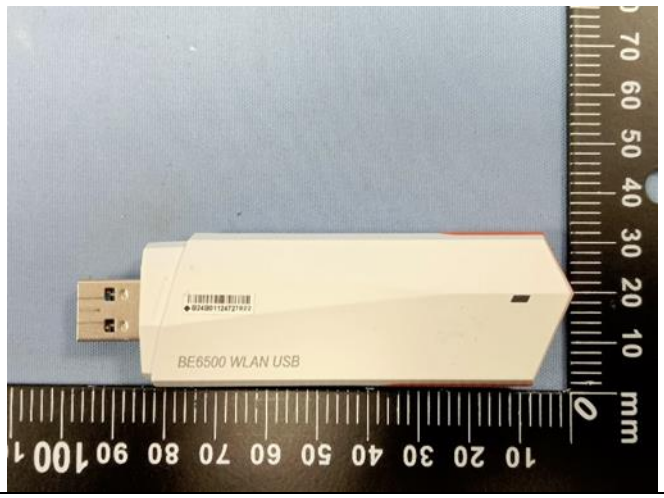
Prüfbericht - Produkte
Test Report - Products

Prüfbericht-Nr.: *Test report no.:*	CN25AKD6 001	**Auftrags-Nr.:** *Order no.:*	48253121	Seite 1 von 57 *Page 1 of 57*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2024-09-13	
Auftraggeber: *Client:*	Edimax Technology Co., Ltd. No.278 , Xinhu 1st Rd., Neihu Dist., Taipei City, Taiwan			
Prüfgegenstand: *Test item:*	2T2R 802.11be Wi-Fi 7 BE6500 USB Dongle			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	EW-7822UBE			
Auftrags-Inhalt: *Order content:*	Test Report for FCC SAR			
Prüfgrundlage: *Test specification:*	FCC 47 CFR §2.1093 IEEE Std 1528-2013 IEC/IEEE 62209-1528:2020 Published RF exposure KDB procedures			
Wareneingangsdatum: *Date of sample receipt:*	2024-12-30			
Prüfmuster-Nr.: *Test sample no:*	A003900059-005			
Prüfzeitraum: *Testing period:*	2025-01-10 - 2025-01-15			
Ort der Prüfung: *Place of testing:*	EMC/RF Taipei Testing Site			
Prüflaboratorium: *Testing laboratory:*	Taipei Testing Laboratories			
Prüfergebnis*: *Test result*:*	Pass			



überprüft von: *compiled by:*	Ginger Chiang	**genehmigt von:** authorized by:	Morrison Huang
Datum: *Date:* 2025-04-15	Ginger Chiang	**Ausstellungsdatum:** *Issue date:* 2025-04-15	Morrison Huang
Stellung / *Position:*	Project Engineer	**Stellung** / *Position:*	Project Engineer

Sonstiges / *Other:*

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.
This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.* *Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
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HISTORY OF THIS TEST REPORT

Revision	Description	Date Issued
R01	Original Release	2025-04-15

1. General Information

1.1 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for the EUT are as follows:

Equipment Class	Operating Mode	Highest Body SAR_{1g} (W/kg)	Highest Reported APD 4cm^2 (W/m^2)	Reported PD PsPD 4cm^2 (W/m^2)
DTS	2.4G WLAN	1.062	-	-
NII	5G WLAN	1.183	-	-
	6G WLAN	0.463	3.456	8.90

Note:

1. 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 to 100 GHz.
2. Per FCC guidance in Oct 2018 TCB workshop, the total exposure ratio calculated by taking ratio of maximum reported SAR divided by SAR limit and adding it to maximum measured power density divided by power density limit. Numerical sum of the ratios should be less than 1.
3. Per FCC interim guidance for near-field power density measurement, the power density was spatially averaged over a circular are of 4 cm^2.
4. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR).

1.2 Equipment Under Test (EUT) Information

1.2.1 General Information

EUT Type	2T2R 802.11be Wi-Fi 7 BE6500 USB Dongle
Model Name	EW-7822UBE
FCC ID	NDD9578222405
Antenna Type	PIFA Antenna
Antenna Gain	WLAN 2.4GHz: 3.2 dBi (Ant 1) / 2 dBi (Ant 2) WLAN U-NII-1: 1.9 dBi (Ant 1) / 2 dBi (Ant 2) WLAN U-NII-2: 1.9 dBi (Ant 1) / 2 dBi (Ant 2) WLAN U-NII-3: 2.7 dBi (Ant 1) / 3.5 dBi (Ant 2) WLAN U-NII-4: 2.7 dBi (Ant 1) / 3.5 dBi (Ant 2) WLAN U-NII-5: 3.3 dBi (Ant 1) / 3.9 dBi (Ant 2) WLAN U-NII-6: 3.5 dBi (Ant 1) / 4 dBi (Ant 2) WLAN U-NII-7: 3.5 dBi (Ant 1) / 4 dBi (Ant 2) WLAN U-NII-8: 3.7 dBi (Ant 1) / 3.6 dBi (Ant 2)

Note: There're 2 configurations of the EUT used for the test.

EUT	Difference
Main sample	EUT with heat sink
2nd sample	EUT with heat sink and thermal pad

1.2.2 Wireless Technologies

Tx Frequency Bands (Unit: MHz)	WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz WLAN U-NII 1: 5150 MHz ~ 5250 MHz WLAN U-NII 2: 5250 MHz ~ 5350 MHz WLAN U-NII 3: 5470 MHz ~ 5725 MHz WLAN U-NII 4: 5725 MHz ~ 5850 MHz WLAN U-NII 5: 5925 MHz ~ 6425 MHz WLAN U-NII 6: 6425 MHz ~ 6525 MHz WLAN U-NII 7: 6525 MHz ~ 6875 MHz WLAN U-NII 8: 6875 MHz ~ 7125 MHz
Uplink Modulations	802.11b: DSSS 802.11a/g/n/ac/ax/be: OFDM / OFDMA

1.3 Maximum Conducted Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

Mode	2.4G WLAN			5.2G WLAN			5.3G WLAN		
	Ant 1	Ant 2	Ant 1+2	Ant 1	Ant 2	Ant 1+2	Ant 1	Ant 2	Ant 1+2
802.11a	N/A	N/A	N/A	13.5	13.5	16.5	13.5	13.5	16.5
802.11b	15.5	15.5	18.5	N/A	N/A	N/A	N/A	N/A	N/A
802.11g	15.5	15.5	18.5	N/A	N/A	N/A	N/A	N/A	N/A
802.11n HT20	15.0	15.0	18.5	13.5	13.5	16.5	13.5	13.5	16.5
802.11n HT40	15.5	15.5	18.5	13.5	13.5	16.5	13.5	13.5	16.5
802.11ac VHT20	15.5	15.5	18.5	13.5	13.5	16.5	13.5	13.5	16.5
802.11ac VHT40	15.5	15.5	18.5	13.5	13.5	16.5	13.5	13.5	16.5
802.11ac VHT80	N/A	N/A	N/A	13.5	13.5	16.5	13.5	13.5	16.5
802.11ac VHT160	N/A	N/A	N/A	N/A	N/A	N/A	13.0	13.0	16.0
802.11ax HE20	15.5	15.5	18.5	13.5	13.5	16.5	13.5	13.5	16.5
802.11ax HE40	15.5	15.5	18.5	13.5	13.5	16.5	13.5	13.5	16.5
802.11ax HE80	N/A	N/A	N/A	13.5	13.5	16.5	13.5	13.5	16.5
802.11ax HE160	N/A	N/A	N/A	13.5	13.5	16.5	13.0	13.0	16.0
802.11be EHT20	15.5	15.5	18.5	13.5	13.5	16.5	13.5	13.5	16.5
802.11be EHT40	15.5	15.5	18.5	13.5	13.5	16.5	13.5	13.5	16.5
802.11be EHT80	N/A	N/A	N/A	13.5	13.5	16.5	13.5	13.5	16.5
802.11be EHT160	N/A	N/A	N/A	N/A	N/A	N/A	13.0	13.0	16.0

Mode	5.6G WLAN			5.8G WLAN			6G WLAN		
	Ant 1	Ant 2	Ant 1+2	Ant 1	Ant 2	Ant 1+2	Ant 1	Ant 2	Ant 1+2
802.11a	15.0	15.0	18.0	15.0	15.0	18.0	N/A	N/A	N/A
802.11b	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11g	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n HT20	15.0	15.0	18.0	15.0	15.0	18.0	N/A	N/A	N/A
802.11n HT40	15.0	15.0	18.0	15.0	15.0	18.0	N/A	N/A	N/A
802.11ac VHT20	15.0	15.0	18.0	15.0	15.0	18.0	N/A	N/A	N/A
802.11ac VHT40	15.0	15.0	18.0	15.0	15.0	18.0	N/A	N/A	N/A
802.11ac VHT80	15.0	15.0	18.0	15.0	15.0	18.0	N/A	N/A	N/A
802.11ac VHT160	13.5	13.0	16.5	N/A	N/A	N/A	N/A	N/A	N/A
802.11ax HE20	15.0	15.0	18.0	15.0	15.0	18.0	1.0	1.0	4.0
802.11ax HE40	15.0	15.0	18.0	15.0	15.0	18.0	4.0	4.0	7.0
802.11ax HE80	15.0	15.0	18.0	15.0	15.0	18.0	7.5	7.5	10.5
802.11ax HE160	13.5	13.0	16.5	15.0	15.0	18.0	10.0	10.0	13.0
802.11be EHT20	15.0	15.0	18.0	15.0	15.0	18.0	1.0	1.0	4.0
802.11be EHT40	15.0	15.0	18.0	15.0	15.0	18.0	4.0	4.0	7.0
802.11be EHT80	15.0	15.0	18.0	15.0	15.0	18.0	7.0	7.0	10.0
802.11be EHT160	13.5	13.5	16.5	N/A	N/A	N/A	10.0	10.0	13.0

2. Test Sites

2.1 Test Laboratory

Taipei Testing Laboratories

11F., No. 758, Sec. 4, Bade Rd., Songshan Dist., Taipei City 105 Taiwan (R.O.C.)

2.2 Test Facilities

Taipei Testing Laboratories

No. 458-18, Sec. 2, Fenliao Rd., Linkou Dist., New Taipei City 244 Taiwan (R.O.C.)

The tests at the test sites have been conducted under the supervision of a TÜV engineer.

