FCC SAR Test Report

FCC ID: 2ADUTLGPAU0F

Project No.	:	2401C089
Equipment	:	AXE3000 WIFI 6E USB ADAPTER WITH DUAL ANTENNAS
Brand Name	:	Panda Wireless
Test Model	:	PAU0F
Series Model	:	IGU0F
Date of Receipt	:	Jan. 08, 2024
Date of Test	:	Feb. 01, 2024 ~ Mar. 06, 2024, Apr. 24, 2024
Issued Date	:	Apr. 26, 2024
Report Version	:	R02
Test Sample	:	Engineering Sample No.: SSL20240108196
Standard(s)	:	Please refer to page 2.
Applicant	:	Panda Wireless, Inc.
Address	:	15559 Union Ave., Suite 300, Los Gatos , CA95032, USA
Manufacturer	:	Panda Wireless, Inc.
Address	:	15559 Union Ave., Suite 300, Los Gatos , CA95032, USA
Factory	:	Panda Wireless, Inc.
Address	:	15559 Union Ave., Suite 300, Los Gatos , CA95032, USA

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

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

KDB447498 D04 Interim General RF Exposure Guidance v01
KDB447498 D02 SAR Procedures for Dongle Xmtr v02
KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
KDB865664 D02 SAR Reporting v01r02

IEC/IEEE 62209-1528 Ed. 1.0 (2020-10) 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)

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** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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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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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCC SAR-1-2401C089	R00	Original Report.	Apr. 08, 2024	Invalid
BTL-FCC SAR-1-2401C089	R01	Modified the comments of TCB.	Apr. 25, 2024	Invalid
BTL-FCC SAR-1-2401C089	R02	Modified the comments of TCB.	Apr. 26, 2024	Valid

1. GENERAL INFORMATION

1.1 STATEMENT OF COMPLIANCE

Mode	Highest Reported Body SAR-1g(W/kg)
WLAN 2.4G	1.511
WLAN 5.2G	1.295
WLAN 5.3G	1.471
WLAN 5.6G	1.380
WLAN 5.8G	1.387
WLAN 6E	0.306

Frequency Band	Highest Averaged Power Density (mW/cm^2)
WLAN 6E	0.795

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 C95.1:1992/IEEE C95.1:1991, 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 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/cm^2 (equal to 10 W/m^2) for frequency up to100 GHz.

1.2 LABORATORY ENVIRONMENT

Temperature	Min. = 20ºC, Max. = 24ºC
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	AXE3000 WIFI 6E USB ADAPTER WITH DUAL ANTENNAS
Brand Name	Panda Wireless
Test Model	PAU0F
Series Model	IGU0F
Model Difference(s)	Only the model name is different, the product is the same.
Hardware Version	V1.0
Software Version	V1.0
Modulation	WiFi(DSSS/OFDM/OFDMA)

Operation Frequency Range(s)

Band			TX (MHz)	RX (MHz)
WiFi	2.4G		2400~2483.5	
	5G	UNII 1	5150~5250	
		UNII 2a	5250~5350	
		UNII 2c	5470~5725	
		UNII 3	5725~5850	
	6E	UNII 5	5925~6425	
		UNII 6	6425~6525	
		UNII 7	6525~6875	
		UNII 8	6875~7125	

Test Channels (low-mid-high)

1-6-11-12-13 (2.4G WIFI 802.11b/g/n HT20/ax HE20)

3-6-9 (2.4G WIFI 802.11n HT40/ax HE40)

Band	UNII 1	UNII 2a	UNII 2c	UNII 3	UNII 5	UNII 6	UNII 7	UNII 8
802.11a	36-40-44-48	52-56-60-64	100-104-108-112-116-132-136-140	149-153-157-161-165	1-45-93	97-105-113	117-149-181-185	189-213-233
802.11n HT20					/	/	/	/
802.11ac VHT20					/	/	/	/
802.11ax HE20					1-45-93	97-105-113	117-149-181-185	189-213-233
802.11n HT40	38-46	54-62	102-110-118-126-134	151-159	/	/	/	/
802.11ac VHT40					/	/	/	/
802.11ax HE40					3-43-91	99-107-115	123-147-179-187	195-211-227
802.11ac VHT80	42	58	106-122	155	/	/	/	/
802.11ax HE80					7-39-87	103-119	135-151-167	183-199-215

Antenna Information

Ant.	Manufacturer	P/N	Type	Band	Gain (dBi)
Ant Main / Ant Aux	Shenzhen Shengtuo Electronic Technology Co., Ltd	N/A	PCB	2400	2.24
				2500	2.80
				5150	3.26
				5850	3.65
				7125	3.48

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	1717	Apr. 10, 2023	1 Year
2	Data Acquisition Electronics	Speag	DAE4	905	Jun. 26, 2023	1 Year
3	E-field Probe	Speag	EX3DV4	7693	Oct. 31, 2023	1 Year
4	E-field Probe	Speag	EUmmWV4	9626	May 17, 2023	1 Year
5	System Validation Dipole	Speag	D2450V2	919	May 28, 2021	3 Years
6	System Validation Dipole	Speag	D5GHzV2	1160	May 27, 2021	3 Years
7	System Validation Dipole	Speag	D6.5GHzV2	1052	Nov. 01, 2021	3 Years
8	ELI Phantom	Speag	ELI Phantom V5.0	1222	N/A	N/A
9	ELI Phantom	Speag	ELI Phantom V5.0	1128	N/A	N/A
10	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1469	N/A	N/A
11	Power Amplifier	Mini-Circuits	ZVE-8G+	520701341	Jan. 20, 2024	1 Year
12	DC Source metter	Iteck	IT6154	0061041267682 01001	Jul. 08, 2023	1 Year
13	Vector Network Analyzer	Agilent	E5071C	MY46102965	Jan. 20, 2024	1 Year
14	Signal Generator	Keysight	N5173B	MY59101420	Jan. 20, 2024	1 Year
15	Smart Power Sensor	R&S	NRP18S	726174	Jun. 12, 2023	1 Year
16	Smart Power Sensor	R&S	NRP-Z21	102209	May 25, 2023	1 Year
17	3.5mm Economy Calibration Kit	Agilent	85052D	MY43252246	Nov. 10, 2023	1 Year
18	Dielectric Assessment Kit	Speag	DAK-3.5	1226	Jan. 24, 2022	3 Years
19	Directional Coupler	Talent Microwave	TC-05180-20S	210628013	Jan. 20, 2024	1 Year
20	Digital Themometer	TES	TES-1310	210706071	Nov. 03, 2023	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.
3. The last used date of DAE(S/N: 1717) is Mar. 06, 2024, within the validation validity period.

2. RF EMISSIONS MEASUREMENT

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is SAR room at the location of Room 108, Building 2, No.1, Yile Road, Songshan Lake Zone, Dongguan City, Guangdong, People's Republic of China.
BTL's Registration Number for FCC: 747969
BTL's Designation Number for FCC: CN1377.

2.2 MEASUREMENT UNCERTAINTY

Uncertainty Budget for Frequency range of 300 MHz to 3 GHz

Symbol	Input quantity *Xi* (source of uncertainty)	Unc. Value	Prob. Dist.	Div.	ci (1g)	ci (10g)	Std.Unc. (1g) (±%)	Std.Unc. (10g) (±%)
Measurement system errors								
CF	Probe calibration(±%)	12.0	N	2	1	1	6.0	6.0
***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
D*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.)(±%)	2.5	N	1	0.78	0.71	2.0	1.8
***LIQ*(*Tc*)**	Conductivity (temp.)(±%)	3.3	R	$\sqrt{3}$	0.78	0.71	1.5	1.4
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
Dxyz	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*(*εϕ*,*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*(D*SAR*)**	Combined uncertainty						10.2	10.1
	Coverage Factor for 95%						k=2	k=2
U	Expanded uncertainty					*U* =	20.4	20.2
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 *Xi* (source of uncertainty)	Unc. Value	Prob. Dist.	Div.	ci (1g)	ci (10g)	Std.Unc. (1g) (±%)	Std.Unc. (10g) (±%)
Measurement system errors								
CF	Probe calibration(±%)	14.0	N	2	1	1	7.0	7.0
***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
D*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.)(±%)	2.5	N	1	0.78	0.71	2.0	1.8
***LIQ*(*Tc*)**	Conductivity (temp.)(±%)	3.4	R	$\sqrt{3}$	0.78	0.71	1.5	1.4
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
Dxyz	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*(*εϕ*,*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*(D*SAR*)**	Combined uncertainty						11.2	11.1
	Coverage Factor for 95%						k=2	k=2
U	Expanded uncertainty					*U* =	22.4	22.2

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 Xi (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
Δxyz	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 (±%)	2.5	N	1	0.78	0.71	2.0	1.8
LIQ(Tc)	Conductivity (temp.)(±%)	2.4	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
Dxyz	Device Positioning(±%)	1	N	1	1	1	1.0	1.0
H	Device Holder(±%)	3.6	N	1	1	1	3.6	3.6
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(±%)	2.5	N	1	1	1	2.5	2.5
VAL	Val Antenna Unc.(±%)	0	N	1	1	1	0.0	0.0
Pin	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	Ö3	1	1	0.0	0.0
μ(ΔSAR)	Combined uncertainty						14.1	14.0
	Coverage Factor for 95%						K=2	K=2
U	Expanded uncertainty					U =	28.1	28.0

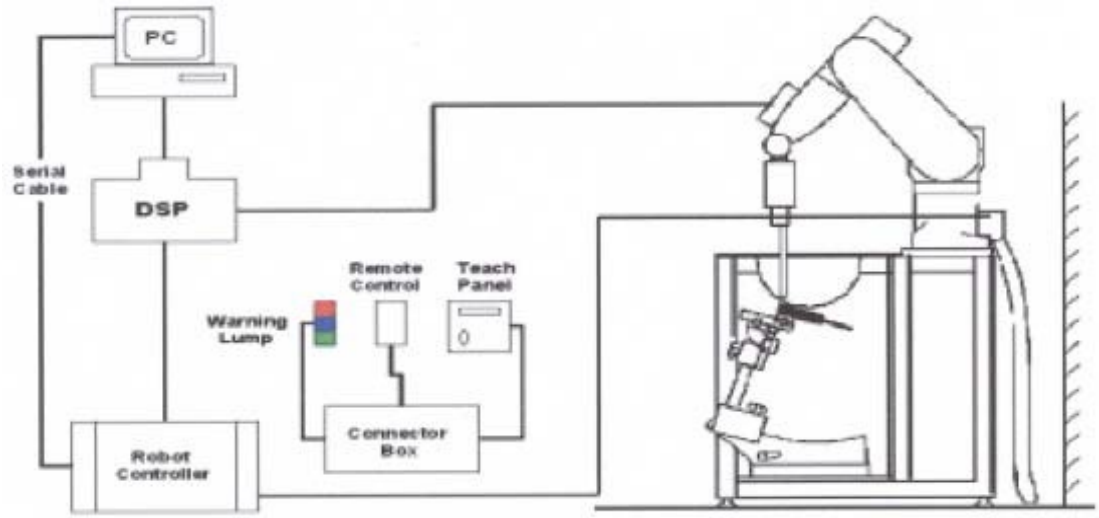
3. SAR MEASUREMENTS SYSTEM CONFIGURATION

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. TheDASY5 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 dosimetrice valuation.

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 µW/g to > 100 mW/g Linearity:± 0.2dB
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

Eachprobeiscalibratedaccordingtoadosimetricassessmentprocedurewithaccuracybetterthan±10%. The spherical isotropy was evaluatedandfoundtobebetterthan±0.25dB. 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 bellow 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 thermistor-based temperature probe is used in conjunction with the E-field probe.

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

Where: Δt=Exposure time (30 seconds),

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

ΔT=Temperature increase due to RF exposure.

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

Where: σ=Simulated tissue conductivity,

ρ=Tissue density (kg/m3).

