

FCC SAR Test Report

Applicant: TCL Communication Ltd.
EUT Description: USB Connect 4G V2(NA)
Model: IK41US
Brand: Vodafone
FCC ID: 2ACCJB115
Standards: FCC 47CFR §2.1093
Date of Receipt: 2025/11/17
Date of Test: 2025/11/19 to 2025/11/24
Date of Issue: 2025/12/08

TOWE. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

the results documented in this report apply only the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility assure that additional production units of the model are manufactured with identical electrical and mechanical components. All sample tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. without written approval of TOWE, the test report shall not be reproduced except in full.



Jim Huang
Approved By:



Jack Li
Reviewed By:

Revision History

Rev.	Issue Date	Description	Revised by
01	2025/12/08	Original	Jack Li

Table of Contents

1	Summary of Test Results.....	5
2	Guidance Applied	6
3	Lab Information	6
3.1	Testing Location.....	6
3.2	Test Facility / Accreditations	6
3.3	Ambient Condition	6
4	Client Information.....	6
4.1	Applicant	6
4.2	Manufacturer	6
5	Product Information.....	7
5.1	Antenna Locations (Bottom View)	7
6	RF Exposure Limits	8
7	Introduction	9
7.1	SAR Definition.....	9
8	SAR Measurements System	10
8.1	The SAR Measurement Set-up	10
8.2	E-Field Probe.....	11
8.3	Data Acquisition Electronics (DAE).....	11
8.4	Phantom	12
8.5	Device Holder	13
8.6	Measurement procedure.....	14
8.6.1	Power reference measurement.....	14
8.6.2	Area scan.....	14
8.6.3	Zoom Scan.....	15
8.6.4	Power Drift Measurement	15
9	Test Equipment list	16
10	SAR measurement variability.....	17
11	Description of Test Position.....	18
11.1	Body exposure conditions.....	18
12	System Verification	19
12.1	Tissue Verification	19
12.2	SAR System Check.....	20
12.2.1	System Check Result.....	20
12.2.2	Detailed System Check Result	20
13	SAR General Measurement Procedures.....	21
13.1	3G SAR Test Reduction Procedure	21
13.2	SAR Measurement Conditions for UMTS.....	21
13.2.1	Output Power Verification	21
13.2.2	Body SAR Measurements	21
13.2.3	SAR Measurements with Rel. 5 HSDPA	21
13.2.4	SAR Measurements with Rel. 6 HSUPA	21
13.2.5	SAR Measurement Conditions for DC-HSDPA.....	21
13.3	SAR Measurement Conditions for LTE.....	22
13.3.1	Spectrum Plots for RB Configurations	22
13.3.2	MPR.....	22
13.3.3	A-MPR.....	22
13.3.4	Largest channel bandwidth standalone SAR test requirements	22
13.3.5	Other channel bandwidth standalone SAR test requirements	23
14	Conducted Power	24
15	SAR Data Summary	25

15.1	SAR Measurement Result of GSM850	25
15.2	SAR Measurement Result of GSM1900	25
15.3	SAR Measurement Result of WCDMA Band II	25
15.4	SAR Measurement Result of WCDMA Band IV	25
15.5	SAR Measurement Result of WCDMA Band V	25
15.6	SAR Measurement Result of LTE Band 2	25
15.7	SAR Measurement Result of LTE Band 4	26
15.8	SAR Measurement Result of LTE Band 5	26
15.9	SAR Measurement Result of LTE Band 7	26
15.10	SAR Measurement Result of LTE Band 12	26
15.11	SAR Measurement Result of LTE Band 13	26
15.12	SAR Measurement Result of LTE Band 71	26
16	Measurement Uncertainty	27
17	Calibration Certificate	27
18	Test Setup Photos	27
Appendix A: System Check Plots		27
Appendix B: SAR Test Plots		27
Appendix C: Calibration certificate		27
Appendix D: Test Setup Photos		27

1 Summary of Test Results

Band	Highest SAR(W/kg)
	Body (1g)
GSM850	0.75
GSM1900	1.23
WCDMA Band II	1.07
WCDMA Band IV	1.39
WCDMA Band V	0.62
LTE Band 2	1.39
LTE Band 4	1.08
LTE Band 5	0.61
LTE Band 7	1.24
LTE Band 12	0.38
LTE Band 13	0.41
LTE Band 71	0.17

Remark:

According to the customer's difference statement, for the SAR test at the worst case based on the original report (I19Z61859-SEM02), for the conducted power please refer to the previous report with report number I19Z61859-SEM02.

