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TEST REPORT

SCOPE OF WORK
FCC TESTING– T3

REPORT NUMBER
250428053SZN-004

ISSUE DATE
12 June 2025

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[---------------------]

PAGES
63

DOCUMENT CONTROL NUMBER
FCC SAR_b

SAR TEST REPORT

For

Zepcam B.V.

BODY CAMERA

FCC ID: 2BOX9-T3BC03A

Model No.: T3

Brand Name: ZEPCAM

Sample ID: Z250428053-001

Report No.: 250428053SZN-004

Issue Date: 12 June 2025

Prepared and Checked by:	***Approved by:***
Bruce	Johnny Wang
Bruce Zheng	***Johnny Wang***
Project Engineer	***Project Engineer***
	12 June 2025

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1. GENERAL INFORMATION

Applicant:	Zepcam B.V. Hogeweg 29, Zaltbommel, Gelderland, Netherlands
Manufacturer:	Zepcam B.V. Hogeweg 29, Zaltbommel, Gelderland, Netherlands
Product Description:	BODY CAMERA
Model Number:	T3
File Number:	250428053SZN-004
Date of Test:	28 April 2025 to 30 May 2025

The above equipment was tested by Intertek Testing Services Shenzhen Ltd. Longhua Branch. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in IEEE 1528-2013 and KDB 865664. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in ANSI/IEEE C95.1-1992.

The test results of this report relate only to the tested sample identified in this report

2. STATEMENT OF COMPLIANCE

The Maximum reported SAR 1g

Band	Max reported SAR Value(W/kg)
	1-g Body-Worn (Separation distance of 0mm)
WCDMA Band 2	0.959
WCDMA Band 4	1.011
WCDMA Band 5	1.066
LTE Band 2	1.416
LTE Band 4	0.999
LTE Band 5	1.170
LTE Band 12	0.696
LTE Band 13	1.245
LTE Band 14	1.381
LTE Band 66	0.862
LTE Band 71	0.555
WLAN 2.4G	0.443
WLAN 5.2G	1.504

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

The maximum reported SAR value is: 1.50W/kg (1g) in the left side position.

3. EQUIPMENT UNDER TEST (EUT) TECHNICAL DESCRIPTION

Characteristics	Description		
Product Name:	BODY CAMERA		
Device type:	Portable device		
Exposure Category:	Uncontrolled Environment/General Population		
Test Mode(s):	UMTS/TM1 (WCDMA system, QPSK modulation)		
	UMTS/TM2 (HSDPA system, QPSK modulation)		
	UMTS/TM3 (HSUPA system, QPSK modulation)		
	LTE/TM1 (LTE system, QPSK modulation)		
	LTE/TM2 (LTE system, 16QAM modulation)		
	WiFi 2.4G (DSSS/OFDM) WiFi 5G (OFDM)		
Device Class:	B		
Antenna Type:	Monopole antenna for WCDMA and LTE, Internal Antenna for WiFi		
Antenna Gain:	UMTS850: -6.87dBi UMTS1700: 1.51dBi UMTS1900: 1.32dBi LTE BAND2: 1.32dBi LTE BAND4: 1.51dBi LTE BAND5: -6.87dBi LTE BAND12: -11.14dBi LTE BAND13: -7.24dBi LTE BAND14: -7.24dBi LTE BAND66: 1.51dBi LTE BAND71: -15.49dBi		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	UMTS 850	824 - 849	869 - 894
	UMTS 1700	1710 - 1755	2110 - 2155
	UMTS 1900	1850 - 1910	1930 - 1990
	LTE Band 2	1850 - 1910	1930 - 1990
	LTE Band 4	1710 - 1755	2110 - 2155
	LTE Band 5	824 - 849	869 - 894
	LTE Band 12	699 - 716	729 - 746
	LTE Band 13	777 - 787	746 - 756
	LTE Band 14	788 - 798	758 - 768
	LTE Band 66	1710 - 1780	2110 - 2180
	LTE Band 71	663 – 698	617 - 652
	2.4G Wi-Fi	2412-2462	
	5 G Wi-Fi	5150MHz~5250 MHz	
GPRS Multislot Class(12)	Max Number of Timeslots in Uplink:	4	
	Max Number of Timeslots in Downlink:	4	
	Max Total Timeslot:	5	
EGPRS Multislot Class(12)	Max Number of Timeslots in Uplink:	4	
	Max Number of Timeslots in Downlink:	4	

Characteristics	Description	
	Max Total Timeslot:	5
HSUPA UE Category:	6	
HSDPA UE Category:	14	
Power Class:	UMTS Band II: 3 UMTS Band IV: 3 UMTS Band V: 3 LTE Band 2: 3 LTE Band 4: 3 LTE Band 5: 3 LTE Band 12: 3 LTE Band 13: 3 LTE Band 14: 3 LTE Band 66: 3 LTE Band 71: 3	
Test Channels (low-mid-high):	9262-9400-9538(UMTS Band II)	
	1312-1413-1513(UMTS Band IV)	
	4132-4182-4233(UMTS Band V)	
	18607-18900-19193(LTE Band 2 BW=1.4MHz)	
	18615-18900-19185(LTE Band 2 BW=3MHz)	
	18625-18900-19175(LTE Band 2 BW=5MHz)	
	18650-18900-19150(LTE Band 2 BW=10MHz)	
	18675-18900-19125(LTE Band 2 BW=15MHz)	
	18700-18900-19100(LTE Band 2 BW=20MHz)	
	19957-20175-20393(LTE Band 4 BW=1.4MHz)	
	19965-20175-20385(LTE Band 4 BW=3MHz)	
	19975-20175-20375(LTE Band 4 BW=5MHz)	
	20000-20175-20350(LTE Band 4 BW=10MHz)	
	20025-20175-20325(LTE Band 4 BW=15MHz)	
	20050-20175-20300(LTE Band 4 BW=20MHz)	
	20407-20525-20643(LTE Band 5 BW=1.4MHz)	
	20415-20525-20635(LTE Band 5 BW=3MHz)	
	20425-20525-20625(LTE Band 5 BW=5MHz)	
	20450-20525-20600(LTE Band 5 BW=10MHz)	
	23017-23095-23173(LTE Band 12 BW=1.4MHz)	
	23025-23095-23165(LTE Band 12 BW=3MHz)	
	23035-23095-23155(LTE Band 12 BW=5MHz)	
	23060-23095-23130(LTE Band 12 BW=10MHz)	
	23205-23230-23255(LTE Band 13 BW=5MHz)	
	23230(LTE Band 13 BW=10MHz)	
	23305-23330-23355(LTE Band 14 BW=5MHz)	
	23330(LTE Band 14 BW=10MHz)	
	131979-132322-132665(LTE Band 66 BW=1.4MHz)	
	131987-132322-132657(LTE Band 66 BW=3MHz)	
	131997-132322-132647(LTE Band 66 BW=5MHz)	

Characteristics	Description
	132022-132322-132622(LTE Band 66 BW=10MHz)
	132047-132322-132597(LTE Band 66 BW=15MHz)
	132072-132322-132572(LTE Band 66 BW=20MHz)
	133147-133297-133447(LTE Band 71 BW=5MHz)
	133172-133297-133422(LTE Band 71 BW=10MHz)
	133197-133297-133397(LTE Band 71 BW=15MHz)
	133222-133322-133372(LTE Band 71 BW=20MHz)
	2.4G Wi-Fi: 802.11b/g/n 20M: 1-6-11
	5G Wi-Fi: 802.11a/n/ac 20M: 36-40-48 802.11n/ac 40M: 38-N/A-46 802.11ac 80M: 42 (There is only one channel per band.)
Power supply:	Charging: DC 5V/2A from 100-240V~, 50/60Hz adapter; Battery: DC 3.8V, 4200mAh, 15.96Wh
Product Software Version:	N/A
Product Hardware Version:	KH3643_V16C

Note:
1. N/A is Not Applicable
2. For more details, please refer to the User's manual of the EUT.
3. The sample under test was selected by the applicant.

4. AUXILIARY EQUIPMENT DETAILS

Description	Manufacturer	Description
Power Adapter(Provided by Applicant)	N/A	Model: XS12-050200U Input: 100-240V~, 50/60Hz, 0.5A Output: 5.0V⎓2.0A
USB cable(Provided by Applicant)	N/A	Length: 120cm, shielded, without ferrite core

5. TEST FACILITY

Site Description	
EMC Lab.	The Laboratory has been assessed and proved to be in compliance with CNAS/CL01: 2006(identical to ISO/IEC17025: 2005) The Certificate Registration Number is L0327
	Accredited by FCC The Certificate Registration Number is CN1188
Name of Firm	Intertek Testing Services Shenzhen Ltd. Longhua Branch
Site Location	101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, ShenZhen, P.R. China

6. GUIDANCE STANDARD

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

☒FCC 47CFR §2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices

☒NSI C95.1, 1992: Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. (IEEE Std C95.1-1991)

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

☒KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04

☒KDB 865664 D02 RF Exposure Reporting v01r02

☒KDB 690783 D01 SAR Listings on Grants v01r03

☒KDB 447498 D01 General RF Exposure Guidance v06

☒KDB 648474 D04 Handset SAR v01r03

☒KDB 941225 D01 SAR test for 3G Devices v03r01

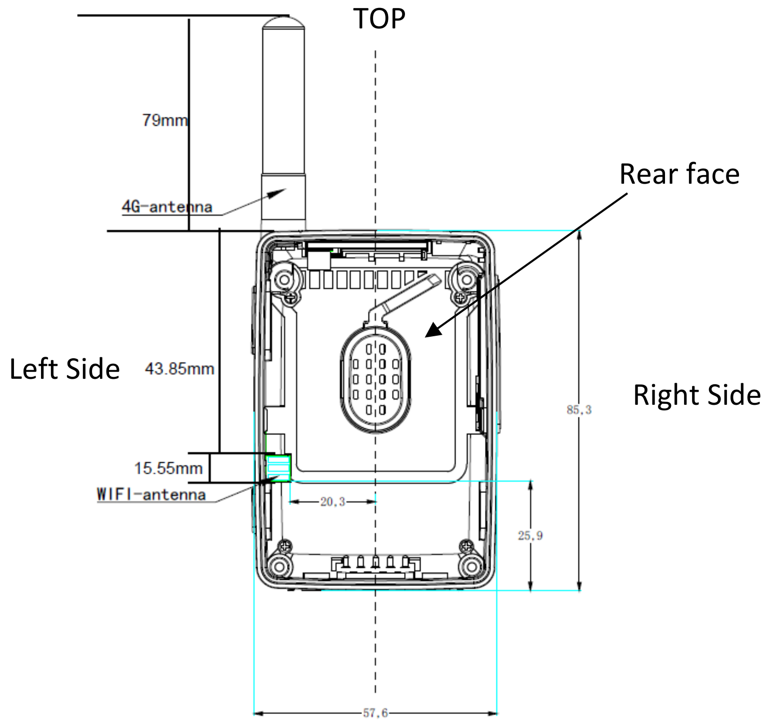
☒KDB 941225 D05 SAR for LTE Devices v02r05

☒KDB 941225 D06 Hotspot Mode v02r01

☒KDB248227 D01 802.11 Wi-Fi SAR v02r02

Remark:
This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 12 of this test report are below limits specified in the relevant standards for the tested bands only.