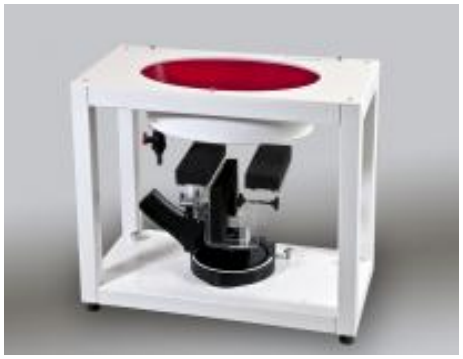
3.2.3 OTHER TEST EQUIPMENT

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 lightweight 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. 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	
Aailable	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. ± 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 ± 0.1mm). 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 ± 30°.)

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

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.

Perform tests for bands above 6G using the test Settings required by IEC/IEEE 62209-1528:2020 according to April 2021 TCB Workshop requirements.

Table 3 – Area scan parameters

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	3 GHz $< f \leq 10$ GHz
Maximum distance between the measured points (geometric centre of the sensors) and the inner phantom surface (z_{M1} in Figure 20 in mm)	5 ± 1	$\delta \ln(2)/2 \pm 0{,}5$ [a]
Maximum spacing between adjacent measured points in mm (see O.8.3.1)[b]	20, or half of the corresponding zoom scan length, whichever is smaller	$60/f$, or half of the corresponding zoom scan length, whichever is smaller
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)[c]	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Tolerance in the probe angle	1°	1°

[a] δ is the penetration depth for a plane-wave incident normally on a planar half-space.

[b] See Clause O.8 on how Δx and Δy may be selected for individual area scan requirements.

[c] The probe angle relative to the phantom surface normal is restricted due to the degradation in the measurement accuracy in fields with steep spatial gradients. The measurement accuracy decreases with increasing probe angle and increasing frequency. This is the reason for the tighter probe angle restriction at frequencies above 3 GHz.

Table 4 – Zoom scan parameters

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	3 GHz $< f \leq 10$ GHz
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 20 and Table 3, in mm)	5	$\delta \ln(2)/2$ [a]
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Maximum spacing between measured points in the x- and y-directions (Δx and Δy, in mm)	8	$24/f$ [b]
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	5	$10/(f-1)$
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	4	$12/f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 20)	1,5	1,5
Minimum edge length of the zoom scan volume in the x- and y-directions (L_z in O.8.3.2, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in O.8.3.2 in mm)	30	22
Tolerance in the probe angle	1°	1°

[a] δ is the penetration depth for a plane-wave incident normally on a planar half-space.

[b] This is the maximum spacing allowed, which might not work for all circumstances.

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:

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

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

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

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

$[mV/(V/m)^2]$for E-field Probes

ConvF = sensitivity enhancement in solution

aij=sensor sensitivity factors for H-field probes

f=carrier frequency [GHz]

E_i=electric field strength of channel i in V/m

H_i= magnetic field strength of channel i in A/m

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

$$E_{tot} = (E_X^2 + E_Y^2 + E_Z^2)^{1/2}$$

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

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

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/cm^3

Note that the density is normally set to 1(or1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

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

With P_{pwe}= equivalent power density of a plane wave in mW/cm^2

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 of the dielectic parameter are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within ± 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. (℃)	Conductivity (σ)	Permittivity (εr)	Targeted Conductivity (σ)	Targeted Permittivity (εr)	Deviation Conductivity (σ) (%)	Deviation Permittivity (εr) (%)	Date
Head	2450	22.5	1.822	39.968	1.80	39.2	1.20	1.96	Feb. 01, 2024
Head	5250	21.4	4.758	35.487	4.71	36.0	1.02	-1.29	Feb. 22, 2024
Head	5600	21.7	5.254	34.995	5.07	35.5	3.63	-1.42	Feb. 23, 2024
Head	5750	21.9	5.217	34.363	5.22	35.4	-0.06	-2.79	Mar. 06, 2024
Head	6500	22.1	5.872	33.645	6.07	34.5	-3.26	-2.48	Feb. 29, 2024
Head	6500	22.2	5.910	33.400	6.07	34.5	-2.64	-3.19	Apr. 24, 2024

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 IEEE 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	Feb. 01, 2024	2450	52.10	12.60	50.40	-3.26	919
Head	Feb. 22, 2024	5250	78.00	7.65	76.50	-1.92	1160
Head	Feb. 23, 2024	5600	80.60	8.06	80.60	0.00	1160
Head	Mar. 06, 2024	5750	76.50	7.40	74.00	-3.27	1160
Head	Feb. 29, 2024	6500	290.00	27.10	271.00	-6.55	1052
Head	Apr. 24, 2024	6500	290.00	28.30	283.00	-2.41	1052

4.3 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 ±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).

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

or

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

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

where

$psPD_{tgt}$ is the target value, derived from repeated measurement of source antenna, normalized to 0 dBm TRP;

$u_{antenna_cal}$ is the standard uncertainty (k = 1) of the $psPD$ of the antenna model;

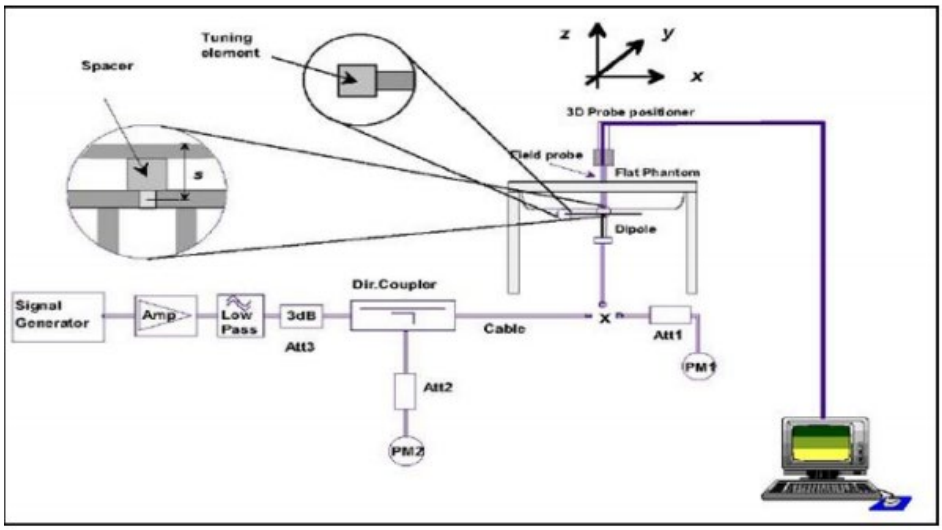
u_{power} is the standard uncertainty (k = 1) of the measured TRP (see Clause A.2);

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 4cm² (W/m²)	Measured 4cm² (W/m²)	Deviation For 4cm² (%)	Dipole S/N
Power Density	Feb. 26, 2024	10	10	51.4	53.9	4.86	1041
Power Density	Apr. 24, 2024	10	10	51.4	51.8	0.78	1041

4.4 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 (±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 (~ 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 7.2.

6. OPERATIONAL CONDITIONS DURING TEST

6.1 TEST POSITION

Test all USB orientations [see figure below: (A) Horizontal-Up, (B) Horizontal-Down, (C) Vertical-Front, and (D) Vertical-Back and Tip] with a device-to-phantom separation distance of 5 mm.

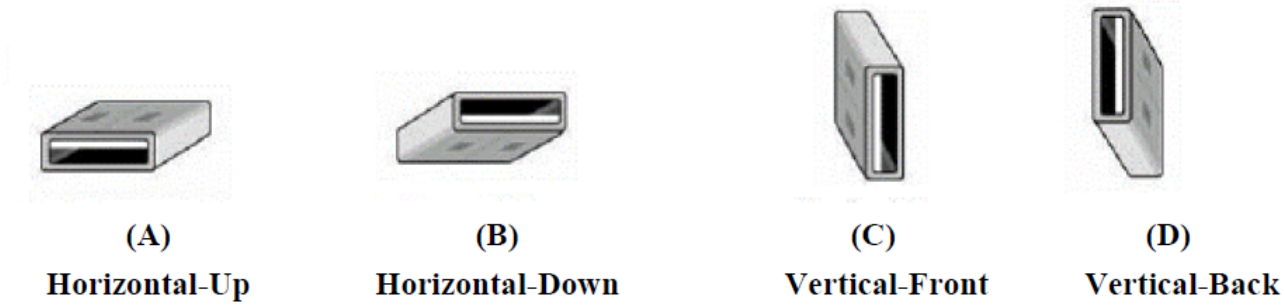
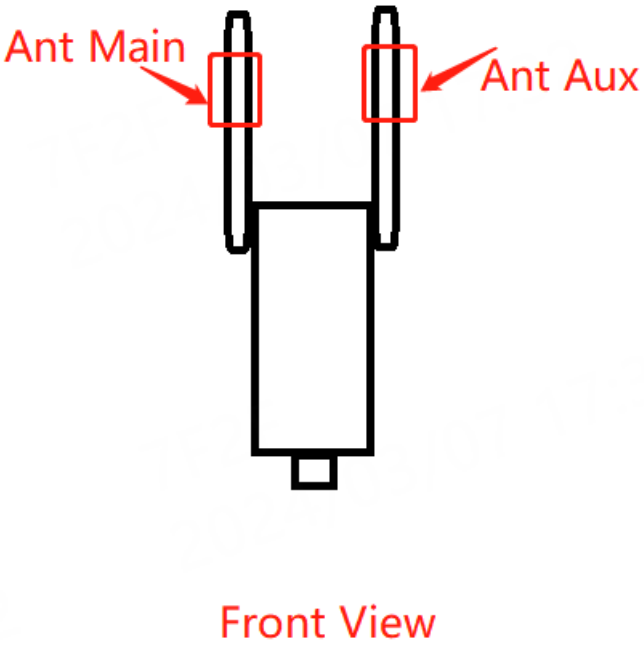


Fig 6.1 USB Connector Orientations Implemented on Laptop Computers

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

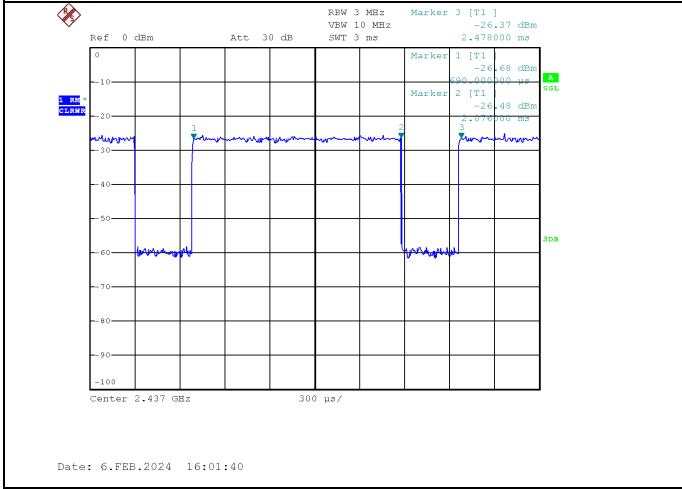
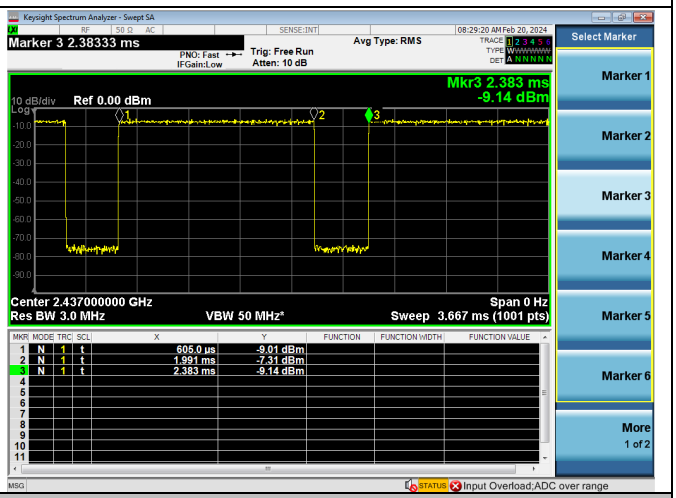
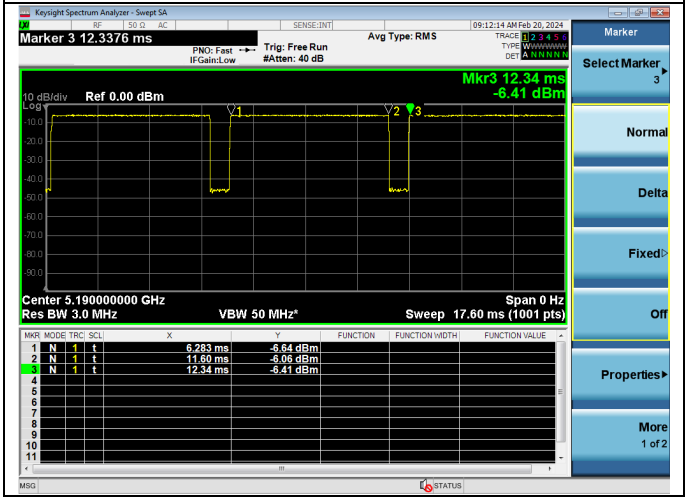
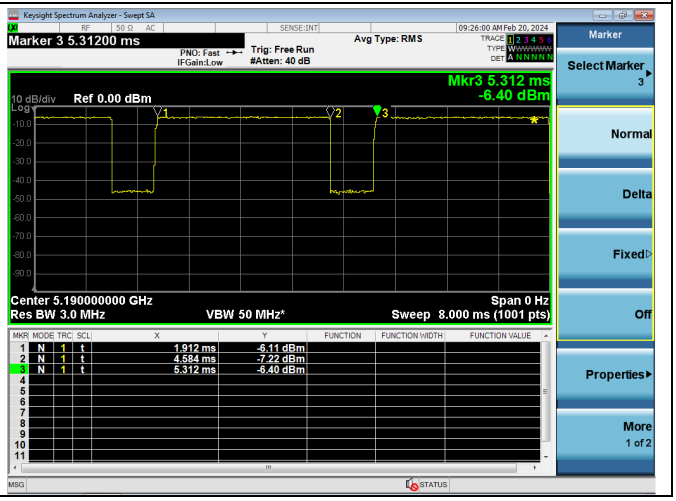


