

**MOTOROLA SOLUTIONS**

MS ISO/IEC 17025
TESTING
SAMM No.0826

DECLARATION OF COMPLIANCE SAR ASSESSMENT PCII Report Part 2 of 2

Motorola Solutions Inc.**EME Test Laboratory**

Motorola Solutions Malaysia Sdn Bhd (Innoplex)
 Plot 2A, Medan Bayan Lepas,
 Mukim 12 SWD 11900 Bayan Lepas Penang, Malaysia.

Date of Report: 06/27/2019**Report Revision:** A

Responsible Engineer: Goh Jue Yie (EME Engineer)
Report Author: Ch'ng Jian Sheng (EME Engineer)
Date/s Tested: 06/17/2019, 06/19/2019, 07/04/2019
Manufacturer: Motorola Solutions Inc.
DUT Description: Handheld Portable – APX6000 and APX6000XE Refresh VHF 136-174 MHz 6W
Test TX mode(s): CW (PTT), Bluetooth, WLAN 802.11 b/g/n
Max. Power output: 6.6 W (LMR 136-174 MHz band), 10 mW (Bluetooth), 1.98 mW (Bluetooth LE), 63.1 mW (WLAN 802.11 b), 25.1 mW (WLAN 802.11g), 15.5 mW (WLAN 802.11n)
Nominal Power: 6.0 W (LMR 136-174 MHz band), 8 mW (Bluetooth), 1.5 mW (Bluetooth LE), 31.6 mW (WLAN 802.11 b), 12.5 mW (WLAN 802.11g), 12.5 mW (WLAN 802.11n)
Tx Frequency Bands: LMR 136-174 MHz; Bluetooth 2.402-2.480 GHz; WLAN 802.11 b/g/n 2.412-2.462 GHz
Signaling type: FM (LMR), FHSS (Bluetooth), 802.11 b/g/n (WLAN)
Model(s) Tested: H98KGD9PW5BN (PMUD3372C) & H98KGD9PW7BN (PMUD3374C)
Model(s) Certified: Refer to Table 1
Serial Number(s): 481TVK0415 & 481TVK0529
Classification: Occupational/Controlled
FCC ID: AZ489FT7087; LMR 150.8-173.4 MHz, Bluetooth 2.402-2.480 GHz, WLAN 802.11 b/g/n 2.412-2.462 GHz
 This report contains results that are immaterial for FCC equipment approval, which are clearly identified.

ISED : 109U-89FT7087; LMR 138-174 MHz, Bluetooth 2.402-2.480 GHz, WLAN 802.11 b/g/n 2.412-2.462 GHz
 This report contains results that are immaterial for ISED equipment approval, which are clearly identified.
ISED Test Site registration: 109AK
FCC Test Firm Registration Number: 823256

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 (no deviation from standard methods). 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.

Tiong
 Nguk Ing

Digitally signed
 by Tiong Nguk
 Ing
 Date: 2019.08.02
 21:45:20 +08'00'

Tiong Nguk Ing**Deputy Technical Manager (Approved Signatory)****Approval Date: 8/2/2019**

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
S Servizio svizzero di taratura
S Swiss Calibration Service

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

Accreditation No.: **SCS 0108**

Client **Motorola Solutions MY**

Certificate No: **CLA150-4005_Feb18**

CALIBRATION CERTIFICATE

Object **CLA150 - SN: 4005**

Calibration procedure(s) **QA CAL-15.v8
Calibration procedure for system validation sources below 700 MHz**

Calibration date: **February 09, 2018**

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 NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5277 (20x)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 3877	30-Dec-17 (No. EX3-3877_Dec17)	Dec-18
DAE4	SN: 654	24-Jul-17 (No. DAE4-654_Jul17)	Jul-18
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (No. 217-02285/02284)	In house check: Jun-18
Power sensor E4412A	SN: MY41498087	06-Apr-16 (No. 217-02285)	In house check: Jun-18
Power sensor E4412A	SN: 000110210	06-Apr-16 (No. 217-02284)	In house check: Jun-18
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-16)	In house check: Jun-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: February 12, 2018

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

Certificate No: CLA150-4005_Feb18

Page 1 of 8

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



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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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 0108**

Glossary:

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

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "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
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "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)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The 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	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
EUT Positioning	Touch Position	
Zoom Scan Resolution	$dx, dy = 4.0$ mm, $dz = 1.4$ mm	Graded Ratio = 1.4 (Z direction)
Frequency	150 MHz $\pm$ 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 $\pm$ 0.2) °C	50.3 $\pm$ 6 %	0.76 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	1 W input power	3.80 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	3.77 W/kg $\pm$ 18.4 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	1 W input power	2.52 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	2.50 W/kg $\pm$ 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 $\pm$ 0.2) °C	62.1 $\pm$ 6 %	0.81 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	1 W input power	3.87 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	3.84 W/kg $\pm$ 18.4 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	1 W input power	2.57 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	2.55 W/kg $\pm$ 18.0 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	$41.9 \Omega + 2.0 j\Omega$
Return Loss	- 20.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$42.9 \Omega + 0.8 j\Omega$
Return Loss	- 22.3 dB

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	August 23, 2013

DASY5 Validation Report for Head TSL

Date: 09.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: CLA150; Type: CLA150; Serial: CLA150 - SN: 4005

Communication System: UID 0 - CW; Frequency: 150 MHz

Medium parameters used: $f = 150$ MHz; $\sigma = 0.76$ S/m; $\epsilon_r = 50.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(12.12, 12.12, 12.12); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 24.07.2017
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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) = 5.37 W/kg

