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SAR TEST REPORT

JVC KENWOOD CORPORATION 1-16-2 Hakusan Midori-ku Yokohama-shi Kanagawa 226-8525 Japan	**Date of Issue: 09. 04, 2015** **Test Report No:HCT-A-1509-F006** **Test Site: HCT CO., LTD.**

FCC ID: **K44475400**

Equipment Type:	**VHF DIGITAL TRANSCEIVER**
Model Name:	**TK-D240-K, TK-D240-M, TK-D240V-K**
Testing has been carried out in accordance with:	**47CFR §2.1093** **ANSI/ IEEE C95.1 - 2005** **IEEE 1528-2013**
Date of Test:	**08. 21, 2015 ~ 08. 25, 2015**

This device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in FCC KDB procedures and had been tested in accordance with the measurement procedures specified in FCC KDB procedures.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested By	Reviewed By
Bong-Kyun Park Test Engineer / SAR Team Certification Division	Dong-Seob Kim Technical Manager / SAR Team Certification Division

Version

Rev.	DATE	DESCRIPTION
HCT-A-1509-F006	09. 04, 2015	First Approval Report

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1. Attestation of Test Result of Device Under Test

Attestation of SAR test result					
Applicant Name:	JVC KENWOOD CORPORATION				
FCC ID:	K44475400				
Model:	TK-D240-K, TK-D240-M, TK-D240V-K				
EUT Type	VHF DIGITAL TRANSCEIVER				
Application Type:	Certification				
The Highest Reported SAR (W/Kg)					
Band	**Tx. Frequency (MHz)**	**Equipment Class**	**Reported 1g SAR (W/kg)**		
			Head	**Body-Worn**	**Note**
VHF(FCC)	150 - 174	TNF	1.87	2.45	50% PTT duty cycle
Date(s) of Tests:	08. 21, 2015 ~ 08. 25, 2015				

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with IEEE Standard 1528-2003 & IEEE 1528-2005 and the following published KDB procedures.

- FCC KDB Publication 447498 D01 General SAR Guidance v05r02
- FCC KDB Publication 941225 D01 3G SAR Procedures v03
- FCC KDB Publication 634646 D01 Handset SAR v01r02
- FCC KDB Publication 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- FCC KDB Publication 865664 D02 SAR Reporting v01r01

3. Output Power Specifications.

3.1 Nominal and Maximum Output Power Specifications

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB publication 447498 D01v05r02.

3.1.1 Maximum Output Power

Band		(W)
150MHz	Maximum	5.2
	Nominal	5

3.1.2 Output Average Conducted Power

UHF			
Model	Frequency	Channel	Power(dBm)
TK-D240-K	150.05	1	37
	158.05	2	36.94
	166	3	37.01
	173.95	4	36.92

For FCC Band:
Per KDB 447498 D01 v05r01 Page 7 section 6) pages 7-8, the number of channels required to be tested is as follows.

F_{high}= 150 MHz
F_{c} = 162 MHz
F_{Low}= 174 MHz
N_{c} = Round $\{[100(f_{high} – f_{low}) / f_c]^{0.5} X (f_c / 100)^{0.2}\}$ = Round $\{[100(174-150) / 162]^{0.5} X (162/100)^{0.2}\}$ = 4
Therefore, for the frequency band from 150 MHz to 174, 4channels are required for testing.

4.Manufacturer's Accessory List

Part No.	Description		Accessory Type	Accessory
KRA-41M	VHF stubby antenna (146-162MHz)		Antenna	1
KRA-41M2	VHF stubby antenna (162-174MHz)			2
KRA-41M3	VHF stubby antenna (136-150MHz)			IC option
KRA-22M	VHF low-profile helical antenna (146-162MHz)			3
KRA-22M2	VHF low-profile helical antenna (162-174MHz)			4
KRA-22M3	VHF low-profile helical antenna (136-150MHz)			IC option
KRA-26M	VHF Helical Antenna (146-162MHz)			5
KRA-26M2	VHF Helical Antenna (162-174MHz)			6
KRA-26M3	VHF Helical Antenna (136-150MHz)			IC option
KNB-45L	Li-ion Battery Pack	2000 mAh	* Battery	1
KNB-69L	Li-ion Battery Pack	2450 mAh		2
KNB-29N	Ni-MH Battery Pack	1500 mAh		3
KNB-53N	Ni-MH Battery Pack	1400 mAh		4
KBH-10	Belt Clip		Body-worn	1
KWR-1	Water Resistance Bag			2
KMC-45D	Speaker Microphone		Audio Accessory	1
KMC-21	Compact Speaker Microphone			2
KEP-2	2.5mm Earphone kit for KMC-45			3
KHS-10-BH	Heavy-duty headset			4
KHS-10-OH	Heavy-duty headset			5
KHS-7	Single Muff Headset			6
KHS-7A	Single Muff Headset w/in-line PTT			7
KHS-8BL/BE	2-Wire Palm Mic w/ Earphone			8
KHS-9BL/BE	3-Wire Lapel Mic w/ Earphone			9
KHS-22	Behind-the-head Headset w/PTT			10
KHS-23	2-Wire Palm Mic			11
KHS-25	D-Ring Ear Headset			12
KHS-26	Ear bund In-line PTT Headset			13
KHS-27	D-Ring In-line PTT Headset			14
KHS-31	C-Ring Headset			15
KHS-1	Headset with PTT/VOX			16
KHS-8NC	2-Wire Palm Mic w/ Earphone, NC			17
KHS-21	Headset			18
KHS-29F	Headset			19
EMC-11	Clip Microphone with Earphone			20
KHS-35F	Headset			21
EMC-12	Clip Microphone with Earphone			22

*** Note:** Battery Dimensions

	KNB-45L	KNB-69L	KNB-29N	KNB-53N
Capacity(mAh)	2000	2450	1500	1400
Width(mm)	54	54	54	54
Depth(mm)	17.7	21.8	17.7	17.7
Height(mm)	114.7	114.7	114.7	114.7

Radio Face Test (Face-Held)

Battery 1						Battery 2					
Ant. 1	Ant. 2	Ant. 3	Ant. 4	Ant. 5	Ant. 6	Ant. 1	Ant. 2	Ant. 3	Ant. 4	Ant. 5	Ant. 6
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery 3						Battery 4					
Ant. 1	Ant. 2	Ant. 3	Ant. 4	Ant. 5	Ant. 6	Ant. 1	Ant. 2	Ant. 3	Ant. 4	Ant. 5	Ant. 6
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Radio Body Test

Battery	Audio Accessory																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
2	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
3	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
4	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Manufacture's disclosed accessory listing information provided by Kenwood corporation.

*Note : Audio AccessoryKMC-45D was chosen for the testing body worn radio configuration. Audio Accessory KMC-21, KEP-2, KHS-10-BH. KHS-10-OH, KHS-7, KHS-7A, KHS-8BL/BE, KHS-9BL/BE, KHS-22,KHS-23, KHS-25, KHS-26, KHS-27, KHS-31, KHS-1, KHS-8NC, KHS-21, KHS-29F, EMC-11, KHS-35F and EMC-12 are excluded per KDB 643646 D01 v01r02 page 10 1) .

5. INTRODUCTION

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-2005 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., Ne York, New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (d*W*) absorbed by (dissipated in) an incremental mass (d*m*) contained in a volume element (d*V*) of a given density (*r*). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

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

Figure 1. SAR Mathematical Equation

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

$$SAR = \sigma E^2 / \rho$$

Where:

σ = conductivity of the tissue-simulant material (S/m)

ρ = mass density of the tissue-simulant material (kg/m^3)

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.

