79	17.50	1.178	96.24	1.039	0.14	0.281	0.344
	WLAN5.5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Ant 3	Standalone	134	5670	1	16.79	17.50	1.178	96.24	1.039	-0.17	0.118	0.144
	WLAN5.5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Ant 3	Standalone	134	5670	1	16.79	17.50	1.178	96.24	1.039	0.17	0.110	0.135
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 3	Simultaneous	138	5690	1	11.64	12.50	1.219	93.19	1.073	-0.08	0.288	0.377
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 3	Simultaneous	138	5690	1	11.64	12.50	1.219	93.19	1.073	-0.17	0.090	0.118
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 3	Simultaneous	138	5690	1	11.64	12.50	1.219	93.19	1.073	-0.08	0.038	0.050
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 3	Simultaneous	138	5690	1	11.64	12.50	1.219	93.19	1.073	-0.04	0.035	0.046
13	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 3	Standalone	155	5775	1	16.68	18.00	1.355	93.19	1.073	-0.05	0.736	**1.070**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 3	Standalone	155	5775	2	16.68	18.00	1.355	93.19	1.073	0.1	0.677	0.984
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 3	Standalone	155	5775	1	16.68	18.00	1.355	93.19	1.073	-0.05	0.203	0.295
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 3	Standalone	155	5775	1	16.68	18.00	1.355	93.19	1.073	0.01	0.081	0.118
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 3	Standalone	155	5775	1	16.68	18.00	1.355	93.19	1.073	0.1	0.087	0.127
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 3	Simultaneous	155	5775	1	11.74	13.00	1.337	93.19	1.073	0.07	0.255	0.366
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 3	Simultaneous	155	5775	1	11.74	13.00	1.337	93.19	1.073	0.18	0.070	0.100
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 3	Simultaneous	155	5775	1	11.74	13.00	1.337	93.19	1.073	-0.1	0.028	0.040
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 3	Simultaneous	155	5775	1	11.74	13.00	1.337	93.19	1.073	0.01	0.030	0.043

16.2 Hotspot SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
750MHz																					
14	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 0	DSI 7	23095	707.5	1	22.86	24.00	1.300	-	-	-0.03	0.996	**1.295**
	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 0	DSI 7	23095	707.5	2	22.86	24.00	1.300	-	-	0.05	0.756	0.983
	LTE Band 12	10M	QPSK	25	0	-	Front	5mm	Ant 0	DSI 7	23095	707.5	1	21.92	23.00	1.282	-	-	0.08	0.765	0.981
	LTE Band 12	10M	QPSK	50	0	-	Front	5mm	Ant 0	DSI 7	23095	707.5	1	21.90	23.00	1.288	-	-	0.01	0.742	0.956
	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	DSI 7	23095	707.5	1	22.86	24.00	1.300	-	-	0.03	0.683	0.888
	LTE Band 12	10M	QPSK	25	0	-	Back	5mm	Ant 0	DSI 7	23095	707.5	1	21.92	23.00	1.282	-	-	-0.08	0.496	0.636
	LTE Band 12	10M	QPSK	50	0	-	Back	5mm	Ant 0	DSI 7	23095	707.5	1	21.90	23.00	1.288	-	-	-0.08	0.486	0.626
	LTE Band 12	10M	QPSK	1	0	-	Left Side	5mm	Ant 0	DSI 7	23095	707.5	1	22.86	24.00	1.300	-	-	-0.08	0.553	0.719
	LTE Band 12	10M	QPSK	25	0	-	Left Side	5mm	Ant 0	DSI 7	23095	707.5	1	21.92	23.00	1.282	-	-	-0.04	0.578	0.741
	LTE Band 12	10M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	DSI 7	23095	707.5	1	22.86	24.00	1.300	-	-	0.17	0.523	0.680
	LTE Band 12	10M	QPSK	25	0	-	Bottom Side	5mm	Ant 0	DSI 7	23095	707.5	1	21.92	23.00	1.282	-	-	0.18	0.291	0.373
	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 4	DSI 7	23095	707.5	1	22.10	23.00	1.230	-	-	-0.04	0.328	0.404
	LTE Band 12	10M	QPSK	25	0	-	Front	5mm	Ant 4	DSI 7	23095	707.5	1	20.96	22.00	1.271	-	-	-0.08	0.201	0.255
	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 4	DSI 7	23095	707.5	1	22.10	23.00	1.230	-	-	0.01	0.456	0.561
	LTE Band 12	10M	QPSK	25	0	-	Back	5mm	Ant 4	DSI 7	23095	707.5	1	20.96	22.00	1.271	-	-	-0.13	0.291	0.370
	LTE Band 12	10M	QPSK	1	0	-	Right Side	5mm	Ant 4	DSI 7	23095	707.5	1	22.10	23.00	1.230	-	-	0.06	0.269	0.331
	LTE Band 12	10M	QPSK	25	0	-	Right Side	5mm	Ant 4	DSI 7	23095	707.5	1	20.96	22.00	1.271	-	-	-0.03	0.167	0.212
	LTE Band 12	10M	QPSK	1	0	-	Top Side	5mm	Ant 4	DSI 7	23095	707.5	1	22.10	23.00	1.230	-	-	-0.03	0.251	0.309
	LTE Band 12	10M	QPSK	25	0	-	Top Side	5mm	Ant 4	DSI 7	23095	707.5	1	20.96	22.00	1.271	-	-	0.08	0.180	0.229
835MHz																					
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Front	5mm	Ant 0	DSI 7	189	836.4	1	27.80	29.00	1.318	-	-	0.08	0.820	1.081
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Front	5mm	Ant 0	DSI 7	128	824.2	1	27.74	29.00	1.337	-	-	-0.17	0.769	1.028
15	GSM850	-	-	-	-	GPRS (3 Tx slots)	Front	5mm	Ant 0	DSI 7	251	848.8	1	27.60	29.00	1.380	-	-	0.01	0.861	**1.189**
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Front	5mm	Ant 0	DSI 7	251	848.8	2	27.60	29.00	1.380	-	-	0.06	0.692	0.955
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Back	5mm	Ant 0	DSI 7	189	836.4	1	27.80	29.00	1.318	-	-	-0.03	0.633	0.834
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Back	5mm	Ant 0	DSI 7	128	824.2	1	27.74	29.00	1.337	-	-	0.14	0.610	0.815
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Back	5mm	Ant 0	DSI 7	251	848.8	1	27.60	29.00	1.380	-	-	0.11	0.605	0.835
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Left Side	5mm	Ant 0	DSI 7	189	836.4	1	27.80	29.00	1.318	-	-	-0.16	0.602	0.794
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Bottom Side	5mm	Ant 0	DSI 7	189	836.4	1	27.80	29.00	1.318	-	-	-0.09	0.471	0.621
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Front	5mm	Ant 4	DSI 7	189	836.4	1	26.14	27.70	1.432	-	-	-0.18	0.433	0.620
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	5mm	Ant 4	DSI 7	189	836.4	1	26.14	27.70	1.432	-	-	-0.08	0.382	0.547
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Right Side	5mm	Ant 4	DSI 7	189	836.4	1	26.14	27.70	1.432	-	-	0.05	0.163	0.233
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Top Side	5mm	Ant 4	DSI 7	189	836.4	1	26.14	27.70	1.432	-	-	-0.03	0.322	0.461
16	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	DSI 7	4182	836.4	1	23.41	24.00	1.146	-	-	-0.06	0.740	**0.848**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	DSI 7	4132	826.4	1	23.36	24.00	1.159	-	-	-0.05	0.715	0.829
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	DSI 7	4233	846.6	1	23.35	24.00	1.161	-	-	0.01	0.696	0.808
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	DSI 7	4182	836.4	1	23.41	24.00	1.146	-	-	0.1	0.533	0.611
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	5mm	Ant 0	DSI 7	4182	836.4	1	23.41	24.00	1.146	-	-	-0.09	0.644	0.738
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	DSI 7	4182	836.4	1	23.41	24.00	1.146	-	-	0.18	0.389	0.446
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 4	DSI 7	4182	836.4	1	21.74	23.00	1.337	-	-	-0.17	0.367	0.491
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 4	DSI 7	4182	836.4	1	21.74	23.00	1.337	-	-	0.02	0.385	0.515
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Side	5mm	Ant 4	DSI 7	4182	836.4	1	21.74	23.00	1.337	-	-	-0.09	0.158	0.211
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Top Side	5mm	Ant 4	DSI 7	4182	836.4	1	21.74	23.00	1.337	-	-	0.01	0.496	0.663
17	LTE Band 5	10M	QPSK	1	0	-	Front	5mm	Ant 0	DSI 7	20525	836.5	1	23.11	24.00	1.227	-	-	0.01	0.683	**0.838**
	LTE Band 5	10M	QPSK	25	0	-	Front	5mm	Ant 0	DSI 7	20525	836.5	1	22.16	23.00	1.213	-	-	-0.08	0.542	0.658
	LTE Band 5	10M	QPSK	50	0	-	Front	5mm	Ant 0	DSI 7	20525	836.5	1	22.14	23.00	1.219	-	-	0.13	0.529	0.645
	LTE Band 5	10M	QPSK	1	0	-	Back	5mm	Ant 0	DSI 7	20525	836.5	1	23.11	24.00	1.227	-	-	0.12	0.492	0.604
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 0	DSI 7	20525	836.5	1	22.16	23.00	1.213	-	-	0.03	0.408	0.495
	LTE Band 5	10M	QPSK	1	0	-	Left Side	5mm	Ant 0	DSI 7	20525	836.5	1	23.11	24.00	1.227	-	-	-0.04	0.477	0.585

	LTE Band 5	10M	QPSK	25	0	-	Left Side	5mm	Ant 0	DSI 7	20525	836.5	1	22.16	23.00	1.213	-	-	-0.15	0.401	0.487
	LTE Band 5	10M	QPSK	1	0	-	Bottom Side	5mm	Ant 0	DSI 7	20525	836.5	1	23.11	24.00	1.227	-	-	0.11	0.347	0.426
	LTE Band 5	10M	QPSK	25	0	-	Bottom Side	5mm	Ant 0	DSI 7	20525	836.5	1	22.16	23.00	1.213	-	-	-0.02	0.296	0.359
	LTE Band 5	10M	QPSK	1	0	-	Front	5mm	Ant 4	DSI 7	20525	836.5	1	22.04	23.00	1.247	-	-	0.08	0.384	0.479
	LTE Band 5	10M	QPSK	25	0	-	Front	5mm	Ant 4	DSI 7	20525	836.5	1	21.06	22.00	1.242	-	-	0.01	0.280	0.348
	LTE Band 5	10M	QPSK	1	0	-	Back	5mm	Ant 4	DSI 7	20525	836.5	1	22.04	23.00	1.247	-	-	-0.13	0.404	0.504
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 4	DSI 7	20525	836.5	1	21.06	22.00	1.242	-	-	0.03	0.275	0.341
	LTE Band 5	10M	QPSK	1	0	-	Right Side	5mm	Ant 4	DSI 7	20525	836.5	1	22.04	23.00	1.247	-	-	-0.18	0.150	0.187
	LTE Band 5	10M	QPSK	25	0	-	Right Side	5mm	Ant 4	DSI 7	20525	836.5	1	21.06	22.00	1.242	-	-	-0.11	0.101	0.125
	LTE Band 5	10M	QPSK	1	0	-	Top Side	5mm	Ant 4	DSI 7	20525	836.5	1	22.04	23.00	1.247	-	-	-0.16	0.310	0.387
	LTE Band 5	10M	QPSK	25	0	-	Top Side	5mm	Ant 4	DSI 7	20525	836.5	1	21.06	22.00	1.242	-	-	-0.15	0.291	0.361
1900MHz																					
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 1	DSI 7	661	1880	1	26.09	26.50	1.099	-	-	-0.06	0.872	0.958
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 1	DSI 7	512	1850.2	1	25.95	26.50	1.135	-	-	-0.14	0.896	1.017
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 1	DSI 7	810	1909.8	1	26.07	26.50	1.104	-	-	-0.19	0.858	0.947
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	Ant 1	DSI 7	661	1880	1	26.09	26.50	1.099	-	-	0.01	0.449	0.493
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Left Side	5mm	Ant 1	DSI 7	661	1880	1	26.09	26.50	1.099	-	-	0.01	0.082	0.090
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Right Side	5mm	Ant 1	DSI 7	661	1880	1	26.09	26.50	1.099	-	-	0.06	0.168	0.185
18	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom Side	5mm	Ant 1	DSI 7	661	1880	1	26.09	26.50	1.099	-	-	0.01	0.936	**1.029**
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom Side	5mm	Ant 1	DSI 7	512	1850.2	1	25.95	26.50	1.135	-	-	0.02	0.880	0.999
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom Side	5mm	Ant 1	DSI 7	810	1909.8	1	26.07	26.50	1.104	-	-	0.12	0.912	1.007
2600MHz																					
	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	DSI 7	40620	2593	1	22.95	23.60	1.161	62.9	1.006	-0.12	0.699	0.817
	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	DSI 7	39750	2506	1	22.89	23.60	1.178	62.9	1.006	0.07	0.660	0.782
	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	DSI 7	40185	2549.5	1	22.89	23.60	1.178	62.9	1.006	-0.02	0.632	0.749
	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	DSI 7	41055	2636.5	1	22.94	23.60	1.164	62.9	1.006	-0.05	0.755	0.884
	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	DSI 7	41490	2680	1	22.88	23.60	1.180	62.9	1.006	-0.13	0.800	0.950
	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 1	DSI 7	40620	2593	1	21.97	23.00	1.268	62.9	1.006	0.08	0.454	0.579
	LTE Band 41	20M	QPSK	100	0	-	Front	5mm	Ant 1	DSI 7	40620	2593	1	21.95	23.00	1.274	62.9	1.006	-0.04	0.450	0.577
	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	DSI 7	40620	2593	1	22.95	23.60	1.161	62.9	1.006	-0.01	0.593	0.693
	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	DSI 7	39750	2506	1	22.89	23.60	1.178	62.9	1.006	0.03	0.555	0.657
	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	DSI 7	40185	2549.5	1	22.89	23.60	1.178	62.9	1.006	-0.11	0.529	0.627
	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	DSI 7	41055	2636.5	1	22.94	23.60	1.164	62.9	1.006	-0.06	0.553	0.648
	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	DSI 7	41490	2680	1	22.88	23.60	1.180	62.9	1.006	-0.15	0.565	0.671
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	DSI 7	40620	2593	1	21.97	23.00	1.268	62.9	1.006	0.03	0.386	0.492
	LTE Band 41	20M	QPSK	100	0	-	Back	5mm	Ant 1	DSI 7	40620	2593	1	21.95	23.00	1.274	62.9	1.006	-0.09	0.369	0.473
	LTE Band 41	20M	QPSK	1	0		Left Side	5mm	Ant 1	DSI 7	40620	2593	1	22.95	23.60	1.161	62.9	1.006	0.14	0.053	0.062
	LTE Band 41	20M	QPSK	50	0		Left Side	5mm	Ant 1	DSI 7	40620	2593	1	21.97	23.00	1.268	62.9	1.006	0.03	0.046	0.059
	LTE Band 41	20M	QPSK	1	0	-	Right Side	5mm	Ant 1	DSI 7	40620	2593	1	22.95	23.60	1.161	62.9	1.006	0.14	0.101	0.118
	LTE Band 41	20M	QPSK	50	0	-	Right Side	5mm	Ant 1	DSI 7	40620	2593	1	21.97	23.00	1.268	62.9	1.006	0.1	0.073	0.093
	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	DSI 7	40620	2593	1	22.95	23.60	1.161	62.9	1.006	-0.09	0.979	1.144
	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	DSI 7	39750	2506	1	22.89	23.60	1.178	62.9	1.006	0.07	0.988	1.170
	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	DSI 7	40185	2549.5	1	22.89	23.60	1.178	62.9	1.006	-0.09	0.939	1.112
	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	DSI 7	41055	2636.5	1	22.94	23.60	1.164	62.9	1.006	-0.16	0.912	1.068
19	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	DSI 7	41490	2680	1	22.88	23.60	1.180	62.9	1.006	-0.02	1.080	**1.282**
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 1	DSI 7	40620	2593	1	21.97	23.00	1.268	62.9	1.006	-0.18	0.627	0.800
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 1	DSI 7	39750	2506	1	21.85	23.00	1.303	62.9	1.006	-0.07	0.607	0.796
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 1	DSI 7	40185	2549.5	1	21.94	23.00	1.276	62.9	1.006	0.11	0.582	0.747
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 1	DSI 7	41055	2636.5	1	21.91	23.00	1.285	62.9	1.006	-0.08	0.551	0.712
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 1	DSI 7	41490	2680	1	21.87	23.00	1.297	62.9	1.006	-0.1	0.571	0.745
	LTE Band 41	20M	QPSK	100	0	-	Bottom Side	5mm	Ant 1	DSI 7	40620	2593	1	21.95	23.00	1.274	62.9	1.006	-0.01	0.571	0.732
3500MHz																					
	LTE Band 42	20M	QPSK	1	0	-	Front	5mm	Ant 5	DSI 7	42590	3500	1	19.90	20.70	1.202	62.9	1.006	-0.15	0.307	0.371
	LTE Band 42	20M	QPSK	50	0	-	Front	5mm	Ant 5	DSI 7	42590	3500	1	19.84	20.70	1.219	62.9	1.006	-0.06	0.274	0.336
	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 5	DSI 7	42590	3500	1	19.90	20.70	1.202	62.9	1.006	0.19	0.504	0.610
	LTE Band 42	20M	QPSK	50	0	-	Back	5mm	Ant 5	DSI 7	42590	3500	1	19.84	20.70	1.219	62.9	1.006	-0.06	0.352	0.432

