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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: SZEMO061202572TXF
Page: 1 of 21
FCC ID: VWZWCREONWIFI

TEST REPORT

Application No. : SZEMO061202572TX
FCC ID: VWZWCREONWIFI
Fundamental Carrier Frequency : 2.412GHz to 2.462GHz
Equipment Under Test (EUT):
Name: CREON
Model No.: CREON WIFI
Standards: FCC PART 15: 2007 Section 15.249
Date of Receipt 20 December 2006
Date of Test 31 August to 13 November 2007
Date of Issue 16 November 2007

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Conduct Emission	FCC PART 15 2007	Section 15.207	PASS
Flied Strength of Fundamental	FCC PART 15 : 2007	Section 15.249 (a)	PASS
Flied Strength of Harmornics or other Frequency	FCC PART 15 : 2007	Section 15.249 (a)/(d) Section 15.209	PASS
Occupied Bandwidth	FCC PART 15 : 2007	Section 15.249	PASS

The test result is only about the USB dungle of the audio system with 2.4G wireless.



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4 General Information

4.1 Client Information

Applicant Name: SPECTRA Technologies Holdings Co., Ltd.
Applicant Address: Unit 1301-09, 19-20, Tower II, Grand Century Place, 193 Prince Edward Road West, Kowloon, H.K.

4.2 General Description of E.U.T.

Product Name: CREON
Power Supply: 12V DC, 2.5A

4.3 Description of Support Units

The EUT was tested as an independent unit: Wireless CREON.

4.4 Standards Applicable for Testing

The customer requested FCC tests for Wireless CREON.
The standard used was FCC PART 15, SUBPART C (2007) section 15.249.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198 Kezhu Road, Science Town Economic& Technology Development District Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.6 Other Information Requested by the Customer

None.



4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0. Effective through December 31, 2006.
- **ACA**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.
- **VCCI**
The 3m Semi-anechoic chamber and Shielded Room (11.5m x 4m x 4m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1599 and C-1706 respectively.
Date of Registration: June 01, 2005. Valid until February 22, 2008
- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**
Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.
- **CNAL – LAB Code: L0141**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAL/AC01: 2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of Testing Laboratories.
- **FCC – Registration No.: 282399**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorised test laboratory for the DoC process.
- **Industry Canada (IC)**
The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5169.



5 Test Results

5.1 Test Instruments

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	16-06-2007	15-06-2008
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	12-12-2007	11-12-2008
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	Coaxial cable	SGS	N/A	SEL0028	01-06-2007	31-05-2008
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0017	12-08-2007	11-08-2008
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	27-06-2007	26-06-2008
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0005	12-08-2007	11-08-2008
8	Pre-amplifier (1-18GHz)	Rohde & Schwarz	AFS42-00101 800-25-S-42	SEL0081	27-06-2007	26-06-2009
9	Band filter	Amindeon	82346	SEL0094	26-08-2007	25-08-2008



5.2 E.U.T. Operation

Operating Environment:

Temperature: 24.0 °C

Humidity: 52 % RH

Atmospheric Pressure: 1012 mbar

EUT Operation: Test in transmitting mode:

1. All frequencies are in 2.412GHz to 2.462GHz.
2. Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz.(The locations of these frequencies one near the top, one near the middle and one near the bottom.)
3. So all the items as followed in testing report are need to test these three frequencies:
Top: Channel – 1; Middle: Channel – 6; Bottom: Channel – 11.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Worse data reate (Mbps)
802.11b	1 to 11	1,6,11	DSSS	CCK	1,2,5,5,11	1
802.11.g	1 to 11	1,6,11	OFDM	BPSK	6,9,12,18,24,36,48,54	6



5.3 Test Procedure & Measurement Data

5.3.1 Conducted Emissions

Test Requirement: FCC Part15.207
Test Method: ANSI C63.4
Test Date: 20 September 2007
Frequency Range: 150KHz to 30MHz
Class / Severity: Class B
Detector: Peak for pre-scan (9kHz Resolution Bandwidth)
Test Procedure:

- a. The EUT was placed 0.8 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power port of a line impedance stabilization network(LISN)
- c. All the support units are connected to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150kHz to 30MHz was searched.

Operating Environment:

Temperature: 24.0 °C Humidity: 52% RH Atmospheric Pressure: 1012 Mbar

EUT Operation: Test the EUT in all normal operation mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate.

5.3.1.1 Measurement Data

An initial pre-scan was performed on the live and neutral lines under COMMUNICATING with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with worst case peak emission were detected.