6. DESCRIPTION OF TEST EQUIPMENT

6.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure.2).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC with Windows XP or Windows 7 is working with SAR Measurement system DASY4 & DASY5, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

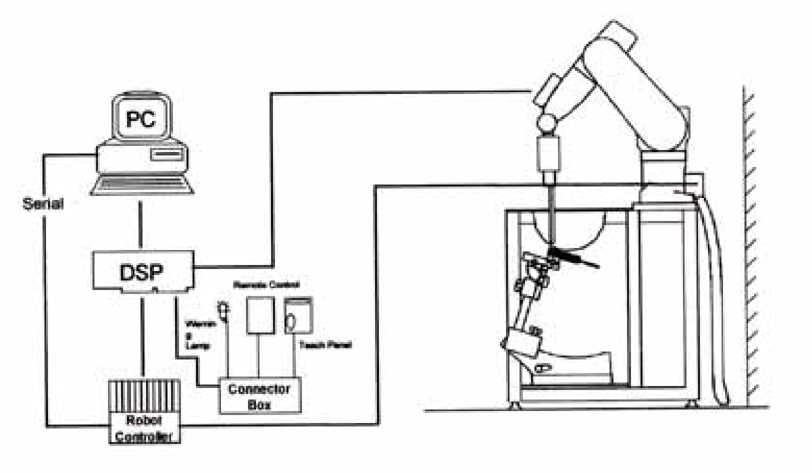

Figure 2. HCT SAR Lab. Test Measurement Set-up

The 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 PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in.

6.2 SAM Phantom

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.
ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure.

Figure 9. SAM Phantom

Shell Thickness	2.0 mm ± 0.2 mm (6 ± 0.2 mm at ear point)
Filling Volume	about 25 L
Dimensions	810 mm x 1000 mm x 500 mm (H x L x W)

6.3 Device Holder for Transmitters

In combination with the SAM Phantom V 4.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatable positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Fig. 4-3. Device Holder

Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations. To produce the Worst-case condition (the hand absorbs antenna output power),
the hand is omitted during the tests.

7. SAR MEASUREMENT PROCEDURE

The evaluation was performed with the following procedure:

2. The SAR distribution at the exposed side of the head or body was measured at a distance no more than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the DUT's head and body area and the horizontal grid resolution was depending on the FCC KDB 865664 D01v01 table 4-1 & IEEE 1528-2013.

3. Based on step, the area of the maximum absorption was determined by sophisticated interpolations routines implemented in DASY software. When an Area Scan has measured all reachable point. DASY system computes the field maximal found in the scanned are, within a range of the maximum. SAR at this fixed point was measured and used as a reference value.

4. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB 865664 D01v01 table 4-1 and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (reference from the DASY manual.)

   a. The data at the surface were extrapolated, since the center of the dipoles is no more than 2.7 mm away from the tip of the probe (it is different from the probe type) and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

   b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan. If the value changed by more than 5 %, the SAR evaluation and drift measurements were repeated.

Area scan and zoom scan resolution setting follow KDB 865664 D01v01r04 quoted below.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5±1 mm	$\frac{1}{2}\cdot\delta\cdot\ln(2)\pm0.5$ 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: ≤8mm 2-3 GHz: ≤5mm*	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.

8. DESCRIPTION OF TEST POSITION

8.1 EAR REFERENCE POINT

Figure 6-2 shows the front, back and side views of the SAM phantom. The center-of-mouth reference point is labeled “M”, the left ear reference point (ERP) is marked “LE”, and the right ERP is marked “RE.” Each ERP is on the B-M (back-mouth) line located 15 mm behind the entrance-to-ear-canal (EEC) point, as shown in Figure 6-1. The Reference Plane is defined as passing through the two ear reference point and point M. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane (See Figure 5-1), Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning.

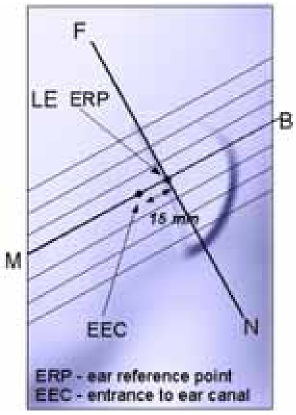

Figure 6-1
Close-up side view of ERP

8.2 HEAD POSITION

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The device under test was placed in a normal operating position with the acoustic output located along the “vertical centerline” on the front of the device aligned to the “ear reference point”(see Figure 6-3). The acoustic output was than located at the same level as the center of the ear reference point. The device under test was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.

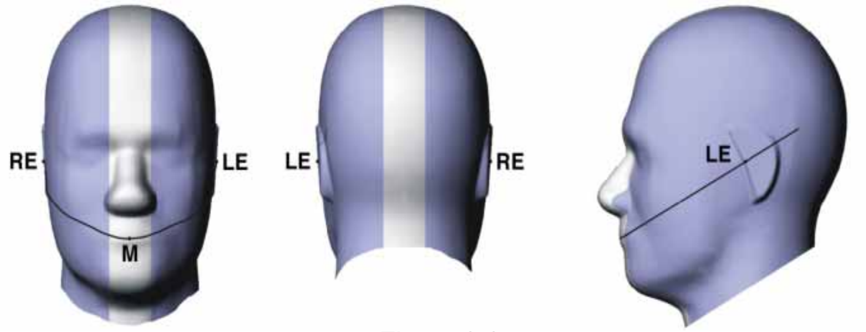

Figure 6-2
Front, back and side views of SAM Twin Phantom

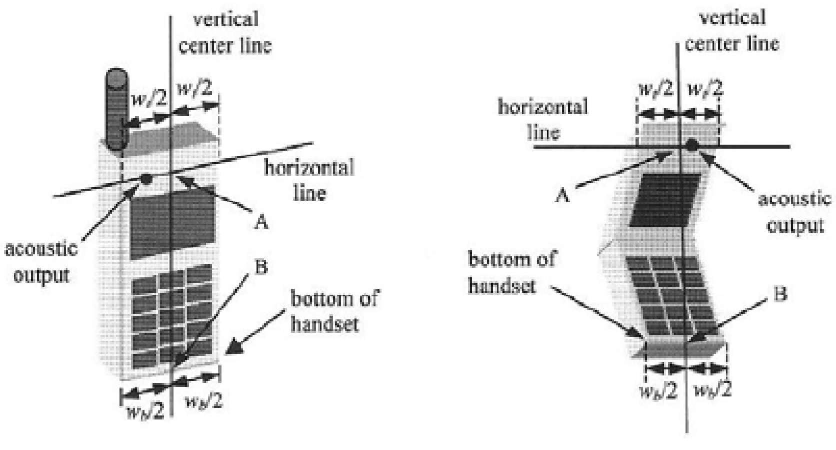

Figure 6-3. Handset vertical and horizontal reference lines

8.3 Body Holster/Belt Clip Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. A device with a headset output is tested with a headset connected to the device. Body dielectric parameters are used.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with each accessory. If multiple accessory share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some Devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used.

Since this EUT does not supply any body worn accessory to the end user a distance of 0 cm from the EUT back surface to the liquid interface is configured for the generic test.

"See the Test SET-UP Photo"

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessory(ies), Including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worst case positioning is then documented and used to perform Body SAR testing.

8.4 Body-Worn Accessory Configurations

Body-worm operating configurations are tested with the belt-dips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-4). Per FCC KDB Publication 648474 D04v01f Body-worm accessory exposure is typically related to voice mode operations when handsets are carried in body-worm accessories. The body-worm accessory procedures in FCC KDB Publication 447498 D01v05 should be used to test for body-worm accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worm accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body- worm accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body- worm accessory with a headset attached to the handset.

Figure 6-4
Sample Body-Worn Diagram

Accessories for Body-worm operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-dip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worm accessories may not always be supplied or available as options for some devices intended to be authorized for body-worm use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worm transmitters. SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

9. ANSI/ IEEE C95.1 - 2005 RF EXPOSURE LIMITS

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population	CONTROLLED ENVIRONMENT Occupational
	(W/kg) or (mW/g)	(W/kg) or (mW/g)
SPATIAL PEAK SAR * (Brain)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.00

Table 8.1 Safety Limits for Partial Body Exposure

NOTES:

* The Spatial Peak value of the SAR averaged over any 1 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

** The Spatial Average value of the SAR averaged over the whole-body.

*** The Spatial Peak value of the SAR averaged over any 10 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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 mad 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 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.