7. EUT ANTENNA LOCATIONS



Test position consideration:

Distance of EUT antenna-to-edge/surface(mm), Test distance:0mm						
Antennas	Rear Face	Front Face	Left Side	Right Side	Top	Bottom
WWAN	≤25mm	≤25mm	≤25mm	>25mm	≤25mm	>25mm
WLAN	≤25mm	≤25mm	≤25mm	>25mm	≤25mm	>25mm

Test distance:0mm						
Antennas	Rear Face	Front Face	Left Side	Right Side	Top	Bottom
WWAN	YES	YES	YES	NO	YES	NO
WLAN	YES	YES	YES	NO	YES	NO

Note:

1. Body-worn SAR assessments are required.
2. Per KDB 447498 D01v06, for handsets the test separation distance is determined by the smallest distance between the outer surface of the device and the user, which is 0 mm for head SAR, 10 mm for body-worn SAR and hotspot SAR.

8. RF EXPOSURE

8.1 LIMITS

Uncontrolled Environment

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

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and ankles
0.08	1.6	4.0

Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

8.2 EVALUATION

☒According to FCC KDB447498 D01 and §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:

   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] · [$\sqrt{f_{(GHz)}}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR,[16] where

   - $f_{(GHz)}$ is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation[17]
   - The result is rounded to one decimal place for comparison

   The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Routine SAR evaluation refers to that specifically required by § 2.1093, using measurements or computer simulation. Portable transmitters with output power greater than the applicable low threshold require SAR testing to qualify for TCB approval.

Exclusion Thresholds = $P\sqrt{F}/D$

P= Maximum turn-up power in mW

F= Channel frequency in GHz

D= Minimum test separation distance in mm

Test Distance (0mm)

Mode	MAX Power (dBm)	Tune Up Power (dBm)	Max Tune Up Power (dBm)	Max Tune Up Power (mW)	Exclusion Thresholds	Limit
Wi-Fi	18.1	17.5±1	18.5	70.79	22.21	3

Result: SAR measurement for Wi-Fi is required.

9. SPECIFIC ABSORPTION RATE (SAR)

9.1 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.

9.2 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.

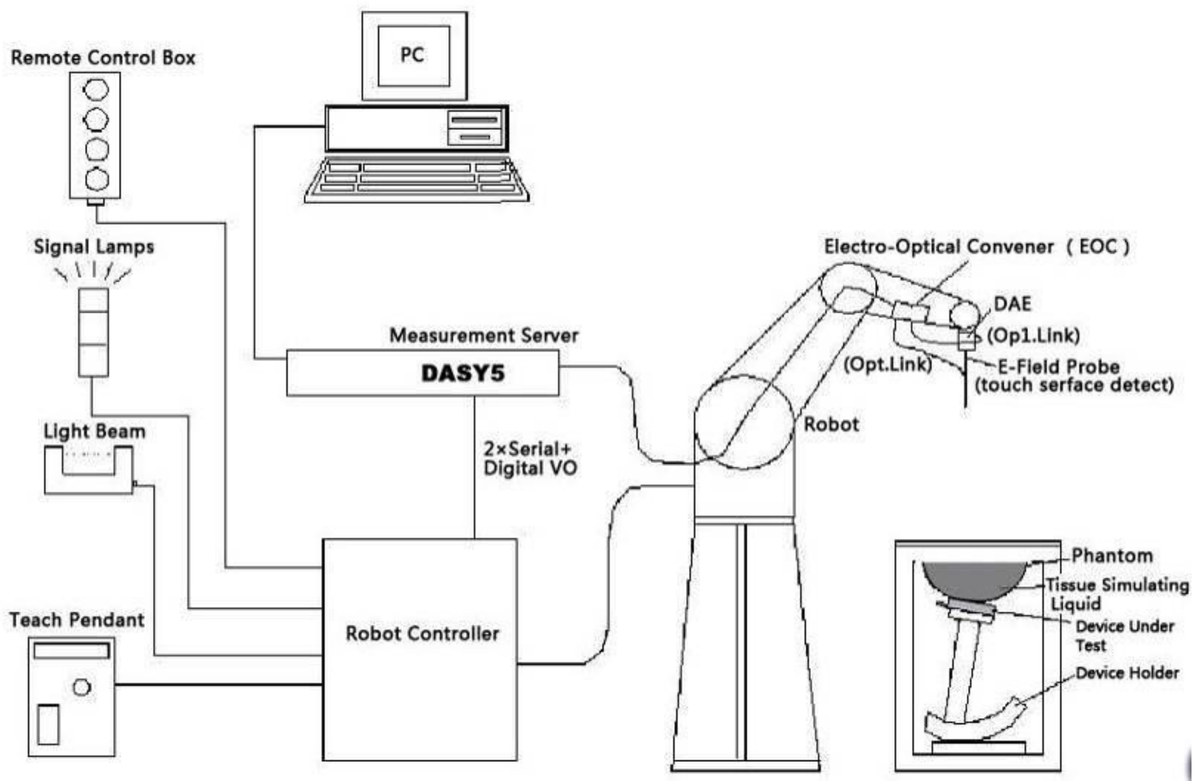
However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

10. SAR MEASUREMENTS SYSTEM CONFIGURATION

10.1 SAR MEASUREMENT SET-UP

The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli TX=RX family) 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 Win 7 profesional operating system and the DASY5 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.



Picture 1. SAR Lab Test Measurement Set-up

10.2 DASY5 E-FIELD PROBE SYSTEM

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY5 software reads the reflection turning a software approach and looks for the maximum using 2nd ord curve fitting. The approach is stopped at reaching the maximum.

Probe Specifications:

Model:	EX3DV4
Calibration:	ISO/IEC 17025 calibration service available
Probe Length:	337 mm
Probe Tip Length:	9 mm
Body Diameter:	10 mm
Tip Diameter:	2.5 mm
Application:	High Precision dosimetric measurements in any exposure scenario (e.g., very strong Picture 2 E-field Probe gradient fields).

Picture 2 E-field Probe

10.3 E-FIELD PROBE CALIBRATION

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equate to 1 mw/ cm^2.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where:
Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
ΔT = Temperature increase due to RF exposure.

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

Where:
σ = Simulated tissue conductivity,
ρ = Tissue density (kg/m^3).

10.4 OTHER TEST EQUIPMENT

10.4.1 Data Acquisition Electronics (DAE)

The data acquisition electronics consist 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 with a 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 mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Picture 3: DAE

10.4.2 Robot

The SPEAG DASY system uses the high precision robots (DASY5: TX90XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Picture 4 DASY 5

10.4.3 Measurement Server

The Measurement server is based on a PC/104 CPU broad with CPU (DASY5: 400 MHz, Intel Celeron), chip disk (DASY5: 128MB), RAM (DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O broad, which is directly connected to the PC/104 bus of the CPU broad.

Picture 5 Server for DASY 5

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

10.4.4 Device Holder for Phantom

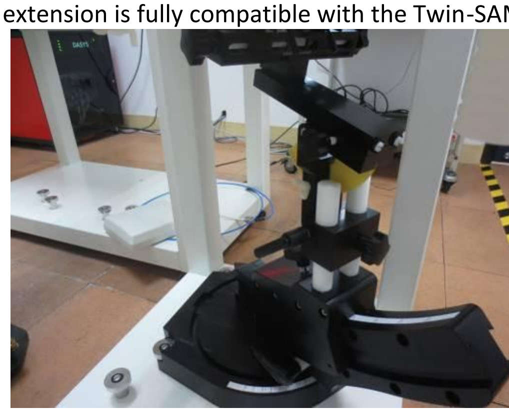
The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε =3 and loss tangent δ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.



Picture 6: Device Holder

10.4.5 Phantom

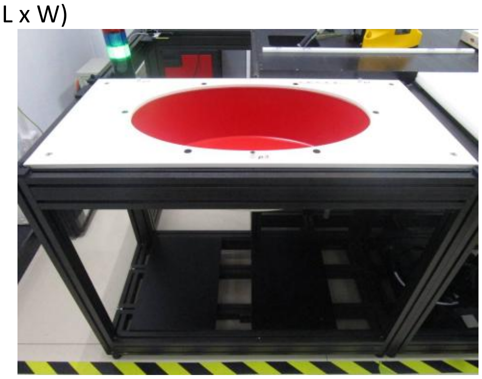
The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to Represent the 90th percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

Shell Thickness: 2 ± 0. 2 mm
Filling Volume: Approx. 25 liters
Dimensions: 810 x l000 x 500 mm (H x L x W)
Available: Special

Picture 7: SAM Twin Phantom

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.

Shell Thickness: 2±0.2 mm
Filling Volume: Approx. 30 liters
Dimensions: 190×600×0 mm (H x L x W)



Picture 8.ELI Phantom

10.5 SCANNING PROCEDURE

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot. Before starting the area scan a grid spacing is set according to FCC KDB Publication 865664. During scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan

After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm.

Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY5 system allows evaluations that combine measured data and robot positions, such as:

- maximum search
- extrapolation
- boundary correction
- peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard’s method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space.

