Prüfbericht-Nr.: *Test report no.:*	CN23O5DG (FCC-SAR) 001	**Auftrags-Nr.:** *Order no.*:	48224548	Seite 1 von 41 *Page 1 of 41*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2023-10-12	
Auftraggeber: *Client:*	medDV GmbH Rudolf-Diesel-Straße 10-12, 35463 Fernwald, Germany			
Prüfgegenstand: *Test item:*	Mobile Medical Assistant			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	NIDApad			
Auftrags-Inhalt: *Order content*:	Test Report for RF Exposure Evaluation			
Prüfgrundlage: *Test specification:*	FCC 47CFR Part 2(2.1093) IEEE Std 1528-2013 IEC TR 63170 IEC/IEEE 63195-1 IEC/IEEE 62209-1528:2020 Published RF exposure KDB procedures			
Wareneingangsdatum: *Date of sample receipt:*	2023-10-04			
Prüfmuster-Nr.: *Test sample no:*	A003574313-002			
Prüfzeitraum: *Testing period:*	2023-10-19 - 2023-10-23			
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:*	Morrison Huang Morrison Huang Project Engineer	**genehmigt von:** authorized by:	Brenda Chen Brenda Chen Senior Project Manager
Datum: *Date:* 2023-11-06		**Ausstellungsdatum:** *Issue date:* 2023-11-06	
Stellung / *Position:*		**Stellung** / *Position:*	

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*

CONTENTS

HISTORY OF THIS TEST REPORT

Revision	Description	Date Issued
R01	Original Release	2023-11-06

1. General Information

1.1 Statement of Compliance

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

Operating Mode	Highest Reported Body SAR_{1g} (0 cm Gap) (W/kg)	APD (W/m^2)	Reported PD PsPD (W/m^2)
2.4G WLAN	0.629	-	-
5G WLAN	0.662	-	-
6G WLAN	0.055	0.446	2.67
Bluetooth	0.107	-	-
Highest Simultaneous Transmission SAR	Body SAR-1g (W/Kg)		
	0.769		

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/cm² (equal to 10 W/m²) for frequency up to 100 GHz.
2. Per FCC guidance in Oct 2018 TCBC 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 area of 4 cm².
4. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/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	Mobile Medical Assistant
Model Name	NIDApad
Antenna Type	PIFA Antenna
Antenna Gain:	WLAN 2.4G: Ant 1: 2.46 dBi (Aux.) / Ant 2: 2.7 dBi (Main) WLAN 5G/6G: Ant 1: 2.6 dBi (Aux.) / Ant 2: 2.09 dBi (Main) Bluetooth: 2.46 dBi

1.2.2 Wireless Technologies

Tx Frequency Bands (Unit: MHz)	WLAN 2.4G: 2412 ~ 2472 WLAN 5G: 5150 ~ 5250, 5250 ~ 5350, 5470 ~ 5725, 5725 ~ 5850 5925 ~ 6425, 6425 ~ 6525, 6525 ~ 6875, 6875 ~ 7125 Bluetooth: 2402 ~ 2480
Uplink Modulations	802.11b: DSSS 802.11a/g/n/ac/ax: OFDM/OFDMA Bluetooth: GFSK, π/4-DQPSK, 8-DPSK Bluetooth LE: GFSK

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	2023/4/28	1 Year
E-field probes	SPEAG	EUmmWV4	9599	2023/4/19	1 Year
Data Acquisition Electronics	SPEAG	DAE4	855	2023/4/25	1 Year
System Validation Dipole	SPEAG	D2450V2	804	2023/3/21	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1235	2023/3/20	1 Year
System Validation Dipole	SPEAG	D6.5GHzV2	1044	2023/4/18	1 Year
5G Verification Source	SPEAG	10GHz	2013	2023/4/26	1 Year
ENA	Agilent	E5080A	MY55200677	2023/1/7	1 Year
Power Meter	Anritsu	ML2495A	1901008	2023/3/17	1 Year
Power Sensor	Anritsu	MA2411B	1725269	2023/3/17	1 Year
Power Sensor	R&S	NRP33S	101622	2023/3/21	1 Year
Signal Analyzer	R&S	FSV40	101512	2023/2/23	1 Year
Signal Generator	R&S	SMB100A03	181334	2023/2/22	1 Year
Digital Thermometer	Testo	608-H1	45197159	2022/11/25	1 Year
Directional coupler	Fairview Microwave	FMCP1025-20	A000553136-001	N/A	N/A
Dielectric Assessment Kit	SPEAG	DAK-3.5	1292	N/A	N/A
ELI Phantom	SPEAG	QDOVA002AA	1153	N/A	N/A
mmWave Phantom	SPEAG	QD015025C	1001 and higher	N/A	N/A
Power Amplifier	EMCI	EMC2830P	980352	N/A	N/A
Power Amplifier	mini-circuits	ZHL-42W	SN002101809	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 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 dep endent 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 dependance	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 dep endent 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) (±%)
CF	Probe calibration(±%)	18.6	N	2	1	1	9.3	9.3
*CF*drift	Probe calibration drift(±%)	1.0	N	1	1	1	0.6	0.6
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	1.7	1.7
ISO	Probe isotropy(±%)	7.6	R	2	1	1	4.4	4.4
DAE	Other probe and data acquisition errors(±%)	0.3	N	1.732	1	1	0.2	0.2
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 (±%)	2.5	N	1	0.78	0.71	2.0	1.8
LIQ(*Tc*)	Conductivity (temp.)(±%)	5	R	1.732	0.78	0.71	2.3	2.0
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(±%)	2	N	1	1	1	2.0	2.0
H	Device Holder(±%)	3.4	N	1	1	1	3.4	3.4
MOD	DUT Modulationm(±%)	2.4	R	1.732	1	1	1.4	1.4
TAS	Time-average SAR(±%)	2.4	R	1.732	1	1	1.4	1.4
*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						14.9	14.8
	Coverage Factor for 95%						K=2	K=2
U	Expanded uncertainty					*U* =	29.7	29.6

4. Submitted Documents

4.1 Test Specification(s)

- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
-IEC/IEEE 62209-1528:2020
- IEC 62479 (2010)
-KDB 447498 D01 General RF Exposure Guidance V06
-KDB 865664 D01 SAR Measurement 100 MHz to 6GHz V01r04
-KDB 865664 D02 SAR Reporting V01r02
-KDB 248227 D01 802.11 Wi-Fi SAR V02r02
-KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
-KDB 616217 D04 SAR for laptop and tablets v01r02

4.2 RF exposure limits (ICNIRP Guidelines)

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

Whole body average SAR	Localized SAR (head and trunk)	Localized SAR (limbs)
0.08	1.6	4.0

Note:

1. Localised SAR averaging mass is any 10g of contiguous tissue; the maximum SAR so obtained should be the value used for the estimation of exposure.
2. The limit applied in this test report is shown in **bold** letters

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.Peak Spatially Averaged Power Density was evaluated over a circular area of 4cm² per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

5. SAR Measurement System

5.1 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:

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

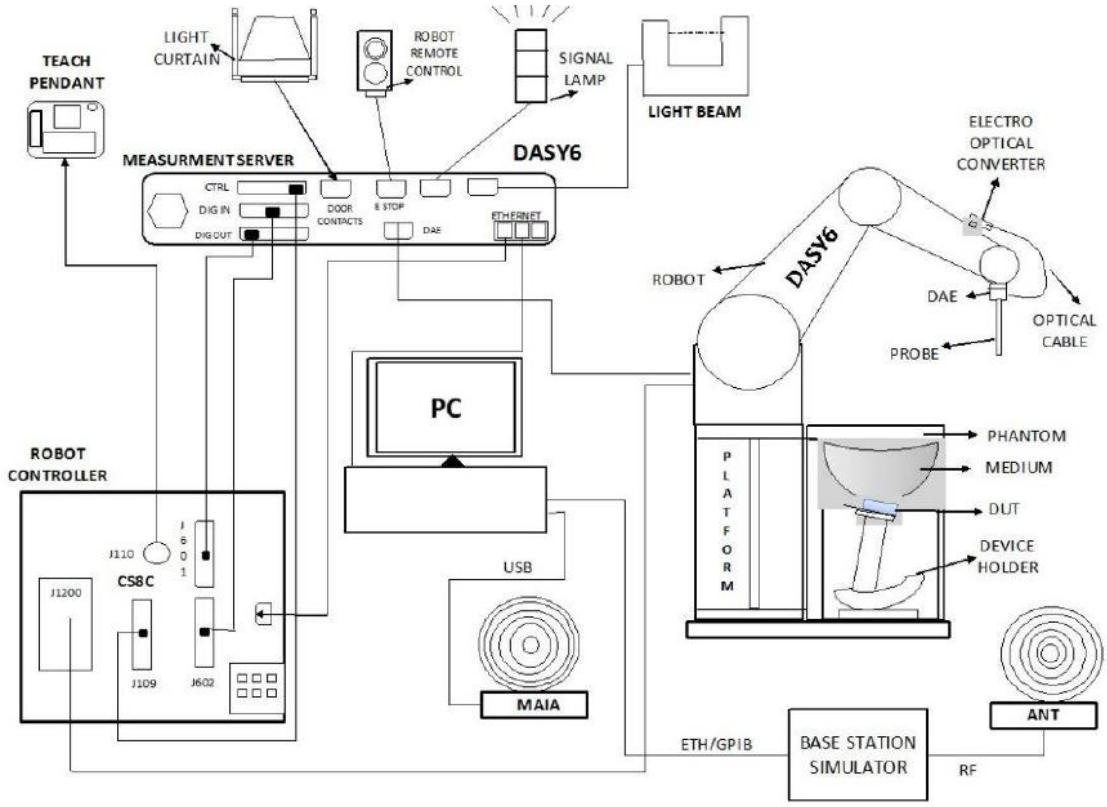
SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be related to the electrical field in the tissue by

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

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

5.2 SPEAG DASY SAR 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 DASY6 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.

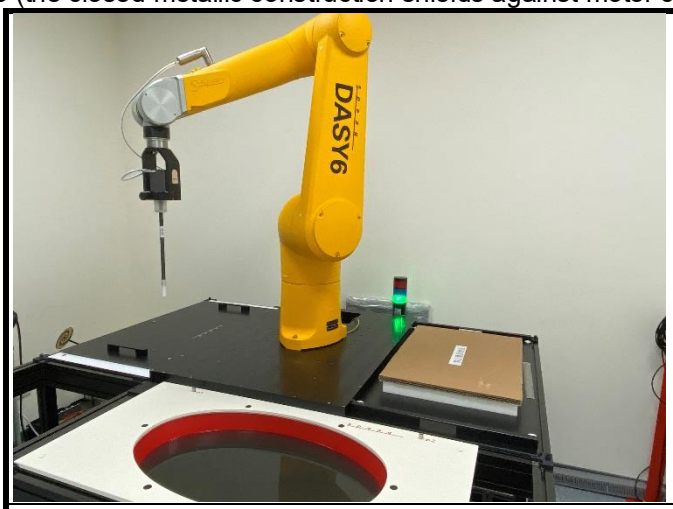


DASY SAR System Setup

5.2.1 Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY6: 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)

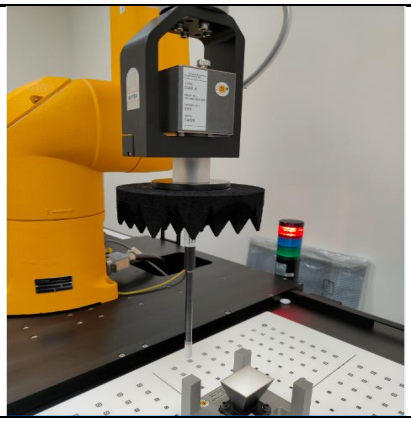


DASY6

5.2.2 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.

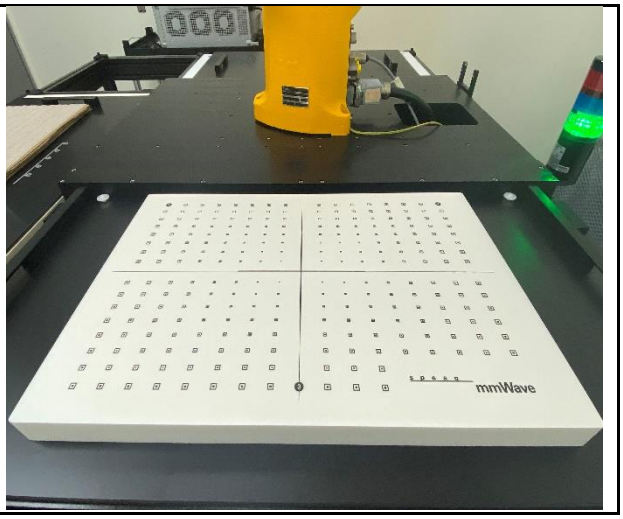
- The measures electric (E-) fields at distances as small as 2 mm from any transmitter.
- Approximates free-space conditions, allowing to evaluate not only the antenna side of the device but also the front (screen) side or any opposite-radiating side of wireless devices operating above 10 GHz without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



mmWave System

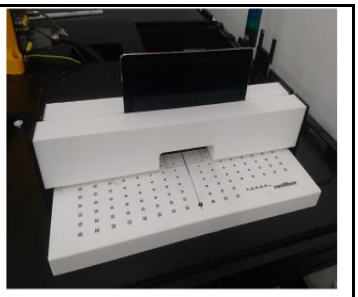
5.2.3 Phantom

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



5.2.4 Device Holder

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



5.2.5 Probe

Model	EUmmWVx / 5G Power Density Probe
Construction	Two dipoles optimally arranged to obtain pseudo-vector information Minimum three measurements/point, 120° 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	10 MHz to 6 GHz Linearity: ± 0.2 dB
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: ± 0.2 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

5.2.6 Data Acquisition Electronics (DAE)

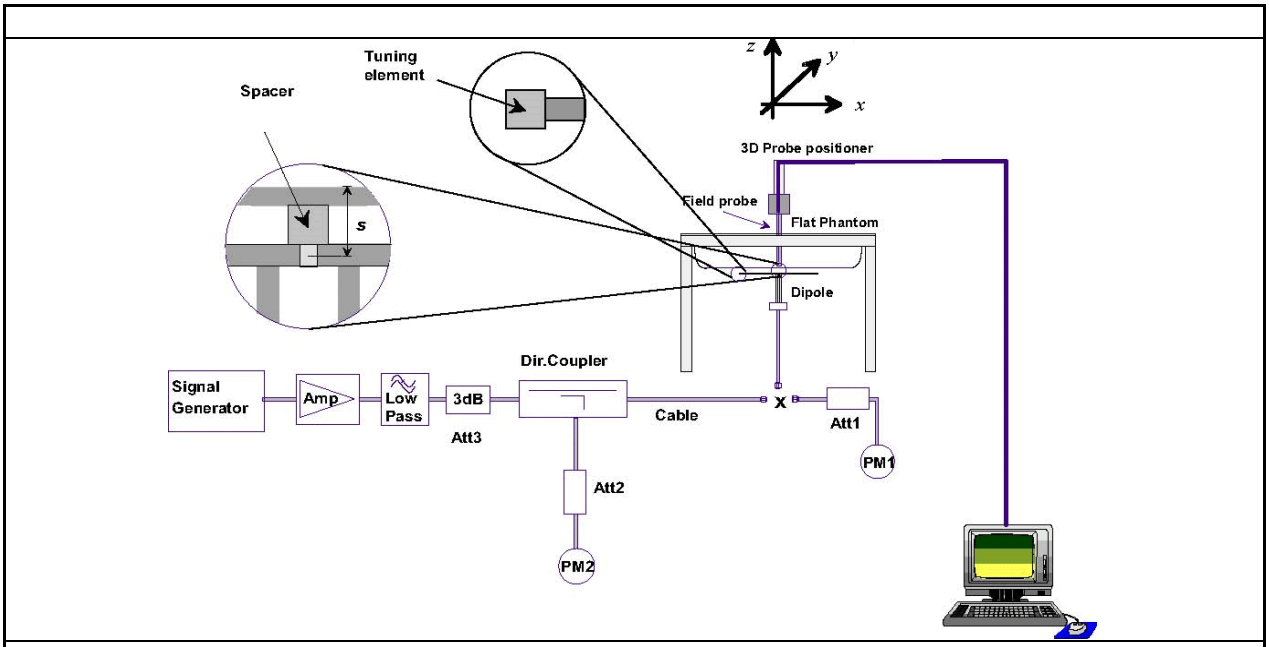
Model	DAE4
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (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

