

SAR TEST REPORT

Application No.: SUCR2512001174TL
Applicant: Elo Touch Solutions, Inc.
Address of Applicant: 670 N. McCarthy Blvd., Suite 100, Milpitas, CA 95035, USA.
Manufacturer: Elo Touch Solutions, Inc.
Address of Manufacturer: 670 N. McCarthy Blvd., Suite 100, Milpitas, CA 95035, USA.
EUT Description: Handheld Terminal
Model No.: EMC-M21C
Trade Mark: Elo
FCC ID: RBWEMCM21C
Standards: FCC 47CFR §2.1093
Date of Receipt: 2025-12-08
Date of Test: 2026-01-01 to 2026-01-12
Date of Issue: 2026-01-19

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

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Revision Record			
Version	Description	Date	Remark
00	Original	2026-01-19	/

Authorized for issue by:		
Prepared By		Leon Liu
		Leon Liu/ Project Engineer
Approved By		Nick Hu
		Nick Hu/ Reviewer

TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)
	Extremity 10g SAR
LTE Band 7	1.90
LTE Band 12(17)	0.65
LTE Band 13	0.80
LTE Band 25(2)	1.62
LTE Band 26(5)	1.15
LTE Band 41	1.13
LTE Band 66(4)	1.63
WI-FI (2.4GHz)	0.84
WI-FI (5GHz)	0.80
BT	<0.10
NFC	<0.10
SAR Limited(W/kg)	4.0
Maximum Simultaneous Transmission SAR (W/kg)	
Scenario	Extremity 10g SAR
Sum SAR	2.74
SPLSR	/
SPLSR Limited	0.1

Note:

1) The Simultaneous transmission SAR is the same test position of the WWAN Antenna + WiFi/BT Antenna.

2) According to TCB workshop October, 2014 RF Exposure Procedures Update (Overlapping Bands): SAR for LTE Band 2/4/5/17 is respectively covered by LTE Band 25/66/26/12 due to similar frequency range, same maximum tune up limit and same channel bandwidth.

Because the frequency range is similar, the maximum tuning limit is the same, and the channel bandwidth and other operating parameters for the smaller band is fully supported by the larger band.

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1 General Information

1.1 General Description of EUT

Product Name:	Handheld Terminal	
Model No.:	EMC-M21C	
Trade Mark:	Elo	
Product Phase:	production unit	
Device Type:	portable device	
Exposure Category:	uncontrolled environment / general population	
IMEI:	355118645002470/355118645001885	
Hardware Version:	V1.03	
Software Version:	7.000.000.0001+am21	
Antenna Type:	Internal Antenna	
Device Operating Configurations:		
Modulation Mode:	LTE: QPSK,16QAM,64QAM WIFI: DSSS,OFDM; BT: GFSK, π/4DQPSK,8DPSK NFC: ASK	
Power Class:	3, tested with power control "max power"(LTE Band)	
Frequency Bands:	Band	Tx(MHz)
	LTE Band 2	1850 ~1910
	LTE Band 4	1710~1755
	LTE Band 5	824~849
	LTE Band 7	2500~2570
	LTE Band 12	699~716
	LTE Band 13	777~787
	LTE Band 17	704~716
	LTE band 25	1850~1915
	LTE Band 26	814~849
	LTE Band 41	2496~2690
	LTE Band 66	1710~1780
	WIFI 2.4G	2412~2462
	WIFI 5G	5150~5250
		5250~5350
		5470~5725
		5725~5850
	BT	2402~2480
	NFC	13.56
RF Cable:	☒ Provided by applicant ☐ Provided by the laboratory	
Battery Information:	Model:	U616879PV-1S1P

	Normal Voltage:	3.8V
	Rated capacity:	5200mAh/19.76Wh
	Manufacturer:	SHENZHEN UTILITY ENERGY 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.		

1.2 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 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	Interim 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

1.3 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.)

1.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.

South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu)
Pilot Free Trade Zone

No tests were sub-contracted.

1.5 Test Engineer

Test Engineer: Koller Chen

1.6 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).

- **FCC (Designation Number: CN1312)**

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. has been recognized as an accredited testing laboratory.

Test Firm Registration Number: 717327

- **ISED (CAB Identifier: CN0120)**

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 27594

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 Configuraion

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 $SAR = \sigma (|E_i|^2) / \rho$ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

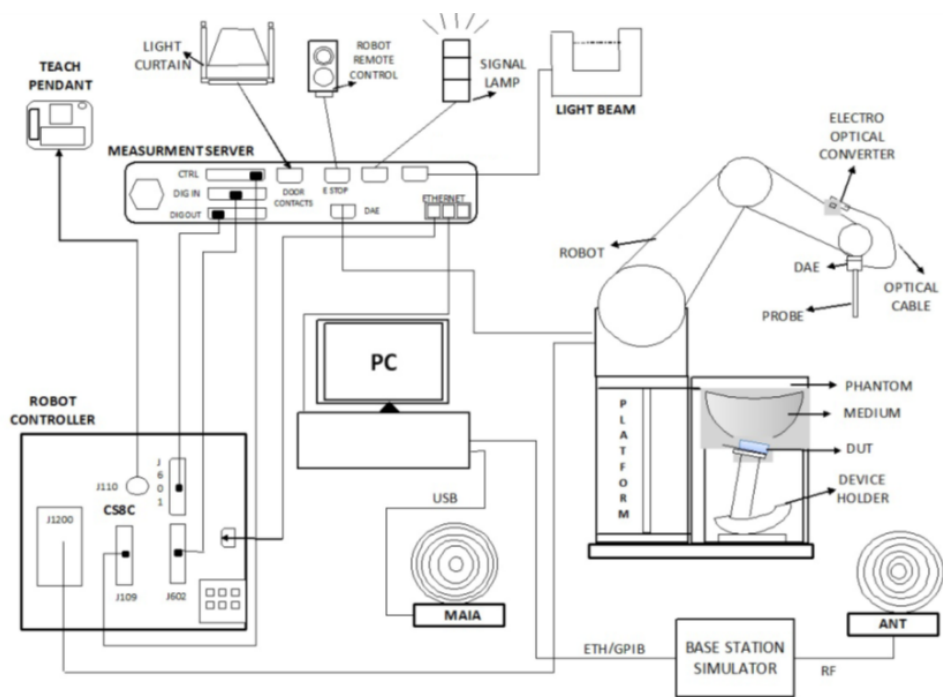
The DASY system for performing compliance tests consists of the following items:

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 system.
- DASY 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 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	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 DASY 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	Vynlester, 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	pprox.. 25 liters	
Wooden Support	SPEAG standard phantom table	

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom. 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	pprox.. 30 liters	
Wooden Support	SPEAG standard phantom table	

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 4 MHz to 10 GHz. 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 $\epsilon=3$ and loss tangent $\delta=0.02$. 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 ($f \leq 2\text{GHz}$), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points ($f \leq 2\text{GHz}$), 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.

If the zoom scan measured as specified in the preceding paragraphs complies with both i) and ii), or if the psSAR is below 0,1 W/kg, no additional measurements are needed.

i) The smallest horizontal distance from the local SAR peaks to all points 3 dB below the SAR peak shall be larger than the horizontal grid steps in both x- and y-directions (Δx , Δy). This shall be checked for the measured zoom scan plane conformal to the phantom at the distance zM1. The minimum distance shall be recorded in the SAR test report.

ii) The ratio of the SAR at the second measured point (M2) to the SAR at the closest measured point (M1) at the x-y location of the measured maximum SAR value shall be at least 30 %. This ratio (in %) shall be recorded in the SAR test report.

