

TEST REPORT

Applicant: Guangdong OPPO Mobile Telecommunications

Corp., Ltd.

NO.18 HaiBin Road, Wusha Village, Chang'an

Address: Town, DongGuan City, Guangdong Province, P.R.

China

Equipment Type: Tablet

Model Name: OPD2419

Brand Name: OPPO

FCC ID: R9C-OP-24978

Test Standard: FCC 47 CFR Part 2.1093

(refer to section 3.1)

Maximum SAR: Body (1 g@0mm): 1.17 W/kg

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ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

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Revision History

Version

Issue Date

Revisions Content

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Initial Issue

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road,
	Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
ivame	Sherizhen balon rechhology Co., Ltd.
	□ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi
	Road, Nanshan District, Shenzhen, Guangdong Province, P. R.
Location	China
Location	☑ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park,
	No. 1008, Songbai Road, Yangguang Community, Xili Sub-district,
	Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation	The laboratory is a testing organization accredited by FCC as a
Certificate	accredited testing laboratory. The designation number is CN1196.

1.3 Test Environment Condition

Ambient Temperature	18°C to 25°C
Ambient Relative	200/ to 700/
Humidity	30% to 70%



2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address	NO.18 HaiBin Road, Wusha Village, Chang'an Town, DongGuan City,
Address	Guangdong Province, P.R. China

2.2 Manufacturer Information

Manufacturer	Guangdong OPPO Mobile Telecommunications Corp., Ltd.	
A ddroop	NO.18 HaiBin Road, Wusha Village, Chang'an Town, DongGuan City,	,
Address	Guangdong Province, P.R. China	

2.3 General Description for Equipment under Test (EUT)

EUT Name	Tablet
Model Name Under Test	OPD2419
Series Model Name	N/A
Description of Model	N/A
name differentiation	N/A
Hardware Version	OPD2419_11
Software Version	ColorOS 15
Dimensions (Approx.)	255.14mm(L)X 188.06mm(W)X6.89mm(H)
Weight (Approx.)	545g
EUT ID	S14, S15
Serial Number	S14: H621519000044F1F003U
Senai Number	S15: H621519000044F1F003T
Note1: EUT ID is used to identify the test sample in the lab internally.	

Note2: It is performed to test SAR with the EUT S15 and conducted power with the EUT S14.



2.4 Ancillary Equipment

	Li-Polymer Battery 1	
	Brand Name	SUPERVOOC
	Model No.	BLT015
	Serial No.	N/A
Ancillary Equipment 1	Capacitance	Rated: 9098mAh/35.12Wh
		Typical: 9340mAh/36.06Wh
	Rated Voltage	3.86 Vdc
	Limited Voltage	4.48 Vdc
	Manufacturer	Dongguan NVT Technology Co., Ltd.



2.5 Technical Information

Network and Wireless	Bluetooth (BR+EDR+BLE)
	WIFI 802.11a, 802.11b, 802.11g, 802.11n(HT20/40),
connectivity	802.11ac(VHT20/40/80)

The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	g Mode 2.4G WIFI, 5G WIFI, Bluetooth	
	802.11b/g /n(HT20/HT40)	2412 ~ 2462 MHz
	VHT20/40	2412 ~ 2462 MHz
Frequency Range	802.11a/	5150 ~ 5250 MHz
Frequency Nange	/n(HT20/HT40)	5250 ~ 5350 MHz
	/ac(VHT20/VHT40/	5470 ~ 5725 MHz
	VHT80)	5725 ~ 5850 MHz
	Bluetooth	2402 ~ 2480 MHz
	WWAN: PIFA Antenna	a
Antenna Type	WIFI: PIFA Antenna	
	Bluetooth: PIFA Antenna	
DTM	N/A	
Hotspot Function	Support	
Power Reduction	Support	
Exposure Category	General Population/Uncontrolled exposure	
Product Type	Portable Device	
EUT Type		☐ Identical prototype
Note: The reduction power details please refer section 8.3.		



3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title	
1	47 CFR Part 2.1093	Radiofrequency radiation exposure evaluation: portable devices	
2	ANSI/IEEE C95.1-	IEEE Standard for Safety Levels with Respect to Human Exposure	
	1992	to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz	
3	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01	
4	KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz	
4	v01r04		
5	KDB 865664 D02	RF Exposure Reporting	
5	v01r02		
6	KDB 616217	SAR for laptop and tablets	
0	D04v01r02		
7	KDB 248227 D01	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS	
'	v02r02	SAR GUIDANCE FOR IEEE 802.11 (WI-FI) TRANSWITTERS	



3.2 Device Category and SAR Limit

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user.

Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

Table of Exposure Limits:

	SAR Value (W/Kg)				
Body Position	General Population/	Occupational/			
	Uncontrolled Exposure	ControlledExposure			
Whole-Body SAR	0.08	0.4			
(averaged over the entire body)	0.08	0.4			
Partial-Body SAR	1.60	8.0			
(averaged over any 1 gram of tissue)	1.00	8.0			
SAR for hands, wrists, feet and					
ankles	4.0	20.0			
(averaged over any 10 grams of tissue)					

NOTE:

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

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

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3.3 Test Result Summary

3.3.1 Highest SAR Values

		Maximum Scaled SAR (W/kg)	Maximum Report SAR (W/kg)	
Equipment	Dand	Body	Body	
Class	Band	(0mm)	(0mm)	
		1g SAR	1g SAR	
DTS	2.4G WIFI	0.93		
	5.2&5.3G WLAN	1.02		
NII	5.6G WLAN	1.17	1.17	
	5.8G WLAN	0.71		
DSS	Bluetooth	0.99		
Liı	mit (W/kg)	1.60	1.60	
	Verdict	PASS		

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3.4 Test Uncertainty

According to KDB 865664 D01, When the highest measured 1 g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis is not required in SAR reports submitted for equipment approval.

The maximum 1 g SAR for the EUT in this report is 1.17 W/kg, which is lower than 1.5 W/kg, so the extensive SAR measurement uncertainty analysis is not required in this report.



4 MEASUREMENT SYSTEM

4.1 Specific Absorption Rate (SAR) Definition

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:

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

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

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

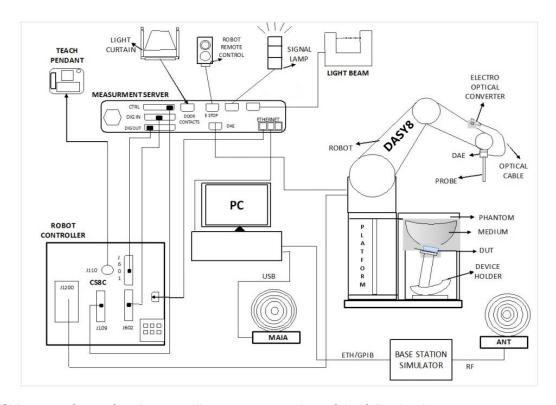
Where: σ is the conductivity of the tissue,

ρ is the mass density of the tissue and E is the RMS electrical field strength.



4.2 DASY SAR System

4.2.1 DASY SAR System Diagram



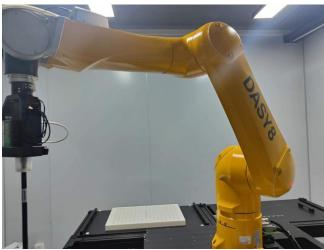
The DASY system for performing compliance tests consists of the following items:

- 1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- 2. A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, ADconversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is
 battery powered with standard or rechargeable batteries. The signal is optically transmitted to the
 EOC.
- 4. A unit to operate the optical surface detector which is connected to the EOC.
- 5. The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
- 6. The DASY measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation.
- 7. DASY5 software and SEMCAD data evaluation software.
- 8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- 9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
- 10. The device holder for handheld mobile phones.
- 11. Tissue simulating liquid mixed according to the given recipes.
- 12. System validation dipoles allowing to validate the proper functioning of the system.



4.2.2 Robot

The Dasy SAR system uses the high precision robots. Symmetrical design with triangular core Built-in optical fiber for surface detection system For the 6-axis controller system, Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents). The robot series have many features that are important for our application:



- High precision (repeatability ±0.02 mm)
- High reliability

 (industrial design)
- Low maintenance costs
 (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements
 (brush less synchron motors; no stepper motors)
- Low ELF interference (motor control _elds shielded via the closed metallic construction shields)

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4.2.3 E-Field Probe

The probe is specially designed and calibrated for use in liquids with high permittivities for the measurements the Specific Dosimetric E-Field Probe EX3DV4 with following specifications is used.

Construction Symmetrical design with triangular core Built-in optical fiber for surface detection system

Built-in shielding against static charges PEEK enclosure material (resistant to organic

solvents, e.g., glycolether)

Calibration ISO/IEC 17025 calibration service available

Frequency 4 MHz to 10 GHz; Linearity: ± 0.2 dB

Directivity ± 0.2 dB in HSL (rotation around probe axis); ± 0.4 dB in HSL (rotation normal to probe

axis)

Dynamic range $5 \mu \text{W/g}$ to > 100 mW/g; Linearity: $\pm 0.2 \text{ dB}$

Dimensions Overall length: 337 mm (Tip: 9 mm) Tip diameter: 2.5 mm (Body: 10 mm) Distance from

probe tip to dipole centers: 1.0 mm

Application General dosimetry up to 3 GHz Compliance tests of mobile phones Fast automatic

scanning in arbitrary phantoms (EX3DV4)



E-Field Probe Calibration Process

Probe calibration is realized, in compliance with IEC/IEEE 62209-1528 and IEEE 1528 std, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the IEC/IEEE 62209-1528 annexe technique using reference guide at the five frequencies.

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4.2.4 **Data Acquisition Electronics**

The data acquisition electronics (DAE) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.



- · Input Impedance: 200MOhm
- The Inputs: Symmetrical and Floating
- Commom Mode Rejection: Above 80dB



4.2.5 Phantoms

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of below 10 GHz. ELI V8.0 is fully compatible with the latest draft of the standard IEC 62209 Part II and all known tissue simulating liquids. ELI V8.0 has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points.



·Flat phantom

Photo of Phantom SN2159



Serial Number	Shell Thickness (mm)	Major ellipse axis (mm)	Minor axis (mm)
SN 2159 ELI V8.0	2.0 ± 0.2	600	400



4.2.6 Device Holder

The DASY device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA"s only. If necessary an additional support of polystyrene material is used. Larger DUT"s (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values. Therefore those devices are normally only tested at the flat part of the SAM.

