FCC SAR Test Report

APPLICANT	:	**Numera Systems US, Inc**
EQUIPMENT	:	**Mobile Personal Emergency Response System**
BRAND NAME	:	**Libris**
MODEL NAME	:	**NUML3-AS1, NUML3-AG1, NUML3-AW1**
FCC ID	:	**2BN8B-L3**
STANDARD	:	**FCC 47 CFR Part 2 (2.1093)**

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Approved by: Si Zhang

ilac-MRA

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA552401	Rev. 01	Initial issue of report	Jul. 21, 2025

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Numera Systems US, Inc, Mobile Personal Emergency Response System, NUML3-AS1, NUML3-AG1, NUML3-AW1,** are as follows.

Highest 1g SAR Summary				
Equipment Class	Frequency Band		Head (Separation 5mm)	Body (Separation 5mm)
			1g SAR (W/kg)	
Licensed	WCDMA	Band II	0.89	**1.17**
		Band IV	**1.06**	1.06
	LTE	LTE Band 2	0.72	0.73
		LTE Band 4	0.66	0.94
		LTE Band 12	0.22	0.22

Highest 10g SAR Summary			
Equipment Class	Frequency Band		Extremity (W/kg) (Separation 0mm)
Licensed	WCDMA	Band II	0.63
		Band IV	0.70
	LTE	LTE Band 2	0.47
		LTE Band 4	**0.71**
		LTE Band 12	0.25
Date of Testing:		2025/7/2 ~ 2025/7/8	

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

2. Administration Data

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	SAR03-KS, SAR06-KS	CN1257	314309

Applicant	
Company Name	Numera Systems US, Inc
Address	44 EAST BEAVER CREEK RD #16 RICHMOND HILL, ON, CANADA

Manufacturer	
Company Name	Numera Systems US, Inc
Address	44 EAST BEAVER CREEK RD #16 RICHMOND HILL, ON, CANADA

3. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Personal Emergency Response System
Brand Name	Libris
Model Name	NUML3-AS1, NUML3-AG1, NUML3-AW1
FCC ID	2BN8B-L3
IMEI Code	866229077407995, 866229077398038
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 12: 699 MHz ~ 716 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is not supported) LTE: QPSK, 16QAM Bluetooth LE
HW Version	V1.1
SW Version	V02
EUT Stage	Production Unit

Remark:

1. This device has no hotspot function.
2. WIFI antenna is with RX only.
3. The device implements Proximity sensors detect mechanism trigger reduced power for the power management for SAR compliance at different exposure conditions (body, extremity). The device will invoke corresponding work scenarios power level, which are provided in the operational description.
4. This device has voice function and PTT (push-to-talk) function, so in-front-of the face and bottom side SAR is performed with 5mm for head SAR testing.
5. This device will be equipped with Belt Clip, so the Belt Clip spot check the worst case of each band to satisfy SAR compliance. When using the Belt Clip, body exposure Condition is considered.
6. This device has one Lanyard that does not contain metal components, it has no effect on RF exposure and does not require evaluation for SAR.
7. The differences between three model names are as below, and the difference does not affect the test, so only NUML3-AS1 was chosen to perform full SAR testing.

Model name	Description
NUML3-AS1	The appearance color is matte silver
NUML3-AG1	The appearance color is matte gold
NUML3-AW1	The appearance color is white

4.2 General LTE SAR Test and Reporting Considerations

<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>2BN8B-L3</td></tr>
<tr><td>Equipment Name</td><td>Mobile Personal Emergency Response System</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>LTE Band 2: 1850 MHz ~ 1910 MHz
LTE Band 4: 1710 MHz ~ 1755 MHz
LTE Band 12: 699 MHz ~ 716 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz</td></tr>
<tr><td>Uplink Modulations used</td><td>QPSK / 16QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Data only</td></tr>
<tr><td>LTE Release Version</td><td>R10, Cat 1</td></tr>
<tr><td>CA Support</td><td>Not Supported</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table>
</td></tr>
<tr><td>LTE A-MPR</td><td>In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, when operating in Proximity sensors detect mechanism; head/body /extremity will trigger reduced power for some bands applied to satisfy SAR compliance, the detail please referred to section 13.</td></tr>
</table>

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

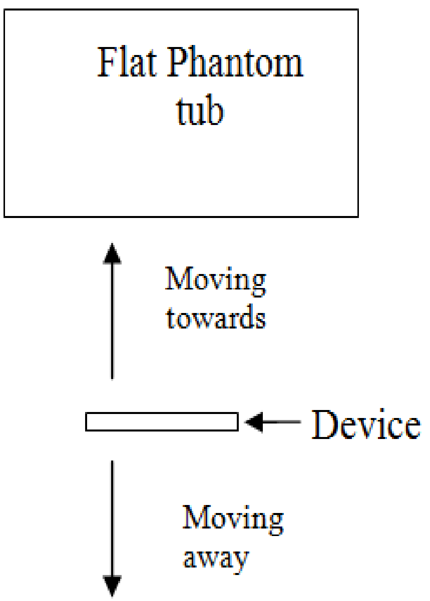
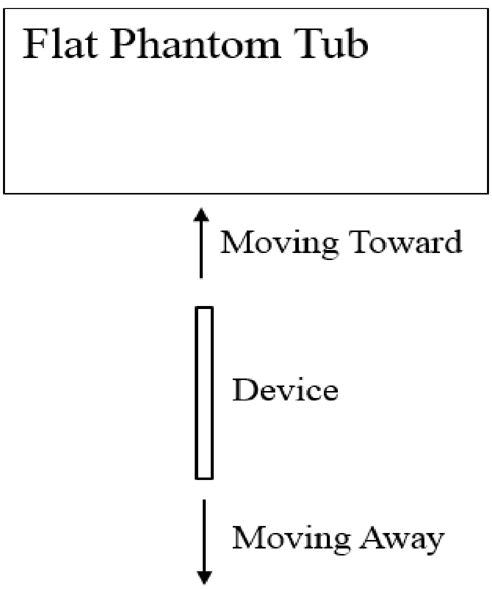
LTE Band 12