10. SYSTEM VERIFICATION

10.1 Tissue Verification

The Head /body simulating material is calibrated by HCT using an Agilent 85070C Dielectric Probe Kit and Agilent Network Analyzer.

Table for Head Tissue Verification

Date of Tests	Tissue Temp	Tissue Type	Freq. (MHz)	Measured Conductivity σ (S/m)	Measured Dielectric Constant, ε	Target Conductivity σ (S/m)	Target Dielectric Constant, ε	% dev σ	% dev ε
08/21/2015	20.4	150H	150	0.7683	52.06	0.7600	52.30	1.09%	-0.46%
			175	0.7852	51.9547	0.7785	51.14	0.86%	1.59%

Table for Body Tissue Verification

Date of Tests	Tissue Temp	Tissue Type	Freq. (MHz)	Measured Conductivity σ (S/m)	Measured Dielectric Constant, ε	Target Conductivity σ (S/m)	Target Dielectric Constant, ε	% dev σ	% dev ε
08/25/2015	21.4	150B	150	0.8195	61.93	0.8000	61.90	2.44%	0.05%
			175	0.8311	61.02	0.8200	61.29	1.35%	-0.44%

10.2 System Verification

Prior to assessment, the system is verified to the ± 10 % of the specifications at 150 MHz by using the system Verification kit. (Graphic Plots Attached)

System Verification Results

Freq.	Date	Probe (S/N)	Dipole (S/N)	Liquid	Amb. Temp.	Liquid Temp.	1 W Target SAR_{1g} (SPEAG)	Measured SAR_{1g}	1 W Normalized SAR_{1g}	Deviation	Limit [%]
[MHz]					[°C]	[°C]	[W/kg]	[W/kg]	[W/kg]	[%]	[%]
150	08/21/2015	3968	4014	Head	20.6	20.4	3.72	0.367	3.67	-1.344	± 10
150	08/25/2015	3968		Body	21.6	21.4	3.81	0.377	3.77	-1.049	± 10

10.3 System Verification 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. (Graphic Plots Attached)

- Cabling the system, using the Verification kit equipments.
- Generate about 100 mW 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.

11. SAR TEST DATA SUMMARY

11.1 Measurement Results (Face-held SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Battery	Antenna	Separation Distance	Measured SAR(mW/g)	SAR 50% Duty (mW/g)	Reported SAR (mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power								
150.05	1	FM	37.16	37	-0.311	KNB-69L	KRA-41M	25mm	0.665	0.333	0.371	
166	3		37.16	37.01	-0.685	KNB-69L	KRA-41M2	25mm	1.53	0.765	0.927	
150.05	1		37.16	37	-0.111	KNB-69L	KRA-22M	25mm	1.07	0.535	0.569	
166	3		37.16	37.01	-0.562	KNB-69L	KRA-22M2	25mm	0.939	0.470	0.553	
150.05	1		37.16	37	-0.031	KNB-69L	KRA-26M	25mm	1.32	0.660	0.690	
166	3		37.16	37.01	-0.194	KNB-69L	KRA-26M2	25mm	3.13	1.565	1.694	
166	3		37.16	37.01	-0.358	KNB-45L	KRA-26M2	25mm	3.23	1.615	1.815	
166	3		37.16	37.01	-0.39	KNB-29N	KRA-26M2	25mm	1.45	0.725	0.821	
166	3		37.16	37.01	-1.52	KNB-53N	KRA-26M2	25mm	2.54	1.270	1.866	1
ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak controlled Exposure/ Occupational									Head 8 W/kg (mW/g) Averaged over 1 gram			

11.2 Measurement Results (Body-worn Belt clip SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Battery	Antenna	Measured SAR(mW/g)	SAR 50% Duty (mW/g)	Reported SAR(mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power							
150.05	1	FM	37.16	37	-0.405	KNB-45L	KRA-41M	2.33	1.165	1.327	
166	3		37.16	37.01	-0.193	KNB-45L	KRA-41M2	2.84	1.42	1.537	
150.05	1		37.16	37	-0.307	KNB-45L	KRA-22M	3.19	1.595	1.776	
166	3		37.16	37.01	-0.513	KNB-45L	KRA-22M2	2.56	1.28	1.491	
150.05	1		37.16	37	-0.048	KNB-45L	KRA-26M	4.36	2.18	2.287	
166	3		37.16	37.01	-0.313	KNB-45L	KRA-26M	3.37	1.685	1.875	
150.05	1		37.16	37	-0.322	KNB-69L	KRA-26M	3.39	1.695	1.894	
150.05	1		37.16	37	-0.527	KNB-29N	KRA-26M	3.46	1.73	2.026	
150.05	1		37.16	37	-0.558	KNB-53N	KRA-26M	4.15	2.075	2.448	2
ANSI/ IEEE C95.1 – 2005– Safety Limit Spatial Peak controlled Exposure/ Occupational								Body 8 W/kg (mW/g) Averaged over 1 gram			

11.3 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003, FCC KDB Procedure.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB 447498 D01v05r02..
6. Test signal call mode is Manual test cord.
7. The EUT was tested for face-held SAR with a 2.5cm separation distance between the front of the EUT and the outer surface of the planer phantom
8. The Body-worn SAR evaluation was performed with the Balt-clip body-worn accessory attached to the DUT and touching the outer surface of the planar phantom.
9. The adjusted SAR value was calculated by first scaling the SAR value up by the drift. This value was then scaled up based on the difference of the upper end the tolerance (36.23dBm) and the measured conducted power. The resultant value is then multiplied by 0.5 to give the SAR value at 50% duty cycle.
10. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB 447498 D01v05r02. Test Procedures applied in accordance with FCC KDB 643646 D01v02
11. For Face-held configuration, the highest capacity battery was selected as the default battery.(KNB-69L)
12. For Body-worn configuration, the thinnest standard battery was selected as the default battery.(KNB-45L)
13. Measurement was reduced per KDB 643646 D01 v01r02
14. When the SAR for all antennas tested using the default battery is ≤ 3.5 W/kg, testing of all other required channels is not necessary.
15. When the SAR of an antenna tested on the highest output power using the default battery is > 3.5 W/Kg and ≤ 4.0 W/, testing of the immediately adjacent channel(s) is not necessary, but testing of other required channels may still be required.
16. When the SAR for all antennas tested using the default battery ≤ 4.0 W/kg, test additional batteries using the antenna and channel configuration that resulted in the highest SAR.
17. When the SAR of an antenna tested on the highest output power channel using the default battery is > 4.0 W/kg and ≤ 6.0 W/kg, testing of the required immediately adjacent channel(s) is necessary. For the remaining channels that cannot be excluded, this rule may be applied recursively with respect to the highest output power channel among the remaining channels.
18. Based on the SAR measured in the body-worn test sequence with default audio accessory, if the SAR for the antenna, body-worn accessory and battery combination(s) applicable to an audio accessory is/are >4.0 W/kg and < 6.0 W/kg, test that audio accessory using the highest body-worn SAR combination(antenna, battery and body-worn accessory) and channel configuration previously identified that is applicable to the audio accessory.

