SAR TEST REPORT

No. I22Z60100-SEM02

For

TCL Communication Ltd.

LINKKEY LTE Cat4 USB Dongle

Model Name: IK42U1

With

Hardware Version: V01

Software Version: IK42_ZZ_02.00_06

FCC ID: 2ACCJB173

Issued Date: 2022-3-23

Note:

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I22Z60100-SEM02	Rev.0	2022-3-12	Initial creation of test report
I22Z60100-SEM02	Rev.0	2022-3-23	Update the GPRS multi-slot Class in section4.1 on page8

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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

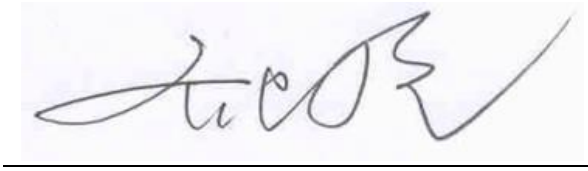
1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Lin xiaojun
Testing Start Date:	February 20, 2022
Testing End Date:	March 12, 2022

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 TCL Communication Ltd. LINKKEY LTE Cat4 USB Dongle IK42U1 is as follows:

Table 2.1: Highest Reported SAR (1g)

Exposure Configuration	Technology Band	Highest Reported SAR 1g(W/kg)
Main antenna (Separation Distance 5/9/14mm)	GSM 850	**0.72**
	PCS 1900	**1.03**
	WCDMA 1900	**0.84**
	WCDMA 1700	**1.25**
	WCDMA 850	**0.60**
	LTE Band 2	**0.83**
	LTE Band 4	**1.15**
	LTE Band 5	**0.46**
	LTE Band 7	**1.32**
	LTE Band 12	**0.24**

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 5/9/14 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**: 1.32W/kg(1g).**

3 Client Information

3.1 Applicant Information

Company Name:	TCL Communication Ltd.
Address/Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
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3.2 Manufacturer Information

Company Name:	TCL Communication Ltd.
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Contact Person:	Peter yang
Contact Email:	peter.yang@tcl.com
Telephone:	+86 755 3664 5759
Fax	+86 755 3661 2000-81722

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

4.1 About EUT

Description:	LINKKEY LTE Cat4 USB Dongle
Model name:	IK42U1
Operating mode(s):	GSM850/900/1800/1900, WDMA850/1700/1900 LTE Band 2/3/4/5/7/12/28
Tested Tx Frequency:	824.2 – 848.8 MHz (GSM 850)
	1850.2 – 1909.8 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)
	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)
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	350114720000749	V01	IK42_ZZ_02.00_06
EUT2	350114720000772	V01	IK42_ZZ_02.00_06
EUT3	350114720000608	V01	IK42_ZZ_02.00_06

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

Note: It is performed to test SAR with the EUT1~2 and conducted power with the EUT3.

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.

KDB447498 D02: SAR Procedures for Dongle Xmtr v02r01: SAR Measurement Procedures for USB Dongle Transmitters

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

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

KDB616217 D04 SAR for laptop and tablets v01r02 SAR Evaluation Considerations for Laptop, Notebook, Notebook and Tablet Computers.

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

The temperature of the tissue-equivalent medium used during measurement must also be within 18 ºC to 25 ºC and within ± 2 ºC of the temperature when the tissue parameters are characterized. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

The dielectric constant (εr) and conductivity (σ) of typical tissue-equivalent media recipes are expected to be within ± 5% of the required target values; but for SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for εr and σ may be relaxed to ± 10%. This is limited to frequencies ≤ 3 GHz.

Table 7.1: Targets for tissue simulating liquid

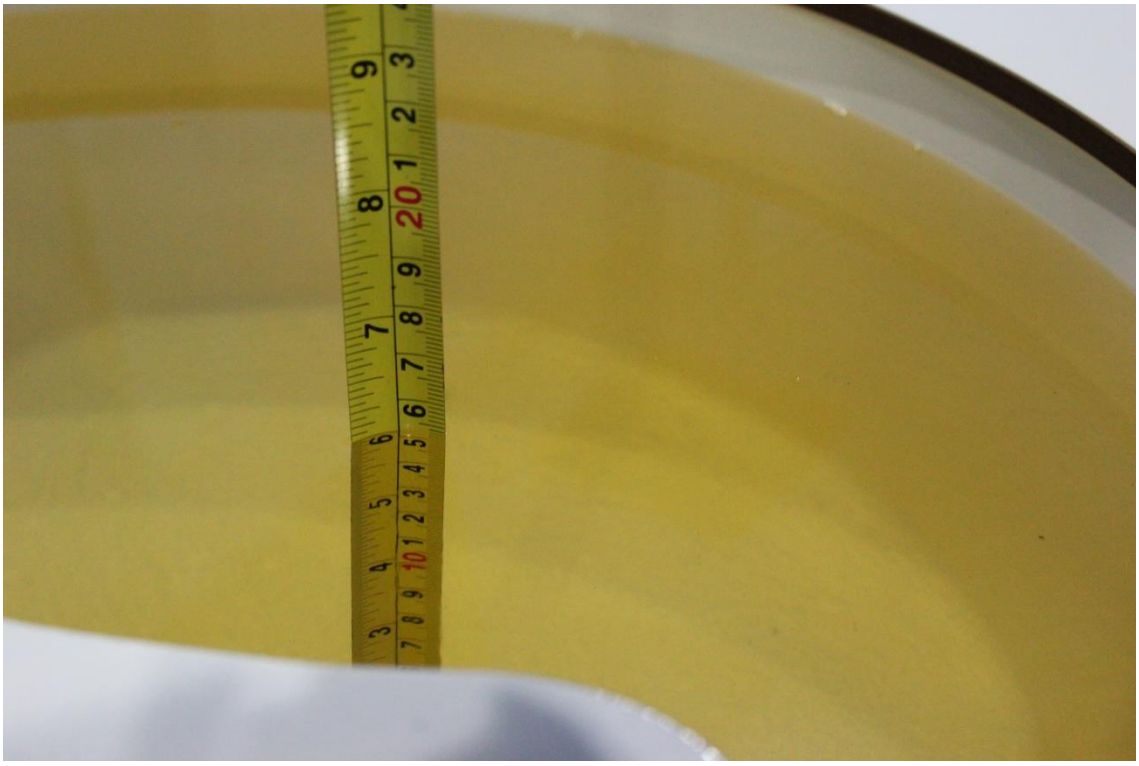
Frequency(MHz)	Liquid Type	Conductivity(σ)	± 5% Range	Permittivity(ε)	± 5% Range
750	Head	0.89	0.85～0.93	41.94	39.8～44.0
835	Head	0.90	0.81～0.99	41.5	37.35～45.65
1750	Head	1.37	1.26～1.54	40.0	36～44
1900	Head	1.40	1.33～1.47	40.00	38.00～42.00
2600	Head	1.96	1.86～2.06	39.01	37.06～40.96

7.2 Dielectric Performance

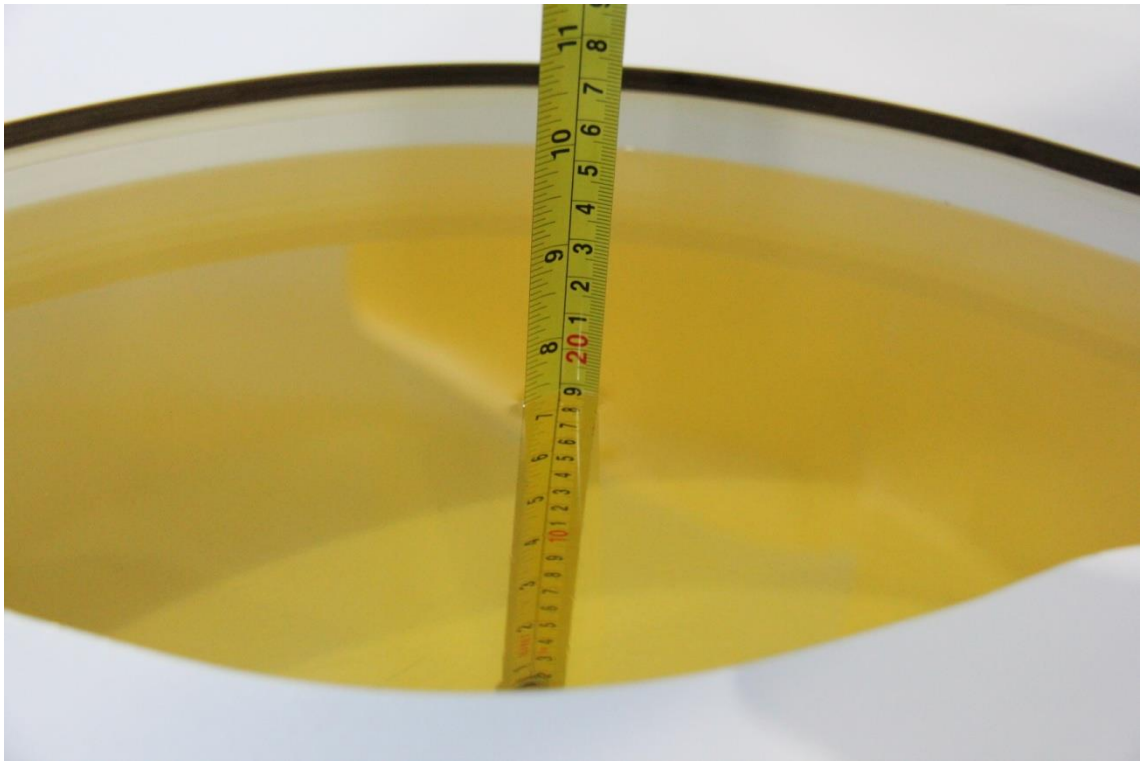
Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2022.2.26	Head	750MHz	45.55	8.61%	0.8193	-7.94%
2022.2.27	Head	835 MHz	45.15	8.80%	0.8593	-4.52%
2022.2.28	Head	1750MHz	42.35	5.66%	1.396	1.90%
2022.3.1	Head	1900 MHz	41.98	4.95%	1.49	6.43%
2022.3.2	Head	2600 MHz	40.54	3.92%	2.066	5.41%

