FCC SAR TEST REPORT

FCC ID	**:**	**UZ7WR50**
Equipment	**:**	**RFID Accessory**
Brand Name	**:**	**Zebra**
Model Name	**:**	**WR50**
Applicant	**:**	**Zebra Technologies Corporation** **1 Zebra Plaza, Holtsville, NY 11742**
Manufacturer	**:**	**Zebra Technologies Corporation** **1 Zebra Plaza, Holtsville, NY 11742**
Standard	**:**	**FCC 47 CFR Part 2 (2.1093)**

The product was received on Apr. 21, 2023 and testing was started from Apr. 25, 2023 and completed on Jun. 01, 2023. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been pass the FCC requirement.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Laboratory, the test report shall not be reproduced except in full.

Approved by: Cona Huang / Deputy Manager

ilac-MRA TAF Testing Laboratory 3786

Sporton International Inc. Wensan Laboratory

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History of this test report

Report No.	Version	Description	Issued Date
FA1O0707-11	01	Initial issue of report	Jun. 02, 2023

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) for Zebra Technologies Corporation, RFID Accessory, WR50, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary			Highest Head Simultaneous Transmission 1g SAR (W/kg)	Highest Extremity Simultaneous Transmission 10g SAR (W/kg)	Highest Body Simultaneous Transmission 1g SAR (W/kg)
		Head (Separation 10mm)	Extremity (Separation 0mm)	Body (Separation 0mm)			
		1g SAR (W/kg)	10g SAR (W/kg)	1g SAR (W/kg)			
DSS	UHF RFID	0.24	0.23	0.74	1.39	0.58	0.74
DXX	NFC		< 0.01			0.58	
DTS	2.4GHz WLAN	0.75	0.35		0.98	0.58	
NII	5GHz WLAN	1.16	0.14		1.39	0.37	
DSS	Bluetooth	0.00	0.00		0.24	0.23	
Date of Testing:		2023/4/25 ~ 2023/6/1					

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation and the FCC designation No. TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Extremity 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

Reviewed by: Jason Wang
Report Producer: Paula Chen

2. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards, the below KDB standard may not including in the TAF code without accreditation.

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- IEC/IEEE 62209-1528:2020
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	RFID Accessory
Brand Name	Zebra
Model Name	WR50
FCC ID	UZ7WR50
Wireless Technology and Frequency Range	UHF RFID : 917.9 MHz ~ 927.7 MHz
Mode	UHF RFID: ASK
HW Version	DV1.2
FW Version	PAAFBS00-001-R07
MFD	23FEB23
EUT Stage	Identical Prototype

Remark:

1. Based on the original filing Sporton SAR report No.: FA1O0707-02, FCC ID: UZ7WS5001 to attach RFID module and in this report, full test RFID operation, spot check WLAN/BT worse case found in original report to show compliance.
2. There are four kinds of SKU as below table. RF Exposure selects SKU2/SKU 6 to be tested and SKU4/SKU8 do not perform due to the change does not affect RF characteristics.
3. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.

Host Information	
Equipment Name	WS50 Wearable Computer
FCC ID	UZ7WS5001
Brand Name	Zebra
Model Name	WS5001
Wireless Technology and Frequency Range	WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz
Mode	WLAN: 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC: ASK

Host Configuration with RFID	SKU2 (SKU -1)	SKU4 (SKU -2)	SKU6 (SKU -4)	SKU8 (SKU -3)
Type	RFID	RFID	RFID	RFID
Scanner	SE4770	SE4770	SE4770	SE4770
NFC	Yes	Yes	Yes	Yes
RFID	Yes	Yes	Yes	Yes
Camera	NA	NA	NA	NA
Battery	3X (2400mAh)	3X (2400mAh)	3X (2400mAh)	3X (2400mAh)
Mounting	Finger Trigger	RIFD BOH	RFID Wrist /W external antenna	RFID BOH /W external antenna

Accessories Information				
Adaptor	Brand Name	Zebra	Model Number	PWR-WUA5V12W0US
Adaptor	Brand Name	Zebra	Model Number	PWR-WUA5V12W0WW
Standard Battery	Brand Name	Zebra	Model Number	BT-000446
High-capacity Battery	Brand Name	Zebra	Model Number	BT-000446B
USB charging cable with cup	Brand Name	Zebra	Model Number	CBL-WS5X-USB1-01
USB C CABLE	Brand Name	Zebra	Model Number	CBL-TC2X-USBC-01

