FCC SAR TEST REPORT

Application No.:	SUCR2503000213AT
Applicant:	Shanghai Sunmi Technology Co.,Ltd.
Manufacturer:	Shanghai Sunmi Technology Co.,Ltd.
Product Name:	Wireless data POS System
Model No.(EUT):	T5F01
Trade Mark:	SUNMI
FCC ID:	2AH25T5F01N
Standards:	FCC 47CFR §2.1093
Date of Receipt:	2025-03-17
Date of Test:	2025-04-14
Date of Issue:	2025-04-18
Test conclusion:	**PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Revision Record			
Version	**Description**	**Date**	**Remark**
01	Original	2025/04/18	/

Authorized for issue by:		
Prepared By		 **Leon Liu/ Project Manager**
Approved By		 **Nick Hu/ Technical Manager**

TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)10-g
	Extremity
GSM850	0.95
GSM1900	3.02
WCDMA Band II	**3.16**
WCDMA Band V	0.95
LTE Band 2	2.82
LTE Band 4	2.52
LTE Band 5	1.02
LTE Band 7	3.02
LTE Band 13	0.92
LTE Band 17	0.64
LTE Band 38	1.73
LTE Band 40	1.28
LTE Band 41	1.74
WI-FI (2.4GHz)	0.48
WI-FI (5GHz)	0.79
NFC	<0.10
SAR Limited(W/kg)	4.0
Maximum Simultaneous Transmission SAR (W/kg)10-g	
Scenario	**Extremity**
Sum SAR	3.37
SPLSR	/
SPLSR Limited	0.1

Note:
This test report (Report No.: SUCR250300021301 issue on 2025/04/18) is based on the original test report (Report No.: KSEM210700112911 issue on 2021/06/30).
Review this report and original report, this report just changing the parts according to the declaration letter from client.
Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.
Therefore in this report NFC is fully tested and other test data please refer to the original report (KSEM210700112911 issue on 2021/06/30).

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1 General Information

1.1 Details of Client

Applicant:	Shanghai Sunmi Technology Co.,Ltd.
Address:	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Manufacturer:	Shanghai Sunmi Technology Co.,Ltd.
Address:	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China

1.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test Engineer:	Zhang Alan; Liu Leon-l

1.3 Test Facility

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

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

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

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 0031225543

1.4 General Description of EUT

Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Product Name:	Wireless data POS System		
Model No.(EUT):	T5F01		
Trade Mark:	SUNMI		
Product Phase:	Production Unit		
Hardware Version:	Ambh6e		
Software Version:	SP3136_V019_20210430_sunmi		
SN:	VM06D14T20015		
Antenna Type:	PIFA Antenna		
Device Operating Configurations :			
Modulation Mode:	**GSM:** GMSK, 8PSK; **WCDMA**: QPSK; **LTE:** QPSK,16QAM; **WIFI:** CCK, DSSS, OFDM; **BT**: GFSK, π/4DQPSK,8DPSK **NFC:** ASK		
Device Class:	B		
GPRS Multi-slots Class:	12	EGPRS Multi-slots Class:	12
HSDPA UE Category:	14	HSUPA UE Category	6
Power Class	4,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “all 1”(WCDMA Band)		
	3, tested with power control Max Power(LTE Band)		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	GSM850	824 - 849	869 - 894
	GSM1900	1850 - 1910	1930 - 1990
	WCDMA Band II	1850 - 1910	1930 - 1990
	WCDMA Band V	824 - 849	869 - 894
	LTE Band 2	1850 - 1910	1930 - 1990
	LTE Band 4	1710 - 1755	2110 - 2155
	LTE Band 5	824 - 849	869 - 894
	LTE Band 7	2500 - 2570	2620 - 2690
	LTE Band 13	777 - 787	746 - 756
	LTE Band 17	704 - 716	734 - 746
	LTE Band 38	2570 - 2620	2570 - 2620
	LTE Band 40	2305~2315 2350~2360	2305~2315 2350~2360
	LTE Band 41	2496 - 2690	2496 - 2690
	Bluetooth	2402-2480	2402-2480
	Wi-Fi 2.4G	2412 - 2462	2412 - 2462
	Wi-Fi 5G	5150 - 5250	5150 - 5250
		5250 - 5350	5250 - 5350
		5470 - 5725	5470 - 5725
		5725 - 5850	5725 - 5850
	NFC	13.56MHz	13.56MHz
RF Cable:	☒ Provided by the applicant ☐ Provided by the laboratory		
Battery Information:	Model:	KPJ 2ICP5/62/70	
	Rated capacity:	7.7V/3500mAh/26.95Wh	
	Manufacturer:	Manufacturer: Sunmi Technology Co., Ltd.	

