



A D T

FCC TEST REPORT (15.407)

REPORT NO.: RF970902L05-1

MODEL NO.: AWLL7025

RECEIVED: Sep. 02, 2008

TESTED: Nov. 03 ~ Nov. 19, 2008

ISSUED: Dec. 08, 2008

APPLICANT: Gemtek Technology Co., Ltd.

ADDRESS: No. 15-1, Zhonghua Rd, Hsinchu Industrial Park, Hsinchu County, Taiwan, R.O.C. 303

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang, Taipei Hsien 244, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This test report consists of 93 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.





A D T

TABLE OF CONTENTS

1.	CERTIFICATION.....	4
2.	SUMMARY OF TEST RESULTS	5
2.1	MEASUREMENT UNCERTAINTY.....	5
3.	GENERAL INFORMATION.....	6
3.1	GENERAL DESCRIPTION OF EUT	6
3.2	DESCRIPTION OF TEST MODES	8
3.2.1	CONFIGURATION OF SYSTEM UNDER TEST	8
3.2.2	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	8
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS	11
3.4	DESCRIPTION OF SUPPORT UNITS	11
4.	TEST TYPES AND RESULTS	12
4.1	RADIATED EMISSION MEASUREMENT	12
4.1.1	LIMITS OF RADIATED EMISSION MEASUREMENT	12
4.1.2	LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS	13
4.1.3	TEST INSTRUMENTS.....	14
4.1.4	TEST PROCEDURES	15
4.1.5	DEVIATION FROM TEST STANDARD.....	15
4.1.6	TEST SETUP.....	16
4.1.7	EUT OPERATING CONDITION.....	16
4.1.8	TEST RESULTS	17
4.2	CONDUCTED EMISSION MEASUREMENT	26
4.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	26
4.2.2	TEST INSTRUMENTS.....	26
4.2.3	TEST PROCEDURES	27
4.2.4	DEVIATION FROM TEST STANDARD.....	27
4.2.5	TEST SETUP.....	28
4.2.6	EUT OPERATING CONDITIONS	28
4.2.7	TEST RESULTS	29
4.3	PEAK TRANSMIT POWER MEASUREMENT	31
4.3.1	LIMITS OF PEAK TRANSMIT POWER MEASUREMENT	31
4.3.2	TEST INSTRUMENTS.....	31
4.3.3	TEST PROCEDURE.....	31
4.3.4	DEVIATION FROM TEST STANDARD.....	32
4.3.5	TEST SETUP.....	32
4.3.6	EUT OPERATING CONDITIONS	32
4.3.7	TEST RESULTS	33
4.4	PEAK POWER EXCURSION MEASUREMENT	44
4.4.1	LIMITS OF PEAK POWER EXCURSION MEASUREMENT	44
4.4.2	TEST INSTRUMENTS.....	44
4.4.3	TEST PROCEDURE.....	44
4.4.4	DEVIATION FROM TEST STANDARD.....	45
4.4.5	TEST SETUP.....	45
4.4.6	EUT OPERATING CONDITIONS	45
4.4.7	TEST RESULTS	46



A D T

4.5	PEAK POWER SPECTRAL DENSITY MEASUREMENT	62
4.5.1	LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT	62
4.5.2	TEST INSTRUMENTS	62
4.5.3	TEST PROCEDURES	62
4.5.4	DEVIATION FROM TEST STANDARD	63
4.5.5	TEST SETUP	63
4.5.6	EUT OPERATING CONDITIONS	63
4.5.7	TEST RESULTS	64
4.6	FREQUENCY STABILITY	73
4.6.1	LIMITS OF FREQUENCY STABILITY MEASUREMENT	73
4.6.2	TEST INSTRUMENTS	73
4.6.3	TEST PROCEDURE	73
4.6.4	DEVIATION FROM TEST STANDARD	74
4.6.5	TEST SETUP	74
4.6.6	EUT OPERATING CONDITION	74
4.6.7	TEST RESULTS	75
4.7	BAND EDGES MEASUREMENT	76
4.7.1	TEST INSTRUMENTS	76
4.7.2	TEST PROCEDURE	77
4.7.3	EUT OPERATING CONDITION	77
4.7.4	TEST RESULTS	78
4.8	ANTENNA REQUIREMENT	90
4.8.1	STANDARD APPLICABLE	90
4.8.2	ANTENNA CONNECTED CONSTRUCTION	90
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION	91
6.	INFORMATION ON THE TESTING LABORATORIES	92
7.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	93

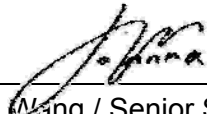


A D T

1. CERTIFICATION

PRODUCT: Dual Band Wireless N USB Adapter
MODEL: AWLL7025
BRAND: Airlink101
APPLICANT: Gemtek Technology Co., Ltd.
TEST SAMPLE: ENGINEERING SAMPLE
TESTED: Nov. 03 ~ Nov. 19, 2008
STANDARDS: **FCC Part 15, Subpart E (Section 15.407)**
ANSI C63.4-2003

The above equipment (Model: AWLL7025) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY :  , **DATE** : Dec. 08, 2008
Joanna Wang / Senior Specialist

TECHNICAL ACCEPTANCE :  , **DATE** : Dec. 08, 2008
Responsible for RF Long Chen / Senior Engineer

APPROVED BY :  , **DATE** : Dec. 08, 2008
Gary Chang / Assistant Manager



2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -10.31dB at 3.844MHz.
15.407(b/1/2/3) (b)(5)	Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz	PASS	Meet the requirement of limit. Minimum passing margin is -1.98dB at 10480.000MHz.
15.407(a/1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.44dB
Radiated emissions	30MHz ~ 200MHz	3.19dB
	200MHz ~ 1000MHz	3.21dB
	1GHz ~ 18GHz	2.26dB
	18GHz ~ 40GHz	1.94dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.



A D T

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Dual Band Wireless N USB Adapter
MODEL NO.	AWLL7025
FCC ID	MXF-U971009GN
POWER SUPPLY	5Vdc from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps Draft 802.11n: up to 300.0Mbps
FREQUENCY RANGE	2.4GHz: 2400.0 ~ 2483.5MHz 5.0GHz: 5150.0 ~ 5250.0MHz, 5725.0 ~ 5825.0MHz
NUMBER OF CHANNEL	2.4GHz: 11 for 802.11b, 802.11g, draft 802.11n (20MHz) 7 for draft 802.11n (40MHz) 5.0GHz: 9 for 802.11a, draft 802.11n (20MHz) 4 for draft 802.11n (40MHz)
OUTPUT POWER	405.538mW for 2400.0 ~ 2483.5MHz 22.701mW for 5150.0 ~ 5250.0MHz 179.279mW for 5725.0 ~ 5825.0MHz
ANTENNA TYPE	Printed antenna with -0.3dBi gain (For 2.4GHz) Printed antenna with 4dBi gain (For 5.0GHz)
DATA CABLE	0.07m shielded USB cable without core
I/O PORTS	USB
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT is a Dual Band Wireless N USB Adapter. The functions of EUT listed as below:

	TEST STANDARD	REFERENCE REPORT
WLAN 802.11b/g, draft 802.11n	FCC Part 15, Subpart C (Section 15.247)	RF970902L05
WLAN 802.11a, draft 802.11n (5725~5825 MHz)		
WLAN 802.11a, draft 802.11n (5150~ 5250MHz)	FCC Part 15, Subpart E (Section 15.407)	RF970902L05-1