	LTE Band 42	20M	QPSK	1	0	-	Left Side	5mm	Ant 5	DSI 7	42590	3500	1	19.90	20.70	1.202	62.9	1.006	-0.04	0.121	0.146
	LTE Band 42	20M	QPSK	50	0	-	Left Side	5mm	Ant 5	DSI 7	42590	3500	1	19.84	20.70	1.219	62.9	1.006	0.13	0.072	0.088
	LTE Band 42	20M	QPSK	1	0	-	Right Side	5mm	Ant 5	DSI 7	42590	3500	1	19.90	20.70	1.202	62.9	1.006	0.12	0.119	0.144
	LTE Band 42	20M	QPSK	50	0	-	Right Side	5mm	Ant 5	DSI 7	42590	3500	1	19.84	20.70	1.219	62.9	1.006	0.07	0.083	0.102
20	LTE Band 42	20M	QPSK	1	0	-	Top Side	5mm	Ant 5	DSI 7	42590	3500	1	19.90	20.70	1.202	62.9	1.006	-0.04	0.512	**0.619**
	LTE Band 42	20M	QPSK	50	0	-	Top Side	5mm	Ant 5	DSI 7	42590	3500	1	19.84	20.70	1.219	62.9	1.006	-0.06	0.343	0.421
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 5	DSI 7	633332	3499.98	1	17.95	19.00	1.274	-	-	-0.05	0.314	0.400
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 5	DSI 7	633332	3499.98	1	17.92	19.00	1.282	-	-	-0.1	0.319	0.409
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 5	DSI 7	633332	3499.98	1	17.95	19.00	1.274	-	-	0.03	0.402	0.512
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	DSI 7	633332	3499.98	1	17.92	19.00	1.282	-	-	0.07	0.417	0.535
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Left Side	5mm	Ant 5	DSI 7	633332	3499.98	1	17.95	19.00	1.274	-	-	-0.05	0.105	0.134
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Left Side	5mm	Ant 5	DSI 7	633332	3499.98	1	17.92	19.00	1.282	-	-	-0.08	0.121	0.155
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Right Side	5mm	Ant 5	DSI 7	633332	3499.98	1	17.95	19.00	1.274	-	-	-0.08	0.089	0.113
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Right Side	5mm	Ant 5	DSI 7	633332	3499.98	1	17.92	19.00	1.282	-	-	-0.13	0.098	0.126
21	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	5mm	Ant 5	DSI 7	633332	3499.98	1	17.95	19.00	1.274	-	-	-0.03	0.487	**0.620**
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	5mm	Ant 5	DSI 7	633332	3499.98	1	17.92	19.00	1.282	-	-	0.01	0.427	0.548

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
2450MHz																	
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 6	Hotspot	6	2437	1	17.71	19.00	1.346	98.6	1.014	-0.15	0.615	0.839
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 6	Hotspot	1	2412	1	17.59	19.00	1.384	98.6	1.014	0.01	0.589	0.826
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6	Hotspot	6	2437	1	17.71	19.00	1.346	98.6	1.014	-0.18	0.394	0.538
	WLAN2.4GHz	802.11b 1Mbps	Left Side	5mm	Ant 6	Hotspot	6	2437	1	17.71	19.00	1.346	98.6	1.014	0.03	0.317	0.433
	WLAN2.4GHz	802.11b 1Mbps	Right Side	5mm	Ant 6	Hotspot	6	2437	1	17.71	19.00	1.346	98.6	1.014	-0.15	0.072	0.098
22	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	Ant 6	Hotspot	6	2437	1	17.71	19.00	1.346	98.6	1.014	0.03	0.668	**0.912**
	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	Ant 6	Hotspot	1	2412	1	17.59	19.00	1.384	98.6	1.014	0.08	0.612	0.859
	Bluetooth	1Mbps	Front	5mm	Ant 6	Full power	39	2441	1	15.88	16.50	1.153	76.85	1.084	-0.01	0.239	0.299
	Bluetooth	1Mbps	Back	5mm	Ant 6	Full power	39	2441	1	15.88	16.50	1.153	76.85	1.084	-0.08	0.133	0.166
	Bluetooth	1Mbps	Left Side	5mm	Ant 6	Full power	39	2441	1	15.88	16.50	1.153	76.85	1.084	0.05	0.119	0.149
	Bluetooth	1Mbps	Right Side	5mm	Ant 6	Full power	39	2441	1	15.88	16.50	1.153	76.85	1.084	0.06	0.029	0.036
23	Bluetooth	1Mbps	Top Side	5mm	Ant 6	Full power	39	2441	1	15.88	16.50	1.153	76.85	1.084	0.05	0.245	**0.306**

16.3 Body Worn Accessory SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Headset	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
750MHz																						
24	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 0	-	DSI 3	23095	707.5	1	22.86	24.00	1.300	-	-	-0.03	0.996	**1.295**
	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 0	-	DSI 3	23095	707.5	2	22.86	24.00	1.300	-	-	0.05	0.756	0.983
	LTE Band 12	10M	QPSK	25	0	-	Front	5mm	Ant 0	-	DSI 3	23095	707.5	1	21.92	23.00	1.282	-	-	0.08	0.765	0.981
	LTE Band 12	10M	QPSK	50	0	-	Front	5mm	Ant 0	-	DSI 3	23095	707.5	1	21.90	23.00	1.288	-	-	0.01	0.742	0.956
	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 0	-	DSI 3	23095	707.5	1	22.86	24.00	1.300	-	-	0.03	0.683	0.888
	LTE Band 12	10M	QPSK	25	0	-	Back	5mm	Ant 0	-	DSI 3	23095	707.5	1	21.92	23.00	1.282	-	-	-0.08	0.496	0.636
	LTE Band 12	10M	QPSK	50	0	-	Back	5mm	Ant 0	-	DSI 3	23095	707.5	1	21.90	23.00	1.288	-	-	-0.08	0.486	0.626
	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 0	Headset	DSI 3	23095	707.5	1	22.86	24.00	1.300	-	-	0.06	0.911	1.184
	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 4	-	DSI 3	23095	707.5	1	22.10	23.00	1.230	-	-	0.01	0.378	0.465
	LTE Band 12	10M	QPSK	25	0	-	Front	5mm	Ant 4	-	DSI 3	23095	707.5	1	20.96	22.00	1.271	-	-	-0.18	0.232	0.295
	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Ant 4	-	DSI 3	23095	707.5	1	22.10	23.00	1.230	-	-	-0.1	0.526	0.647
	LTE Band 12	10M	QPSK	25	0	-	Back	5mm	Ant 4	-	DSI 3	23095	707.5	1	20.96	22.00	1.271	-	-	0.1	0.336	0.427
835MHz																						
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Front	5mm	Ant 0	-	DSI 3	189	836.4	1	27.80	29.00	1.318	-	-	0.08	0.820	1.081
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Front	5mm	Ant 0	-	DSI 3	128	824.2	1	27.74	29.00	1.337	-	-	-0.17	0.769	1.028
25	GSM850	-	-	-	-	GPRS (3 Tx slots)	Front	5mm	Ant 0	-	DSI 3	251	848.8	1	27.60	29.00	1.380	-	-	0.01	0.861	**1.189**
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Back	5mm	Ant 0	-	DSI 3	189	836.4	1	27.80	29.00	1.318	-	-	-0.03	0.633	0.834
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Back	5mm	Ant 0	-	DSI 3	128	824.2	1	27.74	29.00	1.337	-	-	0.14	0.610	0.815
	GSM850	-	-	-	-	GPRS (3 Tx slots)	Back	5mm	Ant 0	-	DSI 3	251	848.8	1	27.60	29.00	1.380	-	-	0.11	0.605	0.835
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 4	-	DSI 3	189	836.4	1	30.85	31.80	1.245	-	-	0.02	0.707	0.880
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 4	-	DSI 3	128	824.2	1	30.81	31.80	1.256	-	-	-0.05	0.660	0.829
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 4	-	DSI 3	251	848.8	1	30.76	31.80	1.271	-	-	0.18	0.676	0.859
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	Ant 4	-	DSI 3	189	836.4	1	30.85	31.80	1.245	-	-	0.14	0.624	0.777
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Front	20mm	Ant 4	-	DSI 4	189	836.4	1	30.91	32.00	1.285	-	-	0.08	0.288	0.370
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	22mm	Ant 4	-	DSI 4	189	836.4	1	30.91	32.00	1.285	-	-	0.01	0.219	0.281
26	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	DSI 3	4182	836.4	1	23.41	24.00	1.146	-	-	-0.06	0.740	**0.848**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	DSI 3	4132	826.4	1	23.36	24.00	1.159	-	-	-0.05	0.715	0.829
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	DSI 3	4233	846.6	1	23.35	24.00	1.161	-	-	0.01	0.696	0.808
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	DSI 3	4182	836.4	1	23.41	24.00	1.146	-	-	0.1	0.533	0.611
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 4	-	DSI 3	4182	836.4	1	21.74	23.00	1.337	-	-	-0.01	0.384	0.513
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 4	-	DSI 3	4182	836.4	1	21.74	23.00	1.337	-	-	-0.16	0.488	0.652
27	LTE Band 5	10M	QPSK	1	0	-	Front	5mm	Ant 0	-	DSI 3	20525	836.5	1	23.11	24.00	1.227	-	-	0.01	0.683	**0.838**
	LTE Band 5	10M	QPSK	25	0	-	Front	5mm	Ant 0	-	DSI 3	20525	836.5	1	22.16	23.00	1.213	-	-	-0.08	0.542	0.658
	LTE Band 5	10M	QPSK	50	0	-	Front	5mm	Ant 0	-	DSI 3	20525	836.5	1	22.14	23.00	1.219	-	-	0.13	0.529	0.645
	LTE Band 5	10M	QPSK	1	0	-	Back	5mm	Ant 0	-	DSI 3	20525	836.5	1	23.11	24.00	1.227	-	-	0.12	0.492	0.604
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 0	-	DSI 3	20525	836.5	1	22.16	23.00	1.213	-	-	0.03	0.408	0.495
	LTE Band 5	10M	QPSK	1	0	-	Front	5mm	Ant 4	-	DSI 3	20525	836.5	1	22.04	23.00	1.247	-	-	0.08	0.384	0.479
	LTE Band 5	10M	QPSK	25	0	-	Front	5mm	Ant 4	-	DSI 3	20525	836.5	1	21.06	22.00	1.242	-	-	0.01	0.280	0.348
	LTE Band 5	10M	QPSK	1	0	-	Back	5mm	Ant 4	-	DSI 3	20525	836.5	1	22.04	23.00	1.247	-	-	-0.13	0.404	0.504
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 4	-	DSI 3	20525	836.5	1	21.06	22.00	1.242	-	-	0.03	0.275	0.341
1900MHz																						
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 1	-	DSI 3	661	1880	1	26.09	26.50	1.099	-	-	-0.08	1.000	1.099
28	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 1	-	DSI 3	512	1850.2	1	25.95	26.50	1.135	-	-	-0.03	1.060	**1.203**
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 1	-	DSI 3	512	1850.2	2	25.95	26.50	1.135	-	-	0.01	1.020	1.158
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 1	-	DSI 3	810	1909.8	1	26.07	26.50	1.104	-	-	-0.08	0.991	1.094
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	Ant 1	-	DSI 3	661	1880	1	26.09	26.50	1.099	-	-	0.1	0.517	0.568
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 1	Headset	DSI 3	661	1880	1	26.09	26.50	1.099	-	-	0.06	0.926	1.018
2600MHz																						
	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	-	DSI 3	40620	2593	1	22.95	23.90	1.245	62.9	1.006	-0.18	0.983	1.231
	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	-	DSI 3	39750	2506	1	22.89	23.90	1.262	62.9	1.006	0.1	0.936	1.188

