Shenzhen Huatongwei International Inspection Co., Ltd.
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone:86-755-26748019 Fax:86-755-26748089 http://www.szhtw.com.cn

SAR REPORT

Report Reference No.................... :	**TRE1503009802**	**R/C……….:**	**60362**
FCC ID.. :	**2AE6CEP8100U1**		
Applicant's name .... :	**Shenzhen Excera Technology Co., Ltd.**		
Address..:	Block K of 4F, Tower A of Junxiangda building,Zhongshanyuan WestRoad,Tongle Village,Nanshan,Shenzhen,China		
Manufacturer.....................................:	**Shenzhen Excera Technology Co., Ltd.**		
Address..:	Block K of 4F, Tower A of Junxiangda building,Zhongshanyuan WestRoad,Tongle Village,Nanshan,Shenzhen,China		
Test item description .... :	**Digital Portable Radio**		
Trade Mark ....:	EXCERA		
Model/Type reference.......................:	EP8100 U1		
List Model ....:	/		
Standard .... :	**OET 65C**		
Date of receipt of test sample………..:	Mar 23, 2015		
Date of testing…………………………:	Apr 7, 2015- Apr 8, 2015		
Date of issue……………………………..:	Apr 9, 2015		
Result................. ……………………..:	**PASS**		

Compiled by (position+printed name+signature)..:	File administrators Shayne Zhu	Shayne Zhu
Supervised by (position+printed name+signature)..:	Test Engineer Jerome Luo	Jerome Luo
Approved by (position+printed name+signature)..:	Manager Hans Hu	Hans Hu

Testing Laboratory Name .... :	**Shenzhen Huatongwei International Inspection Co., Ltd.**
Address..:	Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

IEEE Std C95.1, 1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 KHz to 300 GHz.

IEEE Std 1528™-2003: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

KDB 447498 D01 Mobile Portable RF Exposure v05r02: Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies

KDB 643646 D01 SAR Test for PTT Radios v01r01 : SAR Test Reduction Considerations for Occupational PTT Radios

2. SUMMARY

2.1. Client Information

Applicant:	Shenzhen Excera Technology Co., Ltd.
Address:	Block K of 4F, Tower A of Junxiangda building,Zhongshanyuan WestRoad,Tongle Village,Nanshan,Shenzhen,China
Manufacturer:	Shenzhen Excera Technology Co., Ltd.
Address:	Block K of 4F, Tower A of Junxiangda building,Zhongshanyuan WestRoad,Tongle Village,Nanshan,Shenzhen,China

2.2. Product Description

Name of EUT:	Digital Portable Radio	
Trade mark:	EXCERA	
Model/Type reference:	EP8100 U1	
Listed mode(s):	/	
Power supply:	DC 7.20V	
Device type:	Portable device	
Exposure category:	Controlled environment/Occupational	
Charger information:	Model:ESC102L Input:12Vd.c.,1000mA Output:8.4Vd.c., 1000mA	
Battery information:	Model:EB242L 7.2Vd.c., 2400mAh	
Adapter information:	Model: HKA01212010-2F Input: 100-240Va.c., 50/60Hz, 500mA Output:12.0Vd.c., 1000mA	
Operation Frequency:	From 400MHz to 470MHz	
Rated Output Power:	4.2Watts(36.23dBm)/1.2Watts(30.79dBm)	
Support data rate:	9.6kbps	
Modilation Type:	FM for Analog Voice	
	4FSK for Digital Voice / Digital Data	
Channel Separation:	Analog Voice	12.5kHz
	Digital Voice/Data	12.5kHz
	Digital Data	12.5kHz
Maximum Transmitter Power	Analog	4.27W for 12.5 KHz Channel Separation
	Digital	4.33W for 12.5 KHz Channel Separation
Antenna Type:	External	
Hard version:	E	
Soft version:	0.9.05.009	
Maximum SAR values:	**3.16** W/kg for Digital 12.5KHz (Body-Worn)	
Bluetooth		
Version:	Supported BT3.0+EDR	
Modulation:	GFSK, π/4DQPSK, 8DPSK	
Operation frequency:	2402MHz~2480MHz	
Channel number:	79	

Channel separation:	1MHz
Antenna type:	Internal Antenna
Version:	Supported BT4.0+BLE
Modulation:	GFSK
Operation frequency:	2402MHz~2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	Internal Antenna
GPS	
Modulation:	BPSK
Operation frequency:	1575.42MHz
Antenna type:	External Antenna
Hard version:	E
Soft version:	0.9.05.009

2.3. Equipment under Test

Power supply system utilised

Power supply voltage	:	○	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

2.4. Short description of the Equipment under Test (EUT)

The spatial peak SAR values were assessed for UHF systems. Battery and accessories shell be specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.

2.5. EUT operation mode

The EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.6. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
○	Multimeter	Manufacturer :	/
		Model No. :	/

2.7. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd.
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone: 86-755-26748019 Fax: 86-755-26748089

3.2. Test Facility

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

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: Mar. 01, 2012. Valid time is until February 28, 2015.

A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until Sept 30, 2015.

FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date Jul. 01, 2012, valid time is until Jun. 01, 2015.

IC-Registration No.: 5377A

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Dec. 31, 2013, valid time is until Dec. 31, 2016.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

VCCI

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.:R-2484. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 29, 2015.
Radiated disturbance above 1GHz measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2013. Valid time is until Dec. 23, 2016.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 19, 2015.
Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-1837. Date of Registration: May 07, 2013. Valid time is until May 06, 2016.

DNV

Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2016.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	18-25 ° C
Humidity:	40-65 %
Atmospheric pressure:	950-1050mbar

3.4. Equipments Used during the Test

Test Equipment	Manufacturer	Type/Model	Serial Number	Calibration	
				Last Calibration	Calibration Interval
Data Acquisition Electronics DAEx	SPEAG	DAE4	1315	2014/07/22	1
E-field Probe	SPEAG	ES3DV3	3292	2014/08/15	1
System Validation Dipole 450V3	SPEAG	D450V3	1079	2014/02/28	1
Dielectric Probe Kit	Agilent	85070E	US44020288	/	/
Power meter	Agilent	E4417A	GB41292254	2014/12/26	1
Power sensor	Agilent	8481H	MY41095360	2014/12/26	1
Network analyzer	Agilent	8753E	US37390562	2014/12/25	1

Note:

1) Per KDB865664D01 requirements for dipole calibration, the test laboratory has adopted three year extended calibration interval. Each measured dipole is expected to evalute with following criteria at least on annual interval.
   a) There is no physical damage on the dipole;
   b) System check with specific dipole is within 10% of calibrated values;
   c) The most recent return-loss results,measued at least annually,deviates by no more than 20% from the previous measurement;
   d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 50 Ω from the provious measurement.
2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.
3) D450V3 – serial no. 1079 Extended Dipole Calibrations

Referring to KDB 865664D01V01r03, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration),and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended. <Justification of the extended calibration>

D450V3 – serial no. 1079				
	4500 Head		4500 Body	
Date of Measurement	Return - Loss (dB)	Real Impedance (ohm)	Return - Loss (dB)	Real Impedance (ohm)
2014/02/28	-21.0	59.8	-21.7	56.4
2015/02/22	-20.9	59.7	-21.7	56.3

The return loss is < - 20dB, within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

4. SAR Measurements System configuration

4.1. SAR Measurement Set-up

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

A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).

A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

A unit to operate the optical surface detector which is connected to the EOC.

The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.

The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.

DASY5 software and SEMCAD data evaluation software.