			$\leq 3 \text{ GHz}$	$> 3 \text{ GHz}$
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			$5 \pm 1 \text{ mm}$	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$
Maximum probe angle from probe axis to phantom surface normal at the measurement location			$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$			$\leq 2 \text{ GHz}: \leq 15 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 12 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 12 \text{ mm}$ $4 - 6 \text{ GHz}: \leq 10 \text{ mm}$
			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 $\leq$ 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: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			$\leq 2 \text{ GHz}: \leq 8 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 5 \text{ mm}^*$	$3 - 4 \text{ GHz}: \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz}: \leq 4 \text{ mm}^*$
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		$\leq 5 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 4 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 3 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	$\leq 4 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 3 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z		$\geq 30 \text{ mm}$	$3 - 4 \text{ GHz}: \geq 28 \text{ mm}$ $4 - 5 \text{ GHz}: \geq 25 \text{ mm}$ $5 - 6 \text{ GHz}: \geq 22 \text{ mm}$

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 $\pm 5 \%$.

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 “DAE”. 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:

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

With V_i = compensated signal of channel i ($i = x, y, z$)

U_i = input signal of channel i ($i = x, y, z$)

cf = crest factor of exciting field (DASY parameter)

dcpi = 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 V_i = compensated signal of channel i ($i = x, y, z$)

$Norm_i$ = sensor sensitivity of channel i ($i = x, y, z$)

[mV/(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 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.

$$SAR = (E_{tot}^2 \cdot \sigma) / (\epsilon \cdot 1000)$$

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]

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.

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

with P_{pwe} = equivalent power density of a plane wave in mW/cm²

E_{tot} = total electric field strength in V/m

H_{tot} = 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 ($\sim 10\%$ from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

The 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.

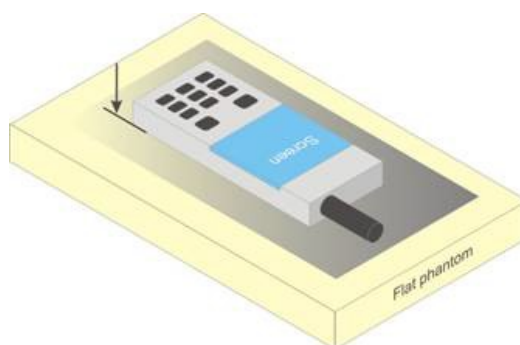
4.2 SAR measurement uncertainty

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 conditions

When SAR measurement is necessary for hand-held devices that do not transmit while at the head or torso, a flat phantom may be used. To assess this type of device, the device shall be placed directly against the flat phantom as shown in Figure 3, for the sides of the device that are in contact with the hand for the intended use.



F-3. Test positions for hand-held devices

6 SAR System Verificaion 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	700-1000	1700-2000	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 Water: De-ionized, 16 MΩ+ resistivity Tween: Polyoxyethylene (20) sorbitan monolaurate Sucrose: 98+% Pure Sucrose HEC: Hydroxyethyl Cellulose					
Head Tissue Simulate Liquid (HBBL600-10000V6) is composed of the following ingredients: (Manufactured by SPEAG) Water: 50-65% Mineral oil: 10-30% Emulsifiers: 8-25% Sodium salt: 0-1.5%					

Table 1 : Recipe of Tissue Simulate Liquid

6.1.2 Measurement for Tissue Simulate Liquid

The Conductivity (σ) and Permittivity (ϵ_r) are listed in Table 2. For the SAR measurement given in this report.

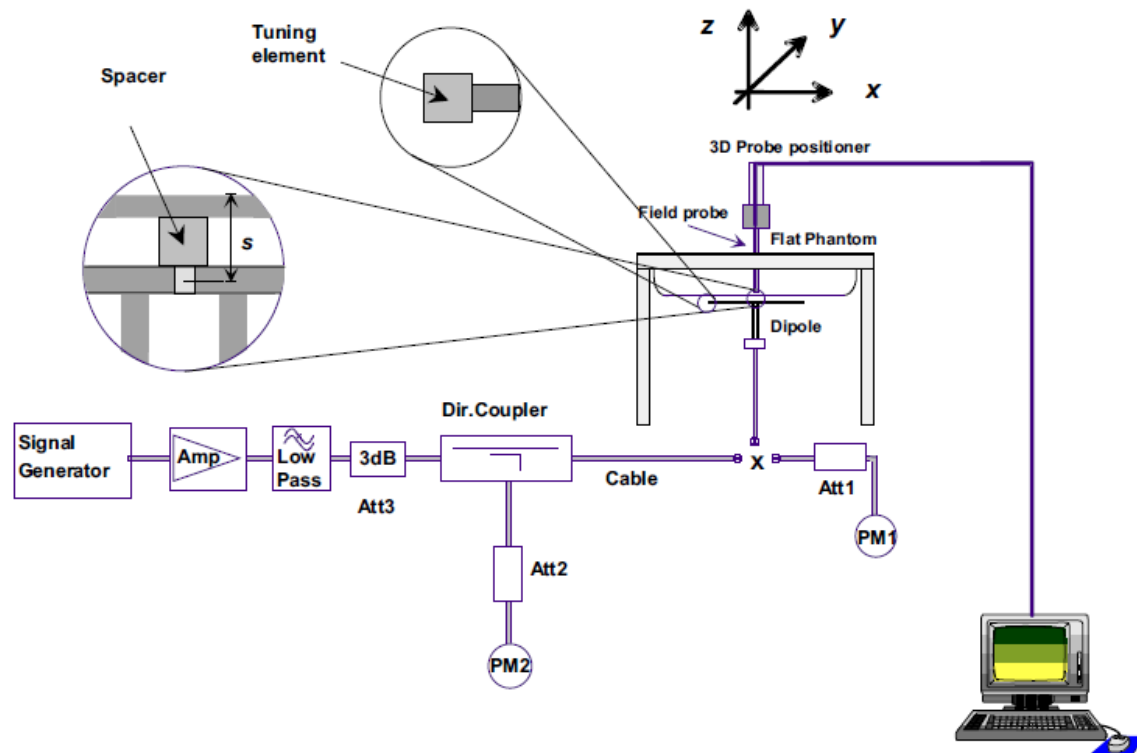
The temperature variation of the Tissue Simulate Liquids was $22 \pm 2^\circ\text{C}$.