2. The frequency bands used in this EUT are listed as follows:

Frequency Band (MHz)	2400~2483.5	5150~5250	5725~5825
802.11b	√		
802.11g	√		
802.11a		√	√
Draft 802.11n (20MHz)	√	√	√
Draft 802.11n (40MHz)	√	√	√

3. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802.11a	1TX
Draft 802.11n (20MHz)	2TX
Draft 802.11n (40MHz)	2TX

4. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 DESCRIPTION OF TEST MODES

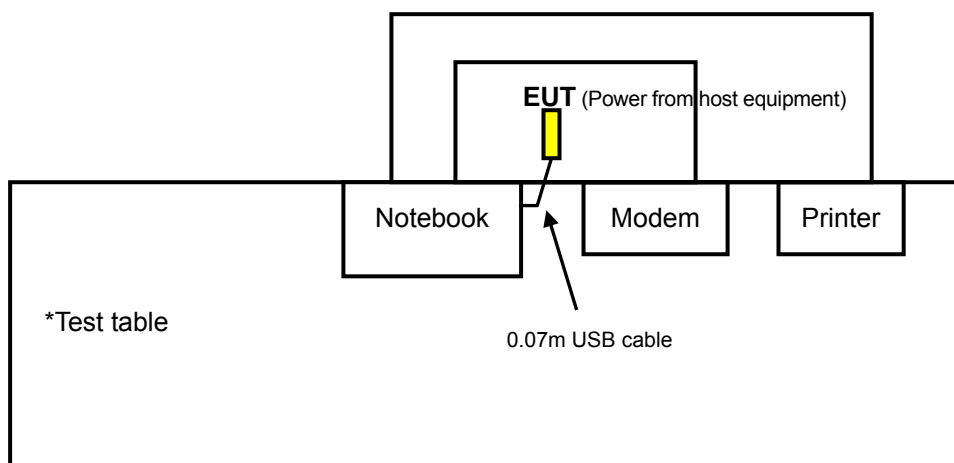
4 channels are provided for 802.11a, draft 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz

2 channels are provided for draft 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190MHz	46	5230MHz

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

RADIATED EMISSION TEST (ABOVE 1GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0	Z
Draft 802.11n (20MHz)	36 to 48	36, 40, 48	OFDM	BPSK	7.2	
Draft 802.11n (40MHz)	38 to 46	38, 46	OFDM	BPSK	15.0	

RADIATED EMISSION TEST (BELOW 1GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
Draft 802.11n (40MHz)	38 to 46	46	OFDM	BPSK	15.0	Z



POWER LINE CONDUCTED EMISSION TEST:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
Draft 802.11n (40MHz)	38 to 46	46	OFDM	BPSK	15.0

BANDEDGE MEASUREMENT:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	36 to 48	36, 48	OFDM	BPSK	6.0
Draft 802.11n (20MHz)	36 to 48	36, 48	OFDM	BPSK	7.2
Draft 802.11n (40MHz)	38 to 46	38, 46	OFDM	BPSK	15.0

ANTENNA PORT CONDUCTED MEASUREMENT:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
Draft 802.11n (20MHz)	36 to 48	36, 40, 48	OFDM	BPSK	7.2
Draft 802.11n (40MHz)	38 to 46	38, 46	OFDM	BPSK	15.0



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)

ANSI C63.4-2003

All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	Dell	D830	10026042688	FCC DoC Approved
2	PRINTER	HP	1300	CNBJC66727	FCC DoC Approved
3	MODEM	ACEEX	1414V/3	0401008269	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8m shielded cable.
3	1.2m braid shielded wire, DB25 & DB9 connector, w/o core.

NOTE: All power cords of the above support units are non shielded (1.8m).



4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

FREQUENCIES (MHz)	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBµV/m) *NOTE 3
	PK	PK
5150 ~ 5250	-27	68.3

NOTE:

1. For frequencies 10MHz or greater above or below the band edge.
2. All emissions within the frequency range from the band edge to 10MHz above or below the band edge.
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).$$



A D T

4.1.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Dec. 26, 2007	Dec. 25, 2008
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 02, 2008	Dec. 01, 2009
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 30, 2008	Apr. 29, 2009
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-408	Jan. 22, 2008	Jan. 21, 2009
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 07, 2008	Jan. 06, 2009
Preamplifier Agilent	8449B	3008A01960	Nov. 03, 2008	Nov. 02, 2009
Preamplifier Agilent	8447D	2944A10631	Nov. 03, 2008	Nov. 02, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	274041/4	Aug. 21, 2008	Aug. 20, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	283397/4	Aug. 21, 2008	Aug. 20, 2009
Software ADT.	ADT_Radiated_V7.6	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table ADT.	TT100.	TT93021704	NA	NA
Turn Table Controller ADT.	SC100.	SC93021704	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 4.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 988962.
 5. The IC Site Registration No. is IC7450F-4.



4.1.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

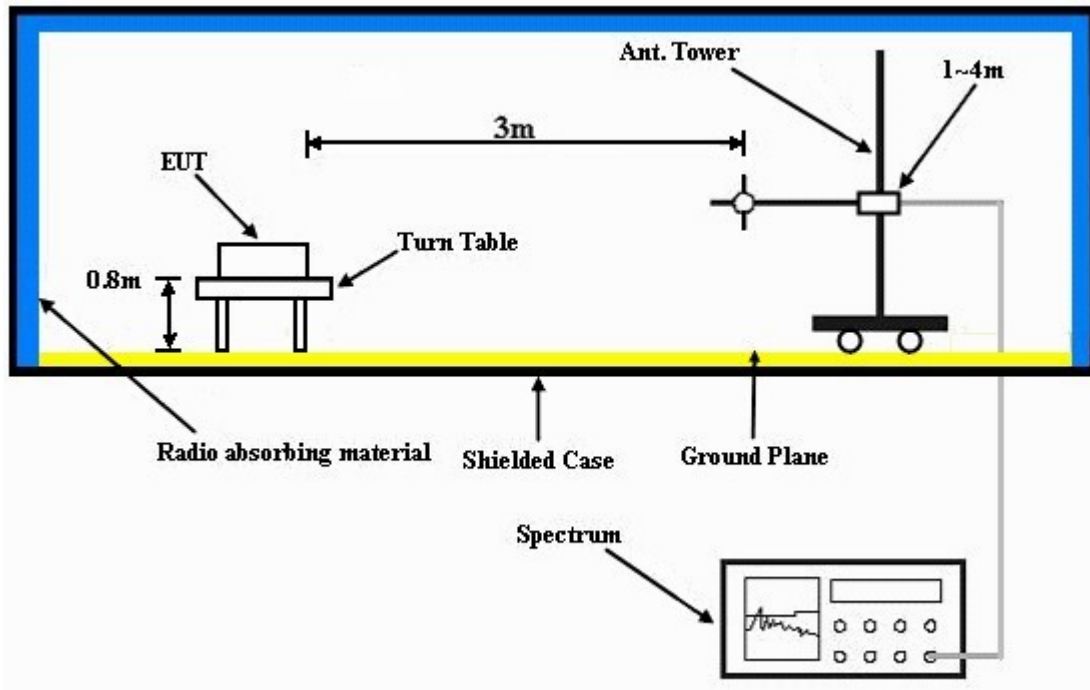
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.5 DEVIATION FROM TEST STANDARD

No deviation.

