CFR 47 FCC Part 15.247

TEST REPORT

Product： **Industrial 802.11a/b/g AP/Client**

Trade Name： MOXA

Model Number： AWK-4121

FCC ID： SLE-AWK-4121

Prepared for

MOXA Inc.

Fl.4, No.135, Lane 235, Pao-Chiao Rd., Shing Tien City, Taipei, R.O.C.

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Prepared by

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Remark：

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The test results in the report only to the tested sample.

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Statement of Compliance

Applicant: MOXA Inc.

Manufacturer: MOXA Inc.

Product: Industrial 802.11a/b/g AP/Client

Model No.: AWK-4121

Tested Power Supply: DC 12~24V

Date of Final Test: Feb. 13, 2009

Configuration of Measurements and Standards Used :

FCC Rules and Regulations Part 15 Subpart C

I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in ANSI C63.4, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relate only to the item tested.

2. The testing report shall not be reproduced expect in full, without the written approval of IETC

Report Issued: 2009/02/16

Project Engineer: Anya Lee Approved: Jerry Liu

1 General Information

1.1 Description of Equipment Under Test

Product : Industrial 802.11a/b/g AP/Client

Model Number : AWK-4121

Applicant : **MOXA Inc.**
Fl.4, No.135, Lane 235, Pao-Chiao Rd., Shing Tien City, Taipei, R.O.C.

Manufacturer : **MOXA Inc.**
Fl.4, No.135, Lane 235, Pao-Chiao Rd., Shing Tien City, Taipei, R.O.C.

Operating Frequency : 2412MHz ~ 2462MHz

Channel Number : Refer to section 1.2

Type of Modulation : DSSS; OFDM

Antenna Description : The product contains 3 sets of antenna. Two sets antenna only support 2.4GHz band the other antenna contain dual band (2.4GHz and 5GHz). Those antenna information as below.

Model No.	Frequency Band	Antenna Type	Antenna Gain	Connector Type
ANT-WDB-ANM-0609	2.4GHz / 5GHz	Dipole	6dBi / 9dBi	N-Male
ANT-WSB-ANM-05 Black	2.4GHz	Dipole	5dBi	N-Male
ANT-WSB-ANM-05 Black 2.4G	2.4GHz	Dipole	5dBi	N-Male

When the device equipped with single band antenna (2.4GHz band only), then the 5GHz band function will be disabled.

Sample Receive date : Dec. 17, 2008

Date of Test : Dec. 17, 2008 ~ Feb. 13, 2009

Additional Description : 1.) The EUT is **Industrial 802.11a/b/g AP/Client**.

2.) The test model is “**AWK-4121**” and included in this report.

3.) For more detail specification about EUT, please refer to the user’s manual.

Product Specifications

WLAN

Standards:
IEEE 802.11a/b/g for Wireless LAN
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP

Modulation:
802.11b: DBPSK, DQPSK, CCK
802.11g: OFDM with BPSK, QPSK, 16QAM, 64QAM
802.11a: OFDM with BPSK, QPSK, 16QAM, 64QAM
OFDM @ 54 Mbps, CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBSK @ 1 Mbps

Operating Channels:
US: 2.412 to 2.462 GHz (11 channels)
5.15 to 5.25 GHz (4 channels)
EU: 2.412 to 2.472 GHz (13 channels)
5.15 to 5.25 GHz (4 channels)
JP: 2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, CCK)
5.15 to 5.25 GHz (4 channels for W52)

Security:
64-bit and 128-bit WEP and WPA/WPA2 (TKIP, AES and IEEE802.1X, EAP-TLS/TTLS/PEAP, EAP-PAP/CHAP/MSCHAP/MSCHAPv2)

Data Rates:
802.11b: 1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps
802.11a/g: 6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps

TX Transmit Power:
802.11b: 1 to 11 Mbps: Typ. 18 dBm (+/- 1.5 dBm)
802.11g: 6 to 24 Mbps: Typ. 18 dBm (+/- 1.5 dBm);
36 to 48 Mbps: Typ. 16 dBm (+/- 1.5 dBm);
54 Mbps: Typ. 15 dBm (+/- 1.5 dBm)
802.11a: 6 to 24 Mbps: Typ. 16 dBm (+/- 1.5 dBm);
36 to 48 Mbps: Typ. 14 dBm (+/- 1.5 dBm);
54 Mbps: Typ. 13dBm (+/- 1.5 dBm)

RX Sensitivity:
802.11b: -92 dBm @ 1 Mbps; -90 dBm @ 2 Mbps;
-88 dBm @ 5.5 Mbps; -84 dBm @ 11 Mbps
802.11g: -87 dBm @ 6 Mbps; -86 dBm @ 9 Mbps;
-85 dBm @ 12 Mbps; -82 dBm @ 18 Mbps;
-80 dBm @ 24 Mbps; -76 dBm @ 36 Mbps;
-72 dBm @ 48 Mbps; -70 dBm @ 54 Mbps
802.11a: -87 dBm @ 6 Mbps; -86 dBm @ 9 Mbps;
-85 dBm @ 12 Mbps; -82 dBm @ 18 Mbps;
-80 dBm @ 24 Mbps; -76 dBm @ 36 Mbps;
-72 dBm @ 48 Mbps; -70 dBm @ 54 Mbps

1.2 Table for Carrier Frequencies

802.11b/ 802.11g

CH No.	1	2	3	4	5	6	7	8	9	10	11
CF (MHz)	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462

1.3 Test Facility

Site Description	:	☒RF Test Room ☒OATS 2
Name of Firm	:	Interocean EMC Technology Corp.
Company web	:	http://www.ietc.com.tw
Site 1, 2 Location	:	No.5-2, Lin 1, Tin-Fu Tsun, Lin-Kou Hsiang, Taipei County, Taiwan, R.O.C.
Site 3, 4 Location	:	No. 12, Ruei-Shu Valley, Ruei-Ping Tsun, Lin-Kou Hsiang, Taipei County, Taiwan, R.O.C.
Site Filing	:	● Federal Communication Commissions – USA Registration No.: 96399 (OATS 1 & 2) Registration No.: 518958 (OATS 3 & 4) Designation No.: TW1020 ● Voluntary Control Council for Interference by Information Technology Equipment (VCCI) – Japan Registration No. (Conducted Room): C-1094 Registration No. (Conducted Room): T-271 Registration No. (OATS 1): R-1040 Registration No. (OATS 2): R-1041 ● Industry Canada (IC) Submission: 113543 ● Japan Electrical Safety & Environment Technology Laboratories (JET) Registration No.: 04S03-01
Site Accreditation	:	● Bureau of Standards and Metrology and Inspection (BSMI) – Taiwan, R.O.C. Accreditation No.: SL2-IN-E-0026 for CNS13438 / CISPR22 SL2-R1-E-0026 for CNS13439 / CISPR13 SL2-R2-E-0026 for CNS13439 / CISPR13 SL2-A1-E-0026 for CNS13783-1 / CISPR14-1 ● TüV NORD Certificate No: TNTW0801R ● Taiwan Accreditation Foundation (TAF) Accreditation No.: 1113

1.4 Test Equipment

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSP30	100002	2009/12/10
Spectrum Analyzer	Agilent	8564EC	4046A00331	2009/04/11
Preamplifier	Agilent	8449B	3008A01434	2009/03/31
Preamplifier	Agilent	83050A	3950A00225	2009/08/10
Preamplifier	SCHAFFNER	CA30100	2	2009/10/20
Horn Antenna	COM-POWER	AH-118	10081	2010/05/12
Horn Antenna	Schwarzbeck	BBHA 9170	213	2010/06/08
Wide Bandwidth Sensor	Anritsu	MA2491A	728133	2009/10/16
Power Meter	Anritsu	ML2495A	736010	2009/10/16
Temp & Humidity chamber	GIAN FORCE	GTH-150-40-2P-U	MAA0305-012	2009/05/14
Signal Generator	Agilent	E8254A	US41140164	2009/05/21
MULTI UE TESTER	JRC	NJZ-2000	ET00184	2009/12/22

Note: The above equipments are within the valid calibration period.

1.5 Summary of Measurement

Report Clause	Test Parameter	Reference Document CFR47 Part15	Results
2	RF Radiated spurious emission test	§15.205, 15.209	Pass
3	RF Conducted spurious emission	§15.247	Pass
4	Maximum Peak output power test	§15.247(b)	Pass
5	Power test of Data Rate	§15.247(b)	Pass
6	6dB Bandwidth	§15.247(a)(2)	Pass
7	Power spectral density	§15.247(e)	Pass
8	Emission on the Band Edge	§15.247(d)	Pass
9	AC Power Line Conducted Emission test	§15.247(b)	Pass

1.6 Justification

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of the frequency band were all arrive limit requirement, thus we evaluate the EUT pass the specified test.

2 RF Radiated spurious emission test

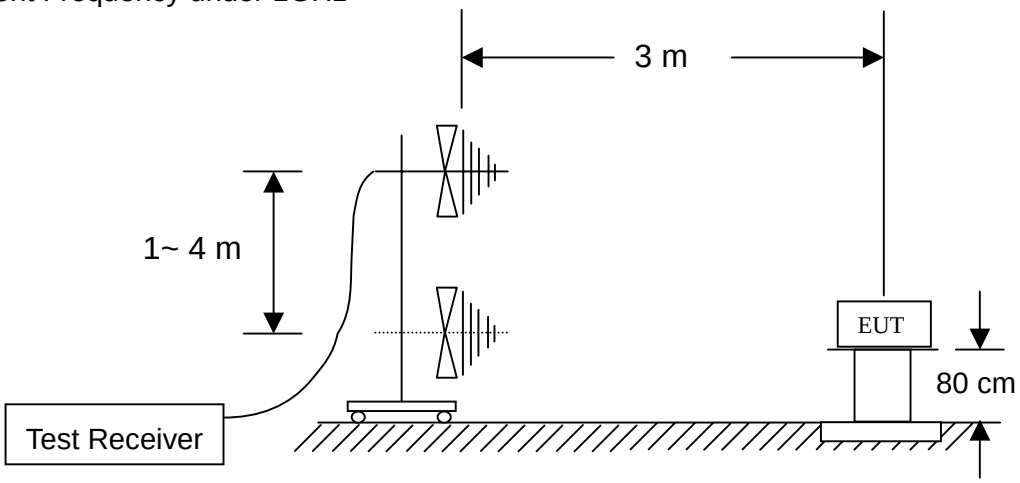
2.1 Limit

For intentional radiator, the radiated emission shall comply with §15.209(a).
For intentional radiators, according to §15.247 (a), operation under this provision is limited to frequency hopping and direct sequence spread spectrum, and the out band emission shall be comply with §15.247 (c)

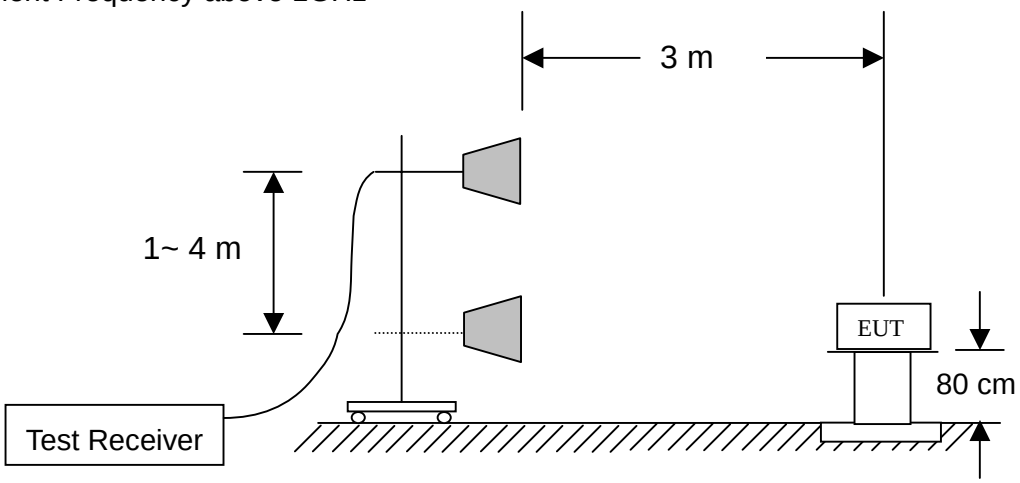
Frequency (MHz)	Field strength dB(μV/m)	Measurement distance (meters)
1.705~30.0	29.5	30
30 ~ 88	40	3
88~216	43.5	3
216~960	46	3
Above 960	54	3

2.2 Configuration of Measurement

Measurement Frequency under 1GHz



Measurement Frequency above 1GHz



2.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.
Radiated emission measurements were performed from 30MHz to 40GHz. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater for frequencies 30MHz to 1GHz, 1MHz for frequencies above 1GHz.
The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meter and down to 1 meter.

2.4 Test Result

PASS.
The final test data is shown on as following pages.

Radiated spurious emission

Test Environment

Ambient temperature ： 26.0℃

Relative humidity ： 53%

Radiated Emission below 1GHz

After verifying 802.11b/g (CH1/CH6/CH11) modes, the worse case was found at 802.11b CH1 mode, the data will present on report.

EUT Equip By ANT-WDB-ANM-0609 Antenna								
Worst case: 802.11b CH1								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
131.996	H	51.41	33.76	15.03	32.68	43.50	-10.82	QP
330.020	H	55.46	32.90	15.52	38.08	46.00	-7.92	QP
560.984	H	51.35	34.19	20.36	37.52	46.00	-8.48	QP
660.008	H	54.93	33.40	21.80	43.33	46.00	-2.67	QP
758.996	H	47.32	32.39	22.69	37.62	46.00	-8.38	QP
164.996	V	59.27	33.50	16.82	42.59	43.50	-0.91	QP
231.000	V	53.04	33.00	18.29	38.33	46.00	-7.67	QP
330.016	V	55.31	32.90	15.52	37.93	46.00	-8.07	QP
660.000	V	56.17	33.40	21.80	44.57	46.00	-1.43	QP
758.996	V	53.04	32.39	22.69	43.34	46.00	-2.66	QP

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
The present spurious only show those points are above noise level and the frequency range test from 30MHz to 1GHz.

EUT Equip By ANT-WSB-ANM-05 BLACK Antenna								
Worst case: 802.11b CH1								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
330.120	H	53.83	32.90	15.52	36.45	46.00	-9.55	QP
560.988	H	50.92	34.19	20.36	37.09	46.00	-8.91	QP
660.000	H	56.07	33.40	21.80	44.47	46.00	-1.53	QP
692.996	H	50.23	33.04	12.22	29.41	46.00	-16.59	QP
758.996	H	50.60	32.39	22.69	40.90	46.00	-5.10	QP
132.012	V	56.74	33.76	15.03	38.01	43.50	-5.49	QP
561.036	V	50.55	34.19	20.36	36.72	46.00	-9.28	QP
660.000	V	57.01	33.40	21.80	45.41	46.00	-0.59	QP
693.016	V	53.41	33.04	22.22	42.59	46.00	-3.41	QP
759.000	V	51.75	32.39	22.69	42.05	46.00	-3.95	QP

EUT Equip By ANT-WSB-ANM-05 Black 2.4G Antenna								
Worst case: 802.11b CH1								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
131.984	H	55.38	33.76	15.03	36.65	43.50	-6.85	QP
561.004	H	52.13	34.19	20.36	38.30	46.00	-7.70	QP
660.004	H	55.64	33.40	21.80	44.04	46.00	-1.96	QP
692.984	H	50.33	33.04	22.22	39.51	46.00	-6.49	QP
758.996	H	50.13	32.39	22.69	40.43	46.00	-5.57	QP
132.004	V	56.67	33.76	15.03	37.94	43.50	-5.56	QP
594.000	V	57.17	33.86	20.88	44.19	46.00	-1.81	QP
659.984	V	56.31	33.40	21.80	44.71	46.00	-1.29	QP
692.984	V	53.38	33.04	22.22	42.56	46.00	-3.44	QP
758.984	V	51.92	32.39	22.69	42.22	46.00	-3.78	QP

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
The present spurious only show those points are above noise level and the frequency range test from 30MHz to 1GHz.

Radiated spurious emission

Radiated Emission above 1GHz

EUT Equip By ANT-WDB-ANM-0609 Antenna

802.11b CH1								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4824	H	50.08	36.50	37.50	51.08	74	-22.92	PK
4824	H	35.32	36.50	37.50	36.32	54	-17.68	AV
*7236	H	42.03	36.69	42.82	48.16	54	-5.84	PK
*9648	H	41.41	37.10	43.42	47.73	54	-6.27	PK
*12060	H	42.94	36.54	46.13	52.53	54	-1.47	PK
*14472	H	51.91	61.11	52.04	42.84	54	-11.16	PK
*16884	H	53.48	60.35	49.31	42.44	54	-11.56	PK
*19296	H	54.31	59.61	43.70	38.40	54	-15.60	PK
*21708	H	55.06	57.48	44.57	42.15	54	-11.85	PK
*24120	H	58.14	53.54	45.80	50.40	54	-3.60	PK
4824	V	57.26	36.50	37.50	58.26	74	-15.74	PK
4824	V	42.22	36.50	37.50	43.22	54	-10.78	AV
*7236	V	43.11	36.69	42.82	49.24	54	-4.76	PK
*9648	V	43.31	37.10	43.42	49.63	54	-4.37	PK
*12060	V	42.17	36.54	46.13	51.76	54	-2.24	PK
*14472	V	52.64	61.11	52.04	43.57	54	-10.43	PK
*16884	V	54.37	60.35	49.31	43.33	54	-10.67	PK
*19296	V	54.99	59.61	43.70	39.08	54	-14.92	PK
*21708	V	55.18	57.48	44.57	42.27	54	-11.73	PK
*24120	V	58.34	53.54	45.80	50.60	54	-3.40	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11b CH6								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4874	H	47.42	36.50	37.59	48.51	74	-25.49	PK
4874	H	33.45	36.50	37.59	34.54	54	-19.46	AV
*7311	H	42.62	36.72	42.96	48.86	54	-5.14	PK
*9748	H	42.50	37.10	43.70	49.10	54	-4.90	PK
*12185	H	42.61	36.41	46.17	52.37	54	-1.63	PK
*14622	H	53.07	60.81	51.51	43.77	54	-10.23	PK
*17059	H	52.44	59.98	50.37	42.83	54	-11.17	PK
*19496	H	54.47	60.06	43.70	38.11	54	-15.89	PK
*21933	H	53.54	57.73	44.44	40.25	54	-13.75	PK
*24370	H	57.67	54.06	45.80	49.41	54	-4.59	PK
4874	V	53.18	36.50	37.59	54.27	74	-19.73	PK
4874	V	39.01	36.50	37.59	40.10	54	-13.90	AV
*7311	V	42.95	36.72	42.96	49.19	54	-4.81	PK
*9748	V	43.46	37.10	43.70	50.06	54	-3.94	PK
*12185	V	43.10	36.41	46.17	52.86	54	-1.14	PK
*14622	V	54.24	60.81	51.51	44.94	54	-9.06	PK
*17059	V	53.29	59.98	50.37	43.68	54	-10.32	PK
*19496	V	55.34	60.06	43.70	38.98	54	-15.02	PK
*21933	V	54.97	57.73	44.44	41.68	54	-12.32	PK
*24370	V	58.67	54.06	45.80	50.41	54	-3.59	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11b CH11								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4924	H	45.96	36.50	37.67	47.13	74	-26.87	PK
4924	H	32.80	36.50	37.67	33.97	54	-20.03	AV
*7386	H	42.94	36.75	43.09	49.28	54	-4.72	PK
*9848	H	43.27	37.10	43.98	50.15	54	-3.85	PK
*12310	H	42.17	36.29	46.23	52.11	54	-1.89	PK
*14772	H	54.75	60.29	50.67	45.13	54	-8.87	PK
*17234	H	53.67	60.13	52.05	45.59	54	-8.41	PK
*19696	H	52.10	59.55	43.54	36.09	54	-17.91	PK
*22158	H	54.14	57.17	44.43	41.40	54	-12.60	PK
*24620	H	56.00	54.15	45.82	47.67	54	-6.33	PK
4924	V	51.92	36.50	37.67	53.09	74	-20.91	PK
4924	V	37.82	36.50	37.67	38.99	54	-15.01	AV
*7386	V	43.54	36.75	43.09	49.88	54	-4.12	PK
*9848	V	44.17	37.10	43.98	51.05	54	-2.95	PK
*12310	V	42.19	36.29	46.23	52.13	54	-1.87	PK
*14772	V	55.11	60.29	50.67	45.49	54	-8.51	PK
*17234	V	54.97	60.13	52.05	46.89	54	-7.11	PK
*19696	V	52.74	59.55	43.54	36.73	54	-17.27	PK
*22158	V	55.37	57.17	44.43	42.63	54	-11.37	PK
*24620	V	56.48	54.15	45.82	48.15	54	-5.85	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11g CH1								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4824	H	48.17	36.50	37.50	49.17	74	-24.83	PK
4824	H	33.87	36.50	37.50	34.87	54	-19.13	AV
*7236	H	42.13	36.69	42.82	48.26	54	-5.74	PK
*9648	H	41.56	37.10	43.42	47.88	54	-6.12	PK
*12060	H	42.79	36.54	46.13	52.38	54	-1.62	PK
*14472	H	51.99	61.11	52.04	42.92	54	-11.08	PK
*16884	H	53.86	60.35	49.31	42.82	54	-11.18	PK
*19296	H	54.38	59.61	43.70	38.47	54	-15.53	PK
*21708	H	55.07	57.48	44.57	42.16	54	-11.84	PK
*24120	H	58.00	53.54	45.80	50.26	54	-3.74	PK
4824	V	56.69	36.50	37.50	57.69	74	-16.31	PK
4824	V	40.71	36.50	37.50	41.71	54	-12.29	AV
*7236	V	43.20	36.69	42.82	49.33	54	-4.67	PK
*9648	V	43.28	37.10	43.42	49.60	54	-4.40	PK
*12060	V	42.13	36.54	46.13	51.72	54	-2.28	PK
*14472	V	52.18	61.11	52.04	43.11	54	-10.89	PK
*16884	V	54.11	60.35	49.31	43.07	54	-10.93	PK
*19296	V	55.17	59.61	43.70	39.26	54	-14.74	PK
*21708	V	55.28	57.48	44.57	42.37	54	-11.63	PK
*24120	V	58.97	53.54	45.80	51.23	54	-2.77	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11g CH6								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4874	H	46.27	36.50	37.59	47.36	74	-26.64	PK
4874	H	32.82	36.50	37.59	33.91	54	-20.09	AV
*7311	H	42.67	36.72	42.96	48.91	54	-5.09	PK
*9748	H	42.68	37.10	43.70	49.28	54	-4.72	PK
*12185	H	42.39	36.41	46.17	52.15	54	-1.85	PK
*14622	H	53.02	60.81	51.51	43.72	54	-10.28	PK
*17059	H	52.16	59.98	50.37	42.55	54	-11.45	PK
*19496	H	54.01	60.06	43.70	37.65	54	-16.35	PK
*21933	H	54.18	57.73	44.44	40.89	54	-13.11	PK
*24370	H	57.64	54.06	45.80	49.38	54	-4.62	PK
4874	V	52.99	36.50	37.59	54.08	74	-19.92	PK
4874	V	37.33	36.50	37.59	38.42	54	-15.58	AV
*7311	V	42.71	36.72	42.96	48.95	54	-5.05	PK
*9748	V	43.49	37.10	43.70	50.09	54	-3.91	PK
*12185	V	43.19	36.41	46.17	52.95	54	-1.05	PK
*14622	V	54.34	60.81	51.51	45.04	54	-8.96	PK
*17059	V	53.47	59.98	50.37	43.86	54	-10.14	PK
*19496	V	55.74	60.06	43.70	39.38	54	-14.62	PK
*21933	V	55.14	57.73	44.44	41.85	54	-12.15	PK
*24370	V	58.67	54.06	45.80	50.41	54	-3.59	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11g CH11								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4924	H	46.16	36.50	37.67	47.33	74	-26.67	PK
4924	H	32.51	36.50	37.67	33.68	54	-20.32	AV
*7386	H	43.04	36.75	43.09	49.38	54	-4.62	PK
*9848	H	43.28	37.10	43.98	50.16	54	-3.84	PK
*12310	H	42.96	36.29	46.23	52.90	54	-1.10	PK
*14772	H	55.15	60.29	50.67	45.53	54	-8.47	PK
*17234	H	53.47	60.13	52.05	45.39	54	-8.61	PK
*19696	H	51.17	59.55	43.54	35.16	54	-18.84	PK
*22158	H	53.57	57.17	44.43	40.83	54	-13.17	PK
*24620	H	56.21	54.15	45.82	47.88	54	-6.12	PK
4924	V	54.36	36.50	37.67	55.53	74	-18.47	PK
4924	V	38.14	36.50	37.67	39.31	54	-14.69	AV
*7386	V	43.51	36.75	43.09	49.85	54	-4.15	PK
*9848	V	44.10	37.10	43.98	50.98	54	-3.02	PK
*12310	V	42.07	36.29	46.23	52.01	54	-1.99	PK
*14772	V	55.17	60.29	50.67	45.55	54	-8.45	PK
*17234	V	55.34	60.13	52.05	47.26	54	-6.74	PK
*19696	V	53.29	59.55	43.54	37.28	54	-16.72	PK
*22158	V	55.39	57.17	44.43	42.65	54	-11.35	PK
*24620	V	56.98	54.15	45.82	48.65	54	-5.35	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