2.3 List of Test and Measurement Instruments

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
E-field probes	SPEAG	EX3DV4	7400	2024/4/25	1 Year
E-field probes	SPEAG	EUmmWV4	9599	2024/4/22	1 Year
Data Acquisition Electronics	SPEAG	DAE4	855	2024/4/22	1 Year
System Validation Dipole	SPEAG	D2450V2	804	2024/3/14	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1235	2024/3/19	1 Year
System Validation Dipole	SPEAG	D6.5GHzV2	1044	2024/4/24	1 Year
5G Verification Source	SPEAG	10GHz	2013	2024/4/23	1 Year
Dielectric Assessment Kit	SPEAG	DAK-3.5	1292	2024/4/22	1 Year
ENA	Agilent	E5080A	MY55200677	2024/1/17	1 Year
Power Meter	Anritsu	ML2495A	1901008	2024/3/12	1 Year
Power Sensor	Anritsu	MA2411B	1725269	2024/3/12	1 Year
Power Sensor	R&S	NRP33S	101622	2024/3/21	1 Year
Signal Analyzer	R&S	FSV40	101512	2024/2/22	1 Year
Signal Generator	R&S	SMB100A03	181336	2024/6/11	1 Year
Digital Thermometer	Testo	608-H1	45207430	2024/11/22	1 Year
Directional coupler	Fairview Microwave	FMCP1025-20	A000553136-001	N/A	N/A
Power Amplifier	EMCI	EMC2830P	980352	N/A	N/A
Power Amplifier	mini-circuits	ZHL-42W	SN002101809	N/A	N/A
Twin Sam Phantom	SPEAG	QD000P40CD	TP-1806	N/A	N/A
mmWave Phantom	SPEAG	QD015025C	1001 and higher	N/A	N/A

3. Measurement Uncertainty

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor(a)	1/k(b)	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity
(b) κ is the coverage factor

Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

PD Uncertainty Budget

cDASY6 Module mmWave Uncertainty Budget Evaluation Distances to the Antennas > λ/2π In Compliance with IEC/IEEE 63195-1					
Error Description	Uncertainty Value (±dB)	Probability	Divisor	(Ci)	Standard Uncertainty (±dB)
Uncertainty terms dependent on the measurement system					
Probe Calibration	0.49	N	1	1	0.49
Probe correction	0.00	R	1.732	1	0.00
Frequency response (BW ≤ 1 GHz)	0.20	R	1.732	1	0.12
Sensor cross coupling	0.00	R	1.732	1	0.00
Isotropy	0.50	R	1.732	1	0.29
Linearity	0.20	R	1.732	1	0.12
Probe scattering	0.00	R	1.732	1	0.00
Probe positioning offset	0.30	R	1.732	1	0.17
Probe positioning repeatability	0.04	R	1.732	1	0.02
Sensor mechanical offset	0.00	R	1.732	1	0.00
Probe spatial resolution	0.00	R	1.732	1	0.00
Field impedance dependence	0.00	R	1.732	1	0.00
Amplitude and phase drift	0.00	R	1.732	1	0.00
Amplitude and phase noise	0.04	R	1.732	1	0.02
Measurement area truncation	0.00	R	1.732	1	0.00
Data acquisition	0.03	N	1	1	0.03
Sampling	0.00	R	1.732	1	0.00
Field reconstruction	1.99	R	1.732	1	1.15
Forward transformation	0.00	R	1.732	1	0.00
Power density scaling	0.00	R	1.732	1	0.00
Spatial averaging	0.10	R	1.732	1	0.06
System detection limit	0.04	R	1.732	1	0.02
Uncertainty terms dependent on the DUT and environmental factors					
Probe coupling with DUT	0.00	R	1.732	1	0.0
Modulation response	0.40	R	1.732	1	0.2
Integration time	0.00	R	1.732	1	0.0
Response time	0.00	R	1.732	1	0.0
Device holder influence	0.10	R	1.732	1	0.1
DUT alignment	0.00	R	1.732	1	0.0
RF ambient conditions	0.04	R	1.732	1	0.0
Ambient reflections	0.04	R	1.732	1	0.0
Immunity / secondary reception	0.00	R	1.732	1	0.0
Drift of the DUT		R	1.732	1	
Combined Std. Uncertainty					1.33
Expanded STD Uncertainty (95%)					2.66

SAR Uncertainty Budget According to IEC/IEEE 62209-1528 (Frequency band: 4MHz - 10GHz range)								
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 (±%)	6.65	N	2	1	1	3.33	3.33
CF_{drift}	Probe calibration drift (±%)	1.0	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 (±%)	3.0	N	1	1	1	3.0	3.0
ISO	Probe isotropy (±%)	7.6	R	2	1	1	3.8	3.8
DAE	Other probe and data acquisition errors (±%)	0.3	N	1.732	1	1	0.17	0.17
AMB	RF ambient and noise (±%)	1.8	N	1	1	1	1.8	1.8
Δ_{xyz}	Probe positioning errors (± mm)	0.20	N	1	0.33	0.33	0.07	0.07
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 (±%)	3.5	N	1	0.78	0.71	2.73	2.49
LIQ(*T*c)	Conductivity (temp.)(±%)	3	R	1	0.78	0.71	1.35	1.23
EPS	Phantom Permittivity (±%)	14	R	1.732	0.5	0.5	4.0	4.0
DIS	Distance DUT – TSL (±%)	2	N	1	2	2	4.0	4.0
D_{xyz}	Device Positioning (±%)	2	N	1	1	1	2.2	2.2
H	Device Holder (±%)	3.4	N	1	1	1	3.2	3.2
MOD	DUT Modulation (±%)	2.4	R	1.732	1	1	1.39	1.39
TAS	Time-average SAR (±%)	2.4	R	1.732	1	1	1.39	1.39
RF_{drift}	DUT drift (±%)	5	N	1	1	1	5.0	5.0
VAL	Val Antenna Unc. (±%)	0	N	1	1	1	0.0	0.0
*P*in	Unc. Input Power (±%)	0	N	1	1	1	0.0	0.0
Corrections to the SAR result								
C(ε',σ)	Deviation to Target (±%)	1.9	N	1	1	0.84	1.9	1.6
C(*R*)	SAR scaling (±%)	0	R	√3	1	1	0.0	0.0
u(Δ*SAR*)	Combined uncertainty						12.15	12.04
	Coverage Factor for 95%						K=2	K=2
U	Expanded uncertainty					U =	±24.30	±24.08

Uncertainty budget for frequency range 4 MHz to 10 GHz

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

4. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR §2.1093, IEEE STD 1528-2013, the following FCC Published RF exposure KDB procedures & manufacturer KDB inquiries:

- KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- KDB 865664 D02 RF Exposure Reporting v01r02
- KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- KDB 447498 D01 General RF Exposure Guidance v07
- KDB 447498 D02 SAR Procedures for Dongle Xmtr v02r01
- IEC 62479:2010
- IEC TR 63170:2018
- IEC/IEEE 62209-1528

5. RF Exposure Limits

5.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

5.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is average over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

6. SAR Measurement System

6.1 Definition of Specific Absorption Rate (SAR)

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

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

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

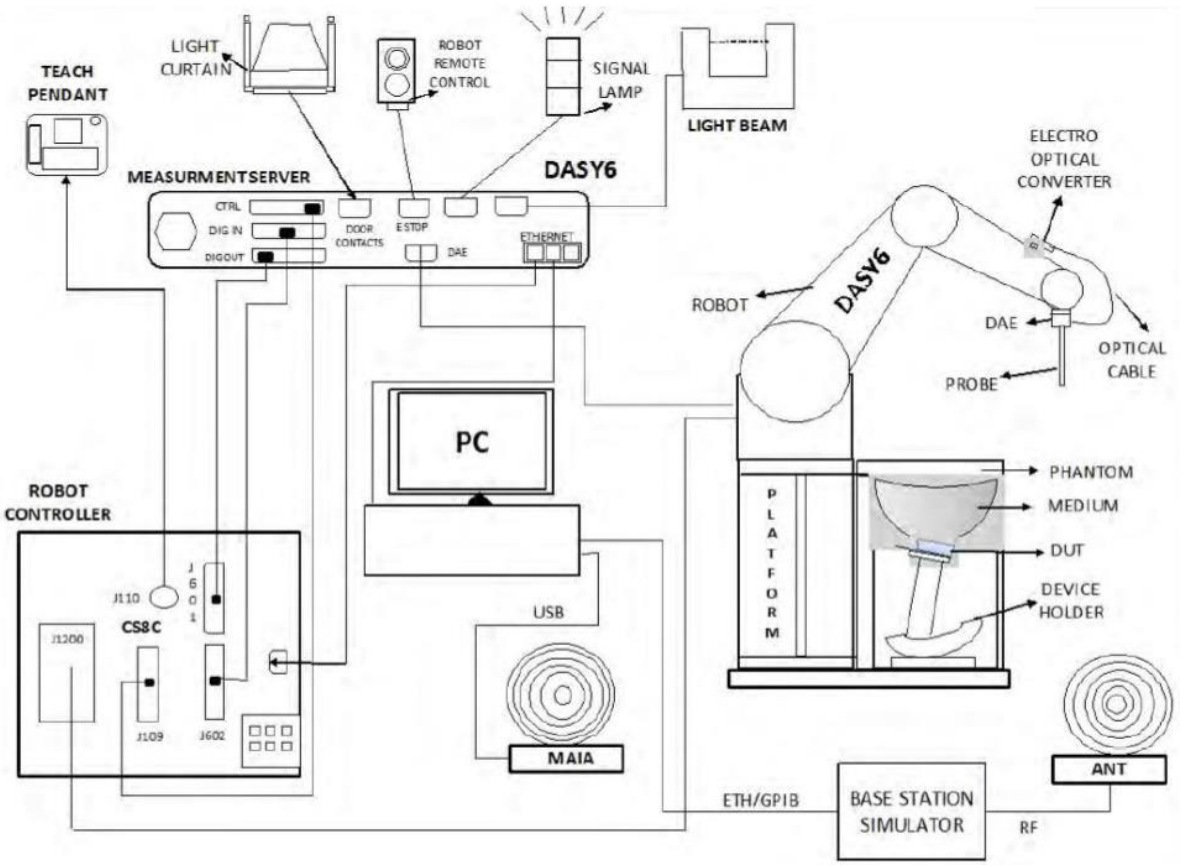
SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

6.2 SPEAG DASY System

DASY system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY6 software defined. The DASY software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.



DASY System Setup

6.2.1 Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

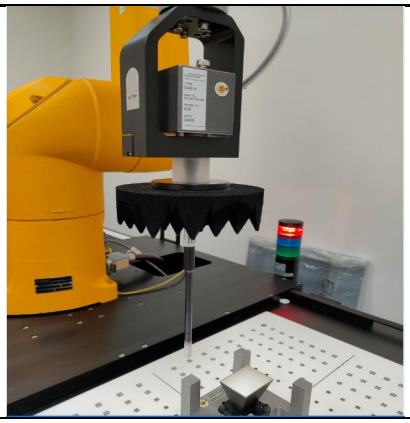
- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

DASY6

6.2.2 mmWave System

The mmWave system uses the from SPEAG(Switzerland) . DASY6 Module mmWave is SPEAG's solution for power density (PD) compliance testing of transmitters operating in the mmWave frequency range 6GHz-110GHz. Incident PD exposure compliance testing of transmitters.

