FCC SAR Test Report

Product	:	2.4GHz Digial Wireless Baby Monitor
Trade mark	:	N/A
Model/Type reference	:	GD7605
Add. Model No.	:	N/A
Report Number	:	200724013SAR-1R1
Date of Issue	:	August 28, 2020
FCC ID	:	TW5GD7605
Test Standards	:	FCC 47 CFR Part 2 §2.1093 ANSI/IEEE C95.1-1992 IEEE Std 1528-2013
Test result	:	PASS

Prepared for:

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Prepared by:

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Version

Version No.	Date	Description
V1.0	August 20, 2020	Original
V1.1	August 28, 2020	Updated the report number

Contents

1 General Information

1.1 Statement of Compliance

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

Mode	Highest Reported Body SAR_{1g} (0 cm Gap) (W/kg)
2.4G	0.02

1.2 EUT Description

1.2.1 General Description

Product Name	2.4GHz Digial Wireless Baby Monitor
Trade mark	N/A
Model No.(EUT)	GD7605
Add. Model No.:	N/A
FCC ID	TW5GD7605
Tx Frequency Bands (Unit: MHz)	2.4G: 2410~2477
Antenna Type	Fixed External Antenna
EUT Stage	Identical Prototype

1.2.2 Wireless Technologies

2.4G	GFSK

1.2.3 List of Accessory

Battery	**Model No.:**	KPL624763
	Battery Type:	Lithium-ion Polymer Rechargeable Battery
	Power Rating	3.7Vdc, 2000mAh
	Type	Li-ion

1.3 Maximum Conducted Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

Operating Mode	Freq.	Declared maximum conducted average output power	Max. positive tolerance according manufacturer
	(MHz)	(dBm)	(dBm)
GFSK	2410	3	1
	2441.5	3	1
	2477	3	1

1.4 Other Information

Sample Received Date:	July 25, 2020
Sample tested Date:	July 26, 2020 to July 26, 2020

1.5 Testing Location

Shenzhen UnionTrust Quality and Technology Co., Ltd.
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Mail: info@uttlab.com Website: Http://www.uttlab.com

1.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

FCC Accredited Lab.
Designation Number: CN1194
Test Firm Registration Number: 259480

A2LA-Lab Certificate No.: 4312.01
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories
CAB identifier: CN0032

1.7 Guidance Standard

The tests documented in this report were performed in accordance with FCC 47 CFR Part 2 §2.1093, IEEE Std 1528-2013, ANSI/IEEE C95.1-1992, the following FCC Published RF exposure KDB procedures:

KDB 865664 D01 v01r04

KDB 865664 D02 v01r02

KDB 447498 D01 v06

KDB 941225 D07 v01r02

2 Specific Absorption Rate (SAR)

2.1 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, by appropriate techniques, to produce specific absorption rates (SARs) as averaged over the whole-body, any 1 g or any 10 g of tissue (defined as a tissue volume in the shape of a cube). All SAR values are to be averaged over any six-minute period. When portable device was used within 20 cm of the user's body, SAR evaluation of the device will be required. The SAR limit in chapter 2.3.

2.2 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:

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

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

SAR measurement can be related to the electrical field in the tissue by

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

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

2.3 SAR Limits

(A) Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

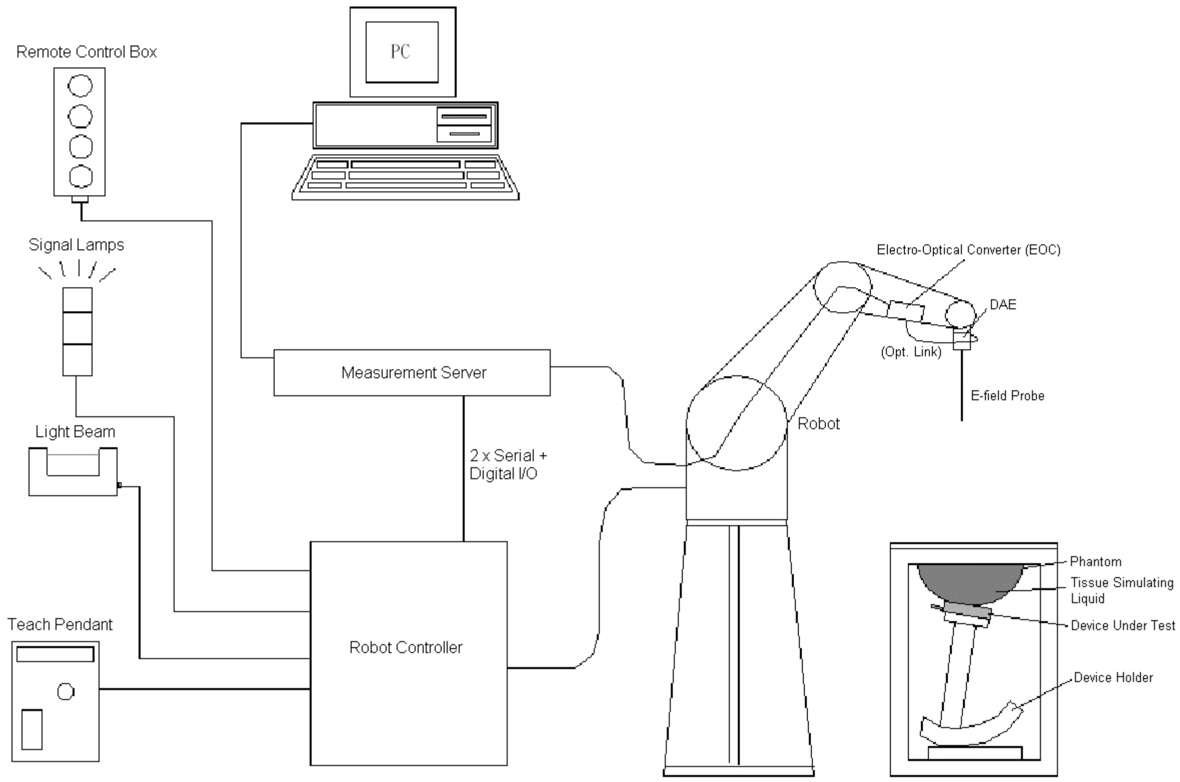
Note:

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram 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.
2. At frequencies above 6.0 GHz, SAR limits are not applicable and MPE limits for power density should be applied at 5 cm or more from the transmitting device.
3. The SAR limit is specified in FCC 47 CFR Part 2 §2.1093, ANSI/IEEE C95.1-1992.

3 SAR Measurement System

3.1 SPEAG DASY System

DASY system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY5 software defined. The DASY software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.



DASY Measurement System

3.1.1 Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

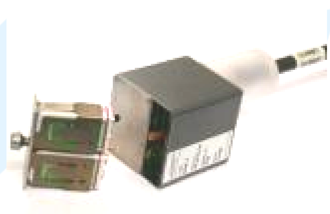
3.1.2 Probe

The SAR measurement is conducted with the dosimetric probe. 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.

Model	EX3DV4	
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 µW/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

Model	ES3DV3	
Construction	Symmetrical design with triangular core. Interleaved sensors. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 4 GHz Linearity: ± 0.2 dB	
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	5 µW/g to 100 mW/g Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm	

3.1.3 Data Acquisition Electronics (DAE)

Model	DAE3, DAE4	
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.	
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)	
Input Offset Voltage	< 5µV (with auto zero)	
Input Bias Current	< 50 fA	
Dimensions	60 x 60 x 68 mm	

3.1.4 Phantom

Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	

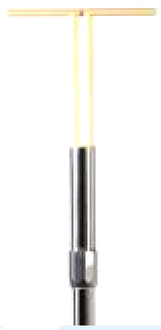
Model	ELI	
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	

3.1.5 Device Holder

Model	Mounting Device	
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	POM	

Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner.	
Material	POM, Acrylic glass, Foam	

3.1.6 System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with l/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.	
Frequency	750 MHz to 5800 MHz	
Return Loss	> 20 dB	
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)	

3.2 SAR Scan Procedure

3.2.1 SAR Reference Measurement (drift)

Prior to the SAR test, local SAR shall be measured at a stationary reference point where the SAR exceeds the lower detection limit of the measurement system.

