TESTING
NVLAP LAB CODE 600118-0

SAR TEST REPORT

No. I19Z70327-SEM01

For

Samsung Electronics. Co., Ltd.

Mobile phone

Model Name: SM-A015T1

With

Hardware Version: REV3.0

Software Version: A015T1.001 (A015T1UVE0ASJ6)

FCC ID: ZCASMA015T1

Issued Date: 2020-1-14

Note:

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Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

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Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Issue Date	Description
I19Z70327-SEM01	Rev.0	2020-1-14	Initial creation of test report
I19Z70327-SEM01	Rev.1	2020-1-17	Updated the tune-up power for GSM1900. Removed duty cycle for speech mode on table 14.1. Updated the test setup photos of left and right head.

TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	CTTL(Shouxiang)
Address:	No. 51 Shouxiang Science Building, Xueyuan Road, Haidian District, Beijing, P. R. China100191

1.2 Testing Environment

Temperature:	18°C~25°C,
Relative humidity:	30%~ 70%
Ground system resistance:	< 0.5 Ω
Ambient noise & Reflection:	< 0.012 W/kg

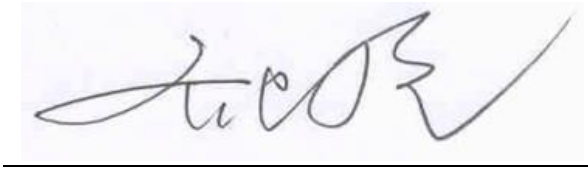
1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Lin Xiaojun
Testing Start Date:	January 2, 2020
Testing End Date:	January 10, 2020

1.4 Signature

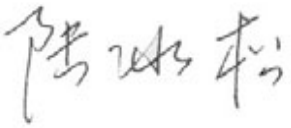
Lin Xiaojun

(Prepared this test report)



Qi Dianyuan

(Reviewed this test report)



Lu Bingsong

Deputy Director of the laboratory

(Approved this test report)

2 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Samsung Electronics. Co., Ltd. Mobile phone SM-A015T1 is as follows:

Table 2.1: Highest Reported SAR (1g)

Exposure Configuration	Technology Band	Highest Reported SAR 1g(W/kg)	Equipment Class
Head	GSM 850	0.38	PCE
	PCS 1900	0.26	
	UMTS FDD 2	0.46	
	UMTS FDD 4	0.22	
	UMTS FDD 5	0.40	
	LTE Band 2	0.47	
	LTE Band 5	0.25	
	LTE Band 7	0.10	
	LTE Band 12	0.21	
	LTE Band 66	0.21	
	LTE Band 71	0.17	
	WLAN 2.4 GHz	0.76	DTS
	WLAN 5GHz	0.10	UNII
Hotspot	GSM 850	0.46	PCE
	PCS 1900	0.65	
	UMTS FDD 2	1.08	
	UMTS FDD 4	**1.12**	
	UMTS FDD 5	0.46	
	LTE Band 2	0.83	
	LTE Band 5	0.33	
	LTE Band 7	0.79	
	LTE Band 12	0.42	
	LTE Band 66	0.80	
	LTE Band 71	0.28	
	WLAN 2.4 GHz	0.19	DTS
	WLAN 5GHz	0.61	UNII

The SAR values found for the Mobile Phone are below the maximum recommended levels of 1.6 W/kg as averaged over any 1g tissue according to the ANSI C95.1-1992.

For body operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and which provides a minimum separation distance of 10 mm between this device and the body of the user. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.

The measurement together with the test system set-up is described in annex C of this test report. A

detailed description of the equipment under test can be found in chapter 4 of this test report. The highest reported SAR value is obtained at the case of **(Table 2.1),** and the values are**: 1.12 W/kg(1g).**

Table 2.2: The sum of reported SAR values for main antenna and WiFi 2.4G

	Position	band	Main antenna	WiFi	Sum
Highest reported SAR value for Head	Right hand, Touch cheek	LTE B2	0.47	0.76	**1.23**
Highest reported SAR value for Body	Bottom 10mm	WCDMA1700	1.12	/	**1.12**

Table 2.3 The sum of reported SAR values for main antenna and WiFi 5G

	Position	band	Main antenna	WiFi	Sum
Highest reported SAR value for Head	Right hand, Touch cheek	LTE B2	0.47	0.10	**0.57**
Highest reported SAR value for Body	Rear 10mm	LTE B7	0.94	0.61	**1.55**

Table 2.4: The sum of reported SAR values for main antenna and BT

	Position	Main antenna	BT	Sum
Maximum reported SAR value for Head	Right hand, Touch cheek	0.47	0.37[1]	**0.84**
Maximum reported SAR value for Body	Bottom 10mm	1.12	/	**1.12**

[1] - Estimated SAR for Bluetooth (see the table 13.4)

3 Client Information

3.1 Applicant Information

Company Name:	Samsung Electronics. Co., Ltd.
Address/Post:	R5, A Tower 22 Floor A-1,(Maetan dong) 129,Samsung-ro,Yeongtong-gu, Suwon-Si, Gyeonggi-do 16677, Korea
Contact Person:	JP KIM
Contact Email:	jp426.kim@samsung.com
Telephone:	+82-10-4376-0326

3.2 Manufacturer Information

Company Name:	Samsung Electronics. Co., Ltd.
Address/Post:	R5, A Tower 22 Floor A-1,(Maetan dong) 129,Samsung-ro,Yeongtong-gu, Suwon-Si, Gyeonggi-do 16677, Korea
Contact Person:	JP KIM
Contact Email:	jp426.kim@samsung.com
Telephone:	+82-10-4376-0326

4 Equipment Under Test (EUT) and Ancillary Equipment (AE)

4.1 About EUT

Description:	Mobile phone
Model name:	SM-A015V
Operating mode(s):	GSM850/900/1800/1900,WCDMA850/1700/1900 LTE Band 2/4/5/7/12/66/71, BT, Wi-Fi(2.4G/5G)
Tested Tx Frequency:	825 – 848.8 MHz (GSM 850)
	1850.2 – 1910 MHz (GSM 1900)
	826.4–846.6 MHz (WCDMA 850 Band V)
	1710 – 1755 MHz (WCDMA 1700 Band IV)
	1850–1910 MHz (WCDMA1900 Band II)
	1860 – 1900 MHz (LTE Band 2)
	824 – 849 MHz (LTE Band 5)
	2502.5 – 2567.5 MHz (LTE Band 7)
	699 – 716 MHz (LTE Band 12)
	1710.7 – 1779.3 MHz (LTE Band 66)
	665.5– 695.5 MHz (LTE Band 71)
	2412 – 2462 MHz (Wi-Fi 2.4G)
	5.15 – 5.35 GHz 5.725 – 5.825 GHz(Wi-Fi 5G)
GPRS/EGPRS Multislot Class:	12
GPRS capability Class:	B
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna

4.2 Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	351767110014361	REV3.0	A015T1.001 (A015T1UVE0ASJ6)
EUT2	351767110012571	REV3.0	A015T1.001 (A015T1UVE0ASJ6)
EUT3	351767110012936	REV3.0	A015T1.001 (A015T1UVE0ASJ6)
EUT4	351767110009700	REV3.0	A015T1.001 (A015T1UVE0ASJ6)
EUT5	351767110006078	REV3.0	A015T1.001 (A015T1UVE0ASJ6)
EUT6	351767110006243	REV3.0	A015T1.001 (A015T1UVE0ASJ6)
EUT7	351767110006458	REV3.0	A015T1.001 (A015T1UVE0ASJ6)
EUT8	351767110019758	REV3.0	A015T1.001 (A015T1UVE0ASJ6)
EUT9	351767110019741	REV3.0	A015T1.001 (A015T1UVE0ASJ6)
EUT10	351767110006706	REV3.0	A015T1.001 (A015T1UVE0ASJ6)
EUT11	351767110003976	REV3.0	A015T1.001 (A015T1UVE0ASJ6)

*EUT ID: is used to identify the test sample in the lab internally.

Note: It is performed to test SAR with the EUT1-7 and conducted power with the EUT8-11.

4.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Secondary Li-ion Battery	QL1695	/	Ningde Amperex Technology Limited
AE2	Secondary Li-ion Battery	QL1695	/	SCUD(Fujian) Electronics Co., Ltd.
AE3	Headset	EHS61ASFWE	/	DONGGUAN YOUNGBO ELECTRONICS CO.,LTD
AE4	Headset	EHS61ASFWE	/	CRESYN VIETNAM CO.,LTD.

*AE ID: is used to identify the test sample in the lab internally.

5 TEST METHODOLOGY

5.1 Applicable Limit Regulations

ANSI C95.1–1992:IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

5.2 Applicable Measurement Standards

IEEE 1528–2013: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

KDB447498 D01: General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

KDB648474 D04 Handset SAR v01r03: SAR Evaluation Considerations for Wireless Handsets.

KDB941225 D01 SAR test for 3G devices v03r01: SAR Measurement Procedures for 3G Devices

KDB941225 D05 SAR for LTE Devices v02r05: SAR Evaluation Considerations for LTE Devices

KDB941225 D06 Hotspot Mode SAR v02r01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

KDB248227 D01 802.11 Wi-Fi SAR v02r02: SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS

KDB865664 D01SAR measurement 100 MHz to 6 GHz v01r04: SAR Measurement Requirements for 100 MHz to 6 GHz.

KDB865664 D02RF Exposure Reporting v01r02: RF Exposure Compliance Reporting and Documentation Considerations

6 Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = c\left(\frac{\delta T}{\delta t}\right)$$

Where: C is the specific head capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

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

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

7 Tissue Simulating Liquids

7.1 Targets for tissue simulating liquid

Table 7.1: Targets for tissue simulating liquid

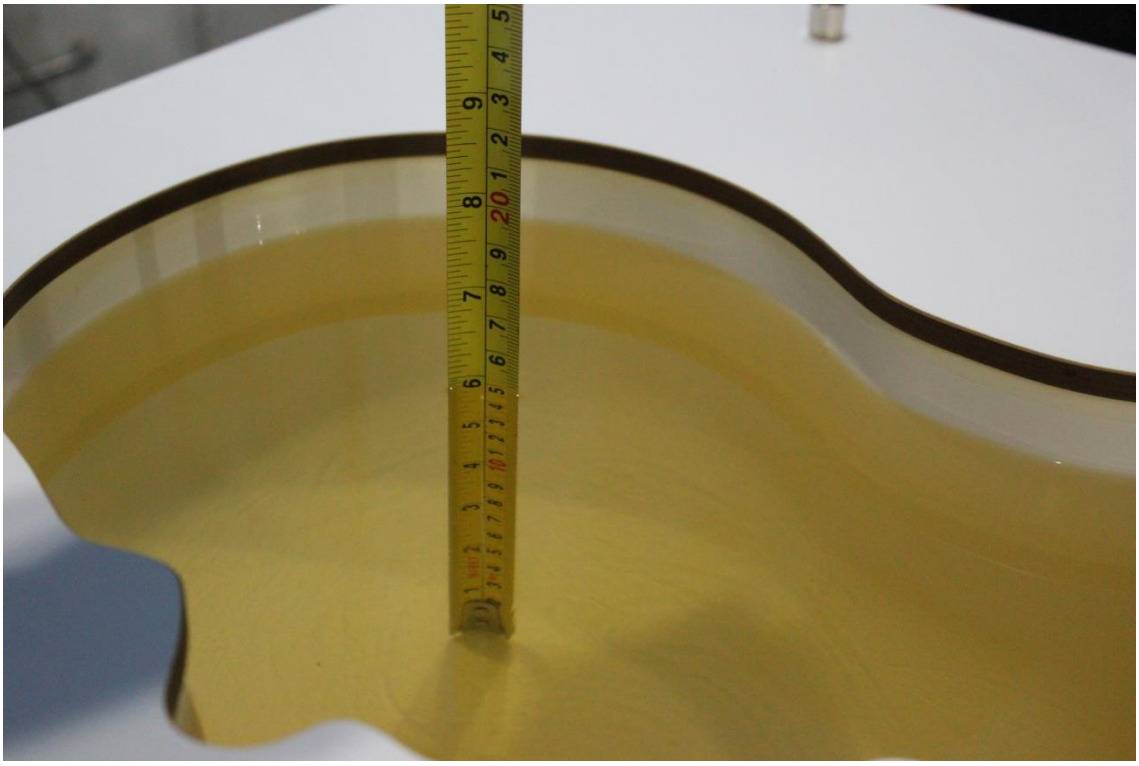
Frequency(MHz)	Liquid Type	Conductivity(σ)	± 5% Range	Permittivity(ε)	± 5% Range
750	Head	0.89	0.85～0.93	41.94	39.8～44.0
835	Head	0.90	0.86～0.95	41.5	39.4～43.6
1750	Head	1.37	1.30～1.44	40.08	38.1～42.1
1900	Head	1.40	1.33～1.47	40.0	38.0～42.0
2450	Head	1.80	1.71～1.89	39.2	37.2～41.2
2600	Head	1.96	1.86～2.06	39.01	37.06～40.96
5250	Head	4.71	4.47～4.95	35.93	34.13～37.73
5600	Head	5.07	4.82～5.32	35.53	33.8～37.3
5750	Head	5.22	4.96～5.48	35.36	33.59～37.13

7.2 Dielectric Performance

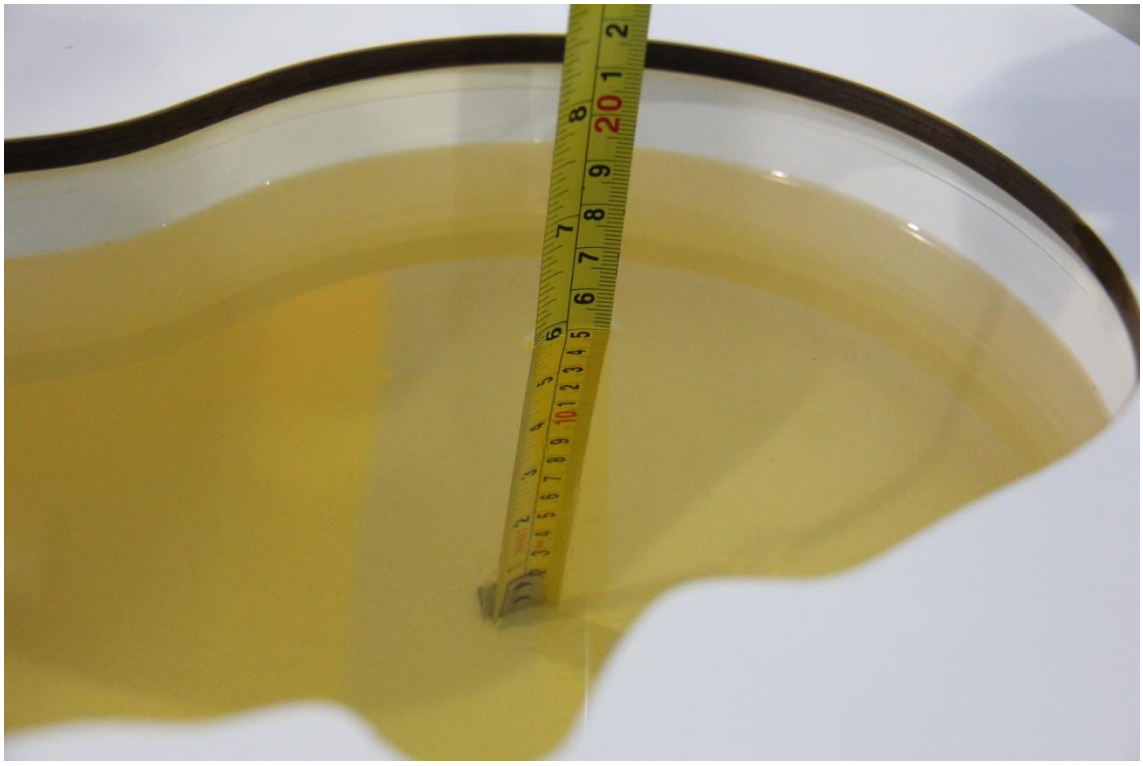
Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2020/1/2	Head	750 MHz	42.22	0.67	0.881	-1.01
2020/1/3	Head	835 MHz	42.29	1.90	0.889	-1.22
2020/1/4	Head	1750 MHz	40.85	1.92	1.358	-0.88
2020/1/5	Head	1900 MHz	40.17	0.43	1.418	1.29
2020/1/6	Head	2450 MHz	39.01	-0.48	1.797	-0.17
2020/1/7	Head	2600 MHz	38.96	-0.13	1.985	1.28
2020/1/8	Head	5250 MHz	35.52	-1.14	4.685	-0.53
2020/1/9	Head	5600 MHz	35.74	0.59	5.019	-1.01
2020/1/10	Head	5750 MHz	35.92	1.58	5.161	-1.13

