



SAR TEST REPORT

Report No.: 20240617G11014X-W5
Product Name: Thermal Imager
Model Name: TP2 PLUS
Series Model Name: TP2, TP2 PRO, TP3, TP3 PLUS, TP3 PRO, TM2, TM2 PLUS, TM2 PRO, TM3, TM3 PLUS, TM3 PRO
FCC ID: 2AEOG-TP2PLUS
Applicant: Shenzhen Mileseey Technology Co., Ltd.
No.3601 Block A, Tanglang Town Plaza West, Fuguang Community,
Address: Taoyuan Street, Nanshan District, 518500 Shenzhen, PEOPLE'S
REPUBLIC OF CHINA
Test Date: 2024/06/28~2024/07/02
Issued by: CCIC Southern Testing Co., Ltd.
Lab Location: Electronic Testing Building, No.43, Shahe Road, Xili Street,
Nanshan District, Shenzhen, Guangdong, China
Tel: 86-755-26627338 **E-Mail:** manager@ccic-set.com

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Test Report

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47CFR §2.1093- Radiofrequency Radiation Exposure Evaluation:
Portable Devices;

Test Standards: **ANSI C95.1-1992:** Safety Levels with Respect to Human Exposure to
Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std
C95.1-1991)

IEEE 1528-2013: IEEE Recommended Practice for Determining the
Peak Spatial-Average Specific Absorption Rate (SAR) in the Human
Head from Wireless Communications Devices: Measurement
Techniques

Test Result: Pass

Tested by: Carl Wei 2024-07-04

Carl Wei, Test Engineer

Reviewed by: Sun Jiaohui 2024-07-04

Sun Jiaohui, Senior Engineer

Approved by: Chris You 2024-07-04

Chris You, Manager



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1. Administrative Data

1.1 Testing Laboratory

Test Site:	CCIC Southern Testing Co., Ltd.
Address:	Electronic Testing Building, No.43, Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China
A2LA Lab Code:	CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025:2017. The accreditation certificate number is 5721.01
FCC Registration:	CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until June.30, 2025.
ISED Registration:	CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until June.30, 2025.
Test Environment Condition:	Temperature (°C): 18 °C ~25 °C Relative Humidity (%): 35%~75% RH Atmospheric Pressure (kPa): 86KPa-106KPa

2. Equipment Under Test (EUT)

Identification of the Equipment under Test

Device type :	portable device
Exposure category:	uncontrolled environment / general population
Product Name:	Thermal Imager
Model Name:	TP2 PLUS
Series Model Name:	TP2, TP2 PRO, TP3, TP3 PLUS, TP3 PRO, TM2, TM2 PLUS, TM2 PRO, TM3, TM3 PLUS, TM3 PRO
Operating Band(s):	WIFI 5G
Test Band(s):	WIFI 5G
Test modulation:	WI-FI 5G(OFDM),
WIFI	5150-5250 MHz
	5250-5350 MHz
	5470-5725 MHz
	5725-5850 MHz
Hardware version :	1.2
Software version :	V306
Antenna type :	PIFA antenna
Battery options :	Model No: YF 653239 Typical Capacity: 1050mAh Rated Voltage: 3.85 V Manufacturer: Dongguan Anyfine Electronic Technology Co., Ltd.
MAX. SAR Value:	Body: 1.126 W/Kg(1g SAR Limit: 1.6W/Kg, 5mm distance) Extremity: 0.777 W/Kg(10g SAR Limit: 4.0W/Kg, 0mm distance)

Note:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. Different models of EUT have the same interior, and the circuit design, layout, components used and internal wiring are the same. The difference is the name for different sales.



3. SAR Summary

Highest Standalone SAR Summary

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Body (5mm Gap)	WIFI U-NII 1	0.694	1.126
	WIFI U-NII 2A	0.689	
	WIFI U-NII 2C	0.615	
	WIFI U-NII 3	1.126	
	Bluetooth	0.021	

Exposure Position	Frequency Band	Scaled 10g-SAR(W/kg)	Highest Scaled 10g-SAR(W/kg)
Extremity (0mm Gap)	WIFI U-NII 1	0.726	0.777
	WIFI U-NII 2A	0.720	
	WIFI U-NII 2C	0.403	
	WIFI U-NII 3	0.777	
	Bluetooth	0.019	

4. Specific Absorption Rate (SAR)

4.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

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

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

$$\text{SAR} = C \frac{\delta T}{\delta t}$$

where C is the specific heat capacity, δT is the temperature rise and δt the exposure duration, or related to the electrical field in the tissue by

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

where σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the rms electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.



