

Intermec Technologies Corporation

Model: 1000CP03C

Evaluated to the following SAR Specifications:

FCC 2.1093: 2011
Health Safety Code 6:2009

Report No. INMC0737.1 Rev 01

Report Prepared By



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

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SAR Evaluation Report



22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Evaluation
Last Date of Test: October 6, 2011
Intermec Technologies Corporation
Model: 1000CP03C

Applicable Standards			
Test Description	Specification	Test Method	Pass/Fail
SAR Evaluation	FCC 2.1093:2011	FCC OET 65C:2001	Pass
		IEEE Std 1528:2003	
		FCC KDB 447498 D01 v04	
		FCC KDB 941225 D01 v02, and D03	
		FCC KDB 648474 D01 v01r05	
	Health Safety Code 6:2009	RSS-102, Issue 4:2010	Pass

Highest SAR Values				
Frequency Band	Head 1g (W/kg)	Body 1g (W/kg)	Limit 1g (W/kg)	Exposure Environment
Cellular	.377	1.12	1.6	General Population Uncontrolled
PCS	.517	1.19 ^{Note 1}		

Note 1: 12mm spacing required between left side of EUT and body phantom

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 Facteau, 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	30-61

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



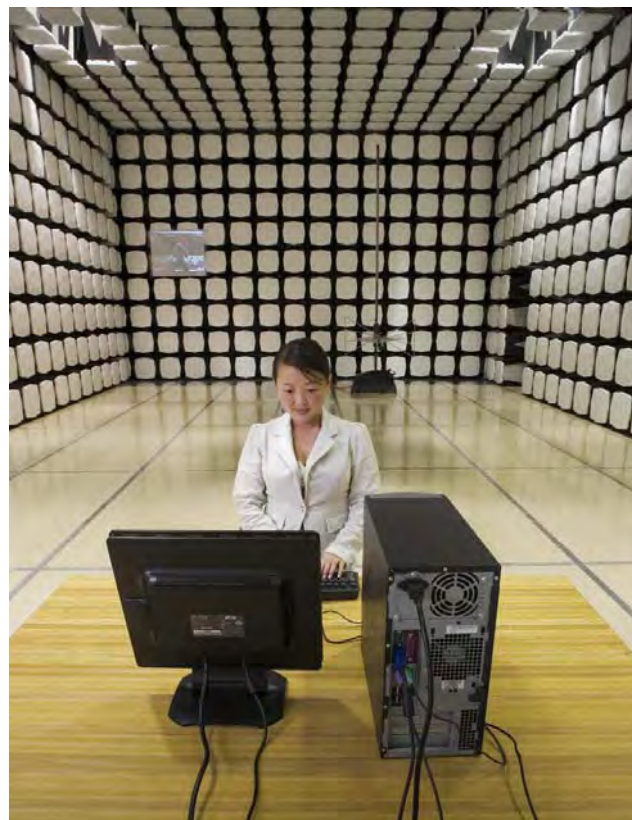
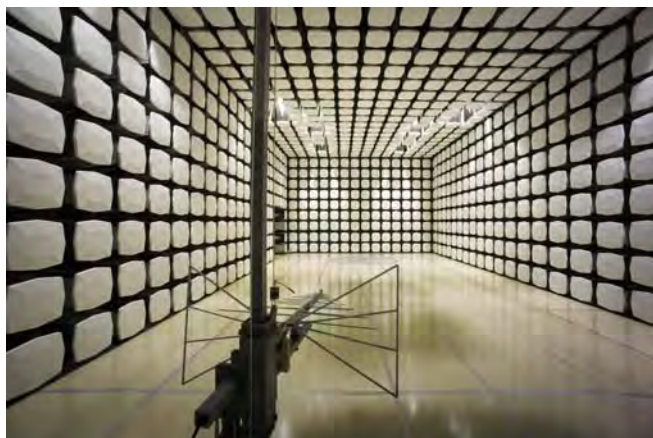
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Sultan, WA 98294
(360) 793-8675

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 19, 2011
Last Date of Test:	October 6, 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 802.11a/b/g/n – Bluetooth radio was evaluated under a separate SAR evaluation report.

Regarding the CDMA (EVDO Rev A) radio:

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

"Routine SAR evaluation with respect to Section 2.1093 of the rules is required for licensed transmitter to show compliance;"

The SAR evaluation documented in this report is for the CDMA (EVDO Rev A) 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	9/19/11	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	9/30/11	SAR Evaluation	Moved left side of EUT 12mm from body phantom	Pat Helton of Intermec said additional padding will be added to the holster to insure a 12mm minimum spacing on the left side.	EUT remained at Northwest EMC following the test.
3	10/6/11	SAR Evaluation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Per FCC KDB 941225, the conducted output power was measured at the low, middle and high channels in each band. An Agilent 8960 test set, Model E5515C, was used to control the EUT. The following applications were installed on the test set: CDMA 2000 Mobile Test Rev B.18.12, and EVDO Term Test Rev A.13.10. This provided all the necessary tools to operate the EUT in the prescribed manner without any difficulties or equipment limitations.

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

1XRTT

Per FCC KDB 941225, measurements for 1XRTT were made according to the procedures in section 4.4.5.2 of 3GPP2C.S0011/TIA-98-E. Results for steps 3, 4, and 10 of the power measurement procedure are tabulated on the following pages. SO55 was measured with power control bits in "All Up" condition; TDSO/SO32 was measured with power control bits in the "Bits Hold" condition.

The Agilent 8960 test set was configured as follows:

- Cell Info > Cell Parameters > System ID (SID) > 16420
 - Network ID (NID) > 65535
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > See attached data sheet
- FCH Service Option (SO) Setup > See attached data sheet
- Traffic Data Rate > Full (9.6kbps)
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
 - R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > Active bits (SO32)
- Rvs Power Ctrl > All Up bits (Maximum TxPout) (SO55)
- Call Params
 - Cell Power > set to -104 dBm/1.23 MHz (SO55)
 - Cell Power > Start at -86 dBm/1.23 MHz , then decrease until max power is reached (SO32)

EVDO Rev 0

Per FCC KDB 941225, measurements for EVDO Rev 0 were made according to the procedures in section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866. The results are tabulated on the following pages.

The Agilent 8960 test set was configured as follows:

RTAP Settings

- Call Control:
 - Generator Info > Channel Data Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
 - Cell Power > Set to -105.5 dBm/1.23 MHz
 - Application Config > Enhanced Test Application Protocol > RTAP
 - RTAP Rate > 153.6 kbps
 - Protocol Rel > 0 (1xEV-DO)
 - Rvs Power Ctrl > All Up bits (Maximum TxPout)

FTAP Settings

Call Control:
Generator Info > Channel Data Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
Call Params:
Cell Power > Set to -105.5 dBm/1.23 MHz
Application Config > Enhanced Test Application Protocol > FTAP
FTAP Rate > 307.2 kbps (2 slot, QPSK)
Protocol Rel > 0 (1xEV-DO)
Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Rev A

For EVDO Rev A mode, measurements were made according to the procedures in section 4.3.4 of 3GPP2 C.S0033-A. The results are tabulated on the following pages.

The Agilent 8960 test set was configured as follows:

RETAP Settings

Call Params:
Cell Power > Set to -60 dBm/1.23 MHz
Protocol Rev > A (1xEV-DO-A)
Application Config > Enhanced Test Application Protocol > RETAP
R-Data Pkt Size > 4096
Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
Call Control:
PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0):
Generator Info > Channel Data Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
ACK R-Data After > Subpacket 0 (All ACK)
Rvs Power Ctrl > All Up bits (Maximum TxPout)

FETAP Settings

Call Params:
Cell Power > Set to -60 dBm/1.23 MHz
Protocol Rev > A (1xEV-DO-A)
Application Config > Enhanced Test Application Protocol > FETAP
F-Traffic Format > 4 (1024, 2, 128) Canonical (307.2k, QPSK)
Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
Call Control:
PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0):
Generator Info > Channel Data Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
ACK R-Data After > Subpacket 0 (All ACK)
Rvs Power Ctrl > All Up bits (Maximum TxPout)

NORTHWEST		Output Power		XMIT 2011.01.18	
EMC					
EUT: 1000CP03C		Work Order: INMC0737			
Serial Number: 14621142016		Date: 09/19/11			
Customer: Intermec Technologies Corporation		Temperature: 24.2			
Attendees: None		Humidity: 45%			
Project:		Barometric Pres.: 1024.3			
Tested by: Rod Peloquin		EUT Power Battery		Job Site: EV08	
TEST SPECIFICATIONS		Test Method			
FCC 2.1093:2011		FCC OET 65C:2001			
COMMENTS					
Conducted output power					
DEVIATIONS FROM TEST STANDARD					
None					
Configuration #	2	Signature <i>Rod Peloquin</i>			

CDMA 2000 1x

Band	Channel	Frequency (MHz)	Radio Configuration (RC)	Service Option (SO)	Conducted Power (Average) dBm	W
Cellular Band	1013	824.7	RC3 (Fwd3, Rvs3)	SO55 (Loopback)	24.58	0.287
				SO32 (FCH+SCH)	23.39	0.218
			RC1(Fwd1, Rvs1)	SO32(FCH)	23.94	0.248
				SO55 (Loopback)	24.62	0.290
	384	836.52	RC3 (Fwd3, Rvs3)	SO55 (Loopback)	24.78	0.301
				SO32 (FCH+SCH)	23.59	0.229
			RC1(Fwd1, Rvs1)	SO32(FCH)	24.58	0.287
				SO55 (Loopback)	24.86	0.306
	777	848.31	RC3 (Fwd3, Rvs3)	SO55 (Loopback)	24.58	0.287
				SO32 (FCH+SCH)	23.34	0.216
			RC1(Fwd1, Rvs1)	SO32(FCH)	24.53	0.284
				SO55 (Loopback)	24.59	0.288
PCS Band	25	1851.25	RC3 (Fwd3, Rvs3)	SO55 (Loopback)	25.17	0.329
				SO32 (FCH+SCH)	23.67	0.233
			RC1(Fwd1, Rvs1)	SO32(FCH)	24.4	0.275
				SO55 (Loopback)	25.26	0.336
	600	1880	RC3 (Fwd3, Rvs3)	SO55 (Loopback)	25.25	0.335
				SO32 (FCH+SCH)	23.85	0.243
			RC1(Fwd1, Rvs1)	SO32(FCH)	24.19	0.262
				SO55 (Loopback)	25.23	0.333
	1175	1908.75	RC3 (Fwd3, Rvs3)	SO55 (Loopback)	24.89	0.308
				SO32 (FCH+SCH)	23.62	0.230
			RC1(Fwd1, Rvs1)	SO32(FCH)	22.62	0.183
				SO55 (Loopback)	24.97	0.314

EV-DO Rev 0

Band	Channel	Frequency (MHz)	FTAP Rate (kbps)	RTAP Rate (kbps)	Conducted Power (Average - MAP) dBm	W
Cellular	1013	824.70	307.2 (2 slot, QPSK)	153.6	24.62	0.290
	384	836.52			24.87	0.307
	777	848.31			24.66	0.292
PCS	25	1851.25			25.19	0.330
	600	1880.00			25.21	0.332
	1175	1908.75			25.12	0.325

EV-DO Rev A

Band	Channel	Frequency (MHz)	FETAP-Traffic Format (kbps)	RETAP-Data Payload Size	Conducted Power (Average) dBm	W
Cellular	1013	824.70	307.2 (QPSK/ACK channel is transmitted at all the slots)	4096	24.74	0.298
	384	836.52			25.04	0.319
	777	848.31			24.65	0.292
PCS	25	1851.25			25.23	0.333
	600	1880.00			25.26	0.336
	1175	1908.75			25.04	0.319

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	Head		Body	
(MHz)	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

NORTHWEST		Tissue - Equivalent Liquid		SAR 2011.02.21	
EMC					
EUT: MSL900				Work Order: INMC0737	
Serial Number: SAT				Date: 09/19/2011	
Customer: Intermec Technologies Corporation				Temperature (°C): 22.8	
Attendees: None				Humidity: 48	
Project: P-INMC018				Barometric Pres. (mb): 1022.30	
Tested by: Ethan Schoonover and Jennifer Herrett				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: MSL900			Liquid Temperature (°C): 22.9		

Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
835	54.571	0.996	55.200	0.970	1.14	-2.71
700.0	55.9	0.868				
705.0	55.8	0.873				
710.0	55.8	0.878				
715.0	55.7	0.882				
720.0	55.7	0.887				
725.0	55.6	0.891				
730.0	55.6	0.895				
735.0	55.5	0.900				
740.0	55.5	0.905				
745.0	55.4	0.909				
750.0	55.3	0.914				
755.0	55.3	0.918				
760.0	55.2	0.922				
765.0	55.2	0.927				
770.0	55.2	0.931				
775.0	55.1	0.936				
780.0	55.1	0.941				
785.0	55.1	0.946				
790.0	55.0	0.951				
795.0	55.0	0.957				
800.0	54.9	0.962				
805.0	54.9	0.967				
810.0	54.8	0.972				
815.0	54.8	0.977				
820.0	54.7	0.981				
825.0	54.7	0.987				
830.0	54.6	0.991				
835.0	54.6	0.996				
840.0	54.5	1.002				
845.0	54.5	1.006				
850.0	54.4	1.011				
855.0	54.4	1.016				
860.0	54.3	1.021				
865.0	54.3	1.026				
870.0	54.2	1.031				
875.0	54.2	1.036				
880.0	54.1	1.041				
885.0	54.1	1.045				
890.0	54.0	1.051				
895.0	54.0	1.055				
900.0	53.9	1.060				
905.0	53.9	1.065				
910.0	53.9	1.071				
915.0	53.8	1.076				
920.0	53.8	1.080				
925.0	53.7	1.085				
930.0	53.7	1.090				
935.0	53.6	1.095				
940.0	53.6	1.100				
945.0	53.5	1.105				
950.0	53.5	1.110				
955.0	53.4	1.115				
960.0	53.4	1.119				
965.0	53.4	1.124				
970.0	53.3	1.129				
975.0	53.3	1.134				
980.0	53.2	1.139				
985.0	53.2	1.144				
990.0	53.2	1.149				
995.0	53.1	1.155				
1000.0	53.1	1.160				
1005.0	53.0	1.165				
1010.0	53.0	1.170				
1015.0	52.9	1.175				
1020.0	52.9	1.180				
1025.0	52.9	1.185				
1030.0	52.8	1.191				
1035.0	52.8	1.196				
1040.0	52.7	1.201				
1045.0	52.7	1.207				
1050.0	52.7	1.212				
1055.0	52.6	1.217				
1060.0	52.6	1.223				
1065.0	52.5	1.228				
1070.0	52.5	1.234				
1075.0	52.5	1.239				
1080.0	52.4	1.244				
1085.0	52.4	1.250				
1090.0	52.3	1.255				
1095.0	52.3	1.260				
1100.0	52.2	1.265				
1105.0	52.2	1.270				
1110.0	52.2	1.275				
1115.0	52.1	1.280				
1120.0	52.1	1.285				
1125.0	52.0	1.291				
1130.0	52.0	1.296				
1135.0	51.9	1.301				
1140.0	51.9	1.306				
1145.0	51.9	1.311				
1150.0	51.8	1.316				
1155.0	51.8	1.322				
1160.0	51.7	1.327				
1165.0	51.7	1.332				
1170.0	51.7	1.337				
1175.0	51.6	1.342				
1180.0	51.6	1.347				
1185.0	51.5	1.352				
1190.0	51.5	1.357				
1195.0	51.5	1.362				
1200.0	51.4	1.368				

NORTHWEST		Tissue - Equivalent Liquid		SAR 2011.02.21	
EMC					
EUT: HSL900				Work Order: INMC0737	
Serial Number: SAS				Date: 09/20/2011	
Customer: Intermec Technologies Corporation				Temperature (°C): 22.6	
Attendees: none				Humidity: 45.1	
Project: PINMC018				Barometric Pres. (mb): 1019	
Tested by: Jennifer Herrett				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: HSL900			Liquid Temperature (°C): 22.1		

Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
835	41.366	0.861	41.500	0.900	0.32	4.28
700.0	42.9	0.742				
705.0	42.9	0.747				
710.0	42.8	0.751				
715.0	42.7	0.756				
720.0	42.7	0.760				
725.0	42.6	0.765				
730.0	42.5	0.770				
735.0	42.5	0.774				
740.0	42.4	0.779				
745.0	42.4	0.783				
750.0	42.3	0.788				
755.0	42.3	0.793				
760.0	42.2	0.797				
765.0	42.1	0.802				
770.0	42.1	0.806				
775.0	42.0	0.811				
780.0	42.0	0.815				
785.0	41.9	0.819				
790.0	41.9	0.824				
795.0	41.8	0.828				
800.0	41.8	0.832				
805.0	41.7	0.836				
810.0	41.7	0.841				
815.0	41.6	0.845				
820.0	41.5	0.849				
825.0	41.5	0.853				
830.0	41.4	0.857				
835.0	41.4	0.861				
840.0	41.3	0.866				
845.0	41.2	0.870				
850.0	41.2	0.875				
855.0	41.1	0.879				
860.0	41.0	0.884				
865.0	41.0	0.888				
870.0	40.9	0.893				
875.0	40.8	0.897				
880.0	40.8	0.901				
885.0	40.7	0.905				
890.0	40.7	0.910				
895.0	40.6	0.915				
900.0	40.6	0.919				
905.0	40.5	0.923				
910.0	40.4	0.928				
915.0	40.4	0.932				
920.0	40.3	0.936				
925.0	40.3	0.940				
930.0	40.2	0.945				
935.0	40.2	0.948				
940.0	40.1	0.953				
945.0	40.0	0.956				
950.0	40.0	0.960				
955.0	39.9	0.964				
960.0	39.9	0.968				
965.0	39.8	0.972				
970.0	39.8	0.976				
975.0	39.7	0.979				
980.0	39.7	0.984				
985.0	39.7	0.988				
990.0	39.6	0.992				
995.0	39.6	0.997				
1000.0	39.5	1.002				
1005.0	39.5	1.006				
1010.0	39.4	1.011				
1015.0	39.4	1.016				
1020.0	39.3	1.021				
1025.0	39.3	1.026				
1030.0	39.2	1.030				
1035.0	39.2	1.035				
1040.0	39.2	1.040				
1045.0	39.1	1.044				
1050.0	39.1	1.049				
1055.0	39.0	1.053				
1060.0	39.0	1.058				
1065.0	38.9	1.063				
1070.0	38.9	1.067				
1075.0	38.8	1.072				
1080.0	38.8	1.076				
1085.0	38.8	1.081				
1090.0	38.7	1.085				
1095.0	38.7	1.089				
1100.0	38.6	1.094				
1105.0	38.6	1.098				
1110.0	38.5	1.101				
1115.0	38.5	1.106				
1120.0	38.4	1.110				
1125.0	38.4	1.114				
1130.0	38.4	1.118				
1135.0	38.3	1.122				
1140.0	38.3	1.127				
1145.0	38.2	1.131				
1150.0	38.2	1.135				
1155.0	38.1	1.139				
1160.0	38.1	1.143				
1165.0	38.0	1.148				
1170.0	38.0	1.152				
1175.0	37.9	1.156				
1180.0	37.9	1.160				
1185.0	37.9	1.165				
1190.0	37.8	1.169				
1195.0	37.8	1.173				
1200.0	37.7	1.178				

NORTHWEST		SAR 2011.02.21	
EMC		Tissue - Equivalent Liquid	
EUT: MSL 1900		Work Order: INMC0737	
Serial Number: SAO		Date: 9-20-2011	
Customer: Intermec Technologies Corporation		Temperature (°C): 23.5	
Attendees: None		Humidity: 44.6	
Project: P-INMC018		Barometric Pres. (mb): 1018.1	
Tested by: Ethan Schoonover		Power: N/A	
Job Site: Cal Lab			
TEST SPECIFICATIONS		Test Method	
FCC 2.1093:2011		FCC OET 65C:2001	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	None	 Signature	
Tissue: MSL 1900		Liquid Temperature (°C): 22.3	

Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1900	52.104	1.490	53.300	1.520	2.24	1.99
1600.0	53.2	1.161				
1612.5	53.2	1.176				
1625.0	53.1	1.190				
1637.5	53.1	1.204				
1650.0	53.0	1.218				
1662.5	53.0	1.233				
1675.0	52.9	1.246				
1687.5	52.9	1.259				
1700.0	52.8	1.272				
1712.5	52.8	1.284				
1725.0	52.7	1.297				
1737.5	52.7	1.309				
1750.0	52.7	1.322				
1762.5	52.6	1.335				
1775.0	52.6	1.349				
1787.5	52.5	1.363				
1800.0	52.5	1.377				
1812.5	52.5	1.392				
1825.0	52.4	1.407				
1837.5	52.4	1.421				
1850.0	52.3	1.435				
1862.5	52.3	1.449				
1875.0	52.2	1.463				
1887.5	52.1	1.476				
1900.0	52.1	1.490				
1912.5	52.1	1.503				
1925.0	52.0	1.516				
1937.5	52.0	1.530				
1950.0	51.9	1.544				
1962.5	51.9	1.559				
1975.0	51.9	1.574				
1987.5	51.8	1.588				
2000.0	51.8	1.603				

NORTHWEST		SAR 2011.02.21	
EMC		Tissue - Equivalent Liquid	
EUT: HSL1900		Work Order: INMC0737	
Serial Number: SAN		Date: 09/21/2011	
Customer: Intermec Technologies Corporation		Temperature (°C): 23.3	
Attendees: None		Humidity: 44.7	
Project: P-INMC018		Barometric Pres. (mb): 1016.50	
Tested by: Jennifer Herrett		Power: None	
Job Site: Cal Lab			
TEST SPECIFICATIONS		Test Method	
FCC 2.1093:2011		FCC OET 65C:2001	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	None	Signature 	
Tissue: HSL1900		Liquid Temperature (°C): 21.6	

Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1900	38.844	1.372	40.000	1.400	2.89	2.02

1600.0	40.2	1.074
1612.5	40.1	1.087
1625.0	40.1	1.100
1637.5	40.0	1.113
1650.0	40.0	1.126
1662.5	39.9	1.139
1675.0	39.8	1.152
1687.5	39.8	1.163
1700.0	39.7	1.174
1712.5	39.7	1.185
1725.0	39.6	1.197
1737.5	39.5	1.209
1750.0	39.5	1.220
1762.5	39.4	1.233
1775.0	39.4	1.245
1787.5	39.4	1.258
1800.0	39.3	1.271
1812.5	39.2	1.284
1825.0	39.2	1.297
1837.5	39.1	1.310
1850.0	39.1	1.323
1862.5	39.0	1.335
1875.0	39.0	1.348
1887.5	38.9	1.359
1900.0	38.8	1.372
1912.5	38.8	1.384
1925.0	38.7	1.396
1937.5	38.7	1.408
1950.0	38.7	1.421
1962.5	38.6	1.433
1975.0	38.6	1.446
1987.5	38.5	1.459
2000.0	38.5	1.472

NORTHWEST		SAR 2011.02.21	
EMC		Tissue - Equivalent Liquid	
EUT: MSL1900		Work Order: INMC0737	
Serial Number: SAO		Date: 10/05/2011	
Customer: Intermec Technologies Corporation		Temperature (°C): 22.4	
Attendees: none		Humidity: 45.6	
Project: P-INMC018		Barometric Pres. (mb): 1000.60	
Tested by: Jennifer Herrett		Power: None	
Job Site: Cal Lab			
TEST SPECIFICATIONS		Test Method	
FCC 2.1093:2011		FCC OET 65C:2001	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	None	Signature 	
Tissue: MSL1900		Liquid Temperature (°C): 22.4	

Frequency (GHz)	Actual Values		Target Values		Deviation (%)	
	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1900	51.920	1.570	53.300	1.520	2.59	-3.31

1600.0	53.1	1.234
1612.5	53.0	1.247
1625.0	53.0	1.260
1637.5	52.9	1.273
1650.0	52.9	1.287
1662.5	52.8	1.300
1675.0	52.8	1.314
1687.5	52.7	1.326
1700.0	52.7	1.340
1712.5	52.7	1.353
1725.0	52.6	1.366
1737.5	52.6	1.381
1750.0	52.5	1.395
1762.5	52.5	1.410
1775.0	52.4	1.425
1787.5	52.4	1.439
1800.0	52.3	1.454
1812.5	52.3	1.468
1825.0	52.2	1.483
1837.5	52.2	1.497
1850.0	52.1	1.512
1862.5	52.1	1.526
1875.0	52.0	1.541
1887.5	52.0	1.556
1900.0	51.9	1.570
1912.5	51.9	1.585
1925.0	51.8	1.599
1937.5	51.8	1.613
1950.0	51.7	1.626
1962.5	51.7	1.640
1975.0	51.6	1.654
1987.5	51.6	1.670
2000.0	51.5	1.684

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

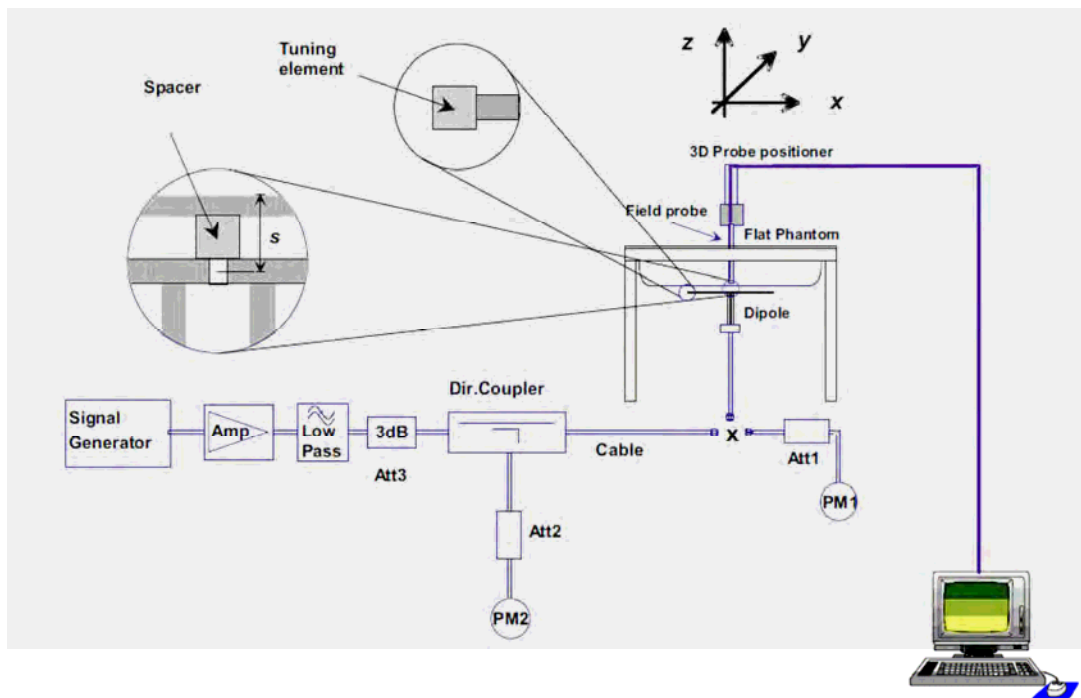
Within 24 hours of a measurement, Northwest EMC used the system validation kit (calibrated reference dipole) to test whether the system was operating within its specifications. The validation was performed in the indicated bands by making SAR measurements of the reference dipole with the phantom filled 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.



