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Dates of Tests: December 03 ~ 07, 2007 Test Report S/N: LR500190710A Test Site : LTA CO., LTD.

CERTIFICATION OF COMPLIANCE

FCC ID.

S7APSX10W

APPLICANT

Sena Technologies, Inc.

FCC Classification	:	FCC Part 15 Difital Transmission System (DTS)
Manufacturing Description	:	Serial Device Server
Manufacturer	:	Sena Technologies, Inc.
Model name	:	PSx10W
Test Device Serial No.:	:	Identical prototype
Rule Part(s)	:	FCC Part 15.247 Subpart C; ANSI C-63.4-2003
Frequency Range	:	2412 ~ 2462MHz
Output Power	:	0.0759 W - Conducted
Data of issue	:	December 12, 2007

This test report is issued under the authority of:

Dong -Min JUNG, Technical Manager

The test was supervised by:

Kyung-Taek LEE, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. This report must not be used by the applicant to claim product endorsement by any agency.

NVLAP LAB Code.: 200723-0

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1. General information's

1-1 Test Performed

Company name	:	LTA Co., Ltd.
Address	:	243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822
Web site	:	http://www.ltalab.com
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Telephone	:	+82-31-323-6008
Facsimile		+82-31-323-6010

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".

<u>1-2 Accredited agencies</u>

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2008-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2009-06-20	EMC accredited Lab.
FCC	U.S.A	610755	2008-03-28	FCC filing
VCCI	JAPAN	R2133, C2307	2008-06-22	VCCI registration
IC	CANADA	IC5799	2008-04-23	IC filing

2. Information's about test item

2-1 Applicant & Manufacturer

Company name	:	Sena Technologies, Inc.
Address	:	210 Yangjae-dong Seocho-gu Seoul 137-130 Korea
TEL / FAX	:	+82-2-571-8283/ +82-2-573-7710

<u>2-2 Equipment Under Test (EUT)</u>

Trade name	:	Serial Device Server	
FCC ID	:	S7APSX10W	
Model name	:	PSx10W (x: refer to the model difference)	
Serial number	:	Identification	
Date of receipt	:	December 13, 2007	
EUT condition	:	Production, not damaged	
Antenna type	:	External antenna (M/N: R-AN2400-1901RS) Max Gain 5dBi	
		External antenna (M/N: R-AN2400-5801RS) Max Gain 3.17dBi	
Antenna connector	:	Reverse polarity SMA connector	
Frequency Range	:	2412 ~ 2462MHz	
RF output power	:	0.0759W - Conducted	
Type of Modulation	:	CCK, DQPSK, DBPSK for DSSS	
		64QAM, 16QAM, QPSK, BPSK for OFDM	
Transfer Rate	:	11/5.5/2/1Mbps for 802.11b	
		54/48/36/24/18/12/9/6Mbps for 802.11g	
Power Source	:	120V, 60Hz by AC/DC Adaptor	

2-3 Model Difference according to the number of RF Module

Model Number	The number of Serial Port
PS210W	2ea
PS110W	lea

2-4 Ancillary Equipment

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Equipment	Model No.	Serial No.	Manufacturer
PC	Dimension TM 3000	8D2SF1S	DELL
Monitor	VS11353	E060T4021/1-1	View Sonic
Keyboard	SK-8115	641-OEWW	DELL
Mouse	MO56UO	510022473	DELL
Print	STYLUS C65	-	EPSON
-	-	-	-

3. Test Report

3.1 Summary of tests

	Daramatar	Test	Status
	r al ameter	Condition	(note 1)
I. FCC Part Section(s)			

WLAN Module is certified by FCC(FCC ID: MQ4WCM6002).

II. Additional items				
15.209	Field Strength of Harmonics Radiated C			
15.207	AC Conducted Emissions	Line Conducted	С	
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable				
<u>Note 2</u> : The data in this test report are traceable to the national or international standards.				

The sample was tested according to the following specification:

FCC Parts 15.247; ANSI C-63.4-2003

3.2 Technical Characteristics Test

3.2.1 Field Strength of Harmonics

Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:	
Center frequency = the worst channel	
Frequency Range = $30 \text{ MHz} \sim 10^{\text{th}}$ harmonic.	
RBW = 100 kHz (30MHz ~ 1 GHz)	$VBW \geq RBW$
= 1 MHz (1 GHz ~ 10^{th} harmonic)	
Span = 100 MHz	Detector function = peak
Trace = max hold	Sweep = auto

Measurement Data: Complies

Frequency (MHz)	Limit (uV/m) @ 10m
30 ~ 88	90 **
88 ~ 216	150 **
216 ~ 960	210 **
Above 960	300

Minimum Standard: FCC Part 15.109

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

1. Measurement Data: other spurious



Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain







Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Measurement Data: 1GHz – 26GHz – 802.11b mode

- Peak

Low channel		Mid channel		High channel	
Frequency (MHz)	Level (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Frequency (MHz)	Level (dBuV/m)
4824	46.3	4874	52.7	4924	48.8
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty		$\pm 6 \mathrm{dB}$			

No other emissions were detected at a level greater than 20dB below limit.

