

# Intermec Technologies Corporation

**Model: 1001CP01S**

Evaluated to the following SAR Specifications:

FCC 2.1093: 2011  
Health Safety Code 6:2009

Report No. ITRM0248.5

Report Prepared By



[www.nwemc.com](http://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: August 8, 2011  
Intermec Technologies Corporation  
Model: 1001CP01S

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

| Highest SAR Values   |                |                |                 |                                 |
|----------------------|----------------|----------------|-----------------|---------------------------------|
| Frequency Band (GHz) | Head 1g (W/kg) | Body 1g (W/kg) | Limit 1g (W/kg) | Exposure Environment            |
| 2.4                  | .079           | .265           | 1.6             | General Population Uncontrolled |
| 5.2, 5.3, 5.5. & 5.8 | .140           | .504           |                 |                                 |

| 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 |
|-----------------|-------------|------|-------------|
| 00              | None        |      |             |

**Barometric Pressure**

The recorded barometric pressure has been normalized to sea level.



# Accreditations and Authorizations

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## 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.

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## 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.

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## 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*)

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## 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.

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## 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).

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# Accreditations and Authorizations

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## 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).*

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## 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).

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## 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

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## 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)*

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## 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.

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## SCOPE

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

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



# Northwest EMC Locations



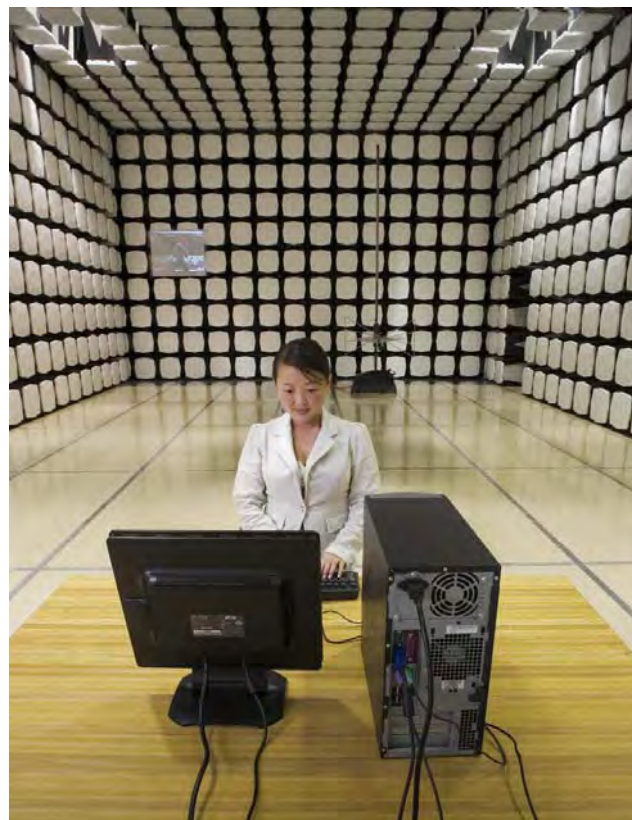
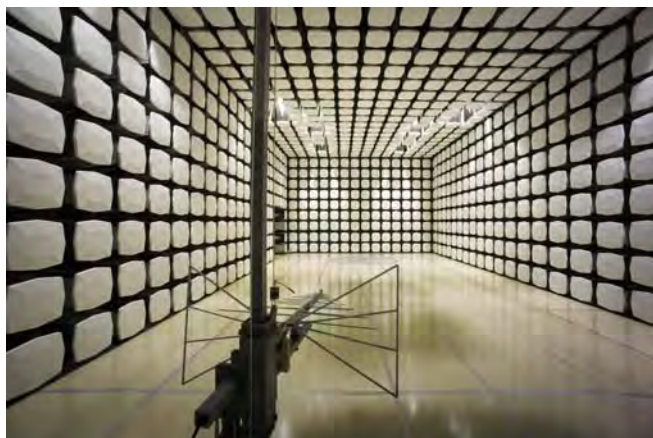
Oregon  
Labs EV01-EV12  
22975 NW Evergreen Pkwy  
Suite 400  
Hillsboro, OR 97124  
(503) 844-4066

California  
Labs OC01-OC13  
41 Tesla  
Irvine, CA 92618  
(949) 861-8918

Minnesota  
Labs MN01-MN08  
9349 W Broadway Ave.  
Brooklyn Park,  
MN 55445  
(763) 425-2281

Washington  
Labs SU01-SU07  
14128 339<sup>th</sup> Ave. SE  
Sultan, WA 98294  
(360) 793-8675

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



## Party Requesting the Test

|                                 |                                   |
|---------------------------------|-----------------------------------|
| <b>Company Name:</b>            | Intermec Technologies Corporation |
| <b>Address:</b>                 | 550 Second St. SE                 |
| <b>City, State, Zip:</b>        | Cedar Rapids, IA 52401-2023       |
| <b>Test Requested By:</b>       | Stu Adams                         |
| <b>Model:</b>                   | 1001CP01S                         |
| <b>First Date of Test:</b>      | July 26, 2011                     |
| <b>Last Date of Test:</b>       | August 8, 2011                    |
| <b>Receipt Date of Samples:</b> | July 19, 2011                     |
| <b>Equipment Design Stage:</b>  | Production                        |
| <b>Equipment Condition:</b>     | No Damage                         |

## Information Provided by the Party Requesting the Test

## Functional Description of the EUT (Equipment Under Test)

The EUT is a handheld computer containing two radio modules, the Intermec Model RC12 and the Sierra Wireless MC8355, 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 MC8355 radio module is a UMTS radio. Its frequency range:

- 824.2 – 848.8 MHz (GPRS, EDGE)
- 826.4 – 846.6 MHz (WCDMA, HSDPA, HSUPA)
- 1850.2 – 1909.8 MHz (GPRS, EDGE)
- 1852.4 – 1907.5 MHz (WCDMA, HSDPA, HSUPA)
- 1712.4 – 1752.6 MHz (WCDMA)

The closest spacing between the UMTS 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 UMTS 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 body. The only Intermec approved accessory for body worn operation is a holster that contains metal. The EUT can only fit in the holster with the top end of the unit pointing down. The holster cup can be attached to the holster belt with either the keypad facing the user, or the side facing the user. In no case can the back of the EUT face the user.

An optional snap-on audio accessory is available. It connects to the bottom end of the unit and provides a standard audio jack for connection of a VR10 headset.

The EUT is powered by a lithium-ion battery, Model 1001AB01.

**Overview of the SAR Evaluation****Objective**

To demonstrate compliance with the SAR requirements of FCC 2.1093 and Canada's Health Safety Code 6.

**Scope**

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

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

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

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

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

|           | 2.45 | 5.15 - 5.35 | 5.47 - 5.85 | GHz |
|-----------|------|-------------|-------------|-----|
| $P_{Ref}$ | 12   | 6           | 5           | mW  |

Device output power should be rounded to the nearest mW to compare with values specified in this table.

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

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

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

**CONFIGURATION 7 ITRM0248****Software/Firmware Running during test**

| Description          | Version      |
|----------------------|--------------|
| Regulatory Test Tool | 1.01.00.0016 |

**EUT**

| Description          | Manufacturer                      | Model/Part Number | Serial Number |
|----------------------|-----------------------------------|-------------------|---------------|
| C1 Handheld Computer | Intermec Technologies Corporation | 1001CP01S         | 28311047275   |
| C1 Holster           | Intermec Technologies Corporation | X11236-V1         | None          |
| C1 Battery           | Intermec Technologies Corporation | 1001AB01          | 1666100990    |

**CONFIGURATION 8 ITRM0248****Software/Firmware Running during test**

| Description          | Version      |
|----------------------|--------------|
| Regulatory Test Tool | 1.01.00.0016 |

**EUT**

| Description            | Manufacturer                      | Model/Part Number | Serial Number |
|------------------------|-----------------------------------|-------------------|---------------|
| C1 Handheld Computer   | Intermec Technologies Corporation | 1001CP01S         | 28311047275   |
| C1 Holster             | Intermec Technologies Corporation | X11236-V1         | None          |
| Headset                | Intermec Technologies Corporation | VR10              | None          |
| Standard Audio Snap-On | Intermec Technologies Corporation | 225-771-001       | Proto 2       |
| C1 Battery             | Intermec Technologies Corporation | 1001AB01          | 1666100990    |

**Cables**

| Cable Type                                                                                             | Shield | Length (m) | Ferrite | Connection 1              | Connection 2      |
|--------------------------------------------------------------------------------------------------------|--------|------------|---------|---------------------------|-------------------|
| Audio Accessory                                                                                        | PA     |            | PA      | Audio Accessory - Headset | Handheld Computer |
| PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown. |        |            |         |                           |                   |

**CONFIGURATION 9 ITRM0248****Software/Firmware Running during test**

| Description          | Version      |
|----------------------|--------------|
| Regulatory Test Tool | 1.01.00.0016 |

**EUT**

| Description          | Manufacturer                      | Model/Part Number | Serial Number |
|----------------------|-----------------------------------|-------------------|---------------|
| C1 Handheld Computer | Intermec Technologies Corporation | 1001CP01S         | 28311047275   |
| C1 Battery           | Intermec Technologies Corporation | 1001AB01          | 1666100990    |

| Equipment modifications |           |                |                                      |                                                                     |                                                   |
|-------------------------|-----------|----------------|--------------------------------------|---------------------------------------------------------------------|---------------------------------------------------|
| Item                    | Date      | Test           | Modification                         | Note                                                                | Disposition of EUT                                |
| 1                       | 7/26/2011 | SAR Evaluation | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 2                       | 8/8/2010  | SAR Evaluation | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed.                  |

**2.4 and 5 GHz Bands**

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

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

Output power measurements are on the following pages.

| NORTHWEST                                   |   | EMC                                                                                               |  | Output Power             |  | XMIT 2011.01.18 |  |
|---------------------------------------------|---|---------------------------------------------------------------------------------------------------|--|--------------------------|--|-----------------|--|
| EUT: 1001CP01S                              |   |                                                                                                   |  | Work Order: ITRM0248     |  |                 |  |
| Serial Number: 28311047275                  |   |                                                                                                   |  | Date: 07/19/11           |  |                 |  |
| Customer: Intermec Technologies Corporation |   |                                                                                                   |  | Temperature: 23          |  |                 |  |
| Attendees: None                             |   |                                                                                                   |  | Humidity: 49%            |  |                 |  |
| Project: ITRM0227                           |   |                                                                                                   |  | Barometric Pres.: 30.01" |  |                 |  |
| Tested by: Rod Peloquin                     |   | EUT Power                                                                                         |  | Battery                  |  | Job Site: EV12  |  |
| TEST SPECIFICATIONS                         |   |                                                                                                   |  | Test Method              |  |                 |  |
| FCC 2.1093:2011                             |   |                                                                                                   |  | FCC OET 65C:2001         |  |                 |  |
| COMMENTS                                    |   |                                                                                                   |  |                          |  |                 |  |
| Conducted output power                      |   |                                                                                                   |  |                          |  |                 |  |
| DEVIATIONS FROM TEST STANDARD               |   |                                                                                                   |  |                          |  |                 |  |
| None                                        |   |                                                                                                   |  |                          |  |                 |  |
| Configuration #                             | 9 | <div style="text-align: right;"> <i>Rodney Le Pellego</i><br/>           Signature         </div> |  |                          |  |                 |  |

| Channel | Frequency<br>(MHz) | Data Rate<br>(Mbps) | Modulation | Conducted Power (Average) |       |
|---------|--------------------|---------------------|------------|---------------------------|-------|
|         |                    |                     |            | dBm                       | W     |
| 1       | 2412               | 1                   | BPSK       | 16.6                      | 0.046 |
|         |                    | 11                  | CCK        | 16.5                      | 0.045 |
|         |                    | 6                   | OFDM       | 13.1                      | 0.020 |
|         |                    | 36                  | OFDM       | 12.9                      | 0.020 |
|         |                    | 54                  | OFDM       | 12.9                      | 0.019 |
|         |                    | 7.2 (MCS0)          | OFDM       | 13.1                      | 0.020 |
|         |                    | 72.2 (MCS7)         | OFDM       | 12.4                      | 0.017 |
| 6       | 2437               | 1                   | BPSK       | 17.1                      | 0.051 |
|         |                    | 11                  | CCK        | 17.0                      | 0.050 |
|         |                    | 6                   | OFDM       | 13.5                      | 0.022 |
|         |                    | 36                  | OFDM       | 13.3                      | 0.022 |
|         |                    | 54                  | OFDM       | 13.3                      | 0.021 |
|         |                    | 7.2 (MCS0)          | OFDM       | 13.5                      | 0.022 |
|         |                    | 72.2 (MCS7)         | OFDM       | 12.8                      | 0.019 |
| 11      | 2462               | 1                   | BPSK       | 17.4                      | 0.055 |
|         |                    | 11                  | CCK        | 17.4                      | 0.054 |
|         |                    | 6                   | OFDM       | 13.8                      | 0.024 |
|         |                    | 36                  | OFDM       | 13.7                      | 0.023 |
|         |                    | 54                  | OFDM       | 13.5                      | 0.023 |
|         |                    | 7.2 (MCS0)          | OFDM       | 13.8                      | 0.024 |
|         |                    | 72.2 (MCS7)         | OFDM       | 13.1                      | 0.021 |

| NORTHWEST                                   |   | Output Power                                                                                   |  | XMIT 2011.01.18          |  |
|---------------------------------------------|---|------------------------------------------------------------------------------------------------|--|--------------------------|--|
| <b>EMC</b>                                  |   |                                                                                                |  |                          |  |
| EUT: 1001CP01S                              |   |                                                                                                |  | Work Order: ITRM0248     |  |
| Serial Number: 28311047275                  |   |                                                                                                |  | Date: 07/20/11           |  |
| Customer: Intermec Technologies Corporation |   |                                                                                                |  | Temperature: 23          |  |
| Attendees: None                             |   |                                                                                                |  | Humidity: 45%            |  |
| Project: ITRM0227                           |   |                                                                                                |  | Barometric Pres.: 30.16" |  |
| Tested by: Rod Peloquin                     |   | EUT Power                                                                                      |  | Battery                  |  |
| TEST SPECIFICATIONS                         |   |                                                                                                |  | Test Method              |  |
| FCC 2.1093:2011                             |   |                                                                                                |  | FCC OET 65C:2001         |  |
| <b>COMMENTS</b>                             |   |                                                                                                |  |                          |  |
| Conducted output power                      |   |                                                                                                |  |                          |  |
| <b>DEVIATIONS FROM TEST STANDARD</b>        |   |                                                                                                |  |                          |  |
| None                                        |   |                                                                                                |  |                          |  |
| Configuration #                             | 3 | <br>Signature |  |                          |  |

| Channel | Frequency<br>(MHz) | Data Rate<br>(Mbps) | Modulation | Conducted Power (Average) |       |
|---------|--------------------|---------------------|------------|---------------------------|-------|
|         |                    |                     |            | dBm                       | W     |
| 36      | 5180               | 6                   | OFDM       | 11.7                      | 0.015 |
|         |                    | 54                  | OFDM       | 10.8                      | 0.012 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.6                      | 0.015 |
|         |                    | 7.2 (MCS7)          | OFDM       | 9.4                       | 0.009 |
| 40      | 5200               | 6                   | OFDM       | 11.7                      | 0.015 |
|         |                    | 54                  | OFDM       | 10.9                      | 0.012 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.6                      | 0.014 |
|         |                    | 7.2 (MCS7)          | OFDM       | 9.5                       | 0.009 |
| 44      | 5220               | 6                   | OFDM       | 11.7                      | 0.015 |
|         |                    | 54                  | OFDM       | 11.0                      | 0.013 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.7                      | 0.015 |
|         |                    | 7.2 (MCS7)          | OFDM       | 11.7                      | 0.015 |
| 48      | 5240               | 6                   | OFDM       | 11.7                      | 0.015 |
|         |                    | 54                  | OFDM       | 10.9                      | 0.012 |
|         |                    | 7.2 (MCS0)          | OFDM       | 12.0                      | 0.016 |
|         |                    | 7.2 (MCS7)          | OFDM       | 9.8                       | 0.010 |
| 52      | 5260               | 6                   | OFDM       | 11.9                      | 0.016 |
|         |                    | 54                  | OFDM       | 11.3                      | 0.013 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.9                      | 0.016 |
|         |                    | 7.2 (MCS7)          | OFDM       | 9.9                       | 0.010 |
| 56      | 5280               | 6                   | OFDM       | 11.8                      | 0.015 |
|         |                    | 54                  | OFDM       | 11.3                      | 0.013 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.9                      | 0.015 |
|         |                    | 7.2 (MCS7)          | OFDM       | 9.9                       | 0.010 |
| 60      | 5300               | 6                   | OFDM       | 11.8                      | 0.015 |
|         |                    | 54                  | OFDM       | 11.2                      | 0.013 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.7                      | 0.015 |
|         |                    | 7.2 (MCS7)          | OFDM       | 9.8                       | 0.010 |
| 64      | 5320               | 6                   | OFDM       | 11.8                      | 0.015 |
|         |                    | 54                  | OFDM       | 11.2                      | 0.013 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.7                      | 0.015 |
|         |                    | 7.2 (MCS7)          | OFDM       | 9.8                       | 0.010 |
| 100     | 5500               | 6                   | OFDM       | 10.8                      | 0.012 |
|         |                    | 7.2 (MCS0)          | OFDM       | 10.7                      | 0.012 |
| 104     | 5520               | 6                   | OFDM       | 11.4                      | 0.014 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.3                      | 0.014 |
| 108     | 5540               | 6                   | OFDM       | 11.1                      | 0.013 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.0                      | 0.013 |
| 112     | 5560               | 6                   | OFDM       | 10.7                      | 0.012 |
|         |                    | 7.2 (MCS0)          | OFDM       | 10.7                      | 0.012 |
| 116     | 5580               | 6                   | OFDM       | 11.3                      | 0.013 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.2                      | 0.013 |
| 120     | 5600               | 6                   | OFDM       | 11.6                      | 0.014 |
|         |                    | 7.2 (MCS0)          | OFDM       | 11.5                      | 0.014 |
| 124     | 5620               | 6                   | OFDM       | 10.5                      | 0.011 |
|         |                    | 7.2 (MCS0)          | OFDM       | 10.4                      | 0.011 |
| 128     | 5640               | 6                   | OFDM       | 9.6                       | 0.009 |
|         |                    | 7.2 (MCS0)          | OFDM       | 9.5                       | 0.009 |
| 132     | 5660               | 6                   | OFDM       | 9.3                       | 0.008 |
|         |                    | 7.2 (MCS0)          | OFDM       | 9.2                       | 0.008 |
| 136     | 5680               | 6                   | OFDM       | 8.9                       | 0.008 |
|         |                    | 7.2 (MCS0)          | OFDM       | 8.9                       | 0.008 |
| 140     | 5700               | 6                   | OFDM       | 8.7                       | 0.007 |
|         |                    | 7.2 (MCS0)          | OFDM       | 8.6                       | 0.007 |
| 149     | 5745               | 6                   | OFDM       | 8.4                       | 0.007 |
|         |                    | 7.2 (MCS0)          | OFDM       | 8.3                       | 0.007 |
| 153     | 5765               | 6                   | OFDM       | 8.1                       | 0.006 |
|         |                    | 7.2 (MCS0)          | OFDM       | 8.1                       | 0.007 |
| 157     | 5785               | 6                   | OFDM       | 8.1                       | 0.007 |
|         |                    | 7.2 (MCS0)          | OFDM       | 8.1                       | 0.007 |
| 161     | 5805               | 6                   | OFDM       | 8.3                       | 0.007 |
|         |                    | 7.2 (MCS0)          | OFDM       | 8.3                       | 0.007 |
| 165     | 5825               | 6                   | OFDM       | 8.3                       | 0.007 |
|         |                    | 7.2 (MCS0)          | OFDM       | 8.2                       | 0.007 |

**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)            | $\epsilon_r$ | $\sigma$ (S/m) | $\epsilon_r$ | $\sigma$ (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           |

( $\epsilon_r$  = relative permittivity,  $\sigma$  = 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<br>(% 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<sup>+</sup>% Pure Sodium Chloride

Sugar: 98<sup>+</sup>% Pure Sucrose

Water: De-ionized, 16 M $\Omega$ <sup>+</sup> resistivity

HEC: Hydroxyethyl Cellulose

DGBE: 99<sup>+</sup>% 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                                   |      | SAR 2011.02.21                                                                              |  |
| <b>EMC</b>                                  |      | <b>Tissue - Equivalent Liquid</b>                                                           |  |
| EUT: MSL501                                 |      | Work Order: ITRM0248                                                                        |  |
| Serial Number: SAV                          |      | Date: 07/25/11                                                                              |  |
| Customer: Intermec Technologies Corporation |      | Temperature (°C): 22.2                                                                      |  |
| Attendees: None                             |      | Humidity: 52.1                                                                              |  |
| Project: ITRM0227                           |      | Barometric Pres. (mb): 1017                                                                 |  |
| 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: MSL501                              |      | Liquid Temperature (°C): 22.2                                                               |  |

| Frequency<br>(GHz) | Actual Values         |              | Target Values         |              | Deviation (%)         |              |
|--------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|
|                    | Relative Permittivity | Conductivity | Relative Permittivity | Conductivity | Relative Permittivity | Conductivity |
| 5800               | 46.043                | 6.027        | 48.200                | 6.000        | 4.47                  | -0.45        |
| 3400.0             | 49.8                  | 3.084        |                       |              |                       |              |
| 3500.0             | 49.7                  | 3.183        |                       |              |                       |              |
| 3600.0             | 49.6                  | 3.284        |                       |              |                       |              |
| 3700.0             | 49.5                  | 3.405        |                       |              |                       |              |
| 3800.0             | 49.3                  | 3.507        |                       |              |                       |              |
| 3900.0             | 49.2                  | 3.609        |                       |              |                       |              |
| 4000.0             | 49.0                  | 3.721        |                       |              |                       |              |
| 4100.0             | 48.8                  | 3.829        |                       |              |                       |              |
| 4200.0             | 48.7                  | 3.950        |                       |              |                       |              |
| 4300.0             | 48.5                  | 4.071        |                       |              |                       |              |
| 4400.0             | 48.5                  | 4.202        |                       |              |                       |              |
| 4500.0             | 48.4                  | 4.328        |                       |              |                       |              |
| 4600.0             | 48.2                  | 4.462        |                       |              |                       |              |
| 4700.0             | 48.0                  | 4.582        |                       |              |                       |              |
| 4800.0             | 47.8                  | 4.712        |                       |              |                       |              |
| 4850.0             | 47.7                  | 4.773        |                       |              |                       |              |
| 4900.0             | 47.7                  | 4.838        |                       |              |                       |              |
| 4950.0             | 47.6                  | 4.898        |                       |              |                       |              |
| 5000.0             | 47.5                  | 4.968        |                       |              |                       |              |
| 5050.0             | 47.4                  | 5.028        |                       |              |                       |              |
| 5100.0             | 47.2                  | 5.087        |                       |              |                       |              |
| 5150.0             | 47.2                  | 5.158        |                       |              |                       |              |
| 5200.0             | 47.1                  | 5.223        |                       |              |                       |              |
| 5250.0             | 47.0                  | 5.285        |                       |              |                       |              |
| 5300.0             | 46.9                  | 5.340        |                       |              |                       |              |
| 5350.0             | 46.8                  | 5.413        |                       |              |                       |              |
| 5400.0             | 46.7                  | 5.473        |                       |              |                       |              |
| 5450.0             | 46.6                  | 5.547        |                       |              |                       |              |
| 5500.0             | 46.6                  | 5.611        |                       |              |                       |              |
| 5550.0             | 46.5                  | 5.674        |                       |              |                       |              |
| 5600.0             | 46.4                  | 5.739        |                       |              |                       |              |
| 5650.0             | 46.3                  | 5.817        |                       |              |                       |              |
| 5700.0             | 46.3                  | 5.880        |                       |              |                       |              |
| 5750.0             | 46.2                  | 5.942        |                       |              |                       |              |
| 5800.0             | 46.0                  | 6.027        |                       |              |                       |              |
| 5850.0             | 46.0                  | 6.097        |                       |              |                       |              |
| 5900.0             | 46.0                  | 6.167        |                       |              |                       |              |

| NORTHWEST                                   |      | SAR 2011.02.21                                                                              |  |
|---------------------------------------------|------|---------------------------------------------------------------------------------------------|--|
| <b>EMC</b>                                  |      | <b>Tissue - Equivalent Liquid</b>                                                           |  |
| EUT: MSL501                                 |      | Work Order: ITRM0248                                                                        |  |
| Serial Number: SAV                          |      | Date: 07/27/2011                                                                            |  |
| Customer: Intermec Technologies Corporation |      | Temperature (°C): 23.4                                                                      |  |
| Attendees: None                             |      | Humidity: 44.5                                                                              |  |
| Project: ITRM0227                           |      | Barometric Pres. (mb): 1020.3                                                               |  |
| 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: MSL501                              |      | Liquid Temperature (°C): 22.2                                                               |  |

| Frequency<br>(GHz) | Actual Values         |              | Target Values         |              | Deviation (%)         |              |
|--------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|
|                    | Relative Permittivity | Conductivity | Relative Permittivity | Conductivity | Relative Permittivity | Conductivity |
| 5800               | 46.685                | 6.054        | 48.200                | 6.000        | 3.14                  | -0.90        |
| 3400.0             | 50.5                  | 3.148        |                       |              |                       |              |
| 3500.0             | 50.4                  | 3.245        |                       |              |                       |              |
| 3600.0             | 50.3                  | 3.348        |                       |              |                       |              |
| 3700.0             | 50.2                  | 3.461        |                       |              |                       |              |
| 3800.0             | 50.0                  | 3.555        |                       |              |                       |              |
| 3900.0             | 49.9                  | 3.658        |                       |              |                       |              |
| 4000.0             | 49.7                  | 3.770        |                       |              |                       |              |
| 4100.0             | 49.5                  | 3.885        |                       |              |                       |              |
| 4200.0             | 49.4                  | 4.012        |                       |              |                       |              |
| 4300.0             | 49.2                  | 4.136        |                       |              |                       |              |
| 4400.0             | 49.1                  | 4.267        |                       |              |                       |              |
| 4500.0             | 49.1                  | 4.393        |                       |              |                       |              |
| 4600.0             | 48.9                  | 4.518        |                       |              |                       |              |
| 4700.0             | 48.7                  | 4.642        |                       |              |                       |              |
| 4800.0             | 48.5                  | 4.769        |                       |              |                       |              |
| 4850.0             | 48.4                  | 4.828        |                       |              |                       |              |
| 4900.0             | 48.4                  | 4.889        |                       |              |                       |              |
| 4950.0             | 48.4                  | 4.946        |                       |              |                       |              |
| 5000.0             | 48.3                  | 5.009        |                       |              |                       |              |
| 5050.0             | 48.2                  | 5.065        |                       |              |                       |              |
| 5100.0             | 48.0                  | 5.129        |                       |              |                       |              |
| 5150.0             | 48.0                  | 5.190        |                       |              |                       |              |
| 5200.0             | 47.8                  | 5.246        |                       |              |                       |              |
| 5250.0             | 47.7                  | 5.309        |                       |              |                       |              |
| 5300.0             | 47.6                  | 5.368        |                       |              |                       |              |
| 5350.0             | 47.5                  | 5.431        |                       |              |                       |              |
| 5400.0             | 47.4                  | 5.500        |                       |              |                       |              |
| 5450.0             | 47.3                  | 5.572        |                       |              |                       |              |
| 5500.0             | 47.3                  | 5.636        |                       |              |                       |              |
| 5550.0             | 47.2                  | 5.704        |                       |              |                       |              |
| 5600.0             | 47.1                  | 5.774        |                       |              |                       |              |
| 5650.0             | 47.0                  | 5.846        |                       |              |                       |              |
| 5700.0             | 46.9                  | 5.917        |                       |              |                       |              |
| 5750.0             | 46.8                  | 5.975        |                       |              |                       |              |
| 5800.0             | 46.7                  | 6.054        |                       |              |                       |              |
| 5850.0             | 46.6                  | 6.124        |                       |              |                       |              |
| 5900.0             | 46.6                  | 6.203        |                       |              |                       |              |

NORTHWEST

EMC

Tissue - Equivalent Liquid

SAR 2011.02.21

|                                             |      |                                                                                             |                   |
|---------------------------------------------|------|---------------------------------------------------------------------------------------------|-------------------|
| EUT: MSL501                                 |      | Work Order: ITRM0248                                                                        |                   |
| Serial Number: SAV                          |      | Date: 07/29/2011                                                                            |                   |
| Customer: Intermec Technologies Corporation |      | Temperature (°C): 20.9                                                                      |                   |
| Attendees: None                             |      | Humidity: 52.5                                                                              |                   |
| Project: ITRM0227                           |      | Barometric Pres. (mb): 1019.2                                                               |                   |
| 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: MSL501                              |      | Liquid Temperature (°C): 21.8                                                               |                   |

| Frequency<br>(GHz) | Actual Values         |              | Target Values         |              | Deviation (%)         |              |
|--------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|
|                    | Relative Permittivity | Conductivity | Relative Permittivity | Conductivity | Relative Permittivity | Conductivity |
| 5800               | 46.079                | 6.057        | 48.200                | 6.000        | 4.40                  | -0.95        |
| 3400.0             | 49.9                  | 3.146        |                       |              |                       |              |
| 3500.0             | 49.9                  | 3.249        |                       |              |                       |              |
| 3600.0             | 49.8                  | 3.364        |                       |              |                       |              |
| 3700.0             | 49.8                  | 3.457        |                       |              |                       |              |
| 3800.0             | 49.6                  | 3.547        |                       |              |                       |              |
| 3900.0             | 49.4                  | 3.638        |                       |              |                       |              |
| 4000.0             | 49.2                  | 3.746        |                       |              |                       |              |
| 4100.0             | 48.9                  | 3.867        |                       |              |                       |              |
| 4200.0             | 48.8                  | 4.010        |                       |              |                       |              |
| 4300.0             | 48.6                  | 4.140        |                       |              |                       |              |
| 4400.0             | 48.5                  | 4.273        |                       |              |                       |              |
| 4500.0             | 48.5                  | 4.409        |                       |              |                       |              |
| 4600.0             | 48.3                  | 4.532        |                       |              |                       |              |
| 4700.0             | 48.2                  | 4.660        |                       |              |                       |              |
| 4800.0             | 48.0                  | 4.819        |                       |              |                       |              |
| 4850.0             | 48.0                  | 4.867        |                       |              |                       |              |
| 4900.0             | 48.0                  | 4.919        |                       |              |                       |              |
| 4950.0             | 47.9                  | 4.998        |                       |              |                       |              |
| 5000.0             | 47.9                  | 5.049        |                       |              |                       |              |
| 5050.0             | 47.8                  | 5.075        |                       |              |                       |              |
| 5100.0             | 47.6                  | 5.146        |                       |              |                       |              |
| 5150.0             | 47.6                  | 5.195        |                       |              |                       |              |
| 5200.0             | 47.4                  | 5.227        |                       |              |                       |              |
| 5250.0             | 47.3                  | 5.294        |                       |              |                       |              |
| 5300.0             | 47.2                  | 5.360        |                       |              |                       |              |
| 5350.0             | 47.0                  | 5.402        |                       |              |                       |              |
| 5400.0             | 46.8                  | 5.486        |                       |              |                       |              |
| 5450.0             | 46.7                  | 5.556        |                       |              |                       |              |
| 5500.0             | 46.7                  | 5.630        |                       |              |                       |              |
| 5550.0             | 46.5                  | 5.699        |                       |              |                       |              |
| 5600.0             | 46.5                  | 5.783        |                       |              |                       |              |
| 5650.0             | 46.4                  | 5.844        |                       |              |                       |              |
| 5700.0             | 46.2                  | 5.927        |                       |              |                       |              |
| 5750.0             | 46.2                  | 5.992        |                       |              |                       |              |
| 5800.0             | 46.1                  | 6.057        |                       |              |                       |              |
| 5850.0             | 45.9                  | 6.144        |                       |              |                       |              |
| 5900.0             | 45.9                  | 6.245        |                       |              |                       |              |

|                                             |      |                                                                                                |  |
|---------------------------------------------|------|------------------------------------------------------------------------------------------------|--|
| NORTHWEST                                   |      | SAR 2011.02.21                                                                                 |  |
| <b>EMC</b>                                  |      | <b>Tissue - Equivalent Liquid</b>                                                              |  |
| EUT: HSL501                                 |      | Work Order: ITRM0248                                                                           |  |
| Serial Number: SAU                          |      | Date: 08/01/2011                                                                               |  |
| Customer: Intermec Technologies Corporation |      | Temperature (°C): 23.3                                                                         |  |
| Attendees: None                             |      | Humidity: 46.8                                                                                 |  |
| Project: ITRM0227                           |      | Barometric Pres. (mb): 1017.1                                                                  |  |
| 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 | <br>Signature |  |
| Tissue: HSL501                              |      | Liquid Temperature (°C): 22.2                                                                  |  |

| Frequency<br>(GHz) | Actual Values         |              | Target Values         |              | Deviation (%)         |              |
|--------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|
|                    | Relative Permittivity | Conductivity | Relative Permittivity | Conductivity | Relative Permittivity | Conductivity |
| 5800               | 35.076                | 5.351        | 35.300                | 5.270        | 0.63                  | -1.54        |
| 3400.0             | 38.5                  | 2.919        |                       |              |                       |              |
| 3450.0             | 38.4                  | 2.955        |                       |              |                       |              |
| 3500.0             | 38.4                  | 2.996        |                       |              |                       |              |
| 3550.0             | 38.4                  | 3.034        |                       |              |                       |              |
| 3600.0             | 38.3                  | 3.070        |                       |              |                       |              |
| 3650.0             | 38.3                  | 3.110        |                       |              |                       |              |
| 3700.0             | 38.3                  | 3.148        |                       |              |                       |              |
| 3750.0             | 38.2                  | 3.181        |                       |              |                       |              |
| 3800.0             | 38.1                  | 3.218        |                       |              |                       |              |
| 3850.0             | 38.1                  | 3.261        |                       |              |                       |              |
| 3900.0             | 38.0                  | 3.301        |                       |              |                       |              |
| 3950.0             | 37.9                  | 3.346        |                       |              |                       |              |
| 4000.0             | 37.9                  | 3.392        |                       |              |                       |              |
| 4050.0             | 37.8                  | 3.441        |                       |              |                       |              |
| 4100.0             | 37.7                  | 3.493        |                       |              |                       |              |
| 4150.0             | 37.6                  | 3.547        |                       |              |                       |              |
| 4200.0             | 37.6                  | 3.603        |                       |              |                       |              |
| 4250.0             | 37.5                  | 3.661        |                       |              |                       |              |
| 4300.0             | 37.5                  | 3.716        |                       |              |                       |              |
| 4350.0             | 37.4                  | 3.770        |                       |              |                       |              |
| 4400.0             | 37.3                  | 3.831        |                       |              |                       |              |
| 4450.0             | 37.3                  | 3.894        |                       |              |                       |              |
| 4500.0             | 37.2                  | 3.944        |                       |              |                       |              |
| 4550.0             | 37.2                  | 3.998        |                       |              |                       |              |
| 4600.0             | 37.1                  | 4.055        |                       |              |                       |              |
| 4650.0             | 37.1                  | 4.105        |                       |              |                       |              |
| 4700.0             | 37.0                  | 4.156        |                       |              |                       |              |
| 4750.0             | 37.0                  | 4.210        |                       |              |                       |              |
| 4800.0             | 36.9                  | 4.259        |                       |              |                       |              |
| 4850.0             | 36.8                  | 4.308        |                       |              |                       |              |
| 4900.0             | 36.7                  | 4.363        |                       |              |                       |              |
| 4950.0             | 36.7                  | 4.414        |                       |              |                       |              |
| 5000.0             | 36.6                  | 4.459        |                       |              |                       |              |
| 5050.0             | 36.5                  | 4.509        |                       |              |                       |              |
| 5100.0             | 36.4                  | 4.563        |                       |              |                       |              |
| 5150.0             | 36.4                  | 4.603        |                       |              |                       |              |
| 5200.0             | 36.3                  | 4.649        |                       |              |                       |              |
| 5250.0             | 36.2                  | 4.700        |                       |              |                       |              |
| 5300.0             | 36.1                  | 4.746        |                       |              |                       |              |
| 5350.0             | 35.9                  | 4.797        |                       |              |                       |              |
| 5400.0             | 35.8                  | 4.857        |                       |              |                       |              |
| 5450.0             | 35.7                  | 4.910        |                       |              |                       |              |
| 5500.0             | 35.6                  | 4.971        |                       |              |                       |              |
| 5550.0             | 35.5                  | 5.036        |                       |              |                       |              |
| 5600.0             | 35.4                  | 5.099        |                       |              |                       |              |
| 5650.0             | 35.3                  | 5.160        |                       |              |                       |              |
| 5700.0             | 35.2                  | 5.228        |                       |              |                       |              |
| 5750.0             | 35.2                  | 5.293        |                       |              |                       |              |
| 5800.0             | 35.1                  | 5.351        |                       |              |                       |              |
| 5850.0             | 35.0                  | 5.418        |                       |              |                       |              |
| 5900.0             | 34.9                  | 5.482        |                       |              |                       |              |

|                                             |      |                                                                                                |  |
|---------------------------------------------|------|------------------------------------------------------------------------------------------------|--|
| NORTHWEST                                   |      | SAR 2011.02.21                                                                                 |  |
| <b>EMC</b>                                  |      | <b>Tissue - Equivalent Liquid</b>                                                              |  |
| EUT: HSL501                                 |      | Work Order: ITRM0248                                                                           |  |
| Serial Number: SAU                          |      | Date: 08/03/2011                                                                               |  |
| Customer: Intermec Technologies Corporation |      | Temperature (°C): 22.3                                                                         |  |
| Attendees: None                             |      | Humidity: 50.5                                                                                 |  |
| Project: ITRM0227                           |      | Barometric Pres. (mb): 1015.8                                                                  |  |
| 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 | <br>Signature |  |
| Tissue: HSL501                              |      | Liquid Temperature (°C): 22                                                                    |  |

| Frequency<br>(GHz) | Actual Values         |              | Target Values         |              | Deviation (%)         |              |
|--------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|
|                    | Relative Permittivity | Conductivity | Relative Permittivity | Conductivity | Relative Permittivity | Conductivity |
| 5800               | 34.796                | 5.428        | 35.300                | 5.270        | 1.43                  | -2.99        |
| 3400.0             | 38.2                  | 2.913        |                       |              |                       |              |
| 3450.0             | 38.2                  | 2.956        |                       |              |                       |              |
| 3500.0             | 38.1                  | 2.998        |                       |              |                       |              |
| 3550.0             | 38.1                  | 3.039        |                       |              |                       |              |
| 3600.0             | 38.0                  | 3.082        |                       |              |                       |              |
| 3650.0             | 38.0                  | 3.125        |                       |              |                       |              |
| 3700.0             | 37.9                  | 3.169        |                       |              |                       |              |
| 3750.0             | 37.9                  | 3.210        |                       |              |                       |              |
| 3800.0             | 37.8                  | 3.253        |                       |              |                       |              |
| 3850.0             | 37.8                  | 3.299        |                       |              |                       |              |
| 3900.0             | 37.7                  | 3.344        |                       |              |                       |              |
| 3950.0             | 37.7                  | 3.391        |                       |              |                       |              |
| 4000.0             | 37.6                  | 3.439        |                       |              |                       |              |
| 4050.0             | 37.6                  | 3.489        |                       |              |                       |              |
| 4100.0             | 37.5                  | 3.540        |                       |              |                       |              |
| 4150.0             | 37.4                  | 3.594        |                       |              |                       |              |
| 4200.0             | 37.4                  | 3.646        |                       |              |                       |              |
| 4250.0             | 37.3                  | 3.698        |                       |              |                       |              |
| 4300.0             | 37.3                  | 3.750        |                       |              |                       |              |
| 4350.0             | 37.2                  | 3.805        |                       |              |                       |              |
| 4400.0             | 37.1                  | 3.860        |                       |              |                       |              |
| 4450.0             | 37.1                  | 3.916        |                       |              |                       |              |
| 4500.0             | 37.0                  | 3.971        |                       |              |                       |              |
| 4550.0             | 36.9                  | 4.024        |                       |              |                       |              |
| 4600.0             | 36.8                  | 4.080        |                       |              |                       |              |
| 4650.0             | 36.8                  | 4.132        |                       |              |                       |              |
| 4700.0             | 36.7                  | 4.188        |                       |              |                       |              |
| 4750.0             | 36.6                  | 4.242        |                       |              |                       |              |
| 4800.0             | 36.5                  | 4.298        |                       |              |                       |              |
| 4850.0             | 36.5                  | 4.356        |                       |              |                       |              |
| 4900.0             | 36.4                  | 4.412        |                       |              |                       |              |
| 4950.0             | 36.3                  | 4.470        |                       |              |                       |              |
| 5000.0             | 36.2                  | 4.527        |                       |              |                       |              |
| 5050.0             | 36.1                  | 4.583        |                       |              |                       |              |
| 5100.0             | 36.0                  | 4.640        |                       |              |                       |              |
| 5150.0             | 36.0                  | 4.695        |                       |              |                       |              |
| 5200.0             | 35.9                  | 4.749        |                       |              |                       |              |
| 5250.0             | 35.8                  | 4.801        |                       |              |                       |              |
| 5300.0             | 35.7                  | 4.855        |                       |              |                       |              |
| 5350.0             | 35.6                  | 4.909        |                       |              |                       |              |
| 5400.0             | 35.5                  | 4.967        |                       |              |                       |              |
| 5450.0             | 35.4                  | 5.022        |                       |              |                       |              |
| 5500.0             | 35.3                  | 5.083        |                       |              |                       |              |
| 5550.0             | 35.2                  | 5.139        |                       |              |                       |              |
| 5600.0             | 35.1                  | 5.194        |                       |              |                       |              |
| 5650.0             | 35.1                  | 5.253        |                       |              |                       |              |
| 5700.0             | 35.0                  | 5.310        |                       |              |                       |              |
| 5750.0             | 34.9                  | 5.369        |                       |              |                       |              |
| 5800.0             | 34.8                  | 5.428        |                       |              |                       |              |
| 5850.0             | 34.7                  | 5.483        |                       |              |                       |              |
| 5900.0             | 34.6                  | 5.539        |                       |              |                       |              |