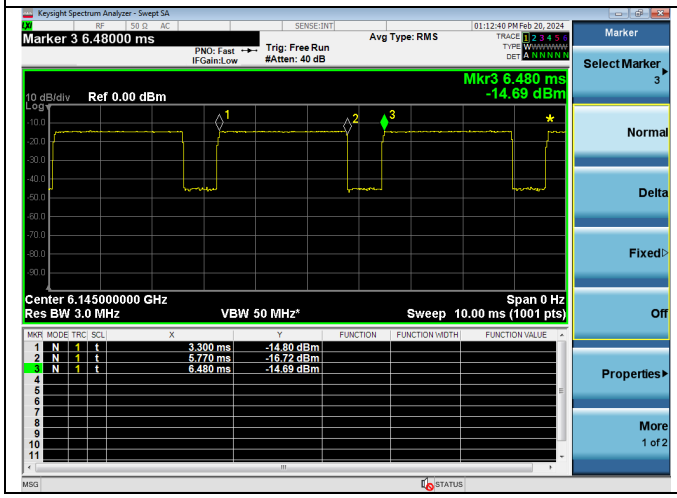
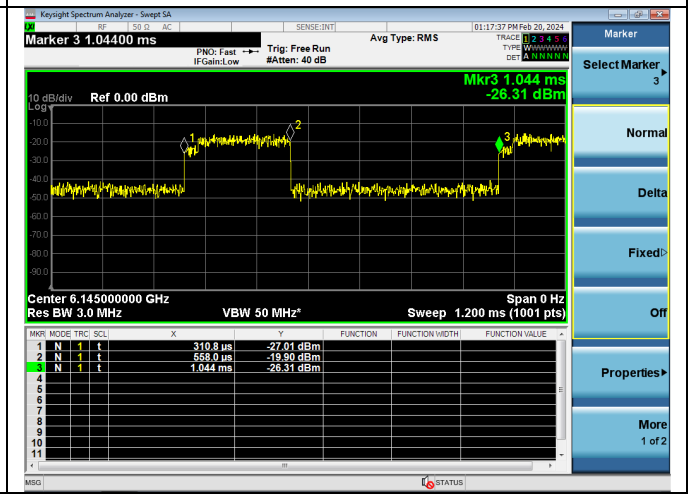
6.2 TEST CONFIGURATION

6.2.1 WIFI TEST CONFIGURATION

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

For WiFi SAR testing, a communication link is set up with the test mode software for WiFi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The test procedures in KDB 248227 D01 are applied.

Duty Cycle	Duty Cycle
WiFi 2.4G_SISO	WiFi 2.4G_MIMO
77.52%	77.95%
	
Duty Cycle	Duty Cycle
WiFi 5G_SISO	WiFi 5G_MIMO
87.78%	78.59%
	

Duty Cycle	Duty Cycle
WiFi 6E_SISO	WiFi 6E_MIMO
77.67%	33.72%
	

6.2.1.1 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 stand alone.
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.

6.2.1.2 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.

6.2.1.3 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 is 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.

6.2.1.4 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.

7. TEST RESULT

7.1 CONDUCTED POWER RESULTS

7.1.1 CONDUCTED POWER MEASUREMENTS OF WIFI

1. Conducted power measurements of WiFi 2.4G

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 2.4G _1TX _Ant Main	802.11b	1	2412	1	11.50	11.39
		6	2437		11.50	11.07
		11	2462		11.50	11.37
	802.11g	1	2412	6	14.00	**13.69**
		6	2437		14.00	**13.86**
		11	2462		14.00	**13.67**
		12	2467		13.00	**12.82**
		13	2472		14.00	**13.78**
	802.11n HT20	1	2412	HT0	12.50	No Required
		6	2437		12.50	
		11	2462		12.50	
		12	2467		12.50	
		13	2472		12.50	
	802.11n HT40	3	2422	HT0	12.50	
		6	2437		12.50	
		9	2452		12.50	
	802.11ax HE20	1	2412	HE0	12.50	
		6	2437		12.50	
		11	2462		12.50	
		12	2467		12.50	
		13	2472		12.50	
	802.11ax HE40	3	2422	HE0	12.50	
		6	2437		12.50	
		9	2452		12.50	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 2.4G _1TX _Ant Aux	802.11b	1	2412	1	11.50	11.00
		6	2437		11.50	11.24
		11	2462		11.50	11.39
	802.11g	1	2412	6	13.00	**12.68**
		6	2437		13.00	**12.60**
		11	2462		13.00	**12.89**
		12	2467		13.50	**13.15**
		13	2472		13.50	**13.06**
	802.11n HT20	1	2412	HT0	12.50	No Required
		6	2437		12.50	
		11	2462		12.50	
		12	2467		12.50	
		13	2472		12.50	
	802.11n HT40	3	2422	HT0	12.50	
		6	2437		12.50	
		9	2452		12.50	
	802.11ax HE20	1	2412	HE0	12.50	
		6	2437		12.50	
		11	2462		12.50	
		12	2467		12.50	
		13	2472		12.50	
	802.11ax HE40	3	2422	HE0	12.50	
		6	2437		12.50	
		9	2452		12.50	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	ANT Main Average Power(dBm)	ANT Aux Average Power(dBm)	Max. Tune up	Total Average Power(dBm)
WiFi 2.4G _2TX _Ant Main +Ant Aux	802.11b	1	2412	1	11.39	11.00	14.50	14.21
		6	2437		11.07	11.24	14.50	14.17
		11	2462		11.37	11.39	14.50	**14.39**
	802.11g	1	2412	6	13.46	13.81	17.00	16.81
		6	2437		13.92	13.96	17.00	**16.95**
		11	2462		13.88	13.89	17.00	16.90
		12	2467		13.73	13.91	17.00	16.83
		13	2472		13.57	13.86	17.00	16.73
	802.11n HT20	1	2412	HT8	-	-	15.50	No Required
		6	2437		-	-	15.50	
		11	2462		-	-	15.50	
		12	2467		-	-	15.50	
		13	2472		-	-	15.50	
	802.11n HT40	3	2422	HT8	-	-	15.50	
		6	2437		-	-	15.50	
		9	2452		-	-	15.50	
	802.11ax HE20	1	2412	HE8	-	-	15.50	
		6	2437		-	-	15.50	
		11	2462		-	-	15.50	
		12	2467		-	-	15.50	
		13	2472		-	-	15.50	
	802.11ax HE40	3	2422	HE8	-	-	15.50	
		6	2437		-	-	15.50	
		9	2452		-	-	15.50	

Note:
1) The Average conducted power of WiFi 2.4G is measured with RMS detector.
2) Per KDB248227 D01, for 2.4G WiFi, the highest measured maximum output power Channel for DSSS modes (802.11g) was selected for SAR measurement. SAR for OFDM modes (2.4GHz 802.11b/n/ax) was not required. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM modes (802.11b/n/ax) to DSSS modes (802.11g) specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
3) The tested channel results are marks in bold.

2. Conducted power measurements of WiFi 5G_UNII 1

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 5G_ UNII 1 _1TX _Ant Main	802.11a	36	5180	6	10.50	No Required
		40	5200		10.50	
		44	5220		10.50	
		48	5240		10.50	
	802.11n HT20	36	5180	MCS0	10.50	
		40	5200		10.50	
		44	5220		10.50	
		48	5240		10.50	
	802.11n HT40	38	5190	MCS0	11.00	**10.83**
		46	5230		11.50	**11.32**
	802.11ac VHT20	36	5180	MCS0	10.50	No Required
		40	5200		10.50	
		44	5220		10.50	
		48	5240		10.50	
	802.11ac VHT40	38	5190	MCS0	10.50	
		46	5230		10.50	
	802.11ac VHT80	42	5210	MCS0	10.50	
	802.11ax HE20	36	5180	MCS0	10.50	
		40	5200		10.50	
		44	5220		10.50	
		48	5240		10.50	
	802.11ax HE40	38	5190	MCS0	10.50	
		46	5230		10.50	
	802.11ax HE80	42	5210	MCS0	10.50	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 5G_ UNII 1 _1TX _Ant Aux	802.11a	36	5180	6	11.50	No Required
		40	5200		11.50	
		44	5220		11.50	
		48	5240		11.50	
	802.11n HT20	36	5180	MCS0	11.50	
		40	5200		11.50	
		44	5220		11.50	
		48	5240		11.50	
	802.11n HT40	38	5190	MCS0	12.00	**11.62**
		46	5230		12.00	**11.95**
	802.11ac VHT20	36	5180	MCS0	11.50	No Required
		40	5200		11.50	
		44	5220		11.50	
		48	5240		11.50	
	802.11ac VHT40	38	5190	MCS0	11.50	
		46	5230		11.50	
	802.11ac VHT80	42	5210	MCS0	11.50	
	802.11ax HE20	36	5180	MCS0	11.50	
		40	5200		11.50	
		44	5220		11.50	
		48	5240		11.50	
	802.11ax HE40	38	5190	MCS0	11.50	
		46	5230		11.50	
	802.11ax HE80	42	5210	MCS0	11.50	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	ANT Main Average Power(dBm)	ANT Aux Average Power(dBm)	Max. Tune up	Total Average Power(dBm)
WiFi 5G_ UNII 1 _2TX _Ant Main +Ant Aux	802.11a	36	5180	6	-	-	14.00	No Required
		40	5200		-	-	14.00	
		44	5220		-	-	14.00	
		48	5240		-	-	14.00	
	802.11n HT20	36	5180	MCS8	-	-	14.00	
		40	5200		-	-	14.00	
		44	5220		-	-	14.00	
		48	5240		-	-	14.00	
	802.11n HT40	38	5190	MCS8	8.93	9.74	14.50	**13.86**
		46	5230		9.27	10.14	14.50	**14.24**
	802.11ac VHT20	36	5180	MCS8	-	-	14.00	No Required
		40	5200		-	-	14.00	
		44	5220		-	-	14.00	
		48	5240		-	-	14.00	
	802.11ac VHT40	38	5190	MCS8	-	-	14.00	
		46	5230		-	-	14.00	
	802.11ac VHT80	42	5210	MCS8	-	-	14.00	
	802.11ax HE20	36	5180	MCS8	-	-	14.00	
		40	5200		-	-	14.00	
		44	5220		-	-	14.00	
		48	5240		-	-	14.00	
	802.11ax HE40	38	5190	MCS8	-	-	14.00	
		46	5230		-	-	14.00	
	802.11ax HE80	42	5210	MCS8	-	-	14.00	

Note:
1) The Average conducted power of WiFi 5G_UNII 1 is measured with RMS detector.
2) The tested channel results are marks in bold.