3.2.2 Area Scan

Measurement procedures for evaluating the SAR of wireless device start with a coarse measurement grid to determine the approximate location of the local peak SAR values. This is known as the area-scan procedure. All antennas and radiating structures that may contribute to the measured SAR or influence the SAR distribution must be included in the area scan. The area scan measurement resolution must enable the extrapolation algorithms of the SAR system to correctly identify the peak SAR location(s) for subsequent zoom scan measurements to correctly determine the 1-g SAR. Area scans are performed at a constant distance from the phantom surface, determined by the measurement frequencies. When a measured peak is closer than ½ the zoom scan volume dimension (x, y) from the edge of the area scan region, unless the entire peak and gram-averaging volume are both captured within the zoom scan volume, the area scan must be repeated by shifting and expanding the area scan region to ensure all peaks are away from the area scan boundary. The area scan resolutions specified in the table below must be applied to the SAR measurements.

<table>
<tr><th></th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td>Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 mm ± 1 mm</td><td>½·δ·ln(2) mm ± 0.5 mm</td></tr>
<tr><td>Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
</table>

3.2.3 Zoom Scan

To evaluate the peak spatial-average SAR values with respect to 1 g or 10 g cubes, fine resolution volume scans, called zoom scans, are performed at the peak SAR locations identified during the area scan. If the cube volume within the zoom scan chosen to calculate the peak spatial-average SAR touches any boundary of the zoom-scan volume, the zoom scan shall be repeated with the center of the zoom-scan volume shifted to the new maximum SAR location. For any secondary peaks found in the area scan that are within 2 dB of the maximum peak and are not within this zoom scan, the zoom scan shall be performed for such peaks, unless the peak spatial-average SAR at the location of the maximum peak is more than 2 dB below the applicable SAR limit (i.e., 1 W/kg for a 1.6 W/kg 1 g limit, or 1.26 W/kg for a 2 W/kg 10 g limit). The zoom scan resolutions specified in the table below must be applied to the SAR measurements.

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom Scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta Z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta Z_{Zoom}(1)$: between 1^{ST} two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta Z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta Z_{Zoom}(n-1)$ mm</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.
* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

3.2.4 SAR Drift Measurement

The local SAR (or conducted power) shall be measured at exactly the same location as in 3.2.1 section. The absolute value of the measurement drift (the difference between the SAR measured in 3.2.1 and 3.2.4 section) shall be recorded. The SAR drift shall be kept within ± 5%.

3.3 Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D2450V2	883	Sep. 20, 2019	3 Year
Dosimetric E-Field Probe	SPEAG	ES3DV3	3090	May. 09, 2020	1 Year
Data Acquisition Electronics	SPEAG	DAE4	662	May. 06, 2020	1 Year
ENA Series Network Analyzer	Agilent	8753ES	US39170317	Nov. 24, 2019	1 Year
Dielectric Assessment Kit	SPEAG	DAK-3.5	1056	N/A	N/A
USB/GPIB Interface	Agilent	82357B	N10149	N/A	N/A
Signal Generator	R&S	SMB100A	103718	May. 14, 2020	1 Year
POWER METER	R&S	NRP	101293	Nov. 24, 2019	1 Year
Thermometer	Lisheng	HTC-1	/	Nov. 25, 2019	1 Year
Coupler	REBES	TC-05180-10 S	161221001	N/A	N/A
Amplifier	Mini-Circuit	ZHL42	QA1252001	N/A	N/A
DC Source	Agilent	66319B	MY43000795	N/A	N/A

3.4 Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

3.5 Tissue Dielectric Parameter Measurement & System Verification

3.5.1 Tissue Simulating Liquids

The temperature of the tissue-equivalent medium used during measurement must also be within 18 °C to 25 °C and within ± 2 °C of the temperature when the tissue parameters are characterized. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 - 4 days of use; or earlier if the dielectric parameters can become out of tolerance.

The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm with ≤ ± 0.5 cm variation for SAR measurements ≤ 3 GHz and ≥ 10.0 cm with ≤ ± 0.5 cm variation for measurements > 3 GHz. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.