Tissue Type	Measured Frequency (MHz)	Measured Tissue		Target Tissue ($\pm 5\%$)		Deviation (Within $\pm 5\%$)		Liquid Temp. ($^\circ\text{C}$)	Test Date
		ϵ_r	$\sigma(\text{S/m})$	ϵ_r	$\sigma(\text{S/m})$	ϵ_r	$\sigma(\text{S/m})$		
13 Head	13	55.821	0.733	55.00	0.75	1.49%	-2.27%	22.5	2026/1/12
750 Head	750	41.908	0.892	41.90	0.89	0.02%	0.22%	22.8	2026/1/1
835 Head	835	42.329	0.909	41.50	0.90	2.00%	1.00%	23.2	2026/1/2
1750 Head	1750	39.026	1.330	40.10	1.37	-2.68%	-2.92%	22.9	2026/1/3
1950 Head	1950	39.235	1.400	40.00	1.40	-1.91%	0.00%	23.4	2026/1/4
2450 Head	2450	39.047	1.793	39.20	1.80	-0.39%	-0.39%	23.1	2026/1/5
2600 Head	2600	38.721	1.957	39.00	1.96	-0.72%	-0.15%	23.3	2026/1/6
5250 Head	5250	36.536	4.857	35.90	4.71	1.77%	3.12%	22.7	2026/1/7
5600 Head	5600	35.668	5.249	35.50	5.07	0.47%	3.53%	22.7	2026/1/7
5750 Head	5750	35.487	5.446	35.40	5.22	0.25%	4.33%	22.7	2026/1/7

Table 2 : 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 $\pm 10\%$ 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 $22\pm 2^\circ\text{C}$, 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-12.The microwave circuit arrangement used for SAR system Check

6.2.1 Justification for Extended SAR Dipole Calibrations

1) 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 20% 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)

Validation Kit	Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W)	Target SAR (normalized to 1W)	Deviation (Within $\pm 10\%$)		Liquid Temp. (°C)	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)		
CLA13_Head	0.112	0.073	0.45	0.29	0.421	0.266	7.14%	7.41%	22.5	2026/1/12
D750V3_Head	2.21	1.51	8.84	6.04	8.54	5.80	3.51%	4.14%	22.8	2026/1/1
D835V2_Head	2.47	1.59	9.88	6.36	9.60	6.16	2.92%	3.25%	23.2	2026/1/2
D1750V2_Head	8.93	4.71	35.72	18.84	36.30	19.30	-1.60%	-2.38%	22.9	2026/1/3
D1950V3_Head	9.99	5.14	39.96	20.56	40.40	20.80	-1.09%	-1.15%	23.4	2026/1/4
D2450V2_Head	13.40	6.28	53.60	25.12	52.70	24.60	1.71%	2.11%	23.1	2026/1/5
D2600V2_Head	13.70	6.14	54.80	24.56	55.20	24.70	-0.72%	-0.57%	23.3	2026/1/6
Validation Kit	Measured SAR 100mW	Measured SAR 100mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W)	Target SAR (normalized to 1W)	Deviation (Within $\pm 10\%$)		Liquid Temp. (°C)	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)		
D5GHzV2_5.25G_Head	7.56	2.12	75.60	21.20	77.20	21.90	-2.07%	-3.20%	22.7	2026/1/7
D5GHzV2_5.6G_Head	7.88	2.18	78.80	21.80	81.10	22.80	-2.84%	-4.39%	22.7	2026/1/7
D5GHzV2_5.75G_Head	7.84	2.17	78.40	21.70	77.80	21.70	0.77%	0.00%	22.7	2026/1/7

Table 3 : SAR System Check Result

6.2.3 Detailed System Check Results

Please see the Appendix A

7 Test Configuration

7.1 Operation Configurations

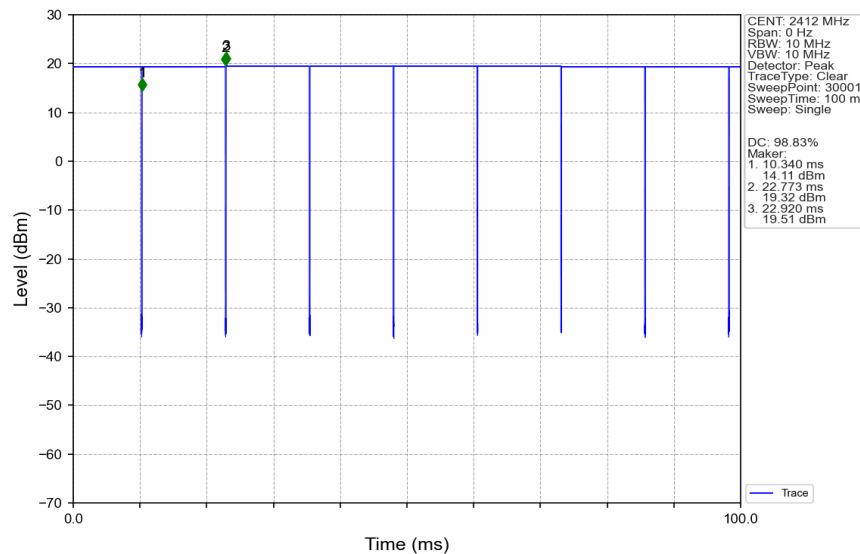
7.1.1 WIFI Test Configuration

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

7.1.1.1 Duty cycle

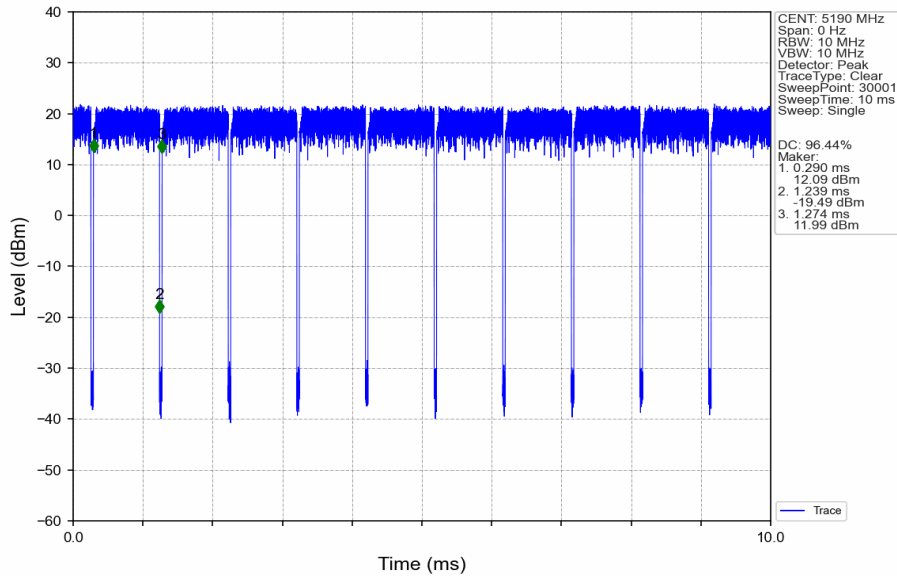
1) Wi-Fi 2.4GHz 802.11b:

Duty cycle=98.83%



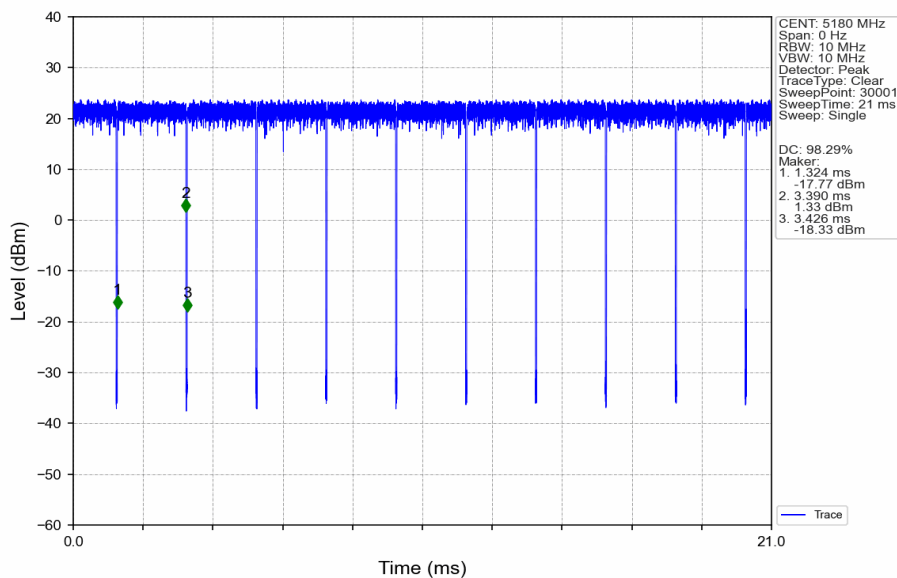
2) Wi-Fi 5GHz 802.11ac VHT40:

Duty cycle=96.44%



3) Wi-Fi 5GHz 802.11a:

Duty cycle=98.29 %



7.1.1.2 Initial Test Position SAR Test Reduction Procedure

DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. The initial test position procedure is described in the following:

- 1) . When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
- 2) . When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) 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, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

7.1.1.3 Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

- 1) . When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.
- 2) . When the highest reported SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.
- 3) . The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.
 - a) SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.
 - b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the reported SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.
- 4) . SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by recursively applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:
 - a) replace "subsequent test configuration" with "next subsequent test configuration" (i.e., subsequent next highest specified maximum output power configuration)
 - b) replace "initial test configuration" with "all tested higher output power configurations"

7.1.1.4 2.4 GHz WiFi SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in following.

- **802.11b DSSS SAR Test Requirements**

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) . When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) . When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

- **2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements**

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3, including sub-sections). 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.

- **SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

7.1.1.5 5 GHz WiFi SAR Procedures

- **U-NII-1 and U-NII-2A Bands**

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following:

- 1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.
- 2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.
- 3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest reported SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

- **U-NII-2C and U-NII-3 Bands**

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. when Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

- 1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
- 2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
- 3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
- 4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n. After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.
 - a) The channel closest to mid-band frequency is selected for SAR measurement.
 - b) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

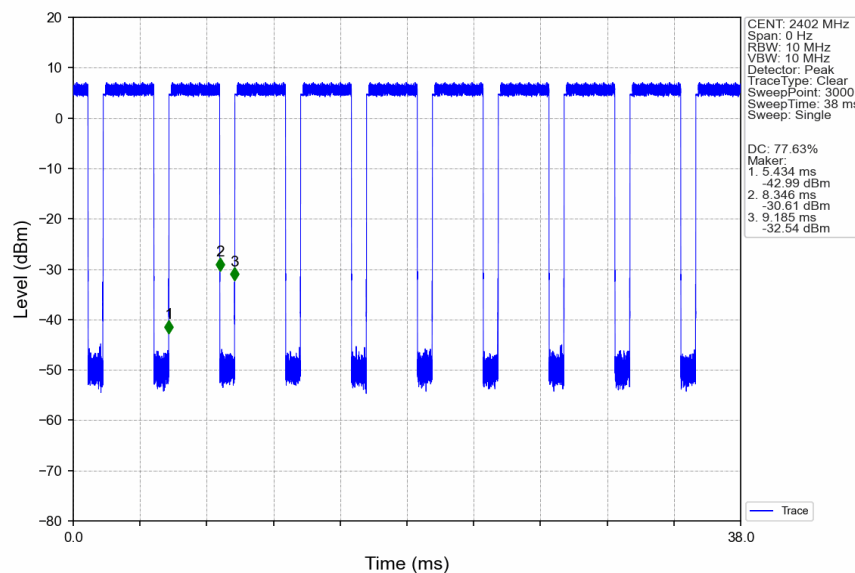
• SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

7.1.2 BT Test Configuration

For the Bluetooth SAR tests, a communication link is set up with the test mode software for BT mode test. Bluetooth USES frequency hopping technology to divide the transmitted data into packets and transmit the packets respectively through 79 designated Bluetooth channels, frequency hops at 1600 hops/second per the Bluetooth standard, the EUT is operated at the RF continuous emission mode.

BT 3DH5 Duty Cycle=77.63%



7.1.3 LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The Radio Communication Analyzer was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

TDD LTE test consideration

For Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

LTE TDD Band support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Frame structure type 2:

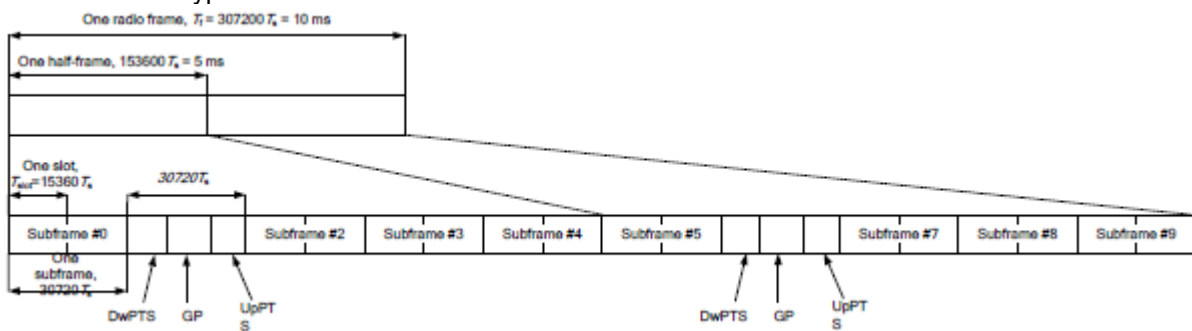


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

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

Table 4.2-2: Uplink-downlink configurations.

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

Calculated Duty Cycle=[Extended cyclic prefix in uplink x (Ts) x # of S + # of U]/10ms

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

A) Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

B) MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Modulation	Channel bandwidth/Transmission bandwidth						MPR (dB)
	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	0
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16QAM	> 5	> 4	> 8	> 12	> 16	> 18	2
64QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	2
64QAM	> 5	> 4	> 8	> 12	> 16	> 18	3

C) A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

4) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

E) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is $> \frac{1}{2}$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

The determination threshold for 10g SAR is 2.5 times the threshold for 1g SAR mentioned in the previous section

8 Test Result

8.1 DUT Antenna Locations (Back View)

The DUT Antenna Locations can be referred to Appendix D

8.2 Measurement of RF Conducted Power

8.2.1 RF Conducted Power Data

The detailed power data can be referred to Appendix E Conducted RF Output Power.

8.3 Measurement of SAR Data

Note:

- 1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) 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:
 - $\leq 0.8\text{W/kg}$ for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$.
- 3) For WiFi 5G,U-NII-2A and U-NII-2C band does not support hotspot function.
- 4) For WiFi SAR test, as the highest reported SAR is smaller than 1.2 W/kg , and the tune-up of the other 802.11 modes are not higher than SAR measurement mode, therefore the adjusted SAR is $\leq 1.2\text{ W/kg}$ for other 802.11 modes, SAR test for the other 802.11 modes are not required. For Product specific 10gSAR the highest reported SAR is smaller than 3.0 W/kg , SAR test for the other 802.11 modes are also not required.
- 5) According to TCB workshop (Overlapping LTE Bands): SAR in LTE band 2/4/5/17 is respectively covered by LTE band 25/66/26/12. Because the frequency range is similar, the maximum tuning limit is the same, and the channel bandwidth and other operating parameters for the smaller band is fully supported by the larger band.