Support unit				
WS50 RFID Shell	Brand Name	Zebra	Part Number Model Number	SG-WS5X-SHLRS-01
WS50 Replacement Deflector for RFID Shell	Brand Name	Zebra	Part Number Model Number	SG-WS5X-DFLTR-01
Replacement Finger Trigger for Converged	Brand Name	Zebra	Part Number Model Number	SG-WS5X-TRGA-01
WS50 Spare Finger Strap for Converged and RFID Trigger, 10 Pack	Brand Name	Zebra	Part Number Model Number	SG-WS5X-STRP-10
WS50 RFID Back of Hand Mount (SKU 4 & 8)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-BHRS-01
WS50 RFID Wrist Mount Plate (SKU 6)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-WSTRS-01
WS50 RFID Back of Hand Mount Glove, Left Hand Small (SKU 4)	Brand Name	Zebra	Part Number Model Number	SG-WEAR-HNWPLS-02
WS50 RFID Back of Hand Mount Glove, Left Hand Medium (SKU 4)	Brand Name	Zebra	Part Number Model Number	SG-WEAR-HNWPLM-02
WS50 RFID Back of Hand Mount Glove, Left Hand Large (SKU 4)	Brand Name	Zebra	Part Number Model Number	SG-WEAR-HNWPLL-02
WS50 RFID Back of Hand Mount Glove, Right Hand Small (SKU 4)	Brand Name	Zebra	Part Number Model Number	SG-WEAR-HNWPRS-02
WS50 RFID Back of Hand Mount Glove, Right Hand Medium (SKU 4)	Brand Name	Zebra	Part Number Model Number	SG-WEAR-HNWPRM-02
WS50 RFID Back of Hand Mount Glove, Right Hand Large (SKU 4)	Brand Name	Zebra	Part Number Model Number	SG-WEAR-HNWPRL-02
Wrist Mount for WS50 RFID, Right Arm, Large (SKU 6)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-WMTRRL-01
Wrist Mount for WS50 RFID, Right Arm, Small (SKU 6)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-WMTRRS-01
Wrist Mount for WS50 RFID, Left Arm, Large (SKU 6)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-WMTRLL-01
Wrist Mount for WS50 RFID, Left Arm, Small (SKU 6)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-WMTRLS-01
WS50 RFID Back of Hand Mount with Wrist Antenna Holder, Right Large (SKU 8)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-BHWRRL-01
WS50 RFID Back of Hand Mount with Wrist Antenna Holder, Right Medium (SKU 8)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-BHWRRM-01
WS50 RFID Back of Hand Mount with Wrist Antenna Holder, Right Small (SKU 8)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-BHWRRS-01
WS50 RFID Back of Hand Mount with Wrist Antenna Holder, Left Large (SKU 8)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-BHWRLL-01
WS50 RFID Back of Hand Mount with Wrist Antenna Holder, Left Medium (SKU 8)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-BHWRLM-01
WS50 RFID Back of Hand Mount with Wrist Antenna Holder, Left Small (SKU 8)	Brand Name	Zebra	Part Number Model Number	SG-WS5X-BHWRLS-01
WS50 UHF RFID Antenna Cable, 800MHz, 210mm Length for Wrist Mount, EMEA	Brand Name	Zebra	Part Number Model Number	CBL-WS5X-ANTR8S-01
WS50 UHF RFID Antenna Cable, 800MHz, 330mm length for Back of Hand Mount, EMEA	Brand Name	Zebra	Part Number Model Number	CBL-WS5X-ANTR8L-01
WS50 UHF RFID Antenna Cable, 900MHz, 210mm length for Wrist Mount, North America and Rest of World Minus EMEA	Brand Name	Zebra	Part Number Model Number	CBL-WS5X-ANTR9S-01
WS50 UHF RFID Antenna Cable, 900MHz, 330mm length for Back of Hand Mount, North America and Rest of World Minus EMEA	Brand Name	Zebra	Part Number Model Number	CBL-WS5X-ANTR9L-01

4. RF Exposure Limits

4.1 Uncontrolled Environment

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

4.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

5. Specific Absorption Rate (SAR)

5.1 Introduction

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.

5.2 SAR Definition

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

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

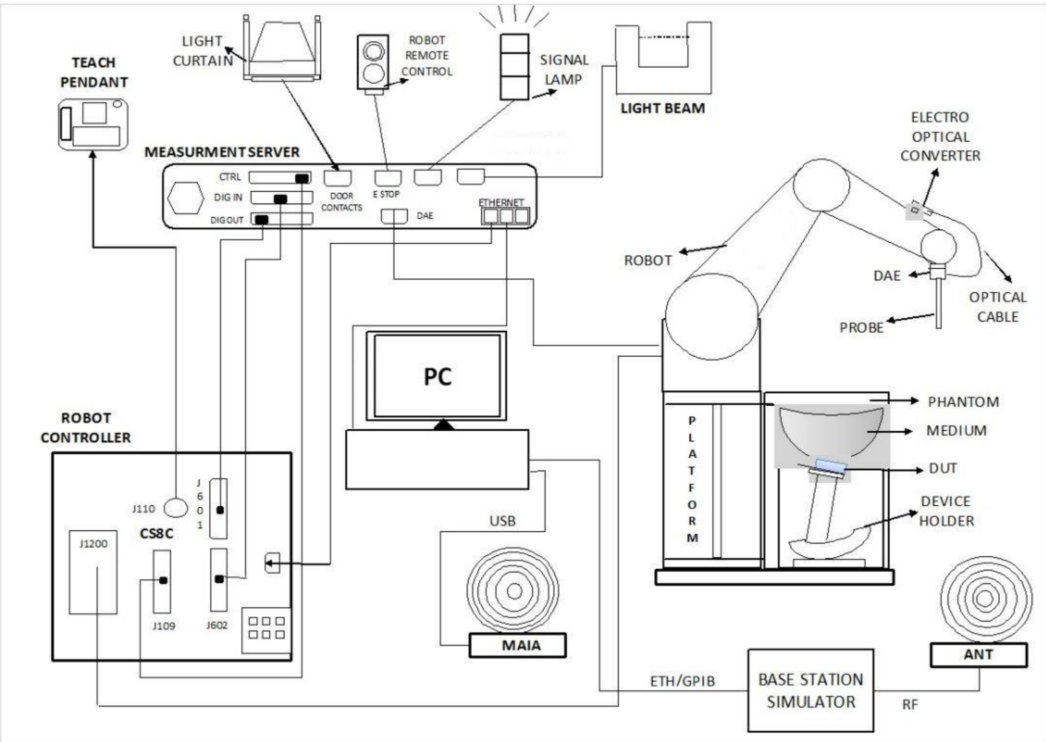
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

6. System Description and Setup

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



- The DASY system in SAR Configuration is shown above
- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running windows software and the DASY software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

6.1 Test Site Location

The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786) and the FCC designation No. TW1190 and TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Test Site	EMC & Wireless Communications Laboratory		Wensan Laboratory		
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan		
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	SAR16-HY
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	SAR17-HY

6.2 E-Field 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.

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – 4 GHz; Linearity: ±0.2 dB (30 MHz – 4 GHz)	
Directivity	±0.2 dB in TSL (rotation around probe axis) ±0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 µW/g – >100 mW/g; Linearity: ±0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)	
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

6.3 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and 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.