They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

Table 1: Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01

Frequency	Maximum Area Scan Resolution (mm) (Δxarea, Δyarea)	Maximum Zoom Scan Resolution (mm) (Δxzoom, Δyzoom)	Maximum Zoom Scan Spatial Resolution (mm) Δzzoom(n)	Minimum Zoom Scan Volume (mm) (x,y,z)
≤2 GHz	≤15	≤8	≤5	≥30
2-3 GHz	≤12	≤5	≤5	≥30
3-4 GHz	≤12	≤5	≤4	≥28
4-5 GHz	≤10	≤4	≤3	≥25
5-6 GHz	≤10	≤4	≤2	≥22

10.6 DATA STORAGE AND EVALUATION

10.6.1 Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DAE4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device set up, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a loss less media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

10.6.2 Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:
- Sensitivity $Norm_i$, a_{i0}, a_{i1}, a_{i2}
- Conversion factor $ConvF_i$
- Diode compression point Dcp_i

Device parameters:
- Frequency f
- Crest factor cf

Media parameters:
- Conductivity
- Density

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

With V_i = compensated signal of channel i (i = x, y, z)
U_i = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp_i = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes: $\mathbf{E_i = (V_i / Norm_i \cdot ConvF)^{1/2}}$

H-field probes: $\mathbf{H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f}$

With $\mathbf{V_i}$ = compensated signal of channel i (i = x, y, z)
$\mathbf{Norm_i}$ = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
$\mathbf{a_{ij}}$ **=** sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
$\mathbf{E_i}$ = electric field strength of channel i in V/m
$\mathbf{H_i}$ = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):
$\mathbf{E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}}$

The primary field data are used to calculate the derived field units.
$\mathbf{SAR = (E_{tot})\ 2 \cdot \sigma / (\rho \cdot 1000)}$
with **SAR** = local specific absorption rate in mW/g
$\mathbf{E_{tot}}$ = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm^3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.
$\mathbf{P_{pwe} = E_{tot}^2 / 3770}$ **or** $\mathbf{P_{pwe} = H_{tot}^2 \cdot 37.7}$
with $\mathbf{P_{pwe}}$ = equivalent power density of a plane wave in mW/cm^2
$\mathbf{E_{tot}}$ = total electric field strength in V/m ; $\mathbf{H_{tot}}$ = total magnetic field strength in A/m

10.7 TISSUE-EQUIVALENT LIQUID

10.7.1 Tissue-equivalent Liquid Ingredients

The liquid is consisted of water, salt and Glycol etc. The liquid has previously been proven to be suited for worst-case. The Table 2 & 3 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the KDB 865664 D01.

Table 2: The following recipe(s) were used for Head (H) and Body (B) Tissue-equivalent liquid(s)

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.4	57.0	-	41.1	-
H835	0.1	-	1.0	1.4	57.0	-	40.5	-
H900	0.1	-	1.0	1.5	56.5	-	40.9	-
H1450	-	45.5	-	0.7	-	-	53.8	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	44.5	-	0.3	-	-	55.2	-
H1800	-	44.9	-	0.2	-	-	54.9	-
H1900	-	44.9	-	0.2	-	-	54.9	-
H2000	-	50	-	-	-	-	50	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	8.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.52	17.3
B750	0.2	-	0.2	0.8	48.8	-	50.0	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B900	0.2	-	0.2	0.9	48.2	-	50.5	-
B1450	-	34.0	-	0.3	-	-	65.7	-
B1640	-	32.5	-	0.3	-	-	67.2	-
B1750	-	29.4	-	0.4	-	-	70.2	-
B1800	-	29.5	-	0.4	-	-	70.1	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2000	-	30.0	-	0.2	-	-	69.8	-
B2300	-	31.0	-	0.1	-	-	68.9	-
B2450	-	31.4	-	0.1	-	-	68.5	-
B2600	-	31.8	-	0.1	-	-	68.1	-
B3500	-	28.8	-	0.1	-	-	71.1	-
B5G	-	-	-	-	-	10.7	78.6	10.7

Table 3: Targets of Tissue Simulating Liquid

Frequency (MHz)	Relative permittivity ε_r	Conductivity (σ) S/m
750	41.9	0.89
835	41.5	0.90
900	41.5	0.97
1750	40.1	1.37
1800	40.0	1.40
1900	40.0	1.40
2000	40.0	1.40
2300	39.5	1.67
2450	39.2	1.80
2600	39.0	1.96
5200	36.0	4.66
5300	35.9	4.76
5500	35.6	4.96
5600	35.5	5.07
5800	35.3	5.27

10.7.2 Tissue-equivalent Liquid Properties

Table 4: Dielectric Performance of Head Tissue Simulating Liquid

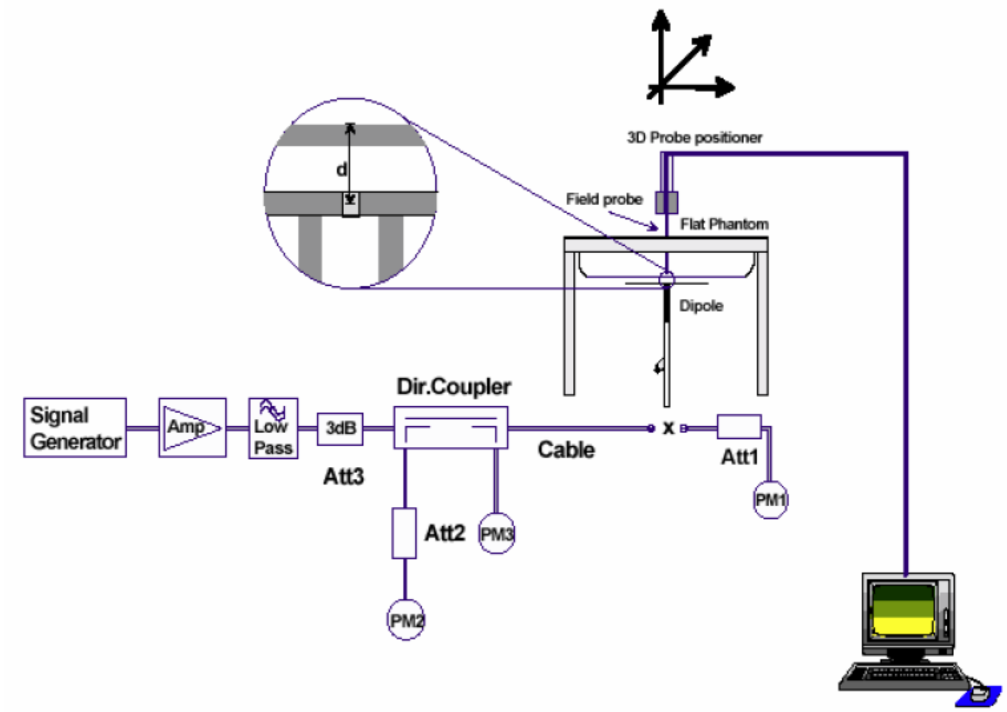
Tissue Verification								
Tissue Type	Frequency (MHz)	Conductivity (σ)	Permittivity (εr)	Targeted Conductivity (σ)	Targeted Permittivity (εr)	Deviation Conductivity (σ)	Deviation Permittivity (εr)	Date
Head	750	0.891	42.430	0.89	41.9	0.11	1.26	5/13/2025
Head	835	0.893	42.242	0.90	41.5	-0.78	1.79	5/15/2025
Head	900	0.943	41.382	0.97	41.5	-2.78	-0.28	5/14/2025
Head	1750	1.401	40.588	1.37	40.1	2.26	1.22	5/20/2025
Head	1900	1.380	40.398	1.40	40.0	-1.43	1.00	5/21/2025
Head	2450	1.880	38.290	1.80	39.2	4.44	-2.32	5/16/2025
Head	5200	4.561	34.813	4.66	36.0	-2.12	-3.30	5/16/2025

Note: The dielectric properties have been measured using the contact probe method at 22±2°C.

10.8 SYSTEM CHECK

10.8.1 Description of System Check

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyzer. A system check measurement was made following the determination of the dielectric parameters of the simulant, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. The system check results (dielectric parameters and SAR values) are given in the table 5. System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %). System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.



Picture 10. System Check Set-up

Justification for Extended SAR Dipole Calibrations
Usage of SAR dipoles calibrated less than 3 years ago but more than 1 year ago were confirmed in maintaining return loss (< - 20 dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB 865664 D01

10.8.2 System Check Results

Table 5: System Check for Simulating Liquid

Frequency (MHz)	Targeted SAR 1g (W/kg)	Measured SAR 1g (W/kg)	Normalized SAR 1g (W/kg)	Deviation SAR 1g (%)	Date
750	8.47	2.09	8.36	-1.30	5/13/2025
835	9.56	2.48	9.92	3.77	5/15/2025
900	10.7	2.72	10.88	1.68	5/14/2025
1750	36.2	9.09	36.36	0.44	5/20/2025
1900	39.5	9.84	39.36	-0.35	5/21/2025
2450	52.5	12.90	51.60	-1.71	5/16/2025
5200	77.6	7.86	78.60	1.29	5/16/2025

Note: Below 5GHz system check input power: 250mW, above 5GHz system check input power: 100mW

11. MEASUREMENT PROCEDURES

11.1 GENERAL DESCRIPTION OF TEST PROCEDURES

A communication link is set up with a System Simulator (SS) by air link, and a call is established. Then EUT is commanded to operate at maximum transmitting power.

Connection to the EUT is established via air interface with CMW500, and the EUT is set to maximum output power. The EUT battery must be fully charged and checked periodically during the test to as certain uniform power output. The antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30 dB.

11.2 MEASUREMENT VARIABILITY

Per FCC KDB Publication 865664 D01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

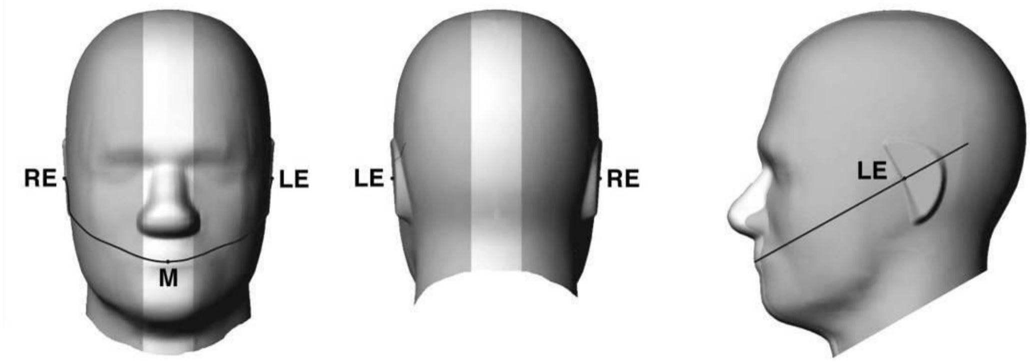
SAR Measurement Variability was assessed using the following procedures for each frequency band:

1. Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) 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 ≥ 1.45 W/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.

