SAR EVALUATION REPORT

Equipment under test	Dual-mode Baby Monitor
Model name	SEM-3053WN
FCC ID	NLMSEM3053WN
Applicant	Hanwha Techwin Co., Ltd.
Manufacturer	RDI Technology (Shenzhen) Co.,Ltd.
Date of test(s)	2017.01.05 ~ 2017.01.05
Date of issue	2017.01.10

Issued to

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Test and report completed by :	**Report approval by :**
Wi-han Jeong Test engineer	Jeff Do Technical manager

Revision history

Revision	Date of issue	Test report No.	Description
-	2017.01.10	KES-SR-17T0001	Initial

TABLE OF CONTENTS

1. General information

Applicant: Hanwha Techwin Co., Ltd.

Applicant address: 1204, Changwon-daero, Seongsan-gu, Changwon-si
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Test site: KES Co., Ltd.

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473-29, Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Korea

Model: SEM-3053WN

FCC ID: NLMSEM3053WN

Test device serial No.: ☒ Production ☐ Pre-production ☐ Engineering

Application purpose: ☒ Original grant ☐ Class I permissive change ☐ Class II permissive change

1.1. EUT description

Equipment under test: Dual-mode Baby Monitor

Frequency range: 2408 ㎒ ~ 2468 ㎒

Modulation technique: FHSS

Type of Modulation: GFSK

Number of channels: 16

Antenna specification: Antenna type: Dipole, Peak gain: 2.0 ㏈i

Power source: DC 3.7 V (Rechargeable Battery)

The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.

1.2. Accessories of EUT

Accessory	Description	Other
Body Worn Accessory	N/A	Standard

1.3. Highest SAR summary

Equipment class	Frequency band	Tissue type	Reported SAR value 1g-SAR (W/kg)
DSS	2.4 GHz	Body	0.136

Notes:
This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications

1.4. Guidance applied

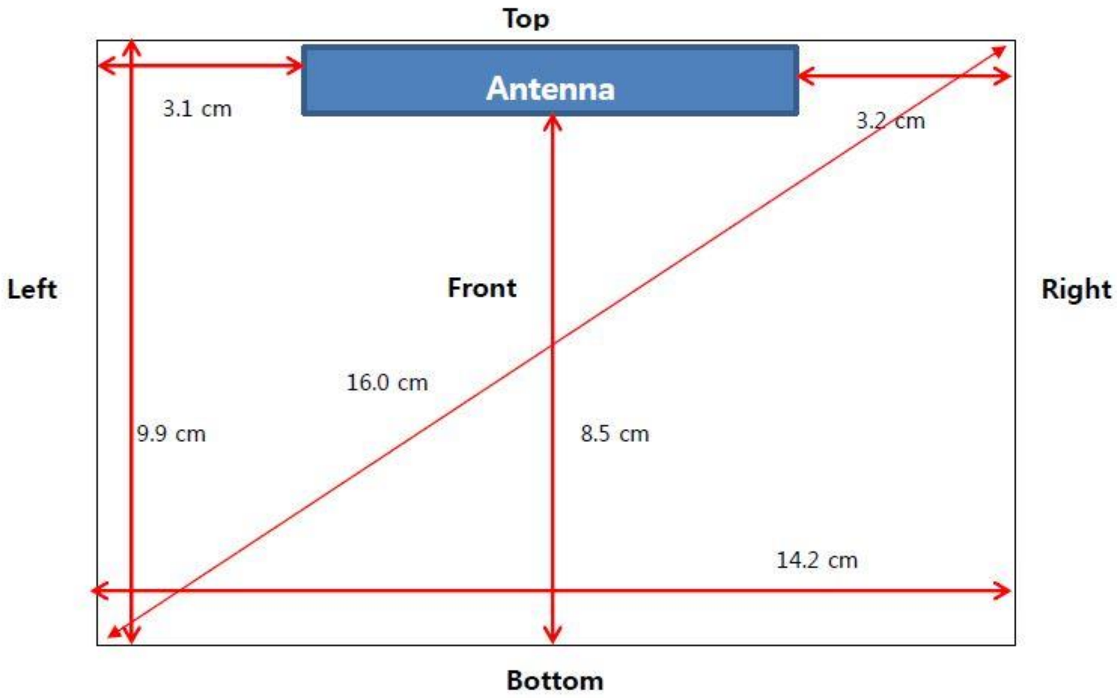
The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- IEEE 1528-2013
- FCC KDB Publication 865664 D01 v01r04 (SAR measurement up to 6 ㎓)
- FCC KDB Publication 865664 D02 v01r02 (SAR reporting)
- FCC KDB Publication 447498 D01 v06 (General SAR guidance)
- FCC KDB Publication 941225 D07 v01r02 (UMPC Mini Tablet)