2 Guidance Applied

FCC 47CFR §2.1093

ANSI/IEEE C95.1-1992

IEEE 1528-2013

FCC KDB 941225 D01 3G SAR Measurement Procedures v03r01

FCC KDB 941225 D05 SAR for LTE Devices v02r05

FCC KDB 447498 D01 General RF Exposure Guidance v06

FCC KDB 447498 D02 SAR Procedures for Dongle Xmtr v02r01

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04

FCC KDB 865664 D02 RF Exposure Reporting v01r02

3 Lab Information

3.1 Testing Location

These measurements tests were conducted at the Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. facility located at F401 and F101, Building E, Hongwei Industrial Zone, Liuxian 3rd Road, Bao'an District, Shenzhen, China. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014

Tel.: +86-755-27212361

Contact Email: info@towewireless.com

3.2 Test Facility / Accreditations

A2LA (Certificate Number: 7088.01)

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

FCC Designation No.: CN1353

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized as an accredited testing laboratory. Designation Number: CN1353.

ISED CAB identifier: CN0152

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0152

Company Number: 31000

3.3 Ambient Condition

Temperature: 18°C~25°C

Relative Humidity: 30%~75%

4 Client Information

4.1 Applicant

Applicant:	TCL Communication Ltd.
Address:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong

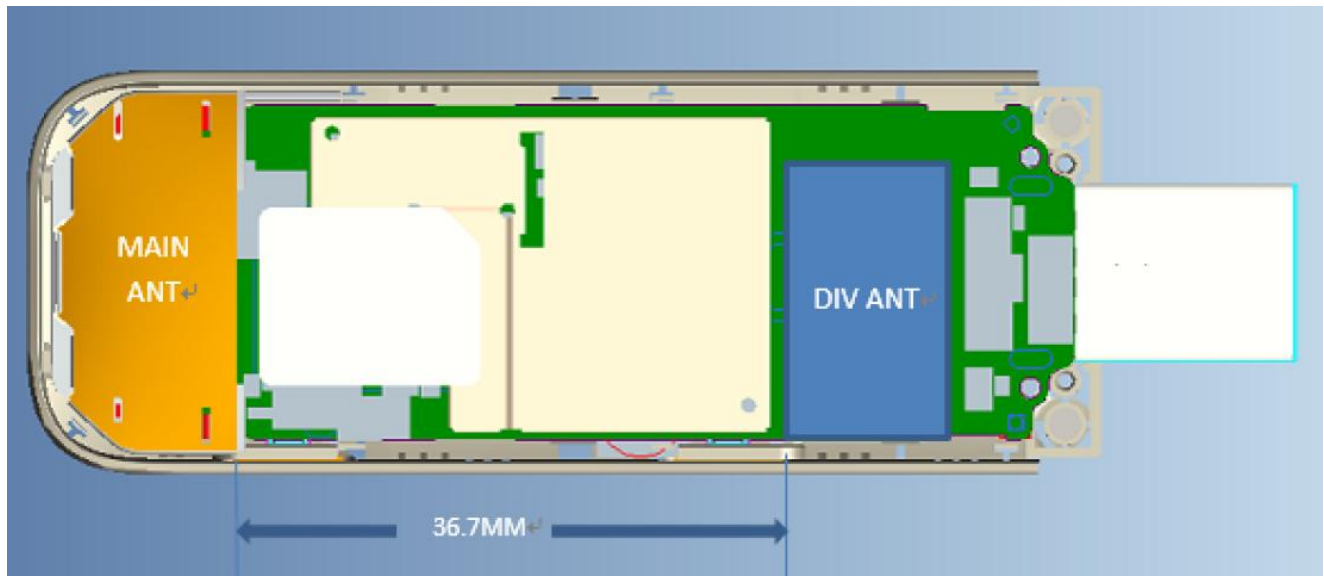
4.2 Manufacturer

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

5 Product Information

EUT Description	USB Connect 4G V2(NA)	
Model	IK41US	
Brand	Vodafone	
Hardware Version	V3.0	
Software Version	IK41_ZZ_02.00_01	
IMEI	354200345300200	
Device Capabilities:		
Band	Frequency Range (MHz)	Modulation Type
GSM850	824~849	GSM, GPRS, EGPRS
GSM1900	1850~1910	
WCDMA Band II	1850~1910	RMC, HSDPA, HSUPA, DC-HSDPA
WCDMA Band IV	1710~1755	
WCDMA Band V	824~849	
LTE Band 2	1850~1910	QPSK 16QAM
LTE Band 4	1710~1755	
LTE Band 5	824~849	
LTE Band 7	2500~2570	
LTE Band 12	699~716	
LTE Band 13	777~787	
LTE Band 71	663~698	
Antenna Type	☐ External, ☒ Integrated	
Remark: The above EUT's information was declared by applicant, please refer to the specifications or user's manual for more detailed description.		