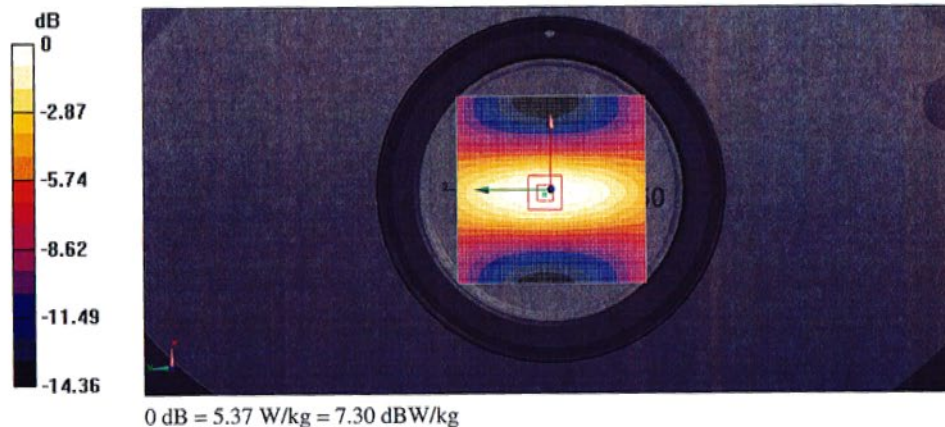
CLA Calibration for HSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan,**dist=1.4mm (8x10x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 83.36 V/m; Power Drift = -0.05 dB

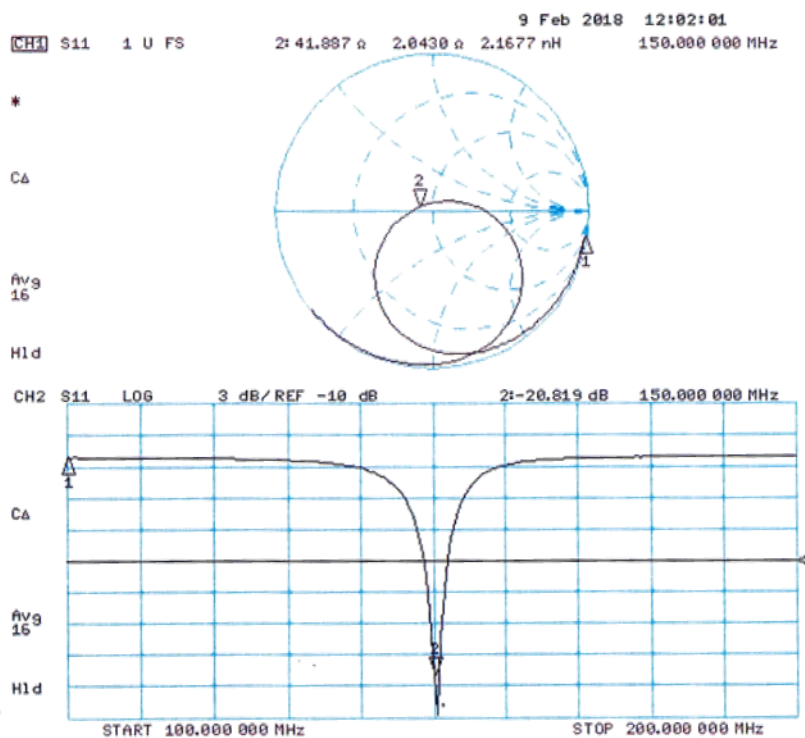
Peak SAR (extrapolated) = 7.14 W/kg

SAR(1 g) = 3.8 W/kg; SAR(10 g) = 2.52 W/kg

Maximum value of SAR (measured) = 5.33 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 09.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: CLA150; Type: CLA150; Serial: CLA150 - SN: 4005

Communication System: UID 0 - CW; Frequency: 150 MHz

Medium parameters used: $f = 150 \text{ MHz}$; $\sigma = 0.81 \text{ S/m}$; $\epsilon_r = 62.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(11.57, 11.57, 11.57); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 24.07.2017
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

CLA Calibration for MSL-LF Tissue/CLA150, touch configuration, Pin=1W/Area Scan**(81x81x1):** Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 5.47 W/kg

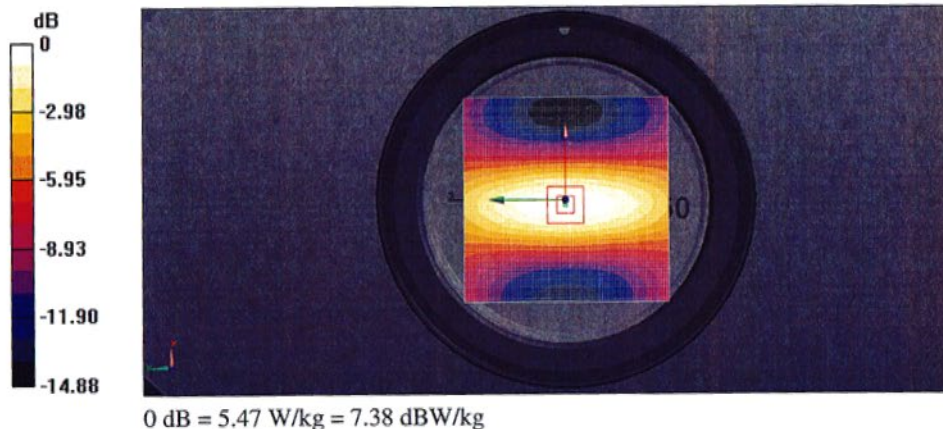
CLA Calibration for MSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan,**dist=1.4mm (8x10x7)/Cube 0:** Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 81.25 V/m; Power Drift = 0.01 dB

