ACCREDITED
TESTING CERT # 2518.05

DECLARATION OF COMPLIANCE SAR ASSESSMENT PCII Report

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Date of Report: 03/27/2015
Report Revision: A

Responsible Engineer:	Chang Chi Chern (EME Engineer)
Report Author:	Chang Chi Chern (EME Engineer)
Date/s Tested:	2/17/2015 & 2/26/2015
Manufacturer/Location:	Motorola, Penang
Sector/Group/Div.:	PCR
Date submitted for test:	01/12/15
DUT Description:	136-174MHz 5W NKP GPS BT GOB
Test TX mode(s):	CW (PTT), BT(CW)
Max. Power output:	6 W (VHF), 10mW (Bluetooth)
Nominal Power:	5 W (VHF), 2.5mW (Bluetooth)
Tx Frequency Bands:	136-174 MHz, 2.402-2.480 GHz (Bluetooth)
Signaling type:	FM, FHSS (BT)
Model(s) Tested:	PMUD3265A
Model(s) Certified:	PMUD3265A
Serial Number(s):	105TPF0210
Classification:	Occupational/Controlled
FCC ID:	AZ489FT3833; 150.8-173.4 MHz; 2402-2480 MHz
IC :	109U-89FT3833; 138-144 MHz; 148-149.9 MHz, 150.05-174 MHz & 2402-2480 MHz

The test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of 8 W/kg averaged over 1 gram per the requirements of 47 CFR 2.1093(d). The 10 grams result is not applicable to FCC filing. The test results clearly demonstrate compliance with ICNIRP (1998) Guidelines for limiting exposure in time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz), Health Physics 74, 494-522 RF Exposure limits of 10 W/kg averaged over 10grams of contiguous tissue.

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 4.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola Solutions Inc 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.

Deanna Zakharia
Digitally signed by Deanna Zakharia
DN: cn=Deanna Zakharia, o=Motorola Solutions, ou=Regulatory Compliance Lab, email=edc015@motorolasolutions.com, c=US
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Deanna Zakharia
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Approval Date: 3/27/2015

Certification Date: 3/27/2015

Certification No. 150306AD

Part 1 of 2

APPENDICES

Report Revision History

Date	Revision	Comments
3/27/2015	A	Release of PCII results with new offered body worn.

1.0 Introduction

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (SAR) measurements performed at the Motorola Solutions Inc. EME Test Laboratory for model number PMUD3265A. This device is classified as Occupational/Controlled.

2.0 FCC SAR Summary

TABLE 1

Equipment Class	Frequency band (MHz)	Max Calc at Body (W/Kg)	
		1g-SAR	10g-SAR
TNF	150.8-173.4	1.82	0.72
*Simultaneous Results		NA	NA

3.0 Abbreviations / Definitions

BT: Bluetooth
CNR: Calibration Not Required
EME: Electromagnetic Energy
DUT: Device Under Test
FHSS: Frequency Hopping Spread Spectrum
NA: Not Applicable
PTT: Push to Talk
SAR: Specific Absorption Rate
RSM: Remote Speaker Microphone
TNF: Licensed Non-Broadcast Transmitter Held to Face

Audio accessories: These accessories allow communication while the DUT is worn on the body.
Body worn accessories: These accessories allow the DUT to be worn on the body of the user.
Maximum Power: Defined as the upper limit of the production line final test station.

4.0 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)

- Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65, FCC, Washington, D.C.:1997.

- 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 Electronics Engineers (IEEE) C95. 1-1992

- Institute of Electrical and Electronics Engineers (IEEE) C95.1-2005

- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998

- Ministry of Health (Canada) Safety Code 6 (2009), Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz

- Australian Communications Authority Radio communications (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 9 kHz and 300 GHz." and "Attachment to resolution # 303 from July 2, 2002"

- IEC62209-2 Edition 1.0 2010-03, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz).

- FCC KDB – 643646 D01 SAR Test for PTT Radios v01r01
- FCC KDB – 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- FCC KDB – 865664 D02 RF Exposure Reporting v01r01
- FCC KDB – 447498 D01 General RF Exposure Guidance v05r02
- FCC KDB – 941225 D05 SAR for LTE Devices v02r03
- FCC KDB – 941225 D01 3G SAR Procedures v03
- FCC KDB – 248227 D01 SAR measurement for 802.11 a/b/g DR02-41929
- FCC KDB - 648474 D04 Handset SAR v01r02

5.0 SAR Limits

TABLE 2

EXPOSURE LIMITS	SAR (W/Kg) (General Population / Uncontrolled Exposure Environment)	SAR (W/Kg) (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)	1.6	8.0
Spatial Peak – ICNIRP/ANSI - (hands/wrists/feet/ankles averaged over 10-g)	4.0	20.0
Spatial Peak - ICNIRP - (Head and Trunk 10-g)	2.0	10.0

6.0 Description of Device Under Test (DUT)

Model PMUD3265A operates using analog frequency modulation (FM) signaling incorporating traditional simplex two-way radio transmission protocol. This model intended use is to be 5-5-90 (5% TX, 5% RX and 90% standby).

This model is also wireless Bluetooth (BT) compatible, with the following operations: Supports Bluetooth 2.1 + EDR (Class 2 BT device); Offers HCI compliant solutions; Receiver sensitivity is -70dBm. The modulation frequency is PI/4DPSK and 8DPSK (GFSK modulation with hopping 79 (1 MHz) channel). Worst case duty cycle for BT is derived from a 5-slot packet type operation which consists of receiving on 1-slot and transmitting on 5-slots, and thus maximum duty cycle is 77% as defined by BT standard.

The model represented under this filing utilize removable antennas (VHF band) capable of transmitting in the 136-174 MHz, and an internal fixed BT antenna capable of transmitting at 2.402 - 2.480 GHz bands respectively. The nominal VHF band output power is 5 W with maximum output power of 6 W and nominal BT output power is 2.5 mW and maximum output of 10 mW, as defined by upper limit of the production line final test station. The intended operating positions are “at the face” with the DUT at least 1 inch from the mouth, and “at the body” by means of the offered body worn accessories. Body worn audio and PTT operation is accomplished by means of optional remote accessories that are connected to the radio. Operation at the body without an audio accessory attached is possible by means of offered wireless BT accessories.

7.0 Optional Accessories and Test Criteria

This device is offered with optional accessories. All accessories were individually evaluated during the test plan creation to determine if testing was required per the guidelines outlined in section 4.0 to assess compliance of this device. The following sections identify the test criteria and details for each accessory category.

7.1 Antenna

There is one antenna applicable for this PCII filing. The table below lists their descriptions.

TABLE 3

Antenna Models	Description	Selected for test	Tested
PMAD4121B	VHF Stubby Antenna; 160-174 MHz; ¼ wave; -11.0dBi	Yes	Yes

7.2 Battery

There is one battery applicable for this PCII filing. The table below lists its description.

TABLE 4

Battery Model	Description	Selected for test	Tested	Comments
PMNN4440AR	BATT STD IP67 LIION1600M1700T	Yes	Yes	

7.3 Body worn Accessory

There is one body worn accessory applicable for this PCII filing. The table below lists its description.

TABLE 5

Body worn Model	Description	Selected for test	Tested	Comments
PMLN7042A	Nylon Carry Case 3" Fixed Loop NKP	Yes	Yes	

7.4 Audio Accessory

There is one audio applicable for this PCII filing. The table below lists its description.

TABLE 6

Audio Acc. Model	Description	Selected for test	Tested	Comments
PMMN4075A	Remote Speaker Microphone Small, No Emergency, IP57	Yes	Yes	

8.0 Description of Test System

8.1 Descriptions of Robotics/Probes/Readout Electronics

TABLE 7

Dosimetric System type	System version	DAE type	Probe Type
Schmid & Partner Engineering AG SPEAG DASY 5	52.8.8.1222	DAE4	ES3DV3 (E-Field)

The DASY5™ system is operated per the instructions in the DASY5™ Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess SAR compliance was calibrated according to ISO/IEC 17025 A2LA guidelines. Section 9.0 presents additional 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.

8.2 Description of Phantom(s)

TABLE 8

Phantom Type	Phantom(s) Used	Material Parameters	Phantom Dimensions LxWxD (mm)	Material Thickness (mm)	Support Structure Material	Loss Tangent (wood)
Triple Flat	NA	200MHz -6GHz; Er = 3-5, Loss Tangent = ≤0.05	280x175x175	2mm +/- 0.2mm	Wood	< 0.05
SAM	NA	300MHz -6GHz; Er = < 5, Loss Tangent = ≤0.05	Human Model			
Oval Flat	√	300MHz -6GHz; Er = 4+/- 1, Loss Tangent = ≤0.05	600x400x190			

8.3 Description of Simulated Tissue

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.

The simulated tissue mixture was mixed based on the Simulated Tissue Composition indicated in Table 9. During the daily testing of this product, the applicable mixture was used to measure the Di-electric parameters at each of the tested frequencies to verify that the Di-electric parameters were within the tolerance of the tissue specifications.

