FCC OET BULLETIN 65 SUPPLEMENT C
SAR EVALUATION REPORT

FOR

Intel® Centrino® Advanced-N + WiMAX 6250
(Tested inside of Lenovo ThinkPad Mini 10 Series Netbook, Model: 3507XXXX)
NETBOOK Model No.: 3506XXXX, 3507XXXX, 3508XXXX and 2876XXXX
(X=0-9, a-z, any symbol or blank)

MODEL: 622ANXHMW

FCC ID: PD9622ANXHU

REPORT NUMBER: 09U12989-3B2

ISSUE DATE: May 18, 2010

Prepared for

INTEL CORPORATION
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Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	April 5, 2010	Initial Issue	--
A	April 6, 2010	Page 29, Section 15 – updated description	Sunny Shih
B	April 30, 2010	Re-measured SAR linearity for all bandwidths.	Sunny Shih
B1	May 7, 2010	Revised based on FCC reviewer's comments	Sunny Shih
B2	May 18, 2010	Added setup photo for SAR linearity measurement	Sunny Shih

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	INTEL CORPORATION 2111 N.E. 25TH AVENUE HILLSBORO, OR 97124, USA
EUT DESCRIPTION:	Intel® Centrino® Advanced-N + WiMAX 6250 Tested inside of Lenovo ThinkPad Mini 10 Series Netbook, Model: 3507XXXX
MODEL NUMBER:	622ANXHMW
DEVICE CATEGORY:	Portable
EXPOSURE CATEGORY:	General Population/Uncontrolled Exposure
DATE TESTED:	January 12 - 13 , 2010 April 30, 2010 (SAR linearity measurement)

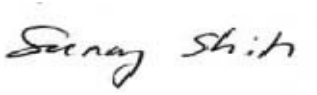
FCC rule parts	Freq. range (MHz)	Highest 1-g SAR (W/kg)	Limit (W/kg)
27	2498.5 – 2687.5	0.013	1.6

Applicable Standards	Test Results
FCC OET Bulletin 65 Supplement C 01-01 and the following SAR test procedures: • KDB 616217 - Laptop with Screen Ant • KDB 615223 - 802 16e WiMax SAR Guidance	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.

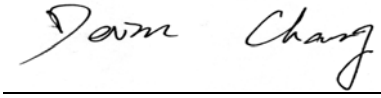
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this 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

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C 01-01 and the following SAR test procedures:

- KDB 616217 - Laptop with Screen Ant
- KDB 615223 - 802 16e WiMax SAR Guidance

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

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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	St酮bli	RX90BL	N/A	N/A		
Robot Remote Control	St酮bli	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	EX3DV4	3686	3	22	2010
E-Field Probe	SPEAG	EX3DV3	3531	2	22	2011
Thermometer	ERTCO	639-1S	1718	4	28	2011
Data Acquisition Electronics	SPEAG	DAE3 V1	500	9	15	2010
System Validation Dipole*	SPEAG	D2600V2	1006	4	21	2012
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		

*** 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)

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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 2600 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	0.73	Normal	1	0.64	0.47
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	1.73
Liquid Permittivity - measurement uncertainty	2.99	Normal	1	0.6	1.79
				Combined Standard Uncertainty Uc(y) =	9.62
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = 19.24 %	
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = 1.53 dB	

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5. EQUIPMENT UNDER TEST

Intel® Centrino® Advanced-N + WiMAX 6250

(Tested inside of Lenovo ThinkPad Mini 10 Series Netbook, Model: 3507XXXX)

Intel® Centrino® Advanced-N + WiMAX 6250 is an embedded IEEE 802.16e and 802.11a/b/g/n wireless network adapter that operates in the 2.4 GHz and 5 GHz spectra for WiFi and 2.6 GHz for WiMAX. The adapter is installed inside the Lenovo host. This adapter is capable of delivering up to 300 Mbps Tx/Rx over WiFi and up to 4 Mbps UL/10 Mbps DL over WiMAX.

622ANXHMW transmits on 5 ms frames using 5 MHz and 10 MHz channels. The 10 MHz channel bandwidth uses 1024 sub-carriers and 35 sub-channels, with 184 null sub-carriers and 840 available for transmission, consisting of 560 data sub-carriers and 280 pilot sub-carriers. The 5 MHz channel bandwidth uses 512 sub-carriers and 17 sub-channels, with 104 null sub-carriers and 408 available for transmission, consisting 272 data sub-carriers and 136 pilot sub-carriers.

WiMAX and 802.11 a/b/g/n co-location conditions:

The 802.16e WiMAX and 802.11 a/b/g/n WiFi radio will not transmit simultaneously. When the 622ANXHMW is installed in the typical laptop computer, once the network is chosen by the end user during WiMAX/WiFi network, only the WiMAX radio or WiFi radio will transmit.

Normal operation:	Lap-held only SAR test with display open at 90° to the keyboard
Antenna tested:	Quanta, Main Antenna, Part Number: QADCFL3_WL_M
Antenna-to-user separation distance:	19.3 cm from Tx (Main)-to-user
Assessment for SAR evaluation for Simultaneous transmission:	**WiMAX – Bluetooth:** The antenna separation distance between the WLAN and Bluetooth is greater than 20 cm, so both are not considered as co-located transmitters each other. Bluetooth - FCC ID: QDS-BRCM1046, Output power is 3.06 mW (<60/f(GHz mW) **WiMAX – WLAN:** The 802.16e WiMAX and 802.11 a/b/g/n WiFi radio will not transmit simultaneously.

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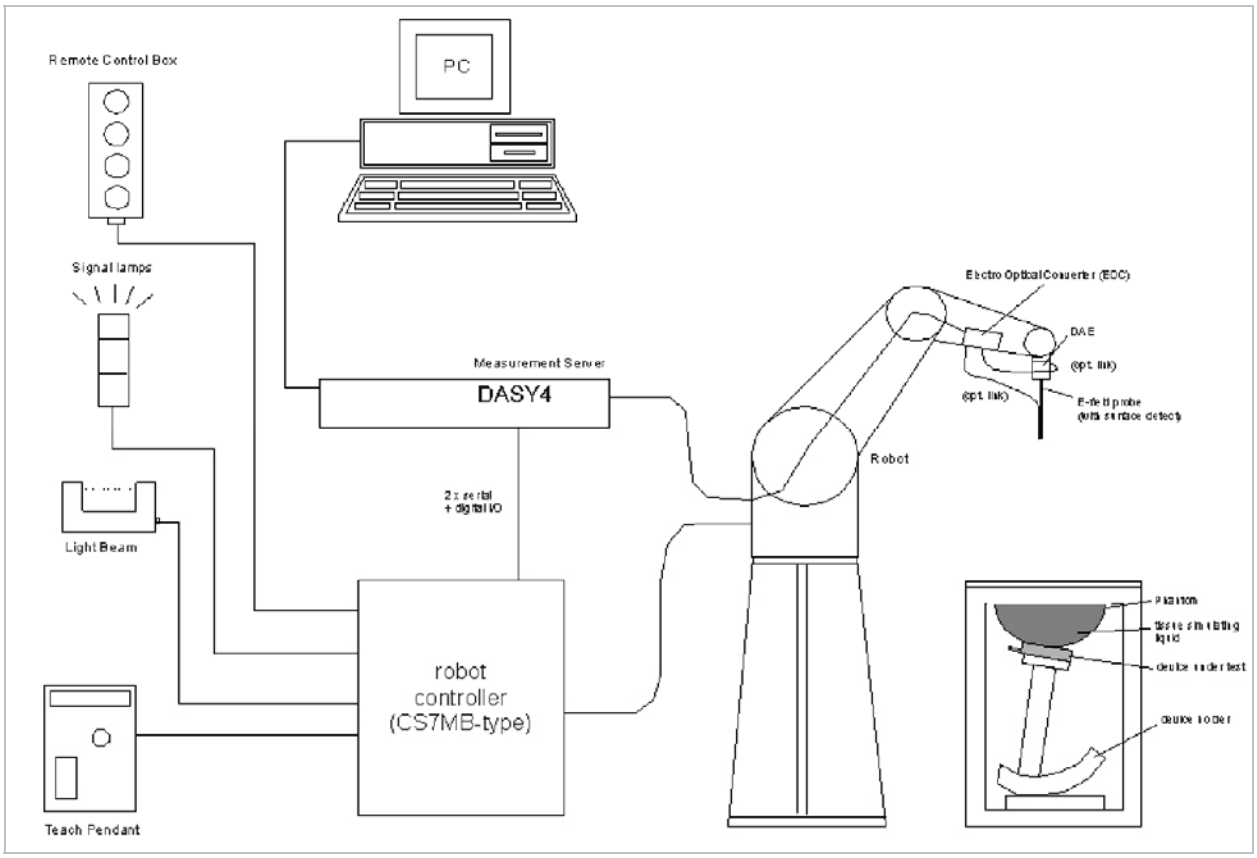
6. SYSTEM DESCRIPTION



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 validating the proper functioning of the system.