Note: *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.
As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

1.4.1 DUT Antenna Locations (Back View)

The DUT Antenna Locations can be referred to Appendix D

Note: The test device is a Wireless data POS System. The display diagonal dimension is 168mm and the overall diagonal dimension of this device is 249mm.

1.5 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 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 941225 D01	3G SAR Measurement Procedures v03r01
KDB 941225 D05	SAR for LTE Devices v02r05
KDB 941225 D05A	LTE Rel.10 KDB Inquiry Sheet v01r02
KDB 248227 D01	SAR Guidance for IEEE 802 11 Wi-Fi SAR v02r02
KDB 447498 D04	General RF Exposure Guidance v01
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02
KDB 690783 D01	SAR Listings on Grants v01r03

1.6 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain*Trunk)	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

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.)

2 Laboratory Environment

Temperature	Min. = 18℃, Max. = 25 ℃
Relative humidity	Min. = 30%, Max. = 70%
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.	

Table 1： The Ambient Conditions

3 SAR Measurements System Configuration

3.1 The SAR Measurement System

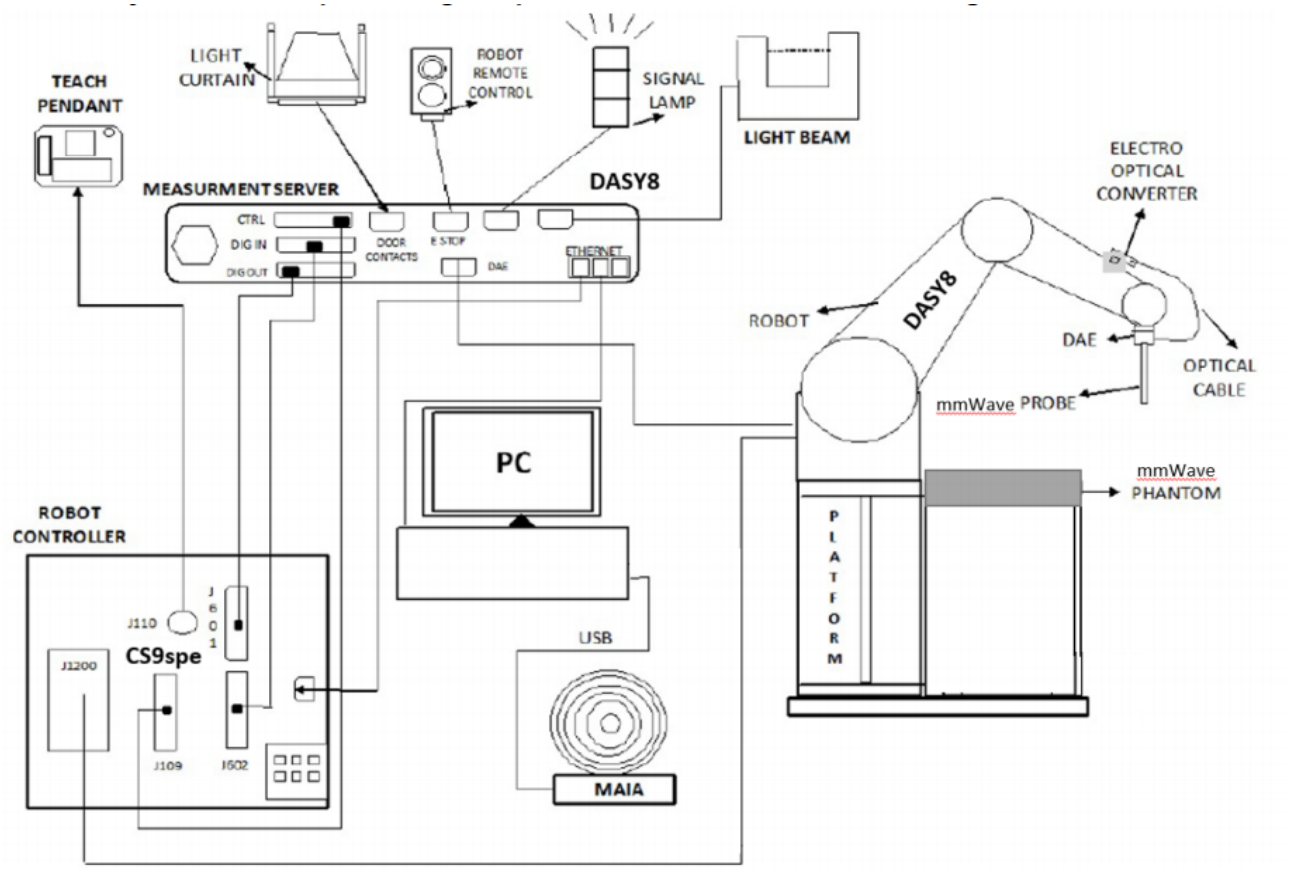
This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