12. MEASUREMENT UNCERTAINTY

Uncertainty (450 MHz)						
Error Description	Tol (± %)	Prob. dist.	Div.	c_i	Standard Uncertainty (± %)	v_{eff}
1. Measurement System						
Probe Calibration	6.65	N	1	1	6.65	∞
Axial Isotropy	4.70	R	1.73	0.7	1.90	∞
Hemispherical Isotropy	9.60	R	1.73	0.7	3.88	∞
Boundary Effects	1.00	R	1.73	1	0.58	∞
Linearity	4.70	R	1.73	1	2.71	∞
System Detection Limits	1.00	R	1.73	1	0.58	∞
Readout Electronics	0.30	N	1.00	1	0.30	∞
Response Time	0.8	R	1.73	1	0.46	∞
Integration Time	2.6	R	1.73	1	1.50	∞
RF Ambient Conditions	3.00	R	1.73	1	1.73	∞
Probe Positioner	0.40	R	1.73	1	0.23	∞
Probe Positioning	2.90	R	1.73	1	1.67	∞
Max SAR Eval	1.00	R	1.73	1	0.58	∞
2.Test Sample Related						
Device Positioning	2.25	N	1.00	1	2.25	9
Device Holder	3.60	N	1.00	1	3.60	∞
Power Drift	5.00	R	1.73	1	2.89	∞
3.Phantom and Setup						
Phantom Uncertainty	4.00	R	1.73	1	2.31	∞
Liquid Conductivity(target)	5.00	R	1.73	0.64	1.85	∞
Liquid Conductivity(meas.)	2.70	N	1	0.64	1.73	∞
Liquid Permitivity(target)	5.00	R	1.73	0.6	1.73	∞
Liquid Permitivity(meas.)	1.90	N	1	0.6	1.14	∞
Combind Standard Uncertainty					11.05	
Coverage Factor for 95 %					$k=2$	
Expanded STD Uncertainty					22.10	

13. SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
SPEAG	ELI Phantom	-	N/A	N/A	N/A
HP	SAR System Control PC	-	N/A	N/A	N/A
Staubli	Robot RX60B L	F05/5K10A1/A/01	N/A	N/A	N/A
Staubli	Robot ControllerCS7MB	F05/5K10A1/C/01	N/A	N/A	N/A
SPEAG	Light Alignment Sensor	265	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D211421	N/A	N/A	N/A
SPEAG	DAE3	446	01/21/2015	Annual	01/21/2016
SPEAG	E-Field Probe EX3DV4	3968	06/18/2015	Annual	06/18/2016
SPEAG	CLA150	4014	09/04/2014	Annual	09/04/2015
Agilent	Power Meter E4419B	MY41291386	10/27/2014	Annual	10/27/2015
Agilent	Power Sensor 8481A	MY41090675	10/27/2014	Annual	10/27/2015
HP	Dielectric Probe Kit 85070C	00721521	CBT		
HP	Dual Directional Coupler 778D	16072	10/27/2014	Annual	10/27/2015
HP	Directional Bridge	86205A	05/20/2015	Annual	05/20/2016
Agilent	Base Station E5515C	GB44400269	02/09/2015	Annual	02/09/2016
HP	Signal Generator N5182A	MY4770230	05/13/2015	Annual	05/13/2016
Agilent	MXA Signal Analyzer N9020A	MY50510407	03/23/2015	Annual	03/23/2016
HP	Network Analyzer 8753ES	JP39240221	03/23/2015	Annual	03/23/2016
HP	AMPLIFIER	8447F	01/13/2015	Annual	01/13/2016
R&S	Base Station CMW500	100990	12/05/2014	Annual	12/05/2015

NOTE:
1. The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Verification measurement is performed by HCT Lab. before each test. The brain/body simulating material is calibrated by HCT using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain/body-equivalent material.

2. CBT (Calibrating Before Testing). Prior to testing, the dielectric probe kit was calibrated via the network analyzer, with the specified procedure (calibrated in pure water) and calibration kit (standard) short circuit, before the dielectric measurement. The specific procedure and calibration kit are provided by Agilent

14. CONCLUSION

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/ IEEE C95.1- 2005.

These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests.

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC and Industry Canada. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

15. REFERENCES

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Attachment 1.– SAR Test Plots

Test Laboratory: HCT CO., LTD
EUT Type: VHF DIGITAL TRANSCEIVER
Liquid Temperature: 20.4℃
Test Date: 08/21/2015
Plot No.: 1

DUT: TK-D240V-K; Type: Ant out

Communication System: 150MHz; Frequency: 166 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 166 MHz; σ = 0.781 mho/m; ε_r = 52; ρ = 1000 kg/m^3

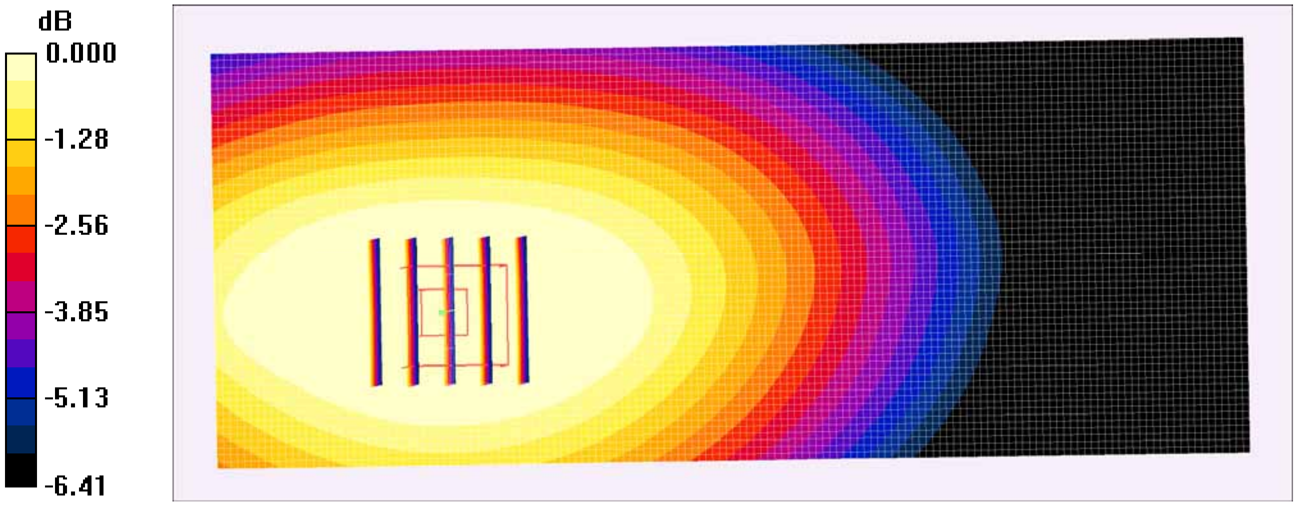
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3968; ConvF(13.09, 13.09, 13.09); Calibrated: 2015-06-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2015-01-21
- Phantom: Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

PTT KRA-26M2 Head 3ch/Area Scan (61x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.06 mW/g

PTT KRA-26M2 Head 3ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 60.0 V/m; Power Drift = -1.52 dB
Peak SAR (extrapolated) = 3.25 W/kg
SAR(1 g) = 2.54 mW/g; SAR(10 g) = 1.98 mW/g
Maximum value of SAR (measured) = 2.65 mW/g



0 dB = 2.65mW/g

Test Laboratory: HCT CO., LTD
EUT Type: VHF DIGITAL TRANSCEIVER
Liquid Temperature: 21.4℃
Test Date: 08/25/2015
Plot No.: 2

DUT: TK-D240V-K; Type: Ant out

Communication System: 150MHz; Frequency: 150.05 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 150.05 MHz; σ = 0.821 mho/m; ε_r = 61.9; ρ = 1000 kg/m^3

