NVLAP LAB CODE 600341-0

FCC SAR TEST REPORT

Applicant:	**Shenzhen Youmi Intelligent Technology Co., Ltd.**
Address:	**406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China**
Product Name:	**Smart Tablet Computer**
FCC ID:	**2ATZ4-TG79PA15**
Standard(s):	**47 CFR Part 2(2.1093)**
Report Number:	**2402T76732E-20A**
Report Date:	**2024/08/22**

The above device has been tested and found compliant with the requirement of the relative standards by Bay Area Compliance Laboratories Corp. (Dongguan).

Reviewed By: Mark Dong	**Approved By:** Brave Lu
Title: SAR Engineer	Title: SAR Engineer

Bay Area Compliance Laboratories Corp. (Dongguan)
No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China
Tel: +86-769-86858888
Fax: +86-769-86858891
www.baclcorp.com.cn

SAR TEST RESULTS SUMMARY

Mode		Max. Reported SAR Level(s) (W/kg)	Limit (W/kg)
GSM 850	1 g Body SAR	0.51	1.6
GSM 1900	1 g Body SAR	**1.18**	
WCDMA Band 2	1 g Body SAR	0.87	
WCDMA Band 5	1 g Body SAR	1.02	
LTE Band 2	1 g Body SAR	1.16	
LTE Band 5	1 g Body SAR	0.28	
LTE Band 7	1 g Body SAR	1.02	
LTE Band 12	1 g Body SAR	0.97	
LTE Band 41	1 g Body SAR	0.78	
WIFI 2.4G	1 g Body SAR	0.43	
WIFI 5.2G	1 g Body SAR	0.38	
WIFI 5.8G	1 g Body SAR	0.35	
BT	1 g Body SAR	0.06	
Simultaneous	1g Body SAR	**1.59**	
	1g Body SAR	**1.59**(Hotspot)	

Applicable Standards	**FCC 47 CFR part 2.1093** Radiofrequency radiation exposure evaluation: portable devices
	IEEE1528:2013 IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
	IEC 62209-2:2010 Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices-Human models, instrumentation, and procedures-Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)
	KDB procedures KDB 447498 D01 General RF Exposure Guidance v06 KDB 616217 D04 SAR for laptop and tablets v01r02 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 941225 D06 Hotspot Mode v02r01 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.**	

CONTENTS

SAR TEST RESULTS SUMMARY 2
DOCUMENT REVISION HISTORY 5
1. GENERAL INFORMATION 6
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 6
2. REFERENCE, STANDARDS, AND GUIDELINES 7
2.1 SAR LIMITS 7
2.2 TEST FACILITY 8
3. DESCRIPTION OF TEST SYSTEM 9
4. EQUIPMENT LIST AND CALIBRATION 14
4.1 EQUIPMENTS LIST & CALIBRATION INFORMATION 14
5. SAR MEASUREMENT SYSTEM VERIFICATION 15
5.1 LIQUID VERIFICATION 15
5.2 LIQUID VERIFICATION RESULTS 15
5.3 SYSTEM ACCURACY VERIFICATION 18
5.4 SYSTEM ACCURACY CHECK RESULTS 18
5.5 SAR SYSTEM VALIDATION DATA 19
6. EUT TEST STRATEGY AND METHODOLOGY 27
6.1TEST POSITIONS FOR BODY-WORN AND OTHER CONFIGURATIONS 27
6.2TEST DISTANCE FOR SAR EVALUATION 27
6.3 SAR EVALUATION PROCEDURE 28
7. CONDUCTED OUTPUT POWER MEASUREMENT 29
7.1 TEST PROCEDURE 29
7.2 RADIO CONFIGURATION 29
7.3 MAXIMUM TARGET OUTPUT POWER 35
7.4 TEST RESULTS: 37
8. STANDALONE SAR TEST EXCLUSION CONSIDERATIONS 53
8.1 ANTENNAS LOCATION: 53
8.2 ANTENNA DISTANCE TO EDGE 53
8.3 SAR TEST EXCLUSION FOR THE EUT EDGE CONSIDERATIONS RESULT 54
9. SAR MEASUREMENT RESULTS 56
9.1 SAR TEST DATA 56
10. MEASUREMENT VARIABILITY 67
11. SAR SIMULTANEOUS TRANSMISSION DESCRIPTION 68

11.1 SIMULTANEOUS TRANSMISSION: **68**
11.2 SIMULTANEOUS SAR TEST EXCLUSION CONSIDERATIONS: **68**
APPENDIX A - MEASUREMENT UNCERTAINTY **69**
APPENDIX B - SAR PLOTS **71**
APPENDIX C - EUT TEST POSITION PHOTOS **72**
APPENDIX D - PROBE CALIBRATION CERTIFICATES **73**
APPENDIX E - DIPOLE CALIBRATION CERTIFICATES **74**

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2402T76732E-20A	Original Report	2024/08/22

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Smart Tablet Computer
EUT Model:	TG4FBG9TA
Multiple Models:	TG4HBG9PA, TG4FBG7TA
Device Type:	Portable
Exposure Category:	Population / Uncontrolled
Antenna Type(s):	Internal Antenna
Body-Worn Accessories:	None
Proximity Sensor:	None
Carrier Aggregation:	None
Operation Modes:	GSM, GPRS/EDGE Data, WCDMA(R99 (Data), HSUPA/HSDPA), FDD-LTE, TDD-LTE,WLAN, Bluetooth
Operation Frequency:	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); 1930-1990 MHz(RX) LTE Band 5: 824-849MHz(TX) ; 869-894 MHz(RX) LTE Band 7: 2500-2570 MHz(TX); 2620-2690 MHz(RX) LTE Band 12: 699-716 MHz(TX); 729-746 MHz(RX) LTE Band 41: 2535-2655 MHz(TX/RX) WLAN 2.4G: 2412-2462 MHz/2422MHz-2452 MHz(TX/RX) WLAN 5.2G: 5150 -5250 MHz(TX/RX) WLAN 5.8G: 5725 -5850 MHz(TX/RX) Bluetooth: 2402-2480MHz(TX/RX)
Maximum Output Power	GSM 850: 32.65 dBm; PCS 1900: 25.12 dBm WCDMA Band 2: 15.34 dBm; WCDMA Band 5: 22.58 dBm LTE Band 2: 18.49 dBm; LTE Band 5: 21.26 dBm LTE Band 7:15.54 dBm; LTE Band 12: 24.91 dBm LTE Band 41: 17.03 dBm WLAN 2.4G: 10.46 dBm WLAN 5.2G: 7.73 dBm WLAN 5.8G: 7.62 dBm Bluetooth(BDR/EDR): 5.76 dBm BLE: 0.10 dBm
Dimensions (L*W*H):	257mm (L) *168mm (W) *91mm (H)
Rated Input Voltage:	DC3.85V from Rechargeable Battery
Serial Number:	2LNW-1
Normal Operation:	Body Supported
EUT Received Date:	2024/5/24
Test Date:	2024/07/26~2024/08/21
EUT Received Status:	Good
Note: The Multiple models are electrically identical with the test model. Please refer to the declaration letter for more detail, which was provided by manufacturer.	

2. 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.

2.1 SAR Limits

FCC Limit

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
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4	20

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 (FCC) applied to the EUT.

2.2 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

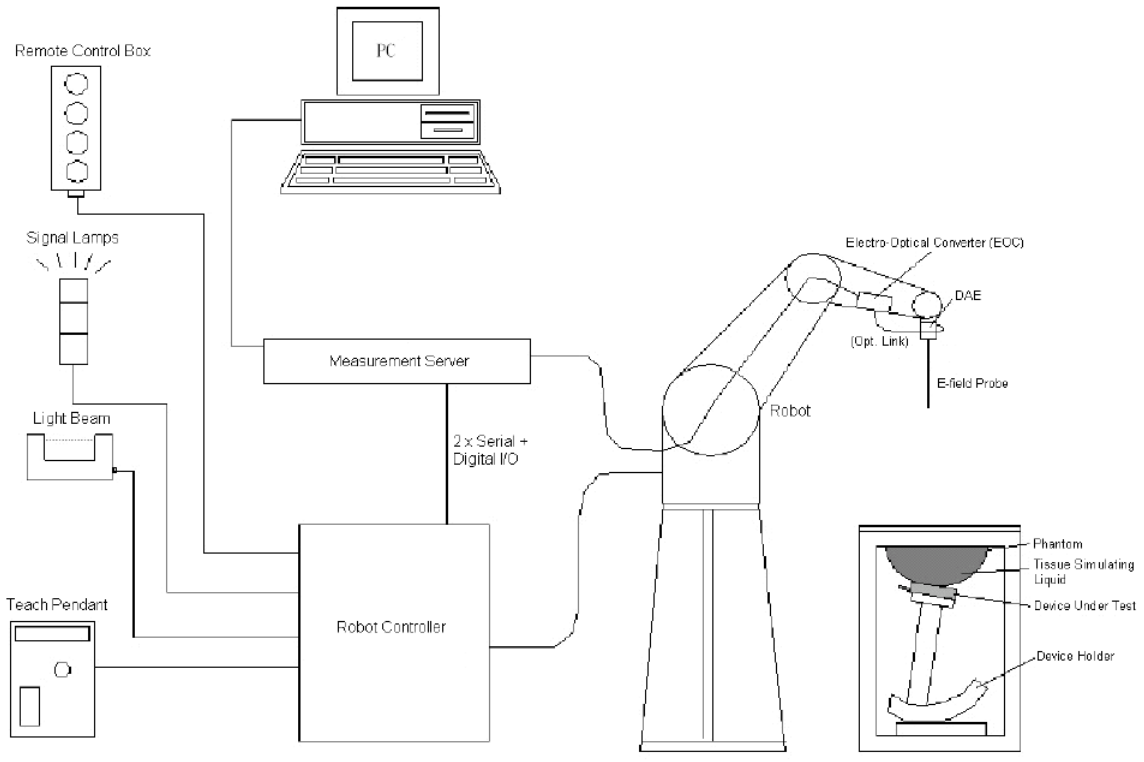
The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. :829273, the FCC Designation No. : CN5044.

3. DESCRIPTION OF TEST SYSTEM

These measurements were performed with the automated near-field scanning system DASY5 from Schmid & Partner Engineering AG (SPEAG) which is the Fifth generation of the system shown in the figure hereinafter:

DASY5 System Description

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal 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.

DASY5 Measurement Server

The DASY5 measurement server is based on a PC/104 CPU board with a 400MHz Intel ULV Celeron, 128MB chip-disk and 128MB 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 DASY5 I/O board, which is directly connected to the PC/104 bus of the CPU board.

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

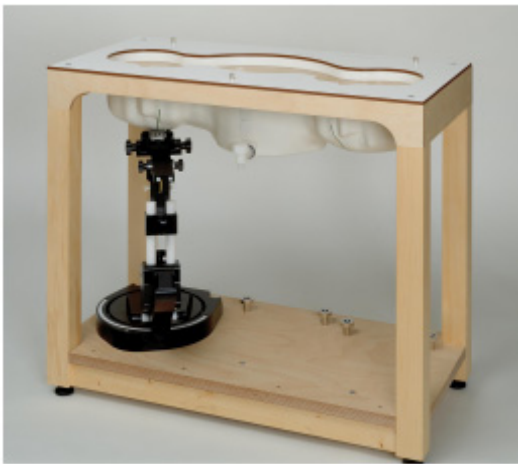
The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of both the DAE4 as well as of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

EX3DV4 E-Field Probes

Frequency	4 MHz–10 GHz Linearity: ± 0.2 dB (30 MHz–10 GHz)
Directivity(typical)	± 0.1 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g – > 100 mW/g Linearity: ± 0.2 dB (noise: typically< 1 µW/g)
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Applications	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, DASY6, DASY8, EASY6, EASY4/MRI

SAM Twin Phantom



The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness
increases to 6 mm). The phantom has three measurement areas:
_ Left Head
_ Right Head
_ Flat phantom

The phantom table for the DASY systems based on the robots have the size of 100 x 50 x 85 cm (L x W x H).
For easy dislocation these tables have fork lift cut outs at the bottom.
The bottom plate contains three pairs of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. Only one device holder is necessary if two phantoms are used (e.g., for different liquids)

A white cover is provided to cover the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on top of this phantom cover are possible.
Three reference marks are provided on the phantom counter. These reference marks are used to teach the absolute phantom position relative to the robot.

Robots

The DASY5 system uses the high precision industrial robot. The robot offers the same features important for our application:

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

The above mentioned robots are controlled by the Staubli CS7MB robot controllers. All information regarding the use and maintenance of the robot arm and the robot controller is contained on the CDs delivered along with the robot. Paper manuals are available upon request direct from Staubli.

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.

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/m^3 is used to represent the head and body tissue density and not the phantomliquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1g cube is 10mm,with the side length of the 10g cube is 21.5mm.

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 x7 x 7 (5mmx5mmx5mm) 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 IEC 62209-1:2016

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
750	*41,9*	*0,89*
835	41,5	0,90
900	41,5	0,97
1 450	40,5	1,20
1 500	*40,4*	*1,23*
1 640	*40,2*	*1,31*
1 750	*40,1*	*1,37*
1 800	40,0	1,40
1 900	40,0	1,40
2 000	40,0	1,40
2 100	*39,8*	*1,49*
2 300	*39,5*	*1,67*
2 450	39,2	1,80
2 600	*39,0*	*1,96*
3 000	38,5	2,40
3 500	*37,9*	*2,91*
4 000	*37,4*	*3,43*
4 500	*36,8*	*3,94*
5 000	*36,2*	*4,45*
5 200	*36,0*	*4,66*
5 400	*35,8*	*4,86*
5 600	*35,5*	*5,07*
5 800	*35,3*	*5,27*
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.