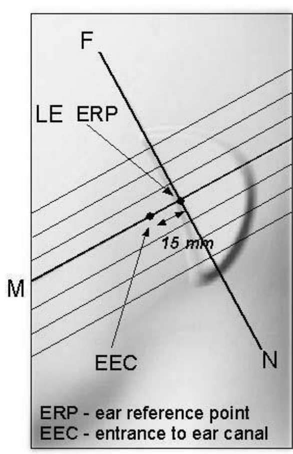
11.3 Test Positions Requirements

11.3.1 Ear and handset reference point

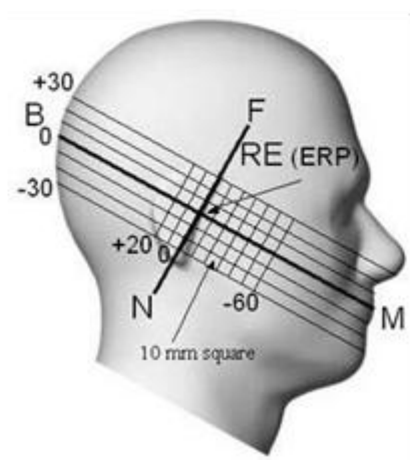
Picture11 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled "M," the left ear reference point (ERP) is marked "LE," and the right ERP is marked "RE." Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Picture12.The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Picture13). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Picture12. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.



Picture11 Front, back, and side views of SAM twin phantom



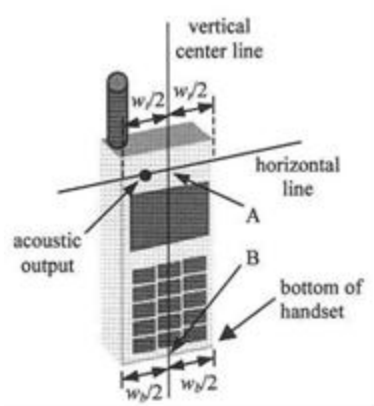
Picture12 Close-up side view of phantom showing the ear region.



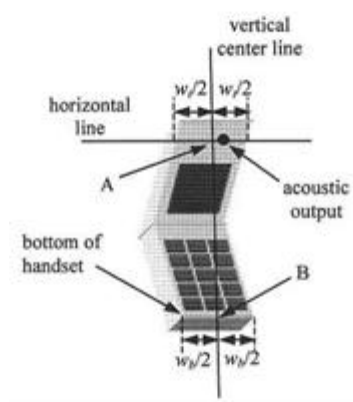
Picture13 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.3.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the Phantom Side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Picture 14 and Picture 15), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Picture 14). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Picture 15), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Picture 16), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Picture 16. The actual rotation angles should be documented in the test report.



Picture14 Handset vertical and horizontal reference lines—"fixed case



Picture15 Handset vertical and horizontal reference lines—"clam-shell case"

Picture16 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3.3 Definition of the tilt position

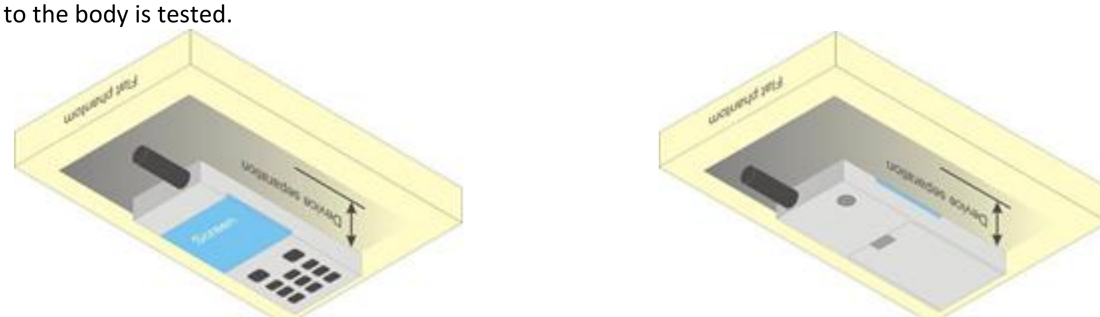
1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Picture 17. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

Picture17 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.3.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Picture 18). Per KDB 648474 D04v01r02, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v05r02 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is < 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

Accessories for body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

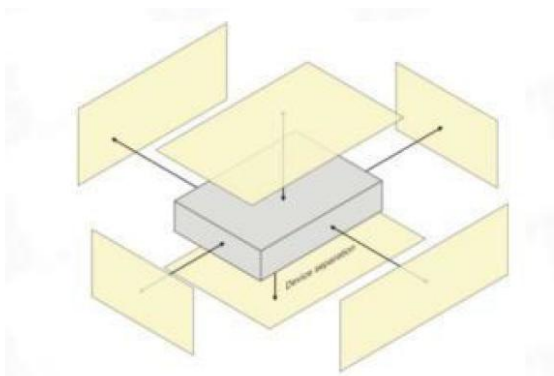


Picture18 Body Worn Position

11.3.5 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v01r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v05r02 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.



11.4 TEST COFIGURATION

11.4.1 GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. Using CMW500 the power level is set to “5” for GSM 850, set to “0” for GSM 1900. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5.

11.4.2 UMTS Test Configuration

11.4.2.1 3G SAR Test Reduction Procedure

In the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. 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.3 This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

11.4.2.2 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, DPDCHn 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.

11.4.2.3 Head SAR

SAR for next to the ear head exposure 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 AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

11.4.2.4 Body-Worn Accessory SAR

SAR for body-worn accessory 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 DPDCHn 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 spreaing code or DPDCHn, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When more than 2 DPDCHn are supported by the handset, it may be necessary to configure additional DPDCHn using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

11.4.3 LTE Test Configuration

This device contains LTE transmitter which follows 3GPP standards, is category 3, supports both QPSK and 16QAM modulations. The output power was tested per 3GPP TS 36.521-1 maximum transmit procedures for both QPSK and 16QAM modulation.

During LTE SAR testing, the related parameters of operating band, channel bandwidth, uplink channel number, modulation type, and RB was set in base station simulator. When the EUT has registered and communicated to base station simulator, the simulator set to make EUT transmitting the maximum radiated power.

11.4.3.1 General

The general test requirements of VoIP support for handsets are described in KDB Publication 648474 D04. The head, body, body-worn accessories and other required test considerations in KDB Publication 447498 D01 and other published RF exposure KDB procedures should be applied to configure LTE devices for standalone and simultaneous transmission in voice and data modes for the required exposure conditions.
Based on the design specifications and other information available from the device manufacturer, typically through measurement and analysis during product development, when the maximum output power specifications for the different RB allocations and RB offset conditions within a channel bandwidth, modulation, or across the channels in a frequency band varies by more than 1 dB, a KDB inquiry is required to determine whether the required test channels are acceptable for SAR testing or if a different set of required test channels should be used. The maximum average conducted output power measured according to the following configurations, for the required test channels, channel bandwidthsand uplink modulations, in each frequency band, are used to support the SAR test reduction and exclusion.
a) 100% RB allocation
b) 1 RB, and also 50% RB allocation, offset to the upper edge, middle, and lower edge of the channel bandwidth of each required test channel
Based on the power measurements, the SAR test reduction and exclusion provisions in KDB Publication 447498 D01 should be applied to determine SAR measurement requirements. 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 configurations and conditions that qualify for SAR test exclusion or require testing must be clearly explained in the SAR report. The procedures in the following subsections are applied separately to test each LTE frequency band. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration. The TTI configurations supported and tested must be described in the SAR report.

11.4.3.2 Largest channel bandwidth standalone SAR test requirements

1. QPSK with 1 RB allocation
Start with the largest channel bandwidth then 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.6 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.

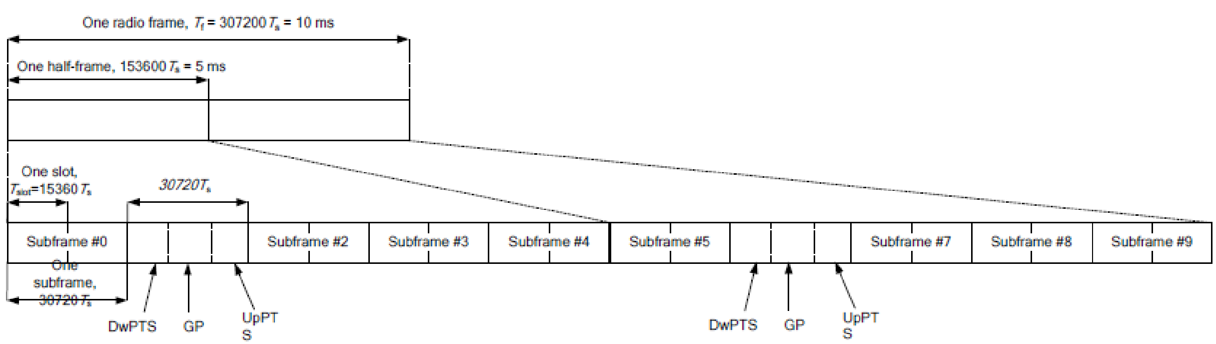
2. QPSK with 50% RB allocation
The procedures required for 1 RB allocation in 5.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.

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 5.2.1 and 5.2.2 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.

4. Higher order modulations
For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in 5.2.1, 5.2.2, and 5.2.3 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 > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

11.4.3.3 TDD-LTE test configurations

According to KDB 941225 D05, SAR testing for TDD-LTE device must be tested using a fixed periodic duty factoraccording to the highest transmission duty factor implemented for the device and supported by the defined 3GPP TDD-LTE configurations. The TDD-LTE of this device supports frame structure type 2 defined in 3GPP TS 36.211 section 4.2, and the frame structure configuration can be referred to below.



3GPP TS 36.211 Figure 4.2-1: Frame Structure Type 2

Special Subframe Configuration	Normal Cyclic Prefix in Downlink			Extended Cyclic Prefix in Downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink
0	6592 · Ts	2192 · Ts	2560 · Ts	7680 · Ts	2192 · Ts	2560 · Ts
1	19760 · Ts			20480 · Ts		
2	21952 · Ts			23040 · Ts		
3	24144 · Ts			25600 · Ts		
4	26336 · Ts			7680 · Ts	4384 · Ts	5120 · Ts
5	6592 · Ts	4384 · Ts	5120 · Ts	20480 · Ts		
6	19760 · Ts			23040 · Ts		
7	21952 · Ts			12800 · Ts		
8	24144 · Ts			-	-	-
9	13168 · Ts			-	-	-

3GPP TS 36.211 Table 4.2-1: Configuration of Special Subframe

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-Point Periodicity	Subframe Number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

3GPP TS 36.211 Table 4.2-2: Uplink-Downlink Configurations

The variety of different TD-LTE uplink-downlink configurations allows a network operator to allocate the network's capacity between uplink and downlink traffic to meet the needs of the network. The uplink duty cycle of these seven configurations can readily be computed and shown in below.