The following Quasi-Peak and Average measurements were performed on the EUT.:



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Live

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.167	-0.04	-0.05	45.41	45.32	65.11	-19.79	QP
0.167	-0.04	-0.05	42.06	41.97	55.11	-13.14	Average
0.329	0.00	-0.04	37.52	37.48	59.48	-22.00	QP
0.329	0.00	-0.04	33.36	33.32	49.48	-16.16	Average
0.402	0.00	-0.04	37.21	37.17	57.81	-20.64	QP
0.402	0.00	-0.04	35.06	35.02	47.81	-12.79	Average
0.499	0.00	-0.04	36.86	36.82	46.02	-9.20	Average
0.499	0.00	-0.04	40.45	40.41	56.02	-15.61	QP
0.661	0.00	-0.05	38.33	38.28	56.00	-17.72	QP
0.661	0.00	-0.05	34.71	34.66	46.00	-11.34	Average
0.831	0.05	-0.05	38.91	38.91	56.00	-17.09	QP
0.831	0.05	-0.05	34.39	34.39	46.00	-11.61	Average

Netural

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.171	-0.05	-0.05	47.77	47.67	64.91	-17.24	QP
0.171	-0.05	-0.05	44.62	44.52	54.91	-10.39	Average
0.325	0.00	-0.04	36.02	35.98	59.58	-23.60	QP
0.325	0.00	-0.04	32.22	32.18	49.58	-17.40	Average
0.406	0.00	-0.04	37.70	37.66	57.73	-20.07	QP
0.406	0.00	-0.04	35.68	35.64	47.73	-12.09	Average
0.499	0.00	-0.04	40.06	40.02	56.02	-16.00	QP
0.499	0.00	-0.04	36.52	36.48	46.02	-9.54	Average
0.668	0.00	-0.05	40.41	40.36	56.00	-15.64	QP
0.668	0.00	-0.05	36.58	36.53	46.00	-9.47	Average
0.830	0.05	-0.05	35.49	35.49	56.00	-20.51	QP
0.830	0.05	-0.05	30.56	30.56	46.00	-15.44	Average



5.3.1.2 Radiated Emissions

Test Requirement: FCC Part15.249, 15.205 and 15.209
 Test Method: ANSI C63.4
 Test Date: 20 September 2007
 Measurement Distance: 3m (Semi-Anechoic Chamber)
 Frequency range: 30 MHz – 10GHz for transmitting mode.
 Test instrumentation resolution bandwidth
 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 M – 25GHz)
 Operation: Receive antenna scan height 1 - 4 m, polarization Vertical/
 Horizontal

Requirements:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m @ 3m)	Field Strength of Harmonics and Spurious Emissions (dBuV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0

