FCC SAR TEST REPORT

Application No.:	SZCR2304001004AT
Applicant:	SZ DJI TECHNOLOGY CO., LTD.
Address of Applicant:	Lobby of T2, DJI Sky City, No. 53 Xianyuan Road, Xili Community, Xili Street, Nanshan District, Shenzhen, China.
Manufacturer:	SZ DJI TECHNOLOGY CO., LTD.
Address of Manufacturer:	Lobby of T2, DJI Sky City, No. 53 Xianyuan Road, Xili Community, Xili Street, Nanshan District, Shenzhen, China.
Product Name:	DJI RC-N2
Model No.:	RC151
Trade mark:	DJI
FCC ID:	SS3-RC1512303
Standard(s) :	FCC 47CFR §2.1093
Date of Receipt:	2023-05-07
Date of Test:	2023-05-08 to 2023-05-10
Date of Issue:	2023-06-05
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

Revision Record

Version	Description	Date	Remark
00	Original	2023-06-05	/

Authorized for issue by:

Owen Xiao

Owen Xiao/ Project Engineer

Eric Fu

Eric Fu / Reviewer

TEST SUMMARY

Frequency Band	Test position	Test mode	Max Reported SAR10g (W/kg)	SAR limit (W/kg)
SDR 2.4GHz	Limbs	20M	1.06	4.0
SDR 5GHz	Limbs	10M	1.19	4.0
Maximum Simultaneous SAR for Limbs			2.08	

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1 General Information

1.1 General Description of EUT

<table>
<tr><td>Product Phase:</td><td colspan="3">Production unit</td></tr>
<tr><td>Device Type:</td><td colspan="3">Portable device</td></tr>
<tr><td>Exposure Category:</td><td colspan="3">Uncontrolled environment / general population</td></tr>
<tr><td>SN:</td><td colspan="3">6V4DL2L0000150</td></tr>
<tr><td>Hardware Version:</td><td colspan="3">V 0.1</td></tr>
<tr><td>Software Version:</td><td colspan="3">V00.00.00.01</td></tr>
<tr><td>Antenna Gain:</td><td colspan="3">2.4G SDR: ANT0&ANT1: 3dBi
5.1G SDR: ANT0&ANT1: 1.5dBi
5.8G SDR: ANT0&ANT1: 4dBi</td></tr>
<tr><td>Antenna Type:</td><td colspan="3">PCB Antenna</td></tr>
<tr><td colspan="4">Device Operating Configurations:</td></tr>
<tr><td>Modulation Mode:</td><td colspan="3">SDR 2.4G：OFDM
SDR 5.1G：OFDM
SDR 5.8G：OFDM</td></tr>
<tr><td rowspan="4">Frequency Bands:</td><td>Band</td><td>Tx(MHz)</td><td>Rx(MHz)</td></tr>
<tr><td>SDR 2.4G</td><td>2403.5~2469.5</td><td>2403.5~2469.5</td></tr>
<tr><td>SDR 5.1G</td><td>5157-5245</td><td>5157-5245</td></tr>
<tr><td>SDR5.8G</td><td>5727.5~5847.2</td><td>5727.5~5847.2</td></tr>
<tr><td rowspan="5">Battery Information:</td><td>Model:</td><td colspan="2">INR18650-26EC</td></tr>
<tr><td>Normal Voltage:</td><td colspan="2">3.6V DC</td></tr>
<tr><td>Rated capacity:</td><td colspan="2">2600mAh*2</td></tr>
<tr><td>Battery Type:</td><td colspan="2">Lithium-ion Rechargeable Cell</td></tr>
<tr><td>Manufacturer:</td><td colspan="2">Hengdian Group DMEGC</td></tr>
</table>

1.2 DUT Antenna Locations

Please see the Appendix D

1.3 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radio frequency Radiation Exposure Evaluation: Portable Devices
IEEE Std C95.1 – 1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 447498 D04 v01	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices
KDB 865664 D01 v01r04	SAR Measurement Requirements for 100 MHz to 6 GHz
KDB 865664 D02 v01r02	RF Exposure Compliance Reporting and Documentation Considerations

1.4 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain*Trunk)	1.60 W/kg	8.00 W/kg
Spatial Average SAR** (Whole Body)	0.08 W/kg	0.40 W/kg
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 W/kg	20.00 W/kg

Notes:

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

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

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

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

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation.)

1.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch
No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

1.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI (Member No. 1937)**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1336**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

2 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

3 SAR Measurements System Configuration

3.1 The SAR Measurement System

This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

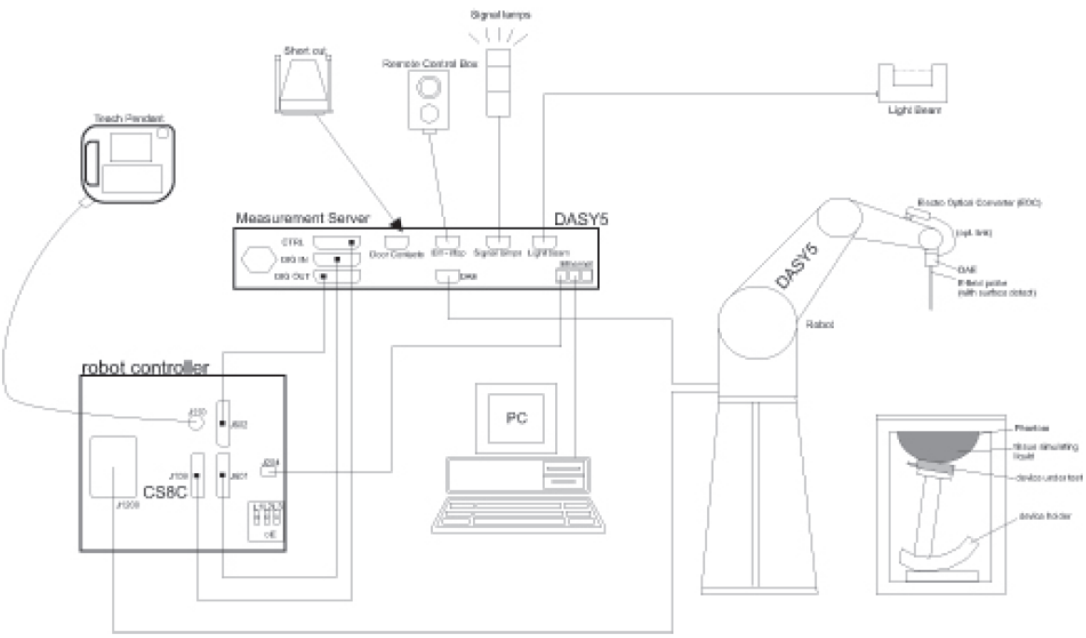
The DASY5 system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software. An arm extension for accommodation the data acquisition electronics (DAE).

