FCC SAR Test Report

Product	:	PT 1 Remote Controller
Trade mark	:	Potensic
Model/Type reference	:	DSRC23A, DSRC23B, DSRC23C, DSRC23D
Serial Number	:	N/A
Report Number	:	EED32R802554
FCC ID	:	2BK8B-DSRC23A
Date of Issue:	:	Apr. 23, 2025
Test Standards	:	Refer to Section 1.5
Test result	:	PASS

Prepared for:
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Check No.: 3204270225

Table of contents

1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report.

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1.2 Application details

Date of receipt of test item:	2025-01-14
Start of test:	2025-01-15
End of test:	2025-01-17

1.3 EUT Information

Device Information：			
Product:	PT 1 Remote Controller		
Model No.(EUT):	DSRC23A, DSRC23B, DSRC23C, DSRC23D		
Test Model:	DSRC23A		
SN:	N/A		
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location		
Exposure Category:	uncontrolled environment / general population		
Antenna Type :	Half-wave dipole PCB antenna		
Antenna gain:	Chain A : 3.39dBi Chain B: 3.15dBi		
Others Accessories：	N/A		
Device Operating Configurations:			
Supporting Mode(s) :	Custom IEEE 802.11(2.4G)		
Test Software of EUT:	Artosyn 8030 PC Tool, and the version was 1.0.3		
Test Power Grade:	17		
Modulation:	OFDM (64-QAM, 16-QAM, QPSK, BPSK)		
Operating Frequency Range(s)	Band	TX(MHz)	RX(MHz)
	2.4G	2415~2470	
Test Channels (low-mid-high):	2415-2445-2470 (2.4G)		
Power Supply:	Li-ion battery*2	EPT 18650 2600mAh 3.6V 9.36Wh 20240819	

Remark:

Model No.: DSRC23A, DSRC23B, DSRC23C, DSRC23D.

Only the model DSRC23A was tested. and everything else is the same except for the model name.

1.4 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing are as below:

Band		MAX Reported SAR (W/kg) 1-g SAR Body (0mm)	SAR Test Limit (W/kg)
2.4G	Antenna rotated	1.142	**1.60**

Note:

The device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits(1.6W/kg) according to the FCC rule §2.1093, the ANSI/IEEE C95.1:1992, the NCRP Report Number 86 for uncontrolled environment, according to the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure, and had been tested in accordance with the measurement methods and Procedures specified in IEEE Std 1528-2013.

1.5 Test standard/s

ANSI Std C95.1-1992	Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
IEEE Std 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 248227 D01	SAR guidance for IEEE 802.11(Wi-Fi) transmitters v02r02
KDB 616217 D04	SAR for laptop and tablets v01r02
KDB 447498 D01	General RF Exposure Guidance v06
KDB 690783 D01	SAR Listings on Grants v01r03
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02

1.6 RF exposure limits

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

The limit applied in this test report is shown in bold letters

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.

1.7 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dW) absorbed by(dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ).

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

SAR is expressed in units of watts per kilogram (W/kg). SAR can be related to the electric field at a point by

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

where:

σ = conductivity of the tissue (S/m)
ρ = mass density of the tissue (kg/m^3)
E = rms electric field strength (V/m)

1.8 Testing laboratory

Test Site	Centre Testing International Group Co., Ltd.
Test Location	Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China
Telephone	+86 (0) 755 3368 3668
Fax	+86 (0) 755 3368 3385

1.9 Test Environment

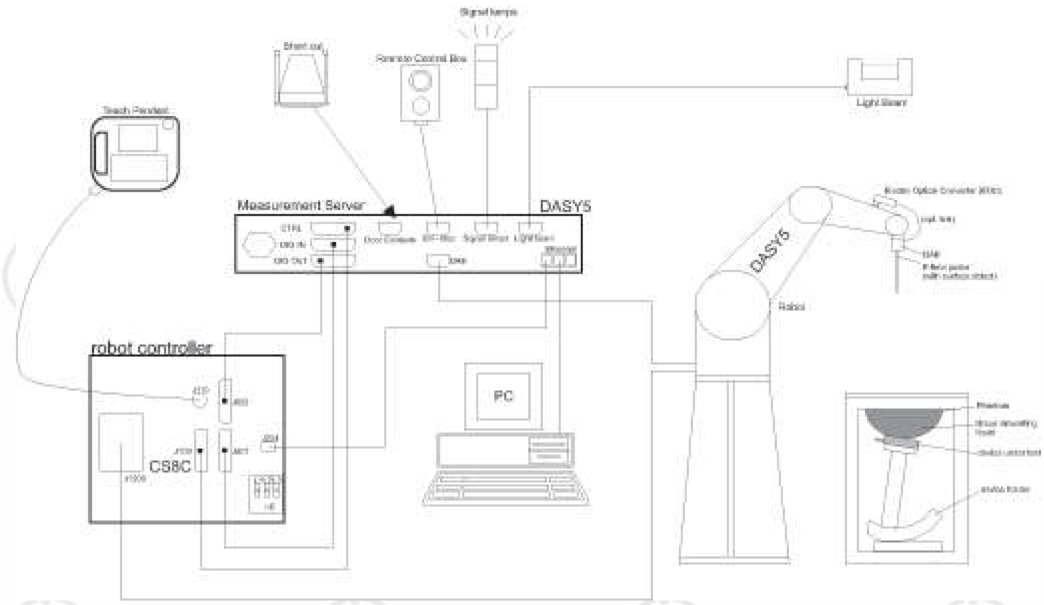
	Required	Actual
Ambient temperature:	18 – 25 °C	21.5 ± 2.0 °C
Tissue Simulating liquid:	18 – 25 °C	21.5 ± 2.0 °C
Relative humidity content:	30 – 70 %	30 – 70 %

1.10 Applicant and Manufacturer

Applicant/Client Name:	Shenzhen Potensic Intelligent Co., Ltd.
Applicant Address:	Room 1901, Jinqizhigu Building, Tangling Road, Nanshan District, Shenzhen, China
Manufacturer Name :	Shenzhen Potensic Intelligent Co., Ltd.
Manufacturer Address :	Room 1901, Jinqizhigu Building, Tangling Road, Nanshan District, Shenzhen, China
Factory Name :	Shenzhen Potensic Intelligent Co., Ltd.
Factory Address :	Room 1901, Jinqizhigu Building, Tangling Road, Nanshan District, Shenzhen, China

2 SAR Measurement System Description and Setup

2.1 The Measurement System Description



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

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

2.2 Probe description

Dosimetric Probes: These Probes are specially designed and calibrated for use in liquids with high permittivities. They should not be used in air, since the spherical isotropy in air is poor(±2 dB). The dosimetric Probes have special calibrations in various liquids at different frequencies.