The fundamental frequency of the EUT is 2.4 to 2.4835GHz

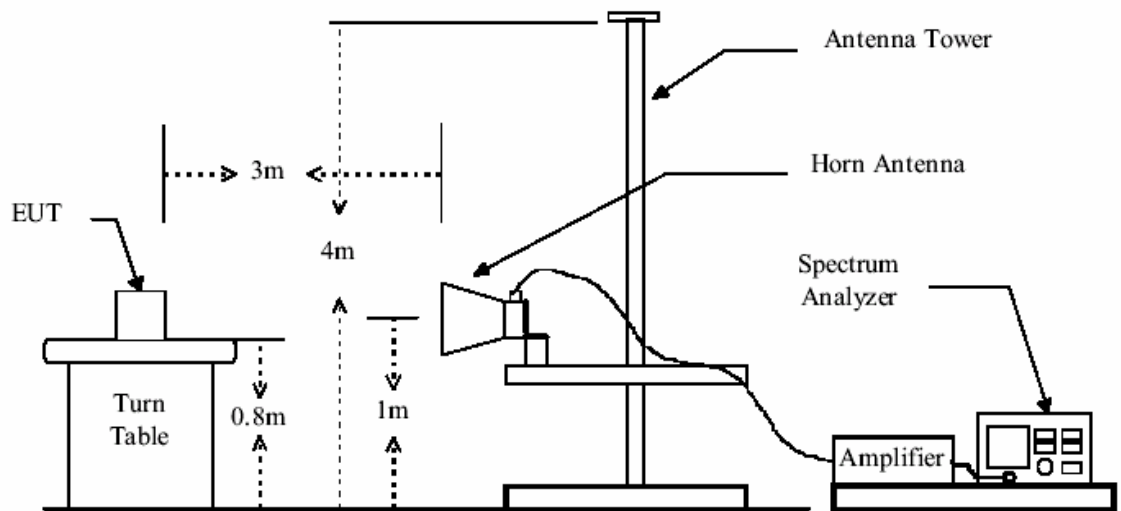
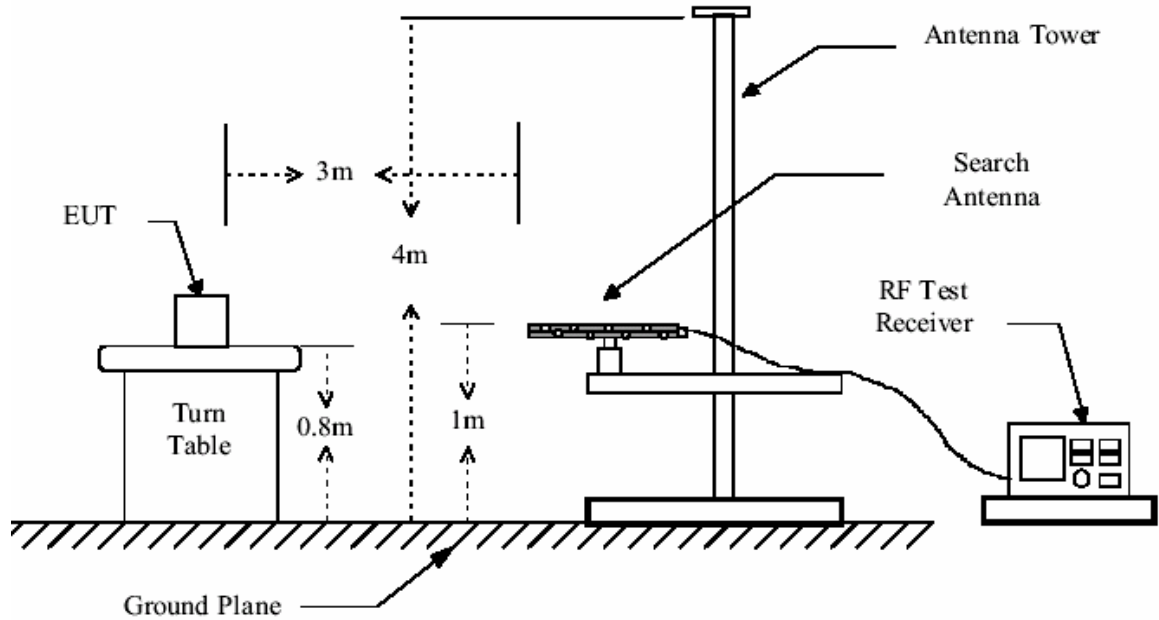
The limit for average field strength dBuv/m for the fundamental frequency = 94.0 dBuV/m.

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuV/m for the harmonics and spurious frequencies = 54.0 dBuV/m. Spurious in the restricted bands must be less than 54.0 dBuV/m or 15.209.

Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receive was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

Test Configuration:





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The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier . The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Peramplifier Factor

The following test results were performed on the EUT: **Fundamental emission**

Fin Level=Final test level+Correction factor[802.11b:20Log(16MHz/1MHz), 11g:20Log(18MHz/111MHz)]

Peak Measurement 802.11b

Test Frequency (GHz)	Measuring Level (dBuV/m) RBW=1MHz VBW=3MHz	Limits (dBuV/m)	Margin (dB)
2.412	108.9	114.0	5.1
2.438	109.1	114.0	4.9
2.462	110.5	114.0	3.5
Average Measurement			
2.412	89.5	94.0	4.5
2.438	90.3	94.0	3.6
2.462	91.2	94.0	2.8

Peak Measurement 802.11g

Test Frequency (GHz)	Measuring Level (dBuV/m) RBW=1MHz VBW=3MHz	Limits (dBuV/m)	Margin (dB)
2.412	107.9	114.0	6.1
2.438	108.4	114.0	5.6
2.462	108.2	114.0	5.8
Average Measurement			
2.412	88.2	94.0	5.8
2.438	88.5	94.0	5.5
2.462	89.2	94.0	4.8

The following test results were performed on the comple system at 30MHz-1000MHz. .
Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
44.55	0.70	10.21	28.10	26.17	8.98	40.00	-31.02
98.87	1.19	9.06	27.89	28.56	10.92	43.50	-32.58
232.73	1.59	11.76	26.99	28.08	14.44	46.00	-31.56
375.32	2.13	16.00	27.25	26.58	17.46	46.00	-28.54
599.39	2.70	19.74	27.62	26.81	21.63	46.00	-24.37
833.16	3.34	22.40	26.77	25.45	24.42	46.00	-21.58