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

5. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance>:

1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (1900MHz) and lowest (750MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the top ends of the device are utilized to determine when the device comes in proximity of the user's body or finger or hand at the front or back or right or left side of the device. There is no need to do sensor coverage testing for the proximity sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the proximity sensor entirely covers the antenna.
3. The sensors can use to detect the proximity of the user's body or handheld states at the front or back or right or left side of the device use a detection threshold distance. When front/back/right/left sides of body or handheld condition is detected reduced power will be active. The trigger distance shown in the sections below.
4. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1mm was performed.

	
Sensor/Handheld detection test set-up, Front and Back sides	Handheld detection test set-up, Left Side, Right Side

<P-sensor>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Left Side		Right Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	15	17	15	17	10	12	10	12

6. RF Exposure Limits

6.1 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.

6.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

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.

7. Specific Absorption Rate (SAR)

7.1 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.

7.2 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:

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

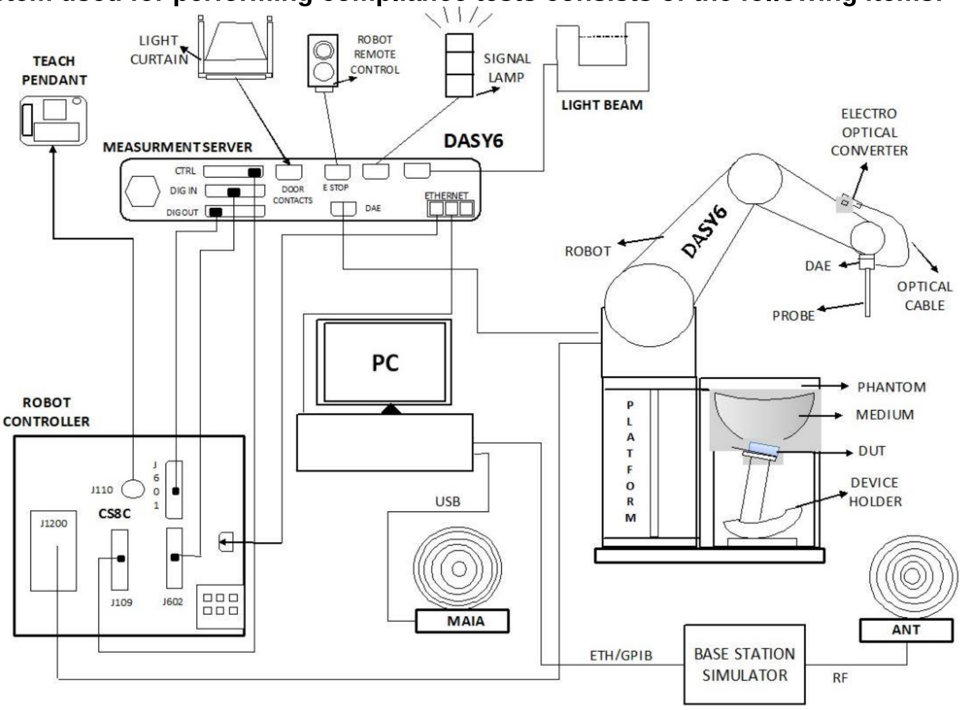
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 or Win10 and the DASY5 or DASY6 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

8.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	4 MHz – 10 GHz Linearity: ±0.2 dB (30 MHz – 10 GHz)	
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

8.2 Data Acquisition Electronics (DAE)

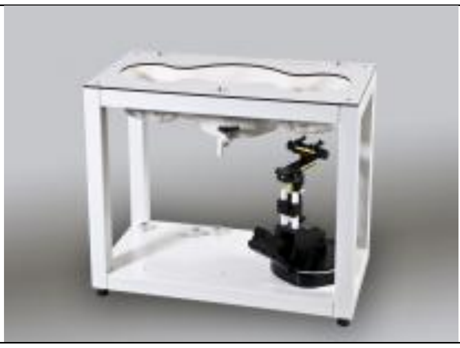
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an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

Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

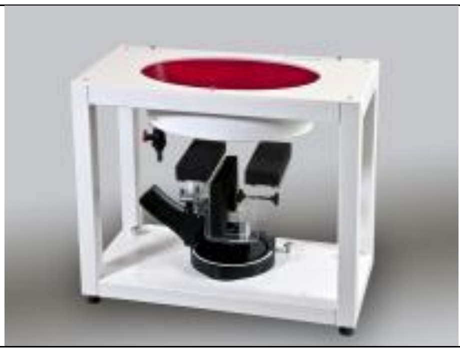
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)
Filling Volume	Approx. 30 liters
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm



The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

8.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

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 positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

9.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

9.2 Power Reference Measurement

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

9.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

9.4 Zoom Scan

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

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

<table>
<tr><th colspan="3"></th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