4.2 Applicable Standards and Limits

4.2.1 Applicable Standards

47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI C95.1-1992	Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991)
IEEE 1528-2013	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 248227 D01	v02r02 802.11 Wi-Fi SAR
KDB 447498 D01	v06 General RF Exposure Guidance
KDB 616217 D04	v01r02 SAR for laptop and tablets
KDB 648474 D04	v01r03 Handset SAR
KDB 865664 D01	v01r04 SAR Measurement 100MHz to 6GHz
KDB 865664 D02	v01r02 SAR Exposure Reporting
KDB 941225 D01	v03r01 3G SAR Procedures
KDB 941225 D05	v02r05 SAR for LTE Devices
KDB 941225 D05A	v01r02 LTE Rel.10 KDB Inquiry Sheet
KDB 941225 D06	v02r01 Hotspot Mode

4.2.2 RF exposure Limits

Human Exposure	Uncontrolled Environment General Population
Spatial Peak SAR* (Brain/Body)	1.60 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g
Spatial Peak SAR*** (Limbs)	4.00 mW/g

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

Notes:

* The Spatial Peak value of the SAR averaged over any 1 grams 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.

4.3 Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SATIMO. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.



SAM Twin Phantom

4.4 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SATIMO as an integral part of the COMOSAR test system.

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



Device holder

4.5 Probe Specification

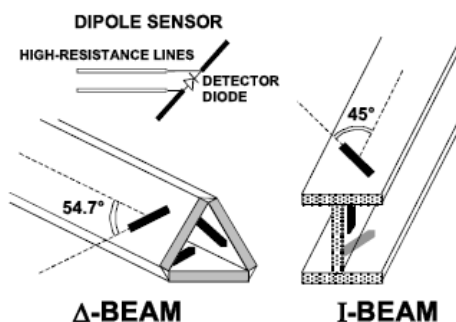


Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	700 MHz to 3 GHz; Linearity: ± 0.5 dB (700 MHz to 3 GHz)
Directivity	± 0.25 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	1.5 μ W/g to 100 mW/g; Linearity: ± 0.5 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 5 mm Distance from probe tip to dipole centers: <2.7 mm
Application	General dosimetry up to 3 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones
Compatibility	COMOSAR

Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



5. Tissue check and recommend Dielectric Parameters

5.1 Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness Power drifts in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Table 1: Recommended Dielectric Performance of Tissue

Ingredients (% by weight)	Frequency (MHz)											
	450		835		915		1900		2450		2600	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.46	52.4	41.05	56.0	54.9	40.4	62.7	73.2	55.24	64.49
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04	0.5	0.024
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0	0.0	0.0
Triton x-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0	44.45	32.25
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.2	52.5	39.0	52.5
Conductivity (s/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.80	1.78	1.96	2.16

MSL/HSL750 (Body and Head liquid for 650 – 850 MHz)

Item	Head Tissue Simulation Liquid HSL750 Muscle(body)Tissue Simulation Liquid MSL750			
H2O	Water, 35 – 58%			
Sucrose	Sugar, white, refined, 40-60%			
NaCl	Sodium Chloride, 0-6%			
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%			
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyl-3(2H)-isothiazolone, 0.1-0.7%			
Frequency (MHz)	Head ϵ_r	Head σ (S/m)	Body ϵ_r	Body σ (S/m)
750	41.9	0.89	55.2	0.97

Note: The liquid of 700MHz&2600MHz typical liquid composition is provided by SATIMO.



