FCC OET BULLETIN 65 SUPPLEMENT C
Class II Permissive Change
IC RSS-102 ISSUE 4

SAR EVALUATION REPORT

For

802.11 bgn 1x2 mini card
(Tested inside of Libretto W100)

MODEL: PA3758U-1MPC

FCC ID: CJ6UPA3758WL
ID: 248H-DPA3758W

REPORT NUMBER: 10U13220-2A

ISSUE DATE: May 21, 2010

Prepared for

TOSHIBA AMERICA INFORMATION SYSTEMS, INC.
9740 IRVINE BLVD. IRVINE,
CA 92618, USA

Prepared by

COMPLIANCE CERTIFICATION SERVICES
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	May 19, 2010	Initial Issue	--
A	May 21, 2010	Updated report based on reviewer's comments, including: 1. Added FCC ID for Bluetooth 2. Added missing data for System verification 3. Fixed Typo for frequency of L and H channel of HT40	Sunny Shih

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	TOSHIBA AMERICA INFORMATION SYSTEMS, INC. 9740 IRVINE BLVD. IRVINE, CA 92618, USA
EUT DESCRIPTION:	802.11 bgn 1x2 mini card (Tested inside of Libretto W100)
MODEL NUMBER:	PA3758U-1MPC
DEVICE CATEGORY:	Portable
EXPOSURE CATEGORY:	General Population/Uncontrolled Exposure
DATE TESTED:	May 18 - 19, 2010

FCC / IC Rule Parts	Freq. Range [MHz]	The Highest 1g SAR mW/g)	Limit (mW/g)
15.247 / RSS-102	2400 – 2483.5	1.17 (Tablet – Bottom face)	1.6

Applicable Standards	Test Results
FCC OET Bulletin 65 Supplement C 01-01 IC RSS 102 Issue 4	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.

Approved & Released For CCS By:

SUNNY SHIH
ENGINEERING SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

DEVIN CHANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

FCC OET Bulletin 65 Supplement C 01-01 and the following specific FCC test procedures:

- KDB 248227 SAR measurement procedures for 802.11a/b/g transmitters
- KDB 447498 D01 Mobile Portable RF Exposure v04, suppl. to KDB 616217 D03

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due date		
				MM	DD	Year
Robot - Six Axes	Stäubli	RX90BL	N/A	N/A		
Robot Remote Control	Stäubli	CS7MB	3403-91535	N/A		
DASY4 Measurement Server	SPEAG	SEUMS001BA	1041	N/A		
Probe Alignment Unit	SPEAG	LB (V2)	261	N/A		
SAM Phantom (SAM1)	SPEAG	QD000P40CA	1185	N/A		
SAM Phantom (SAM2)	SPEAG	QD000P40CA	1050	N/A		
Oval Flat Phantom (ELI 4.0)	SPEAG	QD OVA001 B	1003	N/A		
Electronic Probe kit	HP	85070C	N/A	N/A		
S-Parameter Network Analyzer	Agilent	8753ES-6	MY40001647	11	22	2010
Signal Generator	Agilent	8753ES-6	MY40001647	11	22	2010
E-Field Probe	SPEAG	EX3DV3	3531	2	23	2011
Data Acquisition Electronics	SPEAG	DAE3 V1	500	9	15	2010
System Validation Dipole	SPEAG	D2450V2	706	4	18	2013
ESG Vector Signal Generator	Agilent	E4438C	US44271090	9	17	2010
Amplifier	Mini-Circuits	ZVE-8G	90606	N/A		
Amplifier	Mini-Circuits	ZHL-42W	D072701-5	N/A		
Simulating Liquid	SPAEG	M2450	N/A	Within 24 hrs of first test		

Note: Per KDB 450824 D02 requirements for dipole calibration, CCS has adopted three years calibration intervals. On annual basis, each measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole
2. System validation with specific dipole is within 10% of calibrated value.
3. Return-loss is within 20% of calibrated measurement (test data on file in CCS)
4. Impedance is within 5Ω of calibrated measurement (test data on file in CCS)

4.2. MEASUREMENT UNCERTAINTY

Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram

Component	error, %	Probe Distribution	Divisor	Sensitivity	U (Xi), %
Measurement System					
Probe Calibration (k=1) @ Body 2450 MHz	5.50	Normal	1	1	5.50
Axial Isotropy	1.15	Rectangular	1.732	0.7071	0.47
Hemispherical Isotropy	2.30	Rectangular	1.732	0.7071	0.94
Boundary Effect	0.90	Rectangular	1.732	1	0.52
Probe Linearity	3.45	Rectangular	1.732	1	1.99
System Detection Limits	1.00	Rectangular	1.732	1	0.58
Readout Electronics	0.30	Normal	1	1	0.30
Response Time	0.80	Rectangular	1.732	1	0.46
Integration Time	2.60	Rectangular	1.732	1	1.50
RF Ambient Conditions - Noise	3.00	Rectangular	1.732	1	1.73
RF Ambient Conditions - Reflections	3.00	Rectangular	1.732	1	1.73
Probe Positioner Mechanical Tolerance	0.40	Rectangular	1.732	1	0.23
Probe Positioning with respect to Phantom	2.90	Rectangular	1.732	1	1.67
Extrapolation, Interpolation and Integration	1.00	Rectangular	1.732	1	0.58
Test Sample Related					
Test Sample Positioning	2.90	Normal	1	1	2.90
Device Holder Uncertainty	3.60	Normal	1	1	3.60
Output Power Variation - SAR Drift	5.00	Rectangular	1.732	1	2.89
Phantom and Tissue Parameters					
Phantom Uncertainty (shape and thickness)	4.00	Rectangular	1.732	1	2.31
Liquid Conductivity - deviation from target	5.00	Rectangular	1.732	0.64	1.85
Liquid Conductivity - measurement	-2.31	Normal	1	0.64	-1.48
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	1.73
Liquid Permittivity - measurement	-3.56	Normal	1	0.6	-2.14
				Combined Standard Uncertainty Uc(y) =	9.79
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = 19.58	%
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = 1.55	dB