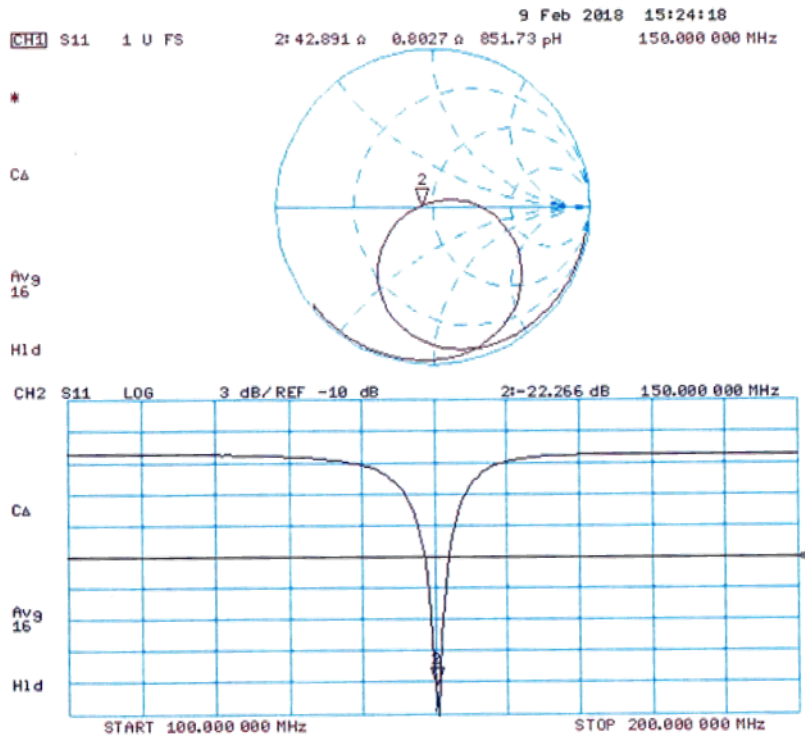
Peak SAR (extrapolated) = 7.26 W/kg

SAR(1 g) = 3.87 W/kg; SAR(10 g) = 2.57 W/kg

Maximum value of SAR (measured) = 5.37 W/kg



Impedance Measurement Plot for Body TSL



Dipole Data

The table below includes dipole impedance and return loss measurement data measured by Motorola Solutions' EME lab. The results meet the requirements stated in KDB 865664.

Dipole 150-4005	Head			Body		
	Impedance		Return Loss	Impedance		Return Loss
Date Measured	real Ω	imag $j\Omega$	dB	real Ω	imag $j\Omega$	dB
02/26/2018	43.11	4.56	-21.01	46.25	-0.63	-28.16
02/09/2019	43.62	5.59	-20.87	46.18	-2.20	-26.77

Appendix D

System Verification Check Scans

Motorola Solutions, Inc. EME Laboratory

Date/Time: 6/16/2019 7:55:47 PM

Robot#: DASY5-PG-3 | Run#: ZZ-SYSP-150B-190616-09
Dipole Model# CLA150
Phantom#: EL14 1016
Tissue Temp: 21.5 (C)
Serial#: 4005
Test Freq: 150.0000 (MHz)
Start Power: 1000 (mW)
Rotation (1D): 0.170 dB
Adjusted SAR (1W): 3.94 mW/g (1g)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 150$ MHz; $\sigma = 0.77$ S/m; $\epsilon_r = 59.8$; $\rho = 1000$ kg/m³
Probe: EX3DV4 - SN7364, Calibrated: 1/23/2019, Frequency: 150 MHz, ConvF(12.37, 12.37, 12.37) @ 150 MHz
Electronics: DAE4 Sn1483, Calibrated: 1/10/2019

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 = 87.64 V/m; Power Drift = -0.09 dB

Fast SAR: SAR(1 g) = 4.64 W/kg; SAR(10 g) = 3.28 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 5.49 W/kg

Below 2 GHz-Rev.2/System Performance Check/0-Degree Cube (5x6x7)/Cube 0:

Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 87.64 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 6.71 W/kg

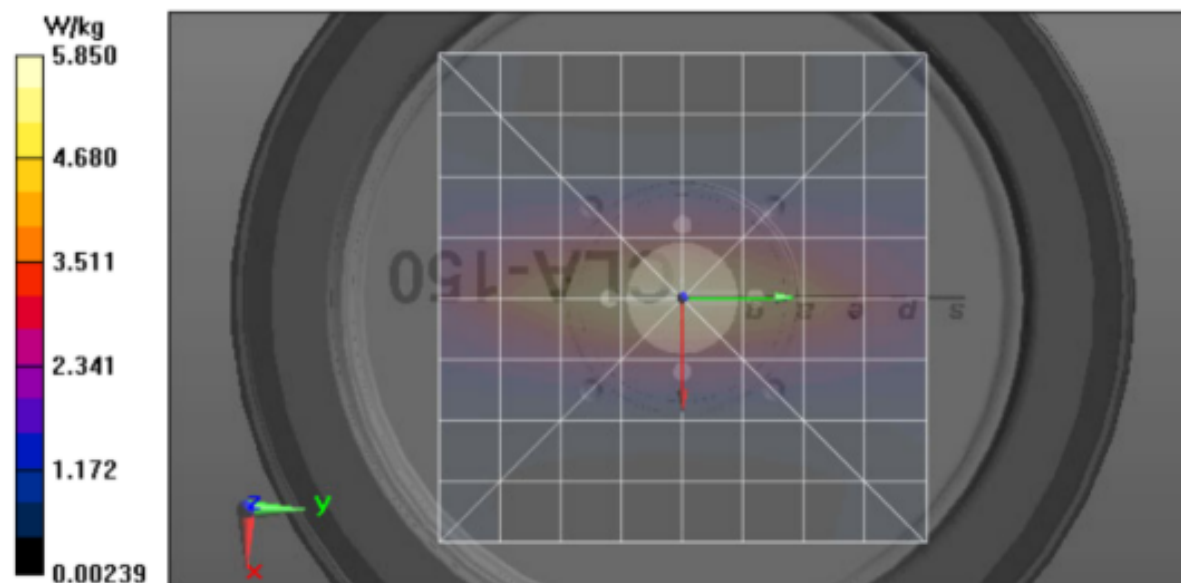
SAR(1 g) = 3.94 W/kg; SAR(10 g) = 2.58 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 5.50 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) = 5.85 W/kg



Motorola Solutions, Inc. EME Laboratory

Date/Time: 6/19/2019 3:42:46 AM

Robot#: DASY5-PG-3 | Run#: ZZ-SYSP-150H-190619-01
Dipole Model# CLA150
Phantom#: ELI4 1016
Tissue Temp: 21.5 (C)
Serial#: 4005
Test Freq: 150.0000 (MHz)
Start Power: 1000 (mW)
Rotation (1D): 0.14 dB
Adjusted SAR (1W): 4.07 mW/g (1g)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 150$ MHz; $\sigma = 0.75$ S/m; $\epsilon_r = 51.5$; $\rho = 1000$ kg/m³
Probe: EX3DV4 - SN7364, Calibrated: 1/23/2019, Frequency: 150 MHz, ConvF(12.97, 12.97, 12.97) @ 150 MHz
Electronics: DAE4 Sn1483, Calibrated: 1/10/2019

