

FCC SAR Compliance Test Report

For

TECNO MOBILE LIMITED

FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET

FOTAN NT HONGKONG

Model: K16SDA

Test Engineer: Zeng Longhao

Report Number: WSCT-ANAB-R&E250700063A-SAR

Report Date: 01 September 2025

FCC ID: 2ADYY-K16SDA-1

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Modified History

REV.	Modification Description	Issued Date	Remark
REV.1.0	Initial Test Report Release	01 September 2025	Li Huaibi

1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report. QTC Certification & Testing Co., Ltd. does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report is not to be reproduced or published in full without the prior written permission.

1.2 Application details

Date of receipt of test item: 2025-06-22
Start of test: 2025-06-25
End of test: 2025-08-18

1.3 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for K16SDA is as below:

Band	Position	MAX ReportedSAR _{1g} (W/kg)	Limit (W/kg)
2.4G WIFI	Body-Worn 0mm	1.303	1.6
5.2G WIFI	Body-Worn 0mm	1.093	
5.4G WIFI	Body-Worn 0mm	1.160	
5.6G WIFI	Body-Worn 0mm	1.307	
5.8G WIFI	Body-Worn 0mm	1.400	
WIFI6E	Body-Worn 0mm	0.319	
BT	Body-Worn 0mm	0.151	
Max.Simultaneous Transmission SAR(W/kg)			
Items	Body SAR (Gap 0mm)		1.6
Sum SAR	1.551		

The device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits of 1.6W/Kg as averaged over any 1g tissue according to the FCC rule §2.1093, the ANSI/IEEE C95.1:2005, the NCRP Report Number 86 for uncontrolled environment, according to the Industry Canada Radio Standards Specification RSS-102 for General Population/ Uncontrolled exposure, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013.

1.4 EUT Information

Device Information:	
Product Type:	Laptop Computer
Model:	K16SDA
Brand Name:	TECNO
Device Type:	Portable device
Exposure Category:	uncontrolled environment / general population
Production Unit or Identical Prototype:	Production Unit
Antenna Type :	Integral Antenna
Antenna Gain:	BT: 2.96dBi 2.4GWIFI: ANT1:2.88dBi,ANT2: 2.96dBi 5GWIFI: ANT1:3.49dBi ,ANT2:2.74dBi WIFI6E: ANT1(MAIN):3.82dBi ANT2(AUX):3.10dBi
Device Operating Configurations:	
Supporting Mode(s) :	Wi-Fi , BT
Software version:	Windows 11
Hardware version:	N160DBC01_MB_V10 VD
Modulation:	(GFSK, $\pi/4$ -DQPSK, 8-DPSK) for BT DSSS (DBPSK, DQPSK, CCK) for IEEE 802.11b OFDM/OFDMA(BPSK,QPSK,16QAM,64QAM,256QAM,1024QAM) for IEEE 802.11g/n/ax IEEE 802.11a/n/ac/ax: OFDM/OFDMA (BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM)
Device Class :	Class B, No DTM Mode

Note:Antenna gain provided by the customer.

Operating Frequency Range(s):	Band	TX(MHz)	RX(MHz)
	Wi-Fi	2412~2462	
	Wi-Fi (5G)	Band 1: 5180-5240 MHz Band 2: 5260-5320 MHz Band 3: 5500-5700 MHz Band 4: 5745-5825 MHz	
	Wi-Fi6E	U-NII-5: 5925-6425MHz U-NII-6: 6425-6525MHz U-NII-7: 6525-6875MHz U-NII-8: 6875-7125MHz	
	BT	2402~2480	2402~2480
Power Source:	Rechargeable Li-ion Polymer Battery: K16S Nominal Voltage: 11.55V Rated Capacity: 6060mAh Rated nergy:70.00Wh Limited Charge Voltage: 13.2V		

Configuration differences

Model	Processor
K16SDA	R5
K16SDA	R7

Note: The prototype machines of two configurations were tested, among which the R7 had the worst test results, which is main model mentioned in the report.

Note:

- The test results of this test report relate exclusively to the test item specified in this test report. World Standardization Certification & Testing Group (Shenzhen) Co.,Ltd does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report is not to be reproduced or published in full without the prior written permission.
- Per KDB 616217 D04 SAR for laptop and tablets, The standalone and simultaneous transmission SAR tests required for tablets are more conservative than the hotspot mode use configurations;therefore, additional testing for hotspot SAR is not required.

2 Testing laboratory

Test Site	World Standardization Certification & Testing Group (Shenzhen) Co., Ltd.
Laboratory:	Building A-B, Baoli'an Industrial Park, No.58 and 60, Tangtou Avenue, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province, China
TEL:	+86-755-23695561
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3 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025:2017.

China	CNAS (Registration Number: L3732)
USA	ANAB (Certificate Number: AT-3951)
Canada	ISED (CAB identifier: CN0111)

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.wsct-cert.com>

Test Environment

4 Test Environment

	Required	Actual
Ambient temperature:	18 – 25 °C	22 ± 2 °C
Tissue Simulating liquid:	22 ± 2 °C	22 ± 2 °C
Relative humidity content:	30 – 70 %	30 – 70 %

5 Applicant and Manufacturer

Applicant/Client Name:	TECNO MOBILE LIMITED
Applicant Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Manufacturer Name:	TECNO MOBILE LIMITED
Manufacturer Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG

6 Test standards:

IEC/IEEE 62209-1528	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate(SAR) in the Human Head from Wireless Communications Devices:Measurement Techniques
RSS-102	Radio Frequency Exposure Compliance of Radio communication Apparatus (All Frequency Bands)(Issue 6 December 2023)
KDB447498 D04	Interim General RF Exposure Guidance v01
KDB616217 D04	SAR for laptop and tabletsv01r03
KDB248227D01	SARmeas for 802.11a/b/g v02r02
KDB865664D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB865664D02	RF Exposure Reporting v01r02

6.1 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain/Body/Arms/Legs)	1.60mW/g	8.00mW/g
Spatial Average SAR** (Whole Body)	0.08mW/g	0.40mW/g
Spatial Peak SAR*** (Heads/Feet/Ankle/Wrist)	4.00mW/g	20.00mW/g

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

Notes:

* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

** The Spatial Average value of the SAR averaged over the whole body.

*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

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).

6.2 SAR Definition

Specific Absorption Rate is defined as 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).

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

SAR is expressed in units of watts per kilogram (W/kg). SAR can be related to the electric field at a point by

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

where:

σ = conductivity of the tissue (S/m)

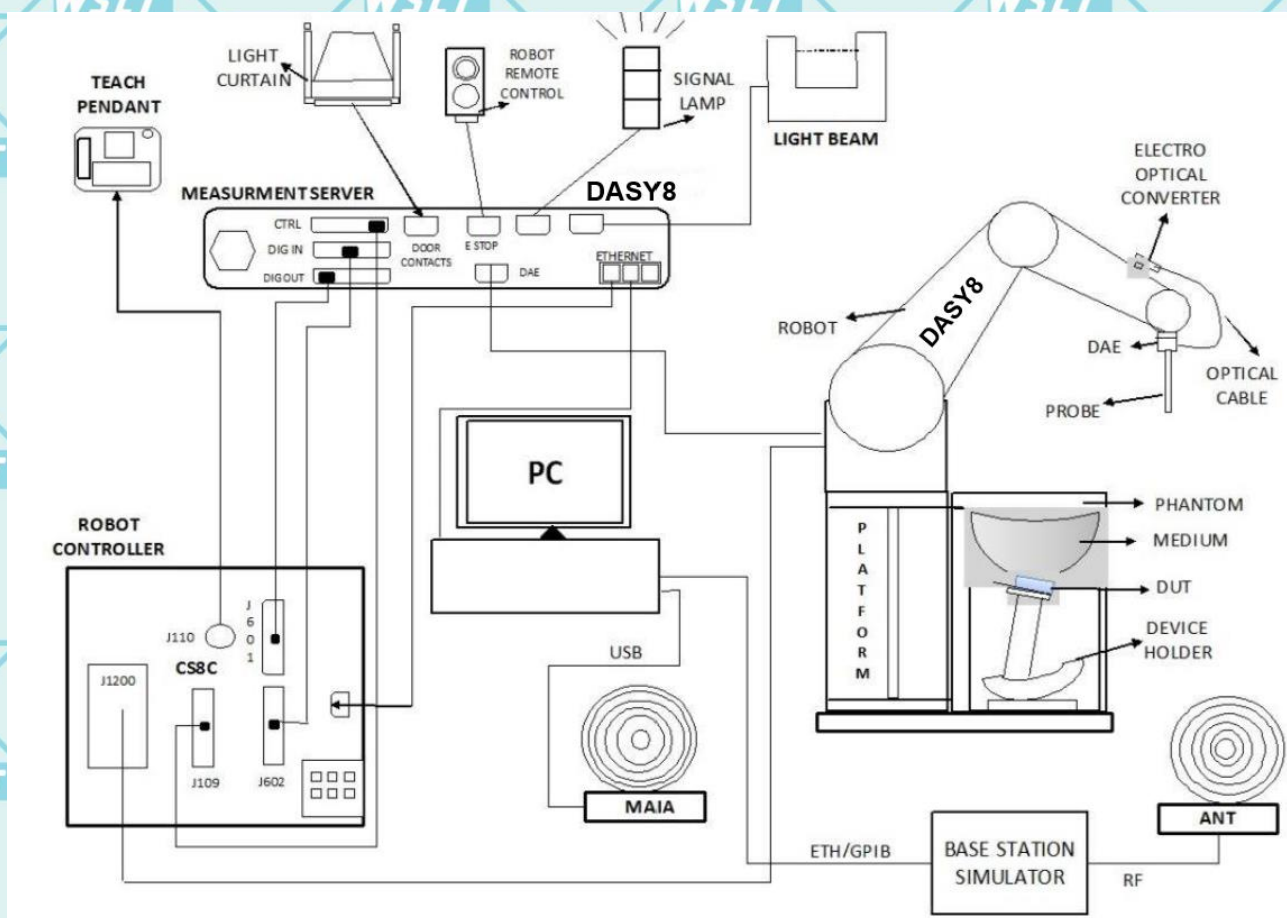
ρ = mass density of the tissue (kg/m³)

E = rms electric field strength (V/m)

7 SAR Measurement System

7.1 The Measurement System

DASY8 is a flexible, high-precision near-field scanner optimized for automated measurements in free-space and tissue simulating liquids (TSL), using the most advanced probes covering the frequency range from 3 kHz to 110 GHz. The software enables point, area, and volume measurements and conformal scanning of complex geometries.



The DASY8 SAR module consists of an isotropic dosimetric probe (SAR) mounted on the TX2 precision robot, which allows field scanning inside anthropomorphic phantoms filled with tissue-simulating liquids. The probes are miniaturized, sensitive, isotropic, linear, stable and calibrated with precise boundary compensation. The spatial accuracy of probe positioning within the phantom is better than 0.2 mm. Scanning is optimized and adaptive to the induced field. The spatial SAR peak is determined without reconstruction.

7.2 Robot

The DASY8 system uses the high-precision industrial robots TX2-60L and TX2-90XL from Stäubli SA (France). The TX2 family of robots provides the ideal combination of speed, rigidity, size, and precision:

- High precision (repeatability 0.03 mm)
- High reliability and low maintenance costs (industrial design)
- ELF interference (motor control fields are shielded by the closed metallic construction)
- Hygienic encapsulated 6-axis arm enabled by a hollow shaft gearbox, no external cables.



7.3 Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG). 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. This probe has a built in optical surface detection system to prevent from collision with phantom.