5.1 Antenna Locations (Bottom View)



6 RF Exposure Limits

Human Exposure	Uncontrolled Environment General Population (W/kg) or (mW/g)	Controlled Environment Occupational (W/kg) or (mW/g)
Spatial Peak SAR¹ (Brain/Trunk)	1.6	8.0
Spatial Average SAR² (Whole Body)	0.08	0.4
Spatial Peak SAR³ (Hands/Feet/Ankle/Wrist)	4.0	20.0

Note:

1, The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

2, The Spatial Average value of the SAR averaged over the whole body.

3, The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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

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

7 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.

7.1 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):

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

Where:

σ is the conductivity of the tissue material (S/m)

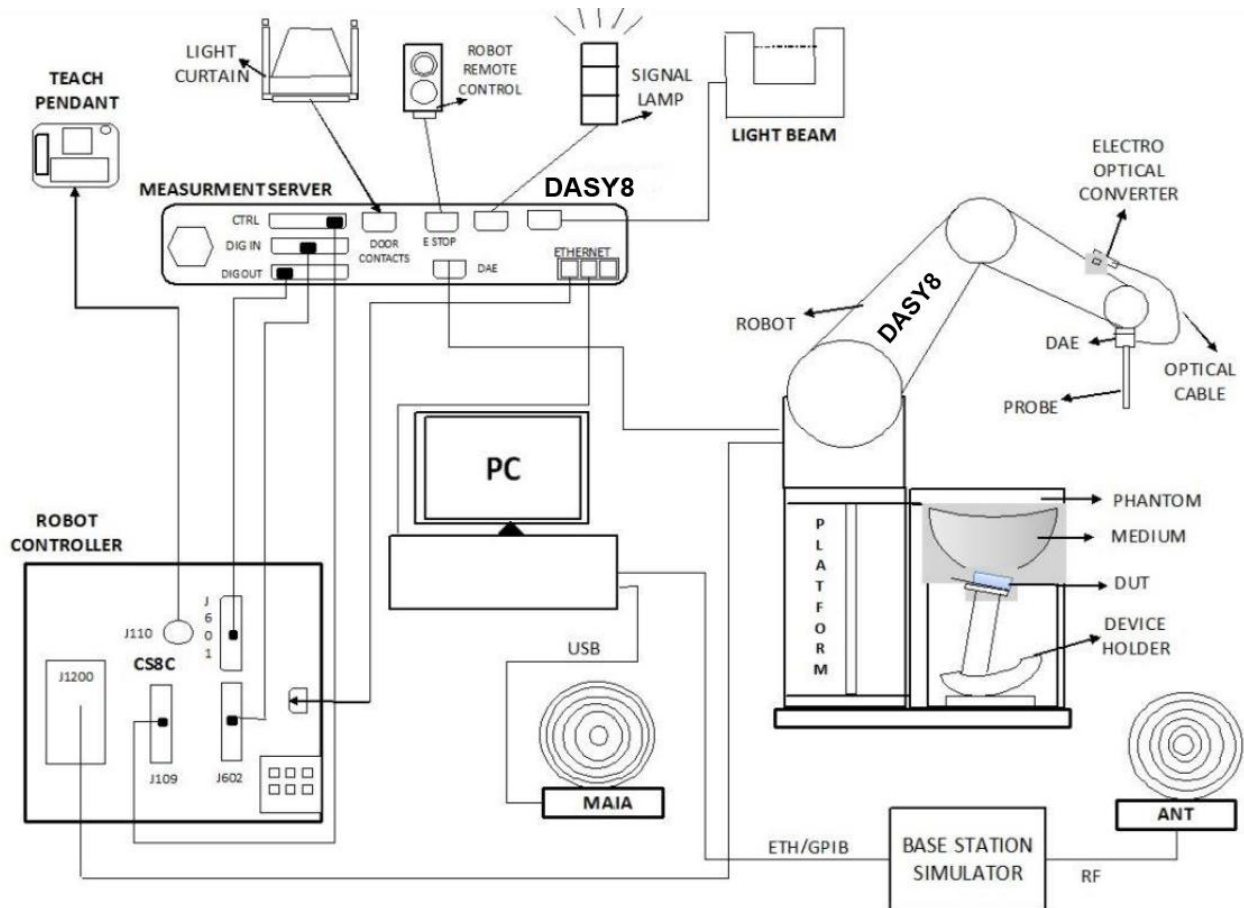
ρ is the mass density of the tissue material (kg/m³)

E is the RMS electrical field strength (V/m)

8 SAR Measurements System

8.1 The SAR Measurement Set-up

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Windows 11 and the DASY8 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

8.2 E-Field Probe

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

8.3 Data Acquisition Electronics (DAE)

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

8.4 Phantom

SAM Twin Phantom:

Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	Approx. 25 liters	
Wooden Support	SPEAG standard phantom table	

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

ELI Phantom:

Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	
Wooden Support	SPEAG standard phantom table	
The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.		