9.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1087	2025/3/12	2026/3/11
SPEAG	1750MHz System Validation Kit	D1750V2	1137	2024/10/15	2025/10/14
SPEAG	1900MHz System Validation Kit	D1900V2	5d182	2024/12/16	2025/12/15
SPEAG	Data Acquisition Electronics	DAE4	1691	2025/6/4	2026/6/3
SPEAG	Data Acquisition Electronics	DAE4	690	2024/10/8	2025/10/7
SPEAG	Dosimetric E-Field Probe	EX3DV4	7706	2025/5/22	2026/5/21
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	2025/2/19	2026/2/18
SPEAG	SAM Twin Phantom	SAM Twin	TP-2022	NCR	NCR
SPEAG	SAM Twin Phantom	SAM Twin	TP-1697	NCR	NCR
Beichuang	Thermo-Hygrometer	HTC-1	1949246	2025/1/11	2026/1/10
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio Communication Analyzer	MT8821C	6262306175	2024/7/4	2025/7/3
Anritsu	Radio Communication Analyzer	MT8820C	6201563900	2025/7/2	2026/7/1
Agilent	ENA Series Network Analyzer	E5071C	MY46112129	2025/7/2	2026/7/1
SPEAG	Dielectric Probe Kit	DAK-3.5	1144	2024/8/20	2025/8/19
Anritsu	Vector Signal Generator	MG3710A	6201682672	2025/1/3	2026/1/2
Rohde & Schwarz	Power Meter	NRVD	102081	2025/7/2	2026/7/1
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	2025/7/2	2026/7/1
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	2025/7/2	2026/7/1
Rohde & Schwarz	Spectrum Analyzer	FSV7	101631	2024/10/11	2025/10/10
TES	DIGITAC THERMOMETER	TYPE-K	220305411	2025/1/2	2026/1/1
ARRA	Power Divider	A3200-2	N/A	Note 1	
MCL	Attenuation1	BW-S10W5+	N/A	Note 1	
MCL	Attenuation2	BW-S10W5+	N/A	Note 1	
MCL	Attenuation3	BW-S10W5+	N/A	Note 1	
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note 1	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note 1	
Agilent	Dual Directional Coupler	778D	20500	Note 1	
Agilent	Dual Directional Coupler	11691D	MY48151020	Note 1	

Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

11. System Verification

11.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.1.

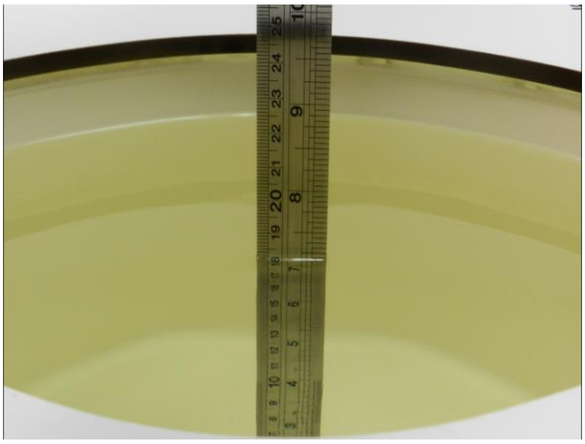


Fig 10.1 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Head	22.8	0.889	42.9	0.89	41.90	-0.11	2.39	±5	2025/7/2
750	Head	22.6	0.886	42.864	0.89	41.90	-0.45	2.30	±5	2025/7/7
1750	Head	22.8	1.37	40.7	1.37	40.10	0.00	1.50	±5	2025/7/3
1750	Head	22.9	1.375	40.753	1.37	40.10	0.36	1.63	±5	2025/7/8
1900	Head	22.7	1.44	39.1	1.40	40.00	2.86	-2.25	±5	2025/7/3
1900	Head	22.8	1.44	39.234	1.40	40.00	2.86	-1.92	±5	2025/7/8

11.3 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2025/7/2	750	Head	50	1087	7706	1691	0.400	8.680	8	-7.83	0.270	5.610	5.4	-3.74
2025/7/7	750	Head	50	1087	3857	690	0.440	8.680	8.8	1.38	0.293	5.610	5.86	4.46
2025/7/3	1750	Head	50	1137	7706	1691	1.990	36.800	39.8	8.15	1.070	19.600	21.4	9.18
2025/7/8	1750	Head	50	1137	3857	690	1.960	36.800	39.2	6.52	1.040	19.600	20.8	6.12
2025/7/3	1900	Head	50	5d182	7706	1691	2.140	39.800	42.8	7.54	1.150	21.000	23	9.52
2025/7/8	1900	Head	50	5d182	3857	690	2.030	39.800	40.6	2.01	1.040	21.000	20.8	-0.95

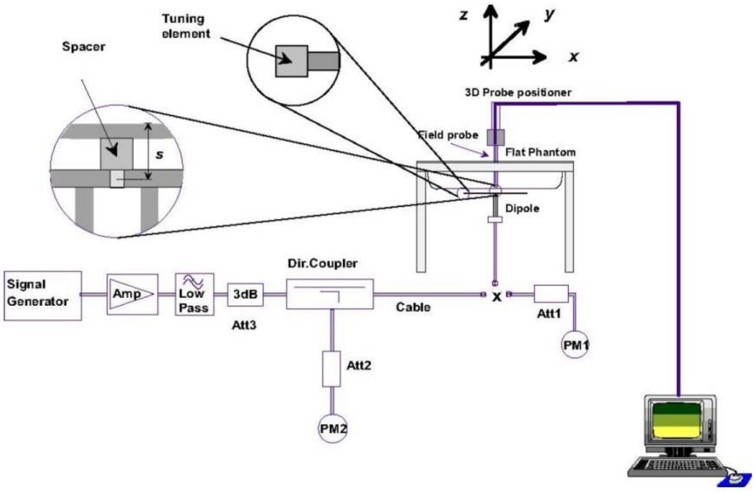


Fig 10.3.1 System Performance Check Setup

Fig 10.3.2 Setup Photo

12. RF Exposure Positions

12.1 Head SAR Testing for Device

(a) To position the device parallel to the phantom surface with front surfaces of the device.