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 = 87.50 V/m; Power Drift = -0.01 dB

Fast SAR: SAR(1 g) = 4.77 W/kg; SAR(10 g) = 3.38 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 5.73 W/kg

Below 2 GHz-Rev.2/System Performance Check/0-Degree Cube (5x6x7)/Cube 0:Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 87.50 V/m; Power Drift = -0.01 dB

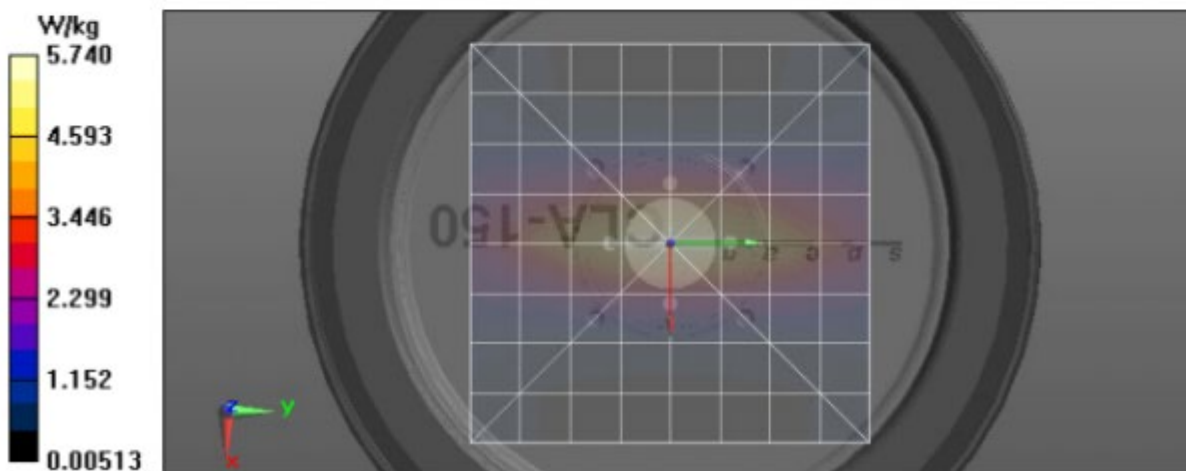
Peak SAR (extrapolated) = 7.10 W/kg

SAR(1 g) = 4.07 W/kg; SAR(10 g) = 2.66 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 5.81 W/kg

Below 2 GHz-Rev.2/System Performance Check/Z-Axis Retraction (1x1x17): Measurementgrid: $dx=20$ mm, $dy=20$ mm, $dz=10$ mm

Maximum value of SAR (measured) = 5.74 W/kg



Motorola Solutions, Inc. EME Laboratory
Date/Time: 7/4/2019 3:29:36 AM

Robot#: DASY5-PG-1 | Run#: ZZ-SYSP-150B-190704-01
 Dipole Model#: CLA150
 Phantom#: ELI4 1016
 Tissue Temp: 21.4 (C)
 Serial#: 4005
 Test Freq: 150.0000 (MHz)
 Start Power: 1000 (mW)
 Rotation (1D): 0.13 dB
 Adjusted SAR (1W): 3.92 mW/g (1g)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 150 \text{ MHz}$; $\sigma = 0.77 \text{ S/m}$; $\epsilon_r = 60$; $\rho = 1000 \text{ kg/m}^3$
 Probe: EX3DV4 - SN3612, Calibrated: 10/18/2018, Frequency: 150 MHz, ConvF(9.73, 9.73, 9.73) @ 150 MHz
 Electronics: DAE4 Sn684, Calibrated: 10/9/2018

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

Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Reference Value = 84.22 V/m; Power Drift = 0.01 dB

Fast SAR: SAR(1 g) = 4.67 W/kg; SAR(10 g) = 3.31 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 5.52 W/kg

Below 2 GHz-Rev.2/System Performance Check/0-Degree Cube (5x6x7)/Cube 0:

Measurement grid: $dx=7.5 \text{ mm}$, $dy=7.5 \text{ mm}$, $dz=5 \text{ mm}$

Reference Value = 84.22 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 6.95 W/kg

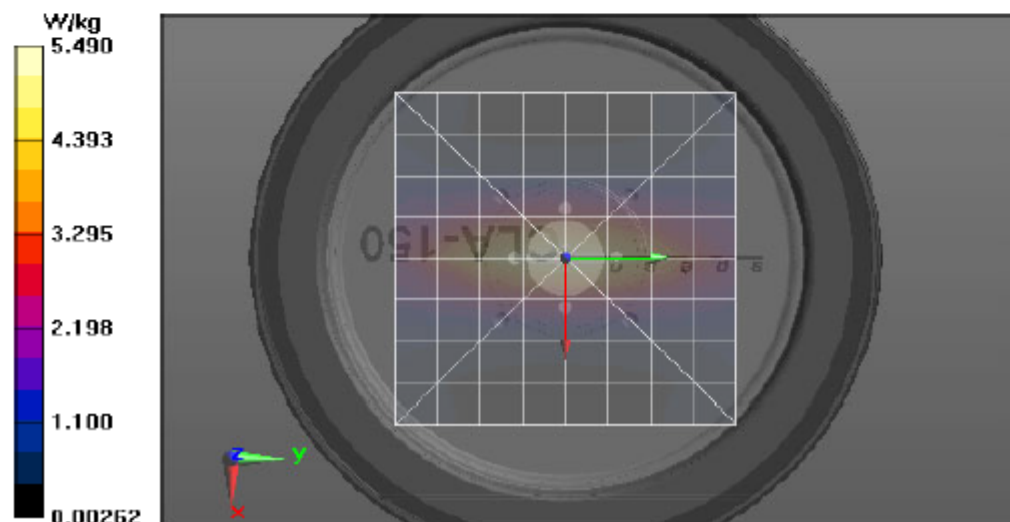
SAR(1 g) = 3.92 W/kg; SAR(10 g) = 2.54 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 5.55 W/kg