4.1.6 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.7 EUT OPERATING CONDITION

- a. Connected the EUT to a notebook via USB cable and placed on a testing table.
- b. The notebook ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the system in full functions.



A D T

4.1.8 TEST RESULTS

802.11a OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1016hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4144.00	49.54 PK	74.00	-24.46	1.03 H	12	13.25	36.29
2	4144.00	36.22 AV	54.00	-17.78	1.03 H	12	-0.07	36.29
3	5150.00	51.05 PK	74.00	-22.95	1.02 H	103	12.41	38.64
4	5150.00	39.23 AV	54.00	-14.77	1.02 H	103	0.59	38.64
5	*5180.00	94.80 PK			1.02 H	103	56.12	38.68
6	*5180.00	84.29 AV			1.02 H	103	45.61	38.68
7	#10360.00	62.46 PK	68.30	-5.84	1.00 H	20	12.88	49.58
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4144.00	50.21 PK	74.00	-23.79	1.12 V	119	13.92	36.29
2	4144.00	39.15 AV	54.00	-14.85	1.12 V	119	2.86	36.29
3	5150.00	54.94 PK	74.00	-19.06	1.22 V	38	16.30	38.64
4	5150.00	41.59 AV	54.00	-12.41	1.22 V	38	2.95	38.64
5	*5180.00	101.30 PK			1.22 V	38	62.62	38.68
6	*5180.00	90.95 AV			1.22 V	38	52.27	38.68
7	#10360.00	65.17 PK	68.30	-3.13	1.54 V	283	15.59	49.58

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#”: The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 40	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1016hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4160.00	49.21 PK	74.00	-24.79	1.10 H	29	12.88	36.33
2	4160.00	36.02 AV	54.00	-17.98	1.10 H	29	-0.31	36.33
3	*5200.00	94.56 PK			1.03 H	106	55.86	38.70
4	*5200.00	84.01 AV			1.03 H	106	45.31	38.70
5	#10400.00	62.25 PK	68.30	-6.05	1.13 H	224	12.56	49.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4160.00	50.56 PK	74.00	-23.44	1.15 V	223	14.23	36.33
2	4160.00	39.48 AV	54.00	-14.52	1.15 V	223	3.15	36.33
3	*5200.00	100.92 PK			1.21 V	39	62.22	38.70
4	*5200.00	90.56 AV			1.21 V	39	51.86	38.70
5	#10400.00	65.03 PK	68.30	-3.27	1.51 V	269	15.34	49.69

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1016hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4192.00	49.31 PK	74.00	-24.69	1.01 H	23	12.89	36.42
2	4192.00	36.02 AV	54.00	-17.98	1.01 H	23	-0.40	36.42
3	*5240.00	95.63 PK			1.01 H	106	56.88	38.75
4	*5240.00	85.02 AV			1.01 H	106	46.27	38.75
5	#10360.00	62.56 PK	68.30	-5.74	1.18 H	234	12.98	49.58
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4192.00	50.33 PK	74.00	-23.67	1.04 V	213	13.91	36.42
2	4192.00	40.20 AV	54.00	-13.80	1.04 V	213	3.78	36.42
3	*5240.00	101.62 PK			1.24 V	22	62.87	38.75
4	*5240.00	91.27 AV			1.24 V	22	52.52	38.75
5	#10480.00	64.86 PK	68.30	-3.44	1.55 V	289	14.94	49.92

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. "#":The radiated frequency is out the restricted band.



A D T

DRAFT 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1016hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4144.00	49.92 PK	74.00	-24.08	1.05 H	16	13.63	36.29
2	4144.00	38.65 AV	54.00	-15.35	1.05 H	16	2.36	36.29
3	5150.00	55.62 PK	74.00	-18.38	1.10 H	276	16.98	38.64
4	5150.00	42.49 AV	54.00	-11.51	1.10 H	276	3.85	38.64
5	*5180.00	98.24 PK			1.10 H	276	59.56	38.68
6	*5180.00	87.81 AV			1.10 H	276	49.13	38.68
7	#6216.00	56.49 PK	68.30	-11.81	1.11 H	28	15.42	41.07
8	#10360.00	64.42 PK	68.30	-3.88	1.01 H	28	14.84	49.58
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4144.00	51.86 PK	74.00	-22.14	1.00 V	93	15.57	36.29
2	4144.00	42.57 AV	54.00	-11.43	1.00 V	93	6.28	36.29
3	5150.00	60.43 PK	74.00	-13.57	1.07 V	231	21.79	38.64
4	5150.00	47.28 AV	54.00	-6.72	1.07 V	231	8.64	38.64
5	*5180.00	103.63 PK			1.07 V	231	64.95	38.68
6	*5180.00	93.28 AV			1.07 V	231	54.60	38.68
7	#6216.00	61.42 PK	68.30	-6.88	1.18 V	329	20.35	41.07
8	#10360.00	66.09 PK	68.30	-2.21	1.49 V	285	16.51	49.58

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 40	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1016hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4160.00	49.63 PK	74.00	-24.37	1.06 H	22	13.30	36.33
2	4160.00	38.25 AV	54.00	-15.75	1.06 H	22	1.92	36.33
3	*5200.00	98.56 PK			1.09 H	278	59.86	38.70
4	*5200.00	88.08 AV			1.09 H	278	49.38	38.70
5	#10400.00	63.95 PK	68.30	-4.35	1.04 H	58	14.26	49.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4160.00	51.63 PK	74.00	-22.37	1.17 V	62	15.30	36.33
2	4160.00	42.28 AV	54.00	-11.72	1.17 V	62	5.95	36.33
3	*5200.00	103.85 PK			1.09 V	235	65.15	38.70
4	*5200.00	93.52 AV			1.09 V	235	54.82	38.70
5	#10400.00	65.69 PK	68.30	-2.61	1.39 V	281	16.00	49.69

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1016hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4192.00	48.13 PK	74.00	-25.87	1.18 H	271	11.71	36.42
2	4192.00	38.02 AV	54.00	-15.98	1.18 H	271	1.60	36.42
3	*5240.00	98.81 PK			1.09 H	280	60.06	38.75
4	*5240.00	88.35 AV			1.09 H	280	49.60	38.75
5	#6288.00	56.86 PK	68.30	-11.44	1.11 H	234	15.46	41.40
6	#10480.00	64.13 PK	68.30	-4.17	1.13 H	216	14.21	49.92
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4192.00	52.45 PK	74.00	-21.55	1.09 V	26	16.03	36.42
2	4192.00	42.36 AV	54.00	-11.64	1.09 V	26	5.94	36.42
3	*5240.00	104.13 PK			1.08 V	236	65.38	38.75
4	*5240.00	93.81 AV			1.08 V	236	55.06	38.75
5	#6288.00	61.95 PK	68.30	-6.35	1.04 V	212	20.55	41.40
6	#10480.00	66.32 PK	68.30	-1.98	1.48 V	265	16.40	49.92

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#“: The radiated frequency is out the restricted band.