EUT Equip By ANT-WSB-ANM-05 BLACK Antenna

802.11b CH1								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
4824	H	47.16	36.50	37.50	48.16	74	-25.84	PK
4824	H	33.44	36.50	37.50	34.44	54	-19.56	AV
*7236	H	42.09	36.69	42.82	48.22	54	-5.78	PK
*9648	H	41.53	37.10	43.42	47.85	54	-6.15	PK
*12060	H	42.66	36.54	46.13	52.25	54	-1.75	PK
*14472	H	51.97	61.11	52.04	42.90	54	-11.10	PK
*16884	H	53.67	60.35	49.31	42.63	54	-11.37	PK
*19296	H	54.39	59.61	43.70	38.48	54	-15.52	PK
*21708	H	54.97	57.48	44.57	42.06	54	-11.94	PK
*24120	H	58.11	53.54	45.80	50.37	54	-3.63	PK
4824	V	55.27	36.50	37.50	56.27	74	-17.73	PK
4824	V	40.27	36.50	37.50	41.27	54	-12.73	AV
*7236	V	43.19	36.69	42.82	49.32	54	-4.68	PK
*9648	V	43.18	37.10	43.42	49.50	54	-4.50	PK
*12060	V	41.97	36.54	46.13	51.56	54	-2.44	PK
*14472	V	52.21	61.11	52.04	43.14	54	-10.86	PK
*16884	V	54.09	60.35	49.31	43.05	54	-10.95	PK
*19296	V	54.91	59.61	43.70	39.00	54	-15.00	PK
*21708	V	55.13	57.48	44.57	42.22	54	-11.78	PK
*24120	V	58.27	53.54	45.80	50.53	54	-3.47	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11b CH6								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4874	H	46.36	36.50	37.59	47.45	74	-26.55	PK
4874	H	33.27	36.50	37.59	34.36	54	-19.64	AV
*7311	H	42.63	36.72	42.96	48.87	54	-5.13	PK
*9748	H	42.51	37.10	43.70	49.11	54	-4.89	PK
*12185	H	42.78	36.41	46.17	52.54	54	-1.46	PK
*14622	H	53.08	60.81	51.51	43.78	54	-10.22	PK
*17059	H	52.44	59.98	50.37	42.83	54	-11.17	PK
*19496	H	54.39	60.06	43.70	38.03	54	-15.97	PK
*21933	H	53.59	57.73	44.44	40.30	54	-13.70	PK
*24370	H	57.64	54.06	45.80	49.38	54	-4.62	PK
4874	V	52.31	36.50	37.59	53.40	74	-20.60	PK
4874	V	36.22	36.50	37.59	37.31	54	-16.69	AV
*7311	V	42.71	36.72	42.96	48.95	54	-5.05	PK
*9748	V	43.49	37.10	43.70	50.09	54	-3.91	PK
*12185	V	43.00	36.41	46.17	52.76	54	-1.24	PK
*14622	V	54.07	60.81	51.51	44.77	54	-9.23	PK
*17059	V	53.27	59.98	50.37	43.66	54	-10.34	PK
*19496	V	55.19	60.06	43.70	38.83	54	-15.17	PK
*21933	V	54.88	57.73	44.44	41.59	54	-12.41	PK
*24370	V	58.48	54.06	45.80	50.22	54	-3.78	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11b CH11								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4924	H	47.32	36.50	37.67	48.49	74	-25.51	PK
4924	H	32.99	36.50	37.67	34.16	54	-19.84	AV
*7386	H	43.01	36.75	43.09	49.35	54	-4.65	PK
*9848	H	43.28	37.10	43.98	50.16	54	-3.84	PK
*12310	H	42.17	36.29	46.23	52.11	54	-1.89	PK
*14772	H	54.07	60.29	50.67	44.45	54	-9.55	PK
*17234	H	53.17	60.13	52.05	45.09	54	-8.91	PK
*19696	H	52.77	59.55	43.54	36.76	54	-17.24	PK
*22158	H	54.09	57.17	44.43	41.35	54	-12.65	PK
*24620	H	55.23	54.15	45.82	46.90	54	-7.10	PK
4924	V	48.82	36.50	37.67	49.99	74	-24.01	PK
4924	V	34.39	36.50	37.67	35.56	54	-18.44	AV
*7386	V	43.44	36.75	43.09	49.78	54	-4.22	PK
*9848	V	44.08	37.10	43.98	50.96	54	-3.04	PK
*12310	V	42.28	36.29	46.23	52.22	54	-1.78	PK
*14772	V	55.31	60.29	50.67	45.69	54	-8.31	PK
*17234	V	54.47	60.13	52.05	46.39	54	-7.61	PK
*19696	V	52.14	59.55	43.54	36.13	54	-17.87	PK
*22158	V	55.37	57.17	44.43	42.63	54	-11.38	PK
*24620	V	56.57	54.15	45.82	48.24	54	-5.76	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11g CH1								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4824	H	46.15	36.50	37.50	47.15	74	-26.85	PK
4824	H	32.97	36.50	37.50	33.97	54	-20.03	AV
*7236	H	42.16	36.69	42.82	48.29	54	-5.71	PK
*9648	H	41.36	37.10	43.42	47.68	54	-6.32	PK
*12060	H	42.47	36.54	46.13	52.06	54	-1.94	PK
*14472	H	51.97	61.11	52.04	42.90	54	-11.10	PK
*16884	H	53.74	60.35	49.31	42.70	54	-11.30	PK
*19296	H	54.97	59.61	43.70	39.06	54	-14.94	PK
*21708	H	55.14	57.48	44.57	42.23	54	-11.77	PK
*24120	H	58.32	53.54	45.80	50.58	54	-3.42	PK
4824	V	54.17	36.50	37.50	55.17	74	-18.83	PK
4824	V	39.01	36.50	37.50	40.01	54	-13.99	AV
*7236	V	43.17	36.69	42.82	49.30	54	-4.70	PK
*9648	V	43.12	37.10	43.42	49.44	54	-4.56	PK
*12060	V	41.68	36.54	46.13	51.27	54	-2.73	PK
*14472	V	52.61	61.11	52.04	43.54	54	-10.46	PK
*16884	V	54.17	60.35	49.31	43.13	54	-10.87	PK
*19296	V	55.24	59.61	43.70	39.33	54	-14.67	PK
*21708	V	54.97	57.48	44.57	42.06	54	-11.94	PK
*24120	V	58.67	53.54	45.80	50.93	54	-3.07	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11g CH6								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4874	H	46.30	36.50	37.59	47.39	74	-26.61	PK
4874	H	32.83	36.50	37.59	33.92	54	-20.08	AV
*7311	H	42.69	36.72	42.96	48.93	54	-5.07	PK
*9748	H	42.36	37.10	43.70	48.96	54	-5.04	PK
*12185	H	42.64	36.41	46.17	52.40	54	-1.60	PK
*14622	H	53.04	60.81	51.51	43.74	54	-10.26	PK
*17059	H	52.10	59.98	50.37	42.49	54	-11.51	PK
*19496	H	53.91	60.06	43.70	37.55	54	-16.45	PK
*21933	H	54.04	57.73	44.44	40.75	54	-13.25	PK
*24370	H	57.17	54.06	45.80	48.91	54	-5.09	PK
4874	V	50.80	36.50	37.59	51.89	74	-22.11	PK
4874	V	35.98	36.50	37.59	37.07	54	-16.93	AV
*7311	V	42.70	36.72	42.96	48.94	54	-5.06	PK
*9748	V	43.51	37.10	43.70	50.11	54	-3.89	PK
*12185	V	43.07	36.41	46.17	52.83	54	-1.17	PK
*14622	V	54.35	60.81	51.51	45.05	54	-8.95	PK
*17059	V	53.58	59.98	50.37	43.97	54	-10.03	PK
*19496	V	55.28	60.06	43.70	38.92	54	-15.08	PK
*21933	V	55.77	57.73	44.44	42.48	54	-11.52	PK
*24370	V	58.36	54.06	45.80	50.10	54	-3.90	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11g CH11								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4924	H	46.31	36.50	37.67	47.48	74	-26.52	PK
4924	H	32.89	36.50	37.67	34.06	54	-19.94	AV
*7386	H	42.67	36.75	43.09	49.01	54	-4.99	PK
*9848	H	42.14	37.10	43.98	49.02	54	-4.98	PK
*12310	H	42.87	36.29	46.23	52.81	54	-1.19	PK
*14772	H	54.17	60.29	50.67	44.55	54	-9.45	PK
*17234	H	53.68	60.13	52.05	45.60	54	-8.40	PK
*19696	H	51.07	59.55	43.54	35.06	54	-18.94	PK
*22158	H	54.17	57.17	44.43	41.43	54	-12.57	PK
*24620	H	55.73	54.15	45.82	47.40	54	-6.60	PK
4924	V	46.83	36.50	37.67	48.00	74	-26.00	PK
4924	V	33.05	36.50	37.67	34.22	54	-19.78	AV
*7386	V	43.47	36.75	43.09	49.81	54	-4.19	PK
*9848	V	44.24	37.10	43.98	51.12	54	-2.88	PK
*12310	V	42.01	36.29	46.23	51.95	54	-2.05	PK
*14772	V	54.96	60.29	50.67	45.34	54	-8.66	PK
*17234	V	55.32	60.13	52.05	47.24	54	-6.76	PK
*19696	V	51.97	59.55	43.54	35.96	54	-18.04	PK
*22158	V	55.68	57.17	44.43	42.94	54	-11.06	PK
*24620	V	56.37	54.15	45.82	48.04	54	-5.96	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

EUT Equip By ANT-WSB-ANM-05 Black 2.4G Antenna

802.11b CH1								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
4824	H	58.37	36.50	37.50	59.37	74	-14.63	PK
4824	H	44.59	36.50	37.50	45.59	54	-8.41	AV
*7236	H	42.31	36.69	42.82	48.44	54	-5.56	PK
*9648	H	41.62	37.10	43.42	47.94	54	-6.06	PK
*12060	H	42.53	36.54	46.13	52.12	54	-1.88	PK
*14472	H	52.01	61.11	52.04	42.94	54	-11.06	PK
*16884	H	53.76	60.35	49.31	42.72	54	-11.28	PK
*19296	H	54.03	59.61	43.70	38.12	54	-15.88	PK
*21708	H	55.31	57.48	44.57	42.40	54	-11.60	PK
*24120	H	59.07	53.54	45.80	51.33	54	-2.67	PK
4824	V	66.12	36.50	37.50	67.12	74	-6.88	PK
4824	V	51.99	36.50	37.50	52.99	54	-1.01	AV
*7236	V	43.22	36.69	42.82	49.35	54	-4.65	PK
*9648	V	43.27	37.10	43.42	49.59	54	-4.41	PK
*12060	V	41.33	36.54	46.13	50.92	54	-3.08	PK
*14472	V	52.67	61.11	52.04	43.60	54	-10.40	PK
*16884	V	55.70	60.35	49.31	44.66	54	-9.34	PK
*19296	V	55.07	59.61	43.70	39.16	54	-14.84	PK
*21708	V	55.14	57.48	44.57	42.23	54	-11.77	PK
*24120	V	58.94	53.54	45.80	51.20	54	-2.80	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11b CH6								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4874	H	58.08	36.50	37.59	59.17	74	-14.83	PK
4874	H	44.03	36.50	37.59	45.12	54	-8.88	AV
*7311	H	42.66	36.72	42.96	48.90	54	-5.10	PK
*9748	H	42.47	37.10	43.70	49.07	54	-4.93	PK
*12185	H	42.97	36.41	46.17	52.73	54	-1.27	PK
*14622	H	53.10	60.81	51.51	43.80	54	-10.20	PK
*17059	H	52.07	59.98	50.37	42.46	54	-11.54	PK
*19496	H	53.95	60.06	43.70	37.59	54	-16.41	PK
*21933	H	54.14	57.73	44.44	40.85	54	-13.15	PK
*24370	H	57.28	54.06	45.80	49.02	54	-4.98	PK
4874	V	64.22	36.50	37.59	65.31	74	-8.69	PK
4874	V	49.92	36.50	37.59	51.01	54	-2.99	AV
*7311	V	42.71	36.72	42.96	48.95	54	-5.05	PK
*9748	V	43.68	37.10	43.70	50.28	54	-3.72	PK
*12185	V	43.12	36.41	46.17	52.88	54	-1.12	PK
*14622	V	54.62	60.81	51.51	45.32	54	-8.68	PK
*17059	V	53.64	59.98	50.37	44.03	54	-9.97	PK
*19496	V	55.84	60.06	43.70	39.48	54	-14.52	PK
*21933	V	55.34	57.73	44.44	42.05	54	-11.95	PK
*24370	V	58.39	54.06	45.80	50.13	54	-3.87	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11b CH11								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4924	H	54.59	36.50	37.67	55.76	74	-18.24	PK
4924	H	41.45	36.50	37.67	42.62	54	-11.38	AV
*7386	H	42.66	36.75	43.09	49.00	54	-5.00	PK
*9848	H	41.36	37.10	43.98	48.24	54	-5.76	PK
*12310	H	42.89	36.29	46.23	52.83	54	-1.17	PK
*14772	H	54.20	60.29	50.67	44.58	54	-9.42	PK
*17234	H	53.69	60.13	52.05	45.61	54	-8.39	PK
*19696	H	51.17	59.55	43.54	35.16	54	-18.84	PK
*22158	H	54.22	57.17	44.43	41.48	54	-12.52	PK
*24620	H	55.61	54.15	45.82	47.28	54	-6.72	PK
4924	V	56.77	36.50	37.67	57.94	74	-16.06	PK
4924	V	43.22	36.50	37.67	44.39	54	-9.61	AV
*7386	V	43.61	36.75	43.09	49.95	54	-4.05	PK
*9848	V	44.58	37.10	43.98	51.46	54	-2.54	PK
*12310	V	42.21	36.29	46.23	52.15	54	-1.85	PK
*14772	V	54.69	60.29	50.67	45.07	54	-8.93	PK
*17234	V	55.39	60.13	52.05	47.31	54	-6.69	PK
*19696	V	51.99	59.55	43.54	35.98	54	-18.02	PK
*22158	V	55.07	57.17	44.43	42.33	54	-11.67	PK
*24620	V	56.97	54.15	45.82	48.64	54	-5.36	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11g CH1								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4824	H	60.03	36.50	37.50	61.03	74	-12.97	PK
4824	H	45.08	36.50	37.50	46.08	54	-7.92	AV
*7236	H	42.66	36.69	42.82	48.79	54	-5.21	PK
*9648	H	42.17	37.10	43.42	48.49	54	-5.51	PK
*12060	H	42.65	36.54	46.13	52.24	54	-1.76	PK
*14472	H	52.74	61.11	52.04	43.67	54	-10.33	PK
*16884	H	53.61	60.35	49.31	42.57	54	-11.43	PK
*19296	H	54.31	59.61	43.70	38.40	54	-15.60	PK
*21708	H	55.13	57.48	44.57	42.22	54	-11.78	PK
*24120	H	59.16	53.54	45.80	51.42	54	-2.58	PK
4824	V	65.29	36.50	37.50	66.29	74	-7.71	PK
4824	V	50.37	36.50	37.50	51.37	54	-2.63	AV
*7236	V	43.11	36.69	42.82	49.24	54	-4.76	PK
*9648	V	43.28	37.10	43.42	49.60	54	-4.40	PK
*12060	V	41.39	36.54	46.13	50.98	54	-3.02	PK
*14472	V	52.47	61.11	52.04	43.40	54	-10.60	PK
*16884	V	55.49	60.35	49.31	44.45	54	-9.55	PK
*19296	V	55.46	59.61	43.70	39.55	54	-14.45	PK
*21708	V	55.68	57.48	44.57	42.77	54	-11.23	PK
*24120	V	58.19	53.54	45.80	50.45	54	-3.55	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11g CH6								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4874	H	58.89	36.50	37.59	59.98	74	-14.02	PK
4874	H	43.19	36.50	37.59	44.28	54	-9.72	AV
*7311	H	42.61	36.72	42.96	48.85	54	-5.15	PK
*9748	H	42.86	37.10	43.70	49.46	54	-4.54	PK
*12185	H	42.81	36.41	46.17	52.57	54	-1.43	PK
*14622	H	53.25	60.81	51.51	43.95	54	-10.05	PK
*17059	H	52.19	59.98	50.37	42.58	54	-11.42	PK
*19496	H	53.64	60.06	43.70	37.28	54	-16.72	PK
*21933	H	54.28	57.73	44.44	40.99	54	-13.01	PK
*24370	H	57.37	54.06	45.80	49.11	54	-4.89	PK
4874	V	64.32	36.50	37.59	65.41	74	-8.59	PK
4874	V	48.62	36.50	37.59	49.71	54	-4.29	AV
*7311	V	42.74	36.72	42.96	48.98	54	-5.02	PK
*9748	V	43.65	37.10	43.70	50.25	54	-3.75	PK
*12185	V	43.28	36.41	46.17	53.04	54	-0.96	PK
*14622	V	54.67	60.81	51.51	45.37	54	-8.63	PK
*17059	V	53.68	59.98	50.37	44.07	54	-9.93	PK
*19496	V	55.69	60.06	43.70	39.33	54	-14.67	PK
*21933	V	55.47	57.73	44.44	42.18	54	-11.82	PK
*24370	V	58.49	54.06	45.80	50.23	54	-3.77	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

802.11g CH11								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
4924	H	55.68	36.50	37.67	56.85	74	-17.15	PK
4924	H	41.60	36.50	37.67	42.77	54	-11.23	AV
*7386	H	42.36	36.75	43.09	48.70	54	-5.30	PK
*9848	H	41.28	37.10	43.98	48.16	54	-5.84	PK
*12310	H	42.78	36.29	46.23	52.72	54	-1.28	PK
*14772	H	54.29	60.29	50.67	44.67	54	-9.33	PK
*17234	H	53.74	60.13	52.05	45.66	54	-8.34	PK
*19696	H	51.39	59.55	43.54	35.38	54	-18.62	PK
*22158	H	54.84	57.17	44.43	42.10	54	-11.90	PK
*24620	H	55.94	54.15	45.82	47.61	54	-6.39	PK
4924	V	55.56	36.50	37.67	56.73	74	-17.27	PK
4924	V	40.33	36.50	37.67	41.50	54	-12.50	AV
*7386	V	43.95	36.75	43.09	50.29	54	-3.71	PK
*9848	V	44.68	37.10	43.98	51.56	54	-2.44	PK
*12310	V	42.61	36.29	46.23	52.55	54	-1.45	PK
*14772	V	54.78	60.29	50.67	45.16	54	-8.84	PK
*17234	V	55.64	60.13	52.05	47.56	54	-6.44	PK
*19696	V	51.96	59.55	43.54	35.95	54	-18.05	PK
*22158	V	55.09	57.17	44.43	42.35	54	-11.65	PK
*24620	V	57.00	54.15	45.82	48.67	54	-5.33	PK

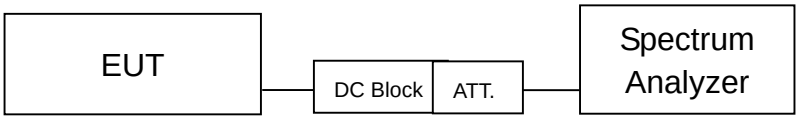
Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
* Mark indicated background noise level.

3 RF Conducted spurious emission

3.1 Limit

According to 15.247(d) requirement：
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, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

3.2 Configuration of Measurement



3.3 Test Procedure

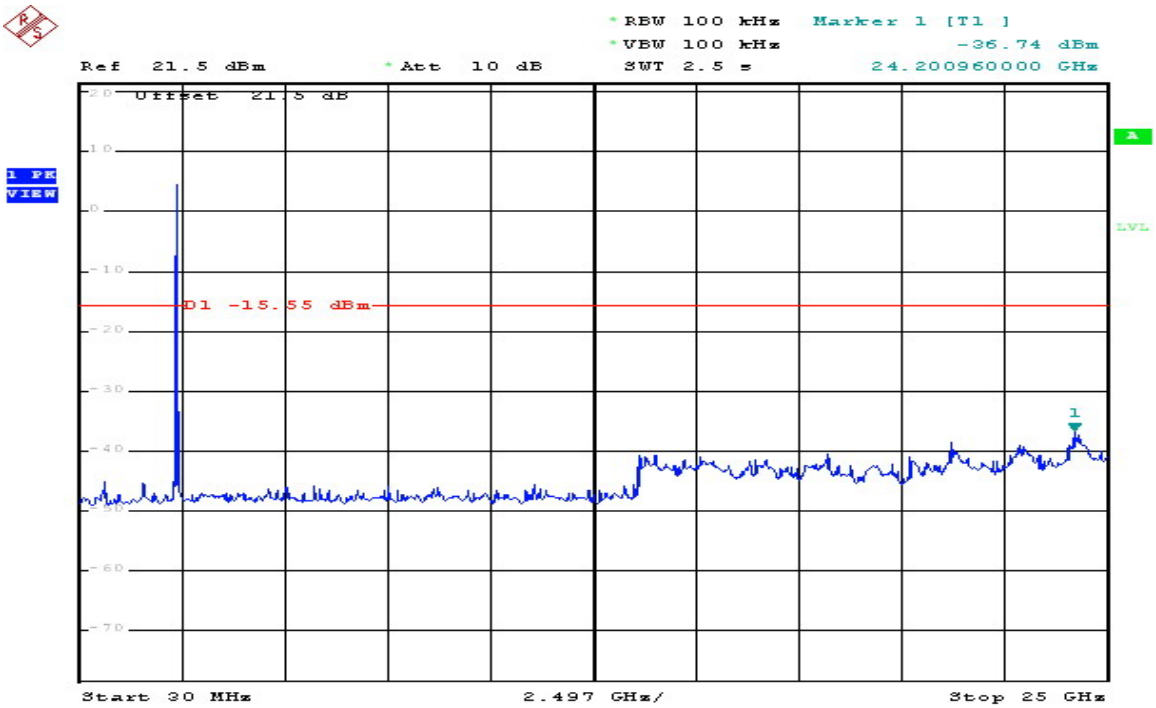
The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The measurements were performed from 30MHz to 40GHz RF antenna conducted per FCC 15.247 (c) was measured from the EUT antenna port using a 50ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz.
Harmonics and spurious noise must be at least 20dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The table below is the results from the highest emission for each channel within the authorized band. This table was used to determine the spurious limit for each channel.

3.4 Test Result

PASS.
The final test data is shown on as following pages.