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7. COMPOSITION OF INGREDIENTS FOR TISSUE SIMULATING LIQUIDS

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)										
	450		835		915		1900		2450		2600
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04	0.05
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7	27.2
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78	2.16

Salt: 99+% Pure Sodium Chloride Sugar: 98+% Pure Sucrose
Water: De-ionized, 16 MΩ+ resistivity HEC: Hydroxyethyl Cellulose
DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

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8. SIMULATING LIQUID 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 Phantom

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	
	ε_r	σ (S/m)
2450	52.7	1.95
2500	52.6	2.02
2600	52.5	2.16
2690	52.4	2.29

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

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8.1. SIMULATING LIQUID CHECK RESULTS

Simulating Liquid Dielectric Parameter Check Result @ Body 2600 MHz
Room Ambient Temperature = 24°C; Relative humidity = 40% Measured by: Devin Chang

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
2500	e'	51.4077	Relative Permittivity (ϵ_r):	51.408	52.6	-2.27	± 5
	e"	14.5936	Conductivity (σ):	2.030	2.02	0.48	± 5
2590	e'	51.1451	Relative Permittivity (ϵ_r):	51.145	52.5	-2.58	± 5
	e"	14.8503	Conductivity (σ):	2.140	2.15	-0.48	± 5
2600	e'	51.0723	Relative Permittivity (ϵ_r):	51.072	52.5	-2.74	± 5
	e"	14.9286	Conductivity (σ):	2.159	2.16	-0.07	± 5
2690	e'	50.8336	Relative Permittivity (ϵ_r):	50.834	52.4	-2.99	± 5
	e"	15.1907	Conductivity (σ):	2.273	2.29	-0.73	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C
January 12, 2010 01:50 PM

Frequency	e'	e"
2480000000.	51.4871	14.4402
2490000000.	51.4443	14.5149
2500000000.	**51.4077**	**14.5936**
2510000000.	51.3528	14.6593
2520000000.	51.3288	14.6963
2530000000.	51.3257	14.7456
2540000000.	51.3135	14.7970
2550000000.	51.2888	14.8155
2560000000.	51.2327	14.8027
2570000000.	51.2058	14.7807
2580000000.	51.1791	14.7940
2590000000.	**51.1451**	**14.8503**
2600000000.	**51.0723**	**14.9286**
2610000000.	51.0320	14.9831
2620000000.	50.9960	15.0408
2630000000.	50.9675	15.0874
2640000000.	50.9488	15.1458
2650000000.	50.9129	15.1703
2660000000.	50.8902	15.1858
2670000000.	50.8887	15.1644
2680000000.	50.8646	15.1825
2690000000.	**50.8336**	**15.1907**
2700000000.	50.7750	15.2411
2710000000.	50.7036	15.2927
2720000000.	50.6441	15.3260

The conductivity (σ) can be given as:

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

where f = target f * 10^6

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

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9. SYSTEM PERFORAMCE CHECK

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

Measurement Conditions

- The measurements were performed in the flat section of the SAM twin phantom filled with Head or Body simulating liquid of the following parameters.
- The DASY4 system with an Isotropic E-Field Probe EX3DV4 SN3686 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 fine cube was chosen for cube
- 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 power (forward power) was 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
D2600V2	D2600V2-1006_Apr09	4/21/12	SAR_{1g}:		57.6
			SAR_{10g}:		25.8

9.1. SYSTEM PERFORMANCE CHECK RESULTS

Ambient Temperature = 24°C; Relative humidity = 40% Measured by: Devin Chang

System validation dipole	Date Tested	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
		Tissue:	Body			
D2600V2	01/12/10	SAR_{1g}:	58.8	57.6	2.08	±10
		SAR_{10g}:	26.1	25.8	1.16	

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SYSTEM CHECK PLOT

Date/Time: 1/12/2010 2:30:18 PM

Test Laboratory: Compliance Certification Services

System Performance Check - D2600V2

DUT: Dipole ; Type: D2600V2; Serial: 1006

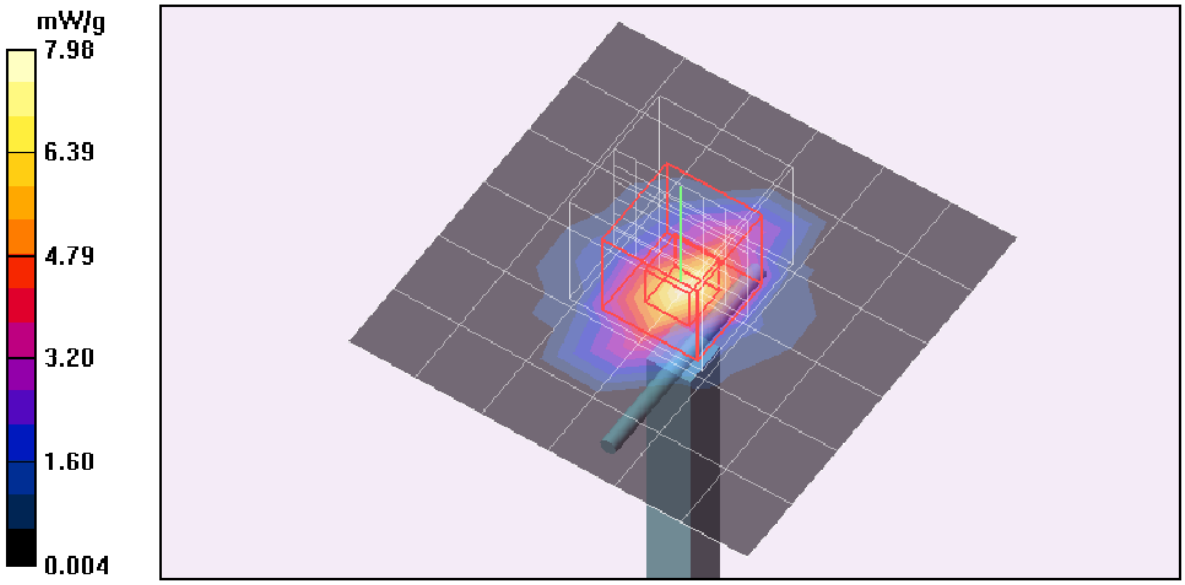
Communication System: System Check Signal - CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.16 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 23.0 deg. C; Liquid Temperature: 22.0 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: EX3DV4 - SN3686; ConvF(6.4, 6.4, 6.4); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 10/20/2008
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:XXXX
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=100mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 7.98 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 61.9 V/m; Power Drift = -0.218 dB
Peak SAR (extrapolated) = 12.4 W/kg
SAR(1 g) = 5.88 mW/g; SAR(10 g) = 2.61 mW/g
Maximum value of SAR (measured) = 7.83 mW/g



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SYSTEM CHECK – Z Plot

Date/Time: 1/12/2010 2:47:18 PM

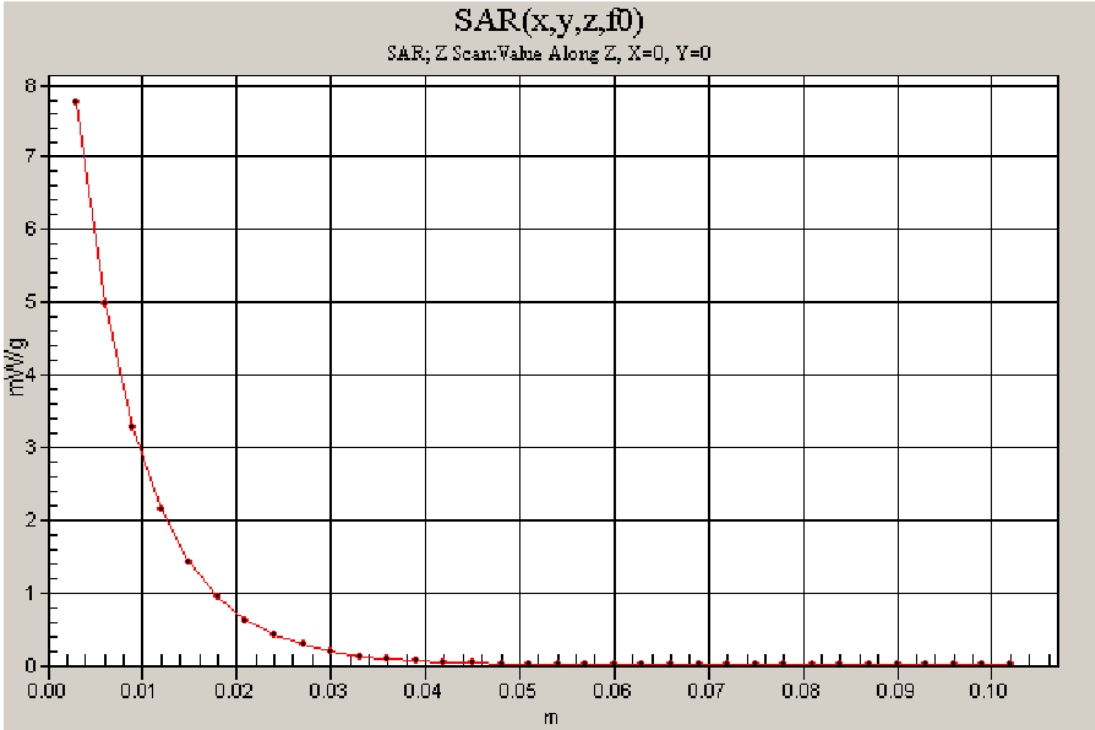
Test Laboratory: Compliance Certification Services

System Performance Check - D2600V2

DUT: Dipole ; Type: D2600V2; Serial: 1006

Communication System: System Check Signal - CW; Frequency: 2600 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) = 7.76 mW/g



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10. WIMAX / 802.16e DEVICE SPECIFICATION

10.1. WiMAX Zone Types

The device and its system are both transmitting using only PUSC zone type. This enables multiple users to transmit simultaneously within the system. FUSC, AMC and other zone types are not used by WiMAX 6250 for uplink transmission. The maximum DL:UL symbol ratio can be determined according to the PUSC requirements. The system transmit an odd number of symbols using DL-PUSL consisting of even multiples of traffics and control symbols plus one symbol for the preamble. Multiples of three symbols are transmitted by the device using UL-PUSC. The OFDMA symbol time allows up to 48 downlink and uplink symbols in each 5 ms frame. TTG and RTG are also included in each frame as DL/UL transmission gaps; therefore, the system can only allow 47 or less symbols per frame. The maximum DL:UL symbol ratio is determined according to these PUSC parameters for evaluating SAR compliance.

