SAR Test Report

Report No.: AGC00589151102FH01

FCC ID	:	T4KD858V
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	DIGITAL RADIO
BRAND NAME	:	N/A
MODEL NAME	:	D858,D878,D888,D898,858,878,888,898
CLIENT	:	Qixiang Electron Science & Technology Co., Ltd.
DATE OF ISSUE	:	Apr. 23,2016
STANDARD(S)	:	IEEE Std. 1528:2013 FCC 47CFR § 2.1093 IEEE/ANSI C95.1
REPORT VERSION	:	V1.0

Attestation of Global Compliance(Shenzhen) Co., Ltd.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 23,2016	Valid	Original Report

Test Report Certification

Applicant Name	Qixiang Electron Science & Technology Co., Ltd.
Applicant Address	Qixiang Building,Tangxi Industrial Zone,Luojiang District,Quanzhou,Fujian,China
Manufacturer Name	Qixiang Electron Science & Technology Co., Ltd.
Manufacturer Address	Qixiang Building,Tangxi Industrial Zone,Luojiang District,Quanzhou,Fujian,China
Product Designation	DIGITAL RADIO
Brand Name	N/A
Model Name	D858,D878,D888,D898,858,878,888,898
Different Description	All the same, except for the model name and appearance. The test model is D858.
EUT Voltage	DC7.4 V by battery
Applicable Standard	IEEE Std. 1528:2013 FCC 47CFR § 2.1093 IEEE/ANSI C95.1
Test Date	Nov.16,2015 to Apr. 18,2016
Performed Location	Attestation of Global Compliance(Shenzhen) Co., Ltd.
	2 F, Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang Street, Bao'an District, Shenzhen, China
Report Template	AGCRT-US-PTT/SAR (2014-12-01)

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1. SUMMARY OF MAXIMUM SAR VALUE

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

Highest tested and scaled SAR Summary（with 50% duty cycle）：

Frequency Band	Separation	Highest Reported 1g-SAR(W/Kg)	
		Face Up (with 25mm separation)	Back Touch
VHF(ANALOG)	12.5K	0.370	0.659
VHF(DIGITAL)	12.5K	0.088	0.272

This device is compliance with Specific Absorption Rate (SAR) for Occupational / Controlled Exposure Environment limits (8.0W/Kg) specified in 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1, and had been tested in accordance with measurement methods and procedures specified in IEEE 1528-2013 and the following specific FCC Test Procedures:
KDB447498 D01 General RF Exposure Guidance v06
KDB 865664 D01 SAR Measurement 100MHz to 6GHz v01r04
KDB 643646 D01 SAR Test for PTT Radios v01r03

2. GENERAL INFORMATION

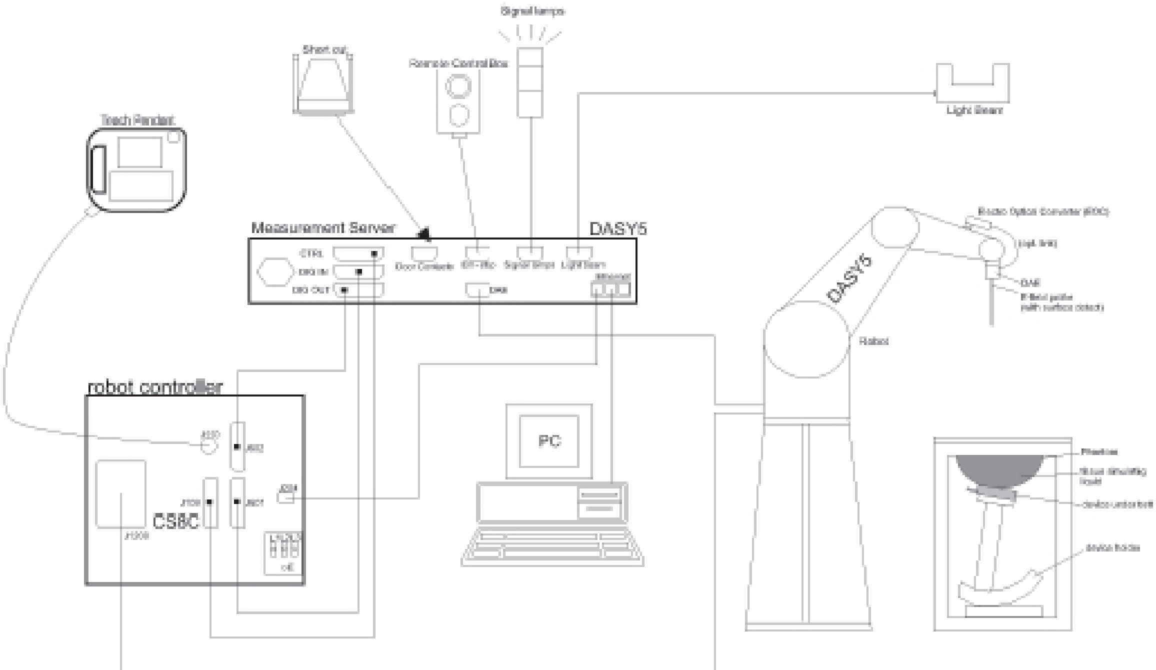
2.1. EUT Description

General Information	
Product Name	DIGITAL RADIO
Test Model	D858
Hardware Version	V1.0
Software Version	V1.0
Exposure Category:	Occupational/Controlled Exposure
Device Category	VHF Portable Transceiver
Modulation Type	FM&4FSK
TX Frequency Range	136-174MHz
Rated Power	5W&1W (It was fixed by the manufacturer, any individual can't arbitrarily change it)
Max. Average Power	Analog: 36.91dBm(5W); 29.89 dBm (1W) Digital: 36.85 dBm(5W); 29.87 dBm (1W)
Channel Spacing	12.5 KHz
Antenna Type	Detachable
Antenna Gain	2.15dBi
Body-Worn Accessories:	Belt Clip with headset
Face-Head Accessories:	None
Battery Type (s) Tested:	DC 7.4V, 2000mAh (by battery)

Product	Type	
	☒ Production unit	☐ Identical Prototype

3. SAR MEASUREMENT SYSTEM

3.1. The DASY5 system used for performing compliance tests consists of following items



- A standard high precision 6-axis robot with controller, teach pendant and software.
- Data acquisition electronics (DAE) which attached to the robot arm extension. The DAE consist 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 with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock
- A dosimetric probe equipped with an optical surface detector system.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital Communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- A Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- Phantoms, device holders and other accessories according to the targeted measurement.

3.2. DASY5 E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEEE 1528, EN62209, IEC 62209, etc.)Under ISO17025.The calibration data are in Appendix D.

Isotropic E-Field Probe Specification

Model	ES3DV3	
Manufacture	SPEAG	
frequency	0.15GHz-3GHz Linearity:±0.2dB(150MHz-3GHz)	
Dynamic Range	0.01W/Kg-100W/Kg Linearity:±0.2dB	
Dimensions	Overall length:337mm Tip diameter:4mm Typical distance from probe tip to dipole centers:2mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

3.3. Data Acquisition Electronics description

The data acquisition electronics (DAE) consist if a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement sever is accomplished through an optical downlink fir data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

DAE4

Input Impedance	200MOhm	
The Inputs	Symmetrical and floating	
Common mode rejection	above 80 dB	

3.4. Robot

The DASY system uses the high precision robots (DASY5:TX60) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from is used. The XL robot series have many features that are important for our application: High precision (repeatability 0.02 mm) High reliability (industrial design) Jerk-free straight movements Low ELF interference (the closed metallic construction shields against motor control fields) 6-axis controller	

3.5. Light Beam Unit

The light beam switch allows automatic “tooling” of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip. The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned prob.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position. e, the same position will be reached with another aligned probe within 0	

3.6. Device Holder

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR). Thus the device needs no repositioning when changing the angles. The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.	

3.7. Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chip-disk (DASY5: 128MB), RAM (DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DAYS I/O board, which is directly connected to the PC/104 bus of the CPU board. The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.	

3.8. PHANTOM

SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas: Left head Right head Flat phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

ELI4 Phantom

Flat phantom a fiberglass shell flat phantom with 2mm+/- 0.2 mm shell thickness. It has only one measurement area for Flat phantom	

4. SAR MEASUREMENT PROCEDURE

4.1. Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and occupational/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

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

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

SAR is expressed in units of Watts per kilogram (W/Kg)
SAR can be obtained using either of the following equations:

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

$$\mathrm{SAR} = c_h \left.\frac{dT}{dt}\right|_{t=0}$$

Where

SAR	is the specific absorption rate in watts per kilogram;
E	is the r.m.s. value of the electric field strength in the tissue in volts per meter;
σ	is the conductivity of the tissue in siemens per metre;
ρ	is the density of the tissue in kilograms per cubic metre;
c_h	is the heat capacity of the tissue in joules per kilogram and Kelvin;
$\frac{dT}{dt} \mid t = 0$	is the initial time derivative of temperature in the tissue in kelvins per second

4.2. SAR Measurement Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurement are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface is 2.7mm This distance cannot be smaller than the distance os sensor calibration points to probe tip as `defined in the probe properties,

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in db) is specified in the standards for compliance testing. For example, a 2db range is required in IEEE Standard 1528 and IEC62209 standards, whereby 3db is a requirement when compliance is assessed in accordance with the ARIB standard (Japan) If one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximum are detected, the number of Zoom Scan has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100MHz to 6GHz

	≤ 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.	

Step 3: Zoom Scan

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

Zoom Scan Parameters extracted from KDB865664 d01 SAR Measurement 100MHz to 6GHz

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

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is $\leq$ 1.4 W/kg, $\leq$ 8 mm, $\leq$ 7 mm and $\leq$ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

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 same settings. 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.

5. TISSUE SIMULATING LIQUID

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15cm. For head SAR testing the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm.The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in 4.2

5.1. The composition of the tissue simulating liquid

The 150MHz liquid has been provided by SPEAG and they do not provide the composition as it is a secret issue.

5.2 Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in IEEE 1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in IEEE 1528.

Target Frequency (MHz)	head		body	
	εr	σ (S/m)	εr	σ (S/m)
150	**52.3**	**0.76**	**61.9**	**0.80**
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	51.6	2.73

(εr = relative permittivity, σ = conductivity and ρ = 1000 kg/m3)

5.3. Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using DASY5 Dielectric Probe Kit and R&S Network Analyzer ZVL6.

Tissue Stimulant Measurement for 150MHz					
	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [°C]	Test time
		εr 52.3(49.685-54.915)	δ[s/m] 0.76(0.722-0.798)		
Head	136.025	53.00	0.74	21.8	Nov.16,2015
	145.525	52.76	0.75		
	150.000	52.18	0.75		
	155.025	52.09	0.77		
	164.500	51.85	0.78		
	173.975	51.49	0.78		
Body	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [°C]	Test time
		εr 61.9(58.805 -64.995)	δ[s/m]0.80(0.76 - 0.84)		
	136.025	62.73	0.78	21.9	Nov.16,2015
	145.525	62.26	0.79		
	150.000	61.90	0.79		
	155.025	61.79	0.80		
	164.500	61.53	0.82		
	173.975	61.44	0.82		

Tissue Stimulant Measurement for 150MHz					
	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [°C]	Test time
		εr 52.3(49.685-54.915)	δ[s/m] 0.76(0.722-0.798)		
Head	136.025	52.94	0.74	21.1	Apr. 18,2016
	145.525	52.11	0.75		
	150.000	51.79	0.77		
	155.025	51.66	0.77		
	164.500	51.47	0.77		
	173.975	51.32	0.78		
Body	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [°C]	Test time
		εr 61.9(58.805 -64.995)	δ[s/m]0.80(0.76 - 0.84)		
	136.025	62.51	0.78	21.5	Apr. 18,2016
	145.525	62.34	0.79		
	150.000	62.00	0.80		
	155.025	61.95	0.81		
	164.500	61.57	0.82		
	173.975	61.46	0.82		

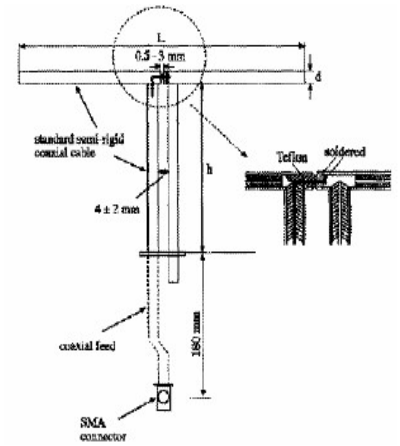
6. SAR SYSTEM CHECK PROCEDURE

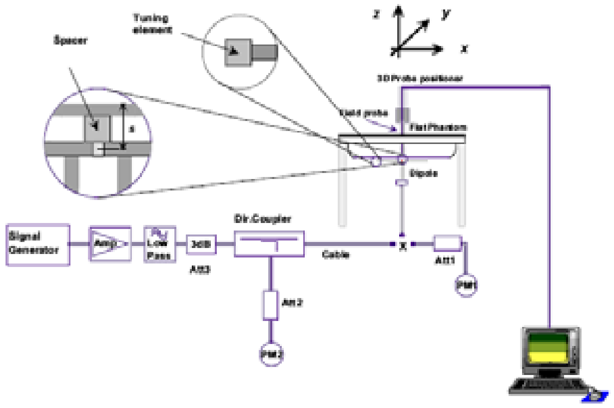
6.1. SAR System Check Procedures

SAR system check is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

Each DASY system is equipped with one or more system check kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system check and system validation. System kit includes a dipole, and dipole device holder.

The system check verifies that the system operates within its specifications. It's performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system check setup is shown as below.





6.2. SAR System Check
6.2.1. Validation Loop Antenna

The Loop Antenna used is based on the IEEE-1528 standard, and is complied with mechanical and electrical specifications in line with the requirements of both IEEE and FCC Supplement C. the table below provides details for the mechanical and electrical Specifications for the Loop Antenna.

Frequency	R/L (mm)	R/h (mm)	d (mm)
150MHz	222	222	97

5.2.2. System check Result

System Performance Check at 150MHz								
Validation Kit: CLA150 SN 4008								
Frequency [MHz]	Target Value(W/Kg)		Reference Result (± 10%)		Normalized to 1W(W/Kg)		Tissue Temp. [°C]	Test time
	1g	10g	1g	10g	1g	10g		
150 head	3.84	2.56	3.456-4.224	2.304-2.816	3.965	2.707	21.8	Nov. 16,2015
150 body	3.88	2.60	3.492-4.268	2.34-2.86	3.917	2.691	21.9	Nov. 16,2015

Note:

(1) We use a CW signal of 24dBm for system check, and then all SAR value are normalized to 1W forward power. The result must be within ±10% of target value.