NORTHWEST		SAR 2011.02.07	
EMC		System Verification	
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:			Barometric Pres.: See Data Sheets
Tested by:	Jennifer Herrett		Job Site: EV08
TEST SPECIFICATIONS		Test Method	
FCC 2.1093:2011		FCC OET 65C:2001 IEEE Std 1528:2003 FCC KDB 447498 D01 v04 FCC KDB 941225 D01 v02, and D03 FCC KDB 648474 D01 V01r05	
Health Safety Code 6:2009		RSS-102, Issue 4:2010	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
No Deviations			
Configuration :	N/A	Signature 	

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
9/19/2011	MSL900 835MHz	20.00	10.00	0.98	0.65	9.83	6.47	9.93	6.51	-1.01	-0.61	
9/20/2011	HSL900 835MHz	20.00	10.00	0.97	0.64	9.66	6.36	9.64	6.29	0.21	1.11	
9/21/2011	HSL1900 1900MHz	20.00	10.00	3.90	2.00	39.00	20.00	40.20	20.90	-2.99	-4.31	
9/21/2011	MSL1900 1900MHz	20.00	10.00	4.05	2.10	40.50	21.00	39.90	21.00	1.50	0.00	
10/5/2011	MSL1900 1900MHz	20.00	10.00	4.32	2.29	43.20	22.90	39.90	21.00	8.27	9.05	
10/6/2011	MSL900 835MHz	20.51	8.89	1.14	0.75	10.14	6.66	9.93	6.51	2.08	2.31	

EMC

SAR TEST DATA

Room Temperature (°C):	23.8	Humidity (%):	48.8	Test Date:	09/19/11
Liquid Temperature (°C):	22.5	Barometric Pressure (mb):	1022.3	Tested by:	Ethan Schoonover

MSL900 System Check_835MHz 09-19-11

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:4D108

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz; Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0.996264$ mho/m, $\epsilon = 54.571$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 835$ MHz; $\sigma = 0.996$ mho/m; $\epsilon = 54.571$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(5.97, 5.97, 5.97); Calibrated: 2/23/2011
Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 5mm (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)

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

Maximum value of Total (measured) = 32.142 V/m

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

Reference Value = 31.282 V/m; Power Drift = 0.04 dB

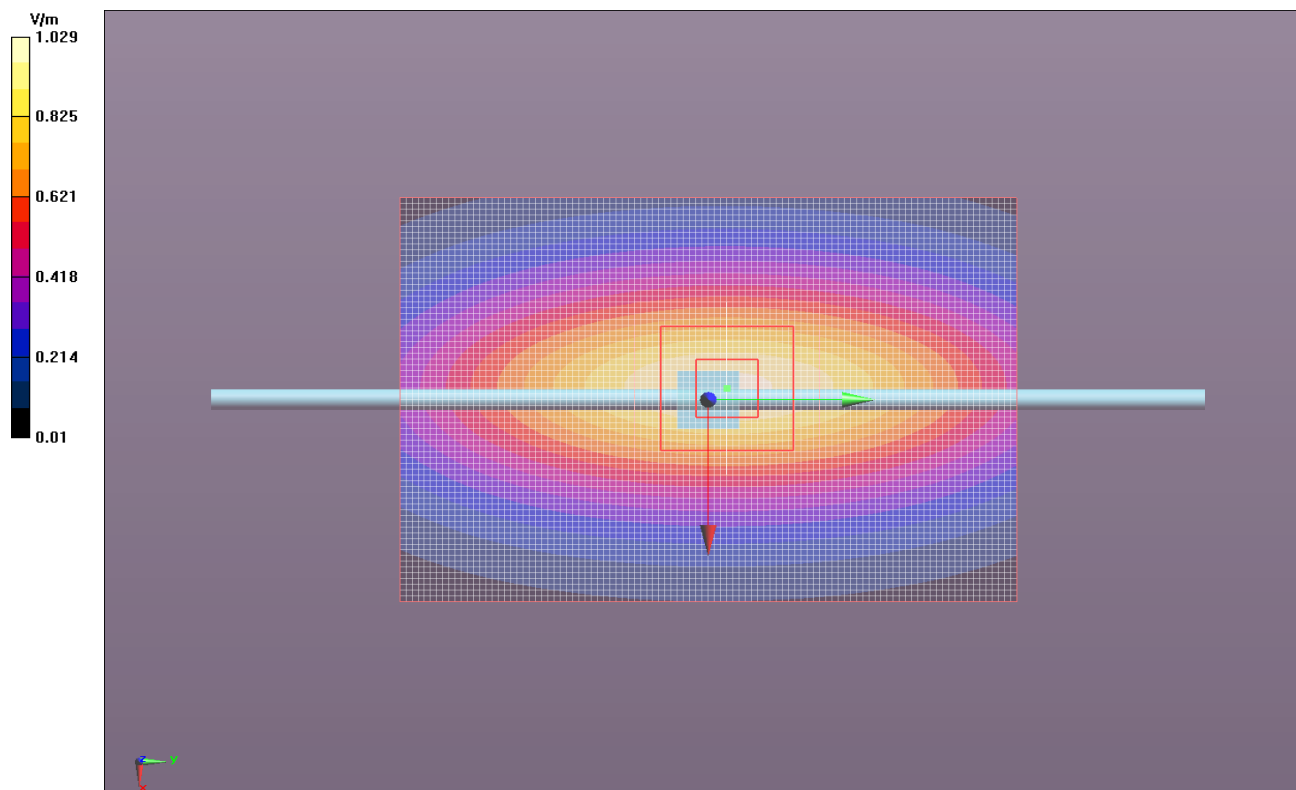
Peak SAR (extrapolated) = 1.446 W/kg

SAR(1 g) = 0.982 mW/g; SAR(10 g) = 0.646 mW/g

Maximum value of SAR (measured) = 0.982 mW/g

System Check/System Check/Area Scan (71x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.978 mW/g



NORTHWEST					SAR 2011.02.07	
EMC		SAR TEST DATA				
Room Temperature (°C):	22.1	Humidity (%):	45	Test Date:	09/20/11	
Liquid Temperature (°C):	22	Barometric Pressure (mb):	1019	Tested by:	Jennifer Herrett	

HSL900 System Check_835MHz 9-20-11

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:4D108

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 835 MHz; σ = 0.861 mho/m; ϵ = 41.366; ρ = 1000 kg/m³ , Medium parameters used: σ = 0.861427 mho/m, ϵ = 41.3662; ρ = 1000 kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

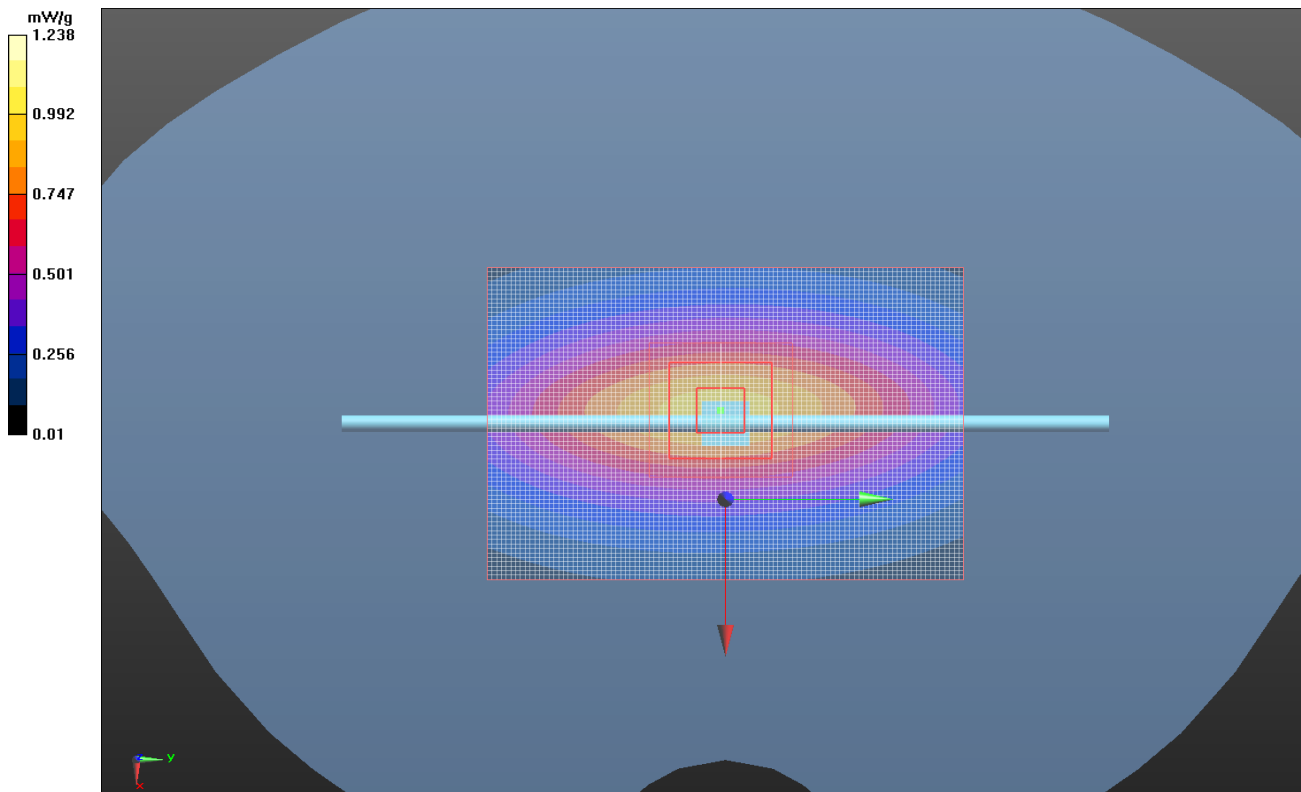
DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(6.01, 6.01, 6.01); 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: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

System Check/System Check/Area Scan (71x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.961 mW/g

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 33.329 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.432 W/kg
SAR(1 g) = 0.966 mW/g; SAR(10 g) = 0.636 mW/g
Maximum value of SAR (measured) = 0.964 mW/g

System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 37.906 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	24.5	Humidity (%):	50	Test Date:	09/21/11
Liquid Temperature (°C):	21.3	Barometric Pressure (mb):	1013.7	Tested by:	Ethan Schoonover

MSL1900 System Check_1900MHz 9-21-11

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:xxx

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz; Communication System PAR: 0 dB
Medium parameters used: $f = 1900$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 52.104$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.48974$ mho/m, $\epsilon_r = 52.1043$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3246; ConvF(4.63, 4.63, 4.63); Calibrated: 11/11/2010
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/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.165 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 7.650 W/kg

SAR(1 g) = 4.05 mW/g; SAR(10 g) = 2.1 mW/g

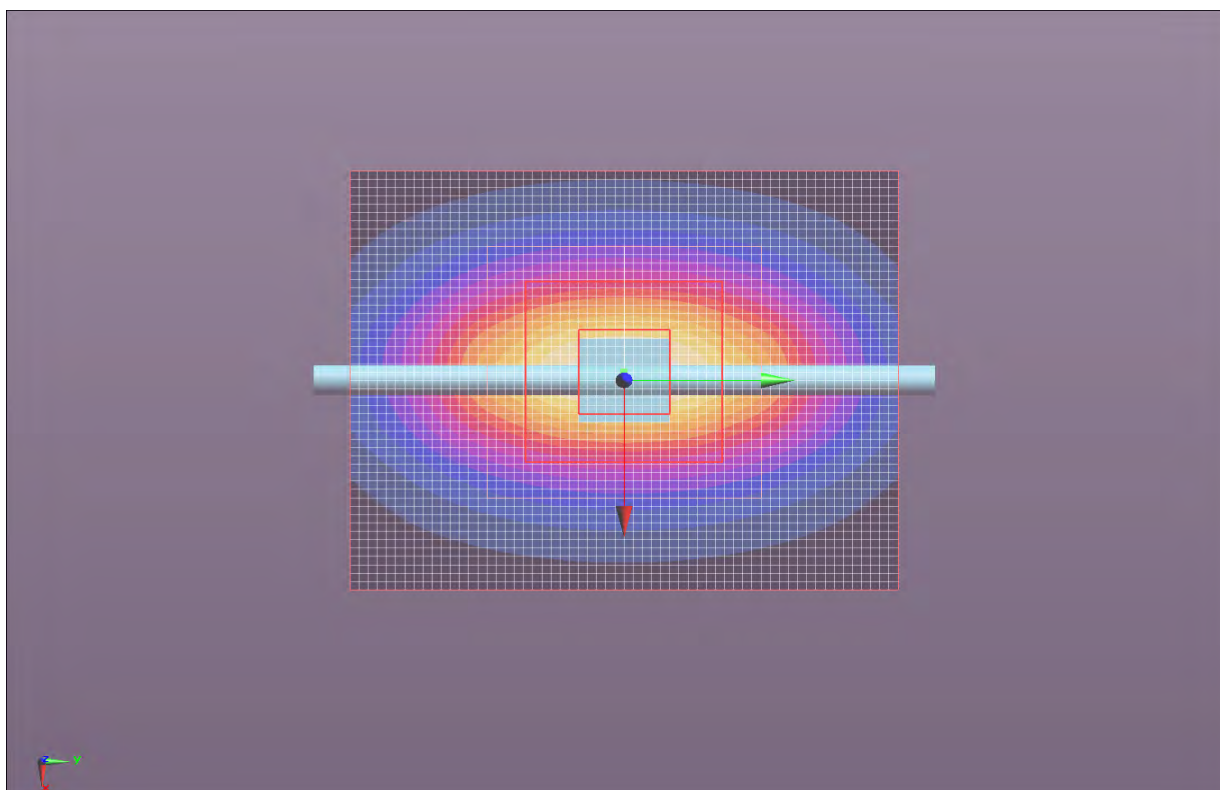
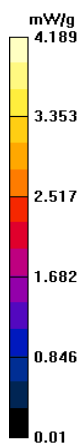
Maximum value of SAR (measured) = 4.030 mW/g

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

Maximum value of SAR (interpolated) = 4.107 mW/g

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

Maximum value of Total (measured) = 53.024 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	24.5	Humidity (%):	50	Test Date:	09/21/11
Liquid Temperature (°C):	21.3	Barometric Pressure (mb):	1013.7	Tested by:	Ethan Schoonover

HSL1900 System Check_1900MHz 9-21-11

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:xxx

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.372$ mho/m; $\epsilon_r = 38.844$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.37175$ mho/m, $\epsilon_r = 38.844$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: ES3DV3 - SN3246; ConvF(5.02, 5.02, 5.02); Calibrated: 11/11/2010

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: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

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

Reference Value = 52.358 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 7.605 W/kg

SAR(1 g) = 3.9 mW/g; SAR(10 g) = 2 mW/g

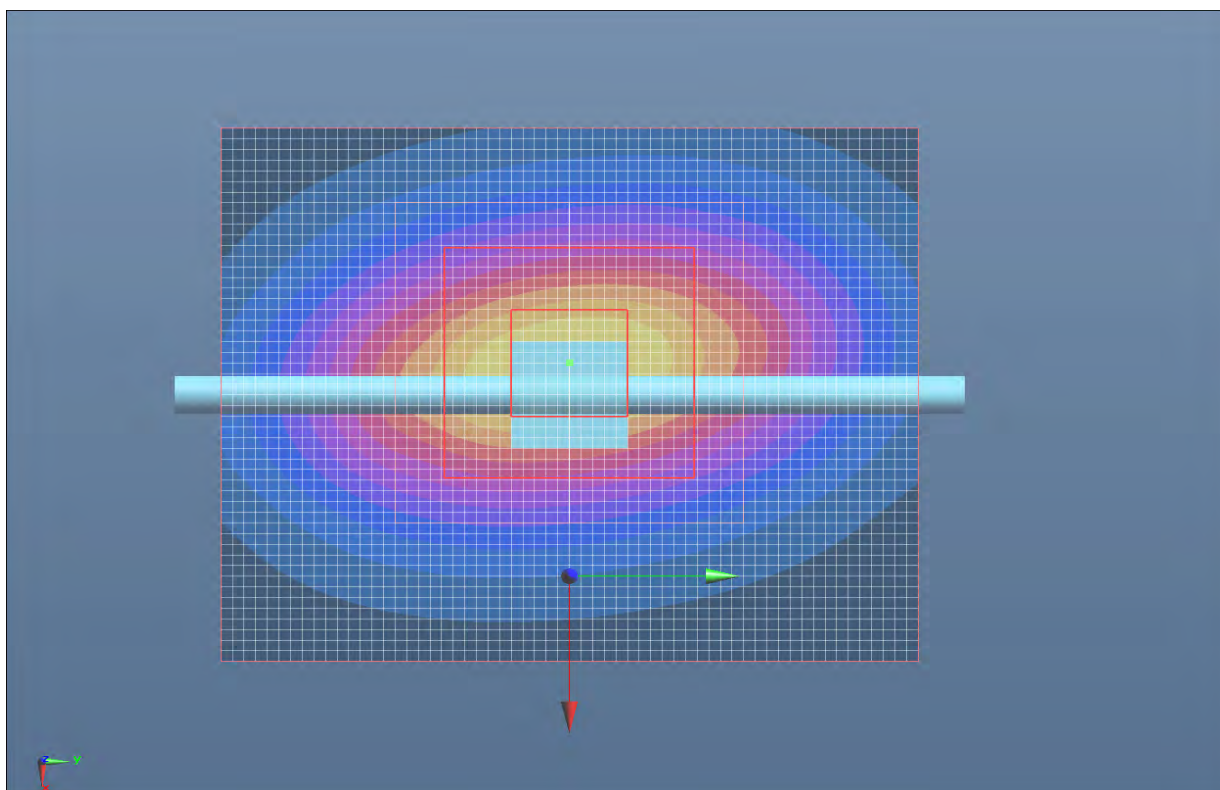
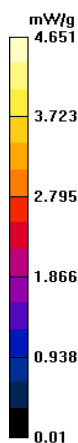
Maximum value of SAR (measured) = 3.841 mW/g

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

Maximum value of SAR (interpolated) = 3.853 mW/g

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

Maximum value of Total (measured) = 58.229 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	22.4	Humidity (%):	42.1	Test Date:	10/05/11
Liquid Temperature (°C):	22.3	Barometric Pressure (mb):	1006	Tested by:	Jennifer Herrett

MSL1900 System Check_1900MHz 10-5-11c

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:5d131

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz; Communication System PAR: 0 dB
 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.57$ mho/m; $\epsilon_r = 51.92$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.57027$ mho/m, $\epsilon_r = 51.9196$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.55, 4.55, 4.55); 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) = 4.382 mW/g

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

Reference Value = 51.053 V/m; Power Drift = 0.06 dB

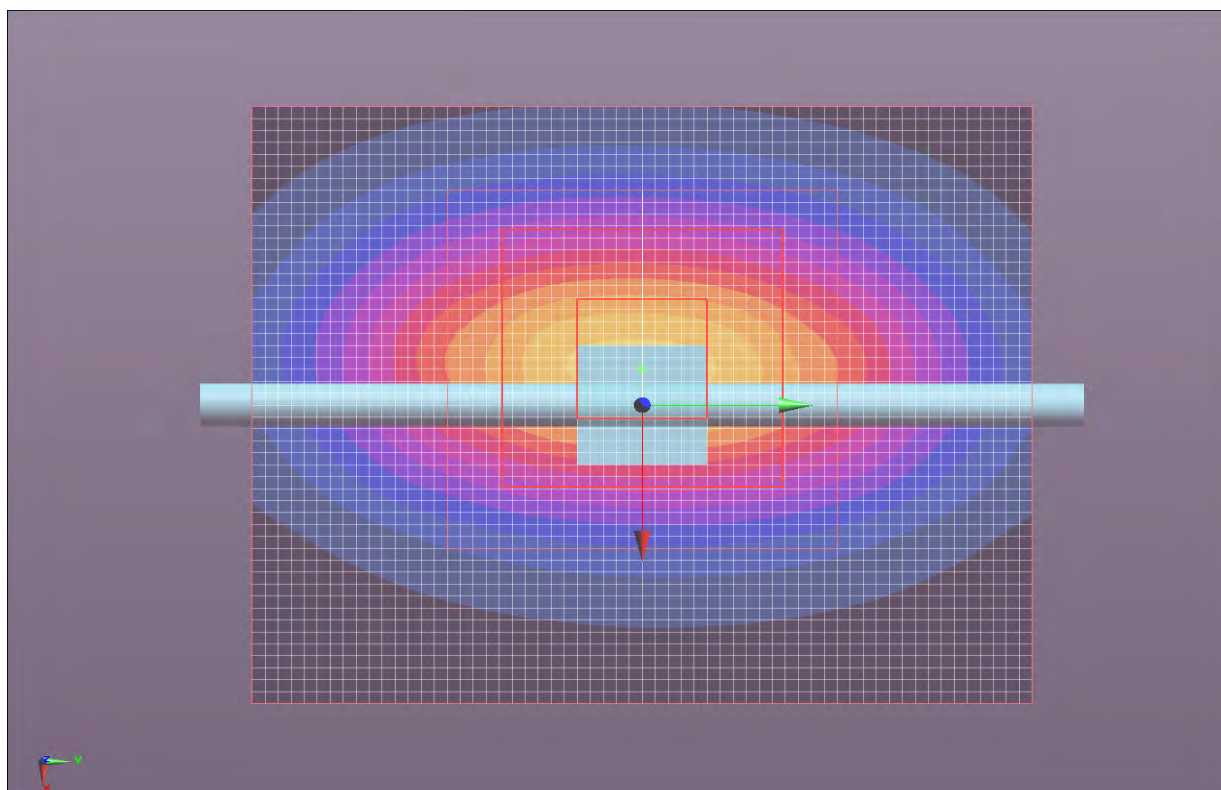
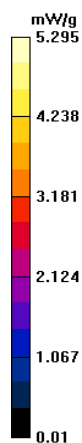
Peak SAR (extrapolated) = 7.858 W/kg

SAR(1 g) = 4.32 mW/g; SAR(10 g) = 2.29 mW/g

Maximum value of SAR (measured) = 4.344 mW/g

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

Maximum value of Total (measured) = 58.070 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	23.8	Humidity (%):	43.4	Test Date:	10/07/11
Liquid Temperature (°C):	22.9	Barometric Pressure (mb):	1022.3	Tested by:	Ethan Schoonover

MSL900 System Check_835MHz 10-6b-11

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:4D108

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz; Communication System PAR: 0 dB

Medium parameters used: $\sigma = 1.0111$ mho/m, $\epsilon_r = 56.5118$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 835$ MHz; $\sigma = 1.011$ mho/m; $\epsilon_r = 56.512$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(5.97, 5.97, 5.97); Calibrated: 2/23/2011

Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 5mm (Mechanical Surface Detection)

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

Maximum value of Total (measured) = 34.991 V/m

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

Reference Value = 34.105 V/m; Power Drift = -0.12 dB

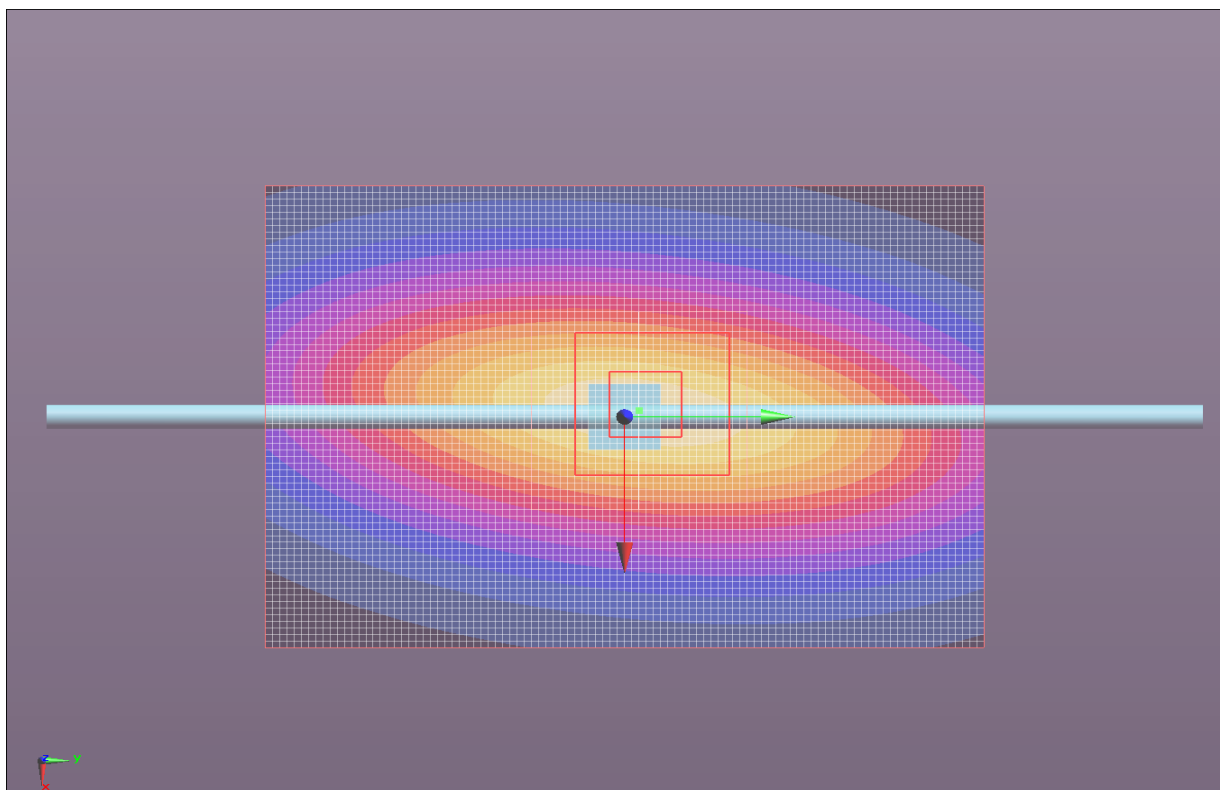
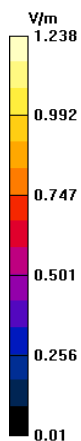
Peak SAR (extrapolated) = 1.674 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.749 mW/g

Maximum value of SAR (measured) = 1.136 mW/g

System Check/System Check/Area Scan (71x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.144 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). When the SAR measured on the highest output channel is $< 0.8 \text{ W/kg}$, SAR evaluation for the other required channels is unnecessary.

All testing was performed with the EUT configured in a worst-case configuration and operating mode to produce the highest SAR levels. An Agilent 8960 test set, Model E5515C, was used to control the EUT. The following applications were installed on the test set: CDMA 2000 Mobile Test Rev B.18.12, and EVDO Term Test Rev A.13.10. This provided all the necessary tools to operate the EUT in the prescribed manner without any difficulties or equipment limitations.

Summary

The following tables summarize the measured SAR values.