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

grid: $dx=20 \text{ mm}$, $dy=20 \text{ mm}$, $dz=10 \text{ mm}$

Maximum value of SAR (measured) = 5.49 W/kg



Motorola Solutions, Inc. EME Laboratory

Date/Time: 6/27/2019 9:26:34 AM

Robot#: DASY5-PG-3 | Run#: ZZ-SYSP-150B-190627-07
Dipole Model#: CLA150
Phantom#: ELI4 1016
Tissue Temp: 21.1 (C)
Serial#: 4005
Test Freq: 150.0000 (MHz)
Start Power: 1000 (mW)
Rotation (1D): 0.14 dB
Adjusted SAR (1W): 4.08 mW/g (1g)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 150$ MHz; $\sigma = 0.79$ S/m; $\epsilon_r = 58.8$; $\rho = 1000$ kg/m³
Probe: EX3DV4 - SN7364, Calibrated: 1/23/2019, Frequency: 150 MHz, ConvF(12.37, 12.37, 12.37) @ 150 MHz
Electronics: DAE4 Sn1483, Calibrated: 1/10/2019

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 = 90.01 V/m; Power Drift = 0.04 dB

Fast SAR: SAR(1 g) = 5.01 W/kg; SAR(10 g) = 3.57 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 6.07 W/kg

Below 2 GHz-Rev.2/System Performance Check/0-Degree Cube (5x6x7)/Cube 0:

Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 90.01 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 7.03 W/kg

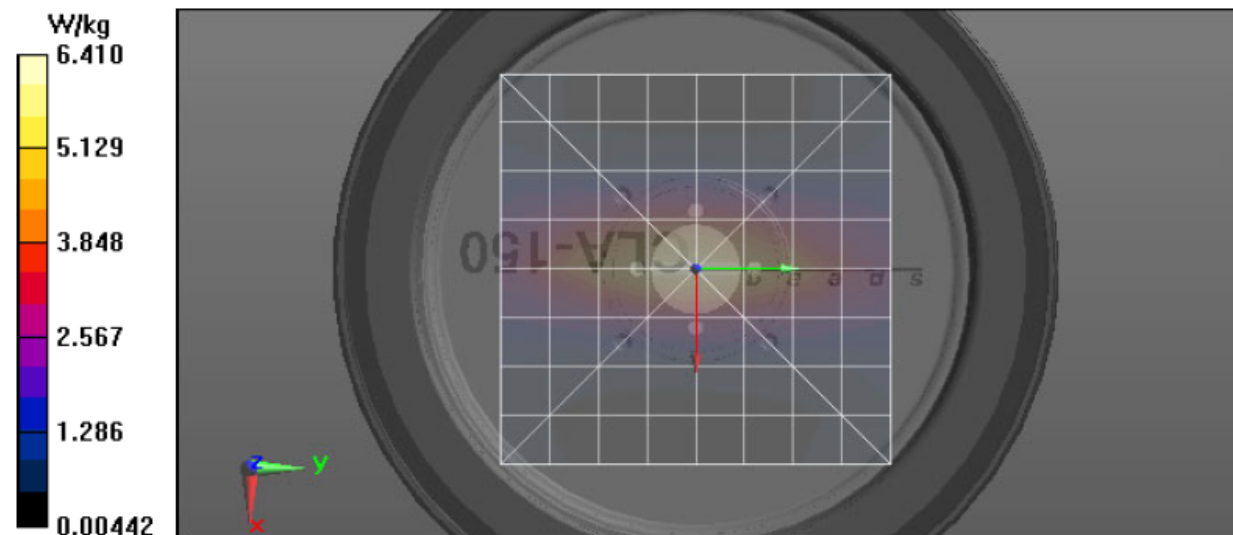
SAR(1 g) = 4.08 W/kg; SAR(10 g) = 2.68 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 5.77 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) = 6.41 W/kg



Motorola Solutions, Inc. EME Laboratory

Date/Time: 7/4/2019 3:35:34 PM

Robot#: DASY5-PG-1 | Run#: LOH(NZ)-SYSP-150H-190704-05
Dipole Model#: CLA150
Phantom#: ELI4 1022
Tissue Temp: 21.5 (C)
Serial#: 4005
Test Freq: 150 (MHz)
Start Power: 1000 (mW)
Rotation (1D): 0.12 dB
Adjusted SAR (1W): 3.86 mW/g (1g)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 150$ MHz; $\sigma = 0.79$ S/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³
Probe: EX3DV4 - SN3612, Calibrated: 10/18/2018, Frequency: 150 MHz, ConvF(9.98, 9.98, 9.98) @ 150 MHz
Electronics: DAE4 Sn684, Calibrated: 10/9/2018

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 = 86.14 V/m; Power Drift = -0.09 dB

Fast SAR: SAR(1 g) = 4.68 W/kg; SAR(10 g) = 3.33 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 5.88 W/kg

Below 2 GHz-Rev.2/System Performance Check/0-Degree Cube (5x6x7)/Cube 0:Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 86.14 V/m; Power Drift = -0.09 dB

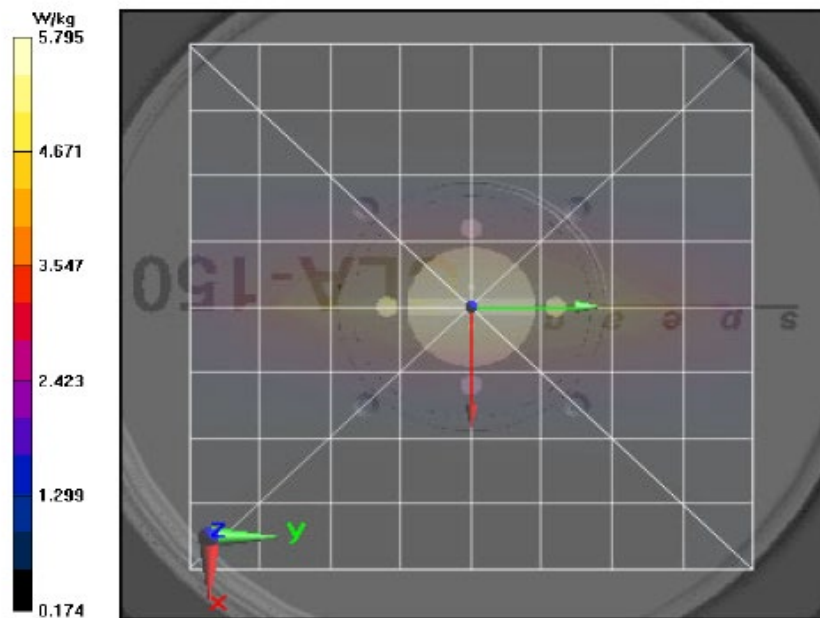
Peak SAR (extrapolated) = 7.40 W/kg

SAR(1 g) = 3.86 W/kg; SAR(10 g) = 2.47 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 5.87 W/kg