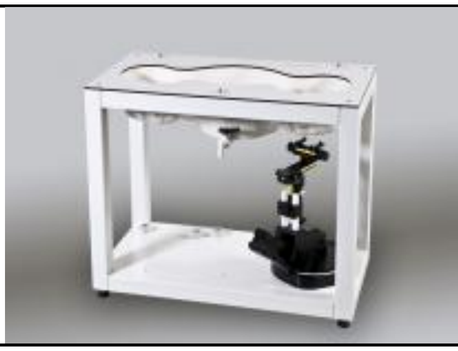
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

6.4 Phantom

<SAM Twin Phantom>

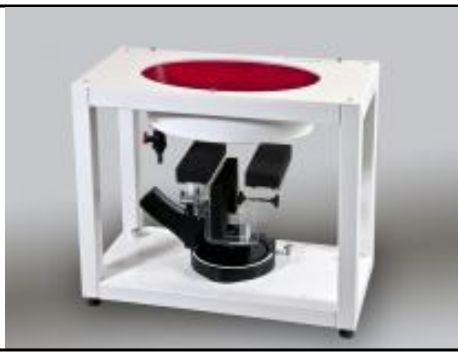
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)
Filling Volume	Approx. 30 liters
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm



The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

6.5 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Mounting Device for Laptops

7. Measurement Procedures

The measurement procedures are as follows:

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

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

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

7.1 Spatial Peak SAR Evaluation

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

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

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

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

7.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

7.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2}\cdot\delta\cdot\ln(2) \pm 0.5$ 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
	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.	

7.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

<table>
<tr><th colspan="3"></th><th>$\leq$ 3 GHz</th><th>$>$ 3 GHz</th></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>$\leq$ 2 GHz: $\leq$ 8 mm
2 – 3 GHz: $\leq$ 5 mm*</td><td>3 – 4 GHz: $\leq$ 5 mm*
4 – 6 GHz: $\leq$ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>$\leq$ 5 mm</td><td>3 – 4 GHz: $\leq$ 4 mm
4 – 5 GHz: $\leq$ 3 mm
5 – 6 GHz: $\leq$ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>$\leq$ 4 mm</td><td>3 – 4 GHz: $\leq$ 3 mm
4 – 5 GHz: $\leq$ 2.5 mm
5 – 6 GHz: $\leq$ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>$\geq$ 30 mm</td><td>3 – 4 GHz: $\geq$ 28 mm
4 – 5 GHz: $\geq$ 25 mm
5 – 6 GHz: $\geq$ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is $\leq$ 1.4 W/kg, $\leq$ 8 mm, $\leq$ 7 mm and $\leq$ 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.</td></tr>
</table>

7.5 Volume Scan Procedures

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

7.6 Power Drift Monitoring

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

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	900MHz System Validation Kit(2)	D900V2	1d171	Mar. 24, 2022	Mar. 22, 2024
SPEAG	900MHz System Validation Kit	D900V2	1d165	Jun. 22, 2022	Jun. 21, 2023
SPEAG	2450MHz System Validation Kit(2)	D2450V2	736	Aug. 17, 2021	Aug. 15, 2023
SPEAG	2450MHz System Validation Kit	D2450V2	929	Nov. 21, 2022	Nov. 20, 2023
SPEAG	5GHz System Validation Kit(2)	D5GHzV2	1006	Sep. 15, 2021	Sep. 13, 2023
SPEAG	5GHz System Validation Kit	D5GHzV2	1128	Nov. 23, 2022	Nov. 22, 2023
SPEAG	13MHz System Validation Kit(2)	CLA13	1011	Jul. 08, 2020	Jul. 05, 2023
SPEAG	Data Acquisition Electronics	DAE4	316	Jan. 23, 2023	Jan. 22, 2024
SPEAG	Data Acquisition Electronics	DAE4	699	Feb. 22, 2023	Feb. 21, 2024
SPEAG	Data Acquisition Electronics	DAE4	1399	Feb. 21, 2023	Feb. 20, 2024
SPEAG	Data Acquisition Electronics	DAE4	1424	Jan. 19, 2023	Jan. 18, 2024
SPEAG	Data Acquisition Electronics	DAE4	1647	Nov. 18, 2022	Nov. 17, 2023
SPEAG	Data Acquisition Electronics	DAE4	1696	Nov. 09, 2022	Nov. 08, 2023
SPEAG	Data Acquisition Electronics	DAE4	1697	Dec. 15, 2022	Dec. 14, 2023
SPEAG	Dosimetric E-Field Probe	ES3DV3	3115	Oct. 25, 2022	Oct. 24, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	3931	Oct. 31, 2022	Oct. 30, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	3976	Feb. 21, 2023	Feb. 20, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7694	Nov. 15, 2022	Nov. 14, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	7700	Jan. 24, 2023	Jan. 23, 2024
Testo	Hygro meter	608-H1	45196600	Nov. 02, 2022	Nov. 01, 2023
Testo	Hygro meter	608-H1	45207528	Nov. 02, 2022	Nov. 01, 2023
RCPTWN	Thermometer	HTC-1	TM685-1	Jun. 27, 2022	Jun. 26, 2023
RCPTWN	Thermometer	HTC-1	TM560-2	Mar. 21, 2023	Mar. 20, 2024
R&S	BT Base Station	CBT32	101136	Oct. 25, 2022	Oct. 24, 2023
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Oct. 12, 2022	Oct. 11, 2023
Keysight	ENA Network Analyzer	E5071C	MY46316648	Jul. 25, 2022	Jul. 24, 2023
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 28, 2022	Sep. 27, 2023
SPEAG	Dielectric Probe Kit	DAK-12	1156	Jul. 28, 2022	Jul. 27, 2023
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3252	Jul. 25, 2022	Jul. 24, 2023
Anritsu	Power Meter	ML2495A	1419002	Aug. 16, 2022	Aug. 15, 2023
Anritsu	Power Meter	ML2495A	1804003	Oct. 17, 2022	Oct. 16, 2023
Anritsu	Power Sensor	MA2411B	1911176	Aug. 16, 2022	Aug. 15, 2023
Anritsu	Power Sensor	MA2411B	1726150	Oct. 17, 2022	Oct. 16, 2023
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Jan. 10, 2023	Jan. 09, 2024
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 19, 2021	Aug. 17, 2023
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 14, 2022	Oct. 13, 2023
Mini-Circuits	Power Amplifier	ZVE-8G+	479102029	Sep. 15, 2022	Sep. 14, 2023
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Warison	Directional Coupler	WCOU-10-50S-10	WR889BMC4B1	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

