

FCC TEST REPORT

for

Wireless Network Adapter

Model No. : WL0118

FCC ID : VOEWL0118

Operating Frequency : 2400-2483.5 MHz

Applicant : ZIONCOM (HONGKONG) TECHNOLOGY LIMITED
Lantian Science and Technology Park, Xinyu Road, Xi street,
Baoan District, Shenzhen, China.

Regulation : ***FCC Part 15.247 Subpart C***

Prepared by : AOV Testing Technology Co., Ltd
AOV Building, Xueyuan Road East, University City, Shenzhen
(Tanglang Village, Xili Town, Nanshan District), China

Test Date : September 5 to October 14, 2008

Date of Report : October 15, 2008

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TEST REPORT DECLARATION

Applicant : ZIONCOM (HONGKONG) TECHNOLOGY LIMITED
Manufacturer : ZIONCOM (HONGKONG) TECHNOLOGY LIMITED
EUT Description : Wireless Network Adapter

Test Procedure Used:
FCC Part 15.247 Subpart C

The E. U. T. listed below has been completed RFI testing by Shenzhen AOV Testing Technology Co., Ltd at the test site of Bontek Compliance Testing Laboratory Ltd. And the Interference emissions can pass **FCC CLASS B** limitations.

The test configurations and the facility comply with the radiated and AC line conducted test site criteria in **ANSI C63.4-2003**.

Date of Test: September 5 to October 14, 2008

Prepared by:



Project Engineer

Reviewer :



Project Manager

1. GENERAL INFORMATION

1.1 General Information

Applicant : ZIONCOM (HONGKONG) TECHNOLOGY LIMITED
Lantian Science and Technology Park, Xinyu Road, Xi
street, Baoan District, Shenzhen, China.

Manufacturer : ZIONCOM (HONGKONG) TECHNOLOGY LIMITED
Lantian Science and Technology Park, Xinyu Road, Xi
street, Baoan District, Shenzhen, China.

1.2 Test Facility

Test Firm : Bontek Compliance Testing Laboratory Ltd.
Certificated by FCC, Registration No.: 338263
Address : FL.1, Building H-3, Hua Qiao Cheng East Industrial Area
Qiaocheng East Road, Nanshan, Shenzhen, P.R.China
Tel : 86-755-86337020
Fax : 86-755-86337028

1.3 Test Instrument Used

No.	Equipment	Manufacturer	Model No.	S/N	Calibrator date
1.	EMI Test Receiver	R&S	ESPI7	100097	2008-2-22
2.	Single Power Conductor Module	FCC	FCC-LISN-5-50-1-01-CISPR25	07101	2008-2-22
3.	EMI Test Receiver	R&S	ESCI	100687	2008-2-22
4.	EMI Test Receiver	R&S	FSU	BCT-019	2008-2-22
5.	Amplifier	HP	8447D	1937A02492	2008-2-22
6.	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2008-2-22
7.	Horn Antenna	SCHWARZBECK	BBHA9120A	B08000991-0001	2008-2-27
8.	High Field Biconical Antenna	ELECTRO-METRICS	EM-6913	166	2008-2-22
9.	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	811	2008-2-22
10.	Remote Active Vertical Antenna	ELECTRO-METRICS	EM-6892	304	2008-2-22
11.	Teo Line Single Phase Module	SCHWARZBECK	NSLK8128	D-69250	2008-3-31
12.	Positioning Controller	C&C	CC-C-1F	MF7802113	2008-2-22
13.	Triple-Loop Antenna	EVERFINE	LLA-2	607004	2008-2-27
14.	10dB attenuator	SCHWARZBECK	MTAIMP-136	R65.90.0001#06	2008-2-22

1.4 Description of Test System

PC	IBM	R50
Printer	EPSON	9330A
Mouse	DELL	MOC5UO
Card Bus (PCMCIA to MINIPCI)	N.A.	N.A.
Software run when test : QA Test_RT2561	N.A.	N.A.

2. POWERLINE CONDUCTED EMISSION TEST

2.1. Test Standard

15.107

2.2. Limits

Frequency MHz	Limits (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes:

1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

2.3. Test Procedure

The EUT is put on the table that is 0.8m high above the ground and at least away from other Metallic surface 0.4m. The EUT is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohms coupling impedance for the testing equipment; and the peripheral equipment powers form other L.I.S.N. Please refer to the block diagram of the test setup and photographs. Both sides of AC line (Line & Neutral) are checked for maximum conducted interference. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables must be changed according to FCC part 15 B.

2.4. Test Result

PASS

Detailed information, Please refer to the following page.

IEEE 802.11b (11Mbps)**Line:**

Frequency (MHz)	AV Read Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)	QP Read Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)
0.4380	30.00	47	17.00	39.90	57	17.10
0.2175	40.80	53	12.20	52.80	63	10.20
2.1975	32.00	46	14.00	40.10	56	15.90
2.6385	29.20	46	16.80	46.10	56	9.90
18.3250	29.70	50	20.30	40.80	60	19.20
29.4735	28.00	50	22.00	37.00	60	23.00

Neutral:

Frequency (MHz)	AV Read Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)	QP Read Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)
0.2220	41.60	53	11.40	53.40	63	9.60
0.5505	37.70	46	9.30	40.70	56	15.30
2.6430	35.10	46	10.90	38.30	56	17.70
9.1730	28.90	50	21.10	40.10	60	19.90
15.5370	28.20	50	21.80	39.80	60	20.20
30.0000	21.00	50	29.00	30.20	60	29.80

IEEE 802.11g (54Mbps)**Line:**

Frequency (MHz)	AV Read Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)	QP Read Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)
0.2990	34.00	52	18.00	50.80	62	11.20
0.5380	31.00	46	15.00	43.20	56	12.80
2.6385	32.10	46	13.90	46.90	56	9.10
8.1280	29.00	50	21.00	39.60	60	20.40
18.3250	29.60	50	20.40	39.70	60	20.30
27.9635	29.40	50	20.60	37.00	60	23.00

Neutral:

Frequency (MHz)	AV Read Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)	QP Read Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)
0.2445	40.00	52	12.00	54.30	62	7.70
0.5505	37.80	46	8.20	42.40	56	13.60
1.0995	36.40	46	9.60	38.20	56	17.80
2.5305	33.50	46	12.50	44.20	56	11.80
6.2970	27.90	50	22.10	38.80	60	21.20
29.9215	22.70	50	27.30	30.20	60	19.80

3. BANDWIDTH

3.1. Test Standard

15.247(a)

3.2. Limits

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500kHz.

3.3. Test Procedure

Record the response of frequency waveform when the EUT was working by a spectrum analyzer or EMI Receiver.

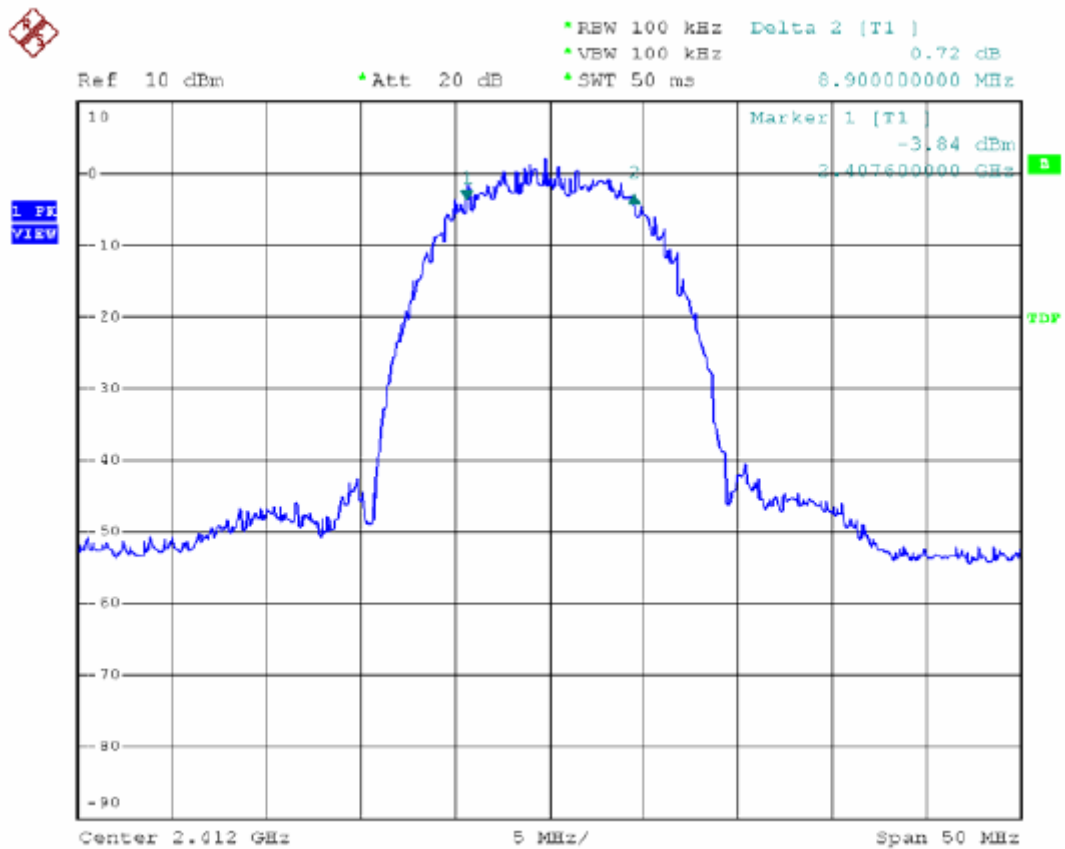
3.4. Test Result

PASS

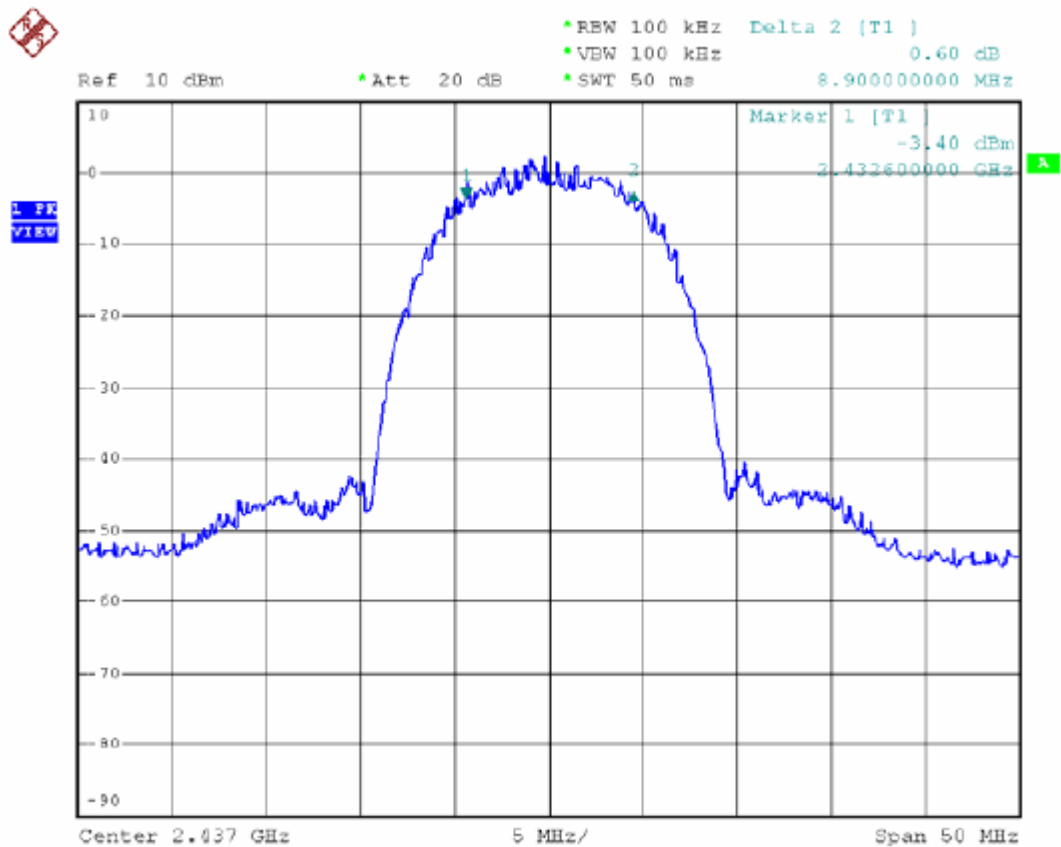
Detailed information, Please refer to the following page.