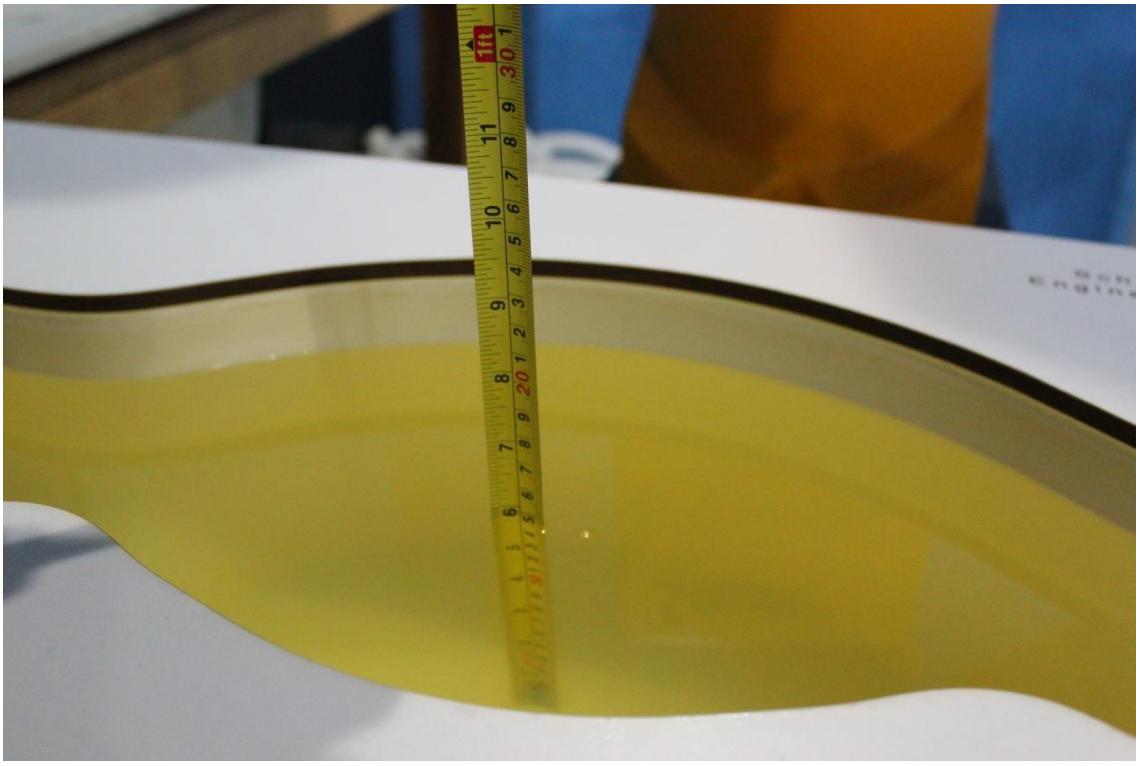
Note: The liquid temperature is 22.0ºC



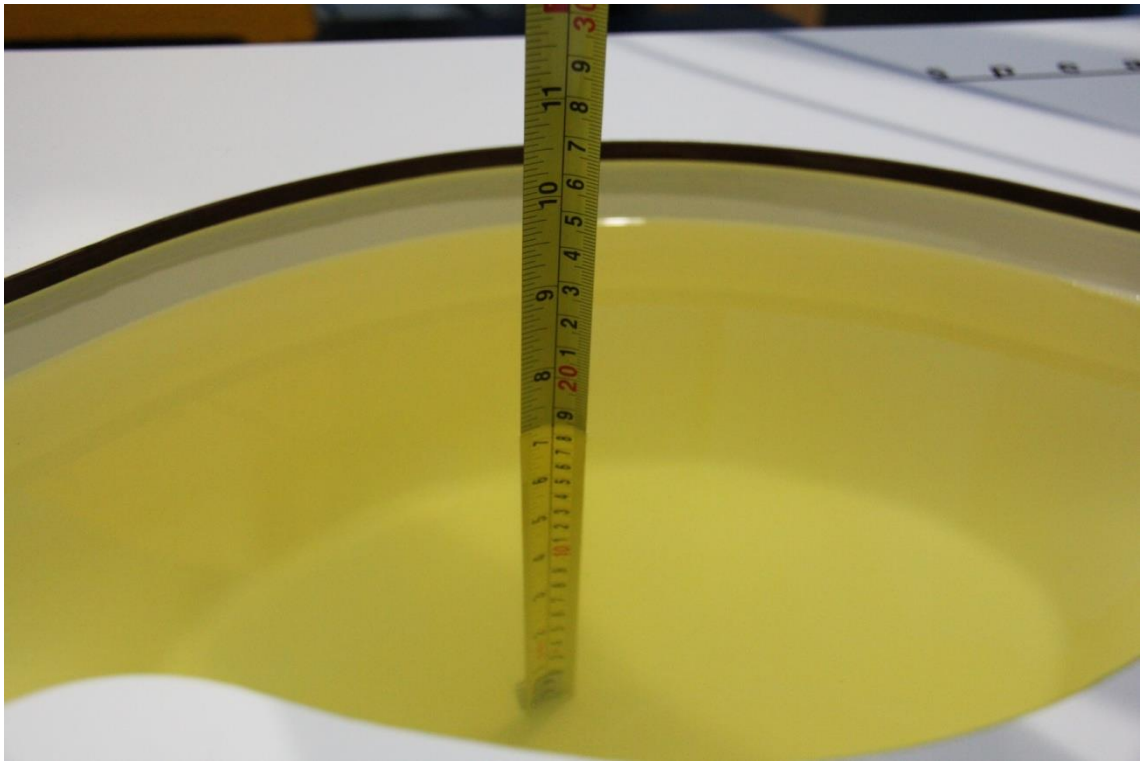
Picture 7-1 Liquid depth in the Flat Phantom (750MHz)



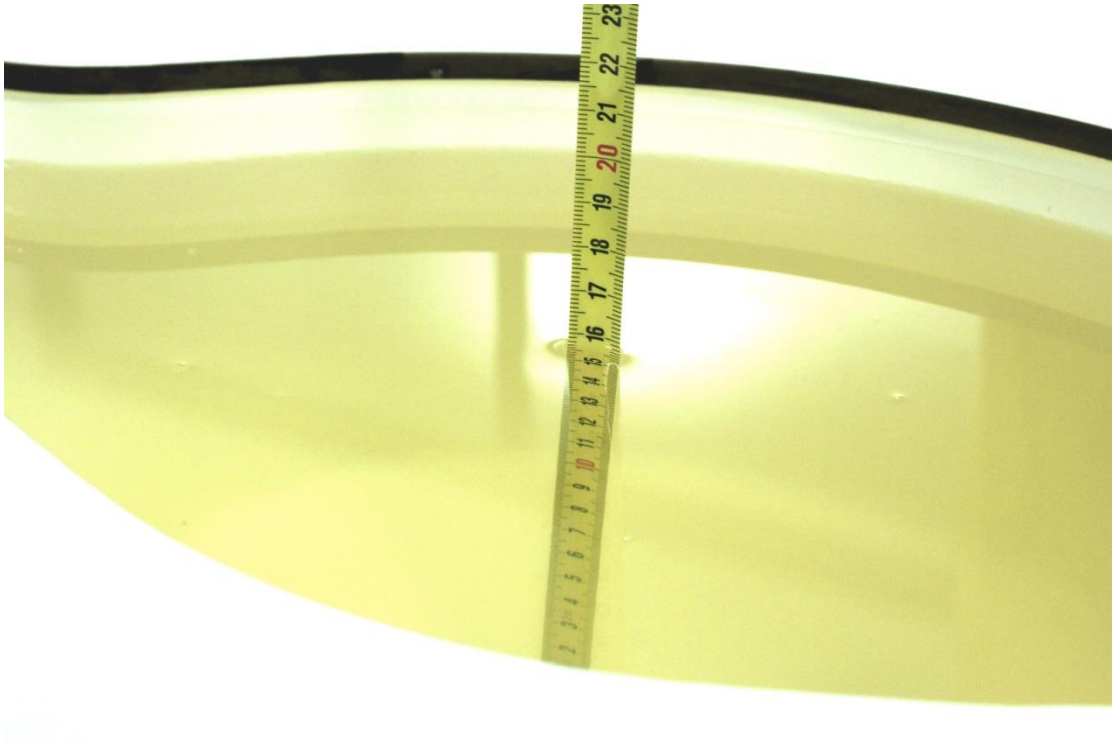
Picture 7-2 Liquid depth in the Flat Phantom (835 MHz)



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



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

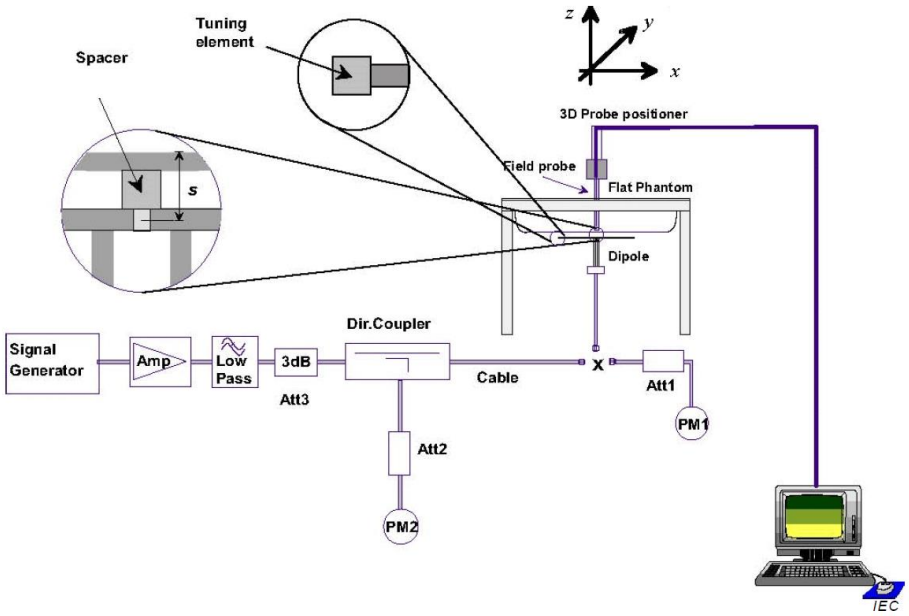


Picture 7-5 Liquid depth in the Flat Phantom (2600MHz)

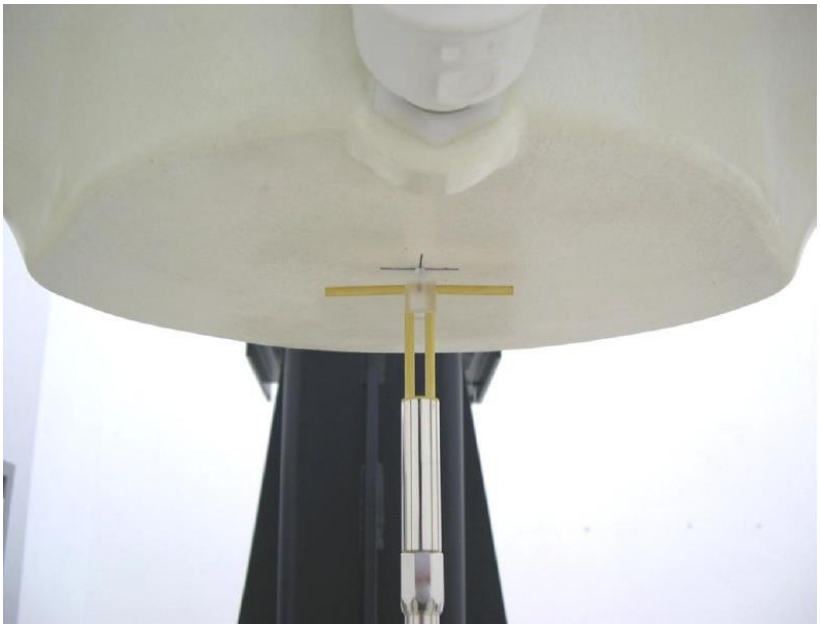
8 System Verification

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
2022.2.26	750 MHz	5.65	8.68	5.32	8.00	-5.84%	-7.83%
2022.2.27	835 MHz	6.24	9.63	6.08	9.76	-2.56%	1.35%
2022.2.28	1750 MHz	19.4	36.9	18.6	34.5	-4.12%	-6.56%
2022.3.1	1900 MHz	20.9	40.1	19.3	36.9	-7.75%	-8.03%
2022.3.2	2600 MHz	25.5	57.1	24.2	53.6	-4.94%	-6.13%

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.

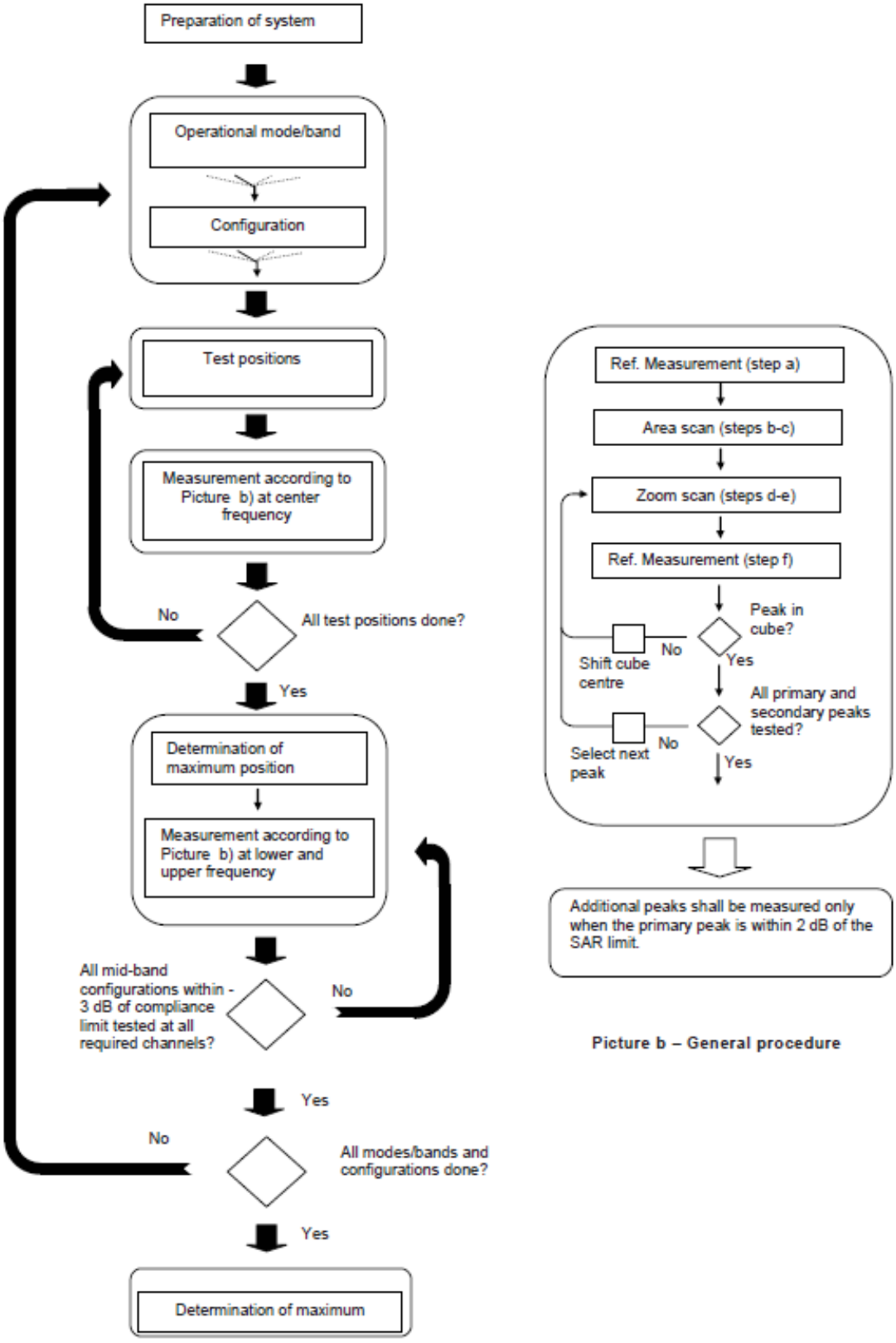
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

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 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.

