SAR TEST REPORT

Test Report No. : 30GE0321-HO-03-A

Applicant	:	**Nagano Japan Radio Co., Ltd.**
Type of Equipment	:	**Wireless LAN Module**
Model No.	:	**NJT-517**
FCC ID	:	**D7LNJT517**
Test regulation	:	**FCC47CFR 2.1093** **FCC OET BULLETIN 65, SUPPLEMENT C** **(Worst condition test only for Class II change)**
Test Result	:	**Complied**

Max. SAR Value
IEEE802.11b/g (2412-2462MHz) : **0.645W/kg (Body, 2462MHz)**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test: March 5, 2010

Tested by: H. Sato
Hisayoshi Sato
EMC Services

Approved by : M. Fujimura
Mitsuru Fujimura
Site Manager of EMC Services

NVLAP®
NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://uljapan.co.jp/emc/nvlap.htm

CONTENTS PAGE

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

SECTION 1: Customer information

Company Name	:	Nagano Japan Radio Co., Ltd.
Address	:	1163 Inasato-machi, Nagano-city 381-2288 Japan
Telephone Number	:	+81-26-285-1323
Facsimile Number	:	+81-26-285-1037
Contact Person	:	Takaaki Fukaya

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless LAN Module
Model No.	:	NJT-517
Serial No.	:	0013E09DDE77KYY6TTLBWA-EP
Rating	:	DC3.3V
Country of Manufacture	:	Japan
Receipt Date of Sample	:	March 4, 2010
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No modification by the test lab.

2.2 Product Description

Model No: NJT-517, referred as the EUT in this report, is the Wireless LAN Module.
It is integrated into a Barcode Handy Terminal.
Clock Frequency : 38.4MHz

Equipment Type		Transceiver
Frequency band	Lower limit	2400MHz
	Upper limit	2483.5MHz
Frequency of Operation		2412-2462MHz
Bandwidth & Channel spacing		20MHz & 5MHz
Type of Modulation		DSSS (DBPSK, DQPSK, CCK) OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type		Inverted F, 1/4 λ
Antenna Connector Type		W. FL Plug
Antenna Gain		3.93dBi max
ITU code		G1D / D1D
Power Supply		DC 3.3V

SECTION 3 : Test standard information

3.1 Requirements for compliance testing defined by the FCC

The US Federal Communications Commission has released the report and order “Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992. According to the Supplement C of OET Bulletin 65 “Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at
maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

1 Specific Absorption Rate (SAR) is a measure of the rate of energy absorption due to exposure to an RF transmitting source (wireless portable device).
2 IEEE/ANSI Std. C95.1-1992 limits are used to determine compliance with FCC ET Docket 93-62.

3.2 SAR Test online

FCC ID:D7LNJT517 granted on 11/13/07 is limited module for Barcode Handy Terminal.
In order to add a new limited Barcode Handy Terminal to an original filing, according to the KDB 178919 (v04r04) item 5) b) iii) (3).
In addition, according to the KDB447498 2) a) iii),it is possible to add in the same platform as the original host device since the new host device has the same operating configurations and exposure conditions with only minor configuration and construction differences.
The changing factor for which the Class2 Permissive Change Application is required is shown at APPENDIX 1.

3.3 Procedure and result

No.	Item	Test Procedure	Limit	Remarks	Exclusion	Result
1	Human Exposure	FCC OET BULLETIN 65, SUPPLEMENT C	FCC47CFR 2.1093	SAR Measurement	N/A	Complied Max.SAR = 0.645W/kg
Note: UL Japan, Inc. 's SAR Work Procedures QPM46 and QPM47						

Result of Max. SAR value
Max. SAR Value:
IEEE802.11b/g(2412-2462MHz) : 0.645W/kg (Body, 2462MHz)

3.4 Exposure limit

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

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.4	8.0	20.0

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

Spatial Average (averaged over the whole body	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.08	1.6	4.0

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).

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

NOTE:GENERAL POPULATION/UNCONTROLLED EXPOSURE
SPATIAL PEAK(averaged over any 1g of tissue) LIMIT
1.6 W/kg

3.5 Test Location

*Shielded room for SAR testings
UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

3.6 Confirmation before SAR testing

3.6.1 Correlation of Output Power between EMC and SAR tests

It was checked that the antenna port power was correlated within 0~+5% (FCC requirements)
The result is shown in Section 6.1.

- **Output power at EMC test**
  EMC power was measured during EMC testing. (S/N: 0013E09DDE77)
  -11b/g mode was measured the output power in the FCC 15.247.

- **Output power at SAR test**
  SAR power was measured before SAR testing. (S/N: 0013E09DDE77KYY6TTLBWA-EP)
  -Worst mode in EMC test was measured the output power.

3.6.2 Power check for SAR testing

- **Data rate check**
  The data rate check was measurement all data rate in the middle frequency.

Reference of modulation table

11b		**11g**	
Modulation	**Data rate [Mbps]**	**Modulation**	**Data rate [Mbps]**
DBPSK	1	BPSK	6
DQPSK	2	BPSK	9
CCK	5.5	QPSK	12
CCK	11	QPSK	18
-	-	16QAM	24
-	-	16QAM	36
-	-	64QAM	48
-	-	64QAM	54

3.7 Confirmation after SAR testing

It was checked that the power drift [W] is within ±5%.The verification of power drift during the SAR test is that DASY4 system calculates the power drift by measureing the e-filed at the same location at beginning and the end of the scan measurement for each test position.

DASY4 system calucation Power drift value[dB] =20log(Ea)/(Eb)
Before SAR testing : Eb[V/m]
After SAR testing : Ea[V/m]

Limit of power drift[W] =+/-5%
X[dB]=10log[P]=10log(1.05/1)=10log(1.05)-10log(1)=0.212dB

from E-filed relations with power.
S=E*H=E^2/ η =P/4 π r^2 (η : Space impedance)
P=E^2*4 π r^2/η
Therefore, The correlation of power and the E-filed
XdB=10log(P)=10log(E)^2=20log(E)

From the above mentioned,
The calculated power drift of DASY4 System must be the less than +/-0.212dB.

3.8 Measurement procedure

This test was performed at based on SAR results of the original approval since this SAR test was evaluation for change approval. The tested positions were performed at the Top and the Rear positions within 2dB of the worst position.
The tested mode (data rate) was performed at the worst condition of original approval.

1. IEEE 802.11b
The 11b (DSSS) mode test was performed on the CCK[11Mbps] modulation, because it was the maximum average power and the worst rate of SAR of original approval.

Step1. The searching for the worst position

Step2. Change to the Low and High channels
This test was performed at the worst conditions of Step2.

2. IEEE 802.11g
The 11g (OFDM) mode test was performed on the QPSK[18Mbps] modulation and the 16QAM[24Mbps] modulation, because it was the maximum average power and the worst rate of SAR of original approval..

Step3. The searching for the worst modulation
This test was performed at the worst position of Step 1

Step4. Change to the Low and High channels
This test was performed at the worst conditions of Step3.

3.9 Test setup of EUT

When users operate or carry the EUT, it could be considered to touch or get close to their bodies. In order to assume this situation, we performed the test at the following positions. Please refer to "APPENDIX 1" for more details.

(1) Top:
The test was performed in touch with Top surface of the transmitter to the flat phantom.

(2) Rear:
The test was performed in touch with Rear surface of the transmitter to the flat phantom.

SECTION 4 : Operation of E.U.T. during testing

4.1 Operating modes for SAR testing

4.1.1 Setting of EUT

This EUT has IEEE.802.11b/g continuous transmitting modes.
The frequency band and the modulation used in the testing of IEEE.802.11b/g are shown as a following.

1. IEEE 802.11b mode

Tx frequency band : 2412-2462MHz
Channel : 1ch(2412MHz),6ch(2437MHz),11ch(2462MHz)
Modulation : DSSS(CCK)
Crest factor : 1

2. IEEE 802.11g mode

Tx frequency band : 2412-2462MHz
Channel : 6ch(2437MHz)
Modulation : OFDM(QPSK, 16QAM)
Crest factor : 1

SECTION 5 : Test surrounding

5.1 Measurement uncertainty

The uncertainty budget has been determined for the DASY4 measurement system according to the SPEAG documents[6][7] and is given in the following Table.