NORTHWEST

EMC

Tissue - Equivalent Liquid

SAR 2011.02.21

|                                             |      |                                   |                   |
|---------------------------------------------|------|-----------------------------------|-------------------|
| EUT: HSL2450                                |      | Work Order: ITRM0248              |                   |
| Serial Number: SAL                          |      | Date: 08/05/2011                  |                   |
| Customer: Intermec Technologies Corporation |      | Temperature (°C): 23.5            |                   |
| Attendees: None                             |      | Humidity: 48.1                    |                   |
| Project: ITRM0227                           |      | Barometric Pres. (mb): 1018.90    |                   |
| 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 <i>Jennifer Herrett</i> |                   |
| Tissue: HSL2450                             |      | Liquid Temperature (°C): 23.5     |                   |

| Frequency<br>(GHz) | Actual Values            |              | Target Values            |              | Deviation (%)            |              |
|--------------------|--------------------------|--------------|--------------------------|--------------|--------------------------|--------------|
|                    | Relative<br>Permittivity | Conductivity | Relative<br>Permittivity | Conductivity | Relative<br>Permittivity | Conductivity |
| 2450               | 37.705                   | 1.832        | 39.200                   | 1.800        | 3.82                     | -1.77        |
| 1900.0             | 40.0                     | 1.234        |                          |              |                          |              |
| 1925.0             | 39.9                     | 1.259        |                          |              |                          |              |
| 1950.0             | 39.8                     | 1.285        |                          |              |                          |              |
| 1975.0             | 39.7                     | 1.311        |                          |              |                          |              |
| 2000.0             | 39.6                     | 1.338        |                          |              |                          |              |
| 2025.0             | 39.5                     | 1.365        |                          |              |                          |              |
| 2050.0             | 39.3                     | 1.393        |                          |              |                          |              |
| 2075.0             | 39.2                     | 1.421        |                          |              |                          |              |
| 2100.0             | 39.1                     | 1.448        |                          |              |                          |              |
| 2125.0             | 39.0                     | 1.475        |                          |              |                          |              |
| 2150.0             | 38.9                     | 1.503        |                          |              |                          |              |
| 2175.0             | 38.8                     | 1.529        |                          |              |                          |              |
| 2200.0             | 38.7                     | 1.556        |                          |              |                          |              |
| 2225.0             | 38.6                     | 1.582        |                          |              |                          |              |
| 2250.0             | 38.5                     | 1.609        |                          |              |                          |              |
| 2275.0             | 38.4                     | 1.636        |                          |              |                          |              |
| 2300.0             | 38.3                     | 1.664        |                          |              |                          |              |
| 2325.0             | 38.2                     | 1.691        |                          |              |                          |              |
| 2350.0             | 38.1                     | 1.719        |                          |              |                          |              |
| 2375.0             | 38.0                     | 1.747        |                          |              |                          |              |
| 2400.0             | 37.9                     | 1.775        |                          |              |                          |              |
| 2425.0             | 37.8                     | 1.803        |                          |              |                          |              |
| 2450.0             | 37.7                     | 1.832        |                          |              |                          |              |
| 2475.0             | 37.6                     | 1.861        |                          |              |                          |              |
| 2500.0             | 37.5                     | 1.890        |                          |              |                          |              |
| 2525.0             | 37.4                     | 1.920        |                          |              |                          |              |
| 2550.0             | 37.3                     | 1.950        |                          |              |                          |              |
| 2575.0             | 37.2                     | 1.979        |                          |              |                          |              |
| 2600.0             | 37.1                     | 2.009        |                          |              |                          |              |
| 2625.0             | 37.0                     | 2.039        |                          |              |                          |              |
| 2650.0             | 36.9                     | 2.069        |                          |              |                          |              |
| 2675.0             | 36.8                     | 2.098        |                          |              |                          |              |
| 2700.0             | 36.7                     | 2.129        |                          |              |                          |              |

NORTHWEST

EMC

Tissue - Equivalent Liquid

SAR 2011.02.21

|                                             |      |                                                                                             |                   |
|---------------------------------------------|------|---------------------------------------------------------------------------------------------|-------------------|
| EUT: HSL2450                                |      | Work Order: ITRM0248                                                                        |                   |
| Serial Number: SAL                          |      | Date: 08/08/2011                                                                            |                   |
| Customer: Intermec Technologies Corporation |      | Temperature (°C): 23.1                                                                      |                   |
| Attendees: None                             |      | Humidity: 43                                                                                |                   |
| Project: ITRM0227                           |      | Barometric Pres. (mb): 1018.4                                                               |                   |
| 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: HSL2450                             |      | Liquid Temperature (°C): 22                                                                 |                   |

| Frequency<br>(GHz) | Actual Values            |              | Target Values            |              | Deviation (%)            |              |
|--------------------|--------------------------|--------------|--------------------------|--------------|--------------------------|--------------|
|                    | Relative<br>Permittivity | Conductivity | Relative<br>Permittivity | Conductivity | Relative<br>Permittivity | Conductivity |
| 2450               | 38.404                   | 1.886        | 39.200                   | 1.800        | 2.03                     | -4.79        |
| 1900.0             | 40.6                     | 1.268        |                          |              |                          |              |
| 1925.0             | 40.5                     | 1.292        |                          |              |                          |              |
| 1950.0             | 40.4                     | 1.318        |                          |              |                          |              |
| 1975.0             | 40.3                     | 1.346        |                          |              |                          |              |
| 2000.0             | 40.2                     | 1.374        |                          |              |                          |              |
| 2025.0             | 40.1                     | 1.404        |                          |              |                          |              |
| 2050.0             | 40.0                     | 1.434        |                          |              |                          |              |
| 2075.0             | 39.9                     | 1.463        |                          |              |                          |              |
| 2100.0             | 39.8                     | 1.490        |                          |              |                          |              |
| 2125.0             | 39.7                     | 1.517        |                          |              |                          |              |
| 2150.0             | 39.6                     | 1.544        |                          |              |                          |              |
| 2175.0             | 39.5                     | 1.572        |                          |              |                          |              |
| 2200.0             | 39.4                     | 1.600        |                          |              |                          |              |
| 2225.0             | 39.3                     | 1.627        |                          |              |                          |              |
| 2250.0             | 39.2                     | 1.655        |                          |              |                          |              |
| 2275.0             | 39.1                     | 1.684        |                          |              |                          |              |
| 2300.0             | 39.0                     | 1.712        |                          |              |                          |              |
| 2325.0             | 38.9                     | 1.740        |                          |              |                          |              |
| 2350.0             | 38.8                     | 1.768        |                          |              |                          |              |
| 2375.0             | 38.7                     | 1.798        |                          |              |                          |              |
| 2400.0             | 38.6                     | 1.827        |                          |              |                          |              |
| 2425.0             | 38.5                     | 1.856        |                          |              |                          |              |
| 2450.0             | 38.4                     | 1.886        |                          |              |                          |              |
| 2475.0             | 38.3                     | 1.915        |                          |              |                          |              |
| 2500.0             | 38.2                     | 1.944        |                          |              |                          |              |
| 2525.0             | 38.1                     | 1.973        |                          |              |                          |              |
| 2550.0             | 38.0                     | 2.004        |                          |              |                          |              |
| 2575.0             | 37.9                     | 2.034        |                          |              |                          |              |
| 2600.0             | 37.8                     | 2.063        |                          |              |                          |              |
| 2625.0             | 37.7                     | 2.094        |                          |              |                          |              |
| 2650.0             | 37.6                     | 2.124        |                          |              |                          |              |
| 2675.0             | 37.5                     | 2.154        |                          |              |                          |              |
| 2700.0             | 37.4                     | 2.185        |                          |              |                          |              |

**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**

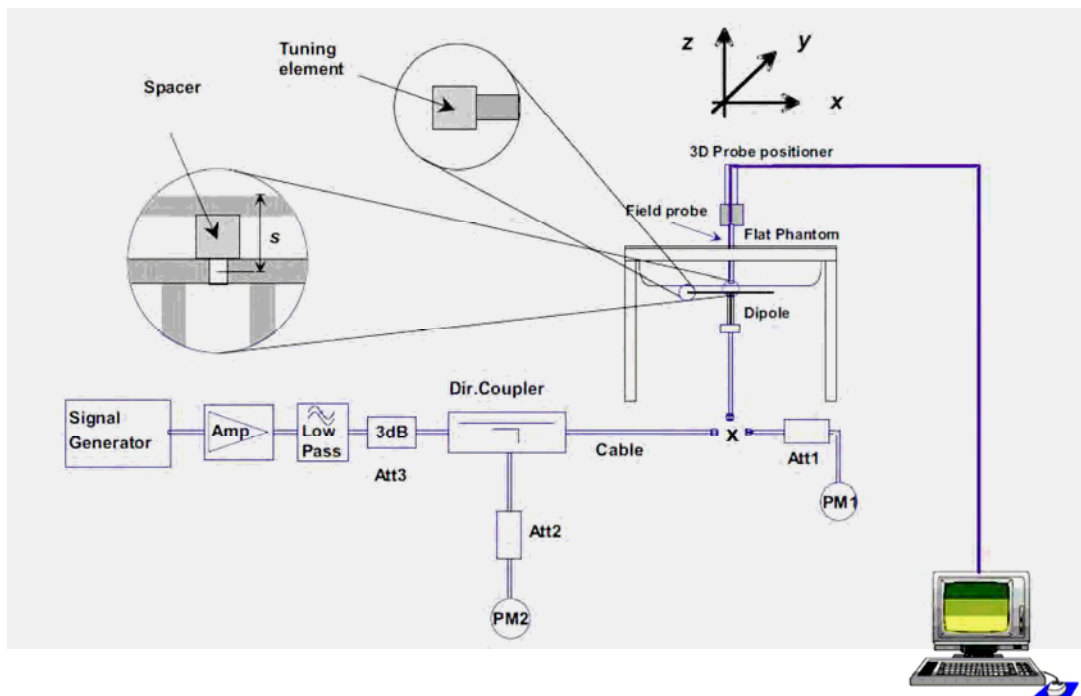
Within 24 hours of a measurement, Northwest EMC used the system validation kit (calibrated reference dipole) to test whether the system was operating within its specifications. The validation was performed in the indicated bands by making SAR measurements of the reference dipole with the phantom filled 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                    |                 |
| <b>EMC</b>                           |                                   | <b>System Verification</b>        |                 |
| EUT:                                 | System Verifications              | Work Order:                       | ITRM0248        |
| Serial Number:                       | Various                           | Date:                             | See Data Sheets |
| Customer:                            | Intermec Technologies Corporation | Temperature:                      | See Data Sheets |
| Attendees:                           | None                              | Humidity:                         | See Data Sheets |
| Project:                             | ITRM0227                          | Barometric Pres.:                 | See Data Sheets |
| Tested by:                           | Jennifer Herrett                  | Job Site:                         | EV08            |
| <b>TEST SPECIFICATIONS</b>           |                                   | <b>Test Method</b>                |                 |
| FCC 2.1093:2011                      |                                   | FCC OET 65C:2001                  |                 |
| FCC 15.247:2011                      |                                   | IEEE Std 1528:2003                |                 |
| FCC 15.407:2001                      |                                   | FCC KDB 447498 D01 v04            |                 |
|                                      |                                   | FCC KDB 248227 D01 V01r02         |                 |
|                                      |                                   | FCC KDB 648474 D01 V01r05         |                 |
|                                      |                                   | FCC 865664                        |                 |
| Health Safety Code 6:2009            |                                   | RSS-102, Issue 4:2010             |                 |
| <b>COMMENTS</b>                      |                                   |                                   |                 |
| None                                 |                                   |                                   |                 |
| <b>DEVIATIONS FROM TEST STANDARD</b> |                                   |                                   |                 |
| No Deviations                        |                                   |                                   |                 |
| Configuration #                      | None                              | Signature <i>Jennifer Herrett</i> |                 |

| Date      | Liquid part number and frequency | Conducted Power into the Dipole (dBm) | Correction Factor | 1g Measured | 10g Measured | 1g Normalized to 1W | 10g Normalized to 1W | Target 1g (Normalized to 1W) - Get from Dipole cal cert | Target 10g (Normalized to 1W) - Get from Dipole cal cert | % difference 1g | % difference 10 g | Comments |
|-----------|----------------------------------|---------------------------------------|-------------------|-------------|--------------|---------------------|----------------------|---------------------------------------------------------|----------------------------------------------------------|-----------------|-------------------|----------|
| 7/27/2011 | MSL501 5500MHz                   | 19.19                                 | 12.05             | 6.68        | 1.89         | 80.50               | 22.78                | 89.30                                                   | 25.00                                                    | -9.86           | -8.90             |          |
| 7/28/2011 | MSL501 5800MHz                   | 18.32                                 | 14.72             | 4.64        | 1.31         | 68.32               | 19.29                | 75.60                                                   | 20.70                                                    | -9.64           | -6.82             |          |
| 7/29/2011 | MSL501 5200MHz                   | 19.65                                 | 10.84             | 6.93        | 1.98         | 75.12               | 21.46                | 78.10                                                   | 21.60                                                    | -3.82           | -0.64             |          |
| 8/3/2011  | HSL501 5500MHz                   | 19.36                                 | 11.59             | 7.59        | 2.16         | 87.95               | 25.03                | 89.30                                                   | 25.00                                                    | -1.51           | 0.12              |          |
| 8/3/2011  | HSL501 5800MHz                   | 18.43                                 | 14.35             | 5.86        | 1.68         | 84.12               | 24.12                | 82.90                                                   | 23.30                                                    | 1.47            | 3.50              |          |
| 8/4/2011  | MSL2450 2450MHz                  | 19.97                                 | 10.07             | 4.91        | 2.28         | 49.44               | 22.96                | 51.50                                                   | 23.90                                                    | -4.00           | -3.94             |          |
| 8/5/2011  | HSL2450 2450MHz                  | 19.77                                 | 10.54             | 5.16        | 2.38         | 54.41               | 25.09                | 53.40                                                   | 24.70                                                    | 1.88            | 1.60              |          |

## EMC

## System Verification

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 23.4 | Humidity (%):             | 47.9   | Test Date: | 07/27/11         |
| Liquid Temperature (°C): | 22.1 | Barometric Pressure (mb): | 1019.9 | Tested by: | Jennifer Herrett |

## MSL501 System Checks\_5500MHz 7-27-11b

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

Communication System: CW; Frequency: 5500 MHz

Medium parameters used:  $f = 5500$  MHz;  $\sigma = 5.611$  mho/m;  $\epsilon = 46.622$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $\sigma = 5.61067$  mho/m,  $\epsilon = 46.6218$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.69, 3.69, 3.69); Calibrated: 11/11/2010

Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)

Electronics: DAE4 Sn1237; Calibrated: 11/10/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096

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

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

Maximum value of SAR (interpolated) = 14.869 mW/g

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

Reference Value = 55.715 V/m; Power Drift = -0.28 dB

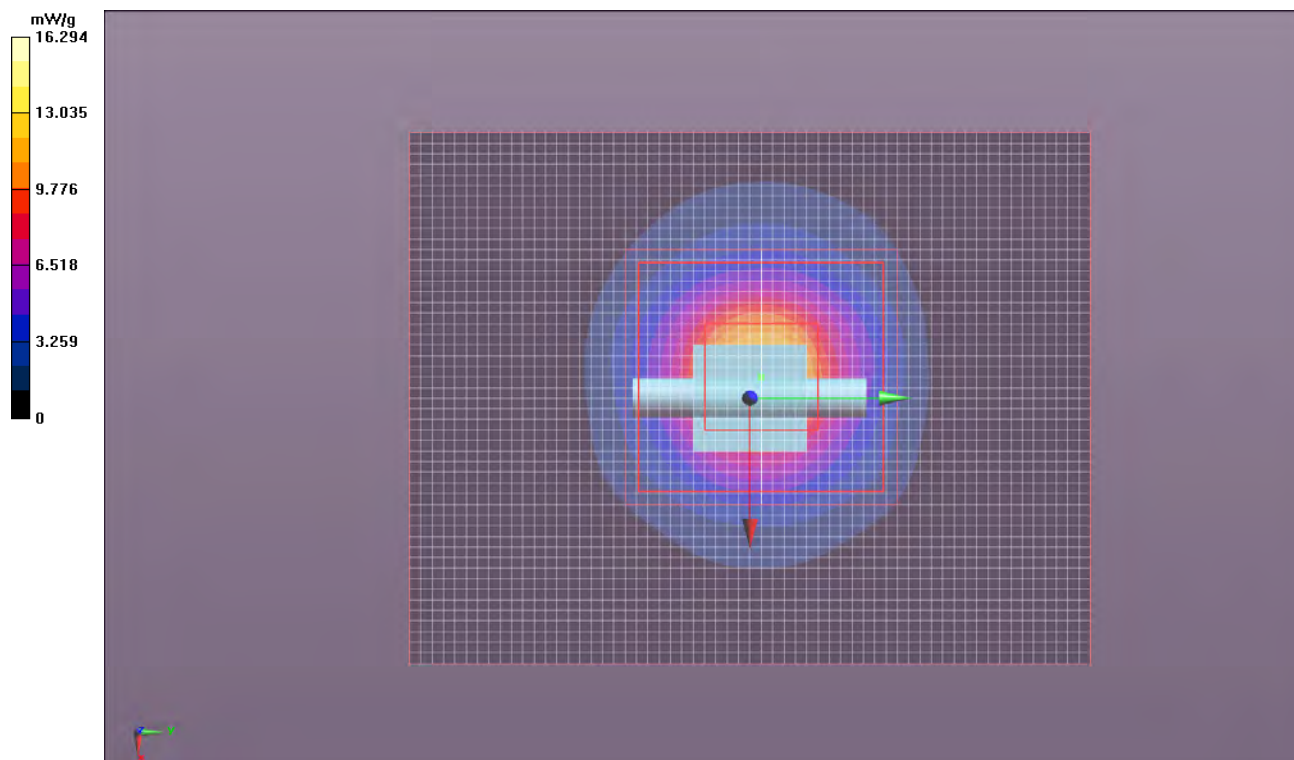
Peak SAR (extrapolated) = 25.977 W/kg

**SAR(1 g) = 6.68 mW/g; SAR(10 g) = 1.89 mW/g**

Maximum value of SAR (measured) = 14.283 mW/g

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

Maximum value of Total (measured) = 53.890 V/m



## EMC

## System Verification

|                          |      |                           |        |            |                                       |
|--------------------------|------|---------------------------|--------|------------|---------------------------------------|
| Room Temperature (°C):   | 23.6 | Humidity (%):             | 43.6   | Test Date: | 07/27/11                              |
| Liquid Temperature (°C): | 22.2 | Barometric Pressure (mb): | 1021.6 | Tested by: | Jennifer Herrett and Ethan Schoonover |

## MSL501 System Checks\_5800MHz 7-28-11b

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

Communication System: CW; Frequency: 5800 MHz

Medium parameters used:  $f = 5800$  MHz;  $\sigma = 6.054$  mho/m;  $\epsilon = 46.685$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $\sigma = 6.05394$  mho/m,  $\epsilon = 46.6849$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.87, 3.87, 3.87); Calibrated: 11/11/2010

Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)

Electronics: DAE4 Sn1237; Calibrated: 11/10/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096

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

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

Maximum value of SAR (interpolated) = 10.275 mW/g

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

Maximum value of Total (measured) = 36.222 V/m

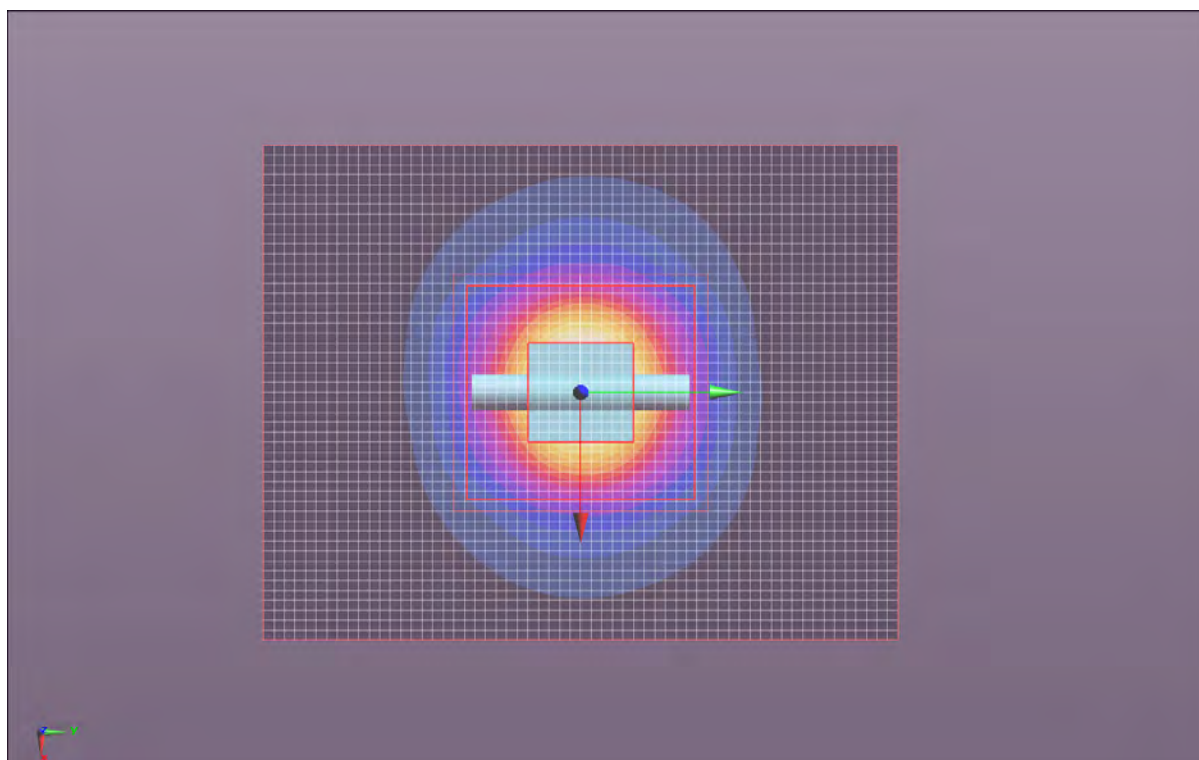
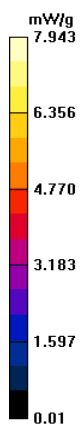
**System Check/System Check - High Channel/Zoom Scan (7x9x7) (7x7x9)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 36.652 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 19.395 W/kg

**SAR(1 g) = 4.64 mW/g; SAR(10 g) = 1.31 mW/g**

Maximum value of SAR (measured) = 9.994 mW/g



## EMC

## System Verification

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 23.3 | Humidity (%):             | 50.5   | Test Date: | 07/29/11         |
| Liquid Temperature (°C): | 21.9 | Barometric Pressure (mb): | 1018.5 | Tested by: | Ethan Schoonover |

## MSL501 System Checks\_5200MHz 7-29-11

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

Communication System: CW; Frequency: 5200 MHz

Medium parameters used:  $f = 5200$  MHz;  $\sigma = 5.245$  mho/m;  $\epsilon = 47.849$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $\sigma = 5.24548$  mho/m,  $\epsilon = 47.8493$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.16, 4.16, 4.16); Calibrated: 11/11/2010

Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)

Electronics: DAE4 Sn1237; Calibrated: 11/10/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096

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

**System Check/System Check - Low Channel/Zoom Scan (7x9x7) (8x8x9)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 55.349 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 26.264 W/kg

**SAR(1 g) = 6.93 mW/g; SAR(10 g) = 1.98 mW/g**

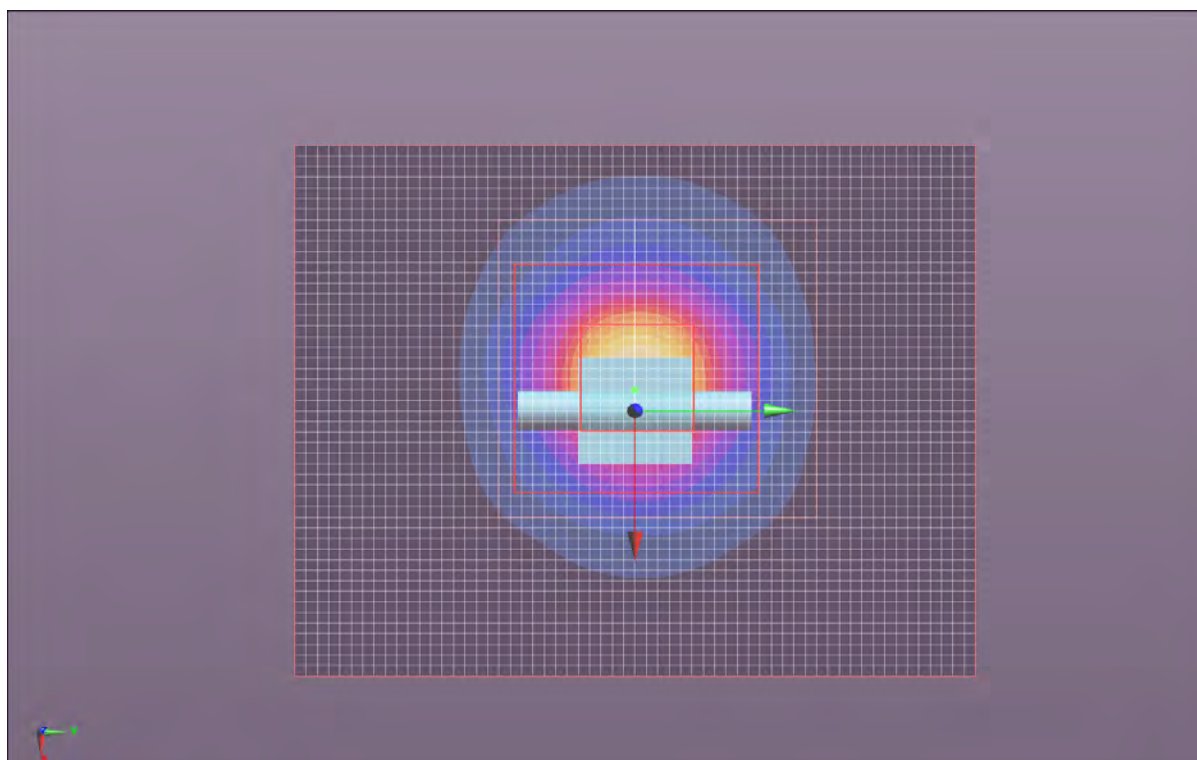
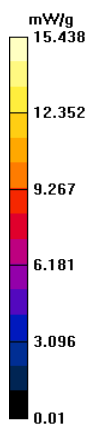
Maximum value of SAR (measured) = 14.420 mW/g

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

Maximum value of SAR (interpolated) = 15.055 mW/g

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

Maximum value of Total (measured) = 54.250 V/m



**EMC****System Verification**

|                          |      |                           |      |            |                  |
|--------------------------|------|---------------------------|------|------------|------------------|
| Room Temperature (°C):   | 23.4 | Humidity (%):             | 48.5 | Test Date: | 08/02/11         |
| Liquid Temperature (°C): | 21   | Barometric Pressure (mb): | 1017 | Tested by: | Jennifer Herrett |

**HSL501 System Checks\_5200MHz 8-2-11**

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

Communication System: CW; Frequency: 5200 MHz

Medium parameters used:  $\sigma = 4.64872$  mho/m,  $\epsilon = 36.266$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $f = 5200$  MHz;  $\sigma = 4.649$  mho/m;  $\epsilon = 36.266$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(5.08, 5.08, 5.08); Calibrated: 11/11/2010

Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1237; Calibrated: 11/10/2010

Phantom: SAM with CRP; Type: SAM; Serial: 1598

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

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

Maximum value of Total (measured) = 67.547 V/m

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

Reference Value = 58.797 V/m; Power Drift = -0.10 dB

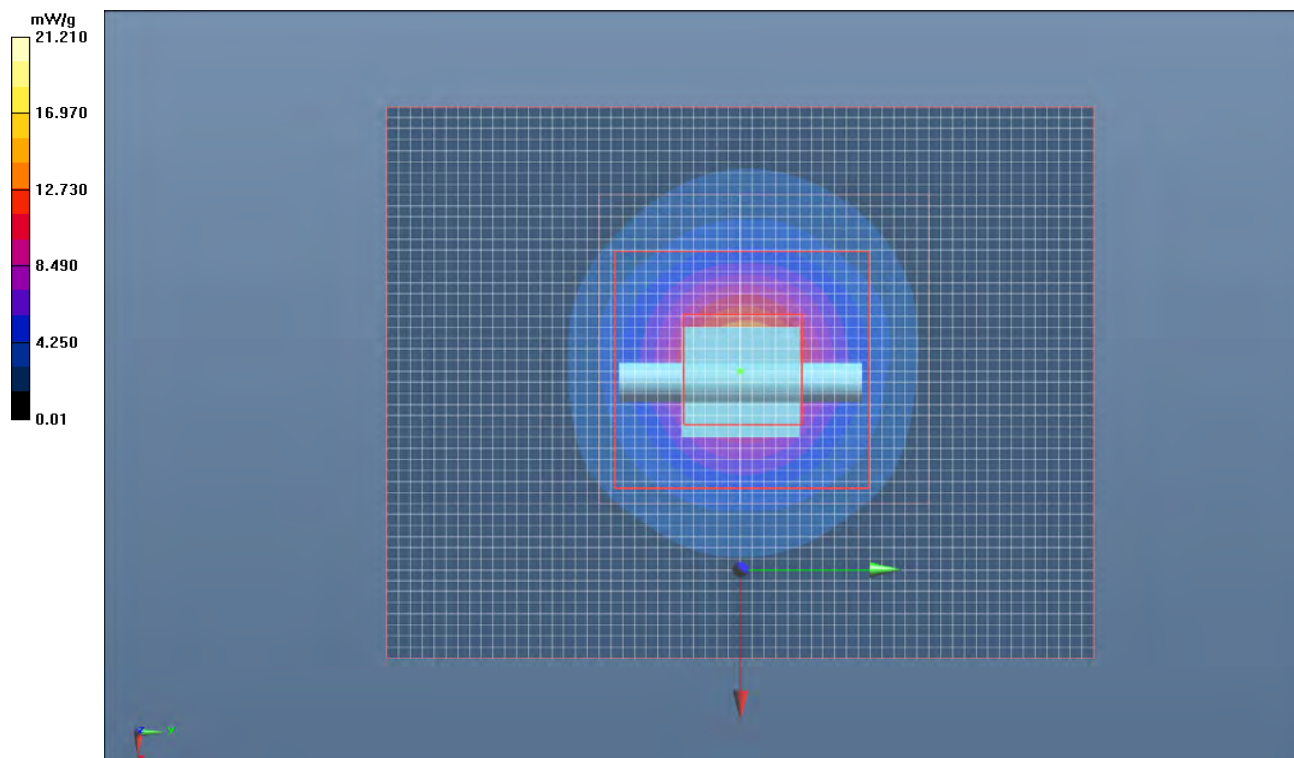
Peak SAR (extrapolated) = 31.802 W/kg

**SAR(1 g) = 7.34 mW/g; SAR(10 g) = 2.1 mW/g**

Maximum value of SAR (measured) = 15.345 mW/g

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

Maximum value of SAR (interpolated) = 15.697 mW/g



## EMC

## System Verification

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 23.6 | Humidity (%):             | 47.7   | Test Date: | 08/03/11         |
| Liquid Temperature (°C): | 22   | Barometric Pressure (mb): | 1015.8 | Tested by: | Jennifer Herrett |

## HSL501 System Checks\_5500MHz 8-3-11

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

Communication System: CW; Frequency: 5500 MHz

Medium parameters used:  $f = 5500$  MHz;  $\sigma = 4.97$  mho/m;  $\epsilon = 35.61$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $\sigma = 4.97046$  mho/m,  $\epsilon = 35.6104$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASYS Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.37, 4.37, 4.37); Calibrated: 11/11/2010

Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)

Electronics: DAE4 Sn1237; Calibrated: 11/10/2010

Phantom: SAM with CRP; Type: SAM; Serial: 1598

Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

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

Maximum value of SAR (interpolated) = 17.052 mW/g

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

Maximum value of Total (measured) = 70.355 V/m

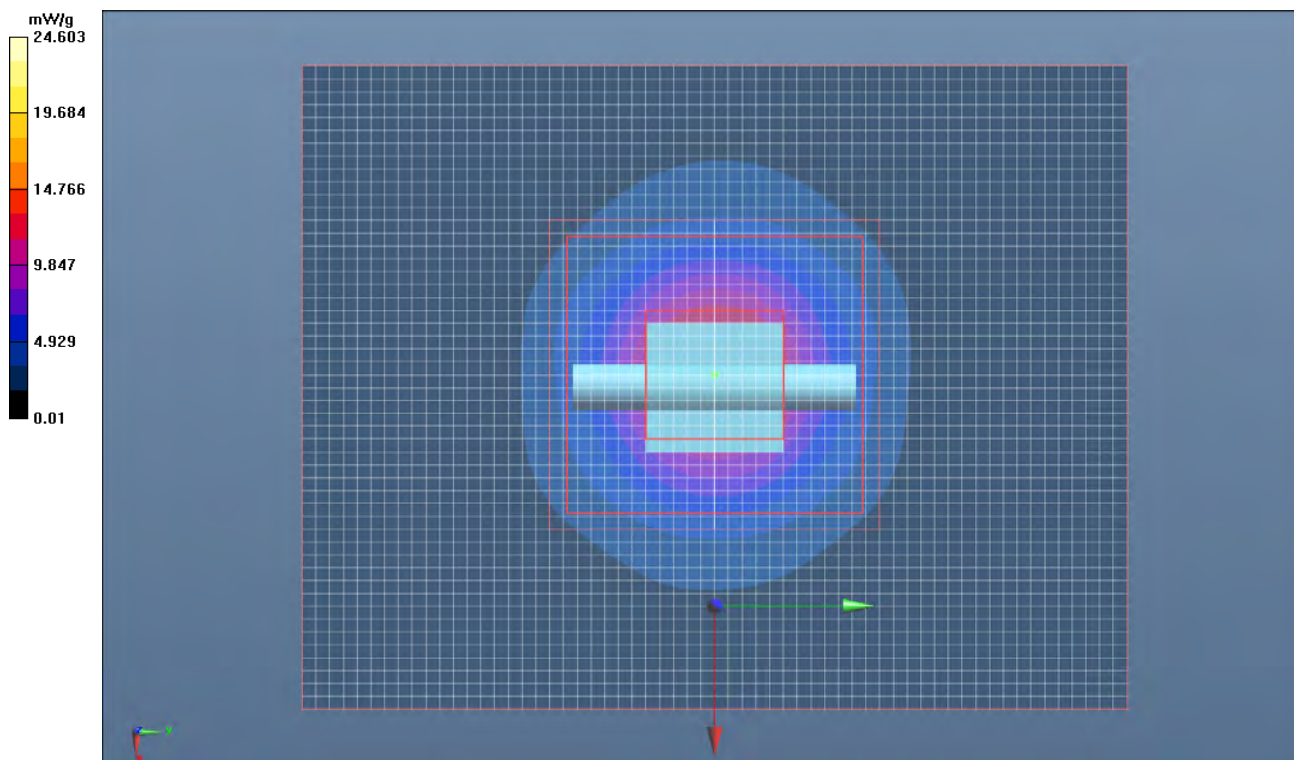
**System Check/System Check - Mid Channel/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 61.580 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 30.931 W/kg