1.5. Test conditions

Ambient temperature	(22 ± 2) ℃
Tissue simulating liquid	(22 ± 2) ℃
Humidity	(55 ± 5) % R.H.

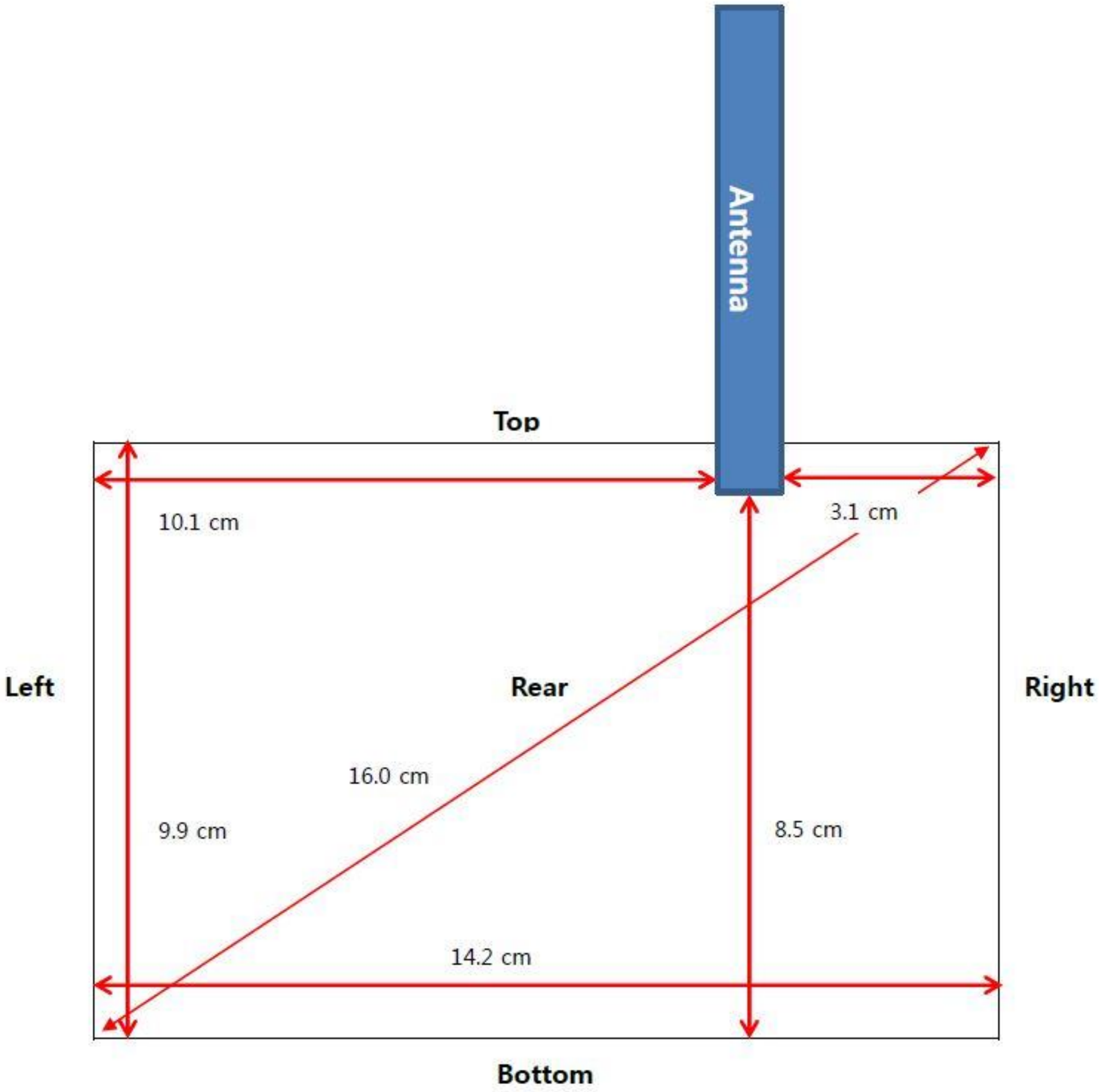
1.6. Test reduction procedure



Frequency	**Tune up power limit**		**Separation distances (mm)**						**SAR Exemption**					
(㎒)	**dBm**	**mW**	**Front**	**Rear**	**Right**	**Left**	**Top**	**Bottom**	**Front**	**Rear**	**Right**	**Left**	**Top**	**Bottom**
2408	19.00	44.71	9	10	32	31	0	85	Measure	Measure	EXEMPT	EXEMPT	Measure	EXEMPT

Note:

According to 941225 D07 UMPC Mini Table, UMPC mini-tablet devices must be tested for 1-g SAR on all surfaces and side edges with a transmitting antenna located at ≤ 25 mm from that surface or edge



Frequency	Tune up power limit		Separation distances (mm)						SAR Exemption					
(㎒)	dBm	mW	Front	Rear	Right	Left	Top	Bottom	Front	Rear	Right	Left	Top	Bottom
2408	19.00	45.71	9	10	32	31	0	85	Measure	Measure	EXEMPT	EXEMPT	Measure	EXEMPT

1.7. SAR definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Figure 1).

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{\rho d\upsilon}\right)$$

Figure 1. SAR Mathematical equation

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

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

Where:

σ = Conductivity of the tissue-simulating material (S/m)

ρ = Mass density of the tissue-simulating material (kg/㎥)

E = Total RMS electric field strength (V/m)

Note:

The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

2. SAR measurement system

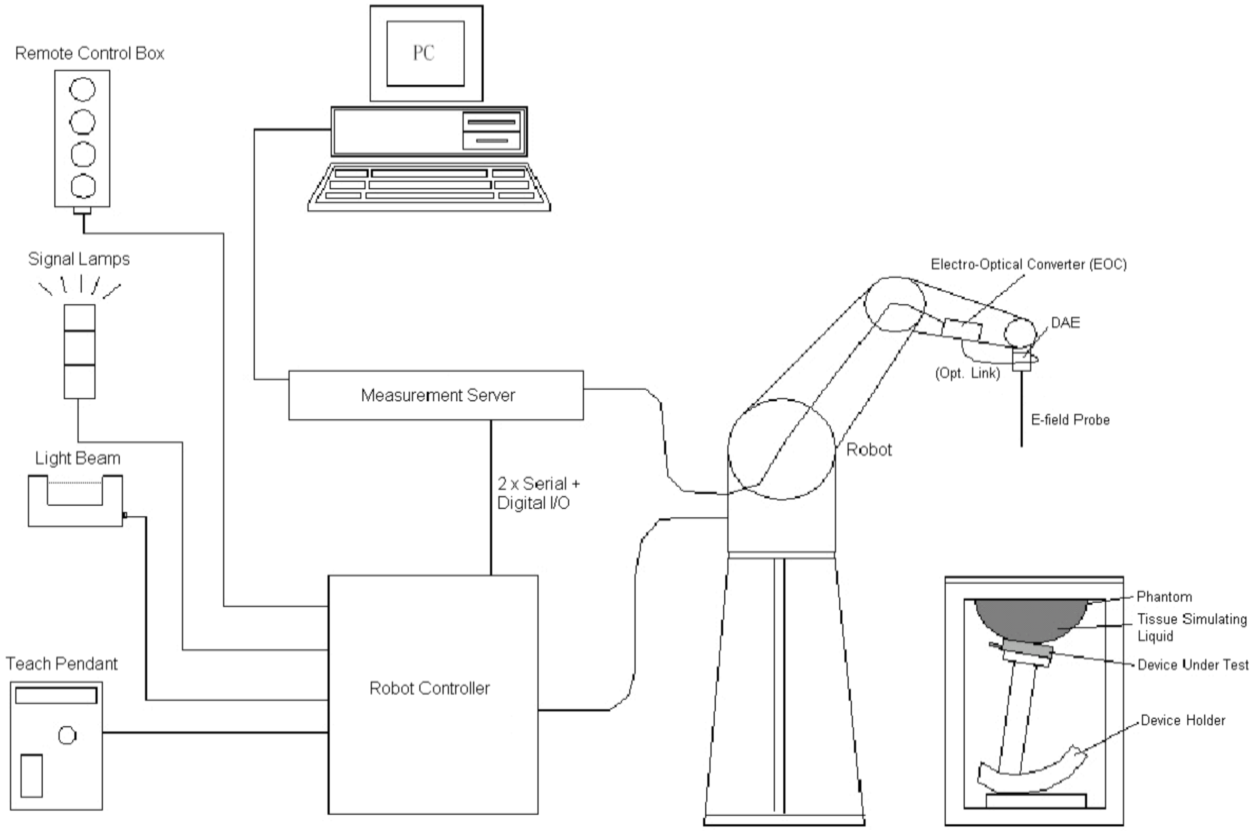


Figure 2. SPEAG DASY system configuration

The DASY system for performance compliance tests is illustrated above graphically. This system consists of the following items:

- A standard high precision 6-axis robot with controller, a teach pendant and software
- A data acquisition electronic (DAE) attached to the robot arm extension
- A dosimetric probe equipped with an optical surface detector system
- The electro-optical converter (EOC) performs the conversion between optical and electrical signals
- A measurement server performs the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the accuracy of the probe positioning
- A computer operating Windows XP
- DASY software
- Remove control with teach pendant and additional circuitry for robot safety such as warming lamps, etc.
- The SAM twin phantom and/or ELI phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

2.1. Robot

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

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

Figure 3. SPEAG DASY 5

2.2. 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 ㎒ to > 6 ㎓ Linearity: ± 0.2 ㏈ (30 ㎒ to 6 ㎓)
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 to > 100 ㎽/g Linearity: ± 0.2 ㏈ (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

Figure 4. Probe

2.3. Data Acquisition Electronics (DAE)

Model	DAE4
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 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: 4 mV, 40 0mV)
Input Offset Voltage	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Input Bias Current	< 50 fA
Dimensions	60 x 60 x 68 mm

Figure 5. DAE

2.4. Phantoms

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

Figure 6. Twin SAM

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

Figure 7. ELI

2.5. Device holder

Model	Mounting device	 Figure 8. 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	 Figure 9. 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. SAR measurement procedure

Step 1: Power reference measurement

The power reference measurement and power reference 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. The minimum distance of probe sensors to surface is 2 ㎜. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2 and 3: Area scan & zoom scan procedures

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 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the zoom scan.
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. The generation of a high-resolution mesh within the measured volume
4. The interpolation of all measured values from the measurement grid to the high-resolution grid
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. The calculation of the averaged SAR within masses of 1 g and 10 g.

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

Note: 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 ≤ 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.

Figure 10. Area and zoom scan resolutions per FCC KDB Publication 865664 D01v01r04

Step 4: Power drift measurement

The power drift measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The power drift measurement gives the field difference in dB from the reading conducted within the last power reference measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

4. Tissue simulating liquids

For the measurement of the field distribution inside the phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. 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 figure 11.

