



**SGS-CSTC Standards
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Report No.: SZEMO061102380RF
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FCC ID: TE7WN321GV2

FCC TEST REPORT

Application No. : SZEMO061102380RF

FCC ID : TE7WN321GV2

Fundamental Frequency : 2.412GHz to 2.462GHz

Equipment under Test (EUT):

Name : 54M Wireless USB Adapter

Model : TL-WN321G

Trade mark : TP-LINK

Standards : FCC PART 15, SUBPART C and SUBPART B: 2006

Date of Receipt : 15 November 2006

Date of Test : 20 November 2006

Date of Issue : 27 November 2006

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

Authorized Signature:

Robinson Lo
Laboratory Manager

This report refers to the General Conditions for Inspection and Testing Services, printed overleaf
This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the SGS PRODUCT CERTIFICATION MARK.. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
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2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Occupied Bandwidth	FCC PART 15 :2006	Section 15.247 (a2)	PASS
Edges Measurement	FCC PART 15 2006	Section 15.247	PASS
Maximum Peak Output Power	FCC PART 15 :2006	Section 15.247 (b)	PASS
Power Spectral Density Measurement	FCC PART 15 :2006	Section 15.247 (d)	PASS
Spurious Radiated Emission (30MHz to 25GHz)	FCC PART 15 :2006	Section 15.109 / 15.209 / 15.247 (C)	PASS
Conducted Emissions	FCC PART 15:2006	Section 15.107 / 15.207	PASS
Antenna requirement.	FCC PART 15:2006	Section 15.247 (b)	PASS



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4 General Information

4.1 Client Information

Applicant: TP-LINK TECHNOLOGIES CO., LTD.
Address of Applicant: Building 7, Section2, Honghualing Industrial Park, Xili, Nanshan District

4.2 Details of E.U.T.

Name: Wireless USB Adapter
Model: TL-WN321G
Power Supply: 5V DC supplied by PC USB port
Operating Frequency: ISM Band for 2400MHz to 2483.5MHz
Number of Channels: 11 Channels
Type of Modulation: DSSS and OFDM.
Antenna Type: Integral
Function Description: The TP-LINK TL-WN321G USB Wireless Adapter gives you the flexibility to install your PC or notebook PC in the most convenient location available, without the cost of running the network cables. Its auto-sensing capability allows high packet transfer up to 54Mbps for maximum throughput, or dynamic range shifting to lower speeds due to distance or operating limitations in an environment with a lot of electromagnetic interference. It can also interoperate with all 11Mbps wireless (802.11b) products. Your wireless communications are protected by up to 128-bit WEP and WPA encryption, so your data stays secure.
It's a wireless lan card.

Test PC information: Test PC: 120Vac/60Hz



Verify the Frequency and Channel

Channel	Frequency (GHz)
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

Note:

1. 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.

2. So all the items as followed in testing report are need to test these three frequencies with CCK and OFDM modulation type respectively:

Top: Channel 1: 2412 MHz.

Middle: Channel 6: 2437 MHz.

Bottom: Channel 11: 2462 MHz.

3. Modulation Type:

(1). CCK modulation with 11Mbps data rate.

(2). OFDM modulation with 54Mbps data rate.

4.3 Test Location

No.198 Kezhu Road, Science Town Economic & Technology Development District Guangzhou, China
510663

Telephone: +86 (0) 20 8215 5555 Fax: +86 (0) 20 8207 5059

4.4 Other Information Requested by the Customer

None.



5 Test Results

5.1 Test Instruments

Test Equipment	Manufacturer	Model	Asset No.	Cal. Due Date
Temperature, Humidity & Barometer	Oregon Scientific	BA-888	EMC0003	25-07-2007
3m Semi- Anechoic Chamber	ETS	N/A	EMC0501	04-11-2007
EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	EMC0506	17-11-2007
Spectrum Analyzer	ROHDE & SCHWARZ	FSP 30	EMC0521	22-12-2007
Bilog Type Antenna	Schaffner Chase	CBL6143	EMC0519	01-12-2007
Horn Antenna	ROHDE & SCHWARZ	HF906	EMC0517	01-04-2007
Peramplifier	Agilent	8449B	EMC0520	30-06-2007
Coaxial cable	SGS	N/A	EMC0514	04-11-2007
Shielding Room	Frankonia	12 x 4 x 4 m ³	EMC0103	N/A
LISN	Schaffner Chase	MNZ050D1 1	1421	05-11-2007
EMI Test Receiver	Rohde & Schwarz	ESCS30	100086	17-11-2007
Coaxial Cable	SGS	2m	EMC0107	01-06-2007

5.2 E.U.T. Operation

Input voltage: 5 VDC supplied by PC USB port

Operating Environment:

Temperature: 24.0 °C
Humidity: 52 % RH
Atmospheric Pressure: 10015 mbar



5.3 Test Procedure & Measurement Data

5.3.1 Conducted Emissions

Test Requirement: FCC Part15 B
Test Method: ANSI C63.4
Test Date: 20 November 2006
Frequency Range: 150KHz to 30MHz
Class / Severity: Class B
Detector: Peak for pre-scan (9kHz Resolution Bandwidth)
Operating Environment:
Temperature: 24.0 °C Humidity: 52% RH Atmospheric Pressure: 1015 Mbar
EUT Operation: Test in normal 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, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

5.3.1.1 Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.
The following Quasi-Peak and Average measurements were performed on the EUT.:



1. For EUT communicating with CCK Mode. Channel – 1

Level Line

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

Neutral Line

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.165	-0.03	-0.04	43.90	43.83	65.21	-21.38	QP
0.165	-0.03	-0.04	40.81	40.74	55.21	-14.47	Average
0.332	0.00	-0.04	41.56	41.52	59.40	-17.88	QP
0.332	0.00	-0.04	38.35	38.31	49.40	-11.09	Average
0.402	0.00	-0.04	37.35	37.31	57.81	-20.50	QP
0.402	0.00	-0.04	35.18	35.14	47.81	-12.67	Average
0.499	0.00	-0.04	40.60	40.56	56.02	-15.46	QP
0.499	0.00	-0.04	37.06	37.02	46.02	-9.00	Average
0.716	0.01	-0.04	41.11	41.08	56.00	-14.92	QP
0.716	0.01	-0.04	38.35	38.32	46.00	-7.68	Average
2.690	0.10	-0.07	38.41	38.44	56.00	-17.56	QP
2.690	0.10	-0.07	32.25	32.28	46.00	-13.72	Average

TEST RESULTS: The unit does meet the FCC requirements.



