

Intermec Technologies Corporation

Model: 1000CP03C

Evaluated to the following SAR Specifications:

FCC 2.1093: 2011
Health Safety Code 6:2009

Report No. INMC0737 Rev 01

Report Prepared By



www.nwemc.com
1-888-EMI-CERT

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SAR Evaluation Report

Certificate of Evaluation
Last Date of Test: October 4, 2011
Intermec Technologies Corporation
Model: 1000CP03C

Applicable Standards			
Test Description	Specification	Test Method	Pass/Fail
SAR Evaluation	FCC 2.1093:2011 FCC 15.247:2011 FCC 15.407:2011	FCC OET 65C:2001	Pass
		IEEE Std 1528:2003	
		FCC KDB 447498 D01 v04	
		FCC KDB 248227 D01 v01r02	
		FCC KDB 648474 D01 v01r05	
	FCC 865664		
	Health Safety Code 6:2009	RSS-102, Issue 4:2010	Pass

Highest SAR Values				
Frequency Band (GHz)	Head 1g (W/kg)	Body 1g (W/kg)	Limit 1g (W/kg)	Exposure Environment
2.4	0.239	0.177	1.6	General Population Uncontrolled
5.2, 5.3, 5.5. & 5.8	0.051	0.398		

Modifications made to the product
 See the Modifications section of this report

Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
 22975 NW Evergreen Parkway, Suite 400
 Hillsboro, OR 97124

Phone: (503) 844-4066 Fax: 844-3826

Approved By:



Don Facticeau, IS Manager



NVLAP Lab Code: 200630-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision Number	Description	Date	Page Number
01	Corrected model number of unit	10/27/11	37-41, 43-46, 48-51, 54-65

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.



Accreditations and Authorizations

FCC

Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.

NVLAP

Northwest EMC, Inc. is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. NVLAP is administered by the National Institute of Standards and Technology (NIST), an agency of the U.S. Commerce Department. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.

Industry Canada

Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS-Gen, Issue 2 and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements. (*Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2, Brooklyn Park: 2834E-1*)

CAB

Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.

Australia/New Zealand

The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).



Accreditations and Authorizations

VCCI

Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071, R-1025, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, and T-1659, Sultan: R-871, G-83, C-1784, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634.*)

BSMI

Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017).

GOST

Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification

KCC

Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157, Brooklyn Park: US0175*)

VIETNAM

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.

SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>



Northwest EMC Locations



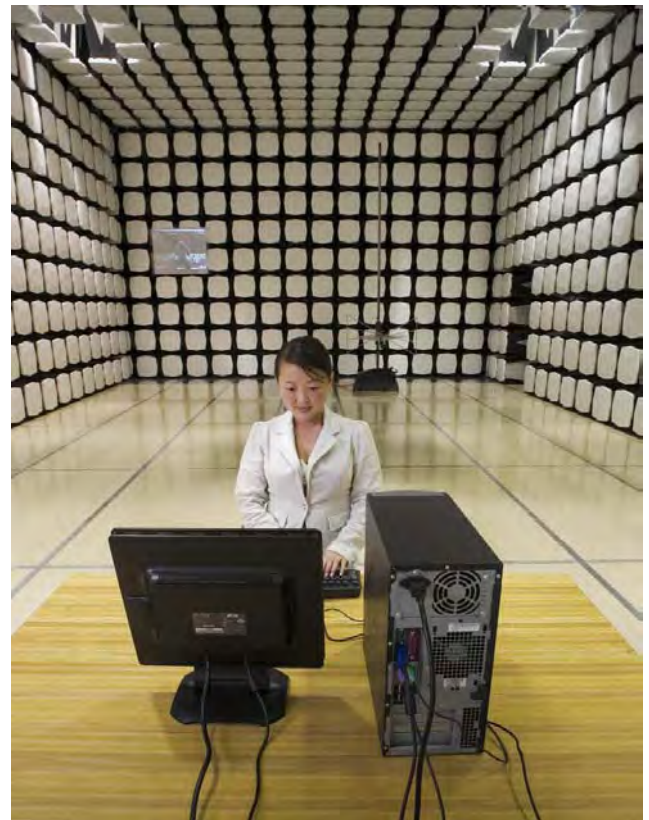
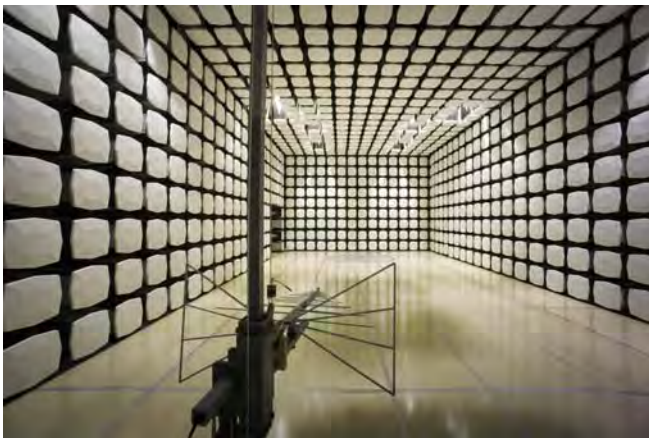
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

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Labs OC01-OC13
41 Tesla
Irvine, CA 92618
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9349 W Broadway Ave.
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Washington
Labs SU01-SU07
14128 339th Ave. SE
Sultan, WA 98294
(360) 793-8675

New York
Labs WA01-WA04
4939 Jordan Rd.
Elbridge, NY 13060
(315) 685-0796



Party Requesting the Test

Company Name:	Intermec Technologies Corporation
Address:	550 Second St. SE
City, State, Zip:	Cedar Rapids, IA 52401-2023
Test Requested By:	Stu Adams
Model:	1000CP03C
First Date of Test:	September 21, 2011
Last Date of Test:	October 4, 2011
Receipt Date of Samples:	September 16, 2011
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test)

The EUT is the Model 1000CP03C handheld computer containing two radio modules, the Intermec Model RC12 and the Sierra Wireless MC5728V, each with their own integral antenna.

The Intermec Model RC12 radio module is an 802.11a/b/g/n – Bluetooth radio. It is not capable of 40 MHz channel operation. The 802.11a/b/g/n and Bluetooth radios share the same antenna, but cannot transmit simultaneously. The frequency range of the 802.11a/b/g/n radio:

- 2412 – 2462 MHz
- 5180 – 5320 MHz
- 5500 – 5700 MHz
- 5745 – 5825 MHz

The frequency range of the Bluetooth radio:

- 2402 – 2480 MHz

The Sierra Wireless MC5728V radio module is a CDMA (EVDO Rev A) radio. Its frequency range:

- 824.7 – 848.31 MHz
- 1851.25 – 1908.8 MHz

The closest spacing between the CDMA antenna and 802.11a/b/g/n antenna is 3.7cm. The 802.11a/b/g/n antenna is on the right side of the handheld computer and the CDMA antenna is on the left side.

In normal operation, the EUT can be held in the hand, or next to the head like a cellular handset, or worn on the wrist/arm in a holster. The wrist holster is specially designed for airline baggage handlers to have their hands free, but still be able to scan bar-codes. The only Intermec approved accessory for body worn operation for the EUT is this wrist holster. The EUT can only fit in the holster with the top end of the unit pointing towards the hand and the keypad facing up away from the arm.

No snap-on accessories can be connected to the EUT while it is in the wrist holster.

The EUT is powered by a lithium-ion battery, Model 1000AB01.

Overview of the SAR Evaluation

Objective

To demonstrate compliance with the SAR requirements of FCC 2.1093 and Canada's Health Safety Code 6. This evaluation will be used to support a Class 2 Permissive Change authorization of FCC ID: EHA-1000CP01CX2. The following changes have been made: the barcode scanner in the previously certified Model 1000CP01C has been slightly repositioned so that it points straight out, instead of tilted downward, resulting in the new Model 1000CP03C (subject of this SAR evaluation). A new holster has been developed for use with Model 1000CP03C that is worn on the wrist / forearm.

Prior to the SAR evaluation of the wrist holster, a non-PBA KDB inquiry was made to the FCC to confirm that a body phantom and body tissue equivalent liquids could be used. The FCC agreed with the proposal (see KDB tracking #758326). SAR measurements of the head configurations that produced the highest SAR in the original filing were also made (see KDB 178919 D01 Permissive Change Policy v05r01, Item #5b).

Scope

The CDMA radio was evaluated under a separate SAR evaluation report.

Regarding the 802.11a/b/g/n-Bluetooth radio:

KDB 648474 D01 is the FCC's Policy for SAR evaluation of handsets with multiple transmitters and antennas. It states:

"When the output of an unlicensed transmitter is $\leq P_{ref}$, and its antenna(s) is ≥ 2.5 cm from other antennas, stand – alone SAR evaluation is not required for that unlicensed transmitter."

The power threshold P_{ref} is defined as the maximum conducted power available at the antenna according to source-based time averaging. P_{ref} is derived from $\frac{1}{2} * (60/f_{GHz})$

	2.45	5.15 - 5.35	5.47 - 5.85	GHz
P_{Ref}	12	6	5	mW
Device output power should be rounded to the nearest mW to compare with values specified in this table.				

Since the output power of Bluetooth is 7mW, and the antenna spacing is 3.7 cm, the Bluetooth radio does not require SAR evaluation.

However the output power of the 802.11a/b/g/n radio is greater than $2 * P_{ref}$ for all bands, so it does require stand-alone SAR evaluation.

The SAR evaluation documented in this report is for the 802.11a/b/g/n portion of the EUT.

CONFIGURATION 1 INMC0737

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Wrist Holster	Taylor Made	TM-CCN70-WS-SW - T5, Revision B	None
Battery	Intermec Technologies Corporation	1000AB01	16961001770
Battery	Intermec Technologies Corporation	1000AB01	24561000347
Handheld Computer	Intermec Technologies Corporation	1000CP03C	14621142016

CONFIGURATION 2 INMC0737

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Battery	Intermec Technologies Corporation	1000AB01	16961001770
Battery	Intermec Technologies Corporation	1000AB01	24561000347
Handheld Computer	Intermec Technologies Corporation	1000CP03C	14621142016

Equipment modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	9/21/2011	SAR Evaluation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	10/04/2011	SAR Evaluation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

2.4 and 5 GHz Bands

Per FCC KDB 248227, the conducted output power was measured at the “default test channels” and at the “required test channels” in each band. Measurements were made while the EUT transmitted at the lowest, middle and the highest data rates for each channel.

Per KDB 648474, among the channels required for normal testing, SAR must be measured on the highest output channel (highlighted in green below). When the SAR measured on the highest output channel is < 0.8 W/kg, SAR evaluation for the other required channels is unnecessary.

Output power measurements are on the following pages.

EUT: 1000CP03C		Work Order: INMC0737
Serial Number: 14621142016		Date: 09/21/11
Customer: Intermec Technologies Corporation		Temperature: 22
Attendees: None		Humidity: 39%
Project:		Barometric Pres.: 30.02
Tested by: Rod Peloquin	EUT Power	Battery
Job Site: EV08		
TEST SPECIFICATIONS		
FCC 2.1093:2011		Test Method
		FCC OET 65C:2001
COMMENTS		
Conducted output power		
DEVIATIONS FROM TEST STANDARD		
None		
Configuration #	2	<i>Rod P. Peloquin</i> Signature

Channel	Frequency (MHz)	Data Rate (Mbps)	Modulation	Conducted Power (Average)	
				dBm	W
1	2412	1	BPSK	16.61	0.046
		11	CCK	16.39	0.044
		6	OFDM	12.99	0.020
		36	OFDM	12.75	0.019
		54	OFDM	12.65	0.018
		7.2 (MCS0)	OFDM	12.95	0.020
		72.2 (MCS7)	OFDM	12.27	0.017
6	2437	1	BPSK	16.98	0.050
		11	CCK	16.83	0.048
		6	OFDM	13.39	0.022
		36	OFDM	13.24	0.021
		54	OFDM	13.12	0.021
		7.2 (MCS0)	OFDM	13.31	0.021
		72.2 (MCS7)	OFDM	12.60	0.018
11	2462	1	BPSK	17.38	0.055
		11	CCK	17.24	0.053
		6	OFDM	13.72	0.024
		36	OFDM	13.63	0.023
		54	OFDM	13.61	0.023
		7.2 (MCS0)	OFDM	13.70	0.023
		72.2 (MCS7)	OFDM	13.00	0.020

EUT: 1000CP03C		Work Order: INMC0737
Serial Number: 14621142016		Date: 09/21/11
Customer: Intermec Technologies Corporation		Temperature: 22
Attendees: None		Humidity: 39%
Project:		Barometric Pres.: 30.02
Tested by: Rod Peloquin	EUT Power	Battery
Job Site: EV08		
TEST SPECIFICATIONS		
FCC 2.1093:2011		Test Method
		FCC OET 65C:2001
COMMENTS		
Conducted output power		
DEVIATIONS FROM TEST STANDARD		
None		
Configuration #	2	<i>Rod Peloquin</i> Signature

Channel	Frequency (MHz)	Data Rate (Mbps)	Modulation	Conducted Power (Average)	
				dBm	W
36	5180	6	OFDM	12.08	0.016
		54	OFDM	11.25	0.013
		7.2 (MCS0)	OFDM	12.09	0.016
		72.2 (MCS7)	OFDM	9.81	0.010
40	5200	6	OFDM	12.16	0.016
		54	OFDM	11.11	0.013
		7.2 (MCS0)	OFDM	12.06	0.016
		72.2 (MCS7)	OFDM	9.84	0.010
44	5220	6	OFDM	12.15	0.016
		54	OFDM	11.35	0.014
		7.2 (MCS0)	OFDM	12.09	0.016
		72.2 (MCS7)	OFDM	9.89	0.010
48	5240	6	OFDM	12.17	0.016
		54	OFDM	11.36	0.014
		7.2 (MCS0)	OFDM	12.14	0.016
		72.2 (MCS7)	OFDM	9.91	0.010
52	5260	6	OFDM	12.34	0.017
		54	OFDM	11.58	0.014
		7.2 (MCS0)	OFDM	12.37	0.017
		72.2 (MCS7)	OFDM	10.12	0.010
56	5280	6	OFDM	12.37	0.017
		54	OFDM	11.61	0.014
		7.2 (MCS0)	OFDM	12.35	0.017
		72.2 (MCS7)	OFDM	10.08	0.010
60	5300	6	OFDM	12.34	0.017
		54	OFDM	11.64	0.015
		7.2 (MCS0)	OFDM	12.35	0.017
		72.2 (MCS7)	OFDM	10.17	0.010
64	5320	6	OFDM	12.37	0.017
		54	OFDM	11.63	0.015
		7.2 (MCS0)	OFDM	12.30	0.017
		72.2 (MCS7)	OFDM	10.07	0.010
100	5500	6	OFDM	11.99	0.016
		7.2 (MCS0)	OFDM	11.96	0.016
104	5520	6	OFDM	11.80	0.015
		7.2 (MCS0)	OFDM	11.81	0.015
108	5540	6	OFDM	11.75	0.015
		7.2 (MCS0)	OFDM	11.72	0.015
112	5560	6	OFDM	11.61	0.014
		7.2 (MCS0)	OFDM	11.67	0.015
116	5580	6	OFDM	11.54	0.014
		7.2 (MCS0)	OFDM	11.48	0.014
120	5600	6	OFDM	11.61	0.014
		7.2 (MCS0)	OFDM	11.58	0.014
124	5620	6	OFDM	11.49	0.014
		7.2 (MCS0)	OFDM	11.48	0.014
128	5640	6	OFDM	11.37	0.014
		7.2 (MCS0)	OFDM	11.33	0.014
132	5660	6	OFDM	11.25	0.013
		7.2 (MCS0)	OFDM	11.21	0.013
136	5680	6	OFDM	11.10	0.013
		7.2 (MCS0)	OFDM	11.16	0.013
140	5700	6	OFDM	11.07	0.013
		7.2 (MCS0)	OFDM	11.05	0.013
149	5745	6	OFDM	10.77	0.012
		7.2 (MCS0)	OFDM	10.82	0.012
153	5765	6	OFDM	10.80	0.012
		7.2 (MCS0)	OFDM	10.76	0.012
157	5785	6	OFDM	10.72	0.012
		7.2 (MCS0)	OFDM	10.73	0.012
161	5805	6	OFDM	10.82	0.012
		7.2 (MCS0)	OFDM	10.80	0.012
165	5825	6	OFDM	10.84	0.012
		7.2 (MCS0)	OFDM	10.83	0.012

Characterization of tissue-equivalent liquid dielectric properties

Per IEEE 1528: 2003, Section 5.2.2, the permittivity and conductivity of the tissue material should be measured at least within 24 hours of any full-compliance test. The measured values must be within +/- 5% of the target values. The temperature variation in the liquid during SAR measurements must be within +/- 2 degrees C of that recorded when the dielectric properties were measured.

The dielectric parameters of the tissue-equivalent liquids were measured within 24 hours of testing using the HP85070E dielectric probe kit. The dielectric measurements were made at 50 MHz intervals. The attached data sheets show that the dielectric parameters of the liquid were within the required 5% tolerances.

Target values of dielectric parameters

Per FCC OET 65C, Appendix C:

“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 and extrapolated according to the head parameters specified in P1528.”

Target Frequency (MHz)	Head		Body	
	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

(ϵ_r = relative permittivity, σ = conductivity and $\rho = 1000 \text{ kg/m}^3$)

Composition of Ingredients for Liquid Tissue Phantoms

Northwest EMC uses tissue-equivalent liquids prepared by SPEAG and confirmed by them to be within +/- 5% from the target values. Their recipes are based upon the following formulations as found in FCC OET 65C, Appendix C:

“The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.”

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

Salt: 99⁺% Pure Sodium Chloride

Sugar: 98⁺% Pure Sucrose

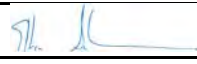
Water: De-ionized, 16 M Ω ⁺ resistivity

HEC: Hydroxyethyl Cellulose

DGBE: 99⁺% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether


EMC**Tissue - Equivalent Liquid**

EUT: MSL2450	Work Order: INMC0737
Serial Number: SAM	Date: 09/21/2011
Customer: Intermec Technologies Corporation	Temperature (°C): 24.5
Attendees: none	Humidity: 50.1
Project: P-INMC018	Barometric Pres. (mb): 1013.7
Tested by: Ethan Schoonover	Power: None
Job Site: EV08	
TEST SPECIFICATIONS	
FCC 2.1093:2011	Test Method FCC OET 65C:2001
COMMENTS	
None	
DEVIATIONS FROM TEST STANDARD	
None	
Configuration #	None
Signature 	
Tissue: MSL2450	
Liquid Temperature (°C): 22.4	

Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
2450	50.239	1.956	52.700	1.950	4.67	-0.32


1900.0	52.1	1.257
1925.0	52.0	1.284
1950.0	51.9	1.311
1975.0	51.9	1.340
2000.0	51.8	1.370
2025.0	51.7	1.401
2050.0	51.6	1.431
2075.0	51.5	1.462
2100.0	51.5	1.493
2125.0	51.4	1.526
2150.0	51.3	1.558
2175.0	51.2	1.591
2200.0	51.1	1.624
2225.0	51.0	1.657
2250.0	51.0	1.690
2275.0	50.9	1.723
2300.0	50.8	1.756
2325.0	50.7	1.789
2350.0	50.6	1.822
2375.0	50.5	1.856
2400.0	50.4	1.890
2425.0	50.3	1.923
2450.0	50.2	1.956
2475.0	50.1	1.991
2500.0	50.0	2.024
2525.0	49.9	2.059
2550.0	49.8	2.093
2575.0	49.7	2.128
2600.0	49.7	2.162
2625.0	49.5	2.196
2650.0	49.4	2.230
2675.0	49.3	2.264
2700.0	49.2	2.300

EMC**Tissue - Equivalent Liquid**

EUT:	HSL2450	Work Order:	INMC0737
Serial Number:	SAL	Date:	09/21/2011
Customer:	Intermec Technologies Corporation	Temperature (°C):	24.5
Attendees:	none	Humidity:	50.1
Project:	P-INMC018	Barometric Pres. (mb):	1013.7
Tested by:	Ethan Schoonover	Power:	None
TEST SPECIFICATIONS		Test Method	
FCC 2.1093:2011		FCC OET 65C:2001	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	None	Signature 	
Tissue: HSL2450		Liquid Temperature (°C): 22.4	


Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
2450	38.361	1.865	39.200	1.800	2.14	-3.63
1900.0	40.5	1.242				
1925.0	40.4	1.267				
1950.0	40.3	1.293				
1975.0	40.2	1.319				
2000.0	40.1	1.346				
2025.0	40.0	1.374				
2050.0	39.9	1.402				
2075.0	39.8	1.430				
2100.0	39.7	1.459				
2125.0	39.7	1.488				
2150.0	39.6	1.517				
2175.0	39.5	1.546				
2200.0	39.4	1.574				
2225.0	39.3	1.603				
2250.0	39.2	1.632				
2275.0	39.1	1.662				
2300.0	39.0	1.691				
2325.0	38.9	1.720				
2350.0	38.8	1.750				
2375.0	38.7	1.778				
2400.0	38.6	1.807				
2425.0	38.5	1.836				
2450.0	38.4	1.865				
2475.0	38.3	1.894				
2500.0	38.1	1.924				
2525.0	38.1	1.954				
2550.0	37.9	1.983				
2575.0	37.8	2.013				
2600.0	37.7	2.042				
2625.0	37.6	2.071				
2650.0	37.5	2.101				
2675.0	37.4	2.130				
2700.0	37.3	2.161				

EMC**Tissue - Equivalent Liquid**

EUT: MSL501	Work Order: INMC0737
Serial Number: SAV	Date: 09/22/2011
Customer: Intermec Technologies Corporation	Temperature (°C): 23.6
Attendees: none	Humidity: 47%
Project: P-INMC018	Barometric Pres. (mb): 1016
Tested by: Ethan Schoonover	Power: None
Job Site: EV08	
TEST SPECIFICATIONS	
FCC 2.1093:2011	Test Method FCC OET 65C:2001
COMMENTS	
None	
DEVIATIONS FROM TEST STANDARD	
None	
Configuration #	None
Signature 	
Tissue: MSL501 Liquid Temperature (°C): 22.3	

Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
5800	45.801	5.886	48.200	6.000	4.98	1.90
3400.0	49.2	3.072				
3500.0	49.1	3.170				
3600.0	49.0	3.272				
3700.0	48.9	3.387				
3800.0	48.7	3.485				
3900.0	48.6	3.580				
4000.0	48.5	3.686				
4100.0	48.4	3.786				
4200.0	48.3	3.899				
4300.0	48.1	4.017				
4400.0	48.0	4.148				
4500.0	47.9	4.266				
4600.0	47.8	4.395				
4700.0	47.6	4.518				
4800.0	47.4	4.646				
4850.0	47.3	4.708				
4900.0	47.3	4.768				
4950.0	47.2	4.821				
5000.0	47.1	4.887				
5050.0	47.0	4.949				
5100.0	46.8	5.007				
5150.0	46.8	5.074				
5200.0	46.8	5.133				
5250.0	46.7	5.193				
5300.0	46.6	5.249				
5350.0	46.5	5.317				
5400.0	46.4	5.377				
5450.0	46.3	5.439				
5500.0	46.3	5.498				
5550.0	46.3	5.559				
5600.0	46.1	5.620				
5650.0	46.1	5.690				
5700.0	46.0	5.748				
5750.0	45.9	5.806				
5800.0	45.8	5.886				
5850.0	45.7	5.950				
5900.0	45.7	6.025				

EMC**Tissue - Equivalent Liquid**

EUT:	HSL501	Work Order:	INMC0737
Serial Number:	SAU	Date:	09/28/2011
Customer:	Intermec Technologies Corporation	Temperature (°C):	23.4
Attendees:	none	Humidity:	42%
Project:	P-INMC018	Barometric Pres. (mb):	1016
Tested by:	Ethan Schoonover	Power:	None
TEST SPECIFICATIONS		Test Method	
FCC 2.1093:2011		FCC OET 65C:2001	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	None	Signature 	
Tissue: HSL501		Liquid Temperature (°C): 22	

Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
5800	34.015	5.072	35.300	5.270	3.64	3.76

3400.0	37.3	2.860
3500.0	37.1	2.938
3600.0	37.0	3.014
3700.0	36.9	3.103
3800.0	36.7	3.170
3900.0	36.6	3.243
4000.0	36.6	3.325
4100.0	36.4	3.404
4200.0	36.4	3.495
4300.0	36.2	3.586
4400.0	36.2	3.693
4500.0	36.1	3.788
4600.0	35.9	3.896
4700.0	35.8	3.990
4800.0	35.6	4.094
4850.0	35.5	4.146
4900.0	35.5	4.197
4950.0	35.5	4.241
5000.0	35.4	4.297
5050.0	35.3	4.345
5100.0	35.1	4.392
5150.0	35.1	4.445
5200.0	35.0	4.491
5250.0	34.9	4.542
5300.0	34.8	4.582
5350.0	34.7	4.639
5400.0	34.6	4.680
5450.0	34.5	4.736
5500.0	34.5	4.783
5550.0	34.5	4.829
5600.0	34.3	4.871
5650.0	34.3	4.931
5700.0	34.2	4.981
5750.0	34.1	5.018
5800.0	34.0	5.072
5850.0	33.9	5.119
5900.0	33.9	5.182

EMC**Tissue - Equivalent Liquid**

EUT: MSL501		Work Order: INMC0737
Serial Number: SAV		Date: 10/03/11
Customer: Intermec Technologies Corporation		Temperature (°C): 22.8
Attendees: none		Humidity: 47.8
Project: P-INMC018		Barometric Pres. (mb): 1011.20
Tested by: Jennifer Herrett	Power: None	Job Site: EV08
TEST SPECIFICATIONS		Test Method
FCC 2.1093:2011		FCC OET 65C:2001
COMMENTS		
None		
DEVIATIONS FROM TEST STANDARD		
None		
Configuration #	None	Signature <i>Jennifer Herrett</i>
Tissue: MSL501		Liquid Temperature (°C): 22.4

Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
5800	45.902	5.924	48.200	6.000	4.77	1.27

3400.0	49.5	3.187
3500.0	49.5	3.242
3600.0	49.5	3.358
3700.0	49.1	3.438
3800.0	49.0	3.602
3900.0	49.0	3.714
4000.0	49.2	3.810
4100.0	48.8	3.884
4200.0	48.7	3.985
4300.0	48.5	4.142
4400.0	48.5	4.253
4500.0	48.6	4.334
4600.0	48.1	4.374
4700.0	47.6	4.549
4800.0	47.2	4.828
4850.0	47.4	4.961
4900.0	47.8	4.978
4950.0	47.7	4.964
5000.0	47.5	5.004
5050.0	47.3	5.019
5100.0	46.9	5.060
5150.0	46.7	5.204
5200.0	46.7	5.356
5250.0	46.8	5.454
5300.0	46.9	5.517
5350.0	47.1	5.565
5400.0	46.9	5.540
5450.0	46.6	5.582
5500.0	46.5	5.672
5550.0	46.5	5.731
5600.0	46.3	5.798
5650.0	46.4	5.916
5700.0	46.7	5.925
5750.0	46.5	5.839
5800.0	45.9	5.924
5850.0	45.8	6.124
5900.0	46.1	6.187

EMC**Tissue - Equivalent Liquid**

EUT: HSL501	Work Order: INMC0737
Serial Number: SAU	Date: 10/03/2011
Customer: Intermec Technologies Corporation	Temperature (°C): 22.8
Attendees: none	Humidity: 47.8
Project: P-INMC018	Barometric Pres. (mb): 1011.20
Tested by: Jennifer Herrett	Power: None
Job Site: EV08	
TEST SPECIFICATIONS	
FCC 2.1093:2011	Test Method FCC OET 65C:2001
COMMENTS	
None	
DEVIATIONS FROM TEST STANDARD	
None	
Configuration #	None
Signature <i>Jennifer Herrett</i>	
Tissue: HSL501	
Liquid Temperature (°C): 22.4	

Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
5800	34.932	5.259	35.300	5.270	1.04	0.21
3400.0	38.2	2.934				
3450.0	38.3	2.965				
3500.0	38.3	2.981				
3550.0	38.2	3.029				
3600.0	38.2	3.074				
3650.0	38.2	3.083				
3700.0	38.0	3.108				
3750.0	37.8	3.177				
3800.0	37.8	3.244				
3850.0	37.8	3.288				
3900.0	37.8	3.344				
3950.0	37.9	3.408				
4000.0	37.9	3.440				
4050.0	37.8	3.460				
4100.0	37.7	3.506				
4150.0	37.6	3.557				
4200.0	37.5	3.601				
4250.0	37.3	3.667				
4300.0	37.3	3.738				
4350.0	37.4	3.791				
4400.0	37.3	3.838				
4450.0	37.4	3.891				
4500.0	37.4	3.914				
4550.0	37.3	3.909				
4600.0	37.0	3.936				
4650.0	36.8	4.004				
4700.0	36.6	4.067				
4750.0	36.4	4.149				
4800.0	36.2	4.287				
4850.0	36.4	4.408				
4900.0	36.7	4.437				
4950.0	36.7	4.432				
5000.0	36.6	4.448				
5050.0	36.4	4.452				
5100.0	36.1	4.481				
5150.0	35.8	4.582				
5200.0	35.7	4.703				
5250.0	35.8	4.793				
5300.0	35.8	4.869				
5350.0	35.9	4.910				
5400.0	35.8	4.902				
5450.0	35.5	4.926				
5500.0	35.3	5.010				
5550.0	35.3	5.073				
5600.0	35.2	5.134				
5650.0	35.2	5.232				
5700.0	35.4	5.274				
5750.0	35.4	5.230				
5800.0	34.9	5.259				
5850.0	34.7	5.406				
5900.0	34.9	5.476				

Requirement

Per IEEE 1528, Section 8.2.1, "System checks are performed prior to compliance tests and the results must always be within $\pm 10\%$ of the target value corresponding to the test frequency, liquid, and the source used. The target values are 1 g or 10 g averaged SAR values measured on systems having current system validation and calibration status, and using the system check setup as shown in Figure 14. These target values should be determined using a standard source."

Test Description

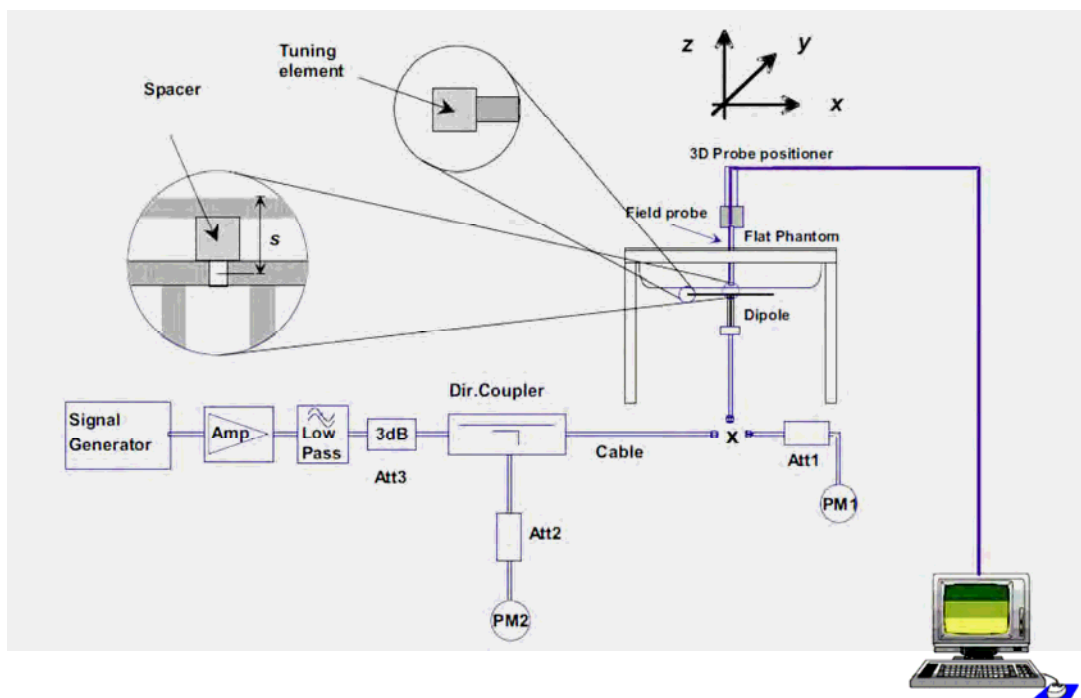
Within 24 hours of a measurement, Northwest EMC used the system validation kit (calibrated reference dipole) to test whether the system was operating within its specifications. The validation was performed in the indicated bands by making SAR measurements of the reference dipole with the phantom filled with the tissue-equivalent liquid. First, a signal generator and power amplifier were used to produce a 100mW level as measured with a power meter at the antenna terminals of the dipole. Then, the reference dipole was positioned below the bottom of the phantom and centered with its axis parallel to the longest side of the phantom. A low loss and low relative permittivity spacer was used to establish the correct distance between the center axis of the reference dipole and the liquid.