For the measurements the Specific Dosimetric E-Field Probe EX3DV4-SN:7895&7391 with following specifications is used



Frequency: 4MHz – 10GHz ;

Linearity: ± 0.2 dB (30MHz – 10GHz)

Dynamic Range: $10 \mu\text{W/g} \rightarrow 100 \text{ mW/g}$

Linearity: ± 0.2 dB (noise: typically $< 1 \mu\text{W/g}$)

Directivity (typical): ± 0.1 dB in TSL (rotation around probe axis)

± 0.3 dB in TSL (rotation normal to probe axis)

Sensor Arrangement	Triangular
Connector Angle	46.9°
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm

5G Power Density Probe: EUmmWV4-SN:9430

E-Field mm-Wave Probe for General Near-Field Measurements

Frequency: 750MHz – 110GHz

Dynamic Range: $< 20 \text{ V/m} - 10'000 \text{ V/m}$ with PRE-10 (min $< 20 \text{ V/m} - 2000 \text{ V/m}$)

Overall length: 320 mm (tip: 20 mm)

Tip diameter: encapsulation 8 mm (internal sensor < 1 mm)

Distance from probe tip to dipole centers: < 2 mm

Sensor displacement to probe's calibration point: < 0.3 mm

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



7.4 DAE

DAE4ip– Data Acquisition Electronics 4 with Integrated Power

Data Acquisition Electronics 4 with an integrated power supply for time unlimited measurements.

Performance:

- Measurement range: -100—+300 mV (16-bit resolution and two range settings: 4 mV, 400 mV)
- Input offset voltage: <5 μ V (with auto zero)
- Input resistance: 200M Ω
- Input bias current: <50 fA
- Power supply: integrated (from the DASY8 measurement server)
- Dimensions(L × W × H): 60×60×68 mm
- Calibration: ISO/IEC 17025 calibration service available.



7.5 Phantom

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 the liquid from evaporating. 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	Vinyl ester, fiberglass reinforced (VE-GF)
Liquid Compatibility	The phantom shell is compatible with SPEAG's tissue-simulating liquids (sugar and oil-based). However, using other liquids may render the phantom warranty void (see note or consult SPEAG support).
Shell Thickness	$2 \pm 0.2\text{mm}$ ($6 \pm 0.2\text{mm}$ at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters
Support	DASY6/8: standard-size platform slot DASY52 stand-alone: SPEAG standard phantom table
Accessories	Mounting Device and Adaptors

mmWave Phantom&DUT Holder

The mmWave phantom has been designed to support EUT during 5G testing. The mmWave phantom approximates free-space conditions, allowing to evaluate not only the antenna side of the device but also the front (screen) or any opposite-radiating side of wireless devices operating above 10 GHz without distorting the radiofrequency (RF) field. It consists of a 40 mm thick Rohacell plate used as a test bed which has a loss tangent ($\tan \delta$) ≤ 0.05 and a relative permittivity (ϵ_r) ≤ 1.2 . The high-performance RF absorbers are placed below the foam. The mmWave phantom is designed to be placed into a standard slot of a DASY8 platform.



The solid low-density mmWave device under test (DUT) holder warrants no impact on the DUT radiation performance and an easy positioning of the DUT in a vertical test configuration.

7.6 Device Holder

The DASY instrument holder is designed to accommodate the various positions specified in the standard. It has two scales for instrument rotation (with respect to the body axis) and instrument tilt (with respect to the line between the ear reference points). The center of rotation for both scales is the Ear Reference Point (ERP). This eliminates the need to reposition the instrument when changing angles.

The DASY instrument holder is made of low-loss POM material with the following dielectric parameters: relative permittivity $\epsilon=3$ and loss tangent $\delta=0.02$. The amount of dielectric material in the immediate vicinity of the device was reduced because measurements indicated that the influence of the clamp on the test results could be reduced.



Device holder

The positioning system allows obtaining cheek and tilting position with a very good accuracy. In compliance with CENELEC, the tilt angle uncertainty is lower than 1°.

7.7 SAR Scan General Requirement

According to kdb865664 D01 v01r04:

Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std 1528-2013. The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements and fully documented in SAR reports, unless further guidance has been provided by the FCC.

			≤ 3 GHz	>3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 mm ± 1 mm	$\frac{1}{2} \delta \ln(2)$ mm ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx Area, Δy Area			≤ 2 GHz: ≤ 15 mm 2-3 GHz: ≤ 12 mm	3-4 GHz: ≤ 12 mm 4-6 GHz: ≤ 10 mm
Maximum zoom scan spatial resolution: Δx Zoom, Δy Zoom			≤ 2 GHz: ≤ 8 mm 2-3 GHz: ≤ 5 mm*	3-4 GHz: ≤ 5 mm* 4-6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: Δz Zoom (n)		≤ 5 mm	3-4 GHz: ≤ 4 mm 4-5 GHz: ≤ 3 mm 5-6 GHz: ≤ 2 mm
	graded grid	Δz Zoom (1): between 1 st two points closest to phantom surface	≤ 4 mm	3-4 GHz: ≤ 3 mm 4-5 GHz: ≤ 2.5 mm 5-6 GHz: ≤ 2 mm
		Δz Zoom (n>1): between subsequent points	≤ 1.5 · Δz Zoom (n-1) mm	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3-4 GHz: ≥ 28 mm 4-5 GHz: ≥ 25 mm 5-6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.

* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

7.8 Measurement procedure

Power Drift :

All SAR tests were performed with a fully charged battery under the DUT and transmitting at maximum output power. The DASY measurement software uses the power reference measurement and power drift measurement procedures to monitor the power drift of the DUT during SAR testing. Both methods measure the field value at a specified reference position before and after the SAR test. The software calculates the field difference in dB. If the power drift exceeds 5%, the SAR is retested.

Area scan:

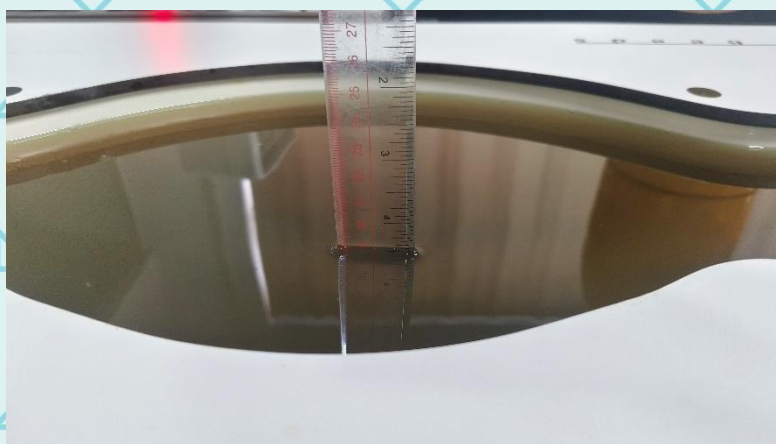
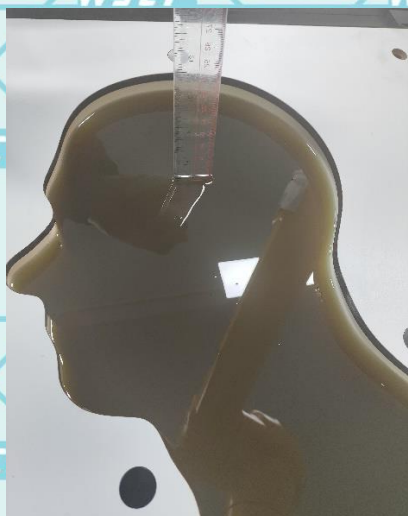
All antennas and radiating structures that may contribute to the measured SAR or influence the SAR distribution must be included in the area scan. The areas of the transmitter(s), antenna(s) and host device, when projected onto the phantom, must be within the area scan measurement region. The area scan measurement resolution must enable the extrapolation algorithms of the SAR system to correctly identify the peak SAR location(s) for subsequent zoom scan measurements to correctly determine the 1-g SAR. Area scans are performed at a constant distance from the phantom surface, determined by the measurement frequencies.

Zoom Scan:

Except when area scan based 1-g SAR estimation applies, a zoom scan measurement is required at the highest peak SAR location determined in the area scan to determine the 1-g SAR. When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR. The zoom scan volume must be larger than the required minimum dimensions described 7.7. There must be at least one measurement point within the first 5 mm from the phantom surface for measurements ≤ 3 GHz, two measurement points for measurements ≤ 5 GHz and three measurement points for measurements above 5 GHz. When graded grids are used, which only applies in the direction normal to the phantom surface, the initial grid separation closest to the phantom surface and subsequent graded grid increment ratios must satisfy the required protocols in 7.7. The 1-g SAR averaging volume must be fully contained within the zoom scan measurement volume boundaries; otherwise, the measurement must be repeated by shifting or expanding the zoom scan volume. The similar requirements also apply to 10-g SAR measurements.

7.9 Tissue simulating liquids: dielectric properties

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



Simulating Head Liquid for 5G(HBBL600-10000MHz V6), Manufactured by SPEAG:

Ingredients	(% by weight)
Water	50-65%
Mineral oil	10-30%
Emulsifiers	8-25%
Sodium salt	0-1.5%

7.10 Tissue simulating liquids: parameters

Used Target Frequency	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
	ϵ_r (+/-5%)	σ (S/m) (+/-5%)	ϵ_r	σ (S/m)		
2450MHz Head	39.20 (37.24~41.16)	1.80 (1.71~1.89)	40.27	1.82	21.6°C	2025-08-02
2550MHz Head	39.10 (37.15~41.05)	1.91 (1.82~2.01)	40.80	1.90	21.6°C	2025-08-05
5200MHz Head	36.00 (34.20~37.80)	4.66 (4.43~4.89)	36.30	4.54	21.6°C	2025-08-08
5500MHz Head	35.60 (33.82~37.38)	4.96 (4.71~5.20)	35.80	4.88	21.6°C	2025-08-12
5800MHz Head	35.30 (33.54~37.06)	5.27 (5.01~5.53)	35.30	5.23	21.6°C	2025-08-15-
6.5GHz Head	34.5 (32.78~36.22)	6.07 (5.84~6.30)	34.00	6.08	21.6°C	2025-08-18

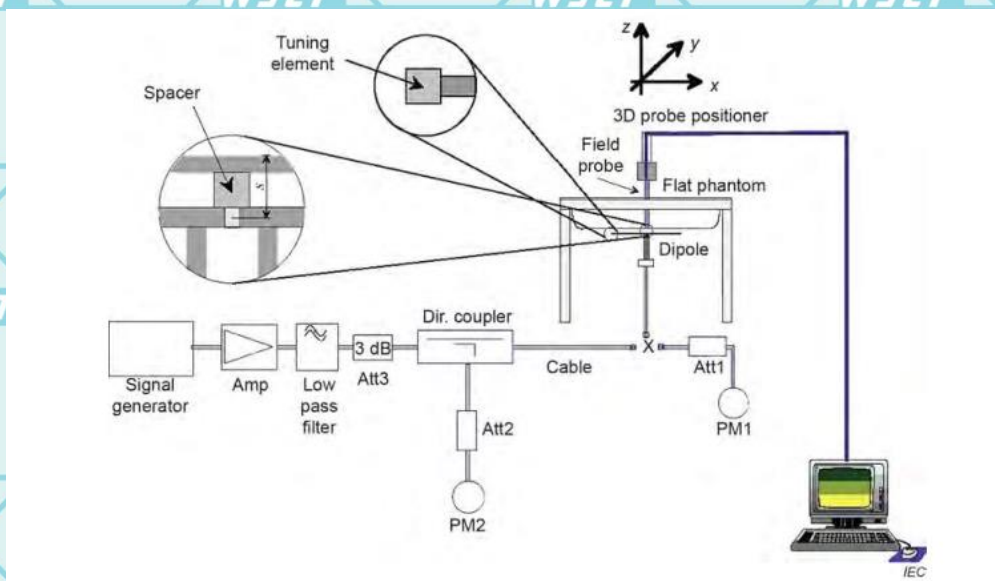
ϵ_r = Relative permittivity, σ = Conductivity

8 System Check

8.1 System check procedure

The System check is performed by using a System check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 100 mW. To adjust this power a power meter is used. The power sensor is connected to the cable before the System check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the validation to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).

System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



8.2 System check results

The system Check is performed for verifying the accuracy of the complete measurement system and performance of the software. The following table shows System check results for all frequency bands and tissue liquids used during the tests (plot(s) see annex A).

