SAR TEST REPORT

No. 24T04Z103041-010

For

IMOO INTERNATIONAL PTE. LTD

Watch Phone

Model Name: W2432AO

FCC ID: 2A6PP-GLI32

with

Hardware Version: GLI32-M-0

Software Version: 1.0.0

Issued Date: 2025-5-10

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
24T04Z103041-010	Rev.0	2025-3-24	Initial creation of test report
24T04Z103041-010	Rev.1	2025-5-10	1. Add simultaneous transmission procedure on page50.

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1 Test Laboratory

1.1 Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA website.

1.2 Testing Location

Location 1: CTTL(Huayuan North Road)
Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191

1.3 Testing Environment

Normal Temperature:	15-35℃
Extreme Temperature:	-10/+55℃
Relative Humidity:	20-75%

1.4 Project data

Testing Start Date:	2025-2-14
Testing End Date:	2025-3-12

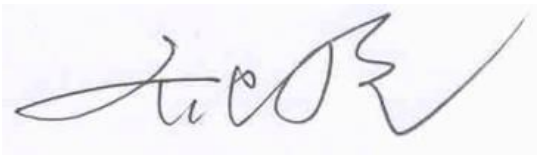
1.5 Signature

Yao Juming

(Prepared this test report)

Lin Jun

(Reviewed this test report)



Qi Dianyuan

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 IMOO INTERNATIONAL PTE. LTD Watch Phone W2432AO are as follows:

Table 2.1: Highest Reported SAR

Technology Band	Front-of-face 1g (W/kg) (Separation Distance 10mm)	Limb-worn 10g (W/kg) (Separation Distance 0mm)	Equipment Class
GSM850	**0.49**	**0.60**	PCE
GSM1900	**0.37**	**1.03**	
WCDMA1900	**0.69**	**1.15**	
WCDMA1700	**0.90**	**1.31**	
WCDMA 850	**0.56**	**0.35**	
LTE Band2	**1.11**	**1.64**	
LTE Band4	**0.94**	**0.98**	
LTE Band5	**0.52**	**0.40**	
LTE Band12	**0.23**	**0.26**	
LTE Band13	**0.36**	**0.37**	
LTE Band26	**0.50**	**0.13**	
LTE Band66	**0.96**	**1.02**	
WLAN 2.4GHz	**0.21**	**0.43**	DTS
WLAN 5GHz	**0.07**	**0.17**	NII
BT	**0.03**	**0.09**	DSS

Remark：

This device supports both LTE B12 and LTE B17.Since the supported frequency span for LTE B17 falls completely within the supports frequency span for LTE B12, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B12.

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 5 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**:**

Front-of-face: 1.11 W/kg(1g)

Limb-worn: 1.64 W/kg(10g)

Table 2.2: The sum of SAR values for WiFi5G+BT

	Position	WiFi-5G	BT	Sum
Highest SAR value for Front-of-face	Front 10mm	0.07	0.03	**0.10**
Highest SAR value for Limb-worn	Rear 0mm	0.17	0.09	**0.26**

According to the above tables, the highest sum of reported SAR values is:

Front-of-face:0.10 W/kg(1g)

Limb-worn: 0.26 W/kg(10g)

The detail for simultaneous transmission consideration is described in chapter 13.

3 Client Information

3.1 Applicant Information

Company Name:	IMOO INTERNATIONAL PTE. LTD
Address/Post:	9 RAFFLES PLACE #26-01 REPUBLIC PLAZA SINGAPORE(048619)
Contact Person:	Timotthy
Contact Email:	timothy@imoo.com
Telephone:	13537401347
Fax:	N/A

3.2 Manufacturer Information

Company Name:	IMOO INTERNATIONAL PTE. LTD
Address/Post:	9 RAFFLES PLACE #26-01 REPUBLIC PLAZA SINGAPORE(048619)
Contact Person:	Timotthy
Contact Email:	timothy@imoo.com
Telephone:	13537401347
Fax:	N/A

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

4.1 About EUT

Description:	Watch Phone
Model name:	W2432AO
Operating mode(s):	GSM850/1900 WCDMA850/1700/1900 LTE Band 2/4/5/12/13/17/26/66 BT, Wi-Fi(2.4G/5G)
Tested Tx Frequency:	824 – 849 MHz (GSM 850)
	1850 – 1910 MHz (GSM 1900)
	824 – 849 MHz (WCDMA 850 Band V)
	1710-1755 MHz (WCDMA1700 Band IV)
	1850 – 1910 MHz (WCDMA1900 Band II)
	1850.7 – 1909.3 MHz (LTE Band 2)
	1710.7 – 1754.3 MHz (LTE Band 4)
	824.7 – 848.3 MHz (LTE Band 5)
	2502.5 – 2567.5 MHz (LTE Band 7)
	699.7 – 715.3 MHz (LTE Band 12)
	779.5 –784.5 MHz (LTE Band 13)
	814.7 – 848.3 MHz (LTE Band 26)
	1710.7 –1779.3 MHz (LTE Band 66)
	2412 – 2462 MHz (Wi-Fi 2.4G)
	5180 – 5240 MHz (Wi-Fi 5.2G)
	5260 – 5320 MHz (Wi-Fi 5.3G)
	5500 – 5720 MHz (Wi-Fi 5.5G)
	5745 – 5825 MHz (Wi-Fi 5.8G)
	2400 – 2483.5 MHz (Bluetooth)
GPRS/EGPRS Multislot Class:	12
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna
Hotspot mode:	Support

4.2 Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	867331070003695	GLI32-M-0	1.0.0
EUT2	867331070005278	GLI32-M-0	1.0.0
EUT3	867331070003687	GLI32-M-0	1.0.0
EUT4	867331070003349	GLI32-M-0	1.0.0

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

Note: It is performed to test SAR with the EUT1-3 and conducted power with the EUT4.

4.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	XTC-I32	/	DONGGUAN IMOO TECHNOLOGY LIMITED

*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 D02 RF 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

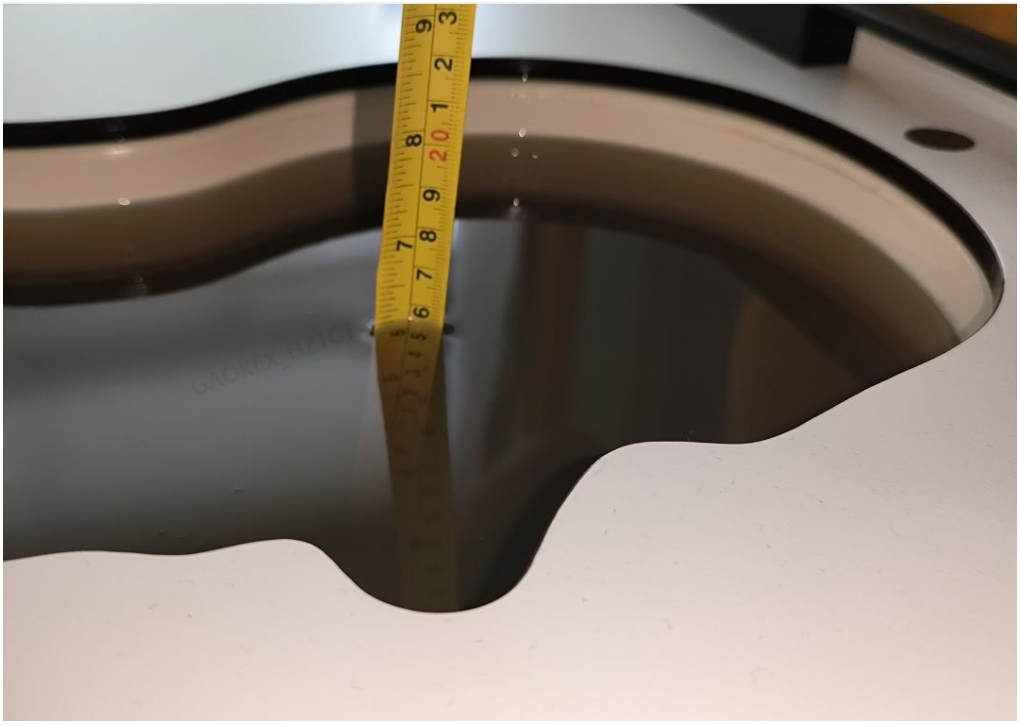
Frequency(MHz)	Liquid Type	Conductivity(σ)	± 5% Range	Permittivity(ε)	± 5% Range
750	Head	0.89	0.85～0.93	41.94	39.8～44.0
835	Head	0.90	0.86～0.95	41.50	39.40～43.60
1800	Head	1.40	1.33～1.47	40.0	38.0～42.0
1900	Head	1.40	1.33～1.47	40.00	38.00～42.00
2450	Head	1.80	1.71～1.89	39.20	37.30～41.10
5250	Head	4.71	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

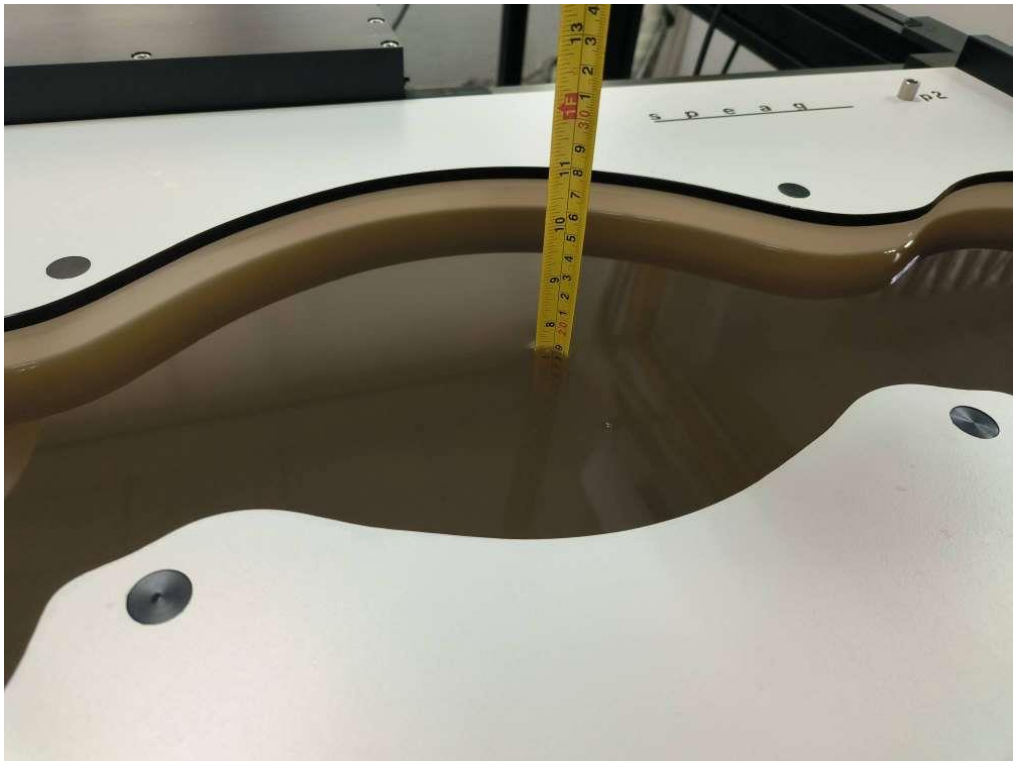
Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2025/3/12	Head	750 MHz	41.458	-1.15%	0.861	-3.26%
2025/3/10	Head	835 MHz	41.45	-0.12%	0.926	2.89%
2025/3/8	Head	1800 MHz	38.951	-2.62%	1.354	-3.29%
2025/3/9	Head	1900 MHz	38.88	-2.80%	1.44	2.86%
2025/2/24	Head	2450 MHz	38.654	-1.39%	1.75	-2.78%
2025/2/25	Head	5250 MHz	36.45	1.45%	4.853	3.04%
2025/2/26	Head	5600 MHz	36.337	2.27%	4.98	-1.78%
2025/2/27	Head	5750 MHz	36.21	2.40%	5.185	-0.67%