Simulated Tissue Composition (by mass)

TABLE 9

% List of Ingredients	150 MHz	
	Head	Body
Sugar	55.4	49.7
Diacetin	0	0
De ionized –Water	38.35	46.2
Salt	5.15	3
HEC	1.0	1.0
Bacteria	0.1	0.1

9.0 Additional Test Equipment

The table below lists additional test equipment used during the SAR assessment.

TABLE 10

Equipment Type	Model Number	Serial Number	Calibration Date	Calibration Due Date
Power Meter	E4418B	MY45100911	6/3/2014	6/3/2015
Power Sensor	8481B	MY41091170	10/25/2014	10/25/2015
Power Meter	E4418B	MY45101014	10/21/2014	10/21/0215
Power Sensor	8481B	MY41091243	7/2/2014	7/2/2015
Signal Generator	E4438C	MY47272101	8/12/2014	8/12/2016
NARDA Bi-Directional Coupler	3020A	41935	8/22/2014	8/22/2015
Amplifier	10W1000C	312858	CNR	CNR
Dickson Temperature Recorder	TM320	6153216	7/11/2014	7/11/2015
Thermometer	HH806AU	080307	11/12/2014	11/12/2015
Therm. Probe	80PK-22	8766	8/11/2014	8/11/2015
Network Analyzer	E5071B	MY42403218	7/24/2014	7/24/2015
Dielectric Assessment Kit	DAK-12	1069	5/13/2014	5/13/2015
Speag Dipole	CLA-150	4010	8/5/2014	8/5/2015
Speag Probe	ES3DV3	3196	3/26/2014	3/26/2015
Speag DAE	DAE4	374	5/14/2014	5/14/2015
Speag DAE	DAE4	1294	11/3/2014	11/3/2015

10.0 SAR Measurement System Validation and Verification

DASY output files of the probe/dipole calibration certificates and system performance test results are included in appendices B, C and D respectively.

10.1 System Validation

The SAR measurement system was validated according to the procedures in KDB 865664. The validation status summary table is below.

TABLE 11

Dates	Probe Calibration Point		Probe SN	Measured Tissue Parameters		Validation for CW		
				σ	ϵ_r	Sensitivity	Linearity	Isotropy
06/24/2014	Body	150	3196	0.97	59.7	Pass	Pass	Pass
06/25/2014	Head	150	3196	0.77	52.0	Pass	Pass	Pass

10.2 System Verification

System performance checks were conducted each day during the SAR assessment. The results are normalized to 1W. APPENDIX D includes DASY plots for each day during the SAR assessment. The table below summarizes the daily system check results used for the SAR assessment.

TABLE 12

Probe Serial #	Tissue Type	Dipole Kit / Serial #	Ref SAR @ 1W (W/kg)	System Check Results Measured (W/kg)	System Check Test Results when normalized to 1W (W/kg)	Tested Date
3196	FCC Body	SPEAG CLA150 / 4010	*3.69 +/- 10%	3.67	3.67	2/17/2015
				3.50	3.50	2/26/2015

10.3 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 9.0. The table below summarizes the measured tissue parameters used for the SAR assessment.

TABLE 13

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
150	FCC Body	0.80 (0.76-0.84)	61.9 (58.8-65.0)	0.78	63.5	2/17/2015
				0.77	62.3	2/26/2015
167	FCC Body	0.81 (0.77-0.85)	61.5 (58.4-64.6)	0.79	62.4	2/17/2015
				0.78	61.5	2/26/2015

11.0 Environmental Test Conditions

The EME Laboratory's 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°C of the temperature at which the dielectric properties were determined. The liquid depth within the phantom used for measurements was at least 15cm. 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:

TABLE 14

	Target	Measured
Ambient Temperature	18 – 25 ˚C	Range: 21.6 – 23.2 ˚C Avg. 22.4 ˚C
Relative Humidity	30 – 70 %	Range: 43.7 – 64.4 % Avg. 54.1 %
Tissue Temperature	NA	Range: 20.6-21.4˚C Avg. 21.0˚C

Relative humidity target range is a recommended target

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.

12.0 DUT Test Setup and Methodology

12.1 Measurements

SAR measurements were performed using the DASY system described in section 8.0 using zoom scans and fast SAR. Oval flat phantoms filled with applicable simulated tissue were used for body and face testing.

The table below includes the step sizes and resolution of area and zoom scans per KDB 865664 requirements.

TABLE 15

<table>
<tr><th colspan="2">Description</th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td colspan="2">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td colspan="2">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="2" rowspan="2">Maximum area scan spatial resolution: ΔxArea, ΔyArea</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="2">Maximum zoom scan spatial resolution: ΔxZoom, ΔyZoom</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td>Maximum zoom scan spatial resolution, normal to phantom surface</td><td>uniform grid: ΔzZoom(n)</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td colspan="4">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

12.2 DUT Configuration(s)

The DUT is a portable device operational at the body and face as described in section 6.0 while using the applicable accessories listed in section 7.0. All accessories listed in section 7.0 of this report were considered when implementing the guidelines specified in KDB 643646.

12.3 DUT Positioning Procedures

The positioning of the device for each body location is described below and illustrated in APPENDIX H.

12.3.1 Body

The DUT was positioned in normal use configuration against the phantom with the offered body worn accessory with the offered audio accessories as applicable.

12.4 DUT Test Channels

The number of test channels was determined by using the following IEEE 1528 equation. The use of this equation produces the same or more test channels compared to the FCC KDB 447498 number of test channels formula.

$$N_c = 2 * roundup[10 * (f_{high} - f_{low}) / f_c] + 1$$

Where
N_c = Number of channels
F_{high} = Upper channel
F_{low} = Lower channel
F_c = Center channel

12.5 SAR Result Scaling Methodology

The calculated 1-gram and 10-gram averaged SAR results indicated as "Max Calc. 1g-SAR" and "Max Calc.10g-SAR" in the data tables is determined by scaling the measured SAR to account for power leveling variations and power slump. A table and graph of output power versus time is provided in APPENDIX F. For this device the "Max Calc. 1g-SAR" and "Max Calc.10g-SAR" are scaled using the following formula:

$$Max\_Calc = SAR\_meas \cdot 10^{\frac{-Drift}{10}} \cdot \frac{P\_max}{P\_int} \cdot DC$$

P_max = Maximum Power (W)
P_int = Initial Power (W)
Drift = DASY drift results (dB)
SAR_meas = Measured 1-g or 10-g Avg. SAR (W/kg)
DC = Transmission mode duty cycle in % where applicable
50% duty cycle is applied for PTT operation

Note: for conservative results, the following are applied:
If P_int > P_max, then P_max/P_int = 1.
Drift = 1 for positive drif

Additional SAR scaling was applied using the methodologies outlined in FCC KDB 865664 using tissue sensitivity values. SAR was scaled for conditions where the tissue permittivity was measured above the nominal target and for tissue conductivity that was measured below the nominal target. Negative or reduced SAR scaling is not permitted.

12.6 DUT Test Plan

The guidelines and requirements outlined from section 4.0 were used to assess compliance of this device. All modes of operation identified in section 6.0 were considered during the development of the test plan. All tests were performed in CW mode and then 50% duty cycle was applied respectively to the final results.

Standalone and simultaneous BT testing were assessed in sections 13.2 and 14.0 per the guidelines of KDB 447498.

13.0 DUT Test Data

13.1 Assessments at Body

The new Nylon Carry Case PMLN7042A were assessed using the accessories indicated in section 7.0 which represent the highest applicable configurations at the body and face found during the initial compliance assessment on file with the FCC. SAR plots of the highest result per Table (bolded) is presented in Appendix E.

TABLE 16

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
Assessments at the Body											
PMAD4121B	PMNN4440AR	PMLN7042A	PMMN4075A	160.000							
				167.000	5.42	-0.52	2.83	1.12	**1.77**	**0.70**	MO-AB-150217-08
				173.400							

13.2 Assessment at the Bluetooth band

Per guidelines in KDB 447498, the following formula was used to determine the test exclusion for standalone Bluetooth transmitter;

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] *[$\sqrt{F_{(GHz)}}$] = 2.40, which is ≤ 3 for 1-g SAR

Where:

Max. power = 7.61mW (10mW*76.1% duty cycle)
Min. test separation distance = 5mm for actual test separation < 5mm
F(GHz) = 2.48 GHz

Per the result from the calculation above, the standalone SAR assessment was not required for Bluetooth band. Therefore, SAR results for Bluetooth are not reported herein.

13.3 Shortened Scan Assessment

A "shortened" scan using the highest SAR configuration overall from the Part 90 was performed to validate the SAR drift of the full DASY5™ coarse and zoom scans. Note that the shortened scan represents the zoom scan performance result; this is obtained by first running a coarse scan to find the peak area and then, using a newly charged battery, a zoom scan only was performed. The results of the shortened cube scan presented in APPENDIX E demonstrate that the scaling methodology used to determine the calculated SAR results presented herein are valid. The SAR results from the table below is provided in APPENDIX E.

