FCC/ISED SAR Test Report

APPLICANT	: Motorola Solutions Inc.
EQUIPMENT	: WAVE PTX TWO-WAY RADIO
BRAND NAME	: MOTOROLA
MODEL NAME	: TLK 25
MODEL NUMBER(FCC)	: HK2197A
HVIN	: HK2199A
PMN	: TLK 25
MODEL NUMBER(IC)	: HK2199A
FCC ID	: AZ499FT7171
IC	: 109U-99FT7171
STANDARD	: FCC 47 CFR Part 2 (2.1093) ISED RSS-102 Issue 6

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093, FCC KDB and ISED RSS-102 Issue 6 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Si Zhang

Approved by: Si Zhang

ACCREDITED
Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA341404	Rev. 01	Initial issue of report.	Mar. 13, 2024
FA341404	Rev. 02	1. Updated Applicant Manufacturer information on page 5. 2. Updated SW information and added S/N information in section 4.1. 3. Added System Verification data in section 11. 4. Added sample 2 SAR relevant data in section 15/16. 5. Added the verification conducted powe of sample2 in appendix D.	Apr. 08, 2024

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Solutions Inc., WAVE PTX TWO-WAY RADIO, TLK 25,** are as follows.

Highest 1g SAR Summary				
Equipment Class	Frequency Band		Body-worn (Separation 0mm) 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
Licensed	LTE	LTE Band 13	1.04	1.27
		LTE Band 5	1.03	
		LTE Band 66/4	1.11	
		LTE Band 2	1.05	
DTS	WLAN	2.4GHz WLAN	1.01	-
NII		5GHz WLAN	**1.19**	-
DSS	Bluetooth	2.4GHz Bluetooth	0.16	1.27

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Extremity 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission 10g SAR (W/kg)
Licensed	LTE	LTE Band 13	**1.27**	1.38
		LTE Band 5	0.93	
		LTE Band 66/4	1.00	
		LTE Band 2	0.90	
DTS	WLAN	2.4GHz WLAN	0.58	-
NII		5GHz WLAN	0.77	-
DSS	Bluetooth	2.4GHz Bluetooth	0.11	1.38
Date of Testing:			2024/1/31 ~ 2024/4/4	

Remark:

1. This device supports LTE B4 and B66. Since the supported frequency span for LTE B4 falls completely within the supports frequency span for LTE B66, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B66.

Declaration of Conformity:
The test results with all measurement uncertainty excluded are 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.

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093), ANSI/IEEE C95.1-1992 and ISED RSS-102 Issue 6, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013, FCC KDB publications and IEC/IEEE 62209-1528:2020, RSS-102.SAR.MEAS Issue 1.

2. Administration Data

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR07-KS	CN1257	314309

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Test Site No.	Sporton Site No.	Company No.	CAB identifier
	SAR07-KS	4086E	CN0050

Applicant	
Company Name	Motorola Solutions Inc.
Address	Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D, 11900 Bayan Lepas, Penang, Malaysia.

Manufacturer	
Company Name	Motorola Solutions Malaysia SDN BHD
Address	Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D, 11900 Bayan Lepas, Penang, Malaysia.

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

FCC	· FCC 47 CFR Part 2 (2.1093) · ANSI/IEEE C95.1-1992 · IEEE 1528-2013 · 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 · FCC KDB 616217 D04 SAR for laptop and tablets v01r02 · FCC KDB 941225 D05 SAR for LTE Devices v02r05
ISED	· ISED RSS-102 Issue 6 · RSS-102.SAR.MEAS Issue 1 · IEC/IEEE 62209-1528:2020 · FCC KDB 447498 D01 General RF Exposure Guidance v06 · FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02 · FCC KDB 616217 D04 SAR for laptop and tablets v01r02 · FCC KDB 941225 D05 SAR for LTE Devices v02r05

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	WAVE PTX TWO-WAY RADIO
Brand Name	MOTOROLA
Model Name	TLK 25
Model Name(FCC)	TLK 25
Model Number(FCC)	HK2197A
HVIN	HK2199A
PMN	TLK 25
Model Number(IC)	HK2199A
FCC ID	AZ499FT7171
IC	109U-99FT7171
IMEI Code	Sample1: 354667800018127(#21), 354667800018242(#22), 354667800018259(#27) Sample2: 354667800020420(#33), 354667800019844(#34) Sample3: 354667800020313(#35)
Wireless Technology and Frequency Range	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 66: 1710 MHz ~ 1780 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	LTE: QPSK, 16QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
SW Version	VANGOGH_BASE_ENG_R01.01.01_AP_R01.02.01_LNA
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Identical Prototype

Remark:

1. This device does not support voice function, and the device does not have receiver or speakers, so in-front-of the face SAR testing was not required. For the device can't support held-to-ear operating mode, so no need to considering head SAR testing.
2. The device can use with assigned accessory manufacturer offered, so perform 0mm body worn accessory SAR.
3. The device implements Proximity sensors trigger reduced power for the power management for SAR compliance at different exposure conditions (body-worn, extremity). Details about the sensor detection are provided in the operational description. The device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to appendix D. power table.
4. The device has four headsets, including 3 wired headsets (Earphone 1/2/3) and 1 wireless Bluetooth headset (Earphone 4). The difference between the headset 1 and headset 2 is that the corresponding labels are different. When simulated voice call via Wireless Bluetooth headset, the device may be in handheld state. So as front and back sides of the phone have been evaluated and also WWAN simultaneously transmitted with Bluetooth, no need to test EUT for body worn condition with Bluetooth headset on. So only headset 2/3 was chosen to perform SAR testing at the worst position SAR among all bands.
5. There are two vintages under test, sample 1 is P2A SAR, sample 2 and sample 3 is PP SAR, according to the difference, the prototype shell mainly changes from glossy to frosted, so P2A sample is used for full testing and PP sample is used to verify highest configurations. The highest SAR result from P2A and PP will be reported.

4.2 Specification of Accessory

Accessories Information				
Battery	**Brand Name**	MOTOROLA	**Model Name**	PMNN4602A
Earphone 1	**Brand Name**	MOTOROLA	**Model Name**	PMLN8536A
Earphone 2	**Brand Name**	MOTOROLA	**Model Name**	PMLN8536B
Earphone 3	**Brand Name**	MOTOROLA	**Model Name**	PMLN8613A
Earphone 4	**Brand Name**	MOTOROLA	**Model Name**	PMLN8123A
Holster Belt Clip	**Brand Name**	MOTOROLA	**Model Name**	PMLN8537A
Badge Clip	**Brand Name**	MOTOROLA	**Model Name**	PMLN8538A

4.3 General LTE SAR Test and Reporting Considerations

<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>AZ499FT7171</td></tr>
<tr><td>IC</td><td>109U-99FT7171</td></tr>
<tr><td>Equipment Name</td><td>WAVE PTX TWO-WAY RADIO</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>LTE Band 2: 1850 MHz ~ 1910 MHz
LTE Band 4: 1710 MHz ~ 1755 MHz
LTE Band 5: 824 MHz ~ 849 MHz
LTE Band 13: 777 MHz ~ 787 MHz
LTE Band 66: 1710 MHz ~ 1780 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 13: 5MHz, 10MHz
LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz</td></tr>
<tr><td>uplink modulations used</td><td>QPSK / 16QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Data only</td></tr>
<tr><td>LTE Release Version</td><td>R10, Cat4</td></tr>
<tr><td>CA Support</td><td>Not Supported</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table>
</td></tr>
<tr><td>LTE A-MPR</td><td>In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, when operating in Proximity sensors/handheld trigger reduced power, body -worn /extremity will trigger reduced power for some bands applied to satisfy SAR compliance, the detail please referred to section 13.</td></tr>
</table>

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 5

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 13

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5		
M	23230	782	23230	782
H	23255	784.5		

LTE Band 66

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

<For LTE Overlap Bands Description>

1) LTE Bands BW

Band	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
LTE Band 4	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 66	Yes	Yes	Yes	Yes	Yes	Yes

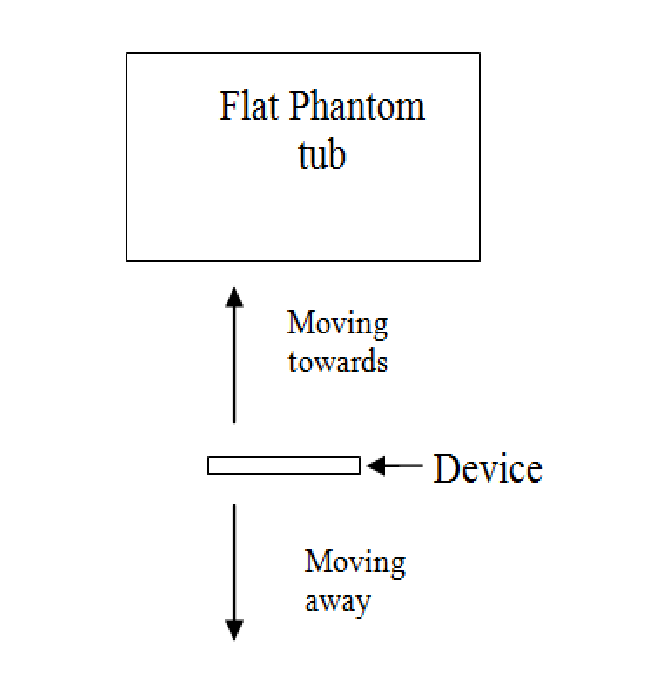
2) LTE Bands tune up:

Band	Sensor On Tune-up Limit	Sensor Off Tune-up Limit	Default Tune-up Limit
LTE Band 4	21	24	24
LTE Band 66	21	24	24