Note: The liquid temperature is 22.0℃



Picture 7-1 Liquid depth in the Head Phantom

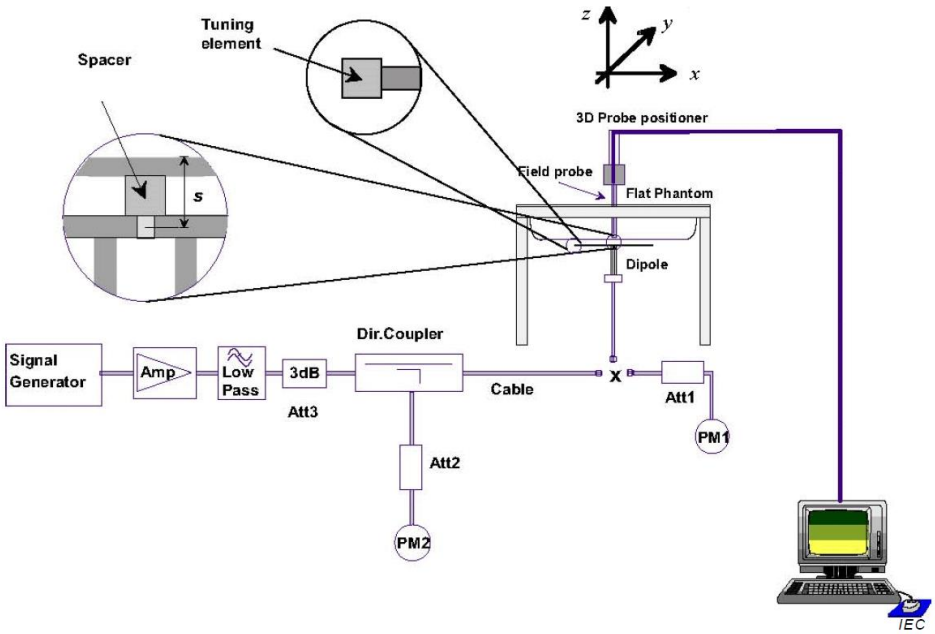


Picture 7-2 Liquid depth in the Flat Phantom

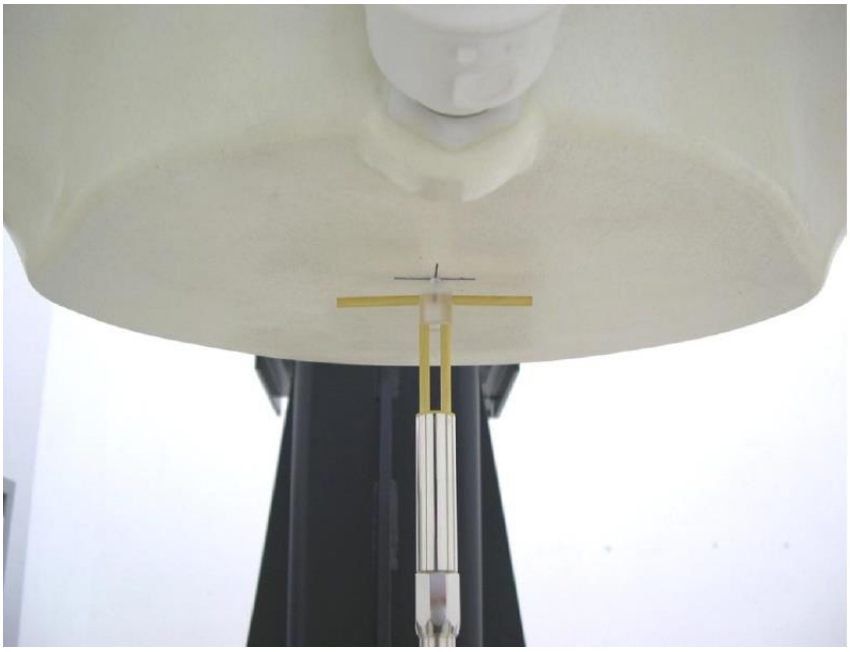
8 System verification

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
2025/3/12	750 MHz	5.53	8.52	5.68	8.76	2.71%	2.82%
2025/3/10	835 MHz	6.09	9.47	6.32	9.84	3.78%	3.91%
2025/3/8	1800 MHz	5.17	9.83	5.24	9.96	1.35%	1.32%
2025/3/9	1900 MHz	5.18	9.83	5.12	9.72	-1.16%	-1.12%
2025/2/24	2450 MHz	24.5	52.2	25.36	53.88	3.51%	3.22%
2025/2/25	5250 MHz	22.4	78.3	22.8	79.8	1.79%	1.92%
2025/2/26	5600 MHz	23.2	81.7	23.9	84.1	3.02%	2.94%
2025/2/27	5750 MHz	22.8	79.9	23.2	81.3	1.75%	1.75%

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.

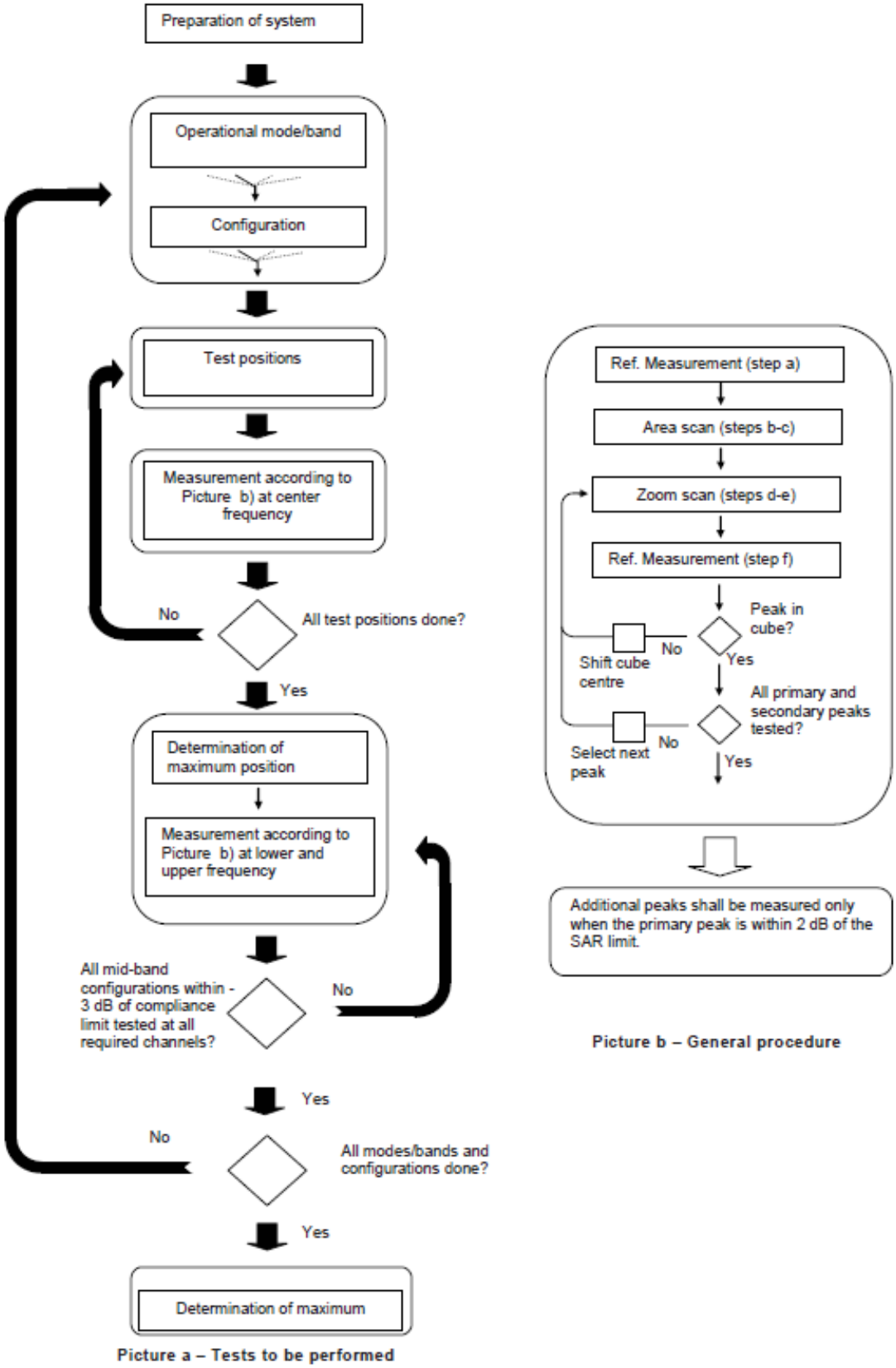
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

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 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.

TDD test:

TDD testing is performed using guidance from FCC KDB 941225 D05 and the SAR test guidance provided in April 2013 TCB works hop notes. TDD is tested at the highest duty factor using UL-DL configuration 0 with special subframe configuration 6 and applying the FDD LTE procedures in KDB 941225 D05. SAR testing is performed using the extended cyclic prefix listed in 3GPP TS 36.211.

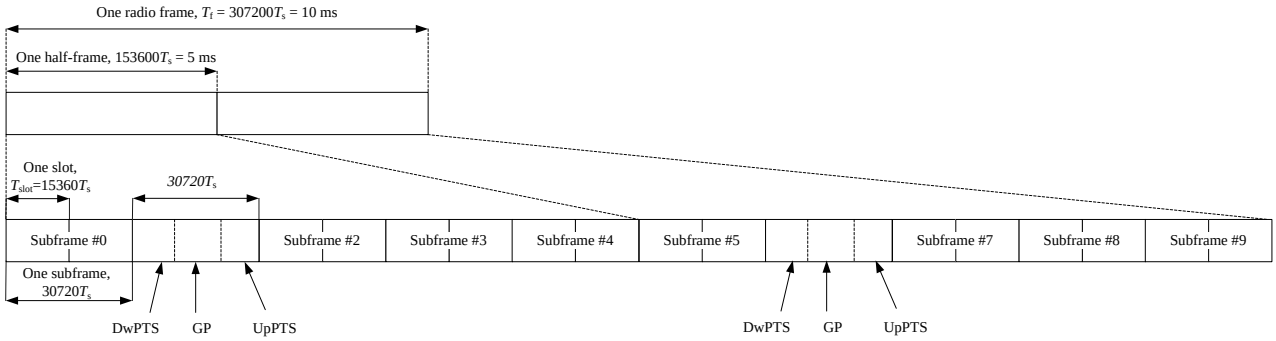


Figure 9.2: Frame structure type 2 (for 5 ms switch-point periodicity)

Table 9.1: 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	$13168 \cdot T_s$			-	-	-

Table 9.2: 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

Duty factor is calculated by:

Duty factor = uplink frame*6+UpPTS*2/one frame length

= (30720.T_s * 6+5120. T_s*2)/307200.T_s

= 0.633

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, DASY8 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

11.1 GSM Measurement result

Table 11.1-1: The conducted power measurement results–GSM850

GSM 850 Speech (GMSK)	Measured timeslot-averaged output power (dBm)			Tune up	calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	31.75	31.97	31.82	33.50	/	/	/	/
GSM 850 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	31.98	31.90	31.75	33.50	-9.03	22.95	22.87	22.72
2 Txslots	29.79	29.78	29.61	31.00	-6.02	23.77	23.76	23.59
3 Txslots	28.48	28.35	28.33	30.00	-4.26	24.22	24.09	24.07
4 Txslots	27.37	27.33	27.18	29.00	-3.01	24.36	24.32	24.17
GSM 850 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	31.99	31.89	31.72	33.50	-9.03	22.96	22.86	22.69
2 Txslots	29.83	29.75	29.60	31.00	-6.02	23.81	23.73	23.58
3 Txslots	28.51	28.32	28.37	30.00	-4.26	24.25	24.06	24.11
4 Txslots	27.34	27.29	27.18	29.00	-3.01	24.33	24.28	24.17
GSM 850 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	26.11	26.23	26.40	27.50	-9.03	17.08	17.20	17.37
2 Txslots	24.90	25.05	25.13	26.50	-6.02	18.88	19.03	19.11
3Txslots	23.56	23.72	23.78	25.00	-4.26	19.30	19.46	19.52
4 Txslots	22.26	22.39	22.49	24.00	-3.01	19.25	19.38	19.48