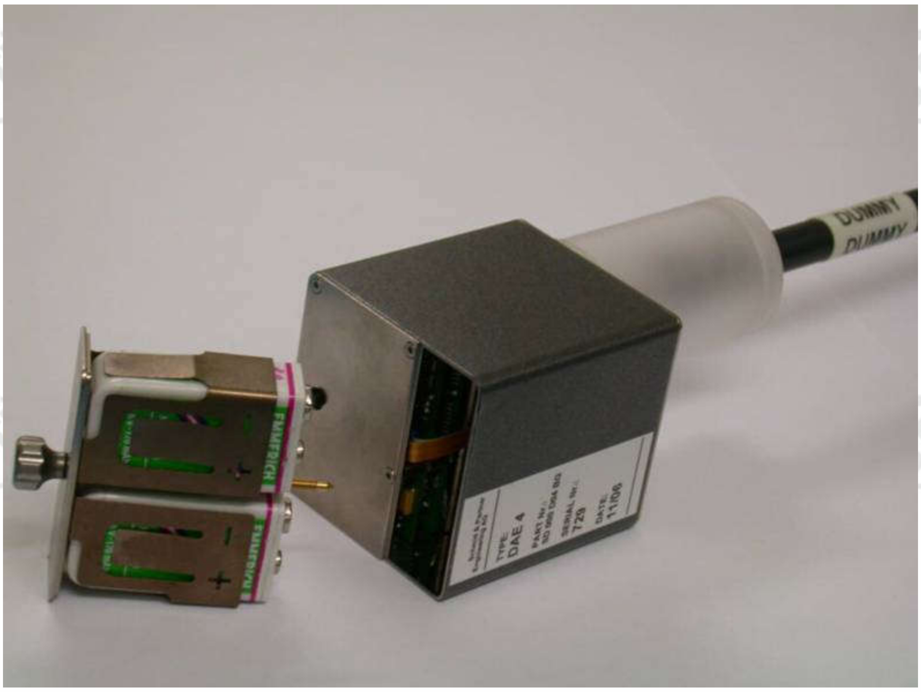
Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Dynamic range	5 μW/g to 100 mW/g; Linearity: ± 0.2 dB

2.3 Data Acquisition Electronics description

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 the DAE4 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

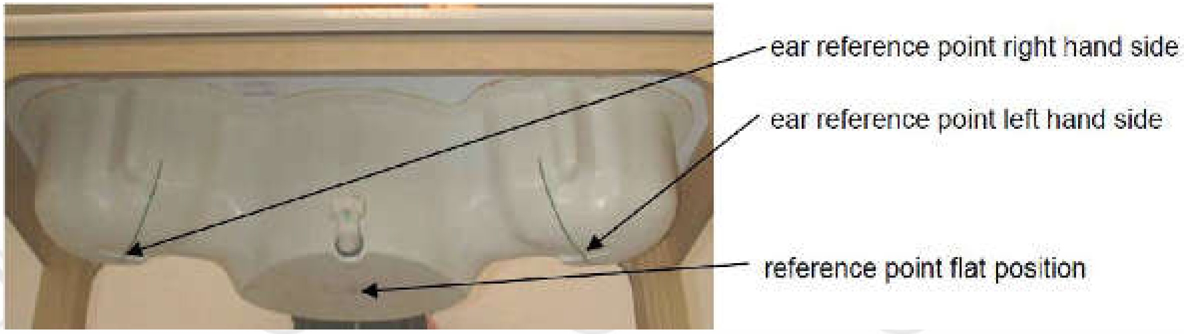
Batteries: The DAE works with either two standard 9V batteries or two 9V (actually 8.4V or 9.6 V) rechargeable batteries. Because the electronics automatically power-down unused components during braking or between measurements, the battery lifetime depends on system usage. Typical lifetimes are >20 hours for batteries and >10 hours for accus. Remove the batteries if you do not plan to use the DAE for a long period of time.



2.4 SAM Twin Phantom description

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 hand
- ♦ Right hand
- ♦ Flat phantom



The phantom table for the DASY systems have the size of 100 x 50 x 85 cm (L xWx H). these tables are reinforced for mounting of the robot onto the table. 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.

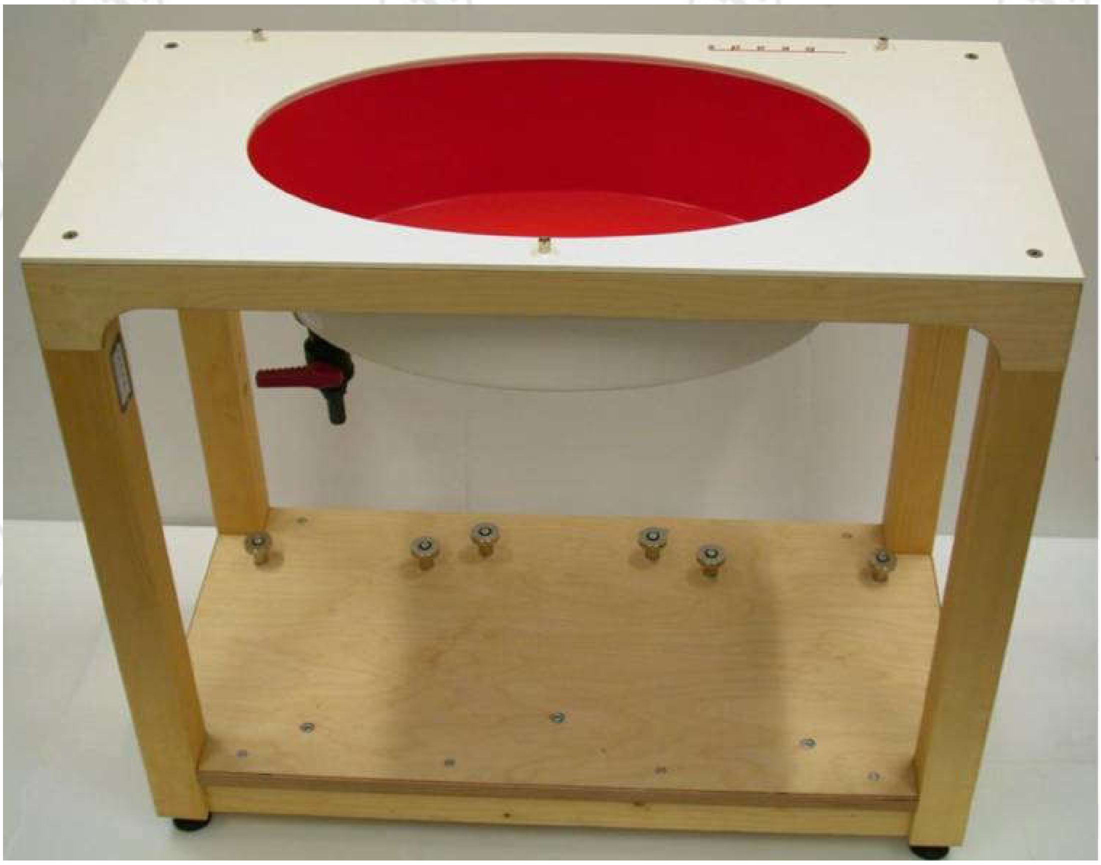
A white cover is Provided to cover the phantom during off-periods to prevent water evaporation and changes in the liquid parameters.