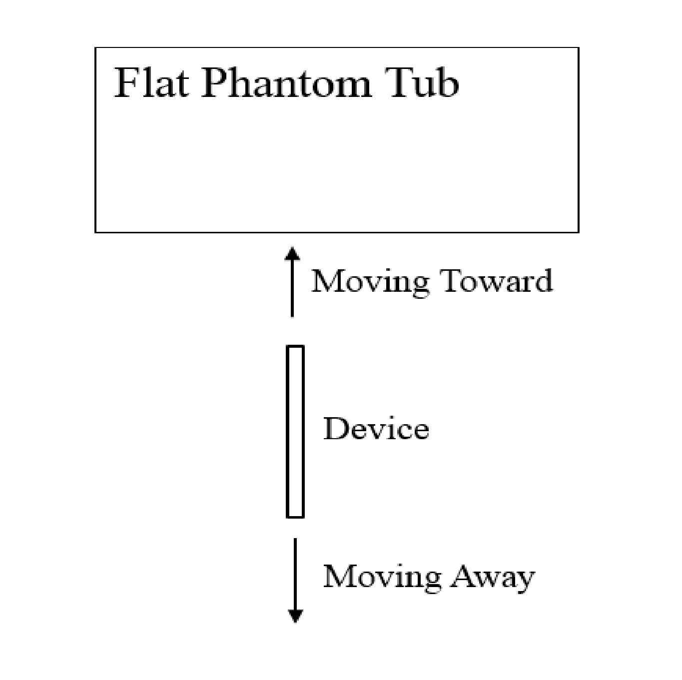
5. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance>:

1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (1900MHz) and lowest (1750MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the bottom ends of the EUT are utilized to determine when the device comes in proximity of the user's body or finger or hand at the front/back/bottom/right sides the device. There is no need to do sensor coverage testing for the proximity sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the proximity sensor entirely covers the antenna.
3. The device employs proximity sensors also can detect the presence of the user's body or finger or hand when handheld state at the front/back/bottom/right sides of the device. When front/back/bottom/right sides of handheld condition is detected reduced power will be active.
4. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1mm was performed:



Handheld detection test set-up, Front and Back sides



Handheld detection test set-up, Right Side, and Bottom Side

<Handheld on>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Right Side		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	8	10	4	7	2	4	4	6

6. RF Exposure Limits

6.1 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.

6.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 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.

ISED has adopted the SAR limits established in Health Canada's RF exposure guideline. The basic restrictions outlined in the following table 3 are based on Health Canada's Safety Code 6 and its Notice.

Table 3 : SAR basic restrictions limits (100 kHz to 6 GHz)

Body region	Uncontrolled environment average SAR (W/kg)	Controlled environment average SAR (W/kg)	Averaging time (minutes)	Averaging mass (g)
Whole body	0.08	0.4	6	whole body
Localized head, neck and trunk	1.6	8	6	1
Localized limbs	4	20	6	10

7. Specific Absorption Rate (SAR)

7.1 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.

7.2 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:

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

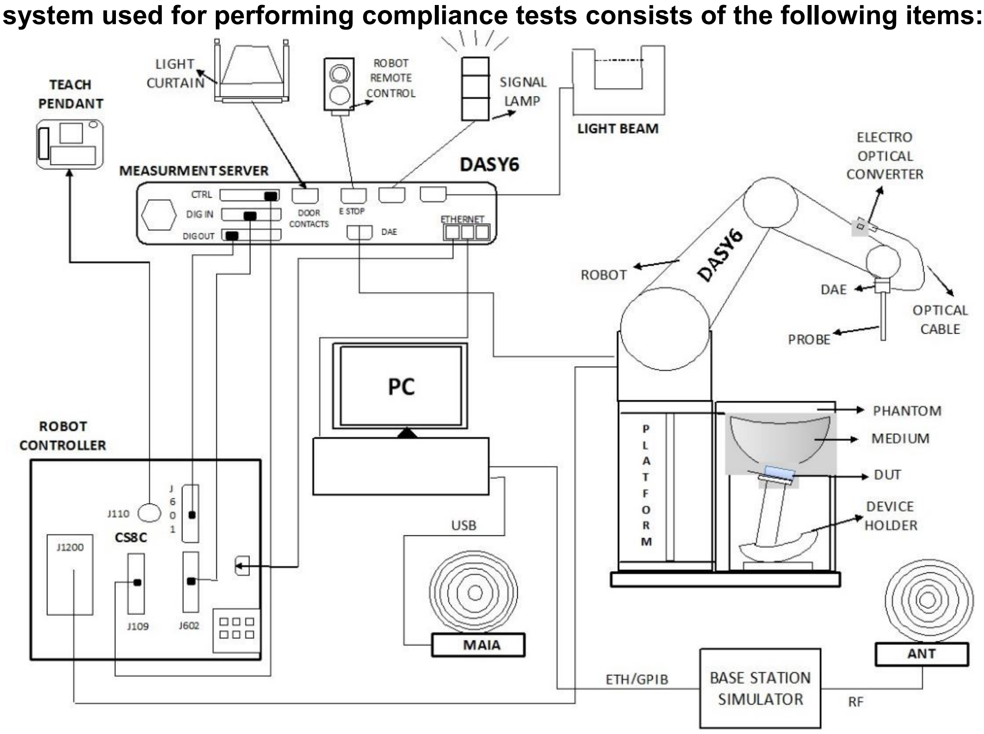
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

The DASY5 system used for performing compliance tests consists of the following items:



- 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 Win7 or Win10 and the DASY5 or DASY6 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.

8.1 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.

<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

8.2 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.

Photo of DAE

8.3 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 or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

8.4 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

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(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 Setup Photo 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

9.1 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

9.2 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.

9.3 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/IEEE 62209-1528:2020 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 for FCC.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 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.	

Area scan parameters extracted from IEC/IEEE 62209-1528:2020 measurement 4 MHz to 10 GHz for ISED.

Parameter	**DUT transmit frequency being tested**	
	f ≤ 3 GHz	**3 GHz < f ≤ 10 GHz**
Maximum distance between the measured points (geometric centre of the sensors) and the inner phantom surface (z_{M1} in Figure 20 in mm)	5 ± 1	δ ln(2)/2 ± 0,5 [a]
Maximum spacing between adjacent measured points in mm (see O.8.3.1)[b]	20, or half of the corresponding zoom scan length, whichever is smaller	60/f, or half of the corresponding zoom scan length, whichever is smaller
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)[c]	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Tolerance in the probe angle	1°	1°

[a] δ is the penetration depth for a plane-wave incident normally on a planar half-space.

[b] See Clause O.8 on how Δx and Δy may be selected for individual area scan requirements.

[c] The probe angle relative to the phantom surface normal is restricted due to the degradation in the measurement accuracy in fields with steep spatial gradients. The measurement accuracy decreases with increasing probe angle and increasing frequency. This is the reason for the tighter probe angle restriction at frequencies above 3 GHz.

9.4 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 for FCC.

			$\leq$ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			$\leq$ 2 GHz: $\leq$ 8 mm 2 – 3 GHz: $\leq$ 5 mm*	3 – 4 GHz: $\leq$ 5 mm* 4 – 6 GHz: $\leq$ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		$\leq$ 5 mm	3 – 4 GHz: $\leq$ 4 mm 4 – 5 GHz: $\leq$ 3 mm 5 – 6 GHz: $\leq$ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	$\leq$ 4 mm	3 – 4 GHz: $\leq$ 3 mm 4 – 5 GHz: $\leq$ 2.5 mm 5 – 6 GHz: $\leq$ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		$\geq$ 30 mm	3 – 4 GHz: $\geq$ 28 mm 4 – 5 GHz: $\geq$ 25 mm 5 – 6 GHz: $\geq$ 22 mm

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 *reported* 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.

Zoom scan parameters extracted from IEC/IEEE 62209-1528:2020 measurement 4 MHz to 10 GHz for ISED.

Parameter	DUT transmit frequency being tested	
	$f \le 3$ GHz	3 GHz < $f \le 10$ GHz
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 20 and Table 3, in mm)	5	δ ln(2)/2 [a]
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Maximum spacing between measured points in the x- and y-directions (Δx and Δy, in mm)	8	$24 / f$ [b]
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	5	$10 / (f - 1)$
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	4	$12 / f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2 / \Delta z_1$ in Figure 20)	1,5	1,5
Minimum edge length of the zoom scan volume in the x- and y-directions (L_z in O.8.3.2, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in O.8.3.2 in mm)	30	22
Tolerance in the probe angle	1°	1°

[a] δ is the penetration depth for a plane-wave incident normally on a planar half-space.

[b] This is the maximum spacing allowed, which might not work for all circumstances.

9.5 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.

9.6 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.