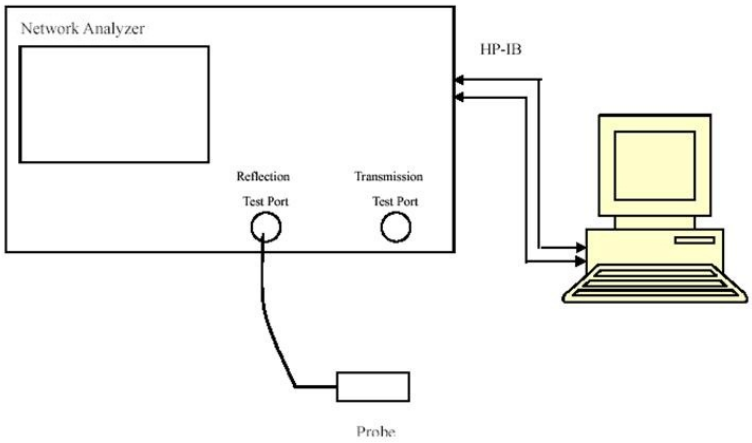
4. EQUIPMENT LIST AND CALIBRATION

4.1 Equipments List & Calibration Information

Equipment	Model	S/N	Calibration Date	Calibration Due Date
DASY5 Test Software	DASY52.10	N/A	NCR	NCR
DASY5 Measurement Server	DASY5 4.5.12	1470	NCR	NCR
Data Acquisition Electronics	DAE4	772	2024/1/23	2025/1/22
E-Field Probe	EX3DV4	7839	2023/9/21	2024/9/20
Mounting Device	MD4HHTV5	SD 000 H01 KA	NCR	NCR
Twin SAM	Twin SAM V5.0	1874	NCR	NCR
Dipole, 750 MHz	D750V3	1167	2022/10/31	2025/10/30
Dipole, 835 MHz	D835V2	453	2021/8/31	2024/8/30
Dipole, 1900 MHz	D1900V2	543	2022/11/2	2025/11/1
Dipole, 2450 MHz	D2450V2	971	2024/6/15	2027/6/14
Dipole, 2600 MHz	D2600V2	1132	2022/11/1	2025/10/31
Dipole,5GHz	D5GHzV2	1246	2022/11/1	2025/10/31
Simulated Tissue Liquid Head	HBBL600-10000V6	SL AAH U16 BC(Batch: 220809-1)	Each Time	/
Network Analyzer	8753C	3033A02857	2023/11/18	2024/11/17
Dielectric assessment kit	1253	SM DAK 040 CA	NCR	NCR
synthesized signal generator	8665B	3438a00584	2023/10/18	2024/10/17
EPM Series Power Meter	E4419B	MY45103907	2023/10/18	2024/10/17
USB Wideband Power Sensor	U2022XA	MY54170006	2023/10/18	2024/10/17
Power Amplifier	ZVE-6W-83+	637202210	NCR	NCR
Power Amplifier	ZHL-5W-202-S+	416402204	NCR	NCR
Directional Coupler	441493	520Z	NCR	NCR
Attenuator	20dB, 100W	LN749	NCR	NCR
Attenuator	6dB, 150W	2754	NCR	NCR
Thermometer	DTM3000	3635	2023/8/11	2024/8/10
Thermometer	DTM3000	3635	2024/8/10	2025/8/9
Hygrothermograph	HTC-2	EM072	2023/11/6	2024/11/5
Wireless communication tester	8960	MY50266471	2023/10/18	2024/10/17
Wideband Radio Communication Tester	CMW500	147473	2023/10/18	2024/10/17

5. SAR MEASUREMENT SYSTEM VERIFICATION

5.1 Liquid Verification



5.2 Liquid Verification Results

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		εr	σ (S/m)	εr	σ (S/m)	Δεr	Δσ (S/m)	
704	Simulated Tissue Liquid Head	42.919	0.884	42.15	0.89	1.82	-0.67	±5
707.5	Simulated Tissue Liquid Head	42.874	0.886	42.13	0.89	1.77	-0.45	±5
711	Simulated Tissue Liquid Head	42.83	0.889	42.11	0.89	1.71	-0.11	±5
750	Simulated Tissue Liquid Head	42.342	0.929	41.9	0.89	1.05	4.38	±5

**Liquid Verification above was performed on2024/07/31.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		εr	σ (S/m)	εr	σ (S/m)	Δεr	Δσ (S/m)	
824.2	Simulated Tissue Liquid Head	41.409	0.929	41.55	0.9	-0.34	3.22	±5
826.4	Simulated Tissue Liquid Head	41.381	0.931	41.54	0.9	-0.38	3.44	±5
829	Simulated Tissue Liquid Head	41.349	0.934	41.53	0.9	-0.44	3.78	±5
835	Simulated Tissue Liquid Head	41.274	0.938	41.5	0.9	-0.54	4.22	±5
836.5	Simulated Tissue Liquid Head	41.255	0.939	41.5	0.9	-0.59	4.33	±5
836.6	Simulated Tissue Liquid Head	41.254	0.939	41.5	0.9	-0.59	4.33	±5
844	Simulated Tissue Liquid Head	41.169	0.946	41.5	0.91	-0.8	3.96	±5
846.6	Simulated Tissue Liquid Head	41.142	0.949	41.5	0.91	-0.86	4.29	±5
848.8	Simulated Tissue Liquid Head	41.119	0.952	41.5	0.91	-0.92	4.62	±5

**Liquid Verification above was performed on2024/08/02.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		εr	σ (S/m)	εr	σ (S/m)	Δεr	Δσ (S/m)	
1850.2	Simulated Tissue Liquid Head	39.471	1.336	40	1.4	-1.32	-4.57	±5
1852.4	Simulated Tissue Liquid Head	39.462	1.337	40	1.4	-1.35	-4.5	±5
1860	Simulated Tissue Liquid Head	39.43	1.343	40	1.4	-1.43	-4.07	±5
1880	Simulated Tissue Liquid Head	39.343	1.36	40	1.4	-1.64	-2.86	±5
1900	Simulated Tissue Liquid Head	39.236	1.379	40	1.4	-1.91	-1.5	±5
1907.6	Simulated Tissue Liquid Head	39.212	1.385	40	1.4	-1.97	-1.07	±5
1909.8	Simulated Tissue Liquid Head	39.205	1.387	40	1.4	-1.99	-0.93	±5

**Liquid Verification above was performed on2024/08/01.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		εr	σ (S/m)	εr	σ (S/m)	Δεr	Δσ (S/m)	
2402	Simulated Tissue Liquid Head	40.481	1.711	39.3	1.76	3.01	-2.78	±5
2411	Simulated Tissue Liquid Head	40.453	1.722	39.28	1.77	2.99	-2.71	±5
2441	Simulated Tissue Liquid Head	40.363	1.754	39.22	1.79	2.91	-2.01	±5
2450	Simulated Tissue Liquid Head	40.325	1.763	39.2	1.8	2.87	-2.06	±5
2480	Simulated Tissue Liquid Head	40.23	1.796	39.16	1.83	2.73	-1.86	±5

**Liquid Verification above was performed on 2024/08/01.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ε_r	σ (S/m)	ε_r	σ (S/m)	$\Delta\varepsilon_r$	Δσ (S/m)	
2510	Simulated Tissue Liquid Head	40.12	1.832	39.12	1.86	2.56	-1.51	±5
2535	Simulated Tissue Liquid Head	40.037	1.862	39.09	1.89	2.42	-1.48	±5
2545	Simulated Tissue Liquid Head	40.137	1.916	39.07	1.9	2.73	0.84	±5
2560	Simulated Tissue Liquid Head	40.274	1.978	39.05	1.92	3.13	3.02	±5
2593	Simulated Tissue Liquid Head	40.173	2.018	39.01	1.95	2.98	3.49	±5
2600	Simulated Tissue Liquid Head	40.149	2.027	39	1.96	2.95	3.42	±5
2645	Simulated Tissue Liquid Head	39.995	2.055	38.94	2.01	2.71	2.24	±5

**Liquid Verification above was performed on2024/08/02.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		εr	σ (S/m)	εr	σ (S/m)	Δεr	Δσ (S/m)	
2412	Simulated Tissue Liquid Head	40.679	1.756	39.28	1.77	3.56	-0.79	±5
2437	Simulated Tissue Liquid Head	40.495	1.772	39.23	1.79	3.22	-1.01	±5
2450	Simulated Tissue Liquid Head	40.432	1.794	39.2	1.8	3.14	-0.33	±5
2462	Simulated Tissue Liquid Head	40.307	1.806	39.18	1.81	2.88	-0.22	±5

**Liquid Verification above was performed on 2024/08/21.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		εr	σ (S/m)	εr	σ (S/m)	Δεr	Δσ (S/m)	
5180	Simulated Tissue Liquid Head	36.702	4.845	36.02	4.64	1.89	4.42	±5
5200	Simulated Tissue Liquid Head	36.644	4.802	36	4.66	1.79	3.05	±5
5240	Simulated Tissue Liquid Head	36.405	4.764	35.96	4.7	1.24	1.36	±5
5250	Simulated Tissue Liquid Head	36.291	4.717	35.95	4.71	0.95	0.15	±5

**Liquid Verification above was performed on2024/08/21.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		εr	σ (S/m)	εr	σ (S/m)	Δεr	Δσ (S/m)	
5745	Simulated Tissue Liquid Head	36.143	5.178	35.36	5.22	2.21	-0.8	±5
5750	Simulated Tissue Liquid Head	35.897	5.234	35.35	5.22	1.55	0.27	±5
5785	Simulated Tissue Liquid Head	35.626	5.419	35.32	5.26	0.87	3.02	±5
5825	Simulated Tissue Liquid Head	35.409	5.507	35.28	5.3	0.37	3.91	±5

**Liquid Verification above was performed on2024/08/21.*

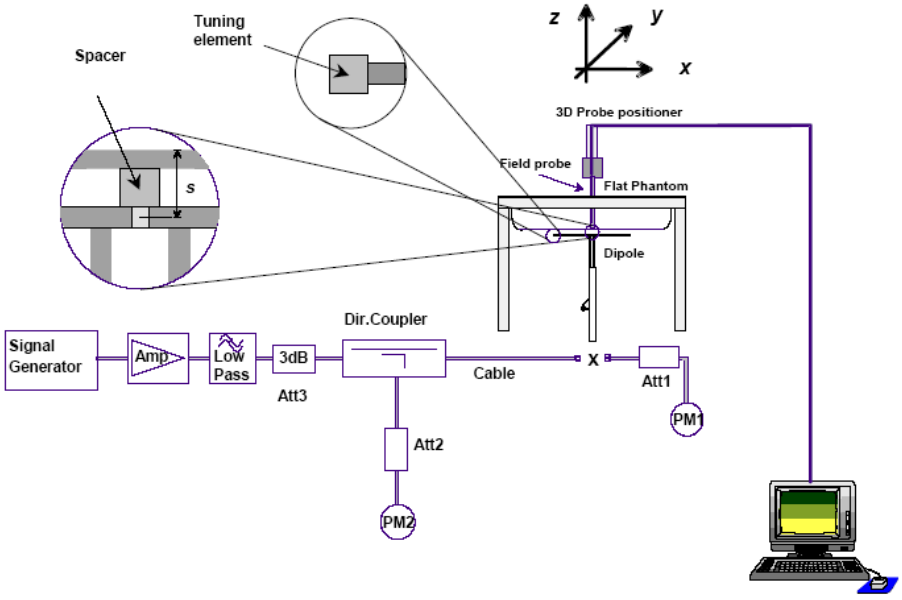
5.3 System Accuracy Verification

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ±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:

a) s = 15 mm ± 0,2 mm for 300 MHz ≤ f ≤ 1 000 MHz;
b) s = 10 mm ± 0,2 mm for 1 000 MHz < f ≤ 3 000 MHz;
c) s = 10 mm ± 0,2 mm for 3 000 MHz < f ≤ 6 000 MHz.