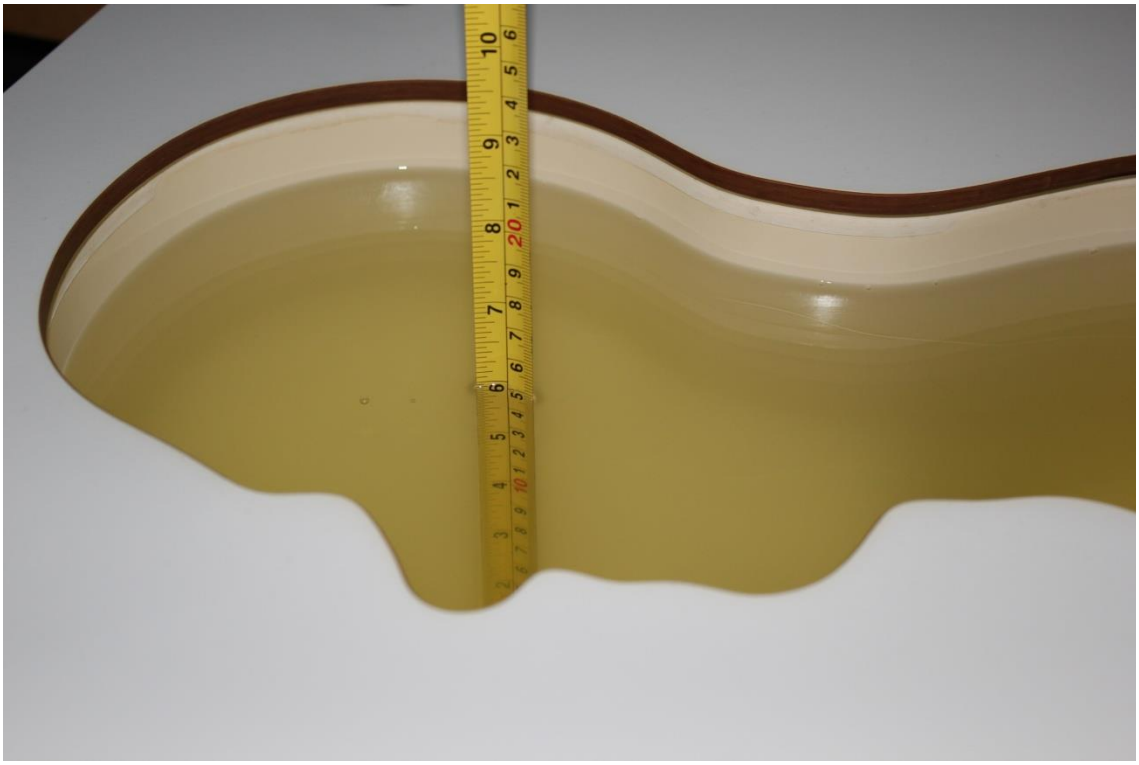
Note: The liquid temperature is 22.0℃



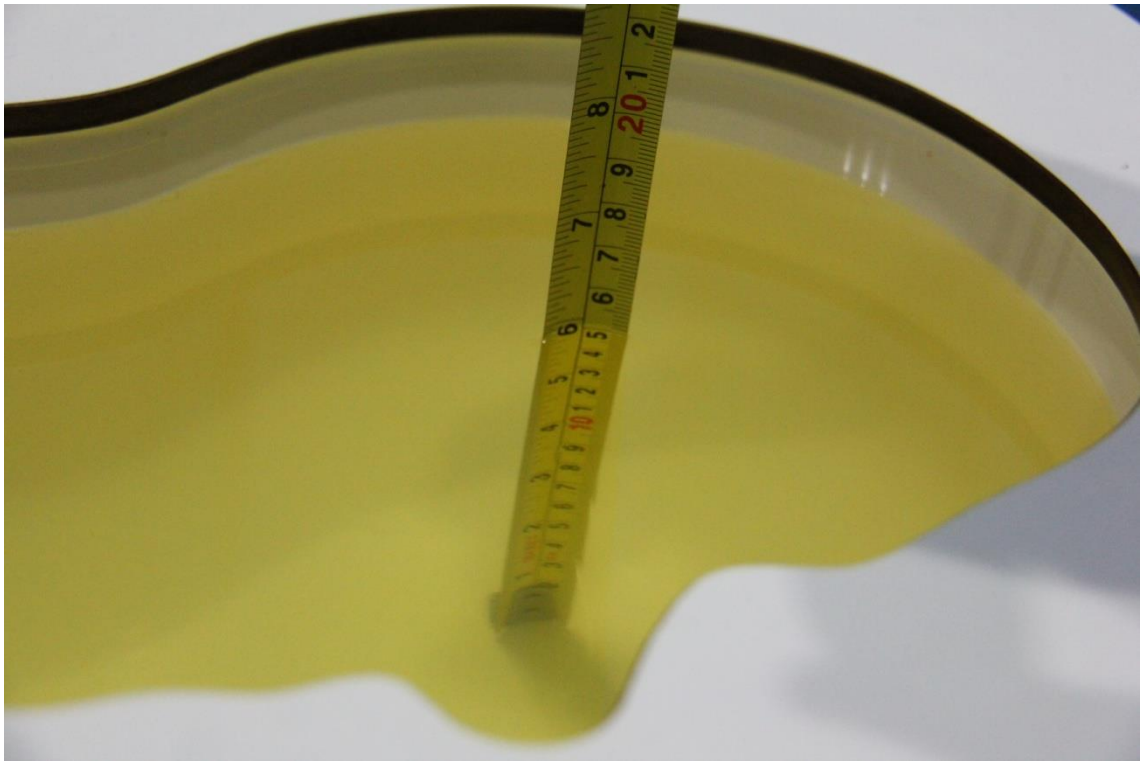
Picture 7-1 Liquid depth in the Head Phantom (750MHz)



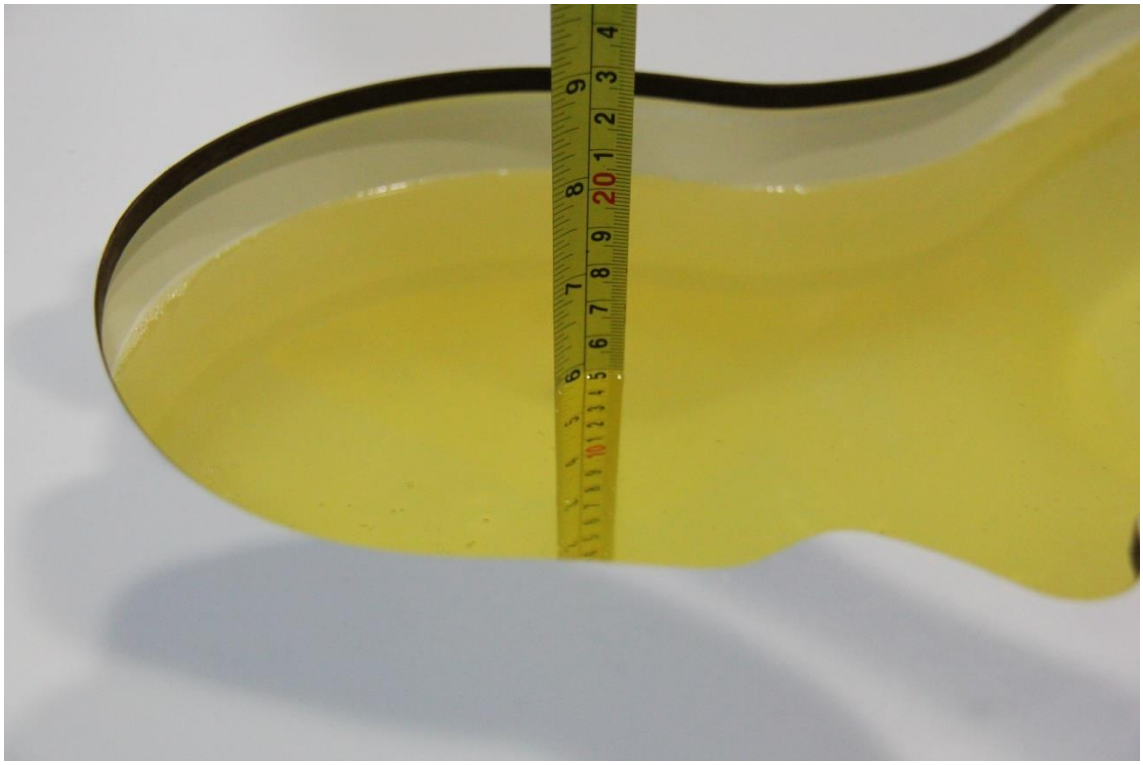
Picture 7-2 Liquid depth in the Head Phantom (835 MHz)



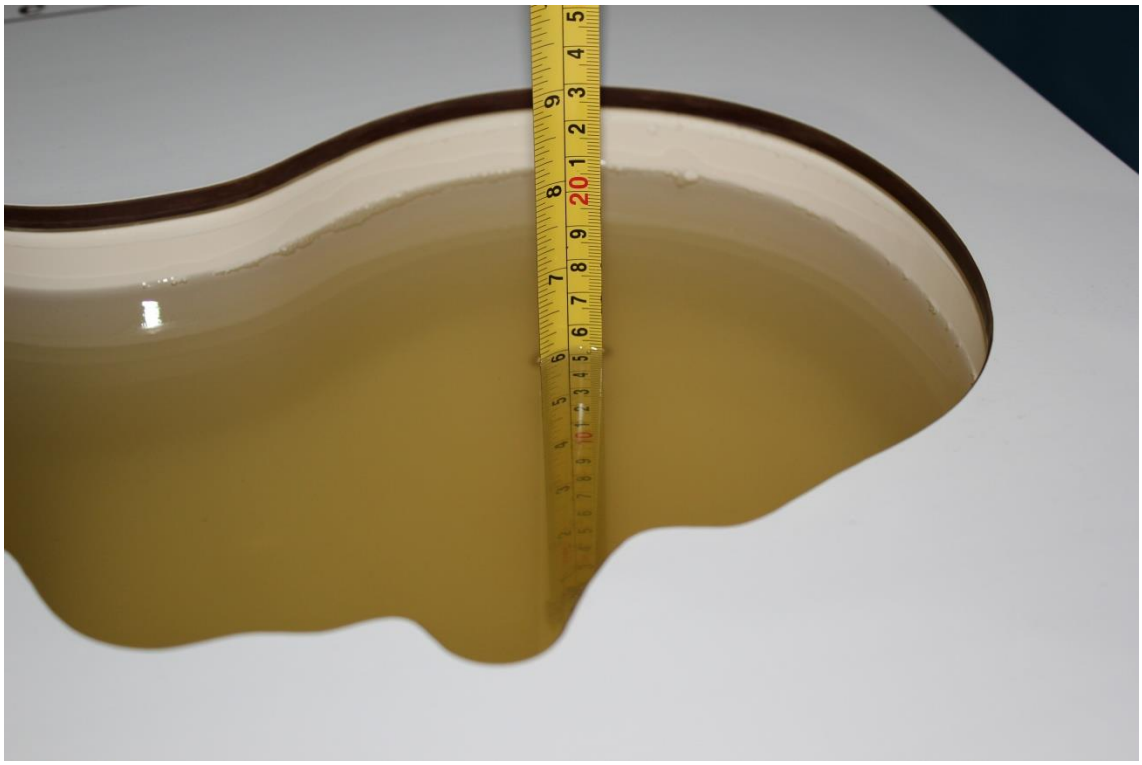
Picture 7-3 Liquid depth in the Head Phantom (1750 MHz)



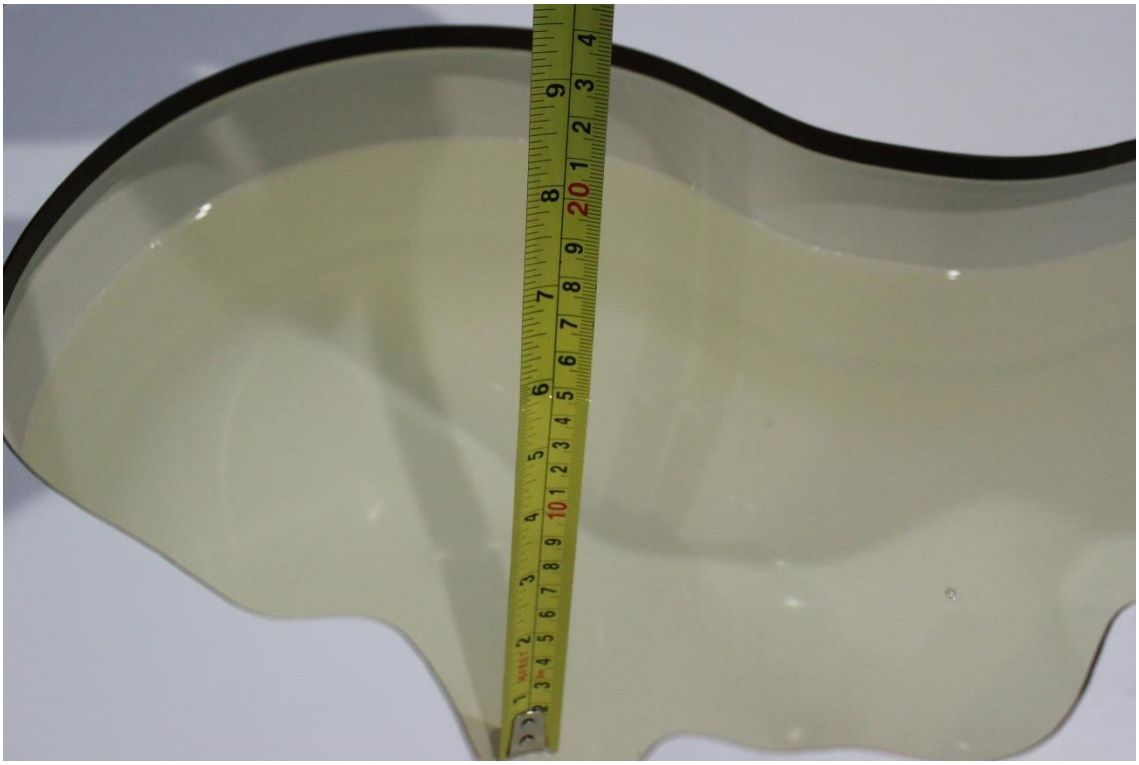
Picture 7-4 Liquid depth in the Head Phantom (1900 MHz)



Picture 7-5 Liquid depth in the Head Phantom (2450MHz)



Picture 7-6 Liquid depth in the Head Phantom (2600 MHz)