(2) Tested normalized SAR (W/kg) = Tested SAR (W/kg) ×[1000/ 10^2.4]

System Performance Check at 150MHz								
Validation Kit: CLA150 SN 4008								
Frequency [MHz]	Target Value(W/Kg)		Reference Result (± 10%)		Normalized to 1W(W/Kg)		Tissue Temp. [°C]	Test time
	1g	10g	1g	10g	1g	10g		
150 head	3.84	2.56	3.456-4.224	2.304-2.816	3.929	2.556	21.8	Apr. 18,2016
150 body	3.88	2.60	3.492-4.268	2.34-2.86	4.130	2.676	21.9	Apr. 18,2016

Note:

(2) We use a CW signal of 23dBm for system check, and then all SAR value are normalized to 1W forward power. The result must be within ±10% of target value.

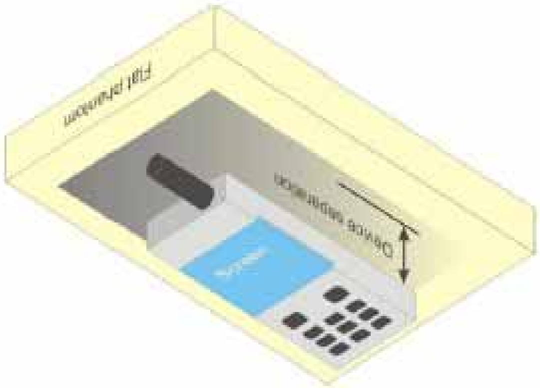
(2) Tested normalized SAR (W/kg) = Tested SAR (W/kg) ×[1000/ 10^2.3]

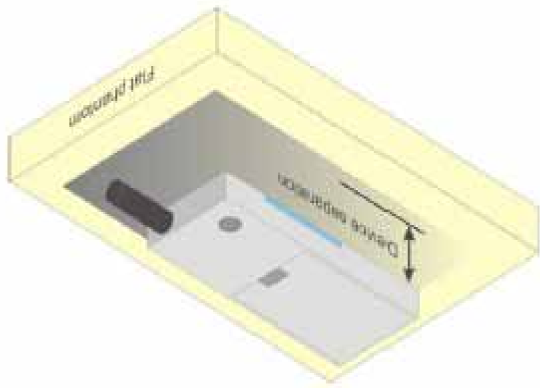
7. EUT TEST POSITION

This EUT was tested in **Front Face and Rear Face.**

7.1. Body Worn Position

(1) To position the EUT parallel to the phantom surface.
(2) To adjust the EUT parallel to the flat phantom.
(3) To adjust the distance between the EUT surface and the flat phantom to **25mm** while used in front of face, and body back touch with belt clip.





8. SAR EXPOSURE LIMITS

SAR assessments have been made in line with the requirements of IEEE-1528, FCC Supplement C, and comply with ANSI/IEEE C95.1-1992 “Controlled Exposure Environment” limits. These limits apply to a location which is deemed as “Controlled Exposure Environment” which can be described as a situation where adults are exposed under known conditions and are trained to be aware of potential risk and to take appropriate precautions.

Limits for Occupational / Controlled Exposure Environment

Type Exposure Limits	Occupational / Controlled Exposure Environment(W/Kg)
Spatial Average SAR (whole body)	8.0

9. TEST EQUIPMENT LIST

Equipment description	Manufacturer/ Model	Identification No.	Current calibration date	Next calibration date
Stäubli Robot	Stäubli-TX60	F13/5Q2UD1/A/01	N/A	N/A
TISSUE Probe	SATIMO	SN 45/11 OCPG45	12/03/2014	12/02/2015
Robot Controller	Stäubli-CS8	139522	N/A	N/A
E-Field Probe	Speag- ES3DV3	SN:3337	10/01/2015	09/30/2016
SAM Twin Phantom	Speag-SAM	1790	N/A	N/A
ELI4 Phantom	ELI V5.0	1210	N/A	N/A
Device Holder	Speag-SD 000 H01 KA	SD 000 H01 KA	N/A	N/A
DAE4	Speag-SD 000 D04 BM	1398	3/11/2015	3/10/2016
SAR Software	Speag-DASY5	DASY52.8	N/A	N/A
Liquid	SATIMO	-	N/A	N/A
Radio Communication Tester	R&S-CMU200	069Y7-158-13-712	03/06/2015	03/05/2016
Loop Antenna	Speag-CLA150	SN 4008	01/24/2014	01/24/2017
Signal Generator	Agilent-E4438C	MY44260051	03/06/2015	03/05/2016
Power Sensor	NRP-Z23	US38261498	03/06/2015	03/05/2016
Spectrum Analyzer E4440	Agilent	US41421290	07/23/2015	07/22/2016
Network Analyzer	Rhode & Schwarz ZVL6	SN100132	03/06/2015	03/05/2016
Attenuator	Warison /WATT-6SR1211	N/A	N/A	N/A
Attenuator	Mini-circuits / VAT-10+	N/A	N/A	N/A
Amplifier	EM30180	SN060552	03/06/2015	03/05/2016
Directional Couple	Werlatone/ C5571-10	SN99463	07/29/2015	07/28/2016
Power Sensor	NRP-Z21	1137.6000.02	10/20/2015	10/19/2016
Power Viewer	R&S	V2.3.1.0	N/A	N/A

Note: Per KDB 865664 Dipole SAR Validation Verification, AGC Lab has adopted 3 years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:
1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss is within 20% of calibrated measurement;
4. Impedance is within 5Ω of calibrated measurement.

Equipment description	Manufacturer/ Model	Identification No.	Current calibration date	Next calibration date
Stäubli Robot	Stäubli-TX60	F13/5Q2UD1/A/01	N/A	N/A
Robot Controller	Stäubli-CS8	139522	N/A	N/A
TISSUE Probe	SATIMO	SN 45/11 OCPG45	12/02/2015	12/01/2016
E-Field Probe	Speag- ES3DV3	SN:3337	10/01/2015	09/30/2016
EL4 Phantom	ELI V5.0	1210	N/A	N/A
Device Holder	Speag-SD 000 H01 KA	SD 000 H01 KA	N/A	N/A
DAE4	Speag-SD 000 D04 BM	1398	02/02/2016	02/01/2017
SAR Software	Speag-DASY5	DASY52.8	N/A	N/A
Liquid	SATIMO	-	N/A	N/A
Loop Antenna	Speag-CLA150	SN 4008	01/24/2014	01/24/2017
Signal Generator	Agilent-E4438C	US41461365	02/29/2016	02/28/2017
Spectrum Analyzer E4440	Agilent	US41421290	07/23/2015	07/22/2016
Network Analyzer	Rhode & Schwarz ZVL6	SN100132	03/01/2016	02/28/2017
Attenuator	Warison /WATT-6SR1211	N/A	N/A	N/A
Attenuator	Mini-circuits / VAT-10+	N/A	N/A	N/A
Amplifier	EM30180	SN060552	03/04/2016	03/03/2017
Directional Couple	Werlatone/ C5571-10	SN99463	07/29/2015	07/28/2016
Directional Couple	Werlatone/ C6026-10	SN99482	07/29/2015	07/28/2016
Power Sensor	NRP-Z21	1137.6000.02	10/20/2015	10/19/2016
Power Sensor	NRP-Z23	US38261498	03/01/2016	02/28/2017
Power Viewer	R&S	V2.3.1.0	N/A	N/A

Note: Per KDB 865664 Dipole SAR Validation Verification, AGC Lab has adopted 3 years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:
1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss is within 20% of calibrated measurement;
4. Impedance is within 5Ω of calibrated measurement.

10. MEASUREMENT UNCERTAINTY

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

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

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

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

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

(b) κ is the coverage factor

Table 13.1 Standard Uncertainty for Assumed Distribution (above table)

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

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

DAYS5 Measurement Uncertainty Measurement uncertainty for 150 MHz to 3GHz averaged over 1 gram / 10 gram.							
Error Description	Uncertainty value(±10%)	Probability Distribution	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6	Normal	1	1	1	6.00	6.00
Axial Isotropy	0.25	Rectangular	$\sqrt{3}$	1	1	0.14	0.14
Hemispherical Isotropy	1.3	Rectangular	$\sqrt{3}$	1	1	0.75	0.75
Linearity	0.3	Rectangular	$\sqrt{3}$	1	1	0.17	0.17
Probe Modulation Response	1.65	Rectangular	$\sqrt{3}$	1	1	0.95	0.95
System Detection Limits	0.9	Rectangular	$\sqrt{3}$	1	1	0.52	0.52
Boundary Effects	0.9	Rectangular	$\sqrt{3}$	1	1	0.52	0.52
Readout Electronics	0.2	Normal	1	1	1	0.20	0.20
Response Time	0	Rectangular	$\sqrt{3}$	1	1	0.00	0.00
Integration Time	0	Rectangular	$\sqrt{3}$	1	1	0.00	0.00
RF Ambient Noise	0.9	Rectangular	$\sqrt{3}$	1	1	0.52	0.52
RF Ambient Reflection	0.9	Rectangular	$\sqrt{3}$	1	1	0.52	0.52
Probe Positioner	0.7	Rectangular	$\sqrt{3}$	1	1	0.40	0.40
Probe Positioning	6.5	Rectangular	$\sqrt{3}$	1	1	3.75	3.75
Post-processing	3.8	Rectangular	$\sqrt{3}$	1	1	2.19	2.19
Test Sample Related							
Device Positioning	3.6	Normal	1	1	1	3.6	3.6
Device Holder	2.9	Normal	1	1	1	2.9	2.9
Measurement SAR Drift	5.0	Rectangular	$\sqrt{3}$	1	1	2.89	2.89
Power Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	0	0
Phantom and Setup							
Phantom Uncertainty (Shape and thickness tolerances)	0.05	Normal	$\sqrt{3}$	1	1	0.03	0.03
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	Rectangular	1	1	0.84	1.90	1.60
Liquid conductivity measurement	5	Normal	1	0.78	0.71	3.90	3.55
Liquid permittivity measurement	5	Rectangular	1	0.23	0.26	1.15	1.30
Liquid conductivity – temperature uncertainty	5	Rectangular	$\sqrt{3}$	0.78	0.71	2.25	2.05
Liquid permittivity – temperature uncertainty	5	Rectangular	$\sqrt{3}$	0.23	0.26	0.66	0.75
Combined Standard Uncertainty						10.17	9.89
Coverage Factor for 95%						K=2	
Expanded Uncertainty						±20.34%	±19.779%

DAYS5 System Check Uncertainty for 150 MHz to 3GHz averaged range								
Error Description	Uncer. value (±10%)	Prob. Dist.	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) V_{eff}
Measurement System								
Probe Calibration	6	Normal	1	1	1	6.00	6.00	∞
Axial Isotropy	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Hemispherical Isotropy	1.3	Rectangular	√3	1	1	0.75	0.75	∞
Boundary Effects	0.3	Rectangular	√3	1	1	0.17	0.17	∞
Linearity	1.65	Rectangular	√3	1	1	0.95	0.95	∞
System Detection Limits	0.9	Rectangular	√3	1	1	0.52	0.52	∞
Modulation Response	0.9	Rectangular	√3	1	1	0.52	0.52	∞
Readout Electronics	0.2	Normal	1	1	1	0.20	0.20	∞
Response Time	0	Rectangular	√3	1	1	0.00	0.00	∞
Integration Time	0	Rectangular	√3	1	1	0.00	0.00	∞
RF Ambient Noise	0.9	Rectangular	√3	1	1	0.52	0.52	∞
RF Ambient Reflection	0.9	Rectangular	√3	1	1	0.52	0.52	∞
Probe Positioner	0.7	Rectangular	√3	1	1	0.40	0.40	∞
Probe Positioning	6.5	Rectangular	√3	1	1	3.75	3.75	∞
Max. SAR Eval.	3.8	Rectangular	√3	1	1	2.19	2.19	∞
Dipole Related								
Deviation of exp. dipole	5.3	Rectangular	√3	1	1	3.06	3.06	∞
Dipole Axis to Liquid Dist.	2.0	Rectangular	√3	1	1	1.15	1.15	∞
Input power & SAR drift	3.3	Rectangular	√3	1	1	1.91	1.91	∞
Phantom and Setup								
Phantom Uncertainty (Shape and thickness tolerances)	0.05	Normal	√3	1	1	0.03	0.03	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	Rectangular	1	1	0.84	1.90	1.60	∞
Liquid conductivity measurement	5	Normal	1	0.78	0.71	3.90	3.55	∞
Liquid permittivity measurement	5	Rectangular	1	0.23	0.26	1.15	1.30	∞
Liquid conductivity – temperature uncertainty	5	Rectangular	√3	0.78	0.71	2.25	2.05	∞
Liquid permittivity – temperature uncertainty	5	Rectangular	√3	0.23	0.26	0.66	0.75	∞
Combined Std. Uncertainty						9.38	9.080	
Expanded STD Uncertainty						±18.77%	±18.16%	

11. CONDUCTED POWER MEASUREMENT

Analog(5W)：

Frequency (MHz)	Channel Spacing	Max. Output Power (dBm)
136.025	12.5KHz	**36.91**
145.525		36.85
155.025		36.81
164.500		36.76
173.975		36.75

Digital(5W):
Voice:

Frequency (MHz)	Channel Spacing	Max. Output Power (dBm)
136.025	12.5KHz	36.72
145.525		36.77
155.025		**36.85**
164.500		36.74
173.975		36.78

Date transmission mode:

Frequency (MHz)	Channel Spacing	Max. Output Power (dBm)
136.025	12.5KHz	**36.84**
145.525		36.72
155.025		36.79
164.500		36.74
173.975		36.76

Analog(1W)：

Frequency (MHz)	Channel Spacing	Max. Output Power (dBm)
136.025	12.5KHz	29.77
145.525		29.80
155.025		29.85
164.500		29.81
173.975		**29.89**

Digital(1W)：
Voice:

Frequency (MHz)	Channel Spacing	Max. Output Power (dBm)
136.025	12.5KHz	29.86
145.525		29.79
155.025		**29.87**
164.500		29.83
173.975		29.84

Date transmission mode:

Frequency (MHz)	Channel Spacing	Max. Output Power (dBm)
136.025	12.5KHz	**29.81**
145.525		29.70
155.025		29.75
164.500		29.76
173.975		29.79

12. TEST RESULTS

12.1. SAR Test Results Summary

12.1.1. Test position and configuration

Head SAR was performed with the device configured in the positions according to KDB 643646 and Body SAR was performed with the device configurate with all accessories close to the Flat Phantom.