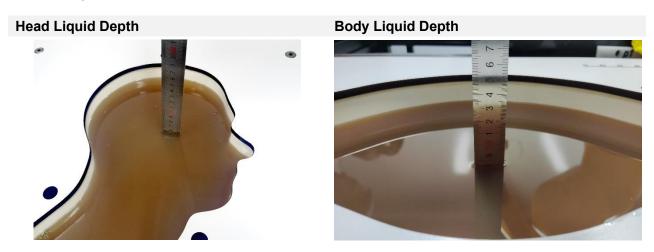


The positioning system allows obtaining cheek and tilting position with a very good accuracy. Incompliance with CENELEC, the tilt angle uncertainty is lower than 1°.



4.2.7 Simulating Liquid

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



The following table gives the recipes for tissue simulating liquid.

TSL	Manufacturer / Model	Freq Range (MHz)	Main Ingredients	
Head WideBand	SPEAG HBBL600- 10000V6	600-10000	Ethanediol, Sodium petroleum sulfonate, Hexylene Glycol / 2-Methyl-pentane-2.4- diol, Alkoxylated alcohol	



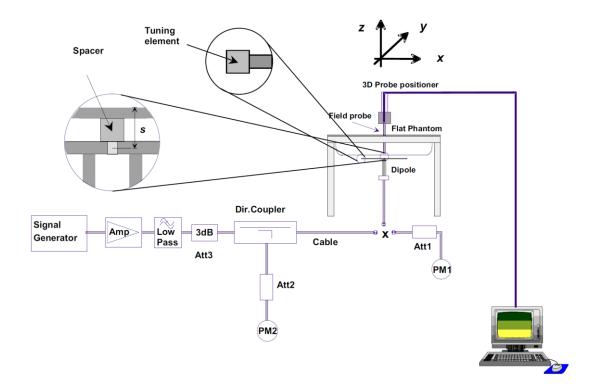
5 SYSTEM VERIFICATION

5.1 Purpose of System Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

5.2 System Check Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:





TEST POSITION CONFIGURATIONS

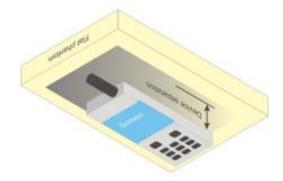
According to KDB 648474 D04 Handset, handsets are tested for SAR compliance in head, body-worn accessory and other use configurations described in the following subsections.

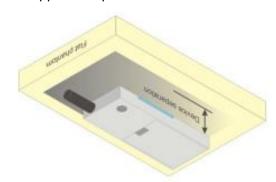
6.1 Body-worn Position Conditions

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB 447498 are used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode. When the reported SAR for a body-worn accessory.

Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required. A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets is used to test for bodyworn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance <= 5 mm to support compliance.



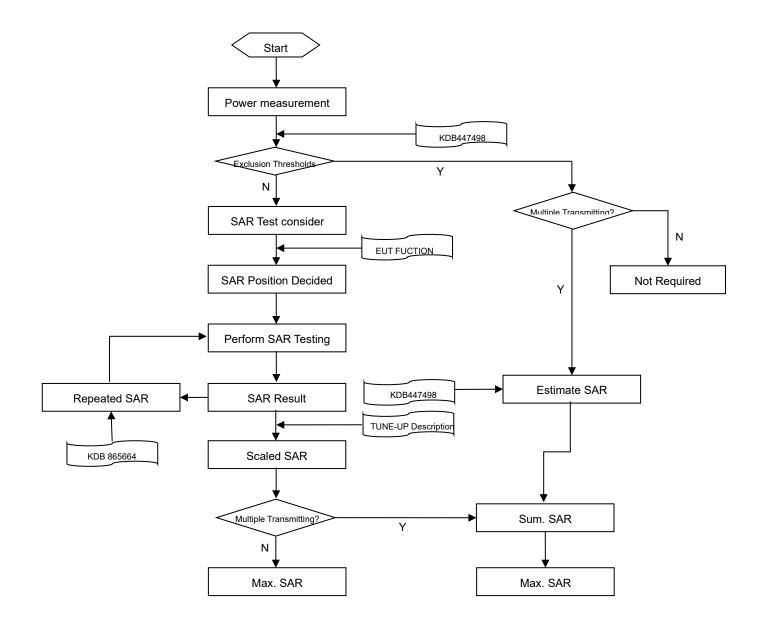


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7 MEASUREMENT PROCEDURE

7.1 Measurement Process Diagram





7.2 SAR Scan General Requirement

Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Boththe 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.

			≤3GHz	>3GHz	
Maximum distance from closest measurement point		5±1 mm	½·δ·ln(2)±0.5 mm		
1,5	ter of probe sensors) to phantom surface e angle from probe axis to phantom surface neasurement location 20°±1°		20°±1°		
Maximum area scan spatial resolution: Δx Area , Δy Area			\leq 2 GHz: \leq 15 mm 3–4 GHz: \leq 12 mm 2 – 3 GHz: \leq 12 mm 4 – 6 GHz: \leq 10 mm When the x or y dimension of the test device, in the		
			measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.		
Maximum zoom scan spa	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*	
	uniform grid: Δz Zoom (n)		≤ 5 mm	3–4 GHz: ≤ 4 mm 4–5 GHz: ≤ 3 mm 5–6 GHz: ≤ 2 mm	
Maximum zoom scan spatial resolution, normal to phantom surface	graded	Δz Zoom (1): between 1st two points closest to phantom surface	≤ 4 mm	3–4 GHz: ≤ 3 mm 4–5 GHz: ≤ 2.5 mm 5–6 GHz: ≤ 2 mm	
Surface	grid		≤ 1.5·Δz Zoom (n-1)		
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:

- 1. δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
- 2. * When zoom scan is required and the reported SAR from the area scan based 1 g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

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7.3 Measurement Procedure

The following steps are used for each test position

- a. Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- b. Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- c. Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to 16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- d. Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 *32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

7.4 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r04 quoted below.

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.



8 CONDUCTED RF OUPUT POWER

8.1 WIFI

8.1.1 2.4G WIFI-ANT.2 Full Power

Band	Mada	Channal	Freq.	Average Power	Tune-up	SAR Test
(GHz)	Mode	Channel	(MHz)	(dBm)	Limit (dBm)	Require.
		1	2412	11.80	12.50	No
	802.11b	6	2437	13.53	14.50	Yes
		11	2462	12.11	13.50	No
		1	2412	11.84	12.50	No
	802.11g	6	2437	18.20	19.00	No
		11	2462	6.04	7.00	No
		1	2412	9.25	10.00	No
	802.11n(HT20)	6	2437	18.17	19.00	No
2.4		11	2462	5.89	7.00	No
2.4	802.11n(HT40)	3	2422	6.33	7.00	No
		6	2437	15.11	17.00	No
		9	2452	4.25	5.00	No
		1	2412	9.66	11.00	No
	VHT20	6	2437	16.56	18.00	No
		11	2462	6.54	8.00	No
		3	2422	7.85	9.00	No
	VHT40	6	2437	14.57	16.00	No
		9	2452	6.74	8.00	No

Note: When multiple channel bandwidth configurations in a frequency band have the same maximum tune-up output power, the test configuration is determined by applying the following steps sequentially.

- 1) The largest channel bandwidth configuration is selected between the multiple configurations in a frequency band with the same maximum tune-up output power.
- 2) When multiple transmission modes (802.11b/g/n/VHT) have the same maximum tune-up output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11b is chosen over 802.11g, and 802.11g chosen over 802.11n.
- 3) According KDB 247228, when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is \leq 1.2 W/kg, OFDM SAR test is not required.

Adjusted SAR = 0.332 * (79.43mW/28.18mW) = 0.936 W/Kg, so 2.4G OFDM SAR test is not required.



8.1.2 2.4G WIFI-ANT.2 DSI1

Band	Mode	Chamal	Freq.	Average Power	Tune-up	SAR Test
(GHz)	Mode	Channel	(MHz)	(dBm)	Limit (dBm)	Require.
		1	2412	10.20	11.00	Yes
	802.11b	6	2437	10.26	11.00	Yes
		11	2462	9.99	11.00	Yes
		1	2412	9.92	11.00	No
	802.11g	6	2437	9.96	11.00	No
		11	2462	6.04	7.00	No
		1	2412	9.25	10.00	No
	802.11n(HT20)	6	2437	9.87	11.00	No
0.4		11	2462	5.89	7.00	No
2.4		3	2422	6.33	7.00	No
	802.11n(HT40)	6	2437	10.01	11.00	No
		9	2452	4.25	5.00	No
		1	2412	9.66	11.00	No
	VHT20	6	2437	9.44	11.00	No
		11	2462	6.54	8.00	No
		3	2422	7.85	9.00	No
	VHT40	6	2437	10.23	11.00	No
		9	2452	6.74	8.00	No

Note: When multiple channel bandwidth configurations in a frequency band have the same maximum tune-up output power, the test configuration is determined by applying the following steps sequentially.

Adjusted SAR = 0.925 * (12.59mW/12.59mW) = 0.925 W/Kg, so 2.4G OFDM SAR test is not required.

¹⁾ The largest channel bandwidth configuration is selected between the multiple configurations in a frequency band with the same maximum tune-up output power.

²⁾ When multiple transmission modes (802.11b/g/n/VHT) have the same maximum tune-up output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11b is chosen over 802.11g, and 802.11g chosen over 802.11n.

³⁾ According KDB 247228, when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is \leq 1.2 W/kg, OFDM SAR test is not required.