NORTHWEST		SAR TEST DATA		SAR 2011.02.07	
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 IEEE Std 1528:2003 FCC KDB 447498 D01 v04 FCC KDB 941225 D01 v02, and D03 FCC KDB 648474 D01 V01r05			
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	Transmit Frequency	Transmit Channel	Transmit Mode	Data Rate (Mbps)	Side	EUT Position	Start Power (Conducted)	SAR Drift During Test (dB)	1g SAR Level	Test #
Head	Cellular	836.52	384	EVDO-Rev. A	FETAP: 307.2 RETAP: 4096 Payload	Right	Cheek	25.04	0.03	0.377	1
							Tilt	25.04	-0.02	0.363	2
						Left	Cheek	25.04	0.03	0.268	3
							Tilt	25.04	0.02	0.238	4

NORTHWEST					SAR 2011.02.07	
EMC		SAR TEST DATA				
Room Temperature (°C):	22.3	Humidity (%):	45.2	Test Date:	09/20/11	
Liquid Temperature (°C):	22.1	Barometric Pressure (mb):	1019	Tested by:	Jennifer Herrett	

Head Test 1 9-20-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 836.52 MHz;Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0.861427$ mho/m, $\epsilon = 41.3662$; $\rho = 1000$ kg/m³ , Medium parameters used (interpolated): f = 836.52 MHz; $\sigma = 0.863$ mho/m; $\epsilon = 41.348$; $\rho = 1000$ kg/m³
Phantom section: Right Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(6.01, 6.01, 6.01); 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: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head - Right/Cheek - Mid/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 18.516 V/m

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

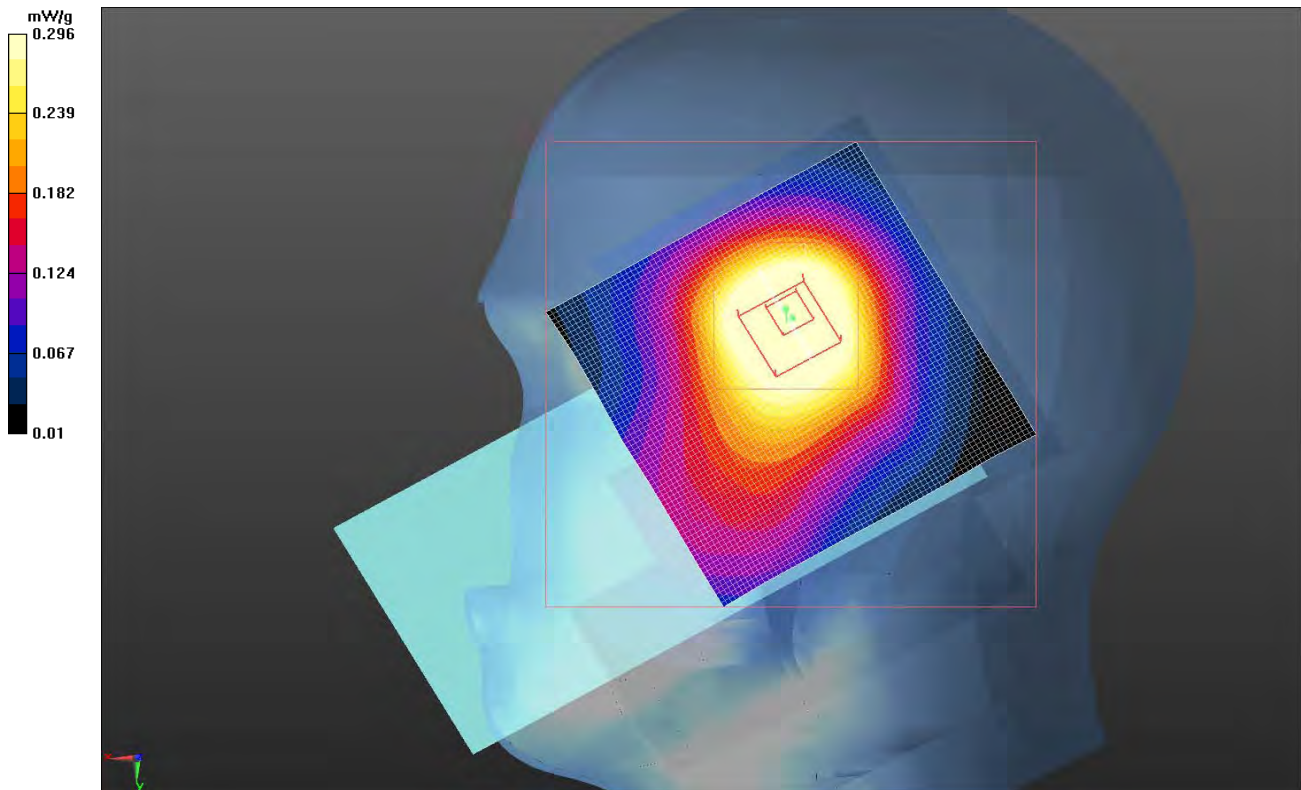
Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.374 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.449 mW/g

Head - Right/Cheek - Mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.992 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.568 W/kg
SAR(1 g) = 0.377 mW/g; SAR(10 g) = 0.249 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (measured) = 0.441 mW/g



NORTHWEST					SAR 2011.02.07	
EMC		SAR TEST DATA				
Room Temperature (°C):	22.3	Humidity (%):	45.2	Test Date:	09/20/11	
Liquid Temperature (°C):	22.1	Barometric Pressure (mb):	1019	Tested by:	Jennifer Herrett	

Head Test 2 9-20-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 836.52 MHz;Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.863 mho/m; ϵ = 41.348; ρ = 1000 kg/m³ , Medium parameters used: σ = 0.861427 mho/m, ϵ = 41.3662; ρ = 1000 kg/m³
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(6.01, 6.01, 6.01); 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: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head - Right/Tilt - Mid/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.411 mW/g

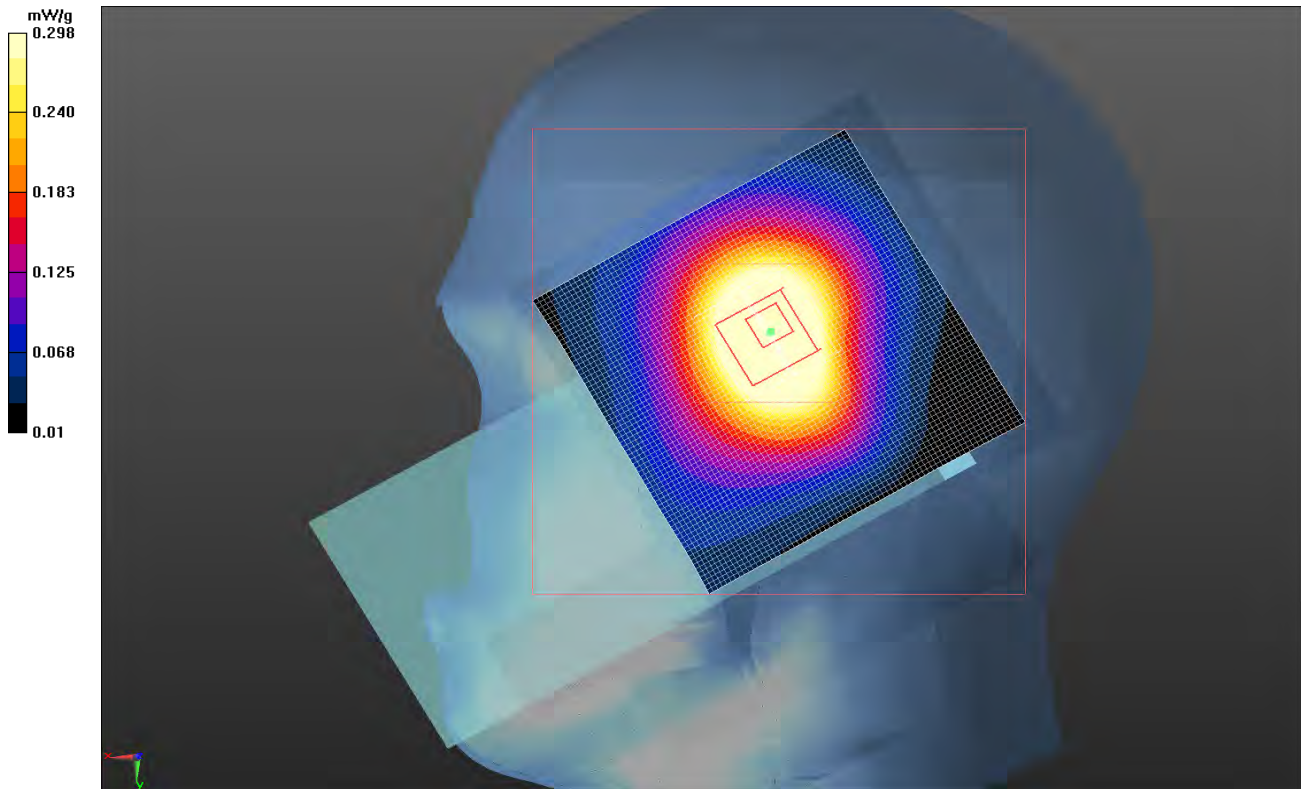
Head - Right/Tilt - Mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.346 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.522 W/kg
SAR(1 g) = 0.363 mW/g; SAR(10 g) = 0.244 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (measured) = 0.418 mW/g

Head - Right/Tilt - Mid/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 18.590 V/m

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

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



NORTHWEST					SAR 2011.02.07	
EMC		SAR TEST DATA				
Room Temperature (°C):	21.9	Humidity (%):	44.9	Test Date:	09/20/11	
Liquid Temperature (°C):	22	Barometric Pressure (mb):	1019	Tested by:	Jennifer Herrett	

Head Test 3 9-20-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 836.52 MHz;Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0.861427$ mho/m, $\epsilon = 41.3662$; $\rho = 1000$ kg/m³ , Medium parameters used (interpolated): f = 836.52 MHz; $\sigma = 0.863$ mho/m; $\epsilon = 41.348$; $\rho = 1000$ kg/m³
Phantom section: Left Section
Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(6.01, 6.01, 6.01); 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 - Mid/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 15.968 V/m

Head - Left/Cheek - Mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.234 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.369 W/kg
SAR(1 g) = 0.268 mW/g; SAR(10 g) = 0.186 mW/g

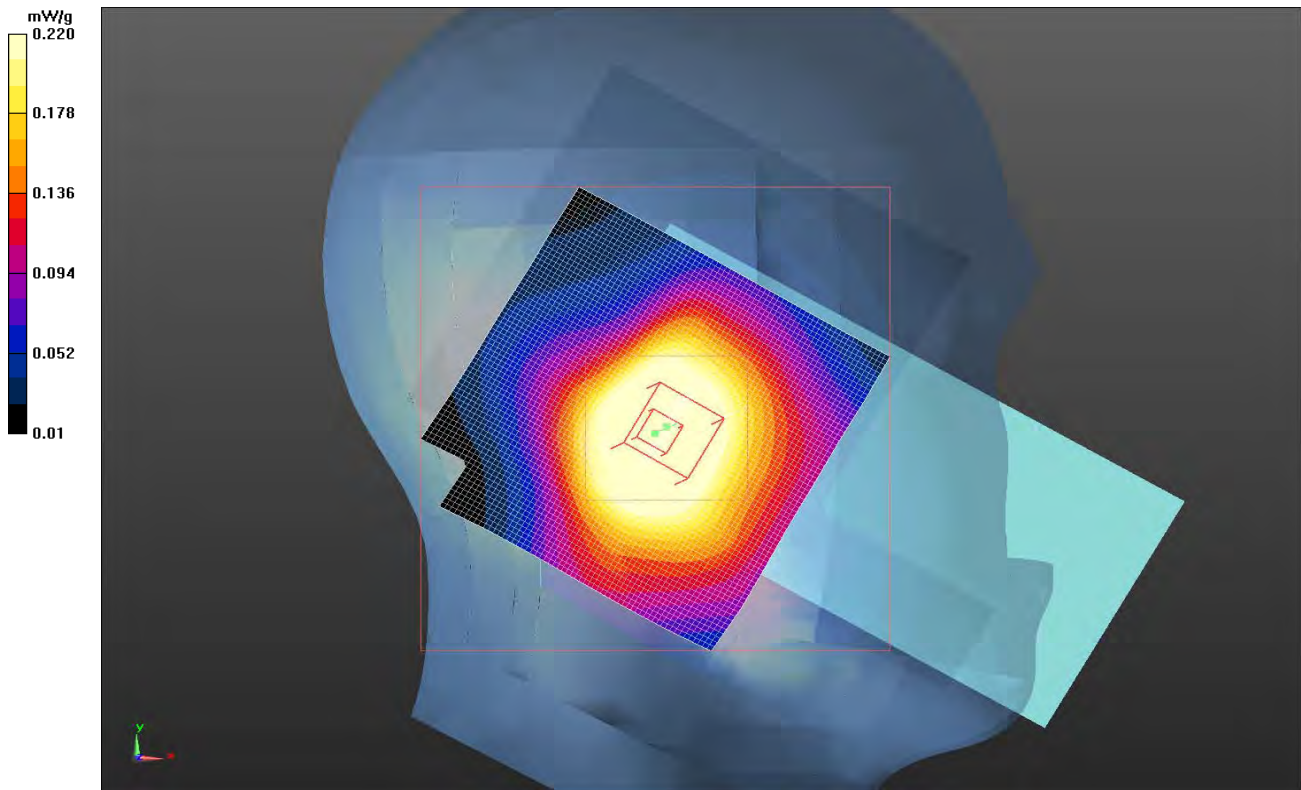
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.306 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.320 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.300 mW/g



NORTHWEST					SAR 2011.02.07	
EMC		SAR TEST DATA				
Room Temperature (°C):	21.9	Humidity (%):	44.9	Test Date:	09/20/11	
Liquid Temperature (°C):	22	Barometric Pressure (mb):	1019	Tested by:	Jennifer Herrett	

Head Test 4 9-20-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 836.52 MHz;Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0.861427$ mho/m, $\epsilon = 41.3662$; $\rho = 1000$ kg/m³ , Medium parameters used (interpolated): f = 836.52 MHz; $\sigma = 0.863$ mho/m; $\epsilon = 41.348$; $\rho = 1000$ kg/m³
Phantom section: Left Section
Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(6.01, 6.01, 6.01); 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/Tilt - Mid/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 14.936 V/m

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

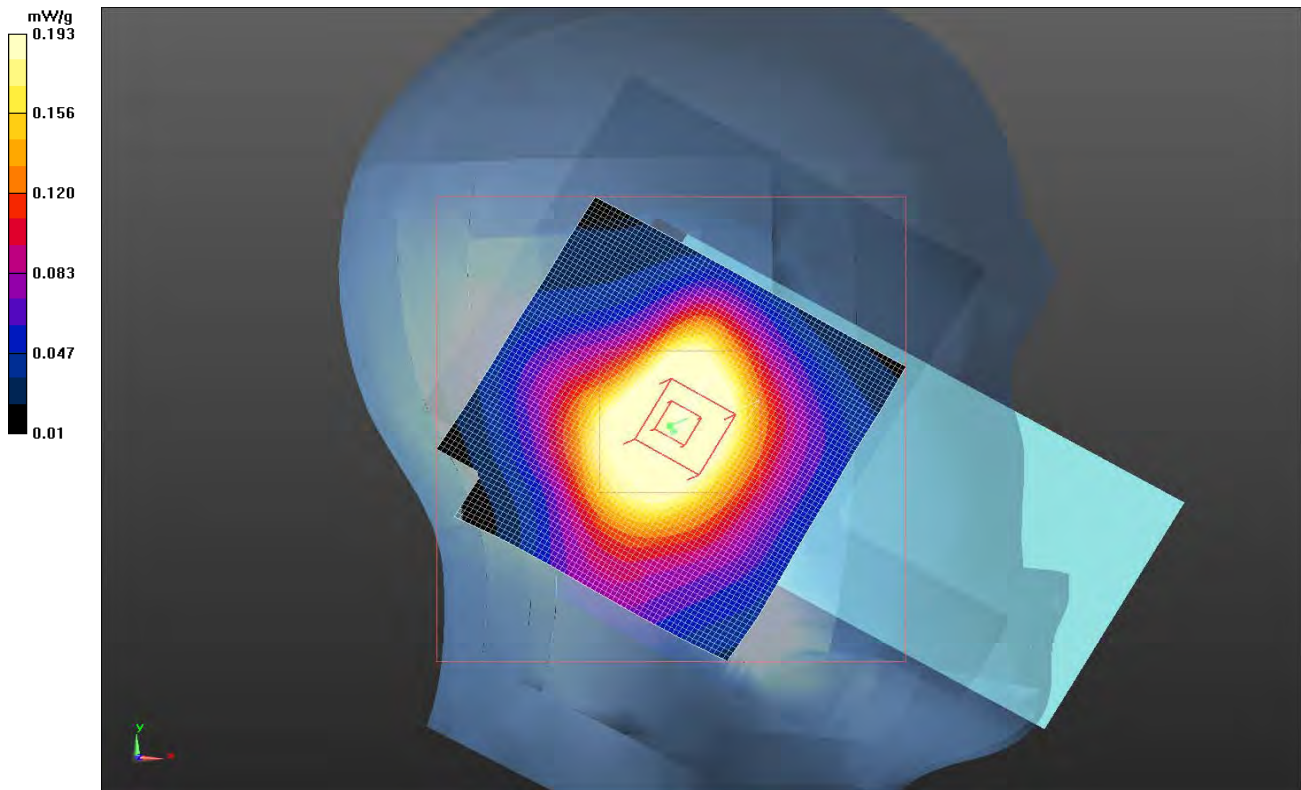
Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.279 mW/g

Head - Left/Tilt - Mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.871 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.343 W/kg
SAR(1 g) = 0.238 mW/g; SAR(10 g) = 0.161 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (measured) = 0.275 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.273 mW/g



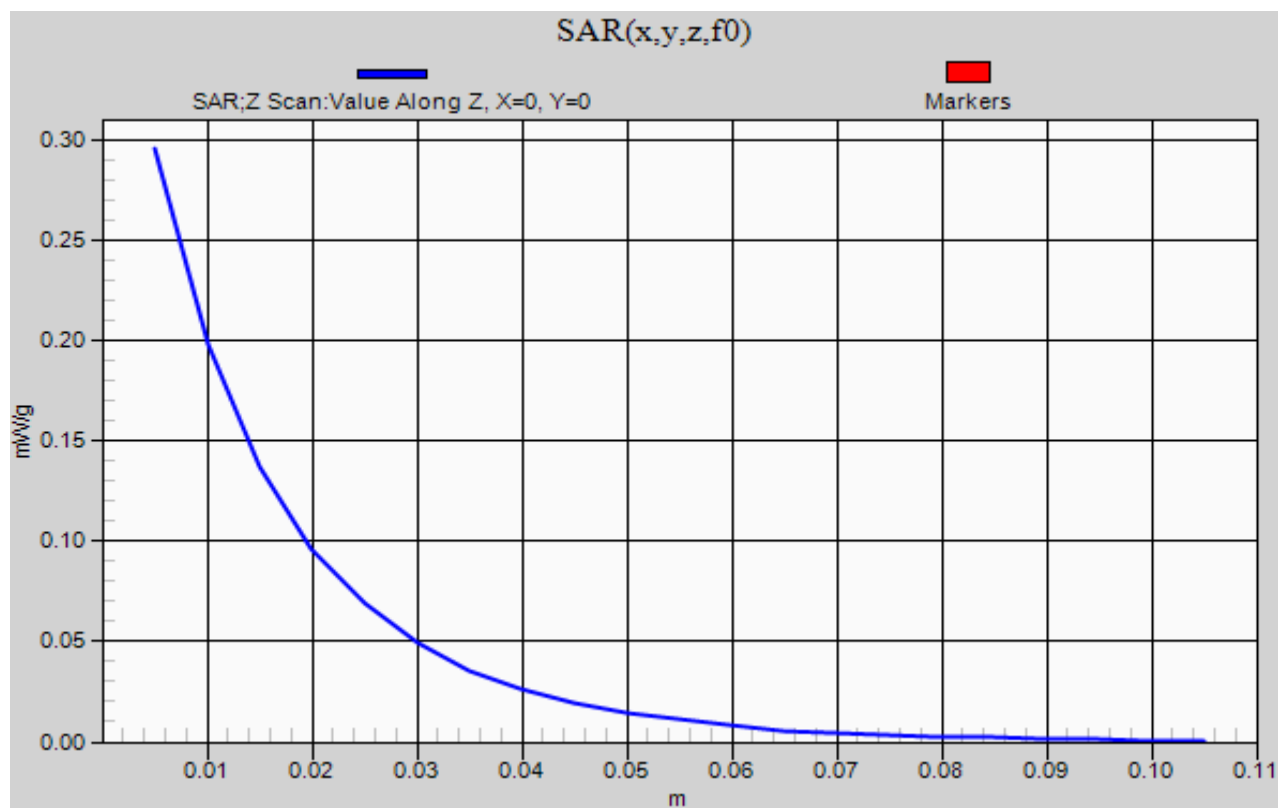
EMC

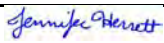
SAR TEST DATA

Room Temperature (°C):	22.3	Humidity (%):	45.2	Test Date:	09/20/11
Liquid Temperature (°C):	22.1	Barometric Pressure (mb):	1019	Tested by:	Jennifer Herrett

Head Test 1 9-20-11

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



NORTHWEST		SAR TEST DATA		SAR 2011.02.07	
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 and Ethan Schoonover	Job Site:	EV08		
TEST SPECIFICATIONS		Test Method			
FCC 2.1093:2011		FCC OET 65C:2001 IEEE Std 1528:2003 FCC KDB 447498 D01 v04 FCC KDB 941225 D01 v02, and D03 FCC KDB 648474 D01 V01r05			
Health Safety Code 6:2009		RSS-102, Issue 4:2010			
COMMENTS					
None					
DEVIATIONS FROM TEST STANDARD					
No Deviations					
Configuration #	1	 Signature			

Test Configuration	Frequency Band	Transmit Frequency	Transmit Channel	Transmit Mode	Data Rate (kbps)	Body-Worn Accessory	EUT Position	Start Power (Conducted)	Drift	Measured SAR Level	Test #
Body	Cellular	824.7	1013	EV-DO Rev. 0	FTAP: 307.2 RTAP: 153.6	Wrist Holster	Left	24.62	-0.0037	1.12	1b
		836.52	384				Left	24.87	0.02	0.489	1d
		848.31	777				Left	24.66	-0.05	0.951	1c
		836.52	384				Right	24.87	0.1	0.202	2
		836.52	384				Back	24.87	0.02	0.314	3
		848.31	777	EV-DO Rev. A	FETAP: 307.2 RETAP: 4096 Payload		Left	24.65	2.26	0.015	4d
		824.7	1013				Left	24.74	0.43	0.008	4e
		836.52	384				Left	25.04	-3.34	0.066	4f

NORTHWEST					SAR 2011.02.07	
EMC		SAR TEST DATA				
Room Temperature (°C):	24.2	Humidity (%):	45.5	Test Date:	09/19/11	
Liquid Temperature (°C):	22.5	Barometric Pressure (mb):	1022.3	Tested by:	Ethan Schoonover	

Body Test 1b 9-19-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 824.7 MHz;Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0.986494$ mho/m, $\epsilon = 54.6655$; $\rho = 1000$ kg/m³ , Medium parameters used: $f = 825$ MHz; $\sigma = 0.986$ mho/m; $\epsilon = 54.666$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

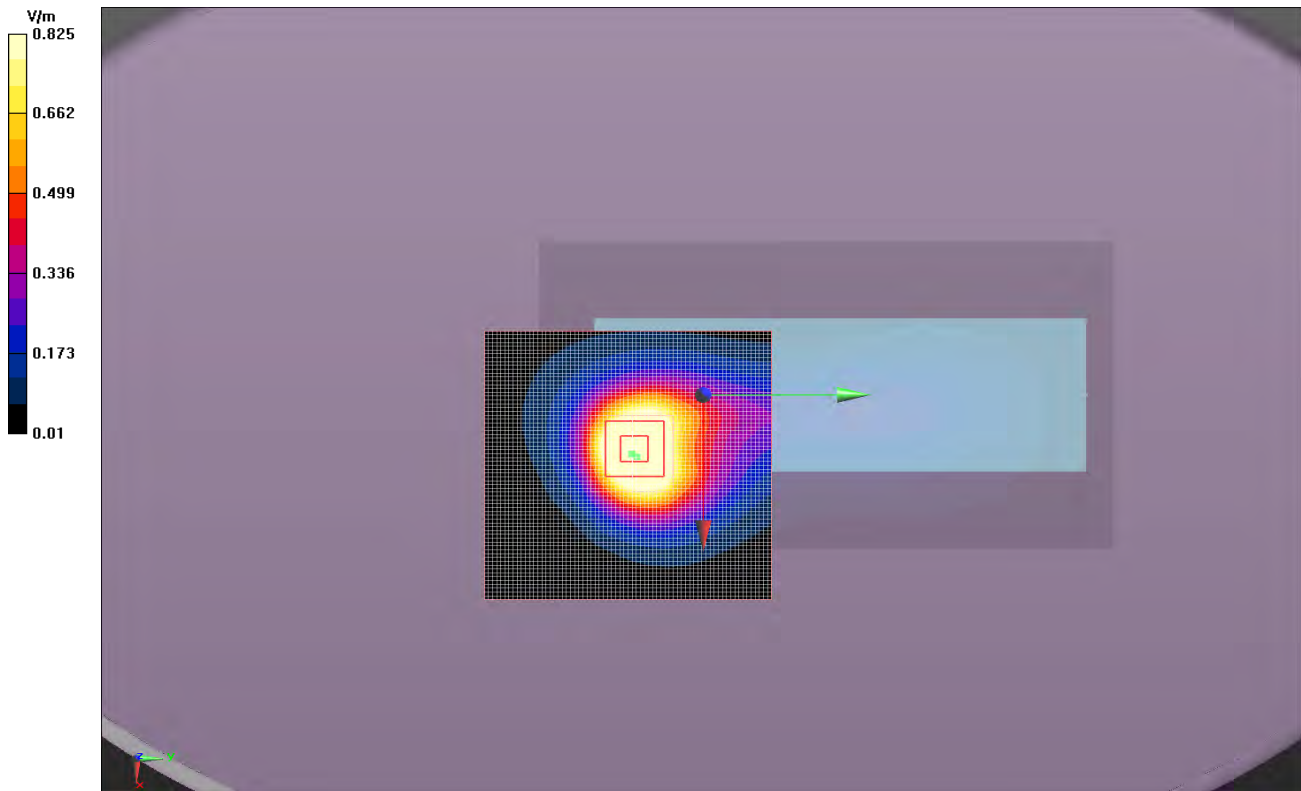
Probe: ES3DV3 - SN3173; ConvF(5.97, 5.97, 5.97); Calibrated: 2/23/2011
Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1237; Calibrated: 11/10/2010
Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096
Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body - Low/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 28.918 V/m

Body/Body - Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 36.235 V/m; Power Drift = -0.0037 dB
Peak SAR (extrapolated) = 1.940 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.637 mW/g
Maximum value of SAR (measured) = 1.381 mW/g

Body/Body - Low/Reference scan (41x71x1): Measurement grid: dx=30mm, dy=30mm
Maximum value of SAR (interpolated) = 1.345 mW/g

Body/Body - Low/Area scan (71x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.288 mW/g



NORTHWEST					SAR 2011.02.07	
EMC		SAR TEST DATA				
Room Temperature (°C):	24.2	Humidity (%):	45.5	Test Date:	09/19/11	
Liquid Temperature (°C):	22.5	Barometric Pressure (mb):	1022.3	Tested by:	Ethan Schoonover	