Three reference marks are Provided on the phantom counter. These reference marks are used to teach the absolute phantom position relative to the robot.

2.5 ELI4 Phantom description

The ELI4 phantom is intended for compliance testing of handheld and body mounted wireless devices in the frequency range of 30MHz to 6 GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209-2 and all known tissue simulating liquids.

ELI4 has been optimized regarding its performance and can be integrated into a SPEAG standard phantom table. 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



2.6 Device Holder description

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

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

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

3 SAR Test Equipment List

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

	Manufacturer	Device Type	Type(Model)	Serial number	Date of last calibration	Valid period
☒	SPEAG	E-Field Probe	EX3DV4	7328	2024-04-18	One year
☐	SPEAG	835 MHz Dipole	D835V2	4d193	2024-01-17	Three years
☐	SPEAG	1750 MHz Dipole	D1750V2	1134	2024-01-17	Three years
☐	SPEAG	1900 MHz Dipole	D1900V2	5d198	2024-01-18	Three years
☐	SPEAG	2000 MHz Dipole	D2000V2	1078	2024-01-22	Three years
☐	SPEAG	2300 MHz Dipole	D2300V2	1082	2023-01-11	Three years
☒	SPEAG	2450 MHz Dipole	D2450V2	959	2024-01-17	Three years
☐	SPEAG	2600 MHz Dipole	D2600V2	1101	2024-01-22	Three years
☐	SPEAG	5 GHz Dipole	D5GHzV2	1208	2024-01-16	Three years
☒	SPEAG	DAKS Probe	DAKS-3.5	1052	2024-04-22	Three years
☒	SPEAG	Planar R140 Vector Reflectometer	DAKS-VNA R140	0200514	2024-04-22	Three years
☒	SPEAG	Data acquisition electronics	DAE4	777	2025-01-07	One year
☒	SPEAG	Software	DASY 5	NA	NCR	NCR
☒	SPEAG	Twin Phantom	SAM V5.0	1875	NCR	NCR
☒	Liquid	Head Liquid	2450 Head	2450	/	/
☐	SPEAG	Flat Phantom	ELI V6.0	2024	NCR	NCR
☐	R & S	Universal Radio Communication Tester	CMU200	101553	2024-12-05	One year
☐	R & S	Universal Radio Communication Tester	CMW500	102898	2024-12-05	One year
☒	Agilent	Signal Generator	N5181A	MY50142334	2024-12-05	One year
☒	BONN	Power Amplifier and directional coupler	SU319W	BL-SZ1550140	2024-12-05	One year
☒	KEITHLEY	RF Power Meter	3500	1128079	2024-06-12	One year
☒	KEITHLEY	RF Power Meter	3500	1128081	2024-06-12	One year
☒	JINGCHUANG	Temperature/ Humidity Indicator	GSP-8	EMK197F00095	2024-06-05	One year

Note:

1) Per KDB865664D01 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. 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) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.

d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the previous measurement.

4 SAR Measurement Procedures

4.1 Spatial Peak SAR Evaluation

The DASY5 software includes all numerical Procedures necessary to evaluate the spatial peak SAR values.The base for the evaluation is a "cube" measurement in a volume of $30mm^3$ (7x7x7 points). The measured volume must include the 1 g and 10 g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan. If the 10g cube or both cubes are not entirely inside the measured volumes,the system issues a warning regarding the evaluated spatial peak values within the PostProcessing engine (SEMCAD X). This means that if the measured volume is shifted, higher values might be possible. To get the correct values you can use a finer measurement grid for the area scan. In complicated field distributions, a large grid spacing for the area scan might miss some details and give an incorrectly interpolated peak location. The entire evaluation of the spatial peak values is performed within the PostProcessing engine (SEMCAD X). The system always gives the maximum values for the 1 g and 10 g cubes.

The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. extraction of the measured data (grid and values) from the Zoom Scan
2. calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. generation of a high-resolution mesh within the measured volume
4. interpolation of all measured values from the measurement grid to the high-resolution grid
5. extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. calculation of the averaged SAR within masses of 1 g and 10 g

4.2 Data Storage and Evaluation

Data Storage

The DASY5 software stores the measured voltage acquired by the Data Acquisition Electronics (DAE) as raw data together with all the necessary software parameters for the data evaluation (Probe calibration data, liquid parameters and communication system parameters) in measurement files with the extension .da5x. The postProcessing software evaluates the data every time the data is visualized or exported. This allows the verification and modification of the setup after completion of the measurement. For example, if a measurement has been performed with an incorrect crest factor, the parameter can be corrected afterwards and the data can be reevaluated.

To avoid unintentional parameter changes or data manipulations, the parameters in measured files are locked. In the administrator access mode of the software, the parameters can be unlocked. After changing the parameters, the measured scans can be reevaluated in the postProcessing engine.

The measured data can be visualized or exported in different units or formats, depending on the selected Probe type (e.g., E-field, H-field, SAR). Some of these units are not available in certain situations or give 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.

Data Evaluation

The fields and SAR are calculated from the measured voltage (Probe voltage acquired by the DAE) and the following parameters:

Probe parameters:	- Sensitivity	$norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion Factor	$convF_i$
	- Diode Compression Point	dcp_i
	- Probe Modulation Response Factors	a_i, b_i,c_i, d
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Relative Permittivity	ρ

This parameters are stored in the DASY5 V52 measurement file.

These parameters must be correctly set in the DASY5 V52 software setup. They are available as configuration file and can be imported into the measurement file. The values displayed in the multimeter window are assessed using the parameters of the actual system setup. In the scan visualization and export modes, the parameters stored in the measurement file are used.

The measured voltage is not Proportional to the exciting. It must be first linearized.

ApProximated Probe Response Linearization using Crest Factor.

This linearization method is enabled when a custom defined communication system is measured. The compensation applied is a function of the measured voltage, the detector diode compression point and the crest factor of the measured signal.