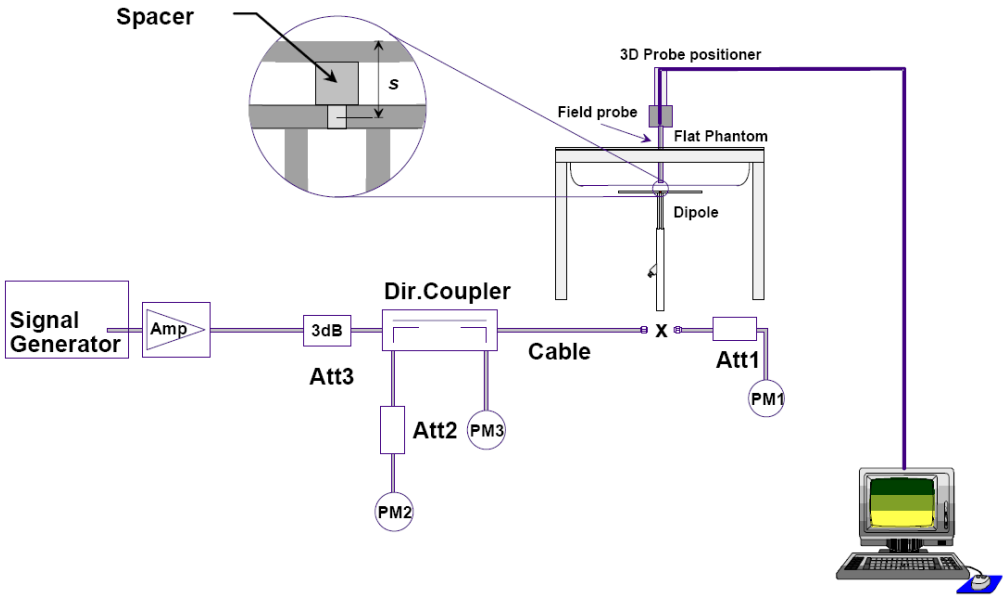


Picture 7-7 Liquid depth in the Head Phantom (5GHz)

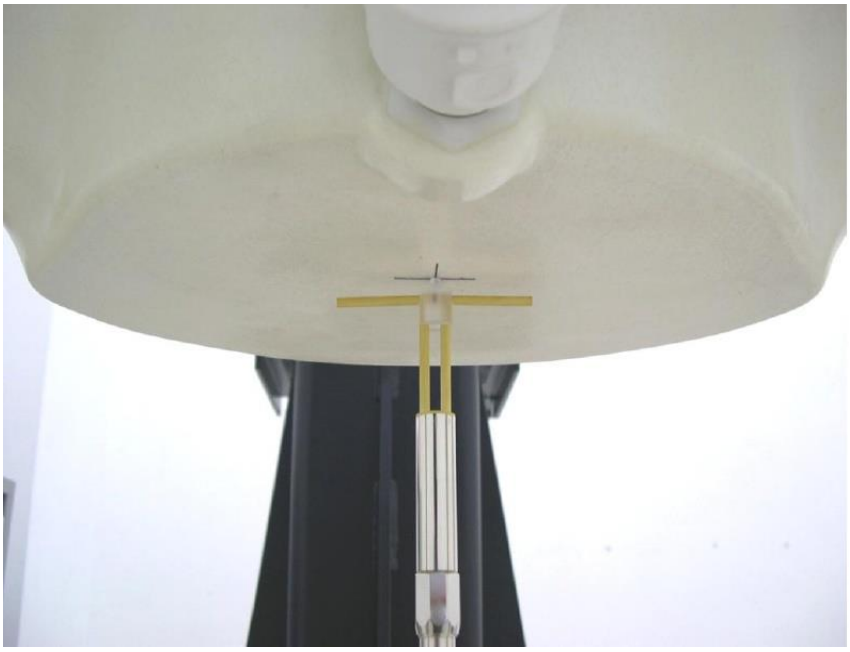
8 System verification

8.1 System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:



Picture 8.1 System Setup for System Evaluation



Picture 8.2 Photo of Dipole Setup

8.2 System Verification

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device.

The system verification results are required that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR. The details are presented in annex B.

Table 8.1: System Verification of Head

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value(W/kg)		Deviation	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2020/1/2	750 MHz	5.57	8.57	5.48	8.6	-1.62%	0.35%
2020/1/3	835 MHz	6.29	9.70	6.28	9.8	-0.16%	1.03%
2020/1/4	1750 MHz	19.3	36.6	19.16	36.76	-0.73%	0.44%
2020/1/5	1900 MHz	20.8	39.7	20.6	39.72	-0.96%	0.05%
2020/1/6	2450 MHz	24.2	51.6	23.76	52	-1.82%	0.78%
2020/1/7	2600 MHz	25.1	55.8	24.64	56.28	-1.83%	0.86%
2020/1/8	5250 MHz	23.2	80.4	23.0	80.1	-0.86%	-0.40%
2020/1/9	5600 MHz	24.1	84.5	23.9	84.2	-0.91%	-0.40%
2020/1/10	5750 MHz	23.0	80.4	23.0	80.0	0.00%	-0.55%

9 Measurement Procedures

9.1 Tests to be performed

In order to determine the highest value of the peak spatial-average SAR of a handset, all device positions, configurations and operational modes shall be tested for each frequency band according to steps 1 to 3 below. A flowchart of the test process is shown in picture 9.1.

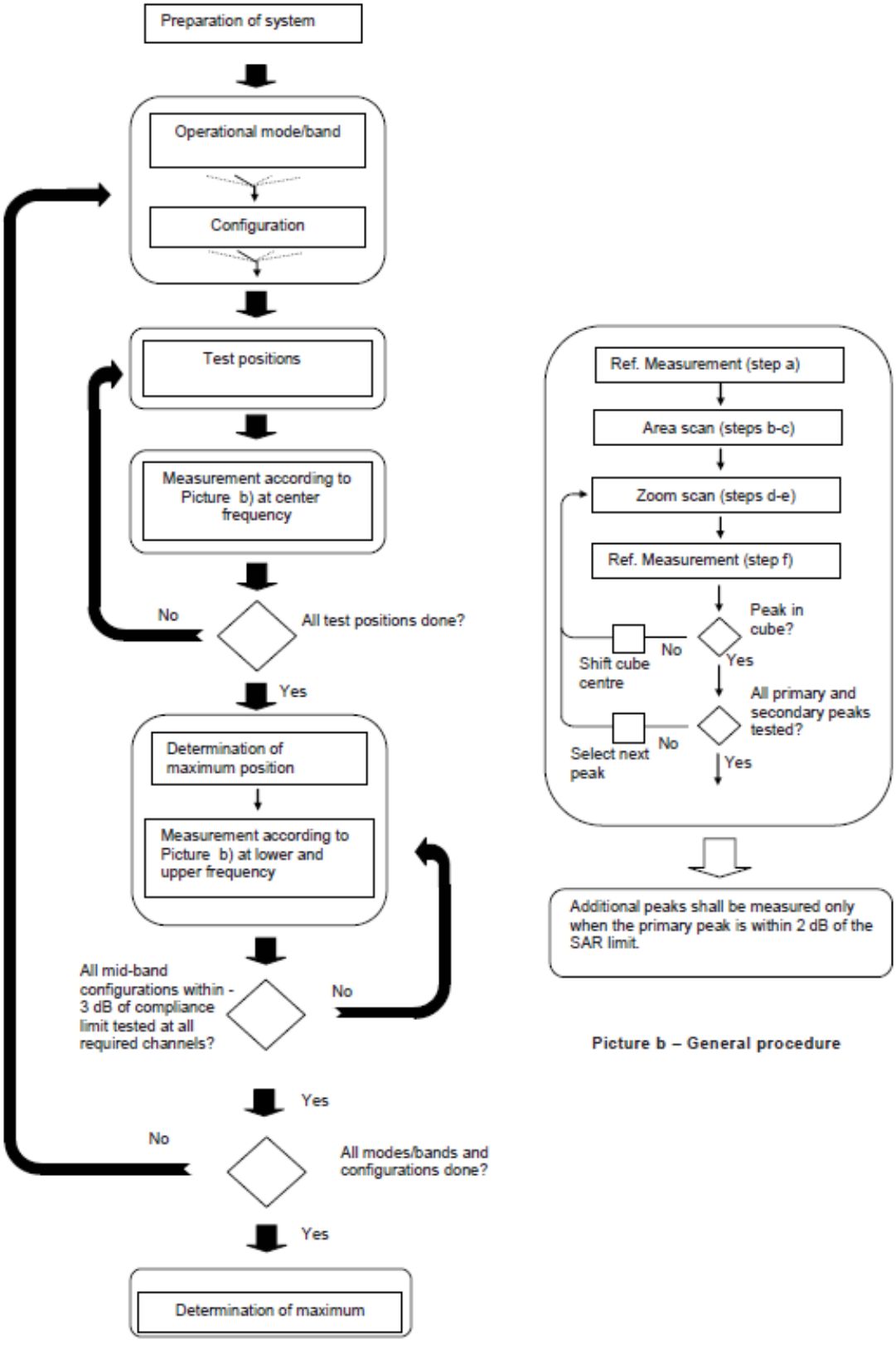
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

a) all device positions (cheek and tilt, for both left and right sides of the SAM phantom, as described in annex D),
b) all configurations for each device position in a), e.g., antenna extended and retracted, and
c) all operational modes, e.g., analogue and digital, for each device position in a) and configuration in b) in each frequency band.

If more than three frequencies need to be tested according to 11.1 (i.e., $N_c > 3$), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1,perform all tests described in 9.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

Step 3: Examine all data to determine the highest value of the peak spatial-average SAR found in Steps 1 to 2.



Picture a – Tests to be performed

Picture b – General procedure

Picture 9.1Block diagram of the tests to be performed

9.2 General Measurement Procedure

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements and fully documented in SAR reports to qualify for TCB approval. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std 1528-2003. The results should be documented as part of the system validation records and may be requested to support test results when all the measurement parameters in the following table are not satisfied.

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

9.3 WCDMA Measurement Procedures for SAR

The following procedures are applicable to WCDMA handsets operating under 3GPP Release99, Release 5 and Release 6. The default test configuration is to measure SAR with an established radio link between the DUT and a communication test set using a 12.2kbps RMC (reference measurement channel) configured in Test Loop Mode 1. SAR is selectively confirmed for other physical channel configurations (DPCCH & $DPDCH_n$), HSDPA and HSPA (HSUPA/HSDPA) modes according to output power, exposure conditions and device operating capabilities. Both uplink and downlink should be configured with the same RMC or AMR, when required. SAR for Release 5 HSDPA and Release 6 HSPA are measured using the applicable FRC (fixed reference channel) and E-DCH reference channel configurations. Maximum output power is verified according to applicable versions of 3GPP TS 34.121 and SAR must be measured according to these maximum output conditions. When Maximum Power Reduction (MPR) is not implemented according to Cubic Metric (CM) requirements for Release 6 HSPA, the following procedures do not apply.

For Release 5 HSDPA Data Devices:

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}	CM/dB
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15	15/15	64	12/15	24/25	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

For Release 6 HSPA Data Devices

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM (dB)	MPR (dB)	AG Index	E-TFCI
1	11/15	15/15	64	11/15	22/15	209/225	1039/225	4	1	1.5	1.5	20	75
2	6/15	15/15	64	6/15	12/15	12/15	12/15	4	1	1.5	1.5	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	1.5	1.5	15	92
4	2/15	15/15	64	2/15	4/15	4/15	56/75	4	1	1.5	1.5	17	71
5	15/15	15/15	64	15/15	24/15	30/15	134/15	4	1	1.5	1.5	21	81

Rel.8 DC-HSDPA (Cat 24)

SAR test exclusion for Rel.8 DC-HSDPA must satisfy the SAR test exclusion requirements of Rel.5 HSDPA. SAR test exclusion for DC-HSDPA devices is determined by power measurements according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to qualify for SAR test exclusion.

9.4 SAR Measurement for LTE

SAR tests for LTE are performed with a base station simulator, Rohde & Rchwarz CMW500. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. All powers were measured with the CMW 500.

It is performed for conducted power and SAR based on the KDB941225 D05.

SAR is evaluated separately according to the following procedures for the different test positions in each exposure condition – head, body, body-worn accessories and other use conditions. The procedures in the following subsections are applied separately to test each LTE frequency band.

1) QPSK with 1 RB allocation
   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 among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.
2) QPSK with 50% RB allocation
   The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.
3) QPSK with 100% RB allocation
   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 in 1) and 2) 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.

9.5 Bluetooth & Wi-Fi Measurement Procedures for SAR

Normal network operating configurations are not suitable for measuring the SAR of 802.11 transmitters in general. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure that the results are consistent and reliable.

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in a test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

9.6 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in section14 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

10 Area Scan Based 1-g SAR

10.1 Requirement of KDB

According to the KDB447498 D01, when the implementation is based the specific polynomial fit algorithm as presented at the 29th Bioelectromagnetics Society meeting (2007) and the estimated 1-gSAR is ≤ 1.2 W/kg, a zoom scan measurement is not required provided it is also not needed for any other purpose; for example, if the peak SAR location required for simultaneous transmission SAR test exclusion can be determined accurately by the SAR system or manually to discriminate between distinctive peaks and scattered noisy SAR distributions from area scans.

There must not be any warning or alert messages due to various measurement concerns identified by the SAR system; for example, noise in measurements, peaks too close to scan boundary, peaks are too sharp, spatial resolution and uncertainty issues etc. The SAR system verification must also demonstrate that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR (See Annex B). When all the SAR results for each exposure condition in a frequency band and wireless mode are based on estimated 1-g SAR, the 1-g SAR for the highest SAR configuration must be determined by a zoom scan.

10.2 Fast SAR Algorithms

The approach is based on the area scan measurement applying a frequency dependent attenuation parameter. This attenuation parameter was empirically determined by analyzing a large number of phones. The MOTOROLA FAST SAR was developed and validated by the MOTOROLA Research Group in Ft. Lauderdale.

In the initial study, an approximation algorithm based on Linear fit was developed. The accuracy of the algorithm has been demonstrated across a broad frequency range (136-2450 MHz)and for both 1- and 10-g averaged SAR using a sample of 264 SAR measurements from 55wireless handsets. For the sample size studied, the root-mean-squared errors of the algorithm mare 1.2% and 5.8% for 1- and 10-g averaged SAR, respectively. The paper describing the algorithm in detail is expected to be published in August 2004 within the Special Issue of Transactions on MTT.

In the second step, the same research group optimized the fitting algorithm to an Polynomial fit whereby the frequency validity was extended to cover the range 30-6000MHz. Details of this study can be found in the BEMS 2007 Proceedings.

Both algorithms are implemented in DASY software.

11 Conducted Output Power

There are two sets of tune-up power, Normal power and Low power, for GSM1900, WCDMA1700/ WCDMA1900 and LTE Band2/7/66 by proximity sensor. The detail of proximity sensor is presented in annex I.

11.1 GSM Measurement result

During the process of testing, the EUT was controlled via Agilent Digital Radio Communication tester (E5515C) to ensure the maximum power transmission and proper modulation. This result contains conducted output power for the EUT. In all cases, the measured peak output power should be greater and within 5% than EMI measurement.