- The measures electric (E-) fields at distances as small as 2 mm from any transmitter.
- Approximates free-space conditions, allowing to evaluate not only the antenna side of the device but also the front (screen) side or any opposite-radiating side of wireless devices operating above 10 GHz without distorting the radio frequency (RF) field.



mmWave System

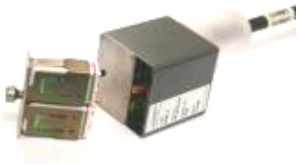
6.2.3 Probes

The SAR measurement is conducted with the dosimetric probe. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

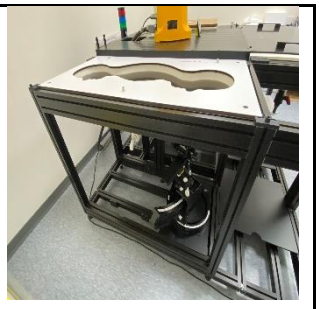
Model	EUmmWVx / 5G Power Density Probe
Construction	Two dipoles optimally arranged to obtain pseudo-vector information. Minimum three measurements/point, 120º rotated around probe axis. Sensors (0.8 mm length) printed on glass substrate protected by high density foam. Low perturbation of the measured field Requires positioner which can do accurate probe rotation
Dimensional tolerance	Overall length: 320 mm (tip: 20 mm) Tip diameter: encapsulation 8 mm (internal sensor <1mm) Distance from probe tip to dipole centers: <2 mm Sensor displacement to probe's calibration point: <0.3 mm

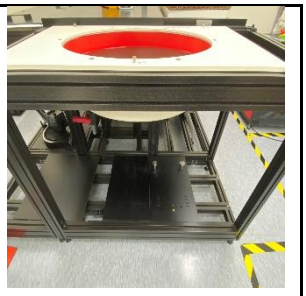
Model	EX3DV4	
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	4 MHz to 10 GHz Linearity: ± 0.2 dB	
Directivity	± 0.1 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 µW/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

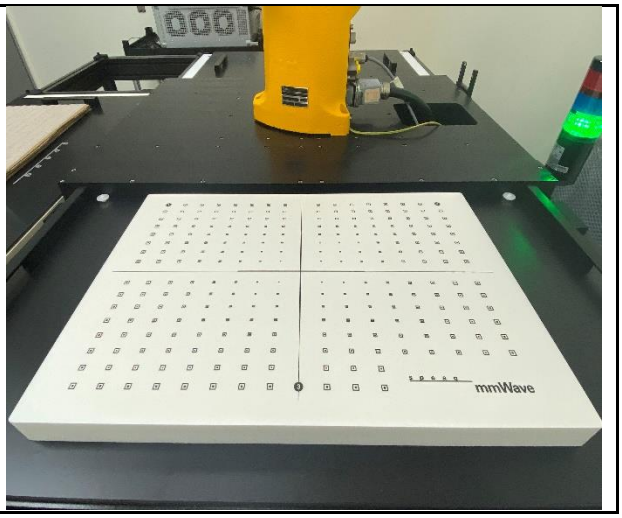
6.2.4 Data Acquisition Electronics (DAE)

Model	DAE4	
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.	
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)	
Input Offset Voltage	< 5µV (with auto zero)	
Input Bias Current	< 50 fA	
Dimensions	60 x 60 x 68 mm	

6.2.5 Phantoms

Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEC/IEEE 62209-1528. 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.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	

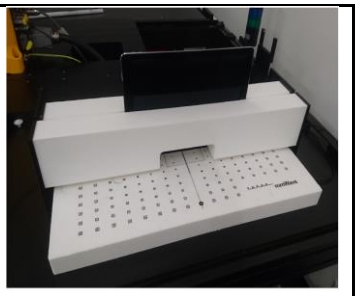
Model	ELI	
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 4 MHz to 10 GHz. ELI is fully compatible with the IEC/IEEE 62209-1528 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	

Model	mmWave Phantom	
Construction	Approximates free-space conditions, allowing to evaluate not only the antenna side of the device but also the front (screen) side or any opposite-radiating side of wireless devices operating above 10 GHz without distorting the radio frequency (RF) field.	
Material	Rohacell plate	
Shell Thickness	40 mm	

6.2.6 Device Holder

Model	Mounting Device	
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	POM	

Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC/IEEE 62209-1528 (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.	
Material	POM, Acrylic glass, Foam	

Model	DUT Holder	
Construction	mmWave DUT Holder – Ensures accurate positioning of smartphones, tablets, and laptops	

6.2.7 System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with l/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.	
Frequency	300 MHz to 10 GHz	
Return Loss	> 20 dB	
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)	

6.2.8 Tissue Simulating Liquids

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed.

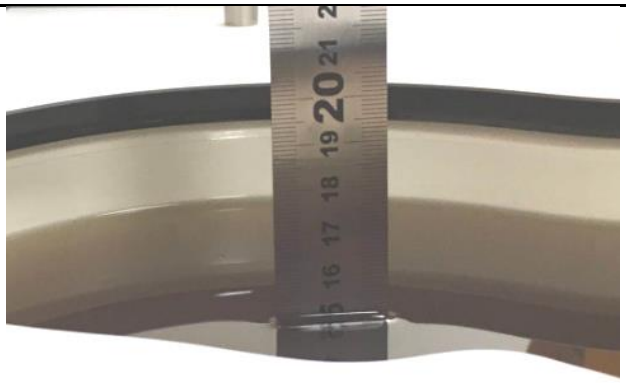


Photo of Liquid Height for Head Position

The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528 Appendix A.
The workshop effective February 19, 2019, FCC has permitted the use of single head tissue simulating liquid specified in IEC 62209 1 for all SAR tests.
The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using a dielectric assessment kit and a network analyzer.

Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of ±5%	Target Conductivity	Range of ±5%
For Head				
750	41.9	39.8 ~ 44.0	0.89	0.85 ~ 0.93
835	41.5	39.4 ~ 43.6	0.90	0.86 ~ 0.95
900	41.5	39.4 ~ 43.6	0.97	0.92 ~ 1.02
1450	40.5	38.5 ~ 42.5	1.20	1.14 ~ 1.26
1640	40.3	38.3 ~ 42.3	1.29	1.23 ~ 1.35
1750	40.1	38.1 ~ 42.1	1.37	1.30 ~ 1.44
1800	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2000	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2300	39.5	37.5 ~ 41.5	1.67	1.59 ~ 1.75
2450	39.2	37.2 ~ 41.2	1.80	1.71 ~ 1.89
2600	39.0	37.1 ~ 41.0	1.96	1.86 ~ 2.06
3500	37.9	36.0 ~ 39.8	2.91	2.76 ~ 3.06
5200	36.0	34.2 ~ 37.8	4.66	4.43 ~ 4.89
5300	35.9	34.1 ~ 37.7	4.76	4.52 ~ 5.00
5500	35.6	33.8 ~ 37.4	4.96	4.71 ~ 5.21
5600	35.5	33.7 ~ 37.3	5.07	4.82 ~ 5.32
5800	35.3	33.5 ~ 37.1	5.27	5.01 ~ 5.53
6500	34.5	32.8 ~ 36.2	6.07	6.04 ~ 6.11

7. SAR Measurement Procedure

According to the SAR test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

The SAR measurement procedures for each of test conditions are as follows:

(a) Make EUT to transmit maximum output power
(b) Measure conducted output power through RF cable
(c) Place the EUT in the specific position of phantom
(d) Perform SAR testing steps on the DASY system
(e) Record the SAR value

7.1 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. According to KDB 865664 D01, the resolution for Area and Zoom scan is specified in the table below.

Items	≤ 2GHz	2-3 GHz	3-4 GHz	4-5 GHz	5-6 GHz
Area Scan (Δx, Δy)	≦15mm	≦12 mm	≦12 mm	≦10 mm	≦10 mm
Zoom Scan (Δx, Δy)	≦8 mm	≦5 mm	≦5 mm	≦4 mm	≦4 mm
Zoom Scan (Δz)	≦5 mm	≦5 mm	≦4 mm	≦3 mm	≦2 mm
Zoom Scan Volume	≧30 mm	≧30 mm	≧28 mm	≧25 mm	≧22 mm

Note:
When zoom scan is required and report SAR is ≦1.4 W/kg, the zoom scan resolution of Δx / Δy (2-3 GHz): ≦8 mm, 3-4 GHz: ≦7 mm, 4-6 GHz: ≦5 mm) may be applied.

7.2 Volume Scan Procedure

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

7.3 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

7.4 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

7.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

8. SAR Measurement Evaluation

8.1 Technical Specification

In general, various vendor specific external test software and chipset based internal test modes are typically used for SAR measurement. These chipset based test mode utilities are generally hardware and manufacturer dependent, and often include substantial flexibility to reconfigure or reprogram a device. A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. The test frequencies established using test mode must correspond to the actual channel frequencies. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. In addition, a periodic transmission duty factor is required for current generation SAR systems to measure SAR correctly. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

According to KDB 248227 D01, this device has installed WLAN engineering testing software which can provide continuous transmitting RF signal. During WLAN SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

Initial Test Configuration
An initial test configuration is determined for OFDM transmission modes in 2.4 GHz and 5 GHz bands according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.

Subsequent Test Configuration
SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. Additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. When the highest reported SAR for the initial test configuration according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤1.2 W/kg, SAR is not required for that subsequent test configuration.

SAR Test Configuration and Channel Selection

When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is using largest channel bandwidth, lowest order modulation, lowest data rate, and lowest order 802.11 mode (i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n). After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following.

1) The channel closest to mid-band frequency is selected for SAR measurement.
2) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

Test Reduction for U-NII-1 (5.2 GHz) and U-NII-2A (5.3 GHz) Bands

For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following.

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition).
2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

8.2 EUT Testing Position

According to technical standards, the EUT is tested for SAR compliance in body described in the following subsections.

8.2.1 Body Exposure Conditions

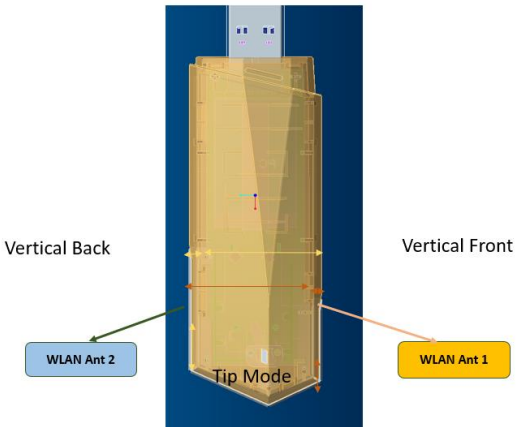
<Simple Dongle Procedures>

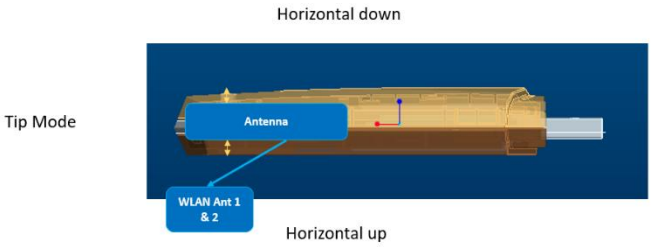
For USB dongle transmitter, according to KDB 447498 D02, SAR evaluation is required for all USB orientations illustrated as below with a device-to-phantom separation distance of 5 mm or less. The typical Horizontal-Up USB connection, found in the majority of host computers, must be tested using an appropriate host computer. A host computer with either Vertical-Front or Vertical-Back USB connection should be used to test one of the vertical USB orientations. If a suitable host computer is not available for testing the Horizontal-Down or the remaining Vertical USB orientation, a high quality USB cable, 12 inches or less, may be used for testing these other orientations.

USB Orientation 1 (Horizontal-Up)	USB Orientation 2 (Horizontal-Down)	USB Orientation 3 (Vertical-Front)	USB Orientation 4 (Vertical-Back)

Illustration for USB Connector Orientations

8.3 Antenna Location





Antenna	To Horizontal down	To Horizontal up
	(mm)	(mm)
WLAN Ant 1	2.30	4.95
WLAN Ant 2	2.30	4.95

8.4 Simultaneous Transmission Possibilities

There is no simultaneous transmission configuration in this device.

8.5 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.

Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	44	-	0.2	-	56.0	-	42.1	-
H835	44	48.4	0.2	1.3	57.0	-	41.1	-
H900	44	48.4	0.2	1.4	58.0	-	40.2	-
H1450	44	-	-	0.6	-	-	56.1	-
H1640	44	-	-	0.5	-	-	53.7	-
H1750	44	45.3	-	0.4	-	-	52.6	-
H1800	44	45.3	-	0.5	-	-	55.2	-
H1900	44	45.3	-	0.2	-	-	55.3	-
H2000	44	45.3	-	0.1	-	-	55.4	-
H2300	44	-	-	0.1	-	-	55.0	-
H2450	44	-	-	0.1	-	-	54.9	-
H2600	44	-	-	0.1	-	-	54.8	-
H3500	44	-	-	0.2	-	20.0	71.8	-
H4000	44	-	-	-	-	-	56.0	-
H5G	44	-	-	-	-	17.2	65.5	17.2
H6G	44	-	-	-	-	-	56.0	-

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16M +resistivity HEC: Hydroxyethyl Cellulose; Sorbitan monolaurate (Tween 20); 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.

The measuring results for tissue simulating liquid are shown as below.

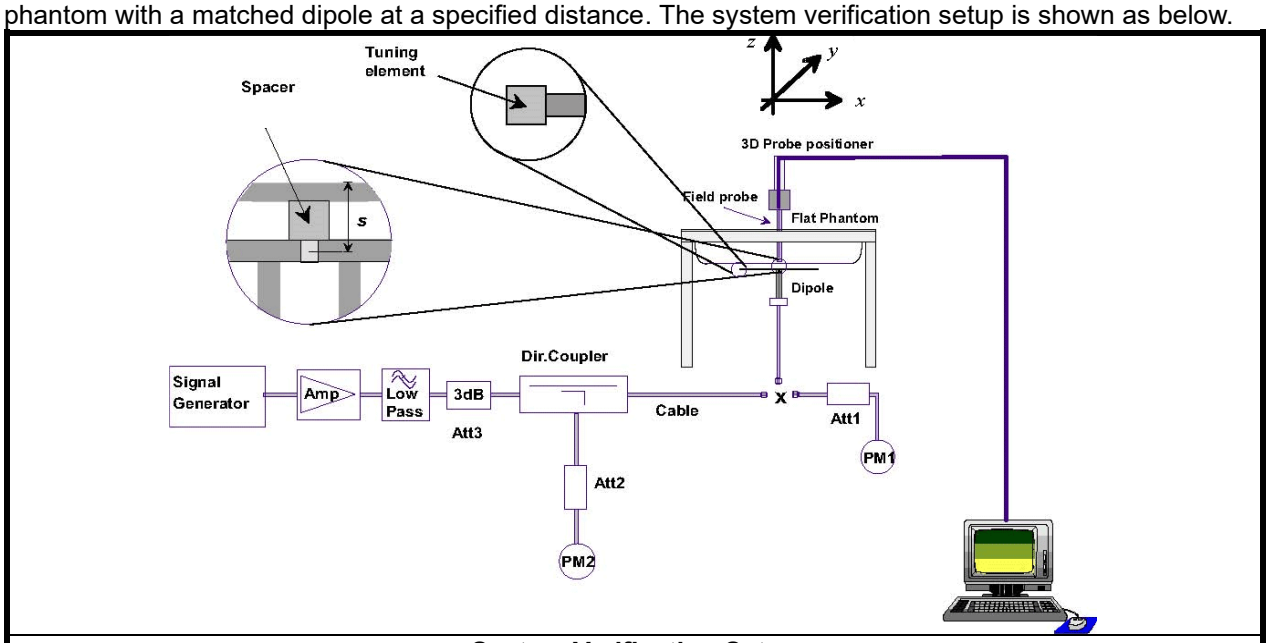
Tissue Type	Frequency (MHz)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)	Test Date
Head	2450	1.815	40.006	1.8	39.2	0.83	2.06	2025/1/15
Head	5250	4.539	35.65	4.71	35.9	-3.63	-0.70	2025/1/13
Head	5600	4.9	34.994	5.07	35.5	-3.35	-1.43	2025/1/13
Head	5750	5.055	34.741	5.22	35.4	-3.16	-1.86	2025/1/13
Head	6500	6.11	34.5	6.07	34.5	0.66	0.00	2025/1/11

Note:
The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ±5% of the target values. Liquid temperature during the SAR testing must be within ±2 ℃.

8.6 SAR System Validation

System check Procedure

The system check verifies that the system operates within its specifications. It is performed daily or before every SAR measurement. The system check uses normal SAR measurements in the flat section of the phantom with a matched dipole at a specified distance. The system verification setup is shown as below.



System Verification Setup

The validation dipole is placed beneath the flat phantom with the specific spacer in place. The distance spacer is touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The spectrum analyzer measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (250 mW is used for 700 MHz to 3 GHz, 100 mW is used for 3.5 GHz to 6 GHz) at the dipole connector and the power meter is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter.

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

The measuring results for SAR system check are shown as below.

Frequency (MHz)	Measured SAR 1g (W/kg)	Normalized SAR 1g (W/kg)	Targeted SAR 1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
2450	13.40	53.6	51.8	3.47	804	7400	855
5250	8.17	81.7	79.6	2.64	1235	7400	855
5600	8.44	84.4	81.7	3.30	1235	7400	855
5750	7.82	78.2	79.1	-1.14	1235	7400	855
6500	29.80	298	295	1.02	1044	7400	855

Note:
Comparing to the reference SAR value provided by SPEAG, the validation data should be within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

8.7 PD System Verification

The system was verified to be within ±0.66 dB of the power density targets on the calibration certificate according to the test system specification in the user's manual and calibration facility recommendation. The 0.66 dB deviation threshold represents the expanded uncertainty for system performance checks using SPEAG's mmWave verification sources. The same spatial resolution and measurement region used in the source calibration was applied during the system check. The measured power density distribution of verification source was also confirmed through visual inspection to have no noticeable differences, both spatially (shape) and numerically (level) from the distribution provided by the manufacturer, per November 2017 TCBC Workshop Notes.

PD System Verification Setup

The measuring results for PD system verification are shown as below.

Frequency (GHz)	5G Verification Source	Distance (mm)	Prad (mW)	Probe S/N	DAE S/N	Date	Normalized 4 cm^2 (W/m^2)	Targeted 4 cm^2 (W/m^2)	Deviation (dB)
10	10GHz-2013	10	138	9599	855	2025/1/10	104	181	-2.41

8.8 Maximum Output Power

8.8.1 Measured Conducted Power Result

All Rate have been tested, the Worst average power (Unit: dBm) is shown as below.

<WLAN 2.4G>

2.4G WIFI_SISO Mode_1TX_ ANT 1					
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
802.11b	1	2412	1	15.15	15.50
	7	2442		15.23	15.50
	13	2472		15.18	15.50
802.11g	1	2412	6	15.07	15.50
	7	2442		15.05	15.50
	13	2472		15.12	15.50
802.11n HT20	1	2412	MCS0	14.90	15.00
	7	2442		14.94	15.00
	13	2472		14.89	15.00
802.11n HT40	3	2422	MCS0	14.97	15.00
	7	2442		15.03	15.50
	11	2462		14.99	15.00
802.11ac VHT20	1	2412	NSS1 MCS0	14.98	15.00
	7	2442		15.03	15.50
	13	2472		14.99	15.00
802.11ac VHT40	3	2422	NSS1 MCS0	15.05	15.50
	7	2442		15.10	15.50
	11	2462		15.07	15.50
802.11ax HE20	1	2412	NSS1 MCS0	15.09	15.50
	7	2442		15.11	15.50
	13	2472		15.07	15.50
802.11ax HE40	3	2422	NSS1 MCS0	15.11	15.50
	7	2442		15.15	15.50
	11	2462		15.12	15.50
802.11be EHT20	1	2412	NSS1 MCS0	15.20	15.50
	7	2442		15.20	15.50
	13	2472		15.18	15.50
802.11be EHT40	3	2422	NSS1 MCS0	15.20	15.50
	7	2442		15.27	15.50
	11	2462		15.22	15.50

2.4G WIFI_SISO Mode_1TX_ ANT 1					
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
802.11b	1	2412	1	15.12	15.50
	7	2442		15.25	15.50
	13	2472		15.14	15.50
802.11g	1	2412	6	15.04	15.50
	7	2442		15.09	15.50
	13	2472		15.06	15.50
802.11n HT20	1	2412	MCS0	14.86	15.00
	7	2442		15.00	15.00
	13	2472		14.83	15.00
802.11n HT40	3	2422	MCS0	14.92	15.00
	7	2442		15.07	15.50
	11	2462		14.96	15.00
802.11ac VHT20	1	2412	NSS1 MCS0	14.93	15.00
	7	2442		15.08	15.50
	13	2472		14.95	15.00
802.11ac VHT40	3	2422	NSS1 MCS0	15.03	15.50
	7	2442		15.14	15.50
	11	2462		15.05	15.50
802.11ax HE20	1	2412	NSS1 MCS0	15.05	15.50
	7	2442		15.17	15.50
	13	2472		15.01	15.50
802.11ax HE40	3	2422	NSS1 MCS0	15.08	15.50
	7	2442		15.21	15.50
	11	2462		15.10	15.50
802.11be EHT20	1	2412	NSS1 MCS0	15.17	15.50
	7	2442		15.28	15.50
	13	2472		15.12	15.50
802.11be EHT40	3	2422	NSS1 MCS0	15.19	15.50
	7	2442		15.29	15.50
	11	2462		15.22	15.50

2.4G WIFI_MIMO Mode_2TX_ANT 1+2							
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)			Max. Tune up
				Ant 1	Ant 2	Ant 1+2	
802.11b	1	2412	1	15.23	15.20	18.23	18.50
	7	2442		15.31	15.34	18.34	18.50
	13	2472		15.27	15.23	18.26	18.50
802.11g	1	2412	6	15.07	15.04	18.07	18.50
	7	2442		15.05	15.09	18.08	18.50
	13	2472		15.12	15.06	18.10	18.50
802.11n HT20	1	2412	MCS0	15.05	15.04	18.06	18.50
	7	2442		15.03	15.11	18.08	18.50
	13	2472		15.03	15.01	18.03	18.50
802.11n HT40	3	2422	MCS0	15.04	15.03	18.05	18.50
	7	2442		15.06	15.11	18.10	18.50
	11	2462		15.04	15.02	18.04	18.50
802.11ac VHT20	1	2412	NSS1 MCS0	15.11	15.10	18.12	18.50
	7	2442		15.09	15.17	18.14	18.50
	13	2472		15.10	15.05	18.09	18.50
802.11ac VHT40	3	2422	NSS1 MCS0	15.10	15.09	18.11	18.50
	7	2442		15.13	15.16	18.16	18.50
	11	2462		15.12	15.09	18.12	18.50
802.11ax HE20	1	2412	NSS1 MCS0	15.15	15.13	18.15	18.50
	7	2442		15.13	15.22	18.19	18.50
	13	2472		15.14	15.08	18.12	18.50
802.11ax HE40	3	2422	NSS1 MCS0	15.15	15.13	18.15	18.50
	7	2442		15.19	15.21	18.21	18.50
	11	2462		15.16	15.15	18.17	18.50
802.11be EHT20	1	2412	NSS1 MCS0	15.20	15.17	18.20	18.50
	7	2442		15.20	15.28	18.25	18.50
	13	2472		15.18	15.12	18.16	18.50
802.11be EHT40	3	2422	NSS1 MCS0	15.20	15.19	18.21	18.50
	7	2442		15.27	15.29	18.29	18.50
	11	2462		15.22	15.22	18.23	18.50