8.3.1 SAR Result of LTE Band 7

LTE Band 7 SAR Test Record											
Ant 0 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(°C)
Extremity Test data (Separate 0mm 1RB)											
Front side	20	QPSK 1_0	21100/2535	1:1	0.697	0.11	23.66	24.50	1.213	0.845	23.3
Back side-strap removed	20	QPSK 1_0	21100/2535	1:1	1.570	0.09	23.66	24.50	1.213	1.904	23.3
Back side-strap attached	20	QPSK 1_0	21100/2535	1:1	1.290	-0.05	23.66	24.50	1.213	1.565	23.3
Left side	20	QPSK 1_0	21100/2535	1:1	0.074	-0.14	23.66	24.50	1.213	0.090	23.3
Right side	20	QPSK 1_0	21100/2535	1:1	0.418	0.09	23.66	24.50	1.213	0.507	23.3
Top side	20	QPSK 1_0	21100/2535	1:1	0.036	0.10	23.66	24.50	1.213	0.044	23.3
Bottom side	20	QPSK 1_0	21100/2535	1:1	1.540	0.13	23.66	24.50	1.213	1.868	23.3
Extremity Test data (Separate 0mm 50%RB)											
Front side	20	QPSK 50_0	21100/2535	1:1	0.562	-0.04	22.08	23.50	1.387	0.779	23.3
Back side-strap removed	20	QPSK 50_0	21100/2535	1:1	1.260	-0.11	22.08	23.50	1.387	1.748	23.3
Back side-strap attached	20	QPSK 50_0	21100/2535	1:1	1.040	-0.07	22.08	23.50	1.387	1.442	23.3
Left side	20	QPSK 50_0	21100/2535	1:1	0.057	-0.01	22.08	23.50	1.387	0.079	23.3
Right side	20	QPSK 50_0	21100/2535	1:1	0.348	0.07	22.08	23.50	1.387	0.483	23.3
Top side	20	QPSK 50_0	21100/2535	1:1	0.026	0.06	22.08	23.50	1.387	0.036	23.3
Bottom side	20	QPSK 50_0	21100/2535	1:1	1.280	-0.11	22.08	23.50	1.387	1.775	23.3

8.3.2 SAR Result of LTE Band 12

LTE Band 12 SAR Test Record											
Ant 0 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(°C)
Extremity Test data (Separate 0mm 1RB)											
Front side	10	QPSK 1_0	23095/707.5	1:1	0.487	-0.12	24.14	24.50	1.086	0.529	22.8
Back side-strap removed	10	QPSK 1_0	23095/707.5	1:1	0.432	0.02	24.14	24.50	1.086	0.469	22.8
Back side-strap attached	10	QPSK 1_0	23095/707.5	1:1	0.262	-0.18	24.14	24.50	1.086	0.285	22.8
Left side	10	QPSK 1_0	23095/707.5	1:1	0.157	-0.19	24.14	24.50	1.086	0.171	22.8
Right side	10	QPSK 1_0	23095/707.5	1:1	0.353	-0.07	24.14	24.50	1.086	0.383	22.8
Top side	10	QPSK 1_0	23095/707.5	1:1	0.029	-0.07	24.14	24.50	1.086	0.031	22.8
Bottom side	10	QPSK 1_0	23095/707.5	1:1	0.600	0.19	24.14	24.50	1.086	0.652	22.8
Extremity Test data (Separate 0mm 50%RB)											
Front side	10	QPSK 25_0	23095/707.5	1:1	0.391	0.14	23.37	23.50	1.030	0.403	22.8
Back side-strap removed	10	QPSK 25_0	23095/707.5	1:1	0.384	0.07	23.37	23.50	1.030	0.396	22.8
Back side-strap attached	10	QPSK 25_0	23095/707.5	1:1	0.214	-0.14	23.37	23.50	1.030	0.220	22.8
Left side	10	QPSK 25_0	23095/707.5	1:1	0.135	0.06	23.37	23.50	1.030	0.139	22.8
Right side	10	QPSK 25_0	23095/707.5	1:1	0.301	-0.18	23.37	23.50	1.030	0.310	22.8
Top side	10	QPSK 25_0	23095/707.5	1:1	0.027	-0.19	23.37	23.50	1.030	0.028	22.8
Bottom side	10	QPSK 25_0	23095/707.5	1:1	0.564	0.06	23.37	23.50	1.030	0.581	22.8

8.3.3 SAR Result of LTE Band 13

LTE Band 13 SAR Test Record											
Ant 0 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(°C)
Extremity Test data (Separate 0mm 1RB)											
Front side	10	QPSK 1_0	23230/782	1:1	0.497	0.09	24.68	25.00	1.076	0.535	22.8
Back side-strap removed	10	QPSK 1_0	23230/782	1:1	0.377	0.07	24.68	25.00	1.076	0.406	22.8
Back side-strap attached	10	QPSK 1_0	23230/782	1:1	0.247	-0.09	24.68	25.00	1.076	0.266	22.8
Left side	10	QPSK 1_0	23230/782	1:1	0.213	0.04	24.68	25.00	1.076	0.229	22.8
Right side	10	QPSK 1_0	23230/782	1:1	0.301	-0.07	24.68	25.00	1.076	0.324	22.8
Top side	10	QPSK 1_0	23230/782	1:1	0.045	0.16	24.68	25.00	1.076	0.048	22.8
Bottom side	10	QPSK 1_0	23230/782	1:1	0.743	0.09	24.68	25.00	1.076	0.799	22.8
Extremity Test data (Separate 0mm 50%RB)											
Front side	10	QPSK 25_0	23230/782	1:1	0.429	0.13	23.46	24.00	1.132	0.486	22.8
Back side-strap removed	10	QPSK 25_0	23230/782	1:1	0.261	-0.03	23.46	24.00	1.132	0.295	22.8
Back side-strap attached	10	QPSK 25_0	23230/782	1:1	0.205	0.19	23.46	24.00	1.132	0.232	22.8
Left side	10	QPSK 25_0	23230/782	1:1	0.184	0.08	23.46	24.00	1.132	0.208	22.8
Right side	10	QPSK 25_0	23230/782	1:1	0.287	0.02	23.46	24.00	1.132	0.325	22.8
Top side	10	QPSK 25_0	23230/782	1:1	0.048	0.05	23.46	24.00	1.132	0.054	22.8
Bottom side	10	QPSK 25_0	23230/782	1:1	0.489	-0.18	23.46	24.00	1.132	0.554	22.8

8.3.4 SAR Result of LTE Band 25

LTE Band 25 SAR Test Record											
Ant 0 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(°C)
Extremity Test data (Separate 0mm 1RB)											
Front side	20	QPSK 1_0	26365/1882.5	1:1	0.371	0.19	23.62	24.50	1.225	0.454	23.4
Back side-strap removed	20	QPSK 1_0	26365/1882.5	1:1	1.320	0.07	23.62	24.50	1.225	1.617	23.4
Back side-strap attached	20	QPSK 1_0	26365/1882.5	1:1	0.607	0.15	23.62	24.50	1.225	0.744	23.4
Left side	20	QPSK 1_0	26365/1882.5	1:1	0.171	-0.01	23.62	24.50	1.225	0.209	23.4
Right side	20	QPSK 1_0	26365/1882.5	1:1	0.098	-0.08	23.62	24.50	1.225	0.120	23.4
Top side	20	QPSK 1_0	26365/1882.5	1:1	0.037	-0.07	23.62	24.50	1.225	0.045	23.4
Bottom side	20	QPSK 1_0	26365/1882.5	1:1	1.040	0.03	23.62	24.50	1.225	1.274	23.4
Extremity Test data (Separate 0mm 50%RB)											
Front side	20	QPSK 50_0	26365/1882.5	1:1	0.294	0.01	22.59	23.50	1.233	0.363	23.4
Back side-strap removed	20	QPSK 50_0	26365/1882.5	1:1	1.100	-0.02	22.59	23.50	1.233	1.356	23.4
Back side-strap attached	20	QPSK 50_0	26365/1882.5	1:1	0.502	-0.13	22.59	23.50	1.233	0.619	23.4
Left side	20	QPSK 50_0	26365/1882.5	1:1	0.138	-0.15	22.59	23.50	1.233	0.170	23.4
Right side	20	QPSK 50_0	26365/1882.5	1:1	0.085	-0.09	22.59	23.50	1.233	0.105	23.4
Top side	20	QPSK 50_0	26365/1882.5	1:1	0.032	-0.18	22.59	23.50	1.233	0.039	23.4
Bottom side	20	QPSK 50_0	26365/1882.5	1:1	0.943	0.04	22.59	23.50	1.233	1.163	23.4

