



FCC SAR Test Report

Project No. : 2504C276
Equipment : Gaming Tablet
Brand Name : N/A
Model Name : OrangePi Neo 8840U, OrangePi Neo 7840U
Date of Receipt : Apr. 18, 2025
Date of Test : Apr. 21, 2025 ~ Jul. 28, 2025
Issued Date : Feb. 06, 2026
Test Sample : Engineering Sample No.: DG20250418129
Standard(s) : Please refer to page 2.
Applicant : Shenzhen Xunlong Software CO., Limited
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The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc. (Dongguan)

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Standard(s)	: IEEE Std C95.1:2019 IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 kHz to 300 GHz. IEC/IEEE 62209-1528:2020 Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz) IEC/IEEE 63195-1-2022 Assessment of power density of human exposure to radio frequency fields from wireless devices in close proximity to the head and body (frequency range of 6 GHz to 300 GHz) -Part 1: Measurement procedure. KDB447498 D04 Interim General RF Exposure Guidance v01 KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
Test method	: KDB616217 D04 SAR for laptop and tablets v01r02 KDB248227 D01 802.11 Wi-Fi SAR v02r02 KDB865664 D02 SAR Reporting v01r02 KDB690783 D01 SAR Listings on Grants v01r03

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL.

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BTL's laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCC SAR-1-2504C276	R00	Original Report.	Dec. 03, 2025	Invalid
BTL-FCC SAR-1-2504C276	R01	This report has below changes: a. Removed the standard IEC TR 63170-2018 in page 2. b. Updated the description in page 54 note 2. It is a revision of the report with serial number BTL-FCC SAR-1-2504C276 R00. This is a newly released report, replacing the BTL-FCC SAR-1-2504C276 R00 report.	Feb. 06, 2026	Valid

1 GENERAL INFORMATION

1.1 STATEMENT OF COMPLIANCE

Mode	Highest Bodyworn SAR-1g (W/kg)
WLAN 2.4G	1.156
WLAN 5.2G	1.192
WLAN 5.3G	1.219
WLAN 5.6G	1.251
WLAN 5.8G	1.167
WLAN 6G	1.040
Bluetooth	0.327

Frequency Band	Highest Averaged Power Density (mW/cm ²)
WLAN 6E	0.634

Note:

- 1) The device is in compliance with Specific Absorption Rate (SAR) for general population uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI/IEEE C95.1, the NCRP Report Number 86 for uncontrolled environment, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528.
- 2) According to standard 47 CFR part 2.1093, the MPE limits specified in part 1.1310 apply to portable devices that transmit at frequencies above 6 GHz. The localized power density limit for general population exposure is 1.0 mW/cm² (equal to 10 W/m²) for frequency up to 100 GHz.

1.2 LABORATORY ENVIRONMENT

Temperature	Min. = 20°C, Max. = 24°C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5Ω
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.	

1.3 GENERAL DESCRIPTION OF EUT

Equipment	Gaming Tablet		
Brand Name	N/A		
Test Model	OrangePi Neo 8840U		
Model Name	OrangePi Neo 8840U, OrangePi Neo 7840U		
Model Difference(s)	Main chip performance varies.		
Hardware Version	OrangePi_NEO_MB_V12		
Software Version	Windows 11		
Operation Frequency	Function	Band	Frequency (MHz)
	WiFi	2.4G	TX : 2412 - 2472 MHz
		5G_UNII 1	TX : 5180 - 5250 MHz
		5G_UNII 2a	TX : 5250 - 5350 MHz
		5G_UNII 2c	TX : 5500 - 5700 MHz
		5G_UNII 3	TX : 5745 - 5825 MHz
		6E_UNII 5	TX : 5925 - 6425 MHz
		6E_UNII 6	TX : 6425 - 6525 MHz
		6E_UNII 7	TX : 6525 - 6875 MHz
		6E_UNII 8	TX : 6875 - 7125 MHz
	Bluetooth	Basic Rate (BR)	TX : 2402 - 2480 MHz
		Enhance Data Rate	TX : 2402 - 2480 MHz
		Bluetooth Low Energy	TX : 2402 - 2480 MHz
Antenna Gain (dBi)	Function	Ant 1	Ant 2
	Bluetooth	2.54	-
	2.4GHz	2.54	2.54
	5GHz	2.75	2.75
	6GHz	3.32	3.32

Note: The antenna gain is provided by the manufacturer.

1.4 MAIN TEST INSTRUMENTS

Item	Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Interval
1	Data Acquisition Electronics	Speag	DAE4	420	Apr. 08, 2025	1 Year
2	Data Acquisition Electronics	Speag	DAE4	1390	Nov. 14, 2024	1 Year
3	Data Acquisition Electronics	Speag	DAE4	1717	Jun. 19, 2025	1 Year
4	E-field Probe	Speag	EX3DV4	3809	Jan. 24, 2025	1 Year
5	E-field Probe	Speag	EX3DV4	7693	Nov. 20, 2024	1 Year
6	E-field Probe	Speag	EUmmWV4	9561	Jun. 18, 2025	1 Year
7	System Validation Dipole	Speag	D2450V2	919	Apr. 22, 2024	3 Years
8	System Validation Dipole	Speag	D5GHzV2	1160	Apr. 25, 2024	3 Years
9	System Validation Dipole	Speag	D6.5GHzV2	1052	Nov. 13, 2024	3 Years
10	System Validation Source	Speag	5G Verification Source 10GHz	1041	May. 27, 2025	1 Years
11	ELI Phantom	Speag	ELI Phantom V5.0	1222	N/A	N/A
12	ELI Phantom	Speag	ELI Phantom V5.0	1128	N/A	N/A
13	Twin Sam Phantom	Speag	SAM-Twim V8.0	2081	N/A	N/A
14	Power Amplifier	Mini-Circuits	ZHL-42W+	QA1333003	May. 29, 2025	1 Year
15	Power Amplifier	Mini-Circuits	ZVE-8G+	520701341	Jan. 12, 2025	1 Year
16	DC Source meter	Iteck	IT6154	0061041267682 01001	May. 29, 2025	1 Year
17	Vector Network Analyzer	Agilent	E5071C	MY46102965	Jan. 11, 2025	1 Year
18	Signal Generator	Keysight	N5173B	MY59101420	Jan. 11, 2025	1 Year
19	Smart Power Sensor	R&S	NRP-Z21	102209	Jan. 12, 2025	1 Year
20	3.5mm Economy Calibration Kit	Agilent	85052D	MY43252246	Nov. 04, 2024	1 Year
21	Dielectric Assessment Kit	Speag	DAK-3.5	1226	Jan. 20, 2025	3 Years
22	Directional Coupler	Talent Microwave	TC-05180-20S	210628013	Jan. 11, 2025	1 Year
23	Liquid Thermometer	Nscing Es	YZ6021S	/	Nov. 24, 2024	1 Year

Note:

1. "N/A" denotes no model name, serial No. or calibration specified.

2.

1) Per KDB865664 D01 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

a) There is no physical damage on the dipole;

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

c) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement;

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

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

2 RF EMISSIONS MEASUREMENT

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is SAR Test room at the location of No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong People's Republic of China.

2.2 MEASUREMENT UNCERTAINTY

Uncertainty Budget for Frequency range of 300 MHz to 3 GHz

Symbol	Input quantity X_i (source of uncertainty)	Unc. Value	Prob. Dist.	Div.	ci (1g)	ci (10g)	Std.Unc. (1g) (±%)	Std.Unc. (10g) (±%)
Measurement system errors								
CF	Probe calibration(±%)	11.0	N	2	1	1	5.5	5.5
CF_{drift}	Probe calibration drift(±%)	1.7	R	$\sqrt{3}$	1	1	1.0	1.0
LIN	Probe linearity and detection limit(±%)	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
BBS	Broadband signal(±%)	3.0	R	$\sqrt{3}$	1	1	1.7	1.7
ISO	Probe isotropy(±%)	7.6	R	$\sqrt{3}$	1	1	4.4	4.4
DAE	Other probe and data acquisition errors(±%)	0.7	N	1	1	1	0.7	0.7
AMB	RF ambient and noise(±%)	1.8	N	1	1	1	1.8	1.8
Δ_{xyz}	Probe positioning errors(±mm)	0.006	N	1	0.14	0.14	0.08	0.08
DAT	Data processing errors(±%)	1.2	N	1	1	1	1.2	1.2
Phantom and device (DUT or validation antenna) errors								
LIQ(σ)	Conductivity (meas.)(±%)	0.8	N	1	0.78	0.71	0.7	0.6
LIQ(T_c)	Conductivity (temp.)(±%)	4.16	R	$\sqrt{3}$	0.78	0.71	1.9	1.7
EPS	Phantom Permittivity(±%)	14	R	$\sqrt{3}$	0	0	0.0	0.0
DIS	Distance DUT - TSL(±%)	2	N	1	2	2	4.0	4.0
D_{xyz}	Device Positioning(±%)	0.5	N	1	1	1	0.5	0.5
H	Device Holder(±%)	1	N	1	1	1	1.0	1.0
MOD	DUT Modulationm(±%)	2.4	R	$\sqrt{3}$	1	1	1.4	1.4
TAS	Time-average SAR(±%)	1.7	R	$\sqrt{3}$	1	1	1.0	1.0
RF_{drift}	DUT drift(±%)	1.6	N	1	1	1	1.6	1.6
VAL	Val Antenna Unc.(±%)	0	N	1	1	1	0.0	0.0
P_{in}	Unc. Input Power(±%)	0	N	1	1	1	0.0	0.0
Corrections to the SAR result								
C(ϵ',σ)	Deviation to Target(±%)	1.9	N	1	1	0.84	1.9	1.6
C(R)	SAR scaling(±%)	0	R	$\sqrt{3}$	1	1	0.0	0.0
u(ΔSAR)	Combined uncertainty						9.8	9.7
	Coverage Factor for 95%						k=2	k=2
U	Expanded uncertainty					U =	19.6	19.4
a Other probability distributions and divisors may be used if they better represent available knowledge of the quantities concerned.								