8.1.3 5G WIFI-ANT.3 Full Power

Band	Mode	Channel	Freq.	Average Powerr	Tune-up	SAR Test
(GHz)	Mode	Channel	(MHz)	(dBm)	Limit (dBm)	Require.
		36	5180	12.49	14.00	No
	802.11a	44	5220	16.73	18.00	No
		48	5240	17.56	18.00	No
		36	5180	12.55	14.00	No
	802.11n(HT20)	44	5220	17.66	18.00	No
		48	5240	17.63	18.00	No
5.2	802.11n(HT40)	38	5190	9.18	11.00	No
5.2	802.TIII(H140)	46	5230	16.22	18.00	No
		36	5180	12.47	14.00	No
	802.11ac(VHT20)	44	5220	16.63	18.00	No
		48	5240	16.57	18.00	No
	000 44 () (11740)	38	5190	9.15	11.00	No
	802.11ac(VHT40)	46	5230	16.24	18.00	No
	802.11ac(VHT80)	42	5210	6.91	8.00	No
		52	5260	17.55	18.00	Yes
	802.11a	60	5300	16.03	18.00	Yes
		64	5320	12.99	14.00	Yes
		52	5260	17.42	18.00	No
	802.11n(HT20)	60	5300	15.90	17.00	No
	Ī	64	5320	12.32	14.00	No
		54	5270	14.27	16.00	No
5.3	802.11n(HT40)	62	5310	10.68	12.00	No
		52	5260	17.41	18.00	No
	802.11ac(VHT20)	60	5300	15.93	17.00	No
		64	5320	12.81	14.00	No
		54	5270	14.24	16.00	No
	802.11ac(VHT40)	62	5310	10.69	12.00	No
	802.11ac(VHT80)	58	5290	8.33	10.00	No
		100	5500	8.91	10.00	Yes
	802.11a	116	5580	18.68	20.00	Yes
		140	5700	9.19	11.00	Yes
		100	5500	8.71	10.50	No
5.6	802.11n(HT20)	116	5580	17.94	19.00	No
		140	5700	9.00	11.00	No
	000 11 11	102	5510	8.51	10.50	No
	802.11n(HT40)	118	5590	17.30	19.00	No



		134	5670	10.97	12.00	No
		100	5500	8.70	10.50	No
	802.11ac(VHT20)	116	5580	18.36	20.00	No
		140	5700	9.03	11.00	No
		102	5510	9.05	11.00	No
	802.11ac(VHT40)	118	5590	17.23	19.00	No
		134	5670	10.94	12.00	No
	000.44 ()(1.1700)	106	5530	9.88	11.00	No
	802.11ac(VHT80)	122	5690	11.45	13.00	No
		149	5745	17.51	19.00	Yes
	802.11a	157	5785	17.81	19.00	Yes
		165	5825	17.87	19.00	Yes
		149	5745	17.79	19.00	No
	802.11n(HT20)	157	5785	17.68	19.00	No
		165	5825	17.74	19.00	No
5.0	000 44 - (UT40)	151	5755	16.62	18.00	No
5.8	802.11n(HT40)	159	5795	16.57	18.00	No
		149	5745	17.27	19.00	No
	802.11ac(VHT20)	157	5785	17.69	19.00	No
		165	5825	17.74	19.00	No
	902 44 co(\/LIT40\	151	5755	16.63	18.00	No
	802.11ac(VHT40)	159	5795	16.56	18.00	No
	802.11ac(VHT80)	155	5775	12.42	14.00	No

Note: 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, each band is tested independently for SAR.



8.1.4 5G WIFI-ANT.3 DSI1

Band	Mode	Channel	Freq.	Average Power	Tune-up	SAR Test
(GHz)	Mode	Channel	(MHz)	(dBm)	Limit (dBm)	Require.
		36	5180	7.01	9.00	No
	802.11a	44	5220	7.54	9.00	No
		48	5240	7.05	9.00	No
		36	5180	7.41	9.00	No
	802.11n(HT20)	44	5220	7.44	9.00	No
		48	5240	7.45	9.00	No
5.2	802.11n(HT40)	38	5190	7.35	9.00	No
5.2	802.TIII(H140)	46	5230	7.28	9.00	No
		36	5180	7.31	9.00	No
	802.11ac(VHT20)	44	5220	7.36	9.00	No
		48	5240	7.41	9.00	No
	000 44 () (38	5190	7.11	9.00	No
	802.11ac(VHT40)	46	5230	7.34	9.00	No
	802.11ac(VHT80)	42	5210	7.05	9.00	No
		52	5260	7.16	9.00	No
	802.11a	60	5300	7.17	9.00	No
		64	5320	7.12	9.00	No
		52	5260	7.45	9.00	No
	802.11n(HT20)	60	5300	7.41	9.00	No
		64	5320	7.52	9.00	No
5.0	200 44 (UT40)	54	5270	7.31	9.00	No
5.3	802.11n(HT40)	62	5310	7.01	9.00	No
		52	5260	7.09	9.00	No
	802.11ac(VHT20)	60	5300	7.05	9.00	No
		64	5320	7.02	9.00	No
	000 44 () (54	5270	7.42	9.00	No
	802.11ac(VHT40)	62	5310	7.32	9.00	No
	802.11ac(VHT80)	58	5290	7.37	9.00	Yes
		100	5500	8.97	10.00	No
	802.11a	116	5580	8.43	10.00	No
		140	5700	8.07	10.00	No
F.0		100	5500	8.15	10.00	No
5.6	802.11n(HT20)	116	5580	8.21	10.00	No
	<u> </u>	140	5700	8.35	10.00	No
	000 44 (1)740)	102	5510	8.07	10.00	No
	802.11n(HT40)	118	5590	8.29	10.00	No



		134	5670	8.36	10.00	No
		100	5500	8.19	10.00	No
	802.11ac(VHT20)	116	5580	8.32	10.00	No
		140	5700	8.37	10.00	No
		102	5510	8.64	10.00	No
	802.11ac(VHT40)	118	5590	8.75	10.00	No
		134	5670	8.76	10.00	No
	000 44 () (LT00)	106	5530	8.89	10.00	Yes
	802.11ac(VHT80)	122	5690	8.39	10.00	Yes
		149	5745	8.04	10.00	No
	802.11a	157	5785	8.11	10.00	No
		165	5825	8.15	10.00	No
		149	5745	8.36	10.00	No
	802.11n(HT20)	157	5785	8.01	10.00	No
		165	5825	8.02	10.00	No
5.8	802.11n(HT40)	151	5755	8.11	10.00	No
5.6	602.1111(H140)	159	5795	8.47	10.00	No
		149	5745	8.32	10.00	No
	802.11ac(VHT20)	157	5785	8.01	10.00	No
		165	5825	8.51	10.00	No
	902 44co(\/LIT40\	151	5755	8.43	10.00	No
	802.11ac(VHT40)	159	5795	8.25	10.00	No
	802.11ac(VHT80)	155	5775	8.56	10.00	Yes

Note: 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, each band is tested independently for SAR.



8.2 Bluetooth

8.2.1 Bluetooth-ANT.2 Full Power&DSI1

Mode	GFSK			π/4-DQPSK		
Channel	0	39	78	0	39	78
Frequency (MHz)	2402	2441	2480	2402	2441	2480
Average Power (dBm)	13.35	11.98	11.22	9.14	7.91	6.94
Tune-Up Limit (dBm)	14.00	13.00	13.00	10.00	8.00	8.00
SAR Test Require	YES	YES	YES	NO	NO	NO
Mode		8-DPSK			1	
Channel	0	39	78	1	1	1
Frequency (MHz)	2402	2441	2480	1	1	1
Average Power (dBm)	9.03	7.76	6.86	1	1	1
Tune-Up Limit (dBm)	10.00	8.00	8.00	1	1	1
SAR Test Require	NO	NO	NO	1	1	1
Mode		BLE-1Mbps			BLE-2Mbps	
Channel	0	19	39	1	19	38
Frequency (MHz)	2402	2440	2480	2404	2440	2478
Average Power (dBm)	1.38	2.17	2.01	1.44	2.20	2.10
Tune-Up Limit (dBm)	3.00	3.00	3.00	3.00	3.00	3.00
SAR Test Require	NO	NO	NO	NO	NO	NO

Note 1: Since bluetooth BR mode is the maximum output power mode, SAR measurements were performed with test software using DH5 modulation, and SAR measurement is not required for the EDR and LE. When the secondary mode is \leq ¼ dB higher than the primary mode.

Note 2: The Bluetooth of the device is based on the SIG (Special Interest Group) protocol, and the maximum TX duty cycle of Bluetooth is limited to 77.6%, so the reported SAR needs to perform the corresponding maximum TX duty cycle.



8.2.2 Bluetooth-ANT.2 DSI2

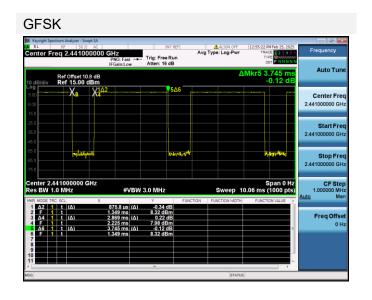
Mode	GFSK			π/4-DQPSK			
Channel	0	39	78	0	39	78	
Frequency (MHz)	2402	2441	2480	2402	2441	2480	
Average Power (dBm)	3.93	4.51	4.25	3.88	4.02	2.89	
Tune-Up Limit (dBm)	5.00	5.00	5.00	5.00	5.00	4.00	
SAR Test Require	NO	YES	NO	NO	NO	NO	
Mode	8-DPSK			1			
Channel	0	39	78	1	1	1	
Frequency (MHz)	2402	2441	2480	1	1	1	
Average Power (dBm)	2.36	2.47	1.39	1	1	1	
Tune-Up Limit (dBm)	4.00	4.00	3.00	1	1	1	
SAR Test Require	NO	NO	NO	1	1	1	
Mode	BLE-1Mbps			BLE-2Mbps			
Channel	0	19	39	1	19	38	
Frequency (MHz)	2402	2440	2480	2404	2440	2478	
Average Power (dBm)	1.38	2.17	2.01	1.44	2.20	2.10	
Tune-Up Limit (dBm)	3.00	3.00	3.00	3.00	3.00	3.00	
SAR Test Require	NO	NO	NO	NO	NO	NO	

Note 1: Since bluetooth BR mode is the maximum output—power mode, SAR measurements were performed with test software using DH5 modulation, and SAR measurement is not required for the EDR and LE. When the secondary mode is \leq $\frac{1}{4}$ dB higher than the primary mode.

Note 2: The Bluetooth of the device is based on the SIG (Special Interest Group) protocol, and the maximum TX duty cycle of Bluetooth is limited to 77.6%, so the reported SAR needs to perform the corresponding maximum TX duty cycle.

Note: The Bluetooth duty cycle is 76.61 % as following figure, according to 2016 Oct. TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 77.6%, therefore the actual duty cycle will be scaled up to 77.6% for Bluetooth reported SAR calculation.