8.5 Device Holder

The SAR measured in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of $\pm 0.5\text{mm}$ would produce uncertainty in the SAR of $\pm 20\%$. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions at which the devices must be measured are defined by the standards. The DASY8 device holder along with the associated adaptors / options is designed to accommodate different types & sizes (laptops, tablets, phones) of test devices and yet provide accurate and repeatable positioning as described in the test standards.

The device holder is available in two configurations (see Figure 3.13.1): for hand held transmitters (mobile phones) – MD4HHTV5 – Mounting Device for Hand-Held Transmitters and for Body-Worn transmitters – MD4LAP5 – Mounting Device for laptops and other body worn transmitters.



(a) MD4HHTV5



(b) MD4LAPV5

Figure 3.13.1: Mounting Device for Hand-Held Devices and Laptop / Body-Worn Devices

8.6 Measurement procedure

8.6.1 Power reference measurement

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

8.6.2 Area scan

Measurement procedures for evaluating SAR from wireless handsets typically start with a coarse measurement grid to determine the approximate location of the local peak SAR values. This is known as the area-scan procedure. In addition, identify the positions of any local maxima with SAR values within 2 dB of the maximum value, and that will not be within the zoom scan of other peaks. Additional zoom scans shall be measured for such peaks only when the primary peak is within 2 dB of the SAR compliance limit.

Area scan parameters measurement as below:

Parameter	DUT transmit frequency being tested	
	$f \leq 3 \text{ GHz}$	$3 \text{ GHz} < f \leq 10 \text{ GHz}$
Maximum distance between the measured points (geometric centre of the sensors) and the inner phantom surface (z_{M1} in Figure 20 in mm)	5 ± 1	$\delta \ln(2)/2 \pm 0,5^a$
Maximum spacing between adjacent measured points in mm (see O.8.3.1) ^b	20, or half of the corresponding zoom scan length, whichever is smaller	$60/f$, or half of the corresponding zoom scan length, whichever is smaller
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20) ^c	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Tolerance in the probe angle	1°	1°
^a δ is the penetration depth for a plane-wave incident normally on a planar half-space. ^b See Clause O.8 on how Δx and Δy may be selected for individual area scan requirements. ^c The probe angle relative to the phantom surface normal is restricted due to the degradation in the measurement accuracy in fields with steep spatial gradients. The measurement accuracy decreases with increasing probe angle and increasing frequency. This is the reason for the tighter probe angle restriction at frequencies above 3 GHz.		

8.6.3 Zoom Scan

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

Zoom Scan parameters measurement as below:

Parameter	DUT transmit frequency being tested	
	$f \leq 3 \text{ GHz}$	$3 \text{ GHz} < f \leq 10 \text{ GHz}$
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 20 and Table 3, in mm)	5	$\delta \ln(2)/2^a$
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Maximum spacing between measured points in the x - and y -directions (Δx and Δy , in mm)	8	$24/f^b$
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	5	$10/(f - 1)$
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	4	$12/f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 20)	1,5	1,5
Minimum edge length of the zoom scan volume in the x - and y -directions (L_z in O.8.3.2, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in O.8.3.2 in mm)	30	22
Tolerance in the probe angle	1°	1°
^a δ is the penetration depth for a plane-wave incident normally on a planar half-space.		
^b This is the maximum spacing allowed, which might not work for all circumstances.		

8.6.4 Power Drift Measurement

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test that must remain within a maximum variation of $\pm 5\%$.