System Verification Setup Block Diagram



5.4 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 (%)
2024/07/31	750MHz	Head	100	1g	0.776	7.76	8.48	-8.49	±10
2024/08/02	835MHz	Head	100	1g	0.976	9.76	9.33	4.61	±10
2024/08/01	1900MHz	Head	100	1g	4.08	40.8	40.2	1.49	±10
2024/08/01	2450MHz	Head	100	1g	5.16	51.6	52.7	-2.09	±10
2024/08/21	2450MHz	Head	100	1g	5.07	50.7	52.7	-3.8	±10
2024/08/02	2600MHz	Head	100	1g	5.67	56.7	55.8	1.61	±10
2024/08/21	5250MHz	Head	100	1g	7.51	75.1	77.5	-3.1	±10
2024/08/21	5750MHz	Head	100	1g	7.72	77.2	78.4	-1.53	±10

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

5.5 SAR SYSTEM VALIDATION DATA

System Performance 750 MHz Head

DUT: D750V3; Type: 750 MHz; Serial: 1167

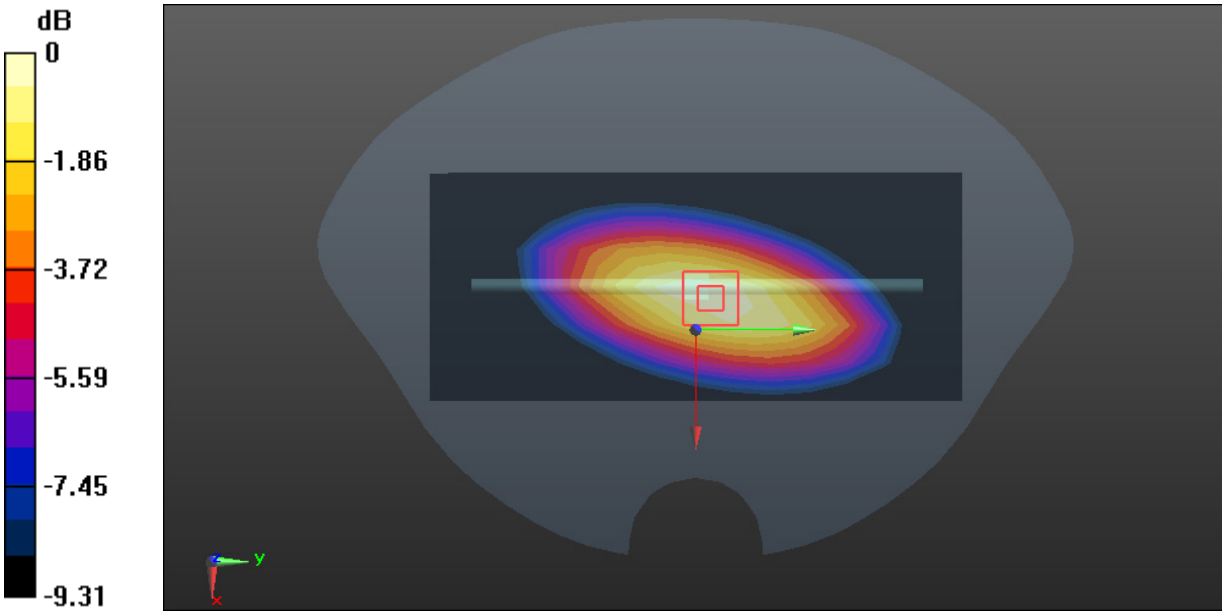
Communication System: CW (0); Frequency: 750MHz;Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.929 S/m; ε_r =42.342; ρ = 1000 kg/m^3;
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(9.95, 8.96, 8.82) @ 750 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(7x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.882 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value =30.34 V/m; Power Drift =0.15 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.776 W/kg; SAR(10 g) = 0.531 W/kg
Maximum value of SAR (measured) = 0.898 W/kg



0 dB = 0.898 W/kg = -0.47 dBW/kg

System Performance 835 MHz Head

DUT: D835V2; Type: 835 MHz; Serial: 453

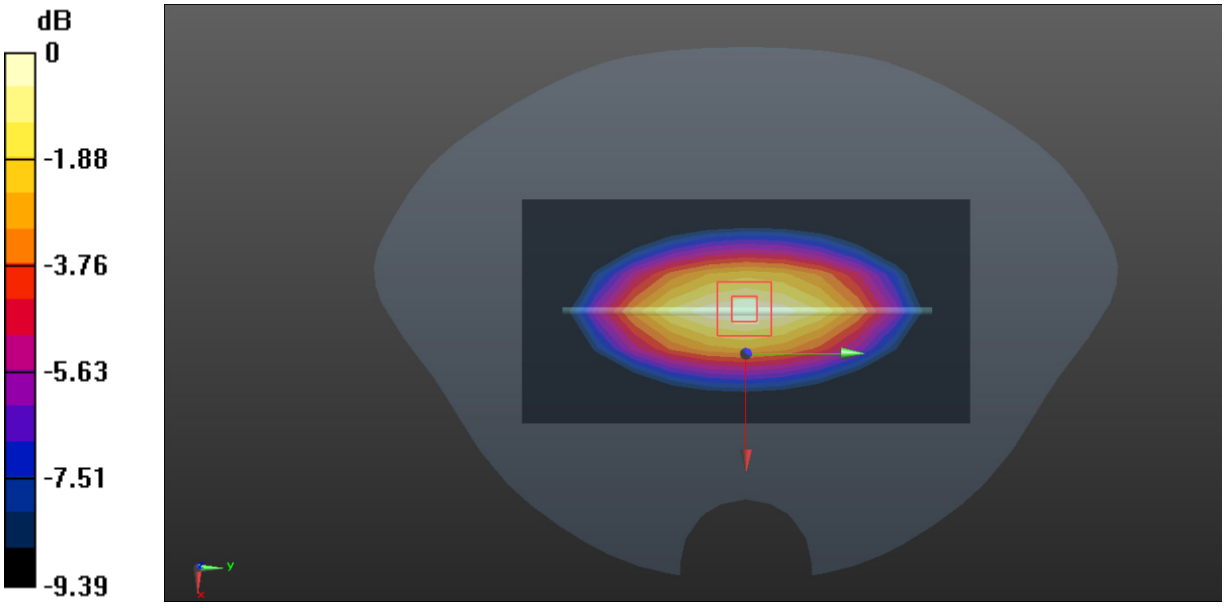
Communication System: CW (0); Frequency: 835MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.938 S/m; ε_r =41.274; ρ = 1000 kg/m^3;
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(9.55, 8.6, 8.54) @ 835 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.19 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value =37.65 V/m; Power Drift =-0.14 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.976 W/kg; SAR(10 g) = 0.662 W/kg
Maximum value of SAR (measured) = 1.15 W/kg



0 dB = 1.15 W/kg = 0.61 dBW/kg

System Performance 1900 MHz Head

DUT: D1900V2; Type: 1900 MHz; Serial: 543

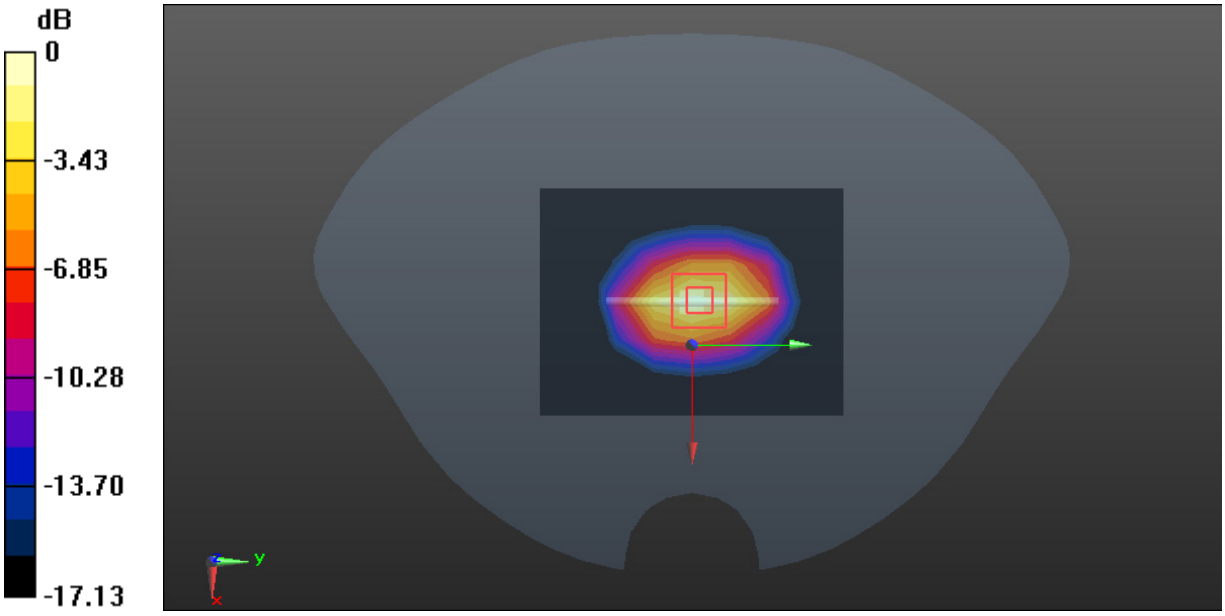
Communication System: CW (0); Frequency: 1900MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.379 S/m; ε_r =39.236; ρ = 1000 kg/m^3;
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(8, 7.27, 7.03) @ 1900 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 4.78 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value =54.32 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 7.02 W/kg
SAR(1 g) = 4.08 W/kg; SAR(10 g) = 2.19 W/kg
Maximum value of SAR (measured) = 4.97 W/kg



0 dB = 4.97 W/kg = 6.96 dBW/kg

System Performance 2450 MHz Head was performed on 2024/08/01.

DUT: D2450V2; Type: 2450 MHz; Serial: 971

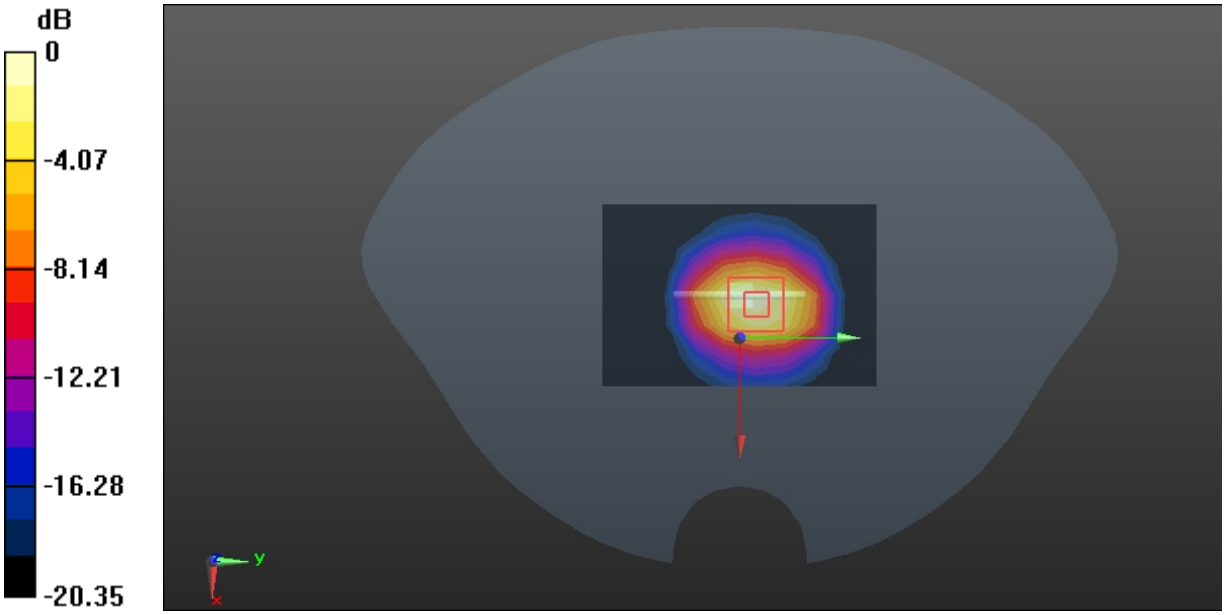
Communication System: CW (0); Frequency: 2450MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.763 S/m; ε_r =40.325; ρ = 1000 kg/m^3;
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(7.49, 6.81, 6.61) @ 2450 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(7x10x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 6.37 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =55.49 V/m; Power Drift =0.14 dB
Peak SAR (extrapolated) = 10.2 W/kg
SAR(1 g) = 5.16 W/kg; SAR(10 g) = 2.48 W/kg
Maximum value of SAR (measured) = 6.66 W/kg



0 dB = 6.66 W/kg = 8.23 dBW/kg

System Performance 2450 MHz Head was performed on 2024/08/21.

DUT: D2450V2; Type: 2450 MHz; Serial: 971

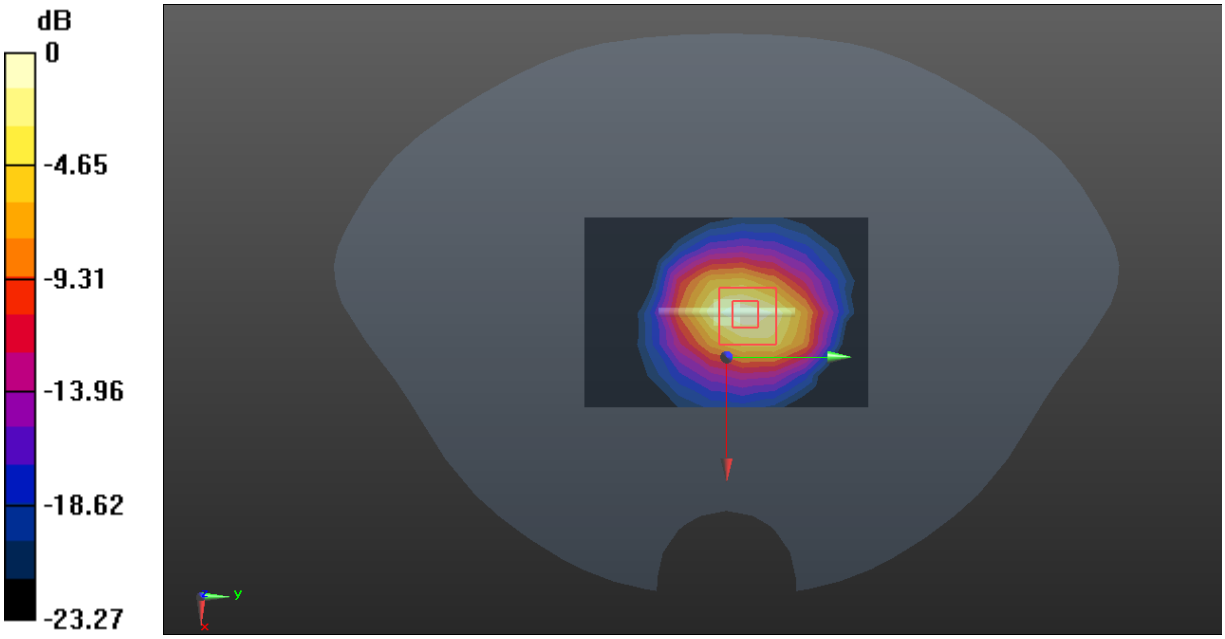
Communication System: CW (0); Frequency: 2450MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.794 S/m; ε_r =40.432; ρ = 1000 kg/m^3;
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(7.49, 6.81, 6.61) @ 2450 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan (7x10x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 6.39 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.32 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 10.1 W/kg
SAR(1 g) = 5.07 W/kg; SAR(10 g) = 2.41 W/kg
Maximum value of SAR (measured) = 6.48 W/kg