	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	-	DSI 3	40185	2549.5	1	22.89	23.90	1.262	62.9	1.006	0.12	0.958	1.216
	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	-	DSI 3	41055	2636.5	1	22.94	23.90	1.247	62.9	1.006	0.08	0.953	1.196
29	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	-	DSI 3	41490	2680	1	22.88	23.90	1.265	62.9	1.006	-0.16	1.010	**1.285**
	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	-	DSI 3	41490	2680	2	22.88	23.90	1.265	62.9	1.006	0.01	0.969	1.233
	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 1	-	DSI 3	40620	2593	1	21.97	23.00	1.268	62.9	1.006	-0.17	0.774	0.987
	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 1	-	DSI 3	39750	2506	1	21.85	23.00	1.303	62.9	1.006	-0.03	0.726	0.952
	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 1	-	DSI 3	40185	2549.5	1	21.94	23.00	1.276	62.9	1.006	0.14	0.779	1.000
	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 1	-	DSI 3	41055	2636.5	1	21.91	23.00	1.285	62.9	1.006	0.11	0.753	0.974
	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 1	-	DSI 3	41490	2680	1	21.87	23.00	1.297	62.9	1.006	-0.05	0.741	0.967
	LTE Band 41	20M	QPSK	100	0	-	Front	5mm	Ant 1	-	DSI 3	40620	2593	1	21.95	23.00	1.274	62.9	1.006	0.18	0.719	0.921
	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	-	DSI 3	40620	2593	1	22.95	23.90	1.245	62.9	1.006	0.14	0.749	0.938
	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	-	DSI 3	39750	2506	1	22.89	23.90	1.262	62.9	1.006	-0.17	0.748	0.950
	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	-	DSI 3	40185	2549.5	1	22.89	23.90	1.262	62.9	1.006	0.17	0.730	0.927
	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	-	DSI 3	41055	2636.5	1	22.94	23.90	1.247	62.9	1.006	-0.05	0.699	0.877
	LTE Band 41	20M	QPSK	1	0	-	Back	5mm	Ant 1	-	DSI 3	41490	2680	1	22.88	23.90	1.265	62.9	1.006	0.01	0.713	0.907
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	DSI 3	40620	2593	1	21.97	23.00	1.268	62.9	1.006	0.1	0.587	0.749
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	DSI 3	39750	2506	1	21.85	23.00	1.303	62.9	1.006	-0.17	0.535	0.701
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	DSI 3	40185	2549.5	1	21.94	23.00	1.276	62.9	1.006	0.04	0.508	0.652
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	DSI 3	41055	2636.5	1	21.91	23.00	1.285	62.9	1.006	-0.01	0.554	0.716
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	DSI 3	41490	2680	1	21.87	23.00	1.297	62.9	1.006	-0.08	0.543	0.709
	LTE Band 41	20M	QPSK	100	0	-	Back	5mm	Ant 1	-	DSI 3	40620	2593	1	21.95	23.00	1.274	62.9	1.006	0.05	0.566	0.725
	LTE Band 41	20M	QPSK	1	0	-	Front	5mm	Ant 1	Headset	DSI 3	40620	2593	1	22.95	23.90	1.245	62.9	1.006	0.02	0.859	1.075
	LTE Band 41	20M	QPSK	1	0	-	Front	20mm	Ant 1	-	DSI 4	40620	2593	1	22.95	24.00	1.274	62.9	1.006	0.03	0.096	0.123
	LTE Band 41	20M	QPSK	1	0	-	Back	22mm	Ant 1	-	DSI 4	40620	2593	1	22.95	24.00	1.274	62.9	1.006	-0.08	0.050	0.064
3500MHz																						
	LTE Band 42	20M	QPSK	1	0	-	Front	5mm	Ant 5	-	DSI 3	42590	3500	1	21.23	22.20	1.250	62.9	1.006	0.06	0.429	0.540
	LTE Band 42	20M	QPSK	50	0	-	Front	5mm	Ant 5	-	DSI 3	42590	3500	1	21.21	22.20	1.256	62.9	1.006	0.13	0.383	0.484
30	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 5	-	DSI 3	42590	3500	1	21.23	22.20	1.250	62.9	1.006	0.09	0.704	**0.885**
	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 5	-	DSI 3	42190	3460	1	21.20	22.20	1.259	62.9	1.006	0.16	0.655	0.830
	LTE Band 42	20M	QPSK	1	0	-	Back	5mm	Ant 5	-	DSI 3	42990	3540	1	21.18	22.20	1.265	62.9	1.006	-0.1	0.663	0.844
	LTE Band 42	20M	QPSK	50	0	-	Back	5mm	Ant 5	-	DSI 3	42590	3500	1	21.21	22.20	1.256	62.9	1.006	0.07	0.592	0.748
	LTE Band 42	20M	QPSK	100	0	-	Back	5mm	Ant 5	-	DSI 3	42590	3500	1	21.19	22.20	1.262	62.9	1.006	0.01	0.503	0.639
	LTE Band 42	20M	QPSK	1	0	-	Front	20mm	Ant 5	-	DSI 4	42590	3500	1	22.89	24.00	1.291	62.9	1.006	-0.08	0.060	0.078
	LTE Band 42	20M	QPSK	1	0	-	Back	22mm	Ant 5	-	DSI 4	42590	3500	1	22.89	24.00	1.291	62.9	1.006	0.1	0.082	0.107
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	5mm	Ant 5	-	DSI 3	633332	3499.98	1	20.30	21.20	1.230	-	-	-0.15	0.539	0.663
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	5mm	Ant 5	-	DSI 3	633332	3499.98	1	20.25	21.20	1.245	-	-	0.19	0.548	0.682
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	5mm	Ant 5	-	DSI 3	633332	3499.98	1	20.30	21.20	1.230	-	-	-0.18	0.690	0.849
31	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	-	DSI 3	633332	3499.98	1	20.25	21.20	1.245	-	-	0.08	0.716	**0.891**
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	5mm	Ant 5	-	DSI 3	633332	3499.98	2	20.25	21.20	1.245	-	-	0.07	0.698	0.869
	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Back	5mm	Ant 5	-	DSI 3	633332	3499.98	1	20.22	21.20	1.253	-	-	0.03	0.704	0.882
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	20mm	Ant 5	-	DSI 4	633332	3499.98	1	23.47	24.00	1.130	-	-	-0.18	0.133	0.150
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	22mm	Ant 5	-	DSI 4	633332	3499.98	1	23.47	24.00	1.130	-	-	0.1	0.183	0.207

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Headset	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
2450MHz																		
32	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 6	-	Full power	6	2437	1	19.10	20.50	1.380	98.6	1.014	-0.01	0.858	**1.201**
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 6	-	Full power	1	2412	1	18.97	20.50	1.422	98.6	1.014	-0.17	0.746	1.076
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 6	-	Full power	11	2462	1	16.98	18.50	1.419	98.6	1.014	0.04	0.426	0.613
	WLAN2.4GHz	802.11g 6Mbps	Front	5mm	Ant 6	-	Full power	6	2437	1	18.32	20.00	1.472	98.25	1.018	0.06	0.711	1.066
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6	-	Full power	6	2437	1	19.10	20.50	1.380	98.6	1.014	-0.01	0.551	0.771
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 6	Headset	Full power	6	2437	1	19.10	20.50	1.380	98.6	1.014	-0.08	0.849	1.188
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 6	-	Simultaneous	6	2437	1	16.86	18.00	1.300	98.6	1.014	-0.08	0.498	0.657
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 6	-	Simultaneous	6	2437	1	16.86	18.00	1.300	98.6	1.014	0.17	0.320	0.422
	WLAN2.4GHz	802.11b 1Mbps	Front	20mm	Ant 6	-	Full power	6	2437	1	19.10	20.50	1.380	98.6	1.014	0.12	0.095	0.133
	WLAN2.4GHz	802.11b 1Mbps	Back	22mm	Ant 6	-	Full power	6	2437	1	19.10	20.50	1.380	98.6	1.014	0.08	0.089	0.125
33	Bluetooth	1Mbps	Front	5mm	Ant 6	-	Full power	39	2441	1	15.88	16.50	1.153	76.85	1.084	-0.07	0.273	**0.341**
	Bluetooth	1Mbps	Back	5mm	Ant 6	-	Full power	39	2441	1	15.88	16.50	1.153	76.85	1.084	0.02	0.163	0.204
5000MHz																		
34	WLAN5.3GHz	802.11n-HT40 MCS0	Front	5mm	Ant 3	-	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	0.09	0.570	**0.833**
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	5mm	Ant 3	-	Full power	62	5310	1	16.80	18.50	1.480	96.24	1.039	0.08	0.434	0.668
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	5mm	Ant 3	-	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	0.01	0.366	0.535
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	5mm	Ant 3		Simultaneous	54	5270	1	14.25	15.50	1.334	96.24	1.039	0.18	0.259	0.359
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	5mm	Ant 3		Simultaneous	54	5270	1	14.25	15.50	1.334	96.24	1.039	-0.04	0.180	0.249
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	20mm	Ant 3	-	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	-0.17	0.095	0.139
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	22mm	Ant 3	-	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	-0.03	0.096	0.140
35	WLAN5.5GHz	802.11a 6Mbps	Front	5mm	Ant 3	-	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	0.05	0.547	**0.776**
	WLAN5.5GHz	802.11a 6Mbps	Back	5mm	Ant 3	-	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	-0.08	0.409	0.580
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 3	-	Simultaneous	138	5690	1	15.12	16.50	1.374	93.19	1.073	-0.08	0.238	0.351
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 3	-	Simultaneous	138	5690	1	15.12	16.50	1.374	93.19	1.073	-0.13	0.193	0.285
	WLAN5.5GHz	802.11a 6Mbps	Front	20mm	Ant 3	-	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	0.14	0.075	0.106
	WLAN5.5GHz	802.11a 6Mbps	Back	22mm	Ant 3	-	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	0.11	0.092	0.130
36	WLAN5.8GHz	802.11a 6Mbps	Front	5mm	Ant 3	-	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	0.06	0.553	**0.774**
	WLAN5.8GHz	802.11a 6Mbps	Back	5mm	Ant 3	-	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	0.1	0.379	0.530
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 3	-	Simultaneous	155	5775	1	15.75	17.00	1.334	93.19	1.073	-0.13	0.243	0.348
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 3	-	Simultaneous	155	5775	1	15.75	17.00	1.334	93.19	1.073	0.06	0.187	0.268
	WLAN5.8GHz	802.11a 6Mbps	Front	20mm	Ant 3	-	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	-0.05	0.092	0.129
	WLAN5.8GHz	802.11a 6Mbps	Back	22mm	Ant 3	-	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	0.18	0.109	0.152