9 Test Equipment list

Manufacturer	Equipment Name	Model	Serial Number	Calibration Date	Due Date of calibration
SPEAG	Twin Phantom	SAM	2173	NCR	NCR
SPEAG	E-Field Probe	EX3DV4	7858	2025/01/15	2026/01/14
SPEAG	E-Field Probe	EX3DV4	7383	2025/03/14	2026/03/13
SPEAG	Data Acquisition Electronics	DAE4	1847	2024/12/31	2025/12/30
SPEAG	System Validation Kits	D750V3	1231	2023/05/04	2026/05/03
SPEAG	System Validation Kits	D835V2	4d302	2023/02/06	2026/02/05
SPEAG	System Validation Kits	D1750V2	1115	2023/03/23	2026/03/22
SPEAG	System Validation Kits	D1900V2	512	2023/03/24	2026/03/23
SPEAG	System Validation Kits	D2600V2	1094	2023/03/23	2026/03/22
SPEAG	Dielectric parameter probes	DAK3.5	1341	2025/07/14	2026/07/13
Agilent	Network Analyzer	E5071B	MY42302220	2025/03/11	2026/03/10
Anritsu	Radio Communication Analyzer	MT8821C	6262170463	2025/03/11	2026/03/10
R&S	Wideband Radio Communication Tester	CMW500	153024	2025/03/11	2026/03/10
Talent Microwave	Directional Coupler	TC-05180-10S	220420003	NCR	NCR
R&S	Signal Generator	SMR20	100648	2025/03/11	2026/03/10
QiJi	Preamplifier	YX28982302	TOWE-EQ-SR-020	NCR	NCR
QiJi	Preamplifier	YX28982301	TOWE-EQ-SR-021	NCR	NCR
R&S	Power Sensor	NRP-Z21	101651	2025/03/11	2026/03/10
R&S	Power Sensor	NRP-Z21	104189	2025/03/11	2026/03/10
HiSiDiKe	Thermometer	TP300	TOWE-EQ-SR-023	2025/03/12	2026/03/11
BingYu	Temperature and Humidity Indicator	HTC-1	TOWE-EQ-SR-025	2025/06/04	2026/06/03

Note:

1. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged or repaired during the interval.
2. The justification data of dipole can be found in Appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

10 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 or 2 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.80 or 2 W/kg (1-g or 10-g respectively), 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 ≥ 1.45 or 3.6 W/kg ($\sim 10\%$ from the 1-g or 10-g respective SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

11 Description of Test Position

11.1 Body exposure conditions

Per FCC KDB 447498 D02, for USB dongle transmitters with internal antennas, test all USB orientations (see figure below) with a device-to-phantom separation distance of 5 mm or less. These test orientations are intended for the exposure conditions found in typical laptop/notebook/netbook or tablet computers with either horizontal or vertical USB connector configurations at various locations in the keyboard section of the computer.

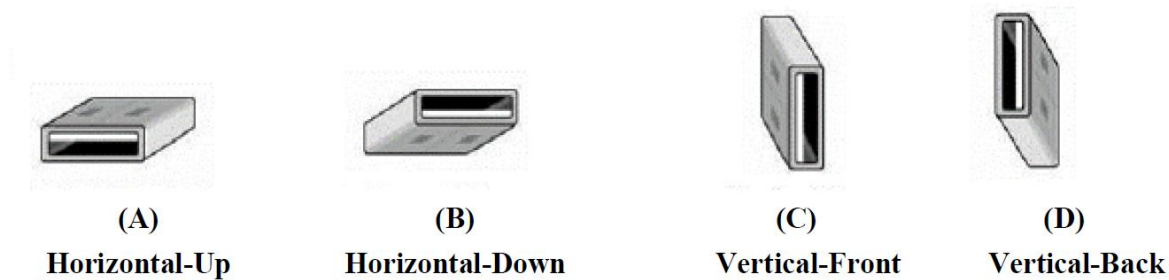
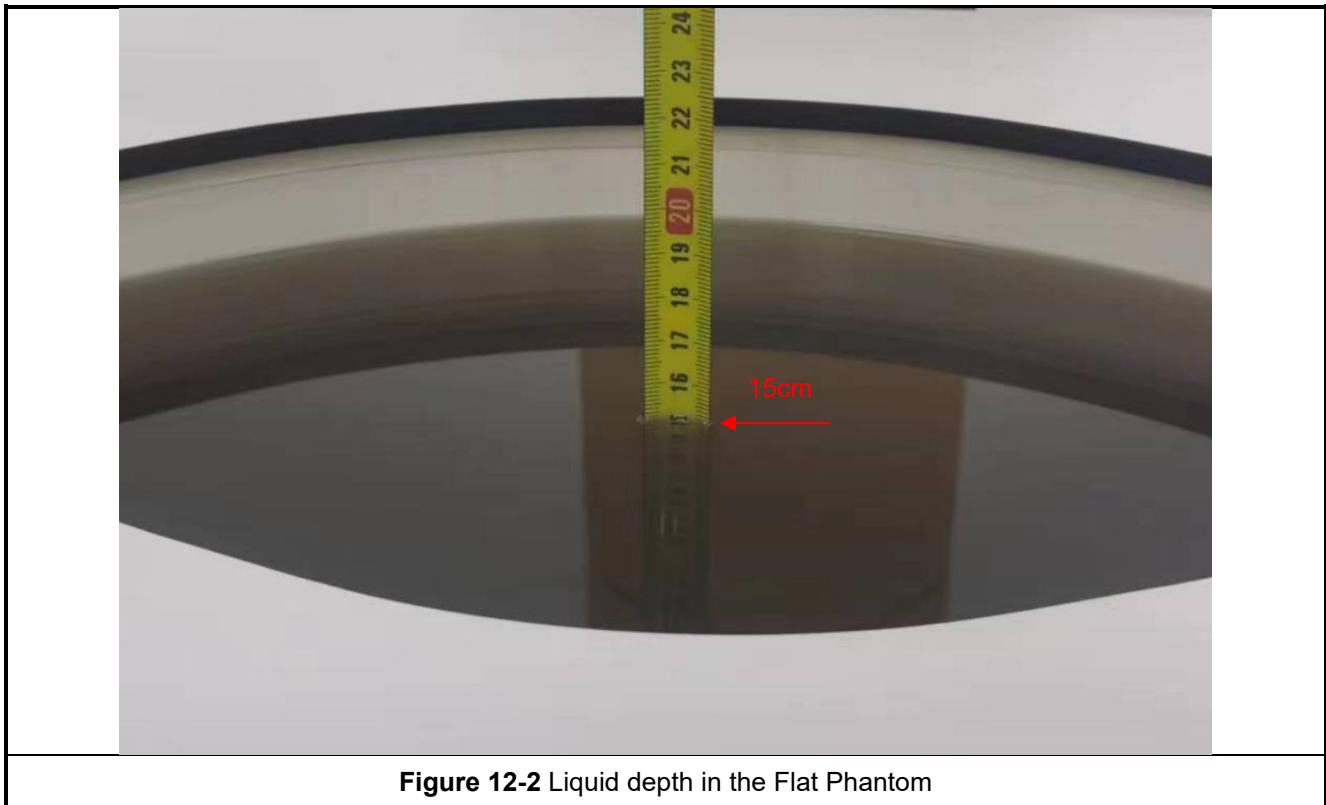