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



F-1. SAR Measurement System Configuration

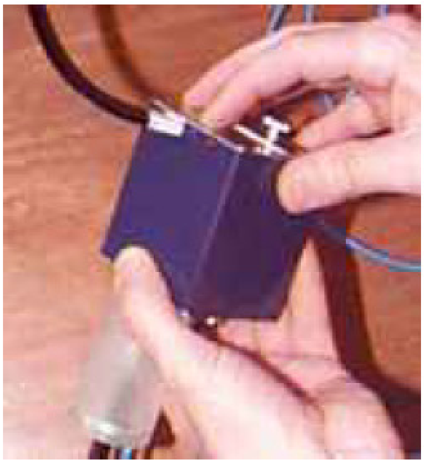
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validat the proper functioning of the system.

3.2 Isotropic E-field Probe EX3DV4

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 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
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

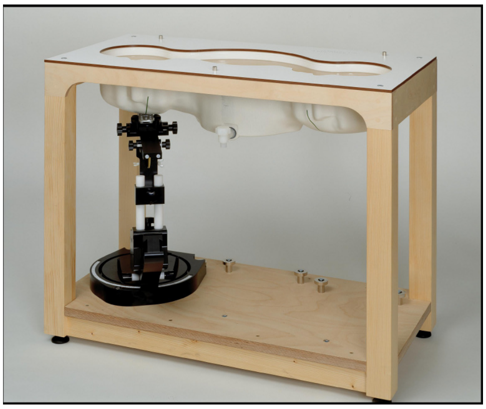
3.3 Data Acquisition Electronics (DAE)

Model	DAE4
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV)
Input Offset Voltage	< 5μV (with auto zero)
Input Bias Current	< 50 f A
Dimensions	60 x 60 x 68 mm



3.4 SAM Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters
Wooden Support	SPEAG standard phantom table



The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.

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3.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	
Wooden Support	SPEAG standard phantom table	

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

ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure.

3.6 Device Holder for Transmitters

F-2. **Device Holder for Transmitters**

- The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
- The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

3.7 Measurement procedure

3.7.1 Scanning procedure

Step 1: Power reference measurement

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

Step 2: *Area scan*

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm.Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: *Zoom scan*

Around this point, a volume of 30mm*30mm*30mm (fine resolution volume scan, zoom scan) was assessed by measuring 5x5x7 points (≤2GHz) and 7x7x7 points (≥2GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification).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. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

Step 4: Power reference measurement (drift)

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT's output power and should vary max. ± 5 %

3.7.2 Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DAE3". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [℃], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

3.7.3 Data Evaluation by SEMCAD

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

Probe parameters: - Sensitivity Normi, ai0, ai1, ai2
- Conversion factor ConvFi
- Diode compression point Dcpi
Device parameters: - Frequency f
- Crest factor cf
Media parameters: - Conductivity ε
- Density ρ

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

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

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

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

With Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)

dcp i = diode compression point (DASY parameter)

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

E-field probes:

$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

H-field probes:

$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel I (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (Etot^2 \cdot \sigma) / (\varepsilon \cdot 1000)$$

With SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ= conductivity in [mho/m] or [Siemens/m]
ε= equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}{}^2{}_2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}{}^2 \cdot 37.7$$

with Ppwe = equivalent power density of a plane wave in mW/cm2
Etot = total electric field strength in V/m
Htot = total magnetic field strength in A/m

4 SAR measurement variability and uncertainty

4.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, 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. The 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.

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.

4.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

5 Description of Test Position

5.1 The Test Position

Per KDB inquiry, SAR can test the sides near the antenna, the surface of the device should be tested for SAR compliance with device touching the phantom. The SAR Exclusion Threshold in KDB 447498 D04 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent device surface is used to determine if SAR testing is required for the adjacent surfaces, with the adjacent surface positioned against the phantom and the surface containing the antenna positioned perpendicular to the phantom.

6 SAR System Verification Procedure

6.1 Tissue Simulate Liquid

6.1.1 Recipes for Tissue Simulate Liquid

The bellowing tables give the recipes for tissue simulating liquids to be used in different frequency bands：

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78
HSL5GHz is composed of the following ingredients： Water：50-65% Mineral oil：10-30% Emulsifiers：8-25% Sodium salt：0-1.5%										
MSL5GHz is composed of the following ingredients： Water：64-78% Mineral oil：11-18% Emulsifiers：9-15% Sodium salt：2-3%										

Table 2： Recipe of Tissue Simulate Liquid

6.1.2 Test Liquids Confirmation

Simulated tissue liquid parameter confirmation

The dielectric parameters were checked prior to assessment using the SPEAG DAK3.5 dielectric probe kit. The dielectric parameters measured are reported in each correspondent section.