Below 2 GHz-Rev.2/System Performance Check/Z-Axis Retraction (1x1x17): Measurementgrid: $dx=20$ mm, $dy=20$ mm, $dz=10$ mm

Maximum value of SAR (measured) = 5.85 W/kg



APPENDIX E
DUT Scans – (Highest SAR configurations and Shortened scan)

Highest configuration at the Body (FCC)
Table 17

Motorola Solutions, Inc. EME Laboratory

Date/Time: 6/17/2019 3:02:00 PM

Robot#: DASY5-PG-3 | Run#: LOH-AB-190617-13#
Model#: PMUD3372C
Phantom#: ELI4 1016
Tissue Temp: 21.2 (C)
Serial#: 481TVK0415
Antenna: NAR6593A
Test Freq: 167.750 (MHz)
Battery: NNTN7034B
Carry Acc: HLN6875A
Audio Acc: None
Start Power: 6.44 (W)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 168$ MHz; $\sigma = 0.78$ S/m; $\epsilon_r = 59.4$; $\rho = 1000$ kg/m³

Probe: EX3DV4 - SN7364, Calibrated: 1/23/2019, Frequency: 167.75 MHz, ConvF(12.37, 12.37, 12.37) @ 167.75 MHz

Electronics: DAE4 Sn1483, Calibrated: 1/10/2019

Below 2 GHz-Rev.2/Ab Scan/1-Area Scan (81x301x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 40.12 V/m; Power Drift = -0.08 dB

Fast SAR: SAR(1 g) = 8.33 W/kg; SAR(10 g) = 4.41 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 12.1 W/kg

Below 2 GHz-Rev.2/Ab Scan/3-Zoom Scan (10x10x7)/Cube 0: Measurement grid: dx=3.5mm, dy=3.5mm, dz=1.4mm

Reference Value = 40.12 V/m; Power Drift = -0.11 dB

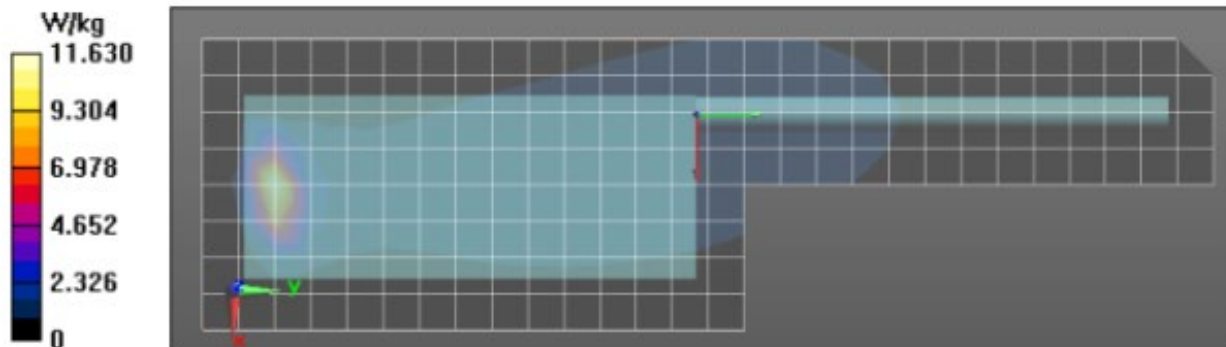
Peak SAR (extrapolated) = 31.4 W/kg

SAR(1 g) = 6.23 W/kg; SAR(10 g) = 2.34 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 11.5 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) = 11.7 W/kg



Highest configuration at the Face (FCC)**Table 17****Motorola Solutions, Inc. EME Laboratory**

Date/Time: 6/19/2019 9:18:54 AM

Robot#: DASY5-PG-3 | Run#: LOH-FACE-190619-06

Model#: PMUD3374C

Phantom#: ELI4 1109

Tissue Temp: 21.2 (C)

Serial#: 481TVK0529

Antenna: NAR6593A

Test Freq: 167.7500 (MHz)

Battery: PMNN4485A

Carry Acc: Front

Audio Acc: None

Start Power: 6.34 (W)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 168$ MHz; $\sigma = 0.77$ S/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Probe: EX3DV4 - SN7364, Calibrated: 1/23/2019, Frequency: 167.75 MHz, ConvF(12.97, 12.97, 12.97) @ 167.75 MHz

Electronics: DAE4 Sn1483, Calibrated: 1/10/2019

Below 2 GHz-Rev.2/Face Scan/1-Area Scan (81x251x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 49.30 V/m; Power Drift = -0.08 dB

Fast SAR: SAR(1 g) = 1.64 W/kg; SAR(10 g) = 1.26 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 1.90 W/kg

Below 2 GHz-Rev.2/Face Scan/3-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 49.30 V/m; Power Drift = -0.04 dB

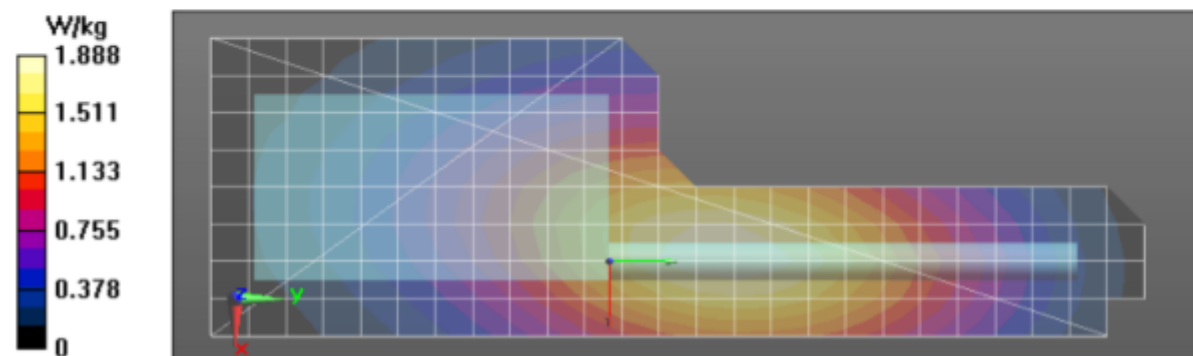
Peak SAR (extrapolated) = 2.16 W/kg

SAR(1 g) = 1.61 W/kg; SAR(10 g) = 1.25 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 1.88 W/kg