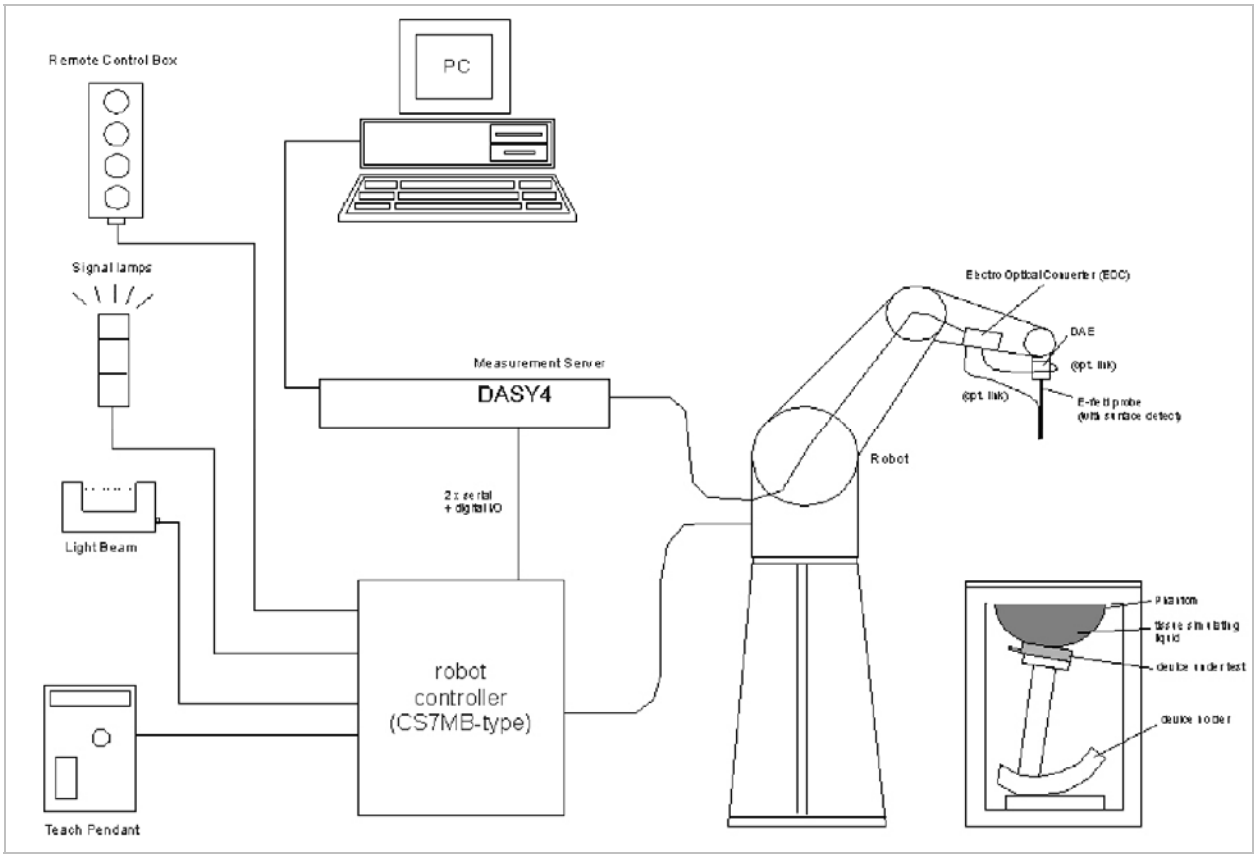
Measurement uncertainty for 300 MHz to 3 GHz averaged over 10 gram

Component	error, %	Probe Distribution	Divisor	Sensitivity	U (Xi), %
Measurement System					
Probe Calibration (k=1) @ 2450 MHz	5.50	Normal	1	1	5.50
Axial Isotropy	1.15	Rectangular	1.732	0.7071	0.47
Hemispherical Isotropy	2.30	Rectangular	1.732	0.7071	0.94
Boundary Effect	0.90	Rectangular	1.732	1	0.52
Probe Linearity	3.45	Rectangular	1.732	1	1.99
System Detection Limits	1.00	Rectangular	1.732	1	0.58
Readout Electronics	0.30	Normal	1	1	0.30
Response Time	0.80	Rectangular	1.732	1	0.46
Integration Time	2.60	Rectangular	1.732	1	1.50
RF Ambient Conditions - Noise	3.00	Rectangular	1.732	1	1.73
RF Ambient Conditions - Reflections	3.00	Rectangular	1.732	1	1.73
Probe Positioner Mechanical Tolerance	0.40	Rectangular	1.732	1	0.23
Probe Positioning with respect to Phantom	2.90	Rectangular	1.732	1	1.67
Extrapolation, Interpolation and Integration	1.00	Rectangular	1.732	1	0.58
Test Sample Related					
Test Sample Positioning	2.90	Normal	1	1	2.90
Device Holder Uncertainty	3.60	Normal	1	1	3.60
Output Power Variation - SAR Drift	5.00	Rectangular	1.732	1	2.89
Phantom and Tissue Parameters					
Phantom Uncertainty (shape and thickness)	4.00	Rectangular	1.732	1	2.31
Liquid Conductivity - deviation from target	5.00	Rectangular	1.732	0.43	1.24
Liquid Conductivity - measurement	-2.31	Normal	1	0.43	-0.99
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.49	1.41
Liquid Permittivity - measurement uncertainty	-3.56	Normal	1	0.49	-1.74
				Combined Standard Uncertainty Uc(y), % =	9.50
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = 19.00	%
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = 1.51	dB

5. EQUIPMENT UNDER TEST

802.11 bgn 1x2 mini card. Tested inside of Libretto W100	
Normal operation:	Laptop mode (display open at 90° to the keyboard), Tablet bottom face, and Tablet edges - Multiple display orientations supporting both portrait and landscape configurations
Antenna tested:	Manufactured / Part number Hitachi / TX 1: HFT60-QT16W
Antenna-to-user separation distances:	See section 13 for details
Antenna-to-antenna separation distances:	WiFi and BT 34 mm from Tx1-to-Bluetooth antenna
Simultaneous transmission:	WiFi can transmit simultaneously with Bluetooth Bluetooth - FCC ID: PIWBSMAN; IC ID: 5255A-BSMAN
Assessment for SAR evaluation for Simultaneous transmission:	WiFi and BT KDB 447498 - The Bluetooth's output power is ≤ 60/f(GHz) mW, which stand-alone SAR evaluation is not required. Thus, simultaneous transmission SAR evaluation is not required for WiFi and Bluetooth antenna pair.