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

with	V_i	=	linearized voltage of channel i (uV)	(i = x,y,z)
	U_i	=	measured voltage of channel i (uV)	(i = x,y,z)
	cf	=	crest factor of exciting field	(DASY parameter)
	dcp_i	=	diode compression point of channel i (uV)	(Probe parameter, i = x,y,z)

Field and SAR Calculation

The primary field data for each channel are calculated using the linearized voltage:

E - fieldProbes : $E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$

H - fieldProbes : $H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$

with	V_i	=	linearized voltage of channel i	(i = x,y,z)
	$Norm_i$	=	sensor sensitivity of channel i	(i = x,y,z)
			$uV/(V/m)^2$ for E-field Probes	
	ConvF	=	sensitivity enhancement in solution	
	a_{ij}	=	sensor sensitivity factors for H-field Probes	
	f	=	carrier frequency [GHz]	
	E_i	=	electric field strength of channel i in V/m	
	H_i	=	magnetic field strength of channel i in A/m	

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

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

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

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

with	SAR	=	local specific absorption rate in mW/g
	E_{tot}	=	total field strength in V/m
	σ	=	conductivity in [mho/m] or [Siemens/m]
	ρ	=	equivalent tissue density in g/cm^3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

Spatial Peak SAR for 1 g and 10 g

The DASY5 software includes all numerical Procedures necessary to evaluate the spatial peak SAR values.The base for the evaluation is a "cube" measurement at the points of the fine cube grid consisting of 5 x 5 x 7 points(with 8mm horizontal resolution) or 7 x 7 x 7 points(with 5mm horizontal resolution) or 8 x 8 x 7 points(with 4mm horizontal resolution)..The entire evaluation of the spatial peak values is performed within the PostProcessing engine (SEMCAD X).The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. extraction of the measured data (grid and values) from the Zoom Scan.
2. calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
3. generation of a high-resolution mesh within the measured volume.
4. interpolation of all measured values from the measurement grid to the high-resolution grid
5. extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface.
6. calculation of the averaged SAR within masses of 1 g and 10 g.

4.3 Data Storage and Evaluation

The DASY5 installation includes predefined files with recommended Procedures for measurements and validation. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

Step 1: Power reference measurement

The Power Reference Measurement and Power Drift Measurement are for monitoring the power drift of the device under test in the batch Process. The Minimum distance of Probe sensors to surface determines the closest measurement point to phantom surface. By default, the Minimum distance of Probe sensors to surface is 4 mm. This distance can be modified by the user, but cannot be smaller than the Distance of sensor calibration points to Probe tip as defined in the Probe Properties. The SAR measurement was taken at a selected spatial reference point to monitor power variations during testing. This fixed location point was measured and used as a reference value.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hotspot. The sophisticated interpolation routines implemented in DASY5 software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE 1528-2003 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Step 3: Zoom Scan

The Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The default Zoom Scan is defined in the following table. DASY5 is also able to perform repeated zoom scans if more than 1 peak is found during area scan. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Area scan and Zoom scan resolutions per FCC KDB Publication 865664 D01:

Frequency	Maximun Area Scan resolution (Δx_{Area},Δy_{Area})	Maximun Zoom Scan spatial resolution (Δx_{Zoom},Δy_{Zoom})	Maximun Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			$\Delta z_{Zoom}(n)$	$\Delta z_{Zoom}(1)$*	$\Delta z_{Zoom}(n>1)$*	
≤ 2GHz	≤ 15mm	≤ 8mm	≤ 5mm	≤ 4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 30mm
2-3GHz	≤ 12mm	≤ 5mm	≤ 5mm	≤ 4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 30mm
3-4GHz	≤ 12mm	≤ 5mm	≤ 4mm	≤ 3mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 28mm
4-5GHz	≤ 10mm	≤ 4mm	≤ 3mm	≤ 2.5mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 25mm
5-6GHz	≤ 10mm	≤ 4mm	≤ 2mm	≤ 2mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 22mm

Step 4: Power Drift Monitoring

The Power Drift Measurement 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 Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. If the value changed by more than 5%, the evaluation should be retested.

5 SAR Verification Procedure

5.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 5.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown as followed:

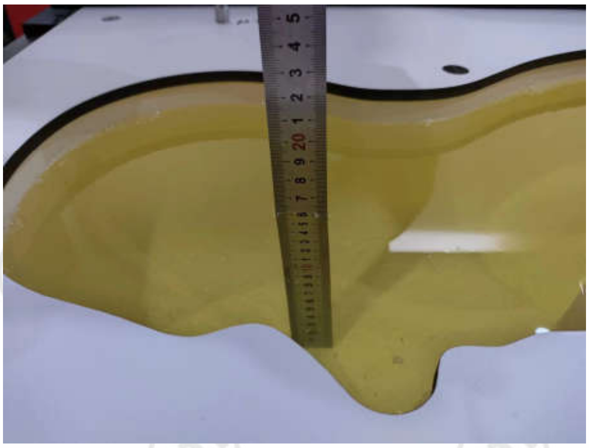


Photo of Liquid Height for Head SAR

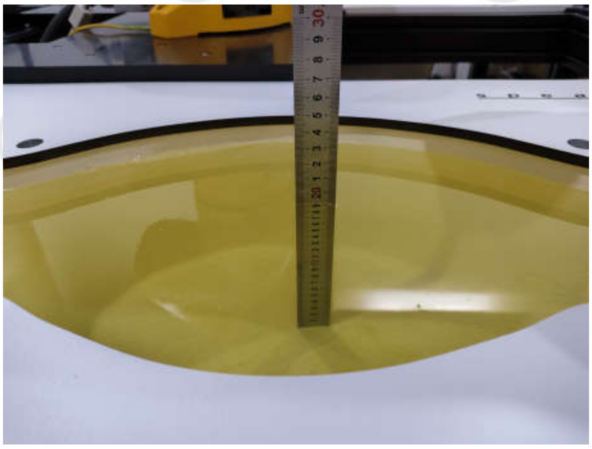


Photo of Liquid Height for Body SAR

5.2 Tissue Verification

The following materials are used for Producing the tissue-equivalent materials.
(Liquids used for tests are marked with☒):

Ingredients (% of weight)	Frequency (MHz)						
Tissue Type	Head Tissue						
frequency band	☐ 835	☐ 1800	☐ 2000	☐ 2300	☒ 2450	☐ 2600	☐ 5200-5800
Water	41.45	52.64	54.9	62.82	62.7	55.242	65.52
Salt (NaCl)	1.45	0.36	0.18	0.51	0.5	0.306	0.0
Sugar	56.0	0.0	0.0	0.0	0.0	0.0	0.0
HEC	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Bactericide	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	36.8	0.0	17.24
DGBE	0.0	47.0	44.92	36.67	0.0	44.452	0.0
Diethylenglycol monohexylether	0.0	0.0	0.0	0.0	0.0	0.0	17.24

Salt: 99+% Pure Sodium Chloride
Sugar: 98+% Pure Sucrose
Water: De-ionized, 16MΩ+ resistivity
HEC: Hydroxyethyl Cellulose
DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100(ultra pure): Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl)phenyl]ether