<WLAN 5G>

5.2G WIFI_SISO Mode_1TX_ ANT 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
5.2G	802.11a	36	5180	6	13.26	13.50
		40	5200		13.31	13.50
		44	5220		13.24	13.50
		48	5240		13.26	13.50
	802.11n HT20	36	5180	MCS0	13.14	13.50
		40	5200		13.18	13.50
		44	5220		13.15	13.50
		48	5240		13.08	13.50
	802.11n HT40	38	5190	MCS0	13.07	13.50
		46	5230		13.13	13.50
	802.11ac VHT20	36	5180	NSS1 MCS0	13.24	13.50
		40	5200		13.27	13.50
		44	5220		13.23	13.50
		48	5240		13.19	13.50
	802.11ac VHT40	38	5190	NSS1 MCS0	13.16	13.50
		46	5230		13.20	13.50
	802.11ac VHT80	42	5210	NSS1 MCS0	13.20	13.50
	802.11ax HE20	36	5180	NSS1 MCS0	13.32	13.50
		40	5200		13.34	13.50
		44	5220		13.31	13.50
		48	5240		13.29	13.50
	802.11ax HE40	38	5190	NSS1 MCS0	13.23	13.50
		46	5230		13.28	13.50
	802.11ax HE80	42	5210	NSS1 MCS0	13.27	13.50
	802.11be EHT20	36	5180	NSS1 MCS0	13.45	13.50
		40	5200		13.46	13.50
		44	5220		13.42	13.50
		48	5240		13.43	13.50
	802.11be EHT40	38	5190	NSS1 MCS0	13.34	13.50
		46	5230		13.37	13.50
	802.11be EHT80	42	5210	NSS1 MCS0	13.38	13.50

5.2G WIFI_SISO Mode_1TX_ ANT 2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
5.2G	802.11a	36	5180	6	13.32	13.50
		40	5200		13.35	13.50
		44	5220		13.29	13.50
		48	5240		13.34	13.50
	802.11n HT20	36	5180	MCS0	13.22	13.50
		40	5200		13.26	13.50
		44	5220		13.22	13.50
		48	5240		13.21	13.50
	802.11n HT40	38	5190	MCS0	13.18	13.50
		46	5230		13.20	13.50
	802.11ac VHT20	36	5180	NSS1 MCS0	13.29	13.50
		40	5200		13.33	13.50
		44	5220		13.28	13.50
		48	5240		13.29	13.50
	802.11ac VHT40	38	5190	NSS1 MCS0	13.25	13.50
		46	5230		13.25	13.50
	802.11ac VHT80	42	5210	NSS1 MCS0	13.28	13.50
	802.11ax HE20	36	5180	NSS1 MCS0	13.36	13.50
		40	5200		13.39	13.50
		44	5220		13.35	13.50
		48	5240		13.38	13.50
	802.11ax HE40	38	5190	NSS1 MCS0	13.30	13.50
		46	5230		13.31	13.50
	802.11ax HE80	42	5210	NSS1 MCS0	13.33	13.50
	802.11be EHT20	36	5180	NSS1 MCS0	13.48	13.50
		40	5200		13.49	13.50
		44	5220		13.47	13.50
		48	5240		13.48	13.50
	802.11be EHT40	38	5190	NSS1 MCS0	13.41	13.50
		46	5230		13.43	13.50
	802.11be EHT80	42	5210	NSS1 MCS0	13.46	13.50

5.2G WIFI_MIMO Mode_2TX_ ANT 1+2								
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)			Max. Tune-up
					Ant 1	Ant 2	Ant 1+2	
5.2G	802.11a	36	5180	6	13.26	13.32	16.30	16.50
		40	5200		13.31	13.35	16.34	16.50
		44	5220		13.24	13.29	16.28	16.50
		48	5240		13.26	13.34	16.31	16.50
	802.11n HT20	36	5180	MCS0	13.14	13.22	16.19	16.50
		40	5200		13.18	13.26	16.23	16.50
		44	5220		13.15	13.22	16.20	16.50
		48	5240		13.08	13.21	16.16	16.50
	802.11n HT40	38	5190	MCS0	13.07	13.18	16.14	16.50
		46	5230		13.13	13.20	16.18	16.50
	802.11ac VHT20	36	5180	NSS1 MCS0	13.24	13.29	16.28	16.50
		40	5200		13.27	13.33	16.31	16.50
		44	5220		13.23	13.28	16.27	16.50
		48	5240		13.19	13.29	16.25	16.50
	802.11ac VHT40	38	5190	NSS1 MCS0	13.16	13.25	16.22	16.50
		46	5230		13.20	13.25	16.24	16.50
	802.11ac VHT80	42	5210	NSS1 MCS0	13.20	13.28	16.25	16.50
	802.11ax HE20	36	5180	NSS1 MCS0	13.32	13.36	16.35	16.50
		40	5200		13.34	13.39	16.38	16.50
		44	5220		13.31	13.35	16.34	16.50
		48	5240		13.29	13.38	16.35	16.50
	802.11ax HE40	38	5190	NSS1 MCS0	13.23	13.30	16.28	16.50
		46	5230		13.28	13.31	16.31	16.50
	802.11ax HE80	42	5210	NSS1 MCS0	13.27	13.33	16.31	16.50
	802.11be EHT20	36	5180	NSS1 MCS0	13.45	13.48	16.48	16.50
		40	5200		13.46	13.49	16.49	16.50
		44	5220		13.42	13.47	16.46	16.50
		48	5240		13.43	13.48	16.47	16.50
	802.11be EHT40	38	5190	NSS1 MCS0	13.34	13.41	16.39	16.50
		46	5230		13.37	13.43	16.41	16.50
	802.11be EHT80	42	5210	NSS1 MCS0	13.38	13.46	16.43	16.50

5.3G WIFI_SISO Mode_1TX_ ANT 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
5.3G	802.11a	52	5260	6	13.25	13.50
		56	5280		13.37	13.50
		60	5300		13.19	13.50
		64	5320		13.20	13.50
	802.11n HT20	52	5260	MCS0	13.12	13.50
		56	5280		13.26	13.50
		60	5300		13.08	13.50
		64	5320		13.10	13.50
	802.11n HT40	54	5270	MCS0	13.11	13.50
		62	5310		13.09	13.50
	802.11ac VHT20	52	5260	NSS1 MCS0	13.21	13.50
		56	5280		13.34	13.50
		60	5300		13.17	13.50
		64	5320		13.20	13.50
	802.11ac VHT40	54	5270	NSS1 MCS0	13.15	13.50
		62	5310		13.15	13.50
	802.11ac VHT80	58	5290	NSS1 MCS0	13.21	13.50
	802.11ac VHT160	50	5250	NSS1 MCS0	12.59	13.00
	802.11ax HE20	52	5260	NSS1 MCS0	13.30	13.50
		56	5280		13.43	13.50
		60	5300		13.24	13.50
		64	5320		13.28	13.50
	802.11ax HE40	54	5270	NSS1 MCS0	13.24	13.50
		62	5310		13.25	13.50
	802.11ax HE80	58	5290	NSS1 MCS0	13.29	13.50
	802.11ax HE160	50	5250	NSS1 MCS0	12.64	13.00
	802.11be EHT20	52	5260	NSS1 MCS0	13.45	13.50
		56	5280		13.48	13.50
		60	5300		13.35	13.50
		64	5320		13.40	13.50
	802.11be EHT40	54	5270	NSS1 MCS0	13.39	13.50
		62	5310		13.39	13.50
	802.11be EHT80	58	5290	NSS1 MCS0	13.42	13.50
	802.11be EHT160	50	5250	NSS1 MCS0	12.70	13.00

5.3G WIFI_SISO Mode_1TX_ ANT 2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
5.3G	802.11a	52	5260	6	13.21	13.50
		56	5280		13.32	13.50
		60	5300		13.15	13.50
		64	5320		13.18	13.50
	802.11n HT20	52	5260	MCS0	13.08	13.50
		56	5280		13.22	13.50
		60	5300		13.01	13.50
		64	5320		13.03	13.50
	802.11n HT40	54	5270	MCS0	13.03	13.50
		62	5310		13.03	13.50
	802.11ac VHT20	52	5260	NSS1 MCS0	13.20	13.50
		56	5280		13.33	13.50
		60	5300		13.13	13.50
		64	5320		13.15	13.50
	802.11ac VHT40	54	5270	NSS1 MCS0	13.07	13.50
		62	5310		13.08	13.50
	802.11ac VHT80	58	5290	NSS1 MCS0	13.15	13.50
	802.11ac VHT160	50	5250	NSS1 MCS0	12.56	13.00
	802.11ax HE20	52	5260	NSS1 MCS0	13.28	13.50
		56	5280		13.40	13.50
		60	5300		13.21	13.50
		64	5320		13.25	13.50
	802.11ax HE40	54	5270	NSS1 MCS0	13.19	13.50
		62	5310		13.21	13.50
	802.11ax HE80	58	5290	NSS1 MCS0	13.26	13.50
	802.11ax HE160	50	5250	NSS1 MCS0	12.62	13.00
	802.11be EHT20	52	5260	NSS1 MCS0	13.41	13.50
		56	5280		13.42	13.50
		60	5300		13.30	13.50
		64	5320		13.33	13.50
	802.11be EHT40	54	5270	NSS1 MCS0	13.30	13.50
		62	5310		13.32	13.50
	802.11be EHT80	58	5290	NSS1 MCS0	13.35	13.50
	802.11be EHT160	50	5250	NSS1 MCS0	12.67	13.00

5.3G WIFI_MIMO Mode_2TX_ ANT 1+2								
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)			Max. Tune-up
					Ant 1	Ant 2	Ant 1+2	
5.3G	802.11a	52	5260	6	13.25	13.21	16.24	16.50
		56	5280		13.37	13.32	16.36	16.50
		60	5300		13.19	13.15	16.18	16.50
		64	5320		13.20	13.18	16.20	16.50
	802.11n HT20	52	5260	MCS0	13.12	13.08	16.11	16.50
		56	5280		13.26	13.22	16.25	16.50
		60	5300		13.08	13.01	16.06	16.50
		64	5320		13.10	13.03	16.08	16.50
	802.11n HT40	54	5270	MCS0	13.11	13.03	16.08	16.50
		62	5310		13.09	13.03	16.07	16.50
	802.11ac VHT20	52	5260	NSS1 MCS0	13.21	13.20	16.22	16.50
		56	5280		13.34	13.33	16.35	16.50
		60	5300		13.17	13.13	16.16	16.50
		64	5320		13.20	13.15	16.19	16.50
	802.11ac VHT40	54	5270	NSS1 MCS0	13.15	13.07	16.12	16.50
		62	5310		13.15	13.08	16.13	16.50
	802.11ac VHT80	58	5290	NSS1 MCS0	13.21	13.15	16.19	16.50
	802.11ac VHT160	50	5250	NSS1 MCS0	12.59	12.56	15.59	16.00
	802.11ax HE20	52	5260	NSS1 MCS0	13.30	13.28	16.30	16.50
		56	5280		13.43	13.40	16.43	16.50
		60	5300		13.24	13.21	16.24	16.50
		64	5320		13.28	13.25	16.28	16.50
	802.11ax HE40	54	5270	NSS1 MCS0	13.24	13.19	16.23	16.50
		62	5310		13.25	13.21	16.24	16.50
	802.11ax HE80	58	5290	NSS1 MCS0	13.29	13.26	16.29	16.50
	802.11ax HE160	50	5250	NSS1 MCS0	12.64	12.62	15.64	16.00
	802.11be EHT20	52	5260	NSS1 MCS0	13.45	13.41	16.44	16.50
		56	5280		13.48	13.42	16.46	16.50
		60	5300		13.35	13.30	16.34	16.50
		64	5320		13.40	13.33	16.38	16.50
	802.11be EHT40	54	5270	NSS1 MCS0	13.39	13.30	16.36	16.50
		62	5310		13.39	13.32	16.37	16.50
	802.11be EHT80	58	5290	NSS1 MCS0	13.42	13.35	16.40	16.50
	802.11be EHT160	50	5250	NSS1 MCS0	12.70	12.67	15.70	16.00