For the reference dipoles, the spacing distance s is given by:

$s = 15\text{mm}, \pm 0.2\text{mm}$ for $300\text{MHz} \leq f \leq 1000 \text{ MHz}$:

$s = 10\text{mm}, \pm 0.2\text{mm}$ for $1000\text{MHz} \leq f \leq 6000\text{MHz}$

The measured 1 g and 10 g spatial average SAR values were normalized to a 1W dipole input power for comparison to the calibration data. The results are summarized in the attached table. The deviation is less than 10% in all cases, indicating that the system performance check was within tolerance.



EUT: System Verifications	Work Order: INMC0737
Serial Number: Various	Date: See Data Sheets
Customer: Intermec Technologies Corporation	Temperature: See Data Sheets
Attendees: None	Humidity: See Data Sheets
Project: INMC0737	Barometric Pres.: See Data Sheets
Tested by: Jennifer Herrett	Job Site: EV08
TEST SPECIFICATIONS	
Test Method	
FCC 2.1093:2011	FCC OET 65C:2001
FCC 15.247:2011	IEEE Std 1528:2003
FCC 15.407:2001	FCC KDB 447498 D01 v04
	FCC KDB 248227 D01 V01r02
	FCC KDB 648474 D01 V01r05
	FCC 865664
Health Safety Code 6:2009	RSS-102, Issue 4:2010
COMMENTS	
None	
DEVIATIONS FROM TEST STANDARD	
No Deviations	
Configuration #	None
	Signature <i>Jennifer Herrett</i>

Date	Liquid part number and frequency	Conducted Power into the Dipole (dBm)	Correction Factor	1g Measured	10g Measured	1g Normalized to 1W	10g Normalized to 1W	Target 1g (Normalized to 1W) - Get from Dipole cal cert	Target 10g (Normalized to 1W) - Get from Dipole cal cert	% difference 1g	% difference 10 g	Comments
9/21/2011	HSL2450 2450MHz	19.98	10.05	4.82	2.24	48.42	22.50	53.40	24.70	-9.32	-8.89	
9/21/2011	MSL2450 2450MHz	20.00	10.00	5.26	2.43	52.60	24.30	51.50	23.90	2.14	1.67	
9/23/2011	MSL501 5200MHz	19.81	10.45	6.92	1.98	72.29	20.69	78.10	21.60	-7.43	-4.23	
9/23/2011	MSL501 5500MHz	19.32	11.69	6.92	1.95	80.93	22.81	89.30	25.00	-9.37	-8.78	
9/23/2011	MSL501 5800MHz	18.40	14.45	4.77	1.34	68.95	19.37	75.60	20.70	-8.80	-6.43	
9/28/2011	HSL501 5200MHz	19.53	11.14	7.25	2.08	80.79	23.18	83.80	23.60	-3.60	-1.79	
9/28/2011	HSL501 5500MHz	19.24	11.91	7.35	2.09	87.56	24.90	89.30	25.00	-1.95	-0.41	
9/28/2011	HSL501 5800MHz	18.21	15.10	5.71	1.64	86.23	24.77	82.90	23.30	4.01	6.29	
10/3/2011	MSL501 5800MHz	18.45	14.29	4.79	1.35	68.44	19.29	75.60	20.70	-9.47	-6.81	
10/3/2011	HSL501 5800MHz	18.45	14.29	6.03	1.72	86.16	24.58	82.90	23.30	3.94	5.48	
10/3/2011	HSL501 5500MHz	19.50	11.22	8.37	2.38	93.91	26.70	89.30	25.00	5.17	6.82	
10/4/2011	HSL501 5200MHz	19.64	10.86	7.57	2.17	82.24	23.58	83.80	23.60	-1.86	-0.10	

Room Temperature (°C):	24.9	Humidity (%):	44.1	Test Date:	09/21/11
Liquid Temperature (°C):	22.4	Barometric Pressure (mb):	1013.7	Tested by:	Ethan Schoonover

MSL2450 System Check_2450MHz 9-21-11

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN 855

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.956$ mho/m; $\epsilon_r = 50.239$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.95627$ mho/m, $\epsilon_r = 50.2388$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.05, 4.05, 4.05); Calibrated: 2/23/2011
 Sensor-Surface: 5mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 5.448 mW/g

System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 46.640 V/m

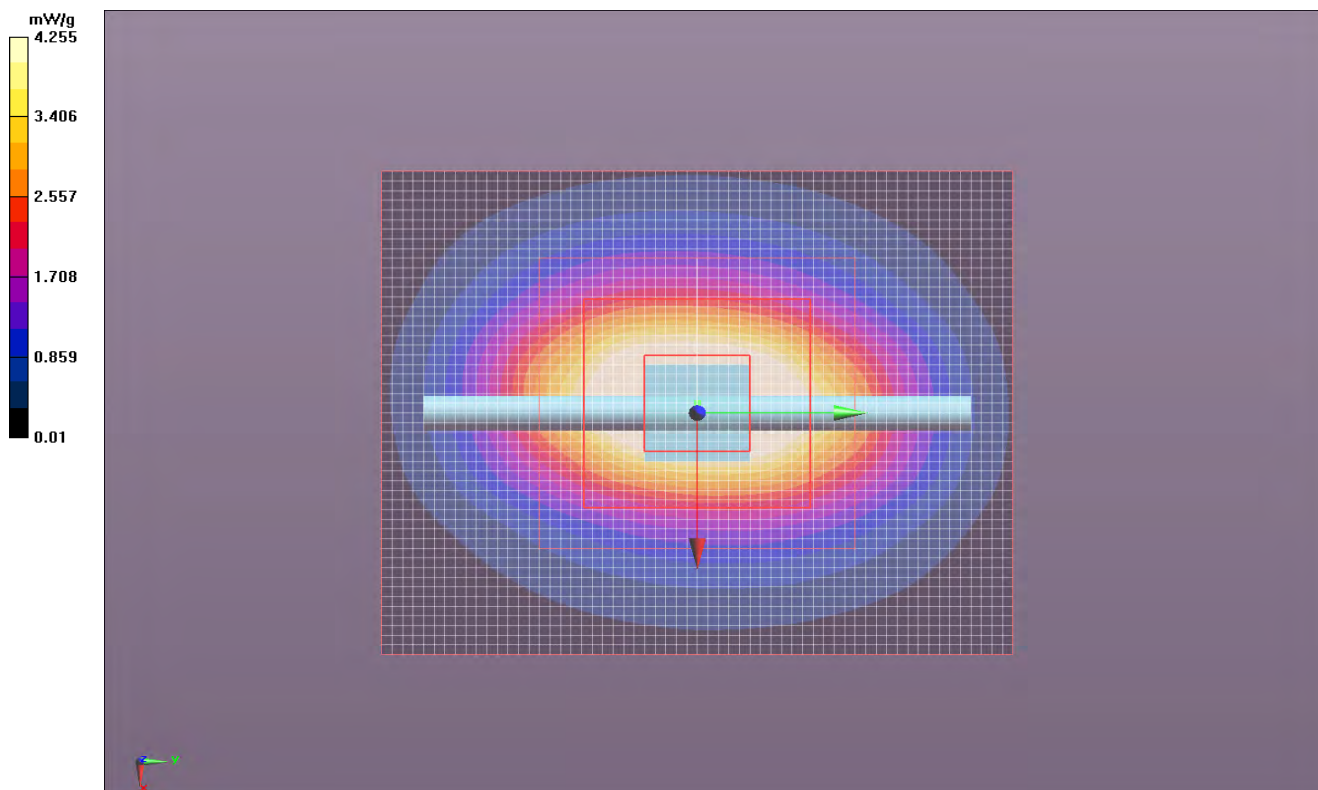
System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.174 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 10.951 W/kg

SAR(1 g) = 5.26 mW/g; SAR(10 g) = 2.43 mW/g

Maximum value of SAR (measured) = 5.238 mW/g



Room Temperature (°C):	24.9	Humidity (%):	44.1	Test Date:	09/21/11
Liquid Temperature (°C):	22.4	Barometric Pressure (mb):	1013.7	Tested by:	Ethan Schoonover

HSL2450 System Check_2450MHz 9-21-11

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN 855

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.865$ mho/m; $\epsilon_r = 38.361$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.86538$ mho/m, $\epsilon_r = 38.3609$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.26, 4.26, 4.26); Calibrated: 2/23/2011
 Sensor-Surface: 5mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 4.793 mW/g

System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 67.679 V/m

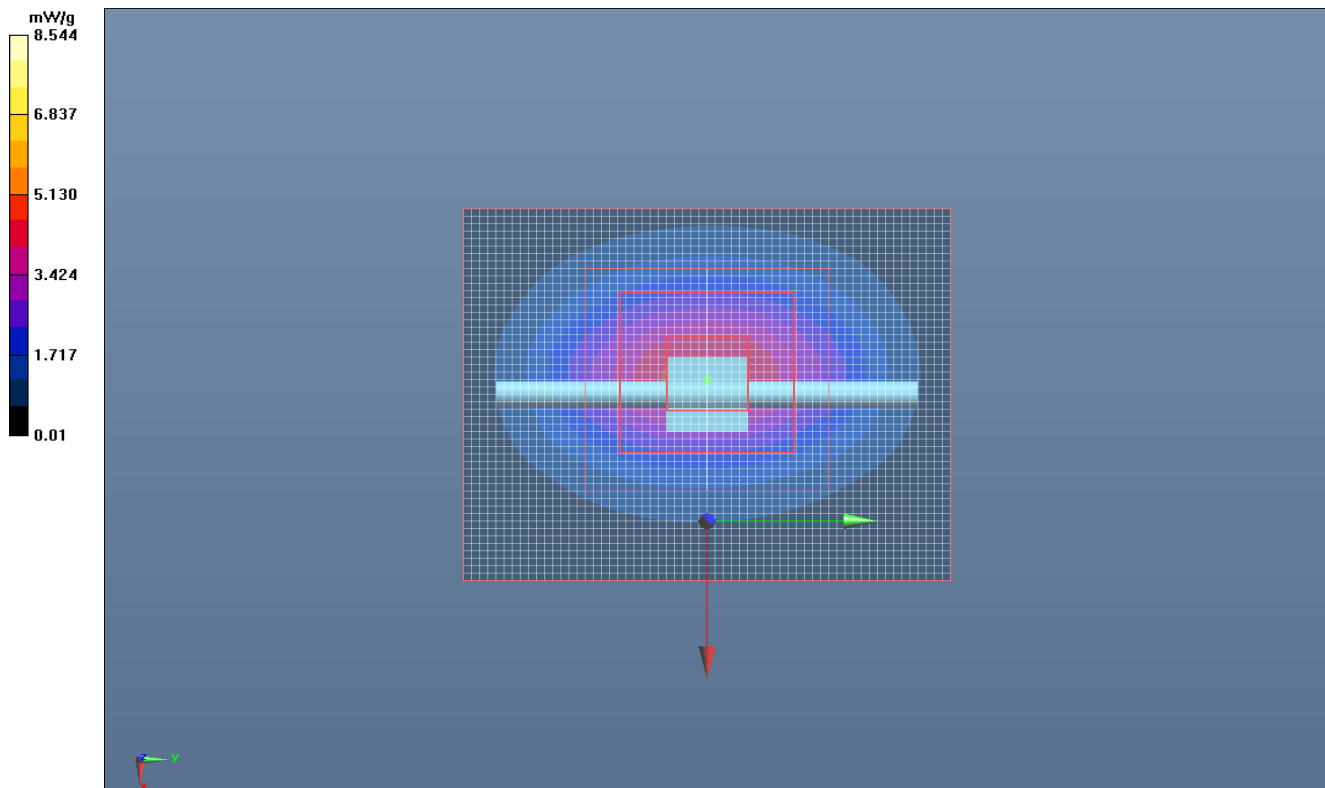
System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 49.350 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 10.073 W/kg

SAR(1 g) = 4.82 mW/g; SAR(10 g) = 2.24 mW/g

Maximum value of SAR (measured) = 4.708 mW/g



Room Temperature (°C):	23.1	Humidity (%):	48.4	Test Date:	09/23/11
Liquid Temperature (°C):	21	Barometric Pressure (mb):	1017.9	Tested by:	Ethan Schoonover

MSL501 System Check_5200MHz 9-23-11

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1066

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5200 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 5200$ MHz; $\sigma = 5.133$ mho/m; $\epsilon_r = 46.764$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.13335$ mho/m, $\epsilon_r = 46.7638$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.16, 4.16, 4.16); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check - Low Channel/Zoom Scan (7x9x7) (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 56.351 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 26.498 W/kg

SAR(1 g) = 6.92 mW/g; SAR(10 g) = 1.98 mW/g

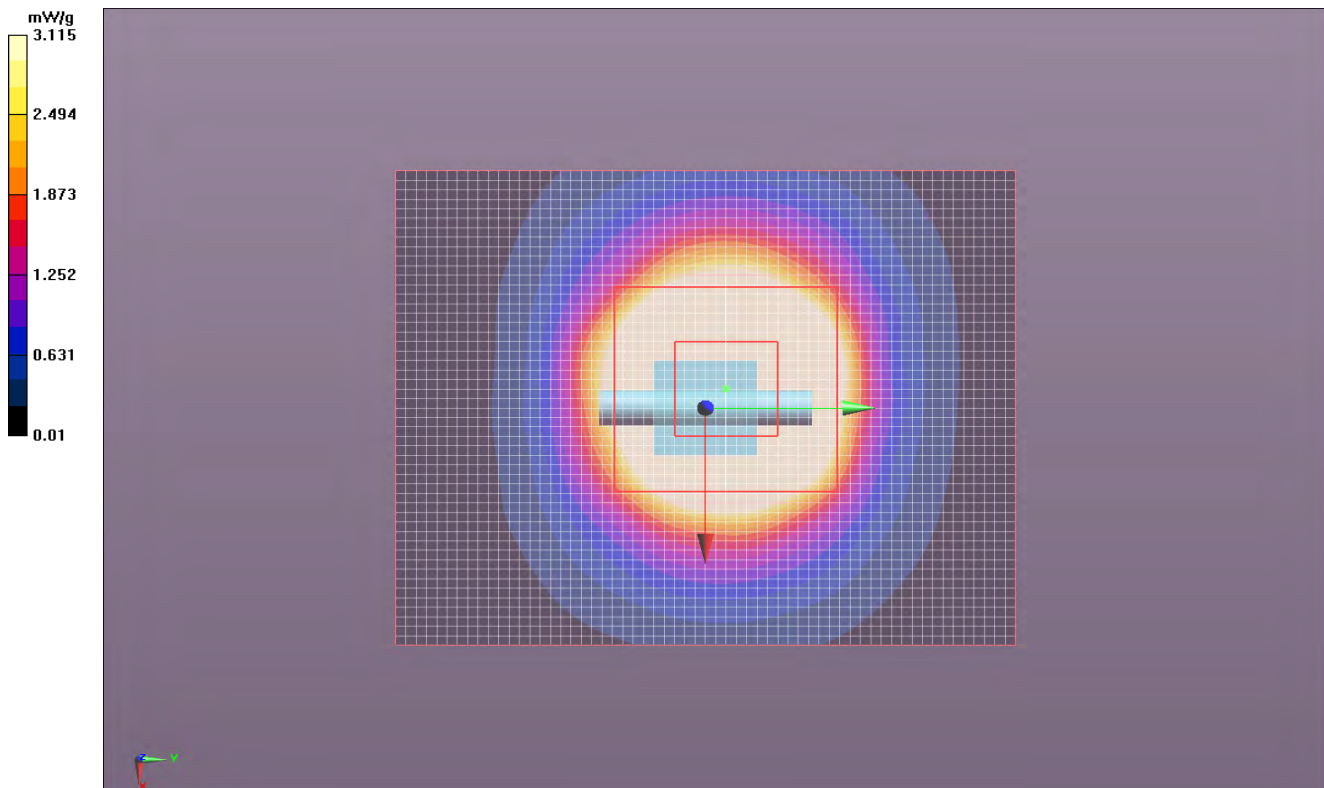
Maximum value of SAR (measured) = 14.596 mW/g

System Check/System Check - Low Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 15.057 mW/g

System Check/System Check - Low Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 24.632 V/m



Room Temperature (°C):	22.9	Humidity (%):	49.6	Test Date:	09/23/11
Liquid Temperature (°C):	21	Barometric Pressure (mb):	1017.9	Tested by:	Ethan Schoonover

MSL501 System Check_5500MHz 9-23-11

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1066

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5500 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 5500$ MHz; $\sigma = 5.497$ mho/m; $\epsilon_r = 46.341$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.4975$ mho/m, $\epsilon_r = 46.3409$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.69, 3.69, 3.69); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check - Mid Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 15.359 mW/g

System Check/System Check - Mid Channel/Zoom Scan (7x9x7) (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 56.189 V/m; Power Drift = -0.0079 dB

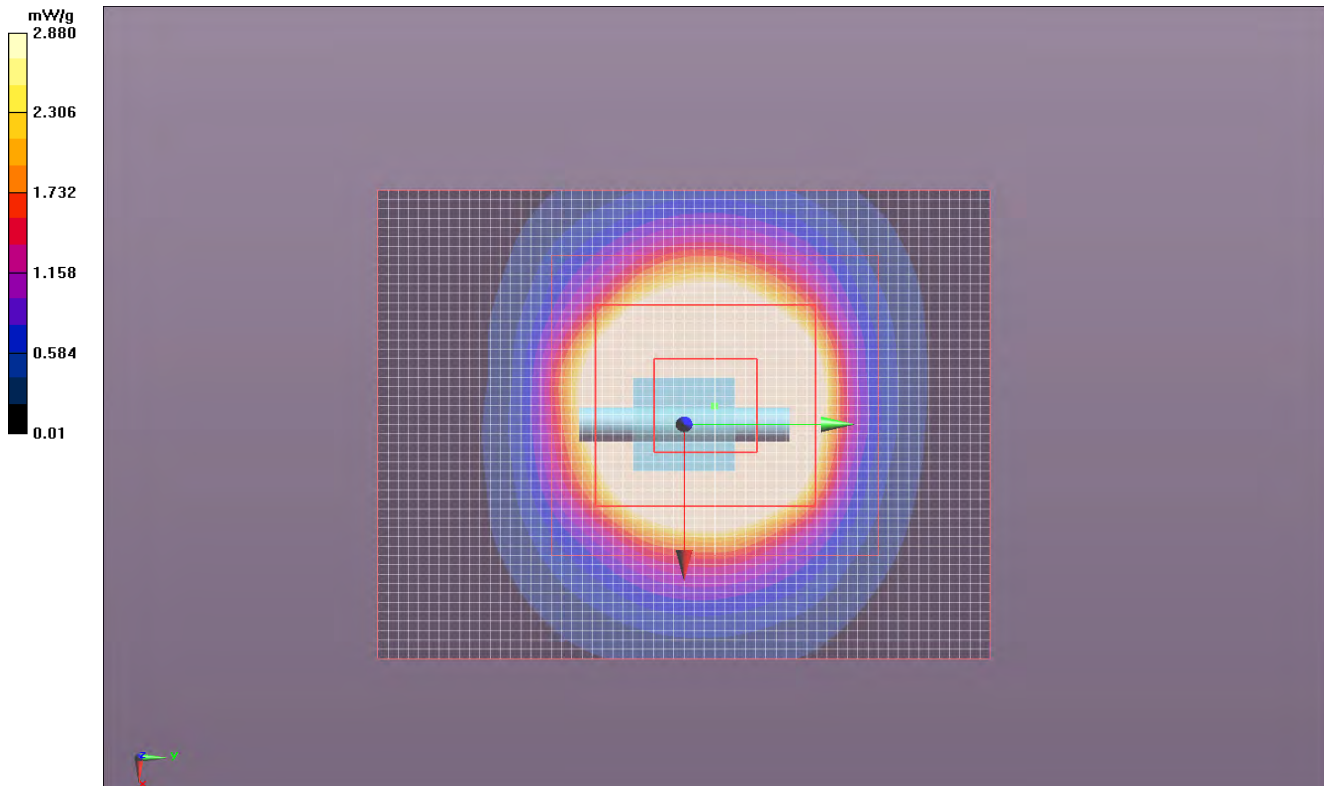
Peak SAR (extrapolated) = 27.299 W/kg

SAR(1 g) = 6.92 mW/g; SAR(10 g) = 1.95 mW/g

Maximum value of SAR (measured) = 14.510 mW/g

System Check/System Check - Mid Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 22.887 V/m



Room Temperature (°C):	22.7	Humidity (%):	51.5	Test Date:	09/23/11
Liquid Temperature (°C):	21	Barometric Pressure (mb):	1017.9	Tested by:	Ethan Schoonover

MSL501 System Check_5800MHz 9-23-11

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1066

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5800 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 5800$ MHz; $\sigma = 5.886$ mho/m; $\epsilon_r = 45.801$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.88612$ mho/m, $\epsilon_r = 45.8012$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

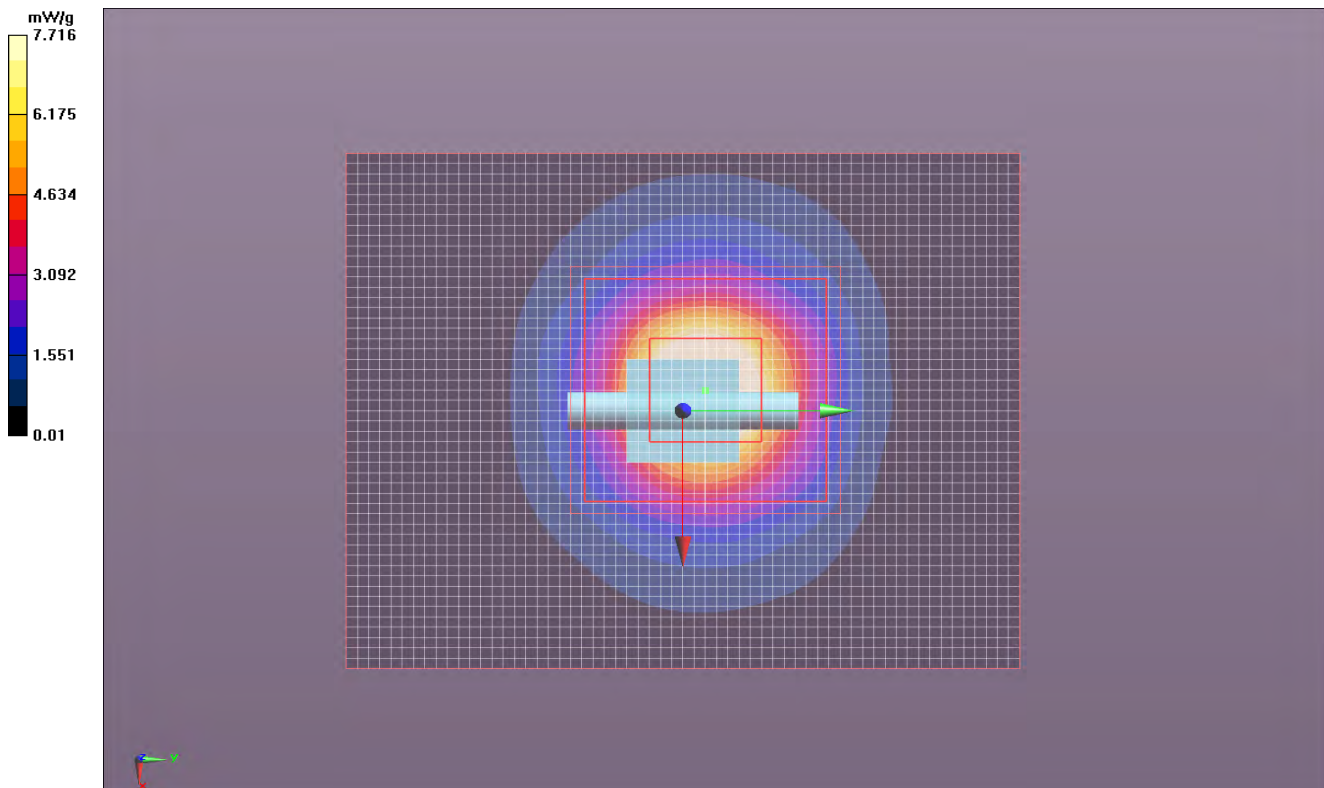
DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.87, 3.87, 3.87); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check - High Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 10.337 mW/g

System Check/System Check - High Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 36.206 V/m

System Check/System Check - High Channel/Zoom Scan (7x9x7) (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
 Reference Value = 36.980 V/m; Power Drift = -0.18 dB
 Peak SAR (extrapolated) = 20.123 W/kg
SAR(1 g) = 4.77 mW/g; SAR(10 g) = 1.34 mW/g
 Maximum value of SAR (measured) = 10.267 mW/g



Room Temperature (°C):	23.3	Humidity (%):	37.7	Test Date:	09/28/11
Liquid Temperature (°C):	21.4	Barometric Pressure (mb):	1019.7	Tested by:	Jennifer Herrett

HSL5800 System Check_5200MHz 9-28-11

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:xxx

Communication System: CW; Communication System Band: ITD5500 (5000.0 - 5900.0 MHz); Frequency: 5200 MHz; Communication System PAR: 0 dB
 Medium parameters used: $\sigma = 4.49083$ mho/m, $\epsilon_r = 35.0002$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5200$ MHz; $\sigma = 4.491$ mho/m; $\epsilon_r = 35$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(5.08, 5.08, 5.08); Calibrated: 11/11/2010
 Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 2mm (Mechanical Surface Detection)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check - Low Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 66.898 V/m

System Check/System Check - Low Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 57.645 V/m; Power Drift = 0.16 dB

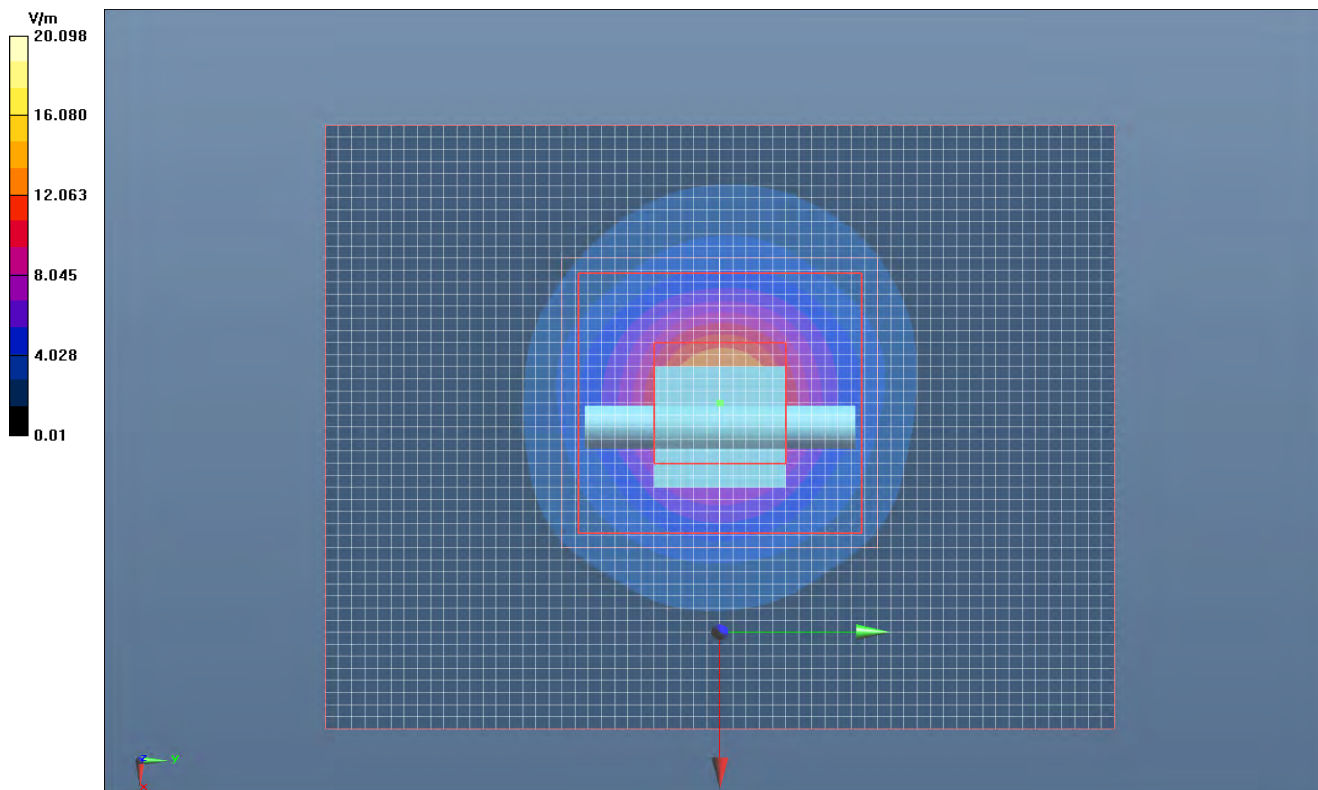
Peak SAR (extrapolated) = 31.120 W/kg

SAR(1 g) = 7.25 mW/g; SAR(10 g) = 2.08 mW/g

Maximum value of SAR (measured) = 15.292 mW/g

System Check/System Check - Low Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 15.051 mW/g



Room Temperature (°C):	23.3	Humidity (%):	37.7	Test Date:	09/28/11
Liquid Temperature (°C):	21.4	Barometric Pressure (mb):	1019.7	Tested by:	Jennifer Herrett

HSL5800 System Check_5500MHz 9-28-11

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:xxx

Communication System: CW; Communication System Band: ITD5500 (5000.0 - 5900.0 MHz); Frequency: 5500 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 5500$ MHz; $\sigma = 4.783$ mho/m; $\epsilon_r = 34.534$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 4.78262$ mho/m, $\epsilon_r = 34.5338$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.37, 4.37, 4.37); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check - Mid Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 15.776 mW/g

System Check/System Check - Mid Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 69.106 V/m