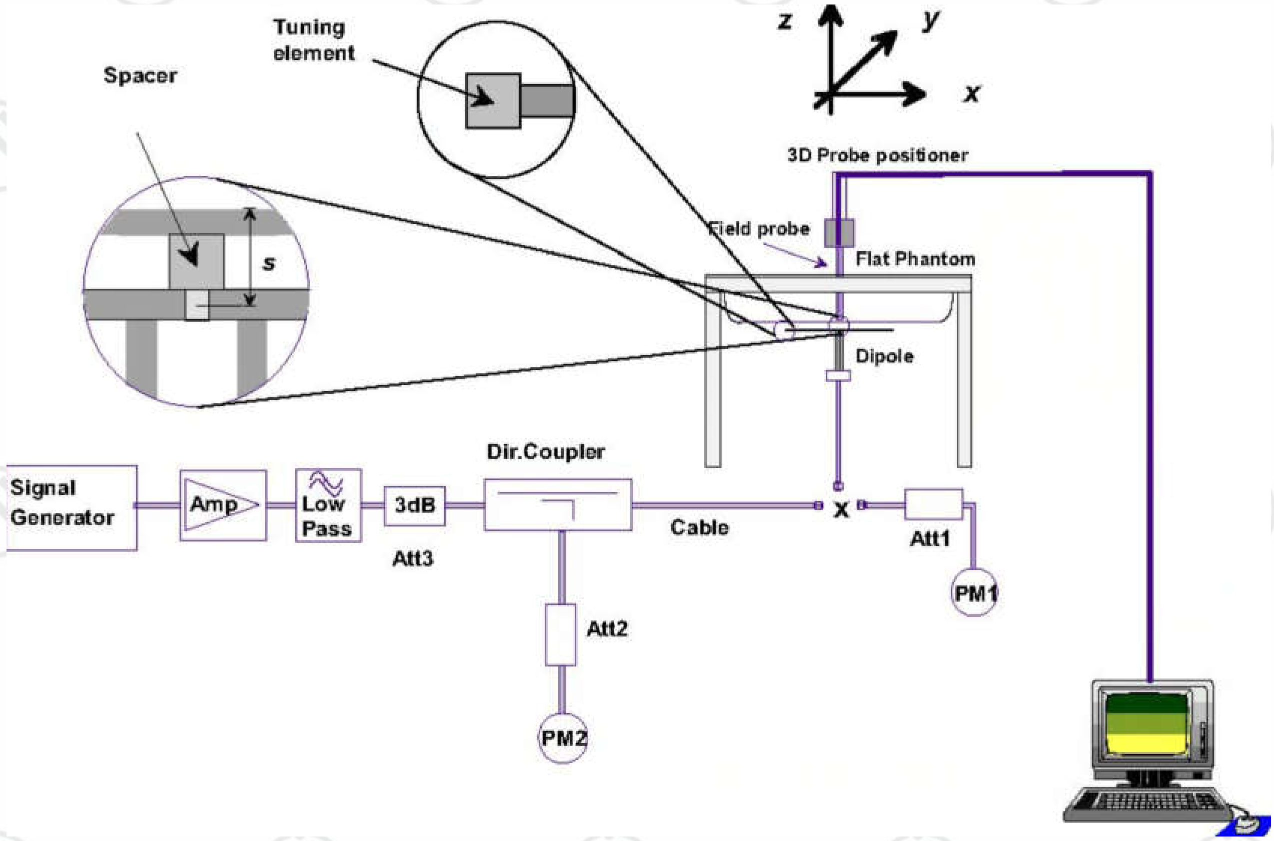
Tissue simulating liquids: parameters:

Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Deviation (Within ±5%)		Liquid Temp.	Test Date
		ε_r (+/-5%)	σ (S/m) (+/-5%)	ε_r	σ (S/m)	Δεr %	Δσ %		
2450 Head	**2450**	39.20 (37.24~41.16)	1.80 (1.71~1.89)	39.90	1.835	1.79	1.94	20.61°C	1/16/2025
	2415	39.27 (37.31~41.23)	1.77 (1.68~1.86)	40.33	1.787	2.70	0.96	20.61°C	1/16/2025
	2445	39.22 (37.26~41.18)	1.79 (1.70~1.88)	39.93	1.826	1.81	2.01	20.61°C	1/16/2025
	2470	39.18 (37.22~41.14)	1.81 (1.72~1.90)	39.93	1.834	1.91	1.33	20.61°C	1/16/2025

5.3 System check Procedure

The System check is performed by using a System check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 100mW. To adjust this power a power meter is used. The power sensor is connected to the cable before the System check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the validation to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).

System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



The equipment setup is shown below:

- ✓ Signal Generator
- ✓ Amplifier
- ✓ Directional coupler
- ✓ Power meter
- ✓ Calibrated dipole

First, the power meter PM1 (including attenuator Att1) is connected to the cable to measure the forward power at the location of the connector (x) to the system check source. The signal generator is adjusted for the desired forward power at the connector as read by power meter PM1 after attenuation Att1 and also as coupled through Att2 to PM2.

After connecting the cable to the source, the signal generator is readjusted for the same reading at power meter PM2.

SAR results are normalized to a forward power of 1W to compare the values with the calibration reports results as described at IEEE 1528 standards.

5.4 Liquid Check

The dielectric parameters check is done prior to the use of the tissue simulating liquid. The verification is made by comparing the relative permittivity and conductivity to the values recommended by the applicable standards.

The liquid verification was performed using the following test setup:

- ✓ VNA (Vector Network Analyzer)
- ✓ Open-Short-Load calibration kit
- ✓ RF Cable
- ✓ Open-Ended Coaxial probe
- ✓ DAK software tool
- ✓ SAR Liquid
- ✓ De-ionized water
- ✓ Thermometer

These are the target dielectric properties of the tissue-equivalent liquid material according to the manufacturer's datasheet:

Frequency	Head Tissue Simulating Media	
(MHz)	ε_r	σ (S/m)
2450	39.20	1.80

(εr = relative permittivity, σ = conductivity and p = 1000 kg/m^3)

The measurement system implement a SAR error compensation algorithm as documented in IEEE Std 1528-2013 (equivalent to draft standard IEEE P1528-2011) to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters (applied to only scale up the measured SAR, and not downward) so, according to FCC OET KDB 865664 D01, the tolerance for ε_r and σ may be relaxed to ± 10%.

5.5 System check results

The system Check is performed for verifying the accuracy of the complete measurement system and performance of the software. The following table shows System check results for all frequency bands and tissue liquids used during the tests (plot(s) see annex A).

System Check (MHz)	Target SAR (1W) (+/-10%)		Measured SAR (Normalized to 100mW)		Measured SAR (Normalized to 1W)		Measured SAR (Tolerances)		Liquid Temp.	Test Date
	1-g (mW/g)	10-g (mW/g)	1-g (mW/g)	10-g (mW/g)	1-g (mW/g)	10-g (mW/g)	1-g(%)	10-g(%)		
D2450 Head	53.60 (48.24~58.96)	24.70 (22.23~27.17)	5.76	2.67	57.60	26.70	7.46	8.10	20.61 °C	1/16/2025
Note: All SAR values are normalized to 1W forward power.										