9.4 Power Drift

To control the output power stability during the SAR test, DASY5 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

This device uses a power reduction mechanism to reduce output powers in certain use conditions when the device is used close the user's body. When the device's antenna is within a certain distance of the user, the sensor activates and reduces the maximum allowed output power. However, the sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, it is necessary to test SAR at a distance 1mm less than the smallest distance from the device and SAR phantom to ensure SAR is compliant when the device is allowed to operate at a nonreduced output power level. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional test positions. Sensor triggering distance summary data is included in Annex I. The details of test scenarios categorization in the table below

Antenna	Sensor deactive	Sensor active
Main antenna	Power Level A1	Power Level B1

11.1 GSM Measurement result

GSM850 Power Level A/B

GSM 850 GPRS (GMSK)	Measured Power (dBm)			Tune up	calculation	Averaged Power (dBm)		
	251	190	128			251	190	128
1 Txslot	33.10	33.01	32.93	33.50	-9.03	24.07	23.98	23.90
2 Txslots	30.48	30.30	30.21	30.50	-6.02	24.46	24.28	24.19
3Txslots	**28.99**	**28.91**	**28.85**	**29.50**	**-4.26**	**24.73**	**24.65**	**24.59**
4 Txslots	27.43	27.32	27.48	27.50	-3.01	24.42	24.31	24.47
GSM 850 EGPRS (GMSK)	Measured Power (dBm)				calculation	Averaged Power (dBm)		
	251	190	128			251	190	128
1 Txslot	32.75	32.63	32.54	33.50	-9.03	23.72	23.60	23.51
2 Txslots	30.45	30.11	30.01	30.50	-6.02	24.43	24.09	23.99
3Txslots	**29.02**	**28.86**	**28.79**	**29.50**	**-4.26**	**24.76**	**24.60**	**24.53**
4 Txslots	27.39	27.48	27.40	27.50	-3.01	24.38	24.47	24.39
GSM 850 EGPRS (8PSK)	Measured Power (dBm)				calculation	Averaged Power (dBm)		
	251	190	128			251	190	128
1 Txslot	26.73	26.73	26.68	28.00	-9.03	17.70	17.70	17.65
2 Txslots	24.13	24.13	24.28	25.00	-6.02	18.11	18.11	18.26
3Txslots	22.95	22.61	23.13	23.50	-4.26	18.69	18.35	18.87
4 Txslots	21.07	21.05	20.81	22.50	-3.01	18.06	18.04	17.80

GSM1900 Power Level A

GSM 1900	Measured Power (dBm)	Tune up	calculation	Averaged Power (dBm)

GPRS (GMSK)	251	190	128			251	190	128
1 Txslot	29.60	29.71	29.54	30.50	-9.03	20.57	20.68	20.51
2 Txslots	26.84	26.74	26.62	27.50	-6.02	20.82	20.72	20.60
3Txslots	**25.32**	**25.27**	**24.92**	**26.00**	**-4.26**	**21.06**	**21.01**	**20.66**
4 Txslots	23.93	23.77	23.41	24.50	-3.01	20.92	20.76	20.40
GSM 1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	810	661	512			810	661	512
1 Txslot	29.65	29.75	29.59	30.50	-9.03	20.62	20.72	20.56
2 Txslots	27.08	26.87	26.94	27.50	-6.02	21.06	20.85	20.92
3Txslots	**25.45**	**25.33**	**25.39**	**26.00**	**-4.26**	**21.19**	**21.07**	**21.13**
4 Txslots	24.05	23.91	23.55	24.50	-3.01	21.04	20.90	20.54
GSM 1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	810	661	512			810	661	512
1 Txslot	26.12	26.05	25.81	27.00	-9.03	17.09	17.02	16.78
2 Txslots	23.70	23.42	23.38	24.00	-6.02	17.68	17.40	17.36
3Txslots	22.02	21.98	21.76	22.50	-4.26	17.76	17.72	17.50
4 Txslots	20.48	20.46	20.21	21.00	-3.01	17.47	17.45	17.20

GSM1900 Power Level B

GSM 1900	Measured Power (dBm)			Tune up	calculation	Averaged Power (dBm)		
GPRS (GMSK)	251	190	128			251	190	128
1 Txslot	25.55	25.39	25.06	26.50	-9.03	16.52	16.36	16.03
2 Txslots	**24.88**	**24.62**	**24.29**	**25.50**	**-6.02**	**18.86**	**18.60**	**18.27**
3Txslots	22.69	22.48	22.03	23.50	-4.26	18.43	18.22	17.77
4 Txslots	20.80	20.56	20.17	21.50	-3.01	17.79	17.55	17.16
GSM 1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	810	661	512			810	661	512
1 Txslot	25.79	25.64	25.56	26.50	-9.03	16.76	16.61	16.53
2 Txslots	**25.07**	**24.81**	**24.49**	**25.50**	**-6.02**	**19.05**	**18.79**	**18.47**
3Txslots	22.87	22.66	22.29	23.50	-4.26	18.61	18.40	18.03
4 Txslots	20.99	20.75	20.38	21.50	-3.01	17.98	17.74	17.37
GSM 1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	810	661	512			810	661	512
1 Txslot	22.47	22.33	22.04	23.50	-9.03	13.44	13.30	13.01
2 Txslots	20.56	20.28	20.21	21.50	-6.02	14.54	14.26	14.19
3Txslots	18.44	18.97	18.07	20.00	-4.26	14.18	14.71	13.81
4 Txslots	16.50	16.31	16.10	17.50	-3.01	13.49	13.30	13.09

11.2 WCDMA Measurement result

WCDMA1900 Power Level A

Item	band	FDDII result			
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)	Tune up
WCDMA	\	22.34	22.21	22.23	23.00
HSUPA	1	20.67	20.65	20.45	22.00
	2	19.68	19.62	19.57	21.00
	3	19.03	19.21	19.03	20.50
	4	19.96	19.88	20.02	21.00
	5	20.85	20.58	20.42	21.50
HSPA+		20.15	20.09	20.11	21.00
DC-HSDPA	1	19.52	19.85	19.68	20.50
	2	19.57	19.63	19.74	20.50
	3	18.94	18.86	18.93	20.00
	4	18.93	19.02	18.97	20.00

WCDMA1900 Power Level B

Item	band	FDDII result			
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)	Tune up
WCDMA	\	19.26	19.47	19.39	20.00
HSUPA	1	17.27	17.18	16.99	18.50
	2	16.55	16.57	16.51	18.50
	3	16.59	16.62	16.51	18.50
	4	16.76	16.79	16.77	18.50
	5	17.28	17.42	17.68	18.50
HSPA+		16.63	16.91	16.86	18.50
DC-HSDPA	1	17.37	17.54	17.45	18.50
	2	17.43	17.62	17.51	18.50
	3	16.85	17.01	16.99	18.50
	4	16.89	17.01	16.95	18.50

WCDMA1700 Power Level A

Item	band	FDDIV result			
	ARFCN	1513 (1752.6MHz)	1412 (1732.4MHz)	1312 (1712.4MHz)	Tune up
WCDMA	\	21.89	21.92	21.83	22.10
HSUPA	1	20.17	20.05	20.16	20.50
	2	19.42	19.54	19.63	20.50
	3	19.12	19.08	19.24	20.50
	4	19.56	19.47	19.28	20.50
	5	20.29	20.05	19.89	20.50

HSPA+		19.91	19.45	19.58	21.00
DC-HSDPA	**1**	19.39	19.32	19.21	20.00
	2	19.38	19.24	19.63	20.00
	3	18.84	18.92	18.93	20.00
	4	18.34	18.72	18.56	20.00

WCDMA1700 Power Level B

Item	**band**	**FDDIV result**			
	ARFCN	**1513 (1752.6MHz)**	**1412 (1732.4MHz)**	**1312 (1712.4MHz)**	**Tune up**
WCDMA	****	18.03	18.03	17.90	19.50
HSUPA	**1**	16.21	16.04	16.05	18.00
	2	16.15	16.13	16.16	18.00
	3	16.07	16.09	16.11	18.00
	4	16.09	16.08	16.01	18.00
	5	16.17	16.14	16.28	18.00
HSPA+		16.08	16.09	16.12	17.50
DC-HSDPA	**1**	16.14	16.20	16.17	17.50
	2	16.11	16.21	16.16	17.50
	3	15.63	15.74	15.75	17.50
	4	15.61	15.73	15.66	17.50

WCDMA850 Power Level A/B

Item	**band**	**FDDV result**			
	ARFCN	**4233 (846.6MHz)**	**4183 (836.6MHz)**	**4132 (826.4MHz)**	**Tune up**
WCDMA	****	21.81	21.79	21.73	23.00
HSUPA	**1**	19.57	19.84	19.71	20.50
	2	19.12	19.48	18.93	20.50
	3	19.16	19.31	19.39	20.50
	4	19.87	19.59	19.72	20.50
	5	20.29	20.30	20.31	21.00
HSPA+		19.59	19.66	20.04	20.50
DC-HSDPA	**1**	20.32	20.27	20.39	21.00
	2	20.33	20.39	20.43	21.00
	3	19.81	19.85	19.89	21.00
	4	19.83	19.87	19.88	21.00

11.3 LTE Measurement result

The maximum output power(Tune-up Limit)

Band	Tune up	
	Power Level A1	Power Level B1
LTE Band 2	23	20
LTE Band 4	23	19.5
LTE Band 5	23	23
LTE Band 7	23.5	19.5
LTE Band 12	23	23

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification. UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

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

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

LTE B2 Power Level A

Band 2				
Bandwidth (MHz)	RB allocation / RB offset	Frequency (MHz)	Actual output power (dBm)	
			QPSK	16QAM
1.4MHz	1RB-High (5)	1909.3	21.89	20.96
		1880	22.04	20.94
		1850.7	21.91	20.93
	1RB-Middle (3)	1909.3	22.07	21.17
		1880	22.09	21.07
		1850.7	21.94	20.96
	1RB-Low (0)	1909.3	21.92	20.97
		1880	21.94	21.02
		1850.7	21.88	20.82
	3RB-High (3)	1909.3	22.00	21.24
		1880	22.07	21.13
		1850.7	21.97	20.93
	3RB-Middle (1)	1909.3	22.08	21.17
		1880	22.03	21.18
		1850.7	21.90	20.93
	3RB-Low (0)	1909.3	22.04	21.09
		1880	21.95	21.14
		1850.7	22.00	20.93
	6RB (0)	1909.3	21.16	20.27
		1880	21.15	20.17
		1850.7	20.97	20.10
3MHz	1RB-High	1908.5	21.92	21.10
		1880 (18900)	22.04	20.88