**SAR(1 g) = 7.59 mW/g; SAR(10 g) = 2.16 mW/g**

Maximum value of SAR (measured) = 16.078 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | System Verification       |        |            |                  |  |
| Room Temperature (°C):   | 23.6 | Humidity (%):             | 47.7   | Test Date: | 08/03/11         |  |
| Liquid Temperature (°C): | 22   | Barometric Pressure (mb): | 1015.8 | Tested by: | Jennifer Herrett |  |

HSL501 System Checks\_5800MHz 8-3-11

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

Communication System: CW; Frequency: 5800 MHz  
Medium parameters used:  $\sigma = 5.35086 \text{ mho/m}$ ,  $\epsilon = 35.0764$ ;  $\rho = 1000 \text{ kg/m}^3$  , Medium parameters used:  $f = 5800 \text{ MHz}$ ;  $\sigma = 5.351 \text{ mho/m}$ ;  $\epsilon = 35.076$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

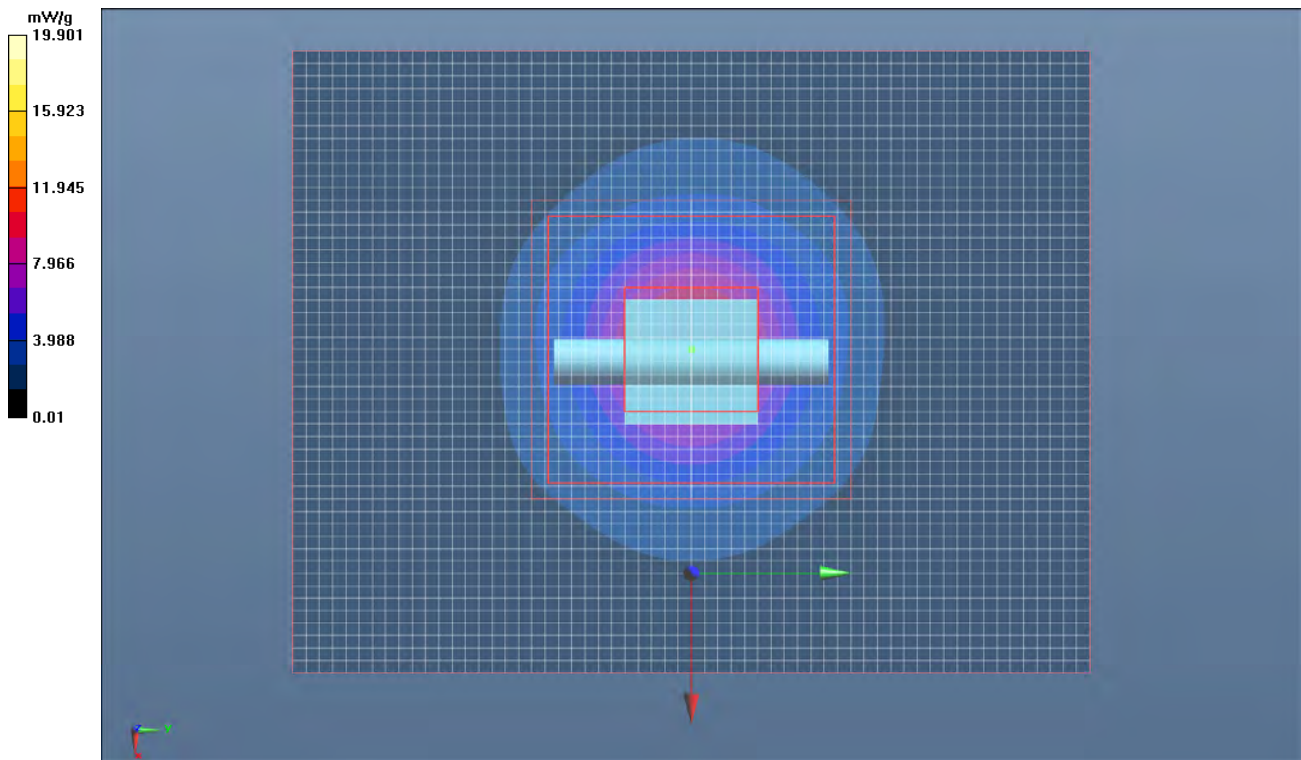
DASY5 Configuration:

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

System Check/System Check - High Channel/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 60.986 V/m

System Check/System Check - High Channel/Area Scan (51x61x1): Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 12.366 mW/g

System Check/System Check - High Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 52.445 V/m; Power Drift = 0.0086 dB  
Peak SAR (extrapolated) = 25.115 W/kg  
SAR(1 g) = 5.86 mW/g; SAR(10 g) = 1.68 mW/g  
Maximum value of SAR (measured) = 12.619 mW/g



## EMC

## System Verification

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 21.8 | Humidity (%):             | 47.2   | Test Date: | 08/04/11         |
| Liquid Temperature (°C): | 21.2 | Barometric Pressure (mb): | 1014.4 | Tested by: | Jennifer Herrett |

## MSL2450 System Check\_2450MHz 8-4-11

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

Communication System: CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.995$  mho/m;  $\epsilon = 50.233$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $\sigma = 1.99534$  mho/m,  $\epsilon = 50.233$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.81, 6.81, 6.81); 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/Area Scan (51x61x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 5.151 mW/g

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

Maximum value of Total (measured) = 61.739 V/m

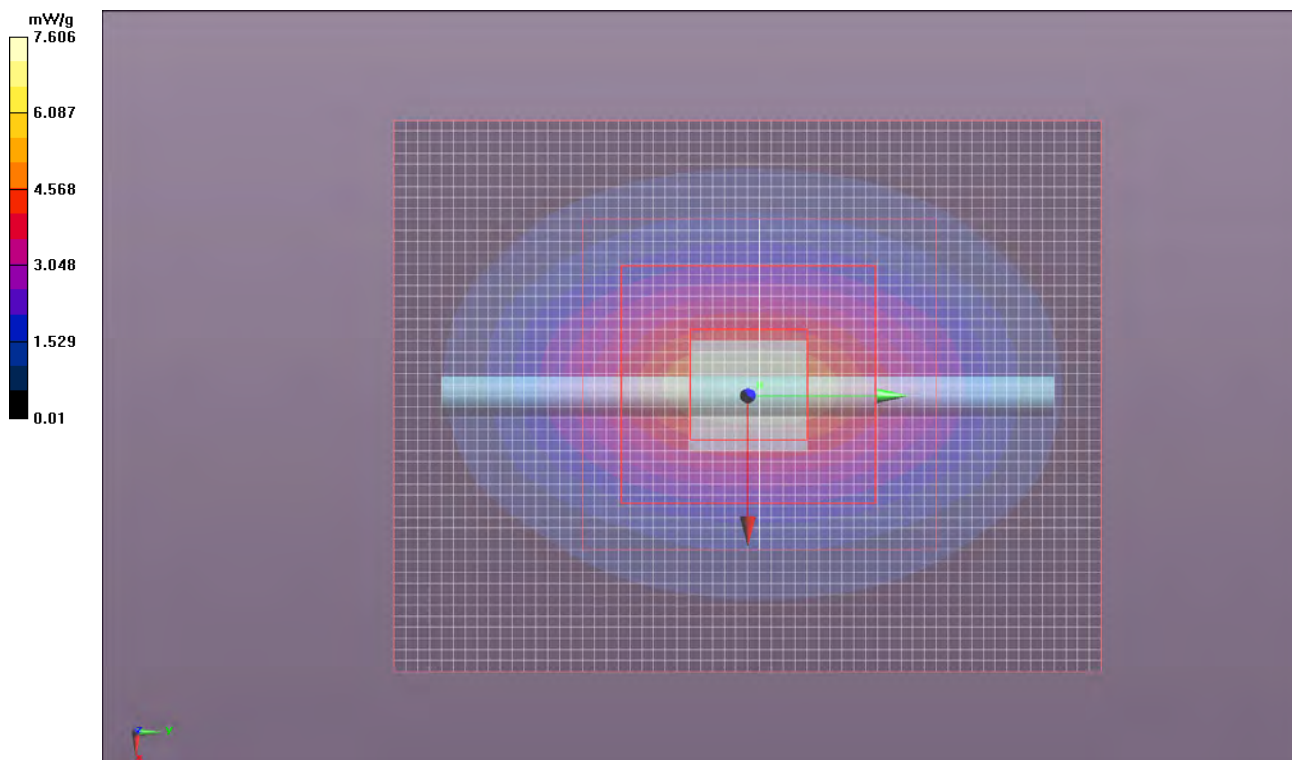
**System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 50.121 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 10.049 W/kg

**SAR(1 g) = 4.91 mW/g; SAR(10 g) = 2.28 mW/g**

Maximum value of SAR (measured) = 4.915 mW/g



## EMC

## System Verification

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 25.2 | Humidity (%):             | 45.6   | Test Date: | 08/05/11         |
| Liquid Temperature (°C): | 23.7 | Barometric Pressure (mb): | 1018.9 | Tested by: | Jennifer Herrett |

## HSL2450 System Check\_2450MHz 8-5-11

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

Communication System: CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.832$  mho/m;  $\epsilon = 37.705$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $\sigma = 1.83175$  mho/m;  $\epsilon = 37.7045$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.69, 6.69, 6.69); 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/Area Scan (51x61x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 5.232 mW/g

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

Maximum value of Total (measured) = 72.673 V/m

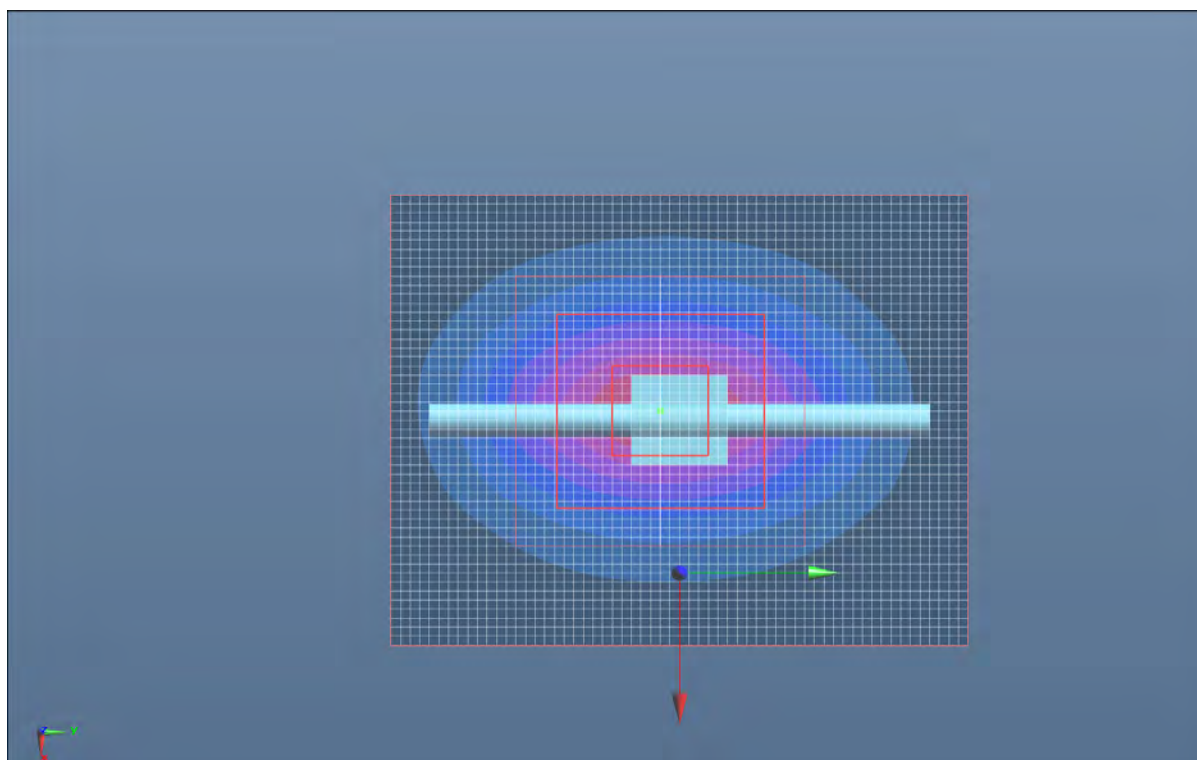
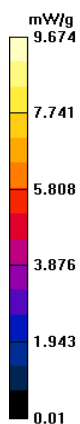
**System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.283 V/m; Power Drift = 0.0097 dB

Peak SAR (extrapolated) = 10.977 W/kg

**SAR(1 g) = 5.16 mW/g; SAR(10 g) = 2.38 mW/g**

Maximum value of SAR (measured) = 5.061 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 body. The only Intermec approved accessory for body worn operation is a holster that contains metal. The EUT can only fit in the holster with the top end of the unit pointing down. The holster cup can be attached to the holster belt with either the keypad facing the user, or the side facing the user. In no case can the back of the EUT face the user. For body worn operation, the keypad side was tested. The holster provides 1.5 cm spacing from the keypad side to the flat phantom.

The 802.11a/b/g/n antenna is on the right side of the EUT. Preliminary testing showed the SAR distribution to be localized to the antenna so for body worn operation, the right side was also tested. The holster provides 1.2 cm spacing from the right side to the flat phantom.

An optional snap-on audio accessory is available. It connects to the bottom end of the unit and provides a standard audio jack for connection of a VR10 headset. Measurements were made with and without the headset. Its contribution to measured SAR was determined to be of no consequence.

The EUT is powered by a lithium-ion battery, Model 1001AB01. It was fully charged before each SAR evaluation.

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

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

### Summary

The following tables summarize the measured SAR values.

| NORTHWEST<br><b>EMC</b>                          |   | <b>SAR TEST DATA</b>              |                                   | SAR 2011.02.07 |  |
|--------------------------------------------------|---|-----------------------------------|-----------------------------------|----------------|--|
| EUT: 1001CP01S                                   |   |                                   | Work Order: ITRM0248              |                |  |
| Serial Number: 28311047275                       |   |                                   | Date: See Data Sheets             |                |  |
| Customer: Intermec Technologies Corporation      |   |                                   | Temperature: See Data Sheets      |                |  |
| Attendees: None                                  |   |                                   | Humidity: See Data Sheets         |                |  |
| Project: None                                    |   |                                   | Barometric Pres.: See Data Sheets |                |  |
| Tested by: Jennifer Herrett and Ethan Schoonover |   |                                   | Job Site: EV08                    |                |  |
| <b>TEST SPECIFICATIONS</b>                       |   |                                   | <b>Test Method</b>                |                |  |
| FCC 2.1093:2011                                  |   |                                   | FCC OET 65C:2001                  |                |  |
| FCC 15.247:2011                                  |   |                                   | IEEE Std 1528:2003                |                |  |
| FCC 15.407:2001                                  |   |                                   | FCC KDB 447498 D01 v04            |                |  |
|                                                  |   |                                   | FCC KDB 248227 D01 V01r02         |                |  |
|                                                  |   |                                   | FCC KDB 648474 D01 V01r05         |                |  |
|                                                  |   |                                   | FCC 865664                        |                |  |
| Health Safety Code 6:2009                        |   |                                   | RSS-102, Issue 4:2010             |                |  |
| <b>COMMENTS</b>                                  |   |                                   |                                   |                |  |
| None                                             |   |                                   |                                   |                |  |
| <b>DEVIATIONS FROM TEST STANDARD</b>             |   |                                   |                                   |                |  |
| No Deviations                                    |   |                                   |                                   |                |  |
| Configuration #                                  | 9 | Signature <i>Jennifer Herrett</i> |                                   |                |  |

| Test Configuration | Frequency Band | Body-Worn Accessory | Transmit Frequency | Transmit Channel | Transmit Mode | Data Rate (Mbps) | Audio Accessory | EUT Position     | Start Power (Conducted) | SAR Drift During Test (dB) | 1g SAR Level | Test # |
|--------------------|----------------|---------------------|--------------------|------------------|---------------|------------------|-----------------|------------------|-------------------------|----------------------------|--------------|--------|
| Head               | 2450           | None                | 2462               | 11               | BPSK          | 1                | None            | Left Head-Cheek  | 17.4                    | 0.28                       | 0.079        | 9      |
|                    |                |                     |                    |                  |               |                  |                 | Left Head-Tilt   | 17.4                    | 0.3                        | 0.045        | 10     |
|                    |                |                     |                    |                  |               |                  |                 | Right Head-Cheek | 17.4                    | 0.27                       | 0.050        | 11     |
|                    |                |                     |                    |                  |               |                  |                 | Right Head-Tilt  | 17.4                    | 0.19                       | 0.047        | 12     |

|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 22.3 | Humidity (%):             | 50.8   | Test Date: | 08/08/11         |  |
| Liquid Temperature (°C): | 21.1 | Barometric Pressure (mb): | 1018.4 | Tested by: | Jennifer Herrett |  |

## Head Test 9 8-8-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 2462 MHz  
Medium parameters used:  $\sigma = 1.82023$  mho/m,  $\epsilon = 39.1635$ ;  $\rho = 1000$  kg/m<sup>3</sup> , Medium parameters used (interpolated): f = 2462 MHz;  $\sigma = 1.835$  mho/m;  $\epsilon = 39.115$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.69, 6.69, 6.69); 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: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head - Left/Cheek/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 5.192 V/m

Head - Left/Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 7.041 V/m; Power Drift = 0.28 dB  
Peak SAR (extrapolated) = 0.153 W/kg  
SAR(1 g) = 0.079 mW/g; SAR(10 g) = 0.039 mW/g

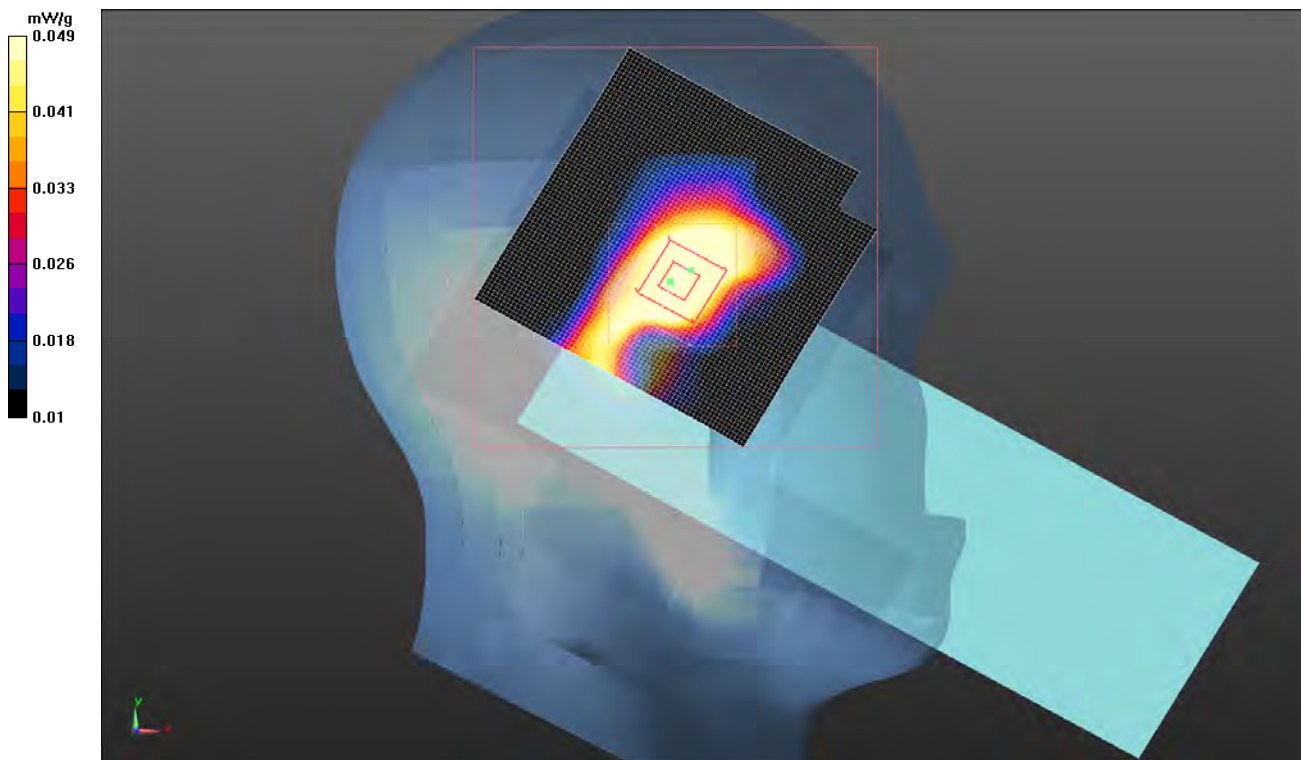
Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (measured) = 0.098 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (interpolated) = 0.062 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (interpolated) = 0.098 mW/g



|                          |      |                           |        |                |                  |
|--------------------------|------|---------------------------|--------|----------------|------------------|
| NORTHWEST                |      |                           |        | SAR 2011.02.07 |                  |
| EMC                      |      | SAR TEST DATA             |        |                |                  |
| Room Temperature (°C):   | 22.3 | Humidity (%):             | 50.8   | Test Date:     | 08/08/11         |
| Liquid Temperature (°C): | 21.1 | Barometric Pressure (mb): | 1018.4 | Tested by:     | Jennifer Herrett |

# Head Test 10 8-8-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 2462 MHz  
Medium parameters used:  $\sigma = 1.82023$  mho/m,  $\epsilon = 39.1635$ ;  $\rho = 1000$  kg/m<sup>3</sup> , Medium parameters used (interpolated): f = 2462 MHz;  $\sigma = 1.835$  mho/m;  $\epsilon = 39.115$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.69, 6.69, 6.69); 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/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 4.063 V/m

Head - Left/Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 5.778 V/m; Power Drift = 0.30 dB  
Peak SAR (extrapolated) = 0.084 W/kg  
**SAR(1 g) = 0.045 mW/g; SAR(10 g) = 0.023 mW/g**

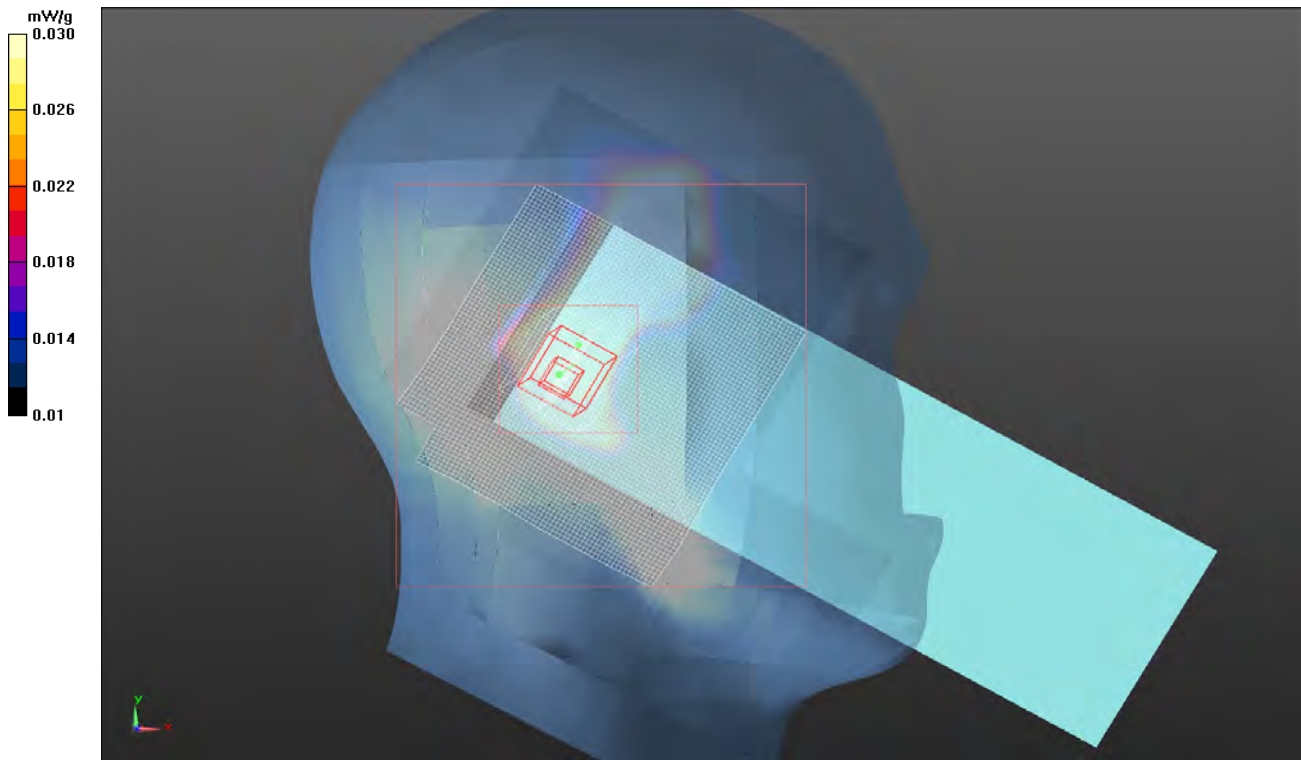
Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (measured) = 0.058 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (interpolated) = 0.098 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (interpolated) = 0.065 mW/g



|                          |      |                           |        |                |                  |
|--------------------------|------|---------------------------|--------|----------------|------------------|
| NORTHWEST                |      |                           |        | SAR 2011.02.07 |                  |
| EMC                      |      | SAR TEST DATA             |        |                |                  |
| Room Temperature (°C):   | 23.3 | Humidity (%):             | 43     | Test Date:     | 08/08/11         |
| Liquid Temperature (°C): | 21   | Barometric Pressure (mb): | 1018.4 | Tested by:     | Jennifer Herrett |

### Head Test 11 8-8-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 2462 MHz  
Medium parameters used (interpolated):  $f = 2462\text{ MHz}$ ;  $\sigma = 1.835\text{ mho/m}$ ;  $\epsilon = 39.115$ ;  $\rho = 1000\text{ kg/m}^3$  , Medium parameters used:  $\sigma = 1.82023\text{ mho/m}$ ,  $\epsilon = 39.1635$ ;  $\rho = 1000\text{ kg/m}^3$   
Phantom section: Right Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.69, 6.69, 6.69); 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: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

**Head - Right/Cheek/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 5.898 V/m; Power Drift = 0.27 dB  
Peak SAR (extrapolated) = 0.086 W/kg  
**SAR(1 g) = 0.050 mW/g; SAR(10 g) = 0.026 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.062 mW/g

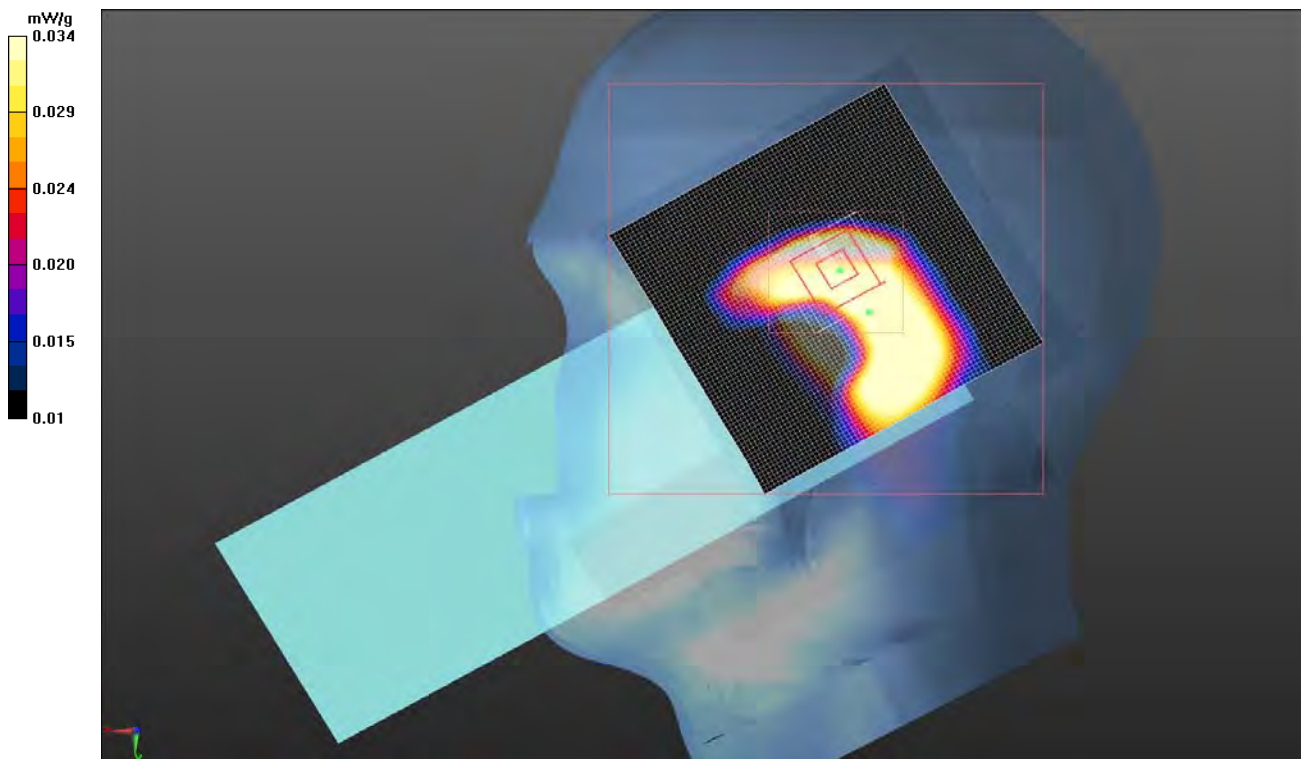
**Head - Right/Cheek/Area scan (71x71x1):** Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.070 mW/g

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

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

**Head - Right/Cheek/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 4.316 V/m



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.3 | Humidity (%):             | 43     | Test Date: | 08/08/11         |  |
| Liquid Temperature (°C): | 21   | Barometric Pressure (mb): | 1018.4 | Tested by: | Jennifer Herrett |  |

### Head Test 12 8-8-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 2462 MHz  
Medium parameters used (interpolated):  $f = 2462\text{ MHz}$ ;  $\sigma = 1.835\text{ mho/m}$ ;  $\epsilon = 39.115$ ;  $\rho = 1000\text{ kg/m}^3$  , Medium parameters used:  $\sigma = 1.82023\text{ mho/m}$ ,  $\epsilon = 39.1635$ ;  $\rho = 1000\text{ kg/m}^3$   
Phantom section: Right Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.69, 6.69, 6.69); 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: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.068 mW/g

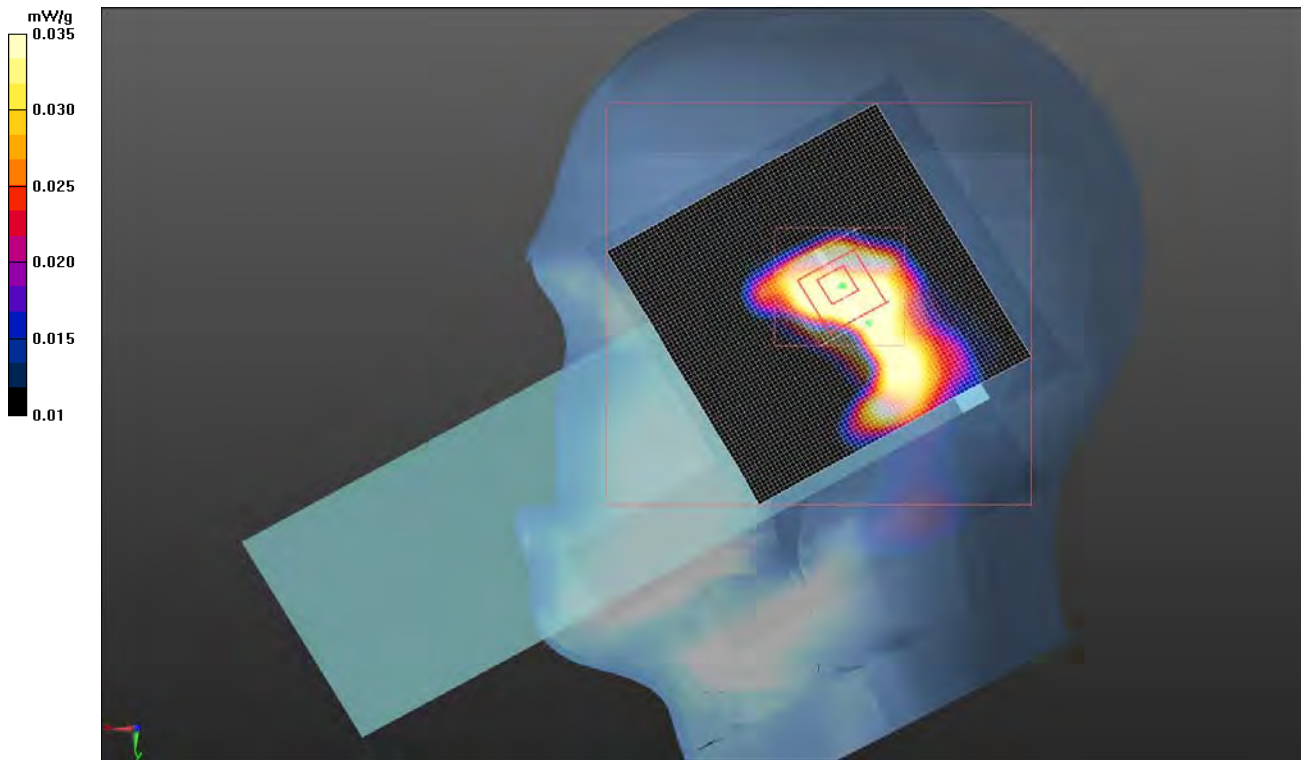
Head - Right/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 4.343 V/m

Head - Right/Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 5.747 V/m; Power Drift = 0.19 dB  
Peak SAR (extrapolated) = 0.082 W/kg  
SAR(1 g) = 0.047 mW/g; SAR(10 g) = 0.024 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.059 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.064 mW/g



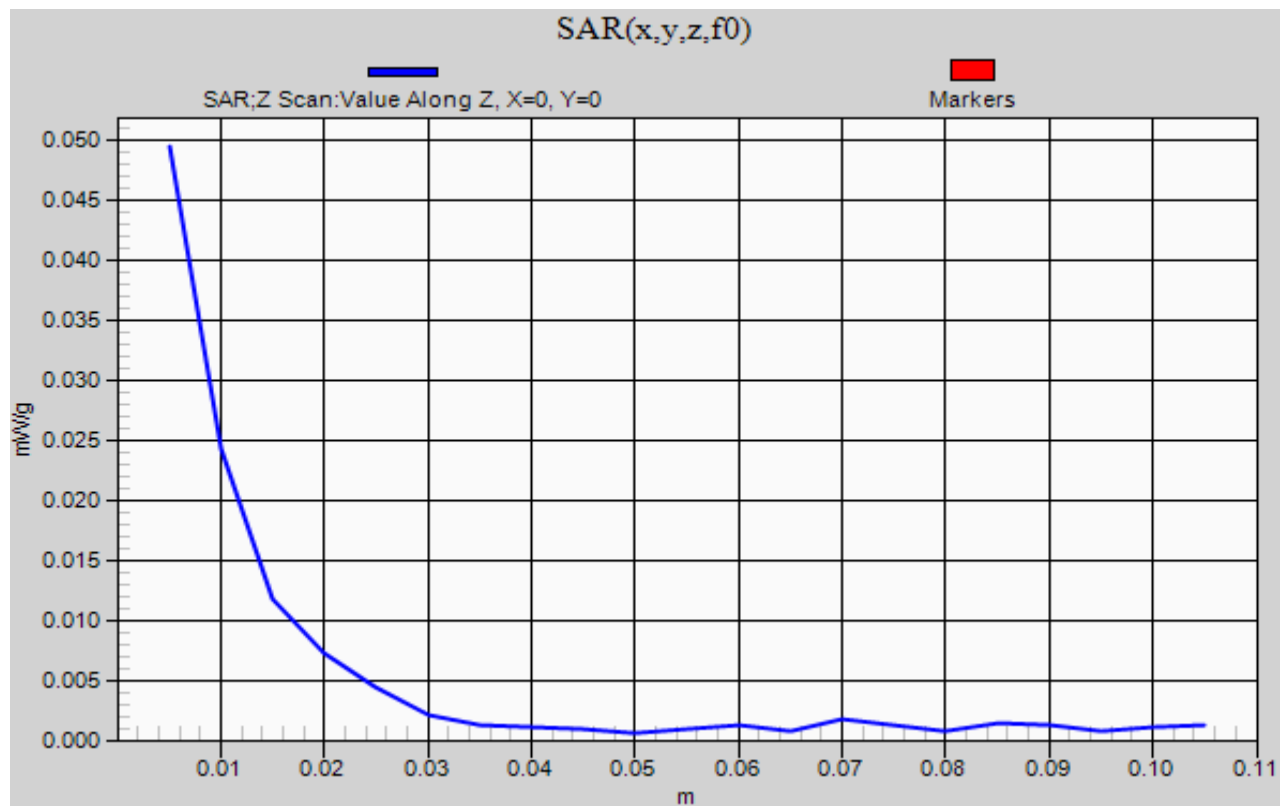
## EMC

## SAR TEST DATA

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 22.3 | Humidity (%):             | 50.8   | Test Date: | 08/08/11         |
| Liquid Temperature (°C): | 21.1 | Barometric Pressure (mb): | 1018.4 | Tested by: | Jennifer Herrett |