IEEE 802.11b (11Mbps)

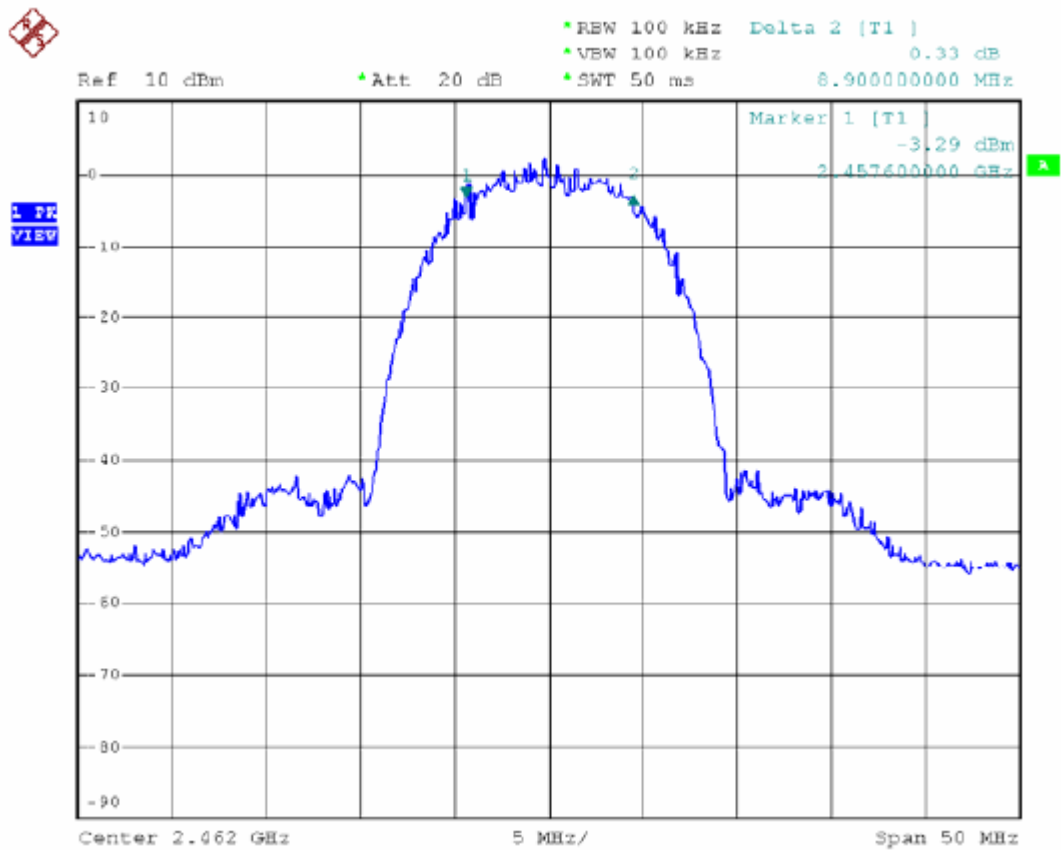
Low Channel: 2.412MHz



Middle Channel: 2.437MHz

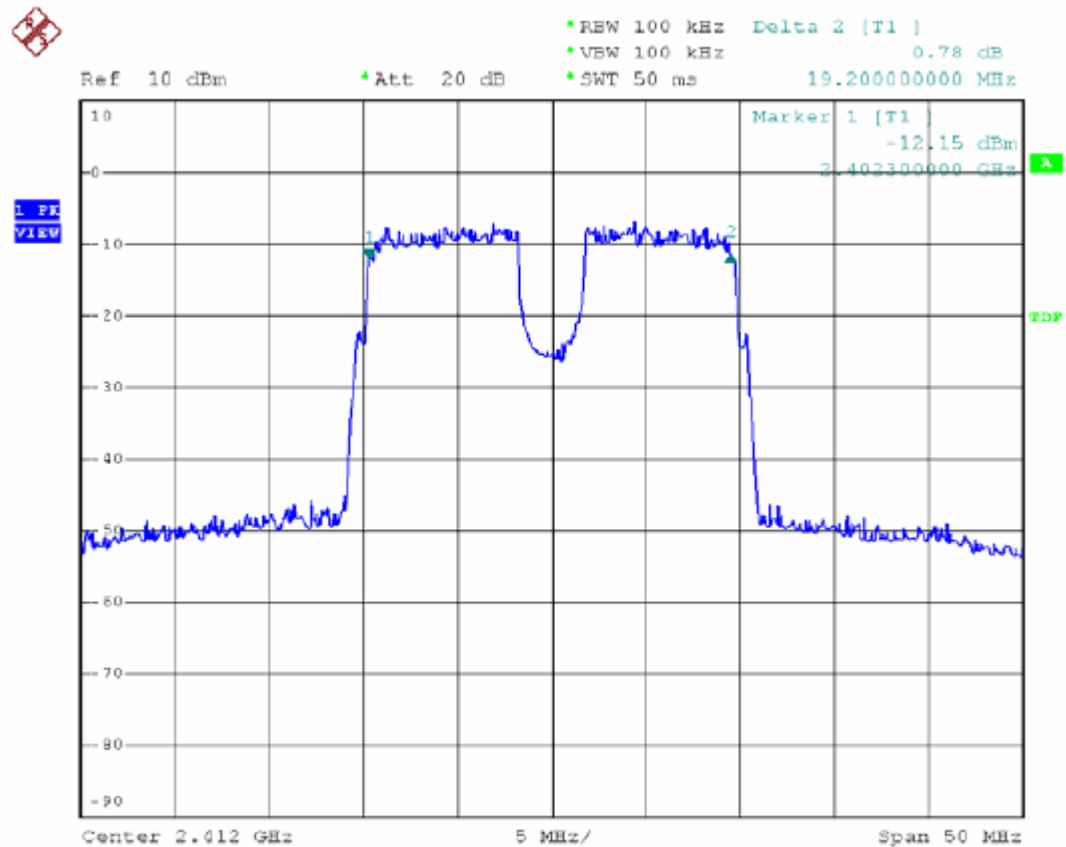


High Channel: 2.462MHz

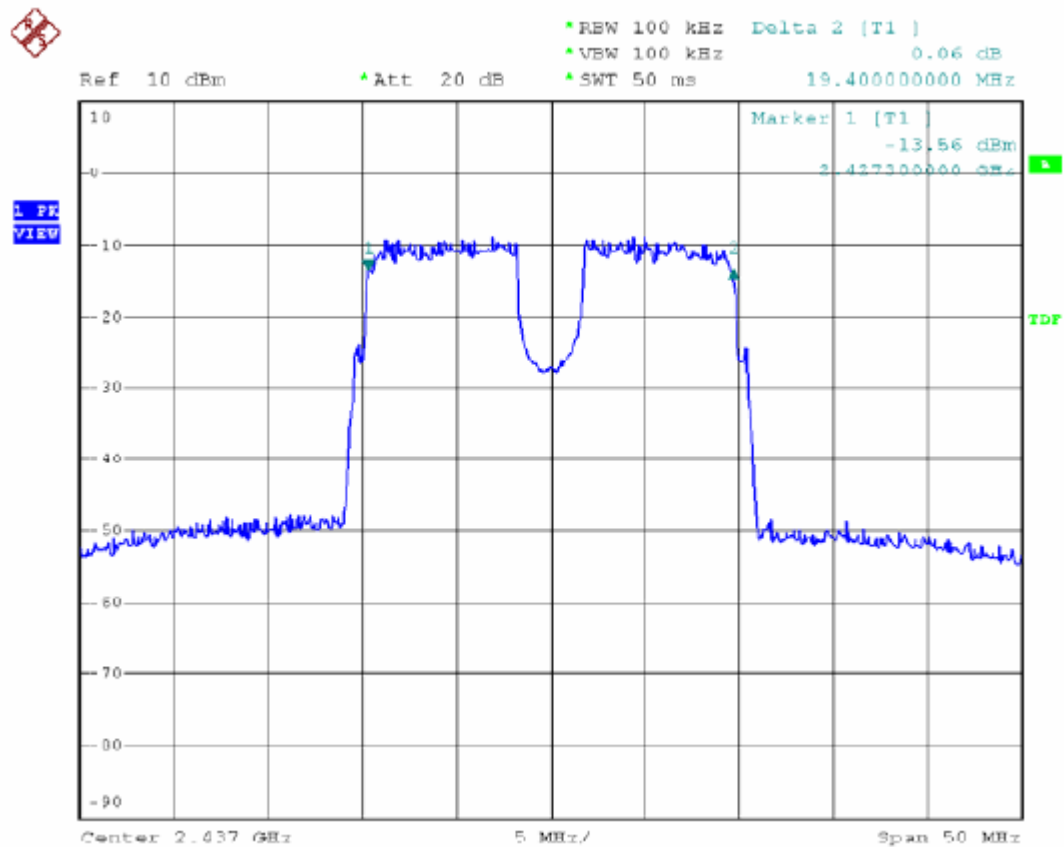


IEEE 802.11g (54Mbps)