16.4 Product specific 10g SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
750MHz																					
37	LTE Band 12	10M	QPSK	1	0	-	Front	0mm	Ant 0	DSI 6	23095	707.5	1	22.86	24.00	1.300	-	-	-0.07	1.640	**2.132**
	LTE Band 12	10M	QPSK	1	0	-	Front	0mm	Ant 0	DSI 6	23095	707.5	2	22.86	24.00	1.300	-	-	0.05	1.390	1.807
	LTE Band 12	10M	QPSK	25	0	-	Front	0mm	Ant 0	DSI 6	23095	707.5	1	21.92	23.00	1.282	-	-	0.03	1.280	1.641
	LTE Band 12	10M	QPSK	50	0	-	Front	0mm	Ant 0	DSI 6	23095	707.5	1	21.90	23.00	1.288	-	-	-0.07	1.250	1.610
835MHz																					
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Front	0mm	Ant 4	DSI 6	189	836.4	1	26.71	27.70	1.256	-	-	0.07	1.870	2.349
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Front	0mm	Ant 4	DSI 6	128	824.2	1	26.70	27.70	1.259	-	-	0.16	1.830	2.304
38	GSM850	-	-	-	-	GPRS (4 Tx slots)	Front	0mm	Ant 4	DSI 6	251	848.8	1	26.68	27.70	1.265	-	-	0.01	1.970	**2.492**
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Front	0mm	Ant 4	DSI 6	251	848.8	2	26.68	27.70	1.265	-	-	0.08	1.820	2.302
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Back	0mm	Ant 4	DSI 6	189	836.4	1	26.71	27.70	1.256	-	-	0.13	1.060	1.331
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Top Side	0mm	Ant 4	DSI 6	189	836.4	1	26.71	27.70	1.256	-	-	0.16	1.660	2.085
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Top Side	0mm	Ant 4	DSI 6	128	824.2	1	26.70	27.70	1.259	-	-	-0.03	1.570	1.977
	GSM850	-	-	-	-	GPRS (4 Tx slots)	Top Side	0mm	Ant 4	DSI 6	251	848.8	1	26.68	27.70	1.265	-	-	0.07	1.600	2.024
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Front	13mm	Ant 4	DSI 4	189	836.4	1	30.91	32.00	1.285	-	-	0.03	0.263	0.338
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	15mm	Ant 4	DSI 4	189	836.4	1	30.91	32.00	1.285	-	-	-0.08	0.287	0.369
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Top Side	14mm	Ant 4	DSI 4	189	836.4	1	30.91	32.00	1.285	-	-	-0.08	0.089	0.114
1900MHz																					
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	0mm	Ant 1	DSI 6	661	1880	1	26.09	26.50	1.099	-	-	-0.16	1.010	1.110
39	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom Side	0mm	Ant 1	DSI 6	661	1880	1	26.09	26.50	1.099	-	-	-0.01	1.320	**1.451**
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom Side	0mm	Ant 1	DSI 6	661	1880	2	26.09	26.50	1.099	-	-	0.05	1.280	1.407
2600MHz																					
	LTE Band 41	20M	QPSK	1	0	-	Front	0mm	Ant 1	DSI 6	40620	2593	1	22.95	24.00	1.274	62.9	1.006	-0.09	1.330	1.704
	LTE Band 41	20M	QPSK	1	0	-	Front	0mm	Ant 1	DSI 6	39750	2506	1	22.89	24.00	1.291	62.9	1.006	-0.06	1.130	1.468
	LTE Band 41	20M	QPSK	1	0	-	Front	0mm	Ant 1	DSI 6	40185	2549.5	1	22.89	24.00	1.291	62.9	1.006	-0.17	1.290	1.676
	LTE Band 41	20M	QPSK	1	0	-	Front	0mm	Ant 1	DSI 6	41055	2636.5	1	22.94	24.00	1.276	62.9	1.006	-0.01	1.380	1.772
	LTE Band 41	20M	QPSK	1	0	-	Front	0mm	Ant 1	DSI 6	41490	2680	1	22.88	24.00	1.294	62.9	1.006	-0.11	1.460	1.901
	LTE Band 41	20M	QPSK	50	0	-	Front	0mm	Ant 1	DSI 6	40620	2593	1	21.97	23.00	1.268	62.9	1.006	0.14	0.856	1.092
	LTE Band 41	20M	QPSK	100	0	-	Front	0mm	Ant 1	DSI 6	40620	2593	1	21.95	23.00	1.274	62.9	1.006	0.03	0.842	1.079
	LTE Band 41	20M	QPSK	1	0	-	Back	0mm	Ant 1	DSI 6	40620	2593	1	22.95	24.00	1.274	62.9	1.006	0.1	1.070	1.371
	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 1	DSI 6	40620	2593	1	21.97	23.00	1.268	62.9	1.006	0.16	0.660	0.842
	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	DSI 6	40620	2593	1	22.95	24.00	1.274	62.9	1.006	-0.06	1.510	1.935
	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	DSI 6	39750	2506	1	22.89	24.00	1.291	62.9	1.006	0.02	1.450	1.884
	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	DSI 6	40185	2549.5	1	22.89	24.00	1.291	62.9	1.006	-0.16	1.500	1.948
40	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	DSI 6	41055	2636.5	1	22.94	24.00	1.276	62.9	1.006	-0.04	1.600	**2.055**
	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	DSI 6	41055	2636.5	2	22.94	24.00	1.276	62.9	1.006	0.01	1.480	1.900
	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	0mm	Ant 1	DSI 6	41490	2680	1	22.88	24.00	1.294	62.9	1.006	0.05	1.550	2.018
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 1	DSI 6	40620	2593	1	21.97	23.00	1.268	62.9	1.006	-0.03	0.984	1.255
	LTE Band 41	20M	QPSK	100	0	-	Bottom Side	0mm	Ant 1	DSI 6	40620	2593	1	21.95	23.00	1.274	62.9	1.006	0.17	0.950	1.217
3500MHz																					
	LTE Band 42	20M	QPSK	1	0	-	Back	0mm	Ant 5	DSI 6	42590	3500	1	22.89	24.00	1.291	62.9	1.006	-0.12	1.670	2.169
	LTE Band 42	20M	QPSK	1	0	-	Back	0mm	Ant 5	DSI 6	42190	3460	1	22.67	24.00	1.358	62.9	1.006	-0.03	1.680	2.296
41	LTE Band 42	20M	QPSK	1	0	-	Back	0mm	Ant 5	DSI 6	42990	3540	1	22.68	24.00	1.355	62.9	1.006	-0.06	1.700	**2.318**
	LTE Band 42	20M	QPSK	50	0	-	Back	0mm	Ant 5	DSI 6	42590	3500	1	21.89	23.00	1.291	62.9	1.006	0.02	1.230	1.598
	LTE Band 42	20M	QPSK	100	0	-	Back	0mm	Ant 5	DSI 6	42590	3500	1	21.84	23.00	1.306	62.9	1.006	0.12	1.220	1.603
	LTE Band 42	20M	QPSK	1	0	-	Top Side	0mm	Ant 5	DSI 6	42590	3500	1	22.89	24.00	1.291	62.9	1.006	0.02	1.480	1.922
	LTE Band 42	20M	QPSK	50	0	-	Top Side	0mm	Ant 5	DSI 6	42590	3500	1	21.89	23.00	1.291	62.9	1.006	-0.03	1.060	1.377
42	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	0mm	Ant 5	DSI 6	633332	3499.98	1	22.39	23.60	1.321	-	-	0.01	1.880	**2.484**
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	0mm	Ant 5	DSI 6	633332	3499.98	2	22.39	23.60	1.321	-	-	0.03	1.850	2.444
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Front	0mm	Ant 5	DSI 6	633332	3499.98	1	22.35	23.60	1.334	-	-	0.14	1.720	2.294
	FR1 n78 Part 27Q	100M	QPSK	270	0	DFT-SCS-30KHz	Front	0mm	Ant 5	DSI 6	633332	3499.98	1	21.83	23.00	1.309	-	-	-0.01	1.470	1.924

	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	0mm	Ant 5	DSI 6	633332	3499.98	1	22.39	23.60	1.321	-	-	-0.12	1.440	1.903
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Back	0mm	Ant 5	DSI 6	633332	3499.98	1	22.35	23.60	1.334	-	-	0.07	1.380	1.840
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	0mm	Ant 5	DSI 6	633332	3499.98	1	22.39	23.60	1.321	-	-	0.04	1.420	1.876
	FR1 n78 Part 27Q	100M	QPSK	135	69	DFT-SCS-30KHz	Top Side	0mm	Ant 5	DSI 6	633332	3499.98	1	22.35	23.60	1.334	-	-	0.11	1.130	1.507
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Front	13mm	Ant 5	DSI 4	633332	3499.98	1	23.47	24.00	1.130	-	-	0.1	0.157	0.177
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Back	15mm	Ant 5	DSI 4	633332	3499.98	1	23.47	24.00	1.130	-	-	-0.18	0.328	0.371
	FR1 n78 Part 27Q	100M	QPSK	1	1	DFT-SCS-30KHz	Top Side	14mm	Ant 5	DSI 4	633332	3499.98	1	23.47	24.00	1.130	-	-	0.05	0.204	0.230

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
2450MHz																	
43	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Ant 6	Full power	6	2437	1	19.10	20.50	1.380	98.6	1.014	-0.09	1.910	**2.673**
	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Ant 6	Full power	6	2437	2	19.10	20.50	1.380	98.6	1.014	0.01	1.710	2.394
	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Ant 6	Full power	1	2412	1	18.97	20.50	1.422	98.6	1.014	0.02	1.750	2.524
	WLAN2.4GHz	802.11b 1Mbps	Top Side	0mm	Ant 6	Full power	6	2437	1	19.10	20.50	1.380	98.6	1.014	-0.1	0.673	0.942
	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Ant 6	Simultaneous	6	2437	1	14.75	16.00	1.334	98.6	1.014	-0.03	0.685	0.926
	WLAN2.4GHz	802.11b 1Mbps	Top Side	0mm	Ant 6	Simultaneous	6	2437	1	14.75	16.00	1.334	98.6	1.014	0.06	0.241	0.326
	WLAN2.4GHz	802.11b 1Mbps	Front	20mm	Ant 6	Full power	6	2437	1	19.10	20.50	1.380	98.6	1.014	0.12	0.071	0.099
	WLAN2.4GHz	802.11b 1Mbps	Top Side	17mm	Ant 6	Full power	6	2437	1	19.10	20.50	1.380	98.6	1.014	0.08	0.132	0.185
5000MHz																	
	WLAN5.2GHz	802.11n-HT40 MCS0	Front	0mm	Ant 3	Full power	46	5230	1	17.80	19.00	1.318	96.24	1.039	0.1	1.020	1.397
	WLAN5.2GHz	802.11n-HT40 MCS0	Back	0mm	Ant 3	Full power	46	5230	1	17.80	19.00	1.318	96.24	1.039	0.12	0.388	0.531
44	WLAN5.2GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 3	Full power	46	5230	1	17.80	19.00	1.318	96.24	1.039	-0.15	1.410	**1.931**
	WLAN5.2GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 3	Full power	46	5230	2	17.80	19.00	1.318	96.24	1.039	0.06	1.380	1.890
	WLAN5.2GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 3	Full power	38	5190	1	15.09	16.50	1.385	96.24	1.039	0.08	0.823	1.184
	WLAN5.2GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 3	Full power	46	5230	1	17.80	19.00	1.318	96.24	1.039	-0.17	0.011	0.015
	WLAN5.2GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 3	Full power	46	5230	1	17.80	19.00	1.318	96.24	1.039	-0.03	0.213	0.292
	WLAN5.2GHz	802.11n-HT40 MCS0	Front	0mm	Ant 3	Simultaneous	46	5230	1	14.89	16.00	1.291	96.24	1.039	0.08	0.531	0.712
	WLAN5.2GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 3	Simultaneous	46	5230	1	14.89	16.00	1.291	96.24	1.039	0.05	0.734	0.985
	WLAN5.2GHz	802.11n-HT40 MCS0	Front	6mm	Ant 3	Full power	46	5230	1	17.80	19.00	1.318	96.24	1.039	0.14	0.165	0.226
	WLAN5.2GHz	802.11n-HT40 MCS0	Left Side	9mm	Ant 3	Full power	46	5230	1	17.80	19.00	1.318	96.24	1.039	-0.17	0.255	0.349
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	0mm	Ant 3	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	0.14	1.150	1.680
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	0mm	Ant 3	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	0.11	0.531	0.776
45	WLAN5.3GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 3	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	0.07	1.540	**2.250**
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 3	Full power	62	5310	1	16.80	18.50	1.480	96.24	1.039	0.02	1.220	1.876
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 3	Full power	54	5270	2	17.52	19.00	1.406	96.24	1.039	0.05	1.510	2.206
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 3	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	-0.05	0.018	0.026
	WLAN5.3GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 3	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	0.18	0.424	0.619
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Front	0mm	Ant 3	Simultaneous	54	5270	1	14.25	15.50	1.334	96.24	1.039	0.03	0.530	0.735
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Ant 3	Simultaneous	54	5270	1	14.25	15.50	1.334	96.24	1.039	-0.02	0.710	0.984
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	6mm	Ant 3	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	-0.17	0.177	0.259
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Side	9mm	Ant 3	Full power	54	5270	1	17.52	19.00	1.406	96.24	1.039	-0.03	0.297	0.434
	WLAN5.5GHz	802.11a 6Mbps	Front	0mm	Ant 3	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	0.14	0.950	1.347
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Ant 3	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	-0.17	0.404	0.573
46	WLAN5.5GHz	802.11a 6Mbps	Left Side	0mm	Ant 3	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	-0.13	1.160	**1.645**
	WLAN5.5GHz	802.11a 6Mbps	Left Side	0mm	Ant 3	Full power	116	5580	2	18.06	19.50	1.393	98.25	1.018	0.02	1.130	1.603
	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	Ant 3	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	0.17	0.020	0.028
	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 3	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	-0.05	0.195	0.277
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	0mm	Ant 3	Simultaneous	138	5690	1	15.58	17.00	1.387	93.19	1.073	0.11	0.540	0.804
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Ant 3	Simultaneous	138	5690	1	15.58	17.00	1.387	93.19	1.073	-0.08	0.659	0.981
	WLAN5.5GHz	802.11a 6Mbps	Front	6mm	Ant 3	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	0.14	0.145	0.206
	WLAN5.5GHz	802.11a 6Mbps	Left Side	9mm	Ant 3	Full power	116	5580	1	18.06	19.50	1.393	98.25	1.018	0.11	0.205	0.291
	WLAN5.8GHz	802.11a 6Mbps	Front	0mm	Ant 3	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	0.01	1.130	1.581
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Ant 3	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	0.1	0.275	0.385
47	WLAN5.8GHz	802.11a 6Mbps	Left Side	0mm	Ant 3	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	0.06	1.160	**1.623**

	WLAN5.8GHz	802.11a 6Mbps	Left Side	0mm	Ant 3	Full power	165	5825	2	18.62	20.00	1.374	98.25	1.018	0.02	1.070	1.497
	WLAN5.8GHz	802.11a 6Mbps	Right Side	0mm	Ant 3	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	-0.17	0.011	0.015
	WLAN5.8GHz	802.11a 6Mbps	Top Side	0mm	Ant 3	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	0.04	0.197	0.276
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	0mm	Ant 3	Simultaneous	155	5775	1	16.30	17.50	1.318	93.19	1.073	0.05	0.649	0.918
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Ant 3	Simultaneous	155	5775	1	16.30	17.50	1.318	93.19	1.073	-0.15	0.666	0.942
	WLAN5.8GHz	802.11a 6Mbps	Front	6mm	Ant 3	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	-0.05	0.153	0.214
	WLAN5.8GHz	802.11a 6Mbps	Left Side	9mm	Ant 3	Full power	165	5825	1	18.62	20.00	1.374	98.25	1.018	0.18	0.183	0.256

