MOTOROLA

ACCREDITED

TESTING CERT # 2518.01

FCC ID: PHX-PCE25100
DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 1

Government & Public Safety
EME Test Laboratory
8000 West Sunrise Blvd
Fort Lauderdale, FL. 33322

Date of Report: 2/13/2008
Report Revision: O
Report ID: PCEx25100_Rev O_080213 SR5738

DUT Photo (Refer to Temporary Confidentiality Exhibit)

Responsible Engineer:	Stephen C. Whalen (EME Sr. Staff Eng.)
Date/s Tested:	1/28/08-1/29/08
Manufacturer/Location:	Sanmina SCI, Penang, Malaysia
Sector/Group/Div.:	Connected Home
Date submitted for test:	1/4/2008
DUT Description:	Laptop Express Card slot device. Utilizes Expedience protocol. This device contains an internal fold down antenna and an RF port for an optional accessory antenna.
Test TX mode(s):	OFDM, TDMA Duty cycle for 5.5MHz channel is 10.53% and 6MHz channel is 9.09%.
Max. Power output:	Internal Antenna: 31.2 dBm (1.32 W); External Port: 32.2 dBm (1.67 W) conducted, pulse average.
Nominal Power:	Internal Antenna: 30.5 dBm (1.12 W); External Antenna: 31.5 dBm (1.41 W) conducted, pulse average.
Tx Frequency Bands:	2496 - 2690 MHz
Signaling type:	Motorola proprietary Expedience protocol (has been referred to in the media as pre-WiMax). This signaling makes use of an OFDM signal structure that is comprised of a TDMA frame made up of 1024 sub-carriers containing QPSK information.
Model(s) Tested:	PCEx25100
Model(s) Certified:	PCEx25100
Serial Number(s):	002E14; 40DA94
Classification:	General Population/Uncontrolled
Rule Part(s):	27

Approved Accessories:
Antenna(s):
123-0552-0900 Internal Slot Radiator (2496 - 2690MHz ¼ wave antenna, 2.2dBi)

Battery(ies):
NA
Body worn accessory(ies):
NA
Audio/Data cable accessory(ies):
NA

Max. Calc. : 1-g Avg. SAR: 1.27 W/kg (Body); 10-g Avg. SAR: 0.65 W/kg (Body)

Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 2.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola EME Laboratory.

I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements.
This reporting format is consistent with the suggested guidelines of the TIA TSB-150 December 2004
The results and statements contained in this report pertain only to the device(s) evaluated.

Signature on file
Deanna Zakharia G&PS EME Lab Senior Resource Manager, Laboratory Director,

Approval Date: 2/13/08

Certification Date: 2/13/08

Certification No.: L1080210P

Part 1 of 1

APPENDICES

Report Revision History

Date	Revision	Comments
2/13/2008	O	Initial release

1.0 Introduction and Overview

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (SAR) measurements performed at the G&PS EME Test Lab for the model number PCEx25100 of FCC ID: PHX-PCE25100. The results herein reflect initial test results.

2.0 Referenced Standards and Guidelines

This product is designed to comply with the following applicable national and international standards and guidelines.

- IEC62209-1(2005) Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)
- United States Federal Communications Commission, Code of Federal Regulations; Rule Part 47CFR § 2.1093 sub-part J:1999
- Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.
- IEEE 1528, 2003 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques"
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-2005 Edition
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz, 1999
- Australian Communications Authority Radiocommunications (Electromagnetic Radiation - Human Exposure) Standard 2003
- ANATEL, Brazil Regulatory Authority, Resolution No. 303 of July 2, 2002 "Regulation of the limitation of exposure to electrical, magnetic, and electromagnetic fields in the radio frequency range between 9KHz and 300 GHz." and “Attachment to resolution # 303 from July 2, 2002”

2.1 SAR Limits

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average - ANSI - (averaged over the whole body)	0.08	0.4
Spatial Peak - ANSI - (averaged over any 1-g of tissue)	1.60	8.0
Spatial Peak – ICNIRP/ANSI - (hands/wrists/feet/ankles averaged over 10-g)	4.0	20.0
Localized SAR - ICNIRP - (Head and Trunk 10-g)	2.0	10.0

3.0 Description of Device Under Test (DUT)

FCC ID: PHX-PCE25100 is a Laptop Express Card slot device which utilizes Expedience protocol. The transmission is Orthogonal Frequency Division Multiplexing (OFDM) and Time Division Duplex TDD. For TDD this device supports a maximum transmitter duty cycle of 9.09% for a 6 MHz channel and 10.53% for a 5.5 MHz channel. The OFDM signal structure is comprised of a TDMA frame made up of 1024 sub-carriers containing QPSK information.

This device contains an internal fold down antenna and an RF port for an optional accessory antenna. Refer to MPE report for optional antenna EME certification.

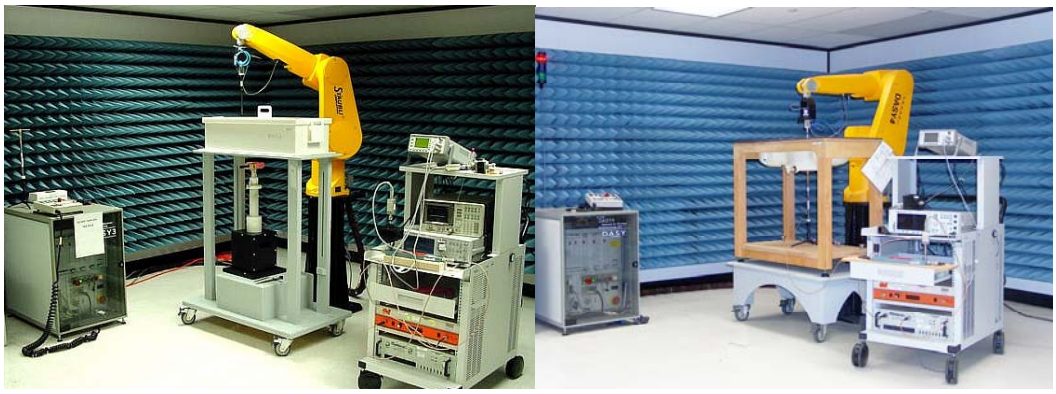
This device will be marketed to and used by the general population. This device may be used in a desk or laptop operation.
FCC ID: PHX-PCE25100 is capable of operating in the 2496-2690MHz band. The rated conducted power is 1.12 watts pulse average for the internal antenna and 1.41 watts pulsed averaged for the external antenna. The maximum conducted output power is 1.32 watts and 1.67 watts respectively as defined by the upper limit of the production line final test station.

FCC ID: PHX-PCE25100 is offered with the options and accessories listed on the coversheet of this report.

Test Output Power

A table of the characteristic power slump versus time is provided in Appendix F.

4.0 Description of Test System



4.1 Descriptions of Robotics/probes/Readout Electronics

The laboratory utilizes a Dosimetric Assessment System (DASY4™) SAR measurement system Version 4.7 build 55 manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot, DAE3V1, and ES3DV2 E-Field probe. Please reference the SPEAG user manual and application notes for detailed probe, robot, and SAR computational procedures. Section 5.0 presents relevant test equipment information. Appendices B and C present the applicable calibration certificates. The E-field probe first scans a coarse grid over a large area inside the phantom in order to locate the interpolated maximum SAR distribution. After the coarse scan measurement, the probe is automatically moved to a position at the interpolated maximum. The subsequent scan can directly use this position as reference for the cube evaluations.

4.2 Description of Phantom(s)

4.2.1 Flat Phantom

Phantom Type	Phantom Material	Phantom Dimensions (cm)	Support structure opening dimensions (cm)	Support structure material	Loss Tangent (wood)
NA	High Density Polyethylene (HDPE)	NA	NA	Wood	< 0.05

4.2.2 SAM Phantom

Phantom Type	Material Parameters	Material Thickness (mm)	Support structure material	Loss Tangent (wood)
NA	200MHz -3GHz; Er = <5, Loss Tangent = <0.05	2mm +/- 0.2mm	Wood	< 0.05

4.2.3 Elliptical Flat Phantom

Phantom ID	Material Parameters	Material Thickness (mm)	Support structure material	Loss Tangent (wood)
OVAL1021	300MHz -6GHz; Er = 4+/-1, Loss Tangent = <0.05	2.0mm +/- 0.2mm	Wood	< 0.05

4.3 Description of Equivalent tissues

Type of Simulated Tissue

The simulated tissue used is compliant to that specified in FCC Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01) and IEEE 1528, 2003 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

The sugar based simulate tissue is produced by placing the correct measured amount of De-ionized water into a large container. Each of the dried ingredients are weighed and added to the water carefully to avoid clumping. If the solution has a high sugar concentration the water is pre-heated to aid in dissolving the ingredients. For Diacetin and similar type simulates, sugar and HEC ingredients are not needed. The solution is mixed thoroughly, covered, and allowed to sit overnight prior to use.