- Average

Low channel		Mid channel		High channel	
Frequency (MHz)	Level (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Frequency (MHz)	Level (dBuV/m)
4824	35.8	4874	41.3	4924	39.2
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty			± 6	ō dB	

No other emissions were detected at a level greater than 20dB below limit.

Measurement Data: 1GHz – 26GHz – 802.11g mode

- Peak

Low channel		Mid channel		High channel	
Frequency (MHz)	Level (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Frequency (MHz)	Level (dBuV/m)
4824	45.2	4874	45.8	4924	46.7
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty		$\pm 6 \mathrm{dB}$			

No other emissions were detected at a level greater than 20dB below limit.

- Average

Low channel		Mid channel		High channel	
Frequency (MHz)	Level (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Frequency (MHz)	Level (dBuV/m)
4824	34.7	4874	35.1	4924	35.9
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty		$\pm 6 dB$			

No other emissions were detected at a level greater than 20dB below limit.

3.2.2 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Measurement Data: Complies

- See next pages for actual measured spectrum plots.
- No emissions were detected at a level greater than 10dB below limit.

Minimum Standard: FCC Part 15.107/EN 55022 Class A

Frequency Range	Conducted Limit (dBuV)			
(MHz)	Quasi-Peak	Average		
0.15 ~ 0.5	79	66		
0.5 ~ 30	73	60		

* Decreases with the logarithm of the frequency

AC Conducted Emissions –Line



Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions –Neutral



Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions –Line



Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions –Neutral



Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions –Line



Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions –Neutral



Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Next Cal. Date
1	Spectrum Analyzer	8594E	3649A03649	HP	Apr-08
2	Signal Generator	8648C	3623A02597	HP	Apr-08
3	Attenuator (3dB)	8491A	37822	HP	Oct-08
4	Attenuator (10dB)	8491A	63196	HP	Oct-08
5	EMI Test Receiver	ESVD	843748/001	R&S	Aug-08
6	LISN	KNW-407	8-1430-1	Kyoritsu	Oct-08
7	Two-Line V-Network	ESH3-Z5	893045/017	R&S	Oct-08
8	RF Amplifier	8447D	2949A02670	HP	Jan-08
9	RF Amplifier	8447D	2439A09058	HP	Oct-08
10	RF Amplifier	8449B	3008A02126	HP	Apr-09
11	Test Receiver	ESHS10	828404009	R&S	Aug-08
12	TRILOG Antenna	VULB 9160	9160-3212	SCHWARZBECK	Jul-08
13	LogPer. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	Apr-09
14	Biconical Antenna	BBA 9106	VHA 9103-2315	SCHWARZBECK	Apr-09
15	Horn Antenna	3115	00055005	ETS LINDGREN	Mar-09
16	Dipole Antenna	VHA9103	2116	Schwarzbeck	Nov-08
17	Dipole Antenna	VHA9103	2117	Schwarzbeck	Nov-08
18	Dipole Antenna	UHA9105	2261	Schwarzbeck	Nov-08
19	Dipole Antenna	UHA9105	2262	Schwarzbeck	Nov-08
20	Spectrum Analyzer	8591E	3649A05888	HP	Oct-08
21	Spectrum Analyzer	8563E	3425A02505	HP	Apr-08
22	Hygro-Thermograph	THB-36	0041557-01	ISUZU	May-08
23	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	Jun-08
24	RF Switch	MP59B	6200414971	ANRITSU	Jun-08
25	RF Switch	MP59B	6200438565	ANRITSU	Jun-08
26	Power Divider	11636A	6243	HP	Oct-08
27	DC Power Supply	6622A	3448A03079	HP	Oct-08
28	Attenuator (30dB)	11636A	6243	HP	Oct-08
29	Frequency Counter	5342A	2826A12411	HP	Apr-08
30	Power Meter	EPM-441A	GB32481702	HP	Apr-08
31	Power Sensor	8481A	2702A64048	HP	Apr-08
32	Audio Analyzer	8903B	3729A18901	HP	Oct-08
33	Modulation Analyzer	8901B	3749A05878	HP	Oct-08
34	TEMP & HUMIDITY Chamber	YJ-500	L05022	JinYoung Tech	Oct-08
35	LOOP-ANTENNA	FMZB 1516	151602/94	SCHWARZBECK	Mar-09