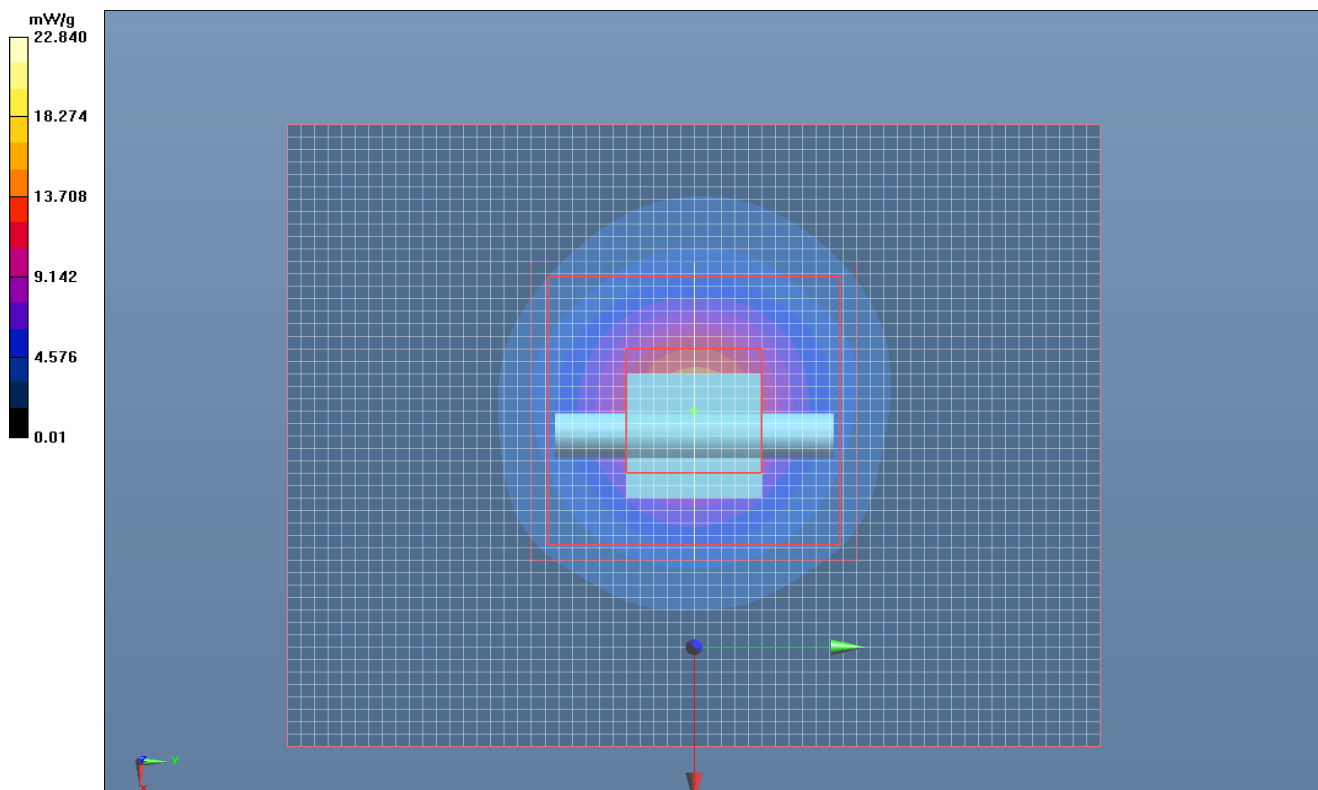
System Check/System Check - Mid Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 60.371 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 29.862 W/kg

SAR(1 g) = 7.35 mW/g; SAR(10 g) = 2.09 mW/g

Maximum value of SAR (measured) = 15.608 mW/g



Room Temperature (°C):	23.3	Humidity (%):	37.7	Test Date:	09/28/11
Liquid Temperature (°C):	21.4	Barometric Pressure (mb):	1019.7	Tested by:	Jennifer Herrett

HSL5800 System Check_5800MHz 9-28-11

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:xxx

Communication System: CW; Communication System Band: ITD5500 (5000.0 - 5900.0 MHz); Frequency: 5800 MHz; Communication System PAR: 0 dB
 Medium parameters used: $\sigma = 5.07166$ mho/m, $\epsilon_r = 34.0145$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5800$ MHz; $\sigma = 5.072$ mho/m; $\epsilon_r = 34.014$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.14, 4.14, 4.14); Calibrated: 11/11/2010
 Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 2mm (Mechanical Surface Detection)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check - High Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 60.629 V/m

System Check/System Check - High Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 12.009 mW/g

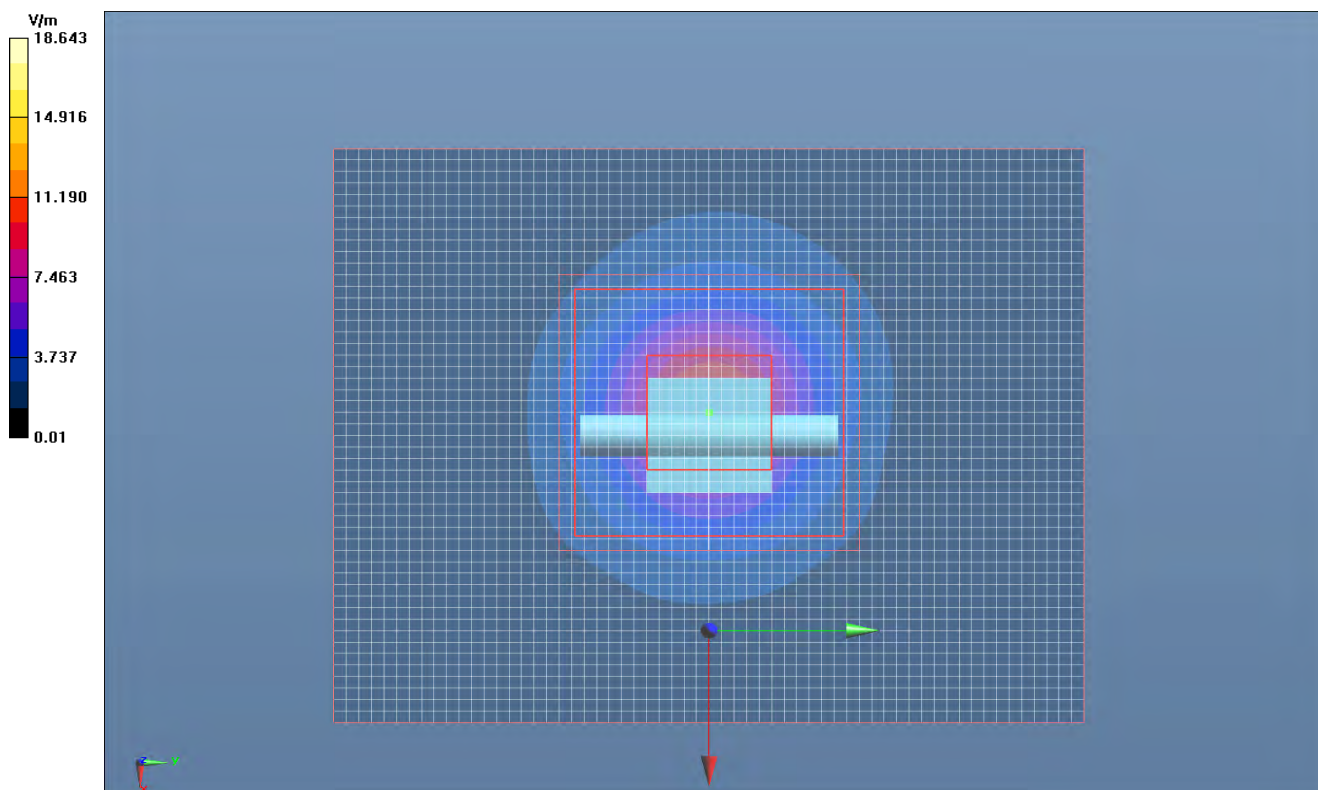
System Check/System Check - High Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 51.437 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 24.229 W/kg

SAR(1 g) = 5.71 mW/g; SAR(10 g) = 1.64 mW/g

Maximum value of SAR (measured) = 12.272 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	23.3	Humidity (%):	45.8	Test Date:	10/03/11
Liquid Temperature (°C):	22.6	Barometric Pressure (mb):	1011.2	Tested by:	Jennifer Herrett

MSL501 System Check_5800MHz 10-3-11

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1066

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5800 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 5800$ MHz; $\sigma = 5.924$ mho/m; $\epsilon = 45.902$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.92394$ mho/m, $\epsilon = 45.9024$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASYS Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.87, 3.87, 3.87); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check - High Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 10.748 mW/g

System Check/System Check - High Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 35.991 V/m

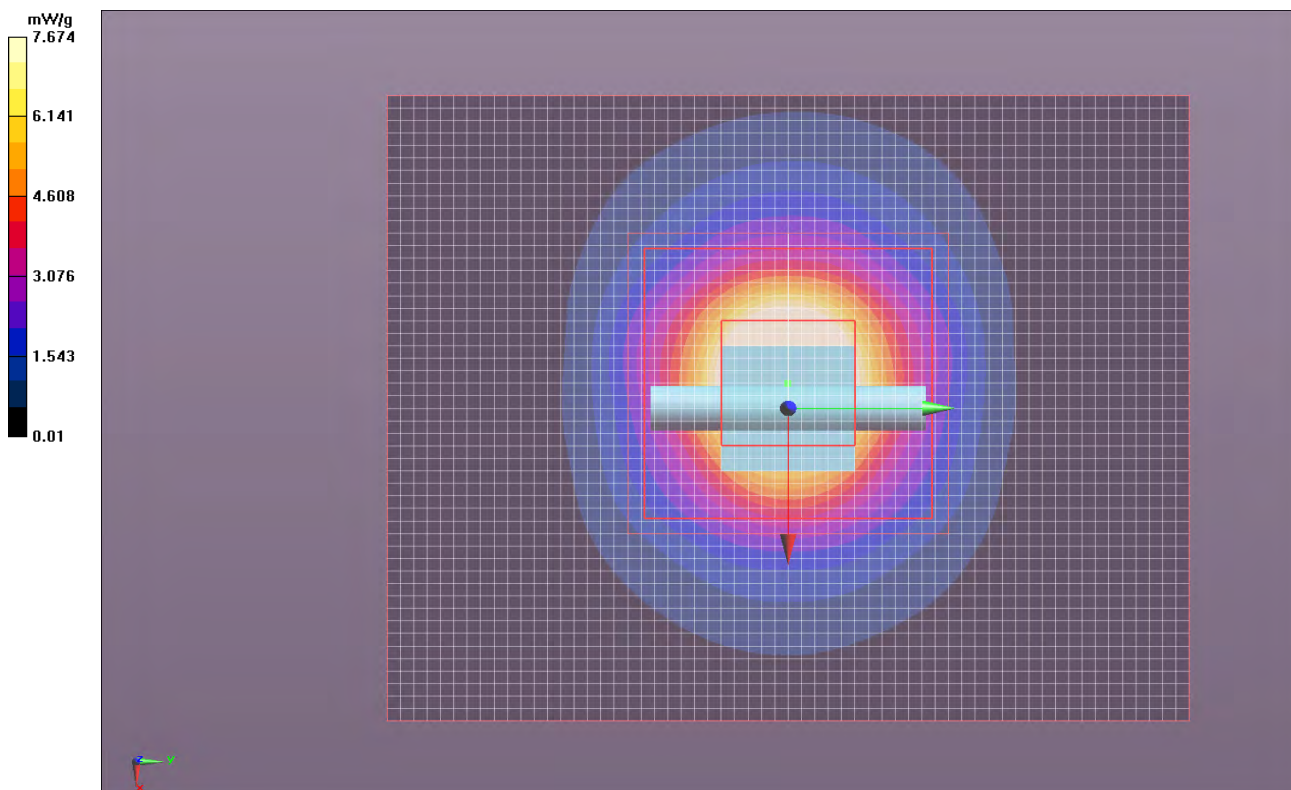
System Check/System Check - High Channel/Zoom Scan (7x9x7) (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 37.102 V/m; Power Drift = -0.27 dB

Peak SAR (extrapolated) = 19.813 W/kg

SAR(1 g) = 4.79 mW/g; SAR(10 g) = 1.35 mW/g

Maximum value of SAR (measured) = 10.406 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	23.3	Humidity (%):	45.8	Test Date:	10/03/11
Liquid Temperature (°C):	22.6	Barometric Pressure (mb):	1011.2	Tested by:	Jennifer Herrett

HSL501 System Check_5800MHz 10-3-11

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1066

Communication System: CW; Communication System Band: ITD5500 (5000.0 - 5900.0 MHz); Frequency: 5800 MHz; Communication System PAR: 0 dB
 Medium parameters used: $\sigma = 5.25887$ mho/m, $\epsilon = 34.9322$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5800$ MHz; $\sigma = 5.259$ mho/m; $\epsilon = 34.932$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.14, 4.14, 4.14); Calibrated: 11/11/2010
 Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 2mm (Mechanical Surface Detection)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check - High Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 60.275 V/m

System Check/System Check - High Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 12.844 mW/g

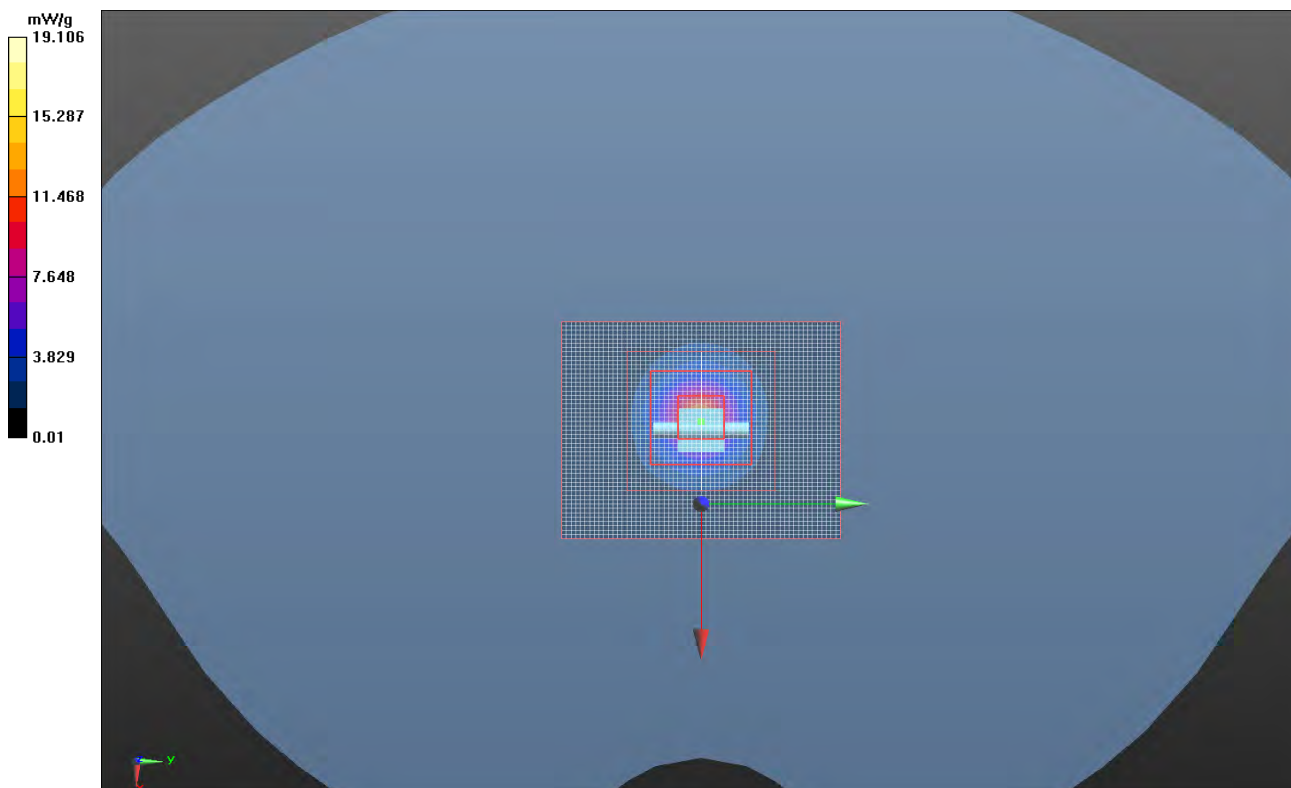
System Check/System Check - High Channel/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 51.395 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 25.567 W/kg

SAR(1 g) = 6.03 mW/g; SAR(10 g) = 1.72 mW/g

Maximum value of SAR (measured) = 12.799 mW/g



Room Temperature (°C):	23.3	Humidity (%):	45.8	Test Date:	10/03/11
Liquid Temperature (°C):	22.6	Barometric Pressure (mb):	1011.2	Tested by:	Jennifer Herrett

HSL501 System Check_5500MHz 10-3-11

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1066

Communication System: CW; Communication System Band: ITD5500 (5000.0 - 5900.0 MHz); Frequency: 5500 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 5500$ MHz; $\sigma = 5.01$ mho/m; $\epsilon = 35.35$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.00956$ mho/m, $\epsilon = 35.3498$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASYS Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.37, 4.37, 4.37); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check - Mid Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 18.529 mW/g

System Check/System Check - Mid Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 71.151 V/m

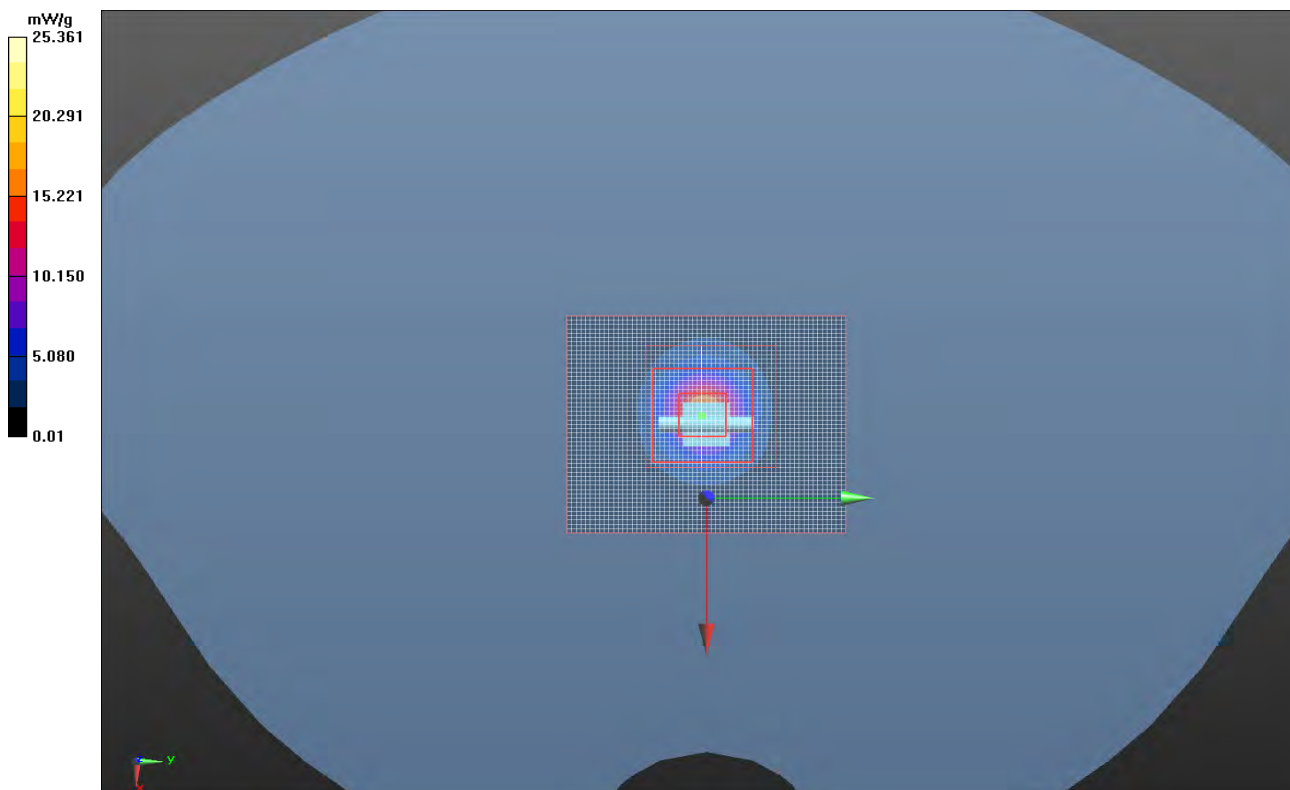
System Check/System Check - Mid Channel/Zoom Scan (8x8x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 59.148 V/m; Power Drift = 0.25 dB

Peak SAR (extrapolated) = 34.776 W/kg

SAR(1 g) = 8.37 mW/g; SAR(10 g) = 2.38 mW/g

Maximum value of SAR (measured) = 17.659 mW/g



Room Temperature (°C):	24.2	Humidity (%):	42.1	Test Date:	10/04/11
Liquid Temperature (°C):	23.5	Barometric Pressure (mb):	1008	Tested by:	Jennifer Herrett

HSL501 System Check_5200MHz 10-4-11

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1066

Communication System: CW; Communication System Band: ITD5500 (5000.0 - 5900.0 MHz); Frequency: 5200 MHz; Communication System PAR: 0 dB
 Medium parameters used: $\sigma = 4.70293$ mho/m, $\epsilon_r = 35.7323$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5200$ MHz; $\sigma = 4.703$ mho/m; $\epsilon_r = 35.732$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(5.08, 5.08, 5.08); Calibrated: 11/11/2010
 Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 2mm (Mechanical Surface Detection)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check - Low Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 68.856 V/m

System Check/System Check - Low Channel/Zoom Scan (8x8x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 60.599 V/m; Power Drift = -0.15 dB

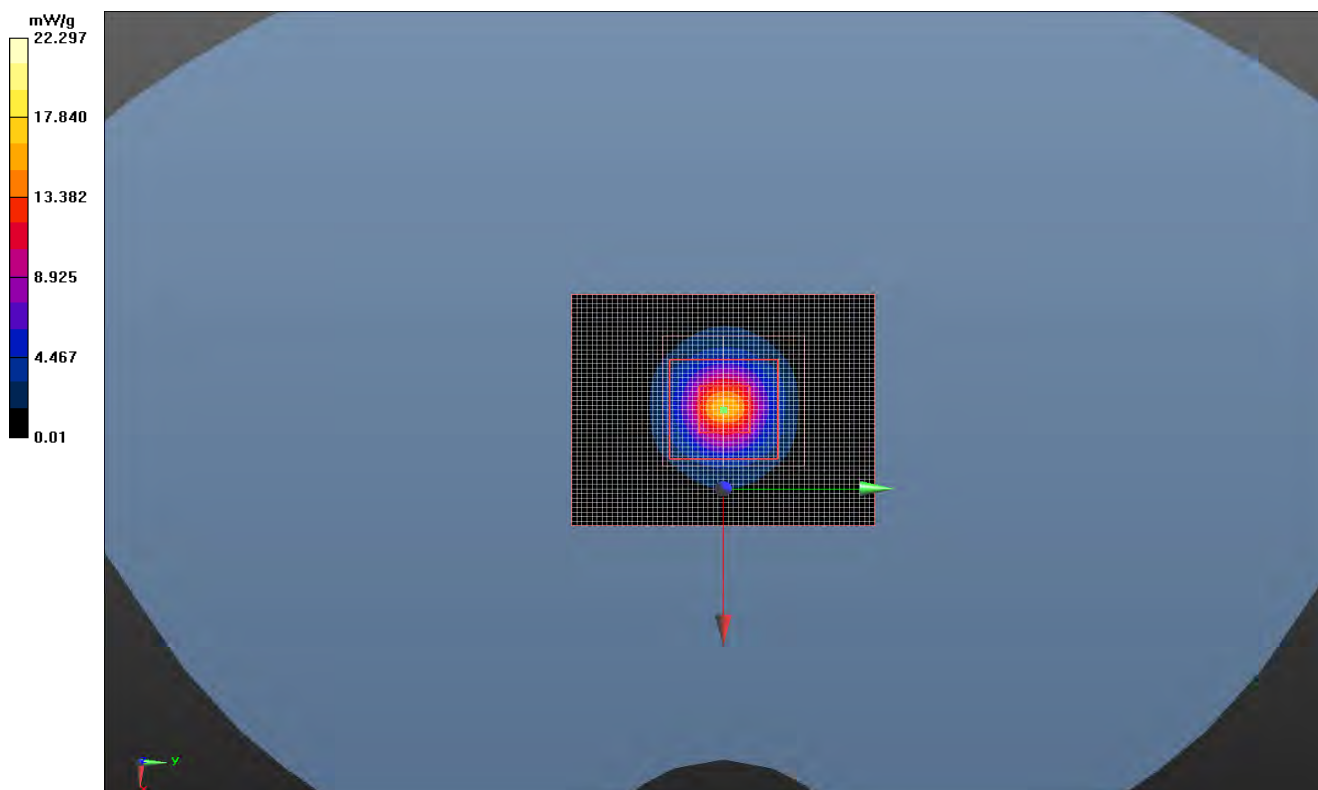
Peak SAR (extrapolated) = 31.998 W/kg

SAR(1 g) = 7.57 mW/g; SAR(10 g) = 2.17 mW/g

Maximum value of SAR (measured) = 15.842 mW/g

System Check/System Check - Low Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 16.325 mW/g



Test Configurations

In normal operation, the EUT can be held in the hand, or next to the head like a cellular handset, or worn on the wrist/arm in a holster. The wrist holster is specially designed for airline baggage handlers to have their hands free, but still be able to scan bar-codes. The only Intermec approved accessory for body worn operation for the EUT is this wrist holster. The EUT can only fit in the holster with the top end of the unit pointing towards the hand and the keypad facing up away from the arm.

No snap-on accessories can be connected to the EUT while it is in the wrist holster.

The EUT is powered by a lithium-ion battery, Model 1000AB01. It was fully charged before each SAR evaluation.

Prior to this SAR evaluation, a non-PBA KDB inquiry was made to the FCC to confirm that a body phantom and body tissue equivalent liquids could be used for the evaluation of the wrist holster on three sides (left, right, back). The FCC agreed with the proposal (see KDB tracking #758326). SAR measurements of the head configurations that produced the highest SAR in the original filing were also made (see KDB 178919 D01 Permissive Change Policy v05r01, Item #5b).

Per KDB 648474, among the channels required for normal testing, SAR must be measured on the highest conducted output power channel in each band (see highlighted values in the Output Power section of this report). Since the measured SAR on the highest output channel is < 0.8 W/kg, SAR evaluation for the other required channels was not performed (reference also KDB 447498 Section 1(e))

All testing was performed with the EUT configured in a worst-case configuration and operating mode to produce the highest SAR levels. The EUT used Intermec test software that permitted the selection of transmit channel, modulation type, and data rate. It operated continuously at nearly 100% duty cycle.

Summary

The following tables summarize the measured SAR values.

SAR TEST DATA

EMC

EUT:	1000CP03C	Work Order:	INMC0737
Serial Number:	14621142016	Date:	See Data Sheets
Customer:	Intermec Technologies Corporation	Temperature:	See Data Sheets
Attendees:	None	Humidity:	See Data Sheets
Project:	P-INMC018	Barometric Pres.:	See Data Sheets
Tested by:	Jennifer Herrett	Job Site:	EV08
TEST SPECIFICATIONS		Test Method	
FCC 2.1093:2011		FCC OET 65C:2001	
FCC 15.247:2011		IEEE Std 1528:2003	
FCC 15.407:2001		FCC KDB 447498 D01 v04	
		FCC KDB 248227 D01 V01r02	
		FCC KDB 648474 D01 V01r05	
		FCC 865664	
Health Safety Code 6:2009		RSS-102, Issue 4:2010	
COMMENTS			
Worst case configuration from original SAR evaluation conducted in Feb 2011			
DEVIATIONS FROM TEST STANDARD			
No Deviations			
Configuration #	1	Signature <i>Jennifer Herrett</i>	

Test Configuration	Frequency Band	Body-Worn Accessory	Transmit Frequency	Transmit Channel	Transmit Mode	Data Rate (Mbps)	Audio Accessory	EUT Position	Start Power (Conducted) (Watts)	SAR Drift During Test (dB)	1g SAR Level (W/kg)	Test #
Head	2450	None	2462MHz	11	BPSK	1Mbps	None	Left Cheek	0.055	0.08	0.239	1
								Right Cheek		0.08	0.169	3
								Right Tilt		-0.02	0.172	4

Room Temperature (°C):	23.3	Humidity (%):	42	Test Date:	09/22/11
Liquid Temperature (°C):	22.2	Barometric Pressure (mb):	1017	Tested by:	Ethan Schoonover

Body Test 1b 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Frequency: 2462 MHz; Communication System PAR: 0 dB
 Medium parameters used: $\sigma = 1.86538$ mho/m, $\epsilon_r = 38.3609$; $\rho = 1000$ kg/m³, Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.879$ mho/m; $\epsilon_r = 38.311$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.26, 4.26, 4.26); Calibrated: 2/23/2011
 Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 3mm (Mechanical Surface Detection)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head - Left/Cheek/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 8.956 V/m

Head - Left/Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 12.994 V/m; Power Drift = 0.08 dB
 Peak SAR (extrapolated) = 0.478 W/kg
SAR(1 g) = 0.239 mW/g; SAR(10 g) = 0.125 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.300 mW/g

Head - Left/Cheek/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm

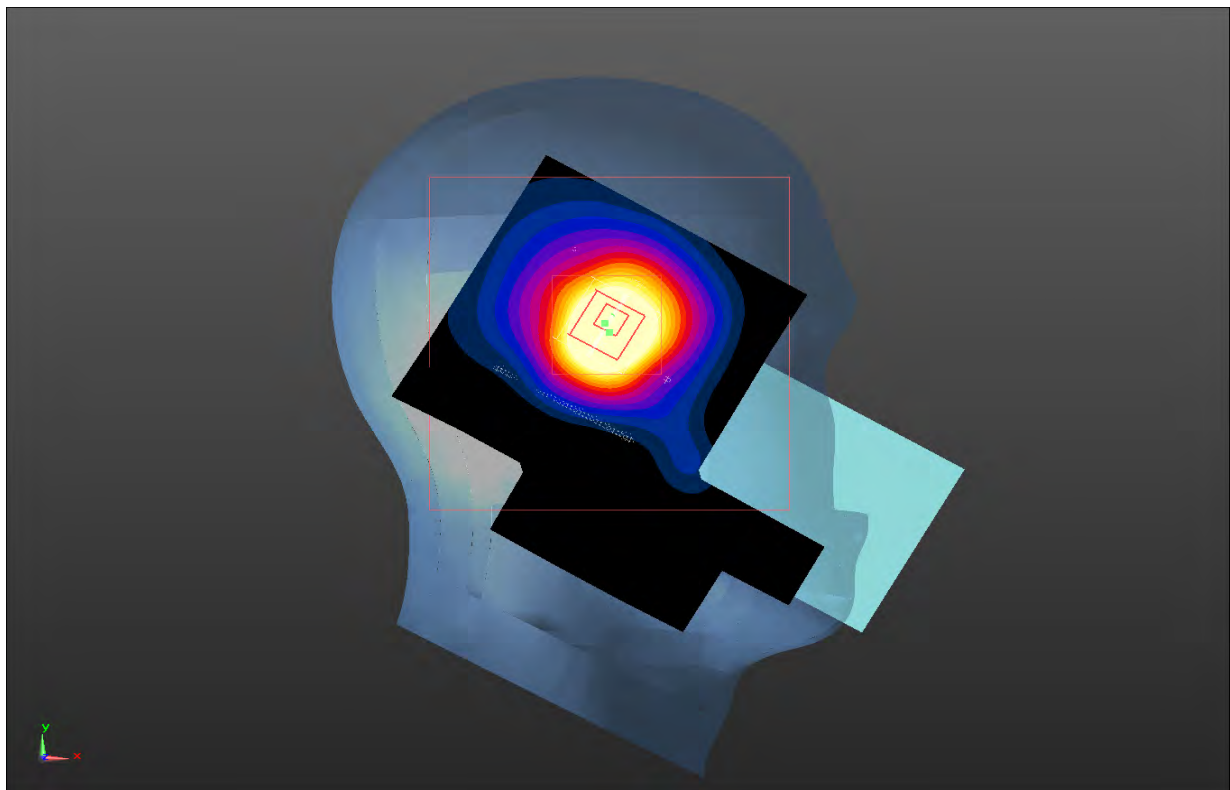
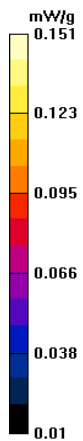
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.240 mW/g

Head - Left/Cheek/Area scan (71x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.304 mW/g



Room Temperature (°C):	24.1	Humidity (%):	45.8	Test Date:	09/22/11
Liquid Temperature (°C):	22.1	Barometric Pressure (mb):	1015.7	Tested by:	Jennifer Herrett

Head Test 3 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Frequency: 2462 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.879$ mho/m; $\epsilon = 38.311$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.86538$ mho/m, $\epsilon = 38.3609$; $\rho = 1000$ kg/m³
 Phantom section: Right Section
 Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASYS5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.26, 4.26, 4.26); Calibrated: 2/23/2011
 Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head - Right/Cheek/Area scan (71x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 0.201 mW/g