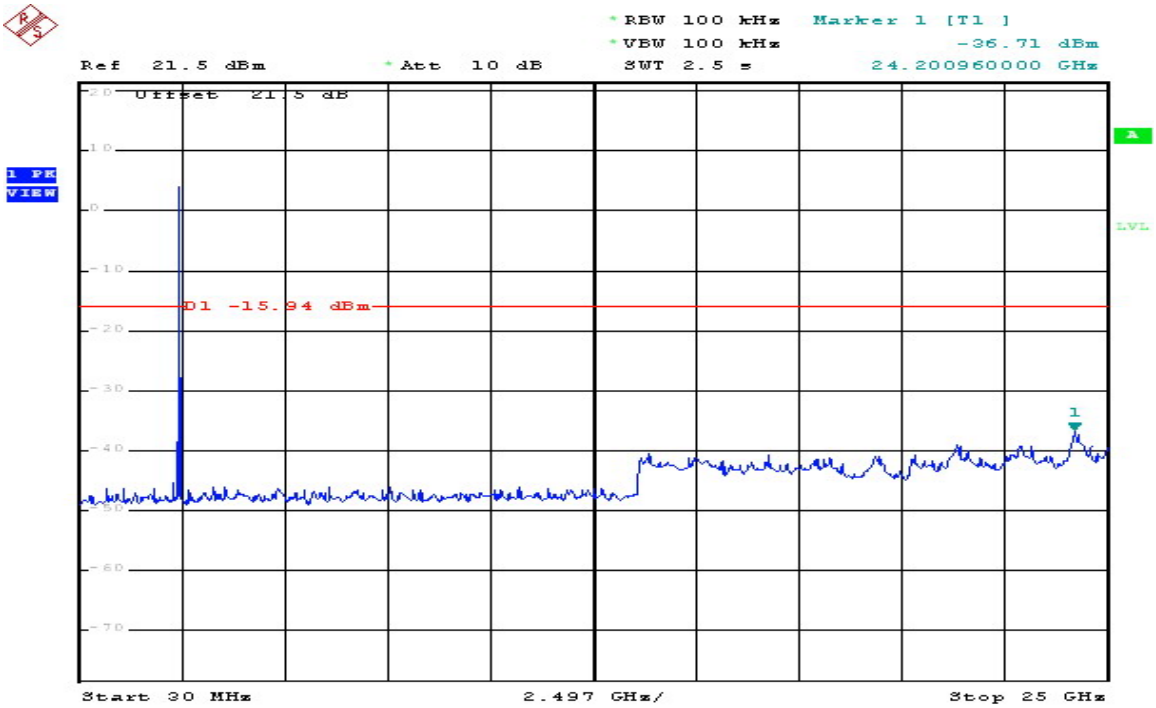
Conducted spurious emission

802.11b CH1 2412MHz



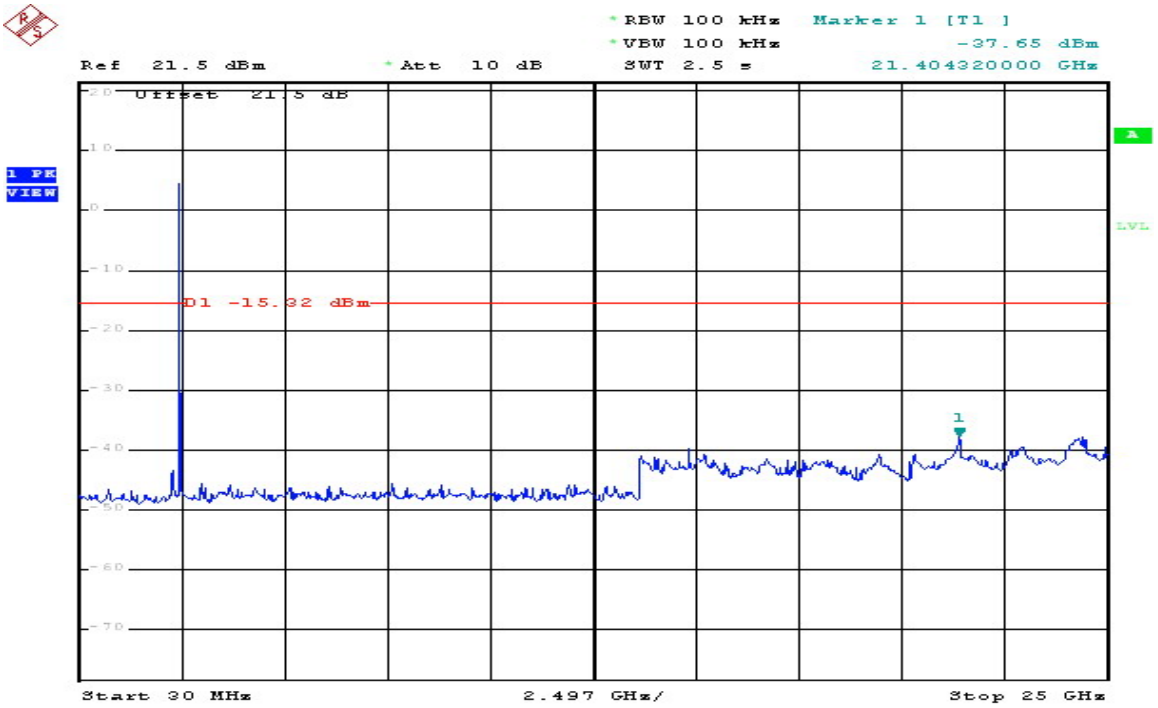
Comment: 802.11b Conducted Spurious 2412MHz
Date: 19.DEC.2006 09:27:04

802.11b CH6 2437MHz



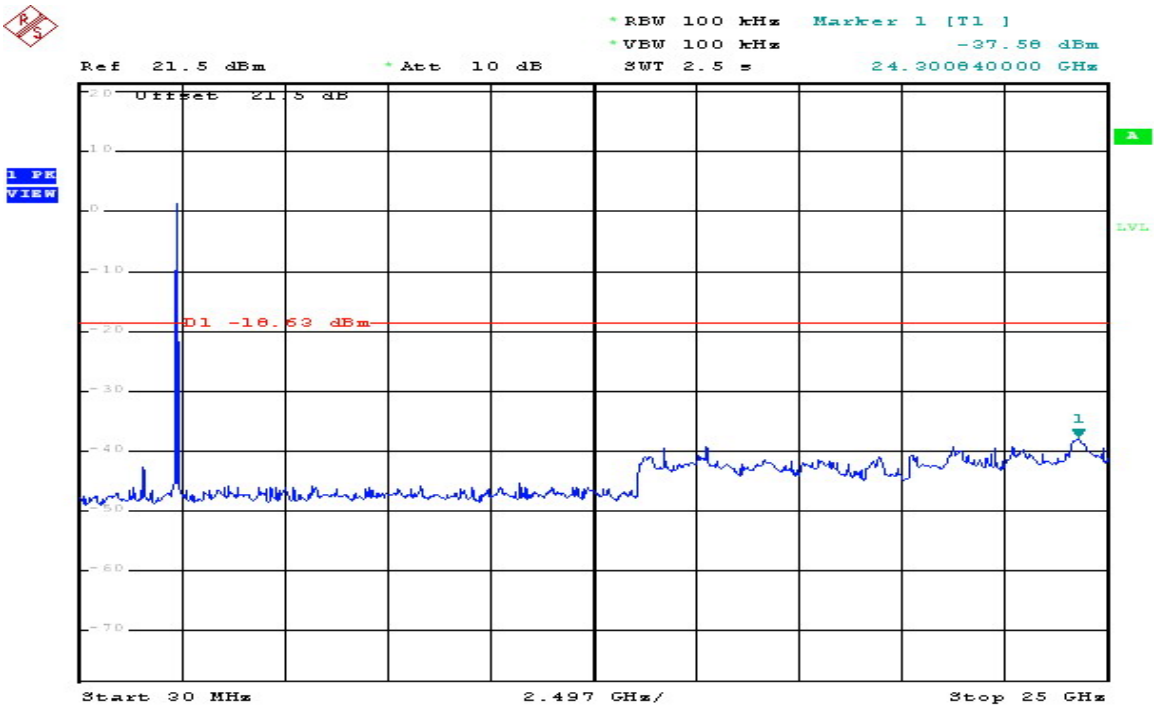
Comment: 802.11b Conducted Spurious 2437MHz
Date: 19.DEC.2006 09:29:10

802.11b CH11 2462MHz



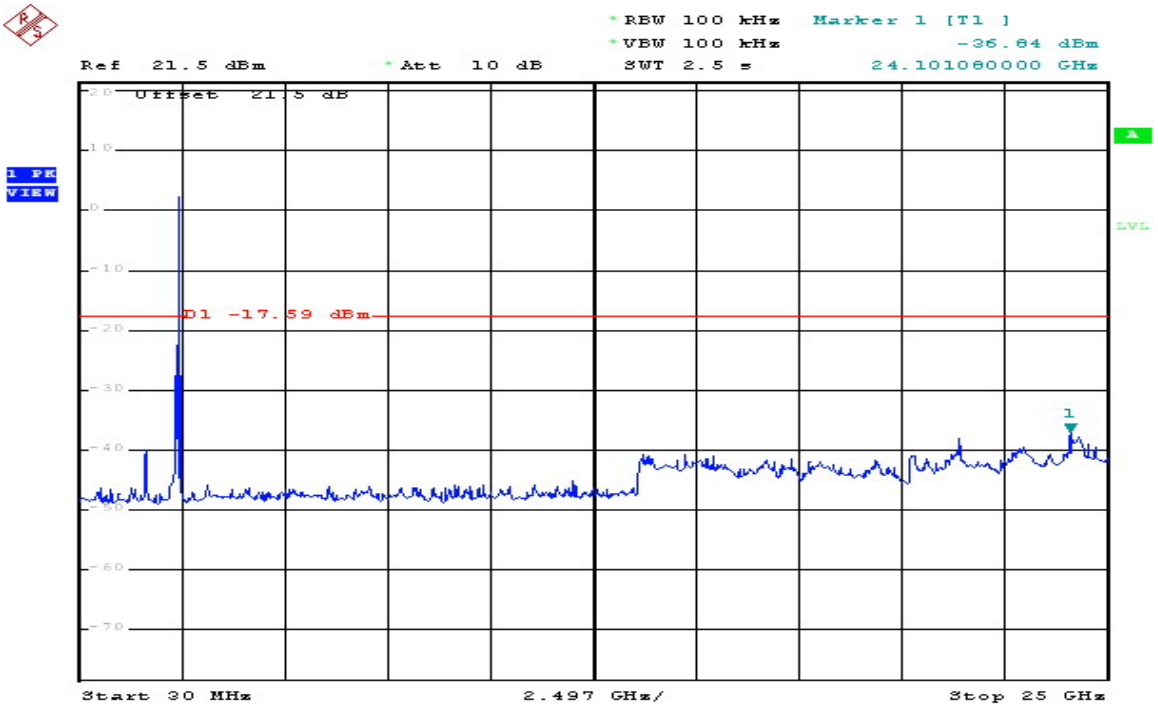
Comment: 802.11b Conducted Spurious 2462MHz
Date: 19.DEC.2008 09:30:08

802.11g CH1 2412MHz



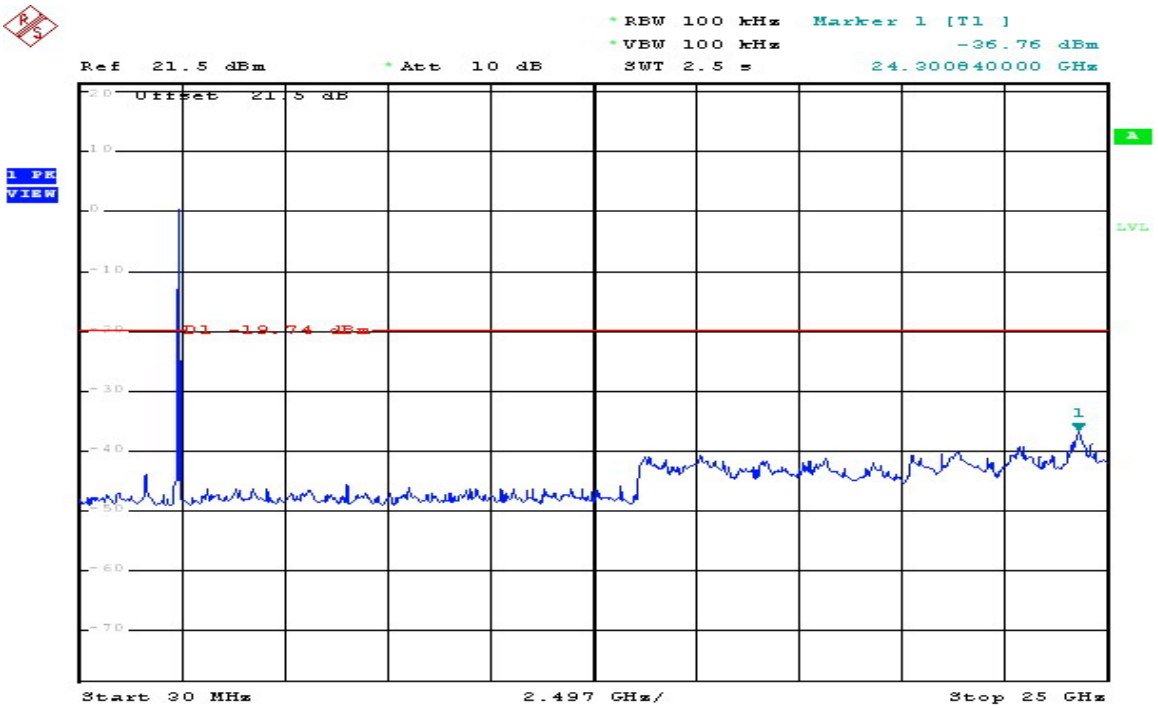
Comment: 802.11g Conducted Spurious 2412MHz
Date: 19.DEC.2008 09:31:14

802.11g CH6 2437MHz



Comment: 802.11g Conducted Spurious 2437MHz
Date: 19.DEC.2006 09:32:18

802.11g CH11 2462MHz



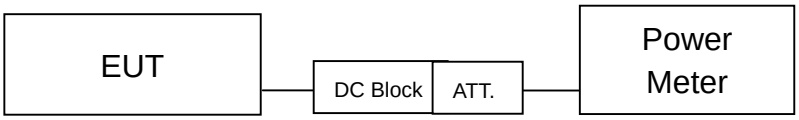
Comment: 802.11g Conducted Spurious 2462MHz
Date: 19.DEC.2006 09:33:16

4 Maximum Peak output power test

4.1 Limit

According to FCC Part15.247 (b)(3) requirement：
For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: The maximum conducted output power shall be less than 1Watt.

4.2 Configuration of Measurement



4.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.
For FCC §15.247(b) the power output was measured on the EUT using a 50 ohm SMA cable connected to peak power meter via power sensor. Peak output power was read directly from power meter. The test was performed at 3 channels (lowest, middle and highest).

4.4 Test Result

PASS.
The final test data is shown on as following pages.

Maximum output power

Mode：802.11b					
CH	Freq. (MHz)	Maximum transmit power		Limit (dBm)	Margin (dB)
		(dBm)	(watts)		
1	2412	19.10	0.0813	30	-10.90
6	2437	18.88	0.0773	30	-11.12
11	2462	18.70	0.0741	30	-11.30

Mode：802.11g					
CH	Freq. (MHz)	Maximum transmit power		Limit (dBm)	Margin (dB)
		(dBm)	(watts)		
1	2412	22.10	0.1622	30	-7.90
6	2437	22.06	0.1607	30	-7.94
11	2462	21.75	0.1496	30	-8.25

5 Power test of Data Rate

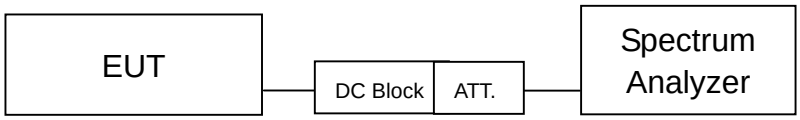
Mode	Bandwidth (MHz)	Channel	Data Rate	Output Power	
				(dBm)	(watts)
802.11b	20	6	1	18.77	0.0753
			5.5	18.67	0.0736
			11	18.88	0.0773
802.11g	20	6	6	22.06	0.1607
			36	22.04	0.1600
			54	21.64	0.1459
802.11a	20	44	6	15.72	0.0373
			36	15.66	0.0368
			54	15.37	0.0344

6 6dB Bandwidth

6.1 Limit

According to FCC Part15.247 (a)(2) requirement：
Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

6.2 Configuration of Measurement



6.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The minimum 6dB bandwidth was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set ≧RBW, and the SPAN>>RBW.
The test was performed at 3 channels (lowest, middle and highest).

6.4 Test Result

PASS.
The final test data is shown on as following pages.

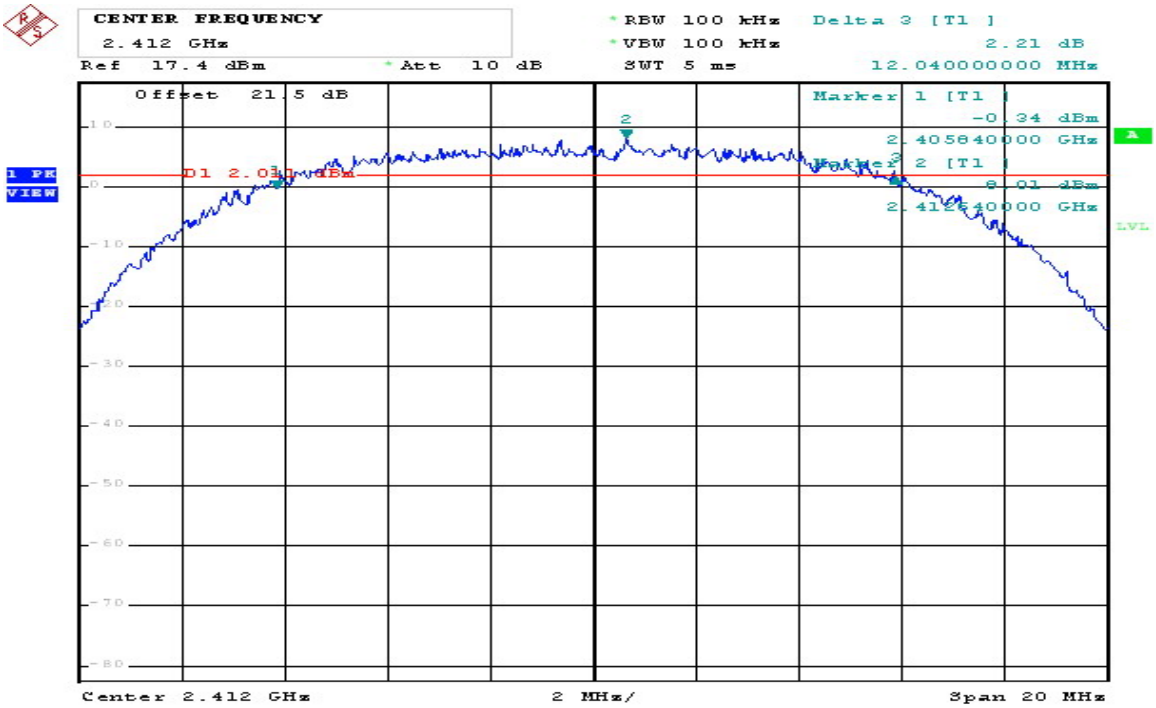
6dB bandwidth

Test Mode：802.11b			
CH No.	**Freq. (MHz)**	**6dB Bandwidth (MHz)**	**Limit (kHz)**
1	2412	12.04	>500
6	2437	10.84	>500
11	2462	11.44	>500

Test Mode：802.11g			
CH No.	**Freq. (MHz)**	**6dB Bandwidth (MHz)**	**Limit (kHz)**
1	2412	16.48	>500
6	2437	16.48	>500
11	2462	16.48	>500

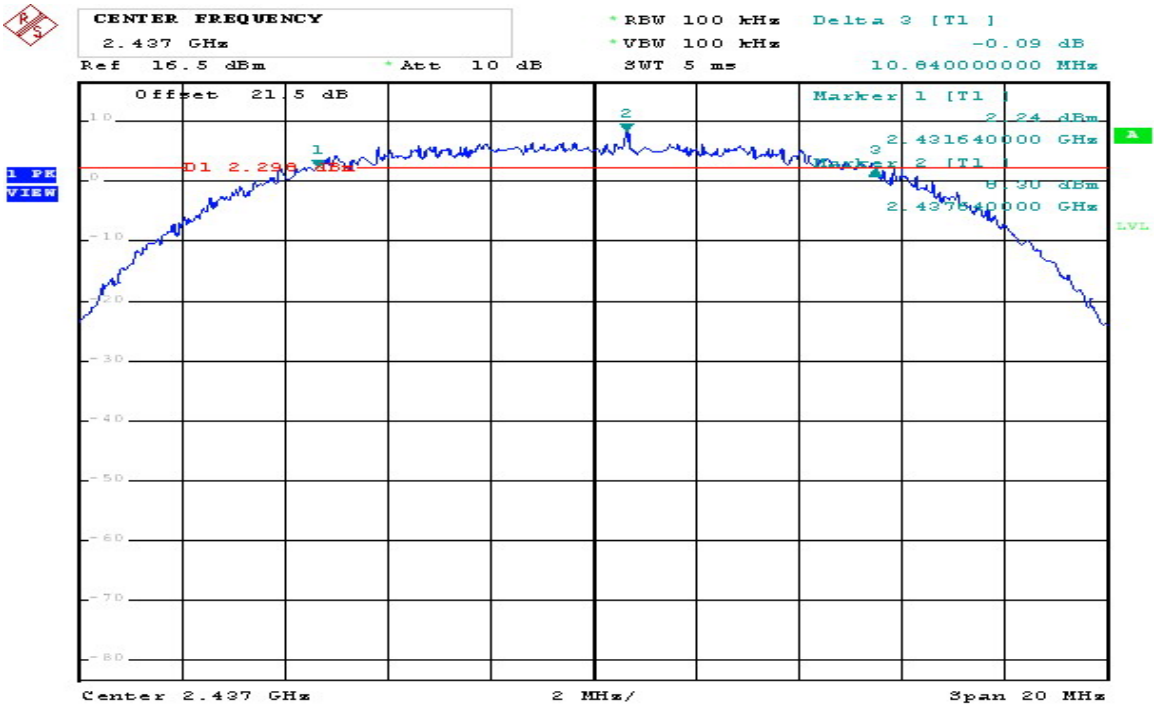
6dB Bandwidth

802.11b CH1 2412MHz



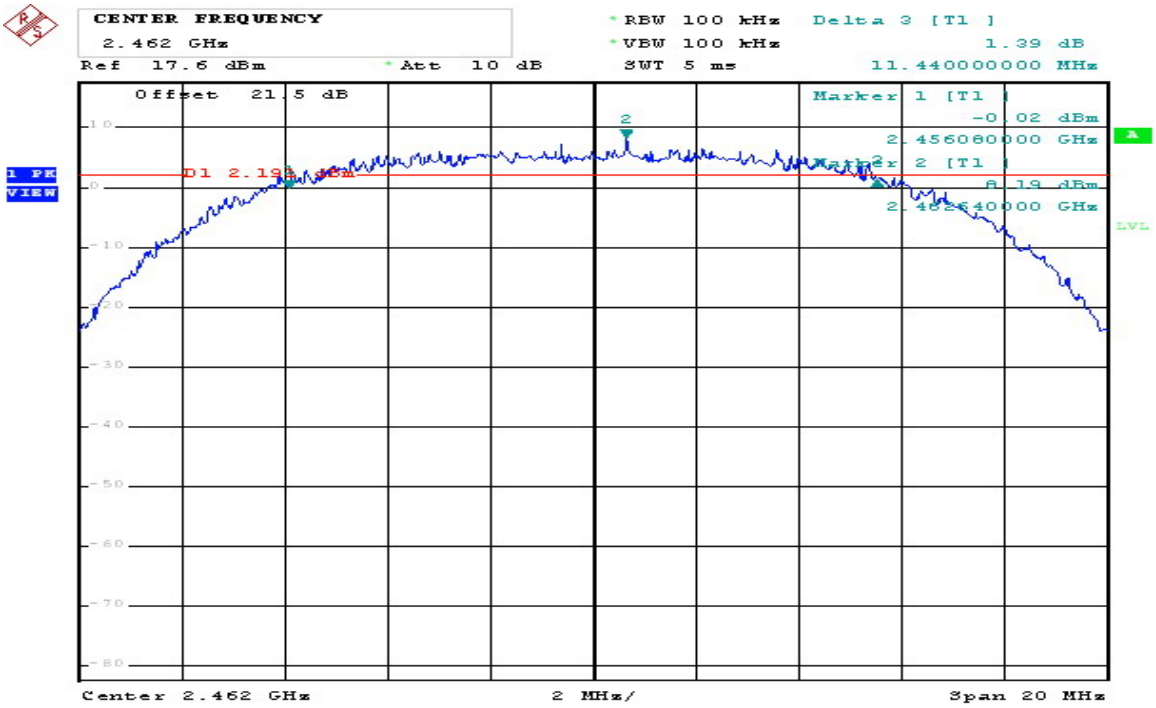
Comment: 802.11b 2412MHz
Date: 19.DEC.2008 08:47:51