TABLE 17

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (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)	Run#
Shorten scan											
PMAD4121B	PMNN4440AR	PMLN7042A	PMMN4075A	167.000	5.44	-0.15	3.19	1.26	**1.82**	**0.72**	MO-AB-150226-02

14.0 Simultaneous Transmission Exclusion for

Per guidelines in KDB 447498, the following formula was used to determine the test exclusion to an antenna that transmits simultaneously with other antennas for test distances ≤ 50mm:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] *[√F(GHz)/X] ≤ 0.4 W/kg (1g)

Where:
X = 7.5 for 1g-SAR; 18.75 for 10g
Max. power = 7.61mW (10mW*76.1% duty cycle)
Min. test separation distance = 5mm for actual test separation < 5mm
F(GHz) = 2.48 GHz

15.0 Results Summary

Based on the test guidelines from KDB 643646 and satisfying frequencies with FCC band to be in compliance with Industry Canada Frequency range, the highest Operational Maximum Calculated 1-gram and 10-gram average SAR values found for this filing:

TABLE 18

Designator	Frequency band (MHz)	Max Calc at Body (W/kg)	
		1g-SAR	10g-SAR
Overall	136-174	1.82	0.72
FCC	150.8-173.4	1.82	0.72
Industry Canada	138-174	1.82	0.72

All results are scaled to the maximum output power

The previously reported results at the body 1.28 W/kg are hereby replaced with the results presented herein.

The test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of 8 W/kg averaged over 1 gram per the requirements of 47 CFR 2.1093(d). The 10 grams result is not applicable to FCC filing.

16.0 Variability Assessment

Per the guidelines in KDB 865664 SAR variability assessment is not required because SAR results are below 4.0W/kg (Occupational).

17.0 System Uncertainty

A system uncertainty analysis is not required for this report per KDB 865664 because the highest report SAR value for Occupational exposure is less than 7.5W/kg.

Per the guidelines of ISO 17025 a reported system uncertainty is required and therefore measurement uncertainty budget is included in Appendix A.

Appendix A
Measurement Uncertainty Budget

Uncertainty Budget for Device Under Test, for 150MHz

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	6.7	N	1.00	1	1	6.7	6.7	∞
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				12	11	482
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				23	23	

Notes for uncertainty budget Table:
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

Uncertainty Budget for System Validation (dipole & flat phantom) for 150MHz									
a	*b*	*c*	*d*	$e = f(d,k)$	*f*	*g*	$h = c \times f / e$	$i = c \times g / e$	*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	6.7	N	1.00	1	1	6.7	6.7	∞
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				10	9	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				19	18	

Notes for uncertainty budget Table:
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
C Service suisse d'étalonnage
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 **Motorola MY**

Certificate No: **ES3-3196_Mar14/3**

CALIBRATION CERTIFICATE (Replacement of No: ES3-3196_Mar14/2)

Object: ES3DV3 - SN:3196

Calibration procedure(s): QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: March 26, 2014

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	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	30-Dec-13 (No. ES3-3013_Dec13)	Dec-14
DAE4	SN: 660	13-Dec-13 (No. DAE4-660_Dec13)	Dec-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

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

Issued: April 18, 2014

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
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 affect 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 with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* 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 ≤ 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.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

Probe ES3DV3

SN:3196

Manufactured: June 16, 2008
Calibrated: March 26, 2014

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3196

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.29	1.30	1.34	± 10.1 %
DCP (mV)[B]	102.2	103.1	102.4	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	186.6	±3.0 %
		Y	0.0	0.0	1.0		211.2	
		Z	0.0	0.0	1.0		199.2	
10012-CAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	3.14	69.7	19.0	1.87	148.2	±0.7 %
		Y	2.97	69.0	18.8		148.8	
		Z	3.57	72.8	20.8		137.7	
10013-CAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	11.36	71.1	23.5	9.46	148.9	±3.0 %
		Y	11.60	72.1	24.3		148.9	
		Z	11.15	70.5	23.2		136.9	
10059-CAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	3.50	71.0	19.6	2.12	147.9	±0.7 %
		Y	3.60	72.0	20.2		148.2	
		Z	3.84	73.3	21.0		137.2	
10060-CAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	8.72	89.3	26.4	2.83	133.0	±0.7 %
		Y	10.20	92.7	27.7		134.4	
		Z	14.93	99.6	29.9		148.1	
10061-CAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	8.65	85.0	25.2	3.60	136.6	±0.7 %
		Y	8.87	86.1	25.8		136.3	
		Z	9.80	87.8	26.5		126.3	
10071-CAA	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	11.51	71.4	23.9	9.83	143.3	±3.0 %
		Y	11.85	72.6	24.9		145.3	
		Z	11.44	71.2	23.9		132.9	
10072-CAA	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	11.08	71.1	23.7	9.62	139.8	±3.0 %
		Y	11.53	72.7	24.8		143.9	
		Z	10.96	70.7	23.5		131.0	
10073-CAA	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	11.24	71.7	24.2	9.94	138.0	±3.5 %
		Y	11.69	73.2	25.4		140.4	
		Z	11.03	70.9	23.8		126.7	
10074-CAA	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	11.39	72.0	24.7	10.30	134.3	±3.3 %
		Y	11.92	73.8	26.0		138.1	
		Z	11.20	71.4	24.5		120.2	
10075-CAA	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	11.62	72.6	25.4	10.77	132.4	±3.5 %
		Y	12.10	74.1	26.5		138.8	
		Z	12.40	74.7	26.7		147.2	
10076-CAA	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	11.63	72.7	25.6	10.94	130.3	±3.5 %
		Y	12.17	74.3	26.7		136.5	
		Z	12.50	75.0	27.0		145.8	

10077-CAA	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	11.68	72.9	25.8	11.00	130.3	±3.8 %
		Y	12.21	74.5	26.9		136.6	
		Z	12.50	75.0	27.1		144.6	
10108-CAB	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	6.27	66.9	19.5	5.80	137.0	±1.2 %
		Y	6.32	67.4	19.8		143.2	
		Z	6.42	67.6	20.0		146.0	
10109-CAB	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	7.27	67.5	20.0	6.43	146.0	±1.4 %
		Y	7.03	66.9	19.8		127.1	
		Z	7.09	67.0	19.8		130.4	
10110-CAB	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	5.93	66.3	19.1	5.75	133.4	±1.2 %
		Y	6.00	66.8	19.6		139.8	
		Z	6.07	67.0	19.7		143.0	
10111-CAB	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	6.97	67.1	19.8	6.44	141.5	±1.4 %
		Y	7.03	67.6	20.2		147.4	
		Z	6.86	66.8	19.8		126.9	
10112-CAB	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	7.49	67.6	20.1	6.59	147.2	±1.4 %
		Y	7.23	67.0	19.9		128.1	
		Z	7.37	67.3	20.1		132.9	
10113-CAB	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	7.23	67.4	20.0	6.62	142.5	±1.4 %
		Y	7.30	67.9	20.4		149.2	
		Z	7.12	67.1	20.0		129.0	
10142-CAB	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	5.76	66.1	19.1	5.73	130.8	±1.2 %
		Y	5.83	66.7	19.6		136.1	
		Z	5.93	66.9	19.7		141.7	
10143-CAB	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	6.73	67.1	19.8	6.35	137.6	±1.4 %
		Y	6.79	67.5	20.1		143.1	
		Z	6.89	67.7	20.3		148.8	
10145-CAB	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	5.71	66.7	19.4	5.76	148.3	±1.2 %
		Y	5.58	66.5	19.5		131.5	
		Z	5.64	66.5	19.5		136.1	
10146-CAB	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	6.42	67.0	19.8	6.41	130.6	±1.2 %
		Y	6.52	67.6	20.3		135.8	
		Z	6.57	67.5	20.2		140.6	
10154-CAB	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	5.93	66.3	19.2	5.75	133.1	±1.2 %
		Y	6.02	67.0	19.7		138.2	
		Z	6.06	67.0	19.7		142.7	
10155-CAB	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	6.97	67.1	19.8	6.43	141.5	±1.4 %
		Y	7.03	67.6	20.2		146.5	
		Z	6.83	66.7	19.7		126.8	
10156-CAB	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	5.69	65.9	19.0	5.79	129.8	±1.2 %
		Y	5.79	66.6	19.6		134.9	
		Z	5.86	66.7	19.6		138.6	
10157-CAB	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	6.71	67.0	19.8	6.49	135.5	±1.4 %
		Y	6.76	67.4	20.2		141.0	
		Z	6.86	67.6	20.3		145.5	