6. SYSTEM SPECIFICATIONS



The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4 software.
- Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

7. TISSUE DIELECTRIC PARAMETERS CHECK

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectric parameters are within the tolerances of the specified target values. For frequencies in 300 MHz to 2 GHz, the measured conductivity and relative permittivity should be within ± 5% of the target values. For frequencies in the range of 2–3 GHz and above the measured conductivity should be within ± 5% of the target values. The measured relative permittivity tolerance can be relaxed to no more than ± 10%.

Reference Values of Tissue Dielectric Parameters for Body (for 300 – 3000 MHz and 5800 MHz)
The body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in IEEE Standard 1528.

Target Frequency (MHz)	Body (Supplement C 01-01)	
	ε_r	σ (S/m)
300	58.20	0.92
450	56.70	0.94
835	55.20	0.97
900	55.00	1.05
915	55.00	1.06
1450	54.00	1.30
1610	53.80	1.40
1800 – 2000	53.30	1.52
2450	52.70	1.95
3000	52.00	2.73
5800	48.20	6.00

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

7.1. TISSUE PARAMETERS CHECK RESULTS FOR 2450 MHZ

Simulating Liquid Dielectric Parameters for Body 2450 MHz
Room Ambient Temperature = 24°C; Relative humidity = 41% Measured by: Devin Chang

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
2450	e'	52.02	Relative Permittivity (ϵ_r):	52.017	52.7	-1.30	± 5
	e"	14.27	Conductivity (σ):	1.945	1.95	-0.27	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C
May 18, 2010 09:57 AM

Frequency	e'	e"
2400000000.	52.1332	14.0756
2405000000.	52.1166	14.1096
2410000000.	52.1065	14.1552
2415000000.	52.0697	14.1527
2420000000.	52.0613	14.1803
2425000000.	52.0596	14.1765
2430000000.	52.0539	14.1934
2435000000.	52.0561	14.1976
2440000000.	52.0435	14.2156
2445000000.	52.0338	14.2165
2450000000.	**52.0167**	**14.2684**
2455000000.	51.9699	14.2940
2460000000.	51.9200	14.2955
2465000000.	51.8736	14.2892
2470000000.	51.8353	14.2861
2475000000.	51.8138	14.2809
2480000000.	51.7938	14.3054
2485000000.	51.7923	14.3125
2490000000.	51.7840	14.3482
2495000000.	51.7739	14.3941
2500000000.	51.7497	14.4475

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Body 2450 MHz
Room Ambient Temperature = 24°C; Relative humidity = 47% Measured by: Devin Chang

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
2450	e'	50.82	Relative Permittivity (ϵ_r):	50.823	52.7	-3.56	± 5
	e"	13.98	Conductivity (σ):	1.905	1.95	-2.31	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C
May 19, 2010 08:40 AM

Frequency	e'	e"
2400000000.	50.9574	13.7365
2405000000.	50.9399	13.7828
2410000000.	50.9242	13.8206
2415000000.	50.8970	13.8147
2420000000.	50.8782	13.8459
2425000000.	50.8580	13.8405
2430000000.	50.8462	13.8520
2435000000.	50.8525	13.8737
2440000000.	50.8543	13.8909
2445000000.	50.8340	13.9383
2450000000.	**50.8226**	**13.9760**
2455000000.	50.7903	13.9907
2460000000.	50.7825	14.0115
2465000000.	50.7304	14.0216
2470000000.	50.7147	14.0206
2475000000.	50.6781	14.0170
2480000000.	50.6787	14.0205
2485000000.	50.6809	14.0312
2490000000.	50.6870	14.0589
2495000000.	50.6743	14.0894
2500000000.	50.6722	14.1375

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

8. SYSTEM VERIFICATION

The system performance check is performed prior to any usage of the system in order to verify SAR system accuracy. The system performance check verifies that the system operates within its specifications of ±10%.

System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the SAM twin phantom filled with Body simulating liquid of the following parameters.
- The DASY4 system with an Isotropic E-Field Probe EX3DV3-SN: 3531 was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
  For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (2.4 GHz) fine cube was chosen for cube integration and Special 8x8x10 (5 GHz) fine cube was chosen for cube integration
- Distance between probe sensors and phantom surface was set to 3 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input powers (forward power) were 100 mW.
- The results are normalized to 1 W input power.

Reference SAR Values for HEAD & BODY-tissue from calibration certificate of SPEAG.