Head - Right/Cheek/Reference scan (51x81x1): Measurement grid: dx=30mm, dy=30mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 0.141 mW/g

Head - Right/Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.149 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.318 W/kg

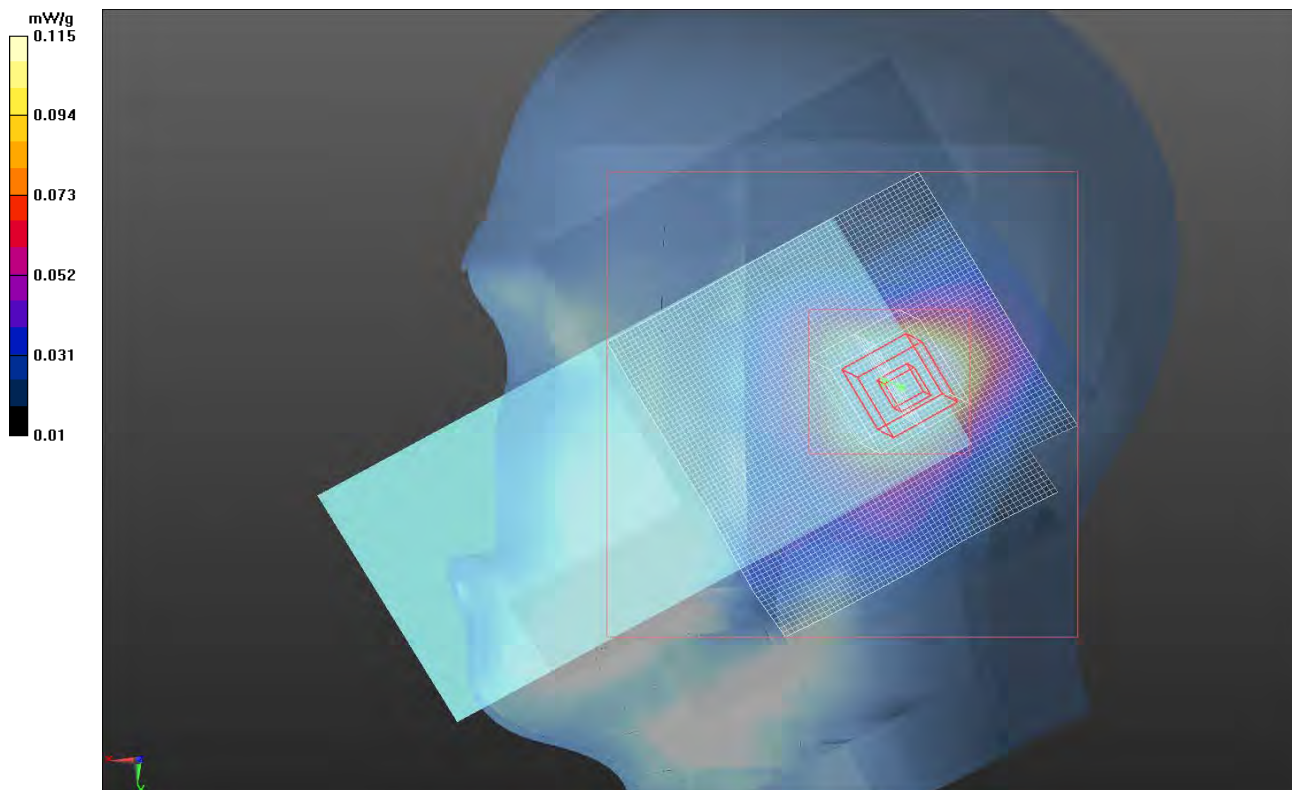
SAR(1 g) = 0.169 mW/g; SAR(10 g) = 0.089 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.213 mW/g

Head - Right/Cheek/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 7.819 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	24.1	Humidity (%):	45.8	Test Date:	09/22/11
Liquid Temperature (°C):	22.1	Barometric Pressure (mb):	1015.7	Tested by:	Jennifer Herrett

Head Test 4 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Frequency: 2462 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.879$ mho/m; $\epsilon = 38.311$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.86538$ mho/m, $\epsilon = 38.3609$; $\rho = 1000$ kg/m³
 Phantom section: Right Section
 Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASYS5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.26, 4.26, 4.26); Calibrated: 2/23/2011
 Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head - Right/Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.632 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.322 W/kg

SAR(1 g) = 0.172 mW/g; SAR(10 g) = 0.090 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.216 mW/g

Head - Right/Tilt/Area scan (71x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.201 mW/g

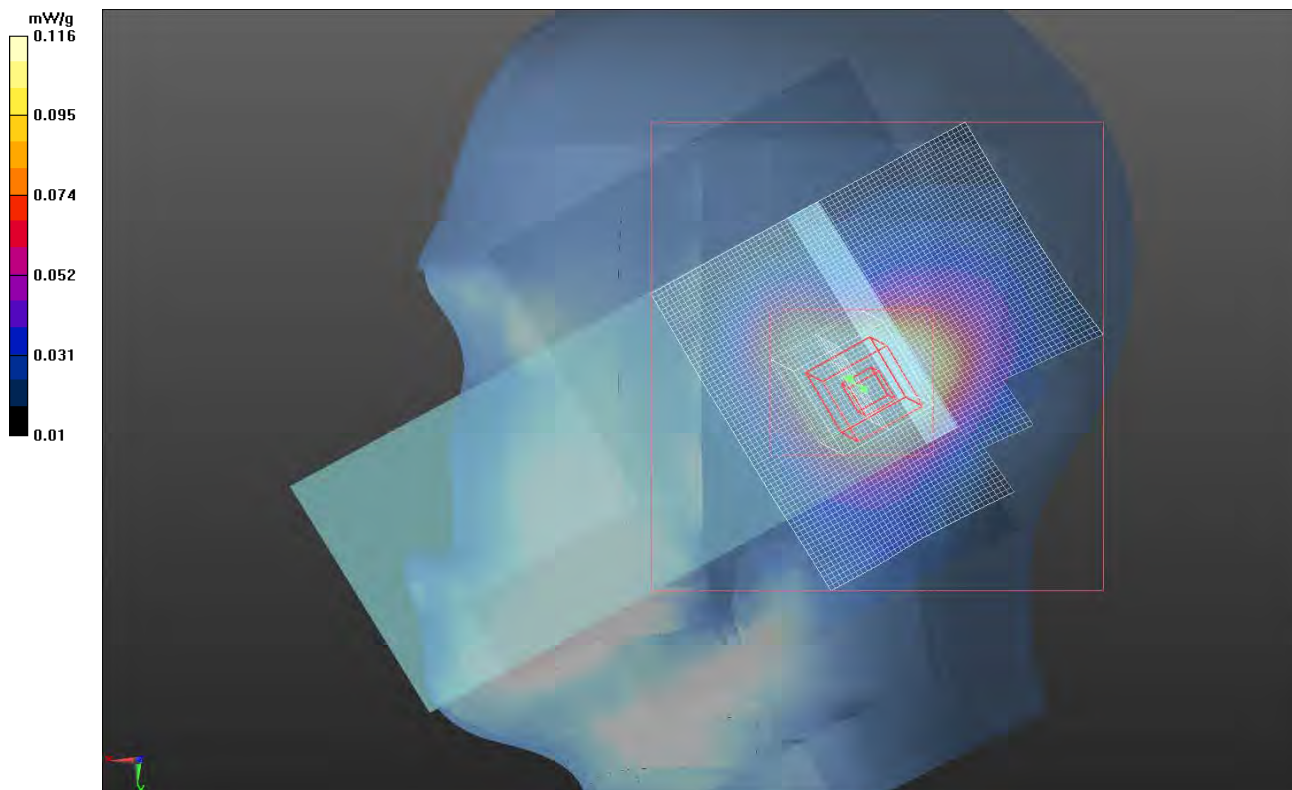
Head - Right/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 7.852 V/m

Head - Right/Tilt/Reference scan (51x81x1): Measurement grid: dx=30mm, dy=30mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

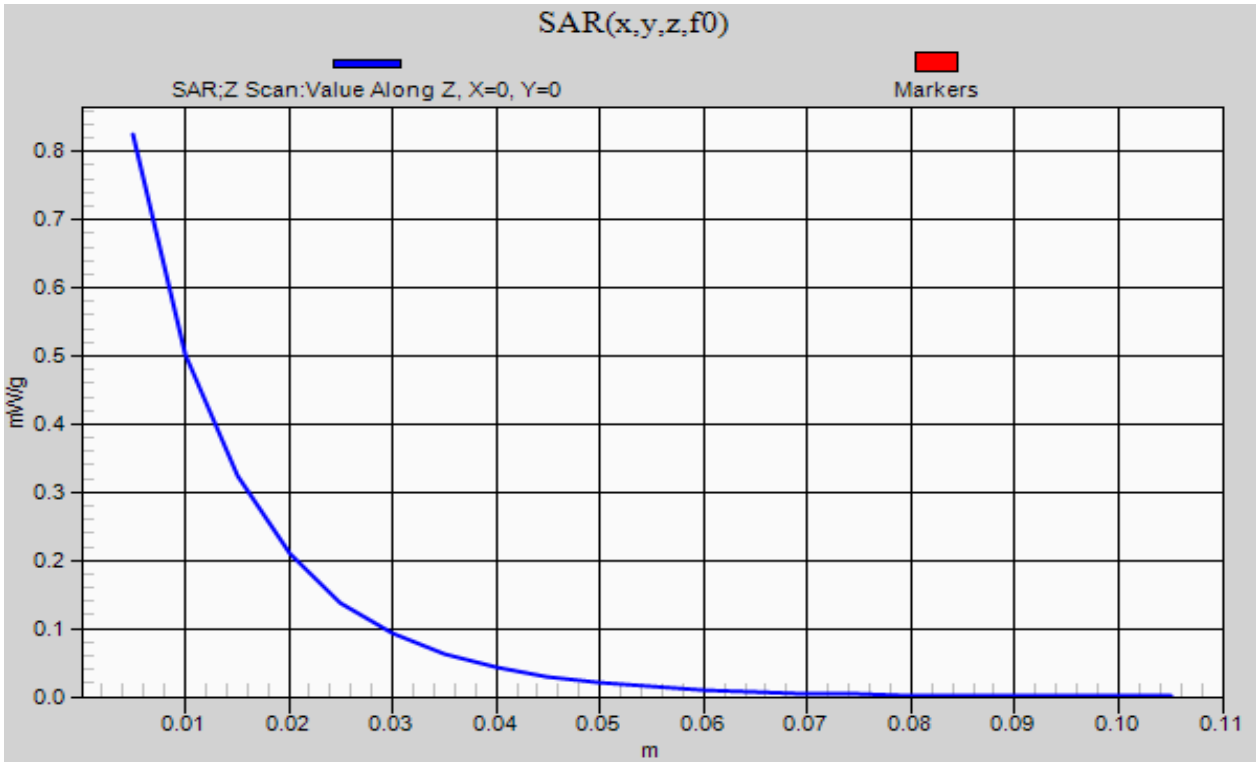
Maximum value of SAR (interpolated) = 0.143 mW/g



Room Temperature (°C):	23.3	Humidity (%):	42	Test Date:	09/22/11
Liquid Temperature (°C):	22.2	Barometric Pressure (mb):	1017	Tested by:	Ethan Schoonover

Body Test 1b 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016



SAR TEST DATA

EMC

EUT:	1000CP03C	Work Order:	INMC0737
Serial Number:	14621142016	Date:	See Data Sheets
Customer:	Intermec Technologies Corporation	Temperature:	See Data Sheets
Attendees:	None	Humidity:	See Data Sheets
Project:	P-INMC018	Barometric Pres.:	See Data Sheets
Tested by:	Jennifer Herrett	Job Site:	EV08
TEST SPECIFICATIONS		Test Method	
FCC 2.1093:2011		FCC OET 65C:2001	
FCC 15.247:2011		IEEE Std 1528:2003	
FCC 15.407:2001		FCC KDB 447498 D01 v04	
		FCC KDB 248227 D01 V01r02	
		FCC KDB 648474 D01 V01r05	
		FCC 865664	
Health Safety Code 6:2009		RSS-102, Issue 4:2010	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
No Deviations			
Configuration #	1	Signature <i>Jennifer Herrett</i>	

Test Configuration	Frequency Band	Body-Worn Accessory	Transmit Frequency	Transmit Channel	Transmit Mode	Data Rate (Mbps)	Audio Accessory	EUT Position	Start Power (Conducted) Watts	SAR Drift During Test (dB)	1g SAR Level (W/kg)	Test #
Body	2450	Wrist Holster	2462	11	BPSK	1Mbps	None	Right	0.055	0.11	0.177	1
								Left		0.11	0.028	2
								Back		-0.0057	0.066	3

Room Temperature (°C):	23.9	Humidity (%):	42	Test Date:	09/22/11
Liquid Temperature (°C):	22.4	Barometric Pressure (mb):	1015.7	Tested by:	Ethan Schoonover

Body Test 1h 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Frequency: 2462 MHz; Communication System PAR: 0 dB
 Medium parameters used: $\sigma = 1.95627$ mho/m, $\epsilon_r = 50.2388$; $\rho = 1000$ kg/m³, Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.973$ mho/m; $\epsilon_r = 50.193$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.81, 6.81, 6.81); Calibrated: 11/11/2010
 Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 3mm (Mechanical Surface Detection)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 7.930 V/m

Body/Body/Reference scan (41x71x1): Measurement grid: dx=30mm, dy=30mm

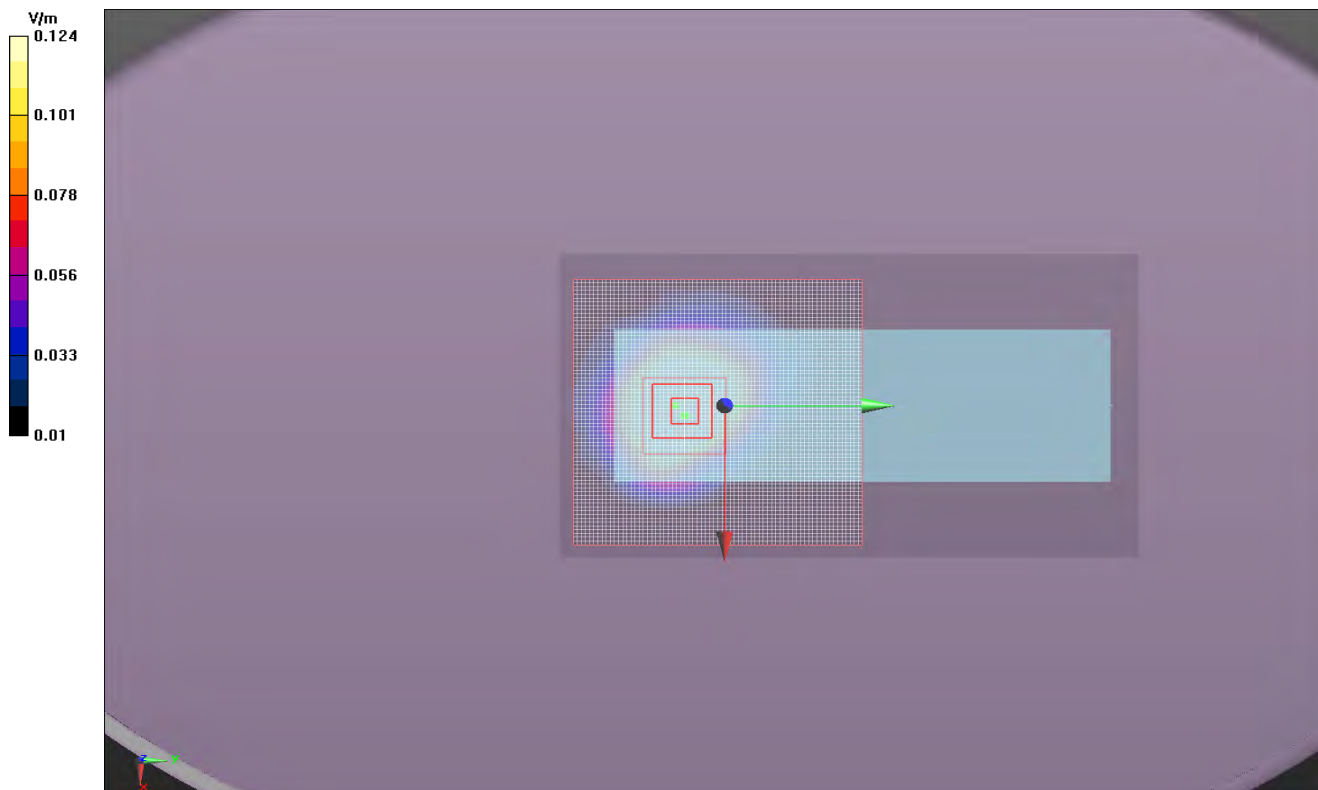
Info: [Interpolated medium parameters used for SAR evaluation.](#)
 Maximum value of SAR (interpolated) = 0.210 mW/g

Body/Body/Area scan (71x71x1): Measurement grid: dx=15mm, dy=15mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)
 Maximum value of SAR (interpolated) = 0.217 mW/g

Body/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 10.104 V/m; Power Drift = 0.11 dB
 Peak SAR (extrapolated) = 0.324 W/kg
SAR(1 g) = 0.177 mW/g; SAR(10 g) = 0.094 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)
 Maximum value of SAR (measured) = 0.220 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	23.9	Humidity (%):	42	Test Date:	09/22/11
Liquid Temperature (°C):	22.4	Barometric Pressure (mb):	1015.7	Tested by:	Jennifer Herrett

Body Test 2 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Frequency: 2462 MHz; Communication System PAR: 0 dB
 Medium parameters used: $\sigma = 1.95627$ mho/m, $\epsilon = 50.2388$; $\rho = 1000$ kg/m³, Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.973$ mho/m; $\epsilon = 50.193$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASYS Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.05, 4.05, 4.05); Calibrated: 2/23/2011
 Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 3mm (Mechanical Surface Detection)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 3.001 V/m

Body/Body/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

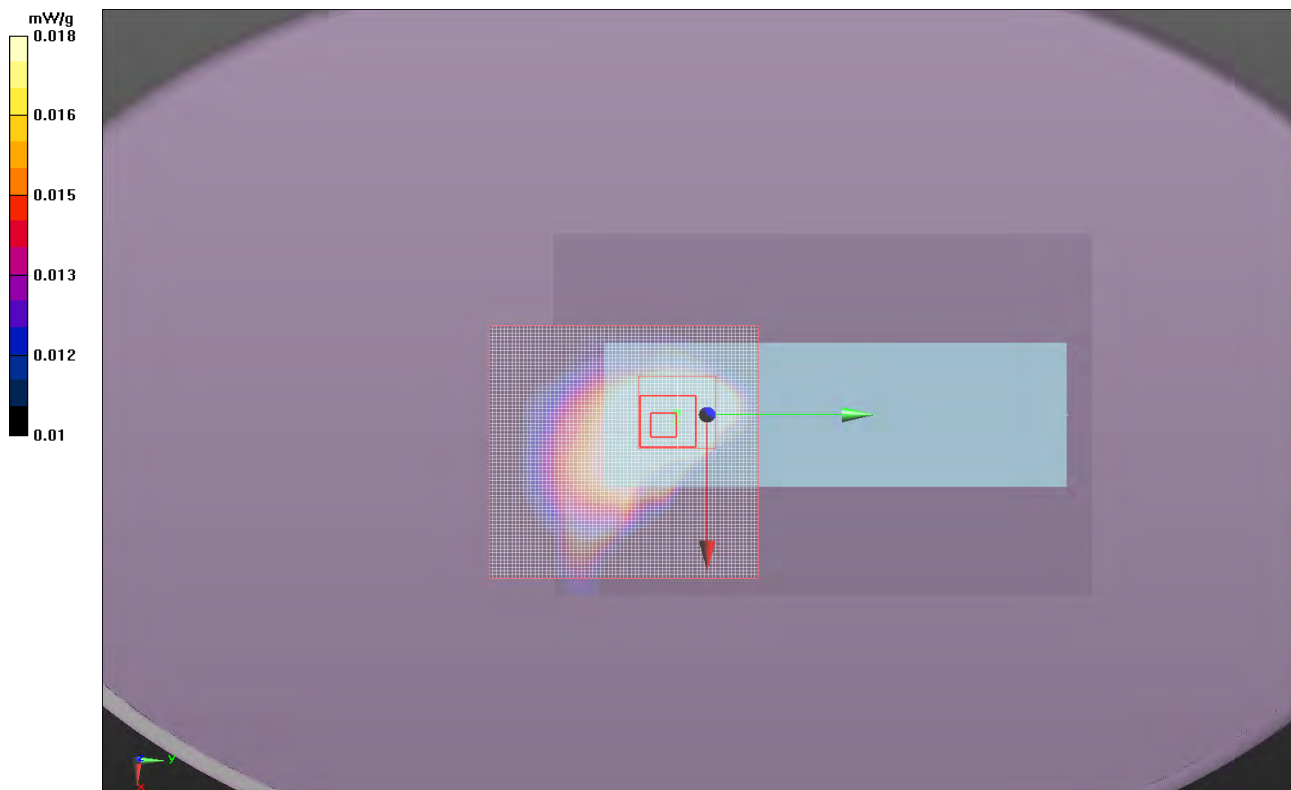
Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (interpolated) = 0.035 mW/g

Body/Body/Area scan (71x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Body/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 4.154 V/m; Power Drift = 0.11 dB
 Peak SAR (extrapolated) = 0.051 W/kg
SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.017 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 0.034 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	24	Humidity (%):	42.2	Test Date:	09/22/11
Liquid Temperature (°C):	22.3	Barometric Pressure (mb):	1015.7	Tested by:	Jennifer Herrett

Body Test 3 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Frequency: 2462 MHz; Communication System PAR: 0 dB
 Medium parameters used: $\sigma = 1.95627$ mho/m, $\epsilon = 50.2388$; $\rho = 1000$ kg/m³, Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.973$ mho/m; $\epsilon = 50.193$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASYS Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.05, 4.05, 4.05); Calibrated: 2/23/2011
 Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 3mm (Mechanical Surface Detection)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 4.654 V/m

Body/Body/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

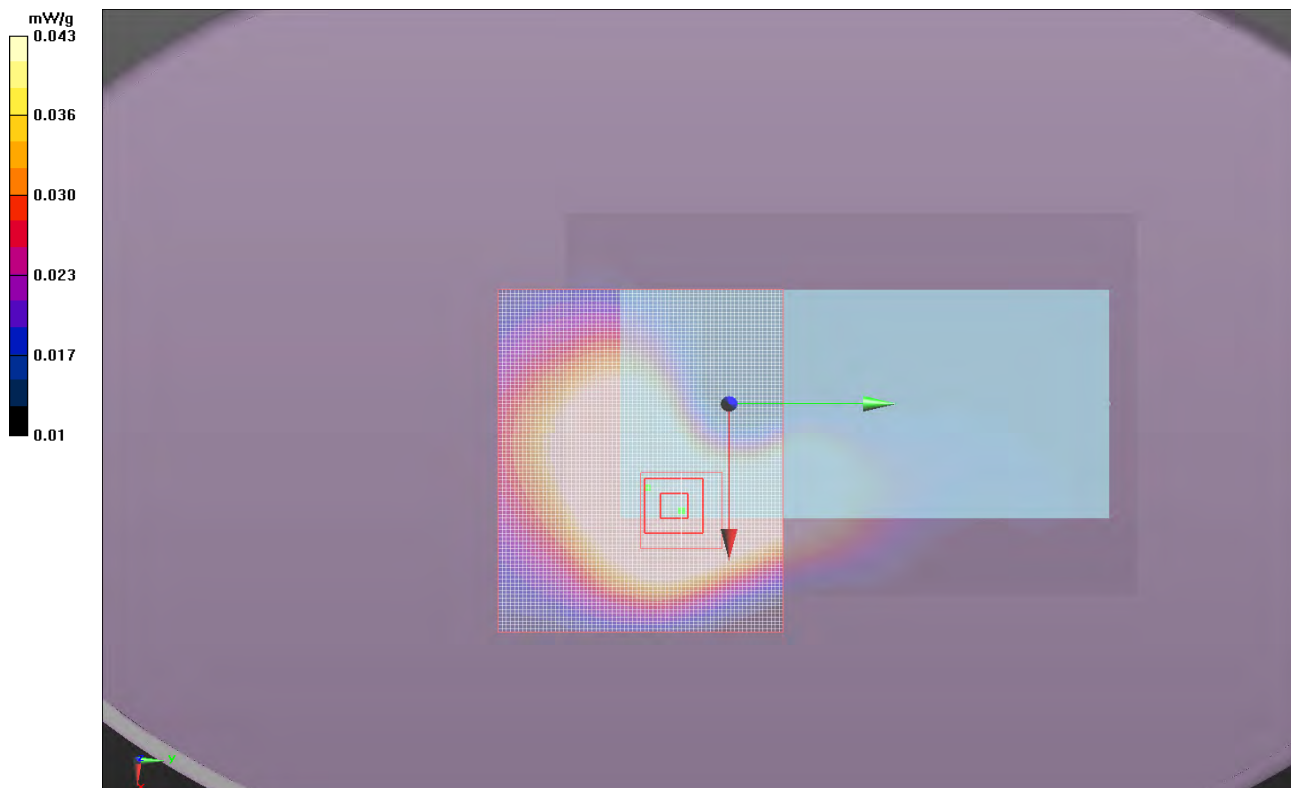
Info: [Interpolated medium parameters used for SAR evaluation.](#)
 Maximum value of SAR (interpolated) = 0.076 mW/g

Body/Body/Area scan (91x71x1): Measurement grid: dx=15mm, dy=15mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)
 Maximum value of SAR (interpolated) = 0.080 mW/g

Body/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 6.402 V/m; Power Drift = -0.0057 dB
 Peak SAR (extrapolated) = 0.119 W/kg
SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.040 mW/g

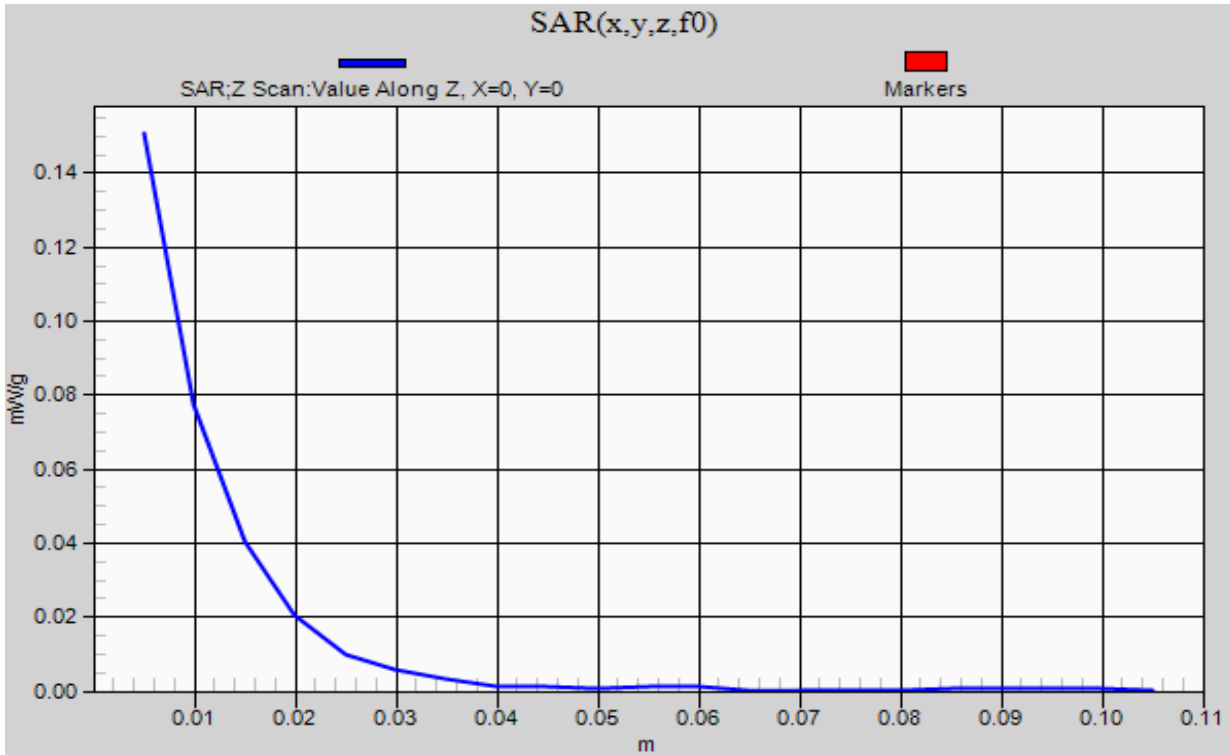
Info: [Interpolated medium parameters used for SAR evaluation.](#)
 Maximum value of SAR (measured) = 0.079 mW/g




Room Temperature (°C):	24	Humidity (%):	42.2	Test Date:	09/22/11
Liquid Temperature (°C):	22.3	Barometric Pressure (mb):	1015.7	Tested by:	Jennifer Herrett

Body Test 3 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016



SAR TEST DATA

EUT:	1000CP03C	Work Order:	INMC0737
Serial Number:	14621142016	Date:	See Data Sheets
Customer:	Intermec Technologies Corporation	Temperature:	See Data Sheets
Attendees:	none	Humidity:	See Data Sheets
Project:	P-INMC018	Barometric Pres.:	See Data Sheets
Tested by:	Rod Munro & Jennifer Herrett	Job Site:	EV08
TEST SPECIFICATIONS		Test Method	
FCC 2.1093:2011		FCC OET 65C:2001	
FCC 15.247:2011		IEEE Std 1528:2003	
FCC 15.407:2001		FCC KDB 447498 D01 v04	
		FCC KDB 248227 D01 V01r02	
		FCC KDB 648474 D01 V01r05	
		FCC 865664	
Health Safety Code 6:2009		RSS-102, Issue 4:2010	
COMMENTS			
Worst case configuration from original SAR evaluation conducted in Feb 2011			
DEVIATIONS FROM TEST STANDARD			
No Deviations			
Configuration #	1	Signature	

Test Configuration	Frequency Band	Body-Worn Accessory	Transmit Frequency	Transmit Channel	Transmit Mode	Data Rate (Mbps)	Audio Accessory	EUT Position	Start Power (Conducted)	SAR Drift During Test (dB)	1g SAR Level	Test #
Head	5200	none	5180	36	BPSK	6	none	Left Tilt	13.4	0.68	0.017	5 b
	5300		5260	52	MSC0	7.2		Left Cheek	13.2	0.53	0.051	6b
	5600		5600	120	BPSK	6		Left Cheek	12.9	-0.01	0.018	7b
	5800		5745	149				Left Cheek	11.6	1	0.034	8b

Room Temperature (°C):	22.5	Humidity (%):	44.50%	Test Date:	10/04/11
Liquid Temperature (°C):	20.3	Barometric Pressure (mb):	1004	Tested by:	Rod Munro and Jennifer Herrett

Head Test 5b 10-4-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5180 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5180$ MHz; $\sigma = 4.655$ mho/m; $\epsilon_r = 35.756$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 4.70293$ mho/m, $\epsilon_r = 35.7323$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(5.08, 5.08, 5.08); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head-Left/Tilt/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 2.654 V/m; Power Drift = 0.68 dB

Peak SAR (extrapolated) = 0.175 W/kg

SAR(1 g) = 0.017 mW/g; SAR(10 g) = 0.00391 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.052 mW/g