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

Table 11.1-2: The conducted power measurement results-GSM1900

PCS1900 Speech (GMSK)	Measured timeslot-averaged output power (dBm)			Tune up	calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	29.67	29.64	29.62	30.50	/	/	/	/
PCS1900 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	29.45	29.40	29.42	30.50	-9.03	20.42	20.37	20.39
2 Txslots	28.37	28.09	28.08	29.50	-6.02	22.35	22.07	22.06
3 Txslots	27.05	26.97	26.84	28.50	-4.26	22.79	22.71	22.58
4 Txslots	25.80	25.63	25.52	26.50	-3.01	22.79	22.62	22.51
PCS1900 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	29.56	29.42	29.42	30.50	-9.03	20.53	20.39	20.39
2 Txslots	28.36	28.11	28.07	29.50	-6.02	22.34	22.09	22.05
3 Txslots	27.17	26.89	26.84	28.50	-4.26	22.91	22.63	22.58
4 Txslots	25.78	25.63	25.58	26.50	-3.01	22.77	22.62	22.57
PCS1900 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	25.42	25.51	25.52	26.50	-9.03	16.39	16.48	16.49
2 Txslots	23.99	23.93	24.04	25.00	-6.02	17.97	17.91	18.02
3Txslots	22.76	22.78	22.77	24.00	-4.26	18.50	18.52	18.51
4 Txslots	22.83	21.46	21.47	23.00	-3.01	19.82	18.45	18.46

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

11.2 WCDMA Measurement result

Table 11.1-1: The conducted Power for WCDMA B2

WCDMA1900	FDDII result (dBm)			Tune up
	9538/9938	9400/9800	9262/9662	
	(1907.6MHz)	(1880MHz)	(1852.4MHz)	
	22.72	22.57	22.48	23.5
HSUPA	21.25	20.98	21.23	22.5
	20.09	20.45	20.39	22
	20.27	20.74	20.45	22
	21.2	21.37	21.26	22.5
	21.93	21.86	21.85	22.5
DC-HSDPA	20.52	20.20	20.50	22
	20.83	21.09	20.86	22
	20.43	20.60	20.32	22
	20.05	20.33	20.33	21.5

Table 11.1-2: The conducted Power for WCDMA B4

WCDMA1700	FDDIV result (dBm)			Tune up
	1513/1738	1412/1637	1312/1537	
	(1752.6MHz)	(1732.4MHz)	(1712.4MHz)	
	22.23	22.39	22.70	23.5
HSUPA	21.07	21.35	21.41	22.5
	20.31	20.38	20.18	22
	19.32	19.43	19.40	21
	20.82	21.26	21.07	22.5
	21.4	21.60	21.66	22.5
DC-HSDPA	20.96	20.74	20.76	22
	20.53	20.61	20.64	22
	20.17	20.43	20.22	22
	19.98	20.42	20.15	21.5

Table 11.1-3: The conducted Power for WCDMA B5

WCDMA850	FDDV result (dBm)			Tune up
	4233/4458	4183/4408	4132/4357	
	(846.6MHz)	(836.6MHz)	(826.4MHz)	
	23.02	23.21	23.24	23.5
HSUPA	21.74	22.09	21.96	22.5
	21.61	21.52	21.44	22
	20.96	20.82	20.68	22
	22.12	22.15	21.87	22.5
	22.11	22.31	22.34	22.5
DC-HSDPA	21.12	21.25	21.35	22
	20.96	21.32	21.18	22
	20.96	20.95	20.82	22
	20.92	20.61	20.79	21.5

11.3 LTE Measurement result

Band	Tune up (dBm)
LTE B2	24
LTE B4	23.5
LTE B5	24
LTE B12	24.5
LTE B13	24
LTE B26	24.5
LTE B66	23.5

LTE B2

BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	1909.3 (19193)	22.97	21.54	20.78
		1880 (18900)	22.99	21.41	20.61
		1850.7 (18607)	22.94	21.79	21.10
	1RB-Middle (3)	1909.3 (19193)	22.91	21.74	21.14
		1880 (18900)	22.81	21.54	20.83
		1850.7 (18607)	23.04	21.67	20.87
	1RB-Low (0)	1909.3 (19193)	22.99	21.60	21.03
		1880 (18900)	22.87	21.34	20.67
		1850.7 (18607)	22.90	21.33	20.72
	3RB-High (3)	1909.3 (19193)	23.01	22.15	20.96
		1880 (18900)	23.05	22.11	20.78
		1850.7 (18607)	23.12	21.86	20.75
	3RB-Middle (1)	1909.3 (19193)	23.02	21.91	20.87
		1880 (18900)	23.25	21.71	20.61
		1850.7 (18607)	23.06	21.92	20.76
	3RB-Low (0)	1909.3 (19193)	22.97	21.89	20.67
		1880 (18900)	23.10	21.74	20.56
		1850.7 (18607)	22.92	21.76	20.74
	6RB (0)	1909.3 (19193)	21.89	20.73	19.99
		1880 (18900)	21.86	20.94	19.92
		1850.7 (18607)	21.87	21.00	19.88
3MHz	1RB-High (14)	1908.5 (19185)	22.91	22.37	21.78
		1880 (18900)	23.06	22.09	20.91
		1851.5 (18615)	22.99	21.57	21.07
	1RB-Middle (7)	1908.5 (19185)	22.86	21.72	21.97
		1880 (18900)	22.91	21.54	21.01
		1851.5 (18615)	23.08	21.76	21.25
	1RB-Low (0)	1908.5 (19185)	22.91	21.73	21.66

		1880 (18900)	22.92	21.94	20.92
		1851.5 (18615)	22.87	21.63	20.73
	8RB-High (7)	1908.5 (19185)	21.97	21.33	20.86
		1880 (18900)	21.92	21.11	19.89
		1851.5 (18615)	22.00	21.15	20.05
	8RB-Middle (4)	1908.5 (19185)	22.09	21.33	20.89
		1880 (18900)	21.95	21.13	19.89
		1851.5 (18615)	22.02	21.17	20.00
	8RB-Low (0)	1908.5 (19185)	22.03	21.31	20.94
		1880 (18900)	21.88	21.25	19.83
		1851.5 (18615)	21.99	21.08	20.06
	15RB (0)	1908.5 (19185)	22.02	21.27	20.91
		1880 (18900)	21.79	20.88	19.79
		1851.5 (18615)	21.91	21.11	20.14
5MHz	1RB-High (24)	1907.5 (19175)	22.97	21.53	21.73
		1880 (18900)	22.85	21.60	21.60
		1852.5 (18625)	22.95	21.51	20.73
	1RB-Middle (12)	1907.5 (19175)	23.01	21.70	21.71
		1880 (18900)	22.97	21.62	21.87
		1852.5 (18625)	23.19	21.87	21.19
	1RB-Low (0)	1907.5 (19175)	23.01	21.88	21.77
		1880 (18900)	22.80	21.90	21.62
		1852.5 (18625)	22.90	21.75	20.78
	12RB-High (13)	1907.5 (19175)	21.92	20.91	20.88
		1880 (18900)	21.85	20.88	19.75
		1852.5 (18625)	22.06	21.10	20.16
	12RB-Middle (6)	1907.5 (19175)	21.98	20.95	19.85
		1880 (18900)	21.79	20.84	19.87
		1852.5 (18625)	21.91	20.86	19.93
	12RB-Low (0)	1907.5 (19175)	22.05	21.03	20.08
		1880 (18900)	21.89	20.78	19.79
		1852.5 (18625)	22.04	21.01	20.09
	25RB (0)	1907.5 (19175)	22.08	20.92	20.99
		1880 (18900)	21.83	20.89	20.03
		1852.5 (18625)	22.04	21.08	20.16
10MHz	1RB-High (49)	1905 (19150)	23.14	21.53	21.10
		1880 (18900)	23.16	22.33	21.05
		1855 (18650)	22.98	21.64	21.03
	1RB-Middle (24)	1905 (19150)	22.94	21.86	21.21
		1880 (18900)	23.06	22.40	20.69
		1855 (18650)	23.05	21.88	21.27

	1RB-Low (0)	1905 (19150)	23.18	21.65	21.44
		1880 (18900)	23.04	21.97	21.04
		1855 (18650)	23.08	21.73	20.91
	25RB-High (25)	1905 (19150)	22.07	21.15	20.24
		1880 (18900)	21.86	21.01	20.14
		1855 (18650)	22.13	21.07	20.12
	25RB-Middle (12)	1905 (19150)	22.05	21.07	20.12
		1880 (18900)	21.80	20.95	19.83
		1855 (18650)	22.03	21.13	20.12
	25RB-Low (0)	1905 (19150)	22.08	21.18	20.13
		1880 (18900)	21.79	21.11	20.16
		1855 (18650)	22.09	21.19	20.22
	50RB (0)	1905 (19150)	22.13	21.08	19.97
		1880 (18900)	21.82	20.81	19.86
		1855 (18650)	22.07	21.18	20.08
15MHz	1RB-High (74)	1902.5 (19125)	23.24	21.83	21.54
		1880 (18900)	23.13	21.63	21.87
		1857.5 (18675)	22.90	21.66	21.12
	1RB-Middle (37)	1902.5 (19125)	23.11	22.15	21.65
		1880 (18900)	22.87	21.60	21.61
		1857.5 (18675)	23.03	21.52	21.10
	1RB-Low (0)	1902.5 (19125)	23.10	21.61	21.34
		1880 (18900)	22.88	21.64	21.66
		1857.5 (18675)	23.21	21.80	20.82
	36RB-High (38)	1902.5 (19125)	22.15	20.98	20.92
		1880 (18900)	21.97	20.82	20.89
		1857.5 (18675)	22.15	20.87	20.01
	36RB-Middle (19)	1902.5 (19125)	22.02	20.96	20.90
		1880 (18900)	22.00	20.75	20.79
		1857.5 (18675)	22.12	20.91	19.99
	36RB-Low (0)	1902.5 (19125)	22.03	21.08	20.86
		1880 (18900)	22.06	20.76	20.87
		1857.5 (18675)	22.23	20.98	20.16
	75RB (0)	1902.5 (19125)	22.04	21.02	20.98
		1880 (18900)	21.90	20.86	20.81
		1857.5 (18675)	22.16	21.05	20.00
20MHz	1RB-High (99)	1900 (19100)	22.43	21.87	20.55
		1880 (18900)	23.09	21.52	20.72
		1860 (18700)	22.94	22.13	20.96
	1RB-Middle (50)	1900 (19100)	22.95	21.84	20.90
		1880 (18900)	22.86	21.69	20.99

		1860 (18700)	23.03	22.27	20.88
	1RB-Low (0)	1900 (19100)	22.97	21.66	21.11
		1880 (18900)	22.94	21.41	21.15
		1860 (18700)	23.03	21.82	20.83
	50RB-High (50)	1900 (19100)	21.87	20.86	19.85
		1880 (18900)	21.74	21.03	20.06
		1860 (18700)	22.02	21.12	20.15
	50RB-Middle (25)	1900 (19100)	21.87	21.03	19.85
		1880 (18900)	21.87	20.95	19.85
		1860 (18700)	22.01	21.11	20.03
	50RB-Low (0)	1900 (19100)	22.02	21.06	20.09
		1880 (18900)	22.05	20.85	19.93
		1860 (18700)	22.03	21.24	20.19
	100RB (0)	1900 (19100)	21.99	20.94	19.78
		1880 (18900)	21.97	20.93	20.02
		1860 (18700)	22.17	21.09	20.12