Duty Cycle



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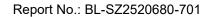
8.3 Power Reduction List

- 1. The device employs proximity sensors that detect the presence of the user's body and Product Specific of the device. When these conditions are detected, Body and Limb reduced power will be active.
- 2. When the proximity sensor invalid, the power is reduced to the corresponding Minimum power scenario.

WLAN&BT Reduced power level table

Reduced State	Sensor state	Receiver state	Transmitting conditions	Position	
			WLAN 2.4G Only		
Full Power	Conser Off	Off	WLAN 5G Only	Left Edge;	
ruli rowei Seli	Sensor Off	(Body scenario)	BT Only	Right Edge	
			WLAN 5G+BT		
		Off	WLAN 2.4G Only		
DSI1	Sensor On		WLAN 5G Only	Back Side;Top Edge;	
		(Body scenario)	BT Only		
Dela	Sensor On	Off	WLAN 5G+BT	Pack Side:Top Edge:	
DSI2	Sensor On	(Body scenario)	VVLAN 5G+B1	Back Side;Top Edge;	

		WLAN Antenna1					
			Body	Body			
Mode	Antenna	Full Power	Receiver off	Receiver off			
		ruii rowei	DSI1	DSI2			
2.4G WLAN 802.11b	ANT2	14.50	11.00	11.00			
2.4G WLAN 802.11g	ANT2	19.00	11.00	11.00			
2.4G WLAN 802.11n20	ANT2	19.00	11.00	11.00			
2.4G WLAN 802.11n40	ANT2	17.00	11.00	11.00			
2.4G WLAN 802.11ac20	ANT2	18.00	11.00	11.00			
2.4G WLAN 802.11ac40	ANT2	16.00	11.00	11.00			
5.2G WLAN 802.11a	ANT3	18.00	9.00	9.00			
5.2G WLAN 802.11n20	ANT3	18.00	9.00	9.00			
5.2G WLAN 802.11n40	ANT3	18.00	9.00	9.00			
5.2G WLAN 802.11ac20	ANT3	18.00	9.00	9.00			
5.2G WLAN 802.11ac40	ANT3	18.00	9.00	9.00			
5.2G WLAN 802.11ac80	ANT3	8.00	9.00	9.00			
5.3G WLAN 802.11a	ANT3	18.00	9.00	9.00			
5.3G WLAN 802.11n20	ANT3	18.00	9.00	9.00			
5.3G WLAN 802.11n40	ANT3	16.00	9.00	9.00			
5.3G WLAN 802.11ac20	ANT3	18.00	9.00	9.00			
5.3G WLAN 802.11ac40	ANT3	16.00	9.00	9.00			
5.3G WLAN 802.11ac80	ANT3	10.00	0.00 9.00				
5.6G WLAN 802.11a	ANT3	20.00	10.00	10.00			
5.6G WLAN 802.11n20	ANT3	19.00	10.00	10.00			





5.6G WLAN 802.11n40	ANT3	19.00	10.00	10.00
5.6G WLAN 802.11ac20	ANT3	20.00	10.00	10.00
5.6G WLAN 802.11ac40	ANT3	19.00	10.00	10.00
5.6G WLAN 802.11ac80	ANT3	13.00	10.00	10.00
5.8G WLAN 802.11a	ANT3	19.00	10.00	10.00
5.8G WLAN 802.11n20	ANT3	19.00	10.00	10.00
5.8G WLAN 802.11n40	ANT3	18.00	10.00	10.00
5.8G WLAN 802.11ac20	ANT3	19.00	10.00	10.00
5.8G WLAN 802.11ac40	ANT3	18.00	10.00	10.00
5.8G WLAN 802.11ac80	ANT3	14.00	10.00	10.00
Bluetooth	ANT2	14.00	14.00	5.00

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9 TEST EXCLUSION CONSIDERATION

For antenna location and support bands please refer the document "BL-SZ2520680-AI EUT internal photo.pdf".

Antenna	Support Bands				
Antenna.2	WLAN2.4G; Bluetooth				
Antenna.3	WLAN5G				

Add: Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China



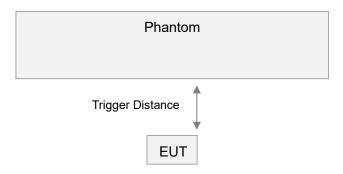
10 PROXIMITY SENSOR TRIGGERING TEST

10.1 Procedures for determining proximity sensor distance

The device uses one proximity sensors to reduce the maximum output power in selected wireless mode and operating configurations to ensure SAR compliance. The sensor implementation can identify and facilitate triggering different max power levels for different scenarios including the device held by hand(Extremity) and different exposure test positions test positions when the device is closed to a user's body.

Proximity sensor triggering distance testing was performed, EUT moving further away from the phantom and EUT moving toward the phantom were both assessed, and the shortest triggering distances were reported and used for SAR assessment. Note that while sensor is failed and it sets the output power to the lowest one in the sensor trigger state ,to make sure the SAR requirements can still be satisfied.

10.1.1 proximity sensor_1



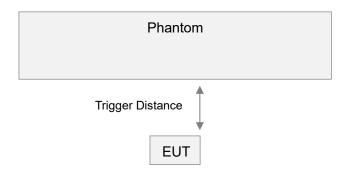
EUT moving toward Phantom

Distance in mm	1~8	9	10	11~13	14	15	16	17	18	19~23	24
Back Side	On	On	On	On	On	On	On	On	On	Off	Off
Top Edge	On	On	On	On	On	On	On	On	On	Off	Off
Note: Power reduction is only applicable for ANT2.											

Web: www.titcgroup.com Template No.: TRP-FCC DASY-Phone-3 (2024-08-13)



10.1.2 proximity sensor channel-2



Distance in mm	9	10	11	12	13~17	18	19	20	21	22~24	25
Back Side	On	On	On	On	On	On	On	Off	Off	Off	Off
Top Edge	On	On	On	On	On	On	On	Off	Off	Off	Off
N. C. D. L. C. L. C. ANTO											

Note: Power reduction is only applicable for ANT3.



To ensure all production units are compliant, it is generally necessary to reduce the triggering distance determined from the triggering tests by 1 mm, or more if it is necessary, and use the smallest distance for EUT moving toward the phantom, minus 1 mm, as the sensor triggering distance for determining the SAR measurement distance.

ANT2 of proximity sensor_1

EUT Sides	Additional SAR test Distance in mm
Back Side	17
Top Edge	17

ANT3 of proximity sensor_2

EUT Sides	Additional SAR test Distance in mm
Back Side	18
Top Edge	18



10.2 Procedures for determining EUT tilt angle influences to proximity sensor triggering

The influence of EUT tilt angles to proximity sensor_1 triggering was determined by positioning each EUT edge that contains a transmitting antenna 2, perpendicular to the flat phantom, at 18 mm separation for the top edge.

Rotating the EUT around the edge next to the phantom in $\leq 10^{\circ}$ increments until the EUT is $\pm 45^{\circ}$ from the vertical position at 0° , and the maximum output power remains in the reduced mode.

The influence of EUT tilt angles to proximity sensor_2 triggering was determined by positioning each EUT edge that contains a transmitting antenna 3, perpendicular to the flat phantom, at 19 mm separation for the top edge.

Rotating the EUT around the edge next to the phantom in $\leq 10^{\circ}$ increments until the EUT is $\pm 45^{\circ}$ from the vertical position at 0° , and the maximum output power remains in the reduced mode.

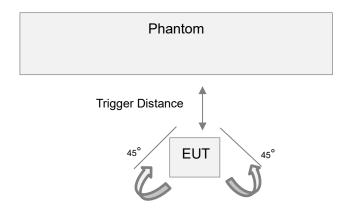


Table: Summary of Phone Tilt Angle Influence to Proximity Sensor Triggering(Top edge)

		Minimum trigger	Power Reduction Status										
Antenna	Position	distance at which power reduction was maintained over ±45°	-45°	-35°	-25°	-15°	-5°	0°	5°	15°	25°	35°	45°
ANT2	Top Edge	18mm	on	on	on	on	on	on	on	on	on	on	on
ANT3	Top Edge	19mm	on	on	on	on	on	on	on	on	on	on	on

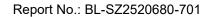
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11 TEST RESULT

11.1WIFI 2.4GHz

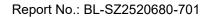
Antenna	Power Reduction	Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift(dB)	1 g Meas SAR(W/kg)	Duty cycle (%)	Duty cycle Factor	Meas. Power (dBm)	Max. tune power(dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Body	Body														
	DSI1&2		Back Side	0	6	2437	-0.07	0.775	99.36	1.006	10.26	11.00	1.186	0.925	1#
Ant.2	Full Power	802.11 b	Right Edge	0	6	2437	-0.01	0.052	99.36	1.006	13.53	14.50	1.250	0.065	/
Ant.2	DSI1&2	802.110	Top Edge	0	6	2437	0.02	0.487	99.36	1.006	10.26	11.00	1.186	0.581	/
	DSI1&2		Back Side	0	1	2412	-0.15	0.707	99.36	1.006	10.20	11.00	1.202	0.855	/
	DSI1&2		Back Side	0	11	2462	-0.18	0.672	99.36	1.006	9.99	11.00	1.262	0.853	/
Body(N-1)															
Ant.2	Full Power	802.11 b	Back Side	17	6	2437	-0.11	0.232	99.36	1.006	13.53	14.50	1.250	0.292	/
Ant.2	Full Power	002.11 D	Top Edge	17	6	2437	0.11	0.264	99.36	1.006	13.53	14.50	1.250	0.332	/
Note: Refe	Note: Refer to ANNEX C for the detailed test data for each test configuration.														