2. For EUT communicating with CCK Mode. Channel – 6

Level Line

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	50.12	50.03	65.11	-15.08	QP
0.167	-0.04	-0.05	46.52	46.43	55.11	-8.68	Average
0.202	-0.10	-0.04	41.09	40.95	63.53	-22.58	QP
0.202	-0.10	-0.04	39.22	39.08	53.53	-14.45	Average
0.334	0.00	-0.04	41.96	41.92	59.35	-17.43	QP
0.334	0.00	-0.04	38.93	38.89	49.35	-10.46	Average
0.506	0.00	-0.04	41.06	41.02	56.00	-14.98	QP
0.506	0.00	-0.04	37.22	37.18	46.00	-8.82	Average
2.942	0.10	-0.07	32.68	32.71	46.00	-13.29	Average
2.942	0.10	-0.07	37.72	37.75	56.00	-18.25	QP
5.794	0.12	-0.13	37.17	37.16	50.00	-12.84	Average
5.794	0.12	-0.13	42.29	42.28	60.00	-17.72	QP

Neutral Line

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.167	-0.04	-0.04	45.57	45.49	65.11	-19.62	QP
0.167	-0.04	-0.04	42.21	42.13	55.11	-12.98	Average
0.250	-0.05	-0.04	27.93	27.84	51.76	-23.92	Average
0.250	-0.05	-0.04	30.91	30.82	61.76	-30.94	QP
0.334	0.00	-0.04	42.31	42.27	59.35	-17.08	QP
0.334	0.00	-0.04	39.28	39.24	49.35	-10.11	Average
0.406	0.00	-0.04	37.61	37.57	57.73	-20.16	QP
0.406	0.00	-0.04	35.79	35.75	47.73	-11.98	Average
0.502	0.00	-0.04	38.23	38.19	46.00	-7.81	Average
0.502	0.00	-0.04	41.90	41.86	56.00	-14.14	QP
7.990	0.17	-0.21	38.52	38.48	50.00	-11.52	Average
7.990	0.17	-0.21	42.66	42.62	60.00	-17.38	QP

TEST RESULTS: The unit does meet the FCC requirements.



3. For EUT communicating with CCK Mode. Channel – 11

Level Line

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	50.01	49.92	65.11	-15.19	QP
0.167	-0.04	-0.05	46.42	46.33	55.11	-8.78	Average
0.334	0.00	-0.04	41.27	41.23	59.35	-18.12	QP
0.334	0.00	-0.04	38.02	37.98	49.35	-11.37	Average
0.506	0.00	-0.04	40.67	40.63	56.00	-15.37	QP
0.506	0.00	-0.04	37.53	37.49	46.00	-8.51	Average
0.672	0.00	-0.05	38.66	38.61	56.00	-17.39	QP
0.672	0.00	-0.05	35.12	35.07	46.00	-10.93	Average
2.998	0.10	-0.08	34.92	34.94	56.00	-21.06	QP
2.998	0.10	-0.08	29.72	29.74	46.00	-16.26	Average
15.526	0.28	-0.52	33.01	32.77	60.00	-27.23	QP
15.526	0.28	-0.52	29.37	29.13	50.00	-20.87	Average

Neutral Line

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.170	-0.04	-0.04	43.58	43.50	64.96	-21.46	QP
0.170	-0.04	-0.04	39.93	39.85	54.96	-15.11	Average
0.201	-0.10	-0.04	36.72	36.58	63.57	-26.99	QP
0.201	-0.10	-0.04	34.69	34.55	53.57	-19.02	Average
0.332	0.00	-0.04	40.58	40.54	59.40	-18.86	QP
0.332	0.00	-0.04	37.16	37.12	49.40	-12.28	Average
0.406	0.00	-0.04	37.44	37.40	57.73	-20.33	QP
0.406	0.00	-0.04	35.21	35.17	47.73	-12.56	Average
0.721	0.01	-0.04	41.53	41.50	56.00	-14.50	QP
0.721	0.01	-0.04	38.62	38.59	46.00	-7.41	Average
2.659	0.10	-0.07	38.29	38.32	56.00	-17.68	QP
2.659	0.10	-0.07	32.17	32.20	46.00	-13.80	Average

TEST RESULTS: The unit does meet the FCC requirements.



4. For EUT communicating with OFDM Mode. Channel – 1

TEST RESULTS: The unit does meet the FCC requirements.

Liver Line

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.170	-0.04	-0.05	44.29	44.20	64.96	-20.76	QP
0.170	-0.04	-0.05	40.22	40.13	54.96	-14.83	Average
0.338	0.00	-0.04	37.92	37.88	49.25	-11.37	Average
0.338	0.00	-0.04	40.84	40.80	59.25	-18.45	QP
0.502	0.00	-0.04	42.28	42.24	56.00	-13.76	QP
0.502	0.00	-0.04	38.00	37.96	46.00	-8.04	Average
0.670	0.00	-0.05	42.34	42.29	56.00	-13.71	QP
0.670	0.00	-0.05	38.47	38.42	46.00	-7.58	Average
0.842	0.05	-0.05	38.00	38.00	46.00	-8.00	Average
0.842	0.05	-0.05	42.78	42.78	56.00	-13.22	QP
3.674	0.10	-0.09	33.54	33.55	46.00	-12.45	Average
3.674	0.10	-0.09	39.27	39.28	56.00	-16.72	QP

Neutral Line

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.170	-0.04	-0.04	48.54	48.46	64.96	-16.50	QP
0.170	-0.04	-0.04	44.86	44.78	54.96	-10.18	Average
0.334	0.00	-0.04	39.60	39.56	49.35	-9.79	Average
0.334	0.00	-0.04	42.68	42.64	59.35	-16.71	QP
0.406	0.00	-0.04	37.32	37.28	57.73	-20.45	QP
0.406	0.00	-0.04	35.66	35.62	47.73	-12.11	Average
0.506	0.00	-0.04	41.63	41.59	56.00	-14.41	QP
0.506	0.00	-0.04	37.18	37.14	46.00	-8.86	Average
0.670	0.00	-0.04	40.08	40.04	56.00	-15.96	QP
0.670	0.00	-0.04	36.92	36.88	46.00	-9.12	Average
2.898	0.10	-0.08	32.32	32.34	46.00	-13.66	Average
2.898	0.10	-0.08	36.96	36.98	56.00	-19.02	QP



