

TEST REPORT

Applicant Name: Telepower Communication Co., Ltd.
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Nanhai District Foshan China
Report Number: 2401A35544E-SAA
FCC ID: 2AJ2B-M1K

Test Standard (s)

FCC 47 CFR part 2.1093

Sample Description

Product Type: POS Terminal
Model No.: M1
Multiple Model(s) No.: M1K, M1KC
Trade Mark: Telpo
Serial Number: 2VH7-4
Date Received: 2024/12/03
Date of Test: 2025/02/06~2025/02/08
Issue Date: 2025/04/11

Test Result:

Pass▲

▲In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

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Sid Luo
SAR Engineer

Approved By:

Luke Jiang

Luke Jiang
SAR Engineer

Note: The information marked#is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

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Attestation of Test Results			
MODE		Max. SAR Level(s) Reported(W/kg)	Limit (W/kg)
GSM 850	1g Body SAR	0.08	1.6
PCS 1900	1g Body SAR	0.07	
WCDMA Band 2	1g Body SAR	0.15	
WCDMA Band 5	1g Body SAR	0.06	
LTE Band 2	1g Body SAR	0.13	
LTE Band 4	1g Body SAR	0.06	
LTE Band 7	1g Body SAR	0.20	
LTE Band 38	1g Body SAR	0.13	
2.4G Wi-Fi	1g Body SAR	0.11	
5.2G Wi-Fi	1g Body SAR	0.04	
Simultaneous	1g Body SAR	0.33	
GSM 850	10g Limb SAR	0.22	4.0
PCS 1900	10g Limb SAR	0.45	
WCDMA Band 2	10g Limb SAR	0.80	
WCDMA Band 5	10g Limb SAR	0.13	
LTE Band 2	10g Limb SAR	1.08	
LTE Band 4	10g Limb SAR	0.53	
LTE Band 7	10g Limb SAR	1.27	
LTE Band 38	10g Limb SAR	0.69	
2.4G Wi-Fi	10g Limb SAR	0.40	
5.2G Wi-Fi	10g Limb SAR	0.13	
Simultaneous	10g Limb SAR	1.67	
Applicable Standards	FCC 47 CFR part 2.1093 Radiation exposure evaluation: portable devices		
	IEEE 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 procedures KDB 447498 D01 General RF Exposure Guidance v06 KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04 KDB 865664 D02 RF Exposure Reporting v01r02 KDB 941225 D01 3G SAR Procedures v03r01 KDB 941225 D05 SAR for LTE Devices v02r05 KDB 248227 D01 802 11 Wi-Fi SAR v02r02		
Note: This wireless device has been shown to be capable of compliance for localized specific absorption rate (SAR) for General Population/Uncontrolled Exposure limits specified in FCC 47 CFR part 2.1093 and has been tested in accordance with the measurement procedures specified in IEEE 1528-2013 and RF exposure KDB procedures. The results and statements contained in this report pertain only to the device(s) evaluated.			

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401A35544E-SAA	Original Report	2025/04/11

EUT DESCRIPTION

This report has been prepared on behalf of **Telepower Communication Co., Ltd.** and their product **POS Terminal**, Models: **M1,M1K,M1KC**, Test Model: **M1**, FCC ID: **2AJ2B-M1K** or the EUT (Equipment under Test) as referred to in the rest of this report.

**All measurement and test data in this report was gathered from production sample serial number: 2VH7-4 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2024-12-03.*

Technical Specification

Product Type:	Portable
Dimensions(L×W×H)	216×83×45mm
Exposure Category:	Population / Uncontrolled
Antenna Type(s):	Internal Antenna
Body-Worn Accessories:	None
Multi-slot Class:	GPRS/EGPRS (Class 12)
Operation modes:	GSM Voice, GPRS/EGPRS Data, WCDMA FDD-LTE, TDD-LTE, Wi-Fi, Bluetooth, BLE, NFC
Frequency Band:	GSM 850: 824-849 MHz(TX); 869-894 MHz(RX) PCS 1900: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 5: 824-849 MHz(TX); 869-894 MHz(RX) LTE Band 2: 1850-1910 MHz(TX); 1930-1990MHz(RX) LTE Band 4: 1710-1755 MHz(TX); 2110-2155 MHz(RX) LTE Band 7: 2500-2570 MHz(TX); 2620-2690MHz(RX) LTE Band 38: 2570-2620 MHz(TX/RX) Wi-Fi 2.4G: 2412 -2462 MHz(TX&RX) Wi-Fi 5.2G: 5150 -5250 MHz(TX&RX) Bluetooth: 2402 -2480 MHz(TX&RX) BLE: 2402 -2480 MHz(TX&RX) NFC: 13.56 MHz
Power Source:	DC 7.60V from Li-ion Battery
Normal Operation:	Body Support and Limb
Note: The Multiple models are electrically identical with the test model except for model name and sales channels. Please refer to the declaration letter [#] for more detail, which was provided by manufacturer.	

REFERENCE, STANDARDS, AND GUIDELINES

FCC:

The Report and Order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g as recommended by the ANSI/IEEE standard C95.1-1992 [6] for an uncontrolled environment (Paragraph 65). According to the Supplement C of OET Bulletin 65 "Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in North America is 1.6 mW/g average over 1 gram of tissue mass.

SAR Limits

FCC Limit(1g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	1.6	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.

Occupational/Controlled Environments are defined as locations where there is exposure that maybe incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).

General Population/Uncontrolled environments Spatial Peak limit 1.6W/kg(Body) for 1g SAR and limit 4.0W/kg(Limb) for 10g Extremity SAR applied to the EUT.

FACILITIES

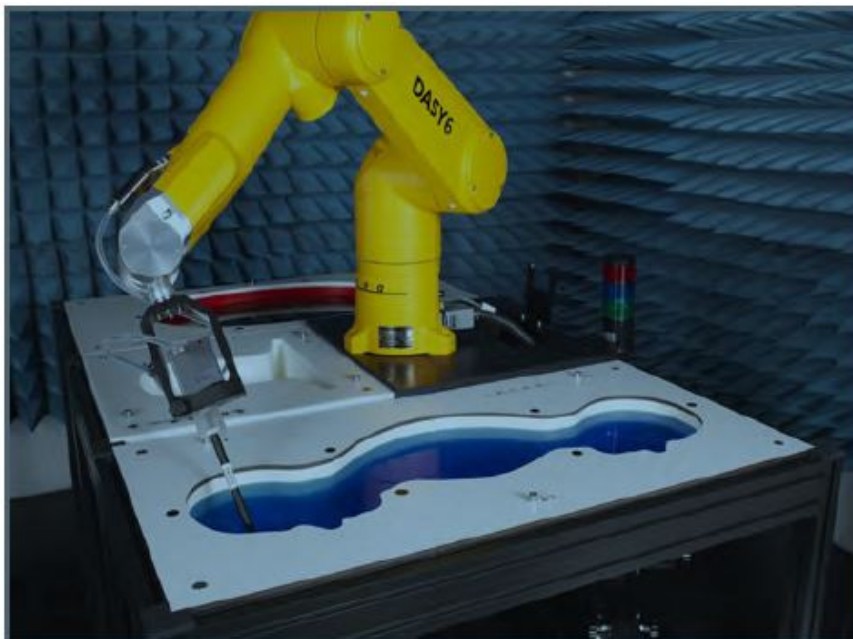
The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect data is located at 5F(B-West) ,6F,7F,the 3rd Phase of Wan Li Industrial Building D,Shihua Rd, FuTian Free Trade Zone, Shenzhen, China

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 715558, the FCC Designation No.: CN5045.

Each test item follows test standards and with no deviation.

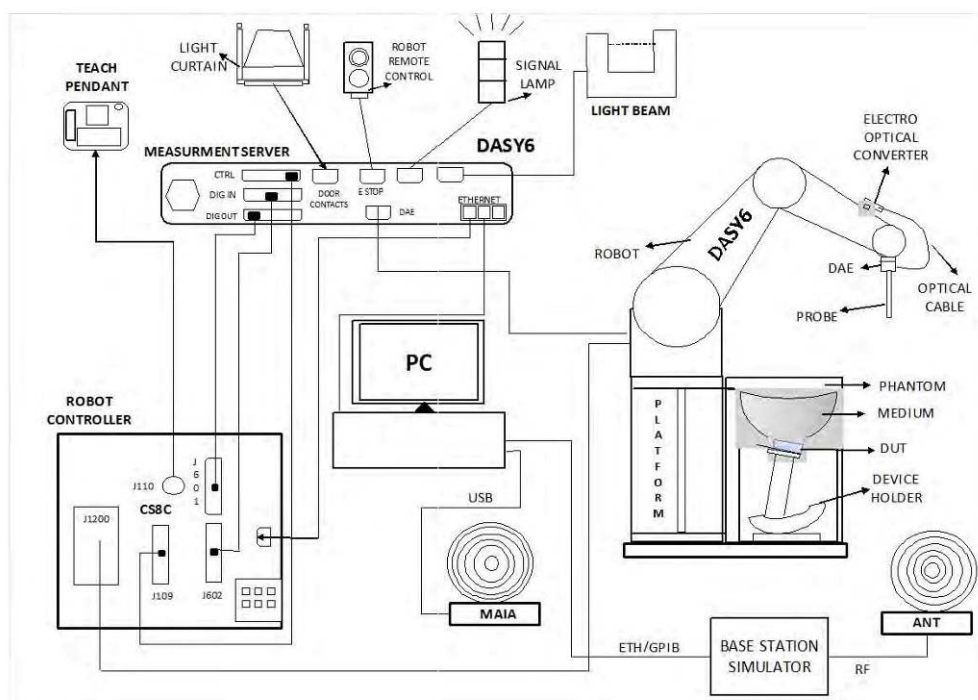
DESCRIPTION OF TEST SYSTEM

These measurements were performed with the automated near-field scanning system DASY6 from Schmid & Partner Engineering AG (SPEAG) which is the Fifth generation of the system shown in the figure hereinafter:



DASY6 System Description

The DASY6 system for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot (Staubli 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 application, 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 professional operating system and the DASY52 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.

DASY6 Measurement Server

The DASY6 measurement server is based on a PC/104 CPU board with a 400 MHz Intel ULV Celeron, 128 MB chip-disk and 128 MB RAM. The necessary circuits for communication with the DAE4 (or DAE3) electronics box, as well as the 16-bit AD converter system for optical detection and digital I/O interface are contained on the DASY6 I/O board, which is directly connected to the PC/104 bus of the CPU board.



The measurement server performs all real-time data evaluations of field measurements and surface detection, controls robot movements, and handles safety operations. 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. Connection of devices from any other supplier could seriously damage the measurement server.

Data Acquisition Electronics

The data acquisition electronics (DAE4) 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 both the DAE4 as well as of the DAE3 box is 200M Ω ; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

EX3DV4 E-Field Probes

Frequency	4 MHz to >10 GHz Linearity: ± 0.2 dB (30 MHz to 10 GHz)
Directivity	± 0.1 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY6, EASY4/MRI

SAM Twin Phantom

The SAM Twin Phantom (shown in front of DASY6) is a fiberglass shell phantom with shell thickness 2 mm, except in the ear region where the thickness is increased to 6 mm. The phantom has three measurement areas: 1) Left Head, 2) Right Head, and 3) Flat Section. For larger devices, the use of the ELI-Phantom (shown behind DASY6) is required. For devices such as glasses with a wireless link, the Face Down Phantom is the most suitable (between the SAM Twin and ELI phantoms).

When the phantom is mounted inside allocated slot of the DASY6 platform, phantom reference points can be taught directly in the DASY5 V5.2 software. When the DASY6 platform is used to mount the

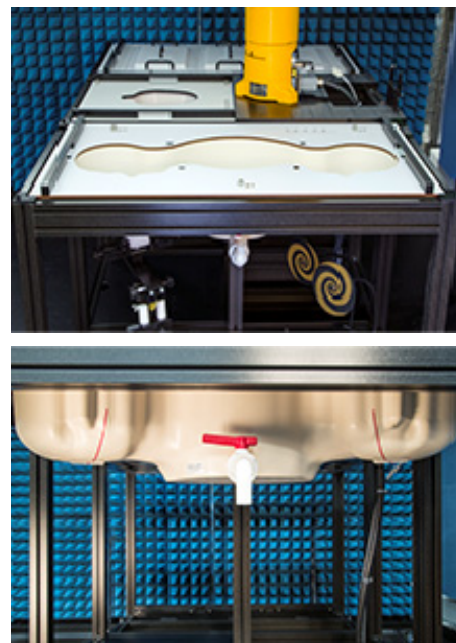
Phantom, some of the phantom teaching points cannot be reached by the robot in DASY5 V5.2. A special tool called P1a-P2aX-Former is provided to transform two of the three points, P1 and P2, to reachable locations. To use these new teaching points, a revised phantom configuration file is required.

In addition to our standard broadband liquids, the phantom can be used with the following tissue simulating liquids:

Sugar-water-based liquids can be left permanently in the phantom. Always cover the liquid when the system is not in use to prevent changes in liquid parameters due to water evaporation.

DGBE-based liquids should be used with care. As DGBE is a softener for most plastics, the liquid should be taken out of the phantom, and the phantom should be dried when the system is not in use (desirable at least once a week).

Do not use other organic solvents without previously testing the solvent resistivity of the phantom. Approximately 25 liters of liquid is required to fill the SAM Twin phantom.



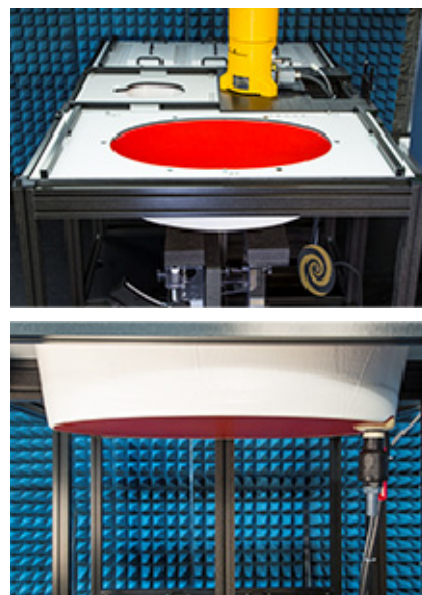
ELI Phantom

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30MHz to 6 GHz. ELI is fully compatible with the latest draft of the standard IEEE 1528:2013 and the use of all known tissue simulating liquids. ELI has been optimized for performance and can be integrated into a SPEAG standard phantom table. A cover is provided to prevent evaporation of water and changes in liquid parameters. 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 can be used with the following tissue simulating liquids:

- Sugar-water-based liquids can be left permanently in the phantom. Always cover the liquid when the system is not in use to prevent changes in liquid parameters due to water evaporation.
- DGBE-based liquids should be used with care. As DGBE is a softener for most plastics, the liquid should be taken out of the phantom, and the phantom should be dried when the system is not in use (desirable at least once a week).
- Do not use other organic solvents without previously testing the solvent resistivity of the phantom.