Error Description	Uncertainty value ± %	Probability distribution	divisor	(ci) 1g	Standard Uncertainty (1g)	vi or veff
Measurement System						
Probe calibration	±6.8	Normal	1	1	±6.8	∞
Axial isotropy of the probe	±4.7	Rectangular	√3	$(1\text{-cp})^{1/2}$	±1.9	∞
Spherical isotropy of the probe	±9.6	Rectangular	√3	$(cp)^{1/2}$	±3.9	∞
Boundary effects	±2.0	Rectangular	√3	1	±1.2	∞
Probe linearity	±4.7	Rectangular	√3	1	±2.7	∞
Detection limit	±1.0	Rectangular	√3	1	±0.6	∞
Readout electronics	±0.3	Normal	1	1	±0.3	∞
Response time	±0.8	Rectangular	√3	1	±0.5	∞
Integration time	±2.6	Rectangular	√3	1	±1.5	∞
RF ambient Noise	±3.0	Rectangular	√3	1	±1.7	∞
RF ambient Reflections	±3.0	Rectangular	√3	1	±1.7	∞
Probe Positioner	±0.8	Rectangular	√3	1	±0.5	∞
Probe positioning	±9.9	Rectangular	√3	1	±5.7	∞
Max.SAR Eval.	±4.0	Rectangular	√3	1	±2.3	∞
Test Sample Related						
Device positioning	±2.9	Normal	1	1	±2.9	7
Device holder uncertainty	±3.6	Normal	1	1	±3.6	1
Power drift	±5.0	Rectangular	√3	1	±5.8	∞
Phantom and Setup						
Phantom uncertainty	±4.0	Rectangular	√3	1	±2.3	∞
Liquid conductivity (target)	±5.0	Rectangular	√3	0.64	±1.8	∞
Liquid conductivity (meas.)	±5.0	Rectangular	1	0.64	±3.2	∞
Liquid permittivity (target)	±5.0	Rectangular	√3	0.6	±1.7	∞
Liquid permittivity (meas.)	±5.0	Rectangular	1	0.6	±3.0	∞
Combined Standard Uncertainty					**±14.360**	
Expanded Uncertainty (k=2)					**±28.7**	

SECTION 6 : Confirmation before testing

6.1 Correlation of Output Power between EMC and SAR tests

6.1.1 EMC power

This data is reference data of EMC test(Report No. 27JE0154-HO-A-R1).
Date of test: August 21, 2007

IEEE802.11b 11Mbps, Maximum output power of EMC test

Ch	Frequency	P/M Reading [dBm]		Cable Loss	Atten.	Result [dBm]		Result [mW]	
	[MHz]	PK	AVG	[dB]	[dB]	PK	AVG	PK	AVG
1	2412	7.55	4.92	1.18	10.02	18.75	16.12	74.99	40.93
6	2437	8.40	5.74	1.18	10.02	19.60	16.94	91.20	49.43
11	2462	8.70	6.07	1.18	10.02	19.90	17.27	97.72	53.33

IEEE802.11g 18Mbps, Maximum output power of EMC test

Ch	Frequency	P/M Reading [dBm]		Cable Loss	Atten.	Result [dBm]		Result [mW]	
	[MHz]	PK	AVG	[dB]	[dB]	PK	AVG	PK	AVG
1	2412	11.55	4.34	1.18	10.02	22.75	15.54	188.36	35.81
6	2437	12.47	5.30	1.18	10.02	23.67	16.50	232.81	44.67
11	2462	12.57	5.74	1.18	10.02	23.77	16.94	238.23	49.43

6.1.2 SAR power

Date of test: March 5, 2010

IEEE802.11g 18Mbps, Maximum output power of SAR test

Ch	Frequency	P/M Reading [dBm]		Cable Loss	Atten.	Result [dBm]		Result [mW]	
	[MHz]	PK	AVG	[dB]	[dB]	PK	AVG	PK	AVG
11	2462	13.41	6.61	0.28	10.09	23.78	16.98	238.78	49.89

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

6.2 Average power for SAR testing

[IEEE802.11b] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading AVG	Cable Loss [dB]	Atten. [dB]	Result [dBm] AVG	Result [mW] AVG
1.0	2437	4.78	0.31	10.09	15.18	32.96
2.0	2437	5.07	0.31	10.09	15.47	35.24
5.5	2437	5.28	0.31	10.09	15.68	36.98
11.0	2437	5.56	0.31	10.09	15.96	39.45

IEEE802.11b 11Mbps

Ch	Frequency [MHz]	P/M Reading AVG	Cable Loss [dB]	Atten. [dB]	Result [dBm] AVG	Result [mW] AVG
1	2412	4.52	0.29	10.09	14.90	30.90
11	2462	6.93	0.28	10.09	17.30	53.70

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

[IEEE802.11g] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading AVG	Cable Loss [dB]	Atten. [dB]	Result [dBm] AVG	Result [mW] AVG
6.0	2437	4.54	0.31	10.09	14.94	31.19
9.0	2437	4.51	0.31	10.09	14.91	30.97
12.0	2437	4.54	0.31	10.09	14.94	31.19
18.0	2437	5.23	0.31	10.09	15.63	36.56
24.0	2437	5.16	0.31	10.09	15.56	35.97
36.0	2437	5.12	0.31	10.09	15.52	35.65
48.0	2437	4.58	0.31	10.09	14.98	31.48
54.0	2437	4.60	0.31	10.09	15.00	31.62

IEEE802.11g 18Mbps

Ch	Frequency [MHz]	P/M Reading AVG	Cable Loss [dB]	Atten. [dB]	Result [dBm] AVG	Result [mW] AVG
1	2412	4.06	0.29	10.09	14.44	27.80
11	2462	6.61	0.28	10.09	16.98	49.89

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

SECTION 7 : Measurement results

7.1 Body SAR 2450MHz

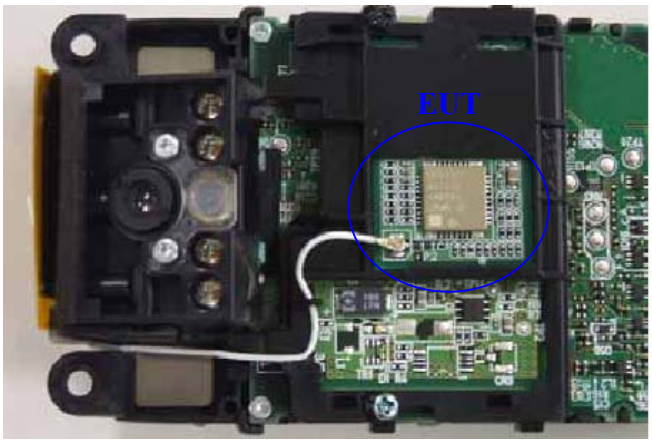
7.1.1 IEEE 802.11b/g

Model : **NJT-517**
Serial No. : **0013E09DDE77KYY6TTLBWA-EP**
Modulation : **DSSS, OFDM**
Measured By : **Hisayoshi Sato**
Date : **March 5, 2010**
Liquid Depth (cm) : **15.0**
Parameters : **εr =50.7, σ =1.95**
Ambient temperature(deg.c.) : **24.5**
Relative Humidity (%) : **38**

BODY SAR MEASUREMENT RESULTS									
Frequency			Modulation	Phantom Section	EUT Set-up Conditions		Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Mode	Channel	[MHz]			Position	Separation [mm]	Before	After	Maximum value of multi-peak
11b mode	**Step 1. The searching for the worst position**								
	6	2437	CCK(11Mbps)	Flat	Top	0	23.9	23.9	**0.280**
	6	2437	CCK(11Mbps)	Flat	Rear	0	23.9	23.9	**0.244**
	Step 2. The test for the Low and High channels								
	1	2412	CCK(11Mbps)	Flat	Top	0	23.9	23.9	**0.238**
	11	2462	CCK(11Mbps)	Flat	Top	0	23.9	23.9	**0.617**
11g mode	**Step 3. The searching for the worst modulation**								
	6	2437	QPSK(18Mbps)	Flat	Top	0	23.9	23.9	**0.257**
	6	2437	16QAM(24Mbps	Flat	Top	0	23.9	23.9	**0.249**
	Step 4. The test for the Low and High channels								
	1	2412	QPSK(18Mbps)	Flat	Top	0	23.9	23.9	**0.228**
	11	2462	QPSK(18Mbps)	Flat	Top	0	23.9	23.9	**0.645**

APPENDIX 1 : Photographs of test setup

1. Photograph of EUT



2. Information of host device

The EUT was manufactured by Nagano Japan Radio Co., Ltd. and will be installed into only BHT-604QW(Handy terminal) which is manufactured by DENSO WAVE INCORPORATED.