IEEE SCC-34/SC-2 P1528 recommended tissue dielectric parameters

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in P1528

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

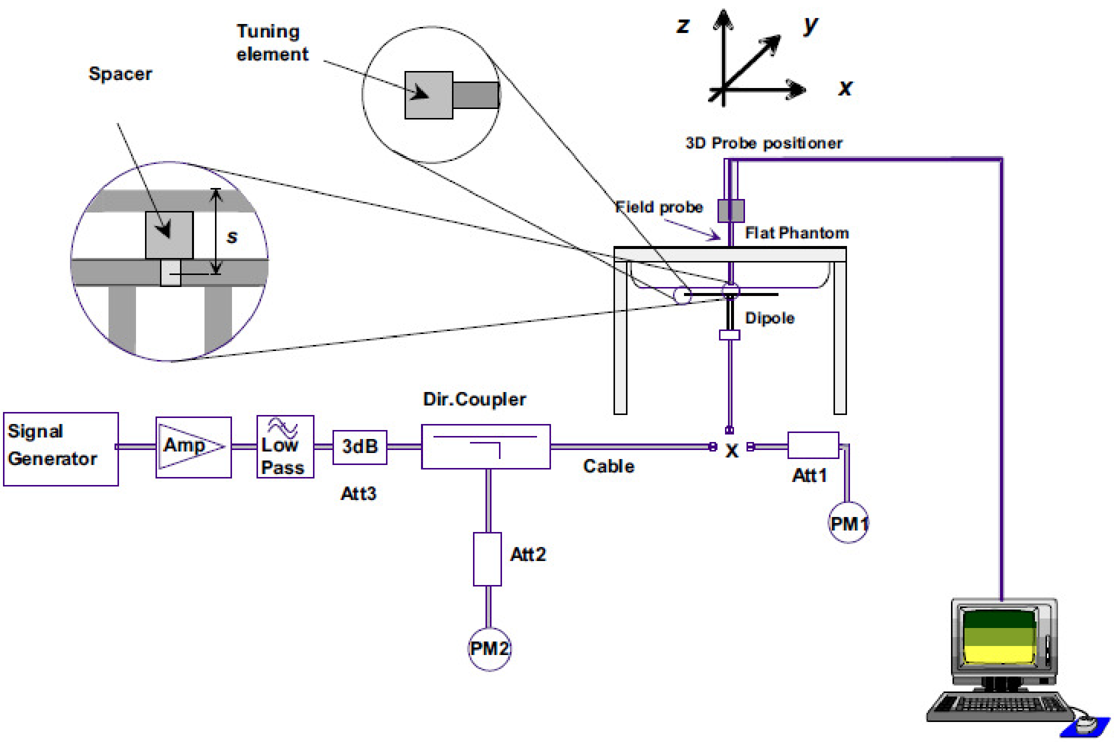
6.1.3 Measurement for Tissue Simulate Liquid

The dielectric properties for this Tissue Simulate Liquids were measured by using the SPEAG DAK3.5 dielectric probe kit in conjunction with Agilent E5071B Network Analyzer (300 KHz-8500 MHz). The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was 22±2℃.

Measurement for Tissue Simulate Liquid										
Tissue Type	Measured Frequency (MHz)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Liquid Temp. (℃)	Date
2450 Head	2450	1.85	38.78	1.80	39.20	2.78	-1.07	±5	22.1	2023/5/8
5200 Head	5250	4.69	34.96	4.71	35.95	-0.42	-2.75	±5	22.3	2023/5/9
5800 Head	5750	5.17	34.97	5.22	35.35	-0.96	-1.07	±5	22.3	2023/5/10

6.2 SAR System Check

The microwave circuit arrangement for system check is sketched in bellow figure. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table. During the tests, the ambient temperature of the laboratory was in the range 22±2℃, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-3. the microwave circuit arrangement used for SAR system verification

6.2.1 Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

a) There is no physical damage on the dipole;

b) System check with specific dipole is within 10% of calibrated value;

c) Return-loss is within 10% of calibrated measurement;

d) Impedance is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

6.2.2 Summary System Check Result(s)

SAR System Validation Result(s)									
Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1w)	Measured SAR (normalized to 1w)	Target SAR (normalized to 1w) (±10%)	Target SAR (normalized to 1w) (±10%)	Liquid Temp. (℃)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D2450V2	Head	13.47	6.41	53.88	25.64	53.4 (48.06~58.74)	24.9 (22.41~27.39)	22.1	2023/5/8
Validation Kit		Measured SAR 100mW	Measured SAR 100mW	Measured SAR (normalized to 1w)	Measured SAR (normalized to 1w)	Target SAR (normalized to 1w) (±10%)	Target SAR (normalized to 1w) (±10%)	Liquid Temp. (℃)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D5GHzV2	Head(5.2GHz)	7.99	2.26	79.9	22.6	76.5 (68.85~84.15)	21.8 (19.62~23.98)	22.3	2023/5/9
	Head(5.8GHz)	8.07	2.27	80.7	22.7	77.0 (69.30~84.70)	21.6 (19.44~23.76)	22.3	2023/5/10

6.2.3 Detailed System Check Results

Please see the Appendix A

7 Test Configuration

7.1 Operation Configurations

7.1.1 SDR 2.4G Test Configuration

For the SAR tests, a communication link is set up with the test mode software for 2.4G, in the case of 2403.5~2469.5 MHz, during the test at each test frequency channel. The EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest rate. operating modes are tested independently according to the service requirements in each frequency band.

7.1.2 SDR 5.1G Test Configuration

For the SAR tests, a communication link is set up with the test mode software for 5.1G, in the case of 5157-5245MHz, during the test at each test frequency channel. The EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest rate. operating modes are tested independently according to the service requirements in each frequency band.

7.1.3 SDR5.8G Test Configuration

For the SAR tests, a communication link is set up with the test mode software for 5.8G, in the case of 5727.5~5847.2MHz, during the test at each test frequency channel. The EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest rate. operating modes are tested independently according to the service requirements in each frequency band.

7.1.4 DUT Antenna Locations

Please see the Appendix A

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8 Test Result

8.1 Measurement of SAR Data

8.1.1 Conducted Power Of SDR 2.4GHz

	Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)	Tune up	Maximum Average Conducted Output Power (dBm)	Tune up
				ANT0		ANT1	
2.4G SDR	1.4M	SISO	2403.5	24.10	25.00	24.05	25.00
			2437.5	24.07	25.00	24.42	25.00
			2469.12	25.17	26.00	25.47	26.00
	3M	SISO	2405.5	27.06	28.00	26.33	28.00
			2437.88	26.60	28.00	26.61	28.00
			2468.2	27.66	28.00	27.34	28.00
	5M	SISO	2404.5	26.63	27.00	26.86	27.00
			2437.74	26.93	28.00	27.05	28.00
			2469.5	27.57	28.00	27.70	28.00
	10M	SISO	2407.5	23.30	24.00	23.20	24.00
			2437.5	27.80	28.00	27.80	28.00
			2467.5	20.40	21.00	20.24	21.00
	20M	SISO	2412.5	20.58	21.00	19.79	21.00
			2437.5	27.97	28.00	27.76	28.00
			2462.5	16.47	17.00	16.71	17.00
	40M	SISO	2422.5	13.92	14.00	13.36	14.00
			2437.5	20.88	21.00	20.27	21.00
			2452.5	13.95	14.00	13.85	14.00
	60M	SISO	2432.5	14.29	15.00	13.69	15.00
			2437.5	14.49	15.00	14.59	15.00
			2442.5	14.48	15.00	13.88	15.00