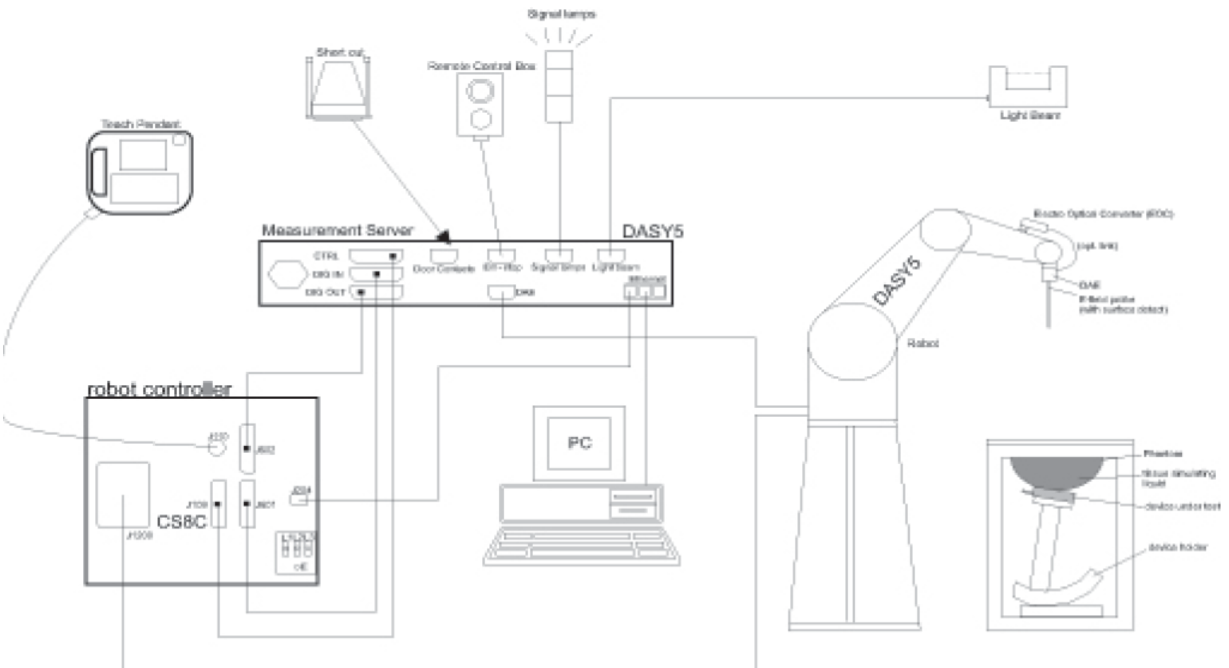
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

The generic twin phantom enabling the testing of left-hand and right-hand usage.

The device holder for handheld mobile phones.

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles allowing to validate the proper functioning of the system.



4.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

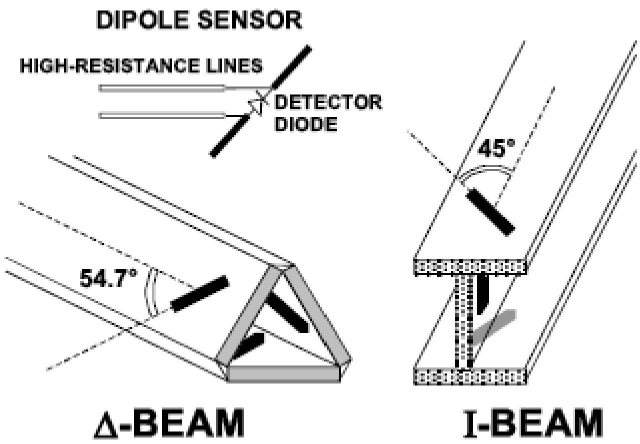
Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 μW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

Isotropic E-Field Probe

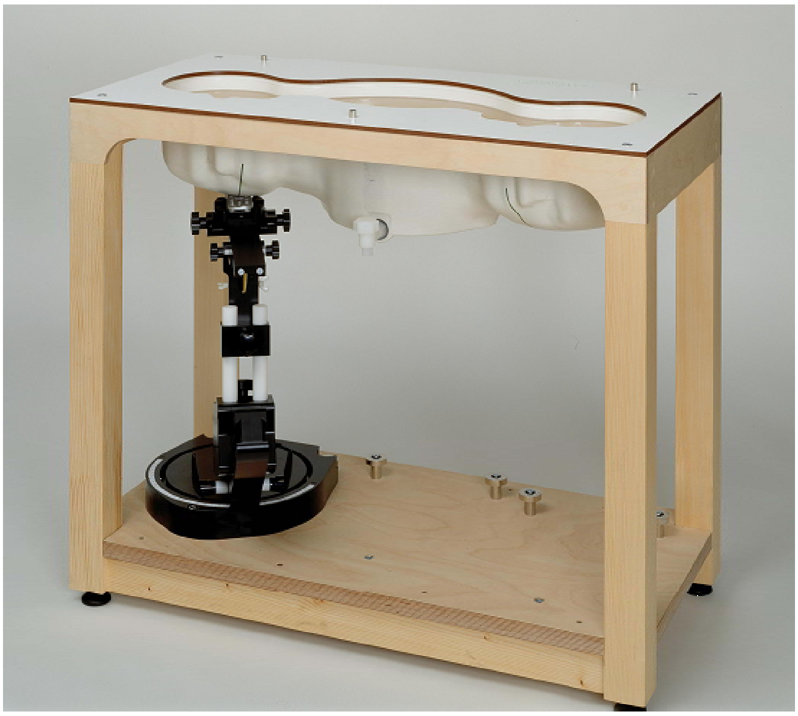
The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



4.3. Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.



SAM Twin Phantom

4.4. Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the DASY system.
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

Device holder supplied by SPEAG

4.5. Scanning Procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan
The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot.Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan
Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

Spatial Peak Detection
The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses.The DASY5 system allows evaluations that combine measured data and robot positions, such as: • maximum search • extrapolation • boundary correction • peak search for averaged SAR During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard’s method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard’s method for extrapolation. For a grid using 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

4.6. Data Storage and Evaluation

Data Storage
The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation
The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

With Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcpi = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

$$\mathrm{E-fieldprobes:} \quad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

$$\mathrm{H-fieldprobes:} \quad H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

with SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

5. SAR Measurement Procedure

5.1. SAR System Validation

5.1.1. Purpose

- To verify the simulating liquids are valid for testing.
- To verify the performance of testing system is valid for testing.

5.2. Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 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 P1528 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 P1528.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (Nacl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton x-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (s/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

IEEE SCC-34/SC-2 P1528 Recommended Tissue Dielectric Parameters

Frequency (MHz)	Head Tissue		Body Tissue	
	εr	Ơ (S/m)	εr	Ơ (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	52.0	2.73
5800	35.3	5.27	48.2	6.00

5.2.1. Dielectric Performance

Dielectric performance of Head tissue simulating liquid				
Frequency (MHz)	Description	DielectricParameters		Temp
		εr	σ(s/m)	℃
450	Recommended result ±5% window	43.50 41.32 - 45.67	0.87 0.83 – 0.91	/
	Measurement value 2015-04-07	43.64	0.89	21

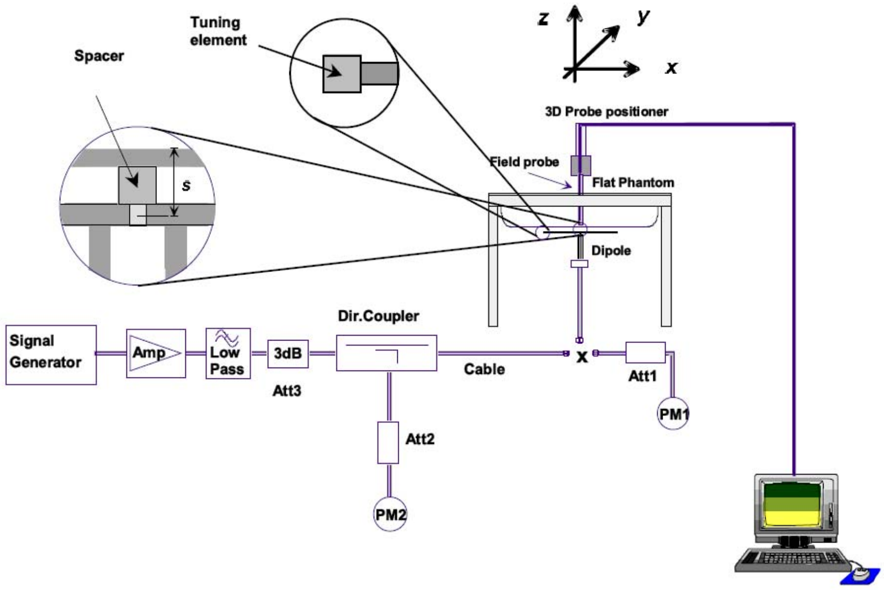
Dielectric performance of Body tissue simulating liquid				
Frequency (MHz)	Description	DielectricParameters		Temp
		εr	σ(s/m)	℃
450	Recommended result ±5% window	56.7 53.87 - 59.53	0.94 0.89 – 0.98	/
	Measurement value 2015-04-08	56.50	0.95	21

5.3. SAR system verification

The purpose of the system check is to verify that the system operates within its specifications at the decice test frequency.The system check is simple check of repeatability to make sure that the system works correctly at the time of the compliance test;

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %).