Below 2 GHz-Rev.2/Face Scan/4-Z-Axis Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 1.86 W/kg



Highest configuration at the Body (ISED)

Table 18

Motorola Solutions, Inc. EME Laboratory

Date/Time: 6/27/2019 10:55:49 AM

Robot#: DASY5-PG-3 | Run#: ZZ-AB-190627-09
 Model#: PMUD3372C
 Phantom#: ELI4 1016
 Tissue Temp: 20.9 (C)
 Serial#: 481TVK0415
 Antenna: NAR6593A
 Test Freq: 139.7000 (MHz)
 Battery: NNTN7034B
 Carry Acc: HLN6875A
 Audio Acc: None
 Start Power: 6.34 (W)

Comments:

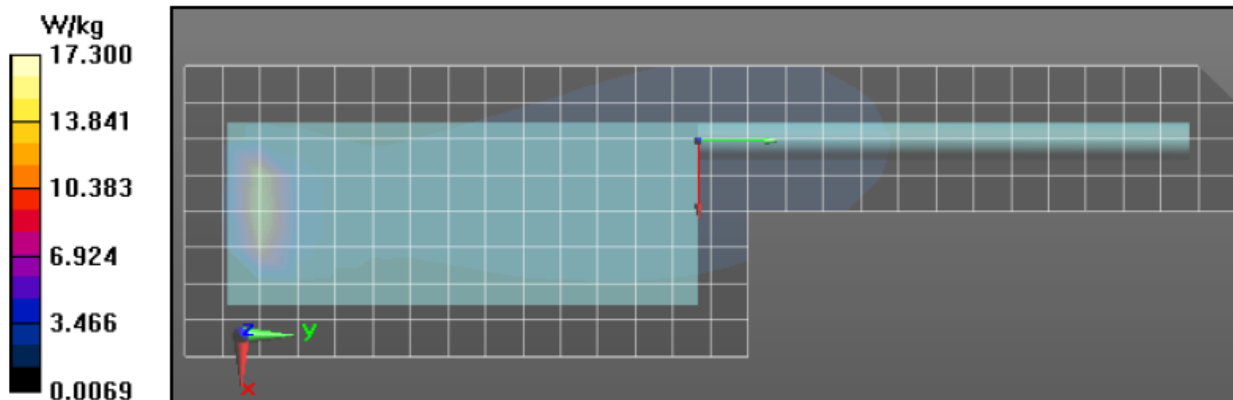
Duty Cycle: 1:1, Medium parameters used: $f = 140$ MHz; $\sigma = 0.79$ S/m; $\epsilon_r = 59.2$; $\rho = 1000$ kg/m³
 Probe: EX3DV4 - SN7364, Calibrated: 1/23/2019, Frequency: 139.7 MHz, ConvF(12.37, 12.37, 12.37) @ 139.7 MHz
 Electronics: DAE4 Sn1483, Calibrated: 1/10/2019

Below 2 GHz-Rev.2/Ab Scan/1-Area Scan (81x301x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Reference Value = 49.14 V/m; Power Drift = -0.12 dB
 Fast SAR: SAR(1 g) = 11.1 W/kg; SAR(10 g) = 6.45 W/kg (SAR corrected for target medium)
 Maximum value of SAR (interpolated) = 15.9 W/kg

Below 2 GHz-Rev.2/Ab Scan/3-Zoom Scan (12x12x7)/Cube 0: Measurement grid: dx=2.8mm, dy=2.8mm, dz=1.4mm
 Reference Value = 49.14 V/m; Power Drift = -0.28 dB
 Peak SAR (extrapolated) = 49.1 W/kg
 SAR(1 g) = 8.41 W/kg; SAR(10 g) = 3.62 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 17.8 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) = 17.3 W/kg



Highest configuration at the Face (ISED)

Table 18

Motorola Solutions, Inc. EME Laboratory

Date/Time: 7/4/2019 4:58:31 PM

Robot#: DASY5-PG-1 | Run#: LOH-FACE-190704-06
 Model#: PMUD3374C
 Phantom#: ELI4 1022
 Tissue Temp: 21.5 (C)
 Serial#: 481TVK0529
 Antenna: NAR6593A
 Test Freq: 139.7000 (MHz)
 Battery: PMNN4485A
 Carry Acc: Front
 Audio Acc: None
 Start Power: 6.60 (W)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 140$ MHz; $\sigma = 0.78$ S/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³

Probe: EX3DV4 - SN3612, Calibrated: 10/18/2018, Frequency: 139.7 MHz, ConvF(9.98, 9.98, 9.98) @ 139.7 MHz

Electronics: DAE4 Sn684, Calibrated: 10/9/2018

Below 2 GHz-Rev.2/Face Scan/1-Area Scan (81x251x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 55.22 V/m; Power Drift = -0.14 dB

Fast SAR: SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.61 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 2.37 W/kg

Below 2 GHz-Rev.2/Face Scan/3-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 55.22 V/m; Power Drift = -0.17 dB