System validation dipole	Cal. certificate #	Cal. due date	SAR Avg (mW/g)		
			Tissue:	Head	Body
D2450V2	D2450V2-706_Apr10	04/18/13	SAR_{1g}:		52.8
			SAR_{10g}:		24.5

8.1. SYSTEM CHECK RESULTS FOR D2450V2

Ambient Temperature = 24°C; Relative humidity = 38% Measured by: Devin Chang

System validation dipole	Date Tested	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
		Tissue:	Body			
D2450V2	05/18/10	SAR_{1g}:	52.9	52.8	0.19	±10
		SAR_{10g}:	24.5	24.5	0.00	

Ambient Temperature = 24°C; Relative humidity = 41% Measured by: Devin Chang

System validation dipole	Date Tested	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
		Tissue:	Body			
D2450V2	05/19/10	SAR_{1g}:	53.1	52.8	0.57	±10
		SAR_{10g}:	24.7	24.5	0.82	

SYSTEM CHECK PLOT

Date/Time: 5/18/2010 10:06:30 AM

Test Laboratory: Compliance Certification Services

System Performance Check - D2450V2

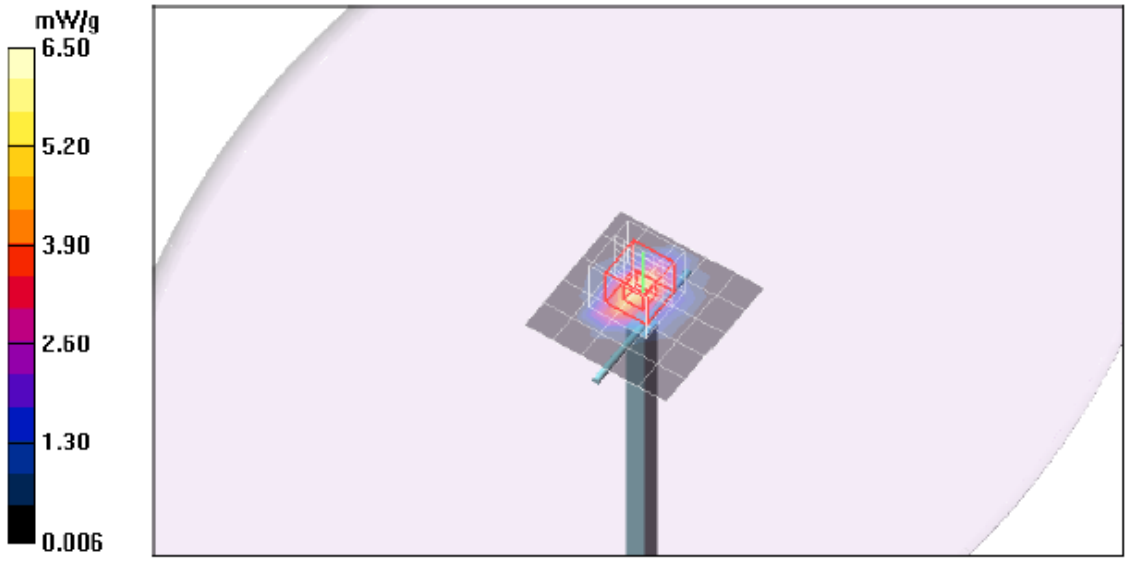
DUT: Dipole ; Type: D2450V2; Serial: 706

Communication System: System Check Signal - CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3531; ConvF(7.58, 7.58, 7.58); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=100mW/Area Scan (6x6x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.50 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.7 V/m; Power Drift = 0.151 dB
Peak SAR (extrapolated) = 10.9 W/kg
SAR(1 g) = 5.29 mW/g; SAR(10 g) = 2.45 mW/g
Maximum value of SAR (measured) = 6.92 mW/g



SYSTEM CHECK – Z Plot

Date/Time: 5/18/2010 10:22:21 AM

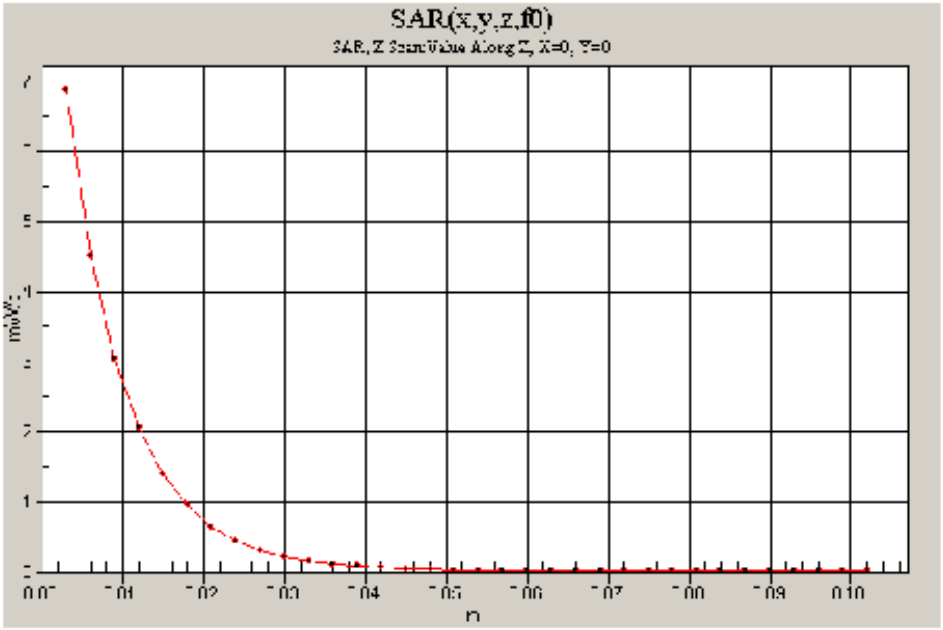
Test Laboratory: Compliance Certification Services

System Performance Check - D2450V2

DUT: Dipole ; Type: D2450V2; Serial: 706

Communication System: System Check Signal - CW; Frequency: 2450 MHz;Duty Cycle: 1:1

d=10mm, Pin=100mW/Z Scan (1x1x34): Measurement grid: dx=20mm, dy=20mm, dz=3mm
Maximum value of SAR (measured) = 6.88 mW/g