(b) To adjust the device parallel to the flat phantom.

(c) To adjust the distance between the device surface and the flat phantom to 5 mm.

12.2 Body SAR Testing for Device

(b) To position the device parallel to the phantom surface with all surfaces of the device.

(b) To adjust the device parallel to the flat phantom.

(c) To adjust the distance between the device surface and the flat phantom to 5 mm.

12.3 Extremity SAR Testing for Device

(c) To position the device parallel to the phantom surface with all surfaces of the device.

(b) To adjust the device parallel to the flat phantom.

(c) To adjust the distance between the device surface and the flat phantom to 0 mm.

Please refer to Appendix D for the test setup photos.

13. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} *(Note1, Note 2)*	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c , and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c .

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} *(Note1)*	β_{ec}	β_{ed} *(Note 4) (Note 5)*	β_{ed} *(SF)*	β_{ed} *(Codes)*	CM (dB) *(Note 2)*	MPR (dB) *(Note 2) (Note 6)*	*AG Index (Note 5)*	*E-TFCI*
1	11/15 *(Note 3)*	15/15 *(Note 3)*	64	11/15 *(Note 3)*	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c . For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c .

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set RMC 12.2Kbps + HSDPA mode.
   ii. Set Cell Power = -25 dBm
   iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
   iv. Select HSDPA Uplink Parameters
   v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
      a). Subtest 1: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_d=15/4
   vi. Set Delta ACK, Delta NACK and Delta CQI = 8
   vii. Set Ack-Nack Repetition Factor to 3
   viii. Set CQI Feedback Cycle (k) to 4 ms
   ix. Set CQI Repetition Factor to 2
   x. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
A summary of these settings are illustrated below:

C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

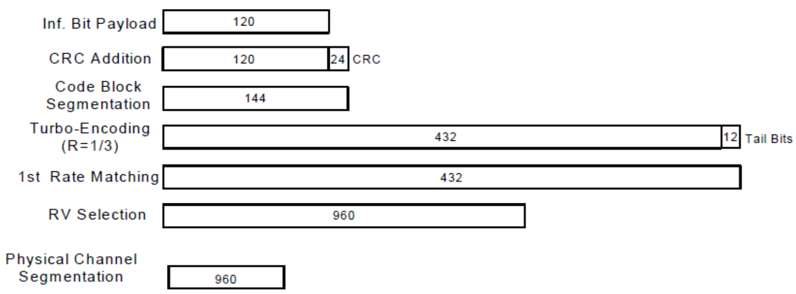


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, 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 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.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B12 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

14. Bluetooth Exclusions Applied

Mode Band	Max Average power(dBm)
	LE
2.4GHz Bluetooth	4.0

Note:

1. Per KDB 447498 D01v06, 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*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison

Bluetooth Max Power (dBm)	Separation Distance (mm)	Frequency (GHz)	exclusion thresholds
4	5	2.48	0.8

Note:

1. Per KDB 447498 D01v06, when the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion. The test exclusion threshold is 0.8 which is <= 3 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, SAR testing is not required.
2. According to the EUT characteristic, Bluetooth LE and WWAN cannot be transmitted simultaneously, so there is no need to consider the transmit simultaneous.

15. Antenna Location

The detailed antenna location information can refer to SAR Test Setup Photos.

16. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   · ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   · ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   · ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. For 10-g extremity SAR testing, only performed within a transmitting antenna located within 25mm from that surface or edge.

WCDMA Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, 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 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. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B12 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

16.1 Head SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	9400	1880	16.19	17.00	1.205	0.08	0.672	0.810
11	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	9262	1852.4	16.01	17.00	1.256	0.01	0.709	**0.891**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	9538	1907.6	16.14	17.00	1.219	0.1	0.596	0.727
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	1413	1732.6	16.29	17.00	1.178	-0.18	0.780	0.919
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	1312	1712.4	16.21	17.00	1.199	-0.03	0.604	0.724
12	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	1513	1752.6	16.12	17.00	1.225	0.02	0.867	**1.062**
13	LTE Band 2	20M	QPSK	1	0	-	Front	5mm	Sensor on	18900	1880	15.89	17.00	1.291	0.01	0.559	**0.722**
	LTE Band 2	20M	QPSK	50	0	-	Front	5mm	Sensor on	18900	1880	15.80	17.00	1.318	0.14	0.519	0.684
14	LTE Band 4	20M	QPSK	1	0	-	Front	5mm	Sensor on	20175	1732.5	15.97	17.00	1.268	-0.07	0.517	**0.656**
	LTE Band 4	20M	QPSK	50	0	-	Front	5mm	Sensor on	20175	1732.5	15.65	17.00	1.365	0.1	0.478	0.652
15	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Sensor on	23095	707.5	16.05	17.00	1.245	0.13	0.178	**0.222**
	LTE Band 12	10M	QPSK	25	0	-	Front	5mm	Sensor on	23095	707.5	15.65	17.00	1.365	0.12	0.155	0.212