System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.



The output power on dipole port must be calibrated to 1000mW before dipole is connected.

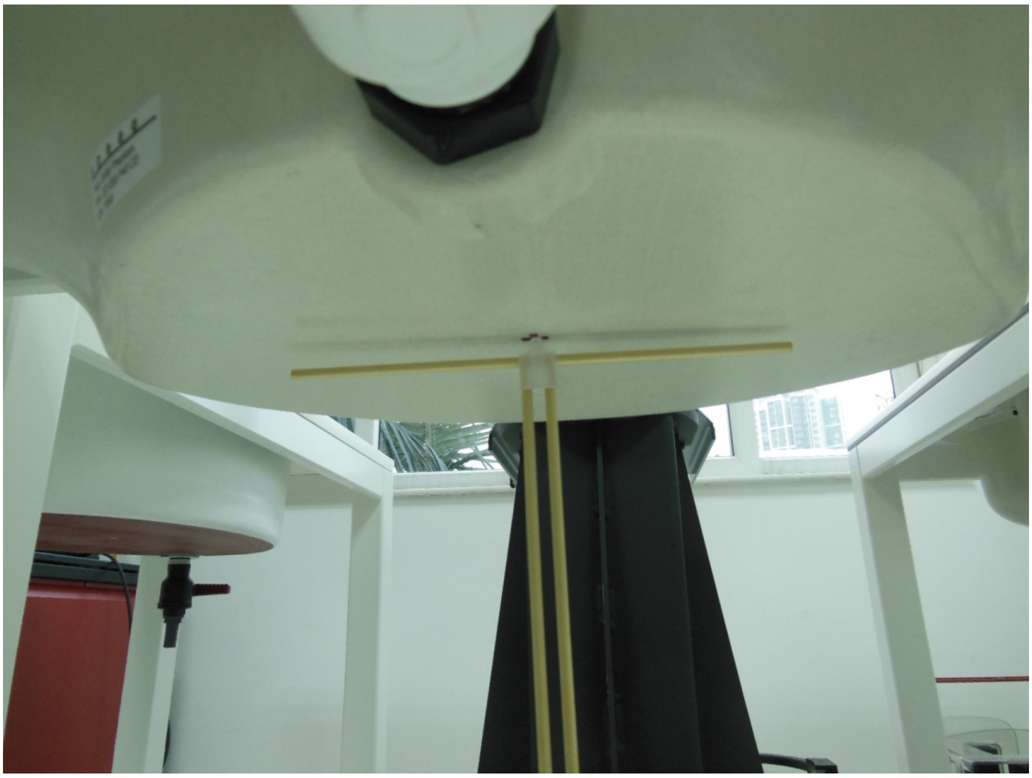


Photo of Dipole Setup

SAR System verification Result

System verification Result for Head			
Frequency (MHz)	Description	SAR(W/kg)	Temp
		1g	℃
450	Recommended result ±10% window	4.63 4.16 – 5.09	/
	Measurement value 2015-04-07	4.51	21

System verification Result for Body			
Frequency (MHz)	Description	SAR(W/kg)	Temp
		1g	℃
450	Recommended result ±10% window	4.45 4.00 – 4.89	/
	Measurement value 2015-04-08	4.28	21

Note:

1. *the graph results see follow.*
2. *Recommended Values used derive from the calibration certificate and 398 mW is used asfeeding power to the calibrated dipole.*

5.4. SAR system Validation

Per FCC KDB 865664 D02v01,SAR system validadion status should be documented 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 FCC KDB 865664 D01 v01 and IEEE 1528-2013.Since SAR probe calibrations are frequency dependent,each 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 Validation Summary

FRE (MHz)	DATE	PROBE SN	PROTE TYPE	PRO CAL. POINT		COND.	PERM.	CW VALIDATION			MOD. VALIDATION		
						σ	ε_r	SENSI-TIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTORY	PAR
450	15-04-7	3292	ES3DV3	450	HEAD	0.89	43.64	PASS	PASS	PASS	4FSK/FM	PASS	N/A
450	15-04-8	3292	ES3DV3	450	BODY	0.95	56.50	PASS	PASS	PASS	4FSK/FM	PASS	N/A

NOTE:While the probes have been calibrated for both CW and modulated signals,all measurements were performed using communication systems calibrated for CW signals only.Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01 for scenarios when CW probe calibrations are used with other signal types.

System Performance Check at 450 MHz Head

DUT: Dipole 450 MHz; Type: D450V3; Serial: 4d134
Date/Time: 07/04/2015 AM
Communication System: CW; Frequency: 450 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 450 MHz; σ = 0.88 S/m; ε_r = 43.57; ρ = 1000 kg/m^3

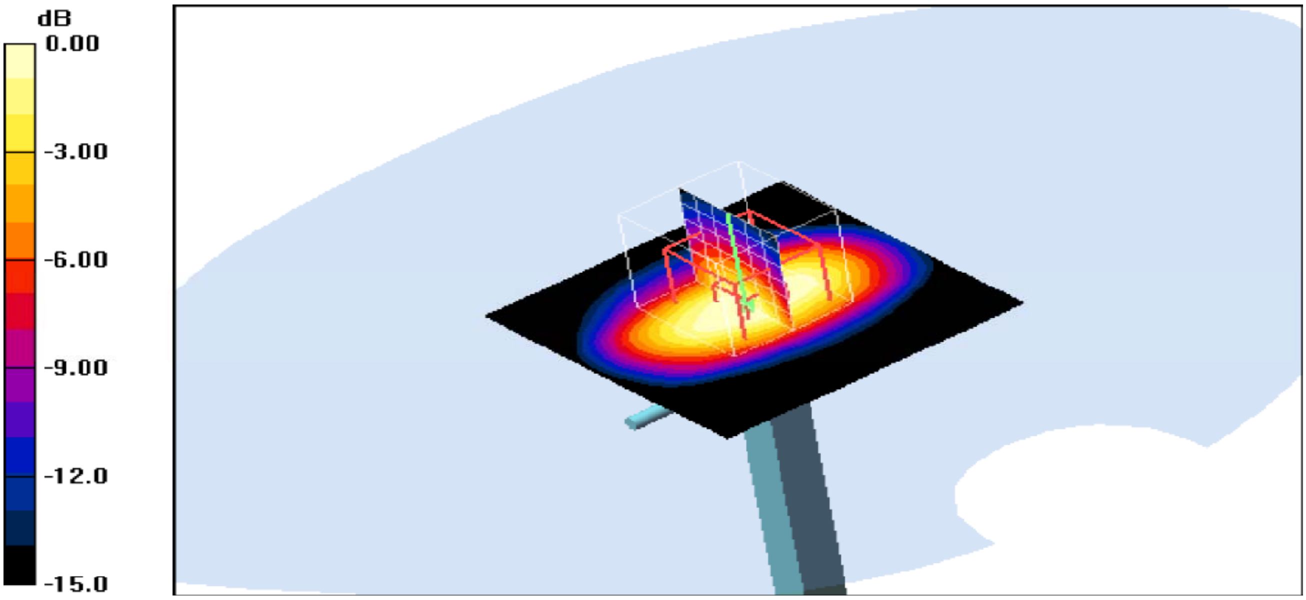
Phantom section: Flat Section

DASY5 Configuration:
Probe: ES3DV3 - SN3292; ConvF(6.71, 6.71, 6.71); Calibrated: 15/08/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1315; Calibrated: 22/07/2014
Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.5 (6469)
Area Scan (61x91x1): Measurement grid: dx=15.00 mm, dy=15.00 mm
Maximum value of SAR (interpolated) = 5.12 mW/g
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.452 V/m; Power Drift = 0.095 dB
Peak SAR (extrapolated) = 7.26 W/kg