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1087	2022/2/24	2025/2/23
SPEAG	835MHz System Validation Kit	D835V2	4d091	2022/8/19	2025/8/18
SPEAG	1750MHz System Validation Kit	D1750V2	1090	2022/2/24	2025/2/22
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	2022/3/30	2025/3/29
SPEAG	2450MHz System Validation Kit	D2450V2	1040	2023/4/25	2024/4/24
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	2022/9/23	2025/9/22
SPEAG	Data Acquisition Electronics	DAE4	1649	2023/4/24	2024/4/23
SPEAG	Dosimetric E-Field Probe	EX3DV4	7630	2023/6/2	2024/6/1
SPEAG	Dosimetric E-Field Probe	EX3DV4	7706	2024/1/24	2025/1/23
SPEAG	SAM Twin Phantom	SAM Twin	TP-2024	NCR	NCR
Testo	Thermo-Hygrometer	608-H1	1241332126	2023/7/10	2024/7/9
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio Communication Analyzer	MT8821C	6262306175	2023/7/5	2024/7/4
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	2023/7/5	2024/7/4
SPEAG	Dielectric Probe Kit	DAK-3.5	1144	2023/8/17	2024/8/16
Anritsu	Vector Signal Generator	MG3710A	6201682672	2024/1/2	2025/1/1
Rohde & Schwarz	Power Meter	NRVD	102081	2023/7/5	2024/7/4
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	2023/7/5	2024/7/4
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	2023/7/5	2024/7/4
R&S	BLUETOOTH TESTER	CBT	101246	2023/5/15	2024/5/14
Rohde & Schwarz	Spectrum Analyzer	FSV7	101631	2023/10/11	2024/10/10
TES	DIGITAC THERMOMETER	1310	220305411	2023/7/8	2024/7/7
ARRA	Power Divider	A3200-2	N/A	Note 1	
MCL	Attenuation1	BW-S10W5+	N/A	Note 1	
MCL	Attenuation2	BW-S10W5+	N/A	Note 1	
MCL	Attenuation3	BW-S10W5+	N/A	Note 1	
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note 1	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note 1	
Agilent	Dual Directional Coupler	778D	20500	Note 1	
Agilent	Dual Directional Coupler	11691D	MY48151020	Note 1	

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
2. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

11. System Verification

11.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. 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, which is shown in Fig. 11.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.2.

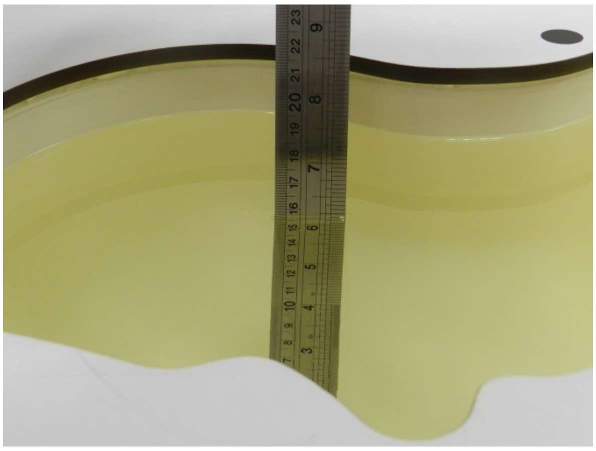


Fig 11.1 Photo of Liquid Height for Head SAR

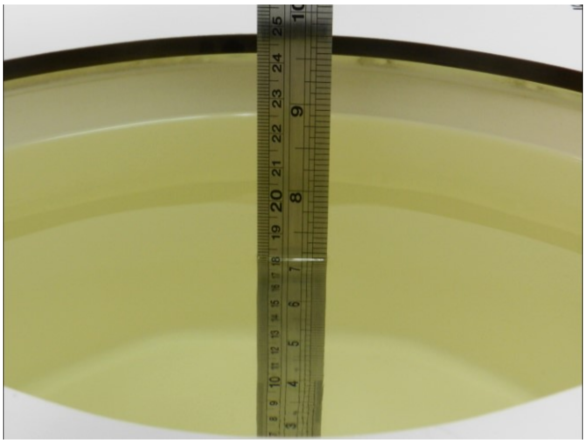


Fig 11.2 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Head	22.6	0.902	41.6	0.89	41.90	1.35	-0.72	±5	2024/1/31
835	Head	22.9	0.931	41.4	0.90	41.50	3.44	-0.24	±5	2024/2/3
1750	Head	22.8	1.35	40.1	1.37	40.10	-1.46	0.00	±5	2024/2/6
1900	Head	22.7	1.43	39.8	1.40	40.00	2.14	-0.50	±5	2024/2/9
2450	Head	22.6	1.77	39.4	1.80	39.20	-1.67	0.51	±5	2024/2/14
5250	Head	22.9	4.67	36.7	4.71	35.90	-0.85	2.23	±5	2024/2/17
5600	Head	22.8	5.08	36.0	5.07	35.50	0.20	1.41	±5	2024/2/19
5750	Head	22.7	5.25	35.8	5.22	35.40	0.57	1.13	±5	2024/2/22
835	Head	22.7	0.920	40.600	0.90	41.50	2.22	-2.17	±5	2024/3/22
2450	Head	22.6	1.850	38.200	1.80	39.20	2.78	-2.55	±5	2024/3/21
5250	Head	22.7	4.570	35.500	4.71	35.90	-2.97	-1.11	±5	2024/3/21
5600	Head	22.6	4.950	34.800	5.07	35.50	-2.37	-1.97	±5	2024/3/21
5750	Head	22.7	5.130	34.600	5.22	35.40	-1.72	-2.26	±5	2024/3/21
1750	Head	22.7	1.340	40.200	1.37	40.10	-2.19	0.25	±5	2024/3/22
5600	Head	22.6	4.950	34.800	5.07	35.50	-2.37	-1.97	±5	2024/4/4

<Tissue Dielectric Parameter Check for Low / Middle / High Frequencies>

General Note:

The tissue measure results for low / middle / high frequencies list below, the results were used in the Dasy SAR system to perform interpolation to determine the dielectric parameters on the SAR test device. The SAR test plots may slightly difference between the tables below due to the digit rounding in the software calculated.

CH	Frequency (MHz)	Liquid Type	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
23230	782	Head	0.911	41.5	0.89	41.75	2.36	-0.72	±5	2024/1/31
20525	836.5	Head	0.932	41.4	0.90	41.50	3.56	-0.24	±5	2024/2/3
132322	1745	Head	1.35	40.3	1.37	40.09	-1.46	0.50	±5	2024/2/6
132072	1720	Head	1.33	40.1	1.36	40.15	-2.21	-0.25	±5	2024/2/6
132572	1770	Head	1.36	40.1	1.38	40.05	-1.45	0.00	±5	2024/2/6
18900	1880	Head	1.42	39.9	1.40	40.00	1.43	-0.25	±5	2024/2/9
18700	1860	Head	1.41	39.9	1.40	40.00	0.71	-0.25	±5	2024/2/9
19100	1900	Head	1.43	39.8	1.40	40.00	2.14	-0.50	±5	2024/2/9
1	2412	Head	1.74	39.4	1.77	39.27	-1.69	0.25	±5	2024/2/14
6	2437	Head	1.76	39.4	1.79	39.22	-1.68	0.51	±5	2024/2/14
11	2462	Head	1.78	39.4	1.81	39.18	-1.66	0.51	±5	2024/2/14
0	2402	Head	1.73	39.4	1.76	39.29	-1.70	0.25	±5	2024/2/14
39	2441	Head	1.76	39.4	1.79	39.22	-1.68	0.51	±5	2024/2/14
78	2480	Head	1.79	39.3	1.80	39.20	-0.56	0.26	±5	2024/2/14
52	5260	Head	4.68	36.6	4.72	35.94	-0.85	1.95	±5	2024/2/17
56	5280	Head	4.71	36.6	4.74	35.92	-0.63	1.95	±5	2024/2/17
64	5320	Head	4.76	36.5	4.78	35.87	-0.42	1.67	±5	2024/2/17
124	5620	Head	5.10	36.0	5.09	35.48	0.20	1.41	±5	2024/2/19
116	5580	Head	5.05	36.0	5.05	35.53	0.00	1.41	±5	2024/2/19
140	5700	Head	5.20	35.8	5.17	35.40	0.58	1.13	±5	2024/2/19
149	5745	Head	5.24	35.8	5.22	35.36	0.38	1.13	±5	2024/2/22
157	5785	Head	5.29	35.7	5.26	35.32	0.57	1.13	±5	2024/2/22
165	5825	Head	5.34	35.6	5.3	35.28	0.75	0.85	±5	2024/2/22
0	2402	Head	1.83	40.9	1.76	39.29	3.98	4.07	±5	2024/3/21
124	5620	Head	4.98	34.8	5.09	35.48	-2.16	-1.97	±5	2024/3/21
165	5825	Head	5.23	35.4	5.3	35.28	-1.32	0.28	±5	2024/3/21
20525	836.5	Head	0.913	42.7	0.90	41.50	1.44	2.89	±5	2024/3/22
64	5320	Head	4.64	35.3	4.78	35.87	-2.93	-1.67	±5	2024/3/21
132322	1745	Head	1.34	42.1	1.37	40.09	-2.19	4.99	±5	2024/3/22
124	5620	Head	5.10	36.0	5.09	35.48	0.20	1.41	±5	2024/4/4

11.3 System Performance Check Results

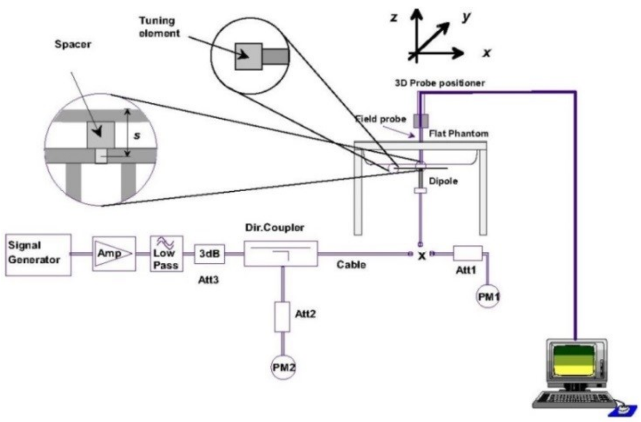
Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the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