Table 11.1-1: The conducted power measurement results for GSM– Normal power

GSM 850	Measured Power (dBm)			Tune up	calculation	Averaged Power (dBm)		
Speech (GMSK)	251	190	128			251	190	128
1 Txslot	32.90	32.71	32.96	33.70	/	/	/	/
GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
GPRS (GMSK)	251	190	128			251	190	128
1 Txslot	32.82	32.59	32.85	33.70	-9.03	23.79	23.56	23.82
2Txslots	29.74	29.72	29.76	30.70	-6.02	23.72	23.70	23.74
3Txslots	28.45	28.27	28.44	29.20	-4.26	24.19	24.01	24.18
4Txslots	**27.61**	**27.57**	**27.57**	**28.20**	**-3.01**	**24.60**	**24.56**	**24.56**
GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	251	190	128			251	190	128
1 Txslot	32.84	32.64	32.92	33.70	-9.03	23.81	23.61	23.89
2Txslots	29.67	29.70	29.75	30.70	-6.02	23.65	23.68	23.73
3Txslots	28.39	28.25	28.43	29.20	-4.26	24.13	23.99	24.17
4Txslots	**27.56**	**27.55**	**27.56**	**28.20**	**-3.01**	**24.55**	**24.54**	**24.55**
GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	251	190	128			251	190	128
1 Txslot	27.35	26.52	26.92	27.70	-9.03	18.32	17.49	17.89
2 Txslots	23.49	24.03	23.79	24.70	-6.02	17.47	18.01	17.77
3 Txslots	21.62	21.95	22.53	22.70	-4.26	17.36	17.69	18.27
4 Txslots	21.35	22.84	21.96	22.70	-3.01	18.34	19.83	18.95
PCS1900	Measured Power (dBm)			Tune up	calculation	Averaged Power (dBm)		
Speech (GMSK)	810	661	512			810	661	512
1 Txslot	30.65	30.71	30.64	31.3	/	/	/	/
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
GPRS (GMSK)	810	661	512			810	661	512
1 Txslot	30.90	30.59	30.51	31.00	-9.03	21.87	21.56	21.48
2Txslots	27.58	27.43	27.27	28.70	-6.02	21.56	21.41	21.25
3Txslots	26.11	26.01	25.76	26.70	-4.26	21.85	21.75	21.50
4Txslots	**25.39**	**25.30**	**25.12**	**25.70**	**-3.01**	**22.38**	**22.29**	**22.11**

PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	810	661	512			810	661	512
1 Txslot	30.40	30.52	30.42	31.00	-9.03	21.37	21.49	21.39
2Txslots	27.59	27.45	27.28	28.70	-6.02	21.57	21.43	21.26
3Txslots	26.12	26.04	25.77	26.70	-4.26	21.86	21.78	21.51
4Txslots	**25.42**	**25.11**	**25.14**	**25.70**	**-3.01**	**22.41**	**22.10**	**22.13**
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	810	661	512			810	661	512
1 Txslot	26.71	26.62	26.52	27.20	-9.03	17.68	17.59	17.49
2 Txslots	24.64	24.41	24.46	25.20	-6.02	18.62	18.39	18.44
3Txslots	22.66	22.50	22.87	23.20	-4.26	18.40	18.24	18.61
4 Txslots	21.30	21.20	21.08	22.20	-3.01	18.29	18.19	18.07

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

According to the conducted power as above, the body measurements are performed with 4Txslots for GSM850 and GSM1900.

Table 11.1-2: The conducted power measurement results for GSM- Low power

PCS1900	Measured Power (dBm)			Tune up	calculation	Averaged Power (dBm)		
Speech (GMSK)	810	661	512			810	661	512
1 Txslot	27.26	27.25	27.08	28.00	/	/	/	/
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
GPRS (GMSK)	810	661	512			810	661	512
1 Txslot	27.39	27.44	27.24	28.00	-9.03	18.36	18.41	18.21
2Txslots	24.41	24.34	24.24	25.00	-6.02	18.39	18.32	18.22
3Txslots	22.74	22.69	22.53	23.50	-4.26	18.48	18.43	18.27
4Txslots	**21.91**	**21.95**	**22.00**	**23.00**	**-3.01**	**18.90**	**18.94**	**18.99**
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	810	661	512			810	661	512
1 Txslot	27.31	27.36	27.17	28.00	-9.03	18.28	18.33	18.14
2Txslots	24.34	24.28	24.18	25.00	-6.02	18.32	18.26	18.16
3Txslots	22.70	22.63	22.49	23.50	-4.26	18.44	18.37	18.23
4Txslots	**21.87**	**21.90**	**21.97**	**23.00**	**-3.01**	**18.86**	**18.89**	**18.96**
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	810	661	512			810	661	512
1 Txslot	23.89	24.05	23.80	25.00	-9.03	14.86	15.02	14.77
2 Txslots	21.56	21.40	21.35	22.00	-6.02	15.54	15.38	15.33
3Txslots	20.03	20.32	19.83	21.00	-4.26	15.77	16.06	15.57
4 Txslots	18.82	18.91	18.78	19.50	-3.01	15.81	15.90	15.77

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

According to the conducted power as above, the body measurements are performed with 4Txslots for GSM1900.

11.2 WCDMA Measurement result

Table 11.2-1: The conducted Power for WCDMA- Normal power

Item	band	FDDV result			
	ARFCN	4233 (846.6MHz)	4182 (836.4MHz)	4132 (826.4MHz)	Tune up
WCDMA	\	24.04	23.90	24.03	24.70
HSUPA	1	22.79	22.72	22.68	23.60
	2	21.66	21.72	21.74	22.60
	3	21.83	21.70	21.73	22.50
	4	22.23	22.09	22.04	22.90
	5	22.81	22.77	22.86	23.70
DC-HSDPA	1	22.01	22.02	22.08	23.00
	2	22.02	22.00	22.07	23.00
	3	21.64	21.61	21.78	23.00
	4	21.58	21.53	21.70	23.00
Item	band	FDDIV result			
	ARFCN	1513 (1752.6MHz)	1412 (1732.4MHz)	1312 (1712.4MHz)	
WCDMA	\	23.25	23.33	23.17	23.50
HSUPA	1	21.68	21.77	21.91	23.20
	2	20.94	21.09	21.16	22.70
	3	20.98	21.08	21.12	22.70
	4	21.54	21.56	21.52	23.00
	5	22.12	22.23	22.02	23.00
DC-HSDPA	1	21.35	21.51	21.47	23.00
	2	21.33	21.52	21.36	23.00
	3	20.84	20.98	20.87	22.00
	4	20.82	20.97	20.81	22.00
Item	band	FDDII result			
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)	Tune up
WCDMA	\	24.31	24.34	24.26	24.70
HSUPA	1	22.75	22.95	22.88	23.60
	2	21.91	22.25	22.28	22.60

	3	22.03	22.04	21.48	22.50
	4	22.26	22.64	22.53	22.90
	5	23.15	23.21	23.20	23.70
DC-HSDPA	1	22.51	22.43	22.46	23.00
	2	22.49	22.48	22.47	23.00
	3	21.99	21.97	22.01	23.00
	4	22.00	21.98	22.03	23.00

Table 11.2-2: The conducted Power for WCDMA- Low power

Item	band	FDDIV result			
	ARFCN	1513 (1752.6MHz)	1412 (1732.4MHz)	1312 (1712.4MHz)	
WCDMA	\	18.19	18.18	18.21	18.80
HSUPA	1	16.72	16.61	16.97	18.00
	2	16.18	16.20	16.21	17.00
	3	16.16	16.15	15.91	17.00
	4	16.17	16.70	16.58	18.00
	5	17.15	17.17	17.19	18.00
DC-HSDPA	1	16.46	16.39	16.41	18.00
	2	16.49	16.38	16.42	18.00
	3	16.01	16.13	16.07	18.00
	4	16.09	16.01	16.06	18.00
Item	band	FDDII result			
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)	Tune up
WCDMA	\	20.91	20.90	20.95	21.20
HSUPA	1	19.89	19.72	19.92	20.00
	2	18.85	18.87	18.70	19.00
	3	18.67	18.83	18.56	19.00
	4	19.30	19.08	19.23	20.00
	5	19.82	19.81	19.87	20.00
DC-HSDPA	1	19.07	19.03	19.12	21.00
	2	18.95	19.02	19.15	20.00
	3	18.61	18.63	18.75	20.00
	4	18.58	18.62	18.71	20.00

11.3 LTE Measurement result

Table 11.3-1: Maximum Power Reduction (MPR) for LTE

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]						MPR (dB)
	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	3

Table 11.3-2: The tune up for LTE- Normal power

Band	Tune up
LTE Band 2	24.2
LTE Band 5	24.2
LTE Band 7	24.2
LTE Band 12	24.2
LTE Band 66	23.7
LTE Band 71	24.2

Table 11.3-3: The tune up for LTE- Low power

Band	Tune up
LTE Band 2	21.5
LTE Band 7	21.5
LTE Band 66	19

Table 11.3-4: The conducted Power for LTE- Normal power

Band 2					
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)	64QAM Actual output power (dBm)
1.4 MHz	1RB High (5)	1909.3	23.64	22.72	21.10
		1880	23.78	23.14	21.50
		1850.7	24.07	23.02	21.39
	1RB Middle (3)	1909.3	23.87	22.81	21.18
		1880	24.01	22.40	20.79
		1850.7	24.13	23.15	21.51
	1RB Low (0)	1909.3	23.79	22.54	20.92
		1880	23.84	22.36	20.75
		1850.7	24.00	22.95	21.32
	3RB High (3)	1909.3	23.87	22.65	21.03
		1880	23.84	22.26	20.66
		1850.7	24.09	23.16	21.52
	3RB Middle (1)	1909.3	23.91	22.52	20.90
		1880	23.89	22.77	21.14
		1850.7	23.98	23.17	21.53
	3RB Low (0)	1909.3	23.72	22.66	21.04
		1880	23.78	22.92	21.29
		1850.7	23.99	23.18	21.54
	6RB (0)	1909.3	22.75	21.67	20.08
		1880	22.75	21.78	20.19
		1850.7	22.98	22.03	20.44
3 MHz	1RB High (14)	1908.5	23.55	22.70	21.08
		1880	23.87	23.20	21.56
		1851.5	24.09	23.15	21.51
	1RB Middle (7)	1908.5	23.84	22.87	21.24
		1880	23.90	23.00	21.37
		1851.5	24.20	22.67	21.05
	1RB Low (0)	1908.5	23.85	22.82	21.19
		1880	23.79	23.14	21.51
		1851.5	24.04	22.49	20.88
	8RB High (7)	1908.5	22.64	21.69	20.10
		1880	22.78	21.82	20.23
		1851.5	22.89	21.92	20.33
	8RB Middle (4)	1908.5	22.77	21.61	20.03
		1880	22.79	21.84	20.25
		1851.5	22.95	22.15	20.54
	8RB Low (0)	1908.5	22.78	21.69	20.10
		1880	22.69	21.89	20.30
		1851.5	22.94	22.19	20.59
	15RB (0)	1908.5	22.77	21.64	20.06
		1880	22.81	21.82	20.23
		1851.5	23.00	22.03	20.43

5 MHz	1RB High (24)	1907.5	23.54	22.57	20.96
		1880	23.99	22.67	21.05
		1852.5	23.68	22.49	20.88
	1RB Middle (12)	1907.5	23.86	22.73	21.11
		1880	24.19	22.34	20.73
		1852.5	24.08	22.57	20.96
	1RB Low (0)	1907.5	23.95	22.76	21.14
		1880	23.88	22.48	20.87
		1852.5	23.80	22.58	20.96
	12RB High (13)	1907.5	22.66	21.55	19.97
		1880	22.81	21.77	20.18
		1852.5	22.90	21.84	20.25
	12RB Middle (6)	1907.5	22.82	21.64	20.06
		1880	22.85	21.73	20.14
		1852.5	23.00	21.88	20.28
	12RB Low (0)	1907.5	22.82	21.75	20.17
		1880	22.81	21.58	20.00
		1852.5	23.02	21.92	20.32
	25RB (0)	1907.5	22.76	21.71	20.12
		1880	22.83	21.87	20.27
		1852.5	23.02	22.06	20.46
10 MHz	1RB High (49)	1905	23.85	22.85	21.22
		1880	23.90	22.84	21.21
		1855	24.12	22.85	21.22
	1RB Middle (24)	1905	24.00	23.11	21.48
		1880	24.15	23.16	21.52
		1855	24.16	22.43	20.81
	1RB Low (0)	1905	23.89	22.96	21.33
		1880	23.96	23.02	21.39
		1855	23.97	22.46	20.85
	25RB High (25)	1905	22.76	21.92	20.33
		1880	22.91	21.85	20.26
		1855	23.03	21.93	20.33
	25RB Middle (12)	1905	23.03	22.11	20.51
		1880	22.93	21.94	20.35
		1855	22.94	22.06	20.46
	25RB Low (0)	1905	22.94	22.05	20.45
		1880	22.82	21.79	20.20
		1855	22.96	21.89	20.30
	50RB (0)	1905	22.83	21.88	20.29
		1880	22.78	21.74	20.16
		1855	22.89	21.78	20.19
15 MHz	1RB High (74)	1902.5	23.84	23.04	21.40
		1880	23.64	22.56	20.94
		1857.5	23.92	23.15	21.51
	1RB Middle (37)	1902.5	24.19	23.08	21.44
		1880	23.91	23.18	21.54
		1857.5	24.00	23.11	21.48

	1RB Low (0)	1902.5	24.12	23.12	21.48
		1880	23.86	23.18	21.55
		1857.5	24.01	23.15	21.51
	36RB High (38)	1902.5	22.73	21.81	20.22
		1880	22.88	21.93	20.33
		1857.5	22.84	21.88	20.29
	36RB Middle (19)	1902.5	22.90	22.01	20.42
		1880	22.86	21.83	20.24
		1857.5	22.88	21.96	20.36
	36RB Low (0)	1902.5	22.90	21.86	20.27
		1880	22.84	21.86	20.27
		1857.5	22.87	21.77	20.18
	75RB (0)	1902.5	22.92	21.84	20.25
		1880	22.81	21.79	20.20
		1857.5	22.91	21.86	20.27
20 MHz	1RB High (99)	1900	23.58	22.67	21.05
		1880	23.59	22.61	21.02
		1860	23.61	22.36	21.56
	1RB Middle (50)	1900	24.06	22.90	21.47
		1880	23.95	22.61	21.23
		1860	24.02	23.01	21.21
	1RB Low (0)	1900	23.96	22.95	21.14
		1880	23.55	22.40	21.07
		1860	23.80	22.40	21.20
	50RB High (50)	1900	22.97	22.04	20.49
		1880	22.71	21.77	20.24
		1860	22.89	21.91	20.36
	50RB Middle (25)	1900	22.93	22.04	20.48
		1880	22.74	21.76	20.29
		1860	22.93	21.83	20.31
	50RB Low (0)	1900	22.92	21.77	20.43
		1880	22.73	21.61	20.17
		1860	22.90	21.71	20.29
	100RB (0)	1900	22.92	21.85	20.63
		1880	22.79	21.67	20.35
		1860	22.83	21.85	20.41

Band 5					
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)	64QAM Actual output power (dBm)
1.4 MHz	1RB High (5)	848.3	23.31	22.36	21.55
		836.5	23.33	22.63	21.80
		824.7	23.44	22.23	21.42
	1RB Middle (3)	848.3	23.34	22.44	21.62
		836.5	23.33	22.61	21.79
		824.7	23.42	22.84	22.01
	1RB Low (0)	848.3	23.31	22.28	21.47
		836.5	23.50	22.58	21.76
		824.7	23.51	22.37	21.56
	3RB High (3)	848.3	23.42	22.48	21.66
		836.5	23.27	22.37	21.56
		824.7	23.48	22.64	21.81
	3RB Middle (1)	848.3	23.40	22.50	21.69
		836.5	23.57	22.50	21.69
		824.7	23.52	22.66	21.84
	3RB Low (0)	848.3	23.36	22.56	21.74
		836.5	23.43	22.30	21.49
		824.7	23.53	22.57	21.75
	6RB (0)	848.3	22.40	21.36	20.58
		836.5	22.47	21.55	20.77
		824.7	22.48	21.26	20.48
3 MHz	1RB High (14)	847.5	23.31	22.07	21.27
		836.5	23.25	22.00	21.20
		825.5	23.41	22.57	21.75
	1RB Middle (7)	847.5	23.34	22.60	21.78
		836.5	23.54	22.68	21.86
		825.5	23.50	22.56	21.74
	1RB Low (0)	847.5	23.36	22.43	21.61
		836.5	23.43	22.50	21.68
		825.5	23.37	22.42	21.61
	8RB High (7)	847.5	22.38	21.36	20.58
		836.5	22.31	21.32	20.55
		825.5	22.52	21.42	20.64
	8RB Middle (4)	847.5	22.40	21.26	20.49
		836.5	22.33	21.46	20.68
		825.5	22.51	21.52	20.74
	8RB Low (0)	847.5	22.37	21.49	20.71
		836.5	22.35	21.37	20.59
		825.5	22.50	21.60	20.81
	15RB (0)	847.5	22.38	21.43	20.65
		836.5	22.33	21.40	20.63
		825.5	22.49	21.49	20.71
5 MHz	1RB	846.5	23.19	21.85	21.06