Body Test 1c 9-19-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 848.31 MHz;Communication System PAR: 0 dB
Medium parameters used: σ = 1.0111 mho/m, ϵ = 54.4228; ρ = 1000 kg/m³ , Medium parameters used (interpolated): f = 848.31 MHz; σ = 1.01 mho/m; ϵ = 54.437; ρ = 1000 kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(5.97, 5.97, 5.97); 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: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body - Low/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 25.982 V/m

Body/Body - Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.649 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.671 W/kg
SAR(1 g) = 0.951 mW/g; SAR(10 g) = 0.527 mW/g

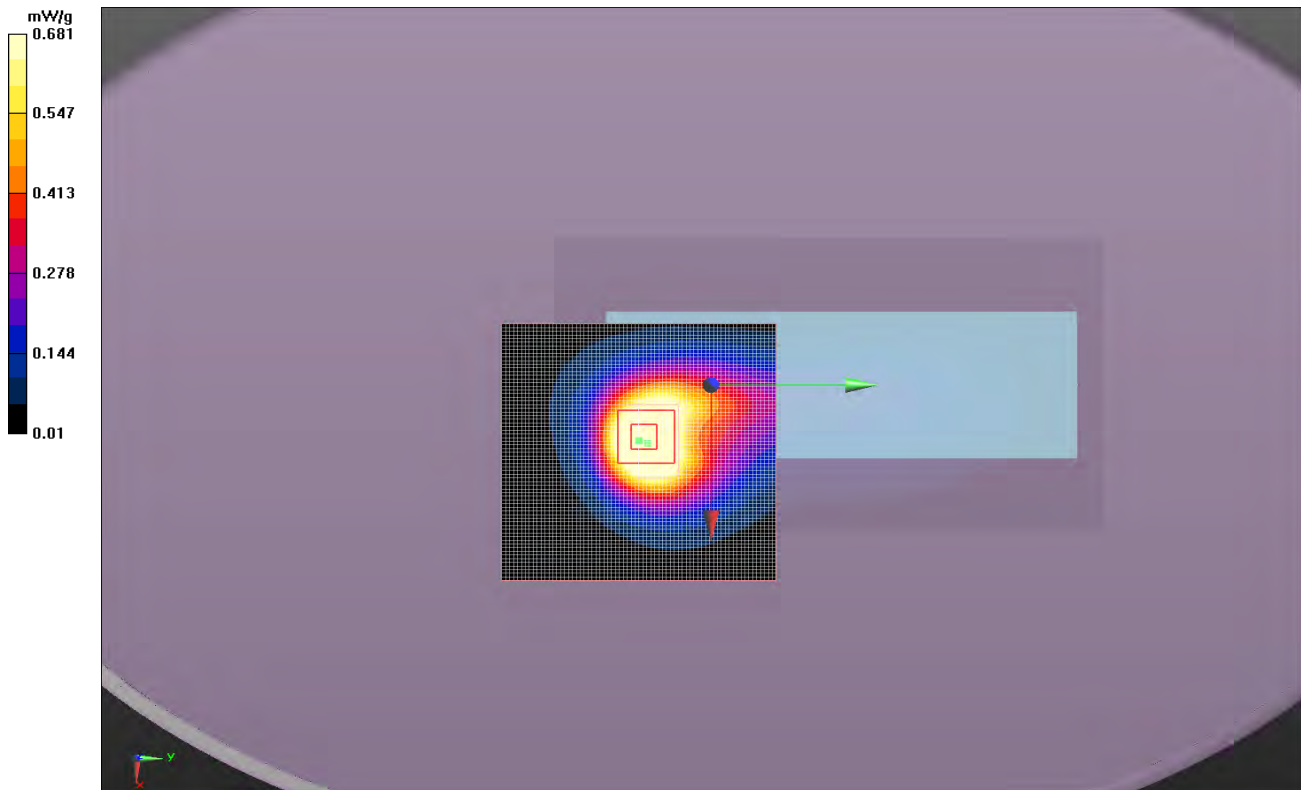
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.160 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.179 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.089 mW/g



NORTHWEST					SAR 2011.02.07	
EMC		SAR TEST DATA				
Room Temperature (°C):	24.4	Humidity (%):	44.8	Test Date:	10/06/11	
Liquid Temperature (°C):	22.5	Barometric Pressure (mb):	1016	Tested by:	Ethan Schoonover	

Body Test 1d 10-6-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 836.52 MHz;Communication System PAR: 0 dB
Medium parameters used: σ = 0.996264 mho/m, ϵ = 54.571; ρ = 1000 kg/m³ , Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.998 mho/m; ϵ = 54.558; ρ = 1000 kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(5.97, 5.97, 5.97); 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: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body - Mid/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 19.357 V/m

Body/Body - Mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.145 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.754 W/kg
SAR(1 g) = 0.489 mW/g; SAR(10 g) = 0.300 mW/g

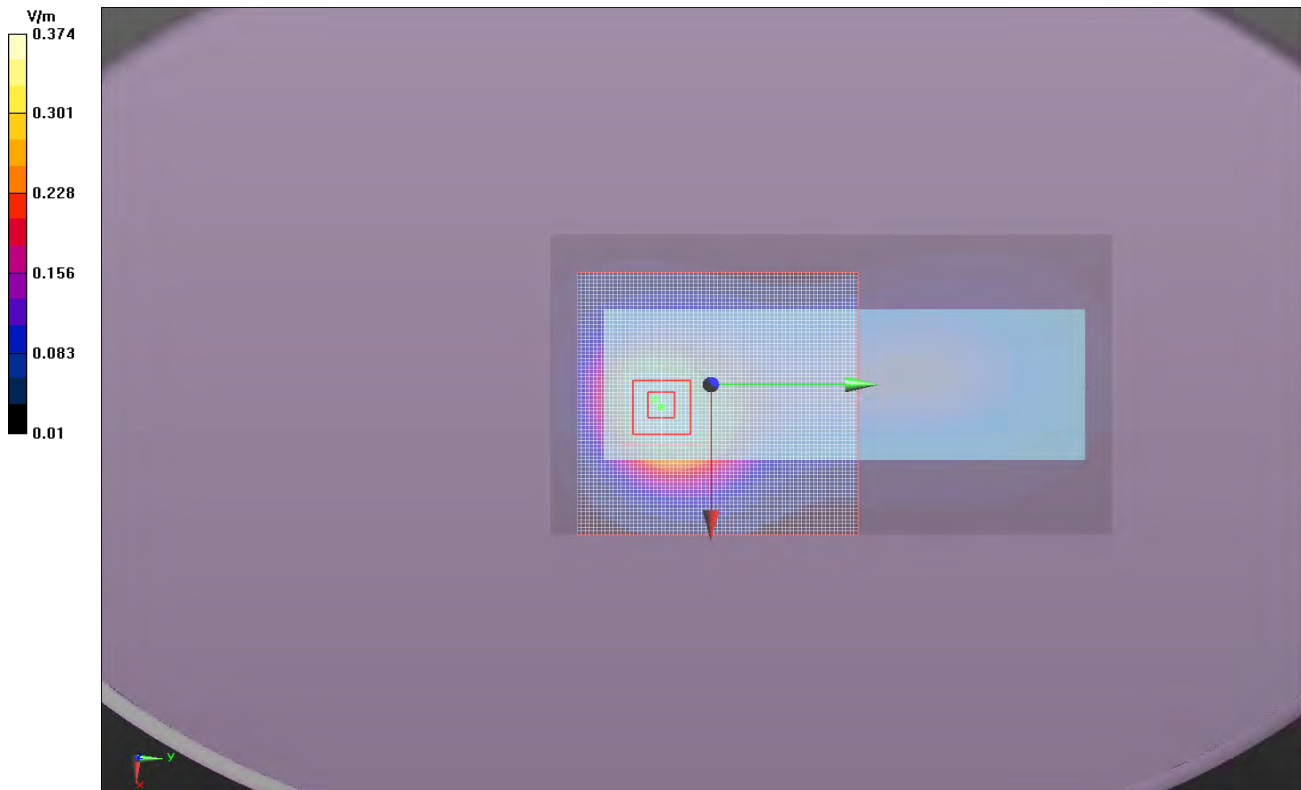
Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (measured) = 0.580 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.457 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.586 mW/g



NORTHWEST					SAR 2011.02.07	
EMC		SAR TEST DATA				
Room Temperature (°C):	24.1	Humidity (%):	45.7	Test Date:	09/19/11	
Liquid Temperature (°C):	22.8	Barometric Pressure (mb):	1022.3	Tested by:	Ethan Schoonover	

Body Test 2 9-19-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 836.52 MHz;Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0.996264$ mho/m, $\epsilon = 54.571$; $\rho = 1000$ kg/m³ , Medium parameters used (interpolated): f = 836.52 MHz; $\sigma = 0.998$ mho/m; $\epsilon = 54.558$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(5.97, 5.97, 5.97); 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: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body - Mid/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 12.710 V/m

Body/Body - Mid/Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.441 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.280 W/kg
SAR(1 g) = 0.202 mW/g; SAR(10 g) = 0.141 mW/g

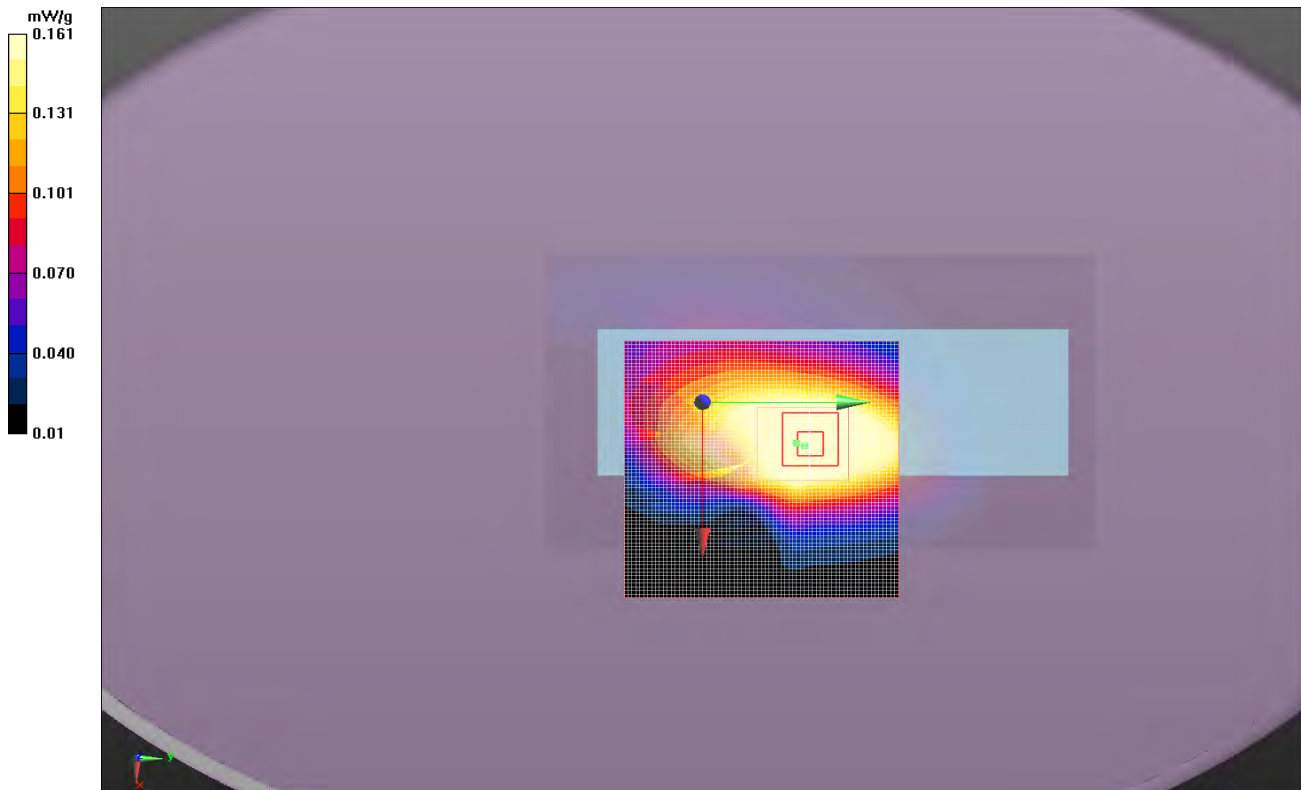
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.230 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.208 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.228 mW/g



NORTHWEST					SAR 2011.02.07	
EMC		SAR TEST DATA				
Room Temperature (°C):	24.1	Humidity (%):	48	Test Date:	09/19/11	
Liquid Temperature (°C):	22.8	Barometric Pressure (mb):	1022.3	Tested by:	Ethan Schoonover	

Body Test 3 9-19-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 836.52 MHz;Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0.996264$ mho/m, $\epsilon = 54.571$; $\rho = 1000$ kg/m³ , Medium parameters used (interpolated): f = 836.52 MHz; $\sigma = 0.998$ mho/m; $\epsilon = 54.558$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(5.97, 5.97, 5.97); 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: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body - Mid/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 15.821 V/m

Body/Body - Mid/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.608 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.424 W/kg
SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.223 mW/g

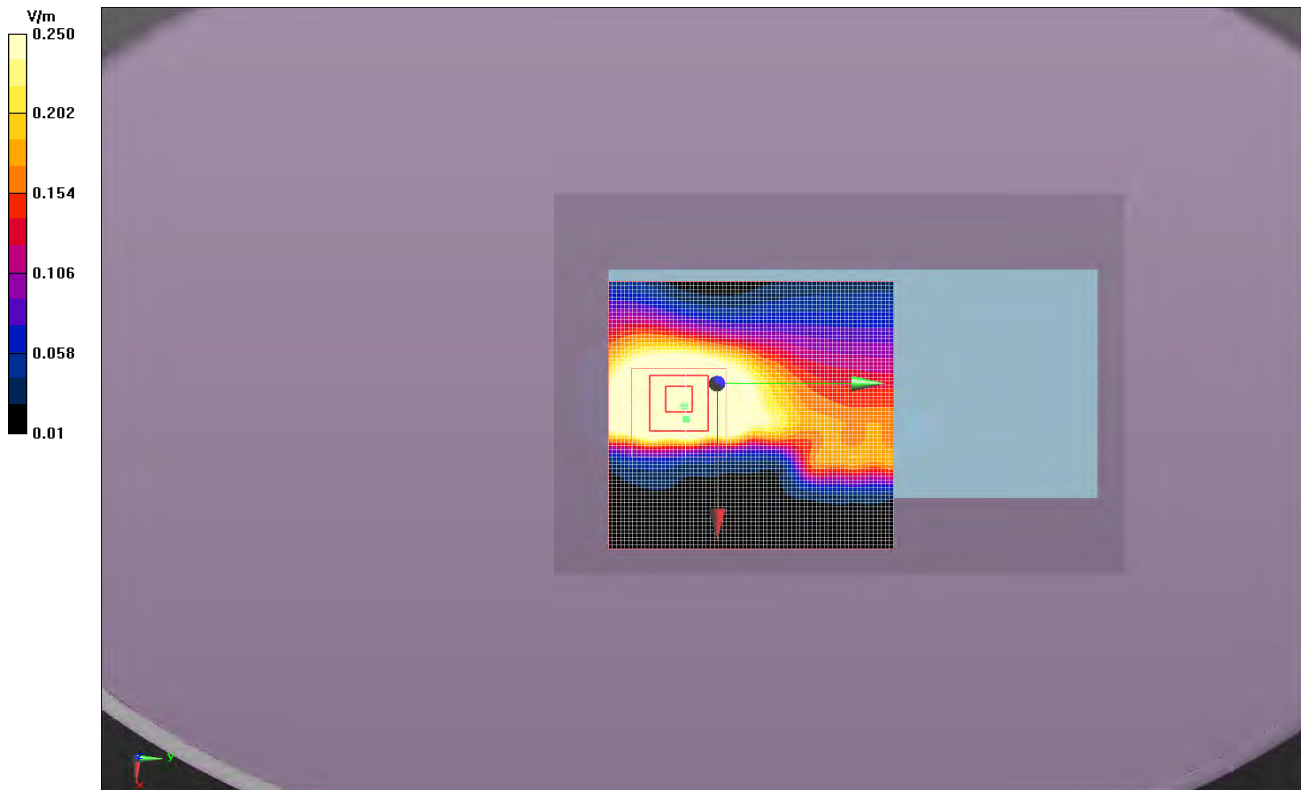
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.355 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.060 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.407 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	23.8	Humidity (%):	47.4	Test Date:	09/19/11
Liquid Temperature (°C):	23.1	Barometric Pressure (mb):	1020.4	Tested by:	Ethan Schoonover

Test 4d 9-19-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 848.31 MHz; Communication System PAR: 0 dB
Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.998$ mho/m; $\epsilon_r = 54.558$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 0.996264$ mho/m, $\epsilon_r = 54.571$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3246; ConvF(6.16, 6.16, 6.16); Calibrated: 9/20/2011
Sensor-Surface: 3mm (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 - Mid/Reference scan (51x81x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 0.014 mW/g

Body/Body - Mid/Area scan (71x81x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.012 mW/g

Body/Body - Mid/Zoom Scan (9x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.402 V/m; Power Drift = 2.26 dB

Peak SAR (extrapolated) = 0.025 W/kg

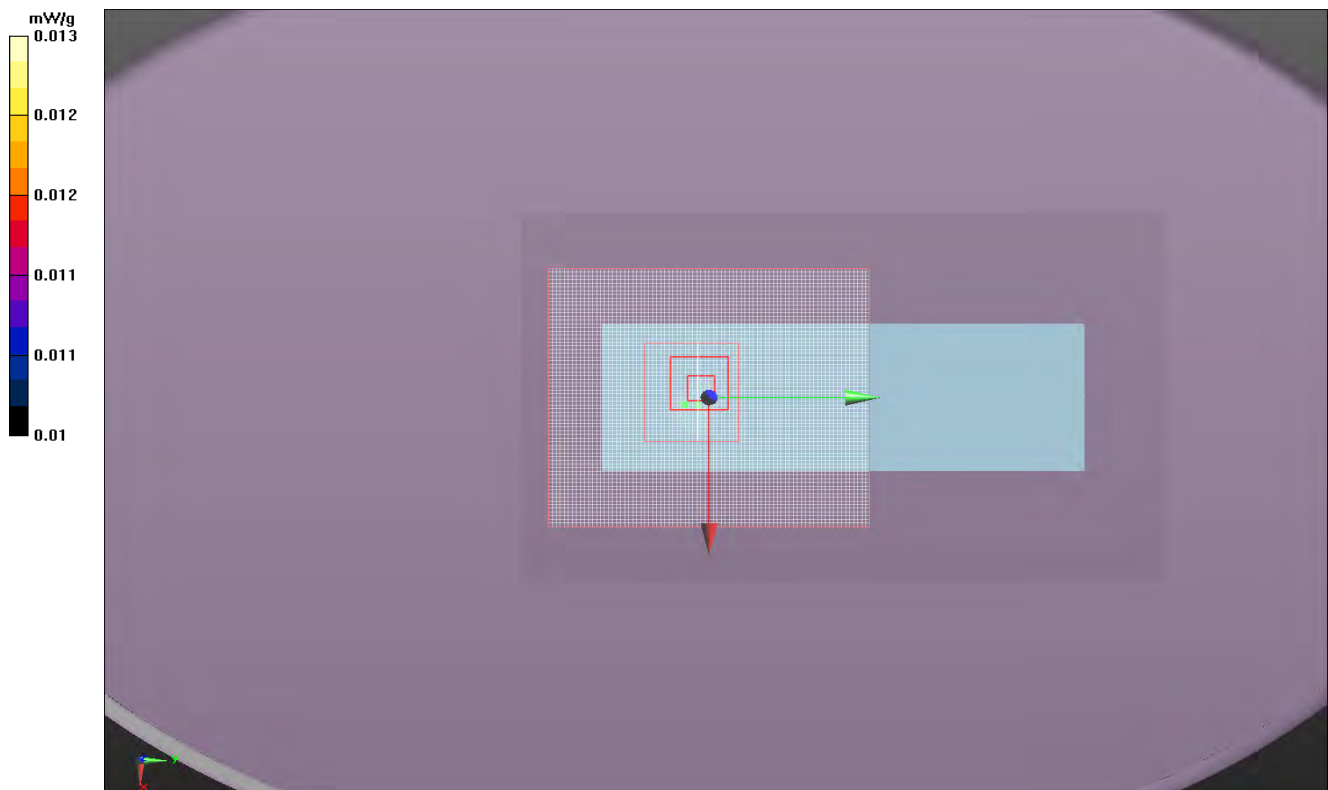
SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00785 mW/g

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

Maximum value of SAR (measured) = 0.025 mW/g

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

Maximum value of Total (measured) = 3.639 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	24.1	Humidity (%):	43.1	Test Date:	09/19/11
Liquid Temperature (°C):	22.9	Barometric Pressure (mb):	1018.3	Tested by:	Ethan Schoonover

Body Test 4e 9-19-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 824.7 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 825$ MHz; $\sigma = 0.986$ mho/m; $\epsilon_r = 54.666$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 0.986494$ mho/m, $\epsilon_r = 54.6655$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: ES3DV3 - SN3246; ConvF(6.16, 6.16, 6.16); Calibrated: 9/20/2011

Sensor-Surface: 3mm (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 - Mid/Reference scan (51x81x1): Measurement grid: dx=30mm, dy=30mm

Maximum value of SAR (interpolated) = 0.014 mW/g

Body/Body - Mid/Area scan (71x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.00825 mW/g

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

Reference Value = 2.968 V/m; Power Drift = 0.43 dB

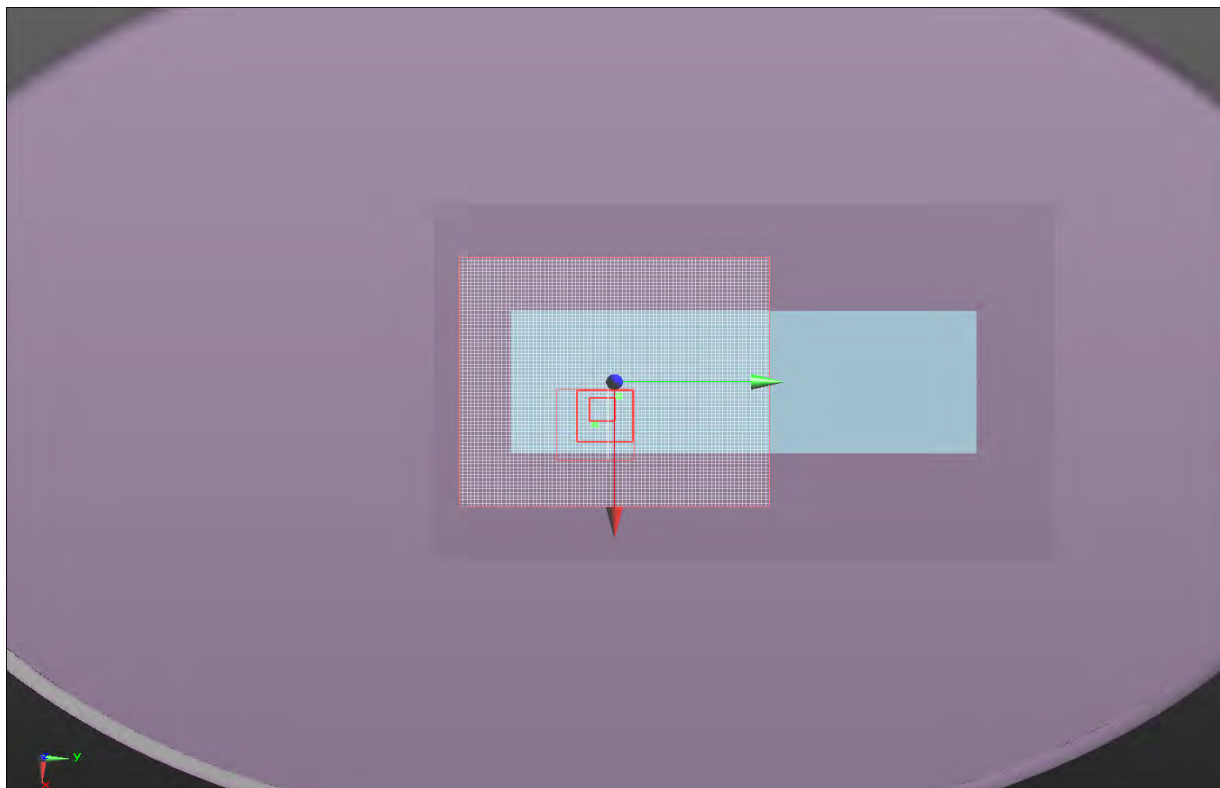
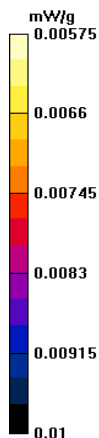
Peak SAR (extrapolated) = 0.011 W/kg

SAR(1 g) = 0.00777 mW/g; SAR(10 g) = 0.00507 mW/g

Maximum value of SAR (measured) = 0.00898 mW/g

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

Maximum value of Total (measured) = 2.413 V/m



EMC**SAR TEST DATA**

Room Temperature (°C):	23	Humidity (%):	44.8	Test Date:	09/19/11
Liquid Temperature (°C):	23.3	Barometric Pressure (mb):	1018.7	Tested by:	Ethan Schoonover

Body Test 4f 9-19-11

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

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 836.52 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.998$ mho/m; $\epsilon_r = 54.558$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 0.996264$ mho/m, $\epsilon_r = 54.571$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: ES3DV3 - SN3246; ConvF(6.16, 6.16, 6.16); Calibrated: 9/20/2011

Sensor-Surface: 3mm (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 - Mid/Reference scan (51x81x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 0.047 mW/g

Body/Body - Mid/Area scan (71x81x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.029 mW/g

Body/Body - Mid/Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.957 V/m; Power Drift = -3.34 dB