The DASY 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

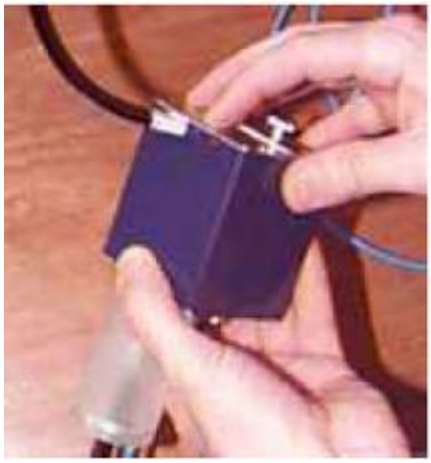
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY8 software.
- 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 validating 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	DASY52 SAR and higher, EASY4/MRI

3.3 Data Acquisition Electronics (DAE)

Model	DAE
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

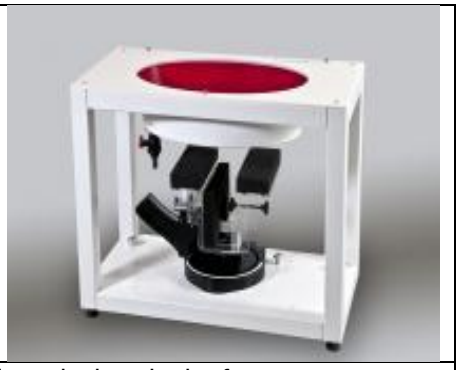
Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx.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

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 IEEE 1528 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 32mm*32mm*30mm (f≤2GHz), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points (f≤2GHz), 7x7x7 points (f for 2-3GHz) and 7x7x12 points (f for 5-6GHz). 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

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 ".DAE4". 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], [°C], [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.

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

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 KDB 865664 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 KDB 865664 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 Extremity Exposure Condition

5.1.1 Extremity exposure conditions

NFC mainly operate in hand-held extremity exposure conditions and NFC sensing distance with other device or reading tag is about 20cm, therefore Standalone 10-g extremity SAR testing for NFC will be performed with active mode and max power mode, with 100% duty cycle at 0mm separation distance.

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	700-900	1750-2000	2300-2500	2500-2700
Water	38.56	40.30	55.24	55.00	54.92
Salt (NaCl)	3.95	1.38	0.31	0.2	0.23
Sucrose	56.32	57.90	0	0	0
HEC	0.98	0.24	0	0	0
Bactericide	0.19	0.18	0	0	0
Tween	0	0	44.45	44.80	44.85
Salt: 99+% Pure Sodium Chloride Sucrose: 98+% Pure Sucrose Water: De-ionized, 16 MΩ+ resistivity HEC: Hydroxyethyl Cellulose Tween: Polyoxyethylene (20) sorbitan monolaurate					
HSL13MHz is composed of the following ingredients： Water：50-90% Non-ionic detergents：5-50% Nacl：0-2% Preservative：0.03-0.1%					