Simulated Tissue Composition

% of listed ingredients	2593MHz		2600MHz	
	Head	Body	Head	Body
Sugar	NA	NA	NA	NA
Diacetin	NA	34.5	NA	34.5
De ionized -Water	NA	65.2	NA	65.2
Salt	NA	0.94	NA	0.94
HEC	NA	NA	NA	NA
Bact.	NA	0.1	NA	0.1

Reference section 6.1 for target parameters

5.0 Additional Test Equipment

Equipment Type	Model Number	Serial Number	Calibration Due Date
Power Meter (Agilent)	E4418B	GB40206553	4/25/2008
Power Meter (HP)	E4418B	US39251150	4/25/2008
Power Meter (HP)	E4418B	US39251152	3/17/2008
Power Sensor (HP)	8482B	3318A06773	5/2/2008
Power Sensor (Agilent)	8482B	3318A07546	5/16/2008
Power Sensor (Agilent)	8482B	3318A07392	3/19/2008

Additional Test Equipment (Continued)

Equipment Type	Model Number	Serial Number	Calibration Due Date
Bi-Directional Coupler (NARDA)	3022	77114	2/17/2008
Signal Generator (HP)	E4421B	US39270649	8/16/2008
Agilent Microwave System Amplifier	83006A	MY39500388	CNR
Agilent Power Supply	87421A	3611A01968	CNR
Agilent PNA-L Network Analyzer	N5230A	MY45001092	5/22/2008
Dielectric Probe Kit (HP)	85070C	US99360076	CNR
Speag Dipole	D2600V2	1002	1/5/2009

6.0 SAR Measurement System Verification

The SAR measurements were conducted with probe model/serial number ES3DV2/SN3007. The system performance check was conducted daily and within 24 hours prior to testing. DASY output files of the probe/dipole calibration certificates and system performance test results are included in appendices B, C, D respectively. The table below summarizes the system performance check results normalized to 1W.
Dipole validation scans at the head from SPEAG are provided in APPENDIX D. The G&PS EME lab validated the dipole to the applicable IEEE system performance targets. Within the same day system validation was performed using FCC body tissue parameters to generate the system performance target values for body at the applicable frequency. The results of the G&PS EME system performance validation are provided herein.

6.1 Equivalent Tissue Test Results

Simulated tissue prepared for SAR measurements is measured daily and within 24 hours prior to actual SAR testing to verify that the tissue is within +/- 5% of target parameters at the center of the transmit band. This measurement is done using the applicable equipment indicated in section 5.0.

Target versus Actual tissue parameters (1/28/08 – 1/29/08)

FCC Body				
Frequency (MHz)	**Di-electric Constant Target**	**Di-electric Constant Meas. (Range)**	**Conductivity Target S/m**	**Conductivity Meas. (Range) S/m**
2593	52.5	52.0-52.5	2.15	2.13-2.14
2600	52.5	52.0-52.5	2.16	2.13-2.14

IEEE Head				
Frequency (MHz)	**Di-electric Constant Target**	**Di-electric Constant Meas. (Range)**	**Conductivity Target S/m**	**Conductivity Meas. (Range) S/m**
NA	NA	NA	NA	NA

6.2 System Check Test Results

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	System Perf. Result when normalized to 1W (mW/g)	Reference SAR @ 1W (mW/g)	Test Date(s)
3007	FCC Body	3/15/07	SPEAG 2600V2 /1002	60.1 +/- 0.8	58.66 +/- 10%	1/28/08-1/29/08 2 test days

Note: See APPENDIX D for an explanation of the reference SAR targets stated above.
(System performance results reflects the median performance +/- ½ of the test date(s) performance ranges)

The DASY4™ system is operated per the instructions in the DASY4™ Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess EME SAR compliance was calibrated according to 17025 A2LA guidelines.

7.0 DUT Test Strategy and Methodology

7.1 DUT Configuration(s)

The DUT is a portable device for laptop or desktop operation using OFDM transmission signaling. The device is placed in the test positions presented in Appendix G.

Test Plan

All options and accessories listed on the cover page of this report were considered in order to develop the SAR test plan for this product. SAR measurements were performed using an elliptical flat phantom with the applicable simulated tissue to assess performance at the body using the relevant transmission mode.

Assessments at the Body **Page 10 & 11 of 44; Table 1**

- Assessment in the 2496-2690MHz band of the available 5.5MHz bandwidth and 6MHz bandwidth.
- Assessment of the optional antenna positions using the worst case from above.
- Assessment of two other Laptops using the worst case from above.
- Assessment of the band edges using the worst case from above.

Shortened scan assessment at the Body **Page 11 of 44; Table 2**

- A “shortened” scan was performed using the test configuration that produced the highest SAR results overall. Note that the shortened scan is obtained by first running a coarse scan to find the peak area and then, using a newly charged battery, a cube scan only was performed. The shortened scan represents the cube scan performance results.

7.2 Device Positioning Procedures

Reference Appendix G for photos of the DUT tested positions.

7.2.1 Body

The DUT was inserted into a laptop and the laptop was positioned in normal use configuration against the phantom.

7.2.2 Head

NA

7.2.3 Face

NA

8.0 Environmental Test Conditions

The EME Laboratory ambient environment is well controlled resulting in very stable simulated tissue temperature and therefore stable dielectric properties. Simulated tissue temperature is measured prior to each scan to insure it is within +/ - 2^{o}C of the temperature at which the dielectric properties were determined. The liquid depth within the phantom used for measurements was 15cm +/- 0.5cm. Additional precautions are routinely taken to ensure the stability of the simulated tissue such as covering the phantoms when scans are not actively in process in order to minimize evaporation. The lab environment is continuously monitored. The table below presents the range and average environmental conditions during the SAR tests reported herein:

	Target	Measured
Ambient Temperature	20 - 25 ˚C	Range: 21.2-24.8˚C Avg. 22.2˚C
Relative Humidity	30 - 70 %	Range: 34.1-56.7% Avg. 46.6%
Tissue Temperature	NA	Range: 20.5-21.5˚C Avg. 20.9 ˚C

The EME Lab RF environment uses a Spectrum Analyzer to monitor for extraneous large signal RF contaminants that could possibly affect the test results. If such unwanted signals are discovered the SAR scans are repeated.

9.0 Test Results Summary

All SAR results obtained by the tests described in Section 7.1 are listed below. Each test configuration was assessed using the full DASY4™ coarse and 5x5x7 cube methodology. The associated SAR plots are provided in APPENDIX E. A shorten scan is reported in Table 2 below based on the highest configuration from Table 1. Appendix E also presents shortened SAR cube scan to assess the validity of the calculated results presented herein.
Note: The results of the shortened cube scans presented in Appendix E demonstrate that the scaling methodology used to determine the calculated SAR results presented herein are valid.

Table1

Assessments at the Body 2496-2690MHz band										
Run Number/ SN	**Antenna Pos.**	**Freq. (MHz)**	**Battery**	**Test position**	**Initial Power (W)**	**SAR Drift (dB)**	**Meas. 1g-SAR (mW/g)**	**Meas. 10g-SAR (mW/g)**	**Max Calc. 1g-SAR (mW/g)**	**Max Calc. 10g-SAR (mW/g)**
Assessment at the body – Laptop 1, 5.5MHZz bandwidth @ 10.53% duty cycle										
MeC-Ab-080128-05/40DA94	90 degrees - Internal (123-0552-0900)	2593	Laptop Battery	Laptop Against Phantom	1.29	-0.428	0.522	0.273	0.59	0.31
Assessment at the body – Laptop 1, 6.0MHZz bandwidth @ 9.09% duty cycle										
MeC-Ab-080128-06/40DA94	90 degrees - Internal (123-0552-0900)	2593	Laptop Battery	Laptop Against Phantom	1.37	-0.529	0.501	0.261	0.57	0.29
Assessment at the body – Laptop 1, Antenna position search 5.5MHZz bandwidth @ 10.53% duty cycle										
MeC-Ab-080128-07/40DA94	Closed Internal (123-0552-0900)	2593	Laptop Battery	Laptop Against Phantom	1.29	-0.472	0.278	0.142	0.32	0.16
MeC-Ab-080128-08/40DA94	Opened (180 Degrees) Internal (123-0552-0900)	2593	Laptop Battery	Laptop Against Phantom	1.31	-0.684	0.922	0.482	1.09	0.57
*** JsT-Ab-080129-07/002E14**	Opened (180 Degrees) Internal (123-0552-0900)	2593	Laptop Battery	Laptop Against Phantom	1.36	-0.160	1.17	0.589	1.21	0.61
Assessment at the body – Laptop 2, 5.5MHZz bandwidth @ 10.53% duty cycle										
JsT-Ab-080129-02/40DA94	Opened (180 Degrees) Internal (123-0552-0900)	2593	Laptop Battery	Laptop Against Phantom	1.33	0.781	0.398	0.226	0.40	0.23
Assessment at the body – Laptop 3, 5.5MHZz bandwidth @ 10.53% duty cycle										
JsT-Ab-080129-04/40DA94	Opened (180 Degrees) Internal (123-0552-0900)	2593	Laptop Battery	Laptop Against Phantom	1.36	-0.532	0.368	0.217	0.42	0.25