Uncertainty Budget for Frequency range of 3 GHz to 6 GHz

Symbol	Input quantity X_i (source of uncertainty)	Unc. Value	Prob. Dist.	Div.	ci (1g)	ci (10g)	Std.Unc. (1g) (±%)	Std.Unc. (10g) (±%)
Measurement system errors								
CF	Probe calibration(±%)	13.1	N	2	1	1	6.6	6.6
CF_{drift}	Probe calibration drift(±%)	1.7	R	$\sqrt{3}$	1	1	1.0	1.0
LIN	Probe linearity and detection limit(±%)	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
BBS	Broadband signal(±%)	2.6	R	$\sqrt{3}$	1	1	1.5	1.5
ISO	Probe isotropy(±%)	7.6	R	$\sqrt{3}$	1	1	4.4	4.4
DAE	Other probe and data acquisition errors(±%)	1.2	N	1	1	1	1.2	1.2
AMB	RF ambient and noise(±%)	1.8	N	1	1	1	1.8	1.8
Δ_{xyz}	Probe positioning errors(±mm)	0.005	N	1	0.29	0.29	0.15	0.15
DAT	Data processing errors(±%)	2.3	N	1	1	1	2.3	2.3
Phantom and device (DUT or validation antenna) errors								
LIQ(σ)	Conductivity (meas.)(±%)	0.7	N	1	0.78	0.71	0.6	0.5
LIQ(T_c)	Conductivity (temp.)(±%)	2.45	R	$\sqrt{3}$	0.78	0.71	1.1	1.0
EPS	Phantom Permittivity(±%)	14	R	$\sqrt{3}$	0.25	0.25	2.0	2.0
DIS	Distance DUT - TSL(±%)	2	N	1	2	2	4.0	4.0
D_{xyz}	Device Positioning(±%)	0.3	N	1	1	1	0.3	0.3
H	Device Holder(±%)	1.9	N	1	1	1	1.9	1.9
MOD	DUT Modulationm(±%)	2.4	R	$\sqrt{3}$	1	1	1.4	1.4
TAS	Time-average SAR(±%)	1.7	R	$\sqrt{3}$	1	1	1.0	1.0
RF_{drift}	DUT drift(±%)	0.2	N	1	1	1	0.2	0.2
VAL	Val Antenna Unc.(±%)	0	N	1	1	1	0.0	0.0
P_{in}	Unc. Input Power(±%)	0	N	1	1	1	0.0	0.0
Corrections to the SAR result								
C(ϵ', σ)	Deviation to Target(±%)	1.9	N	1	1	0.84	1.9	1.6
C(R)	SAR scaling(±%)	0	R	$\sqrt{3}$	1	1	0.0	0.0
u(ΔSAR)	Combined uncertainty						10.7	10.6
	Coverage Factor for 95%						k=2	k=2
U	Expanded uncertainty					U =	21.4	21.3
a Other probability distributions and divisors may be used if they better represent available knowledge of the quantities concerned.								

Uncertainty Budget for Frequency range of above 6 GHz

Symbol	Input quantity X_i (source of uncertainty)	Unc. Value	Prob. Dist.	Div.	ci (1g)	ci (10g)	Std.Unc. (1g) (±%)	Std.Unc. (10g) (±%)
Measurement system errors								
CF	Probe calibration(±%)	18.6	N	2	1	1	9.3	9.3
CF_{drift}	Probe calibration drift(±%)	1.7	N	1	1	1	1.0	1.0
LIN	Probe linearity and detection limit(±%)	4.7	R	1.732	1	1	2.7	2.7
BBS	Broadband signal(±%)	2.8	N	1	1	1	1.6	1.6
ISO	Probe isotropy(±%)	7.6	R	2	1	1	4.4	4.4
DAE	Other probe and data acquisition errors(±%)	2.4	N	1.732	1	1	1.4	1.4
AMB	RF ambient and noise(±%)	1.8	N	1	1	1	1.8	1.8
Δ_{xyz}	Probe positioning errors(±mm)	0.01	N	1	0.33	0.33	0.00	0.00
DAT	Data processing errors(±%)	3.5	N	1	1	1	3.5	3.5
Phantom and device (DUT or validation antenna) errors								
LIQ(σ)	Conductivity (meas.) DAK (±%)	2.0	N	1	0.78	0.71	1.6	1.4
LIQ(T_c)	Conductivity (temp.) (±%)	2.43	R	1.732	0.78	0.71	1.1	1.0
EPS	Phantom Permittivity(±%)	14	R	1.732	0.5	0.5	4.0	4.0
DIS	Distance DUT - TSL(±%)	2	N	1	2	2	4.0	4.0
D_{xyz}	Device Positioning(±%)	1	N	1	1	1	1.0	1.0
H	Device Holder(±%)	2	N	1	1	1	2.0	2.0
MOD	DUT Modulationm(±%)	2.4	R	1.732	1	1	1.4	1.4
TAS	Time-average SAR(±%)	1.7	R	1.732	1	1	1.0	1.0
RF_{drift}	DUT drift(±%)	2	N	1	1	1	2.0	2.0
VAL	Val Antenna Unc.(±%)	0	N	1	1	1	0.0	0.0
P_{in}	Unc. Input Power(±%)	0	N	1	1	1	0.0	0.0
Corrections to the SAR result								
C(ϵ',σ)	Deviation to Target(±%)	1.9	N	1	1	0.84	1.9	1.6
C(R)	SAR scaling(±%)	0	R	$\sqrt{3}$	1	1	0.0	0.0
u(ΔSAR)	Combined uncertainty						13.6	13.6
	Coverage Factor for 95%						k=2	k=2
U	Expanded uncertainty					U =	27.2	27.1
a Other probability distributions and divisors may be used if they better represent available knowledge of the quantities concerned.								

Uncertainty Budget for PD

Error Description	Uncertainty Value (±dB)	Probability	Divisor	(Ci)	(Ci) 10g	Standard Uncertainty (±dB)	Standard Uncertainty (10g) (±%)
Uncertainty terms dependent on the measurement system							
Probe Calibration	0.98	N	1	1	1	0.98	1.0
Probe correction	0.00	R	1.732	1	0.7	0.00	0.0
Frequency response (BW ≤ 1 GHz)	0.20	R	1.732	1	0.7	0.12	0.1
Sensor cross coupling	0.00	R	1.732	1	1	0.00	0.0
Isotropy	0.50	R	1.732	1	1	0.29	0.3
Linearity	0.20	R	1.732	1	1	0.12	0.1
Probe scattering	0.00	R	1.732	1	1	0.00	0.0
Probe positioning offset	0.30	R	1.732	1	1	0.17	0.2
Probe positioning repeatability	0.04	R	1.732	1	1	0.02	0.0
Sensor mechanical offset	0.00	R	1.732	1	1	0.00	0.0
Probe spatial resolution	0.00	R	1.732	1	1	0.00	0.0
Field impedance dependance	0.00	R	1.732	1	1	0.00	0.0
Amplitude and phase drift	0.00	R	1.732	1	1	0.00	0.0
Amplitude and phase noise	0.04	R	1.732	1	1	0.02	0.0
Measurement area truncation	0.00	R	1.732	1	1	0.00	0.0
Data acquisition	0.03	N	1	1	1	0.03	0.0
Sampling	0.00	R	1.732	1	1	0.00	0.0
Field reconstruction	2.00	R	1.732	1	1	1.15	1.2
Forward transformation	0.00	R	1.732	1	1	0.00	0.0
Power density scaling	0.00	R	1.732	1	1	0.00	0.0
Spatial averaging	0.10	R	1.732	1	1	0.06	0.1
System detection limit	0.04	R	1.732	1	1	0.02	0.0
Uncertainty terms dependent on the DUT and environmental factors							
Probe coupling with DUT	0.00	R	1.732	1	1	0.0	0.0
Modulation response	0.40	R	1.732	1	0.84	0.2	0.2
Integration time	0.00	R	1.732	1	0.71	0.0	0.0
Response time	0.00	R	1.732	1	0.71	0.0	0.0
Device holder influence	0.10	R	1.732	1	0.71	0.1	0.0
DUT alignment	0.00	R	1.732	1	0.71	0.0	0.0
RF ambient conditions	0.04	R	1.732	1	0.26	0.0	0.0
Ambient reflections	0.04	R	1.732	1	0.26	0.0	0.0
Immunity / secondary reception	0.00	R	1.732	1	0.26	0.0	0.0
Drift of the DUT	0.00	R	1.732	1	0.26	0.0	0.0
Combined Std. Uncertainty						1.59	1.6%
Coverage Factor for 95 %						k=2	k=2
Expanded STD Uncertainty (95%)						3.18	3.1%

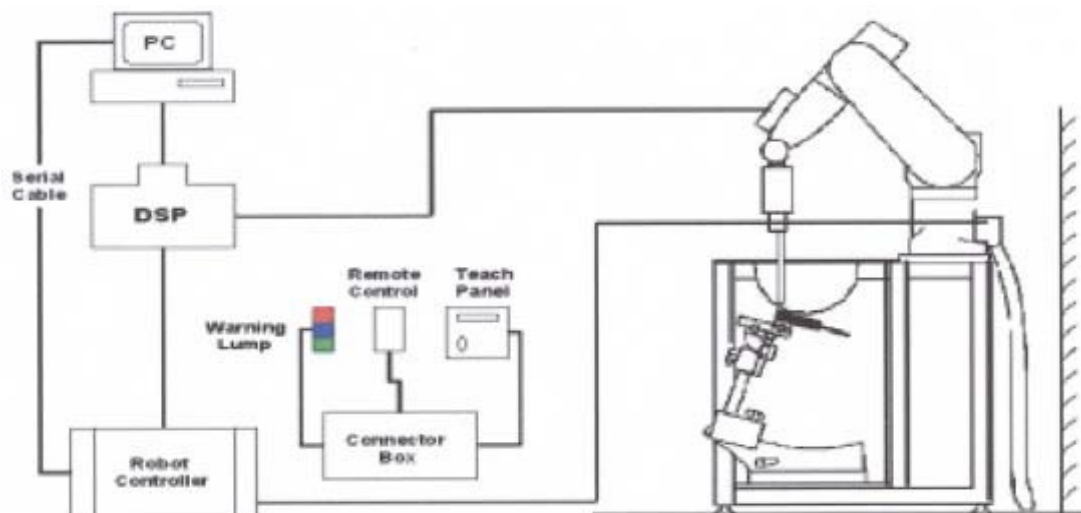
3 SAR MEASUREMENTS SYSTEM CONFIGURATION

3.1 SAR MEASUREMENT SET-UP

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

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. 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.
3. A data acquisition electronic (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.
4. A unit to operate the optical surface detector which is connected to the EOC.
5. The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
6. The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows.
7. DASY5 software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

3.1.1 TEST SETUP LAYOUT



3.2 DASY5 E-FIELD PROBE SYSTEM

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

3.2.1 PROBE SPECIFICATION

EX3DV4

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm



E-field Probe

3.2.2 E-FIELD PROBE CALIBRATION

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. The spherical isotropy was evaluated and found to be better than $\pm 0.25\text{dB}$. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies below 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermostat-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C \frac{\Delta T}{\Delta t}$$

Where: Δt =Exposure time (30 seconds),

C =Heat capacity of tissue (brain or muscle),

ΔT =Temperature increase due to RF exposure.

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

Where: σ = Simulated Tissue Conductivity,

ρ =Tissue density (kg/m³).

3.2.3 OTHER TEST EQUIPMENT

3.2.3.1. DEVICE HOLDER FOR TRANSMITTERS

Construction: Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices (e.g., laptops, cameras, etc.) It is light weight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI and SAM v6.0 Phantoms.

Material: POM, Acrylic glass, Foam

3.2.3.2 PHANTOM

Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.	
Shell Thickness	2 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000mm; Width: 500mm Height: adjustable feet	
Available	Special	

Model	ELI Phantom	
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Shell Thickness	2 ± 0.1 mm	
Filling Volume	Approx. 30 liters	
Dimensions	Length: 600 mm; Width: 190mm Height: adjustable feet	
Available	Special	

3.2.4 SCANNING PROCEDURE

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

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. The indicated drift is mainly the variation of the DUT’s output power and should vary max. $\pm 5\%$.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above $\pm 0.1\text{mm}$). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within $\pm 30^\circ$.)