	(14)	1851.5	21.81	20.87
	1RB-Middle (7)	1908.5	21.73	21.00
		1880 (18900)	21.87	20.94
		1851.5	21.78	20.71
	1RB-Low (0)	1908.5	21.64	20.99
		1880 (18900)	21.88	20.99
		1851.5	21.77	20.74
	8RB-High (7)	1908.5	21.12	20.05
		1880 (18900)	21.18	20.15
		1851.5	21.07	20.27
	8RB-Middle (4)	1908.5	21.11	20.14
		1880 (18900)	21.13	20.22
		1851.5	20.94	20.13
	8RB-Low (0)	1908.5	21.10	20.24
		1880 (18900)	21.06	20.15
		1851.5	20.96	20.17
	15RB (0)	1908.5	21.03	20.05
		1880 (18900)	21.08	20.13
		1851.5	20.95	20.01
5MHz	1RB-High (24)	1907.5	21.84	21.18
		1880	21.89	20.82
		1852.5	21.83	20.78
	1RB-Middle (12)	1907.5	22.03	20.89
		1880	21.92	20.71
		1852.5	21.58	20.79
	1RB-Low (0)	1907.5	21.84	20.85
		1880	21.86	20.70
		1852.5	21.69	20.76
	12RB-High (13)	1907.5	21.04	20.20
		1880	21.04	20.19
		1852.5	20.94	19.94
	12RB-Middle (6)	1907.5	21.09	20.05
		1880	21.08	20.03
		1852.5	20.91	19.82
	12RB-Low (0)	1907.5	20.98	19.88
		1880	21.04	19.88
		1852.5	20.82	19.85
	25RB (0)	1907.5	21.04	20.14
		1880	21.05	20.08
		1852.5	20.96	20.00
10MHz	1RB-High (49)	1905	21.84	20.84
		1880	21.82	20.80
		1855	22.09	21.05
	1RB-Middle (24)	1905	21.85	20.81
		1880	22.00	20.93
		1855	21.90	20.75
	1RB-Low (0)	1905	21.58	20.82
		1880	21.66	20.93
		1855	21.81	20.75
	25RB-High (25)	1905	21.02	20.14
		1880	21.08	20.10
		1855	20.97	20.22
	25RB-Middle (12)	1905	21.00	20.11
		1880	21.06	20.18
		1855	20.94	20.00
	25RB-Low (0)	1905	20.98	19.93
		1880	21.04	20.07
		1855	20.83	19.91
	50RB (0)	1905	21.08	19.87
		1880	21.03	20.09
		1855	20.94	19.91
15MHz	1RB-High (74)	1902.5	21.99	20.83
		1880	21.97	20.78
		1857.5	21.99	20.83
	1RB-Middle (37)	1902.5	21.83	20.79
		1880	21.99	20.82
		1857.5	21.98	20.84
		1902.5	21.75	20.89

	1RB-Low (0)	1880	21.77	20.90
		1857.5	21.83	20.82
	36RB-High (38)	1902.5	21.02	19.84
		1880	21.07	20.09
		1857.5	21.17	20.11
	36RB-Middle (19)	1902.5	20.91	19.85
		1880	21.06	20.06
		1857.5	21.03	19.97
	36RB-Low (0)	1902.5	20.88	19.84
		1880	21.01	20.04
		1857.5	20.86	19.87
	75RB (0)	1902.5	20.92	19.96
		1880	21.04	20.07
		1857.5	21.03	20.14
20MHz	1RB-High (99)	1900	21.97	20.84
		1880	21.98	21.07
		1860	22.09	20.78
	1RB-Middle (50)	1900	22.04	20.98
		1880	22.11	21.04
		1860	22.25	21.08
	1RB-Low (0)	1900	21.82	20.90
		1880	21.79	20.88
		1860	21.83	20.78
	50RB-High (50)	1900	21.01	19.93
		1880	21.10	20.00
		1860	21.11	20.18
	50RB-Middle (25)	1900	20.13	19.97
		1880	21.15	20.09
		1860	21.17	20.18
	50RB-Low (0)	1900	21.09	19.86
		1880	21.12	19.98
		1860	20.96	20.05
	100RB (0)	1900	21.06	19.91
		1880	21.10	19.96
		1860	21.12	20.05

LTE B2 Power Level B

Band 2				
Bandwidth (MHz)	RB allocation	Frequency (MHz)	Actual output power (dBm)	
	RB offset		QPSK	16QAM
1.4MHz	1RB-High (5)	1909.3	18.93	18.15
		1880	18.96	18.10
		1850.7	18.92	17.73
	1RB-Middle (3)	1909.3	18.97	18.20
		1880	19.15	18.11
		1850.7	19.01	17.75
	1RB-Low (0)	1909.3	18.92	18.01
		1880	19.09	17.86
		1850.7	18.84	17.78
	3RB-High (3)	1909.3	19.17	17.98
		1880	19.13	18.23
		1850.7	18.89	17.79
	3RB-Middle (1)	1909.3	19.23	18.20
		1880	19.09	18.21
		1850.7	18.90	17.85
	3RB-Low (0)	1909.3	19.09	18.01
		1880	19.01	18.07
		1850.7	18.91	17.70
	6RB (0)	1909.3	18.21	17.11
		1880	18.07	17.10
		1850.7	17.94	16.96

3MHz	1RB-High (14)	1908.5	19.19	18.02
		1880 (18900)	18.91	18.07
		1851.5	18.87	17.87
	1RB-Middle (7)	1908.5	19.20	18.06
		1880 (18900)	19.38	17.90
		1851.5	18.88	17.79
	1RB-Low (0)	1908.5	19.16	17.84
		1880 (18900)	19.11	17.81
		1851.5	18.87	17.74
	8RB-High (7)	1908.5	18.20	17.33
		1880 (18900)	18.14	17.25
		1851.5	17.94	16.85
	8RB-Middle (4)	1908.5	18.18	17.23
		1880 (18900)	18.09	17.06
		1851.5	17.94	16.88
	8RB-Low (0)	1908.5	18.14	17.13
		1880 (18900)	18.12	17.04
		1851.5	17.91	16.94
	15RB (0)	1908.5	18.21	17.16
		1880 (18900)	18.13	17.00
		1851.5	17.94	16.80
5MHz	1RB-High (24)	1907.5	19.06	18.03
		1880	18.83	17.78
		1852.5	18.95	17.56
	1RB-Middle (12)	1907.5	19.14	17.98
		1880	19.03	17.72
		1852.5	18.69	17.78
	1RB-Low (0)	1907.5	19.00	17.97
		1880	19.01	17.84
		1852.5	18.62	17.54
	12RB-High (13)	1907.5	18.14	17.03
		1880	18.03	17.03
		1852.5	17.96	16.89
	12RB-Middle (6)	1907.5	18.19	17.01
		1880	18.03	17.05
		1852.5	17.97	16.80
	12RB-Low (0)	1907.5	18.12	16.96
		1880	18.06	17.01
		1852.5	17.81	16.58
	25RB (0)	1907.5	18.11	17.25
		1880	18.02	16.85
		1852.5	17.96	16.88
10MHz	1RB-High (49)	1905	19.12	18.00
		1880	18.90	17.98
		1855	19.28	17.96
	1RB-Middle (24)	1905	19.32	18.00
		1880	19.24	17.98
		1855	19.01	17.68
	1RB-Low (0)	1905	18.87	17.89
		1880	18.91	17.90
		1855	18.86	17.70
	25RB-High (25)	1905	18.06	17.08
		1880	18.15	16.98
		1855	18.02	16.86
	25RB-Middle (12)	1905	18.07	17.00
		1880	18.15	17.09
		1855	18.01	16.86
	25RB-Low (0)	1905	17.99	16.92
		1880	18.07	17.13
		1855	17.93	16.77
	50RB (0)	1905	18.10	16.93
		1880	18.10	17.07
		1855	17.98	16.92
15MHz	1RB-High (74)	1902.5	19.45	17.97
		1880	19.14	17.75
		1857.5	19.23	17.91
	1RB-Middle	1902.5	19.12	17.76
		1880	19.05	17.91

	(37)	1857.5	19.22	17.67
	1RB-Low (0)	1902.5	18.92	18.00
		1880	19.17	17.90
		1857.5	18.97	17.51
	36RB-High (38)	1902.5	18.08	16.93
		1880	18.22	16.85
		1857.5	18.22	16.97
	36RB-Middle (19)	1902.5	18.01	17.02
		1880	18.25	16.95
		1857.5	18.16	16.88
	36RB-Low (0)	1902.5	18.03	17.00
		1880	18.20	16.92
		1857.5	17.90	16.83
	75RB (0)	1902.5	18.14	17.02
		1880	18.22	17.03
		1857.5	18.15	16.88
20MHz	1RB-High (99)	1900	19.23	17.99
		1880	18.95	17.95
		1860	19.28	17.82
	1RB-Middle (50)	1900	19.27	17.93
		1880	19.37	18.18
		1860	19.38	18.14
	1RB-Low (0)	1900	19.24	18.01
		1880	18.90	17.91
		1860	18.75	17.70
	50RB-High (50)	1900	18.15	16.97
		1880	18.03	16.93
		1860	18.04	17.08
	50RB-Middle (25)	1900	18.25	17.04
		1880	18.20	17.11
		1860	18.26	17.08
	50RB-Low (0)	1900	18.21	17.05
		1880	18.15	17.15
		1860	17.96	16.98
	100RB (0)	1900	18.20	17.14
		1880	18.09	16.92
		1860	18.21	17.02

LTE B4 Power Level A

Band 4				
Bandwidth (MHz)	RB allocation	Frequency (MHz)	Actual output power (dBm)	
	RB offset		QPSK	16QAM
1.4MHz	1RB-High	1754.3	22.01	20.84
		1732.5	22.02	20.83
		1710.7	21.76	20.57
	1RB-Middle (3)	1754.3	21.84	20.89
		1732.5	22.09	21.01
		1710.7	21.87	20.70
	1RB-Low (0)	1754.3	21.69	20.71
		1732.5	21.84	20.80
		1710.7	21.64	20.57
	3RB-High (3)	1754.3	22.10	21.09
		1732.5	21.83	20.98
		1710.7	21.85	21.03

	3RB-Middle (1)	1754.3	21.90	21.12
		1732.5	21.88	20.95
		1710.7	21.95	21.00
	3RB-Low (0)	1754.3	21.74	20.73
		1732.5	21.74	20.88
		1710.7	21.86	20.90
	6RB (0)	1754.3	21.00	19.93
		1732.5	20.92	19.69
		1710.7	20.64	19.78
3MHz	1RB-High (14)	1753.5	22.03	21.54
		1732.5	22.08	21.34
		1711.5	21.58	20.48
	1RB-Middle (7)	1753.5	21.59	20.72
		1732.5	22.00	20.98
		1711.5	21.71	20.51
	1RB-Low (0)	1753.5	21.72	20.51
		1732.5	22.04	20.88
		1711.5	21.84	20.73
	8RB-High (7)	1753.5	20.92	20.00
		1732.5	21.12	20.06
		1711.5	20.91	19.75
	8RB-Middle (4)	1753.5	21.04	20.04
		1732.5	21.17	20.01
		1711.5	20.88	19.85
	8RB-Low (0)	1753.5	20.94	19.95
		1732.5	20.97	20.03
		1711.5	20.87	19.84
	15RB (0)	1753.5	20.92	19.89
		1732.5	20.95	19.96
		1711.5	20.95	19.87
5MHz	1RB-High (24)	1752.5	22.13	20.95
		1732.5	21.84	20.73
		1712.5	21.71	20.49
	1RB-Middle (12)	1752.5	21.80	20.66
		1732.5	21.91	20.52
		1712.5	21.73	20.53
	1RB-Low (0)	1752.5	21.88	20.76
		1732.5	21.84	20.85
		1712.5	21.86	20.84
	12RB-High (13)	1752.5	20.96	20.00
		1732.5	21.06	20.05
		1712.5	20.86	19.85
	12RB-Middle (6)	1752.5	20.79	19.73
		1732.5	20.93	19.99
		1712.5	20.85	19.86
	12RB-Low (0)	1752.5	20.89	19.72
		1732.5	21.00	20.05
		1712.5	20.86	19.63
	25RB (0)	1752.5	20.88	19.82