## Head Test 9 8-8-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275



| NORTHWEST                                        |       | SAR TEST DATA                                                                               |  | SAR 2011.02.07 |
|--------------------------------------------------|-------|---------------------------------------------------------------------------------------------|--|----------------|
| <b>EMC</b>                                       |       |                                                                                             |  |                |
| EUT: 1001CP01S                                   |       | Work Order: ITRM0248                                                                        |  |                |
| Serial Number: 28311047275                       |       | Date: See Data Sheets                                                                       |  |                |
| Customer: Intermec Technologies Corporation      |       | Temperature: See Data Sheets                                                                |  |                |
| Attendees: None                                  |       | Humidity: See Data Sheets                                                                   |  |                |
| Project: None                                    |       | Barometric Pres.: See Data Sheets                                                           |  |                |
| Tested by: Jennifer Herrett and Ethan Schoonover |       | Job Site: EV08                                                                              |  |                |
| <b>TEST SPECIFICATIONS</b>                       |       | <b>Test Method</b>                                                                          |  |                |
| FCC 2.1093:2011                                  |       | FCC OET 65C:2001                                                                            |  |                |
| FCC 15.247:2011                                  |       | IEEE Std 1528:2003                                                                          |  |                |
| FCC 15.407:2001                                  |       | FCC KDB 447498 D01 v04                                                                      |  |                |
|                                                  |       | FCC KDB 248227 D01 V01r02                                                                   |  |                |
|                                                  |       | FCC KDB 648474 D01 V01r05                                                                   |  |                |
|                                                  |       | FCC 865664                                                                                  |  |                |
| Health Safety Code 6:2009                        |       | RSS-102, Issue 4:2010                                                                       |  |                |
| <b>COMMENTS</b>                                  |       |                                                                                             |  |                |
| None                                             |       |                                                                                             |  |                |
| <b>DEVIATIONS FROM TEST STANDARD</b>             |       |                                                                                             |  |                |
| No Deviations                                    |       |                                                                                             |  |                |
| Configuration #                                  | 7 & 8 | Signature  |  |                |

| Test Configuration | Frequency Band | Body-Worn Accessory | Transmit Frequency | Transmit Channel | Transmit Mode | Data Rate (Mbps) | Audio Accessory | EUT Position | Start Power (Conducted) | SAR Drift During Test (dB) | 1g SAR Level | Test # |
|--------------------|----------------|---------------------|--------------------|------------------|---------------|------------------|-----------------|--------------|-------------------------|----------------------------|--------------|--------|
| Body               | 2450MHz        | Holster             | 2462MHz            | Ch 11            | BPSK          | 1Mbps            | None            | Right        | 17.4                    | -0.03                      | 0.265        | 9      |
|                    |                |                     |                    |                  |               |                  |                 | Front        | 17.4                    | 0.27                       | 0.034        | 10     |
|                    |                |                     |                    |                  |               |                  | VR Headset      | Right        | 17.4                    | 0.04                       | 0.234        | 11     |
|                    |                |                     |                    |                  |               |                  |                 | Front        | 17.4                    | 0.4                        | 0.040        | 12     |

**EMC****SAR TEST DATA**

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 24.4 | Humidity (%):             | 44.6   | Test Date: | 08/03/11         |
| Liquid Temperature (°C): | 22   | Barometric Pressure (mb): | 1013.6 | Tested by: | Ethan Schoonover |

**Head Test 9 8-3-11**

**DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275**

Communication System: CW; Frequency: 2462 MHz

Medium parameters used:  $\sigma = 1.99534$  mho/m,  $\epsilon = 50.233$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used (interpolated):  $f = 2462$  MHz;  $\sigma = 2.011$  mho/m;  $\epsilon = 50.188$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.81, 6.81, 6.81); Calibrated: 11/11/2010

Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1237; Calibrated: 11/10/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096

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

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

Maximum value of Total (measured) = 9.527 V/m

**Body/Body/Reference scan (51x101x1):** Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 0.209 mW/g

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

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

Maximum value of SAR (interpolated) = 0.309 mW/g

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

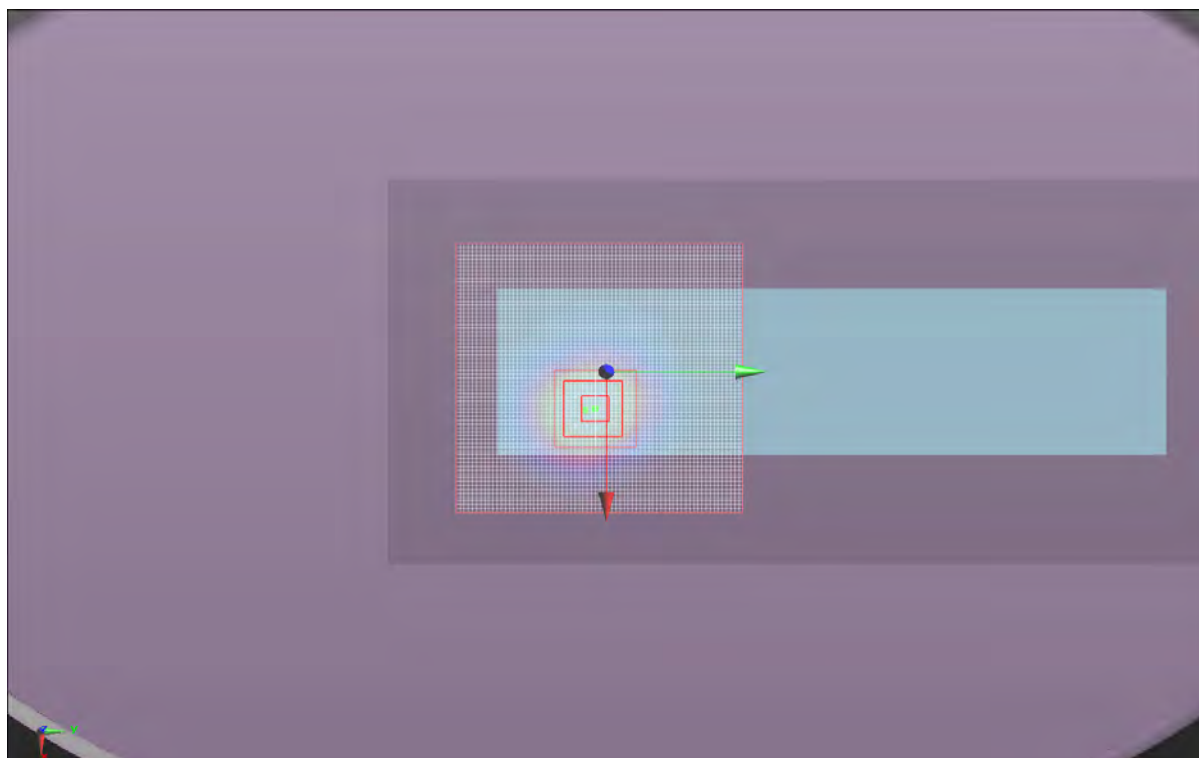
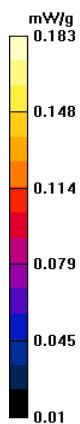
Reference Value = 11.301 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.506 W/kg

**SAR(1 g) = 0.265 mW/g; SAR(10 g) = 0.131 mW/g**

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

Maximum value of SAR (measured) = 0.340 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 24.7 | Humidity (%):             | 44     | Test Date: | 08/03/11         |  |
| Liquid Temperature (°C): | 22.3 | Barometric Pressure (mb): | 1013.6 | Tested by: | Ethan Schoonover |  |

Head Test 10 8-3-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 2462 MHz  
Medium parameters used:  $\sigma = 1.99534$  mho/m,  $\epsilon = 50.233$ ;  $\rho = 1000$  kg/m<sup>3</sup> , Medium parameters used (interpolated):  $f = 2462$  MHz;  $\sigma = 2.011$  mho/m;  $\epsilon = 50.188$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.81, 6.81, 6.81); Calibrated: 11/11/2010  
Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 3mm (Mechanical Surface Detection)  
Electronics: DAE4 Sn1237; Calibrated: 11/10/2010  
Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096  
Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 3.490 V/m

Body/Body/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm

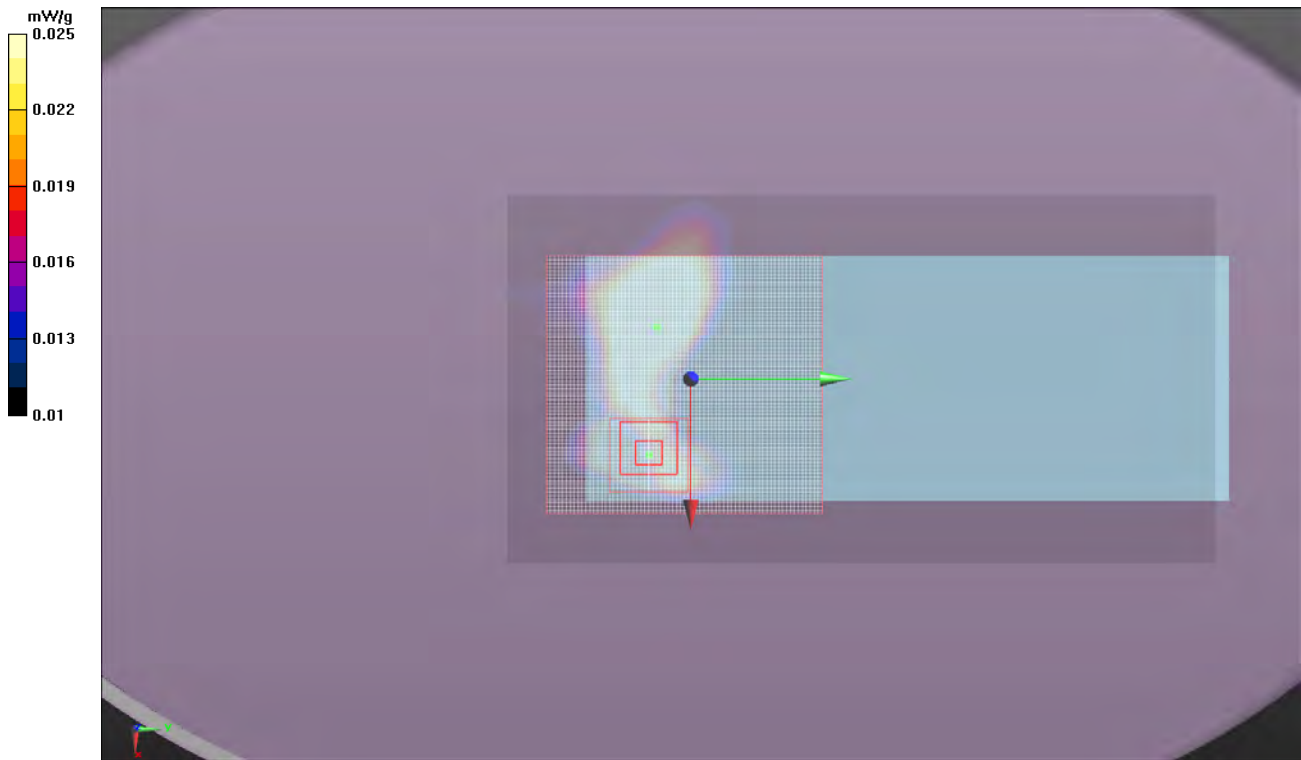
Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.042 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.051 mW/g

Body/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 4.762 V/m; Power Drift = 0.27 dB  
Peak SAR (extrapolated) = 0.059 W/kg  
SAR(1 g) = 0.034 mW/g; SAR(10 g) = 0.019 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.042 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 22.8 | Humidity (%):             | 50.3   | Test Date: | 08/04/11         |  |
| Liquid Temperature (°C): | 21.9 | Barometric Pressure (mb): | 1014.4 | Tested by: | Jennifer Herrett |  |

Body Test 11 8-4-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 2462 MHz  
Medium parameters used:  $\sigma = 1.99534$  mho/m,  $\epsilon = 50.233$ ;  $\rho = 1000$  kg/m<sup>3</sup> , Medium parameters used (interpolated):  $f = 2462$  MHz;  $\sigma = 2.011$  mho/m;  $\epsilon = 50.188$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.81, 6.81, 6.81); Calibrated: 11/11/2010  
Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 3mm (Mechanical Surface Detection)  
Electronics: DAE4 Sn1237; Calibrated: 11/10/2010  
Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096  
Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 9.050 V/m

Body/Body/Reference scan (51x101x1): Measurement grid: dx=30mm, dy=30mm

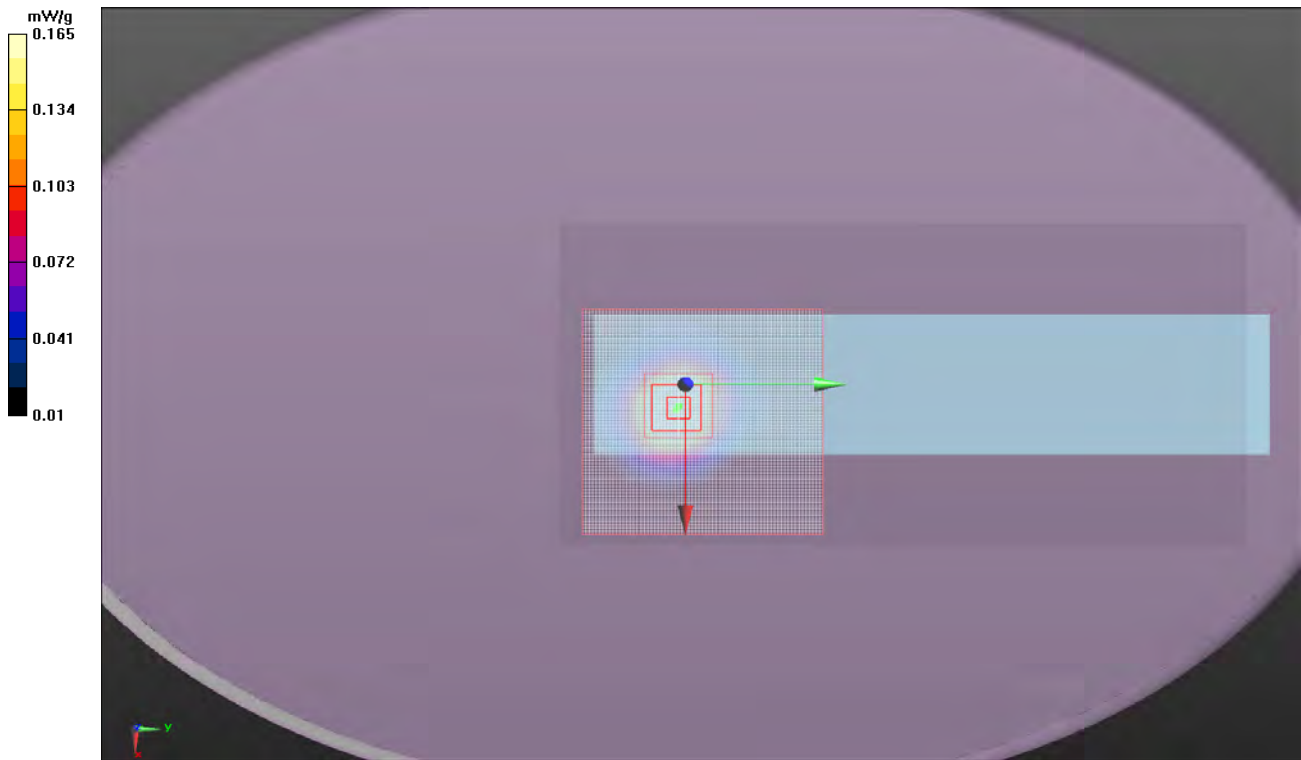
Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.255 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.314 mW/g

Body/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 12.346 V/m; Power Drift = 0.04 dB  
Peak SAR (extrapolated) = 0.438 W/kg  
SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.119 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.295 mW/g



## EMC

## SAR TEST DATA

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 22.8 | Humidity (%):             | 50.3   | Test Date: | 08/04/11         |
| Liquid Temperature (°C): | 21.9 | Barometric Pressure (mb): | 1014.4 | Tested by: | Jennifer Herrett |

## Body Test 12 8-4-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 2462 MHz

Medium parameters used:  $\sigma = 1.99534$  mho/m,  $\epsilon = 50.233$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used (interpolated):  $f = 2462$  MHz;  $\sigma = 2.011$  mho/m;  $\epsilon = 50.188$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(6.81, 6.81, 6.81); Calibrated: 11/11/2010

Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1237; Calibrated: 11/10/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096

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

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

Maximum value of Total (measured) = 3.750 V/m

**Body/Body/Reference scan (51x101x1):** Measurement grid: dx=30mm, dy=30mm

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

Maximum value of SAR (interpolated) = 0.045 mW/g

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

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

Maximum value of SAR (interpolated) = 0.048 mW/g

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

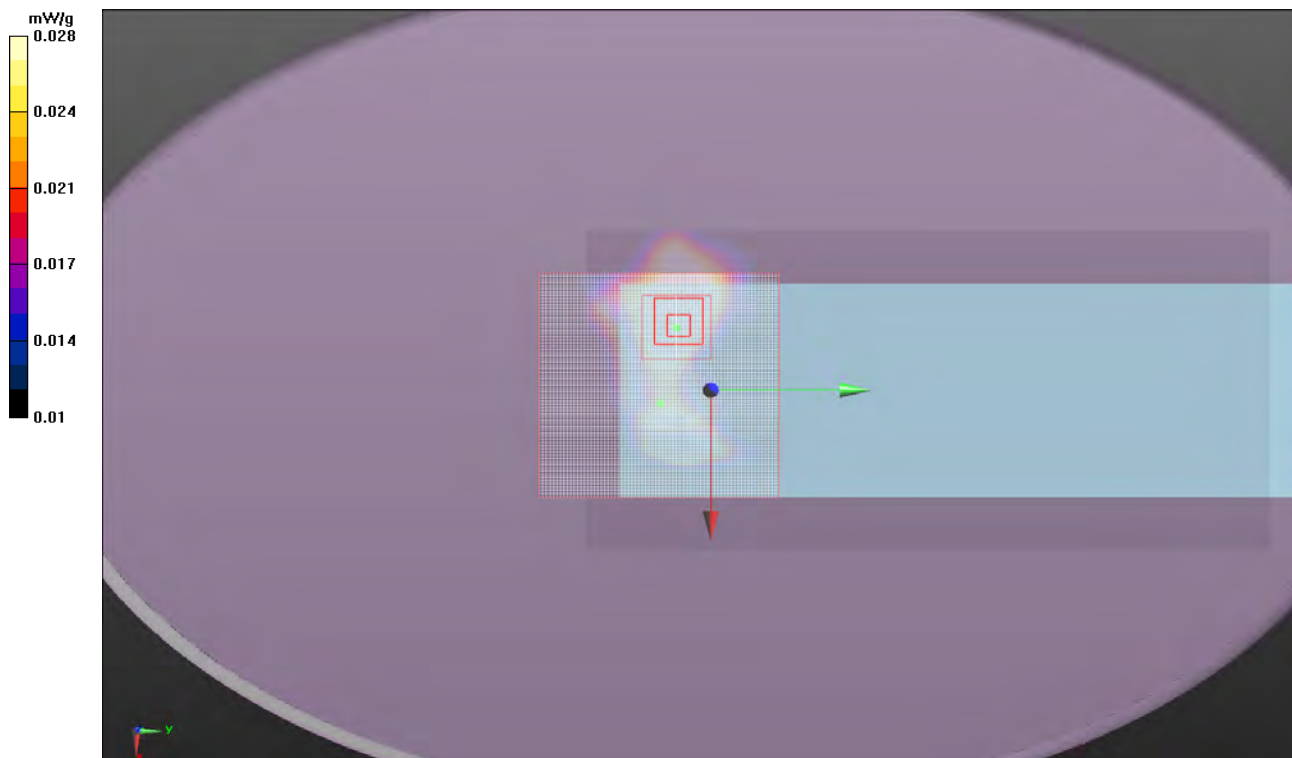
Reference Value = 4.923 V/m; Power Drift = 0.40 dB

Peak SAR (extrapolated) = 0.069 W/kg

**SAR(1 g) = 0.040 mW/g; SAR(10 g) = 0.023 mW/g**

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

Maximum value of SAR (measured) = 0.048 mW/g



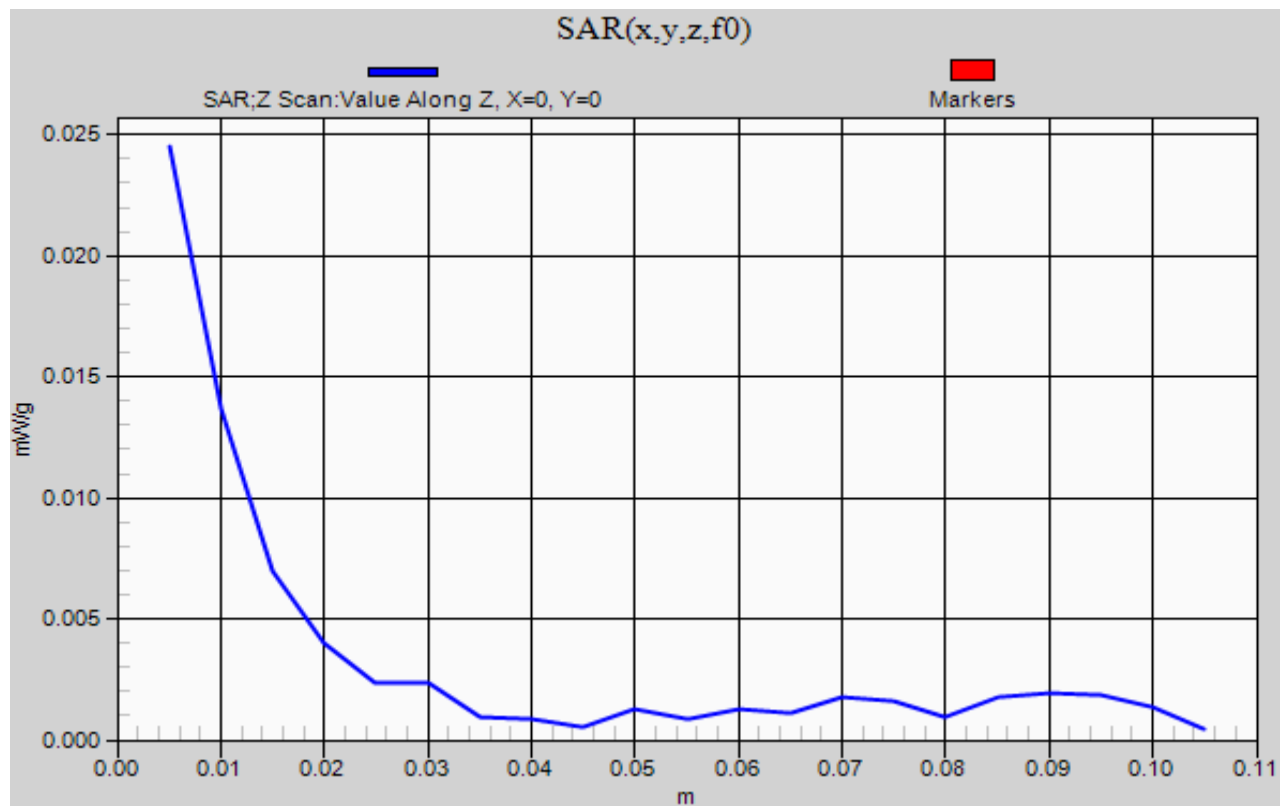
## EMC

## SAR TEST DATA

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 24.4 | Humidity (%):             | 44.6   | Test Date: | 08/03/11         |
| Liquid Temperature (°C): | 22   | Barometric Pressure (mb): | 1013.6 | Tested by: | Ethan Schoonover |

## Head Test 9 8-3-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275



| NORTHWEST<br>EMC                                 |   | SAR TEST DATA                     |  | SAR 2011.02.07 |
|--------------------------------------------------|---|-----------------------------------|--|----------------|
| EUT: 1001CP01S                                   |   | Work Order: ITRM0248              |  |                |
| Serial Number: 28311047275                       |   | Date: See Data Sheets             |  |                |
| Customer: Intermec Technologies Corporation      |   | Temperature: See Data Sheets      |  |                |
| Attendees: None                                  |   | Humidity: See Data Sheets         |  |                |
| Project: None                                    |   | 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                  |  |                |
| FCC 15.247:2011                                  |   | IEEE Std 1528:2003                |  |                |
| FCC 15.407:2001                                  |   | FCC KDB 447498 D01 v04            |  |                |
|                                                  |   | FCC KDB 248227 D01 V01r02         |  |                |
|                                                  |   | FCC KDB 648474 D01 V01r05         |  |                |
|                                                  |   | FCC 865664                        |  |                |
| Health Safety Code 6:2009                        |   | RSS-102, Issue 4:2010             |  |                |
| COMMENTS                                         |   |                                   |  |                |
| None                                             |   |                                   |  |                |
| DEVIATIONS FROM TEST STANDARD                    |   |                                   |  |                |
| No Deviations                                    |   |                                   |  |                |
| Configuration #                                  | 9 | Signature <i>Jennifer Herrett</i> |  |                |

| Test Configuration | Frequency Band | Body-Worn Accessory | Transmit Frequency | Transmit Channel | Transmit Mode | Data Rate (Mbps) | Audio Accessory | EUT Position     | Start Power (Conducted) | SAR Drift During Test (dB) | 1g SAR Level | Test # |
|--------------------|----------------|---------------------|--------------------|------------------|---------------|------------------|-----------------|------------------|-------------------------|----------------------------|--------------|--------|
| Head               | 5200           | None                | 5180               | 36               | OFDM          | 6                | None            | Left Head-Cheek  | 11.7                    | 0.09                       | 0.085        | 21     |
|                    |                |                     |                    |                  |               |                  |                 | Left Head-Tilt   | 11.7                    | 0.007                      | 0.042        | 22     |
|                    |                |                     |                    |                  |               |                  |                 | Right Head-Cheek | 11.7                    | 0.16                       | 0.035        | 23     |
|                    |                |                     |                    |                  |               |                  |                 | Right Head-Tilt  | 11.7                    | 0.11                       | 0.026        | 24     |
|                    | 5300           |                     | 5260               | 52               |               |                  |                 | Left Head-Cheek  | 11.9                    | 0.02                       | 0.140        | 33     |
|                    |                |                     |                    |                  |               |                  |                 | Left Head-Tilt   | 11.9                    | 0.11                       | 0.067        | 34     |
|                    |                |                     |                    |                  |               |                  |                 | Right Head-Cheek | 11.9                    | 0.48                       | 0.040        | 35     |
|                    |                |                     |                    |                  |               |                  |                 | Right Head-Tilt  | 11.9                    | 0.37                       | 0.048        | 36     |
|                    | 5500           |                     | 5600               | 120              |               |                  |                 | Left Head-Cheek  | 11.6                    | 0.17                       | 0.087        | 45     |
|                    |                |                     |                    |                  |               |                  |                 | Left Head-Tilt   | 11.6                    | 0.33                       | 0.053        | 46     |
|                    |                |                     |                    |                  |               |                  |                 | Right Head-Cheek | 11.6                    | 0.4                        | 0.039        | 47     |
|                    |                |                     |                    |                  |               |                  |                 | Right Head-Tilt  | 11.6                    | 0.45                       | 0.024        | 48     |
|                    | 5800           |                     | 5745               | 120              |               |                  |                 | Left Head-Cheek  | 8.4                     | 0.24                       | 0.095        | 57     |
|                    |                |                     |                    |                  |               |                  |                 | Left Head-Tilt   | 8.4                     | 0.07                       | 0.066        | 58     |
|                    |                |                     |                    |                  |               |                  |                 | Right Head-Cheek | 8.4                     | 0.36                       | 0.037        | 59     |
|                    |                |                     |                    |                  |               |                  |                 | Right Head-Tilt  | 8.4                     | 0.24                       | 0.036        | 60     |

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

|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.5 | Humidity (%):             | 49.2   | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 21.5 | Barometric Pressure (mb): | 1016.3 | Tested by: | Ethan Schoonover |  |

# Head Test 21 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5180 MHz  
Medium parameters used:  $\sigma$  = 4.64872 mho/m,  $\epsilon$  = 36.266;  $\rho$  = 1000 kg/m<sup>3</sup> , Medium parameters used (interpolated): f = 5180 MHz;  $\sigma$  = 4.63 mho/m;  $\epsilon$  = 36.31;  $\rho$  = 1000 kg/m<sup>3</sup>  
Phantom section: Left Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

**Head/Cheek/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 2.799 V/m

**Head/Cheek/Zoom Scan (9x9x9)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 6.073 V/m; Power Drift = 0.09 dB  
Peak SAR (extrapolated) = 0.287 W/kg  
**SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.032 mW/g**

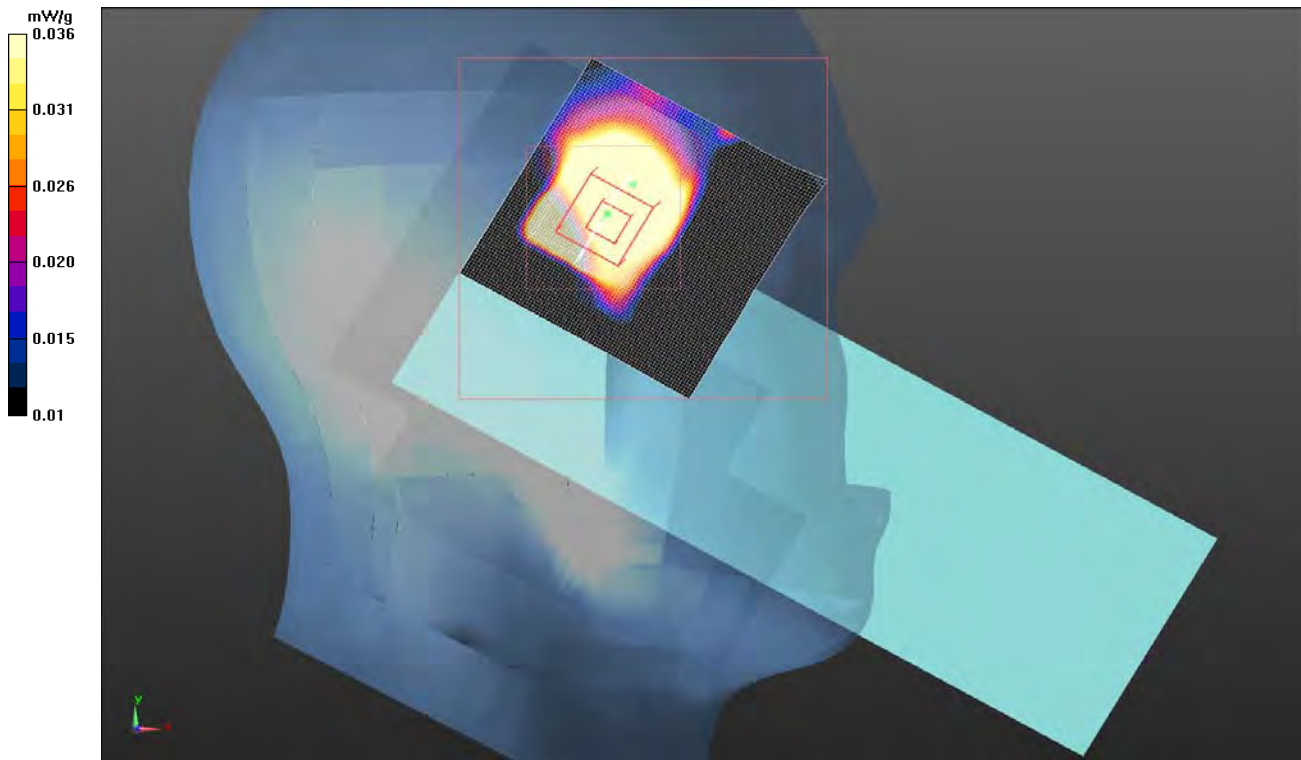
[Info: Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.154 mW/g

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

[Info: Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.135 mW/g

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

[Info: Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.153 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.8 | Humidity (%):             | 50.2   | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 21.5 | Barometric Pressure (mb): | 1016.3 | Tested by: | Ethan Schoonover |  |

### Head Test 22 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5180 MHz  
Medium parameters used (interpolated):  $f = 5180\text{ MHz}$ ;  $\sigma = 4.63\text{ mho/m}$ ;  $\epsilon = 36.31$ ;  $\rho = 1000\text{ kg/m}^3$  , Medium parameters used:  $\sigma = 4.64872\text{ mho/m}$ ,  $\epsilon = 36.266$ ;  $\rho = 1000\text{ kg/m}^3$   
Phantom section: Left Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.113 mW/g

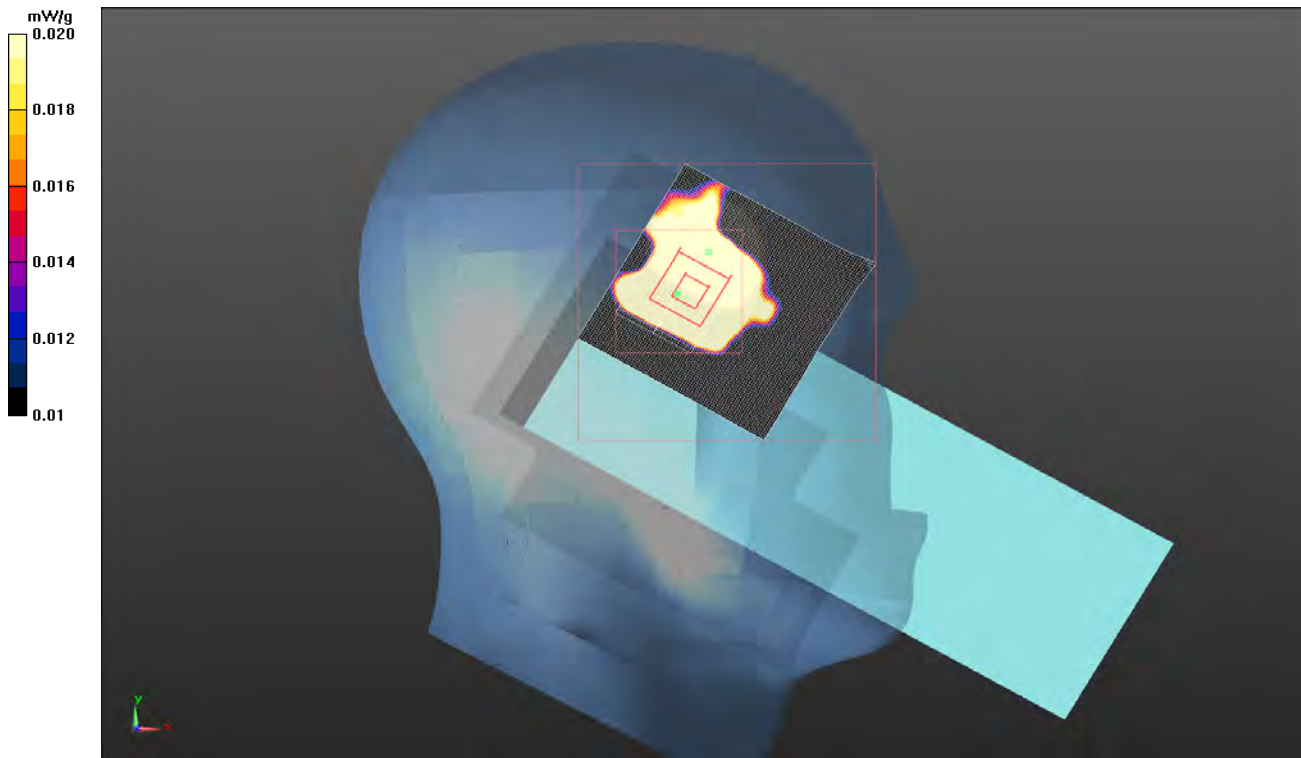
Head/Tilt/Zoom Scan (10x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 4.496 V/m; Power Drift = -0.0074 dB  
Peak SAR (extrapolated) = 0.134 W/kg  
**SAR(1 g) = 0.042 mW/g; SAR(10 g) = 0.016 mW/g**

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

Head/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 2.087 V/m

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.099 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.2 | Humidity (%):             | 49     | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 21.4 | Barometric Pressure (mb): | 1016.3 | Tested by: | Ethan Schoonover |  |

# Head Test 21 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5180 MHz  
Medium parameters used (interpolated):  $f = 5180\text{ MHz}$ ;  $\sigma = 4.63\text{ mho/m}$ ;  $\epsilon = 36.31$ ;  $\rho = 1000\text{ kg/m}^3$  , Medium parameters used:  $\sigma = 4.64872\text{ mho/m}$ ,  $\epsilon = 36.266$ ;  $\rho = 1000\text{ kg/m}^3$   
Phantom section: Right Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.137 mW/g