SAR(1 g) = 4.51 mW/g
SAR(10 g) = 2.84 mW/g

Maximum value of SAR (measured) = 5.25 mW/g



System Performance Check 450MHz Head 1000mW

System Performance Check at 450 MHz Body

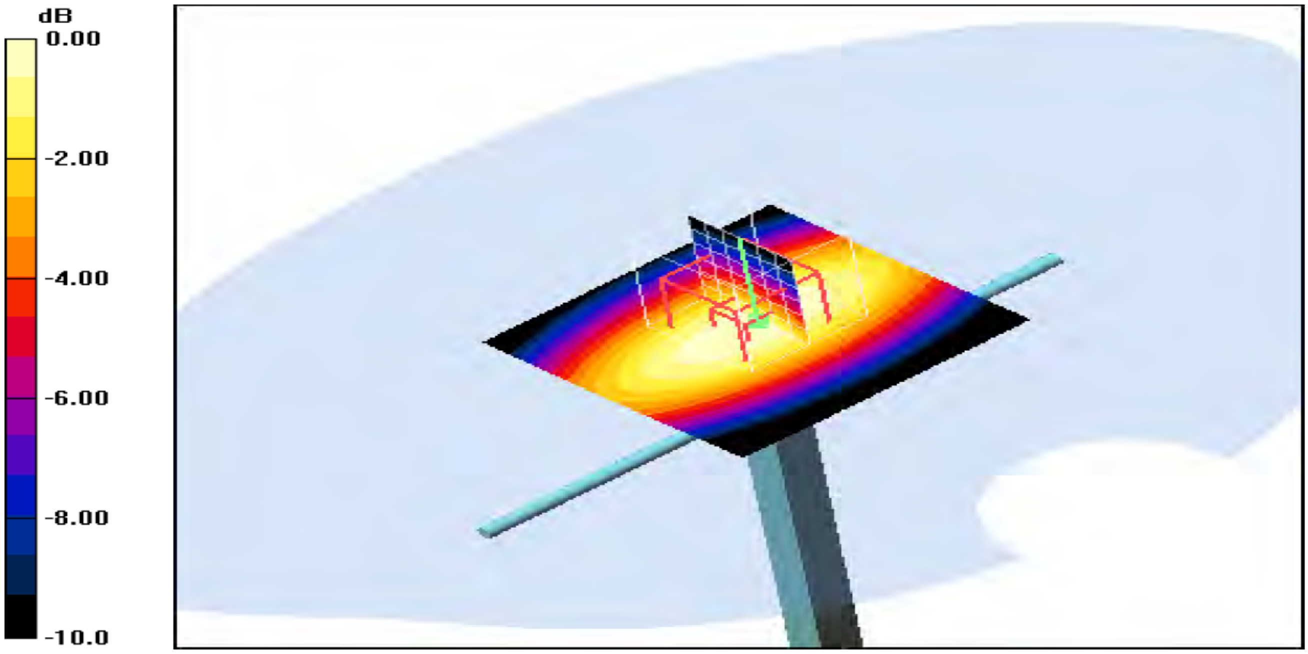
DUT: Dipole 450 MHz; Type: D450V3; Serial: 4d134
Date/Time: 08/04/2015 AM
Communication System: CW; Frequency: 450 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 450 MHz; σ = 0.95 S/m; ε_r = 56.50; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
Probe: ES3DV3 - SN3292; ConvF(7.10, 7.10, 7.10); Calibrated: 15/08/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1315; Calibrated: 22/07/2014
Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.5 (6469)
Area Scan (61x91x1): Measurement grid: dx=15.00 mm, dy=15.00 mm
Maximum value of SAR (interpolated) = 4.89 mW/g
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =88.656 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 5.64 W/kg

SAR(1 g) = 4.28 mW/g
SAR(10 g) =2.52 mW/g

Maximum value of SAR (measured) =4.93 mW/g



System Performance Check 450MHz Body 1000mW

5.5. Measurement Procedures

Tests to be performed

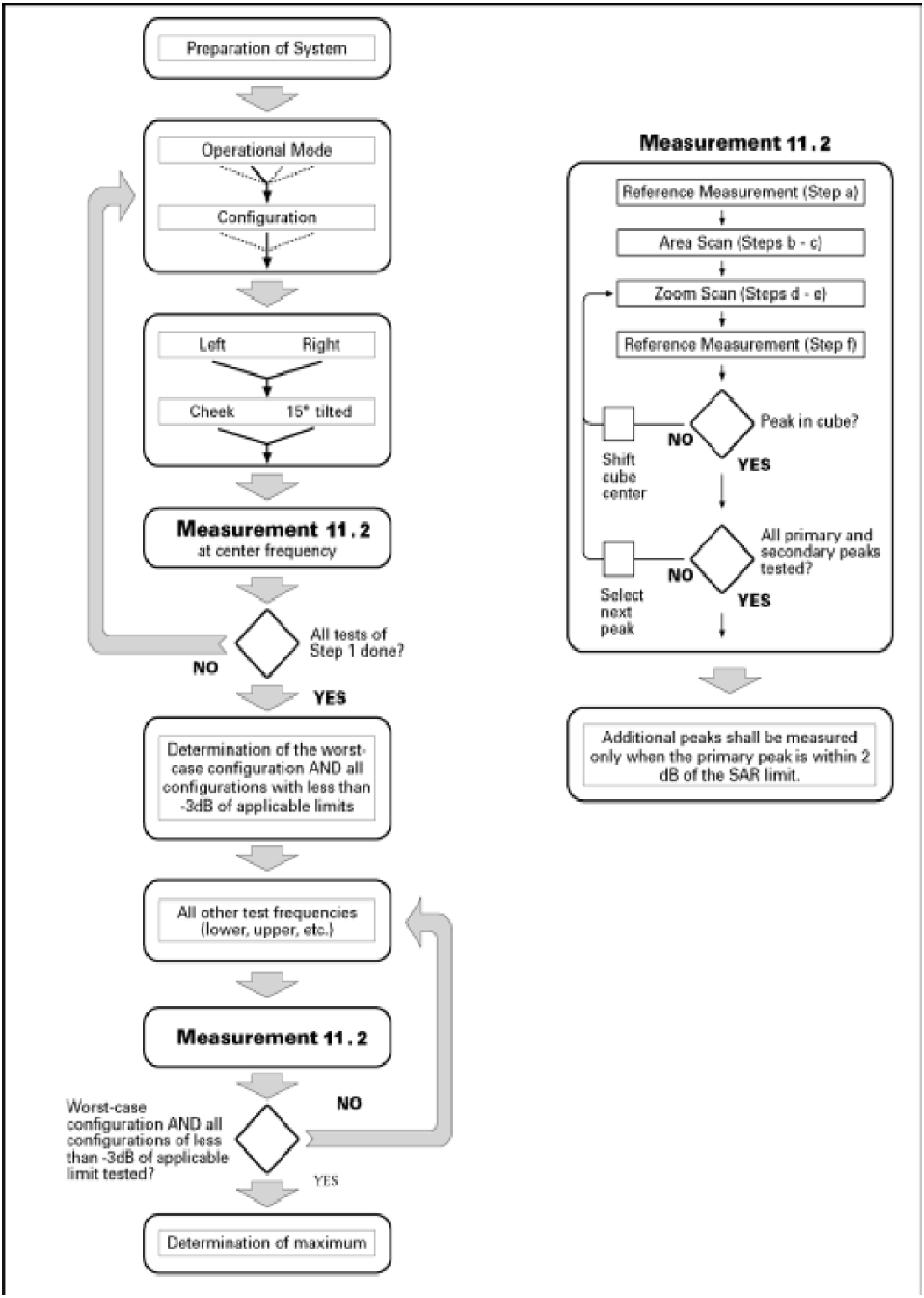
In order to determine the highest value of the peak spatial-average SAR of a handset, all device positions, configurations and operational modes shall be tested for each frequency band according to steps 1 to 3 below. A flowchart of the test process is shown in Picture 11

Step 1: The tests described in 11.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

a) all device positions (cheek and tilt, for both left and right sides of the SAM phantom, as described in Chapter 8),
b) all configurations for each device position in a), e.g., antenna extended and retracted, and
c) all operational modes, e.g., analogue and digital, for each device position in a) and configuration in b) in each frequency band.
d) If more than three frequencies need to be tested according to 11.1 (i.e., $N_c > 3$), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1, perform all tests described in 11.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

Step 3: Examine all data to determine the highest value of the peak spatial-average SAR found in Steps 1 to 2.