UL-DL Configuration	0	1	2	3	4	5	6
Highest Duty-Cycle	63.33%	43.33%	23.33%	31.67%	21.67%	11.67%	53.33%

Considering the highest transmission duty cycle, TDD-LTE was tested using Uplink-Downlink Configuration 0 with 6 uplink subframe and 2 special subframe. The special subframe was set to special subframe configuration 7 using extended cyclic prefix uplink. Therefore, SAR testing for TDD-LTE was performed at the maximum output power with highest transmission duty cycle of 63.33%.

12. TEST RESULTS

12.1 Conducted Power Results

Test Condition:

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The base station simulator was connected to the antenna terminal.

2 Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.

3 Environmental Conditions

Environmental Conditions	Temperature	22ºC
	Relative Humidity	55%
	Atmospheric Pressure	1009mbar

4 Test Date: 07 May 2025
   Tested By: Bruce Zheng

Test Procedures:

Mobile Phone radio output power measurement

1. The transmitter output port was connected to base station emulator.
2. Establish communication link between emulator and EUT and set EUT to operate at maximum output power all the time.
3. Select lowest, middle, and highest channels for each band and different possible test mode.
4. Measure the conducted peak burst power and conducted average burst power from EUT antenna port.

Source-based Time Averaged Burst Power Calculation:

For TDMA, the following duty cycle factor was used to calculate the source-based time average power

Number of Time slot	1	2	3	4
Duty Cycle	1:8	1:4	1:2.66	1:2
Duty cycle factor	-9.03 dB	-6.02 dB	-4.26 dB	-3.01 dB
Crest Factor	8	4	2.66	2

Remark: Time slot duty cycle factor = 10 * log (Time Slot Duty Cycle)
Source based time averaged power = Maximum burst averaged power (1 Uplink) – 9.03 dB
Source based time averaged power = Maximum burst averaged power (2 Uplink) – 6.02 dB
Source based time averaged power = Maximum burst averaged power (3 Uplink) – 4.26 dB
Source based time averaged power = Maximum burst averaged power (4 Uplink) – 3.01 dB

12.1.1 W-CDMA

Per KDB 941225 D01 3G SAR Procedures for W-CDMA:
Maximum output power is verified on the high, middle, and low channels and using the appropriate 12.2 kbps RMC with TPC (transmit power control) set to all "1's"

Release 99 Setup Procedures used to establish the test signals
The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1. A summary of these settings is illustrated below:

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

Maximum Output Power for W-CDMA
SAR measurement is not required for the HSDPA, HSUPA, DC-HSDPA and HSPA*. When primary mode and the adjusted SAR is ≤ 1.2 W/kg and secondary mode is ≤ ¼ dB higher than the primary mode

WCDMA - Average Power (dBm)												
Band	WCDMA Band II				WCDMA Band IV				WCDMA Band V			
Channel	9262	9400	9538	Tune up Power tolerant	1312	1413	1513	Tune up Power tolerant	4132	4183	4233	Tune up Power tolerant
Frequency (MHz)	1852.4	1880	1907.6	/	1712.4	1732.6	1752.6	/	826.4	836.6	846.6	/
RMC 12.2k	14.58	14.15	14.32	15.0	15.60	16.41	16.17	16.5	24.31	24.29	24.30	24.5
HSDPA Subtest-1	13.66	13.17	13.34	14.0	14.83	15.48	15.34	16.0	23.30	23.25	23.37	23.5
HSDPA Subtest-2	13.07	12.60	12.77	13.5	15.01	15.79	15.93	16.0	22.99	22.83	22.95	23.0
HSDPA Subtest-3	12.95	12.46	12.64	13.0	15.36	16.27	16.56	17.0	22.84	22.83	22.82	23.0
HSDPA Subtest-4	12.89	12.41	12.59	13.0	15.85	16.29	16.75	17.0	22.91	22.83	22.83	23.0
HSUPA Subtest-1	12.93	12.77	12.93	13.0	15.91	17.73	17.69	18.0	23.22	22.58	23.41	23.5
HSUPA Subtest-2	11.86	11.85	12.01	12.5	17.97	17.93	18.05	18.5	22.39	22.01	21.93	22.5
HSUPA Subtest-3	11.83	11.24	11.65	12.0	13.34	15.25	15.06	15.5	21.39	21.87	21.63	22.0
HSUPA Subtest-4	13.88	12.86	13.18	14.0	16.53	17.33	17.40	17.5	22.26	22.52	22.77	23.0
HSUPA Subtest-5	15.36	15.22	14.91	15.5	17.08	18.06	18.21	18.5	23.40	23.28	22.72	23.5

12.1.2 LTE

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

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 3

Modulation	Channel bandwidth / Transmission bandwidth (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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signalling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-
Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.					

Maximum Output Power for LTE

LTE QPSK configuration has the highest maximum average output power per 3GPP standard.
SAR measurement is not required for the 16QAM and 64QAM. When the highest maximum output power for 16QAM and 64QAM is ≤ ½ dB higher than the QPSK or when the reported SAR for the QPSK configuration is ≤ 1.45 W/kg.
Please refer to section 3. for LTE detail test channels.

Band	Bandwidth	Modulation	Channel	RB Configuration	Result (dBm)	Tune up limited (dBm)
Band2	20MHz	QPSK	18700	1RB#0	18.43	18.0±1
				1RB#49	18.92	18.0±1
				1RB#99	18.75	18.0±1
				50RB#0	17.45	18.0±1
				50RB#25	17.44	18.0±1
				50RB#50	17.60	18.0±1
				100RB#0	17.56	18.0±1
			18900	1RB#0	18.59	18.0±1
				1RB#49	18.29	18.0±1
				1RB#99	18.22	18.0±1
				50RB#0	17.43	18.0±1
				50RB#25	17.45	18.0±1
				50RB#50	17.33	18.0±1
				100RB#0	17.31	18.0±1
			19100	1RB#0	18.25	18.0±1
				1RB#49	18.82	18.0±1
				1RB#99	18.28	18.0±1
				50RB#0	17.24	18.0±1
				50RB#25	17.42	18.0±1
				50RB#50	17.58	18.0±1
				100RB#0	17.48	18.0±1
Band	Bandwidth	Modulation	Channel	RB Configuration	Result (dBm)	Tune up limited (dBm)
Band4	20MHz	QPSK	20050	1RB#0	16.79	16.5±1
				1RB#49	17.37	16.5±1
				1RB#99	17.31	16.5±1
				50RB#0	15.86	16.5±1
				50RB#25	15.86	16.5±1
				50RB#50	16.19	16.5±1
				100RB#0	16.04	16.5±1
			20175	1RB#0	17.07	16.5±1
				1RB#49	17.33	16.5±1
				1RB#99	17.13	16.5±1
				50RB#0	16.04	16.5±1
				50RB#25	15.96	16.5±1
				50RB#50	16.05	16.5±1
				100RB#0	16.04	16.5±1

			20300	1RB#0	17.17	16.5±1
				1RB#49	17.01	16.5±1
				1RB#99	16.95	16.5±1
				50RB#0	16.23	16.5±1
				50RB#25	16.14	16.5±1
				50RB#50	16.21	16.5±1
				100RB#0	16.14	16.5±1
Band	Bandwidth	Modulation	Channel	RB Configuration	Result (dBm)	Tune up limited (dBm)
Band5	10MHz	QPSK	20450	1RB#0	23.54	23.0±1
				1RB#24	23.91	23.0±1
				1RB#49	24.00	23.0±1
				25RB#0	22.88	23.0±1
				25RB#12	22.92	23.0±1
				25RB#25	22.94	23.0±1
				50RB#0	22.83	23.0±1
			20525	1RB#0	23.64	23.0±1
				1RB#24	23.97	23.0±1
				1RB#49	23.65	23.0±1
				25RB#0	22.99	23.0±1
				25RB#12	22.97	23.0±1
				25RB#25	22.81	23.0±1
				50RB#0	22.77	23.0±1
			20600	1RB#0	23.65	23.0±1
				1RB#24	23.79	23.0±1
				1RB#49	23.87	23.0±1
				25RB#0	22.81	23.0±1
				25RB#12	22.77	23.0±1
				25RB#25	22.84	23.0±1
				50RB#0	22.76	23.0±1
Band	Bandwidth	Modulation	Channel	RB Configuration	Result (dBm)	Tune up limited (dBm)
Band12	10MHz	QPSK	23060	1RB#0	24.53	24.0±1
				1RB#24	24.32	24.0±1
				1RB#49	24.58	24.0±1
				25RB#0	23.45	24.0±1
				25RB#12	23.46	24.0±1
				25RB#25	23.68	24.0±1
				50RB#0	23.37	24.0±1
			23095	1RB#0	24.27	24.0±1
				1RB#24	24.89	24.0±1
				1RB#49	24.72	24.0±1
				25RB#0	23.54	24.0±1

				25RB#12	23.52	24.0±1
				25RB#25	23.62	24.0±1
				50RB#0	23.43	24.0±1
			23130	1RB#0	24.44	24.0±1
				1RB#24	24.45	24.0±1
				1RB#49	24.39	24.0±1
				25RB#0	23.66	24.0±1
				25RB#12	23.70	24.0±1
				25RB#25	23.47	24.0±1
				50RB#0	23.45	24.0±1
Band	Bandwidth	Modulation	Channel	RB Configuration	Result (dBm)	Tune up limited (dBm)
Band13	10MHz	QPSK	23230	1RB#0	24.50	24.0±1
				1RB#24	24.53	24.0±1
				1RB#49	24.58	24.0±1
				25RB#0	23.76	24.0±1
				25RB#12	23.76	24.0±1
				25RB#25	23.66	24.0±1
				50RB#0	23.74	24.0±1
Band	Bandwidth	Modulation	Channel	RB Configuration	Result (dBm)	Tune up limited (dBm)
Band14	10MHz	QPSK	23230	1RB#0	24.74	24.0±1
				1RB#24	24.54	24.0±1
				1RB#49	24.87	24.0±1
				25RB#0	23.88	24.0±1
				25RB#12	23.88	24.0±1
				25RB#25	23.83	24.0±1
				50RB#0	23.83	24.0±1
Band	Bandwidth	Modulation	Channel	RB Configuration	Result (dBm)	Tune up limited (dBm)
Band66	20MHz	QPSK	132072	1RB#0	15.05	14.5±1
				1RB#49	15.34	14.5±1
				1RB#99	15.22	14.5±1
				50RB#0	13.83	14.5±1
				50RB#25	13.83	14.5±1
				50RB#50	14.39	14.5±1
				100RB#0	14.06	14.5±1
			132322	1RB#0	15.30	14.5±1
				1RB#49	15.06	14.5±1
				1RB#99	15.27	14.5±1
				50RB#0	14.71	14.5±1
				50RB#25	14.71	14.5±1
				50RB#50	14.01	14.5±1