12.1.2. Operation Mode

- Set the EUT to maximum output power level and transmit on lower, middle and top channel with 100% duty cycle individually during SAR measurement.
- Per KDB 447498D01 v06 Chapter 4.1 6) the number of channels to be assessed is 5.
- Per KDB 643646 D01, Passive body-worn and audio accessories generally do not apply to the head SAR of PTT radios. Head SAR is measured with the front surface of the radio positioned at 2.5 cm parallel to a flat phantom.

  When testing antennas with the default battery:

  a. When the SAR≤ 3.5 W/kg, testing of all other required channels is not necessary for that antenna;
  b. When the SAR > 3.5 W/kg and ≤ 4.0 W/kg, testing of the required immediately channel(s) is not necessary; testing of the other required channels may still be required.
  c. When the SAR > 4.0 W/kg and ≤ 6.0 W/kg, SAR should be measured for that antenna on the all required channels;
  d. When the highest scaled SAR is ≤ 6.0 W/kg, PBA is not required
- Per KDB 643646 D01, Body SAR is measured with the radio placed in a body-worn accessory, positioned against a flat phantom, representative of the normal operating conditions expected by users and typically with a standard default audio accessory supplied with the radio.

  When testing antennas with the default battery: the same test measurement with head part.

12.1.3. SAR Test Results Summary

SAR MEASUREMENT(5W)									
Depth of Liquid (cm):>15					Relative Humidity (%): 54.2				
Product: DIGITAL RADIO									
Test Mode: Hold to Face with 2.5 cm separation & body back touch with clip(VHF)									
Position	**Freq. (MHz)**	**Separation (KHz)**	**Power Drift (<±0.2)**	**SAR 1g with 100% duty Cycle (W/kg)**	**SAR 1g with 50% duty cycle (W/Kg)**	**Max. Turn-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit W/kg**
Analog									
Face Up	136.025	12.5	-0.11	0.723	**0.362**	37	36.91	**0.370**	8.0
Back Touch	136.025	12.5	-0.09	1.290	**0.645**	37	36.91	**0.659**	8.0
Digital									
Face Up	155.025	12.5	0.08	0.169	**0.085**	37	36.85	**0.088**	8.0
Back Touch	155.025	12.5	0.02	0.525	**0.263**	37	36.85	**0.272**	8.0

Note:
1 During the test, EUT power is 5 W with 100% duty cycle;
2.There is just default battery and antenna in this project;
3 According to KDB 643646 D01, when testing antennas with the default battery:
a. When the SAR≤ 3.5 W/kg, testing of all other required channels is not necessary for that antenna;
b. When the SAR > 3.5 W/kg and ≤ 4.0 W/kg, testing of the required immediately channel(s) is not necessary; testing of the other required channels may still be required.
c. When the SAR > 4.0 W/kg and ≤ 6.0 W/kg, SAR should be measured for that antenna on the all required channels;
d. When the highest scaled SAR is ≤ 6.0 W/kg, PBA is not required

Repeated SAR(Analog)								
Product: DMR Two Way Radio								
Test Mode: body back touch with clip(VHF)								
Position	**Frequency (MHz)**	**Separation (KHz)**	**Power Drift (<±0.2db)**	**Once SAR 1g with 100% duty cycle (W/kg)**	**Once SAR 1g with 50% duty cycle (W/Kg)**	**Twice SAR 1g with 100% duty cycle (W/kg)**	**Twice SAR 1g with 50% duty cycle (W/kg)**	**Limit W/kg**
Back Touch	136.025	12.5	0.18	1.18	0.590	-	-	8.0

SAR MEASUREMENT(1W)									
Depth of Liquid (cm):>15					Relative Humidity (%): 60.6				
Product: DIGITAL RADIO									
Test Mode: Hold to Face with 2.5 cm separation & body back touch with clip(VHF)									
Position	**Freq. (MHz)**	**Separation (KHz)**	**Power Drift (<±0.2)**	**SAR 1g with 100% duty Cycle (W/kg)**	**SAR 1g with 50% duty cycle (W/Kg)**	**Max. Turn-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit W/kg**
Analog									
Face Up	173.975	12.5	-0.08	0.230	0.115	30.00	29.89	0.118	8.0
Back Touch	173.975	12.5	-0.08	0.572	0.286	30.00	29.89	0.293	8.0
Digital									
Face Up	155.025	12.5	0.02	0.150	0.075	30.00	29.87	0.077	8.0
Back Touch	155.025	12.5	-0.09	0.364	0.182	30.00	29.87	0.188	8.0

Note:
1 During the test, EUT power is 1 W with 100% duty cycle;
2.There is just default battery and antenna in this project;
3 According to KDB 643646 D01, when testing antennas with the default battery:
a. When the SAR≤ 3.5 W/kg, testing of all other required channels is not necessary for that antenna;
b. When the SAR > 3.5 W/kg and ≤ 4.0 W/kg, testing of the required immediately channel(s) is not necessary; testing of the other required channels may still be required.
c. When the SAR > 4.0 W/kg and ≤ 6.0 W/kg, SAR should be measured for that antenna on the all required channels;
d. When the highest scaled SAR is ≤ 6.0 W/kg, PBA is not required

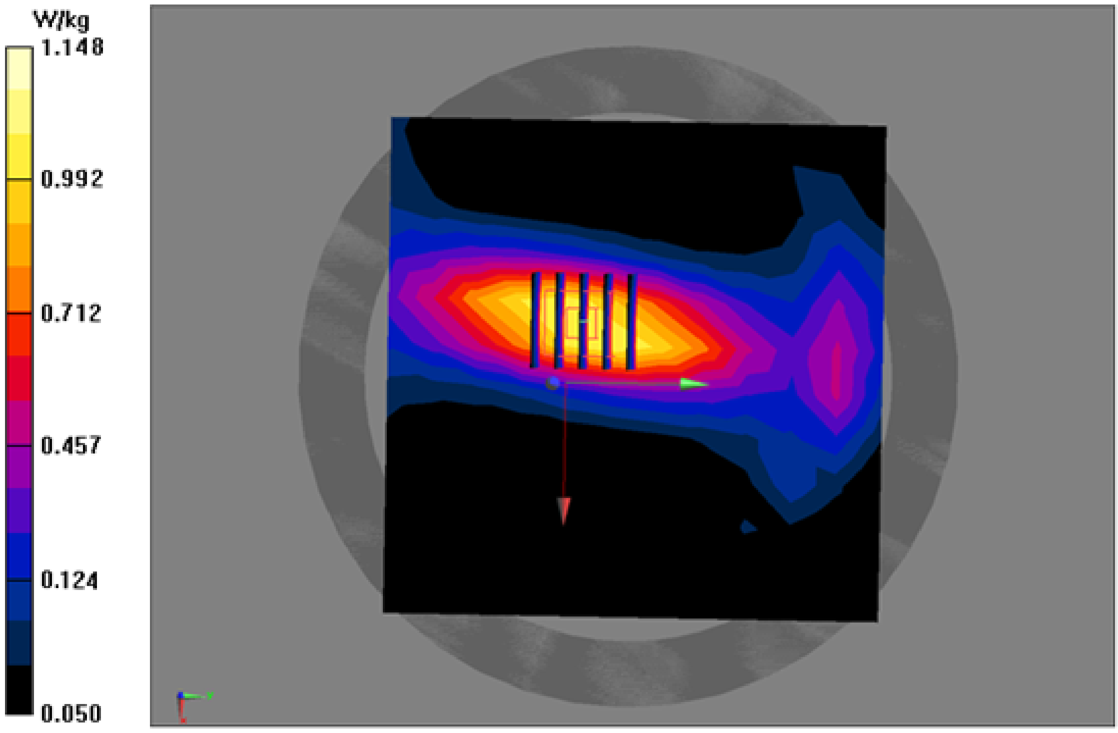
APPENDIX A. SAR SYSTEM CHECK DATA

Test Laboratory: AGC Lab **Test date: Nov.16,2015**
System Check Head 150MHz
DUT: Dipole 150 MHz Type: SID 150
Communication System: CW; Communication System Band: CW; Duty Cycle: 1:1;
Frequency: 150MHz; Medium parameters used: f = 150MHz; σ =0.75 mho/m; ε r = 52.18 ; ρ = 1000 kg/m^3 ;
Phantom Type: Elliptical Phantom; Input Power=24dBm
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.8

DASY Configuration:
- Probe: ES3DV3 – SN3337; ConvF(7.63, 7.63,7.63); Calibrated:10/01/2015;;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
- Electronics: DAE4 Sn1398; Calibrated: 3/11/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 150MHz Head/Area Scan (12x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.024 W/kg

Configuration/System Check 150MHz Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 43.753 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.644 W/kg
SAR(1 g) = 0.996 W/kg; SAR(10 g) = 0.680 W/kg
Maximum value of SAR (measured) = 1.148 W/kg

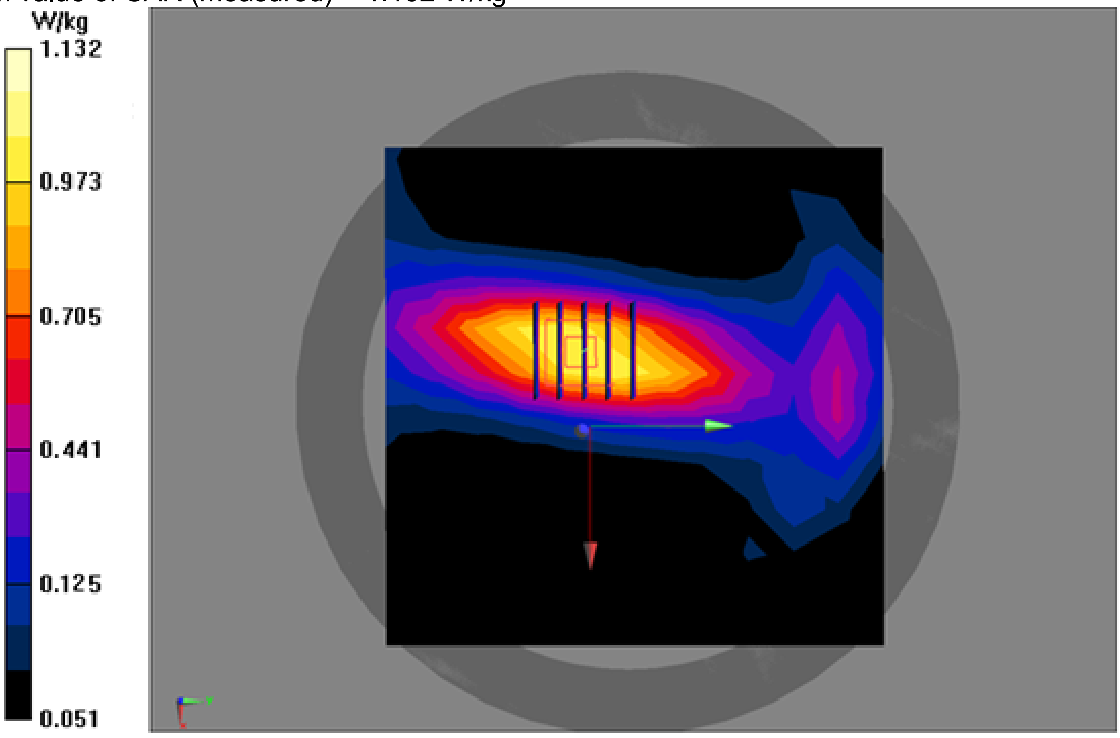


Test Laboratory: AGC Lab **Test date: Nov.16,2015**
System Check Body 150MHz
DUT: Dipole 150 MHz Type: SID 150
Communication System: CW; Communication System Band: CW; Duty Cycle: 1:1;
Frequency: 150MHz; Medium parameters used: f = 150MHz; σ =0.79 mho/m; ε r = 61.90 ; ρ = 1000 kg/m³ ;
Phantom Type: Elliptical Phantom; Input Power=24dBm
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.9

DASY Configuration:
Probe: ES3DV3 – SN3337; ConvF(7.24, 7.24,7.24); Calibrated:10/01/2015;;
Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
Electronics: DAE4 Sn1398; Calibrated: 3/11/2015
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 150MHz Body/ Area Scan (12x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.008 W/kg

Configuration/System Check 150MHz Body/ Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 43.707 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.984 W/kg; SAR(10 g) = 0.676 W/kg
Maximum value of SAR (measured) = 1.132 W/kg

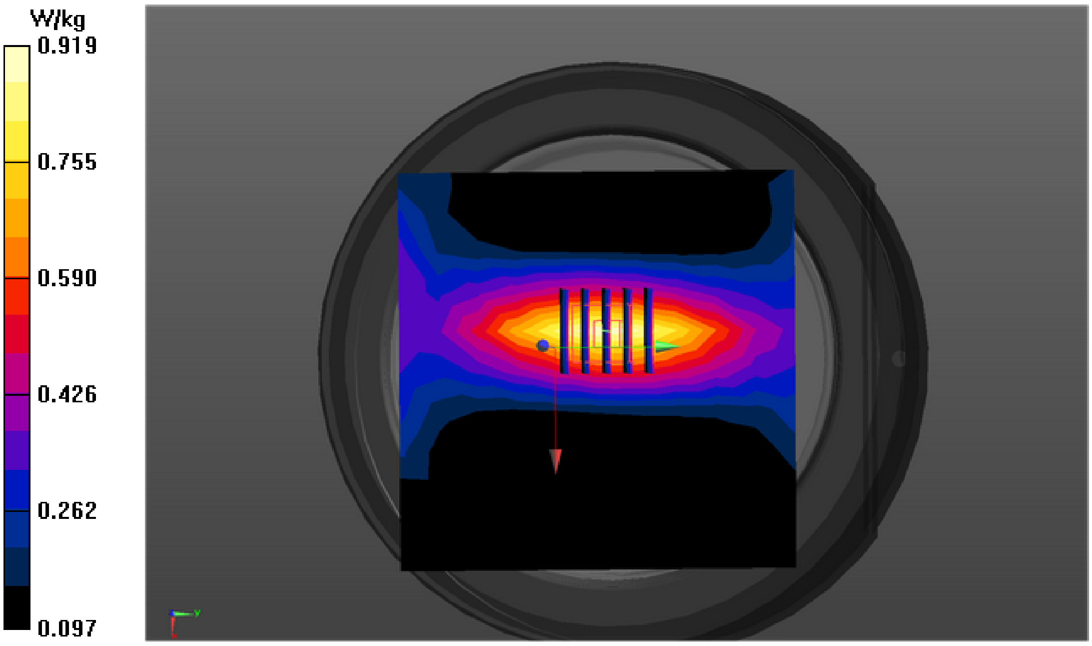


Test Laboratory: AGC Lab **Test date: Apr. 18,2016**
System Check Head 150MHz
DUT: Dipole 150 MHz Type: SID 150
Communication System: CW; Communication System Band: CW; Duty Cycle: 1:1;
Frequency: 150MHz; Medium parameters used: f = 150MHz; σ =0.77 mho/m; ε r = 51.79 ; ρ = 1000 kg/m³ ;
Phantom Type: Elliptical Phantom; Input Power=23dBm
Ambient temperature (℃): 21.7, Liquid temperature (℃): 21.1