8.3.5 SAR Result of LTE Band 26

LTE Band 26 SAR Test Record											
Ant 0 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(°C)
Extremity Test data (Separate 0mm 1RB)											
Front side	15	QPSK 1_0	26865/831.5	1:1	0.679	0.16	24.27	25.00	1.183	0.803	23.2
Back side-strap removed	15	QPSK 1_0	26865/831.5	1:1	0.539	-0.11	24.27	25.00	1.183	0.638	23.2
Back side-strap attached	15	QPSK 1_0	26865/831.5	1:1	0.412	0.13	24.27	25.00	1.183	0.487	23.2
Left side	15	QPSK 1_0	26865/831.5	1:1	0.229	0.17	24.27	25.00	1.183	0.271	23.2
Right side	15	QPSK 1_0	26865/831.5	1:1	0.380	-0.06	24.27	25.00	1.183	0.450	23.2
Top side	15	QPSK 1_0	26865/831.5	1:1	0.063	-0.14	24.27	25.00	1.183	0.075	23.2
Bottom side	15	QPSK 1_0	26865/831.5	1:1	0.968	0.15	24.27	25.00	1.183	1.145	23.2
Extremity Test data (Separate 0mm 50%RB)											
Front side	15	QPSK 36_0	26865/831.5	1:1	0.549	-0.16	23.54	24.00	1.112	0.610	23.2
Back side-strap removed	15	QPSK 36_0	26865/831.5	1:1	0.444	-0.16	23.54	24.00	1.112	0.494	23.2
Back side-strap attached	15	QPSK 36_0	26865/831.5	1:1	0.345	0.13	23.54	24.00	1.112	0.384	23.2
Left side	15	QPSK 36_0	26865/831.5	1:1	0.187	0.03	23.54	24.00	1.112	0.208	23.2
Right side	15	QPSK 36_0	26865/831.5	1:1	0.308	-0.08	23.54	24.00	1.112	0.342	23.2
Top side	15	QPSK 36_0	26865/831.5	1:1	0.058	-0.12	23.54	24.00	1.112	0.064	23.2
Bottom side	15	QPSK 36_0	26865/831.5	1:1	0.840	-0.09	23.54	24.00	1.112	0.934	23.2

8.3.6 SAR Result of LTE Band 41

LTE Band 41 SAR Test Record											
Ant 0 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(°C)
Extremity Test data (Separate 0mm 1RB)											
Front side	20	QPSK 1_0	40620/2593	1:1.58	0.447	-0.03	23.39	24.00	1.151	0.514	23.3
Back side-strap removed	20	QPSK 1_0	40620/2593	1:1.58	0.984	0.01	23.39	24.00	1.151	1.133	23.3
Back side-strap attached	20	QPSK 1_0	40620/2593	1:1.58	0.653	0.08	23.39	24.00	1.151	0.752	23.3
Left side	20	QPSK 1_0	40620/2593	1:1.58	0.062	-0.15	23.39	24.00	1.151	0.071	23.3
Right side	20	QPSK 1_0	40620/2593	1:1.58	0.285	0.07	23.39	24.00	1.151	0.328	23.3
Top side	20	QPSK 1_0	40620/2593	1:1.58	0.021	0.07	23.39	24.00	1.151	0.024	23.3
Bottom side	20	QPSK 1_0	40620/2593	1:1.58	0.820	0.01	23.39	24.00	1.151	0.944	23.3
Extremity Test data (Separate 0mm 50%RB)											
Front side	20	QPSK 50_0	40620/2593	1:1.58	0.362	0.06	22.42	23.00	1.143	0.414	23.3
Back side-strap removed	20	QPSK 50_0	40620/2593	1:1.58	0.682	0.03	22.42	23.00	1.143	0.780	23.3
Back side-strap attached	20	QPSK 50_0	40620/2593	1:1.58	0.544	0.19	22.42	23.00	1.143	0.622	23.3
Left side	20	QPSK 50_0	40620/2593	1:1.58	0.049	0.05	22.42	23.00	1.143	0.056	23.3
Right side	20	QPSK 50_0	40620/2593	1:1.58	0.227	0.19	22.42	23.00	1.143	0.259	23.3
Top side	20	QPSK 50_0	40620/2593	1:1.58	0.015	-0.11	22.42	23.00	1.143	0.017	23.3
Bottom side	20	QPSK 50_0	40620/2593	1:1.58	0.820	0.13	22.42	23.00	1.143	0.937	23.3

8.3.7 SAR Result of LTE Band 66

LTE Band 66 SAR Test Record											
Ant 0 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(°C)
Extremity Test data (Separate 0mm 1RB)											
Front side	20	QPSK 1_0	132322/1745	1:1	0.467	0.05	23.72	24.00	1.067	0.498	22.9
Back side-strap removed	20	QPSK 1_0	132322/1745	1:1	1.530	0.17	23.72	24.00	1.067	1.633	22.9
Back side-strap attached	20	QPSK 1_0	132322/1745	1:1	0.553	0.03	23.72	24.00	1.067	0.590	22.9
Left side	20	QPSK 1_0	132322/1745	1:1	0.246	-0.16	23.72	24.00	1.067	0.262	22.9
Right side	20	QPSK 1_0	132322/1745	1:1	0.098	0.02	23.72	24.00	1.067	0.105	22.9
Top side	20	QPSK 1_0	132322/1745	1:1	0.000	0.08	23.72	24.00	1.067	0.000	22.9
Bottom side	20	QPSK 1_0	132322/1745	1:1	1.510	-0.13	23.72	24.00	1.067	1.611	22.9
Extremity Test data (Separate 0mm 50%RB)											
Front side	20	QPSK 50_0	132322/1745	1:1	0.387	0.02	22.49	23.00	1.125	0.435	22.9
Back side-strap removed	20	QPSK 50_0	132322/1745	1:1	1.240	-0.01	22.49	23.00	1.125	1.395	22.9
Back side-strap attached	20	QPSK 50_0	132322/1745	1:1	0.479	-0.18	22.49	23.00	1.125	0.539	22.9
Left side	20	QPSK 50_0	132322/1745	1:1	0.205	-0.05	22.49	23.00	1.125	0.231	22.9
Right side	20	QPSK 50_0	132322/1745	1:1	0.080	-0.14	22.49	23.00	1.125	0.090	22.9
Top side	20	QPSK 50_0	132322/1745	1:1	0.000	-0.16	22.49	23.00	1.125	0.000	22.9
Bottom side	20	QPSK 50_0	132322/1745	1:1	1.210	-0.05	22.49	23.00	1.125	1.361	22.9