A D T

DRAFT 802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 38	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1016hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4152.00	49.83 PK	74.00	-24.17	1.14 H	258	13.52	36.31
2	4152.00	38.24 AV	54.00	-15.76	1.14 H	258	1.93	36.31
3	5150.00	56.94 PK	74.00	-17.06	1.08 H	270	18.30	38.64
4	5150.00	43.82 AV	54.00	-10.18	1.08 H	270	5.18	38.64
5	*5190.00	97.01 PK			1.08 H	270	58.32	38.69
6	*5190.00	86.60 AV			1.08 H	270	47.91	38.69
7	#6288.00	56.15 PK	68.30	-12.15	1.19 H	274	14.75	41.40
8	#10380.00	64.25 PK	68.30	-4.05	1.24 H	59	14.61	49.64
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4152.00	51.04 PK	74.00	-22.96	1.16 V	212	14.73	36.31
2	4152.00	41.68 AV	54.00	-12.32	1.16 V	212	5.37	36.31
3	5150.00	61.00 PK	74.00	-13.00	1.15 V	225	22.36	38.64
4	5150.00	48.18 AV	54.00	-5.82	1.15 V	225	9.54	38.64
5	*5190.00	102.34 PK			1.15 V	225	63.65	38.69
6	*5190.00	91.60 AV			1.15 V	225	52.91	38.69
7	#6228.00	59.86 PK	68.30	-8.44	1.14 V	213	18.73	41.13
8	#10380.00	65.56 PK	68.30	-2.74	1.48 V	284	15.92	49.64

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1016hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4184.00	49.63 PK	74.00	-24.37	1.01 H	265	13.23	36.40
2	4184.00	38.02 AV	54.00	-15.98	1.01 H	265	1.62	36.40
3	*5230.00	97.24 PK			1.10 H	274	58.50	38.74
4	*5230.00	86.85 AV			1.10 H	274	48.11	38.74
5	#6276.00	55.63 PK	68.30	-12.67	1.01 H	211	14.29	41.34
6	#10460.00	64.36 PK	68.30	-3.94	1.21 H	52	14.50	49.86
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4184.00	51.23 PK	74.00	-22.77	1.09 V	206	14.83	36.40
2	4184.00	41.89 AV	54.00	-12.11	1.09 V	206	5.49	36.40
3	*5230.00	102.46 PK			1.16 V	228	63.72	38.74
4	*5230.00	91.75 AV			1.16 V	228	53.01	38.74
5	#6276.00	59.61 PK	68.30	-8.69	1.14 V	29	18.27	41.34
6	#10460.00	65.03 PK	68.30	-3.27	1.49 V	301	15.17	49.86

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#“: The radiated frequency is out the restricted band.



A D T

BELOW 1GHz WORST-CASE DATA : DRAFT 802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1024hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	239.88	32.93 QP	46.00	-13.07	1.25 H	10	19.72	13.21
2	360.43	28.41 QP	46.00	-17.59	1.00 H	10	12.09	16.31
3	570.41	29.53 QP	46.00	-16.47	1.25 H	94	7.15	22.39
4	724.01	27.56 QP	46.00	-18.44	1.00 H	124	2.03	25.53
5	795.95	30.95 QP	46.00	-15.05	1.00 H	154	4.61	26.34
6	871.78	32.28 QP	46.00	-13.72	1.25 H	337	4.64	27.64
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	175.72	26.78 QP	43.50	-16.72	1.00 V	40	13.43	13.35
2	360.43	24.57 QP	46.00	-21.43	1.50 V	193	8.26	16.31
3	599.58	28.28 QP	46.00	-17.72	1.00 V	304	5.17	23.11
4	720.12	27.74 QP	46.00	-18.26	1.25 V	181	2.25	25.49
5	797.89	35.54 QP	46.00	-10.46	1.25 V	190	9.18	26.36
6	960.00	31.47 QP	46.00	-14.53	1.00 V	97	2.63	28.84

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Sep. 22, 2008	Sep. 21, 2009
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Jan. 04, 2008	Jan. 03, 2009
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 10, 2008	Jan. 09, 2009
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jul. 30, 2008	Jul. 29, 2009
Software ADT	ADT_Cond_V3	NA	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 2.
 3. The VCCI Site Registration No. is C-2047.



A D T

4.2.3 TEST PROCEDURES

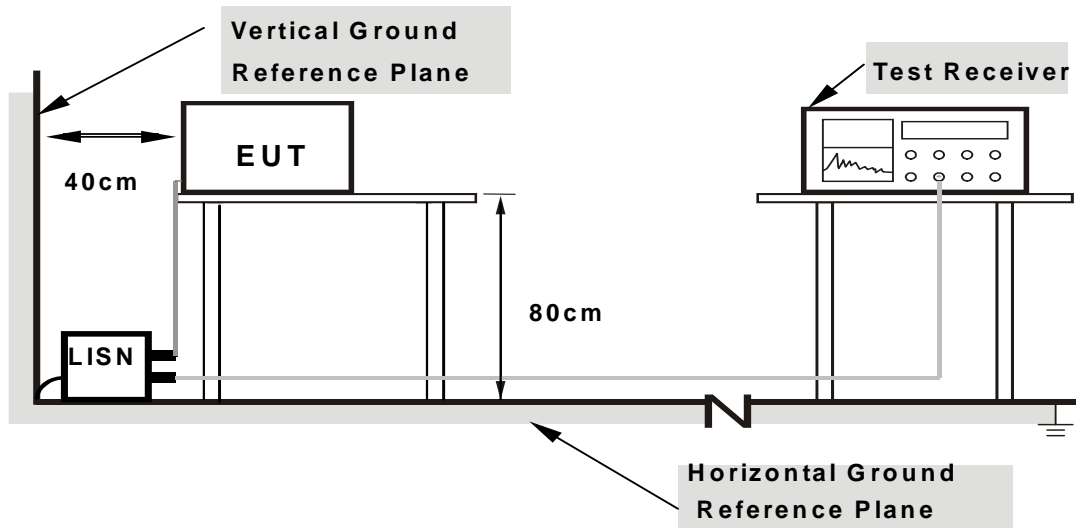
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

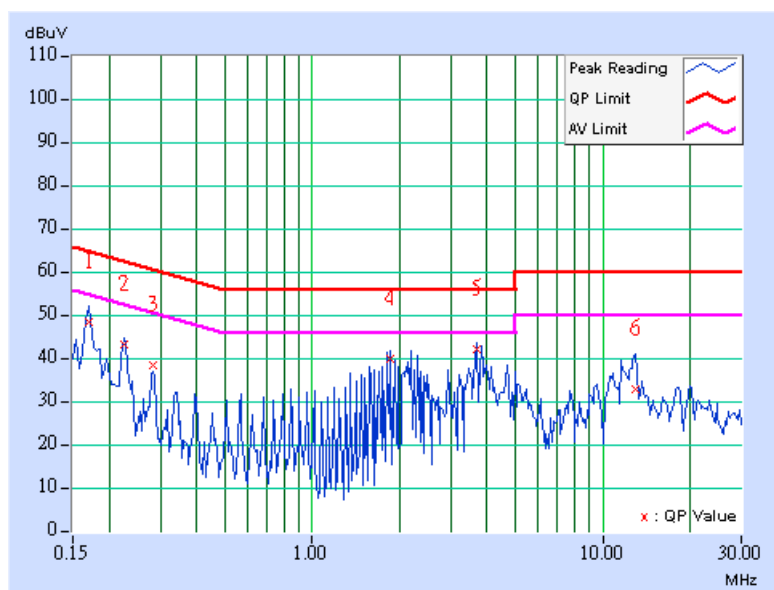
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : DRAFT 802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	PHASE	Line 1
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	15.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	23deg. C, 67%RH, 1018hPa	TESTED BY	Mark Liao