		1732.5	21.02	19.86
		1712.5	20.85	19.97
10MHz	1RB-High (49)	1750	21.96	21.06
		1732.5	22.02	20.83
		1715	21.85	20.68
	1RB-Middle (24)	1750	21.77	20.94
		1732.5	22.00	20.88
		1715	21.94	20.87
	1RB-Low (0)	1750	22.07	20.86
		1732.5	22.03	20.78
		1715	21.91	20.60
	25RB-High (25)	1750	21.14	20.11
		1732.5	20.99	20.01
		1715	21.02	19.91
	25RB-Middle (12)	1750	21.05	20.12
		1732.5	21.02	19.94
		1715	20.96	19.97
	25RB-Low (0)	1750	21.08	20.16
		1732.5	21.06	19.93
		1715	21.01	20.02
	50RB (0)	1750	21.10	20.18
		1732.5	21.07	19.91
		1715	20.93	20.03
15MHz	1RB-High (74)	1747.5	21.97	21.01
		1732.5	22.18	20.87
		1717.5	22.05	20.81
	1RB-Middle (37)	1747.5	21.87	20.87
		1732.5	21.98	20.81
		1717.5	21.89	20.94
	1RB-Low (0)	1747.5	22.07	21.04
		1732.5	22.04	20.83
		1717.5	21.96	20.80
	36RB-High (38)	1747.5	21.09	20.13
		1732.5	21.03	20.07
		1717.5	21.01	19.95
	36RB-Middle (19)	1747.5	21.04	19.98
		1732.5	20.97	19.99
		1717.5	21.04	19.97
	36RB-Low (0)	1747.5	21.11	19.95
		1732.5	21.02	20.01
		1717.5	20.98	20.00
	75RB (0)	1747.5	21.03	20.22
		1732.5	21.11	19.94
		1717.5	20.99	20.13
20MHz	1RB-High (99)	1745	21.91	20.90
		1732.5	22.06	20.91
		1720	21.86	20.74
	1RB-Middle	1745	22.05	21.06

	(50)	1732.5	22.04	21.04
		1720	21.85	21.08
	1RB-Low (0)	1745	22.09	20.95
		1732.5	22.07	20.95
		1720	21.99	20.65
	50RB-High (50)	1745	21.02	20.02
		1732.5	21.04	19.99
		1720	21.02	19.98
	50RB-Middle (25)	1745	21.01	20.05
		1732.5	21.01	20.07
		1720	21.02	19.91
	50RB-Low (0)	1745	21.10	20.22
		1732.5	21.07	20.03
		1720	21.04	20.06
	100RB (0)	1745	21.06	20.23
		1732.5	21.05	20.00
		1720	21.05	20.11

LTE B4 Power Level B

Band 4				
Bandwidth (MHz)	RB allocation	Frequency (MHz)	Actual output power (dBm)	
	RB offset		QPSK	16QAM
1.4MHz	1RB-High	1754.3	18.15	16.83
		1732.5	18.19	16.96
		1710.7	18.04	16.79
	1RB-Middle (3)	1754.3	18.15	16.87
		1732.5	18.21	17.18
		1710.7	18.26	17.02
	1RB-Low (0)	1754.3	17.96	16.69
		1732.5	18.13	16.96
		1710.7	18.02	16.99
	3RB-High (3)	1754.3	18.20	17.27
		1732.5	18.13	17.20
		1710.7	18.10	17.02
	3RB-Middle (1)	1754.3	18.19	17.15
		1732.5	18.36	17.33
		1710.7	18.18	17.06
	3RB-Low (0)	1754.3	18.14	17.14
		1732.5	18.28	17.21
		1710.7	18.01	17.16
	6RB (0)	1754.3	17.17	16.15
		1732.5	17.13	16.19
		1710.7	17.08	16.12
3MHz	1RB-High	1753.5	18.19	17.06

	(14)	1732.5	18.27	16.93
		1711.5	18.17	17.54
	1RB-Middle (7)	1753.5	18.07	16.95
		1732.5	18.26	17.04
		1711.5	18.28	16.97
	1RB-Low (0)	1753.5	17.93	16.69
		1732.5	18.02	17.05
		1711.5	18.18	16.76
	8RB-High (7)	1753.5	16.88	15.76
		1732.5	17.00	16.32
		1711.5	17.05	16.24
	8RB-Middle (4)	1753.5	17.11	15.82
		1732.5	17.02	16.13
		1711.5	17.02	16.08
	8RB-Low (0)	1753.5	16.99	15.79
		1732.5	16.99	16.20
		1711.5	16.99	15.92
	15RB (0)	1753.5	16.97	15.83
		1732.5	16.99	15.87
		1711.5	17.06	15.78
5MHz	1RB-High (24)	1752.5	18.37	17.74
		1732.5	18.23	17.18
		1712.5	17.96	16.89
	1RB-Middle (12)	1752.5	18.07	17.72
		1732.5	18.20	17.01
		1712.5	18.23	16.88
	1RB-Low (0)	1752.5	18.02	17.54
		1732.5	18.17	16.93
		1712.5	18.06	16.69
	12RB-High (13)	1752.5	17.32	16.00
		1732.5	17.29	16.22
		1712.5	17.11	16.17
	12RB-Middle (6)	1752.5	17.15	15.83
		1732.5	17.17	16.09
		1712.5	17.20	16.01
	12RB-Low (0)	1752.5	17.15	15.86
		1732.5	17.06	16.01
		1712.5	17.16	16.11
	25RB (0)	1752.5	17.17	16.01
		1732.5	17.14	16.27
		1712.5	17.16	16.23
10MHz	1RB-High (49)	1750	18.19	16.95
		1732.5	17.90	16.80
		1715	18.05	16.74
	1RB-Middle (24)	1750	18.12	16.85
		1732.5	17.78	16.95
		1715	18.18	16.84
	1RB-Low (0)	1750	18.20	16.95
		1732.5	18.13	16.50

		1715	18.05	16.72
	25RB-High (25)	1750	16.96	16.10
		1732.5	17.04	15.79
		1715	17.06	16.01
	25RB-Middle (12)	1750	17.05	16.17
		1732.5	16.94	15.88
		1715	17.13	16.09
	25RB-Low (0)	1750	17.10	16.12
		1732.5	16.96	15.80
		1715	17.18	16.04
	50RB (0)	1750	17.01	16.04
		1732.5	17.04	15.79
		1715	17.01	16.07
15MHz	1RB-High (74)	1747.5	18.41	16.91
		1732.5	18.22	17.00
		1717.5	17.99	16.60
	1RB-Middle (37)	1747.5	18.26	17.06
		1732.5	18.08	16.77
		1717.5	18.05	17.09
	1RB-Low (0)	1747.5	18.44	17.14
		1732.5	18.24	16.99
		1717.5	18.22	16.85
	36RB-High (38)	1747.5	17.18	16.06
		1732.5	17.28	16.06
		1717.5	17.03	16.05
	36RB-Middle (19)	1747.5	17.23	16.12
		1732.5	17.15	16.00
		1717.5	17.11	16.13
	36RB-Low (0)	1747.5	17.25	16.06
		1732.5	17.06	16.03
		1717.5	17.16	16.16
	75RB (0)	1747.5	17.22	16.04
		1732.5	17.25	16.13
		1717.5	17.06	16.09
20MHz	1RB-High (99)	1745	18.65	17.16
		1732.5	18.63	17.53
		1720	18.30	17.11
	1RB-Middle (50)	1745	18.65	17.36
		1732.5	18.64	17.49
		1720	18.36	17.13
	1RB-Low (0)	1745	18.72	17.33
		1732.5	18.65	17.06
		1720	18.41	16.94
	50RB-High (50)	1745	17.50	16.22
		1732.5	17.46	16.32
		1720	17.38	16.24
	50RB-Middle (25)	1745	17.60	16.47
		1732.5	17.54	16.34

		1720	17.49	16.27
	50RB-Low (0)	1745	17.66	16.51
		1732.5	17.59	16.24
		1720	17.56	16.25
	100RB (0)	1745	17.69	16.46
		1732.5	17.53	16.28
		1720	17.42	16.19

LTE B5 Power Level A/B

Band 5				
Bandwidth (MHz)	RB allocation	Frequency (MHz)	Actual output power (dBm)	
	RB offset		QPSK	16QAM
1.4MHz	1RB-High (5)	848.3	21.69	20.43
		836.5	21.60	20.63
		824.7	21.50	20.46
	1RB-Middle (3)	848.3	21.64	20.65
		836.5	21.65	20.71
		824.7	21.53	20.78
	1RB-Low (0)	848.3	21.62	20.73
		836.5	21.54	20.56
		824.7	21.62	20.36
	3RB-High (3)	848.3	21.70	20.84
		836.5	21.69	20.69
		824.7	21.58	20.55
	3RB-Middle (1)	848.3	21.57	20.96
		836.5	21.62	20.71
		824.7	21.53	20.66
	3RB-Low (0)	848.3	21.80	20.92
		836.5	21.63	20.61
		824.7	21.51	20.61
	6RB (0)	848.3	20.61	19.73
		836.5	20.70	19.74
		824.7	20.65	19.70
3MHz	1RB-High (14)	847.5	21.65	20.30
		836.5	21.58	20.60
		825.5	21.53	20.46
	1RB-Middle (7)	847.5	21.84	20.59
		836.5	21.62	20.60
		825.5	21.51	20.27
	1RB-Low (0)	847.5	21.79	20.36
		836.5	21.69	20.66
		825.5	21.66	20.51
	8RB-High (7)	847.5	20.69	19.86
		836.5	20.63	19.83

		825.5	20.74	19.79
	8RB-Middle (4)	847.5	20.76	20.07
		836.5	20.65	19.88
		825.5	20.73	19.69
	8RB-Low (0)	847.5	20.73	20.12
		836.5	20.78	19.71
		825.5	20.74	19.81
	15RB (0)	847.5	20.64	19.72
		836.5	20.61	19.60
		825.5	20.51	19.63
5MHz	1RB-High (24)	846.5	21.51	20.49
		836.5	21.32	20.50
		826.5	21.15	20.59
	1RB-Middle (12)	846.5	21.75	20.44
		836.5	21.42	20.41
		826.5	21.48	20.45
	1RB-Low (0)	846.5	21.46	20.55
		836.5	21.39	20.37
		826.5	21.48	20.50
	12RB-High (13)	846.5	20.54	19.64
		836.5	20.55	19.52
		826.5	20.57	19.76
	12RB-Middle (6)	846.5	20.59	19.49
		836.5	20.57	19.69
		826.5	20.60	19.55
	12RB-Low (0)	846.5	20.67	19.60
		836.5	20.56	19.74
		826.5	20.60	19.64
	25RB (0)	846.5	20.60	19.62
		836.5	20.52	19.50
		826.5	20.65	19.56
10MHz	1RB-High (49)	844	21.56	20.38
		836.5	21.56	20.41
		829	21.38	20.46
	1RB-Middle (24)	844	21.55	20.50
		836.5	21.60	20.56
		829	21.37	20.39
	1RB-Low (0)	844	21.72	20.62
		836.5	21.63	20.69
		829	21.39	20.41
	25RB-High (25)	844	20.54	19.79
		836.5	20.61	19.69
		829	20.72	19.61
	25RB-Middle (12)	844	20.61	19.55
		836.5	20.65	19.65
		829	20.63	19.63
	25RB-Low (0)	844	20.75	19.61
		836.5	20.66	19.64
		829	20.65	19.63

	50RB (0)	844	20.82	19.59
		836.5	20.72	19.63
		829	20.63	19.64

LTE B7 Power Level A

Band 7				
Bandwidth (MHz)	RB allocation	Frequency (MHz)	Actual output power (dBm)	
	RB offset		QPSK	16QAM
5MHz	1RB-High (24)	2567.5	22.58	21.58
		2535	22.61	21.32
		2502.5	22.49	20.87
	1RB-Middle (12)	2567.5	22.60	21.76
		2535	23.11	22.34
		2502.5	22.94	22.14
	1RB-Low (0)	2567.5	22.75	21.74
		2535	22.63	20.97
		2502.5	22.48	21.54
	12RB-High (13)	2567.5	21.87	20.59
		2535	21.82	20.62
		2502.5	21.28	20.85
	12RB-Middle (6)	2567.5	21.81	20.78
		2535	21.62	20.53
		2502.5	21.61	20.55
	12RB-Low (0)	2567.5	21.57	20.66
		2535	21.78	20.79
		2502.5	21.70	20.28
	25RB (0)	2567.5	21.98	20.79
		2535	21.73	20.61
		2502.5	21.77	20.21
10MHz	1RB-High (49)	2565	22.64	21.72
		2535	22.62	21.55
		2505	22.50	21.50
	1RB-Middle (24)	2565	22.85	21.77
		2535	23.09	21.17
		2505	22.30	21.20
	1RB-Low (0)	2565	22.91	21.98
		2535	22.70	21.61
		2505	22.36	21.61
	25RB-High (25)	2565	21.94	21.10
		2535	22.00	20.44
		2505	21.72	20.93
	25RB-Middle (12)	2565	21.85	20.96
		2535	21.61	20.69
		2505	21.60	20.75
	25RB-Low (0)	2565	21.92	20.86
		2535	22.27	20.43