Frequency:5200/5400/5600/5800MHz	
Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

Table 2 Recommended Tissue Dielectric Parameters

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



5.2 Simulate liquid

Liquid check results:

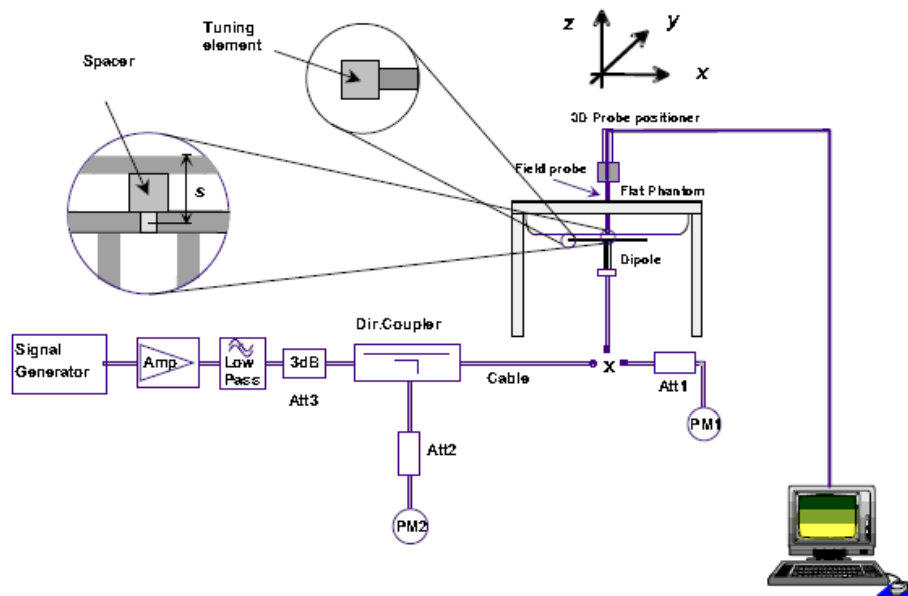
Table 3: Dielectric Performance of Tissue Simulating Liquid

/	Frequency	Permittivity ϵ	Conductivity σ (S/m)	Liquid Temp. (°C)	Test Date
Target value	2450MHz	$39.2 \pm 5\%$ (37.24~41.16)	$1.80 \pm 5\%$ (1.71~1.89)	21.8	2024/06/28
Validation value		40.57	1.79		
Target value	5200MHz	$36.0 \pm 5\%$ (34.20~37.80)	$4.66 \pm 5\%$ (4.427~4.893)	21.5	2024/07/01
Validation value		36.62	4.69		
Target value	5400MHz	$35.8 \pm 5\%$ (34.01~37.59)	$4.86 \pm 5\%$ (4.617~5.103)	21.5	2024/07/01
Validation value		36.27	4.94		
Target value	5600MHz	$35.5 \pm 5\%$ (33.725~37.275)	$5.07 \pm 5\%$ (4.8165~5.3235)	21.2	2024/07/02
Validation value		36.18	4.97		
Target value	5800MHz	$35.3 \pm 5\%$ (33.535~37.065)	$5.27 \pm 5\%$ (5.0065~5.5335)	21.2	2024/07/02
Validation value		35.75	5.30		

SAR System validation

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of $\pm 10\%$. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

The following procedure, recommended for performing validation tests using box phantoms is based on the procedures described in the IEEE standard P1528. Setup according to the setup diagram below:



With the SG and Amp and with directional coupler in place, set up the source signal at the relevant frequency and use a power meter to measure the power at the end of the SMA cable that you intend to connect to the balanced dipole. Adjust the SG to make this, say, 0.01W (10 dBm). If this level is too high to read directly with the power meter sensor, insert a calibrated attenuator (e.g. 10 or 20 dB) and make a suitable correction to the power meter reading.

- Note 1: In this method, the directional coupler is used for monitoring rather than setting the exact feed power level. If, however, the directional coupler is used for power measurement, you should check the frequency range and power rating of the coupler and measure the coupling factor (referred to output) at the test frequency using a VNA.
- Note 2: Remember that the use of a 3dB attenuator (as shown in Figure 8.1 of P1528) means that you need an RF amplifier of 2 times greater power for the same feed power. The other issue is the cable length. You might get up to 1dB of loss per meter of cable, so the cable length after the coupler needs to be quite short.
- Note 3: For the validation testing done using CW signals, most power meters are suitable. However, if you are measuring the output of a modulated signal from either a signal generator or a handset, you must ensure that the power meter correctly reads the modulated signals.

The measured 1-gram averaged SAR values of the device against the phantom are provided in Tables 5 and Table 6. The body phantom were full of the body tissue simulating liquid. The EUT was supplied with full-charged battery for each measurement.

The distance between the back of the EUT and the bottom of the flat phantom is 10 mm (taking into account of the IEEE 1528 and the place of the antenna).