Head-Left/Tilt/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.046 mW/g

Head-Left/Tilt/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.022 mW/g

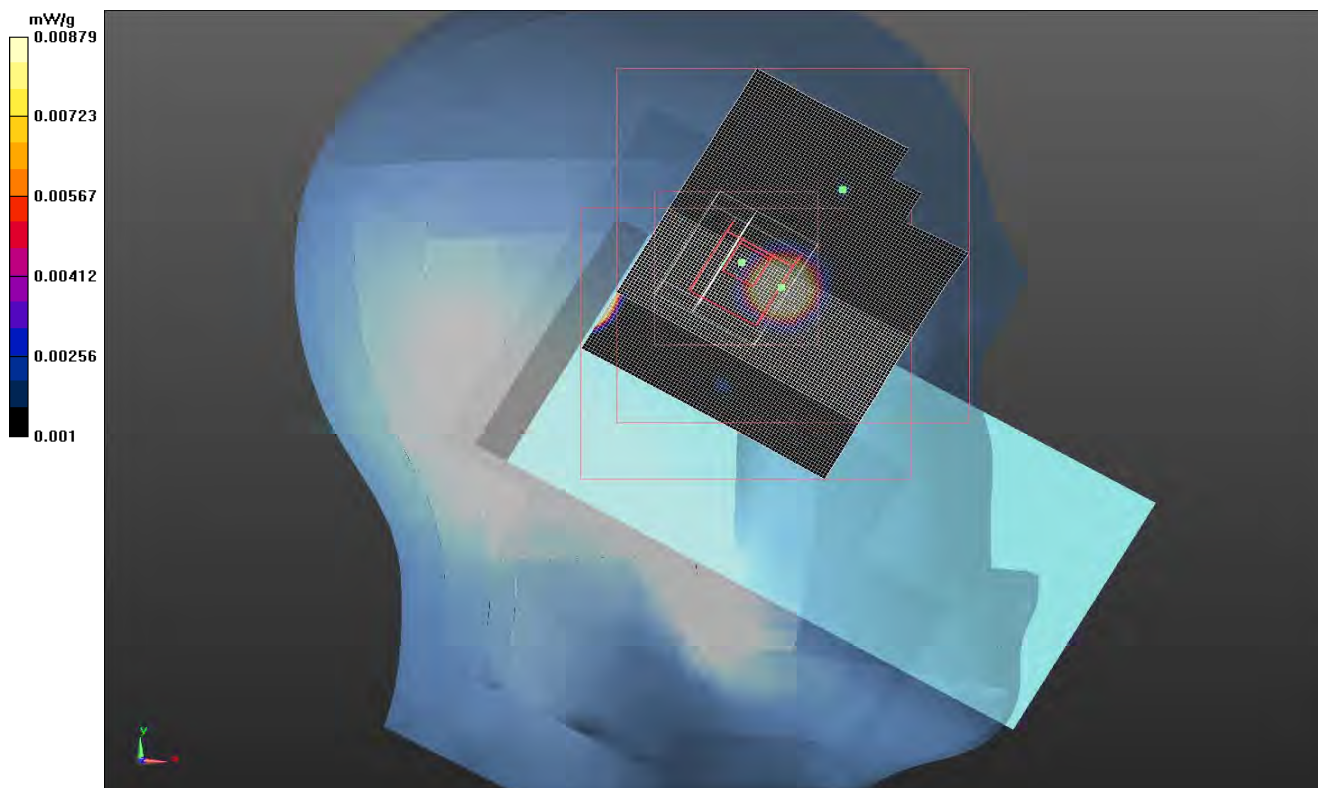
Head-Left/Tilt/Area scan 2 (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.00229 mW/g

Head-Left/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 1.374 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	23.8	Humidity (%):	44.60%	Test Date:	10/04/11
Liquid Temperature (°C):	22	Barometric Pressure (mb):	1006.6	Tested by:	Rod Munro and Jennifer Herrett

Head Test 6b 10-4-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5260 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5260$ MHz; $\sigma = 4.808$ mho/m; $\epsilon_r = 35.773$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 4.79272$ mho/m, $\epsilon_r = 35.7645$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.59, 4.59, 4.59); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head-Left/Cheek/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 0.093 mW/g

Head-Left/Cheek/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 0.139 mW/g

Head-Left/Cheek/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 4.447 V/m; Power Drift = 0.53 dB

Peak SAR (extrapolated) = 0.141 W/kg

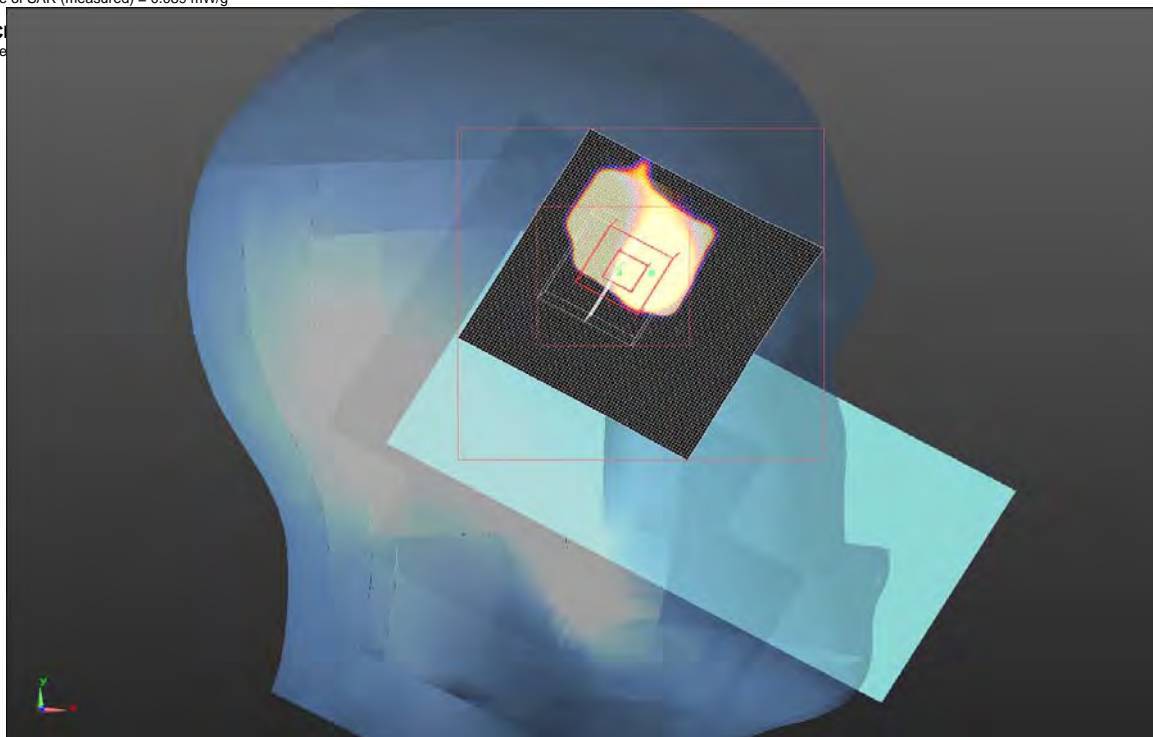
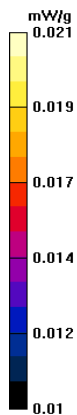
SAR(1 g) = 0.051 mW/g; SAR(10 g) = 0.021 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.089 mW/g

Head-Left/C

Maximum value



EMC

SAR TEST DATA

Room Temperature (°C):	22.1	Humidity (%):	4410.00%	Test Date:	10/04/11
Liquid Temperature (°C):	20.6	Barometric Pressure (mb):	1001.6	Tested by:	Rod Munro and Jennifer Herrett

Head Test 7b 10-4-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5600 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 5600$ MHz; $\sigma = 5.134$ mho/m; $\epsilon = 35.173$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.13385$ mho/m, $\epsilon = 35.1734$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASYS5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.37, 4.37, 4.37); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head-Left/Tilt/Zoom Scan (11x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 3.251 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.177 W/kg

SAR(1 g) = 0.018 mW/g; SAR(10 g) = 0.00695 mW/g

Maximum value of SAR (measured) = 0.036 mW/g

Head-Left/Tilt/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

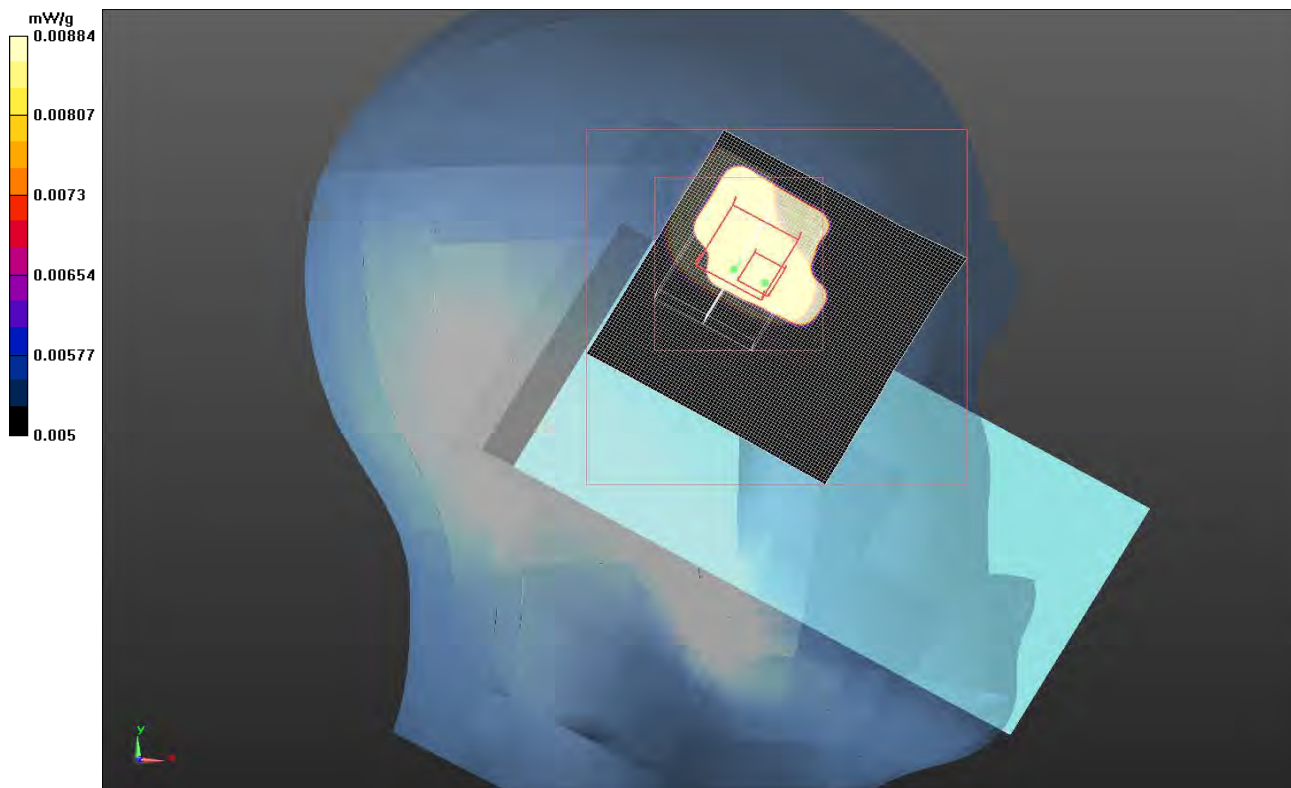
Maximum value of SAR (interpolated) = 0.062 mW/g

Head-Left/Tilt/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

Maximum value of SAR (interpolated) = 0.041 mW/g

Head-Left/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 1.312 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	22.1	Humidity (%):	4410.00%	Test Date:	10/04/11
Liquid Temperature (°C):	20.6	Barometric Pressure (mb):	1001.6	Tested by:	Rod Munro and Jennifer Herrett

Head Test 8b 10-4-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5745 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5745$ MHz; $\sigma = 5.234$ mho/m; $\epsilon = 35.373$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.22998$ mho/m, $\epsilon = 35.3715$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASYS5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.14, 4.14, 4.14); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: SAM with CRP; Type: SAM; Serial: 1598
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head-Left/Tilt/Zoom Scan (10x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 3.577 V/m; Power Drift = 1.00 dB

Peak SAR (extrapolated) = 0.221 W/kg

SAR(1 g) = 0.034 mW/g; SAR(10 g) = 0.018 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.055 mW/g

Head-Left/Tilt/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.081 mW/g

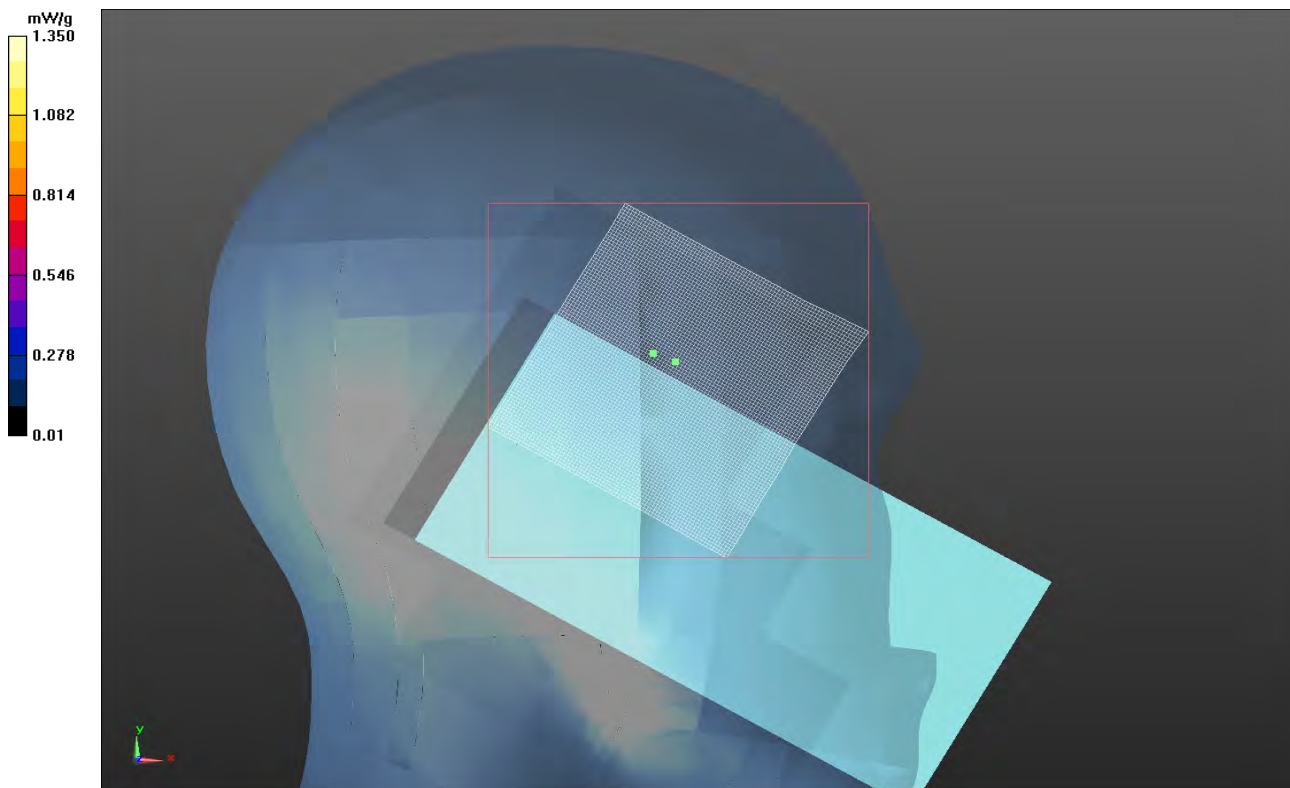
Head-Left/Tilt/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.056 mW/g

Head-Left/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

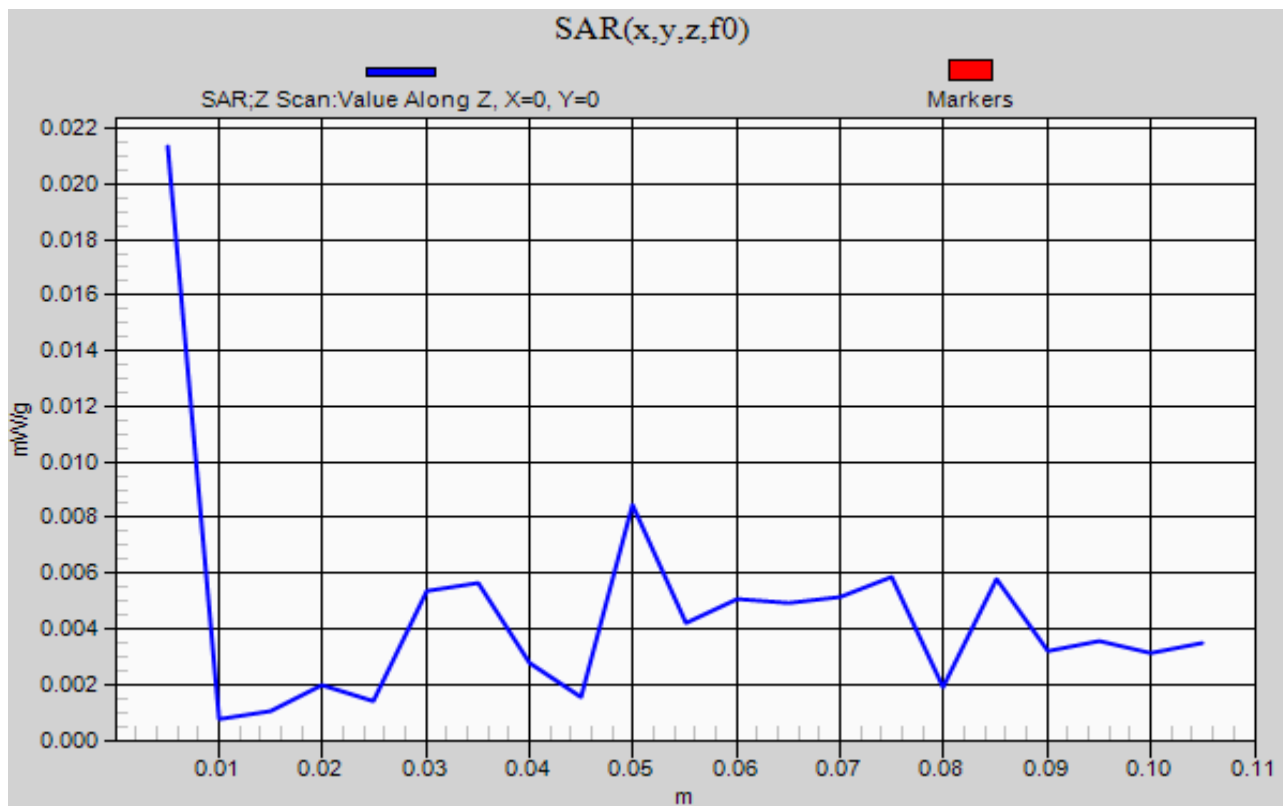
Maximum value of Total (measured) = 1.350 V/m



EMC SAR TEST DATA

Room Temperature (°C):	23.8	Humidity (%):	44.60%	Test Date:	10/04/11
Liquid Temperature (°C):	22	Barometric Pressure (mb):	1006.6	Tested by:	Rod Munro and Jennifer Herrett

Head Test 6b 10-4-11



SAR TEST DATA

SAR 2011.02.07

EUT: 1000CP03C	Work Order: INMC0737
Serial Number: 14621142016	Date: See Data Sheets
Customer: Intermec Technologies Corporation	Temperature: See Data Sheets
Attendees: None	Humidity: See Data Sheets
Project: P-INMC018	Barometric Pres.: See Data Sheets
Tested by: Ethan Schoonover and Jennifer Herrett	Job Site: EV08

TEST SPECIFICATIONS	Test Method
FCC 2.1093:2011	FCC OET 65C:2001
FCC 15.247:2011	IEEE Std 1528:2003
FCC 15.407:2001	FCC KDB 447498 D01 v04
	FCC KDB 248227 D01 V01r02
	FCC KDB 648474 D01 V01r05
	FCC 865664
Health Safety Code 6:2009	RSS-102, Issue 4:2010

COMMENTS
None

DEVIATIONS FROM TEST STANDARD
No Deviations

Configuration #	1	<i>Signature</i>
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Test Configuration	Frequency Band	Transmit Frequency	Transmit Channel	Transmit Mode	Data Rate (Mbps)	Body-Worn Accessory	Audio Accessory	EUT Position	Start Power (Conducted) Watts	SAR Drift During Test	1g SAR Level (W/kg)	Test #
Body	5200	5240	48	OFDM	6Mbps	Wrist holster	none	Right	0.016	0.02	0.299	4
								Left	0.016	Note 2	0.014	5
								Back	0.016	-0.011	0.221	6
	5300	5320	64	OFDM	6Mbps	Wrist holster	none	Right	0.017	0.12	0.388	7
								Left	0.017	Note 2	0.015	8
								Back	0.017	-0.03	0.343	9
	5600	5500	100	OFDM	6Mbps	Wrist holster	none	Right	0.016	-0.03	0.398	10
								Left	0.016	Note 2	0.001	11
								Back	0.016	0.77	0.210	12
	5800	5825	165	OFDM	6Mbps	Wrist holster	none	Right	0.012	0.07	0.187	13
								Left	0.012	Note 2	Note 1	14
								Back	0.012	0.34	0.074	15

Note 1: Zoom scan not performed, no hot spots detected, area scan results were less than the required system sensitivity of 0.01mW/g.
 Note 2: Due to the low value of measured SAR, the SAR drift measurement was made close to the measurement noise floor and is therefore inaccurate.

Room Temperature (°C):	22.8	Humidity (%):	42.8	Test Date:	09/22/11
Liquid Temperature (°C):	21.3	Barometric Pressure (mb):	1016	Tested by:	Ethan Schoonover

Body Test 4 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5240 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5240$ MHz; $\sigma = 5.181$ mho/m; $\epsilon_r = 46.704$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.19299$ mho/m, $\epsilon_r = 46.6891$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.16, 4.16, 4.16); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Reference scan (41x71x1): Measurement grid: dx=30mm, dy=30mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.372 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 4.784 V/m

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
 Reference Value = 6.099 V/m; Power Drift = 0.02 dB
 Peak SAR (extrapolated) = 1.029 W/kg
SAR(1 g) = 0.299 mW/g; SAR(10 g) = 0.116 mW/g

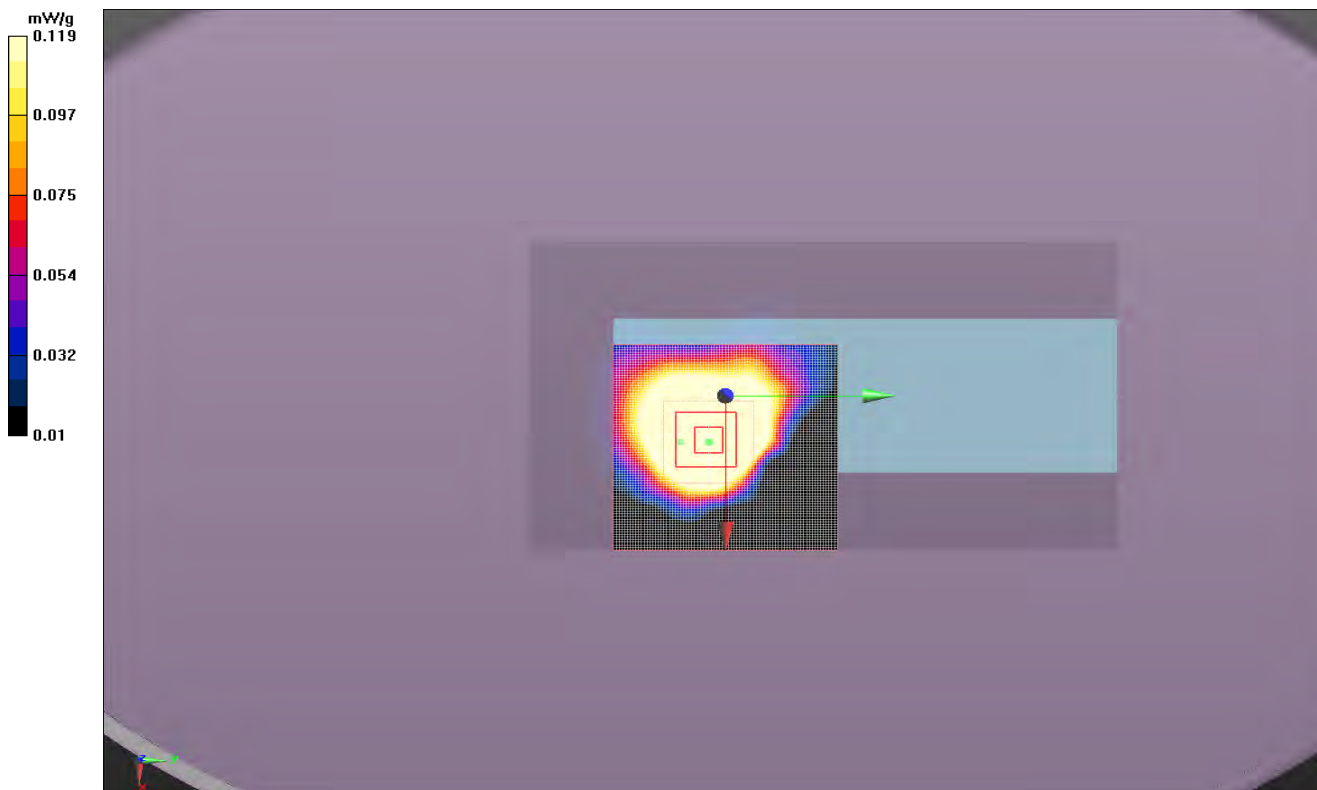
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.555 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.516 mW/g



Room Temperature (°C):	22.9	Humidity (%):	43.3	Test Date:	09/22/11
Liquid Temperature (°C):	21.3	Barometric Pressure (mb):	1016	Tested by:	Ethan Schoonover

Body Test 5 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5240 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5240$ MHz; $\sigma = 5.181$ mho/m; $\epsilon_r = 46.704$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.19299$ mho/m, $\epsilon_r = 46.6891$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.16, 4.16, 4.16); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Reference scan (41x71x1): Measurement grid: dx=30mm, dy=30mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.018 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 1.176 V/m

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
 Reference Value = 0 V/m; Power Drift = 999.0 dB
 Peak SAR (extrapolated) = 0.093 W/kg
SAR(1 g) = 0.014 mW/g; SAR(10 g) = 0.00551 mW/g

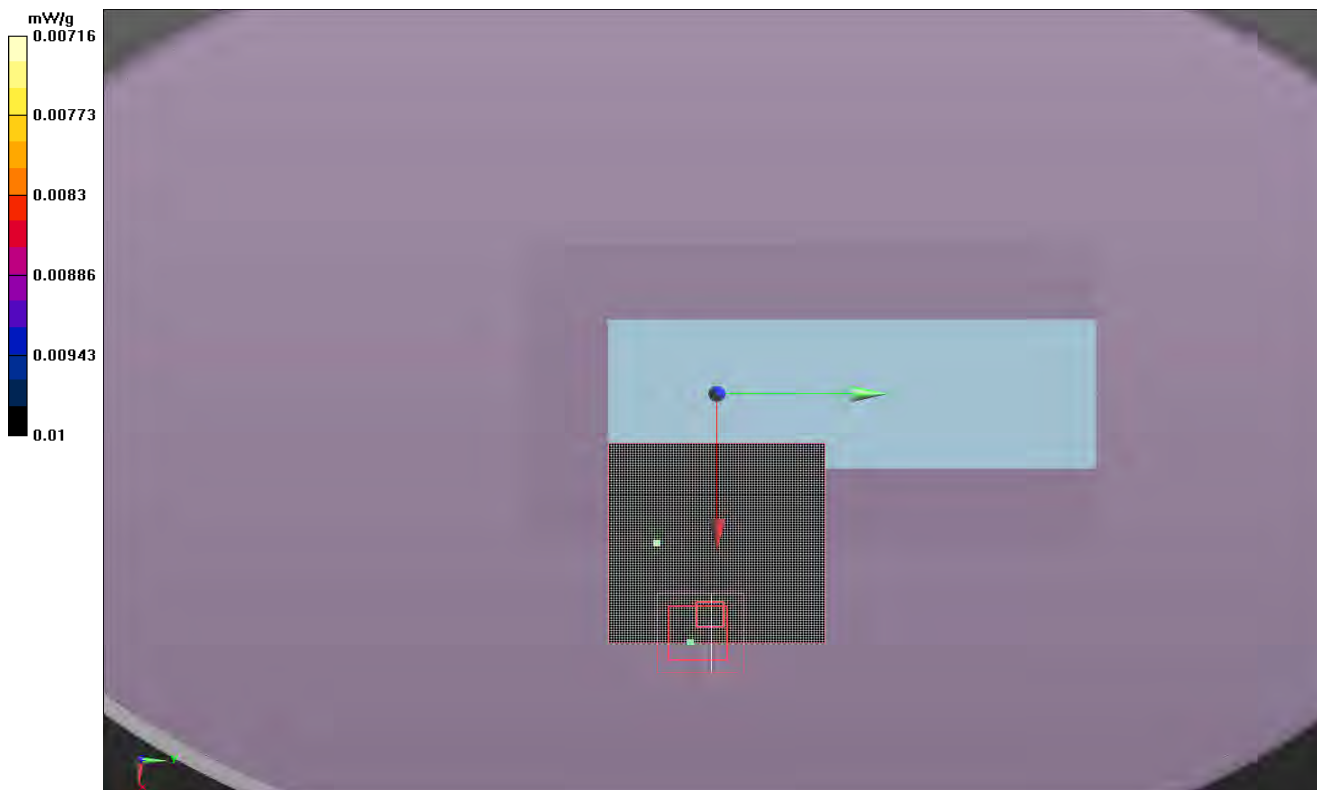
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.032 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.028 mW/g



Room Temperature (°C):	22.8	Humidity (%):	44.8	Test Date:	09/22/11
Liquid Temperature (°C):	21.3	Barometric Pressure (mb):	1016	Tested by:	Ethan Schoonover

Body Test 6 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5240 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5240$ MHz; $\sigma = 5.181$ mho/m; $\epsilon_r = 46.704$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.19299$ mho/m, $\epsilon_r = 46.6891$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.16, 4.16, 4.16); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Reference scan (41x71x1): Measurement grid: dx=30mm, dy=30mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.319 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 4.487 V/m

Body/Body/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
 Reference Value = 3.660 V/m; Power Drift = -0.11 dB
 Peak SAR (extrapolated) = 0.691 W/kg
SAR(1 g) = 0.221 mW/g; SAR(10 g) = 0.097 mW/g

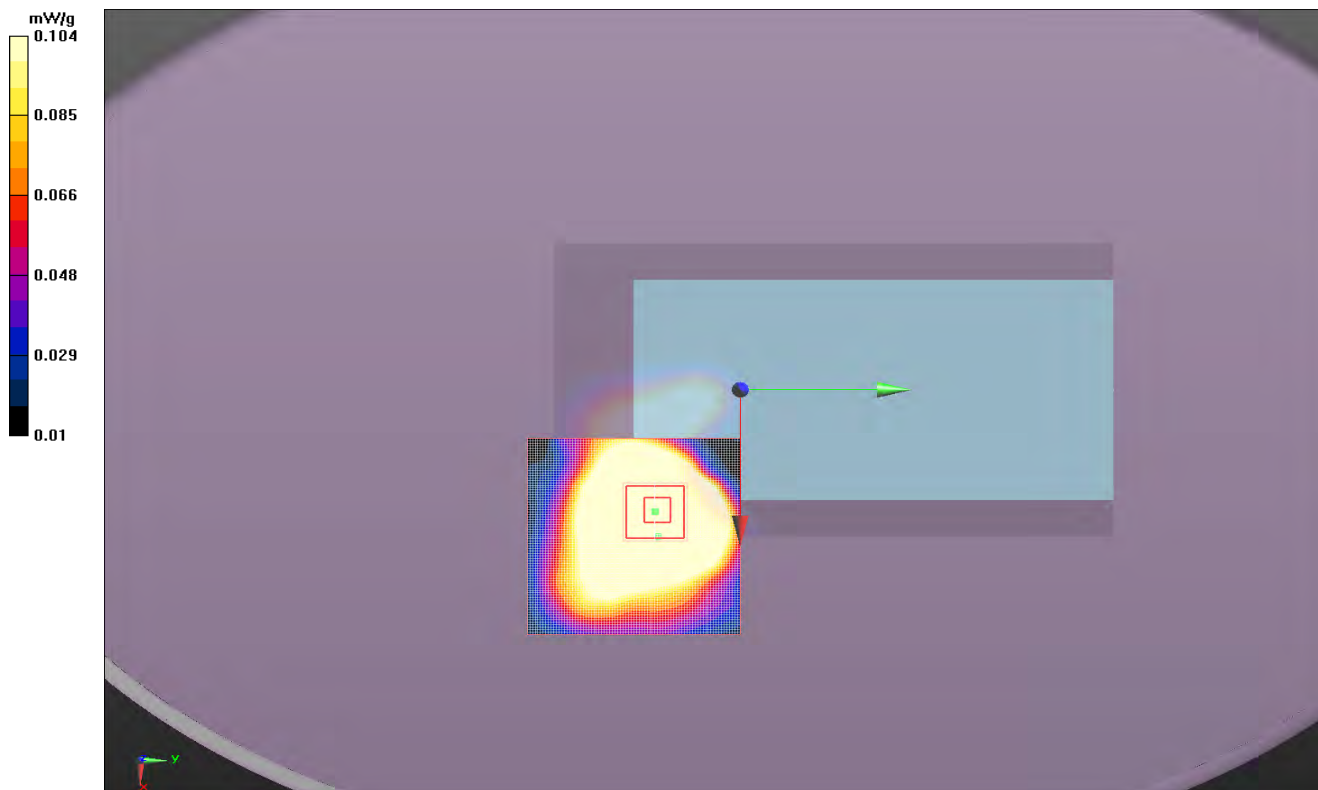
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.390 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.401 mW/g