DASY Configuration:
Probe: ES3DV3 – SN3337; ConvF(7.63, 7.63,7.63); Calibrated:10/01/2015;;
Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
Electronics: DAE4 Sn1398; Calibrated: 02/02/2016
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 150MHz Head /Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.845 W/kg

Configuration/System Check 150MHz Head /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.330 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.784 W/kg; SAR(10 g) = 0.510 W/kg
Maximum value of SAR (measured) = 0.919 W/kg

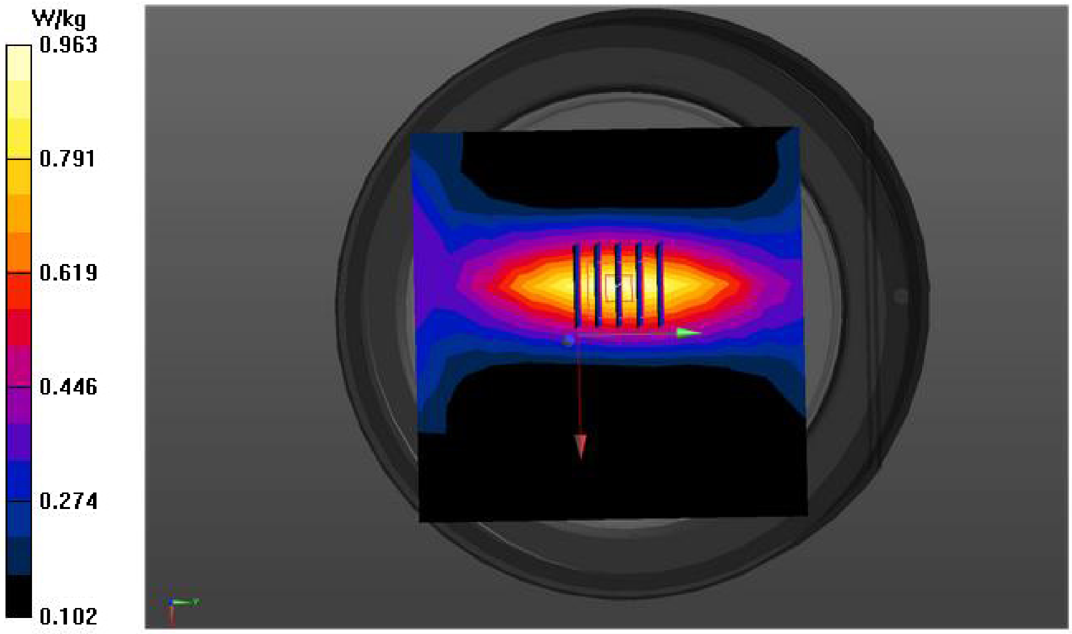


Test Laboratory: AGC Lab **Test date: Apr. 18,2016**
System Check Body 150MHz
DUT: Dipole 150 MHz Type: SID 150
Communication System: CW; Communication System Band: CW; Duty Cycle: 1:1;
Frequency: 150MHz; Medium parameters used: f = 150MHz; σ =0.80 mho/m; ε r = 62.00 ; ρ = 1000 kg/m³ ;
Phantom Type: Elliptical Phantom; Input Power=23dBm
Ambient temperature (℃): 21.7, Liquid temperature (℃): 21.5

DASY Configuration:
- Probe: ES3DV3 – SN3337; ConvF(7.24, 7.24,7.24); Calibrated:10/01/2015;;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
- Electronics: DAE4 Sn1398; Calibrated: 02/02/2016
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 150MHz Body /Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.886 W/kg

Configuration/System Check 150MHz Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.022 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.40 W/kg
SAR(1 g) = 0.824 W/kg; SAR(10 g) = 0.534 W/kg
Maximum value of SAR (measured) = 0.963 W/kg



APPENDIX B. SAR MEASUREMENT DATA

Analog(5W):

Test Laboratory: AGC Lab **Date: Nov.16,2015**

150MHz Body –Touch (12.5 KHz)

DUT: DIGITAL RADIO; Type: D858

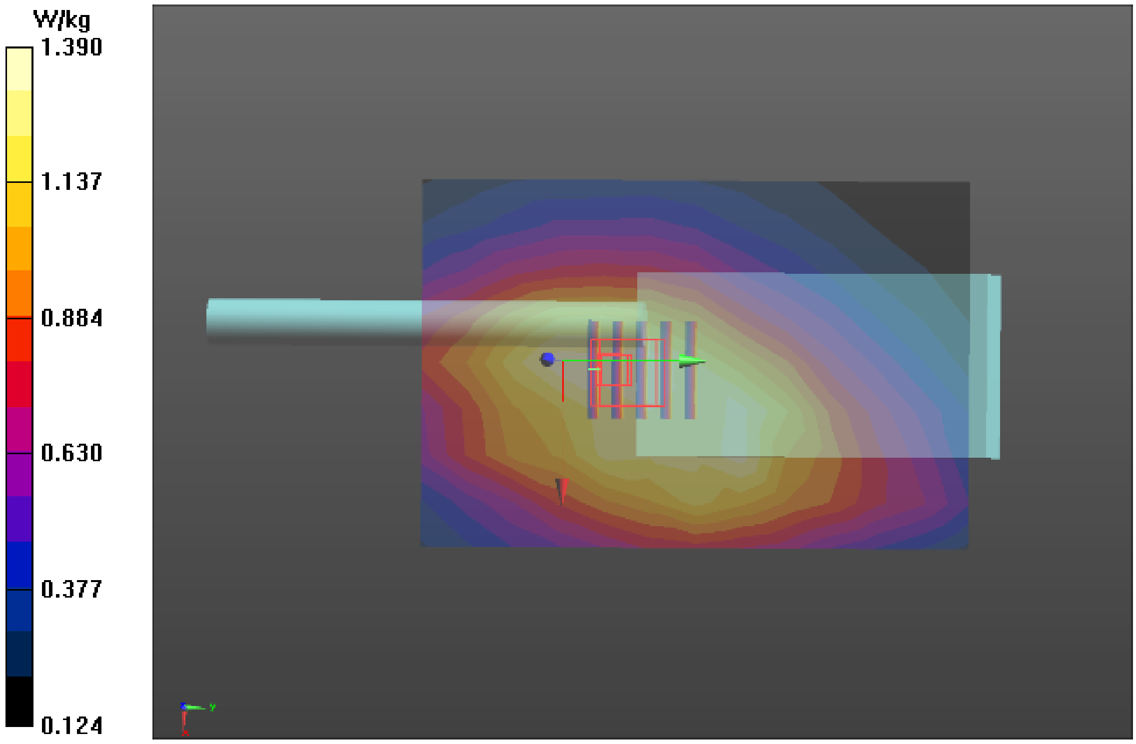
Communication System: CW; Communication System Band: 150MHz; Duty Cycle: 1:1;
Frequency:136.025 MHz; Medium parameters used: f = 150MHz; σ =0.78 mho/m; ε r = 62.73; ρ = 1000 kg/m³ ;
Phantom Type: Elliptical Phantom
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.8

DASY Configuration:

- Probe: ES3DV3 – SN3337; ConvF(7.63, 7.63,7.63); Calibrated:10/01/2015;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
- Electronics: DAE4 Sn1398; Calibrated: 3/11/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BACK/1/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.39 W/kg

BACK/1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.445 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.89 W/kg
SAR(1 g) = 1.29 W/kg; SAR(10 g) = 0.952 W/kg
Maximum value of SAR (measured) = 1.46 W/kg



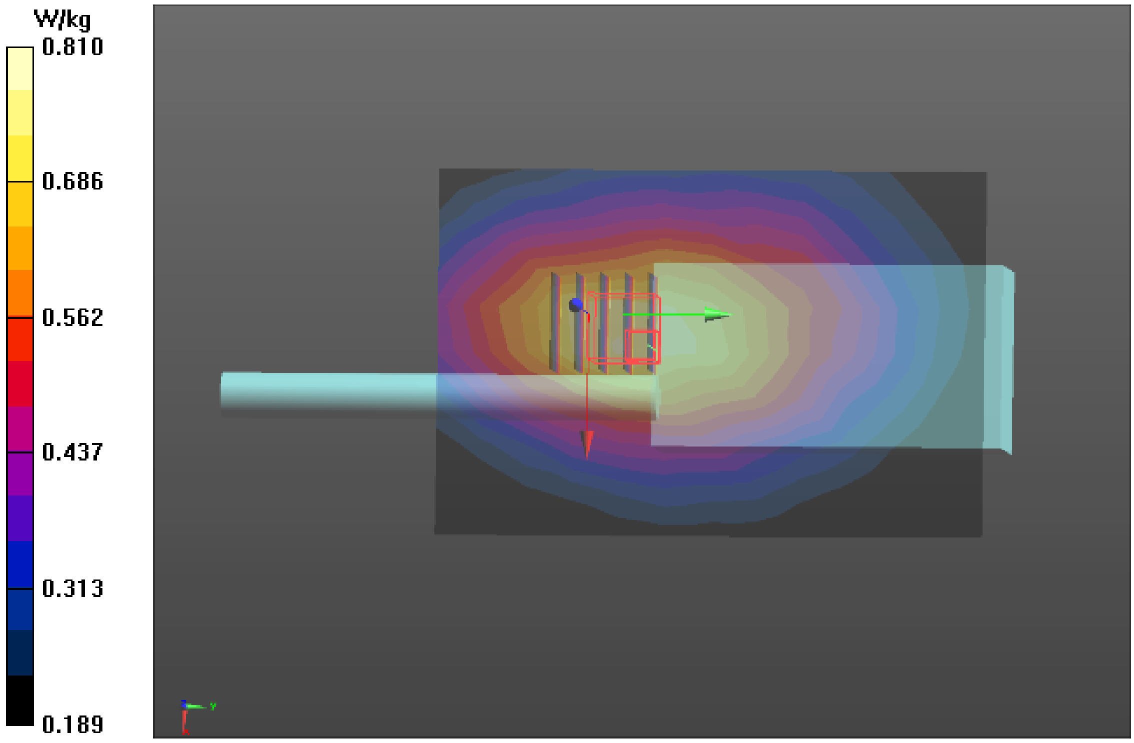
Test Laboratory: AGC Lab **Date: Nov.16,2015**
150MHz face up 2.5cm (12.5 KHz)
DUT: DIGITAL RADIO; Type: D858

Communication System: CW; Communication System Band: 150MHz; Duty Cycle: 1:1;
Frequency:136.025 MHz; Medium parameters used: f = 150MHz; σ =0.74 mho/m; ε r = 53.00; ρ = 1000 kg/m^3 ;
Phantom Type: Elliptical Phantom
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.8

DASY Configuration:
- Probe: ES3DV3 – SN3337; ConvF(7.63, 7.63,7.63); Calibrated:10/01/2015;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
- Electronics: DAE4 Sn1398; Calibrated: 3/11/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

FRONT/1/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.774 W/kg

FRONT/1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.445 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.723 W/kg; SAR(10 g) = 0.551 W/kg
Maximum value of SAR (measured) = 0.810 W/kg



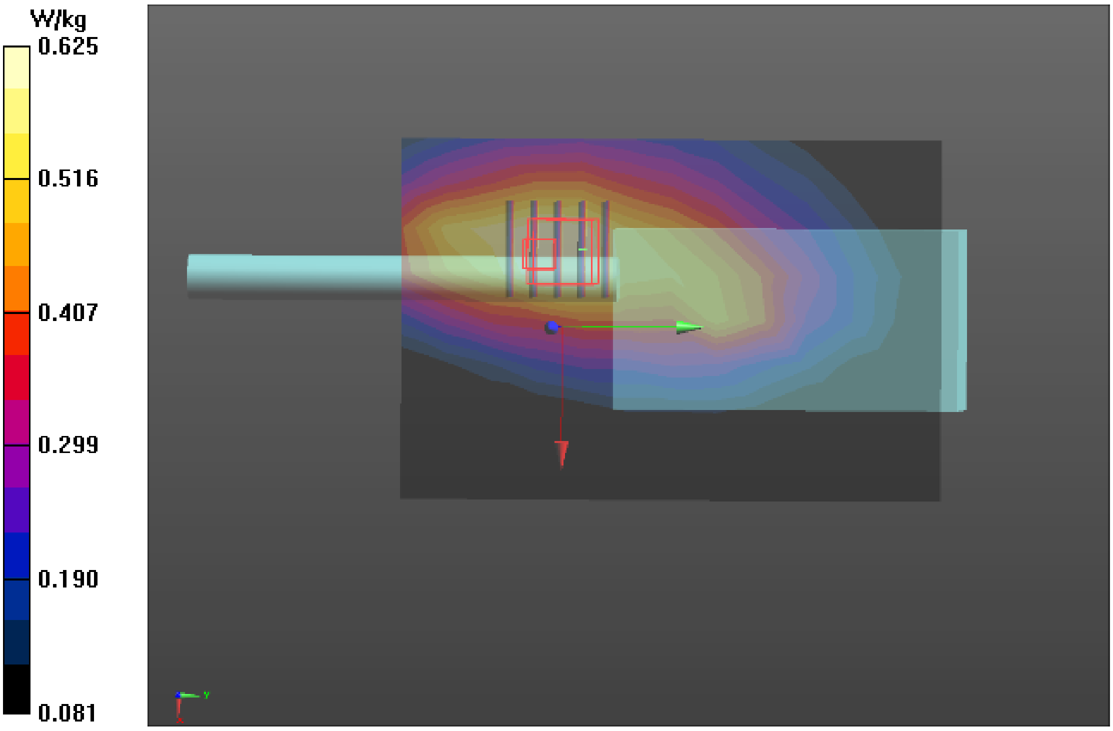
Digital(5W):
Test Laboratory: AGC Lab **Date: Nov.16,2015**
150MHz Body –Touch (12.5 KHz)
DUT: DIGITAL RADIO; Type: D858

Communication System: CW; Communication System Band: 150MHz; Duty Cycle: 1:1;
Frequency:155.025 MHz; Medium parameters used: f = 150 MHz; σ =0.80 mho/m; ε r = 61.79; ρ = 1000 kg/m ;
Phantom Type: Elliptical Phantom
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.9

DASY Configuration:
- Probe: ES3DV3 – SN3337; ConvF(7.24, 7.24,7.24); Calibrated:10/01/2015
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
- Electronics: DAE4 Sn1398; Calibrated: 3/11/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210 ;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BACK/8/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.575 W/kg