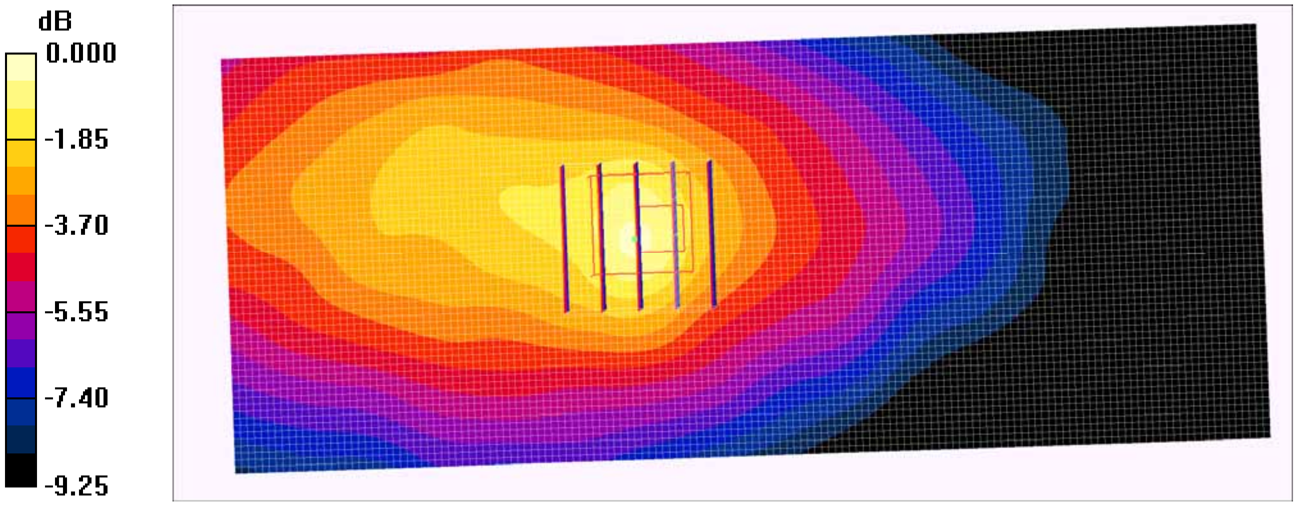
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3968; ConvF(12.4, 12.4, 12.4); Calibrated: 2015-06-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2015-01-21
- Phantom: Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

PTT KRA-26M Body 1ch/Area Scan (61x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.21 mW/g

PTT KRA-26M Body 1ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 75.2 V/m; Power Drift = -0.558 dB
Peak SAR (extrapolated) = 8.24 W/kg
SAR(1 g) = 4.15 mW/g; SAR(10 g) = 2.61 mW/g
Maximum value of SAR (measured) = 4.69 mW/g



0 dB = 4.69mW/g

Attachment 2.– Verification Plots

■ Verification Data (150 MHz Head)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 20.4
Test Date: 08. 21. 2015

DUT: CLA-150; Type: CLA-150

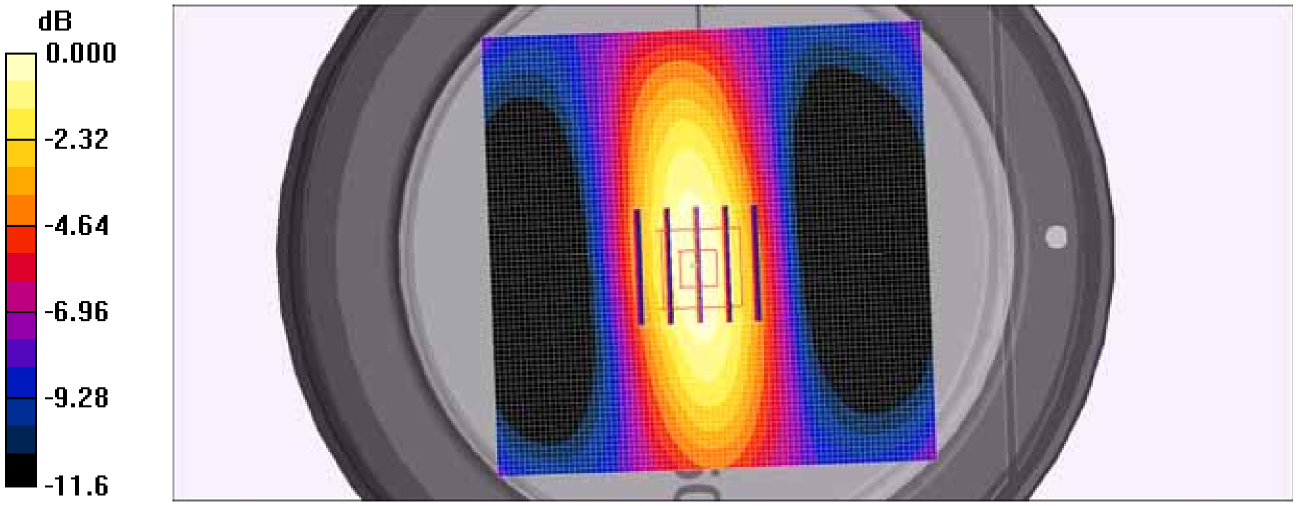
Communication System: CW; Frequency: 150 MHz;Duty Cycle: 1:1
Medium parameters used: f = 150 MHz; σ = 0.769 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3968; ConvF(13.09, 13.09, 13.09); Calibrated: 2015-06-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2015-01-21
- Phantom: Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

150MHz Head Verification/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.486 mW/g

150MHz Head Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.3 V/m; Power Drift = 0.023 dB
Peak SAR (extrapolated) = 0.628 W/kg
SAR(1 g) = 0.367 mW/g; SAR(10 g) = 0.228 mW/g
Maximum value of SAR (measured) = 0.491 mW/g



0 dB = 0.491mW/g

■ Verification Data (150 MHz Body)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.4
Test Date: 08. 25. 2015

DUT: CLA-150; Type: CLA-150

Communication System: CW; Frequency: 150 MHz;Duty Cycle: 1:1

Medium parameters used: f = 150 MHz; σ = 0.821 mho/m; ε_r = 61.9; ρ = 1000 kg/m^3

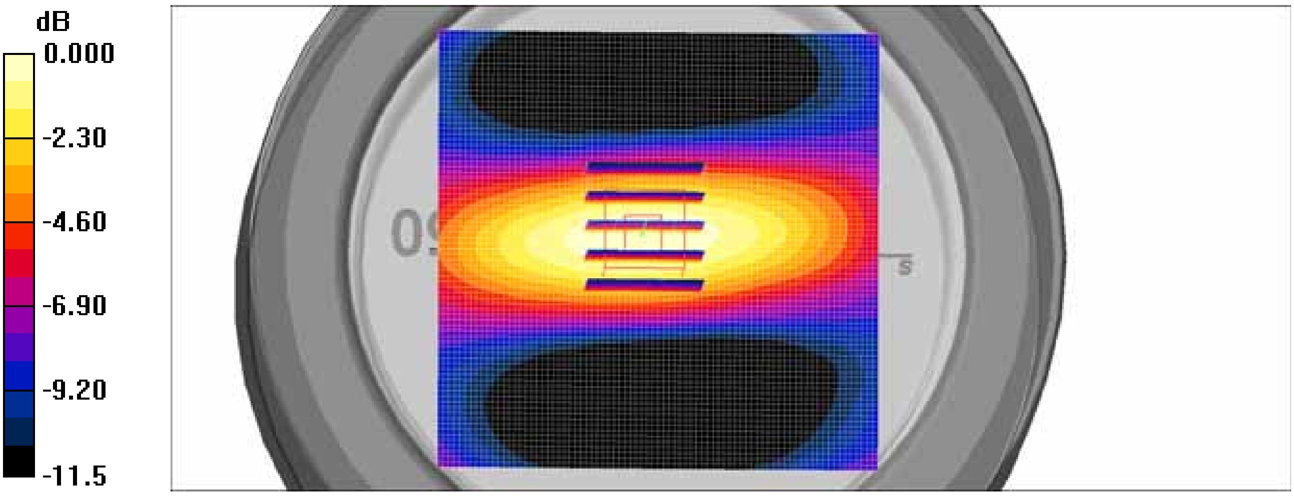
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3968; ConvF(12.4, 12.4, 12.4); Calibrated: 2015-06-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2015-01-21
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

150MHz Body Verification/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.526 mW/g

150MHz Body Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.6 V/m; Power Drift = -0.006 dB
Peak SAR (extrapolated) = 0.668 W/kg
SAR(1 g) = 0.394 mW/g; SAR(10 g) = 0.246 mW/g
Maximum value of SAR (measured) = 0.525 mW/g



0 dB = 0.525mW/g

Attachment 3. – Probe Calibration Data

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **HCT (Dymstec)**

Certificate No: **EX3-3968_Jun15**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3968
Calibration procedure(s)	QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for dosimetric E-field probes
Calibration date:	June 18, 2015