0 dB = 6.48 W/kg = 8.12 dBW/kg

System Performance 2600 MHz Head

DUT: D2600V2; Type: 2600 MHz; Serial: 1132

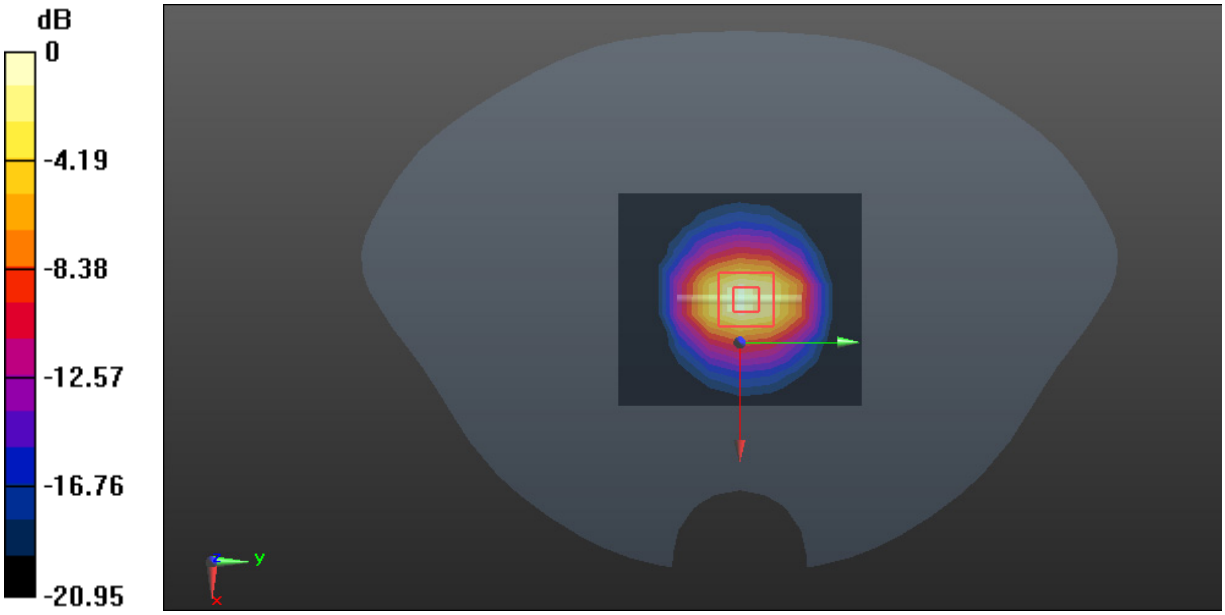
Communication System: CW (0); Frequency: 2600MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.027 S/m; ε_r =40.149; ρ = 1000 kg/m^3;
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(7.61, 6.94, 6.73) @ 2600 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(8x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 5.67 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =60.24 V/m; Power Drift =0.18 dB
Peak SAR (extrapolated) = 11.4 W/kg
SAR(1 g) = 5.67 W/kg; SAR(10 g) = 2.64 W/kg
Maximum value of SAR (measured) = 7.44 W/kg



0 dB = 7.44 W/kg = 8.72 dBW/kg

System Performance 5250 MHz Head

DUT: D5GHzV2; Type: 5250 MHz; Serial: SN:1246;

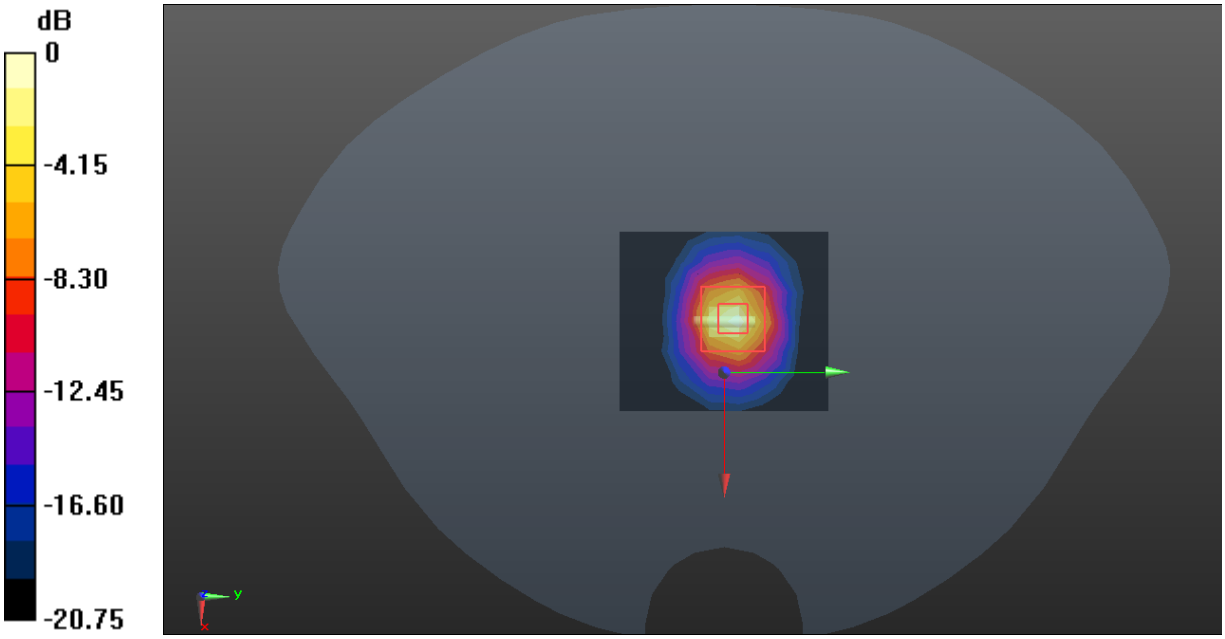
Communication System: CW (0); Frequency: 5250MHz;Duty Cycle: 1:1
Medium parameters used: f = 5250 MHz; σ = 4.717 S/m; ε_r =36.291; ρ = 1000 kg/m^3;
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(5.62, 5.1, 4.97) @ 5250 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(7x8x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 17.7 W/kg

Zoom Scan (8x8x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value =41.34 V/m; Power Drift =0.11 dB
Peak SAR (extrapolated) = 30.9 W/kg
SAR(1 g) = 7.51 W/kg; SAR(10 g) = 2.13 W/kg
Maximum value of SAR (measured) = 18.5 W/kg



0 dB = 18.5 W/kg = 12.67 dBW/kg

System Performance 5750 MHz Head

DUT: D5GHzV2; Type: 5750 MHz; Serial: SN:1246;

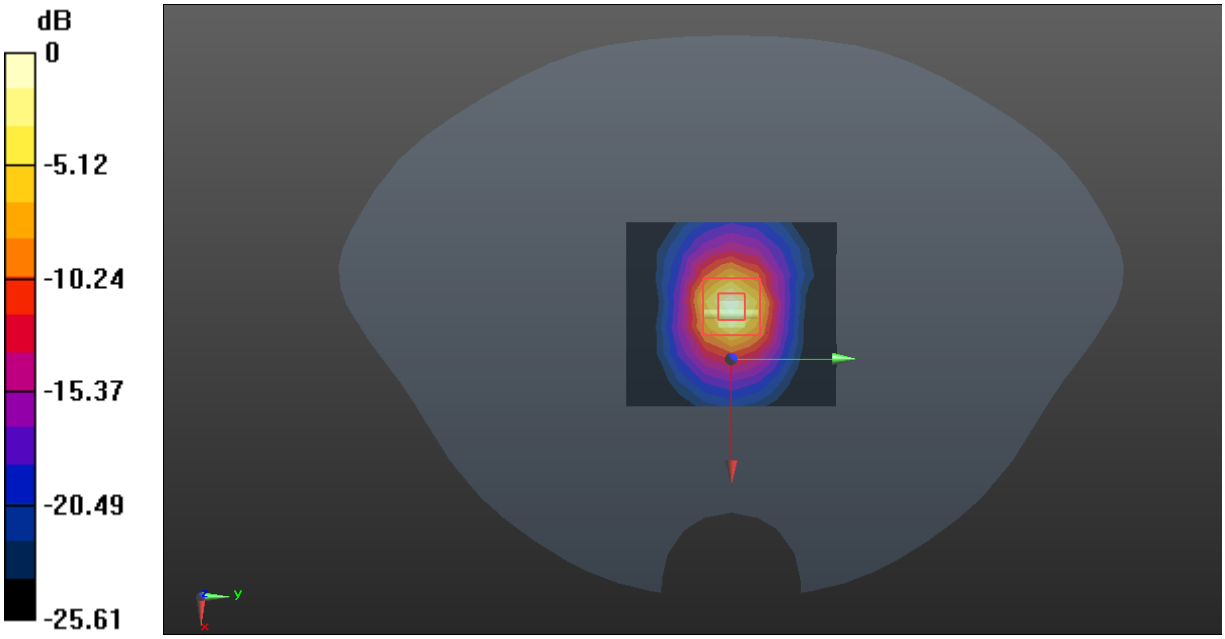
Communication System: CW (0); Frequency: 5750MHz;Duty Cycle: 1:1
Medium parameters used: f = 5750 MHz; σ = 5.234 S/m; ε_r =35.897; ρ = 1000 kg/m^3;
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(5.04, 4.65, 4.62) @ 5750 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(8x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 20.3 W/kg

Zoom Scan (8x8x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value =38.91 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 35.4 W/kg
SAR(1 g) = 7.72 W/kg; SAR(10 g) = 2.15 W/kg
Maximum value of SAR (measured) = 20.1 W/kg



0 dB = 20.1 W/kg = 13.03 dBW/kg

6. EUT TEST STRATEGY AND METHODOLOGY

6.1Test 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.

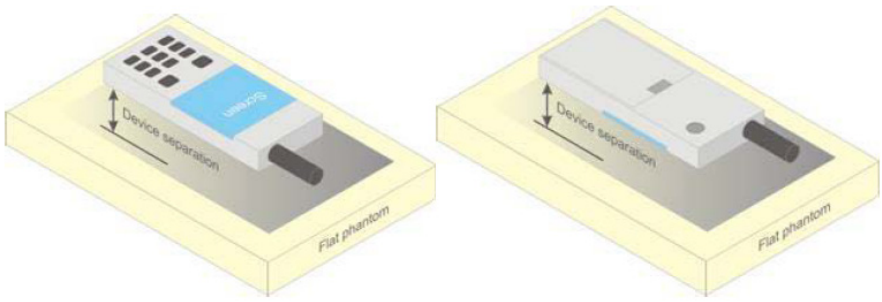


Figure 5 – Test positions for body-worn devices

6.2Test Distance for SAR Evaluation

In this case the EUT(Equipment Under Test) is set 0mm away from the phantom, the test distance is 0mm.

6.3 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.

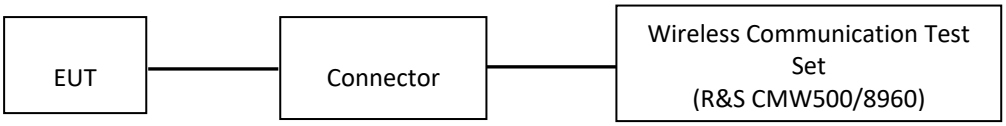
All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

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.

7. CONDUCTED OUTPUT POWER MEASUREMENT

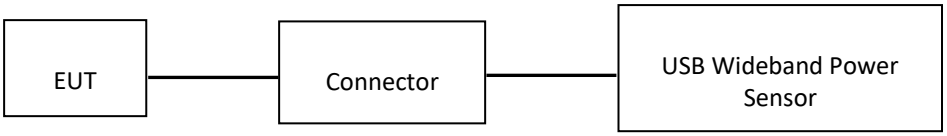
7.1 Test Procedure

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 USB Wideband Power Sensor through Connector.



WLAN/BT

7.2 Radio Configuration

The power measurement was configured by the Wireless Communication Test Set.

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 Enter the same channel number for TCH channel (test channel) and BCCH channel
Frequency Offset > + 0 Hz
Mode > BCCH and TCH
BCCH Level > -85 dBm (May need to adjust if link is not stabe)
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 Signal on to turn on the signal and change settings

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_c/β_d	8/15

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 Settings	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	15/15	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
	MPR(dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs=βhs/ βc	30/15			

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 kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_FCIs	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	

DC-HSDPA

The following tests were conducted according to the test requirements in Table C.8.1.12 of 3GPP TS 34.121-1

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

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

HSPA+

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	$\beta_{ed}1$: 30/15 $\beta_{ed}2$: 30/15	$\beta_{ed}3$: 24/15 $\beta_{ed}4$: 24/15	3.5	2.5	14	105	105

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

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

FDD-LTE

For UE Power Class 1 and 3, the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2-1due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1.

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

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

For UE Power Class 1 and 3 the specific requirements and identified sub clauses are specified in Table 6.2.4-1 along with the allowed A-MPR values that may be used to meet these requirements. The allowed A-MPR values specified below in Table 6.2.4.-1 to 6.2.4-15 are in addition to the allowed MPR requirements specified in sub clause 6.2.3.