Approximately 25 liters of liquid is required to fill the ELI phantom.



Robots

The DASY6 system uses the high-precision industrial robots TX60L, TX90XL, and RX160L from Staubli SA (France). The TX robot family - the successor of the well-known RX robot family - continues to offer the features important for DASY6 applications:

- 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 synchrony motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

The robots are controlled by the Staubli CS8c robot controllers. All information regarding the use and maintenance of the robot arm and the robot controller is provided.

Calibration Frequency Points for EX3DV4 E-Field Probes SN: 7896 Calibrated: 2024/11/07

Calibration Frequency Point (MHz)	Frequency Range (MHz)		Conversion Factor		
	From	To	X	Y	Z
750 Head	650	810	8.72	9.14	9.15
900 Head	810	1000	8.08	8.47	8.48
1750 Head	1650	1810	7.20	7.55	7.56
1900 Head	1810	2000	6.96	7.29	7.30
2300 Head	2200	2399	6.79	7.12	7.13
2450 Head	2399	2500	6.54	6.85	6.86
2600 Head	2500	2700	6.60	6.92	6.93
3300 Head	3200	3400	5.83	6.12	6.12
3500 Head	3400	3600	5.91	6.19	6.20
3700 Head	3600	3800	5.92	6.20	6.21
3900 Head	3800	4000	5.79	6.07	6.07
5250 Head	5140	5360	4.86	5.09	5.09
5600 Head	5490	5700	4.52	4.74	4.74
5800 Head	5700	5900	4.56	4.78	4.78
6500 Head	5900	7200	4.74	4.96	4.97

SAR Scan Procedures**Step 1: 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. The minimum distance of probe sensors to surface is 1.4 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scans

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a 15mm² step integral, with 1.5mm interpolation used to locate the peak SAR area used for zoom scan assessments.

Where the system identifies multiple SAR peaks (which are within 25% of peak value) the system will provide the user with the option of assessing each peak location individually for zoom scan averaging.

Area Scan Parameters extracted from KDB 865664 D01 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 mm ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2)$ mm ± 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.	

Step 3: Zoom Scan (Cube Scan Averaging)

The averaging zoom scan volume utilized in the DASY5 software is in the shape of a cube and the side dimension of a 1 g or 10 g mass is dependent on the density of the liquid representing the simulated tissue. A density of 1000 kg/m³ is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1g cube is 5mm, with the side length of the 10g cube is 21.5mm.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			$\leq 2 \text{ GHz}: \leq 8 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 5 \text{ mm}^*$	$3 - 4 \text{ GHz}: \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz}: \leq 4 \text{ mm}^*$
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		$\leq 5 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 4 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 3 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	$\leq 4 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 3 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1) \text{ mm}$	
Minimum zoom scan volume	x, y, z		$\geq 30 \text{ mm}$	$3 - 4 \text{ GHz}: \geq 28 \text{ mm}$ $4 - 5 \text{ GHz}: \geq 25 \text{ mm}$ $5 - 6 \text{ GHz}: \geq 22 \text{ mm}$
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.				
* When zoom scan is required and the <u>reported</u> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB Publication 447498 is $\leq 1.4 \text{ W/kg}$, $\leq 8 \text{ mm}$, $\leq 7 \text{ mm}$ and $\leq 5 \text{ mm}$ zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

Step 4: Power Drift Measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

When the cube intersects with the surface of the phantom, it is oriented so that 3 vertices touch the surface of the shell or the center of a face is tangent to the surface. The face of the cube closest to the surface is modified in order to conform to the tangent surface.

The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications (including FCC) utilize a physical step of 7 x 7 x 7 (5mm x 5mm x 5mm) providing a volume of 30 mm in the X & Y & Z axis.

Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE 1528:2013

Recommended Tissue Dielectric Parameters for Head liquid

Table A.3 – Dielectric properties of the head tissue-equivalent liquid

Frequency MHz	Relative permittivity ϵ_r	Conductivity (σ) S/m
300	45,3	0,87
450	43,5	0,87
<i>750</i>	<i>41,9</i>	<i>0,89</i>
835	41,5	0,90
900	41,5	0,97
1 450	40,5	1,20
<i>1 500</i>	<i>40,4</i>	<i>1,23</i>
<i>1 640</i>	<i>40,2</i>	<i>1,31</i>
<i>1 750</i>	<i>40,1</i>	<i>1,37</i>
1 800	40,0	1,40
1 900	40,0	1,40
2 000	40,0	1,40
<i>2 100</i>	<i>39,8</i>	<i>1,49</i>
<i>2 300</i>	<i>39,5</i>	<i>1,67</i>
2 450	39,2	1,80
<i>2 600</i>	<i>39,0</i>	<i>1,96</i>
3 000	38,5	2,40
<i>3 500</i>	<i>37,9</i>	<i>2,91</i>
<i>4 000</i>	<i>37,4</i>	<i>3,43</i>
<i>4 500</i>	<i>36,8</i>	<i>3,94</i>
<i>5 000</i>	<i>36,2</i>	<i>4,45</i>
<i>5 200</i>	<i>36,0</i>	<i>4,66</i>
<i>5 400</i>	<i>35,8</i>	<i>4,86</i>
<i>5 600</i>	<i>35,5</i>	<i>5,07</i>
<i>5 800</i>	<i>35,3</i>	<i>5,27</i>
6 000	35,1	5,48

NOTE For convenience, permittivity and conductivity values at those frequencies which are not part of the original data provided by Drossos et al. [33] or the extension to 5 800 MHz are provided (i.e. the values shown *in italics*). These values were linearly interpolated between the values in this table that are immediately above and below these values, except the values at 6 000 MHz that were linearly extrapolated from the values at 3 000 MHz and 5 800 MHz.

EQUIPMENT LIST AND CALIBRATION

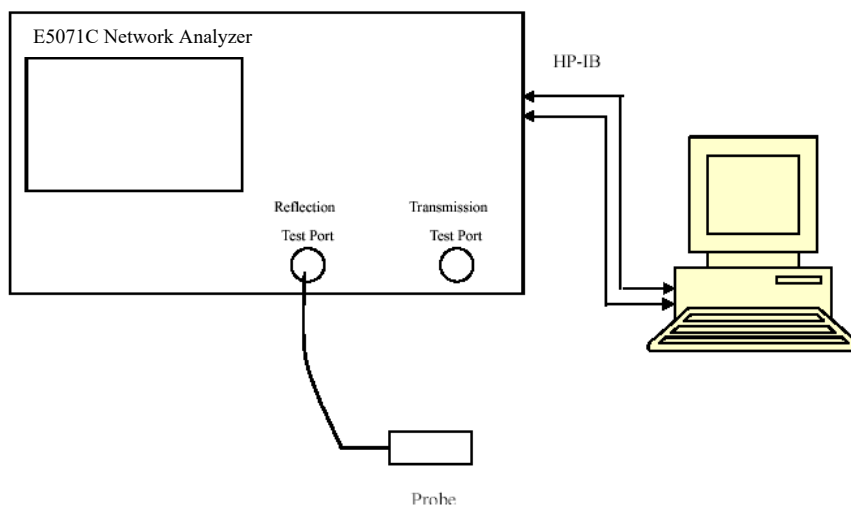
Equipment's List & Calibration Information

Equipment	Model	S/N	Calibration Date	Calibration Due Date
DASY5 Test Software	DASY52 52.10.2	N/A	NCR	NCR
DASY6 Measurement Server	DASY6 6.0.31	N/A	NCR	NCR
Data Acquisition Electronics	DAE4	1325	2024/10/08	2025/10/07
Dosimetric E-field Probes	EX3DV4	7896	2024/11/07	2025/11/06
Mounting Device	MD4HHTV5	SD 000 H01 KA	NCR	NCR
SAM Twin Phantom	SAM-Twin V8.0	1962	NCR	NCR
Dipole, 900MHz	D900V2	132	2023/09/26	2026/09/25
Dipole, 1750MHz	D1750V2	1199	2023/03/27	2026/03/26
Dipole, 1900MHz	D1900V2	5d231	2023/02/17	2026/02/16
Dipole, 2450MHz	D2450V2	1103	2023/03/27	2026/03/26
Dipole, 2600MHz	D2600V2	1207	2023/03/27	2026/03/26
Dipole,5GHz	D5GHzV2	1374	2023/03/27	2026/03/26
Simulated Tissue Liquid Head	HBBL600-10000V6	2200808-2	Each Time	/
Network Analyzer	E5071C	SER MY46519680	2024/05/21	2025/05/20
Dielectric Assessment Kit	DAK-3.5	1248	NCR	NCR
MXG Analog Signal Generator	N5181A	MY48180408	2024/12/04	2025/12/03
USB wideband power sensor	U2021XA	MY52350001	2024/05/21	2025/05/20
Directional Coupler	855673	3307	NCR	NCR
20dB Attenuator	2	BH9879	NCR	NCR
RF Power Amplifier	5205FE	1014	NCR	NCR
Amplifier	ZVE-8G+	558401902	NCR	NCR
Wideband Radio Communication Tester	CMW500	146520	2024/05/21	2025/05/20
Thermometer	DTM3000	N/A	2024/12/10	2025/12/09
Temperature & Humidity Meter	10316377	N/A	2024/12/10	2025/12/09
Spectrum Analyzer	FSV40	101942	2024/09/20	2025/09/19

NCR: No Calibration Required.

SAR MEASUREMENT SYSTEM VERIFICATION

Liquid Verification



Liquid Verification Setup Block Diagram

Liquid Verification Results

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ϵ_r	σ (S/m)	ϵ_r	σ (S/m)	$\Delta\epsilon_r$	$\Delta\sigma$ (S/m)	
824.2	Simulated Tissue Liquid Head	42.601	0.909	41.55	0.90	2.53	1.00	± 5
826.4	Simulated Tissue Liquid Head	42.598	0.910	41.54	0.90	2.55	1.11	± 5
836.6	Simulated Tissue Liquid Head	42.581	0.916	41.50	0.90	2.60	1.78	± 5
846.6	Simulated Tissue Liquid Head	42.564	0.922	41.50	0.91	2.56	1.32	± 5
848.8	Simulated Tissue Liquid Head	42.560	0.923	41.50	0.91	2.55	1.43	± 5
900	Simulated Tissue Liquid Head	42.474	0.953	41.50	0.97	2.35	-1.75	± 5

*Liquid Verification above was performed on 2025/02/06.

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ϵ_r	σ (S/m)	ϵ_r	σ (S/m)	$\Delta\epsilon_r$	$\Delta\sigma$	
1720	Simulated Tissue Liquid Head	39.070	1.368	40.11	1.35	-2.59	1.33	± 5
1732.5	Simulated Tissue Liquid Head	39.037	1.372	40.10	1.36	-2.65	0.88	± 5
1745	Simulated Tissue Liquid Head	39.004	1.377	40.08	1.37	-2.68	0.51	± 5
1750	Simulated Tissue Liquid Head	38.991	1.378	40.07	1.37	-2.69	0.58	± 5

*Liquid Verification above was performed on 2025/02/06.

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ϵ_r	σ (S/m)	ϵ_r	σ (S/m)	$\Delta\epsilon_r$	$\Delta\sigma$	
1850.2	Simulated Tissue Liquid Head	39.479	1.367	40.00	1.40	-1.30	-2.36	± 5
1852.4	Simulated Tissue Liquid Head	39.473	1.367	40.00	1.40	-1.32	-2.36	± 5
1860	Simulated Tissue Liquid Head	39.455	1.367	40.00	1.40	-1.36	-2.36	± 5
1880	Simulated Tissue Liquid Head	39.405	1.367	40.00	1.40	-1.49	-2.36	± 5
1900	Simulated Tissue Liquid Head	39.355	1.367	40.00	1.40	-1.61	-2.36	± 5
1907.6	Simulated Tissue Liquid Head	39.336	1.368	40.00	1.40	-1.66	-2.29	± 5
1909.8	Simulated Tissue Liquid Head	39.331	1.368	40.00	1.40	-1.67	-2.29	± 5

*Liquid Verification above was performed on 2025/02/07.

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ϵ_r	σ (S/m)	ϵ_r	σ (S/m)	$\Delta\epsilon_r$	$\Delta\sigma$ (S/m)	
2412	Simulated Tissue Liquid Head	38.989	1.780	39.27	1.77	-0.72	0.56	± 5
2437	Simulated Tissue Liquid Head	38.921	1.804	39.22	1.79	-0.76	0.78	± 5
2450	Simulated Tissue Liquid Head	38.885	1.817	39.20	1.80	-0.80	0.94	± 5
2462	Simulated Tissue Liquid Head	38.852	1.828	39.18	1.81	-0.84	0.99	± 5

*Liquid Verification above was performed on 2025/02/08.

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ϵ_r	σ (S/m)	ϵ_r	σ (S/m)	$\Delta\epsilon_r$	$\Delta\sigma$	
2510	Simulated Tissue Liquid Head	39.479	1.823	39.12	1.86	0.92	-1.99	± 5
2535	Simulated Tissue Liquid Head	39.400	1.859	39.09	1.89	0.79	-1.64	± 5
2565	Simulated Tissue Liquid Head	39.306	1.901	39.05	1.92	0.66	-0.99	± 5
2580	Simulated Tissue Liquid Head	39.259	1.922	39.03	1.94	0.59	-0.93	± 5
2595	Simulated Tissue Liquid Head	39.212	1.944	39.01	1.95	0.52	-0.31	± 5
2600	Simulated Tissue Liquid Head	39.196	1.951	39.00	1.96	0.50	-0.46	± 5
2610	Simulated Tissue Liquid Head	39.164	1.965	38.99	1.97	0.45	-0.25	± 5

*Liquid Verification above was performed on 2025/02/07.