11.2WIFI 5GHz

5.3G 802.11ac80 5.3G 802.11a 5.3G 802.11ac80 5.6G 802.11ac80 5.6G 802.11ac80	Back Side Left Edge Top Edge Back Side	0 0	58 52	5290												
5.3G 802.11a 5.3G 802.11ac80 5.6G 802.11ac80	Left Edge Top Edge	0		5290	Body DSI1&2 5.3G 802.11ac80 Back Side 0 58 5290 0.19 0.450 91.34 1.095 7.37 9.00 1.455 0.717 /											
5.3G 802.11ac80 5.6G 802.11ac80	Top Edge		52		0.19	0.450	91.34	1.095	7.37	9.00	1.455	0.717	/			
5.6G 802.11ac80		0		5260	0.15	0.246	91.34	1.095	17.55	18.00	1.109	0.299	/			
	Back Side		58	5290	-0.04	0.639	91.34	1.095	7.37	9.00	1.455	1.018	2#			
r 5.6G 802.11a	1	0	106	5530	-0.14	0.825	91.34	1.095	8.89	10.00	1.291	1.166	3#			
	Left Edge	0	116	5580	0.01	0.265	91.34	1.095	18.68	20.00	1.355	0.393	/			
5.6G 802.11ac80	Top Edge	0	106	5530	0.11	0.806	91.34	1.095	8.89	10.00	1.291	1.139	/			
5.6G 802.11ac80	Back Side	0	122	5610	0.06	0.726	91.34	1.095	8.39	10.00	1.449	1.152	/			
5.8G 802.11ac80	Back Side	0	155	5775	0.01	0.468	91.34	1.095	8.56	10.00	1.393	0.714	4#			
r 5.8G 802.11a	Left Edge	0	157	5785	0.06	0.022	91.34	1.095	17.81	19.00	1.315	0.032	/			
5.8G 802.11ac80	Top Edge	0	155	5775	0.14	0.396	91.34	1.095	8.56	10.00	1.393	0.604	/			
Body(N-1)																
r	Back Side	18	52	5260	-0.07	0.526	95.70	1.045	17.55	18.00	1.109	0.610	/			
	Top Edge	18	52	5260	0.10	0.749	95.70	1.045	17.55	18.00	1.109	0.868	/			
	Top Edge	18	60	5300	-0.17	0.545	95.70	1.045	16.03	18.00	1.574	0.896	/			
r	Top Edge	18	64	5320	-0.11	0.267	95.70	1.045	12.99	14.00	1.262	0.352	/			
r	Back Side	18	116	5580	-0.07	0.629	95.70	1.045	18.68	20.00	1.355	0.891	/			
	Top Edge	18	116	5580	0.06	0.702	95.70	1.045	18.68	20.00	1.355	0.994	/			
	Top Edge	18	100	5500	0.02	0.101	95.70	1.045	8.91	10.00	1.285	0.136	/			
r	Top Edge	18	140	5700	-0.19	0.083	95.70	1.045	9.19	11.00	1.517	0.132	/			
r	Back Side	18	157	5785	0.16	0.676	95.70	1.045	17.81	19.00	1.315	0.929	/			
	Top Edge	18	157	5785	-0.11	0.775	95.70	1.045	17.81	19.00	1.315	1.065	/			
	Top Edge	18	149	5745	0.14	0.782	95.70	1.045	17.51	19.00	1.409	1.151	/			
r	Top Edge	18	165	5825	0.05	0.796	95.70	1.045	17.87	19.00	1.297	1.079	/			
	5.6G 802.11ac80 5.8G 802.11ac80 r 5.8G 802.11a 5.8G 802.11a 5.8G 802.11a r 5.3G 802.11a r 5.6G 802.11a r 5.6G 802.11a	5.6G 802.11ac80 Back Side 5.8G 802.11ac80 Back Side 5.8G 802.11a Left Edge 5.8G 802.11a Top Edge Top Edge	5.6G 802.11ac80 Back Side 0 5.8G 802.11ac80 Back Side 0 5.8G 802.11a Left Edge 0 5.8G 802.11a Top Edge 18 Top Edge 18	5.6G 802.11ac80 Back Side 0 122 5.8G 802.11ac80 Back Side 0 155 5.8G 802.11a Left Edge 0 157 5.8G 802.11ac80 Top Edge 0 155 5.8G 802.11acs Top Edge 18 52 Top Edge 18 52 Top Edge 18 60 Top Edge 18 64 18 116 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 <td>5.6G 802.11ac80 Back Side 0 122 5610 5.8G 802.11ac80 Back Side 0 155 5775 5.8G 802.11a Left Edge 0 157 5785 5.8G 802.11ac80 Top Edge 0 155 5775 Back Side 18 52 5260 Top Edge 18 60 5300 Top Edge 18 64 5320 Top Edge 18 116 5580 Top Edge 18 116 5580 Top Edge 18 100 5500 Top Edge 18 140 5700 Top Edge 18 157 5785 Top Edge 18 157 5785 Top Edge 18 149 5745 Top Edge 18 149 5745 Top Edge 18 165 5825</td> <td>5.6G 802.11ac80 Back Side 0 122 5610 0.06 5.8G 802.11ac80 Back Side 0 155 5775 0.01 or 5.8G 802.11a Left Edge 0 157 5785 0.06 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 or 5.8G 802.11a Back Side 18 52 5260 -0.07 or Top Edge 18 60 5300 -0.17 or Top Edge 18 64 5320 -0.11 or Top Edge 18 116 5580 -0.07 or Top Edge 18 100 5500 0.02 or Top Edge 18 140 5700 -0.19 or Top Edge 18 157 5785 -0.11 or Top Edge 18 157 5785 -0.11 or Top Edge 18 149 5745 0.14</td> <td>5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 or 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 or 5.8G 802.11a Back Side 18 52 5260 -0.07 0.526 Top Edge 18 60 5300 -0.17 0.545 or Top Edge 18 64 5320 -0.11 0.267 or Back Side 18 116 5580 -0.07 0.629 or Top Edge 18 100 5500 0.02 0.101 or Top Edge 18 140 5700 -0.19 0.083 or Top Edge 18 157 5785 -0.11 0.775 or Top Edge</td> <td>5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 r 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 91.34 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 *** Side Side Side Side Side Side Side Side</td> <td>5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 1.095 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 1.095 r 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 91.34 1.095 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 r 5.8G 802.11a Back Side 18 52 5260 -0.07 0.526 95.70 1.045 r Top Edge 18 52 5260 0.10 0.749 95.70 1.045 r Top Edge 18 64 5320 -0.17 0.545 95.70 1.045 r Top Edge 18 116 5580 -0.07 0.629 95.70 1.045 r Top Edge 18 116 5580 0.06 0.702 95.70 1</td> <td>5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 1.095 8.39 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 1.095 8.56 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 91.34 1.095 17.81 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 8.56 Top Edge 18 52 5260 0.10 0.749 95.70 1.045 17.55 Top Edge 18 60 5300 0.17 0.545 95.70 1.045 16.03 Top Edge 18 64 5320 0.11 0.267 95.70 1.045 12.99 Back Side 18 116 5580 0.06 0.702 95.70 1.045 18.68 Top Edge 18 100 5500 0.02 0.101 95.70 1.045 18.68 Top Edge 18 140 5700 0.02 0.101 95.70 1.045 9.19 Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81 Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81 Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81 Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81</td> <td>5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 1.095 8.39 10.00 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 1.095 8.56 10.00 r 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 91.34 1.095 17.81 19.00 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 8.56 10.00 r 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 8.56 10.00 r 5.3G 802.11ac80 Top Edge 18 52 5260 -0.07 0.526 95.70 1.045 17.55 18.00 Top Edge 18 60 5300 -0.17 0.545 95.70 1.045 17.55 18.00 r 70p Edge 18 64 5320 -0.11 0.267 95.70 1.045 12.99 14.00 r 8.6G 802.11a Back Side 18 116 5580 -0.07 0.629 95.70 1.045 18.68 20.00 Top Edge 18 100 5500 0.02 0.101 95.70 1.045 8.91 10.00 r 8.6G 802.11a Back Side 18 140 5700 -0.19 0.083 95.70 1.045 9.19 11.00 r 9.6G 802.11a Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81 19.00 Top Edge 18 149 5745 0.14 0.782 95.70 1.045 17.81 19.00</td> <td>5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 1.095 8.39 10.00 1.449 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 1.095 8.56 10.00 1.393 r 5.8G 802.11ac Left Edge 0 157 5785 0.06 0.022 91.34 1.095 17.81 19.00 1.315 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 8.56 10.00 1.393 r 5.3G 802.11ac80 Top Edge 18 52 5260 -0.07 0.526 95.70 1.045 17.55 18.00 1.109 r 5.3G 802.11a Back Side 18 52 5260 0.10 0.749 95.70 1.045 17.55 18.00 1.109 Top Edge 18 60 5300 -0.17 0.545 95.70 1.045 17.55 18.00 1.574 Top Edge 18 64 5320 -0.11 0.267 95.70 1.045 12.99 14.00 1.262 r 5.6G 802.11a Back Side 18 116 5580 -0.07 0.629 95.70 1.045 18.68 20.00 1.355 Top Edge 18 100 5500 0.02 0.101 95.70 1.045 18.68 20.00 1.355 Top Edge 18 140 5700 -0.19 0.083 95.70 1.045 18.891 10.00 1.285 Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81 19.00 1.315 Top Edge 18 157 5785 -0.11 0.775 95.70 1.045 17.81 19.00 1.315 Top Edge 18 149 5745 0.14 0.782 95.70 1.045 17.81 19.00 1.315</td> <td>5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 1.095 8.39 10.00 1.449 1.152 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 1.095 8.56 10.00 1.393 0.714 r 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 91.34 1.095 17.81 19.00 1.315 0.032 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 8.56 10.00 1.393 0.604 The property of the p</td>	5.6G 802.11ac80 Back Side 0 122 5610 5.8G 802.11ac80 Back Side 0 155 5775 5.8G 802.11a Left Edge 0 157 5785 5.8G 802.11ac80 Top Edge 0 155 5775 Back Side 18 52 5260 Top Edge 18 60 5300 Top Edge 18 64 5320 Top Edge 18 116 5580 Top Edge 18 116 5580 Top Edge 18 100 5500 Top Edge 18 140 5700 Top Edge 18 157 5785 Top Edge 18 157 5785 Top Edge 18 149 5745 Top Edge 18 149 5745 Top Edge 18 165 5825	5.6G 802.11ac80 Back Side 0 122 5610 0.06 5.8G 802.11ac80 Back Side 0 155 5775 0.01 or 5.8G 802.11a Left Edge 0 157 5785 0.06 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 or 5.8G 802.11a Back Side 18 52 5260 -0.07 or Top Edge 18 60 5300 -0.17 or Top Edge 18 64 5320 -0.11 or Top Edge 18 116 5580 -0.07 or Top Edge 18 100 5500 0.02 or Top Edge 18 140 5700 -0.19 or Top Edge 18 157 5785 -0.11 or Top Edge 18 157 5785 -0.11 or Top Edge 18 149 5745 0.14	5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 or 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 or 5.8G 802.11a Back Side 18 52 5260 -0.07 0.526 Top Edge 18 60 5300 -0.17 0.545 or Top Edge 18 64 5320 -0.11 0.267 or Back Side 18 116 5580 -0.07 0.629 or Top Edge 18 100 5500 0.02 0.101 or Top Edge 18 140 5700 -0.19 0.083 or Top Edge 18 157 5785 -0.11 0.775 or Top Edge	5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 r 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 91.34 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 *** Side Side Side Side Side Side Side Side	5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 1.095 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 1.095 r 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 91.34 1.095 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 r 5.8G 802.11a Back Side 18 52 5260 -0.07 0.526 95.70 1.045 r Top Edge 18 52 5260 0.10 0.749 95.70 1.045 r Top Edge 18 64 5320 -0.17 0.545 95.70 1.045 r Top Edge 18 116 5580 -0.07 0.629 95.70 1.045 r Top Edge 18 116 5580 0.06 0.702 95.70 1	5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 1.095 8.39 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 1.095 8.56 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 91.34 1.095 17.81 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 8.56 Top Edge 18 52 5260 0.10 0.749 95.70 1.045 17.55 Top Edge 18 60 5300 0.17 0.545 95.70 1.045 16.03 Top Edge 18 64 5320 0.11 0.267 95.70 1.045 12.99 Back Side 18 116 5580 0.06 0.702 95.70 1.045 18.68 Top Edge 18 100 5500 0.02 0.101 95.70 1.045 18.68 Top Edge 18 140 5700 0.02 0.101 95.70 1.045 9.19 Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81 Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81 Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81 Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81	5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 1.095 8.39 10.00 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 1.095 8.56 10.00 r 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 91.34 1.095 17.81 19.00 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 8.56 10.00 r 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 8.56 10.00 r 5.3G 802.11ac80 Top Edge 18 52 5260 -0.07 0.526 95.70 1.045 17.55 18.00 Top Edge 18 60 5300 -0.17 0.545 95.70 1.045 17.55 18.00 r 70p Edge 18 64 5320 -0.11 0.267 95.70 1.045 12.99 14.00 r 8.6G 802.11a Back Side 18 116 5580 -0.07 0.629 95.70 1.045 18.68 20.00 Top Edge 18 100 5500 0.02 0.101 95.70 1.045 8.91 10.00 r 8.6G 802.11a Back Side 18 140 5700 -0.19 0.083 95.70 1.045 9.19 11.00 r 9.6G 802.11a Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81 19.00 Top Edge 18 149 5745 0.14 0.782 95.70 1.045 17.81 19.00	5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 1.095 8.39 10.00 1.449 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 1.095 8.56 10.00 1.393 r 5.8G 802.11ac Left Edge 0 157 5785 0.06 0.022 91.34 1.095 17.81 19.00 1.315 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 8.56 10.00 1.393 r 5.3G 802.11ac80 Top Edge 18 52 5260 -0.07 0.526 95.70 1.045 17.55 18.00 1.109 r 5.3G 802.11a Back Side 18 52 5260 0.10 0.749 95.70 1.045 17.55 18.00 1.109 Top Edge 18 60 5300 -0.17 0.545 95.70 1.045 17.55 18.00 1.574 Top Edge 18 64 5320 -0.11 0.267 95.70 1.045 12.99 14.00 1.262 r 5.6G 802.11a Back Side 18 116 5580 -0.07 0.629 95.70 1.045 18.68 20.00 1.355 Top Edge 18 100 5500 0.02 0.101 95.70 1.045 18.68 20.00 1.355 Top Edge 18 140 5700 -0.19 0.083 95.70 1.045 18.891 10.00 1.285 Top Edge 18 157 5785 0.16 0.676 95.70 1.045 17.81 19.00 1.315 Top Edge 18 157 5785 -0.11 0.775 95.70 1.045 17.81 19.00 1.315 Top Edge 18 149 5745 0.14 0.782 95.70 1.045 17.81 19.00 1.315	5.6G 802.11ac80 Back Side 0 122 5610 0.06 0.726 91.34 1.095 8.39 10.00 1.449 1.152 5.8G 802.11ac80 Back Side 0 155 5775 0.01 0.468 91.34 1.095 8.56 10.00 1.393 0.714 r 5.8G 802.11a Left Edge 0 157 5785 0.06 0.022 91.34 1.095 17.81 19.00 1.315 0.032 5.8G 802.11ac80 Top Edge 0 155 5775 0.14 0.396 91.34 1.095 8.56 10.00 1.393 0.604 The property of the p			