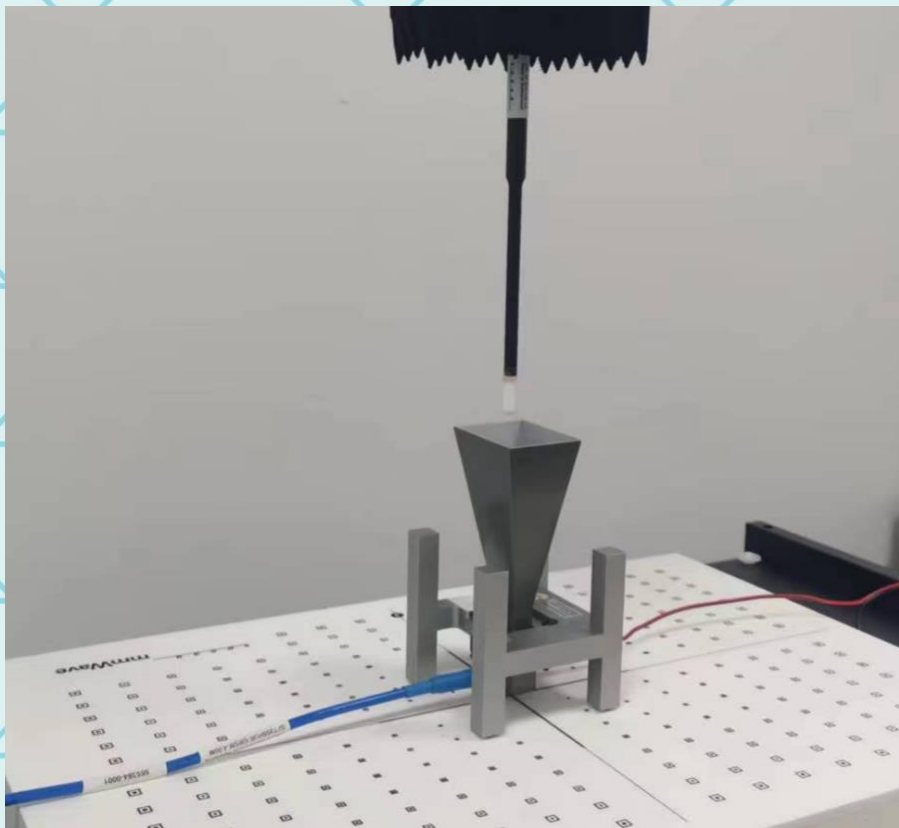
System Check	Target SAR (1W) (+/-10%)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (W/kg)	10-g (W/kg)	1-g (W/kg)	10-g (W/kg)		
D2550V2 Body	54.10 (48.69~59.51)	24.70 (22.23~27.17)	55.80	25.60	21.6°C	2025-08-05
D5200V2 Body	76.00 (68.40~83.60)	22.00 (19.80~24.20)	71.70	20.70	21.6°C	2025-08-08
D5300V2 Body	80.60 (72.54~88.66)	23.30 (20.97~25.63)	80.80	23.10	21.6°C	2025-08-08
D5500V2 Body	85.60 (77.04~94.16)	24.50 (22.05~26.95)	79.00	22.50	21.6°C	2025-08-12
D5600V2 Body	83.30 (74.97~91.63)	24.10 (21.69~26.51)	78.70	22.40	21.6°C	2025-08-12
D5800V2 Body	79.00 (71.10~86.90)	22.70 (20.43~24.97)	77.60	22.00	21.6°C	2025-08-15
D6.5GHzV2 Body	298.00 (268.20~327.80)	54.90 (49.41~60.39)	290.00	54.40	21.6°C	2025-08-18

Note: 1. All SAR values are normalized to 1W forward power.
2. The actual forward power output to the dipole antenna is 20dbm(100mw), so the measured value differs ten times from the table

8.3 Power Density Test 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



System Verification Setup Photo

Frequency (GHz)	PD Verification Source	Distance (mm)	Measured 4cm^2 (W/m^2)	Target 4cm^2 (W/m^2)	Deviation (dB)	Measured Date
10G	10GHz_1075	10	55.30	57.00	-0.13	2025-02-21
10G	10GHz_1075	10	55.60	57.00	-0.11	2025-02-21

Detailed System Check Results Please see the annex A.

9 SAR Test Test Configuration

9.1 Wi-Fi Test Configuration

For the 802.11b/g SAR tests, a communication link is set up with the test mode software for Wi-Fi mode test. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 1, 6 and 11 respectively in the case of 2450 MHz. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate. 802.11b/g operating modes are tested independently according to the service requirements in each frequency band. 802.11b/g modes are tested on channel 1, 6, 11; however, if output power reduction is necessary for channels 1 and/or 11 to meet restricted band requirements the highest output channel closest to each of these channels must be tested instead.

SAR is not required for 802.11g/n channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels.

Mode	Band	GHz	Channel	"Default Test Channels"	
				802.11b	802.11g
802.11b/g	2.4 GHz	2412	1#	√	△
		2437	6	√	△
		2462	11#	√	△

Notes:

√ = "default test channels"

△ = possible 802.11g channels with maximum average output ¼ dB the "default test channels"

= when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

802.11 Test Channels per FCC Requirements

9.2 WiFi 5G SAR Test Procedures

A) U-NII-1 and U-NII-2A Bands

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. 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); otherwise, both bands are tested independently for SAR.

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; otherwise, both bands are tested independently for SAR.

3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50.

Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest reported SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

B) U-NII-2C and U-NII-3 Bands

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

C) OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

- 1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
- 2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
- 3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
- 4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; 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. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.

- 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.

D) SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

9.3 RF Exposure Limits for Frequencies Above 6 GHz

Per §1.1310 (d)(3), the MPE limits are applied for frequencies above 6 GHz. Power Density is expressed in units of W/m^2 or mW/cm^2 .

Peak Spatially Averaged Power Density was evaluated over a circular area of 4 cm^2 per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes.

Human Exposure Limits Specified in FCC 47 CFR §1.1310

Human Exposure to Radiofrequency (RF) Radiation Limits		
Frequency Range [MHz]	Power Density [mW/cm^2]	Average Time [Minutes]
(A) Limits For Occupational / Controlled Environments		
1,500 – 100,000	5.0	6
(B) Limits For General Population / Uncontrolled Environments		
1,500 – 100,000	1.0	30

Note: 1.0 mW/cm^2 is 10 W/m^2

9.4 Miscellaneous Testing Considerations

Per FCC guidance, SAR was performed using 6.5 GHz SAR probe calibration factors. FCC KDB 648474 and FCC KDB 248227 were followed for test positions, distances, and modes. Per TCB workshop October 2020 notes, 5 channels were tested. Absorbed power density (APD) using a 4 cm^2 averaging area is reported based on SAR measurements. Incident power density is evaluated at 2mm ensuring that the resolution is sufficient such that integrated power density (iPD) between $d=2\text{ mm}$ and $d=15\text{ mm}$ varies by $< 1\text{ dB}$ per equipment manufacturer guidance. Power density results are scaled up for uncertainty above 30%.

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm and less than 200mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router $1\text{ g SAR} > 1.2\text{ W/kg}$.

6 GHz WIFI SAR results are used for simultaneous transmission analysis with the other transmitters and total exposure ratio (TER). Analysis can be found in SAR report and Near Field PD Report.

10 Detailed Test Results

10.1 Conducted Power measurements

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

10.1.1 Conducted Power of Wi-Fi 2.4G

MAIN ANT1

Mode	802.11b		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	21.91	22.15	22.60
Mode	802.11g		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	24.91	25.45	25.64
Mode	802.11n(HT20)		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	24.00	24.34	24.57
Mode	802.11n(HT40)		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	24.55	24.47	24.78
Mode	802.11ax 20		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	24.07	24.37	24.45
Mode	802.11ax 40		
Channel/Frequency(MHz)	3(2422)	6(2437)	9(2452)
Average Power(dBm)	24.70	24.80	24.83

AUX ANT2

Mode	802.11b		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	21.73	22.02	22.16
Mode	802.11g		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	24.63	25.09	25.27
Mode	802.11n(HT20)		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	21.35	21.61	21.80
Mode	802.11n(HT40)		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	20.64	20.88	21.06
Mode	802.11ax 20		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	22.93	23.26	23.35
Mode	802.11ax 40		
Channel/Frequency(MHz)	3(2422)	6(2437)	9(2452)
Average Power(dBm)	23.27	23.60	23.53

MIMO Mode

Mode	802.11n(HT20)		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	24.83	25.10	25.40
Mode	802.11n(HT40)		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	27.78	28.28	28.47
Mode	802.11ax 20		
Channel/Frequency(MHz)	1(2412)	6(2437)	11(2462)
Average Power(dBm)	25.88	26.20	26.41
Mode	802.11ax 40		
Channel/Frequency(MHz)	3(2422)	6(2437)	9(2452)
Average Power(dBm)	26.03	26.05	26.32

<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 Wi-Fi 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.

10.1.2 Conducted Power of Wi-Fi 5G

Ant 1						
Band	Mode	Channel	Frequency(MHz)	Tune-up	Average Power(dBm)	SAR Test(Yes/No)
U-NII-1 (5150-5250)	802.11a	36	5180	12.00 ±1.0	11.74	Yes
		48	5240	11.50 ±1.0	11.39	No
	802.11n-HT20	36	5180	11.00 ±1.0	10.60	No
		48	5240	10.00 ±1.0	9.86	No
	802.11n-HT40	38	5190	9.50 ±1.0	9.22	No
		46	5230	9.00 ±1.0	8.75	No
	802.11ac-VHT20	36	5180	9.50 ±1.0	9.07	No
		48	5240	9.00 ±1.0	8.74	No
	802.11ac-VHT40	38	5190	8.50 ±1.0	8.14	No
		46	5230	8.00 ±1.0	7.84	No
	802.11ac-VHT80	42	5210	7.00 ±1.0	6.72	No
		36	5180	11.50 ±1.0	11.41	No
	802.11ax-HT20	48	5240	11.50 ±1.0	11.38	No
		38	5190	12.00 ±1.0	11.66	No
U-NII-1 (5150-5250)	802.11a	36	5180	11.00 ±1.0	10.57	No
		48	5240	10.50 ±1.0	10.18	No
	802.11n-HT20	36	5180	9.50 ±1.0	9.13	No
		48	5240	9.00 ±1.0	8.99	No
	802.11n-HT40	38	5190	8.00 ±1.0	7.54	No
		46	5230	7.50 ±1.0	7.41	No
	802.11ac-VHT20	36	5180	8.00 ±1.0	7.53	No
		48	5240	8.00 ±1.0	7.51	No
	802.11ac-VHT40	38	5190	7.50 ±1.0	7.17	No
		46	5230	7.00 ±1.0	6.80	No
	802.11ac-VHT80	42	5210	6.50 ±1.0	6.26	No
		36	5180	10.50 ±1.0	10.17	No
	802.11ax-HT20	48	5240	10.50 ±1.0	10.14	No
		38	5190	11.50 ±1.0	11.21	Yes
U-NII-1 (5150-5250)	802.11a	36	5180	13.00 ±1.0	12.94	No
		48	5240	12.50 ±1.0	12.46	No
	802.11n-HT20	38	5190	11.50 ±1.0	11.47	No
		46	5230	11.50 ±1.0	11.14	No
	802.11n-HT40	36	5180	11.50 ±1.0	11.38	No
		48	5240	11.50 ±1.0	11.18	No
	802.11ac-VHT20	38	5190	11.00 ±1.0	10.69	No
		46	5230	10.50 ±1.0	10.36	No
	802.11ac-VHT40	42	5210	10.00 ±1.0	9.51	No
		36	5180	14.00 ±1.0	13.84	No
	802.11ac-VHT80	48	5240	14.00 ±1.0	13.81	No
		38	5190	14.50 ±1.0	14.45	Yes
	802.11ax-HT20	46	5230	14.50 ±1.0	14.06	No
		42	5210	14.00 ±1.0	13.61	No
U-NII-1 (5150-5250)	802.11a	36	5180	11.00 ±1.0	10.68	No
		48	5240	10.50 ±1.0	10.18	No
	802.11n-HT20	36	5180	9.50 ±1.0	9.13	No
		48	5240	9.00 ±1.0	8.99	No
	802.11n-HT40	38	5190	8.00 ±1.0	7.54	No
		46	5230	7.50 ±1.0	7.41	No
	802.11ac-VHT20	36	5180	8.00 ±1.0	7.53	No
		48	5240	8.00 ±1.0	7.51	No
	802.11ac-VHT40	38	5190	7.50 ±1.0	7.17	No
		46	5230	7.00 ±1.0	6.80	No
	802.11ac-VHT80	42	5210	6.50 ±1.0	6.26	No
		36	5180	10.50 ±1.0	10.17	No
	802.11ax-HT20	48	5240	10.50 ±1.0	10.14	No
		38	5190	11.50 ±1.0	11.21	Yes