802.11b CH6 2437MHz



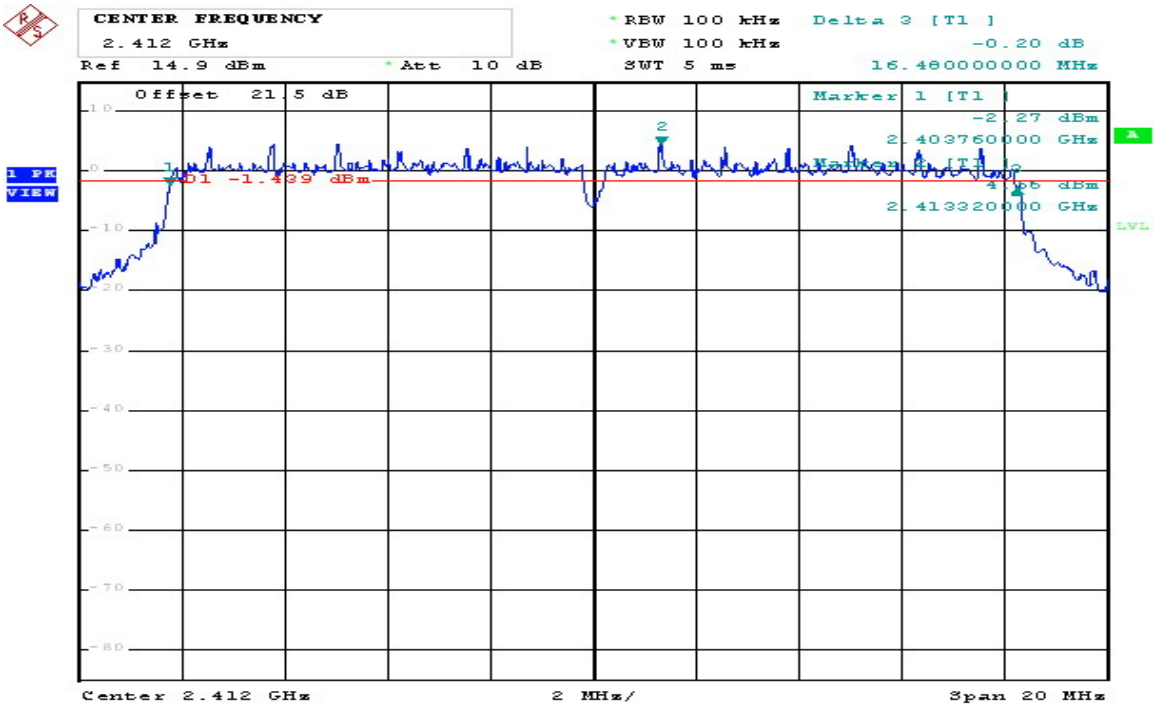
Comment: 802.11b 2437MHz
Date: 19.DEC.2008 08:49:35

802.11b CH11 2462MHz



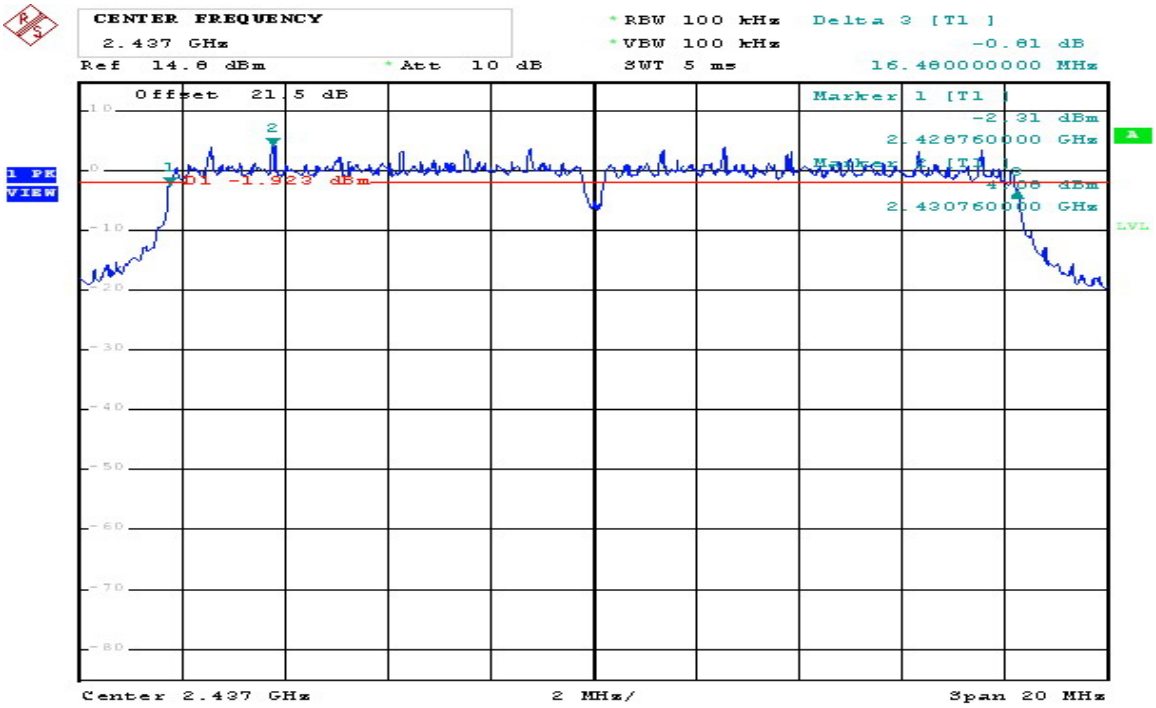
Comment: 802.11b 2462MHz
Date: 19.DEC.2008 08:52:25

802.11g CH1 2412MH



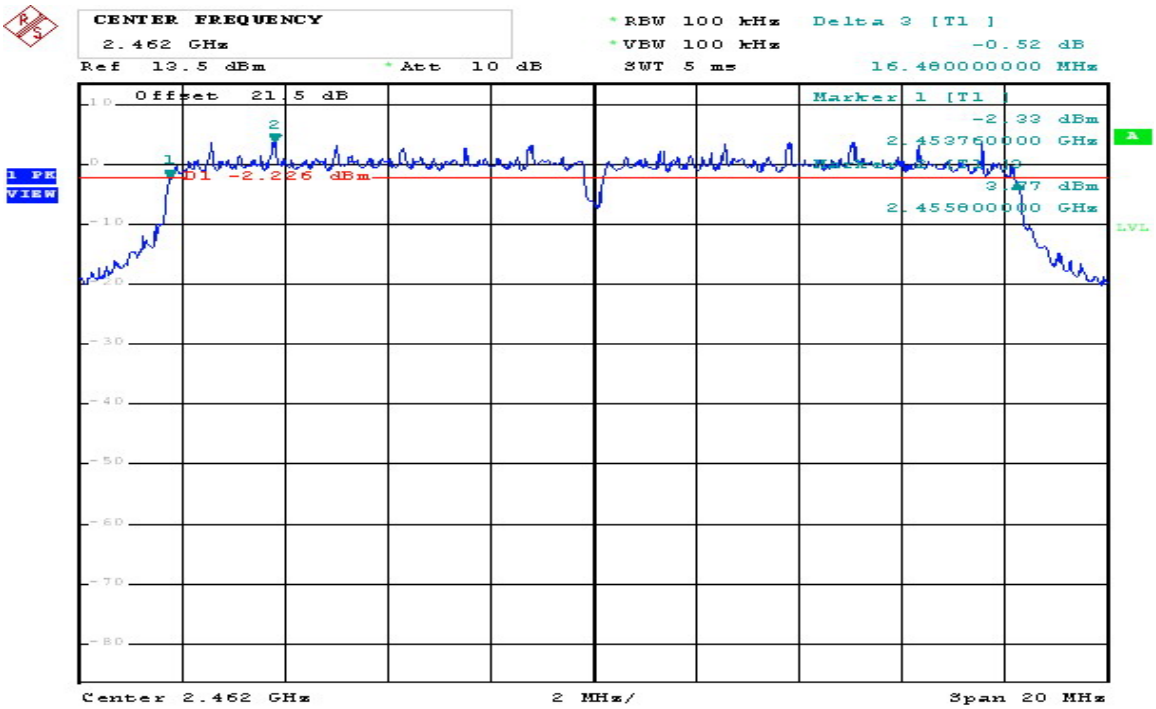
Comment: 802.11g 2412MHz
Date: 19.DEC.2008 08:54:27

802.11g CH6 2437MHz



Comment: 802.11g 2437MHz
Date: 19.DEC.2008 08:55:42

802.11g CH11 2462MHz



Comment: 802.11g 2462MHz
Date: 19.DEC.2008 08:57:07

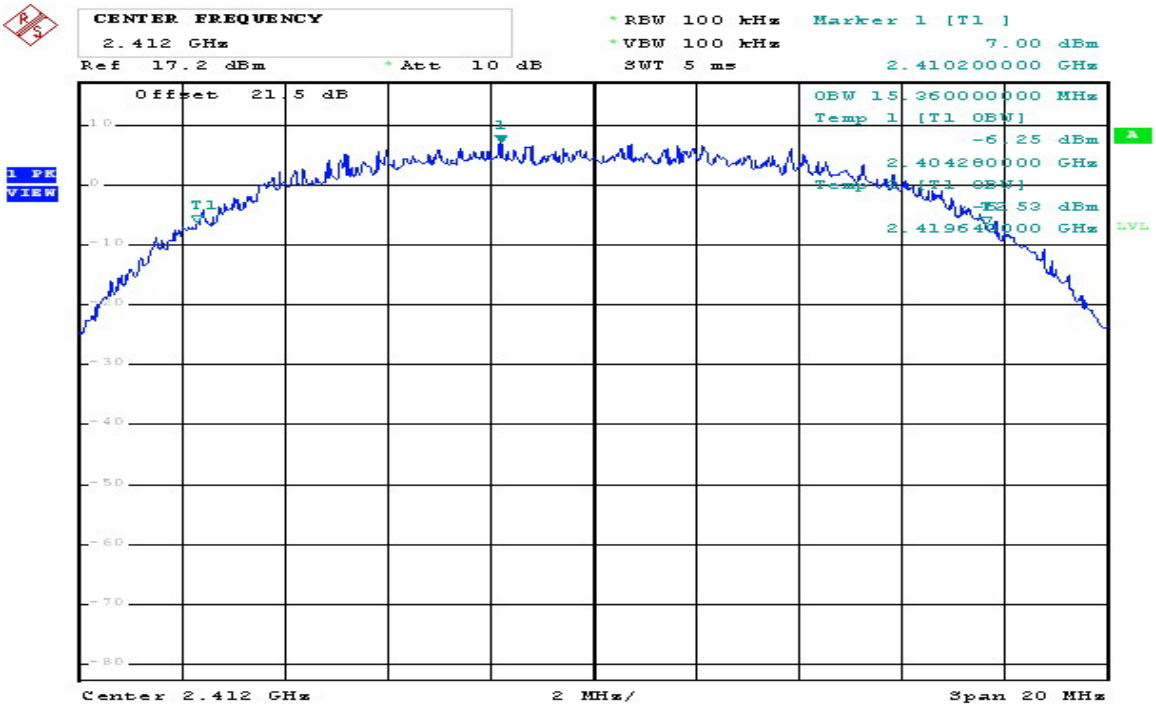
99%Occupied bandwidth

Test Mode：802.11b		
CH No.	**Freq. (MHz)**	**Occupied Bandwidth (MHz)**
1	2412	15.36
6	2437	15.44
11	2462	15.40

Test Mode：802.11g		
CH No.	**Freq. (MHz)**	**Occupied Bandwidth (MHz)**
1	2412	16.52
6	2437	16.52
11	2462	16.52

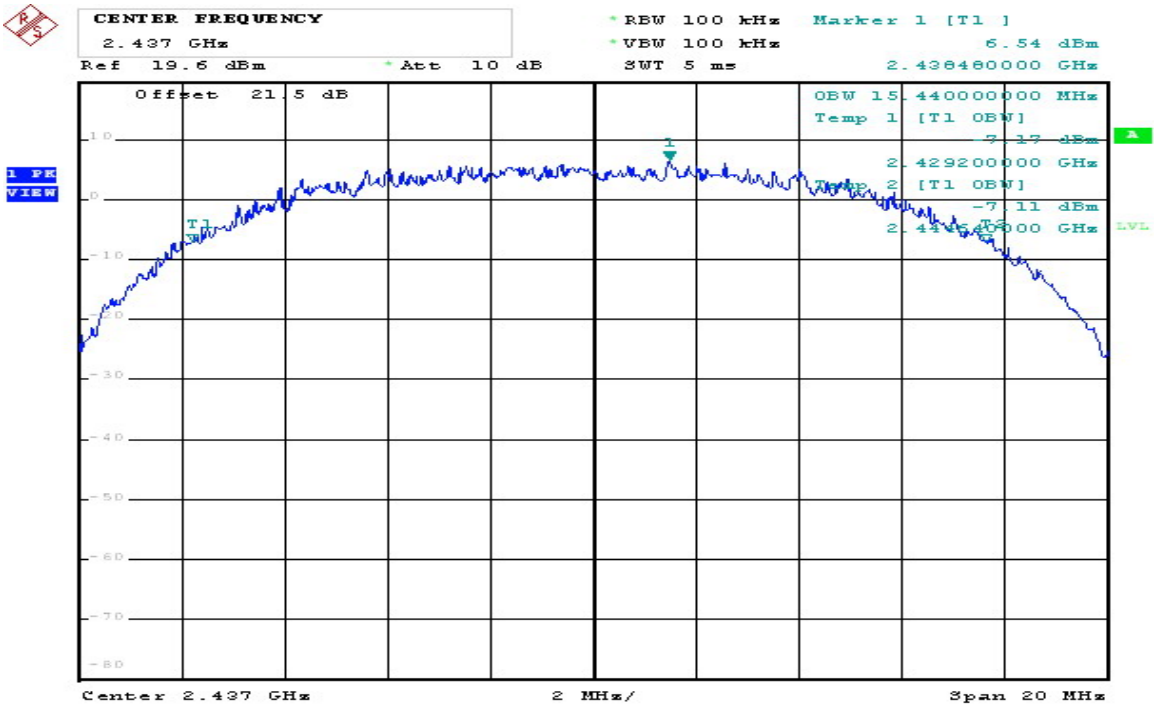
99%Occupied bandwidth

802.11b CH1 2412MHz



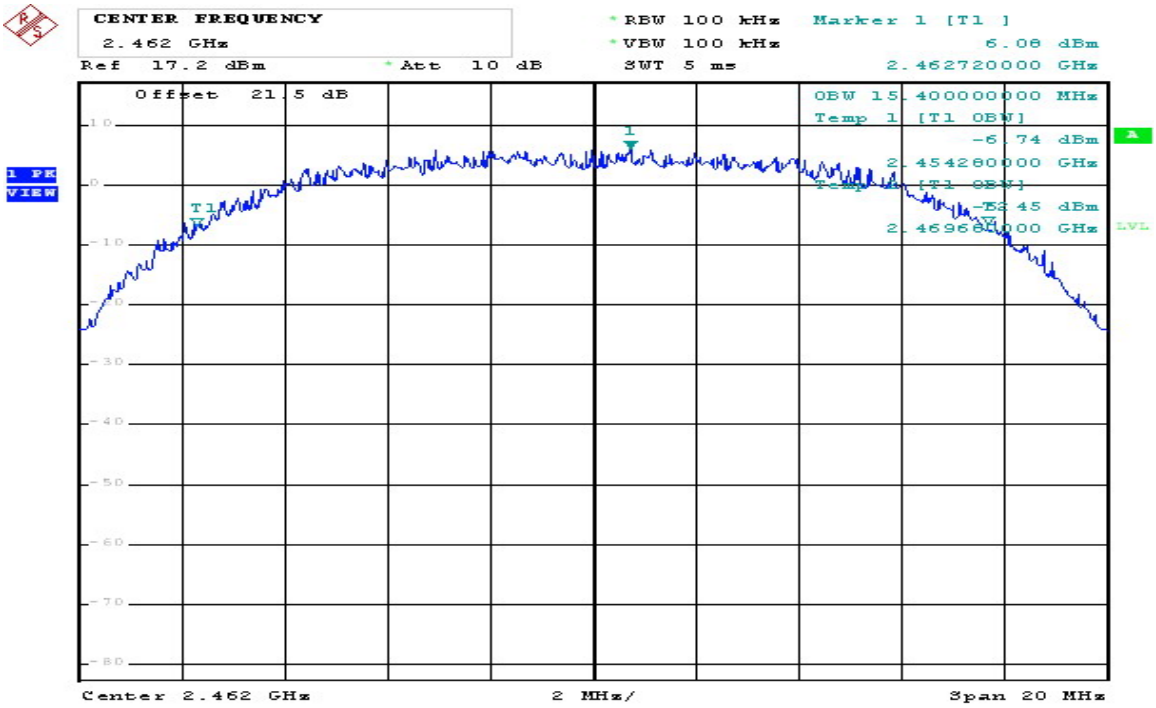
Comment: 802.11b 2412MHz
Date: 19.DEC.2008 08:48:11

802.11b CH6 2437MHz



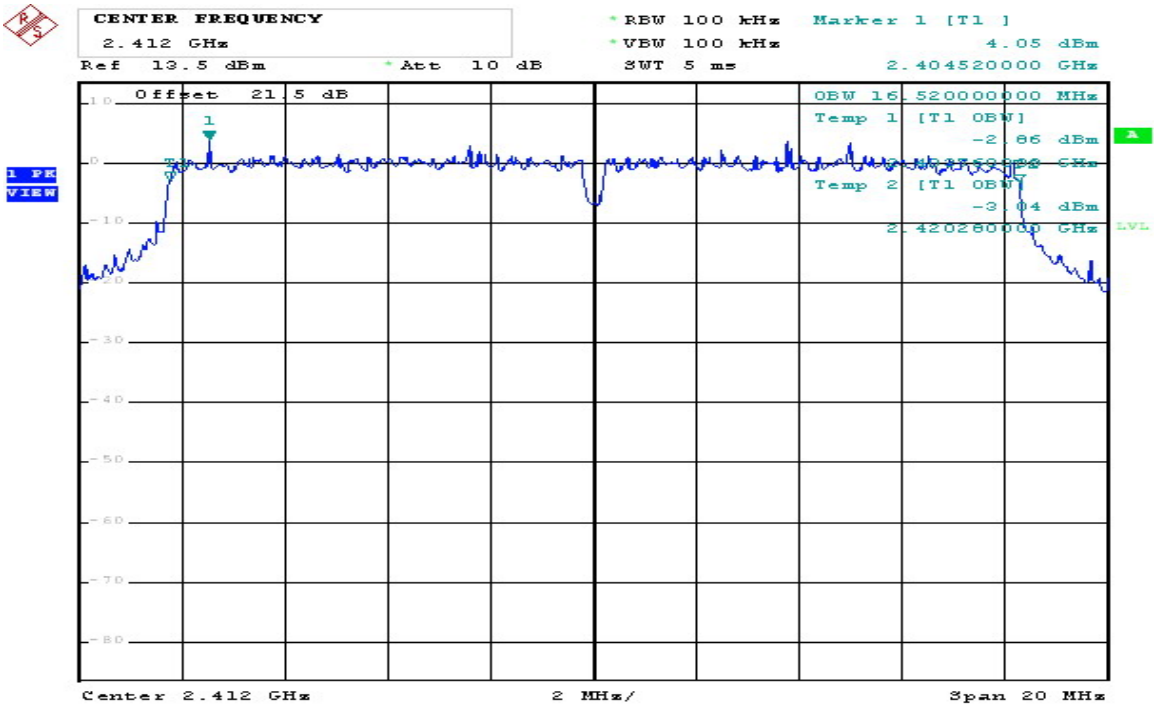
Comment: 802.11b 2437MHz
Date: 19.DEC.2008 08:49:57

802.11b CH11 2462MHz



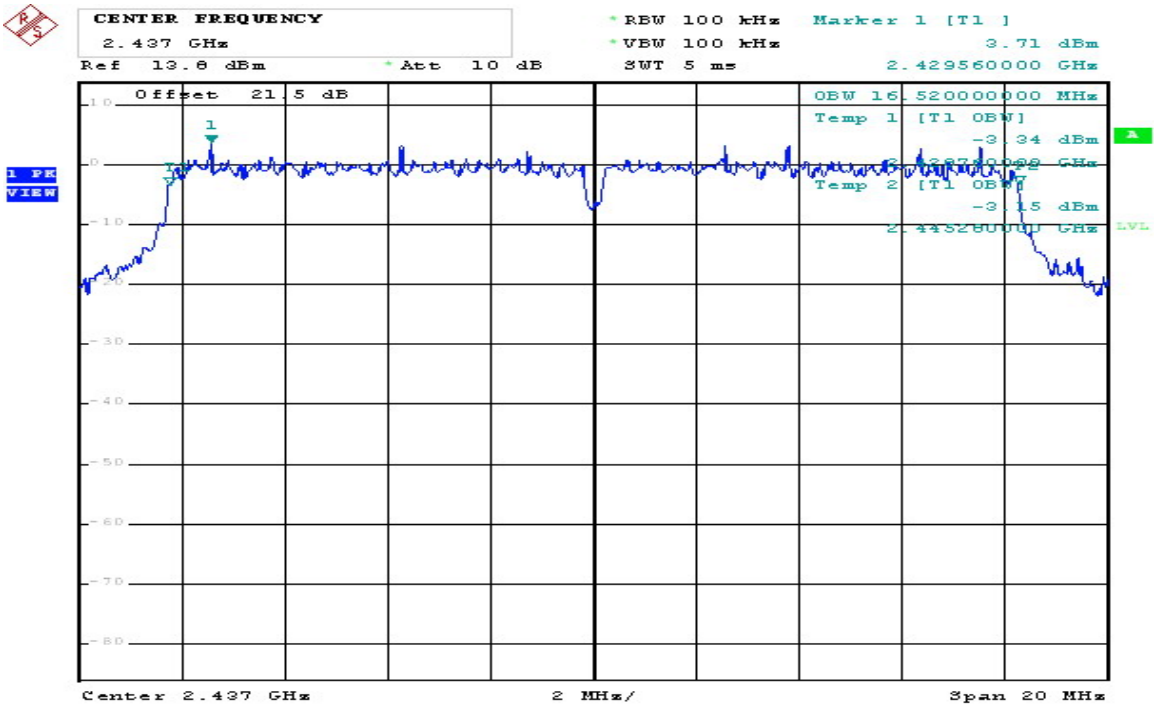
Comment: 802.11b 2462MHz
Date: 19.DEC.2008 08:52:45

802.11g CH1 2412MHz



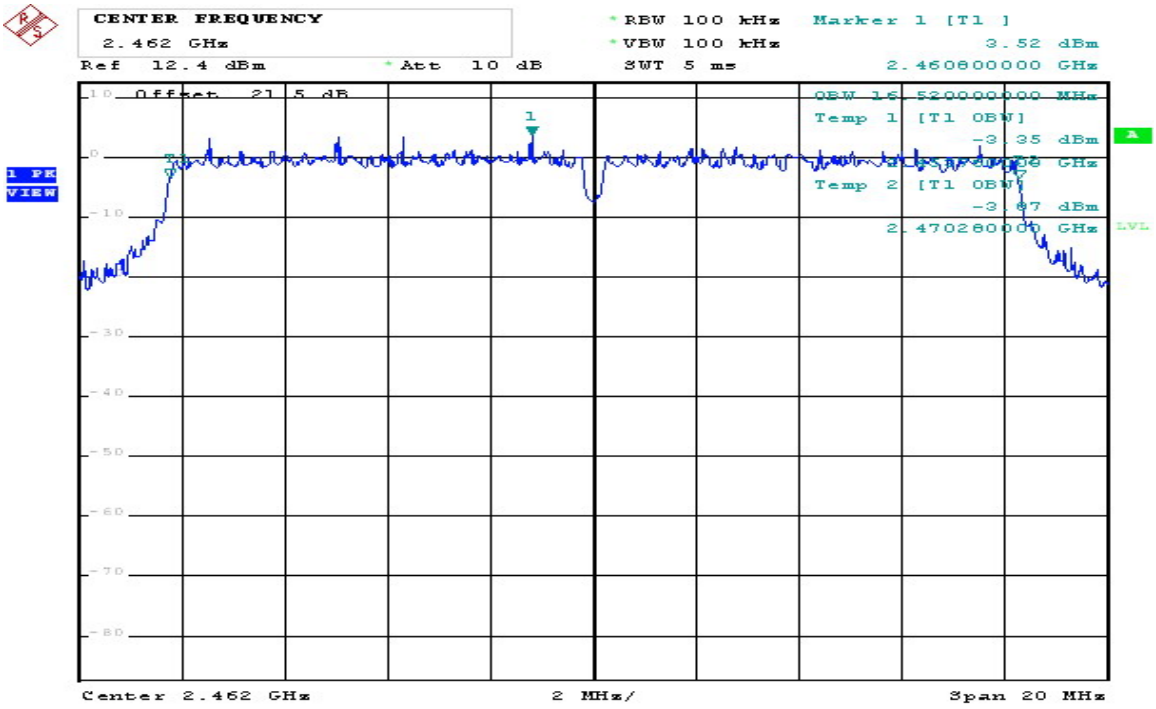
Comment: 802.11g 2412MHz
Date: 19.DEC.2008 08:54:45

802.11g CH6 2437MHz



Comment: 802.11g 2437MHz
Date: 19.DEC.2008 08:56:01

802.11g CH11 2462MHz



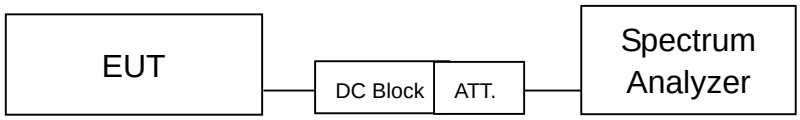
Comment: 802.11g 2462MHz
Date: 19.DEC.2008 08:57:27

7 Power spectral density

7.1 Limit

According to FCC Part15.247 (e) requirement：
For digitally modulated systems, the 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.