LTE B4

BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	1754.3 (20393)	22.83	21.73	20.83
		1732.5 (20175)	22.84	21.88	20.59
		1710.7 (19957)	22.76	21.52	20.52
	1RB-Middle (3)	1754.3 (20393)	22.80	21.66	20.55
		1732.5 (20175)	22.87	21.93	20.85
		1710.7 (19957)	22.81	21.74	20.60
	1RB-Low (0)	1754.3 (20393)	22.77	21.51	21.43
		1732.5 (20175)	22.66	21.38	20.59
		1710.7 (19957)	22.75	21.60	20.94
	3RB-High (3)	1754.3 (20393)	22.96	22.03	20.88
		1732.5 (20175)	22.80	21.74	20.51
		1710.7 (19957)	22.88	21.89	20.41
	3RB-Middle (1)	1754.3 (20393)	23.06	21.73	21.02
		1732.5 (20175)	22.90	21.79	20.61
		1710.7 (19957)	22.90	22.02	20.75
	3RB-Low (0)	1754.3 (20393)	22.91	21.74	20.82
		1732.5 (20175)	23.07	21.66	20.50
		1710.7 (19957)	23.28	21.93	20.61
	6RB (0)	1754.3 (20393)	21.89	20.93	19.88
		1732.5 (20175)	21.77	20.94	19.97
		1710.7 (19957)	21.86	20.85	19.84

3MHz	1RB-High (14)	1753.5 (20385)	22.95	21.50	20.84
		1732.5 (20175)	22.82	22.12	20.85
		1711.5 (19965)	22.94	21.34	20.72
	1RB-Middle (7)	1753.5 (20385)	23.11	21.70	20.93
		1732.5 (20175)	22.95	21.68	20.86
		1711.5 (19965)	22.82	21.58	21.00
	1RB-Low (0)	1753.5 (20385)	22.98	21.70	20.94
		1732.5 (20175)	22.94	21.90	20.94
		1711.5 (19965)	22.89	21.65	20.65
	8RB-High (7)	1753.5 (20385)	21.85	20.87	19.97
		1732.5 (20175)	21.85	21.09	19.97
		1711.5 (19965)	22.02	21.13	19.76
	8RB-Middle (4)	1753.5 (20385)	21.88	21.04	20.01
		1732.5 (20175)	21.88	20.91	19.99
		1711.5 (19965)	22.03	21.06	19.77
	8RB-Low (0)	1753.5 (20385)	21.87	21.05	20.03
		1732.5 (20175)	21.83	21.03	20.02
		1711.5 (19965)	22.06	21.06	19.71
	15RB (0)	1753.5 (20385)	21.89	20.78	19.77
		1732.5 (20175)	21.74	20.74	19.82
		1711.5 (19965)	21.89	20.86	19.78
5MHz	1RB-High (24)	1752.5 (20375)	23.07	21.80	21.32
		1732.5 (20175)	22.66	22.13	20.86
		1712.5 (19975)	22.90	21.24	20.82
	1RB-Middle (12)	1752.5 (20375)	22.98	21.90	21.21
		1732.5 (20175)	22.77	21.54	20.97
		1712.5 (19975)	22.82	21.58	21.09
	1RB-Low (0)	1752.5 (20375)	22.96	22.21	21.07
		1732.5 (20175)	22.77	21.95	20.88
		1712.5 (19975)	22.86	22.12	20.86
	12RB-High (13)	1752.5 (20375)	21.92	20.90	20.05
		1732.5 (20175)	21.86	20.85	19.82
		1712.5 (19975)	21.99	20.91	20.03
	12RB-Middle (6)	1752.5 (20375)	21.93	20.84	19.82
		1732.5 (20175)	21.80	20.71	19.68
		1712.5 (19975)	21.96	20.96	19.79
	12RB-Low (0)	1752.5 (20375)	22.01	20.86	20.00
		1732.5 (20175)	21.78	20.89	19.98
		1712.5 (19975)	21.96	20.81	19.96
	25RB (0)	1752.5 (20375)	21.94	20.98	20.18
		1732.5 (20175)	21.81	20.57	19.74

		1712.5 (19975)	21.96	21.05	19.97
10MHz	1RB-High (49)	1750 (20350)	23.16	21.65	20.62
		1732.5 (20175)	22.80	21.35	20.70
		1715 (20000)	22.97	21.53	20.86
	1RB-Middle (24)	1750 (20350)	23.07	22.02	20.82
		1732.5 (20175)	22.81	21.46	21.05
		1715 (20000)	22.94	21.86	21.25
	1RB-Low (0)	1750 (20350)	22.87	21.95	20.82
		1732.5 (20175)	22.60	21.48	20.84
		1715 (20000)	23.00	21.53	20.66
	25RB-High (25)	1750 (20350)	21.94	21.03	19.95
		1732.5 (20175)	21.84	20.93	19.93
		1715 (20000)	21.89	20.98	19.86
	25RB-Middle (12)	1750 (20350)	21.90	21.01	19.85
		1732.5 (20175)	21.76	20.82	19.62
		1715 (20000)	21.95	21.04	20.00
	25RB-Low (0)	1750 (20350)	22.01	21.13	19.80
		1732.5 (20175)	21.86	20.93	19.72
		1715 (20000)	22.02	21.02	20.06
	50RB (0)	1750 (20350)	21.99	21.12	19.82
		1732.5 (20175)	21.92	20.83	19.83
		1715 (20000)	21.99	20.88	20.03
15MHz	1RB-High (74)	1747.5 (20325)	22.80	21.63	21.39
		1732.5 (20175)	22.67	21.39	20.60
		1717.5 (20025)	23.11	21.48	20.69
	1RB-Middle (37)	1747.5 (20325)	23.17	21.58	21.09
		1732.5 (20175)	22.70	21.35	20.98
		1717.5 (20025)	22.87	21.49	20.61
	1RB-Low (0)	1747.5 (20325)	23.05	21.70	20.90
		1732.5 (20175)	22.61	21.55	21.11
		1717.5 (20025)	23.10	22.18	20.82
	36RB-High (38)	1747.5 (20325)	21.99	21.04	20.12
		1732.5 (20175)	21.91	20.90	19.95
		1717.5 (20025)	21.88	20.96	19.99
	36RB-Middle (19)	1747.5 (20325)	21.91	20.96	20.05
		1732.5 (20175)	21.77	20.74	19.81
		1717.5 (20025)	21.94	21.01	20.04
	36RB-Low (0)	1747.5 (20325)	22.11	21.09	20.00
		1732.5 (20175)	21.78	20.82	19.89
		1717.5 (20025)	21.98	20.99	20.13
	75RB (0)	1747.5 (20325)	21.91	20.97	20.06

		1732.5 (20175)	21.85	20.91	19.88
		1717.5 (20025)	21.91	20.97	19.94
20MHz	1RB-High (99)	1745 (20300)	22.85	21.66	20.75
		1732.5 (20175)	22.77	21.86	20.84
		1720 (20050)	22.76	21.28	20.56
	1RB-Middle (50)	1745 (20300)	23.01	21.79	20.79
		1732.5 (20175)	23.03	21.41	21.00
		1720 (20050)	22.70	21.67	20.72
	1RB-Low (0)	1745 (20300)	22.87	21.41	20.74
		1732.5 (20175)	22.98	21.32	21.40
		1720 (20050)	22.97	21.62	20.22
	50RB-High (50)	1745 (20300)	21.71	20.95	19.84
		1732.5 (20175)	21.59	20.56	19.61
		1720 (20050)	21.73	20.60	19.84
	50RB-Middle (25)	1745 (20300)	21.73	20.98	19.92
		1732.5 (20175)	21.81	20.55	19.70
		1720 (20050)	21.80	20.85	19.71
	50RB-Low (0)	1745 (20300)	21.79	21.05	19.97
		1732.5 (20175)	21.56	20.50	19.63
		1720 (20050)	21.71	20.87	19.91
	100RB (0)	1745 (20300)	21.86	20.83	20.01
		1732.5 (20175)	21.71	20.39	19.83
		1720 (20050)	21.74	20.79	19.93

LTE B5

BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	848.3 (20643)	23.12	22.16	21.16
		836.5 (20525)	23.48	22.59	21.44
		824.7 (20407)	23.43	22.21	21.33
	1RB-Middle (3)	848.3 (20643)	23.29	22.02	21.43
		836.5 (20525)	23.67	22.21	21.63
		824.7 (20407)	23.58	22.37	21.52
	1RB-Low (0)	848.3 (20643)	23.46	21.87	21.11
		836.5 (20525)	23.40	22.11	21.38
		824.7 (20407)	23.36	22.00	21.28
	3RB-High (3)	848.3 (20643)	23.44	22.12	21.14
		836.5 (20525)	23.49	22.20	21.34
		824.7 (20407)	23.60	22.67	21.61
	3RB-Middle (1)	848.3 (20643)	23.55	22.12	21.35
		836.5 (20525)	23.44	22.33	21.36

		824.7 (20407)	23.53	22.23	21.44
	3RB-Low (0)	848.3 (20643)	23.34	22.07	21.42
		836.5 (20525)	23.56	22.30	21.26
		824.7 (20407)	23.48	22.32	21.67
	6RB (0)	848.3 (20643)	22.16	21.30	20.36
		836.5 (20525)	22.35	21.27	20.57
		824.7 (20407)	22.38	21.27	20.52
3MHz	1RB-High (14)	847.5 (20635)	23.42	21.73	21.54
		836.5 (20525)	23.42	21.92	21.32
		825.5 (20415)	23.41	21.96	21.22
	1RB-Middle (7)	847.5 (20635)	23.45	22.28	21.46
		836.5 (20525)	23.50	22.21	21.62
		825.5 (20415)	23.58	22.09	21.44
	1RB-Low (0)	847.5 (20635)	23.58	21.89	21.14
		836.5 (20525)	23.46	22.08	21.24
		825.5 (20415)	23.53	22.38	21.66
	8RB-High (7)	847.5 (20635)	22.26	21.43	20.25
		836.5 (20525)	22.45	21.41	20.43
		825.5 (20415)	22.41	21.45	20.41
	8RB-Middle (4)	847.5 (20635)	22.42	21.40	20.45
		836.5 (20525)	22.42	21.46	20.48
		825.5 (20415)	22.50	21.53	20.53
	8RB-Low (0)	847.5 (20635)	22.42	21.43	20.43
		836.5 (20525)	22.34	21.73	20.41
		825.5 (20415)	22.45	21.67	20.38
	15RB (0)	847.5 (20635)	22.37	21.24	20.29
		836.5 (20525)	22.44	21.51	20.50
		825.5 (20415)	22.47	21.47	20.47
5MHz	1RB-High (24)	846.5 (20625)	23.26	21.75	21.11
		836.5 (20525)	23.56	21.92	21.61
		826.5 (20425)	23.60	22.46	21.31
	1RB-Middle (12)	846.5 (20625)	23.62	22.31	21.71
		836.5 (20525)	23.77	22.73	21.61
		826.5 (20425)	23.71	22.31	21.65
	1RB-Low (0)	846.5 (20625)	23.54	21.83	21.19
		836.5 (20525)	23.86	22.76	21.48
		826.5 (20425)	23.62	22.46	21.30
	12RB-High (13)	846.5 (20625)	22.39	21.48	20.79
		836.5 (20525)	22.76	21.70	20.95
		826.5 (20425)	22.69	21.47	20.51
	12RB-Middle (6)	846.5 (20625)	22.57	21.60	20.86