Picture 11 Block diagram of the tests to be performed

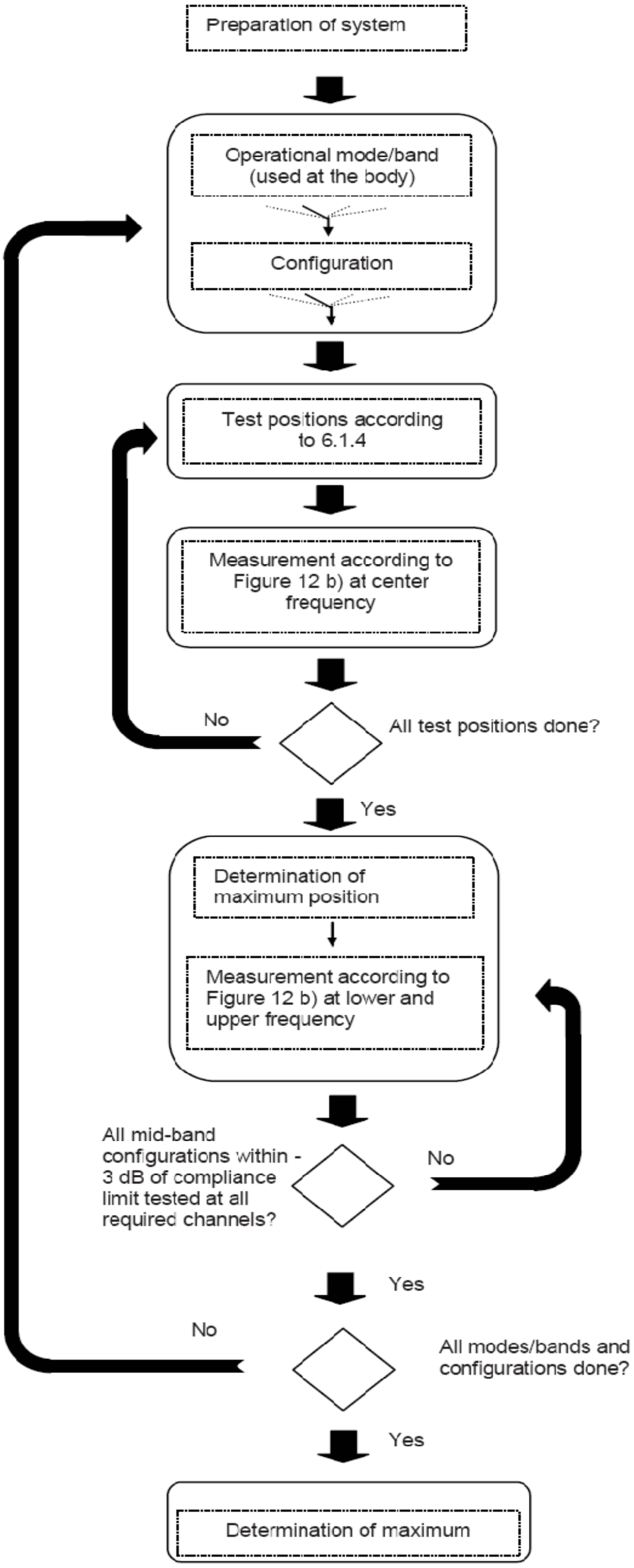


Figure 12a – Tests to be performed

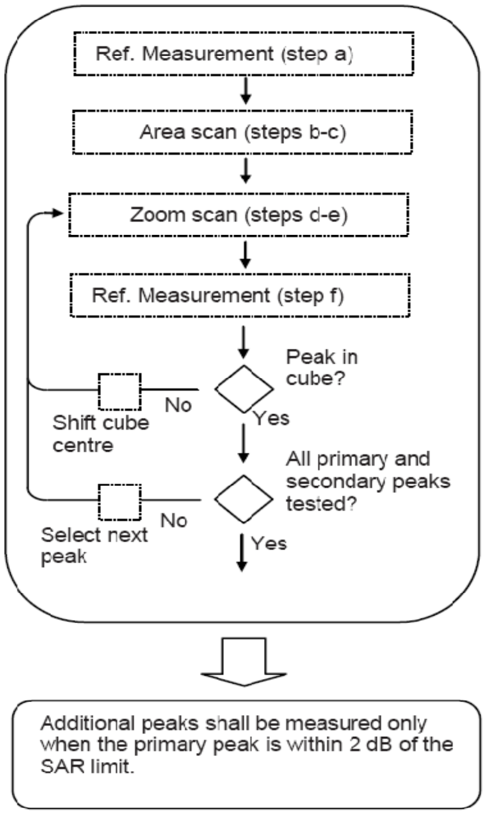


Figure 12b – General procedure

Picture 12 Block diagram of the tests to be performed

Measurement procedure

The following procedure shall be performed for each of the test conditions (see Picture 11) described in 11.1:

a) Measure the local SAR at a test point within 8 mm or less in the normal direction from the inner surface of the phantom.

b) Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall not be closer than 20 mm from the phantom side walls. The distance between the measurement points should enable the detection of the location of local maximum with an accuracy of better than half the linear dimension of the tissue cube after interpolation. A maximum grip spacing of 20 mm for frequencies below 3 GHz and (60/f [GHz]) mm for frequencies of 3GHz and greater is recommended. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδln(2)/2 mm for frequencies of 3 GHz and greater, whereδis the plane wave skin depth and ln(x) is the natural logarithm. The maximum variation of the sensor-phantom surface shall be ±1 mm for frequencies below 3 GHz and ±0.5 mm for frequencies of 3 GHz and greater. At all measurement points the angle of the probe with respect to the line normal to the surface should be less than 5°. If this cannot be achieved for a measurement distance to the phantom inner surface shorter than the probe diameter, additional measurement distance to the phantom inner surface shorter than the probe diameter, additional

c) From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that are not within the zoom-scan volume; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR limit. This is consistent with the 2 dB threshold already stated;
d) Measure the three-dimensional SAR distribution at the local maxima locations identified in step
e) The horizontal grid step shall be (24 / f[GHz]) mm or less but not more than 8 mm. The minimum zoom size of 30 mm by 30 mm and 30 mm for frequencies below 3 GHz. For higher frequencies, the minimum zoom size of 22 mm by 22 mm and 22 mm. The grip step in the vertical direction shall be (8-f[GHz]) mm or less but not more than 5 mm, if uniform spacing is used. If variable spacing is used in the vertical direction, the maximum spacing between the two closest measured points to the phantom shell shall be (12 / f[GHz]) mm or less but not more than 4 mm, and the spacing between father points shall increase by an incremental factor not exceeding 1.5. When variable spacing is used, extrapolation routines shall be tested with the same spacing as used in measurements. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz and δln(2)/2 mm for frequencies of 3 GHz and greater, where δis the plane wave skin depth and ln(x) is the natural logarithm. Separate grids shall be centered on each of the local SAR maxima found in step c). Uncertainties due to field distortion between the media boundary and the dielectric enclosure of the probe should also be minimized, which is achieved is the distance between the phantom surface and physical tip of the probe is larger than probe tip diameter. Other methods may utilize correction procedures for these boundary effects that enable high precision measurements closer than half the probe diameter. For all measurement points, the angle of the probe with respect to the flat phantom surface shall be less than 5. If this cannot be achieved an additional uncertainty evaluation is needed.
f) Use post processing(e.g. interpolation and extrapolation) procedures to determine the local SAR values at the spatial resolution needed for mass averaging.

Power Drift
To control the output power stability during the SAR test, DASY5 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 2 to Table 6 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

5.6. SAR Limits

FCC Limit (1g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.

Occupational/Controlled Environments are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).