● Area Scan

The “area scan” measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement. Standard grid spacing for head measurements is 15 mm in x- and y- dimension ($\leq 2\text{GHz}$), 12 mm in x- and y- dimension (2-4 GHz) and 10mm in x- and y- dimension (4-6GHz). If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation.

● Zoom Scan

A “zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous “coarse” scan. This is a fine grid with maximum scan spatial resolution: $\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}} \leq 2\text{GHz} \leq 8\text{mm}$, 2-4GHz $\leq 5\text{ mm}$ and 4-6 GHz $\leq 4\text{mm}$; $\Delta z_{\text{zoom}} \leq 3\text{GHz} \leq 5\text{ mm}$, 3-4 GHz $\leq 4\text{mm}$ and 4-6GHz $\leq 2\text{mm}$ where the robot additionally moves the probe along the z-axis away from the bottom of the Phantom. DASY is also able to perform repeated zoom scans if more than 1 peak is found during area scan. In this document, the evaluated peak 1g and 10g averaged SAR values are shown in the 2D-graphics in Appendix B. Test results relevant for the specified standard (see chapter 1.4.) are shown in table form in chapter 7.2.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 2 mm steps. This measurement shows the continuity of the liquid and can - depending in the field strength – also show the liquid depth.

The following table summarizes the area scan and zoom scan resolutions per FCC KDB 865664D01:

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

3.2.5 SPATIAL PEAK SAR EVALUATION

The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The basis of the evaluation are the SAR values measured at the points of the fine cube grid consisting of 5 x 5 x 7 points (with 8mm horizontal resolution) or 7 x 7 x 7 points (with 5mm horizontal resolution) or 8 x 8 x 7 points (with 4mm horizontal resolution). The algorithm that finds the maximal averaged volume is separated into three different stages.

- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting "Graph Evaluated".
- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.
- All neighboring volumes are evaluated until no neighboring volume with a higher average value is found.

Extrapolation

The extrapolation is based on a least square algorithm [W. Gander, Computer mathematic, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computer mathematic, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].

Volume Averaging

At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.

Advanced Extrapolation

DASY5 uses the advanced extrapolation option which is able to compensate boundary effects on E-field probes.

3.2.6 DATA STORAGE AND EVALUATION

3.2.6.1 DATA STORAGE

The DASY5 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], [mW/g], [mW/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.

3.2.7 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, a_{i0} , a_{i1} , a_{i2}
	Conversion factor	ConvF _i
	Diode compression point	Dcp _i
Device parameters:	Frequency	f
	Crest factor	cf
Media parameters:	Conductivity	
	Density	

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 DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

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

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

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

With	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)
	dcp _i = diode compression point	(DASY parameter)

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

$$\text{E-field probes: } E_i = (V_i / \text{Norm}_i \cdot \text{ConvF})^{1/2}$$

$$\text{H-field probes: } H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$$

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):

$$E_{\text{tot}} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

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

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

With SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m
= conductivity in [mho/m] or [Siemens/m]
= 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.

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

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

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

H_{tot} = total magnetic field strength in A/m

4 SYSTEM VERIFICATION PROCEDURE

4.1 TISSUE VERIFICATION

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine if the dielectric parameters are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within $\pm 5\%$ of the target values.

The following materials are used for producing the tissue-equivalent materials.

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
Head 2450	-	45.0	-	0.1	-	-	54.9	-
Head 5G	-	-	-	-	-	17.2	65.5	17.3

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

Tissue Verification									
Tissue Type	Frequency (MHz)	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Targeted Conductivity (σ)	Targeted Permittivity (ϵ_r)	Deviation Conductivity (σ) (%)	Deviation Permittivity (ϵ_r) (%)	Date
Head	2450	22.4	1.822	39.968	1.80	39.2	1.22	1.96	Jun. 17, 2025
Head	5250	22.2	4.589	35.391	4.71	36.0	-2.57	-1.55	Jun. 18, 2025
Head	5250	21.9	4.744	35.502	4.71	36.0	0.72	-1.25	Jul. 14, 2025
Head	5600	22.2	5.051	34.576	5.07	35.5	-0.37	-2.60	Jun. 18, 2025
Head	5600	21.9	5.125	34.618	5.07	35.5	1.08	-2.48	Jul. 14, 2025
Head	5750	22.2	5.168	34.173	5.22	35.4	-1.00	-3.33	Jun. 18, 2025
Head	6500	22.4	5.870	33.600	6.07	34.5	-3.29	-2.61	Jul. 15, 2025

Note:

- 1)The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.
- 2)KDB 865664 was ensured to be applied for probe calibration frequencies greater than or equal to 50MHz of the EUT frequencies.
- 3)The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies. The SAR test plots may slightly differ from the table above since the DASY rounds to three significant digits.

4.2 SYSTEM CHECK

The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to EN IEC/IEEE 62209-1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests.

System Check	Date	Frequency (MHz)	Targeted SAR 1g (W/kg)	Measured SAR 1g (W/kg)	normalized SAR 1g (W/kg)	Deviation (%)	Dipole S/N
Head	Jun. 17, 2025	2450	53.10	5.33	53.30	0.38	919
Head	Jun. 18, 2025	5250	78.70	7.82	78.20	-0.64	1160
Head	Jul. 14, 2025	5250	78.70	7.86	78.60	-0.13	1160
Head	Jun. 18, 2025	5600	81.80	7.97	79.70	-2.57	1160
Head	Jul. 14, 2025	5600	81.80	7.89	78.90	-3.55	1160
Head	Jun. 18, 2025	5750	78.70	7.61	76.10	-3.30	1160
Head	Jul. 15, 2025	6500	291.00	27.60	276.00	-5.15	1052

4.2.1 POWER DENSITY SYSTEM CHECK

System check provides a fast and reliable method to routinely verify that the measurement system is operational with no system component failures, including probe defects, drifts or deviation from target performance requirements. A system check also verifies the repeatability of the measurement system before compliance testing.

The measurement of a verification source is started from 5G probe installed and the phantom taught. The verification source is placed on the 5G phantom. Due to the internal distance from the horn to the outer surface of the verification source, the measurement distance set in the software should be offset by -4.45 mm; e.g, for measurement of the verification source at 10 mm, the measurement distance set in the software should be 5.55mm (10mm -4.45 mm).

The system check is a complete measurement using simple well-defined reference sources. According to the description of "Relative system check" in Section A.3 of Annex A to the IEC IEEE 63195-1 test standard, the uncertainty tolerance range of the system performance check can be converted to a percentage by referring to the uncertainty K=1 of the source calibration certificate. Here are some examples of A.5 and A.6 formulas! The uncertainty tolerance range of this calibration certificate is $\pm 15.88\%$. According to the measured psPD 4cm² result, within the tolerance of the calibration certificate standard uncertainty, the system verification is successful. The instruments and procedures used for system inspection shall ensure that the system is ready to perform compliance tests.

Before starting DUT PD testing in any configuration, the acceptance criteria shall be met. The relative system check is successful if a) or b) is met:

- a) All absolute differences between the measured values, $psPD_{meas}$ and target values $psPD_{tgt}$, with $psPD$ values averaged over 1 cm² and/or 4 cm², shall be within the combined uncertainty u_c of the measurement system and the source antenna, according to Formula (A.4) if the uncertainty is expressed in decibel, or according to Formula (A.5) if the uncertainty is expressed in percent, along with Formula (A.6).

$$\Delta psPD_{tgt} = \left| 10 \times \lg \left(\frac{psPD_{meas}}{psPD_{tgt}} \right) \right| < \min(2 \times |u_c|, 2 \text{ dB}) \quad (\text{A.4})$$

or

$$\Delta psPD_{tgt} = \left| \frac{psPD_{meas} - psPD_{tgt}}{psPD_{tgt}} \right| < \min(2 \times |u_c|, 58 \%) \quad (\text{A.5})$$

$$u_c = \sqrt{u_{\text{antenna_cal}}^2 + u_{\text{power}}^2 + u_{\text{meas}}^2} \quad (\text{A.6})$$

where

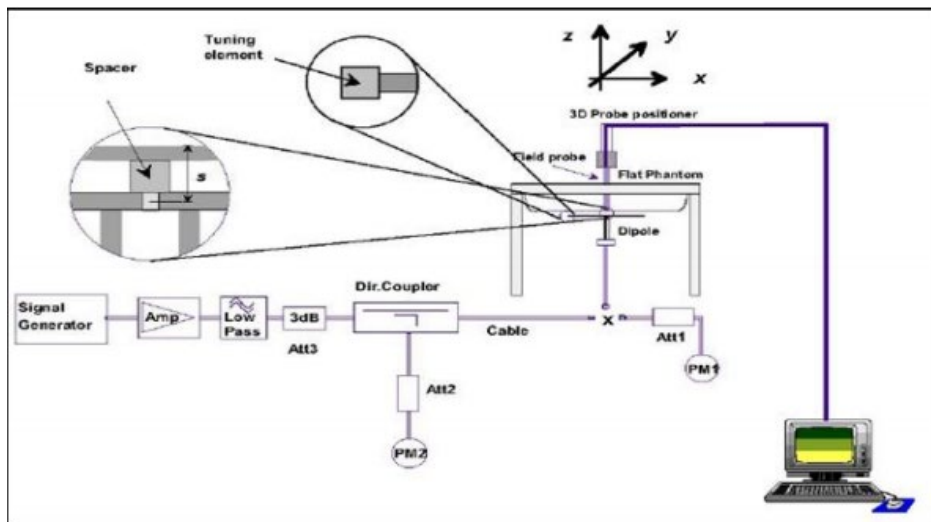
- $psPD_{tgt}$ is the target value, derived from repeated measurement of source antenna, normalized to 0 dBm TRP;
- $u_{\text{antenna_cal}}$ is the standard uncertainty ($k = 1$) of the $psPD$ of the antenna model;
- u_{power} is the standard uncertainty ($k = 1$) of the measured TRP (see Clause A.2);
- u_{meas} is the standard uncertainty ($k = 1$) of the $psPD$ measurement (probe calibration, electronics, and positioning).

System Check	Date	Frequency (GHz)	Distance (mm)	Targeted 4cm ² (W/m ²)	Measured 4cm ² (W/m ²)	Deviation For 4cm ² (%)	Dipole S/N
Power Density	Jul. 22, 2025	10G $\pm$ 10MHz	10	57.5	52.3	-9.04	1041

4.3 SYSTEM CHECK PROCEDURE

The system check is performed by using a system check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250mW (below 3GHz) or 100mW (3-6GHz). To adjust this power a power meter is used.

The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system check to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test. System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system ($\pm 10\%$).



5 SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

5.1 SAR MEASUREMENT VARIABILITY

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

The detailed repeated measurement results are shown in Section 8.