5. For EUT communicating with OFDM Mode. Channel -6

Liver Line

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.170	-0.04	-0.04	48.22	48.14	64.96	-16.82	QP
0.170	-0.04	-0.04	44.05	43.97	54.96	-10.99	Average
0.334	0.00	-0.04	39.00	38.96	49.35	-10.39	Average
0.334	0.00	-0.04	42.56	42.52	59.35	-16.83	QP
0.502	0.00	-0.04	41.40	41.36	56.00	-14.64	QP
0.502	0.00	-0.04	38.62	38.58	46.00	-7.42	Average
0.670	0.00	-0.04	35.61	35.57	46.00	-10.43	Average
0.670	0.00	-0.04	39.94	39.90	56.00	-16.10	QP
0.838	0.05	-0.04	38.57	38.58	56.00	-17.42	QP
0.838	0.05	-0.04	34.12	34.13	46.00	-11.87	Average
2.958	0.10	-0.08	32.52	32.54	46.00	-13.46	Average
2.958	0.10	-0.08	36.87	36.89	56.00	-19.11	QP

Neutral Line

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.170	-0.04	-0.05	44.35	44.26	64.96	-20.70	QP
0.170	-0.04	-0.05	40.88	40.79	54.96	-14.17	Average
0.334	0.00	-0.04	41.99	41.95	59.35	-17.40	QP
0.334	0.00	-0.04	38.62	38.58	49.35	-10.77	Average
0.670	0.00	-0.05	41.23	41.18	56.00	-14.82	QP
0.670	0.00	-0.05	37.00	36.95	46.00	-9.05	Average
0.842	0.05	-0.05	37.11	37.11	46.00	-8.89	Average
0.842	0.05	-0.05	42.16	42.16	56.00	-13.84	QP
0.926	0.08	-0.05	41.73	41.76	56.00	-14.24	QP
0.926	0.08	-0.05	36.98	37.01	46.00	-8.99	Average
2.742	0.10	-0.07	31.97	32.00	46.00	-14.00	Average
2.742	0.10	-0.07	37.93	37.96	56.00	-18.04	QP

TEST RESULTS: The unit does meet the FCC requirements.



6. For EUT communicating with OFDM Mode . Channel – 11

Level Line

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.170	-0.04	-0.04	47.74	47.66	64.96	-17.30	QP
0.170	-0.04	-0.04	44.22	44.14	54.96	-10.82	Average
0.201	-0.10	-0.04	39.58	39.44	53.57	-14.13	Average
0.201	-0.10	-0.04	41.66	41.52	63.57	-22.05	QP
0.325	0.00	-0.04	32.96	32.92	49.58	-16.66	Average
0.325	0.00	-0.04	35.47	35.43	59.58	-24.15	QP
0.402	0.00	-0.04	34.97	34.93	47.81	-12.88	Average
0.402	0.00	-0.04	36.41	36.37	57.81	-21.44	QP
0.499	0.00	-0.04	39.75	39.71	56.02	-16.31	QP
0.499	0.00	-0.04	36.28	36.24	46.02	-9.78	Average
0.661	0.00	-0.04	35.52	35.48	56.00	-20.52	QP
0.661	0.00	-0.04	31.14	31.10	46.00	-14.90	Average

Neutral Line

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

TEST RESULTS: The unit does meet the FCC requirements.



5.3.2 Spurious Radiated Emissions

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 Section 15.247
Test Date: 20 November 2006
Measurement Distance: 3m (Semi-Anechoic Chamber)
Frequency range 30 MHz – 25GHz for transmitting mode.
Test instrumentation resolution bandwidth 120 kHz (30 MHz - 1000 MHz)
1 MHz (1000 MHz – 25GHz)
Receive antenna scan height 1 m - 4 m, polarization Vertical / Horizontal

Limit: 40.0 dB μ V/m between 30MHz & 88MHz
43.5 dB μ V/m between 88MHz & 216MHz
46.0 dB μ V/m between 216MHz & 960MHz
54.0 dB μ V/m above 960MHz

Test Procedure: The procedure used was ANSI Standard C63.4-2000. 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.

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 on 20 November 2006:

1. For EUT communicating with CCK Mode. Channel – 1

Frequency (MHz)	Antenna Polarization	Emission Level Qusia-Peak (dBuV/m)	Limit (dBuV/m)	Margin (dB)
76.000	Vertical	35.9	40.0	4.1
134.000	Vertical	37.2	43.5	6.3
76.000	Horizontal	36.1	40.0	3.9
134.000	Horizontal	38.4	43.5	5.1

Above 1000MHz

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)		Antenna Polarization
4824.044	49.54	74.0	-24.46	PK	Vertical
4824.044	37.34	54.0	-16.66	AV	Vertical
7232.112	42.92	74.0	-31.08	PK	Vertical
7232.112	34.92	54.0	-19.08	AV	Vertical

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.



2. For EUT communicating with CCK Mode. Channel – 6
30MHz- 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level Qusia-Peak (dBuV/m)	Limit (dBuV/m)	Margin (dB)
76.000	Vertical	35.2	40.0	4.8
134.000	Vertical	37.8	43.5	5.7
76.000	Horizontal	35.9	40.0	4.1
134.000	Horizontal	38.6	43.5	4.9

Above 1000MHz

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)		Antenna Polarization
4874.134	49.83	74.0	-24.17	PK	Vertical
4874.134	39.33	54.0	-14.67	AV	Vertical
7307.429	47.89	74.0	-26.11	PK	Vertical
7307.429	37.89	54.0	-16.11	AV	Vertical

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.



3. For EUT communicating with CCK Mode. Channel – 11
30MHz- 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level Qusia-Peak (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)
76.000	Vertical	36.0	40.0	-4.0
134.000	Vertical	37.5	43.5	-6.0
76.000	Horizontal	36.2	40.0	-3.8
134.000	Horizontal	38.7	43.5	-4.8

Above 1000MHz

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)		Antenna Polarization
4924.061	47.31	74.0	-26.69	PK	Vertical
4924.061	36.91	54.0	-17.09	AV	Vertical
7388.903	45.84	74.0	-28.16	PK	Vertical
7388.903	34.84	54.0	-19.16	AV	Vertical

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.



4. For EUT communicating with OFDM Mode. Channel – 1
30MHz- 1000MHz

Frequency (MHz)	Antenna Polarization	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
71.71	Vertical	56.03	35.95	40.0	-4.05
131.85	Vertical	50.88	32.35	43.5	-11.15
164.83	Vertical	51.09	34.62	43.5	-8.88
299.66	Horizontal	39.23	28.26	46.0	-17.74
396.66	Horizontal	42.51	33.56	46.0	-12.44
626.55	Horizontal	39.01	34.74	46.0	-11.26

Above 1000MHz

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)		Antenna Polarization
4829.114	43.34	74.0	-30.66	PK	Vertical
4829.114	32.34	54.0	-21.66	AV	Vertical
7236.78	43.72	74.0	-30.28	PK	Vertical
7236.78	33.42	54.0	-20.58	AV	Vertical

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.