Figure: USB Connector Orientations Implemented on Laptop Computers

12 System Verification

12.1 Tissue Verification

The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. The temperature variation of the Tissue Simulate Liquids was $22\pm 2^{\circ}\text{C}$, the liquid depth of the ear reference point or the flat phantom was at least 15 cm (which is shown in Figure 12-1/12-2).



Frequency (MHz)	Tissue Type	Liquid Temp. ($^{\circ}\text{C}$)	Target Tissue		Measured Tissue		Deviation (Limit $\pm 5\%$)		Date
			Permittivity ϵ_r	Conductivity $\sigma(\text{S/m})$	Permittivity ϵ_r	Conductivity $\sigma(\text{S/m})$	$\Delta\epsilon_r$	$\Delta\sigma$	
750	Head	22.2	41.90	0.89	41.800	0.886	-0.24%	-0.45%	2025/11/23
835	Head	22.1	41.50	0.90	41.400	0.909	-0.24%	1.00%	2025/11/19
1750	Head	22.1	40.10	1.37	40.700	1.350	1.50%	-1.46%	2025/11/19
1900	Head	22.1	40.00	1.40	40.400	1.430	1.00%	2.14%	2025/11/19
2600	Head	22.1	39.00	1.96	39.000	1.970	0.00%	0.51%	2025/11/19

Table 1: Measurement Tissue Parameters

12.2 SAR System Check

Prior to SAR assessment, a SAR system Check measurement was performed to see if the measured SAR was within $\pm 10\%$ from the target SAR values. The System Performance Check Setup in Figure 12-3.