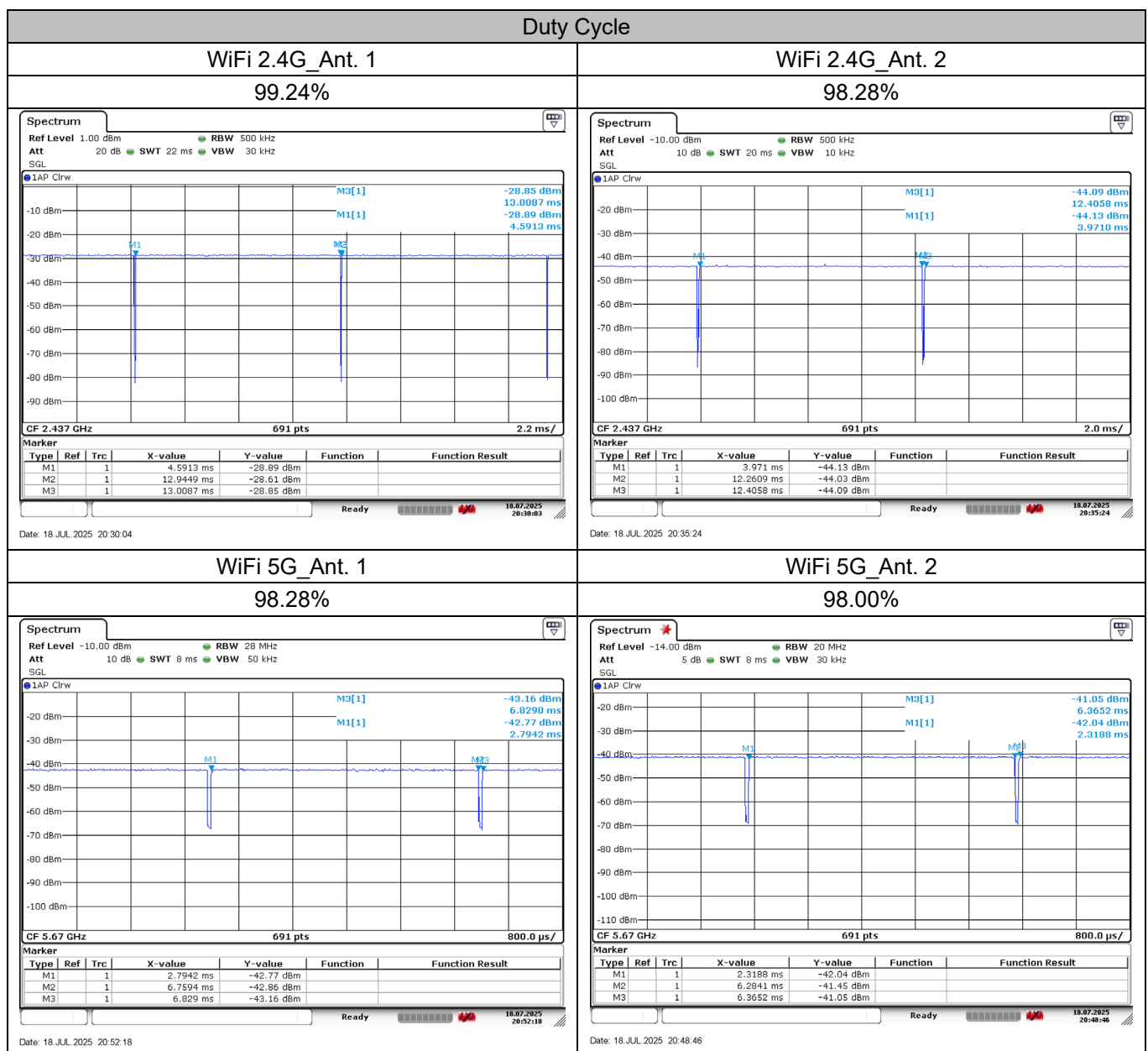
6 OPERATIONAL CONDITIONS DURING TEST

6.1 GENERAL DESCRIPTION OF TEST PROCEDURES

Connection to the EUT is established via air interface with base station An, and the EUT is Set to maximum output power by base station. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. The antenna connected to the output of the base station simulator shall be placed at least 50cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30dB.

6.2 TEST CONFIGURATION

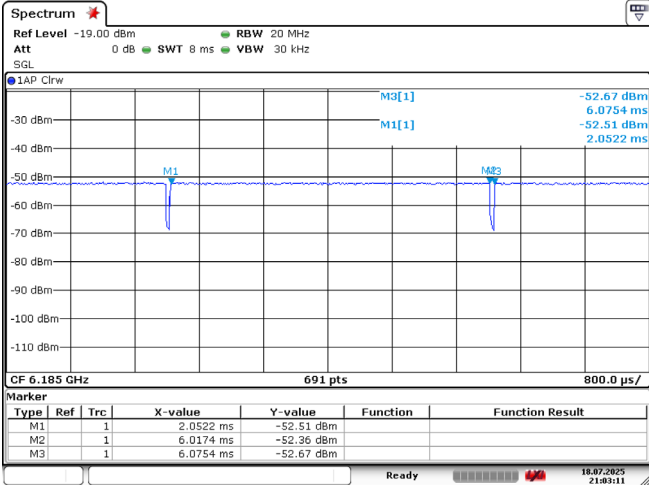
For WLAN / BT SAR testing, WLAN / BT engineering testing software installed on the DUT can provide continuous transmitting RF signal.



Duty Cycle

WiFi 6G_Ant. 1

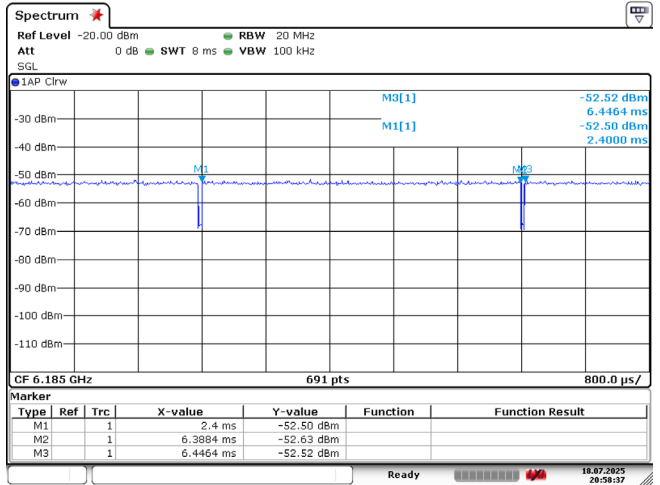
98.56%



Date: 18 JUL 2025 21:03:11

WiFi 6G_Ant. 2

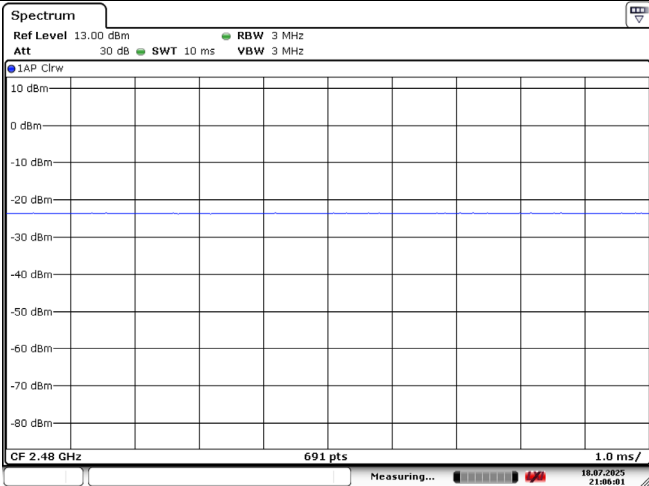
98.57%



Date: 18 JUL 2025 20:58:37

Bluetooth

100%



Date: 18 JUL 2025 21:06:02

6.2.1 WLAN 2.4G SAR Test Requirements

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. 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 2.4 GHz 802.11g/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.

6.2.2 WLAN 5G SAR TEST REQUIREMENTS

U-NII-1 and U-NII-2A Band

For devices that operate in both U-NII-1 and U-NII-2A bands, 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. 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.

U-NII-2C, 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, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification.

Unless band gap channels are permanently disabled, they must be considered for SAR testing.

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.¹¹ 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.

6.2.3 OFDM TRANSMISSION MODE AND SAR TEST CHANNEL SELECTION

For the 2.4GHz and 5GHz bands, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations (for example 802.11a, 802.11n and 802.11ac, or 802.11g and 802.11n, with the same channel bandwidth, modulation, and data rate, etc.), the lower order 802.11 mode (i.e. 802.11a then 802.11n and 802.11ac, or 802.11g then 802.11n) is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

6.2.4 INITIAL TEST CONFIGURATION PROCEDURE

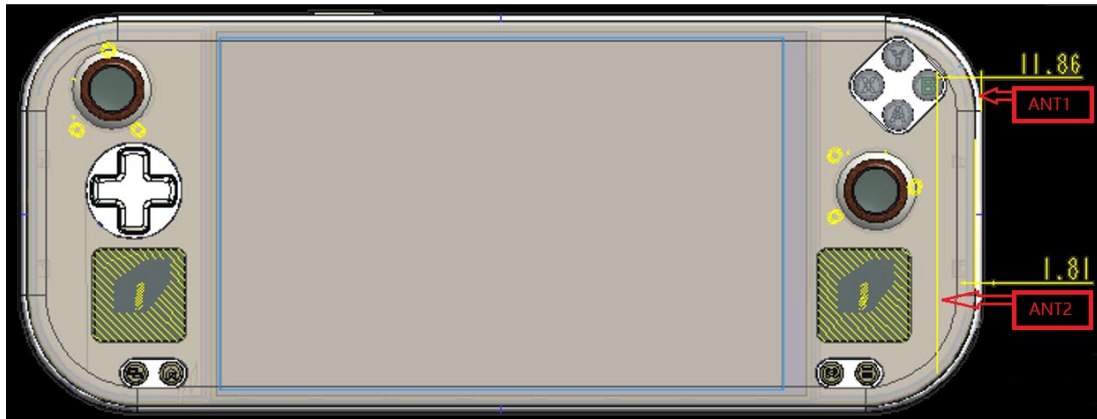
For OFDM, in both 2.4G and 5GHz bands, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. If the average RF output powers of the highest identical transmission modes are within 0.25 dB of each other, mid channel of the transmission mode with highest average RF output powers is the initial test channel. Otherwise, the channel of the transmission mode with the highest average RF output power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required.

Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurement.

6.3 TEST POSITION ANTENNA LOCATION

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



Unit: mm

The SAR measurement positions of each antenna are as below:

Antenna	Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
Ant 1 (BT+WIFI)	Yes	Yes	Yes	Yes	Yes	Yes
Ant 2 (WIFI)	Yes	Yes	Yes	Yes	Yes	Yes

7 CONDUCTED POWER RESULTS

7.1 CONDUCTED POWER MEASUREMENT RESULTS OF BLUETOOTH

BT	Average Conducted Power(dBm)			
	Max.	CH0	CH39	CH78
	Tune up	2402MHz	2441MHz	2480MHz
DH5	7.50	6.29	6.93	7.39
2DH5	5.00	4.06	4.75	4.90
3DH5	5.00	4.17	4.84	4.96

BT	Average Conducted Power(dBm)			
	Max.	CH0	CH19	CH39
	Tune up	2402MHz	2440MHz	2480MHz
BLE(1M)	4.00	2.90	3.02	3.68
BLE(2M)	4.00	3.04	3.48	3.67

Note: The tested channel results are marks in bold.