9. System Verification

9.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18℃ to 25℃, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18℃ to 25℃ and within ± 2℃ of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.
The liquid tissue depth was at least 15cm in the phantom for all SAR testing

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
13	22.5	0.728	54.443	0.75	55.00	-2.93	-1.01	±5	2023/5/29
900	22.3	0.955	41.828	0.97	41.50	-1.55	0.79	±5	2023/5/11
900	22.8	0.952	42.353	0.97	41.50	-1.86	2.06	±5	2023/5/12
900	22.7	0.942	42.053	0.97	41.50	-2.89	1.33	±5	2023/5/18
900	22.4	0.960	42.653	0.97	41.50	-1.03	2.78	±5	2023/6/1
2450	22.6	1.799	39.399	1.80	39.20	-0.06	0.51	±5	2023/4/25
2450	22.3	1.811	39.389	1.80	39.20	0.61	0.48	±5	2023/5/12
2450	22.3	1.860	40.825	1.80	39.20	3.33	4.15	±5	2023/5/25
5250	22.4	4.776	36.050	4.71	35.95	1.40	0.28	±5	2023/4/26
5250	22.3	4.838	36.647	4.71	35.95	2.72	1.94	±5	2023/5/24
5600	22.4	5.116	35.617	5.07	35.50	0.91	0.33	±5	2023/4/26
5600	22.7	5.070	36.500	5.07	35.50	0.00	2.82	±5	2023/5/12
5600	22.3	5.226	36.112	5.07	35.50	3.08	1.72	±5	2023/5/24
5750	22.4	5.274	35.436	5.22	35.35	1.03	0.24	±5	2023/4/26

9.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
SAR11	2023/5/29	13	1000	CLA13-1011	EX3DV4 - SN3931	DAE4 Sn1696					0.347	0.343	0.347	2.06
SAR13	2023/5/11	900	50	D900V2-1d171	EX3DV4 - SN7700	DAE4 Sn1697	0.514	11.000	10.28	-6.55	0.335	7.090	6.7	-5.50
SAR14	2023/5/12	900	250	D900V2-1d165	EX3DV4 - SN7694	DAE4 Sn1399	2.790	11.000	11.16	1.45	1.820	7.020	7.28	3.70
SAR14	2023/5/18	900	250	D900V2-1d165	EX3DV4 - SN7694	DAE4 Sn1399	2.750	11.000	11	0.00	1.800	7.020	7.2	2.56
SAR14	2023/6/1	900	250	D900V2-1d165	EX3DV4 - SN7694	DAE4 Sn316	2.810	11.000	11.24	2.18	1.830	7.020	7.32	4.27
SAR14	2023/4/25	2450	50	D2450V2-736	EX3DV4 - SN7694	DAE4 Sn1647	2.550	54.200	51	-5.90	1.190	25.300	23.8	-5.93
SAR08	2023/5/12	2450	250	D2450V2-929	ES3DV3 - SN3115	DAE4 Sn699	12.400	52.400	49.6	-5.34	5.770	24.700	23.08	-6.56
SAR14	2023/5/25	2450	50	D2450V2-736	EX3DV4 - SN7694	DAE4 Sn1399	2.630	54.200	52.6	-2.95	1.220	25.300	24.4	-3.56
SAR12	2023/4/26	5250	50	D5GHzV2-1006-5250	EX3DV4 - SN3976	DAE4 Sn1424	3.910	81.700	78.2	-4.28	1.120	23.200	22.4	-3.45
SAR13	2023/5/24	5250	100	D5GHzV2-1128-5250	EX3DV4 - SN7700	DAE4 Sn1697	8.310	77.900	83.1	6.68	2.380	22.600	23.8	5.31
SAR12	2023/4/26	5600	50	D5GHzV2-1006-5600	EX3DV4 - SN3976	DAE4 Sn1424	4.240	85.100	84.8	-0.35	1.200	24.000	24	0.00
SAR11	2023/5/12	5600	50	D5GHzV2-1128-5600	EX3DV4 - SN3931	DAE4 Sn1696	3.840	80.100	76.8	-4.12	1.160	22.700	23.2	2.20
SAR13	2023/5/24	5600	100	D5GHzV2-1128-5600	EX3DV4 - SN7700	DAE4 Sn1697	8.660	80.100	86.6	8.11	2.470	22.700	24.7	8.81
SAR12	2023/4/26	5750	50	D5GHzV2-1006-5750	EX3DV4 - SN3976	DAE4 Sn1424	3.830	81.400	76.6	-5.90	1.080	22.900	21.6	-5.68

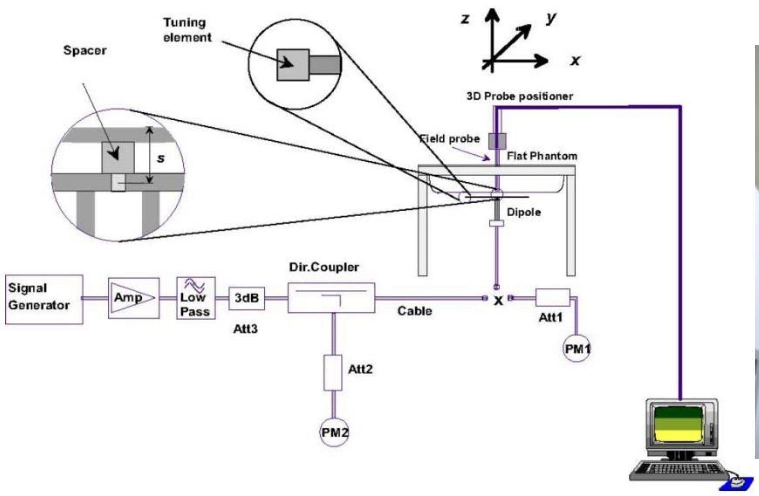


Fig 8.3.1 System Performance Check Setup

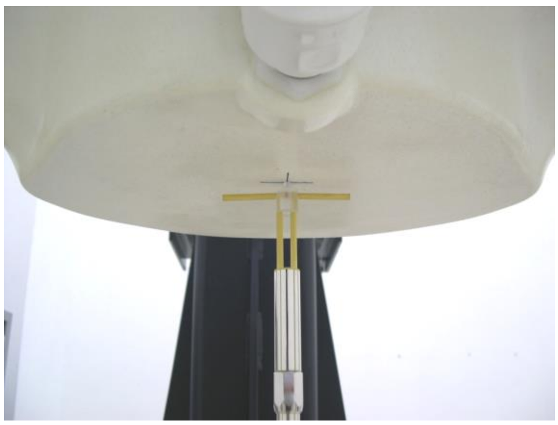


Fig 8.3.2 Setup Photo

10. RF Exposure Positions

10.1 Extremity Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

11. WiFi/Bluetooth Output Power (Unit: dBm)

General Note:

1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, additional output power measurements were not necessary.
2. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
3. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
4. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
5. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	21.60	22.00	100.00
		6	2437	21.50	22.00	
		11	2462	21.80	22.00	
	802.11g 6Mbps	1	2412	Not Required	21.50	Not Required
		6	2437		22.00	
		11	2462		21.50	
	802.11n-HT20 MCS0	1	2412		20.00	
		6	2437		20.00	
		11	2462		20.00	
	802.11n-HT40 MCS0	3	2422		20.50	
		6	2437		20.50	
		9	2452		18.00	
	802.11ac-VHT20 MCS0	1	2412		20.00	
		6	2437		20.00	
		11	2462		19.50	
	802.11ac-VHT40 MCS0	3	2422		19.50	
		6	2437		20.50	
		9	2452		19.50	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	Not Required	21.50	Not Required
		40	5200		21.50	
		44	5220		21.50	
		48	5240		21.50	
	802.11n-HT20 MCS0	36	5180		21.50	
		40	5200		21.50	
		44	5220		21.50	
		48	5240		21.50	
	802.11n-HT40 MCS0	38	5190		19.50	
		46	5230		21.50	
	802.11ac-VHT20 MCS0	36	5180		20.50	
		40	5200		20.50	
		44	5220		21.50	
		48	5240		20.50	
	802.11ac-VHT40 MCS0	38	5190		20.50	
		46	5230		21.00	
	802.11ac-VHT80 MCS0	42	5210		16.50	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	20.40	21.50	91.10
		56	5280	20.20	21.50	
		60	5300	20.00	21.50	
		64	5320	20.50	21.50	
	802.11n-HT20 MCS0	52	5260	Not Required	21.50	Not Required
		56	5280		21.50	
		60	5300		21.50	
		64	5320		21.50	
	802.11n-HT40 MCS0	54	5270	21.10	21.50	99.47
		62	5310	19.40	19.50	
	802.11ac-VHT20 MCS0	52	5260	Not Required	20.50	Not Required
		56	5280		20.50	
		60	5300		20.50	
		64	5320		20.50	
	802.11ac-VHT40 MCS0	54	5270		21.50	
		62	5310		20.50	
	802.11ac-VHT80 MCS0	58	5290		20.50	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	Not Required	21.50	Not Required
		116	5580		21.50	
		124	5620		21.50	
		132	5660		21.50	
		144	5720		21.50	
	802.11n-HT20 MCS0	100	5500		21.50	
		116	5580		21.50	
		124	5620		21.50	
		132	5660		21.50	
		144	5720		21.50	
	802.11n-HT40 MCS0	102	5510	18.20	18.50	99.47
		110	5550	21.10	21.50	
		126	5630	21.00	21.50	
		134	5670	21.10	21.50	
		142	5710	20.90	21.20	
	802.11ac-VHT20 MCS0	100	5500	Not Required	21.50	Not Required
		116	5580		21.50	
		124	5620		21.00	
		132	5660		20.50	
		144	5720		21.50	
	802.11ac-VHT40 MCS0	102	5510		18.50	
		110	5550		21.50	
		126	5630		21.50	
		134	5670		21.50	
		142	5710		21.20	
	802.11ac-VHT80 MCS0	106	5530		20.50	
		122	5610		20.50	
		138	5690		20.50	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	Not Required	20.00	Not Required
		157	5785		20.00	
		165	5825		20.00	
	802.11n-HT20 MCS0	149	5745		20.00	
		157	5785		20.00	
		165	5825		20.00	
	802.11n-HT40 MCS0	151	5755	19.90	20.00	99.47
		159	5795	19.70	20.00	
	802.11ac-VHT20 MCS0	149	5745	Not Required	20.00	Not Required
		157	5785		20.00	
		165	5825		20.00	
	802.11ac-VHT40 MCS0	151	5755		20.00	
		159	5795		20.00	
	802.11ac-VHT80 MCS0	155	5775	19.80	20.00	96.12