6 SAR Measurement variability and uncertainty

6.1 SAR measurement variability

In accordance with published RF Exposure KDB Procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04. 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.The same Procedures should be adapted for measurements according to extremity exposure limits by applying a factor of 2.5 for extremity exposure.

1) Repeated measurement is not required when the original highest measured SAR is < 2.0 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 2.0 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 > 3.0 or when the original or repeated measurement is ≥ 3.6 W/kg (~ 10% from the 10-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥3.75 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

6.2 SAR measurement uncertainty

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

7 SAR Test Configuration

7.1 Wi-Fi 2.4G Test Configurations

For WiFi SAR testing, a communication link is set up with the testing software for WiFi mode test. During the test,at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The RF signal utilized in SAR measurement has 100% duty cycle and its crest factor is 1. The test Procedures in KDB 248227D01 v02r02 are applied.

Per KDB 248227 D01 802.11 Wi-Fi SAR v02r02,SAR Test Reduction criteria are as follows:

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS Procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the *initial test position(s)* by applying the DSSS or OFDM SAR measurement Procedures in the required wireless mode test configuration(s). The relative SAR levels of multiple exposure test positions can be established by area scan measurements on the highest measured output power channel to determine the initial test position. The area scans must be measured using the same SAR measurement configurations, including test channel, maximum output power, Probe tip to phantom distance, scan resolution etc.

When the *reported* SAR for the *initial test position* is:

1) ≤0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR Procedures.
2) > 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions are tested.

3) For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required test channels are considered.

SAR is not required for the following 2.4 GHz OFDM conditions.

1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.

2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

8 SAR Test Results

8.1 Conducted Power Measurements

8.1.1 Conducted Power of 2.4G

The output power of 2.4G is as following:

Test Data of Conducted Output Power and Equivalent Isotropic Radiated Power -Total								
Test Mode	Test Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Limits (dBm)	E.I.R.P. (Average Power) (dBm)	E.I.R.P. (Peak Power) (dBm)	Limits (dBm)	Pass or Fail
Custom IEEE 802.11	2415	19.55	27.01	≤30	22.94	30.40	≤36	Pass
	2445	**19.58**	26.92	≤30	**22.97**	30.31	≤36	Pass
	2470	19.05	27.50	≤30	22.44	30.89	≤36	Pass

8.2 SAR test results

Notes:

1) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is: ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.

2) Per KDB447498 D01, All measurement SAR result is scaled-up to account for tune-up tolerance is compliant.

3) Per KDB865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤ 20%, and the measured SAR <1.45W/Kg, only one repeated measurement is required.

4) Per KDB865664 D02v01r02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The same Procedures should be adapted for measurements according to extremity exposure limits by applying a factor of 2.5 for extremity exposure. The published RF exposure KDB Procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-Processing (Refer to appendix B for details).

8.2.1 Results overview of 2.4G

Test antenna（1+2） rotated:

Test Position With 0mm	Test channel /Freq. (MHz)	Modulation	SAR Value (W/kg)		Power Drift (dBm)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Actual Duty Cycle	Reported SAR_{1-g} (W/kg)	Liquid Temp.	Plot Page
			1-g	10-g								
Front Side	2445	OFDM	0.077	0.042	-0.010	19.58	20.00	0.085	100.00 %	0.085	20.61° C	-
Back Side	2445	OFDM	0.001	0.001	0.000	19.58	20.00	0.001	100.00 %	0.001	20.61° C	-
Top Side	2445	OFDM	0.944	0.378	0.160	19.58	20.00	1.040	100.00 %	1.040	20.61° C	48
Top Side	2415	OFDM	0.921	0.348	-0.150	19.55	20.00	1.022	100.00 %	1.022	20.61° C	50
Top Side	2470	OFDM	0.887	0.364	-0.030	19.05	20.00	1.104	100.00 %	**1.104**	20.61° C	52
SAR1-g >0.8 (W/kg) Repeated												
Top Side	2445	OFDM	0.944	0.382	0.010	19.58	20.00	1.040	100.00 %	1.040	20.61° C	49
Top Side	2415	OFDM	0.953	0.394	-0.070	19.55	20.00	1.057	100.00 %	1.057	20.61° C	51
Top Side	2470	OFDM	0.918	0.380	-0.090	19.05	20.00	1.142	100.00 %	**1.142**	20.61° C	53

Note: Per KDB248227D01:

1) Scaled SAR = SAR Value * 10(0.1*(Tune up Power-Conducted Power))

Reported SAR = SAR Value * 10(0.1*(Tune up Power-Conducted Power))/ Duty factor * 100

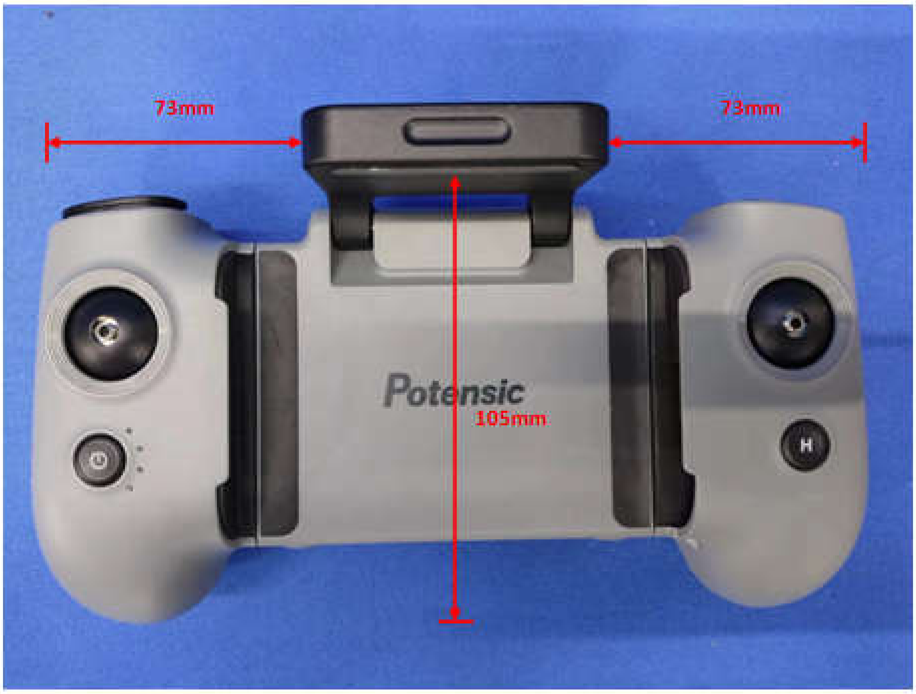
8.3 Multiple Transmitter Information

The location of the antennas inside this device is shown as below picture:

Antenna rotated:

<Top Side>

< Left Side>



<Right Side>

<Bottom Side>

<EUT Front View>

8.4 Stand-alone SAR

Per FCC KDB 447498 D01:

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

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

• f(GHz) is the RF channel transmit frequency in GHz

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

• The result is rounded to one decimal place for comparison

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

2) 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 a)] + [(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 a)] + [(test separation distance – 50 mm)·10]} mW at > 1500 MHz and ≤ 6 GHz

Antenna rotated:

(Antennas <50mm to adjacent sides)

Band	Exposure Condition	f(GHz)	Pmax	Pmax	Seperation Distance(mm)						SAR Test (Yes or No)					
			dBm	mW	Front side	Back side	Left side	Right side	Top side	Bottom side	Front side	Back side	Left side	Right side	Top side	Bottom side
2.4G	Body 0mm	2.45	20.00	100.00	5.00	5.00	73.00	73.00	5.00	105.00	Yes	Yes	>50mm	>50mm	Yes	>50mm

(Antennas >50mm to adjacent sides)

Band	Exposure Condition	f(GHz)	Pmax	Pmax	Seperation Distance(mm)						SAR Test (Yes or No)					
			dBm	mW	Front side	Back side	Left side	Right side	Top side	Bottom side	Front side	Back side	Left side	Right side	Top side	Bottom side
2.4G	Body 0mm	2.45	20.00	100.00	5.00	5.00	73.00	73.00	5.00	105.00	<50mm	<50mm	No	No	<50mm	No

3) When the minimum test separation distance is > 50 mm, the estimated SAR value is 0.4 W/kg.

For conditions where the estimated SAR is overly conservative for certain conditions, the test lab may choose to perform standalone SAR measurements and use the measured SAR to determine simultaneous transmission SAR test exclusion.

Appendix A

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table. The equation and threshold in section 4.3.1 must be applied to determine SAR test exclusion.

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

MHz	30	35	40	45	50	mm
150	232	271	310	349	387	SAR Test Exclusion Threshold (mW)
300	164	192	219	246	274	
450	134	157	179	201	224	
835	98	115	131	148	164	
900	95	111	126	142	158	
1500	73	86	98	110	122	
1900	65	76	87	98	109	
2450	57	67	77	86	96	
3600	47	55	63	71	79	
5200	39	46	53	59	66	
5400	39	45	52	58	65	
5800	37	44	50	56	62	

Appendix B

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and > 50 mm

Approximate SAR test exclusion power thresholds at selected frequencies and test separation distances are illustrated in the following table. The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.

MHz	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	mm
100	474	481	487	494	501	507	514	521	527	534	541	547	554	561	567	
150	387	397	407	417	427	437	447	457	467	477	487	497	507	517	527	
300	274	294	314	334	354	374	394	414	434	454	474	494	514	534	554	
450	224	254	284	314	344	374	404	434	464	494	524	554	584	614	644	
835	164	220	275	331	387	442	498	554	609	665	721	776	832	888	943	
900	158	218	278	338	398	458	518	578	638	698	758	818	878	938	998	
1500	122	222	322	422	522	622	722	822	922	1022	1122	1222	1322	1422	1522	mW
1900	109	209	309	409	509	609	709	809	909	1009	1109	1209	1309	1409	1509	
2450	96	196	296	396	496	596	696	796	896	996	1096	1196	1296	1396	1496	
3600	79	179	279	379	479	579	679	779	879	979	1079	1179	1279	1379	1479	
5200	66	166	266	366	466	566	666	766	866	966	1066	1166	1266	1366	1466	
5400	65	165	265	365	465	565	665	765	865	965	1065	1165	1265	1365	1465	
5800	62	162	262	362	462	562	662	762	862	962	1062	1162	1262	1362	1462	

For 2.4GHz, we use interpolation measurement to get the evaluation limits:

Frequency (MHz)	Exemption Limits (mW)		
	At separation distance of 5 mm	At separation distance of 50 mm	At separation distance of 70 mm
2.4G	10	96	296

Conclusion：

Frequency (MHz)	Device edge location	Maximum turn-up power(mW)	SAR test (Yes/No)
2.4G	Front Side (5mm)	100>10	Yes
	Back Side (5mm)	100>10	Yes
	Left Side (73mm)	100<296	No
	Right Side (73mm)	100<296	No
	Top Side (5mm)	100>10	Yes
	Bottom Side (105mm)	100<296	No

8.5 Simultaneous Transmission Possibilitiesand Conlcusion

The above SAR results are sufficient to determine that the simultaneous transmission case does not exceed the SAR limit, so the tested result is comply with the FCC limit.

Annex A: Appendix A: SAR System performance Check Plots

(Please See Appendix A)

Annex B: Appendix B: SAR Measurement results Plots

(Please See Appendix B)

Annex C: Appendix C: Calibration reports

(Please See Appendix C)

Annex D: Appendix D: Antenna rotated Photo documentation

(Please See Appendix D)

Statement

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;

2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;

3. The result(s) shown in this report refer(s) only to the sample(s) tested;

4. Unless otherwise stated,the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule stated in ILAC-G8:09/2019/CNAS-GL015:2022;

5. Without written approval of CTI, this report can't be reproduced except in full.

*** End of Report ***

Appendix A:SAR System performance Check Plots
Table of contents
System Performance Check-D2450

Date/Time: 1/16/2025 13:22:40

Test Laboratory: CTI SAR Lab

Systemcheck 2450-Head

DUT: D2450V2 - SN959; Type: D2450V2; Serial: SN959

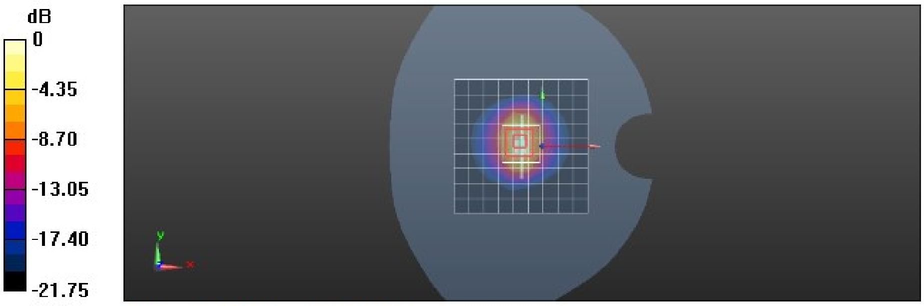
Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2450 MHz; σ = 1.835 S/m; ε_r = 39.895; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN7328; ConvF(7.69, 7.69, 7.69) @ 2450 MHz; Calibrated: 4/18/2024
  - Modulation Compensation:
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn777; Calibrated: 1/6/2025
- Phantom: Twin SAM V5.0; Type: QD000P40CD; Serial: 1875
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Configuration/d=10mm,Pin=100mW/Area Scan (10x10x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 7.19 W/kg