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ϵ_r	σ (S/m)	ϵ_r	σ (S/m)	$\Delta\epsilon_r$	$\Delta\sigma$ (S/m)	
5180	Simulated Tissue Liquid Head	35.409	4.641	36.02	4.64	-1.70	0.02	± 5
5200	Simulated Tissue Liquid Head	35.360	4.658	36.00	4.66	-1.78	-0.04	± 5
5240	Simulated Tissue Liquid Head	35.263	4.692	35.96	4.70	-1.94	-0.17	± 5
5250	Simulated Tissue Liquid Head	35.238	4.700	35.95	4.71	-1.98	-0.21	± 5

*Liquid Verification above was performed on 2025/02/08.

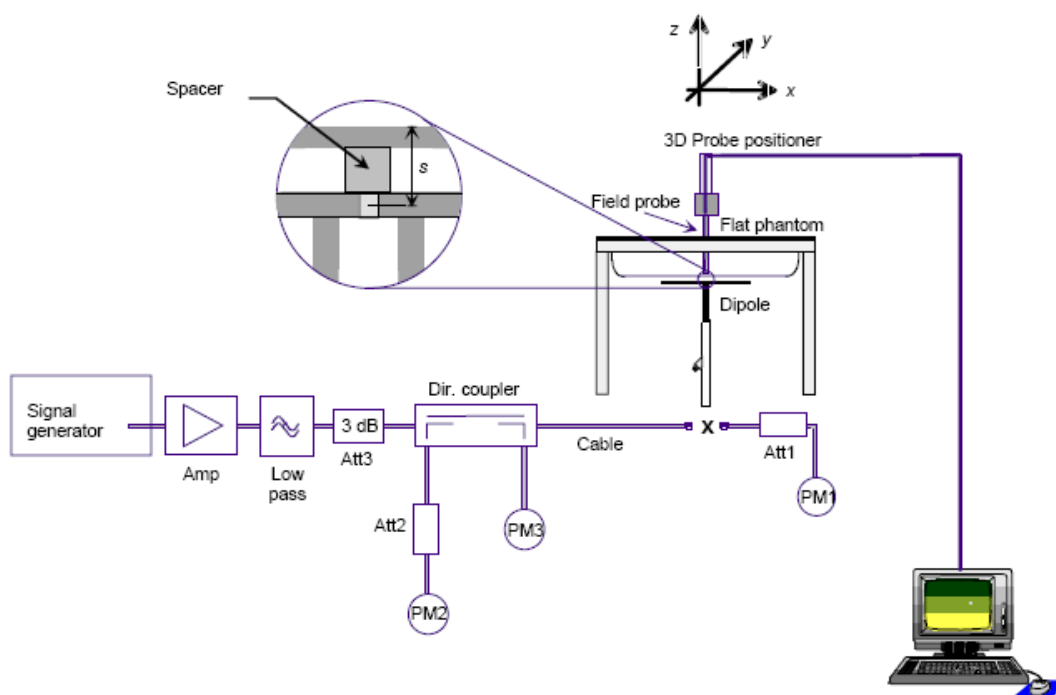
System Accuracy Verification

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of $\pm 10\%$. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

The spacing distances in the **System Verification Setup Block Diagram** is given by the following:

- $s = 15 \text{ mm} \pm 0,2 \text{ mm}$ for $300 \text{ MHz} \leq f \leq 1\,000 \text{ MHz}$;
- $s = 10 \text{ mm} \pm 0,2 \text{ mm}$ for $1\,000 \text{ MHz} < f \leq 3\,000 \text{ MHz}$;
- $s = 10 \text{ mm} \pm 0,2 \text{ mm}$ for $3\,000 \text{ MHz} < f \leq 6\,000 \text{ MHz}$.

System Verification Setup Block Diagram



System Accuracy Check Results

Date	Frequency Band (MHz)	Liquid Type	Input Power (mW)	Measured SAR (W/kg)		Normalized to 1W (W/kg)	Target Value (W/Kg)	Delta (%)	Tolerance (%)
2025/02/06	900	Head	100	1g	1.03	10.3	10.8	-4.630	± 10
2025/02/06	900	Head	100	10g	0.686	6.86	6.93	-1.010	± 10
2025/02/06	1750	Head	100	1g	3.39	33.9	36	-5.833	± 10
2025/02/06	1750	Head	100	10g	1.91	19.1	18.9	1.058	± 10
2025/02/07	1900	Head	100	1g	3.97	39.7	39.9	-0.501	± 10
2025/02/07	1900	Head	100	10g	2.17	21.7	20.8	4.327	± 10
2025/02/08	2450	Head	100	1g	4.97	49.7	51.7	-3.868	± 10
2025/02/08	2450	Head	100	10g	2.47	24.7	24.2	2.066	± 10
2025/02/07	2600	Head	100	1g	5.48	54.8	55.2	-0.725	± 10
2025/02/07	2600	Head	100	10g	2.64	26.4	24.8	6.452	± 10
2025/02/08	5250	Head	100	1g	8.33	83.3	80.1	3.995	± 10
2025/02/08	5250	Head	100	10g	2.49	24.9	23.1	7.792	± 10

Note:

All the SAR values are normalized to 1Watt forward power.

SAR SYSTEM VALIDATION DATA

System Performance 900 MHz

DUT: Dipole 900 MHz; Type: D900V2; Serial: 132

Communication System: UID 0, CW (0); Frequency: 900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.953 \text{ S/m}$; $\epsilon_r = 42.474$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7896; ConvF(8.08, 8.47, 8.48) @ 900 MHz;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1325; Calibrated: 10/8/2024
- Phantom: SAM-Twin V8.0 P1aP2a; Type: QD 000 P41 AA ; Serial: 1962
- Measurement SW: DASY52, Version 52.10 (2);

Configuration/Head 900MHz Pin=100mW/Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 1.38 W/kg

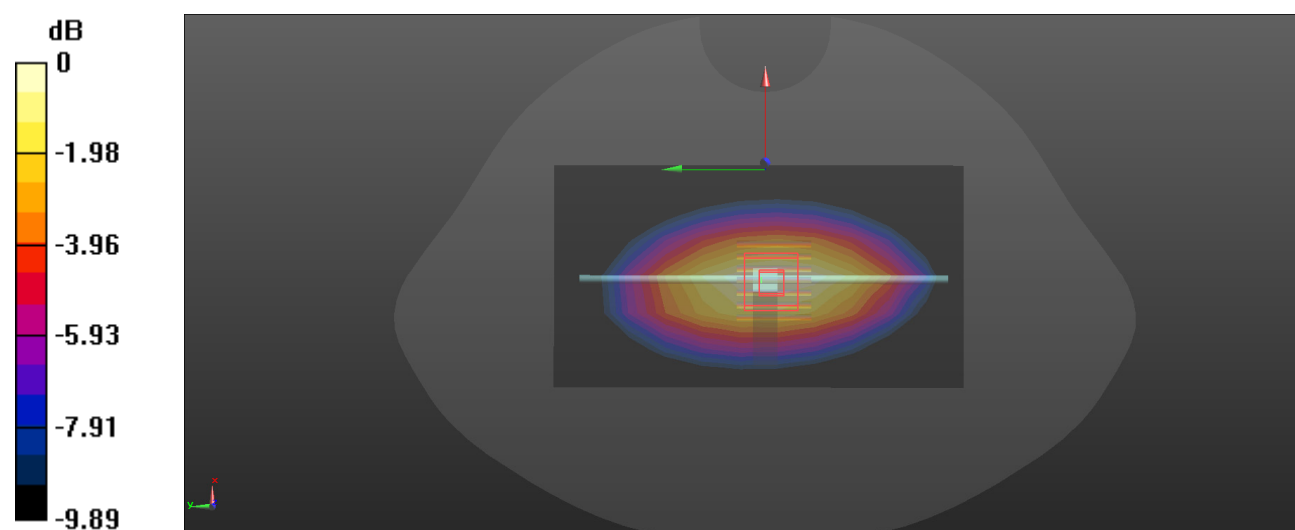
Configuration/Head 900MHz Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 36.02 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.686 W/kg

Maximum value of SAR (measured) = 1.30 W/kg



0 dB = 1.30 W/kg = 1.14 dBW/kg

System Performance 1750 MHz**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1199**

Communication System: UID 0, CW (0); Frequency: 1750 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.378$ S/m; $\epsilon_r = 38.991$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7896; ConvF(7.2, 7.55, 7.56) @ 1750 MHz;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1325; Calibrated: 10/8/2024
- Phantom: SAM-Twin V8.0 P1aP2a; Type: QD 000 P41 AA ; Serial: 1962
- Measurement SW: DASY52, Version 52.10 (2);

Configuration/Head 1750MHz Pin=100mW/Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 5.17 W/kg

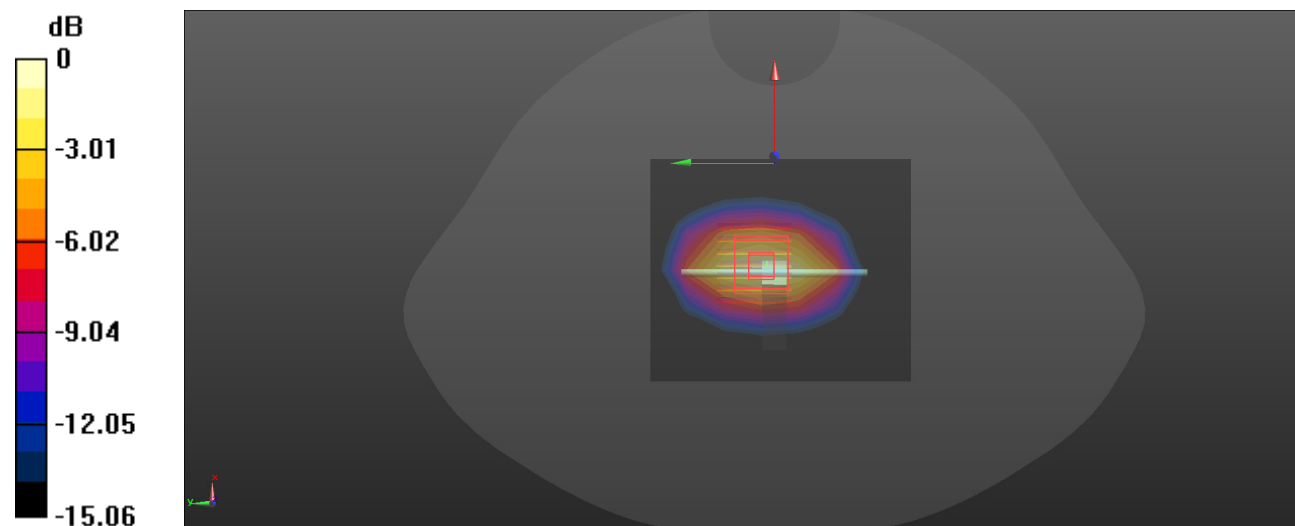
Configuration/Head 1750MHz Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.22 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 5.58 W/kg

SAR(1 g) = 3.39 W/kg; SAR(10 g) = 1.91 W/kg

Maximum value of SAR (measured) = 4.89 W/kg



0 dB = 4.89 W/kg = 6.89 dBW/kg

System Performance 1900 MHz**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d231**

Communication System: UID 0, CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.367$ S/m; $\epsilon_r = 39.355$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7896; ConvF(6.96, 7.29, 7.3) @ 1900 MHz;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1325; Calibrated: 10/8/2024
- Phantom: SAM-Twin V8.0 P1aP2a; Type: QD 000 P41 AA ; Serial: 1962
- Measurement SW: DASY52, Version 52.10 (2);

Configuration/Head 1900MHz Pin=100mW/Area Scan (9x13x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 5.08 W/kg

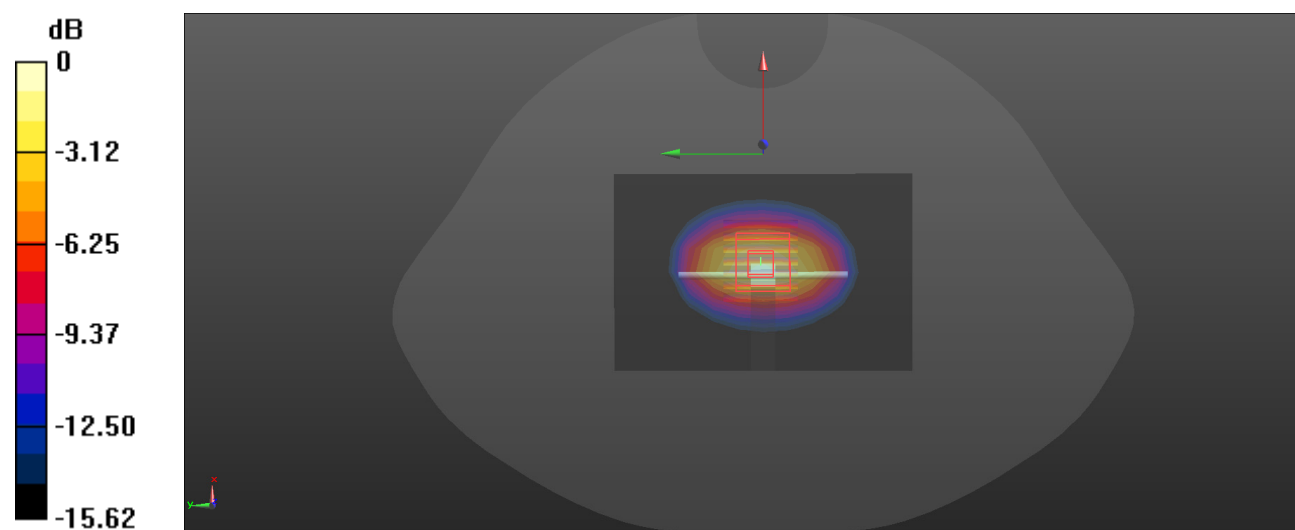
Configuration/Head 1900MHz Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.13 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 6.55 W/kg

SAR(1 g) = 3.97 W/kg; SAR(10 g) = 2.17 W/kg

Maximum value of SAR (measured) = 5.77 W/kg



0 dB = 5.77 W/kg = 7.61 dBW/kg

System Performance 2450 MHz**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 1103**