5.2.7 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	750 MHz to 6500 MHz
Return Loss	> 20 dB
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)

5.3 SAR System Verification

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, 154.8mW is used 6GHz to 10GHz) 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 %.

5.4 PSD 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

5.5 SAR Measurement Procedure

According to the SAR test standard, If an array system is used, the following procedure and requirements shall be applied:

a) Measure the electric field or magnetic field over the measurement region.

b) Apply the reconstruction algorithm to reconstruct the SAR distribution in the volume of interest.

c) Apply the averaging algorithm as described in 6.5 to determine the psSAR.

d) If a sequence of different configurations is evaluated without recharging the battery, then the first measurement shall be repeated at the end of each measurement and the relative difference between the first and last measurement shall be within the repeatability tolerance of the system but not larger than 5 %. If the SAR difference exceeds 5 % then the measurements shall be repeated with full charged battery or all SAR values shall be increased by the absolute percentage difference between the first and last 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

5.5.1 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.

6. Test Set-up and Operation Modes

6.1 EUT Configuration and Setting

<Considerations Related to WLAN for Setup and Testing>
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.

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.

6.2 Test Positions Configuration

According to technical standards, handsets are tested for SAR compliance in the configurations described in the following subsections.

6.2.1 Body Exposure Conditions

For full-size tablet, SAR evaluation is required for back surface and edges of the devices. The back surface and edges of the tablet are tested with the tablet touching the phantom. Exposures from antennas through the front surface of the display section of a tablet are generally limited to the user's hands. Exposures to hands for typical consumer transmitters used in tablets are not expected to exceed the extremity SAR limit; therefore, SAR evaluation for the front surface of tablet display screens are generally not necessary. When voice mode is supported on a tablet and it is limited to speaker mode or headset operations only, additional SAR testing for this type of voice use is not required.

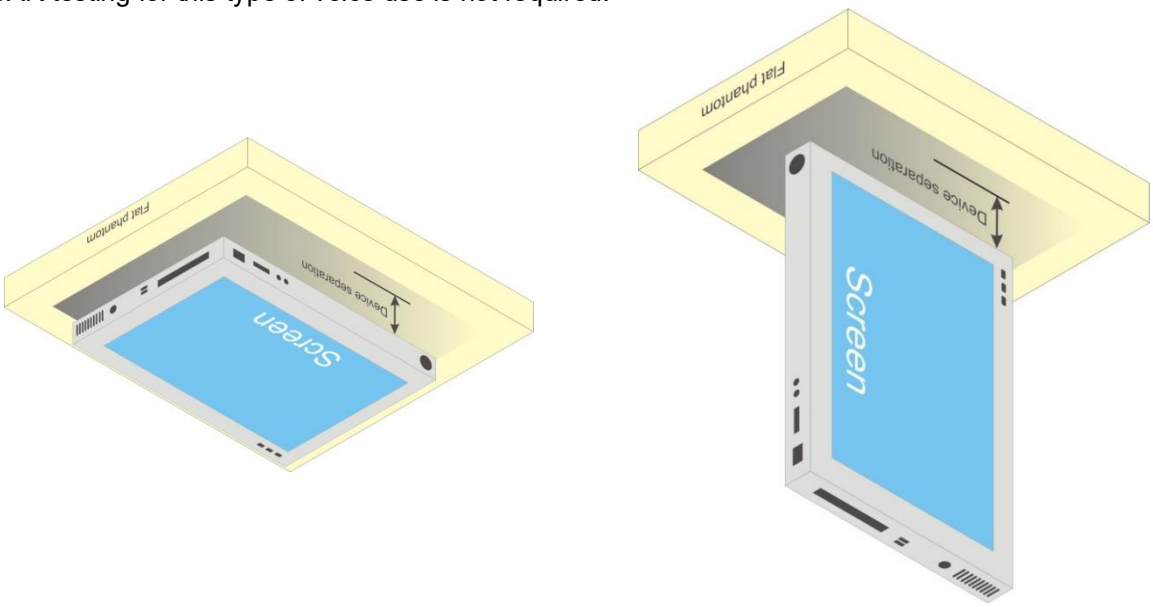
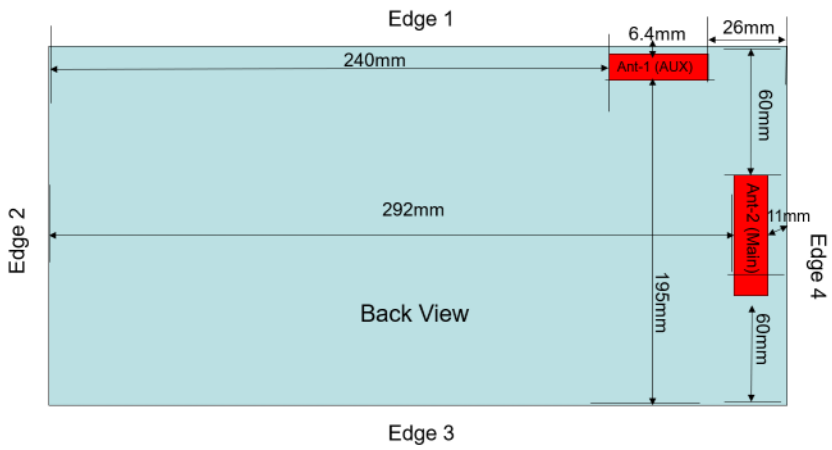


Fig-4.1 Illustration for Tablet Setup

6.2.2 Antenna Location



6.2.3 SAR Test Exclusion Evaluations

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

$$P_{\text{th}}\,(\text{mW}) = ERP_{20\,\text{cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

$$P_{\text{th}}\,(\text{mW}) = \begin{cases} ERP_{20\,\text{cm}}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\,\text{cm}} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,\text{cm}}\sqrt{f}}\right)$$