11.3Bluetooth

Antenna	Power Reduction	Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift(dB)	1 g Meas SAR(W/kg)	Duty cycle	Duty cycle Factor	Meas. Power (dBm)	Max. tune power(dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Body															
	DSI1		Back Side	0	0	2402	-0.03	0.841	76.61	1.013	13.35	14.00	1.161	0.989	5#
	Full Power		Right Edge	0	0	2402	0.11	0.031	76.61	1.013	13.35	14.00	1.161	0.036	/
Ant.2	DSI1	DH5	Top Edge	0	0	2402	0.03	0.545	76.61	1.013	13.35	14.00	1.161	0.641	/
	DSI1		Back Side	0	39	2441	-0.14	0.604	76.61	1.013	11.98	13.00	1.265	0.774	/
	DSI1		Back Side	0	78	2480	0.08	0.517	76.61	1.013	11.22	13.00	1.507	0.789	/
	DSI2		Back Side	0	0	2402	-0.01	0.122	76.61	1.013	4.51	5.00	1.119	0.138	/
Ant.2	Full Power	DH5	Right Edge	0	0	2402	-0.12	0.008	76.61	1.013	4.51	5.00	1.119	0.009	/
	DSI2		Top Edge	0	0	2402	0.11	0.073	76.61	1.013	4.51	5.00	1.119	0.083	/
Note: Refe	Note: Refer to ANNEX C for the detailed test data for each test configuration.														



12 SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are \leq 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is \leq 1.10, the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR repeated measurement procedure:

- 1. When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
- 2. When the highest measured SAR is >= 0.80 W/kg, repeat that measurement once.
- If the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20, or when the original or repeated measurement is >= 1.45 W/kg, perform a second repeated measurement.
- 4. If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20, and the original, first or second repeated measurement is >= 1.5 W/kg, perform a third repeated measurement.

Frequency		DE E		Highest	Repeated	Repeated1th	Largest to
Band	Wireless Band	RF Exposure Conditions	Test Position	Measured SAR	SAR	Measured SAR	Smallest SAR
(MHz)		Conditions		(W/kg)	(Yes/No)	(W/kg)	Radio
2402	Bluetooth	Body	Back Side	0.841	Yes	0.822	1.02
5530	WIFI5.6G	Body	Back Side	0.825	Yes	0.803	1.03

Note: The ratio of largest to smallest SAR for the original and first repeated measurements is < 1.20, the second repeated measurement. is not required.



13 SIMULTANEOUS TRANSMISSION

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR 1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR 1g 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR 1g is greater than the SAR limit (SAR 1g 1.6 W/kg), SAR test exclusion is determined by the SAR to Peak Location Ratio (SPLSR).

13.1 Simultaneous Transmission Mode Consider

No.	Simultaneous Tx Combination	Body-worn							
1	WIFI5G+BT	Yes							
Note: 1.	Note: 1. The maximum SAR summation is calculated based on the same configuration and test position.								



13.2Sum SAR of Simultaneous Transmission

13.2.1 Body Simultaneous Transmission SAR Evaluation for WLAN Antenna with Bluetooth

	Stand alone	SAR	SUM SAR
Position	1	2	SUM SAR
Position	Bluetooth	MAX. WLAN 5GHz	Sum SAR
	Biuetooth	MAX. WLAN 5GHZ	(1+2)
Back Side 0mm	0.138	1.166	1.304
Left Edge 0mm	0.000	0.393	0.393
Right Edge 0mm	0.009	0.000	0.009
Top Edge 0mm	0.083	1.139	1.222

Note:

^{1:} The highest Summed 1g SAR is 1.304 W/Kg < 1.6 W/kg, so Simultaneous Transmission SAR test is not required.



14 TEST EQUIPMENTS LIST

Description	Manufacturer	Model	Serial No./Version	Cal. Date	Cal. Due
PC	Dell	N/A	N/A	N/A	N/A
Test Software	Speag	DASY8	16.2.2.1588	N/A	N/A
2450MHz Validation Dipole	Speag	D2450V2	SN: 952	2024/05/07	2027/05/06
5GHz Validation Dipole	Speag	D5GHzV2	SN: 1200	2024/05/09	2027/05/08
Data Acquisition Electronicsr	Speag	DAE4	SN: 1711	2024/03/18	2025/03/17
E-Field Probe	Speag	EX3DV4	SN: 7893	2024/09/05	2025/09/04
Signal Generator	R&S	SMB100A	177746	2024/04/24	2025/04/23
Power Meter	R&S	NRVD-B2	835843/014	2024/08/08	2025/08/07
Power Sensor	R&S	NRV-Z4	100381	2024/08/08	2025/08/07
Power Sensor	R&S	NRV-Z2	100211	2024/08/08	2025/08/07
Wireless Communication Test Set	Anritsu	MT8820C	6201144551	2024/05/14	2025/05/13
Network Analyzer	Agilent	E5071C	MY46103472	2024/09/11	2025/09/10
Thermometer	Elitech	RC-4HC	EF7216002985	2024/10/31	2025/10/30
Thermometer	Elitech	RC-4HC	EF720B004811	2024/10/31	2025/10/30
Power Amplifier	Mini-Circuits	ZVA-183W-S+	932502132	N/A	N/A
Dielectric Probe Kit	Speag	DAK3.5	SN: 1312	N/A	N/A
Phantom	Speag	ELI V8.0	SN: 2159	N/A	N/A
Attenuator	COM-MW	ZA-S1-31	1305003187	N/A	N/A
Directional coupler	AA-MCS	AAMCS-UDC	000272	N/A	N/A

Note: For dipole antennas, BALUN has adopted 3 years as calibration intervals, and on annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

- 1. There is no physical damage on the dipole;
- 2. System validation with specific dipole is within 10% of calibrated value;
- 3. Return-loss in within 20% of calibrated measurement.
- 4. Impedance (real or imaginary parts) in within 5 Ohms of calibrated measurement.



ANNEX A SIMULATING LIQUID VERIFICATION RESULT

The dielectric parameters of the liquids were verified prior to the SAR evaluation using a DAK 3.5 Dielectric Probe Kit.