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Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
44.55	0.70	9.61	28.10	33.66	15.87	40.00	-24.13
93.05	1.13	8.82	27.93	33.12	15.14	43.50	-28.36
98.87	1.19	9.06	27.89	33.73	16.09	43.50	-27.41
117.30	1.25	8.08	27.71	30.37	11.99	43.50	-31.51
299.66	1.90	13.85	26.72	24.30	13.33	46.00	-32.67
517.91	2.62	18.34	27.69	25.34	18.61	46.00	-27.39

The following test results were performed 802.11b at above 1 GHz the Lowest Channel (2.412GHz)

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector
2390	1.96	32.25	0	17.12	51.33	74	-22.67	Peak
2390	1.96	32.25	0	13.83	48.04	54	-5.96	Average
2400	2.13	31.87	0	17.91	51.91	74	-22.09	Peak
2400	2.13	31.87	0	14.29	48.29	54	-5.71	Average
4824.00	2.72	34.02	45.42	49.79	41.11	74	-32.89	Peak
4824.00	2.72	34.02	45.42	47.69	39.01	54	-14.99	Average

The Middle Channel (2.436GHz)

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector
4872.00	2.70	34.04	45.39	47.32	38.67	74	-15.33	Peak
4872.00	2.70	34.04	45.39	47.32	39.87	54	-14.13	Average

The Highest Channel (2.462GHz)

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector
2483.5	1.98	32.28	0	15.76	50.02	74	-23.98	Peak
2483.5	1.98	32.28	0	12.19	46.45	54	-7.55	Average
4924.00	2.72	34.02	45.42	49.74	41.06	74	-32.94	Peak
4924.00	2.72	34.02	45.42	44.31	35.36	54	-18.64	Average



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The following test results were performed 802.11g at above 1 GHz

The Lowest Channel (2.412GHz)

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector
2390	1.96	32.25	0	15.08	49.29	74	-24.71	Peak
2390	1.96	32.25	0	11.45	45.66	54	-8.34	Average
2400	2.13	31.87	0	15.73	53.81	74	-20.19	Peak
2400	2.13	31.87	0	12.80	50.88	54	-3.12	Average
4824.00	2.72	34.02	45.42	47.63	38.95	74	-35.05	Peak
4824.00	2.72	34.02	45.42	44.27	35.59	54	-18.41	Average

The Middle Channel (2.436GHz)

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector
4872.00	2.70	34.04	45.39	46.17	37.52	74	-36.48	Peak
4872.00	2.70	34.04	45.39	44.48	35.83	54	-18.17	Average

The Highest Channel (2.462GHz)

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector
2483.5	1.98	32.28	0	17.90	52.16	74	-21.84	Peak
2483.5	1.98	32.28	0	13.77	48.03	54	-5.97	Average
4924.00	2.72	34.02	45.42	48.17	39.49	74	-34.51	Peak
4924.00	2.72	34.02	45.42	43.09	34.41	54	-19.59	Average

Remark:

- 1). According to 15.249 (e) As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

TEST RESULTS: The unit does meet the FCC requirements.



5.3.2 Occupied Bandwidth

Test Requirement: FCC Part 15 C

Test Method: Based on FCC Part15 C Section 15.249:
Operation within the band 2.4000 – 2.4835GHz