5.6G WIFI_SISO Mode_1TX_ ANT 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
5.6G	802.11a	100	5500	6	14.63	15.00
		116	5580		14.70	15.00
		124	5620		14.63	15.00
		132	5660		14.71	15.00
		140	5700		14.82	15.00
	802.11n HT20	100	5500	MCS0	14.62	15.00
		116	5580		14.59	15.00
		124	5620		14.54	15.00
		132	5660		14.63	15.00
		140	5700		14.63	15.00
	802.11n HT40	102	5510	MCS0	14.54	15.00
		110	5550		14.61	15.00
		126	5630		14.55	15.00
		134	5670		14.63	15.00
	802.11ac VHT20	100	5500	NSS1 MCS0	14.66	15.00
		116	5580		14.64	15.00
		124	5620		14.58	15.00
		132	5660		14.67	15.00
		140	5700		14.72	15.00
	802.11ac VHT40	102	5510	NSS1 MCS0	14.57	15.00
		110	5550		14.65	15.00
		126	5630		14.59	15.00
		134	5670		14.66	15.00
	802.11ac VHT80	106	5530	NSS1 MCS0	14.54	15.00
		122	5610		14.59	15.00
	802.11ac VHT160	114	5570	NSS1 MCS0	13.21	13.50
	802.11ax HE20	100	5500	NSS1 MCS0	14.71	15.00
		116	5580		14.71	15.00
		124	5620		14.66	15.00
		132	5660		14.77	15.00
		140	5700		14.80	15.00
	802.11ax HE40	102	5510	NSS1 MCS0	14.61	15.00
		110	5550		14.71	15.00
		126	5630		14.64	15.00
		134	5670		14.70	15.00
	802.11ax HE80	106	5530	NSS1 MCS0	14.59	15.00
		122	5610		14.64	15.00
	802.11ax HE160	114	5570	NSS1 MCS0	13.27	13.50
	802.11be EHT20	100	5500	NSS1 MCS0	14.73	15.00
		116	5580		14.84	15.00
		124	5620		14.82	15.00
		132	5660		14.91	15.00
		140	5700		14.90	15.00
	802.11be EHT40	102	5510	NSS1 MCS0	14.64	15.00
		110	5550		14.75	15.00
		126	5630		14.68	15.00
		134	5670		14.85	15.00
	802.11be EHT80	106	5530	NSS1 MCS0	14.68	15.00
		122	5610		14.77	15.00
	802.11be EHT160	114	5570	NSS1 MCS0	13.34	13.50

5.6G WIFI_SISO Mode_1TX_ ANT 2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
5.6G	802.11a	100	5500	6	14.61	15.00
		116	5580		14.61	15.00
		124	5620		14.59	15.00
		132	5660		14.63	15.00
		140	5700		14.73	15.00
	802.11n HT20	100	5500	MCS0	14.52	15.00
		116	5580		14.55	15.00
		124	5620		14.51	15.00
		132	5660		14.57	15.00
		140	5700		14.55	15.00
	802.11n HT40	102	5510	MCS0	14.51	15.00
		110	5550		14.57	15.00
		126	5630		14.52	15.00
		134	5670		14.57	15.00
	802.11ac VHT20	100	5500	NSS1 MCS0	14.54	15.00
		116	5580		14.59	15.00
		124	5620		14.53	15.00
		132	5660		14.62	15.00
		140	5700		14.66	15.00
	802.11ac VHT40	102	5510	NSS1 MCS0	14.52	15.00
		110	5550		14.61	15.00
		126	5630		14.54	15.00
		134	5670		14.62	15.00
	802.11ac VHT80	106	5530	NSS1 MCS0	14.60	15.00
		122	5610		14.54	15.00
	802.11ac VHT160	114	5570	NSS1 MCS0	12.92	13.00
	802.11ax HE20	100	5500	NSS1 MCS0	14.62	15.00
		116	5580		14.68	15.00
		124	5620		14.63	15.00
		132	5660		14.74	15.00
		140	5700		14.77	15.00
	802.11ax HE40	102	5510	NSS1 MCS0	14.55	15.00
		110	5550		14.64	15.00
		126	5630		14.58	15.00
		134	5670		14.65	15.00
	802.11ax HE80	106	5530	NSS1 MCS0	14.63	15.00
		122	5610		14.61	15.00
	802.11ax HE160	114	5570	NSS1 MCS0	12.99	13.00
	802.11be EHT20	100	5500	NSS1 MCS0	14.67	15.00
		116	5580		14.77	15.00
		124	5620		14.74	15.00
		132	5660		14.86	15.00
		140	5700		14.84	15.00
	802.11be EHT40	102	5510	NSS1 MCS0	14.57	15.00
		110	5550		14.68	15.00
		126	5630		14.61	15.00
		134	5670		14.77	15.00
	802.11be EHT80	106	5530	NSS1 MCS0	14.75	15.00
		122	5610		14.71	15.00
	802.11be EHT160	114	5570	NSS1 MCS0	13.05	13.50

5.6G WIFI_MIMO Mode_2TX_ ANT 1+2								
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)			Max. Tune-up
					Ant 1	Ant 2	Ant 1+2	
5.6G	802.11a	100	5500	6	14.63	14.61	17.63	18.00
		116	5580		14.70	14.61	17.67	18.00
		124	5620		14.63	14.59	17.62	18.00
		132	5660		14.71	14.63	17.68	18.00
		140	5700		14.82	14.73	17.79	18.00
	802.11n HT20	100	5500	MCS0	14.62	14.52	17.58	18.00
		116	5580		14.59	14.55	17.58	18.00
		124	5620		14.54	14.51	17.54	18.00
		132	5660		14.63	14.57	17.61	18.00
		140	5700		14.63	14.55	17.60	18.00
	802.11n HT40	102	5510	MCS0	14.54	14.51	17.54	18.00
		110	5550		14.61	14.57	17.60	18.00
		126	5630		14.55	14.52	17.55	18.00
		134	5670		14.63	14.57	17.61	18.00
	802.11ac VHT20	100	5500	NSS1 MCS0	14.66	14.54	17.61	18.00
		116	5580		14.64	14.59	17.63	18.00
		124	5620		14.58	14.53	17.57	18.00
		132	5660		14.67	14.62	17.66	18.00
		140	5700		14.72	14.66	17.70	18.00
	802.11ac VHT40	102	5510	NSS1 MCS0	14.57	14.52	17.56	18.00
		110	5550		14.65	14.61	17.64	18.00
		126	5630		14.59	14.54	17.58	18.00
		134	5670		14.66	14.62	17.65	18.00
	802.11ac VHT80	106	5530	NSS1 MCS0	14.54	14.60	17.58	18.00
		122	5610		14.59	14.54	17.58	18.00
	802.11ac VHT160	114	5570	NSS1 MCS0	13.21	12.92	16.08	16.50
	802.11ax HE20	100	5500	NSS1 MCS0	14.71	14.62	17.68	18.00
		116	5580		14.71	14.68	17.71	18.00
		124	5620		14.66	14.63	17.66	18.00
		132	5660		14.77	14.74	17.77	18.00
		140	5700		14.80	14.77	17.80	18.00
	802.11ax HE40	102	5510	NSS1 MCS0	14.61	14.55	17.59	18.00
		110	5550		14.71	14.64	17.69	18.00
		126	5630		14.64	14.58	17.62	18.00
		134	5670		14.70	14.65	17.69	18.00
	802.11ax HE80	106	5530	NSS1 MCS0	14.59	14.63	17.62	18.00
		122	5610		14.64	14.61	17.64	18.00
	802.11ax HE160	114	5570	NSS1 MCS0	13.27	12.99	16.14	16.50
	802.11be EHT20	100	5500	NSS1 MCS0	14.73	14.67	17.71	18.00
		116	5580		14.84	14.77	17.82	18.00
		124	5620		14.82	14.74	17.79	18.00
		132	5660		14.91	14.86	17.90	18.00
		140	5700		14.90	14.84	17.88	18.00
	802.11be EHT40	102	5510	NSS1 MCS0	14.64	14.57	17.62	18.00
		110	5550		14.75	14.68	17.73	18.00
		126	5630		14.68	14.61	17.66	18.00
		134	5670		14.85	14.77	17.82	18.00
	802.11be EHT80	106	5530	NSS1 MCS0	14.68	14.75	17.73	18.00
		122	5610		14.77	14.71	17.75	18.00
	802.11be EHT160	114	5570	NSS1 MCS0	13.34	13.05	16.21	16.50

5.8G WIFI_SISO Mode_1TX_ ANT 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
5.8G	802.11a	149	5745	6	14.67	15.00
		157	5785		14.68	15.00
		165	5825		14.67	15.00
	802.11n HT20	149	5745	MCS0	14.54	15.00
		157	5785		14.55	15.00
		165	5825		14.56	15.00
	802.11n HT40	151	5755	MCS0	14.56	15.00
		159	5795		14.53	15.00
	802.11ac VHT20	149	5745	NSS1 MCS0	14.57	15.00
		157	5785		14.59	15.00
		165	5825		14.59	15.00
	802.11ac VHT40	151	5755	NSS1 MCS0	14.61	15.00
		159	5795		14.56	15.00
	802.11ac VHT80	155	5775	NSS1 MCS0	14.54	15.00
	802.11ax HE20	149	5745	NSS1 MCS0	14.63	15.00
		157	5785		14.66	15.00
		165	5825		14.64	15.00
	802.11ax HE40	151	5755	NSS1 MCS0	14.65	15.00
		159	5795		14.61	15.00
	802.11ax HE80	155	5775	NSS1 MCS0	14.59	15.00
	802.11be EHT20	149	5745	NSS1 MCS0	14.78	15.00
		157	5785		14.80	15.00
		165	5825		14.77	15.00
	802.11be EHT40	151	5755	NSS1 MCS0	14.68	15.00
		159	5795		14.63	15.00
	802.11be EHT80	155	5775	NSS1 MCS0	14.68	15.00