No	Freq. [MHz]	Corr. Factor [dB]	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.13	47.93	-	48.06	-	64.98	54.98	-16.93	-
2	0.224	0.13	42.66	-	42.79	-	62.66	52.66	-19.87	-
3	0.283	0.13	37.63	-	37.76	-	60.73	50.73	-22.97	-
4	1.863	0.25	39.16	-	39.41	-	56.00	46.00	-16.59	-
5	3.672	0.41	41.48	-	41.89	-	56.00	46.00	-14.11	-
6	12.992	0.77	32.24	-	33.01	-	60.00	50.00	-26.99	-

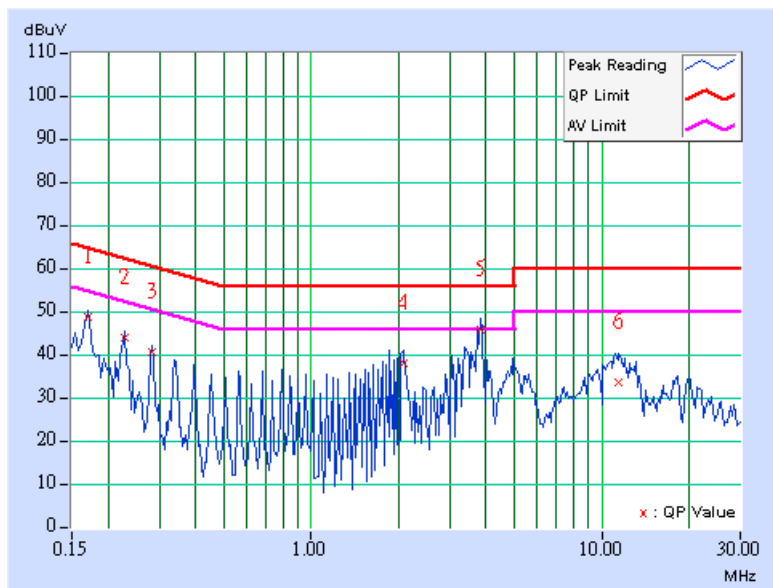
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	PHASE	Line 1
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	15.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	23deg. C, 67%RH, 1018hPa	TESTED BY	Mark Liao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.14	48.29	-	48.43	-	64.98	54.98	-16.55	-
2	0.228	0.14	43.57	-	43.71	-	62.52	52.52	-18.81	-
3	0.283	0.14	40.15	-	40.29	-	60.73	50.73	-20.44	-
4	2.090	0.27	37.55	-	37.82	-	56.00	46.00	-18.18	-
5	3.844	0.42	45.27	-	45.69	-	56.00	46.00	-10.31	-
6	11.465	0.61	33.11	-	33.72	-	60.00	50.00	-26.28	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.





A D T

4.3 PEAK TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB

NOTE: Where B is the 26dB emission bandwidth in MHz.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
High Speed Peak Power Meter	ML2495A	0824012	Aug. 04, 2008	Aug. 03, 2009
Power Sensor	MA2444B	0738138	Aug. 04, 2008	Aug. 03, 2009

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Measurement Bandwidth of ML2495A is 65MHz greater than 26dB bandwidth of emission.

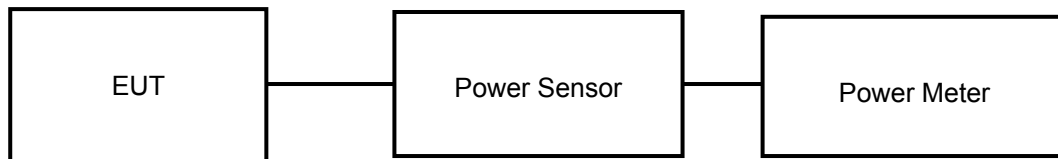
4.3.3 TEST PROCEDURE

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



4.3.7 TEST RESULTS

PEAK POWER OUTPUT: 802.11a OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
36	5180	11.272	10.52	30	PASS
40	5200	10.000	10.00	30	PASS
48	5240	11.429	10.58	30	PASS

DRAFT 802.11n (20MHz) OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	8.51	8.52	14.208	11.53	30	PASS
40	5200	9.08	8.54	15.236	11.83	30	PASS
48	5240	9.03	9.06	16.052	12.06	30	PASS



A D T

DRAFT 802.11n (40MHz) OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
38	5190	10.06	10.53	21.437	13.31	30	PASS
46	5230	10.52	10.58	22.701	13.56	30	PASS



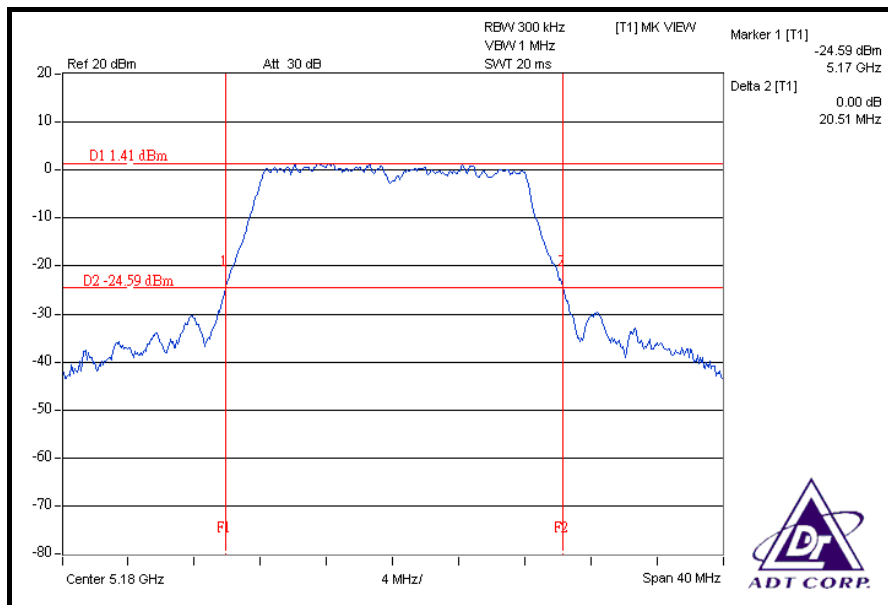
A D T

26dB OCCUPIED BANDWIDTH: 802.11a OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)	PASS / FAIL
36	5180	20.51	PASS
40	5200	20.13	PASS
48	5240	20.32	PASS