Table 2： Recipe of Tissue Simulate Liquid

6.1.2 Measurement for Tissue Simulate Liquid

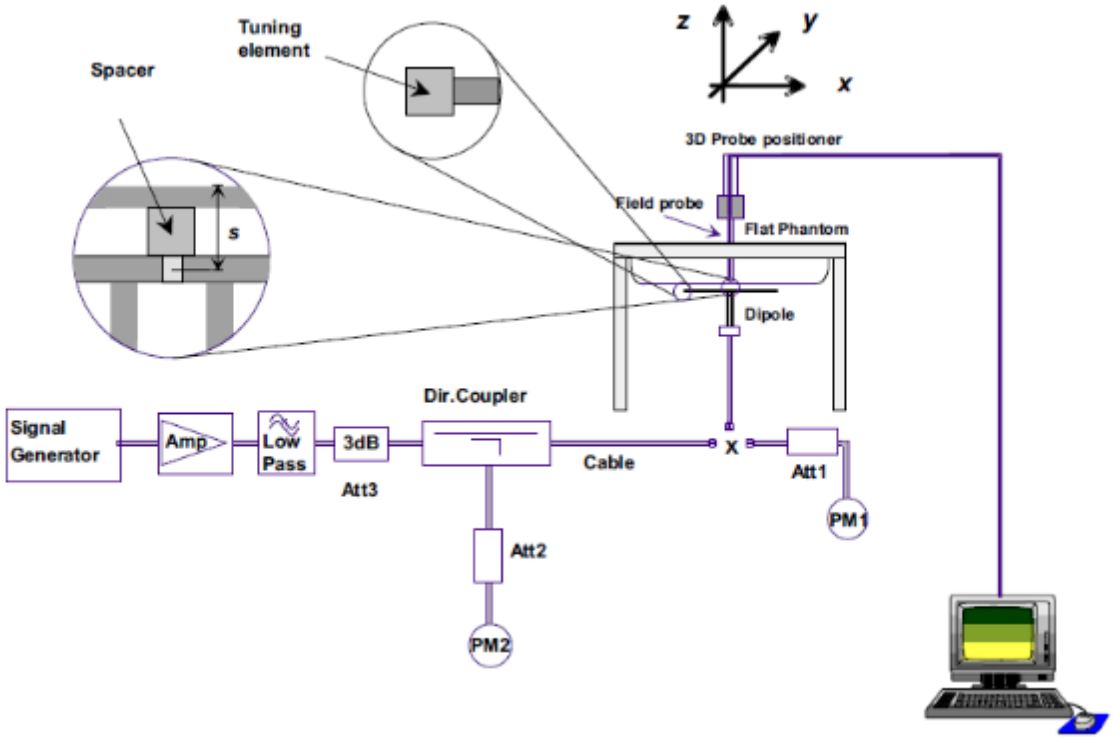
The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was 22±2°C.

Measurement for Tissue Simulate Liquid								
Tissue Type	Measured Frequency （MHz）	Target Tissue (±5%)		Measured Tissue		Deviation (Within ±5%)		Liquid Temp. (℃)
		ε_r	σ(S/m)	ε_r	σ(S/m)	ε_r	σ(S/m)	
13 Head	13	55.0	0.75	54.900	0.729	-0.18%	-2.80%	22.4

Table 3： Measurement result of Tissue electric parameters.

6.2 SAR System Check

The microwave circuit arrangement for system Check is sketched in F-12. 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 (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15±0.5 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 check

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%)	Deviation (Within ±10%)		Liquid Temp. (℃)	Test Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)	1-g(W/kg)	10-g(W/kg)		
CLA-13	Head	0.109	0.071	0.44	0.28	0.421	0.266	3.56%	6.77%	22.4	2025/4/14

Table 4： SAR System Check Result.

6.2.3 Detailed System Check Results

Please see the Appendix A

7 Test Result

7.1 Measurement of SAR Data

Note:

1) The maximum reported SAR value is marked in **bold.** Graph results refer to Appendix B

2) Per KDB 447498 D04, 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:

- ≤ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ≤ 100MHz.
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.

NFC:

1) NFC SAR is measured for all edges and surfaces of the device.
2) NFC 13.56MHz antenna port is not available on the device to support conducted power measurement, therefore the measured results are referred to as reported SAR.

7.1.1 SAR Result of NFC

NFC SAR Test Record									
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 10-g	Power drift (dB)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
NFC Test data (Separate 0mm)									
Front side	NFC	13.56MHz	100.00%	1.000	0.082	0.06	1.000	0.082	22.4
Back side	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.4
Left side	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.4
Right side	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.4
Top side	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.4
Bottom side	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.4

7.2 Multiple Transmitter Evaluation

7.2.1 Simultaneous SAR test evaluation

•Simultaneous Transmission Possibilities

No.	Simultaneous Tx Combination	Extremity
1	WWAN + WLAN 2.4GHz + NFC	Yes
2	WWAN + WLAN 5GHz + NFC	Yes
3	WWAN + BT + NFC	Yes

Note:

1) Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required it wireless router 1g SAR(Scaled to the maximum output power ,including tolerance) ＜ 1.2 W/Kg. Therefore, no further analysis beyond tables included in this section was required to determine that possible Simultaneous transmission scenarios would not exceed the SAR limit.