		836.5 (20525)	22.65	21.57	20.64
		826.5 (20425)	22.55	21.48	20.54
	12RB-Low (0)	846.5 (20625)	22.55	21.52	20.55
		836.5 (20525)	22.69	21.60	20.67
		826.5 (20425)	22.66	21.77	20.66
	25RB (0)	846.5 (20625)	22.50	21.52	20.69
		836.5 (20525)	22.80	21.64	20.83
		826.5 (20425)	22.59	21.68	20.78
10MHz	1RB-High (49)	844 (20600)	22.95	21.62	20.38
		836.5 (20525)	22.86	21.34	21.25
		829 (20450)	22.86	21.39	20.98
	1RB-Middle (24)	844 (20600)	23.01	21.74	21.20
		836.5 (20525)	23.23	21.42	21.05
		829 (20450)	22.95	21.98	21.43
	1RB-Low (0)	844 (20600)	22.75	21.76	21.15
		836.5 (20525)	22.98	21.81	20.31
		829 (20450)	22.84	21.17	20.84
	25RB-High (25)	844 (20600)	21.80	20.85	19.70
		836.5 (20525)	21.97	21.07	19.91
		829 (20450)	21.92	20.94	20.07
	25RB-Middle (12)	844 (20600)	21.92	20.83	19.81
		836.5 (20525)	21.92	20.95	20.14
		829 (20450)	21.92	20.91	20.08
	25RB-Low (0)	844 (20600)	21.93	21.03	20.15
		836.5 (20525)	21.98	21.18	20.01
		829 (20450)	21.95	21.10	20.17
	50RB (0)	844 (20600)	21.82	20.89	19.90
		836.5 (20525)	21.98	21.17	20.00
		829 (20450)	21.91	21.00	20.00

LTE B12

BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	715.3	23.94	22.65	21.81
		707.5	24.01	22.09	21.40
		699.7	23.80	21.98	21.13
	1RB-Middle (3)	715.3	24.08	22.03	21.97
		707.5	24.12	22.17	21.54
		699.7	23.90	22.15	21.39
	1RB-Low (0)	715.3	23.89	21.90	21.67
		707.5	24.05	22.11	21.37

		699.7	23.73	22.03	21.04
	3RB-High (3)	715.3	23.90	22.57	21.80
		707.5	24.05	22.23	21.35
		699.7	23.87	22.14	20.91
	3RB-Middle (1)	715.3	23.93	22.63	21.91
		707.5	24.10	22.12	21.23
		699.7	23.90	22.11	20.95
	3RB-Low (0)	715.3	23.87	22.57	21.84
		707.5	24.05	22.93	21.18
		699.7	23.82	22.56	20.93
	6RB (0)	715.3	22.35	21.34	21.37
		707.5	22.40	21.53	20.62
		699.7	22.30	21.04	20.41
3MHz	1RB-High (14)	714.5	23.89	22.43	20.86
		707.5	23.97	22.15	21.20
		700.5	23.85	21.79	20.91
	1RB-Middle (7)	714.5	23.84	22.16	22.17
		707.5	24.16	22.25	21.57
		700.5	24.10	22.25	21.33
	1RB-Low (0)	714.5	23.80	22.57	21.36
		707.5	24.01	22.62	21.24
		700.5	23.62	22.29	21.63
	8RB-High (7)	714.5	22.38	21.47	20.38
		707.5	22.56	21.78	20.53
		700.5	22.51	21.54	20.34
	8RB-Middle (4)	714.5	22.43	21.68	20.42
		707.5	22.63	21.75	20.56
		700.5	22.50	21.54	20.35
	8RB-Low (0)	714.5	22.42	21.55	20.24
		707.5	22.61	22.01	20.58
		700.5	22.43	21.47	20.45
	15RB (0)	714.5	22.39	21.32	20.44
		707.5	22.42	21.59	20.52
		700.5	22.44	21.45	20.67
5MHz	1RB-High (24)	713.5	23.62	22.39	22.28
		707.5	23.95	21.75	21.70
		701.5	23.98	21.61	20.94
	1RB-Middle (12)	713.5	24.16	22.31	22.41
		707.5	24.20	22.27	22.42
		701.5	24.06	22.30	21.51
	1RB-Low (0)	713.5	23.98	21.93	21.75

		707.5	24.02	22.65	22.37
		701.5	23.78	22.50	20.59
	12RB-High (13)	713.5	22.30	21.24	21.30
		707.5	22.47	21.51	21.40
		701.5	22.49	21.46	20.44
	12RB-Middle (6)	713.5	22.64	21.57	21.39
		707.5	22.56	21.67	21.30
		701.5	22.62	21.72	20.51
	12RB-Low (0)	713.5	22.56	21.59	21.33
		707.5	22.50	21.52	21.34
		701.5	22.43	21.50	20.62
	25RB (0)	713.5	22.43	22.09	21.34
		707.5	22.49	21.96	21.36
		701.5	22.43	21.57	20.59
10MHz	1RB-High (49)	711	23.64	21.87	20.80
		707.5	23.86	21.85	20.51
		704	23.53	21.69	21.12
	1RB-Middle (24)	711	23.70	21.91	21.22
		707.5	23.79	21.65	21.61
		704	23.81	22.48	21.64
	1RB-Low (0)	711	23.53	21.89	21.09
		707.5	23.87	22.01	21.45
		704	23.41	21.66	20.97
	25RB-High (25)	711	22.05	21.16	20.68
		707.5	22.29	21.16	20.79
		704	22.34	21.41	20.50
	25RB-Middle (12)	711	22.14	21.26	20.15
		707.5	22.14	21.17	20.25
		704	22.13	21.48	20.24
	25RB-Low (0)	711	22.33	21.66	20.77
		707.5	22.42	21.19	20.57
		704	22.34	21.09	20.19
	50RB (0)	711	22.10	21.13	20.27
		707.5	21.98	20.80	20.28
		704	22.48	21.54	20.57

LTE B13

BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
5MHz	1RB-High (24)	784.5 (23255)	23.54	22.68	21.71
		782 (23230)	23.50	22.08	21.15
		779.5 (23205)	23.49	22.15	21.17
	1RB-Middle (12)	784.5 (23255)	23.71	22.74	21.73
		782 (23230)	23.78	22.26	21.72
		779.5 (23205)	23.58	22.30	21.77
	1RB-Low (0)	784.5 (23255)	23.57	22.09	21.18
		782 (23230)	23.58	21.95	21.50
		779.5 (23205)	23.48	22.52	21.47
	12RB-High (13)	784.5 (23255)	22.60	21.25	20.39
		782 (23230)	22.45	21.82	20.80
		779.5 (23205)	22.69	21.41	20.46
	12RB-Middle (6)	784.5 (23255)	22.64	21.42	20.50
		782 (23230)	22.45	21.37	20.53
		779.5 (23205)	22.35	21.28	20.42
	12RB-Low (0)	784.5 (23255)	22.60	21.63	20.60
		782 (23230)	22.43	21.79	20.68
		779.5 (23205)	22.26	21.30	20.44
	25RB (0)	784.5 (23255)	22.40	21.19	20.87
		782 (23230)	22.54	21.91	20.48
		779.5 (23205)	22.47	21.53	20.69
10MHz	1RB-High (49)	782 (23230)	23.32	21.72	21.32
	1RB-Middle (24)	782 (23230)	23.55	21.92	21.51
	1RB-Low (0)	782 (23230)	23.03	21.94	21.30
	25RB-High (25)	782 (23230)	22.09	21.23	20.18
	25RB-Middle (12)	782 (23230)	22.08	21.12	20.05
	25RB-Low (0)	782 (23230)	22.13	21.17	20.29
	50RB (0)	782 (23230)	22.22	21.37	20.17

LTE B26

BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	848.3 (27033)	23.90	21.75	20.82
		831.5 (26865)	23.91	22.11	20.86
		814.7 (26697)	23.71	21.81	20.89
	1RB-Middle (3)	848.3 (27033)	23.89	21.93	20.95
		831.5 (26865)	24.01	22.18	21.39
		814.7 (26697)	23.73	21.90	20.98

	1RB-Low (0)	848.3 (27033)	23.96	21.66	20.91
		831.5 (26865)	23.57	21.69	21.15
		814.7 (26697)	23.54	21.72	20.86
	3RB-High (3)	848.3 (27033)	23.65	22.08	20.87
		831.5 (26865)	24.11	22.37	21.08
		814.7 (26697)	23.81	21.96	20.85
	3RB-Middle (1)	848.3 (27033)	23.73	22.64	20.62
		831.5 (26865)	24.13	22.27	21.07
		814.7 (26697)	23.68	22.30	20.91
	3RB-Low (0)	848.3 (27033)	23.78	22.11	20.92
		831.5 (26865)	24.10	22.37	21.13
		814.7 (26697)	23.67	21.85	20.71
	6RB (0)	848.3 (27033)	22.01	21.12	20.05
		831.5 (26865)	22.31	21.36	20.38
		814.7 (26697)	22.07	20.89	20.04
3MHz	1RB-High (14)	847.5 (27025)	23.68	21.93	21.69
		831.5 (26865)	24.06	22.44	21.56
		815.5 (26705)	23.89	21.87	20.85
	1RB-Middle (7)	847.5 (27025)	24.01	21.96	21.92
		831.5 (26865)	24.17	22.05	21.50
		815.5 (26705)	24.12	21.85	21.06
	1RB-Low (0)	847.5 (27025)	23.86	22.25	22.02
		831.5 (26865)	23.97	22.10	21.16
		815.5 (26705)	23.82	21.75	21.59
	8RB-High (7)	847.5 (27025)	22.26	21.32	20.81
		831.5 (26865)	22.48	21.65	20.37
		815.5 (26705)	22.45	21.45	20.27
	8RB-Middle (4)	847.5 (27025)	22.28	21.34	20.85
		831.5 (26865)	22.65	21.56	20.32
		815.5 (26705)	22.49	21.47	20.34
	8RB-Low (0)	847.5 (27025)	22.36	21.31	21.07
		831.5 (26865)	22.49	21.52	20.35
		815.5 (26705)	22.42	21.41	20.28
	15RB (0)	847.5 (27025)	22.23	21.03	21.07
		831.5 (26865)	22.49	21.39	20.42
		815.5 (26705)	22.31	21.35	20.40
5MHz	1RB-High (24)	846.5 (27015)	23.45	21.88	21.92
		831.5 (26865)	23.65	22.29	21.43
		816.5 (26715)	23.86	22.68	21.39
	1RB-Middle (12)	846.5 (27015)	23.51	21.84	22.06
		831.5 (26865)	24.01	22.16	21.04

		816.5 (26715)	23.77	21.86	21.27
	1RB-Low (0)	846.5 (27015)	23.55	21.88	21.21
		831.5 (26865)	23.79	22.11	21.14
		816.5 (26715)	23.73	21.88	20.94
	12RB-High (13)	846.5 (27015)	21.98	20.99	20.61
		831.5 (26865)	22.30	21.88	20.17
		816.5 (26715)	22.12	21.01	20.62
	12RB-Middle (6)	846.5 (27015)	22.06	21.24	21.07
		831.5 (26865)	22.28	21.43	20.26
		816.5 (26715)	22.18	20.97	20.10
	12RB-Low (0)	846.5 (27015)	22.11	21.00	20.93
		831.5 (26865)	22.52	21.52	20.72
		816.5 (26715)	22.07	21.33	20.35
	25RB (0)	846.5 (27015)	21.94	20.93	21.02
		831.5 (26865)	22.65	21.27	20.82
		816.5 (26715)	22.58	21.40	20.27
10MHz	1RB-High (49)	844 (26990)	23.75	21.83	21.56
		831.5 (26865)	24.01	22.36	21.24
		820 (26750)	24.03	21.84	21.58
	1RB-Middle (24)	844 (26990)	24.01	21.86	21.38
		831.5 (26865)	24.13	22.08	21.89
		820 (26750)	23.96	22.10	21.62
	1RB-Low (0)	844 (26990)	23.94	22.12	21.20
		831.5 (26865)	24.20	21.98	21.70
		820 (26750)	23.76	22.10	21.35
	25RB-High (25)	844 (26990)	22.31	21.37	20.46
		831.5 (26865)	22.46	21.55	20.75
		820 (26750)	22.73	21.83	20.30
	25RB-Middle (12)	844 (26990)	22.31	21.35	20.24
		831.5 (26865)	22.48	21.57	20.43
		820 (26750)	22.35	21.34	20.25
	25RB-Low (0)	844 (26990)	22.59	21.66	20.65
		831.5 (26865)	22.54	21.62	20.78
		820 (26750)	22.46	21.66	20.08
	50RB (0)	844 (26990)	21.60	21.53	20.23
		831.5 (26865)	22.51	21.48	20.49
		820 (26750)	22.11	21.70	20.21
15MHz	1RB-High (74)	841.5 (26965)	23.75	21.90	20.99
		831.5 (26865)	23.41	22.13	21.65
		822.5 (26775)	23.92	22.09	21.53
	1RB-Middle (37)	841.5 (26965)	23.79	21.99	21.06