Test Date: 20 September 2007

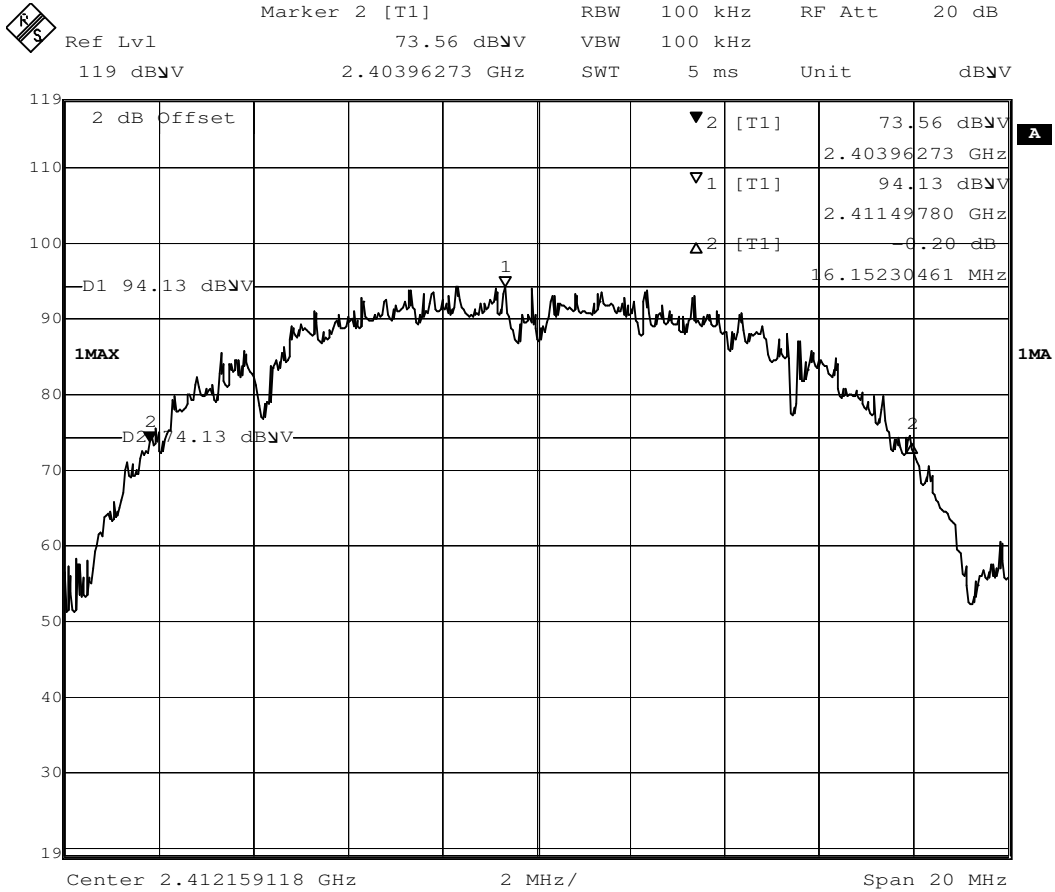
Requirements: 15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Method of measurement: A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken. The vertical is set to 10dB per division. The horizontal scale is set to 2MHz per division.



The occupied bandwidth as below:

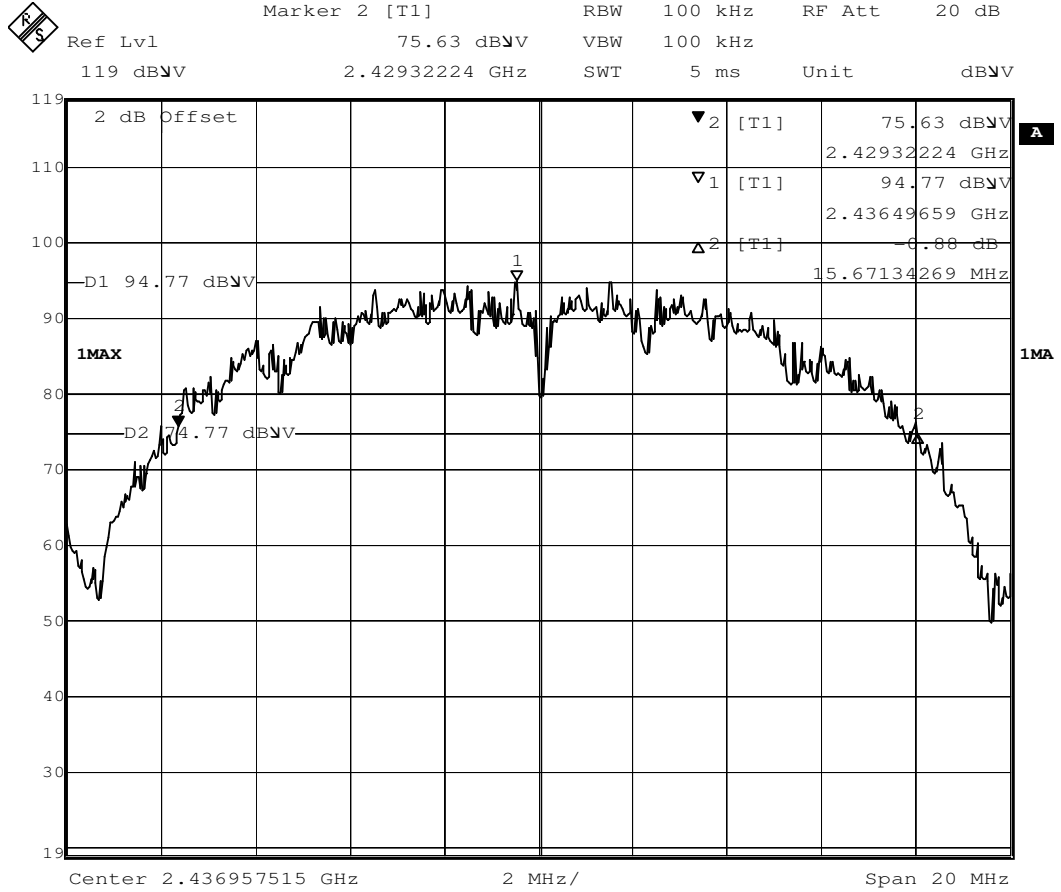
802.11b 20dB bandwidth 2.412GHz



Date: 28.FEB.2008 17:09:38



802.11b 20dB bandwidth 2.438GHz



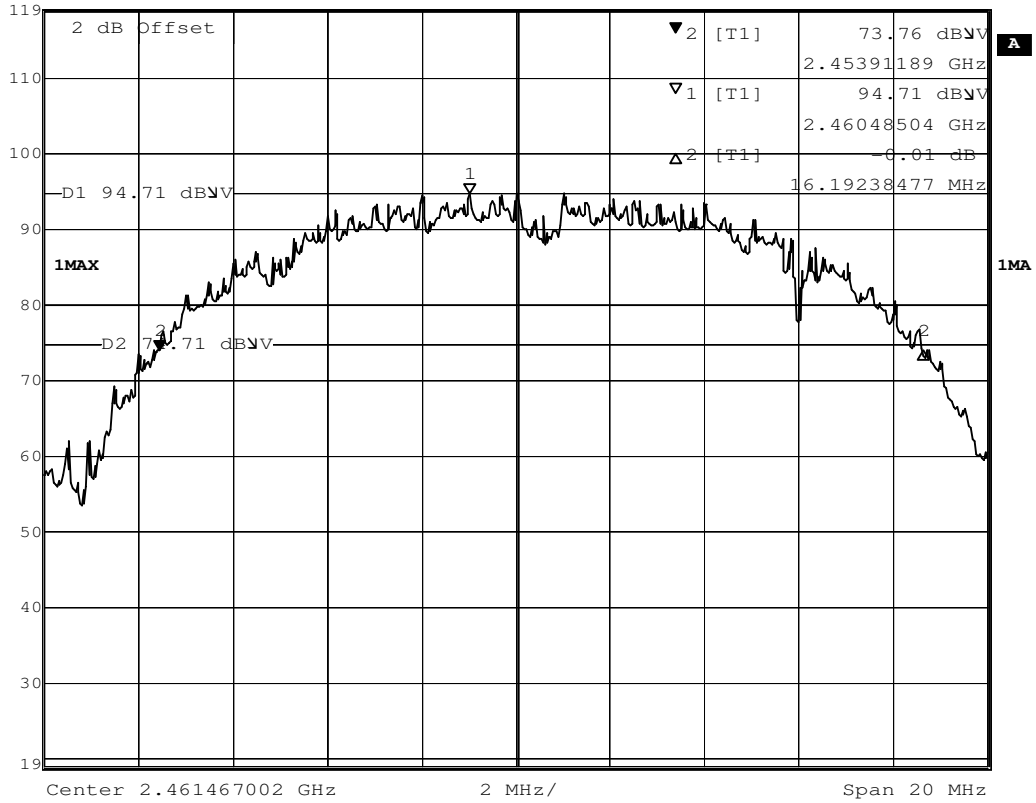
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802.11b 20dB bandwidth 2.462GHz