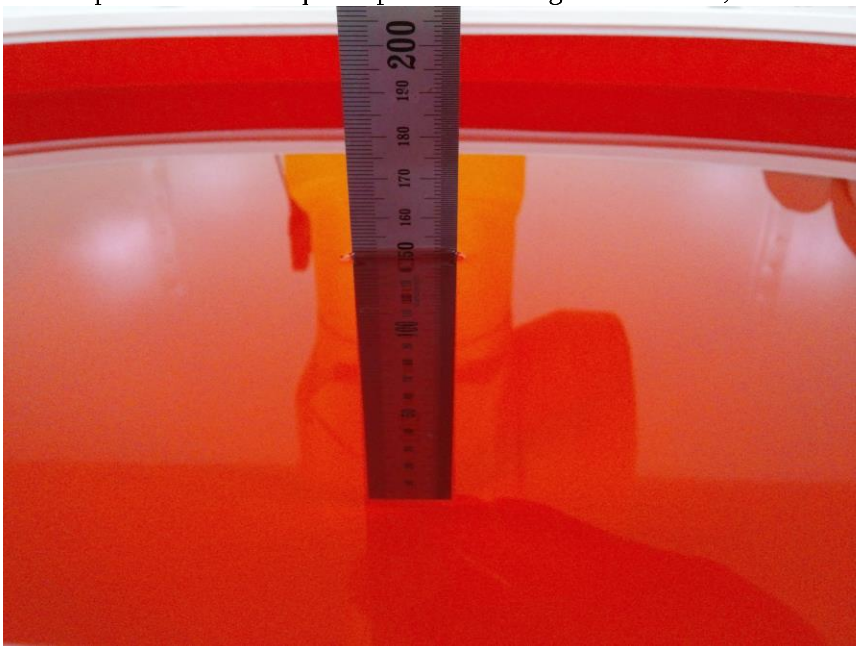


Figure 11. Liquid height photo

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an Agilent dielectric probe kit and an Agilent network analyzer.

The following table shows the measuring results for simulating liquid.

Frequency (㎒)	Tissue type	Liquid temp.(℃)	Parameters	Target value	Measured value	Deviation (%)	Limit (%)	Data
2450	Body	22.3	Permittivity (εr)	52.7	52.693	-0.01	±5	2017.01.05
			Conductivity (σ)	1.95	1.958	0.41	±5	2017.01.05

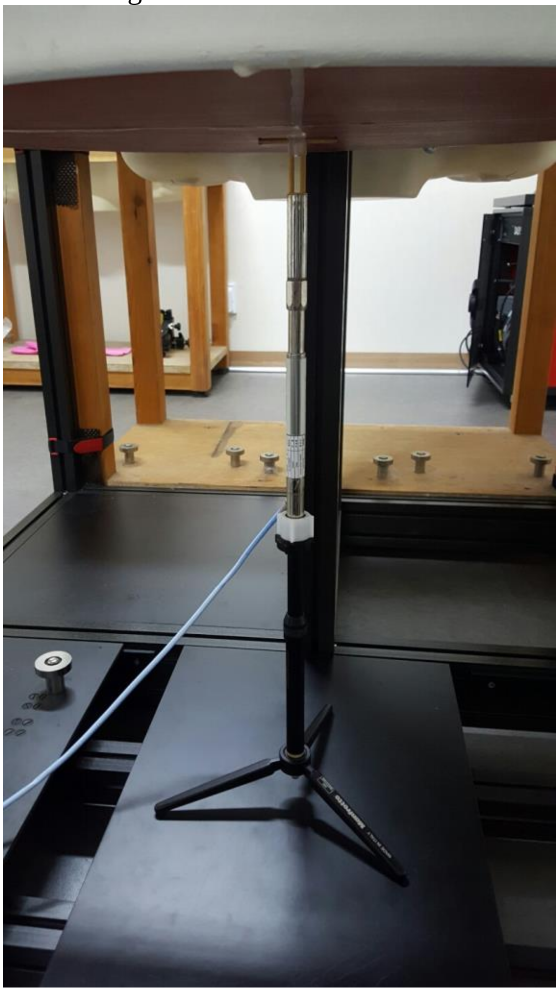
5. System verification

5.1. Procedure

SAR measurement was prior to assessment, the system is verified to the ±10 % of the specifications at each frequency band by using the system verification kit.

- Cabling the system, using the verification kit equipment.
- Generate about 250 ㎽ input level from the signal generator to the dipole antenna.
- Dipole antenna was placed below the flat phantom.
- The measured one-gram SAR at the surface of the phantom above the dipole feed-point should be within 10 % of the target reference value.
- The results are normalized to 1 W input power.

Note;
SAR verification was performed according to the FCC KDB 865664 D01v01r04.