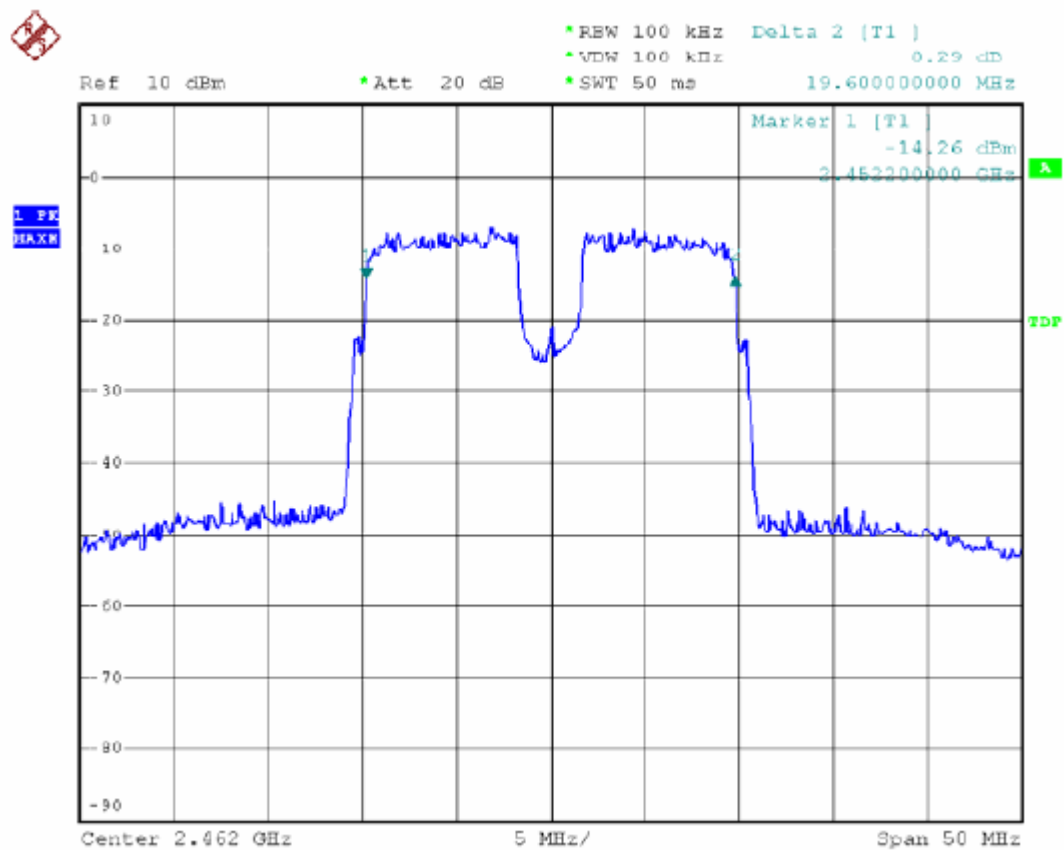
Low Channel: 2.412MHz



Middle Channel: 2.437MHz



High Channel: 2.462MHz



4. MAXIMUM PEAK OUTPUT POWER

4.1.Rules Part No.

15.247(b)

4.2.Limits

The maximum peak output power measurement is 1w (30dBm).

4.3.Test Procedure

The antenna of the EUT was connected to the RF input cord of power meter with a coaxial cable, power was read directly from the meter and cable loss was added to the reading to obtain power at the EUT antenna terminal. The EUT output power was set to maximum to produce the worse case test result.

4.4.Test Result

PASS

IEEE 802.11b (11Mbps)

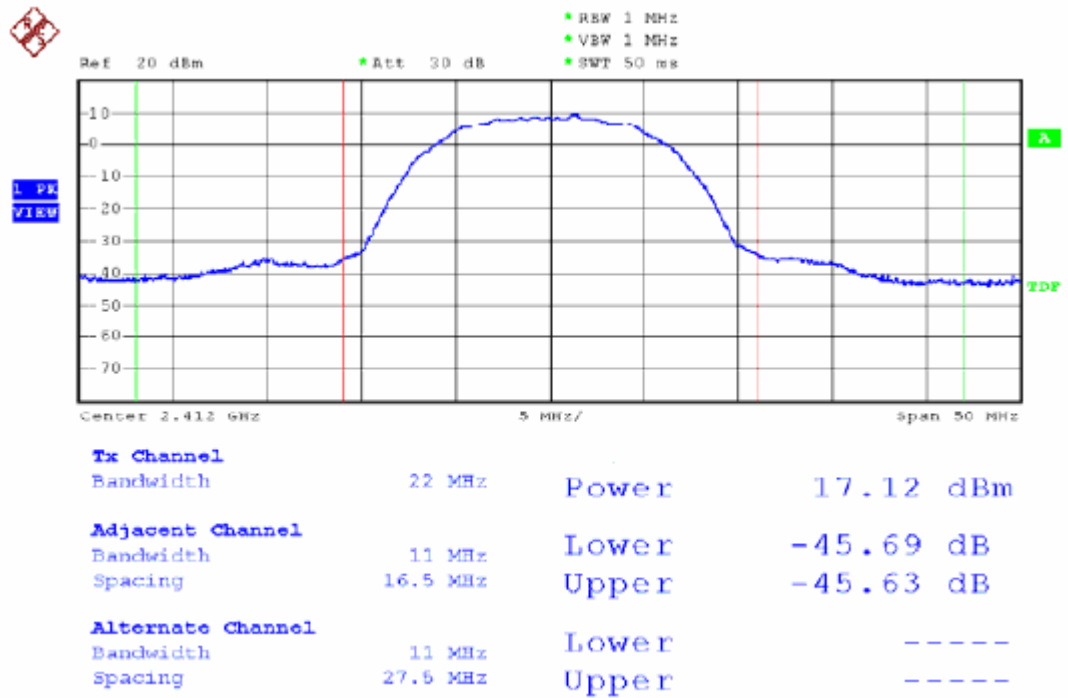
Channel	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
Low	2412	17.12	51.50
Middle	2437	17.19	52.40
High	2462	17.06	50.80

IEEE 802.11g (54Mbps)

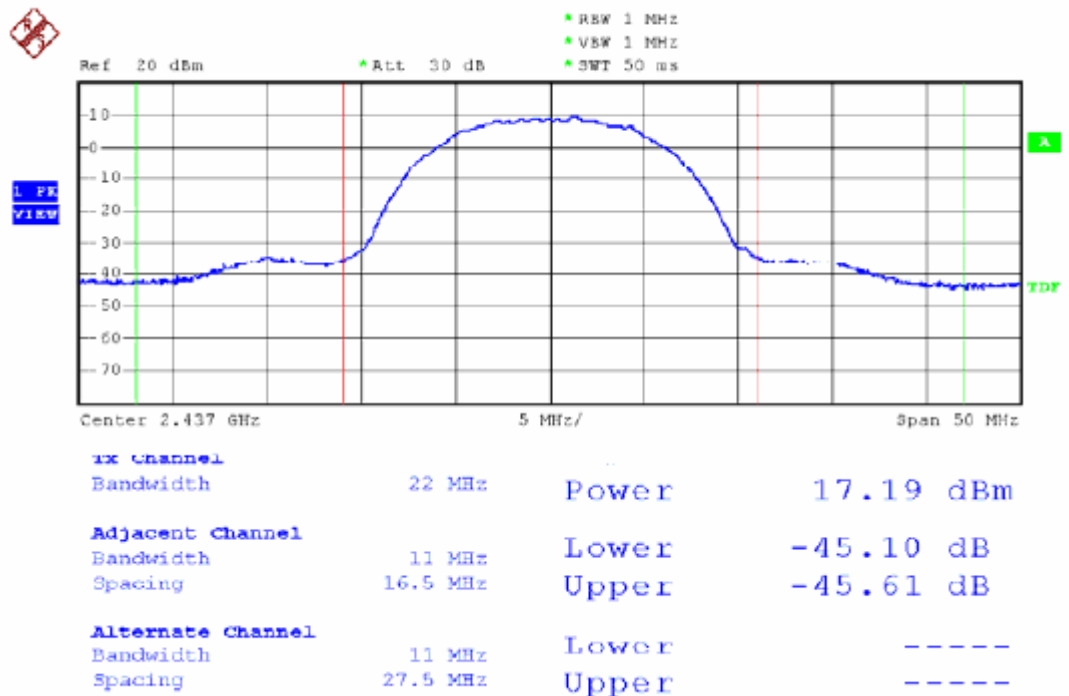
Channel	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
Low	2412	14.20	26.30
Middle	2437	14.49	28.10
High	2462	14.37	27.40

IEEE 802.11b (11Mbps)

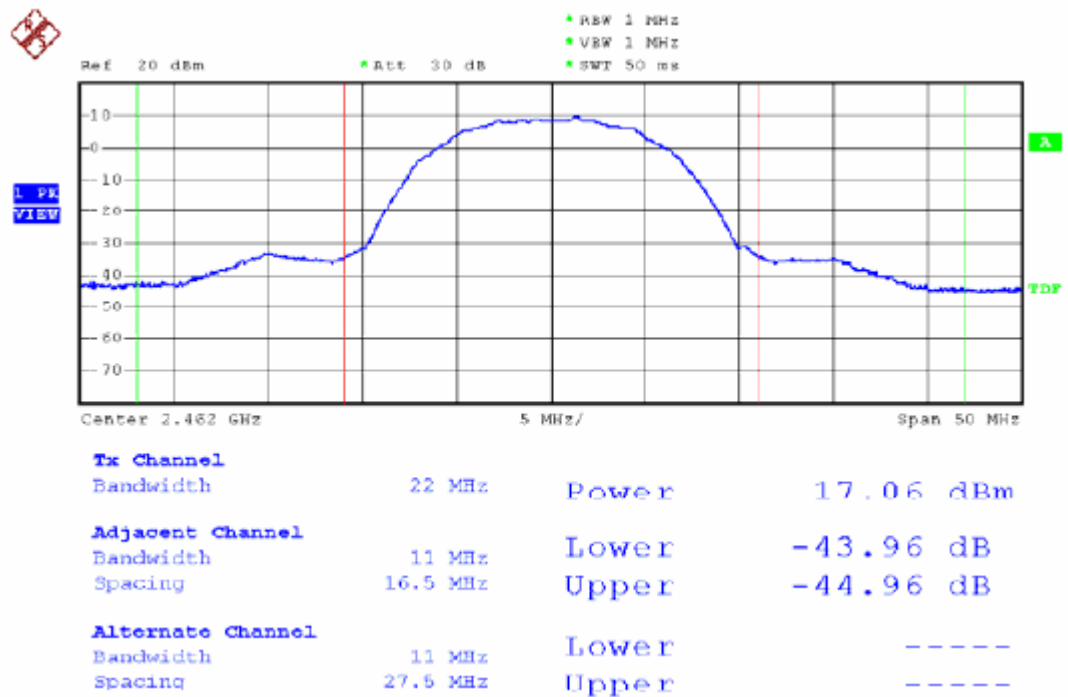
Low Channel:



Middle Channel:

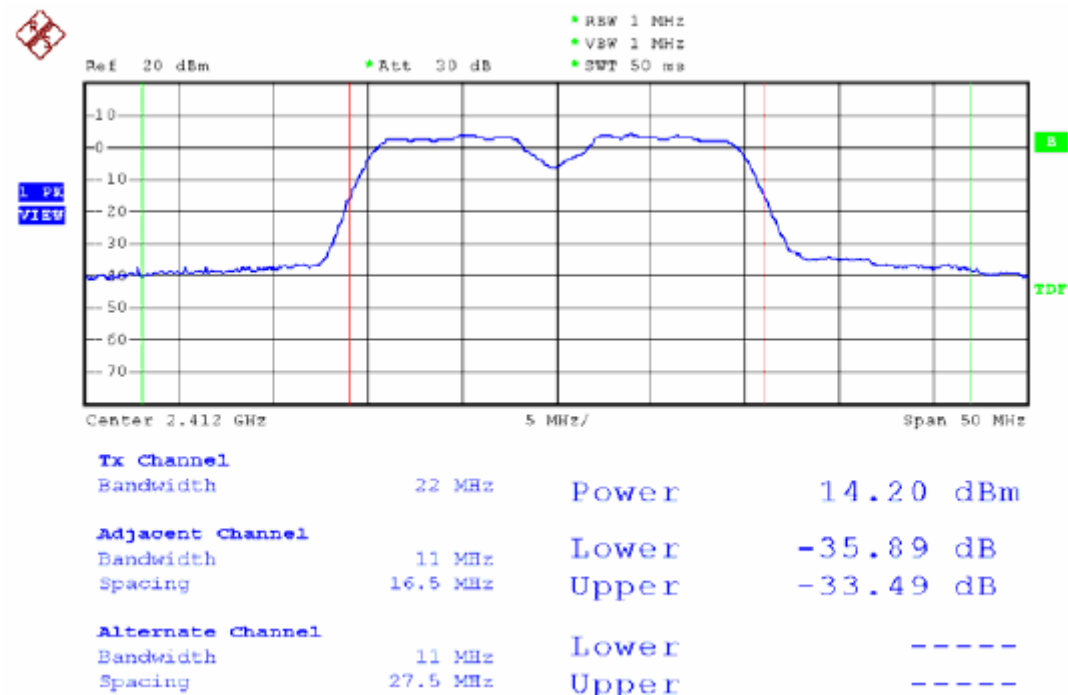


High Channel:

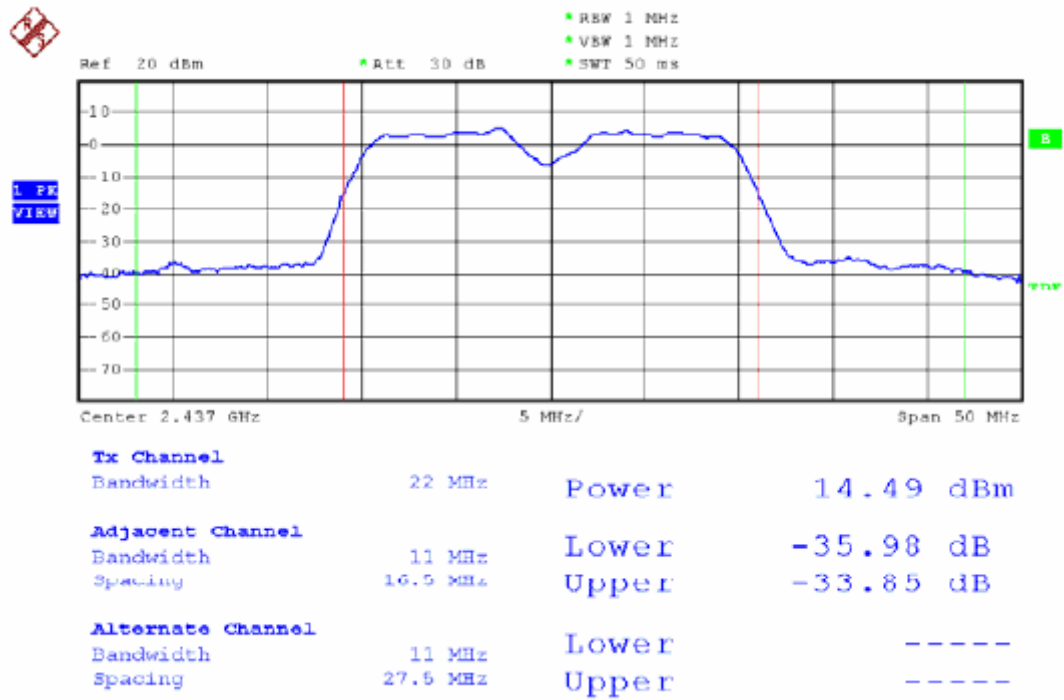


IEEE 802.11g (54Mbps)

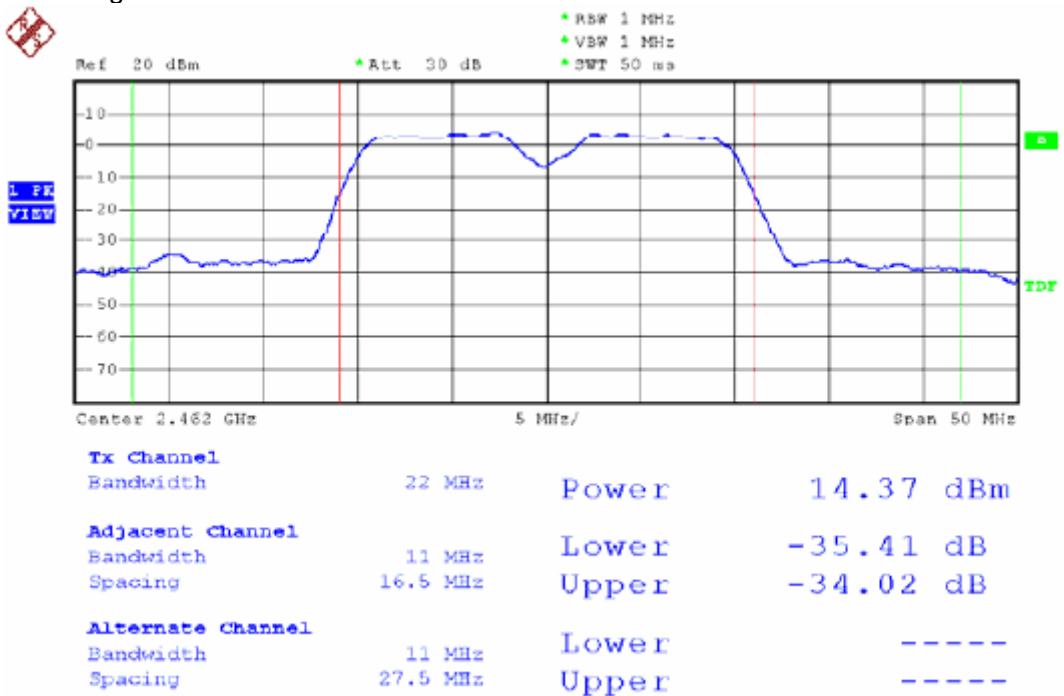
Low Channel:



Middle Channel:



High Channel:



5. 100 KHZ BANDWITH OUTSIDE THE FREQUENCY BAND

5.1.Rules Part No.

15.247(c)

5.2.Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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.

5.3.Test Procedure

The transmitter output was connected to EMI receiver with a low lose cable, the band edge was measured and recorded.

5.4.Test Result

PASS

IEEE 802.11b (11Mbps)

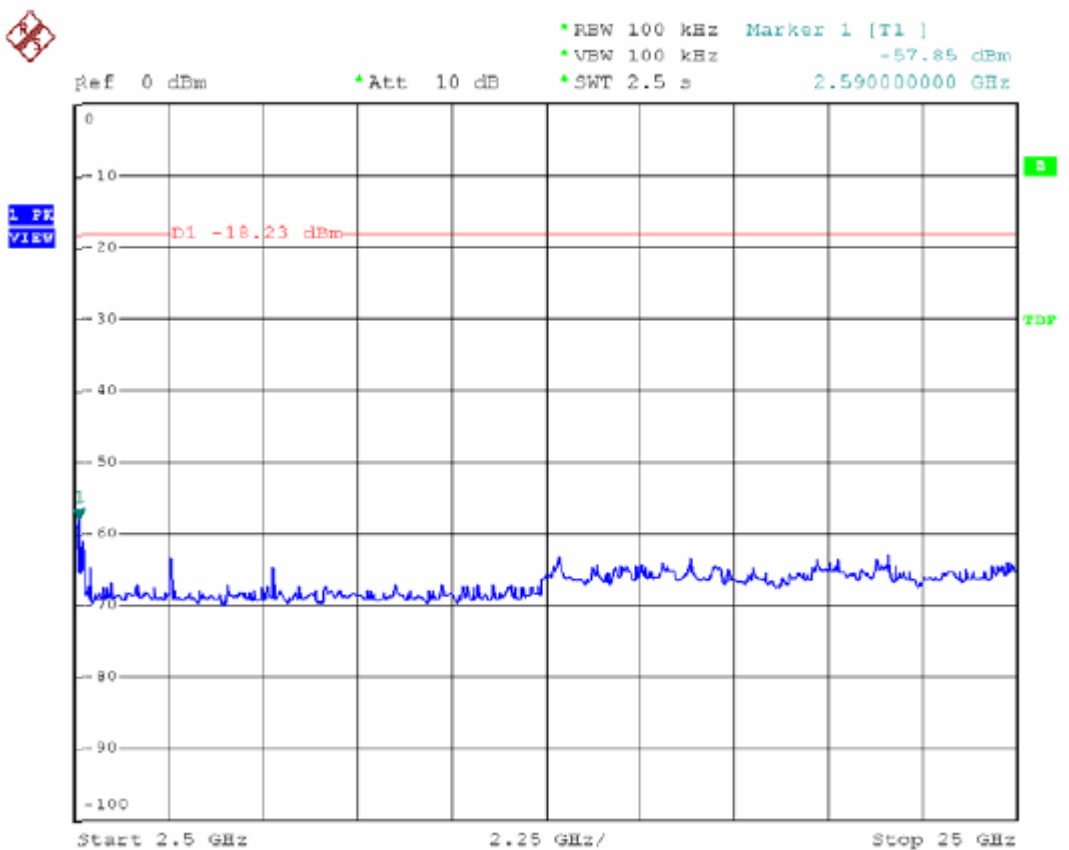
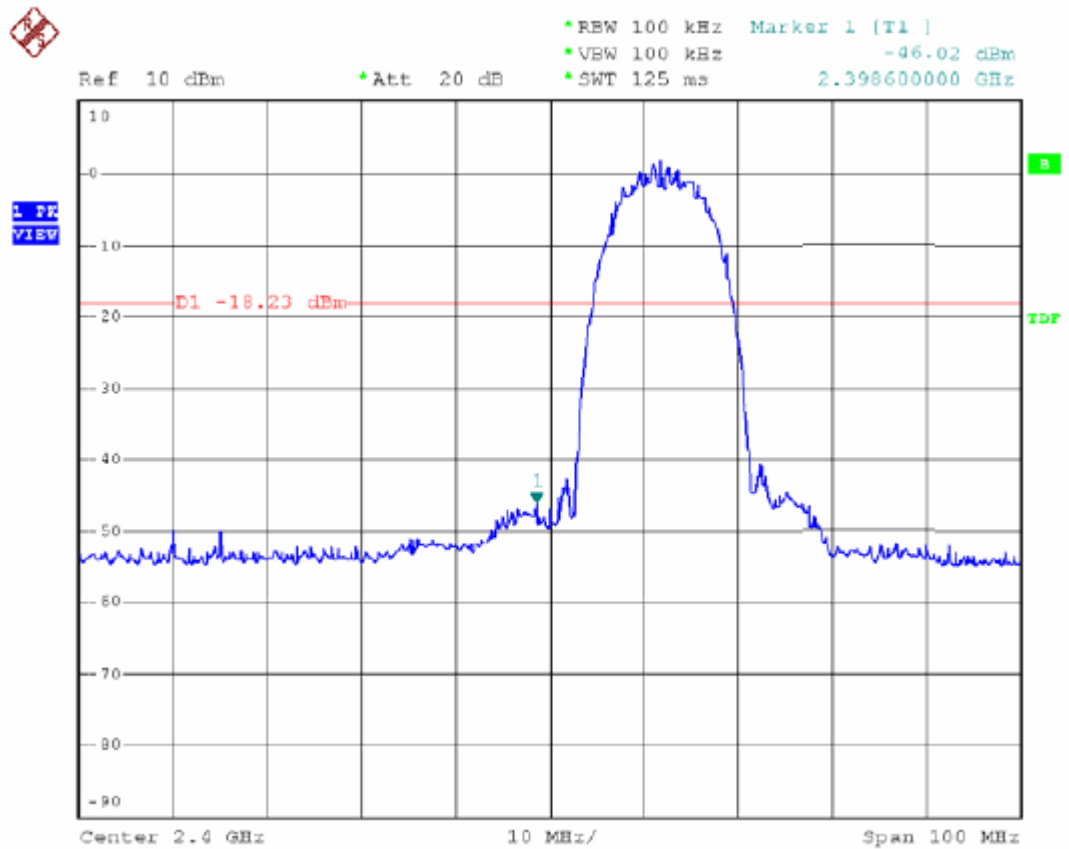
Channel	Frequency (MHz)	Max value in frequency (MHz)	Max value (dBm)
Low	2412	2398	-46.02
High	2462	2487	-52.93