8.1.1 Conducted Power of SDR 5.1GHz

	Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)	Tune up	Maximum Average Conducted Output Power (dBm)	Tune up
				ANT0		ANT1	
5.1G SDR	10M	SISO	5157	4.89	5	4.84	5
			5201	19.61	20	19.26	20
			5245	19.65	20	18.6	19
	20M	SISO	5161	5.76	6	5.47	6
			5200	19.14	19.5	18.68	19.5
			5240	18.93	19	18.89	19
	40M	SISO	5170	10.19	10.5	9.53	10.5
			5200	18.83	19	18.78	19
			5230	18.86	19	18.72	19

8.1.2 Conducted Power of SDR 5.8GHz

	Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)	Tune up	Maximum Average Conducted Output Power (dBm)	Tune up
				ANT0		ANT1	
5.8G SDR	1.4M	SISO	5728.5	26.69	27	25.96	27
			5786.5	26.57	27	26.83	27
			5846.12	27.6	28	27.3	28
	3M	SISO	5727.5	27.25	28	26.26	27
			5784.5	26.91	28	26.6	27
			5847.2	27.95	28	26.79	27
	5M	SISO	5732.5	27.07	28	26.08	27
			5782.5	26.76	28	26.35	27
			5842.5	27.83	28	26.78	27
	10M	SISO	5730.5	27.44	28.5	26.53	27.5
			5787.5	27.25	28.5	27.04	27.5
			5844.5	28.04	28.5	27.32	27.5
	20M	SISO	5735.5	27.41	28	26.43	27
			5787.5	27.23	28	26.85	27
			5839.5	27.79	28	26.87	27
	40M	SISO	5745.5	23.08	25	22.18	25
			5787.5	24.87	25	24.9	25
			5829.5	22.87	23	21.35	23
	60M	SISO	5755.5	22.76	23.5	22.43	23.5
			5787.5	22.91	23.5	23.31	23.5
			5819.5	23.1	23.5	23.45	23.5
	80M	SISO	5765.5	23.77	24	22.97	23.5
			5787.5	23.6	24	22.84	23.5
			5809.5	23.9	24	23.34	23.5

8.2 SAR-based Exemption

The following SAR test exclusion Thresholds based on KDB 447498 D04 Interim General RF Exposure Guidance v01 Appendix B

Extremity SAR ANT0

Freq.Band	Frequency (MHz)	Position	Max Power (dBm)	Antenna Gain (dBi)	Max Power (mW)	Antenna to user (mm)	Exclusion Power (mW)	Exclusion (Yes/No)
SDR 2.4G	2437.5	Front Side	28	3	631	8	16.8	No
	2437.5	Back Side	28	3	631	8.9	20.6	No
	2437.5	Left Side	28	3	631	93.9	1817.3	Yes
	2437.5	Right Side	28	3	631	43.9	428.3	No
	2437.5	Top Side	28	3	631	3.6	3.7	No
	2437.5	Bottom Side	28	3	631	99.1	2013.4	Yes

Extremity SAR ANT1

Freq.Band	Frequency (MHz)	Position	Max Power (dBm)	Antenna Gain (dBi)	Max Power (mW)	Antenna to user (mm)	Exclusion Power (mW)	Exclusion (Yes/No)
SDR 2.4G	2437.5	Front Side	28	3	631	8	16.8	No
	2437.5	Back Side	28	3	631	8.9	20.6	No
	2437.5	Left Side	28	3	631	43.9	428.3	No
	2437.5	Right Side	28	3	631	93.9	1817.3	Yes
	2437.5	Top Side	28	3	631	3.6	3.7	No
	2437.5	Bottom Side	28	3	631	99.1	2013.4	Yes

Extremity SAR ANT0								
Freq.Band	Frequency (MHz)	Position	Max Power (dBm)	Antenna Gain (dBi)	Max Power (mW)	Antenna to user (mm)	Exclusion Power (mW)	Exclusion (Yes/No)
SDR 5G	5200	Front Side	20	3	100	8	9.9	No
	5200	Back Side	20	3	100	8.9	12.4	No
	5200	Left Side	20	3	100	93.9	1604.7	Yes
	5200	Right Side	20	3	100	43.9	333.7	No
	5200	Top Side	20	3	100	3.6	1.9	No
	5200	Bottom Side	20	3	100	99.1	1793.7	Yes

Extremity SAR ANT1								
Freq.Band	Frequency (MHz)	Position	Max Power (dBm)	Antenna Gain (dBi)	Max Power (mW)	Antenna to user (mm)	Exclusion Power (mW)	Exclusion (Yes/No)
SDR 5G	5200	Front Side	20	3	100	8	9.9	No
	5200	Back Side	20	3	100	8.9	12.4	No
	5200	Left Side	20	3	100	43.9	333.7	No
	5200	Right Side	20	3	100	93.9	1604.7	Yes
	5200	Top Side	20	3	100	3.6	1.9	No
	5200	Bottom Side	20	3	100	99.1	1793.7	Yes

Extremity SAR ANT0								
Freq.Band	Frequency (MHz)	Position	Max Power (dBm)	Antenna Gain (dBi)	Max Power (mW)	Antenna to user (mm)	Exclusion Power (mW)	Exclusion (Yes/No)
SDR 5G	5787.5	Front Side	28.5	3	708	8	9.2	No
	5787.5	Back Side	28.5	3	708	8.9	11.5	No
	5787.5	Left Side	28.5	3	708	93.9	1576.8	Yes
	5787.5	Right Side	28.5	3	708	43.9	322.2	No
	5787.5	Top Side	28.5	3	708	3.6	1.7	No
	5787.5	Bottom Side	28.5	3	708	99.1	1764.7	Yes

Extremity SAR ANT1								
Freq.Band	Frequency (MHz)	Position	Max Power (dBm)	Antenna Gain (dBi)	Max Power (mW)	Antenna to user (mm)	Exclusion Power (mW)	Exclusion (Yes/No)
SDR 5G	5787.5	Front Side	27.5	3	562	8	9.2	No
	5787.5	Back Side	27.5	3	562	8.9	11.5	No
	5787.5	Left Side	27.5	3	562	43.9	322.2	No
	5787.5	Right Side	27.5	3	562	93.9	1576.8	Yes
	5787.5	Top Side	27.5	3	562	3.6	1.7	No
	5787.5	Bottom Side	27.5	3	562	99.1	1764.7	Yes

Note:

1. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
2. Per KDB 447498 D04, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.