Peak SAR (extrapolated) = 0.124 W/kg

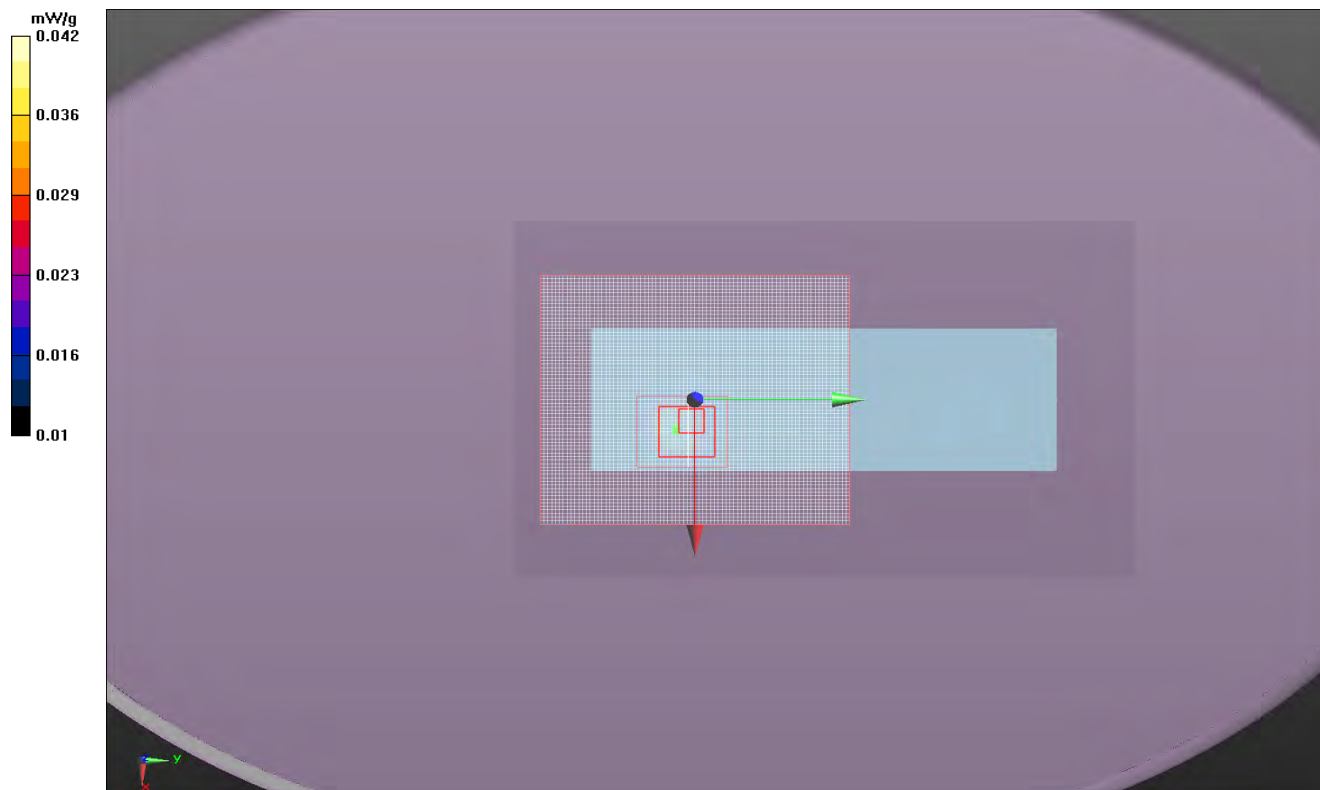
SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.042 mW/g

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

Maximum value of SAR (measured) = 0.075 mW/g

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

Maximum value of Total (measured) = 6.516 V/m



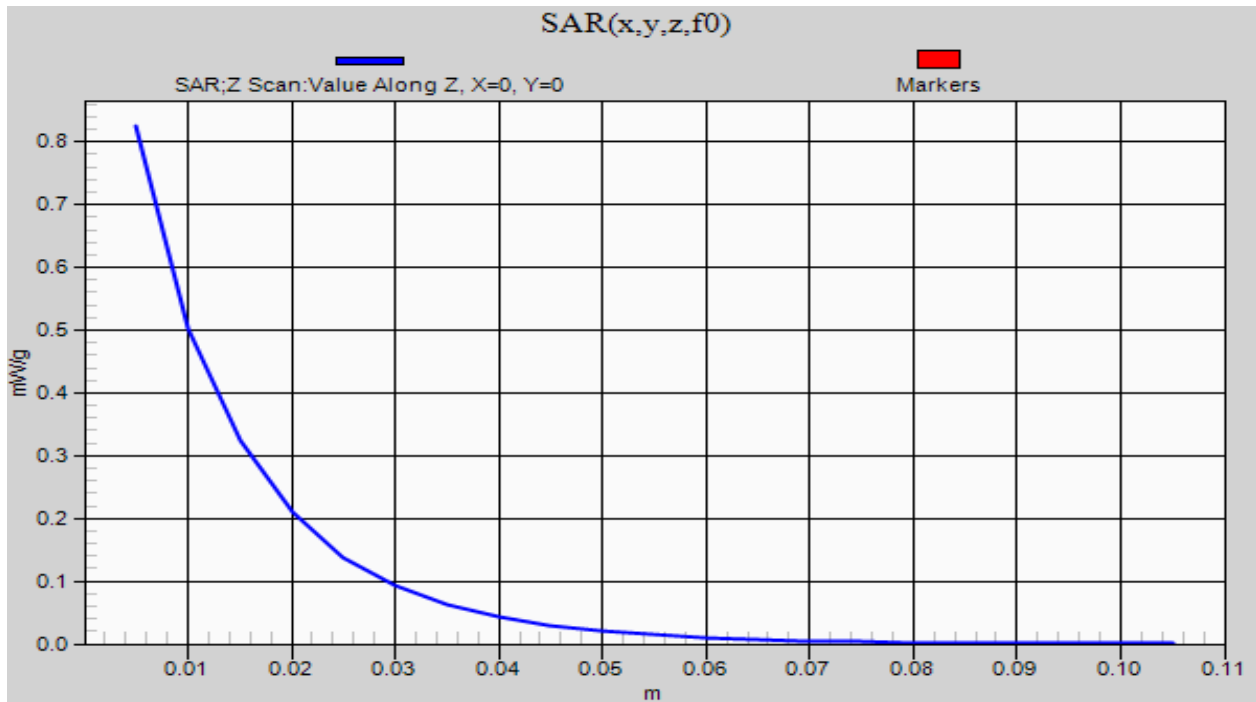
EMC

SAR TEST DATA

Room Temperature (°C):	24.2	Humidity (%):	45.5	Test Date:	09/19/11
Liquid Temperature (°C):	22.5	Barometric Pressure (mb):	1022.3	Tested by:	Ethan Schoonover

Body Test 1b 9-19-11

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



NORTHWEST		SAR TEST DATA		SAR 2011.02.07	
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 and Ethan Schoonover		Job Site: EV08			
TEST SPECIFICATIONS		Test Method			
FCC 2.1093:2011		FCC OET 65C:2001 IEEE Std 1528:2003 FCC KDB 447498 D01 v04 FCC KDB 941225 D01 v02, and D03 FCC KDB 648474 D01 V01r05			
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	Transmit Frequency	Transmit Channel	Transmit Mode	Data Rate (Mbps)	Side	EUT Position	Start Power (Conducted)	SAR Drift During Test (dB)	1g SAR Level	Test #
Head	PCS	1880	600	RC3 (Fwd 3, Rvs 3) SO55 (Loopback)	9.6	Right	Cheek	25.25	0.04	0.517	5
							Tilt	25.25	0.13	0.381	6
						Left	Cheek	25.25	0.28	0.376	7
							Tilt	25.25	0.01	0.279	8

EMC

SAR TEST DATA

Room Temperature (°C):	21.8	Humidity (%):	44.3	Test Date:	09/21/11
Liquid Temperature (°C):	20.6	Barometric Pressure (mb):	1013.7	Tested by:	Ethan Schoonover

Head Test 5 9-21-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1880 MHz; Communication System PAR: 0 dB
Medium parameters used: $\sigma = 1.34749$ mho/m, $\epsilon_r = 38.9532$; $\rho = 1000$ kg/m³, Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.352$ mho/m; $\epsilon_r = 38.929$; $\rho = 1000$ kg/m³
Phantom section: Right Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3246; ConvF(5.02, 5.02, 5.02); Calibrated: 11/11/2010
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 - Right/Cheek - Mid/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 16.368 V/m

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

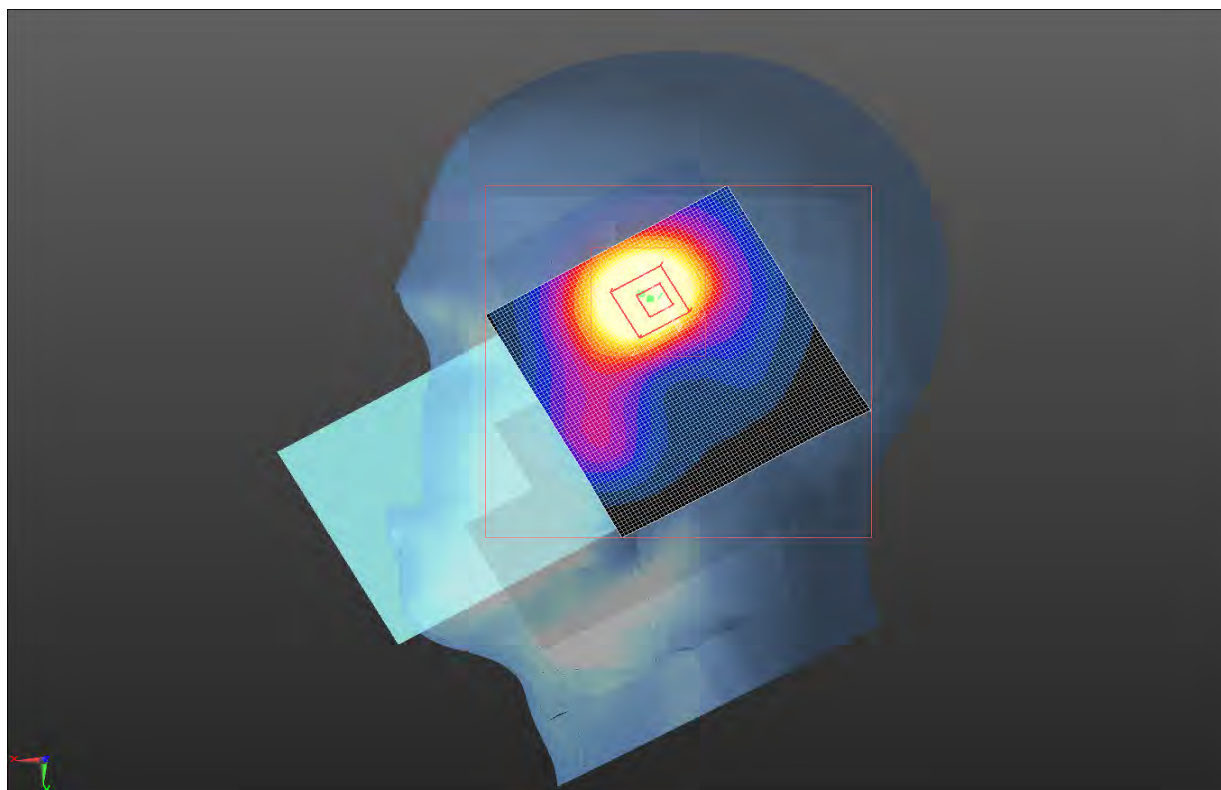
[Info: Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.405 mW/g

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

[Info: Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.654 mW/g

Head - Right/Cheek - Mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.723 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.938 W/kg
SAR(1 g) = 0.517 mW/g; SAR(10 g) = 0.289 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (measured) = 0.634 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	24.4	Humidity (%):	50.8	Test Date:	09/21/11
Liquid Temperature (°C):	21.1	Barometric Pressure (mb):	1013.7	Tested by:	Ethan Schoonover

Head Test 6 9-21-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1880 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.352$ mho/m; $\epsilon_r = 38.929$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.34749$ mho/m, $\epsilon_r = 38.9532$; $\rho = 1000$ kg/m³
 Phantom section: Right Section
 Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3246; ConvF(5.02, 5.02, 5.02); Calibrated: 11/11/2010
 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: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head - Right/Tilt - Mid/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 0.312 mW/g

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

Reference Value = 16.770 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.696 W/kg

SAR(1 g) = 0.381 mW/g; SAR(10 g) = 0.212 mW/g

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

Maximum value of SAR (measured) = 0.475 mW/g

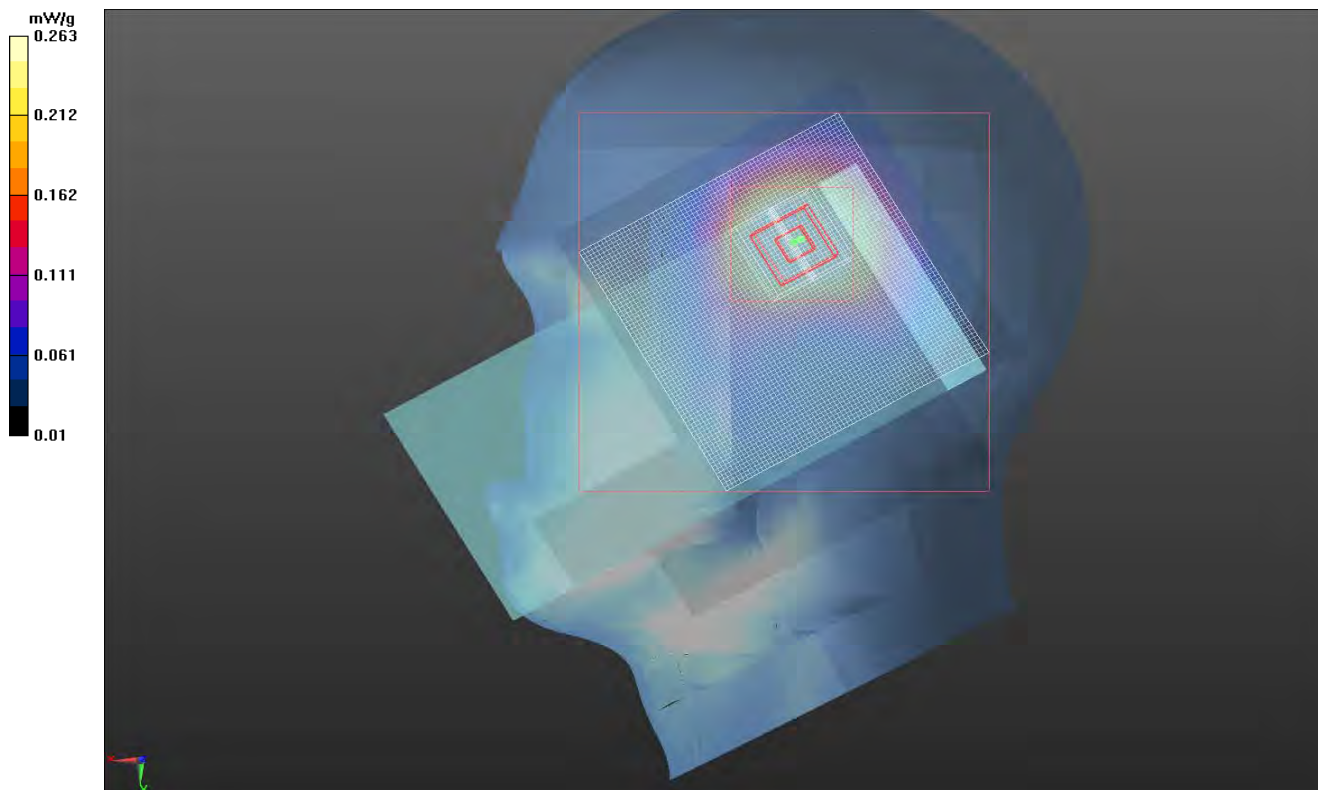
Head - Right/Tilt - Mid/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 13.940 V/m

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

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

Maximum value of SAR (interpolated) = 0.435 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	22.2	Humidity (%):	44	Test Date:	09/21/11
Liquid Temperature (°C):	21.1	Barometric Pressure (mb):	1013.7	Tested by:	Ethan Schoonover

Head Test 7 9-21-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1880 MHz; Communication System PAR: 0 dB
Medium parameters used: $\sigma = 1.34749$ mho/m, $\epsilon_r = 38.9532$; $\rho = 1000$ kg/m³, Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.352$ mho/m; $\epsilon_r = 38.929$; $\rho = 1000$ kg/m³
Phantom section: Left Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3246; ConvF(5.02, 5.02, 5.02); Calibrated: 11/11/2010
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 - Mid/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 14.177 V/m

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

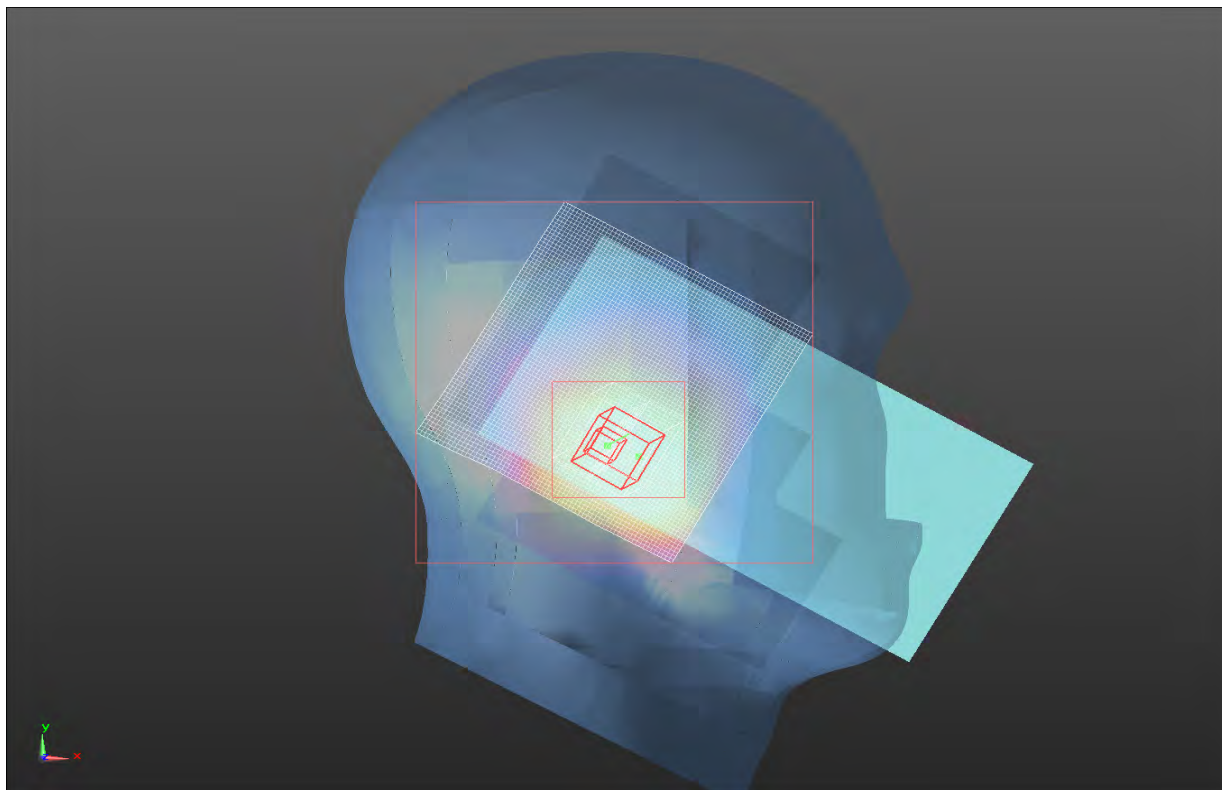
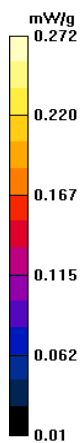
[Info: Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.330 mW/g

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

[Info: Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (interpolated) = 0.419 mW/g

Head - Left/Cheek - Mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.886 V/m; Power Drift = 0.28 dB
Peak SAR (extrapolated) = 0.627 W/kg
SAR(1 g) = 0.376 mW/g; SAR(10 g) = 0.222 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)
Maximum value of SAR (measured) = 0.451 mW/g



EMC

SAR TEST DATA

Room Temperature (°C):	22.1	Humidity (%):	44.3	Test Date:	09/21/11
Liquid Temperature (°C):	21	Barometric Pressure (mb):	1013.7	Tested by:	Ethan Schoonover

Head Test 8 9-21-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1880 MHz; Communication System PAR: 0 dB
Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.352$ mho/m; $\epsilon_r = 38.929$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.34749$ mho/m, $\epsilon_r = 38.9532$; $\rho = 1000$ kg/m³
Phantom section: Left Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3246; ConvF(5.02, 5.02, 5.02); Calibrated: 11/11/2010
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: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

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

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

Maximum value of SAR (interpolated) = 0.226 mW/g

Head - Left/Tilt - Mid/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.671 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.283 W/kg

SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.105 mW/g

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

Maximum value of SAR (measured) = 0.202 mW/g

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

Reference Value = 14.671 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.467 W/kg

SAR(1 g) = 0.279 mW/g; SAR(10 g) = 0.161 mW/g

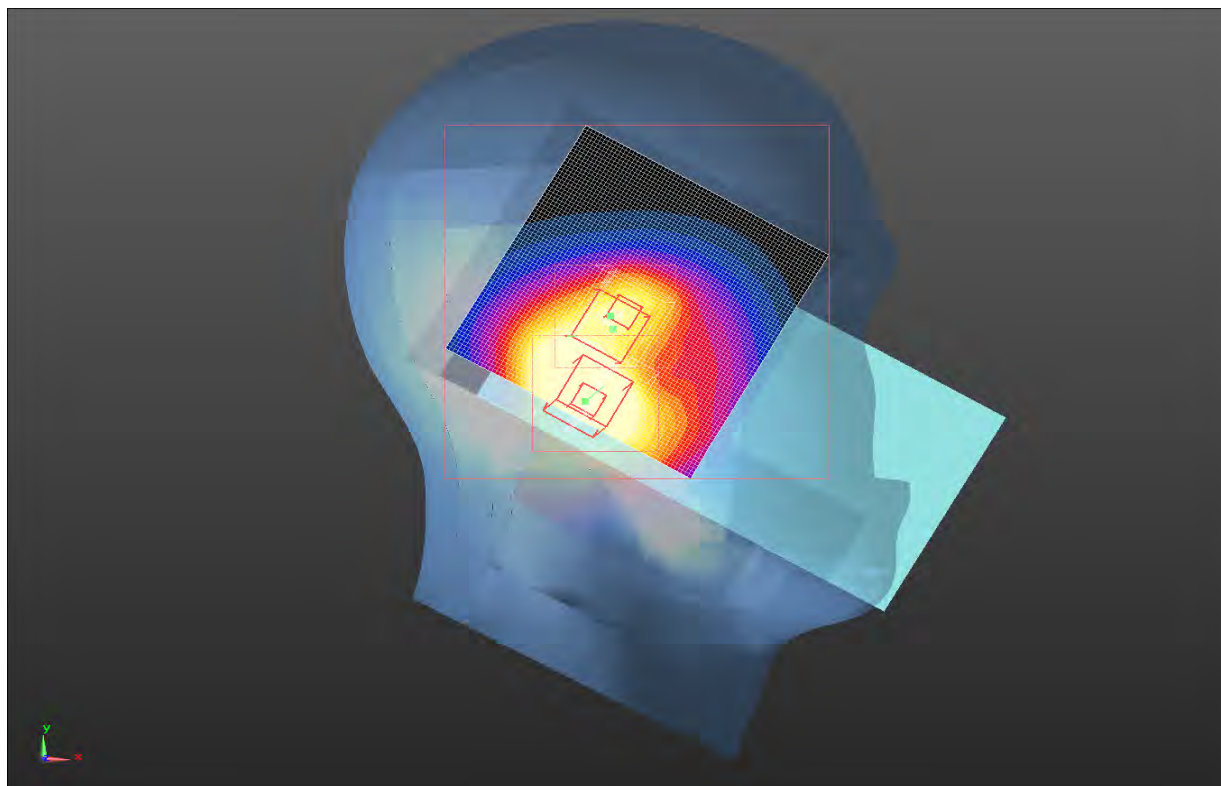
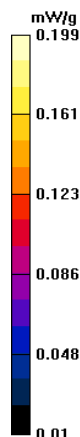
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.342 mW/g

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

Maximum value of Total (measured) = 12.129 V/m

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



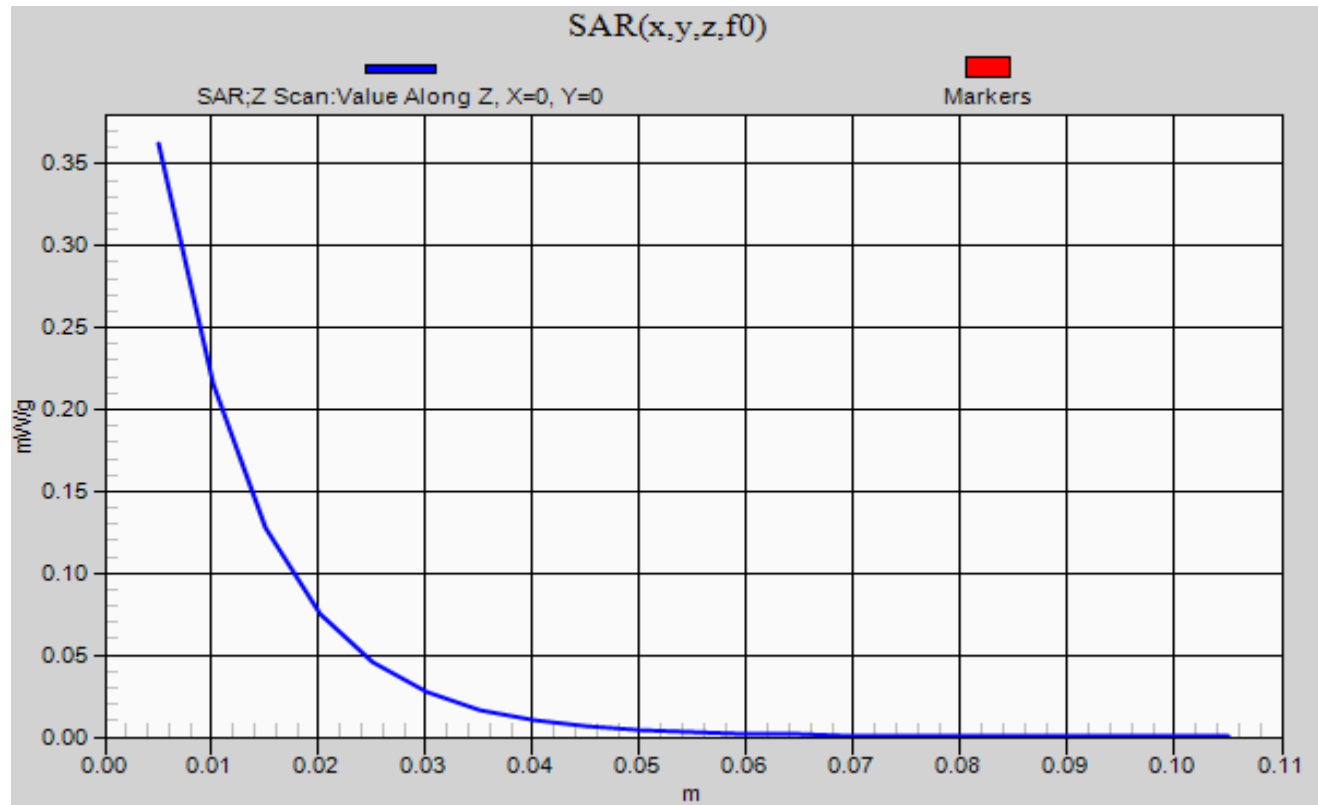
EMC

SAR TEST DATA

Room Temperature (°C):	21.8	Humidity (%):	44.3	Test Date:	09/21/11
Liquid Temperature (°C):	20.6	Barometric Pressure (mb):	1013.7	Tested by:	Ethan Schoonover

Head Test 5 9-21-11

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



EMC

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:	Jennifer Herrett	Job Site:	EV08
TEST SPECIFICATIONS		Test Method	
FCC 2.1093:2011		FCC OET 65C:2001 IEEE Std 1528:2003 FCC KDB 447498 D01 v04 FCC KDB 941225 D01 v02, and D03 FCC KDB 648474 D01 V01r05	
Health Safety Code 6:2009		RSS-102, Issue 4:2010	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
No Deviations			
Configuration #	1	Signature 	