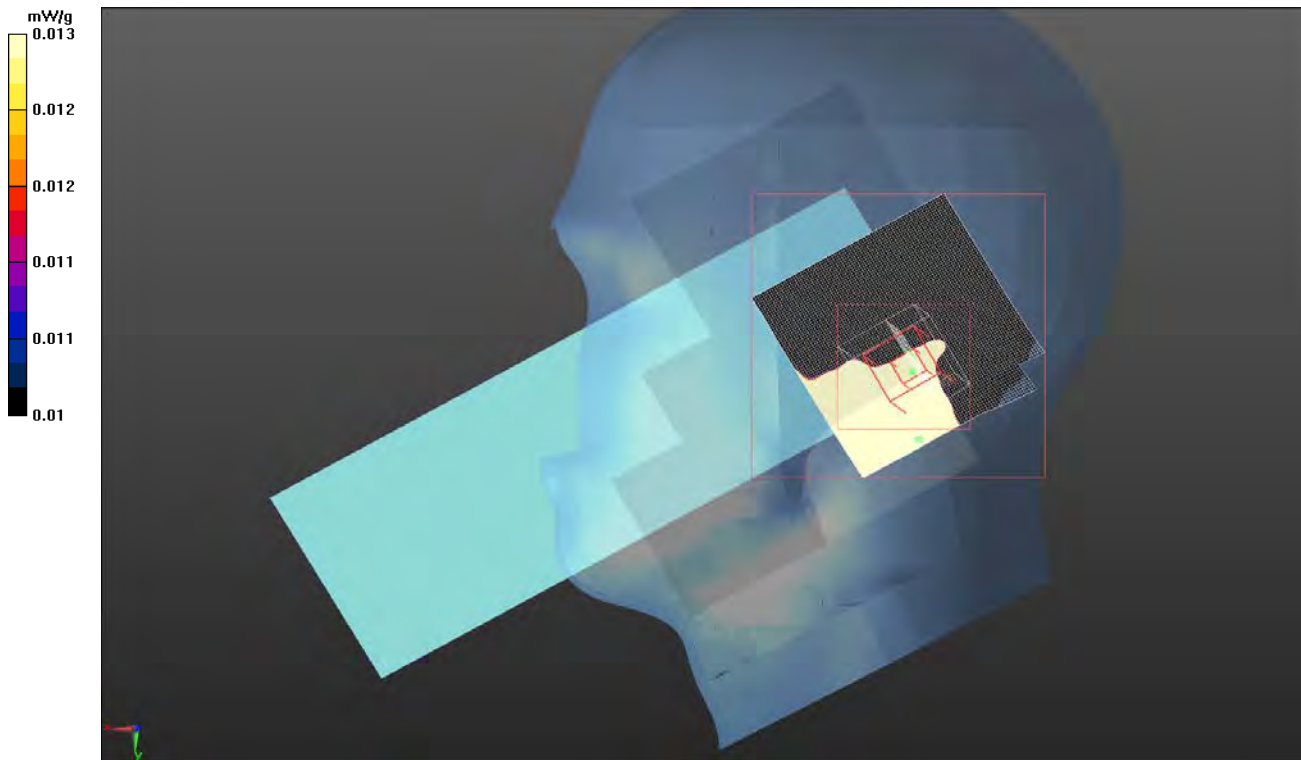
Head/Cheek/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 1.680 V/m

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.146 mW/g

Head/Cheek/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 3.921 V/m; Power Drift = 0.16 dB  
Peak SAR (extrapolated) = 0.106 W/kg  
**SAR(1 g) = 0.035 mW/g; SAR(10 g) = 0.015 mW/g**

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.064 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.2 | Humidity (%):             | 49     | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 21.4 | Barometric Pressure (mb): | 1016.3 | Tested by: | Ethan Schoonover |  |

### Head Test 24 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5180 MHz;Communication System PAR: 0 dB  
Medium parameters used (interpolated): f = 5180 MHz;  $\sigma$  = 4.63 mho/m;  $\epsilon$  = 36.31;  $\rho$  = 1000 kg/m<sup>3</sup> , Medium parameters used:  $\sigma$  = 4.64872 mho/m,  $\epsilon$  = 36.266;  $\rho$  = 1000 kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.049 mW/g

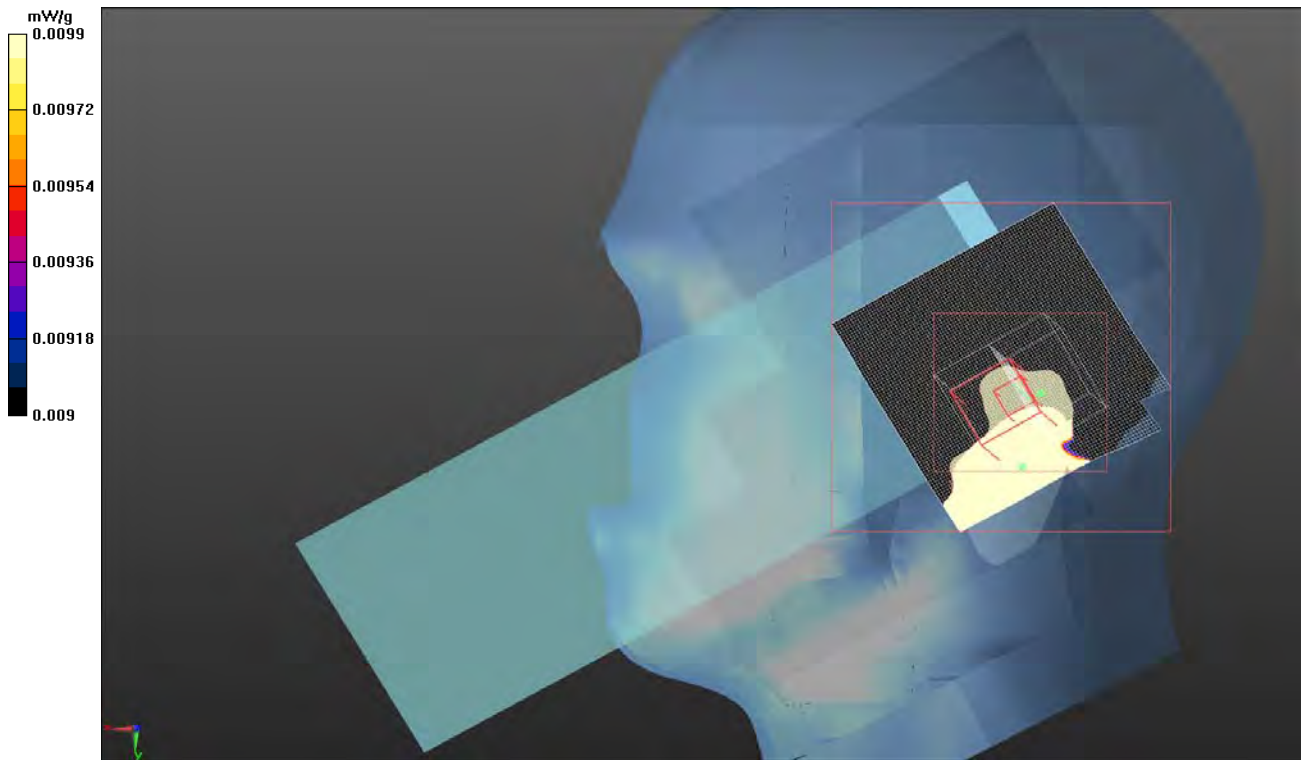
Head/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 1.462 V/m

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.075 mW/g

Head/Tilt/Zoom Scan (9x11x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 3.915 V/m; Power Drift = 0.11 dB  
Peak SAR (extrapolated) = 0.174 W/kg  
**SAR(1 g) = 0.026 mW/g; SAR(10 g) = 0.00906 mW/g**

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.061 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.2 | Humidity (%):             | 49     | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 21.4 | Barometric Pressure (mb): | 1014.1 | Tested by: | Ethan Schoonover |  |

## Head Test 33 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5260 MHz  
Medium parameters used:  $\sigma = 4.70019$  mho/m,  $\epsilon = 36.1677$ ;  $\rho = 1000$  kg/m<sup>3</sup> , Medium parameters used (interpolated): f = 5260 MHz;  $\sigma = 4.709$  mho/m;  $\epsilon = 36.146$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.59, 4.59, 4.59); Calibrated: 11/11/2010  
Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 2mm (Mechanical Surface Detection)  
Electronics: DAE4 Sn1237; Calibrated: 11/10/2010  
Phantom: SAM with CRP; Type: SAM; Serial: 1598  
Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

**Head/Cheek/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 3.448 V/m

**Head/Cheek/Zoom Scan (9x9x9)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 7.077 V/m; Power Drift = 0.02 dB  
Peak SAR (extrapolated) = 0.408 W/kg  
**SAR(1 g) = 0.140 mW/g; SAR(10 g) = 0.068 mW/g**

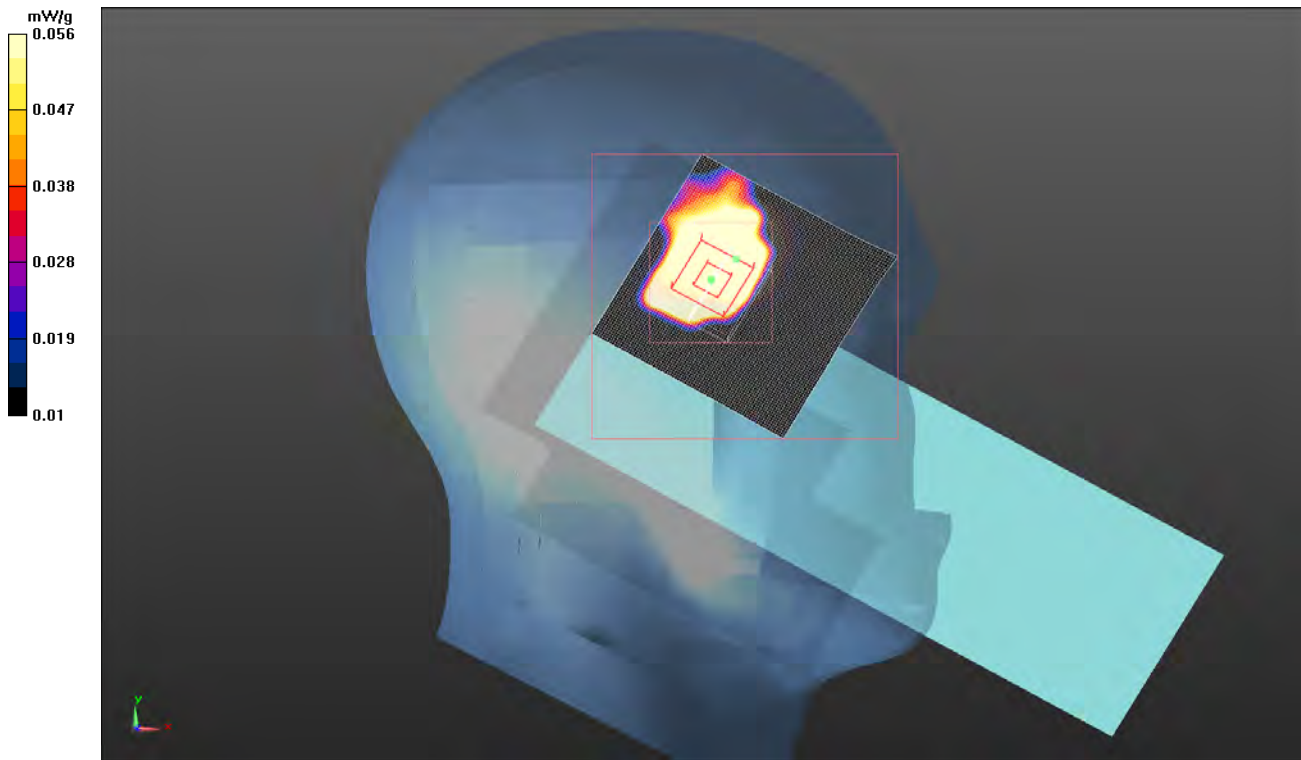
Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (measured) = 0.228 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (interpolated) = 0.197 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (interpolated) = 0.204 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.6 | Humidity (%):             | 49.2   | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 21.4 | Barometric Pressure (mb): | 1014.1 | Tested by: | Ethan Schoonover |  |

### Head Test 34 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5260 MHz  
Medium parameters used (interpolated):  $f = 5260\text{ MHz}$ ;  $\sigma = 4.709\text{ mho/m}$ ;  $\epsilon = 36.146$ ;  $\rho = 1000\text{ kg/m}^3$  , Medium parameters used:  $\sigma = 4.70019\text{ mho/m}$ ,  $\epsilon = 36.1677$ ;  $\rho = 1000\text{ kg/m}^3$   
Phantom section: Left Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.165 mW/g

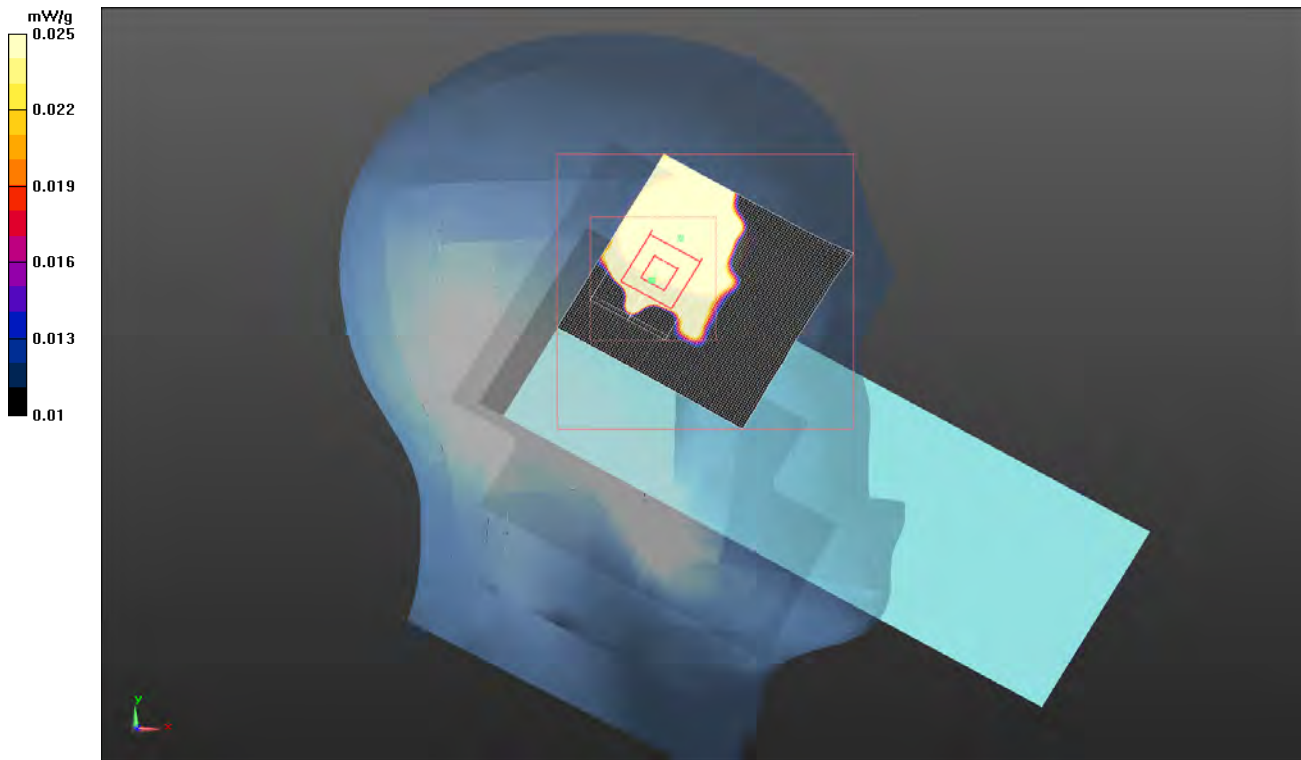
Head/Tilt/Zoom Scan (10x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 5.318 V/m; Power Drift = 0.11 dB  
Peak SAR (extrapolated) = 0.427 W/kg  
**SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.027 mW/g**

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.115 mW/g

Head/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 2.297 V/m

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.152 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 22   | Humidity (%):             | 41.1   | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 21.1 | Barometric Pressure (mb): | 1014.1 | Tested by: | Ethan Schoonover |  |

### Head Test 36 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5260 MHz  
Medium parameters used (interpolated):  $f = 5260\text{ MHz}$ ;  $\sigma = 4.709\text{ mho/m}$ ;  $\epsilon = 36.146$ ;  $\rho = 1000\text{ kg/m}^3$  , Medium parameters used:  $\sigma = 4.70019\text{ mho/m}$ ,  $\epsilon = 36.1677$ ;  $\rho = 1000\text{ kg/m}^3$   
Phantom section: Right Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.092 mW/g

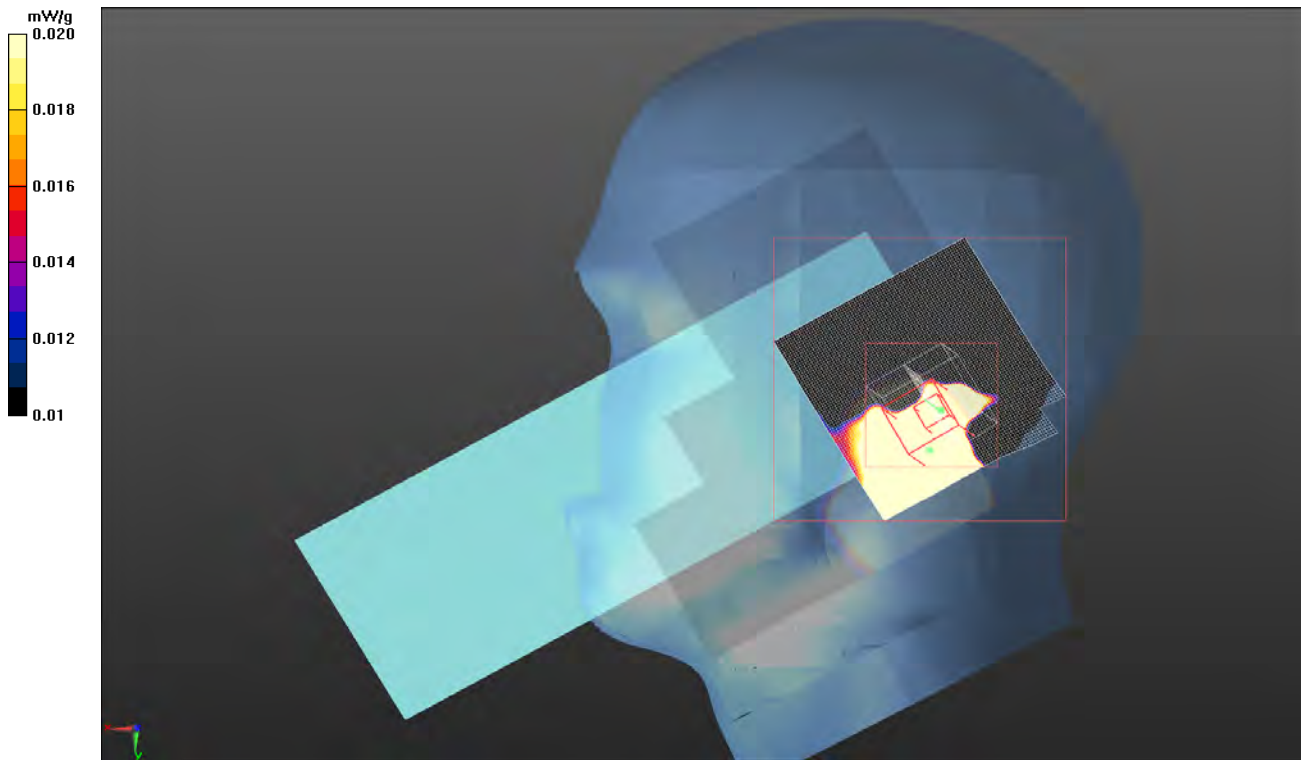
Head/Cheek/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 2.086 V/m

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.111 mW/g

Head/Cheek/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 4.079 V/m; Power Drift = 0.48 dB  
Peak SAR (extrapolated) = 0.426 W/kg  
**SAR(1 g) = 0.040 mW/g; SAR(10 g) = 0.018 mW/g**

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.071 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 21.9 | Humidity (%):             | 42.5   | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 21.1 | Barometric Pressure (mb): | 1014.1 | Tested by: | Ethan Schoonover |  |

# Head Test 36 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5260 MHz  
Medium parameters used (interpolated):  $f = 5260\text{ MHz}$ ;  $\sigma = 4.709\text{ mho/m}$ ;  $\epsilon = 36.146$ ;  $\rho = 1000\text{ kg/m}^3$  , Medium parameters used:  $\sigma = 4.70019\text{ mho/m}$ ,  $\epsilon = 36.1677$ ;  $\rho = 1000\text{ kg/m}^3$   
Phantom section: Right Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.59, 4.59, 4.59); Calibrated: 11/11/2010  
Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)  
Electronics: DAE4 Sn1237; Calibrated: 11/10/2010  
Phantom: SAM with CRP; Type: SAM; Serial: 1598  
Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

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

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

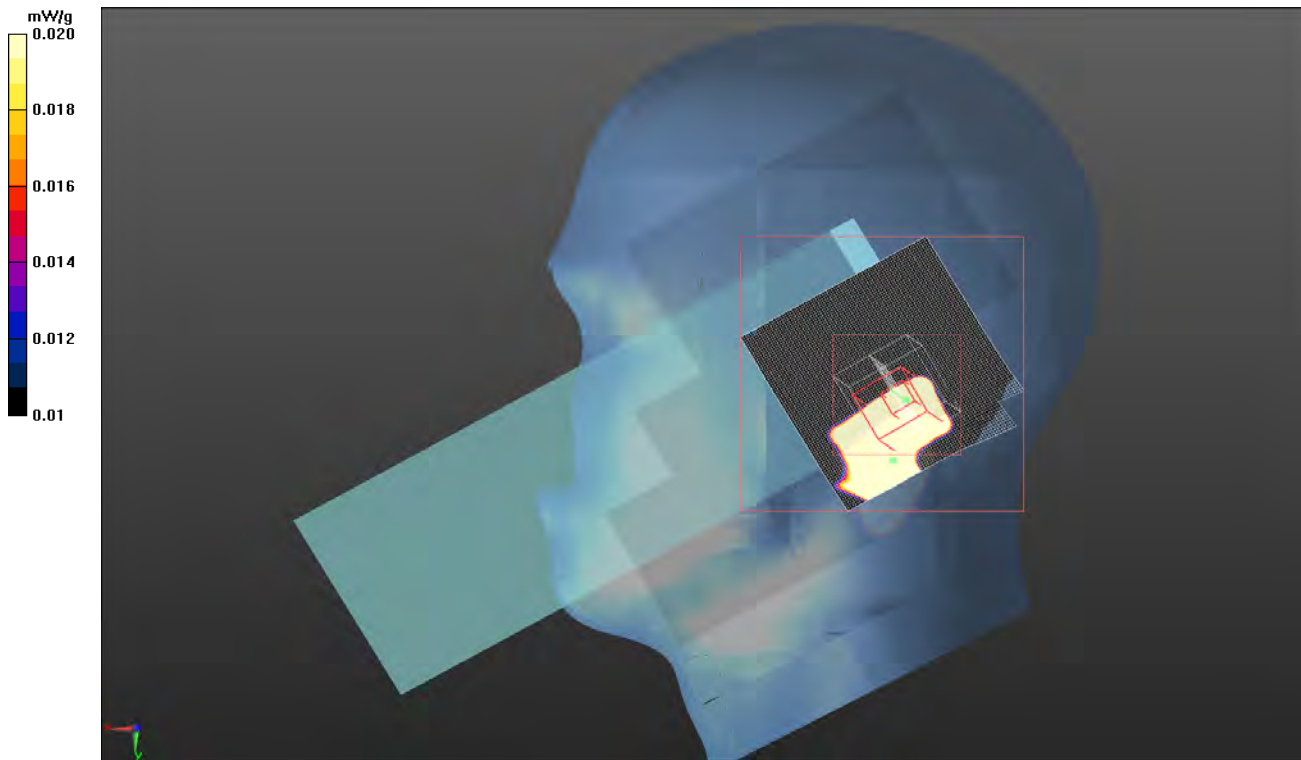
Head/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 2.045 V/m

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.152 mW/g

Head/Tilt/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 4.457 V/m; Power Drift = 0.37 dB  
Peak SAR (extrapolated) = 0.162 W/kg  
**SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.023 mW/g**

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.090 mW/g



|                          |      |                           |      |            |                  |  |
|--------------------------|------|---------------------------|------|------------|------------------|--|
| NORTHWEST                |      |                           |      |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |      |            |                  |  |
| Room Temperature (°C):   | 23.7 | Humidity (%):             | 47.9 | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 22   | Barometric Pressure (mb): | 1015 | Tested by: | Ethan Schoonover |  |

# Head Test 45 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5600 MHz  
Medium parameters used: f = 5600 MHz;  $\sigma$  = 5.099 mho/m;  $\epsilon$  = 35.415;  $\rho$  = 1000 kg/m<sup>3</sup> , Medium parameters used:  $\sigma$  = 5.09884 mho/m,  $\epsilon$  = 35.4148;  $\rho$  = 1000 kg/m<sup>3</sup>  
Phantom section: Left Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

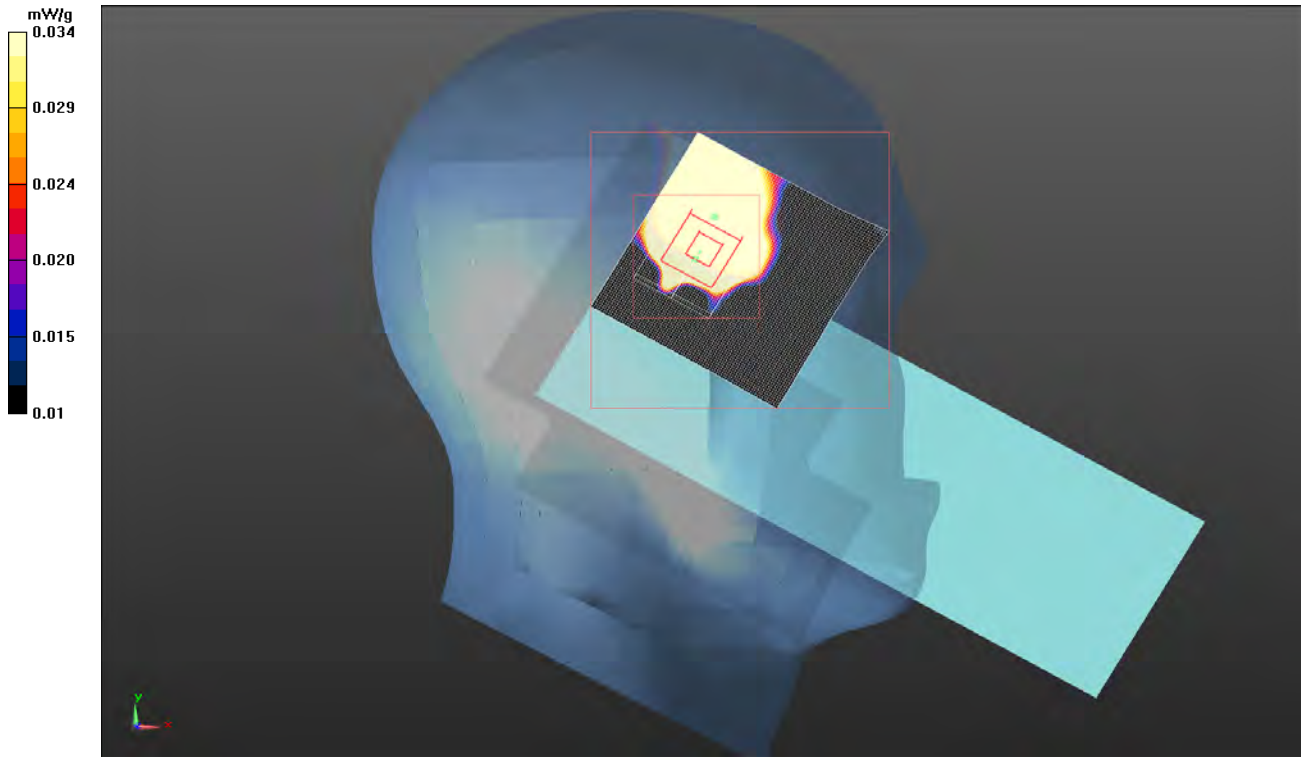
Probe: EX3DV4 - SN3746; ConvF(4.37, 4.37, 4.37); Calibrated: 11/11/2010  
Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)  
Electronics: DAE4 Sn1237; Calibrated: 11/10/2010  
Phantom: SAM with CRP; Type: SAM; Serial: 1598  
Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

**Head/Cheek/Reference scan (51x91x1):** Measurement grid: dx=30mm, dy=30mm  
Maximum value of SAR (interpolated) = 0.180 mW/g

**Head/Cheek/Area scan (81x81x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.186 mW/g

**Head/Cheek/Zoom Scan (10x9x9)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 5.727 V/m; Power Drift = 0.17 dB  
Peak SAR (extrapolated) = 0.536 W/kg  
**SAR(1 g) = 0.087 mW/g; SAR(10 g) = 0.038 mW/g**  
Maximum value of SAR (measured) = 0.156 mW/g

**Head/Cheek/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 2.591 V/m



|                          |      |                           |      |            |                  |  |
|--------------------------|------|---------------------------|------|------------|------------------|--|
| NORTHWEST                |      |                           |      |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |      |            |                  |  |
| Room Temperature (°C):   | 24.5 | Humidity (%):             | 51.1 | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 22.3 | Barometric Pressure (mb): | 1015 | Tested by: | Ethan Schoonover |  |

### Head Test 46 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5600 MHz  
Medium parameters used: f = 5600 MHz;  $\sigma$  = 5.099 mho/m;  $\epsilon$  = 35.415;  $\rho$  = 1000 kg/m<sup>3</sup> , Medium parameters used:  $\sigma$  = 5.09884 mho/m,  $\epsilon$  = 35.4148;  $\rho$  = 1000 kg/m<sup>3</sup>  
Phantom section: Left Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

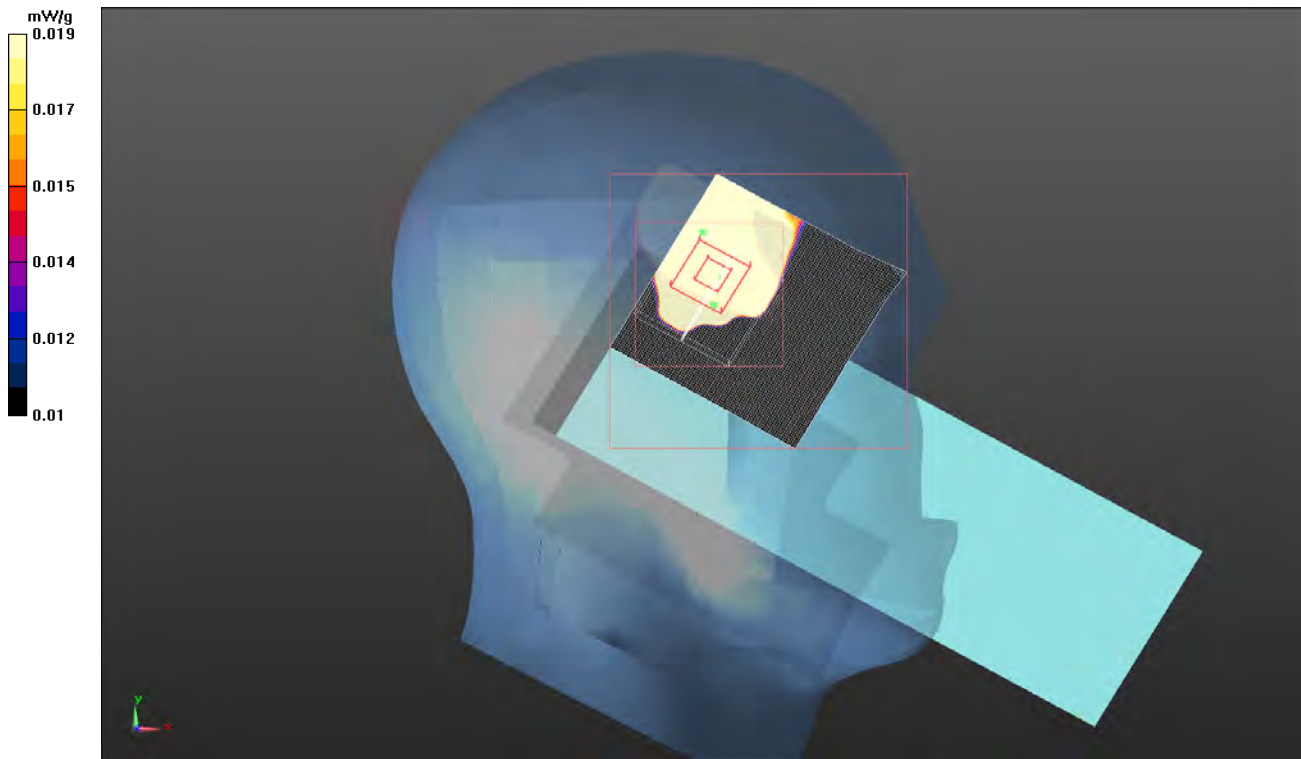
Probe: EX3DV4 - SN3746; ConvF(4.37, 4.37, 4.37); Calibrated: 11/11/2010  
Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)  
Electronics: DAE4 Sn1237; Calibrated: 11/10/2010  
Phantom: SAM with CRP; Type: SAM; Serial: 1598  
Measurement SW: DASYS2, Version 52.6 (2);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

**Head/Tilt/Zoom Scan (11x11x9)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 4.730 V/m; Power Drift = 0.33 dB  
Peak SAR (extrapolated) = 0.190 W/kg  
**SAR(1 g) = 0.053 mW/g; SAR(10 g) = 0.023 mW/g**  
Maximum value of SAR (measured) = 0.115 mW/g

**Head/Tilt/Area scan (81x81x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.102 mW/g

**Head/Tilt/Reference scan (51x71x1):** Measurement grid: dx=30mm, dy=30mm  
Maximum value of SAR (interpolated) = 0.112 mW/g

**Head/Tilt/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 1.919 V/m



|                          |      |                           |      |            |                  |  |
|--------------------------|------|---------------------------|------|------------|------------------|--|
| NORTHWEST                |      |                           |      |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |      |            |                  |  |
| Room Temperature (°C):   | 24.4 | Humidity (%):             | 48.8 | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 22.3 | Barometric Pressure (mb): | 1015 | Tested by: | Ethan Schoonover |  |

# Head Test 47 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5600 MHz  
Medium parameters used: f = 5600 MHz;  $\sigma$  = 5.099 mho/m;  $\epsilon$  = 35.415;  $\rho$  = 1000 kg/m<sup>3</sup> , Medium parameters used:  $\sigma$  = 5.09884 mho/m,  $\epsilon$  = 35.4148;  $\rho$  = 1000 kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

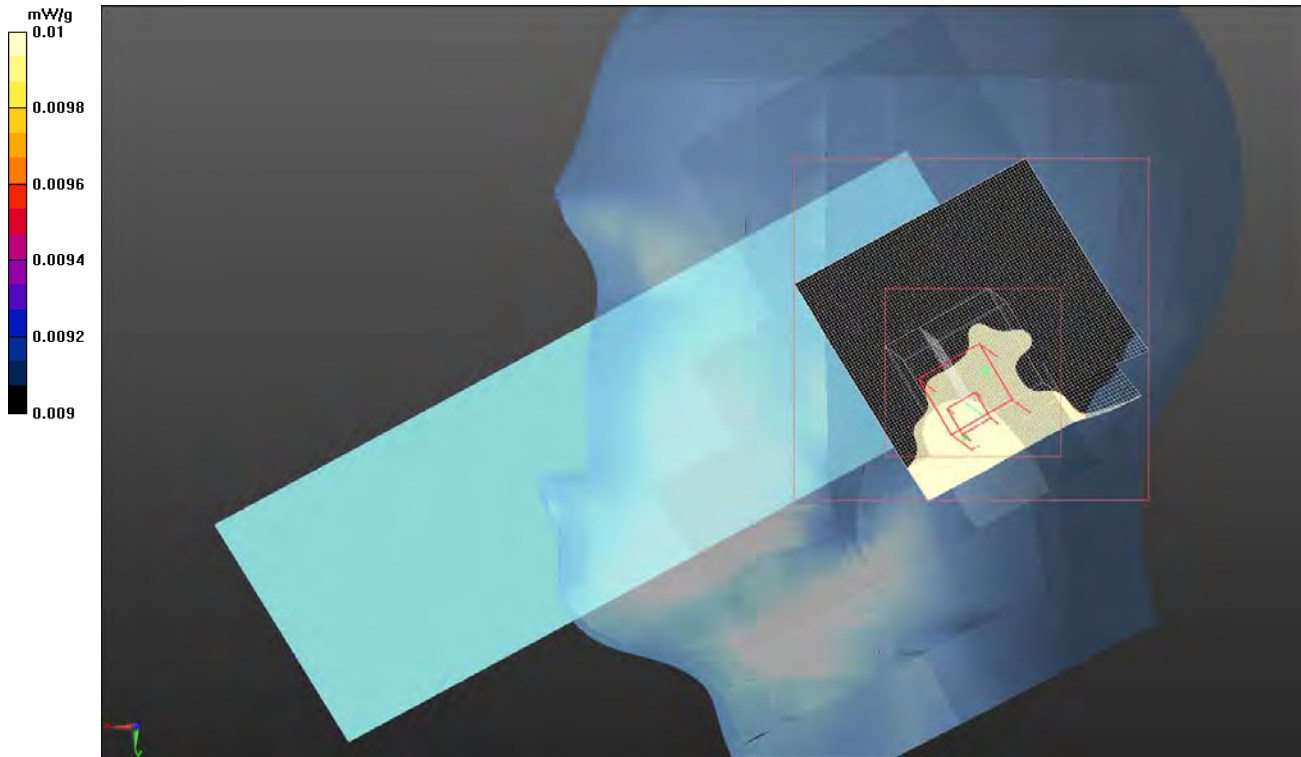
Probe: EX3DV4 - SN3746; ConvF(4.37, 4.37, 4.37); Calibrated: 11/11/2010  
Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)  
Electronics: DAE4 Sn1237; Calibrated: 11/10/2010  
Phantom: SAM with CRP; Type: SAM; Serial: 1598  
Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Head/Cheek/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm  
Maximum value of SAR (interpolated) = 0.058 mW/g

Head/Cheek/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.093 mW/g

Head/Cheek/Zoom Scan (10x10x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 3.621 V/m; Power Drift = 0.40 dB  
Peak SAR (extrapolated) = 0.242 W/kg  
**SAR(1 g) = 0.039 mW/g; SAR(10 g) = 0.019 mW/g**  
Maximum value of SAR (measured) = 0.059 mW/g