	High (24)	836.5	23.17	21.79	21.00
		826.5	23.33	22.39	21.58
	1RB Middle (12)	846.5	23.47	22.44	21.63
		836.5	23.33	22.01	21.22
		826.5	23.68	22.43	21.61
	1RB Low (0)	846.5	23.19	21.67	20.88
		836.5	23.16	21.84	21.04
		826.5	23.19	22.19	21.38
	12RB High (13)	846.5	22.31	21.26	20.49
		836.5	22.36	21.27	20.50
		826.5	22.52	21.42	20.65
	12RB Middle (6)	846.5	22.37	21.43	20.65
		836.5	22.41	21.42	20.64
		826.5	22.58	21.56	20.78
	12RB Low (0)	846.5	22.37	21.43	20.65
		836.5	22.31	21.39	20.61
		826.5	22.44	21.23	20.46
	25RB (0)	846.5	22.32	21.45	20.67
		836.5	22.37	21.47	20.69
		826.5	22.45	21.36	20.58
10 MHz	1RB High (49)	844.0	23.22	22.05	21.25
		836.5	23.17	22.30	21.23
		829.0	23.77	22.12	21.19
	1RB Middle (24)	844.0	23.71	22.70	21.62
		836.5	23.63	22.64	21.65
		829.0	23.98	22.12	21.78
	1RB Low (0)	844.0	23.30	22.02	21.26
		836.5	23.38	22.33	21.35
		829.0	23.85	22.25	21.28
	25RB High (25)	844.0	22.34	21.54	20.81
		836.5	22.33	21.37	20.72
		829.0	22.44	21.39	20.60
	25RB Middle (12)	844.0	22.38	21.51	20.87
		836.5	22.47	21.43	20.87
		829.0	22.66	21.72	20.67
	25RB Low (0)	844.0	22.24	21.38	20.65
		836.5	22.39	21.27	20.61
		829.0	22.40	21.48	20.58
	50RB (0)	844.0	22.27	21.36	20.59
		836.5	22.41	21.25	20.62
		829.0	22.40	21.38	20.66

Band 7					
Bandwidth (MHz)	RB allocation	Frequency (MHz)	Actual output power (dBm)		
	RB offset		QPSK	16QAM	64QAM
5MHz	1RB_High	2567.5	23.44	22.17	21.15
		2535	23.23	22.28	21.26
		2502.5	23.81	22.62	21.59
	1RB_Middle	2567.5	23.67	22.27	21.25
		2535	23.61	22.37	21.34
		2502.5	23.96	22.94	21.89
	1RB_Low	2567.5	23.31	22.12	21.10
		2535	23.26	22.25	21.23
		2502.5	23.75	22.82	21.77
	12RB_High	2567.5	22.55	21.61	20.62
		2535	22.75	21.63	20.64
		2502.5	22.95	21.84	20.84
	12RB_Middle	2567.5	22.65	21.72	20.73
		2535	22.71	21.65	20.66
		2502.5	23.06	22.11	21.10
	12RB_Low	2567.5	22.57	21.65	20.66
		2535	22.57	21.64	20.65
		2502.5	22.95	22.01	21.00
	25RB	2567.5	22.57	21.59	20.60
		2535	22.62	21.71	20.72
		2502.5	22.96	21.84	20.84
10MHz	1RB_High	2565	23.55	22.68	21.64
		2535	23.64	22.05	21.04
		2505	23.52	22.42	21.39
	1RB_Middle	2565	23.65	23.09	22.03
		2535	23.83	22.49	21.46
		2505	24.11	22.37	21.35
	1RB_Low	2565	23.39	22.66	21.62
		2535	23.58	22.13	21.12
		2505	23.86	22.86	21.81
	25RB_High	2565	22.55	21.49	20.51
		2535	22.75	21.86	20.86
		2505	22.87	22.01	21.00
	25RB_Middle	2565	22.62	21.67	20.68
		2535	22.74	21.61	20.62
		2505	23.05	21.34	20.36
	25RB_Low	2565	22.45	21.51	20.52
		2535	22.68	21.73	20.73
		2505	22.99	22.19	21.18
	50RB	2565	22.58	21.62	20.62
		2535	22.70	21.86	20.86
		2505	22.85	21.87	20.87
15MHz	1RB_High	2562.5	23.14	22.16	21.15

		2535	23.38	23.18	22.12
		2507.5	23.49	22.68	21.64
	1RB_Middle	2562.5	23.22	22.46	21.43
		2535	23.52	23.09	22.03
		2507.5	23.71	23.09	22.04
	1RB_Low	2562.5	23.34	21.96	20.95
		2535	23.38	23.15	22.09
		2507.5	23.97	23.07	22.01
	36RB_High	2562.5	22.61	21.63	20.64
		2535	22.68	21.70	20.70
		2507.5	22.66	21.76	20.76
	36RB_Middle	2562.5	22.54	21.57	20.58
		2535	22.62	21.62	20.63
		2507.5	22.74	21.86	20.86
	36RB_Low	2562.5	22.39	21.52	20.53
		2535	22.61	21.47	20.49
		2507.5	22.93	21.94	20.94
	75RB	2562.5	22.47	21.47	20.48
		2535	22.64	21.67	20.68
		2507.5	22.69	21.71	20.72
20MHz	1RB_High	2560	23.42	22.47	21.44
		2535	23.30	22.56	21.75
		2510	23.08	21.92	22.04
	1RB_Middle	2560	23.67	22.70	21.83
		2535	23.73	22.60	21.45
		2510	23.86	22.96	22.06
	1RB_Low	2560	23.27	22.18	21.81
		2535	23.34	22.05	21.92
		2510	23.27	22.36	21.92
	50RB_High	2560	22.50	21.60	20.82
		2535	22.72	21.50	21.11
		2510	22.55	21.50	20.99
	50RB_Middle	2560	22.56	21.45	20.98
		2535	22.70	21.53	21.12
		2510	22.68	21.73	21.12
	50RB_Low	2560	22.73	21.62	20.88
		2535	22.80	21.61	21.00
		2510	22.90	21.87	20.95
	100RB	2560	22.51	21.60	20.82
		2535	22.71	21.64	21.20
		2510	22.54	21.69	21.01

Band 12					
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)	64QAM Actual output power (dBm)
1.4 MHz	1RB High (5)	715.3	23.73	22.89	21.76
		707.5	23.73	22.63	21.51
		699.7	23.63	22.46	21.34
	1RB Middle (3)	715.3	24.08	22.89	21.76
		707.5	23.86	22.83	21.70
		699.7	24.02	22.54	21.42
	1RB Low (0)	715.3	23.88	22.62	21.50
		707.5	23.83	22.72	21.60
		699.7	24.05	22.63	21.51
	3RB High (3)	715.3	23.64	23.17	22.04
		707.5	23.81	22.47	21.35
		699.7	23.91	22.75	21.63
	3RB Middle (1)	715.3	23.91	22.97	21.84
		707.5	23.79	22.73	21.60
		699.7	23.97	22.70	21.58
	3RB Low (0)	715.3	23.80	23.08	21.94
		707.5	23.74	22.76	21.63
		699.7	23.82	22.68	21.56
	6RB (0)	715.3	22.72	21.78	20.68
		707.5	22.81	21.92	20.81
		699.7	22.81	21.53	20.44
3 MHz	1RB High (14)	714.5	23.73	22.95	21.82
		707.5	23.83	22.61	21.49
		700.5	23.90	23.17	22.03
	1RB Middle (7)	714.5	23.98	22.61	21.49
		707.5	24.08	22.79	21.67
		700.5	23.94	23.03	21.89
	1RB Low (0)	714.5	23.85	22.53	21.41
		707.5	23.85	22.91	21.78
		700.5	23.86	22.59	21.47
	8RB High (7)	714.5	22.81	21.75	20.65
		707.5	22.75	21.67	20.57
		700.5	22.85	21.82	20.72
	8RB Middle (4)	714.5	22.64	21.45	20.36
		707.5	22.83	21.99	20.89
		700.5	22.74	21.96	20.85
	8RB Low (0)	714.5	22.72	21.44	20.35
		707.5	22.87	21.95	20.84
		700.5	22.75	21.92	20.81
	15RB (0)	714.5	22.71	21.68	20.58
		707.5	22.75	21.84	20.73
		700.5	22.75	21.84	20.74
5 MHz	1RB High (24)	713.5	23.65	22.17	21.56
		707.5	23.50	22.46	21.84

		701.5	23.60	22.57	21.95
	1RB Middle (12)	713.5	24.07	22.17	21.56
		707.5	24.05	22.66	22.04
		701.5	24.01	22.40	21.79
	1RB Low (0)	713.5	23.62	22.28	21.67
		707.5	23.76	22.30	21.69
		701.5	23.87	22.36	21.74
	12RB High (13)	713.5	22.59	21.66	21.06
		707.5	22.75	21.71	21.11
		701.5	22.74	21.68	21.09
	12RB Middle (6)	713.5	22.65	21.71	21.12
		707.5	22.79	21.83	20.73
		701.5	22.73	21.78	20.68
	12RB Low (0)	713.5	22.74	21.73	20.63
		707.5	22.68	21.71	20.62
		701.5	22.70	21.84	20.74
	25RB (0)	713.5	22.61	21.81	20.71
		707.5	22.65	21.71	21.11
		701.5	22.72	21.75	21.15
10 MHz	1RB High (49)	711	23.54	22.54	21.92
		707.5	23.67	22.82	22.18
		704	23.68	22.33	21.78
	1RB Middle (24)	711	24.11	23.01	21.96
		707.5	23.92	23.03	22.10
		704	23.95	22.53	22.04
	1RB Low (0)	711	23.88	22.94	21.82
		707.5	23.57	22.65	21.72
		704	23.69	22.37	21.81
	25RB High (25)	711	22.61	21.67	21.06
		707.5	22.82	21.93	20.92
		704	22.83	22.03	21.14
	25RB Middle (12)	711	22.96	22.08	20.77
		707.5	22.85	21.88	21.11
		704	22.87	21.88	21.15
	25RB Low (0)	711	22.79	22.12	21.03
		707.5	22.65	21.78	21.04
		704	22.57	21.50	20.78
	50RB (0)	711	22.70	21.79	21.07
		707.5	22.64	21.72	21.05
		704	22.80	21.89	21.04

Band 66					
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)	64QAM Actual output power (dBm)
1.4 MHz	1RB	1779.3	23.15	22.05	20.84

	High (5)	1745	23.20	22.08	20.87
		1710.7	23.06	21.84	20.63
	1RB Middle (3)	1779.3	23.32	22.12	20.91
		1745	23.42	22.26	21.05
		1710.7	23.05	21.99	20.78
	1RB Low (0)	1779.3	23.32	22.07	20.86
		1745	23.20	22.34	21.13
		1710.7	23.00	21.88	20.67
	3RB High (3)	1779.3	23.20	21.96	20.75
		1745	23.27	21.66	20.46
		1710.7	22.98	21.96	20.75
	3RB Middle (1)	1779.3	23.39	22.53	21.31
		1745	23.31	22.39	21.17
		1710.7	22.87	22.07	20.85
	3RB Low (0)	1779.3	23.22	22.22	21.01
		1745	23.19	22.45	21.23
		1710.7	22.81	21.86	20.65
	6RB (0)	1779.3	22.30	21.54	20.33
		1745	22.35	21.26	20.05
		1710.7	22.14	21.12	19.92
3 MHz	1RB High (14)	1778.5	22.08	22.26	21.04
		1745	23.32	22.29	21.07
		1711.5	22.84	21.99	20.77
	1RB Middle (7)	1778.5	23.24	22.58	21.37
		1745	23.25	22.31	21.09
		1711.5	22.79	21.97	20.76
	1RB Low (0)	1778.5	23.07	22.01	20.80
		1745	23.28	22.27	21.06
		1711.5	22.95	22.01	20.80
	8RB High (7)	1778.5	22.12	21.19	19.98
		1745	22.32	21.46	20.25
		1711.5	22.01	20.77	19.57
	8RB Middle (4)	1778.5	22.12	20.98	19.78
		1745	22.37	21.52	20.32
		1711.5	22.01	20.77	19.57
	8RB Low (0)	1778.5	22.17	21.27	20.06
		1745	22.34	21.51	20.31
		1711.5	22.02	20.75	19.55
	15RB (0)	1778.5	22.24	21.51	20.31
		1745	22.36	21.43	20.22
		1711.5	21.95	20.91	19.71
5 MHz	1RB High (24)	1777.5	23.22	21.77	20.56
		1745	23.22	22.39	21.18
		1712.5	23.03	21.69	20.48
	1RB Middle (12)	1777.5	23.28	21.91	20.70
		1745	23.22	21.82	20.61
		1712.5	22.92	21.95	20.74
	1RB	1777.5	23.14	21.76	20.55

	Low (0)	1745	23.15	21.89	20.68
		1712.5	22.79	21.53	20.32
	12RB High (13)	1777.5	22.32	21.12	19.91
		1745	22.41	21.26	20.06
		1712.5	21.96	20.94	19.74
	12RB Middle (6)	1777.5	22.39	21.15	19.94
		1745	22.26	21.28	20.08
		1712.5	21.99	20.92	19.72
	12RB Low (0)	1777.5	22.37	21.47	20.27
		1745	22.32	21.35	20.14
		1712.5	21.95	20.88	19.68
	25RB (0)	1777.5	22.32	21.10	19.90
		1745	22.33	21.36	20.15
		1712.5	21.93	20.79	19.59
10 MHz	1RB High (49)	1775	23.26	22.36	21.15
		1745	23.38	21.86	20.65
		1715	22.94	21.78	20.57
	1RB Middle (24)	1775	23.66	21.82	20.61
		1745	23.32	22.63	21.41
		1715	22.96	21.90	20.69
	1RB Low (0)	1775	23.38	22.36	21.15
		1745	23.27	22.03	20.82
		1715	22.96	21.65	20.44
	25RB High (25)	1775	22.23	21.19	19.99
		1745	22.34	21.44	20.23
		1715	22.13	21.17	19.97
	25RB Middle (12)	1775	22.44	21.21	20.01
		1745	22.36	21.29	20.08
		1715	22.01	21.20	19.99
	25RB Low (0)	1775	22.37	21.17	19.97
		1745	22.22	21.14	19.94
		1715	21.79	20.98	19.78
	50RB (0)	1775	22.19	21.26	20.06
		1745	22.24	21.23	20.03
		1715	21.97	20.97	19.77
15 MHz	1RB High (74)	1772.5	23.03	22.61	21.40
		1745	23.20	22.43	21.21
		1717.5	23.20	22.19	20.97
	1RB Middle (37)	1772.5	23.30	22.44	21.23
		1745	23.19	22.65	21.43
		1717.5	23.33	22.61	21.39
	1RB Low (0)	1772.5	23.06	22.24	21.02
		1745	22.96	22.66	21.45
		1717.5	23.21	22.10	20.89
	36RB High (38)	1772.5	22.20	21.24	20.03
		1745	22.31	21.18	19.98
		1717.5	22.20	21.13	19.92
	36RB	1772.5	22.34	21.36	20.15

	Middle (19)	1745	22.35	21.27	20.06
		1717.5	22.12	20.90	19.70
	36RB Low (0)	1772.5	22.33	21.25	20.04
		1745	22.23	21.16	19.96
		1717.5	21.88	20.83	19.63
	75RB (0)	1772.5	22.22	21.25	20.05
		1745	22.36	21.26	20.06
		1717.5	22.03	20.95	19.74
20 MHz	1RB High (99)	1770	23.25	21.86	20.65
		1745	23.31	21.93	20.82
		1720	22.78	21.72	20.38
	1RB Middle (50)	1770	23.42	22.43	21.14
		1745	23.25	22.57	20.88
		1720	23.08	22.30	20.47
	1RB Low (0)	1770	23.44	21.93	20.41
		1745	23.29	21.68	20.67
		1720	23.10	21.31	19.99
	50RB High (50)	1770	22.25	21.05	19.46
		1745	22.31	21.26	19.71
		1720	22.11	21.01	19.39
	50RB Middle (25)	1770	22.22	21.22	19.72
		1745	22.30	21.36	19.70
		1720	22.12	21.14	19.37
	50RB Low (0)	1770	22.43	21.12	19.68
		1745	22.33	21.12	19.52
		1720	22.16	20.89	19.29
	100RB (0)	1770	22.25	20.98	19.53
		1745	22.17	21.26	19.66
		1720	22.01	21.03	19.34