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Ant	Band	Freq. (MHz)	Ant Gain (dBi)	Output Power		ERP	Separation Distance (mm)									
							Bottom Face		Edge1		Edge2		Edge3		Edge4	
							5		6.4		240		195		26	
							Calculated Threshold Value Pth (mW)									
							Bottom Face		Edge1		Edge2		Edge3		Edge4	
				dBm	mW	mW	Pth	Exempt	Pth	Exempt	Pth	Exempt	Pth	Exempt	Pth	Exempt
Ant 1	WLAN 2.4GHz	2437	2.46	20.5	112.202	120.504	2.8	X	4.4	X	4327.6	V	2916.2	V	63.3	X
Ant 1	WLAN 5GHz_B1	5220	2.6	18	63.096	69.984	1.5	X	2.5	X	4460.1	V	2904	V	45.2	X
Ant 1	WLAN 5GHz_B2	5300	2.6	18	63.096	69.984	1.5	X	2.5	X	4462.8	V	2903.8	V	44.9	X
Ant 1	WLAN 5GHz_B3	5720	2.6	18.5	70.795	78.524	1.4	X	2.3	X	4476.3	V	2902.6	V	43.4	X
Ant 1	WLAN 5GHz_B4	5745	2.6	18.5	70.795	78.524	1.4	X	2.3	X	4477	V	2902.5	V	43.3	X
Ant 1	Bluetooth	2480	2.46	12.5	17.783	19.099	2.7	X	4.3	X	4330.6	V	2915.9	V	62.8	V

Ant	Band	Freq. (MHz)	Ant Gain (dBi)	Output Power		ERP	Separation Distance (mm)									
							Bottom Face		Edge1		Edge2		Edge3		Edge4	
							5		60		292		60		11	
							Calculated Threshold Value Pth (mW)									
							Bottom Face		Edge1		Edge2		Edge3		Edge4	
				dBm	mW	mW	Pth	Exempt	Pth	Exempt	Pth	Exempt	Pth	Exempt	Pth	Exempt
Ant 2	WLAN 2.4GHz	2437	2.7	20.5	112.202	127.350	2.8	X	310.3	V	6282.8	V	310.3	V	12.3	X
Ant 2	WLAN 5GHz_B1	5220	2.09	18	63.096	62.230	1.5	X	254.2	V	6688.7	V	254.2	V	7.6	X
Ant 2	WLAN 5GHz_B2	5300	2.09	18	63.096	62.230	1.5	X	253.2	V	6697.1	V	253.2	V	7.6	X
Ant 2	WLAN 5GHz_B3	5620	2.09	19.5	89.125	87.902	1.4	X	249.4	V	6729.4	V	249.4	V	7.3	X
Ant 2	WLAN 5GHz_B4	5825	2.09	18.5	70.795	69.823	1.4	X	247.1	V	6749.2	V	247.1	V	7.1	X

6.2.4 Simultaneous Transmission Possibilities

The simultaneous transmission possibilities for this device are listed as below.

Simultaneous TX Combination	Capable Transmit Configurations	Body
1	WLAN 2.4G MIMO	Yes
2	WLAN 5G MIMO	Yes
3	WLAN 6G MIMO	Yes
4	WLAN 5G MIMO + Bluetooth	Yes
5	WLAN 6G MIMO + Bluetooth	Yes

6.3 Tissue Verification

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	1.838	40.87	1.8	39.2	2.11	4.26	2023/10/21
Head	5250	4.655	36.621	4.71	35.9	-1.17	2.01	2023/10/19
Head	5600	5.02	36.169	5.07	35.5	-0.99	1.88	2023/10/19
Head	5750	5.182	36.004	5.22	35.4	-0.73	1.71	2023/10/19
Head	6500	6.14	33.8	6.07	34.5	1.15	-2.03	2023/10/22

Note:

1. 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°C.
2. Since the maximum deviation of dielectric properties of the tissue simulating liquid is within 5%, SAR correction is evaluated in the measurement uncertainty shown on section 3 of this report.

6.4 System Verification

The measuring results for system check are shown as below.

Test Date	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
2023/10/21	2450	52.3	13.10	52.4	0.19	804	7400	855
2023/10/19	5250	79.8	8.14	81.4	2.01	1235	7400	855
2023/10/19	5600	82.7	8.67	86.7	4.84	1235	7400	855
2023/10/19	5750	81.4	8.28	82.8	1.72	1235	7400	855
2023/10/22	6500	294	27.50	275	-6.46	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.

6.5 PD System Verification Results

Test Date	Frequency (GHz)	5G Verification Source	Distance (mm)	Prad (mW)	Normalized 4cm² (W/m²)	Targeted 4cm² (W/m²)	Deviation (dB)	Dipole S/N	Probe S/N	DAE S/N
2023/10/23	10	10GHz-2013	10	132	79.77	173	-3.36	9599	9599	855

6.5 Conducted Power Results

The measuring conducted power (Unit: dBm) are shown as below.

<WLAN 2.4G>

2.4G WIFI_ANT 1					
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
802.11b	1	2412	1	19.10	19.5
	6	2437		20.39	20.5
	11	2462		18.93	19
	12	2467		16.37	16.5
	13	2472		13.74	14
802.11g	1	2412	6	15.98	16
	6	2437		20.19	20.5
	11	2462		16.18	16.5
	12	2467		14.20	14.5
	13	2472		1.93	2
802.11n HT20	1	2412	MCS0	15.12	15.5
	6	2437		18.81	19
	11	2462		13.95	14
	12	2467		12.92	13
	13	2472		1.24	1.5
802.11n HT40	3	2422	MCS0	13.28	13.5
	6	2437		13.69	14
	9	2452		12.80	13
	10	2457		11.83	12
	11	2462		2.78	3
802.11ac VHT20	1	2412	NSS1 MCS0	15.19	15.5
	6	2437		18.88	19
	11	2462		14.02	14.5
	12	2467		12.98	13
	13	2472		1.32	1.5
802.11ac VHT40	3	2422	NSS1 MCS0	13.35	13.5
	6	2437		13.77	14
	9	2452		12.96	13
	10	2457		11.92	12
	11	2462		2.88	3
802.11ax HE20	1	2412	NSS1 MCS0	15.42	15.5
	6	2437		19.07	19.5
	11	2462		14.17	14.5
	12	2467		13.20	13.5
	13	2472		1.59	2
802.11ax HE40	3	2422	NSS1 MCS0	13.51	14
	6	2437		13.95	14
	9	2452		13.14	13.5
	10	2457		12.15	12.5
	11	2462		3.06	3.5

2.4G WIFI_ANT 1					
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
802.11b	1	2412	1	19.42	19.5
	6	2437		20.35	20.5
	11	2462		18.83	19
	12	2467		16.80	17
	13	2472		14.25	14.5
802.11g	1	2412	6	16.95	17
	6	2437		19.58	20
	11	2462		16.67	17
	12	2467		14.69	15
	13	2472		2.55	3
802.11n HT20	1	2412	MCS0	16.04	16.5
	6	2437		18.65	19
	11	2462		14.17	14.5
	12	2467		13.27	13.5
	13	2472		2.18	2.5
802.11n HT40	3	2422	MCS0	13.51	14
	6	2437		14.14	14.5
	9	2452		13.14	13.5
	10	2457		12.18	12.5
	11	2462		4.03	4.5
802.11ac VHT20	1	2412	NSS1 MCS0	16.15	16.5
	6	2437		18.72	19
	11	2462		14.25	14.5
	12	2467		13.33	13.5
	13	2472		2.25	2.5
802.11ac VHT40	3	2422	NSS1 MCS0	13.69	14
	6	2437		14.23	14.5
	9	2452		13.24	13.5
	10	2457		12.26	12.5
	11	2462		4.12	4.5
802.11ax HE20	1	2412	NSS1 MCS0	16.39	16.5
	6	2437		18.89	19
	11	2462		14.49	14.5
	12	2467		13.56	14
	13	2472		2.40	2.5
802.11ax HE40	3	2422	NSS1 MCS0	13.90	14
	6	2437		14.44	14.5
	9	2452		13.41	13.5
	10	2457		12.48	12.5
	11	2462		4.35	4.5