16.5 Repeated SAR Measurement

<1g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Right Cheek	0mm	Ant 6	Standalone	6	2437	15.30	16.50	1.318	98.6	1.014	0.01	1.030	1	1.377
2nd	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Right Cheek	0mm	Ant 6	Standalone	6	2437	15.30	16.50	1.318	98.6	1.014	0.02	1.010	1.020	1.350
1st	WLAN5GHz	-	-	-	-	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 3	Standalone	134	5670	16.79	17.50	1.178	96.24	1.039	-0.06	0.896	1	1.096
2nd	WLAN5GHz	-	-	-	-	802.11n-HT40 MCS0	Right Cheek	0mm	Ant 3	Standalone	134	5670	16.79	17.50	1.178	96.24	1.039	0.02	0.875	1.024	1.071
1st	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	DSI 7	41490	2680	22.88	23.60	1.180	62.9	1.006	-0.02	1.080	1	1.282
2nd	LTE Band 41	20M	QPSK	1	0	-	Bottom Side	5mm	Ant 1	DSI 7	41490	2680	22.88	23.60	1.180	62.9	1.006	0.02	1.050	1.029	1.247
1st	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 0	DSI 3	23095	707.5	22.86	24.00	1.300	-	-	-0.03	0.996	1	1.295
2nd	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Ant 0	DSI 3	23095	707.5	22.86	24.00	1.300	-	-	0.02	0.975	1.022	1.268
1st	GSM850	-	-	-	-	GPRS (3 Tx slots)	Front	5mm	Ant 0	DSI 3	251	848.8	27.60	29.00	1.380	-	-	0.01	0.861	1	1.189
2nd	GSM850	-	-	-	-	GPRS (3 Tx slots)	Front	5mm	Ant 0	DSI 3	251	848.8	27.60	29.00	1.380	-	-	0.03	0.845	1.019	1.166
1st	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 1	DSI 3	512	1850.2	25.95	26.50	1.135	-	-	-0.03	1.060	1	1.203
2nd	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	Ant 1	DSI 3	512	1850.2	25.95	26.50	1.135	-	-	0.02	1.020	1.039	1.158

General Note:

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

17. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product specific 10g SAR
1.	WWAN + WLAN2.4GHz	Yes	Yes	Yes	Yes
2.	WWAN + WLAN5GHz	Yes	Yes		Yes
3.	WWAN + Bluetooth	Yes	Yes	Yes	Yes
4.	WLAN5GHz+ Bluetooth	Yes	Yes		Yes
5.	WWAN + WLAN5GHz+ Bluetooth	Yes	Yes		Yes
6.	WWAN + WLAN2.4GHz+ NFC				Yes
7.	WWAN + WLAN5GHz+ NFC				Yes
8.	WWAN + Bluetooth+ NFC				Yes
9.	WLAN5GHz+ Bluetooth+ NFC				Yes
10.	WWAN + WLAN5GHz+ Bluetooth+ NFC				Yes

General Note:

1. This device supports VoIP in GPRS, WCDMA, LTE and 5GNR (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. WWAN above includes 5G NR bands.
3. EUT will choose each GSM, WCDMA, LTE and 5GNR according to the network signal condition; therefore, they will not operate simultaneously at any moment.
4. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
5. WLAN5GHz has no hotspot function.
6. Qualcomm Smart Transmit algorithm support to WWAN except WIFI/BT and NFC. Each antenna group has controlled the total RF exposure from all transmitter to not exceed FCC limit. Therefore, in this report, it is evaluated whether the sum of the groups of each antenna does not exceed FCC limit or spatial separation is applied. In addition, each antenna group need to satisfy simultaneous transmission analysis with External radios (WIFI/BT and NFC) in this report.
7. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
8. According to the EUT characteristic, WLAN 5GHz and Bluetooth can transmit simultaneously.
9. According to the EUT characteristic, WLAN 5GHz and WLAN 2.4GHz can't transmit simultaneously.
10. According to the EUT characteristic, WLAN 2.4GHz and Bluetooth can't transmit simultaneously.
11. NFC can transmit simultaneously with other Radios in extremity exposure condition.
12. For Headset SAR and non-Headset SAR always chose higher SAR to do co-located analysis.
13. For distance SAR and non-distance SAR always chose higher SAR to do co-located analysis.
14. 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.
15. For standalone WWAN, always choose the highest SAR among all WWAN bands within the selected antenna for each exposure position to perform simultaneous transmission analysis with WLAN/BT. This is the worst co-located analysis and can represent each band.
16. The maximum SAR summation is calculated based on the same configuration and test position.
17. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
    i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
    ii) SPLSR = (SAR1 + SAR2)^1.5 / (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.
    v) The SPLSR calculated results please refer to section 17.6.

17.1 Sub6 Antenna Groups

Qualcomm® Smart Transmit™ 3.0 of Smart Transmit (GEN2) Feature operates based on pre-defined sub6 antenna groups (AG). Sub6 Tx antennas in the device are grouped based on spatial variation of RF exposure distributions, where the RF exposure of one AG is mutually exclusive from other AG. This is accomplished by demonstrating below conditions for all exposure positions under each DSI for a given exposure category.

1) Case 1: Demonstrate that Sum of maximum reported SAR from each of the sub6 AGs and the reported normalized SAR values from radios outside Smart Transmit should be less than regulatory limits for each supported DSI. This condition must be demonstrated for all antenna combinations of sub6 AGs.
   i. For a given DSI, obtain the highest *reported* SAR for each antenna out of all supported technologies and frequency bands. Obtain the maximum *reported* SAR for each AG by taking the maximum out of *reported* SAR for all antennas belonging to each AG.
   ii. Demonstrate that the sum of maximum reported SAR (normalized to regulatory limit) from each of the sub6 AGs and the sum of reported SAR (normalized to regulatory limit) from all supported radios outside of Smart Transmit should be less than 1.0
2) Case 2: If the Case 1 is NOT met, then for a given antenna grouping scheme plus external radios/antennas (ERs) (referred to as 'configuration'), demonstrate all AG pairs, all ER pairs and all (AG, ER) pairs in the configuration meet SPLSR criteria (Section 4.3.2 (c) in FCC KDB 447498 D01 v06) for each exposure position under each supported DSI. For a given exposure position under a given DSI, prove all AG pairs, all ER pairs and all (AG, ER) pairs (if there are external radios outside Smart Transmit) in the configuration meet SPLSR.

This device supports two sub6 AG: AG0 and AG1, the detailed please refer to the below table:

Antenna Group 0 (AG0)	ANT4 & ANT5
Antenna Group 1 (AG1)	ANT0 & ANT1

3) This model's multi_Tx_factor is 1.0.

The conditions are verified through the following criterias:

i) (SAR1 + SAR2 criteria): If SPLSR criteria is not used, then the highest reported SAR at *Plimit* for each antenna should be obtained out of all supported technologies and frequency bands for each DSI. Demonstrate that the sum of reported SAR of one antenna from each of the sub6 AGs and the sum of RF exposure from all supported radios outside of Smart Transmit should be less than the regulatory limit as given below for each DSI.

1. Obtain the worst-case reported SAR for each antenna group (i.e., maximum *reported* SAR at *Plimit* out of all supported technologies, frequency bands and antennas in AG0 and AG1), denoted as max.SAR.AG0 and max.SAR.AG1, and obtain the worst-case RF exposure for each external radio, and demonstrate that the sum of these RF exposures meets: { [max.SAR.AG0+ max.SAR.AG1] + WIFI/BT worst-case reported SAR} ≤ 1.6 (for 1g, or 4.0 for 10g). (WIFI/BT worst-case reported SAR is the worst SAR in all combinations of WIFI and BT simultaneous transmission)

ii) (SPLSR criteria): For each antenna, obtain the highest reported SAR value at *Plimit* out of all supported technologies for each frequency band. Using these values, demonstrate for a given DSI that every antenna from one sub6 AG meets SPLSR criteria with every antenna in another sub6 AG for all frequency bands. This criteria must be demonstrated for all antenna pair combinations irrespective of supported simultaneous transmission scenarios as given below for each DSI:

a. SPLSR criteria should be met for all antenna pair combinations of AG0 and AG1. As it can be seen, these include all combinations of antenna groups, antennas, and frequency bands.
b. Obtain combined SAR per AG: Obtain the worst-case conservative combined SAR and its peak location for each AG.
c. Use the 'closest' peak location out of all antennas of AGj to evaluate SPLSR with other AGs in the configuration. Note, by 'closest', select the peak location out of all antennas (ϵ AGj) that is closest to the peak location of other AG where SPLSR is evaluated.

iii) (combination of SPLSR & SAR1+SAR2 criteria): If SPLSR criteria for all the combinations of sub6 antenna groups in (i) is demonstrated to show that each AG is mutually exclusive from other AGs, and if the WIFI/BT antennas supported outside of Smart Transmit do not meet SPLSR criteria, then the condition in (ii) reduces to: {max.SAR.AG0 + worst-case reported SAR} ≤ 1.6 and {max.SAR.AG1+ worst-case reported SAR } ≤ 1.6 for compliance demonstration (for 1g, or 4.0 for 10g).

For summed SAR results and SPLSR detailed analysis, please refer to section 17.2/17.3 / 17.4 / 17.5 / 17.6 of this report. All of the combinations of sub6 antenna groups are sufficient to show that AG0 is mutually exclusive from AG1 and that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE 1528- 2013 Section 6.3.4.1.

17.2 Head Exposure Conditions

General Note: The unit of SAR evaluation is W/kg.
Simultaneous Transmission Evaluation of WWAN+WLAN+BT:
<AG0 maximum reported SAR>:

Test Position	Ant4	Ant5	MAX
Right Cheek	0.580	0.890	0.890
Right Tilted	0.464	0.848	0.848
Left Cheek	0.898	0.729	0.898
Left Tilted	0.694	0.679	0.694

<AG1 maximum reported SAR>:

Test Position	Ant0	Ant1	MAX
Right Cheek	0.283	0.268	0.283
Right Tilted	0.186	0.061	0.186
Left Cheek	0.447	0.140	0.447
Left Tilted	0.253	0.102	0.253

<WLAN2.4GHz/5GHz+BT Worse-case SAR>:

Test Position	WLAN2.4GHz Ant6	WLAN5GHz Ant3	BT Ant6	WLAN5GHz Ant3+BT Ant6	MAX
Right Cheek	0.690	0.377	0.296	0.673	0.690
Right Tilted	0.416	0.118	0.183	0.301	0.416
Left Cheek	0.327	0.050	0.140	0.190	0.327
Left Tilted	0.368	0.046	0.159	0.205	0.368

<Simultaneous Transmission analysis of AG0 + AG1 + WLAN+BT Worse-case>:

Test Position	AG0	AG1	WLAN/BT worst case	AG1+AG0+WLAN +BT worse case
Right Cheek	0.890	0.283	0.690	**1.86**
Right Tilted	0.848	0.186	0.416	**1.45**
Left Cheek	0.898	0.447	0.327	**1.67**
Left Tilted	0.694	0.253	0.368	**1.32**

Note: The results marked yellow in above table refers to the detailed analysis corresponding to each position below tables.

Right Cheek					
Ant combination	AG1	AG0	WLAN/BT worst case	AG1+AG0+WLAN +BT worse case	SPLSR
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
Ant0-Ant4	0.283	0.580	0.690	1.55	-
Ant0-Ant5	0.283	0.890	0.690	**1.86**	Case 1
Ant1-Ant4	0.268	0.580	0.690	1.54	-
Ant1-Ant5	0.268	0.890	0.690	**1.85**	Case 2

Left Cheek					
Ant combination	AG1	AG0	WLAN/BT worst case	AG1+AG0+WLAN +BT worse case	SPLSR
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
Ant0-Ant4	0.447	0.898	0.327	**1.67**	Case 3
Ant0-Ant5	0.447	0.729	0.327	1.50	-
Ant1-Ant4	0.140	0.898	0.327	1.37	-
Ant1-Ant5	0.140	0.729	0.327	1.20	-

<Simultaneous Transmission analysis of WLAN/BT only without WWAN>:

Test Position	WLAN5GHz Ant3	BT Ant6	WLAN5GHz Ant3+BT Ant6
Right Cheek	1.096	0.490	**1.59**
Right Tilted	0.344	0.308	0.65
Left Cheek	0.144	0.235	0.38
Left Tilted	0.135	0.266	0.40

17.3 Hotspot Exposure Conditions

General Note: The unit of SAR evaluation is W/kg.
Simultaneous Transmission Evaluation of WWAN+WLAN+BT:
<AG0 maximum reported SAR>:

Test Position	Ant4	Ant5	MAX
Front	0.620	0.409	0.620
Back	0.561	0.610	0.610
Left Side		0.155	0.155
Right Side	0.331	0.144	0.331
Top Side	0.663	0.620	0.663

<AG1 maximum reported SAR>:

Test Position	Ant0	Ant1	MAX
Front	1.295	1.017	1.295
Back	0.888	0.693	0.888
Left Side	0.794	0.090	0.794
Right Side		0.185	0.185
Bottom Side	0.680	1.282	1.282

<WLAN2.4GHz/5GHz+BT Worse-case SAR>:

Test Position	WLAN2.4GHz Ant6	BT Ant6	MAX
Front	0.839	0.299	0.839
Back	0.538	0.166	0.538
Left Side	0.433	0.149	0.433
Right Side	0.098	0.036	0.098
Top Side	0.912	0.306	0.912

<Simultaneous Transmission analysis of AG0 + AG1 + WLAN+BT Worse-case>:

Test Position	AG0	AG1	WLAN/BT worst case	AG1+AG0+WLAN/BT worse case
Front	0.620	1.295	0.839	**2.75**
Back	0.610	0.888	0.538	**2.04**
Left Side	0.155	0.794	0.433	1.38
Right Side	0.331	0.185	0.098	0.61
Top Side	0.663		0.912	**1.58**
Bottom Side		1.282		1.28

Note: The results marked yellow in above table refers to the detailed analysis corresponding to each position below tables.

Front					
Ant combination	AG1	AG0	WLAN/BT worst case	AG1+AG0+WLAN/BT worse case	SPLSR
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
Ant0-Ant4	1.295	0.620	0.839	**2.75**	Case 1
Ant0-Ant5	1.295	0.409	0.839	**2.54**	Case 2
Ant1-Ant4	1.017	0.620	0.839	**2.48**	Case 3
Ant1-Ant5	1.017	0.409	0.839	**2.27**	Case 4

Back					
Ant combination	AG1	AG0	WLAN/BT worst case	AG1+AG0+WLAN/BT worse case	SPLSR
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
Ant0-Ant4	0.888	0.561	0.538	**1.99**	Case 5
Ant0-Ant5	0.888	0.610	0.538	**2.04**	Case 6
Ant1-Ant4	0.693	0.561	0.538	**1.79**	Case 7
Ant1-Ant5	0.693	0.610	0.538	**1.84**	Case 8

17.4 Body-Worn Accessory Exposure Conditions

General Note: The unit of SAR evaluation is W/kg.
Simultaneous Transmission Evaluation of WWAN+WLAN+BT:
<AG0 maximum reported SAR>:

Test Position	Ant4	Ant5	MAX
Front	0.880	0.682	0.880
Back	0.777	0.891	0.891

<AG1 maximum reported SAR>:

Test Position	Ant0	Ant1	MAX
Front	1.295	1.285	1.295
Back	0.888	0.950	0.950

<WLAN2.4GHz/5GHz+BT Worse-case SAR

Test Position	WLAN2.4GHz Ant6	WLAN5GHz Ant3	BT Ant6	WLAN5GHz Ant3+BT Ant6	MAX
Front	0.657	0.359	0.341	0.700	0.700
Back	0.422	0.285	0.204	0.489	0.489

<Simultaneous Transmission analysis of AG0 + AG1 + WLAN+BT Worse-case>:

Test Position	AG0	AG1	WLAN/BT worst case	AG1+AG0+WLAN +BT worse case
Front	0.880	1.295	0.700	**2.88**
Back	0.891	0.950	0.489	**2.33**

Note: The results marked yellow in above table refers to the detailed analysis corresponding to each position below tables.