Table 4: system validation (1g)
System Check Results

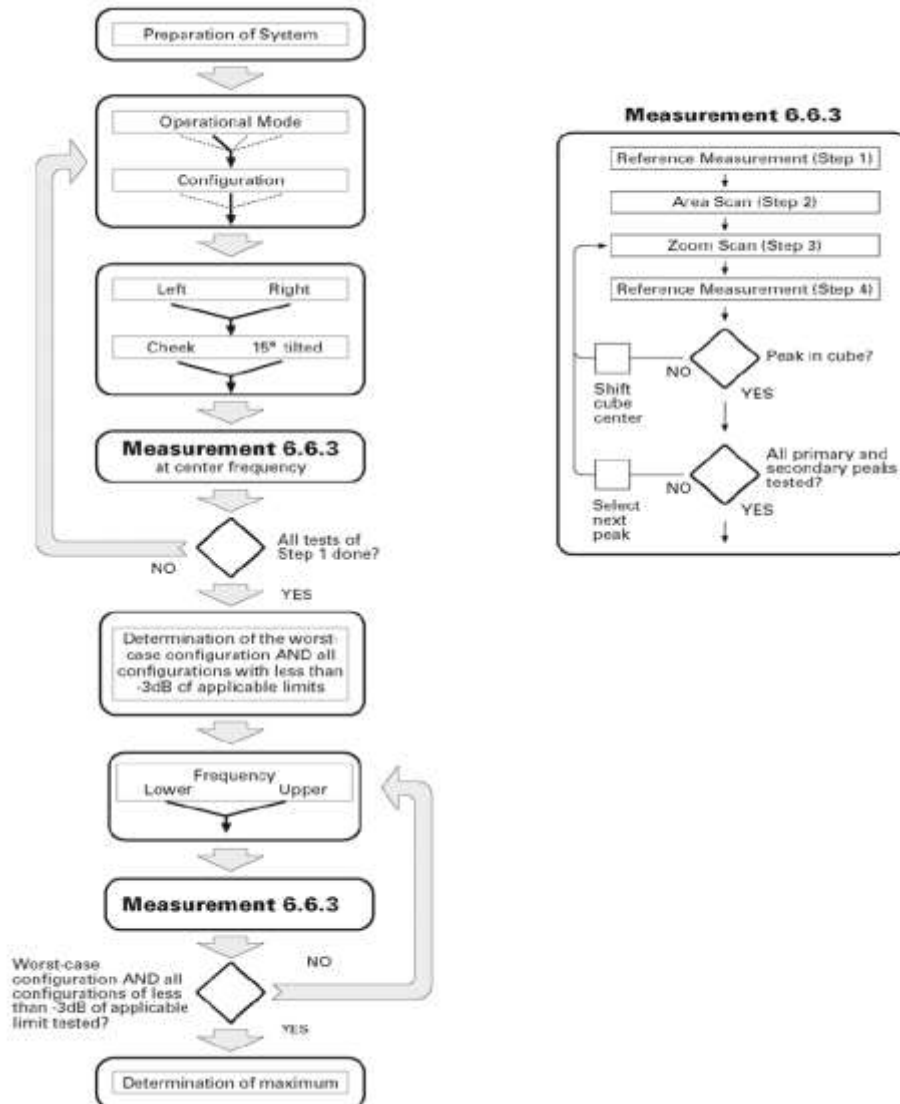
Frequency	Duty cycle	Target value (1-g) (W/Kg)	10mW Test value (1-g) (W/Kg)	Test SAR Normalized to 1W(w/Kg)	Test Date
2450MHz	1:1	51.74 W/kg±10% (46.566~56.914)	0.5231	52.31	2024/06/28
5200MHz	1:1	152.95 W/kg±10% (137.655~168.245)	1.5207	152.07	2024/07/01
5400MHz	1:1	159.94 W/kg±10% (143.946~175.934)	1.4977	149.77	2024/07/01
5600MHz	1:1	166.59 W/kg±10% (149.931~183.249)	1.7879	178.79	2024/07/02
5800MHz	1:1	174.67 W/kg±10% (157.203~192.137)	1.6683	166.83	2024/07/02

Note:

1. Target value was referring to the measured value in the calibration certificate of reference dipole.
2. All SAR values are normalized to 1W forward power.