Head/Cheek/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 1.402 V/m



|                          |      |                           |      |            |                  |  |
|--------------------------|------|---------------------------|------|------------|------------------|--|
| NORTHWEST                |      |                           |      |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |      |            |                  |  |
| Room Temperature (°C):   | 23.8 | Humidity (%):             | 47   | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 22.1 | Barometric Pressure (mb): | 1015 | Tested by: | Ethan Schoonover |  |

# Head Test 48 8-1-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5600 MHz  
Medium parameters used:  $\sigma = 5.09884$  mho/m,  $\epsilon = 35.4148$ ;  $\rho = 1000$  kg/m<sup>3</sup> , Medium parameters used: f = 5600 MHz;  $\sigma = 5.099$  mho/m;  $\epsilon = 35.415$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

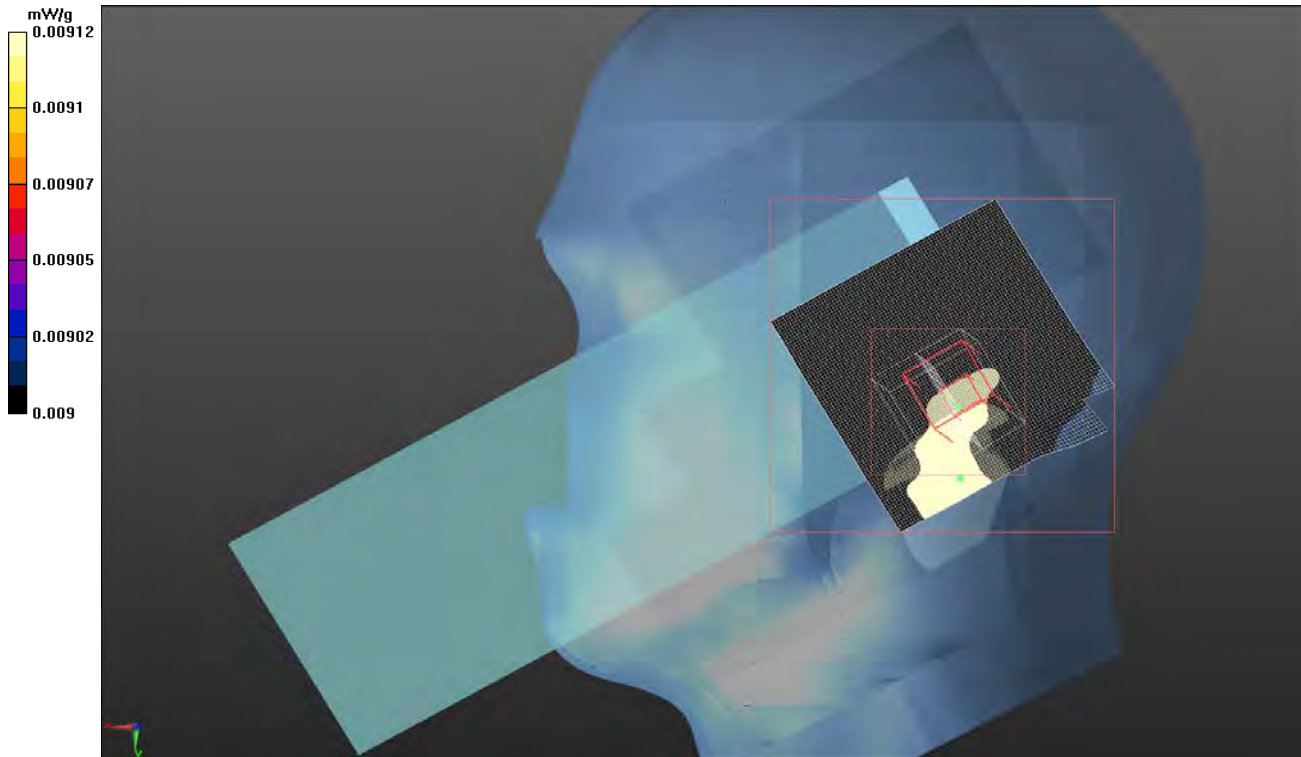
Probe: EX3DV4 - SN3746; ConvF(4.37, 4.37, 4.37); Calibrated: 11/11/2010  
Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 2mm (Mechanical Surface Detection)  
Electronics: DAE4 Sn1237; Calibrated: 11/10/2010  
Phantom: SAM with CRP; Type: SAM; Serial: 1598  
Measurement SW: DASYS2, Version 52.6 (2);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

Head/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 1.338 V/m

Head/Tilt/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.161 mW/g

Head/Tilt/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 3.529 V/m; Power Drift = 0.45 dB  
Peak SAR (extrapolated) = 0.213 W/kg  
**SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.00748 mW/g**  
Maximum value of SAR (measured) = 0.056 mW/g

Head/Tilt/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm  
Maximum value of SAR (interpolated) = 0.063 mW/g



**EMC****SAR TEST DATA**

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 22.7 | Humidity (%):             | 48.5   | Test Date: | 08/01/11         |
| Liquid Temperature (°C): | 21.3 | Barometric Pressure (mb): | 1013.9 | Tested by: | Ethan Schoonover |

**Head Test 57 8-3-11**

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5745 MHz

Medium parameters used (interpolated):  $f = 5745$  MHz;  $\sigma = 5.363$  mho/m;  $\epsilon = 34.888$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $\sigma = 5.36925$  mho/m,  $\epsilon = 34.8799$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(4.14, 4.14, 4.14); Calibrated: 11/11/2010

Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)

Electronics: DAE4 Sn1237; Calibrated: 11/10/2010

Phantom: SAM with CRP; Type: SAM; Serial: 1598

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

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

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

Maximum value of SAR (interpolated) = 0.207 mW/g

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

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

Maximum value of SAR (interpolated) = 0.191 mW/g

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

Reference Value = 6.492 V/m; Power Drift = 0.24 dB

Peak SAR (extrapolated) = 0.436 W/kg

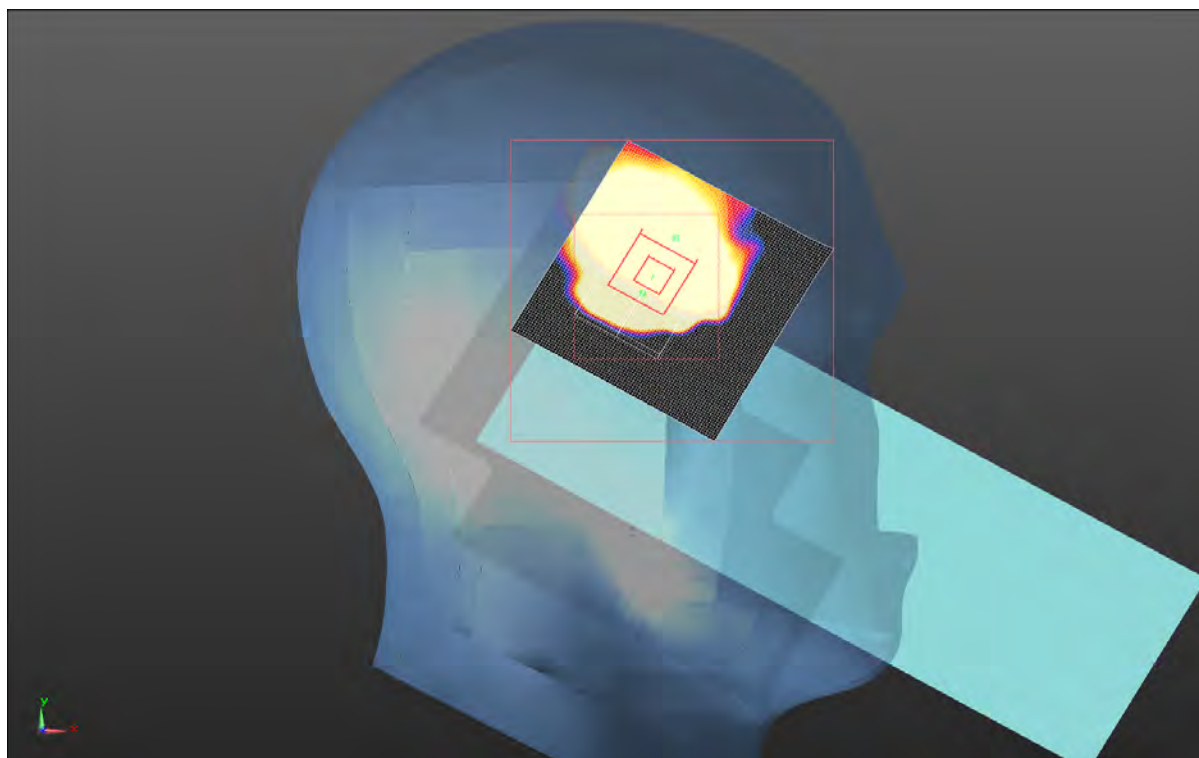
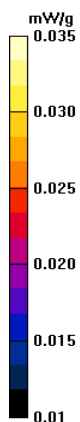
**SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.037 mW/g**

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

Maximum value of SAR (measured) = 0.181 mW/g

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

Maximum value of Total (measured) = 2.565 V/m



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.8 | Humidity (%):             | 50.1   | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 22   | Barometric Pressure (mb): | 1013.9 | Tested by: | Ethan Schoonover |  |

## Head Test 58 8-3-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5745 MHz  
Medium parameters used (interpolated):  $f = 5745\text{ MHz}$ ;  $\sigma = 5.363\text{ mho/m}$ ;  $\epsilon = 34.888$ ;  $\rho = 1000\text{ kg/m}^3$  , Medium parameters used:  $\sigma = 5.36925\text{ mho/m}$ ,  $\epsilon = 34.8799$ ;  $\rho = 1000\text{ kg/m}^3$   
Phantom section: Left Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

**Head/Tilt/Zoom Scan (9x9x9)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 5.069 V/m; Power Drift = -0.07 dB  
Peak SAR (extrapolated) = 0.542 W/kg  
**SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.026 mW/g**

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.111 mW/g

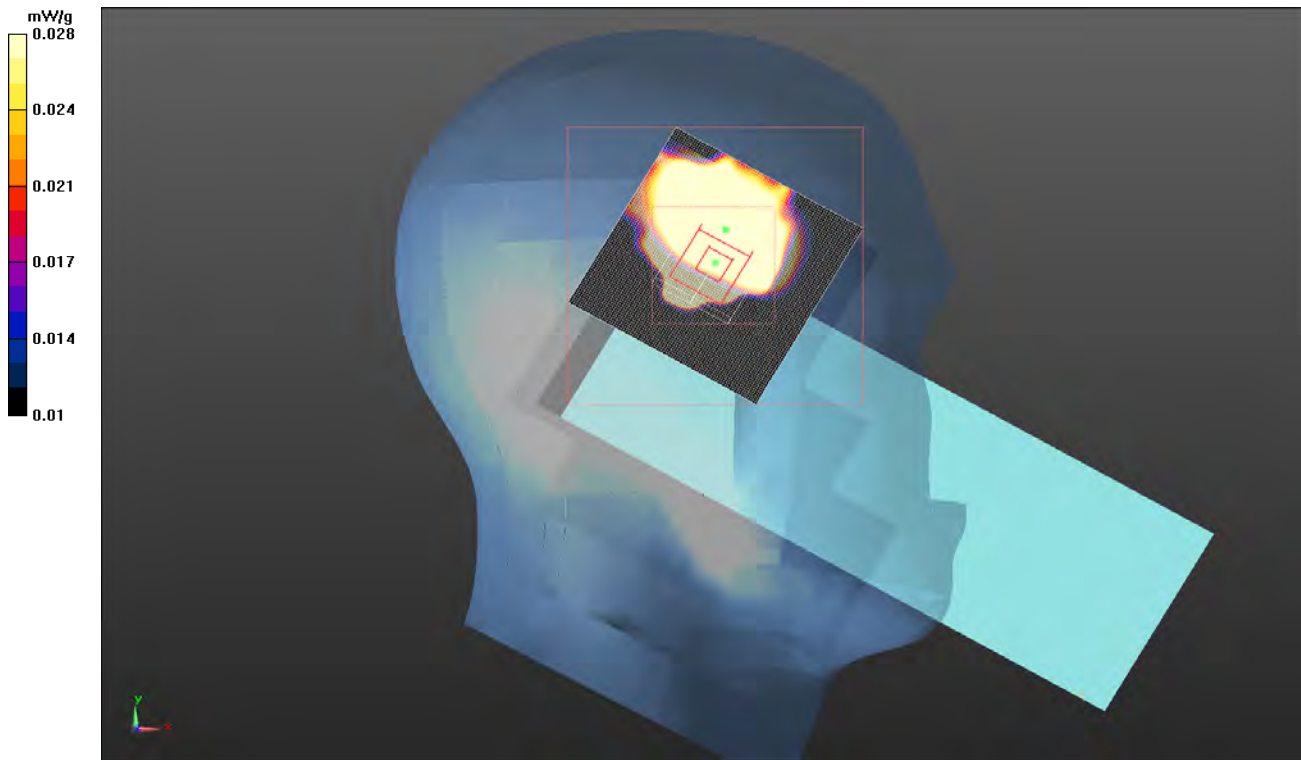
**Head/Tilt/Area scan (81x81x1):** Measurement grid: dx=10mm, dy=10mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.106 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.137 mW/g

**Head/Tilt/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 2.272 V/m



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.4 | Humidity (%):             | 49.2   | Test Date: | 08/01/11         |  |
| Liquid Temperature (°C): | 21.5 | Barometric Pressure (mb): | 1013.9 | Tested by: | Ethan Schoonover |  |

# Head Test 59 8-3-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5745 MHz  
Medium parameters used (interpolated):  $f = 5745\text{ MHz}$ ;  $\sigma = 5.363\text{ mho/m}$ ;  $\epsilon = 34.888$ ;  $\rho = 1000\text{ kg/m}^3$  , Medium parameters used:  $\sigma = 5.36925\text{ mho/m}$ ,  $\epsilon = 34.8799$ ;  $\rho = 1000\text{ kg/m}^3$   
Phantom section: Right Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.106 mW/g

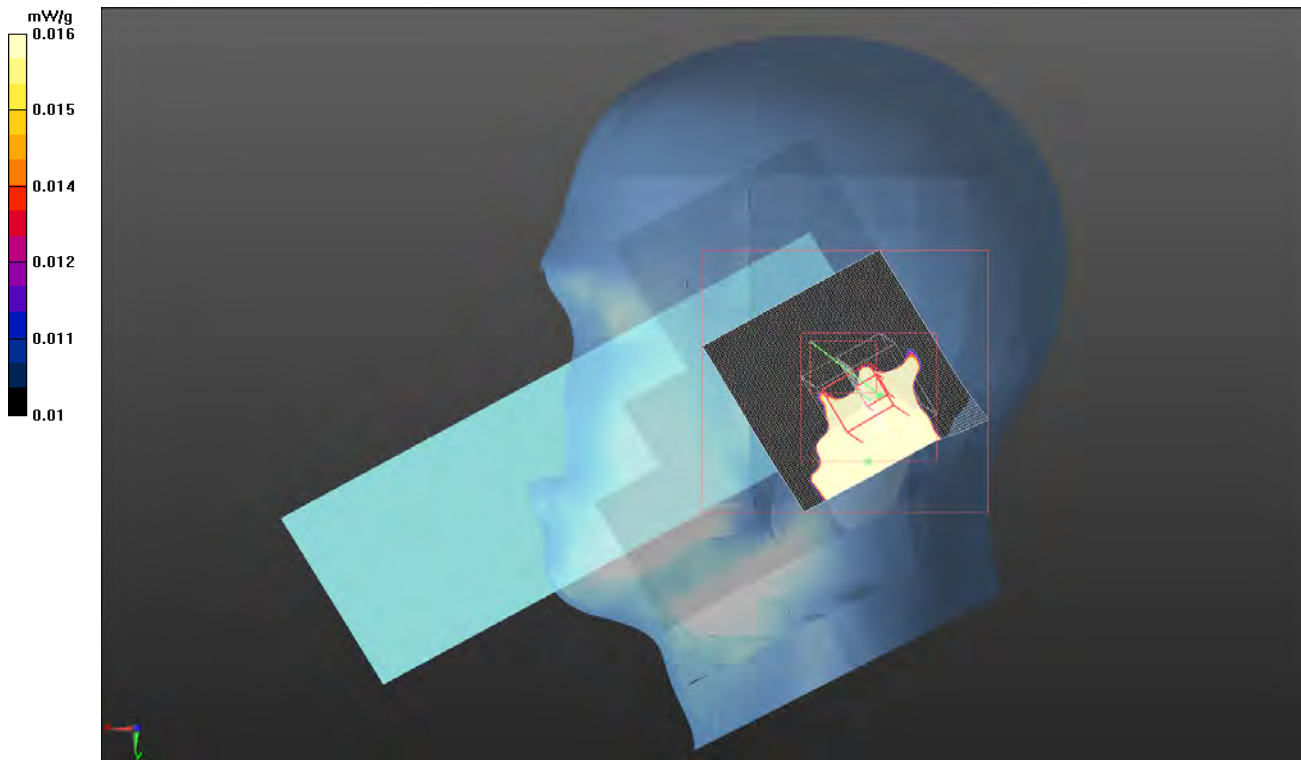
Head/Cheek/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.119 mW/g

Head/Cheek/Zoom Scan (10x10x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 4.489 V/m; Power Drift = 0.36 dB  
Peak SAR (extrapolated) = 0.257 W/kg  
**SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.013 mW/g**

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.087 mW/g

Head/Cheek/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 1.736 V/m



|                          |      |                           |        |            |                  |                |
|--------------------------|------|---------------------------|--------|------------|------------------|----------------|
| NORTHWEST                |      | SAR TEST DATA             |        |            |                  | SAR 2011.02.07 |
| EMC                      |      |                           |        |            |                  |                |
| Room Temperature (°C):   | 23   | Humidity (%):             | 48.3   | Test Date: | 08/01/11         |                |
| Liquid Temperature (°C): | 21.4 | Barometric Pressure (mb): | 1013.9 | Tested by: | Ethan Schoonover |                |

# Head Test 60 8-3-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5745 MHz  
Medium parameters used:  $\sigma = 5.36925$  mho/m,  $\epsilon = 34.8799$ ;  $\rho = 1000$  kg/m<sup>3</sup> , Medium parameters used (interpolated): f = 5745 MHz;  $\sigma = 5.363$  mho/m;  $\epsilon = 34.888$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

Head/Tilt/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 1.893 V/m

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

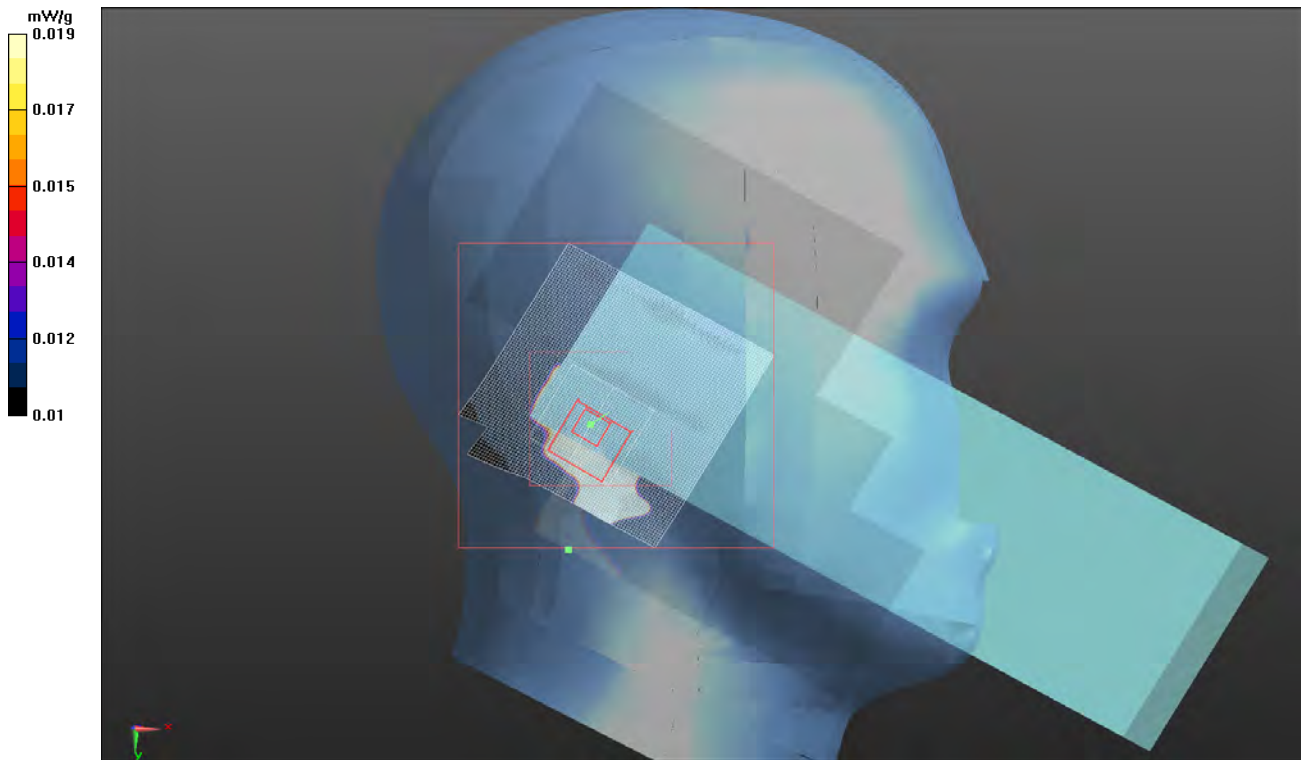
Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.099 mW/g

Head/Tilt/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 4.293 V/m; Power Drift = 0.24 dB  
Peak SAR (extrapolated) = 0.277 W/kg  
SAR(1 g) = 0.036 mW/g; SAR(10 g) = 0.017 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.086 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.057 mW/g



|                                                  |   |                                                                                             |  |                |  |
|--------------------------------------------------|---|---------------------------------------------------------------------------------------------|--|----------------|--|
| NORTHWEST                                        |   | SAR TEST DATA                                                                               |  | SAR 2011.02.07 |  |
| <b>EMC</b>                                       |   |                                                                                             |  |                |  |
| EUT: 1001CP01S                                   |   | Work Order: ITRM0248                                                                        |  |                |  |
| Serial Number: 28311047275                       |   | Date: See Data Sheets                                                                       |  |                |  |
| Customer: Intermec Technologies Corporation      |   | Temperature: See Data Sheets                                                                |  |                |  |
| Attendees: None                                  |   | Humidity: See Data Sheets                                                                   |  |                |  |
| Project: None                                    |   | 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                                                                            |  |                |  |
| FCC 15.247:2011                                  |   | IEEE Std 1528:2003                                                                          |  |                |  |
| FCC 15.407:2001                                  |   | FCC KDB 447498 D01 v04                                                                      |  |                |  |
|                                                  |   | FCC KDB 248227 D01 V01r02                                                                   |  |                |  |
|                                                  |   | FCC KDB 648474 D01 V01r05                                                                   |  |                |  |
|                                                  |   | FCC 865664                                                                                  |  |                |  |
| Health Safety Code 6:2009                        |   | RSS-102, Issue 4:2010                                                                       |  |                |  |
| COMMENTS                                         |   |                                                                                             |  |                |  |
| None                                             |   |                                                                                             |  |                |  |
| DEVIATIONS FROM TEST STANDARD                    |   |                                                                                             |  |                |  |
| No Deviations                                    |   |                                                                                             |  |                |  |
| Configuration #                                  | 7 | Signature  |  |                |  |

| Test Configuration | Frequency Band | Body-Worn Accessory | Transmit Frequency | Transmit Channel | Transmit Mode | Data Rate (Mbps) | Audio Accessory | EUT Position | Start Power (Conducted) | SAR Drift During Test (dB) | 1g SAR Level | Test # |
|--------------------|----------------|---------------------|--------------------|------------------|---------------|------------------|-----------------|--------------|-------------------------|----------------------------|--------------|--------|
| Body               | 5200MHz        | Holster             | 5180MHz            | 36               | OFDM          | 6Mbps            | None            | Right        | 11.7                    | 0.11                       | 0.392        | 17     |
|                    |                |                     |                    |                  |               |                  |                 | Front        | 11.7                    | 0.27                       | 0.051        | 18     |
|                    | 5300MHz        |                     | 5260MHz            | 52               |               |                  |                 | Right        | 11.9                    | -0.02                      | 0.504        | 23     |
|                    |                |                     |                    |                  |               |                  |                 | Front        | 11.9                    | 0.23                       | 0.066        | 24     |
|                    | 5600MHz        |                     | 5600MHz            | 120              |               |                  |                 | Right        | 11.6                    | 0.09                       | 0.329        | 29     |
|                    |                |                     |                    |                  |               |                  |                 | Front        | 11.6                    | 0                          | 0.038        | 30     |
|                    | 5800MHz        |                     | 5745MHz            | 149              |               |                  |                 | Right        | 8.4                     | -0.0055                    | 0.311        | 35     |
|                    |                |                     |                    |                  |               |                  |                 | Front        | 8.4                     | Note 2                     | 0.040        | 36     |

Note 1: Zoom scan not performed, no hot spots detected, area scan results were less than the required system sensitivity of 0.01mW/g.

Note 2: Due to the low value of measured SAR, the SAR drift measurement was made close to the measurement noise floor and is therefore inaccurate.

|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.8 | Humidity (%):             | 54.5   | Test Date: | 07/29/11         |  |
| Liquid Temperature (°C): | 21.9 | Barometric Pressure (mb): | 1019.2 | Tested by: | Jennifer Herrett |  |

Body Test 17 7-29-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5180 MHz  
Medium parameters used (interpolated): f = 5180 MHz;  $\sigma$  = 5.223 mho/m;  $\epsilon$  = 47.895;  $\rho$  = 1000 kg/m<sup>3</sup> , Medium parameters used:  $\sigma$  = 5.24548 mho/m,  $\epsilon$  = 47.8493;  $\rho$  = 1000 kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

Body/Body/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.651 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 5.787 V/m

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 12.613 V/m; Power Drift = 0.11 dB  
Peak SAR (extrapolated) = 1.219 W/kg  
SAR(1 g) = 0.392 mW/g; SAR(10 g) = 0.152 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.702 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.722 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.6 | Humidity (%):             | 54.5   | Test Date: | 07/29/11         |  |
| Liquid Temperature (°C): | 21.6 | Barometric Pressure (mb): | 1019.2 | Tested by: | Jennifer Herrett |  |

Body Test 18 7-29-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5180 MHz  
Medium parameters used (interpolated): f = 5180 MHz;  $\sigma$  = 5.223 mho/m;  $\epsilon$  = 47.895;  $\rho$  = 1000 kg/m<sup>3</sup> , Medium parameters used:  $\sigma$  = 5.24548 mho/m,  $\epsilon$  = 47.8493;  $\rho$  = 1000 kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

Body/Body/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.106 mW/g

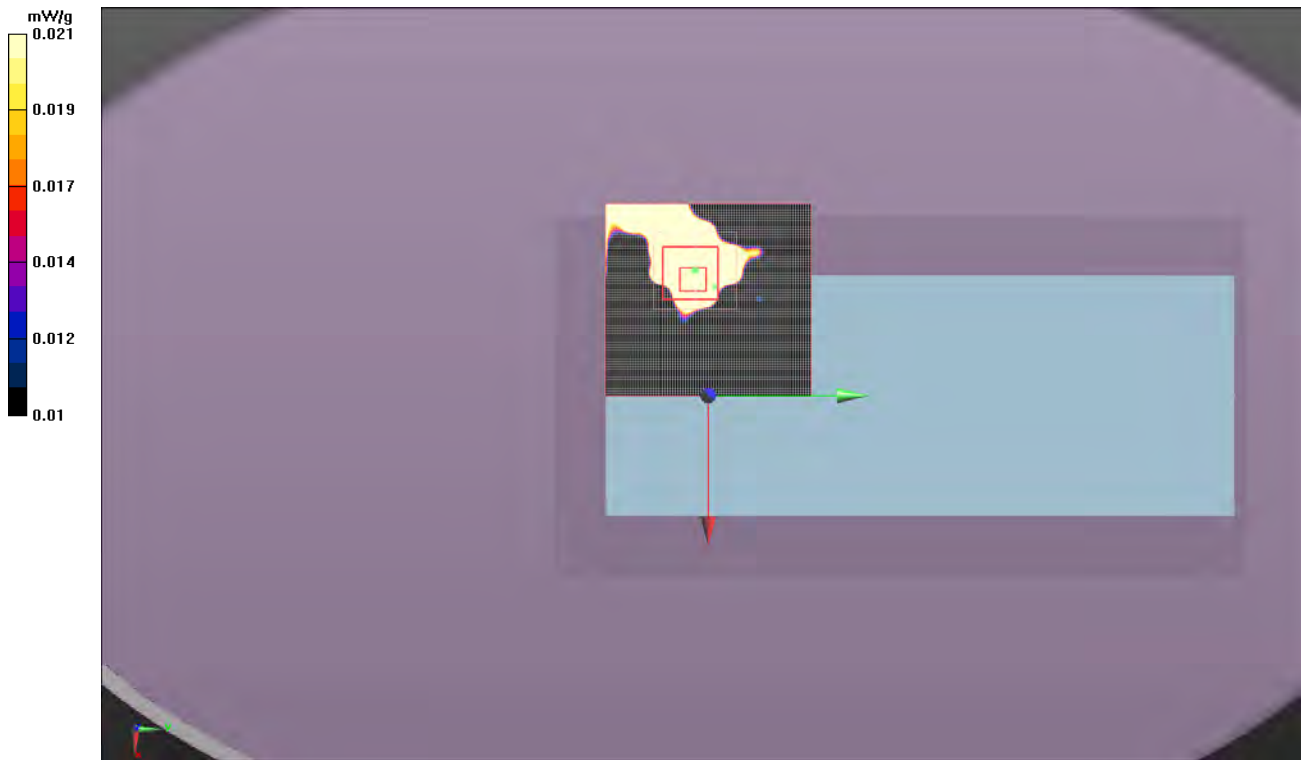
Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 2.026 V/m

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 4.997 V/m; Power Drift = 0.27 dB  
Peak SAR (extrapolated) = 0.214 W/kg  
SAR(1 g) = 0.051 mW/g; SAR(10 g) = 0.020 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.093 mW/g

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

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.156 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.5 | Humidity (%):             | 52.7   | Test Date: | 07/29/11         |  |
| Liquid Temperature (°C): | 21.9 | Barometric Pressure (mb): | 1019.2 | Tested by: | Jennifer Herrett |  |

Body Test 23 7-29-11b

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5260 MHz  
Medium parameters used (interpolated): f = 5260 MHz;  $\sigma$  = 5.32 mho/m;  $\epsilon$  = 47.709;  $\rho$  = 1000 kg/m<sup>3</sup> , Medium parameters used:  $\sigma$  = 5.30871 mho/m,  $\epsilon$  = 47.7311;  $\rho$  = 1000 kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

Body/Body/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm

Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (interpolated) = 1.022 mW/g

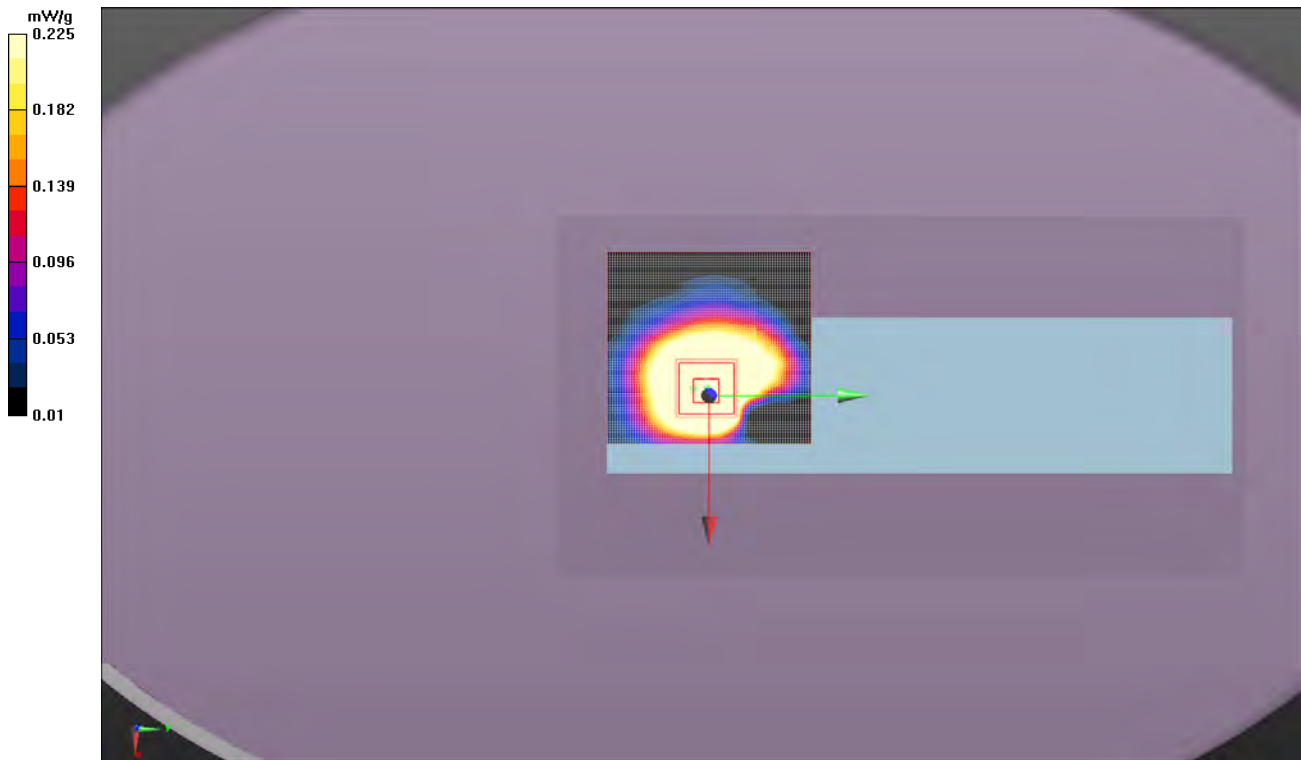
Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (interpolated) = 0.964 mW/g

Body/Body/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 14.424 V/m; Power Drift = -0.02 dB  
Peak SAR (extrapolated) = 1.620 W/kg  
SAR(1 g) = 0.504 mW/g; SAR(10 g) = 0.200 mW/g

Info: Interpolated medium parameters used for SAR evaluation.  
Maximum value of SAR (measured) = 0.915 mW/g

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 6.498 V/m



## EMC

## SAR TEST DATA

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 23.9 | Humidity (%):             | 52.1   | Test Date: | 07/29/11         |
| Liquid Temperature (°C): | 22.2 | Barometric Pressure (mb): | 1015.2 | Tested by: | Ethan Schoonover |

## Body Test 24 7-29-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5260 MHz

Medium parameters used (interpolated):  $f = 5260$  MHz;  $\sigma = 5.32$  mho/m;  $\epsilon = 47.709$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $\sigma = 5.30871$  mho/m,  $\epsilon = 47.7311$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.8, 3.8, 3.8); Calibrated: 11/11/2010

Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 0mm (Fix Surface)

Electronics: DAE4 Sn1237; Calibrated: 11/10/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096

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

**Body/Body/Reference scan (51x101x1):** Measurement grid: dx=30mm, dy=30mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 0.094 mW/g

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

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 0.157 mW/g

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

Reference Value = 5.509 V/m; Power Drift = 0.23 dB

Peak SAR (extrapolated) = 0.204 W/kg

**SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.027 mW/g**

Info: Interpolated medium parameters used for SAR evaluation.