2.4G WIFI_ANT 1+2					
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
802.11b	1	2412	1	22.27	22.5
	6	2437		23.38	23.5
	11	2462		21.89	22.0
	12	2467		19.60	19.8
	13	2472		17.01	17.3
802.11g	1	2412	6	19.50	19.5
	6	2437		22.91	23.3
	11	2462		19.44	19.8
	12	2467		17.46	17.8
	13	2472		5.26	5.5
802.11n HT20	1	2412	MCS0	18.61	19.0
	6	2437		21.74	22.0
	11	2462		17.07	17.3
	12	2467		16.11	16.3
	13	2472		4.75	5.0
802.11n HT40	3	2422	MCS0	16.41	16.8
	6	2437		16.93	17.3
	9	2452		15.98	16.3
	10	2457		15.02	15.3
	11	2462		6.46	6.8
802.11ac VHT20	1	2412	NSS1 MCS0	18.71	19.0
	6	2437		21.81	22.0
	11	2462		17.15	17.5
	12	2467		16.17	16.3
	13	2472		4.82	5.0
802.11ac VHT40	3	2422	NSS1 MCS0	16.53	16.8
	6	2437		17.02	17.3
	9	2452		16.11	16.3
	10	2457		15.10	15.3
	11	2462		6.55	6.8
802.11ax HE20	1	2412	NSS1 MCS0	18.94	19.0
	6	2437		21.99	22.3
	11	2462		17.34	17.5
	12	2467		16.39	16.8
	13	2472		5.02	5.3
802.11ax HE40	3	2422	NSS1 MCS0	16.72	17.0
	6	2437		17.21	17.3
	9	2452		16.29	16.5
	10	2457		15.33	15.5
	11	2462		6.76	7.0

<WLAN 5G>

5.2G WIFI_ANT 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.2G	802.11a	36	5180	6	16.02	16.5
		40	5200		17.67	18
		44	5220		17.52	18
		48	5240		17.26	17.5
	802.11n HT20	36	5180	MCS0	15.52	16
		40	5200		15.54	16
		44	5220		15.59	16
		48	5240		15.72	16
	802.11n HT40	38	5190	MCS0	13.43	13.5
		46	5230		15.06	15.5
	802.11ac VHT20	36	5180	NSS1 MCS0	15.58	16
		40	5200		15.66	16
		44	5220		15.65	16
		48	5240		15.78	16
	802.11ac VHT40	38	5190	NSS1 MCS0	13.51	14
		46	5230		15.18	15.5
	802.11ac VHT80	42	5210	NSS1 MCS0	10.72	11
	802.11ax HE20	36	5180	NSS1 MCS0	15.65	16
		40	5200		15.78	16
		44	5220		15.71	16
		48	5240		15.89	16
	802.11ax HE40	38	5190	NSS1 MCS0	13.55	14
		46	5230		15.24	15.5
	802.11ax HE80	42	5210	NSS1 MCS0	10.84	11

5.2G WIFI_ANT 2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.2G	802.11a	36	5180	6	15.72	16
		40	5200		17.88	18
		44	5220		17.96	18
		48	5240		17.31	17.5
	802.11n HT20	36	5180	MCS0	15.44	15.5
		40	5200		15.48	15.5
		44	5220		15.51	16
		48	5240		15.59	16
	802.11n HT40	38	5190	MCS0	13.31	13.5
		46	5230		14.87	15
	802.11ac VHT20	36	5180	NSS1 MCS0	15.51	16
		40	5200		15.54	16
		44	5220		15.62	16
		48	5240		15.70	16
	802.11ac VHT40	38	5190	NSS1 MCS0	13.35	13.5
		46	5230		14.94	15
	802.11ac VHT80	42	5210	NSS1 MCS0	11.10	11.5
	802.11ax HE20	36	5180	NSS1 MCS0	15.57	16
		40	5200		15.61	16
		44	5220		15.70	16
		48	5240		15.80	16
	802.11ax HE40	38	5190	NSS1 MCS0	13.38	13.5
		46	5230		15.02	15.5
	802.11ax HE80	42	5210	NSS1 MCS0	11.19	11.5

5.2G WIFI_ANT 1+2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.2G	802.11a	36	5180	6	18.88	19.3
		40	5200		20.79	21.0
		44	5220		20.76	21.0
		48	5240		20.30	20.5
	802.11n HT20	36	5180	MCS0	18.49	18.8
		40	5200		18.52	18.8
		44	5220		18.56	19.0
		48	5240		18.67	19.0
	802.11n HT40	38	5190	MCS0	16.38	16.5
		46	5230		17.98	18.3
	802.11ac VHT20	36	5180	NSS1 MCS0	18.56	19.0
		40	5200		18.61	19.0
		44	5220		18.65	19.0
		48	5240		18.75	19.0
	802.11ac VHT40	38	5190	NSS1 MCS0	16.44	16.8
		46	5230		18.07	18.3
	802.11ac VHT80	42	5210	NSS1 MCS0	13.92	14.3
	802.11ax HE20	36	5180	NSS1 MCS0	18.62	19.0
		40	5200		18.71	19.0
		44	5220		18.72	19.0
		48	5240		18.86	19.0
	802.11ax HE40	38	5190	NSS1 MCS0	16.48	16.8
		46	5230		18.14	18.5
	802.11ax HE80	42	5210	NSS1 MCS0	14.03	14.3

5.3G WIFI_ANT 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.3G	802.11a	52	5260	6	17.55	18
		56	5280		17.74	18
		60	5300		17.98	18
		64	5320		16.31	16.5
	802.11n HT20	52	5260	MCS0	15.78	16
		56	5280		16.06	16.5
		60	5300		15.90	16
		64	5320		15.58	16
	802.11n HT40	54	5270	MCS0	15.39	15.5
		62	5310		14.88	15
	802.11ac VHT20	52	5260	NSS1 MCS0	15.91	16
		56	5280		16.13	16.5
		60	5300		16.03	16.5
		64	5320		15.70	16
	802.11ac VHT40	54	5270	NSS1 MCS0	15.45	15.5
		62	5310		15.02	15.5
	802.11ac VHT80	58	5290	NSS1 MCS0	12.65	13
	802.11ac VHT160	50	5250	NSS1 MCS0	11.04	11.5
	802.11ax HE20	52	5260	NSS1 MCS0	15.95	16
		56	5280		16.24	16.5
		60	5300		16.09	16.5
		64	5320		15.75	16
	802.11ax HE40	54	5270	NSS1 MCS0	15.54	16
		62	5310		15.13	15.5
	802.11ax HE80	58	5290	NSS1 MCS0	12.77	13
	802.11ax HE160	50	5250	NSS1 MCS0	11.17	11.5

5.3G WIFI_ANT 2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.3G	802.11a	52	5260	6	17.61	18
		56	5280		17.69	18
		60	5300		17.85	18
		64	5320		16.16	16.5
	802.11n HT20	52	5260	MCS0	15.34	15.5
		56	5280		15.42	15.5
		60	5300		15.27	15.5
		64	5320		15.43	15.5
	802.11n HT40	54	5270	MCS0	14.72	15
		62	5310		14.47	14.5
	802.11ac VHT20	52	5260	NSS1 MCS0	15.42	15.5
		56	5280		15.51	16
		60	5300		15.35	15.5
		64	5320		15.55	16
	802.11ac VHT40	54	5270	NSS1 MCS0	14.77	15
		62	5310		14.54	15
	802.11ac VHT80	58	5290	NSS1 MCS0	12.23	12.5
	802.11ac VHT160	50	5250	NSS1 MCS0	11.13	11.5
	802.11ax HE20	52	5260	NSS1 MCS0	15.46	15.5
		56	5280		15.59	16
		60	5300		15.41	15.5
		64	5320		15.62	16
	802.11ax HE40	54	5270	NSS1 MCS0	14.83	15
		62	5310		14.61	15
	802.11ax HE80	58	5290	NSS1 MCS0	12.31	12.5
	802.11ax HE160	50	5250	NSS1 MCS0	11.26	11.5