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.817$ S/m; $\epsilon_r = 38.885$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7896; ConvF(6.54, 6.85, 6.86) @ 2450 MHz;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1325; Calibrated: 10/8/2024
- Phantom: SAM-Twin V8.0 P1aP2a; Type: QD 000 P41 AA ; Serial: 1962
- Measurement SW: DASY52, Version 52.10 (2);

Configuration/Head 2450MHz Pin=100mW/Area Scan (9x10x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 7.69 W/kg

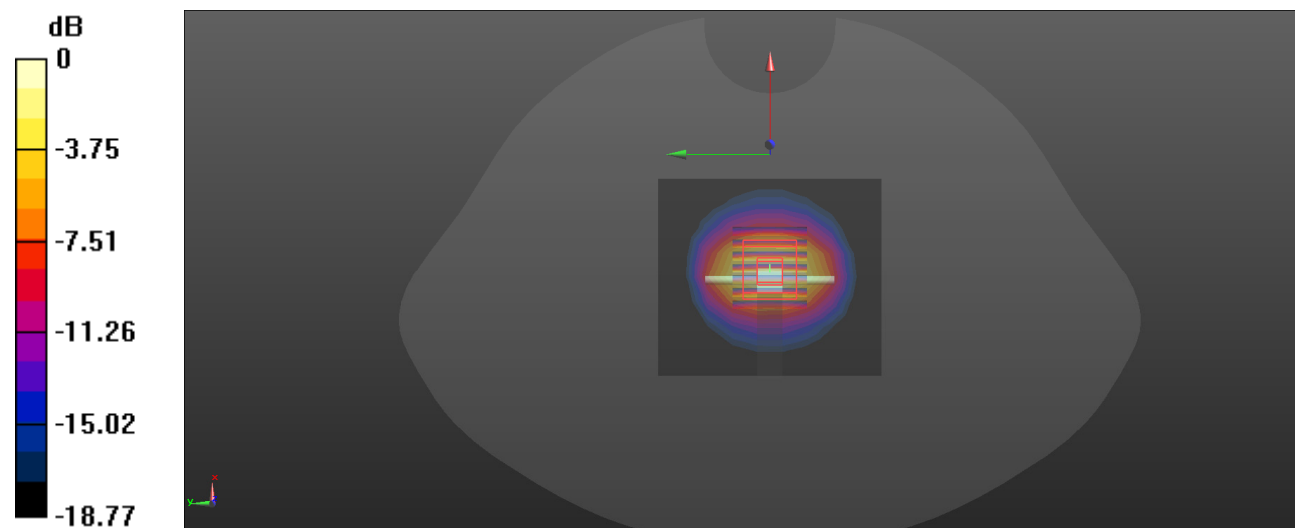
Configuration/Head 2450MHz Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 61.05 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 8.90 W/kg

SAR(1 g) = 4.97 W/kg; SAR(10 g) = 2.47 W/kg

Maximum value of SAR (measured) = 7.69 W/kg



0 dB = 7.69 W/kg = 8.86 dBW/kg

System Performance 2600 MHz**DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1207**

Communication System: UID 0, CW (0); Frequency: 2600 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2600$ MHz; $\sigma = 1.951$ S/m; $\epsilon_r = 39.196$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7896; ConvF(6.6, 6.92, 6.93) @ 2600 MHz;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1325; Calibrated: 10/8/2024
- Phantom: SAM-Twin V8.0 P1aP2a; Type: QD 000 P41 AA ; Serial: 1962
- Measurement SW: DASY52, Version 52.10 (2);

Configuration/Head 2600MHz Pin=100mW/Area Scan (9x10x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 8.33 W/kg

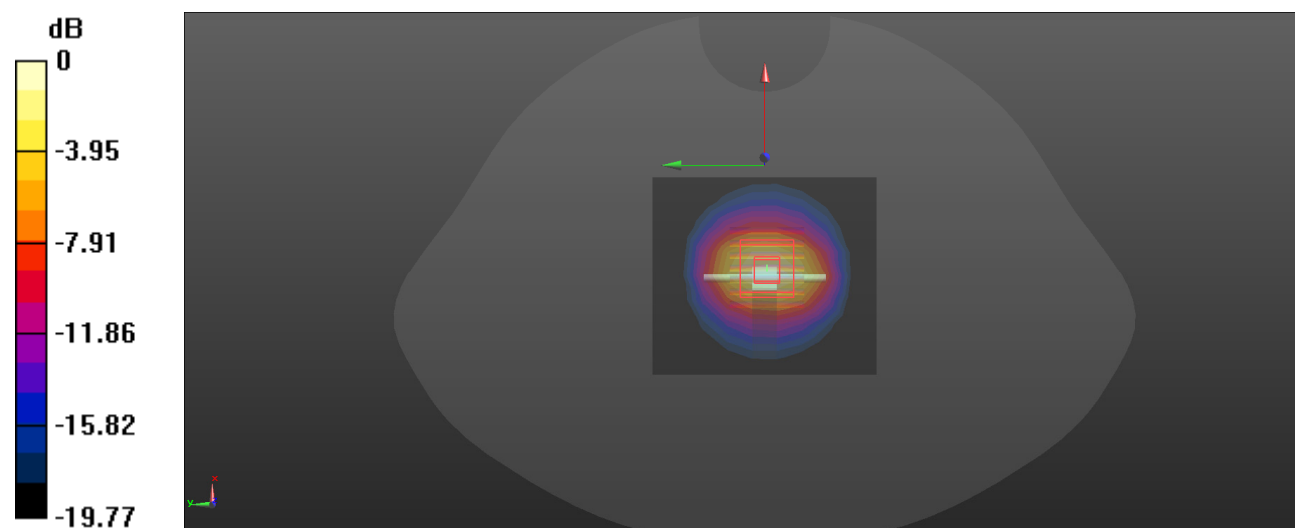
Configuration/Head 2600MHz Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 58.02 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 10.1 W/kg

SAR(1 g) = 5.48 W/kg; SAR(10 g) = 2.64 W/kg

Maximum value of SAR (measured) = 8.67 W/kg



0 dB = 8.67 W/kg = 9.38 dBW/kg

System Performance 5250 MHz**DUT: Dipole D5GHz; Type: D5GHzV2; Serial: 1374**

Communication System: UID 0, CW (0); Frequency: 5250 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5250$ MHz; $\sigma = 4.7$ S/m; $\epsilon_r = 35.238$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7896; ConvF(4.86, 5.09, 5.09) @ 5250 MHz;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1325; Calibrated: 10/8/2024
- Phantom: SAM-Twin V8.0 P1aP2a; Type: QD 000 P41 AA ; Serial: 1962
- Measurement SW: DASY52, Version 52.10 (2);

Configuration/Head 5250MHz Pin=100mW/Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 20.1 W/kg

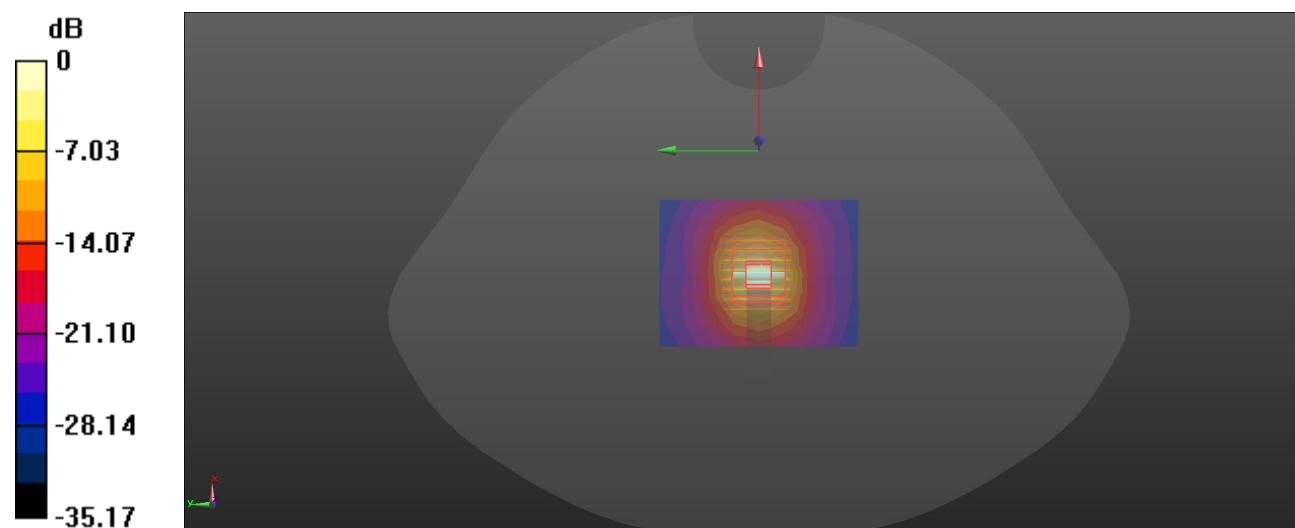
Configuration/Head 5250MHz Pin=100mW/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 47.26 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 28.3 W/kg

SAR(1 g) = 8.33 W/kg; SAR(10 g) = 2.49 W/kg

Maximum value of SAR (measured) = 18.0 W/kg



0 dB = 18.0 W/kg = 12.55 dBW/kg

EUT TEST STRATEGY AND METHODOLOGY

Test positions for body-worn and other configurations

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only the accessory that dictates the closest spacing to the body must be tested.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.

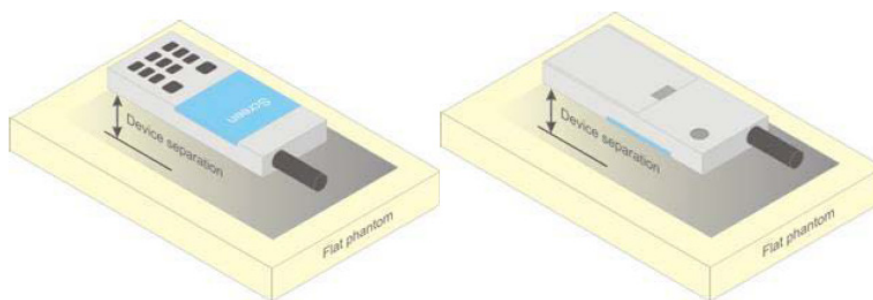


Figure 5 – Test positions for body-worn devices

Test Distance for SAR Evaluation

For Limb mode(10g Extremity SAR) the EUT(Equipment Under Test) is set directly against the phantom, the test distance is 0mm;

For Body mode(1g Body SAR) the EUT(Equipment Under Test) is set 5mm away from the phantom, the test distance is 5mm

SAR Evaluation Procedure

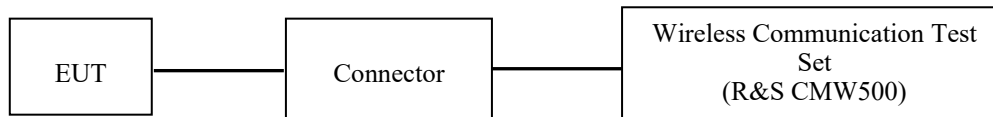
The evaluation was performed with the following procedure:

- Step 1: Measurement of the SAR value at a fixed location above the ear point or central position was used as a reference value for assessing the power drop. The SAR at this point is measured at the start of the test and then again at the end of the testing.
- Step 2: The SAR distribution at the exposed side of the head was measured at a distance of 4 mm from the inner surface of the shell. The area covered the entire dimension of the head or radiating structures of the EUT, the horizontal grid spacing was 15 mm x 15 mm, and the SAR distribution was determined by integrated grid of 1.5mm x 1.5mm. Based on these data, the area of the maximum absorption was determined by spline interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.
- Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7x 7 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:
- 1) The data at the surface were extrapolated, since the center of the dipoles is 1.2 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
 - 2) The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 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 integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the averages.
- All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
- Step 4: Re-measurement of the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation was repeated.

CONDUCTED OUTPUT POWER MEASUREMENT

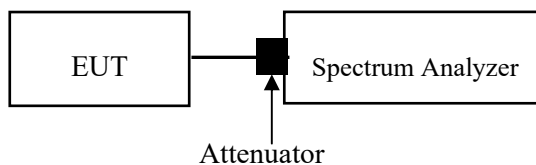
Test Procedure

The RF output of the transmitter was connected to the input of the Wireless Communication Test Set through Connector.



GSM/WCDMA/LTE

The RF output of the transmitter was connected to the input port of the Spectrum Analyzer through Attenuator.



BT/BLE/WLAN

Description of Test Configuration

EUT Operation Condition:

EUT Operation Mode:	The system was configured for testing in each operation mode.
Equipment Modifications:	No
EUT Exercise Software:	No
The maximum power was configured per 3GPP Standard for each operation modes as below setting: GSM/GPRS/EGPRS Function: Menu select > GSM Mobile Station > GSM 850/1900 Press Connection control to choose the different menus Press RESET > choose all the reset all settings Connection Press Signal Off to turn off the signal and change settings Network Support > GSM + GPRS or GSM + EGSM Main Service > Packet Data Service selection > Test Mode A – Auto Slot Config. off MS Signal Press Slot Config Bottom on the right twice to select and change the number of time slots and power setting > Slot configuration > Uplink/Gamma > 33 dBm for GPRS 850 > 30 dBm for GPRS 1900 > 27 dBm for EGPRS 850 > 26 dBm for EGPRS 1900 BS Signal channel Enter the same channel number for TCH channel (test channel) and BCCH Frequency Offset > + 0 Hz Mode > BCCH and TCH BCCH Level > -85 dBm (May need to adjust if link is not stable) BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel] Channel Type > Off P0 > 4 dB Slot Config> Unchanged (if already set under MS signal) TCH > choose desired test channel Hopping > Off Main Timeslot > 3 Network Coding Scheme > CS4 (GPRS) and MCS5 (EGPRS) Bit Stream > 2E9-1 PSR Bit Stream AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input Connection Press Sign	

WCDMA-Release 99

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification. The EUT has a nominal maximum output power of 24dBm (+1.7/-3.7).

WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β / β_d	8/15

WCDMA HSDPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subset	1	2	3	4
WCDMA General Set ings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	12/15	15/15	15/15
	β_d	1 /15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
HSDPA Specific Settings	MPR(dB)	0	0	0.5	0.5
	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs= β_{hs}/β_c	30/15			

HSPA+

The following tests were conducted according to the test requirements in Table C.11.1.4 of 3GPP TS 34.121-1

Sub-test	β_c (Note3)	β_d	β_{hs} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default.

Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

WCDMA HSUPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

	Mode	HSUPA	HSUPA	HSUPA	HSUPA	HSUPA
	Subset	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30 15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	-
	β_{hs}	22/15	12/15	30/15	4/15	5/15
	CM(dB)	1.0	3.0	2.0	3.0	1.0
	MPR(dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback	4ms				
	CQI Repetition Factor	2				
	Ahs= β_{hs}/β_c	30/15				
HSUPA Specific Settings	DE-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI	75	67	92	71	81
	Associated Max UL Data Rate k ps	242.1	174.9	482.8	205.8	308.9
	Reference E_FCI	E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27	E-TFCI 11 E-TFCI PO4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27		

LTE (FDD):

The following tests were conducted according to the test requirements in 3GPP TS36.101

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

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

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 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
64 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 Signaling 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
NS_04	6.6.2.2.2	41	20	>10	≤ 1
			5	>6	≤ 1
NS_05	6.6.3.3.1	1	10, 15, 20	See Table 6.2.4-4	≤ 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.

TDD-LTE

P TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$		
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

We used configuration 0 for LTE Band 38 SAR test, that is 63.33%(1:1.58)for duty cycle.

Maximum Target Output Power

Max Target Power(dBm)			
Mode/Band	Channel		
	Low	Middle	High
GSM 850	34.0	34.0	34.0
GPRS 1 TX Slot	34.0	34.0	34.0
GPRS 2 TX Slot	33.5	33.5	33.5
GPRS 3 TX Slot	31.5	31.5	31.5
GPRS 4 TX Slot	30.5	30.5	30.5
EGPRS 1 TX Slot	29.3	29.3	29.3
EGPRS 2 TX Slot	28.3	28.3	28.3
EGPRS 3 TX Slot	26.0	26.0	26.0
EGPRS 4 TX Slot	24.8	24.8	24.8
PCS 1900	30.5	30.5	30.5
GPRS 1 TX Slot	31.0	31.0	31.0
GPRS 2 TX Slot	31.0	31.0	31.0
GPRS 3 TX Slot	29.0	29.0	29.0
GPRS 4 TX Slot	27.5	27.5	27.5
EGPRS 1 TX Slot	28.5	28.5	28.5
EGPRS 2 TX Slot	27.5	27.5	27.5
EGPRS 3 TX Slot	25.6	25.6	25.6
EGPRS 4 TX Slot	24.3	24.3	24.3
WCDMA Band 2	25.5	25.5	25.5
HSDPA	24.5	24.5	24.5
HSUPA	24.3	24.3	24.3
HSPA+	23.5	23.5	23.5
WCDMA Band 5	24.2	24.2	24.2
HSDPA	23.5	23.5	23.5
HSUPA	23.5	23.5	23.5
HSPA+	23.0	23.0	23.0

Max Target Power(dBm)			
Mode/Band	Channel		
	Low	Middle	High
LTE Band 2	25.8	25.8	25.8
LTE Band 4	25.0	25.0	25.0
LTE Band 7	25.4	25.4	25.4
LTE Band 38	24.5	24.5	25.0
WLAN 2.4G 802.11b	15.0	15.0	15.0
WLAN 2.4G 802.11g	15.0	15.0	15.0
WLAN 2.4G 802.11n-ht20	14.5	14.5	14.5
WLAN 2.4G 802.11n-ht40	11.0	11.0	11.0
WLAN 5.2G 802.11a	16.0	16.0	16.0
WLAN 5.2G 802.11ac-vht20	17.5	17.5	17.5
WLAN 5.2G 802.11ac-vht40	17.4	/	17.4
WLAN 5.2G 802.11ac-vht80	/	17.0	/
Bluetooth BDR	5.0	5.0	5.0
Bluetooth EDR	4.0	4.0	4.0
BLE	-2.0	-2.0	-2.0

Note: The Maximum Target Power for LTE bands corresponds to their maximum power in QPSK modes with maximum bandwidth.

Test Results:**GSM**

Band	Frequency (MHz)	RF Output Power (dBm)
GSM 850	824.2	33.60
	836.6	33.69
	848.8	33.21
PCS 1900	1850.2	30.10
	1880	30.05
	1909.8	30.18

GPRS:

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
GSM 850	128	824.2	33.18	32.42	30.65	29.31
	190	836.6	33.59	33.03	31.37	29.97
	251	848.8	33.75	33.02	31.33	30.02
PCS 1900	512	1850.2	30.85	30.61	28.70	27.39
	661	1880	30.71	30.78	28.55	27.25
	810	1909.8	30.08	30.09	28.10	26.99

EGPRS:

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
GSM 850	128	824.2	28.67	27.97	25.62	23.62
	190	836.6	28.73	27.54	25.51	24.42
	251	848.8	28.96	27.63	24.93	24.31
PCS 1900	512	1850.2	27.79	27.16	24.86	23.66
	661	1880	28.04	27.05	25.32	23.90
	810	1909.8	27.56	26.66	24.75	23.35

For SAR, the time based average power is relevant, the difference in between depends on the duty cycle of the TDMA signal.

Number of Time slot	1	2	3	4
Duty Cycle	1:8	1:4	1:2.66	1:2
Time based Ave. power compared to slotted Ave. power	-9 dB	-6 dB	-4.25 dB	-3 dB
Crest Factor	8	4	2.66	2

The time based average power for GSM

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)
GSM 850	128	824.2	24.60
	190	836.6	24.69
	251	848.8	24.21
PCS 1900	512	1850.2	21.10
	661	1880	21.05
	810	1909.8	21.18

The time based average power for GPRS

Band	Channel No.	Frequency (MHz)	Time based average Power (dBm)			
			1 slot	2 slot	3 slots	4 slots
GSM 850	128	824.2	24.18	26.42	26.40	26.31
	190	836.6	24.59	27.03	27.12	26.97
	251	848.8	24.75	27.02	27.08	27.02
PCS 1900	512	1850.2	21.85	24.61	24.45	24.39
	661	1880	21.71	24.78	24.30	24.25
	810	1909.8	21.08	24.09	23.85	23.99

The time based average power for EGPRS

Band	Channel No.	Frequency (MHz)	Time based average Power (dBm)			
			1 slot	2 slot	3 slots	4 slots
GSM 850	128	824.2	19.67	21.97	21.37	20.62
	190	836.6	19.73	21.54	21.26	21.42
	251	848.8	19.96	21.63	20.68	21.31
PCS 1900	512	1850.2	18.79	21.16	20.61	20.66
	661	1880	19.04	21.05	21.07	20.90
	810	1909.8	18.56	20.66	20.50	20.35

Note:

1. Rohde & Schwarz Radio Communication Tester (CMW500) was used for the measurement of GSM peak and average output power for active timeslots.
2. For GSM voice, 1 timeslot has been activated with power level 5 (850 MHz band) and 0 (1900 MHz band).
3. For GPRS, 1, 2, 3 and 4 timeslots has been activated separately with power level 3(850 MHz band) and 3(1900 MHz band).

WCDMA Band 2

Test Condition	Test Mode	3GPP Sub Test	RF Power(dBm)		
			Low Channel	Mid Channel	High Channel
Normal	Rel 99 RMC	/	24.73	25.19	25.08
	HSDPA	1	23.92	24.01	24.23
		2	23.68	23.79	23.94
		3	23.32	23.40	23.63
		4	23.43	23.33	23.49
	HSUPA	1	23.15	23.11	23.46
		2	23.87	23.89	24.06
		3	22.91	22.92	23.05
		4	23.97	23.86	24.06
		5	22.83	22.79	23.01
	HSPA+	1	22.96	23.21	22.87

WCDMA Band 5

Test Condition	Test Mode	3GPP Sub Test	RF Power(dBm)		
			Low Channel	Mid Channel	High Channel
Normal	Rel 99 RMC	/	23.78	23.96	23.87
	HSDPA	1	22.95	22.78	23.24
		2	22.74	22.71	22.99
		3	22.42	22.30	22.70
		4	22.34	22.31	22.70
	HSUPA	1	22.43	22.11	22.62
		2	22.93	22.86	23.11
		3	21.93	21.96	22.31
		4	22.95	22.79	23.27
		5	21.98	21.81	22.28
	HSPA+	1	22.39	22.63	22.49

Note:

1. The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2 kbps RMC (reference measurement Channel) Configured in Test Loop Model 1.
2. KDB 941225 D01-Body SAR is not required for HSDPA/HSUPA/HSPA+ when the maximum average output of each RF channel is less than ¼ dB higher than measured 12.2kbps RMC or the maximum SAR for 12.2kbps RMC is < 75% of SAR limit.

LTE Band 2:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	RB1#0	25.33	25.30	25.10
		RB1#2	25.45	25.09	25.27
		RB1#5	25.39	24.76	24.99
		RB3#0	25.31	24.97	25.07
		RB3#1	25.31	25.00	25.18
		RB3#2	25.26	24.92	25.04
		RB6#0	24.37	23.92	24.04
	16-QAM	RB1#0	24.45	23.69	24.37
		RB1#2	24.67	23.76	24.46
		RB1#5	24.41	23.71	24.26
		RB3#0	24.41	23.99	24.33
		RB3#1	24.52	24.08	24.27
		RB3#2	24.34	24.02	24.31
		RB6#0	23.44	23.13	22.97
3M	QPSK	RB1#0	24.77	25.03	25.38
		RB1#7	24.77	25.03	25.36
		RB1#14	24.83	25.01	25.32
		RB8#0	23.72	24.33	24.54
		RB8#4	23.75	24.28	24.46
		RB8#7	23.68	24.33	24.52
		RB15#0	23.80	24.30	24.45
	16-QAM	RB1#0	23.64	24.68	24.11
		RB1#7	23.59	24.53	24.09
		RB1#14	23.63	24.67	24.21
		RB8#0	22.76	23.37	23.50
		RB8#4	22.87	23.43	23.44
		RB8#7	22.77	23.29	23.15
		RB15#0	22.87	23.32	23.35
5M	QPSK	RB1#0	25.02	24.72	24.84
		RB1#12	25.36	24.91	25.12
		RB1#24	25.05	24.65	24.97
		RB12#0	24.26	23.86	23.95
		RB12#6	24.25	23.97	24.09
		RB12#11	24.23	23.76	23.88
		RB25#0	23.84	23.84	23.95
	16-QAM	RB1#0	24.31	23.67	23.87
		RB1#12	24.44	23.95	24.22
		RB1#24	24.21	23.76	23.91
		RB12#0	22.91	22.87	23.13
		RB12#6	22.89	23.04	23.21
		RB12#11	22.84	22.90	22.93
		RB25#0	22.85	22.94	23.04

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
10M	QPSK	RB1#0	25.07	25.23	25.11
		RB1#24	25.23	25.51	25.24
		RB1#49	25.03	25.36	25.07
		RB25#0	24.19	24.24	23.98
		RB25#12	24.21	24.39	23.90
		RB25#24	24.19	24.26	23.92
		RB50#0	24.25	24.31	23.84
	16-QAM	RB1#0	23.89	24.23	24.27
		RB1#24	23.92	24.48	24.36
		RB1#49	24.00	24.16	24.36
		RB25#0	23.11	23.10	23.22
		RB25#12	23.29	23.12	23.13
		RB25#24	23.36	23.11	23.04
		RB50#0	23.26	22.80	23.01
15M	QPSK	RB1#0	24.95	24.94	25.32
		RB1#37	24.91	25.20	25.75
		RB1#74	24.63	24.89	25.48
		RB36#0	23.95	23.96	24.57
		RB36#16	23.75	24.09	24.63
		RB36#35	23.80	23.94	24.53
		RB75#0	23.91	23.88	24.31
	16-QAM	RB1#0	23.53	24.56	23.86
		RB1#37	23.84	24.66	24.10
		RB1#74	23.60	24.40	23.84
		RB36#0	22.88	23.36	23.06
		RB36#16	22.79	23.41	23.47
		RB36#35	22.84	23.42	23.53
		RB75#0	22.83	23.31	23.47
20M	QPSK	RB1#0	24.98	24.80	24.99
		RB1#49	25.49	25.15	25.19
		RB1#99	24.88	24.81	24.87
		RB50#0	24.31	23.90	24.05
		RB50#24	24.27	23.92	24.06
		RB50#49	24.19	23.88	24.01
		RB100#0	24.23	23.68	24.01
	16-QAM	RB1#0	24.15	24.13	23.97
		RB1#49	24.41	24.47	24.30
		RB1#99	24.24	24.11	23.87
		RB50#0	23.26	22.80	23.02
		RB50#24	22.88	22.89	23.01
		RB50#50	22.90	22.65	23.07
		RB100#0	23.32	22.75	22.98

LTE Band 4:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	RB1#0	24.21	24.37	24.72
		RB1#2	24.47	24.50	24.79
		RB1#5	24.32	24.41	24.71
		RB3#0	24.38	24.45	24.68
		RB3#1	24.57	24.58	24.68
		RB3#2	24.53	24.49	24.57
		RB6#0	23.58	23.49	23.64
	16-QAM	RB1#0	23.20	23.37	23.97
		RB1#2	23.36	23.42	24.01
		RB1#5	23.36	23.22	23.81
		RB3#0	23.64	23.74	23.86
		RB3#1	23.78	23.66	23.93
		RB3#2	23.70	23.66	23.86
		RB6#0	22.72	22.80	22.64
3M	QPSK	RB1#0	24.33	24.51	24.78
		RB1#7	24.41	24.37	24.81
		RB1#14	24.29	24.45	24.75
		RB8#0	23.60	23.53	23.70
		RB8#4	23.62	23.59	23.67
		RB8#7	23.47	23.48	23.72
		RB15#0	23.58	23.52	23.57
	16-QAM	RB1#0	23.36	23.52	23.92
		RB1#7	23.19	23.48	24.04
		RB1#14	23.21	23.40	23.93
		RB8#0	22.45	22.64	22.87
		RB8#4	22.57	22.66	22.88
		RB8#7	22.50	22.52	22.71
		RB15#0	22.54	22.54	22.76
5M	QPSK	RB1#0	24.44	24.41	24.51
		RB1#12	24.65	24.55	24.79
		RB1#24	24.44	24.33	24.53
		RB12#0	23.53	23.62	23.66
		RB12#6	23.62	23.64	23.71
		RB12#11	23.51	23.58	23.64
		RB25#0	23.51	23.57	23.56
	16-QAM	RB1#0	23.50	24.00	23.54
		RB1#12	23.74	24.30	23.79
		RB1#24	23.44	24.00	23.55
		RB12#0	22.49	22.53	22.67
		RB12#6	22.69	22.65	22.80
		RB12#11	22.67	22.59	22.84
		RB25#0	22.67	22.62	22.67