Photo of Liquid Height

Table-3.1 Tissue Dielectric Parameters for Head and Body

Target Frequency (MHz)	Head		Body	
	εr	σ (S/m)	εr	σ (S/m)
750	*41.9*	*0.89*	*55.5*	*0.96*
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
1450	*40.5*	*1.20*	*54.0*	*1.30*
1640	*40.3*	*1.29*	*53.8*	*1.40*
1750	*40.1*	*1.37*	*53.4*	*1.49*
1800	40.0	1.40	53.3	1.52
1900	40.0	1.40	53.3	1.52
2000	40.0	1.40	53.3	1.52
2300	*39.5*	*1.67*	*52.9*	*1.81*
2450	39.2	1.80	52.7	1.95
2600	*39.0*	*1.96*	*52.5*	*2.16*
3500	*37.9*	*2.91*	*51.3*	*3.31*
5200	*36.0*	*4.66*	*49.0*	*5.30*
5300	*35.9*	*4.76*	*48.9*	*5.42*
5500	*35.6*	*4.96*	*48.6*	*5.65*
5600	*35.5*	*5.07*	*48.5*	*5.77*
5800	35.3	5.27	48.2	6.00
(εr = relative permittivity, σ = conductivity and ρ = 1000 kg/m3)				

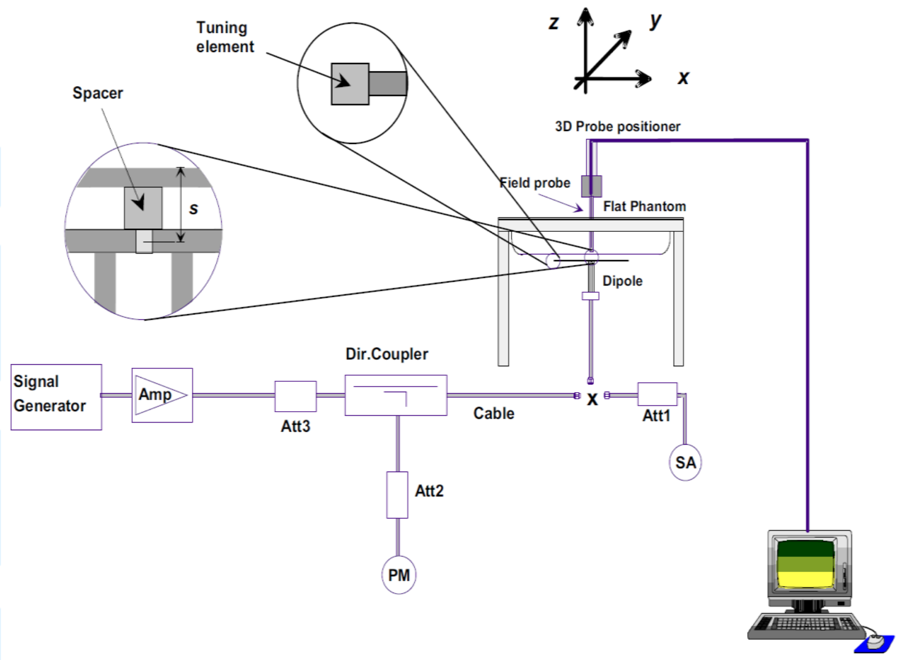
The following table gives the recipes for tissue simulating liquids.

Table-3.2 Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.4	57.0	-	41.1	-
H835	0.1	-	1.0	1.4	57.0	-	40.5	-
H900	0.1	-	1.0	1.5	56.5	-	40.9	-
H1450	-	45.5	-	0.7	-	-	53.8	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	44.5	-	0.3	-	-	55.2	-
H1800	-	44.9	-	0.2	-	-	54.9	-
H1900	-	44.9	-	0.2	-	-	54.9	-
H2000	-	50	-	-	-	-	50	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	8.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.52	17.3
B750	0.2	-	0.2	0.8	48.8	-	50.0	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B900	0.2	-	0.2	0.9	48.2	-	50.5	-
B1450	-	34.0	-	0.3	-	-	65.7	-
B1640	-	32.5	-	0.3	-	-	67.2	-
B1750	-	29.4	-	0.4	-	-	70.2	-
B1800	-	29.5	-	0.4	-	-	70.1	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2000	-	30.0	-	0.2	-	-	69.8	-
B2300	-	31.0	-	0.1	-	-	68.9	-
B2450	-	31.4	-	0.1	-	-	68.5	-
B2600	-	31.8	-	0.1	-	-	68.1	-
B3500	-	28.8	-	0.1	-	-	71.1	-
B5G	-	-	-	-	-	10.7	78.6	10.7

3.5.2 System Check Description

The system check procedure provides a simple, fast, and reliable test method that can be performed daily or before every SAR measurement. The objective here is to ascertain that the measurement system has acceptable accuracy and repeatability. This test requires a flat phantom and a radiating source. The system verification setup is shown as below.