BACK/8/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.943 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.525 W/kg; SAR(10 g) = 0.358 W/kg
Maximum value of SAR (measured) = 0.625 W/kg



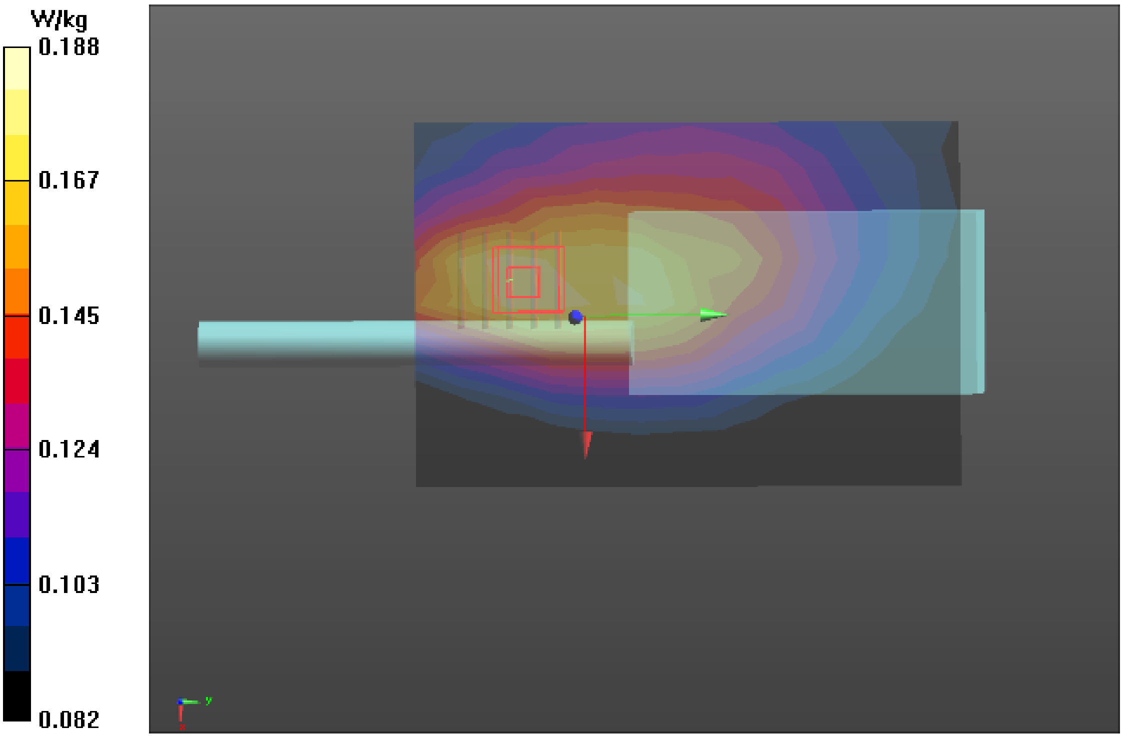
Test Laboratory: AGC Lab **Date: Nov.16,2015**
150MHz face up 2.5cm (12.5 KHz)
DUT: DIGITAL RADIO; Type: D858

Communication System: CW; Communication System Band: 150MHz; Duty Cycle: 1:1;
Frequency:150.025 MHz; Medium parameters used: f = 150 MHz; σ =0.77 mho/m; ε r = 52.09; ρ = 1000 kg/m ;
Phantom Type: Elliptical Phantom
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.9

DASY Configuration:
- Probe: ES3DV3 – SN3337; ConvF(7.24, 7.24,7.24); Calibrated:10/01/2015
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
- Electronics: DAE4 Sn1398; Calibrated: 3/11/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210 ;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

FRONT/8/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.178 W/kg

FRONT/8/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.212 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.254 W/kg
SAR(1 g) = 0.169 W/kg; SAR(10 g) = 0.138 W/kg
Maximum value of SAR (measured) = 0.188 W/kg



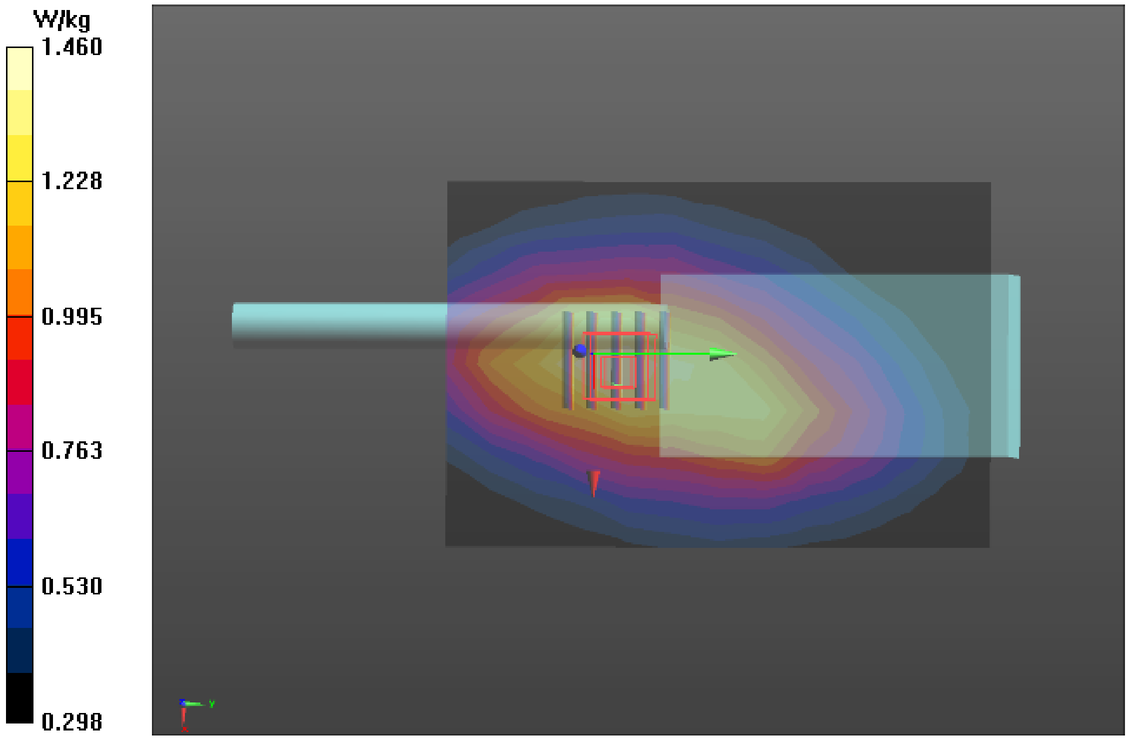
Analog (5W) :Repeated SAR
Test Laboratory: AGC Lab **Date: Nov.16,2015**
150MHz Body –Touch (12.5 KHz)
DUT: DIGITAL RADIO; Type: D858

Communication System: CW; Communication System Band: 150MHz; Duty Cycle: 1:1;
Frequency:136.025 MHz; Medium parameters used: f = 150MHz; σ =0.78 mho/m; ε r = 62.73; ρ = 1000 kg/m^3 ;
Phantom Type: Elliptical Phantom
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.8

DASY Configuration:
- Probe: ES3DV3 – SN3337; ConvF(7.63, 7.63,7.63); Calibrated:10/01/2015;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
- Electronics: DAE4 Sn1398; Calibrated: 3/11/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BACK/REPEATED-1/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.33 W/kg

BACK/REPEATED-1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 41.102 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 1.75 W/kg
SAR(1 g) = 1.18 W/kg; SAR(10 g) = 0.876 W/kg
Maximum value of SAR (measured) = 1.46 W/kg



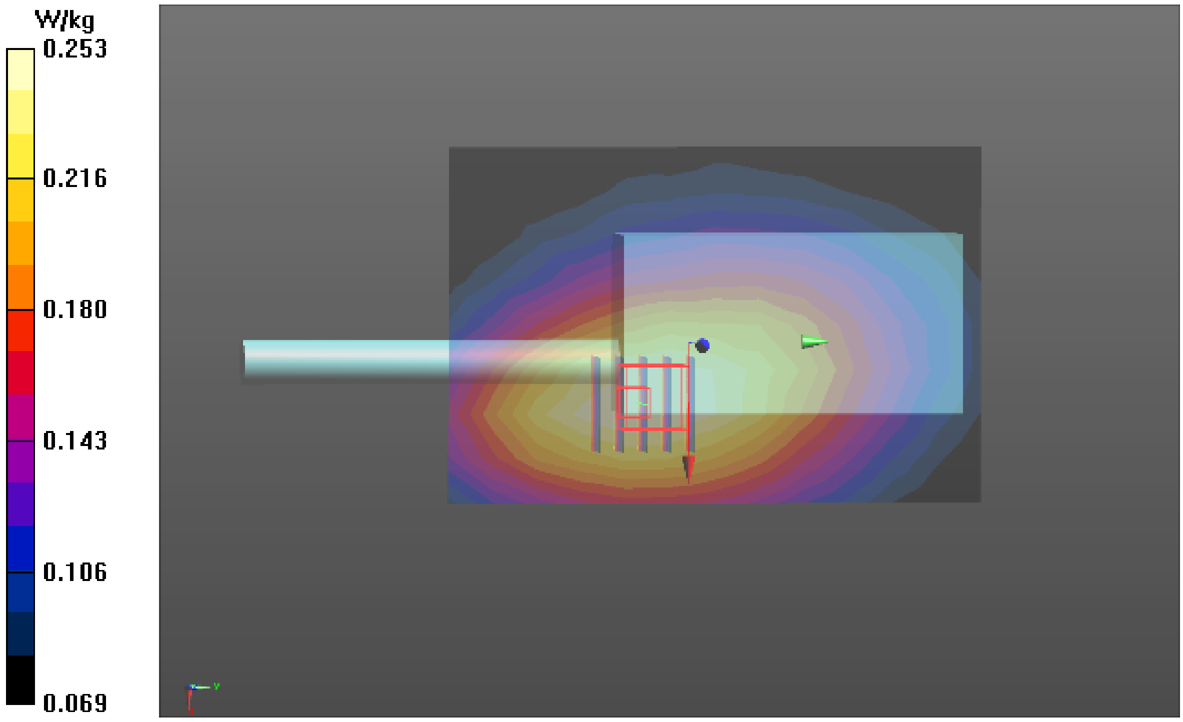
Analog(1W):
Test Laboratory: AGC Lab **Date: Apr. 18,2016**
150MHz face up 2.5cm (12.5 KHz)
DUT: DIGITAL RADIO; Type: D868

Communication System: CW; Communication System Band: 150MHz; Duty Cycle: 1:1;
Frequency:173.975MHz; Medium parameters used: f = 150MHz; σ =0.78 mho/m; ε r = 51.32; ρ = 1000 kg/m³ ;
Phantom Type: Elliptical Phantom
Ambient temperature (℃): 21.7, Liquid temperature (℃): 21.1

DASY Configuration:
- Probe: ES3DV3 – SN3337; ConvF(7.63, 7.63,7.63); Calibrated:10/01/2015;;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
- Electronics: DAE4 Sn1398; Calibrated: 02/02/2016
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

FRONT/3/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.257 W/kg

FRONT/3/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.143 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.329 W/kg
SAR(1 g) = 0.230 W/kg; SAR(10 g) = 0.181 W/kg
Maximum value of SAR (measured) = 0.253 W/kg



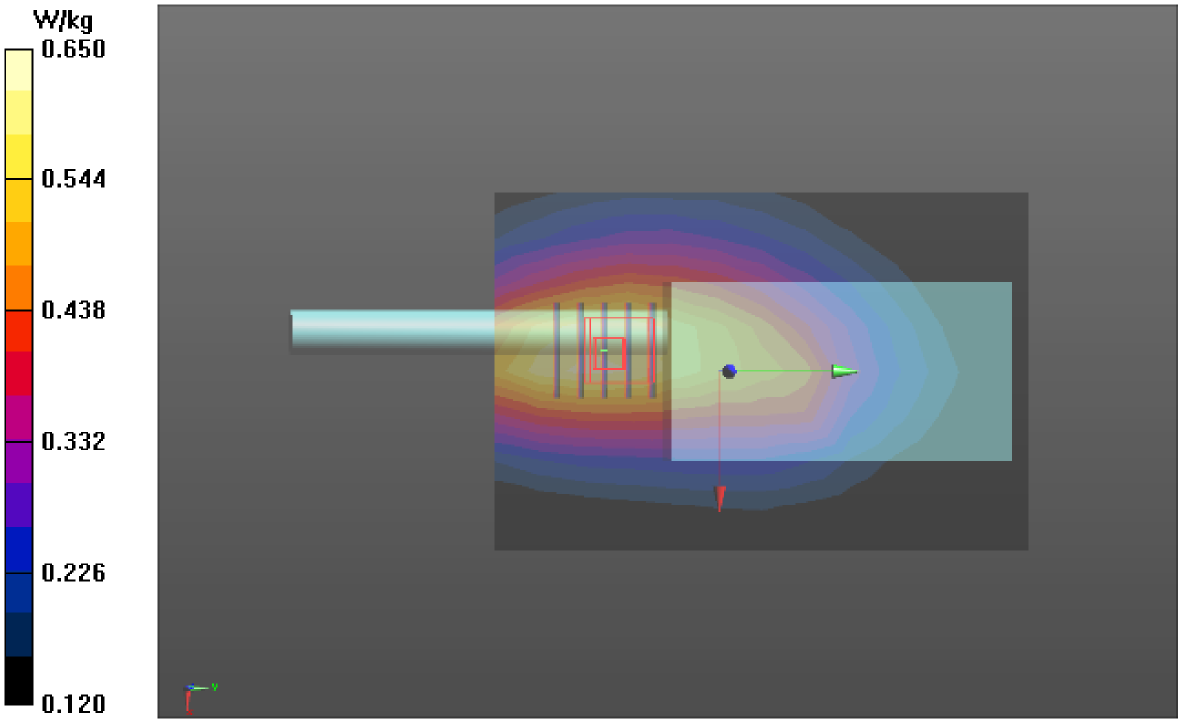
Test Laboratory: AGC Lab **Date: Apr. 18,2016**
150MHz Body –Touch (12.5 KHz)
DUT: DIGITAL RADIO; Type: D868

Communication System: CW; Communication System Band: 150MHz; Duty Cycle: 1:1;
Frequency:173.975 MHz; Medium parameters used: f = 150 MHz; σ =0.82 mho/m; ε r = 61.46; ρ = 1000 kg/m ;
Phantom Type: Elliptical Phantom
Ambient temperature (℃): 21.7, Liquid temperature (℃): 21.5