				100RB#0	14.21	14.5±1
			132572	1RB#0	15.27	14.5±1
				1RB#49	15.19	14.5±1
				1RB#99	15.17	14.5±1
				50RB#0	15.01	14.5±1
				50RB#25	15.01	14.5±1
				50RB#50	15.16	14.5±1
				100RB#0	15.17	14.5±1
Band	Bandwidth	Modulation	Channel	RB Configuration	Result (dBm)	Tune up limited (dBm)
Band71	20MHz	QPSK	133222	1RB#0	23.01	22.5±1
				1RB#49	23.49	22.5±1
				1RB#99	22.85	22.5±1
				50RB#0	22.08	22.5±1
				50RB#25	22.06	22.5±1
				50RB#50	22.07	22.5±1
				100RB#0	22.02	22.5±1
			133322	1RB#0	22.95	22.5±1
				1RB#49	23.24	22.5±1
				1RB#99	22.81	22.5±1
				50RB#0	22.06	22.5±1
				50RB#25	21.96	22.5±1
				50RB#50	21.98	22.5±1
				100RB#0	21.98	22.5±1
			13372	1RB#0	23.01	22.5±1
				1RB#49	23.17	22.5±1
				1RB#99	22.98	22.5±1
				50RB#0	21.87	22.5±1
				50RB#25	21.98	22.5±1
				50RB#50	22.16	22.5±1
				100RB#0	22.00	22.5±1

12.1.3 Wi-Fi 2.4 GHz

Maximum Output Power for Wi-Fi 2.4 GHz

Mode	Channel number	Frequency (MHz)	Data rate (Mbps)	Average Output Power(dBm)	Average Tune up limited(dBm)
802.11b	1	2412	1	18.0	17.5±1
	6	2437	1	18.1	17.5±1
	11	2462	1	18.1	17.5±1
802.11g	1	2412	6	17.7	17.0±1
	6	2437	6	17.7	17.0±1
	11	2462	6	17.6	17.0±1
802.11n(HT20)	1	2412	MCS0	16.2	15.5±1
	6	2437	MCS0	16.3	15.5±1
	11	2462	MCS0	16.4	15.5±1

12.1.4 Wi-Fi 5 GHz

Maximum Output Power for Wi-Fi 5 GHz

Mode	Frequency (MHz)	Data rate (Mbps)	Output Power(dBm)	Tune up limited(dBm)
11A	5180	MCS0	9.23	8.5±1
	5200	MCS0	9.05	8.5±1
	5240	MCS0	9.03	8.5±1
11N20	5180	MCS0	6.71	6.0±1
	5200	MCS0	6.50	6.0±1
	5240	MCS0	6.53	6.0±1
11N40	5190	MCS0	5.15	4.5±1
	5230	MCS0	5.29	4.5±1
11AC20	5180	MCS0	5.44	5.0±1
	5200	MCS0	5.45	5.0±1
	5240	MCS0	5.54	5.0±1
11AC40	5190	MCS0	5.82	5.0±1
	5230	MCS0	5.83	5.0±1
11AC80	5210	MCS0	2.66	2.0±1

12.2 SAR TEST RESULTS

Table 6: SAR Values of WCDMA BAND II

Test Positions		Channel		Test Mode	Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
		CH.	MHz		Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
Body (0mm Separation)	Front side	9262	1852.4	RMC 12.2kbps	15.0	14.58	0.3440	0.379	--
	Back side	9262	1852.4	RMC 12.2kbps	15.0	14.58	0.3780	0.416	--
	Left Side	9262	1852.4	RMC 12.2kbps	15.0	14.58	0.8710	0.959	1
	Top Side	9262	1852.4	RMC 12.2kbps	15.0	14.58	0.2030	0.224	--
	Left Side	9400	1880	RMC 12.2kbps	15.0	14.15	0.7840	0.953	--
	Left Side	9538	1907.6	RMC 12.2kbps	15.0	14.32	0.7910	0.925	--

Table 7: SAR Values of WCDMA BAND IV

Test Positions		Channel		Test Mode	Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
		CH.	MHz		Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
Body (0mm Separation)	Front side	1413	1732.6	RMC 12.2kbps	16.5	16.41	0.4780	0.488	--
	Back side	1413	1732.6	RMC 12.2kbps	16.5	16.41	0.5030	0.514	--
	Left Side	1413	1732.6	RMC 12.2kbps	16.5	16.41	0.9900	1.011	2
	Top Side	1413	1732.6	RMC 12.2kbps	16.5	16.41	0.2280	0.233	--
	Left Side	1312	1712.4	RMC 12.2kbps	16.5	15.0	0.8050	0.990	--
	Left Side	1513	1752.6	RMC 12.2kbps	16.5	16.17	0.9120	0.984	--

Table 8: SAR Values of WCDMA BAND V

Test Positions		Channel		Test Mode	Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
		CH.	MHz		Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
Body (0mm Separation)	Front side	4132	826.4	RMC 12.2kbps	24.5	24.31	0.5120	0.535	--
	Back side	4132	826.4	RMC 12.2kbps	24.5	24.31	0.5850	0.611	--
	Left Side	4132	826.4	RMC 12.2kbps	24.5	24.31	1.0200	1.066	3
	Top Side	4132	826.4	RMC 12.2kbps	24.5	24.31	0.1450	0.151	--
	Left Side	4182	836.4	RMC 12.2kbps	24.5	24.29	0.9500	0.997	--
	Left Side	4233	846.6	RMC 12.2kbps	24.5	24.30	0.9530	0.998	--

Table 9: SAR Values of LTE BAND 2, 20MHz, QPSK

Test Mode	Test Positions		Channel		Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
			CH.	MHz	Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
1RB #49	Body (0mm Separation)	Front side	18700	1860	19.0	18.92	0.6770	0.690	--
		Back side	18700	1860	19.0	18.92	0.6910	0.704	--
		Left Side	18700	1860	19.0	18.92	1.3900	1.416	4
		Top Side	18700	1860	19.0	18.92	0.3050	0.311	--
		Left Side	18900	1880	19.0	18.29	1.1200	1.319	--
		Left Side	19100	1900	19.0	18.82	0.8450	0.881	--
1RB #0	Body (0mm Separation)	Left Side	18700	1860	19.0	18.43	1.1200	1.277	
		Left Side	18900	1880	19.0	18.59	1.2100	1.330	
		Left Side	19100	1900	19.0	18.25	0.8120	0.965	
1RB #99	Body (0mm Separation)	Left Side	18700	1860	19.0	18.75	1.2400	1.313	
		Left Side	18900	1880	19.0	18.22	1.0800	1.292	
		Left Side	19100	1900	19.0	18.28	0.8190	0.967	
50%RB #50	Body (0mm Separation)	Front side	18700	1860	18.0	17.60	0.3040	0.333	--
		Back side	18700	1860	18.0	17.60	0.3220	0.353	--
		Left Side	18700	1860	18.0	17.60	0.7030	0.771	--
		Top Side	18700	1860	18.0	17.60	0.1950	0.214	--
		Left Side	18900	1880	18.0	17.33	0.6460	0.754	--
		Left Side	19100	1900	18.0	17.58	0.6530	0.719	--
100%RB #0	Body (0mm Separation)	Left Side	18700	1860	18.0	17.56	0.5450	0.603	--

Table 10: SAR Values of LTE BAND 4, 20MHz, QPSK

Test Mode	Test Positions		Channel		Power(dBm)		SAR 1g(W/Kg), Limit(1.6W/kg)		Plot No.
			CH.	MHz	Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
1RB #49	Body (0mm Separation)	Front side	20050	1720	17.5	17.37	0.4720	0.486	--
		Back side	20050	1720	17.5	17.37	0.5020	0.517	--
		Left Side	20050	1720	17.5	17.37	0.9700	0.999	5
		Top Side	20050	1720	17.5	17.37	0.2430	0.250	--
		Left Side	20175	1732.5	17.5	17.33	0.9100	0.946	--
		Left Side	20300	1745	17.5	17.01	0.8440	0.945	--
1RB #0	Body (0mm Separation)	Left Side	20050	1720	17.5	16.79	0.8120	0.956	--
			20175	1732.5	17.5	17.07	0.7880	0.870	--
			20300	1745	17.5	17.17	0.9040	0.975	--
1RB #99	Body (0mm Separation)	Left Side	20050	1720	17.5	17.31	0.8340	0.871	--
			20175	1732.5	17.5	17.13	0.7950	0.866	--
			20300	1745	17.5	16.95	0.8220	0.933	--
50%RB #25	Body (0mm Separation)	Front side	20300	1745	16.5	16.23	0.2780	0.296	--
		Back side	20300	1745	16.5	16.23	0.2990	0.318	--
		Left Side	20300	1745	16.5	16.23	0.5440	0.579	--
		Top Side	20300	1745	16.5	16.23	0.2550	0.271	--
		Left Side	20050	1720	16.5	15.86	0.4050	0.469	--
		Left Side	20175	1732.5	16.5	16.04	0.5210	0.579	--
100% RB #0	Body (0mm Separation)	Left Side	20300	1745	16.5	16.14	0.5290	0.575	--

Table 11: SAR Values of LTE BAND 5, 10MHz, QPSK

Test Mode	Test Positions		Channel		Power(dBm)		SAR 1g(W/Kg), Limit(1.6W/kg)		Plot No.
			CH.	MHz	Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
1RB #49	Body (0mm Separation)	Front side	20450	829	24.0	24.00	0.6230	0.623	--
		Back side	20450	829	24.0	24.00	0.6770	0.677	--
		Left Side	20450	829	24.0	24.00	1.1700	1.170	6
		Top Side	20450	829	24.0	24.00	0.2110	0.211	--
		Left Side	20525	836.5	24.0	23.65	1.0200	1.106	--
		Left Side	20600	844	24.0	23.87	1.1100	1.144	--
1RB #0	Body (0mm Separation)	Left Side	20450	829	24.0	23.54	0.9920	1.103	--
		Left Side	20525	836.5	24.0	23.64	0.9100	0.989	--
		Left Side	20600	844	24.0	23.65	0.9600	1.041	--
1RB #24	Body (0mm Separation)	Left Side	20450	829	24.0	23.91	0.9980	1.019	--
		Left Side	20525	836.5	24.0	23.97	0.9220	0.928	--
		Left Side	20600	844	24.0	23.79	1.0300	1.081	--
50%RB #0	Body (0mm Separation)	Front side	20525	836.5	23.0	22.99	0.4050	0.406	--
		Back side	20525	836.5	23.0	22.99	0.4120	0.413	--
		Left Side	20525	836.5	23.0	22.99	0.7450	0.747	--
		Top Side	20525	836.5	23.0	22.99	0.1550	0.155	--
		Left Side	20450	829	23.0	22.88	0.7120	0.732	--
		Left Side	20600	844	23.0	22.81	0.7160	0.748	--
100%RB #0	Body (0mm Separation)	Left Side	20450	829	23.0	22.83	0.6880	0.715	--