8.3.8 SAR Result of WIFI 2.4G

Wi-Fi 2.4G SAR Test Record											
Ant3 Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
Extremity Test data (Separate 0mm)											
Front side	802.11b	1/2412	98.83%	1.012	0.574	0.02	19.95	20.50	1.135	0.659	23.1
Back side-strap removed	802.11b	1/2412	98.83%	1.012	0.731	-0.07	19.95	20.50	1.135	0.840	23.1
Back side-strap attached	802.11b	1/2412	98.83%	1.012	0.351	0.13	19.95	20.50	1.135	0.403	23.1
Left side	802.11b	1/2412	98.83%	1.012	0.032	0.15	19.95	20.50	1.135	0.037	23.1
Right side	802.11b	1/2412	98.83%	1.012	0.525	0.10	19.95	20.50	1.135	0.603	23.1
Top side	802.11b	1/2412	98.83%	1.012	0.113	-0.05	19.95	20.50	1.135	0.130	23.1
Bottom side	802.11b	1/2412	98.83%	1.012	0.080	-0.03	19.95	20.50	1.135	0.092	23.1

8.3.9 SAR Result of WIFI 5G

Wi-Fi 5G SAR Test Record											
Ant3 Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
Extremity Test data of U-NII-1 (Separate 0mm)											
Front side	802.11ac VHT40	46/5230	96.44%	1.037	0.197	0.08	20.00	21.00	1.259	0.257	22.7
Back side-strap removed	802.11ac VHT40	46/5230	96.44%	1.037	0.310	-0.06	20.00	21.00	1.259	0.405	22.7
Back side-strap attached	802.11ac VHT40	46/5230	96.44%	1.037	0.145	0.15	20.00	21.00	1.259	0.189	22.7
Left side	802.11ac VHT40	46/5230	96.44%	1.037	0.001	0.13	20.00	21.00	1.259	0.001	22.7
Right side	802.11ac VHT40	46/5230	96.44%	1.037	0.611	0.07	20.00	21.00	1.259	0.798	22.7
Top side	802.11ac VHT40	46/5230	96.44%	1.037	0.045	0.19	20.00	21.00	1.259	0.059	22.7
Bottom side	802.11ac VHT40	46/5230	96.44%	1.037	0.001	0.07	20.00	21.00	1.259	0.001	22.7
Extremity Test data of U-NII-2A (Separate 0mm)											
Front side	802.11ac VHT40	54/5270	96.44%	1.037	0.194	-0.14	20.14	21.00	1.219	0.245	22.7
Back side-strap removed	802.11ac VHT40	54/5270	96.44%	1.037	0.336	-0.14	20.14	21.00	1.219	0.425	22.7
Back side-strap attached	802.11ac VHT40	54/5270	96.44%	1.037	0.147	-0.04	20.14	21.00	1.219	0.186	22.7
Left side	802.11ac VHT40	54/5270	96.44%	1.037	0.001	-0.18	20.14	21.00	1.219	0.001	22.7
Right side	802.11ac VHT40	54/5270	96.44%	1.037	0.471	0.14	20.14	21.00	1.219	0.595	22.7
Top side	802.11ac VHT40	54/5270	96.44%	1.037	0.044	-0.13	20.14	21.00	1.219	0.056	22.7
Bottom side	802.11ac VHT40	54/5270	96.44%	1.037	0.001	-0.17	20.14	21.00	1.219	0.001	22.7
Extremity Test data of U-NII-2C (Separate 0mm)											
Front side	802.11ac VHT40	134/5670	96.44%	1.037	0.207	-0.10	20.08	21.00	1.236	0.265	22.7
Back side-strap removed	802.11ac VHT40	134/5670	96.44%	1.037	0.367	-0.04	20.08	21.00	1.236	0.470	22.7
Back side-strap attached	802.11ac VHT40	134/5670	96.44%	1.037	0.156	0.06	20.08	21.00	1.236	0.200	22.7
Left side	802.11ac VHT40	134/5670	96.44%	1.037	0.001	-0.19	20.08	21.00	1.236	0.001	22.7
Right side	802.11ac VHT40	134/5670	96.44%	1.037	0.350	-0.11	20.08	21.00	1.236	0.449	22.7
Top side	802.11ac VHT40	134/5670	96.44%	1.037	0.026	-0.05	20.08	21.00	1.236	0.033	22.7
Bottom side	802.11ac VHT40	134/5670	96.44%	1.037	0.001	0.17	20.08	21.00	1.236	0.001	22.7
Extremity Test data of U-NII-3 (Separate 0mm)											
Front side	802.11a	149/5745	98.29%	1.017	0.186	0.12	19.57	21.00	1.390	0.263	22.7
Back side-strap removed	802.11a	149/5745	98.29%	1.017	0.338	0.19	19.57	21.00	1.390	0.478	22.7
Back side-strap attached	802.11a	149/5745	98.29%	1.017	0.151	0.16	19.57	21.00	1.390	0.213	22.7
Left side	802.11a	149/5745	98.29%	1.017	0.001	0.06	19.57	21.00	1.390	0.001	22.7
Right side	802.11a	149/5745	98.29%	1.017	0.300	0.18	19.57	21.00	1.390	0.424	22.7
Top side	802.11a	149/5745	98.29%	1.017	0.035	-0.07	19.57	21.00	1.390	0.049	22.7
Bottom side	802.11a	149/5745	98.29%	1.017	0.001	0.08	19.57	21.00	1.390	0.001	22.7



8.3.10 SAR Result of BT

Bluetooth SAR Test Record											
Ant3 Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
Extremity Test data (Separate 0mm)											
Front side	3DH5	78/2480	77.63%	1.288	0.047	0.04	11.59	12.00	1.099	0.067	23.1
Back side-strap removed	3DH5	78/2480	77.63%	1.288	0.064	0.06	11.59	12.00	1.099	0.091	23.1
Back side-strap attached	3DH5	78/2480	77.63%	1.288	0.031	0.05	11.59	12.00	1.099	0.044	23.1
Left side	3DH5	78/2480	77.63%	1.288	0.001	0.08	11.59	12.00	1.099	0.001	23.1
Right side	3DH5	78/2480	77.63%	1.288	0.048	-0.06	11.59	12.00	1.099	0.068	23.1
Top side	3DH5	78/2480	77.63%	1.288	0.001	-0.15	11.59	12.00	1.099	0.001	23.1
Bottom side	3DH5	78/2480	77.63%	1.288	0.001	-0.07	11.59	12.00	1.099	0.001	23.1

8.3.11 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.(°C)
NFC Test data (Separate 0mm)									
Front side	NFC	13.56MHz	100.00%	1.000	0.007	0.16	1.000	0.007	22.5
Back side-strap removed	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.5
Back side-strap attached	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.5
Left side	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.5
Right side	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.5
Top side	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.5
Bottom side	NFC	13.56MHz	100.00%	1.000	0.000	0.00	1.000	0.000	22.5

8.4 Multiple Transmitter Evaluation

8.4.1 Simultaneous SAR test evaluation

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

8.4.2 Simultaneous Transmission SAR Summation Scenario

Extremity:

Test position		SARmax (W/kg)					Summed SAR				
		WWAN	WiFi 2.4G	WiFi 5G	BT	NFC					
		1	2	3	4	5	1+2	1+3	1+4	1+5	1+3+4+5
LTE Band 7	Front side	0.845	0.659	0.265	0.067	0.007	1.504	1.110	0.912	0.852	1.184
	Back side	1.904	0.840	0.478	0.091	0.000	2.744	2.382	1.995	1.904	2.473
	Left side	0.090	0.037	0.001	0.001	0.000	0.127	0.091	0.091	0.090	0.092
	Right side	0.507	0.603	0.798	0.068	0.000	1.110	1.305	0.575	0.507	1.373
	Top side	0.044	0.130	0.059	0.001	0.000	0.174	0.103	0.045	0.044	0.104
	Bottom side	1.868	0.092	0.001	0.001	0.000	1.960	1.869	1.869	1.868	1.870
LTE Band 12(17)	Front side	0.529	0.659	0.265	0.067	0.007	1.188	0.794	0.596	0.536	0.868
	Back side	0.469	0.840	0.478	0.091	0.000	1.309	0.947	0.560	0.469	1.038
	Left side	0.171	0.037	0.001	0.001	0.000	0.208	0.172	0.172	0.171	0.173
	Right side	0.383	0.603	0.798	0.068	0.000	0.986	1.181	0.451	0.383	1.249
	Top side	0.031	0.130	0.059	0.001	0.000	0.161	0.090	0.032	0.031	0.091
	Bottom side	0.652	0.092	0.001	0.001	0.000	0.744	0.653	0.653	0.652	0.654
LTE Band 13	Front side	0.535	0.659	0.265	0.067	0.007	1.194	0.800	0.602	0.542	0.874
	Back side	0.406	0.840	0.478	0.091	0.000	1.246	0.884	0.497	0.406	0.975
	Left side	0.229	0.037	0.001	0.001	0.000	0.266	0.230	0.230	0.229	0.231
	Right side	0.325	0.603	0.798	0.068	0.000	0.928	1.123	0.393	0.325	1.191
	Top side	0.054	0.130	0.059	0.001	0.000	0.184	0.113	0.055	0.054	0.114
	Bottom side	0.799	0.092	0.001	0.001	0.000	0.891	0.800	0.800	0.799	0.801
LTE Band 25(2)	Front side	0.454	0.659	0.265	0.067	0.007	1.113	0.719	0.521	0.461	0.793
	Back side	1.617	0.840	0.478	0.091	0.000	2.457	2.095	1.708	1.617	2.186
	Left side	0.209	0.037	0.001	0.001	0.000	0.246	0.210	0.210	0.209	0.211
	Right side	0.120	0.603	0.798	0.068	0.000	0.723	0.918	0.188	0.120	0.986
	Top side	0.045	0.130	0.059	0.001	0.000	0.175	0.104	0.046	0.045	0.105
	Bottom side	1.274	0.092	0.001	0.001	0.000	1.366	1.275	1.275	1.274	1.276
LTE Band 26(5)	Front side	0.803	0.659	0.265	0.067	0.007	1.462	1.068	0.870	0.810	1.142
	Back side	0.638	0.840	0.478	0.091	0.000	1.478	1.116	0.729	0.638	1.207
	Left side	0.271	0.037	0.001	0.001	0.000	0.308	0.272	0.272	0.271	0.273
	Right side	0.450	0.603	0.798	0.068	0.000	1.053	1.248	0.518	0.450	1.316
	Top side	0.075	0.130	0.059	0.001	0.000	0.205	0.134	0.076	0.075	0.135
	Bottom side	1.145	0.092	0.001	0.001	0.000	1.237	1.146	1.146	1.145	1.147
LTE Band 41	Front side	0.514	0.659	0.265	0.067	0.007	1.173	0.779	0.581	0.521	0.853
	Back side	1.133	0.840	0.478	0.091	0.000	1.973	1.611	1.224	1.133	1.702
	Left side	0.071	0.037	0.001	0.001	0.000	0.108	0.072	0.072	0.071	0.073
	Right side	0.328	0.603	0.798	0.068	0.000	0.931	1.126	0.396	0.328	1.194
	Top side	0.024	0.130	0.059	0.001	0.000	0.154	0.083	0.025	0.024	0.084
	Bottom side	0.944	0.092	0.001	0.001	0.000	1.036	0.945	0.945	0.944	0.946
LTE Band 66(4)	Front side	0.498	0.659	0.265	0.067	0.007	1.157	0.763	0.565	0.505	0.837
	Back side	1.633	0.840	0.478	0.091	0.000	2.473	2.111	1.724	1.633	2.202
	Left side	0.262	0.037	0.001	0.001	0.000	0.299	0.263	0.263	0.262	0.264
	Right side	0.105	0.603	0.798	0.068	0.000	0.708	0.903	0.173	0.105	0.971
	Top side	0.000	0.130	0.059	0.001	0.000	0.130	0.059	0.001	0.000	0.060
	Bottom side	1.611	0.092	0.001	0.001	0.000	1.703	1.612	1.612	1.611	1.613

9 Equipment list

Test Platform		SPEAG DASY Professional				
Software Reference		DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)				
Hardware Reference						
Equipment		Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	Twin Phantom	SPEAG	SAM8	1824	NCR	NCR
☒	Test Phantom	SPEAG	ELI V5.0	1239	NCR	NCR
☒	DAE	SPEAG	DAE4	1245	2025-09-08	2026-09-07
☒	DAE	SPEAG	DAE4	1740	2025-02-17	2026-02-16
☒	E-Field Probe	SPEAG	EX3DV4	7735	2025-01-29	2026-01-28
☒	E-Field Probe	SPEAG	EX3DV4	3982	2025-11-07	2026-11-06
☒	Validation Kits	SPEAG	CLA13	1032	2023-02-09	2026-02-08
☒	Validation Kits	SPEAG	D750V3	1214	2025-04-01	2028-03-31
☒	Validation Kits	SPEAG	D835V2	4d161	2023-08-25	2026-08-24
☒	Validation Kits	SPEAG	D1750V2	1105	2023-11-03	2026-11-02
☒	Validation Kits	SPEAG	D1950V3	1218	2023-05-04	2026-05-03
☒	Validation Kits	SPEAG	D2450V2	922	2023-08-28	2026-08-27
☒	Validation Kits	SPEAG	D2600V2	1158	2025-03-31	2028-03-30
☒	Validation Kits	SPEAG	D5GHzV2	1174	2023-08-23	2026-08-22
☒	Dielectric parameter probes	SPEAG	DAKS-3.5	1120	2025-08-25	2026-08-24
☒	Vector Network Analyzer and Vector Reflectometer	SPEAG	DAKS_VNA R140	50920	2025-08-25	2026-08-24
☒	Dielectric parameter probes	SPEAG	DAKS-12	1043	2025-09-22	2026-09-21
☒	Vector Network Analyzer and Vector Reflectometer	SPEAG	DAKS_VNA R60	21423005	2025-09-22	2026-09-21
☒	Universal Radio Communication Tester	R&S	CMW500	111637	2025-09-03	2026-09-02
☒	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
☒	USB Average Power Sensor	Keysight	U2002H	MY5639004	2025-09-10	2026-09-09
☒	USB Average Power Sensor	Agilent	U2002H	MY48200110	2025-11-20	2026-11-19
☒	USB Power Sensor	KEYSIGHT	U8481A	MZ52460001	2025-06-16	2026-06-14
☒	USB Power Sensor	KEYSIGHT	U8481A	MZ52460007	2025-06-16	2026-06-14
☒	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	2025-09-16	2026-09-15
☒	Humidity and Temperature Indicator	MingGao	MingGao	NA	2025-09-16	2026-09-15

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



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10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

Appendix E: Conducted RF Output Power

--- End of report ---