7.2 CONDUCTED POWER MEASUREMENTS OF WI-FI 2.4GHZ

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power (dBm)
2.4G WIFI _1TX_ ANT 1	802.11b	1	2412	1	14.50	13.81
		6	2437		14.50	14.03
		11	2462		14.50	13.78
	802.11g	1	2412	6	14.00	12.16
		6	2437		14.00	13.58
		11	2462		14.00	13.22
	802.11n HT20	1	2412	HT0	14.00	12.52
		6	2437		14.00	13.51
		11	2462		14.00	13.18
	802.11n HT40	3	2422	HT0	14.00	13.83
		6	2437		14.00	13.69
		9	2452		14.00	13.63
	802.11ax20	1	2412	HE0	14.00	12.64
		6	2437		14.00	13.67
		11	2462		14.00	13.29
	802.11ax40	3	2422	EHT0	14.00	13.61
		6	2437		14.00	13.49
		9	2452		14.00	13.40

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power (dBm)
2.4G WIFI _1TX_ ANT 2	802.11b	1	2412	1	15.50	14.99
		6	2437		15.50	15.37
		11	2462		15.50	15.24
	802.11g	1	2412	6	15.00	13.49
		6	2437		15.00	14.86
		11	2462		15.00	14.76
	802.11n HT20	1	2412	HT0	15.00	13.53
		6	2437		15.00	14.80
		11	2462		15.00	14.70
	802.11n HT40	3	2422	HT0	15.50	14.81
		6	2437		15.50	14.94
		9	2452		15.50	15.01
	802.11ax20	1	2412	HE0	15.00	13.58
		6	2437		15.00	14.85
		11	2462		15.00	14.78
	802.11ax40	3	2422	EHT0	15.00	14.64
		6	2437		15.00	14.80
		9	2452		15.00	14.85

Note: The tested channel results are marks in bold.

7.3 CONDUCTED POWER MEASUREMENTS OF WI-FI 5GHZ UNII_1

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
5.2G UNII_1 _1TX_ANT 1	802.11a	36	5180	6	5.50	5.06
		40	5200		5.50	4.78
		48	5240		5.50	5.11
	802.11n HT20	36	5180	MCS0	5.50	4.90
		40	5200		5.50	5.14
		48	5240		5.50	5.13
	802.11n HT40	38	5190	MCS0	6.00	5.40
		46	5230		6.00	5.52
	802.11ac VHT20	36	5180	MCS0	5.00	4.82
		40	5200		5.00	4.90
		48	5240		5.00	4.94
	802.11ac VHT40	38	5190	MCS0	6.00	5.33
		46	5230		6.00	5.58
	802.11ax HE20	36	5180	MCS0	5.50	4.87
		40	5200		5.50	4.69
		48	5240		5.50	5.32
	802.11ax HE40	38	5190	MCS0	5.50	4.94
		46	5230		5.50	5.22
	802.11ac VHT80	42	5210	MCS0	5.50	5.11
	802.11ax HE80	42	5210	MCS0	5.00	4.98
	802.11ac VHT160	50	5250	MCS0	5.50	5.46
	802.11ax HE160	50	5250	MCS0	5.50	5.48

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
5.2G UNII_1 _1TX_ ANT 2	802.11a	36	5180	6	13.00	12.61
		40	5200		13.00	12.75
		48	5240		13.00	12.84
	802.11n HT20	36	5180	MCS0	13.00	12.57
		40	5200		13.00	12.78
		48	5240		13.00	12.80
	802.11n HT40	38	5190	MCS0	13.50	13.02
		46	5230		13.50	13.10
	802.11ac VHT20	36	5180	MCS0	13.00	12.59
		40	5200		13.00	12.74
		48	5240		13.00	12.78
	802.11ac VHT40	38	5190	MCS0	13.50	12.90
		46	5230		13.50	13.01
	802.11ax HE20	36	5180	MCS0	13.00	12.66
		40	5200		13.00	12.86
		48	5240		13.00	12.89
	802.11ax HE40	38	5190	MCS0	13.00	12.70
		46	5230		13.00	12.78
	802.11ac VHT80	42	5210	MCS0	13.50	13.10
	802.11ax HE80	42	5210	MCS0	13.00	12.79
	802.11ac VHT160	50	5250	MCS0	13.50	13.14
	802.11ax HE160	50	5250	MCS0	13.50	13.16

Note: The tested channel results are marks in bold.

7.4 CONDUCTED POWER MEASUREMENTS OF WI-FI 5GHZ UNII_2A

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
5.3G UNII_2A _1TX_ANT 1	802.11a	52	5260	6	5.50	4.90
		56	5280		5.50	5.29
		64	5320		5.50	5.34
	802.11n HT20	52	5260	MCS0	5.50	4.93
		56	5280		5.50	5.11
		64	5320		5.50	5.22
	802.11n HT40	54	5270	MCS0	6.00	5.42
		62	5310		6.00	5.51
	802.11ac VHT20	52	5260	MCS0	5.50	4.96
		56	5280		5.50	5.07
		64	5320		5.50	5.43
	802.11ac VHT40	54	5270	MCS0	6.00	5.43
		62	5310		6.00	5.55
	802.11ax HE20	52	5260	MCS0	5.50	4.95
		56	5280		5.50	5.04
		64	5320		5.50	5.21
	802.11ax HE40	54	5270	MCS0	6.00	5.05
		62	5310		6.00	5.54
	802.11ac VHT80	58	5290	MCS0	5.50	5.35
	802.11ax HE80	58	5290	MCS0	5.50	5.10

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
5.3G UNII_2A _1TX_ ANT 2	802.11a	52	5260	6	13.50	12.73
		56	5280		13.50	13.03
		64	5320		13.50	13.05
	802.11n HT20	52	5260	MCS0	13.00	12.70
		56	5280		13.00	12.96
		64	5320		13.00	12.98
	802.11n HT40	54	5270	MCS0	13.50	13.13
		62	5310		13.50	13.40
	802.11ac VHT20	52	5260	MCS0	13.50	12.75
		56	5280		13.50	12.96
		64	5320		13.50	13.02
	802.11ac VHT40	54	5270	MCS0	13.50	13.13
		62	5310		13.50	13.38
	802.11ax HE20	52	5260	MCS0	13.50	12.74
		56	5280		13.50	13.07
		64	5320		13.50	13.11
	802.11ax HE40	54	5270	MCS0	13.50	12.86
		62	5310		13.50	13.18
	802.11ac VHT80	58	5290	MCS0	13.50	13.48
	802.11ax HE80	58	5290	MCS0	13.00	12.93

Note: The tested channel results are marks in bold.

7.5 CONDUCTED POWER MEASUREMENTS OF WI-FI 5GHZ UNII_2C

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
5.6G UNII_2C _1TX_ANT 1	802.11a	100	5500	6	5.50	4.95
		120	5600		5.50	4.58
		140	5700		5.50	5.15
	802.11n HT20	100	5500	MCS0	5.50	4.81
		120	5600		5.50	4.53
		140	5700		5.50	5.17
	802.11n HT40	102	5510	MCS0	6.00	5.25
		118	5590		6.00	5.03
		134	5670		6.00	5.71
	802.11ac VHT20	100	5500	MCS0	5.50	5.06
		120	5600		5.50	4.44
		140	5700		5.50	5.1
	802.11ac VHT40	102	5510	MCS0	5.50	5.19
		118	5590		5.50	5.08
		134	5670		5.50	5.48
	802.11ax HE20	100	5500	MCS0	5.50	5
		120	5600		5.50	4.78
		140	5700		5.50	5.46
	802.11ax HE40	102	5510	MCS0	5.50	5.02
		118	5590		5.50	4.78
		134	5670		5.50	5.28
	802.11ac VHT80	106	5530	MCS0	5.50	5.15
		122	5610		5.50	5.25
	802.11ax HE80	106	5530	MCS0	5.00	4.81
		122	5610		5.00	4.71
	802.11ac VHT160	114	5570	MCS0	5.50	5.29
	802.11ax HE160	114	5570	MCS0	5.50	5.4

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
5.6G UNII_2C _1TX_ANT 2	802.11a	100	5500	6	12.50	12.34
		120	5600		12.50	11.97
		140	5700		12.50	12.24
	802.11n HT20	100	5500	MCS0	12.50	12.26
		120	5600		12.50	11.89
		140	5700		12.50	12.22
	802.11n HT40	102	5510	MCS0	13.00	12.57
		118	5590		13.00	12.25
		134	5670		13.00	12.35
	802.11ac VHT20	100	5500	MCS0	12.50	12.22
		120	5600		12.50	11.96
		140	5700		12.50	12.17
	802.11ac VHT40	102	5510	MCS0	13.00	12.54
		118	5590		13.00	12.24
		134	5670		13.00	12.34
	802.11ax HE20	100	5500	MCS0	12.50	12.29
		120	5600		12.50	11.99
		140	5700		12.50	12.2
	802.11ax HE40	102	5510	MCS0	12.50	12.26
		118	5590		12.50	11.96
		134	5670		12.50	12.07
	802.11ac VHT80	106	5530	MCS0	12.50	12.49
		122	5610		12.50	12.32
	802.11ax HE80	106	5530	MCS0	12.50	12.15
		122	5610		12.50	12
	802.11ac VHT160	114	5570	MCS0	12.50	12.39
	802.11ax HE160	114	5570	MCS0	12.50	12.26

Note: The tested channel results are marks in bold.

7.6 CONDUCTED POWER MEASUREMENTS OF WI-FI 5GHZ UNII_3

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
5.8G UNII_3 _1TX_ ANT 1	802.11a	149	5745	6	7.00	6.32
		157	5785		7.00	6.58
		165	5825		7.00	6.58
	802.11n HT20	149	5745	MCS0	6.50	6.18
		157	5785		6.50	6.38
		165	5825		6.50	6.39
	802.11n HT40	151	5755	MCS0	7.00	6.74
		159	5795		7.00	6.89
	802.11ac VHT20	149	5745	MCS0	7.00	6.33
		157	5785		7.00	6.54
		165	5825		7.00	6.44
	802.11ac VHT40	151	5755	MCS0	7.00	6.8
		159	5795		7.00	6.9
	802.11ax HE20	149	5745	MCS0	7.00	6.29
		157	5785		7.00	6.45
		165	5825		7.00	6.64
	802.11ax HE40	151	5755	MCS0	7.00	6.62
		159	5795		7.00	6.78
	802.11ac VHT80	155	5775	MCS0	7.00	6.93
	802.11ax HE80	155	5775	MCS0	6.50	6.44

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
5.8G UNII_3 _1TX_ ANT 2	802.11a	149	5745	6	13.50	12.55
		157	5785		13.50	12.67
		165	5825		13.50	13.07
	802.11n HT20	149	5745	MCS0	13.50	12.54
		157	5785		13.50	12.71
		165	5825		13.50	13.03
	802.11n HT40	151	5755	MCS0	13.50	12.95
		159	5795		13.50	13.06
	802.11ac VHT20	149	5745	MCS0	13.50	12.56
		157	5785		13.50	12.7
		165	5825		13.50	13.01
	802.11ac VHT40	151	5755	MCS0	13.50	12.9
		159	5795		13.50	13
	802.11ax HE20	149	5745	MCS0	13.50	13.12
		157	5785		13.50	12.82
		165	5825		13.50	13.1
	802.11ax HE40	151	5755	MCS0	13.00	12.69
		159	5795		13.00	12.78
	802.11ac VHT80	155	5775	MCS0	13.50	13.02
	802.11ax HE80	155	5775	MCS0	13.00	12.8

Note: The tested channel results are marks in bold.