IEEE 802.11g (54Mbps)

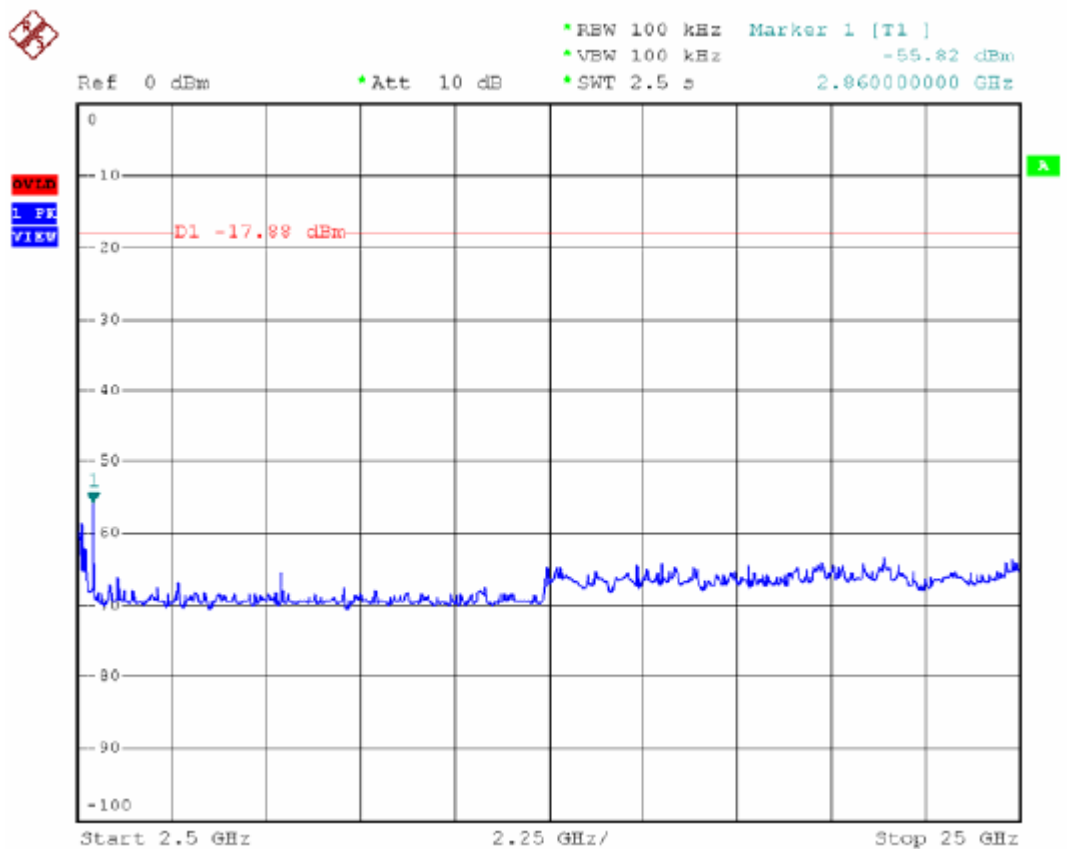
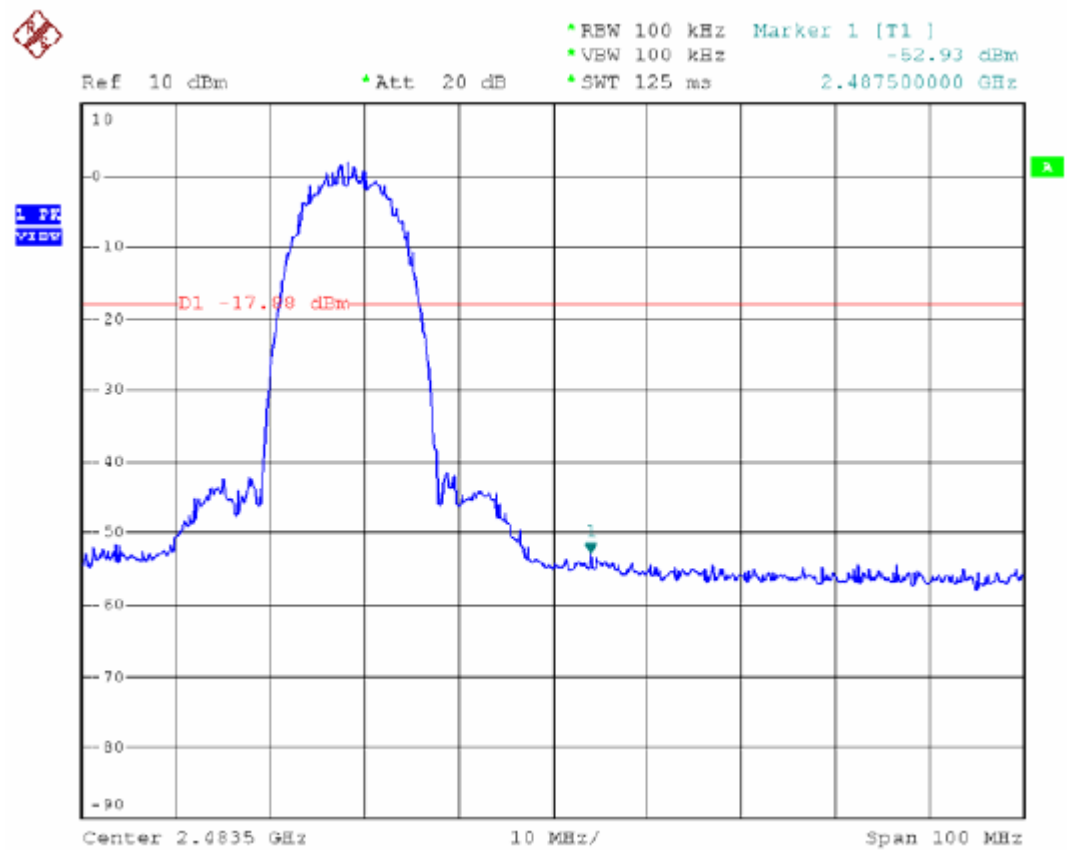
Channel	Frequency (MHz)	Max value in frequency (MHz)	Max value (dBm)
Low	2412	2398	-46.26
High	2462	2484	-50.79

IEEE 802.11b (11Mbps)

Low Channel:

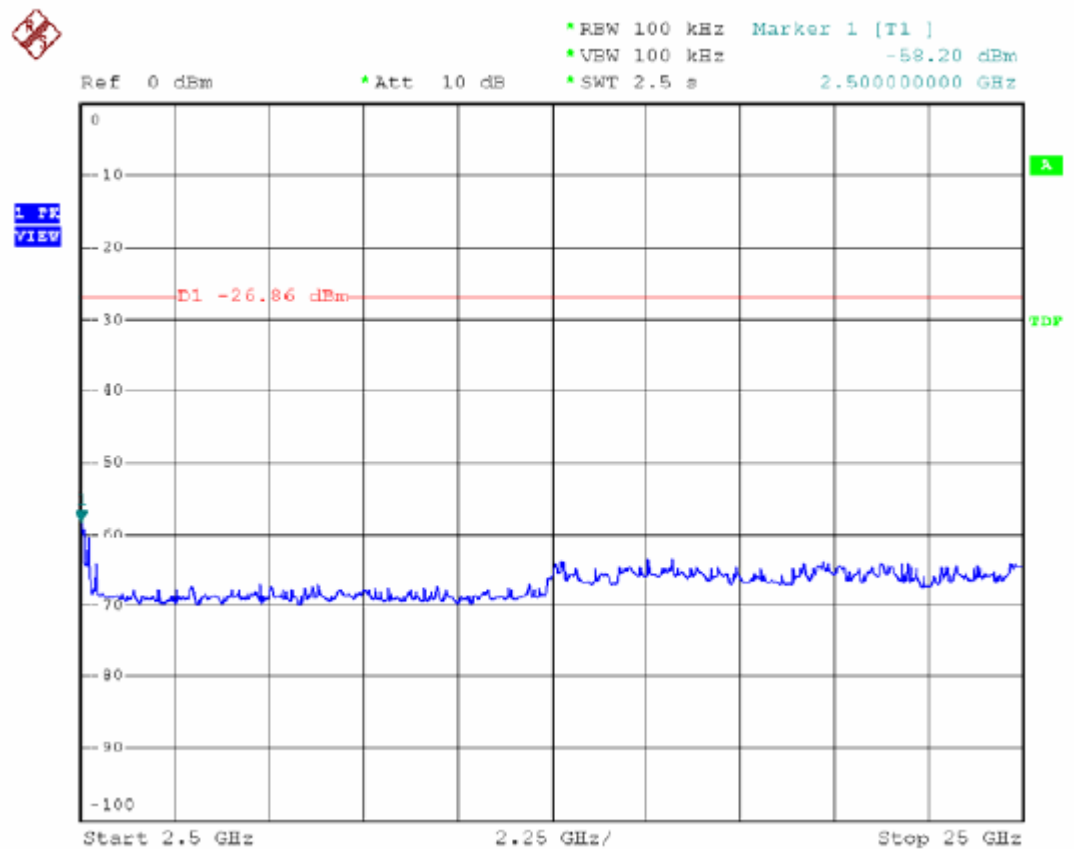
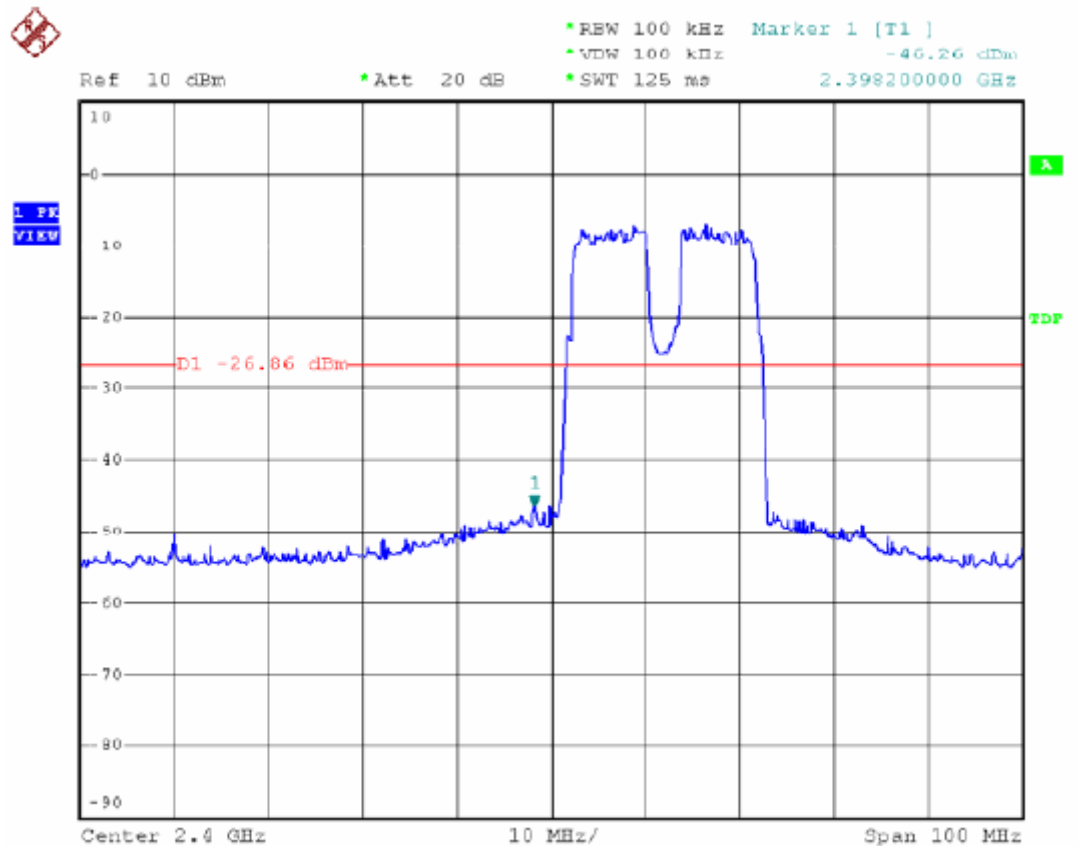