6. TEST RESULTS

6.1. Conducted Power Measurement Results

Conducted power measurement results

Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Power Level (dBm)
Analog/FM	12.5kHz	Low Channel	406.5	36.30
		Middle Channel	421.5	36.25
		Middle Channel	450.5	36.24
		High Channel	469.5	36.01
Digital/4FSK	12.5kHz	Low Channel	406.5	36.27
		Middle Channel	421.5	36.31
		Middle Channel	450.5	36.36
		High Channel	469.5	36.15

Bluetooth			
Mode	Channel	Frequency (MHz)	AV Conducted power (dBm)
GFSK-BLE	CH00	2402	-5.94
	CH19	2440	-4.45
	CH39	2480	-4.73
GFSK	CH00	2402	3.48
	CH39	2441	5.58
	CH78	2480	6.14
π/4QPSK	CH00	2402	3.25
	CH39	2441	5.42
	CH78	2480	6.00
8DPSK	CH00	2402	3.35
	CH39	2441	5.52
	CH78	2480	6.16

6.2. Test reduction procedure

Maximum power level

The maximum power level, $P_{max,m}$, that can be transmitted by a device before the SAR averaged over a mass, m, exceeds a given limit, SAR_{lim}, can be defined. Any device transmitting at power levels below $P_{max,m}$ can then be excluded from SAR testing. The lowest possible value for $P_{max,m}$ is: $P_{max,m} = SAR_{lim} * m$.

6.2.1. Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

Appendix A

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

Picture 12.2 Power Thresholds

Standalone SAR test exclusion considerations							
Communication system	Frequency (MHz)	Configuration	Maximum Average Power (dBm)	Separation Distance (mm)	Calculation Result	SAR Exclusion Thresholds	Standalone SAR Exclusion
BT	2450	Head	7.0	5	1.56	3.0	no
		Body	7.0	10	0.78	3.0	no

6.2.2. Estimated SAR

When standalone SAR is not required to be measured per FCC KDB 447498 D01,the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR}=\frac{(\text{max.power of channel,including tune-up tolerance,mW})}{(\text{min.test separation distance,mm})}*\frac{\sqrt{f(GHz)}}{7.5}$$

Per FCC KD B447498 D01,simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the transmitting antenna in a specific a physical test configuration is ≤1.6 W/Kg.When the sum is greater than the SAR limit,SAR test exclusion is determined by the SAR to peak location separation ratio.

$$\text{Ratio}=\frac{(SAR_1+SAR_2)^{1.5}}{(\text{peak location separation,mm})}<0.04$$

For Bluetooth,the Estimated SAR for Body at 5mm.

Estimated stand alone SAR					
Communication System	frequency (GHz)	distance (mm)	P_{av} (including tune tune-up tolerance (dBm)	P_{av} (including tune tune-up tolerance (mW)	estimated$_{1\text{-}g}$ (W/Kg)
Bluetooth 2450 body worn	2.45	5	7.00	5.01	0.21
Bluetooth 2450 Face Held	2.45	25	7.00	5.01	0.04

6.3. SAR Measurement Results

<table>
<tr><th>Test Frequency</th><th rowspan="2">Mode/Band</th><th rowspan="2">Test Configuration</th><th colspan="2">Average SAR over1g(W/kg) (Including power drift)</th><th rowspan="2">Scaling Factor</th><th colspan="2">Average SAR over1g(W/kg) (Including Power Drift and Scaling factor)</th><th rowspan="2">SAR limit 1g (W/kg)</th><th rowspan="2">Ref. Plot #</th></tr>
<tr><th>MHz</th><th>100% Duty Cycle</th><th>50% Duty Cycle</th><th>100% Duty Cycle</th><th>50% Duty Cycle</th></tr>
<tr><td colspan="10">The EUT display towards ground for 12.5 KHz (Digital, Face Held)</td></tr>
<tr><td>406.5</td><td rowspan="4">Digital 12.5KHz</td><td rowspan="4">Face Held</td><td>4.26</td><td>2.13</td><td>1.25</td><td>5.33</td><td>2.66</td><td>8.0</td><td>5</td></tr>
<tr><td>421.5</td><td>3.99</td><td>2.00</td><td>1.24</td><td>4.95</td><td>2.48</td><td>8.0</td><td>--</td></tr>
<tr><td>450.5</td><td>4.08</td><td>2.04</td><td>1.22</td><td>4.98</td><td>2.49</td><td>8.0</td><td>--</td></tr>
<tr><td>469.5</td><td>3.78</td><td>1.89</td><td>1.28</td><td>4.84</td><td>2.42</td><td>8.0</td><td>--</td></tr>
<tr><td colspan="10">The EUT display towards ground for 12.5 KHz with Belt(Digital, Body-Worn)</td></tr>
<tr><td>406.5</td><td rowspan="4">Digital 12.5KHz</td><td rowspan="4">Body-worn</td><td>4.35</td><td>2.18</td><td>1.25</td><td>5.44</td><td>2.73</td><td>8.0</td><td>1</td></tr>
<tr><td>421.5</td><td>3.85</td><td>1.93</td><td>1.24</td><td>4.77</td><td>2.39</td><td>8.0</td><td>2</td></tr>
<tr><td>450.5</td><td>4.83</td><td>2.42</td><td>1.22</td><td>5.89</td><td>2.95</td><td>8.0</td><td>3</td></tr>
<tr><td>469.5</td><td>4.03</td><td>2.02</td><td>1.28</td><td>5.16</td><td>2.59</td><td>8.0</td><td>4</td></tr>
<tr><td colspan="10">The EUT display towards ground for 12.5 KHz with Belt (Analog, Body-Worn)
(Worst case test position of Digital 12.5KHz)</td></tr>
<tr><td>450.5</td><td>Analog 12.5KHz</td><td>Body-worn</td><td>4.66</td><td>2.33</td><td>1.26</td><td>5.87</td><td>2.94</td><td>8.0</td><td>--</td></tr>
</table>

Note : 1. The product with Digital and Analog mode, we tested 2 modes and recorded worst case at Digital mode;
2.The value with bile color is the maximum SAR value of each test band;
3.The exposure category about EUT:controlled environment /Occupational,so the SAR limit is 8.0 W/kg averaged over any 1g of tissue.

6.3.1. Evaluation of Simultaneous SAR

<table>
<tr><th colspan="7">Simultaneous transmission SAR</th></tr>
<tr><th>Test Frequency</th><th>Test Position</th><th>Digital 12.5K Reported SAR_{1-g} (W/Kg)</th><th>BT Reported SAR_{1-g} (W/Kg)</th><th>MAX. ΣSAR_{1-g} (W/Kg)</th><th>Peak location separation ratio</th><th>Simut. Meas. Required</th></tr>
<tr><td>406.5</td><td>Face Held</td><td>2.66</td><td>0.04</td><td>2.70</td><td>no</td><td>no</td></tr>
<tr><td>421.5</td><td>Face Held</td><td>2.48</td><td>0.04</td><td>2.52</td><td>no</td><td>no</td></tr>
<tr><td>450.5</td><td>Face Held</td><td>2.49</td><td>0.04</td><td>2.53</td><td>no</td><td>no</td></tr>
<tr><td>469.5</td><td>Face Held</td><td>2.42</td><td>0.04</td><td>2.46</td><td>no</td><td>no</td></tr>
<tr><td>406.5</td><td>Body-worn</td><td>2.73</td><td>0.21</td><td>2.94</td><td>no</td><td>no</td></tr>
<tr><td>421.5</td><td>Body-worn</td><td>2.39</td><td>0.21</td><td>2.60</td><td>no</td><td>no</td></tr>
<tr><td>450.5</td><td>Body-worn</td><td>2.95</td><td>0.21</td><td>3.16</td><td>no</td><td>no</td></tr>
<tr><td>469.5</td><td>Body-worn</td><td>2.59</td><td>0.21</td><td>2.80</td><td>no</td><td>no</td></tr>
</table>

The maximum values of ∑SAR1-g is **3.16** W/Kg.