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
10M	QPSK	RB1#0	24.45	24.53	24.43
		RB1#24	24.57	24.76	24.74
		RB1#49	24.44	24.72	24.51
		RB25#0	23.48	23.56	23.80
		RB25#12	23.56	23.62	23.75
		RB25#24	23.67	23.53	23.74
		RB50#0	23.60	23.59	23.75
	16-QAM	RB1#0	23.40	23.93	23.43
		RB1#24	23.56	23.96	23.40
		RB1#49	23.35	23.83	23.26
		RB25#0	22.73	22.67	22.93
		RB25#12	22.67	22.73	22.87
		RB25#24	22.76	22.74	22.74
		RB50#0	22.64	22.69	22.83
15M	QPSK	RB1#0	24.29	24.43	24.51
		RB1#37	24.66	24.85	24.86
		RB1#74	24.34	24.56	24.64
		RB36#0	23.57	23.53	23.82
		RB36#16	23.58	23.71	23.72
		RB36#35	23.68	23.65	23.81
		RB75#0	23.53	23.58	23.67
	16-QAM	RB1#0	23.37	23.63	23.46
		RB1#37	23.44	23.94	23.81
		RB1#74	23.23	23.88	23.49
		RB36#0	22.54	22.44	22.71
		RB36#16	22.61	22.60	22.65
		RB36#35	22.57	22.60	22.65
		RB75#0	22.57	22.63	22.70
20M	QPSK	RB1#0	24.32	24.41	24.45
		RB1#49	24.75	24.91	24.88
		RB1#99	24.30	24.60	24.46
		RB50#0	23.50	23.74	23.51
		RB50#24	23.53	23.89	23.67
		RB50#49	23.49	23.87	23.66
		RB100#0	23.51	23.52	23.64
	16-QAM	RB1#0	23.56	23.83	23.53
		RB1#49	23.87	24.24	23.97
		RB1#99	23.48	23.92	23.63
		RB50#0	22.36	22.47	22.66
		RB50#24	22.41	22.56	22.83
		RB50#50	22.52	22.67	22.67
		RB100#0	22.52	22.50	22.75

LTE Band 7:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	RB1#0	24.74	24.60	24.72
		RB1#12	25.06	24.75	25.05
		RB1#24	24.30	24.51	24.79
		RB12#0	23.42	23.57	23.97
		RB12#6	23.50	23.71	24.05
		RB12#11	23.44	23.68	23.85
		RB25#0	23.42	23.60	23.86
	16-QAM	RB1#0	23.26	23.57	24.40
		RB1#12	23.57	23.71	24.71
		RB1#24	23.35	23.64	24.36
		RB12#0	22.50	22.69	22.97
		RB12#6	22.62	22.84	23.10
		RB12#11	22.53	22.59	22.97
		RB25#0	22.41	22.74	22.92
10M	QPSK	RB1#0	24.87	24.60	25.11
		RB1#25	24.91	24.74	25.34
		RB1#49	24.97	24.76	25.16
		RB25#0	23.80	23.72	24.08
		RB25#12	23.94	23.66	24.06
		RB25#24	24.00	23.75	24.01
		RB50#0	24.00	23.60	23.88
	16-QAM	RB1#0	23.67	23.43	24.35
		RB1#25	23.87	23.76	24.45
		RB1#49	23.58	23.62	24.30
		RB25#0	23.74	23.86	23.94
		RB25#12	22.92	22.79	23.09
		RB25#24	23.02	22.75	23.10
		RB50#0	22.75	22.66	22.90
15M	QPSK	RB1#0	24.46	24.47	25.06
		RB1#37	24.61	24.78	25.28
		RB1#74	24.54	24.60	25.07
		RB36#0	23.39	23.75	23.95
		RB36#16	23.48	23.77	24.01
		RB36#35	23.68	23.86	24.04
		RB75#0	23.41	23.70	24.07
	16-QAM	RB1#0	23.36	23.47	24.21
		RB1#37	23.72	23.68	24.36
		RB1#74	23.50	23.52	24.10
		RB36#0	22.44	22.73	23.06
		RB36#16	22.50	22.77	23.03
		RB36#35	22.56	22.78	23.01
		RB75#0	22.46	22.70	23.02

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
20M	QPSK	RB1#0	24.27	24.55	24.85
		RB1#49	24.97	25.08	25.36
		RB1#99	24.36	24.87	24.79
		RB50#0	23.87	23.81	23.97
		RB50#24	23.73	23.76	24.04
		RB50#49	23.78	23.81	23.85
		RB100#0	23.61	23.60	23.93
	16-QAM	RB1#0	23.31	24.01	23.91
		RB1#49	23.82	24.30	24.30
		RB1#99	23.45	24.15	23.89
		RB50#0	22.38	22.64	22.91
		RB50#24	22.38	22.65	23.05
		RB50#49	22.55	22.71	22.93
		RB100#0	22.48	22.71	22.91

LTE Band 38:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	RB1#0	23.32	23.68	24.14
		RB1#12	23.74	24.01	24.60
		RB1#24	23.46	23.76	24.30
		RB12#0	22.35	22.80	23.15
		RB12#6	22.36	22.84	23.15
		RB12#11	22.42	22.82	23.24
		RB25#0	22.73	22.79	23.19
	16-QAM	RB1#0	23.18	22.83	23.23
		RB1#12	23.37	23.23	23.57
		RB1#24	23.22	22.87	23.24
		RB12#0	21.96	21.79	22.16
		RB12#6	22.07	21.82	22.26
		RB12#11	21.86	21.87	22.14
		RB25#0	21.86	21.69	22.25
10M	QPSK	RB1#0	23.97	23.65	24.03
		RB1#25	24.20	23.93	24.54
		RB1#49	23.76	23.64	24.17
		RB25#0	22.76	22.71	22.96
		RB25#12	22.81	22.84	23.20
		RB25#24	22.95	22.90	23.24
		RB50#0	22.95	22.85	23.11
	16-QAM	RB1#0	22.99	22.95	23.19
		RB1#25	23.25	23.07	23.74
		RB1#49	22.92	22.90	23.42
		RB25#0	23.76	23.83	24.13
		RB25#12	21.84	21.79	22.08
		RB25#24	21.97	21.75	22.29
		RB50#0	21.86	21.82	22.07
15M	QPSK	RB1#0	23.74	23.83	23.87
		RB1#37	23.94	24.03	24.42
		RB1#74	23.52	23.75	24.16
		RB36#0	22.94	22.87	23.02
		RB36#16	22.98	22.85	23.10
		RB36#35	22.90	22.92	23.26
		RB75#0	22.82	22.94	23.13
	16-QAM	RB1#0	22.87	23.13	23.28
		RB1#37	23.14	23.31	23.62
		RB1#74	22.73	23.05	23.42
		RB36#0	21.84	21.76	22.08
		RB36#16	21.84	21.65	22.12
		RB36#35	21.91	21.83	22.37
		RB75#0	21.88	21.84	22.19

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
20M	QPSK	RB1#0	23.87	23.76	23.85
		RB1#49	24.26	24.24	24.61
		RB1#99	24.03	23.92	24.26
		RB50#0	22.78	22.67	22.74
		RB50#24	22.81	22.75	22.98
		RB50#49	22.81	22.98	23.25
		RB100#0	22.72	22.86	23.04
	16-QAM	RB1#0	22.83	22.95	22.63
		RB1#49	23.12	23.03	23.27
		RB1#99	22.69	22.85	23.11
		RB50#0	21.71	21.72	21.81
		RB50#24	21.72	21.86	22.07
		RB50#49	21.82	21.85	22.14
		RB100#0	21.70	21.74	22.00

WLAN 2.4G:

Mode	Channel frequency (MHz)	Data Rate	RF Average Output Power (dBm)
802.11b	2412	1Mbps	14.52
	2437		14.62
	2462		14.38
802.11g	2412	6Mbps	14.56
	2437		13.33
	2462		13.24
802.11n-ht20	2412	MCS0	14.03
	2437		14.06
	2462		13.92
802.11n-ht40	2422	MCS0	10.44
	2437		10.45
	2452		10.33

Duty Cycle:

Test Mode	Test frequency (MHz)	Duty Cycle [%]
802.11b	2437	99.45
802.11g	2437	96.04
802.11 n-ht20	2437	96.58
802.11 n-ht40	2437	92.29

Note: Duty cycle data for 2.4G WLAN, please refer to FCC ID: 2AJ2B-M1K, RF report of 2401A35544E-RF-00C, issued by Bay Area Compliance Laboratories Corp.(Shenzhen).

WLAN 5.2G:

Mode	Channel frequency (MHz)	Data Rate	RF Average Output Power (dBm)
802.11a	5180	1Mbps	15.69
	5200		15.51
	5240		15.38
802.11ac-vht20	5180	MCS0	17.25
	5200		17.08
	5240		16.96
802.11ac-vht40	5190	MCS0	17.18
	5230		17.10
802.11ac-vht80	5210	MCS0	16.81

Note: The n20/n40 mode was reduced test as identical parameter with ac20/ac40 mode.

Duty Cycle:

Test Mode	Test frequency (MHz)	Duty Cycle [%]
802.11a	5200	94.31
802.11ac-vht20	5200	96.61
802.11ac-vht40	5190	93.53
802.11ac-vht80	5210	87.03

Note: Duty cycle data for 5.2G WLAN, please refer to FCC ID: 2AJ2B-MIK, RF report of 2401A35544E-RF-00D, issued by Bay Area Compliance Laboratories Corp.(Shenzhen).

Bluetooth:

Mode	Channel frequency (MHz)	RF Conducted Output Power (dBm)
BDR(GFSK)	2402	3.63
	2441	4.71
	2480	3.91
EDR($\pi/4$ -DQPSK)	2402	2.61
	2441	3.70
	2480	3.01
EDR(8DPSK)	2402	2.67
	2441	3.68
	2480	2.97
BLE 1M	2402	-3.48
	2441	-2.26
	2480	-3.10

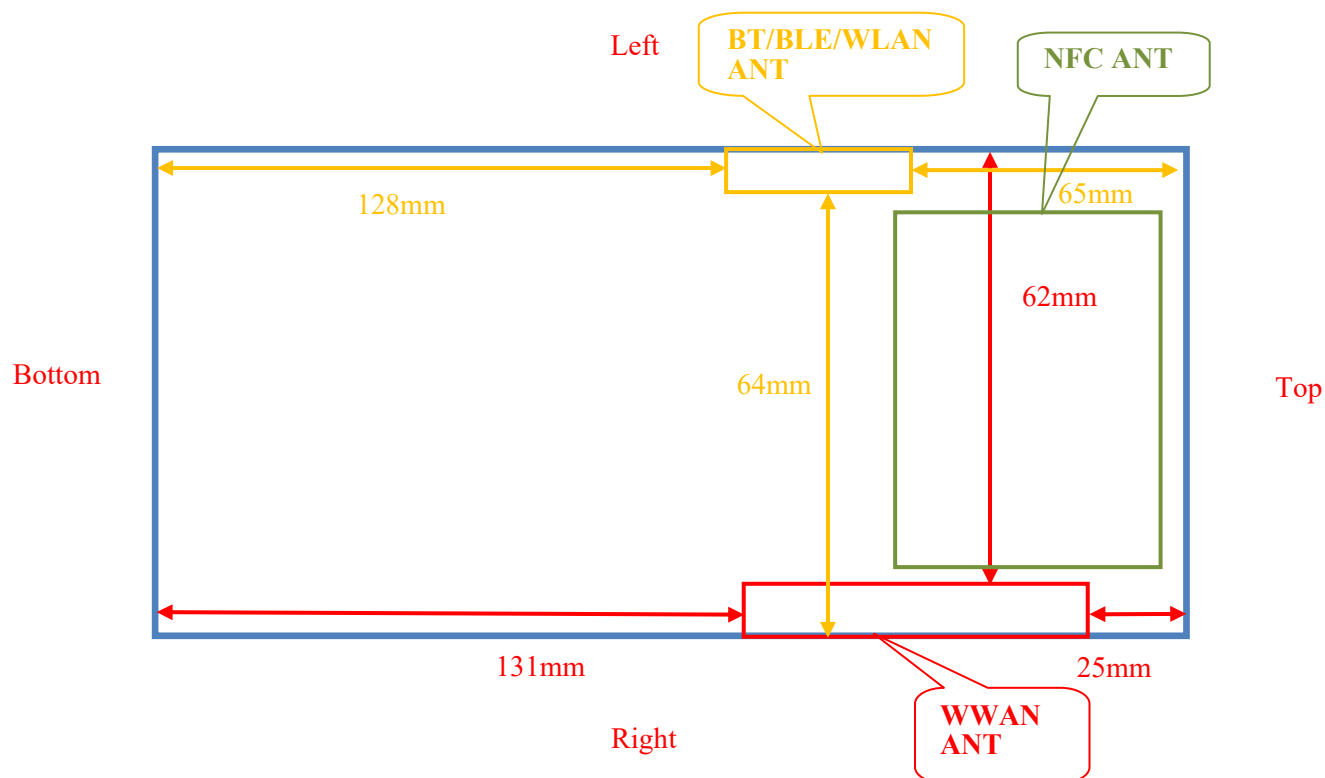
Duty Cycle:

Test Mode	Test frequency (MHz)	Duty Cycle [%]
BLE 1M	2402	84.35
	2441	84.73
	2480	84.51

Note: Duty cycle data for BLE, please refer to FCC ID: 2AJ2B-M1K, RF report of 2401A35544E-RF-00A, issued by Bay Area Compliance Laboratories Corp.(Shenzhen).