Table 12: SAR Values of LTE BAND 12, 10MHz, QPSK

Test Mode	Test Positions		Channel		Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
			CH.	MHz	Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
1RB #24	Body (0mm Separation)	Front side	23095	707.5	25.0	24.89	0.2030	0.208	--
		Back side	23095	707.5	25.0	24.89	0.2110	0.216	--
		Left Side	23095	707.5	25.0	24.89	0.6790	0.696	7
		Top Side	23095	707.5	25.0	24.89	0.1130	0.116	--
		Left Side	23060	704	25.0	24.30	0.5780	0.679	--
		Left Side	23130	711	25.0	24.45	0.6060	0.688	--
50%RB #12	Body (0mm Separation)	Front side	23130	711	24.0	23.70	0.1340	0.144	--
		Back side	23130	711	24.0	23.70	0.1420	0.152	--
		Left Side	23130	711	24.0	23.70	0.5060	0.542	--
		Top Side	23130	711	24.0	23.70	0.0790	0.085	--
		Left Side	23060	704	24.0	23.46	0.4590	0.520	--
		Left Side	23095	707.5	24.0	23.52	0.4460	0.498	--

Table 13: SAR Values of LTE BAND 13, 10MHz, QPSK

Test Mode	Test Positions		Channel		Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
			CH.	MHz	Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
1RB #49	Body (0mm Separation)	Front side	23230	782	25.0	24.58	0.6080	0.670	--
		Back side	23230	782	25.0	24.58	0.6230	0.686	--
		Left Side	23230	782	25.0	24.58	1.1300	1.245	8
		Top Side	23230	782	25.0	24.58	0.2890	0.318	--
1RB #0	Body (0mm Separation)	Left Side	23230	782	25.0	24.50	1.0800	1.212	--
1RB #24	Body (0mm Separation)	Left Side	23230	782	25.0	24.53	1.0100	1.125	--
50%RB #0	Body (0mm Separation)	Front side	23230	782	24.0	23.76	0.3550	0.375	--
		Back side	23230	782	24.0	23.76	0.3560	0.376	--
		Left Side	23230	782	24.0	23.76	0.7540	0.797	--
		Top Side	23230	782	24.0	23.76	0.1350	0.143	--
100%RB #0	Body (0mm Separation)	Left Side	23230	782	24.0	23.74	0.7030	0.746	--

Table 14: SAR Values of LTE BAND 14, 10MHz, QPSK

Test Mode	Test Positions		Channel		Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
			CH.	MHz	Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
1RB #49	Body (0mm Separation)	Front side	23330	793	25.0	24.87	0.6840	0.705	--
		Back side	23330	793	25.0	24.87	0.6920	0.713	--
		Left Side	23330	793	25.0	24.87	1.3400	1.381	**9**
		Top Side	23330	793	25.0	24.87	0.3510	0.362	--
1%RB #0	Body (0mm Separation)	Left Side	23330	793	25.0	24.74	1.2500	1.327	--
1%RB #24	Body (0mm Separation)	Left Side	23330	793	25.0	24.54	1.1700	1.301	--
50%RB #0	Body (0mm Separation)	Front side	23330	793	24.0	23.88	0.3780	0.389	--
		Back side	23330	793	24.0	23.88	0.3880	0.399	--
		Left Side	23330	793	24.0	23.88	0.7630	0.784	--
		Top Side	23330	793	24.0	23.88	0.1530	0.157	--
100%RB #0	Body (0mm Separation)	Left Side	23330	793	24.0	23.83	0.7440	0.774	--

Table 15: SAR Values of LTE BAND 66, 20MHz, QPSK

Test Mode	Test Positions		Channel		Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
			CH.	MHz	Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
1RB #49	Body (0mm Separation)	Front side	132072	1720	15.5	15.34	0.3110	0.323	--
		Back side	132072	1720	15.5	15.34	0.3350	0.348	--
		Left Side	132072	1720	15.5	15.34	0.6890	0.715	--
		Top Side	132072	1720	15.5	15.34	0.1320	0.137	--
		Left Side	132322	1745	15.5	15.06	0.7790	0.862	10
		Left Side	132572	1770	15.5	15.19	0.7100	0.763	--
1RB #0	Body (0mm Separation)	Left Side	132322	1745	15.5	15.30	0.7710	0.807	--
1RB #99	Body (0mm Separation)	Left Side	132322	1745	15.5	15.27	0.7660	0.808	--
50%RB #50	Body (0mm Separation)	Front side	132572	1770	15.5	15.16	0.2150	0.233	--
		Back side	132572	1770	15.5	15.16	0.2350	0.254	--
		Left Side	132572	1770	15.5	15.16	0.6170	0.667	--
		Top Side	132572	1770	15.5	15.16	0.1030	0.111	--
		Left Side	132072	1720	15.5	14.39	0.5470	0.706	--
		Left Side	132322	1745	15.5	14.01	0.4880	0.688	--
100%RB #0	Body (0mm Separation)	Left Side	132322	1745	15.5	15.17	0.4950	0.534	--

Table 16: SAR Values of LTE BAND 71, 20MHz, QPSK

Test Mode	Test Positions		Channel		Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
			CH.	MHz	Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
1RB #49	Body (0mm Separation)	Front side	133372	688	24.0	23.60	0.2210	0.242	--
		Back side	133372	688	24.0	23.60	0.2350	0.258	--
		Left Side	133372	688	24.0	23.60	0.5060	0.555	11
		Top Side	133372	688	24.0	23.60	0.1750	0.192	--
		Left Side	133222	673	24.0	23.56	0.4880	0.540	--
		Left Side	133322	683	24.0	23.54	0.4780	0.531	--
50%RB #50	Body (0mm Separation)	Front side	133322	683	22.5	22.34	0.1660	0.172	--
		Back side	133322	683	22.5	22.34	0.1720	0.178	--
		Left Side	133322	683	22.5	22.34	0.4120	0.427	--
		Top Side	133322	683	22.5	22.34	0.1050	0.109	--
		Left Side	133222	673	22.5	22.33	0.3830	0.398	--
		Left Side	133372	688	22.5	22.33	0.3880	0.403	--

Table 17: SAR Values of Wi-Fi (DTS Band)

Test Positions		Channel		Test Mode	Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
		CH.	MHz		Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
Body (0mm Separation)	Front side	6	2437	1Mbps	18.5	18.10	0.1450	0.159	--
	Back side	6	2437	1Mbps	18.5	18.10	0.1560	0.171	--
	Left Side	6	2437	1Mbps	18.5	18.10	0.3710	0.407	--
	Top Side	6	2437	1Mbps	18.5	18.10	0.1120	0.123	--
	Back side	1	2412	1Mbps	18.5	18.00	0.3950	0.443	12
	Back side	11	2462	1Mbps	18.5	18.10	0.3380	0.371	--

Table 18: SAR Values of Wi-Fi (UNII-1)

Test Positions		Channel		Test Mode	Power(dBm)		SAR 1g(W/Kg), Limit (1.6W/kg)		Plot No.
		CH.	MHz		Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
Body (0mm Separation)	Front side	36	5180	6Mbps	9.5	9.23	0.5060	0.538	--
	Back side	36	5180	6Mbps	9.5	9.23	0.6440	0.685	--
	Left Side	36	5180	6Mbps	9.5	9.23	1.2700	1.351	--
	Top Side	36	5180	6Mbps	9.5	9.23	0.3100	0.330	--
	Left Side	40	5200	6Mbps	9.5	9.05	1.2900	1.431	--
	Left Side	48	5240	6Mbps	9.5	9.03	1.3500	1.504	13

Notes:

1. According to FCC KDB 248227 D01v02r02 section 5.2.2, DSSS SAR value*(OFDM power/DSSS power) =0.443*(10^(18.0/10)/10^(18.5/10)) =0.431W/kg≤1.2W/kg, SAR for OFDM is not required.
2. Per KDB Publication 941225 D06 where SAR test considerations for handsets (L x W > 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device with antennas 2.5 cm or closer to the edge of the device, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worm accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

12.3 Measurement variability consideration

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1. Repeated measurement is not required when the original highest measured SAR is < 0.8 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 ≥ 0.8 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 (~ 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.

12.4 Repeated SAR

Band	Channel	Mode	RF Exposure	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	First Repeated	
							Measurement SAR (W/kg)	largest to smallest SAR Ratio
WCDMA BAND II	9262	RMC 12.2kbps	Body	Left Side	Yes	0.871	0.822	1.06
WCDMA BAND IV	1413	RMC 12.2kbps	Body	Left Side	Yes	0.990	0.910	1.09
WCDMA BAND IV	1312	RMC 12.2kbps	Body	Left Side	Yes	0.805	0.801	1.00
WCDMA BAND IV	1513	RMC 12.2kbps	Body	Left Side	Yes	0.912	0.909	1.00
WCDMA BAND V	4132	RMC 12.2kbps	Body	Left Side	Yes	1.020	0.992	1.03
WCDMA BAND V	4182	RMC 12.2kbps	Body	Left Side	Yes	0.950	0.946	1.00
WCDMA BAND V	4233	RMC 12.2kbps	Body	Left Side	Yes	0.953	0.949	1.00
LTE BAND 2	18700	QPSK20M	Body	Left Side	Yes	1.390	1.320	1.05
LTE BAND 2	18900	QPSK20M	Body	Left Side	Yes	1.120	1.090	1.03
LTE BAND 2	19100	QPSK20M	Body	Left Side	Yes	0.845	0.841	1.00
LTE BAND 4	20050	QPSK20M	Body	Left Side	Yes	0.970	0.930	1.04
LTE BAND 4	20175	QPSK20M	Body	Left Side	Yes	0.910	0.905	1.01
LTE BAND 4	20300	QPSK20M	Body	Left Side	Yes	0.844	0.841	1.00
LTE BAND 5	20450	QPSK10M	Body	Left Side	Yes	1.170	1.130	1.04
LTE BAND 5	20525	QPSK10M	Body	Left Side	Yes	1.020	0.990	1.03

LTE BAND 5	20600	QPSK10M	Body	Left Side	Yes	1.110	1.090	1.02
LTE BAND 13	23230	QPSK10M	Body	Left Side	Yes	1.130	1.090	1.04
LTE BAND 14	23330	QPSK10M	Body	Left Side	Yes	1.340	1.320	1.02
Wi-Fi (UNII-1)	36	802.11a	Body	Left Side	Yes	1.270	1.210	1.05
Wi-Fi (UNII-1)	40	802.11a	Body	Left Side	Yes	1.290	1.180	1.09
Wi-Fi (UNII-1)	48	802.11a	Body	Left Side	Yes	1.350	1.310	1.09

Note: Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is < 1.20

12.5 Simultaneous Transmission SAR Analysis.

as declared by the manufacturer, this EUT does not support csimultaneous transmissions between WCDMA, LTE, 2.4GHz Wi-Fi, and 5GHz Wi-Fi.