Band 71					
Bandwidth (MHz)	RB allocation	Frequency (MHz)	Actual output power (dBm)		
	RB offset		QPSK	16QAM	64QAM
5MHz	1RB_High	695.5	22.44	21.46	20.40
		680.5	22.99	21.63	20.81
		665.5	22.79	21.95	20.97
	1RB_Middle	695.5	22.99	21.79	20.89
		680.5	23.22	22.05	21.00
		665.5	22.89	21.64	20.63
	1RB_Low	695.5	22.67	21.73	20.84
		680.5	23.08	21.63	20.70
		665.5	22.49	21.53	20.59
	12RB_High	695.5	21.75	20.97	20.03
		680.5	22.28	21.41	20.46
		665.5	22.03	20.95	19.87

	12RB_Middle	695.5	21.89	20.92	19.97
		680.5	22.38	21.33	20.40
		665.5	22.04	21.02	20.19
	12RB_Low	695.5	21.95	21.19	20.23
		680.5	22.24	21.50	20.56
		665.5	22.03	21.20	20.19
	25RB	695.5	21.92	21.08	20.05
		680.5	22.31	21.59	20.68
		665.5	22.08	21.13	20.16
10MHz	1RB_High	693	22.76	21.97	21.16
		680.5	22.80	21.79	20.89
		668	22.99	22.28	21.32
	1RB_Middle	693	23.14	22.21	21.18
		680.5	23.36	22.29	21.43
		668	22.96	21.97	21.04
	1RB_Low	693	22.80	22.05	21.02
		680.5	23.07	21.87	20.95
		668	22.78	21.83	20.92
	25RB_High	693	21.81	20.95	19.91
		680.5	22.22	21.51	20.62
		668	22.32	21.75	20.84
	25RB_Middle	693	21.99	21.22	20.26
		680.5	22.28	21.47	20.44
		668	22.24	21.32	20.30
	25RB_Low	693	22.09	21.23	20.27
		680.5	22.29	21.44	20.55
		668	22.08	21.11	20.10
	50RB	693	21.93	21.06	19.97
		680.5	22.20	21.38	20.36
		668	22.19	21.31	20.27
15MHz	1RB_High	690.5	22.85	21.94	21.02
		680.5	22.85	21.84	20.78
		670.5	22.79	22.77	21.95
	1RB_Middle	690.5	23.32	22.60	21.51
		680.5	22.78	22.49	21.44
		670.5	22.92	22.85	21.99
	1RB_Low	690.5	23.12	22.15	21.10
		680.5	23.02	22.21	21.27
		670.5	22.67	21.95	21.05
	36RB_High	690.5	21.97	21.11	20.08
		680.5	22.12	21.20	20.14
		670.5	22.23	21.43	20.55
	36RB_Middle	690.5	22.07	21.15	20.22
		680.5	22.27	21.39	20.47
		670.5	22.20	21.37	20.31
	36RB_Low	690.5	22.15	21.26	20.45
		680.5	22.22	21.43	20.39
		670.5	21.99	21.21	20.38

	75RB	690.5	22.07	21.19	20.16
		680.5	22.20	21.45	20.41
		670.5	22.12	21.28	20.24
20MHz	1RB_High	688	23.06	22.09	21.11
		683	23.08	22.15	21.16
		673	23.55	22.04	21.15
	1RB_Middle	688	23.73	22.09	21.05
		683	23.56	22.18	21.31
		673	23.77	22.40	21.41
	1RB_Low	688	23.29	22.12	21.14
		683	23.12	22.22	21.35
		673	23.50	22.02	20.94
	50RB_High	688	22.08	21.21	20.36
		683	22.08	21.36	20.27
		673	22.18	21.25	20.40
	50RB_Middle	688	22.08	21.15	20.33
		683	22.12	21.39	20.52
		673	22.22	21.37	20.46
	50RB_Low	688	22.07	21.15	20.07
		683	22.16	21.42	20.46
		673	22.07	21.22	20.36
	100RB	688	22.04	21.13	20.04
		683	22.24	21.43	20.45
		673	22.21	21.41	20.37

Low power

Table 11.3-4: The conducted Power for LTE-Low power

Band 2					
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)	64QAM Actual output power (dBm)
1.4 MHz	1RB High (5)	1909.3	21.17	20.03	18.98
		1880	20.99	19.99	18.94
		1850.7	21.34	20.31	19.26
	1RB Middle (3)	1909.3	21.18	20.01	18.96
		1880	21.15	20.46	19.41
		1850.7	21.49	20.41	19.36
	1RB Low (0)	1909.3	21.21	20.04	18.99
		1880	21.08	20.44	19.39
		1850.7	21.42	20.22	19.17
	3RB High (3)	1909.3	21.33	20.33	19.28
		1880	21.24	20.04	18.99
		1850.7	21.45	20.49	19.44
	3RB Middle (1)	1909.3	21.38	20.40	19.35
		1880	21.39	20.20	19.15
		1850.7	21.41	20.40	19.35
	3RB	1909.3	21.34	20.38	19.33

	Low (0)	1880	21.25	20.08	19.03
		1850.7	21.35	20.41	19.36
	6RB (0)	1909.3	20.30	19.43	18.38
		1880	20.30	18.97	17.92
		1850.7	20.47	19.46	17.41
3 MHz	1RB High (14)	1908.5	21.02	19.90	18.85
		1880	21.32	20.00	18.95
		1851.5	21.41	20.37	19.32
	1RB Middle (7)	1908.5	21.28	20.48	19.43
		1880	21.39	20.25	19.20
		1851.5	21.41	20.34	19.29
	1RB Low (0)	1908.5	21.27	20.08	19.03
		1880	21.24	20.33	19.28
		1851.5	21.41	20.42	19.36
	8RB High (7)	1908.5	20.38	19.32	18.27
		1880	20.33	19.11	18.06
		1851.5	20.44	19.43	18.39
	8RB Middle (4)	1908.5	20.42	19.13	18.08
		1880	20.37	19.16	18.11
		1851.5	20.41	19.42	18.37
	8RB Low (0)	1908.5	20.37	19.40	18.36
		1880	20.34	18.93	17.88
		1851.5	20.46	19.20	18.16
	15RB (0)	1908.5	20.29	19.26	18.21
		1880	20.34	19.25	18.21
		1851.5	20.46	19.35	18.30
5 MHz	1RB High (24)	1907.5	21.08	20.03	18.99
		1880	21.32	19.99	18.94
		1852.5	21.10	20.05	19.01
	1RB Middle (12)	1907.5	21.41	20.05	19.00
		1880	21.13	19.95	18.90
		1852.5	21.44	19.95	18.90
	1RB Low (0)	1907.5	21.45	19.90	18.85
		1880	21.28	19.80	18.76
		1852.5	21.21	19.84	18.79
	12RB High (13)	1907.5	20.33	19.03	17.99
		1880	20.28	19.13	18.09
		1852.5	20.39	19.23	18.18
	12RB Middle (6)	1907.5	20.41	19.19	18.14
		1880	20.35	19.29	18.25
		1852.5	20.48	19.20	18.15
	12RB Low (0)	1907.5	20.44	19.16	18.12
		1880	20.22	19.27	18.22
		1852.5	20.40	19.19	18.14
	25RB (0)	1907.5	20.37	19.38	18.33
		1880	20.23	19.28	18.23
		1852.5	20.46	19.29	18.25
10 MHz	1RB	1905	21.35	20.32	19.27

	High (49)	1880	21.15	20.41	19.36
		1855	21.29	20.26	19.21
	1RB Middle (24)	1905	21.33	20.18	19.13
		1880	21.41	20.00	18.95
		1855	21.47	20.44	19.39
	1RB Low (0)	1905	21.25	20.15	19.10
		1880	21.21	19.83	18.78
		1855	21.47	20.22	19.17
	25RB High (25)	1905	20.33	19.20	18.15
		1880	20.29	19.33	18.28
		1855	20.24	19.35	18.30
	25RB Middle (12)	1905	20.32	19.29	18.24
		1880	20.27	19.42	18.37
		1855	20.38	19.41	18.36
	25RB Low (0)	1905	20.13	19.21	18.16
		1880	20.21	19.25	18.20
		1855	20.31	19.33	18.29
	50RB (0)	1905	20.22	19.26	18.21
		1880	20.16	19.18	18.13
		1855	20.31	19.26	18.21
15 MHz	1RB High (74)	1902.5	21.04	19.67	18.62
		1880	21.11	20.41	19.35
		1857.5	21.46	20.23	19.18
	1RB Middle (37)	1902.5	21.16	19.99	18.94
		1880	21.12	20.06	19.01
		1857.5	21.40	20.42	19.37
	1RB Low (0)	1902.5	21.05	20.48	19.43
		1880	21.30	20.48	19.43
		1857.5	21.44	20.35	19.30
	36RB High (38)	1902.5	20.43	19.13	18.08
		1880	20.38	19.30	18.25
		1857.5	20.32	19.10	18.05
	36RB Middle (19)	1902.5	20.24	19.25	18.20
		1880	20.31	19.14	18.09
		1857.5	20.29	19.26	18.21
	36RB Low (0)	1902.5	20.16	19.16	18.11
		1880	20.22	19.14	18.09
		1857.5	20.35	19.20	18.15
	75RB (0)	1902.5	20.20	19.30	18.25
		1880	20.34	19.21	18.16
		1857.5	20.34	19.30	18.25
20 MHz	1RB High (99)	1900	21.44	20.19	19.14
		1880	21.15	20.19	18.71
		1860	21.05	19.92	18.92
	1RB Middle (50)	1900	21.49	20.42	19.07
		1880	21.46	19.95	18.80
		1860	21.43	19.99	18.72
	1RB	1900	21.32	20.18	18.68

	Low (0)	1880	21.08	20.33	18.65
		1860	21.12	19.90	18.70
	50RB High (50)	1900	20.34	19.39	18.17
		1880	20.43	19.32	17.98
		1860	20.40	19.45	18.05
	50RB Middle (25)	1900	20.47	19.34	17.95
		1880	20.39	19.23	17.96
		1860	20.36	19.45	17.94
	50RB Low (0)	1900	20.21	19.17	17.87
		1880	20.35	19.37	17.93
		1860	20.28	19.37	18.00
	100RB (0)	1900	20.29	19.34	18.05
		1880	20.37	19.42	18.02
		1860	20.37	19.36	18.05

Band 7					
Bandwidth (MHz)	RB allocation	Frequency (MHz)	Actual output power (dBm)		
	RB offset		QPSK	16QAM	64QAM
5MHz	1RB_High	2567.5	20.76	19.75	19.07
		2535	20.90	19.41	18.74
		2502.5	20.79	20.06	19.38
	1RB_Middle	2567.5	21.01	19.60	18.93
		2535	20.87	19.47	18.81
		2502.5	21.08	20.02	19.34
	1RB_Low	2567.5	20.77	19.59	18.92
		2535	20.87	19.47	18.80
		2502.5	20.65	19.57	18.90
	12RB_High	2567.5	19.97	18.99	18.34
		2535	19.98	18.81	18.17
		2502.5	20.00	18.96	18.31
	12RB_Middle	2567.5	20.06	18.88	18.24
		2535	20.02	18.86	18.22
		2502.5	20.08	18.99	18.34
	12RB_Low	2567.5	19.99	19.11	18.46
		2535	19.90	18.74	18.10
		2502.5	19.95	19.09	18.44
	25RB	2567.5	19.98	18.82	18.17
		2535	19.97	19.05	18.40
		2502.5	19.99	19.06	18.41
10MHz	1RB_High	2565	20.99	19.94	19.26
		2535	20.99	19.98	19.30
		2505	21.03	20.12	19.13
	1RB_Middle	2565	21.22	20.23	19.24
		2535	21.28	20.45	19.46
		2505	21.25	20.38	19.38
	1RB_Low	2565	20.85	19.97	18.98

		2535	21.06	20.06	19.08
		2505	20.89	20.34	19.34
	25RB_High	2565	20.06	19.19	18.24
		2535	20.00	19.06	18.11
		2505	20.02	19.02	18.07
	25RB_Middle	2565	20.13	19.17	18.21
		2535	20.06	18.92	18.27
		2505	20.11	19.08	18.42
	25RB_Low	2565	19.86	19.01	18.36
		2535	19.89	18.95	18.31
		2505	19.87	19.07	18.42
	50RB	2565	19.92	18.94	18.29
		2535	20.06	18.99	18.34
		2505	19.93	18.89	18.24
15MHz	1RB_High	2562.5	21.02	20.11	19.42
		2535	20.81	19.88	19.20
		2507.5	20.77	20.43	19.13
	1RB_Middle	2562.5	21.19	20.29	19.10
		2535	20.90	20.04	19.15
		2507.5	21.05	20.47	19.17
	1RB_Low	2562.5	21.00	19.56	18.90
		2535	20.79	19.79	19.11
		2507.5	20.92	20.08	19.39
	36RB_High	2562.5	19.96	18.97	18.32
		2535	19.96	18.98	18.34
		2507.5	19.98	18.83	18.19
	36RB_Middle	2562.5	19.89	18.99	18.34
		2535	19.91	19.10	18.44
		2507.5	19.99	18.82	18.18
	36RB_Low	2562.5	19.76	18.76	18.12
		2535	19.85	18.96	18.31
		2507.5	19.89	18.88	18.24
	75RB	2562.5	19.75	18.95	18.31
		2535	19.95	18.84	18.20
		2507.5	19.84	18.88	18.23
20MHz	1RB_High	2560	20.96	19.91	19.23
		2535	20.65	19.75	19.09
		2510	20.72	19.41	19.07
	1RB_Middle	2560	21.06	20.20	19.12
		2535	21.06	19.67	19.28
		2510	21.14	20.11	19.37
	1RB_Low	2560	20.79	19.58	19.43
		2535	20.58	19.68	19.09
		2510	20.86	19.31	18.93
	50RB_High	2560	19.90	18.81	18.02
		2535	19.88	18.87	18.27
		2510	19.91	18.81	18.30
	50RB_Middle	2560	19.97	19.00	18.29
		2535	19.90	18.92	18.36

		2510	19.88	18.89	18.29
	50RB_Low	2560	19.80	18.85	18.11
		2535	19.76	18.68	18.21
		2510	19.87	18.93	18.16
	100RB	2560	19.76	18.79	18.03
		2535	19.84	18.87	18.23
		2510	19.79	18.87	18.26

Band 66					
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)	64QAM Actual output power (dBm)
1.4 MHz	1RB High (5)	1779.3	18.26	17.22	16.22
		1745	18.29	17.64	16.62
		1710.7	18.28	17.14	16.14
	1RB Middle (3)	1779.3	18.40	17.30	16.29
		1745	18.47	17.06	16.06
		1710.7	18.27	17.01	16.01
	1RB Low (0)	1779.3	18.42	17.46	16.45
		1745	18.31	17.84	16.82
		1710.7	18.33	17.19	16.19
	3RB High (3)	1779.3	18.43	17.48	16.47
		1745	18.65	16.85	15.86
		1710.7	18.24	17.31	16.31
	3RB Middle (1)	1779.3	18.46	17.37	16.37
		1745	18.66	17.43	16.43
		1710.7	18.33	17.41	16.40
	3RB Low (0)	1779.3	18.50	17.46	16.45
		1745	18.36	17.50	16.49
		1710.7	18.25	17.42	16.41
	6RB (0)	1779.3	17.58	16.76	15.77
		1745	17.48	16.14	15.17
		1710.7	17.41	16.26	15.29
3 MHz	1RB High (14)	1778.5	18.39	17.25	16.25
		1745	18.66	17.54	16.53
		1711.5	18.28	16.94	15.94
	1RB Middle (7)	1778.5	18.68	17.39	16.38
		1745	18.61	17.90	16.88
		1711.5	18.33	17.03	16.03
	1RB Low (0)	1778.5	18.52	17.54	16.52
		1745	18.54	17.56	16.55
		1711.5	18.11	17.01	16.01
	8RB High (7)	1778.5	17.52	16.24	15.26
		1745	17.50	16.77	15.78
		1711.5	17.34	16.21	15.24
	8RB	1778.5	17.57	16.50	15.51