Ant 1						
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Power(dBm)	SAR Test(Yes/No)
U-NII-2a (5250-5350)	802.11a	52	5260	11.00 ±1.0	11.00	No
		64	5320	11.00 ±1.0	10.96	No
	802.11n-HT20	52	5260	10.00 ±1.0	9.88	No
		64	5320	9.50 ±1.0	9.37	No
	802.11n-HT40	54	5270	9.00 ±1.0	8.52	No
		62	5310	8.50 ±1.0	8.11	No
	802.11ac-VHT20	52	5260	9.00 ±1.0	8.65	No
		64	5320	8.50 ±1.0	8.21	No
	802.11ac-VHT40	54	5270	8.00 ±1.0	7.64	No
		62	5310	7.50 ±1.0	7.06	No
	802.11ac-VHT80	58	5290	6.50 ±1.0	6.13	No
		802.11ax-HT20	52	5260	11.50 ±1.0	11.18
64	5320		11.00 ±1.0	10.68	No	
802.11ax-HT40	54	5270	11.50 ±1.0	11.23	Yes	
	62	5310	11.50 ±1.0	11.04	No	
802.11ax-HT80	58	5290	10.50 ±1.0	10.32	No	
	Ant 2					
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Power(dBm)	SAR Test(Yes/No)
U-NII-2a (5250-5350)	802.11a	52	5260	9.50 ±1.0	9.43	No
		64	5320	9.50 ±1.0	9.07	No
	802.11n-HT20	52	5260	8.50 ±1.0	8.16	No
		64	5320	8.00 ±1.0	7.64	No
	802.11n-HT40	54	5270	7.00 ±1.0	6.60	No
		62	5310	7.50 ±1.0	7.11	No
	802.11ac-VHT20	52	5260	7.00 ±1.0	6.83	No
		64	5320	6.50 ±1.0	6.45	No
	802.11ac-VHT40	54	5270	7.00 ±1.0	6.63	No
		62	5310	6.50 ±1.0	6.41	No
	802.11ac-VHT80	58	5290	6.00 ±1.0	5.79	No
		802.11ax-HT20	52	5260	10.00 ±1.0	9.71
64	5320		9.00 ±1.0	8.94	No	
802.11ax-HT40	54	5270	10.00 ±1.0	9.87	No	
	62	5310	10.00 ±1.0	9.89	Yes	
802.11ax-HT80	58	5290	9.00 ±1.0	8.71	No	
	MIMO					
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Power(dBm)	SAR Test(Yes/No)
U-NII-2a (5250-5350)	802.11n-HT20	52	5260	12.50 ±1.0	12.11	No
		64	5320	12.00 ±1.0	11.60	No
	802.11n-HT40	54	5270	11.00 ±1.0	10.68	No
		62	5310	11.00 ±1.0	10.65	No
	802.11ac-VHT20	52	5260	11.00 ±1.0	10.84	No
		64	5320	10.50 ±1.0	10.43	No
	802.11ac-VHT40	54	5270	10.50 ±1.0	10.17	No
		62	5310	10.00 ±1.0	9.76	No
	802.11ac-VHT80	58	5290	9.00 ±1.0	8.97	No
		802.11ax-HT20	52	5260	14.00 ±1.0	13.52
	64		5320	13.00 ±1.0	12.91	No
	802.11ax-HT40	54	5270	14.00 ±1.0	13.61	Yes
62		5310	14.00 ±1.0	13.51	No	
802.11ax-HT80	58	5290	13.00 ±1.0	12.60	No	

Ant 1						
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Power(dBm)	SAR Test(Yes/No)
U-NII-2c (5470-5725)	802.11a	100	5500	11.00 ±1.0	10.94	No
		140	5700	11.50 ±1.0	11.30	No
	802.11n-HT20	100	5500	9.50 ±1.0	9.48	No
		140	5700	10.00 ±1.0	9.94	No
	802.11n-HT40	102	5510	7.50 ±1.0	7.33	No
		134	5670	8.50 ±1.0	8.42	No
	802.11ac-VHT20	100	5500	9.50 ±1.0	9.07	No
		140	5700	9.00 ±1.0	8.74	No
	802.11ac-VHT40	102	5510	7.00 ±1.0	6.51	No
		134	5670	8.00 ±1.0	7.71	No
	802.11ac-VHT80	106	5530	6.00 ±1.0	5.70	No
		122	5610	6.50 ±1.0	6.27	No
	802.11ax-HT20	100	5500	10.50 ±1.0	10.34	No
		140	5700	11.50 ±1.0	11.25	No
	802.11ax-HT40	102	5510	10.50 ±1.0	10.22	No
		134	5670	12.00 ±1.0	11.81	Yes
	802.11ax-HT80	106	5530	10.00 ±1.0	9.87	No
		122	5610	11.00 ±1.0	10.78	No
	802.11ax- HT160	114	5570	9.00 ±1.0	8.95	No
Ant 2						
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Power(dBm)	SAR Test(Yes/No)
U-NII-2c (5470-5725)	802.11a	100	5500	16.00 ±1.0	16.00	No
		140	5700	10.50 ±1.0	10.34	No
	802.11n-HT20	100	5500	8.50 ±1.0	8.49	No
		140	5700	9.00 ±1.0	8.57	No
	802.11n-HT40	102	5510	7.00 ±1.0	6.68	No
		134	5670	8.50 ±1.0	8.44	No
	802.11ac-VHT20	100	5500	8.00 ±1.0	7.53	No
		140	5700	8.00 ±1.0	7.51	No
	802.11ac-VHT40	102	5510	6.00 ±1.0	5.86	No
		134	5670	7.00 ±1.0	6.93	No
	802.11ac-VHT80	106	5530	6.50 ±1.0	6.42	No
		122	5610	7.00 ±1.0	6.94	No
	802.11ax-HT20	100	5500	10.00 ±1.0	9.66	No
		140	5700	10.50 ±1.0	10.06	No
	802.11ax-HT40	102	5510	10.00 ±1.0	9.67	No
		134	5670	11.00 ±1.0	10.62	Yes
	802.11ax-HT80	106	5530	9.00 ±1.0	8.97	No
		122	5610	10.00 ±1.0	9.96	No
	802.11ax- HT160	114	5570	7.50 ±1.0	7.07	No
MIMO						
Band	Mode	Channel	Frequency (MHz)	Tune-up	AveragePower(dBm)	SAR Test(Yes/No)
U-NII-2c (5470-5725)	802.11n-HT20	100	5500	12.50 ±1.0	12.02	No
		140	5700	12.50 ±1.0	12.32	No
	802.11n-HT40	102	5510	10.50 ±1.0	10.03	No
		134	5670	11.50 ±1.0	11.44	No
	802.11ac-VHT20	100	5500	11.50 ±1.0	11.38	No
		140	5700	11.50 ±1.0	11.18	No
	802.11ac-VHT40	102	5510	9.50 ±1.0	9.21	No
		134	5670	10.50 ±1.0	10.35	No
	802.11ac-VHT80	106	5530	9.50 ±1.0	9.09	No
		122	5610	10.00 ±1.0	9.63	No
	802.11ax-HT20	100	5500	13.50 ±1.0	13.02	No
		140	5700	14.00 ±1.0	13.71	No
	802.11ax-HT40	102	5510	13.00 ±1.0	12.96	No
		134	5670	14.50 ±1.0	14.27	Yes
	802.11ax-HT80	106	5530	12.50 ±1.0	12.45	No
		122	5610	13.50 ±1.0	13.40	No
	802.11ax- HT160	114	5570	11.50 ±1.0	11.12	No

Ant 1						
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Powe(dBm)	SAR Test(Yes/No)
U-NII-3 (5725-5825)	802.11a	149	5745	11.50 ±1.0	11.47	No
		165	5825	11.50 ±1.0	11.47	No
	802.11n-HT20	149	5745	10.50 ±1.0	10.28	No
		165	5825	10.50 ±1.0	10.32	No
	802.11n-HT40	151	5755	9.00 ±1.0	8.66	No
		159	5795	9.50 ±1.0	9.28	No
	802.11ac-VHT20	149	5745	9.00 ±1.0	8.98	No
		165	5825	9.00 ±1.0	8.90	No
	802.11ac-VHT40	151	5755	8.00 ±1.0	7.83	No
		159	5795	8.50 ±1.0	8.29	No
	802.11ac-VHT80	155	5775	7.00 ±1.0	6.82	No
		149	5745	11.50 ±1.0	11.26	No
	802.11ax-HT20	165	5825	12.00 ±1.0	11.56	No
		151	5755	12.00 ±1.0	11.85	No
802.11ax-HT40	159	5795	12.50 ±1.0	12.17	Yes	
	802.11ax-HT80	155	5775	11.50 ±1.0	11.07	No
Ant 2						
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Powe(dBm)	SAR Test(Yes/No)
U-NII-3 (5725-5825)	802.11a	149	5745	10.50 ±1.0	10.06	No
		165	5825	11.00 ±1.0	10.80	No
	802.11n-HT20	149	5745	9.00 ±1.0	8.61	No
		165	5825	9.50 ±1.0	9.04	No
	802.11n-HT40	151	5755	8.00 ±1.0	7.92	No
		159	5795	8.50 ±1.0	8.26	No
	802.11ac-VHT20	149	5745	7.50 ±1.0	7.29	No
		165	5825	8.00 ±1.0	7.98	No
	802.11ac-VHT40	151	5755	8.00 ±1.0	7.97	No
		159	5795	8.50 ±1.0	8.18	No
	802.11ac-VHT80	155	5775	7.50 ±1.0	7.18	No
		149	5745	10.00 ±1.0	9.82	No
	802.11ax-HT20	165	5825	11.00 ±1.0	10.72	No
		151	5755	11.00 ±1.0	10.51	No
802.11ax-HT40	159	5795	11.00 ±1.0	10.94	Yes	
	802.11ax-HT80	155	5775	10.50 ±1.0	10.07	No
MIMO						
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Powe(dBm)	SAR Test(Yes/No)
U-NII-3 (5725-5825)	802.11n-HT20	149	5745	13.00 ±1.0	12.54	No
		165	5825	13.00 ±1.0	12.74	No
	802.11n-HT40	151	5755	11.50 ±1.0	11.32	No
		159	5795	12.00 ±1.0	11.81	No
	802.11ac-VHT20	149	5745	11.50 ±1.0	11.23	No
		165	5825	11.50 ±1.0	11.47	No
	802.11ac-VHT40	151	5755	11.00 ±1.0	10.91	No
		159	5795	11.50 ±1.0	11.25	No
	802.11ac-VHT80	155	5775	10.50 ±1.0	10.01	No
		149	5745	14.00 ±1.0	13.61	No
	802.11ax-HT20	165	5825	14.50 ±1.0	14.17	No
		151	5755	14.50 ±1.0	14.24	No
	802.11ax-HT40	159	5795	15.00 ±1.0	14.61	Yes
		802.11ax-HT80	155	5775	14.00 ±1.0	13.61

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

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.