Table1 (continued)

Assessments at the Body 2496-2690MHz band										
Run Number/ SN	**Antenna Pos.**	**Freq. (MHz)**	**Battery**	**Test position**	**Initial Power (W)**	**SAR Drift (dB)**	**Meas. 1g-SAR (mW/g)**	**Meas. 10g-SAR (mW/g)**	**Max Calc. 1g-SAR (mW/g)**	**Max Calc. 10g-SAR (mW/g)**
Assessment at the body – Frequency search Laptop 1, 5.5MHZz bandwidth @ 10.53% duty cycle										
JsT-Ab-080129-05/40DA94	Opened (180 Degrees) Internal (123-0552-0900)	2499	Laptop Battery	Laptop Against Phantom	1.36	-0.321	0.789	0.411	0.85	0.44
JsT-Ab-080129-06/40DA94	Opened (180 Degrees) Internal (123-0552-0900)	2687	Laptop Battery	Laptop Against Phantom	1.35	-0.119	0.617	0.321	0.63	0.33

Table2

*Worst case configuration from above shortened scan –using the DASY 4 full coarse and 5x5x7 cube scan measurements.										
Shorten Scan MeC-Ab-080129-09/002E14	Opened (180 Degrees) Internal (123-0552-0900)	2593	Laptop Battery	Laptop Against Phantom	1.37	-0.257	1.2	0.612	1.27	0.65

9.1 Highest SAR results calculation methodology

The calculated maximum 1-gram and 10-gram averaged SAR results reported herein for the full DASY ™ coarse and 5x5x7 cube measurements are determined by scaling the measured SAR to account for power leveling variations and power slump. For this device the Maximum Calculated 1-gram and 10-gram averaged peak SAR is calculated using the following formula:

Max. Calc. 1-g/10-g Avg. SAR = ((SAR meas. / (10^(Pdrift/10)))*(Pmax/Pint))* DC%
P_{max} = Maximum Power (W)
P_{int} = Initial Power (W)
Pdrift = DASY drift results (dB) - (for conservative results positive drifts are not accounted for)
SAR_{meas}. = Measured 1-g/10-g Avg. SAR (mW/g)
DC % = Transmission mode duty cycle in % where applicable
50% duty cycle is applied for PTT operation.

10.0 Conclusion

The highest Operational Maximum Calculated 1-gram and 10-gram average SAR values found for FCC ID: PHX-PCE25100 models PCEx25100.

Max. Calc. : 1-g Avg. SAR: 1.27 W/kg (Body); 10-g Avg. SAR: 0.65 W/kg (Body)

These test results clearly demonstrate compliance with FCC General Population/Uncontrolled RF Exposure limits of **1.6W/kg** per the requirements of 47 CFR 2.1093(d).

APPENDIX A
Measurement Uncertainty

Uncertainty Budget for Device Under Test, for 30 MHz to 3 GHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	IEEE 1528 section	**Tol. (± %)**	**Prob Dist**	**Div.**	c_i **(1 g)**	c_i **(10 g)**	**1 g** u_i **(±%)**	**10 g** u_i **(±%)**	v_i
Measurement System									
Probe Calibration	E.2.1	5.9	N	1.00	1	1	5.9	5.9	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	1.1	R	1.73	1	1	0.6	0.6	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mech. Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.2	N	1.00	1	1	3.2	3.2	29
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0	8
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	N	1.00	0.64	0.43	2.1	1.4	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	N	1.00	0.6	0.49	1.1	0.9	∞
Combined Standard Uncertainty			RSS				11	11	411
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				22	22	

FCD-0558 Rev 5

Uncertainty Budget for System Validation (dipole & flat phantom) for 30 MHz to 3 GHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**IEEE 1528 section**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i (1 g)**	**c_i (10 g)**	**1 g u_i (±%)**	**10 g u_i (±%)**	**v_i**
Measurement System									
Probe Calibration	E.2.1	5.9	N	1.00	1	1	5.9	5.9	∞
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0	0	0.0	0.0	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t. Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	2.0	R	1.73	1	1	1.2	1.2	∞
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	R	1.73	0.64	0.43	1.2	0.8	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	R	1.73	0.6	0.49	0.6	0.5	∞
Combined Standard Uncertainty			RSS				9	9	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				18	17	

FCD-0558 Rev 5

Notes for Tables 1 and 2
a) Column headings *a-k* are given for reference.
b) Tol. - tolerance in influence quantity.
c) Prob. Dist. – Probability distribution
d) N, R - normal, rectangular probability distributions
e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
f) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty.

Appendix B
Probe Calibration Certificates

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

S Schweizerischer Kalibrierdienst
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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 Motorola MFRL

Certificate No: ES3-3007_Mar07

CALIBRATION CERTIFICATE

Object	ES3DV2 - SN:3007
Calibration procedure(s)	QA CAL-01.v5 and QA CAL-14.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	March 15, 2007
Condition of the calibrated item	In Tolerance

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-06 (METAS, No. 217-00592)	Aug-07
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-06 (METAS, No. 217-00593)	Aug-07
Reference Probe ES3DV2	SN: 3013	4-Jan-07 (SPEAG, No. ES3-3013_Jan07)	Jan-08
DAE4	SN: 654	21-Jun-06 (SPEAG, No. DAE4-654_Jun06)	Jun-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Fin Bomholt	R&D Director	

Issued: March 16, 2007

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

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) 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
b) 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:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV2

SN:3007

Manufactured:	October 22, 1999
Last calibrated:	May 25, 2006
Recalibrated:	March 15, 2007

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ES3DV2 SN:3007 **March 15, 2007**

DASY - Parameters of Probe: ES3DV2 SN:3007

Sensitivity in Free Space[A]

Diode Compression[B]

NormX	**1.73** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**92** mV
NormY	**1.86** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**93** mV
NormZ	**1.87** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**95** mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL **2450 MHz** **Typical SAR gradient: 10.5 % per mm**

Sensor Center to Phantom Surface Distance		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	7.6	6.2
SAR_{be} [%]	With Correction Algorithm	0.7	0.3

TSL **2600 MHz** **Typical SAR gradient: 11 % per mm**

Sensor Center to Phantom Surface Distance		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	8.1	6.5
SAR_{be} [%]	With Correction Algorithm	0.6	0.3