CH 36





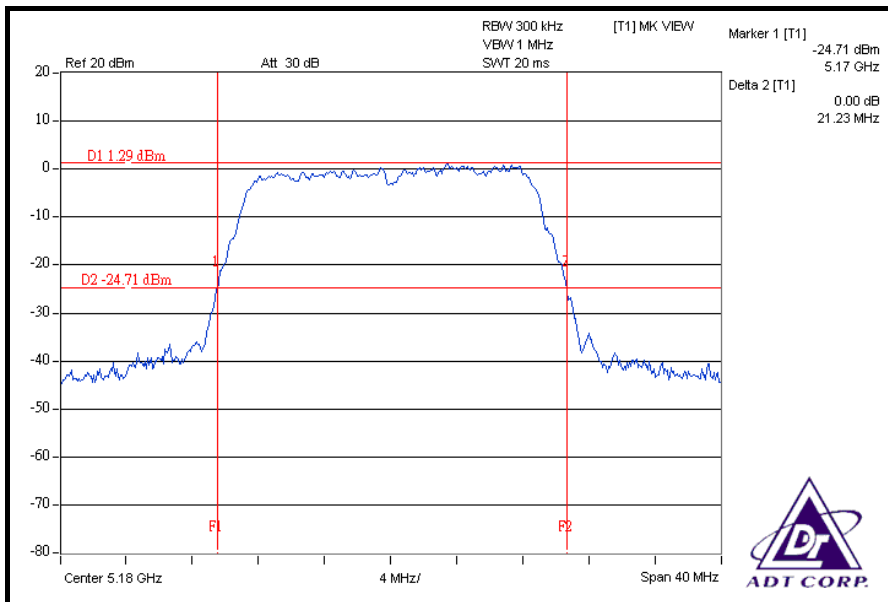
A D T

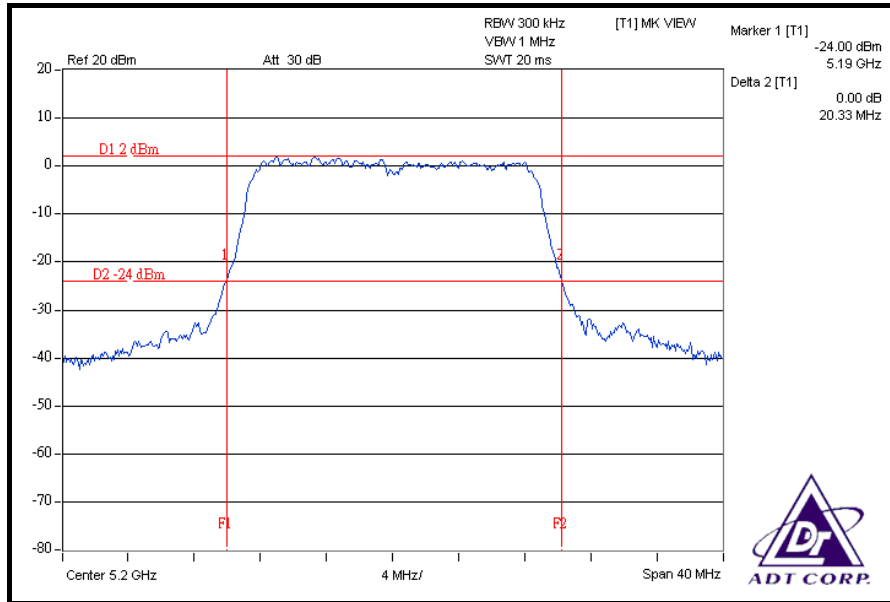
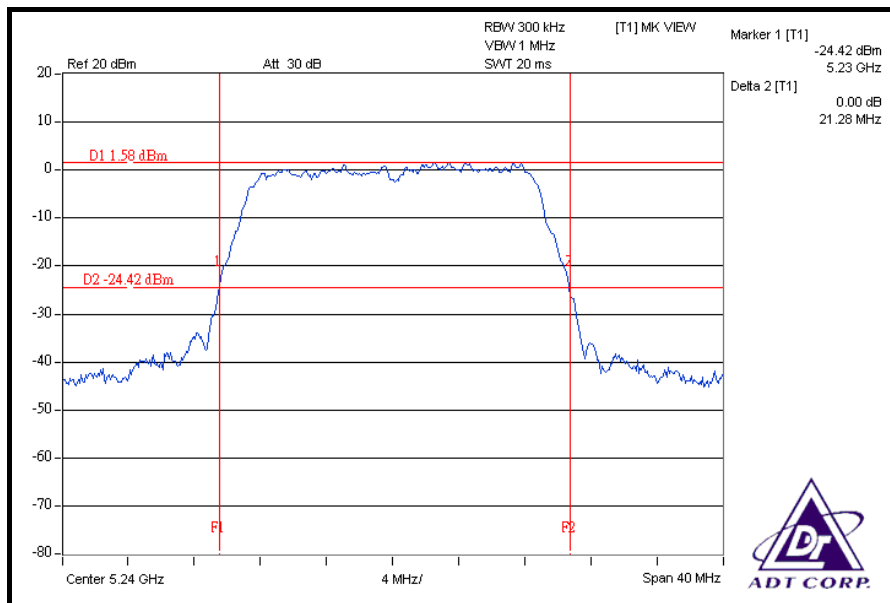
DRAFT 802.11n (20MHz) OFDM MODULATION

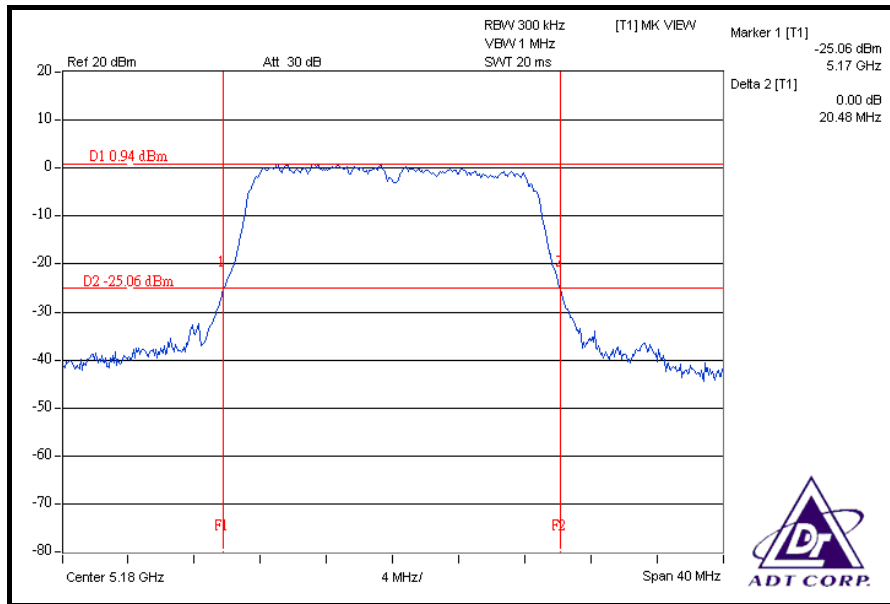
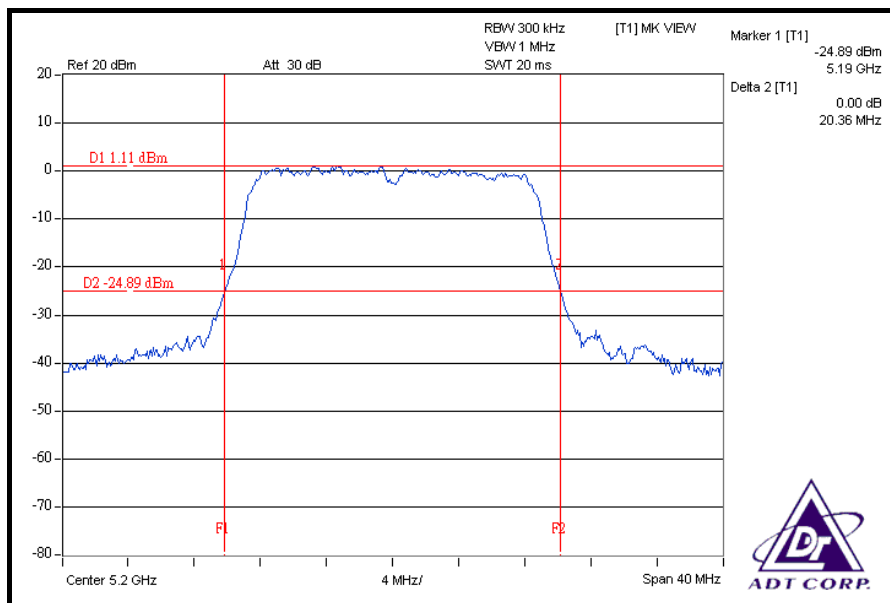
MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
36	5180	21.33	20.48	PASS
40	5200	20.33	20.36	PASS
48	5240	21.28	20.51	PASS