6.4. SAR Test Graph Results

Digital 12.5KHz,Body-Worn 406. 5 MHz

Communication System: DuiJiangJi; Frequency: 406. 5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 406. 5 MHz; σ = 0.96 mho/m; ε r = 56.02; ρ = 1000 kg/m
Phantom section: Flat Section

DASY5 Configuration:
Probe: EX3DV3 - SN3292; ConvF(7.10, 7.10, 7.10); Calibrated: 15/08/2014;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1315; Calibrated: 22/07/2014
Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)
Area Scan (51x101x1): Measurement grid: dx=15.00 mm, dy=15.00 mm
Maximum value of SAR (interpolated) = 4.01 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 67.457 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 4.88 mW/g

SAR(1 g) = 4.35 mW/g
SAR(10 g) = 3.02 mW/g

Maximum value of SAR (measured) = 4.88 W/kg

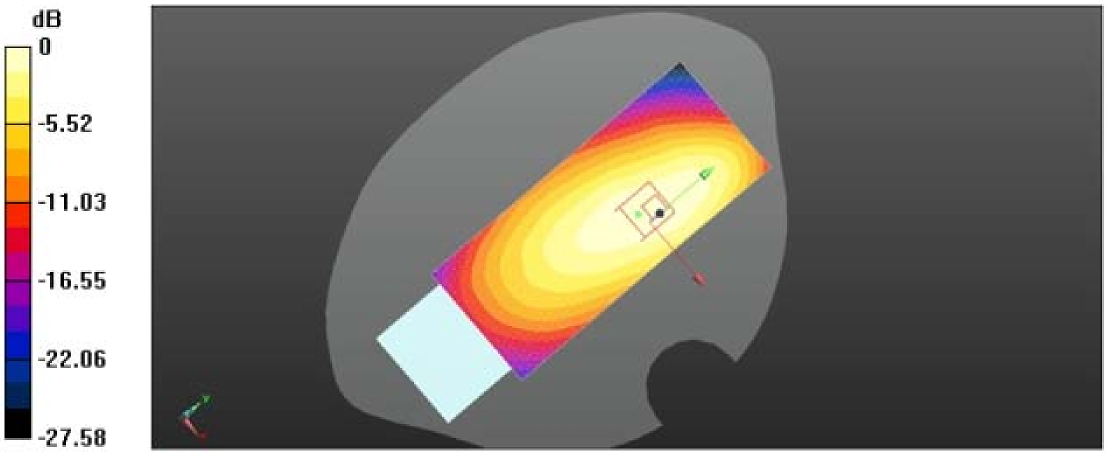


Figure 1: Digital 12.5KHz,Body-Worn 406.5 MHz

Digital 12.5KHz,Body-Worn 421.5 MHz

Communication System: DuiJiangJi; Frequency: 421.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 421.5 MHz; σ = 0.97 mho/m; ε r = 56.23; ρ = 1000 kg/m
Phantom section: Flat Section

DASY5 Configuration:
Probe: EX3DV3 - SN3292; ConvF(7.10, 7.10, 7.10); Calibrated: 15/08/2014;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1315; Calibrated: 22/07/2014
Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)
Area Scan (51x101x1): Measurement grid: dx=15.00 mm, dy=15.00 mm
Maximum value of SAR (interpolated) = 3.55 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.735 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 4.52 mW/g

SAR(1 g) = 3.85 mW/g
SAR(10 g) = 2.37 mW/g

Maximum value of SAR (measured) = 4.52 W/kg

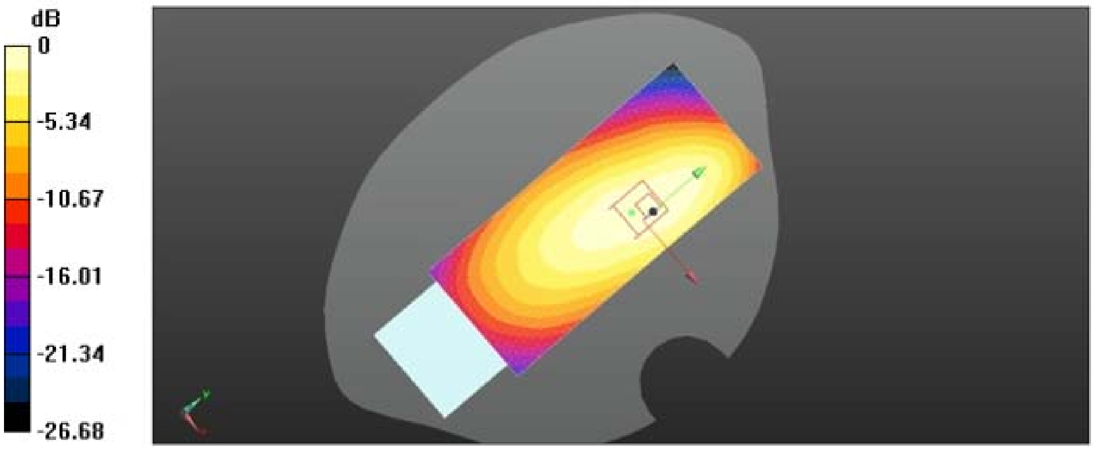


Figure 2: Digital 12.5KHz,Body-Worn 421.5 MHz

Digital 12.5KHz,Body-Worn 450.5 MHz

Communication System: DuiJiangJi; Frequency: 450.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 450.5 MHz; σ = 0.94 mho/m; ε r = 56.23; ρ = 1000 kg/m
Phantom section: Flat Section

DASY5 Configuration:
Probe: EX3DV3 - SN3292; ConvF(7.10, 7.10, 7.10); Calibrated: 15/08/2014;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1315; Calibrated: 22/07/2014
Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)
Area Scan (51x101x1): Measurement grid: dx=15.00 mm, dy=15.00 mm
Maximum value of SAR (interpolated) = 4.37 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.763 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 5.16 mW/g

SAR(1 g) = 4.83 mW/g
SAR(10 g) = 2.52 mW/g

Maximum value of SAR (measured) = 5.16 W/kg

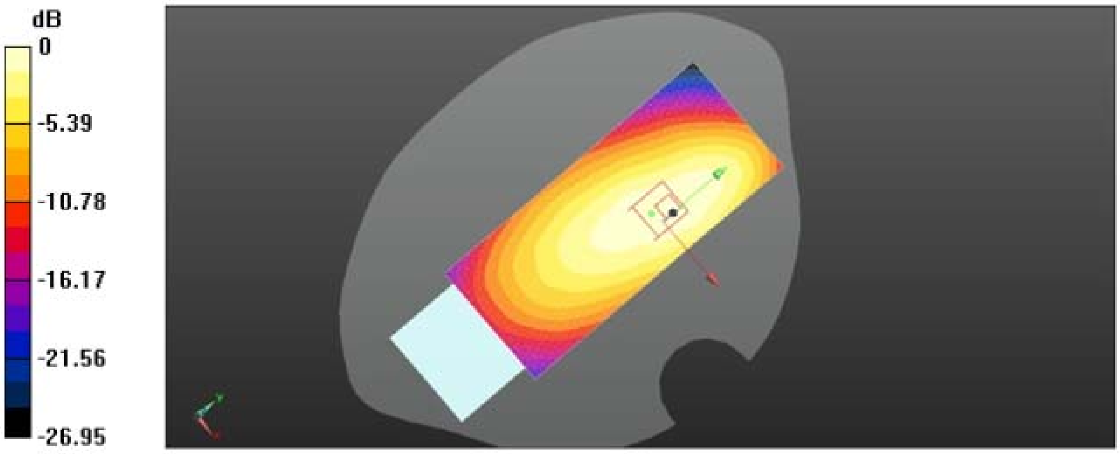


Figure 3: Digital 12.5KHz,Body-Worn 450.5 MHz

Digital 12.5KHz,Body-Worn 469.0 MHz

Communication System: DuiJiangJi; Frequency: 469.0 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 469.0 MHz; σ = 0.97 mho/m; ε r = 56.54; ρ = 1000 kg/m
Phantom section: Flat Section

DASY5 Configuration:
Probe: EX3DV3 - SN3292; ConvF(7.10, 7.10, 7.10); Calibrated: 15/08/2014;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1315; Calibrated: 22/07/2014
Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)
Area Scan (51x101x1): Measurement grid: dx=15.00 mm, dy=15.00 mm
Maximum value of SAR (interpolated) = 3.92 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.632 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 4.25 mW/g