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

Network Signalling value	Requirements (subclause)	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	N/A
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	N/A
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	
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	
NS_11	6.6.2.2.1	23	1.4, 3, 5, 10, 15, 20	Table 6.2.4-5	
NS_12	6.6.3.3.5	26	1.4, 3, 5	Table 6.2.4-6	
NS_13	6.6.3.3.6	26	5	Table 6.2.4-7	
NS_14	6.6.3.3.7	26	10, 15	Table 6.2.4-8	
NS_15	6.6.3.3.8	26	1.4, 3, 5, 10, 15	Table 6.2.4-9 Table 6.2.4-10	
NS_16	6.6.3.3.9	27	3, 5, 10	Table 6.2.4-11, Table 6.2.4-12, Table 6.2.4-13	
NS_17	6.6.3.3.10	28	5, 10	Table 5.6-1	N/A
NS_18	6.6.3.3.11	28	5	≥ 2	≤ 1
			10, 15, 20	≥ 1	≤ 4
NS_19	6.6.3.3.12	44	10, 15, 20	Table 6.2.4-14	
NS_20	6.2.2 6.6.2.2.1 6.6.3.2	23	5, 10, 15, 20	Table 6.2.4-15	
...					
NS_32	-	-	-	-	-

TDD-LTE

LTE TDD Band 41 supports 3GPP 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	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
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 41 SAR test, that is 63.33%(1:1.58)for duty cycle.

7.3 Maximum Target Output Power

Max Target Power(dBm)			
Mode/Band	Channel		
	Low	Middle	High
GSM 850	33	33	33
GPRS 1 TX Slot	32.5	32.5	32.5
GPRS 2 TX Slot	30.5	30.5	30.5
GPRS 3 TX Slot	28.5	28.5	28.5
GPRS 4 TX Slot	26.5	26.5	26.5
EDGE 1 TX Slot	26	26	26
EDGE 2 TX Slot	24	24	24
EDGE 3 TX Slot	22	22	22
EDGE 4 TX Slot	19.5	19.5	19.5
GSM 1900	25.5	25.5	25.5
GPRS 1 TX Slot	25.5	25.5	25.5
GPRS 2 TX Slot	25	25	25
GPRS 3 TX Slot	24.5	24.5	24.5
GPRS 4 TX Slot	23	23	23
EDGE 1 TX Slot	21	21	21
EDGE 2 TX Slot	21	21	21
EDGE 3 TX Slot	21	21	21
EDGE 4 TX Slot	19.5	19.5	19.5
WCDMA Band 2	15.5	15.5	15.5
HSDPA	15.5	15.5	15.5
HSUPA	15.5	15.5	15.5
WCDMA Band 5	23	23	23
HSDPA	22	22	22
HSUPA	22.5	22.5	22.5
LTE Band 2(20M)	18.5	18.5	18.5
LTE Band 5(10M)	21.5	21.5	21.5
LTE Band 7(20M)	16	16	16
LTE Band 12(10M)	25	25	25
LTE Band 41(20M)	17.1	17.1	17.1
WIFI 2.4G(802.11b)	10	7	10.5
WIFI 2.4G(802.11g)	10.5	7	10.5
WIFI 2.4G(802.11n ht20)	10.5	7	10.5
WIFI 2.4G(802.11n ht40)	10	9	10
WIFI 5.2G(802.11a)	8	8	8
WIFI 5.2G(802.11n20)	7.9	7.9	7.9
WIFI 5.2G(802.11n40)	7.9	/	7.9
WIFI 5.2G(802.11ac20)	7.9	7.9	7.9
WIFI 5.2G(802.11ac40)	7.9	/	7.9
WIFI 5.2G(802.11ac80)	/	7.9	/
WIFI 5.8G(802.11a)	7.5	7.5	7.5
WIFI 5.8G(802.11n20)	8	8	8
WIFI 5.8G(802.11n40)	7.5	/	7.5
WIFI 5.8G(802.11ac20)	7.9	7.9	7.9
WIFI 5.8G(802.11ac40)	7.5	/	7.5

Max Target Power(dBm)			
Mode/Band	Channel		
	Low	Middle	High
WIFI 5.8G(802.11ac80)	/	7.9	/
Bluetooth BDR/EDR	4.5	4	6
BLE 1Mbps	0.5	0.5	0.5
BLE 2Mbps	0.5	0.5	0.5

7.4 Test Results:

GSM

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)
GSM 850	128	824.2	32.03
	190	836.6	32.65
	251	848.8	32.41
GSM 1900	512	1850.2	24.85
	661	1880	25.04
	810	1909.8	24.45

GPRS:

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
GSM 850	128	824.2	31.23	29.37	27.29	25.23
	190	836.6	32.10	29.34	27.46	25.53
	251	848.8	32.11	30.10	28.00	26.04
GSM 1900	512	1850.2	25.08	24.83	24.21	22.52
	661	1880	25.12	24.83	24.49	22.38
	810	1909.8	24.40	24.40	24.30	21.98

EDGE:

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
GSM 850	128	824.2	25.63	23.37	21.56	18.86
	190	836.6	24.80	23.16	21.24	18.72
	251	848.8	25.24	23.85	21.03	18.75
GSM 1900	512	1850.2	20.89	20.60	20.33	18.31
	661	1880	20.64	20.79	20.62	18.60
	810	1909.8	20.72	20.69	20.62	19.11

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 GPRS

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
GSM 850	128	824.2	22.23	23.37	23.04	22.23
	190	836.6	23.1	23.34	23.21	22.53
	251	848.8	23.11	**24.1**	23.75	23.04
GSM 1900	512	1850.2	16.08	18.83	19.96	19.52
	661	1880	16.12	18.83	**20.24**	19.38
	810	1909.8	15.4	18.4	20.05	18.98

The time based average power for EDGE

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
GSM 850	128	824.2	16.63	17.37	17.31	15.86
	190	836.6	15.8	17.16	16.99	15.72
	251	848.8	16.24	17.85	16.78	15.75
GSM 1900	512	1850.2	11.89	14.6	16.08	15.31
	661	1880	11.64	14.79	16.37	15.6
	810	1909.8	11.72	14.69	16.37	16.11

Note:

1. Agilent Technologies Communication Tester (8960) 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).
4. According to KDB941225D01-SAR for EGPRS mode are not required when the source-based time-averaged output power for data mode is lower than that in the normal GPRS mode.

WCDMA:

WCDMA Band 2::

Test Mode	Conducted Average Output Power(dBm)		
	Lowest Channel	Middle Channel	Highest Channel
WCDMA	15.09	14.95	15.11
HSDPA Subset 1	14.72	15.17	14.60
HSDPA Subset 2	14.55	15.08	14.96
HSDPA Subset 3	14.62	14.59	14.42
HSDPA Subset 4	14.91	14.62	14.60
HSUPA Subset 1	15.20	15.00	14.99
HSUPA Subset 2	15.08	15.08	15.17
HSUPA Subset 3	14.74	15.31	15.34
HSUPA Subset 4	14.75	15.01	15.12
HSUPA Subset 5	15.17	15.30	14.93

WCDMA Band 5::

Test Mode	Conducted Average Output Power(dBm)		
	Lowest Channel	Middle Channel	Highest Channel
WCDMA	21.42	22.10	22.58
HSDPA Subset 1	21.30	21.07	21.50
HSDPA Subset 2	21.03	21.25	20.98
HSDPA Subset 3	20.45	20.72	20.98
HSDPA Subset 4	20.43	20.94	20.78
HSUPA Subset 1	22.11	21.99	22.48
HSUPA Subset 2	22.10	21.97	22.30
HSUPA Subset 3	21.88	21.34	21.91
HSUPA Subset 4	22.12	21.95	21.99
HSUPA Subset 5	22.04	22.09	22.28

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 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	1@0	15.21	15.69	16.51
		1@2	15.60	15.98	16.72
		1@5	15.61	15.95	16.58
		3@0	15.54	15.94	16.69
		3@1	15.49	16.01	16.83
		3@2	15.59	15.92	16.72
		6@0	14.54	15.05	15.73
	16-QAM	1@0	13.88	14.24	14.75
		1@2	14.51	14.36	14.96
		1@5	14.35	14.30	15.04
		3@0	14.12	14.59	15.35
		3@1	14.33	14.73	15.31
		3@2	14.20	14.61	15.25
		6@0	13.22	13.59	14.27
3M	QPSK	1@0	15.08	15.76	16.58
		1@7	15.86	16.07	16.73
		1@14	15.97	16.10	16.72
		8@0	14.77	15.01	15.50
		8@4	14.70	14.98	15.43
		8@7	15.10	15.02	15.51
		15@0	14.73	15.05	15.61
	16-QAM	1@0	13.90	14.89	14.72
		1@7	14.64	15.14	15.12
		1@14	14.70	14.96	14.97
		8@0	13.17	13.85	14.27
		8@4	13.17	13.84	14.38
		8@7	13.54	13.69	14.42
		15@0	13.44	13.59	14.13
5M	QPSK	1@0	15.12	15.60	16.40
		1@12	16.24	16.23	16.85
		1@24	16.21	15.93	16.39
		12@0	14.65	14.79	15.31
		12@6	14.60	14.94	15.37
		12@11	14.67	14.79	15.55
		25@0	15.06	14.97	15.44
	16-QAM	1@0	13.35	14.23	14.58
		1@12	14.77	14.78	15.04
		1@24	14.54	14.49	14.58
		12@0	13.45	13.42	14.09
		12@6	13.44	13.53	14.11
		12@11	13.52	13.41	13.95
		25@0	13.85	13.73	13.95
10M	QPSK	1@0	14.54	15.47	17.27

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
		1@24	16.00	15.94	16.72
		1@49	16.01	16.55	17.06
		25@0	14.58	14.71	15.73
		25@12	14.63	14.80	15.97
		25@24	14.66	14.92	15.75
		50@0	14.76	15.16	15.89
	16-QAM	1@0	13.30	14.63	15.27
		1@24	14.90	15.02	14.96
		1@49	14.83	15.59	15.25
		25@0	13.29	13.47	14.57
		25@12	13.03	13.66	14.48
		25@24	13.17	13.64	14.36
		50@0	13.39	13.88	14.35
15M	QPSK	1@0	14.57	15.65	17.30
		1@37	15.17	15.94	16.19
		1@74	15.32	16.25	16.11
		36@0	13.86	14.76	15.97
		36@16	14.02	14.97	16.04
		36@35	13.94	14.83	15.95
		75@0	14.22	15.09	15.54
	16-QAM	1@0	13.92	14.70	16.50
		1@37	14.95	15.81	15.41
		1@74	14.46	15.27	15.21
		36@0	13.66	14.59	14.71
		36@16	13.55	14.74	14.67
		36@35	13.75	14.68	14.60
		75@0	13.66	14.70	14.24
20M	QPSK	1@0	18.29	18.49	18.48
		1@49	18.26	18.31	18.03
		1@99	18.16	18.25	18.14
		50@0	18.43	18.38	18.06
		50@24	18.41	18.29	18.19
		50@49	18.28	18.36	18.46
		100@0	18.15	18.16	18.24
	16-QAM	1@0	17.94	17.84	17.55
		1@49	17.41	17.22	17.92
		1@99	17.51	17.34	17.69
		50@0	17.12	17.1	17.65
		50@24	17.22	17.04	17.37
		50@49	17.31	17.05	17.56
		100@0	17.01	17.3	17.93

LTE Band 5:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1@0	20.42	20.74	20.52
		1@2	20.84	20.65	20.63
		1@5	20.61	20.73	20.84
		3@0	20.98	20.90	20.88
		3@1	20.89	20.83	21.04
		3@2	20.74	20.54	21.16
		6@0	20.08	19.69	19.77
	16-QAM	1@0	19.53	20.35	19.99
		1@2	19.27	20.56	20.11
		1@5	19.53	19.93	19.81
		3@0	19.55	19.43	19.61
		3@1	19.23	19.59	19.30
		3@2	19.50	19.16	19.76
		6@0	18.78	18.75	18.44
3M	QPSK	1@0	20.97	20.55	20.56
		1@7	20.68	20.71	20.57
		1@14	20.54	20.65	20.37
		8@0	19.99	19.99	20.09
		8@4	20.02	19.94	20.03
		8@7	19.89	19.77	19.70
		15@0	19.96	19.69	20.10
	16-QAM	1@0	20.26	20.90	20.21
		1@7	20.15	20.46	20.30
		1@14	20.38	19.23	20.00
		8@0	18.93	18.99	18.84
		8@4	18.85	19.11	18.84
		8@7	18.76	18.62	18.85
		15@0	18.63	18.51	18.83
5M	QPSK	1@0	20.59	20.69	20.58
		1@12	20.56	20.96	20.57
		1@24	20.51	20.60	20.49
		12@0	19.67	20.12	20.21
		12@6	19.73	20.04	20.26
		12@11	19.78	20.11	20.19
		25@0	19.70	19.63	19.87
	16-QAM	1@0	19.67	20.40	19.06
		1@12	19.67	20.06	19.32
		1@24	19.51	20.36	18.64
		12@0	18.53	18.52	18.87
		12@6	18.36	18.61	18.65
		12@11	18.57	18.49	18.97
		25@0	18.63	18.39	18.76
10M	QPSK	1@0	20.95	21.26	20.72

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
		1@24	20.71	20.67	20.7
		1@49	20.91	20.69	20.75
		25@0	19.7	20.23	19.8
		25@12	19.84	20.12	19.82
		25@24	19.7	20.02	19.66
		50@0	19.69	19.92	20.03
	16-QAM	1@0	19.93	20.83	20.38
		1@24	19.82	20.63	20.02
		1@49	19.51	20.56	19.92
		25@0	19.77	19.79	19.85
		25@12	19.59	19.74	19.72
		25@24	19.58	19.85	19.81
		50@0	19.62	19.73	19.75