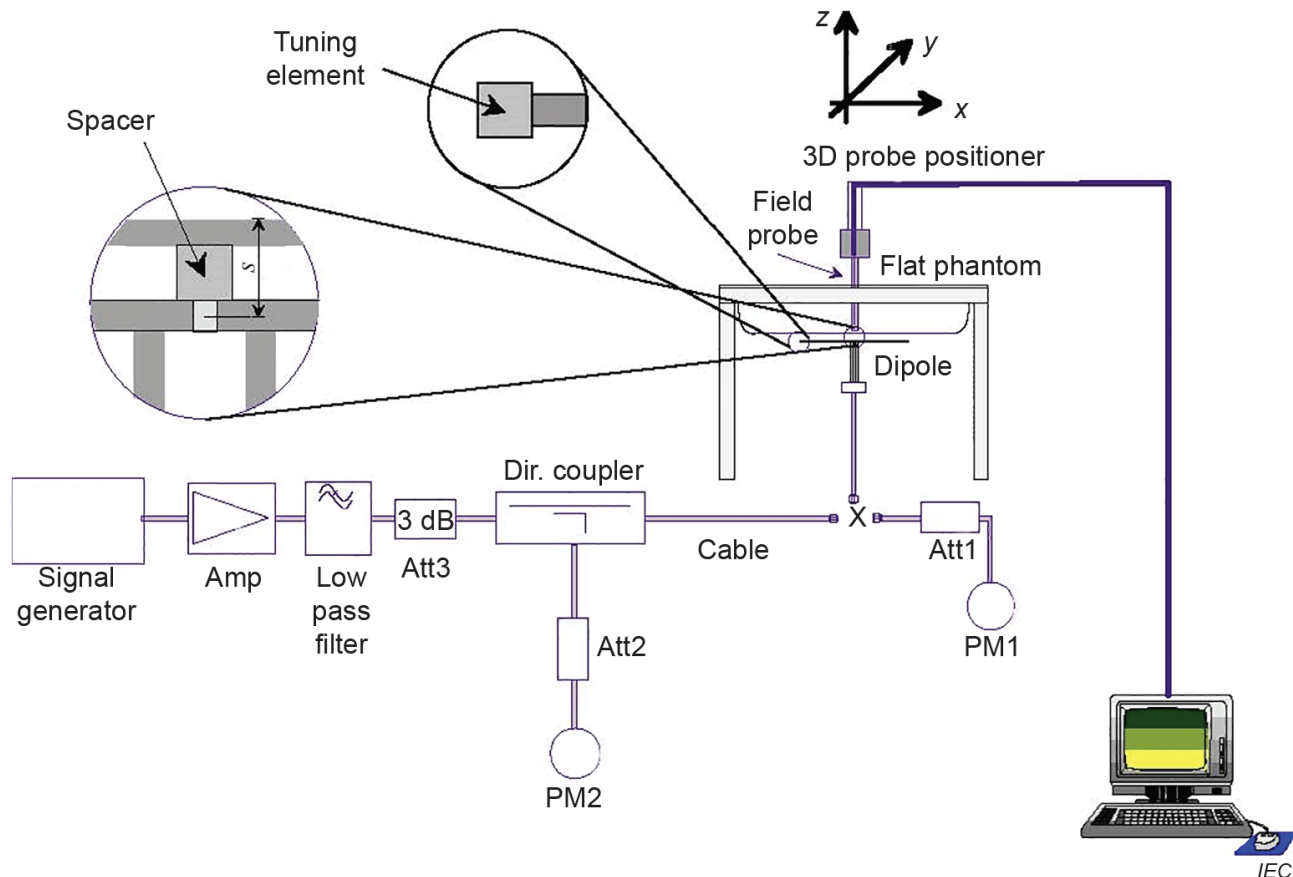


Figure 12-3 System Performance Check Setup

12.2.1 System Check Result

Frequency (MHz)	Tissue Type	Dipole	S/N	Target SAR (1W)		Measured SAR (100mW)		Measured SAR (normalized to 1W)		Deviation (Limit $\pm 10\%$)		Date
				1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	$\Delta 1g$	$\Delta 10g$	
750	Head	D750V3	1231	8.67	5.67	0.873	0.576	8.73	5.76	0.69%	1.59%	2025/11/23
835	Head	D835V2	4d302	9.78	6.37	1.000	0.658	10.00	6.58	2.25%	3.30%	2025/11/19
1750	Head	D1750V2	1115	36.90	19.50	3.490	1.860	34.90	18.60	-5.42%	-4.62%	2025/11/19
1900	Head	D1900V2	512	39.40	20.50	4.130	2.150	41.30	21.50	4.82%	4.88%	2025/11/19
2600	Head	D2600V2	1094	56.30	25.00	5.670	2.580	56.70	25.80	0.71%	3.20%	2025/11/19

Table 2: SAR System Check Result

12.2.2 Detailed System Check Result

Please see Appendix A

13 SAR General Measurement Procedures

13.1 3G SAR Test Reduction Procedure

In FCC KDB Publication 941225 D01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

13.2 SAR Measurement Conditions for UMTS

13.2.1 Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1's" for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCH_n and spreading codes, HSDPA, HSPA) are required in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

13.2.2 Body SAR Measurements

SAR for body configurations is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCH_n configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or DPDCH_n, for the highest reported SAR configuration in 12.2 kbps RMC.

13.2.3 SAR Measurements with Rel. 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSDPA is measured using and FRC with H-Set 1 in Sub-test and a 12.2 kbps RMC without HSDPA. Handsets with both HSDPA and HSUPA are tested according to release 6 HSPA test procedures. 8.4.5 SAR Measurement with Rel.6 HSUPA The 3G SAR test Reduction Procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, Using H-Set 1 and QPSK for FRC and a 12.2kbps RMC configured in Test Loop Mode 1 and Power Control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

13.2.4 SAR Measurements with Rel. 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA.

When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

13.2.5 SAR Measurement Conditions for DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

13.3 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 or Anritsu MT8820C/MT8821C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

13.3.1 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

13.3.2 MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Modulation	Channel bandwidth/Transmission bandwidth						MPR (dB)
	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	0
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16QAM	> 5	> 4	> 8	> 12	> 16	> 18	2
64QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	2
64QAM	> 5	> 4	> 8	> 12	> 16	> 18	3
256QAM	≥1						5

13.3.3 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

13.3.4 Largest channel bandwidth standalone SAR test requirements

A. 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 for 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.

B. QPSK with 50% RB allocation

The procedures required for 1 RB allocation in A are applied to measure the SAR for QPSK with 50% RB allocation.