3. Conducted power measurements of WiFi 5G_UNII 2a

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 5G_ UNII 2a _1TX _Ant Main	802.11a	52	5260	6	10.50	No Required
		56	5280		10.50	
		60	5300		10.50	
		64	5320		10.50	
	802.11n HT20	52	5260	MCS0	10.50	
		56	5280		10.50	
		60	5300		10.50	
		64	5320		10.50	
	802.11n HT40	54	5270	MCS0	11.00	**10.88**
		62	5310		11.00	**10.82**
	802.11ac VHT20	52	5260	MCS0	10.50	No Required
		56	5280		10.50	
		60	5300		10.50	
		64	5320		10.50	
	802.11ac VHT40	54	5270	MCS0	10.50	
		62	5310		10.50	
	802.11ac VHT80	58	5290	MCS0	10.50	
	802.11ax HE20	52	5260	MCS0	10.50	
		56	5280		10.50	
		60	5300		10.50	
		64	5320		10.50	
	802.11ax HE40	54	5270	MCS0	10.50	
		62	5310		10.50	
	802.11ax HE80	58	5290	MCS0	10.50	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 5G_ UNII 2a _1TX _Ant Aux	802.11a	52	5260	6	10.00	No Required
		56	5280		10.00	
		60	5300		10.00	
		64	5320		10.00	
	802.11n HT20	52	5260	MCS0	10.00	
		56	5280		10.00	
		60	5300		10.00	
		64	5320		10.00	
	802.11n HT40	54	5270	MCS0	11.00	**10.61**
		62	5310		10.50	**10.37**
	802.11ac VHT20	52	5260	MCS0	10.00	No Required
		56	5280		10.00	
		60	5300		10.00	
		64	5320		10.00	
	802.11ac VHT40	54	5270	MCS0	10.00	
		62	5310		10.00	
	802.11ac VHT80	58	5290	MCS0	10.00	
	802.11ax HE20	52	5260	MCS0	10.00	
		56	5280		10.00	
		60	5300		10.00	
		64	5320		10.00	
	802.11ax HE40	54	5270	MCS0	10.00	
		62	5310		10.00	
	802.11ax HE80	58	5290	MCS0	10.00	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	ANT Main Average Power(dBm)	ANT Aux Average Power(dBm)	Max. Tune up	Total Average Power(dBm)
WiFi 5G_ UNII 2a _2TX _Ant Main +Ant Aux	802.11a	52	5260	6	-	-	14.00	No Required
		56	5280		-	-	14.00	
		60	5300		-	-	14.00	
		64	5320		-	-	14.00	
	802.11n HT20	52	5260	MCS8	-	-	14.00	
		56	5280		-	-	14.00	
		60	5300		-	-	14.00	
		64	5320		-	-	14.00	
	802.11n HT40	54	5270	MCS8	9.82	10.08	14.50	**14.46**
		62	5310		9.87	9.91	14.50	**14.40**
	802.11ac VHT20	52	5260	MCS8	-	-	14.00	No Required
		56	5280		-	-	14.00	
		60	5300		-	-	14.00	
		64	5320		-	-	14.00	
	802.11ac VHT40	54	5270	MCS8	-	-	14.00	
		62	5310		-	-	14.00	
	802.11ac VHT80	58	5290	MCS8	-	-	14.00	
	802.11ax HE20	52	5260	MCS8	-	-	14.00	
		56	5280		-	-	14.00	
		60	5300		-	-	14.00	
		64	5320		-	-	14.00	
	802.11ax HE40	54	5270	MCS8	-	-	14.00	
		62	5310		-	-	14.00	
	802.11ax HE80	58	5290	MCS8	-	-	14.00	

Note:
1) The Average conducted power of WiFi 5G_UNII 2a is measured with RMS detector.
2) The tested channel results are marks in bold.

4. Conducted power measurements of WiFi 5G_UNII 2c

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 5G_ UNII 2c _1TX _Ant Main	802.11a	100	5500	6	11.50	No Required
		104	5520		11.50	
		108	5540		11.50	
		112	5560		11.50	
		116	5580		11.50	
		132	5660		11.50	
		136	5680		11.50	
		140	5700		11.50	
	802.11n HT20	100	5500	MCS0	11.50	
		104	5520		11.50	
		108	5540		11.50	
		112	5560		11.50	
		116	5580		11.50	
		132	5660		11.50	
		136	5680		11.50	
		140	5700		11.50	
	802.11n HT40	102	5510	MCS0	11.50	
		110	5550		11.50	
		118	5590		11.50	
		126	5630		11.50	
		134	5670		11.50	
	802.11ac VHT20	100	5500	MCS0	11.50	
		104	5520		11.50	
		108	5540		11.50	
		112	5560		11.50	
		116	5580		11.50	
		132	5660		11.50	
		136	5680		11.50	
		140	5700		11.50	
	802.11ac VHT40	102	5510	MCS0	11.50	
		110	5550		11.50	
		118	5590		11.50	
		126	5630		11.50	
		134	5670		11.50	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 5G_ UNII 2c _1TX _Ant Main	802.11ac VHT80	106	5530	MCS0	12.50	**12.08**
		122	5610		12.00	**11.77**
	802.11ax HE20	100	5500	MCS0	11.50	No Required
		104	5520		11.50	
		108	5540		11.50	
		112	5560		11.50	
		116	5580		11.50	
		132	5660		11.50	
		136	5680		11.50	
		140	5700		11.50	
	802.11ax HE40	102	5510	MCS0	11.50	
		110	5550		11.50	
		118	5590		11.50	
		126	5630		11.50	
		134	5670		11.50	
	802.11ax HE80	106	5530	MCS0	11.50	
		122	5610		11.50	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 5G_ UNII 2c _1TX _Ant Aux	802.11a	100	5500	6	11.00	No Required
		104	5520		11.00	
		108	5540		11.00	
		112	5560		11.00	
		116	5580		11.00	
		132	5660		11.00	
		136	5680		11.00	
		140	5700		11.00	
	802.11n HT20	100	5500	MCS0	11.00	
		104	5520		11.00	
		108	5540		11.00	
		112	5560		11.00	
		116	5580		11.00	
		132	5660		11.00	
		136	5680		11.00	
		140	5700		11.00	
	802.11n HT40	102	5510	MCS0	11.00	
		110	5550		11.00	
		118	5590		11.00	
		126	5630		11.00	
		134	5670		11.00	
	802.11ac VHT20	100	5500	MCS0	11.00	
		104	5520		11.00	
		108	5540		11.00	
		112	5560		11.00	
		116	5580		11.00	
		132	5660		11.00	
		136	5680		11.00	
		140	5700		11.00	
	802.11ac VHT40	102	5510	MCS0	11.00	
		110	5550		11.00	
		118	5590		11.00	
		126	5630		11.00	
		134	5670		11.00	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 5G_ UNII 2c _1TX _Ant Aux	802.11ac VHT80	106	5530	MCS0	11.50	**11.29**
		122	5610		11.50	**11.02**
	802.11ax HE20	100	5500	MCS0	11.00	No Required
		104	5520		11.00	
		108	5540		11.00	
		112	5560		11.00	
		116	5580		11.00	
		132	5660		11.00	
		136	5680		11.00	
		140	5700		11.00	
	802.11ax HE40	102	5510	MCS0	11.00	
		110	5550		11.00	
		118	5590		11.00	
		126	5630		11.00	
		134	5670		11.00	
	802.11ax HE80	106	5530	MCS0	11.00	
		122	5610		11.00	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	ANT Main Average Power(dBm)	ANT Aux Average Power(dBm)	Max. Tune up	Total Average Power(dBm)
WiFi 5G_ UNII 2c _2TX _Ant Main +Ant Aux	802.11a	100	5500	6	-	-	14.50	No Required
		104	5520		-	-	14.50	
		108	5540		-	-	14.50	
		112	5560		-	-	14.50	
		116	5580		-	-	14.50	
		132	5660		-	-	14.50	
		136	5680		-	-	14.50	
		140	5700		-	-	14.50	
	802.11n HT20	100	5500	MCS8	-	-	14.50	
		104	5520		-	-	14.50	
		108	5540		-	-	14.50	
		112	5560		-	-	14.50	
		116	5580		-	-	14.50	
		132	5660		-	-	14.50	
		136	5680		-	-	14.50	
		140	5700		-	-	14.50	
	802.11n HT40	102	5510	MCS8	-	-	14.50	
		110	5550		-	-	14.50	
		118	5590		-	-	14.50	
		126	5630		-	-	14.50	
		134	5670		-	-	14.50	
	802.11ac VHT20	100	5500	MCS8	-	-	14.50	
		104	5520		-	-	14.50	
		108	5540		-	-	14.50	
		112	5560		-	-	14.50	
		116	5580		-	-	14.50	
		132	5660		-	-	14.50	
		136	5680		-	-	14.50	
		140	5700		-	-	14.50	
	802.11ac VHT40	102	5510	MCS8	-	-	14.50	
		110	5550		-	-	14.50	
		118	5590		-	-	14.50	
		126	5630		-	-	14.50	
		134	5670		-	-	14.50	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	ANT Main Average Power(dBm)	ANT Aux Average Power(dBm)	Max. Tune up	Total Average Power(dBm)
WiFi 5G_ UNII 2c _2TX _Ant Main +Ant Aux	802.11ac VHT80	106	5530	MCS8	10.36	10.53	15.00	**14.96**
		122	5610		10.37	10.48	15.00	**14.94**
	802.11ax HE20	100	5500	MCS8	-	-	14.50	No Required
		104	5520		-	-	14.50	
		108	5540		-	-	14.50	
		112	5560		-	-	14.50	
		116	5580		-	-	14.50	
		132	5660		-	-	14.50	
		136	5680		-	-	14.50	
		140	5700		-	-	14.50	
	802.11ax HE40	102	5510	MCS8	-	-	14.50	
		110	5550		-	-	14.50	
		118	5590		-	-	14.50	
		126	5630		-	-	14.50	
		134	5670		-	-	14.50	
	802.11ax HE80	106	5530	MCS8	-	-	14.50	
		122	5610		-	-	14.50	

Note:
1) The Average conducted power of WiFi 5G_UNII 2c is measured with RMS detector.
2) The tested channel results are marks in bold.