WiMAX chipset is capable of supporting the following Downlink / Uplink based upon 802.16e.

Description	Down Link	Up Link
Number of OFDM Symbols in Down Link and Up Link for 5 MHz and 10 MHz Bandwidth	**35**	**12**
	34	13
	32	15
	31	16
	30	17
	29	**18**
	28	19
	27	20
	26	21

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10.2. DUTY FACTOR CONSIDERATIONS

a. All Test Vector are performing with all UL symbols at maximum power.

b. Although the chipset can supply higher downlink-to-uplink (DL/UL) symbol ratios, WiMAX 6250 is only supplied to BRS/EBS WiMAX operators with agreements to transmit at a maximum DL/UL symbol ratio of 29:18. WiMAX 6250 is limited by firmware and the corresponding WiMAX system to operate at or below this maximum duty factor. Therefore, the maximum transmission duty factor supported by the chipset is not applicable for this device. The system can transmit up to 48 OFDMA symbols in each 5 ms frame, including 1.6 symbols for TTG and RTG.

c. UL Burst Max. Average Power was measured using spectrum analyzer gated to measure the power only during Tx "On" stage.

Mode	Test Vector file name	Ch. No	f (MHz)	Max. Avg Pwr	
				(dBm)	(mW)
16QAM 10M	DQ4_12_UQ16_12_10M	368	2593	23.60	229.09
QPSK 10M	DQ64_UQ4_12_21S_10M	368	2593	23.50	223.87
16QAM 5M	DQ4_12_UQ16_34_5M	378	2593	24.20	263.03
QPSK 5M	DQ64_56_UQ4_12_5M	378	2593	24.20	263.03

d. The control channels may occupy up to 5 slots during normal operation. A slot is a sub-channel with the duration of 3 symbols. There are a total of 35 slots in the 10 MHz channel configuration

e. The control channels may occupy up to 5 slots during normal operation. A slot is a sub-channel with the duration of 3 symbols. There are a total of 17 slots in the 5 MHz channel configuration.

f. Max. Rated / Certified Power:

Modulation	Channel Bandwidth	Power (mW)
16QAM	10 MHz	221.3
QPSK	10 Mhz	229.1
16QAM	5 MHz	269.2
QPSK	5 Mhz	269.2

g. By comparing to the measured output power (Section 10.2 item c) Vs the Max. Rated / Certified Power (Section 10.2 item f), the following max. Power is used to calculate the scaling factor.

Max. Power Used to Caculated the Scaling Factor		
Modulation	Channel Bandwidth	Power (mW)
16QAM	10 MHz	229.09
QPSK	10 Mhz	229.10
16QAM	5 MHz	269.20
QPSK	5 Mhz	269.20

h. When the device is transmitting at max rated power, the output power for the control symbol and the target output power for UL:DL ratio of 29:18 is calculated as the following:

Modulation	Ch. BW	Max pwr (mW)	Max pwr control symbol (max. pwr x 5 / 35)	29:18 DL:UL ration Pwr (mW) ((ctrl_symb_pwr x 3) + (max_pwr x 15))
16QAM	10 MHz	229.09	32.73	3534.53
QPSK	10 Mhz	229.10	32.73	3534.69
Modulation	Ch. BW	Max pwr (mW)	Max pwr control symbol (max. pwr x 5 / 17)	29:18 DL:UL ration Pwr (mW) ((ctrl_symb_pwr x 3) + (max_pwr x 15))
16QAM	5 MHz	269.20	79.18	4275.53
QPSK	5 Mhz	269.20	79.18	4275.53

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i. Test Vector waveform power

10 MHz BW / 16QAM: DQ4_12_UQ16_12_10M (32:15 DL:UL Ratio)

Ch. #	Freq. (MHz)	Measured Pwr (mW)	Number of Traffic Symbols	Traffic Symbols Pwr (mW)
0	2501	229.09	12	2749.08
368	2593	229.09	12	2749.08
736	2685	223.87	12	2686.44

10 MHz BW / QPSK: DQ64_UQ4_12_21S_10M (23:24 DL:UL Ratio)

Ch. #	Freq. (MHz)	Measured Pwr (mW)	Number of Traffic Symbols	Traffic Symbols Pwr (mW)
0	2501	218.78	21	4594.38
368	2593	223.87	21	4701.27
736	2685	218.78	21	4594.38

5 MHz BW / 16QAM: DQ4_12_UQ16_34_5M (26:21 DL:UL Ratio)

Ch. #	Freq. (MHz)	Measured Pwr (mW)	Number of Traffic Symbols	Traffic Symbols Pwr (mW)
0	2498.5	269.15	18	4844.70
378	2593	263.03	18	4734.54
756	2687.5	263.03	18	4734.54

5 MHz BW / QPSK: DQ64_UQ4_12_5M (26:21 DL:UL Ratio)

Ch. #	Freq. (MHz)	Measured Pwr (mW)	Number of Traffic Symbols	Traffic Symbols Pwr (mW)
0	2498.5	269.15	18	4844.70
378	2593	263.03	18	4734.54
756	2687.5	269.15	18	4844.70

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10.3. DUTY FACTOR SCALING TO DL:UL RATIO OF 29:18

10 MHz BW / 16QAM: DQ4_12_UQ16_12_10M (32:15 DL:UL Ratio)

Ch. #	Freq. (MHz)	29:18 Rated Pwr	32:15 Traffic Symbol Pwr	Scaling Factor (Rated Pwr/Traffic Pwr)
0	2501	3534.53	2749.08	1.29
368	2593	3534.53	2749.08	1.29
736	2685	3534.53	2686.44	1.32

10 MHz BW / QPSK: DQ64_UQ4_12_21S_10M (23:24 DL:UL Ratio)

Ch. #	Freq. (MHz)	29:18 Rated Pwr	23:24 Traffic Symbol Pwr	Scaling Factor (Rated Pwr/Traffic Pwr)
0	2501	3534.69	4594.38	0.77
368	2593	3534.69	4701.27	0.75
736	2685	3534.69	4594.38	0.77

5 MHz BW / 16QAM: DQ4_12_UQ16_34_5M (26:21 DL:UL Ratio)

Ch. #	Freq. (MHz)	29:18 Rated Pwr	26:21 Traffic Symbol Pwr	Scaling Factor (Rated Pwr/Traffic Pwr)
0	2498.5	4275.53	4844.70	0.88
378	2593	4275.53	4734.54	0.90
756	2687.5	4275.53	4734.54	0.90

5 MHz BW / QPSK: DQ64_UQ4_12_5M (26:21 DL:UL Ratio)

Ch. #	Freq. (MHz)	29:18 Rated Pwr	26:21 Traffic Symbol Pwr	Scaling Factor (Rated Pwr/Traffic Pwr)
0	2498.5	4275.53	4844.70	0.88
378	2593	4275.53	4734.54	0.90
756	2687.5	4275.53	4844.70	0.88

10.4. CONVERSION FACTOR & SAR SCALE FACTOR

Mode	Test Vector file name	DL:UL Ratio	Duty factor (%) (Calculated)	Conversion factor (100/duty cycle)	Scale factor DL:UL symbol ratio of 29:18
16QAM 10M	DQ4_12_UQ16_12_10M	32 :15	24.7	4.05	1.29
QPSK 10M	DQ64_UQ4_12_21S_10M	23 :24	43.2	2.31	0.75
16QAM 5M	DQ4_12_UQ16_34_5M	26 :21	37.0	2.70	0.90
QPSK 5M	DQ64_56_UQ4_12_5M	26 :21	37.0	2.70	0.90

Note: The duty factor can be given as: (number of traffic symbols*102.857*us*)/5000*us*