STANDALONE SAR TEST EXCLUSION CONSIDERATIONS

Antennas Location:



EUT Front View



EUT Right View



EUT Left View

Antenna Distance To Edge:

Antenna Distance To Edge(mm)						
Antenna	Front	Back	Left	Right	Top	Bottom
WWAN ANT	13	<5	62	< 5	25	131
BT/BLE/WLAN ANT	13	<5	<5	64	65	128

Standalone SAR test exclusion considerations:**Body Support:**

Mode	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Distance (mm)	Calculated value	Threshold (1-g)	SAR Test Exclusion
Bluetooth/BLE	2480	5.0	3.16	5	1.0	3	Yes
2.4G WLAN	2462	15.0	31.62	5	9.9	3	No
5.2G WLAN	5240	17.5	56.23	5	25.7	3	No

Limb:

Mode	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Distance (mm)	Calculated value	Threshold (10-g)	SAR Test Exclusion
Bluetooth/BLE	2480	5.0	3.16	0	1.0	7.5	Yes
2.4G WLAN	2462	15.0	31.62	0	9.9	7.5	No
5.2G WLAN	5240	17.5	56.23	0	25.7	7.5	No

NOTE:

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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot$

$[\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

1. $f(\text{GHz})$ is the RF channel transmit frequency in GHz.

2. Power and distance are rounded to the nearest mW and mm before calculation.

3. The result is rounded to one decimal place for comparison.

4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

According to KDB 447498 D01 General RF Exposure Guidance v06, clause 4.3. General SAR test exclusion guidance:

c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by $[1 + \log(100/f(\text{MHz}))]$

2) For test separation distances ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$

3) SAR measurement procedures are not established below 100 MHz.

Measurement Result:

For NFC, the power of EUT: E Field@3m is 67.19dBuV/m = -28.01 dBm(0.002mW)

Note: $E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2$ for $d = 3 \text{ m}$.

SAR test exclusion threshold for NFC(13.56MHz) separation distance $< 50\text{mm}$

$$= [474 * (1 + \log(100/f_{(\text{MHz})}))] / 2$$

$$= 443\text{mW}$$

$$> 0.002\text{mW}$$

Conclusion:

The NFC SAR evaluation can be exempted.

Note: NFC data please refer to FCC ID: 2AJ2B-M1K , RF report of 2401A35544E-RF-00F, issued by Bay Area Compliance Laboratories Corp.(Shenzhen).

Standalone SAR estimation:

Mode	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Distance (mm)	Estimated 1-g (W/kg)
BT Body	2480	5.0	3.16	5	0.13

Mode	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Distance (mm)	Estimated 10-g (W/kg)
BT Limb	2480	5.0	3.16	0	0.05

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})} / x]$$

W/kg for test separation distances $\leq 50 \text{ mm}$;

where $x = 7.5$ for 1-g SAR, 18.5 for 10-g SAR.

When the minimum test separation distance is $< 5 \text{ mm}$, a distance of 5 mm is applied to determine SAR test Exclusion

Standalone SAR test exclusion considerations:**Limb:**

Mode	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Test Exclusion Distance (mm)
GSM 850	848.8	27.3	537.03	73.0
PCS 1900	1909.8	25.0	316.23	54.4
WCDMA Band 2	1907.6	25.5	354.81	58.3
WCDMA Band 5	846.6	24.2	263.03	32.2
LTE Band 2	1900	25.6	363.08	59.1
LTE Band 4	1745	25.0	316.23	53.2
LTE Band 7	2560	25.4	346.74	61.2
LTE Band 38	2610	24.5	281.84	55.1
WLAN 2.4G	2462	15.0	31.62	6.6
WLAN 5.2G	5240	17.5	56.23	17.1

Note:

The maximum time based average power is used for calculation.

SAR test exclusion for the EUT edge considerations Result**Limb:**

Mode	Front	Back	Left	Right	Top	Bottom
GSM 850	Required	Required	Required	Required	Required	Exclusion
PCS 1900	Required	Required	Exclusion	Required	Required	Exclusion
WCDMA Band 2	Required	Required	Exclusion	Required	Required	Exclusion
WCDMA Band 5	Required	Required	Exclusion	Required	Required	Exclusion
LTE Band 2	Required	Required	Exclusion	Required	Required	Exclusion
LTE Band 4	Required	Required	Exclusion	Required	Required	Exclusion
LTE Band 7	Required	Required	Exclusion	Required	Required	Exclusion
LTE Band 38	Required	Required	Exclusion	Required	Required	Exclusion
WLAN 2.4G	Required	Required	Required	Exclusion	Exclusion	Exclusion
WLAN 5.2G	Required	Required	Required	Exclusion	Exclusion	Exclusion

Note:

Required: The distance is less than **Test Exclusion Distance**, the SAR test is required.

Exclusion: The distance is large than **Test Exclusion Distance**, SAR test is not required.

SAR test exclusion for the EUT edge considerations detail:**Distance< 50mm(To Edges)**

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:

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

1. $f(\text{GHz})$ is the RF channel transmit frequency in GHz.

2. Power and distance are rounded to the nearest mW and mm before calculation.

3. The result is rounded to one decimal place for comparison.

4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

Distance> 50mm(To Edges)

At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following:

a. $[\text{Power allowed at numeric threshold for 50 mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)]$ mW, at 100 MHz to 1500 MHz

b. $[\text{Power allowed at numeric threshold for 50 mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \cdot 10]$ mW at > 1500 MHz and ≤ 6 GHz.

SAR MEASUREMENT RESULTS

This page summarizes the results of the performed dosimetric evaluation.

Test Results:

Environmental Conditions:

Temperature:	22.5 ~ 23.8℃	21.8 ~ 23℃	21.7 ~ 22.5℃
Relative Humidity:	38 ~ 51%	32 ~ 48%	29 ~ 40%
ATM Pressure:	101.1kPa	101.2kPa	101.7kPa
Test Date:	2025/2/06	2025/2/07	2025/2/08

** Testing was performed by Bob Lu, Calvin Li and Sid Luo.*

GSM 850 :

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg) Limited=1.6W/kg			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Support (5mm)	824.2	GPRS	/	/	/	/	/	/
	836.6	GPRS	31.37	31.5	1.030	0.076	0.08	1#
	848.8	GPRS	/	/	/	/	/	/
EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	10g SAR (W/Kg), Limited=4.0W/kg			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Limb Front (0mm)	824.2	GPRS	/	/	/	/	/	/
	836.6	GPRS	31.37	31.5	1.030	0.092	0.10	/
	848.8	GPRS	/	/	/	/	/	/
Limb Back (0mm)	824.2	GPRS	/	/	/	/	/	/
	836.6	GPRS	31.37	31.5	1.030	0.159	0.17	/
	848.8	GPRS	/	/	/	/	/	/
Limb Left (0mm)	824.2	GPRS	/	/	/	/	/	/
	836.6	GPRS	31.37	31.5	1.030	0.054	0.06	/
	848.8	GPRS	/	/	/	/	/	/
Limb Right (0mm)	824.2	GPRS	/	/	/	/	/	/
	836.6	GPRS	31.37	31.5	1.030	0.206	0.22	2#
	848.8	GPRS	/	/	/	/	/	/
Limb Top (0mm)	824.2	GPRS	/	/	/	/	/	/
	836.6	GPRS	31.37	31.5	1.030	0.048	0.05	/
	848.8	GPRS	/	/	/	/	/	/

Note:

1. When the SAR value is less than half of the limit, testing for other channels are optional.
2. The EUT transmit and receive through the same GSM antenna while testing SAR.
3. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.
4. When the maximum output power variation across the required test channels is > 0.5 dB, instead of the middle channel, the highest output power channel must be used.
5. The Multi-slot Classes of EUT is Class 12 which has maximum 4 Downlink slots and 4 Uplink slots, the maximum active slots is 5, when perform the multiple slots scan, 2DL+3UL is the worst case.
6. The max. time based average power of GSM/GPRS/EGPRS mode was selected to Body and Limb SAR testing.

PCS 1900 :

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg) Limited=1.6W/kg			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Support (5mm)	1850.2	GPRS	/	/	/	/	/	/
	1880	GPRS	30.78	31.0	1.052	0.063	0.07	3#
	1909.8	GPRS	/	/	/	/	/	/
EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	10g SAR (W/Kg), Limited=4.0W/kg			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Limb Front (0mm)	1850.2	GPRS	/	/	/	/	/	/
	1880	GPRS	30.78	31.0	1.052	0.045	0.05	/
	1909.8	GPRS	/	/	/	/	/	/
Limb Back (0mm)	1850.2	GPRS	/	/	/	/	/	/
	1880	GPRS	30.78	31.0	1.052	0.116	0.13	/
	1909.8	GPRS	/	/	/	/	/	/
Limb Right (0mm)	1850.2	GPRS	/	/	/	/	/	/
	1880	GPRS	30.78	31.0	1.052	0.420	0.45	4#
	1909.8	GPRS	/	/	/	/	/	/
Limb Top (0mm)	1850.2	GPRS	/	/	/	/	/	/
	1880	GPRS	30.78	31.0	1.052	0.009	0.01	/
	1909.8	GPRS	/	/	/	/	/	/

Note:

1. When the SAR value is less than half of the limit, testing for other channels are optional.
2. The EUT transmit and receive through the same GSM antenna while testing SAR.
3. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.
4. When the maximum output power variation across the required test channels is > 0.5 dB, instead of the middle channel, the highest output power channel must be used.
5. The Multi-slot Classes of EUT is Class 12 which has maximum 4 Downlink slots and 4 Uplink slots, the maximum active slots is 5, when perform the multiple slots scan, 3DL+2UL is the worst case.
6. The max. time based average power of GSM/GPRS/EGPRS mode was selected to Body and Limb SAR testing.

WCDMA Band 2 :

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg) Limited=1.6W/kg			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Support (5mm)	1852.4	RMC	/	/	/	/	/	/
	1880	RMC	25.19	25.5	1.074	0.131	0.15	5#
	1907.6	RMC	/	/	/	/	/	/
EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	10g SAR (W/Kg), Limited=4.0W/kg			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Limb Front (0mm)	1852.4	RMC	/	/	/	/	/	/
	1880	RMC	25.19	25.5	1.074	0.108	0.12	/
	1907.6	RMC	/	/	/	/	/	/
Limb Back (0mm)	1852.4	RMC	/	/	/	/	/	/
	1880	RMC	25.19	25.5	1.074	0.214	0.23	/
	1907.6	RMC	/	/	/	/	/	/
Limb Right (0mm)	1852.4	RMC	/	/	/	/	/	/
	1880	RMC	25.19	25.5	1.074	0.743	0.80	6#
	1907.6	RMC	/	/	/	/	/	/
Limb Top (0mm)	1852.4	RMC	/	/	/	/	/	/
	1880	RMC	25.19	25.5	1.074	0.020	0.03	/
	1907.6	RMC	/	/	/	/	/	/

WCDMA Band 5 :

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg) Limited=1.6W/kg			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Support (5mm)	826.4	RMC	/	/	/	/	/	/
	836.6	RMC	23.96	24.2	1.057	0.049	0.06	7#
	846.6	RMC	/	/	/	/	/	/
EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	10g SAR (W/Kg), Limited=4.0W/kg			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Limb Front (0mm)	826.4	RMC	/	/	/	/	/	/
	836.6	RMC	23.96	24.2	1.057	0.073	0.08	/
	846.6	RMC	/	/	/	/	/	/
Limb Back (0mm)	826.4	RMC	/	/	/	/	/	/
	836.6	RMC	23.96	24.2	1.057	0.089	0.10	/
	846.6	RMC	/	/	/	/	/	/
Limb Right (0mm)	826.4	RMC	/	/	/	/	/	/
	836.6	RMC	23.96	24.2	1.057	0.115	0.13	8#
	846.6	RMC	/	/	/	/	/	/
Limb Top (0mm)	826.4	RMC	/	/	/	/	/	/
	836.6	RMC	23.96	24.2	1.057	0.034	0.04	/
	846.6	RMC	/	/	/	/	/	/

Note:

1. When the SAR value is less than half of the limit, testing for other channels are optional.
2. The EUT transmit and receive through the same antenna while testing SAR.
3. The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2 kbps RMC (reference measurement Channel) Configured in Test Loop Model.
4. KDB 941225 D01-Body SAR is not required for HSDPA/HSUPA/HSPA+ when the maximum average output of each RF channel is less than ¼ dB higher than measured 12.2kbps RMC or the maximum SAR for 12.2kbps RMC is < 75% of SAR limit.
5. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.

LTE Band 2 :

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg) Limited=1.6W/kg			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Support (5mm)	1860	20	1RB	/	/	/	/	/	/
	1880	20	1RB	25.15	25.8	1.161	0.098	0.12	/
	1900	20	1RB	/	/	/	/	/	/
	1880	20	50%RB	23.92	25.8	1.542	0.081	0.13	9#
EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	10g SAR (W/Kg), Limited=4.0W/kg			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Limb Front (0mm)	1860	20	1RB	/	/	/	/	/	/
	1880	20	1RB	25.15	25.8	1.161	0.108	0.13	/
	1900	20	1RB	/	/	/	/	/	/
	1880	20	50%RB	23.92	25.8	1.542	0.086	0.14	/
Limb Back (0mm)	1860	20	1RB	/	/	/	/	/	/
	1880	20	1RB	25.15	25.8	1.161	0.204	0.24	/
	1900	20	1RB	/	/	/	/	/	/
	1880	20	50%RB	23.92	25.8	1.542	0.177	0.28	/
Limb Right (0mm)	1860	20	1RB	/	/	/	/	/	/
	1880	20	1RB	25.15	25.8	1.161	0.848	0.99	/
	1900	20	1RB	/	/	/	/	/	/
	1880	20	50%RB	23.92	25.8	1.542	0.699	1.08	10#
Limb Top (0mm)	1860	20	1RB	/	/	/	/	/	/
	1880	20	1RB	25.15	25.8	1.161	0.018	0.03	/
	1900	20	1RB	/	/	/	/	/	/
	1880	20	50%RB	23.92	25.8	1.542	0.016	0.03	/

LTE Band 4 :