<1g SAR>

Date	Frequency (MHz)	Tissue Type	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 (%)
2024/1/31	750	Head	50	1087	7630	1649	0.406	8.58	8.12	-5.36
2024/2/3	835	Head	50	4d091	7630	1649	0.447	9.45	8.94	-5.40
2024/2/6	1750	Head	50	1090	7630	1649	1.73	37.00	34.6	-6.49
2024/2/9	1900	Head	50	5d118	7630	1649	2.11	39.30	42.2	7.38
2024/2/14	2450	Head	50	1040	7630	1649	2.70	52.70	54	2.47
2024/2/17	5250	Head	50	1113	7630	1649	4.05	81.50	81	-0.61
2024/2/19	5600	Head	50	1113	7630	1649	4.36	82.60	87.2	5.57
2024/2/22	5750	Head	50	1113	7630	1649	3.96	80.80	79.2	-1.98
2024/3/22	835	Head	50	4d091	7706	1649	0.449	9.45	8.98	-4.97
2024/3/21	2450	Head	50	1040	7706	1649	2.690	52.70	53.8	2.09
2024/3/21	5250	Head	50	1113	7706	1649	3.920	81.50	78.4	-3.80
2024/3/21	5600	Head	50	1113	7706	1649	4.280	82.60	85.6	3.63
2024/3/21	5750	Head	50	1113	7706	1649	3.880	80.80	77.6	-3.96
2024/3/22	1750	Head	50	1090	7706	1649	1.750	37.00	35	-5.41
2024/4/4	5600	Head	50	1113	7706	1649	4.270	82.60	85.4	3.39

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2024/1/31	750	Head	50	1087	7630	1649	0.272	5.65	5.44	-3.72
2024/2/3	835	Head	50	4d091	7630	1649	0.297	6.22	5.94	-4.50
2024/2/6	1750	Head	50	1090	7630	1649	0.909	19.50	18.18	-6.77
2024/2/9	1900	Head	50	5d118	7630	1649	1.09	20.40	21.8	6.86
2024/2/14	2450	Head	50	1040	7630	1649	1.28	24.60	25.6	4.07
2024/2/17	5250	Head	50	1113	7630	1649	1.18	23.30	23.6	1.29
2024/2/19	5600	Head	50	1113	7630	1649	1.26	23.70	25.2	6.33
2024/2/22	5750	Head	50	1113	7630	1649	1.15	23.00	23	0.00
2024/3/22	835	Head	50	4d091	7706	1649	0.295	6.22	5.9	-5.14
2024/3/21	2450	Head	50	1040	7706	1649	1.270	24.60	25.4	3.25
2024/3/21	5250	Head	50	1113	7706	1649	1.140	23.30	22.8	-2.15
2024/3/21	5600	Head	50	1113	7706	1649	1.230	23.70	24.6	3.80
2024/3/21	5750	Head	50	1113	7706	1649	1.120	23.00	22.4	-2.61
2024/3/22	1750	Head	50	1090	7706	1649	0.917	19.50	18.34	-5.95
2024/4/4	5600	Head	50	1113	7706	1649	1.230	23.70	24.6	3.80



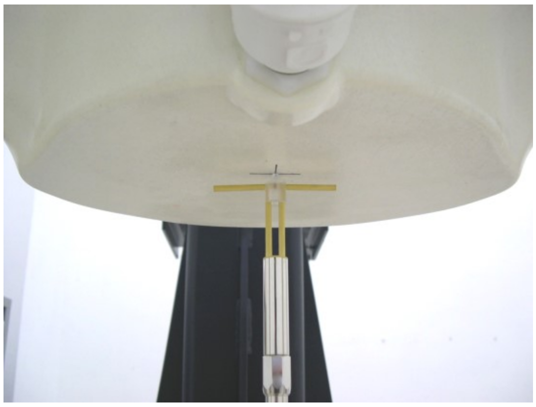


Fig 11.3.1 System Performance Check Setup **Fig 11.3.2 Setup Photo**

12. RF Exposure Positions

12.1 SAR Testing for WAVE PTX TWO-WAY RADIO

<For Body>

(a) To position the device parallel to the phantom surface with back surfaces of the device.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device surface and the flat phantom to 0mm.

<For Extremity SAR>

(a) To position the device parallel to the phantom surface with all surfaces of the device.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device surface and the flat phantom to 0mm.

<EUT Setup Photos>

Please refer to Appendix for the test setup photos.

13. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix D.

<LTE Conducted Power>

General Note:

1. Anritsu MT8821C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE B4 SAR test was covered by B66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
    a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
    b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

<WLAN Conducted Power>

General Note:

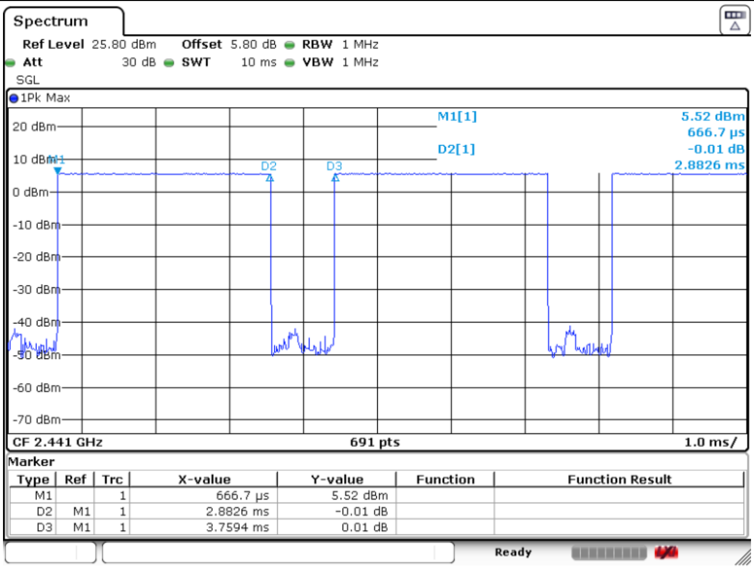
1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default 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.

<2.4GHz Bluetooth>

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle are 76.68% as following figure, Bluetooth SAR scaling need further consideration and the theoretical duty cycle is 83.3%, therefore the actual duty cycle will be scaled up to the theoretical value of Bluetooth reported SAR calculation.

Bluetooth time-domain plot



14. Antenna Location

The detailed antenna location information can refer to SAR Test Setup Photos.

15. SAR Test Results

General Note:

1. 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 SAR testing of Bluetooth signal with 83.3% theoretical duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle) *83.3%".
   d. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   e. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. 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
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The device implements Proximity sensors trigger reduced power for the power management for SAR compliance at different exposure conditions (body-worn, extremity). The device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to appendix D. power table.
5. For some WWAN frequency bands, the power level is the same when the sensor is on and when the sensor is off, and there is no difference.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE B4 SAR test was covered by B66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
   b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

WLAN/Bluetooth 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, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 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.