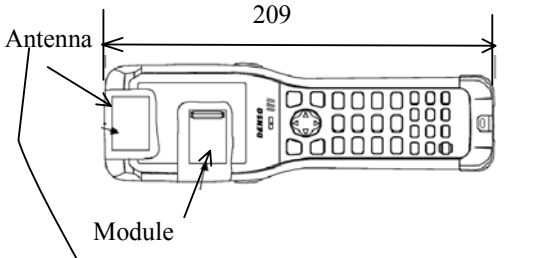
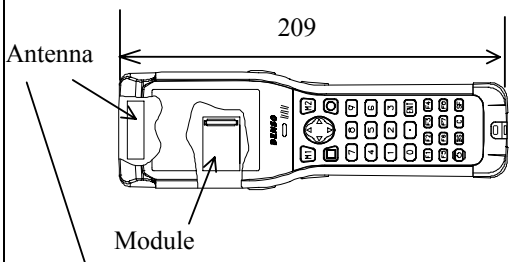
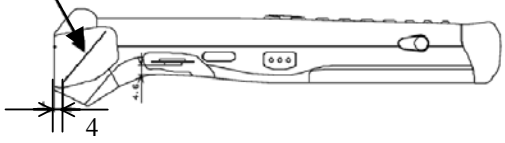
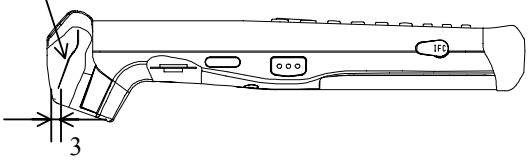
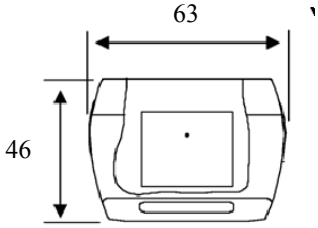
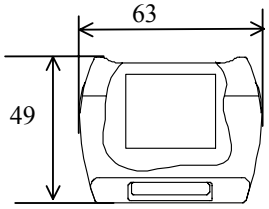
Type of Equipment		Handy terminal
Model No.		BHT604QW
Serial No.		54963103837001566
Manufacture		DENSO WAVE INCORPORATED
Battery	Type :	Li-ion Battery
	Model Name :	BT-20L
	Rating :	DC 3.7V / 1700mAh
	Manufacturer	DENSO WAVE INCORPORATED
	Option Battery	N/A
Accessories		N/A
Size of EUT		63(W)×209(H)×49(D)mm
Condition of EUT		Production model
The shortest distance between surface of host device and antenna		3.0mm
Category Identified		Portable device
Position of Antenna		Please refer to next page.

The changing factor for which the Class2 Permissive Change Application is required is shown below. (Table 1)

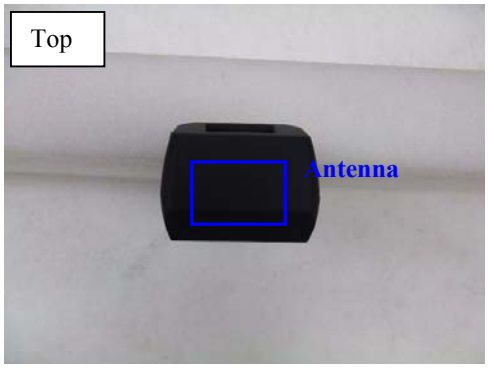
<Table1: Changing factor >

Changing factor		Original	Permissive Change
Host device configuration (Refer to the table2)	Host device Type	Barcode Handy terminal	No change
	Model No.	BHT600BW or BHT604BW	BHT604QW
	Barcode read:	one-dimensional model	two-dimensional model
	Size	63(W)*209(H)*46(D) mm	63(W)×209(H)×49(D)mm
Antenna (Refer to the table2)	Type	Inverted F, ¼ λ	No change
	Gain	3.93dBi	No change
	Shortest distance	4.0mm	3.0mm
Max. SAR result	1g SAR	0.858W/kg	0.645W/kg

<Table2:Antenna location>

Original	Permissive Change
	
 Shortest distance: 4.0mm	 Shortest distance: 3.0mm
	

3. Photograph of host devise



4. Photograph of test setup

(1) Top

(2) Rear

APPENDIX 2 : SAR Measurement data

1. Evaluation procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the E-field at a fixed location above the ear point or central position of flat phantom was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of head or body position was measured at a distance of each device from the inner surface of the shell. The area covered the entire dimension of the antenna of EUT and the horizontal grid spacing was 15 mm x 15 mm . Based on these data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Around this point found in the Step 2 (area scan), a volume of 30mm x 30mm x 30mm was assessed by measuring 7 x 7 x 7 points for IEEE802.11b/g(2.4G) and for any secondary peaks found in the Step2 which are within 2dB of maximum peak (level more than ambient noise ($\geq$0.012 W/kg)) and not with this Step3 (Zoom scan) is repeated. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

(1). The data at the surface were extrapolated, since the center of the dipoles is 1mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. Therefore minimum distance of probe sensor from surface was set to the 2mm.
The extrapolation was based on a least square algorithm [4]. A polynomial of the fourth order was calculated through the points in z-axes.
This polynomial was then used to evaluate the points between the surface and the probe tip.

(2). The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the “Not a knot"-condition (in x, y and z-directions) [4], [5]. The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

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

Step 4: Re-measurement of the E-field at the same location as in Step 1.

2. Measurement data

NJT-517/ Top / CCK(11Mbps) / 2437MHz

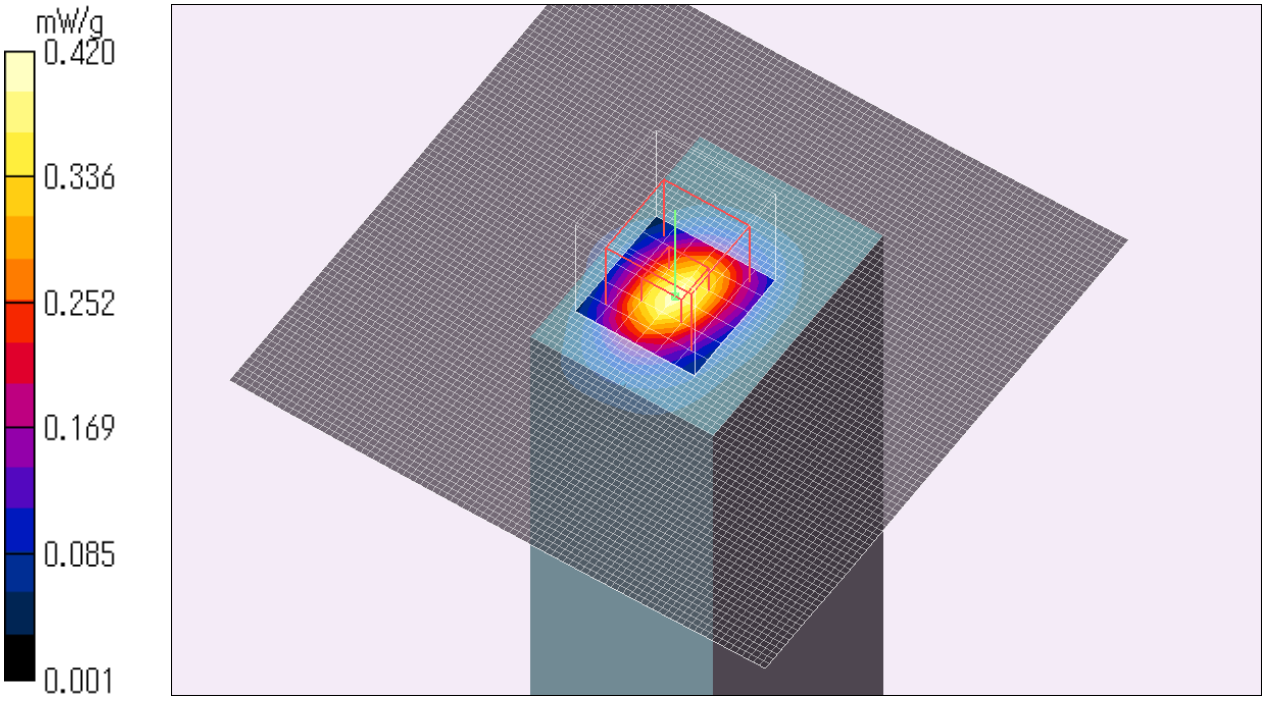
Crest factor: 1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV3 - SN3507; ConvF(8.11, 8.11, 8.11); Calibrated: 2010/02/19
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Area Scan (91x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.429 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = 0.081 dB
Peak SAR (extrapolated) = 0.548 W/kg

SAR(1 g) = 0.280 mW/g; SAR(10 g) = 0.132 mW/g
Maximum value of SAR (measured) = 0.420 mW/g

Test Date = 03/05/10
Ambient Temperature = 24.5 degree.C
Liquid Temperature = Before 23.9 degree.C , After 23.9 degree.C