5. For EUT communicating with OFDM Mode. Channel – 6
30MHz- 1000MHz

Frequency (MHz)	Antenna Polarization	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
71.71	Vertical	55.00	34.92	40.0	-7.07
131.85	Vertical	49.88	31.35	43.5	-12.15
164.83	Vertical	50.06	33.59	43.5	-9.91
299.66	Horizontal	40.23	29.26	46.0	-16.74
396.66	Horizontal	43.51	34.56	46.0	-11.44
626.55	Horizontal	40.01	35.74	46.0	-10.26

Above 1000MHz

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)		Antenna Polarization
4874.229	41.33	74.0	-32.67	PK	Vertical
4874.229	31.33	54.0	-22.67	AV	Vertical
7308.022	41.89	74.0	-32.11	PK	Vertical
7308.022	30.89	54.0	-23.11	AV	Vertical

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.



6. For EUT communicating with OFDM Mode. Channel – 11
30MHz- 1000MHz

Frequency (MHz)	Antenna Polarization	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
143.49	Vertical	49.5	31.73	43.5	-11.77
163.86	Vertical	54.12	37.66	43.5	-5.84
231.76	Vertical	49.64	35.95	46.0	-10.05
297.72	Horizontal	44.67	33.64	46.0	-12.36
396.66	Horizontal	42.51	33.56	46.0	-12.44
529.55	Horizontal	41.7	35.24	46.0	-10.76

Above 1000MHz

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)		Antenna Polarization
4931.198	43.01	74.0	-10.99	PK	Vertical
4931.198	32.21	54.0	-21.79	AV	Vertical
7383.642	42.44	74.0	-11.56	PK	Vertical
7383.642	32.24	54.0	-21.76	AV	Vertical

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.



5.3.3 Occupied Bandwidth

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 C Section 15.247:
Test Date: 20 November 2006
Requirements: 15.247 (a2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

Method of measurement: The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB. Analyzer and the attached plot was taken.

Test results:

1. The EUT communicating with CCK Mode

Channel	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2.412	12.8	0.5	Pass
6	2.437	12.6	0.5	Pass
11	2.462	12.8	0.5	Pass

2. The EUT communicating with OFDM Mode

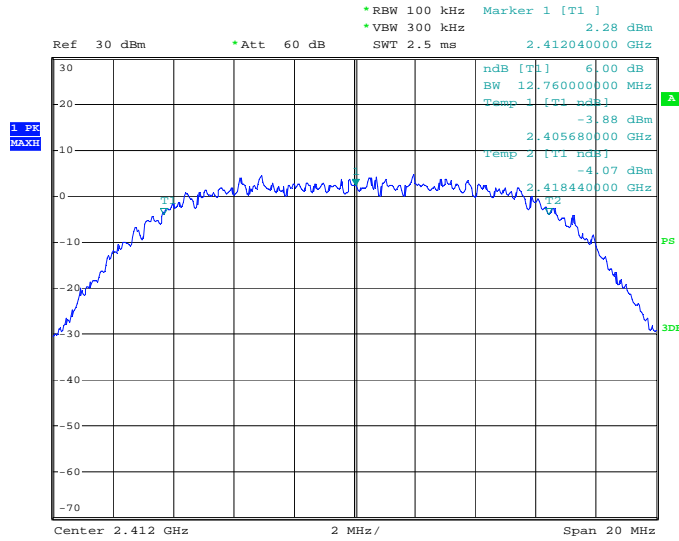
Channel	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2.412	16.8	0.5	Pass
6	2.437	16.8	0.5	Pass
11	2.462	16.8	0.5	Pass

Conclusion:: The unit does meet the FCC requirements.

Please refer to the graph as below:

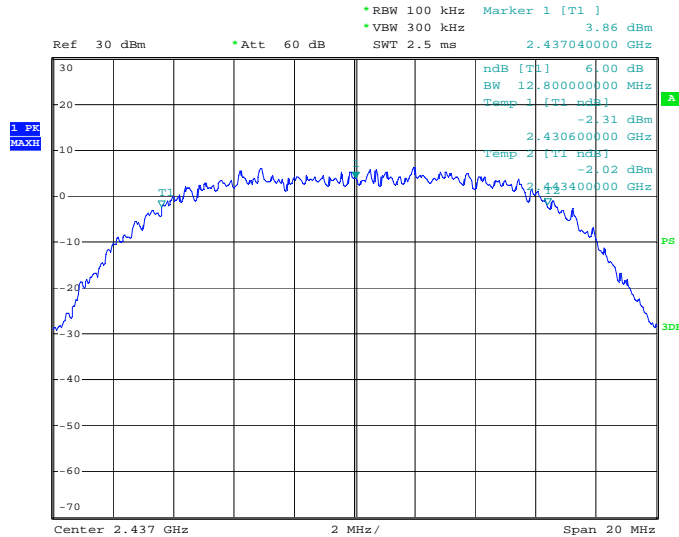


1. For EUT communicating with CCK Mode. Channel – 1



N
Date: 16.NOV.2006 17:09:07

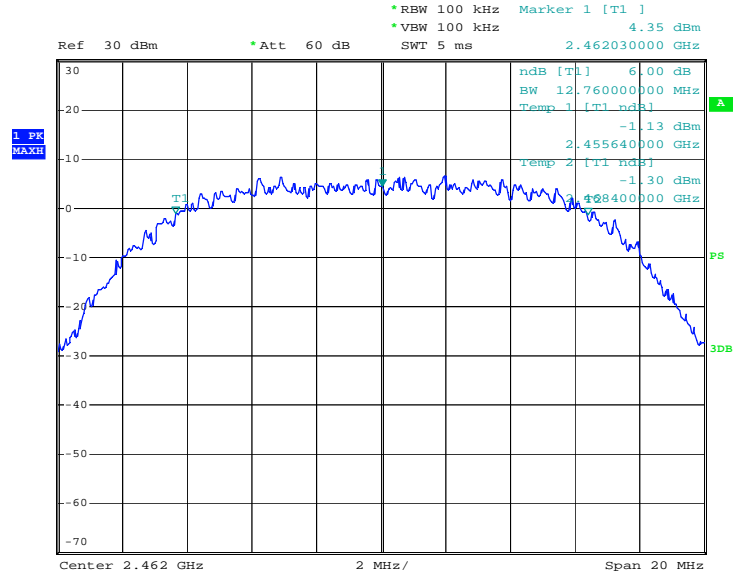
2. For EUT communicating with CCK Mode. Channel – 6