3. Per KDB 447498 D04, standalone SAR test exclusion threshold is applied; If the distance of the antenna to the user is < 5mm, 5mm is used to determine SAR exclusion threshold
4. Per KDB 447498 D04, the 1-g and 10-g SAR test exclusion thresholds for 300 MHz to 6 GHz

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by Formula (B.2).

$$P_{\mathrm{th}}\ (\mathrm{mW}) = ERP_{20\ \mathrm{cm}}\ (\mathrm{mW}) = \begin{cases} 2040f & 0.3\ \mathrm{GHz} \le f < 1.5\ \mathrm{GHz} \\ 3060 & 1.5\ \mathrm{GHz} \le f \le 6\ \mathrm{GHz} \end{cases} \qquad (\mathrm{B.1})$$

$$P_{\mathrm{th}}\ (\mathrm{mW}) = \begin{cases} ERP_{20\ \mathrm{cm}}(d/20\ \mathrm{cm})^{x} & d \le 20\ \mathrm{cm} \\ ERP_{20\ \mathrm{cm}} & 20\ \mathrm{cm} < d \le 40\ \mathrm{cm} \end{cases} \qquad (\mathrm{B.2})$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ \mathrm{cm}}\sqrt{f}}\right)$$

and f is in GHz, d is the separation distance (cm), and ERP_{20cm} is per Formula (B.1).
The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz) \ Distance (mm)	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

5. when 10-g extremity SAR applies, SAR test exemption may be considered by applying a factor of 2.5 to the SAR-based exemption thresholds.

8.3 Measurement of SAR Data

8.3.1 SAR Result Of 2.4G

SDR 2.4G SAR Test Record												
Test position	**Test mode**	**Test ch./Freq.**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power (dBm)**	**Tune up Limit (dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**16.44% Scaled SAR 10-g (W/kg)**	**Liquid Temp .(℃)**	**SAR limit (W/kg)**
Extremity Test data(0mm)antenna0												
Front side	20M	2437.5	0.782	0.402	-0.08	27.97	28.0	1.007	0.405	0.067	21.1	4.0
Back side	20M	2437.5	0.305	0.152	-0.15	27.97	28.0	1.007	0.153	0.025	21.1	4.0
Left side	20M	2437.5	0.287	0.141	-0.15	27.97	28.0	1.007	0.142	0.023	21.1	4.0
Right side	20M	2437.5	0.873	0.510	-0.15	27.97	28.0	1.007	0.514	0.085	21.1	4.0
Top side	20M	2437.5	17.3	6.420	-0.08	27.97	28.0	1.007	6.465	**1.063**	21.1	4.0
Extremity Test data(0mm)antenna1												
Front side	20M	2437.5	1.090	0.592	0.08	27.76	28.0	1.057	0.626	0.103	21.1	4.0
Back side	20M	2437.5	0.355	0.167	-0.13	27.76	28.0	1.057	0.176	0.029	21.1	4.0
Left side	20M	2437.5	0.338	0.161	-0.15	27.97	28.0	1.007	0.162	0.027	21.1	4.0
Right side	20M	2437.5	0.873	0.510	-0.15	27.97	28.0	1.007	0.514	0.085	21.1	4.0
Top side	20M	2437.5	11.8	4.850	0.05	27.76	28.0	1.057	5.126	**0.843**	21.1	4.0

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B
2) The scaled SAR = Measured SAR(W/kg) * Duty Cycle Scaled factor * Scaled factor
3) Duty Cycle Scaled factor = 100% Duty Cycle / Measured Duty Cycle
4) The maximum possible duty factor in normal use condition is 16.44%
5) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel.

8.3.2 SAR Result Of 5G

SDR 5.1G SAR Test Record												
Test position	**Test mode**	**Test ch./Freq.**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power (dBm)**	**Tune up Limit (dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**16.44% Scaled SAR 10-g (W/kg)**	**Liquid Temp .(℃)**	**SAR limit (W/kg)**
Extremity Test data(0mm) antenna0												
Front side	10M	5200	0.925	0.512	-0.08	19.61	20.0	1.094	0.560	0.092	22.3	4.0
Back side	10M	5200	0.363	0.149	-0.03	19.61	20.0	1.094	0.163	0.027	22.3	4.0
Top side	10M	5200	18.2	4.570	0.09	19.61	20.0	1.094	4.999	**0.822**	22.3	4.0
Extremity Test data(0mm) antenna1												
Front side	10M	5200	0.952	0.557	-0.07	19.26	20.0	1.186	0.660	0.109	22.3	4.0
Back side	10M	5200	0.285	0.126	-0.06	19.26	20.0	1.186	0.149	0.024	22.3	4.0
Top side	10M	5200	12.9	2.640	-0.04	19.26	20.0	1.186	3.130	**0.515**	22.3	4.0

Note:

6) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B
7) The scaled SAR = Measured SAR(W/kg) * Duty Cycle Scaled factor * Scaled factor
8) Duty Cycle Scaled factor = 100% Duty Cycle / Measured Duty Cycle
9) The maximum possible duty factor in normal use condition is 16.44%
10) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel.