5. Conducted power measurements of WiFi 5G_UNII 3

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 5G_ UNII 3 _1TX _Ant Main	802.11a	149	5745	6	12.50	No Required
		153	5765		12.50	
		157	5785		12.50	
		161	5805		12.50	
		165	5825		12.50	
	802.11n HT20	149	5745	MCS0	12.50	
		153	5765		12.50	
		157	5785		12.50	
		161	5805		12.50	
		165	5825		12.50	
	802.11n HT40	151	5755	MCS0	13.00	**12.84**
		159	5795		13.00	**12.71**
	802.11ac VHT20	149	5745	MCS0	12.50	No Required
		153	5765		12.50	
		157	5785		12.50	
		161	5805		12.50	
		165	5825		12.50	
	802.11ac VHT40	151	5755	MCS0	12.50	
		159	5795		12.50	
	802.11ac VHT80	155	5775	MCS0	12.50	
	802.11ax HE20	149	5745	MCS0	12.50	
		153	5765		12.50	
		157	5785		12.50	
		161	5805		12.50	
		165	5825		12.50	
	802.11ax HE40	151	5755	MCS0	12.50	
		159	5795		12.50	
	802.11ax HE80	155	5775	MCS0	12.50	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 5G_ UNII 3 _1TX _Ant Aux	802.11a	149	5745	6	12.50	No Required
		153	5765		12.50	
		157	5785		12.50	
		161	5805		12.50	
		165	5825		12.50	
	802.11n HT20	149	5745	MCS0	12.50	
		153	5765		12.50	
		157	5785		12.50	
		161	5805		12.50	
		165	5825		12.50	
	802.11n HT40	151	5755	MCS0	13.00	**12.90**
		159	5795		13.00	**12.86**
	802.11ac VHT20	149	5745	MCS0	12.50	No Required
		153	5765		12.50	
		157	5785		12.50	
		161	5805		12.50	
		165	5825		12.50	
	802.11ac VHT40	151	5755	MCS0	12.50	
		159	5795		12.50	
	802.11ac VHT80	155	5775	MCS0	12.50	
	802.11ax HE20	149	5745	MCS0	12.50	
		153	5765		12.50	
		157	5785		12.50	
		161	5805		12.50	
		165	5825		12.50	
	802.11ax HE40	151	5755	MCS0	12.50	
		159	5795		12.50	
	802.11ax HE80	155	5775	MCS0	12.50	

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	ANT Main Average Power(dBm)	ANT Aux Average Power(dBm)	Max. Tune up	Total Average Power(dBm)
WiFi 5G_ UNII 3 _2TX _Ant Main +Ant Aux	802.11a	149	5745	6	-	-	15.00	No Required
		153	5765		-	-	15.00	
		157	5785		-	-	15.00	
		161	5805		-	-	15.00	
		165	5825		-	-	15.00	
	802.11n HT20	149	5745	MCS8	-	-	15.00	
		153	5765		-	-	15.00	
		157	5785		-	-	15.00	
		161	5805		-	-	15.00	
		165	5825		-	-	15.00	
	802.11n HT40	151	5755	MCS8	12.16	12.43	15.50	**15.31**
		159	5795		11.74	12.41	15.50	**15.10**
	802.11ac VHT20	149	5745	MCS8	-	-	15.00	No Required
		153	5765		-	-	15.00	
		157	5785		-	-	15.00	
		161	5805		-	-	15.00	
		165	5825		-	-	15.00	
	802.11ac VHT40	151	5755	MCS8	-	-	15.00	
		159	5795		-	-	15.00	
	802.11ac VHT80	155	5775	MCS8	-	-	15.00	
	802.11ax HE20	149	5745	MCS8	-	-	15.00	
		153	5765		-	-	15.00	
		157	5785		-	-	15.00	
		161	5805		-	-	15.00	
		165	5825		-	-	15.00	
	802.11ax HE40	151	5755	MCS8	-	-	15.00	
		159	5795		-	-	15.00	
	802.11ax HE80	155	5775	MCS8	-	-	15.00	

Note:
1) The Average conducted power of WiFi 5G_UNII 3 is measured with RMS detector.
2) The tested channel results are marks in bold.

6. Conducted power measurements of WiFi 6E_UNII 5

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 6E_ UNII 5 _1TX _Ant Main	802.11a	1	5955	MCS0	-3.00	-3.02
		45	6175		-3.50	-3.60
		93	6415		-3.50	-3.54
	802.11ax HE20	1	5955	MCS0	-2.50	-2.57
		45	6175		-1.50	-1.69
		93	6415		-3.00	-3.20
	802.11ax HE40	3	5965	MCS0	-0.50	-0.73
		43	6165		0.00	-0.20
		91	6405		-1.00	-1.10
	802.11ax HE80	7	5985	MCS0	3.00	2.53
		39	6145		3.00	2.68
		87	6385		**3.50**	**3.37**

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 6E_ UNII 5 _1TX _Ant Aux	802.11a	1	5955	MCS0	-4.00	-4.10
		45	6175		-3.00	-3.35
		93	6415		-3.00	-3.50
	802.11ax HE20	1	5955	MCS0	-3.50	-3.85
		45	6175		-1.50	-1.93
		93	6415		-3.50	-3.52
	802.11ax HE40	3	5965	MCS0	-0.50	-0.70
		43	6165		0.00	-0.07
		91	6405		-0.50	-0.57
	802.11ax HE80	7	5985	MCS0	2.00	1.94
		39	6145		**3.00**	**2.93**
		87	6385		2.50	2.33

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	ANT Main Average Power(dBm)	ANT Aux Average Power(dBm)	Max. Tune up	Total Average Power(dBm)
WiFi 6E_ UNII 5 _2TX _Ant Main +Ant Aux	802.11a	1	5955	MCS8	-3.02	-4.10	-0.50	-0.52
		45	6175		-3.60	-3.35	0.00	-0.46
		93	6415		-3.54	-3.50	-0.50	-0.51
	802.11ax HE20	1	5955	MCS8	-2.57	-3.85	0.00	-0.15
		45	6175		-1.69	-1.93	1.50	1.20
		93	6415		-3.20	-3.52	0.00	-0.35
	802.11ax HE40	3	5965	MCS8	-0.73	-0.70	2.50	2.30
		43	6165		-0.20	-0.07	3.00	2.88
		91	6405		-1.10	-0.57	2.50	2.18
	802.11ax HE80	7	5985	MCS8	2.53	1.94	5.50	5.26
		39	6145		2.68	2.93	6.00	5.82
		87	6385		**3.37**	**2.33**	**6.00**	**5.89**

Note:
1) The Average conducted power of WiFi 5G_UNII 5 is measured with RMS detector.
2) The tested channel results are marks in bold.

7. Conducted power measurements of WiFi 5G_UNII 6

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 6E_ UNII 6 _1TX _Ant Main	802.11a	97	6435	MCS0	-3.00	-3.46
		105	6475		-2.50	-2.96
		113	6515		-3.00	-3.49
	802.11ax HE20	97	6435	MCS0	-2.50	-2.91
		105	6475		-2.00	-2.47
		113	6515		-2.50	-2.59
	802.11ax HE40	99	6445	MCS0	-0.50	-0.98
		107	6485		-1.50	-1.69
		115	6525		-1.00	-1.50
	802.11ax HE80	103	6465	MCS0	1.50	1.45
		119	6545		2.00	1.82

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 6E_ UNII 6 _1TX _Ant Aux	802.11a	97	6435	MCS0	-2.00	-2.15
		105	6475		-2.00	-2.33
		113	6515		-2.50	-2.89
	802.11ax HE20	97	6435	MCS0	-2.00	-2.16
		105	6475		-1.50	-1.98
		113	6515		-2.50	-2.52
	802.11ax HE40	99	6445	MCS0	0.50	0.06
		107	6485		0.00	-0.39
		115	6525		-0.50	-0.90
	802.11ax HE80	103	6465	MCS0	2.00	1.76
		119	6545		2.50	2.31

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	ANT Main Average Power(dBm)	ANT Aux Average Power(dBm)	Max. Tune up	Total Average Power(dBm)
WiFi 6E_ UNII 6 _2TX _Ant Main +Ant Aux	802.11a	97	6435	MCS8	-3.46	-2.15	0.50	0.25
		105	6475		-2.96	-2.33	0.50	0.38
		113	6515		-3.49	-2.89	0.00	-0.17
	802.11ax HE20	97	6435	MCS8	-2.91	-2.16	0.50	0.49
		105	6475		-2.47	-1.98	1.00	0.79
		113	6515		-2.59	-2.52	0.50	0.46
	802.11ax HE40	99	6445	MCS8	-0.98	0.06	3.00	2.58
		107	6485		-1.69	-0.39	2.50	2.02
		115	6525		-1.50	-0.90	2.00	1.82
	802.11ax HE80	103	6465	MCS8	1.45	1.76	5.00	4.62
		119	6545		1.82	2.31	5.50	5.08

Note:
1) The Average conducted power of WiFi 5G_UNII 6 is measured with RMS detector.
2) The tested channel results are marks in bold.

8. Conducted power measurements of WiFi 5G_UNII 7

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 6E_ UNII 7 _1TX _Ant Main	802.11a	117	6535	MCS0	-3.50	-3.92
		149	6695		-4.00	-4.41
		181	6855		-3.00	-3.55
		185	6875		-4.00	-4.36
	802.11ax HE20	117	6535	MCS0	-2.50	-2.62
		149	6695		-1.50	-1.80
		181	6855		-3.00	-3.18
		185	6875		-3.50	-3.59
	802.11ax HE40	123	6565	MCS0	-1.50	-1.78
		147	6685		0.50	0.27
		179	6845		0.00	-0.38
		187	6885		0.00	0.24
	802.11ax HE80	135	6625	MCS0	2.00	1.76
		151	6705		**3.50**	**3.14**
		167	6785		2.00	1.91

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 6E_ UNII 7 _1TX _Ant Aux	802.11a	117	6535	MCS0	-3.50	-3.75
		149	6695		-1.50	-1.86
		181	6855		-3.00	-3.50
		185	6875		-3.00	-3.27
	802.11ax HE20	117	6535	MCS0	-2.50	-2.96
		149	6695		-2.50	-2.92
		181	6855		-2.50	-2.66
		185	6875		-2.50	-2.76
	802.11ax HE40	123	6565	MCS0	-2.00	-2.50
		147	6685		-0.50	-0.69
		179	6845		-1.00	-1.48
		187	6885		-1.00	-1.36
	802.11ax HE80	135	6625	MCS0	2.00	1.71
		151	6705		1.50	1.28
		167	6785		**3.50**	**3.22**

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	ANT Main Average Power(dBm)	ANT Aux Average Power(dBm)	Max. Tune up	Total Average Power(dBm)
WiFi 6E_ UNII 7 _2TX _Ant Main +Ant Aux	802.11a	117	6535	MCS8	-3.92	-3.75	-0.50	-0.82
		149	6695		-4.41	-1.86	0.50	0.06
		181	6855		-3.55	-3.50	-0.50	-0.51
		185	6875	MCS8	-4.36	-3.27	-0.50	-0.77
	802.11ax HE20	117	6535	MCS8	-2.62	-2.96	0.50	0.22
		149	6695		-1.80	-2.92	1.00	0.69
		181	6855		-3.18	-2.66	0.50	0.10
		185	6875	MCS8	-3.59	-2.76	0.00	-0.14
	802.11ax HE40	123	6565		-1.78	-2.50	1.00	0.89
		147	6685		0.27	-0.69	3.00	2.83
		179	6845	MCS8	-0.38	-1.48	2.50	2.12
		187	6885		0.24	-1.36	3.00	2.52
	802.11ax HE80	135	6625	MCS8	1.76	1.71	5.00	4.75
		151	6705		3.14	1.28	5.50	5.32
		167	6785		**1.91**	**3.22**	**6.00**	**5.62**

Note:
1) The Average conducted power of WiFi 5G_UNII 7 is measured with RMS detector.
2) The tested channel results are marks in bold.

9. Conducted power measurements of WiFi 5G_UNII 8

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 6E_ UNII 8 _1TX _Ant Main	802.11a	189	6895	MCS0	-2.50	-2.71
		213	7015		-3.50	-3.63
		233	7115		-2.00	-2.16
	802.11ax HE20	189	6895	MCS0	-1.50	-1.82
		213	7015		1.50	1.32
		233	7115		-1.50	-1.76
	802.11ax HE40	195	6925	MCS0	-0.50	-0.84
		211	7005		1.50	1.42
		227	7085		0.50	0.14
	802.11ax HE80	183	6865	MCS0	3.50	**3.24**
		199	6945		3.50	**3.41**
		215	7025		3.00	**2.74**

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Max. Tune up	Average Power(dBm)
WiFi 6E_ UNII 8 _1TX _Ant Aux	802.11a	189	6895	MCS0	-3.00	-3.39
		213	7015		-2.50	-2.54
		233	7115		-2.50	-2.91
	802.11ax HE20	189	6895	MCS0	-2.50	-2.62
		213	7015		1.50	1.27
		233	7115		-2.50	-2.79
	802.11ax HE40	195	6925	MCS0	-2.00	-2.19
		211	7005		2.00	1.77
		227	7085		-1.00	-1.43
	802.11ax HE80	183	6865	MCS0	4.00	**3.63**
		199	6945		3.50	**3.16**
		215	7025		2.50	**2.23**

Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	ANT Main Average Power(dBm)	ANT Aux Average Power(dBm)	Max. Tune up	Total Average Power(dBm)
WiFi 6E_ UNII 8 _2TX _Ant Main +Ant Aux	802.11a	189	6895	MCS8	-2.71	-3.39	0.00	-0.03
		213	7015		-3.63	-2.54	0.00	-0.04
		233	7115		-2.16	-2.91	0.50	0.49
	802.11ax HE20	189	6895	MCS8	-1.82	-2.62	1.00	0.81
		213	7015		1.32	1.27	4.50	4.31
		233	7115		-1.76	-2.79	1.00	0.77
	802.11ax HE40	195	6925	MCS8	-0.84	-2.19	2.00	1.55
		211	7005		1.42	1.77	5.00	4.61
		227	7085		0.14	-1.43	2.50	2.44
	802.11ax HE80	183	6865	MCS8	3.24	3.63	6.50	**6.45**
		199	6945		3.41	3.16	6.50	**6.30**
		215	7025		2.74	2.23	6.00	**5.50**

Note:
1) The Average conducted power of WiFi 5G_UNII 8 is measured with RMS detector.
2) The tested channel results are marks in bold.