Sensor Offset

Probe Tip to Sensor Center	**2.7** mm

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

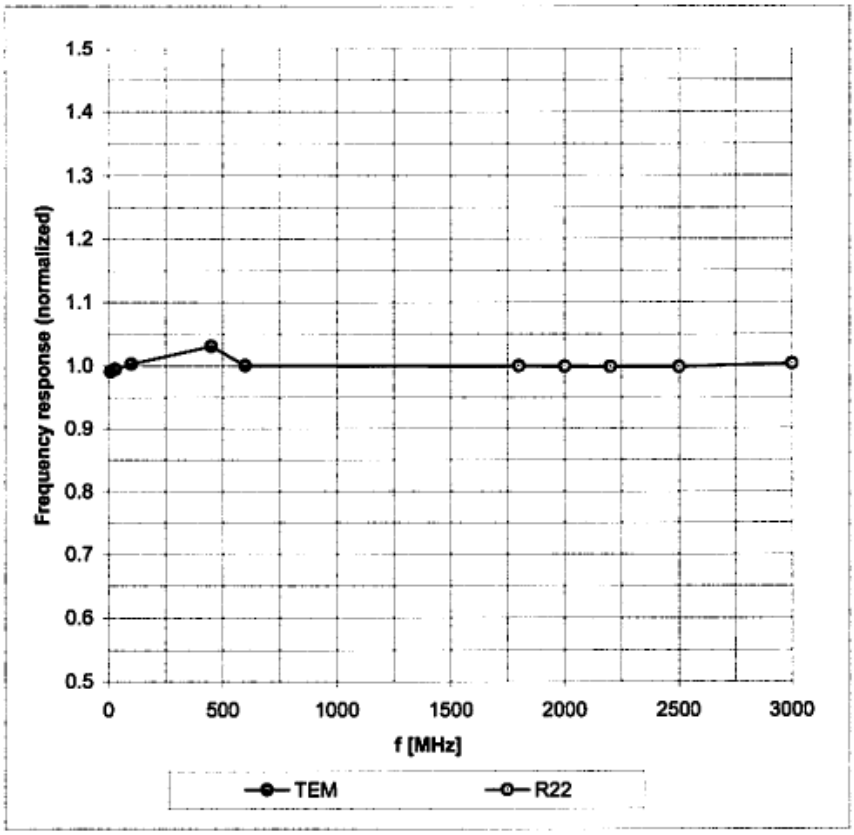
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

ES3DV2 SN:3007 March 15, 2007

Frequency Response of E-Field

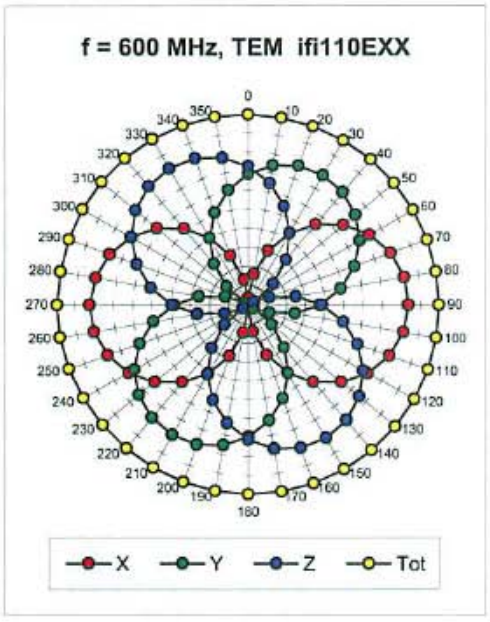
(TEM-Cell:ifi110 EXX, Waveguide: R22)

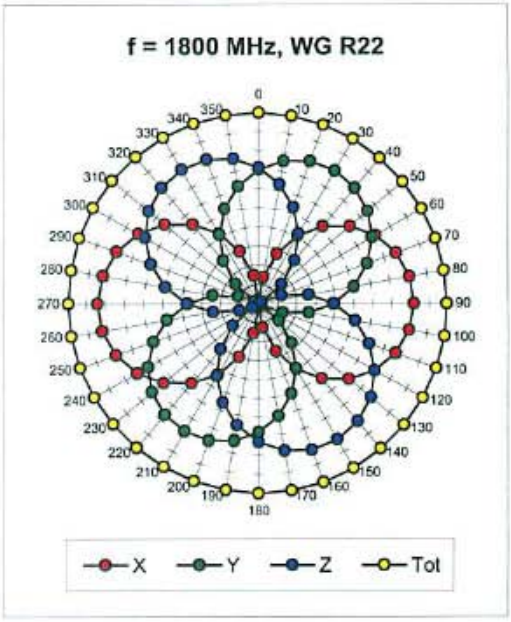


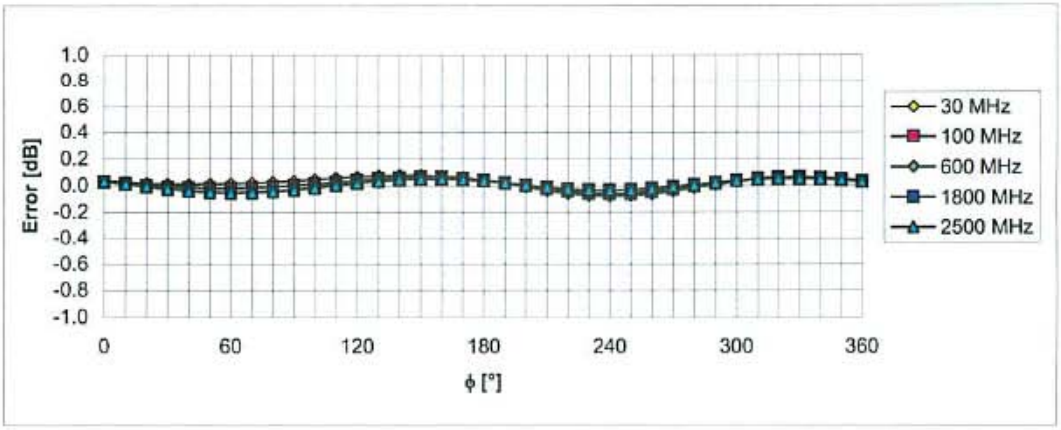
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ES3DV2 SN:3007 March 15, 2007

Receiving Pattern (ϕ), ϑ = 0°





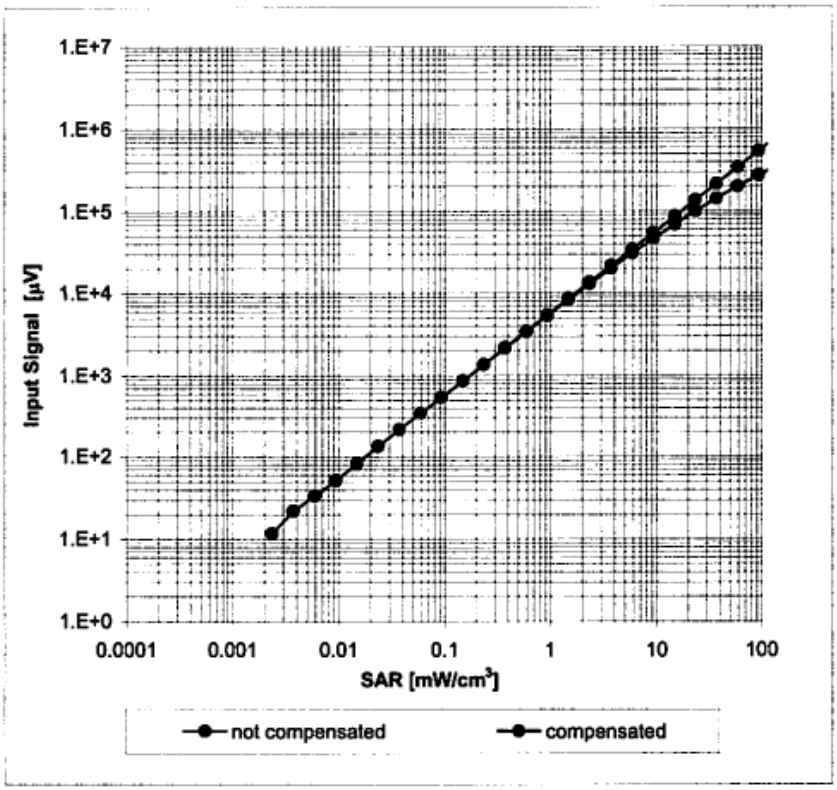


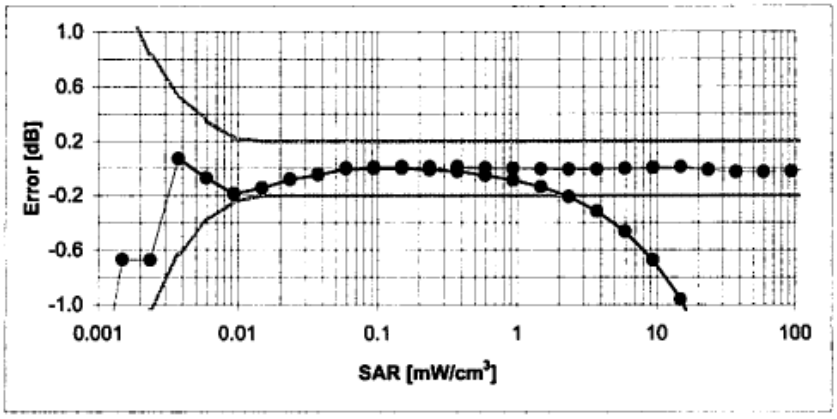
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

ES3DV2 SN:3007 March 15, 2007

Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)