LTE Band 7:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1@0	14.82	14.5	14.37
		1@12	14.34	14.29	14.36
		1@24	14.86	14.35	14.35
		12@0	14.24	14.31	14.58
		12@6	14.29	13.8	14.35
		12@11	14.23	13.39	14.25
		25@0	14.34	13.22	14.38
	16-QAM	1@0	14.02	14.02	14.05
		1@12	14.69	14.3	14.58
		1@24	14.24	13.49	13.97
		12@0	13.17	13.81	13.95
		12@6	13.06	13.8	13.98
		12@11	13.06	13.79	13.9
		25@0	13.1	13.54	13.96
10M	QPSK	1@0	14.41	15.14	13.55
		1@24	15	14.72	14.34
		1@49	14.7	14.6	14.41
		25@0	13.6	15	14.7
		25@12	13.58	15.05	14.59
		25@24	13.52	15.06	14.59
		50@0	14.03	14.81	14.8
	16-QAM	1@0	13.3	14.07	13.61
		1@24	13.57	14.3	14.32
		1@49	14.26	14.41	14.14
		25@0	13.77	13.96	13.87
		25@12	13.75	14.11	13.84
		25@24	13.7	13.95	13.93
		50@0	13.05	13.89	13.89
15M	QPSK	1@0	14.48	14.63	15.15
		1@37	15.31	14.56	14.3
		1@74	15.13	14.97	14.5
		36@0	13.88	15.2	14.81
		36@16	13.84	15.34	14.74
		36@35	13.91	15.28	14.81
		75@0	14.37	14.95	14.92
	16-QAM	1@0	13.55	14.1	14.44
		1@37	14.35	14.25	14.55
		1@74	14.02	14.11	14.42
		36@0	13.07	14.24	13.79
		36@16	13.05	14.22	13.76
		36@35	13.17	14.2	13.92
		75@0	13.59	13.92	14.07
20M	QPSK	1@0	15.34	15.54	15.46

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
		1@49	15.06	14.92	15.27
		1@99	14.11	14.69	14.39
		50@0	14.75	14.68	14.47
		50@24	14.62	14.77	14.69
		50@49	14.66	14.74	14.66
		100@0	14.2	14.32	14.8
	16-QAM	1@0	14.14	14.55	14.32
		1@49	14.95	14.05	14.05
		1@99	14.01	14.56	14.62
		50@0	14.68	14.55	14.5
		50@24	14.43	14.58	14.34
		50@49	14.43	14.37	14.24
		100@0	14.09	14.96	14.76

LTE Band 12:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1@0	24.17	24.51	24.82
		1@2	24.05	24.62	24.86
		1@5	24.10	24.51	24.55
		3@0	24.23	24.45	24.72
		3@1	24.01	24.72	24.91
		3@2	24.21	24.37	24.86
		6@0	22.94	24.06	23.80
	16-QAM	1@0	22.76	23.19	23.92
		1@2	22.70	23.74	24.04
		1@5	22.61	23.73	24.10
		3@0	22.89	23.37	23.72
		3@1	22.83	23.54	23.70
		3@2	22.67	23.48	23.73
		6@0	21.75	22.83	22.55
3M	QPSK	1@0	23.95	24.58	24.61
		1@7	24.38	24.59	24.75
		1@14	24.01	24.42	24.88
		8@0	23.09	23.17	23.59
		8@4	23.01	23.51	23.77
		8@7	23.21	23.90	23.82
		15@0	23.04	23.91	23.80
	16-QAM	1@0	22.58	23.82	23.89
		1@7	22.76	24.40	23.51
		1@14	22.69	24.26	23.60
		8@0	21.86	22.12	22.52
		8@4	21.87	22.14	22.75
		8@7	22.41	22.71	22.80
		15@0	21.95	22.70	22.49
5M	QPSK	1@0	23.88	24.15	24.65
		1@12	24.01	24.49	24.63
		1@24	24.10	24.75	24.73
		12@0	23.07	23.38	23.56
		12@6	23.08	23.34	23.59
		12@11	22.91	23.36	23.69
		25@0	23.19	23.92	23.74
	16-QAM	1@0	22.70	22.99	22.57
		1@12	22.30	23.20	22.88
		1@24	22.79	23.20	22.86
		12@0	21.62	21.83	22.28
		12@6	21.67	21.96	22.12
		12@11	21.56	22.11	22.27
		25@0	22.13	22.64	22.57
10M	QPSK	1@0	23.99	24.42	24.37

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
		1@24	24.15	24.61	24.68
		1@49	24.5	24.73	24.84
		25@0	23.13	23.24	24.06
		25@12	23.19	24.41	24.01
		25@24	23.22	23.25	23.89
		50@0	23.12	23.92	23.71
	16-QAM	1@0	23.31	23.54	23.32
		1@24	23.74	23.53	23.6
		1@49	23.49	24.15	23.63
		25@0	23.3	23.09	23.59
		25@12	23.42	23.9	23.7
		25@24	23.44	23.18	23.56
		50@0	23.58	23.63	23.26

LTE Band 41:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	2569MHz (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1@0	15.64	15.66	16.13	15.07
		1@12	16.14	16.24	16.67	15.86
		1@24	15.23	15.29	15.83	15.47
		12@0	14.91	14.99	15.43	14.64
		12@6	15.05	15.16	15.41	14.64
		12@11	14.90	15.04	15.49	14.97
		25@0	15.00	14.97	15.49	15.03
	16-QAM	1@0	14.77	14.89	15.04	14.11
		1@12	15.32	15.29	15.36	15.04
		1@24	14.33	14.48	14.74	14.70
		12@0	13.75	13.8	14.34	13.87
		12@6	13.66	13.79	14.36	13.80
		12@11	13.70	13.77	14.42	13.98
		25@0	13.71	13.79	14.34	14.06
10M	QPSK	1@0	15.88	15.97	16.51	15.32
		1@24	15.90	15.86	16.63	16.10
		1@49	16.11	16.17	16.50	16.58
		25@0	15.24	15.38	15.64	15.11
		25@12	15.26	15.23	15.83	14.97
		25@24	15.36	15.5	15.74	15.04
		50@0	15.15	15.11	15.63	15.20
	16-QAM	1@0	14.63	14.64	15.71	14.29
		1@24	14.79	14.88	15.82	14.78
		1@49	14.72	14.77	15.67	15.05
		25@0	13.87	13.97	14.46	13.71
		25@12	13.87	13.95	14.40	13.70
		25@24	13.80	13.9	14.50	13.90
		50@0	13.87	13.83	14.42	13.93
15M	QPSK	1@0	16.26	16.38	16.95	15.76
		1@37	15.99	16.11	16.63	16.14
		1@74	15.54	15.56	16.00	16.26
		36@0	15.21	15.32	15.76	15.10
		36@16	15.28	15.39	15.94	15.19
		36@35	15.20	15.27	15.80	15.24
		75@0	14.99	15.09	15.50	15.31
	16-QAM	1@0	14.74	14.84	16.05	14.59
		1@37	14.55	14.58	15.61	14.99
		1@74	14.17	14.12	15.24	15.25
		36@0	13.99	14.08	14.60	13.86
		36@16	13.90	13.95	14.79	13.95
		36@35	13.75	13.71	14.79	14.03
		75@0	13.71	13.74	14.28	14.06
20M	QPSK	1@0	16.76	16.85	17.03	15.99

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	2569MHz (dBm)	Middle Channel (dBm)	High Channel (dBm)
20M	QPSK	1@49	15.95	15.93	16.4	16.12
		1@99	16.07	16.17	16.11	16.92
		50@0	15.42	15.45	16.08	15.13
		50@24	15.38	15.45	15.95	15.95
		50@49	15.64	15.76	16.13	15.82
		100@0	15.63	15.68	15.69	16.35
	16-QAM	1@0	15.92	16.03	16.25	15.87
		1@49	15.19	15.25	15.76	15.13
		1@99	15.31	15.36	15.14	15.63
		50@0	15.37	15.44	15.8	15.97
		50@24	15.3	15.43	15.94	15.97
		50@49	15.49	15.48	15.76	15.95
		100@0	15.32	15.29	15.48	15.66

WLAN: 2.4G

Mode	Channel frequency (MHz)	Data Rate	Duty cycle (%)	RF Output Power (dBm)
802.11b	2412	1Mbps	97.73	9.52
	2437			6.79
	2462			**10.46**
802.11g	2412	6Mbps	88.82	9.98
	2437			6.61
	2462			10.24
802.11n ht20	2412	MCS0	87.61	10.11
	2437			6.75
	2462			10.38
802.11n ht40	2422		77.81	9.25
	2437			8.66
	2452			9.68

Note: The duty cycle plots, please refer to the radio report: 2401T76732E-RF-00B▲, which was issued by Bay Area Compliance Laboratories Corp. (Shenzhen).

WLAN: 5.2G

Mode	Channel frequency (MHz)	Data Rate	Duty cycle (%)	RF Output Power (dBm)
802.11a	5180	6Mbps	89.21	**7.73**
	5200			7.56
	5240			7.54
802.11n20	5180	MCS0	87.99	7.71
	5200			7.53
	5240			7.69
802.11n40	5190		87.49	7.23
	5230			7.52
802.11ac20	5180		87.99	7.55
	5200			7.69
	5240			7.51
802.11ac40	5190		87.49	7.13
	5230			7.28
802.11ac80	5210		76.45	7.62

Note: The duty cycle plots, please refer to the radio report: 2401T76732E-RF-00C▲, which was issued by Bay Area Compliance Laboratories Corp. (Shenzhen).

WLAN: 5.8G

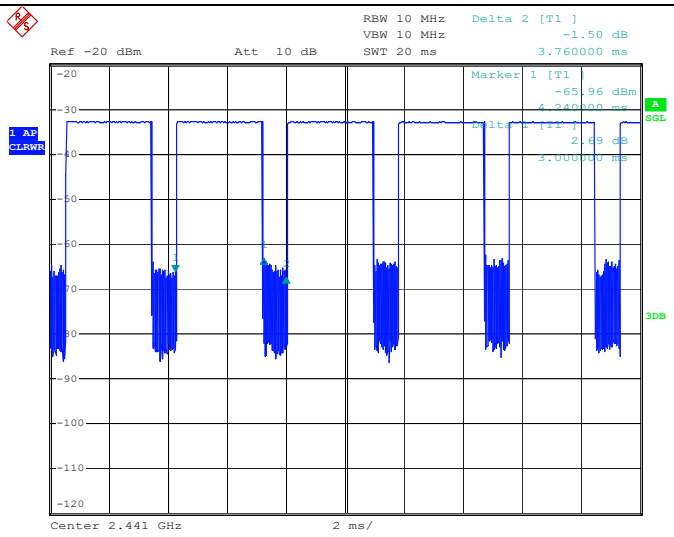
Mode	Channel frequency (MHz)	Data Rate	Duty cycle (%)	RF Output Power (dBm)
802.11a	5745	6Mbps	89.21	7.12
	5785			7.16
	5825			7.48
802.11n20	5745	MCS0	87.99	7.36
	5785			**7.62**
	5825			7.27
802.11n40	5755		87.49	7.38
	5795			7.41
802.11ac20	5745		87.99	7.31
	5785			7.61
	5825			7.19
802.11ac40	5755		87.49	7.47
	5795			7.49
802.11ac80	5775		76.45	7.55

Note: The duty cycle plots, please refer to the radio report: 2401T76732E-RF-00C▲, which was issued by Bay Area Compliance Laboratories Corp. (Shenzhen).

Bluetooth:

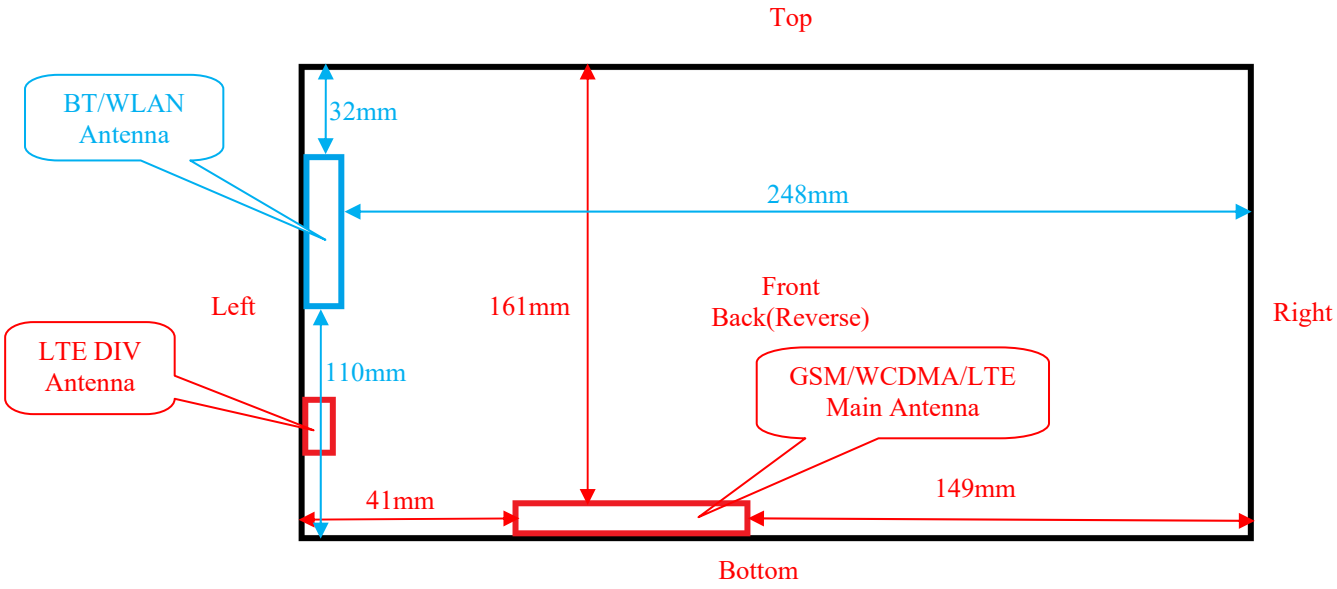
Mode	Channel frequency (MHz)	RF Output Power (dBm)
BDR(GFSK)	2402	4.39
	2411	**5.76**
	2441	3.83
	2480	5.72
EDR(π/4-DQPSK)	2402	3.66
	2409	4.88
	2441	3.06
	2480	4.53
EDR(8DPSK)	2402	4.19
	2411	5.54
	2441	3.21
	2480	4.78
BLE 1Mbps	2402	-0.57
	2440	-1.22
	2480	0.10
BLE 2Mbps	2402	-0.71
	2440	-1.62
	2480	0.10