5.8G WIFI_SISO Mode_1TX_ ANT 2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
5.8G	802.11a	149	5745	6	14.62	15.00
		157	5785		14.62	15.00
		165	5825		14.63	15.00
	802.11n HT20	149	5745	MCS0	14.51	15.00
		157	5785		14.52	15.00
		165	5825		14.52	15.00
	802.11n HT40	151	5755	MCS0	14.51	15.00
		159	5795		14.51	15.00
	802.11ac VHT20	149	5745	NSS1 MCS0	14.54	15.00
		157	5785		14.54	15.00
		165	5825		14.55	15.00
	802.11ac VHT40	151	5755	NSS1 MCS0	14.53	15.00
		159	5795		14.52	15.00
	802.11ac VHT80	155	5775	NSS1 MCS0	14.59	15.00
	802.11ax HE20	149	5745	NSS1 MCS0	14.60	15.00
		157	5785		14.64	15.00
		165	5825		14.61	15.00
	802.11ax HE40	151	5755	NSS1 MCS0	14.58	15.00
		159	5795		14.55	15.00
	802.11ax HE80	155	5775	NSS1 MCS0	14.63	15.00
	802.11be EHT20	149	5745	NSS1 MCS0	14.71	15.00
		157	5785		14.73	15.00
		165	5825		14.71	15.00
	802.11be EHT40	151	5755	NSS1 MCS0	14.61	15.00
		159	5795		14.58	15.00
	802.11be EHT80	155	5775	NSS1 MCS0	14.75	15.00

5.8G WIFI_MIMO Mode_2TX_ ANT 1+2								
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)			Max. Tune-up
					Ant 1	Ant 2	Ant 1+2	
5.8G	802.11a	149	5745	6	14.67	14.62	17.66	18.00
		157	5785		14.68	14.62	17.66	18.00
		165	5825		14.67	14.63	17.66	18.00
	802.11n HT20	149	5745	MCS0	14.54	14.51	17.54	18.00
		157	5785		14.55	14.52	17.55	18.00
		165	5825		14.56	14.52	17.55	18.00
	802.11n HT40	151	5755	MCS0	14.56	14.51	17.55	18.00
		159	5795		14.53	14.51	17.53	18.00
	802.11ac VHT20	149	5745	NSS1 MCS0	14.57	14.54	17.57	18.00
		157	5785		14.59	14.54	17.58	18.00
		165	5825		14.59	14.55	17.58	18.00
	802.11ac VHT40	151	5755	NSS1 MCS0	14.61	14.53	17.58	18.00
		159	5795		14.56	14.52	17.55	18.00
	802.11ac VHT80	155	5775	NSS1 MCS0	14.54	14.59	17.58	18.00
	802.11ax HE20	149	5745	NSS1 MCS0	14.63	14.60	17.63	18.00
		157	5785		14.66	14.64	17.66	18.00
		165	5825		14.64	14.61	17.64	18.00
	802.11ax HE40	151	5755	NSS1 MCS0	14.65	14.58	17.63	18.00
		159	5795		14.61	14.55	17.59	18.00
	802.11ax HE80	155	5775	NSS1 MCS0	14.59	14.63	17.62	18.00
	802.11be EHT20	149	5745	NSS1 MCS0	14.78	14.71	17.76	18.00
		157	5785		14.80	14.73	17.78	18.00
		165	5825		14.77	14.71	17.75	18.00
	802.11be EHT40	151	5755	NSS1 MCS0	14.68	14.61	17.66	18.00
		159	5795		14.63	14.58	17.62	18.00
	802.11be EHT80	155	5775	NSS1 MCS0	14.68	14.75	17.73	18.00

6G WIFI_SISO Mode_1TX_ ANT 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
6G	802.11ax HE20	1	5955	NSS1 MCS0	0.92	1.00
		57	6235		0.62	1.00
		113	6515		0.64	1.00
		173	6815		0.85	1.00
		233	7115		0.91	1.00
	802.11ax HE40	3	5965	NSS1 MCS0	3.92	4.00
		59	6245		3.76	4.00
		107	6485		3.61	4.00
		171	6805		3.53	4.00
		227	7085		3.46	3.50
	802.11ax HE80	7	5985	NSS1 MCS0	7.01	7.50
		71	6305		6.57	7.00
		119	6545		6.49	6.50
		167	6785		6.53	7.00
		215	7025		6.10	6.50
	802.11ax HE160	15	6025	NSS1 MCS0	9.42	9.50
		47	6185		9.72	10.00
		111	6505		9.23	9.50
		175	6825		9.51	10.00
		207	6985		9.12	9.50
	802.11be EHT20	1	5955	NSS1 MCS0	0.99	1.00
		57	6235		0.69	1.00
		113	6515		0.68	1.00
		173	6815		0.92	1.00
		233	7115		0.96	1.00
	802.11be EHT40	3	5965	NSS1 MCS0	3.96	4.00
		59	6245		3.80	4.00
		107	6485		3.67	4.00
		171	6805		3.56	4.00
		227	7085		3.49	3.50
	802.11be EHT80	7	5985	NSS1 MCS0	6.96	7.00
		71	6305		6.60	7.00
		119	6545		6.49	6.50
		167	6785		6.65	7.00
		215	7025		6.21	6.50
	802.11be EHT160	15	6025	NSS1 MCS0	9.45	9.50
		47	6185		9.76	10.00
		111	6505		9.27	9.50
		175	6825		9.54	10.00
		207	6985		9.20	9.50

6G WIFI_SISO Mode_1TX_ ANT 2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
6G	802.11ax HE20	1	5955	NSS1 MCS0	0.87	1.00
		57	6235		0.58	1.00
		113	6515		0.58	1.00
		173	6815		0.67	1.00
		233	7115		0.73	1.00
	802.11ax HE40	3	5965	NSS1 MCS0	3.96	4.00
		59	6245		3.76	4.00
		107	6485		3.61	4.00
		171	6805		3.57	4.00
		227	7085		3.40	3.50
	802.11ax HE80	7	5985	NSS1 MCS0	7.12	7.50
		71	6305		6.70	7.00
		119	6545		6.37	6.50
		167	6785		6.69	7.00
		215	7025		6.06	6.50
	802.11ax HE160	15	6025	NSS1 MCS0	9.46	9.50
		47	6185		9.75	10.00
		111	6505		9.38	9.50
		175	6825		9.75	10.00
		207	6985		9.26	9.50
	802.11be EHT20	1	5955	NSS1 MCS0	0.96	1.00
		57	6235		0.65	1.00
		113	6515		0.63	1.00
		173	6815		0.71	1.00
		233	7115		0.78	1.00
	802.11be EHT40	3	5965	NSS1 MCS0	3.99	4.00
		59	6245		3.78	4.00
		107	6485		3.64	4.00
		171	6805		3.61	4.00
		227	7085		3.45	3.50
	802.11be EHT80	7	5985	NSS1 MCS0	6.82	7.00
		71	6305		6.73	7.00
		119	6545		6.46	6.50
		167	6785		6.75	7.00
		215	7025		6.11	6.50
	802.11be EHT160	15	6025	NSS1 MCS0	9.49	9.50
		47	6185		9.79	10.00
		111	6505		9.40	9.50
		175	6825		9.81	10.00
		207	6985		9.36	9.50

6G WIFI_MIMO Mode_2TX_ ANT 1+2								
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)			Max. Tune-up
					Ant 1	Ant 2	Ant 1+2	
6G	802.11ax HE20	1	5955	6	0.92	0.87	3.91	4.00
		57	6235		0.62	0.58	3.61	4.00
		113	6515		0.64	0.58	3.62	4.00
		173	6815		0.85	0.67	3.77	4.00
		233	7115		0.91	0.73	3.83	4.00
	802.11ax HE40	3	5965	MCS0	3.92	3.96	6.95	7.00
		59	6245		3.76	3.76	6.77	7.00
		107	6485		3.61	3.61	6.62	7.00
		171	6805		3.53	3.57	6.56	7.00
		227	7085		3.46	3.40	6.44	6.50
	802.11ax HE80	7	5985	MCS0	7.01	7.12	10.08	10.50
		71	6305		6.57	6.70	9.65	10.00
		119	6545		6.49	6.37	9.44	9.50
		167	6785		6.53	6.69	9.62	10.00
		215	7025		6.10	6.06	9.09	9.50
	802.11ax HE160	15	6025	NSS1 MCS0	9.42	9.46	12.45	12.50
		47	6185		9.72	9.75	12.75	13.00
		111	6505		9.23	9.38	12.32	12.50
		175	6825		9.51	9.75	12.64	13.00
		207	6985		9.12	9.26	12.20	12.50
	802.11be EHT20	1	5955	NSS1 MCS0	0.99	0.96	3.99	4.00
		57	6235		0.69	0.65	3.68	4.00
		113	6515		0.68	0.63	3.67	4.00
		173	6815		0.92	0.71	3.83	4.00
		233	7115		0.96	0.78	3.88	4.00
	802.11be EHT40	3	5965	NSS1 MCS0	3.96	3.99	6.99	7.00
		59	6245		3.80	3.78	6.80	7.00
		107	6485		3.67	3.64	6.67	7.00
		171	6805		3.56	3.61	6.60	7.00
		227	7085		3.49	3.45	6.48	6.50
	802.11be EHT80	7	5985	NSS1 MCS0	6.96	6.82	9.90	10.00
		71	6305		6.60	6.73	9.68	10.00
		119	6545		6.49	6.46	9.49	9.50
		167	6785		6.65	6.75	9.71	10.00
		215	7025		6.21	6.11	9.17	9.50
	802.11be EHT160	15	6025	NSS1 MCS0	9.45	9.49	12.48	12.50
		47	6185		9.76	9.79	12.79	13.00
		111	6505		9.27	9.40	12.35	12.50
		175	6825		9.54	9.81	12.69	13.00
		207	6985		9.20	9.36	12.29	12.50

8.9 SAR Testing Results

8.9.1 SAR Test Reduction Considerations

<KDB 447498 D01, General RF Exposure Guidance>

Testing of other required channels within the operating mode of a frequency band is not required when the reported SAR for the mid-band or highest output power channel is:

(1) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
(2) ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
(3) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

<KDB 248227 D01, SAR Guidance for Wi-Fi Transmitters>

(1) For handsets operating next to ear, hotspot mode or mini-tablet configurations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When the reported SAR of initial test position is <= 0.4 W/kg, SAR testing for remaining test positions is not required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is <= 0.8 W/kg or all test positions are measured.
(2) For WLAN 2.4 GHz, the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is <= 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is <= 1.2 W/kg.
(3) For WLAN 5 GHz, the initial test configuration was selected according to the transmission mode with the highest maximum output power. When the reported SAR of initial test configuration is > 0.8 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SAR result is <= 1.2 W/kg or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and it is <= 1.2 W/kg.
(4) For WLAN MIMO mode, the power-based standalone SAR test exclusion or the sum of SAR provision in KDB 447498 to determine simultaneous transmission SAR test exclusion should be applied. Otherwise, SAR for MIMO mode will be measured with all applicable antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

<PD Test Result>

Power Density General Notes:

(1) The Probe Factor for SAR Testing were used 6.5GHz SAR Probe calibration factor.
For the SAR measurement test, five channels were selected according to the criteria of FCC KDB 248227. According to the notes of FCC Oct. 2020 TCBC Workshop Interim procedures, start instead with a minimum of 5 test channels across the full band.

(2) The absorbed power density (APD) using a 4cm² averaging area is reported based on SAR measurements.

(3) Per equipment manufacturer guidance, power density was measured at d=2 and d=λ/8 mm using the same grid size and grid step size for some frequencies, surfaces and each antenna. The integrated Power Density (iPD) was calculated based on these measurements. Since iPD ratio between the two distances is < 1dB, the grid step (0.05) was sufficient for determining compliance at d=2mm.

(4) Since there is no different PD limit on different exposure conditions, therefore the PD test was performed of a 2mm separation between sensor and EUT surface to cover all exposure conditions of phablet.

(5) According to FCC test guidance and equipment manufacturer guidance, power density results were scaled according to IEC62479:2010 for the portion of the measurement uncertainty > 30%. Total expanded uncertainty of 2.66 dB was used to determine the psPD measurement scaling factor.