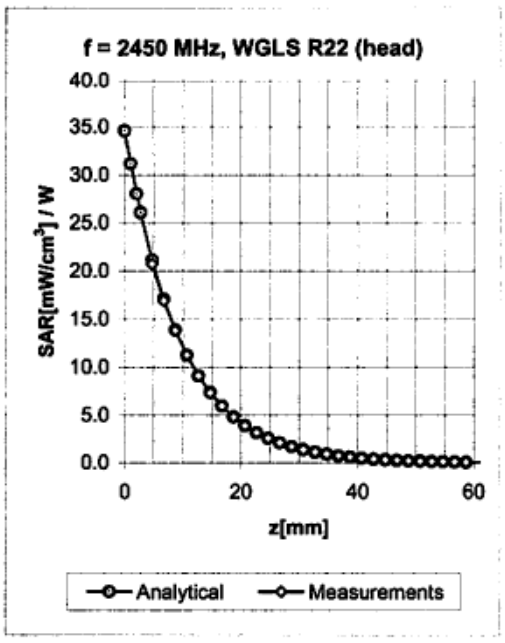


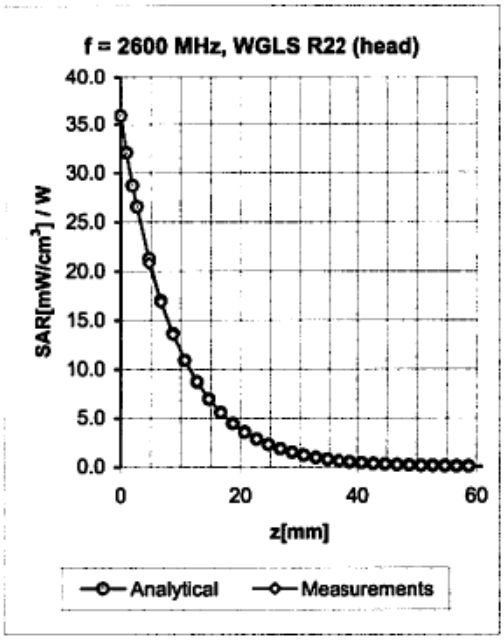


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

ES3DV2 SN:3007 March 15, 2007

Conversion Factor Assessment





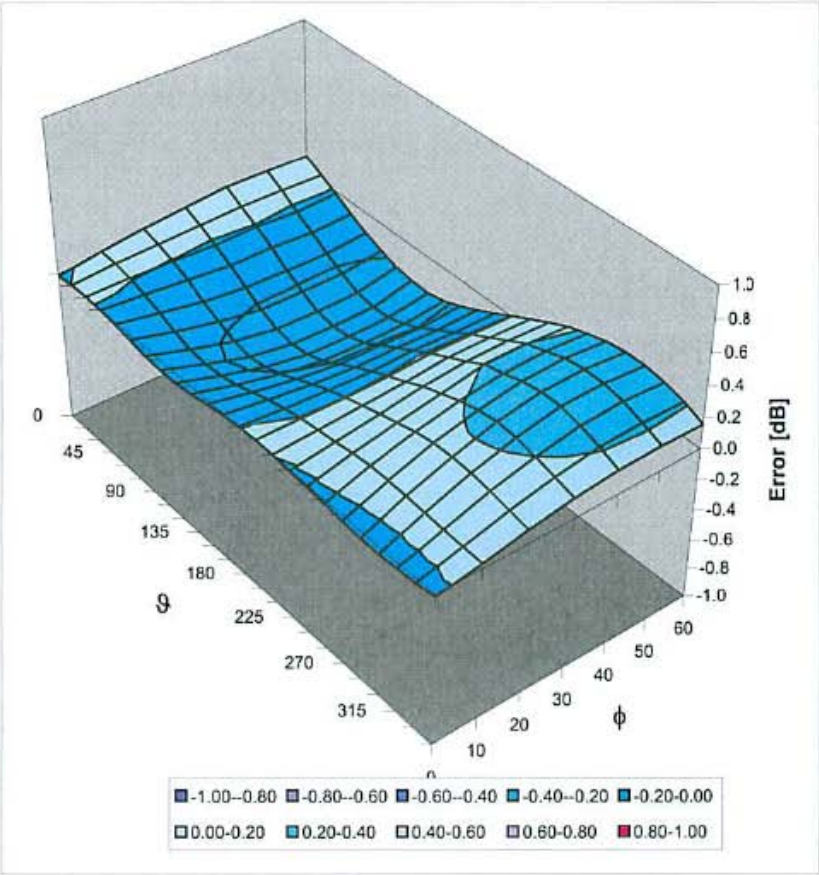
f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.62	1.70	4.54 ± 11.8% (k=2)
2600	± 50 / ± 100	Head	39.0 ± 5%	1.96 ± 5%	0.59	1.74	4.34 ± 11.8% (k=2)
3500	± 50 / ± 100	Head	37.9 ± 5%	2.91 ± 5%	0.59	1.50	4.17 ± 13.1% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.75	1.51	4.20 ± 11.8% (k=2)
2600	± 50 / ± 100	Body	52.5 ± 5%	2.16 ± 5%	0.98	1.22	3.85 ± 11.8% (k=2)
3500	± 50 / ± 100	Body	51.3 ± 5%	3.31 ± 5%	0.74	1.53	3.34 ± 13.1% (k=2)

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

ES3DV2 SN:3007 March 15, 2007

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Appendix C
Dipole Calibration Certificates

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

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Accreditation No.: SCS 108

Client **Motorola CGISS** Certificate No: **D2600V2-1002_Jan07**

CALIBRATION CERTIFICATE

Object	D2600V2 - SN: 1002
Calibration procedure(s)	QA CAL-05.v6 Calibration procedure for dipole validation kits
Calibration date:	January 5, 2007
Condition of the calibrated item	In Tolerance

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	03-Oct-06 (METAS, No. 217-00608)	Oct-07
Power sensor HP 8481A	US37292783	03-Oct-06 (METAS, No. 217-00608)	Oct-07
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference Probe ES3DV2	SN 3025	19-Oct-06 (SPEAG, No. ES3-3025_Oct06)	Oct-07
DAE4	SN: 907	20-Jul-06 (SPEAG, No. DAE4-907_Jul06)	Jul-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-05)	In house check: Oct-07
RF generator Agilent E4421B	MY41000675	11-May-05 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Nov-07

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

Issued: January 8, 2007

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

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Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) 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
b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
c) 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:

d) DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY4	V4.7
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	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.8 ± 6 %	1.90 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C	-------	-----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	15.0 mW / g
SAR normalized	normalized to 1W	60.0 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**59.8 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.68 mW / g
SAR normalized	normalized to 1W	26.7 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**26.5 mW / g ± 16.5 % (k=2)**

[1] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.3 Ω - 5.5 jΩ
Return Loss	– 24.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.144 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	December 23, 2006

DASY4 Validation Report for Head TSL

Date/Time: 05.01.2007 14:37:50

Test Laboratory: SPEAG, Zurich, Switzerland

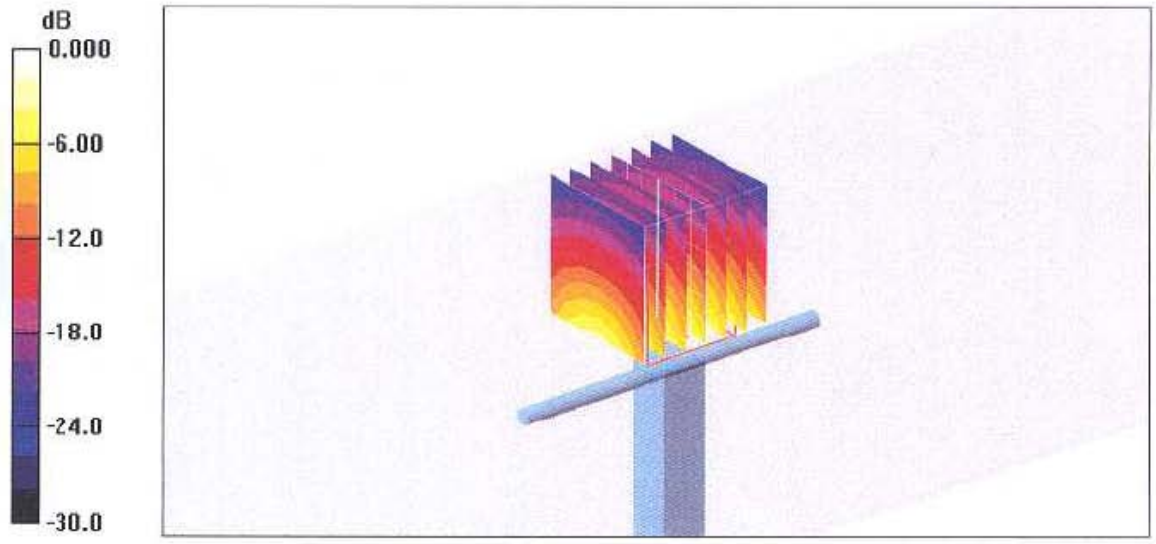
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN1002