SDR 5.8G SAR Test Record												
Test position	**Test mode**	**Test ch./Freq.**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power (dBm)**	**Tune up Limit (dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**16.44% Scaled SAR 10-g (W/kg)**	**Liquid Temp .(℃)**	**SAR limit (W/kg)**
Extremity Test data(0mm) antenna0												
Front side	10M	5787.5	1.170	0.526	-0.13	27.25	28.5	1.334	0.701	0.115	22.3	4.0
Back side	10M	5787.5	2.63	1.170	0.14	27.25	28.5	1.334	1.560	0.256	22.3	4.0
Left side	10M	5787.5	0.13	0.057	0.14	27.25	28.5	1.334	0.076	0.012	22.3	4.0
Right side	10M	5787.5	0.82	0.351	0.14	27.25	28.5	1.334	0.468	0.077	22.3	4.0
Top side	10M	5787.5	21.9	5.240	-0.11	27.25	28.5	1.334	6.988	1.149	22.3	4.0
Top side	10M	5730.5	22.300	5.680	0.06	27.44	28.5	1.276	7.250	**1.192**	22.3	4.0
Top side	10M	5844.5	21.600	5.110	0.07	28.04	28.5	1.112	5.681	0.934	22.3	4.0
Extremity Test data(0mm) antenna1												
Front side	10M	5787.5	0.893	0.406	-0.08	27.04	27.5	1.112	0.451	0.074	22.3	4.0
Back side	10M	5787.5	1.89	0.841	0.14	27.04	27.5	1.112	0.935	0.154	22.3	4.0
Left side	10M	5787.5	0.06	0.028	0.14	27.04	27.5	1.112	0.031	0.005	22.3	4.0
Right side	10M	5787.5	0.76	0.314	0.14	27.04	27.5	1.112	0.349	0.057	22.3	4.0
Top side	10M	5787.5	15.9	4.540	0.05	27.04	27.5	1.112	5.047	0.830	22.3	4.0
Top side	10M	5730.5	15.320	4.320	0.07	26.53	27.5	1.250	5.401	**0.888**	22.3	4.0
Top side	10M	5844.5	15.120	4.130	-0.12	27.32	27.5	1.042	4.305	0.708	22.3	4.0

Note:

11) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B
12) The scaled SAR = Measured SAR(W/kg) * Duty Cycle Scaled factor * Scaled factor
13) Duty Cycle Scaled factor = 100% Duty Cycle / Measured Duty Cycle
14) The maximum possible duty factor in normal use condition is 16.44%
15) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel.

9 Equipment list

Test Platform	SPEAG DASY5 Professional
Location	SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch
Software Reference	DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

Hardware Reference

	Equipment	Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	P C	DELL	Core(TM)i3-6100 3.7GHz	7LLVLG2	N/A	N/A
☒	Signal Generator	Agilent	N5173B	MY53270267	2022/07/12	2023/07/11
☒	S-Parameter Network Analyzer	Agilent	E5071C	MY46527453	2022/06/21	2023/06/20
☒	DAK-3.5 probe	SPEAG	DAK-3.5	1102	N/A	N/A
☒	Power sensor	KEYSIGHT	U2021XA	MY57110007	2022/07/12	2023/7/11
☒	universal Radio communication tester	R&S	CMW500	154501	2023/03/20	2024/03/19
☒	DAE	SPEAG	DAE4	760	2022/06/06	2023/06/05
☒	E-field PROBE	SPEAG	EX3DV4	3836	2022/06/27	2023/06/26
☒	Dipole	SPEAG	D2450V2	955	2022/06/06	2025/06/05
☒	Dipole	SPEAG	D5GHzV2	1042	2022/06/01	2025/05/31
☒	Electro Thermometer	MITIR	N/A	N/A	2022/06/02	2023/06/01
☒	Amplifier	Mini-circuits	ZVE-3W-83+	857501833	N/A	N/A
☒	Amplifier	Mini-circuits	ZHL-42W	A0950002	N/A	N/A
☒	3db ATTENUATOR	SHX	SMA-3dB-6G	12021302	N/A	N/A
☒	DUMMY PROBE	SPEAG	DP_2	SPDP2001AA	N/A	N/A
☒	Dual Directional Coupler	Agilent	772D	MY46151275	N/A	N/A
☒	SAM PHANTOM (ELI4 v4.0)	SPEAG	QDOVA001BB	1102	N/A	N/A
☒	ELI V8.0	SPEAG	QDOVA004AA	2062	N/A	N/A
☒	Twin SAM Phantom	SPEAG	QD000P40CD	1673	N/A	N/A
	Twin Phantom	SPEAG	QD000P40CB	1438	N/A	N/A
☒	ROBOT KRC	SPEAG	CS8	SP1/D/211/421/00	N/A	N/A
☒	LIQUID CALIBRATION KIT	ANTENNESSA	41/05 OCP9	00425167	N/A	N/A

Note: All the equipments are within the valid period when the tests are performed.

All measurement facilities used to collect the measurement data are located at

☒ No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

The plots are showing as followings.

Date: 2023/5/8

Test Laboratory: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

System Performance Check-Body D2450

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 955

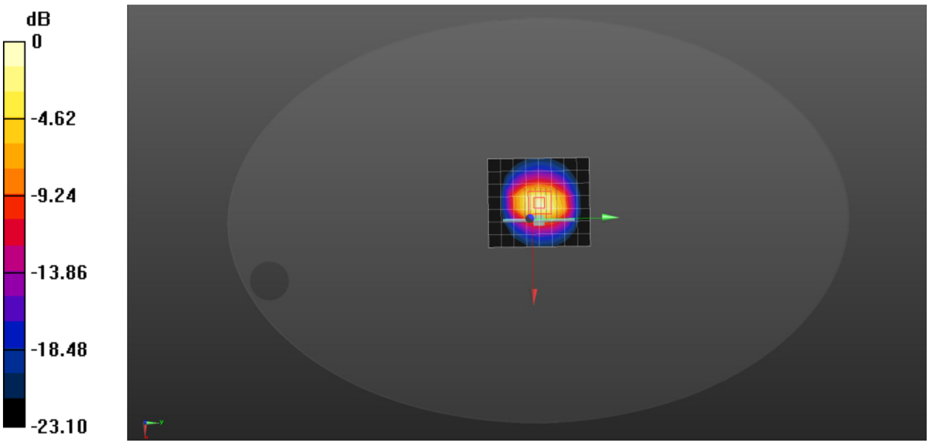
Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.807 S/m; ε_r = 39.325; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3836; ConvF(7.27, 7.27, 7.27); Calibrated: 2022/6/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn760; Calibrated: 2022/6/6
- Phantom: ELI v4.0; Type: QDOVA002AA; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (4); SEMCAD X Version 14.6.8 (7028)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 21.3 W/kg