Configuration/d=10mm,Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 78.32 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 12.5 W/kg
SAR(1 g) = 5.76 W/kg; SAR(10 g) = 2.67 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 45%
Maximum value of SAR (measured) = 9.85 W/kg



0 dB = 9.85 W/kg = 9.93 dBW/kg

Appendix B:SAR Measurement results Plots

Table of contents
2.4G WiFi Antenna rotated

Date/Time: 1/16/2025 17:51:08

Test Laboratory: CTI SAR Lab

2.4G 2445CH Top Side 0mm Antenna rotated

DUT: PT 1 Remote Controller; Type: NA; Serial: NA

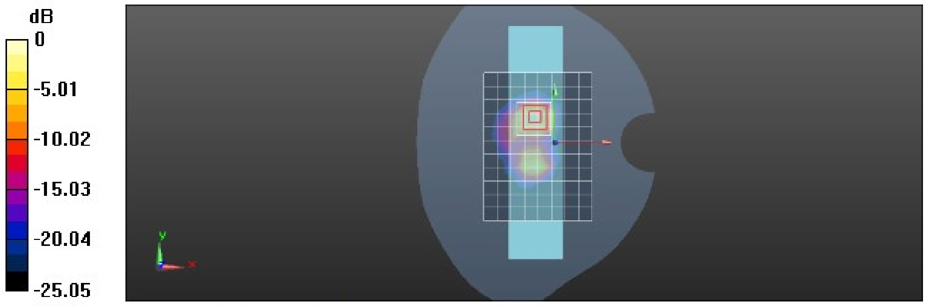
Communication System: UID 0, 2.4G (0); Communication System Band: 2.4G; Frequency: 2445 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2445 MHz; σ = 1.826 S/m; ε_r = 39.93; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN7328; ConvF(7.69, 7.69, 7.69) @ 2445 MHz; Calibrated: 4/18/2024
    - Modulation Compensation:
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn777; Calibrated: 1/6/2025
- Phantom: Twin SAM V5.0; Type: QD000P40CD; Serial: 1875
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Configuration/Head/Area Scan (9x12x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 1.28 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.5mm
Reference Value = 6.283 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 2.33 W/kg
SAR(1 g) = 0.944 W/kg; SAR(10 g) = 0.378 W/kg
Smallest distance from peaks to all points 3 dB below = 7.6 mm
Ratio of SAR at M2 to SAR at M1 = 75.8%
Maximum value of SAR (measured) = 1.61 W/kg



0 dB = 1.61 W/kg = 2.07 dBW/kg

Date/Time: 1/16/2025 18:11:33

Test Laboratory: CTI SAR Lab

2.4G 2445CH Top Side 0mm Antenna rotated-Repeated

DUT: PT 1 Remote Controller; Type: NA; Serial: NA

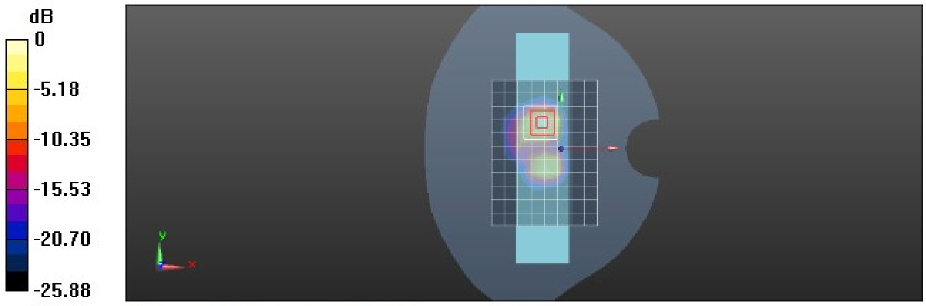
Communication System: UID 0, 2.4G (0); Communication System Band: 2.4G; Frequency: 2445 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2445 MHz; σ = 1.826 S/m; ε_r = 39.93; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN7328; ConvF(7.69, 7.69, 7.69) @ 2445 MHz; Calibrated: 4/18/2024
  - Modulation Compensation:
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn777; Calibrated: 1/6/2025
- Phantom: Twin SAM V5.0; Type: QD000P40CD; Serial: 1875
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Configuration/Head/Area Scan (9x12x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 1.55 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.5mm
Reference Value = 6.772 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 2.16 W/kg
SAR(1 g) = 0.944 W/kg; SAR(10 g) = 0.382 W/kg
Smallest distance from peaks to all points 3 dB below = 8 mm
Ratio of SAR at M2 to SAR at M1 = 76.5%
Maximum value of SAR (measured) = 1.56 W/kg



0 dB = 1.56 W/kg = 1.93 dBW/kg

Date/Time: 1/16/2025 17:20:54

Test Laboratory: CTI SAR Lab

2.4G 2415CH Top Side 0mm Antenna rotated

DUT: PT 1 Remote Controller; Type: NA; Serial: NA

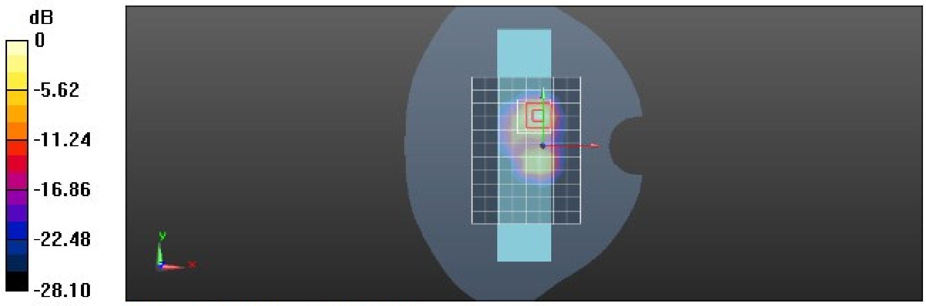
Communication System: UID 0, 2.4G (0); Communication System Band: 2.4G; Frequency: 2415 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2415 MHz; σ = 1.787 S/m; ε_r = 40.327; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN7328; ConvF(7.69, 7.69, 7.69) @ 2415 MHz; Calibrated: 4/18/2024
    - Modulation Compensation:
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn777; Calibrated: 1/6/2025
- Phantom: Twin SAM V5.0; Type: QD000P40CD; Serial: 1875
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Configuration/Head/Area Scan (9x12x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 1.61 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.5mm
Reference Value = 5.953 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 2.15 W/kg
SAR(1 g) = 0.921 W/kg; SAR(10 g) = 0.348 W/kg
Smallest distance from peaks to all points 3 dB below = 7.1 mm
Ratio of SAR at M2 to SAR at M1 = 78.1%
Maximum value of SAR (measured) = 1.58 W/kg



0 dB = 1.58 W/kg = 1.99 dBW/kg