7.2.2 Simultaneous Transmission SAR Summation Scenario

Extremity:

WWAN Band	Exposure position	①MAX.	②MAX.	③MAX.	④MAX.	⑤MAX.	Summed SAR	Summed SAR	Summed SAR	Case NO.
		WWAN SAR(W/kg)	WLAN 2.4GHz SAR(W/kg)	WLAN 5GHz SAR(W/kg)	BT SAR(W/kg)	NFC SAR(W/kg)	①+②+⑤	①+③+⑤	①+④+⑤	
GSM850	Front	0.073	0.008	0.013	0.094	0.082	0.163	0.168	0.249	No
	Back	0.946	0.157	0.209	0.094	0	1.103	1.155	1.040	No
	Left	0.094	0.021	0.021	0.094	0	0.115	0.115	0.188	No
	Right	0.046	0.482	0.792	0.094	0	0.528	0.838	0.140	No
	Top	0.761	0.015	0.015	0.094	0	0.776	0.776	0.855	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
GSM1900	Front	0.193	0.008	0.013	0.094	0.082	0.283	0.288	0.369	No
	Back	3.016	0.157	0.209	0.094	0	3.173	3.225	3.110	No
	Left	0.208	0.021	0.021	0.094	0	0.229	0.229	0.302	No
	Right	0.086	0.482	0.792	0.094	0	0.568	0.878	0.180	No
	Top	2.858	0.015	0.015	0.094	0	2.873	2.873	2.952	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
WCDMA Band II	Front	0.199	0.008	0.013	0.094	0.082	0.289	0.294	0.375	No
	Back	3.157	0.157	0.209	0.094	0	3.314	3.366	3.251	No
	Left	0.276	0.021	0.021	0.094	0	0.297	0.297	0.370	No
	Right	0.12	0.482	0.792	0.094	0	0.602	0.912	0.214	No
	Top	2.779	0.015	0.015	0.094	0	2.794	2.794	2.873	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
WCDMA Band V	Front	0.159	0.008	0.013	0.094	0.082	0.249	0.254	0.335	No
	Back	0.95	0.157	0.209	0.094	0	1.107	1.159	1.044	No
	Left	0.069	0.021	0.021	0.094	0	0.090	0.090	0.163	No
	Right	0.045	0.482	0.792	0.094	0	0.527	0.837	0.139	No
	Top	0.912	0.015	0.015	0.094	0	0.927	0.927	1.006	No
	Bottom	0.887	0	0	0.094	0	0.887	0.887	0.981	No
LTE Band 2	Front	0.164	0.008	0.013	0.094	0.082	0.254	0.259	0.340	No
	Back	2.82	0.157	0.209	0.094	0	2.977	3.029	2.914	No
	Left	0.23	0.021	0.021	0.094	0	0.251	0.251	0.324	No
	Right	0.087	0.482	0.792	0.094	0	0.569	0.879	0.181	No
	Top	2.54	0.015	0.015	0.094	0	2.555	2.555	2.634	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
LTE Band 4	Front	0.179	0.008	0.013	0.094	0.082	0.269	0.274	0.355	No
	Back	2.52	0.157	0.209	0.094	0	2.677	2.729	2.614	No
	Left	0.274	0.021	0.021	0.094	0	0.295	0.295	0.368	No
	Right	0.126	0.482	0.792	0.094	0	0.608	0.918	0.220	No
	Top	2.259	0.015	0.015	0.094	0	2.274	2.274	2.353	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
LTE Band 5	Front	0.131	0.008	0.013	0.094	0.082	0.221	0.226	0.307	No
	Back	1.019	0.157	0.209	0.094	0	1.176	1.228	1.113	No
	Left	0.239	0.021	0.021	0.094	0	0.260	0.260	0.333	No
	Right	0.089	0.482	0.792	0.094	0	0.571	0.881	0.183	No
	Top	0.99	0.015	0.015	0.094	0	1.005	1.005	1.084	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
LTE Band 7	Front	0.117	0.008	0.013	0.094	0.082	0.207	0.212	0.293	No
	Back	3.024	0.157	0.209	0.094	0	3.181	3.233	3.118	No