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 116.75 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 31.4 W/kg
SAR(1 g) = 13.47 W/kg; SAR(10 g) = 6.41 W/kg
Maximum value of SAR (measured) = 22.9 W/kg



0 dB = 22.9 W/kg = 13.60 dBW/kg

Date: 2023/5/9

Test Laboratory: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

System Performance Check-Body D5200

DUT: Dipole 5250 MHz; Type: D5GHzV2; Serial: 1042

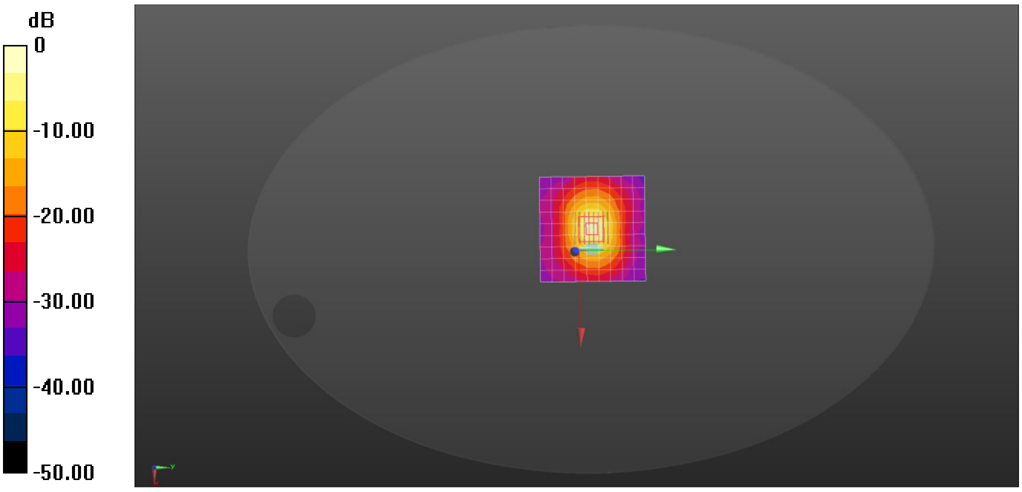
Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5250 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5250 MHz; σ = 4.636 S/m; ε_r = 35.088; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3836; ConvF(5.26, 5.26, 5.26); Calibrated: 2022/6/27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn760; Calibrated: 2022/6/6
- Phantom: ELI v4.0; Type: QDOVA002AA; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (4); SEMCAD X Version 14.6.8 (7028)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5250 MHz /Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 12.8 W/kg

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=520 MHz /Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.087 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 29.8 W/kg
SAR(1 g) = 7.99 W/kg; SAR(10 g) = 2.26 W/kg
Maximum value of SAR (measured) = 14.4 W/kg



0 dB = 14.4 W/kg = 11.58 dBW/kg

Date: 2023/5/10

Test Laboratory: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
System Performance Check-Body D57500
DUT: Dipole 5750 MHz; Type: D5GHzV2; Serial: 1042

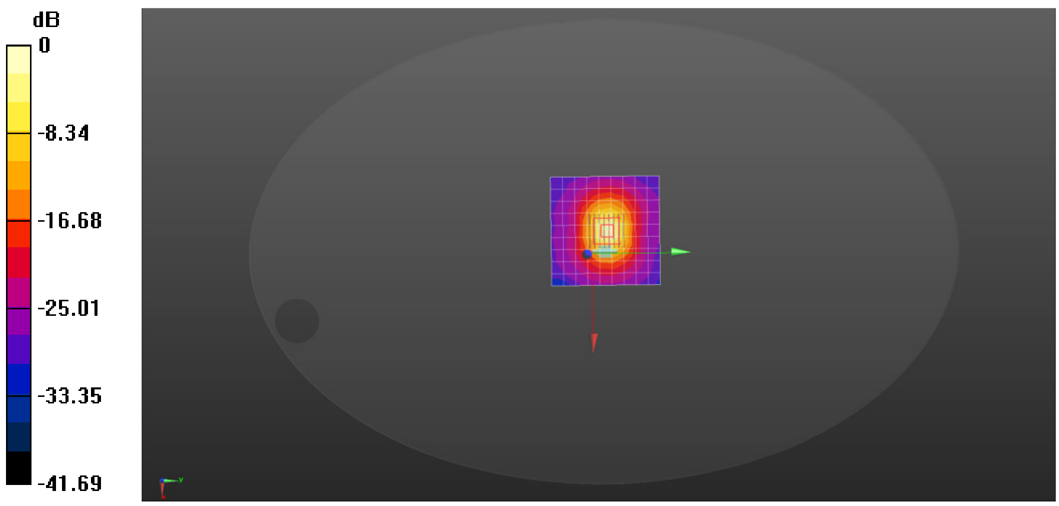
Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5750 MHz; σ = 5.034 S/m; ε_r = 34.299; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3836; ConvF(4.7, 4.7, 4.7); Calibrated: 2022/6/27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn760; Calibrated: 2022/6/6
- Phantom: ELI v4.0; Type: QDOVA002AA; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (4); SEMCAD X Version 14.6.8 (7028)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5750 MHz/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 24.8 W/kg

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5750 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 80.249 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 47.3 W/kg
SAR(1 g) = 8.07 W/kg; SAR(10 g) = 2.27 W/kg
Maximum value of SAR (measured) = 26.0 W/kg



0 dB = 26.0 W/kg = 14.15 dBW/kg

Appendix B: Detailed Test Results

The plots of worse case are showing as followings.