FOR CHAIN 0: CH 36



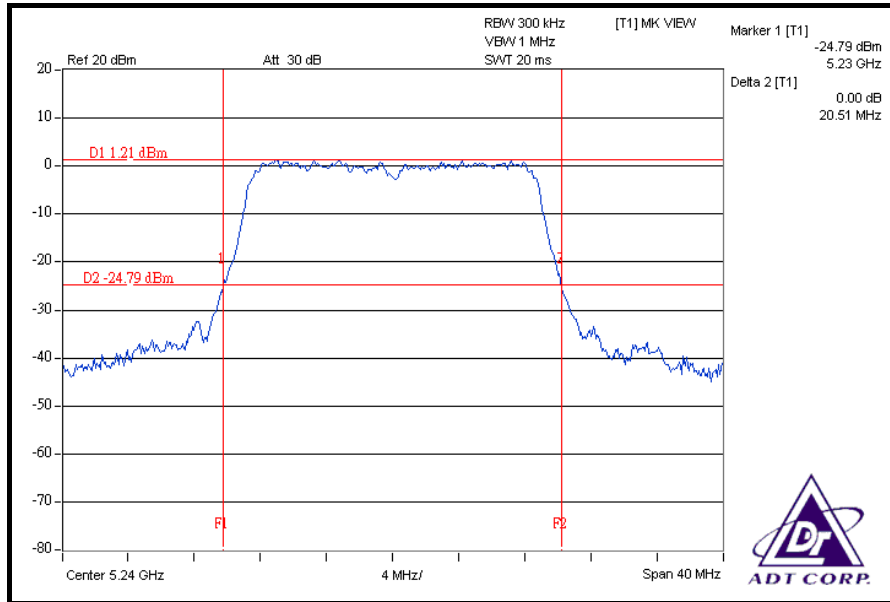
CH 40

CH 48


FOR CHAIN 1: CH 36**CH 40**



A D T

CH 48





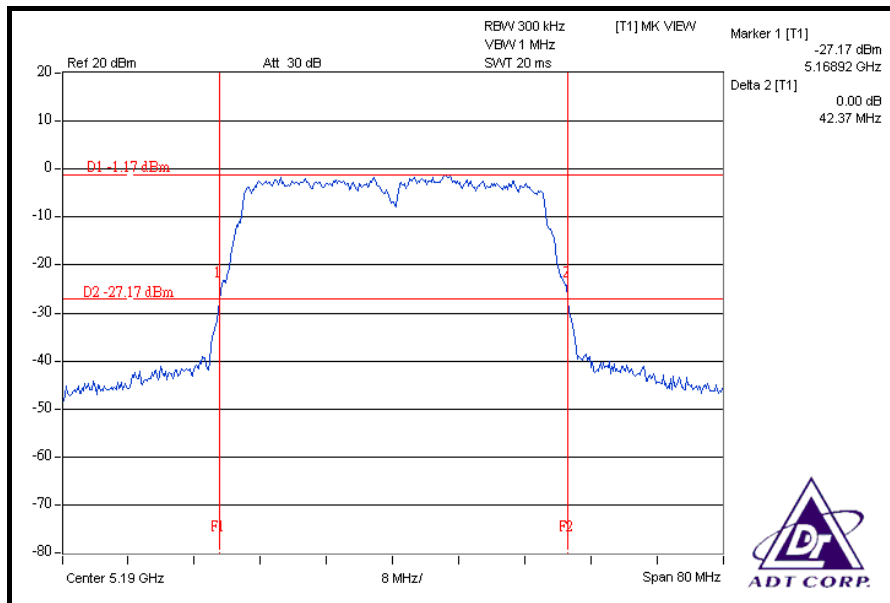
A D T

DRAFT 802.11n (40MHz) OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
38	5190	42.37	39.90	PASS
46	5230	42.35	42.34	PASS