Communication System: CW-2600; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: HSL U10 BB_060425;
Medium parameters used: f = 2600 MHz; σ = 1.9 mho/m; ε_r = 37.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

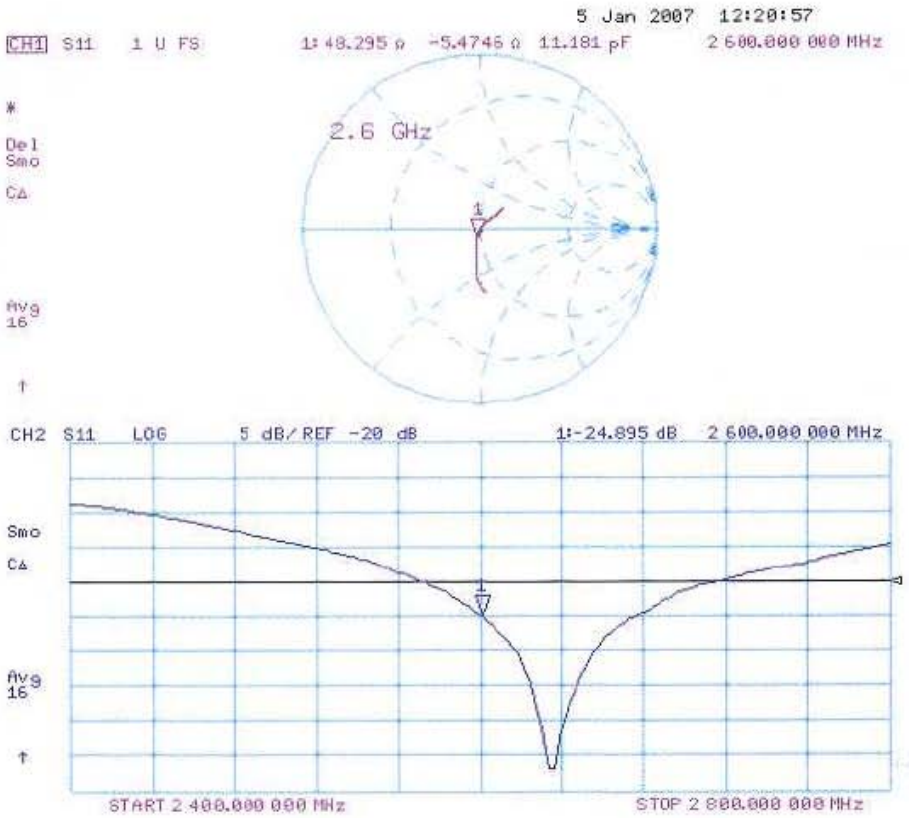
- Probe: ES3DV2 - SN3025 (HF); ConvF (4.34, 4.34, 4.34); Calibrated: 19.10.2006
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 20.07.2006
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (dist=3mm) (7x7x7)/Cube 0: Measurement grid:
dx=5mm, dy=5mm, dz=5mm
Reference Value = 78.8 V/m; Power Drift = 0.129 dB
Peak SAR (extrapolated) = 33.7 W/kg
SAR(1 g) = 15 mW/g; SAR(10 g) = 6.68 mW/g
Maximum value of SAR (measured) = 20.3 mW/g



0 dB = 20.3mW/g

Impedance Measurement Plot for Head TSL



Appendix D
Test System Verification Scans

Dipole validation scans at the head from SPEAG are provided in APPENDIX C. G&PS' EME lab validates its' dipole(s) to the applicable IEEE system performance targets. A system validation was performed using FCC body tissue parameters to generate the system performance target values for body at the applicable frequency. Dipoles are assessed using multiple probes and measurements were performed using the isotropic assessment procedure mentioned below.
To assess the isotropic characteristics of the measurement probe, two system performance zoom scans (0 and 90 degrees) were measured. The measured results were averaged together in order to obtain the final calculated 1 gram results.
The results obtained from each probe were then averaged together to determine the new measured SAR target.

Motorola Government & Public Safety EME Laboratory

Date/Time: 1/28/2008 7:14:12 AM

Robot# / Run#: DASY4-FL-3 / ErC-SYSP-2600B-080128-01
Phantom# / Tissue Temp.: OVAL1021 / 21.9 (C)
Dipole Model# / Serial#: D2600V2 / 1002
TX Freq. / Start power: 2600 (MHz) / 100 (mW)

Target: 58.66 mW/g (1g)
Calculated: 59.30 mW/g (1g)
Percent from Target (+/-): 1.1 % (1g)

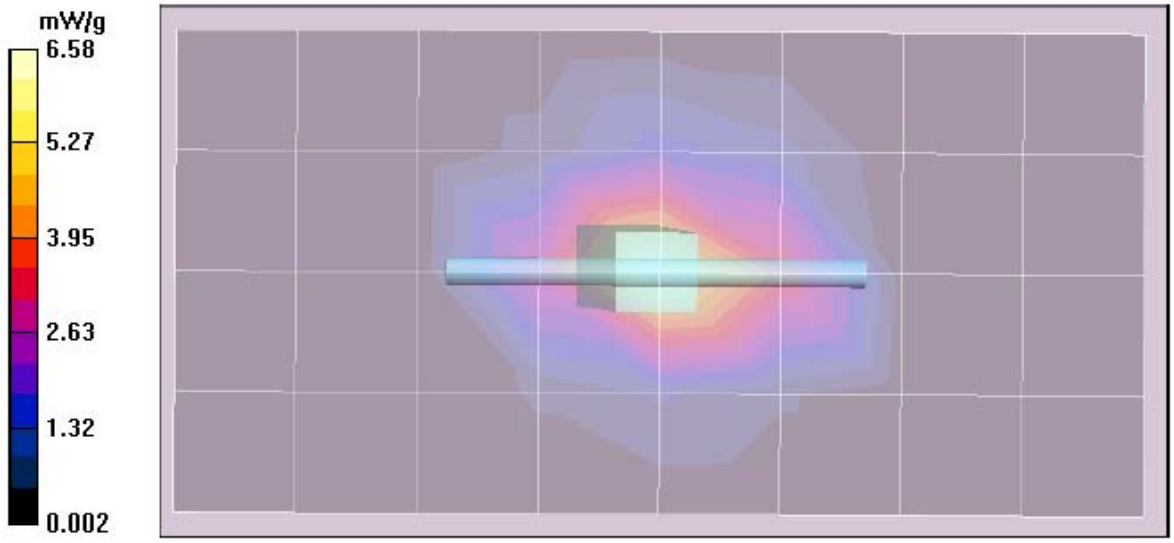
Probe: ES3DV2 - SN3007, Calibrated: 3/15/2007, ConvF(3.85, 3.85, 3.85)
Electronics: DAE3 Sn401, Calibrated: 8/28/2007
Duty Cycle: 1:1, Medium parameters used: f = 2600 MHz; σ = 2.13 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 56.9 V/m; Power Drift = -0.00765 dB
Peak SAR (extrapolated) = 12.9 W/kg
SAR(1 g) = 5.89 mW/g; SAR(10 g) = 2.61 mW/g
Maximum value of SAR (measured) = 6.59 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 56.9 V/m; Power Drift = -0.00765 dB
Peak SAR (extrapolated) = 13.1 W/kg
SAR(1 g) = 5.97 mW/g; SAR(10 g) = 2.65 mW/g
Maximum value of SAR (measured) = 6.72 mW/g

System Performance Check/Dipole Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.58 mW/g

System Performance Check/Z-Axis Retraction (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm
Maximum value of SAR (measured) = 6.78 mW/g



Motorola Government & Public Safety EME Laboratory

Date/Time: 1/29/2008 6:24:32 AM

Robot# / Run#: DASY4-FL-3 / ErC-SYSP-2600B-080129-01
Phantom# / Tissue Temp.: OVAL1021 / 21.9 (C)
Dipole Model# / Serial#: D2600V2 / 1002
TX Freq. / Start power: 2600 (MHz) / 100 (mW)