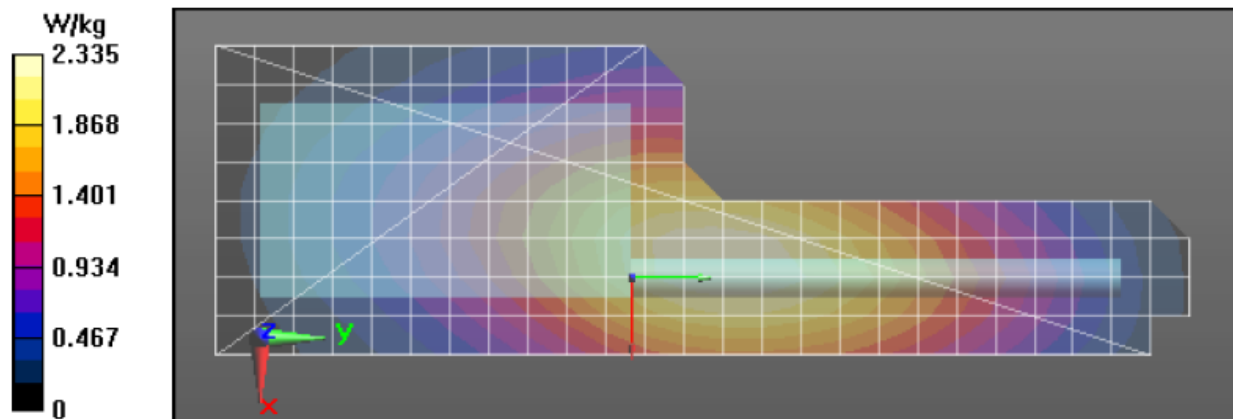
Peak SAR (extrapolated) = 2.69 W/kg

SAR(1 g) = 1.99 W/kg; SAR(10 g) = 1.55 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 2.33 W/kg

Below 2 GHz-Rev.2/Face Scan/4-Z-Axis Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 2.33 W/kg



Shortened Scan Table 19

Motorola Solutions, Inc. EME Laboratory
Date/Time: 7/4/2019 8:19:38 AM

Robot#: DASY5-PG-1 | Run#: LOH-AB-190704-04
Model#: PMUD3372C
Phantom#: ELI4 1016
Tissue Temp: 21.3 (C)
Serial#: 481TVK0415
Antenna: NAR6593A
Test Freq: 167.750 (MHz)
Battery: NNTN7034B
Carry Acc: HLN6875A
Audio Acc: None
Start Power: 6.44 (W)

Comments: Shorten Scan

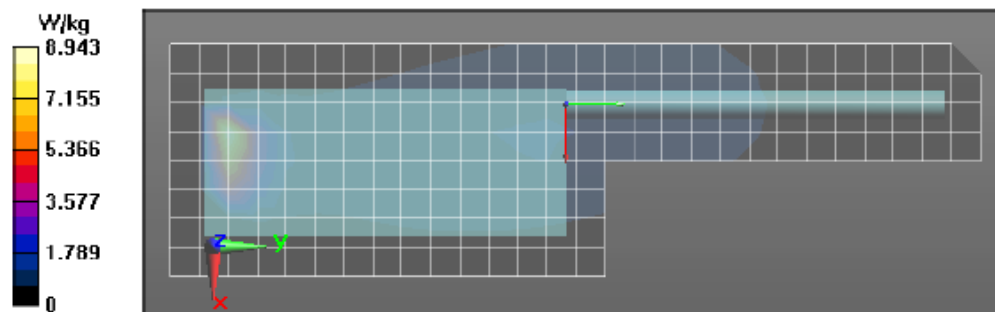
Duty Cycle: 1:1, Medium parameters used: $f = 168 \text{ MHz}$; $\sigma = 0.78 \text{ S/m}$; $\epsilon_r = 59.6$; $\rho = 1000 \text{ kg/m}^3$
Probe: EX3DV4 - SN3612, Calibrated: 10/18/2018, Frequency: 167.75 MHz, ConvF(9.73, 9.73) @ 167.75 MHz
Electronics: DAE4 Sn684, Calibrated: 10/9/2018

Below 2 GHz-Rev.2/Ab Scan/1-Area Scan (81x301x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
Reference Value = 38.42 V/m; Power Drift = -0.11 dB
Fast SAR: SAR(1 g) = 7.33 W/kg; SAR(10 g) = 4.04 W/kg (SAR corrected for target medium)
Maximum value of SAR (interpolated) = 11.7 W/kg

Below 2 GHz-Rev.2/Ab Scan/2-Volume 2D Scan (41x41x1): Interpolated grid: $dx=0.7500 \text{ mm}$, $dy=0.7500 \text{ mm}$, $dz=1.000 \text{ mm}$
Reference Value = 38.42 V/m; Power Drift = -0.13 dB
Fast SAR: SAR(1 g) = 10.3 W/kg; SAR(10 g) = 4.89 W/kg (SAR corrected for target medium)
Maximum value of SAR (interpolated) = 16.3 W/kg

Below 2 GHz-Rev.2/Ab Scan/4-Z-Axis Scan (1x1x17): Measurement grid: $dx=20\text{mm}$, $dy=20\text{mm}$, $dz=10\text{mm}$
Maximum value of SAR (measured) = 15.8 W/kg

Below 2 GHz-Rev.2/Ab Scan/3-Zoom Scan (14x10x7)/Cube 0: Measurement grid: $dx=3.5\text{mm}$, $dy=3.5\text{mm}$, $dz=1.4\text{mm}$
Reference Value = 85.60 V/m; Power Drift = -0.56 dB
Peak SAR (extrapolated) = 27.7 W/kg
SAR(1 g) = 5.85 W/kg; SAR(10 g) = 2.47 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 10.4 W/kg



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

Scan Description	Referenced Table	Test Time (min.)	SAR 1g (W/kg)
Shorten scan (zoom)	19	8	3.41
Full scan (area & zoom)	17	25	3.27

APPENDIX F

DUT Test Position Photos

1.0 Highest SAR Test Position

1.1 Body

DUT with antenna NAR6593A, battery NNTN7034B and belt clip HLN6875A positioned against the phantom without an audio accessory.



Antenna kit #	Separation Distances (mm)		
	@bottom surface of the DUT	@ antenna's base	@ antenna's tip
NAR6593A	0	43	74

1.2 Face

Back of DUT with antenna NAR6593A and battery PMNN4485A separated 2.5cm from the phantom.



Antenna kit #	Separation Distances (mm)		
	@bottom surface of the DUT	@ antenna's base	@ antenna's tip
NAR6593A	28	35	50