15.1 Body Worn SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Configure	SAR Sensor State	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
750MHz																			
01	LTE Band 13	10M	QPSK	1	0	Back	0mm	Badge Clip	Sensor on	Full Power	23230	782	1	24.15	24.50	1.084	-0.09	0.962	**1.043**
	LTE Band 13	10M	QPSK	25	0	Back	0mm	Badge Clip	Sensor on	Full Power	23230	782	1	23.19	23.50	1.074	0.02	0.707	0.759
	LTE Band 13	10M	QPSK	50	0	Back	0mm	Badge Clip	Sensor on	Full Power	23230	782	1	23.06	23.50	1.107	-0.01	0.751	0.831
	LTE Band 13	10M	QPSK	1	0	Back	0mm	Badge Clip + Van Gogh Earpiece	Sensor on	Full Power	23230	782	1	24.15	24.50	1.084	-0.15	0.836	0.906
	LTE Band 13	10M	QPSK	1	0	Back	0mm	Badge Clip + Short Cord Earpiece	Sensor on	Full Power	23230	782	1	24.15	24.50	1.084	-0.09	0.838	0.908
	LTE Band 13	10M	QPSK	1	0	Back	0mm	Holster Belt Clip	Sensor off	Full Power	23230	782	1	24.15	24.50	1.084	-0.18	0.204	0.221
	LTE Band 13	10M	QPSK	25	0	Back	0mm	Holster Belt Clip	Sensor off	Full Power	23230	782	1	23.19	23.50	1.074	-0.15	0.186	0.200
	LTE Band 13	10M	QPSK	1	0	Back	0mm	Holster Belt Clip + Van Gogh Earpiece	Sensor off	Full Power	23230	782	1	24.15	24.50	1.084	-0.12	0.114	0.124
	LTE Band 13	10M	QPSK	1	0	Back	0mm	Holster Belt Clip + Short Cord Earpiece	Sensor off	Full Power	23230	782	1	24.15	24.50	1.084	-0.06	0.136	0.147
835MHz																			
02	LTE Band 5	10M	QPSK	1	0	Back	0mm	Badge Clip	Sensor on	Full Power	20525	836.5	1	23.78	24.50	1.180	-0.04	0.876	**1.034**
	LTE Band 5	10M	QPSK	25	0	Back	0mm	Badge Clip	Sensor on	Full Power	20525	836.5	1	22.80	23.50	1.175	-0.02	0.804	0.945
	LTE Band 5	10M	QPSK	50	0	Back	0mm	Badge Clip	Sensor on	Full Power	20525	836.5	1	22.74	23.50	1.191	-0.03	0.766	0.912
	LTE Band 5	10M	QPSK	1	0	Back	0mm	Badge Clip + Van Gogh Earpiece	Sensor on	Full Power	20525	836.5	1	23.78	24.50	1.180	-0.01	0.720	0.850
	LTE Band 5	10M	QPSK	1	0	Back	0mm	Badge Clip + Short Cord Earpiece	Sensor on	Full Power	20525	836.5	1	23.78	24.50	1.180	-0.09	0.659	0.778
	LTE Band 5	10M	QPSK	1	0	Back	0mm	Holster Belt Clip	Sensor off	Full Power	20525	836.5	1	23.78	24.50	1.180	-0.12	0.184	0.217
	LTE Band 5	10M	QPSK	25	0	Back	0mm	Holster Belt Clip	Sensor off	Full Power	20525	836.5	1	22.80	23.50	1.175	-0.13	0.177	0.208
	LTE Band 5	10M	QPSK	1	0	Back	0mm	Holster Belt Clip + Van Gogh Earpiece	Sensor off	Full Power	20525	836.5	1	23.78	24.50	1.180	-0.13	0.106	0.125
	LTE Band 5	10M	QPSK	1	0	Back	0mm	Holster Belt Clip + Short Cord Earpiece	Sensor off	Full Power	20525	836.5	1	23.78	24.50	1.180	-0.04	0.086	0.102
1750MHz																			
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	132322	1745	1	20.36	21.00	1.159	0.09	0.830	0.962
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	132072	1720	1	20.34	21.00	1.164	-0.19	0.820	0.955
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	132572	1770	1	20.32	21.00	1.169	-0.14	0.833	0.974
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	132322	1745	1	20.32	21.00	1.169	-0.19	0.805	0.941
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	132072	1720	1	20.29	21.00	1.178	-0.13	0.767	0.903
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	132572	1770	1	20.22	21.00	1.197	-0.1	0.802	0.960
	LTE Band 66	20M	QPSK	100	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	132322	1745	1	20.28	21.00	1.180	-0.1	0.821	0.969
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Badge Clip + Van Gogh Earpiece	Sensor on	Reduced Power	132572	1770	1	20.32	21.00	1.169	-0.14	0.876	1.024
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Badge Clip + Van Gogh Earpiece	Sensor on	Reduced Power	132322	1745	1	20.36	21.00	1.159	0.03	0.817	0.947
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Badge Clip + Van Gogh Earpiece	Sensor on	Reduced Power	132072	1720	1	20.34	21.00	1.164	0.08	0.867	1.009
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Badge Clip + Short Cord Earpiece	Sensor on	Reduced Power	132572	1770	1	20.32	21.00	1.169	-0.05	0.829	0.970
03	LTE Band 66	20M	QPSK	1	0	Back	3mm	Badge Clip + Van Gogh Earpiece	Sensor off	Full Power	132572	1770	1	23.35	24.00	1.161	-0.17	0.959	**1.114**
	LTE Band 66	20M	QPSK	1	0	Back	3mm	Badge Clip + Van Gogh Earpiece	Sensor off	Full Power	132322	1745	1	23.40	24.00	1.148	-0.01	0.835	0.959
	LTE Band 66	20M	QPSK	1	0	Back	3mm	Badge Clip + Van Gogh Earpiece	Sensor off	Full Power	132072	1720	1	23.31	24.00	1.172	-0.06	0.800	0.938
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Holster Belt Clip	Sensor off	Full Power	132322	1745	1	23.40	24.00	1.148	-0.06	0.208	0.239
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Holster Belt Clip	Sensor off	Full Power	132322	1745	1	22.56	23.00	1.107	-0.08	0.202	0.224
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Holster Belt Clip + Van Gogh Earpiece	Sensor off	Full Power	132322	1745	1	23.40	24.00	1.148	-0.03	0.225	0.258
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Holster Belt Clip + Short Cord Earpiece	Sensor off	Full Power	132322	1745	1	23.40	24.00	1.148	-0.18	0.215	0.247
1900MHz																			
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	18900	1880	1	20.38	21.00	1.153	-0.17	0.636	0.734
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	18700	1860	1	20.34	21.00	1.164	0.1	0.614	0.715
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	19100	1900	1	20.22	21.00	1.197	0.07	0.598	0.716
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	18900	1880	1	20.33	21.00	1.167	-0.11	0.647	0.755
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	18700	1860	1	20.30	21.00	1.175	0.15	0.690	0.811
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	19100	1900	1	20.13	21.00	1.222	-0.08	0.581	0.710
	LTE Band 2	20M	QPSK	100	0	Back	0mm	Badge Clip	Sensor on	Reduced Power	18900	1880	1	20.31	21.00	1.172	-0.03	0.637	0.747
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Badge Clip + Van Gogh Earpiece	Sensor on	Reduced Power	18700	1860	1	20.30	21.00	1.175	-0.03	0.696	0.818
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Badge Clip + Short Cord Earpiece	Sensor on	Reduced Power	18700	1860	1	20.30	21.00	1.175	-0.02	0.729	0.857
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Badge Clip + Short Cord Earpiece	Sensor on	Reduced Power	19100	1900	1	20.13	21.00	1.222	0.1	0.594	0.726
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Badge Clip + Short Cord Earpiece	Sensor on	Reduced Power	18900	1880	1	20.33	21.00	1.167	0.03	0.655	0.764
04	LTE Band 2	20M	QPSK	1	0	Back	3mm	Badge Clip + Short Cord Earpiece	Sensor off	Full Power	18700	1860	1	23.31	24.00	1.172	-0.11	0.898	**1.053**

	LTE Band 2	20M	QPSK	1	0	Back	3mm	Badge Clip + Short Cord Earpiece	Sensor off	Full Power	19100	1900	1	23.26	24.00	1.186	0.02	0.651	0.772
	LTE Band 2	20M	QPSK	1	0	Back	3mm	Badge Clip + Short Cord Earpiece	Sensor off	Full Power	18900	1880	1	23.35	24.00	1.161	-0.19	0.817	0.949
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Holster Belt Clip	Sensor off	Full Power	18900	1880	1	23.35	24.00	1.161	0.07	0.201	0.233
	LTE Band 2	20M	QPSK	50	0	Back	0mm	Holster Belt Clip	Sensor off	Full Power	18900	1880	1	22.41	23.00	1.146	-0.16	0.153	0.175
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Holster Belt Clip + Van Gogh Earpiece	Sensor off	Full Power	18900	1880	1	23.35	24.00	1.161	0.03	0.214	0.249
	LTE Band 2	20M	QPSK	1	0	Back	0mm	Holster Belt Clip + Short Cord Earpiece	Sensor off	Full Power	18900	1880	1	23.35	24.00	1.161	-0.13	0.195	0.226

Plot No.	Band	Mode	Test Position	Gap (mm)	Configure	SAR Sensor State	Power State	Ch.	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)
					WLAN/BT													
05	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Badge Clip	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	-0.03	0.903	1.006
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Badge Clip	No Sensor	Full power	6	2437	1	15.58	16.50	1.236	98.6	1.014	0.09	0.586	0.734
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Badge Clip	No Sensor	Full power	11	2462	1	15.90	16.00	1.023	98.6	1.014	0.03	0.501	0.520
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	0.02	0.880	0.981
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Badge Clip + Short Cord Earpiece	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	0.01	0.855	0.953
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Holster Belt Clip	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	0.09	0.052	0.058
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Holster Belt Clip + Van Gogh Earpiece	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	-0.08	0.053	0.059
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Holster Belt Clip + Short Cord Earpiece	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	-0.09	0.052	0.058
	Bluetooth	1Mbps	Back	0mm	Badge Clip	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	0.03	0.043	0.073
	Bluetooth	1Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	-0.06	0.045	0.076
06	Bluetooth	1Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	0	2402	2	10.34	12.00	1.466	76.68	1.086	0.04	0.098	0.156
	Bluetooth	1Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	39	2441	1	9.62	11.50	1.542	76.68	1.086	0.01	0.000	0.000
	Bluetooth	1Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	78	2480	1	9.59	11.50	1.552	76.68	1.086	0.02	0.000	0.000
	Bluetooth	1Mbps	Back	0mm	Badge Clip + Short Cord Earpiece	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	-0.07	0.045	0.076
	Bluetooth	1Mbps	Back	0mm	Holster Belt Clip	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	0.04	0.000	0.000
	Bluetooth	1Mbps	Back	0mm	Holster Belt Clip + Van Gogh Earpiece	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	0.01	0.000	0.000
	Bluetooth	1Mbps	Back	0mm	Holster Belt Clip + Short Cord Earpiece	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	0.05	0.003	0.005
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	52	5260	1	17.04	18.00	1.247	98.25	1.018	0.04	0.835	1.060
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	56	5280	1	16.66	17.50	1.213	98.25	1.018	0.03	0.821	1.014
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	64	5320	1	16.21	18.00	1.510	98.25	1.018	0.01	0.747	1.148
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	56	5280	1	16.66	17.50	1.213	98.25	1.018	-0.06	0.960	1.186
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	52	5260	1	17.04	18.00	1.247	98.25	1.018	-0.07	0.919	1.167
07	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	64	5320	1	16.21	18.00	1.510	98.25	1.018	0.06	0.776	1.193
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Badge Clip + Short Cord Earpiece	No Sensor	Full power	64	5320	1	16.21	18.00	1.510	98.25	1.018	0.07	0.701	1.078
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Holster Belt Clip	No Sensor	Full power	52	5260	1	17.04	18.00	1.247	98.25	1.018	-0.01	0.102	0.130
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Holster Belt Clip + Van Gogh Earpiece	No Sensor	Full power	52	5260	1	17.04	18.00	1.247	98.25	1.018	-0.09	0.100	0.127
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Holster Belt Clip + Short Cord Earpiece	No Sensor	Full power	52	5260	1	17.04	18.00	1.247	98.25	1.018	-0.05	0.103	0.131
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	0.05	0.574	0.690
08	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	124	5620	3	18.05	18.50	1.109	98.25	1.018	0.08	0.932	1.052
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	116	5580	1	17.65	18.50	1.216	98.25	1.018	0.01	0.535	0.662
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	140	5700	1	17.01	18.00	1.256	98.25	1.018	0.06	0.289	0.370
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	0.01	0.475	0.571
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Badge Clip + Short Cord Earpiece	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	0.09	0.494	0.594
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Holster Belt Clip	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	0.09	0.056	0.067
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Holster Belt Clip + Van Gogh Earpiece	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	0.03	0.050	0.060
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Holster Belt Clip + Short Cord Earpiece	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	0.06	0.076	0.091
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	0.06	0.150	0.215
09	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	165	5825	2	16.35	17.50	1.303	98.25	1.018	0.05	0.256	0.340
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	149	5745	1	15.51	17.00	1.409	98.25	1.018	-0.06	0.142	0.204
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	157	5785	1	15.90	17.50	1.445	98.25	1.018	0.04	0.133	0.196
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	0.02	0.127	0.182
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Badge Clip + Short Cord Earpiece	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	0.09	0.138	0.198
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Holster Belt Clip	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	0.01	0.018	0.026
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Holster Belt Clip + Van Gogh Earpiece	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	0.02	0.020	0.029
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Holster Belt Clip + Short Cord Earpiece	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	0.09	0.012	0.017