Test Configuration	Frequency Band	Transmit Frequency	Transmit Channel	Transmit Mode	Data Rate (Mbps)	Body-Worn Accessory	EUT Position	Start Power (Conducted)	SAR Drift During Test (dB)	1g SAR Level	Test #
Body	PCS	1880	600	EV-DO Rev. 0	FTAP: 307.2 RTAP: 153.6	Wrist Holster	Left	25.21	-0.05	0.854	5d
		1851.25	25				Left	25.21	0.46	1.060	5e
		1908.75	1175				Left	25.21	-0.07	0.802	5f
		1880	600	EV-DO Rev. A	FETAP: 307.2 RETAP: 4096 Payload		Right	25.21	-0.39	0.062	6
		1851.25	25				Back	25.21	-0.12	0.499	7
							Left	25.23	0.02	1.19	8e
							Left	25.26	0.008	0.971	8d
							Left	25.04	-0.1	0.91	8f

EMC

SAR TEST DATA

Room Temperature (°C):	23.2	Humidity (%):	45.7	Test Date:	10/05/11
Liquid Temperature (°C):	22.4	Barometric Pressure (mb):	1015.2	Tested by:	Ethan Schoonover

Body Test 5d 10-5-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1880 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.547$ mho/m; $\epsilon_r = 52.004$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.54078$ mho/m, $\epsilon_r = 52.0257$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.55, 4.55, 4.55); Calibrated: 2/23/2011

Sensor-Surface: 3mm (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 - Mid/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 0.890 mW/g

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

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

Maximum value of SAR (interpolated) = 1.005 mW/g

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

Reference Value = 25.304 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.280 W/kg

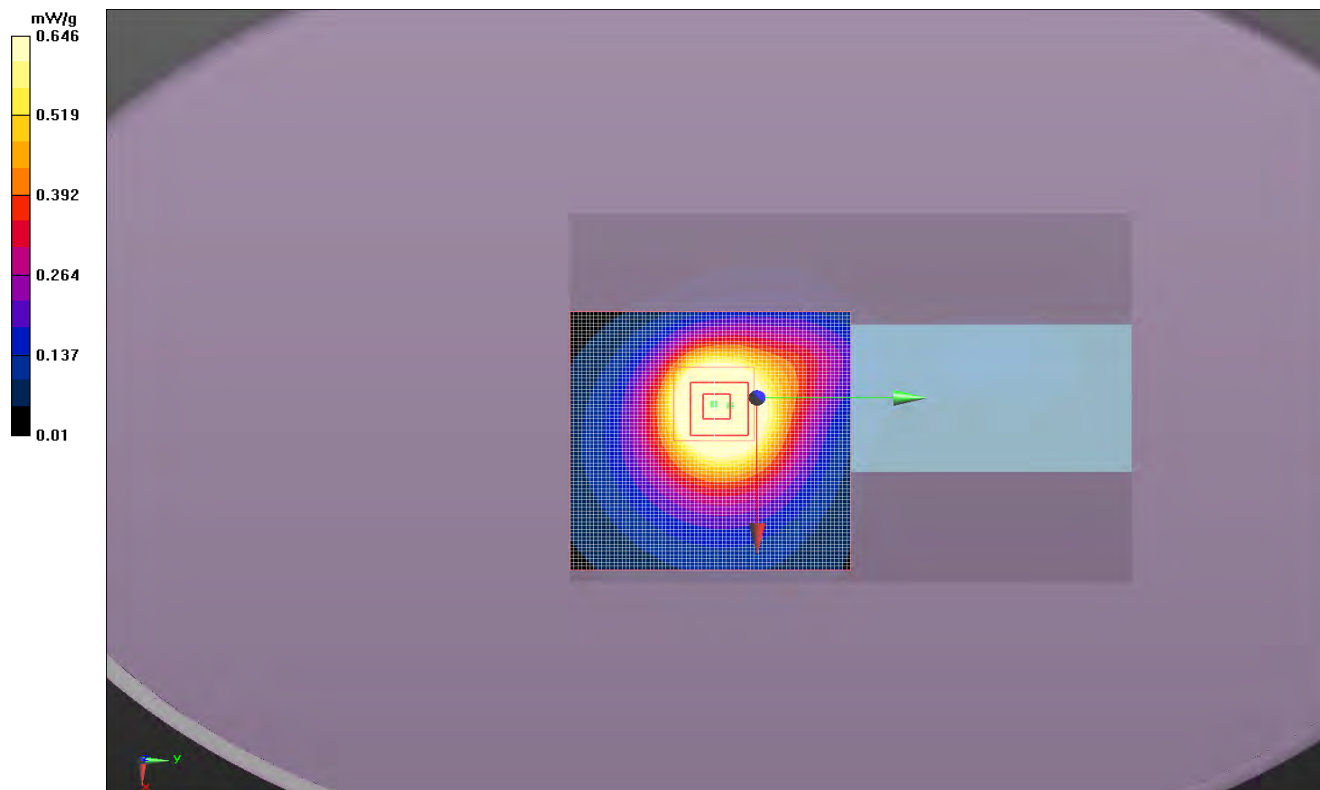
SAR(1 g) = 0.854 mW/g; SAR(10 g) = 0.532 mW/g

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

Maximum value of SAR (measured) = 1.002 mW/g

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

Maximum value of Total (measured) = 20.443 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	23.3	Humidity (%):	42.8	Test Date:	10/05/11
Liquid Temperature (°C):	22.2	Barometric Pressure (mb):	1015.2	Tested by:	Ethan Schoonover

Body Test 5e 10-5-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1851.25 MHz; Communication System PAR: 0 dB
Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.513$ mho/m; $\epsilon_r = 52.125$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.51163$ mho/m, $\epsilon_r = 52.1297$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.55, 4.55, 4.55); Calibrated: 2/23/2011
Sensor-Surface: 3mm (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 - Mid/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 1.143 mW/g

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

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

Maximum value of SAR (interpolated) = 1.241 mW/g

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

Reference Value = 26.896 V/m; Power Drift = 0.46 dB

Peak SAR (extrapolated) = 1.579 W/kg

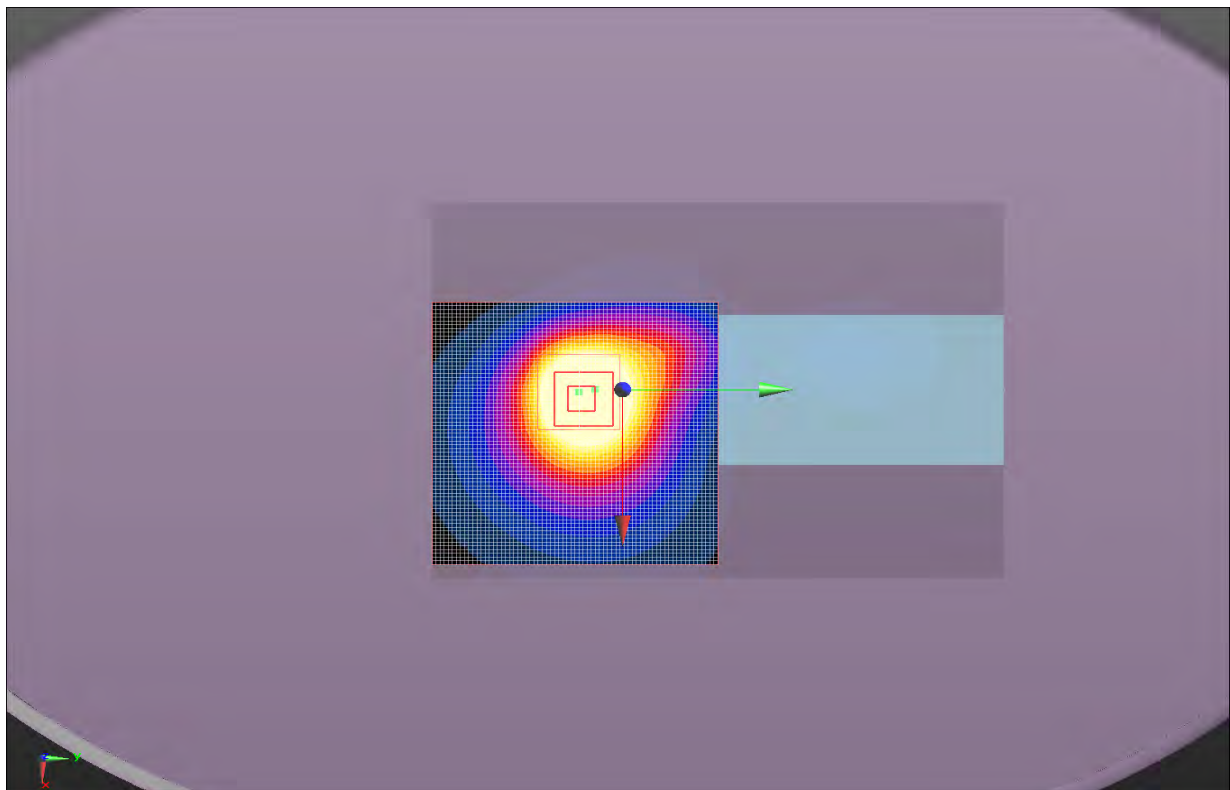
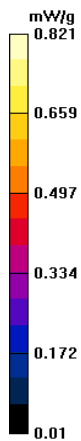
SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.668 mW/g

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

Maximum value of SAR (measured) = 1.238 mW/g

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

Maximum value of Total (measured) = 23.300 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	23.3	Humidity (%):	42.8	Test Date:	10/05/11
Liquid Temperature (°C):	22.2	Barometric Pressure (mb):	1015.2	Tested by:	Ethan Schoonover

Body Test 5f 10-5-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1908.75 MHz; Communication System PAR: 0 dB
Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 51.881$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.58477$ mho/m, $\epsilon_r = 51.8651$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.55, 4.55, 4.55); Calibrated: 2/23/2011
Sensor-Surface: 3mm (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 - Mid/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 0.858 mW/g

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

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

Maximum value of SAR (interpolated) = 0.938 mW/g

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

Reference Value = 24.546 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.222 W/kg

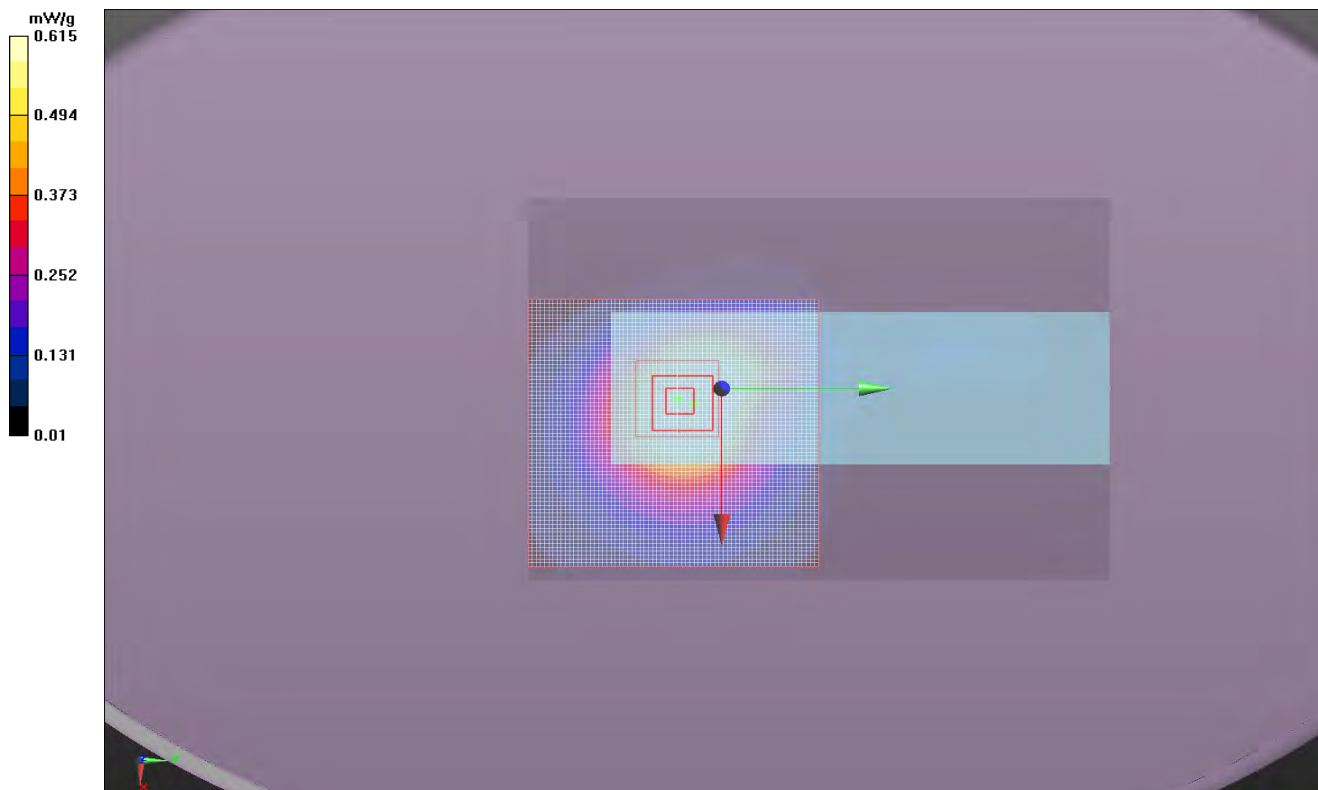
SAR(1 g) = 0.802 mW/g; SAR(10 g) = 0.496 mW/g

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

Maximum value of SAR (measured) = 0.949 mW/g

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

Maximum value of Total (measured) = 19.730 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	21.7	Humidity (%):	46.7	Test Date:	09/20/11
Liquid Temperature (°C):	22	Barometric Pressure (mb):	1016.9	Tested by:	Ethan Schoonover

Body Test 6 9-20-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1880 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.468$ mho/m; $\epsilon_r = 52.178$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.46276$ mho/m, $\epsilon_r = 52.1977$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.55, 4.55, 4.55); Calibrated: 2/23/2011

Sensor-Surface: 3mm (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 - Mid/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 0.060 mW/g

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

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

Maximum value of SAR (interpolated) = 0.076 mW/g

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

Reference Value = 7.133 V/m; Power Drift = -0.39 dB

Peak SAR (extrapolated) = 0.094 W/kg

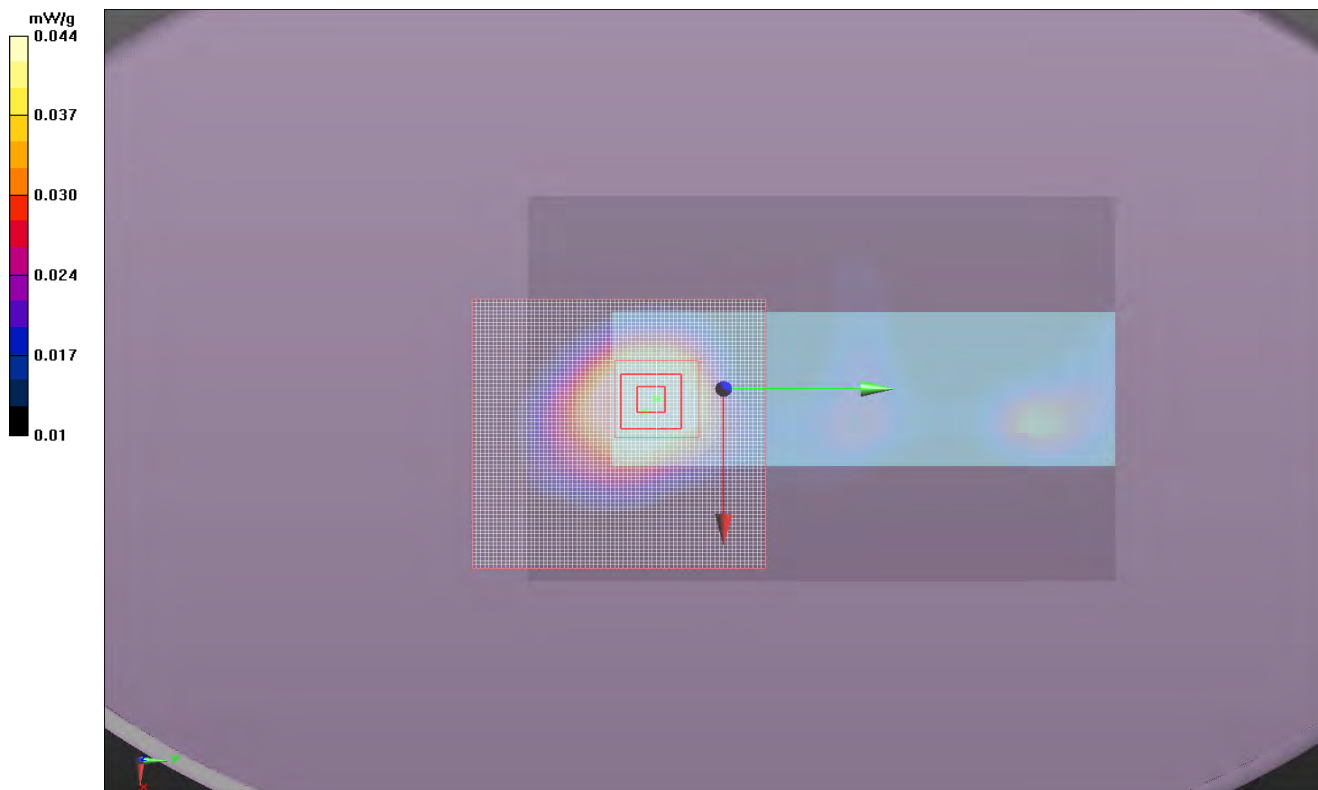
SAR(1 g) = 0.062 mW/g; SAR(10 g) = 0.038 mW/g

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

Maximum value of SAR (measured) = 0.072 mW/g

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

Maximum value of Total (measured) = 5.486 V/m



EMC**SAR TEST DATA**

Room Temperature (°C):	22.3	Humidity (%):	46.4	Test Date:	09/21/11
Liquid Temperature (°C):	21.3	Barometric Pressure (mb):	1016.5	Tested by:	Jennifer Herrett

Body Test 7 9-21-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1880 MHz; Communication System PAR: 0 dB
 Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.468$ mho/m; $\epsilon = 52.178$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.46276$ mho/m, $\epsilon = 52.1977$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.55, 4.55, 4.55); Calibrated: 2/23/2011
 Sensor-Surface: 3mm (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 - Mid/Reference scan (51x81x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 0.561 mW/g

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

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

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

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

Reference Value = 19.571 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.753 W/kg

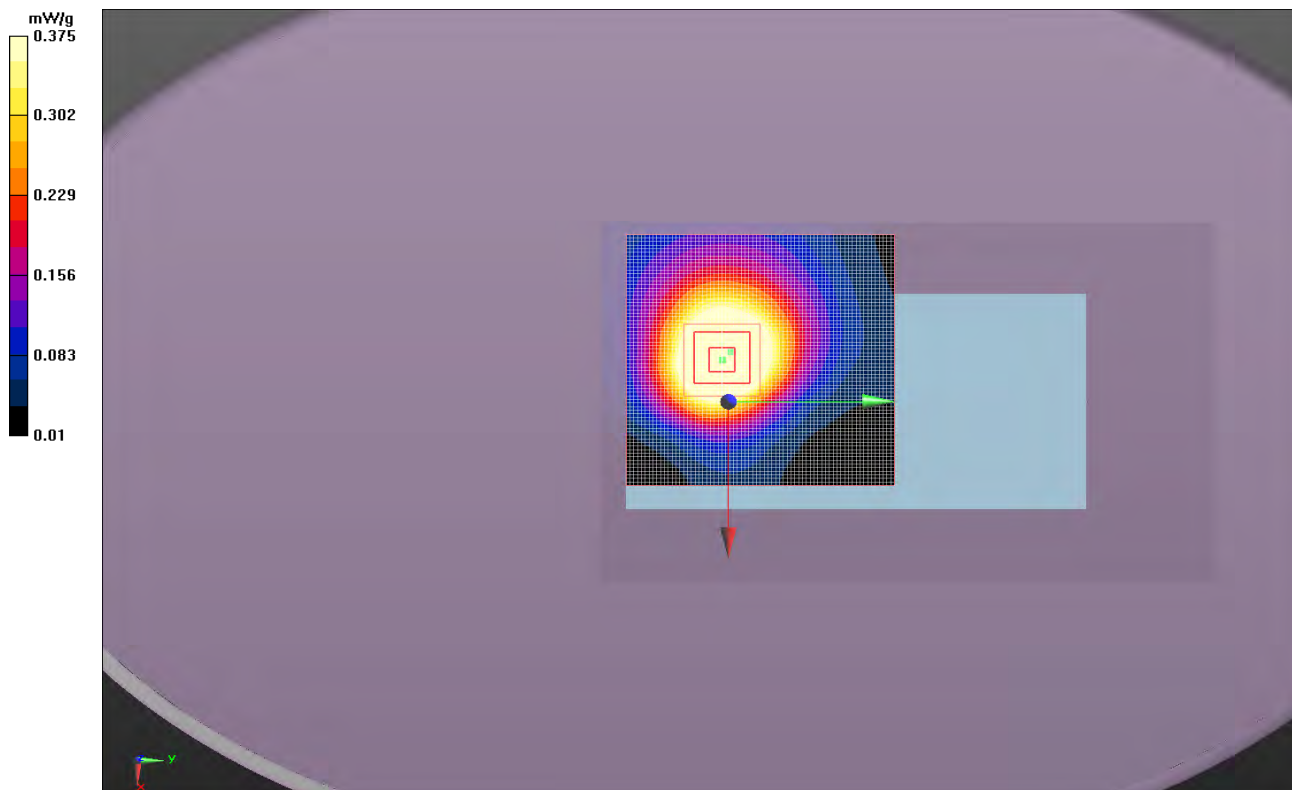
SAR(1 g) = 0.499 mW/g; SAR(10 g) = 0.313 mW/g

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

Maximum value of SAR (measured) = 0.586 mW/g

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

Maximum value of Total (measured) = 15.979 V/m



EMC**SAR TEST DATA**

Room Temperature (°C):	22.8	Humidity (%):	42.9	Test Date:	10/05/11
Liquid Temperature (°C):	21.2	Barometric Pressure (mb):	1015.2	Tested by:	Ethan Schoonover

Body Test 8d 10-5-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1880 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.547$ mho/m; $\epsilon_r = 52.004$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.54078$ mho/m, $\epsilon_r = 52.0257$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.55, 4.55, 4.55); Calibrated: 2/23/2011

Sensor-Surface: 3mm (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 - Mid/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 1.009 mW/g

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

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

Maximum value of SAR (interpolated) = 1.056 mW/g

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

Reference Value = 26.173 V/m; Power Drift = 0.0078 dB

Peak SAR (extrapolated) = 1.505 W/kg

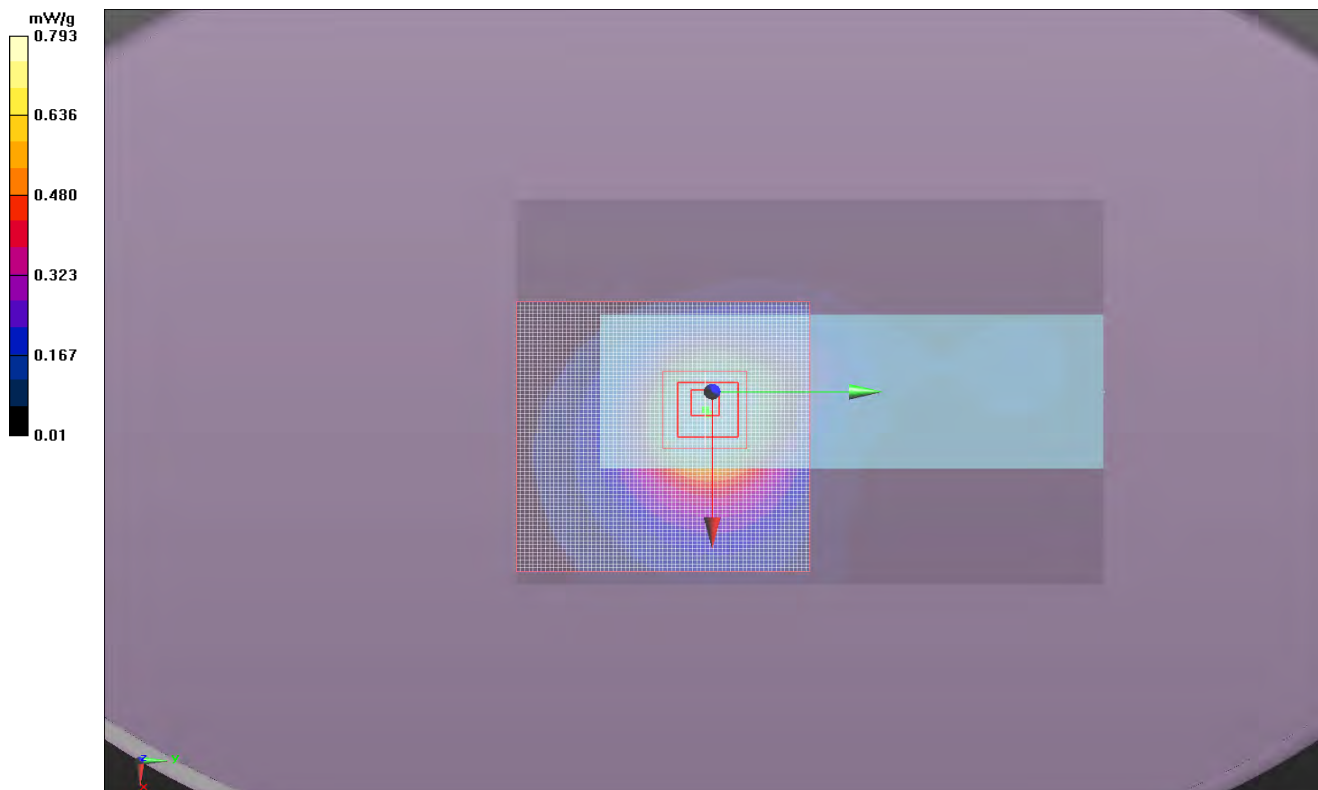
SAR(1 g) = 0.971 mW/g; SAR(10 g) = 0.599 mW/g

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

Maximum value of SAR (measured) = 1.183 mW/g

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

Maximum value of Total (measured) = 22.648 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	22.8	Humidity (%):	42.9	Test Date:	10/05/11
Liquid Temperature (°C):	21.2	Barometric Pressure (mb):	1015.2	Tested by:	Ethan Schoonover

Body Test 8e 10-5-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1851.25 MHz; Communication System PAR: 0 dB
Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.513$ mho/m; $\epsilon_r = 52.125$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.51163$ mho/m, $\epsilon_r = 52.1297$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.55, 4.55, 4.55); Calibrated: 2/23/2011
Sensor-Surface: 3mm (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 - Mid/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 1.322 mW/g

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

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

Maximum value of SAR (interpolated) = 1.392 mW/g

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

Reference Value = 29.020 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.706 W/kg