Target: 58.66 mW/g (1g)
Calculated: 60.90 mW/g (1g)
Percent from Target (+/-): 3.8 % (1g)

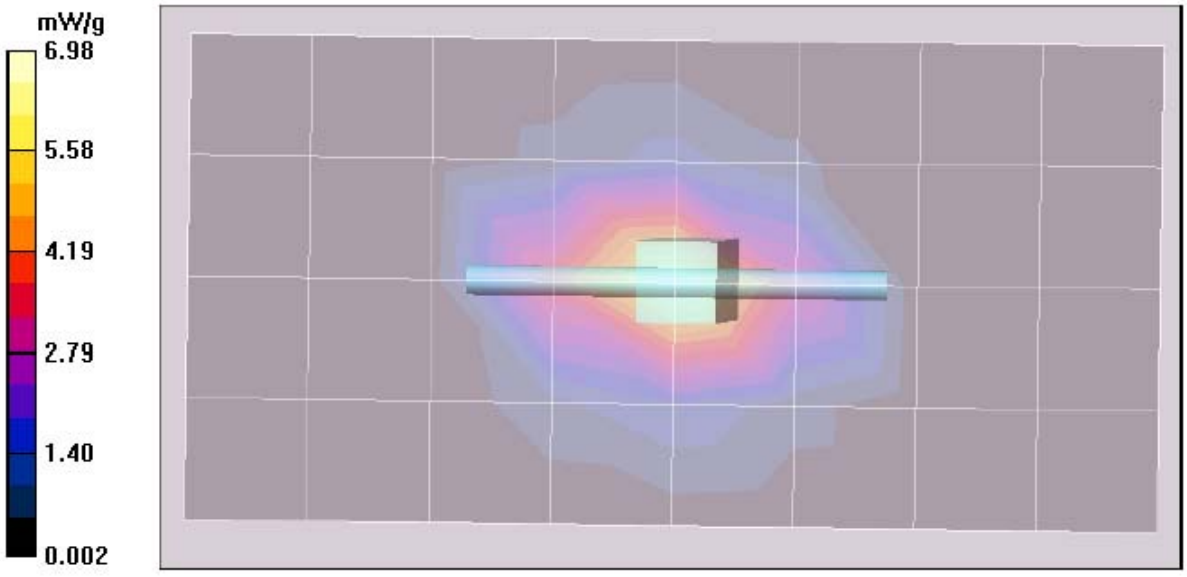
Probe: ES3DV2 - SN3007, Calibrated: 3/15/2007, ConvF(3.85, 3.85, 3.85)
Electronics: DAE3 Sn401, Calibrated: 8/28/2007
Duty Cycle: 1:1, Medium parameters used: f = 2600 MHz; σ = 2.14 mho/m; ε_r = 52; ρ = 1000 kg/m^3

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 58.0 V/m; Power Drift = -0.00951 dB
Peak SAR (extrapolated) = 13.4 W/kg
SAR(1 g) = 6.08 mW/g; SAR(10 g) = 2.7 mW/g
Maximum value of SAR (measured) = 6.87 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 58.0 V/m; Power Drift = -0.00951 dB
Peak SAR (extrapolated) = 13.3 W/kg
SAR(1 g) = 6.1 mW/g; SAR(10 g) = 2.71 mW/g
Maximum value of SAR (measured) = 6.95 mW/g

System Performance Check/Dipole Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.98 mW/g

System Performance Check/Z-Axis Retraction (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm
Maximum value of SAR (measured) = 6.93 mW/g



DIPOLE SAR TARGET - HEAD

Date:	01/10/08	Frequency (MHz):	2600
Lab Location:	NE	Mixture Type:	IEEE Head
DAE Serial #:	363	Ambient Temp.(°C):	22.7

Tissue Characteristics

Permitivity:	36.9	Phantom Type/SN:	40302002B-S12
Conductivity:	2.01	Distance (mm):	10 mm
Tissue Temp.(°C):	21		

Reference Source:	Dipole	Power to Dipole:	50 mW
Reference SN:	1002		

Target SAR Value: 59.8 mW/g (1g avg.), 26.5 mW/g (10g avg.)
(normalized to 1.0 W)

New Target:

Average Measured SAR Value: 56.71 mW/g (1g avg.), 24.71 mW/g (10g avg.)

Percent Difference From Target (MUST be within k=2 Uncertainty): -5.17% (1g ave)
-6.77% (10g ave)

Test performed by: Gene Von Holten Initial: HvH

Probe SN #s	1-G Cube	Diff from Ave	10-G Cube	Diff from Ave	Robot
3006	57.19	0.85%	24.91	0.83%	1
3007	56.23	-0.85%	24.50	-0.83%	1
		-100.00%		-100.00%	
		-100.00%		-100.00%	
		-100.00%		-100.00%	
Average	56.7100		24.7050	New Measured SAR Value	
		(normalized to 1.0 W, including drift)			

DIPOLE SAR TARGET - BODY

Date:	01/10/08	Frequency (MHz):	2600
Lab Location:	NE	Mixture Type:	FCC Body
DAE Serial #:	363	Ambient Temp.(°C):	22.1

Tissue Characteristics

Permitivity:	54.2	Phantom Type/SN:	OVAL1021
Conductivity:	2.21	Distance (mm):	10
Tissue Temp.(°C):	20.9		

Reference Source:	Dipole	Power to Dipole:	50 mW
Reference SN:	1002		

New Target:

Average Measured SAR Value: **58.66** mW/g(1g avg.), **25.79** mW/g (10g avg.)

Test performed by: **Gene Von Holten** Initial: HvH

Probe SN #s	1-G Cube	Diff from Ave	10-G Cube	Diff from Ave	Robot
3006	57.64	-1.7%	25.31	-1.9%	R1
3007	59.67	1.7%	26.28	1.9%	R1
		-100.0%		-100.0%	Rx
		-100.0%		-100.0%	Rx
		-100.0%		-100.0%	Rx
Average	58.6550		25.7925	New Measured SAR Value	
		(normalized to 1.0 W, including drift)			

Appendix E
DUT Scans (Shortened Scan and Highest SAR configuration)

Shortened Scan Results

Motorola Government & Public Safety EME Laboratory

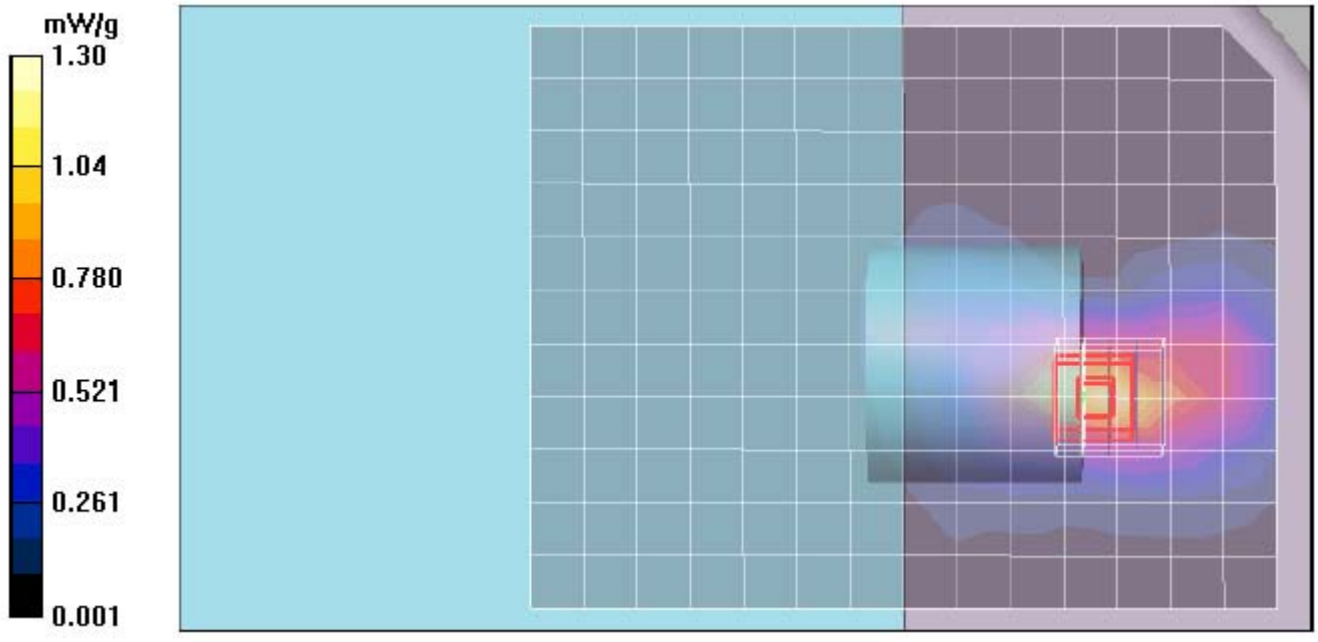
Date/Time: 1/29/2008 6:59:08 PM

Robot# / Run#: DASY4-FL-3 / MeC-Ab-080129-09
Phantom# / Tissue Temp.: OVAL1021 / 20.6 (C)
DUT Model# / Serial#: PCEx25100 / 002E14
Antenna / TX Freq.: Internal Opened (180 degrees) / 2593 (MHz)
Battery: Dell Laptop Battery #TypeDF192
Carry Acc. / Cable Acc.: None / None
Start Power: 1.37 (W)