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	01-Apr-15 (No. 217-02128)	Mar-16
Power sensor E4412A	MY41498087	01-Apr-15 (No. 217-02128)	Mar-16
Reference 3 dB Attenuator	SN: S5054 (3c)	01-Apr-15 (No. 217-02129)	Mar-16
Reference 20 dB Attenuator	SN: S5277 (20x)	01-Apr-15 (No. 217-02132)	Mar-16
Reference 30 dB Attenuator	SN: S5129 (30b)	01-Apr-15 (No. 217-02133)	Mar-16
Reference Probe ES3DV2	SN: 3013	30-Dec-14 (No. ES3-3013_Dec14)	Dec-15
DAE4	SN: 660	14-Jan-15 (No. DAE4-660_Jan15)	Jan-16
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: June 18, 2015

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

Probe EX3DV4

SN:3968

Manufactured: September 30, 2013
Calibrated: June 18, 2015

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3968

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.36	0.35	0.42	± 10.1 %
DCP (mV)[B]	103.1	102.8	96.8	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	130.3	±3.0 %
		Y	0.0	0.0	1.0		129.8	
		Z	0.0	0.0	1.0		142.3	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3968

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unct. (k=2)
150	52.3	0.76	13.09	13.09	13.09	0.00	1.00	± 13.3 %
300	45.3	0.87	12.28	12.28	12.28	0.10	1.20	± 13.3 %
450	43.5	0.87	10.61	10.61	10.61	0.18	1.20	± 13.3 %
750	41.9	0.89	9.92	9.92	9.92	0.18	1.57	± 12.0 %
835	41.5	0.90	9.60	9.60	9.60	0.21	1.64	± 12.0 %
900	41.5	0.97	9.45	9.45	9.45	0.22	1.25	± 12.0 %
1450	40.5	1.20	8.28	8.28	8.28	0.26	1.02	± 12.0 %
1750	40.1	1.37	8.23	8.23	8.23	0.31	0.80	± 12.0 %
1900	40.0	1.40	7.95	7.95	7.95	0.30	0.80	± 12.0 %
1950	40.0	1.40	7.66	7.66	7.66	0.38	0.80	± 12.0 %
2300	39.5	1.67	7.51	7.51	7.51	0.37	0.80	± 12.0 %
2450	39.2	1.80	7.21	7.21	7.21	0.36	0.80	± 12.0 %
2600	39.0	1.96	7.06	7.06	7.06	0.39	0.89	± 12.0 %
3500	37.9	2.91	6.82	6.82	6.82	0.29	1.33	± 13.1 %
5200	36.0	4.66	5.26	5.26	5.26	0.30	1.80	± 13.1 %
5300	35.9	4.76	5.09	5.09	5.09	0.35	1.80	± 13.1 %
5500	35.6	4.96	4.86	4.86	4.86	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.59	4.59	4.59	0.40	1.80	± 13.1 %
5800	35.3	5.27	4.68	4.68	4.68	0.40	1.80	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3968

Calibration Parameter Determined in Body Tissue Simulating Media

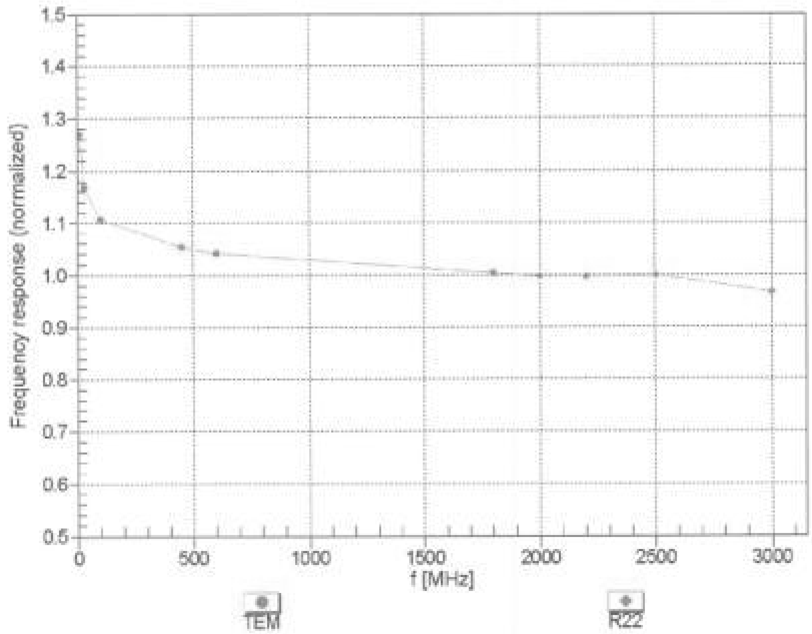
f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unct. (k=2)
150	61.9	0.80	12.40	12.40	12.40	0.00	1.00	± 13.3 %
300	58.2	0.92	11.34	11.34	11.34	0.05	1.10	± 13.3 %
450	56.7	0.94	10.86	10.86	10.86	0.12	1.20	± 13.3 %
750	55.5	0.96	9.49	9.49	9.49	0.34	1.03	± 12.0 %
835	55.2	0.97	9.55	9.55	9.55	0.50	0.80	± 12.0 %
900	55.0	1.05	9.34	9.34	9.34	0.42	0.93	± 12.0 %
1750	53.4	1.49	7.87	7.87	7.87	0.42	0.80	± 12.0 %
1900	53.3	1.52	7.60	7.60	7.60	0.33	0.95	± 12.0 %
2450	52.7	1.95	7.25	7.25	7.25	0.36	0.80	± 12.0 %
2600	52.5	2.16	7.10	7.10	7.10	0.24	0.80	± 12.0 %
5200	49.0	5.30	4.71	4.71	4.71	0.40	1.90	± 13.1 %
5300	48.9	5.42	4.44	4.44	4.44	0.40	1.90	± 13.1 %
5500	48.6	5.65	4.14	4.14	4.14	0.45	1.90	± 13.1 %
5600	48.5	5.77	3.93	3.93	3.93	0.45	1.90	± 13.1 %
5800	48.2	6.00	4.27	4.27	4.27	0.45	1.90	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

EX3DV4– SN:3968 June 18, 2015

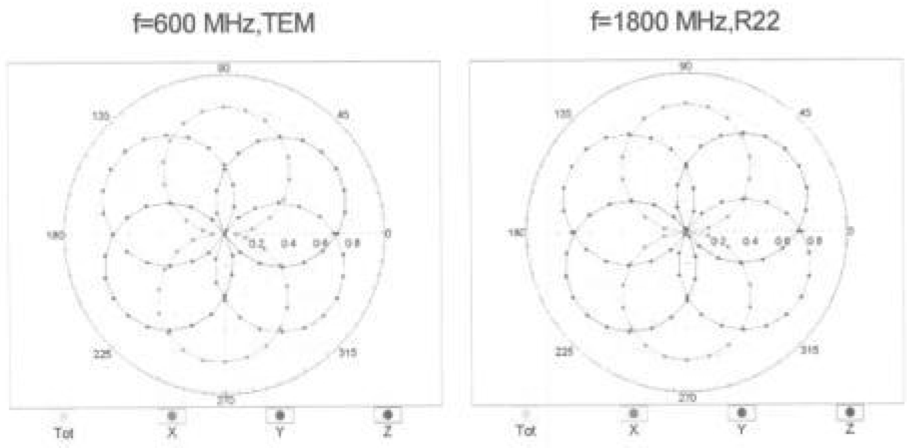
Frequency Response of E-Field

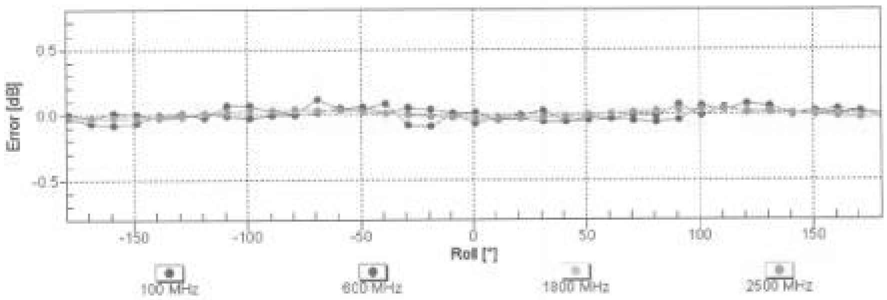
(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