6. SAR measurement procedure

The SAR test against the head phantom was carried out as follow:



Establish a call with the maximum output power with a base station simulator, the connection between the EUT and the base station simulator is established via air interface.

After an area scan has been done at a fixed distance of 2mm from the surface of the phantom on the source side, a 3D scan is set up around the location of the maximum spot SAR. First, a point within the scan area is visited by the probe and a SAR reading taken at the start of testing. At the end of testing, the probe is returned to the same point and a second reading is taken. Comparison between these start and end readings enables the power drift during measurement to be assessed.

Above is the scanning procedure flow chart and table from the IEEE p1528 standard. This is the procedure for which all compliant testing should be carried out to ensure that all variations of the device position and transmission behavior are tested.



7. Conducted RF Output Power

7.1 WIFI Conducted Power

Wi-Fi U-NII-1 Output power

Channel/Freq.(MHz)	Output Power (dBm)		
	802.11 a	802.11 n20	802.11 ac20
36/5180.0	6.39	5.37	5.16
44/5220.0	6.63	5.54	5.18
48/5240.0	6.89	5.54	5.10

Channel/Freq.(MHz)	Output Power (dBm)	
	802.11 n40	802.11 ac40
38/5190.0	5.19	5.15
46/5230.0	5.25	5.32

Channel/Freq.(MHz)	Output Power (dBm)
	802.11 ac80
42/5210.0	5.07

Wi-Fi U-NII-2A Output power

Channel/Freq.(MHz)	Output Power (dBm)		
	802.11 a	802.11 n20	802.11 ac20
52/5260.0	6.38	5.80	5.45
60/5300.0	6.11	5.60	5.10
64/5320.0	6.10	5.83	5.27

Channel/Freq.(MHz)	Output Power (dBm)	
	802.11 n40	802.11 ac40
54/5270.0	5.53	5.61
62/5310.0	5.14	5.25

Channel/Freq.(MHz)	Output Power (dBm)
	802.11 ac80
58/5290.0	5.16



Wi-Fi U-NII-2C Output power

Channel/Freq.(MHz)	Output Power (dBm)		
	802.11 a	802.11 n20	802.11 ac20
100/5500.0	6.39	5.68	5.22
120/5600.0	6.70	5.66	5.60
140/5700.0	6.06	5.72	5.68

Channel/Freq.(MHz)	Output Power (dBm)	
	802.11 n40	802.11 ac40
102/5510.0	5.13	5.02
118/5590.0	5.86	5.30
134/5670.0	5.52	5.42

Channel/Freq.(MHz)	Output Power (dBm)	
	802.11 ac80	
106/5530.0	5.02	
122/5610.0	5.35	

Wi-Fi U-NII-3 Output power

Channel/Freq.(MHz)	Output Power (dBm)		
	802.11 a	802.11 n20	802.11 ac20
149/5745.0	5.91	5.56	5.06
157/5785.0	6.07	5.40	5.32
165/5825.0	5.92	5.58	5.48

Channel/Freq.(MHz)	Output Power (dBm)	
	802.11 n40	802.11 ac40
151/5755.0	5.72	5.09
159/5795.0	4.64	4.74

Channel/Freq.(MHz)	Output Power (dBm)	
	802.11 ac80	
155/5775.0	5.16	



7.2 Bluetooth Output Power

Channel	Frequency (MHz)	Bluetooth Output Power(dBm)		
		GFSK	$\pi/4$ -DQPSK	8-DPSK
CH 0	2402	0.28	0.34	0.74
CH 39	2441	1.60	1.59	2.06
CH 78	2480	2.95	3.02	3.50

Channel	Frequency (MHz)	BLE Output Power(dBm)
		1M(GFSK)
CH 0	2402	1.68
CH 19	2440	3.01
CH 39	2480	4.44

8. Antenna Location:





Antenna-to-User (Edge Side) distance (mm):

Antenna	Front	Back	Left	Right	Top	Bottom
WIFI/BT ANT	<25	<25	<25	<25	>25	>25

The Body SAR measurement positions of each band are as below:

Antenna	Front	Back	Left	Right	Top	Bottom
WIFI/BT ANT Body	Yes	Yes	Yes	Yes	No	No

Note:

1. SAR is measured for all sides and surfaces with a transmitting antenna located within 25 mm from that surface or edge.
2. The other Frequencies were measured at the worst position

9. Scaling Factor calculation

Operation Mode	Channel /Frequency	Output Power(dBm)	Tune up Power in tolerance(dBm)	Max. Tune up(dBm)	Scaling Factor
Wi-Fi U-NII-1 802.11a	36/5180.0	6.39	6.0 ± 1.0	7.00	1.151
	44/5220.0	6.63	6.0 ± 1.0	7.00	1.089
	48/5240.0	6.89	6.5 ± 1.0	7.50	1.151
Wi-Fi U-NII-2a 802.11a	52/5260.0	6.38	6.0 ± 1.0	7.00	1.153
	60/5300.0	6.11	5.5 ± 1.0	6.50	1.094
	64/5320.0	6.10	5.5 ± 1.0	6.50	1.096
Wi-Fi U-NII-2c 802.11a	100/5500.0	6.39	6.0 ± 1.0	7.00	1.151
	120/5600.0	6.70	6.0 ± 1.0	7.00	1.072
	140/5700.0	6.06	5.5 ± 1.0	6.50	1.107
Wi-Fi U-NII-3 802.11a	149/5745.0	5.91	5.5 ± 1.0	6.50	1.146
	157/5785.0	6.07	5.5 ± 1.0	6.50	1.104
	165/5825.0	5.92	5.5 ± 1.0	6.50	1.143
BLE 1M(GFSK)	0/2402.0	1.68	1.0 ± 1.0	2.00	1.076
	19/2440.0	3.01	2.5 ± 1.0	3.50	1.119
	39/2480.0	4.44	4.0 ± 1.0	5.00	1.138



10. Test Results

Results overview of WI-FI U-NII 1

Body(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)	SAR Plot.
Front Upward	44/5220.0	802.11a	/	/	1.089	/	1.6	/
Back Upward	44/5220.0	802.11a	0.201	2.77	1.089	0.219	1.6	/
Left	44/5220.0	802.11a	/	/	1.089	/	1.6	/
Right	44/5220.0	802.11a	0.637	-1.62	1.089	0.694	1.6	1
Extremity(0mm)	Channel /Frequency	Mode	SAR Value (W/kg)10-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)10-g	Limit (W/kg)	SAR Plot.
Front Upward	44/5220.0	802.11a	0.024	-1.13	1.089	0.026	4.0	/
Back Upward	44/5220.0	802.11a	0.155	-2.60	1.089	0.169	4.0	/
Left	44/5220.0	802.11a	0.045	0.44	1.089	0.049	4.0	/
Right	44/5220.0	802.11a	0.667	-0.10	1.089	0.726	4.0	2

Results overview of WI-FI U-NII 2A

Body(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)	SAR Plot.
Front Upward	60/5300.0	802.11a	/	/	1.094	/	1.6	/
Back Upward	60/5300.0	802.11a	0.206	-1.39	1.094	0.225	1.6	/
Left	60/5300.0	802.11a	/	/	1.094	/	1.6	/
Right	60/5300.0	802.11a	0.630	1.54	1.094	0.689	1.6	3
Extremity(0mm)	Channel /Frequency	Mode	SAR Value (W/kg)10-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)10-g	Limit (W/kg)	SAR Plot.
Front Upward	60/5300.0	802.11a	0.020	-2.26	1.094	0.022	4.0	/
Back Upward	60/5300.0	802.11a	0.163	-0.31	1.094	0.178	4.0	/
Left	60/5300.0	802.11a	0.047	-1.20	1.094	0.051	4.0	/
Right	60/5300.0	802.11a	0.658	0.79	1.094	0.720	4.0	4

**Results overview of WI-FI U-NII 2C**

Body(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)	SAR Plot.
Front Upward	120/5600.0	802.11a	/	/	1.072	/	1.6	/
Back Upward	120/5600.0	802.11a	0.218	1.84	1.072	0.234	1.6	/
Left	120/5600.0	802.11a	/	/	1.072	/	1.6	/
Right	120/5600.0	802.11a	0.574	-2.14	1.072	0.615	1.6	5
Extremity(0mm)	Channel /Frequency	Mode	SAR Value (W/kg)10-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)10-g	Limit (W/kg)	SAR Plot.
Front Upward	120/5600.0	802.11a	0.014	0.99	1.072	0.015	4.0	/
Back Upward	120/5600.0	802.11a	0.159	-2.49	1.072	0.170	4.0	/
Left	120/5600.0	802.11a	0.045	-0.38	1.072	0.048	4.0	/
Right	120/5600.0	802.11a	0.376	-0.65	1.072	0.403	4.0	6