Head Liquid

Date	Liquid Type	Fre. (MHz)	Temp.	Meas. Conductivity (σ) (S/m)	Meas. Permittivity (ε)	Target Conductivity (σ) (S/m)	Target Permittivity (ε)	Conductivity Tolerance (%)	Permittivity Tolerance (%)
2025.03.05	Head	2450	21.4	1.77	39.05	1.80	39.20	-1.67	-0.38
2025.03.06	Head	5250	21.7	4.56	35.75	4.71	35.93	-3.18	-0.50
2025.03.07	Head	5600	21.2	4.92	34.69	5.07	35.53	-2.96	-2.36
2025.03.08	Head	5750	21.5	5.24	36.07	5.22	35.36	0.38	2.01
Note: The tel	ranca lin	it of Con	du ativitu a	nd Dormittivity is	E0/				

Note: The tolerance limit of Conductivity and Permittivity is± 5%.



ANNEX B SYSTEM CHECK RESULT

Comparing to the original SAR value provided by SPEAG, the validation data should be within itsspecification of 10 %(for 1 g).

Head liquid 1g

Data	Liquid	Freq.	Power	Measured	Normalized	Dipole SAR	Tolerance
Date	Туре	(MHz)	(mW)	SAR (W/kg)	SAR (W/kg)	(W/kg)	(%)
2025.03.05	Head	2450	100	5.36	53.60	52.60	1.90
2025.03.06	Head	5250	100	7.82	78.20	77.70	0.64
2025.03.07	Head	5600	100	8.12	81.20	81.30	-0.12
2025.03.08	Head	5750	100	7.74	77.40	77.60	-0.26
Note: The tolera	ance limit of Syst	em validation ±10	0%.				



System Performance Check Data (2450MHz)

Exposure Conditions

Phantom	Position,	Band	Group,	Frequency	Conversion	TSL	TSL	Ambient	Liquid
Section,	Test		UID	[MHz],	Factor	Conductivit	Permittivity	Temperatur	Temperatur
TSL	Distance			Channel		y [S/m]		е	е
	[mm]			Number				[°C]	[°C]
Flat,		D2450	CW,	2450.0,	6.98	1.77	39.0	22.1	21.4
HSL			0	50					

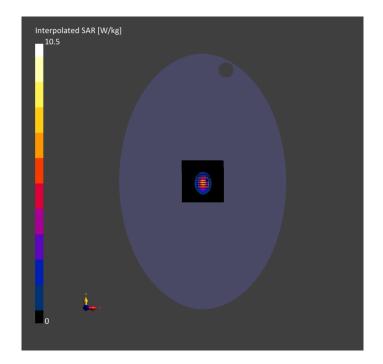
Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date	
ELI V8.0 (20deg probe tilt) -	HBBL-600-10000 2025-03-05	EX3DV4 - SN7893, 2024-09-05	DAE4 Sn1711, 2024-03-18	
2159				

Scan Setup

•					
	Area Scan	Zoom Scan		Area Scan	Zoom Scan
Grid Extents [mm]	80.0 x 80.0	30.0 x 30.0 x 30.0	Date	2025-03-05	2025-03-05
Grid Steps [mm]	10.0 x 10.0	5.0 x 5.0 x 1.5	psSAR1g [W/kg]	5.12	5.36
Sensor Surface	3.0	1.4	psSAR10g	2.39	2.49
[mm]			[W/kg]		
Graded Grid	Yes	Yes	Power Drift [dB]	-0.11	0.03
Grading Ratio	1.5	1.5	Power Scaling	Disabled	Disabled
MAIA	N/A	N/A	Scaling Factor		
Surface Detection	VMS + 6p	VMS + 6p	[dB]		
Scan Method	Measured	Measured	TSL Correction	No correction	No correction
			M2/M1 [%]		80.2
			Dist 3dB Peak		9.2
			[mm]		







System Performance Check Data (5250MHz)

Exposure Conditions

Phantom	Position,	Band	Group,	Frequency	Conversion	TSL	TSL	Ambient	Liquid
Section,	Test		UID	[MHz],	Factor	Conductivit	Permittivity	Temperatur	Temperatur
TSL	Distance			Channel		y [S/m]		е	е
	[mm]			Number				[℃]	[°C]
Flat,		D5GHz	CW,	5250.0,	5.44	4.56	35.8	22.6	21.7
,		DOGHZ	CVV,	5250.0,	5.44	4.50	33.0	22.0	21.1

Hardware Setup

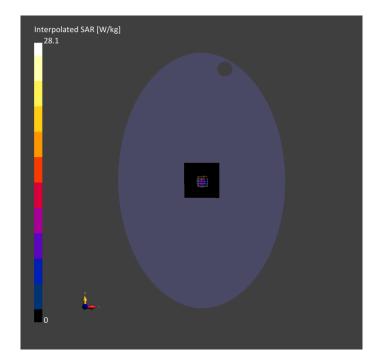
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) -	HBBL-600-10000 2025-03-06	EX3DV4 - SN7893, 2024-09-05	DAE4 Sn1711, 2024-03-18
2159			

Scan Setup

Mea	suren	nent	Resi	ılts

	Area Scan	Zoom Scan		Area Scan	Zoom Scan
Grid Extents [mm]	80.0 x 80.0	22.0 x 22.0 x 22.0	Date	2025-03-06	2025-03-06
Grid Steps [mm]	10.0 x 10.0	4.0 x 4.0 x 1.4	psSAR1g [W/kg]	6.62	7.82
Sensor Surface	3.0	1.4	psSAR10g	1.99	2.23
[mm]			[W/kg]		
Graded Grid	Yes	Yes	Power Drift [dB]	0.03	0.01
Grading Ratio	1.5	1.4	Power Scaling	Disabled	Disabled
MAIA	N/A	N/A	Scaling Factor		
Surface Detection	VMS + 6p	VMS + 6p	[dB]		
Scan Method	Measured	Measured	TSL Correction	No correction	No correction
			M2/M1 [%]		65.5
			Dist 3dB Peak		7.6
			[mm]		







System Performance Check Data (5600MHz)

Exposure Conditions

Phantom	Position,	Band	Group,	Frequency	Conversion	TSL	TSL	Ambient	Liquid
Section,	Test		UID	[MHz],	Factor	Conductivit	Permittivity	Temperatur	Temperatur
TSL	Distance			Channel		y [S/m]		е	е
	[mm]			Number				[°C]	[℃]
	£			Hamber				[~]	[~]
Flat,		D5GHz	CW,	5600.0,	4.91	4.92	34.7	22.4	21.2

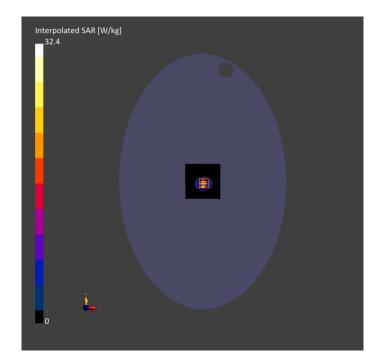
Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date	
ELI V8.0 (20deg probe tilt) -	HBBL-600-10000 2025-03-07	EX3DV4 - SN7893, 2024-09-05	DAE4 Sn1711, 2024-03-18	
2159				

Scan Setup

	Area Scan	Zoom Scan		Area Scan	Zoom Scan
Grid Extents [mm]	80.0 x 80.0	22.0 x 22.0 x 22.0	Date	2025-03-07	2025-03-07
Grid Steps [mm]	10.0 x 10.0	4.0 x 4.0 x 1.4	psSAR1g [W/kg]	6.82	8.12
Sensor Surface	3.0	1.4	psSAR10g	2.09	2.31
[mm]			[W/kg]		
Graded Grid	Yes	Yes	Power Drift [dB]	-0.16	-0.02
Grading Ratio	1.5	1.4	Power Scaling	Disabled	Disabled
MAIA	N/A	N/A	Scaling Factor		
Surface Detection	VMS + 6p	VMS + 6p	[dB]		
Scan Method	Measured	Measured	TSL Correction	No correction	No correction
			M2/M1 [%]		62.6
			Dist 3dB Peak		7.7
			[mm]		







System Performance Check Data (5750MHz)

Exposure Conditions

Phantom	Position,	Band	Group,	Frequency	Conversion	TSL	TSL	Ambient	Liquid
Section,	Test		UID	[MHz],	Factor	Conductivit	Permittivity	Temperatur	Temperatur
TSL	Distance			Channel		y [S/m]		е	е
	[mm]			Number				[℃]	[°C]
Flat,		D5GHz	CW,	5750.0,	4.98	5.24	36.1	22.3	21.5
HSL									

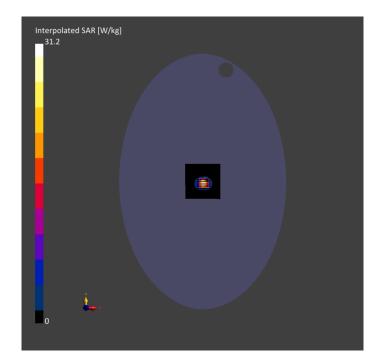
Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) -	HBBL-600-10000 2025-03-08	EX3DV4 - SN7893, 2024-09-05	DAE4 Sn1711, 2024-03-18
2159			

Scan Setup

	Area Scan	Zoom Scan		Area Scan	Zoom Scan
Grid Extents [mm]	80.0 x 80.0	22.0 x 22.0 x 22.0	Date	2025-03-08	2025-03-08
Grid Steps [mm]	10.0 x 10.0	4.0 x 4.0 x 1.4	psSAR1g [W/kg]	6.77	7.74
Sensor Surface	3.0	1.4	psSAR10g	2.06	2.16
[mm]			[W/kg]		
Graded Grid	Yes	Yes	Power Drift [dB]	0.05	0.01
Grading Ratio	1.5	1.4	Power Scaling	Disabled	Disabled
MAIA	N/A	N/A	Scaling Factor		
Surface Detection	VMS + 6p	VMS + 6p	[dB]		
Scan Method	Measured	Measured	TSL Correction	No correction	No correction
			M2/M1 [%]		61.7
			Dist 3dB Peak		8.3
			[mm]		







ANNEX C TEST DATA

Meas.1 Body Plane with Back Side 0mm on 6 Channel in IEEE802.11b mode with Antenna 2 Exposure Conditions