7.7 CONDUCTED POWER MEASUREMENTS OF WI-FI 6GHZ UNII_5

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
U-NII-5 _1TX_ ANT 1	802.11ax HE20	1	5955	MCS0	4.50	4.39
		49	6195		4.50	4.3
		93	6415		4.50	4.37
	802.11ax HE40	3	5965	MCS0	6.00	5.69
		43	6165		6.00	5.62
		91	6405		6.00	5.81
	802.11ax HE80	7	5985	MCS0	6.00	5.58
		39	6145		6.00	5.47
		87	6385		6.00	5.82
	802.11ax HE160	15	6025	MCS0	6.50	5.98
		47	6185		6.50	6.17
		79	6345		6.50	6

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
U-NII-5 _1TX_ ANT 2	802.11ax HE20	1	5955	MCS0	6.00	5.75
		49	6195		6.00	5.31
		93	6415		6.00	5.59
	802.11ax HE40	3	5965	MCS0	9.00	8.76
		43	6165		9.00	8.43
		91	6405		9.00	8.54
	802.11ax HE80	7	5985	MCS0	9.00	8.79
		39	6145		9.00	8.47
		87	6385		9.00	8.78
	802.11ax HE160	15	6025	MCS0	9.00	8.96
		47	6185		9.00	8.98
		79	6345		9.00	8.97

Note: The tested channel results are marks in bold.

7.8 CONDUCTED POWER MEASUREMENTS OF WI-FI 6GHZ UNII_6

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
U-NII-6 _1TX_ ANT 1	802.11ax HE20	97	6435	MCS0	5.00	4.61
		105	6475		5.00	4.58
		113	6515		5.00	4.38
	802.11ax HE40	99	6445	MCS0	6.00	5.9
		107	6485		6.00	5.76
		115	6525		6.00	5.69
	802.11ax HE80	103	6465	MCS0	6.00	5.75
	802.11ax HE160	111	6505	MCS0	6.50	6.04

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
U-NII-6 _1TX_ ANT 2	802.11ax HE20	97	6435	MCS0	6.00	5.29
		105	6475		6.00	5.29
		113	6515		6.00	5.35
	802.11ax HE40	99	6445	MCS0	9.00	8.73
		107	6485		9.00	8.53
		115	6525		9.00	8.57
	802.11ax HE80	103	6465	MCS0	9.00	8.76
	802.11ax HE160	111	6505	MCS0	9.50	9.13

Note: The tested channel results are marks in bold.

7.9 CONDUCTED POWER MEASUREMENTS OF WI-FI 6GHZ UNII_7

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
U-NII-7 _1TX_ ANT 1	802.11ax HE20	117	6535	MCS0	4.00	3.54
		149	6695		4.00	3.56
		181	6855		4.00	3.59
	802.11ax HE40	115	6525	MCS0	6.00	5.95
		147	6685		6.00	5.74
		179	6845		6.00	5.88
	802.11ax HE80	135	6625	MCS0	6.00	5.79
		151	6705		6.00	5.66
		167	6785		6.00	5.89
	802.11ax HE160	143	6665	MCS0	6.50	6.1
		175	6825		6.50	6.4

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power (dBm)
U-NII-7 _1TX_ ANT 2	802.11ax HE20	117	6535	MCS0	5.00	4.6
		149	6695		5.00	4.54
		181	6855		5.00	4.6
	802.11ax HE40	115	6525	MCS0	8.00	7.66
		147	6685		8.00	7.39
		179	6845		8.00	7.64
	802.11ax HE80	135	6625	MCS0	9.00	8.54
		151	6705		9.00	8.37
		167	6785		9.00	8.49
	802.11ax HE160	143	6665	MCS0	9.00	8.63
		175	6825		9.00	8.91

Note: The tested channel results are marks in bold.

7.10 CONDUCTED POWER MEASUREMENTS OF WI-FI 6GHZ UNII_8

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power(dBm)
U-NII-8 _1TX_ANT 1	802.11ax HE20	185	6875	MCS0	4.00	3.47
		209	6995		4.00	3.73
		233	7115		4.00	3.54
	802.11ax HE40	187	6885	MCS0	6.00	5.57
		187	6965		6.00	5.6
		227	7085		6.00	5.82
	802.11ax HE80	183	6865	MCS0	6.00	5.62
		199	6945		6.00	5.46
		215	7025		6.00	5.77
	802.11ax HE160	207	6985	MCS0	6.50	6.14

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune-up	Average Power(dBm)
U-NII-8 _1TX_ANT 2	802.11ax HE20	185	6875	MCS0	4.50	4.47
		209	6995		4.50	4.48
		233	7115		4.50	4.4
	802.11ax HE40	187	6885	MCS0	8.00	7.62
		187	6965		8.00	7.71
		227	7085		8.00	7.6
	802.11ax HE80	183	6865	MCS0	9.00	8.73
		199	6945		9.00	8.6
		215	7025		9.00	8.79
	802.11ax HE160	207	6985	MCS0	9.00	8.98

Note: The tested channel results are marks in bold.

7.11 SAR TEST RESULTS

General Notes:

- 1) Per KDB447498 D04, all measurement SAR results are scaled to the maximum tune-up tolerance limit to demonstrate compliant.
- 2) Per KDB447498 D04, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is: ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz. When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel must be used.
- 3) Per KDB865664 D01, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg; if the deviation among the repeated measurement is $\leq 20\%$, and the measured SAR < 1.45 W/kg, only one repeated measurement is required.
- 4) Per KDB941225 D06, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
- 5) Per KDB648474 D04, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is ≤ 1.2 W/kg, no additional SAR evaluations using a headset are required.
- 6) Per KDB865664 D02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing.

WLAN Notes:

- 1) For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. 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. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
- 2) Justification for test configurations for WLAN per KDB Publication 248227 for 5GHZ WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed power. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2W/kg. See Section 7.1 for more information.

8 SAR TEST RESULTS

8.1 BODY SAR TEST RESULTS

Separation Distance (mm): 0mm

SAR test results of 2.4G WiFi

Test No.	Band	Channel	Test Position	Ant	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR (W/kg)
W01	802.11b	6	Front Face	Ant1	1M	99.24	14.50	14.03	0.07	0.122	0.059	0.137
W02	802.11b	6	Rear Face	Ant1	1M	99.24	14.50	14.03	0.01	0.082	0.044	0.092
W03	802.11b	6	Left Side	Ant1	1M	99.24	14.50	14.03	0	<0.001	<0.001	<0.001
W04	802.11b	6	Right Side	Ant1	1M	99.24	14.50	14.03	-0.07	1.030	0.349	1.156
W05	802.11b	6	Top Side	Ant1	1M	99.24	14.50	14.03	0	0.031	0.013	0.035
W06	802.11b	6	Bottom Side	Ant1	1M	99.24	14.50	14.03	0	0.026	0.012	0.029
W07	802.11b	1	Right Side	Ant1	1M	99.24	14.50	13.81	-0.03	0.825	0.319	0.974
W08	802.11b	11	Right Side	Ant1	1M	99.24	14.50	13.78	0.08	0.889	0.334	1.057
W10	802.11b	6	Front Face	Ant2	1M	98.28	15.5	15.37	-0.14	0.404	0.178	0.424
W11	802.11b	6	Rear Face	Ant2	1M	98.28	15.5	15.37	0.03	0.241	0.125	0.253
W12	802.11b	6	Left Side	Ant2	1M	98.28	15.5	15.37	0	<0.001	<0.001	<0.001
W13	802.11b	6	Right Side	Ant2	1M	98.28	15.5	15.37	0.04	0.518	0.225	0.543
W14	802.11b	6	Top Side	Ant2	1M	98.28	15.5	15.37	0	0.028	0.014	0.029
W15	802.11b	6	Bottom Side	Ant2	1M	98.28	15.5	15.37	-0.09	0.105	0.049	0.110
W16	802.11b	1	Right Side	Ant2	1M	98.28	15.5	14.99	0.07	0.471	0.202	0.539
W17	802.11b	11	Right Side	Ant2	1M	98.28	15.5	15.24	-0.07	0.496	0.211	0.536

Note: The value with boldface is the maximum SAR Value of each test band.

SAR test results of Bluetooth

Test No.	Band	Channel	Test Position	Ant	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR (W/kg)
W19	DH5	78	Front Face	Ant1	1M	100.00	7.5	7.39	0.08	0.056	0.020	0.057
W20	DH5	78	Rear Face	Ant1	1M	100.00	7.5	7.39	0.01	0.025	0.012	0.026
W21	DH5	78	Left Side	Ant1	1M	100.00	7.5	7.39	0	<0.001	<0.001	<0.001
W22	DH5	78	Right Side	Ant1	1M	100.00	7.5	7.39	0.05	0.319	0.108	0.327
W23	DH5	78	Top Side	Ant1	1M	100.00	7.5	7.39	0	<0.001	<0.001	<0.001
W24	DH5	78	Bottom Side	Ant1	1M	100.00	7.5	7.39	0	<0.001	<0.001	<0.001
W25	DH5	0	Right Side	Ant1	1M	100.00	7.5	6.29	0.08	0.235	0.076	0.311
W26	DH5	39	Right Side	Ant1	1M	100.00	7.5	6.93	0.05	0.271	0.085	0.309

Note: The value with boldface is the maximum SAR Value of each test band.