15.2 Extremity SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Headset	Power State	Power State	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
750MHz																			
10	LTE Band 13	10M	QPSK	1	0	Front	0mm	-	Sensor on	Full power	23230	782	1	24.15	24.50	1.084	0.01	1.170	1.268
	LTE Band 13	10M	QPSK	25	0	Front	0mm	-	Sensor on	Full power	23230	782	1	23.19	23.50	1.074	0.02	0.910	0.977
	LTE Band 13	10M	QPSK	1	0	Back	0mm	-	Sensor on	Full power	23230	782	1	24.15	24.50	1.084	-0.01	0.516	0.559
	LTE Band 13	10M	QPSK	25	0	Back	0mm	-	Sensor on	Full power	23230	782	1	23.19	23.50	1.074	0.01	0.404	0.434
	LTE Band 13	10M	QPSK	1	0	Left Side	0mm	-	Sensor on	Full power	23230	782	1	24.15	24.50	1.084	-0.01	0.280	0.303
	LTE Band 13	10M	QPSK	25	0	Left Side	0mm	-	Sensor on	Full power	23230	782	1	23.19	23.50	1.074	-0.18	0.217	0.233
	LTE Band 13	10M	QPSK	1	0	Right Side	0mm	-	Sensor on	Full power	23230	782	1	24.15	24.50	1.084	0.06	0.291	0.315
	LTE Band 13	10M	QPSK	25	0	Right Side	0mm	-	Sensor on	Full power	23230	782	1	23.19	23.50	1.074	-0.16	0.324	0.348
	LTE Band 13	10M	QPSK	1	0	Bottom Side	0mm	-	Sensor on	Full power	23230	782	1	24.15	24.50	1.084	-0.08	0.708	0.767
	LTE Band 13	10M	QPSK	25	0	Bottom Side	0mm	-	Sensor on	Full power	23230	782	1	23.19	23.50	1.074	-0.02	0.527	0.566
	LTE Band 13	10M	QPSK	1	0	Front	0mm	Van Gogh Earpiece	Sensor on	Full power	23230	782	1	24.15	24.50	1.084	0.03	1.010	1.095
	LTE Band 13	10M	QPSK	1	0	Front	0mm	Short Cord Earpiece	Sensor on	Full power	23230	782	1	24.15	24.50	1.084	-0.07	1.060	1.149
835MHz																			
	LTE Band 5	10M	QPSK	1	0	Front	0mm	-	Sensor on	Full power	20525	836.5	1	23.78	24.50	1.180	-0.04	0.628	0.741
	LTE Band 5	10M	QPSK	25	0	Front	0mm	-	Sensor on	Full power	20525	836.5	1	22.80	23.50	1.175	-0.19	0.559	0.657
	LTE Band 5	10M	QPSK	1	0	Back	0mm	-	Sensor on	Full power	20525	836.5	1	23.78	24.50	1.180	-0.11	0.410	0.484
	LTE Band 5	10M	QPSK	25	0	Back	0mm	-	Sensor on	Full power	20525	836.5	1	22.80	23.50	1.175	-0.02	0.404	0.475
	LTE Band 5	10M	QPSK	1	0	Left Side	0mm	-	Sensor on	Full power	20525	836.5	1	23.78	24.50	1.180	-0.05	0.212	0.250
	LTE Band 5	10M	QPSK	25	0	Left Side	0mm	-	Sensor on	Full power	20525	836.5	1	22.80	23.50	1.175	0.08	0.215	0.253
	LTE Band 5	10M	QPSK	1	0	Right Side	0mm	-	Sensor on	Full power	20525	836.5	1	23.78	24.50	1.180	-0.1	0.300	0.354
	LTE Band 5	10M	QPSK	25	0	Right Side	0mm	-	Sensor on	Full power	20525	836.5	1	22.80	23.50	1.175	0.04	0.282	0.331
	LTE Band 5	10M	QPSK	1	0	Bottom Side	0mm	-	Sensor on	Full power	20525	836.5	1	23.78	24.50	1.180	0.05	0.333	0.393
	LTE Band 5	10M	QPSK	25	0	Bottom Side	0mm	-	Sensor on	Full power	20525	836.5	1	22.80	23.50	1.175	0.11	0.296	0.348
	LTE Band 5	10M	QPSK	1	0	Front	0mm	Van Gogh Earpiece	Sensor on	Full power	20525	836.5	1	23.78	24.50	1.180	-0.02	0.701	0.827
11	LTE Band 5	10M	QPSK	1	0	Front	0mm	Van Gogh Earpiece	Sensor on	Full power	20525	836.5	2	23.55	24.50	1.245	-0.06	0.743	0.925
	LTE Band 5	10M	QPSK	1	0	Front	0mm	Short Cord Earpiece	Sensor on	Full power	20525	836.5	1	23.78	24.50	1.180	-0.15	0.575	0.679
1750MHz																			
	LTE Band 66	20M	QPSK	1	0	Front	0mm	-	Sensor on	Reduced Power	132322	1745	1	20.36	21.00	1.159	-0.04	0.716	0.830
	LTE Band 66	20M	QPSK	50	0	Front	0mm	-	Sensor on	Reduced Power	132322	1745	1	20.32	21.00	1.169	-0.03	0.744	0.870
	LTE Band 66	20M	QPSK	1	0	Back	0mm	-	Sensor on	Reduced Power	132322	1745	1	20.36	21.00	1.159	-0.18	0.406	0.470
	LTE Band 66	20M	QPSK	50	0	Back	0mm	-	Sensor on	Reduced Power	132322	1745	1	20.32	21.00	1.169	-0.18	0.414	0.484
	LTE Band 66	20M	QPSK	1	0	Left Side	0mm	-	Sensor off	Reduced Power	132322	1745	1	23.40	24.00	1.148	-0.04	0.319	0.366
	LTE Band 66	20M	QPSK	50	0	Left Side	0mm	-	Sensor off	Reduced Power	132322	1745	1	22.56	23.00	1.107	0.01	0.224	0.248
	LTE Band 66	20M	QPSK	1	0	Right Side	0mm	-	Sensor on	Reduced Power	132322	1745	1	20.36	21.00	1.159	-0.05	0.114	0.132
	LTE Band 66	20M	QPSK	50	0	Right Side	0mm	-	Sensor on	Reduced Power	132322	1745	1	20.32	21.00	1.169	-0.14	0.084	0.098
	LTE Band 66	20M	QPSK	1	0	Bottom Side	0mm	-	Sensor on	Reduced Power	132322	1745	1	20.36	21.00	1.159	-0.03	0.554	0.642
	LTE Band 66	20M	QPSK	50	0	Bottom Side	0mm	-	Sensor on	Reduced Power	132322	1745	1	20.32	21.00	1.169	0.01	0.576	0.674
	LTE Band 66	20M	QPSK	50	0	Front	0mm	Van Gogh Earpiece	Sensor on	Reduced Power	132322	1745	1	20.32	21.00	1.169	-0.04	0.731	0.855
	LTE Band 66	20M	QPSK	50	0	Front	0mm	Short Cord Earpiece	Sensor on	Reduced Power	132322	1745	1	20.32	21.00	1.169	-0.18	0.758	0.886
12	LTE Band 66	20M	QPSK	50	0	Front	0mm	Short Cord Earpiece	Sensor on	Reduced Power	132322	1745	2	19.61	21.00	1.377	0.06	0.728	1.003
	LTE Band 66	20M	QPSK	50	0	Front	0mm	Short Cord Earpiece	Sensor on	Reduced Power	132072	1720	1	20.29	21.00	1.178	-0.14	0.702	0.827
	LTE Band 66	20M	QPSK	50	0	Front	0mm	Short Cord Earpiece	Sensor on	Reduced Power	132572	1770	1	20.22	21.00	1.197	-0.13	0.653	0.781
	LTE Band 66	20M	QPSK	1	0	Front	7mm	-	Sensor off	Reduced Power	132322	1745	1	23.40	24.00	1.148	0.02	0.375	0.431
	LTE Band 66	20M	QPSK	50	0	Front	7mm	-	Sensor off	Reduced Power	132322	1745	1	22.56	23.00	1.107	0.03	0.342	0.378
	LTE Band 66	20M	QPSK	1	0	Back	3mm	-	Sensor off	Reduced Power	132322	1745	1	23.40	24.00	1.148	0.02	0.425	0.488
	LTE Band 66	20M	QPSK	1	0	Right Side	1mm	-	Sensor off	Reduced Power	132322	1745	1	23.40	24.00	1.148	-0.13	0.262	0.301
	LTE Band 66	20M	QPSK	1	0	Bottom Side	3mm	-	Sensor off	Reduced Power	132322	1745	1	23.40	24.00	1.148	-0.11	0.589	0.676
	LTE Band 66	20M	QPSK	50	0	Bottom Side	3mm	-	Sensor off	Reduced Power	132322	1745	1	22.56	23.00	1.107	0.05	0.550	0.609
1900MHz																			
13	LTE Band 2	20M	QPSK	1	0	Front	0mm	-	Sensor on	Reduced Power	18900	1880	1	20.38	21.00	1.153	-0.18	0.779	0.899
	LTE Band 2	20M	QPSK	1	0	Front	0mm	-	Sensor on	Reduced Power	18700	1860	1	20.34	21.00	1.164	0.02	0.679	0.790