	Left	0.376	0.021	0.021	0.094	0	0.397	0.397	0.470	No
	Right	0.092	0.482	0.792	0.094	0	0.574	0.884	0.186	No
	Top	2.672	0.015	0.015	0.094	0	2.687	2.687	2.766	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
LTE Band 13	Front	0.057	0.008	0.013	0.094	0.082	0.147	0.152	0.233	No
	Back	0.921	0.157	0.209	0.094	0	1.078	1.130	1.015	No
	Left	0.095	0.021	0.021	0.094	0	0.116	0.116	0.189	No
	Right	0.045	0.482	0.792	0.094	0	0.527	0.837	0.139	No
	Top	0.793	0.015	0.015	0.094	0	0.808	0.808	0.887	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
LTE Band 17	Front	0.045	0.008	0.013	0.094	0.082	0.135	0.140	0.221	No
	Back	0.64	0.157	0.209	0.094	0	0.797	0.849	0.734	No
	Left	0.076	0.021	0.021	0.094	0	0.097	0.097	0.170	No
	Right	0.028	0.482	0.792	0.094	0	0.510	0.820	0.122	No
	Top	0.582	0.015	0.015	0.094	0	0.597	0.597	0.676	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
LTE Band 38	Front	0.115	0.008	0.013	0.094	0.082	0.205	0.210	0.291	No
	Back	1.452	0.157	0.209	0.094	0	1.609	1.661	1.546	No
	Left	0.187	0.021	0.021	0.094	0	0.208	0.208	0.281	No
	Right	0.047	0.482	0.792	0.094	0	0.529	0.839	0.141	No
	Top	1.725	0.015	0.015	0.094	0	1.740	1.740	1.819	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
LTE Band 40	Front	0.13	0.008	0.013	0.094	0.082	0.220	0.225	0.306	No
	Back	1.278	0.157	0.209	0.094	0	1.435	1.487	1.372	No
	Left	0.184	0.021	0.021	0.094	0	0.205	0.205	0.278	No
	Right	0.042	0.482	0.792	0.094	0	0.524	0.834	0.136	No
	Top	0.699	0.015	0.015	0.094	0	0.714	0.714	0.793	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No
LTE Band 41	Front	0.019	0.008	0.013	0.094	0.082	0.109	0.114	0.195	No
	Back	1.707	0.157	0.209	0.094	0	1.864	1.916	1.801	No
	Left	0.029	0.021	0.021	0.094	0	0.050	0.050	0.123	No
	Right	0.015	0.482	0.792	0.094	0	0.497	0.807	0.109	No
	Top	1.741	0.015	0.015	0.094	0	1.756	1.756	1.835	No
	Bottom	0	0	0	0.094	0	0.000	0.000	0.094	No

8 Equipment list

Test Platform		SPEAG DASY8 Professional				
Description		SAR Test System				
Software Reference		cDASY8 V16.4.0.5005				
Hardware Reference						
Equipment		Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	Twin Phantom	SPEAG	ELI V8.0	2217	NCR	NCR
☒	DAE	SPEAG	DAE4ip	1826	2025-02-17	2026-02-16
☒	E-Field Probe	SPEAG	EX3DV4	7735	2025-01-29	2026-01-28
☒	Validation Kits	SPEAG	CLA13	1032	2023-02-09	2026-02-08
☒	Dielectric parameter probes	SPEAG	DAKS-3.5	1102	N/A	N/A
☒	Universal Radio Communication Tester	R&S	CMW500	111637	2024-09-12	2025-09-11
☒	RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR
☒	Signal Generator	R&S	SMB100A	182393	2025-02-05	2026-02-04
☒	Preamplifier	Qiji	YX28980933	202104001	NCR	NCR
☒	Power Sensor	Keysight	U2002H	121251	2024-09-13	2025-09-12
☒	Attenuator	SHX	TS2-3dB	30704	NCR	NCR
☒	Coaxial low pass filter	Mini-Circuits	VLF-2500(+)	NA	NCR	NCR
☒	Coaxial low pass filter	Microlab Fxr	LA-F13	NA	NCR	NCR
☒	DC POWER SUPPLY	SAKO	SK1730SL5A	NA	NCR	NCR
☒	Speed reading thermometer	LKM	DTM3000	NA	2024-09-14	2025-09-13
☒	Humidity and Temperature Indicator	MingGao	MingGao	NA	2024-09-16	2025-09-15

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

9 Calibration certificate

Please see the Appendix C

10 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

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