SYSTEM CHECK PLOT

Date/Time: 5/19/2010 08:02:24 AM

Test Laboratory: Compliance Certification Services

System Performance Check - D2450V2

DUT: Dipole ; Type: D2450V2; Serial: 706

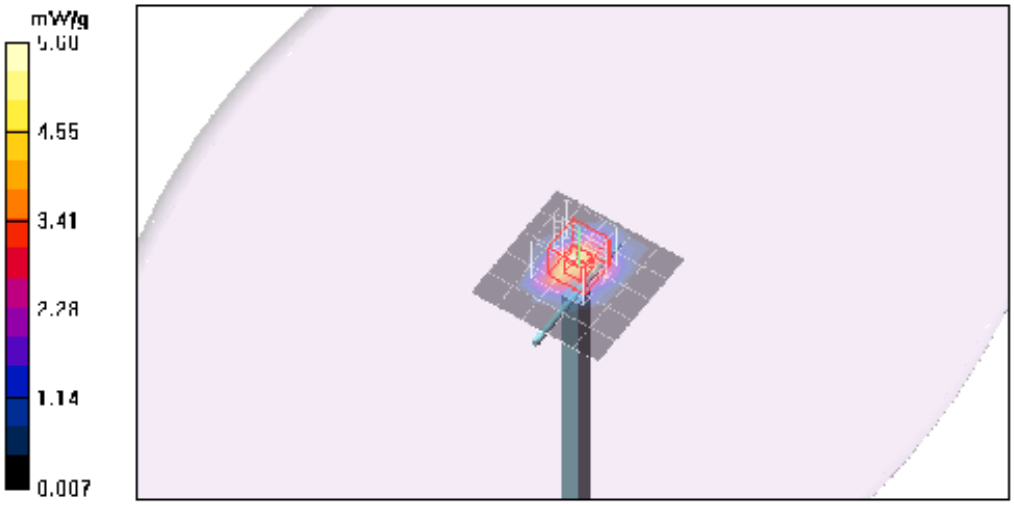
Communication System: System Check Signal - CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(7.58, 7.58, 7.58); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=100mW/Area Scan (6x6x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 5.68 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.3 V/m; Power Drift = 0.001 dB
Peak SAR (extrapolated) = 10.9 W/kg
SAR(1 g) = 5.31 mW/g; SAR(10 g) = 2.47 mW/g
Maximum value of SAR (measured) = 7.01 mW/g



SYSTEM CHECK – Z Plot

Date/Time: 5/19/2010 08:18:04 AM

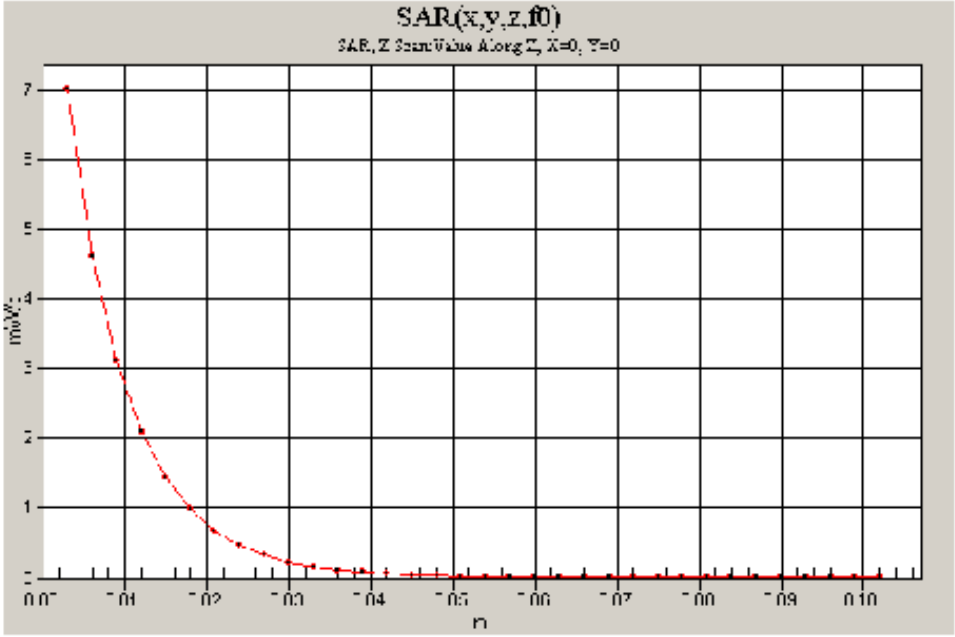
Test Laboratory: Compliance Certification Services

System Performance Check - D2450V2

DUT: Dipole ; Type: D2450V2; Serial: 706

Communication System: System Check Signal - CW; Frequency: 2450 MHz;Duty Cycle: 1:1

d=10mm, Pin=100mW/Z Scan (1x1x34): Measurement grid: dx=20mm, dy=20mm, dz=3mm
Maximum value of SAR (measured) = 7.01 mW/g



9. OUTPUT POWER VERIFICATION

Results

Mode	Channel	Freq. (MHz)	Average Output Power (dBm)
802.11b	1	2412	18.3
	6	2437	17.8
	11	2462	17.9
802.11g	1	2412	16.6
	6	2437	16.9
	11	2462	15.5
802.11n HT20	1	2412	16.5
	6	2437	16.7
	11	2462	15.2
802.11n HT40	3	2422	16.6
	6	2437	16.6
	9	2452	14.9

Note: KDB 248227 - SAR is not required for 802.11g channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

10. SUMMARY OF SAR TEST RESULTS

KDB 248227 - SAR is not required for 802.11g channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

1. Laptop - Lap-held (94 mm from Tx antenna-to-user)

Mode	Channel	f (MHz)	Results (mW/g)	
			1g-SAR	10g-SAR
802.11b	1	2412		
	6	2437	0.015	0.013
	11	2462		

2. Tablet – Bottom face (8 mm from Tx antenna-to-user)

Mode	Channel	f (MHz)	Results (mW/g)	
			1g-SAR	10g-SAR
802.11b	1	2412	0.797	0.355
	6	2437	0.846	0.377
	11	2462	**1.170**	**0.507**

3. Tablet – Edges with the following configurations

3.1 Edge - Primary Landscape (187 mm from Tx antenna-to-user)

This is not the most conservative antenna-to-user distance at edge mode. According to KDB 447498 4) b) ii) (2) - SAR is required only for the edge with the most conservative exposure conditions.