12.6 MAXIMUM GRAPH RESULTS

The graph results see ANNEX C.

13. MEASUREMENT UNCERTAINTY

13.1 Uncertainty for SAR Test

Uncertainty Component	Tol. (%)	Prob Dist.	Div	ci (10g)	ci.ui(%) (10g)	vi
Probe Calibration	±6.7	N	1	1	±6.7	∞
Axial Isotropy	±0.5	R	$\sqrt{3}$	1	±0.3	∞
Hemispherical Isotropy	±2.6	R	$\sqrt{3}$	1	±1.5	∞
Linearity	±0.6	R	$\sqrt{3}$	1	±0.3	∞
Probe modulation response	±2.4	R	$\sqrt{3}$	1	±1.4	∞
Detection Limits	±1.0	R	$\sqrt{3}$	1	±0.6	∞
Boundary Effect	±2.0	R	$\sqrt{3}$	1	±1.2	∞
Readout Electronics	±0.3	N	1	1	±0.3	∞
Response Time	±0.8	R	$\sqrt{3}$	1	±0.5	∞
Integration Time	±2.6	R	$\sqrt{3}$	1	±1.5	∞
RF Ambient Conditions - Noise	±3.0	R	$\sqrt{3}$	1	±1.7	∞
RF Ambient Conditions - Reflections	±3.0	R	$\sqrt{3}$	1	±1.7	∞
Probe Positioner Mech. Restrictions	±0.8	R	$\sqrt{3}$	1	±0.5	∞
Probe Positioning with respect to Phantom Shell	±6.7	R	$\sqrt{3}$	1	±3.9	∞
Post-processing	±4.0	R	$\sqrt{3}$	1	±2.3	∞
Test Sample Related						
Device Holder Uncertainty	±3.6	N	1	1	±3.6	M-1
Test Sample Positioning	±2.9	N	1	1	±2.9	M-1
Power scaling	±0.0	R	$\sqrt{3}$	1	±0.0	∞
Drift of output power (measured SAR drift)	±5.0	R	$\sqrt{3}$	1	±2.9	∞
Phantom and Tissue Parameters						
Phantom Uncertainty (shape and thickness tolerances)	±7.6	R	$\sqrt{3}$	1	±4.4	∞
Algorithm for correcting SAR for deviations in permittivity and conductivity	±1.9	N	1	0.84	±1.3	∞
Liquid conductivity(meas.)	±2.5	N	1	0.71	±1.3	M-1
Liquid permittivity(meas.)	±2.5	N	1	0.26	±0.2	M
Liquid permittivity - temperature uncertainty	±3.4	R	$\sqrt{3}$	0.71	±1.0	∞
Liquid conductivity - temperature uncertainty	±0.4	R	$\sqrt{3}$	0.26	±0.0	∞
Combined Standard Uncertainty	±11.6					
Expanded STD Uncertainty	±23.2					

13.2 Uncertainty for System Validation

Uncertainty Component	Tol. (%)	Prob Dist.	Div	Ci (10g)	ci.ui(%) (10g)	vi
Probe Calibration	±6.7	N	1	1	±6.7	∞
Axial Isotropy	±0.5	R	$\sqrt{3}$	1	±0.3	∞
Hemispherical Isotropy	±2.6	R	$\sqrt{3}$	1	±1.5	∞
Linearity	±0.6	R	$\sqrt{3}$	1	±0.3	∞
Modulation response	±0.0	R	$\sqrt{3}$	1	±0.0	∞
Detection Limits	±1.0	R	$\sqrt{3}$	1	±0.6	∞
Boundary Effect	±1.0	R	$\sqrt{3}$	1	±0.6	∞
Readout Electronics	±0.3	N	1	1	±0.3	∞
Response Time	±0.0	R	$\sqrt{3}$	1	±0.0	∞
Integration Time	±0.0	R	$\sqrt{3}$	1	±0.0	∞
RF Ambient Conditions - Noise	±1.0	R	$\sqrt{3}$	1	±0.6	∞
RF Ambient Conditions - Reflections	±1.0	R	$\sqrt{3}$	1	±0.6	∞
Probe Positioner Mech. Restrictions	±0.8	R	$\sqrt{3}$	1	±0.5	∞
Probe Positioning with respect to Phantom Shell	±6.7	R	$\sqrt{3}$	1	±3.9	∞
Post-processing	±4.0	R	$\sqrt{3}$	1	±2.3	∞
Field source						
Deviation of the experimental source from numerical source	±5.5	N	1	1	±5.5	∞
Source to liquid distance	±2.0	R	$\sqrt{3}$	1	±1.2	∞
Drift of output power (measured SAR drift)	±3.4	R	$\sqrt{3}$	1	±2.0	∞
Phantom and Setup						
Phantom Uncertainty (shape and thickness tolerances)	±4.0	R	$\sqrt{3}$	1	±2.3	∞
Algorithm for correcting SAR for deviations in permittivity and conductivity	±1.9	N	1	0.84	±1.3	∞
Liquid conductivity(meas.)	±2.5	N	1	0.21	±0.1	M
Liquid permittivity(meas.)	±2.5	N	1	0.26	±0.2	M
Liquid permittivity - temperature uncertainty	±1.7	R	$\sqrt{3}$	0.71	±0.5	1
Liquid conductivity - temperature uncertainty	±0.3	R	$\sqrt{3}$	0.26	±0.0	∞
Combined Std. Uncertainty	±10.2					
Expanded STD Uncertainty	±20.4					

14. MAIN TEST INSTRUMENT

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
SZ060-01	SAR Test System	SPEAG	DASY52 SAR TX90XL	F14/5YJ0B1 /A/01	2025-04-21	1 year
SZ060-01-01	E-Field Probe	SPEAG	EX3DV4	7322	2025-04-21	1 year
SZ060-01-03	System Validation Dipole	SPEAG	D750V3	1141	2024-03-14	3 year
SZ060-01-04	System Validation Dipole	SPEAG	D835V2	4d196	2024-03-14	3 year
SZ060-01-05	System Validation Dipole	SPEAG	D900V2	1d182	2024-11-06	3 year
SZ060-01-06	System Validation Dipole	SPEAG	D1750V2	1138	2024-11-06	3 year
SZ060-01-07	System Validation Dipole	SPEAG	D1900V2	5d203	2024-11-04	3 year
SZ060-01-10	System Validation Dipole	SPEAG	D2450V2	966	2024-11-06	3 year
SZ060-01-11	System Validation Dipole	SPEAG	D2600V2	1108	2024-11-08	3 year
SZ060-01-12	System Validation Dipole	SPEAG	D5GHzV2	1218	2024-11-05	3 year
SZ060-01-13	Data Acquisition Unit	SPEAG	DAE4	1473	2025-04-21	1 year
SZ060-01-14	Dielectric Assessment Kit	SPEAG	DAKS 3.5	1056	2024-11-01	1 year
SZ060-01-15	Vector Reflectometer	Copper Mountain Technologies	Planar R140	0090614	2024-11-01	1 year
SZ060-01-16	Thermometer	LKM electronics GmbH	DTM3000	3477	2024-12-26	1 year
SZ060-01-17	Power Amplifier	Mini Circuits	ZHL-42W+	QA1449003	2024-11-01	1 year
SZ060-01-18	Power Amplifier	Mini Circuits	ZVE-8G+	111701437	2024-11-01	1 year
SZ060-01-19	SAM Twin Phantom	SPEAG	SAM Twin Phantom V5.0	1888	N/A	N/A
SZ060-01-20	SAM Twin Phantom	SPEAG	SAM Twin Phantom V5.0	1891	N/A	N/A
SZ060-01-21	ELI Phantom	SPEAG	ELI Phantom V6.0	2033	N/A	N/A
SZ180-13	MXG Vector Signal Generator	Keysight	N5182B	MY53051328	2024-09-29	1 year
SZ070-04	Directional Bridge	Agilent	86205A	MY31402141	2024-12-05	1 year
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	2025-04-21	1 year
SZ182-02-01	Pulse Power Sensor	Anritsu	MA2411B	1207429	2025-04-21	1 year
SZ182-03	Average power sensor	R&S	NRP-Z22	101689	2025-04-21	1 year
SZ065-06	Wideband Radio Communication Tester	R&S	CMW500	154161	2024-09-29	1 year
N/A	Device Holder	SPEAG	N/A	N/A	N/A	N/A

ANNEX A: TEST LAYOUT AND SETUP

The Test Layout and Setup are saved with filename: SAR Test Layout and Setup.pdf.

ANNEX B: SYSTEM CHECK RESULTS

The graph results see ANNEX B of 250428053SZN-004-Appendix A.

ANNEX C: MAXIMUM GRAPH RESULTS

The graph results see ANNEX C of 250428053SZN-004-Appendix A.

ANNEX D: SYSTEM VALIDATION

The graph results see ANNEX D of 250428053SZN-004-Appendix A.

ANNEX E: EUT PHOTO

The EUT photos are saved with filename: external photos.pdf & internal photos.pdf.

ANNEX F: PROBE CALIBRATION CERTIFICATE

The graph results see ANNEX F of 250428053SZN-004-Appendix B.

ANNEX G: DIPOLE CALIBRATION CERTIFICATE

The graph results see ANNEX G of 250428053SZN-004-Appendix B.

ANNEX H: DAE CALIBRATION CERTIFICATE

The graph results see ANNEX H of 250428053SZN-004-Appendix B.

**********************************End the Report**********************************