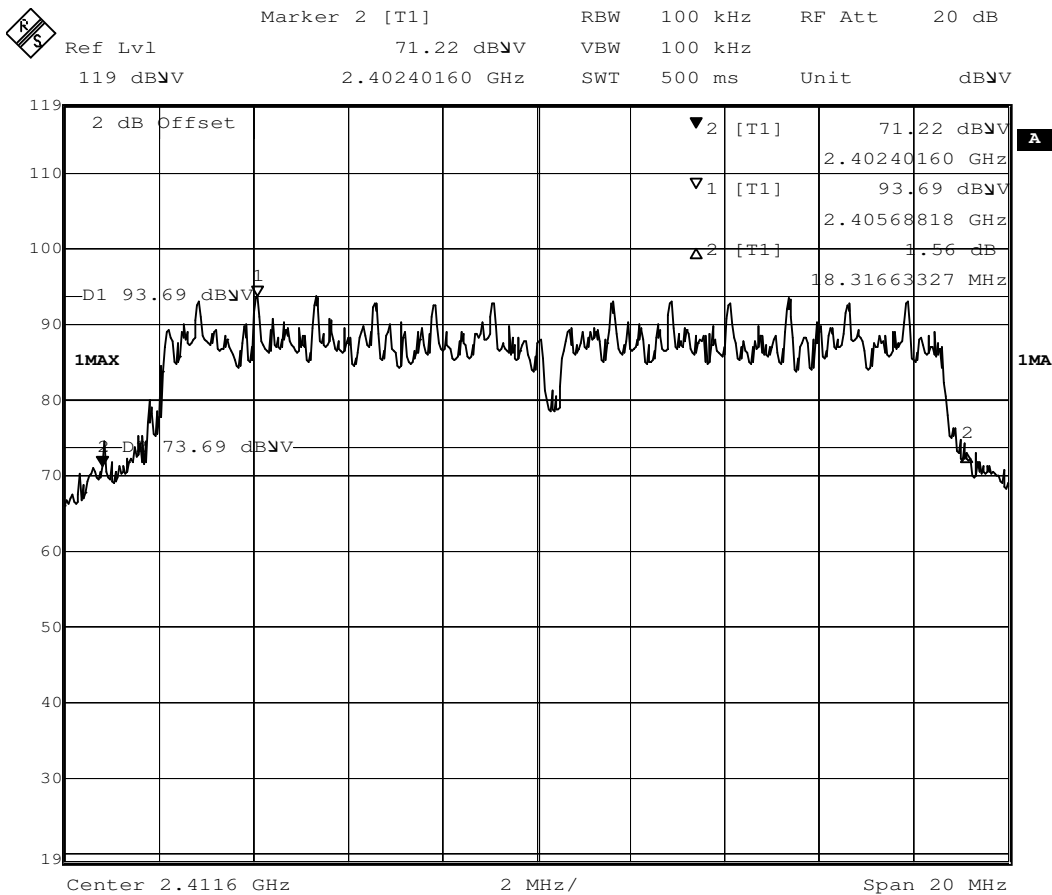
Ref Lvl	73.76 dBμV	RBW	100 kHz	RF Att	20 dB
119 dBμV	2.45391189 GHz	VBW	100 kHz	SWT	5 ms
		Unit			dBμV