16.2 Body SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	9400	1880	16.19	17.00	1.205	0.08	0.672	0.810
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Sensor on	9400	1880	16.19	17.00	1.205	0.01	0.485	0.584
	WCDMA II _Belt Clip	-	-	-	-	RMC 12.2Kbps	Back	0mm	Sensor on	9400	1880	16.19	17.00	1.205	-0.11	0.401	0.483
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	5mm	Sensor on	9400	1880	16.19	17.00	1.205	0.03	0.313	0.377
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	5mm	Sensor on	9400	1880	16.19	17.00	1.205	-0.08	0.396	0.477
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	9262	1852.4	16.01	17.00	1.256	0.01	0.709	0.891
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	9538	1907.6	16.14	17.00	1.219	0.1	0.596	0.727
01	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	14mm	Full Power	9400	1880	23.25	24.00	1.189	-0.04	0.981	**1.166**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	14mm	Full Power	9262	1852.4	23.17	24.00	1.211	0.08	0.916	1.109
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	14mm	Full Power	9538	1907.6	23.22	24.00	1.197	0.01	0.825	0.988
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	14mm	Full Power	9400	1880	23.25	24.00	1.189	0.14	0.762	0.906
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	14mm	Full Power	9262	1852.4	23.17	24.00	1.211	0.03	0.712	0.862
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	14mm	Full Power	9538	1907.6	23.22	24.00	1.197	-0.08	0.641	0.767
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	9mm	Full Power	9400	1880	23.25	24.00	1.189	0.11	0.699	0.831
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	9mm	Full Power	9262	1852.4	23.17	24.00	1.211	-0.08	0.653	0.791
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	9mm	Full Power	9538	1907.6	23.22	24.00	1.197	0.1	0.588	0.704
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	9mm	Full Power	9400	1880	23.25	24.00	1.189	-0.05	0.947	1.126
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	9mm	Full Power	9262	1852.4	23.17	24.00	1.211	-0.18	0.884	1.071
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	9mm	Full Power	9538	1907.6	23.22	24.00	1.197	0.1	0.796	0.953
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	1413	1732.6	16.29	17.00	1.178	-0.18	0.780	0.919
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	Sensor on	1413	1732.6	16.29	17.00	1.178	0.1	0.661	0.779
	WCDMA IV _Belt Clip	-	-	-	-	RMC 12.2Kbps	Back	0mm	Sensor on	1413	1732.6	16.29	17.00	1.178	0.09	0.537	0.633
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	5mm	Sensor on	1413	1732.6	16.29	17.00	1.178	0.12	0.300	0.353
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	5mm	Sensor on	1413	1732.6	16.29	17.00	1.178	0.08	0.440	0.518
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	1312	1712.4	16.21	17.00	1.199	-0.03	0.604	0.724
02	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	Sensor on	1513	1752.6	16.12	17.00	1.225	0.02	0.867	**1.062**
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	14mm	Full Power	1413	1732.6	22.93	24.00	1.279	0.01	0.610	0.780
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	14mm	Full Power	1413	1732.6	22.93	24.00	1.279	0.08	0.520	0.665
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	9mm	Full Power	1413	1732.6	22.93	24.00	1.279	-0.17	0.410	0.524
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	9mm	Full Power	1413	1732.6	22.93	24.00	1.279	-0.03	0.569	0.728
	LTE Band 2	20M	QPSK	1	0	-	Front	5mm	Sensor on	18900	1880	15.89	17.00	1.291	0.01	0.559	0.722
	LTE Band 2	20M	QPSK	50	0	-	Front	5mm	Sensor on	18900	1880	15.80	17.00	1.318	0.14	0.519	0.684
	LTE Band 2	20M	QPSK	1	0	-	Back	5mm	Sensor on	18900	1880	15.89	17.00	1.291	0.11	0.397	0.513
	LTE Band 2_Belt Clip	20M	QPSK	1	0	-	Back	0mm	Sensor on	18900	1880	15.89	17.00	1.291	0.05	0.323	0.417
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Sensor on	18900	1880	15.80	17.00	1.318	-0.05	0.380	0.501
	LTE Band 2	20M	QPSK	1	0	-	Left Side	5mm	Sensor on	18900	1880	15.89	17.00	1.291	0.18	0.263	0.340
	LTE Band 2	20M	QPSK	50	0	-	Left Side	5mm	Sensor on	18900	1880	15.80	17.00	1.318	0.14	0.242	0.319
	LTE Band 2	20M	QPSK	1	0	-	Right Side	5mm	Sensor on	18900	1880	15.89	17.00	1.291	-0.17	0.323	0.417
	LTE Band 2	20M	QPSK	50	0	-	Right Side	5mm	Sensor on	18900	1880	15.80	17.00	1.318	0.17	0.308	0.406
03	LTE Band 2	20M	QPSK	1	0	-	Front	14mm	Full Power	18900	1880	22.75	24.00	1.334	-0.01	0.549	**0.732**
	LTE Band 2	20M	QPSK	1	0	-	Back	14mm	Full Power	18900	1880	22.75	24.00	1.334	-0.08	0.431	0.575
	LTE Band 2	20M	QPSK	1	0	-	Left Side	9mm	Full Power	18900	1880	22.75	24.00	1.334	-0.08	0.339	0.452
	LTE Band 2	20M	QPSK	1	0	-	Right Side	9mm	Full Power	18900	1880	22.75	24.00	1.334	0.1	0.515	0.687
	LTE Band 4	20M	QPSK	1	0	-	Front	5mm	Sensor on	20175	1732.5	15.97	17.00	1.268	-0.07	0.517	0.656
	LTE Band 4	20M	QPSK	50	0	-	Front	5mm	Sensor on	20175	1732.5	15.65	17.00	1.365	0.1	0.478	0.652
	LTE Band 4	20M	QPSK	1	0	-	Back	5mm	Sensor on	20175	1732.5	15.97	17.00	1.268	-0.17	0.419	0.531
	LTE Band 4	20M	QPSK	50	0	-	Back	5mm	Sensor on	20175	1732.5	15.65	17.00	1.365	0.04	0.428	0.584
	LTE Band 4_Belt Clip	20M	QPSK	50	0	-	Back	0mm	Sensor on	20175	1732.5	15.65	17.00	1.365	0.05	0.364	0.497
	LTE Band 4	20M	QPSK	1	0	-	Left Side	5mm	Sensor on	20175	1732.5	15.97	17.00	1.268	-0.01	0.172	0.218
	LTE Band 4	20M	QPSK	50	0	-	Left Side	5mm	Sensor on	20175	1732.5	15.65	17.00	1.365	-0.08	0.196	0.268
	LTE Band 4	20M	QPSK	1	0	-	Right Side	5mm	Sensor on	20175	1732.5	15.97	17.00	1.268	0.05	0.311	0.394