10158-CAB	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	7.23	67.4	20.0	6.62	143.1	±1.4 %
		Y	7.28	67.8	20.4		148.2	
		Z	7.10	67.0	20.0		127.9	
10159-CAB	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	6.84	67.2	19.9	6.56	136.3	±1.2 %
		Y	6.88	67.5	20.3		142.4	
		Z	7.01	67.9	20.5		147.3	
10166-CAB	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	5.09	66.3	19.2	5.46	142.5	±1.2 %
		Y	5.18	67.0	19.7		149.6	
		Z	5.02	66.1	19.2		129.2	
10167-CAB	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	6.07	67.7	20.1	6.21	145.8	±1.2 %
		Y	5.92	67.2	20.0		130.1	
		Z	5.98	67.3	20.1		131.8	
10175-CAB	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	4.93	66.4	19.4	5.72	134.6	±0.9 %
		Y	5.00	67.0	19.8		142.6	
		Z	5.11	67.4	20.1		149.7	
10176-CAB	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	5.68	67.5	20.3	6.52	134.8	±1.2 %
		Y	5.81	68.2	20.9		142.7	
		Z	5.67	67.4	20.4		127.0	
10177-CAC	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	4.92	66.4	19.4	5.73	134.0	±0.9 %
		Y	5.01	67.0	19.9		142.6	
		Z	5.12	67.5	20.2		149.5	
10178-CAB	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	5.67	67.4	20.3	6.52	133.1	±1.4 %
		Y	5.87	68.5	21.1		142.1	
		Z	5.65	67.4	20.5		126.9	
10179-CAB	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	5.68	67.6	20.4	6.50	133.0	±1.2 %
		Y	5.82	68.3	20.9		142.6	
		Z	5.62	67.3	20.3		127.2	
10180-CAB	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	5.68	67.6	20.3	6.50	133.6	±1.2 %
		Y	5.88	68.6	21.1		142.1	
		Z	5.67	67.5	20.5		126.9	
10184-CAB	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	4.92	66.3	19.4	5.73	133.1	±0.9 %
		Y	5.03	67.1	20.0		142.2	
		Z	5.11	67.4	20.1		149.3	
10185-CAB	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	5.66	67.4	20.3	6.51	133.2	±1.4 %
		Y	5.84	68.4	21.0		142.0	
		Z	5.65	67.3	20.4		127.4	
10187-CAB	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	4.91	66.3	19.3	5.73	133.7	±1.2 %
		Y	5.05	67.2	20.0		141.7	
		Z	5.10	67.3	20.1		149.6	
10188-CAB	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	5.68	67.5	20.3	6.52	133.6	±1.4 %
		Y	5.88	68.6	21.1		141.9	
		Z	5.70	67.6	20.5		126.9	
10298-AAA	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	5.77	66.8	19.5	5.72	148.7	±0.9 %
		Y	5.64	66.6	19.5		132.4	
		Z	5.75	66.8	19.7		140.5	

10299-AAA	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	6.52	66.9	19.7	6.39	131.8	±1.2 %
		Y	6.62	67.5	20.2		139.1	
		Z	6.71	67.7	20.3		147.5	
10315-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	2.88	68.7	18.6	1.71	147.4	±0.5 %
		Y	2.78	68.5	18.7		130.6	
		Z	3.02	70.3	19.8		137.6	
10316-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	10.27	69.4	21.8	8.36	145.9	±2.2 %
		Y	10.15	69.3	22.0		127.0	
		Z	10.17	69.2	21.8		134.8	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 8 and 9).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3196

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) C	Relative Permittivity F	Conductivity (S/m) F	ConvF X	ConvF Y	ConvF Z	Alpha G	Depth G (mm)	Unct. (k=2)
150	52.3	0.76	7.21	7.21	7.21	0.04	1.20	± 13.3 %
220	49.0	0.81	7.20	7.20	7.20	0.05	1.20	± 13.3 %
300	45.3	0.87	7.17	7.17	7.17	0.15	1.50	± 13.3 %
450	43.5	0.87	6.64	6.64	6.64	0.23	1.80	± 13.3 %
750	41.9	0.89	6.66	6.66	6.66	0.80	1.16	± 12.0 %
900	41.5	0.97	6.30	6.30	6.30	0.54	1.42	± 12.0 %
1810	40.0	1.40	5.40	5.40	5.40	0.70	1.27	± 12.0 %
1950	40.0	1.40	5.16	5.16	5.16	0.76	1.22	± 12.0 %
2300	39.5	1.67	4.91	4.91	4.91	0.80	1.24	± 12.0 %
2450	39.2	1.80	4.63	4.63	4.63	0.80	1.28	± 12.0 %
2600	39.0	1.96	4.44	4.44	4.44	0.80	1.26	± 12.0 %
3500	37.9	2.91	4.37	4.37	4.37	0.90	1.21	± 13.1 %
3700	37.7	3.12	4.07	4.07	4.07	0.90	1.21	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3196

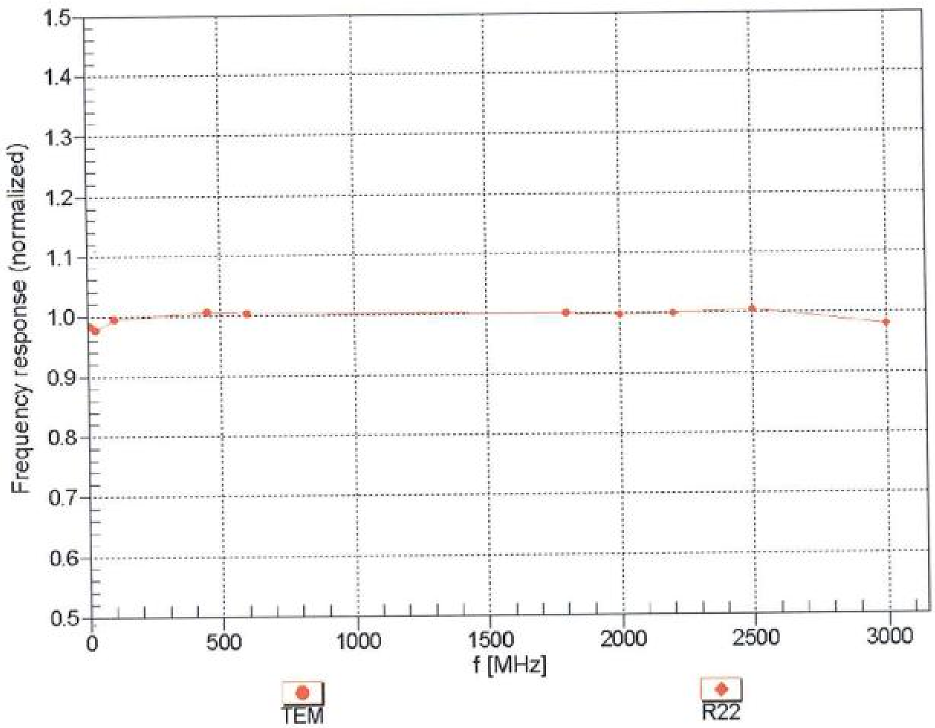
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unct. (k=2)
150	61.9	0.80	6.83	6.83	6.83	0.04	1.20	± 13.3 %
220	60.2	0.86	6.65	6.65	6.65	0.05	1.20	± 13.3 %
300	58.2	0.92	6.83	6.83	6.83	0.10	1.60	± 13.3 %
450	56.7	0.94	6.92	6.92	6.92	0.14	1.58	± 13.3 %
750	55.5	0.96	6.24	6.24	6.24	0.31	1.91	± 12.0 %
900	55.0	1.05	6.02	6.02	6.02	0.51	1.47	± 12.0 %
1810	53.3	1.52	4.82	4.82	4.82	0.62	1.42	± 12.0 %
1950	53.3	1.52	4.80	4.80	4.80	0.49	1.78	± 12.0 %
2300	52.9	1.81	4.39	4.39	4.39	0.80	1.25	± 12.0 %
2450	52.7	1.95	4.25	4.25	4.25	0.80	1.39	± 12.0 %
2600	52.5	2.16	4.03	4.03	4.03	0.80	1.01	± 12.0 %
3500	51.3	3.31	3.69	3.69	3.69	0.80	1.26	± 13.1 %
3700	51.0	3.55	3.56	3.56	3.56	0.80	1.61	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