NJT-517/ Rear / CCK(11Mbps) / 2437MHz

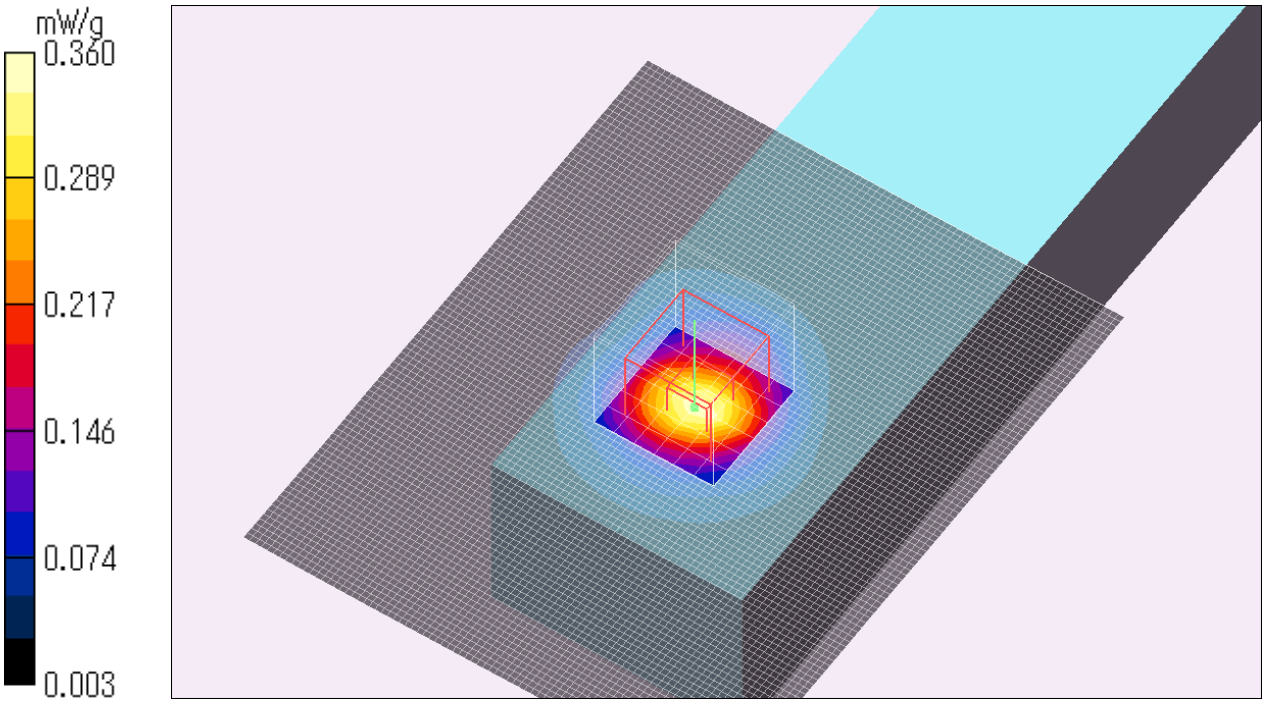
Crest factor: 1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV3 - SN3507; ConvF(8.11, 8.11, 8.11); Calibrated: 2010/02/19
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.328 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = -0.075 dB
Peak SAR (extrapolated) = 0.478 W/kg

SAR(1 g) = 0.244 mW/g; SAR(10 g) = 0.121 mW/g
Maximum value of SAR (measured) = 0.360 mW/g

Test Date = 03/05/10
Ambient Temperature = 24.5 degree.C
Liquid Temperature = Before 23.9 degree.C , After 23.9 degree.C



UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

NJT-517/ Top / CCK(11Mbps) / 2412MHz

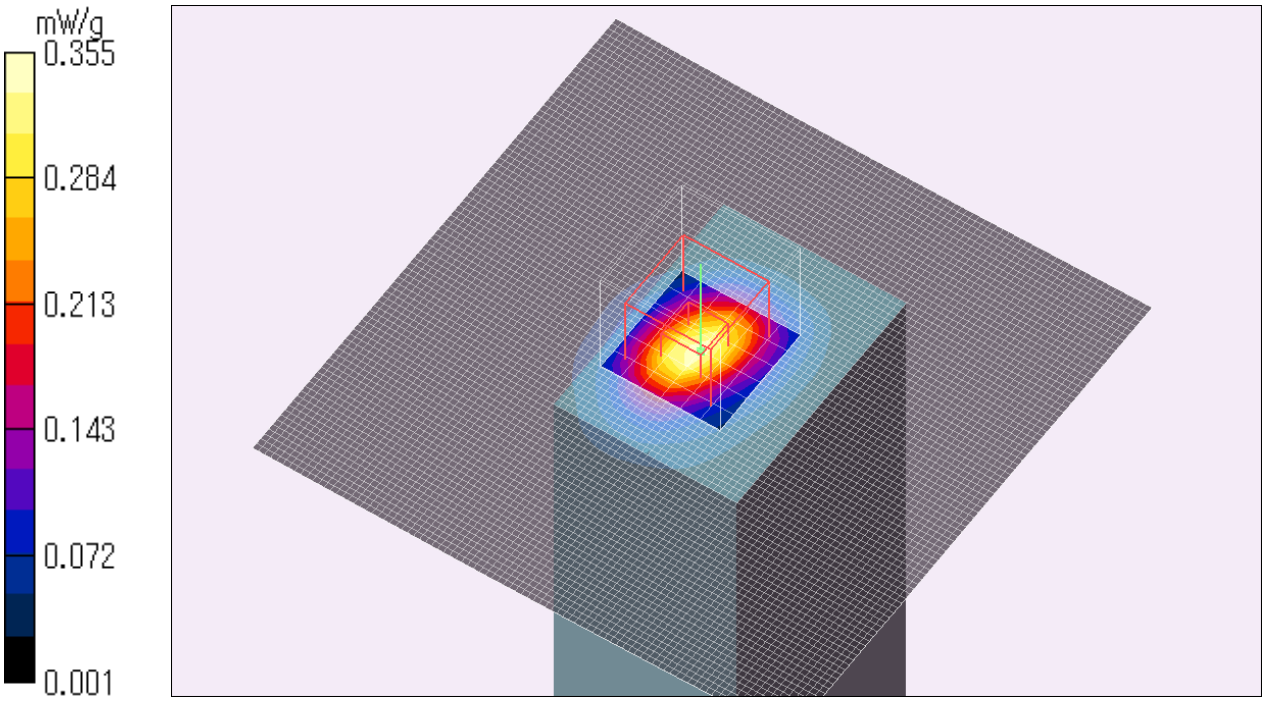
Crest factor: 1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV3 - SN3507; ConvF(8.11, 8.11, 8.11); Calibrated: 2010/02/19
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Area Scan (91x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.376 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.2 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 0.473 W/kg

SAR(1 g) = 0.238 mW/g; SAR(10 g) = 0.111 mW/g
Maximum value of SAR (measured) = 0.355 mW/g

Test Date = 03/05/10
Ambient Temperature = 24.5 degree.C
Liquid Temperature = Before 23.9 degree.C , After 23.9 degree.C



NJT-517/ Top / CCK(11Mbps) / 2462MHz

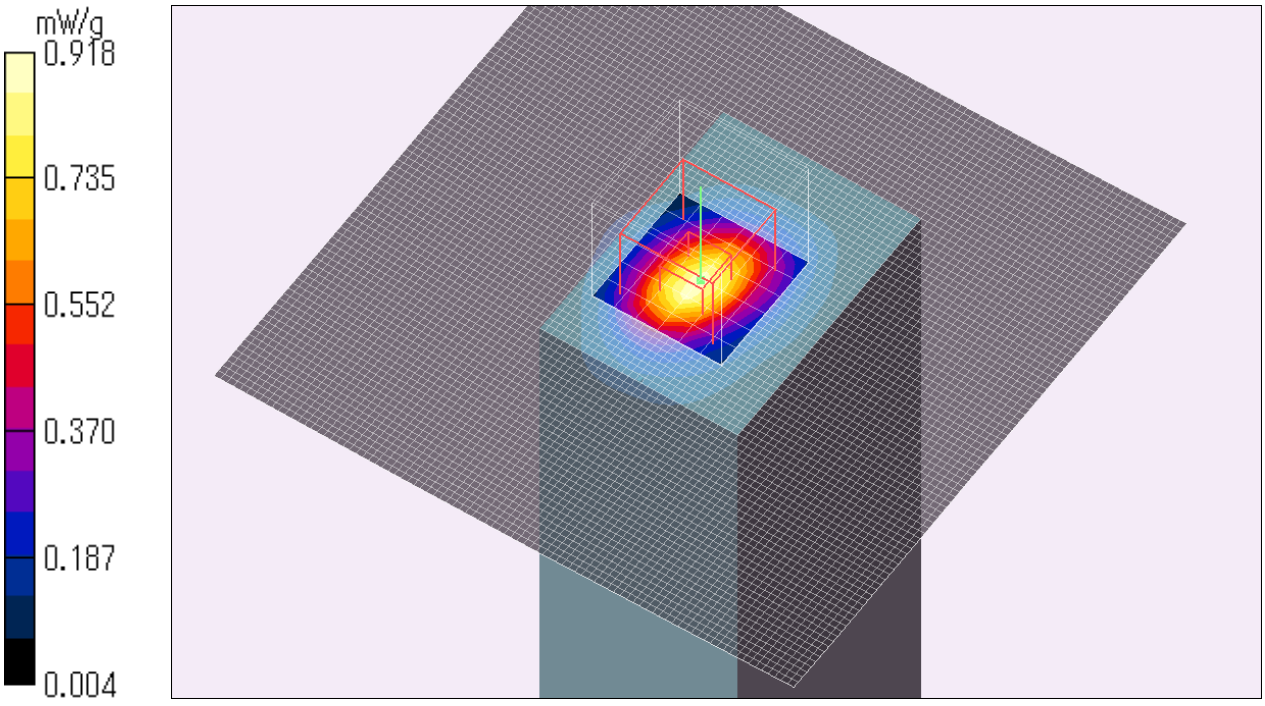
Crest factor: 1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV3 - SN3507; ConvF(8.11, 8.11, 8.11); Calibrated: 2010/02/19
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Area Scan (91x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.944 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.2 V/m; Power Drift = -0.135 dB
Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.617 mW/g; SAR(10 g) = 0.280 mW/g
Maximum value of SAR (measured) = 0.918 mW/g