Results overview of WI-FI U-NII 3

Body(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)	SAR Plot.
Front Upward	157/5785.0	802.11a	/	/	1.072	/	1.6	/
Back Upward	157/5785.0	802.11a	0.429	-0.72	1.072	0.460	1.6	/
Left	157/5785.0	802.11a	/	/	1.072	/	1.6	/
Right	157/5785.0	802.11a	1.012	-2.68	1.072	1.085	1.6	7
Right Repeat	157/5785.0	802.11a	1.003	0.07	1.072	1.075	1.6	/
Right	149/5745.0	802.11a	0.978	0.22	1.151	1.126	1.6	/
Right	165/5825.0	802.11a	0.999	-2.24	1.107	1.106	1.6	/
Extremity(0mm)	Channel /Frequency	Mode	SAR Value (W/kg)10-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)10-g	Limit (W/kg)	SAR Plot.
Front Upward	157/5785.0	802.11a	0.034	-0.98	1.072	0.036	4.0	/
Back Upward	157/5785.0	802.11a	0.300	0.20	1.072	0.322	4.0	/
Left	157/5785.0	802.11a	0.067	-2.18	1.072	0.072	4.0	/
Right	157/5785.0	802.11a	0.725	1.55	1.072	0.777	4.0	8

**Results overview of Bluetooth**

Body(5mm)	Channel /Frequency	Mode	SAR Value (W/kg)1-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)1-g	Limit (W/kg)	SAR Plot.
Front Upward	19/2440.0	BLE 1M(GFSK)	/	/	1.072	/	1.6	/
Back Upward	19/2440.0	BLE 1M(GFSK)	0.012	1.17	1.072	0.013	1.6	/
Left	19/2440.0	BLE 1M(GFSK)	/	/	1.072	/	1.6	/
Right	19/2440.0	BLE 1M(GFSK)	0.021	1.66	1.072	0.023	1.6	9
Extremity(0mm)	Channel /Frequency	Mode	SAR Value (W/kg)10-g	Power drift(%)	Scaled Factor	Scaled SAR (W/Kg)10-g	Limit (W/kg)	SAR Plot.
Front Upward	19/2440.0	BLE 1M(GFSK)	/	/	1.072	/	4.0	/
Back Upward	19/2440.0	BLE 1M(GFSK)	0.010	1.84	1.072	0.011	4.0	/
Left	19/2440.0	BLE 1M(GFSK)	/	/	1.072	/	4.0	/
Right	19/2440.0	BLE 1M(GFSK)	0.018	0.24	1.072	0.019	4.0	10

Note:

Per KDB Publication 941225 D01v03r01. RMC 12.2kbps was as primary mode SAR, when the primary mode SAR less than 1.2W/kg, secondary SAR (HSPA) was not requires.

When the 1-g SAR for the mid-band channel or the channel with the highest output power satisfy the following conditions, testing of the other channels in the band is not required. (Per KDB 447498 D01 General RF Exposure Guidance v06)

- ≤ 0.8 W/kg, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg, when the transmission band is ≥ 200 MHz



11.Measurement Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) $u_i(\%)$	Degree of freedom ν_{eff} or ν_i
Measurement System								
1	- Probe Calibration	B	5.8	N	1	1	5.8	∞
2	- Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	∞
3	— Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	∞
4	- Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	∞
5	- Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	∞
6	- System Detection Limits	B	1.0	R	$\sqrt{3}$	1	0.58	∞
7	Modulation response	B	3	N	1	1	3.00	
8	- Readout Electronics	B	0.5	N	1	1	0.50	∞
9	- Response Time	B	1.4	R	$\sqrt{3}$	1	0.81	∞
10	- Integration Time	B	3.0	R	$\sqrt{3}$	1	1.73	∞
11	- RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	- Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	∞
13	- Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	∞
14	- Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	∞
Uncertainties of the DUT								