Front					
Ant combination	AG1	AG0	WLAN/BT worst case	AG1+AG0+WLAN +BT worse case	SPLSR
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
Ant0-Ant4	1.295	0.880	0.700	**2.88**	Case 1
Ant0-Ant5	1.295	0.682	0.700	**2.68**	Case 2
Ant1-Ant4	1.285	0.880	0.700	**2.87**	Case 3
Ant1-Ant5	1.285	0.682	0.700	**2.67**	Case 4

Back					
Ant combination	AG1	AG0	WLAN/BT worst case	AG1+AG0+WLAN +BT worse case	SPLSR
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
Ant0-Ant4	0.888	0.777	0.489	**2.15**	Case 5
Ant0-Ant5	0.888	0.891	0.489	**2.27**	Case 6
Ant1-Ant4	0.950	0.777	0.489	**2.22**	Case 7
Ant1-Ant5	0.950	0.891	0.489	**2.33**	Case 8

<Simultaneous Transmission analysis of WLAN/BT only without WWAN>:

Test Position	WLAN5GHz Ant3	BT Ant6	WLAN5GHz Ant3+BT Ant6
Front	0.833	0.366	1.20
Back	0.580	0.204	0.78

17.5 Product specific 10g SAR Exposure Conditions

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

General Note: The unit of SAR evaluation is W/kg.
Simultaneous Transmission Evaluation of WWAN+WLAN+BT+NFC:
<AG0 maximum reported SAR>:

Test Position	Ant4	Ant5	MAX
Front	2.492	2.484	2.492
Back	1.331	2.318	2.318
Left Side			0.000
Right Side			0.000
Top Side	2.085	1.922	2.085

<AG1 maximum reported SAR>:

Test Position	Ant0	Ant1	MAX
Front	2.132	1.901	2.132
Back		1.371	1.371
Left Side			0.000
Right Side			0.000
Bottom Side		2.055	2.055

<WLAN2.4GHz/5GHz+BT +NFC Worse-case SAR

Test Position	WLAN5GHz Ant3	WLAN2.4GHz Ant6	MAX
Front	0.918	0.926	0.926
Back	0.776		0.776
Left Side	0.985		0.985
Right Side	0.028		0.028
Top Side	0.619	0.326	0.619

<Simultaneous Transmission analysis of AG0 + AG1 + WLAN+BT Worse-case+NFC>:

Test Position	AG0	AG1	WLAN/BT worst case	NFC	AG1+AG0+WLAN/BT worse case+NFC
Front	2.492	2.132	0.926	0.000	**5.55**
Back	2.318	0.000	0.776	0.043	**3.14**
Left Side	0.985	0.000	0.985	0.001	1.97
Right Side	0.028	0.000	0.028	0.001	0.06
Top Side	2.085		0.619	0.001	2.71
Bottom Side		0.000		0.001	0.00

Note: The results marked yellow in above table refers to the detailed analysis corresponding to each position below tables.

Front						
Ant combination	AG1	AG0	WLAN/BT worst case	NFC	AG1+AG0+WLAN/BT worse case+NFC	SPLSR
	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	SAR	10g SAR (W/kg)	
Ant0-Ant4	2.132	2.492	0.926	0.000	**5.55**	Case 1
Ant0-Ant5	2.132	2.484	0.926	0.000	**5.54**	Case 2
Ant1-Ant4	1.901	2.492	0.926	0.000	**5.32**	Case 3
Ant1-Ant5	1.901	2.484	0.926	0.000	**5.31**	Case 4

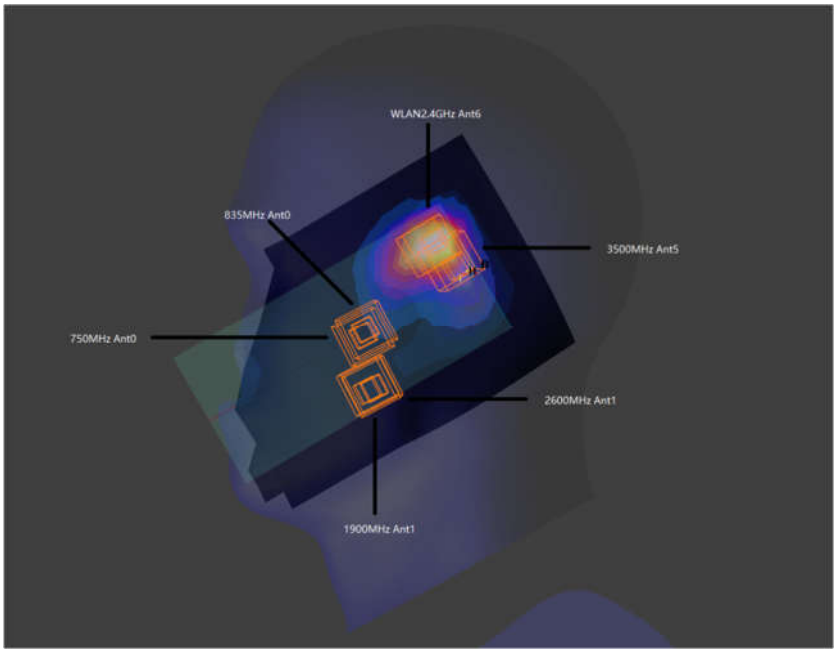
<Simultaneous Transmission analysis of WLAN/BT+NFC only without WWAN>:

Test Position	WLAN2.4GHz Ant6	WLAN5GHz Ant3	NFC	WLAN 2.4G Ant6+NFC	WLAN 5GHz Ant3+NFC
Front	2.673	1.680	0.000	2.67	1.68
Back		0.776	0.043	0.04	0.82
Left Side		2.250	0.001	0.00	2.25
Right Side		0.028	0.001	0.00	0.03
Top Side	0.942	0.619	0.001	0.94	0.62
Bottom Side			0.001	0.00	0.00

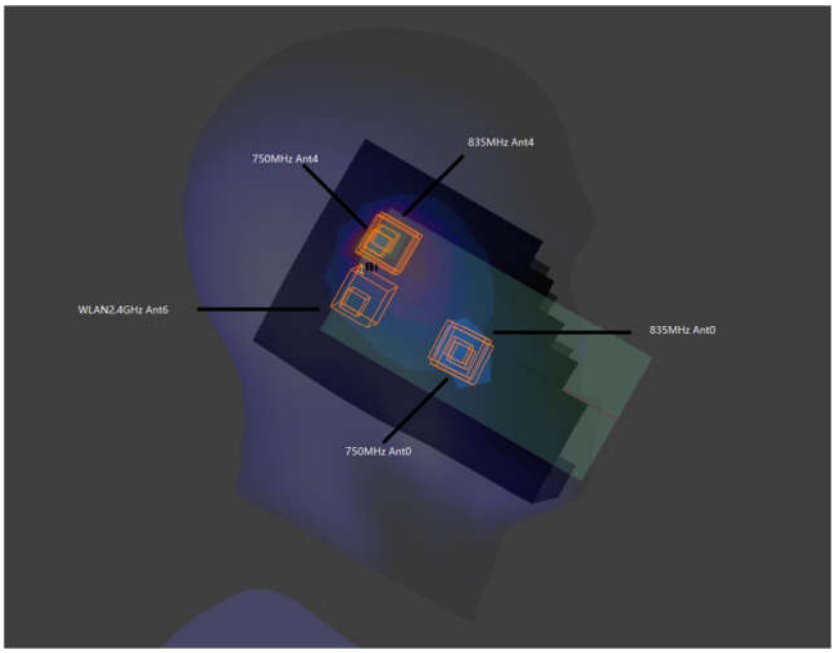
17.6 SPLSR Evaluation and Analysis

General Note:

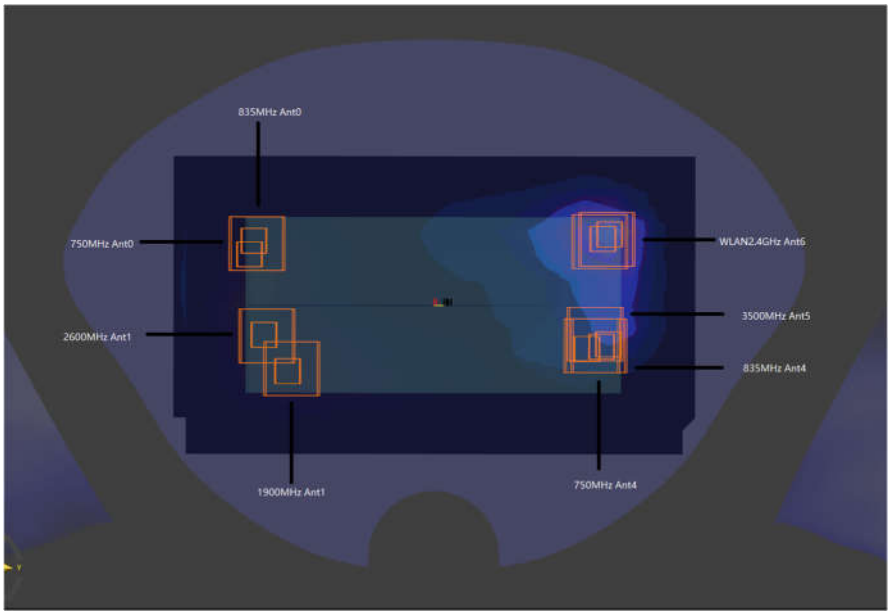
1. When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of [(x1−x2)2 + (y1−y2)2 + (z1−z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
2. SPLSR = (SAR1 + SAR2)1.5 / (min. separation distance, mm). If SPLSR ≤ 0.04 for 1g SAR, simultaneously transmission SAR measurement is not necessary.
3. Per April 2022 TCB Workshop Notes, WLAN2.4GHz/BT Antenna 6/ WLAN5GHz Antenna 3 was summed algebraically with the AG0 for the purposes of hybrid SPLSR combination and they are located at the top of the device
4. Per April 2022 TCB Workshop, instead of doing a small volume scan over a co-located antenna pair, used summing the SAR values of the co-located pair and using that value in SPLSR calculation. In the calculation used the minimum distance between the spatially separated antenna and the closest antenna of the co-located antenna pair to be conservative.
5. The detail hotspot point for each transmitter in each exposure condition are showing as below figure and the minimum 3D distance for each sum combination is used for SPLSR analysis.
6. The axis peak locations refer to Section 17.7.