Test Date = 03/05/10
Ambient Temperature = 24.5 degree.C
Liquid Temperature = Before 23.9 degree.C , After 23.9 degree.C



NJT-517/ Top / QPSK(18Mbps) / 2437MHz

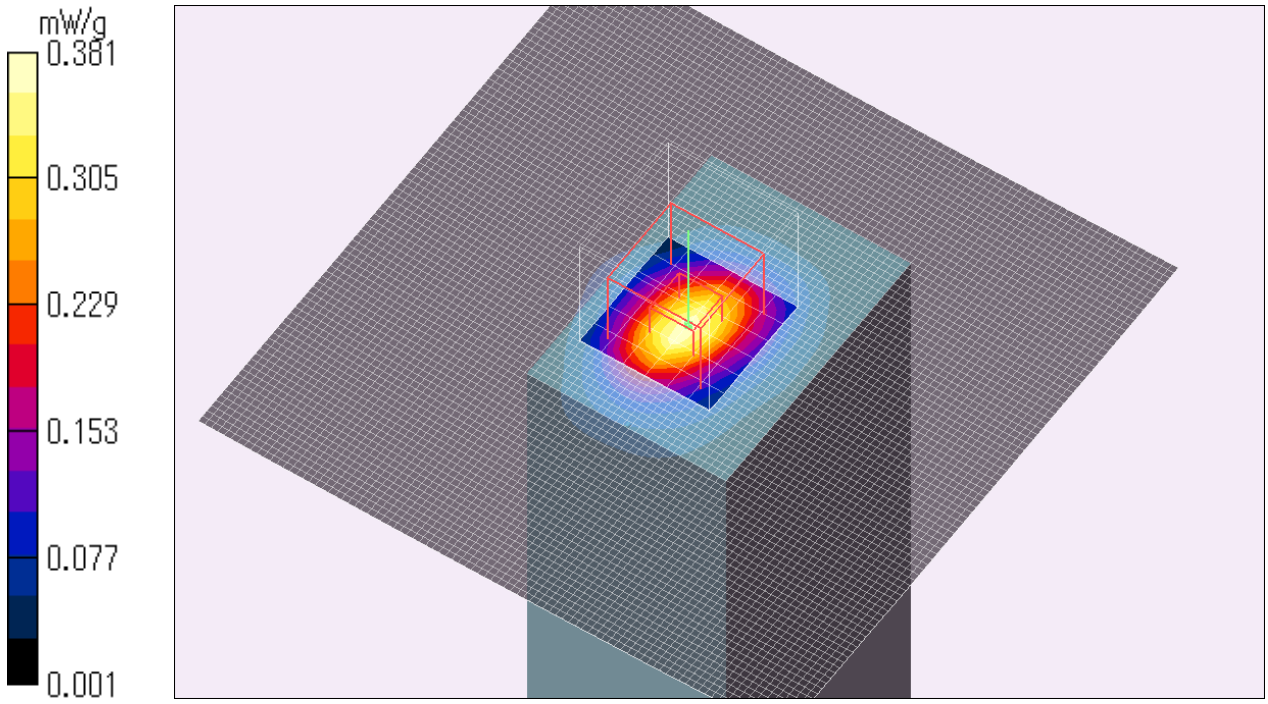
Crest factor: 1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV3 - SN3507; ConvF(8.11, 8.11, 8.11); Calibrated: 2010/02/19
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Area Scan (91x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.405 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = -0.115 dB
Peak SAR (extrapolated) = 0.507 W/kg

SAR(1 g) = 0.257 mW/g; SAR(10 g) = 0.119 mW/g
Maximum value of SAR (measured) = 0.381 mW/g

Test Date = 03/05/10
Ambient Temperature = 24.5 degree.C
Liquid Temperature = Before 23.9 degree.C , After 23.9 degree.C



NJT-517/ Top / 16QAM(24Mbps) / 2437MHz

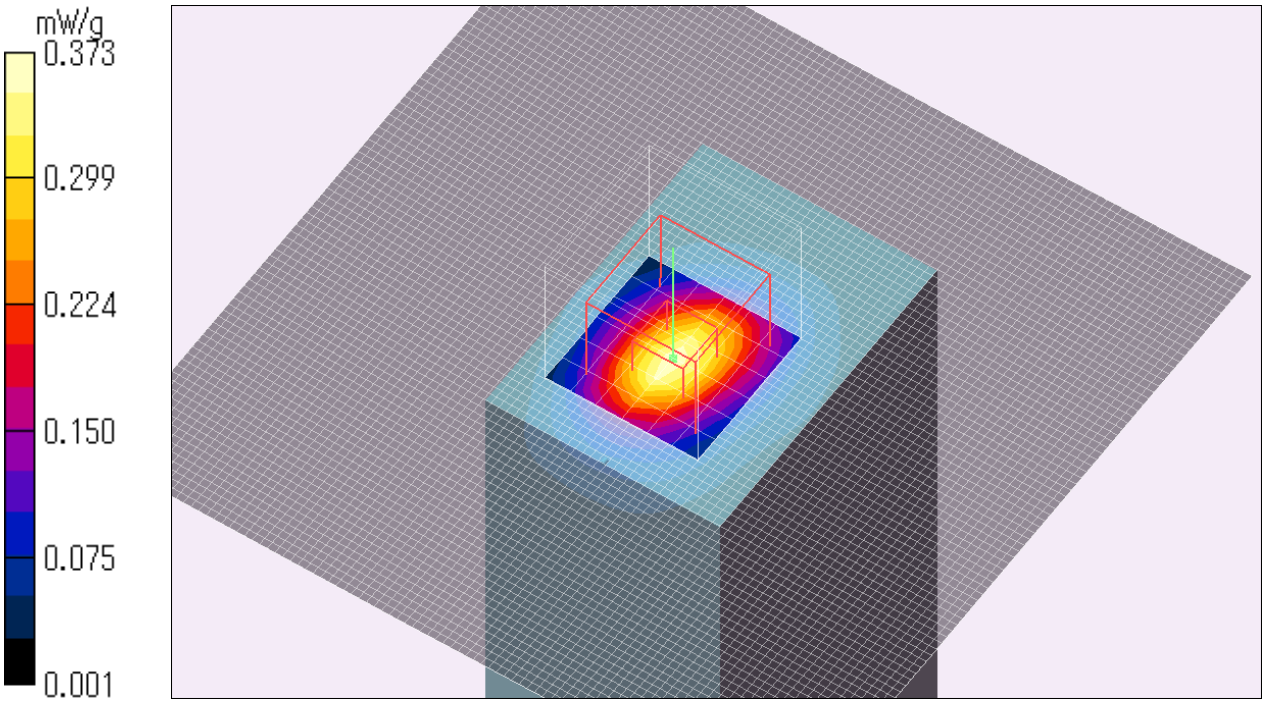
Crest factor: 1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV3 - SN3507; ConvF(8.11, 8.11, 8.11); Calibrated: 2010/02/19
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Area Scan (91x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.390 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = -0.170 dB
Peak SAR (extrapolated) = 0.490 W/kg

SAR(1 g) = 0.249 mW/g; SAR(10 g) = 0.116 mW/g
Maximum value of SAR (measured) = 0.373 mW/g

Test Date = 03/05/10
Ambient Temperature = 24.5 degree.C
Liquid Temperature = Before 23.9 degree.C , After 23.9 degree.C