ES3DV3– SN:3196 March 26, 2014

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

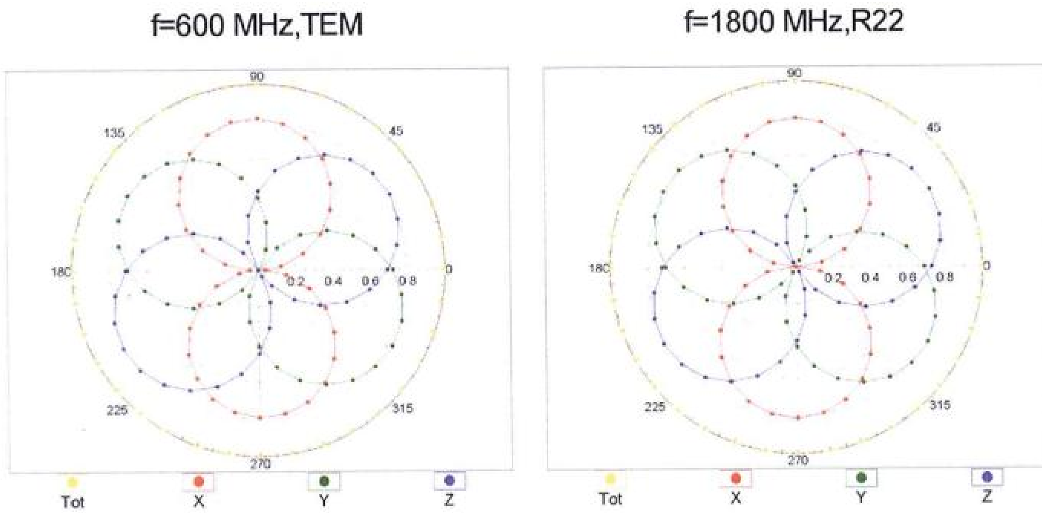


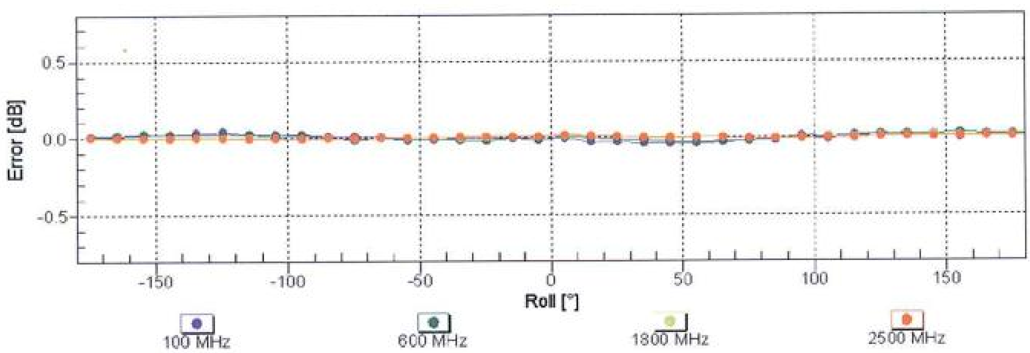
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Certificate No: ES3-3196_Mar14/3 Page 10 of 14

ES3DV3– SN:3196 March 26, 2014

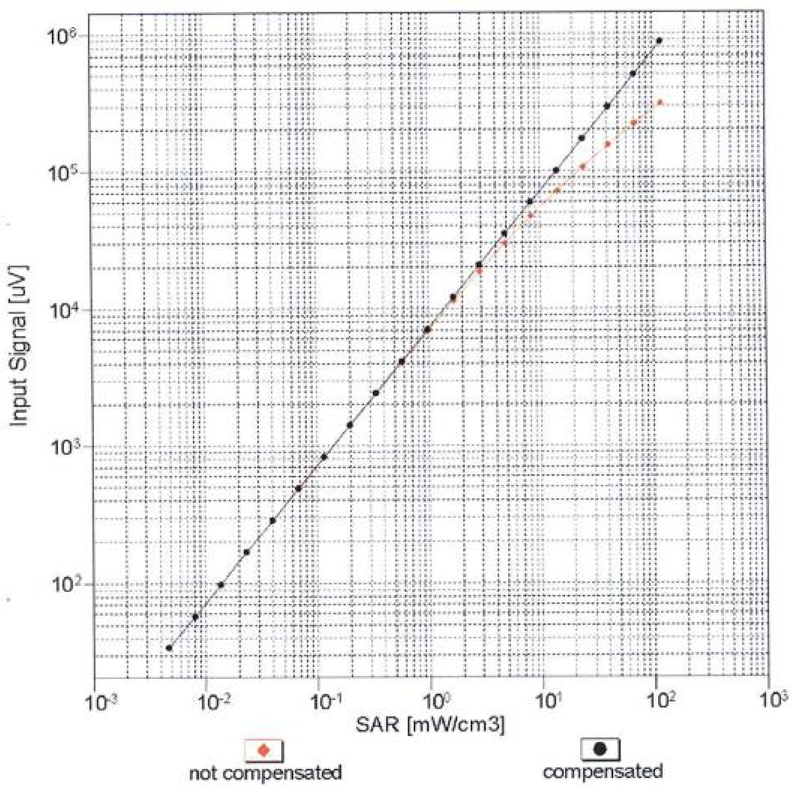
Receiving Pattern (ϕ), $\vartheta = 0°$

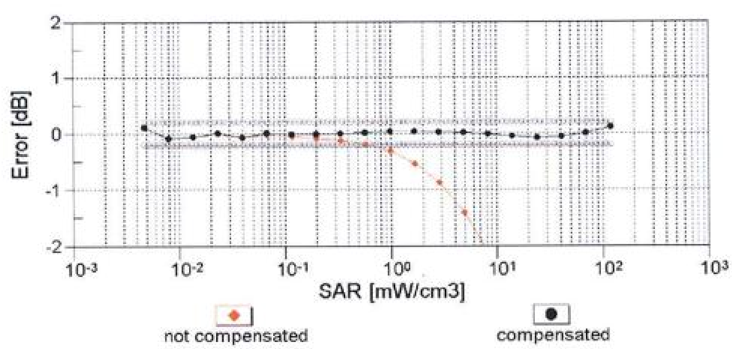




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f_{eval}= 1900 MHz)

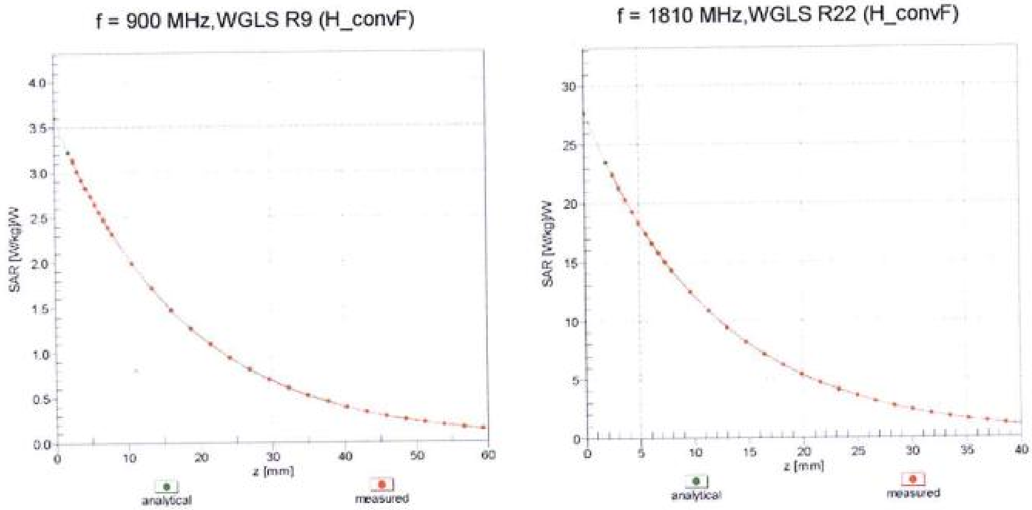




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

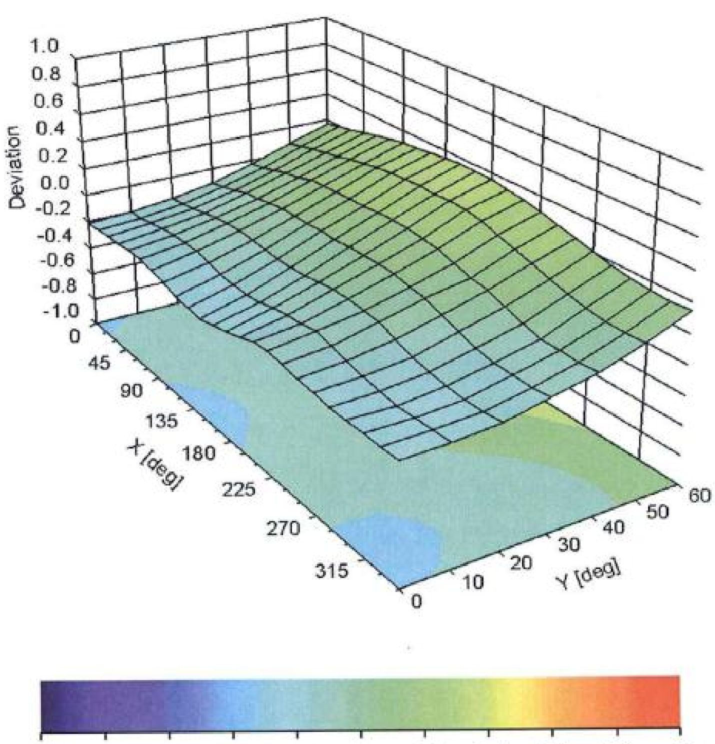
ES3DV3– SN:3196 March 26, 2014

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



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

Certificate No: ES3-3196_Mar14/3 Page 13 of 14

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3196

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	5.3
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Appendix C
Dipole Calibration Certificates

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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 Motorola MY

Certificate No: CLA150-4010_May14

CALIBRATION CERTIFICATE

Object	CLA150 - SN: 4010
Calibration procedure(s)	QA CAL-15.v8 Calibration procedure for system validation sources below 700 MHz
Calibration date:	May 08, 2014

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	03-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: S5054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: S5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe EX3DV4	SN: 3877	06-Jan-14 (No. EX3-3877_Jan14)	Jan-15
DAE4	SN: 654	18-Jul-13 (No. DAE4-654_Jul13)	Jul-14

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	04-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 8, 2014

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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**

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) IEC 62209-2, "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 2013
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) 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 source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. 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.