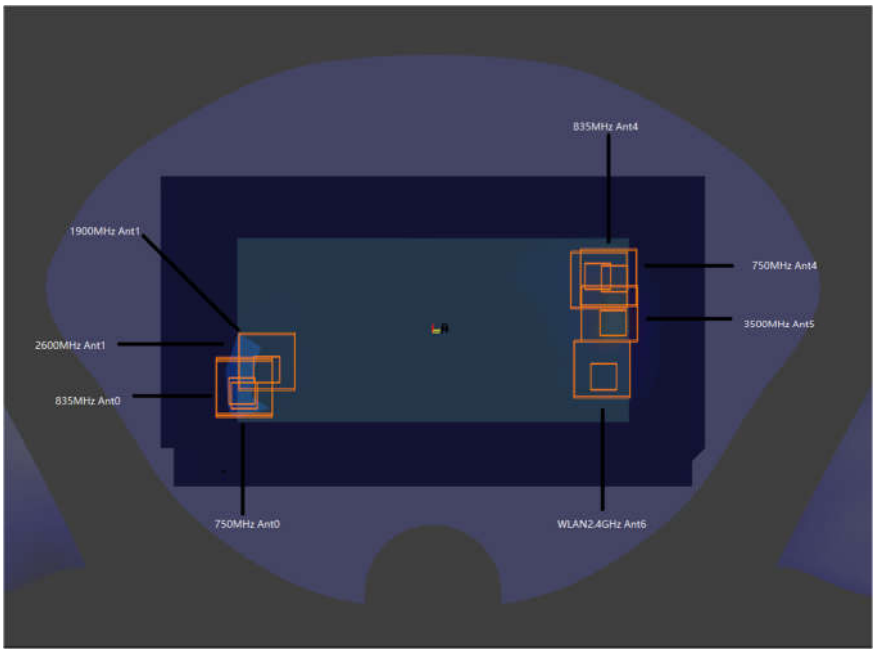
WWAN+WLAN for Head_ Right Cheek_0mm



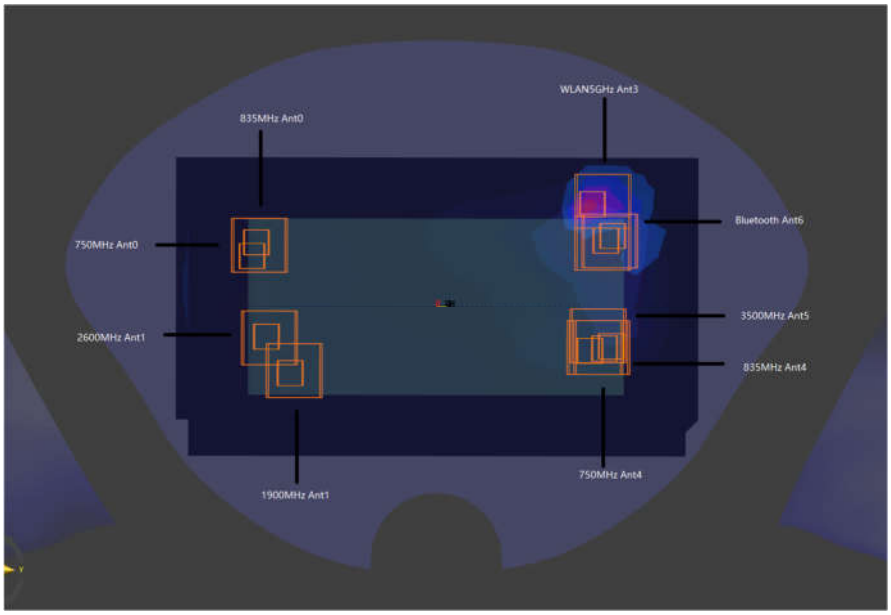
WWAN+WLAN for Head_ Left Cheek_0mm



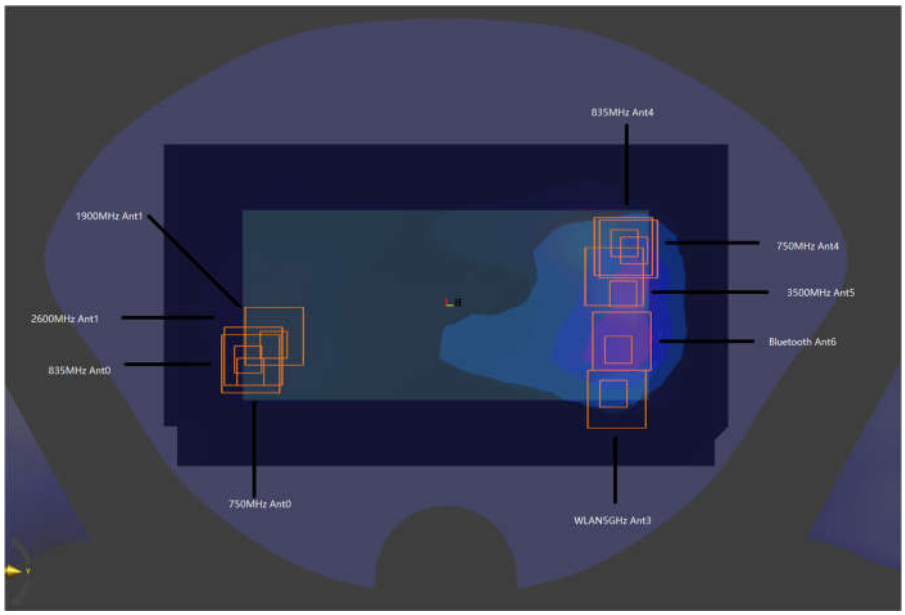
WWAN+WLAN for Hotspot_ Front_5mm



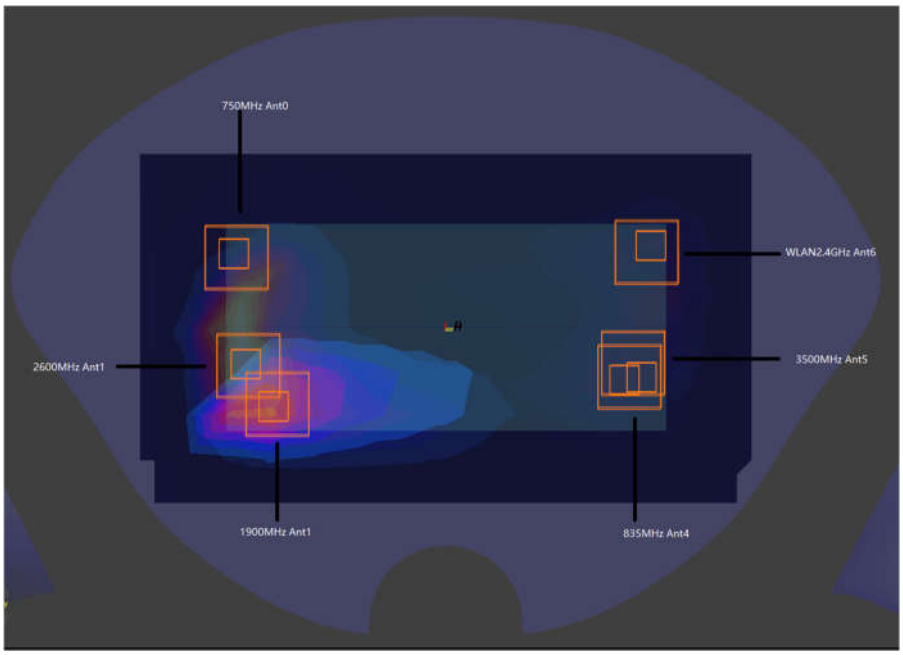
WWAN+WLAN for Hotspot_ Back_5mm



WWAN+WLAN for Body-worn_ Front_5mm



WWAN+WLAN for Body-worn _ Back_5mm



WWAN+WLAN for Extremity_ Front_0mm

<For Head>

No.1 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 0	Right Cheek	0.283	0.283	0mm	58.2	-258.5	-172.6	71.5	1.86	0.04	Not required
Ant 5		0.890	1.580	0mm	11	-312.2	-173.8				
WLAN2.4GHz Ant6		0.690		0mm							
Ant 0	Right Cheek	0.283	0.283	0mm	58.2	-258.5	-172.6	74.6	1.86	0.03	Not required
Ant 5		0.890	1.580	0mm							
WLAN2.4GHz Ant6		0.690		0mm	23.6	-324.6	-174.9				
No.2 Band	**Position**	**SAR 1g SAR (W/kg)**	**Summed**	**Gap**	**SAR peak location (mm)**			**3D distance (mm)**	**Summed SAR (W/kg)**	**SPLSR Results**	**Simultaneous SAR**
					X	**Y**	**Z**				
Ant 1	Right Cheek	0.268	0.268	0mm	54.7	-249.8	-174.3	76.2	1.85	0.03	Not required
Ant 5		0.890	1.580	0mm	11	-312.2	-173.8				
WLAN2.4GHz Ant6		0.690		0mm							
Ant 1	Right Cheek	0.268	0.268	0mm	54.7	-249.8	-174.3	81.0	1.85	0.03	Not required
Ant 5		0.890	1.580	0mm							
WLAN2.4GHz Ant6		0.690		0mm	23.6	-324.6	-174.9				

No.3 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 0	Left Cheek	0.447	0.447	0mm	56.8	273.2	-175.8	65.3	1.67	0.03	Not required
Ant 4		0.898	1.225	0mm	18.4	326	-174.5				
WLAN2.4GHz Ant6		0.327		0mm							
Ant 0	Left Cheek	0.447	0.447	0mm	56.8	273.2	-175.8	58.1	1.67	0.04	Not required
Ant 4		0.898	1.225	0mm							
WLAN2.4GHz Ant6		0.327		0mm	15.7	314	-171.4				

<For Hotspot>

No.1 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 0	Front	1.295	1.295	5mm	-41.5	-72.9	-207	145.4	2.75	0.03	Not required
Ant 4		0.620	1.459	5mm	-10	69	-207				
WLAN2.4GHz Ant6		0.839		5mm							
Ant 0	Front	1.295	1.295	5mm	-41.5	-72.9	-207	143.0	2.75	0.03	Not required
Ant 4		0.620	1.459	5mm							
WLAN2.4GHz Ant6		0.839		5mm	-54.5	69.5	-207				
No.2 Band	**Position**	**SAR 1g SAR (W/kg)**	**Summed**	**Gap**	**SAR peak location (mm)**			**3D distance (mm)**	**Summed SAR (W/kg)**	**SPLSR Results**	**Simultaneous SAR**
					X	**Y**	**Z**				
Ant 0	Front	1.295	1.295	5mm	-41.5	-72.9	-207	137.3	2.54	0.03	Not required
Ant 5		0.409	1.248	5mm	-7	60	-207				
WLAN2.4GHz Ant6		0.839		5mm							
Ant 0	Front	1.295	1.295	5mm	-41.5	-72.9	-207	143.0	2.54	0.03	Not required
Ant 5		0.409	1.248	5mm							
WLAN2.4GHz Ant6		0.839		5mm	-54.5	69.5	-207				
No.3 Band	**Position**	**SAR 1g SAR (W/kg)**	**Summed**	**Gap**	**SAR peak location (mm)**			**3D distance (mm)**	**Summed SAR (W/kg)**	**SPLSR Results**	**Simultaneous SAR**
					X	**Y**	**Z**				
Ant 1	Front	1.017	1.017	5mm	-4.6	-71.9	-207	141.0	2.48	0.03	Not required
Ant 4		0.620	1.459	5mm	-10	69	-207				
WLAN2.4GHz Ant6		0.839		5mm							
Ant 1	Front	1.017	1.017	5mm	-4.6	-71.9	-207	149.9	2.48	0.03	Not required
Ant 4		0.620	1.459	5mm							
WLAN2.4GHz Ant6		0.839		5mm	-54.5	69.5	-207				
No.4 Band	**Position**	**SAR 1g SAR (W/kg)**	**Summed**	**Gap**	**SAR peak location (mm)**			**3D distance (mm)**	**Summed SAR (W/kg)**	**SPLSR Results**	**Simultaneous SAR**
					X	**Y**	**Z**				

Ant 1	Front	1.017	1.017	5mm	-4.6	-71.9	-207	131.9	2.27	0.03	Not required
Ant 5		0.409	1.248	5mm	-7	60	-207				
WLAN2.4GHz Ant6		0.839		5mm							
Ant 1	Front	1.017	1.017	5mm	-4.6	-71.9	-207	149.9	2.27	0.02	Not required
Ant 5		0.409	1.248	5mm							
WLAN2.4GHz Ant6		0.839		5mm	-54.5	69.5	-207				

No.5 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 0	Back	0.888	0.888	5mm	-10	-73.5	-207	144.1	1.99	0.02	Not required
Ant 4		0.561	1.099	5mm	-43.6	66.6	-207				
WLAN2.4GHz Ant6		0.538		5mm							
Ant 0	Back	0.888	0.888	5mm	-10	-73.5	-207	140.6	1.99	0.02	Not required
Ant 4		0.561	1.099	5mm							
WLAN2.4GHz Ant6		0.538		5mm	-7	67	-204				

No.6 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 0	Back	0.888	0.888	5mm	-10	-73.5	-207	140.0	2.04	0.02	Not required
Ant 5		0.610	1.148	5mm	-27	65.5	-207				
WLAN2.4GHz Ant6		0.538		5mm							
Ant 0	Back	0.888	0.888	5mm	-10	-73.5	-207	140.6	2.04	0.02	Not required
Ant 5		0.610	1.148	5mm							
WLAN2.4GHz Ant6		0.538		5mm	-7	67	-204				

No.7 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 1	Back	0.693	0.693	5mm	-6	-61.5	-207	133.5	1.79	0.02	Not required
Ant 4		0.561	1.099	5mm	-43.6	66.6	-207				
WLAN2.4GHz Ant6		0.538		5mm							
Ant 1	Back	0.693	0.693	5mm	-6	-61.5	-207	128.5	1.79	0.02	Not required
Ant 4		0.561	1.099	5mm							
WLAN2.4GHz Ant6		0.538		5mm	-7	67	-204				

No.8 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 1	Back	0.693	0.693	5mm	-6	-61.5	-207	128.7	1.84	0.02	Not required
Ant 5		0.610	1.148	5mm	-27	65.5	-207				
WLAN2.4GHz Ant6		0.538		5mm							
Ant 1	Back	0.693	0.693	5mm	-6	-61.5	-207	128.5	1.84	0.02	Not required
Ant 5		0.610	1.148	5mm							
WLAN2.4GHz Ant6		0.538		5mm	-7	67	-204				

<For Body-worn>

No.1 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 0	Front	1.295	1.295	5mm	-41.5	-72.9	-207	145.4	2.88	0.03	Not required
Ant 4		0.880	1.580	5mm	-10	69	-207				
WLAN5GHz Ant3		0.359		5mm							
Bluetooth Ant6		0.341		5mm							
Ant 0	Front	1.295	1.295	5mm	-41.5	-72.9	-207	138.1	2.88	0.04	Not required
Ant 4		0.880	1.580	5mm							
WLAN5GHz Ant3		0.359		5mm	-65.7	63.1	-207				
Bluetooth Ant6		0.341		5mm							
Ant 0	Front	1.295	1.295	5mm	-41.5	-72.9	-207	140.3	2.88	0.03	Not required
Ant 4		0.880	1.580	5mm							
WLAN5GHz Ant3		0.359		5mm							
Bluetooth Ant6		0.341		5mm	-52.5	67	-207				

No.2 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 0	Front	1.295	1.295	5mm	-41.5	-72.9	-207	137.3	2.68	0.03	Not required
Ant 5		0.682	1.382	5mm	-7	60	-207				
WLAN5GHz Ant3		0.359		5mm							
Bluetooth Ant6		0.341		5mm							
Ant 0	Front	1.295	1.295	5mm	-41.5	-72.9	-207	138.1	2.68	0.03	Not required
Ant 5		0.682	1.382	5mm							
WLAN5GHz Ant3		0.359		5mm	-65.7	63.1	-207				
Bluetooth Ant6		0.341		5mm							
Ant 0	Front	1.295	1.295	5mm	-41.5	-72.9	-207	140.3	2.68	0.03	Not required
Ant 5		0.682	1.382	5mm							
WLAN5GHz Ant3		0.359		5mm							
Bluetooth Ant6		0.341		5mm	-52.5	67	-207				

No.3 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 1	Front	1.285	1.285	5mm	-4.6	-71.9	-207	141.0	2.87	0.03	Not required
Ant 4		0.880	1.580	5mm	-10	69	-207				
WLAN5GHz Ant3		0.359		5mm							
Bluetooth Ant6		0.341		5mm							
Ant 1	Front	1.285	1.285	5mm	-21	-73.5	-207	143.7	2.87	0.03	Not required
Ant 4		0.880	1.580	5mm							
WLAN5GHz Ant3		0.359		5mm	-65.7	63.1	-207				
Bluetooth Ant6		0.341		5mm							
Ant 1	Front	1.285	1.285	5mm	-21	-73.5	-207	144.0	2.87	0.03	Not required
Ant 4		0.880	1.580	5mm							
WLAN5GHz Ant3		0.359		5mm							
Bluetooth Ant6		0.341		5mm	-52.5	67	-207				