15	- Position of the DUT	A	2.6	N	$\sqrt{3}$	1	2.6	5
16	- Holder of the DUT	A	3	N	$\sqrt{3}$	1	3.0	5
17	- Output Power Variation – SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.89	∞
Phantom and Tissue Parameters								
18	- Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	∞
19	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	B	2	N	1	1	2.00	
20	- Liquid Conductivity Target – tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
21	- Liquid Conductivity – measurement Uncertainty)	B	4	N	$\sqrt{3}$	1	0.92	9
22	- Liquid Permittivity Target tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
23	- Liquid Permittivity – measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	∞
Combined Standard Uncertainty				RSS			10.63	
Expanded uncertainty (Confidence interval of 95 %)				K=2			21.26	



12. System Check Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) $u_i(\%)$	Degree of freedom ν_{eff} or ν_i
	Measurement System							
1	- Probe Calibration	B	5.8	N	1	1	5.8	∞
2	- Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	∞
3	- Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	∞
4	- Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	∞
5	- Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	∞
6	- System Detection Limits	B	1	R	$\sqrt{3}$	1	0.58	∞
7	Modulation response	B	0	N	1	1	0.00	
8	- Readout Electronics	B	0.5	N	1	1	0.50	∞
9	- Response Time	B	0.00	R	$\sqrt{3}$	1	0.00	∞
10	- Integration Time	B	1.4	R	$\sqrt{3}$	1	0.81	∞
11	- RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	- Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	∞
13	- Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	∞
14	- Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	∞
	Uncertainties of the DUT							



15	Deviation of experimental source from numerical source	A	4	N	1	1	4.00	5
16	Input Power and SAR drift measurement	A	5	R	$\sqrt{3}$	1	2.89	5
17	Dipole Axis to Liquid Distance	B	2	R	$\sqrt{3}$	1	1.2	∞
Phantom and Tissue Parameters								
18	- Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	∞
19	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	B	2	N	1	1	2.00	
20	- Liquid Conductivity Target – tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
21	- Liquid Conductivity – measurement Uncertainty)	B	4	N	$\sqrt{3}$	1	0.92	9
22	- Liquid Permittivity Target tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
23	- Liquid Permittivity – measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	∞
Combined Standard Uncertainty				RSS			10.15	
Expanded uncertainty (Confidence interval of 95 %)				K=2			20.29	



13.Equipment List

This table is a complete overview of the SAR measurement equipment. Devices used during the test described are marked ☒.

	EQUIPMENT	Model	Serial number	Calibration Date	Due Date
<input checked="" type="checkbox"/>	SAR Probe	SSE2	3223-EPGO-422	2023/08/28	2024/08/27
<input checked="" type="checkbox"/>	SAR Probe	SSE2	SN 41/18 EPGO330	2024/01/24	2025/01/23
<input checked="" type="checkbox"/>	Dipole	SID2450	SN 09/13 DIP2G450-220	2023/05/24	2026/05/23
<input checked="" type="checkbox"/>	Dipole	SWG5500	SN15/15 WGA39	2023/05/25	2026/05/24
<input checked="" type="checkbox"/>	Multimeter	Keithley-2000	4014020	2024/01/18	2025/01/17
<input checked="" type="checkbox"/>	Vector Network Analyzer(R&S)	ZVB8	100343	2024/01/18	2025/01/17
<input checked="" type="checkbox"/>	PC 3.5 Fixed Match Calibration Kit	ZV-Z32	100571	2024/01/18	2025/01/17
<input checked="" type="checkbox"/>	Dielectric Probe Kit	SCLMP	SN 09/13 OCPG51	2024/01/18	2025/01/17
<input checked="" type="checkbox"/>	Signal Generator	SMU100A	177649	2024/01/18	2025/01/17
<input checked="" type="checkbox"/>	Amplifier	Nucletudes	143060	2024/01/18	2025/01/17
<input checked="" type="checkbox"/>	Directional Coupler	DC6180A	305827	2024/06/02	2025/06/01
<input checked="" type="checkbox"/>	Power Meter	NRP2	103434	2024/01/18	2025/01/17



ANNEX A: Appendix A: SAR System performance Check Plots

(Please See Appendix A)

ANNEX B: Appendix B: SAR Measurement results Plots

(Please See Appendix B)

ANNEX C: Appendix C: Calibration reports

(Please See Appendix C)

ANNEX D: Appendix D: SAR Test Setup

(Please See Appendix D)

—End of the Report—