High Channel:

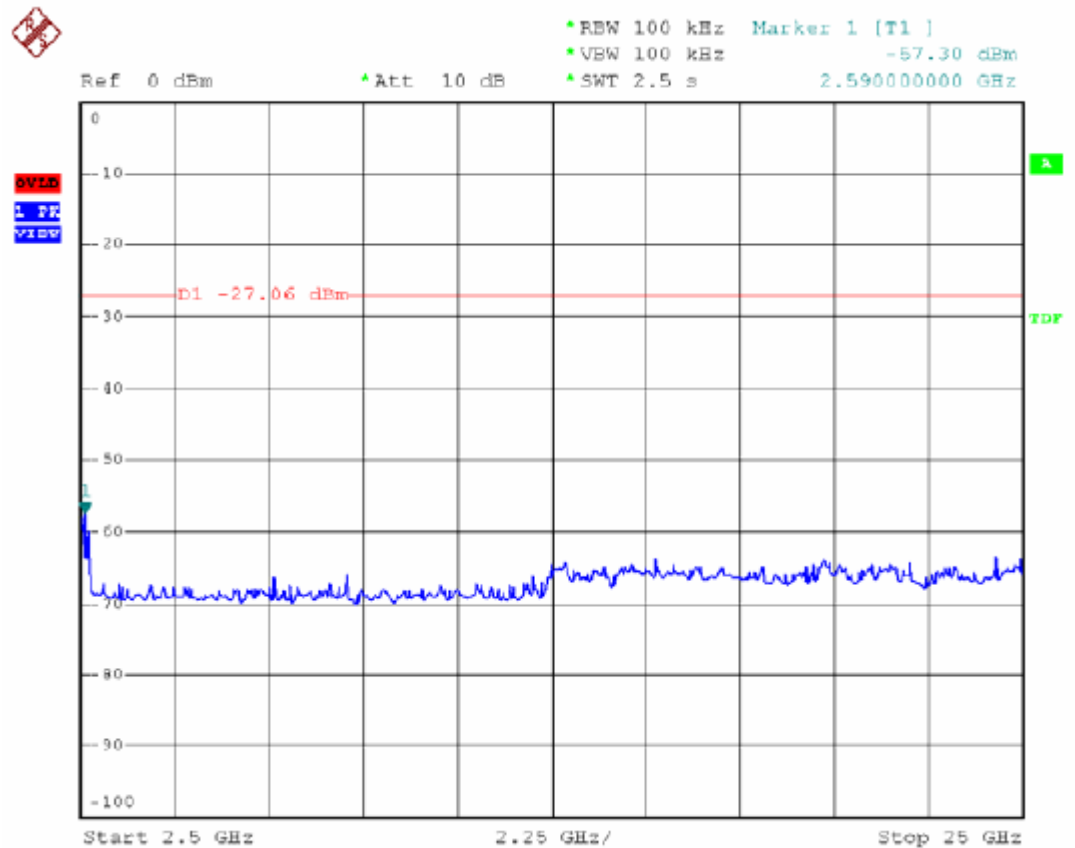
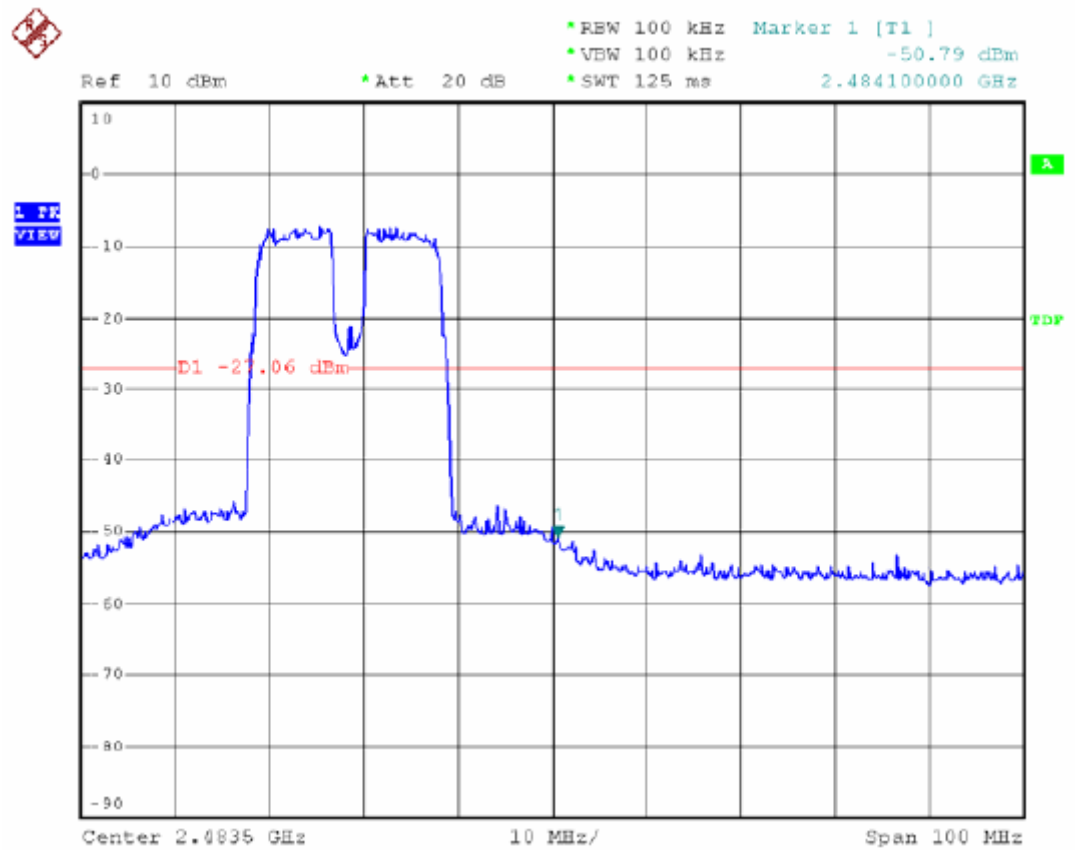


IEEE 802.11g (54Mbps)

Low Channel:



High Channel:



6. POWER SPECTRAL DENSITY

6.1.Rules Part No.

15.247(d)

6.2.Limits

The maximum of power spectral density measurement is 8dBm.

6.3.Test Procedure

The transmitter output was connected to EMI receiver with a low lose cable, the resolution bandwidth was set 3kHz RBW and 30kHz VBW as the fundamental frequency. The power spectral density was measured and recorded.

6.4.Test Result

PASS

IEEE 802.11b (11Mbps)

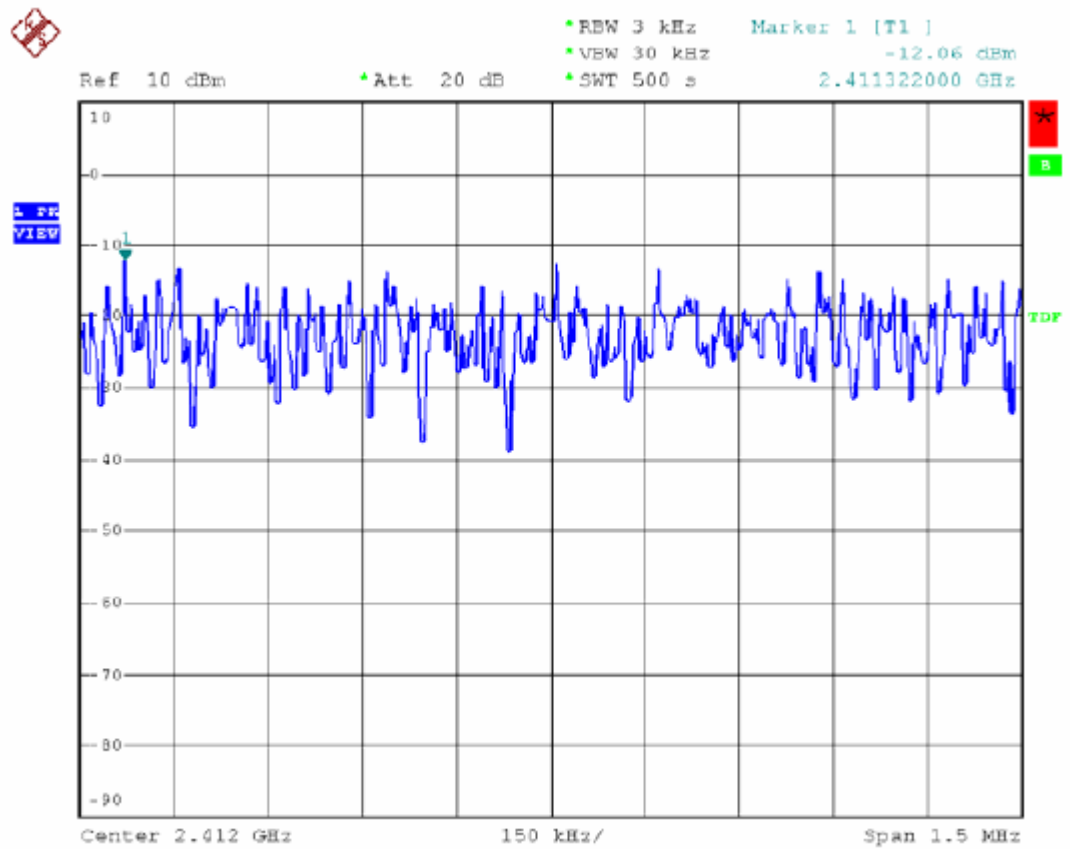
Channel	Frequency (MHz)	Max power density of 3kHz bandwidth (dBm)
Low	2412	-12.06
Middle	2437	-11.67
High	2462	-11.74