	LTE Band 4	20M	QPSK	50	0	-	Right Side	5mm	Sensor on	20175	1732.5	15.65	17.00	1.365	0.06	0.300	0.410
04	LTE Band 4	20M	QPSK	1	0	-	Front	14mm	Full Power	20175	1732.5	22.86	24.00	1.300	-0.05	0.722	**0.939**
	LTE Band 4	20M	QPSK	1	0	-	Front	14mm	Full Power	20050	1720	22.85	24.00	1.303	0.12	0.544	0.709
	LTE Band 4	20M	QPSK	1	0	-	Front	14mm	Full Power	20300	1745	22.74	24.00	1.337	0.08	0.692	0.925
	LTE Band 4	20M	QPSK	100	0	-	Front	14mm	Full Power	20175	1732.5	21.78	23.00	1.324	0.04	0.531	0.703
	LTE Band 4	20M	QPSK	1	0	-	Back	14mm	Full Power	20175	1732.5	22.86	24.00	1.300	0.08	0.634	0.824
	LTE Band 4	20M	QPSK	1	0	-	Back	14mm	Full Power	20050	1720	22.85	24.00	1.303	-0.17	0.477	0.622
	LTE Band 4	20M	QPSK	1	0	-	Back	14mm	Full Power	20300	1745	22.74	24.00	1.337	-0.03	0.607	0.812
	LTE Band 4	20M	QPSK	100	0	-	Back	14mm	Full Power	20175	1732.5	21.78	23.00	1.324	0.01	0.489	0.647
	LTE Band 4	20M	QPSK	1	0	-	Left Side	9mm	Full Power	20175	1732.5	22.86	24.00	1.300	0.01	0.439	0.571
	LTE Band 4	20M	QPSK	1	0	-	Right Side	9mm	Full Power	20175	1732.5	22.86	24.00	1.300	0.03	0.685	0.891
	LTE Band 4	20M	QPSK	1	0	-	Right Side	9mm	Full Power	20050	1720	22.85	24.00	1.303	0.14	0.516	0.672
	LTE Band 4	20M	QPSK	1	0	-	Right Side	9mm	Full Power	20300	1745	22.74	24.00	1.337	0.11	0.656	0.877
	LTE Band 4	20M	QPSK	100	0	-	Right Side	9mm	Full Power	20175	1732.5	21.78	23.00	1.324	0.04	0.522	0.691
05	LTE Band 12	10M	QPSK	1	0	-	Front	5mm	Sensor on	23095	707.5	16.05	17.00	1.245	0.13	0.178	**0.222**
	LTE Band 12	10M	QPSK	25	0	-	Front	5mm	Sensor on	23095	707.5	15.65	17.00	1.365	0.12	0.155	0.212
	LTE Band 12	10M	QPSK	1	0	-	Back	5mm	Sensor on	23095	707.5	16.05	17.00	1.245	0.03	0.091	0.113
	LTE Band 12	10M	QPSK	25	0	-	Back	5mm	Sensor on	23095	707.5	15.65	17.00	1.365	0.18	0.104	0.142
	LTE Band 12_Belt Clip	10M	QPSK	25	0	-	Back	0mm	Sensor on	23095	707.5	15.65	17.00	1.365	0.05	0.102	0.139
	LTE Band 12	10M	QPSK	1	0	-	Left Side	5mm	Sensor on	23095	707.5	16.05	17.00	1.245	0.16	0.062	0.077
	LTE Band 12	10M	QPSK	25	0	-	Left Side	5mm	Sensor on	23095	707.5	15.65	17.00	1.365	-0.1	0.069	0.094
	LTE Band 12	10M	QPSK	1	0	-	Right Side	5mm	Sensor on	23095	707.5	16.05	17.00	1.245	0.07	0.059	0.073
	LTE Band 12	10M	QPSK	25	0	-	Right Side	5mm	Sensor on	23095	707.5	15.65	17.00	1.365	0.18	0.070	0.096
	LTE Band 12	10M	QPSK	1	0	-	Front	14mm	Full Power	23095	707.5	22.94	24.00	1.276	-0.09	0.173	0.221
	LTE Band 12	10M	QPSK	1	0	-	Back	14mm	Full Power	23095	707.5	22.94	24.00	1.276	-0.18	0.092	0.117
	LTE Band 12	10M	QPSK	1	0	-	Left Side	9mm	Full Power	23095	707.5	22.94	24.00	1.276	0.1	0.115	0.147
	LTE Band 12	10M	QPSK	1	0	-	Right Side	9mm	Full Power	23095	707.5	22.94	24.00	1.276	0.12	0.116	0.148