SAR test results of 5G WiFi

Test No.	Band	Channel	Test Position	Ant	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR (W/kg)
W28	802.11ac VHT40	46	Front Face	Ant1	MCS0	98.28	6	5.58	-0.06	0.183	0.055	0.205
W29	802.11ac VHT40	46	Rear Face	Ant1	MCS0	98.28	6	5.58	0.05	0.054	0.017	0.061
W30	802.11ac VHT40	46	Left Side	Ant1	MCS0	98.28	6	5.58	0	<0.001	<0.001	<0.001
W31	802.11ac VHT40	46	Right Side	Ant1	MCS0	98.28	6	5.58	0.01	0.986	0.193	1.105
W32	802.11ac VHT40	46	Top Side	Ant1	MCS0	98.28	6	5.58	0.04	<0.001	<0.001	<0.001
W33	802.11ac VHT40	46	Bottom Side	Ant1	MCS0	98.28	6	5.58	0.06	0.045	0.012	0.051
W33	802.11ac VHT40	38	Right Side	Ant1	MCS0	98.28	6	5.33	0.05	0.925	0.183	1.098
W35	802.11ax HE160	50	Front Face	Ant2	MCS0	98.00	13.5	13.16	0.12	0.130	0.048	0.143
W36	802.11ax HE160	50	Rear Face	Ant2	MCS0	98.00	13.5	13.16	0	1.080	0.398	1.192
W37	802.11ax HE160	50	Left Side	Ant2	MCS0	98.00	13.5	13.16	0	<0.001	<0.001	<0.001
W38	802.11ax HE160	50	Right Side	Ant2	MCS0	98.00	13.5	13.16	-0.06	0.464	0.180	0.512
W39	802.11ax HE160	50	Top Side	Ant2	MCS0	98.00	13.5	13.16	0.09	0.041	0.012	0.045
W40	802.11ax HE160	50	Bottom Side	Ant2	MCS0	98.00	13.5	13.16	0.01	0.345	0.132	0.381
W42	802.11ac VHT40	62	Front Face	Ant1	MCS0	98.28	6	5.55	0.06	0.287	0.068	0.324
W43	802.11ac VHT40	62	Rear Face	Ant1	MCS0	98.28	6	5.55	0.13	0.045	0.014	0.050
W44	802.11ac VHT40	62	Left Side	Ant1	MCS0	98.28	6	5.55	0	<0.001	<0.001	<0.001
W45	802.11ac VHT40	62	Right Side	Ant1	MCS0	98.28	6	5.55	-0.05	1.080	0.230	1.219
W46	802.11ac VHT40	62	Top Side	Ant1	MCS0	98.28	6	5.55	-0.08	0.051	0.008	0.058
W47	802.11ac VHT40	62	Bottom Side	Ant1	MCS0	98.28	6	5.55	-0.01	0.033	0.005	0.037
W48	802.11ac VHT40	54	Right Side	Ant1	MCS0	98.28	6	5.43	0.04	1.010	0.219	1.172
W50	802.11ac VHT80	58	Front Face	Ant2	MCS0	98.00	13.5	13.48	-0.08	0.176	0.059	0.180
W51	802.11ac VHT80	58	Rear Face	Ant2	MCS0	98.00	13.5	13.48	0	1.060	0.389	1.087
W52	802.11ac VHT80	58	Left Side	Ant2	MCS0	98.00	13.5	13.48	0	<0.001	<0.001	<0.001
W53	802.11ac VHT80	58	Right Side	Ant2	MCS0	98.00	13.5	13.48	0.03	0.457	0.173	0.468
W54	802.11ac VHT80	58	Top Side	Ant2	MCS0	98.00	13.5	13.48	-0.06	0.063	0.011	0.065
W55	802.11ac VHT80	58	Bottom Side	Ant2	MCS0	98.00	13.5	13.48	0.05	0.371	0.135	0.380
W57	802.11n HT40	134	Front Face	Ant1	MCS0	98.28	6	5.71	0	0.206	0.060	0.224
W58	802.11n HT40	134	Rear Face	Ant1	MCS0	98.28	6	5.71	-0.12	0.051	0.012	0.055
W59	802.11n HT40	134	Left Side	Ant1	MCS0	98.28	6	5.71	0	<0.001	<0.001	<0.001
W60	802.11n HT40	134	Right Side	Ant1	MCS0	98.28	6	5.71	0.08	0.844	0.164	0.918
W61	802.11n HT40	134	Top Side	Ant1	MCS0	98.28	6	5.71	0.06	0.049	0.012	0.053
W62	802.11n HT40	134	Bottom Side	Ant1	MCS0	98.28	6	5.71	0.15	0.046	0.008	0.050
W63	802.11n HT40	102	Right Side	Ant1	MCS0	98.28	6	5.25	0.06	0.901	0.177	1.090
W64	802.11n HT40	118	Right Side	Ant1	MCS0	98.28	6	5.03	0.01	0.789	0.152	1.004
W66	802.11n HT40	102	Front Face	Ant2	MCS0	98.00	13	12.57	0.08	0.087	0.033	0.098
W67	802.11n HT40	102	Rear Face	Ant2	MCS0	98.00	13	12.57	0	1.110	0.398	1.251
W68	802.11n HT40	102	Left Side	Ant2	MCS0	98.00	13	12.57	0	<0.001	<0.001	<0.001
W69	802.11n HT40	102	Right Side	Ant2	MCS0	98.00	13	12.57	0.03	0.476	0.174	0.536
W70	802.11n HT40	102	Top Side	Ant2	MCS0	98.00	13	12.57	-0.09	0.069	0.019	0.078
W71	802.11n HT40	102	Bottom Side	Ant2	MCS0	98.00	13	12.57	0.07	0.292	0.109	0.329
W72	802.11n HT40	134	Rear Face	Ant2	MCS0	98.00	13	12.25	-0.07	1.03	0.375	1.249
W73	802.11n HT40	118	Rear Face	Ant2	MCS0	98.00	13	12.35	0.08	1.04	0.379	1.233

Test No.	Band	Channel	Test Position	Ant	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR (W/kg)
W75	802.11ac VHT80	155	Front Face	Ant1	MCS0	98.28	7	6.93	-0.06	0.251	0.083	0.260
W76	802.11ac VHT80	155	Rear Face	Ant1	MCS0	98.28	7	6.93	-0.03	0.050	0.019	0.052
W77	802.11ac VHT80	155	Left Side	Ant1	MCS0	98.28	7	6.93	0	<0.001	<0.001	<0.001
W78	802.11ac VHT80	155	Right Side	Ant1	MCS0	98.28	7	6.93	0.06	1.100	0.234	1.137
W79	802.11ac VHT80	155	Top Side	Ant1	MCS0	98.28	7	6.93	0.07	0.036	0.013	0.037
W80	802.11ac VHT80	155	Bottom Side	Ant1	MCS0	98.28	7	6.93	0.01	0.057	0.009	0.058
W82	802.11ax HE20	149	Front Face	Ant2	MCS0	98.00	13.5	13.12	-0.11	0.087	0.029	0.097
W83	802.11ax HE20	149	Rear Face	Ant2	MCS0	98.00	13.5	13.12	0.09	0.883	0.327	0.983
W84	802.11ax HE20	149	Left Side	Ant2	MCS0	98.00	13.5	13.12	0	<0.001	<0.001	<0.001
W85	802.11ax HE20	149	Right Side	Ant2	MCS0	98.00	13.5	13.12	-0.04	0.388	0.131	0.432
W86	802.11ax HE20	149	Top Side	Ant2	MCS0	98.00	13.5	13.12	0.02	0.041	0.013	0.046
W87	802.11ax HE20	149	Bottom Side	Ant2	MCS0	98.00	13.5	13.12	0.01	0.266	0.095	0.296
W88	802.11ax HE20	165	Rear Face	Ant2	MCS0	98.00	13.5	13.1	0.09	0.894	0.329	1.000
W89	802.11ax HE20	157	Rear Face	Ant2	MCS0	98.00	13.5	12.82	0	0.978	0.355	1.167

Note: The value with boldface is the maximum SAR Value of each test band.

SAR test results of 6E WiFi

Test No.	Band	Channel	Test Position	Ant	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR (W/kg)
W91	802.11ax HE160	47	Front Face	Ant1	MCS0	98.56	6.5	6.17	0.03	0.239	0.071	0.262
W92	802.11ax HE160	47	Rear Face	Ant1	MCS0	98.56	6.5	6.17	-0.05	0.039	0.013	0.043
W93	802.11ax HE160	47	Left Side	Ant1	MCS0	98.56	6.5	6.17	0	<0.001	<0.001	<0.001
W94	802.11ax HE160	47	Right Side	Ant1	MCS0	98.56	6.5	6.17	0.02	0.950	0.212	1.040
W95	802.11ax HE160	47	Top Side	Ant1	MCS0	98.56	6.5	6.17	-0.02	0.029	0.009	0.031
W96	802.11ax HE160	47	Bottom Side	Ant1	MCS0	98.56	6.5	6.17	-0.19	0.042	0.009	0.046
W97	802.11ax HE160	15	Right Side	Ant1	MCS0	98.56	6.5	5.98	0.03	0.896	0.192	1.025
W98	802.11ax HE160	79	Right Side	Ant1	MCS0	98.56	6.5	6	-0.01	0.814	0.187	0.927
W100	802.11ax HE160	47	Front Face	Ant2	MCS0	98.57	9	8.98	-0.09	0.0468	0.0121	0.048
W101	802.11ax HE160	47	Rear Face	Ant2	MCS0	98.57	9	8.98	-0.01	0.368	0.116	0.375
W102	802.11ax HE160	47	Left Side	Ant2	MCS0	98.57	9	8.98	0	<0.001	<0.001	<0.001
W103	802.11ax HE160	47	Right Side	Ant2	MCS0	98.57	9	8.98	0.06	0.106	0.0383	0.108
W104	802.11ax HE160	47	Top Side	Ant2	MCS0	98.57	9	8.98	0	<0.001	<0.001	<0.001
W105	802.11ax HE160	47	Bottom Side	Ant2	MCS0	98.57	9	8.98	-0.05	0.0936	0.0299	0.095
W106	802.11ax HE160	15	Rear Face	Ant2	MCS0	98.57	9	8.96	-0.02	0.345	0.106	0.353
W107	802.11ax HE160	79	Rear Face	Ant2	MCS0	98.57	9	8.97	0.12	0.357	0.112	0.365
W109	802.11ax HE160	111	Front Face	Ant1	MCS0	98.56	6.5	6.04	0.09	0.363	0.092	0.409
W110	802.11ax HE160	111	Rear Face	Ant1	MCS0	98.56	6.5	6.04	-0.13	0.088	0.021	0.099
W111	802.11ax HE160	111	Left Side	Ant1	MCS0	98.56	6.5	6.04	0	<0.001	<0.001	<0.001
W112	802.11ax HE160	111	Right Side	Ant1	MCS0	98.56	6.5	6.04	-0.02	0.843	0.192	0.951
W113	802.11ax HE160	111	Top Side	Ant1	MCS0	98.56	6.5	6.04	0.02	0.050	0.000	0.056
W114	802.11ax HE160	111	Bottom Side	Ant1	MCS0	98.56	6.5	6.04	0	<0.001	<0.001	<0.001
W116	802.11ax HE160	111	Front Face	Ant2	MCS0	98.57	9.5	9.13	0.19	0.0521	0.0172	0.058
W117	802.11ax HE160	111	Rear Face	Ant2	MCS0	98.57	9.5	9.13	-0.02	0.405	0.119	0.447
W118	802.11ax HE160	111	Left Side	Ant2	MCS0	98.57	9.5	9.13	0	<0.001	<0.001	<0.001
W119	802.11ax HE160	111	Right Side	Ant2	MCS0	98.57	9.5	9.13	0.11	0.16	0.0518	0.177
W120	802.11ax HE160	111	Top Side	Ant2	MCS0	98.57	9.5	9.13	0.05	0.0643	0.0124	0.071
W121	802.11ax HE160	111	Bottom Side	Ant2	MCS0	98.57	9.5	9.13	0.14	0.102	0.0316	0.113
W123	802.11ax HE160	175	Front Face	Ant1	MCS0	98.56	6.5	6.4	0.1	0.355	0.084	0.369
W124	802.11ax HE160	175	Rear Face	Ant1	MCS0	98.56	6.5	6.4	0.04	0.044	0.007	0.046
W125	802.11ax HE160	175	Left Side	Ant1	MCS0	98.56	6.5	6.4	0	<0.001	<0.001	<0.001
W126	802.11ax HE160	175	Right Side	Ant1	MCS0	98.56	6.5	6.4	0.09	0.545	0.132	0.566
W127	802.11ax HE160	175	Top Side	Ant1	MCS0	98.56	6.5	6.4	-0.04	0.041	0.009	0.043
W128	802.11ax HE160	175	Bottom Side	Ant1	MCS0	98.56	6.5	6.4	-0.02	0.047	0.010	0.048
W129	802.11ax HE160	143	Right Side	Ant1	MCS0	98.56	6.5	6.1	-0.14	0.713	0.159	0.793
W131	802.11ax HE160	175	Front Face	Ant2	MCS0	98.57	9	8.91	0.1	0.0565	0.0185	0.059
W132	802.11ax HE160	175	Rear Face	Ant2	MCS0	98.57	9	8.91	0.05	0.398	0.128	0.412
W133	802.11ax HE160	175	Left Side	Ant2	MCS0	98.57	9	8.91	0	<0.001	<0.001	<0.001
W134	802.11ax HE160	175	Right Side	Ant2	MCS0	98.57	9	8.91	0.05	0.183	0.0586	0.190
W135	802.11ax HE160	175	Top Side	Ant2	MCS0	98.57	9	8.91	-0.19	0.0419	0.0087	0.043
W136	802.11ax HE160	175	Bottom Side	Ant2	MCS0	98.57	9	8.91	0.11	0.078	0.0273	0.081
W137	802.11ax HE160	143	Rear Face	Ant2	MCS0	98.57	9	8.63	0.04	0.436	0.126	0.482