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg) Limited=1.6W/kg			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Support (5mm)	1720	20	1RB	/	/	/	/	/	/
	1732.5	20	1RB	24.91	25.0	1.021	0.053	0.06	/
	1745	20	1RB	/	/	/	/	/	/
	1732.5	20	50%RB	23.89	25.0	1.291	0.046	0.06	11#
EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	10g SAR (W/Kg), Limited=4.0W/kg			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Limb Front (0mm)	1720	20	1RB	/	/	/	/	/	/
	1732.5	20	1RB	24.91	25.0	1.021	0.081	0.09	/
	1745	20	1RB	/	/	/	/	/	/
	1732.5	20	50%RB	23.89	25.0	1.291	0.069	0.09	/
Limb Back (0mm)	1720	20	1RB	/	/	/	/	/	/
	1732.5	20	1RB	24.91	25.0	1.021	0.144	0.15	/
	1745	20	1RB	/	/	/	/	/	/
	1732.5	20	50%RB	23.89	25.0	1.291	0.125	0.17	/
Limb Right (0mm)	1720	20	1RB	/	/	/	/	/	/
	1732.5	20	1RB	24.91	25.0	1.021	0.455	0.47	/
	1745	20	1RB	/	/	/	/	/	/
	1732.5	20	50%RB	23.89	25.0	1.291	0.403	0.53	12#
Limb Top (0mm)	1720	20	1RB	/	/	/	/	/	/
	1732.5	20	1RB	24.91	25.0	1.021	0.018	0.02	/
	1745	20	1RB	/	/	/	/	/	/
	1732.5	20	50%RB	23.89	25.0	1.291	0.016	0.03	/

LTE Band 7 :

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg) Limited=1.6W/kg			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Support (5mm)	2510	20	1RB	/	/	/	/	/	/
	2535	20	1RB	25.08	25.4	1.076	0.172	0.19	/
	2565	20	1RB	/	/	/	/	/	/
	2535	20	50%RB	23.81	25.4	1.442	0.138	0.20	13#
EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	10g SAR (W/Kg), Limited=4.0W/kg			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Limb Front (0mm)	2510	20	1RB	/	/	/	/	/	/
	2535	20	1RB	25.08	25.4	1.076	0.158	0.18	/
	2565	20	1RB	/	/	/	/	/	/
	2535	20	50%RB	23.81	25.4	1.442	0.120	0.18	/
Limb Back (0mm)	2510	20	1RB	/	/	/	/	/	/
	2535	20	1RB	25.08	25.4	1.076	0.239	0.26	/
	2565	20	1RB	/	/	/	/	/	/
	2535	20	50%RB	23.81	25.4	1.442	0.215	0.32	/
Limb Right (0mm)	2510	20	1RB	/	/	/	/	/	/
	2535	20	1RB	25.08	25.4	1.076	0.995	1.08	/
	2565	20	1RB	/	/	/	/	/	/
	2535	20	50%RB	23.81	25.4	1.442	0.880	1.27	14#
Limb Top (0mm)	2510	20	1RB	/	/	/	/	/	/
	2535	20	1RB	25.08	25.4	1.076	0.132	0.15	/
	2565	20	1RB	/	/	/	/	/	/
	2535	20	50%RB	23.81	25.4	1.442	0.119	0.18	/

LTE Band 38 :

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg) Limited=1.6W/kg			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Support (5mm)	2580	20	1RB	/	/	/	/	/	/
	2595	20	1RB	24.24	24.5	1.062	0.099	0.11	/
	2610	20	1RB	/	/	/	/	/	/
	2595	20	50%RB	22.98	24.5	1.419	0.090	0.13	15#
EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	10g SAR (W/Kg), Limited=4.0W/kg			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Limb Front (0mm)	2580	20	1RB	/	/	/	/	/	/
	2595	20	1RB	24.24	24.5	1.062	0.085	0.10	/
	2610	20	1RB	/	/	/	/	/	/
	2595	20	50%RB	22.98	24.5	1.419	0.071	0.11	/
Limb Back (0mm)	2580	20	1RB	/	/	/	/	/	/
	2595	20	1RB	24.24	24.5	1.062	0.123	0.14	/
	2610	20	1RB	/	/	/	/	/	/
	2595	20	50%RB	22.98	24.5	1.419	0.108	0.16	/
Limb Right (0mm)	2580	20	1RB	/	/	/	/	/	/
	2595	20	1RB	24.24	24.5	1.062	0.544	0.58	/
	2610	20	1RB	/	/	/	/	/	/
	2595	20	50%RB	22.98	24.5	1.419	0.485	0.69	16#
Limb Top (0mm)	2580	20	1RB	/	/	/	/	/	/
	2595	20	1RB	24.24	24.5	1.062	0.108	0.12	/
	2610	20	1RB	/	/	/	/	/	/
	2595	20	50%RB	22.98	24.5	1.419	0.105	0.15	/

Note:

1. When the SAR value is less than half of the limit, testing for other channels are optional.
2. SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02.
3. KDB941225D05-SAR for higher order modulation is required only when the highest maximum output power for the configuration in the higher order modulation is > 0.5 dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg
4. KDB941225D05-For QPSK with 100% RB allocation, when the reported SAR measured for the Highest output power channel is <1.45 W/kg, tests for the remaining required test channels are optional.
5. KDB941225D05- 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.
6. KDB941225D05- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offset the upper edge, middle and lower edge of each required test channel.
7. KDB941225D05- other channel bandwidths SAR test is required when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > 0.5 dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

WLAN 2.4G:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg) Limited=1.6W/kg				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Body Support (5mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	14.62	15.0	1.091	1.01	0.097	0.11	17#
	2462	802.11b	/	/	/	/	/	/	/
EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	10g SAR (W/Kg), Limited=4.0W/kg				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Limb Front (0mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	14.62	15.0	1.091	1.01	0.069	0.08	/
	2462	802.11b	/	/	/	/	/	/	/
Limb Back (0mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	14.62	15.0	1.091	1.01	0.367	0.40	18#
	2462	802.11b	/	/	/	/	/	/	/
Limb Left (0mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	14.62	15.0	1.091	1.01	0.356	0.39	/
	2462	802.11b	/	/	/	/	/	/	/

Note:

1. When the SAR value is less than half of the limit, testing for other channels are optional.
2. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.
3. For 802.11b mode power is the largest among 802.11b/g/n-ht20/n-ht40, 802.11b mode as initial test configuration is selected to test.
4. According KDB 248227 D01, for SAR testing of 802.11 WIFI signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)".

WLAN 5.2G:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg) Limited=1.6W/kg				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Body Support (5mm)	5180	802.11ac-vht20	/	/	/	/	/	/	/
	5200	802.11ac-vht20	17.08	17.5	1.102	1.04	0.036	0.04	19#
	5240	802.11ac-vht20	/	/	/	/	/	/	/
EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	10g SAR (W/Kg), Limited=4.0W/kg				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Limb Front (0mm)	5180	802.11ac-vht20	/	/	/	/	/	/	/
	5200	802.11ac-vht20	17.08	17.5	1.102	1.04	<0.001	0.01	/
	5240	802.11ac-vht20	/	/	/	/	/	/	/
Limb Back (0mm)	5180	802.11ac-vht20	/	/	/	/	/	/	/
	5200	802.11ac-vht20	17.08	17.5	1.102	1.04	0.113	0.13	20#
	5240	802.11ac-vht20	/	/	/	/	/	/	/
Limb Left (0mm)	5180	802.11ac-vht20	/	/	/	/	/	/	/
	5200	802.11ac-vht20	17.08	17.5	1.102	1.04	0.024	0.03	/
	5240	802.11ac-vht20	/	/	/	/	/	/	/

Note:

1. When the SAR value is less than half of the limit, testing for other channels are optional.
2. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.
3. For 802.11ac-vht20 mode power is the largest among 802.11a/ac-vht20/ac-vht40/ac-vht80, 802.11ac-vht20 mode as initial test configuration is selected to test.
4. According KDB 248227 D01, for SAR testing of 802.11 WIFI signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)".

SAR Measurement Variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01. 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 < 0.80 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 ($\sim 10\%$ 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 .

The Highest Measured SAR Configuration in Each Frequency Band

Body

SAR probe calibration point	Frequency Band	Freq.(MHz)	EUT Position	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio
				Original	Repeated	
/	/	/	/	/	/	/

Limb

SAR probe calibration point	Frequency Band	Freq.(MHz)	EUT Position	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio
				Original	Repeated	
/	/	/	/	/	/	/

Note:

1. Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20 .
2. The measured SAR results **do not** have to be scaled to the maximum tune-up tolerance to determine if repeated measurements are required.
3. SAR measurement variability must be assessed for each frequency band, which is determined by the **SAR probe calibration point and tissue-equivalent medium** used for the device measurements.

SAR DUT HOLDER PERTURBATIONS

In accordance with TCB workshop October 2016:

1) SAR perturbation due to test device holders, depending on antenna locations, buttons locations on phones or device, form factor (e.g. dongles etc.), the measured SAR could be influenced by the relative positions of the test device and its holder

2) SAR measurement standards have included protocols to evaluate this with a flat phantom, with and without the device holder

3) When the highest reported SAR of an antenna is > 1.2 W/kg, holder perturbation verification is required for each antenna, using the highest SAR configuration among all applicable frequency bands in the same exact device and holder positions used for head and body SAR measurements; i.e. same device/button locations in the holder

Per IEEE 1528: 2013/Annex E/E.4.1.1: Device holder perturbation tolerance for a specific test device: Type B
When it is unknown if a device holder perturbs the fields of a test device, the SAR uncertainty shall be assessed with a flat phantom (see Clause 5) by comparing the SAR with and without the device holder according to the following tests:

The SAR tolerance for device holder disturbance is computed using Equation (E.21) and entered in the corresponding row of the appropriate uncertainty table with an assumed rectangular probability distribution and $\nu_i = \infty$ degrees of freedom:

$$SAR_{\text{tolerance}} [\%] = 100 \times \left(\frac{SAR_{\text{w/holder}} - SAR_{\text{w/o holder}}}{SAR_{\text{w/o holder}}} \right) \quad (\text{E.21})$$

The Highest Measured SAR Configuration among all applicable Frequency Band

Frequency Band	Freq.(MHz)	EUT Position	Meas. SAR (W/kg)		The Device holder perturbation uncertainty
			With holder	Without holder	
/	/	/	/	/	/

SAR SIMULTANEOUS TRANSMISSION DESCRIPTION

Simultaneous Transmission:

Description of Simultaneous Transmit Capabilities	
Transmitter Combination	Simultaneous?
WWAN(GSM/WCDMA/LTE) + Bluetooth + NFC	√
WWAN(GSM/WCDMA/LTE) + WLAN + NFC	√
WLAN + Bluetooth	×

Simultaneous SAR test exclusion considerations:

Mode (SAR1+SAR2)	Position	Reported SAR(W/kg)		Σ SAR < 1.6W/kg
		SAR1	SAR2	
MAX.WWAN(GSM/WCDMA/LTE) + Bluetooth	Body Support	0.20	0.13	0.33
MAX.WWAN(GSM/WCDMA/LTE) + 2.4G WLAN		0.20	0.11	0.31
MAX.WWAN(GSM/WCDMA/LTE) + 5G WLAN		0.20	0.04	0.24

Conclusion:

Sum of SAR: Σ SAR $\leq$ 1.6 W/kg therefore simultaneous transmission Body SAR with Volume Scans is not required.

Mode (SAR1+SAR2)	Position	Reported SAR(W/kg)		Σ SAR < 4.0W/kg
		SAR1	SAR2	
MAX.WWAN(GSM/WCDMA/LTE) + Bluetooth	Limb	1.27	0.05	1.32
MAX.WWAN(GSM/WCDMA/LTE) + 2.4G WLAN		1.27	0.40	1.67
MAX.WWAN(GSM/WCDMA/LTE) + 5G WLAN		1.27	0.13	1.40

Note:

For the EIRP of NFC is 0.002mW, per KDB447498 D01 clause 4.3, the estimated SAR is so lower, so the NFC almost have no influence on the results of simultaneous transmission.

Conclusion:

Sum of SAR: Σ SAR $\leq$ 4.0 W/kg therefore simultaneous transmission Limb SAR with Volume Scans is **not** required.

SAR Plots

Please Refer to the Attachment.

APPENDIX A MEASUREMENT UNCERTAINTY

The uncertainty budget has been determined for the measurement system and is given in the following Table.

Measurement uncertainty evaluation for IEEE1528-2013 SAR test

Source of uncertainty	Tolerance/ uncertainty y ± %	Probability distributio n	Divisor	ci (1 g)	ci (10 g)	Standard uncertai nty ± %, (1 g)	Standard uncertai nty ± %, (10 g)
Measurement system							
Probe calibration	13.9	N	1	1	1	13.9	13.9
Axial Isotropy	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
Hemispherical Isotropy	9.6	R	$\sqrt{3}$	0	0	0.0	0.0
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Linearity	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
Detection limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Modulation response	4.0	R	$\sqrt{3}$	1	1	2.3	2.3
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	$\sqrt{3}$	1	1	0.0	0.0
Integration time	0.0	R	$\sqrt{3}$	1	1	0.0	0.0
RF ambient conditions – noise	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
RF ambient conditions—reflections	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Probe positioner mech. Restrictions	0.8	R	$\sqrt{3}$	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	$\sqrt{3}$	1	1	3.9	3.9
Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation	3.9	R	$\sqrt{3}$	1	1	2.3	2.3
Test sample related							
Test sample positioning	2.8	N	1	1	1	2.8	2.8
Device holder uncertainty	6.3	N	1	1	1	6.3	6.3
Drift of output power	5.0	R	$\sqrt{3}$	1	1	2.9	2.9
SAR scaling	2.0	R	$\sqrt{3}$	1	1	1.2	1.2
Phantom and tissue parameters							
Phantom uncertainty (shape and thickness tolerances)	4.0	R	$\sqrt{3}$	1	1	2.3	2.3
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.9	1.6
Liquid conductivity measurement	5.5	N	1	0.78	0.71	4.3	3.9
Liquid permittivity measurement	2.9	N	1	0.23	0.26	0.7	0.8
Liquid conductivity—temperature uncertainty	1.7	R	$\sqrt{3}$	0.78	0.71	0.8	0.7
Liquid permittivity—temperature uncertainty	2.7	R	$\sqrt{3}$	0.23	0.26	0.4	0.4
Combined standard uncertainty		RSS				12.2	12.0
Expanded uncertainty 95 % confidence interval)						24.3	23.9

APPENDIX B EUT TEST POSITION PHOTOS

Please Refer to the Attachment.

APPENDIX C PROBE CALIBRATION CERTIFICATES

Please Refer to the Attachment.

APPENDIX D DIPOLE CALIBRATION CERTIFICATES

Please Refer to the Attachment.

APPENDIX E RETURN LOSS&IMPEDANCE MEASUREMENT

Please Refer to the Attachment.

******* END OF REPORT *******