N
Date: 16.NOV.2006 17:10:19



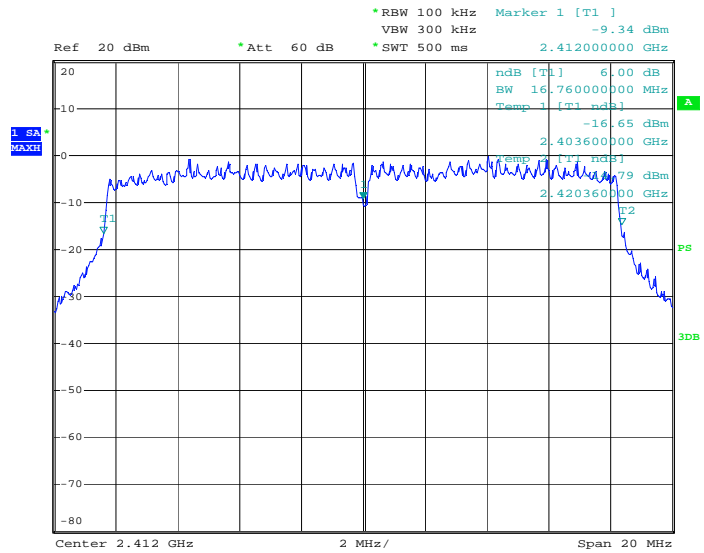
3. For EUT communicating with CCK Mode. Channel – 11



N

Date: 16.NOV.2006 17:25:07

4. For EUT communicating with OFDM Mode. Channel – 1

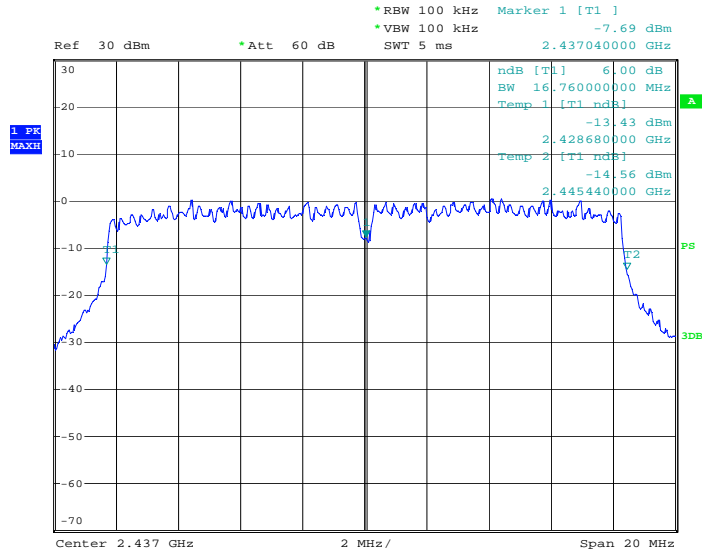


N

Date: 16.NOV.2006 16:42:11

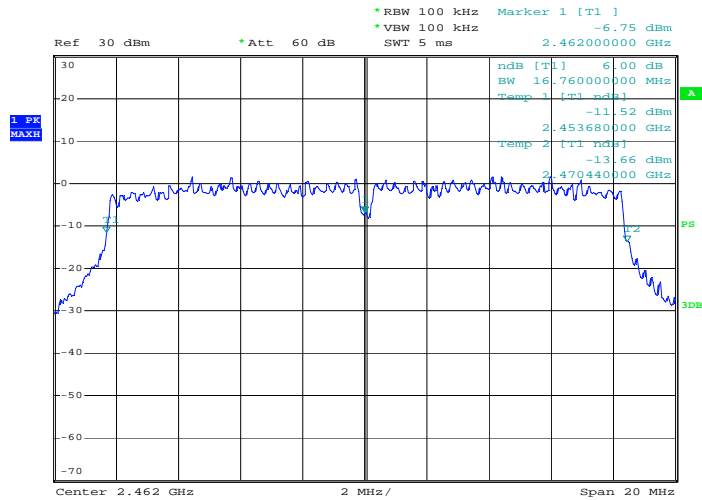


5. For EUT communicating with OFDM Mode. Channel – 6



N
Date: 16.NOV.2006 17:31:02

6. For EUT communicating with OFDM Mode. Channel – 11



N
Date: 16.NOV.2006 17:29:25



5.3.4 Maximum Peak Output Power:

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 C Section 15.247.
Test Date: 20 November 2006
Requirements:

Regulation 15.247 (b) The Limit of Maximum Peak Output Power Measurement is 30dBm.

Test results

1. For EUT communicating with CCK Mode

Channel	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER Limit (dBm)	PASS/FAIL
1	2.412	17.4	30.0	Pass
6	2.437	18.5	30.0	Pass
11	2.462	18.4	30.0	Pass

2. For EUT communicating OFDM Mode

Channel	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER Limit (dBm)	PASS/FAIL
1	2.412	18.1	30.0	Pass
6	2.437	19.2	30.0	Pass
11	2.462	19.5	30.0	Pass

Conclusion:
The EUT meets the requirements of this section.



5.3.5 Band Edges Measurement

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 C Section 15.247.
Test Date: 20 November 2006
Requirements:

Regulation 15.247 (C) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Test Procedures:

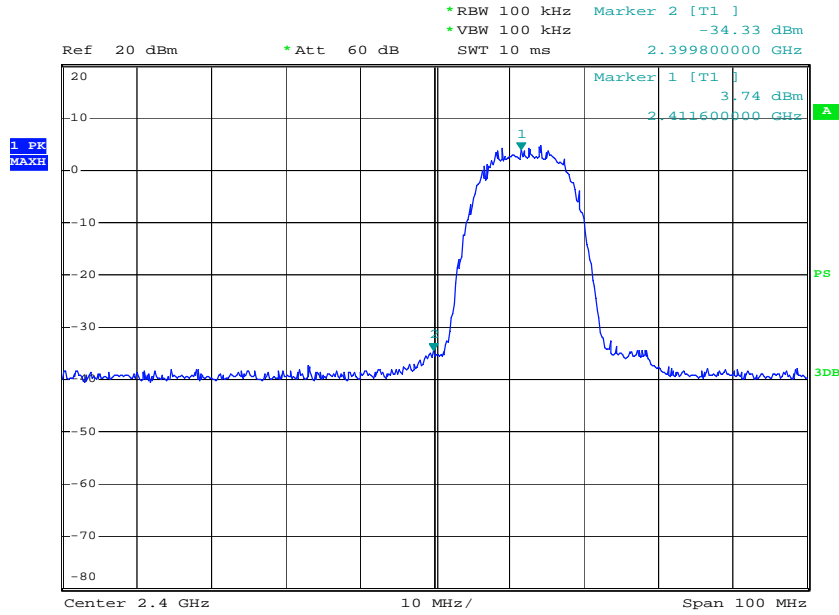
The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

Test Result:

Please refer to the measurement graph and data.