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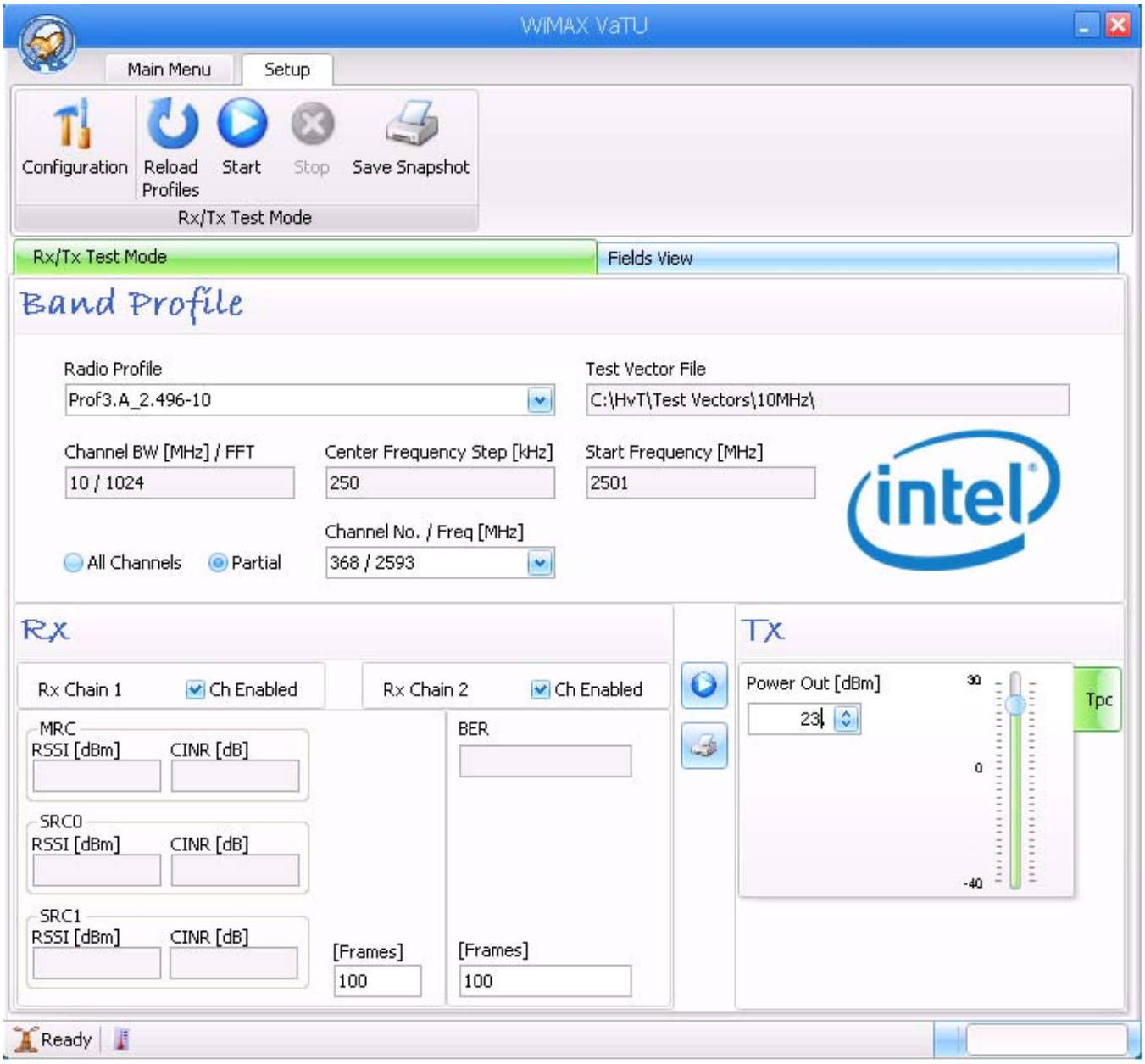
11. TEST SOFTWARE

The test software tool (WiMAX VaTU SW application) is installed on the host device, WiMAX , to transmit at max. output power. During normal operation, the output power of WiMAX client module is controlled by a WiMAX basestation, which also determines the characteristics of the transmission. For testing purposes, the device output power is kept at this max. using WiMAX VATU SW application loaded in the host device. The uplink transmission is maintained at a stable condition by the radio profile loaded in Vector signal generator. This enables the WiMAX module to transmit at max. power with a constant duty factor according to the specific radio profile. The test software serves only one purpose, to configure the WiMAX module to transmit at the max. power during SAR measurement.

The driver software installed in the host support equipment during testing was WiMAX VaTU, version: 5.0.0.1

VaTU SW Application



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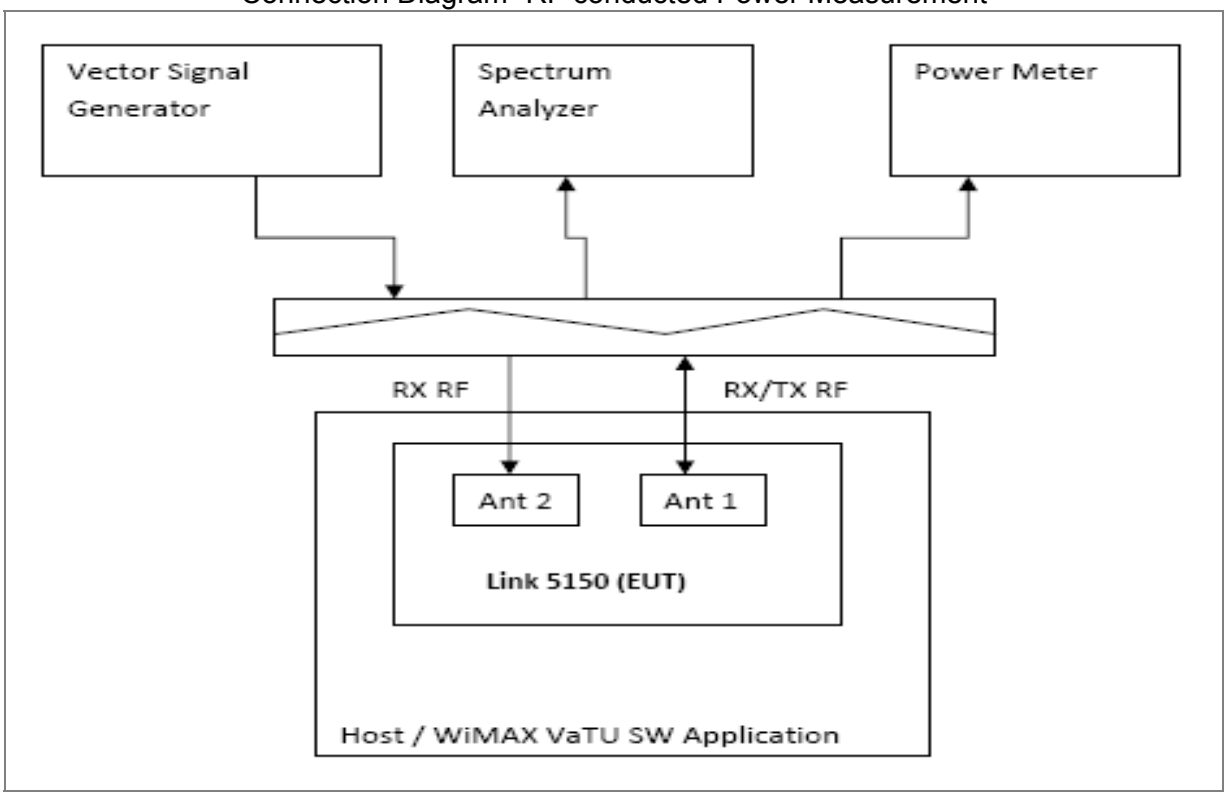
12. SIGNAL GENERATEOR DETAILS

Frame Profile loaded in Vector Signal Generator:

Test Vector File Name	BW	DL:UL Symbols	UL duty Cycle (%) (Calculated)	DL Modulation	UL Modulation
DQ4_12_UQ16_12_10M	10 MHz	32:15	24.7	QPSK R1/2	QAM16 R3/4
DQ64_UQ4_12_21S_10M	10 MHz	23:24	43.2	QAM64 R5/6	QPSK R1/2
DQ4_12_UQ16_34_5M	5 MHz	26:21	37.0	QPSK R1/2	QAM16 R3/4
DQ64_56_UQ4_12_5M	5 MHz	26:21	37.0	QAM64 R5/6	QPSK R1/2