7.2 Configuration of Measurement



7.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The power spectrum density was measured from the antenna port of the EUT using a 50ohm spectrum analyzer with the resolution bandwidth set at 3kHz, video bandwidth set at 10kHz, span of 1.5MHz, and sweep time set at 500 seconds. Power Density was read directly correction was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest).

7.4 Test Result

PASS.
The final test data is shown on as following pages.

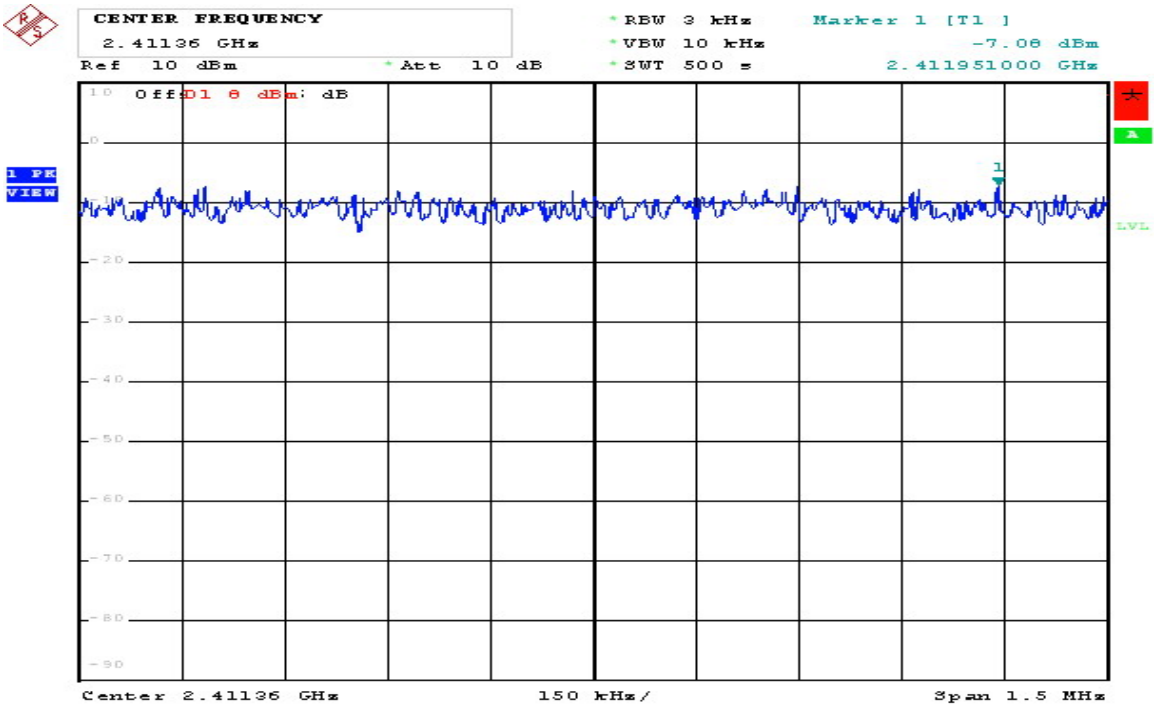
Power spectral density

802.11b				
CH	**Freq. (MHz)**	**Power Spectral Density (dBm)**	**Limit (dBm)**	**Margin (dB)**
1	2412	-7.08	8	-15.08
6	2437	-6.80	8	-14.80
11	2462	-6.36	8	-14.36

802.11g				
CH	**Freq. (MHz)**	**Power Spectral Density (dBm)**	**Limit (dBm)**	**Margin (dB)**
1	2412	-8.49	8	-16.49
6	2437	-8.89	8	-16.89
11	2462	-9.17	8	-17.17

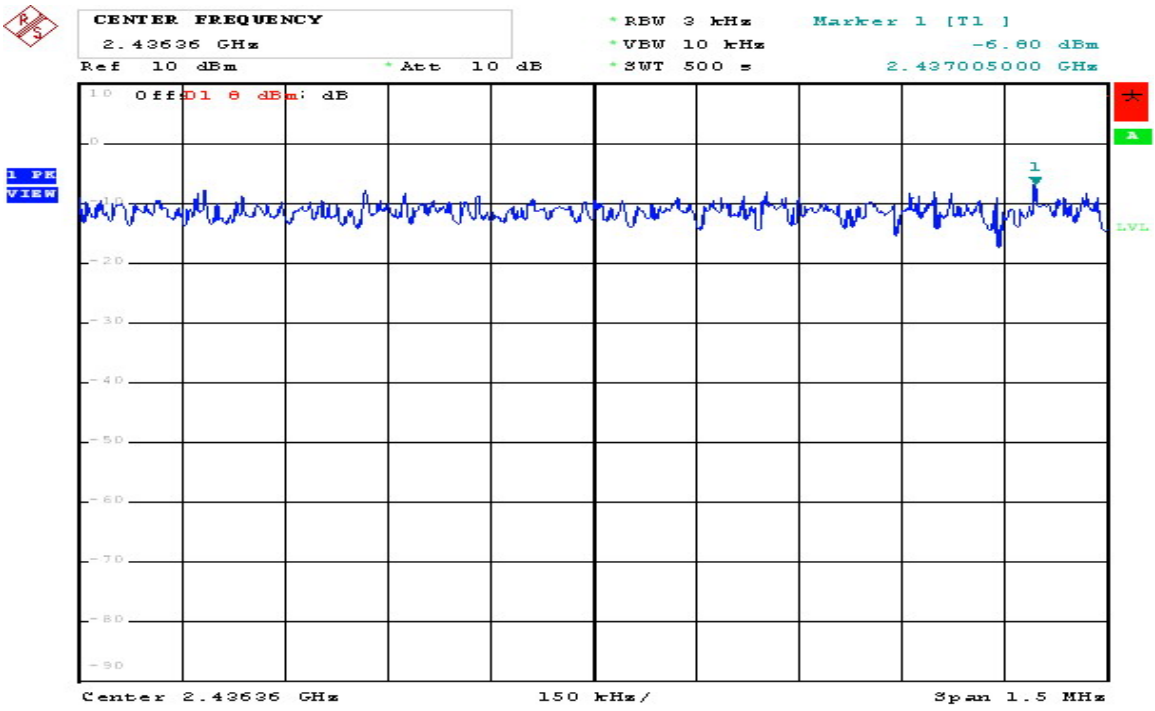
Power spectral density

802.11b CH1 2412MHz



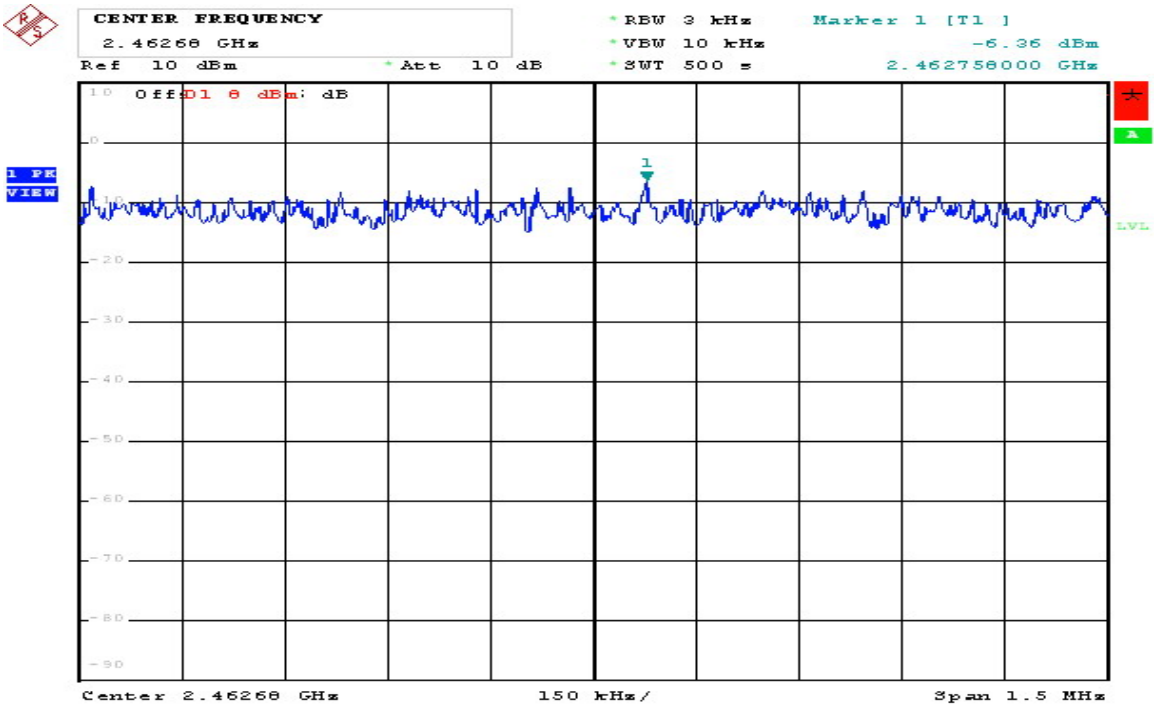
Comment: 802.11b 2412MHz
Date: 19.DEC.2008 09:10:58

802.11b CH6 2437MHz



Comment: 802.11b 2437MHz
Date: 19.DEC.2008 09:09:35

802.11b CH11 2462MHz



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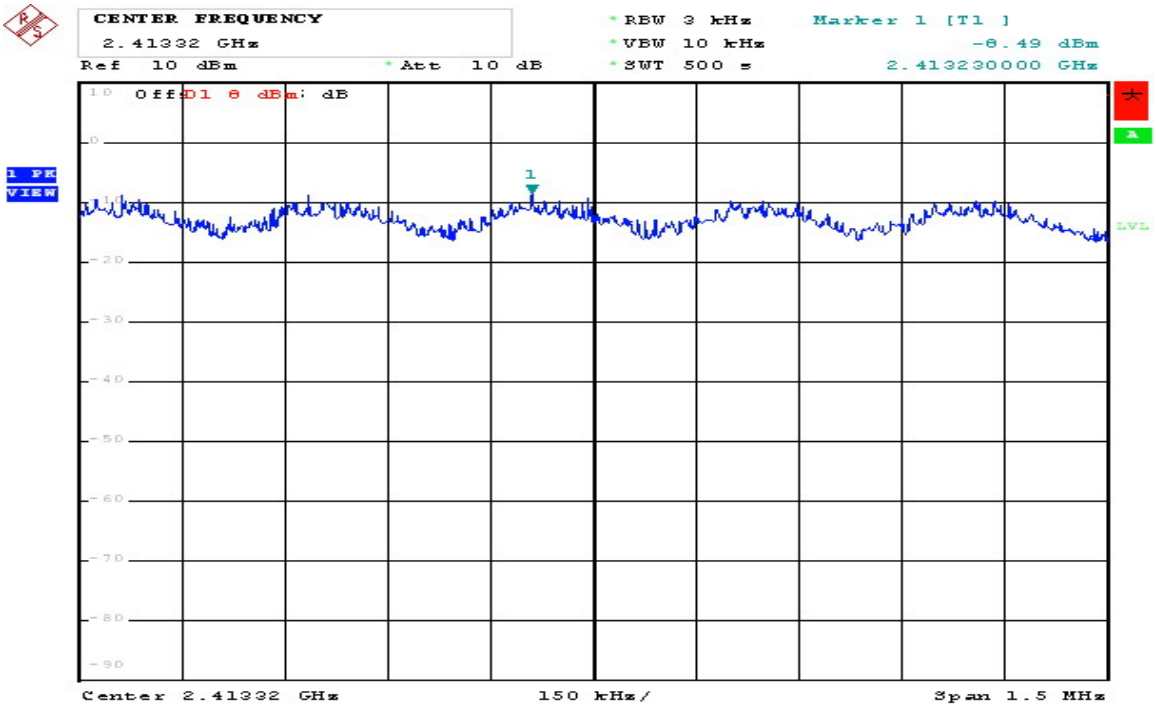
Date: 19.DEC.2008 09:07:13

802.11g CH1 2412MHz



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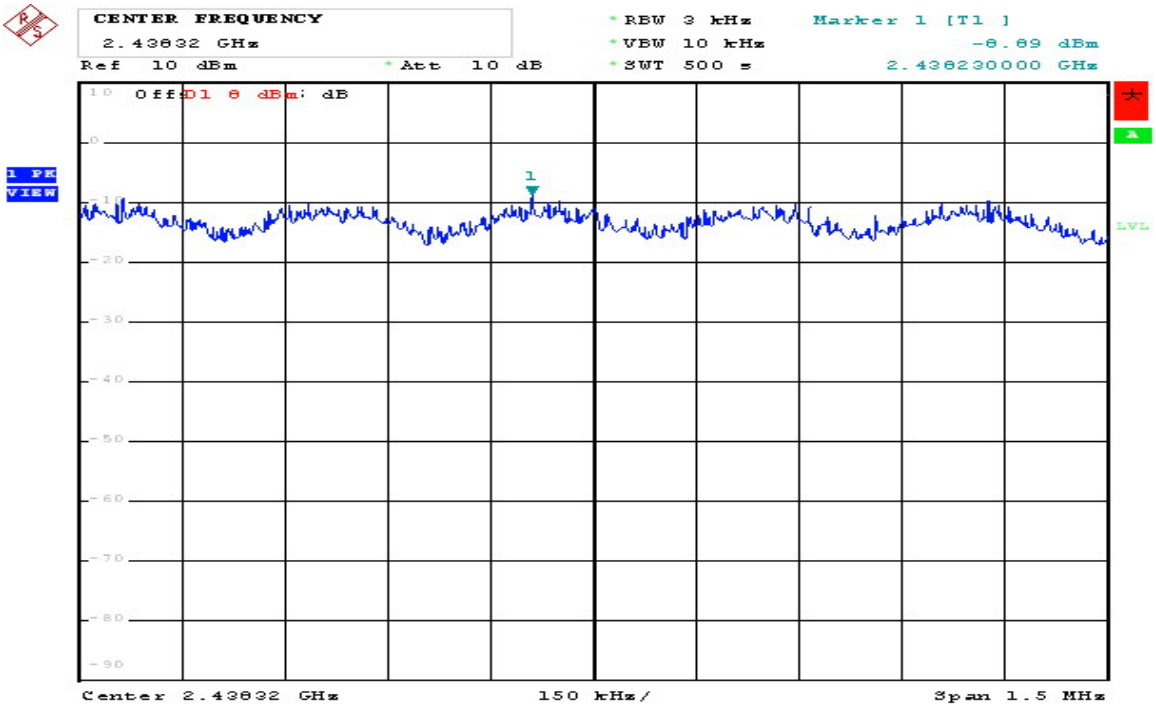
802.11g CH6 2437MHz



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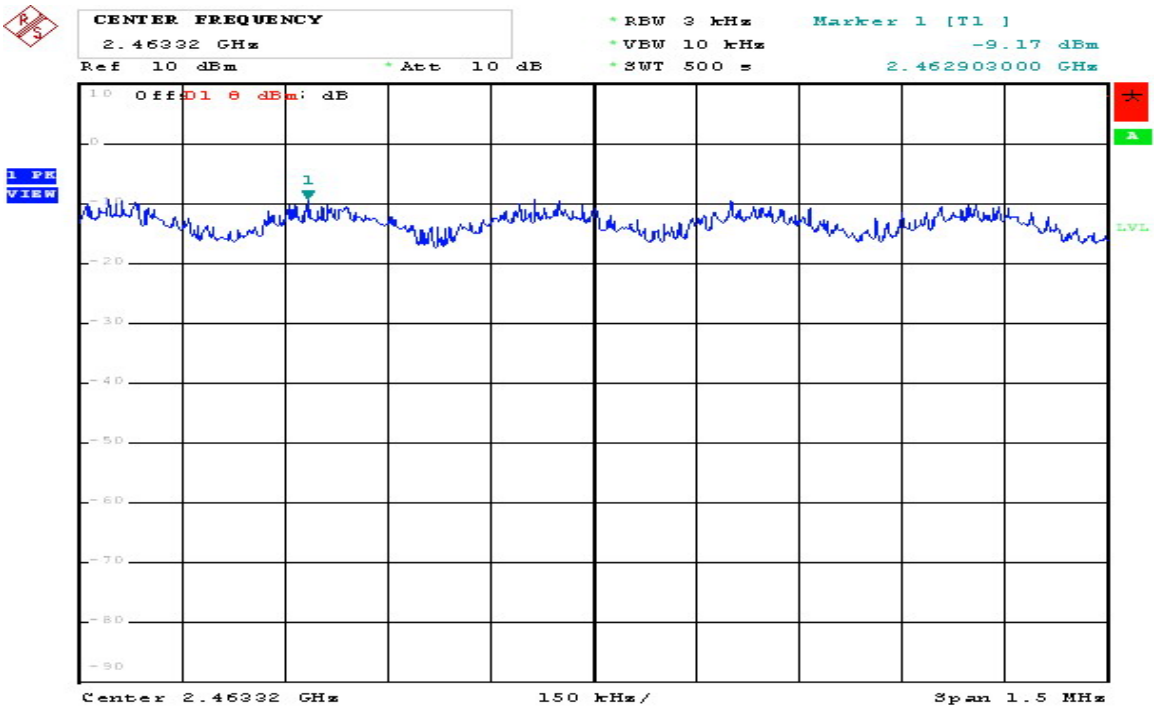
802.11g CH11 2462MHz



Comment: 802.11g 2462MHz
Date: 19.DEC.2006 09:05:02

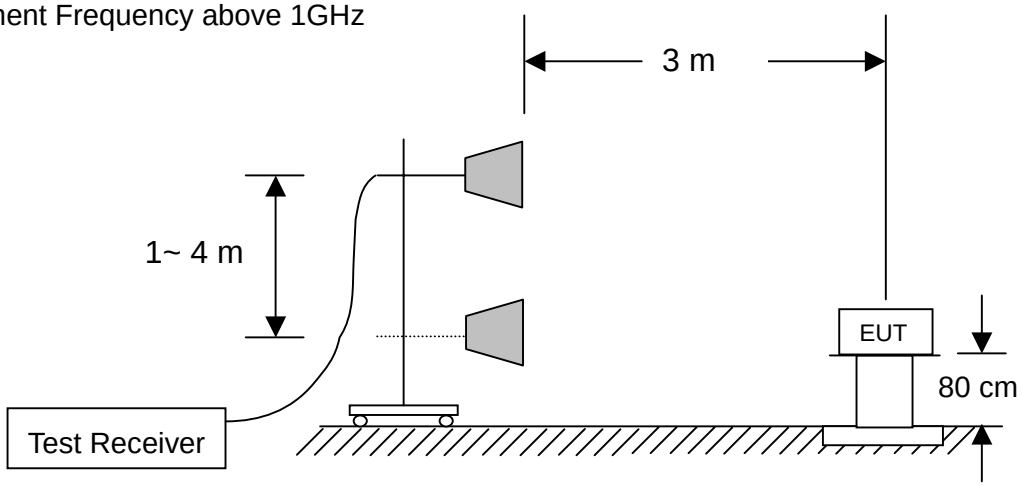
8 Emission on the Band Edge test

8.1 Limit

In any 100kHz 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.

8.2 Configuration of Measurement

Measurement Frequency above 1GHz



8.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.
Set RBW =1M, VBW= RBW for peak, and VBW=10Hz for average.
The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meter and down to 1 meter.

8.4 Test Result

PASS.
The final test data is shown on as following pages.

Band edge

EUT Equip By ANT-WDB-ANM-0609 Antenna

802.11b					
CH	Restrict Freq. Band (MHz)	Detector Mode	Maximum level (dB μV/m)	Limit (dBm)	Margin (dB)
1	2310~2390	PK	55.96	74	-18.04
		AV	44.52	54	-9.48
11	2483.5~2500	PK	53.77	74	-20.23
		AV	42.24	54	-11.76

802.11g					
CH	Restrict Freq. Band (MHz)	Detector Mode	Maximum level (dB μV/m)	Limit (dBm)	Margin (dB)
1	2310~2390	PK	70.15	74	-3.85
		AV	50.75	54	-3.25
11	2483.5~2500	PK	69.63	74	-4.37
		AV	50.65	54	-3.35

EUT Equip By ANT-WSB-ANM-05 BLACK Antenna

802.11b					
CH	Restrict Freq. Band (MHz)	Detector Mode	Maximum level (dB μV/m)	Limit (dBm)	Margin (dB)
1	2310~2390	PK	61.49	74	-12.51
		AV	50.62	54	-3.38
11	2483.5~2500	PK	61.48	74	-12.52
		AV	50.05	54	-3.95

802.11g					
CH	Restrict Freq. Band (MHz)	Detector Mode	Maximum level (dB μV/m)	Limit (dBm)	Margin (dB)
1	2310~2390	PK	72.04	74	-1.96
		AV	52.53	54	-1.47
11	2483.5~2500	PK	72.84	74	-1.16
		AV	53.12	54	-0.88

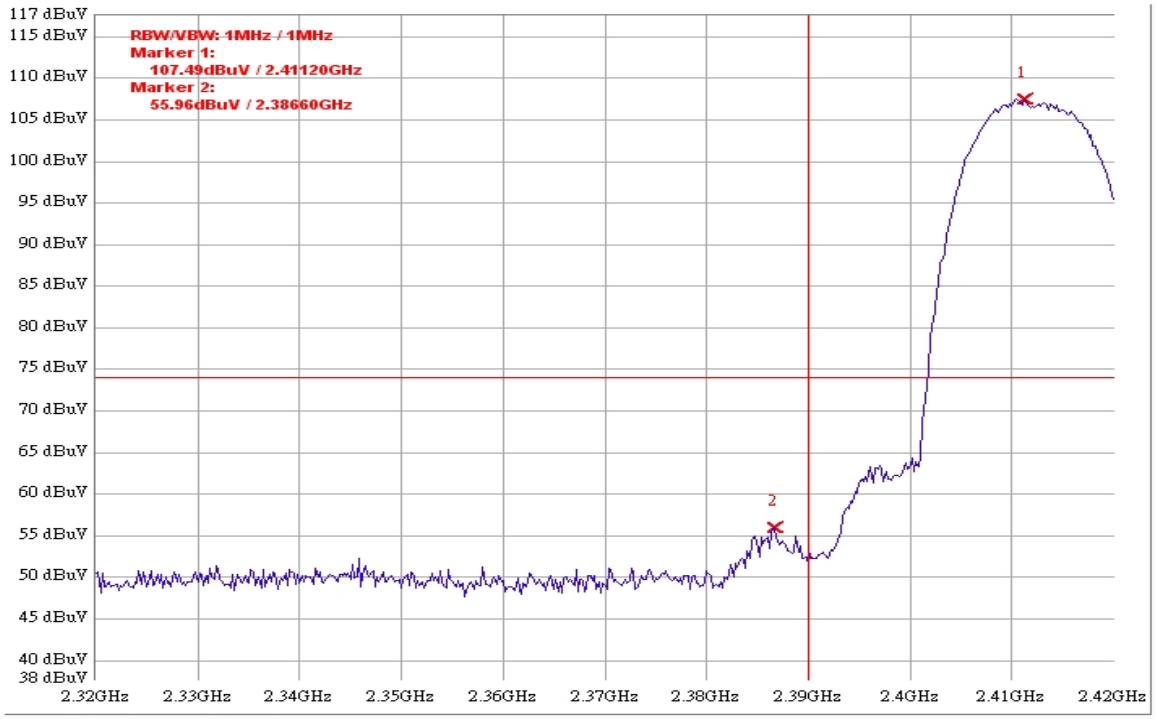
EUT Equip By ANT-WSB-ANM-05 Black 2.4G Antenna

802.11b					
CH	**Restrict Freq. Band (MHz)**	**Detector Mode**	**Maximum level (dB μV/m)**	**Limit (dBm)**	**Margin (dB)**
1	2310~2390	PK	61.29	74	-12.71
		AV	49.34	54	-4.66
11	2483.5~2500	PK	55.47	74	-18.53
		AV	43.54	54	-10.46

802.11g					
CH	**Restrict Freq. Band (MHz)**	**Detector Mode**	**Maximum level (dB μV/m)**	**Limit (dBm)**	**Margin (dB)**
1	2310~2390	PK	71.28	74	-2.72
		AV	52.80	54	-1.20
11	2483.5~2500	PK	64.70	74	-9.30
		AV	46.01	54	-7.99