Date: 29.FEB.2008 11:36:47



802.11g 20dB bandwidth 2.412GHz



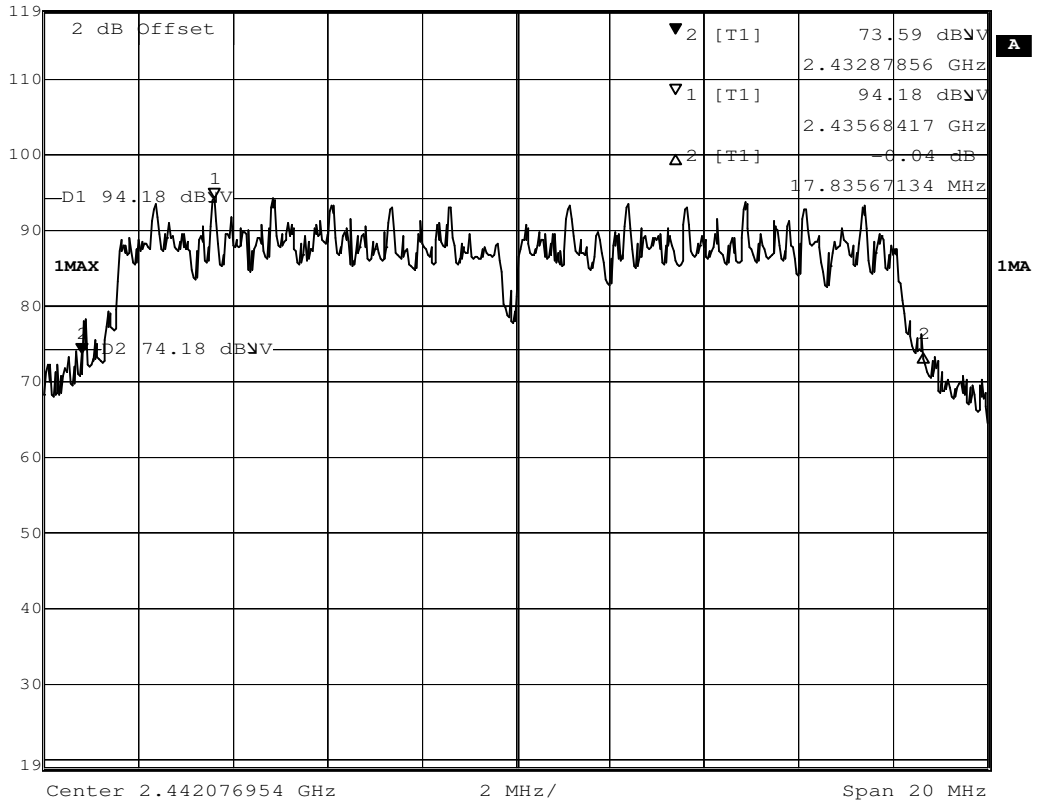
Date: 29.FEB.2008 17:05:41



802.11g 20dB bandwidth 2.438GHz



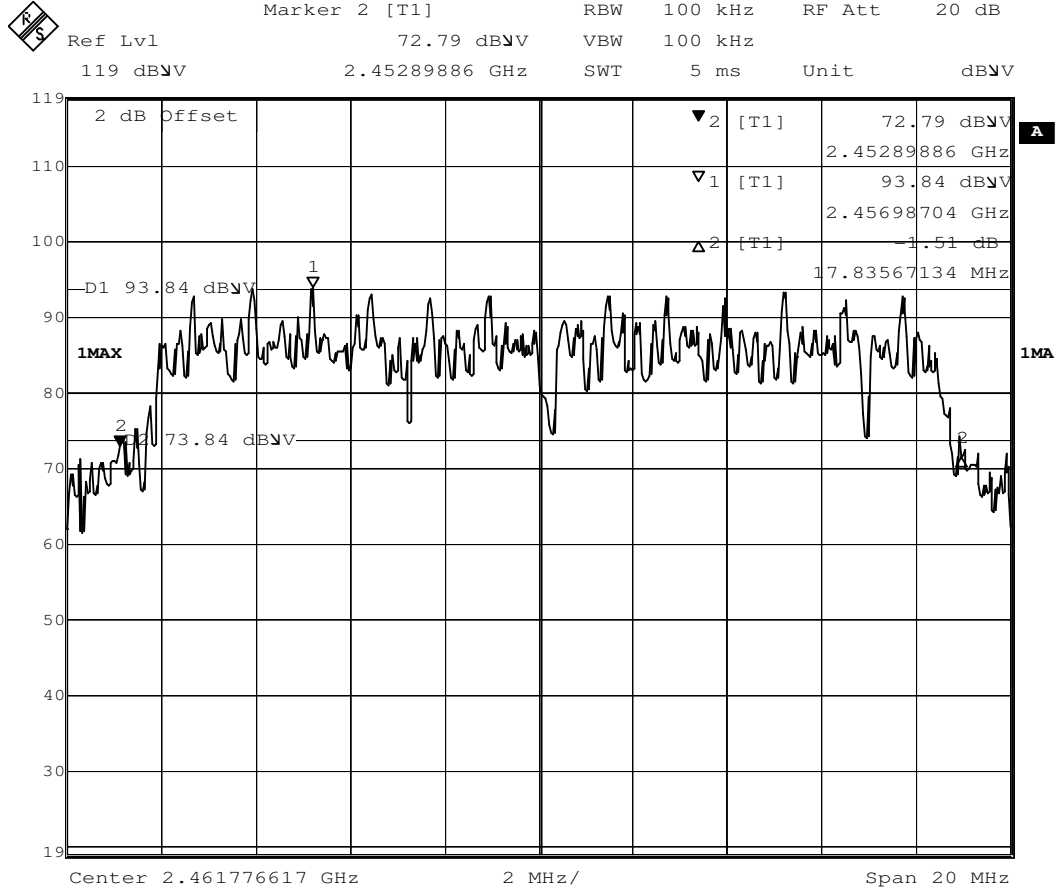
Ref Lvl	73.59 dBµV	RBW	100 kHz	RF Att	20 dB
119 dBµV	2.43287856 GHz	VBW	100 kHz	SWT	500 ms
		Unit			dBµV



Date: 29.FEB.2008 16:35:40



802.11g 20dB bandwidth 2.462GHz



Date: 29.FEB.2008 12:19:59

The results: The unit does meet the FCC requirements.