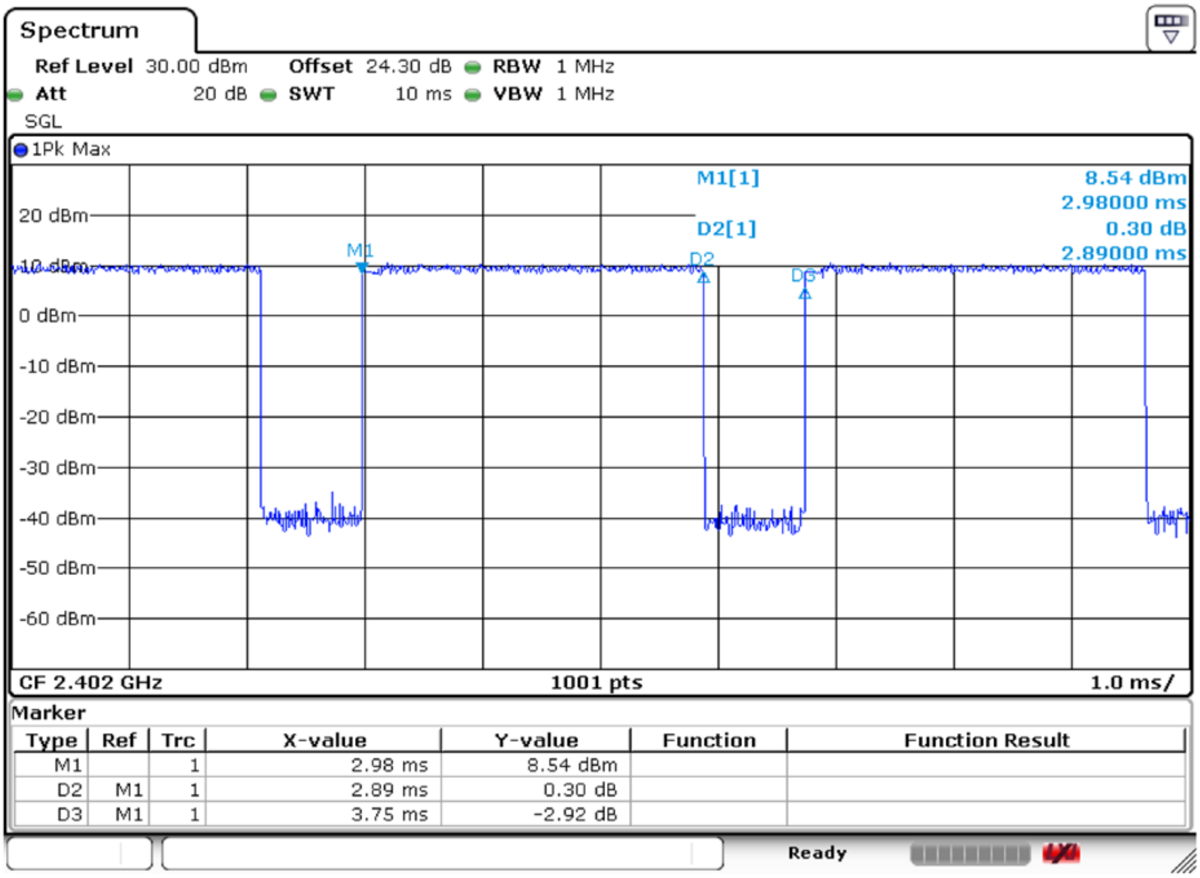
<2.4GHz Bluetooth>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
Bluetooth	BR / EDR 2.0 1Mbps	0	2402	4.70	6.00	77.07
		39	2441	5.70	6.50	
		78	2480	4.30	5.00	
	BR / EDR 2.0 2Mbps	0	2402	Not Required	4.00	Not Required
		39	2441		4.00	
		78	2480		4.00	
	BR / EDR 2.0 3Mbps	0	2402		4.00	
		39	2441		4.00	
		78	2480		4.00	
	LE 4.0 GFSK	0	2402		6.00	
		19	2440		6.00	
		39	2480		6.00	

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 77.07% considered in SAR testing, and the duty cycle would be scaled to theoretical 83.3% in reported SAR calculation.

BT Duty cycle

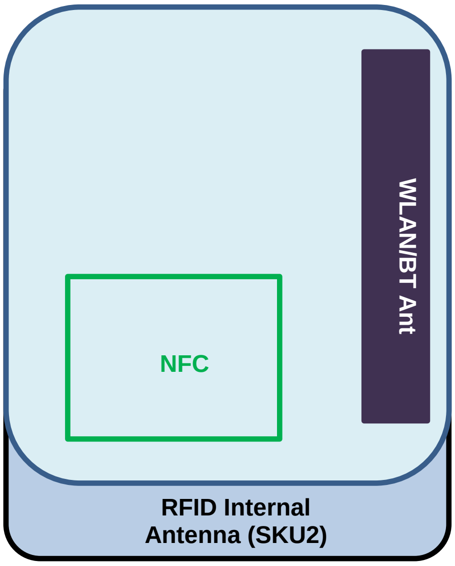


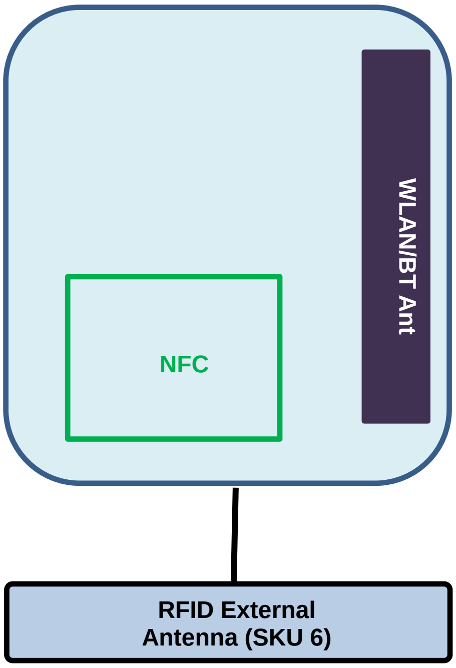
12. RFID Output Power (Unit: dBm)

Internal_ SKU2			
Mode	Frequency (MHz)	Average power (dBm)	Tune-up Limit (dBm)
RFID	917.9	22.40	24.00
	922.7	22.40	24.00
	927.7	22.30	24.00
Duty Cycle (%)		87.23	

External_ SKU6			
Mode	Frequency (MHz)	Average power (dBm)	Tune-up Limit (dBm)
RFID	917.9	22.50	24.00
	922.7	22.50	24.00
	927.7	22.40	24.00
Duty Cycle (%)		86.59	

13. Antenna Location





14. SAR Test Results

General Note:

1. The UHF RFID was using engineering mode to continuous transmission.
2. The UHF RFID is made of a Core unit (main wearable computer running Android OS), one RFID module and one battery. In order to preserve the battery life as well as preventing excessive heat to be dissipated, RF duty cycle will be limited to 20% by SW.
3. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   d. For RFID: Reported SAR(W/kg)= Measured SAR(W/kg) * Tune-up Scaling Factor * Duty Cycle scaling factor
4. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
5. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, WLAN5.2GHz SAR testing is not required when the WLAN5.3GHz band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for WLAN5.2GHz band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

NFC Note:

1. NFC mainly operate in hand-held extremity exposure conditions and NFC sensing distance with other device or reading tag is about 20cm, therefore Standalone 10-g extremity SAR testing for NFC will be performed with active mode and max power mode, with 100% duty cycle at 0mm separation distance.
2. NFC 13.56MHz antenna port is not available on the device to support conducted power measurement, therefore the measured results are referred to as reported SAR.
3. NFC SAR test tissue-simulating liquid parameter: refer to IEC/IEEE 62209-1528 2020.