No.4 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 1	Front	1.285	1.285	5mm	-4.6	-71.9	-207	131.9	2.67	0.03	Not required
Ant 5		0.682	1.382	5mm	-7	60	-207				
WLAN5GHz Ant3		0.359		5mm							
Bluetooth Ant6		0.341		5mm							
Ant 1	Front	1.285	1.285	5mm	-21	-73.5	-207	143.7	2.67	0.03	Not required
Ant 5		0.682	1.382	5mm							
WLAN5GHz Ant3		0.359		5mm	-65.7	63.1	-207				
Bluetooth Ant6		0.341		5mm							
Ant 1	Front	1.285	1.285	5mm	-21	-73.5	-207	144.0	2.67	0.03	Not required
Ant 5		0.682	1.382	5mm							
WLAN5GHz Ant3		0.359		5mm							
Bluetooth Ant6		0.341		5mm	-52.5	67	-207				

No.5 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 0	Back	0.888	0.888	5mm	-10	-73.5	-207	144.1	2.15	0.02	Not required
Ant 4		0.777	1.266	5mm	-43.6	66.6	-207				
WLAN5GHz Ant3		0.285		5mm							
Bluetooth Ant6		0.204		5mm							
Ant 0	Back	0.888	0.888	5mm	-8.5	-73.5	-207	135.4	2.15	0.02	Not required
Ant 4		0.777	1.266	5mm							
WLAN5GHz Ant3		0.285		5mm	7	61	-207				
Bluetooth Ant6		0.204		5mm							
Ant 0	Back	0.888	0.888	5mm	-8.5	-73.5	-207	139.5	2.15	0.02	Not required
Ant 4		0.777	1.266	5mm							
WLAN5GHz Ant3		0.285		5mm							

Bluetooth Ant6		0.204		5mm	-8	66	-207				

No.6 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 0	Back	0.888	0.888	5mm	-10	-73.5	-207	140.0	2.27	0.02	Not required
Ant 5		0.891	1.380	5mm	-27	65.5	-207				
WLAN5GHz Ant3		0.285		5mm							
Bluetooth Ant6		0.204		5mm							
Ant 0	Back	0.888	0.888	5mm	-8.5	-73.5	-207	135.4	2.27	0.03	Not required
Ant 5		0.891	1.380	5mm							
WLAN5GHz Ant3		0.285		5mm	7	61	-207				
Bluetooth Ant6		0.204		5mm							
Ant 0	Back	0.888	0.888	5mm	-8.5	-73.5	-207	139.5	2.27	0.02	Not required
Ant 5		0.891	1.380	5mm							
WLAN5GHz Ant3		0.285		5mm							
Bluetooth Ant6		0.204		5mm	-8	66	-207				

No.7 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 1	Back	0.950	0.950	5mm	-6	-61.5	-207	133.5	2.22	0.02	Not required
Ant 4		0.777	1.266	5mm	-43.6	66.6	-207				
WLAN5GHz Ant3		0.285		5mm							
Bluetooth Ant6		0.204		5mm							
Ant 1	Back	0.950	0.950	5mm	-6	-61.5	-207	123.2	2.22	0.03	Not required
Ant 4		0.777	1.266	5mm							
WLAN5GHz Ant3		0.285		5mm	7	61	-207				
Bluetooth Ant6		0.204		5mm							
Ant 1	Back	0.950	0.950	5mm	-6	-61.5	-207	127.5	2.22	0.03	Not required
Ant 4		0.777	1.266	5mm							
WLAN5GHz Ant3		0.285		5mm							
Bluetooth Ant6		0.204		5mm	-8	66	-207				

No.8 Band	Position	SAR 1g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 1	Back	0.950	0.950	5mm	-6	-61.5	-207	128.7	2.33	0.03	Not required
Ant 5		0.891	1.380	5mm	-27	65.5	-207				
WLAN5GHz Ant3		0.285		5mm							
Bluetooth Ant6		0.204		5mm							
Ant 1	Back	0.950	0.950	5mm	-6	-61.5	-207	123.2	2.33	0.03	Not required
Ant 5		0.891	1.380	5mm							
WLAN5GHz Ant3		0.285		5mm	7	61	-207				
Bluetooth Ant6		0.204		5mm							
Ant 1	Back	0.950	0.950	5mm	-6	-61.5	-207	127.5	2.33	0.03	Not required
Ant 5		0.891	1.380	5mm							
WLAN5GHz Ant3		0.285		5mm							
Bluetooth Ant6		0.204		5mm	-8	66	-207				

<For Extremity>

No.1 Band	Position	SAR 10g SAR (W/kg)	Summed	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Ant 0	Front	2.132	2.132	0mm	-41	-73.9	-207	153.1	5.55	0.09	Not required
Ant 4		2.492	3.418	0mm	-6.5	75.3	-207				
WLAN2.4GHz Ant6		0.926		0mm							
Ant 0	Front	2.132	2.132	0mm	-41	-73.9	-207	144.0	5.55	0.09	Not required
Ant 4		2.492	3.418	0mm							
WLAN2.4GHz Ant6		0.926		0mm	-54.5	69.5	-207				
No.2 Band	**Position**	**SAR 10g SAR (W/kg)**	**Summed**	**Gap**	**SAR peak location (mm)**			**3D distance (mm)**	**Summed SAR (W/kg)**	**SPLSR Results**	**Simultaneous SAR**
					X	**Y**	**Z**				
Ant 0	Front	2.132	2.132	0mm	-41	-73.9	-207	139.1	5.54	0.09	Not required
Ant 5		2.484	3.410	0mm	-7	61	-207				
WLAN2.4GHz Ant6		0.926		0mm							
Ant 0	Front	2.132	2.132	0mm	-41	-73.9	-207	144.0	5.54	0.09	Not required
Ant 5		2.484	3.410	0mm							
WLAN2.4GHz Ant6		0.926		0mm	-54.5	69.5	-207				
No.3 Band	**Position**	**SAR 10g SAR (W/kg)**	**Summed**	**Gap**	**SAR peak location (mm)**			**3D distance (mm)**	**Summed SAR (W/kg)**	**SPLSR Results**	**Simultaneous SAR**
					X	**Y**	**Z**				
Ant 1	Front	1.901	1.901	0mm	-4.6	-71.9	-207	147.2	5.32	0.08	Not required
Ant 4		2.492	3.418	0mm	-6.5	75.3	-207				
WLAN2.4GHz Ant6		0.926		0mm							
Ant 1	Front	1.901	1.901	0mm	-21	-73.5	-207	146.9	5.32	0.08	Not required
Ant 4		2.492	3.418	0mm							
WLAN2.4GHz Ant6		0.926		0mm	-54.5	69.5	-207				
No.4 Band	**Position**	**SAR 10g SAR (W/kg)**	**Summed**	**Gap**	**SAR peak location (mm)**			**3D distance (mm)**	**Summed SAR (W/kg)**	**SPLSR Results**	**Simultaneous SAR**
					X	**Y**	**Z**				
Ant 1	Front	1.901	1.901	0mm	-4.6	-71.9	-207	132.9	5.31	0.09	Not required
Ant 5		2.484	3.410	0mm	-7	61	-207				
WLAN2.4GHz Ant6		0.926		0mm							
Ant 1	Front	1.901	1.901	0mm	-21	-73.5	-207	146.9	5.31	0.08	Not required
Ant 5		2.484	3.410	0mm							
WLAN2.4GHz Ant6		0.926		0mm	-54.5	69.5	-207				

17.7 Maximum Reported SAR and SAR Peak Locations

General Note:

1. The maximum reported SAR and SAR Peak Locations corresponding to each position of each frequency band of each antenna in the below tables are as follows.
2. The unit of SAR evaluation is W/kg. The unit of x, y, z with Axis evaluation is mm.

<For Head>

Right Cheek												
Band		Ant0			Ant1			Ant5				
GSM850	SAR	0.283										
	Axis	58.2	-258.5	-172.6								
GSM1900	SAR				0.144							
	Axis				61	-247.6	-172.7					
WCDMA V	SAR	0.179										
	Axis	58.2	-258.5	-172.6								
LTE Band 12	SAR	0.179										
	Axis	59.9	-258.5	-172								
LTE Band 5	SAR	0.147										
	Axis	58.2	-258.5	-172.6								
LTE Band 41	SAR				0.268							
	Axis				54.7	-249.8	-174.3					
LTE Band 42	SAR							0.888				
	Axis							11	-312.2	-173.8		
FR1 n78	SAR							0.890				
	Axis							9.3	-312.5	-173.6		

WLAN2.4GHz Ant6	SAR (W/kg)	0.690		
	Axis	23.6	-324.6	-174.9

Left Cheek									
Band		Ant0			Ant4				
GSM850	SAR	0.447			0.898				
	Axis	56.8	273.2	-175.8	13.1	322.9	-174.1		
WCDMA V	SAR	0.302			0.879				
	Axis	57	261.5	-175.1	18.8	330.8	-174.3		
LTE Band 12	SAR	0.268			0.878				
	Axis	58.1	266.6	-171.8	18.4	326	-174.5		
LTE Band 5	SAR	0.253			0.883				
	Axis	58.4	260.1	-174.8	15.8	324.1	-174.3		

WLAN2.4GHz Ant6	SAR (W/kg)	0.327		
	Axis	15.7	314	-171.4

<For Hotspot>

Front												
Band		Ant0			Ant1			Ant4			Ant5	
GSM850	SAR	1.189						0.620				
	Axis	-43.8	-74.5	-207				-6.5	75.3	-207		
GSM1900	SAR				1.017							
	Axis				-4.6	-71.9	-207					
WCDMA V	SAR	0.848						0.491				
	Axis	-46.2	-75.4	-207				-8.5	70.5	-207		
LTE Band 12	SAR	1.295						0.404				
	Axis	-41	-73.9	-207				-10	72	-207		
LTE Band 5	SAR	0.838						0.479				
	Axis	-41.5	-72.9	-207				-10	69	-207		
LTE Band 41	SAR				0.950							
	Axis				-21	-73.5	-207					
LTE Band 42	SAR										0.371	
	Axis										-7	60	-207
FR1 n78	SAR										0.409	
	Axis										-7	61	-207

WLAN2.4GHz Ant6	SAR (W/kg)	0.839		
	Axis	-54.5	69.5	-207

Back												
Band		Ant0			Ant1			Ant4			Ant5	
GSM850	SAR	0.835						0.777				
	Axis	-9.4	-73.5	-207				-44.2	66.6	-207		
GSM1900	SAR				0.568							
	Axis				-6	-61.5	-207					
WCDMA V	SAR	0.611						0.652				
	Axis	-8.5	-73.5	-207				-43.6	66.6	-207		
LTE Band 12	SAR	0.888						0.647				
	Axis	-10	-73.5	-207				-45.9	66.9	-207		
LTE Band 5	SAR	0.604						0.504				
	Axis	-10	-73.5	-207				-45.1	66.6	-207		
LTE Band 41	SAR				0.950							
	Axis				-9	-64	-207					
LTE Band 42	SAR										0.885	
	Axis										-28	70.5	-207
FR1 n78	SAR										0.891	
	Axis										-27	65.5	-207

WLAN2.4GHz Ant6	SAR (W/kg)	0.538		
	Axis	-7	67	-204

<For Body-worn>

Front														
Band		Ant0			Ant1			Ant4			Ant5			
GSM850	SAR	1.189						0.880						
	Axis	-43.8	-74.5	-207				-6.5	75.3	-207				
GSM1900	SAR				1.203									
	Axis				-4.6	-71.9	-207							
WCDMA V	SAR	0.848						0.513						
	Axis	-46.2	-75.4	-207				-8.5	70.5	-207				
LTE Band 12	SAR	1.295						0.465						
	Axis	-41	-73.9	-207				-10	72	-207				
LTE Band 5	SAR	0.838						0.479						
	Axis	-41.5	-72.9	-207				-10	69	-207				
LTE Band 41	SAR				1.285									
	Axis				-21	-73.5	-207							
LTE Band 42	SAR										0.540			
	Axis										-7	60	-207	
FR1 n78	SAR										0.682			
	Axis										-7	61	-207	

Bluetooth Ant6	SAR (W/kg)	0.366			WLAN5GHz Ant3	SAR (W/kg)	0.388		
	Axis	-52.5	67	-207		Axis	-65.7	63.1	-207

Back														
Band		Ant0			Ant1			Ant4			Ant5			
GSM850	SAR	0.835						0.777						
	Axis	-9.4	-73.5	-207				-44.2	66.6	-207				
GSM1900	SAR				0.568									
	Axis				-6	-61.5	-207							
WCDMA V	SAR	0.611						0.652						
	Axis	-8.5	-73.5	-207				-43.6	66.6	-207				
LTE Band 12	SAR	0.888						0.647						
	Axis	-10	-73.5	-207				-45.9	66.9	-207				
LTE Band 5	SAR	0.604						0.504						
	Axis	-10	-73.5	-207				-45.1	66.6	-207				
LTE Band 41	SAR				0.950									
	Axis				-9	-64	-207							
LTE Band 42	SAR										0.885			
	Axis										-28	70.5	-207	
FR1 n78	SAR										0.891			
	Axis										-27	65.5	-207	

Bluetooth Ant6	SAR (W/kg)	0.204			WLAN5GHz Ant3	SAR (W/kg)	0.285		
	Axis	-8	66	-207		Axis	7	61	-207

<For Extremity>

Front												
Band		**Ant0**			**Ant1**			**Ant4**			**Ant5**	
GSM850	**SAR**							**2.492**				
	Axis							-6.5	75.3	-207		
GSM1900	**SAR**				**1.110**							
	Axis				-4.6	-71.9	-207					
LTE Band 12	**SAR**	**2.132**										
	Axis	-41	-73.9	-207								
LTE Band 41	**SAR**				**1.901**							
	Axis				-21	-73.5	-207					
FR1 n78	**SAR**										**2.484**	
	Axis										-7	61	-207

WLAN2.4GHz Ant6	**SAR (W/kg)**	**0.926**		
	Axis	-54.5	69.5	-207

Test Engineer： Martin Li, Varus Wang, Light Wang, Ricky Gu

18. 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.

19. 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 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

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

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

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

[9] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

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

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

[12] FCC KDB 941225 D05A v01r02, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Oct 2015

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

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

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