Phantom	Position,	Band	Group,	Frequency	Conversion	TSL	TSL	Ambient	Liquid
Section,	Test		UID	[MHz],	Factor	Conductivit	Permittivity	Temperatur	Temperatur
TSL	Distance			Channel		y [S/m]		е	е
	[mm]			Number				[°C]	[°]
Flat,	BACK,	WLAN	WLAN,	2437.0,	6.98	1.76	39.4	22.1	21.4
неі	0.00	2.4GHz	10012-CAB	6					

Hardware Setup

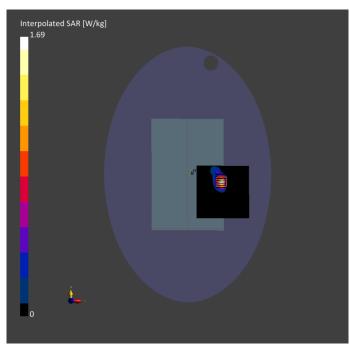
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date	
ELI V8.0 (20deg probe tilt) -	HBBL-600-10000 2025-03-05	EX3DV4 - SN7893, 2024-09-05	DAE4 Sn1711, 2024-03-18	
2159				

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	120.0 x 120.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	12.0 x 12.0	5.0 x 5.0 x 5.0
Sensor Surface	3.0	1.4
[mm]		
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.5
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2025-03-05	2025-03-05
psSAR1g [W/kg]	0.554	0.775
psSAR10g [W/kg]	0.234	0.297
Power Drift [dB]	-0.17	-0.07
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
TSL Correction	No correction	No correction
M2/M1 [%]		51.1
Dist 3dB Peak [mm]		6.1



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Template No.: TRP-FCC DASY-Phone-3 (2024-08-13)



Meas.2 Body Plane with Top Edge 0mm on 58 Channel in IEEE802.11ac80 mode with Antenna 3 Exposure Conditions

Phantom	Position,	Band	Group,	Frequency	Conversion	TSL	TSL	Ambient	Liquid
Section,	Test		UID	[MHz],	Factor	Conductivit	Permittivity	Temperatur	Temperatur
TSL	Distance			Channel		y [S/m]		е	е
	[mm]			Number				[°C]	[°C]
Flat,	[mm] EDGE TOP,	WLAN	WLAN,	Number 5290.0,	5.44	4.61	35.7	[°C]	[°C] 21.7

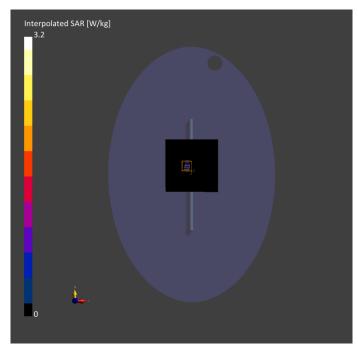
Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) -	HBBL-600-10000 2025-03-06	EX3DV4 - SN7893, 2024-09-05	DAE4 Sn1711, 2024-03-18
2159			

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	120.0 x 120.0	24.0 x 24.0 x 22.0
Grid Steps [mm]	10.0 x 10.0	4.0 x 4.0 x 2.0
Sensor Surface	3.0	1.4
[mm]		
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	Υ	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

	Area Scan	Zoom Scan
Date	2025-03-06	2025-03-06
psSAR1g [W/kg]	0.422	0.639
psSAR10g [W/kg]	0.111	0.122
Power Drift [dB]	-0.06	-0.04
Power Scaling	Disabled	Disabled
Scaling Factor		
[dB]		
TSL Correction	No correction	No correction
M2/M1 [%]		50.5
Dist 3dB Peak		4.0
[mm]		





Meas.3 Body Plane with Back Side 0mm on 106 Channel in IEEE802.11ac80 mode with Antenna 3 Exposure Conditions

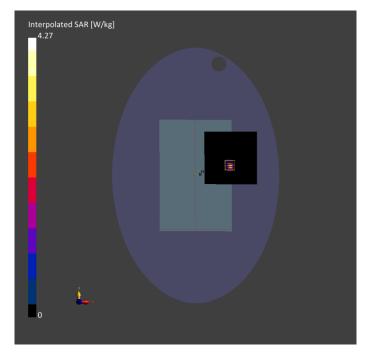
Phantom	Position,	Band	Group,	Frequency	Conversion	TSL	TSL	Ambient	Liquid
Section,	Test		UID	[MHz],	Factor	Conductivit	Permittivity	Temperatur	Temperatur
TSL	Distance			Channel		y [S/m]		е	е
	[mm]			Number				[°C]	[°C]
Flat,	BACK,	WLAN	WLAN,	5530.0,	4.91	4.83	35.4	22.4	21.2
HSL	0.00	5GHz	10544-AAD	106					

Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) -	HBBL-600-10000 2025-03-07	EX3DV4 - SN7893, 2024-09-05	DAE4 Sn1711, 2024-03-18
2159			

Scan Setup

	Area Scan	Zoom Scan		Area Scan	Zoom Scan
Grid Extents [mm]	120.0 x 120.0	24.0 x 24.0 x 22.0	Date	2025-03-07	2025-03-07
Grid Steps [mm]	10.0 x 10.0	4.0 x 4.0 x 2.0	psSAR1g [W/kg]	0.547	0.825
Sensor Surface	3.0	1.4	psSAR10g [W/kg]	0.124	0.160
[mm]			Power Drift [dB]	0.09	-0.14
Graded Grid	Yes	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	1.5	1.4	Scaling Factor		
MAIA	Υ	N/A	[dB]		
Surface Detection	VMS + 6p	VMS + 6p	TSL Correction	No correction	No correction
Scan Method	Measured	Measured	M2/M1 [%]		47.8
			Dist 3dB Peak		4.0
			[mm]		





Meas.4 Body Plane with Back Side 0mm on 155 Channel in IEEE802.11ac80 mode with Antenna 3 Exposure Conditions

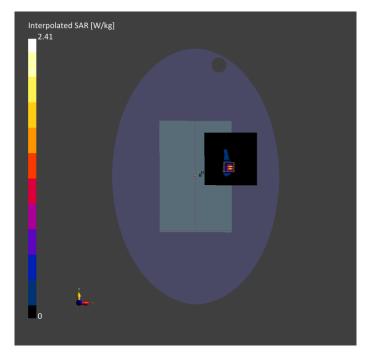
Phantom	Position,	Band	Group,	Frequency	Conversion	TSL	TSL	Ambient	Liquid
Section,	Test		UID	[MHz],	Factor	Conductivit	Permittivity	Temperatur	Temperatur
TSL	Distance			Channel		y [S/m]		е	е
	[mm]			Number				[°C]	[°C]
Flat,	BACK,	WLAN	WLAN,	5775.0,	4.98	5.27	36.0	22.3	21.5
HSI	0.00	5GHz	10544-AAD	155					

Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) -	HBBL-600-10000 2025-03-08	EX3DV4 - SN7893, 2024-09-05	DAE4 Sn1711, 2024-03-18
2159			

Scan Setup

	Area Scan	Zoom Scan		Area Scan	Zoom Scan
Grid Extents [mm]	120.0 x 120.0	24.0 x 24.0 x 22.0	Date	2025-03-08	2025-03-08
Grid Steps [mm]	10.0 x 10.0	4.0 x 4.0 x 2.0	psSAR1g [W/kg]	0.334	0.468
Sensor Surface	3.0	1.4	psSAR10g [W/kg]	0.082	0.098
[mm]			Power Drift [dB]	0.11	0.01
Graded Grid	Yes	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	1.5	1.4	Scaling Factor		
MAIA	Υ	N/A	[dB]		
Surface Detection	VMS + 6p	VMS + 6p	TSL Correction	No correction	No correction
Scan Method	Measured	Measured	M2/M1 [%]		48.5
			Dist 3dB Peak		4.0
			[mm]		





Meas.5 Body Plane with Back Side 0mm on 0 Channel in Bluetooth mode with Antenna 2 Exposure Conditions

Phantom	Position,	Band	Group,	Frequency	Conversion	TSL	TSL	Ambient	Liquid
Section,	Test		UID	[MHz],	Factor	Conductivit	Permittivity	Temperatur	Temperatur
TSL	Distance			Channel		y [S/m]		е	е
	[mm]			Number				[°C]	[°C]
Flat,	BACK,	ISM 2.4	Bluetooth,	2402.0,	6.98	1.72	39.6	22.1	21.4
HSL	0.00	GHz	10032-CAA	0					
		Band							

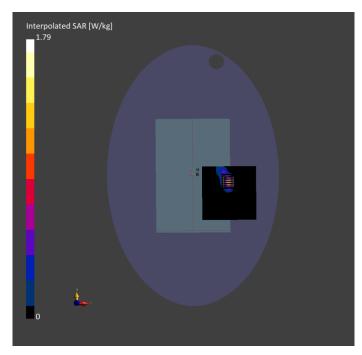
Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) -	HBBL-600-10000 2025-03-05	EX3DV4 - SN7893, 2024-09-05	DAE4 Sn1711, 2024-03-18
2159			

Scan Setup

Area Scan	Zoom Scan
120.0 x 120.0	30.0 x 30.0 x 30.0
12.0 x 12.0	5.0 x 5.0 x 5.0
3.0	1.4
Yes	Yes
1.5	1.5
N/A	N/A
VMS + 6p	VMS + 6p
Measured	Measured
	120.0 x 120.0 12.0 x 12.0 3.0 Yes 1.5 N/A VMS + 6p

	Area Scan	Zoom Scan
Date	2025-03-05	2025-03-05
psSAR1g [W/kg]	0.772	0.841
psSAR10g [W/kg]	0.304	0.327
Power Drift [dB]	-0.13	-0.03
Power Scaling	Disabled	Disabled
Scaling Factor		
[dB]		
TSL Correction	No correction	No correction
M2/M1 [%]		50.7
Dist 3dB Peak		6.0
[mm]		





ANNEX D EUT EXTERNAL PHOTOS

Please refer the document "BL-SZ2520680-AW.pdf".

ANNEX E SAR TEST SETUP PHOTOS

Please refer the document "BL-SZ2520680-AS.pdf".

ANNEX F CALIBRATION REPORT

Please refer the document "BL-SZ2520680-AC.pdf".

ANNEX G TUNE-UP PROCEDURE

Please refer the document "BL-SZ2520680-AT.pdf".



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