	LTE Band 2	20M	QPSK	1	0	Front	0mm	-	Sensor on	Reduced Power	19100	1900	1	20.22	21.00	1.197	0.06	0.618	0.740
	LTE Band 2	20M	QPSK	50	0	Front	0mm	-	Sensor on	Reduced Power	18900	1880	1	20.33	21.00	1.167	-0.12	0.710	0.828
	LTE Band 2	20M	QPSK	1	0	Back	0mm	-	Sensor on	Reduced Power	18900	1880	1	20.38	21.00	1.153	0.13	0.364	0.420
	LTE Band 2	20M	QPSK	50	0	Back	0mm	-	Sensor on	Reduced Power	18900	1880	1	20.33	21.00	1.167	-0.02	0.331	0.386
	LTE Band 2	20M	QPSK	1	0	Left Side	0mm	-	Sensor off	Reduced Power	18900	1880	1	23.35	24.00	1.161	-0.09	0.336	0.390
	LTE Band 2	20M	QPSK	50	0	Left Side	0mm	-	Sensor off	Reduced Power	18900	1880	1	22.41	23.00	1.146	0.01	0.284	0.325
	LTE Band 2	20M	QPSK	1	0	Right Side	0mm	-	Sensor on	Reduced Power	18900	1880	1	20.38	21.00	1.153	-0.11	0.061	0.070
	LTE Band 2	20M	QPSK	50	0	Right Side	0mm	-	Sensor on	Reduced Power	18900	1880	1	20.33	21.00	1.167	0.05	0.057	0.067
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	-	Sensor on	Reduced Power	18900	1880	1	20.38	21.00	1.153	0.05	0.659	0.760
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0mm	-	Sensor on	Reduced Power	18900	1880	1	20.33	21.00	1.167	-0.05	0.563	0.657
	LTE Band 2	20M	QPSK	1	0	Front	0mm	Van Gogh Earpiece	Sensor on	Reduced Power	18900	1880	1	20.38	21.00	1.153	-0.11	0.719	0.829
	LTE Band 2	20M	QPSK	1	0	Front	0mm	Short Cord Earpiece	Sensor on	Reduced Power	18900	1880	1	20.38	21.00	1.153	-0.08	0.664	0.766
	LTE Band 2	20M	QPSK	1	0	Front	7mm	-	Sensor off	Reduced Power	18900	1880	1	23.35	24.00	1.161	-0.1	0.362	0.420
	LTE Band 2	20M	QPSK	1	0	Back	3mm	-	Sensor off	Reduced Power	18900	1880	1	23.35	24.00	1.161	-0.08	0.340	0.395
	LTE Band 2	20M	QPSK	1	0	Right Side	1mm	-	Sensor off	Reduced Power	18900	1880	1	23.35	24.00	1.161	-0.03	0.158	0.184
	LTE Band 2	20M	QPSK	1	0	Bottom Side	3mm	-	Sensor off	Reduced Power	18900	1880	1	23.35	24.00	1.161	-0.05	0.732	0.850

Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Power State	Power State	Ch.	Freq. (MHz)	Sample	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)
	WLAN/BT																	
	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	-	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	-0.18	0.474	0.528
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	-	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	0.02	0.375	0.418
	WLAN2.4GHz	802.11b 1Mbps	Left Side	0mm	-	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	0.01	0.039	0.043
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	-	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	0.06	0.334	0.372
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	0mm	-	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	-0.03	0.104	0.116
14	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Van Gogh Earpiece	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	-0.01	0.519	0.578
	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Van Gogh Earpiece	No Sensor	Full power	6	2437	1	15.58	16.50	1.236	98.6	1.014	-0.18	0.270	0.338
	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Van Gogh Earpiece	No Sensor	Full power	11	2462	1	15.90	16.00	1.023	98.6	1.014	-0.19	0.272	0.282
	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Short Cord Earpiece	No Sensor	Full power	1	2412	1	17.59	18.00	1.099	98.6	1.014	0.09	0.485	0.540
	Bluetooth	1Mbps	Front	0mm	-	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	0.05	0.024	0.041
	Bluetooth	1Mbps	Back	0mm	-	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	0.09	0.016	0.027
	Bluetooth	1Mbps	Left Side	0mm	-	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	0.02	0.000	0.000
	Bluetooth	1Mbps	Right Side	0mm	-	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	0.07	0.012	0.020
	Bluetooth	1Mbps	Bottom Side	0mm	-	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	0.01	0.001	0.002
	Bluetooth	1Mbps	Front	0mm	Van Gogh Earpiece	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	0.05	0.025	0.042
15	Bluetooth	1Mbps	Front	0mm	Van Gogh Earpiece	No Sensor	Full power	0	2402	2	10.34	12.00	1.466	76.68	1.086	-0.09	0.070	0.111
	Bluetooth	1Mbps	Front	0mm	Van Gogh Earpiece	No Sensor	Full power	39	2441	1	9.62	11.50	1.542	76.68	1.086	0.08	0.000	0.000
	Bluetooth	1Mbps	Front	0mm	Van Gogh Earpiece	No Sensor	Full power	78	2480	1	9.59	11.50	1.552	76.68	1.086	0.01	0.000	0.000
	Bluetooth	1Mbps	Front	0mm	Short Cord Earpiece	No Sensor	Full power	0	2402	1	10.08	12.00	1.556	76.68	1.086	-0.01	0.023	0.039
	WLAN5.3GHz	802.11a 6Mbps	Front	0mm	-	No Sensor	Full power	52	5260	1	17.04	18.00	1.247	98.25	1.018	-0.08	0.245	0.311
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	-	No Sensor	Full power	52	5260	1	17.04	18.00	1.247	98.25	1.018	-0.09	0.271	0.344
	WLAN5.3GHz	802.11a 6Mbps	Left Side	0mm	-	No Sensor	Full power	52	5260	1	17.04	18.00	1.247	98.25	1.018	-0.02	0.037	0.047
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	-	No Sensor	Full power	52	5260	1	17.04	18.00	1.247	98.25	1.018	-0.06	0.399	0.507
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	-	No Sensor	Full power	56	5280	1	16.66	17.50	1.213	98.25	1.018	0.06	0.322	0.398
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	-	No Sensor	Full power	64	5320	1	16.21	18.00	1.510	98.25	1.018	0.19	0.349	0.537
16	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm		No Sensor	Full power	64	5320	2	16.20	18.00	1.514	98.25	1.018	-0.05	0.428	0.659
	WLAN5.3GHz	802.11a 6Mbps	Bottom Side	0mm	-	No Sensor	Full power	52	5260	1	17.04	18.00	1.247	98.25	1.018	-0.01	0.371	0.471
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Van Gogh Earpiece	No Sensor	Full power	64	5320	1	16.21	18.00	1.510	98.25	1.018	0.03	0.228	0.350
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Short Cord Earpiece	No Sensor	Full power	64	5320	1	16.21	18.00	1.510	98.25	1.018	-0.07	0.285	0.438
	WLAN5.5GHz	802.11a 6Mbps	Front	0mm	-	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	-0.04	0.145	0.174
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	-	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	-0.06	0.171	0.205
	WLAN5.5GHz	802.11a 6Mbps	Left Side	0mm	-	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	0.05	0.011	0.013
	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	-	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	-0.02	0.377	0.453
17	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm		No Sensor	Full power	124	5620	2	18.05	18.50	1.109	98.25	1.018	-0.01	0.682	0.770
	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	-	No Sensor	Full power	116	5580	1	17.65	18.50	1.216	98.25	1.018	-0.03	0.240	0.297

	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	-	No Sensor	Full power	140	5700	1	17.01	18.00	1.256	98.25	1.018	-0.06	0.147	0.188
	WLAN5.5GHz	802.11a 6Mbps	Bottom Side	0mm	-	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	-0.03	0.206	0.248
	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	Van Gogh Earpiece	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	-0.04	0.273	0.328
	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	Short Cord Earpiece	No Sensor	Full power	124	5620	1	17.78	18.50	1.180	98.25	1.018	-0.09	0.309	0.371
	WLAN5.8GHz	802.11a 6Mbps	Front	0mm	-	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	0.01	0.047	0.067
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	-	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	0.02	0.041	0.059
	WLAN5.8GHz	802.11a 6Mbps	Left Side	0mm	-	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	0.19	0.004	0.006
	WLAN5.8GHz	802.11a 6Mbps	Right Side	0mm	-	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	-0.05	0.099	0.142
	WLAN5.8GHz	802.11a 6Mbps	Bottom Side	0mm	-	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	-0.02	0.040	0.057
	WLAN5.8GHz	802.11a 6Mbps	Right Side	0mm	Van Gogh Earpiece	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	-0.07	0.104	0.149
	WLAN5.8GHz	802.11a 6Mbps	Right Side	0mm	Short Cord Earpiece	No Sensor	Full power	165	5825	1	16.02	17.50	1.406	98.25	1.018	-0.13	0.109	0.156
18	WLAN5.8GHz	802.11a 6Mbps	Right Side	0mm	Short Cord Earpiece	No Sensor	Full power	165	5825	2	16.35	17.50	1.303	98.25	1.018	0.04	0.189	0.251
	WLAN5.8GHz	802.11a 6Mbps	Right Side	0mm	Short Cord Earpiece	No Sensor	Full power	149	5745	1	15.51	17.00	1.409	98.25	1.018	-0.06	0.088	0.126
	WLAN5.8GHz	802.11a 6Mbps	Right Side	0mm	Short Cord Earpiece	No Sensor	Full power	157	5785	1	15.90	17.50	1.445	98.25	1.018	0.05	0.083	0.122