3.2 Edge - Secondary Landscape (5 mm from Tx antenna-to-user)

Mode	Channel	f (MHz)	Results (mW/g)	
			1g-SAR	10g-SAR
802.11b	1	2412		
	6	2437	0.147	0.076
	11	2462		

3.3 Edge - Primary Portrait (20 mm from Tx antenna-to-user)

Mode	Channel	f (MHz)	Results (mW/g)	
			1g-SAR	10g-SAR
802.11b	1	2412		
	6	2437	0.380	0.160
	11	2462		

3.4 Edge - Secondary Portrait (207 mm from Tx antenna-to-user)

This is not the most conservative antenna-to-user distance at edge mode. According to KDB 447498 4) b) ii) (2) - SAR is required only for the edge with the most conservative exposure conditions.

11. SAR TEST PLOTS

Date/Time: 5/19/2010 10:48:12 AM

Test Laboratory: Compliance Certification Services

Laptop Mode_Lap-hepd

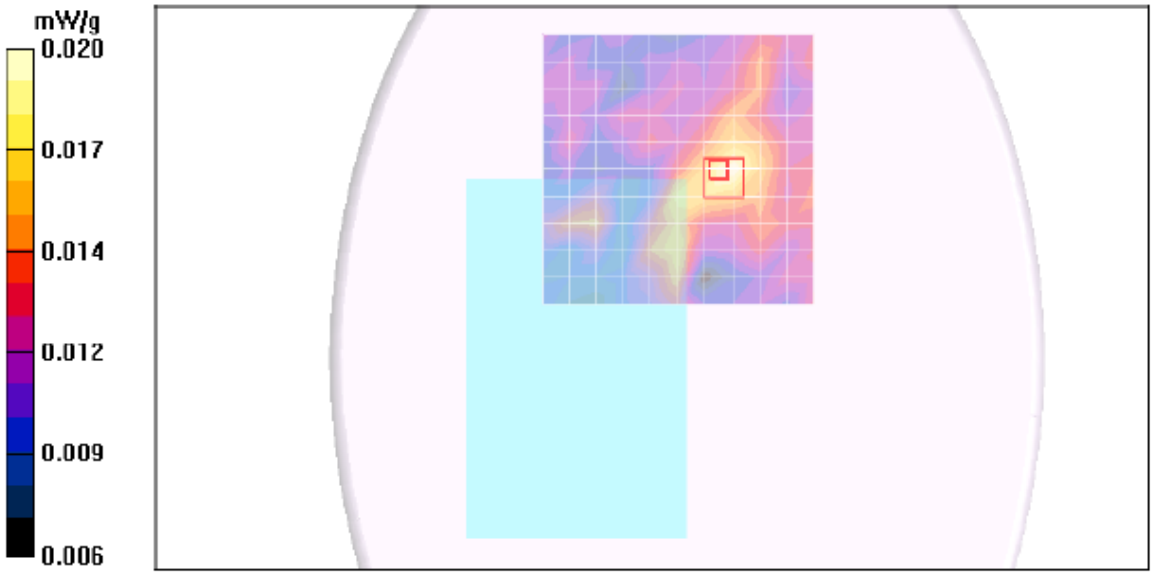
DUT: Toshiba; Type: NA; Serial: NA

Communication System: 802.11bg; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.88 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3531; ConvF(7.58, 7.58, 7.58); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b M-ch Mian Ant/Area Scan (11x11x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.020 mW/g

802.11b M-ch Mian Ant/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 2.14 V/m; Power Drift = 0.129 dB
Peak SAR (extrapolated) = 0.032 W/kg
SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.013 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.019 mW/g



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Test Laboratory: Compliance Certification Services

Tablet - Bottom face

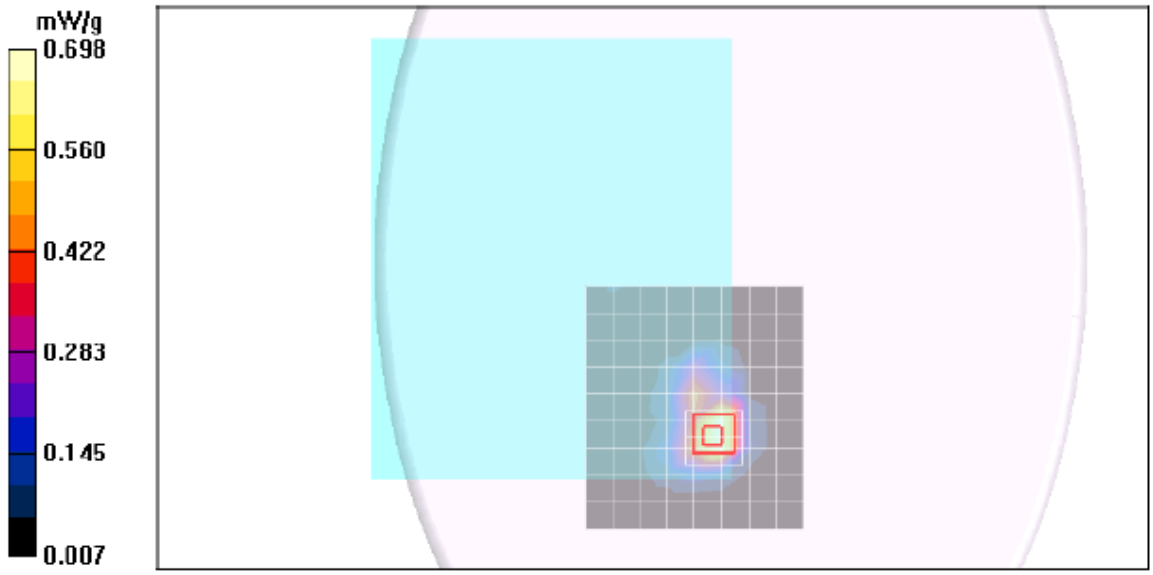
DUT: Toshiba; Type: NA; Serial: NA

Communication System: 802.11bg; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3531; ConvF(7.58, 7.58, 7.58); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b L-ch Mian Ant/Area Scan (9x10x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.698 mW/g