1. This is the hard copy of our measurement for EUT communicating with CCK Mode channel 1 bandedge.

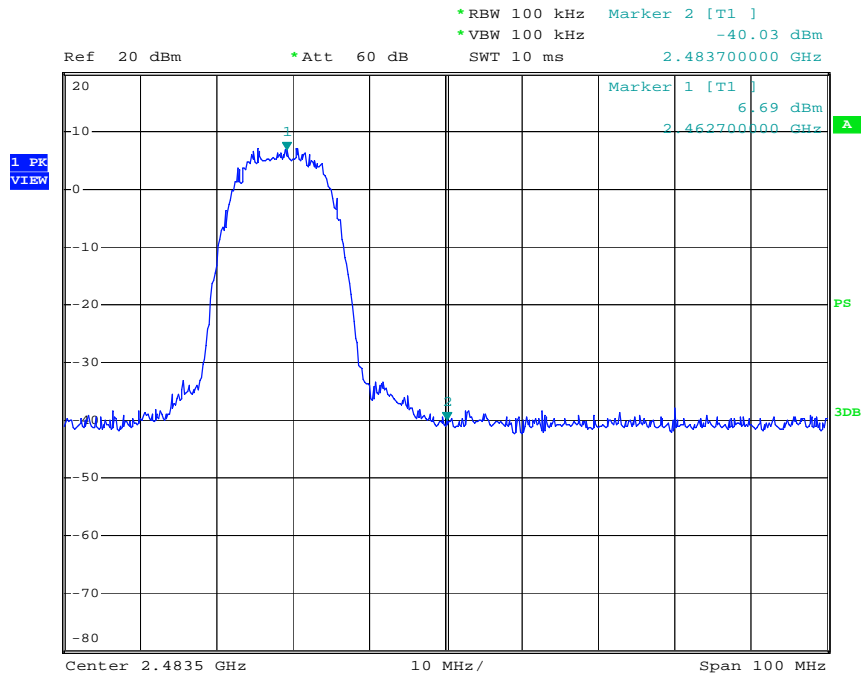


N

Date: 16.NOV.2006 17:44:08



2. This is the hard copy of our measurement for EUT communicating with CCK Mode channel 11 bandedge.



N

Date: 16.NOV.2006 17:41:44



Conclusion:

The spectrum plot extended to the start frequency : 2390MHz and the stop frequency 2485MHz (restriction bands are 2310 – 2390 MHz and 2483.5 – 2500MHz).
In any 100 kHz bandwidth outside the frequency band are at least than 20 dB below that in the 100 kHz bandwidth within the band.

For Wireless USB Adapter **channel 1** bandedge

The band edge emission plot on page 28 shows 34.3dB delta between carrier maximum power and local maximum emission in restrict band (2390MHz). The emission of carrier strength list in Radiated Emission test is 84.7dB μ V/m, so the maximum field strength in restrict band is $84.7 - 34.3 = 50.4$ dB μ V/m which is under 54 dB μ V/m limit.

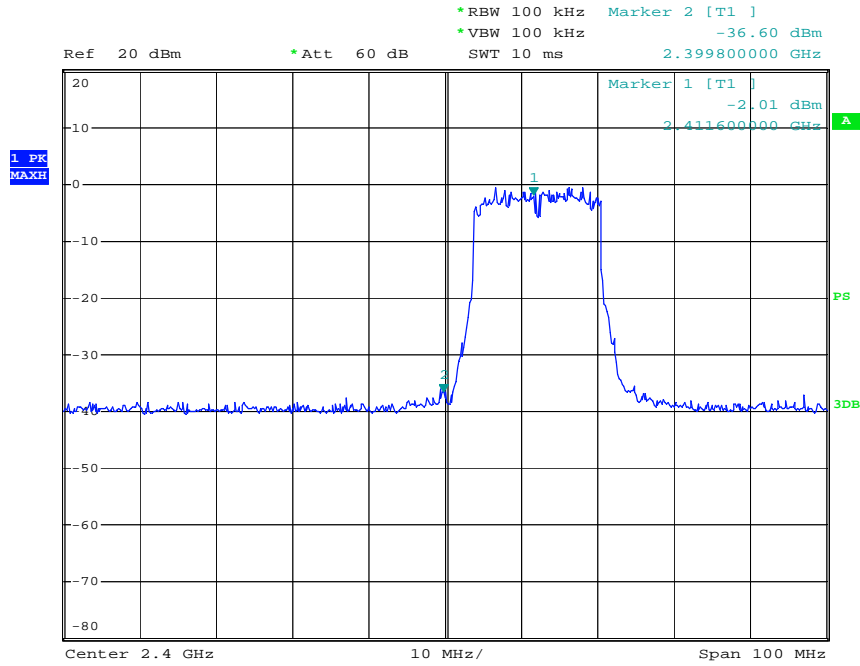
For Wireless USB Adapter **channel 11** bandedge

The band edge emission plot on page 29 shows 40dB delta between carrier maximum power and local maximum emission in restrict band (2483.5MHz). The emission of carrier strength list in Radiated Emission test is 79.5dB μ V/m, so the maximum field strength in restrict band is $79.5 - 40 = 39.5$ dB μ V/m which is under 54 dB μ V/m limit.

The EUT meets the requirements of this section.



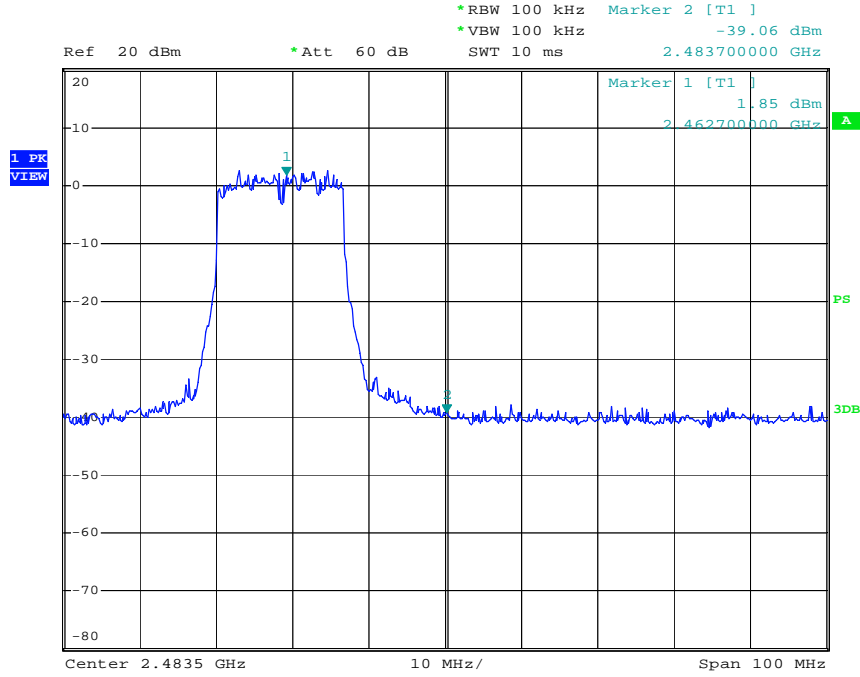
1. This is the hard copy of our measurement for EUT communicating with OFDM Mode channel 1 bandedge.