14.1 Head SAR

<RFID SAR>

Plot No.	Band	Test Position	Gap (mm)	Freq. (MHz)	SKU	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	UHF RFID	Front	10mm	917.9	SKU 2	22.40	24.00	1.445	87.23	0.229	0.05	0.314	0.104
01	UHF RFID	Front	10mm	922.7	SKU 2	22.40	24.00	1.445	87.23	0.229	-0.1	0.715	0.237
	UHF RFID	Front	10mm	927.7	SKU 2	22.30	24.00	1.479	87.23	0.229	-0.15	0.694	0.235
	UHF RFID	Front	10mm	917.9	SKU 6	22.50	24.00	1.413	86.59	0.231	-0.16	0.084	0.027
	UHF RFID	Front	10mm	922.7	SKU 6	22.50	24.00	1.413	86.59	0.231	-0.17	0.107	0.035
	UHF RFID	Front	10mm	927.7	SKU 6	22.40	24.00	1.445	86.59	0.231	-0.04	0.105	0.035

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	SKU	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	11	2462	SKU 2	21.80	22.00	1.047	100	1.000	-0.12	0.631	0.661
02	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	1	2412	SKU 2	21.60	22.00	1.096	100	1.000	-0.13	0.680	0.746
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	6	2437	SKU 2	21.50	22.00	1.122	100	1.000	-0.06	0.660	0.741
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	11	2462	SKU 6	21.80	22.00	1.047	100	1.000	-0.04	0.618	0.647
03	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	54	5270	SKU 2	21.10	21.50	1.096	99.47	1.005	-0.02	1.050	1.157
	WLAN5GHz	802.11a 6Mbps	Front	10mm	64	5320	SKU 2	20.50	21.50	1.259	91.10	1.098	0.13	0.809	1.118
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	54	5270	SKU 6	21.10	21.50	1.096	99.47	1.005	-0.02	0.897	0.988
	WLAN5GHz	802.11a 6Mbps	Front	10mm	64	5320	SKU 6	20.50	21.50	1.259	91.10	1.098	0.04	0.660	0.912
04	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	142	5710	SKU 2	20.90	21.20	1.072	99.47	1.005	-0.17	0.927	0.998
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	110	5550	SKU 2	21.10	21.50	1.096	99.47	1.005	0.06	0.826	0.910
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	102	5510	SKU 2	18.20	18.50	1.072	99.47	1.005	-0.13	0.813	0.876
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	126	5630	SKU 2	21.00	21.50	1.122	99.47	1.005	-0.19	0.844	0.952
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	134	5670	SKU 2	21.10	21.50	1.096	99.47	1.005	-0.01	0.903	0.995
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	142	5710	SKU 6	20.90	21.20	1.072	99.47	1.005	0.03	0.868	0.935
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	110	5550	SKU 6	21.10	21.50	1.096	99.47	1.005	0.08	0.806	0.888
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	102	5510	SKU 6	18.20	18.50	1.072	99.47	1.005	-0.05	0.713	0.768
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	126	5630	SKU 6	21.00	21.50	1.122	99.47	1.005	-0.04	0.764	0.862
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	134	5670	SKU 6	21.10	21.50	1.096	99.47	1.005	-0.03	0.713	0.786
05	WLAN5GHz	802.11ac-VHT80 MCS0	Front	10mm	155	5775	SKU 2	19.80	20.00	1.047	96.12	1.040	-0.04	0.638	0.695
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	151	5755	SKU 2	19.90	20.00	1.023	99.47	1.005	0.1	0.616	0.634
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	10mm	155	5775	SKU 6	19.80	20.00	1.047	96.12	1.040	-0.03	0.623	0.678

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	SKU	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
06	Bluetooth	1Mbps	Front	10mm	39	2441	SKU 2	5.70	6.50	1.202	77.07	1.081	0.07	0.003	0.004
	Bluetooth	1Mbps	Front	10mm	0	2402	SKU 2	4.70	6.00	1.349	77.07	1.081	0.1	0.001	0.001
	Bluetooth	1Mbps	Front	10mm	78	2480	SKU 2	4.30	5.00	1.175	77.07	1.081	-0.08	0.001	0.001
	Bluetooth	1Mbps	Front	10mm	39	2441	SKU 6	5.70	6.50	1.202	77.07	1.081	0.03	0.001	0.001

14.2 Body SAR

<RFID SAR>

Plot No.	Band	Test Position	Gap (mm)	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
07	UHF RFID	Front	0mm	917.9	SKU 6	22.50	24.00	1.413	86.59	0.231	-0.18	2.270	0.741
	UHF RFID	Front	0mm	922.7	SKU 6	22.50	24.00	1.413	86.59	0.231	-0.04	1.920	0.626
	UHF RFID	Front	0mm	927.7	SKU 6	22.40	24.00	1.445	86.59	0.231	-0.01	1.350	0.451

14.3 Extremity SAR

<NFC SAR>

Plot No.	Band	Test Position	Gap (mm)	Freq. (MHz)	SKU	Power Drift (dB)	Measured 10g SAR (W/kg)
08	NFC	Back	0mm	13.56	SKU 2	-0.01	0.001
	NFC	Back	0mm	13.56	SKU 6	-0.01	0.001