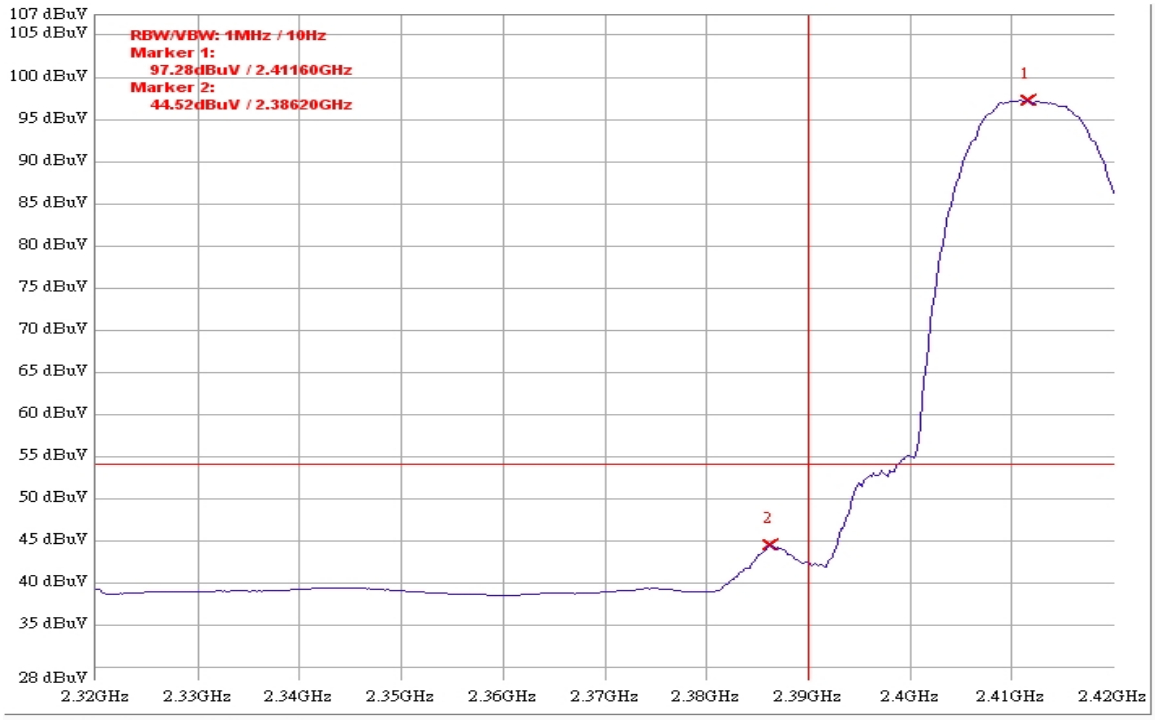
EUT Equip By ANT-WDB-ANM-0609 Antenna

802.11b CH1 2412MHz PK



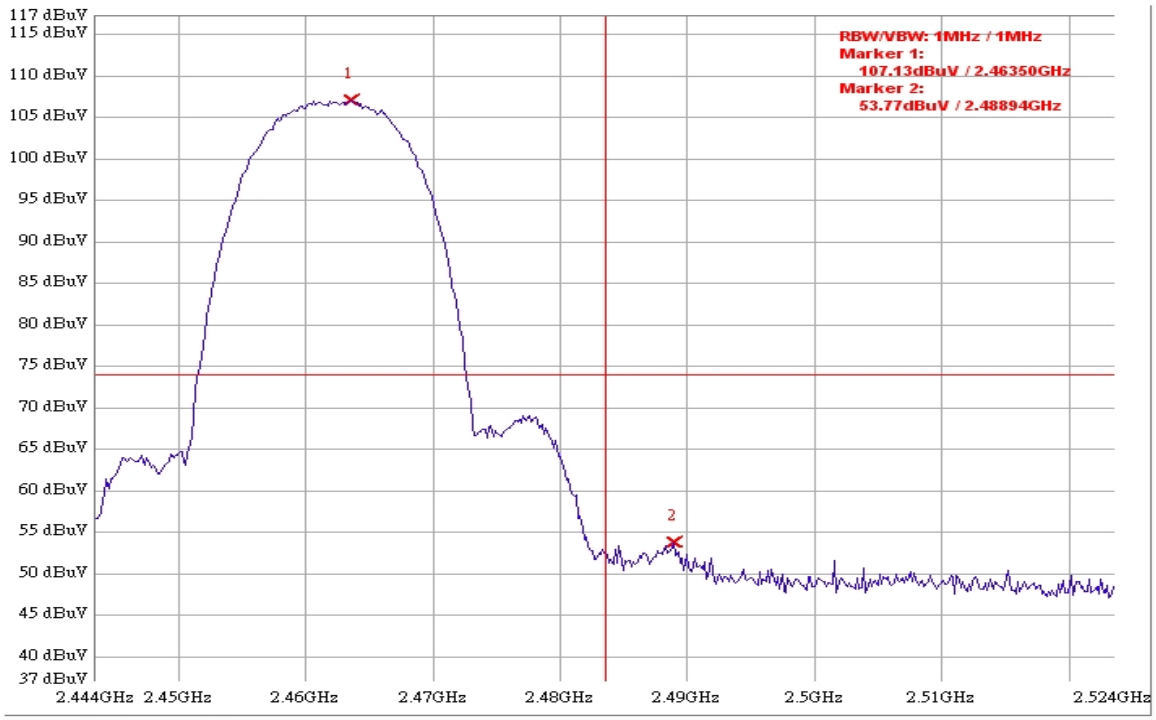
Band Edge_802.11b_2412MHz_PK

802.11b CH1 2412MHz AV

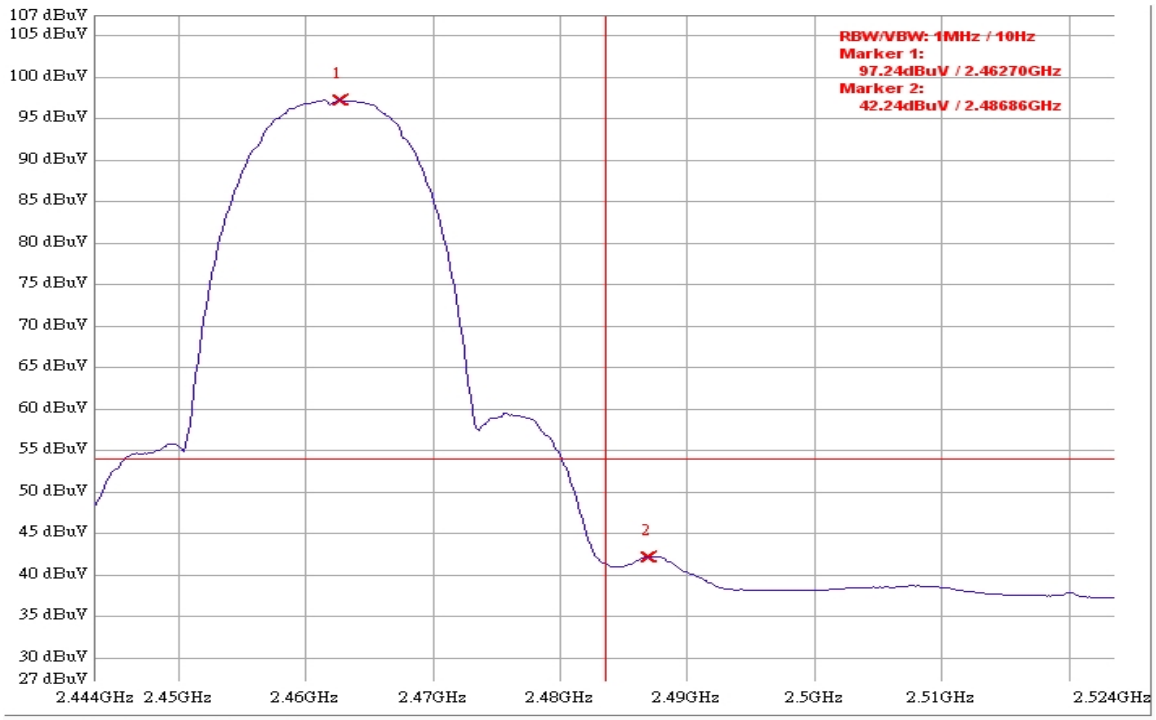


Band Edge_802.11b_2412MHz_AV

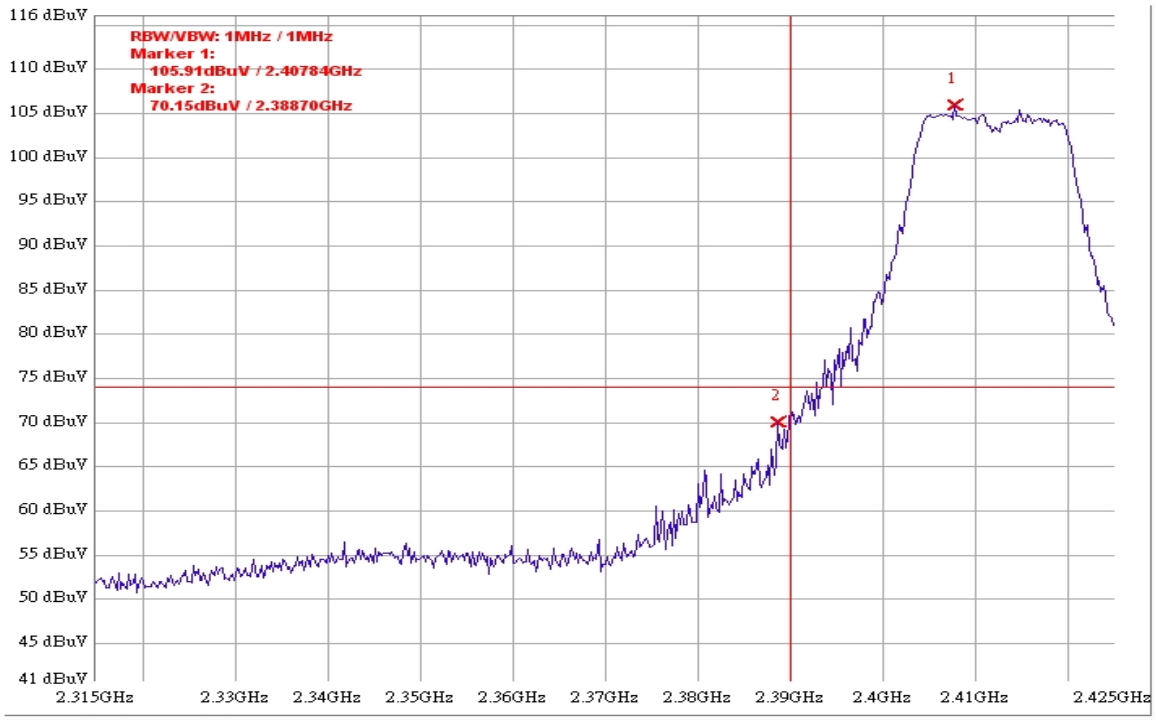
802.11b CH11 2462MHz PK



802.11b CH11 2462MHz AV

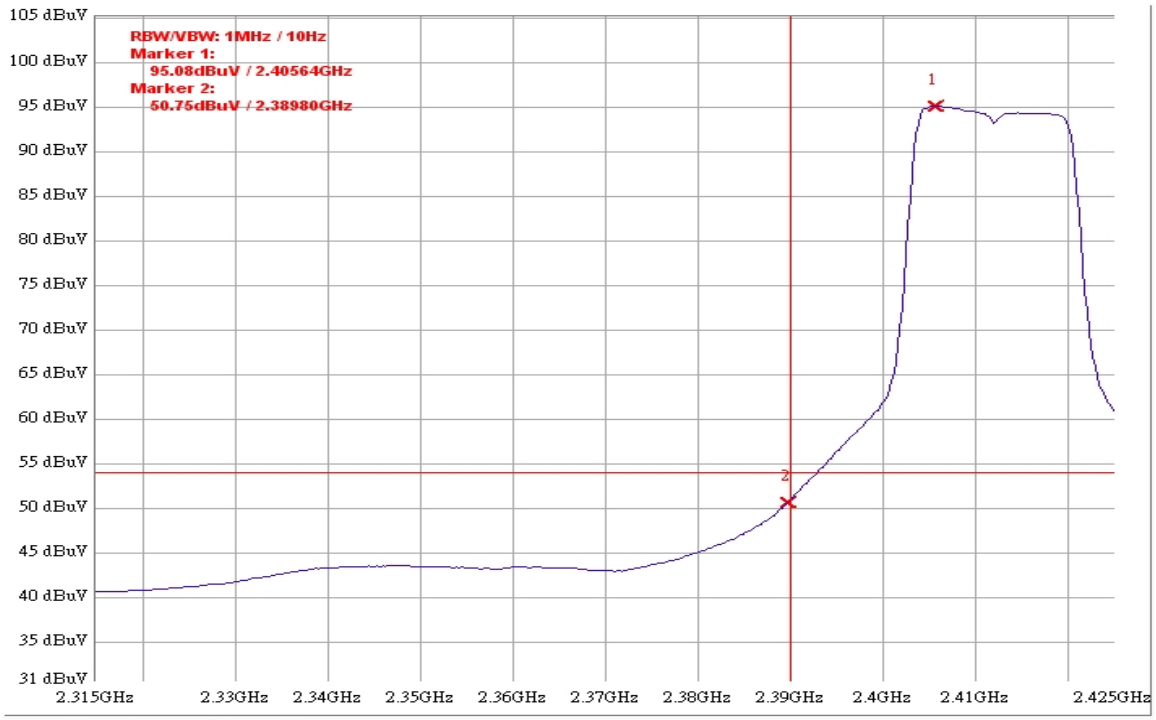


802.11g CH1 2412MHz PK



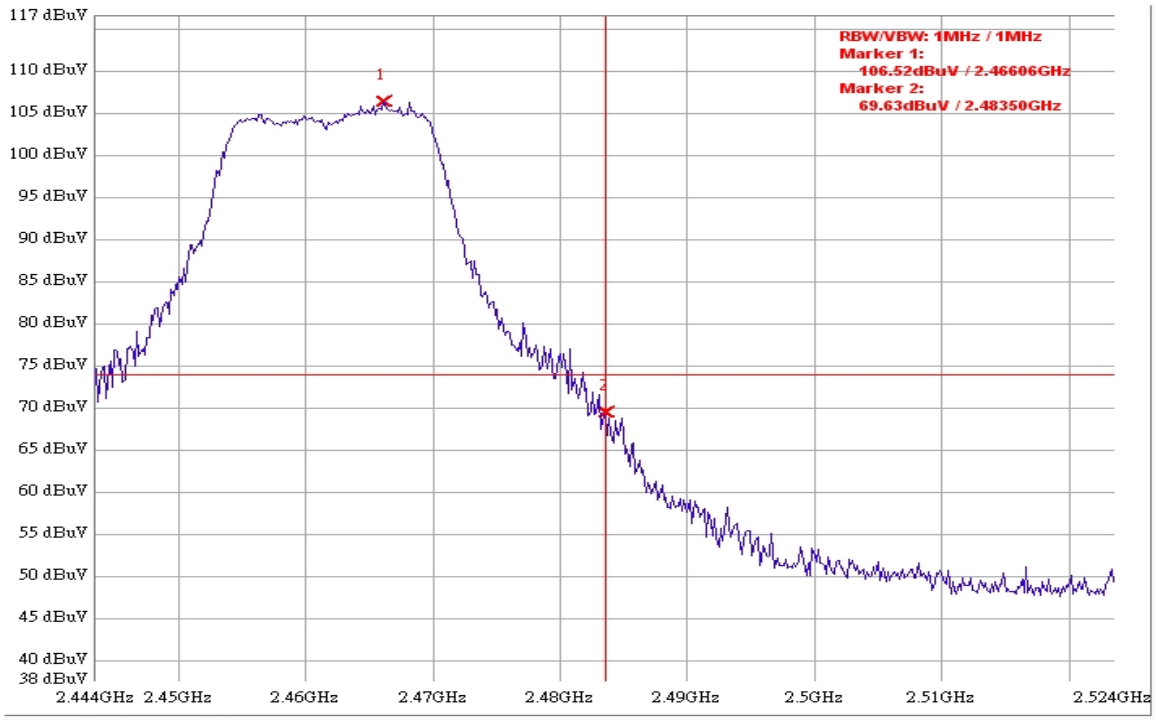
Band Edge_802.11g_2412MHz_PK

802.11g CH1 2412MHz AV



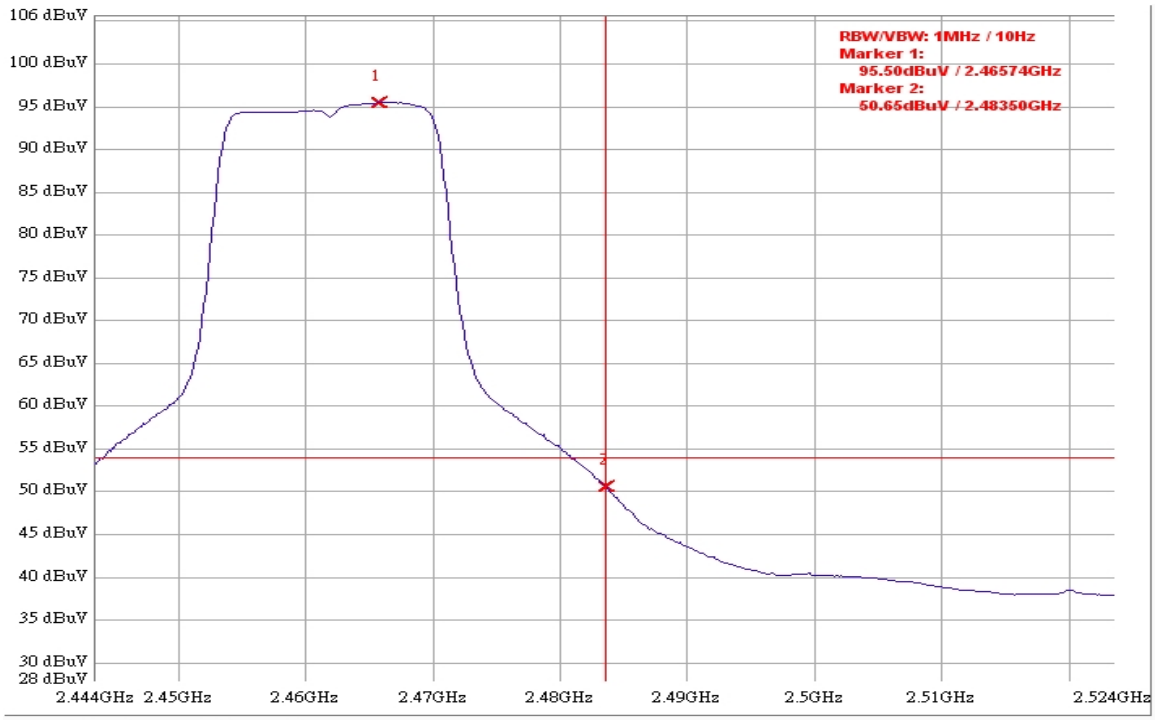
Band Edge_802.11g_2412MHz_AV

802.11g CH11 2462MHz PK



Band Edge_802.11g_2462MHz_PK

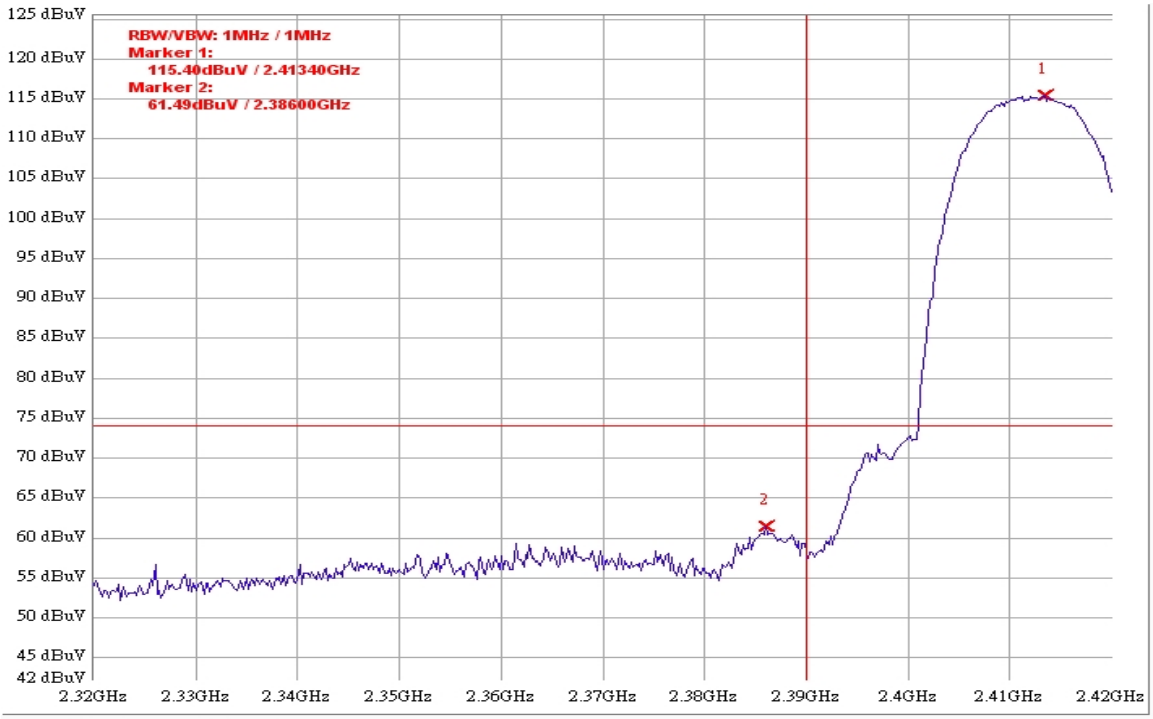
802.11g CH11 2462MHz AV



Band Edge_802.11g_2462MHz_AV

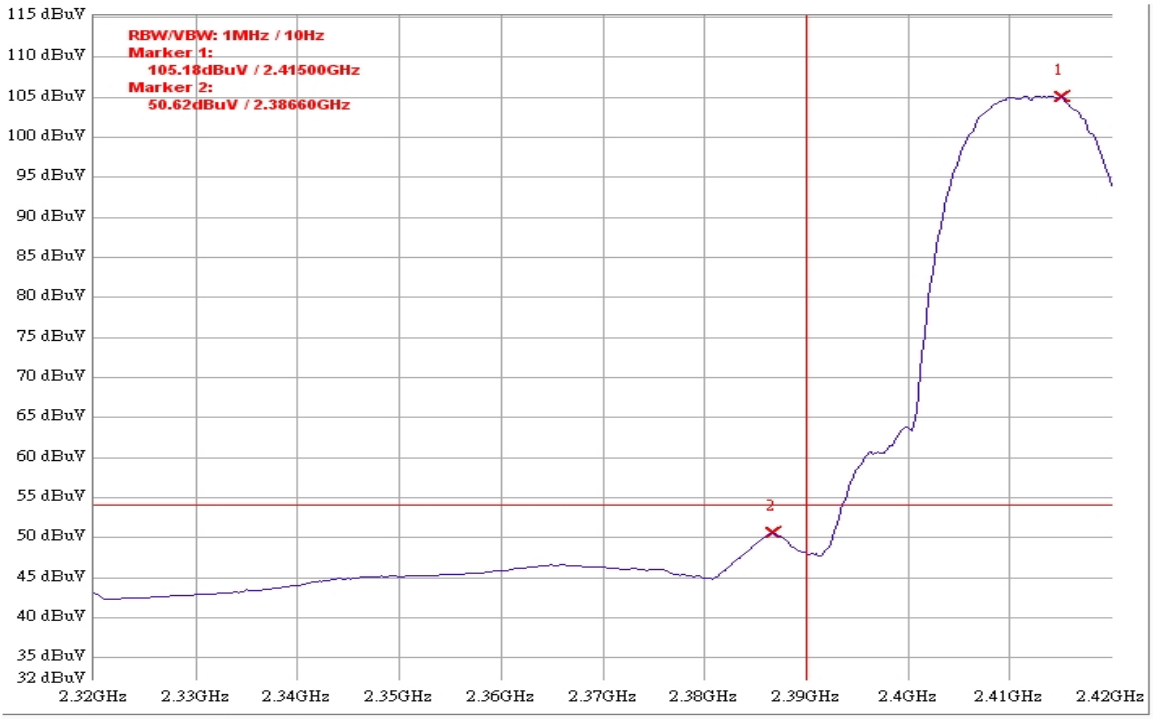
EUT Equip By ANT-WSB-ANM-05 BLACK Antenna