	Middle (4)	1745	17.55	16.63	15.64
		1711.5	17.30	16.46	15.48
	8RB Low (0)	1778.5	17.50	16.33	15.35
		1745	17.53	16.43	15.45
		1711.5	17.31	16.26	15.29
	15RB (0)	1778.5	17.47	16.49	15.51
		1745	17.55	16.38	15.40
		1711.5	17.26	16.28	15.31
5 MHz	1RB High (24)	1777.5	18.26	17.15	16.15
		1745	18.43	17.04	16.04
		1712.5	17.99	17.06	16.06
	1RB Middle (12)	1777.5	18.45	17.31	16.30
		1745	18.48	16.99	16.00
		1712.5	18.35	16.87	15.88
	1RB Low (0)	1777.5	18.40	17.16	16.16
		1745	18.45	16.87	15.88
		1712.5	17.79	16.76	15.77
	12RB High (13)	1777.5	17.37	16.29	15.32
		1745	17.60	16.41	15.43
		1712.5	17.22	16.13	15.16
	12RB Middle (6)	1777.5	17.48	16.58	15.59
		1745	17.48	16.44	15.46
		1712.5	17.22	16.23	15.25
	12RB Low (0)	1777.5	17.43	16.35	15.38
		1745	17.45	16.31	15.34
		1712.5	17.26	16.19	15.21
	25RB (0)	1777.5	17.44	16.36	15.38
		1745	17.47	16.55	15.57
		1712.5	17.30	16.23	15.25
10 MHz	1RB High (49)	1775	18.63	17.45	16.44
		1745	18.35	17.99	16.96
		1715	18.09	17.13	16.13
	1RB Middle (24)	1775	18.79	17.82	16.79
		1745	18.84	17.50	16.49
		1715	18.58	17.35	16.34
	1RB Low (0)	1775	18.44	17.20	16.20
		1745	18.13	17.12	16.12
		1715	18.26	16.98	15.98
	25RB High (25)	1775	17.38	16.36	15.38
		1745	17.55	16.74	15.75
		1715	17.32	16.47	15.49
	25RB Middle (12)	1775	17.43	16.68	15.70
		1745	17.58	16.76	15.77
		1715	17.28	16.53	15.54
	25RB Low (0)	1775	17.38	16.49	15.50
		1745	17.36	16.54	15.56
		1715	17.25	16.20	15.23
	50RB	1775	17.34	16.39	15.41

	(0)	1745	17.47	16.55	15.56
		1715	17.24	16.15	15.18
15 MHz	1RB High (74)	1772.5	18.14	17.26	16.25
		1745	18.25	17.86	16.84
		1717.5	18.44	17.24	16.24
	1RB Middle (37)	1772.5	18.55	17.52	16.51
		1745	18.40	17.28	16.28
		1717.5	18.57	17.23	16.22
	1RB Low (0)	1772.5	18.35	16.97	15.98
		1745	18.07	17.88	16.86
		1717.5	18.48	17.38	16.37
	36RB High (38)	1772.5	17.36	16.42	15.44
		1745	17.54	16.56	15.58
		1717.5	17.28	16.10	15.13
	36RB Middle (19)	1772.5	17.56	16.54	15.56
		1745	17.57	16.50	15.52
		1717.5	17.36	16.27	15.30
	36RB Low (0)	1772.5	17.54	16.37	15.39
		1745	17.37	16.26	15.29
		1717.5	17.23	16.21	15.24
	75RB (0)	1772.5	17.34	16.41	15.43
		1745	17.49	16.48	15.49
		1717.5	17.22	16.30	15.32
20 MHz	1RB High (99)	1770	18.15	16.77	16.28
		1745	18.16	17.49	16.59
		1720	18.13	16.97	16.64
	1RB Middle (50)	1770	18.84	17.34	16.98
		1745	18.46	17.47	16.15
		1720	18.47	17.42	16.88
	1RB Low (0)	1770	18.14	17.18	16.93
		1745	17.86	16.85	16.49
		1720	18.21	17.03	16.45
	50RB High (50)	1770	17.63	16.24	15.74
		1745	17.57	16.54	15.90
		1720	17.29	16.30	15.64
	50RB Middle (25)	1770	17.44	16.38	16.00
		1745	17.49	16.60	15.92
		1720	17.21	16.29	15.79
	50RB Low (0)	1770	17.43	16.36	15.83
		1745	17.36	16.39	15.76
		1720	17.26	16.06	15.70
	100RB (0)	1770	17.39	16.33	15.87
		1745	17.47	16.44	15.87
		1720	17.19	16.13	15.57

11.5 Wi-Fi and BT Measurement result

The maximum output power of BT is 9.24dBm.
The maximum tune up of BT is 9.5dBm.

Normal power

The average conducted power for Wi-Fi is as following:

WiFi-2.4G

802.11b	Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps				
WLAN2450	11(2462MHz)	19.47	/	/	/				
	6(2437(MHz)	19.40	/	/	/				
	1(2412MHz)	19.48	19.46	19.47	19.44				
Tune up	***/***	**19.5**	**19.5**	**19.5**	**19**				
802.11g	Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
WLAN2450	11(2462MHz)	19.45	19.44	18.42	18.41	17.41	17.40	16.33	16.30
	6(2437(MHz)	19.41	/	/	/	/	/	/	/
	1(2412MHz)	19.34	/	/	/	/	/	/	/
Tune up	***/***	**19.5**	**19.5**	**18.5**	**18.5**	**17.6**	**17.6**	**16.7**	**16.7**
802.11n-20MHz	Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
WLAN2450	11(2462MHz)	19.53	19.50	18.44	17.41	17.40	16.36	16.34	15.35
	6(2437(MHz)	19.46	/	/	/	/	/	/	/
	1(2412MHz)	19.42	/	/	/	/	/	/	/
Tune up	***/***	**19.6**	**19.6**	**19**	**18**	**18**	**17**	**17**	**15.7**
802.11n-40MHz	Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
WLAN2450	9(2452MHz)	18.41	/	/	/	/	/	/	/
	6(2437MHz)	18.52	/	/	/	/	/	/	/
	3(2422MHz)	18.82	17.56	16.50	15.42	14.85	14.44	13.86	13.30
Tune up	***/***	**19.60**	**19.00**	**18.00**	**17.00**	**16.50**	**16.00**	**15.50**	**14.20**

WiFi-5G

802.11n(dBm)-40MHz								
Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
38(5190 MHz)	17.81	/	/	/	/	/	/	/
46(5230 MHz)	17.98	17.50	16.99	15.86	14.78	14.29	13.77	13.29
Tune up	**19.00**	**18.50**	**18.00**	**17.00**	**16.00**	**16.00**	**15.50**	**15.00**
54(5270 MHz)	18.07	17.55	17.03	15.92	14.82	14.31	13.79	13.21
62(5310 MHz)	17.81	/	/	/	/	/	/	/
Tune up	**19.00**	**18.50**	**18.00**	**17.00**	**16.00**	**16.00**	**15.50**	**15.00**
102(5510 MHz)	16.91	/	/	/	/	/	/	/
110(5550 MHz)	16.92	/	/	/	/	/	/	/

118(5590 MHz)	17.29	/	/	/	/	/	/	/
126(5630 MHz)	17.69	/	/	/	/	/	/	/
134(5670 MHz)	17.85	17.43	16.96	15.89	14.91	14.42	13.92	13.34
142(5710 MHz)	17.48	/	/	/	/	/	/	/
Tune up	**19.00**	**18.50**	**18.00**	**17.00**	**16.00**	**16.00**	**15.50**	**15.00**
151(5755 MHz)	15.76	/	/	/	/	/	/	/
159(5795 MHz)	16.01	15.98	15.93	15.86	14.82	14.28	13.79	13.24
Tune up	**17.00**	**17.00**	**17.00**	**17.00**	**16.00**	**15.00**	**14.50**	**14.00**

Low power

The average conducted power for Wi-Fi is as following:

WiFi-2.4G

802.11b	Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps				
WLAN2450	11(2462MHz)	18.15	/	/	/				
	6(2437(MHz)	18.10	/	/	/				
	1(2412MHz)	18.30	18.05	18.29	18.24				
turn up	/	**19.00**	**19.00**	**19.00**	**19.00**				
802.11g	Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
WLAN2450	11(2462MHz)	18.46	18.40	18.42	18.41	17.41	17.40	16.33	16.30
	6(2437(MHz)	18.41	/	/	/	/	/	/	/
	1(2412MHz)	18.39	/	/	/	/	/	/	/
turn up	/	**19.00**	**19.00**	**18.50**	**18.50**	**17.60**	**17.60**	**16.70**	**16.70**
802.11n-20MHz	Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
WLAN2450	11(2462MHz)	18.52	18.50	18.44	17.41	17.40	16.36	16.34	15.35
	6(2437(MHz)	18.42	/	/	/	/	/	/	/
	1(2412MHz)	18.46	/	/	/	/	/	/	/
turn up	/	**19.00**	**19.00**	**19.00**	**18.00**	**18.00**	**17.00**	**17.00**	**15.70**
802.11n-40MHz	Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
WLAN2450	9(2452MHz)	17.42	/	/	/	/	/	/	/
	6(2437MHz)	17.34	/	/	/	/	/	/	/
	3(2422MHz)	17.67	17.56	16.50	15.42	14.85	14.44	13.86	13.30
turn up	/	**18.00**	**18.00**	**18.00**	**17.00**	**16.50**	**16.00**	**15.50**	**14.20**

WiFi-5G

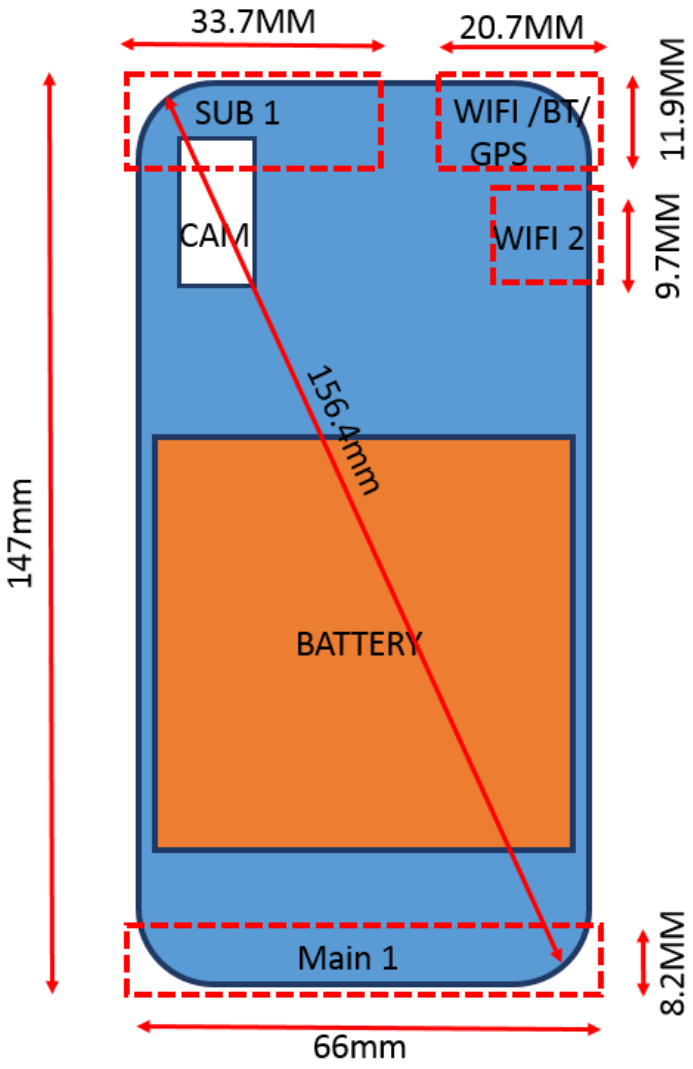
802.11n(dBm)-40MHz								
Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
38(5190 MHz)	15.87	/	/	/	/	/	/	/
46(5230 MHz)	15.96	15.95	15.92	15.86	15.34	14.78	14.28	13.81
54(5270 MHz)	15.94	15.93	15.91	15.83	15.34	14.75	14.24	13.68
62(5310 MHz)	15.72	/	/	/	/	/	/	/
102(5510 MHz)	15.29	/	/	/	/	/	/	/
110(5550 MHz)	15.36	/	/	/	/	/	/	/
118(5590 MHz)	15.66	/	/	/	/	/	/	/
126(5630 MHz)	15.85	/	/	/	/	/	/	/
134(5670 MHz)	15.95	15.93	15.90	15.93	15.70	15.19	14.63	14.19
142(5710 MHz)	15.86	/	/	/	/	/	/	/
151(5755 MHz)	15.33	/	/	/	/	/	/	/
159(5795 MHz)	15.55	15.53	15.52	15.45	14.94	14.41	13.90	13.35
Tune up	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**15.00**	**14.50**	**14.00**

12 Simultaneous TX SAR Considerations

12.1 Introduction

The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” are applicable to handsets with built-in unlicensed transmitters such as 802.11 a/b/g and Bluetooth devices which may simultaneously transmit with the licensed transmitter.
For this device, the BT and Wi-Fi can transmit simultaneous with other transmitters.

12.2 Transmit Antenna Separation Distances



Picture 12.1 Antenna Locations

12.3 SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR, the edges with less than 2.5 cm distance to the antennas need to be tested for SAR.

SAR measurement positions						
Mode	Front	Rear	Left edge	Right edge	Top edge	Bottom edge
Main antenna	Yes	Yes	Yes	Yes	No	Yes
WLAN	Yes	Yes	Yes	No	Yes	No

12.4 Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied. The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

Table 12.1: Standalone SAR test exclusion considerations

Band/Mode	F(GHz)	Position	SAR test exclusion threshold(mW)	RF output power		SAR test exclusion
				dBm	mW	
Bluetooth	2.441	Head	9.60	9.5	8.91	Yes
		Body	19.20	9.5	8.91	Yes
2.4GHz WLAN	2.45	Head	9.58	19.6	91.2	No
		Body	19.17	19.6	91.2	No
5GHz WLAN	5.2	Head	6.58	19	79.43	No
		Body	13.16	19	79.43	No
	5.3	Head	6.52	19	79.43	No
		Body	13.03	19	79.43	No
	5.6	Head	6.34	19	79.43	No
		Body	12.68	19	79.43	No
	5.8	Head	6.23	19	79.43	No
		Body	12.46	19	79.43	No

13 Evaluation of Simultaneous

Table 13.1: The sum of reported SAR values for main antenna and WiFi 2.4G

	Position	band	Main antenna	WiFi	Sum
Highest reported SAR value for Head	Right hand, Touch cheek	LTE B2	0.47	0.76	**1.23**
Highest reported SAR value for Body	Bottom 10mm	WCDMA1700	1.12	/	**1.12**

Table 13.2 The sum of reported SAR values for main antenna and WiFi 5G

	Position	band	Main antenna	WiFi	Sum
Highest reported SAR value for Head	Right hand, Touch cheek	LTE B2	0.47	0.10	**0.57**
Highest reported SAR value for Body	Rear 10mm	WCDMA1700	0.94	0.61	**1.55**

Table 13.3: The sum of reported SAR values for main antenna and BT

	Position	Main antenna	BT	Sum
Maximum reported SAR value for Head	Right hand, Touch cheek	0.47	0.37[1]	**0.84**
Maximum reported SAR value for Body	Bottom 10mm	1.12	/	**1.12**

[1] - Estimated SAR for Bluetooth (see the table 13.4)

Table 13.4: Estimated SAR for Bluetooth

Mode/Band	F (GHz)	Position	Distance (mm)	Upper limit of power *		Estimated$_{1g}$ (W/kg)
				dBm	mW	
Bluetooth	2.441	Head	5	9.5	8.9	0.37
Bluetooth	2.441	Body	10	9.5	8.9	0.19
Bluetooth	2.441	Body	19	9.5	8.9	0.10

* - Maximum possible output power declared by manufacturer

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;

where x = 7.5 for 1-g SAR.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

Conclusion:

According to the above tables, the sum of reported SAR values is<1.6W/kg. So the simultaneous transmission SAR with volume scans is not required.