802.11b L-ch Mian Ant/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 2.57 V/m; Power Drift = 0.138 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 0.797 mW/g; SAR(10 g) = 0.355 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.09 mW/g



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Test Laboratory: Compliance Certification Services

Tablet - Bottom face

DUT: Toshiba; Type: NA; Serial: NA

Communication System: 802.11bg; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.88 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

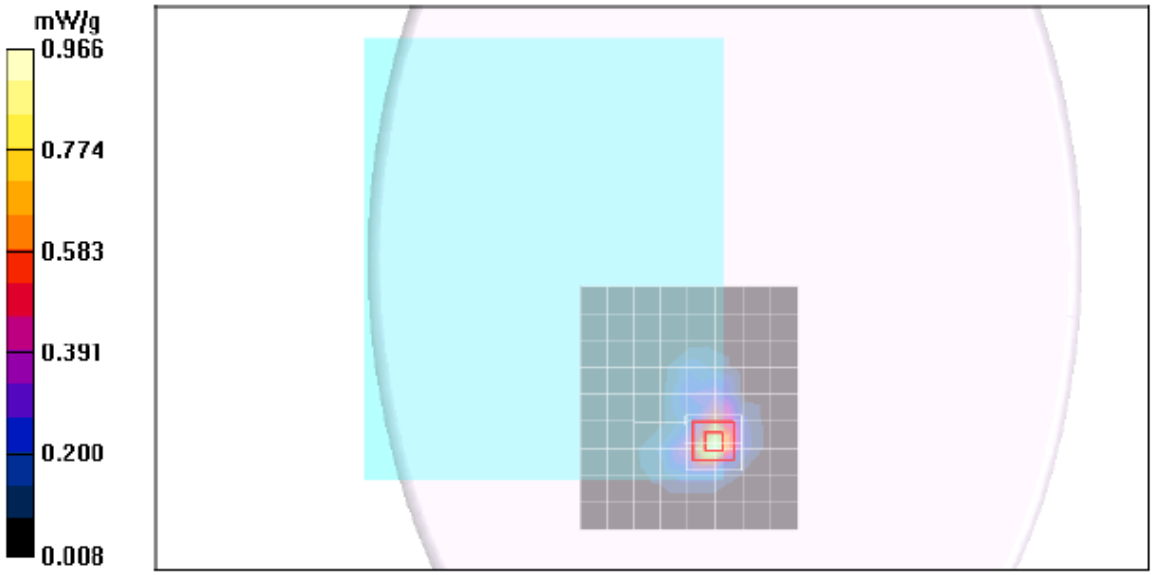
DASY4 Configuration:
- Probe: EX3DV3 - SN3531; ConvF(7.58, 7.58, 7.58); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b M-ch Mian Ant/Area Scan (9x10x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.966 mW/g

802.11b M-ch Mian Ant/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 2.53 V/m; Power Drift = -0.099 dB
Peak SAR (extrapolated) = 1.87 W/kg
SAR(1 g) = 0.846 mW/g; SAR(10 g) = 0.377 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.10 mW/g



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Test Laboratory: Compliance Certification Services

Tablet - Bottom face

DUT: Toshiba; Type: NA; Serial: NA

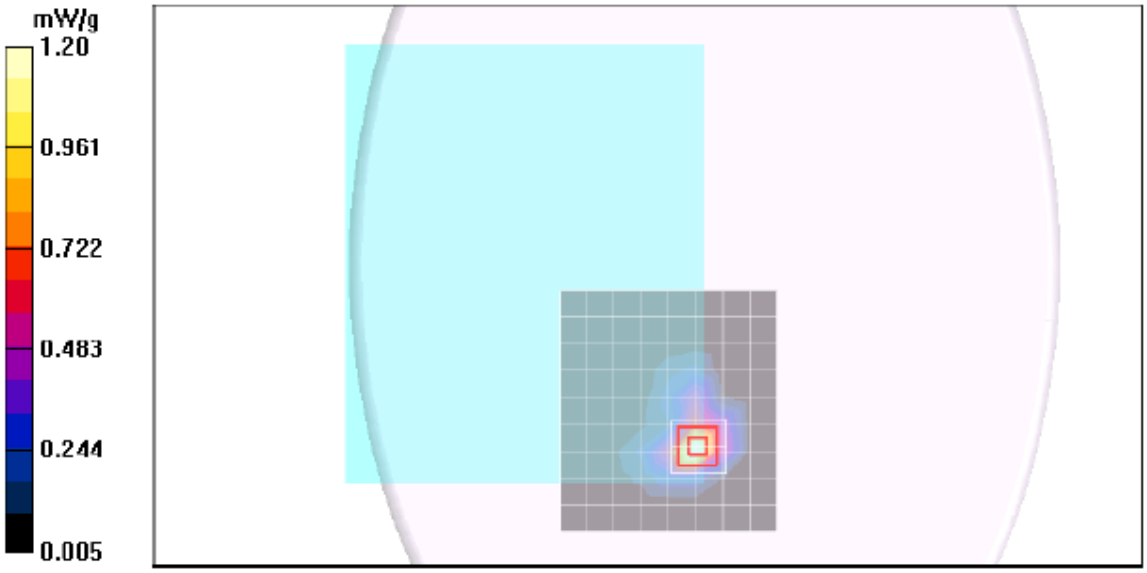
Communication System: 802.11bg; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.92 mho/m; ε_r = 50.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(7.58, 7.58, 7.58); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b H-ch Mian Ant 2/Area Scan (9x10x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.46 mW/g