Test Modes	Ton (ms)	Ton+off (ms)	Duty cycle (%)	Scaled Factor (1/duty cycle)
BDR(GFSK)	3.00	3.76	79.8	1.3

Duty Cycle	
BDR(GFSK)	

8. STANDALONE SAR TEST EXCLUSION CONSIDERATIONS

8.1 Antennas Location:



8.2 Antenna Distance To Edge

Antenna Distance To Edge(mm)						
Antenna	**Back**	**Front**	**Left**	**Right**	**Top**	**Bottom**
WWAN Antenna(GSM/WCDMA/LTE)	< 5	< 5	41	149	161	< 5
WLAN/BT Antenna	< 5	< 5	< 5	248	32	110

8.3 SAR test exclusion for the EUT edge considerations Result

Mode	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Test Exclusion Distance (mm)
GSM 850	848.8	24.5	281.8	71
PCS 1900	1909.8	20.25	105.9	48.7
WCDMA Band 2	1907.6	15.5	35.5	16.3
WCDMA Band 5	846.6	23	199.5	56.4
LTE Band 2	1900	18.5	70.8	32.5
LTE Band 5	844	21.5	141.3	43.2
LTE Band 7	2560	16	39.8	21.2
LTE Band 12	707.5	25	316.2	79.2
LTE Band 41	2645	17.1	51.3	27.8
WLAN 2.4G	2462	10.5	11.2	5.8
WLAN 5.2G	5240	8	6.3	4.8
WLAN 5.8G	5825	8	6.3	5.1
BT	2480	6	4	2.0

Note: The GSM850/PCS1900 based average power for calculation.

Mode	Back	Front	Left	Right	Top	Bottom
GSM 850	**Required**	**Required**	**Required**	Exclusion	Exclusion	**Required**
PCS 1900	**Required**	**Required**	**Required**	Exclusion	Exclusion	**Required**
WCDMA Band 2	**Required**	**Required**	Exclusion	Exclusion	Exclusion	**Required**
WCDMA Band 5	**Required**	**Required**	**Required**	Exclusion	Exclusion	**Required**
LTE Band 2	**Required**	**Required**	Exclusion	Exclusion	Exclusion	**Required**
LTE Band 5	**Required**	**Required**	**Required**	Exclusion	Exclusion	**Required**
LTE Band 7	**Required**	**Required**	Exclusion	Exclusion	Exclusion	**Required**
LTE Band 12	**Required**	**Required**	**Required**	Exclusion	Exclusion	**Required**
LTE Band 41	**Required**	**Required**	Exclusion	Exclusion	Exclusion	**Required**
WLAN 2.4G	**Required**	**Required**	**Required**	Exclusion	Exclusion	Exclusion
WLAN 5.2G	**Required**	**Required**	**Required**	Exclusion	Exclusion	Exclusion
WLAN 5.8G	**Required**	**Required**	**Required**	Exclusion	Exclusion	Exclusion
BT	**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.
Exclusion*：SAR test exclusion evaluation has been done above.

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:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] ·
[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤7.5 for 10-g extremity SAR, where
1. f(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.
5. The Time based average Power is used for calculation

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) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz.

9. SAR MEASUREMENT RESULTS

This page summarizes the results of the performed dosimetric evaluation.

9.1 SAR Test Data

Temperature:	21.6-22.5 ℃	22.6-23.1℃	22.7-23.3 ℃	22.4-23.1 ℃	22.2-22.9 ℃	22.4-23.1 ℃
Relative Humidity:	38%	40%	36%	41%	33%	36%
ATM Pressure:	98.6 kPa	100.0 kPa	100.8 kPa	100.2 kPa	100.8 kPa	100.9 kPa
Test Date:	2024/7/26	2024/7/27	2024/7/31	2024/08/01	2024/08/02	2024/08/21

Testing was performed by Lily Yang, Petre Ma, Mark Dong.

GSM 850:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Worn Front (0mm)	824.2	GSM	/	/	/	/	/	/
	836.6	GSM	32.65	33	1.084	0.256	0.28	/
	848.8	GSM	/	/	/	/	/	/
Body Worn Back (0mm)	824.2	GSM	/	/	/	/	/	/
	836.6	GSM	32.65	33	1.084	0.360	0.39	/
	848.8	GSM	/	/	/	/	/	/
Body Front (0mm)	824.2	GPRS	/	/	/	/	/	/
	836.6	GPRS	29.34	30.5	1.306	0.099	0.13	/
	848.8	GPRS	/	/	/	/	/	/
Body Back (0mm)	824.2	GPRS	29.37	30.5	1.297	0.373	0.48	/
	836.6	GPRS	29.34	30.5	1.306	0.392	**0.51**	1#
	848.8	GPRS	30.1	30.5	1.096	0.373	0.41	/
Body Left (0mm)	824.2	GPRS	/	/	/	/	/	/
	836.6	GPRS	29.34	30.5	1.306	<0.01	0.01	/
	848.8	GPRS	/	/	/	/	/	/
Body Bottom (0mm)	824.2	GPRS	/	/	/	/	/	/
	836.6	GPRS	29.34	30.5	1.306	0.304	0.40	/
	848.8	GPRS	/	/	/	/	/	/

Note:

1. When the 1-g SAR is ≤ 0.8W/Kg, 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.

GSM 1900:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Worn Front (0mm)	1850.2	GSM	/	/	/	/	/	/
	1880	GSM	25.04	25.5	1.112	0.307	0.34	/
	1909.8	GSM	/	/	/	/	/	/
Body Worn Back (0mm)	1850.2	GSM	/	/	/	/	/	/
	1880	GSM	25.04	25.5	1.112	0.506	0.56	/
	1909.8	GSM	/	/	/	/	/	/
Body Front (0mm)	1850.2	GPRS	24.21	24.5	1.069	0.940	1.00	/
	1880	GPRS	24.49	24.5	1.002	1.03	1.03	/
	1909.8	GPRS	24.3	24.5	1.047	0.883	0.92	/
Body Back (0mm)	1850.2	GPRS	24.21	24.5	1.069	0.840	0.90	/
	1880	GPRS	24.49	24.5	1.002	1	1.00	/
	1909.8	GPRS	24.3	24.5	1.047	0.893	0.93	/
Body Left (0mm)	1850.2	GPRS	/	/	/	/	/	/
	1880	GPRS	24.49	24.5	1.002	<0.01	0.01	/
	1909.8	GPRS	/	/	/	/	/	/
Body Bottom (0mm)	1850.2	GPRS	24.21	24.5	1.069	1.06	1.13	/
	1880	GPRS	24.49	24.5	1.002	1.18	**1.18**	2#
	1909.8	GPRS	24.3	24.5	1.047	0.942	0.99	/

Note:

1. When the 1-g SAR is ≤ 0.8W/Kg, 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.

WCDMA Band 2:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	1852.4	RMC	15.09	15.5	1.099	0.451	0.50	/
	1880	RMC	14.95	15.5	1.135	0.767	**0.87**	3#
	1907.6	RMC	15.11	15.5	1.094	0.662	0.72	/
Body Back (0mm)	1852.4	RMC	/	/	/	/	/	/
	1880	RMC	14.95	15.5	1.135	0.559	0.63	/
	1907.6	RMC	/	/	/	/	/	/
Body Bottom (0mm)	1852.4	RMC	/	/	/	/	/	/
	1880	RMC	14.95	15.5	1.135	0.344	0.39	/
	1907.6	RMC	/	/	/	/	/	/

WCDMA Band 5:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	826.4	RMC	/	/	/	/	/	/
	836.6	RMC	22.1	23	1.230	0.570	0.70	/
	846.6	RMC	/	/	/	/	/	/
Body Back (0mm)	826.4	RMC	21.42	23	1.439	0.706	**1.02**	4#
	836.6	RMC	22.1	23	1.230	0.591	0.73	/
	846.6	RMC	22.58	23	1.102	0.655	0.72	/
Body Left (0mm)	826.4	RMC	/	/	/	/	/	/
	836.6	RMC	22.1	23	1.230	0.507	0.62	/
	846.6	RMC	/	/	/	/	/	/
Body Bottom (0mm)	826.4	RMC	/	/	/	/	/	/
	836.6	RMC	22.1	23	1.230	<0.01	0.01	/
	846.6	RMC	/	/	/	/	/	/

Note:

1. When the 1-g SAR is≤ 0.8W/Kg, 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 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)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	1860	20	1RB	18.29	18.5	1.05	0.844	0.89	/
	1880	20	1RB	18.49	18.5	1.002	0.898	0.90	/
	1900	20	1RB	18.48	18.5	1.005	0.893	0.90	/
	1880	20	50%RB	18.38	18.5	1.028	0.704	0.72	/
	1880	20	100%RB	18.16	18.5	1.081	0.750	0.81	/
Body Back (0mm)	1860	20	1RB	18.29	18.5	1.05	0.761	0.80	/
	1880	20	1RB	18.49	18.5	1.002	0.940	0.94	/
	1900	20	1RB	18.48	18.5	1.005	0.968	0.97	/
	1860	20	50%RB	18.43	18.5	1.016	0.811	0.82	/
	1880	20	50%RB	18.38	18.5	1.028	0.832	0.86	/
	1900	20	50%RB	18.46	18.5	1.009	1.15	**1.16**	5#
	1880	20	100%RB	18.16	18.5	1.081	0.875	0.95	/
Body Bottom (0mm)	1860	20	1RB	/	/	/	/	/	/
	1880	20	1RB	18.49	18.5	1.002	0.261	0.26	/
	1900	20	1RB	/	/	/	/	/	/
	1880	20	50%RB	18.38	18.5	1.028	0.243	0.25	/

LTE Band 5:

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	829	10	1RB	/	/	/	/	/	/
	836.5	10	1RB	21.26	21.5	1.057	0.154	0.16	/
	844	10	1RB	/	/	/	/	/	/
	836.5	10	50%RB	20.23	21.5	1.340	0.119	0.16	/
Body Back (0mm)	829	10	1RB	20.95	21.5	1.135	0.219	0.25	/
	836.5	10	1RB	21.26	21.5	1.057	0.237	0.25	/
	844	10	1RB	20.75	21.5	1.188	0.046	0.05	/
	836.5	10	50%RB	20.23	21.5	1.340	0.209	**0.28**	6#
Body Left (0mm)	829	10	1RB	/	/	/	/	/	/
	836.5	10	1RB	21.26	21.5	1.057	<0.01	0.01	/
	844	10	1RB	/	/	/	/	/	/
	836.5	10	50%RB	20.23	21.5	1.340	<0.01	0.01	/
Body Bottom (0mm)	829	10	1RB	/	/	/	/	/	/
	836.5	10	1RB	21.26	21.5	1.057	0.073	0.08	/
	844	10	1RB	/	/	/	/	/	/
	836.5	10	50%RB	20.23	21.5	1.340	0.029	0.04	/

LTE Band 7:

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	2510	20	1RB	/	/	/	/	/	/
	2535	20	1RB	15.54	16	1.112	0.683	0.76	/
	2560	20	1RB	/	/	/	/	/	/
	2535	20	50%RB	14.77	16	1.327	0.447	0.59	/
Body Back (0mm)	2510	20	1RB	15.34	16	1.164	0.365	0.42	/
	2535	20	1RB	15.54	16	1.112	0.917	**1.02**	**7#**
	2560	20	1RB	15.46	16	1.132	0.565	0.64	/
	2535	20	50%RB	14.77	16	1.327	0.591	0.78	/
	2535	20	100%RB	14.32	16	1.472	0.527	0.78	/
Body Bottom (0mm)	2510	20	1RB	/	/	/	/	/	/
	2535	20	1RB	15.54	16	1.112	0.459	0.51	/
	2560	20	1RB	/	/	/	/	/	/
	2535	20	50%RB	14.77	16	1.327	0.361	0.48	/

LTE Band 12:

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	704	10	1RB	/	/	/	/	/	/
	707.5	10	1RB	24.73	25	1.064	0.170	0.18	/
	711	10	1RB	/	/	/	/	/	/
	707.5	10	50%RB	24.41	25	1.146	0.143	0.16	/
Body Back (0mm)	704	10	1RB	24.5	25	1.122	0.864	**0.97**	8#
	707.5	10	1RB	24.73	25	1.064	0.354	0.38	/
	711	10	1RB	24.84	25	1.038	0.598	0.62	/
	707.5	10	50%RB	24.41	25	1.146	0.291	0.33	/
Body Left (0mm)	704	10	1RB	/	/	/	/	/	/
	707.5	10	1RB	24.73	25	1.064	<0.01	0.01	/
	711	10	1RB	/	/	/	/	/	/
	707.5	10	50%RB	24.41	25	1.146	<0.01	0.01	/
Body Bottom (0mm)	704	10	1RB	/	/	/	/	/	/
	707.5	10	1RB	24.73	25	1.064	0.125	0.13	/
	711	10	1RB	/	/	/	/	/	/
	707.5	10	50%RB	24.41	25	1.146	0.108	0.12	/