		831.5 (26865)	23.94	22.15	21.21
		822.5 (26775)	23.91	22.09	21.75
	1RB-Low (0)	841.5 (26965)	23.89	22.23	21.24
		831.5 (26865)	23.75	21.59	21.66
		822.5 (26775)	23.67	22.26	20.98
	36RB-High (38)	841.5 (26965)	22.32	21.25	20.25
		831.5 (26865)	22.39	21.41	20.56
		822.5 (26775)	22.26	21.30	20.22
	36RB-Middle (19)	841.5 (26965)	22.28	21.30	20.26
		831.5 (26865)	22.42	21.55	20.58
		822.5 (26775)	22.37	21.37	20.31
	36RB-Low (0)	841.5 (26965)	22.45	21.59	20.44
		831.5 (26865)	22.46	21.51	20.52
		822.5 (26775)	22.33	21.28	19.64
	75RB (0)	841.5 (26965)	21.90	21.40	20.27
		831.5 (26865)	22.36	21.40	20.36
		822.5 (26775)	22.35	21.37	20.28

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BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	1779.3 (132665)	23.02	21.96	20.90
		1745 (132322)	23.12	22.46	20.81
		1710.7 (131979)	23.10	21.59	20.48
	1RB-Middle (3)	1779.3 (132665)	23.14	22.07	21.02
		1745 (132322)	23.24	21.78	20.88
		1710.7 (131979)	23.05	21.98	20.55
	1RB-Low (0)	1779.3 (132665)	22.97	22.08	20.75
		1745 (132322)	23.15	21.74	20.85
		1710.7 (131979)	23.01	21.62	20.36
	3RB-High (3)	1779.3 (132665)	23.01	21.85	21.08
		1745 (132322)	23.42	22.02	20.97
		1710.7 (131979)	23.18	21.96	21.02
	3RB-Middle (1)	1779.3 (132665)	23.04	22.00	20.85
		1745 (132322)	23.44	22.34	20.94
		1710.7 (131979)	23.07	21.91	20.91
	3RB-Low (0)	1779.3 (132665)	22.99	21.78	20.81
		1745 (132322)	23.41	22.26	20.73
		1710.7 (131979)	23.12	21.99	20.61
	6RB (0)	1779.3 (132665)	21.88	20.69	19.91
		1745 (132322)	22.15	21.21	19.91

		1710.7 (131979)	22.11	21.20	20.18
3MHz	1RB-High (14)	1778.5 (132657)	21.83	21.93	20.85
		1745 (132322)	23.19	21.77	21.42
		1711.5 (131987)	22.80	21.64	21.10
	1RB-Middle (7)	1778.5 (132657)	22.16	21.65	21.14
		1745 (132322)	23.17	21.89	21.47
		1711.5 (131987)	23.05	21.79	21.19
	1RB-Low (0)	1778.5 (132657)	21.95	21.94	21.20
		1745 (132322)	23.19	21.74	21.34
		1711.5 (131987)	23.07	21.79	21.15
	8RB-High (7)	1778.5 (132657)	22.01	20.67	19.73
		1745 (132322)	22.13	21.23	20.24
		1711.5 (131987)	22.00	20.99	19.94
	8RB-Middle (4)	1778.5 (132657)	22.04	21.01	19.82
		1745 (132322)	22.07	21.38	20.30
		1711.5 (131987)	22.03	20.86	19.95
	8RB-Low (0)	1778.5 (132657)	21.92	21.01	19.90
		1745 (132322)	22.07	21.31	20.26
		1711.5 (131987)	22.35	21.41	19.86
	15RB (0)	1778.5 (132657)	21.97	20.94	20.33
		1745 (132322)	22.04	21.24	20.33
		1711.5 (131987)	22.02	20.87	19.89
5MHz	1RB-High (24)	1777.5 (132647)	23.02	21.36	20.78
		1745 (132322)	23.16	21.52	20.96
		1712.5 (131997)	22.84	21.42	20.88
	1RB-Middle (12)	1777.5 (132647)	22.95	21.72	20.90
		1745 (132322)	23.13	21.76	21.17
		1712.5 (131997)	23.01	21.79	21.07
	1RB-Low (0)	1777.5 (132647)	22.89	21.30	21.39
		1745 (132322)	23.23	21.58	21.09
		1712.5 (131997)	22.76	22.08	20.98
	12RB-High (13)	1777.5 (132647)	21.74	20.90	19.81
		1745 (132322)	22.15	20.85	20.16
		1712.5 (131997)	21.91	20.95	20.11
	12RB-Middle (6)	1777.5 (132647)	21.66	21.03	19.84
		1745 (132322)	22.03	21.08	20.22
		1712.5 (131997)	22.12	21.02	19.88
	12RB-Low (0)	1777.5 (132647)	21.86	20.84	20.11
		1745 (132322)	21.89	20.94	20.10
		1712.5 (131997)	22.04	21.01	20.22
	25RB (0)	1777.5 (132647)	21.84	20.77	20.02

		1745 (132322)	21.99	21.30	20.47
		1712.5 (131997)	21.97	21.01	20.27
10MHz	1RB-High (49)	1775 (132622)	22.00	21.61	20.31
		1745 (132322)	23.28	21.68	20.54
		1715 (132022)	23.09	21.93	20.60
	1RB-Middle (24)	1775 (132622)	21.95	21.53	21.34
		1745 (132322)	23.18	21.68	20.71
		1715 (132022)	23.21	21.78	21.30
	1RB-Low (0)	1775 (132622)	21.91	21.34	20.79
		1745 (132322)	23.02	21.79	21.25
		1715 (132022)	23.35	21.64	21.22
	25RB-High (25)	1775 (132622)	21.93	20.81	19.87
		1745 (132322)	22.19	21.15	20.30
		1715 (132022)	22.01	20.95	19.89
	25RB-Middle (12)	1775 (132622)	21.94	20.88	19.94
		1745 (132322)	22.13	21.19	20.35
		1715 (132022)	22.13	21.18	20.23
	25RB-Low (0)	1775 (132622)	21.97	20.82	19.96
		1745 (132322)	22.21	21.24	20.05
		1715 (132022)	22.04	21.27	19.94
	50RB (0)	1775 (132622)	21.89	20.84	19.83
		1745 (132322)	22.24	21.17	20.27
		1715 (132022)	21.92	21.00	20.01
15MHz	1RB-High (74)	1772.5 (132597)	22.86	22.28	21.23
		1745 (132322)	23.19	21.64	21.26
		1717.5 (132047)	22.89	21.55	21.30
	1RB-Middle (37)	1772.5 (132597)	22.77	22.12	21.25
		1745 (132322)	23.13	21.64	21.03
		1717.5 (132047)	23.31	21.86	21.31
	1RB-Low (0)	1772.5 (132597)	22.90	21.77	20.72
		1745 (132322)	23.25	21.81	21.26
		1717.5 (132047)	23.35	21.65	21.46
	36RB-High (38)	1772.5 (132597)	21.87	20.81	19.99
		1745 (132322)	22.15	21.20	20.26
		1717.5 (132047)	22.08	21.00	19.98
	36RB-Middle (19)	1772.5 (132597)	21.95	20.69	19.82
		1745 (132322)	22.07	21.05	20.17
		1717.5 (132047)	22.11	21.05	20.13
	36RB-Low (0)	1772.5 (132597)	21.91	21.02	19.84
		1745 (132322)	22.18	21.34	20.29
		1717.5 (132047)	22.14	21.08	20.27

	75RB (0)	1772.5 (132597)	21.88	20.91	19.91
		1745 (132322)	22.09	21.16	20.17
		1717.5 (132047)	22.16	21.21	20.26
20MHz	1RB-High (99)	1770 (132572)	22.71	21.08	20.88
		1745 (132322)	22.89	21.27	20.64
		1720 (132072)	22.82	21.20	20.33
	1RB-Middle (50)	1770 (132572)	22.71	21.31	20.91
		1745 (132322)	23.05	21.74	20.85
		1720 (132072)	22.95	21.41	20.54
	1RB-Low (0)	1770 (132572)	23.08	21.18	20.92
		1745 (132322)	23.16	21.38	21.16
		1720 (132072)	22.95	21.33	20.43
	50RB-High (50)	1770 (132572)	21.64	20.33	19.61
		1745 (132322)	21.81	20.85	19.69
		1720 (132072)	21.75	20.77	19.68
	50RB-Middle (25)	1770 (132572)	21.54	20.31	19.59
		1745 (132322)	21.85	20.87	19.73
		1720 (132072)	21.75	20.52	19.58
	50RB-Low (0)	1770 (132572)	21.67	20.45	19.58
		1745 (132322)	22.00	20.84	19.91
		1720 (132072)	21.71	20.64	19.80
	100RB (0)	1770 (132572)	21.56	20.38	19.47
		1745 (132322)	21.81	20.68	19.78
		1720 (132072)	21.73	20.72	19.79

11.4 Wi-Fi and BT Measurement result

The maximum output power of BT antenna is 3.10dBm.

The maximum tune up of BT antenna is 5dBm.

GFSK			EDR2M-4_DQPSK			EDR3M-8DPSK		
Channel 0	Channel 39	Channel 78	Channel 0	Channel 39	Channel 78	Channel 0	Channel 39	Channel 78
1.71	3.10	2.20	-0.24	1.14	0.25	-0.23	1.14	0.24

Wi-Fi 2.4G

802.11b		
Channel\data rate	1Mbps	Tune up
11(2462MHz)	16.23	17.00
6(2437(MHz)	16.28	17.00
1(2412MHz)	16.15	17.00
802.11g		
Channel\data rate	6Mbps	Tune up
11(2462MHz)	13.32	14.00
6(2437(MHz)	13.37	14.00
1(2412MHz)	13.30	14.00
802.11n-20MHz		
Channel\data rate	MCS0	Tune up
11(2462MHz)	11.28	12.00
6(2437(MHz)	11.45	12.00
1(2412MHz)	11.48	12.00

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802.11a(dBm)		
Channel\data rate	6Mbps	Tune up
36(5180 MHz)	10.45	12.00
40(5200 MHz)	10.41	12.00
44(5220 MHz)	10.54	12.00
48(5240 MHz)	10.68	12.00
52(5260 MHz)	10.28	12.00
56(5280 MHz)	10.40	12.00
60(5300 MHz)	10.45	12.00
64(5320 MHz)	10.52	12.00
100(5500 MHz)	11.55	12.00
104(5520 MHz)	10.91	12.00
108(5540 MHz)	10.38	12.00
112(5560 MHz)	10.45	12.00
116(5580 MHz)	10.48	12.00
120(5600 MHz)	11.33	12.00
124(5620 MHz)	11.41	12.00
128(5640 MHz)	11.20	12.00
132(5660 MHz)	10.95	12.00
136(5680 MHz)	10.87	12.00
140(5700 MHz)	10.58	12.00
144(5720 MHz)	10.71	12.00
149(5745 MHz)	10.97	12.00
153(5765 MHz)	10.95	12.00
157(5785 MHz)	11.00	12.00
161(5805 MHz)	11.04	12.00
165(5825 MHz)	10.50	12.00