802.11b H-ch Mian Ant 2/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 2.61 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 2.48 W/kg
SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.507 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.58 mW/g



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Test Laboratory: Compliance Certification Services

Secondary Landscape

DUT: Toshiba; Type: NA; Serial: NA

Communication System: 802.11bg; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.88 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

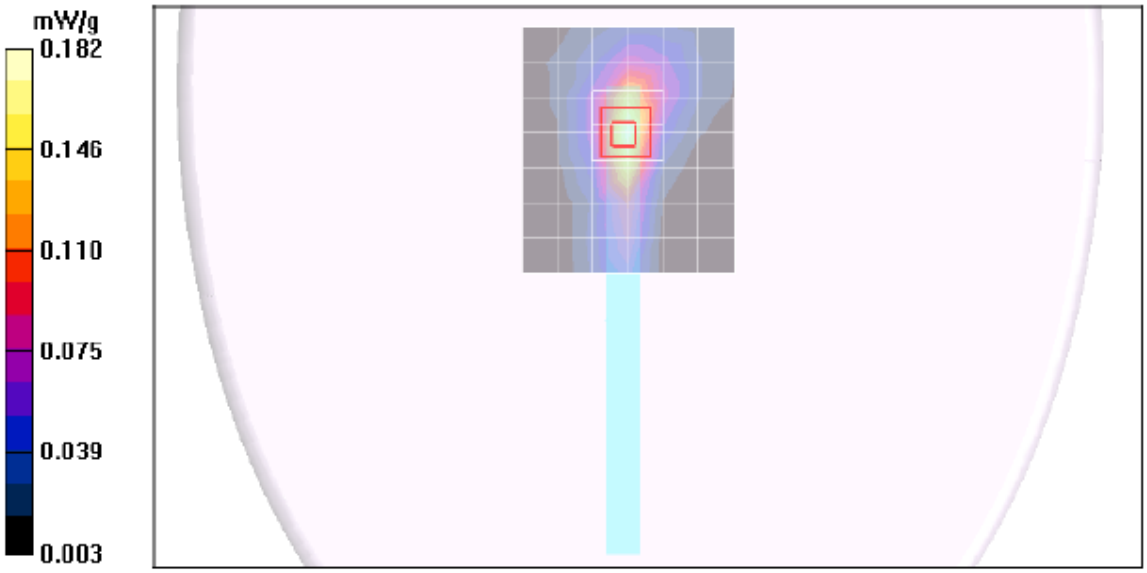
DASY4 Configuration:
- Probe: EX3DV3 - SN3531; ConvF(7.58, 7.58, 7.58); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b M-ch Mian Ant/Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.182 mW/g

802.11b M-ch Mian Ant/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 7.89 V/m; Power Drift = 0.186 dB
Peak SAR (extrapolated) = 0.278 W/kg
SAR(1 g) = 0.147 mW/g; SAR(10 g) = 0.076 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.183 mW/g



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Test Laboratory: Compliance Certification Services

Primary Portrait

DUT: Toshiba; Type: NA; Serial: NA

Communication System: 802.11bg; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.88 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

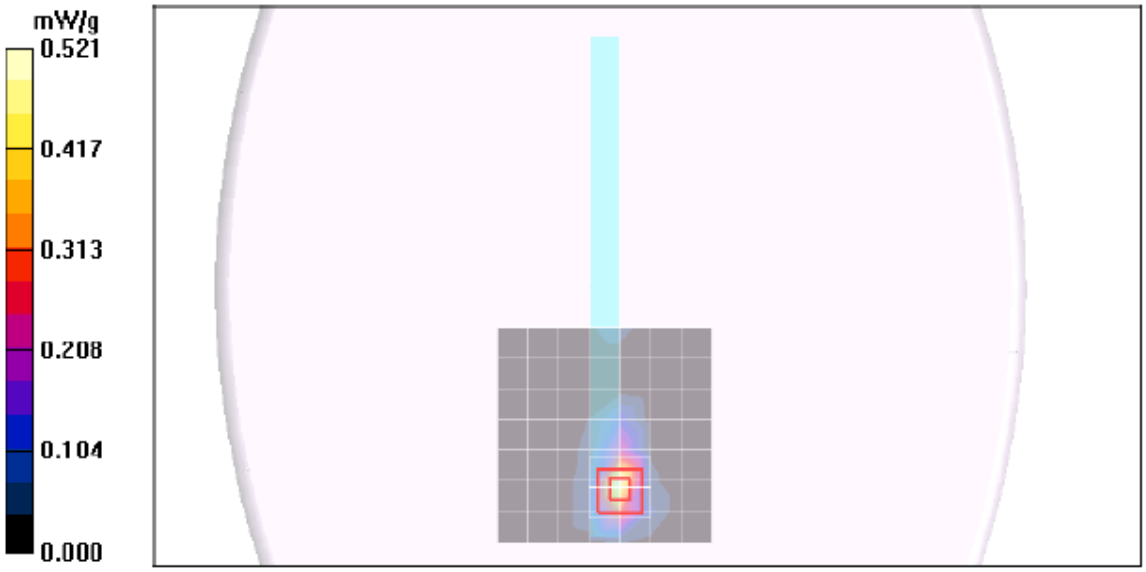
DASY4 Configuration:
- Probe: EX3DV3 - SN3531; ConvF(7.58, 7.58, 7.58); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b M-ch Mian Ant/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.521 mW/g

802.11b M-ch Mian Ant/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 4.00 V/m; Power Drift = -0.056 dB
Peak SAR (extrapolated) = 0.841 W/kg
SAR(1 g) = 0.380 mW/g; SAR(10 g) = 0.160 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.516 mW/g



12. ATTACHMENTS

No.	Contents	No. of page (s)
1	Certificate of E-Field Probe - EX3DV3 SN 3531	11
2	Certificate of System Validation Dipole - D2450 SN:706	9