Room Temperature (°C):	24.1	Humidity (%):	46.4	Test Date:	09/22/11
Liquid Temperature (°C):	21.8	Barometric Pressure (mb):	1016	Tested by:	Ethan Schoonover

Body Test 7b 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5320 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5320$ MHz; $\sigma = 5.276$ mho/m; $\epsilon_r = 46.554$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.24876$ mho/m, $\epsilon_r = 46.5843$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.8, 3.8, 3.8); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.528 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 5.814 V/m

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
 Reference Value = 10.407 V/m; Power Drift = 0.12 dB
 Peak SAR (extrapolated) = 1.358 W/kg
SAR(1 g) = 0.388 mW/g; SAR(10 g) = 0.136 mW/g

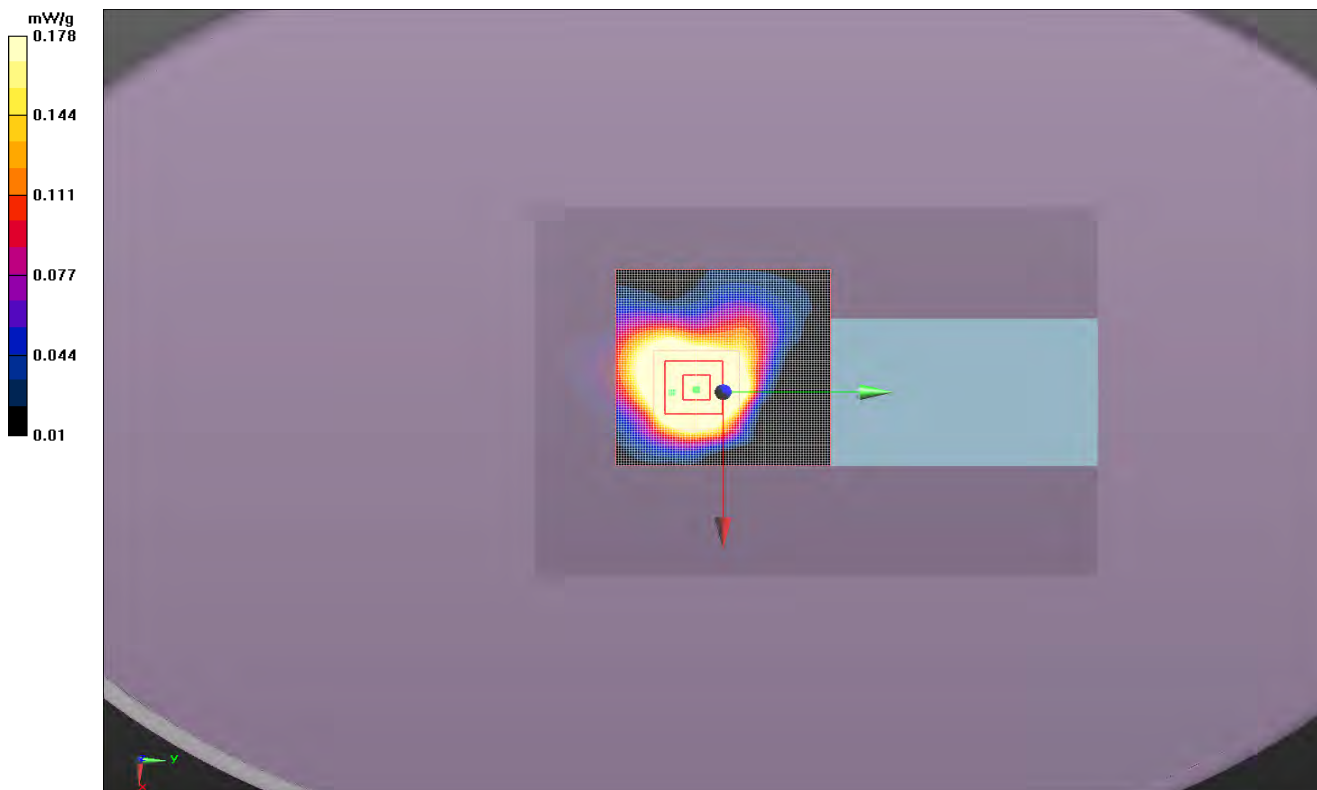
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.755 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.748 mW/g



Room Temperature (°C):	24.4	Humidity (%):	47.9	Test Date:	09/22/11
Liquid Temperature (°C):	21.8	Barometric Pressure (mb):	1016	Tested by:	Ethan Schoonover

Body Test 8 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5240 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5240$ MHz; $\sigma = 5.181$ mho/m; $\epsilon_r = 46.704$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.19299$ mho/m, $\epsilon_r = 46.6891$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.16, 4.16, 4.16); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Reference scan (41x71x1): Measurement grid: dx=30mm, dy=30mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.030 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 1.498 V/m

Body/Body/Zoom Scan (11x11x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 0 V/m; Power Drift = 999.0 dB

Peak SAR (extrapolated) = 0.153 W/kg

SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00475 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.027 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.024 mW/g



Room Temperature (°C):	25.2	Humidity (%):	48.3	Test Date:	09/22/11
Liquid Temperature (°C):	21.8	Barometric Pressure (mb):	1016	Tested by:	Ethan Schoonover

Body Test 9 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5320 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5320$ MHz; $\sigma = 5.276$ mho/m; $\epsilon_r = 46.554$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.24876$ mho/m, $\epsilon_r = 46.5843$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.8, 3.8, 3.8); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.587 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 5.215 V/m

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
 Reference Value = 4.279 V/m; Power Drift = -0.03 dB
 Peak SAR (extrapolated) = 1.013 W/kg
SAR(1 g) = 0.343 mW/g; SAR(10 g) = 0.147 mW/g

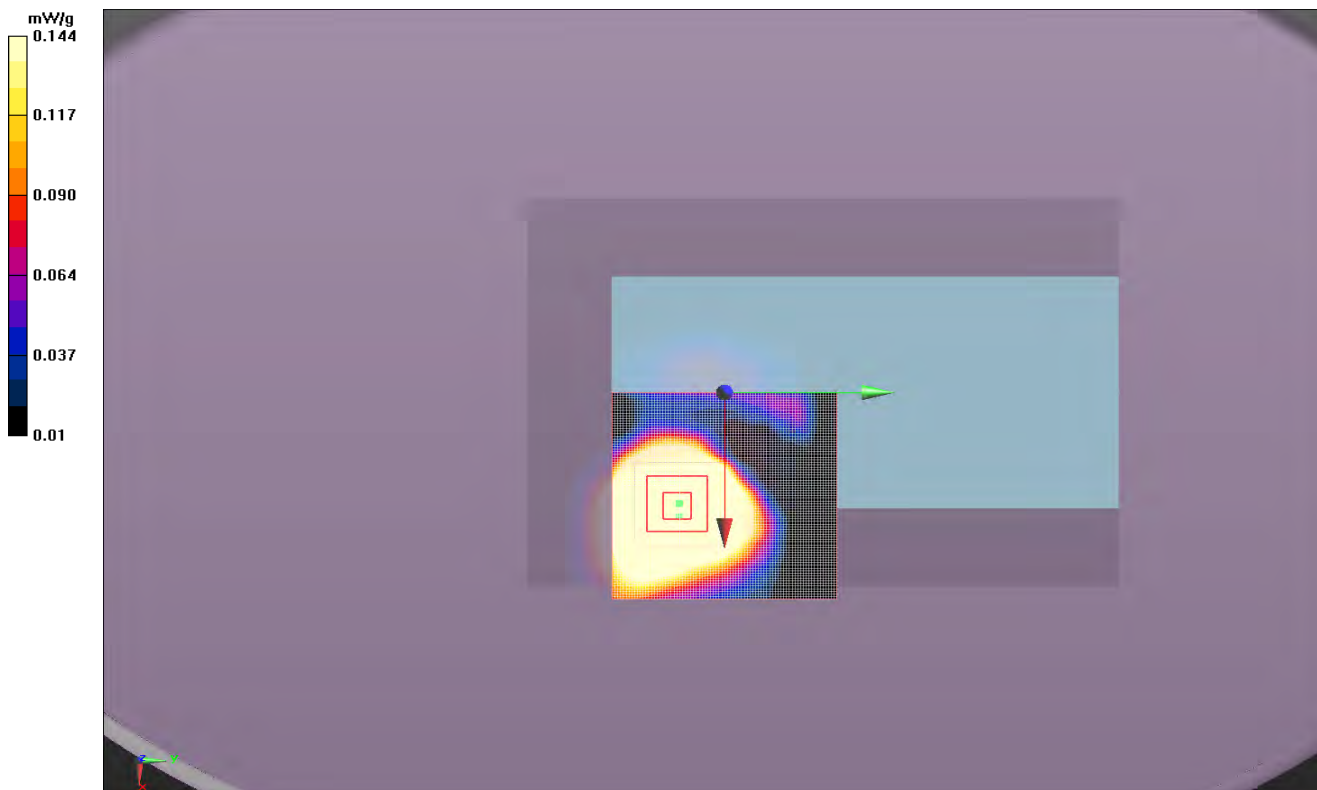
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.596 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.597 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	22.7	Humidity (%):	49.3	Test Date:	09/23/11
Liquid Temperature (°C):	21.3	Barometric Pressure (mb):	1017.9	Tested by:	Ethan Schoonover

Body Test 10 9-23-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5500 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 5500$ MHz; $\sigma = 5.497$ mho/m; $\epsilon_r = 46.341$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.4975$ mho/m, $\epsilon_r = 46.3409$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

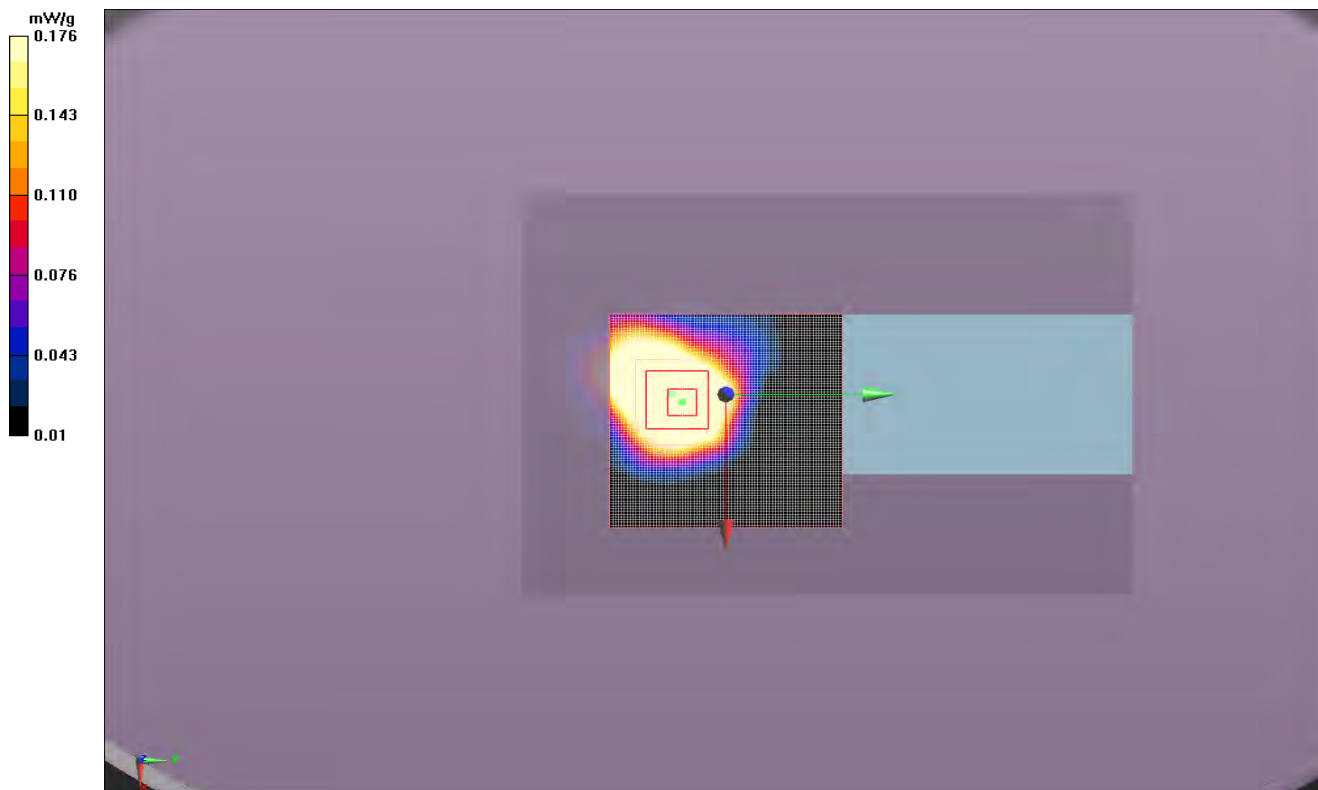
Probe: EX3DV4 - SN3746; ConvF(3.69, 3.69, 3.69); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm
 Maximum value of SAR (interpolated) = 0.577 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 5.660 V/m

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
 Reference Value = 7.081 V/m; Power Drift = -0.03 dB
 Peak SAR (extrapolated) = 1.472 W/kg
SAR(1 g) = 0.398 mW/g; SAR(10 g) = 0.137 mW/g
 Maximum value of SAR (measured) = 0.795 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.720 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	23	Humidity (%):	51.1	Test Date:	09/23/11
Liquid Temperature (°C):	21	Barometric Pressure (mb):	1017.9	Tested by:	Ethan Schoonover

Body Test 11a 9-23-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5500 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 5500$ MHz; $\sigma = 5.497$ mho/m; $\epsilon_r = 46.341$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.4975$ mho/m, $\epsilon_r = 46.3409$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

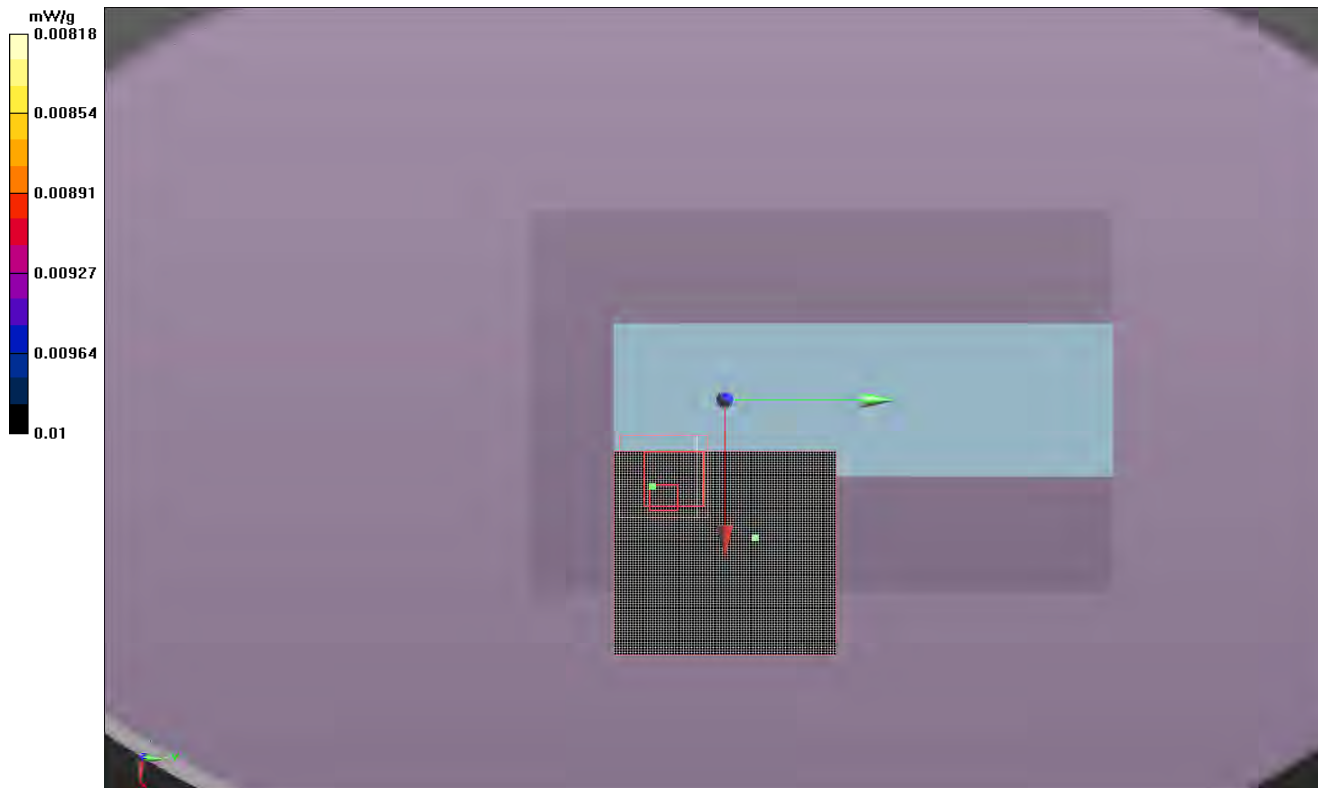
Probe: EX3DV4 - SN3746; ConvF(3.69, 3.69, 3.69); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm
 Maximum value of SAR (interpolated) = 0.028 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 1.220 V/m

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
 Reference Value = 0 V/m; Power Drift = 999.0 dB
 Peak SAR (extrapolated) = 0.028 W/kg
SAR(1 g) = 0.000783 mW/g; SAR(10 g) = 8.59e-005 mW/g
 Maximum value of SAR (measured) = 0.024 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.069 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	25.3	Humidity (%):	42.9	Test Date:	09/22/11
Liquid Temperature (°C):	21.9	Barometric Pressure (mb):	1016	Tested by:	Ethan Schoonover

Body Test 12 9-22-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5500 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 5500$ MHz; $\sigma = 5.497$ mho/m; $\epsilon_r = 46.341$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.4975$ mho/m, $\epsilon_r = 46.3409$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

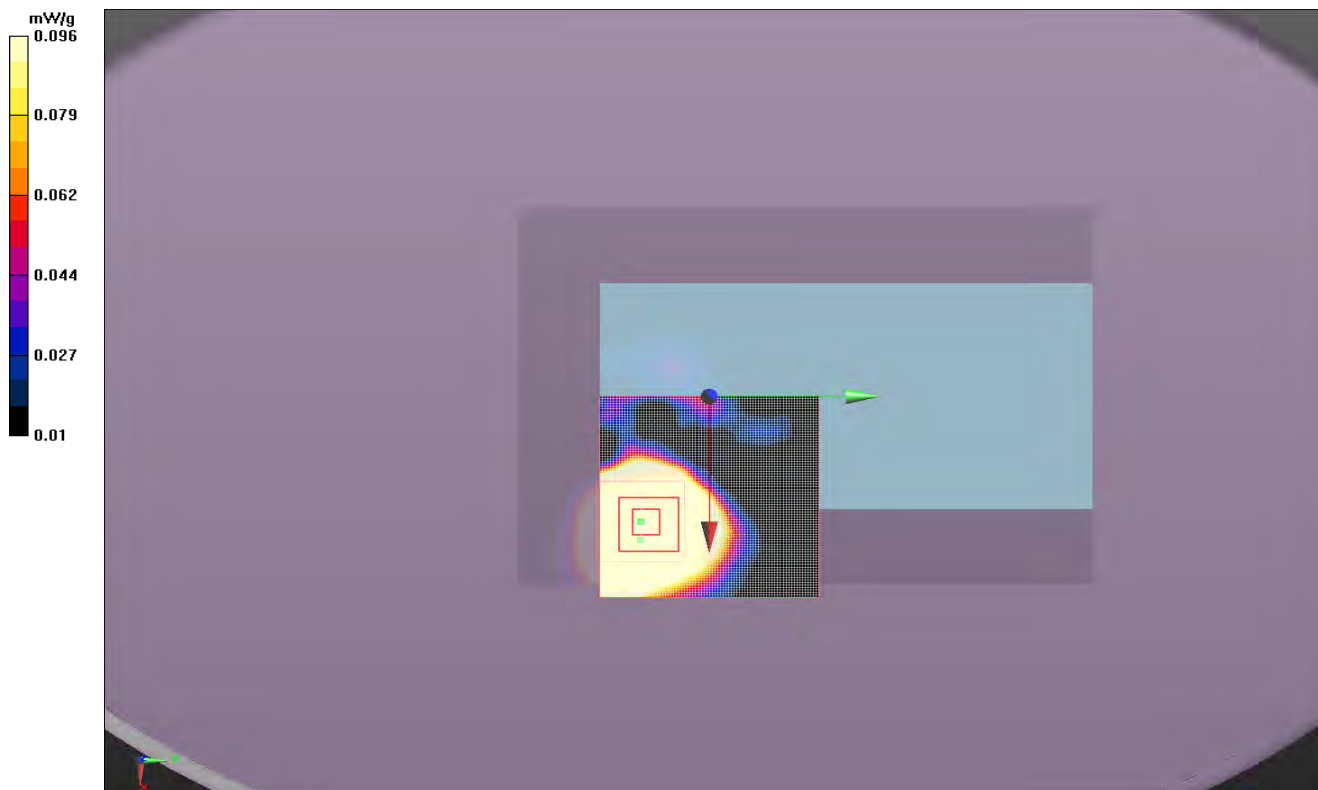
Probe: EX3DV4 - SN3746; ConvF(3.69, 3.69, 3.69); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm
 Maximum value of SAR (interpolated) = 0.471 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
 Maximum value of Total (measured) = 4.181 V/m

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
 Reference Value = 2.965 V/m; Power Drift = 0.77 dB
 Peak SAR (extrapolated) = 0.618 W/kg
SAR(1 g) = 0.210 mW/g; SAR(10 g) = 0.086 mW/g
 Maximum value of SAR (measured) = 0.373 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.372 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	23.3	Humidity (%):	45.8	Test Date:	10/03/11
Liquid Temperature (°C):	22.6	Barometric Pressure (mb):	1011.2	Tested by:	Jennifer Herrett

Body Test 13 10-3-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5825 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5825$ MHz; $\sigma = 6.021$ mho/m; $\epsilon = 46.05$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.98589$ mho/m, $\epsilon = 46.0858$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASYS Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.87, 3.87, 3.87); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Zoom Scan (8x8x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 9.063 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 1.687 W/kg

SAR(1 g) = 0.187 mW/g; SAR(10 g) = 0.067 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.378 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 3.280 V/m

Body/Body/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

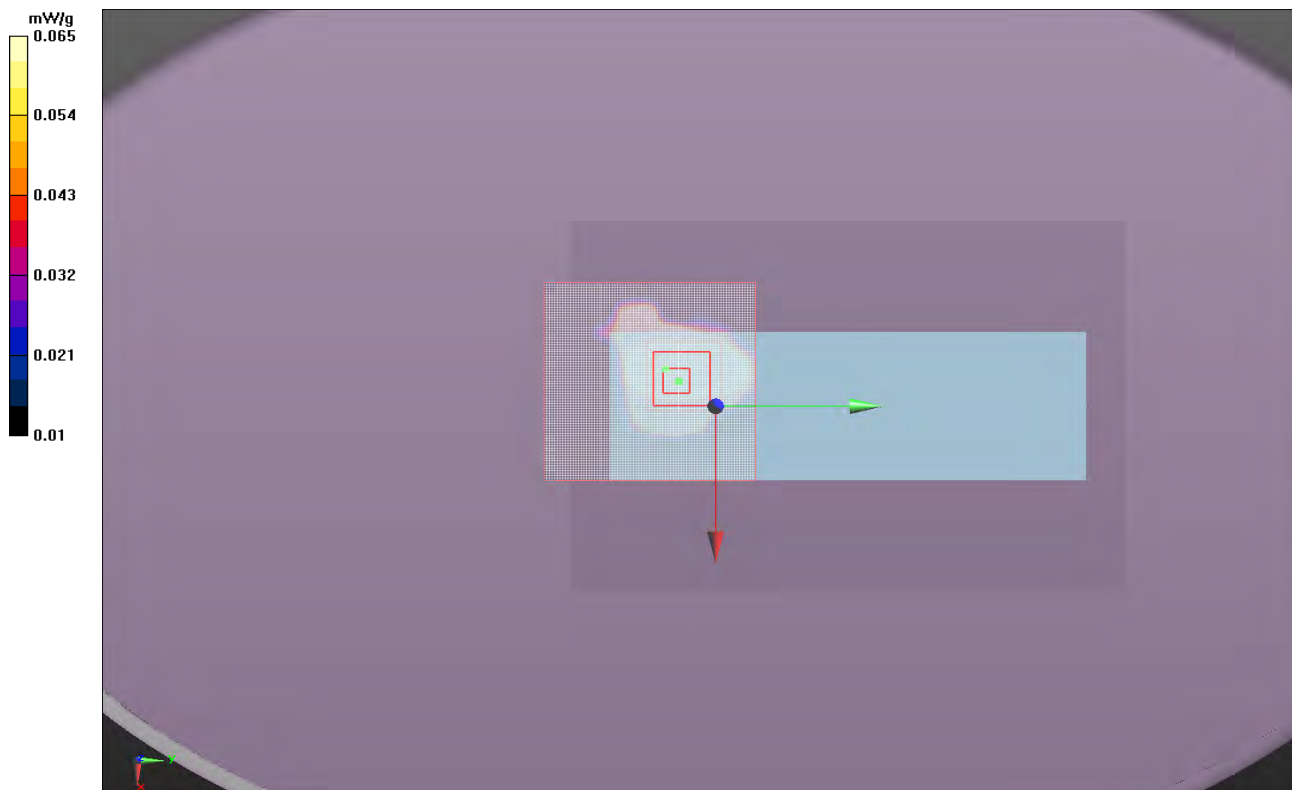
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.265 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.374 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	23.2	Humidity (%):	46.9	Test Date:	10/03/11
Liquid Temperature (°C):	22.4	Barometric Pressure (mb):	1011.2	Tested by:	Jennifer Herrett

Body Test 14 10-3-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5825 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5825$ MHz; $\sigma = 6.021$ mho/m; $\epsilon = 46.05$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASYS5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.87, 3.87, 3.87); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

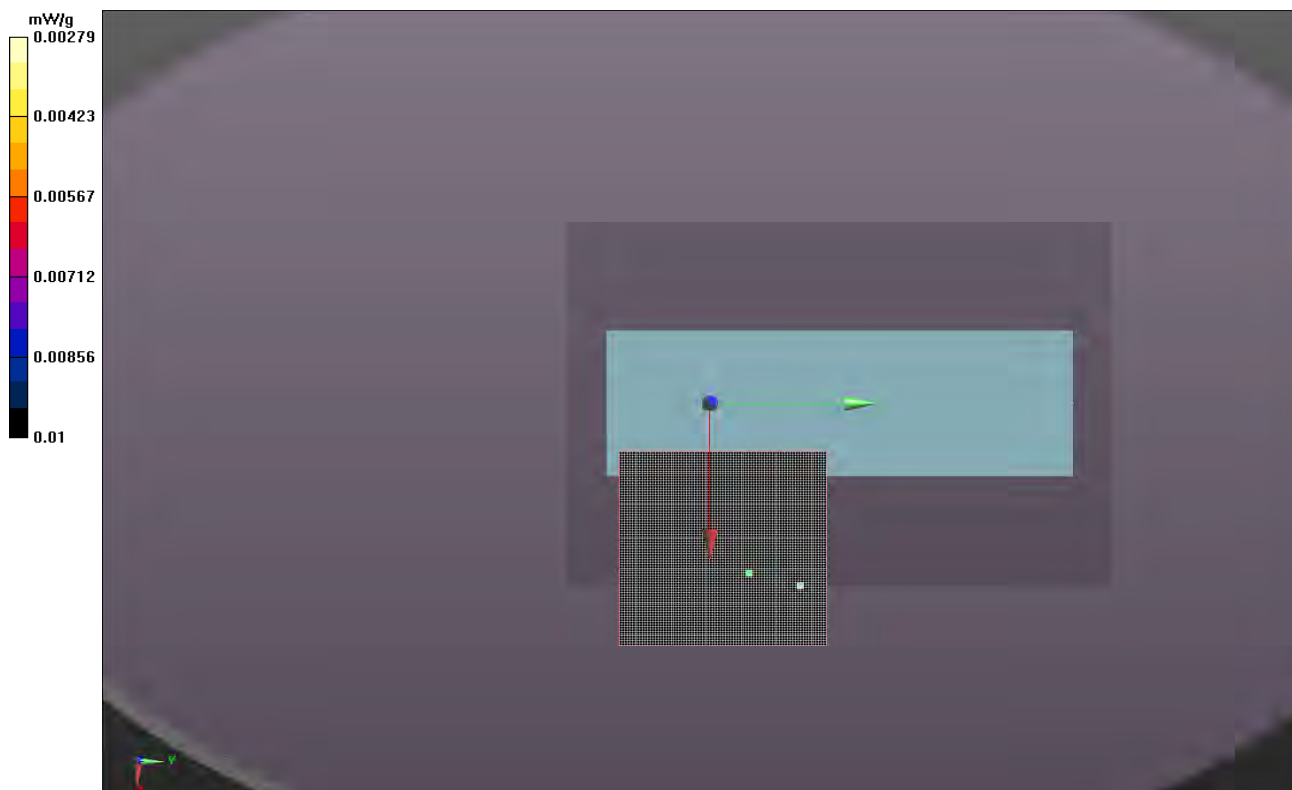
Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 0.00542 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 0.00279 mW/g



Room Temperature (°C):	23.2	Humidity (%):	46.9	Test Date:	10/03/11
Liquid Temperature (°C):	22.4	Barometric Pressure (mb):	1011.2	Tested by:	Jennifer Herrett

Body Test 15 10-3-11

DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5825 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 5825$ MHz; $\sigma = 6.021$ mho/m; $\epsilon_r = 46.05$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 5.98589$ mho/m, $\epsilon_r = 46.0858$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASYS5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.87, 3.87, 3.87); Calibrated: 11/11/2010
 Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)
 Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
 Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
 Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Zoom Scan (8x8x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 5.006 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.189 W/kg

SAR(1 g) = 0.069 mW/g; SAR(10 g) = 0.029 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.123 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 2.143 V/m

Body/Body/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.147 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.122 mW/g