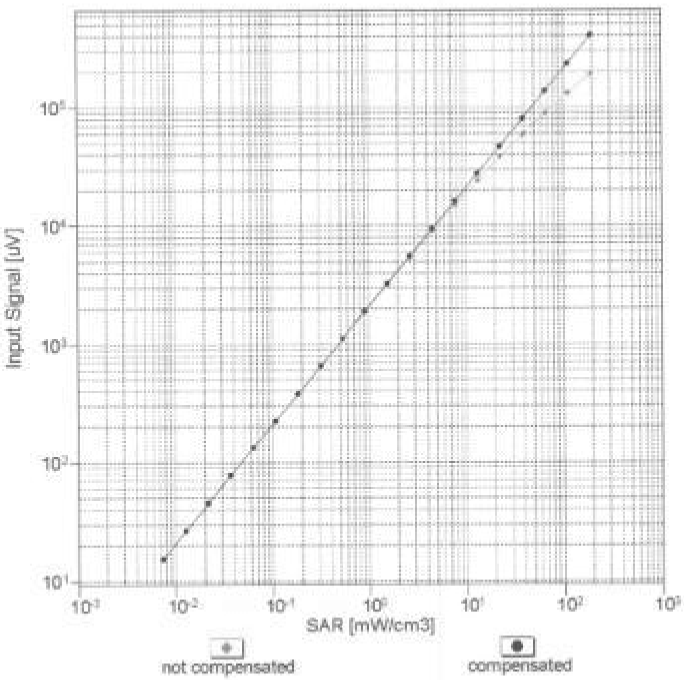


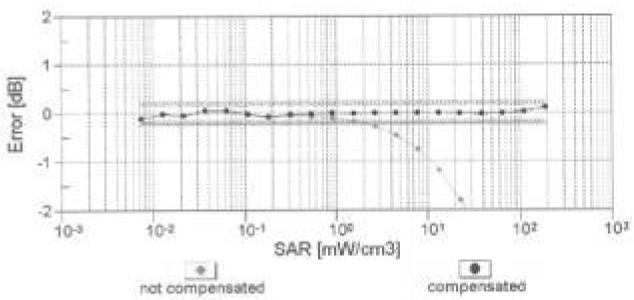
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

EX3DV4– SN:3968 June 18, 2015

Dynamic Range f(SAR$_{head}$)

(TEM cell , f_{eval}= 1900 MHz)





Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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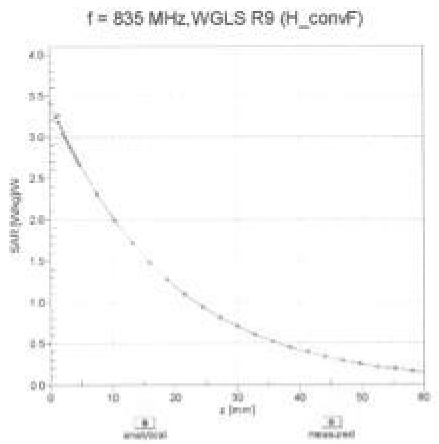
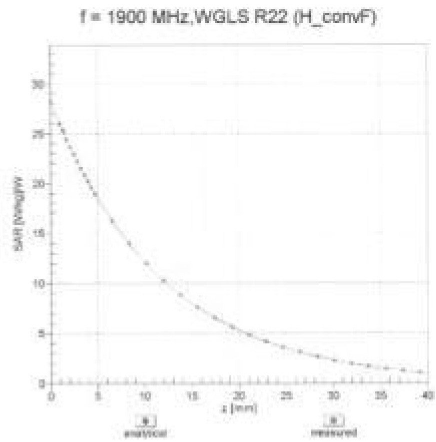
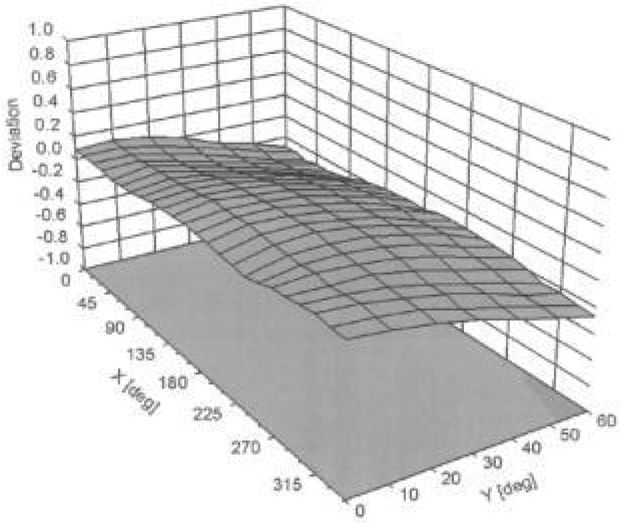
Conversion Factor Assessment

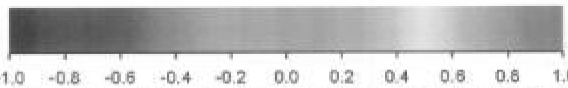




Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3968

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	61.1
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Attachment 4. – Dipole Calibration Data

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **HCT (Dymstec)** Certificate No: **CLA150-4014_Sep14**

CALIBRATION CERTIFICATE

Object: CLA150 - SN: 4014

Calibration procedure(s): QA CAL-15.v8
Calibration procedure for system validation sources below 700 MHz

Calibration date: September 04, 2014

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	03-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: S5054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: S5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe EX3DV4	SN: 3877	06-Jan-14 (No. EX3-3877_Jan14)	Jan-15
DAE4	SN: 654	30-Jun-14 (No. DAE4-654_Jun14)	Jun-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	04-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 11, 2014

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2013
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
EUT Positioning	Touch Position	
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	
Frequency	150 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	52.3	0.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	51.5 ± 6 %	0.78 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	1 W input power	3.77 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**3.72 W/kg ± 18.4 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	1 W input power	2.51 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**2.48 W/kg ± 18.0 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	61.9	0.80 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	61.1 ± 6 %	0.81 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	1 W input power	3.86 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**3.81 W/kg ± 18.4 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	1 W input power	2.59 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**2.56 W/kg ± 18.0 % (k=2)**

Appendix (Additional assessments outside the scope of SCS108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	46.6 Ω - 5.9 jΩ
Return Loss	- 23.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.4 Ω + 6.7 jΩ
Return Loss	- 23.2 dB

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	June 30, 2014

HCT CO., LTD.
74, Seoicheon-ro 578 beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 Rep. of Korea
TEL: +82 31 645 6300 FAX: +82 31 645 6401

DASY5 Validation Report for Head TSL

Date: 05.09.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: CLA150; Type: CLA150; Serial: CLA150 - SN: 4014

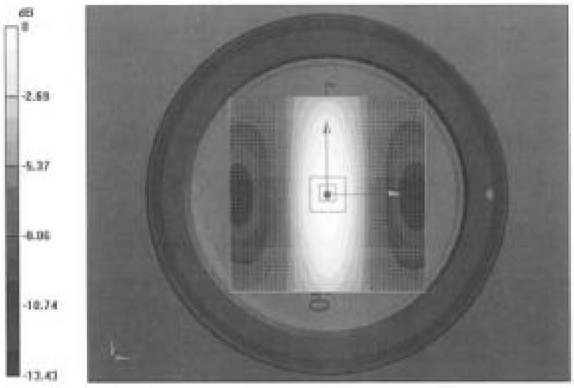
Communication System: UID 0 - CW; Frequency: 150 MHz
Medium parameters used: f = 150 MHz; σ = 0.77 S/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(11.76, 11.76, 11.76); Calibrated: 06.01.2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 30.06.2014
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