7.2 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 > ½ 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 ≥ 0.8W/kg; if the deviation among the repeated measurement is ≤ 20%, and the measured SAR < 1.45W/kg, only one repeated measurement is required.
4) Per 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 2.4GHz WIFI single transmission chain operations, the highest measured maximum output power Channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section7.1.4 for more information.
3. 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 than1.2W/kg. See Section 6.1.4 for more information.

7.2.1 SAR MEASUREMENT RESULT

Separation distance 0.5cm

1. SAR test results of WiFi 2.4G

Test No.	Band	Channel	Test Position	Ant	Ant Angle	Data Rate	Maximum Tune-up (dBm)	Conducted Power (dBm)	Duty Cycle (%)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W1	802.11g	6	Front Face	Main	0	6M	14.00	13.86	77.52	0.04	0.523	0.253	0.697
W2	802.11g	6	Rear Face	Main	0	6M	14.00	13.86	77.52	-0.06	0.319	0.165	0.425
W3	802.11g	6	Left Side	Main	0	6M	14.00	13.86	77.52	0.16	0.763	0.337	1.017
W4	802.11g	6	Right Side	Main	0	6M	14.00	13.86	77.52	0.00	0.392	0.187	0.522
W5	802.11g	6	Top Side 1	Main	0	6M	14.00	13.86	77.52	-0.14	0.090	0.046	0.120
W6	802.11g	6	Top Side 2	Main	0	6M	14.00	13.86	77.52	0.02	0.096	0.048	0.128
W7	802.11g	6	Left Side	Main	90	6M	14.00	13.86	77.52	-0.16	0.916	0.422	1.220
W8	802.11g	6	Left Side	Main	180	6M	14.00	13.86	77.52	0.13	0.887	0.392	1.182
W9	802.11g	1	Left Side	Main	90	6M	14.00	13.69	77.52	0.05	**1.030**	**0.463**	**1.427**
W10	802.11g	11	Left Side	Main	90	6M	14.00	13.67	77.52	-0.04	1.020	0.458	1.420
W11	802.11g	12	Left Side	Main	90	6M	13.00	12.82	77.52	-0.02	0.966	0.432	1.299
W12	802.11g	13	Left Side	Main	90	6M	14.00	13.78	77.52	-0.07	0.961	0.430	1.304
W13	802.11g	1	Left Side (Repeated)	Main	90	6M	14.00	13.69	77.52	-0.14	0.932	0.421	1.291
W14	802.11g	12	Front Face	Aux	0	6M	13.50	13.15	77.52	-0.01	0.333	0.164	0.466
W15	802.11g	12	Rear Face	Aux	0	6M	13.50	13.15	77.52	0.04	0.502	0.224	0.702
W16	802.11g	12	Left Side	Aux	0	6M	13.50	13.15	77.52	0.06	0.028	0.014	0.039
W17	802.11g	12	Right Side	Aux	0	6M	13.50	13.15	77.52	-0.07	0.732	0.309	1.024
W18	802.11g	12	Top Side 1	Aux	0	6M	13.50	13.15	77.52	0.00	0.012	0.006	0.017
W19	802.11g	12	Top Side 2	Aux	0	6M	13.50	13.15	77.52	0.00	0.001	0.003	0.001
W20	802.11g	12	Right Side	Aux	90	6M	13.50	13.15	77.52	0.00	0.987	0.443	1.380
W21	802.11g	12	Right Side	Aux	180	6M	13.50	13.15	77.52	-0.16	0.947	0.411	1.324
W22	802.11g	1	Right Side	Aux	90	6M	13.00	12.68	77.52	0.00	0.943	0.419	1.310
W23	802.11g	6	Right Side	Aux	90	6M	13.00	12.60	77.52	-0.09	**1.010**	**0.453**	**1.429**
W24	802.11g	11	Right Side	Aux	90	6M	13.00	12.89	77.52	-0.07	0.977	0.437	1.293
W25	802.11g	13	Right Side	Aux	90	6M	13.50	13.06	77.52	0.05	0.941	0.420	1.343
W26	802.11g	6	Right Side (Repeated)	Aux	90	6M	13.00	12.60	77.52	0.05	0.953	0.417	1.348
W27	802.11g	6	Front Face	Main+Aux	0	6M	17.00	16.95	77.95	-0.08	0.549	0.274	0.712
W28	802.11g	6	Rear Face	Main+Aux	0	6M	17.00	16.95	77.95	0.01	0.546	0.255	0.708
W29	802.11g	6	Left Side	Main+Aux	0	6M	17.00	16.95	77.95	0.01	0.833	0.370	1.081
W30	802.11g	6	Right Side	Main+Aux	0	6M	17.00	16.95	77.95	0.06	0.778	0.329	1.010
W31	802.11g	6	Top Side 1	Main+Aux	0	6M	17.00	16.95	77.95	0.11	0.097	0.050	0.126
W32	802.11g	6	Top Side 2	Main+Aux	0	6M	17.00	16.95	77.95	-0.07	0.098	0.049	0.127
W33	802.11g	6	Left Side	Main+Aux	90	6M	17.00	16.95	77.95	-0.05	1.070	0.479	1.388
W34	802.11g	6	Left Side	Main+Aux	180	6M	17.00	16.95	77.95	-0.07	1.010	0.443	1.311
W35	802.11g	1	Left Side	Main+Aux	90	6M	17.00	16.81	77.95	0.20	1.120	0.506	1.501
W36	802.11g	11	Left Side	Main+Aux	90	6M	17.00	16.90	77.95	0.08	**1.150**	**0.512**	**1.511**
W37	802.11g	12	Left Side	Main+Aux	90	6M	17.00	16.83	77.95	0.03	1.090	0.488	1.454
W38	802.11g	13	Left Side	Main+Aux	90	6M	17.00	16.73	77.95	0.00	1.080	0.487	1.475
W39	802.11g	11	Left Side (Repeated)	Main+Aux	90	6M	17.00	16.90	77.95	0.02	1.070	0.481	1.406
W40	802.11b	11	Left Side	Main+Aux	90	1M	14.50	14.39	77.95	0.08	0.472	0.207	0.621

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

2. SAR test results of WiFi 5G

Test No.	Band	Channel	Test Position	Ant	Ant Angle	Data Rate	Maximum Tune-up (dBm)	Conducted Power (dBm)	Duty Cycle (%)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W37	802.11n HT40	46	Front Face	Main	0	HT0	11.50	11.32	87.78	0.00	0.140	0.034	0.166
W38	802.11n HT40	46	Rear Face	Main	0	HT0	11.50	11.32	87.78	0.00	0.753	0.169	0.894
W39	802.11n HT40	46	Left Side	Main	0	HT0	11.50	11.32	87.78	0.05	0.766	0.179	0.910
W40	802.11n HT40	46	Right Side	Main	0	HT0	11.50	11.32	87.78	-0.09	0.054	0.019	0.064
W41	802.11n HT40	46	Top Side 1	Main	0	HT0	11.50	11.32	87.78	-0.08	0.083	0.029	0.099
W42	802.11n HT40	46	Top Side 2	Main	0	HT0	11.50	11.32	87.78	-0.03	0.113	0.050	0.134
W43	802.11n HT40	46	Left Side	Main	90	HT0	11.50	11.32	87.78	0.00	0.824	0.199	0.978
W44	802.11n HT40	46	Left Side	Main	180	HT0	11.50	11.32	87.78	0.00	1.080	0.275	1.282
W45	802.11n HT40	38	Left Side	Main	180	HT0	11.00	10.83	87.78	0.00	**1.090**	**0.266**	**1.291**
W180	802.11n HT40	38	Left Side (Repeated)	Main	180	HT0	11.00	10.83	87.78	-0.01	1.030	0.278	1.220
W46	802.11n HT40	46	Front Face	Aux	0	HT0	12.00	11.95	87.78	-0.01	0.827	0.186	0.953
W47	802.11n HT40	46	Rear Face	Aux	0	HT0	12.00	11.95	87.78	0.07	0.097	0.028	0.111
W48	802.11n HT40	46	Left Side	Aux	0	HT0	12.00	11.95	87.78	0.00	0.027	0.010	0.031
W49	802.11n HT40	46	Right Side	Aux	0	HT0	12.00	11.95	87.78	0.09	0.972	0.228	1.120
W50	802.11n HT40	46	Top Side 1	Aux	0	HT0	12.00	11.95	87.78	0.00	0.055	0.018	0.063
W51	802.11n HT40	46	Top Side 2	Aux	0	HT0	12.00	11.95	87.78	-0.02	0.090	0.029	0.103
W52	802.11n HT40	46	Right Side	Aux	90	HT0	12.00	11.95	87.78	0.00	1.030	0.250	1.187
W53	802.11n HT40	46	Right Side	Aux	180	HT0	12.00	11.95	87.78	0.00	**1.110**	**0.223**	**1.279**
W54	802.11n HT40	38	Right Side	Aux	180	HT0	12.00	11.62	87.78	0.00	0.895	0.210	1.113
W181	802.11n HT40	46	Right Side (Repeated)	Aux	180	HT0	12.00	11.95	87.78	0.03	1.090	0.305	1.256
W55	802.11n HT40	46	Front Face	Main+Aux	0	HT8	14.50	14.24	78.59	-0.05	0.685	0.150	0.926
W56	802.11n HT40	46	Rear Face	Main+Aux	0	HT8	14.50	14.24	78.59	0.00	0.371	0.070	0.502
W57	802.11n HT40	46	Left Side	Main+Aux	0	HT8	14.50	14.24	78.59	0.08	0.678	0.156	0.917
W58	802.11n HT40	46	Right Side	Main+Aux	0	HT8	14.50	14.24	78.59	0.00	0.711	0.162	0.961
W59	802.11n HT40	46	Top Side 1	Main+Aux	0	HT8	14.50	14.24	78.59	0.00	0.120	0.044	0.162
W60	802.11n HT40	46	Top Side 2	Main+Aux	0	HT8	14.50	14.24	78.59	0.00	0.050	0.019	0.068
W61	802.11n HT40	46	Right Side	Main+Aux	90	HT8	14.50	14.24	78.59	-0.07	0.752	0.183	1.017
W62	802.11n HT40	46	Right Side	Main+Aux	180	HT8	14.50	14.24	78.59	0.00	**0.958**	**0.217**	**1.295**
W63	802.11n HT40	38	Right Side	Main+Aux	180	HT8	14.50	13.86	78.59	-0.07	0.762	0.180	1.122
W182	802.11n HT40	46	Right Side (Repeated)	Main+Aux	180	HT8	14.50	14.24	78.59	0.00	0.900	0.196	1.217