<RFID SAR>

Plot No.	Band	Test Position	Gap (mm)	Freq. (MHz)	SKU	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	UHF RFID	Back	0mm	917.9	SKU 2	22.40	24.00	1.445	87.23	0.229	-0.06	0.287	0.095
	UHF RFID	Back	0mm	922.7	SKU 2	22.40	24.00	1.445	87.23	0.229	-0.02	0.196	0.065
	UHF RFID	Back	0mm	927.7	SKU 2	22.30	24.00	1.479	87.23	0.229	-0.03	0.297	0.101
	UHF RFID	Back	0mm	917.9	SKU 6	22.50	24.00	1.413	86.59	0.231	0.06	0.697	0.227
09	UHF RFID	Back	0mm	922.7	SKU 6	22.50	24.00	1.413	86.59	0.231	-0.04	0.697	0.227
	UHF RFID	Back	0mm	927.7	SKU 6	22.40	24.00	1.445	86.59	0.231	0.04	0.666	0.222

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	SKU	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
10	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	11	2462	SKU 2	21.80	22.00	1.047	100	1.000	0.05	0.336	0.352
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	1	2412	SKU 2	21.60	22.00	1.096	100	1.000	0.09	0.255	0.280
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	6	2437	SKU 2	21.50	22.00	1.122	100	1.000	-0.04	0.259	0.291
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	11	2462	SKU 6	21.80	22.00	1.047	100	1.000	-0.14	0.075	0.079
11	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	54	5270	SKU 2	21.10	21.50	1.096	99.47	1.005	-0.15	0.125	0.138
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	54	5270	SKU 6	21.10	21.50	1.096	99.47	1.005	-0.09	0.059	0.065
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	102	5510	SKU 2	18.20	18.50	1.072	99.47	1.005	0.16	0.074	0.080
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	110	5550	SKU 2	21.10	21.50	1.096	99.47	1.005	0.05	0.076	0.084
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	126	5630	SKU 2	21.00	21.50	1.122	99.47	1.005	-0.12	0.079	0.089
12	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	134	5670	SKU 2	21.10	21.50	1.096	99.47	1.005	0.01	0.087	0.096
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	142	5710	SKU 2	20.90	21.20	1.072	99.47	1.005	0.05	0.078	0.084
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	102	5510	SKU 6	18.20	18.50	1.072	99.47	1.005	-0.1	0.032	0.034
13	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	155	5775	SKU 2	19.80	20.00	1.047	96.12	1.040	-0.18	0.048	0.052
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	151	5755	SKU 2	19.90	20.00	1.023	99.47	1.005	0.05	0.048	0.049
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	155	5775	SKU 6	19.80	20.00	1.047	96.12	1.040	-0.05	0.038	0.041

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	SKU	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
14	Bluetooth	1Mbps	Back	0mm	39	2441	SKU 2	5.70	6.50	1.202	77.07	1.081	0.03	0.002	0.003
	Bluetooth	1Mbps	Back	0mm	0	2402	SKU 2	4.70	6.00	1.349	77.07	1.081	0.09	0.001	0.001
	Bluetooth	1Mbps	Back	0mm	78	2480	SKU 2	4.30	5.00	1.175	77.07	1.081	-0.12	0.001	0.001
	Bluetooth	1Mbps	Back	0mm	39	2441	SKU 6	5.70	6.50	1.202	77.07	1.081	0.04	0.001	0.001

14.4 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	SKU	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	54	5270	SKU 2	21.10	21.50	1.096	99.47	1.005	-0.02	1.050	-	1.157
2nd	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	54	5270	SKU 2	21.10	21.50	1.096	99.47	1.005	0.07	0.995	1.056	1.096
1st	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	142	5710	SKU 2	20.90	21.20	1.072	99.47	1.005	-0.17	0.927	-	0.998
2nd	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	142	5710	SKU 2	20.90	21.20	1.072	99.47	1.005	-0.09	0.915	1.013	0.985

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

15. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Head	Extremity
1.	WLAN2.4GHz + RFID	Yes	Yes
2.	WLAN5GHz + RFID	Yes	Yes
3.	Bluetooth + RFID	Yes	Yes
4.	WLAN2.4GHz + NFC + RFID		Yes
5.	WLAN5GHz + NFC + RFID		Yes
6.	Bluetooth + NFC + RFID		Yes

1. The Scaled SAR summation is calculated based on the same configuration and test position.
2. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

15.1 Head Exposure Conditions

Exposure Position	1	2	3	4	1+4 Summed 1g SAR (W/kg)	2+4 Summed 1g SAR (W/kg)	3+4 Summed 1g SAR (W/kg)
	WLAN2.4GHz	WLAN5GHz	Bluetooth	UHF RFID			
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
Front at 10mm	0.746	1.157	0.004	0.237	**0.983**	**1.394**	**0.241**

15.2 Extremity Exposure Conditions

Exposure Position	1	2	3	4	5	1+4+5 Summed 10g SAR (W/kg)	2+4+5 Summed 10g SAR (W/kg)	3+4+5 Summed 10g SAR (W/kg)
	WLAN2.4GHz	WLAN5GHz	Bluetooth	NFC	UHF RFID			
	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)			
Back at 0mm	0.352	0.138	0.003	0.001	0.227	**0.580**	**0.366**	**0.231**

Test Engineer： Jeff Tsao, Randy Lin and Kevin Guo

16. Uncertainty Assessment

Declaration of Conformity:
The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

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

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

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

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

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

(b) κ is the coverage factor

Standard Uncertainty for Assumed Distribution

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

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

The judgment of conformity in the report is based on the measurement results excluding the measurement uncertainty.

Applicable for SAR Measurements:

Uncertainty Budget (4 MHz - 10 GHz range)							
Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	18.60	N	2	1	1	9.3	9.3
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Linearity	4.70	R	1.732	1	1	2.7	2.7
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Boundary Effects	2.00	R	1.732	1	1	1.2	1.2
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	6.70	R	1.732	1	1	3.9	3.9
Post-processing	4.00	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Holder	3.60	N	1	1	1	3.6	3.6
Test sample Positioning	3.03	N	1	1	1	3.0	3.0
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Phantom and Setup							
Phantom Uncertainty	7.60	R	1.732	1	1	4.4	4.4
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.77	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.77	2.3	2.2
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.77	1.1	1.1
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.77	1.7	1.6
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						14.5%	14.2%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						29.0%	28.4%

17. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[6] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[7] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[8] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.

[9] IEC/IEEE 62209-1528:2020, “Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz)”, Oct. 2020