CLA Calibration for HSL-LF Tissue/CLA150, touch configuration, Pin=1W/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 4.74 W/kg

CLA Calibration for HSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan, dist=1.4mm (8x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 78.54 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 7.09 W/kg
SAR(1 g) = 3.77 W/kg; SAR(10 g) = 2.51 W/kg
Maximum value of SAR (measured) = 5.24 W/kg



0 dB = 4.74 W/kg = 6.76 dBW/kg

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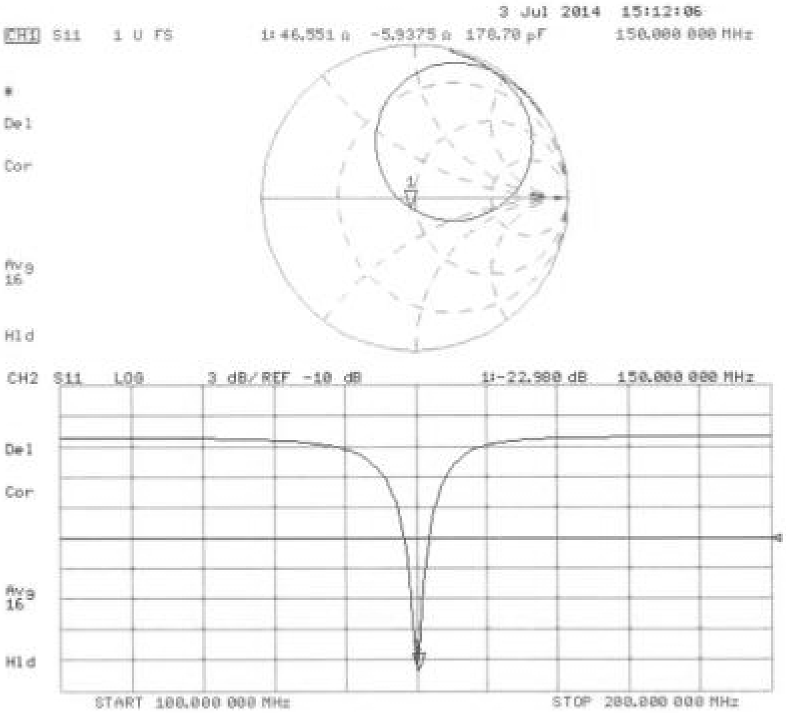
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 04.09.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: CLA-150; Type: CLA-150; Serial: 4014

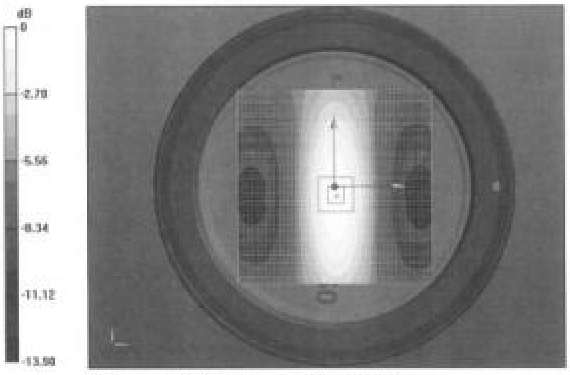
Communication System: UID 0 - CW; Frequency: 150 MHz
Medium parameters used: f = 150 MHz; $\sigma = 0.81$ S/m; $\varepsilon_r = 61.1$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(11.45, 11.45, 11.45); Calibrated: 06.01.2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 30.06.2014
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

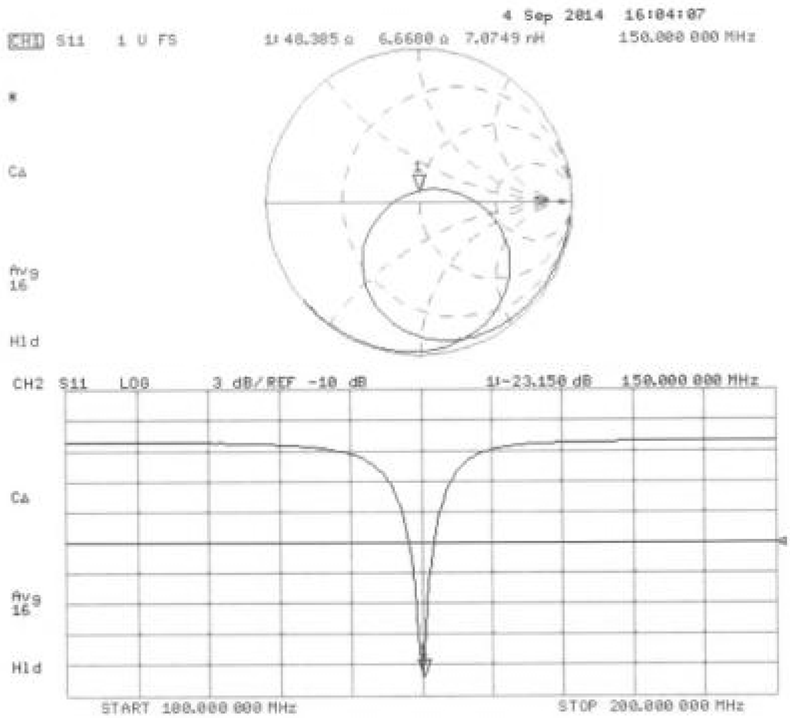
CLA Calibration for MSL-LF Tissue/CLA150, touch configuration, Pin=1W/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 4.83 W/kg

CLA Calibration for MSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan, dist=1.4mm (8x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 77.28 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 7.09 W/kg
SAR(1 g) = 3.86 W/kg; SAR(10 g) = 2.59 W/kg
Maximum value of SAR (measured) = 5.36 W/kg



0 dB = 4.83 W/kg = 6.84 dBW/kg

Impedance Measurement Plot for Body TSL



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Attachment 5. – SAR Tissue Characterization

The brain and muscle mixtures consist of a viscous gel using hydrox-ethyl cellulose (HEC) gelling agent and saline solution (see Table 3.1). Preservation with a bacteriacide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The mixture characterizations used for the brain and muscle tissue simulating liquids are according to the data by C. Gabriel and G. Hartsgrove.

Ingredients (% by weight)	Frequency (MHz)	
	150	
Tissue Type	Head	Body
Water	38.35 %	46.6 %
Salt (NaCl)	5.15 %	2.6 %
Sugar	55.5 %	49.7 %
HEC	0.9 %	1.0 %
Bactericide	0.1 %	0.1 %
Triton X-100	-	-
DGBE	-	-
Diethyleneglycolhexylether	-	-

Salt:	99 % Pure Sodium Chloride	Sugar:	98 % Pure Sucrose
Water:	De-ionized, 16M resistivity	HEC:	Hydroxyethyl Cellulose
DGBE:	99 % Di(ethylene glycol) butyl ether,[2-(2-butoxyethoxy) ethanol]		
Triton X-100(ultra pure):	Polyethylene glycol mono[4-(1,1,3,3-tetramethylbutyl)phenyl] ether		

Composition of the Tissue Equivalent Matter

Attachment 6. – SAR SYSTEM VALIDATION

Per FCC KCB 865664 D02v01r01, SAR system validation status should be document to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in IEEE 1528-2003 and FCC KDB 865664 D01v01r04. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

SAR System No.	Probe	Probe Type	Probe Calibration Point		Dipole	Date	Dielectric Parameters		CW Validation			Modulation Validation		
							Measured Permittivity	Measured Conductivity	Sensitivity	Probe Linearity	Probe Isotropy	MOD. Type	Duty Factor	PAR
1	3968	EX3DV4	Head	150	4014	07/13/2015	52.43	0.772	PASS	PASS	PASS	N/A	N/A	N/A
1	3968	EX3DV4	Body	150	4014	07/13/2015	62.27	0.806	PASS	PASS	PASS	N/A	N/A	N/A

SAR System Validation Summary

Note;

All measurement were performed using probes calibrated for CW signal only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r03. SAR system were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to KDB 865664 D01v01r04.