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%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
EUT Positioning	Touch Position	
Zoom Scan Resolution	dx, dy, dz = 5.0 mm	
Frequency	150 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	52.3	0.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	49.9 ± 6 %	0.76 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	1 W input power	3.59 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**3.55 W/kg ± 18.4 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	1 W input power	2.39 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**2.37 W/kg ± 18.0 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	61.9	0.80 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	62.5 ± 6 %	0.80 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	1 W input power	3.68 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**3.69 W/kg ± 18.4 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	1 W input power	2.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**2.46 W/kg ± 18.0 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.2 Ω - 3.5 jΩ
Return Loss	- 28.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.6 Ω - 7.7 jΩ
Return Loss	- 22.3 dB

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 15, 2014

DASY5 Validation Report for Head TSL

Date: 08.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: CLA150; Type: CLA150; Serial: CLA150 - SN: 4010

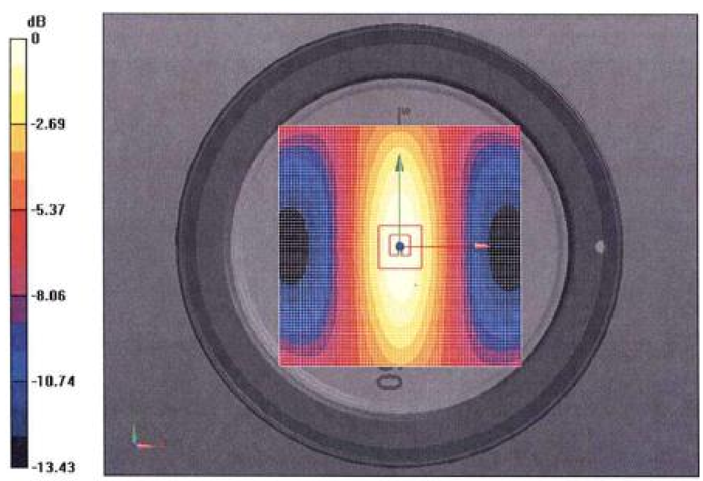
Communication System: UID 0 - CW; Frequency: 150 MHz
Medium parameters used: f = 150 MHz; σ = 0.76 S/m; ε_r = 49.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(11.76, 11.76, 11.76); Calibrated: 06.01.2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 18.07.2013
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

CLA Calibration for HSL-LF Tissue/CLA150, touch configuration, Pin=1W/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 4.65 W/kg

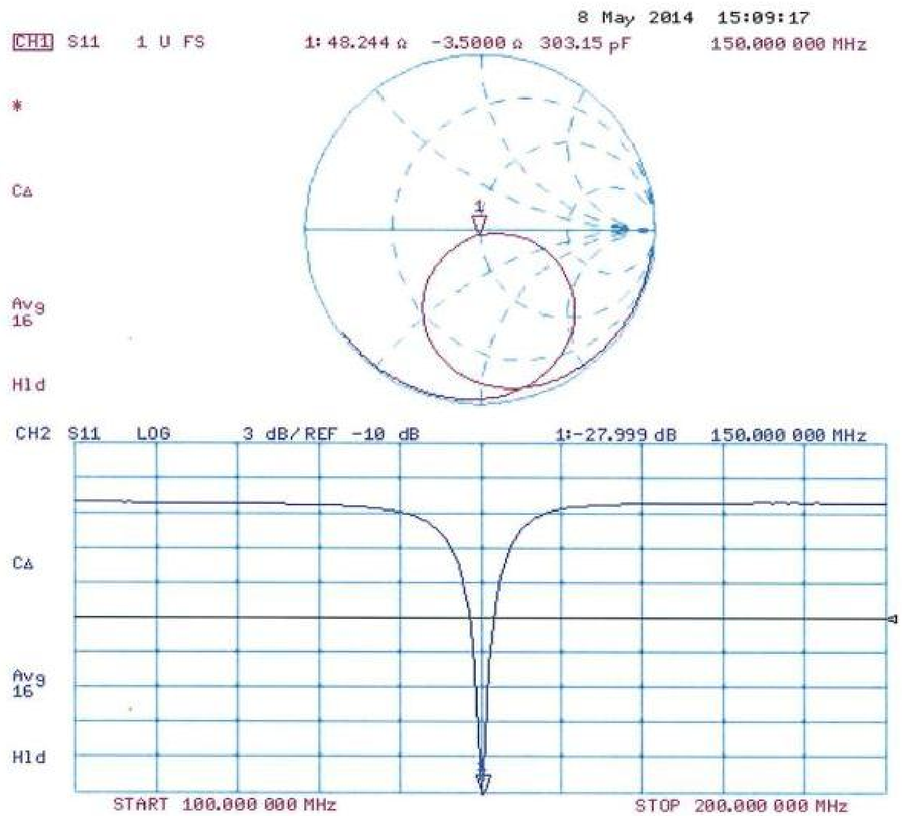
CLA Calibration for HSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 78.11 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 5.77 W/kg
SAR(1 g) = 3.59 W/kg; SAR(10 g) = 2.39 W/kg
Maximum value of SAR (measured) = 4.64 W/kg



0 dB = 4.65 W/kg = 6.67 dBW/kg

Certificate No: CLA150-4010_May14 Page 5 of 8

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 08.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: CLA150; Type: CLA150; Serial: CLA150 - SN: 4010

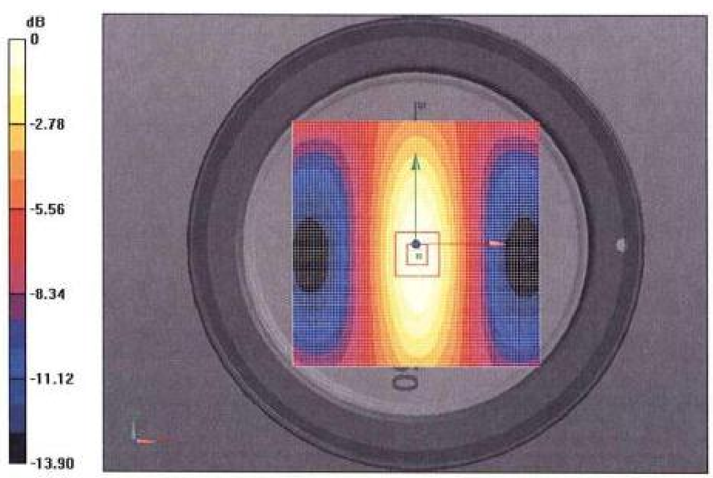
Communication System: UID 0 - CW; Frequency: 150 MHz
Medium parameters used: f = 150 MHz; $\sigma = 0.8$ S/m; $\varepsilon_r = 62.5$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(11.45, 11.45, 11.45); Calibrated: 06.01.2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 18.07.2013
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

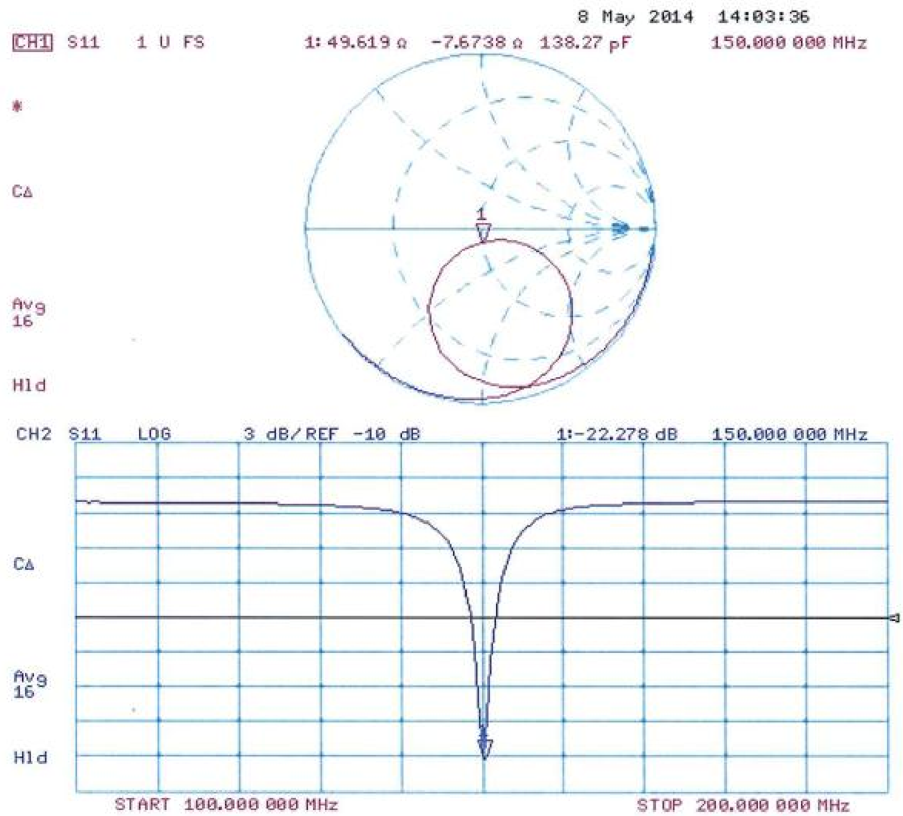
CLA Calibration for MSL-LF Tissue/CLA150, touch configuration, Pin=1W/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 4.77 W/kg