Body/Body/Zoom Scan 2 (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

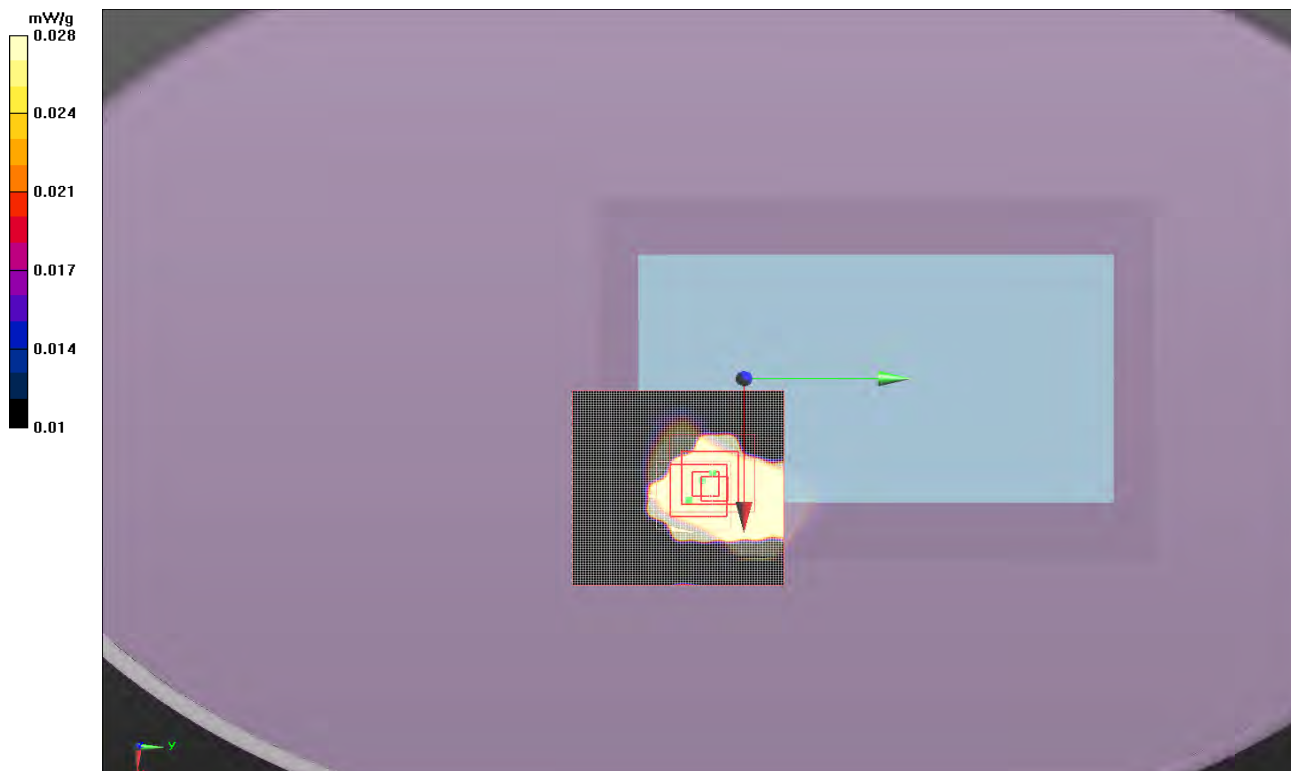
Reference Value = 5.006 V/m; Power Drift = 0.34 dB

Peak SAR (extrapolated) = 0.195 W/kg

SAR(1 g) = 0.074 mW/g; SAR(10 g) = 0.036 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.124 mW/g

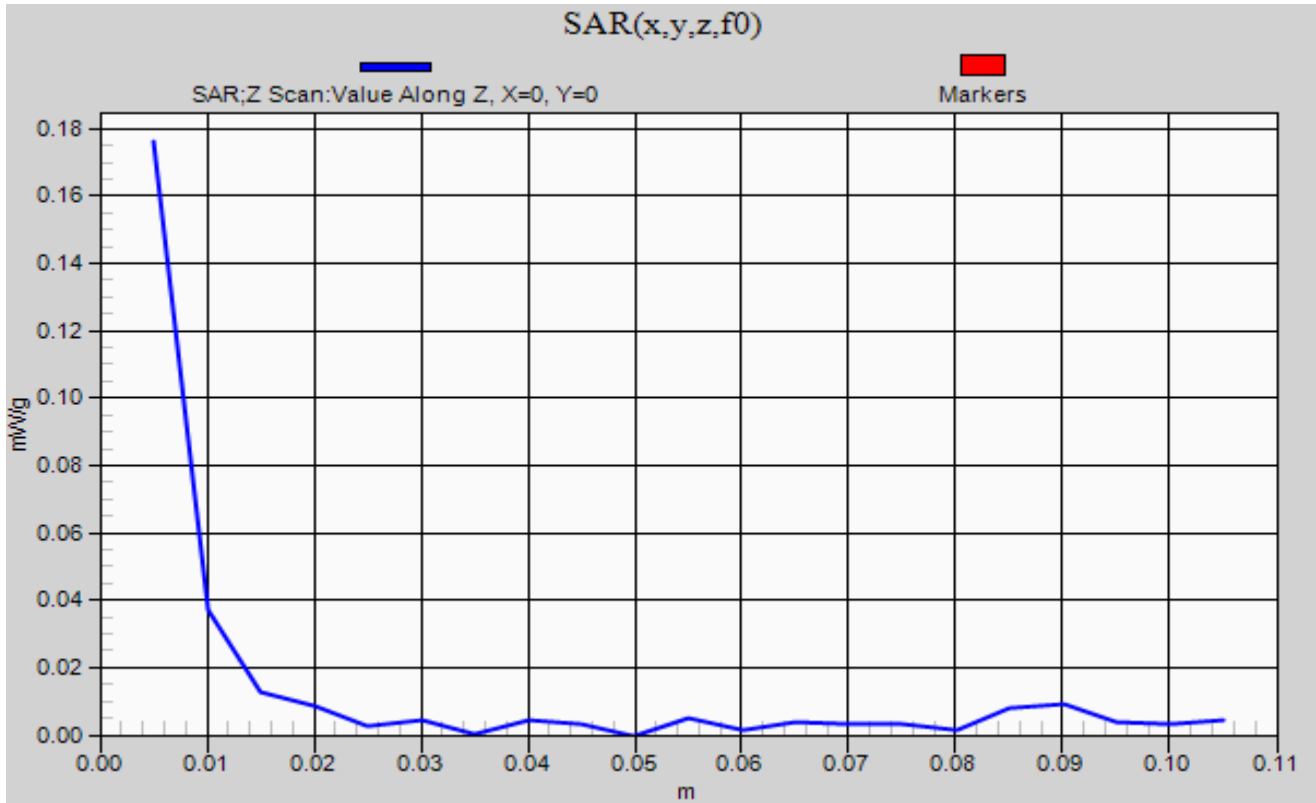


EMC

SAR TEST DATA

Room Temperature (°C):	22.7	Humidity (%):	49.3	Test Date:	09/23/11
Liquid Temperature (°C):	21.3	Barometric Pressure (mb):	1017.9	Tested by:	Ethan Schoonover

Body Test 10 9-23-11

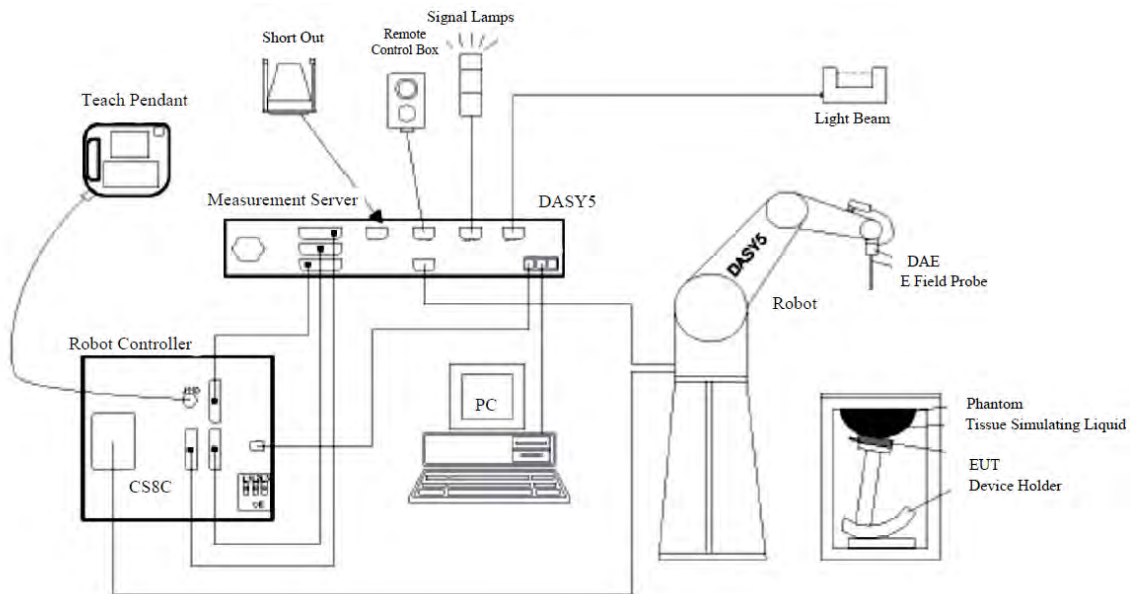


SAR Measurement System

Schmid & Partner Engineering AG, DASY52

Northwest EMC selected the leader in SAR evaluation systems to provide the measurement tools for this evaluation. SPEAG's DASY52 is the fastest and most accurate scanner on the market. It is fully compatible with all world-wide standards for transmitters operating at the ear or within 20cm of the body. It provides full compatibility with IEC 62209-1, IEC 62209-2, IEEE 1528 as well as national adaptations such as FCC OET-65c and Korean Std. MIC #2000-93

The DASY52 system for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot (Staubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (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.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- 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.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom, oval flat phantom, device holder, tissue simulating liquids, and validation dipole kits.

Test Site

Northwest EMC, Lab EV08

The SAR measurement system is located in a semi-anechoic chamber. This provides an ambient free environment that also eliminates reflections.

The chamber is 12 ft wide by 16 ft long x 8 ft high. A dedicated HVAC unit provides +/- 1 degree C temperature control.



TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Robot Arm	Staeubli	TX60LSPEAG	SAA	NCR	0 mo
Phantom, Twin SAM (Head)	SPEAG	QD 000 P40 CC	SAB	NCR	0 mo
Phantom, 2mm Oval ELI4 (Body)	SPEAG	QD OVA 001 BB	SAC	NCR	0 mo
Light Beam Unit	SPEAG	SE UKS 030 AA	SAD	NCR	0 mo
SAR Probe	SPEAG	EX3DV4	SAG	11/11/2010	12 mo
DAE	Schid & Partner Engineering	SD 000 D04 EJ	SAH	11/11/2010	12 mo
Robot Controller	Staeubli	CS8C	SAI	11/11/2010	12 mo
Robot Chasis and power Supply	Staeubli	N/A	SAJ	NCR	0 mo
DASY5 Measurement Server	Staeubli	DAYS5	SAK	NCR	0 mo
Head Solution	SPEAG	HSL 2450	SAL	Within 24 hours of a measurement	
Body Solution	SPEAG	MSL 2450	SAM		
Head Solution	SPEAG	HSL 501	SAU		
Body Solution	SPEAG	MSL 501	SAV		
Device Holder	SPEAG	N/A	SAW	NCR	0 mo
Antenna, Dipole 2450MHz SAR	SPEAG	D2450V2	ADL	11/11/2010	12 mo
Antenna, Dipole 5.1-5.8GHz SAR	SPEAG	D5GHzV2	ADM	11/16/2010	12 mo
Network Analyzer	Hewlett Packard	N5230A	NAD	8/3/2011	12 mo
Dielectric Probe Kit	Agilent	85070E	IPP	9/8/2010	24 mo
Power Meter	Agilent	N1913A	SQR	6/6/2011	24 mo
Power Sensor	Agilent	E9300H	SQO	6/6/2011	24 mo
MXG Analog Signal Generator	Agilent	N5181A	TIG	NCR	0 mo
Broadband Amplifier, SMA, 2000-8000 MHz	Mini Circuits	ZVE-3W-83+	TTA	NCR	0 mo
Humidity Temperature Meter	Omegaette	HH311	DTX	3/29/2011	24 mo
Humidity Temperature Meter	Omegaette	HH311	DTY	3/29/2011	24 mo
Wireless Communication Test Set	Agilent	E5515C	BSV	NCR	0 mo

Using the mode of operation and configuration noted within this report, an EFT/Burst Immunity test was performed. The test is intended to demonstrate the immunity of electrical and electronic equipment when subjected to types of transient disturbances such as those originating from switching transients (interruption of inductive loads, relay contact bounce, etc.). The repetitive fast transient test is a test with burts consisting of a number of fast transients, coupled into power supply, control and signal ports of electrical and electronic equipment. Significant for the test is short rise time, the repetition rate and the low energy of the transients.

Measurement Uncertainty Budgets per IEEE 1528:2003

300 – 3000 MHz range

Uncertainty Component	Tolerance (+/- %)	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	u_i (1g) (+/-%)	u_i (10g) (+/-%)	v_i
Measurement System								
Probe calibration (k=1)	5.5	normal	1	1	1	5.5	5.5	∞
Axial isotropy	4.7	rectangular	1.732	0.707	0.707	1.9	1.9	∞
Hemispherical isotropy	9.6	rectangular	1.732	0.707	0.707	3.9	3.9	∞
Boundary effect	1.0	rectangular	1.732	1	1	0.6	0.6	∞
Linearity	4.7	rectangular	1.732	1	1	2.7	2.7	∞
System detection limits	1.0	rectangular	1.732	1	1	0.6	0.6	∞
Readout electronics	0.3	normal	1	1	1	0.3	0.3	∞
Response time	0.8	rectangular	1.732	1	1	0.5	0.5	∞
Integration time	2.6	rectangular	1.732	1	1	1.5	1.5	∞
RF ambient conditions - noise	1.7	rectangular	1.732	1	1	1.0	1.0	∞
RF Ambient Reflections	0.0	rectangular	1.732	1	1	0.0	0.0	∞
Probe positioner mechanical tolerance	0.4	rectangular	1.732	1	1	0.2	0.2	∞
Probe positioner with respect to phantom shell	2.9	rectangular	1.732	1	1	1.7	1.7	∞
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	1.0	rectangular	1.732	1	1	0.6	0.6	∞
Test Sample Related								
Device Positioning	2.9	normal	1	1	1	2.9	2.9	145
Device Holder	3.6	normal	1	1	1	3.6	3.6	5
Power Drift	5.0	rectangular	1.732	1	1	2.9	2.9	∞
Phantom and tissue parameters								
Phantom Uncertainty - shell thickness tolerances	4.0	rectangular	1.732	1	1	2.3	2.3	∞
Liquid conductivity - deviation from target values	5.0	rectangular	1.732	0.64	0.43	1.8	1.2	∞
Liquid conductivity - measurement uncertainty	6.5	normal	1	0.64	0.43	4.2	2.8	∞
Liquid permittivity - deviation from target values	5.0	rectangular	1.732	0.6	0.49	1.7	1.4	∞
Liquid permittivity - measurement uncertainty	3.2	normal	1	0.6	0.49	1.9	1.6	∞
Combined Standard Uncertainty	RSS					11.2	10.6	387
Expanded Measurement Uncertainty (95% Confidence/	normal (k=2)					22.5	21.2	

3 – 6 GHz range

Uncertainty Component	Tolerance (+/- %)	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	u_i (1g) (+/-%)	u_i (10g) (+/-%)	v_i
Measurement System								
Probe calibration (k=1)	6.55	normal	1	1	1	6.6	6.6	∞
Axial isotropy	4.7	rectangular	1.732	0.707	0.707	1.9	1.9	∞
Hemispherical isotropy	9.6	rectangular	1.732	0.707	0.707	3.9	3.9	∞
Boundary effect	2.0	rectangular	1.732	1	1	1.2	1.2	∞
Linearity	4.7	rectangular	1.732	1	1	2.7	2.7	∞
System detection limits	1.0	rectangular	1.732	1	1	0.6	0.6	∞
Readout electronics	0.3	normal	1	1	1	0.3	0.3	∞
Response time	0.8	rectangular	1.732	1	1	0.5	0.5	∞
Integration time	2.6	rectangular	1.732	1	1	1.5	1.5	∞
RF ambient conditions - noise	1.7	rectangular	1.732	1	1	1.0	1.0	∞
RF Ambient Reflections	0.0	rectangular	1.732	1	1	0.0	0.0	∞
Probe positioner mechanical tolerance	0.8	rectangular	1.732	1	1	0.5	0.5	∞
Probe positioner with respect to phantom shell	9.9	rectangular	1.732	1	1	5.7	5.7	∞
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	4.0	rectangular	1.732	1	1	2.3	2.3	∞
Test Sample Related								
Device Positioning	2.9	normal	1	1	1	2.9	2.9	145
Device Holder	3.6	normal	1	1	1	3.6	3.6	5
Power Drift	5.0	rectangular	1.732	1	1	2.9	2.9	∞
Phantom and tissue parameters								
Phantom Uncertainty - shell thickness tolerances	4.0	rectangular	1.732	1	1	2.3	2.3	∞
Liquid conductivity - deviation from target values	5.0	rectangular	1.732	0.64	0.43	1.8	1.2	∞
Liquid conductivity - measurement uncertainty	6.5	normal	1	0.64	0.43	4.2	2.8	∞
Liquid permittivity - deviation from target values	5.0	rectangular	1.732	0.6	0.49	1.7	1.4	∞
Liquid permittivity - measurement uncertainty	3.2	normal	1	0.6	0.49	1.9	1.6	∞
Combined Standard Uncertainty	RSS					13.2	12.7	330
Expanded Measurement Uncertainty (95% Confidence/	normal (k=2)					26.5	25.4	

Probe Calibration

Please see attached calibration data

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



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

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

Accreditation No.: **SCS 108**

Client **Northwest EMC**

Certificate No: **EX3-3746_Nov10**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3746**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-14.v3, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes**

Calibration date: **November 11, 2010**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: November 11, 2010

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



Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

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

Probe EX3DV4

SN:3746

Manufactured:	March 26, 2010
Calibrated:	November 11, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 SN:3746

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.47	0.49	0.50	± 10.1%
DCP (mV) ^B	94.5	94.5	95.5	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	110.5	± 2.9 %
			Y	0.00	0.00	1.00	114.3	
			Z	0.00	0.00	1.00	111.2	
10061	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	3.60	X	3.86	70.08	19.28	77.9	± 2.1 %
			Y	2.62	65.07	16.74	78.0	
			Z	3.03	66.48	17.70	77.6	
10069	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	12.20	X	11.72	66.82	21.98	80.1	± 6.1 %
			Y	10.64	65.22	21.04	73.9	
			Z	11.40	66.10	21.47	79.3	
10077	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	13.12	X	11.10	65.64	21.82	69.7	± 6.9 %
			Y	11.26	67.57	23.06	93.9	
			Z	10.95	65.59	21.88	69.1	

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

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3746

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz] ^c	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	6.69	6.69	6.69	0.43	0.76 ± 11.0%
5200	± 50 / ± 100	36.0 ± 5%	4.66 ± 5%	5.08	5.08	5.08	0.99	0.67 ± 13.1%
5300	± 50 / ± 100	35.9 ± 5%	4.76 ± 5%	4.59	4.59	4.59	0.49	1.39 ± 13.1%
5500	± 50 / ± 100	35.6 ± 5%	4.96 ± 5%	4.37	4.37	4.37	0.47	1.59 ± 13.1%
5800	± 50 / ± 100	35.3 ± 5%	5.27 ± 5%	4.14	4.14	4.14	0.47	1.76 ± 13.1%

^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3746

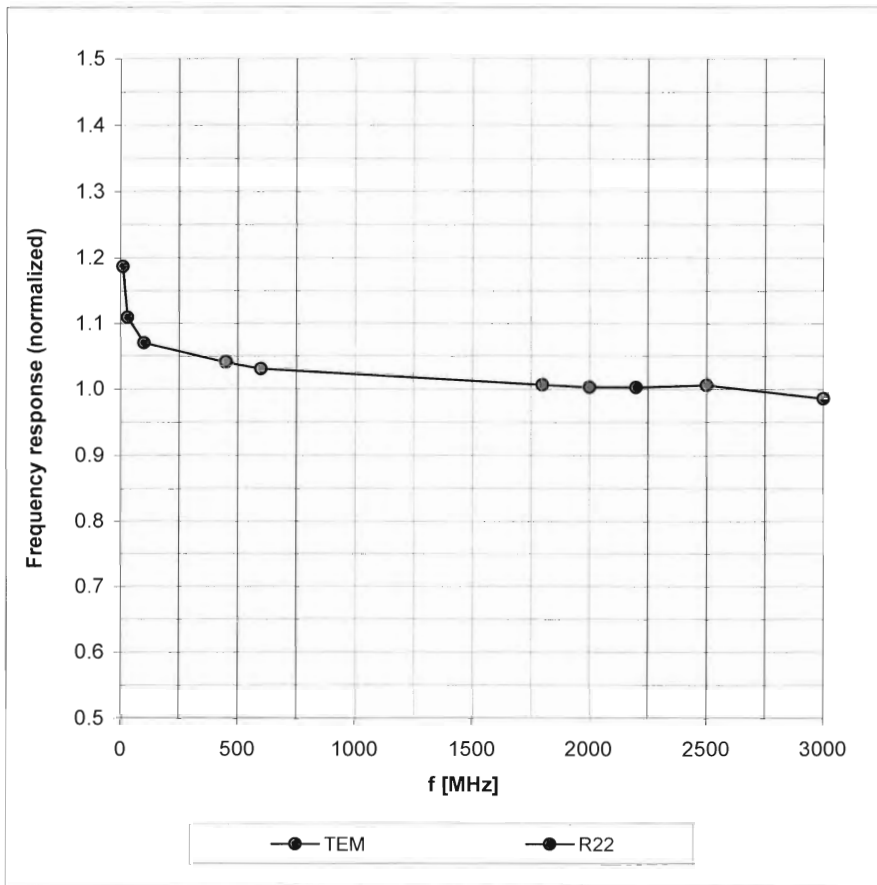
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz] ^c	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	6.81	6.81	6.81	0.48	0.73 ± 11.0%
5200	± 50 / ± 100	49.0 ± 5%	5.30 ± 5%	4.16	4.16	4.16	0.51	1.76 ± 13.1%
5300	± 50 / ± 100	48.9 ± 5%	5.42 ± 5%	3.80	3.80	3.80	0.54	1.88 ± 13.1%
5500	± 50 / ± 100	48.6 ± 5%	5.65 ± 5%	3.69	3.69	3.69	0.54	2.02 ± 13.1%
5800	± 50 / ± 100	48.2 ± 5%	6.00 ± 5%	3.87	3.87	3.87	0.53	1.94 ± 13.1%

^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

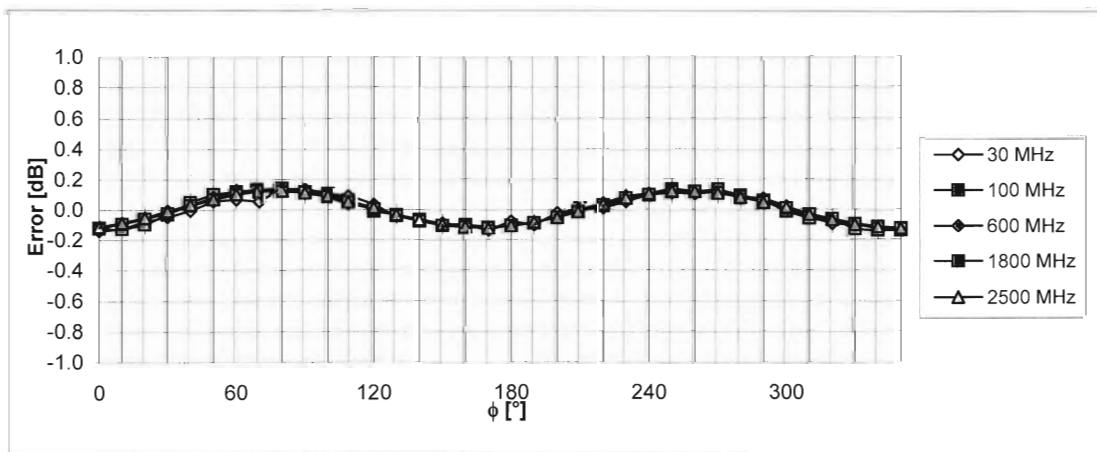
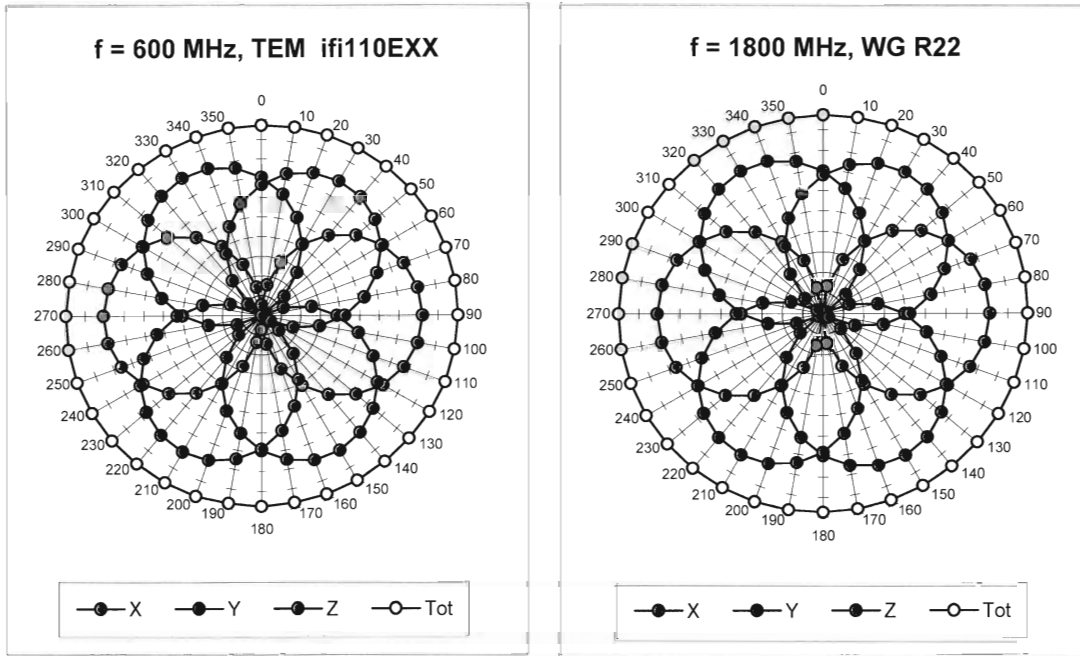
Frequency Response of E-Field

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



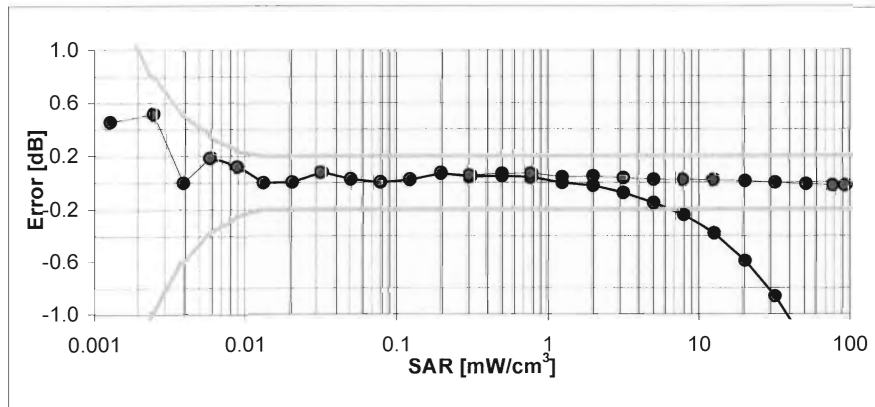
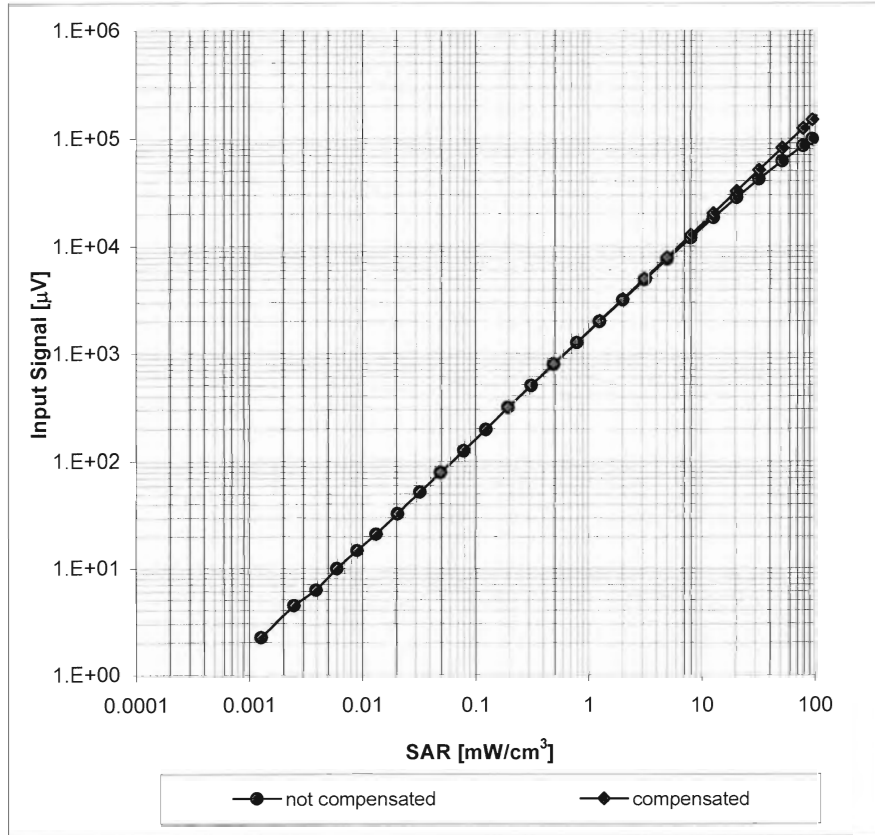
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

Receiving Pattern (ϕ), $\vartheta = 0^\circ$



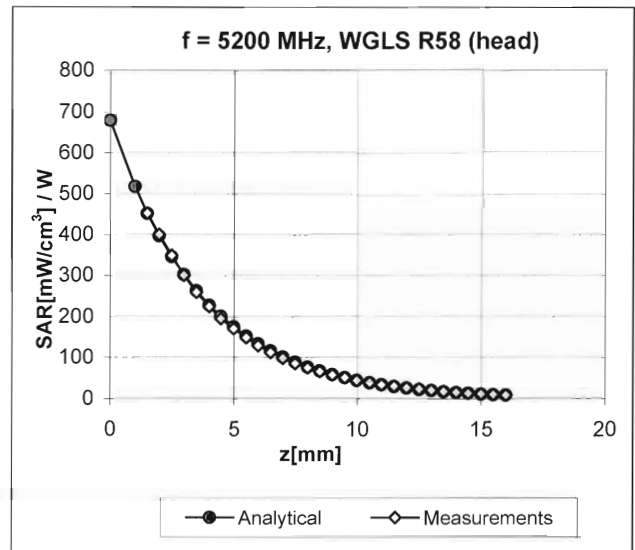
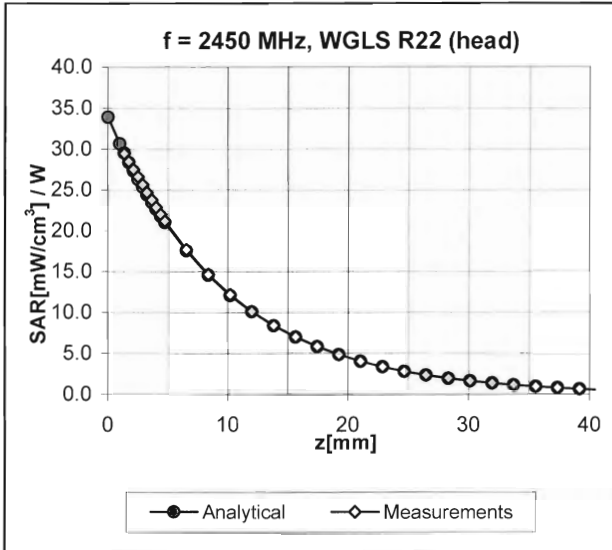
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range f(SAR_{head}) (Waveguide R22, f = 1800 MHz)