Comments: Short Scan at the body
Shortened scan reflects highest SAR producing configuration; Run time 8 minutes.
Representative "normal" scan run time was 25 minutes
"Shortened" scan max calculated SAR using SAR drift: 1-g Avg. = 1.27mW/g; 10-g Avg. = 0.65mW/g
"Normal" scan max calculated SAR using SAR drift: 1-g Avg. = 1.21mW/g; 10-g Avg. = 0.61mW/g
(see part 1 of 1 section 9.0 run # JsT-Ab-080129-07)

Electronics: DAE3 Sn401, Calibrated: 8/28/2007
Duty Cycle: 1:9.5, Medium parameters used: f = 2593 MHz; σ = 2.14 mho/m; ε_r = 52; ρ = 1000 kg/m3

Ab Scan/5x5x7 Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 24.8 V/m; Power Drift = -0.257 dB
Peak SAR (extrapolated) = 2.53 W/kg
SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.612 mW/g
Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.
Maximum value of SAR (measured) = 1.27 mW/g



Highest SAR Configurations Results

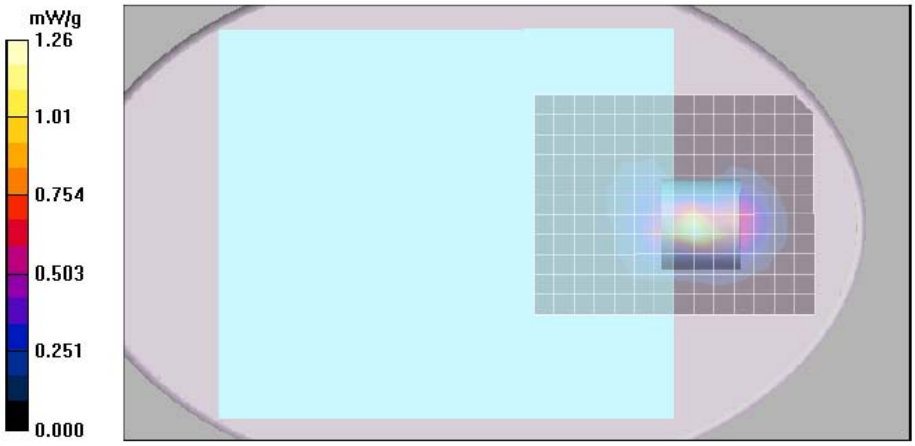
Motorola Government & Public Safety EME Laboratory

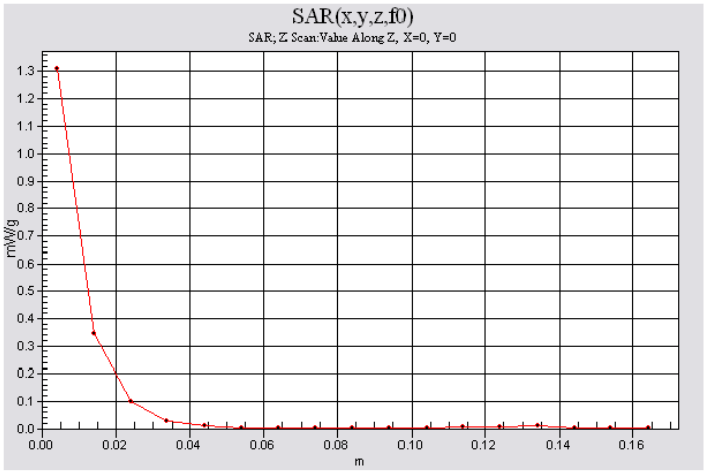
Date/Time: 1/29/2008 3:18:51 PM

Robot# / Run#: DASY4-FL-3 / JsT-Ab-080129-07
Phantom# / Tissue Temp.: OVAL1021 / 20.5 (C)
DUT Model# / Serial#: PCEx25100 / 002E14
Antenna / TX Freq.: Internal Opened (180 degrees) / 2593 (MHz)
Battery: Dell Laptop Battery #TypeDF192
Carry Acc. / Cable Acc.: None / None
Start Power: 1.36 (W)

Probe: ES3DV2 - SN3007, Calibrated: 3/15/2007, ConvF(3.85, 3.85, 3.85)
Electronics: DAE3 Sn401, Calibrated: 8/28/2007
Duty Cycle: 1:9.5, Medium parameters used: f = 2593 MHz; σ = 2.14 mho/m; ε_r = 52; ρ = 1000 kg/m3

Ab Scan/5x5x7 Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 20.2 V/m; Power Drift = -0.160 dB
Peak SAR (extrapolated) = 2.48 W/kg
SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.589 mW/g
Maximum value of SAR (measured) = 1.29 mW/g





APPENDIX F
DUT Supplementary Data (Power slump)

Model # PCEx25100
Serial # 002E14

	Dell Laptop Battery #		WiMax 5.5 MHz
Battery	TypeDF192	**Transmit Mode**	Mode w/ TxAGC=8
Frequency	2593 MHz	**Audio Accessory**	None
Date	1/29/2008		

TX TIME (minutes)	**Meaured Power** Watts
	Dell Laptop Battery # TypeDF192
0.0	1.40
1.0	1.32
2.0	1.23
3.0	1.18
4.0	1.14
5.0	1.10
6.0	1.09
7.0	1.07
8.0	1.06
9.0	1.06
10.0	1.05
11.0	1.04
12.0	1.03
13.0	1.02
14.0	1.02
15.0	1.02
16.0	1.02
17.0	1.02
18.0	1.02
19.0	1.03
20.0	1.04
21.0	1.05
22.0	1.04
23.0	1.03
24.0	1.03
25.0	1.02
26.0	1.02
27.0	1.02
28.0	1.02
29.0	1.01
30.0	1.01
31.0	1.01
32.0	1.00
33.0	1.01
34.0	1.02
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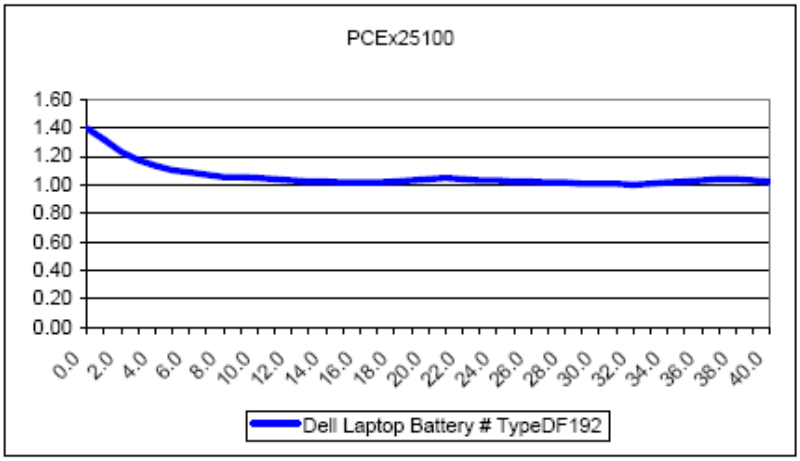
36.0	1.03
37.0	1.04
38.0	1.04
39.0	1.03
40.0	1.02



Appendix G
DUT Test Position Photos

Photos are available in Temporary Confidentiality Exhibit

Appendix H
DUT Photos

Photos are available in Temporary Confidentiality Exhibit

Appendix I

DUT Antenna Separation Distances and Offered Accessory Test Status

The following table(s) summarizes the separation distances and test status provided by each of the applicable laptops:

Laptop Models	Tested ?	Min. Separation distances between DUT antenna and phantom surface. (mm)	Comments
1 – Dell	Yes	6	NA
2 – ZT Affinity	Yes	18	NA
3 - Toshiba	Yes	20	NA