CLA Calibration for MSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 76.42 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 5.84 W/kg
SAR(1 g) = 3.68 W/kg; SAR(10 g) = 2.46 W/kg
Maximum value of SAR (measured) = 4.73 W/kg



0 dB = 4.77 W/kg = 6.79 dBW/kg

Impedance Measurement Plot for Body TSL



Appendix D
System Verification Check Scans

Motorola Solutions, Inc. EME Laboratory

Date/Time: 2/17/2015 4:25:36 PM

Robot#: DASY5-PG-1 | Run#: MO-SYSP-150B-150217-07
Dipole Model#: CLA150
Phantom#: ELI5 1150
Tissue Temp: 21.4 (C)
Serial#: 4010
Test Freq: 150.000(MHz)
Start Power: 1000 (mW)
Rotation (1D): 0.04 dB
Adjusted SAR (1W): 3.67 mW/g (1g)

Comments:

Duty Cycle: 1:1, Medium parameters used: f = 150 MHz; σ = 0.78 S/m; ε_r = 63.5; ρ = 1000 kg/m^3
Probe: ES3DV3 - SN3196, , Frequency: 150 MHz, ConvF(6.83, 6.83, 6.83); Calibrated: 3/26/2014
Electronics: DAE3 Sn374, Calibrated: 5/14/2014

Below 2 GHz-Rev.2/System Performance Check/Dipole Area Scan 2 (81x81x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 73.11 V/m; Power Drift = 0.02 dB
Fast SAR: SAR(1 g) = 3.92 W/kg; SAR(10 g) = 2.79 W/kg (SAR corrected for target medium)
Maximum value of SAR (interpolated) = 4.23 W/kg

Below 2 GHz-Rev.2/System Performance Check/Dipole Area Scan 2 (9x9x1):

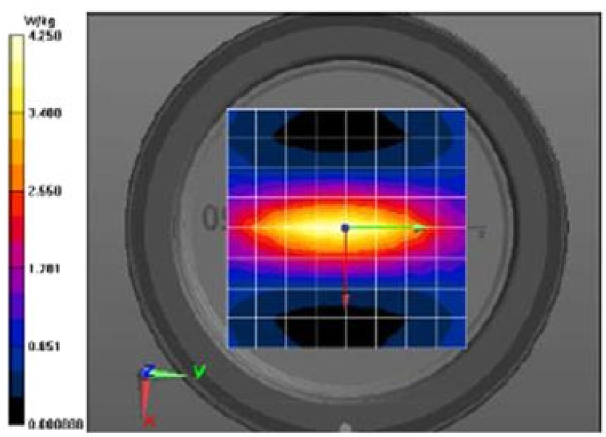
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 4.20 W/kg

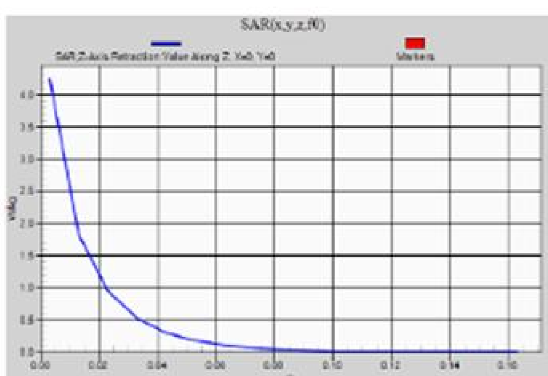
Below 2 GHz-Rev.2/System Performance Check/0-Degree Cube (5x5x7)/Cube 0:

Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 73.11 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 6.12 W/kg
SAR(1 g) = 3.67 W/kg; SAR(10 g) = 2.34 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 4.23 W/kg

Below 2 GHz-Rev.2/System Performance Check/Z-Axis Retraction (1x1x17):

Measurement grid: dx=20mm, dy=20mm, dz=10mm
Maximum value of SAR (measured) = 4.25 W/kg





Motorola Solutions, Inc. EME Laboratory
Date/Time: 2/26/2015 10:52:18 AM

Robot#: DASY5-PG-1 | Run#: MO(AZ)-SYSP-150B-150226-01
Dipole Model#: CLA150
Phantom#: ELI5 1150
Tissue Temp: 20.8 (C)
Serial#: 4010
Test Freq: 150.000 (MHz)
Start Power: 1000 (mW)
Rotation (1D): 0.031 dB
Adjusted SAR (1W): 3.50 mW/g (1g)

Comments:

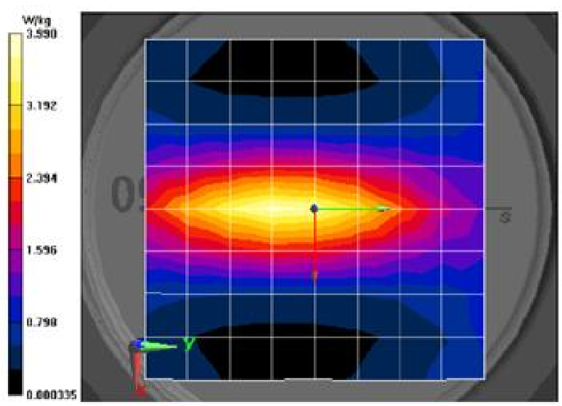
Duty Cycle: 1:1, Medium parameters used: f = 150 MHz; σ = 0.77 S/m; ε_r = 62.3; ρ = 1000 kg/m^3
Probe: ES3DV3 - SN3196, , Frequency: 150 MHz, ConvF(6.83, 6.83, 6.83); Calibrated: 3/26/2014
Electronics: DAE4 Sn1294, Calibrated: 11/3/2014

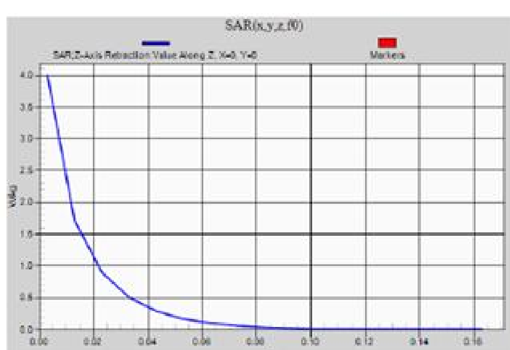
Below 2 GHz-Rev.2/System Performance Check/Dipole Area Scan 2 (81x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 70.54 V/m; Power Drift = 0.16 dB
Fast SAR: SAR(1 g) = 3.59 W/kg; SAR(10 g) = 2.56 W/kg (SAR corrected for target medium)
Maximum value of SAR (interpolated) = 3.86 W/kg

Below 2 GHz-Rev.2/System Performance Check/Dipole Area Scan 2 (9x9x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.84 W/kg

Below 2 GHz-Rev.2/System Performance Check/0-Degree Cube (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 70.54 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 5.89 W/kg
SAR(1 g) = 3.5 W/kg; SAR(10 g) = 2.23 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 4.02 W/kg

Below 2 GHz-Rev.2/System Performance Check/Z-Axis Retraction (1x1x17):
Measurement grid: dx=20mm, dy=20mm, dz=10mm
Maximum value of SAR (measured) = 3.99 W/kg





Appendix E
DUT Scans – (Shortened Scan and Highest SAR configurations)

Shortened Scan Results

Motorola Solutions, Inc. EME Laboratory

Date/Time: 2/26/2015 1:30:31 PM

Robot#: DASY5-PG-01 | Run#: MO-AB-150226-02
Model#: PMUD3265A
Phantom#: ELI5 1150
Tissue Temp: 20.9 (C)
Serial#: 105TPF0210 (Non GOB)
Antenna: PMAD4121B
Test Freq: 167.000 (MHz)
Battery: PMNN4440AR
Carry Acc: PMLN7042A
Audio Acc: PMMN4075A
Start Power: 5.44 (W)

Comments: Shorten scan.