System Verification Setup

3.5.3 Tissue Verification

The measuring results for tissue simulating liquid are shown as below.

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Jul. 26, 2020	Head	2450	22.0	1.777	40.200	1.80	39.20	-1.28	2.55

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ± 5% of the target values. The variation of the liquid temperature must be within ± 2 °C during the test.

3.5.4 System Verification

The measuring result for system verification is tabulated as below. Dipole input signal is 10 mw in the System check.

Test Date	Tissue Type	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Jul. 26, 2020	Head	2450	52.60	0.482	48.20	-8.37	883	3090	662

Note:

Comparing to the reference SAR value, the validation data should be within its specification of 10%. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Per KDB 865664, SAR system validation status should be documented to confirm measurement accuracy. SAR measurement systems are validated according to procedures in KDB 865664. The validation status is documented according to the validation date(s), measurement frequencies, SAR probe and tissue dielectric parameters. When multiple SAR system is used, the validation status of each SAR system is needed to be documented separately according to the associated system components.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probe and tissue dielectric parameters are shown as below.

Date	Probe S/N	Tested Freq. (MHz)	Tissue Type	Perm	Cond	CW Validation			Mod. Validation		
						Sensitivity	Probe Linearity	Probe Isotropy	Mod. Type	Duty Factor	Peak to average power ratio
Jun. 30, 2020	3090	750	Head	41.04	0.874	PASS	PASS	PASS	N/A	N/A	N/A
Jun. 30, 2020	3090	835	Head	40.69	0.921	PASS	PASS	PASS	GMSK	PASS	N/A
Jun. 30, 2020	3090	900	Head	42.28	0.930	PASS	PASS	PASS	GMSK	PASS	N/A
Jun. 30, 2020	3090	1750	Head	38.87	1.313	PASS	PASS	PASS	N/A	N/A	N/A
Jun. 30, 2020	3090	1900	Head	38.67	1.410	PASS	PASS	PASS	GMSK	PASS	N/A
Jun. 30, 2020	3090	2000	Head	38.51	1.469	PASS	PASS	PASS	N/A	N/A	N/A
Jun. 30, 2020	3090	2300	Head	38.11	1.672	PASS	PASS	PASS	TDD	PASS	N/A
Jun. 30, 2020	3090	2450	Head	40.15	1.792	PASS	PASS	PASS	OFDM/GFSK	PASS	PASS
Jun. 30, 2020	3090	2600	Head	37.75	1.905	PASS	PASS	PASS	TDD	PASS	N/A

4 SAR Measurement Evaluation

4.1 EUT Configuration and Setting

4.1.1 2.4G Configuration and Testing

In general, various vendor specific external test software and chipset based internal test modes are typically used for SAR measurement. These chipset based test mode utilities are generally hardware and manufacturer dependent, and often include substantial flexibility to reconfigure or reprogram a device. The device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. In addition, a periodic transmission duty factor is required for current generation SAR systems to measure SAR correctly.

This device has installed engineering testing software which can provide continuous transmitting RF signal. During SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

4.1.2 Antenna Config

The device support Tx antenna for 2.4G band.
(Refer to the Antenna location picture in the appendix D for details).

SAR test procedure is as below:

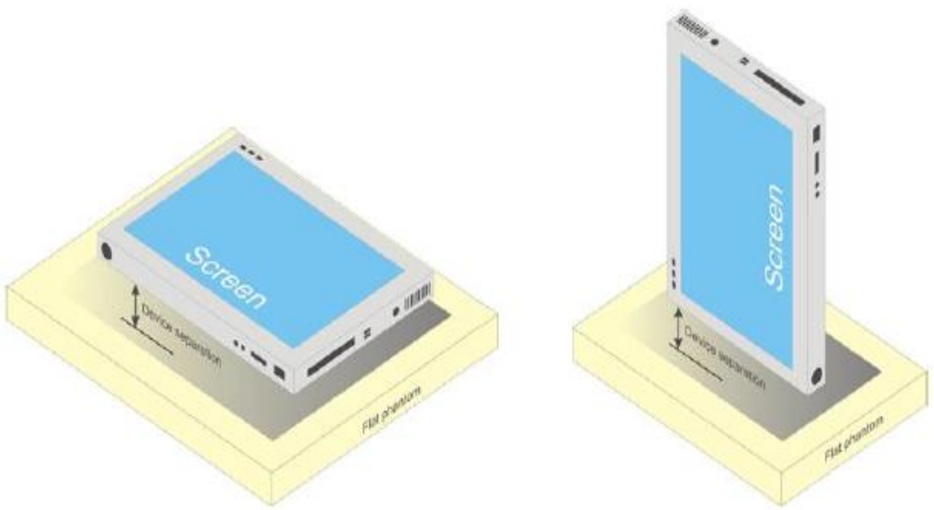
During the SAR test, the Tx Antenna is set to the MAX transmit power level and test the SAR respectively in all applicable RF exposure conditions. Some commands or test scripts are supplied to fix the operation state so that only one TX antenna is chosen and tested at a time. The Tx antenna is completely covered by the appropriate SAR measurements.

4.2 EUT Testing Position

4.2.1 Body Exposure Conditions

RF Exposure Conditions	Test Position	Separation Distance	SAR test exclusion
Body	Front Face	0 cm	Note 1
	Rear Face		
	Left Side		
	Right Side		
	Top Side		
	Bottom Side		
	Top Side Tilt		

Note:
1) The equipment has a rotatable antenna, the product's rotating antenna contains two scenarios, defined as: vertical (0°) and horizontal (90°), detailed test photos please refer to the attached D
2) The monitor is overall diagonal dimension < 20 cm, This device is typically operated like a mini-tablet and are usually designed with certain UMPC features and operating characteristics
3) We found that the external antenna of the product is near the top surface, verified by the rotation angle, the nearest tilt angle to the external antenna is 60°, in order to test a more conservative SAR, increased the Top Side Tilt 60°



4.3 Measured Conducted Power Result

4.3.1 Conducted Power of 2.4G

The following table summarized the data of the conduction power:

Operating Mode	Freq. (MHz)	conducted peak output power (dBm)	duty cycle factor (dB)	conducted average output power (dBm)
GFSK	2410	19.919	-16.99	2.929
	2441.5	19.833	-16.99	2.843
	2477	19.350	-16.99	2.360

Note:

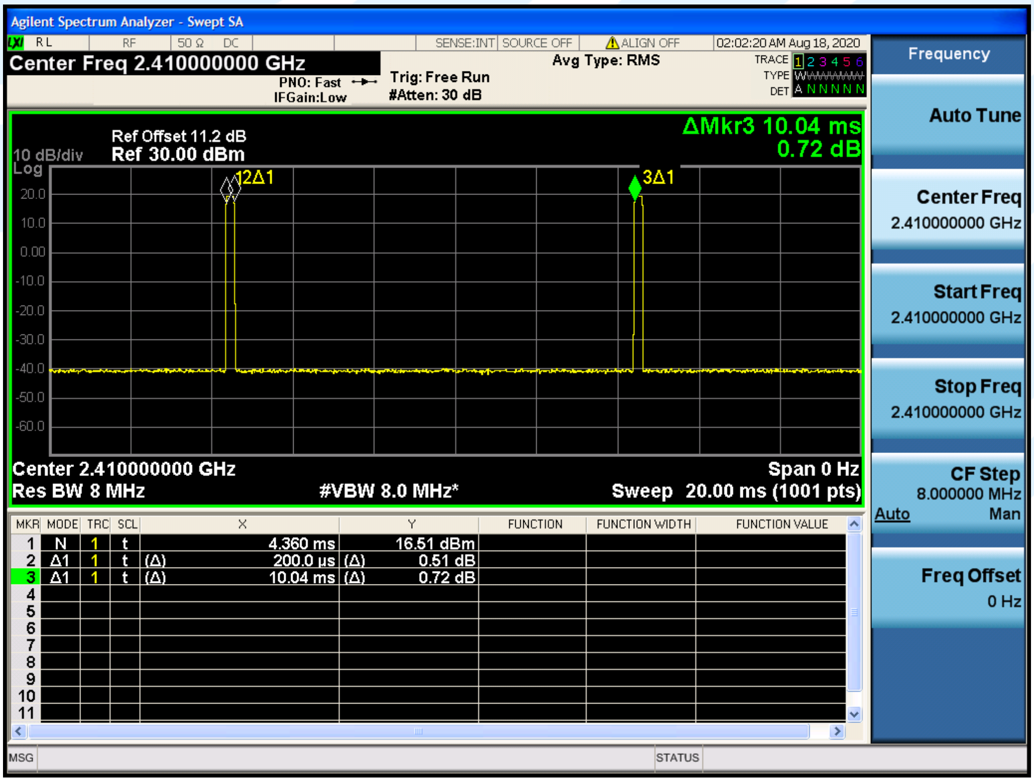
1) Time Average power (dBm) = Peak power (dBm) + Time Average factor.