LTE Band 41:

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	2545	20	1RB	/	/	/	/	/	/
	2569	20	1RB	/	/	/	/	/	/
	2593	20	1RB	17.03	17.1	1.016	0.588	0.6	/
	2645	20	1RB	/	/	/	/	/	/
	2593	20	50%RB	16.13	17.1	1.25	0.414	0.52	/
Body Back (0mm)	2545	20	1RB	/	/	/	/	/	/
	2569	20	1RB	/	/	/	/	/	/
	2593	20	1RB	17.03	17.1	1.016	0.772	**0.78**	9#
	2645	20	1RB	/	/	/	/	/	/
	2593	20	50%RB	16.13	17.1	1.25	0.546	0.68	/
Body Bottom (0mm)	2545	20	1RB	/	/	/	/	/	/
	2569	20	1RB	/	/	/	/	/	/
	2593	20	1RB	17.03	17.1	1.016	0.516	0.52	/
	2645	20	1RB	/	/	/	/	/	/
	2593	20	50%RB	16.13	17.1	1.25	0.340	0.43	/

Note:
1.The frequency range of LTE Band 41 is 2535~ 2655MHz. Per KDB 447498 D01, according to the following formula Calculate Nc is 4.
2.KDB procedures *the following should be applied to determine the number of required test channels. The test channels should be evenly spread across the transmission frequency band of each wireless mode.*

$$N_c = Round\{[100(f_{high} - f_{low})/f_c]^{0.5} \times (f_c/100)^{0.2}\},$$

where
- N_c is the number of test channels, rounded to nearest integer,
- f_{high} and f_{low} are the highest and lowest channel frequencies within the transmission band,
- f_c is the mid-band channel frequency,
- all frequencies are in MHz.

3. The power class 3 used for LTE Band 41 SAR testing.

Note:
1. When the 1-g SAR is ≤ 0.8W/Kg, 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.
8. Worst case SAR for 50% RB allocation is selected to be tested.

WIFI 2.4G:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	/	/	/	/	/	/	/
	2462	802.11b	10.46	10.5	1.009	1.02	0.301	0.31	/
Body Back (0mm)	2412	802.11b	9.52	10	1.117	1.02	0.367	0.42	/
	2437	802.11b	6.79	7	1.05	1.02	0.309	0.33	/
	2462	802.11b	10.46	10.5	1.009	1.02	0.420	**0.43**	10#
Body Left (0mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	/	/	/	/	/	/	/
	2462	802.11b	10.46	10.5	1.009	1.02	0.111	0.11	/

Note: The test data above was performed on 2024/08/21.

Note:

1. When the 1-g SAR is≤ 0.8W/kg, 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.

WIFI 5.2G:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	5180	802.11a	/	/	/	/	/	/	/
	5200	802.11a	7.56	8	1.107	1.12	0.077	0.10	/
	5240	802.11a	/	/	/	/	/	/	/
Body Back (0mm)	5180	802.11a	7.73	8	1.064	1.12	0.291	0.35	/
	5200	802.11a	7.56	8	1.107	1.12	0.191	0.24	/
	5240	802.11a	7.54	8	1.112	1.12	0.302	**0.38**	11#
Body Left (0mm)	5180	802.11a	/	/	/	/	/	/	/
	5200	802.11a	7.56	8	1.107	1.12	0.177	0.22	/
	5240	802.11a	/	/	/	/	/	/	/

Note:

1. When the 1-g SAR is≤ 0.8W/kg, 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 802.11a mode power is the largest among 802.11a/n/ac, 802.11 a mode as initial test configuration is selected to test.
4. According 2016 Oct. TCB, for SAR testing of 5G WIFI 802.11a 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)”.

WIFI 5.8G:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	5745	802.11n20	/	/	/	/	/	/	/
	5785	802.11n20	7.62	8	1.091	1.14	0.020	0.02	/
	5825	802.11n20	/	/	/	/	/	/	/
Body Back (0mm)	5745	802.11n20	7.36	8	1.159	1.14	0.261	0.34	/
	5785	802.11n20	7.62	8	1.091	1.14	0.254	0.32	/
	5825	802.11n20	7.27	8	1.183	1.14	0.258	**0.35**	**12#**
Body Left (0mm)	5745	802.11n20	/	/	/	/	/	/	/
	5785	802.11n20	7.62	8	1.091	1.14	0.172	0.21	/
	5825	802.11n20	/	/	/	/	/	/	/

Note:

1. When the 1-g SAR is≤ 0.8W/kg, 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 802.11n20 mode power is the largest among 802.11a/n/ac, 802.11 n20 mode as initial test configuration is selected to test.
4. According 2016 Oct. TCB, for SAR testing of 5G WIFI 802.11a 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)”.

BT:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Body Front (0mm)	2402	BDR(GFSK)	/	/	/	/	/	/	/
	2411	BDR(GFSK)	/	/	/	/	/	/	/
	2441	BDR(GFSK)	3.83	4	1.037	1.3	0.015	0.02	/
	2480	BDR(GFSK)	/	/	/	/	/	/	/
Body Back (0mm)	2402	BDR(GFSK)	4.39	4.5	1.026	1.3	0.018	0.02	/
	2411	BDR(GFSK)	5.76	6	1.057	1.3	0.042	**0.06**	13#
	2441	BDR(GFSK)	3.83	4	1.037	1.3	0.018	0.02	/
	2480	BDR(GFSK)	5.72	6	1.067	1.3	0.023	0.03	/
Body Left (0mm)	2402	BDR(GFSK)	/	/	/	/	/	/	/
	2411	BDR(GFSK)	/	/	/	/	/	/	/
	2441	BDR(GFSK)	3.83	4	1.037	1.3	0.017	0.02	/
	2480	BDR(GFSK)	/	/	/	/	/	/	/

Note: The test data above was performed on 2024/08/01.

Note:
1. When the 1-g SAR is less than half of the limit, testing for low and high channel is optional.
2. For GFSK mode power is the largest among GFSK, π/4-DQPSK and 8DPSK, GFSK mode as initial test configuration is selected to test.

10. 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 (~ 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.

Note: The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

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	
750MHz	LTE Band 12	704	Body Back	0.864	0.822	1.05
1900MHz	PCS 1900	1880	Body Bottom	1.18	1.15	1.03
2600MHz	LTE Band 7	2535	Body Back	0.917	0.903	1.02

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.

11. SAR SIMULTANEOUS TRANSMISSION DESCRIPTION

11.1 Simultaneous Transmission:

Description of Simultaneous Transmit Capabilities		
Transmitter Combination	**Simultaneous?**	**Hotspot?**
WWAN(GSM/WCDMA/LTE)Antenna + WIFI 2.4G	√	√
WWAN(GSM/WCDMA/LTE)Antenna + WIFI 5G	√	×
WWAN(GSM/WCDMA/LTE)Antenna + Bluetooth	√	×
WLAN 2.4G+ Bluetooth	×	×
WLAN 5G + Bluetooth	×	×
WLAN 2.4G + WLAN 5G	×	×

11.2 Simultaneous SAR test exclusion considerations:

Mode(SAR1+SAR2)	Position	Reported SAR(W/kg)		ΣSAR < 1.6W/kg
		SAR1	SAR2	
WWAN(GSM/WCDMA/LTE)Antenna + WIFI 2.4G	Body Front	1.03	0.31	1.34
	Body Back	1.16	0.43	**1.59**
	Body Left	0.62	0.11	0.73
	Body Bottom	1.18	NA	NA
WWAN(GSM/WCDMA/LTE)Antenna + WIFI 5G	Body Front	1.03	0.10	1.13
	Body Back	1.16	0.38	1.54
	Body Left	0.62	0.22	0.84
	Body Bottom	1.18	NA	NA
WWAN(GSM/WCDMA/LTE)Antenna + Bluetooth	Body Front	1.03	0.02	1.05
	Body Back	1.16	0.06	1.22
	Body Left	0.62	0.02	0.64
	Body Bottom	1.18	NA	NA
WWAN(GSM/WCDMA/LTE)Antenna + WIFI 2.4G (Hotspot)	Body Front	1.03	0.31	1.34
	Body Back	1.16	0.43	1.59
	Body Left	0.62	0.11	0.73
	Body Bottom	1.18	NA	NA

Conclusion:
Sum of SAR:**ΣSAR ≤1.6 W/kg** therefore simultaneous transmission SAR with Volume Scans is **not required**.

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

Uncertainty component	Tolerance/ uncertainty ± %	Probability distribution	Divisor	ci (1 g)	ci (10 g)	Standard uncertainty ± %, (1 g)	Standard uncertainty ± %, (10 g)
Measurement system							
Probe calibration(k=1)	6.55	N	1	1	1	6.6	6.6
Axial isotropy	4.7	R	√3	√0.5	√0.5	1.9	1.9
Hemispherical isotropy	9.6	R	√3	√0.5	√0.5	3.9	3.9
Boundary effect	1.0	R	√3	1	1	0.6	0.6
Linearity	4.7	R	√3	1	1	2.7	2.7
System detection limits	1.0	R	√3	1	1	0.6	0.6
Modulation response	0.0	R	√3	1	1	0.0	0.0
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	√3	1	1	0.0	0.0
Integration time	0.0	R	√3	1	1	0.0	0.0
RF ambientconditions-noise	1.0	R	√3	1	1	0.6	0.6
RF ambient conditions-reflections	1.0	R	√3	1	1	0.6	0.6
Probe positioner mech.tolerance	0.8	R	√3	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	√3	1	1	3.9	3.9
Extrapolation, interpolation, and integrationsalgorithms for max. SAR evaluation	2.0	R	√3	1	1	1.2	1.2
Test sample related							
Test sample positioning	3.3	N	1	1	1	3.3	3.3
Device holder uncertainty	4.7	N	1	1	1	4.7	4.7
Output power variation –SAR draft measurement	5.0	R	√3	1	1	2.9	2.9
SAR scaling	2.8	R	√3	1	1	1.6	1.6
Phantom and tissue parameters							
Phantom shell uncertainty– shape, thicknessand permittivity	4.0	R	√3	1	1	2.3	2.3
Uncertainty in SARcorrection for deviationsin permittivity and conductivity	1.9	N	1	1	0.84	1.9	1.6
Liquid conductivity meas.	2.5	N	1	0.78	0.71	2.0	1.8
Liquid permittivity meas.	2.5	N	1	0.23	0.26	0.6	0.7
Liquid conductivity – temperatureuncertainty	1.7	R	√3	0.78	0.71	0.8	0.7
Liquid permittivity – temperatureuncertainty	0.3	R	√3	0.23	0.26	0.0	0.0
Combined standard uncertainty		RSS				12.1	12.0
Expanded uncertainty (95 % confidence interval)		k=2				24.2	24.0

Measurement uncertainty evaluation for IEC62209-2 SAR test

Source of uncertainty	Tolerance/ Uncertainty value ± %	Probability Distribution	Divisor	ci (1 g)	ci (10 g)	Standard uncertainty ± %, (1 g)	Standard uncertainty ± %, (10 g)
Measurement system							
Probe calibration	6.55	N	1	1	1	6.6	6.6
Isotropy	4.7	R	√3	1	1	2.7	2.7
Linearity	4.7	R	√3	1	1	2.7	2.7
Probe modulation response	0.0	R	√3	1	1	0.0	0.0
Detection limits	1.0	R	√3	1	1	0.6	0.6
Boundary effect	1.0	R	√3	1	1	0.6	0.6
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	√3	1	1	0.0	0.0
Integration time	0.0	R	√3	1	1	0.0	0.0
RF ambientconditions – noise	1.0	R	√3	1	1	0.6	0.6
RF ambient conditions–reflections	1.0	R	√3	1	1	0.6	0.6
Probe positioner mech. restrictions	0.8	R	√3	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	√3	1	1	3.9	3.9
Post-processing	2.0	R	√3	1	1	1.2	1.2
Test sample related							
Device holder uncertainty	4.7	N	1	1	1	4.7	4.7
Test sample positioning	3.3	N	1	1	1	3.3	3.3
Power scaling	4.5	R	√3	1	1	2.6	2.6
Drift of output power (measured SAR drift)	5.0	R	√3	1	1	2.9	2.9
Phantom and set-up							
Phantom uncertainty (shape and thickness tolerances)	4.0	R	√3	1	1	2.3	2.3
Algorithm for correcting SAR for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.9	1.6
Liquid conductivity (meas.)	2.5	N	1	0.78	0.71	2.0	1.8
Liquid permittivity (meas.)	2.5	N	1	0.23	0.26	0.6	0.7
Liquid conductivity – temperatureuncertainty	1.7	R	√3	0.78	0.71	0.8	0.7
Liquid permittivity – temperatureuncertainty	0.3	R	√3	0.23	0.26	0.0	0.0
Combined standard uncertainty		RSS				11.8	11.7
Expanded uncertainty (95 % confidence interval)						23.6	23.4

APPENDIX B - SAR PLOTS

Please refer to the attachment.

APPENDIX C - EUT TEST POSITION PHOTOS

Please refer to the attachment.

APPENDIX D - PROBE CALIBRATION CERTIFICATES

Please refer to the attachment.

APPENDIX E - DIPOLE CALIBRATION CERTIFICATES

Please refer to the attachment.

===== END OF REPORT ====