NJT-517/ Top / QPSK(18Mbps) / 2412MHz

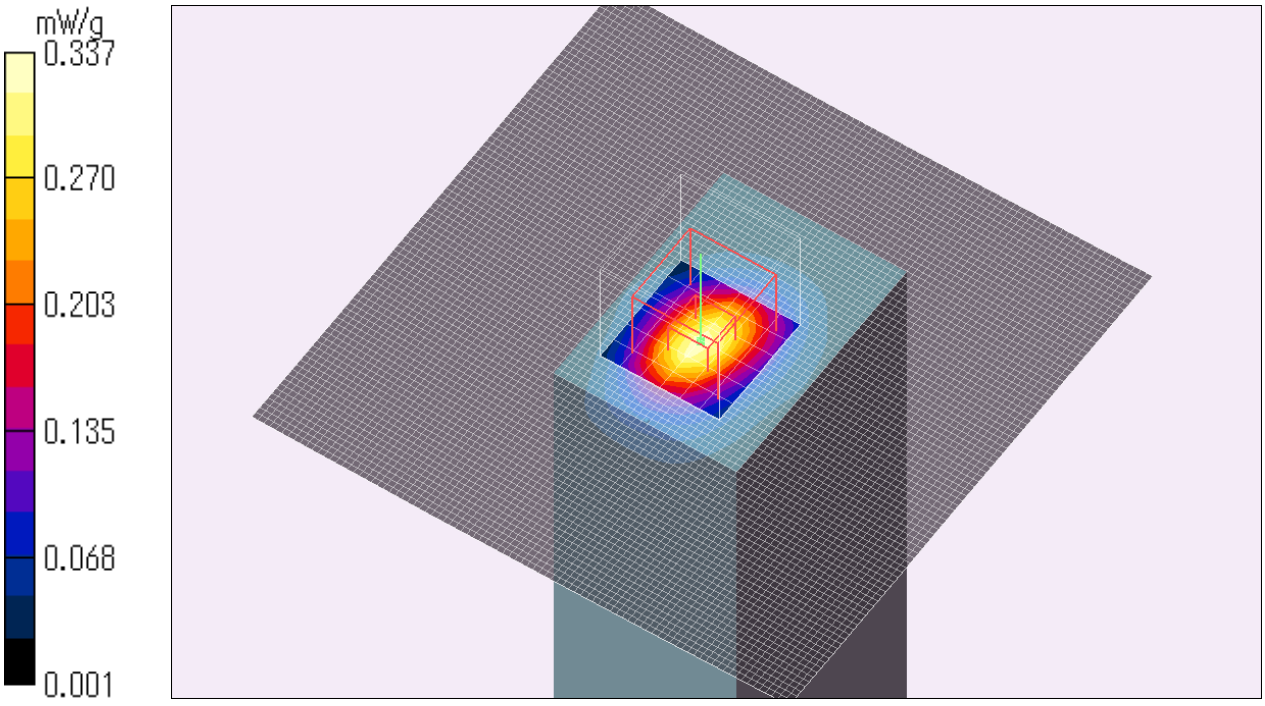
Crest factor: 1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV3 - SN3507; ConvF(8.11, 8.11, 8.11); Calibrated: 2010/02/19
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Area Scan (91x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.361 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.4 V/m; Power Drift = -0.127 dB
Peak SAR (extrapolated) = 0.444 W/kg

SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.108 mW/g
Maximum value of SAR (measured) = 0.337 mW/g

Test Date = 03/05/10
Ambient Temperature = 24.5 degree.C
Liquid Temperature = Before 23.9 degree.C , After 23.9 degree.C



NJT-517/ Top / QPSK(18Mbps) / 2462MHz

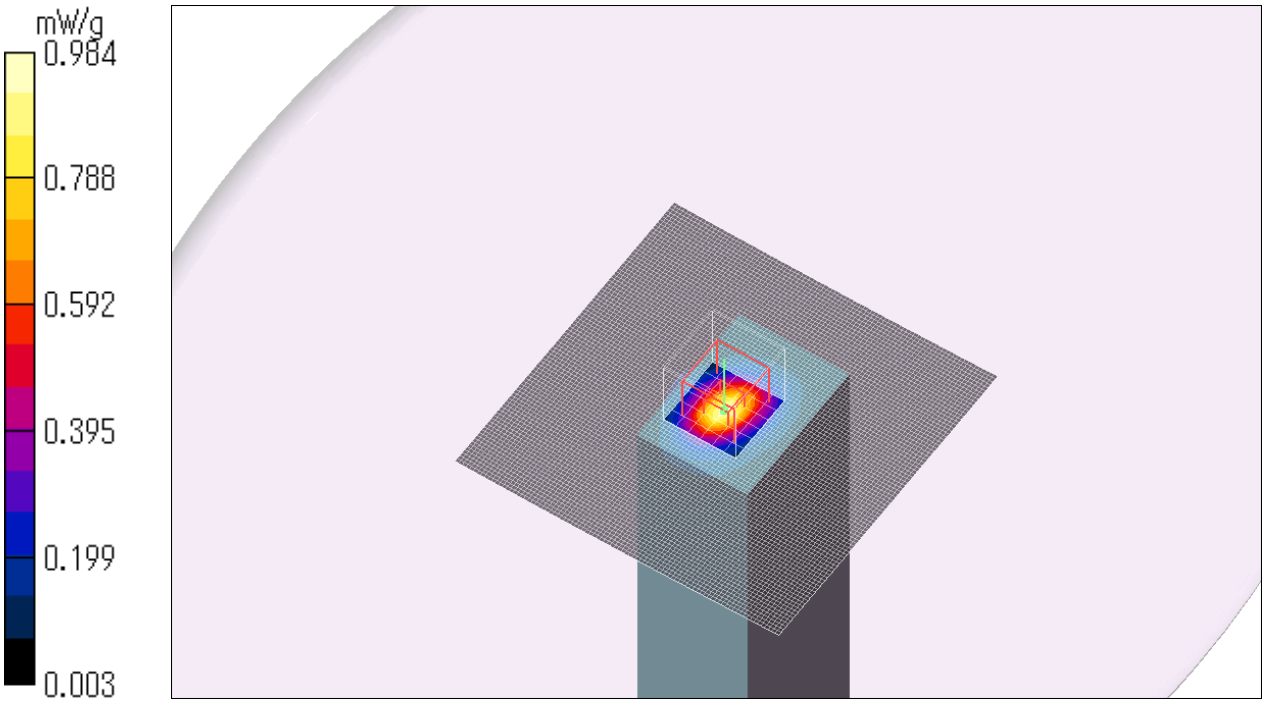
Crest factor: 1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV3 - SN3507; ConvF(8.11, 8.11, 8.11); Calibrated: 2010/02/19
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Area Scan (91x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.964 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.9 V/m; Power Drift = -0.101 dB
Peak SAR (extrapolated) = 1.29 W/kg

SAR(1 g) = 0.645 mW/g; SAR(10 g) = 0.293 mW/g
Maximum value of SAR (measured) = 0.984 mW/g

Test Date = 03/05/10
Ambient Temperature = 24.5 degree.C
Liquid Temperature = Before 23.9 degree.C , After 23.9 degree.C