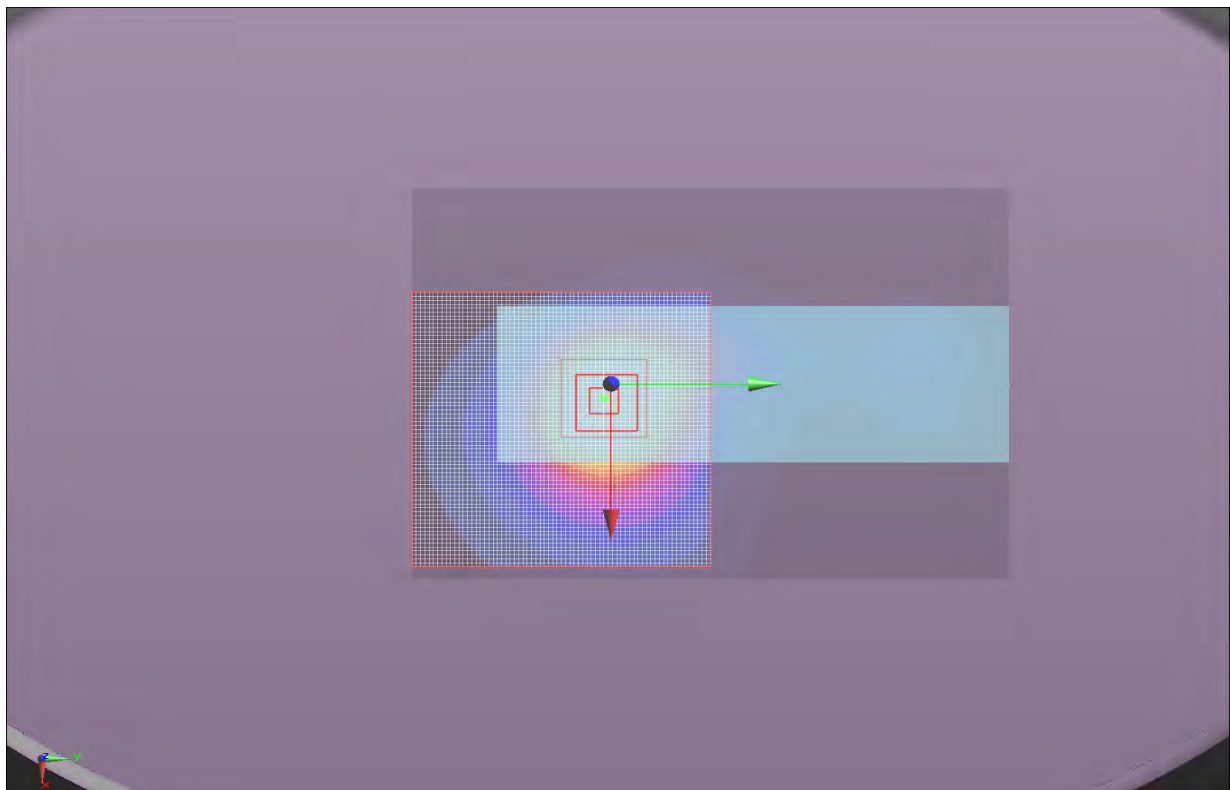
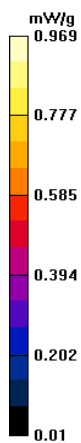
SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.740 mW/g

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

Maximum value of SAR (measured) = 1.396 mW/g

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

Maximum value of Total (measured) = 25.306 V/m



EMC

SAR TEST DATA

Room Temperature (°C):	23.2	Humidity (%):	45.7	Test Date:	10/05/11
Liquid Temperature (°C):	22.4	Barometric Pressure (mb):	1015.2	Tested by:	Ethan Schoonover

Body Test 8f 10-5-11

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

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1908.75 MHz; Communication System PAR: 0 dB
Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 51.881$; $\rho = 1000$ kg/m³, Medium parameters used: $\sigma = 1.58477$ mho/m, $\epsilon_r = 51.8651$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3173; ConvF(4.55, 4.55, 4.55); Calibrated: 2/23/2011
Sensor-Surface: 3mm (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 - Mid/Reference scan (51x71x1): Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 0.956 mW/g

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

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

Maximum value of SAR (interpolated) = 1.056 mW/g

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

Reference Value = 26.835 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 1.385 W/kg

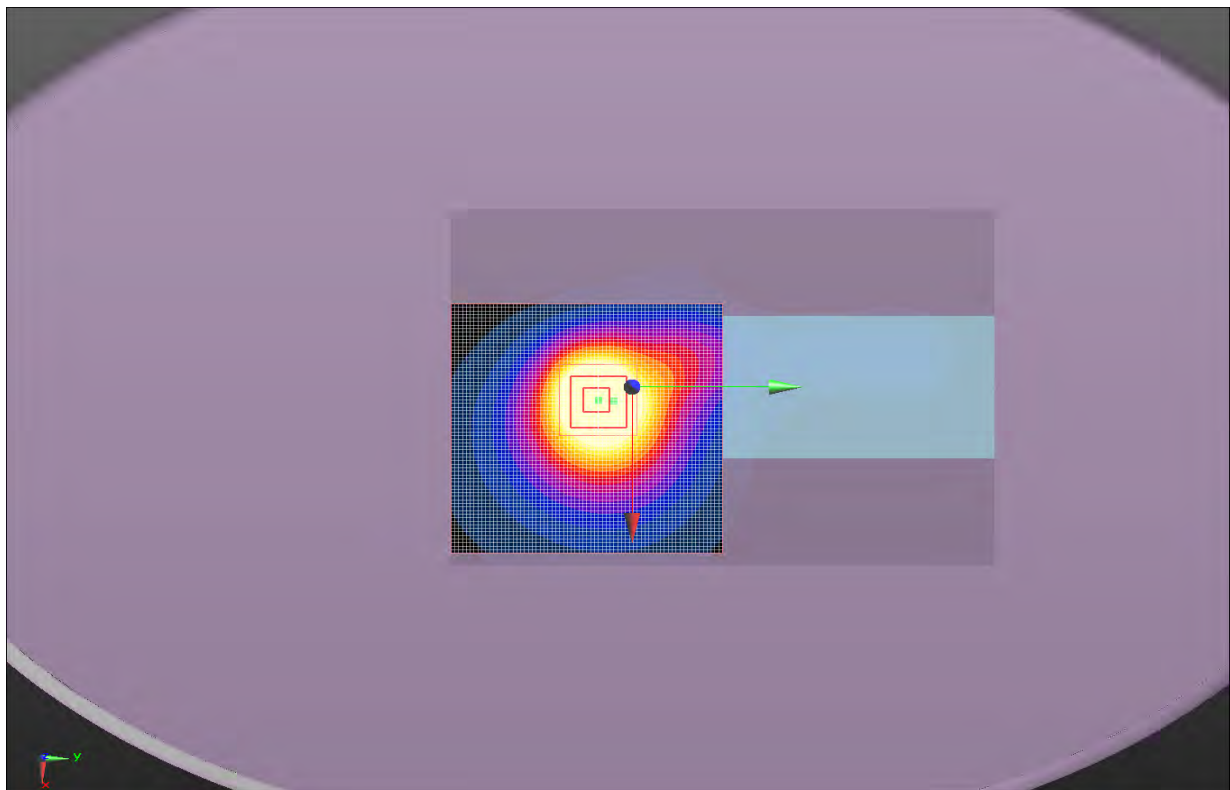
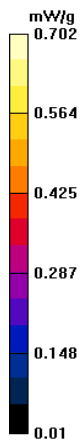
SAR(1 g) = 0.910 mW/g; SAR(10 g) = 0.563 mW/g

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

Maximum value of SAR (measured) = 1.075 mW/g

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

Maximum value of Total (measured) = 21.079 V/m



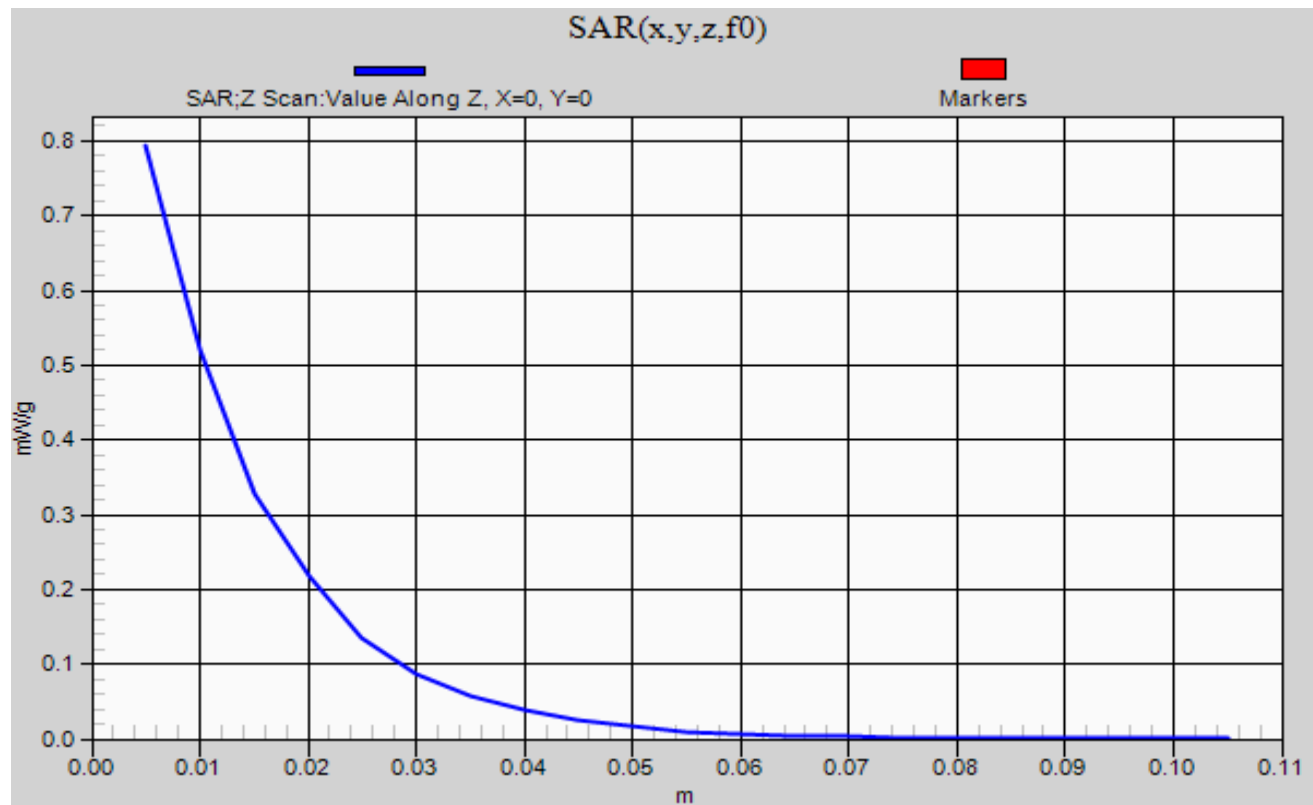
EMC

SAR TEST DATA

Room Temperature (°C):	22.8	Humidity (%):	42.9	Test Date:	10/05/11
Liquid Temperature (°C):	21.2	Barometric Pressure (mb):	1015.2	Tested by:	Ethan Schoonover

Body Test 8e 10-5-11

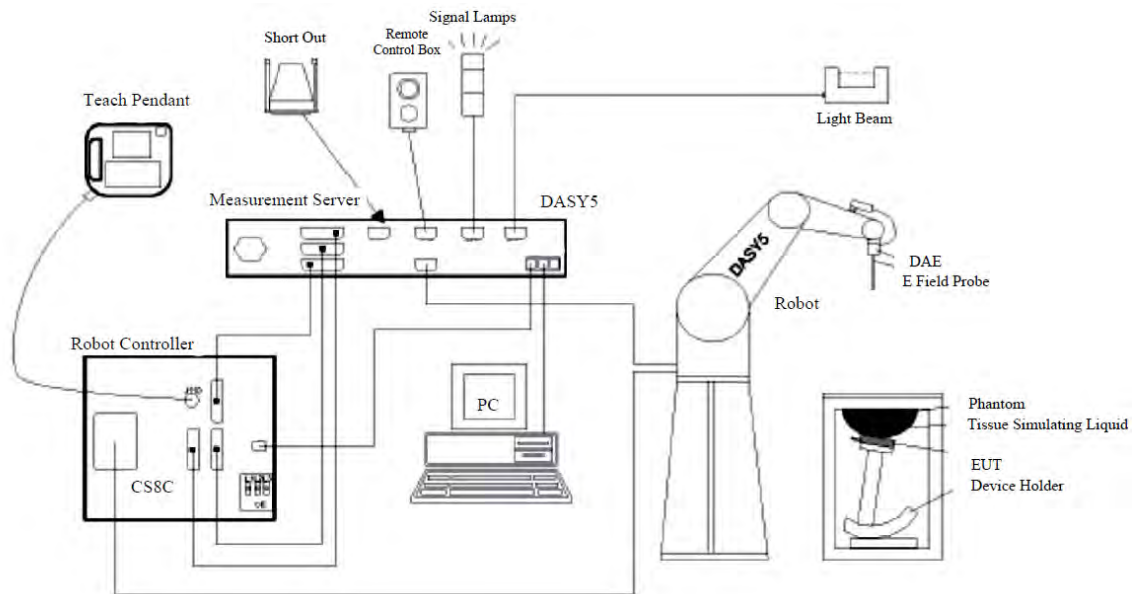
DUT: Handheld Computer; Type: 1000CP03C; Serial: 42016



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:



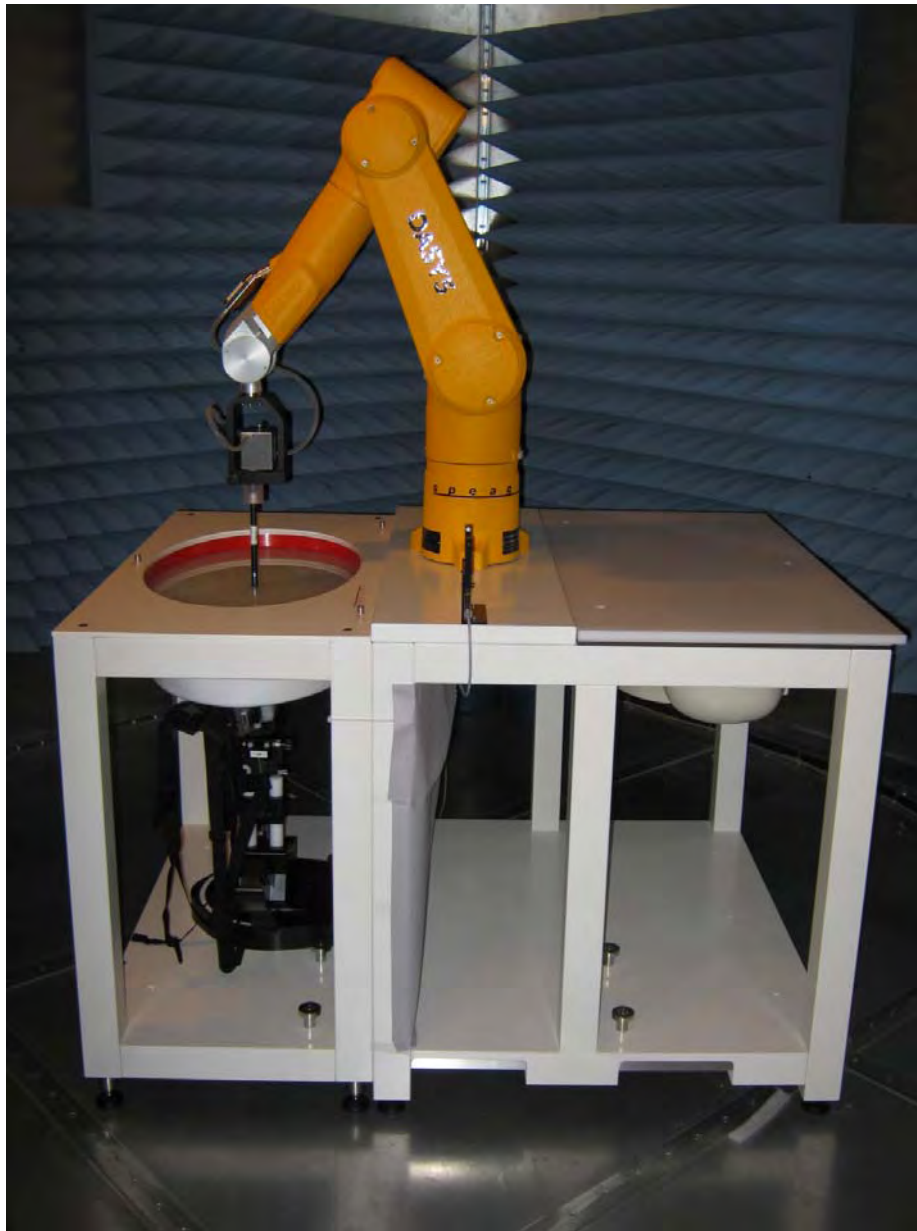
- A standard high precision 6-axis robot (Staubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) 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
Wireless Communication Test Set	Agilent	E5515C	BSV	NCR	0 mo
Humidity Temperature Meter	Omegaette	HH311	DTY	3/29/2011	24 mo
Humidity Temperature Meter	Omegaette	HH311	DTX	3/29/2011	24 mo
band Amplifier, SMA, 800-2000 MHz	Mini Circuits	ZHL-5W-2G-S+	TRZ	NCR	0 mo
MXG Analog Signal Generator	Agilent	N5181A	TIG	NCR	0 mo
Power Sensor	Agilent	E9300H	SQO	6/6/2011	24 mo
Power Meter	Agilent	N1913A	SQR	6/6/2011	24 mo
Dielectric Probe Kit	Agilent	85070E	IPP	9/8/2010	24 mo
Network Analyzer	Hewlett Packard	N5230A	NAD	8/3/2011	12 mo
Antenna, Dipole 1900MHz SAR	SPEAG	D1900v2	ADO	11/24/2010	12 mo
Antenna, Dipole 835MHz SAR	SPEAG	D835V2	ADK	10/19/2010	12 mo
Device Holder	SPEAG	N/A	SAW	NCR	0 mo
Body Solution	SPEAG	MSL 900	SAT	Within 24 of hours of a measurement	
Head Solution	SPEAG	HSL 900	SAS		
Body Solution	SPEAG	MSL 1900	SAO		
Head Solution	SPEAG	HSL 1900	SAN		
DASY5 Measurement Server	Staeubli	DAYS5	SAK	NCR	0 mo
Robot Chasis and power Supply	Staeubli	N/A	SAJ	NCR	0 mo
Robot Controller	Staeubli	CS8C	SAI	11/11/2010	12 mo
DAE	SPEAG	SD 000 D04 EJ	SAH	11/11/2010	12 mo
SAR Probe	SPEAG	ES3DV3	R035	2/23/2011	12 mo
Light Beam Unit	SPEAG	SE UKS 030 AA	SAD	NCR	0 mo
Phantom, 2mm Oval ELI4 (Body)	SPEAG	QD OVA 001 BB	SAC	NCR	0 mo
Phantom, Twin SAM (Head)	SPEAG	QD 000 P40 CC	SAB	NCR	0 mo
Robot Arm	Staeubli	TX60LSPEAG	SAA	NCR	0 mo

Northwest EMC	Measurement Uncertainty	Rev 12/09/2010
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Measurement Uncertainty Budget 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	

Probe 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
 Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

Client **SPEAG Replacement**

Certificate No: **ES3-3173_Feb11**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3173**

Calibration procedure(s) **QA CAL-01.v7, QA CAL-23.v4, QA CAL-25.v3**
Calibration procedure for dosimetric E-field probes

Calibration date: **February 23, 2011**

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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	01-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	01-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	01-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	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	23-Apr-10 (No. DAE4-654_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

Calibrated by:	Name Claudio Leubler	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature

Issued: February 24, 2011

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



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

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 affect 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.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- 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 ES3DV3

SN:3173

Manufactured: January 23, 2008
Calibrated: February 23, 2011

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3173

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V/m})^2$) ^A	1.21	1.28	1.35	$\pm 10.1 \%$
DCP (mV) ^B	95.9	100.2	100.8	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	144.1	$\pm 2.7 \%$
			Y	0.00	0.00	1.00	114.9	
			Z	0.00	0.00	1.00	113.4	

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

^A The uncertainties of NormX,Y,Z do not affect the E^2 -field uncertainty inside TSL (see Pages 5 and 6).

^B Numerical linearization parameter: uncertainty not required.

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3173

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.25	6.25	6.25	0.99	1.11	± 12.0 %
835	41.5	0.90	6.01	6.01	6.01	0.99	1.12	± 12.0 %
900	41.5	0.97	5.93	5.93	5.93	0.99	1.12	± 12.0 %
1640	40.3	1.29	5.34	5.34	5.34	0.99	1.11	± 12.0 %
1750	40.1	1.37	5.20	5.20	5.20	0.99	1.13	± 12.0 %
1810	40.0	1.40	5.05	5.05	5.05	0.94	1.15	± 12.0 %
1900	40.0	1.40	4.96	4.96	4.96	0.96	1.13	± 12.0 %
1950	40.0	1.40	4.80	4.80	4.80	0.91	1.17	± 12.0 %
2000	40.0	1.40	4.88	4.88	4.88	0.99	1.06	± 12.0 %
2150	39.7	1.53	4.72	4.72	4.72	0.95	1.13	± 12.0 %
2300	39.5	1.67	4.58	4.58	4.58	0.96	1.09	± 12.0 %
2450	39.2	1.80	4.26	4.26	4.26	0.92	1.14	± 12.0 %
2600	39.0	1.96	4.13	4.13	4.13	0.90	1.16	± 12.0 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: ES3DV3- SN:3173

Calibration Parameter Determined in Body Tissue Simulating Media

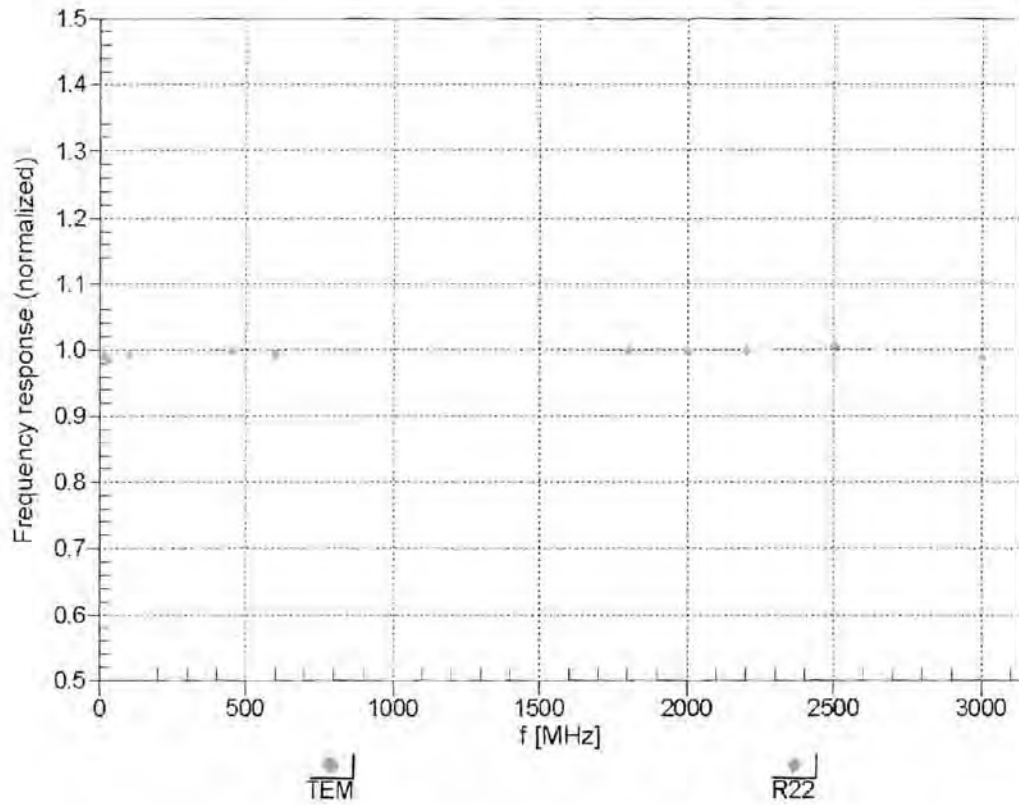
f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.01	6.01	6.01	0.99	1.15	± 12.0 %
835	55.2	0.97	5.97	5.97	5.97	0.99	1.16	± 12.0 %
900	55.0	1.05	5.89	5.89	5.89	0.99	1.14	± 12.0 %
1640	53.8	1.40	5.30	5.30	5.30	0.99	1.18	± 12.0 %
1750	53.4	1.49	4.87	4.87	4.87	0.95	1.22	± 12.0 %
1810	53.3	1.52	4.71	4.71	4.71	0.95	1.20	± 12.0 %
1900	53.3	1.52	4.55	4.55	4.55	0.90	1.24	± 12.0 %
1950	53.3	1.52	4.61	4.61	4.61	0.93	1.20	± 12.0 %
2000	53.3	1.52	4.49	4.49	4.49	0.89	1.24	± 12.0 %
2150	53.1	1.66	4.37	4.37	4.37	0.98	1.16	± 12.0 %
2300	52.9	1.81	4.19	4.19	4.19	0.99	1.08	± 12.0 %
2450	52.7	1.95	4.05	4.05	4.05	0.99	1.01	± 12.0 %
2600	52.5	2.16	3.90	3.90	3.90	0.99	1.03	± 12.0 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Frequency Response of E-Field

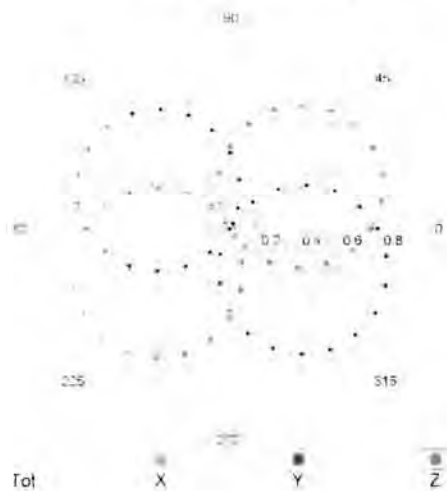
(TEM-Cell:ifi110 EXX, Waveguide: R22)