SAR(1 g) = 4.03 mW/g
SAR(10 g) = 2.66 mW/g

Maximum value of SAR (measured) = 4.25 W/kg

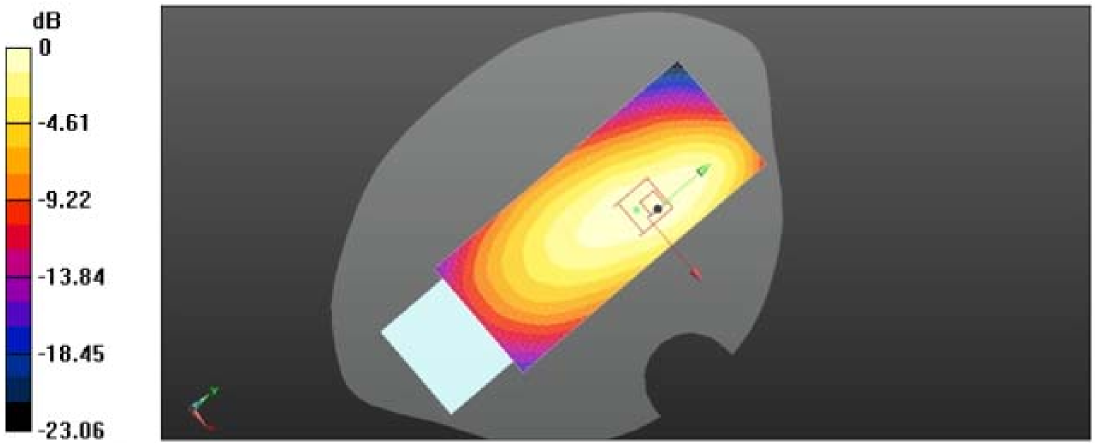


Figure 4: Digital 12.5KHz,Body-Worn 469.0 MHz

Digital 12.5KHz,Face Held 406. 5 MHz

Communication System: DuiJiangJi; Frequency: 406. 5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 406. 5 MHz; σ = 0.88 mho/m; ε r = 43.15; ρ = 1000 kg/m
Phantom section: Flat Section

DASY5 Configuration:
Probe: ES3DV3 - SN3292; ConvF(6.71, 6.71, 6.71); Calibrated: 15/08/2014;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1315; Calibrated: 22/07/2014
Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)
Area Scan (51x101x1): Measurement grid: dx=15.00 mm, dy=15.00 mm
Maximum value of SAR (interpolated) = 4.55 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 65.237 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 4.31 mW/g

SAR(1 g) = 4.26 mW/g
SAR(10 g) = 2.78 mW/g

Maximum value of SAR (measured) = 4.57 W/kg

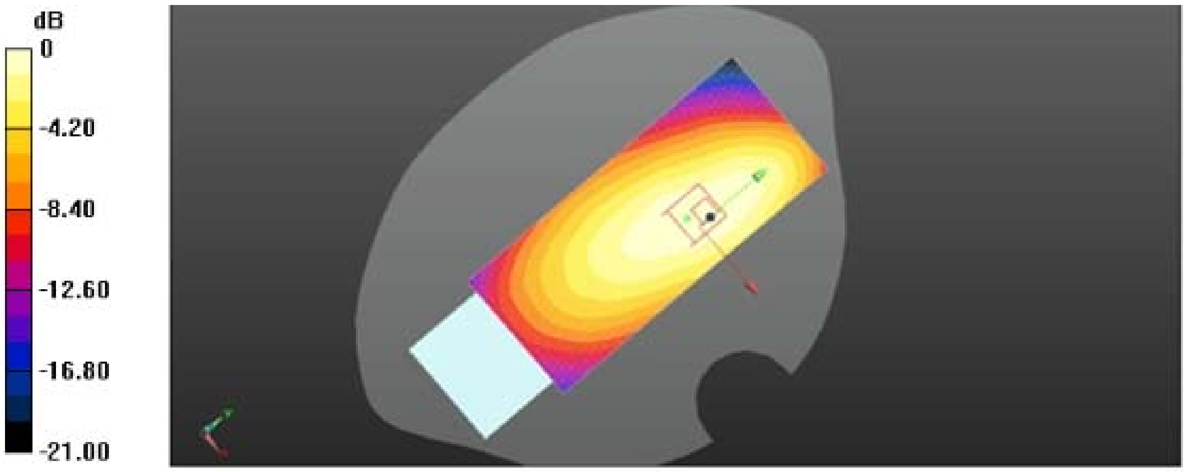


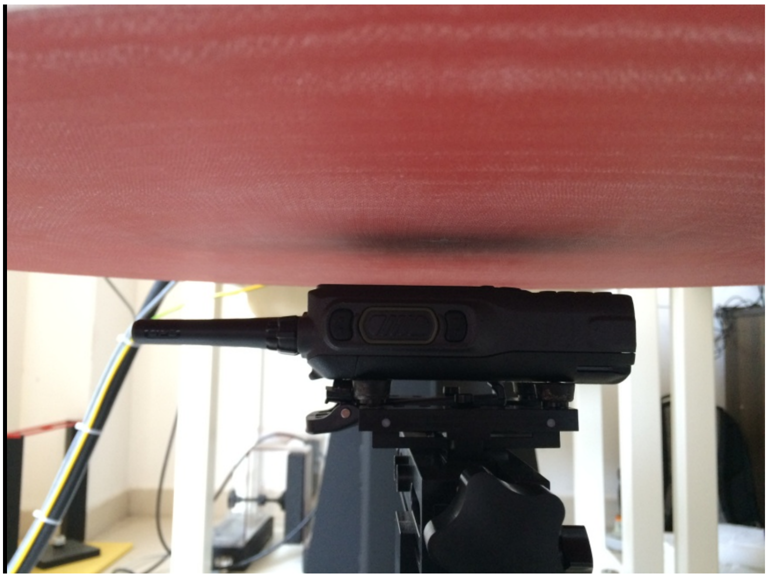
Figure 5: Digital 12.5KHz,Body-Worn 406.5 MHz

7. Measurement Uncertainty

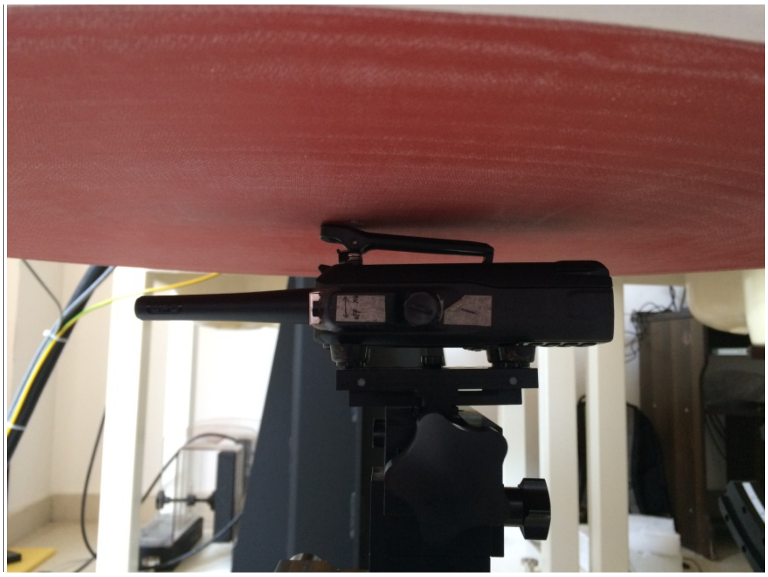
Uncertainty Component	Unc. vaule ±%	Prob Dist.	Div.	C_i 1g	C_i 10g	Std.Unc. ±%.1g	Std.Unc. ±%.10g	V_i
Measurement System								
Probe Calibration	5.9	N	1	1	1	5.9	5.9	∞
Axial Isotropy	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	9.6	R	$\sqrt{3}$	0.7	0.7	3.9	3.9	∞
Boundary Effect	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Linearity	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
System Detection Limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Readout Electronics	0.3	N	1	1	1	0.3	0.3	∞
Response Time	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
Integration Time	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
RF Ambient Conditions - Noise	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test Sample Related								
Test Sample Positioning	2.1	N	1	1	1	2.1	2.1	150
Device Holder Uncertainty	3.6	N	1	1	1	3.6	3.6	5
Output Power Variation - SAR drift measurement	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and Tissue Parameters								
Phantom Uncertainty (shape and thickness tolerances)	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
Conductivity Target - tolerance	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
Conductivity - measurement uncertainty	2.5	N	1	0.64	0.43	1.6	1.1	∞
Permittivity Target - tolerance	5.0	R	$\sqrt{3}$	0.60	0.49	1.7	1.4	∞
Permittivity - measurement uncertainty	1.9	N	1	0.60	0.49	1.5	1.2	5
Combined Standard Uncertainty		R				±11.2%	±10.8%	387
Coverage Factor for 95%			2					
Expanded STD Uncertainty						+22.4%	±21.6%	

8. Test Setup Photos

450MHz Liquid of Body



25mm Face-held,The EUT display towards phantom



0mm Body-worn, The EUT display towards ground,belt clip attach the phantom