10.1.3 Conducted Power of Wi-Fi 6E

ANT 1						
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
Wi-Fi 6E	802.11ax-HE20	1	5955	9.00	8.92	No
		45	6175	9.50	9.2	No
		117	6535	8.50	8.43	No
		185	6875	8.50	8.25	No
		229	7095	9.00	8.74	No
	802.11ax-HE40	3	5965	9.50	9.49	Yes
		43	6165	9.00	8.98	Yes
		115	6525	9.50	9.21	Yes
		179	6845	8.50	8.15	Yes
		227	7085	9.00	8.75	Yes
	802.11ax-HE80	7	5985	9.00	8.55	No
		39	6145	8.50	8.28	No
		103	6465	8.50	8.49	No
		151	6705	8.50	8.02	No
		215	7025	8.00	7.95	No
	802.11ax-HE160	15	6025	6.50	6.28	No
		47	6185	6.00	5.66	No
		111	6505	5.50	5.32	No
		175	6825	5.00	4.90	No
		207	6985	6.00	5.83	No

ANT2						
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
Wi-Fi 6E	802.11ax-HE20	1	5955	10.00	9.63	No
		45	6175	8.50	8.39	No
		117	6535	8.00	7.97	No
		185	6875	9.00	8.61	No
		229	7095	8.50	8.38	No
	802.11ax-HE40	3	5965	10.00	9.73	Yes
		43	6165	9.00	8.58	Yes
		115	6525	8.50	8.02	Yes
		179	6845	8.50	8.35	Yes
		227	7085	8.50	8.43	Yes
	802.11ax-HE80	7	5985	9.50	9.22	No
		39	6145	8.00	7.98	No
		103	6465	7.50	7.13	No
		151	6705	8.50	8.25	No
		215	7025	8.00	7.95	No
	802.11ax-HE160	15	6025	6.00	5.55	No
		47	6185	5.50	5.27	No
		111	6505	5.00	4.79	No
		175	6825	5.50	5.5	No
		207	6985	6.00	5.97	No

MIMO mode						
Band	Mode	Channel	Frequency (MHz)	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
Wi-Fi 6E	802.11ax-HE20	1	5955	12.50	12.30	No
		45	6175	12.00	11.82	No
		117	6535	11.50	11.22	No
		185	6875	11.50	11.44	No
		229	7095	12.00	11.57	No
	802.11ax-HE40	3	5965	13.00	12.62	Yes
		43	6165	12.00	11.79	Yes
		115	6525	12.00	11.67	Yes
		179	6845	11.50	11.26	Yes
		227	7085	12.00	11.60	Yes
	802.11ax-HE80	7	5985	12.00	11.91	No
		39	6145	11.50	11.14	No
		103	6465	11.00	10.87	No
		151	6705	11.50	11.15	No
		215	7025	11.00	10.96	No
	802.11ax-HE160	15	6025	9.00	8.94	No
		47	6185	8.50	8.48	No
		111	6505	8.50	8.07	No
		175	6825	8.50	8.22	No
		207	6985	9.00	8.91	No

Note:

1. The manufacturer has confirmed that the devices tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
2. Batteries are fully charged at the beginning of the measurements. The DUT was connected to a wall charger for some measurements due to the test duration. It was confirmed that the charger plugged into this DUT did not impact the near-field PD test results.
3. Power density was calculated by repeated E-field measurements on two measurement planes separated by N/4.
4. The device was 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.
5. Per FCC guidance and equipment manufacturer guidance, power density results were scaled according to IEC 62479:2010 for the portion of the measurement uncertainty > 30%. Total expanded uncertainty of 2.66 dB (84.5%) was used to determine the PSD measurement scaling factor.
6. Per equipment manufacturer guidance, power density was measured at d=2mm and d=N/5mm using the same grid size and grid step size for some frequencies and surfaces. The integrated Power Density (iPD) was calculated based on these measurements. Since iPD ratio between the two distances is < 1dB, the grid step was sufficient for determining compliance at d=2mm.
7. psPD for MIMO was evaluated by making a measurement with both antennas transmitting simultaneously.

10.2 Conducted Power of BT

EDR	Mode	Maximum Tune-up(dBm)	Average Conducted Output Power (dBm)		
			0	39	78
			2402MHz	2441MHz	2480MHz
	GFSK	10.00	9.42	9.77	9.85
	π/4QPSK	10.00	9.40	9.70	9.60
	8DPSK	10.00	9.23	9.76	9.59
BLE	Mode	Maximum Tune-up(dBm)	Average Conducted Output Power (dBm)		
			0	19	39
			2402MHz	2440MHz	2480MHz
	1Mbps	11.00	10.40	10.71	10.85
	2Mbps	11.00	10.51	10.76	10.73
Channel	Frequency (GHz)	Max. Tune-up Power (dBm)	Max. Power (dBm)	Exclusion thresholds for 1-g SAR(dBm)	SAR evaluation required
78	2480	10.00	9.85	4.77	Yes
39	2480	11.00	10.85	4.77	Yes

Note

- Per KDB 447498 D04 Interim General RF Exposure Guidance v01, the 1-g SAR test exclusion thresholds for 300 MHz to 6 GHz at test separation distances ≤ 40 cm are determined by:

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B.2})$$

where

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

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

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

- Per KDB 248227 D01 v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
- The output power of all data rate were prescan, just the worst case (the lowest data rate) of all mode were shown in report.

10.3 Tune-up powertolerance

Band	Tune-up power tolerance(dBm)				
WIFI	2.4G (MAIN ANT1)		802.11b	Max output power =23.00±1.0dbm	
			802.11g	Max output power =26.00±1.0dbm	
			802.11n (HT20)	Max output power =25.00±1.0dbm	
			802.11n (HT40)	Max output power =25.00±1.0dbm	
			802.11ax20	Max output power =24.50±1.0dbm	
			802.11ax40	Max output power =25.00±1.0dbm	
	2.4G (AUX ANT2)		802.11b	Max output power =22.50±1.0dbm	
			802.11g	Max output power =25.50±1.0dbm	
			802.11n (HT20)	Max output power =22.00±1.0dbm	
			802.11n (HT40)	Max output power =21.50±1.0dbm	
			802.11ax20	Max output power =23.50±1.0dbm	
			802.11ax40	Max output power =24.00±1.0dbm	
	2.4G (MIMO Mode)		802.11n (HT20)	Max output power =25.50±1.0dbm	
			802.11n (HT40)	Max output power =28.50±1.0dbm	
			802.11ax20	Max output power =26.50±1.0dbm	
			802.11ax40	Max output power =26.50±1.0dbm	
	U-NII-1 (5150-5250)		Ant 1	802.11a	Max output power =12.00±1.0dbm
			Ant 2	802.11ax-HT40	Max output power =11.50±1.0dbm
			MIMO	802.11ax-HT40	Max output power =14.50±1.0dbm
	U-NII-2a (5250-5350)		Ant 1	802.11ax-HT40	Max output power =11.50±1.0dbm
			Ant 2	802.11ax-HT40	Max output power =10.00±1.0dbm
			MIMO	802.11ax-HT40	Max output power =14.00±1.0dbm
	U-NII-2c (5470-5725)		Ant 1	802.11ax-HT40	Max output power =12.00±1.0dbm
			Ant 2	802.11ax-HT40	Max output power =11.00±1.0dbm
MIMO			802.11ax-HT40	Max output power =14.50±1.0dbm	
U-NII-3 (5725-5825)		Ant 1	802.11ax-HT40	Max output power =12.50±1.0dbm	
		Ant 2	802.11ax-HT40	Max output power =11.00±1.0dbm	
		MIMO	802.11ax-HT40	Max output power =15.00±1.0dbm	
U-NII-5 (5925-6425)		Ant 1	802.11ax-HE40	Max output power =9.50±1.0dbm	
		Ant 2	802.11ax-HE40	Max output power =10.00±1.0dbm	
		MIMO	802.11ax-HE40	Max output power =13.00±1.0dbm	
U-NII-6 (6425-6525)		Ant 1	802.11ax-HE40	Max output power =9.50±1.0dbm	
		Ant 2	802.11ax-HE40	Max output power =8.50±1.0dbm	
		MIMO	802.11ax-HE40	Max output power =12.00±1.0dbm	
U-NII-7 (6525-6875)		Ant 1	802.11ax-HE40	Max output power =8.50±1.0dbm	
		Ant 2	802.11ax-HE40	Max output power =8.50±1.0dbm	
		MIMO	802.11ax-HE40	Max output power =11.50±1.0dbm	
U-NII-8 (6875-7125)		Ant 1	802.11ax-HE40	Max output power =9.00±1.0dbm	
		Ant 2	802.11ax-HE40	Max output power =8.50±1.0dbm	
		MIMO	802.11ax-HE40	Max output power =12.00±1.0dbm	
BT	GFSK mode			Max output power =10.00±1.0dbm	
	Pi/4DQPSK mode			Max output power =10.00±1.0dbm	
	8DPSK mode			Max output power =10.00±1.0dbm	
BLE	1Mbps Power			Max output power =11.00±1.0dbm	
	2Mbps Power			Max output power =11.00±1.0dbm	

11 SAR test results

Notes:

1) Per KDB447498, the SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the scaled SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit ($< 0.8 \text{ W/kg}$), testing at the high and low channels is optional.

2) Per KDB447498, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is: $\leq 0.8 \text{ W/kg}$ or 2.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\leq 100 \text{ MHz}$. When the maximum output power variation across the required test channels is $> \frac{1}{2} \text{ dB}$, instead of the middle channel, the highest output power channel must be used.

3) Per KDB447498, All measurement SAR result is scaled-up to account for tune-up tolerance is compliant.

4) Per KDB648474 D04v01r03, body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn with headset SAR.

5) Per KDB248227 D01v02r02, the procedures required to establish specific device operating configurations for testing the SAR of 802.11 a/b/g transmitters.

6) Per KDB865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is $\geq 0.8 \text{ W/Kg}$; if the deviation among the repeated measurement is $\leq 20\%$, and the measured SAR $< 1.45 \text{ W/Kg}$, only one repeated measurement is required.

7) Per KDB865664 D02v01r02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is $> 1.5 \text{ W/kg}$, or $> 7.0 \text{ W/kg}$ for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing (Refer to appendix B for details).

8) Per KDB6162147 D04v01r02, the SAR requirements for laptop and tablet computers, and its to determine the minimum test separation distance .

11.1 Results overview of Wi-Fi

11.1.1 Results overview of Wi-Fi 2.4G

Mode	Test Position of Body with 0mm	Test channel /Freq.(MHz)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Limit (dBm)	Scaled SAR1-g (W/kg)	Scaling Factor
			1-g	10-g					
802.11g MAIN ANT1	Front side	11/2462	0.280	0.138	0.050	25.64	26.00	0.304	1.086
	Rear side	11/2462	0.533	0.225	-0.020	25.64	26.00	0.579	1.086
	Top side	11/2462	0.659	0.277	-0.010	25.27	25.50	0.695	1.054
802.11g AUX ANT2	Front side	11/2462	0.304	0.141	-0.060	25.27	25.50	0.321	1.054
	Rear side	11/2462	0.472	0.202	-0.020	25.27	25.50	0.498	1.054
	Top side	11/2462	0.558	0.237	-0.030	25.64	26.00	0.606	1.086
802.11ax 40 MIMO	Front side	9/2452	0.563	0.249	0.000	26.32	26.50	0.587	1.042
	Rear side	9/2452	0.697	0.324	0.010	26.32	26.50	0.726	1.042
	Top side	9/2452	1.250	0.561	-0.090	26.32	26.50	1.303	1.042

11.1.2 Results overview of Wi-Fi 5G

Mode	Test Position of Body with 0mm	Test channel /Freq.(MHz)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Limit (dBm)	Scaled SAR1-g (W/kg)	Scaling Factor
			1-g	10-g					
WLAN5.2g(gap 0mm)									
802.11a MAIN ANT1	Front side	36/5180	0.416	0.164	0.080	11.74	12.00	0.442	1.062
	Rear side	36/5180	0.906	0.318	0.030	11.74	12.00	0.962	1.062
	Top side	36/5180	0.887	0.305	-0.080	11.74	12.00	0.942	1.062
802.11ax-HT40 AUX ANT2	Front side	42/5210	0.805	0.227	0.150	11.21	11.50	0.861	1.069
	Rear side	42/5210	0.766	0.264	-0.100	11.21	11.50	0.819	1.069
	Top side	42/5210	0.967	0.330	0.020	11.21	11.50	1.034	1.069
802.11ax-HT40 MIMO	Front side	42/5210	0.819	0.246	0.060	14.45	14.50	0.828	1.012
	Rear side	42/5210	0.903	0.327	-0.040	14.45	14.50	0.913	1.012
	Top side	42/5210	1.080	0.391	0.070	14.45	14.50	1.093	1.012
Mode	Test Position of Body with 0mm	Test channel /Freq.(MHz)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Limit (dBm)	Scaled SAR1-g (W/kg)	Scaling Factor
			1-g	10-g					
WLAN5.4g(gap 0mm)									
802.11ax-HT40 MAIN ANT1	Front side	64/5320	0.391	0.154	0.150	11.23	11.50	0.416	1.064
	Rear side	64/5320	0.895	0.297	-0.040	11.23	11.50	0.952	1.064
	Top side	64/5320	0.971	0.329	0.020	11.23	11.50	1.033	1.064
802.11ax-HT40 AUX ANT2	Front side	58/5290	0.665	0.199	0.040	9.89	10.00	0.682	1.026
	Rear side	58/5290	1.050	0.371	-0.110	9.89	10.00	1.077	1.026
	Top side	58/5290	0.990	0.334	0.050	9.89	10.00	1.015	1.026
802.11ax-HT40 MIMO	Front side	58/5290	0.755	0.239	0.150	13.61	14.00	0.826	1.094
	Rear side	58/5290	0.870	0.667	-0.040	13.61	14.00	0.952	1.094
	Top side	58/5290	1.060	0.370	-0.040	13.61	14.00	1.160	1.094