		2505	21.22	20.31
	50RB (0)	2565	22.10	20.81
		2535	21.65	21.12
		2505	21.87	20.48
15MHz	1RB-High (74)	2562.5	22.73	21.67
		2535	22.68	21.80
		2507.5	22.24	22.01
	1RB-Middle (37)	2562.5	22.74	21.78
		2535	22.75	21.25
		2507.5	22.24	21.35
	1RB-Low (0)	2562.5	22.84	21.83
		2535	22.71	20.87
		2507.5	22.57	21.54
	36RB-High (38)	2562.5	21.81	20.71
		2535	21.25	20.24
		2507.5	21.27	21.13
	36RB-Middle (19)	2562.5	22.09	20.99
		2535	21.59	20.63
		2507.5	21.63	20.62
	36RB-Low (0)	2562.5	21.74	21.07
		2535	22.06	21.00
		2507.5	21.17	20.85
	75RB (0)	2562.5	21.80	20.86
		2535	21.25	20.29
		2507.5	22.33	20.69
20MHz	1RB-High (99)	2560	22.42	21.13
		2535	22.57	20.96
		2510	22.13	22.09
	1RB-Middle (50)	2560	22.59	21.66
		2535	22.37	21.05
		2510	22.33	21.59
	1RB-Low (0)	2560	23.16	20.84
		2535	22.71	20.58
		2510	22.45	21.40
	50RB-High (50)	2560	22.19	20.82
		2535	21.48	20.42
		2510	21.67	20.54
	50RB-Middle (25)	2560	21.63	20.74
		2535	21.43	20.46
		2510	21.56	20.61
	50RB-Low (0)	2560	21.57	20.43
		2535	21.44	20.54
		2510	21.40	20.29
	100RB (0)	2560	21.95	20.45
		2535	21.40	20.50
		2510	21.47	20.43

LTE B7 Power Level B

Band 7				
Bandwidth (MHz)	RB allocation	Frequency (MHz)	Actual output power (dBm)	
	RB offset		QPSK	16QAM
5MHz	1RB-High (24)	2567.5	18.18	18.28
		2535	18.33	18.26
		2502.5	18.45	18.34
	1RB-Middle (12)	2567.5	18.36	18.31
		2535	18.46	18.36
		2502.5	18.50	18.25
	1RB-Low (0)	2567.5	18.30	18.27
		2535	18.60	18.32
		2502.5	18.31	18.39
	12RB-High (13)	2567.5	18.36	17.32
		2535	18.47	17.25
		2502.5	18.49	17.36
	12RB-Middle (6)	2567.5	18.50	17.41
		2535	18.51	17.43
		2502.5	18.53	17.29
	12RB-Low (0)	2567.5	18.45	17.34
		2535	18.56	17.49
		2502.5	18.54	17.31
	25RB (0)	2567.5	18.34	17.42
		2535	18.52	17.44
		2502.5	18.46	17.51
10MHz	1RB-High (49)	2565	18.32	18.28
		2535	18.43	18.33
		2505	18.52	18.48
	1RB-Middle (24)	2565	18.49	18.37
		2535	18.63	18.24
		2505	18.59	18.40
	1RB-Low (0)	2565	18.46	18.40
		2535	18.66	18.45
		2505	18.32	18.32
	25RB-High (25)	2565	18.36	17.27
		2535	18.61	17.43
		2505	18.51	17.55
	25RB-Middle (12)	2565	18.54	17.39
		2535	18.63	17.56
		2505	18.58	17.53
	25RB-Low (0)	2565	18.52	17.31
		2535	18.54	17.46
		2505	18.56	17.53
	50RB (0)	2565	18.54	17.34
		2535	18.56	17.31

		2505	18.61	17.58
15MHz	1RB-High (74)	2562.5	18.54	18.35
		2535	18.48	18.30
		2507.5	18.60	18.30
	1RB-Middle (37)	2562.5	18.65	18.38
		2535	18.58	18.34
		2507.5	18.69	18.36
	1RB-Low (0)	2562.5	18.65	18.35
		2535	18.65	18.55
		2507.5	18.53	18.43
	36RB-High (38)	2562.5	18.59	17.53
		2535	18.58	17.46
		2507.5	18.74	17.64
	36RB-Middle (19)	2562.5	18.58	17.49
		2535	18.71	17.50
		2507.5	18.66	17.63
	36RB-Low (0)	2562.5	18.53	17.41
		2535	18.67	17.44
		2507.5	18.63	17.52
	75RB (0)	2562.5	18.50	17.29
		2535	18.62	17.54
		2507.5	18.65	17.50
20MHz	1RB-High (99)	2560	18.43	18.20
		2535	18.15	18.16
		2510	18.47	18.29
	1RB-Middle (50)	2560	18.59	18.53
		2535	18.60	18.58
		2510	18.62	18.66
	1RB-Low (0)	2560	18.58	18.38
		2535	18.59	18.48
		2510	18.48	18.37
	50RB-High (50)	2560	18.47	17.34
		2535	18.54	17.50
		2510	18.59	17.54
	50RB-Middle (25)	2560	18.45	17.48
		2535	18.53	17.56
		2510	18.57	17.54
	50RB-Low (0)	2560	18.43	17.44
		2535	18.52	17.59
		2510	18.57	17.54
	100RB (0)	2560	18.47	17.42
		2535	18.50	17.48
		2510	18.56	17.52

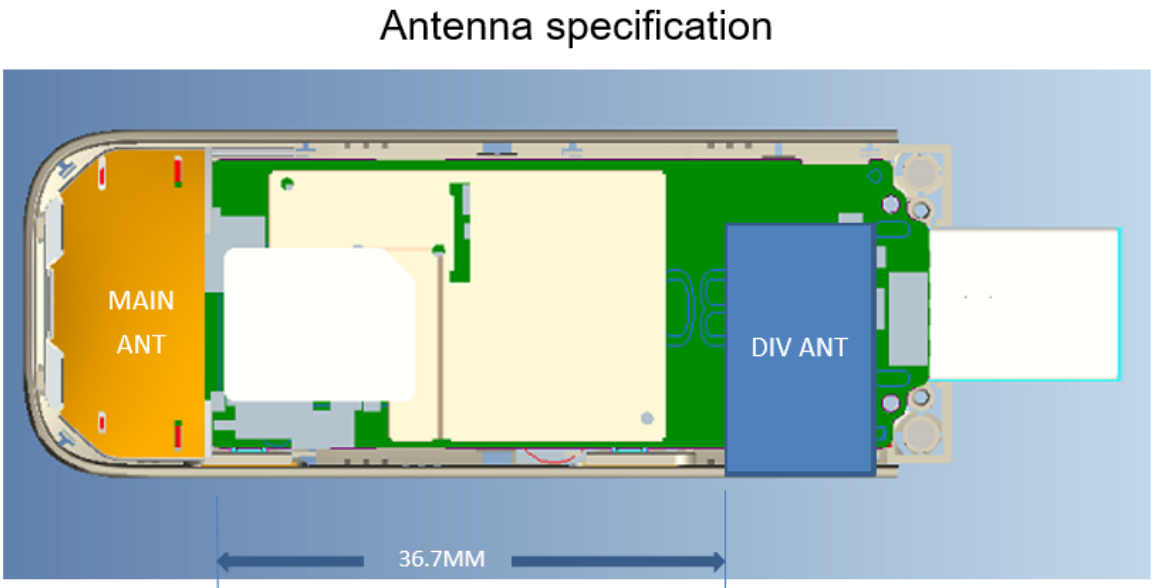
LTE B12 Power Level A/B

Band 12

Bandwidth (MHz)	RB allocation	Frequency (MHz)	Actual output power (dBm)	
	RB offset		QPSK	16QAM
1.4MHz	1RB-High	715.3	21.71	20.45
		707.5	21.70	20.29
		699.7	21.30	20.02
	1RB-Middle (3)	715.3	21.65	20.69
		707.5	21.70	20.51
		699.7	21.28	20.43
	1RB-Low (0)	715.3	21.36	20.42
		707.5	21.57	20.21
		699.7	21.15	20.30
	3RB-High (3)	715.3	21.53	20.62
		707.5	21.76	20.84
		699.7	21.40	20.45
	3RB-Middle (1)	715.3	21.51	20.71
		707.5	21.65	20.89
		699.7	21.38	20.46
	3RB-Low (0)	715.3	21.57	20.52
		707.5	21.48	20.82
		699.7	21.24	20.42
	6RB (0)	715.3	20.67	19.67
		707.5	20.56	19.68
		699.7	20.33	19.47
3MHz	1RB-High (14)	714.5	21.77	20.91
		707.5	21.68	20.48
		700.5	21.62	20.46
	1RB-Middle (7)	714.5	21.65	20.45
		707.5	21.72	20.31
		700.5	21.60	20.24
	1RB-Low (0)	714.5	21.91	20.56
		707.5	21.62	20.32
		700.5	21.58	20.13
	8RB-High (7)	714.5	20.74	19.89
		707.5	20.78	19.75
		700.5	20.60	19.54
	8RB-Middle (4)	714.5	20.81	19.86
		707.5	20.76	19.77
		700.5	20.57	19.59
	8RB-Low (0)	714.5	20.81	19.92
		707.5	20.87	19.68
		700.5	20.42	19.67
	15RB (0)	714.5	20.73	19.70
		707.5	20.71	19.57
		700.5	20.54	19.18
5MHz	1RB-High (24)	713.5	21.45	20.39
		707.5	21.34	20.09
		701.5	21.26	20.35

	1RB-Middle (12)	713.5	21.38	20.24
		707.5	21.37	20.40
		701.5	21.28	20.29
	1RB-Low (0)	713.5	21.43	20.28
		707.5	21.31	20.45
		701.5	21.25	20.24
	12RB-High (13)	713.5	20.49	19.54
		707.5	20.59	19.40
		701.5	20.27	19.15
	12RB-Middle (6)	713.5	20.58	19.63
		707.5	20.48	19.45
		701.5	20.36	19.28
	12RB-Low (0)	713.5	20.53	19.40
		707.5	20.52	19.59
		701.5	20.38	19.37
	25RB (0)	713.5	20.49	19.52
		707.5	20.53	19.68
		701.5	20.30	19.37
10MHz	1RB-High (49)	711	21.55	20.40
		707.5	21.26	20.24
		704	21.59	20.35
	1RB-Middle (24)	711	21.60	20.33
		707.5	21.59	20.40
		704	21.46	20.30
	1RB-Low (0)	711	21.54	20.28
		707.5	21.34	20.56
		704	21.40	20.26
	25RB-High (25)	711	20.63	19.74
		707.5	20.55	19.34
		704	20.64	19.56
	25RB-Middle (12)	711	20.65	19.64
		707.5	20.45	19.55
		704	20.46	19.49
	25RB-Low (0)	711	20.61	19.61
		707.5	20.48	19.50
		704	20.42	19.45
	50RB (0)	711	20.63	19.55
		707.5	20.54	19.44
		704	20.41	19.43

12 Transmit Antenna Position and Size



MAIN

Type	Supplier	Comments
FPC	Haitong	

DIV ANT

Type	Supplier	Comments
PCB ANT	TRIPOD	

Picture 12.1 Antenna Position and size

13 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 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.

KDB447498 D02: SAR Procedures for Dongle Xmtr v02r01: The 5 mm test separation distance used for testing simple dongles has been established based on the overall host platform (laptop/notebook/netbook) and device variations, and varying user operating configurations and

exposure conditions expected for a peripheral device. The same test distance should generally apply to dongles with swivel or rotating connectors. The procedures described for simple dongles should be used to position the four surfaces of the dongle at 5 mm from the phantom to evaluate SAR. At least one of the horizontal and one of the vertical positions should be tested using an applicable host computer. If the antenna is within 1 cm from the tip of the dongle (the end without the USB connector), the tip of the dongle should also be tested at 5 mm perpendicular to the phantom.