16.3 Extremity SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	0mm	Sensor on	9400	1880	16.19	17.00	1.205	0.06	0.479	0.577
	WCDMA II _Belt Clip	-	-	-	-	RMC 12.2Kbps	Front	0mm	Sensor on	9400	1880	16.19	17.00	1.205	0.01	0.431	0.519
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Sensor on	9400	1880	16.19	17.00	1.205	-0.15	0.361	0.435
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	0mm	Sensor on	9400	1880	16.19	17.00	1.205	0.19	0.318	0.383
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	0mm	Sensor on	9400	1880	16.19	17.00	1.205	0.07	0.349	0.421
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Top Side	0mm	Full Power	9400	1880	23.25	24.00	1.189	-0.18	0.271	0.322
06	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	14mm	Full Power	9400	1880	23.25	24.00	1.189	-0.04	0.528	**0.628**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	14mm	Full Power	9400	1880	23.25	24.00	1.189	0.14	0.422	0.502
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	9mm	Full Power	9400	1880	23.25	24.00	1.189	0.11	0.364	0.433
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	9mm	Full Power	9400	1880	23.25	24.00	1.189	-0.05	0.520	0.618
07	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	0mm	Sensor on	1413	1732.6	16.29	17.00	1.178	-0.15	0.597	**0.703**
	WCDMA IV _Belt Clip	-	-	-	-	RMC 12.2Kbps	Front	0mm	Sensor on	1413	1732.6	16.29	17.00	1.178	-0.11	0.502	0.591
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	0mm	Sensor on	1413	1732.6	16.29	17.00	1.178	-0.15	0.512	0.603
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	0mm	Sensor on	1413	1732.6	16.29	17.00	1.178	0.11	0.223	0.263
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	0mm	Sensor on	1413	1732.6	16.29	17.00	1.178	-0.08	0.441	0.519
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Top Side	0mm	Full Power	1413	1732.6	22.93	24.00	1.279	-0.17	0.469	0.600
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	14mm	Full Power	1413	1732.6	22.93	24.00	1.279	0.01	0.383	0.490
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	14mm	Full Power	1413	1732.6	22.93	24.00	1.279	0.08	0.329	0.421
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left Side	9mm	Full Power	1413	1732.6	22.93	24.00	1.279	-0.17	0.240	0.307
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right Side	9mm	Full Power	1413	1732.6	22.93	24.00	1.279	-0.03	0.351	0.449
08	LTE Band 2	20M	QPSK	1	0	-	Front	0mm	Sensor on	18900	1880	15.89	17.00	1.291	-0.04	0.364	**0.470**
	LTE Band 2_Belt Clip	20M	QPSK	1	0	-	Front	0mm	Sensor on	18900	1880	15.89	17.00	1.291	0.06	0.279	0.360
	LTE Band 2	20M	QPSK	50	0	-	Front	0mm	Sensor on	18900	1880	15.80	17.00	1.318	-0.04	0.352	0.464
	LTE Band 2	20M	QPSK	1	0	-	Back	0mm	Sensor on	18900	1880	15.89	17.00	1.291	-0.08	0.285	0.368
	LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Sensor on	18900	1880	15.80	17.00	1.318	0.17	0.278	0.366
	LTE Band 2	20M	QPSK	1	0	-	Left Side	0mm	Sensor on	18900	1880	15.89	17.00	1.291	0.18	0.258	0.333
	LTE Band 2	20M	QPSK	50	0	-	Left Side	0mm	Sensor on	18900	1880	15.80	17.00	1.318	-0.04	0.247	0.326
	LTE Band 2	20M	QPSK	1	0	-	Right Side	0mm	Sensor on	18900	1880	15.89	17.00	1.291	-0.08	0.257	0.332
	LTE Band 2	20M	QPSK	50	0	-	Right Side	0mm	Sensor on	18900	1880	15.80	17.00	1.318	-0.13	0.264	0.348
	LTE Band 2	20M	QPSK	1	0	-	Top Side	0mm	Full Power	18900	1880	22.75	24.00	1.334	-0.13	0.254	0.339
	LTE Band 2	20M	QPSK	50	0	-	Top Side	0mm	Full Power	18900	1880	21.83	23.00	1.309	0.06	0.221	0.289
	LTE Band 2	20M	QPSK	1	0	-	Front	14mm	Full Power	18900	1880	22.75	24.00	1.334	-0.01	0.327	0.436
	LTE Band 2	20M	QPSK	1	0	-	Back	14mm	Full Power	18900	1880	22.75	24.00	1.334	-0.08	0.257	0.343
	LTE Band 2	20M	QPSK	1	0	-	Left Side	9mm	Full Power	18900	1880	22.75	24.00	1.334	-0.08	0.191	0.255
	LTE Band 2	20M	QPSK	1	0	-	Right Side	9mm	Full Power	18900	1880	22.75	24.00	1.334	0.1	0.301	0.402
09	LTE Band 4	20M	QPSK	1	0	-	Front	0mm	Sensor on	20175	1732.5	15.97	17.00	1.268	-0.08	0.557	**0.706**
	LTE Band 4_Belt Clip	20M	QPSK	1	0	-	Front	0mm	Sensor on	20175	1732.5	15.97	17.00	1.268	0.01	0.467	0.592
	LTE Band 4	20M	QPSK	50	0	-	Front	0mm	Sensor on	20175	1732.5	15.65	17.00	1.365	0.08	0.510	0.696
	LTE Band 4	20M	QPSK	1	0	-	Back	0mm	Sensor on	20175	1732.5	15.97	17.00	1.268	-0.07	0.430	0.545
	LTE Band 4	20M	QPSK	50	0	-	Back	0mm	Sensor on	20175	1732.5	15.65	17.00	1.365	0.05	0.460	0.628
	LTE Band 4	20M	QPSK	1	0	-	Left Side	0mm	Sensor on	20175	1732.5	15.97	17.00	1.268	-0.11	0.161	0.204
	LTE Band 4	20M	QPSK	50	0	-	Left Side	0mm	Sensor on	20175	1732.5	15.65	17.00	1.365	-0.12	0.188	0.257
	LTE Band 4	20M	QPSK	1	0	-	Right Side	0mm	Sensor on	20175	1732.5	15.97	17.00	1.268	0.03	0.404	0.512
	LTE Band 4	20M	QPSK	50	0	-	Right Side	0mm	Sensor on	20175	1732.5	15.65	17.00	1.365	-0.16	0.398	0.543
	LTE Band 4	20M	QPSK	1	0	-	Top Side	0mm	Full Power	20175	1732.5	22.86	24.00	1.300	-0.02	0.531	0.690
	LTE Band 4	20M	QPSK	50	0	-	Top Side	0mm	Full Power	20175	1732.5	22.06	23.00	1.242	0.15	0.417	0.518
	LTE Band 4	20M	QPSK	1	0	-	Front	14mm	Full Power	20175	1732.5	22.86	24.00	1.300	-0.05	0.440	0.572
	LTE Band 4	20M	QPSK	1	0	-	Back	14mm	Full Power	20175	1732.5	22.86	24.00	1.300	0.08	0.388	0.504
	LTE Band 4	20M	QPSK	1	0	-	Left Side	9mm	Full Power	20175	1732.5	22.86	24.00	1.300	0.01	0.252	0.328