IEEE 802.11g (54Mbps)

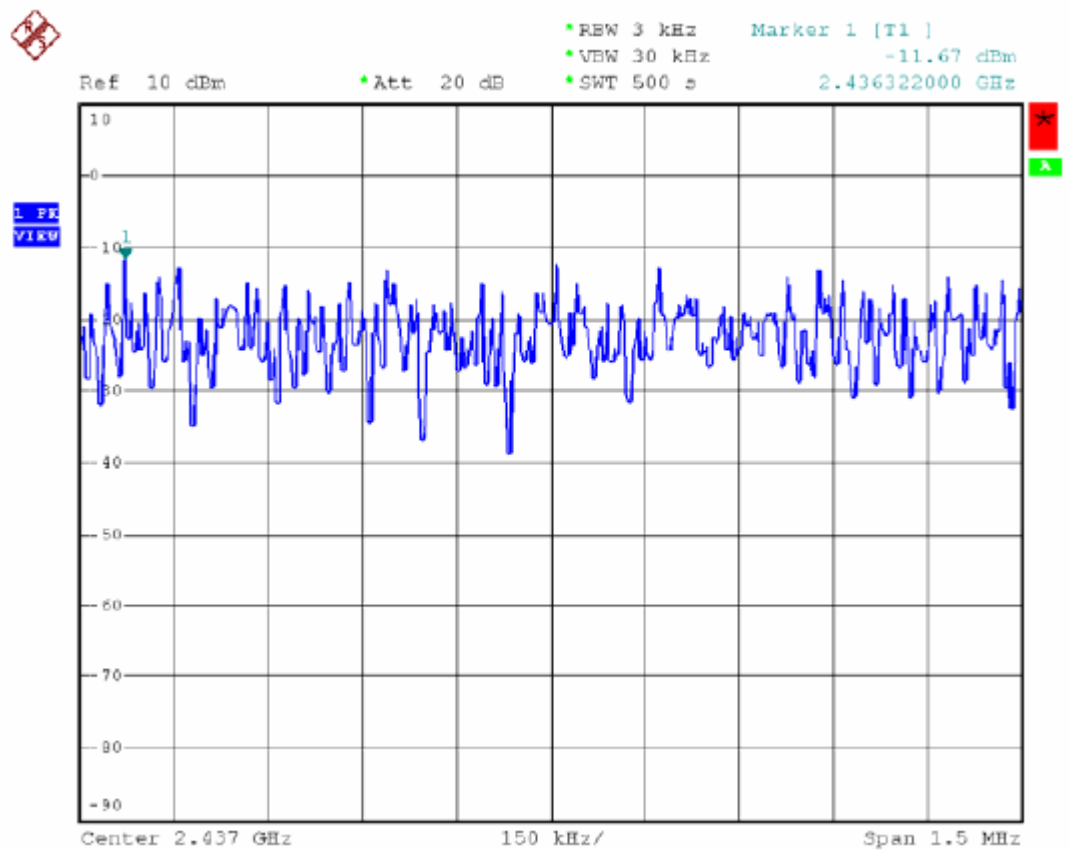
Channel	Frequency (MHz)	Max power density of 3kHz bandwidth (dBm)
Low	2412	-34.52
Middle	2437	-36.09
High	2462	-25.35

IEEE 802.11b (11Mbps)

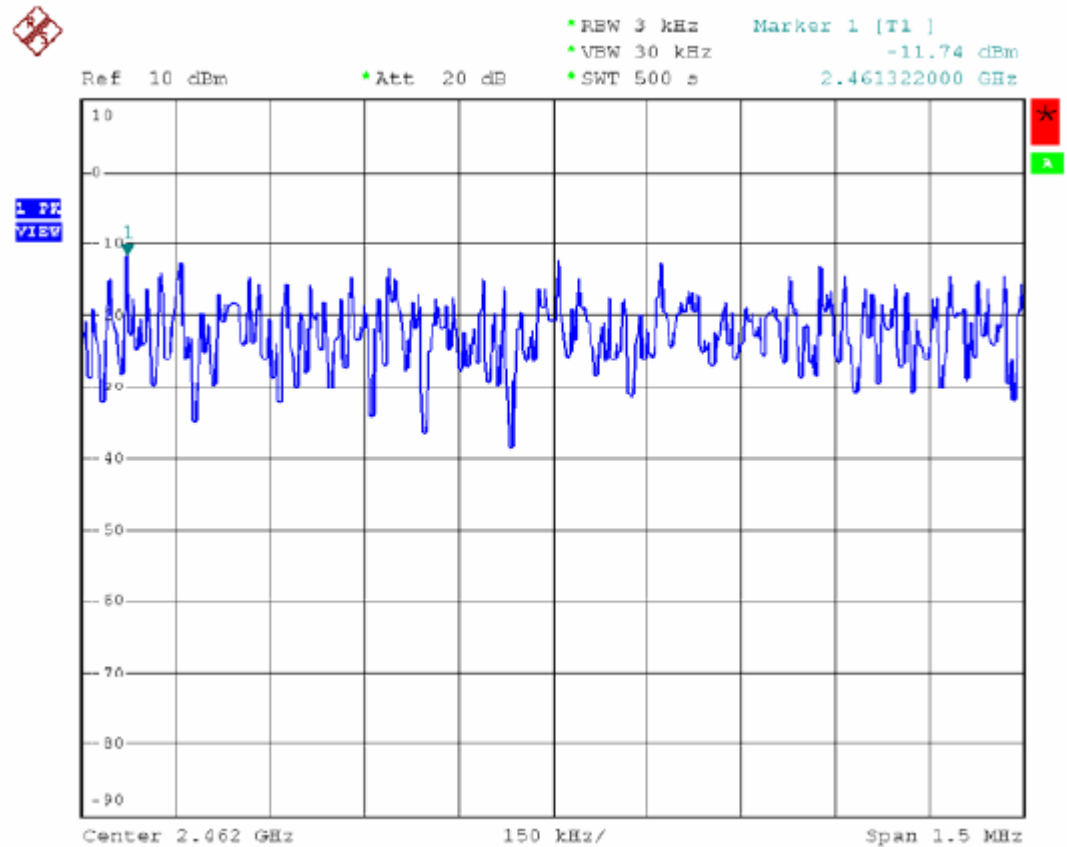
Low Channel:



Middle Channel:

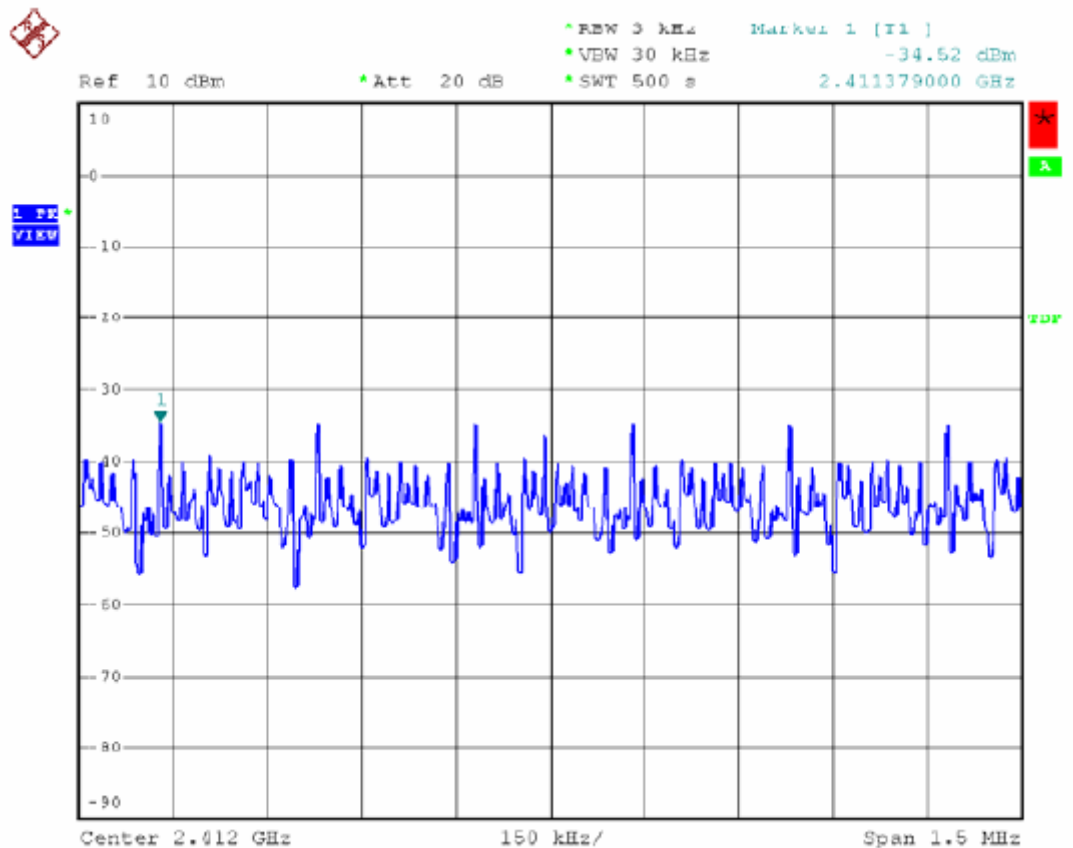


High Channel:

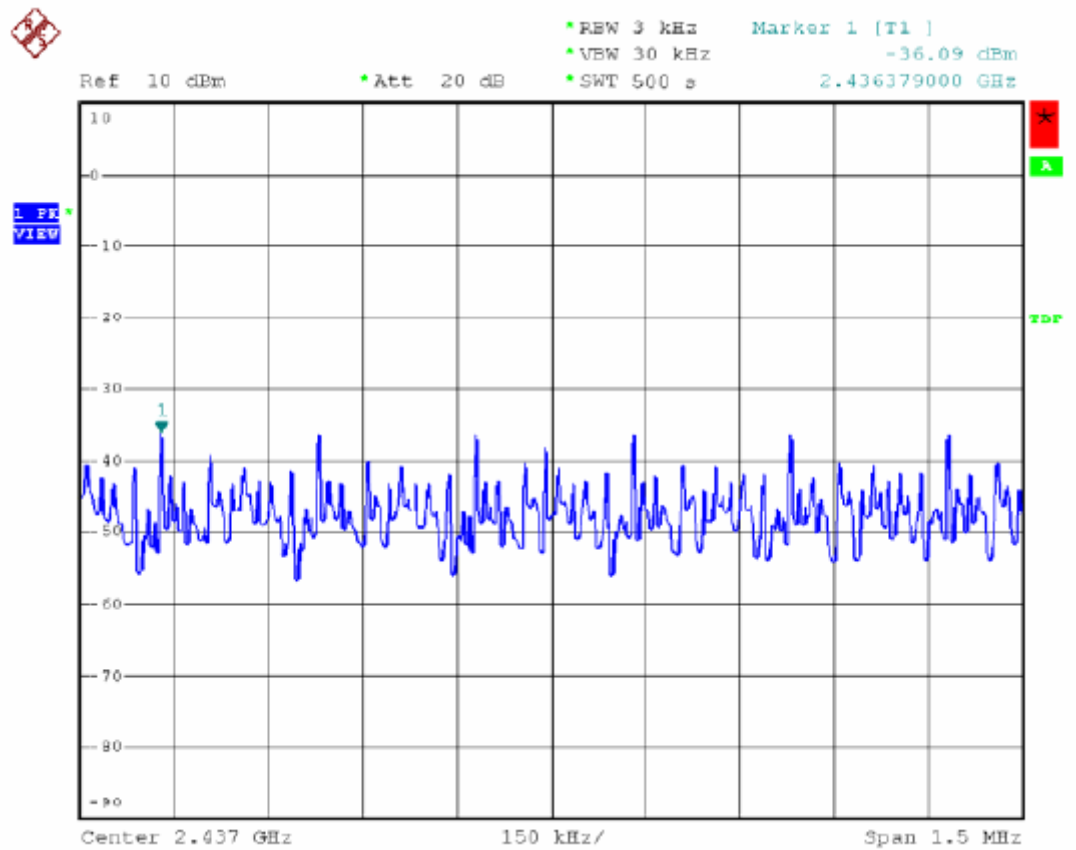


IEEE 802.11g (54Mbps)

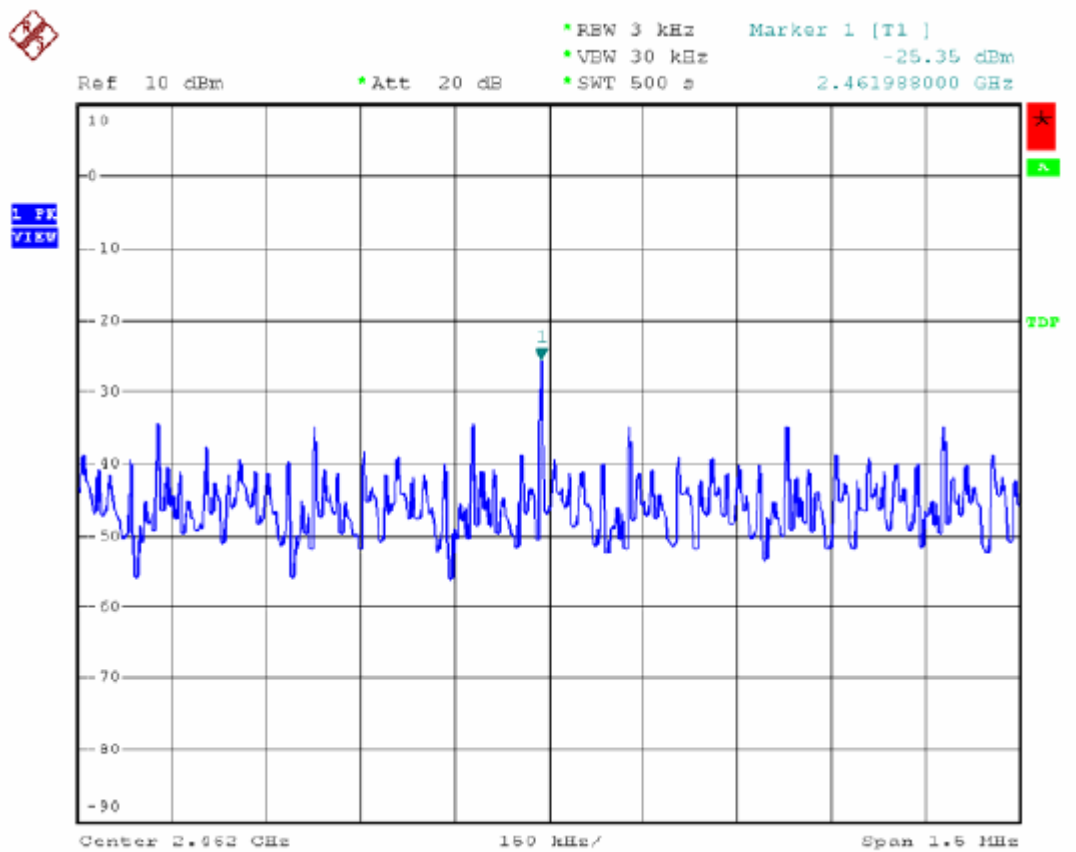
Low Channel:



Middle Channel:



High Channel:



7. RADIATION INTERFERENCE

7.1.Rules Part No.

15.209

7.2.Limits

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency of (MHz)	Emission Field Strength (microvolts/meter)
30 - 88	100 (40)
88 - 216	150 (43.5)
216 - 960	200 (46.0)
Above 960	500 (54.0)

7.3.Test Procedure

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES:

The EUT is placed on a turned table that is 0.8 meter above the ground. The turned table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna that is mounted on the antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (log periodical antenna and horn antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz.

The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

7.4.Test Result

PASS

IEEE 802.11b (11Mbps)**Low Channel: 2412MHz**

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
99.9400	37.8	35.2	43.5	8.3
165.8000	41.7	36.5	43.5	7.0
198.3800	35.3	32.9	43.5	10.6
398.8800	34.7	30.7	46	15.3
499.4800	35.1	32.7	46	13.3
557.2800	34.6	29.9	46	16.1
4823.9600	51.5	38.3	54	15.7(AV)
24120.0000	40.9	37.2	54	16.8(AV)

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
99.9400	39.2	36.0	43.5	7.5
132.8200	40.0	33.7	43.5	9.8
198.7800	37.7	34.8	43.5	8.7
398.1200	38.2	35.9	46	10.1
499.4800	37.9	35.1	46	10.9
623.2400	40.7	38.3	46	7.7
4823.9600	50.3	40.1	54	13.9(AV)
24120.0000	41.3	38.4	54	16.6(AV)

Middle Channel: 2437MHz

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
99.9800	40.0	36.3	43.5	7.2
117.4600	37.6	32.4	43.5	11.1
198.8800	37.9	33.9	43.5	9.6
499.4800	41.2	35.6	46	10.4
623.2400	40.3	35.8	46	10.2
4873.9800	51.7	41.8	54	12.2(AV)
24370.0000	40.3	37.6	54	16.4(AV)

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
99.8400	38.8	35.7	43.5	7.8
132.3800	38.3	33.1	43.5	10.4
198.8800	36.9	33.5	43.5	10.0
499.6600	40.5	37.7	46	8.3
623.2400	41.7	38.2	46	7.8
4873.9800	49.9	37.4	54	16.6(AV)
24370.0000	41.7	40.6	54	13.4(AV)

High Channel: 2462MHz

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
99.8800	38.9	36.3	43.5	7.2
132.3800	34.1	34.1	43.5	9.4
198.8800	40.1	37.4	43.5	6.1
499.6600	38.6	36.9	46	9.1
557.2800	36.6	32.4	46	13.6
4923.9800	48.4	36.6	54	17.4(AV)
24620.0000	39.8	37.8	54	16.2(AV)

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
99.8600	40.3	37.1	43.5	6.4
155.3500	37.5	35.7	43.5	7.8
198.8800	39.6	35.3	43.5	8.2
499.4800	40.6	38.2	46	7.8
623.4400	39.0	36.6	46	9.4
4923.9800	51.9	40.7	54	13.3(AV)
24620.0000	40.5	37.0	54	17.0(AV)

IEEE 802.11g (54Mbps)**Low Channel: 2412MHz**

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
100.0200	40.6	37.4	43.5	6.1
132.8800	39.6	35.0	43.5	8.5
199.9800	39.7	37.5	43.5	6.0
499.8800	38.2	37.1	46	8.9
4824.0000	40.2	36.2	54	17.8(AV)
24120.0000	37.4	36.0	54	18.0(AV)

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
99.8800	38.7	35.3	43.5	8.2
155.0500	37.3	34.7	43.5	8.8
199.8800	39.8	35.9	43.5	7.6
499.8800	40.9	37.6	46	8.4
4823.9800	39.7	37.0	54	17.0(AV)
24120.0000	40.3	35.5	54	18.5(AV)

Middle Channel: 2437MHz

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
100.0000	39.7	36.9	43.5	6.6
165.3800	32.4	30.1	43.5	13.4
199.6600	38.5	37.3	43.5	6.2
499.6800	42.3	37.8	46	8.2
4873.9800	39.6	37.7	54	16.3(AV)
24370.0000	40.5	36.9	54	17.1(AV)

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
99.8800	40.02	37.2	43.5	6.3
132.3800	38.9	35.4	43.5	8.1
199.8800	39.4	36.7	43.5	6.8
499.8800	39.7	38.1	46	7.9
4874.0000	43.5	37.2	54	16.8(AV)
24370.0000	40.0	35.9	54	18.1(AV)

High Channel: 2462MHz

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
99.8800	39.9	35.8	43.5	7.7
132.8800	37.3	34.9	43.5	8.6
199.9800	40.2	37.5	43.5	6.0
499.9800	41.7	39.2	46	6.8
4924.0000	39.9	37.0	54	17.0(AV)
24620.0000	40.2	36.7	54	17.3(AV)

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
99.8800	38.3	36.4	43.5	7.1
132.0200	40.0	37.3	43.5	6.2
1999.8800	37.6	36.8	43.5	6.7
500.0200	40.9	37.7	46	8.3
4923.9800	40.6	36.1	54	17.9(AV)
24620.0000	40.2	36.6	54	17.4(AV)

8. RESTRICTED BANDS OF OPERATION

Section 15.205:

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
¹ 0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
2. 17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
2. 20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 –	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.52525	2655 – 2900	22.01 – 23.12
8.41425 – 8.41475	156.7 – 156.9	3260 – 3267	23.6 – 24.0
12.29 – 12.293	162.0125 – 167.17	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	167.72 – 173.2	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	240 – 285	3600 – 4400	(²)
13.36 – 13.41	322 – 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

9. PHOTOGRAPH OF TEST

9.1.Photo of Power Line Conducted Emission Test



9.2.Photo of Radiated Emission Test