DASY Configuration:
- Probe: ES3DV3 – SN3337; ConvF(7.24, 7.24,7.24); Calibrated:10/01/2015;;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
- Electronics: DAE4 Sn1398; Calibrated: 02/02/2016
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BACK/3/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.626 W/kg

BACK/3/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.143 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.934 W/kg
SAR(1 g) = 0.572 W/kg; SAR(10 g) = 0.412 W/kg
Maximum value of SAR (measured) = 0.650 W/kg



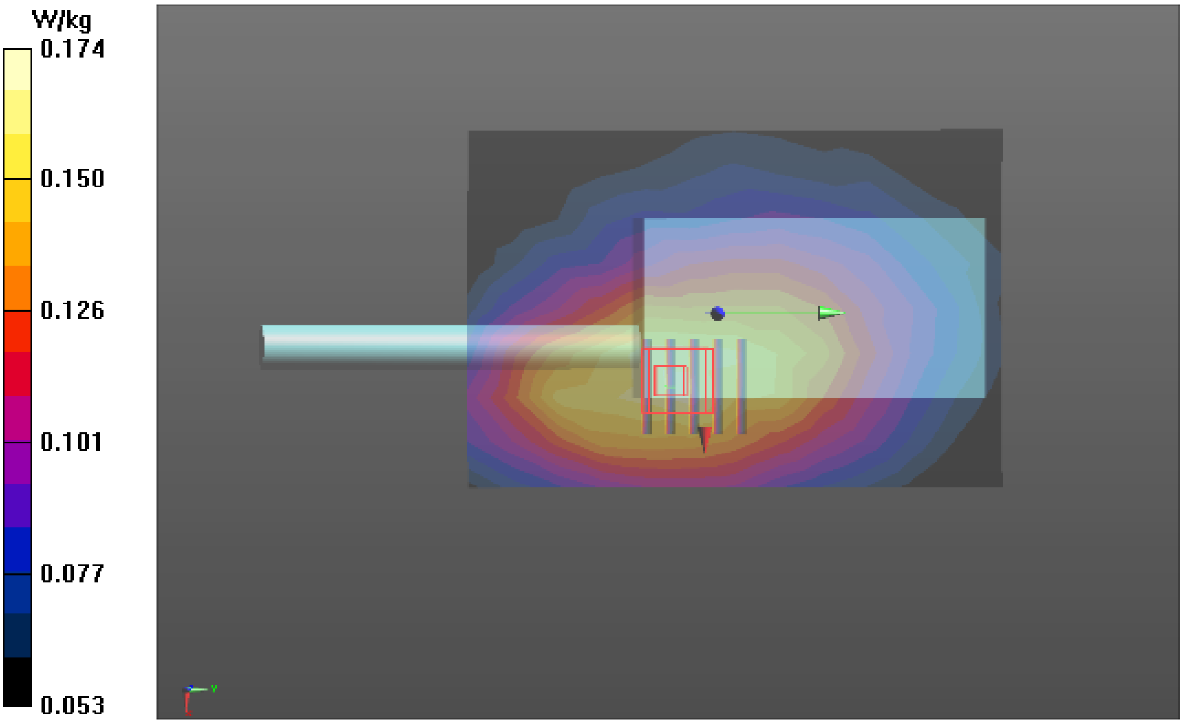
Digital(1W):
Test Laboratory: AGC Lab **Date: Apr. 18,2016**
150MHz face up 2.5cm (12.5 KHz)
DUT: DIGITAL RADIO; Type: D868

Communication System: CW; Communication System Band: 150MHz; Duty Cycle: 1:1;
Frequency:155.025 MHz; Medium parameters used: f = 150MHz; σ =0.77 mho/m; ε r = 51.66; ρ = 1000 kg/m^3 ;
Phantom Type: Elliptical Phantom
Ambient temperature (℃): 21.7, Liquid temperature (℃): 21.1

DASY Configuration:
Probe: ES3DV3 – SN3337; ConvF(7.63, 7.63,7.63); Calibrated:10/01/2015;;
Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
Electronics: DAE4 Sn1398; Calibrated: 02/02/2016
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

FRONT/8/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.171 W/kg

FRONT/8/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.943 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.219 W/kg
SAR(1 g) = 0.150 W/kg; SAR(10 g) = 0.116 W/kg
Maximum value of SAR (measured) = 0.174 W/kg



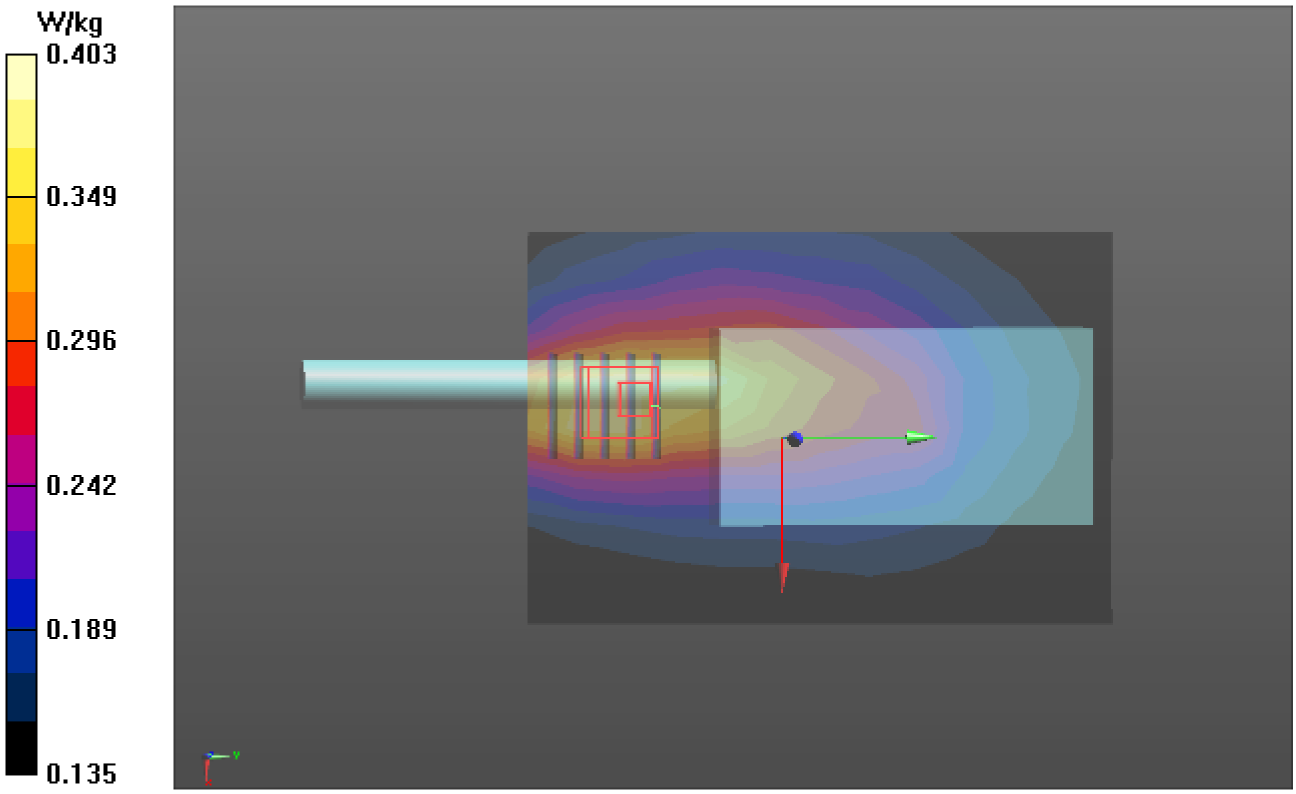
Test Laboratory: AGC Lab **Date: Apr. 18,2016**
150MHz Body –Touch (12.5 KHz)
DUT: DIGITAL RADIO; Type: D868

Communication System: CW; Communication System Band: 150MHz; Duty Cycle: 1:1;
Frequency:155.025 MHz; Medium parameters used: f = 150 MHz; σ =0.81 mho/m; ε r = 61.95; ρ = 1000 kg/m ;
Phantom Type: Elliptical Phantom
Ambient temperature (℃): 21.7, Liquid temperature (℃): 21.5

DASY Configuration:
- Probe: ES3DV3 – SN3337; ConvF(7.24, 7.24,7.24); Calibrated:10/01/2015;;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0,
- Electronics: DAE4 Sn1398; Calibrated: 02/02/2016
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1210
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BACK/8/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.401 W/kg

BACK/8/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.532 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.544 W/kg
SAR(1 g) = 0.364 W/kg; SAR(10 g) = 0.283 W/kg
Maximum value of SAR (measured) = 0.403 W/kg



APPENDIX C. TEST SETUP PHOTOGRAPHS &EUT PHOTOGRAPHS

Test Setup Photographs

Face Up with 2.5 cm Separation Distance.

Body Back Touch with all accessories

Note : The headset is just for testing. This tested and electrically similar headsets may be used