8.9.2 SAR Results for Body Exposure Condition (Separation Distance is 5mm Gap)

Plot No.	Band	Mode	Test Position	Antenna	EUT	Ch.	Freq. (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Reported SAR-1g (W/kg)
	WLAN2.4GHz	802.11b	Horizontal Up	Ant 0+1	Main	6	2437	18.34	18.50	1.039	1.001	0.09	0.933	0.970
	WLAN2.4GHz	802.11b	Horizontal Up	Ant 0+1	Main	1	2412	18.23	18.50	1.065	1.001	0.07	0.996	1.062
	WLAN2.4GHz	802.11b	Horizontal Up	Ant 0+1	Main	11	2462	18.26	18.50	1.057	1.001	-0.02	0.905	0.957
	WLAN2.4GHz	802.11b	Horizontal Down	Ant 0+1	Main	6	2437	18.34	18.50	1.039	1.001	-0.07	0.957	0.995
98	WLAN2.4GHz	802.11b	Horizontal Down	Ant 0+1	Main	1	2412	18.23	18.50	1.065	1.001	0.04	1.010	**1.077**
	WLAN2.4GHz	802.11b	Horizontal Down	Ant 0+1	Main	11	2462	18.26	18.50	1.057	1.001	-0.05	0.936	0.990
	WLAN2.4GHz	802.11b	Vertical Front	Ant 0+1	Main	6	2437	18.34	18.50	1.039	1.001	-0.19	0.167	0.174
	WLAN2.4GHz	802.11b	Vertical Back	Ant 0+1	Main	6	2437	18.34	18.50	1.039	1.001	0	0.181	0.188
	WLAN2.4GHz	802.11b	Tip Mode	Ant 0+1	Main	6	2437	18.34	18.50	1.039	1.001	-0.18	0.263	0.273
	WLAN2.4GHz	802.11b	Horizontal Down	Ant 0+1	2nd	1	2412	18.23	18.50	1.065	1.001	-0.11	0.942	1.005
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	56	5280	16.36	16.50	1.034	1.013	-0.12	0.885	0.927
39	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	52	5260	16.24	16.50	1.062	1.013	0.15	1.080	**1.161**
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	60	5300	16.18	16.50	1.076	1.013	-0.16	0.949	1.035
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	64	5320	16.20	16.50	1.071	1.013	-0.1	0.944	1.025
	WLAN5GHz	802.11a	Horizontal Down	Ant 0+1	Main	56	5280	16.36	16.50	1.034	1.013	-0.08	0.538	0.563
	WLAN5GHz	802.11a	Vertical Front	Ant 0+1	Main	56	5280	16.36	16.50	1.034	1.013	-0.06	0.266	0.279
	WLAN5GHz	802.11a	Vertical Back	Ant 0+1	Main	56	5280	16.36	16.50	1.034	1.013	0.08	0.283	0.296
	WLAN5GHz	802.11a	Tip Mode	Ant 0+1	Main	56	5280	16.36	16.50	1.034	1.013	-0.19	0.388	0.406
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	2nd	52	5260	16.24	16.50	1.062	1.013	0.02	1.030	1.108
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	132	5660	17.68	18.00	1.076	1.013	-0.14	0.989	1.078
73	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	100	5500	17.63	18.00	1.089	1.013	-0.05	1.070	**1.180**
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	116	5580	17.67	18.00	1.080	1.013	-0.16	0.983	1.075
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	124	5620	17.62	18.00	1.091	1.013	-0.12	1.010	1.117
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	140	5700	17.79	18.00	1.051	1.013	0.06	0.934	0.994
	WLAN5GHz	802.11a	Horizontal Down	Ant 0+1	Main	132	5660	17.68	18.00	1.076	1.013	0.03	0.706	0.770
	WLAN5GHz	802.11a	Vertical Front	Ant 0+1	Main	132	5660	17.68	18.00	1.076	1.013	0.06	0.490	0.534
	WLAN5GHz	802.11a	Vertical Back	Ant 0+1	Main	132	5660	17.68	18.00	1.076	1.013	-0.13	0.504	0.550
	WLAN5GHz	802.11a	Tip Mode	Ant 0+1	Main	132	5660	17.68	18.00	1.076	1.013	-0.1	0.663	0.723
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	2nd	100	5500	17.63	18.00	1.089	1.013	-0.02	1.040	1.147
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	157	5785	17.66	18.00	1.081	1.013	0.04	0.934	1.023
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	149	5745	17.66	18.00	1.083	1.013	-0.12	0.922	1.011
78	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	Main	165	5825	17.66	18.00	1.081	1.013	-0.16	1.080	**1.183**
	WLAN5GHz	802.11a	Horizontal Down	Ant 0+1	Main	157	5785	17.66	18.00	1.081	1.013	0.12	0.636	0.697
	WLAN5GHz	802.11a	Vertical Front	Ant 0+1	Main	157	5785	17.66	18.00	1.081	1.013	-0.12	0.462	0.506
	WLAN5GHz	802.11a	Vertical Back	Ant 0+1	Main	157	5785	17.66	18.00	1.081	1.013	-0.01	0.458	0.502
	WLAN5GHz	802.11a	Tip Mode	Ant 0+1	Main	157	5785	17.66	18.00	1.081	1.013	-0.05	0.593	0.650
	WLAN5GHz	802.11a	Horizontal Up	Ant 0+1	2nd	165	5825	17.66	18.00	1.081	1.013	-0.18	1.050	1.150

Test Engineer: Ginger Chiang

8.9.3 WLAN APD Results (Separation Distance is 5mm Gap)

Plot No.	Band	Mode	Test Position	Antenna	EUT	Ch.	Freq. (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Reported SAR-1g (W/kg)	Measured APD 4cm^2 (W/m^2)	Reported APD 4cm^2 (W/m^2)
102	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	Main	47	6185	12.75	13.00	1.060	1.028	0.11	0.425	**0.463**	3.17	3.46
	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	Main	15	6025	12.45	12.50	1.011	1.028	0.17	0.354	0.368	2.74	2.85
	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	Main	111	6505	12.32	12.50	1.043	1.028	0.03	0.296	0.317	2.36	2.53
	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	Main	175	6825	12.64	13.00	1.086	1.028	-0.11	0.282	0.315	2.23	2.49
	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	Main	207	6985	12.20	12.50	1.071	1.028	0.1	0.281	0.309	2.21	2.43
	WLAN6GHz	802.11ax HE160	Horizontal Down	Ant 0+1	Main	47	6185	12.75	13.00	1.060	1.028	0.17	0.161	0.176	1.29	1.41
	WLAN6GHz	802.11ax HE160	Vertical Front	Ant 0+1	Main	47	6185	12.75	13.00	1.060	1.028	-0.19	0.132	0.144	1.07	1.17
	WLAN6GHz	802.11ax HE160	Vertical Back	Ant 0+1	Main	47	6185	12.75	13.00	1.060	1.028	-0.15	0.123	0.134	0.97	1.06
	WLAN6GHz	802.11ax HE160	Tip Mode	Ant 0+1	Main	47	6185	12.75	13.00	1.060	1.028	-0.19	0.170	0.185	1.55	1.69
	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	2nd	47	6185	12.75	13.00	1.060	1.028	-0.14	0.386	0.421	0.29	0.32

Test Engineer: Ginger Chiang

8.9.4 WLAN PD Results (Separation Distance is Air 2mm Gap)

Plot No.	Band	Mode	Test Position	Antenna	EUT	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-up Power (dBm)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Grip Step (λ)	Scaling Factor for measurement uncertainty	Power Drift (dB)	Measured Normal psPD (W/m^2)	Reported Normal psPD (W/m^2)	Measured Total psPD (W/m^2)	Reported Total psPD (W/m^2)
	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	Main	47	6185	12.75	13.00	1.060	1.028	0.0625	1.358	-0.13	4.02	5.95	5.37	7.95
	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	Main	15	6025	12.45	12.50	1.011	1.028	0.0625	1.358	0.02	5.66	7.99	6.18	8.73
	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	Main	111	6505	12.32	12.50	1.043	1.028	0.0625	1.358	-0.17	4.04	5.88	4.56	6.64
114	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	Main	175	6825	12.64	13.00	1.086	1.028	0.0625	1.358	0.12	5.39	8.17	5.87	**8.90**
	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	Main	207	6985	12.20	12.50	1.071	1.028	0.0625	1.358	0.19	4.76	7.12	5.46	8.17
	WLAN6GHz	802.11ax HE160	Horizontal Down	Ant 0+1	Main	47	6185	12.75	13.00	1.060	1.028	0.0625	1.358	0.15	2.37	3.51	2.50	3.70
	WLAN6GHz	802.11ax HE160	Vertical Front	Ant 0+1	Main	47	6185	12.75	13.00	1.060	1.028	0.0625	1.358	0.05	3.22	4.77	3.39	5.02
	WLAN6GHz	802.11ax HE160	Vertical Back	Ant 0+1	Main	47	6185	12.75	13.00	1.060	1.028	0.0625	1.358	0.09	1.98	2.93	2.04	3.02
	WLAN6GHz	802.11ax HE160	Tip Mode	Ant 0+1	Main	47	6185	12.75	13.00	1.060	1.028	0.0625	1.358	0.06	2.04	3.02	2.13	3.15
	WLAN6GHz	802.11ax HE160	Horizontal Up	Ant 0+1	2nd	175	6825	12.64	13.00	1.086	1.028	0.0625	1.358	0.12	4.84	7.34	5.46	8.28

Test Engineer: Ginger Chiang

8.9.5 SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10, the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These 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.

SAR repeated measurement procedure:

1. When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
2. When the highest measured SAR is >= 0.80 W/kg, repeat that measurement once.
3. 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, perform a second repeated measurement.
4. If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20, and the original, first or second repeated measurement is >= 1.5 W/kg, perform a third repeated measurement.

Band	Mode	Test Position	Ch.	Original Measured SAR-1g (W/kg)	1st Repeated SAR-1g (W/kg)	L/S Ratio (%)	2nd Repeated SAR-1g (W/kg)	L/S Ratio (%)	3rd Repeated SAR-1g (W/kg)	L/S Ratio (%)
WLAN 2.4GHz	802.11b	Horizontal Down	2412	1.010	1.030	2.0	N/A	N/A	N/A	N/A
WLAN 5GHz	802.11a	Horizontal Up	5260	1.080	1.040	-3.7	N/A	N/A	N/A	N/A
WLAN 5GHz	802.11a	Horizontal Up	5500	1.070	1.090	1.9	N/A	N/A	N/A	N/A
WLAN 5GHz	802.11a	Horizontal Up	5825	1.080	1.090	0.9	N/A	N/A	N/A	N/A

8.9.6 DUT Holder Perturbations

Depending on antenna locations, buttons locations on phones or device, form factor (e.g. dongles etc.), the measured SAR could be influenced by the relative positions of the test device and its holder.

When the highest reported SAR of an antenna is > 1.2 W/kg, holder perturbation verification is required, using the highest SAR configuration among all applicable frequency bands with and without the device holder.

All the measured SAR are less than 1.2 W/kg, so the holder perturbation verification is not required.

9. Appendixes

Appendix A – SAR Plots of System Verification

Appendix B – SAR Plots of SAR Measurement

Appendix C – Calibration Certificate for Probe and Dipole

Appendix D – Photographs of the Test Set-Up

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