Connection Diagram- RF conducted Power Measurement



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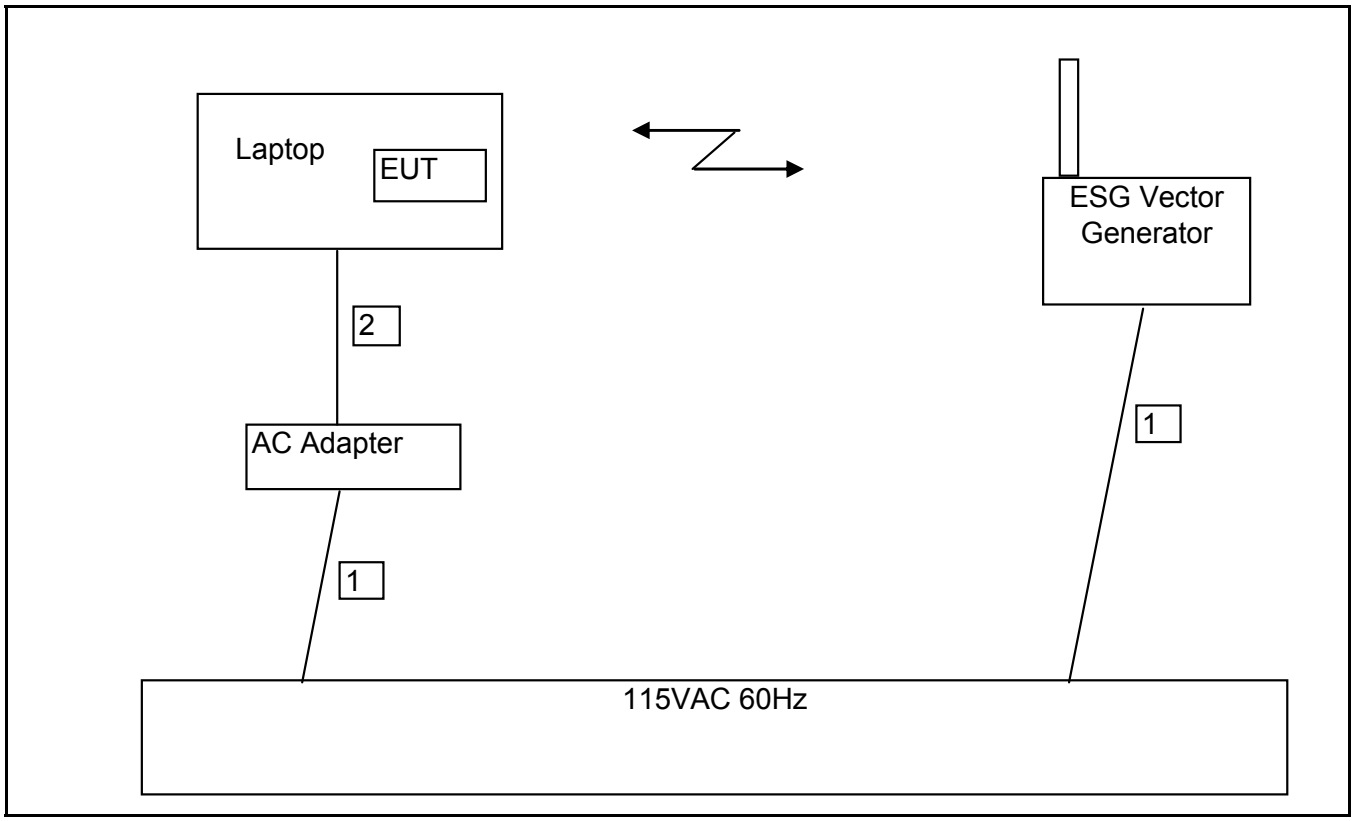
SAR Measurement



Agilent ESG Vector Signal Generator / Model: E4438C is used in conjunction with Intel supplied radio profile to configure the WiFi/WiMAX module for the SAR evaluation. ESG Vector Signal Generator is loaded with the downlink signal, containing the respective FCH, DL-MAP and UL-MAP required by the test device to configure the uplink transmission. The waveform is configured for a DL:UL symbol ratio of 32:15 for 10 MHz/16WAM; 23:24 for 10MHz/QPSK and 26:21 for 5 MHz/16WAM/QPSK using Intel Signal Waveform Software for 802.16 WiMAX, on the PC and downloaded to the VSG. The test device can synchronize itself to the signal received from VSG, both in frequency and time. It then modulates the DL-MAP and UL-MAP transmitted in the downlink sub-frame and determine the DL:UL symbol ratio. The downlink burst is repeated in each frame, every 5 ms, to simulate the normal transmission from a WiMAX base station. The UL-MAP received by the device is used to configure the uplink burst with all data symbols and sub-channels active. Since this is a one-way communication configuration, control channel transmission is neither requested nor transmitted.

For TDD systems, both uplink and downlink transmissions are at the same frequency. The output power of the VSG is kept at least 80 dB lower than the test device to avoid interfering with the SAR measurements. In addition, a horn antenna is used for the VSG and it is kept more than 1 meter away from the test device to further minimize unnecessary pickup by the SAR probe.

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13. COMMUNICATION TEST SET DETAILS

Modulation and channel bandwidth selection is loaded to Vector Signal Generator. For example, when evaluating 16QAM with 10 MHz channel Bandwidth, radio profile name "DQ4_12_UQ16_12_10M " is active on the Vector Signal Generator.

Parameter /Value	Frame definition for 10 MHz RCT		
	Test vector name		Remark
	DQ4_12_UQ16_12_10M	DQ64_UQ4_12_21S_10M	
Band Width	10MHz	10MHz	
FFT size	1024	1024	
UL Traffic Symbols	12	21	
Down link			
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	single zone
Burst profile / MCS	MCS : QPSK R1/2	MCS : QAM64 R5/6	Single DIUC
Up link			
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	single zone
Burst profile / MCS	MCS : QAM16 R3/4	MCS : QPSK R1/2	Single DIUC

Parameter /Value	Frame definition for 5MHz RCT		
	Test vector name		Remarks
	DQ4_12_UQ16_34_5M	DQ64_56_UQ4_12_5M	
Band Width	5MHz	5MHz	
FFT size	512	512	
UL traffic symbols	18	18	
Down link			
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	single zone
Burst profile / MCS	MCS : QPSK R1/2	MCS : QAM64 R5/6	Single DIUC
Up link			
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	single zone
Burst profile / MCS	MCS : QAM16 R3/4	MCS : QPSK R1/2	Single DIUC

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14. OUTPUT POWER AND PEAK TO AVERAGE RATIO

The max average conducted output power is measured for the uplink burst in the difference modulation and channel bandwidth.

14.1. AVERAGE OUTPUT POWER

10 MHz

Mode	Test Vector file name	Ch. No	f (MHz)	Avg power	
				(dBm)	(mW)
16QAM	DQ4_12_UQ16_12_10M	0	2501	23.60	229.09
		368	2593	**23.60**	**229.09**
		736	2685	23.50	223.87
QPSK	DQ64_UQ4_12_21S_10M	0	2501	23.40	218.78
		368	2593	**23.50**	**223.87**
		736	2685	23.40	218.78

5 MHz

Mode	Test Vector file name	Ch. No	f (MHz)	Avg power	
				(dBm)	(mW)
16QAM	DQ4_12_UQ16_34_5M	0	2498.5	**24.30**	**269.15**
		378	2593	24.20	263.03
		756	2687.5	24.20	263.03
QPSK	DQ64_56_UQ4_12_5M	0	2498.5	**24.30**	**269.15**
		378	2593	24.20	263.03
		756	2687.5	24.30	269.15

14.2. PEAK TO AVERAGE RATIO

Peak and Average Output power measurements were made with Power Meter.

10 MHz

Mode	Test Vector file name	Ch. No	f (MHz)	Conducted Power (dBm)		Peak-to-average ratio (PAR)
				Peak	Average	
16QAM	DQ4_12_UQ16_12_10M	368	2593	31.221	23.85	7.371
QPSK	DQ64_UQ4_12_21S_10M	368	2593	31.167	23.919	7.248

5 MHz

Mode	Test Vector file name	Ch. No	f (MHz)	Conducted Power (dBm)		Peak-to-average ratio (PAR)
				Peak	Average	
16QAM	DQ4_12_UQ16_34_5M	378	2593	31.221	23.332	7.889
QPSK	DQ64_56_UQ4_12_5M	378	2593	31.221	23.445	7.776

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15. SUMMARY OF SAR TEST RESULTS

The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.

Laptop Mode (with display open at 90° to the keyboard)

Bandwidth	Mode	Test vector file name	f (MHz)	1g_SAR (mW/g)	Scale Up Factor to DL:UL Symbol ratio of 29:18	Corrected 1g_SAR (mW/g)
10MHz	16QAM	DQ4_12_UQ16_12_10M	2593	0.0100	1.29	0.013
	QPSK	DQ64_UQ4_12_21S_10M	2593	0.0120	0.75	0.009
5MHz	16QAM	DQ4_12_UQ16_34_5M	2593	0.0098	0.90	0.009
	QPSK	DQ64_56_UQ4_12_5M	2593	0.0083	0.90	0.007

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SAR Test Plot for 10 M 16QAM

Date/Time: 1/12/2010 7:23:06 PM

Test Laboratory: Compliance Certification Services

Laptop - Lapheld

DUT: Lenovo; Type: NA; Serial: NA

Communication System: WIMAX 2.6G; Frequency: 2593 MHz;Duty Cycle: 1:4.05
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.15 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