Test No.	Band	Channel	Test Position	Ant	Ant Angle	Data Rate	Maximum Tune-up (dBm)	Conducted Power (dBm)	Duty Cycle (%)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W64	802.11n HT40	54	Front Face	Main	0	HT0	11.00	10.88	87.78	0.00	0.109	0.026	0.128
W65	802.11n HT40	54	Rear Face	Main	0	HT0	11.00	10.88	87.78	-0.18	0.697	0.145	0.816
W66	802.11n HT40	54	Left Side	Main	0	HT0	11.00	10.88	87.78	0.07	0.726	0.173	0.850
W67	802.11n HT40	54	Right Side	Main	0	HT0	11.00	10.88	87.78	0.00	0.038	0.014	0.045
W68	802.11n HT40	54	Top Side 1	Main	0	HT0	11.00	10.88	87.78	-0.08	0.068	0.022	0.080
W69	802.11n HT40	54	Top Side 2	Main	0	HT0	11.00	10.88	87.78	0.12	0.068	0.025	0.080
W70	802.11n HT40	54	Left Side	Main	90	HT0	11.00	10.88	87.78	0.00	0.793	0.194	0.929
W71	802.11n HT40	54	Left Side	Main	180	HT0	11.00	10.88	87.78	0.00	**1.160**	**0.293**	**1.358**
W72	802.11n HT40	62	Left Side	Main	180	HT0	11.00	10.82	87.78	0.00	0.929	0.226	1.103
W183	802.11n HT40	54	Left Side (Repeated)	Main	180	HT0	11.00	10.88	87.78	0.05	1.020	0.216	1.195
W73	802.11n HT40	54	Front Face	Aux	0	HT0	11.00	10.61	87.78	0.05	0.730	0.157	0.910
W74	802.11n HT40	54	Rear Face	Aux	0	HT0	11.00	10.61	87.78	0.00	0.092	0.025	0.115
W75	802.11n HT40	54	Left Side	Aux	0	HT0	11.00	10.61	87.78	0.00	0.016	0.006	0.019
W76	802.11n HT40	54	Right Side	Aux	0	HT0	11.00	10.61	87.78	0.03	0.802	0.191	0.999
W77	802.11n HT40	54	Top Side 1	Aux	0	HT0	11.00	10.61	87.78	0.03	0.028	0.012	0.035
W78	802.11n HT40	54	Top Side 2	Aux	0	HT0	11.00	10.61	87.78	-0.08	0.079	0.025	0.098
W79	802.11n HT40	54	Right Side	Aux	90	HT0	11.00	10.61	87.78	0.03	0.894	0.216	1.114
W80	802.11n HT40	54	Right Side	Aux	180	HT0	11.00	10.61	87.78	0.00	**1.180**	**0.257**	**1.471**
W81	802.11n HT40	62	Right Side	Aux	180	HT0	10.50	10.37	87.78	0.01	1.230	0.300	1.444
W184	802.11n HT40	62	Right Side (Repeated)	Aux	180	HT0	10.50	10.37	87.78	0.09	1.170	0.280	1.373
W82	802.11n HT40	54	Front Face	Main+Aux	0	HT8	14.50	14.46	78.59	0.00	0.604	0.129	0.775
W83	802.11n HT40	54	Rear Face	Main+Aux	0	HT8	14.50	14.46	78.59	-0.04	0.200	0.060	0.257
W84	802.11n HT40	54	Left Side	Main+Aux	0	HT8	14.50	14.46	78.59	0.07	0.843	0.177	1.082
W85	802.11n HT40	54	Right Side	Main+Aux	0	HT8	14.50	14.46	78.59	0.01	0.832	0.177	1.068
W86	802.11n HT40	54	Top Side 1	Main+Aux	0	HT8	14.50	14.46	78.59	-0.04	0.832	0.177	1.068
W87	802.11n HT40	54	Top Side 2	Main+Aux	0	HT8	14.50	14.46	78.59	-0.17	0.087	0.037	0.111
W88	802.11n HT40	54	Left Side	Main+Aux	90	HT8	14.50	14.46	78.59	0.00	0.609	0.144	0.782
W89	802.11n HT40	54	Left Side	Main+Aux	180	HT8	14.50	14.46	78.59	0.00	**1.090**	**0.252**	**1.399**
W90	802.11n HT40	62	Left Side	Main+Aux	180	HT8	14.50	14.40	78.59	0.00	0.957	0.235	1.246
W185	802.11n HT40	54	Left Side (Repeated)	Main+Aux	180	HT8	14.50	14.46	78.59	0.04	0.986	0.229	1.266

Test No.	Band	Channel	Test Position	Ant	Ant Angle	Data Rate	Maximum Tune-up (dBm)	Conducted Power (dBm)	Duty Cycle (%)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W91	802.11ac VHT80	106	Front Face	Main	0	VHT0	12.50	12.08	87.78	0.00	0.119	0.038	0.149
W92	802.11ac VHT80	106	Rear Face	Main	0	VHT0	12.50	12.08	87.78	0.00	1.050	0.220	1.318
W93	802.11ac VHT80	106	Left Side	Main	0	VHT0	12.50	12.08	87.78	0.00	0.943	0.234	1.183
W94	802.11ac VHT80	106	Right Side	Main	0	VHT0	12.50	12.08	87.78	0.00	0.018	0.006	0.022
W95	802.11ac VHT80	106	Top Side 1	Main	0	VHT0	12.50	12.08	87.78	-0.01	0.014	0.006	0.017
W96	802.11ac VHT80	106	Top Side 2	Main	0	VHT0	12.50	12.08	87.78	0.07	0.012	0.003	0.015
W97	802.11ac VHT80	106	Left Side	Main	90	VHT0	12.50	12.08	87.78	0.00	0.854	0.206	1.072
W98	802.11ac VHT80	106	Left Side	Main	180	VHT0	12.50	12.08	87.78	0.00	**1.100**	**0.277**	**1.380**
W99	802.11ac VHT80	122	Left Side	Main	180	VHT0	12.00	11.77	87.78	0.00	0.740	0.178	0.889
W186	802.11ac VHT80	106	Left Side (Repeated)	Main	180	VHT0	12.50	12.08	87.78	0.06	1.070	0.258	1.343
W100	802.11ac VHT80	106	Front Face	Aux	0	VHT0	11.50	11.29	87.78	0.04	0.927	0.208	1.108
W101	802.11ac VHT80	106	Rear Face	Aux	0	VHT0	11.50	11.29	87.78	0.00	0.178	0.050	0.213
W102	802.11ac VHT80	106	Left Side	Aux	0	VHT0	11.50	11.29	87.78	0.00	0.010	0.003	0.012
W103	802.11ac VHT80	106	Right Side	Aux	0	VHT0	11.50	11.29	87.78	0.06	1.070	0.251	1.279
W104	802.11ac VHT80	106	Top Side 1	Aux	0	VHT0	11.50	11.29	87.78	0.02	0.010	0.004	0.012
W105	802.11ac VHT80	106	Top Side 2	Aux	0	VHT0	11.50	11.29	87.78	0.00	0.021	0.006	0.025
W106	802.11ac VHT80	106	Right Side	Aux	90	VHT0	11.50	11.29	87.78	0.00	0.933	0.217	1.116
W107	802.11ac VHT80	106	Right Side	Aux	180	VHT0	11.50	11.29	87.78	0.00	**1.140**	**0.275**	**1.363**
W108	802.11ac VHT80	122	Right Side	Aux	180	VHT0	11.50	11.02	87.78	0.00	0.986	0.244	1.254
W187	802.11ac VHT80	106	Right Side (Repeated)	Aux	180	VHT0	11.50	11.29	87.78	-0.05	1.100	0.287	1.315
W109	802.11ac VHT80	106	Front Face	Main+Aux	0	VHT8	15.00	14.96	78.59	0.01	0.856	0.186	1.100
W110	802.11ac VHT80	106	Rear Face	Main+Aux	0	VHT8	15.00	14.96	78.59	0.06	0.626	0.136	0.805
W111	802.11ac VHT80	106	Left Side	Main+Aux	0	VHT8	15.00	14.96	78.59	0.07	0.683	0.162	0.878
W112	802.11ac VHT80	106	Right Side	Main+Aux	0	VHT8	15.00	14.96	78.59	0.02	0.830	0.202	1.067
W113	802.11ac VHT80	106	Top Side 1	Main+Aux	0	VHT8	15.00	14.96	78.59	0.05	0.020	0.010	0.026
W114	802.11ac VHT80	106	Top Side 2	Main+Aux	0	VHT8	15.00	14.96	78.59	-0.09	0.184	0.074	0.237
W115	802.11ac VHT80	106	Right Side	Main+Aux	90	VHT8	15.00	14.96	78.59	0.02	0.793	0.181	1.019
W116	802.11ac VHT80	106	Right Side	Main+Aux	180	VHT8	15.00	14.96	78.59	0.00	**0.984**	**0.238**	**1.265**
W117	802.11ac VHT80	122	Right Side	Main+Aux	180	VHT8	15.00	14.94	78.59	0.00	0.941	0.226	1.215
W188	802.11ac VHT80	106	Right Side (Repeated)	Main+Aux	180	VHT8	15.00	14.96	78.59	0.00	0.916	0.240	1.177

Test No.	Band	Channel	Test Position	Ant	Ant Angle	Data Rate	Maximum Tune-up (dBm)	Conducted Power (dBm)	Duty Cycle (%)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W118	802.11n HT40	151	Front Face	Main	0	HT0	13.00	12.84	87.78	0.00	0.175	0.054	0.207
W119	802.11n HT40	151	Rear Face	Main	0	HT0	13.00	12.84	87.78	0.00	0.928	0.202	1.097
W120	802.11n HT40	151	Left Side	Main	0	HT0	13.00	12.84	87.78	0.01	1.020	0.268	1.206
W121	802.11n HT40	151	Right Side	Main	0	HT0	13.00	12.84	87.78	0.00	0.002	<0.0001	0.002
W122	802.11n HT40	151	Top Side 1	Main	0	HT0	13.00	12.84	87.78	0.00	0.017	0.006	0.020
W123	802.11n HT40	151	Top Side 2	Main	0	HT0	13.00	12.84	87.78	-0.02	0.014	0.005	0.017
W124	802.11n HT40	151	Left Side	Main	90	HT0	13.00	12.84	87.78	0.00	0.810	0.201	0.957
W125	802.11n HT40	151	Left Side	Main	180	HT0	13.00	12.84	87.78	0.06	**1.030**	**0.263**	**1.217**
W126	802.11n HT40	159	Left Side	Main	180	HT0	13.00	12.71	87.78	0.00	0.928	0.237	1.130
W189	802.11n HT40	151	Left Side (Repeated)	Main	180	HT0	13.00	12.84	87.78	0.00	1.010	0.254	1.194
W127	802.11n HT40	151	Front Face	Aux	0	HT0	13.00	12.90	87.78	0.00	0.897	0.220	1.046
W128	802.11n HT40	151	Rear Face	Aux	0	HT0	13.00	12.90	87.78	0.07	0.228	0.068	0.266
W129	802.11n HT40	151	Left Side	Aux	0	HT0	13.00	12.90	87.78	-0.07	0.081	0.026	0.094
W130	802.11n HT40	151	Right Side	Aux	0	HT0	13.00	12.90	87.78	0.01	1.010	0.286	1.177
W131	802.11n HT40	151	Top Side 1	Aux	0	HT0	13.00	12.90	87.78	0.03	0.089	0.029	0.104
W132	802.11n HT40	151	Top Side 2	Aux	0	HT0	13.00	12.90	87.78	-0.08	0.109	0.038	0.127
W133	802.11n HT40	151	Right Side	Aux	90	HT0	13.00	12.90	87.78	0.09	0.904	0.239	1.054
W134	802.11n HT40	151	Right Side	Aux	180	HT0	13.00	12.90	87.78	-0.06	**1.190**	**0.306**	**1.387**
W135	802.11n HT40	159	Right Side	Aux	180	HT0	13.00	12.86	87.78	-0.08	1.170	0.309	1.377
W190	802.11n HT40	151	Right Side (Repeated)	Aux	180	HT0	13.00	12.90	87.78	0.00	1.180	0.321	1.376
W136	802.11n HT40	151	Front Face	Main+Aux	0	HT8	15.50	15.31	78.59	0.03	0.823	0.200	1.095
W137	802.11n HT40	151	Rear Face	Main+Aux	0	HT8	15.50	15.31	78.59	0.00	0.554	0.137	0.737
W138	802.11n HT40	151	Left Side	Main+Aux	0	HT8	15.50	15.31	78.59	0.05	0.978	0.255	1.301
W139	802.11n HT40	151	Right Side	Main+Aux	0	HT8	15.50	15.31	78.59	0.01	0.921	0.259	1.225
W140	802.11n HT40	151	Top Side 1	Main+Aux	0	HT8	15.50	15.31	78.59	0.00	0.106	0.035	0.141
W141	802.11n HT40	151	Top Side 2	Main+Aux	0	HT8	15.50	15.31	78.59	-0.09	0.120	0.041	0.160
W142	802.11n HT40	151	Left Side	Main+Aux	90	HT8	15.50	15.31	78.59	0.00	0.837	0.200	1.113
W143	802.11n HT40	151	Left Side	Main+Aux	180	HT8	15.50	15.31	78.59	0.00	**1.010**	**0.256**	**1.343**
W144	802.11n HT40	159	Left Side	Main+Aux	90	HT8	15.50	15.10	78.59	0.00	0.938	0.242	1.309
W191	802.11n HT40	151	Left Side (Repeated)	Main+Aux	180	HT8	15.50	15.31	78.59	0.00	0.973	0.245	1.294