802.11n(dBm)-20MHz		
Channel\data rate	MCS0	Tune up
36(5180 MHz)	10.22	12.00
40(5200 MHz)	10.44	12.00
44(5220 MHz)	10.05	12.00
48(5240 MHz)	10.73	12.00
52(5260 MHz)	10.30	12.00
56(5280 MHz)	10.40	12.00
60(5300 MHz)	10.52	12.00
64(5320 MHz)	10.59	12.00
100(5500 MHz)	11.35	12.00
104(5520 MHz)	10.90	12.00
108(5540 MHz)	10.55	12.00
112(5560 MHz)	10.63	12.00
116(5580 MHz)	10.55	12.00
120(5600 MHz)	11.46	12.00
124(5620 MHz)	11.43	12.00
128(5640 MHz)	11.31	12.00
132(5660 MHz)	11.10	12.00
136(5680 MHz)	10.83	12.00
140(5700 MHz)	10.56	12.00
144(5720 MHz)	10.74	12.00
149(5745 MHz)	11.00	12.00
153(5765 MHz)	10.98	12.00
157(5785 MHz)	11.05	12.00
161(5805 MHz)	11.07	12.00
165(5825 MHz)	10.58	12.00

802.11n(dBm)-40MHz		
Channel\data rate	MCS0	Tune up
38(5190 MHz)	10.21	12.00
46(5230 MHz)	10.04	12.00
54(5270 MHz)	10.37	12.00
62(5310 MHz)	10.51	12.00
102(5510 MHz)	11.46	12.00
110(5550 MHz)	11.09	12.00
118(5590 MHz)	11.84	12.00
126(5630 MHz)	11.73	12.00
134(5670 MHz)	11.61	12.00
142(5710 MHz)	11.51	12.00
151(5755 MHz)	10.46	12.00
159(5795 MHz)	11.04	12.00

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’t transmit simultaneous with other transmitters.

12.2 Transmit Antenna Separation Distances

Please refer to the documents: < The Photos of SAR test - 24T04Z103041-010 >

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.

13 Evaluation of Simultaneous

The simultaneous transmission possibilities for this device are listed as below:

NO.	Antenna combines	head	body
1	WWAN + BT	NO	NO
2	WWAN + Wi-Fi 2.4G	NO	NO
3	WWAN + Wi-Fi 5G	NO	NO
4	WWAN + Wi-Fi 5G + BT	NO	NO
5	Wi-Fi 5G + BT	YES	YES

Table 13-1: Simultaneous Transmission

Reported SAR 1g (W/kg)				
State		**1**	**2**	**1+2**
Body		WiFi 5G	BT	
Front	10mm	0.07	0.03	**0.10**
Reported SAR 10g (W/kg)				
State		**1**	**2**	**1+2**
Limb		WiFi 5G	BT	
Rear	0mm	0.17	0.09	**0.26**

14 SAR Test Result

Note:

KDB 447498 D01 General RF Exposure Guidance:

For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor

For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor

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

KDB 648474 D04 Handset SAR:

With headset attached, 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 headset attached to the handset.

KDB 941225 D01 SAR test for 3G devices:

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 or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% 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 for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.

Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low,Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.

Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.

Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is <1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

For LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. 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; therefore, the requirement for H, M and L channels may not fully apply.

KDB 248227 D01 SAR meas for 802.11:

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions.An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

To determine the initial test position, Area Scans were performed to determine the position with the Maximum Value of SAR (measured). The position that produced the highest Maximum Value of SAR is considered the worst case position; thus used as the initial test position.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the initial test position(s) by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The initial test position(s) is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s).

When the reported SAR for 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 wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.

> 0.4 W/kg, SAR is repeated using the same wireless mode test 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 reported SAR is ≤ 0.8 W/kg or all required test positions are tested.

- For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
- When it is unclear, all equivalent conditions must be tested.

For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required test channels are considered.

- The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.

When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.

When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

Table 14.1: Duty Cycle

Mode	Duty Cycle
GSM850/1900	1:8.3
GPRS/EGPRS 850 4TX	1:2
GPRS/EGPRS 1900 3TX	1:2.67
WCDMA&LTE FDD	1:1

14.1 SAR results for 2G/3G/4G

RF Exposure Conditions	Frequency Band	Channel Number	Frequency (MHz)	Mode	Test Position	Distance	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Body	GSM850	251	848.8	Speech	Front	10mm	\	31.75	33.5	0.322	**0.48**	0.201	**0.30**	0.02
Body	GSM850	190	836.6	Speech	Front	10mm	1	31.97	33.5	0.347	0.49	0.21	**0.30**	0.05
Body	GSM850	128	824.2	Speech	Front	10mm	\	31.82	33.5	0.27	**0.40**	0.164	**0.24**	-0.04
Body	GSM850	251	848.8	GPRS(4TX)	Rear	0mm	\	27.37	29	0.593	**0.86**	0.371	**0.54**	0.11
Body	GSM850	190	836.6	GPRS(4TX)	Rear	0mm	2	27.33	29	0.676	**0.99**	0.407	0.60	0.17
Body	GSM850	128	824.2	GPRS(4TX)	Rear	0mm	\	27.18	29	0.515	**0.78**	0.311	**0.47**	0.08
Body	GSM1900	810	1909.8	Speech	Front	10mm	\	29.67	30.5	0.302	**0.37**	0.183	**0.22**	-0.05
Body	GSM1900	661	1880	Speech	Front	10mm	3	29.64	30.5	0.306	0.37	0.192	**0.23**	-0.04
Body	GSM1900	512	1850.2	Speech	Front	10mm	\	29.62	30.5	0.288	**0.35**	0.183	**0.22**	-0.1
Body	GSM1900	810	1909.8	GPRS(3TX)	Rear	0mm	4	27.05	28.5	1.33	**1.86**	0.738	1.03	0.03
Body	GSM1900	661	1880	GPRS(3TX)	Rear	0mm	\	26.97	28.5	1.29	**1.83**	0.715	**1.02**	0.06
Body	GSM1900	512	1850.2	GPRS(3TX)	Rear	0mm	\	26.84	28.5	1.13	**1.66**	0.654	**0.96**	-0.14
Body	WCDMA1900	9538	1907.6	RMC	Front	10mm	\	22.72	23.5	0.477	**0.57**	0.291	**0.35**	0.18
Body	WCDMA1900	9400	1880	RMC	Front	10mm	\	22.57	23.5	0.531	**0.66**	0.331	**0.41**	-0.17
Body	WCDMA1900	9262	1852.4	RMC	Front	10mm	5	22.48	23.5	0.547	0.69	0.35	**0.44**	0.01
Body	WCDMA1900	9538	1907.6	RMC	Rear	0mm	\	22.72	23.5	1.41	**1.69**	0.784	**0.94**	0.16
Body	WCDMA1900	9400	1880	RMC	Rear	0mm	\	22.57	23.5	1.57	**1.94**	0.897	**1.11**	0.04
Body	WCDMA1900	9262	1852.4	RMC	Rear	0mm	6	22.48	23.5	1.58	**2.00**	0.908	1.15	0.01
Body	WCDMA1700	1513	1752.6	RMC	Front	10mm	7	22.23	23.5	0.674	0.90	0.423	**0.57**	0.08
Body	WCDMA1700	1412	1732.4	RMC	Front	10mm	\	22.39	23.5	0.562	**0.73**	0.343	**0.44**	0.09
Body	WCDMA1700	1312	1712.4	RMC	Front	10mm		22.7	23.5	0.424	**0.51**	0.251	**0.30**	-0.07
Body	WCDMA1700	1513	1752.6	RMC	Rear	0mm	8	22.23	23.5	1.72	**2.30**	0.975	1.31	0.06
Body	WCDMA1700	1412	1732.4	RMC	Rear	0mm	\	22.39	23.5	1.47	**1.90**	0.834	**1.08**	0.08
Body	WCDMA1700	1312	1712.4	RMC	Rear	0mm	\	22.7	23.5	1.25	**1.50**	0.708	**0.85**	0.1
Body	WCDMA850	4233	846.6	RMC	Front	10mm	\	23.02	23.5	0.493	**0.55**	0.293	**0.33**	-0.04
Body	WCDMA850	4183	836.6	RMC	Front	10mm	9	23.21	23.5	0.521	0.56	0.308	**0.33**	-0.01
Body	WCDMA850	4132	826.4	RMC	Front	10mm	\	23.24	23.5	0.508	**0.54**	0.298	**0.32**	-0.13
Body	WCDMA850	4233	846.6	RMC	Rear	0mm	\	23.02	23.5	0.468	**0.52**	0.299	**0.33**	0.15
Body	WCDMA850	4183	836.6	RMC	Rear	0mm	10	23.21	23.5	0.54	**0.58**	0.327	0.35	-0.03
Body	WCDMA850	4132	826.4	RMC	Rear	0mm	\	23.24	23.5	0.477	**0.51**	0.295	**0.31**	-0.03
Body	LTE Band2	19100	1900	1RB-Low	Front	10mm	\	22.97	24	0.827	**1.05**	0.519	**0.66**	0.05
Body	LTE Band2	18900	1880	1RB-High	Front	10mm	\	23.09	24	0.874	**1.08**	0.555	**0.68**	0.09
Body	LTE Band2	18700	1860	1RB-Low	Front	10mm	11	23.03	24	0.884	1.11	0.567	**0.71**	-0.15
Body	LTE Band2	18700	1860	100RB	Front	10mm	\	22.17	23	0.706	**0.85**	0.446	**0.54**	-0.01
Body	LTE Band2	19100	1900	50RB-Low	Front	10mm	\	22.02	23	0.678	**0.85**	0.423	**0.53**	-0.11
Body	LTE Band2	18900	1880	50RB-Low	Front	10mm	\	22.05	23	0.702	**0.87**	0.445	**0.55**	0.03
Body	LTE Band2	18700	1860	50RB-Low	Front	10mm	\	22.03	23	0.718	**0.90**	0.461	**0.58**	-0.11
Body	LTE Band2	19100	1900	1RB-Low	Rear	0mm	\	22.97	24	2.31	**2.93**	1.28	**1.62**	0.18
Body	LTE Band2	18900	1880	1RB-High	Rear	0mm	12	23.09	24	2.4	**2.96**	1.33	1.64	-0.04
Body	LTE Band2	18700	1860	1RB-Low	Rear	0mm	\	23.03	24	2.19	**2.74**	1.22	**1.53**	-0.13
Body	LTE Band2	18700	1860	100RB	Rear	0mm	\	22.17	23	1.98	**2.40**	1.09	**1.32**	0.05
Body	LTE Band2	18900	1880	50RB-Low	Rear	0mm	\	22.03	23	1.99	**2.49**	1.1	**1.38**	-0.07
Body	LTE Band4	20300	1745	1RB-Mid	Front	10mm	13	23.01	23.5	0.843	0.94	0.513	**0.57**	0.01
Body	LTE Band4	20175	1732.5	1RB-Low	Front	10mm	\	23.03	23.5	0.76	**0.85**	0.462	**0.51**	0.04
Body	LTE Band4	20050	1720	1RB-Low	Front	10mm	\	22.97	23.5	0.716	**0.81**	0.429	**0.48**	0.02
Body	LTE Band4	20300	1745	100RB	Front	10mm	\	21.86	22.5	0.619	**0.72**	0.375	**0.43**	0.11
Body	LTE Band4	20300	1745	50RB-Low	Front	10mm	\	21.79	22.5	0.66	**0.78**	0.403	**0.47**	-0.07
Body	LTE Band4	20175	1732.5	50RB-Mid	Front	10mm	\	21.81	22.5	0.611	**0.72**	0.372	**0.44**	0.17
Body	LTE Band4	20050	1720	50RB-Mid	Front	10mm	\	21.8	22.5	0.631	**0.74**	0.381	**0.45**	0.04
Body	LTE Band4	20300	1745	1RB-Mid	Rear	0mm	14	23.01	23.5	1.52	**1.70**	0.872	0.98	-0.07
Body	LTE Band4	20175	1732.5	1RB-Low	Rear	0mm	\	23.03	23.5	1.23	**1.37**	0.708	**0.79**	0.07
Body	LTE Band4	20050	1720	1RB-Low	Rear	0mm	\	22.97	23.5	1.37	**1.55**	0.782	**0.88**	0.08
Body	LTE Band4	20300	1745	100RB	Rear	0mm	\	21.86	22.5	1.06	**1.23**	0.612	**0.71**	-0.08
Body	LTE Band4	20175	1732.5	50RB-Low	Rear	0mm	\	21.81	22.5	1	**1.17**	0.581	**0.68**	0.02
Body	LTE Band5	20525	836.5	1RB-Mid	Front	10mm	15	23.23	24	0.435	0.52	0.263	**0.31**	0.08
Body	LTE Band5	20525	836.5	25RB-Low	Front	10mm	\	21.98	23	0.344	**0.44**	0.208	**0.26**	
Body	LTE Band5	20525	836.5	1RB-Low	Rear	0mm	16	23.23	24	0.544	**0.65**	0.331	0.40	0.02
Body	LTE Band5	20525	836.5	25RB-Low	Rear	0mm	\	21.98	23	0.452	**0.57**	0.272	**0.34**	
Body	LTE Band12	23095	707.5	1RB-Low	Front	10mm	17	23.87	24.5	0.2	0.23	0.123	**0.14**	-0.09
Body	LTE Band12	23095	707.5	25RB-Low	Front	10mm	\	22.42	23.5	0.135	**0.17**	0.083	**0.11**	
Body	LTE Band12	23095	707.5	1RB-Low	Rear	0mm	18	23.87	24.5	0.381	**0.44**	0.226	0.26	0.04
Body	LTE Band12	23095	707.5	25RB-Low	Rear	0mm	\	22.42	23.5	0.254	**0.33**	0.151	**0.19**	
Body	LTE Band13	23230	782	1RB-Mid	Front	10mm	19	23.55	24	0.322	0.36	0.197	**0.22**	0.09
Body	LTE Band13	23230	782	25RB-Low	Front	10mm	\	22.13	23	0.24	**0.29**	0.133	**0.16**	
Body	LTE Band13	23230	782	1RB-Low	Rear	0mm	20	23.55	24	0.544	**0.60**	0.331	0.37	-0.16
Body	LTE Band13	23230	782	25RB-Low	Rear	0mm	\	22.13	23	0.465	**0.57**	0.285	**0.35**	
Body	LTE Band26	26865	831.5	1RB-Mid	Front	10mm	21	23.94	24.5	0.443	0.50	0.272	**0.31**	0.06
Body	LTE Band26	26865	831.5	36RB-Low	Front	10mm	\	22.46	23.5	0.305	**0.39**	0.188	**0.24**	
Body	LTE Band26	26865	831.5	1RB-Mid	Rear	0mm	22	23.94	24.5	0.824	**0.94**	0.501	0.13	0.13
Body	LTE Band26	26865	831.5	36RB-Low	Rear	0mm	\	22.46	23.5	0.553	**0.70**	0.338	**0.43**	
Body	LTE Band66	132572	1770	1RB-Low	Front	10mm	\	23.08	23.5	0.808	**0.89**	0.489	**0.54**	-0.13
Body	LTE Band66	132322	1745	1RB-Low	Front	10mm	\	23.16	23.5	0.837	**0.91**	0.502	**0.54**	0.16
Body	LTE Band66	132072	1720	1RB-Low	Front	10mm	23	22.95	23.5	0.847	0.96	0.504	**0.57**	-0.15
Body	LTE Band66	132072	1720	100RB	Front	10mm	\	21.73	22.5	0.672	**0.80**	0.405	**0.48**	-0.05
Body	LTE Band66	132322	1745	50RB-Low	Front	10mm	\	22	22.5	0.658	**0.74**	0.396	**0.44**	0.11
Body	LTE Band66	132572	1770	1RB-Low	Rear	0mm	\	23.08	23.5	1.59	**1.75**	0.914	**1.01**	0.11
Body	LTE Band66	132322	1745	1RB-Low	Rear	0mm	24	23.16	23.5	1.64	**1.77**	0.947	1.02	0.03
Body	LTE Band66	132072	1720	1RB-Low	Rear	0mm	\	22.95	23.5	1.57	**1.78**	0.888	**1.01**	0.06
Body	LTE Band66	132322	1745	100RB	Rear	0mm	\	21.81	22.5	1.29	**1.51**	0.738	**0.87**	-0.14
Body	LTE Band66	132322	1745	50RB-Low	Rear	0mm	\	22	22.5	1.27	**1.42**	0.725	**0.81**	0.12