DEPTH OF THE LIQUID IN THE PHANTOM—ZOOM IN

Note：The position used in the measurement were according to IEEE 1528-2013

150-Head Liquid	150-Body Liquid
	

EUT PHOTOGRAPHS

TOTAL VIEW OF EUT

TOP VIEW OF EUT

BOTTOM VIEW OF EUT

FRONT VIEW OF EUT

BACK VIEW OF EUT

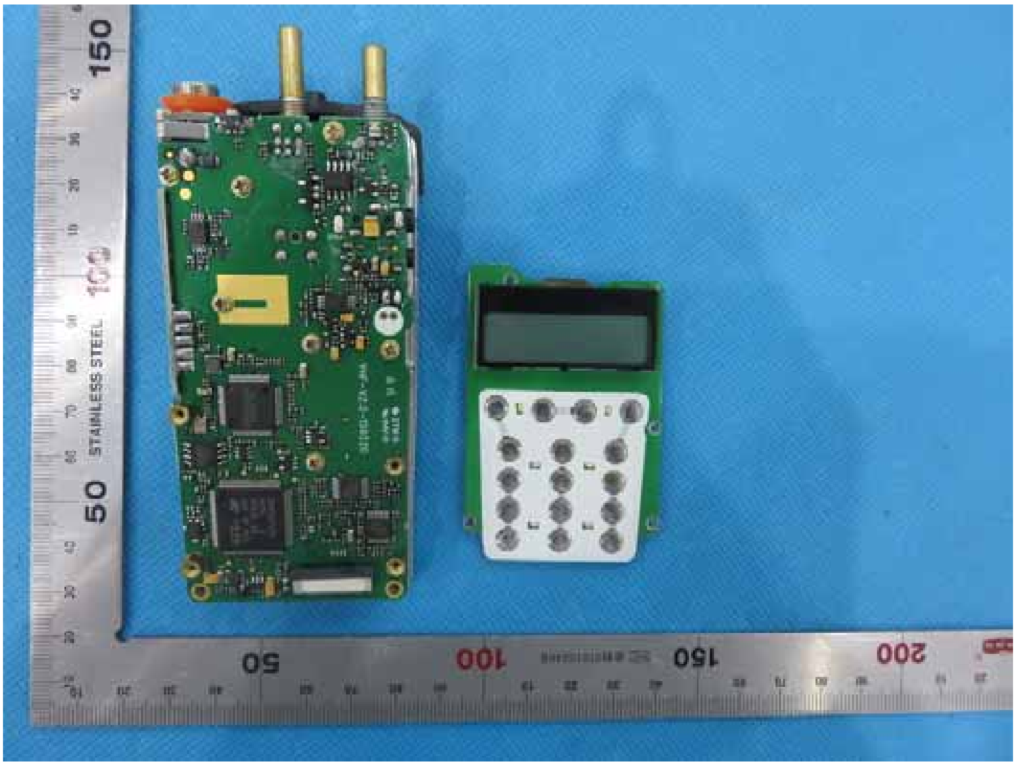
LEFT VIEW OF EUT

RIGHT VIEW OF EUT

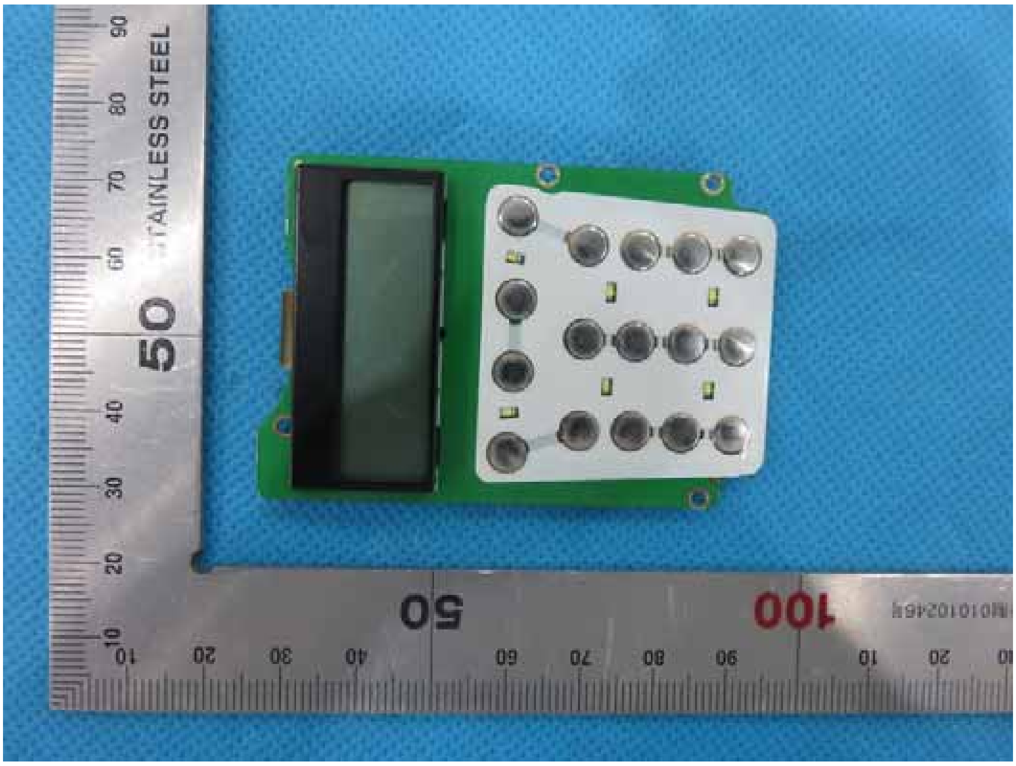
OPEN VIEW OF EUT-1

OPEN VIEW OF EUT-2

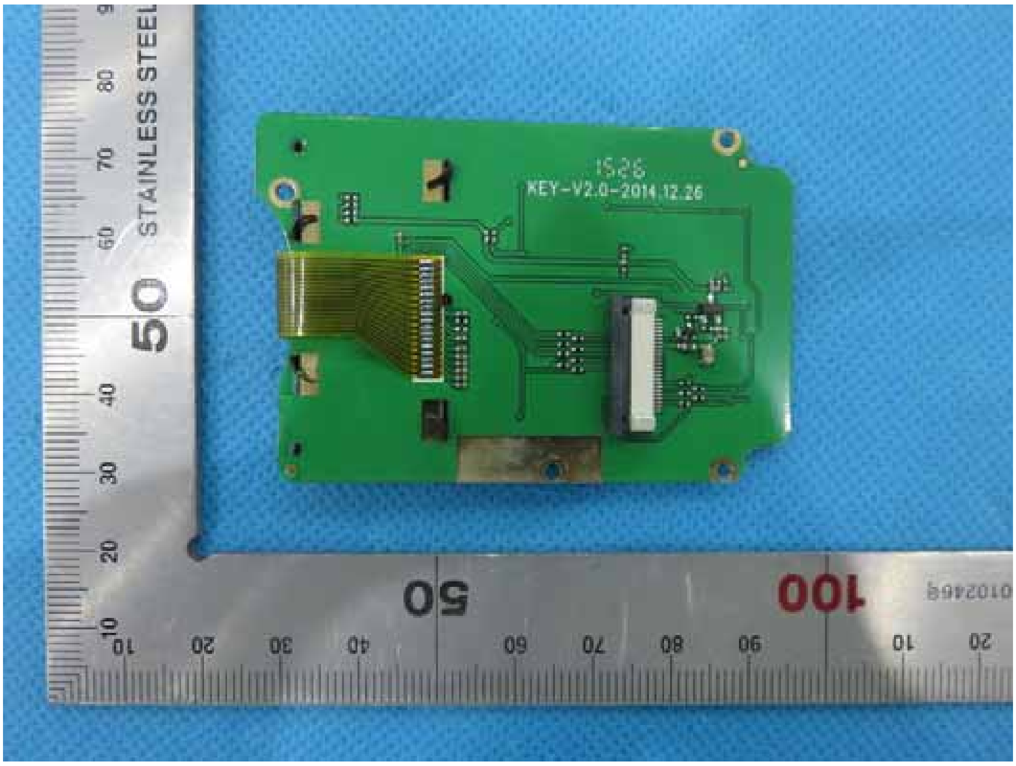
INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2

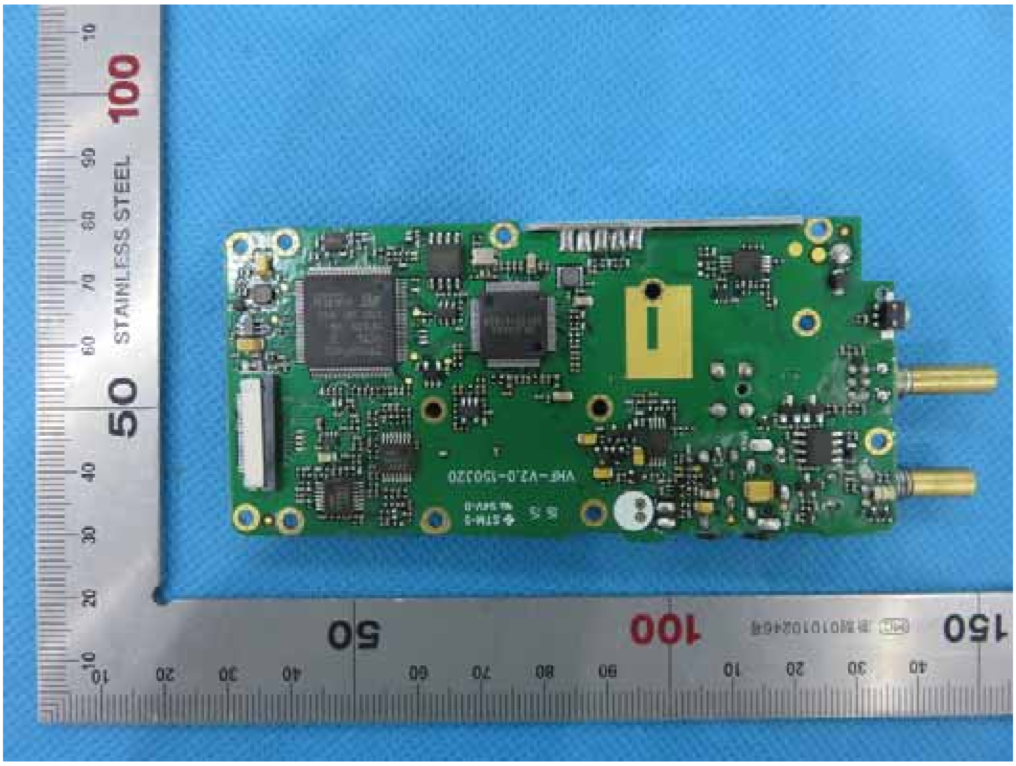


INTERNAL VIEW OF EUT-3

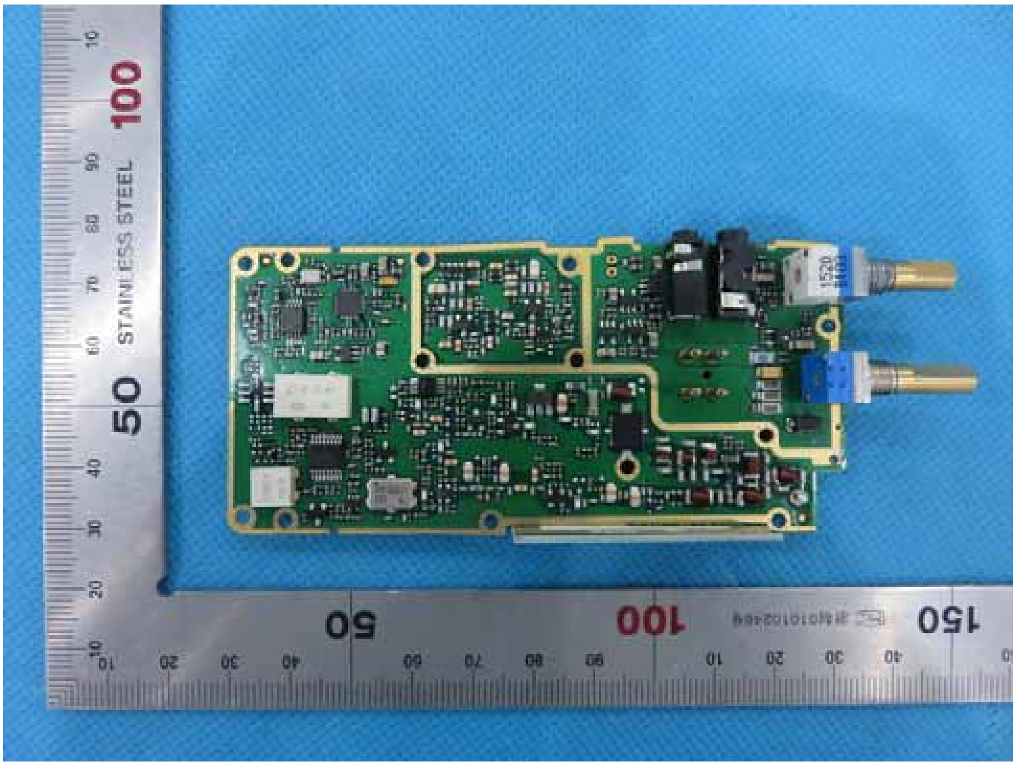


INTERNAL VIEW OF EUT-4

INTERNAL VIEW OF EUT-5



INTERNAL VIEW OF EUT-6



APPENDIX D. 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 **AGC-CERT (Auden)**

Certificate No: ES3-3337_Oct15

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3337
Calibration procedure(s)	QA CAL-01.v9, QA CAL-12.v9, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for dosimetric E-field probes
Calibration date:	October 1, 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:	Israe Elnaouq	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: October 2, 2015

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 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
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

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 ES3DV3

SN:3337

Manufactured: January 24, 2012
Calibrated: October 1, 2015

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3337

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.10	0.96	1.00	± 10.1 %
DCP (mV)[B]	106.0	105.9	103.4	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB$\sqrt{\mu V}$	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	192.9	±3.3 %
		Y	0.0	0.0	1.0		163.2	
		Z	0.0	0.0	1.0		197.3	

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 Norm X,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: ES3DV3 - SN:3337

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)	Unc (k=2)
150	52.3	0.76	7.63	7.63	7.63	0.04	1.20	± 13.3 %
450	43.5	0.87	6.88	6.88	6.88	0.25	2.20	± 13.3 %
835	41.5	0.90	6.32	6.32	6.32	0.49	1.45	± 12.0 %
900	41.5	0.97	6.23	6.23	6.23	0.37	1.68	± 12.0 %
1810	40.0	1.40	5.28	5.28	5.28	0.51	1.53	± 12.0 %
1900	40.0	1.40	5.23	5.23	5.23	0.80	1.16	± 12.0 %
2100	39.8	1.49	5.28	5.28	5.28	0.62	1.35	± 12.0 %
2450	39.2	1.80	4.66	4.66	4.66	0.80	1.25	± 12.0 %

[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: ES3DV3 - SN:3337

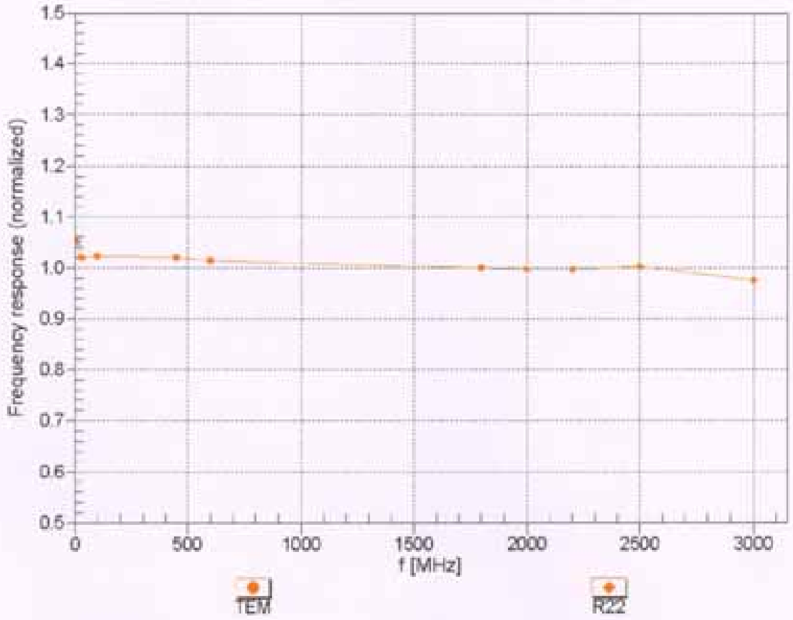
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
150	61.9	0.80	7.24	7.24	7.24	0.06	1.20	± 13.3 %
450	56.7	0.94	7.12	7.12	7.12	0.15	1.74	± 13.3 %
835	55.2	0.97	6.31	6.31	6.31	0.43	1.63	± 12.0 %
900	55.0	1.05	6.29	6.29	6.29	0.35	1.81	± 12.0 %
1810	53.3	1.52	4.94	4.94	4.94	0.54	1.48	± 12.0 %
1900	53.3	1.52	4.83	4.83	4.83	0.45	1.78	± 12.0 %
2100	53.2	1.62	4.90	4.90	4.90	0.67	1.39	± 12.0 %
2450	52.7	1.95	4.36	4.36	4.36	0.80	1.14	± 12.0 %

[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.

Frequency Response of E-Field

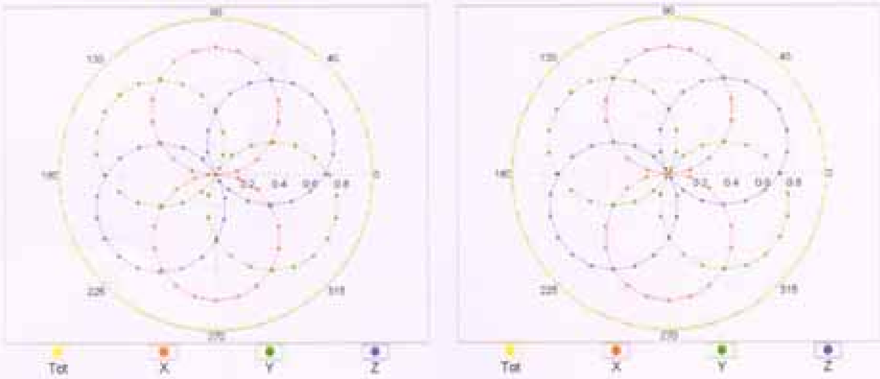
(TEM-Cell:ifi110 EXX, Waveguide: R22)