5.3G WIFI_ANT 1+2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.3G	802.11a	52	5260	6	20.59	21.0
		56	5280		20.73	21.0
		60	5300		20.93	21.0
		64	5320		19.25	19.5
	802.11n HT20	52	5260	MCS0	18.58	18.8
		56	5280		18.76	19.0
		60	5300		18.61	18.8
		64	5320		18.52	18.8
	802.11n HT40	54	5270	MCS0	18.08	18.3
		62	5310		17.69	17.8
	802.11ac VHT20	52	5260	NSS1 MCS0	18.68	18.8
		56	5280		18.84	19.3
		60	5300		18.71	19.0
		64	5320		18.64	19.0
	802.11ac VHT40	54	5270	NSS1 MCS0	18.13	18.3
		62	5310		17.80	18.3
	802.11ac VHT80	58	5290	NSS1 MCS0	15.46	15.8
	802.11ac VHT160	50	5250	NSS1 MCS0	14.10	14.5
	802.11ax HE20	52	5260	NSS1 MCS0	18.72	18.8
		56	5280		18.94	19.3
		60	5300		18.77	19.0
		64	5320		18.70	19.0
	802.11ax HE40	54	5270	NSS1 MCS0	18.21	18.5
		62	5310		17.89	18.3
	802.11ax HE80	58	5290	NSS1 MCS0	15.56	15.8
	802.11ax HE160	50	5250	NSS1 MCS0	14.23	14.5

5.6G WIFI_ANT 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.6G	802.11a	100	5500	6	14.85	15
		116	5580		18.22	18.5
		124	5620		18.12	18.5
		132	5660		17.94	18
		144	5720		18.29	18.5
	802.11n HT20	100	5500	MCS0	14.65	15
		116	5580		15.02	15.5
		124	5620		14.85	15
		132	5660		14.73	15
		144	5720		15.16	15.5
	802.11n HT40	102	5510	MCS0	13.61	14
		110	5550		15.22	15.5
		126	5630		14.74	15
		134	5670		15.35	15.5
		142	5710		14.83	15
	802.11ac VHT20	100	5500	NSS1 MCS0	14.71	15
		116	5580		15.10	15.5
		124	5620		14.94	15
		132	5660		14.82	15
		144	5720		15.29	15.5
	802.11ac VHT40	102	5510	NSS1 MCS0	13.65	14
		110	5550		15.27	15.5
		126	5630		14.83	15
		134	5670		15.44	15.5
		142	5710		14.92	15
	802.11ac VHT80	106	5530	NSS1 MCS0	13.14	13.5
		122	5610		13.93	14
		138	5690		14.60	15
	802.11ac VHT160	114	5570	NSS1 MCS0	12.03	12.5
	802.11ax HE20	100	5500	NSS1 MCS0	14.78	15
		116	5580		15.16	15.5
		124	5620		15.02	15.5
		132	5660		14.93	15
		144	5720		15.38	15.5
	802.11ax HE40	102	5510	NSS1 MCS0	13.73	14
		110	5550		15.33	15.5
		126	5630		14.88	15
		134	5670		15.49	15.5
		142	5710		15.01	15.5
	802.11ax HE80	106	5530	NSS1 MCS0	13.26	13.5
		122	5610		14.07	14.5
		138	5690		14.61	15
	802.11ax HE160	114	5570	NSS1 MCS0	12.18	12.5

5.6G WIFI_ANT 2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.6G	802.11a	100	5500	6	15.04	15.5
		116	5580		19.11	19.5
		124	5620		19.01	19.5
		132	5660		18.93	19
		144	5720		18.24	18.5
	802.11n HT20	100	5500	MCS0	14.84	15
		116	5580		15.66	16
		124	5620		16.11	16.5
		132	5660		16.02	16.5
		144	5720		15.30	15.5
	802.11n HT40	102	5510	MCS0	13.85	14
		110	5550		15.10	15.5
		126	5630		15.19	15.5
		134	5670		14.69	15
		142	5710		15.04	15.5
	802.11ac VHT20	100	5500	NSS1 MCS0	14.92	15
		116	5580		15.73	16
		124	5620		16.16	16.5
		132	5660		16.05	16.5
		144	5720		15.37	15.5
	802.11ac VHT40	102	5510	NSS1 MCS0	13.91	14
		110	5550		15.18	15.5
		126	5630		15.32	15.5
		134	5670		14.81	15
		142	5710		15.15	15.5
	802.11ac VHT80	106	5530	NSS1 MCS0	13.55	14
		122	5610		14.62	15
		138	5690		14.64	15
	802.11ac VHT160	114	5570	NSS1 MCS0	12.59	13
	802.11ax HE20	100	5500	NSS1 MCS0	14.97	15
		116	5580		15.81	16
		124	5620		16.24	16.5
		132	5660		16.13	16.5
		144	5720		15.43	15.5
	802.11ax HE40	102	5510	NSS1 MCS0	13.99	14
		110	5550		15.29	15.5
		126	5630		15.38	15.5
		134	5670		14.86	15
		142	5710		15.22	15.5
	802.11ax HE80	106	5530	NSS1 MCS0	13.67	14
		122	5610		14.75	15
		138	5690		14.65	15
	802.11ax HE160	114	5570	NSS1 MCS0	12.74	13

5.6G WIFI_ANT 1+2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.6G	802.11a	100	5500	6	17.96	18.3
		116	5580		21.70	22.0
		124	5620		21.60	22.0
		132	5660		21.47	21.5
		144	5720		21.28	21.5
	802.11n HT20	100	5500	MCS0	17.76	18.0
		116	5580		18.36	18.8
		124	5620		18.54	18.8
		132	5660		18.43	18.8
		144	5720		18.24	18.5
	802.11n HT40	102	5510	MCS0	16.74	17.0
		110	5550		18.17	18.5
		126	5630		17.98	18.3
		134	5670		18.04	18.3
		142	5710		17.95	18.3
	802.11ac VHT20	100	5500	NSS1 MCS0	17.83	18.0
		116	5580		18.44	18.8
		124	5620		18.60	18.8
		132	5660		18.49	18.8
		144	5720		18.34	18.5
	802.11ac VHT40	102	5510	NSS1 MCS0	16.79	17.0
		110	5550		18.24	18.5
		126	5630		18.09	18.3
		134	5670		18.15	18.3
		142	5710		18.05	18.3
	802.11ac VHT80	106	5530	NSS1 MCS0	16.36	16.8
		122	5610		17.30	17.5
		138	5690		17.63	18.0
	802.11ac VHT160	114	5570	NSS1 MCS0	15.33	15.8
	802.11ax HE20	100	5500	NSS1 MCS0	17.89	18.0
		116	5580		18.51	18.8
		124	5620		18.68	19.0
		132	5660		18.58	18.8
		144	5720		18.42	18.5
	802.11ax HE40	102	5510	NSS1 MCS0	16.87	17.0
		110	5550		18.32	18.5
		126	5630		18.15	18.3
		134	5670		18.20	18.3
		142	5710		18.13	18.5
	802.11ax HE80	106	5530	NSS1 MCS0	16.48	16.8
		122	5610		17.43	17.8
		138	5690		17.64	18.0
	802.11ax HE160	114	5570	NSS1 MCS0	15.48	15.8