14 SAR Test Result

It is determined by user manual for the distance between the EUT and the phantom bottom. The distance is 10 mm and just applied to the condition of body worn accessory.

It is performed for all SAR measurements with area scan based 1-g SAR estimation (Fast SAR). A zoom scan measurement is added when the estimated 1-g SAR is the highest measured SAR in each exposure configuration, wireless mode and frequency band combination or more than 1.2W/kg.

The calculated SAR is obtained by the following formula:

$$\text{Reported SAR} = \text{Measured SAR} \times 10^{(P_{Target}-P_{Measured})/10}$$

Where P_{Target} is the power of manufacturing upper limit;

$P_{Measured}$ is the measured power in chapter 11.

Table 14.1: Duty Cycle

Mode	Duty Cycle
GPRS&EGPRS for GSM	1:2
WCDMA&LTE FDD	1:1

The evaluation of multi-Batteries:

We'll perform the head measurement in all bands with the primary Battery depending on the evaluation of multi-Batteries and retest on highest value point with other Battery. Then, repeat the measurement in the Body test.

Frequency		Mode/Band	Side	Position	Battery	1g SAR (W/kg)	PowerDrift
MHz	Channel						
251	848.8	GSM850	Right	Cheek	B1	0.336	0.03
251	848.8	GSM850	Right	Cheek	B2	0.304	0.03

Note: According to the values in the above table, the **B1** is the primary Battery.

We'll perform the head measurement with the B1 and retest on highest value point with others.

Frequency		Mode/Band	Position	Battery	1g SAR (W/kg)	PowerDrift
MHz	Channel					
251	848.8	GSM850	Rear 10mm	B1	0.405	0.07
251	848.8	GSM850	Rear 10mm	B2	0.365	0.01

Note: According to the values in the above table, the **B1** is the primary Battery.

We'll perform the body measurement with the B1 and retest on highest value point with others.

Note

B1: The battery of QL1695 by Ningde Amperex Technology Limited

B2: The battery of QL1695 by SCUD(Fujian) Electronics Co., Ltd.

H1: The headset of EHS61ASFWE by DONGGUAN YOUNGBO ELECTRONICS CO.,LTD

H2: The headset of EHS61ASFWE by CRESYN VIETNAM CO.,LTD.

14.1 SAR results for Fast SAR

.

Table 14.1-1: SAR Values (GSM 850 MHz Band - Head)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Side	Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz										
190	836.6	Left	Cheek	/	27.57	28.2	0.228	**0.26**	0.173	**0.20**	0.04
190	836.6	Left	Tilt	/	27.57	28.2	0.174	**0.20**	0.133	**0.15**	0.06
251	848.8	Right	Cheek	Fig.1	27.61	28.2	0.336	**0.38**	0.258	**0.30**	0.03
190	836.6	Right	Cheek	/	27.57	28.2	0.268	**0.31**	0.203	**0.23**	0.07
128	824.2	Right	Cheek	/	27.57	28.2	0.195	**0.23**	0.148	**0.17**	-0.01
190	836.6	Right	Tilt	/	27.57	28.2	0.164	**0.19**	0.125	**0.14**	-0.09
251	848.8	Right	Cheek	B2	27.61	28.2	0.304	**0.35**	0.211	**0.24**	0.03

Note: the head SAR of GSM850 is tested with GPRS (4Txslots) mode because of VoIP.

Table 14.1-2: SAR Values (GSM 850 MHz Band - Body)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Mode (number of timeslots)	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz										
190	836.6	GPRS (4)	Front	/	27.57	28.2	0.286	**0.33**	0.229	**0.26**	0.08
251	848.8	GPRS (4)	Rear	Fig.2	27.61	28.2	0.405	**0.46**	0.311	**0.36**	0.07
190	836.6	GPRS (4)	Rear	/	27.57	28.2	0.39	**0.45**	0.306	**0.35**	-0.12
128	824.2	GPRS (4)	Rear	/	27.57	28.2	0.347	**0.40**	0.267	**0.31**	0.11
190	836.6	GPRS (4)	Left	/	27.57	28.2	0.26	**0.30**	0.185	**0.21**	-0.06
190	836.6	GPRS (4)	Right	/	27.57	28.2	0.229	**0.26**	0.166	**0.19**	0.01
190	836.6	GPRS (4)	Bottom	/	27.57	28.2	0.089	**0.10**	0.055	**0.06**	0.12
251	848.8	EGPRS (4)	Rear	/	27.56	28.2	0.362	**0.42**	0.269	**0.31**	0.05
251	848.8	GPRS (4)	Rear	B2	27.61	28.2	0.365	**0.42**	0.253	**0.29**	0.01

Note: The distance between the EUT and the phantom bottom is 10mm.

Table 14.1-3: SAR Values (GSM 1900 MHz Band - Head)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz										
661	1880	Left	Cheek	/	25.30	25.7	0.187	**0.21**	0.127	**0.14**	0.14
661	1880	Left	Tilt	/	25.30	25.7	0.175	**0.19**	0.109	**0.12**	-0.14
810	1909.8	Right	Cheek	/	25.39	25.7	0.224	**0.24**	0.14	**0.15**	0.12
661	1880	Right	Cheek	Fig.3	25.30	25.7	0.238	**0.26**	0.147	**0.16**	0.05
512	1850.2	Right	Cheek	/	25.12	25.7	0.156	**0.18**	0.1	**0.11**	-0.16
661	1880	Right	Tilt	/	25.30	25.7	0.117	**0.13**	0.078	**0.09**	0.10
661	1880	Right	Cheek	B2	25.30	25.7	0.206	**0.23**	0.131	**0.14**	-0.02

Note: the head SAR of GSM1900 is tested with GPRS (4Txslots) mode because of VoIP.

Table 14.1-4: SAR Values (GSM 1900 MHz Band - Body)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Mode (number of timeslots)	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz										
661	1880	GPRS (4)	Front	Note1	25.30	25.7	0.253	**0.28**	0.159	**0.17**	-0.18
661	1880	GPRS (4)	Rear	Note2	25.30	25.7	0.245	**0.27**	0.157	**0.17**	0.12
661	1880	GPRS (4)	Left	/	25.30	25.7	0.133	**0.15**	0.086	**0.09**	-0.15
661	1880	GPRS (4)	Right	/	25.30	25.7	0.21	**0.23**	0.128	**0.14**	-0.01
661	1880	GPRS (4)	Bottom	Note2	25.30	25.7	0.403	**0.44**	0.247	**0.27**	-0.14
661	1880	GPRS (4)	Front	/	21.95	23	0.2	**0.25**	0.123	**0.16**	0.16
661	1880	GPRS (4)	Rear	/	21.95	23	0.346	**0.44**	0.194	**0.25**	0.09
810	1909.8	GPRS (4)	Bottom	/	21.91	23	0.468	**0.60**	0.247	**0.32**	0.17
661	1880	GPRS (4)	Bottom	/	21.95	23	0.438	**0.56**	0.241	**0.31**	-0.07
512	1850.2	GPRS (4)	Bottom	Fig.4	22.00	23	0.519	**0.65**	0.282	**0.35**	0.14
512	1850.2	EGPRS (4)	Bottom	/	21.97	23	0.401	**0.51**	0.207	**0.26**	0.09
512	1850.2	GPRS (4)	Bottom	B2	22.00	23	0.473	**0.59**	0.251	**0.32**	0.03

Note: The distance between the EUT and the phantom bottom is 10mm.

Note1: The distance between the EUT and the phantom bottom is 15mm.

Note2: The distance between the EUT and the phantom bottom is 19mm.

Table 14.1-5: SAR Values (WCDMA 1900 MHz Band - Head)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Side	Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz										
9400	1880	Left	Cheek	/	24.34	24.7	0.322	**0.35**	0.216	**0.23**	-0.10
9400	1880	Left	Tilt	/	24.34	24.7	0.27	**0.29**	0.163	**0.18**	0.06
9538	1907.6	Right	Cheek	/	24.31	24.7	0.363	**0.40**	0.224	**0.25**	-0.18
9400	1880	Right	Cheek	/	24.34	24.7	0.411	**0.45**	0.256	**0.28**	0.15
9262	1852.4	Right	Cheek	Fig.5	24.26	24.7	0.414	**0.46**	0.255	**0.28**	0.01
9400	1880	Right	Tilt	/	24.34	24.7	0.191	**0.21**	0.124	**0.13**	-0.08
9262	1852.4	Right	Cheek	B2	24.26	24.7	0.386	**0.43**	0.238	**0.26**	0.03

Table 14.1-6: SAR Values (WCDMA 1900 MHz Band - Body)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz									
9400	1880	Front	Note1	24.34	24.7	0.385	**0.42**	0.234	**0.25**	0.17
9400	1880	Rear	Note2	24.34	24.7	0.378	**0.41**	0.228	**0.25**	0.02
9400	1880	Left	/	24.34	24.7	0.173	**0.19**	0.106	**0.12**	-0.16
9400	1880	Right	/	24.34	24.7	0.293	**0.32**	0.172	**0.19**	-0.03
9400	1880	Bottom	Note2	24.34	24.7	0.6	**0.65**	0.354	**0.38**	-0.09
9400	1880	Front	/	20.90	21.2	0.401	**0.43**	0.227	**0.24**	0.06
9538	1907.6	Rear	/	20.90	21.2	0.617	**0.66**	0.338	**0.36**	0.16
9538	1907.6	Bottom	/	20.91	21.2	0.831	**0.89**	0.434	**0.46**	0.11
9400	1880	Bottom	/	20.90	21.2	0.942	**1.01**	0.5	**0.54**	0.01
9262	1852.4	Bottom	Fig.6	20.95	21.2	1.02	**1.08**	0.536	**0.57**	0.08
9262	1852.4	Bottom	B2	20.95	21.2	0.872	**0.92**	0.413	**0.44**	-0.05

Note: The distance between the EUT and the phantom bottom is 10mm.

Note1: The distance between the EUT and the phantom bottom is 15mm.

Note2: The distance between the EUT and the phantom bottom is 19mm.

Table 14.1-7: SAR Values (WCDMA 1700 MHz Band - Head)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Side	Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz										
1412	1732.4	Left	Cheek	/	23.33	23.5	0.155	**0.16**	0.102	**0.11**	-0.05
1412	1732.4	Left	Tilt	/	23.33	23.5	0.085	**0.09**	0.053	**0.06**	0.18
1513	1752.6	Right	Cheek	Fig.7	23.25	23.5	0.204	**0.22**	0.129	**0.14**	0.06
1412	1732.4	Right	Cheek	/	23.33	23.5	0.195	**0.20**	0.123	**0.13**	0.03
1312	1712.4	Right	Cheek	/	23.17	23.5	0.167	**0.18**	0.107	**0.12**	-0.02
1412	1732.4	Right	Tilt	/	23.33	23.5	0.051	**0.05**	0.031	**0.03**	-0.17
1513	1752.6	Right	Cheek	B2	23.25	23.5	0.186	**0.20**	0.103	**0.11**	0.01

Table 14.1-8: SAR Values (WCDMA 1700 MHz Band - Body)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz									
1412	1732.5	Front	Note1	23.33	23.5	0.537	**0.56**	0.325	**0.34**	-0.01
1412	1732.5	Rear	Note2	23.33	23.5	0.655	**0.68**	0.386	**0.40**	-0.14
1412	1732.5	Left	/	23.33	23.5	0.046	**0.05**	0.032	**0.03**	-0.04
1412	1732.5	Right	/	23.33	23.5	0.188	**0.20**	0.115	**0.12**	-0.09
1412	1732.5	Bottom	Note2	23.33	23.5	0.752	**0.78**	0.503	**0.52**	0.01
1412	1732.5	Front	/	18.18	18.8	0.339	**0.39**	0.188	**0.22**	-0.08
1412	1732.5	Rear	/	18.18	18.8	0.818	**0.94**	0.445	**0.51**	0.07
1513	1752.6	Bottom	/	18.19	18.8	0.804	**0.93**	0.437	**0.50**	-0.07
1412	1732.5	Bottom	/	18.18	18.8	0.899	**1.04**	0.49	**0.57**	0.17
1312	1712.4	Bottom	Fig.8	18.21	18.8	0.974	**1.12**	0.526	**0.60**	0.06
1312	1712.4	Bottom	B2	18.21	18.8	0.894	**1.02**	0.433	**0.50**	-0.09

Note: The distance between the EUT and the phantom bottom is 10mm.

Note1: The distance between the EUT and the phantom bottom is 15mm.

Note2: The distance between the EUT and the phantom bottom is 19mm.

Table 14.1-9: SAR Values (WCDMA 850 MHz Band - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C											
Frequency		Side	Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz										
4183	836.6	Left	Cheek	/	23.90	24.7	0.292	**0.35**	0.226	**0.27**	-0.01
4183	836.6	Left	Tilt	/	23.90	24.7	0.217	**0.26**	0.173	**0.21**	-0.17
4233	846.6	Right	Cheek	Fig.9	24.04	24.7	0.345	**0.40**	0.263	**0.31**	0.07
4183	836.6	Right	Cheek	/	23.90	24.7	0.316	**0.38**	0.243	**0.29**	-0.11
4132	826.4	Right	Cheek	/	24.03	24.7	0.25	**0.29**	0.191	**0.22**	0.06
4183	836.6	Right	Tilt	/	23.90	24.7	0.193	**0.23**	0.155	**0.19**	0.14
4233	846.6	Right	Cheek	B2	24.04	24.7	0.314	**0.37**	0.247	**0.29**	-0.07

Table 14.1-10: SAR Values (WCDMA 850 MHz Band - Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz									
4183	836.6	Front	/	23.90	24.7	0.248	**0.30**	0.191	**0.23**	-0.19
4233	846.6	Rear	/	24.04	24.7	0.376	**0.44**	0.289	**0.34**	-0.13
4183	836.6	Rear	Fig.10	23.90	24.7	0.383	**0.46**	0.294	**0.35**	-0.09
4132	826.4	Rear	/	24.03	24.7	0.361	**0.42**	0.275	**0.32**	-0.09
4183	836.6	Left	/	23.90	24.7	0.235	**0.28**	0.163	**0.20**	-0.14
4183	836.6	Right	/	23.90	24.7	0.26	**0.31**	0.183	**0.22**	0.07
4183	836.6	Bottom	/	23.90	24.7	0.073	**0.09**	0.039	**0.05**	-0.07
4183	836.6	Rear	B2	23.90	24.7	0.354	**0.43**	0.271	**0.33**	-0.04

Note: The distance between the EUT and the phantom bottom is 10mm.

Table 14.1-11: SAR Values (LTE Band2 - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C												
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
Ch.	MHz											
19100	1900	1RB_Mid	Left	Cheek	/	24.06	24.2	0.344	**0.36**	0.227	**0.23**	-0.15
19100	1900	1RB_Mid	Left	Tilt	/	24.06	24.2	0.401	**0.41**	0.243	**0.25**	0.18
19100	1900	1RB_Mid	Right	Cheek	Fig.11	24.06	24.2	0.458	**0.47**	0.284	**0.29**	0.13
19100	1900	1RB_Mid	Right	Tilt	/	24.06	24.2	0.247	**0.26**	0.16	**0.17**	-0.10
19100	1900	50RB_High	Left	Cheek	/	22.97	23.2	0.285	**0.30**	0.188	**0.20**	-0.07
19100	1900	50RB_High	Left	Tilt	/	22.97	23.2	0.274	**0.29**	0.163	**0.17**	0.02
19100	1900	50RB_High	Right	Cheek	/	22.97	23.2	0.33	**0.35**	0.208	**0.22**	-0.18
19100	1900	50RB_High	Right	Tilt	/	22.97	23.2	0.18	**0.19**	0.114	**0.12**	0.13
19100	1900	1RB_Mid	Left	Cheek	B2	24.06	24.2	0.412	**0.43**	0.267	**0.28**	-0.11

Note: The LTE mode is QPSK_20MHz.