14.2 SAR results for WIFI/BT

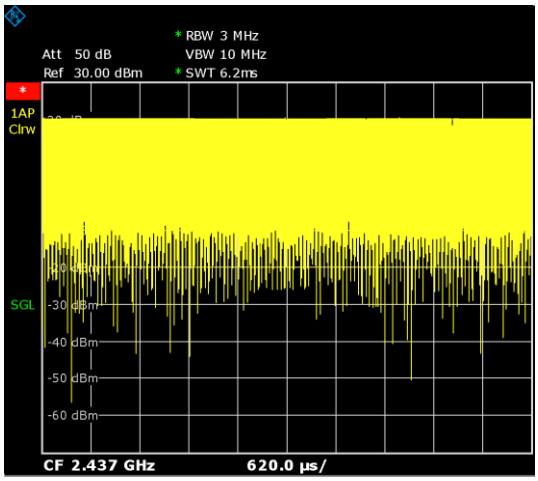
The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.

When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n ac then ax) is selected.

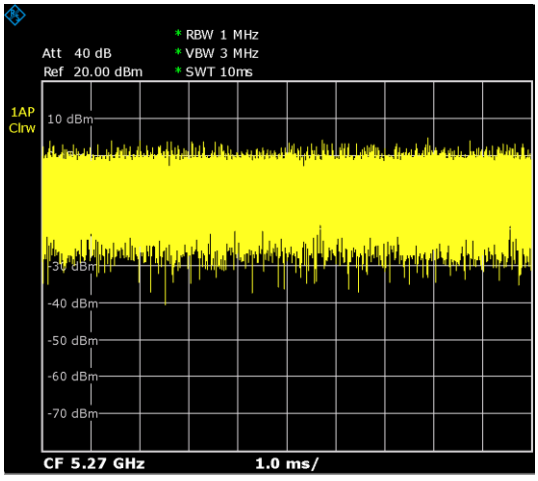
SAR Test reduction was applied from KDB 248227 guidance, when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.

Duty factor plot

Wifi2.4G



WIFI5G



RF Exposure Conditions	Frequency Band	Channel Number	Frequency (MHz)	Mode	Test Position	Distance	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Body	WIFI2.4G	11	2462	WIFI 802.11b 1M	Front	10mm	\	16.23	17	0.143	**0.17**	0.082	**0.10**	-0.08
Body	WIFI2.4G	6	2437	WIFI 802.11b 1M	Front	10mm	25	16.28	17	0.177	**0.21**	0.106	**0.13**	0.11
Body	WIFI2.4G	1	2412	WIFI 802.11b 1M	Front	10mm	\	16.15	17	0.147	**0.18**	0.089	**0.11**	0.18
Body	WIFI2.4G	11	2462	WIFI 802.11b 1M	Rear	0mm	\	16.23	17	0.578	**0.69**	0.304	**0.36**	0.09
Body	WIFI2.4G	6	2437	WIFI 802.11b 1M	Rear	0mm	26	16.28	17	0.684	**0.81**	0.366	**0.43**	-0.01
Body	WIFI2.4G	1	2412	WIFI 802.11b 1M	Rear	0mm	\	16.15	17	0.519	**0.63**	0.278	**0.34**	0.03
Body	WIFI5G	62	5310	WIFI 802.11n 40M	Front	10mm	27	10.51	12	0.049	**0.07**	0.043	**0.06**	0.03
Body	WIFI5G	118	5590	WIFI 802.11n 40M	Front	10mm	\	11.84	12	0.046	**0.05**	0.044	**0.05**	0.03
Body	WIFI5G	159	5795	WIFI 802.11n 40M	Front	10mm	\	11.04	12	0.048	**0.06**	0.049	**0.06**	0.07
Body	WIFI5G	62	5310	WIFI 802.11n 40M	Rear	0mm	28	10.51	12	0.294	**0.41**	0.122	**0.17**	-0.01
Body	WIFI5G	118	5590	WIFI 802.11n 40M	Rear	0mm	\	11.84	12	0.37	**0.38**	0.143	**0.15**	0.06
Body	WIFI5G	159	5795	WIFI 802.11n 40M	Rear	0mm	\	11.04	12	0.28	**0.35**	0.121	**0.15**	-0.09
Body	BT	39	2441	DH5	Front	10mm	29	3.1	5	0.019	**0.03**	0.016	**0.02**	0.03
Body	BT	39	2441	DH5	Rear	0mm	30	3.1	5	0.098	**0.15**	0.061	**0.09**	-0.15

15 SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20

Band	Frequency		Setup	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
	Ch.	MHz						
LTE B2	18700	1860	1RB-Low	Front 10mm	0.884	0.862	1.03	\
LTE B4	20300	1745	1RB-Mid	Front 10mm	0.843	0.825	1.02	\
LTE B66	132072	1720	1RB-Low	Front 10mm	0.847	0.831	1.02	\

16 Measurement Uncertainty

16.1 Measurement Uncertainty for Normal SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.0	N	1	1	1	6.0	6.0	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	N	1	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521

Combined standard uncertainty	$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$					9.55	9.43	257
Expanded uncertainty (confidence interval of 95 %)	$u_e = 2u_c$					19.1	18.9	

16.2 Measurement Uncertainty for Normal SAR Tests (3~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞

21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						10.7	10.6	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						21.4	21.1	

16.3 Measurement Uncertainty for Fast SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.0	N	1	1	1	6.0	6.0	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	7.0	R	$\sqrt{3}$	1	1	4.0	4.0	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞

20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						10.4	10.3	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						20.8	20.6	

16.4 Measurement Uncertainty for Fast SAR Tests (3~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	14.0	R	$\sqrt{3}$	1	1	8.1	8.1	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5

17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						13.5	13.4	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						27.0	26.8	

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	N5239A	MY55491241	May 21, 2024	One year
02	Power sensor	NRP50S	101488	June 5, 2024	One year
03	Power sensor	NRP50S	101489	June 5, 2024	One year
04	Signal Generator	MG3700A	6201052605	June 12 2024	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	CMW500	129942	May 17, 2024	One year
07	E-field Probe	EX3DV4	7727	September 11, 2024	One year
08	DAE	DAE4ip	1832	December 31, 2024	One year
09	Dipole Validation Kit	D750V3	1017	July 9,2024	One year
10	Dipole Validation Kit	D835V2	4d069	July 9,2024	One year
11	Dipole Validation Kit	D1800V2	2d145	July 11,2024	One year
12	Dipole Validation Kit	D1900V2	5d101	July 8,2024	One year
13	Dipole Validation Kit	D2450V2	853	July 10,2024	One year
14	Dipole Validation Kit	D2600V2	1012	July 10,2024	One year
15	Dipole Validation Kit	D3500V2	1016	June 13,2024	One year
16	Dipole Validation Kit	D3700V2	1004	June 24,2024	One year
17	Dipole Validation Kit	D5GHzV2	1060	June 12,2024	One year

END OF REPORT BODY

Appendixes

Refer to separated files for the following appendixes

ANNEX A Graph Results

ANNEX B System Verification Results

ANNEX C SAR Measurement Setup

ANNEX D Position of the wireless device in relation to the phantom

ANNEX E Equivalent Media Recipes

ANNEX F System Validation

ANNEX G Probe Calibration Certificate

ANNEX H Dipole Calibration Certificate

ANNEX I Accreditation Certificate