Mode	Test Position of Body with 0mm	Test channel /Freq.(MHz)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Limit (dBm)	Scaled SAR1-g (W/kg)	Scaling Factor
			1-g	10-g					
WLAN5.6g(gap 0mm)									
802.11ax-HT40 MAIN ANT1	Front side	106/5530	0.775	0.265	0.120	11.81	12.00	0.810	1.045
	Rear side	106/5530	1.140	0.381	0.060	11.81	12.00	1.191	1.045
	Top side	106/5530	1.300	0.437	0.150	11.81	12.00	1.358	1.045
802.11ax-HT40 AUX ANT2	Front side	122/5610	1.070	0.298	0.150	10.62	11.00	1.168	1.091
	Rear side	122/5610	0.644	0.219	-0.040	10.62	11.00	0.703	1.091
	Top side	122/5610	1.020	0.267	0.050	10.62	11.00	1.113	1.091
802.11ax-HT40 MIMO	Front side	122/5610	1.130	0.323	0.050	14.27	14.50	1.191	1.054
	Rear side	122/5610	1.240	0.441	-0.080	14.27	14.50	1.307	1.054
	Top side	122/5610	0.803	0.292	-0.020	14.27	14.50	0.847	1.054
Mode	Test Position of Body with 0mm	Test channel /Freq.(MHz)	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Limit (dBm)	Scaled SAR1-g (W/kg)	Scaling Factor
			1-g	10-g					
WLAN5.8g(gap 0mm)									
802.11ax-HT40 MAIN ANT1	Front side	149/5745	0.432	0.176	0.150	12.17	12.50	0.466	1.079
	Rear side	149/5745	1.230	0.431	-0.030	12.17	12.50	1.327	1.079
	Top side	149/5745	1.220	0.433	-0.130	12.17	12.50	1.316	1.079
802.11ax-HT40 AUX ANT2	Front side	155/5775	1.050	0.268	0.050	10.94	11.00	1.065	1.014
	Rear side	155/5775	0.802	0.270	-0.020	10.94	11.00	0.813	1.014
	Top side	155/5775	0.871	0.309	-0.080	10.94	11.00	0.883	1.014
802.11ax-HT40 MIMO	Front side	165/5825	1.140	0.301	0.120	14.61	15.00	1.247	1.094
	Rear side	165/5825	1.160	0.410	-0.070	14.61	15.00	1.269	1.094
	Top side	165/5825	1.280	0.448	-0.060	14.61	15.00	1.400	1.094

11.1.3 Results overview of Wi-Fi 6E&PD

Mode	Position	Test channel /Freq.(MHz)	SAR Value (W/kg)		Power Drift (dB)	Duty cycle (%)	Duty cycle Factor	Conducted Power (dBm)	Tune-up Limit (dBm)	Scaled SAR1-g (W/kg)	Scaling Factor	Measured APD (W/m ²) 4cm ²	Report APD (W/m ²)
			1-g	10-g									
WIFI6E ANT1	Front side	3/5965	0.232	0.072	0.180	100	1.00	9.49	9.50	0.233	1.002	1.640	1.644
	Rear side	3/5965	0.285	0.099	0.140	100	1.00	9.49	9.50	0.286	1.002	2.220	2.225
	Top side	3/5965	0.318	0.109	0.100	100	1.00	9.49	9.50	0.319	1.002	2.460	2.466
	Top side	43/6165	0.221	0.072	-0.140	100	1.00	9.49	9.50	0.222	1.002	1.570	1.574
	Top side	115/6525	0.229	0.063	-0.480	100	1.00	9.49	9.50	0.230	1.002	1.470	1.473
	Top side	179/6845	0.295	0.093	-0.130	100	1.00	9.49	9.50	0.296	1.002	2.100	2.105
	Top side	227/7085	0.221	0.074	0.110	100	1.00	9.49	9.50	0.222	1.002	1.680	1.684

Mode	Position	Test channel /Freq.(MHz)	SAR Value (W/kg)		Power Drift (dB)	Duty cycle (%)	Duty cycle Factor	Conducted Power (dBm)	Tune-up Limit (dBm)	Scaled SAR1-g (W/kg)	Scaling Factor	Measured APD (W/m ²) 4cm ²	Report APD (W/m ²)
			1-g	10-g									
WIFI6E ANT2	Front side	3/5965	0.247	0.068	0.140	100	1.00	9.73	10.00	0.263	1.064	1.560	1.660
	Rear side	3/5965	0.188	0.062	-0.200	100	1.00	9.73	10.00	0.200	1.064	1.390	1.479
	Top side	3/5965	0.196	0.064	0.060	100	1.00	9.73	10.00	0.209	1.064	1.420	1.511
	Top side	43/6165	0.152	0.052	0.150	100	1.00	9.73	10.00	0.162	1.064	1.170	1.245
	Top side	115/6525	0.198	0.062	0.030	100	1.00	9.73	10.00	0.211	1.064	1.430	1.522
	Top side	179/6845	0.241	0.076	0.020	100	1.00	9.73	10.00	0.256	1.064	1.730	1.841
	Top side	227/7085	0.209	0.065	-0.190	100	1.00	9.73	10.00	0.222	1.064	1.290	1.373

Mode	Position	Test channel /Freq.(MHz)	SAR Value (W/kg)		Power Drift (dB)	Duty cycle (%)	Duty cycle Factor	Conducted Power (dBm)	Tune-up Limit (dBm)	Scaled SAR1-g (W/kg)	Scaling Factor	Measured APD (W/m ²) 4cm ²	Report APD (W/m ²)
			1-g	10-g									
WIFI6E MIMO	Front side	3/5965	0.214	0.057	0.130	100	1.00	12.62	13.00	0.234	1.091	1.320	1.441
	Rear side	3/5965	0.248	0.085	-0.120	100	1.00	12.62	13.00	0.271	1.091	1.920	2.096
	Top side	3/5965	0.164	0.057	0.150	100	1.00	12.62	13.00	0.179	1.091	1.300	1.419
	Top side	43/6165	0.122	0.041	0.070	100	1.00	12.62	13.00	0.133	1.091	0.918	1.002
	Top side	115/6525	0.124	0.042	0.130	100	1.00	12.62	13.00	0.135	1.091	0.940	1.026
	Top side	179/6845	0.098	0.031	0.010	100	1.00	12.62	13.00	0.107	1.091	0.687	0.750
	Top side	227/7085	0.220	0.075	0.030	100	1.00	12.62	13.00	0.240	1.091	1.690	1.845

IPD data

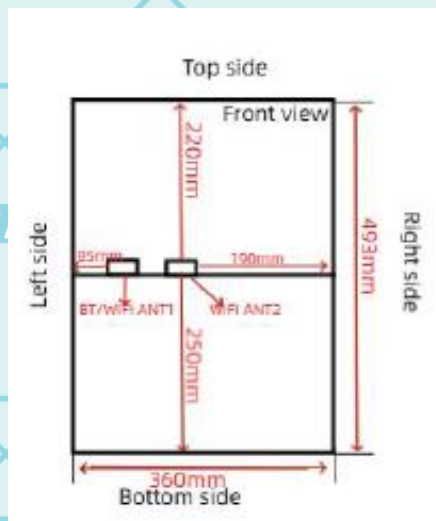
Mode	Position	Test channel /Freq.(MHz)	Gap (mm)	Grid Step (λ)	Normal IPD (W/m ²)	Total IPD (W/m ²)	Duty cycle (%)	Duty cycle Factor	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	Reported Normal psPD (W/m ²)	Reported Total psPD (W/m ²)
WIFI6E ANT1	Top side	3/5965	2.000	0.0625	5.480	8.660	100	1.00	9.45	9.50	1.012	5.543	8.760

11.2 Results overview of BT

Test Position of Body with 0mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conduct ed Power (dBm)	Tune-up Limit(dBm)	Scaled SAR _{1-g} (W/kg)	Scalig factor
			1-g	10-g					
BTantenna to side									
Front side	78/2480	GFSK	0.009	0.004	0.020	9.85	10.00	0.009	1.035
Rear side	78/2480	GFSK	0.012	0.004	-0.130	9.85	10.00	0.012	1.035
Top side	78/2480	GFSK	0.146	0.049	-0.030	9.85	10.00	0.151	1.035

12 Multiple Transmitter Information

The SAR measurement positions of each side are as below:



<Rear Side>

Mode	Front side	Rear side	Left side	Right side	Top side	Bottom side
Wi-Fi/BT Antenna	Yes	Yes	No	No	Yes	No

Per KDB 616217 Laptop host platform test requirements: When antennas are incorporated in the keyboard section of a laptop computer, SAR is required for the bottom surface of the keyboard. Provided tablet use conditions are not supported by the laptop computer, SAR tests for bystander exposure from the edges of the keyboard and display screen of laptop computers are generally not required.

12.1 Simultaneous Transmission SAR Summation Scenario

Mode	Position	WIFI MaxSAR 1g(W/kg)	Ant 1 BT 1g(W/kg)	WIFI + BT 1g(W/kg)
2.4Gwifi	Front	0.587	0.009	0.596
	Back	0.726	0.012	0.738
	Top	1.303	0.151	1.454
5.2Gwifi	Front	0.828	0.009	0.837
	Back	0.962	0.012	0.974
	Top	1.093	0.151	1.244
5.4Gwifi	Front	0.826	0.009	0.835
	Back	1.077	0.012	1.089
	Top	1.160	0.151	1.311
5.6Gwifi	Front	1.191	0.009	1.200
	Back	1.307	0.012	1.319
	Top	1.358	0.151	1.509
5.8Gwifi	Front	1.247	0.009	1.256
	Back	1.327	0.012	1.339
	Top	1.400	0.151	1.551
WIFI6E	Front	0.263	0.009	0.272
	Back	0.286	0.012	0.298
	Top	0.319	0.151	0.470

12.2 Measurement uncertainty evaluation for SAR test

The following table includes the uncertainty table of the IEEE 1528. The values are determined by SPEAG. The breakdown of the individual uncertainties is as follows:

DASY8 Uncertainty Budget								
According to IEC/IEEE 62209-1528								
(Frequency band: 300MHz-3GHz range)								
Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(ci) (1g)	(ci) (10g)	Std. Unc (1g)	Std. Unc (10g)
Measurement System Errors								
CF	Probe Calibration	±13.3%	N	2	1	1	±6.7%	±6.7%
CF _{drift}	Probe Calibration Drift	±1.7%	R	$\sqrt{3}$	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±2.8%	R	$\sqrt{3}$	1	1	±1.6%	±1.6%
ISO	Probe Isotropy	±7.6%	R	$\sqrt{3}$	1	1	±4.4%	±4.4%
DAE	Other Probe+Electronic	±0.8%	N	1	1	1	±0.8%	±0.8%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ_{sys}	Probe Positioning	±0.006 mm	N	1	0.14	0.14	±0.10%	±0.10%
DAT	Data Processing	±1.2%	N	1	1	1	±1.2%	±1.2%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) DAK	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%
LIQ(T_{σ})	Conductivity (temp.) BB	±3.3%	R	$\sqrt{3}$	0.78	0.71	±1.5%	±1.4%
EPS	Phantom Permittivity	±14.0%	R	$\sqrt{3}$	0	0	±0%	±0%
DIS	Distance DUT - TSL	±2.0%	N	1	2	2	±4.0%	±4.0%
D _{xyz}	Device Positioning	±1.0%	N	1	1	1	±1.0%	±1.0%
H	Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%
MOD	DUT Modulation ^m	±2.4%	R	$\sqrt{3}$	1	1	±1.4%	±1.4%
TAS	Time-average SAR	±1.7%	R	$\sqrt{3}$	1	1	±1.0%	±1.0%
RF _{drift}	DUT drift	±2.5%	N	1	1	1	±2.5%	±2.5%
VAL	Val Antenna Unc. ^{val}	±0.0%	N	1	1	1	±0.0%	±0.0%
RF _{in}	Unc. Input Power ^{val}	±0.0%	N	1	1	1	±0.0%	±0.0%
Correction to the SAR results								
C(ϵ , σ)	Deviation to Target	±1.9%	N	1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling ^p	±0.0%	R	$\sqrt{3}$	1	1	±0.0%	±0.0%
u(Δ SAR)	Combined Uncertainty						±11.3%	±11.2%
U	Expanded Uncertainty						±22.6%	±22.5%

DASY8 Uncertainty Budget

According to IEC/IEEE 62209-1528
(Frequency band: 3GHz–6GHz range)

Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(ci) (1g)	(ci) (10g)	Std. Unc (1g)	Std. Unc (10g)
Measurement System Errors								
CF	Probe Calibration	±13.1%	N	2	1	1	±6.55%	±6.55%
CF _{drift}	Probe Calibration Drift	±1.7%	R	$\sqrt{3}$	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%
ISO	Probe Isotropy	±7.6%	R	$\sqrt{3}$	1	1	±4.4%	±4.4%
DAE	Other Probe+Electronic	±1.2%	N	1	1	1	±1.2%	±1.2%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ_{sys}	Probe Positioning	±0.005 mm	N	1	0.29	0.29	±0.2%	±0.20%
DAT	Data Processing	±2.3%	N	1	1	1	±2.3%	±2.3%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) DAK	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%
LIQ(T_{σ})	Conductivity (temp.) JBB	±3.4%	R	$\sqrt{3}$	0.78	0.71	±1.5%	±1.4%
EPS	Phantom Permittivity	±14.0%	R	$\sqrt{3}$	0.25	0.25	±2.0%	±2.0%
DIS	Distance DUT – TSL	±2.0%	N	1	2	2	±4.0%	±4.0%
D _{xyz}	Device Positioning	±1.0%	N	1	1	1	±1.0%	±1.0%
H	Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%
MOD	DUT Modulation ^m	±2.4%	R	$\sqrt{3}$	1	1	±1.4%	±1.4%
TAS	Time-average SAR	±1.7%	R	$\sqrt{3}$	1	1	±1.0%	±1.0%
RF _{drift}	DUT drift	±2.5%	N	1	1	1	±2.5%	±2.5%
VAL	Val Antenna Unc. ^{val}	±0.0%	N	1	1	1	±0.0%	±0.0%
RF _{in}	Unc. Input Power ^{val}	±0.0%	N	1	1	1	±0.0%	±0.0%
Correction to the SAR results								
C(ϵ , σ)	Deviation to Target	±1.9%	N	1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling ^p	±0.0%	R	$\sqrt{3}$	1	1	±0.0%	±0.0%
u(Δ SAR)	Combined Uncertainty						±11.6%	±11.6%
U	Expanded Uncertainty						±23.3%	±23.1%

DASY8 Uncertainty Budget

According to IEC/IEEE 62209-1528

(Frequency band: 6 GHz–10 GHz range)

Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) (1 g)	(c_i) (10 g)	Std. Unc. (1 g)	Std. Unc. (10 g)
Measurement System Errors								
CF	Probe Calibration	±18.6%	N	2	1	1	±9.3%	±9.3%
CF _{drift}	Probe Calibration Drift	±1.7%	R	√3	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±2.6%	R	√3	1	1	±1.5%	±1.5%
ISO	Probe Isotropy	±7.6%	R	√3	1	1	±4.4%	±4.4%
DAE	Other Probe+Electronic	±2.4%	N	1	1	1	±2.4%	±2.4%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ _{sys}	Probe Positioning	±0.005 mm	N	1	0.50	0.50	±0.3%	±0.3%
DAT	Data Processing	±3.5%	N	1	1	1	±3.5%	±3.5%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) ^{DAK}	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%
LIQ(T _σ)	Conductivity (temp.) ^{BB}	±2.4%	R	√3	0.78	0.71	±1.1%	±1.0%
EPS	Phantom Permittivity	±14.0%	R	√3	0.5	0.5	±4.0%	±4.0%
DIS	Distance DUT – TSL	±2.0%	N	1	2	2	±4.0%	±4.0%
D _{xyz}	Device Positioning	±1.0%	N	1	1	1	±1.0%	±1.0%
H	Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%
MOD	DUT Modulation ^m	±2.4%	R	√3	1	1	±1.4%	±1.4%
TAS	Time-average SAR	±1.7%	R	√3	1	1	±1.0%	±1.0%
RF _{drift}	DUT drift	±2.5%	N	1	1	1	±2.5%	±2.5%
VAL	Val Antenna Unc. ^{val}	±0.0%	N	1	1	1	±0.0%	±0.0%
RF _{in}	Unc. Input Power ^{val}	±0.0%	N	1	1	1	±0.0%	±0.0%
Correction to the SAR results								
C(ε, σ)	Deviation to Target	±1.9%	N	1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling ^p	±0.0%	R	√3	1	1	±0.0%	±0.0%
u(ΔSAR)	Combined Uncertainty						±14.2%	±14.1%
U	Expanded Uncertainty						±28.4%	±28.3%

DASY8 Uncertainty Budget for PD (avg $\geq 1 \text{ cm}^2$)

Evaluation Distances to the Antennas $\geq \lambda/25$

in Compliance with IEC/IEEE 63195

Error Description	Unc. Value ($\pm \text{dB}$)	Probab. Distri.	Div.	(c_i)	Std. Unc. ($\pm \text{dB}$)	(v_i) v_{eff}
Uncertainty terms dependent on the measurement system						
CAL	Calibration	0.49	N	1	0.49	∞
COR	Probe correction	0	R	$\sqrt{3}$	0	∞
FRS	Frequency response ($\text{BW} \leq 1 \text{ GHz}$)	0.20	R	$\sqrt{3}$	0.12	∞
SCC	Sensor cross coupling	0	R	$\sqrt{3}$	0	∞
ISO	Isotropy	0.50	R	$\sqrt{3}$	0.29	∞
LIN	Linearity	0.20	R	$\sqrt{3}$	0.12	∞
PSC	Probe scattering	0	R	$\sqrt{3}$	0	∞
PPO	Probe positioning offset	0.30	R	$\sqrt{3}$	0.17	∞
PPR	Probe positioning repeatability	0.04	R	$\sqrt{3}$	0.02	∞
SMO	Sensor mechanical offset	0	R	$\sqrt{3}$	0	∞
PSR	Probe spatial resolution	0	R	$\sqrt{3}$	0	∞
FLD	Field impedance dependence	0	R	$\sqrt{3}$	0	∞
MED	Measurement drift	0.05	R	$\sqrt{3}$	0.03	∞
APN	Amplitude and phase noise	0.04	R	$\sqrt{3}$	0.02	∞
TR	Measurement area truncation	0	R	$\sqrt{3}$	0	∞
DAQ	Data acquisition	0.03	N	1	0.03	∞
SMP	Sampling	0	R	$\sqrt{3}$	0	∞
REC	Field reconstruction	0.60	R	$\sqrt{3}$	0.35	∞
SNR	Signal-to-Noise Ratio	0	R	$\sqrt{3}$	0	∞
TRA	FTE/MEO	0	R	$\sqrt{3}$	0 (0)	∞
SCA	Power density scaling	—	R	$\sqrt{3}$	—	∞
SAV	Spatial averaging	0.10	R	$\sqrt{3}$	0.06	∞
Uncertainty terms dependent on the DUT and environmental factors						
PC	Probe coupling with DUT	0	R	$\sqrt{3}$	0	∞
MOD	Modulation response	0.40	R	$\sqrt{3}$	0.23	∞
IT	Integration time	0	R	$\sqrt{3}$	0	∞
RT	Response time	0	R	$\sqrt{3}$	0	∞
DH	Device holder influence	0.10	R	$\sqrt{3}$	0.06	∞
DA	DUT alignment	0	R	$\sqrt{3}$	0	∞
AC	RF ambient conditions	0.04	R	$\sqrt{3}$	0.02	∞
TEM	Laboratory Temperature	0.05	R	$\sqrt{3}$	0.03	∞
REF	Laboratory Reflections	0.04	R	$\sqrt{3}$	0.02	∞
MSI	Immunity / secondary reception	0	R	$\sqrt{3}$	0	∞
DRI	Drift of the DUT	—	R	$\sqrt{3}$	—	∞
Combined Std Uncertainty (w/ FTE/MEO)					0.75	∞
Expanded Std Uncertainty (w/ FTE/MEO)					1.51	

DASY8 Uncertainty Budget for relative PD (avg $\geq 1 \text{ cm}^2$)

Evaluation Distances to the Antennas $\geq \lambda/25$

in Compliance with IEC/IEEE 63195

Error Description		Unc. Value (±dB)	Probab. Distri.	Div.	(c _i)	Std. Unc. (±dB)	(v _i) v _{eff}
Uncertainty terms dependent on the measurement system							
CAL	Calibration	0.49	N	1	0	0.0	∞
COR	Probe correction	0	R	√3	1	0	∞
FRS	Frequency response (BW ≤ 1 GHz)	0.20	R	√3	0	0.0	∞
SCC	Sensor cross coupling	0	R	√3	1	0	∞
ISO	Isotropy	0.50	R	√3	0.5	0.14	∞
LIN	Linearity	0.20	R	√3	0.5	0.06	∞
PSC	Probe scattering	0	R	√3	1	0	∞
PPO	Probe positioning offset	0.30	R	√3	0	0.0	∞
PPR	Probe positioning repeatability	0.04	R	√3	1	0.02	∞
SMO	Sensor mechanical offset	0	R	√3	1	0	∞
PSR	Probe spatial resolution	0	R	√3	1	0	∞
FLD	Field impedance dependence	0	R	√3	1	0	∞
MED	Measurement drift	0.05	R	√3	1	0.03	∞
APN	Amplitude and phase noise	0.04	R	√3	1	0.02	∞
TR	Measurement area truncation	0	R	√3	1	0	∞
DAQ	Data acquisition	0.03	N	1	1	0.03	∞
SMP	Sampling	0	R	√3	1	0	∞
REC	Field reconstruction	0.6	R	√3	0.5	0.17	∞
SNR	Signal-to-Noise Ratio	0	R	√3	1	0	∞
TRA	FTE/MEO	0 (0)	R	√3	0.5	0	∞
SCA	Power density scaling	–	R	√3	1	–	∞
SAV	Spatial averaging	0.10	R	√3	1	0.06	∞
Uncertainty terms dependent on the DUT and environmental factors							
PC	Probe coupling with DUT	0	R	√3	1	0	∞
MOD	Modulation response	0.40	R	√3	1	0.23	∞
IT	Integration time	0	R	√3	1	0	∞
RT	Response time	0	R	√3	1	0	∞
DH	Device holder influence	0.10	R	√3	0	0.0	∞
DA	DUT alignment	0	R	√3	1	0	∞
AC	RF ambient conditions	0.04	R	√3	1	0.02	∞
TEM	Laboratory Temperature	0.05	R	√3	1	0.03	∞
REF	Laboratory Reflections	0.04	R	√3	1	0.02	∞
MSI	Immunity / secondary reception	0	R	√3	1	0	∞
DRI	Drift of the DUT	–	R	√3	1	–	∞
Combined Std Uncertainty (w/ FTE/MEO)						0.34	∞
Expanded Std Uncertainty (w/ FTE/MEO)						0.68	