N
Date: 16.NOV.2006 17:46:27



2.This is the hard copy of our measurement for EUT communicating with OFDM Mode channel 11 bandedge.



N

Date: 16.NOV.2006 17:40:19



Conclusion:

The spectrum plot extended to the start frequency : 2390MHz and the stop frequency 2485MHz (restriction bands are 2310 – 2390 MHz and 2483.5 – 2500MHz).
In any 100 kHz bandwidth outside the frequency band are at least than 20 dB below that in the 100 kHz bandwidth within the band.

Wireless USB Adapter channel 1 bandedge

The band edge emission plot on page31 shows 36.6dB delta between carrier maximum power and local maximum emission in restrict band (2390MHz). The emission of carrier strength list in Radiated Emission test is 79.5.dB μ V/m, so the maximum field strength in restrict band is $79.5 - 36.6 = 50.9$ dB μ V/m which is under 54 dB μ V/m limit.

Wireless USB Adapter channel 11 bandedge

The band edge emission plot on page 32 shows 39.0dB delta between carrier maximum power and local maximum emission in restrict band (2483.5MHz). The emission of carrier strength list in Radiated Emission test is 88.0dB μ V/m, so the maximum field strength in restrict band is $88.0 - 39.0 = 49.0$ dB μ V/m which is under 54 dB μ V/m limit.

The EUT meets the requirements of this section.



5.3.6 Power Spectral Density Measurement

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 C Section 15.247.
Test Date: 16 November 2006
Requirements:

Regulation 15.247 (d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

Test Procedures:

The tests below are running with the EUT transmitter set at high power mode .A USB port from a notebook computer to the EUT. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Connected with the spectrum analyzer.

Set spectrum analyzer RBW = 3 KHz, VBW > RBW (e.g. VBW = 10 KHz), Span = 2 MHz. Turn around the table to find maximum emission. Then set the Span = 300 KHz and sweep time = 100 sec. Peak the maximum emission again. The peak level measured must be no greater than + 8dBm.

The EUT was set transmitting continuously and force selection of output power level and channel number. We'd observed that the peak levels aren't greater than +8dBm limit.



Test Result:

1. For EUT communicating with CCK Mode

Channel	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM Limit (dBm)	PASS/FAIL
1	2.412	-11.5	8.0	Pass
6	2.437	-10.3	8.0	Pass
11	2.462	-9.4	8.0	Pass

2. For EUT communicating with OFDM Mode

Channel	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM Limit (dBm)	PASS/FAIL
1	2.412	-20.7	8.0	Pass
6	2.442	-19.3	8.0	Pass
11	2.462	-18.2	8.0	Pass

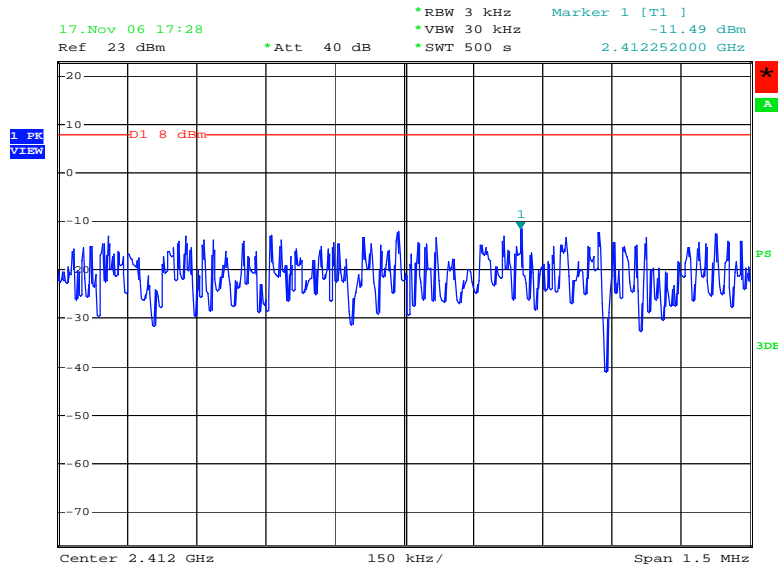
Conclusion:

The EUT meets the requirements of this section.

Please refer to the graph as below:

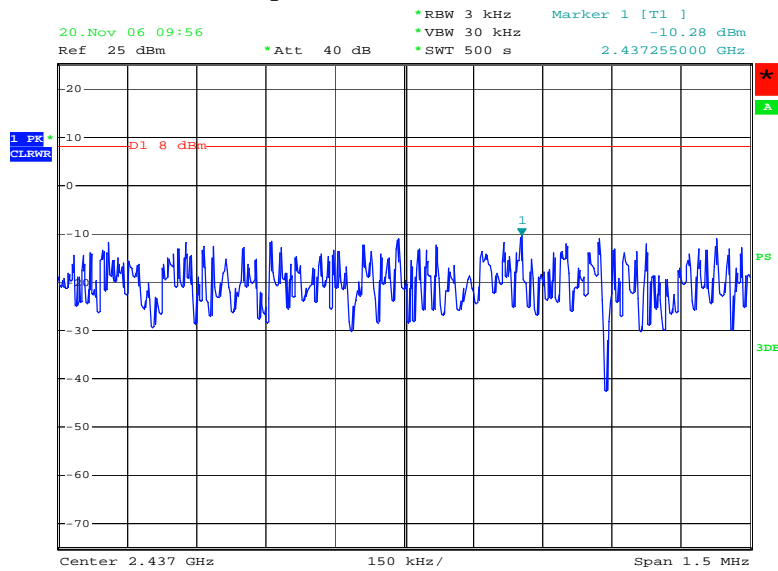


1. For EUT communicating with CCK Mode. Channel – 1



N
Date: 17.NOV.2006 17:28:28

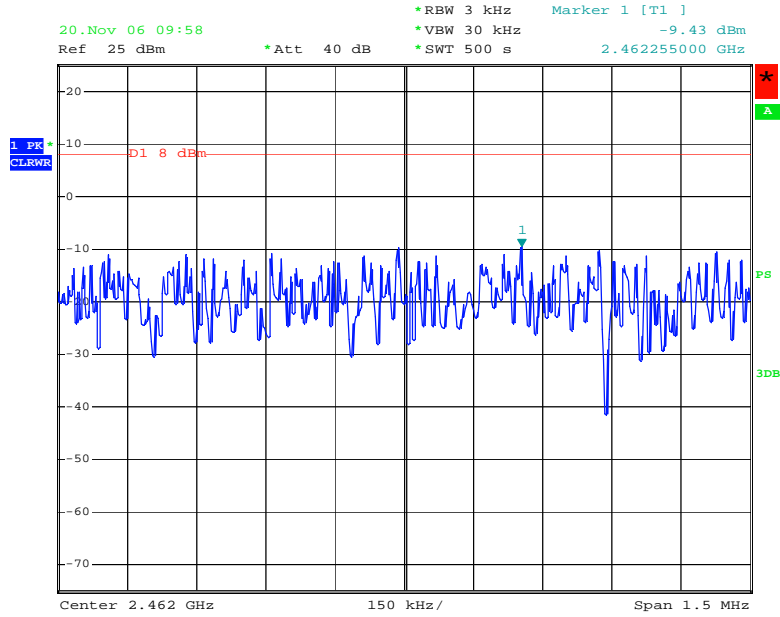
2. For EUT communicating with CCK Mode. Channel – 6



N
Date: 20.NOV.2006 09:56:49



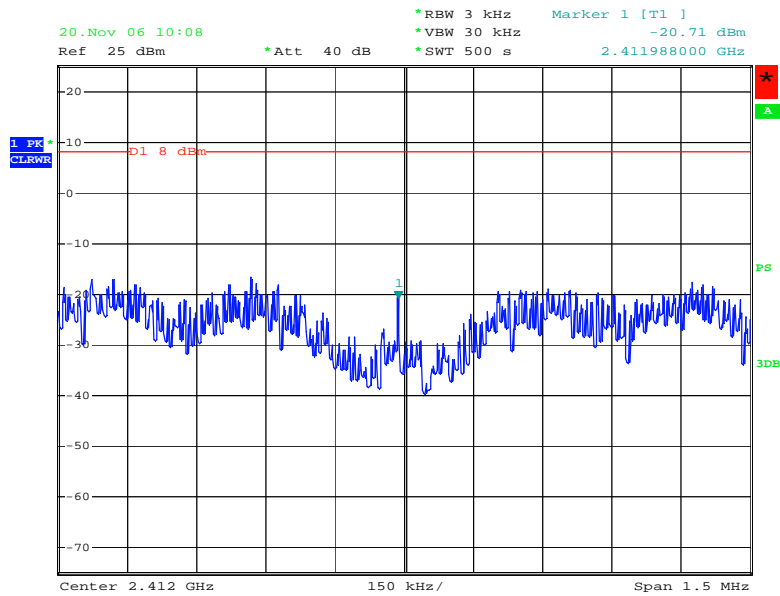
3. For EUT communicating with CCK Mode. Channel – 11



N

Date: 20.NOV.2006 09:58:58

1. For EUT communicating with OFDM Mode. Channel – 1

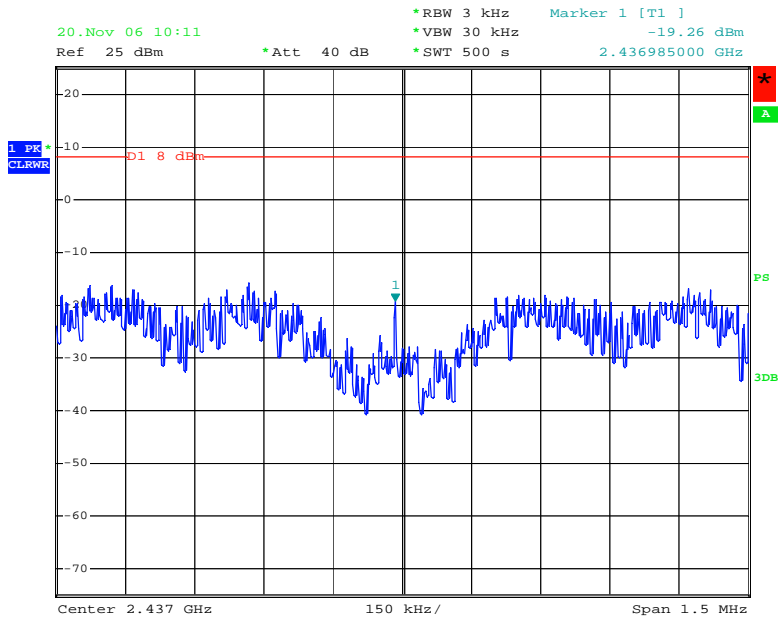


N

Date: 20.NOV.2006 10:08:37

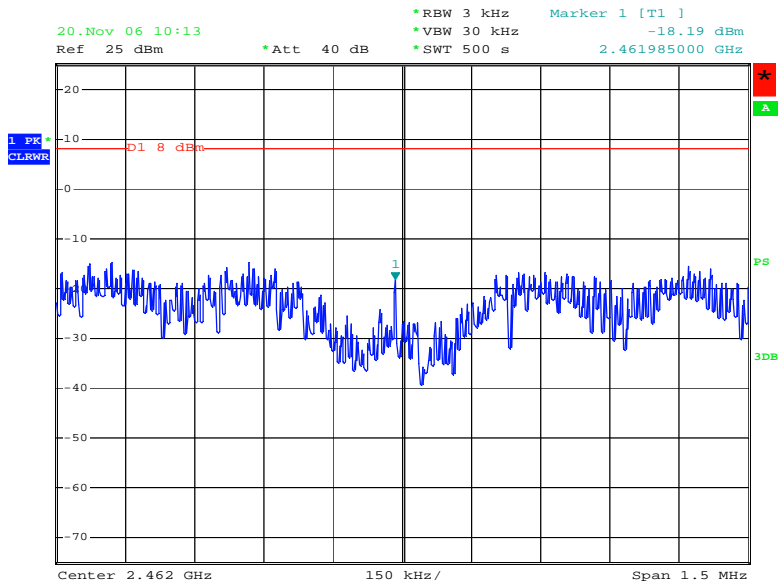


2. For EUT communicating with OFDM Mode. Channel – 6



N
Date: 20.NOV.2006 10:11:17

3. For EUT communicating with OFDM Mode. Channel – 11



N
Date: 20.NOV.2006 10:13:55



5.3.7 Antenna Requirement

STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247(b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.