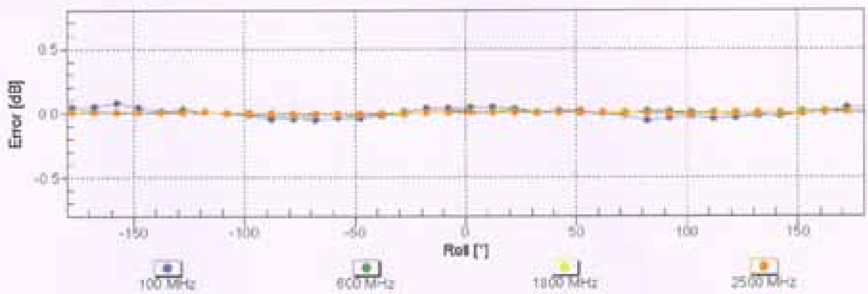


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), $\vartheta = 0°$

f=600 MHz,TEM f=1800 MHz,R22

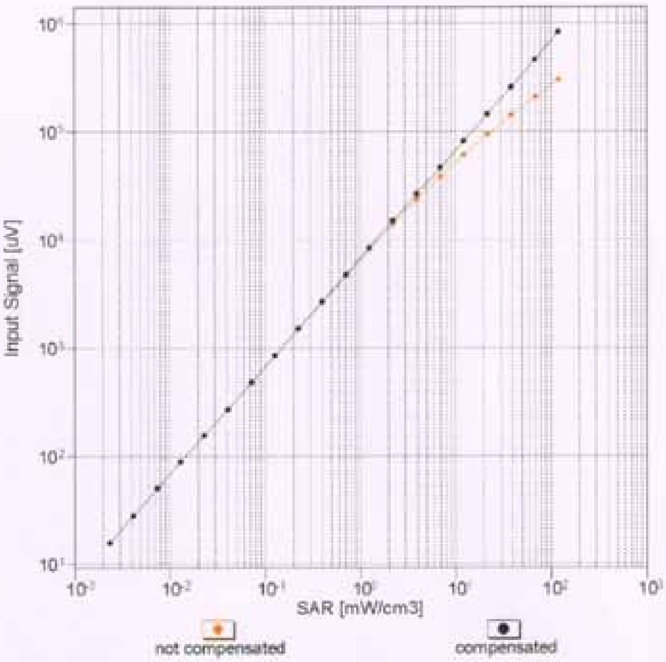


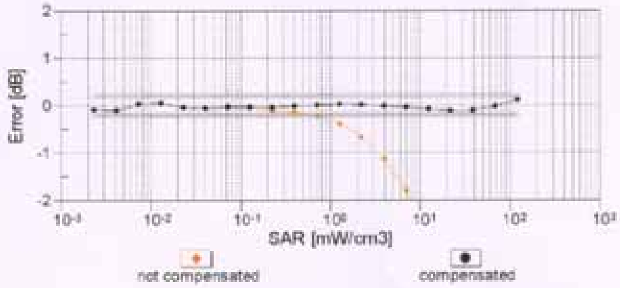


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

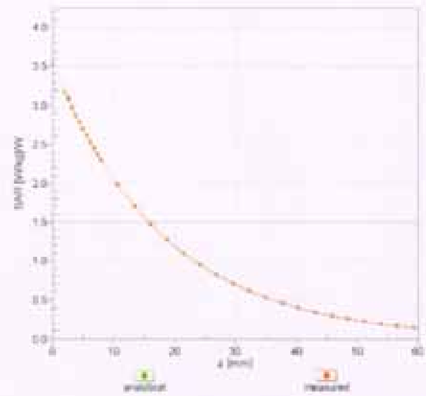
(TEM cell , f_{eval}= 1900 MHz)

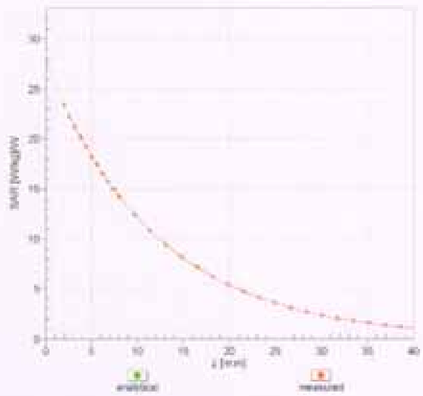




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

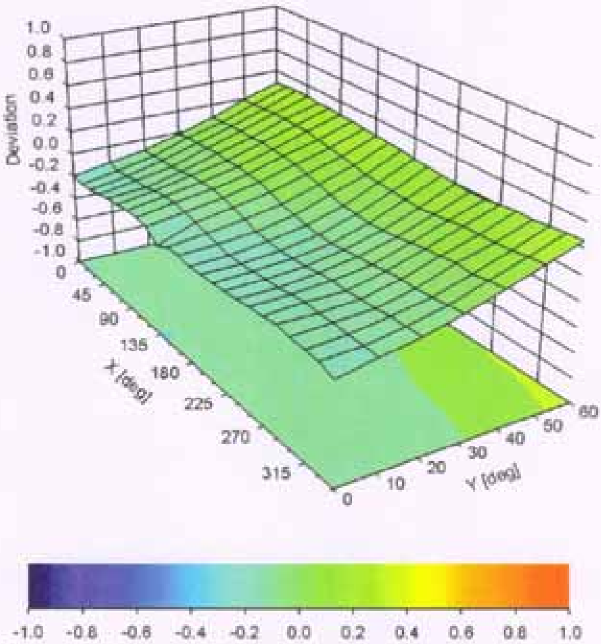
Conversion Factor Assessment





Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3337

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	2.3
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

APPENDIX E. DAE CALIBRATION DATA

Calibration Laboratory of
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Zeughausstrasse 43, 8004 Zurich, Switzerland

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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

Client **AGC-CERT (Auden)**

Certificate No: **DAE4-1398_Mar15**

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BM - SN: 1398
Calibration procedure(s)	QA CAL-06.v29 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	March 11, 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
Keithley Multimeter Type 2001	SN: 0810278	03-Oct-14 (No:15573)	Oct-15
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Auto DAE Calibration Unit	SE UWS 053 AA 1001	06-Jan-15 (in house check)	In house check: Jan-16
Calibrator Box V2.1	SE UMS 006 AA 1002	06-Jan-15 (in house check)	In house check: Jan-16

	Name	Function	Signature
Calibrated by:	R.Mayoraz	Technician	
Approved by:	Fin Bomholt	Deputy Technical Manager	i.V.

Issued: March 11, 2015

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

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Swiss Calibration Service

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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

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV , full range = -100...+300 mV

Low Range: 1LSB = 61nV , full range = -1.......+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.177 ± 0.02% (k=2)	404.159 ± 0.02% (k=2)	403.623 ± 0.02% (k=2)
Low Range	3.97359 ± 1.50% (k=2)	3.99241 ± 1.50% (k=2)	3.96904 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	195.5 ° ± 1 °

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	199993.58	-1.10	-0.00
Channel X	+ Input	20001.61	1.19	0.01
Channel X	- Input	-19998.75	2.61	-0.01
Channel Y	+ Input	199994.17	-0.06	-0.00
Channel Y	+ Input	19999.73	-0.66	-0.00
Channel Y	- Input	-20002.27	-0.74	0.00
Channel Z	+ Input	199994.39	-0.01	-0.00
Channel Z	+ Input	19999.60	-0.65	-0.00
Channel Z	- Input	-20002.37	-0.85	0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.37	-0.22	-0.01
Channel X	+ Input	201.03	-0.14	-0.07
Channel X	- Input	-198.68	0.01	-0.00
Channel Y	+ Input	2000.16	-0.39	-0.02
Channel Y	+ Input	199.64	-1.42	-0.71
Channel Y	- Input	-200.57	-1.84	0.93
Channel Z	+ Input	2000.33	-0.14	-0.01
Channel Z	+ Input	199.88	-1.17	-0.58
Channel Z	- Input	-200.01	-1.12	0.56

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-13.00	-14.85
	- 200	16.87	14.74
Channel Y	200	8.65	8.14
	- 200	-11.30	-11.41
Channel Z	200	7.15	7.52
	- 200	-9.35	-9.51

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	-3.68	-0.69
Channel Y	200	5.01	-	-0.86
Channel Z	200	8.26	0.74	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15958	16128
Channel Y	15964	17962
Channel Z	15846	14478

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	-0.22	-1.08	0.72	0.33
Channel Y	-1.19	-1.94	-0.30	0.32
Channel Z	-1.46	-2.11	0.01	0.32

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

In Collaboration with
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E-mail: cttl@chinattl.com Http://www.chinattl.cn

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CALIBRATION
CNAS L0570

Client : agc-cert

Certificate No: Z16-97012

CALIBRATION CERTIFICATE

Object	DAE4 - SN: 1398
Calibration Procedure(s)	FD-Z11-2-002-01 Calibration Procedure for the Data Acquisition Electronics (DAEx)
Calibration date:	February 02, 2016

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Process Calibrator 753	1971018	06-July-15 (CTTL, No:J15X04257)	July-16

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: February 03, 2016

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E-mail: cttl@chinattl.com Http://www.chinattl.cn

Glossary:

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters:

- *DC Voltage Measurement*: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.

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CALIBRATION LABORATORY

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E-mail: cttl@chinattl.com Http://www.chinattl.cn

DC Voltage Measurement

A/D - Converter Resolution nominal
High Range: 1LSB = 6.1μV , full range = -100...+300 mV
Low Range: 1LSB = 61nV , full range = -1.......+3mV
DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.195 ± 0.15% (k=2)	404.179 ± 0.15% (k=2)	403.642 ± 0.15% (k=2)
Low Range	3.97538 ± 0.7% (k=2)	3.99360 ± 0.7% (k=2)	3.97118 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	196° ± 1 °

APPENDIX F LOOP ANTENNA CALIBRATION DATA

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

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Accreditation No.: SCS 108

Client **AGC-CERT (Auden)**

Certificate No: CLA150-4008_Jan14

CALIBRATION CERTIFICATE

Object	CLA150 - SN: 4008
Calibration procedure(s)	QA CAL-15.v8 Calibration procedure for system validation sources below 700 MHz
Calibration date:	January 24, 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	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5058 (20k)	04-Apr-13 (No. 217-01736)	Apr-14
Type-N mismatch combination	SN: 5047.3 / 06327	04-Apr-13 (No. 217-01739)	Apr-14
Reference Probe EX3DV4	SN: 3877	06-Jan-14 (No. EX3-3877_Jan14)	Jan-15
DAE4	SN: 654	18-Jul-13 (No. DAE4-654_Jul13)	Jul-14

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:	Israe El-Naouq	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 29, 2014

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Zeughausstrasse 43, 8004 Zurich, Switzerland

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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	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
EUT Positioning	Touch Position	
Zoom Scan Resolution	dx, dy, dz = 5.0 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	50.5 ± 6 %	0.76 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	3.84 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**3.81 W/kg ± 18.4 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	1 W input power	2.56 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**2.54 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	62.8 ± 6 %	0.80 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	3.88 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**3.89 W/kg ± 18.4 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	1 W input power	2.60 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**2.61 W/kg ± 18.0 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	44.0 Ω - 6.9 jΩ
Return Loss	- 20.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.4 Ω - 9.3 jΩ
Return Loss	- 20.1 dB

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 16, 2013

DASY5 Validation Report for Head TSL

Date: 24.01.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: CLA150; Type: CLA150; Serial: CLA150 - SN: 4008

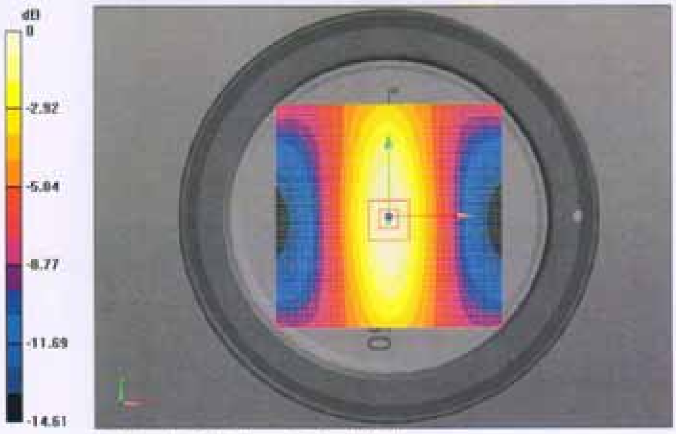
Communication System: UID 0 - CW; Frequency: 150 MHz
Medium parameters used: f = 150 MHz; $\sigma = 0.76$ S/m; $\varepsilon_r = 50.5$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(11.76, 11.76, 11.76); Calibrated: 06.01.2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 18.07.2013
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

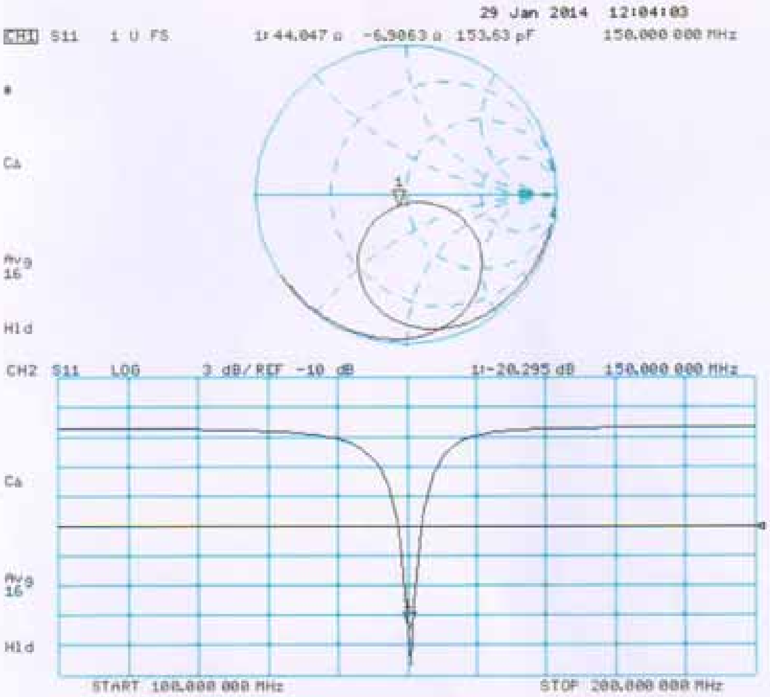
CLA Calibration for HSL-LF Tissue/CLA150, touch configuration, Pin=1W/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 4.92 W/kg

CLA Calibration for HSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 80.503 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 6.12 W/kg
SAR(1 g) = 3.84 W/kg; SAR(10 g) = 2.56 W/kg
Maximum value of SAR (measured) = 4.93 W/kg



0 dB = 4.92 W/kg = 6.92 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 24.01.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: CLA150; Type: CLA150; Serial: CLA150 - SN: 4008

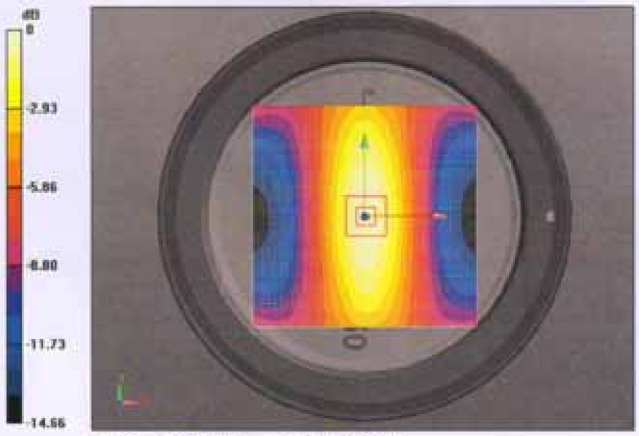
Communication System: UID 0 - CW; Frequency: 150 MHz
Medium parameters used: f = 150 MHz; $\sigma = 0.799$ S/m; $\varepsilon_r = 62.757$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(11.45, 11.45, 11.45); Calibrated: 06.01.2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 18.07.2013
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

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) = 4.99 W/kg

CLA Calibration for MSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 78.941 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 6.21 W/kg
SAR(1 g) = 3.88 W/kg; SAR(10 g) = 2.6 W/kg
Maximum value of SAR (measured) = 5.00 W/kg



0 dB = 4.99 W/kg = 6.98 dBW/kg

Impedance Measurement Plot for Body TSL