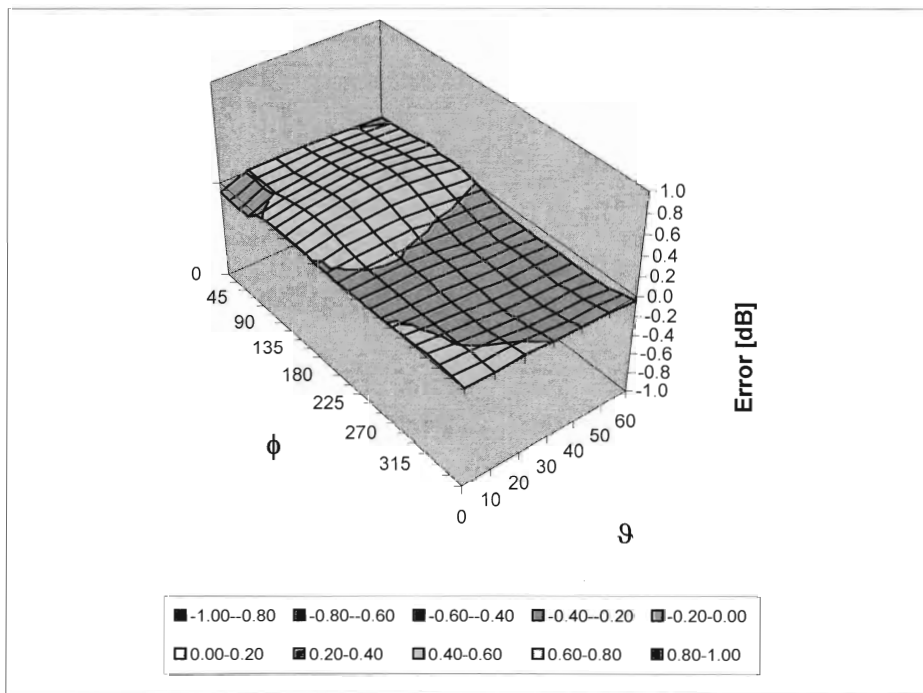
Uncertainty of Linearity Assessment: $\pm 0.6\%$ (k=2)

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ (k=2)

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

Dipole Calibration

Please see attached calibration data

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



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

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 The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Northwest EMC**

Certificate No: **D2450V2-855_Nov10**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 855**

Calibration procedure(s) **QA CAL-05.v7
 Calibration procedure for dipole validation kits**

Calibration date: **November 11, 2010**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: November 12, 2010

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

Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.8 ± 6 %	1.72 mho/m ± 6 %
Head TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.1 mW / g
SAR normalized	normalized to 1W	52.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	53.4 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.13 mW / g
SAR normalized	normalized to 1W	24.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	24.7 mW / g ± 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.3 ± 6 %	1.92 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.8 mW / g
SAR normalized	normalized to 1W	51.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	51.5 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.96 mW / g
SAR normalized	normalized to 1W	23.8 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	23.9 mW / g ± 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.0 Ω + 2.1 j Ω
Return Loss	- 27.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.5 Ω + 5.0 j Ω
Return Loss	- 26.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.158 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 10, 2009

DASY5 Validation Report for Head TSL

Date/Time: 11.11.2010 12:05:34

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:855

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U12 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.72$ mho/m; $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

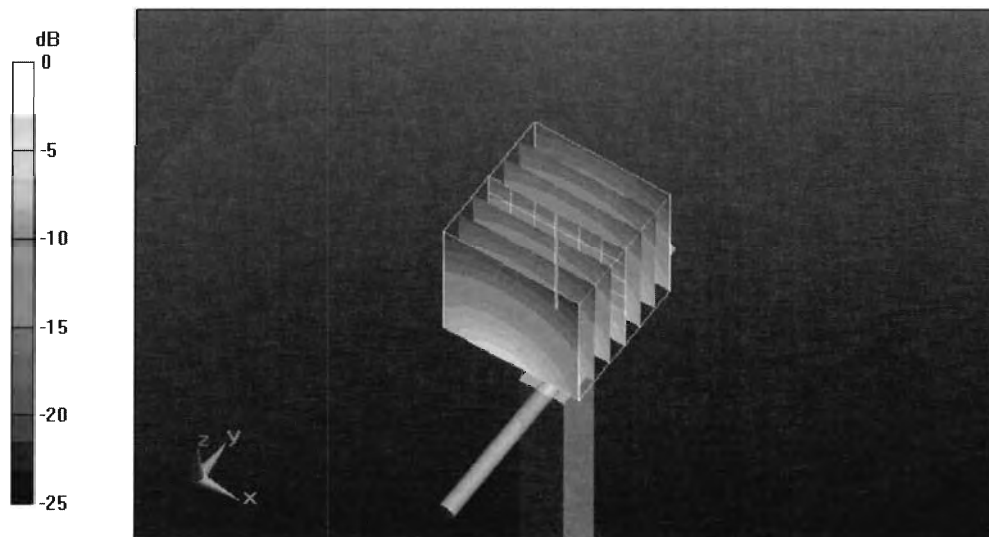
Pin=250 mW/d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 102.4 V/m; Power Drift = 0.031 dB

Peak SAR (extrapolated) = 26.8 W/kg

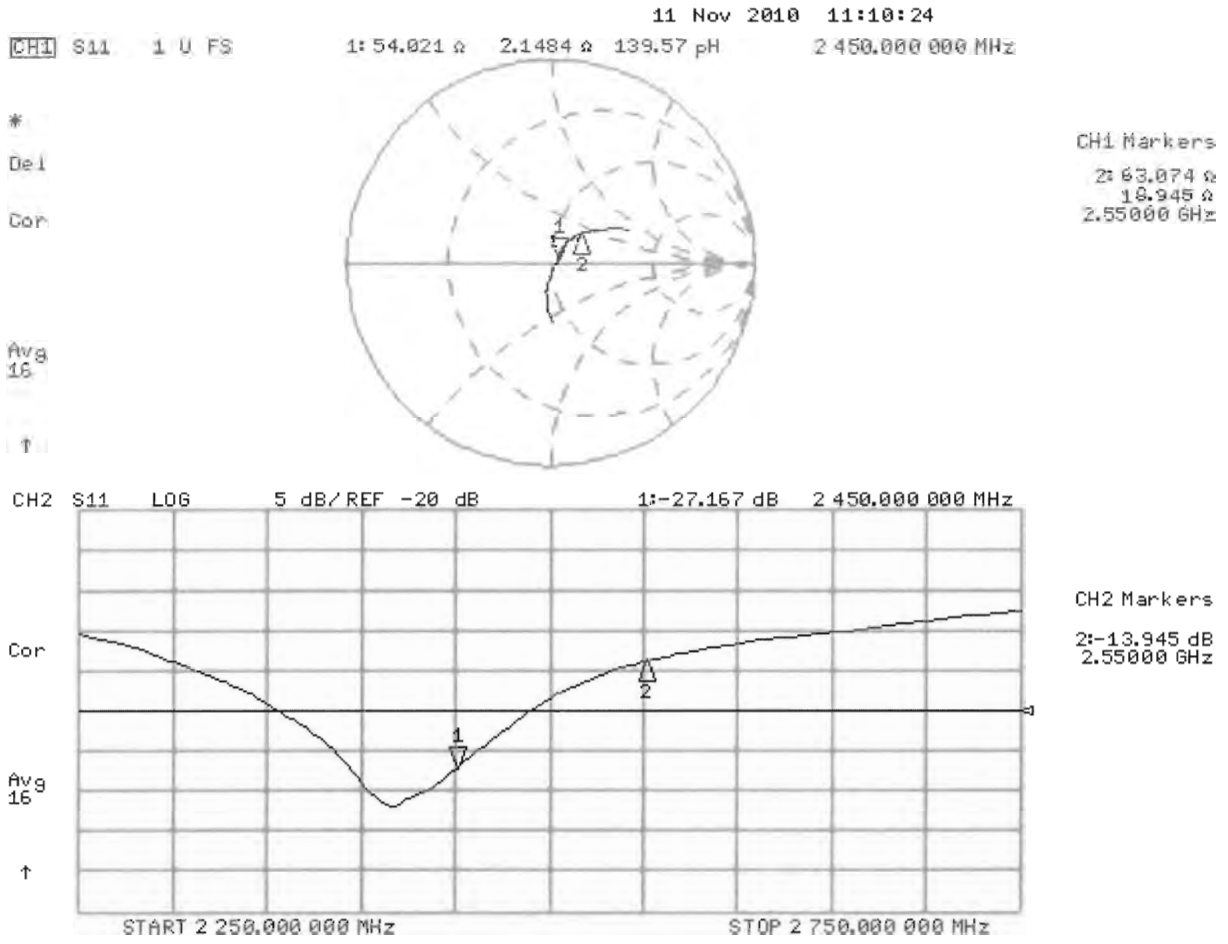
SAR(1 g) = 13.1 mW/g; SAR(10 g) = 6.13 mW/g

Maximum value of SAR (measured) = 16.7 mW/g



0 dB = 16.7mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 11.11.2010 14:17:34

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:855

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: MSL U12 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.92$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

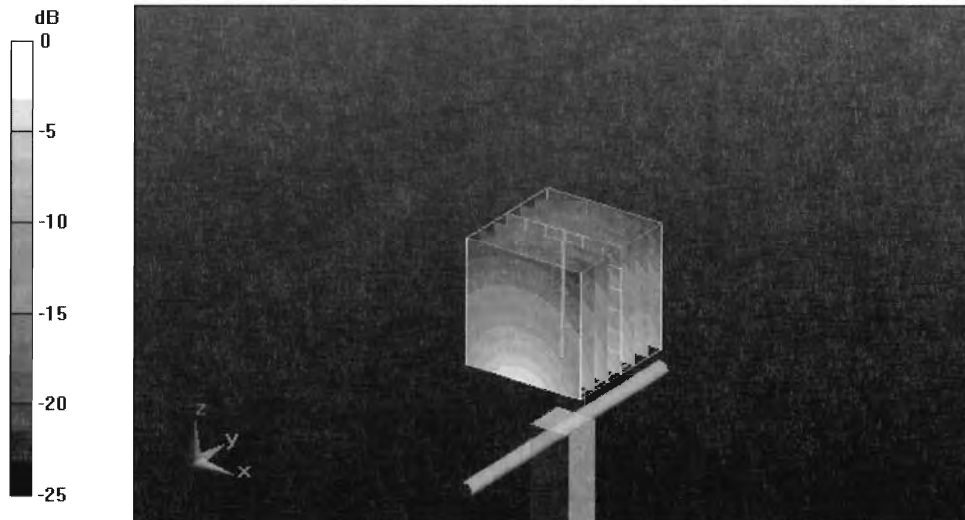
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.4 V/m; Power Drift = 0.034 dB

Peak SAR (extrapolated) = 26.7 W/kg

SAR(1 g) = 12.8 mW/g; SAR(10 g) = 5.96 mW/g

Maximum value of SAR (measured) = 16.9 mW/g



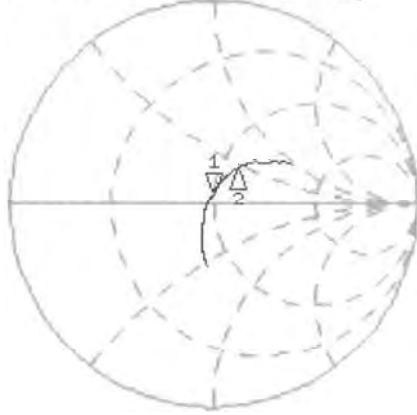
0 dB = 16.9mW/g

Impedance Measurement Plot for Body TSL

11 Nov 2010 11:10:46

CH1 S11 1 U FS 1: 49.539 Ω 4.9863 Ω 323.92 μ H 2 450.000 000 MHz

De1
Cor

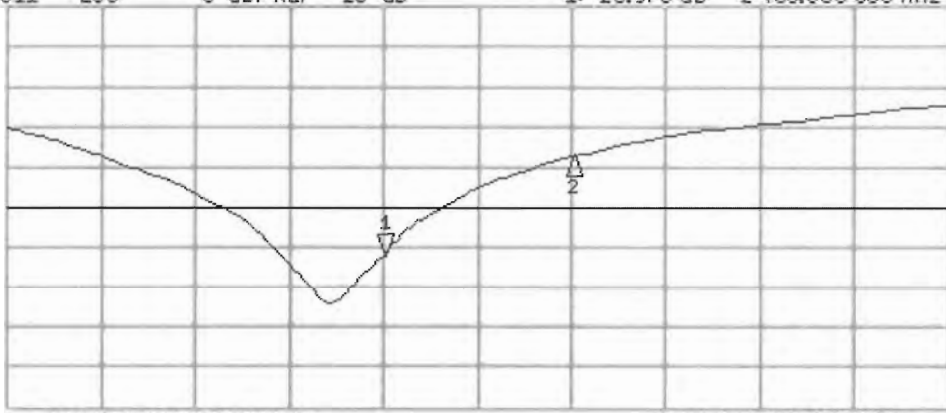


CH1 Markers
2: 58.180 Ω
21.350 Ω
2.55000 GHz

Avg
15
↑

CH2 S11 LOG 5 dB/REF -20 dB 1: -25.976 dB 2 450.000 000 MHz

Cor
Avg
15
↑



CH2 Markers
2: -13.666 dB
2.55000 GHz

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



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

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Northwest EMC**

Certificate No: **D5GHzV2-1066_Nov10**

CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN: 1066**

Calibration procedure(s) **QA CAL-22.v1
Calibration procedure for dipole validation kits between 3-6 GHz**

Calibration date: **November 16, 2010**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe EX3DV4	SN: 3503	05-Mar-10 (No. EX3-3503_Mar10)	Mar-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct 11

Calibrated by: **Claudio Leubler** Name: Claudio Leubler Function: Laboratory Technician

Approved by: **Katja Pokovic** Name: Katja Pokovic Function: Technical Manager

Signature: *[Handwritten signatures]*

Issued: November 17, 2010



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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

- IEC Std 62209 Part 2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", Draft Version 0.9, December 2004
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:* SAR measured at the stated antenna input power.
- SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Area Scan resolution	dx, dy = 10 mm	
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 2.0 mm	
Frequency	5200 MHz ± 1 MHz 5500 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.2 ± 6 %	4.59 mho/m ± 6 %
Head TSL temperature during test	(21.7 ± 0.2) °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	100 mW input power	8.33 mW / g
SAR normalized	normalized to 1W	83.3 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	83.8 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.35 mW / g
SAR normalized	normalized to 1W	23.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	23.6 mW / g ± 19.5 % (k=2)

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.7 ± 6 %	4.90 mho/m ± 6 %
Head TSL temperature during test	(21.7 ± 0.2) °C	----	----

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	100 mW input power	8.88 mW / g
SAR normalized	normalized to 1W	88.8 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	89.3 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.49 mW / g
SAR normalized	normalized to 1W	24.9 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	25.0 mW / g ± 19.5 % (k=2)

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.3 ± 6 %	5.21 mho/m ± 6 %
Head TSL temperature during test	(21.7 ± 0.2) °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	100 mW input power	8.25 mW / g
SAR normalized	normalized to 1W	82.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	82.9 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.32 mW / g
SAR normalized	normalized to 1W	23.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	23.3 mW / g ± 19.5 % (k=2)

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.4 ± 6 %	5.32 mho/m ± 6 %
Body TSL temperature during test	(22.3 ± 0.2) °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	100 mW input power	7.86 mW / g
SAR normalized	normalized to 1W	78.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	78.1 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.18 mW / g
SAR normalized	normalized to 1W	21.8 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	21.6 mW / g ± 19.5 % (k=2)

Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.65 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.9 ± 6 %	5.70 mho/m ± 6 %
Body TSL temperature during test	(22.3 ± 0.2) °C	----	----

SAR result with Body TSL at 5500 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	100 mW input power	8.54 mW / g
SAR normalized	normalized to 1W	85.4 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	84.8 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.35 mW / g
SAR normalized	normalized to 1W	23.5 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	23.3 mW / g ± 19.5 % (k=2)

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.5 ± 6 %	6.10 mho/m ± 6 %
Body TSL temperature during test	(22.3 ± 0.2) °C	----	----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	100 mW input power	7.61 mW / g
SAR normalized	normalized to 1W	76.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	75.6 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.09 mW / g
SAR normalized	normalized to 1W	20.9 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	20.7 mW / g ± 19.5 % (k=2)

Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	$51.2 \Omega - 7.0 j\Omega$
Return Loss	-23.1 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	$52.6 \Omega - 2.8 j\Omega$
Return Loss	-28.6 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	$56.0 \Omega - 0.4 j\Omega$
Return Loss	-24.9 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	$51.4 \Omega - 5.6 j\Omega$
Return Loss	-24.8 dB

Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	$52.9 \Omega - 2.0 j\Omega$
Return Loss	-29.4 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	$56.7 \Omega + 1.2 j\Omega$
Return Loss	-23.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.198 ns
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After long term use with 40 W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 27, 2006

DASY5 Validation Report for Head TSL

/Time: 15.11.2010 13:45:25

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1066

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: HSL 501

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.6$ mho/m; $\epsilon_r = 37.2$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5500$ MHz; $\sigma = 4.91$ mho/m; $\epsilon_r = 36.7$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5800$ MHz; $\sigma = 5.22$ mho/m; $\epsilon_r = 36.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.36, 5.36, 5.36), ConvF(4.85, 4.85, 4.85), ConvF(4.74, 4.74, 4.74); Calibrated: 05.03.2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Configuration D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x2mm), dist=2mm (8x8x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 64.7 V/m; Power Drift = 0.075 dB

Peak SAR (extrapolated) = 32.1 W/kg

SAR(1 g) = 8.33 mW/g; SAR(10 g) = 2.35 mW/g

Maximum value of SAR (measured) = 16.2 mW/g

Configuration D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x2mm), dist=2mm (8x8x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 65 V/m; Power Drift = 0.077 dB

Peak SAR (extrapolated) = 36.3 W/kg

SAR(1 g) = 8.88 mW/g; SAR(10 g) = 2.49 mW/g

Maximum value of SAR (measured) = 17.7 mW/g

Configuration D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x2mm), dist=2mm (8x8x12)/Cube 0:

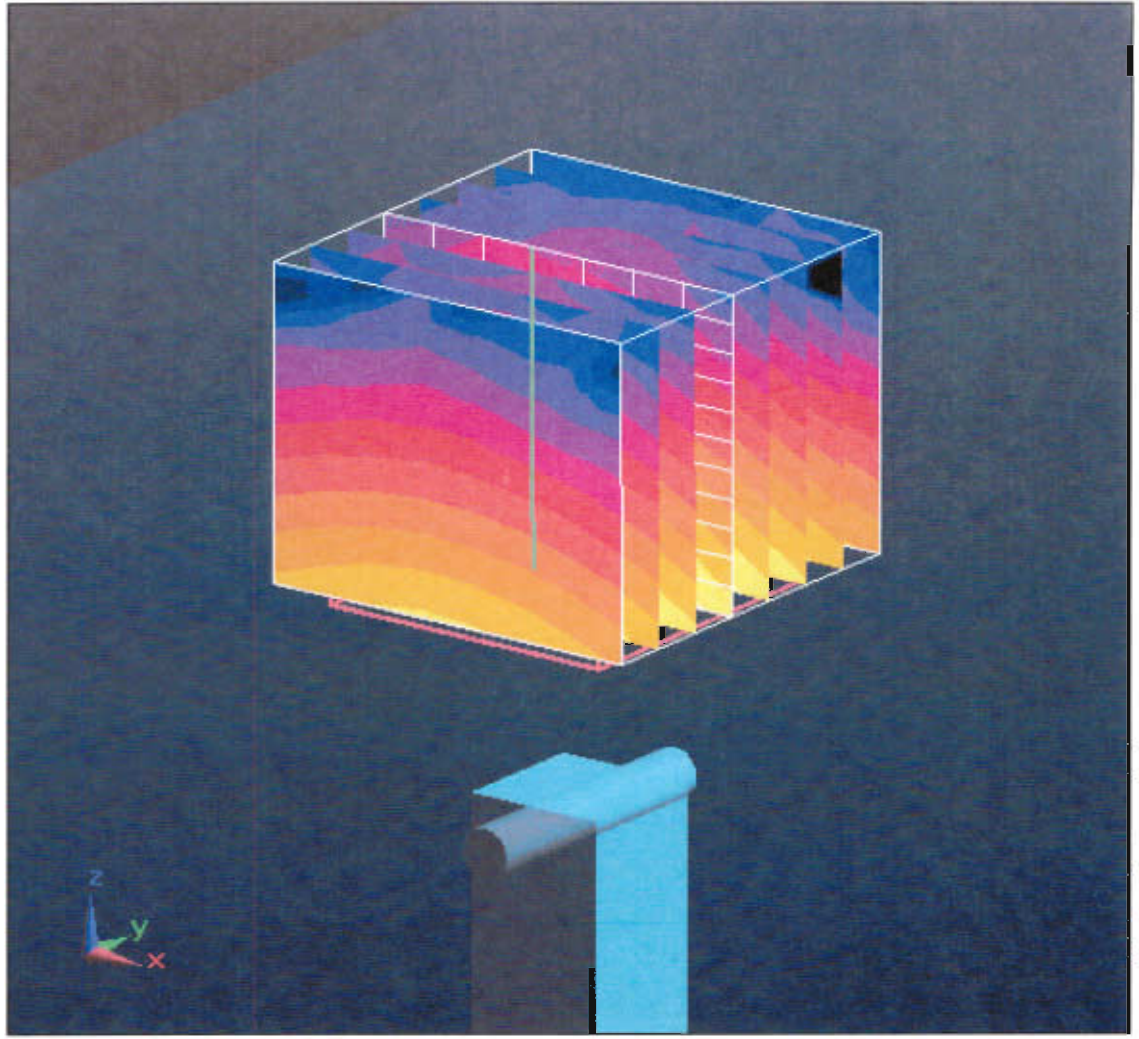
Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 61.5 V/m; Power Drift = 0.062 dB

Peak SAR (extrapolated) = 34.8 W/kg

SAR(1 g) = 8.25 mW/g; SAR(10 g) = 2.32 mW/g

Maximum value of SAR (measured) = 16.4 mW/g



0 dB = 16.4mW/g

Impedance Measurement Plot for Head TSL

15 Nov 2010 09:44:56

CH1 S11 1 U FS

31 51.168 Ω -6.9785 Ω 4.3859 pF 5 200.000 000 MHz

*
Del
Cor



CH1 Markers

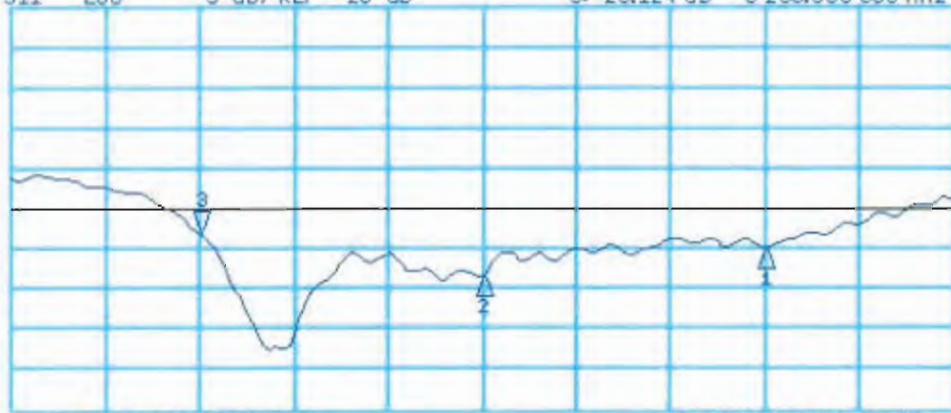
1: 51.168 Ω
-365.23 Ω
5.80000 GHz
2: 52.637 Ω
-2.7576 Ω
5.50000 GHz

avg
16

CH2 S11 LOG 5 dB/REF -20 dB 31 -23.124 dB 5 200.000 000 MHz

Cor

avg
16



CH2 Markers

1: -24.942 dB
5.80000 GHz
2: -26.572 dB
5.50000 GHz

START 5 000.000 000 MHz

STOP 6 000.000 000 MHz

DASY5 Validation Report for Body TSL

Date/Time: 16.11.2010 15:06:09

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1066

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: MSL 5000 MHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 5.3$ mho/m; $\epsilon_r = 47.4$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5500$ MHz; $\sigma = 5.68$ mho/m; $\epsilon_r = 46.9$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5800$ MHz; $\sigma = 6.08$ mho/m; $\epsilon_r = 46.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.88, 4.88, 4.88), ConvF(4.37, 4.37, 4.37), ConvF(4.57, 4.57, 4.57); Calibrated: 05.03.2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Configuration D5GHzV2 Dipole (Body)/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x2mm), dist=2mm (8x8x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 60.6 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 32 W/kg

SAR(1 g) = 7.86 mW/g; SAR(10 g) = 2.18 mW/g

Maximum value of SAR (measured) = 15.4 mW/g

Configuration D5GHzV2 Dipole (Body)/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x2mm), dist=2mm (8x8x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 61.2 V/m; Power Drift = -0.016 dB

Peak SAR (extrapolated) = 36.6 W/kg

SAR(1 g) = 8.54 mW/g; SAR(10 g) = 2.35 mW/g

Maximum value of SAR (measured) = 16.8 mW/g

Configuration D5GHzV2 Dipole (Body)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x2mm), dist=2mm (8x8x12)/Cube 0:

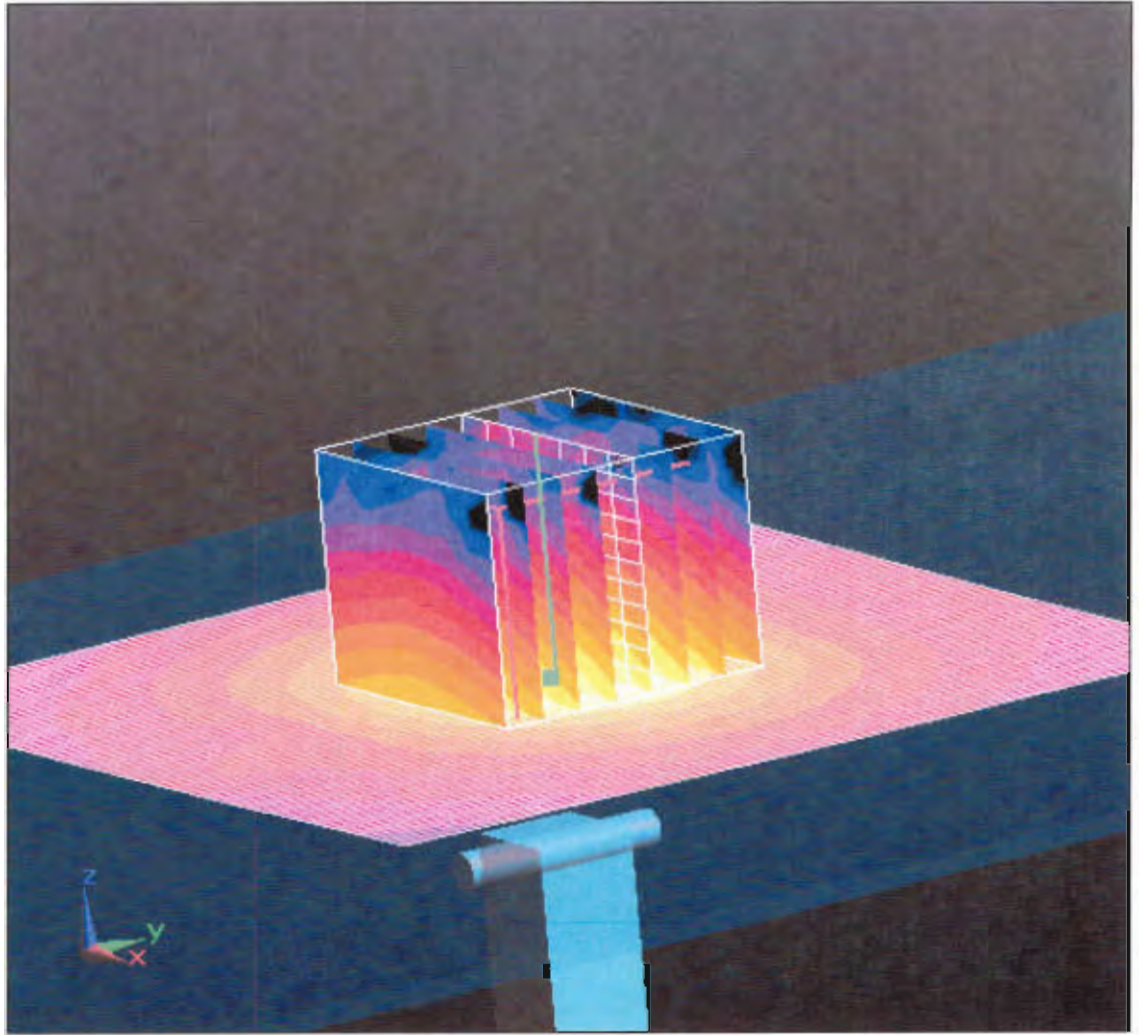
Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 56.3 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 34.4 W/kg

SAR(1 g) = 7.61 mW/g; SAR(10 g) = 2.09 mW/g

Maximum value of SAR (measured) = 15.1 mW/g



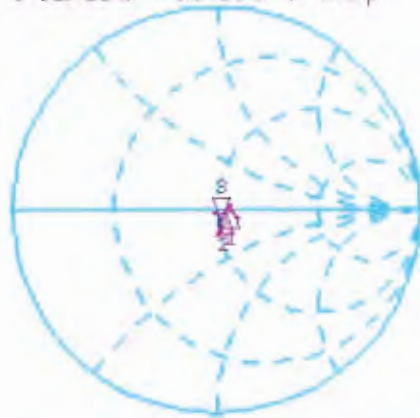
0 dB = 15.1mW/g

Impedance Measurement Plot for Body TSL

16 Nov 2010 12:14:24

CH1 S11 1 U FS 3: 51.412 Ω -5.6426 Ω 5.4242 μF 5 200.000 000 MHz

*
Del
Cor
Avg
16
t

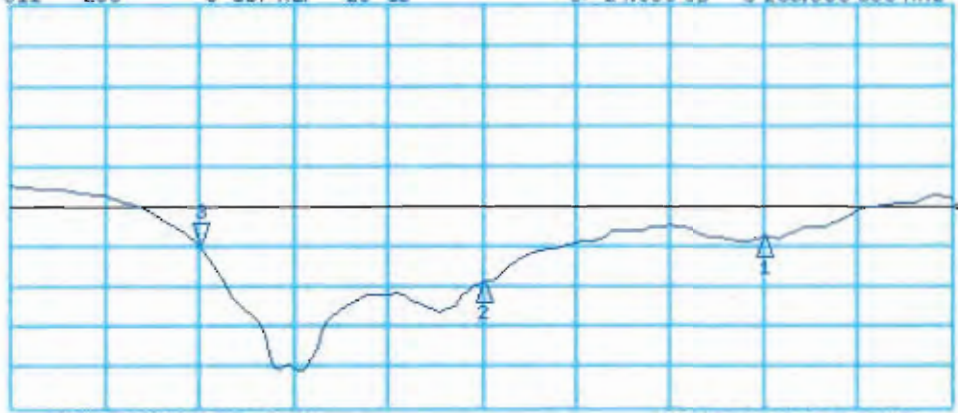


CH1 Markers

1: 56.717 Ω
1.2324 Ω
5.00000 GHz
2: 52.065 Ω
-1.9756 Ω
5.50000 GHz

CH2 S11 LOG 5 dB/REF -20 dB 3: -24.835 dB 5 200.000 000 MHz

Cor
Avg
16
t



CH2 Markers

1: -23.876 dB
5.00000 GHz
2: -29.399 dB
5.50000 GHz

START 5 000.000 000 MHz

STOP 5 500.000 000 MHz