802.11b CH1 2412MHz PK



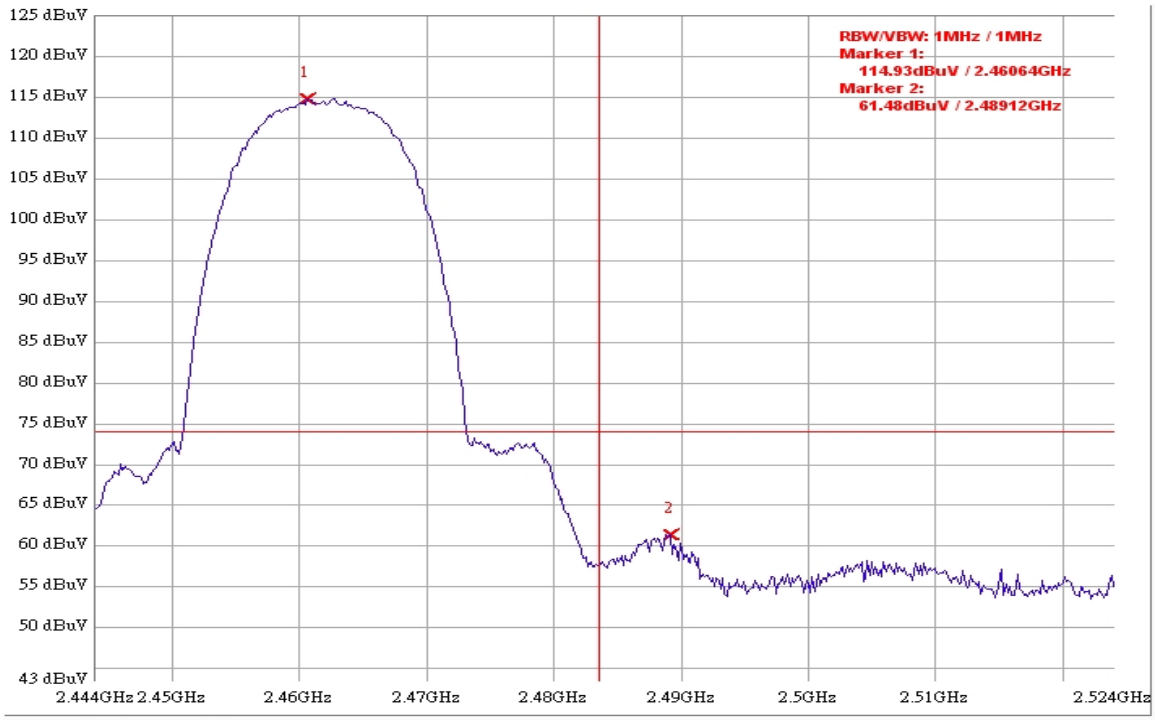
Band Edge_802.11b_2412MHz_PK

802.11b CH1 2412MHz AV



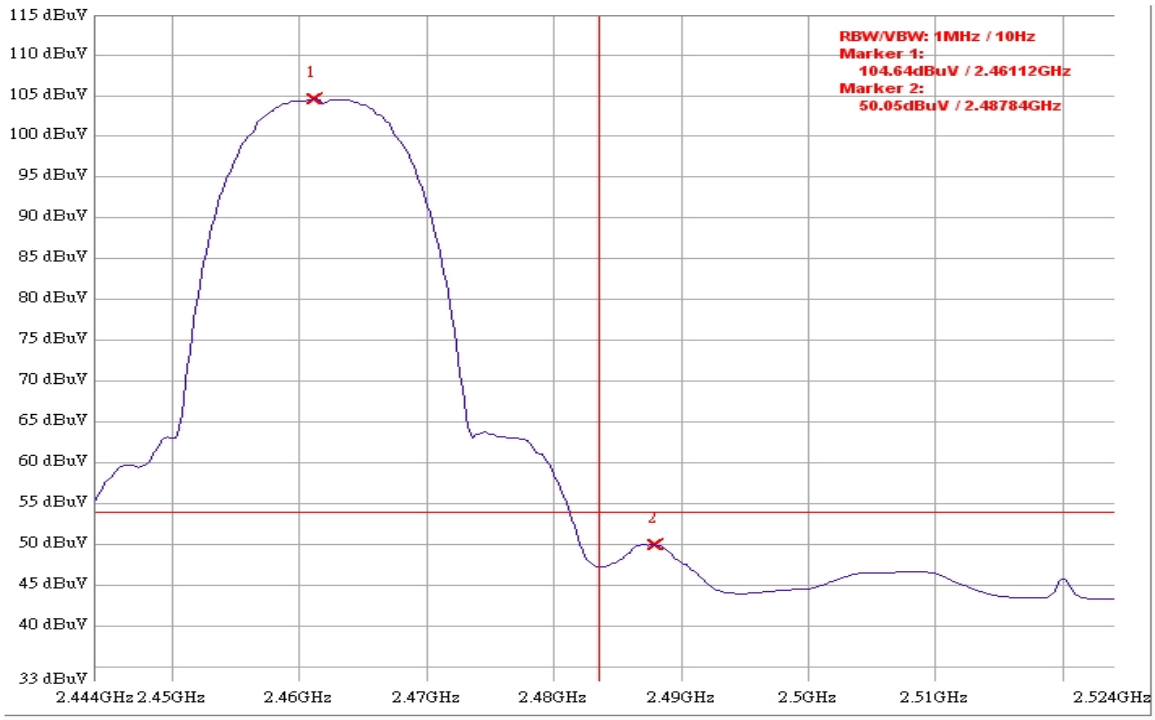
Band Edge_802.11b_2412MHz_AV

802.11b CH11 2462MHz PK



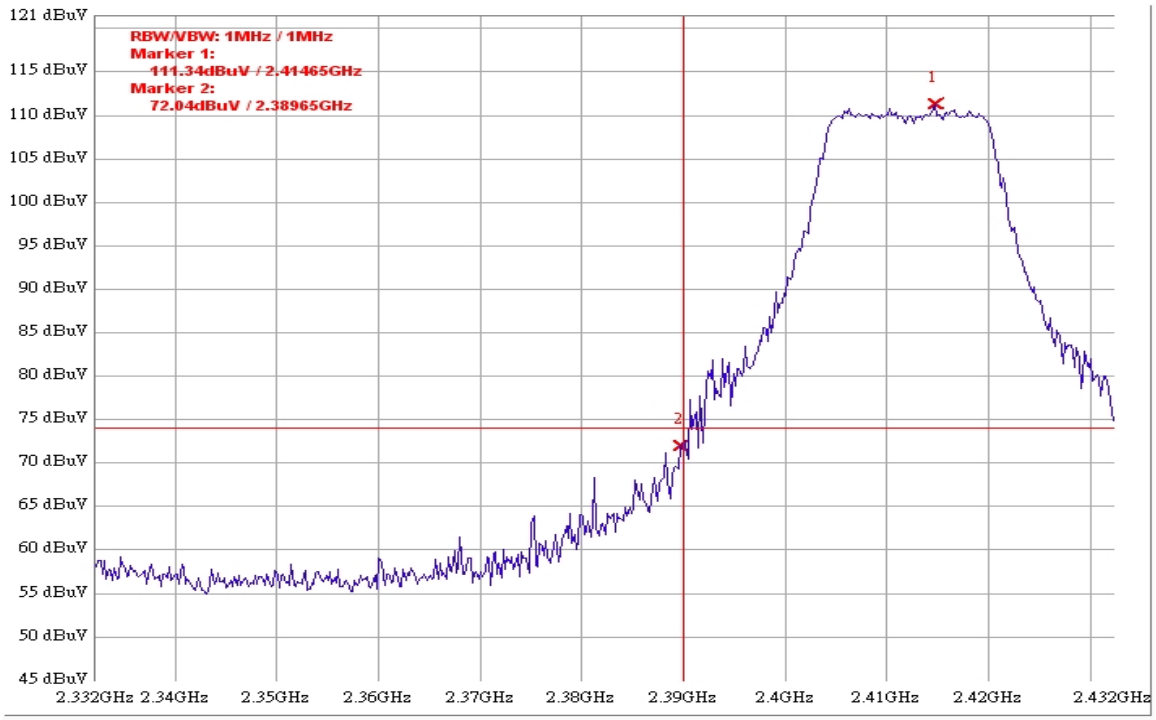
Band Edge_802.11b_2462MHz_PK

802.11b CH11 2462MHz AV

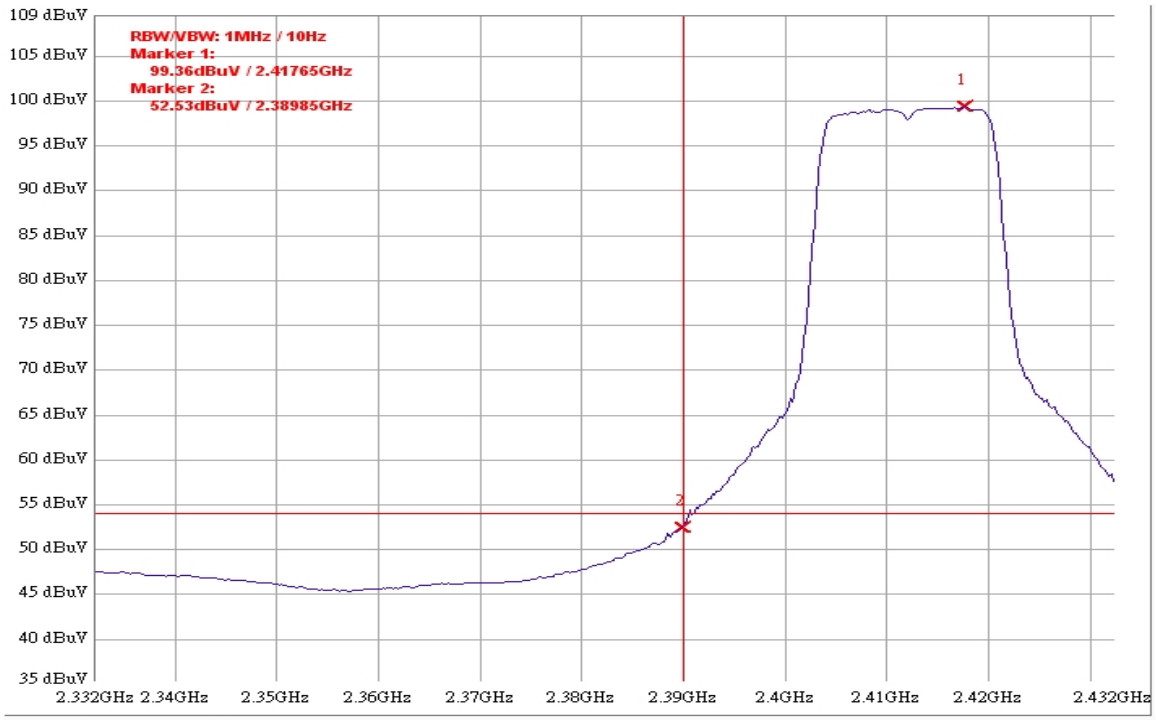


Band Edge_802.11b_2462MHz_AV

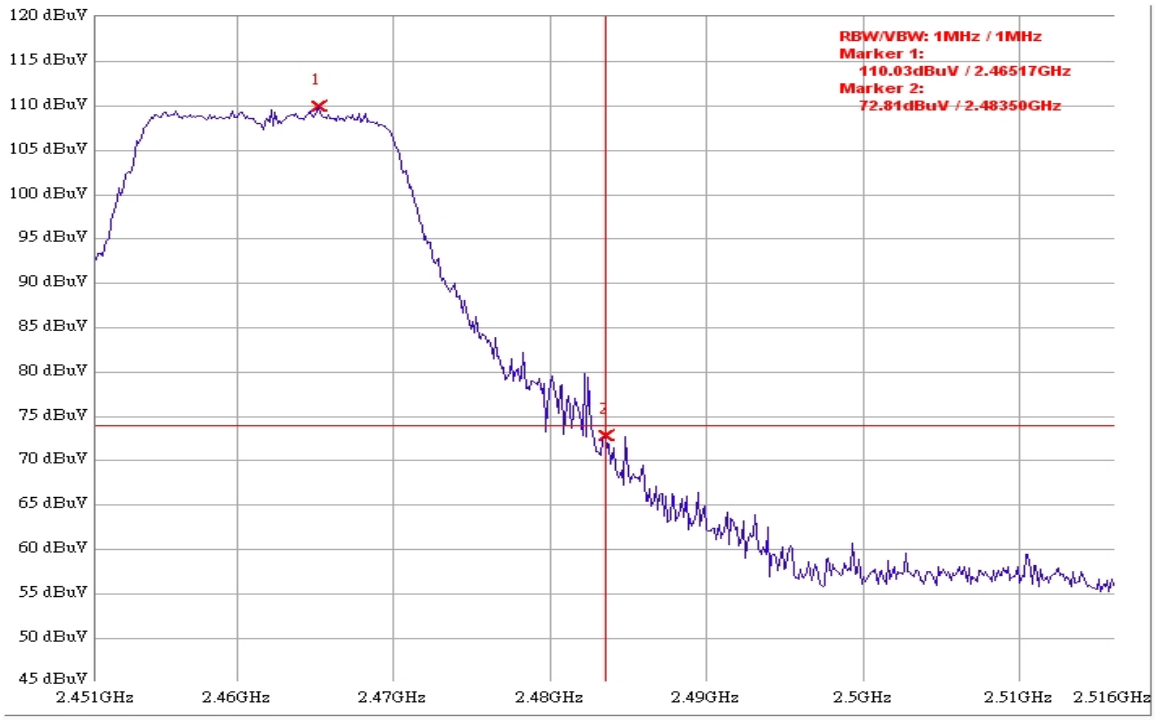
802.11g CH1 2412MHz PK



802.11g CH1 2412MHz AV

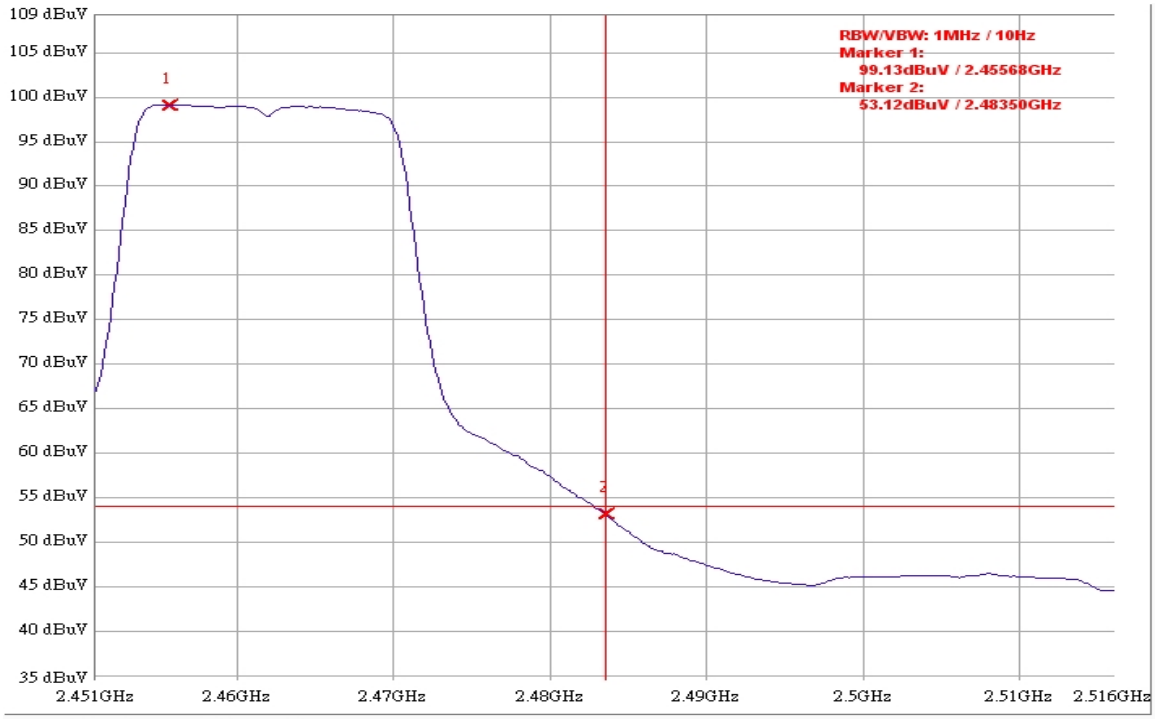


802.11g CH11 2462MHz PK



Band Edge_802.11g_2462MHz_PK

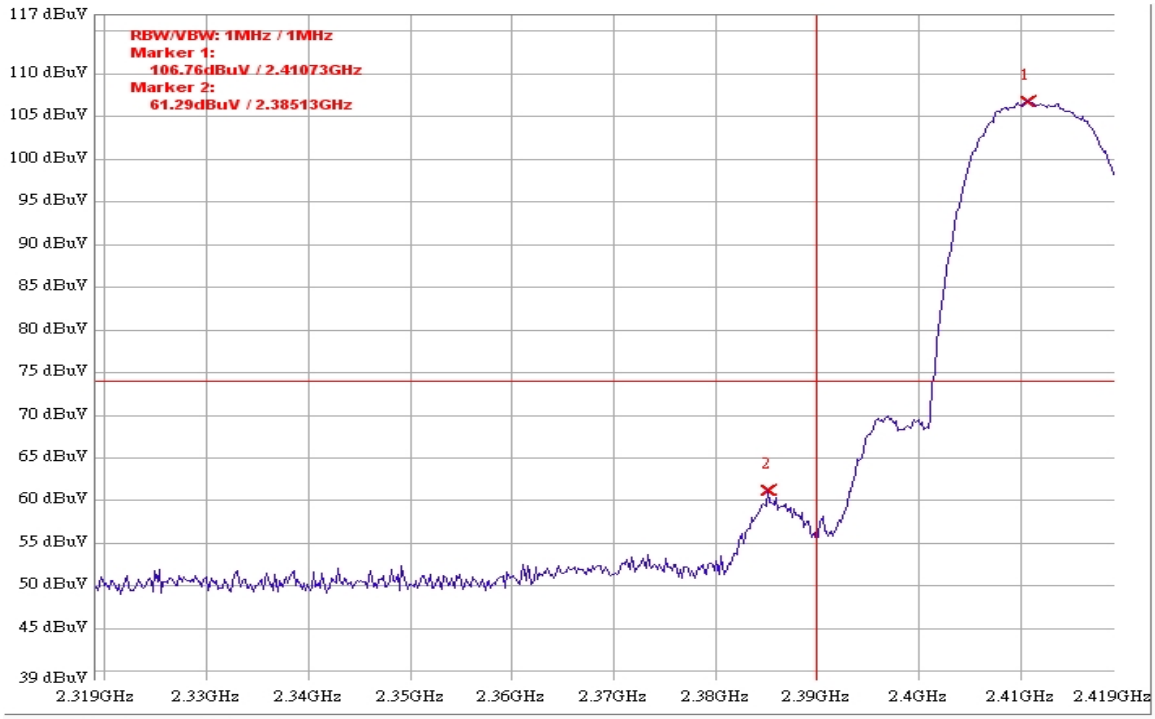
802.11g CH11 2462MHz AV



Band Edge_802.11g_2462MHz_AV

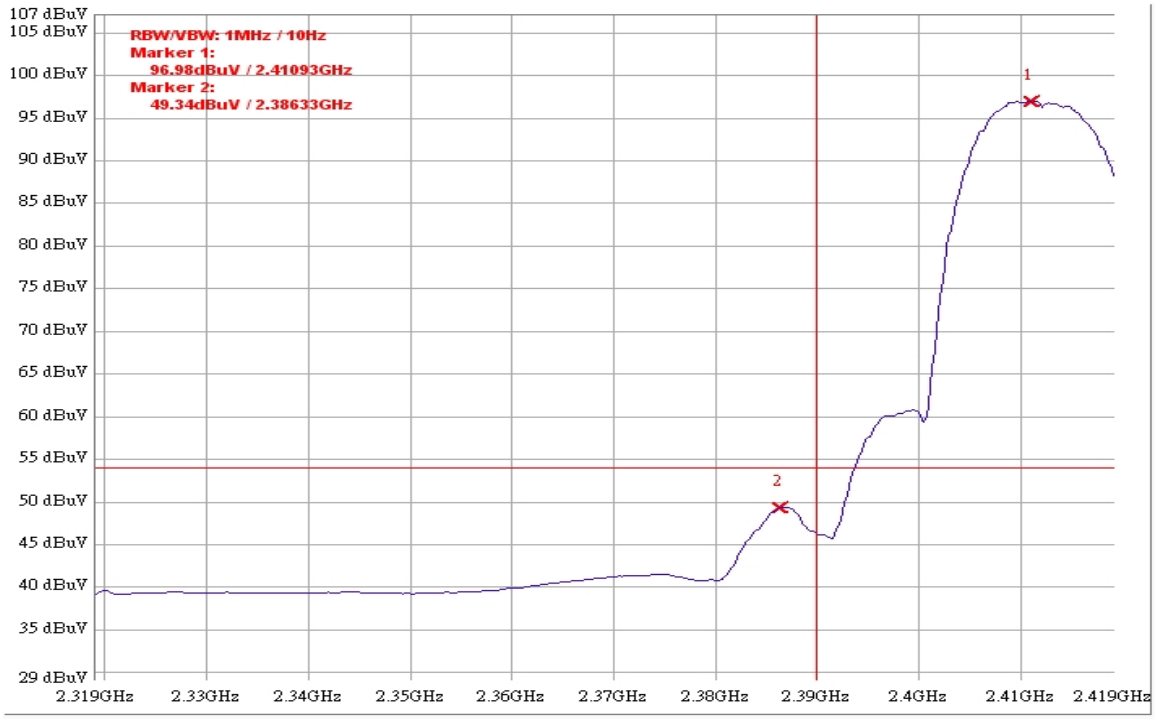
EUT Equip By ANT-WSB-ANM-05 Black 2.4G Antenna