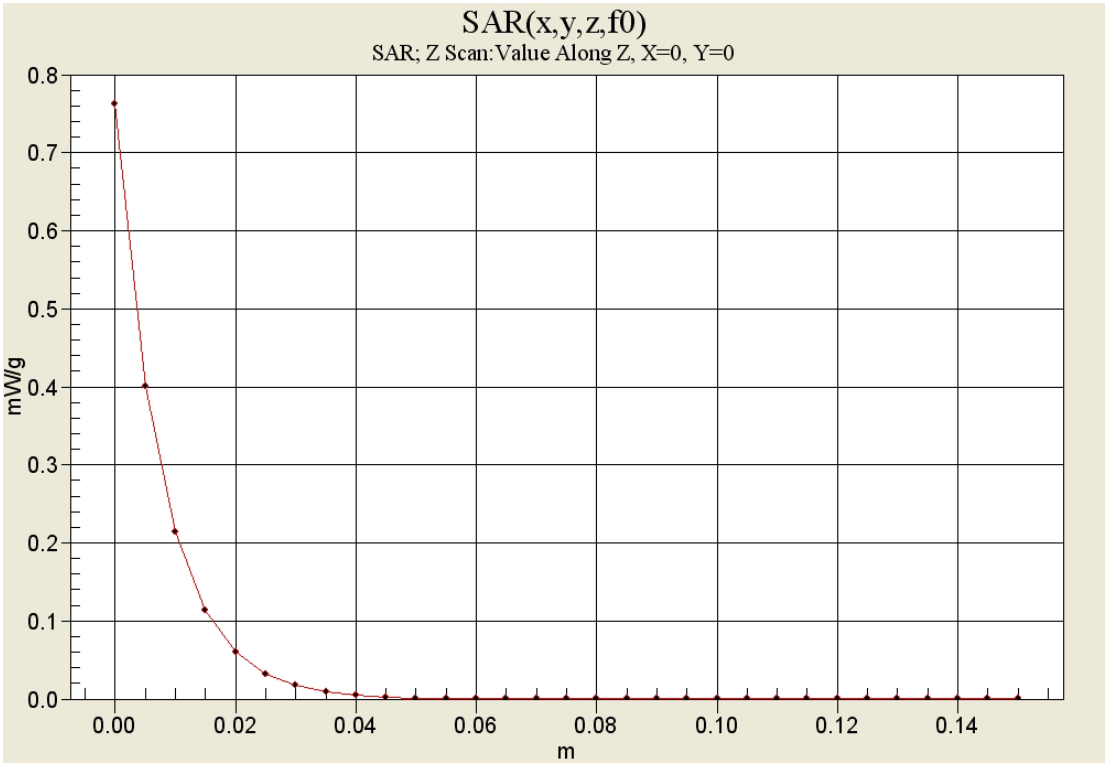
Z-axis scan at max SAR location

NJT-517/ Top / QPSK(18Mbps) / 2462MHz

Crest factor: 1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV3 - SN3507; ConvF(8.11, 8.11, 8.11); Calibrated: 2010/02/19
- Sensor-Surface: 0mm (Fix Surface)
- Phantom: Flat Phantom ELI4.0
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.762 mW/g

Test Date = 03/05/10
Ambient Temperature = 24.5 degree.C
Liquid Temperature = Before 23.9 degree.C , After 23.9 degree.C



APPENDIX 3 : Test instruments

1. Equipment used

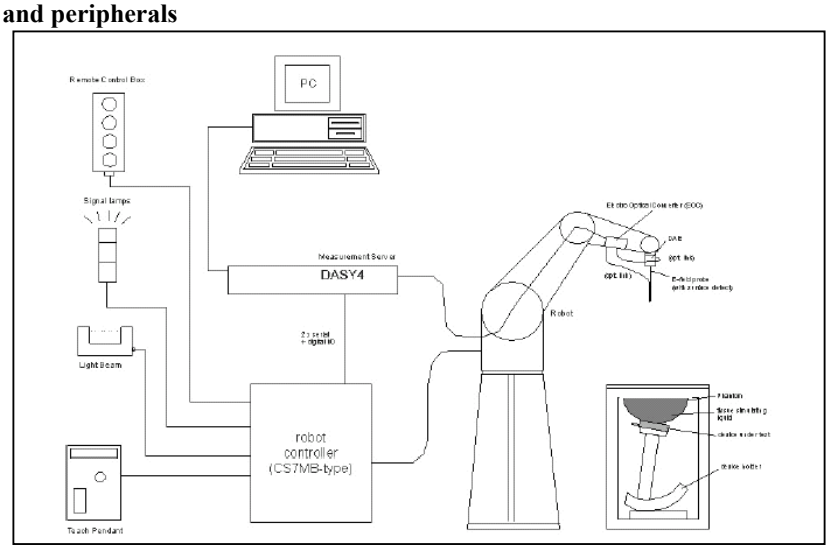
Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAT-23	Attenuator(10dB) DC-18GHz	Orient Microwave	BX10-0476-00	-	Power Measurement	2009/03/24 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	Power Measurement	2009/09/09 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	Power Measurement	2009/09/09 * 12
MOS-04	Digital Humidity Indicator	N.T	NT-1800	MOS04	Power Measurement	2010/02/09 * 12
MPM-01	Power Meter	Agilent	E4417A	GB41290639	SAR	2010/02/16 * 12
MPSE-01	Power Sensor	Agilent	E9300B	US40010300	SAR	2010/02/11 * 12
MPSE-03	Power sensor	Agilent	E9327A	US40440576	SAR	2010/02/19 * 12
MAT-15	Attenuator(30dB)	Agilent	8498A	US40010300	SAR	2010/02/24 * 12
MSG-10	Signal Generator	Agilent	N5181A	MY47421098	SAR	2009/06/30 * 12
MRFA-02	RF Power Amplifier	OPHIR	5056F	1005	SAR	2009/07/30 * 12
MHDC-12	Dual Directional Coupler	Hewlett Packard	772D	2839A0016	SAR	-
MNA-01	Network Analyzer	Agilent/HP	E8358A	US41080381	SAR	2009/08/28 * 12
MDPK-01	Dielectric probe kit	Agilent	85070D	-	SAR	Pre Check
MNCK-01	Type N Calibration Kit	Agilent	85032F	MY41495257	SAR	2009/08/28 * 12
MPB-03	Dosimetric E-Field Probe	Schmid&Partner Engineering AG	EX3DV3	3507	SAR	2010/02/19 * 12
MDAE-01	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE3 V1	509	SAR	2009/07/08* 12
COTS-MSTW-16	DASY4	Schmid&Partner Engineering AG	DASY4 V4.7 Build71	-	SAR	-
COTS-MSTW-17	S-Parameter Network Analyzer	Agilent	-	-	SAR	-
MDA-07	Dipole Antenna	Schmid&Partner Engineering AG	D2450V2	713	SAR	2008/09/08 * 24
MPF-02	2mmOval Flat Phantom ERI 4.0	Schmid&Partner Engineering AG	QD VA 001B (ERI4.0)	1045	SAR	-
MOS-05	Thermo-Hygrometer	Custom	CTH-190	810201	SAR	2009/04/28 * 12
MOS-10	Digtal thermometer	HANNA	Checktemp-2	MOS-10	SAR	2010/02/05 * 12
MBM-13	Barometer	Sunoh	SBR121	873	SAR	2007/12/27 * 36
Muscle 2450MHz					Daily check Target value ± 5 to 10%	
SAR room					Daily check Ambient Noise<0.012W/kg	

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

2. Dosimetry assessment setup

These measurements were performed with the automated near-field scanning system DASY4 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9 m), which positions the probes with a positional repeatability of better than +/- 0.02 mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit. The SAR measurements were conducted with the dosimetry probe EX3DV3, SN: 3507(manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure described in [2] with accuracy of better than +/-10%. The spherical isotropy was evaluated with the procedure described in [3] and found to be better than +/-0.25 dB. The phantom used was the SAM Twin Phantom as described in FCC supplement C, IEEE P1528 and CENELEC EN50361.

3. Configuration and peripherals



The DASY4 system for performing compliance tests consist of the following items:

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

2. 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.

3. 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.

4. The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection.
The EOC is connected to the measurement server.

5. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.

6. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.

7. A computer operating Windows 2000.

8. DASY4 software.

9. Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.

10. The 2mm Flat phantom ERI4.0

11. The device holder for handheld mobile phones.

12. Tissue simulating liquid mixed according to the given recipes.

13. Validation dipole kits allowing to validate the proper functioning of the system.

4. System components

EX3DV3 Probe Specification

Construction:
Symmetrical design with triangular core
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., glycol ether)
Calibration:
Basic Broad Band calibration in air : 10-3000 MHz
Conversion Factors (Head and Body):

Frequency:
10 MHz to > 6GHz; Linearity: +/-0.2 dB(30 MHz to 3 GHz)

Directivity:
+/-0.3 dB in HSL (rotation around probe axis)
+/-0.5 dB in tissue material (rotation normal probe axis)

Dynamic Range:
10uW/g to > 100 mW/g;Linearity: +/-0.2 dB(noise: typically < 1uW/g)

Dimensions:
Overall length: 330 mm (Tip: 20 mm)
Tip diameter: 2.5mm (Body: 12 mm)
Typical distance from probe tip to dipole centers: 1 mm

Application:
Highprecision dosimetric measurement in any exposure scenario
(e.g., very strong gradient fields).Only probe which enables compliance
testing for frequencies up to 6GHz with precision of better 30%.

EX3DV3 E-field Probe

2mm Flat phantom ERI4.0

Description

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209 Part II and all known tissue simulating liquids. ELI4 has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is supported by software version DASY4.5 and higher and is compatible with all SPEAG dosimetric probes and dipoles.

Shell Thickness
2.0 ± 0.2 mm (sagging: <1%)

Filling Volume
approx. 30 liters

Dimensions
Major ellipse axis: 600 mm
Minor axis: 400 mm

Compatibilities
- Standard: IEC 62209 Part II (Draft 0.9 and higher)
- Software release: DASY 4.5 or higher
- SPEAG standard phantom table
- all SPEAG dosimetric probes and dipoles

Device Holder
For this measurement, the urethane foam was used as device holder.