Duty Cycle

Mode	Duty Cycle
GPRS&EGPRS 1 Slot	1:8.3
GPRS&EGPRS 2 Slot	1:4
GPRS&EGPRS 3 Slot	1:2.67
GPRS&EGPRS 4 Slot	1:2
WCDMA&LTE FDD	1:1

Ambient Temperature: 21.5-23.5 ℃ Liquid Temperature: 21.5-23.5 ℃

13.1 SAR results

RF Exposure Conditions	Frequency Band	Channel Number	Frequency (MHz)	Mode/RB	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	GPRS	Top	5mm	A.1	28.99	29.5	0.64	**0.72**	0.425	**0.48**	-0.08
Body	GSM850	190	836.6	GPRS	Top	5mm	\	28.91	29.5	0.557	**0.64**	0.38	**0.44**	-0.06
Body	GSM850	128	824.2	GPRS	Top	5mm	\	28.85	29.5	0.557	**0.65**	0.384	**0.45**	0.16
Body	GSM850	190	836.6	GPRS	Bottom	5mm	\	28.91	29.5	0.289	**0.33**	0.184	**0.21**	0.03
Body	GSM850	190	836.6	GPRS	Front	5mm	\	28.91	29.5	0.26	**0.30**	0.167	**0.19**	0.17
Body	GSM850	251	848.8	EGPRS	Bottom	5mm	\	29.02	29.5	0.364	**0.41**	0.254	**0.28**	-0.07
Body	GSM1900	661	1880	GPRS	Top	14mm	\	25.27	26	0.217	**0.26**	0.133	**0.16**	0.05
Body	GSM1900	661	1880	GPRS	Bottom	14mm	\	25.27	26	0.2	**0.24**	0.125	**0.15**	0.17
Body	GSM1900	810	1909.8	GPRS	Front	9mm	\	25.32	26	0.508	**0.59**	0.272	**0.32**	-0.12
Body	GSM1900	661	1880	GPRS	Front	9mm	\	25.27	26	0.509	**0.60**	0.286	**0.34**	0.07
Body	GSM1900	512	1850.2	GPRS	Front	9mm	\	24.92	26	0.469	**0.60**	0.253	**0.32**	-0.10
Body	GSM1900	661	1880	GPRS	Rear	9mm	\	25.27	26	0.28	**0.33**	0.176	**0.21**	0.04
Body	GSM1900	661	1880	EGPRS	Front	9mm	\	25.33	26	0.471	**0.55**	0.261	**0.30**	0.06
Body	GSM1900	661	1880	GPRS	Top	5mm	\	24.62	25.5	0.644	**0.79**	0.346	**0.42**	-0.17
Body	GSM1900	810	1909.8	GPRS	Bottom	5mm	\	24.88	25.5	0.759	**0.88**	0.395	**0.46**	-0.14
Body	GSM1900	661	1880	GPRS	Bottom	5mm	\	24.62	25.5	0.761	**0.93**	0.412	**0.50**	-0.10
Body	GSM1900	512	1850.2	GPRS	Bottom	5mm	A.2	24.29	25.5	0.777	**1.03**	0.433	**0.57**	0.06
Body	GSM1900	661	1880	GPRS	Front	5mm	\	24.62	25.5	0.603	**0.74**	0.318	**0.39**	0.00
Body	GSM1900	661	1880	GPRS	Rear	5mm	\	24.62	25.5	0.364	**0.45**	0.196	**0.24**	0.07
Body	GSM1900	512	1850.2	EGPRS	Bottom	5mm	\	24.49	25.5	0.624	**0.79**	0.308	**0.39**	-0.09
Body	WCDMA1900	9400	1880	RMC	Top	14mm	\	22.21	23	0.349	**0.42**	0.201	**0.24**	-0.05
Body	WCDMA1900	9400	1880	RMC	Bottom	14mm	\	22.21	23	0.323	**0.39**	0.185	**0.22**	0.16
Body	WCDMA1900	9538	1907.6	RMC	Front	9mm	\	22.34	23	0.498	**0.58**	0.277	**0.32**	-0.08
Body	WCDMA1900	9400	1880	RMC	Front	9mm	\	22.21	23	0.491	**0.59**	0.272	**0.33**	-0.18
Body	WCDMA1900	9262	1852.4	RMC	Front	9mm	\	22.23	23	0.596	**0.71**	0.331	**0.40**	-0.05
Body	WCDMA1900	9262	1852.4	RMC	Rear	9mm	\	22.23	23	0.337	**0.40**	0.189	**0.23**	-0.15
Body	WCDMA1900	9538	1907.6	RMC	Top	5mm	A.3	19.26	20	0.706	**0.84**	0.365	**0.43**	0.09
Body	WCDMA1900	9400	1880	RMC	Top	5mm	\	19.47	20	0.694	**0.78**	0.374	**0.42**	0.04
Body	WCDMA1900	9262	1852.4	RMC	Top	5mm	\	19.39	20	0.692	**0.80**	0.38	**0.44**	0.18
Body	WCDMA1900	9400	1880	RMC	Bottom	5mm	\	19.47	20	0.637	**0.72**	0.351	**0.40**	0.10
Body	WCDMA1900	9400	1880	RMC	Front	5mm	\	19.47	20	0.539	**0.61**	0.292	**0.33**	-0.01
Body	WCDMA1900	9400	1880	RMC	Rear	5mm	\	19.47	20	0.325	**0.37**	0.177	**0.20**	-0.12
Body	WCDMA 1700	1412	1732.4	RMC	Top	14mm	\	21.92	22.1	0.326	**0.34**	0.185	**0.19**	0.14
Body	WCDMA 1700	1412	1732.4	RMC	Bottom	14mm	\	21.92	22.1	0.299	**0.31**	0.178	**0.19**	-0.08
Body	WCDMA 1700	1513	1752.6	RMC	Front	9mm	\	21.89	22.1	0.539	**0.57**	0.304	**0.32**	-0.05
Body	WCDMA 1700	1412	1732.4	RMC	Front	9mm	\	21.92	22.1	0.649	**0.68**	0.354	**0.37**	0.17
Body	WCDMA 1700	1312	1712.4	RMC	Front	9mm	\	21.83	22.1	0.577	**0.61**	0.322	**0.34**	-0.03
Body	WCDMA 1700	1412	1732.4	RMC	Rear	9mm	\	21.92	22.1	0.223	**0.23**	0.133	**0.14**	-0.15
Body	WCDMA 1700	1513	1752.6	RMC	Top	5mm	\	18.03	19.5	0.757	**1.06**	0.412	**0.58**	-0.04
Body	WCDMA 1700	1412	1732.4	RMC	Top	5mm	\	18.03	19.5	0.785	**1.10**	0.446	**0.63**	0.11
Body	WCDMA 1700	1312	1712.4	RMC	Top	5mm	A.4	17.9	19.5	0.862	**1.25**	0.461	**0.67**	0.01
Body	WCDMA 1700	1513	1752.6	RMC	Bottom	5mm	\	18.03	19.5	0.584	**0.82**	0.317	**0.44**	0.04
Body	WCDMA 1700	1412	1732.4	RMC	Bottom	5mm	\	18.03	19.5	0.6	**0.84**	0.334	**0.47**	-0.08
Body	WCDMA 1700	1312	1712.4	RMC	Bottom	5mm	\	17.9	19.5	0.597	**0.86**	0.329	**0.48**	0.08
Body	WCDMA 1700	1513	1752.6	RMC	Front	5mm	\	18.03	19.5	0.653	**0.92**	0.354	**0.50**	0.03
Body	WCDMA 1700	1412	1732.4	RMC	Front	5mm	\	18.03	19.5	0.677	**0.95**	0.363	**0.51**	0.16
Body	WCDMA 1700	1312	1712.4	RMC	Front	5mm	\	17.9	19.5	0.672	**0.97**	0.351	**0.51**	0.07
Body	WCDMA 1700	1412	1732.4	RMC	Rear	5mm	\	18.03	19.5	0.265	**0.37**	0.148	**0.21**	0.00
Body	WCDMA 850	4233	846.6	RMC	Top	5mm	\	21.81	23	0.435	**0.57**	0.290	**0.38**	0.10
Body	WCDMA 850	4183	836.6	RMC	Top	5mm	A.5	21.79	23	0.456	**0.60**	0.301	**0.40**	-0.08
Body	WCDMA 850	4132	826.4	RMC	Top	5mm	\	21.73	23	0.44	**0.59**	0.292	**0.39**	-0.12
Body	WCDMA 850	4183	836.6	RMC	Bottom	5mm	\	21.79	23	0.366	**0.48**	0.245	**0.32**	0.08
Body	WCDMA 850	4183	836.6	RMC	Front	5mm	\	21.79	23	0.25	**0.33**	0.169	**0.22**	0.14
Body	WCDMA 850	4132	826.4	RMC	Rear	5mm	\	21.73	23	0.296	**0.40**	0.191	**0.26**	-0.01
Body	LTE Band2	18700	1860	1RB_Mid	Top	14mm	\	22.25	23	0.297	**0.35**	0.177	**0.21**	0.00
Body	LTE Band2	18700	1860	1RB_Mid	Bottom	14mm	\	22.25	23	0.264	**0.31**	0.156	**0.19**	-0.11
Body	LTE Band2	18700	1860	1RB_Mid	Front	9mm	\	22.25	23	0.442	**0.53**	0.245	**0.29**	-0.02
Body	LTE Band2	18700	1860	1RB_Mid	Rear	9mm	\	22.25	23	0.351	**0.42**	0.195	**0.23**	0.02
Body	LTE Band2	18700	1860	50RB_Mid	Top	14mm	\	21.17	22	0.219	**0.27**	0.130	**0.16**	-0.01
Body	LTE Band2	18700	1860	50RB_Mid	Bottom	14mm	\	21.17	22	0.233	**0.28**	0.136	**0.16**	0.17
Body	LTE Band2	18700	1860	50RB_Mid	Front	9mm	\	21.17	22	0.386	**0.47**	0.212	**0.26**	0.09
Body	LTE Band2	18700	1860	50RB_Mid	Rear	9mm	\	21.17	22	0.254	**0.31**	0.141	**0.17**	0.18
Body	LTE Band2	19100	1900	1RB_Mid	Top	5mm	\	19.27	20	0.637	**0.75**	0.348	**0.41**	0.06
Body	LTE Band2	18900	1880	1RB_Mid	Top	5mm	\	19.37	20	0.662	**0.77**	0.354	**0.41**	0.03
Body	LTE Band2	18700	1860	1RB_Mid	Top	5mm	A.6	19.38	20	0.719	**0.83**	0.372	**0.43**	-0.13
Body	LTE Band2	19100	1900	1RB_Mid	Bottom	5mm	\	19.27	20	0.612	**0.72**	0.341	**0.40**	0.07
Body	LTE Band2	18900	1880	1RB_Mid	Bottom	5mm	\	19.37	20	0.653	**0.75**	0.361	**0.42**	0.07
Body	LTE Band2	18700	1860	1RB_Mid	Bottom	5mm	\	19.38	20	0.708	**0.82**	0.368	**0.42**	0.10
Body	LTE Band2	18700	1860	1RB_Mid	Front	5mm	\	19.38	20	0.572	**0.66**	0.296	**0.34**	-0.02
Body	LTE Band2	18700	1860	1RB_Mid	Rear	5mm	\	19.38	20	0.333	**0.38**	0.175	**0.20**	-0.15
Body	LTE Band2	18700	1860	50RB_Mid	Top	5mm	\	18.26	19	0.59	**0.70**	0.301	**0.36**	0.04
Body	LTE Band2	18700	1860	50RB_Mid	Bottom	5mm	\	18.26	19	0.549	**0.65**	0.287	**0.34**	-0.09
Body	LTE Band2	18700	1860	50RB_Mid	Front	5mm	\	18.26	19	0.434	**0.51**	0.225	**0.27**	-0.03
Body	LTE Band2	18700	1860	50RB_Mid	Rear	5mm	\	18.26	19	0.265	**0.31**	0.137	**0.16**	-0.10
Body	LTE Band2	18700	1860	100RB	Top	5mm	\	18.21	19	0.543	**0.65**	0.274	**0.33**	0.04
Body	LTE Band2	18700	1860	100RB	Bottom	5mm	\	18.21	19	0.552	**0.66**	0.283	**0.34**	-0.07