5.2. System verification

Frequency (㎒)	Tissue type	Probe (S/N)	Antenna (S/N)	1 W Target SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	Deviation (%)	Limit (%)	Data
2450	Body	3879	896	49.5	12.1	48.4	-2.22	±10	2017.01.05

6. RF exposure limits

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.

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. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

	Uncontrolled environment general population (W/kg) or (㎽/g)	**Controlled environment occupational (W/kg) or (㎽/g)**
Spatial peak SAR head	1.60	8.00
Spatial average SAR whole body	0.08	0.40
Spatial peak SAR hands, feet, ankles, wrists	4.00	20.00

Figure 12. RF exposure limits

7. Test results summary

7.1. RF conducted power

7.1.1. Power measurement procedures

According KDB 447498 D01 General RF Exposure Guidance v06 Section 4.1 b) states that "Unless it is specified differently in the published RF exposure KDB procedures, these requirements also apply to test reduction and test exclusion considerations. Time-averaged maximum conducted output power applies to SAR and, as required by § 2.1091(c), time-averaged ERP applies to MPE. When an antenna port is not correct one available on the device to support conducted power measurement, such as FRS and certain Part 15. transmitters with built-in integral antennas, the maximum output power allowed for production units should be used to determine RF exposure test exclusion and compliance."

7.1.2. RF conducted power

Mode	Frequency (㎒)	Channel	Measured Average power (㏈m)
GFSK	2 408	1	18.76
GFSK	2 440	9	18.63
GFSK	2 468	16	18.20

7.1.3. Target power and Tune-up limits

Mode	Frequency (㎒)	Channel	Tune-up Power(㏈m)	Tune-up limits(㏈m)
GFSK	2 408	1	18.0	19.0
GFSK	2 440	9	18.0	19.0
GFSK	2 468	16	17.5	18.5

Note:

1. The device operates using the following maximum output power specifications. The reported SAR is measured SAR value adjusted for maximum output power tolerance.
2. Tune up tolerance is ±1.0 ㏈.

7.2. SAR results

7.2.1. SAR measurement results

Plot No.	Antenna	EUT position	Frequency (㎒)	Ch.	Distance (mm)	Power(㏈m)		Tune-up Scaling Factor	Duty Cycle (%)	Duty Cycle Scaling Factor	SAR_{1g}(W/kg)	
						Measured power	Tune up limit				Measured SAR	Scaled SAR
1	Folded	Top	2408	1	5	18.76	19.0	1.06	83	1.20	0.04	0.051
2	Folded	Front	2408	1	5	18.76	19.0	1.06	83	1.20	0.011	0.014
3	Folded	Rear	2408	1	5	18.76	19.0	1.06	83	1.20	0.015	0.019
4	Unfolded	Top	2408	1	5	18.76	19.0	1.06	83	1.20	0.011	0.014
5	Unfolded	Front	2408	1	5	18.76	19.0	1.06	83	1.20	0.107	0.136
6	Unfolded	Rear	2408	1	5	18.76	19.0	1.06	83	1.20	0.032	0.041

Note:

1. The test data reported are worst case SAR values according to test procedure specified in IEEE 1528-2003,FCC KDB publication 865664 D01v01r04 and 447498 D01v06.
2. All mode of operation were investigated and worst case results are reported.
3. Battery is fully charged at the beginning of the SAR measurements.
4. Liquid tissue depth was at least 15 cm for all frequencies.
5. The manufacturer has confirmed that device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
6. According to the FCC KDB publication 865664 D01v01r04, variability SAR tests are required if the measured SAR results for the frequency band are more than 0.8 W/kg.
7. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB publication 447498 D01v06.
8. According to the FCC KDB publication 447498 D01, Testing of other required channels with in 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.
9. According to the FCC KDB publication 941225 D07, at 5 mm separation from a flat phantom, for the data modes, wireless technologies and frequency bands supported by the device to determine SAR compliance. When 1-g SAR is tested at 5 mm, 10-g SAR is not required.
10. When duty cycle is non-100% the measured SAR is scaled-up by the duty cycle scaling factor which is equal to “1/(duty cycle)”.
11. Scaled SAR(W/kg) = Measured SAR[W/kg] x Duty cycle Scaling Factor x Tune up Scaling Factor.