2) Time Average factor = 10*log(duty cycle)

3) Per KDB 447498, the tested device was within the specified tune-up tolerances range, but not more than 2dB lower than the maximum tune-up tolerance limit.

The equipment is used as a Monitor, it is a infrequent transmissions equipment, the equipment only supports the low duty cycle working mode, The maximum duty cycle for this device is 2% , according to the KDB 865664D02 requirements, the duty cycle test results are shown in the following table:

Type of Modulation	On Time (msec)	Period (msec)	Duty Cycle (linear)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)
GFSK	0.2	10	0.02	2.00	-16.99	5.00



4.4 SAR Testing Results

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

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Frenquey	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
1	2.4G	GFSK	Front Face 0°	0	2441.5	4.0	2.843	0.080	<0.001	<0.001	1.31	<0.001
	2.4G	GFSK	Rear Face 0°	0	2441.5	4.0	2.843	0.100	0.012	0.005	1.31	0.016
	2.4G	GFSK	Left Side 0°	0	2441.5	4.0	2.843	0.100	<0.001	<0.001	1.31	<0.001
	2.4G	GFSK	Right Side 0°	0	2441.5	4.0	2.843	0.100	<0.001	<0.001	1.31	<0.001
	2.4G	GFSK	Bottom Side 0°	0	2441.5	4.0	2.843	0.067	<0.001	<0.001	1.31	<0.001
	2.4G	GFSK	Top Side 0°	0	2441.5	4.0	2.843	0.067	0.008	0.006	1.31	0.011
	2.4G	GFSK	Front Face 90°	0	2441.5	4.0	2.843	0.060	<0.001	<0.001	1.31	<0.001
	2.4G	GFSK	Rear Face 90°	0	2441.5	4.0	2.843	0.012	0.010	0.004	1.31	0.013
	2.4G	GFSK	Left Side 90°	0	2441.5	4.0	2.843	0.123	<0.001	<0.001	1.31	<0.001
	2.4G	GFSK	Right Side 90°	0	2441.5	4.0	2.843	0.100	<0.001	<0.001	1.31	<0.001
	2.4G	GFSK	Bottom Side 90°	0	2441.5	4.0	2.843	0.062	<0.001	<0.001	1.31	<0.001
	2.4G	GFSK	Top Side 90°	0	2441.5	4.0	2.843	0.023	0.007	0.004	1.31	0.009
	2.4G	GFSK	Top Side Tilt	0	2441.5	4.0	2.843	-0.021	0.016	0.009	1.31	0.021
	2.4G	GFSK	Top Side Tilt	0	2410	4.0	2.929	0.066	**0.018**	0.010	1.28	0.023
	2.4G	GFSK	Top Side Tilt	0	2477	4.0	2.360	0.058	0.016	0.010	1.46	**0.024**

*** End of Report ***

Appendix A. SAR Plots of System Verification

The plots for system verification with largest deviation for each SAR system combination are shown as follows.

Appendix B. SAR Plots of SAR Measurement

The SAR plots for highest measured SAR in each exposure configuration, wireless mode and frequency band combination, and measured SAR > 1.5 W/kg are shown as follows.

Appendix C. Calibration Certificate for Probe and Dipole

The calibration certificates are shown as follows.

Appendix D. Photographs of EUT and Setup