5.8G WIFI_ANT 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.8G	802.11a	149	5745	6	18.23	18.5
		157	5785		17.97	18
		165	5825		17.94	18
	802.11n HT20	149	5745	MCS0	15.41	15.5
		157	5785		15.35	15.5
		165	5825		15.18	15.5
	802.11n HT40	151	5755	MCS0	15.12	15.5
		159	5795		14.70	15
	802.11ac VHT20	149	5745	NSS1 MCS0	15.48	15.5
		157	5785		15.42	15.5
		165	5825		15.26	15.5
	802.11ac VHT40	151	5755	NSS1 MCS0	15.20	15.5
		159	5795		14.76	15
	802.11ac VHT80	155	5775	NSS1 MCS0	14.01	14.5
	802.11ax HE20	149	5745	NSS1 MCS0	15.55	16
		157	5785		15.47	15.5
		165	5825		15.31	15.5
	802.11ax HE40	151	5755	NSS1 MCS0	15.33	15.5
		159	5795		14.82	15
	802.11ax HE80	155	5775	NSS1 MCS0	14.08	14.5

5.8G WIFI_ANT 2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.8G	802.11a	149	5745	6	18.02	18.5
		157	5785		18.14	18.5
		165	5825		18.04	18.5
	802.11n HT20	149	5745	MCS0	15.49	15.5
		157	5785		16.03	16.5
		165	5825		16.00	16
	802.11n HT40	151	5755	MCS0	15.16	15.5
		159	5795		15.19	15.5
	802.11ac VHT20	149	5745	NSS1 MCS0	15.55	16
		157	5785		16.11	16.5
		165	5825		16.07	16.5
	802.11ac VHT40	151	5755	NSS1 MCS0	15.25	15.5
		159	5795		15.26	15.5
	802.11ac VHT80	155	5775	NSS1 MCS0	14.79	15
	802.11ax HE20	149	5745	NSS1 MCS0	15.61	16
		157	5785		16.19	16.5
		165	5825		16.14	16.5
	802.11ax HE40	151	5755	NSS1 MCS0	15.40	15.5
		159	5795		15.33	15.5
	802.11ax HE80	155	5775	NSS1 MCS0	14.91	15

5.8G WIFI_ANT 1+2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
5.8G	802.11a	149	5745	6	21.14	21.5
		157	5785		21.07	21.3
		165	5825		21.00	21.3
	802.11n HT20	149	5745	MCS0	18.46	18.5
		157	5785		18.71	19.0
		165	5825		18.62	18.8
	802.11n HT40	151	5755	MCS0	18.15	18.5
		159	5795		17.96	18.3
	802.11ac VHT20	149	5745	NSS1 MCS0	18.53	18.8
		157	5785		18.79	19.0
		165	5825		18.69	19.0
	802.11ac VHT40	151	5755	NSS1 MCS0	18.24	18.5
		159	5795		18.03	18.3
	802.11ac VHT80	155	5775	NSS1 MCS0	17.43	17.8
	802.11ax HE20	149	5745	NSS1 MCS0	18.59	19.0
		157	5785		18.86	19.0
		165	5825		18.76	19.0
	802.11ax HE40	151	5755	NSS1 MCS0	18.38	18.5
		159	5795		18.09	18.3
	802.11ax HE80	155	5775	NSS1 MCS0	17.53	17.8

6G WIFI_ANT 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
6G	802.11a	1	5955	6	1.14	1.5
		57	6235		0.19	0.5
		113	6515		0.63	1
		173	6815		1.47	1.5
		233	7115		1.43	1.5
	802.11ax HE20	1	5955	NSS1 MCS0	2.45	2.5
		57	6235		0.97	1
		113	6515		3.57	4
		173	6815		2.22	2.5
		233	7115		-1.77	0.5
	802.11ax HE40	3	5965	NSS1 MCS0	4.44	4.5
		59	6245		5.29	5.5
		107	6485		5.44	5.5
		171	6805		6.08	6.5
		227	7085		6.68	7
	802.11ax HE80	7	5985	NSS1 MCS0	8.08	8.5
		71	6305		7.83	8
		119	6545		8.56	9
		167	6785		8.49	8.5
		215	7025		8.14	8.5
	802.11ax HE160	15	6025	NSS1 MCS0	10.19	10.5
		47	6185		9.44	9.5
		111	6505		9.98	10
		175	6825		10.20	10.5
		207	6985		9.58	10

6G WIFI_ANT 2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
6G	802.11a	1	5955	6	2.40	2.5
		57	6235		2.20	2.5
		113	6515		2.39	2.5
		173	6815		1.33	1.5
		233	7115		2.61	3
	802.11ax HE20	1	5955	NSS1 MCS0	3.51	4
		57	6235		2.85	3
		113	6515		3.70	4
		173	6815		2.61	3
		233	7115		0.89	1
	802.11ax HE40	3	5965	NSS1 MCS0	6.08	6.5
		59	6245		6.78	7
		107	6485		7.43	7.5
		171	6805		4.86	5
		227	7085		6.51	7
	802.11ax HE80	7	5985	NSS1 MCS0	8.77	9
		71	6305		9.18	9.5
		119	6545		8.79	9
		167	6785		7.99	8
		215	7025		8.71	9
	802.11ax HE160	15	6025	NSS1 MCS0	10.33	10.5
		47	6185		10.39	10.5
		111	6505		10.51	11
		175	6825		9.55	10
		207	6985		10.06	10.5

6G WIFI_ANT 1+2						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune up
6G	802.11a	1	5955	6	4.83	5.0
		57	6235		4.32	4.6
		113	6515		4.61	4.8
		173	6815		4.41	4.5
		233	7115		5.07	5.3
	802.11ax HE20	1	5955	NSS1 MCS0	6.02	6.3
		57	6235		5.02	5.1
		113	6515		6.65	7.0
		173	6815		5.43	5.8
		233	7115		2.77	3.8
	802.11ax HE40	3	5965	NSS1 MCS0	8.35	8.6
		59	6245		9.11	9.3
		107	6485		9.56	9.6
		171	6805		8.52	8.8
		227	7085		9.61	10.0
	802.11ax HE80	7	5985	NSS1 MCS0	11.45	11.8
		71	6305		11.57	11.8
		119	6545		11.69	12.0
		167	6785		11.26	11.3
		215	7025		11.44	11.8
	802.11ax HE160	15	6025	NSS1 MCS0	13.27	13.5
		47	6185		12.95	13.0
		111	6505		13.26	13.5
		175	6825		12.90	13.3
		207	6985		12.84	13.3

<Bluetooth>

BT	Average Conducted Power (dBm)			
	Max. Tune up	CH0	CH39	CH78
		2402MHz	2441MHz	2480MHz
DH5	12.5	12.46	12.42	12.35
2DH5	8.5	8.28	8.14	8.25
3DH5	8.5	8.29	8.15	8.26

BT	Average Conducted Power (dBm)			
	Max. Tune up	CH0	CH19	CH39
		2402MHz	2440MHz	2480MHz
BLE(1M)	5.0	4.70	4.82	4.79
BLE(2M)	5.0	4.61	4.77	4.76

6.6 SAR Testing Results

6.6.1 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 antennas. 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.