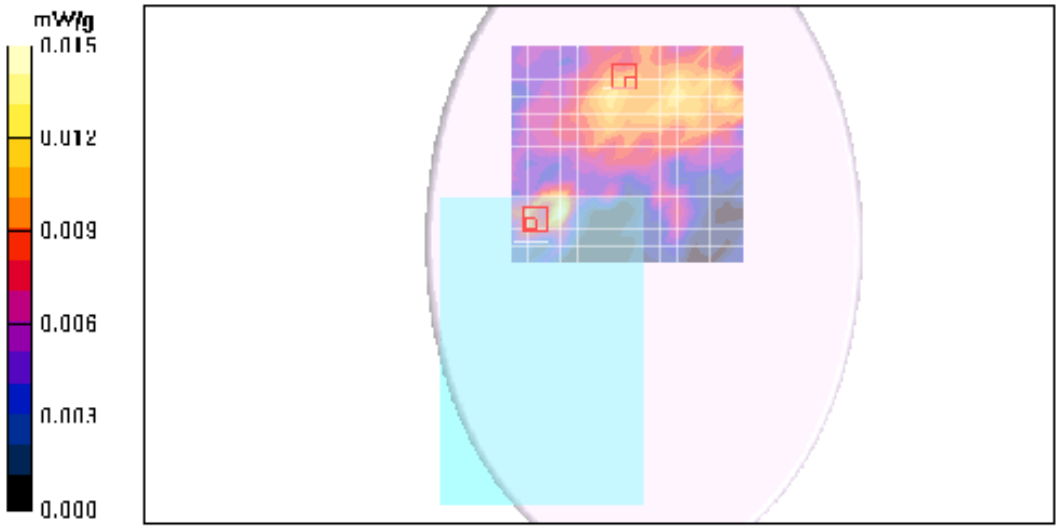
Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3686; ConvF(6.4, 6.4, 6.4); Calibrated: 3/23/2009
- 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

10MHz_16QAM_ M-ch/Area Scan (15x14x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.015 mW/g

10MHz_16QAM_ M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 2.82 V/m; Power Drift = -0.155 dB
Peak SAR (extrapolated) = 0.031 W/kg
SAR(1 g) = 0.010 mW/g; SAR(10 g) = 0.00576 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.014 mW/g

10MHz_16QAM_ M-ch/Zoom Scan (7x7x9)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 2.82 V/m; Power Drift = -0.155 dB
Peak SAR (extrapolated) = 0.033 W/kg
SAR(1 g) = 0.00709 mW/g; SAR(10 g) = 0.00361 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.013 mW/g



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SAR Test Plot for 10 M QPSK

Date/Time: 1/12/2010 8:29:19 PM

Test Laboratory: Compliance Certification Services

Laptop - Lapheld

DUT: Lenovo; Type: NA; Serial: NA

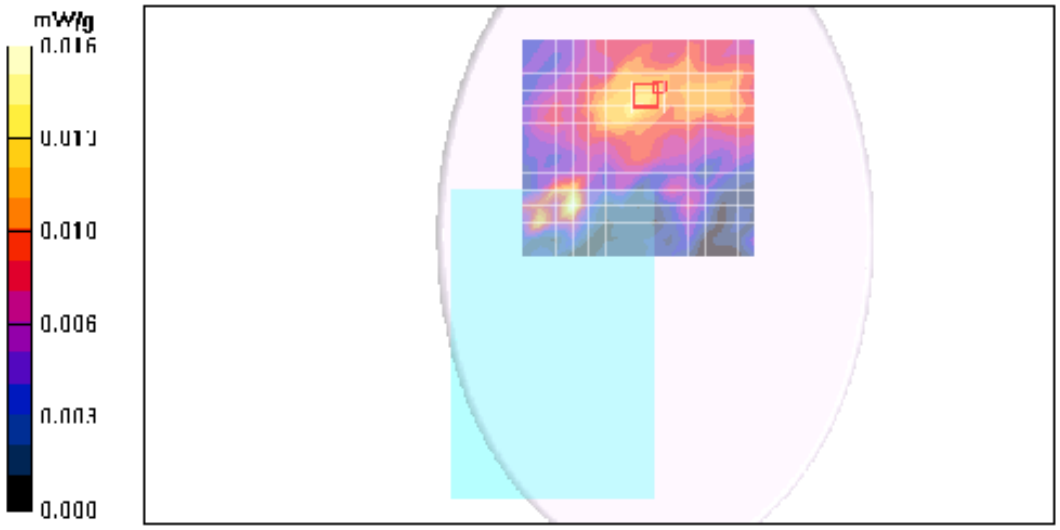
Communication System: WIMAX 2.6G; Frequency: 2593 MHz;Duty Cycle: 1:2.31
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.15 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

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: EX3DV4 - SN3686; ConvF(6.4, 6.4, 6.4); Calibrated: 3/23/2009
- 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

10MHz_QPSK_ M-ch/Area Scan (15x14x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.016 mW/g

10MHz_QPSK_ M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 2.86 V/m; Power Drift = -0.014 dB
Peak SAR (extrapolated) = 0.039 W/kg
SAR(1 g) = 0.012 mW/g; SAR(10 g) = 0.00749 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.015 mW/g



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SAR Test Plot for 5 M 16QAM

Date/Time: 1/12/2010 11:57:27 PM

Test Laboratory: Compliance Certification Services

Laptop - Lapheld

DUT: Lenovo; Type: NA; Serial: NA

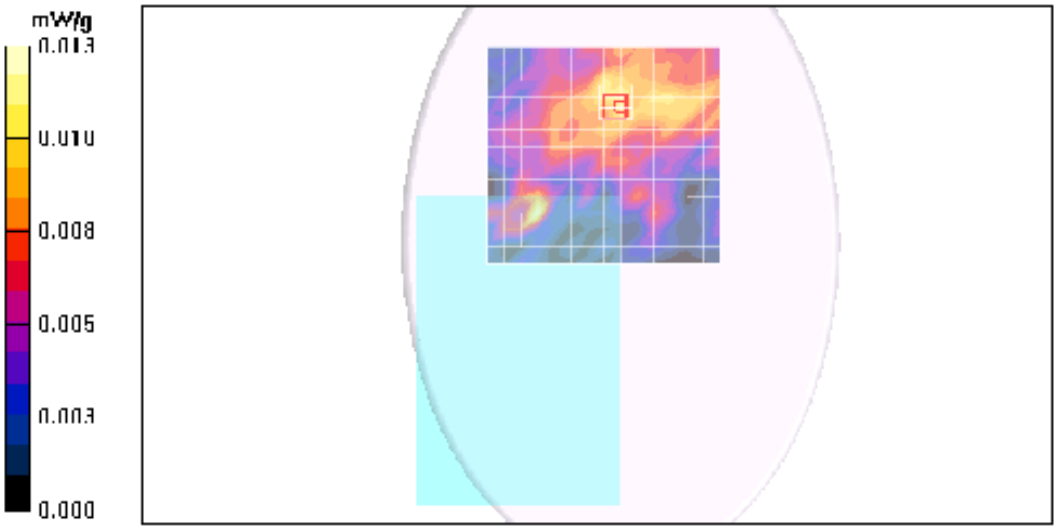
Communication System: WIMAX 2.6G; Frequency: 2593 MHz;Duty Cycle: 1:2.7
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.15 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

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: EX3DV4 - SN3686; ConvF(6.4, 6.4, 6.4); Calibrated: 3/23/2009
- 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

5MHz_16QAM_ M-ch/Area Scan (15x14x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.013 mW/g

5MHz_16QAM_ M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 2.52 V/m; Power Drift = 0.157 dB
Peak SAR (extrapolated) = 0.032 W/kg
SAR(1 g) = 0.00975 mW/g; SAR(10 g) = 0.0053 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.012 mW/g



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SAR Test Plot for 5 M QPSK

Date/Time: 1/12/2010 10:16:17 PM

Test Laboratory: Compliance Certification Services

Laptop - Lapheld

DUT: Lenovo; Type: NA; Serial: NA

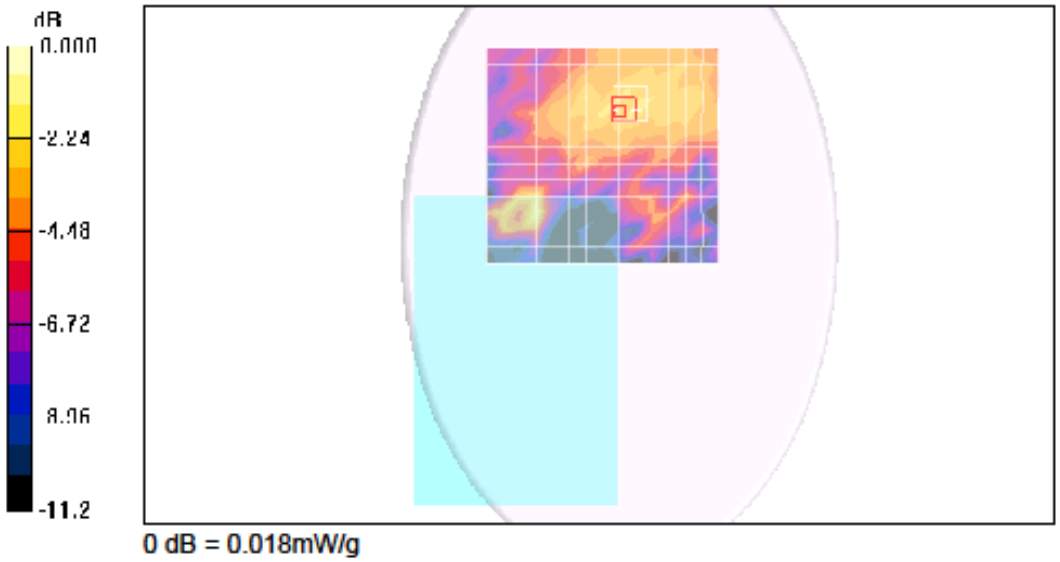
Communication System: WIMAX 2.6G; Frequency: 2593 MHz;Duty Cycle: 1:2.7
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.15 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