Body	LTE Band4	20300	1745	1RB_Low	Top	14mm	\	22.09	23	0.488	**0.60**	0.181	**0.22**	-0.04
Body	LTE Band4	20300	1745	1RB_Low	Bottom	14mm	\	22.09	23	0.386	**0.48**	0.150	**0.18**	-0.02
Body	LTE Band4	20300	1745	1RB_Low	Front	9mm	\	22.09	23	0.617	**0.76**	0.221	**0.27**	0.07
Body	LTE Band4	20300	1745	1RB_Low	Rear	9mm	\	22.09	23	0.335	**0.41**	0.125	**0.15**	0.14
Body	LTE Band4	20300	1745	50RB_Low	Top	14mm	\	21.1	22	0.406	**0.50**	0.152	**0.19**	-0.13
Body	LTE Band4	20300	1745	50RB_Low	Bottom	14mm	\	21.1	22	0.301	**0.37**	0.116	**0.14**	0.19
Body	LTE Band4	20300	1745	50RB_Low	Front	9mm	\	21.1	22	0.63	**0.78**	0.226	**0.28**	-0.07
Body	LTE Band4	20300	1745	50RB_Low	Rear	9mm	\	21.1	22	0.267	**0.33**	0.101	**0.12**	0.11
Body	LTE Band4	20050	1720	1RB_Low	Top	5mm	\	18.41	19.5	0.815	**1.05**	0.41	**0.53**	-0.15
Body	LTE Band4	20175	1732.5	1RB_Low	Top	5mm	\	18.65	19.5	0.871	**1.06**	0.44	**0.54**	0.14
Body	LTE Band4	20300	1745	1RB_Low	Top	5mm	**A.7**	18.72	19.5	0.964	**1.15**	0.488	**0.58**	0.07
Body	LTE Band4	20300	1720	1RB_Low	Bottom	5mm	\	18.41	19.5	0.71	**0.91**	0.382	**0.49**	0.04
Body	LTE Band4	20300	1732.5	1RB_Low	Bottom	5mm	\	18.65	19.5	0.68	**0.83**	0.371	**0.45**	0.06
Body	LTE Band4	20300	1745	1RB_Low	Bottom	5mm	\	18.72	19.5	0.79	**0.95**	0.409	**0.49**	0.17
Body	LTE Band4	20300	1745	1RB_Low	Front	5mm	\	18.72	19.5	0.652	**0.78**	0.331	**0.40**	0.17
Body	LTE Band4	20300	1745	1RB_Low	Rear	5mm	\	18.72	19.5	0.296	**0.35**	0.162	**0.19**	0.04
Body	LTE Band4	20300	1720	50RB_Low	Top	5mm	\	17.56	18.5	0.728	**0.90**	0.376	**0.47**	0.04
Body	LTE Band4	20300	1732.5	50RB_Low	Top	5mm	\	17.59	18.5	0.714	**0.88**	0.351	**0.43**	-0.17
Body	LTE Band4	20300	1745	50RB_Low	Top	5mm	\	17.66	18.5	0.753	**0.91**	0.381	**0.46**	0.18
Body	LTE Band4	20300	1745	50RB_Low	Bottom	5mm	\	17.66	18.5	0.436	**0.53**	0.235	**0.29**	0.08
Body	LTE Band4	20300	1745	50RB_Low	Front	5mm	\	17.66	18.5	0.493	**0.60**	0.255	**0.31**	0.02
Body	LTE Band4	20300	1745	50RB_Low	Rear	5mm	\	17.66	18.5	0.235	**0.29**	0.127	**0.15**	0.16
Body	LTE Band4	20300	1745	100RB	Top	5mm	\	17.69	18.5	0.584	**0.70**	0.327	**0.39**	0.04
Body	LTE Band4	20300	1745	100RB	Bottom	5mm	\	17.69	18.5	0.453	**0.55**	0.304	**0.37**	-0.01
Body	LTE Band5	20600	844	1RB_Low	Top	5mm	\	21.72	23	0.292	**0.39**	0.184	**0.25**	-0.02
Body	LTE Band5	20600	844	1RB_Low	Bottom	5mm	\	21.72	23	0.29	**0.39**	0.193	**0.26**	-0.15
Body	LTE Band5	20600	844	1RB_Low	Front	5mm	\	21.72	23	0.268	**0.36**	0.178	**0.24**	0.16
Body	LTE Band5	20600	844	1RB_Low	Rear	5mm	\	21.72	23	0.252	**0.34**	0.163	**0.22**	0.00
Body	LTE Band5	20600	844	25RB_Low	Top	5mm	**A.8**	20.75	22	0.342	**0.46**	0.227	**0.30**	-0.01
Body	LTE Band5	20600	844	25RB_Low	Bottom	5mm	\	20.75	22	0.29	**0.39**	0.194	**0.26**	-0.18
Body	LTE Band5	20600	844	25RB_Low	Front	5mm	\	20.75	22	0.201	**0.27**	0.133	**0.18**	0.08
Body	LTE Band5	20600	844	25RB_Low	Rear	5mm	\	20.75	22	0.132	**0.18**	0.082	**0.11**	0.05
Body	LTE Band7	21350	2560	1RB_Low	Top	14mm	\	23.16	23.5	0.376	**0.41**	0.167	**0.18**	0.06
Body	LTE Band7	21350	2560	1RB_Low	Bottom	14mm	\	23.16	23.5	0.478	**0.52**	0.210	**0.23**	0.07
Body	LTE Band7	21350	2560	1RB_Low	Front	9mm	\	23.16	23.5	0.584	**0.63**	0.248	**0.27**	-0.11
Body	LTE Band7	21350	2560	1RB_Low	Rear	9mm	\	23.16	23.5	0.271	**0.29**	0.111	**0.12**	-0.03
Body	LTE Band7	21350	2560	50RB_High	Top	14mm	\	22.19	22.5	0.282	**0.30**	0.122	**0.13**	-0.19
Body	LTE Band7	21350	2560	50RB_High	Bottom	14mm	\	22.19	22.5	0.184	**0.20**	0.078	**0.08**	-0.14
Body	LTE Band7	21350	2560	50RB_High	Front	9mm	\	22.19	22.5	0.38	**0.41**	0.164	**0.18**	0.18
Body	LTE Band7	21350	2560	50RB_High	Rear	9mm	\	22.19	22.5	0.18	**0.19**	0.078	**0.08**	-0.16
Body	LTE Band7	20850	2510	1RB_Mid	Top	5mm	\	18.62	19.5	1.02	**1.25**	0.39	**0.48**	-0.16
Body	LTE Band7	21100	2535	1RB_Mid	Top	5mm	\	18.6	19.5	0.991	**1.22**	0.392	**0.48**	-0.02
Body	LTE Band7	21350	2560	1RB_Mid	Top	5mm	\	18.59	19.5	0.872	**1.08**	0.341	**0.42**	0.10
Body	LTE Band7	20850	2510	1RB_Mid	Bottom	5mm	**A.9**	18.62	19.5	1.08	**1.32**	0.468	**0.57**	0.01
Body	LTE Band7	21100	2535	1RB_Mid	Bottom	5mm	\	18.6	19.5	0.989	**1.22**	0.45	**0.55**	0.08
Body	LTE Band7	21350	2560	1RB_Mid	Bottom	5mm	\	18.59	19.5	0.878	**1.08**	0.413	**0.51**	0.11
Body	LTE Band7	20850	2510	1RB_Mid	Front	5mm	\	18.62	19.5	0.599	**0.73**	0.260	**0.32**	-0.14
Body	LTE Band7	20850	2510	1RB_Mid	Rear	5mm	\	18.62	19.5	0.152	**0.19**	0.072	**0.09**	0.06
Body	LTE Band7	20850	2510	50RB_High	Top	5mm	\	18.59	19.5	0.937	**1.16**	0.337	**0.42**	0.07
Body	LTE Band7	21100	2535	50RB_High	Top	5mm	\	18.54	19.5	0.903	**1.13**	0.318	**0.40**	1.07
Body	LTE Band7	21350	2560	50RB_High	Top	5mm	\	18.47	19.5	0.855	**1.08**	0.292	**0.37**	2.07
Body	LTE Band7	20850	2510	50RB_High	Bottom	5mm	\	18.59	19.5	0.806	**0.99**	0.364	**0.45**	0.05
Body	LTE Band7	21100	2535	50RB_High	Bottom	5mm	\	18.54	19.5	0.767	**0.96**	0.312	**0.39**	-0.12
Body	LTE Band7	21350	2560	50RB_High	Bottom	5mm	\	18.47	19.5	0.777	**0.98**	0.294	**0.37**	0.08
Body	LTE Band7	20850	2510	50RB_High	Front	5mm	\	18.59	19.5	0.469	**0.58**	0.208	**0.26**	-0.17
Body	LTE Band7	20850	2510	50RB_High	Rear	5mm	\	18.59	19.5	0.144	**0.18**	0.064	**0.08**	-0.17
Body	LTE Band7	20850	2510	100RB	Top	5mm	\	18.56	19.5	0.745	**0.93**	0.281	**0.35**	0.05
Body	LTE Band7	20850	2510	100RB	Bottom	5mm	\	18.56	19.5	0.731	**0.91**	0.274	**0.34**	0.08
Body	LTE Band12	23130	711	1RB_Mid	Top	5mm	\	21.6	23	0.166	**0.23**	0.112	**0.15**	0.15
Body	LTE Band12	23130	711	1RB_Mid	Bottom	5mm	**A.10**	21.6	23	0.175	**0.24**	0.113	**0.16**	-0.11
Body	LTE Band12	23130	711	1RB_Mid	Front	5mm	\	21.6	23	0.096	**0.13**	0.062	**0.09**	0.02
Body	LTE Band12	23130	711	1RB_Mid	Rear	5mm	\	21.6	23	0.104	**0.14**	0.071	**0.10**	-0.01
Body	LTE Band12	23130	711	25RB_Mid	Top	5mm	\	20.65	22	0.121	**0.17**	0.085	**0.12**	0.14
Body	LTE Band12	23130	711	25RB_Mid	Bottom	5mm	\	20.65	22	0.13	**0.18**	0.085	**0.12**	0.14
Body	LTE Band12	23130	711	25RB_Mid	Front	5mm	\	20.65	22	0.069	**0.09**	0.045	**0.06**	-0.05
Body	LTE Band12	23130	711	25RB_Mid	Rear	5mm	\	20.65	22	0.087	**0.12**	0.060	**0.08**	0.10

14 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		Mode	Test Position	Distance (mm)	Highest Measured SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
	Ch.	MHz							
WCDMA 1700	1312	1712.4	RMC	Top	5mm	0.862	0.824	1.05	/
LTE Band4	20050	1720	1RB_Low	Top	5mm	0.815	0.793	1.03	/
LTE Band4	20175	1732.5	1RB_Low	Top	5mm	0.871	0.836	1.04	/
LTE Band4	20300	1745	1RB_Low	Top	5mm	0.964	0.924	1.04	/
LTE Band7	20850	2510	1RB_Mid	Top	5mm	1.02	0.953	1.07	/
LTE Band7	21100	2535	1RB_Mid	Top	5mm	0.991	0.917	1.08	/
LTE Band7	21350	2560	1RB_Mid	Top	5mm	0.872	0.826	1.06	/
LTE Band7	20850	2510	1RB_Mid	Bottom	5mm	1.08	1.01	1.07	/
LTE Band7	21100	2535	1RB_Mid	Bottom	5mm	0.989	0.938	1.05	/
LTE Band7	21350	2560	1RB_Mid	Bottom	5mm	0.878	0.863	1.02	/
LTE Band7	20850	2510	50RB_High	Top	5mm	0.937	0.856	1.09	/
LTE Band7	21100	2535	50RB_High	Top	5mm	0.903	0.863	1.05	/
LTE Band7	21350	2560	50RB_High	Top	5mm	0.855	0.842	1.02	/
LTE Band7	20850	2510	50RB_High	Bottom	5mm	0.806	0.784	1.03	/

15 Measurement Uncertainty

15.1 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	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	√3	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	√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	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.4	R	√3	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	√3	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	√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	√3	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	√3	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	√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	√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	

15.2 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	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	√3	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	√3	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	√3	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.8	R	√3	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	√3	1	1	3.9	3.9	∞
13	Post-processing	B	4.0	R	√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	√3	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	√3	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	√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	√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	

15.3 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	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	√3	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	√3	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	√3	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.4	R	√3	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	√3	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	√3	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	7.0	R	√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	√3	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	√3	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	√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	√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	

15.4 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	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	√3	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	√3	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	√3	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.8	R	√3	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	√3	1	1	3.9	3.9	∞
13	Post-processing	B	1.0	R	√3	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	14.0	R	√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	√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	

16 MAIN TEST INSTRUMENTS

Table 16.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	January 14, 2022	One year
02	Power meter	NRP2	106276	May 11, 2021	One year
03	Power sensor	NRP6A	101369		
04	Signal Generator	E4438C	MY49071430	January 13, 2022	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	CMW500	166370	June 25, 2021	One year
07	E-field Probe	SPEAG EX3DV4	7517	January 19, 2022	One year
08	DAE	SPEAG DAE4	1525	September 1, 2021	One year
09	Dipole Validation Kit	SPEAG D750V2	1017	July 12,,2021	One year
10	Dipole Validation Kit	SPEAG D835V2	4d069	July 12,,2021	One year
11	Dipole Validation Kit	SPEAG D1750V2	1003	July 12,,2021	One year
12	Dipole Validation Kit	SPEAG D1900V2	5d101	July 15,2021	One year
13	Dipole Validation Kit	SPEAG D2600V2	1012	July 26,2021	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 Sensor Triggering Data Summary

ANNEX J Accreditation Certificate