Date: 2023/5/8

Test Laboratory: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
SDR 2.4GHz 20M Top Side ANT0 0mm
DUT: DJI RC-N2; Type: RC151

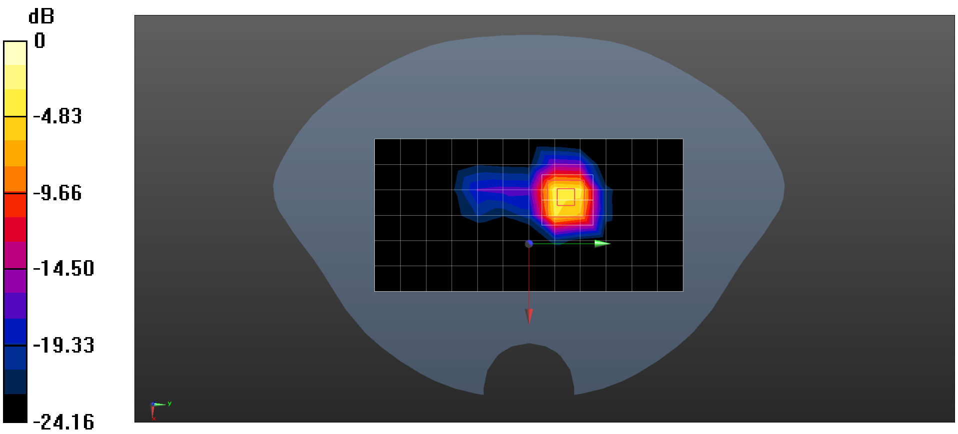
Communication System Band: SDR; Frequency: 2437.5 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2437.5 MHz; σ = 1.801 S/m; ε_r = 39.34; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3836; ConvF(7.27, 7.27, 7.27); Calibrated: 2022/6/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn760; Calibrated: 2022/6/6
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (11x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 21.9 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.128 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 47.2 W/kg
SAR(1 g) = 17.3 W/kg; SAR(10 g) = 6.42 W/kg
Maximum value of SAR (measured) = 24.7 W/kg



0 dB = 24.7 W/kg = 13.93 dBW/kg

Date: 2023/5/9

Test Laboratory: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SDR 5.1GHz 10M Top Side ANT0 0mm

DUT: DJI RC-N2; Type: RC151

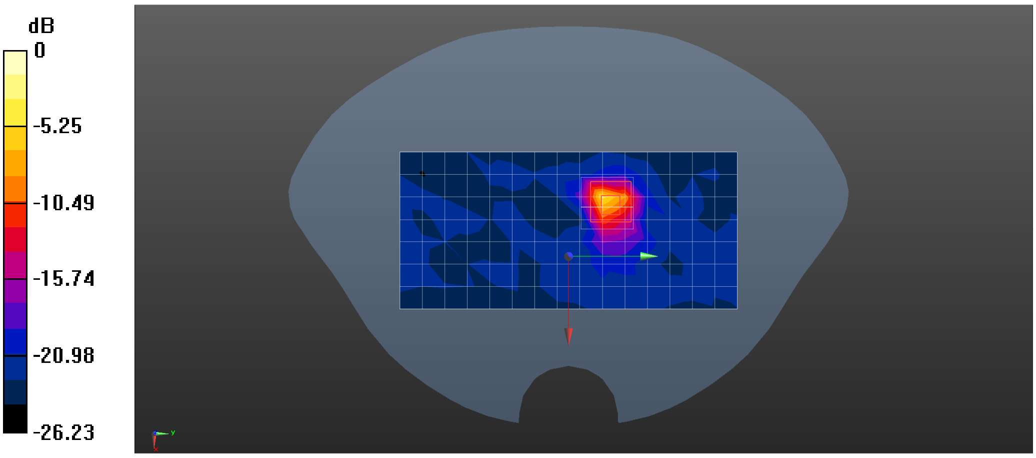
Communication System Band: SDR 5.1G; Frequency: 5201 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5201 MHz; σ = 4.641 S/m; ε_r = 35.069; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3836; ConvF(5.26, 5.26, 5.26); Calibrated: 2022/6/27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn760; Calibrated: 2022/6/6
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (16x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 54.2 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 3.774 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 134 W/kg
SAR(1 g) = 18.2 W/kg; SAR(10 g) = 4.57 W/kg
Maximum value of SAR (measured) = 56.4 W/kg



0 dB = 56.4 W/kg = 17.51 dBW/kg

Date: 2023/5/10

Test Laboratory: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
SDR 5.8GHz 10M Top Side ANT0 0mm
DUT: DJI RC-N2; Type: RC151

Communication System Band: SDR 5.8G; Frequency: 5787.55 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5787.5 MHz; σ = 5.213 S/m; ε_r = 33.952; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007

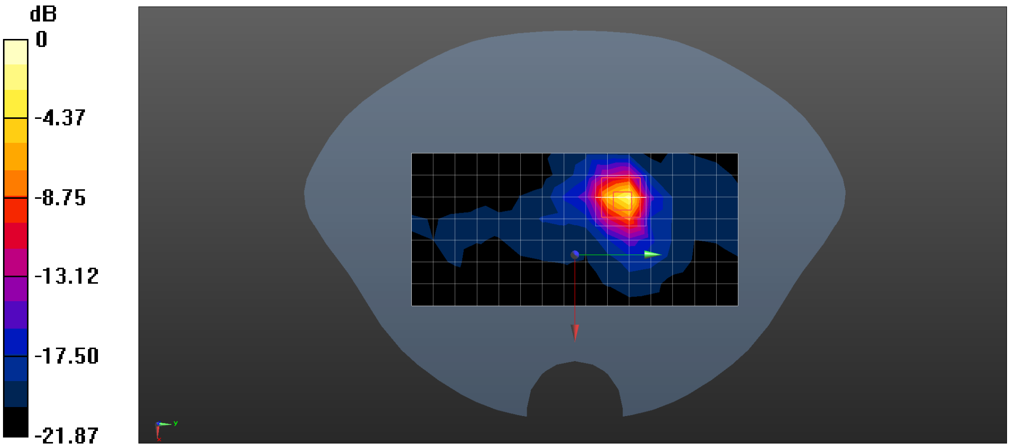
DASY5 Configuration:

- Probe: EX3DV4 - SN3836; ConvF(4.78, 4.78, 4.78); Calibrated: 2022/6/27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn760; Calibrated: 2022/6/6
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1102
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Body/Area Scan (16x41x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 46.3 W/kg

Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 10.431 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) =119 W/kg
SAR(1 g) = 22.3 W/kg; SAR(10 g) = 5.68 W/kg

Maximum value of SAR (measured) =45.7 W/kg



0 dB = 45.7 W/kg = 16.60 dBW/kg

Appendix C: Calibration certificate

Appendix D: Photographs

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