C. 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 A and B are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

D. Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in A, B, and C to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

13.3.5 Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in 13.4.4 to determine the channels and RB configurations that need SAR testing, then only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is $> \frac{1}{2}$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration, or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

14 Conducted Power

Note:

According to the customer's difference statement, for the SAR test at the worst case based on the original report (I19Z61859-SEM02), for the conducted power please refer to the previous report with report number I19Z61859-SEM02.

15 SAR Data Summary

General Notes:

- 1) The Highest Reported SAR Plot refer to Appendix B.

15.1 SAR Measurement Result of GSM850

Test position	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm							
Bottom side	GPRS 1TS	128/824.2	0.027	32.48	33.00	1.127	0.030
Top side	GPRS 1TS	190/836.6	0.566	32.56	33.00	1.107	0.626

Table 3: SAR of GSM850.

15.2 SAR Measurement Result of GSM1900

Test position	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm							
Bottom side	GPRS 3TS	661/1880	0.038	22.80	23.50	1.175	0.045
Top side	GPRS 3TS	661/1880	0.893	22.80	23.50	1.175	1.049

Table 4: SAR of GSM1900.

15.3 SAR Measurement Result of WCDMA Band II

Test position	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm							
Top side	RMC	9538/1907.6	0.971	20.48	20.50	1.005	0.975

Table 5: SAR of WCDMA Band II.

15.4 SAR Measurement Result of WCDMA Band IV

Test position	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 9mm							
Back side	RMC	1312/1712.4	0.165	22.46	23.00	1.132	0.187

Table 6: SAR of WCDMA Band IV.

15.5 SAR Measurement Result of WCDMA Band V

Test position	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 9mm							
Bottom side	RMC	4183/846.6	0.030	22.71	23.00	1.069	0.032
Top side	RMC	4183/846.6	0.517	22.71	23.00	1.069	0.553

Table 7: SAR of WCDMA Band V.

15.6 SAR Measurement Result of LTE Band 2

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm								
Top side	20	QPSK 1 RB 50	19100/1900	0.779	19.63	20.00	1.089	0.848

Table 8: SAR of LTE Band 2.

15.7 SAR Measurement Result of LTE Band 4

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm								
Back side	20	QPSK 1 RB 0	20300/1745	0.348	22.80	23.00	1.047	0.364

Table 9: SAR of LTE Band 4.

15.8 SAR Measurement Result of LTE Band 5

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm								
Bottom side	10	QPSK 1 RB 25	20600/844	0.026	22.74	23.50	1.191	0.031
Top side	10	QPSK 1 RB 25	20600/844	0.510	22.74	23.50	1.191	0.608

Table 10: SAR of LTE Band 5.

15.9 SAR Measurement Result of LTE Band 7

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm								
Top side	20	QPSK 1 RB 50	21350/2560	0.692	17.87	19.00	1.297	0.898

Table 11: SAR of LTE Band 7.

15.10 SAR Measurement Result of LTE Band 12

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm								
Bottom side	10	QPSK 1 RB 25	23130/711	0.021	22.39	23.50	1.291	0.027
Top side	10	QPSK 1 RB 25	23130/711	0.297	22.39	23.50	1.291	0.383

Table 12: SAR of LTE Band 12.

15.11 SAR Measurement Result of LTE Band 13

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm								
Bottom side	10	QPSK 1 RB 49	23230/782	0.022	22.29	23.50	1.321	0.029
Top side	10	QPSK 1 RB 49	23230/782	0.310	22.29	23.50	1.321	0.410

Table 13: SAR of LTE Band 13.

15.12 SAR Measurement Result of LTE Band 71

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm								
Bottom side	20	QPSK 50 RB 50	133222/673	0.017	21.28	22.50	1.324	0.023
Front side	20	QPSK 50 RB 50	133222/673	0.128	21.28	22.50	1.324	0.170

Table 14: SAR of LTE Band 71.

16 Measurement Uncertainty

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

17 Calibration Certificate

Please see the Appendix C

18 Test Setup Photos

Please see the Appendix D

Appendix A: System Check Plots

Appendix B: SAR Test Plots

Appendix C: Calibration certificate

Appendix D: Test Setup Photos

--- The End ---