Test No.	Band	Channel	Test Position	Ant	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR (W/kg)
W139	802.11ax HE160	207	Front Face	Ant1	MCS0	98.56	6.5	6.14	0.19	0.271	0.072	0.299
W140	802.11ax HE160	207	Rear Face	Ant1	MCS0	98.56	6.5	6.14	0.02	0.050	0.014	0.055
W141	802.11ax HE160	207	Left Side	Ant1	MCS0	98.56	6.5	6.14	0	<0.001	<0.001	<0.001
W142	802.11ax HE160	207	Right Side	Ant1	MCS0	98.56	6.5	6.14	-0.01	0.589	0.134	0.649
W143	802.11ax HE160	207	Top Side	Ant1	MCS0	98.56	6.5	6.14	0.04	0.040	0.010	0.045
W144	802.11ax HE160	207	Bottom Side	Ant1	MCS0	98.56	6.5	6.14	-0.14	0.052	0.011	0.057
W146	802.11ax HE160	207	Front Face	Ant2	MCS0	98.57	9	8.98	0.09	0.0526	0.0167	0.054
W147	802.11ax HE160	207	Rear Face	Ant2	MCS0	98.57	9	8.98	0.06	0.416	0.127	0.424
W148	802.11ax HE160	207	Left Side	Ant2	MCS0	98.57	9	8.98	0	<0.001	<0.001	<0.001
W149	802.11ax HE160	207	Right Side	Ant2	MCS0	98.57	9	8.98	0.04	0.145	0.0482	0.148
W150	802.11ax HE160	207	Top Side	Ant2	MCS0	98.57	9	8.98	0.02	0.0677	0.0157	0.069
W151	802.11ax HE160	207	Bottom Side	Ant2	MCS0	98.57	9	8.98	0.17	0.0795	0.0255	0.081

Note: The value with boldface is the maximum SAR Value of each test band.

Power Density results of 6E WiFi

System&Position						SAR									Power Density							
Test No.	Band	Channel	Test Position	Separation Distance (mm)	Ant	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR	APD W/m² (4cm²)	Grid Size (λ)	Scaling Factor for Measurement Uncertainty	Averaging Area (cm²)	Power Drift (dB)	Normal PsPd (W/m²)	Scaling Normal PsPd (W/m²)	Total PsPd (W/m²)	Scaling Total PsPd (W/m²)
W94	802.11axHE160	47	Right Side	0	Ant1	MCS0	98.56%	6.5	6.17	0.02	0.950	0.212	1.040	5.1	0.0625	1.55	4	-0.03	2.54	4.320	3.73	6.34
W137	802.11axHE160	143	Rear Face	0	Ant2	MCS0	98.57%	9	8.63	0.04	0.436	0.126	0.482	2.9	0.0625	1.55	4	-0.01	1.39	2.386	2.75	4.72

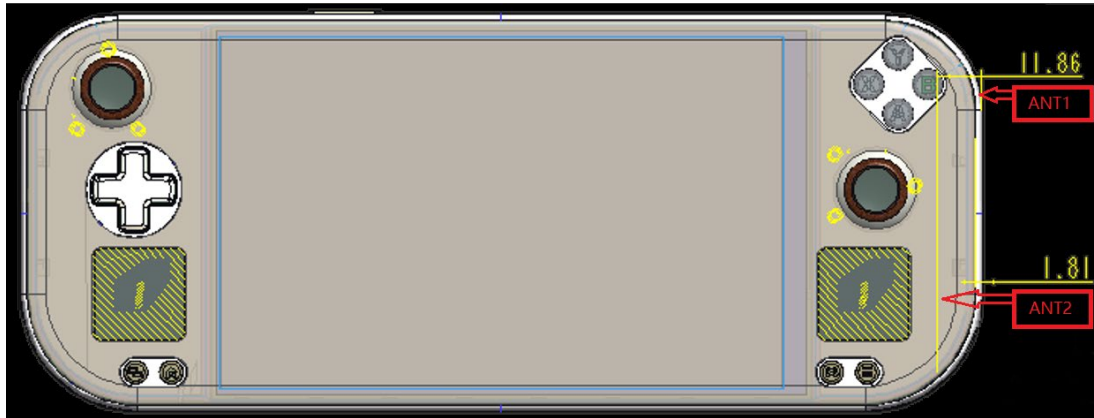
Note:

- 1) Chose the worst case of WiFi 6E to test power density.
- 2) This device is in compliance with power density for general population or uncontrolled exposure limits, and has been tested in accordance with the measurement methods and procedures specified in IEC/IEEE 63195-1.

9 MULTIPLE TRANSMITTER EVALUATION

The following tables list information which is relevant for the decision if a simultaneous transmit evaluation is necessary according to FCC KDB 447498 D04 Interim General RF Exposure Guidance v01.

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



Unit: mm

9.1 SIMULTANEOUS TRANSMISSION CONDITIONS

Per FCC KDB447498 D04, SAR compliance for simultaneous transmission must be considered when the maximum duration of overlapping transmissions, including network hand-offs, is greater than 30 seconds. This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis.

The Simultaneous Transmission Possibilities of this device are as below:

NO.	Simultaneous Tx Combination	Body
1	WiFi 2.4G (Ant 1)	Yes
2	WiFi 5G (Ant 1)	Yes
3	WiFi 6E (Ant 1)	Yes
4	BT (Ant 1)	Yes
5	WiFi 2.4G (Ant 2)	Yes
6	WiFi 5G (Ant 2)	Yes
7	WiFi 6E (Ant 2)	Yes
8	WiFi 2.4G (Ant 1) + BT (Ant 1)	Yes
9	WiFi 5G (Ant 1) + BT (Ant 1)	Yes
10	WiFi 6E (Ant 1) + BT (Ant 1)	Yes

Note: Only the Ant 1 supports BT function.

9.2 SAR UMMATION SCENARIO

	Position	Body SAR1g(W/Kg)					
		Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
ANT 1	802.11b	0.137	0.092	<0.001	1.156	0.035	0.029
	5.2G	0.205	0.061	<0.001	1.105	<0.001	0.051
	5.3G	0.324	0.050	<0.001	1.219	0.058	0.037
	5.6G	0.224	0.055	<0.001	1.090	0.053	0.050
	5.8G	0.260	0.052	<0.001	1.137	0.037	0.058
	6G	0.409	0.099	<0.001	1.040	0.056	0.057
	Bluetooth	0.057	0.026	<0.001	0.327	<0.001	<0.001
ANT 2	802.11b	0.424	0.253	<0.001	0.543	0.029	0.110
	5.2G	0.143	1.192	<0.001	0.512	0.045	0.381
	5.3G	0.180	1.087	<0.001	0.468	0.065	0.380
	5.6G	0.098	1.251	<0.001	0.536	0.078	0.329
	5.8G	0.097	1.167	<0.001	0.432	0.046	0.296
	6G	0.059	0.482	<0.001	0.190	0.071	0.113
	Max. SAR Summation	0.424	1.251	0.000	1.219	0.078	0.381

	Position	Body SAR1g(W/Kg)					
		Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
ANT 1	802.11b	0.137	0.092	<0.001	1.156	0.035	0.029
	5.2G	0.205	0.061	<0.001	1.105	<0.001	0.051
	5.3G	0.324	0.050	<0.001	1.219	0.058	0.037
	5.6G	0.224	0.055	<0.001	1.090	0.053	0.050
	5.8G	0.260	0.052	<0.001	1.137	0.037	0.058
	6.5G	0.409	0.099	<0.001	1.040	0.056	0.057
	Bluetooth	0.057	0.026	<0.001	0.327	<0.001	<0.001
	Max. SAR Summation	0.466	0.125	<0.001	1.546	0.058	0.058

Note:

- 1) MAX. $\sum \text{SAR}_{1g} < 1.6 \text{ W/Kg}$, the SAR to peak location separation ratio should not be considered, otherwise, see section 7.3.3 for more information.
- 2) The highest simultaneous SAR value = 1.546 W/Kg, per KDB690783 D01.

10 TEST LAYOUT

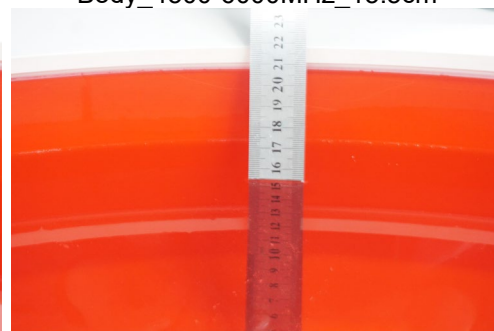
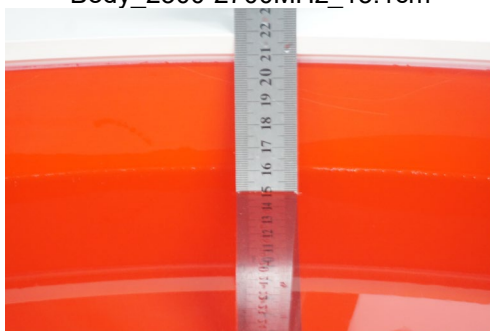
Specific Absorption Rate Test Layout



Liquid depth in the flat Phantom ($\geq 15\text{cm}$ depth)

Body_2300-2700MHz_15.1cm

Body_4500-6000MHz_15.5cm



Appendix A.SAR Plots of System Verification

(Pls See BTL-FCC SAR-1-2504C276_Appendix A.)

Appendix B.SAR Plots of SAR Measurement

(Pls See BTL-FCC SAR-1-2504C276_Appendix B.)

Appendix C.Calibration Certificate

(Pls See BTL-FCC SAR-1-2504C276_Appendix C.)

Appendix D.Photographs of the Test Set-Up

(Pls See BTL-FCC SAR-1-2504C276_Appendix D.)

End of Test Report