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

**Body/Body/Zoom Scan 2 (11x9x9)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 5.509 V/m; Power Drift = 0.28 dB

Peak SAR (extrapolated) = 0.202 W/kg

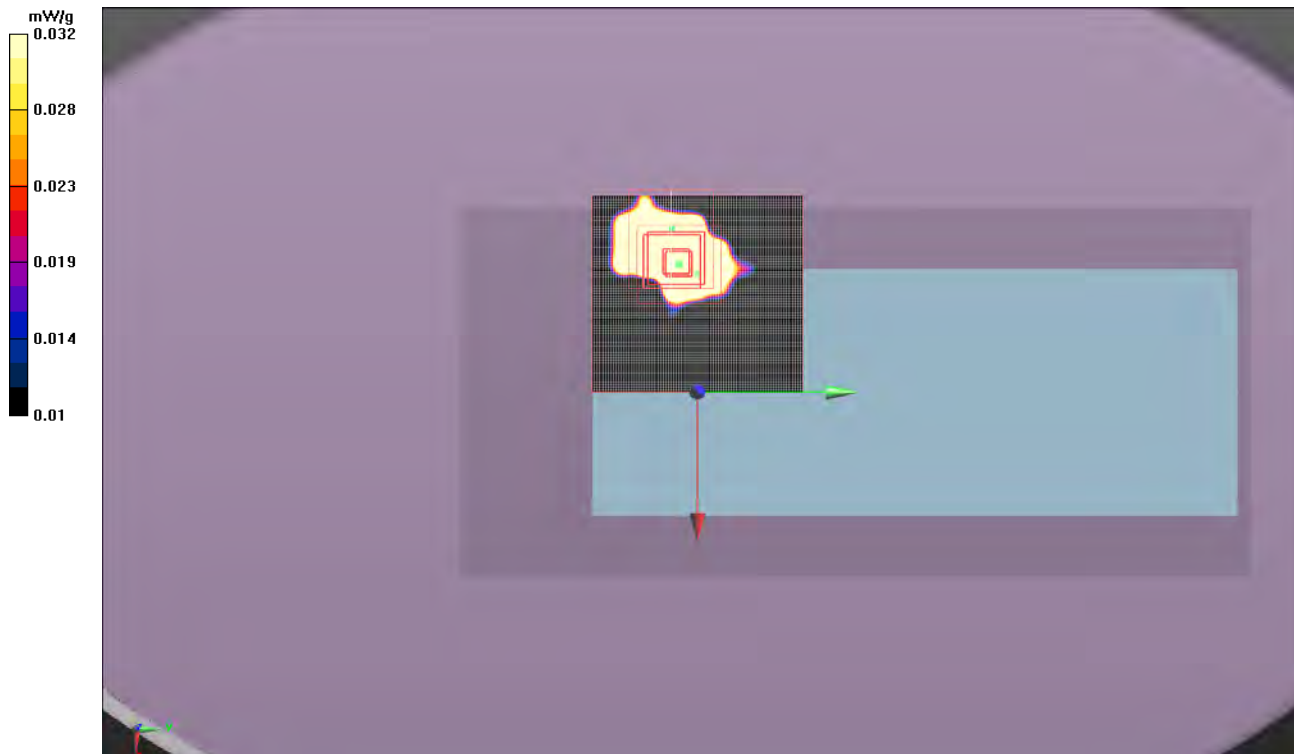
**SAR(1 g) = 0.063 mW/g; SAR(10 g) = 0.024 mW/g**

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.118 mW/g

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

Maximum value of Total (measured) = 2.441 V/m



**EMC****SAR TEST DATA**

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 22.7 | Humidity (%):             | 45.9   | Test Date: | 07/27/11         |
| Liquid Temperature (°C): | 21.9 | Barometric Pressure (mb): | 1020.7 | Tested by: | Ethan Schoonover |

**Body Test 29, 7-27-11**

**DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275**

Communication System: CW; Frequency: 5600 MHz

Medium parameters used:  $\sigma = 5.77422$  mho/m,  $\epsilon_r = 47.0659$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $f = 5600$  MHz;  $\sigma = 5.774$  mho/m;  $\epsilon_r = 47.066$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.69, 3.69, 3.69); Calibrated: 11/11/2010

Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 2mm (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/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of Total (measured) = 4.686 V/m

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

Reference Value = 9.932 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.097 W/kg

**SAR(1 g) = 0.329 mW/g; SAR(10 g) = 0.134 mW/g**

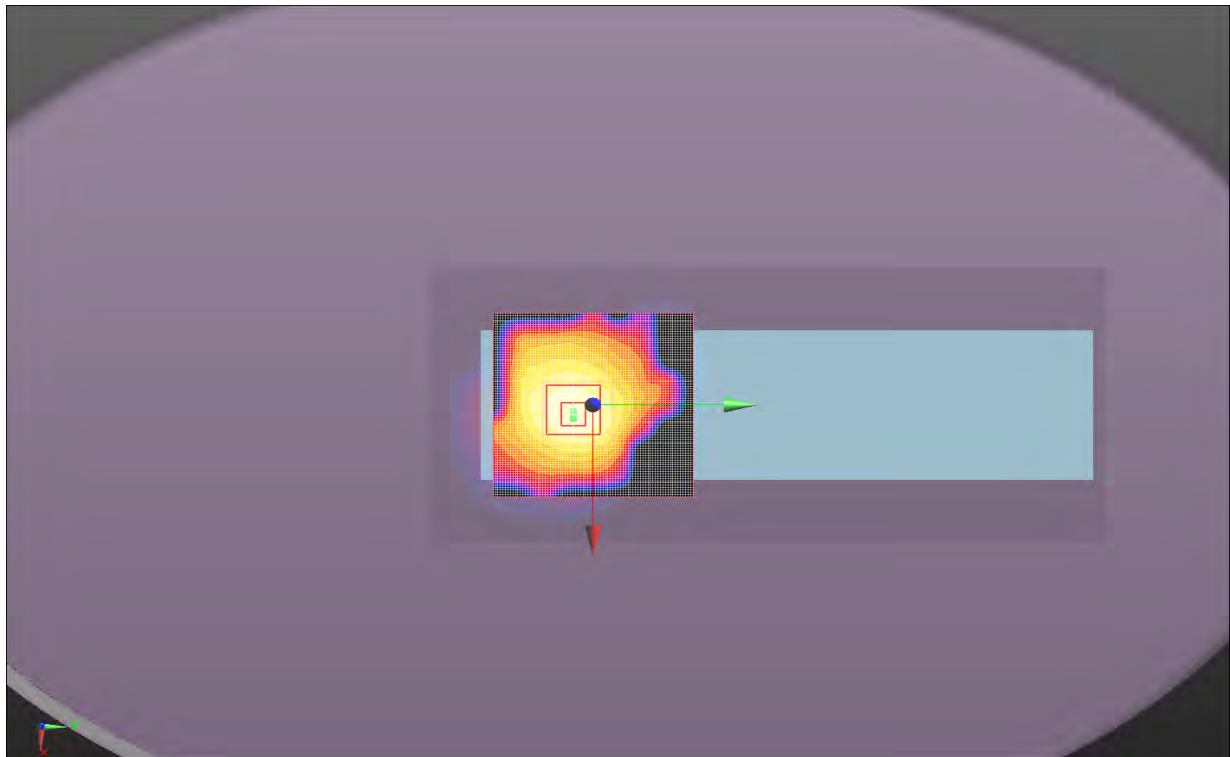
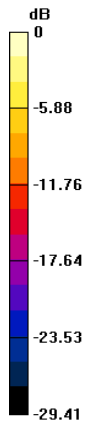
Maximum value of SAR (measured) = 0.596 mW/g

**Body/Body/Reference scan (41x91x1):** Measurement grid: dx=30mm, dy=30mm

Maximum value of SAR (interpolated) = 0.609 mW/g

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

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



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 22.7 | Humidity (%):             | 45.9   | Test Date: | 07/27/11         |  |
| Liquid Temperature (°C): | 21.9 | Barometric Pressure (mb): | 1020.7 | Tested by: | Ethan Schoonover |  |

Body Test 30, 7-27-11

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5600 MHz  
Medium parameters used:  $\sigma = 5.77422 \text{ mho/m}$ ,  $\epsilon = 47.0659$ ;  $\rho = 1000 \text{ kg/m}^3$  , Medium parameters used:  $f = 5600 \text{ MHz}$ ;  $\sigma = 5.774 \text{ mho/m}$ ;  $\epsilon = 47.066$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

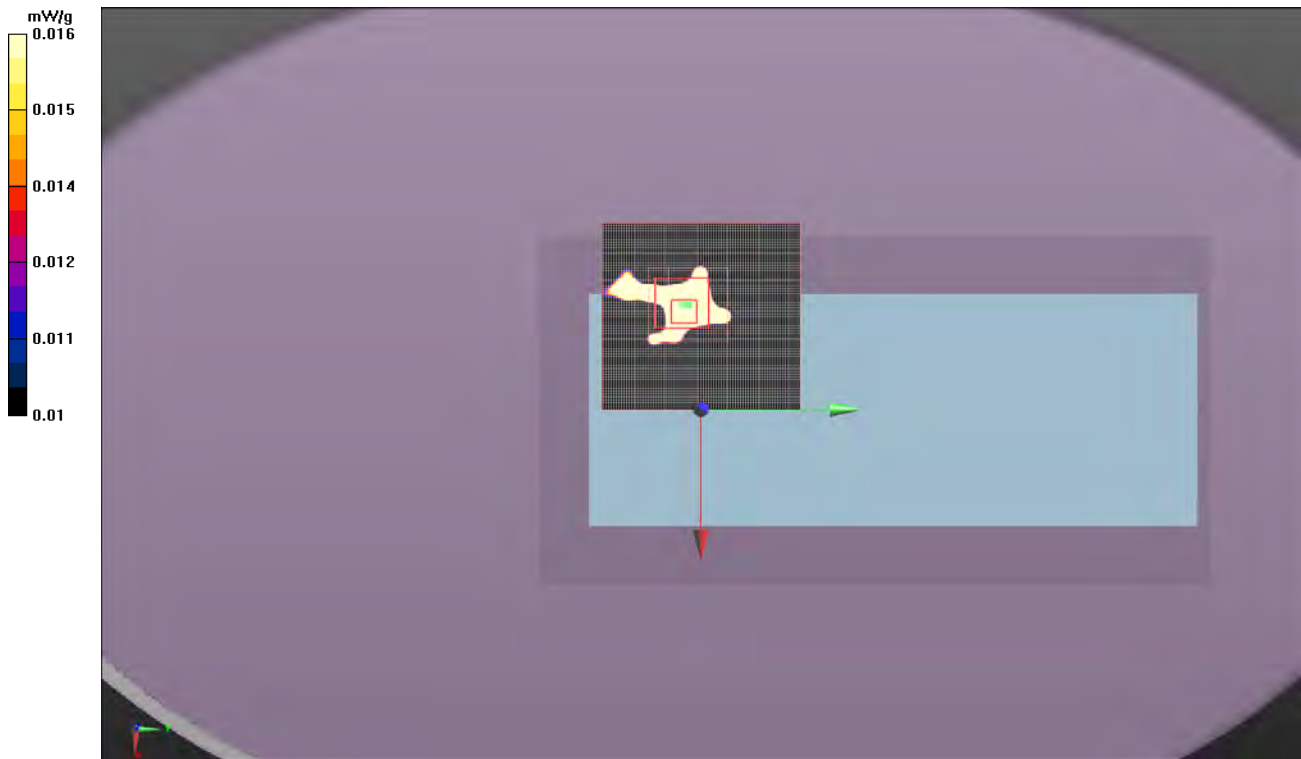
Probe: EX3DV4 - SN3746; ConvF(3.69, 3.69, 3.69); Calibrated: 11/11/2010  
Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 2mm (Mechanical Surface Detection)  
Electronics: DAE4 Sn1237; Calibrated: 11/10/2010  
Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1096  
Measurement SW: DASYS2, Version 52.6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

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 1.681 V/m

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 0 V/m; Power Drift = 0 dB  
Peak SAR (extrapolated) = 0.277 W/kg  
SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.015 mW/g  
Maximum value of SAR (measured) = 0.088 mW/g

Body/Body/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm  
Maximum value of SAR (interpolated) = 0.110 mW/g

Body/Body/Area scan (81x81x1): Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.219 mW/g



|                          |      |                           |        |            |                  |  |
|--------------------------|------|---------------------------|--------|------------|------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07   |  |
| EMC                      |      | SAR TEST DATA             |        |            |                  |  |
| Room Temperature (°C):   | 23.4 | Humidity (%):             | 49.7   | Test Date: | 07/28/11         |  |
| Liquid Temperature (°C): | 22.1 | Barometric Pressure (mb): | 1021.6 | Tested by: | Jennifer Herrett |  |

Body Test 35

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5745 MHz  
Medium parameters used:  $\sigma = 5.97517$  mho/m,  $\epsilon = 46.7914$ ;  $\rho = 1000$  kg/m<sup>3</sup> , Medium parameters used (interpolated): f = 5745 MHz;  $\sigma = 5.969$  mho/m;  $\epsilon = 46.799$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

Body/Body/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 4.405 V/m

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

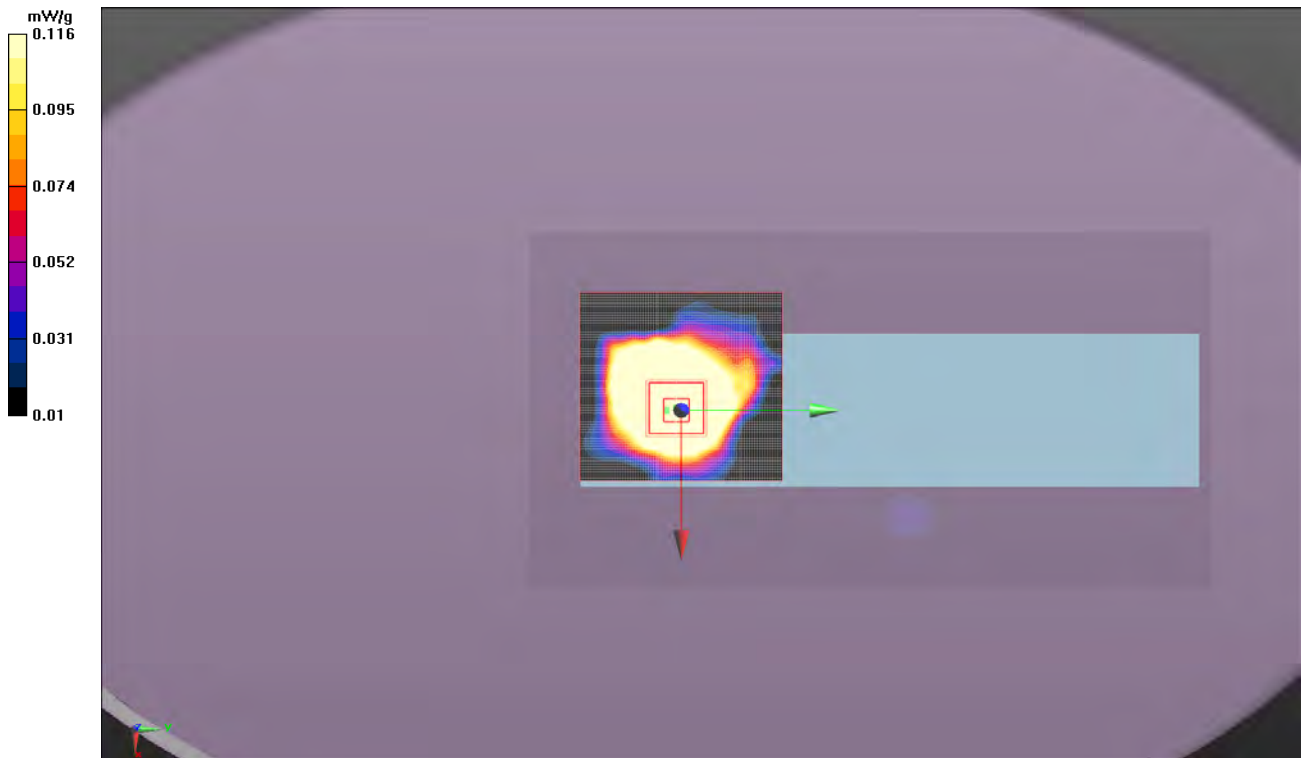
Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.615 mW/g

Body/Body/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.645 mW/g

Body/Body/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 11.231 V/m; Power Drift = -0.0055 dB  
Peak SAR (extrapolated) = 1.139 W/kg  
SAR(1 g) = 0.311 mW/g; SAR(10 g) = 0.117 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.595 mW/g



|                          |      |                           |        |            |                                       |  |
|--------------------------|------|---------------------------|--------|------------|---------------------------------------|--|
| NORTHWEST                |      |                           |        |            | SAR 2011.02.07                        |  |
| EMC                      |      | SAR TEST DATA             |        |            |                                       |  |
| Room Temperature (°C):   | 23.4 | Humidity (%):             | 47     | Test Date: | 07/28/11                              |  |
| Liquid Temperature (°C): | 22   | Barometric Pressure (mb): | 1021.6 | Tested by: | Jennifer Herrett and Ethan Schoonover |  |

Body Test 36

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

Communication System: CW; Frequency: 5745 MHz  
Medium parameters used:  $\sigma = 5.97517$  mho/m,  $\epsilon = 46.7914$ ;  $\rho = 1000$  kg/m<sup>3</sup> , Medium parameters used (interpolated): f = 5745 MHz;  $\sigma = 5.969$  mho/m;  $\epsilon = 46.799$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3746; ConvF(3.87, 3.87, 3.87); Calibrated: 11/11/2010  
Sensor-Surface: 0mm (Fix Surface), Sensor-Surface: 2mm (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/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Maximum value of Total (measured) = 2.523 V/m

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

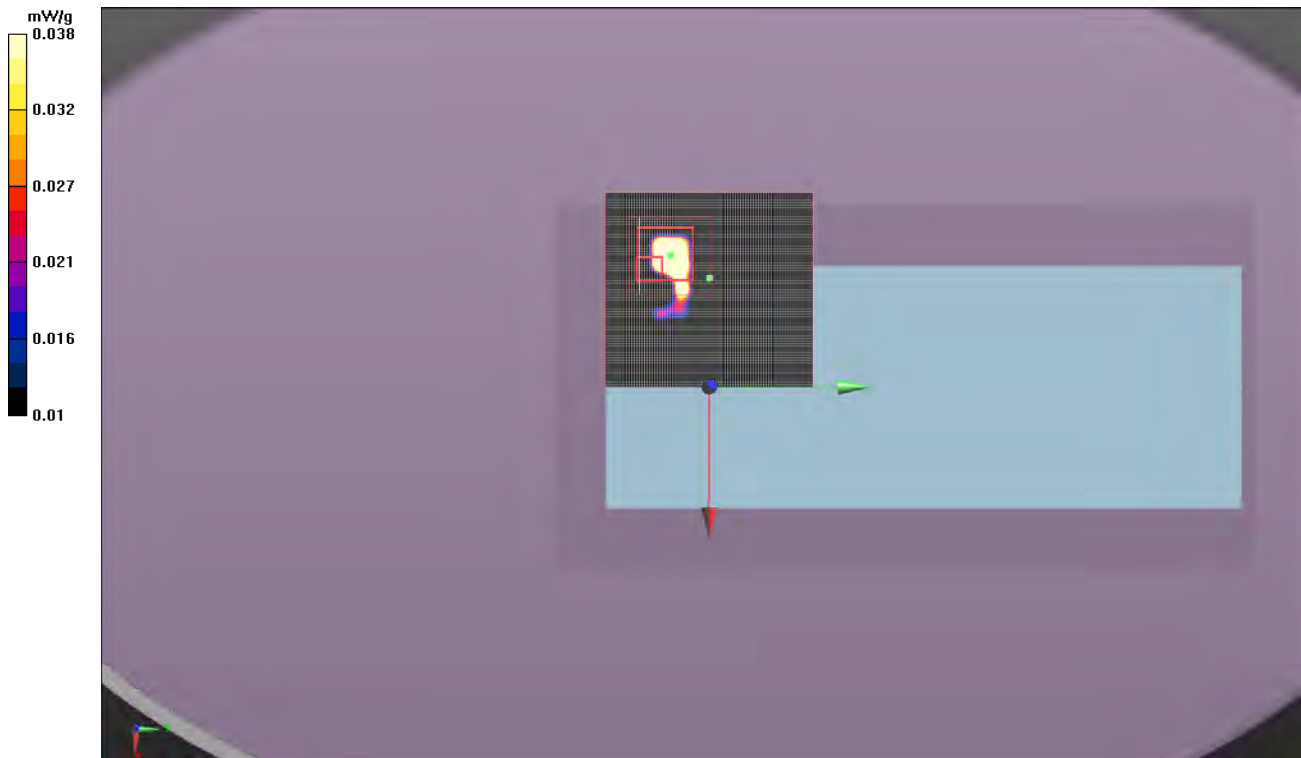
Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.202 mW/g

Body/Body/Reference scan (51x91x1): Measurement grid: dx=30mm, dy=30mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (interpolated) = 0.052 mW/g

Body/Body/Zoom Scan (9x9x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm  
Reference Value = 0 V/m; Power Drift = 999.0 dB  
Peak SAR (extrapolated) = 0.775 W/kg  
SAR(1 g) = 0.041 mW/g; SAR(10 g) = 0.021 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)  
Maximum value of SAR (measured) = 0.775 mW/g



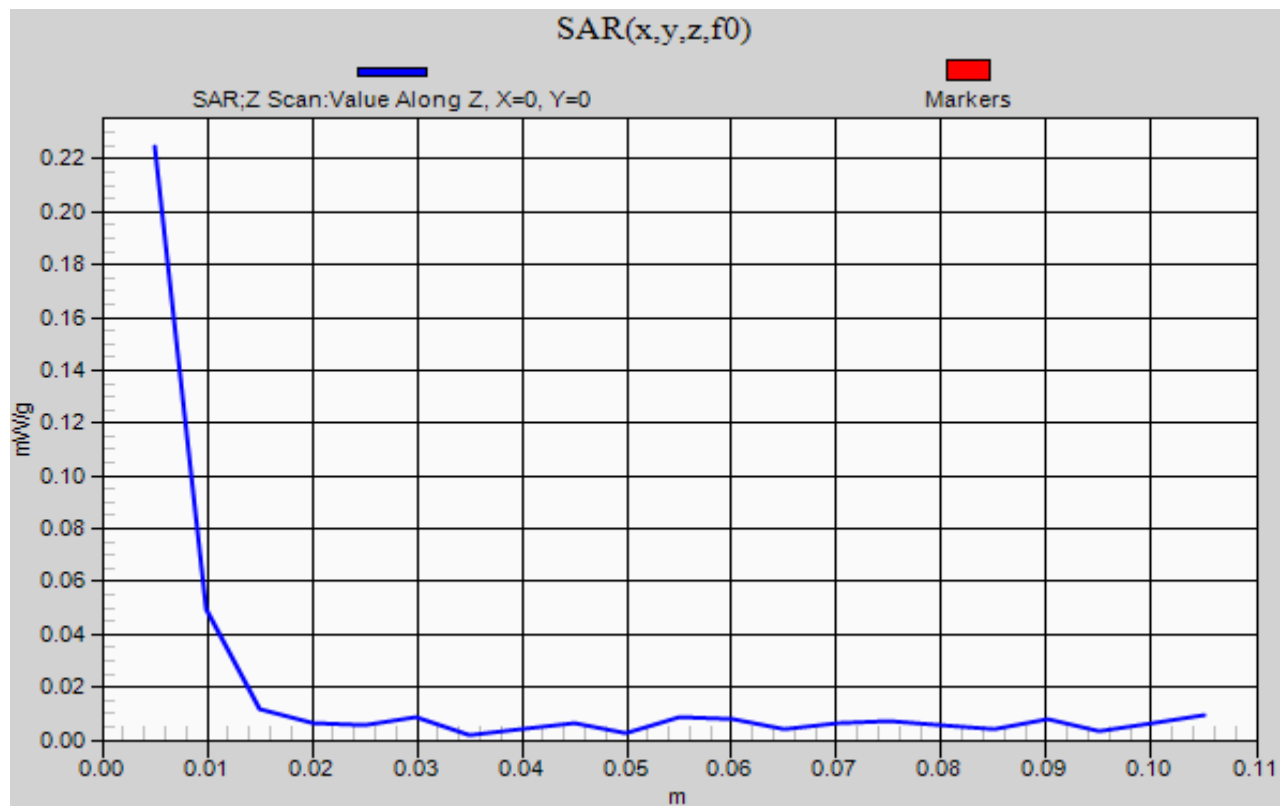
## EMC

## SAR TEST DATA

|                          |      |                           |        |            |                  |
|--------------------------|------|---------------------------|--------|------------|------------------|
| Room Temperature (°C):   | 23.5 | Humidity (%):             | 52.7   | Test Date: | 07/29/11         |
| Liquid Temperature (°C): | 21.9 | Barometric Pressure (mb): | 1019.2 | Tested by: | Jennifer Herrett |

## Body Test 23 7-29-11b

DUT: Handheld Computer (C1); Type: 1001CP01S; Serial: 28311047275

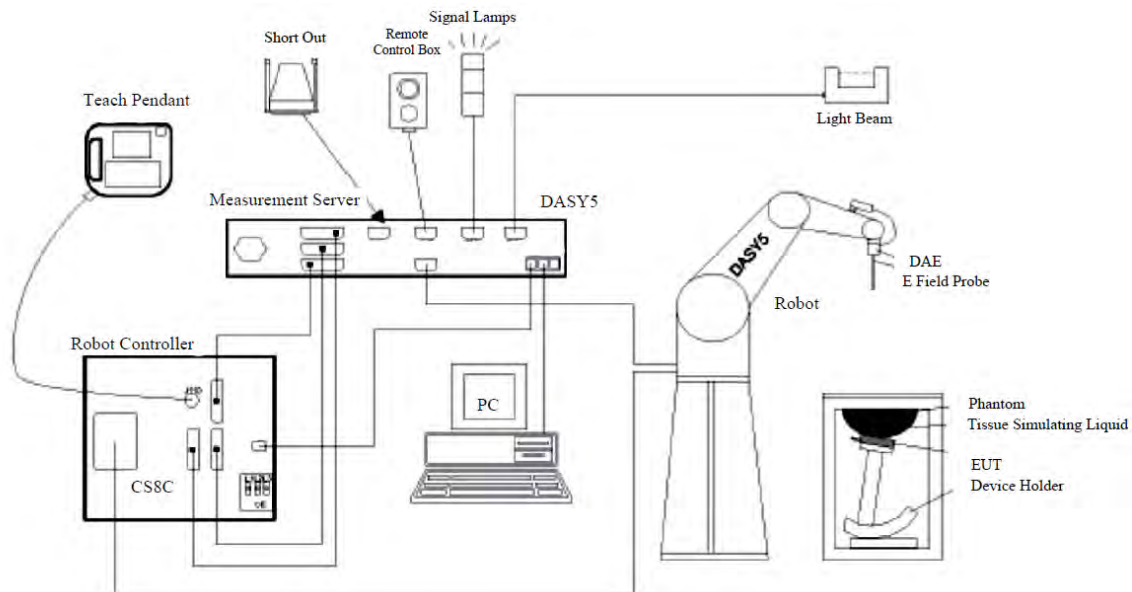


## SAR Measurement System

## Schmid &amp; Partner Engineering AG, DASY52

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

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



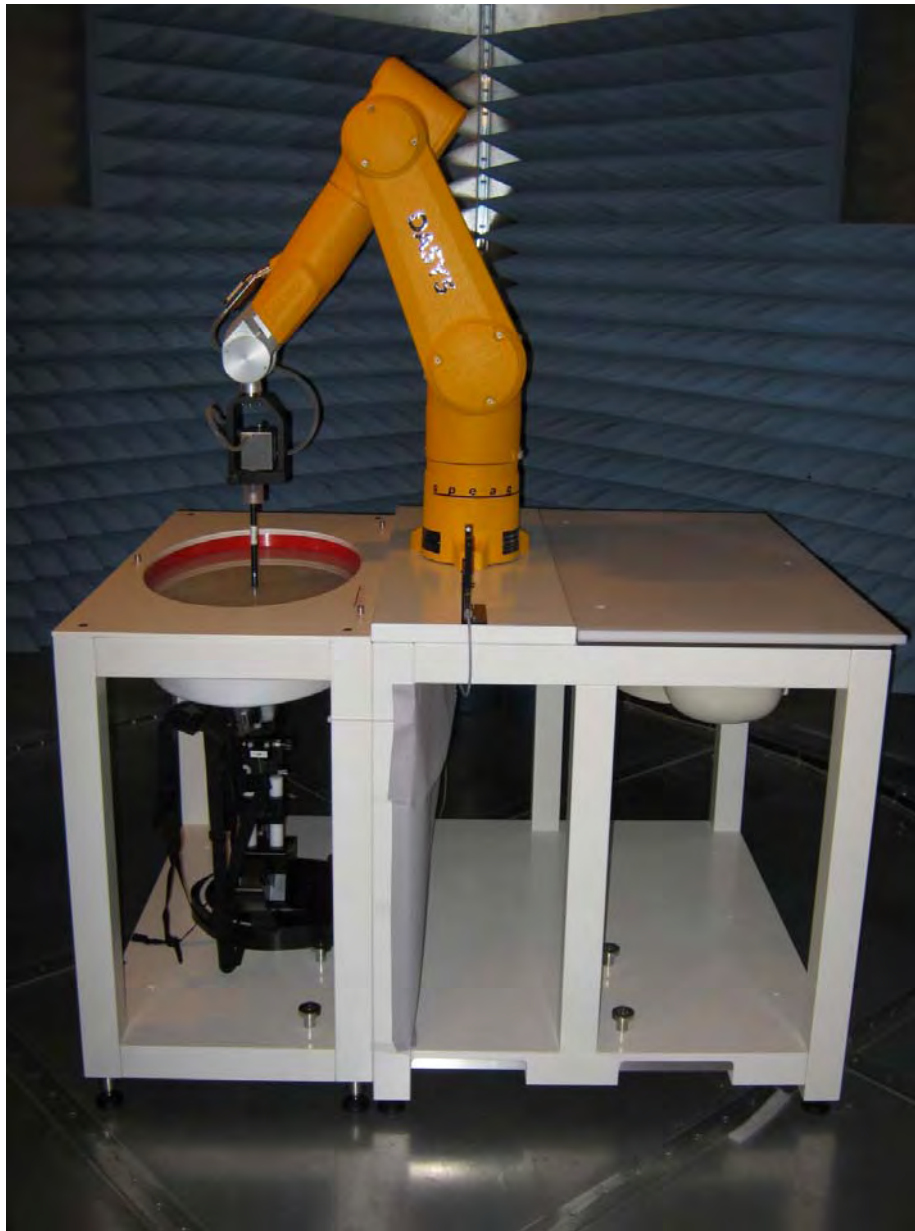
- A standard high precision 6-axis robot (Staubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE)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

**Test Site**

**Northwest EMC, Lab EV08**

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

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



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

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

|                         |                                |                |
|-------------------------|--------------------------------|----------------|
| Northwest<br><b>EMC</b> | <b>Measurement Uncertainty</b> | Rev 12/09/2010 |
|-------------------------|--------------------------------|----------------|

## Measurement Uncertainty Budgets per IEEE 1528:2003

### 300 – 3000 MHz range

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

**3 – 6 GHz range**

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

**Probe Calibration**

Please see attached calibration data

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



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

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

Accreditation No.: SCS 108

Client Northwest EMC

Certificate No: EX3-3746\_Nov10

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3746

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

Calibration date: November 11, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

Issued: November 11, 2010

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



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

Accreditation No.: **SCS 108**

## Glossary:

|                          |                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                      | tissue simulating liquid                                                                                                                                |
| NORM <sub>x,y,z</sub>    | sensitivity in free space                                                                                                                               |
| ConvF                    | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                              |
| DCP                      | diode compression point                                                                                                                                 |
| CF                       | crest factor (1/duty_cycle) of the RF signal                                                                                                            |
| A, B, C                  | modulation dependent linearization parameters                                                                                                           |
| Polarization $\varphi$   | $\varphi$ rotation around probe axis                                                                                                                    |
| Polarization $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center),<br>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<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not effect the  $E^2$ -field uncertainty inside TSL (see below *ConvF*).
- NORM( $f$ )<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* *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<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: 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<sub>x,y,z</sub> \* *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  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

# Probe EX3DV4

## SN:3746

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

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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

Basic Calibration Parameters

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

Modulation Calibration Parameters

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

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

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).  
<sup>B</sup> Numerical linearization parameter: uncertainty not required.  
<sup>E</sup> Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

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

Calibration Parameter Determined in Head Tissue Simulating Media

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

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

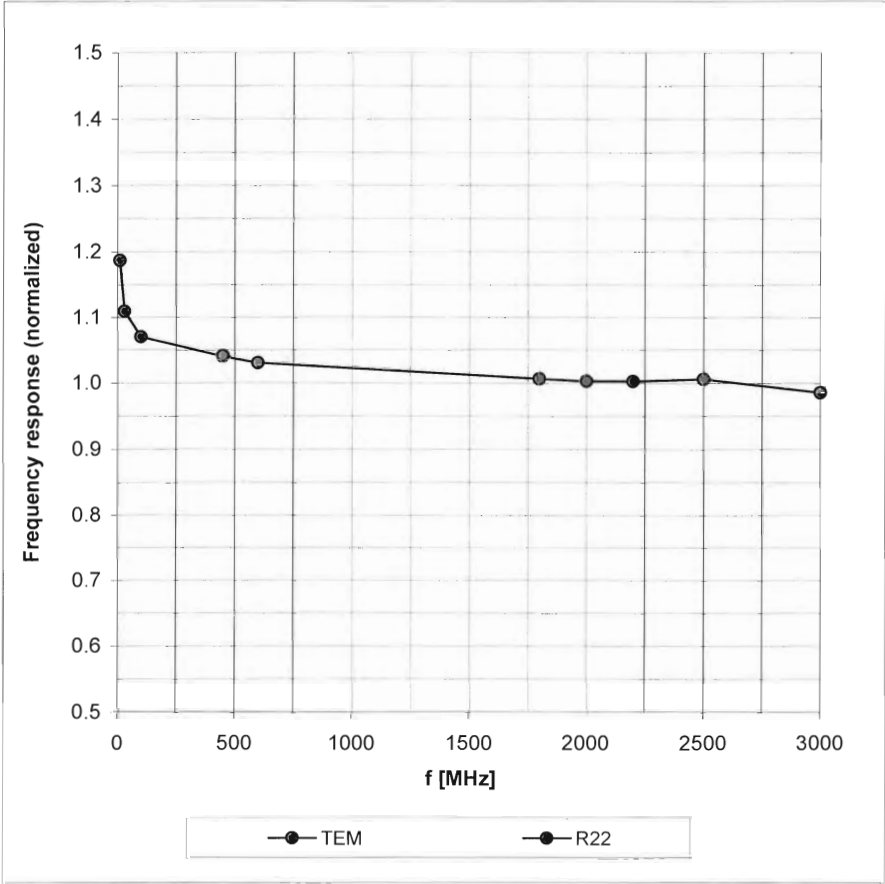
DASY/EASY - Parameters of Probe: EX3DV4 SN:3746

Calibration Parameter Determined in Body Tissue Simulating Media

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

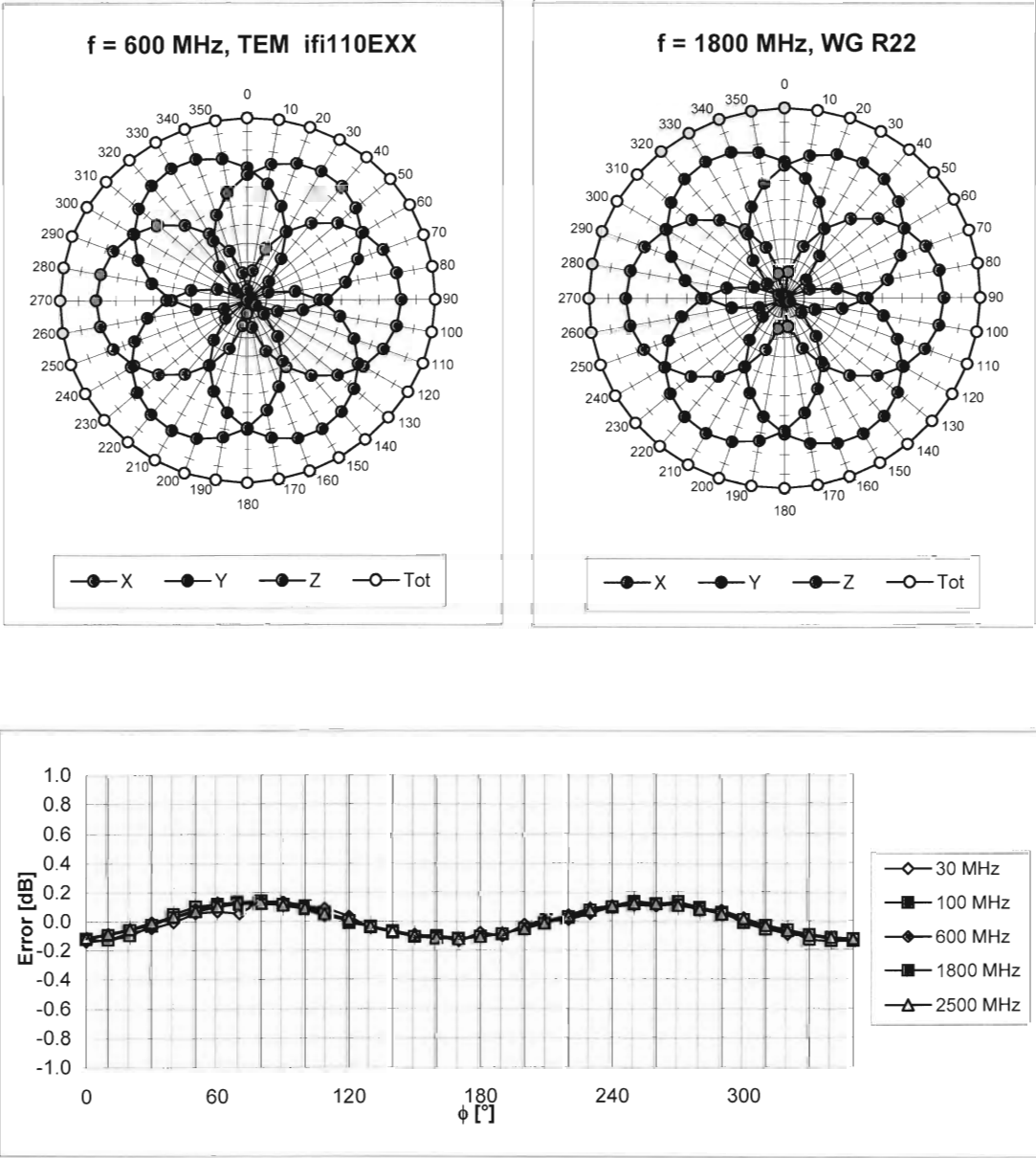
<sup>c</sup> The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Frequency Response of E-Field  
(TEM-Cell:ifi110 EXX, Waveguide: R22)