802.11b CH1 2412MHz PK



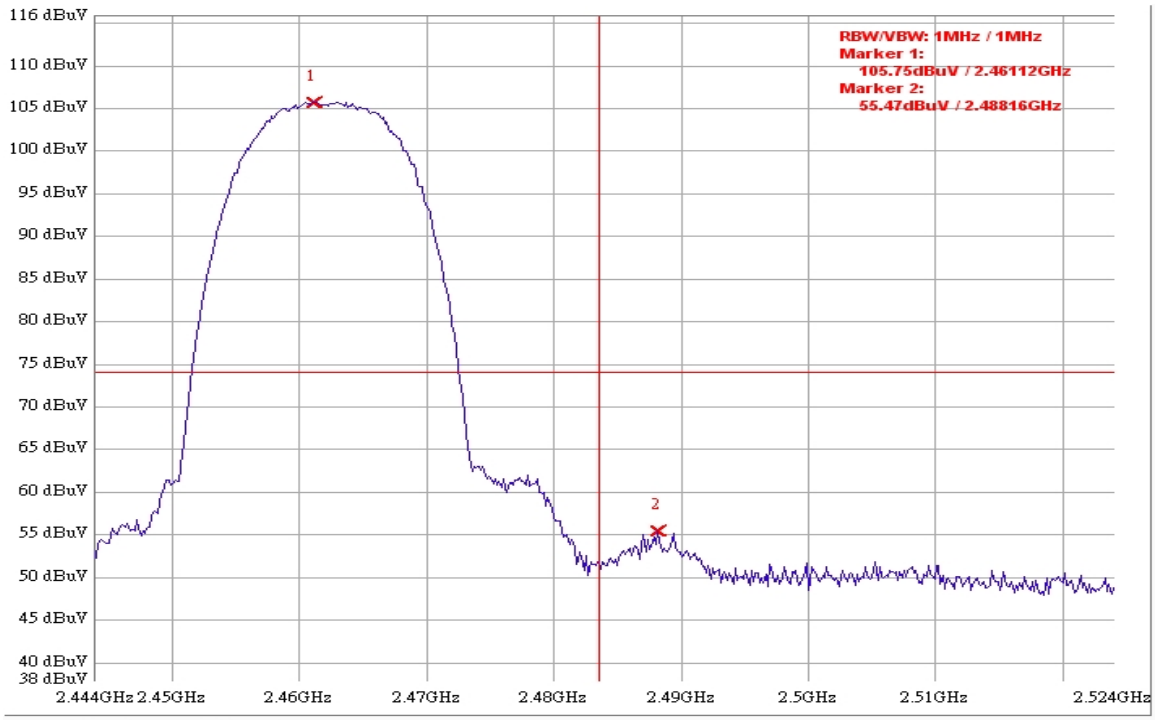
Band Edge_802.11b_2412MHz_PK

802.11b CH1 2412MHz AV

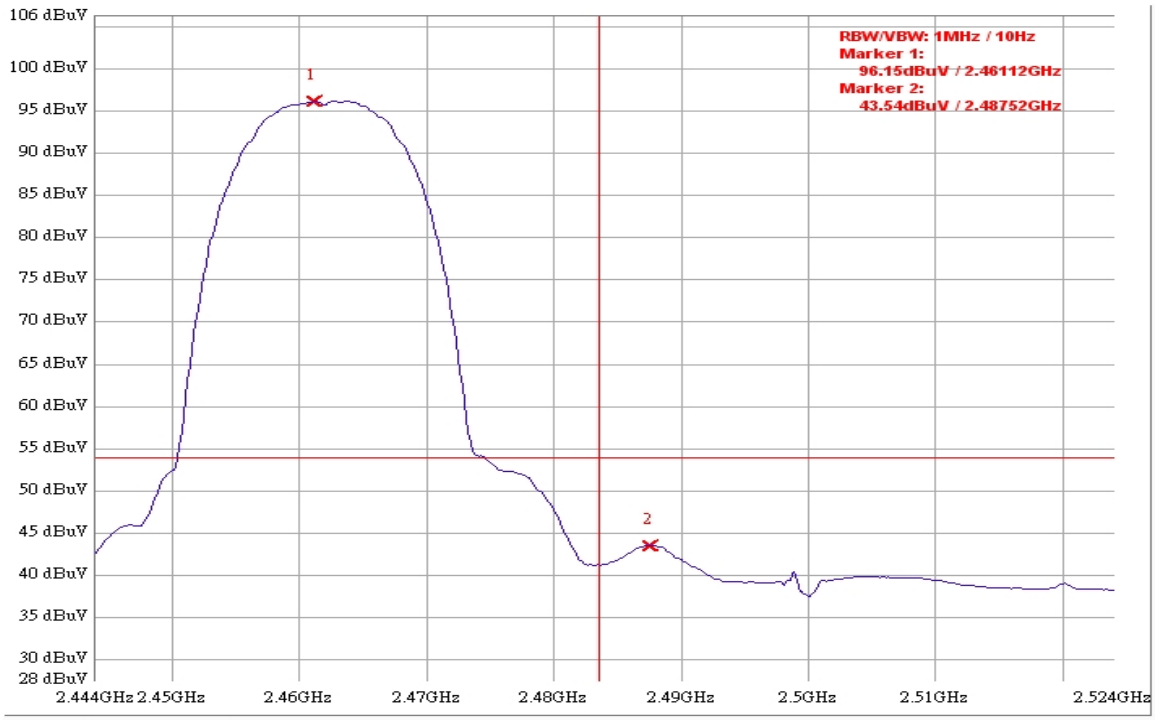


Band Edge_802.11b_2412MHz_AV

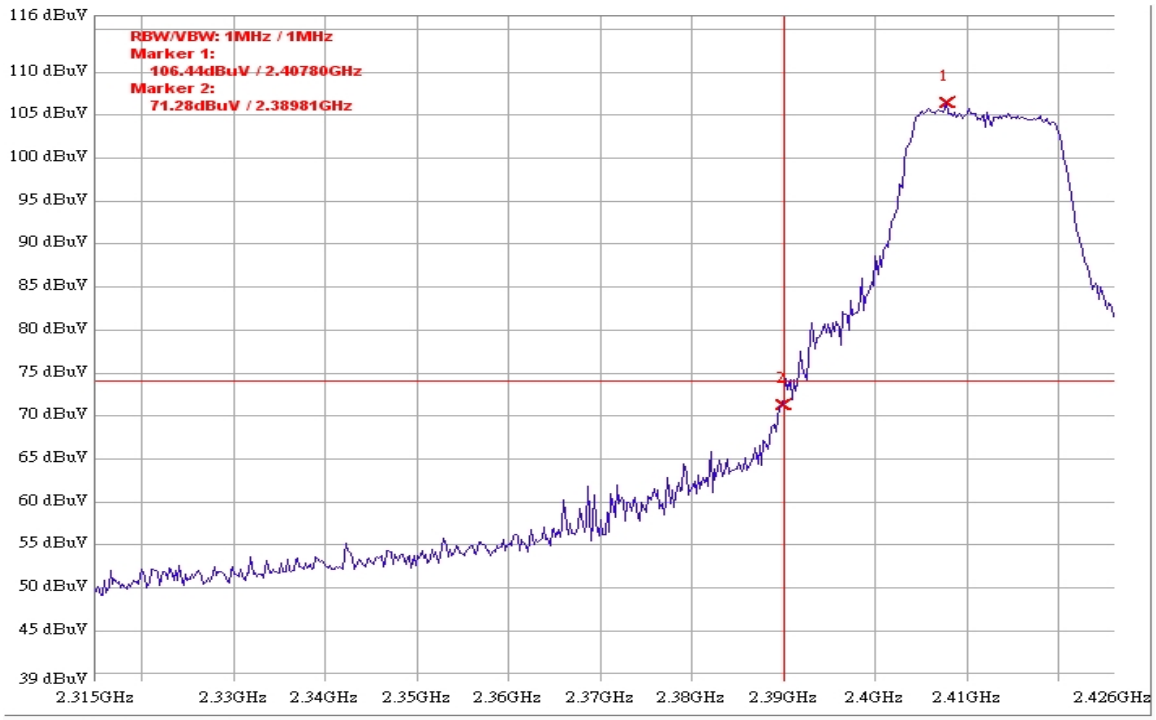
802.11b CH11 2462MHz PK



802.11b CH11 2462MHz AV

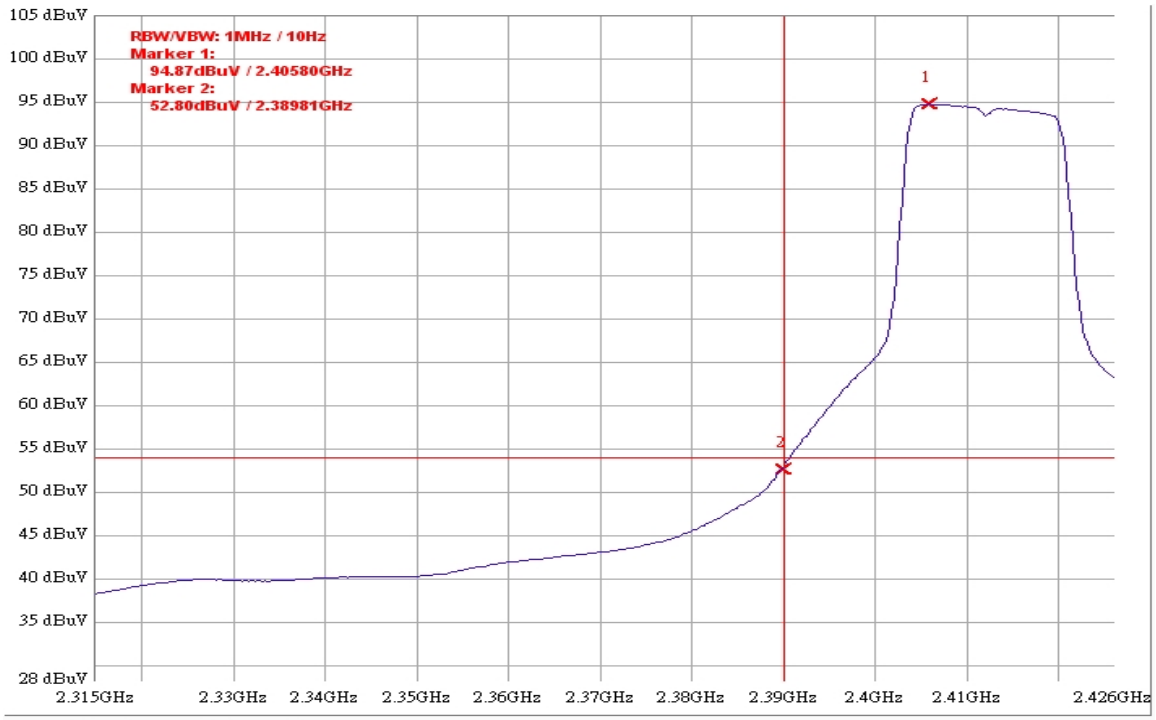


802.11g CH1 2412MHz PK



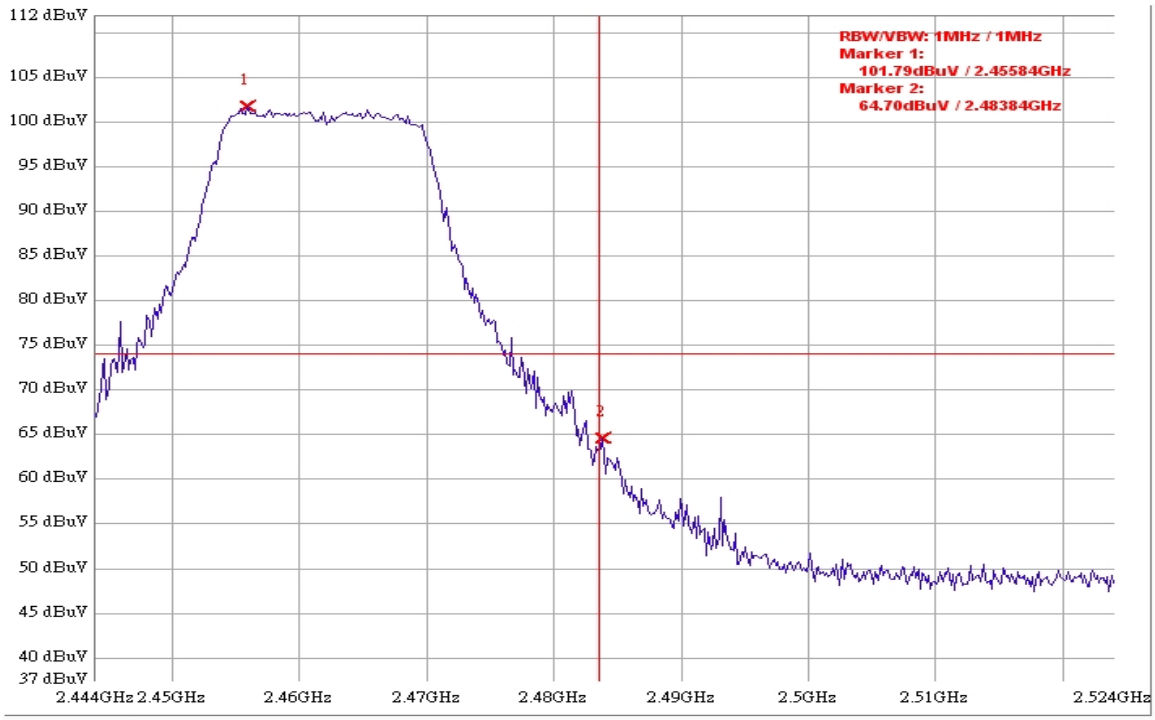
Band Edge_802.11g_2412MHz_PK

802.11g CH1 2412MHz AV



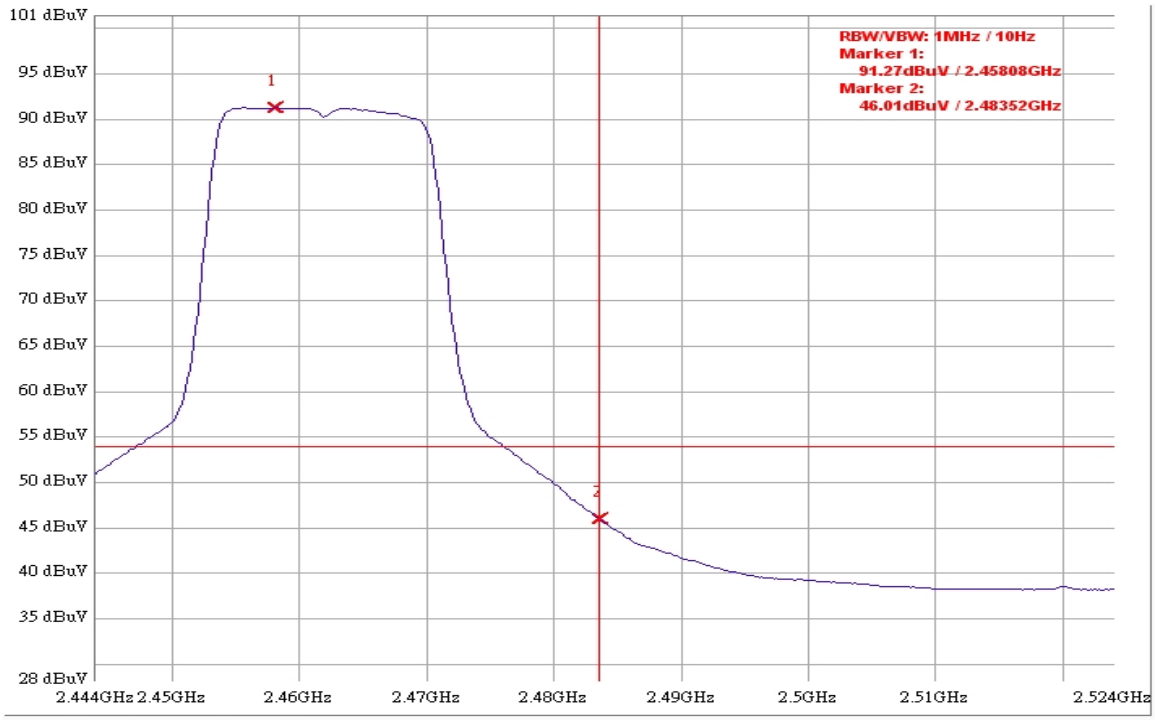
Band Edge_802.11g_2412MHz_AV

802.11g CH11 2462MHz PK



Band Edge_802.11g_2462MHz_PK

802.11g CH11 2462MHz AV



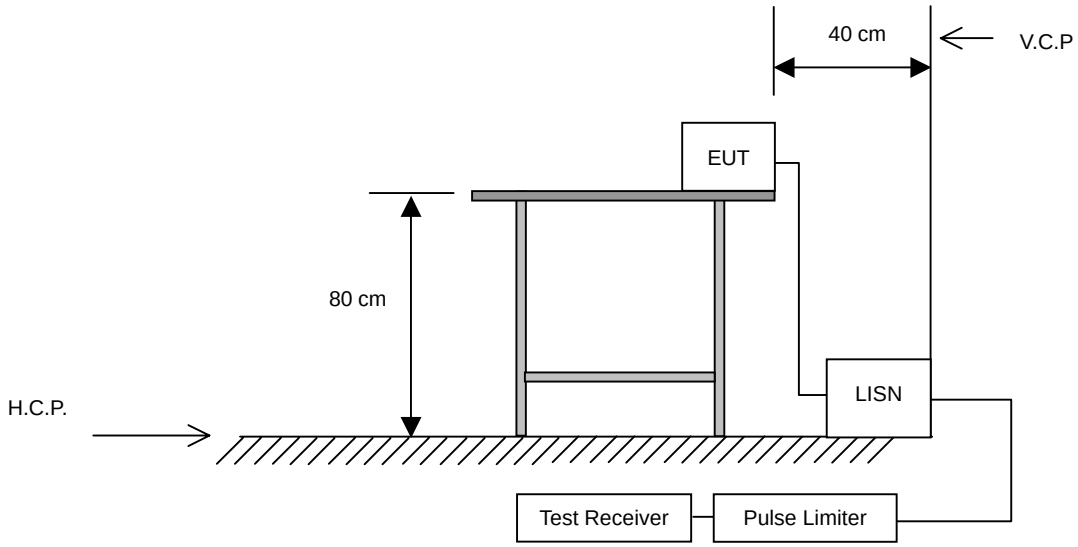
Band Edge_802.11g_2462MHz_AV

9 AC Power Line Conducted Emission test

9.1 Limit

Frequency (MHz)	Quasi-Peak (dB μV)	Average (dB μV)
0.15 to 0.5	66 to 56	56 to 46
> 0.5 to 5	56	46
> 5 to 30	60	50
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

9.2 Configuration of Measurement



9.3 Test Procedures

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

1) The EUT was placed 80cm height above ground on a non-conductive table and vertical conducting plane located 40cm to the rear of the EUT.
2) The EUT was connected to the main power through Line Impedance Stabilization Networks (LISN). This setup provided a 50ohm/50mH coupling impedance for the measuring equipment. The auxiliary equipment will place in secondary LISN.
3) Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/2003 on conducted measurement.

9.4 Test Result

PASS.

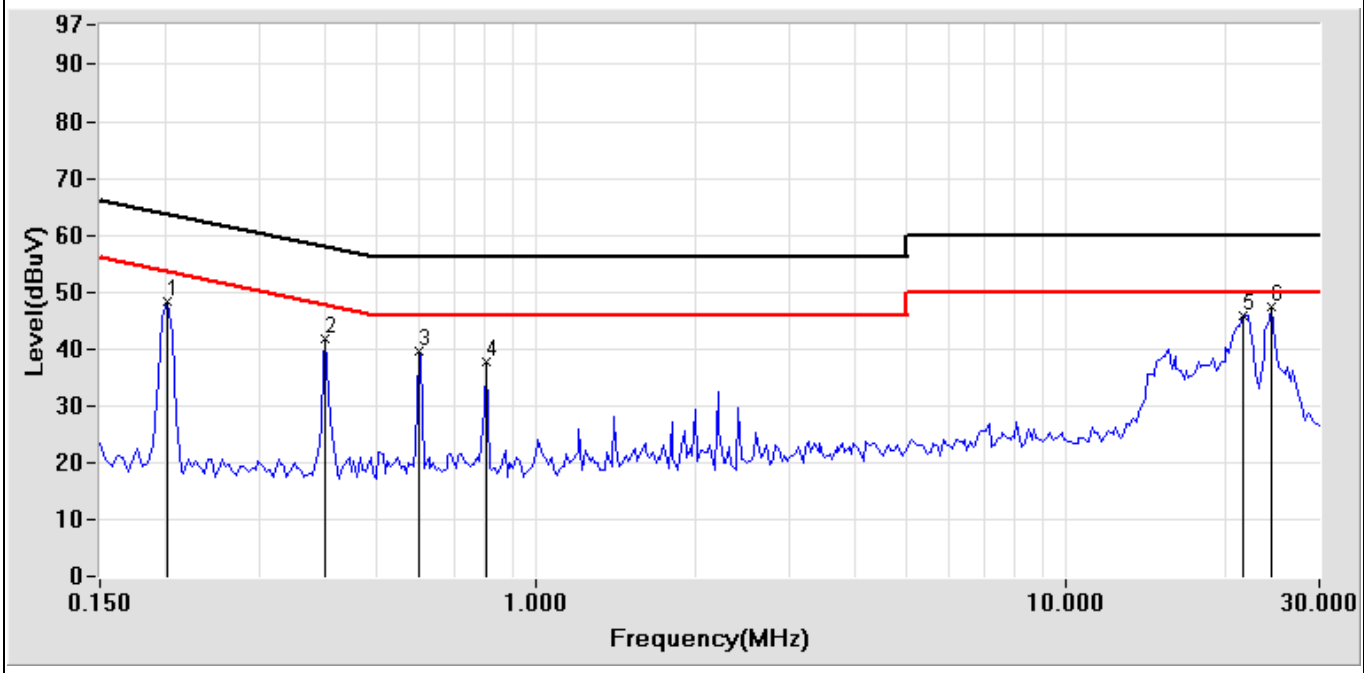
The final test data is shown on as following pages.

Power Line Conducted Test Data

EUT: Industrial 802.11a/b/g AP/Client	POLARITY: Line
CLIENT: MOXA	DISTANCE:
MODEL: AWK-4121	Serial No.:
RATING: DC 12V (worst case)	FILE/DATA#: MOXA.emi/53
Temperature: 17.0 ℃	OPERATOR: Terry
Humidity: 47 %	TEST SITE: Conduction1

Frequency	Factor	Meter Reading (dBµV)		Emission Level (dBµV)		Limits (dBµV)		Margin (dB)	
(MHz)	(dB)	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.201	0.15	48.20	48.13	48.35	48.28	63.57	53.57	-15.22	-5.29
0.400	0.15	41.30	41.22	41.45	41.37	57.85	47.85	-16.40	-6.48
0.599	0.15	40.00	39.80	40.15	39.95	56.00	46.00	-15.85	-6.05
0.802	0.17	37.00	36.92	37.17	37.09	56.00	46.00	-18.83	-8.91
21.576	0.96	40.65	31.20	41.61	32.16	60.00	50.00	-18.39	-17.84
24.298	1.03	45.23	44.27	46.26	45.30	60.00	50.00	-13.74	-4.70

Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



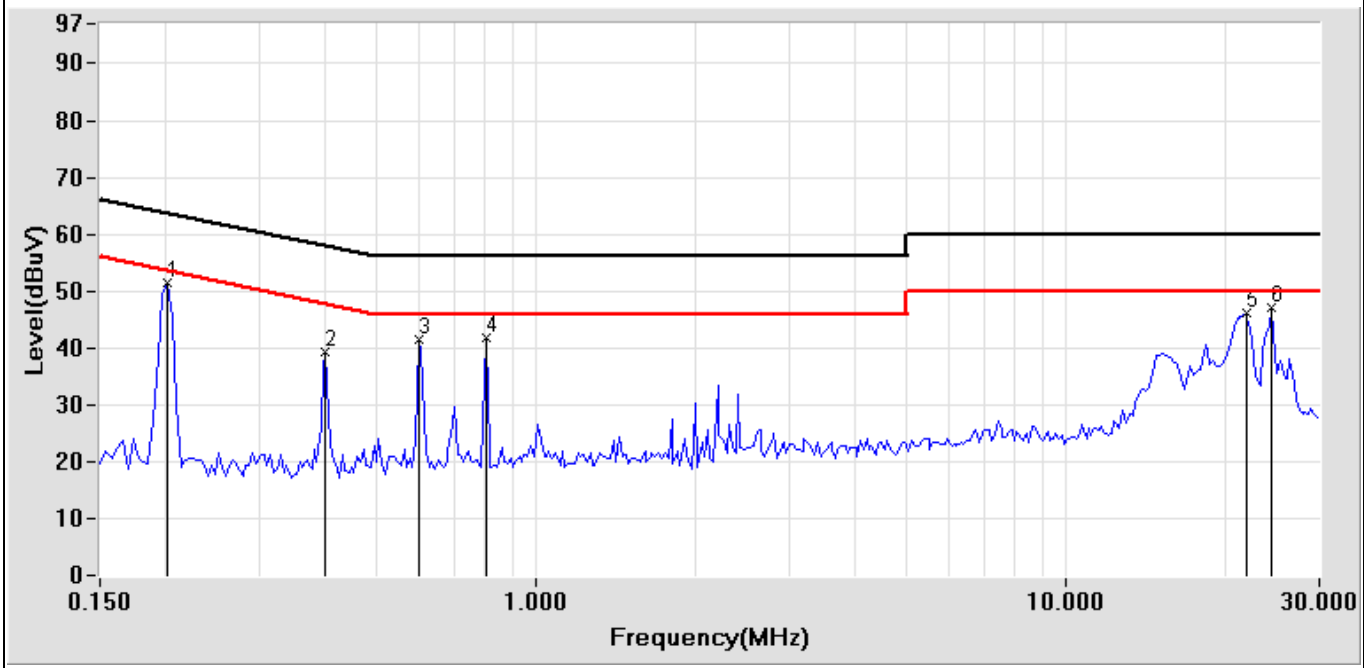
Test Mode: Working Mode

Power Line Conducted Test Data

EUT: Industrial 802.11a/b/g AP/Client	POLARITY: Neutral
CLIENT: MOXA	DISTANCE:
MODEL: AWK-4121	Serial No.:
RATING: DC 12V (worst case)	FILE/DATA#: MOXA.emi/52
Temperature: 17.0 ℃	OPERATOR: Terry
Humidity: 47 %	TEST SITE: Conduction1

Frequency	Factor	Meter Reading (dBµV)		Emission Level (dBµV)		Limits (dBµV)		Margin (dB)	
(MHz)	(dB)	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.201	0.16	50.60	50.55	50.76	50.71	63.57	53.57	-12.81	-2.86
0.400	0.16	38.60	38.59	38.76	38.75	57.85	47.85	-19.09	-9.10
0.599	0.16	41.40	41.30	41.56	41.46	56.00	46.00	-14.44	-4.54
0.802	0.18	41.50	41.40	41.68	41.58	56.00	46.00	-14.32	-4.42
21.795	1.10	40.21	30.59	41.31	31.69	60.00	50.00	-18.69	-18.31
24.298	1.17	45.12	44.18	46.29	45.35	60.00	50.00	-13.71	-4.65

Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



Test Mode: Working Mode