15.3 Repeated SAR Measurement

<1g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Configure	SAR Sensor State	Power State	Ch.	Freq. (MHz)	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	LTE Band 13	10M	QPSK	1	0	-	Back	0mm	Badge Clip	Sensor on	Full Power	23230	782	24.15	24.50	1.084	-	-	-0.09	0.962	1	1.043
2nd	LTE Band 13	10M	QPSK	1	0	-	Back	0mm	Badge Clip	Sensor on	Full Power	23230	782	24.15	24.50	1.084	-	-	0.03	0.958	1.004	1.038
1st	LTE Band 5	10M	QPSK	1	0	-	Back	0mm	Badge Clip	Sensor on	Full Power	20525	836.5	23.78	24.50	1.180	-	-	-0.04	0.876	1	1.034
2nd	LTE Band 5	10M	QPSK	1	0	-	Back	0mm	Badge Clip	Sensor on	Full Power	20525	836.5	23.78	24.50	1.180	-	-	0.01	0.855	1.025	1.009
1st	LTE Band 66	20M	QPSK	1	0	-	Back	3mm	Badge Clip + Van Gogh Earpiece	Sensor off	Full Power	132572	1770	23.35	24.00	1.161	-	-	-0.17	0.959	1	1.114
2nd	LTE Band 66	20M	QPSK	1	0	-	Back	3mm	Badge Clip + Van Gogh Earpiece	Sensor off	Full Power	132572	1770	23.35	24.00	1.161	-	-	0.02	0.946	1.014	1.099
1st	LTE Band 2	20M	QPSK	1	0	-	Back	3mm	Badge Clip + Short Cord Earpiece	Sensor off	Full Power	18700	1860	23.31	24.00	1.172	-	-	-0.11	0.898	1	1.053
2nd	LTE Band 2	20M	QPSK	1	0	-	Back	3mm	Badge Clip + Short Cord Earpiece	Sensor off	Full Power	18700	1860	23.31	24.00	1.172	-	-	0.03	0.885	1.015	1.037
1st	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Back	0mm	Badge Clip	No Sensor	Full power	1	2412	17.59	18.00	1.099	98.6	1.014	-0.03	0.903	1	1.006
2nd	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Back	0mm	Badge Clip	No Sensor	Full power	1	2412	17.59	18.00	1.099	98.6	1.014	0.02	0.889	1.016	0.991
1st	WLAN5.3GHz	-	-	-	-	802.11a 6Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	56	5280	16.66	17.50	1.213	98.25	1.018	-0.06	0.960	1	1.186
2nd	WLAN5.3GHz	-	-	-	-	802.11a 6Mbps	Back	0mm	Badge Clip + Van Gogh Earpiece	No Sensor	Full power	56	5280	16.66	17.50	1.213	98.25	1.018	0.03	0.955	1.005	1.180
1st	WLAN5.5GHz	-	-	-	-	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	124	5620	18.05	18.50	1.109	98.25	1.018	0.08	0.932	1	1.052
2nd	WLAN5.5GHz	-	-	-	-	802.11a 6Mbps	Back	0mm	Badge Clip	No Sensor	Full power	124	5620	18.05	18.50	1.109	98.25	1.018	0.11	0.928	1.04	1.048

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. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The ratio is the difference in percentage between original and repeated *measured SAR*.
5. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	WAVE PTX TWO-WAY RADIO	
		Body-worn	Extremity
1.	WWAN + Bluetooth	Yes	Yes

General Note:

1. EUT will choose each LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
2. According to the EUT characteristic, WLAN 5GHz and Bluetooth can't transmit simultaneously.
3. According to the EUT characteristic, WLAN 5GHz and WLAN 2.4GHz can't transmit simultaneously.
4. According to the EUT characteristic, WLAN 2.4GHz and Bluetooth can't transmit simultaneously.
5. The maximum SAR summation is calculated based on the same configuration and test position.
6. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/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 for 1g SAR and SPLSR≤ 0.10 for 10g SAR, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.

16.1 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1	2	1+2
		WWAN	Bluetooth	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
LTE Band 2	Back	1.053	0.156	1.21
LTE Band 5	Back	1.034	0.156	1.19
LTE Band 13	Back	1.043	0.156	1.20
LTE Band 66	Back	1.114	0.156	1.27

16.2 Extremity SAR Exposure Conditions

WWAN Band	Exposure Position	1	2	1+2
		WWAN	Bluetooth	Summed
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)
LTE Band 2	Front	0.899	0.111	1.01
	Back	0.420	0.027	0.45
	Left side	0.390		0.39
	Right side	0.184	0.020	0.20
	Bottom side	0.850	0.002	0.85
LTE Band 5	Front	0.925	0.111	1.04
	Back	0.484	0.027	0.51
	Left side	0.253		0.25
	Right side	0.354	0.020	0.37
	Bottom side	0.393	0.002	0.40
LTE Band 13	Front	1.268	0.111	**1.38**
	Back	0.559	0.027	0.59
	Left side	0.303		0.30
	Right side	0.348	0.020	0.37
	Bottom side	0.767	0.002	0.77
LTE Band 66	Front	1.003	0.111	1.11
	Back	0.488	0.027	0.52
	Left side	0.366		0.37
	Right side	0.301	0.020	0.32
	Bottom side	0.792	0.002	0.79

Test Engineer : Martin Li, Varus Wang, Light Wang, Ricky Gu

17. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.

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

Error Description	Uncert. Value (±%)	Prob. Dist.	Div.	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System Errors							
Probe Calibration	12.0	N	2	1	1	6.0	6.0
Probe Calibration Drift	1.7	R	1.732	1	1	1.0	1.0
Probe Linearity	4.7	R	1.732	1	1	2.7	2.7
Broadband Signal	3.0	R	1.732	1	1	1.7	1.7
Probe Isotropy	7.6	R	1.732	1	1	4.4	4.4
Data Acquisition	0.3	N	1	1	1	0.3	0.3
RF Ambient	1.8	N	1	1	1	1.8	1.8
Probe Positioning	0.006	N	1	0.14	0.14	0.0	0.0
Data Processing	1.2	N	1	1	1	1.2	1.2
Phantom and Device Errors							
Conductivity (meas.)	2.5	N	1	0.78	0.71	2.0	1.8
Conductivity (temp.)	3.0	R	1.732	0.78	0.71	1.4	1.2
Phantom Permittivity	14.0	R	1.732	0	0	0.0	0.0
Distance DUT - TSL	2.0	N	1	2	2	4.0	4.0
Device Positioning (±0.5mm)	3.0	N	1	1	1	3.0	3.0
Device Holder	3.4	N	1	1	1	3.4	3.4
DUT Modulation	2.4	R	1.732	1	1	1.4	1.4
Time-average SAR	1.7	R	1.732	1	1	1.0	1.0
DUT drift	2.5	N	1	1	1	2.5	2.5
Val Antenna Unc.	0.0	N	1	1	1	0.0	0.0
Unc. Input Power	0.0	N	1	1	1	0.0	0.0
Correction to the SAR results							
Deviation to Target	1.9	N	1	1	0.84	1.9	1.6
SAR scaling	0.0	R	1.732	1	1	0.0	0.0
Combined Std. Uncertainty						11.3%	11.2%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						22.5%	22.3%

Uncertainty Budget for frequency range 300 MHz to 3 GHz

Error Description	Uncert. Value (±%)	Prob. Dist.	Div.	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	14.0	N	2	1	1	7.0	7.0
Probe Calibration Drift	1.7	R	1.732	1	1	1.0	1.0
Probe Linearity	4.7	R	1.732	1	1	2.7	2.7
Broadband Signal	2.8	R	1.732	1	1	1.6	1.6
Probe Isotropy	7.6	R	1.732	1	1	4.4	4.4
Data Acquisition	0.3	N	1	1	1	0.3	0.3
RF Ambient	1.8	N	1	1	1	1.8	1.8
Probe Positioning	0.005	N	1	0.14	0.14	0.0	0.0
Data Processing	3.5	N	1	1	1	3.5	3.5
Phantom and Device Errors							
Conductivity (meas.)	3.4	N	1	0.78	0.71	2.7	2.4
Conductivity (temp.)	3.3	R	1.732	0.78	0.71	1.5	1.4
Phantom Permittivity	14.0	R	1.732	0.25	0.25	2.0	2.0
Distance DUT - TSL	3.0	N	1	2	2	6.0	6.0
Device Positioning (±0.5mm)	2.5	N	1	1	1	2.5	2.5
Device Holder	3.6	N	1	1	1	3.6	3.6
DUT Modulation	3.5	R	1.732	1	1	2.0	2.0
Time-average SAR	2.6	R	1.732	1	1	1.5	1.5
DUT drift	2.5	N	1	1	1	2.5	2.5
Val Antenna Unc.	0.0	N	1	1	1	0.0	0.0
Unc. Input Power	0.0	N	1	1	1	0.0	0.0
Correction to the SAR results							
Deviation to Target	1.9	N	1	1	0.84	1.9	1.6
SAR scaling	0.0	R	1.732	1	1	0.0	0.0
Combined Std. Uncertainty						13.4%	13.3%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						26.8%	26.6%

Uncertainty Budget for frequency range 3 GHz to 6 GHz

18. References

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