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: EX3DV4 - SN3686; ConvF(6.4, 6.4, 6.4); Calibrated: 3/23/2009
- 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

5MHz_QPSK_ M-ch/Area Scan (15x14x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.013 mW/g

5MHz_QPSK_ M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 2.51 V/m; Power Drift = 0.120 dB
Peak SAR (extrapolated) = 0.039 W/kg
SAR(1 g) = 0.00833 mW/g; SAR(10 g) = 0.00423 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.018 mW/g



0 dB = 0.018mW/g

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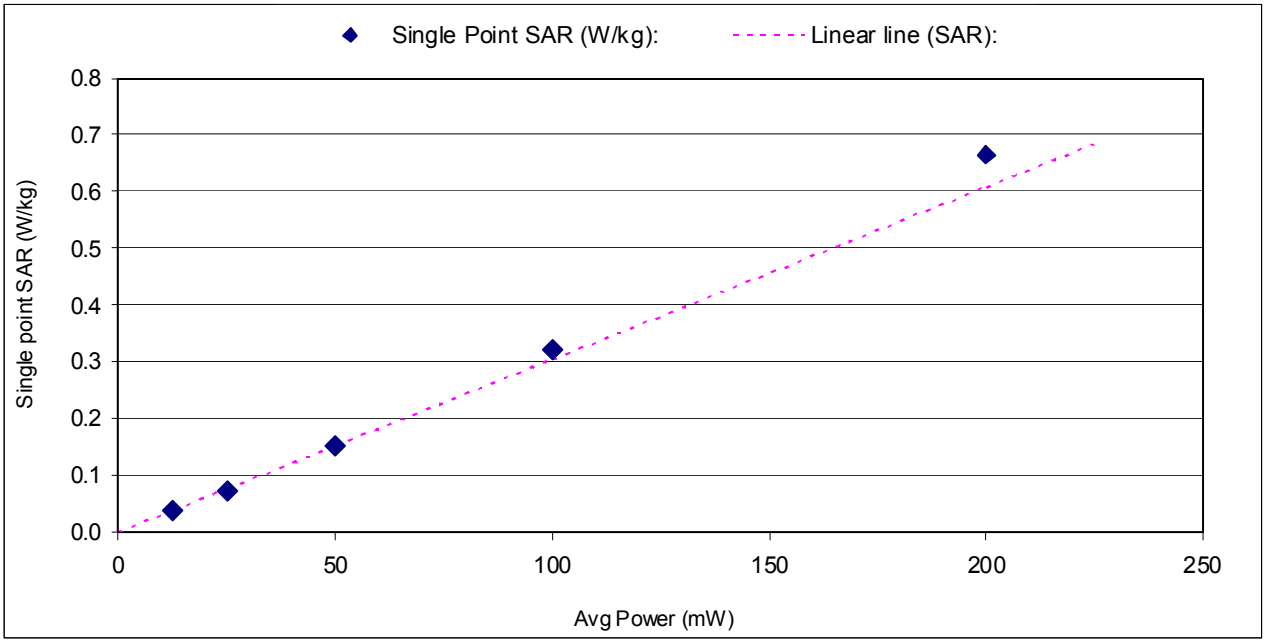
16. PAR AND SAR ERROR CONSIDERATION

In order to estimate the measurement error due to PAR issues, the configuration with the highest SAR in each channel bandwidth and frequency band is measured at various power levels, from approximately 12.5 mW at approx. 3 dB steps, until the maximum power is reached.

Note: During the tests, the top of LCD panel is positioned at 0 cm separation distance to flat phantom (for purpose of evaluation but not consider as normal operation).

10M16QAM

Average Power (mW):	12.5	25.0	50.0	100.0	200.0
Single Point SAR (W/kg):	0.038	0.073	0.153	0.322	0.665
Linear line (SAR):	0.038	0.076	0.152	0.304	0.608
Estimation (%):	0.000	-3.947	0.658	5.921	9.375



Procedure:

1. Position the EUT at flat phantom with 0 cm separation distance
2. Perform single point SAR evaluation with EUT power to be tuned at 12.5 mW
3. Record the highest single point SAR value 0.038 W/kg @ 12.5 mW.
4. Without changing probe position but tune the EUT power to 25 mW (3dB step).
5. Record the highest single point SAR value 0.073 W/kg @ 25 mW - second single peak SAR
6. Repeat the step 4 and 5 to measure single peak SAR for third, fourth and fifth single peak SAR

Procedure in establishing linear line (SAR):

- First reference Point = 0 when power = 0
- Second reference Point: 0.038 W/kg @ 12.5 mW
- Third reference point: (0.038/12.5) * 25 = 0.076 W/kg
- Fourth reference point: (0.038/12.5) * 50 = 0.152 W/kg
- Fifth h reference point: (0.038/12.5) * 100 = 0.304 W/kg
- Sixth reference point: (0.038/12.5) * 200 = 0.608 W/kg

Draw a reference line from first reference point to sixth reference point.

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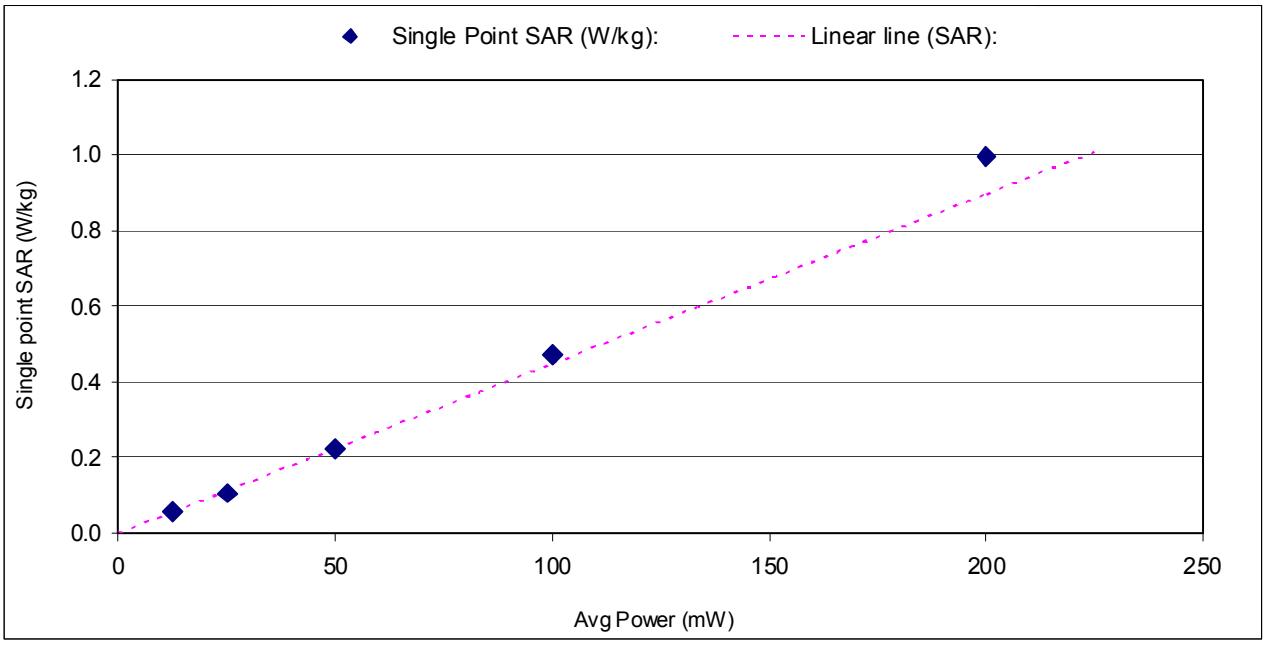
Note: During the tests, the top of LCD panel is positioned at 0 cm separation distance to flat phantom (for purpose of evaluation but not consider as normal operation).

10MQPSK

Average Power (mW):	12.5	25.0	50.0	100.0	200.0
Single Point SAR (W/kg):	0.056	0.106	0.223	0.472	0.997
Linear line (SAR):	0.056	0.112	0.224	0.448	0.896
Estimation (%):	0.000	-5.357	-0.446	5.357	11.272



Procedure:

1. Position the EUT at flat phantom with 0 cm separation distance
2. Perform single point SAR evaluation with EUT power to be tuned at 12.5 mW
3. Record the highest single point SAR value 0.056 W/kg @ 12.5 mW.
4. Without changing probe position but tune the EUT power to 25 mW (3dB step).
5. Record the highest single point SAR value 0.106 W/kg @ 25 mW - second single peak SAR
6. Repeat the step 4 and 5 to measure single peak SAR for third, fourth and fifth single peak SAR

Procedure in establishing linear line (SAR):

- First reference Point = 0 when power = 0
- Second reference Point: 0.056 W/kg @ 12.5 mW
- Third reference point: (0.056/12.5) * 25 = 0.112 W/kg
- Fourth reference point: (0.056/12.5) * 50 = 0.224 W/kg
- Fifth h reference point: (0.056/12.5) * 100 = 0.448 W/kg
- Sixth reference point: (0.056/12.5) * 200 = 0.896 W/kg

Draw a reference line from first reference point to sixth reference point.