DASY8 Uncertainty Budget for peak PD or H-field

Evaluation Distances to the Antennas $\geq \lambda/25$

in Compliance with IEC/IEEE 63195

Error Description	Unc. Value ($\pm$ dB)	Probab. Distri.	Div.	(c_i)	Std. Unc. ($\pm$ dB)	(v_i) v_{eff}
Uncertainty terms dependent on the measurement system						
CAL	Calibration	0.49	N	1	0.49	∞
COR	Probe correction	0	R	1	0	∞
FRS	Frequency response ($BW \leq 1$ GHz)	0.20	R	$\sqrt{3}$	0.12	∞
SCC	Sensor cross coupling	0	R	$\sqrt{3}$	0	∞
ISO	Isotropy	0.50	R	$\sqrt{3}$	0.29	∞
LIN	Linearity	0.20	R	$\sqrt{3}$	0.12	∞
PSC	Probe scattering	0	R	$\sqrt{3}$	0	∞
PPO	Probe positioning offset	0.30	R	$\sqrt{3}$	0.17	∞
PPR	Probe positioning repeatability	0.04	R	$\sqrt{3}$	0.02	∞
SMO	Sensor mechanical offset	0	R	$\sqrt{3}$	0	∞
PSR	Probe spatial resolution	0	R	$\sqrt{3}$	0	∞
FLD	Field impedance dependence	0	R	$\sqrt{3}$	0	∞
MED	Measurement drift	0	R	$\sqrt{3}$	0	∞
APN	Amplitude and phase noise	0.04	R	$\sqrt{3}$	0.02	∞
TR	Measurement area truncation	0	R	$\sqrt{3}$	0	∞
DAQ	Data acquisition	0.03	N	1	0.03	∞
SMP	Sampling	0	R	$\sqrt{3}$	0	∞
REC	Field reconstruction	0.8	R	$\sqrt{3}$	0.46	∞
SNR	Signal-to-Noise Ratio	0	R	$\sqrt{3}$	0	∞
TRA	FTE/MEO	0 (0)	R	$\sqrt{3}$	0	∞
SCA	Power density scaling	—	R	$\sqrt{3}$	1	∞
SAV	Spatial averaging	0.10	R	$\sqrt{3}$	0.06	∞
Uncertainty terms dependent on the DUT and environmental factors						
PC	Probe coupling with DUT	0	R	$\sqrt{3}$	0	∞
MOD	Modulation response	0.40	R	$\sqrt{3}$	0.23	∞
IT	Integration time	0	R	$\sqrt{3}$	0	∞
RT	Response time	0	R	$\sqrt{3}$	0	∞
DH	Device holder influence	0.10	R	$\sqrt{3}$	0.06	∞
DA	DUT alignment	0	R	$\sqrt{3}$	0	∞
AC	RF ambient conditions	0.04	R	$\sqrt{3}$	0.02	∞
TEM	Laboratory Temperature	0.05	R	$\sqrt{3}$	0.03	∞
REF	Laboratory Reflections	0.04	R	$\sqrt{3}$	0.02	∞
MSI	Immunity / secondary reception	0	R	$\sqrt{3}$	0	∞
DRI	Drift of the DUT	—	R	$\sqrt{3}$	—	∞
Combined Std Uncertainty (w/ FTE/MEO)					0.81	∞
Expanded Std Uncertainty (w/ FTE/MEO)					1.62	

DASY8 Uncertainty Budget for E-field

Evaluation Distances to the Antennas $\geq \lambda/25$

in Compliance with IEC/IEEE 63195

Error Description	Unc. Value ($\pm$ dB)	Probab. Distri.	Div.	(c_i)	Std. Unc. ($\pm$ dB)	(v_i) v_{eff}
Uncertainty terms dependent on the measurement system						
CAL	Calibration	0.49	N	1	0.49	∞
COR	Probe correction	0	R	$\sqrt{3}$	0	∞
FRS	Frequency response ($BW \leq 1$ GHz)	0.20	R	$\sqrt{3}$	0.12	∞
SCC	Sensor cross coupling	0	R	$\sqrt{3}$	0	∞
ISO	Isotropy	0.50	R	$\sqrt{3}$	0.29	∞
LIN	Linearity	0.20	R	$\sqrt{3}$	0.12	∞
PSC	Probe scattering	0	R	$\sqrt{3}$	0	∞
PPO	Probe positioning offset	0.30	R	$\sqrt{3}$	0.17	∞
PPR	Probe positioning repeatability	0.04	R	$\sqrt{3}$	0.02	∞
SMO	Sensor mechanical offset	0	R	$\sqrt{3}$	0	∞
PSR	Probe spatial resolution	0	R	$\sqrt{3}$	0	∞
FLD	Field impedance dependence	0	R	$\sqrt{3}$	0	∞
MED	Measurement drift	0.05	R	$\sqrt{3}$	0.03	∞
APN	Amplitude and phase noise	0.04	R	$\sqrt{3}$	0.02	∞
TR	Measurement area truncation	0	R	$\sqrt{3}$	0	∞
DAQ	Data acquisition	0.03	N	1	0.03	∞
SMP	Sampling	0	R	$\sqrt{3}$	0	∞
REC	Field reconstruction	0 (0)	R	$\sqrt{3}$	0	∞
SNR	Signal-to-Noise Ratio	0	R	$\sqrt{3}$	0	∞
TRA	Forward transformation	0 (0)	R	$\sqrt{3}$	0	∞
SCA	Power density scaling	—	R	$\sqrt{3}$	1	∞
SAV	Spatial averaging	0.10	R	$\sqrt{3}$	0.06	∞
Uncertainty terms dependent on the DUT and environmental factors						
PC	Probe coupling with DUT	0	R	$\sqrt{3}$	0	∞
MOD	Modulation response	0.40	R	$\sqrt{3}$	0.23	∞
IT	Integration time	0	R	$\sqrt{3}$	0	∞
RT	Response time	0	R	$\sqrt{3}$	0	∞
DH	Device holder influence	0.10	R	$\sqrt{3}$	0.06	∞
DA	DUT alignment	0	R	$\sqrt{3}$	0	∞
AC	RF ambient conditions	0.04	R	$\sqrt{3}$	0.02	∞
TEM	Laboratory Temperature	0.05	R	$\sqrt{3}$	0.03	∞
REF	Laboratory Reflections	0.04	R	$\sqrt{3}$	0.02	∞
MSI	Immunity / secondary reception	0	R	$\sqrt{3}$	0	∞
DRI	Drift of the DUT	—	R	$\sqrt{3}$	1	∞
Combined Std Uncertainty (w/ FTE/MEO)					0.67	∞
Expanded Std Uncertainty (w/ FTE/MEO)					1.33	

12.3 Measurement uncertainty evaluation for system check

The following table includes the uncertainty table of the IEEE 1528. The values are determined by SPEAG. The breakdown of the individual uncertainties is as follows:

Uncertainty For System Performance Check								
Uncertainty Component	Tol. (±%)	Prob. Dist.	Div.	C _i 1g	C _i 10g	1g U _i (±%)	10g U _i (±%)	V _i
measurement system								
Probe Calibration	6.7	N	1	1	1	6.70	6.70	∞
Axial Isotropy	4.7	R	$\sqrt{3}$	0.7	0.7	1.90	1.90	∞
Hemispherical Isotropy	9.6	R	$\sqrt{3}$	0.7	0.7	3.88	3.88	∞
Boundary Effect	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	4.7	R	$\sqrt{3}$	1	1	2.71	2.71	∞
system detection Limits	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	0	N	1	1	1	0.00	0.00	∞
Readout Electronics	0.3	N	1	1	1	0.30	0.30	∞
Response Time	0	R	$\sqrt{3}$	1	1	0.00	0.00	∞
Integration Time	0	R	$\sqrt{3}$	1	1	0.00	0.00	∞
RF ambient Conditions - Noise	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
RF ambient Conditions – Reflections	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Probe positioned Mechanical Tolerance	0.8	R	$\sqrt{3}$	1	1	0.46	0.46	∞
Probe positioning with respect to Phantom Shell	6.7	R	$\sqrt{3}$	1	1	3.87	3.87	∞
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Dipole								
Deviation of experimental source from numerical source	5.5	N	1	1	1	3.18	3.18	∞
Input power and SAR drift measurement	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Dipole axis to liquid Distance	3.4	R	$\sqrt{3}$	1	1	1.96	1.96	∞
Phantom and Tissue Parameters								
Phantom Uncertainty (shape and thickness tolerances)	4.0	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviation (in permittivity and conductivity)	2	N	1	1	0.84	2.0	1.68	∞
Liquid conductivity (meas.)	2.5	N	1	0.78	0.71	1.13	1.03	5
Liquid conductivity (target.)	5	R	$\sqrt{3}$	0.78	0.71	3.90	3.55	5
Liquid Permittivity (meas.)	2.5	N	1	0.23	0.26	0.33	0.38	∞
Liquid Permittivity (target.)	5	R	$\sqrt{3}$	0.23	0.26	1.15	1.30	∞
Combined Standard Uncertainty		Rss				11.29	11.18	
Expanded Uncertainty (95% Confidence interval)		k				20.57	19.95	

13 Test equipment and ancillaries used for tests

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

	Manufacturer	Device Type	Type(Model)	Serial number	calibration	
					Last Cal.	Due Date
☒	SPEAG	E-Field PROBE	EX3DV4	7895	2024-11-28	2025-11-27
☒	SPEAG	E-Field PROBE	EX3DV4	7391	2024-11-16	2025-11-15
☒	SPEAG	mmWV PROBE	EUmmWV4	9430	2024-11-15	2025-11-14
☒	SPEAG	Validation Kits	D750V3	1151	2024-08-19	2027-08-18
☒	SPEAG	Validation Kits	D835V2	4d203	2024-08-20	2027-08-19
☒	SPEAG	Validation Kits	D1750V2	1143	2024-08-20	2027-08-19
☒	SPEAG	Validation Kits	D1900V2	5d211	2024-08-19	2027-08-18
☒	SPEAG	Validation Sources	D2550V2	1015	2024-08-16	2027-08-15
☒	SPEAG	Validation Sources	D3500V2	1164	2024-10-17	2027-10-16
☒	SPEAG	Validation Sources	D3700V2	1139	2024-10-17	2027-10-16
☒	SPEAG	Validation Sources	D3900V2	1106	2024-10-17	2027-10-16
☒	SPEAG	Validation Sources	D4600V2	1097	2024-10-17	2027-10-16
☒	SPEAG	Validation Sources	D4900V2	1093	2024-10-08	2027-10-07
☒	SPEAG	Validation Sources	D5GHzV2	1412	2024-10-17	2027-10-16
☒	SPEAG	Validation Sources	D6.5GHzV2	1116	2024-10-14	2027-10-13
☒	SPEAG	DAE	DAE4ip	1872	2024-10-18	2025-10-17
☒	SPEAG	Dielectric parameter probes	DAK-3.5	1363	2024-11-05	2025-11-04
☒	R & S	Universal Radio Communication Tester	CMU 200	119733	2024-10-21	2025-10-20
☒	R & S	Universal Radio Communication Tester	CMW500	144459	2024-10-21	2025-10-20
☒	R & S	UXM5G Wireless Test Platform	E7515B	MY60192341	2024-10-21	2025-10-20
☒	HP	Network Analyser	8753D	3410A08889	2024-10-21	2025-10-20
☒	HP	Signal Generator	E4421B	GB39340770	2024-10-28	2025-10-27
☒	Keithley	Multimeter	Keithley 2000	4014539	2024-10-28	2025-10-27
☒	SATIMO	Amplifier	Power Amplifier	MODU-023-A-0004	2024-10-21	2025-10-20
☒	Agilent	Power Meter	E4418B	GB43312909	2024-10-21	2025-10-20
☒	Agilent	Power Meter Sensor	E4412A	MY41500046	2024-10-21	2025-10-20

Annex A: System performance verification

(Please See the SAR Measurement Plots of annex A.)

Annex B: Measurement results

(Please See the SAR Measurement Plots of annex B.)

Annex C: Calibration reports

(Please See the Calibration reports of annex C.)

Annex D: Test setup photos