	LTE Band 4	20M	QPSK	1	0	-	Right Side	9mm	Full Power	20175	1732.5	22.86	24.00	1.300	0.03	0.413	0.537
	LTE Band 12	10M	QPSK	1	0	-	Front	0mm	Sensor on	23095	707.5	16.05	17.00	1.245	-0.05	0.111	0.138
	LTE Band 12	10M	QPSK	25	0	-	Front	0mm	Sensor on	23095	707.5	15.65	17.00	1.365	-0.08	0.099	0.135
10	LTE Band 12	10M	QPSK	1	0	-	Back	0mm	Sensor on	23095	707.5	16.05	17.00	1.245	-0.07	0.199	**0.248**
	LTE Band 12_Belt Clip	10M	QPSK	1	0	-	Back	0mm	Sensor on	23095	707.5	16.05	17.00	1.245	0.06	0.066	0.082
	LTE Band 12	10M	QPSK	25	0	-	Back	0mm	Sensor on	23095	707.5	15.65	17.00	1.365	0.16	0.181	0.247
	LTE Band 12	10M	QPSK	1	0	-	Left Side	0mm	Sensor on	23095	707.5	16.05	17.00	1.245	0.05	0.184	0.229
	LTE Band 12	10M	QPSK	25	0	-	Left Side	0mm	Sensor on	23095	707.5	15.65	17.00	1.365	0.05	0.180	0.246
	LTE Band 12	10M	QPSK	1	0	-	Right Side	0mm	Sensor on	23095	707.5	16.05	17.00	1.245	-0.03	0.197	0.245
	LTE Band 12	10M	QPSK	25	0	-	Right Side	0mm	Sensor on	23095	707.5	15.65	17.00	1.365	-0.15	0.181	0.247
	LTE Band 12	10M	QPSK	1	0	-	Top Side	0mm	Full Power	23095	707.5	22.94	24.00	1.276	0.02	0.176	0.225
	LTE Band 12	10M	QPSK	25	0	-	Top Side	0mm	Full Power	23095	707.5	22.14	23.00	1.219	0.07	0.183	0.223
	LTE Band 12	10M	QPSK	1	0	-	Front	14mm	Full Power	23095	707.5	22.94	24.00	1.276	-0.09	0.119	0.152
	LTE Band 12	10M	QPSK	1	0	-	Back	14mm	Full Power	23095	707.5	22.94	24.00	1.276	-0.18	0.065	0.083
	LTE Band 12	10M	QPSK	1	0	-	Left Side	9mm	Full Power	23095	707.5	22.94	24.00	1.276	0.1	0.078	0.100
	LTE Band 12	10M	QPSK	1	0	-	Right Side	9mm	Full Power	23095	707.5	22.94	24.00	1.276	0.12	0.077	0.098

16.4 Repeated SAR Measurement

<1g>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA II	RMC 12.2Kbps	Front	14mm	Full Power	9400	1880	23.25	24.00	1.189	-0.04	0.981	1	1.166
2nd	WCDMA II	RMC 12.2Kbps	Front	14mm	Full Power	9400	1880	23.25	24.00	1.189	0.04	0.950	1.033	1.130
1st	WCDMA IV	RMC 12.2Kbps	Front	5mm	Sensor on	1513	1752.6	16.12	17.00	1.225	0.02	0.867	1	1.062
2nd	WCDMA IV	RMC 12.2Kbps	Front	5mm	Sensor on	1513	1752.6	16.12	17.00	1.225	0.09	0.811	1.069	0.993

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

17. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations
1.	None

General Note:

1. EUT will choose each WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
2. According to the EUT characteristic, WWAN and Bluetooth can’t transmit simultaneously.

Test Engineer : Martin Li, Varus Wang, Light Wang, Ricky Gu

18. Uncertainty Assessment

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

19. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] 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”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[6] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[7] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

[8] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[9] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[10] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.

[11] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

Appendixes

Please refer to separated files for the following appendixes

Appendix A. Plots of System Performance Check

Appendix B. Plots of High SAR Measurement

Appendix C. DASY Calibration Certificate

Appendix D. Test Setup Photos

Appendix E. Conducted RF Output Power Table

------THE END------