6.6.2 SAR Results for Body Exposure Condition (Separation Distance is 0cm Gap)

Plot No.	Band	Mode	Test Position	Antenna	Ch.	Frequency (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)
20	WLAN2.4GHz	802.11b 1Mbps	Bottom Face	Ant 1	6	2437	20.39	20.50	1.026	1.018	0	0.001	0.001
21	WLAN2.4GHz	802.11b 1Mbps	Edge 1	Ant 1	6	2437	20.39	20.50	1.026	1.018	0.04	0.602	**0.629**
22	WLAN2.4GHz	802.11b 1Mbps	Edge 4	Ant 1	6	2437	20.39	20.50	1.026	1.018	-0.07	0.003	0.003
23	WLAN2.4GHz	802.11b 1Mbps	Bottom Face	Ant 2	6	2437	20.35	20.50	1.035	1.018	0	0.001	0.001
24	WLAN2.4GHz	802.11b 1Mbps	Edge 4	Ant 2	6	2437	20.35	20.50	1.035	1.018	-0.02	0.014	0.015
25	Bluetooth	1Mbps	Bottom Face	Ant 1	0	2402	12.46	12.50	1.009	1.081	0	0.010	0.011
26	Bluetooth	1Mbps	Edge 1	Ant 1	0	2402	12.46	12.50	1.009	1.081	-0.1	0.098	**0.107**
8	WLAN5GHz	802.11a 6Mbps	Bottom Face	Ant 1	60	5300	17.98	18.00	1.005	1.007	0	0.001	0.001
7	WLAN5GHz	802.11a 6Mbps	Edge 1	Ant 1	60	5300	17.98	18.00	1.005	1.007	0.08	0.654	**0.662**
14	WLAN5GHz	802.11a 6Mbps	Edge 4	Ant 1	60	5300	17.98	18.00	1.005	1.007	0.14	0.012	0.012
9	WLAN5GHz	802.11a 6Mbps	Bottom Face	Ant 2	60	5300	17.85	18.00	1.035	1.007	0	0.001	0.001
17	WLAN5GHz	802.11a 6Mbps	Edge 4	Ant 2	60	5300	17.85	18.00	1.035	1.007	-0.09	0.135	0.141
10	WLAN5GHz	802.11a 6Mbps	Bottom Face	Ant 1	144	5720	18.29	18.50	1.050	1.007	0	0.001	0.001
5	WLAN5GHz	802.11a 6Mbps	Edge 1	Ant 1	144	5720	18.29	18.50	1.050	1.007	-0.09	0.248	0.262
15	WLAN5GHz	802.11a 6Mbps	Edge 4	Ant 1	144	5720	18.29	18.50	1.050	1.007	-0.15	0.014	0.015
11	WLAN5GHz	802.11a 6Mbps	Bottom Face	Ant 2	116	5580	19.11	19.50	1.094	1.007	0	0.001	0.001
18	WLAN5GHz	802.11a 6Mbps	Edge 4	Ant 2	116	5580	19.11	19.50	1.094	1.007	-0.14	0.347	0.382
12	WLAN5GHz	802.11a 6Mbps	Bottom Face	Ant 1	149	5745	18.23	18.50	1.064	1.007	0	0.001	0.001
6	WLAN5GHz	802.11a 6Mbps	Edge 1	Ant 1	149	5745	18.23	18.50	1.064	1.007	0.01	0.268	0.287
16	WLAN5GHz	802.11a 6Mbps	Edge 4	Ant 1	149	5745	18.23	18.50	1.064	1.007	0	0.002	0.002
13	WLAN5GHz	802.11a 6Mbps	Bottom Face	Ant 2	157	5785	18.14	18.50	1.086	1.007	0	0.001	0.001
19	WLAN5GHz	802.11a 6Mbps	Edge 4	Ant 2	157	5785	18.14	18.50	1.086	1.007	-0.09	0.377	0.412
20	WLAN2.4GHz	802.11b 1Mbps	Bottom Face	Ant 1	6	2437	20.39	20.50	1.026	1.018	0	0.001	0.001
21	WLAN2.4GHz	802.11b 1Mbps	Edge 1	Ant 1	6	2437	20.39	20.50	1.026	1.018	0.04	0.602	**0.629**
22	WLAN2.4GHz	802.11b 1Mbps	Edge 4	Ant 1	6	2437	20.39	20.50	1.026	1.018	-0.07	0.003	0.003
23	WLAN2.4GHz	802.11b 1Mbps	Bottom Face	Ant 2	6	2437	20.35	20.50	1.035	1.018	0	0.001	0.001
24	WLAN2.4GHz	802.11b 1Mbps	Edge 4	Ant 2	6	2437	20.35	20.50	1.035	1.018	-0.02	0.014	0.015

6.6.3 WLAN APD Results (Separation Distance is 0mm Gap)

Plot No.	Band	Mode	Test Position	Antenna	Ch.	Frequency (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 W/m^2 (4cm^2)
27	WLAN6GHz	802.11ax-HE160	Bottom Face	Ant 1	175	6825	10.20	10.50	1.072	1.009	-0.19	0.003	0.003	0.000
28	WLAN6GHz	802.11ax-HE160	Edge 1	Ant 1	175	6825	10.20	10.50	1.072	1.009	-0.09	0.023	**0.025**	0.163
30	WLAN6GHz	802.11ax-HE160	Edge 4	Ant 1	175	6825	10.20	10.50	1.072	1.009	-0.12	0.001	0.001	0.000
31	WLAN6GHz	802.11ax-HE160	Bottom Face	Ant 2	111	6505	10.51	11.00	1.119	1.009	0	0.001	0.001	0.000
34	WLAN6GHz	802.11ax-HE160	Edge 4	Ant 2	111	6505	10.51	11.00	1.119	1.009	0.17	0.049	0.055	0.446

6.6.4 WLAN PD Results (Separation Distance is 2mm Gap)

Plot No.	Band	Mode	Test Position	Antenna	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)	Normal psPD (W/m^2)	Scaled Normal psPD (W/m^2)	Total psPD (W/m^2)	Scaled Total psPD (W/m^2)
35	WLAN6GHz	802.11ax-HE160	Bottom Face	Ant 1	175	6825	10.20	10.50	1.072	1.009	0.05	1.5535	-0.02	0.766	1.29	1.28	2.15
36	WLAN6GHz	802.11ax-HE160	Edge 1	Ant 1	175	6825	10.20	10.50	1.072	1.009	0.05	1.5535	0.06	0.918	1.54	1.59	**2.67**
38	WLAN6GHz	802.11ax-HE160	Edge 4	Ant 1	175	6825	10.20	10.50	1.072	1.009	0.05	1.5535	-0.11	0.467	0.78	0.823	1.38
39	WLAN6GHz	802.11ax-HE160	Bottom Face	Ant 2	111	6505	10.51	11.00	1.119	1.009	0.05	1.5535	-0.05	0.599	1.05	0.916	1.61
42	WLAN6GHz	802.11ax-HE160	Edge 4	Ant 2	111	6505	10.51	11.00	1.119	1.009	0.05	1.5535	-0.03	0.766	1.34	1.3	2.28

6.6.6 Simultaneous Multi-band Transmission Evaluation

Regarding the compliance of this device in simultaneous transmission modes, the simultaneous multi-band transmission was evaluated by summation method for each test condition at each frequency where simultaneous operation is intended. The maximum summed SAR value is as below.

Body	Reported SAR (W/kg)							Summed 10g SAR (W/kg)				
	1	2	3	4	5	6	7					
Exposure Position	2.4GHz WLAN Ant 1	2.4GHz WLAN Ant 2	5GHz WLAN Ant 1	5GHz WLAN Ant 2	6GHz WLAN Ant 1	6GHz WLAN Ant 2	Bluetooth	1+2	3+4	5+6	3+4+7	5+6+7
Bottom Face	0.001	0.001	0.001	0.001	0.003	0.001	0.011	0.002	0.002	0.004	0.013	0.015
Edge 1	0.629	-	0.662	-	0.025	-	0.107	0.629	0.662	0.025	0.769	0.132
Edge 4	0.003	0.015	0.015	0.412	0.001	0.055	-	0.018	0.427	0.056	0.427	0.056

Summary:
The SAR summation of maximum SAR of WWAN and WLAN for each position is under the SAR limitation (**1.6 W/kg for Head and body, and 4.0 W/kg for Limbs**). Therefore, the simultaneous transmission condition is compliance with the SAR criterion.

7. 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

Appendix E – PD Plots of System Verification

Appendix F – PD Plots of PD Measurement

Appendix G – PD Calibration Certificate for Probe and Source

Appendix H – PD Photographs of the Test Set-Up

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