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

3. SAR test results of WiFi 6E

Test No.	Band	Channel	Test Position	Ant	Ant Angle	Data Rate	Maximum Tune-up (dBm)	Conducted Power (dBm)	Duty Cycle (%)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W145	802.11ax80	199	Front Face	Main	0	HE0	3.50	3.41	77.67	0.00	0.027	0.006	0.036
W146	802.11ax80	199	Rear Face	Main	0	HE0	3.50	3.41	77.67	0.00	0.004	0.001	0.005
W147	802.11ax80	199	Left Side	Main	0	HE0	3.50	3.41	77.67	-0.09	0.065	0.017	0.086
W148	802.11ax80	199	Right Side	Main	0	HE0	3.50	3.41	77.67	0.00	0.000	<0.0001	0.000
W149	802.11ax80	199	Top Side 1	Main	0	HE0	3.50	3.41	77.67	-0.01	0.019	0.006	0.025
W150	802.11ax80	199	Top Side 2	Main	0	HE0	3.50	3.41	77.67	0.00	0.036	0.012	0.048
W151	802.11ax80	199	Left Side	Main	90	HE0	3.50	3.41	77.67	0.00	**0.093**	**0.022**	**0.122**
W152	802.11ax80	199	Left Side	Main	180	HE0	3.50	3.41	77.67	0.00	0.085	0.023	0.112
W153	802.11ax80	183	Left Side	Main	90	HE0	3.50	3.24	77.67	0.00	0.083	0.021	0.114
W154	802.11ax80	215	Left Side	Main	90	HE0	3.00	2.74	77.67	0.00	0.070	0.018	0.096
W175	802.11ax80	87	Left Side	Main	90	HE0	3.50	3.37	77.67	0.00	0.060	0.019	0.080
W176	802.11ax80	151	Left Side	Main	90	HE0	3.50	3.14	77.67	0.00	0.065	0.019	0.091
W155	802.11ax80	183	Front Face	Aux	0	HE0	4.00	3.63	77.67	0.00	0.052	0.010	0.073
W156	802.11ax80	183	Rear Face	Aux	0	HE0	4.00	3.63	77.67	0.00	0.000	<.0.0001	0.000
W157	802.11ax80	183	Left Side	Aux	0	HE0	4.00	3.63	77.67	0.00	0.000	<0.0001	0.000
W158	802.11ax80	183	Right Side	Aux	0	HE0	4.00	3.63	77.67	-0.03	0.096	0.024	0.135
W159	802.11ax80	183	Top Side 1	Aux	0	HE0	4.00	3.63	77.67	-0.06	0.009	0.003	0.013
W160	802.11ax80	183	Top Side 2	Aux	0	HE0	4.00	3.63	77.67	/	0.000	<0.0001	0.000
W161	802.11ax80	183	Right Side	Aux	90	HE0	4.00	3.63	77.67	0.00	**0.114**	**0.027**	**0.160**
W162	802.11ax80	183	Right Side	Aux	180	HE0	4.00	3.63	77.67	0.00	0.097	0.025	0.135
W163	802.11ax80	199	Right Side	Aux	90	HE0	3.50	3.16	77.67	0.00	0.099	0.026	0.138
W164	802.11ax80	215	Right Side	Aux	90	HE0	2.50	2.23	77.67	0.00	0.068	0.019	0.093
W177	802.11ax80	39	Right Side	Aux	90	HE0	3.00	2.93	77.67	0.00	0.051	0.017	0.067
W178	802.11ax80	167	Right Side	Aux	90	HE0	3.50	3.22	77.67	0.00	0.058	0.019	0.080
W165	802.11ax80	183	Front Face	Main+Aux	0	HE8	6.50	6.45	33.72	0.00	0.042	0.008	0.127
W166	802.11ax80	183	Rear Face	Main+Aux	0	HE8	6.50	6.45	33.72	0.00	0.012	0.002	0.036
W167	802.11ax80	183	Left Side	Main+Aux	0	HE8	6.50	6.45	33.72	-0.02	0.051	0.013	0.152
W168	802.11ax80	183	Right Side	Main+Aux	0	HE8	6.50	6.45	33.72	-0.07	0.085	0.022	0.256
W169	802.11ax80	183	Top Side 1	Main+Aux	0	HE8	6.50	6.45	33.72	0.07	0.026	0.009	0.078
W170	802.11ax80	183	Top Side 2	Main+Aux	0	HE8	6.50	6.45	33.72	0.00	0.019	0.005	0.058
W171	802.11ax80	183	Right Side	Main+Aux	90	HE8	6.50	6.45	33.72	0.00	0.097	0.027	0.291
W172	802.11ax80	183	Right Side	Main+Aux	180	HE8	6.50	6.45	33.72	0.00	**0.102**	**0.026**	**0.306**
W173	802.11ax80	199	Right Side	Main+Aux	180	HE8	6.50	6.30	33.72	0.00	0.069	0.018	0.214
W174	802.11ax80	215	Right Side	Main+Aux	180	HE8	6.00	5.50	33.72	0.00	0.062	0.018	0.206
W179	802.11ax80	87	Right Side	Main+Aux	180	HE8	6.00	5.89	33.72	0.00	0.055	0.020	0.167
W180	802.11ax80	167	Right Side	Main+Aux	180	HE8	6.00	5.62	33.72	0.00	0.057	0.022	0.184

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

4. SAR test results of Power Density

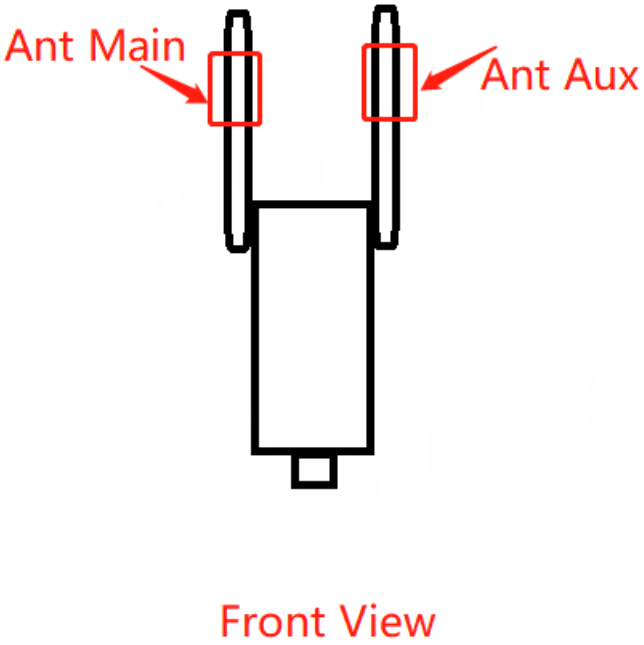
System&Posistion					DUT&Accessory	SAR								Power Density							
Test No.	Band	Channel	Test Position	Ant Angle	Ant	Data Rate	Duty Cycle (%)	Maximum Tune up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR	Grid Step [λ]	Scaling Factor for Measurement Uncertainty	Averaging Area [c㎡]	Power Drift [dB]	Normal PsPD [W/㎡]	Scaling Normal PsPD 【W/㎡】	Total PsPD [W/㎡]	Scaling Total PsPD [W/㎡]
W151	802.11ax80	199	Left Side	90	Main	HE0	77.67	3.50	3.41	0	**0.093**	**0.022**	**0.122**	0.0625	1.55	4	-0.09	1.34	2.73	2.54	**5.17**
W161	802.11ax80	183	Right Side	90	Aux	HE0	77.67	4.00	3.63	0	**0.114**	**0.027**	**0.160**	0.0625	1.55	4	-0.17	1.18	2.56	1.95	**4.24**
W172	802.11ax80	183	Right Side	180	Main +Aux	HE8	33.72	6.50	6.45	0	**0.102**	**0.026**	**0.306**	0.0625	1.55	4	-0.17	0.95	4.41	1.71	**7.95**

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 TCBC workshop notes and IEC TR 63170.

8 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:



8.1 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.	Configuration	Body
1	WLAN 2.4G Main Ant + WLAN 2.4G Aux Ant	Yes
2	WLAN 5G_UNII 1 Main Ant + WLAN 5G_UNII 1 Aux Ant	Yes
3	WLAN 5G_UNII 2a Main Ant + WLAN 5G_UNII 2a Aux Ant	Yes
4	WLAN 5G_UNII 2c Main Ant + WLAN 5G_UNII 2c Aux Ant	Yes
5	WLAN 5G_UNII 3 Main Ant + WLAN 5G_UNII 3 Aux Ant	Yes
6	WLAN 5G_UNII 5 Main Ant + WLAN 5G_UNII 5 Aux Ant	Yes
7	WLAN 5G_UNII 6 Main Ant + WLAN 5G_UNII 6 Aux Ant	Yes
8	WLAN 5G_UNII 7 Main Ant + WLAN 5G_UNII 7 Aux Ant	Yes
9	WLAN 5G_UNII 8 Main Ant + WLAN 5G_UNII 8 Aux Ant	Yes

8.2 SAR UMMATION SCENARIO

The results of transmit simultaneous please refer to section 7.2.1.

Highest Simultaneous Transmission with Multiple transmitters	Total Exposure Radio		Total Exposure Radio		Total Exposure Radio
6E Main+PD Aux	Main	0.122	Aux	0.424	0.500
6E Aux+PD Main	Aux	0.160	Main	0.517	0.617
Max SAR&Power Density					**0.617**

Note:
1) 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 TCBC workshop notes and IEC TR 63170.
2) When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% risk level.

APPENDIX

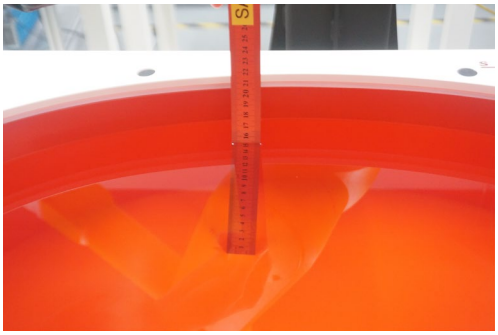
1. TEST LAYOUT

Specific Absorption Rate Test Layout

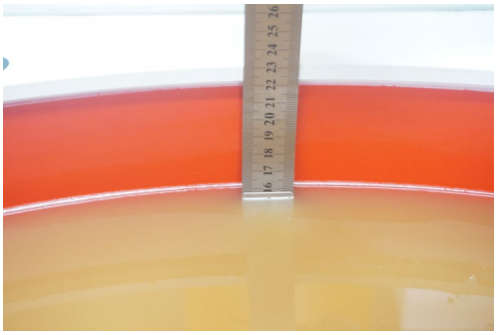
Liquid depth in the flat Phantom (≥15cm depth)

Body_2300-2700MHz_19.0cm

Body_4500-6000MHz_15.4cm



Body_600-10000MHz_15.8cm



Appendix A. SAR Plots of System Verification

(Pls See BTL-FCC SAR-1-2401C089_Appendix A.)

Appendix B. SAR Plots of SAR Measurement

(Pls See BTL-FCC SAR-1-2401C089_Appendix B.)

Appendix C. Calibration Certificate

(Pls See BTL-FCC SAR-1-2401C089_Appendix C.)

Appendix D. Photographs of the Test Set-Up

(Pls See BTL-FCC SAR-1-2401C089_Appendix D.)

End of Test Report