5. Test system specifications

Robot RX60L

Number of Axes	:	6
Payload	:	1.6 kg
Reach	:	800mm
Repeatability	:	+/-0.025mm
Control Unit	:	CS7M
Programming Language	:	V+
Manuafacture	:	Stäubli Unimation Corp. Robot Model: RX60

DASY4 Measurement server

Features	:	166MHz low power Pentium MMX 32MB chipdisk and 64MB RAM Serial link to DAE (with watchdog supervision) 16 Bit A/D converter for surface detection system Two serial links to robot (one for real-time communication which is supervised by watchdog) Ethernet link to PC (with watchdog supervision) Emergency stop relay for robot safety chainTwo expansion slots for future applications
Manufacture	:	Schimid & Partner Engineering AG

Data Acquisition Electronic (DAE)

Features	:	Signal amplifier, multiplexer, A/D converter and control logic Serial optical link for communication with DASY4 embedded system (fully remote controlled) 2 step probe touch detector for mechanical surface detection and emergency robot stop (not in -R version)
Measurement Range	:	1 µV to > 200 mV (16 bit resolution and two range settings: 4mV, 400mV)
Input Offset voltage	:	< 1 µV (with auto zero)
Input Resistance	:	200 MΩ
Battery Power	:	> 10 h of operation (with two 9 V battery)
Dimension	:	60 x 60 x 68 mm
Manufacture	:	Schimid & Partner Engineering AG

Software

Item	:	Dosimetric Assesment System DASY4
Type No.	:	SD 000 401A, SD 000 402A
Software version No.	:	DASY4 V4.7 Build80
Manufacture / Origin	:	Schimid & Partner Engineering AG

E-Field Probe

Model	:	EX3DV3
Serial No.	:	3507
Construction	:	Symmetrical design with triangular core
Frequency	:	10 MHz to 6 GHz
Linearity	:	+/-0.2 dB (30 MHz to 3 GHz)
Manufacture	:	Schimid & Partner Engineering AG

Phantom

Type	:	2mm
Shell Thickness	:	2.0 ± 0.2 mm (sagging: <1%)
Filling Volume	:	approx. 30 liters
Dimensions	:	Major ellipse axis: 600 mm Minor axis: 400 mm
Manufacture	:	Schimid & Partner Engineering AG

6. Simulated Tissues Composition (2450MHz)

Ingredient	MIXTURE(%)
	Muscle 2450MHz
Water	68.64
DGMBE	31.37

Note:DGMBE(Diethylenglycol-monobuthyl ether)

7. Simulated Tissue Liquid Parameter confirmation (2450MHz)

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement are reported in each correspondent section.

7-a Muscle 2450 MHz

Type of liquid : **Muscle 2450 MHz**
Ambient temperature (deg.c.) : **24.5 (5-Mar)**
Relative Humidity (%) : **38 (5-Mar)**
Liquid depth (cm) : **15.0**

DIELECTRIC PARAMETERS MEASUREMENT RESULTS								
Date	Frequency	Liquid Temp [deg.c]		Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
		Before	After					
5-Mar	2450	23.9	23.9	Relative Permittivity εr	52.7	50.7	-3.8	+/-5
				Coductivity σ [mho/m]	1.95	1.95	0.0	+/-5

*1 The target values is a parameter defined in FCC OET 65.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS								
Date	Frequency	Liquid Temp [deg.c]		Parameters	Target Value*2	Measured	Deviation [%]	Limit [%]
		Before	After					
5-Mar	2450	23.9	23.9	Relative Permittivity εr	50.6	50.7	0.2	+/-5
				Coductivity σ [mho/m]	1.96	1.95	-0.5	+/-5

*2 The target value is the calibrated dipole TSL parameters. (D2450V2 SN:713)

8. System validation data(2450MHz)

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of +/-10%. The validation results are in the table below. Please refer to APPENDIX3.

8-b Body System validation of 2450MHz

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of +/-10%. The validation results are in the table below.

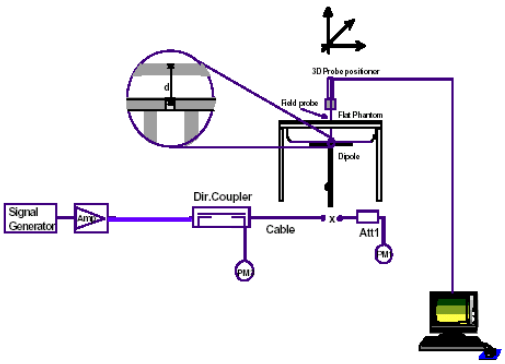
We performed the system validation based on FCC requirement, [The 1-g or 10-g SAR values measured using the required tissue dielectric parameters should be within 10% of manufacturer calibrated dipole SAR values. However these manufacturer calibrated dipole target SAR values should be substantially similar to those defined in IEEE Standard 1528.] and FCC permits [SAR system verification with the actual liquid used for DUT SAR measurement should be the default operating procedures.] We confirmed the this dipole manufacture's validation date for head is within 5% against IEEE Standard 1528. so we can only use Body liquid validation data for our system verification

Type of liquid : **Muscle 2450MHz**
Frequenc : **2450MHz**
Ambient temperature (deg.c.) : **24.5 (5-Mar)**
Relative Humidity (%) : **38 (5-Mar)**
Dipole : **D2450V2 SN:713**
Power : **250mW**

SYSTEM PERFORMANCE CHECK										
Date	Liquid (Muscle 2450MHz)						System dipole validation target & measured			
	Liquid Temp [deg.c.]		Relative Permittivity εr		Conductivity σ [mho/m]		SAR 1g [W/kg]		Deviation [%]	Limit [%]
	Before	After	Target	Measured	Target	Measured	Target*2	Measured		
5-Mar	23.9	23.9	50.6	50.7	1.96	1.95	12.1	12.8	5.8	+/-10

*2 The target value is a manufacturer calibrated dipole 1g SAR value. (D2450V2 SN:713)

Note: Please refer to Attachment for the result representation in plot format



2450MHz System performance check setup

Test system for the system performance check setup diagram

9. Validation uncertainty

The uncertainty budget has been determined for the DASY4 measurement system according to the SPEAG documents[6][7] and is given in the following Table.

Error Description	Uncertainty value ± %	Probability distribution	divisor	(ci) 1g	Standard Uncertainty (1g)	vi or veff
Measurement System						
Probe calibration	±6.8	Normal	1	1	±6.8	∞
Axial isotropy of the probe	±4.7	Rectangular	√3	1	±2.7	∞
Spherical isotropy of the probe	±9.6	Rectangular	0	0	0	∞
Boundary effects	±2.0	Rectangular	√3	1	±1.2	∞
Probe linearity	±4.7	Rectangular	√3	1	±2.7	∞
Detection limit	±1.0	Rectangular	√3	1	±0.6	∞
Readout electronics	±0.3	Normal	1	1	±0.3	∞
Response time	0	Rectangular	√3	1	0	∞
Integration time	0	Rectangular	√3	1	0	∞
RF ambient Noise	±3.0	Rectangular	√3	1	±1.7	∞
RF ambient Reflections	±3.0	Rectangular	√3	1	±1.7	∞
Probe Positioner	±0.8	Rectangular	√3	1	±0.5	∞
Probe positioning	±9.9	Rectangular	1	1	±5.7	∞
Algorithms for Max.SAR Eval.	±4.0	Rectangular	√3	1	±2.3	∞
Dipole						
Dipole Axis to Liquid Distance	±2.0	Rectangular	√3	1	±1.2	∞
Input power and SAR drift meas.	±4.7	Rectangular	√3	1	±2.7	∞
Phantom and Setup						
Phantom uncertainty	±4.0	Rectangular	√3	1	±2.3	∞
Liquid conductivity (target)	±5.0	Rectangular	√3	0.64	±1.8	∞
Liquid conductivity (meas.)	±5.0	Rectangular	1	0.64	±3.2	∞
Liquid permittivity (target)	±5.0	Rectangular	√3	0.6	±1.7	∞
Liquid permittivity (meas.)	±5.0	Rectangular	1	0.6	±3.0	∞
Combined Standard Uncertainty					**±12.079**	
Expanded Uncertainty (k=2)					**±24.2**	

10. Validation Measurement data (2450MHz)

BODY 2450MHzSystem Validation / Dipole 2450 MHz / Forward Conducted Power : 250mW

Crest factor: 1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV3 - SN3507; ConvF(8.11, 8.11, 8.11); Calibrated: 2010/02/19
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Area Scan (91x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 19.7 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 99.4 V/m; Power Drift = 0.042 dB
Peak SAR (extrapolated) = 26.5 W/kg

SAR(1 g) = 12.8 mW/g; SAR(10 g) = 5.87 mW/g
Maximum value of SAR (measured) = 19.8 mW/g

Test Date = 03/05/10
Ambient Temperature = 24.5 degree.C
Liquid Temperature = Before 23.9 degree.C , After 23.9 degree.C