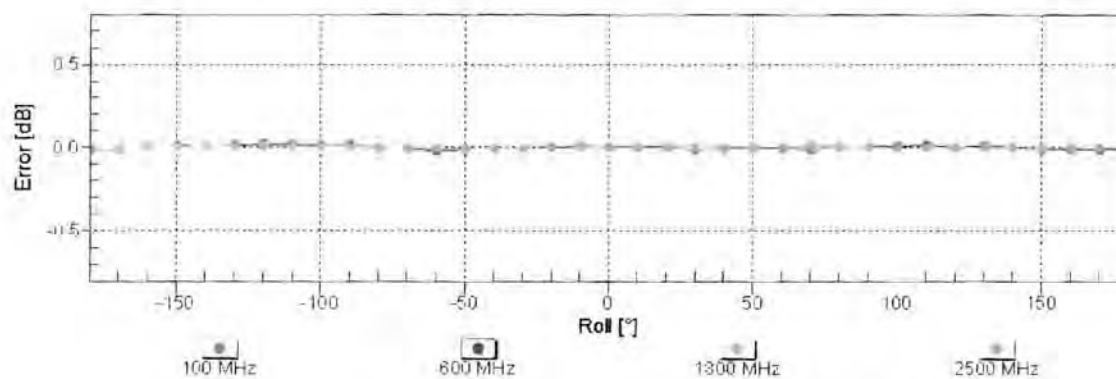
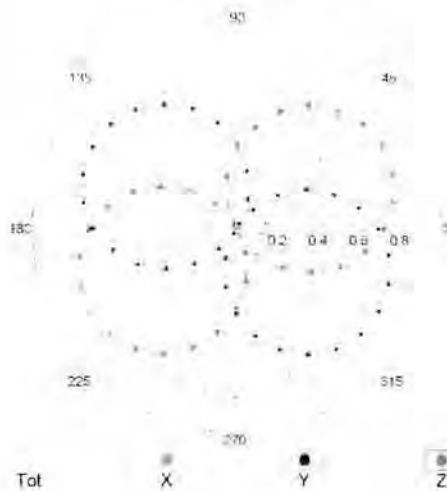
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

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

f=600 MHz,TEM

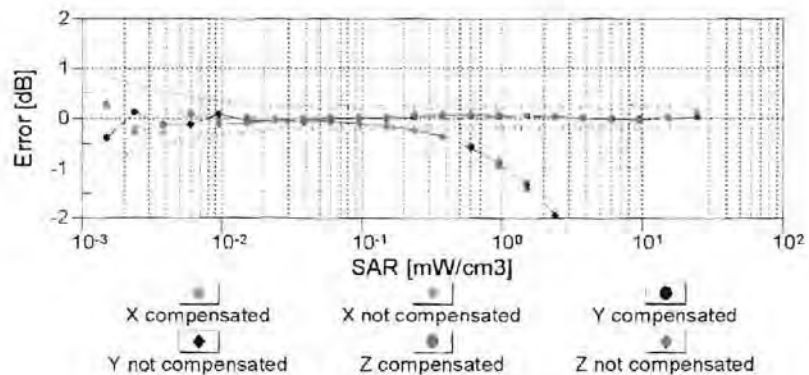
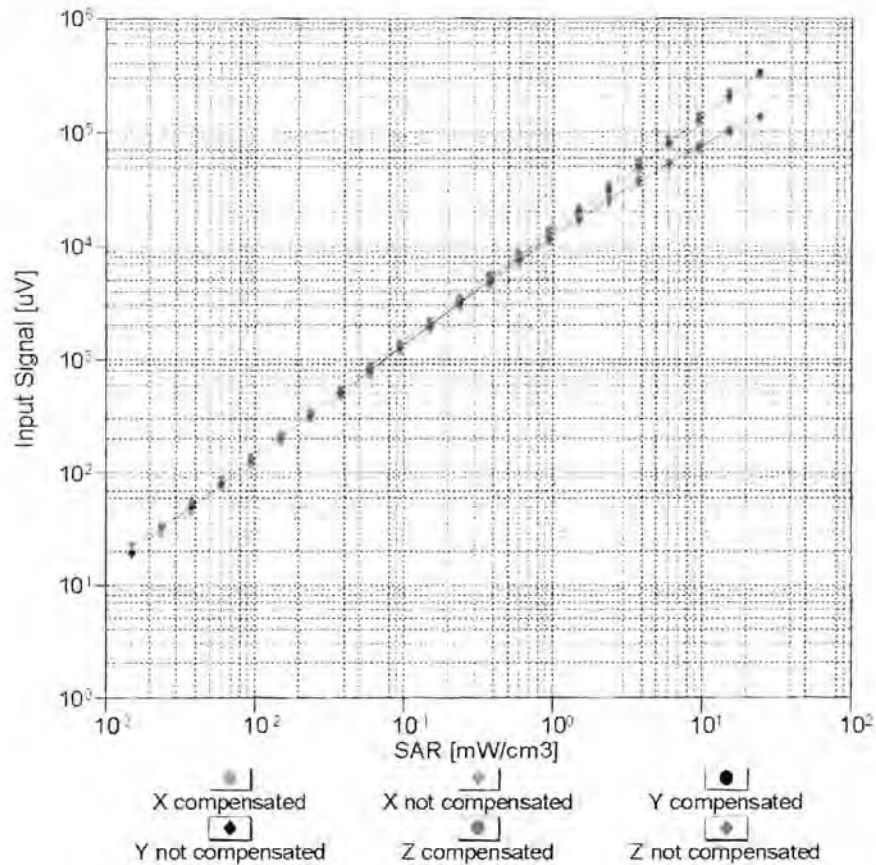


f=1800 MHz,R22



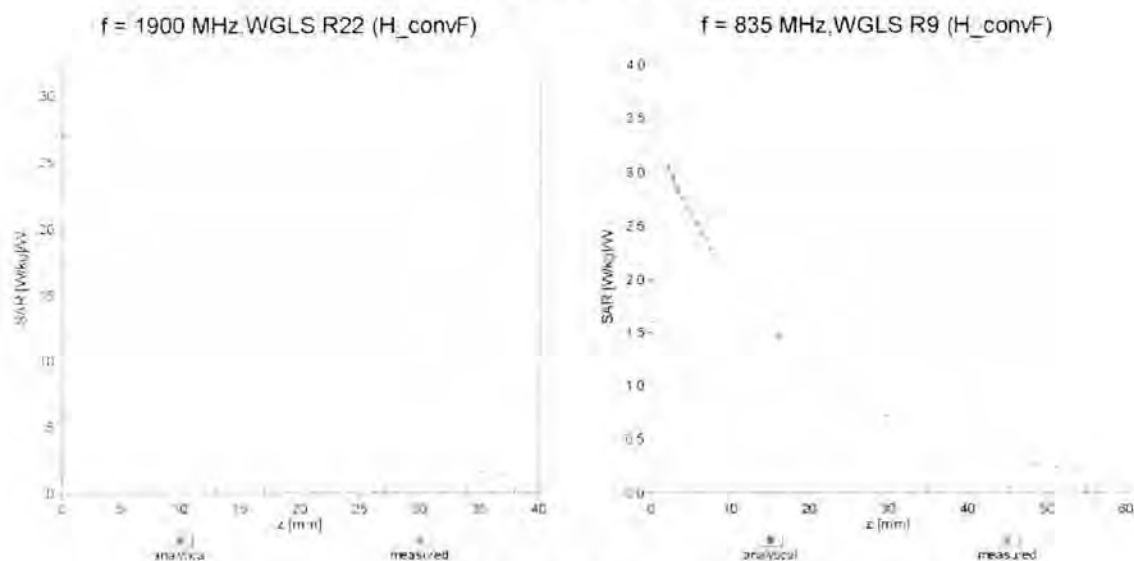
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f = 900 \text{ MHz}$)



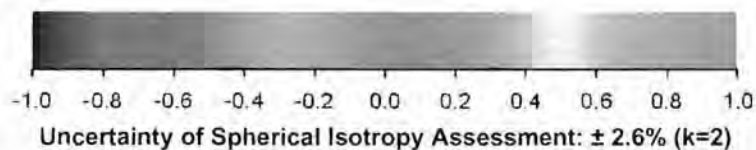
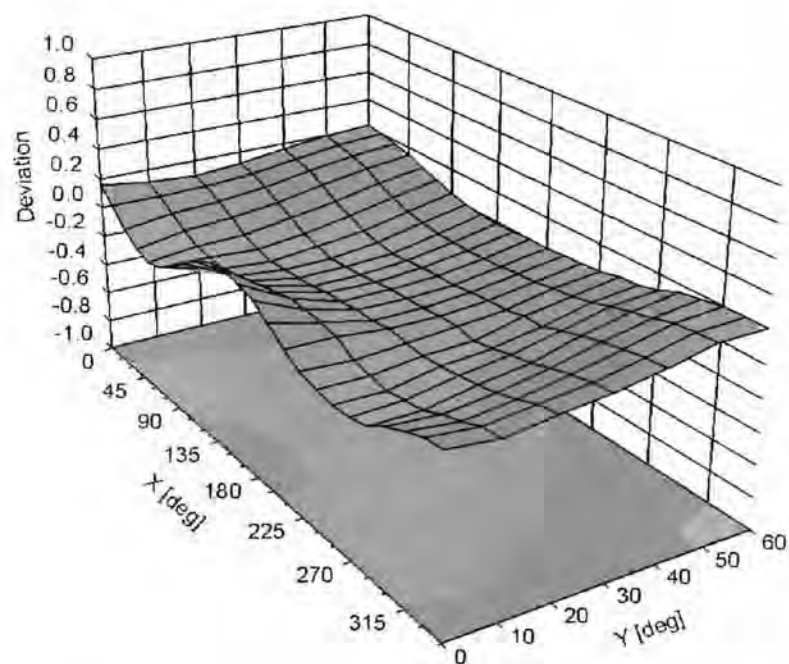
Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), $f = 900 \text{ MHz}$



DASY/EASY - Parameters of Probe: ES3DV3 - SN:3173

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	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Northwest

EMC

Dipole Calibration

Rev 12/09/2010

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

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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Multilateral Agreement for the recognition of calibration certificates

Client **Northwest EMC**

Certificate No: **D835V2-4d108_Oct10**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 4d108**

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

Calibration date: **October 19, 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 $(22 \pm 3)^{\circ}\text{C}$ 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 Dimce Iliev	Function Laboratory Technician	Signature
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Approved by:	Katja Pokovic	Technical Manager	
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Issued: October 19, 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:

- 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
- 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 V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.3 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.40 mW / g
SAR normalized	normalized to 1W	9.60 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.64 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.57 mW / g
SAR normalized	normalized to 1W	6.28 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.29 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	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.4 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature during test	(21.8 ± 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	2.53 mW / g
SAR normalized	normalized to 1W	10.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	9.93 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.65 mW / g
SAR normalized	normalized to 1W	6.60 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	6.51 mW / g ± 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.8 Ω - 3.2 j Ω
Return Loss	- 28.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.0 Ω - 4.4 j Ω
Return Loss	- 26.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.396 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	May 26, 2010

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d108

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL900

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.9 \text{ mho/m}$; $\epsilon_r = 42.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; 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)

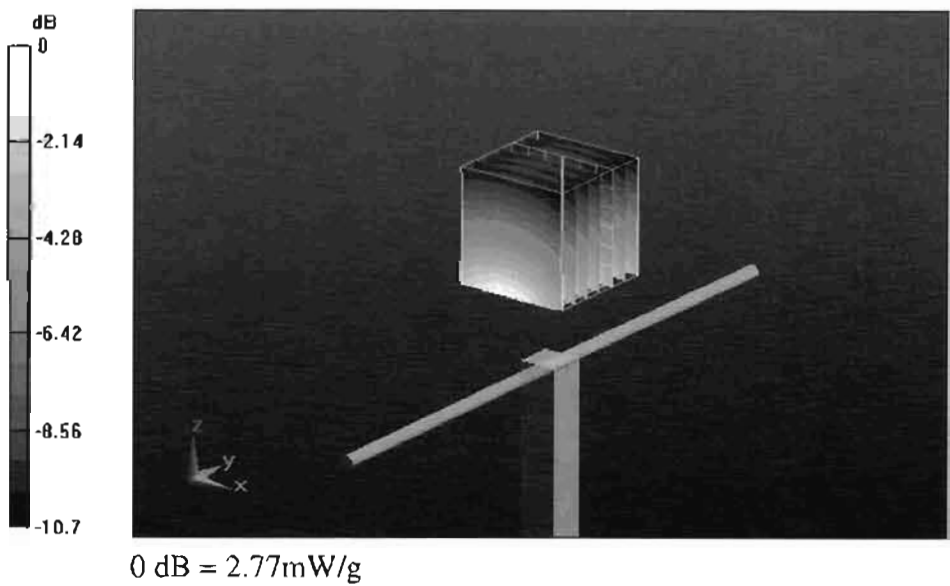
Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.1 V/m; Power Drift = 0.000575 dB

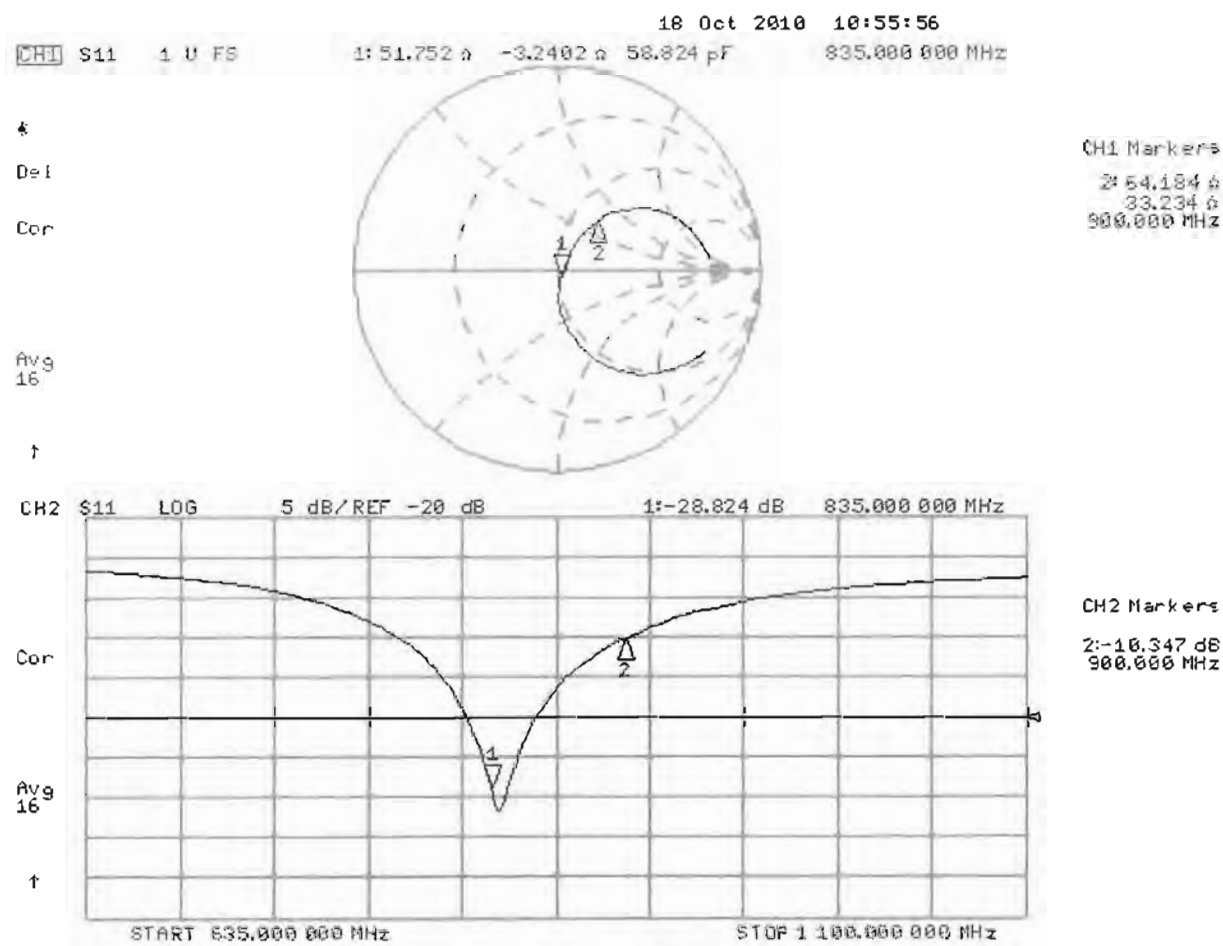
Peak SAR (extrapolated) = 3.61 W/kg

SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.57 mW/g

Maximum value of SAR (measured) = 2.77 mW/g



Impedance Measurement Plot for Head TSL



Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d108

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: MSL900

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 54.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.86, 5.86, 5.86); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; 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)

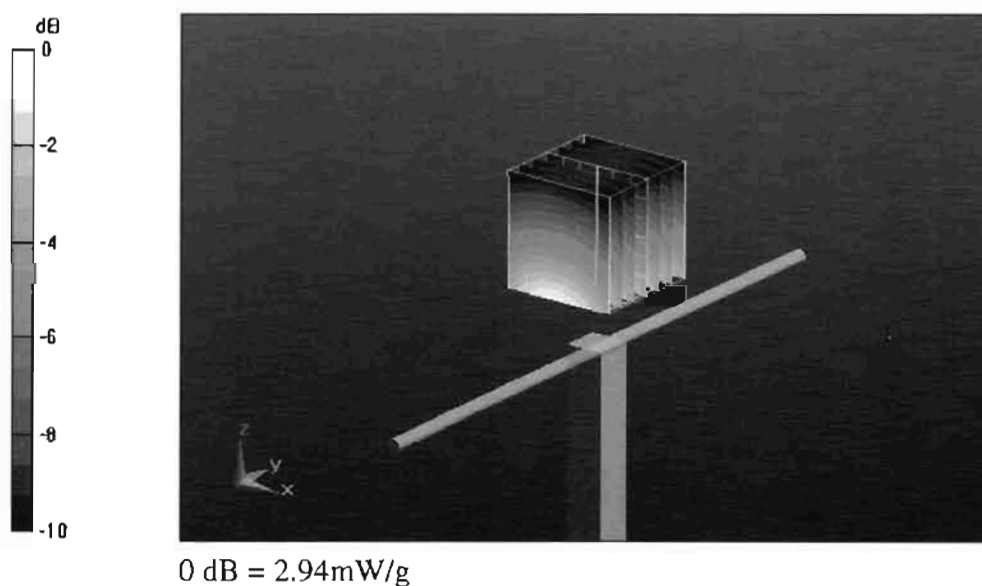
Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.4 V/m; Power Drift = 0.0047 dB

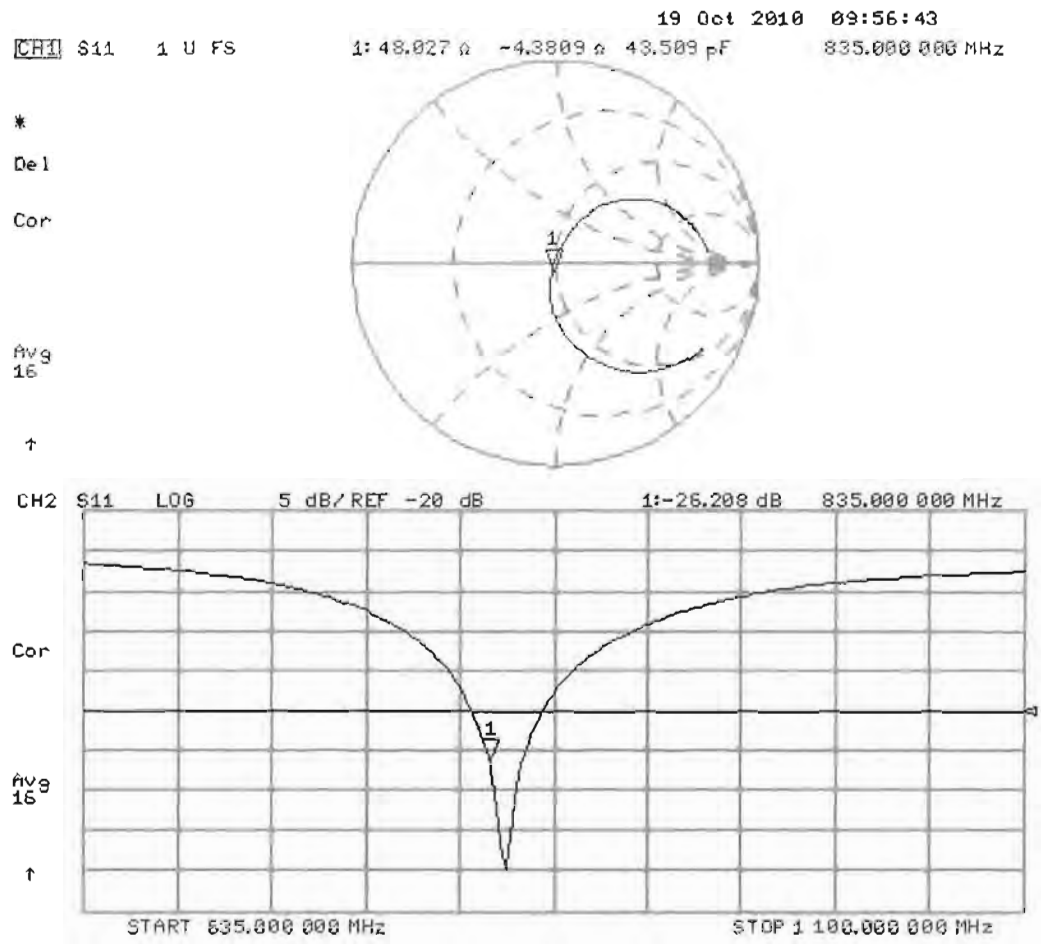
Peak SAR (extrapolated) = 3.73 W/kg

SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.65 mW/g

Maximum value of SAR (measured) = 2.94 mW/g



Impedance Measurement Plot for Body TSL



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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Northwest EMC**

Certificate No: **D1900V2-5d131_Nov10**

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d131**

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

Calibration date: **November 24, 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 $(22 \pm 3)^{\circ}\text{C}$ 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** **Function**
Claudio Leubler **Laboratory Technician**

Signature

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

Issued: November 25, 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:

- 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
- 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
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	39.3 $\pm$ 6 %	1.40 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.1 mW / g
SAR normalized	normalized to 1W	40.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	40.2 mW /g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.23 mW / g
SAR normalized	normalized to 1W	20.9 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	20.9 mW /g $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.8 ± 6 %	1.52 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	10.0 mW / g
SAR normalized	normalized to 1W	40.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	39.9 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.25 mW / g
SAR normalized	normalized to 1W	21.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	21.0 mW / g ± 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$52.7 \Omega + 6.5 j\Omega$
Return Loss	- 23.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$48.1 \Omega + 6.9 j\Omega$
Return Loss	- 22.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.206 ns
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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	April 14, 2010

DASY5 Validation Report for Head TSL

Date/Time: 10.11.2010 16:31:30

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d131

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL U12 BB

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); 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)

Head/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

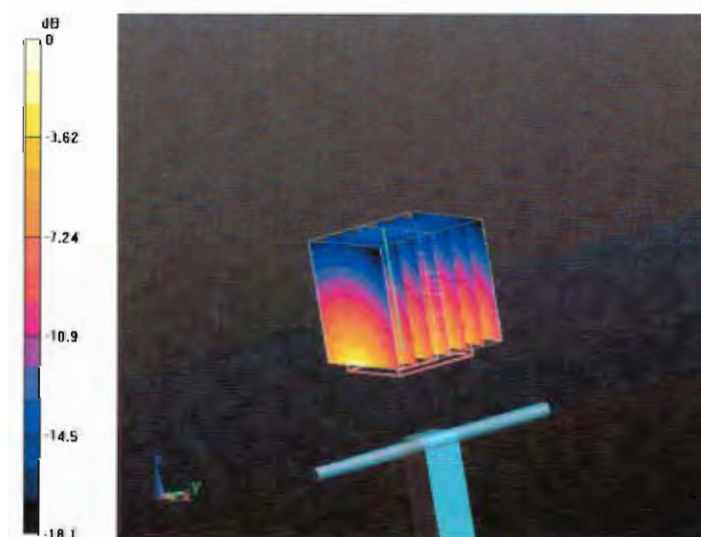
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 95.1 V/m ; Power Drift = 0.064 dB

Peak SAR (extrapolated) = 18.4 W/kg

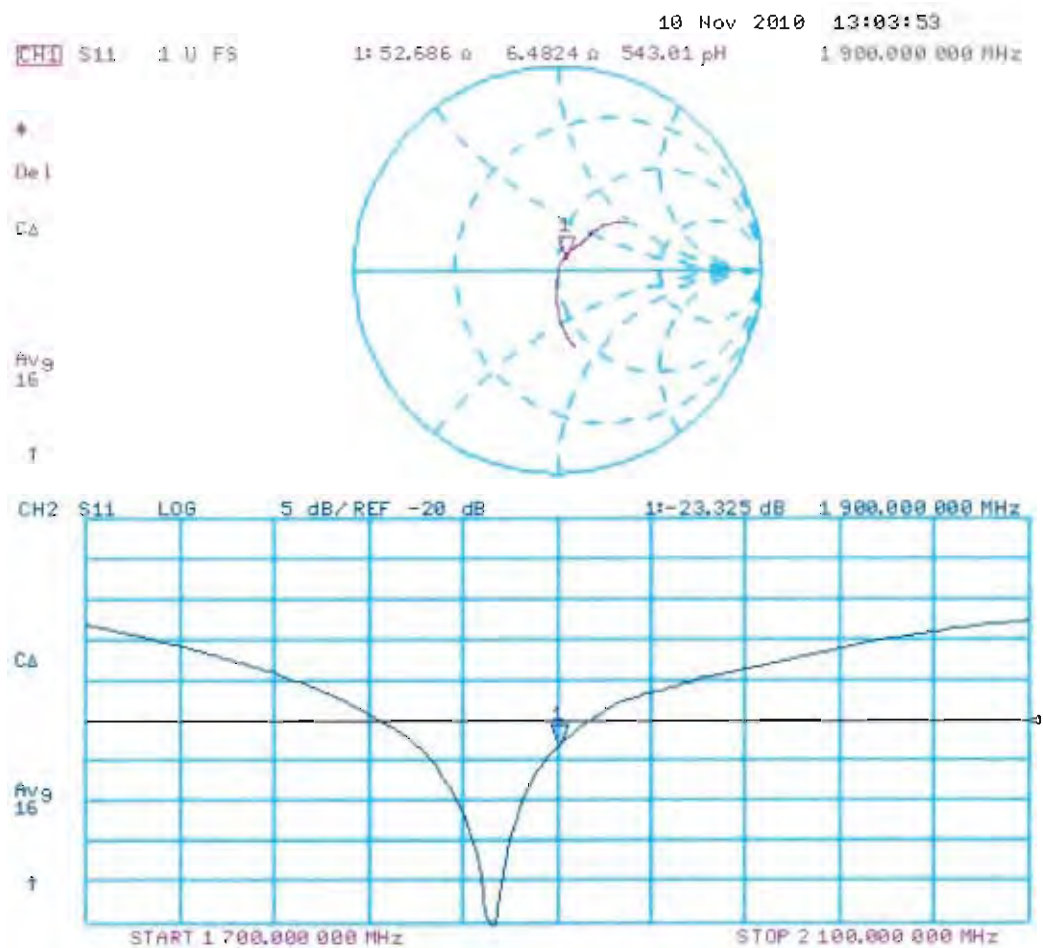
SAR(1 g) = 10.1 mW/g ; SAR(10 g) = 5.23 mW/g

Maximum value of SAR (measured) = 12.6 mW/g



0 dB = 12.6 mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 24.11.2010 12:48:29

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d131

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: MSL U12 BB

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); 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)

Body/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.7 V/m; Power Drift = -0.00519 dB

Peak SAR (extrapolated) = 17.2 W/kg

SAR(1 g) = 10 mW/g; SAR(10 g) = 5.25 mW/g

Maximum value of SAR (measured) = 12.3 mW/g



0 dB = 12.3mW/g

Impedance Measurement Plot for Body TSL