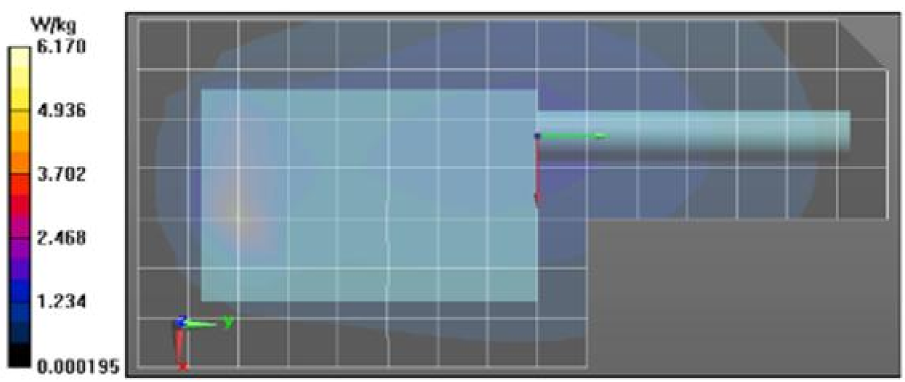
Duty Cycle: 1:1, Medium parameters used: f = 167 MHz; σ = 0.78 S/m; ε_r = 61.5; ρ = 1000 kg/m^3
Probe: ES3DV3 - SN3196, , Frequency: 167 MHz, ConvF(6.83, 6.83, 6.83); Calibrated: 3/26/2014
Electronics: DAE4 Sn1294, Calibrated: 11/3/2014

Below 2 GHz-Rev.2/Ab Scan/1-Area Scan (71x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 65.63 V/m; Power Drift = -0.33 dB
Fast SAR: SAR(1 g) = 3.16 W/kg; SAR(10 g) = 1.85 W/kg (SAR corrected for target medium)
Maximum value of SAR (interpolated) = 4.10 W/kg

Below 2 GHz-Rev.2/Ab Scan/2-Volume 2D Scan (41x41x1): Interpolated grid: dx=0.7500 mm, dy=0.7500 mm, dz=1.000 mm
Reference Value = 65.63 V/m; Power Drift = -0.42 dB
Fast SAR: SAR(1 g) = 3.37 W/kg; SAR(10 g) = 1.6 W/kg (SAR corrected for target medium)
Maximum value of SAR (interpolated) = 5.79 W/kg

Below 2 GHz-Rev.2/Ab Scan/3-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 50.64 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 17.1 W/kg
SAR(1 g) = 3.19 W/kg; SAR(10 g) = 1.26 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 5.27 W/kg

Below 2 GHz-Rev.2/Ab Scan/4-Z-Axis Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm
Maximum value of SAR (measured) = 6.17 W/kg



Shortened scan reflects highest SAR producing configuration and is compared to the full scan.

Scan Description	Test Time (min.)	SAR 1g (W/kg)	SAR 10g (W/kg)
Shorten scan (zoom)	7	1.82	0.72
Full scan (area & zoom)	25	1.77	0.70

Highest Body SAR Configuration Results

Motorola Solutions, Inc. EME Laboratory
Date/Time: 2/17/2015 5:22:30 PM

Robot#: DASY5-PG-01 | Run#: MO-AB-150217-08
Model#: PMUD3265A
Phantom#: ELI5 1150
Tissue Temp: 21.0 (C)
Serial#: 105TPK0210 (Non GOB)
Antenna: PMAD4121B
Test Freq: 167.000 (MHz)
Battery: PMNN4440AR
Carry Acc: PMLN7042A
Audio Acc: PMMN4075A
Start Power: 5.42 (W)

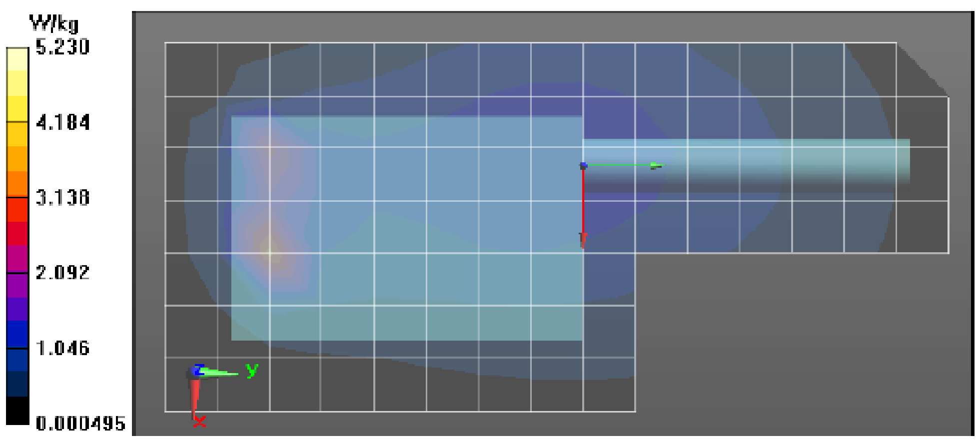
Comments:

Duty Cycle: 1:1, Medium parameters used: f = 167 MHz; σ = 0.79 S/m; ε_r = 62.4; ρ = 1000 kg/m^3
Probe: ES3DV3 - SN3196, , Frequency: 167 MHz, ConvF(6.83, 6.83, 6.83); Calibrated: 3/26/2014
Electronics: DAE3 Sn374, Calibrated: 5/14/2014

Below 2 GHz-Rev.2/Ab Scan/1-Area Scan (71x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 70.80 V/m; Power Drift = -0.32 dB
Fast SAR: SAR(1 g) = 2.58 W/kg; SAR(10 g) = 1.49 W/kg (SAR corrected for target medium)
Maximum value of SAR (interpolated) = 3.46 W/kg

Below 2 GHz-Rev.2/Ab Scan/3-Zoom Scan (8x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 70.80 V/m; Power Drift = -0.52 dB
Peak SAR (extrapolated) = 11.3 W/kg
SAR(1 g) = 2.83 W/kg; SAR(10 g) = 1.12 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 4.84 W/kg

Below 2 GHz-Rev.2/Ab Scan/4-Z-Axis Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm
Maximum value of SAR (measured) = 5.23 W/kg

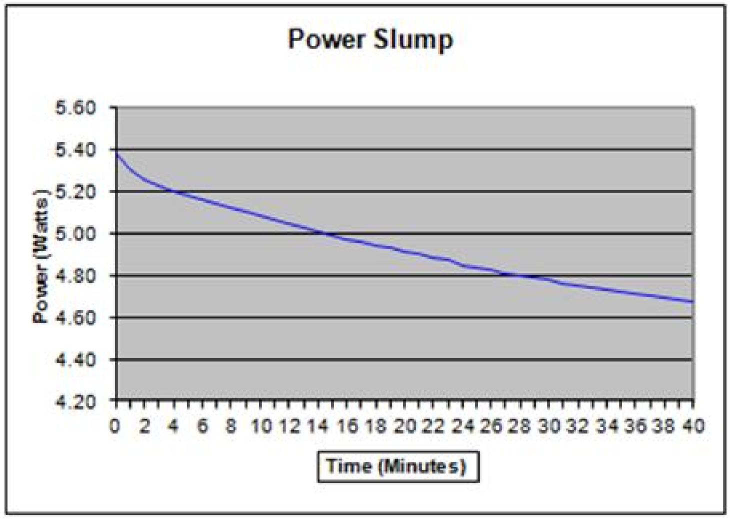


Appendix F
DUT Power slump

Power Slump Model # : PMUD3265A
Serial # : 105TPF0210

Battery: PMNN4440AR **Transmit Mode:** CW
Frequency (MHz): 167 **Audio Accessory:** PMMN4075A
Date: 3/4/2015

Tx Time (Minutes)	Power (Watts)
0.0	5.38
1.0	5.31
2.0	5.26
3.0	5.23
4.0	5.20
5.0	5.18
6.0	5.16
7.0	5.14
8.0	5.12
9.0	5.10
10.0	5.09
11.0	5.07
12.0	5.05
13.0	5.03
14.0	5.01
15.0	4.99
16.0	4.97
17.0	4.96
18.0	4.94
19.0	4.93
20.0	4.91
21.0	4.90
22.0	4.88
23.0	4.87
24.0	4.85
25.0	4.84
26.0	4.83
27.0	4.81
28.0	4.80
29.0	4.79
30.0	4.78
31.0	4.76
32.0	4.75
33.0	4.74
34.0	4.73
35.0	4.72
36.0	4.71
37.0	4.70
38.0	4.69
39.0	4.68
40.0	4.67



Appendix G
DUT Test Position Photos

1.0 Highest SAR Test Position per body location

1.1 Body

DUT w/ antenna PMAD4121B with offered battery PMNN4440AR and Nylon Carry Case PMLN7042A against the phantom and audio cable PMMN4075A attached.

Antenna kit #	Body-worn Kit #	Battery kit #	Separation Distances (mm)		
			@ bottom surface of the DUT	@ antenna`s base	@ antenna`s tip
PMAD4121B*	PMLN7042A	PMNN4440A*	3	34	52

* Accessories that were previously reported.