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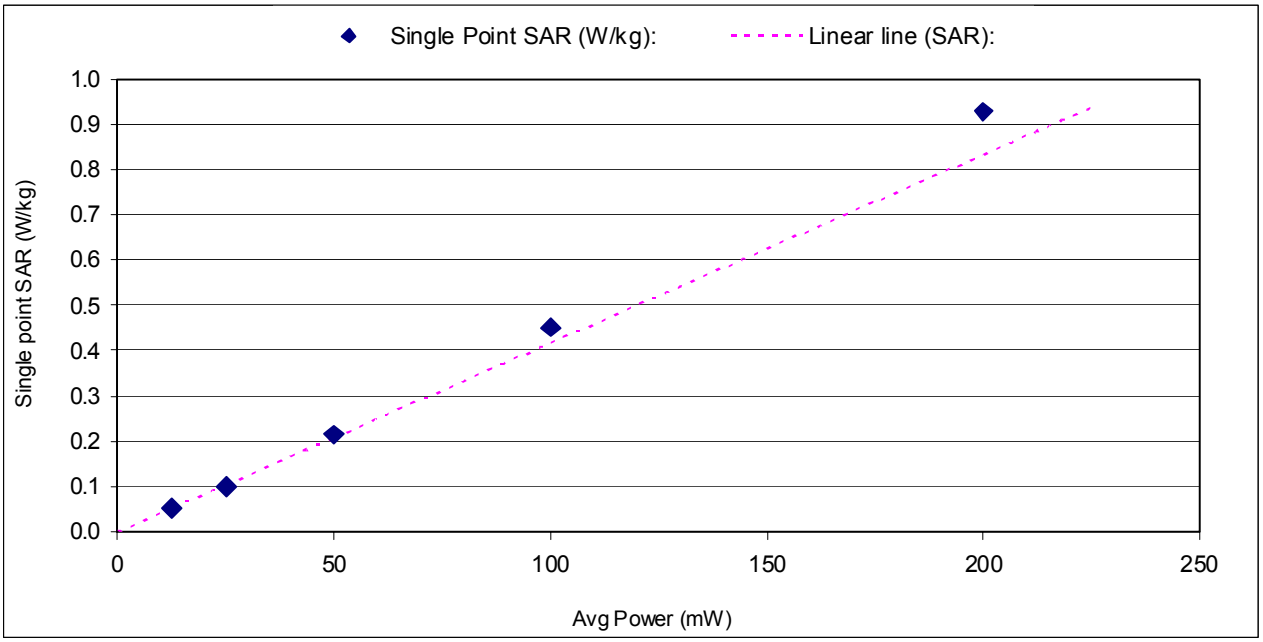
Note: During the tests, the top of LCD panel is positioned at 0 cm separation distance to flat phantom (for purpose of evaluation but not consider as normal operation).

5M16QAM

Average Power (mW):	12.5	25.0	50.0	100.0	200.0
Single Point SAR (W/kg):	0.052	0.101	0.214	0.451	0.927
Linear line (SAR):	0.052	0.104	0.208	0.416	0.832
Estimation (%):	0.000	-2.885	2.885	8.413	11.418



Procedure:

1. Position the EUT at flat phantom with 0 cm separation distance
2. Perform single point SAR evaluation with EUT power to be tuned at 12.5 mW
3. Record the highest single point SAR value 0.052 W/kg @ 12.5 mW.
4. Without changing probe position but tune the EUT power to 25 mW (3dB step).
5. Record the highest single point SAR value 0.101 W/kg @ 25 mW - second single peak SAR
6. Repeat the step 4 and 5 to measure single peak SAR for third, fourth and fifth single peak SAR

Procedure in establishing linear line (SAR):

- First reference Point = 0 when power = 0
- Second reference Point: 0.052 W/kg @ 12.5 mW
- Third reference point: (0.052/12.5) * 25 = 0.104 W/kg
- Fourth reference point: (0.052/12.5) * 50 = 0.208 W/kg
- Fifth h reference point: (0.052/12.5) * 100 = 0.416 W/kg
- Sixth reference point: (0.052/12.5) * 200 = 0.832 W/kg

Draw a reference line from first reference point to sixth reference point.

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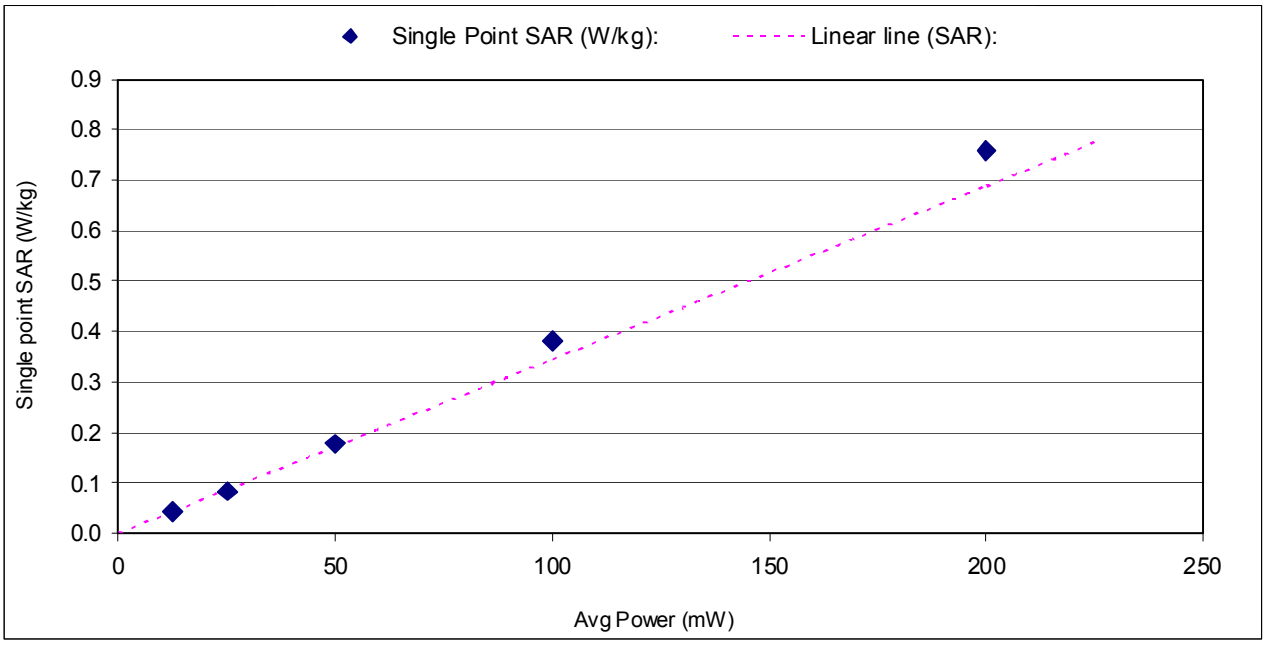
Note: During the tests, the top of LCD panel is positioned at 0 cm separation distance to flat phantom (for purpose of evaluation but not consider as normal operation).

5MQPSK

Average Power (mW):	12.5	25.0	50.0	100.0	200.0
Single Point SAR (W/kg):	0.043	0.083	0.177	0.381	0.758
Linear line (SAR):	0.043	0.086	0.172	0.344	0.688
Estimation (%):	0.000	-3.488	2.907	10.756	10.174



Procedure:

1. Position the EUT at flat phantom with 0 cm separation distance
2. Perform single point SAR evaluation with EUT power to be tuned at 12.5 mW
3. Record the highest single point SAR value 0.043 W/kg @ 12.5 mW.
4. Without changing probe position but tune the EUT power to 25 mW (3dB step).
5. Record the highest single point SAR value 0.083 W/kg @ 25 mW - second single peak SAR
6. Repeat the step 4 and 5 to measure single peak SAR for third, fourth and fifth single peak SAR

Procedure in establishing linear line (SAR):

- First reference Point = 0 when power = 0
- Second reference Point: 0.043 W/kg @ 12.5 mW
- Third reference point: (0.043/12.5) * 25 = 0.086 W/kg
- Fourth reference point: (0.043/12.5) * 50 = 0.172 W/kg
- Fifth h reference point: (0.043/12.5) * 100 = 0.344 W/kg
- Sixth reference point: (0.043/12.5) * 200 = 0.688 W/kg

Draw a reference line from first reference point to sixth reference point.

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17. ATTACHMENTS

No.	Contents	No. of page (s)
1	Certificate of E-Field Probe - EX3DV4 SN3686	10
2	Certificate of E-Field Probe - EX3DV3 SN3531	11
3	Certificate of System Validation Dipole - D2600V2 - SN:1006	6

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