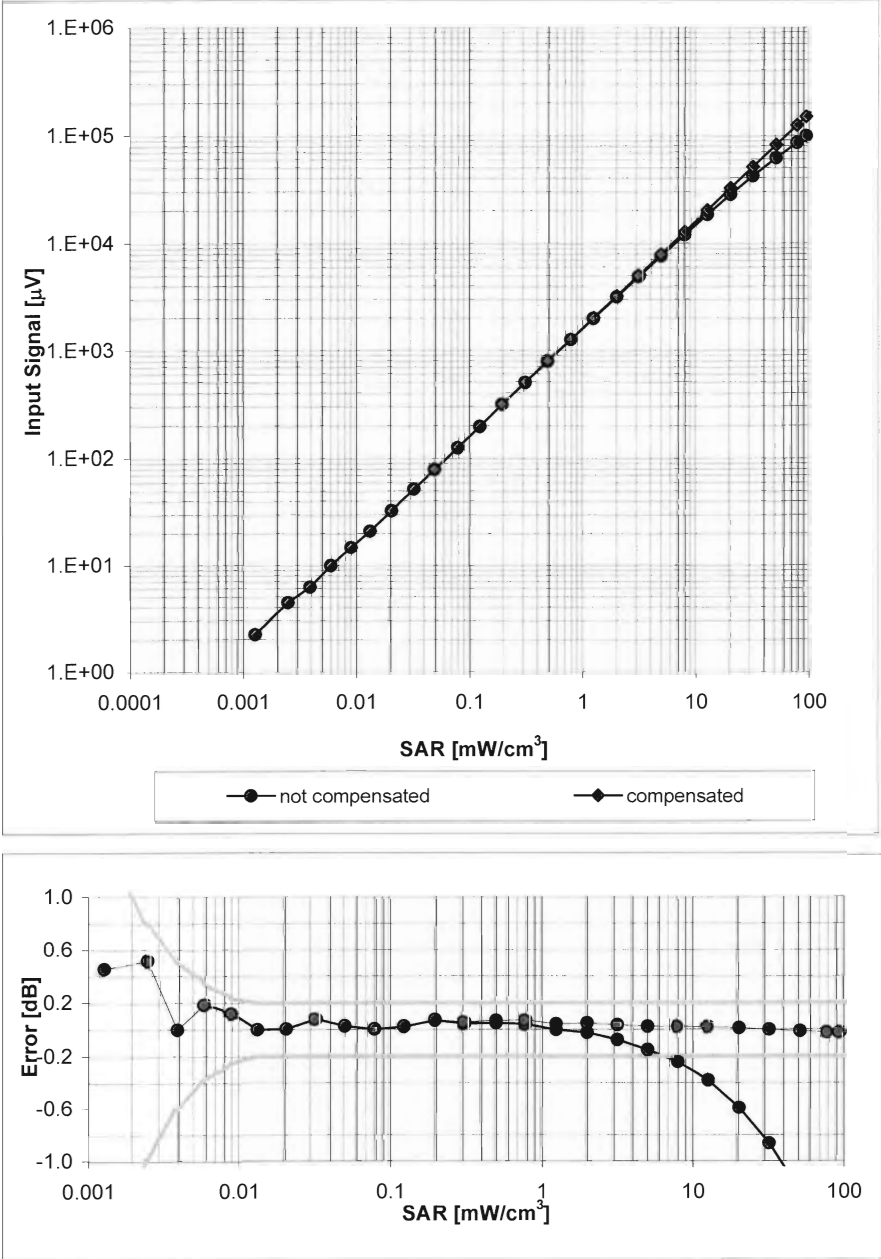
Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

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



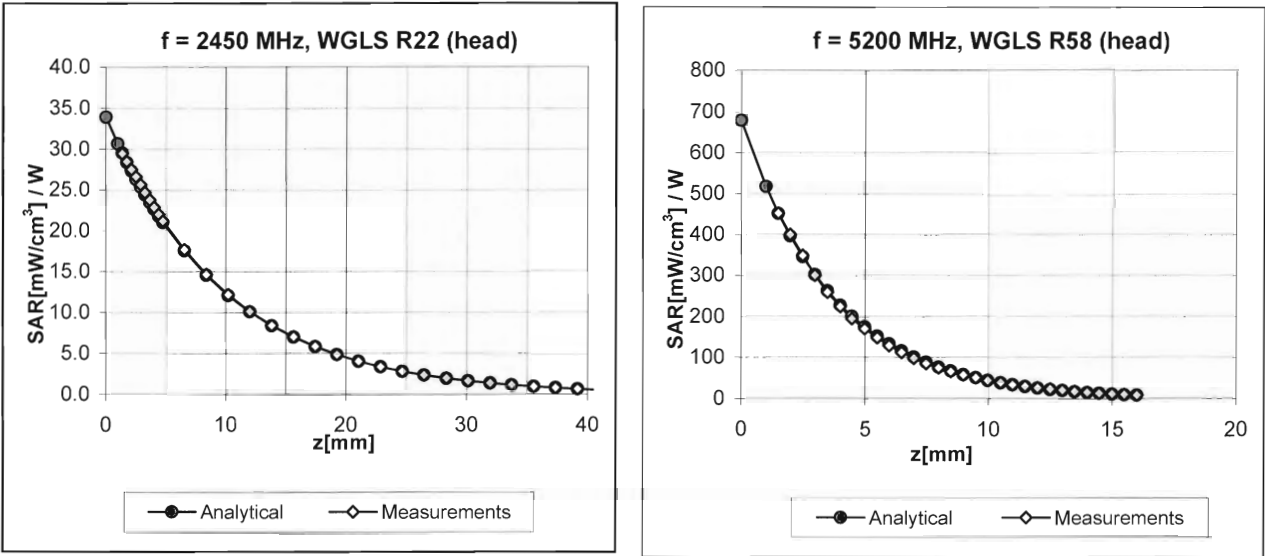
Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

Dynamic Range f(SAR<sub>head</sub>)  
(Waveguide R22, f = 1800 MHz)



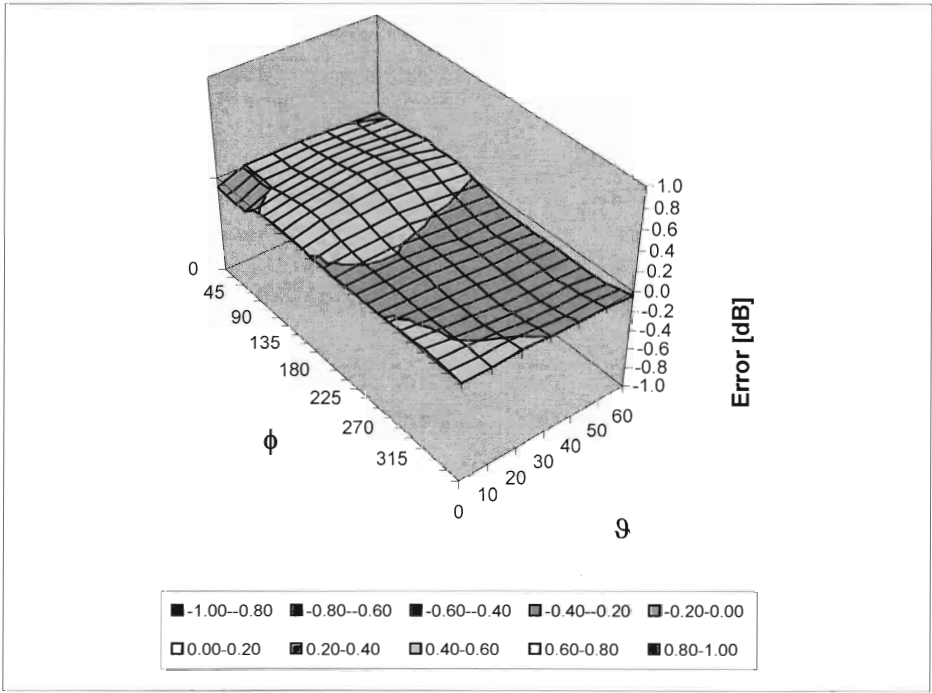
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error ( $\phi$ ,  $\vartheta$ ), f = 900 MHz



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

Other Probe Parameters

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

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

Accreditation No.: SCS 108

Client Northwest EMC

Certificate No: D2450V2-855\_Nov10

CALIBRATION CERTIFICATE

Object D2450V2 - SN: 855

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

Calibration date: November 11, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704         | 06-Oct-10 (No. 217-01266)         | Oct-11                 |
| Power sensor HP 8481A       | US37292783         | 06-Oct-10 (No. 217-01266)         | Oct-11                 |
| Reference 20 dB Attenuator  | SN: 5086 (20g)     | 30-Mar-10 (No. 217-01158)         | Mar-11                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 30-Mar-10 (No. 217-01162)         | Mar-11                 |
| Reference Probe ES3DV3      | SN: 3205           | 30-Apr-10 (No. ES3-3205_Apr10)    | Apr-11                 |
| DAE4                        | SN: 601            | 10-Jun-10 (No. DAE4-601_Jun10)    | Jun-11                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| RF generator R&S SMT-06     | 100005             | 4-Aug-99 (in house check Oct-09)  | In house check: Oct-11 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-10) | In house check: Oct-11 |

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

Issued: November 12, 2010

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Measurement Conditions

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

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

Head TSL parameters

The following parameters and calculations were applied.

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

SAR result with Head TSL

|                                                       |                    |                           |
|-------------------------------------------------------|--------------------|---------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                           |
| SAR measured                                          | 250 mW input power | 13.1 mW / g               |
| SAR normalized                                        | normalized to 1W   | 52.4 mW / g               |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 53.4 mW /g ± 17.0 % (k=2) |

|                                                         |                    |                           |
|---------------------------------------------------------|--------------------|---------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                           |
| SAR measured                                            | 250 mW input power | 6.13 mW / g               |
| SAR normalized                                          | normalized to 1W   | 24.5 mW / g               |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 24.7 mW /g ± 16.5 % (k=2) |

Body TSL parameters

The following parameters and calculations were applied.

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

SAR result with Body TSL

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

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

# Appendix

## Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 54.0 $\Omega$ + 2.1 j $\Omega$ |
| Return Loss                          | - 27.2 dB                      |

## Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 49.5 $\Omega$ + 5.0 j $\Omega$ |
| Return Loss                          | - 26.0 dB                      |

## General Antenna Parameters and Design

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

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

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

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

## Additional EUT Data

|                 |                   |
|-----------------|-------------------|
| Manufactured by | SPEAG             |
| Manufactured on | November 10, 2009 |

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL U12 BB

Medium parameters used:  $f = 2450 \text{ MHz}$ ;  $\sigma = 1.72 \text{ mho/m}$ ;  $\epsilon_r = 38.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

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

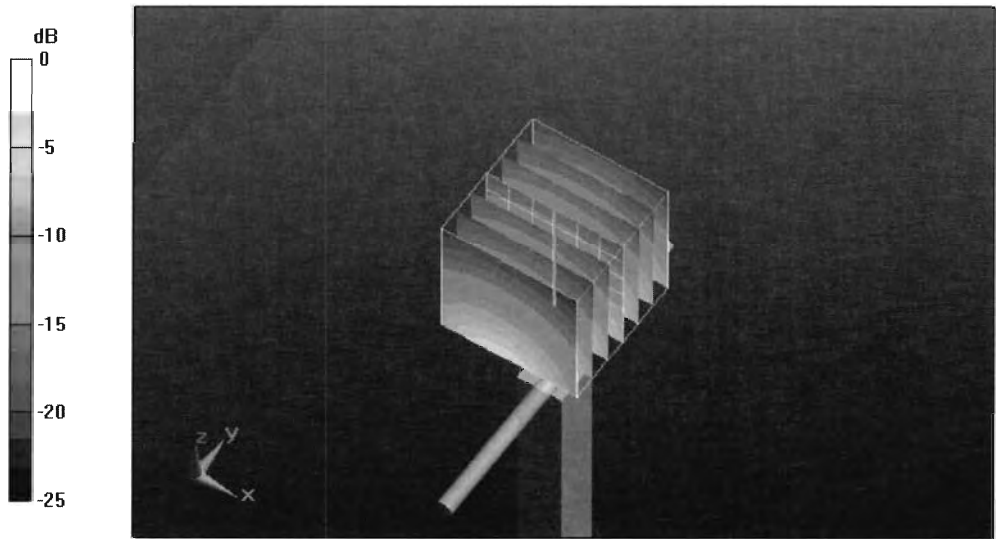
**Pin=250 mW/d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

Peak SAR (extrapolated) = 26.8 W/kg

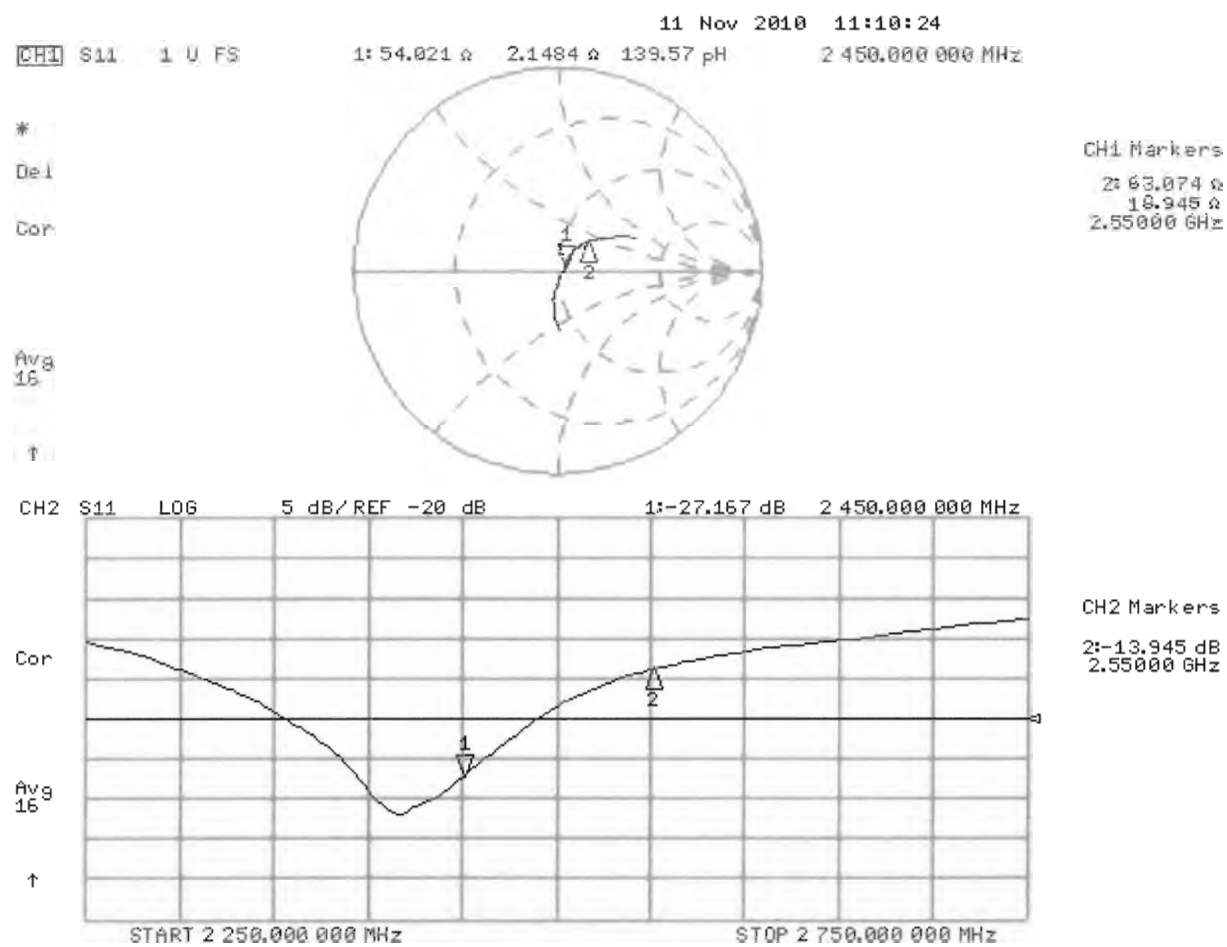
**SAR(1 g) = 13.1 mW/g; SAR(10 g) = 6.13 mW/g**

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



0 dB = 16.7mW/g

Impedance Measurement Plot for Head TSL



Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: MSL U12 BB

Medium parameters used:  $f = 2450 \text{ MHz}$ ;  $\sigma = 1.92 \text{ mho/m}$ ;  $\epsilon_r = 52.3$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

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

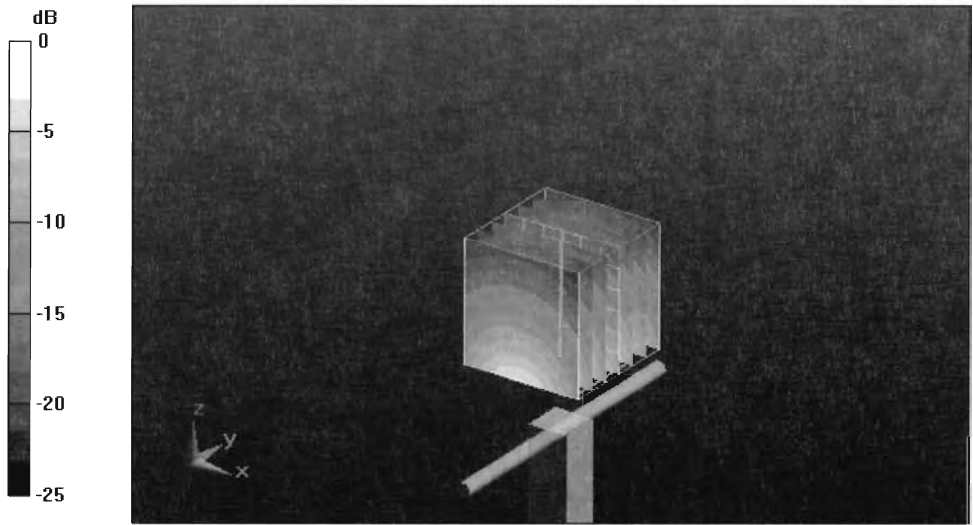
**Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

Peak SAR (extrapolated) = 26.7 W/kg

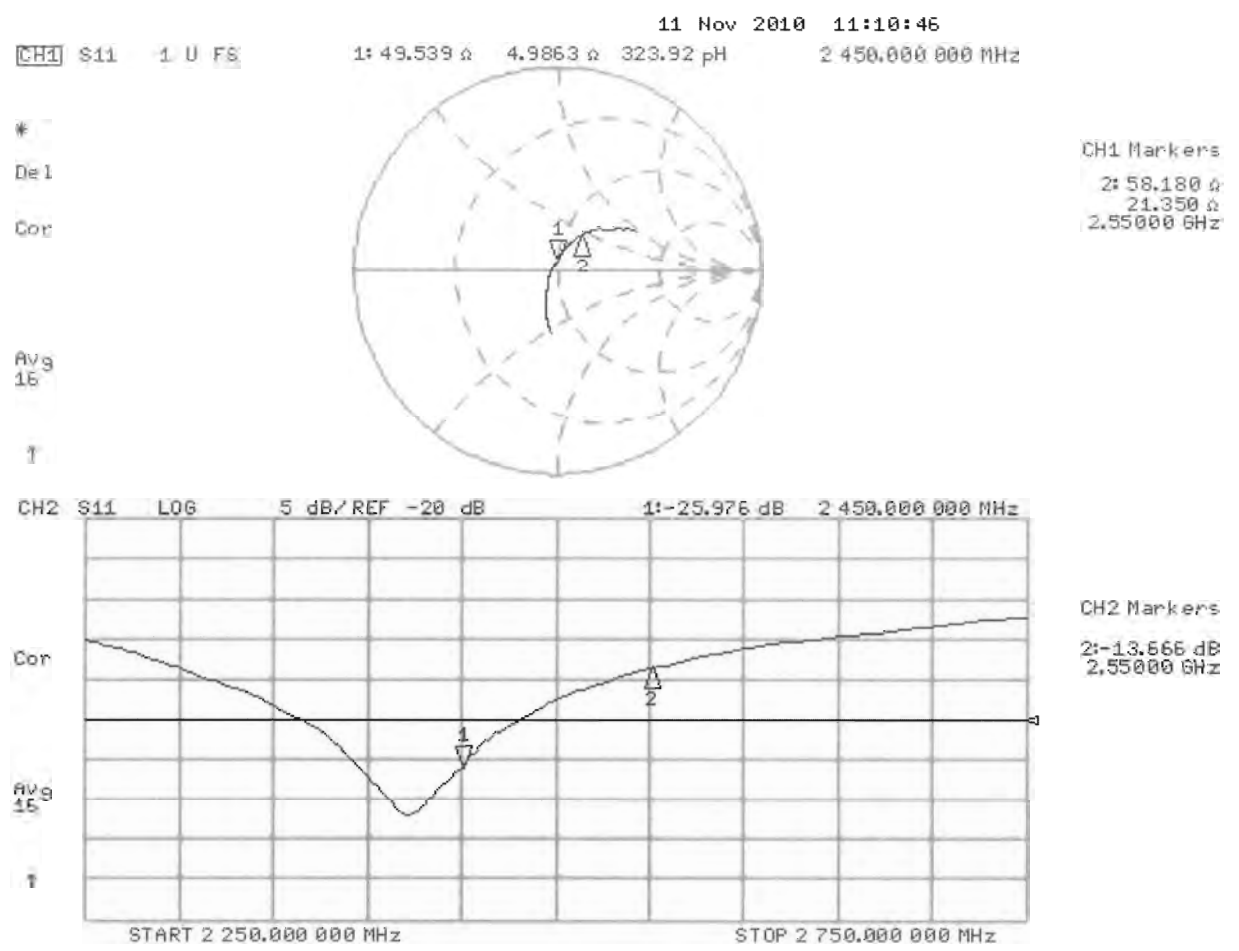
**SAR(1 g) = 12.8 mW/g; SAR(10 g) = 5.96 mW/g**

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



0 dB = 16.9mW/g

Impedance Measurement Plot for Body TSL



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

Accreditation No.: **SCS 108**

Client **Northwest EMC**

Certificate No: **D5GHzV2-1066\_Nov10**

## CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN: 1066**

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

Calibration date: **November 16, 2010**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704         | 06-Oct-10 (No. 217-01266)         | Oct-11                 |
| Power sensor HP 8481A       | US37292783         | 06-Oct-10 (No. 217-01266)         | Oct-11                 |
| Reference 20 dB Attenuator  | SN: 5086 (20g)     | 30-Mar-10 (No. 217-01158)         | Mar-11                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 30-Mar-10 (No. 217-01162)         | Mar-11                 |
| Reference Probe EX3DV4      | SN: 3503           | 05-Mar-10 (No. EX3-3503_Mar10)    | Mar-11                 |
| DAE4                        | SN: 601            | 10-Jun-10 (No. DAE4-601_Jun10)    | Jun-11                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| RF generator R&S SMT-06     | 100005             | 4-Aug-99 (in house check Oct-09)  | In house check: Oct-11 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-10) | In house check: Oct 11 |

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

Issued: November 17, 2010

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

Accreditation No.: **SCS 108**

### Glossary:

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

### Calibration is Performed According to the Following Standards:

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

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

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

## Measurement Conditions

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

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

## Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>      | 22.0 °C             | 36.0           | 4.66 mho/m           |
| <b>Measured Head TSL parameters</b>     | (22.0 $\pm$ 0.2) °C | 37.2 $\pm$ 6 % | 4.59 mho/m $\pm$ 6 % |
| <b>Head TSL temperature during test</b> | (21.7 $\pm$ 0.2) °C | ----           | ----                 |

## SAR result with Head TSL at 5200 MHz

|                                                             |                    |                                                  |
|-------------------------------------------------------------|--------------------|--------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | condition          |                                                  |
| SAR measured                                                | 100 mW input power | 8.33 mW / g                                      |
| SAR normalized                                              | normalized to 1W   | 83.3 mW / g                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>83.8 mW / g <math>\pm</math> 19.9 % (k=2)</b> |

|                                                               |                    |                                                  |
|---------------------------------------------------------------|--------------------|--------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                  |
| SAR measured                                                  | 100 mW input power | 2.35 mW / g                                      |
| SAR normalized                                                | normalized to 1W   | 23.5 mW / g                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>23.6 mW / g <math>\pm</math> 19.5 % (k=2)</b> |

## Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

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

## SAR result with Head TSL at 5500 MHz

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

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

## Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

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

## SAR result with Head TSL at 5800 MHz

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

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

## Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

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

## SAR result with Body TSL at 5200 MHz

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

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

## Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

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

## SAR result with Body TSL at 5500 MHz

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

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

## Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

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

## SAR result with Body TSL at 5800 MHz

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

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

## Appendix

### Antenna Parameters with Head TSL at 5200 MHz

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

### Antenna Parameters with Head TSL at 5500 MHz

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

### Antenna Parameters with Head TSL at 5800 MHz

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

### Antenna Parameters with Body TSL at 5200 MHz

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

### Antenna Parameters with Body TSL at 5500 MHz

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

### Antenna Parameters with Body TSL at 5800 MHz

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

## General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.198 ns |
|----------------------------------|----------|

After long term use with 40 W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

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

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

## Additional EUT Data

|                 |                   |
|-----------------|-------------------|
| Manufactured by | SPEAG             |
| Manufactured on | November 27, 2006 |

## DASY5 Validation Report for Head TSL

/Time: 15.11.2010 13:45:25

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL 501

Medium parameters used:  $f = 5200$  MHz;  $\sigma = 4.6$  mho/m;  $\epsilon_r = 37.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>,

Medium parameters used:  $f = 5500$  MHz;  $\sigma = 4.91$  mho/m;  $\epsilon_r = 36.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>,

Medium parameters used:  $f = 5800$  MHz;  $\sigma = 5.22$  mho/m;  $\epsilon_r = 36.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

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

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

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

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

Peak SAR (extrapolated) = 32.1 W/kg

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

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

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

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

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

Peak SAR (extrapolated) = 36.3 W/kg

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

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

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

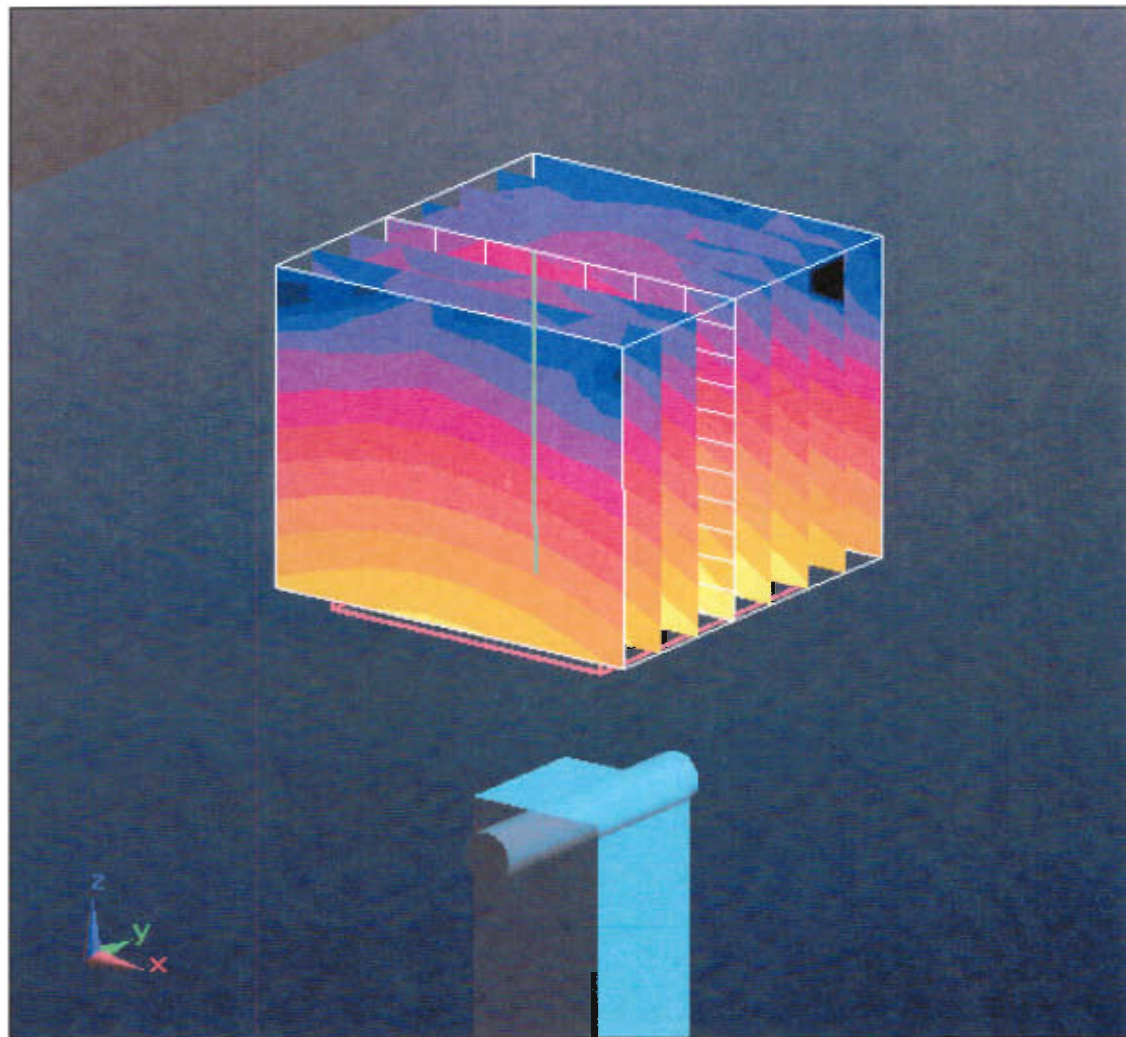
Measurement grid: dx=4mm, dy=4mm, dz=2mm

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

Peak SAR (extrapolated) = 34.8 W/kg

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

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



0 dB = 16.4mW/g

## Impedance Measurement Plot for Head TSL

15 Nov 2010 09:44:56

CH1 S11 1 U FS

31 51.168  $\Omega$  -6.9785  $\Omega$  4.3859 pF 5 200.000 000 MHz

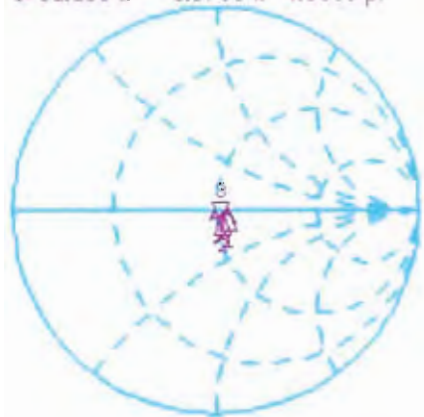
\*

Del

Cor

avg

16



CH1 Markers

1: 55.984  $\Omega$

-365.23  $\Omega$

5.80000 GHz

2: 52.627  $\Omega$

-2.7576  $\Omega$

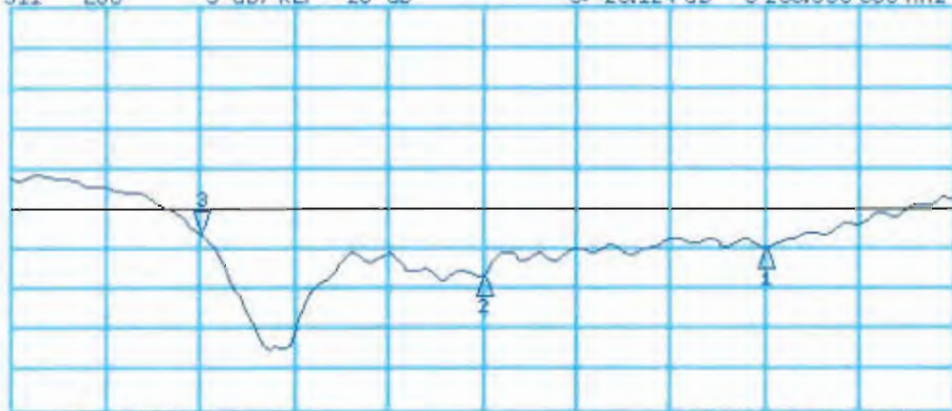
5.50000 GHz

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

Cor

avg

16



CH2 Markers

1: -24.942 dB

5.80000 GHz

2: -28.572 dB

5.50000 GHz

## DASY5 Validation Report for Body TSL

Date/Time: 16.11.2010 15:06:09

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: MSL 5000 MHz

Medium parameters used:  $f = 5200$  MHz;  $\sigma = 5.3$  mho/m;  $\epsilon_r = 47.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>,

Medium parameters used:  $f = 5500$  MHz;  $\sigma = 5.68$  mho/m;  $\epsilon_r = 46.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>,

Medium parameters used:  $f = 5800$  MHz;  $\sigma = 6.08$  mho/m;  $\epsilon_r = 46.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

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

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

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

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

Peak SAR (extrapolated) = 32 W/kg

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

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

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

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

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

Peak SAR (extrapolated) = 36.6 W/kg

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

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

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

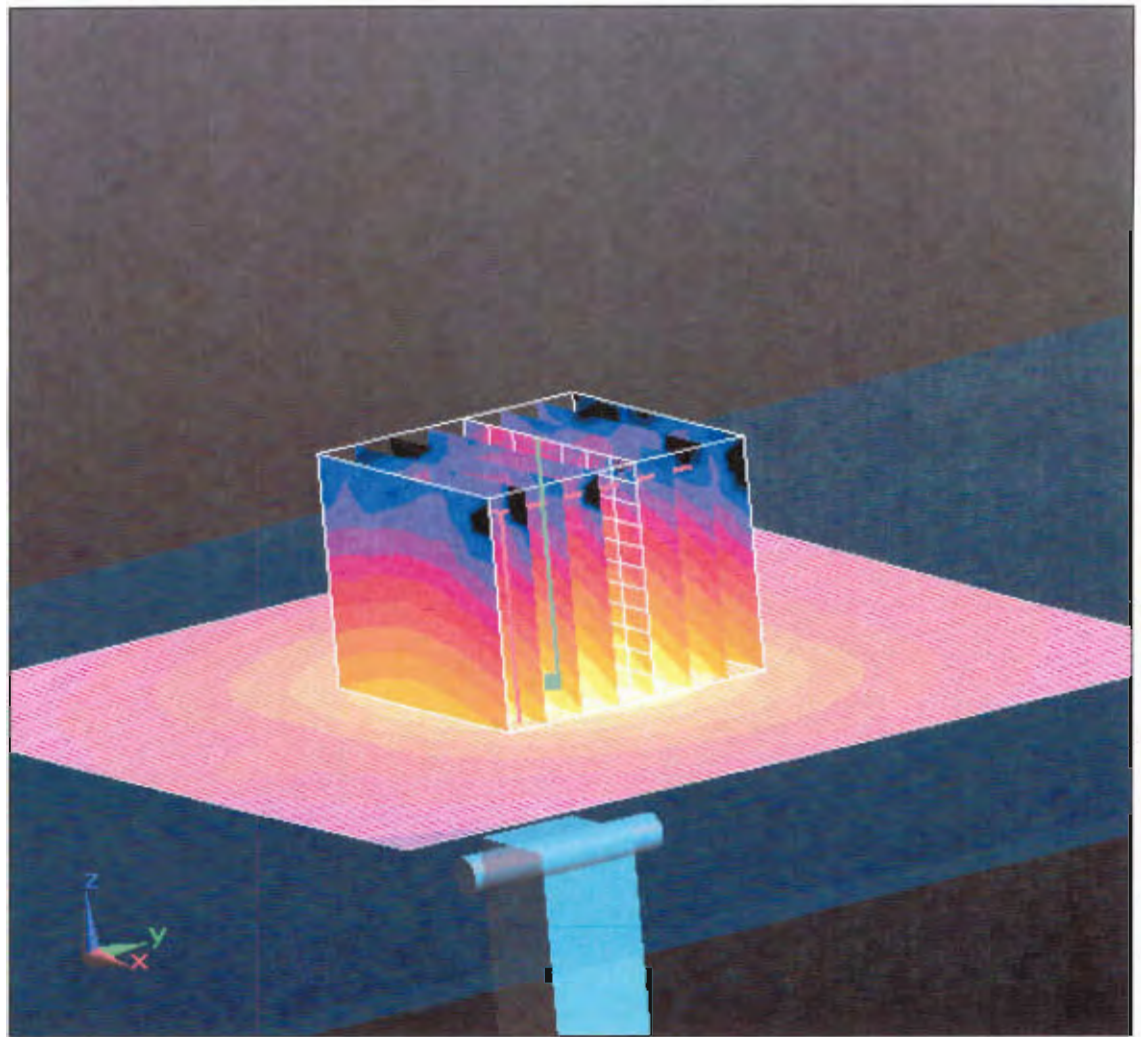
Measurement grid: dx=4mm, dy=4mm, dz=2mm

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

Peak SAR (extrapolated) = 34.4 W/kg

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

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



0 dB = 15.1mW/g

# Impedance Measurement Plot for Body TSL

16 Nov 2010 12:14:24

CH1 S11 1 U FS 3: 51.412  $\Omega$  -5.6426  $\Omega$  5.4242 pF 5 200.000 000 MHz

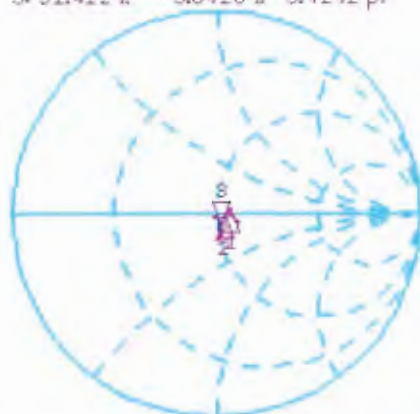
\*

De1

Cor

Avg  
16

†



CH1 Markers

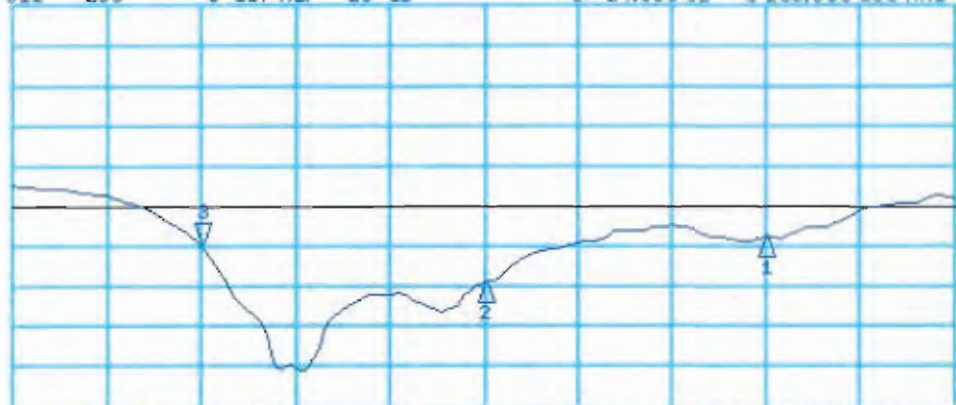
1: 56.717  $\Omega$   
1.2324  $\Omega$   
5.0000 GHz  
2: 52.865  $\Omega$   
-1.9766  $\Omega$   
5.5000 GHz

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

Cor

Avg  
16

†



CH2 Markers

1: -23.876 dB  
5.0000 GHz  
2: -29.399 dB  
5.5000 GHz

START 5 000.000 000 MHz

STOP 6 000.000 000 MHz