8. Measurement equipment

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Stäubli Robot Unit	Stäubli	TX60L	F15/5Y7QA1/A/01	N/A	N/A
Data Acquisition Electronics	SPEAG	DAE4	1460	1year	2017.05.30
E-Field Probe	SPEAG	EX3DV4	3879	1year	2017.08.31
Electro Optical Converter	SPEAG	EOC60	1096	N/A	N/A
2mm Oval Phantom ELI5	SPEAG	QD OVA 003 AA	2036	N/A	N/A
Dipole Antenna	SPEAG	D2450V2	896	2years	2018.05.24
S-Parameter Network Analyzer	Agilent	8753ES	MY40000210	1year	2017.07.24
Calibration Kit	Agilent	85033D	3423A02429	N/A	N/A
EPM Series Power Meter	HP	E4419B	GB37290599	1year	2017.07.04
E-Series AVG Power Sensor	HP	E9300H	MY41495967	1year	2017.07.04
E-Series AVG Power Sensor	HP	E9300H	US39215405	1year	2017.07.04
Power Meter	Anritsu	ML2495A	1438001	1year	2017.01.25
Pulse Power Sensor	Anritsu	MA2411B	1339205	1year	2017.01.25
RF Power Amplifier	None	EMPOWER	1030	1year	2017.07.04
Dual Directional Coupler	HP	11692D	1212A03523	1year	2017.07.04
Vector Signal Generator	R&S	SMBV100A	256397	1year	2017.07.04
Signal Analyzer	R&S	FSV30	101389	1year	2017.01.25
Hygro-Thermometer	BODYCOM	BJ5478	N/A	1year	2017.07.05
Dielectric Probe Kit	Agilent	85070E	MY44300696	N/A	N/A

9. Measurement Uncertainty

DASY5 Uncertainty Budget						
Uncertainty Component	**Tol (%)**	**Prob. Dist.**	**Div.**	**$C_{i\ (1g)}$**	**1g u_i (%)**	**V_i or Veff**
Measurement system						
Probe calibration (k = 1)	6.30	N	1.00	1.00	6.30	∞
Axial isotropy	0.50	R	1.73	0.70	0.20	∞
Hemispherical isotropy	2.60	R	1.73	0.70	1.05	∞
Boundary effect	0.80	R	1.73	1.00	0.46	∞
Linearity	0.60	R	1.73	1.00	0.35	∞
System detection limits	0.25	R	1.73	1.00	0.14	∞
Readout electronics	1.00	R	1.73	1.00	0.58	∞
Response time	0.00	R	1.73	1.00	0.00	∞
Integration time	2.60	R	1.73	1.00	1.50	∞
RF ambient conditions—noise	3.00	R	1.73	1.00	1.73	∞
RF ambient conditions—reflections	3.00	R	1.73	1.00	1.73	∞
Probe positioner mechanical tolerance	1.50	R	1.73	1.00	0.87	∞
Probe positioning with respect to phantom shell	2.90	R	1.73	1.00	1.67	∞
Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation	1.00	R	1.73	1.00	0.58	∞
Test sample positioning	2.30	N	1.00	1.00	2.30	9
Device holder uncertainty	3.60	N	1.00	1.00	3.60	5
Output power variation -SAR drift measurement	5.00	R	1.73	1.00	2.89	∞
SAR scaling	0.00	R	1.73	1.00	0.00	∞
Phantom shell uncertainty—shape, thickness, and permittivity	4.00	R	1.73	1.00	2.31	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.90	R	1.73	1.00	1.10	∞
Liquid conductivity measurement	0.28	N	1.00	0.64	0.18	5
Liquid permittivity measuremen	0.09	N	1.00	0.60	0.05	5
Liquid conductivity—target	5.00	R	1.73	0.64	1.85	∞
Liquid permittivity—target	5.00	R	1.73	0.60	1.73	∞
Combined standard uncertainty(RSS)					± 9.65 %	8 256.084
Expanded uncertainty					± 19.30 %	K=2

Appendix list