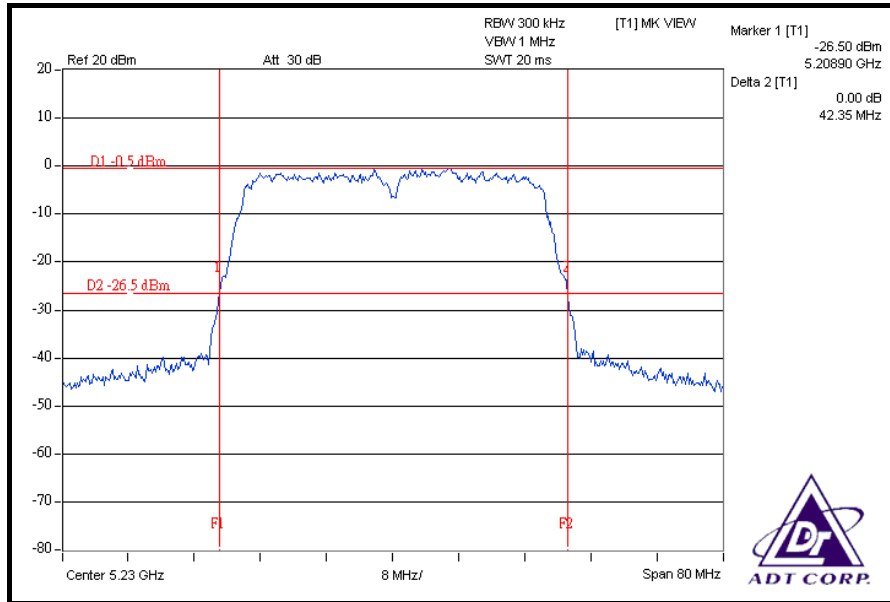
FOR CHAIN 0: CH 38



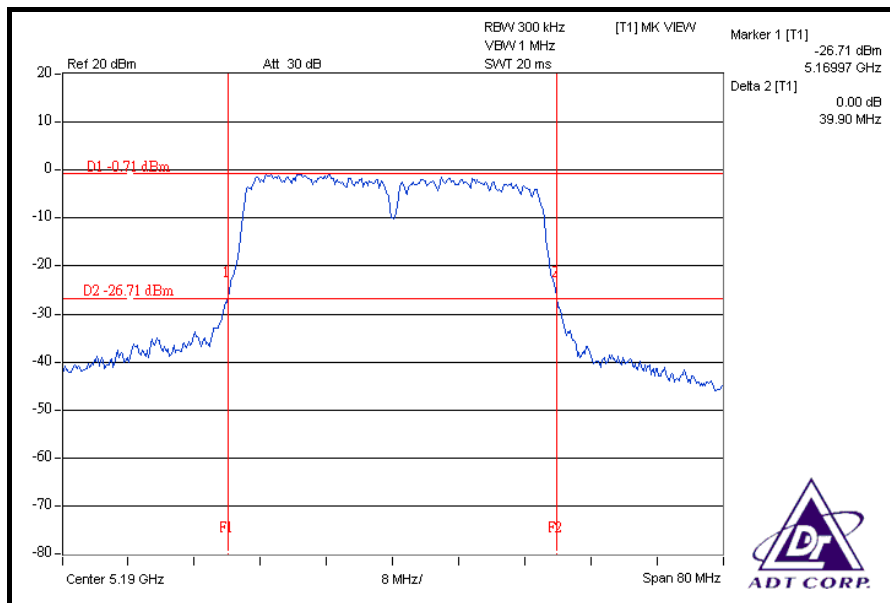


A D T

CH 46



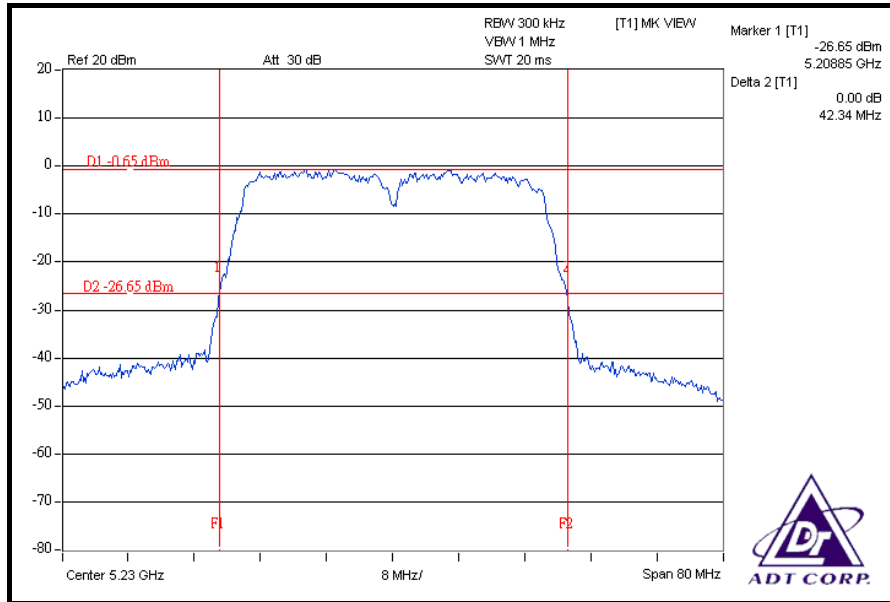
FOR CHAIN 1: CH 38





A D T

CH 46





A D T

4.4 PEAK POWER EXCURSION MEASUREMENT

4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	13dB

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

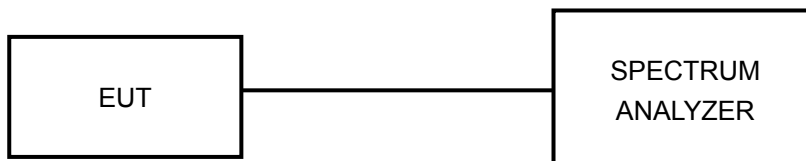
4.4.3 TEST PROCEDURE

- a. The transmitter output was connected to the spectrum analyzer.
- b. Set the spectrum bandwidth span to view the entire spectrum.
- c. Using peak detector and Max-hold function for Trace 1 (RB = 1MHz, VB = 3MHz) and 2 (RB = 1MHz, VB = 300kHz).
- d. The differences between Trace1 and Trace 2 in any 1MHz band at f1 to f2 range were recorded and showed to another trace.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



A D T

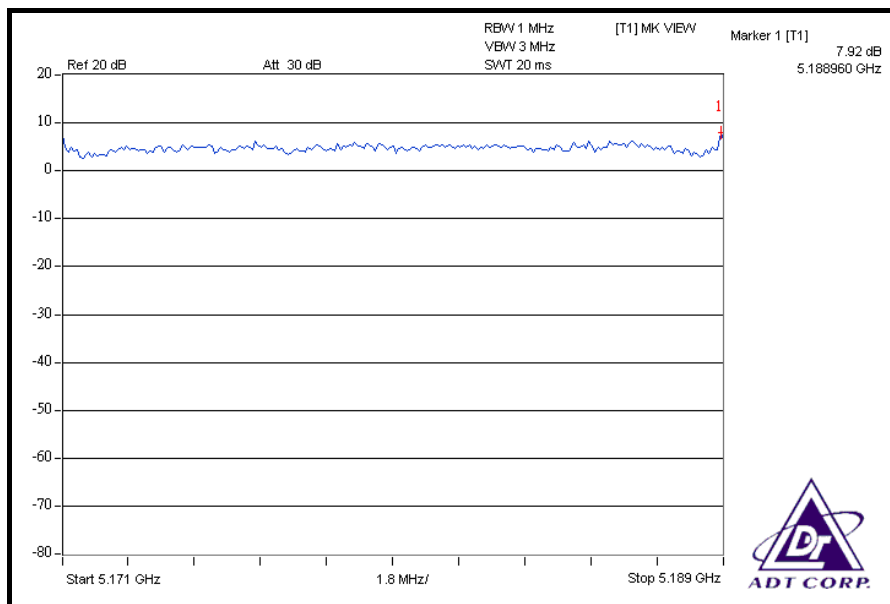
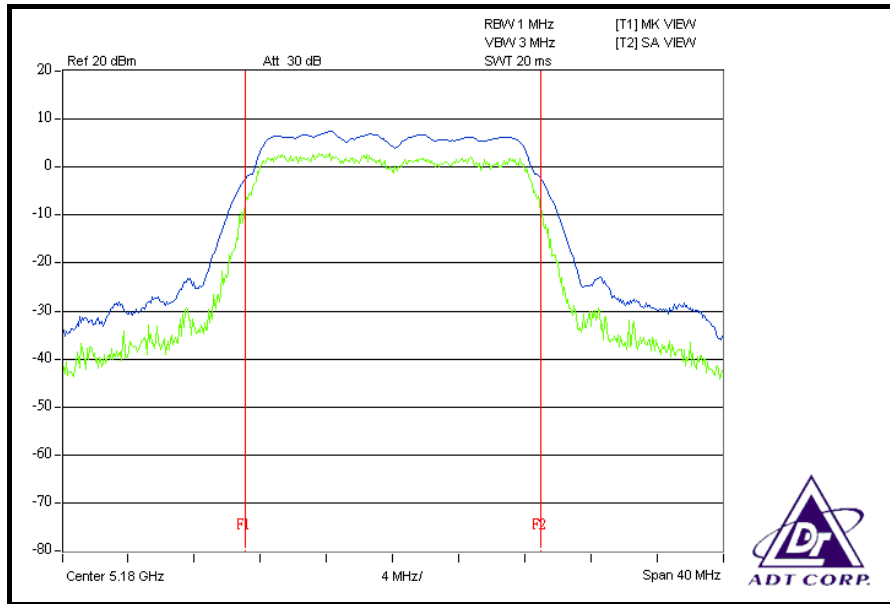
4.4.7 TEST RESULTS

802.11a OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
36	5180	7.92	13	PASS
40	5200	7.42	13	PASS
48	5240	7.52	13	PASS

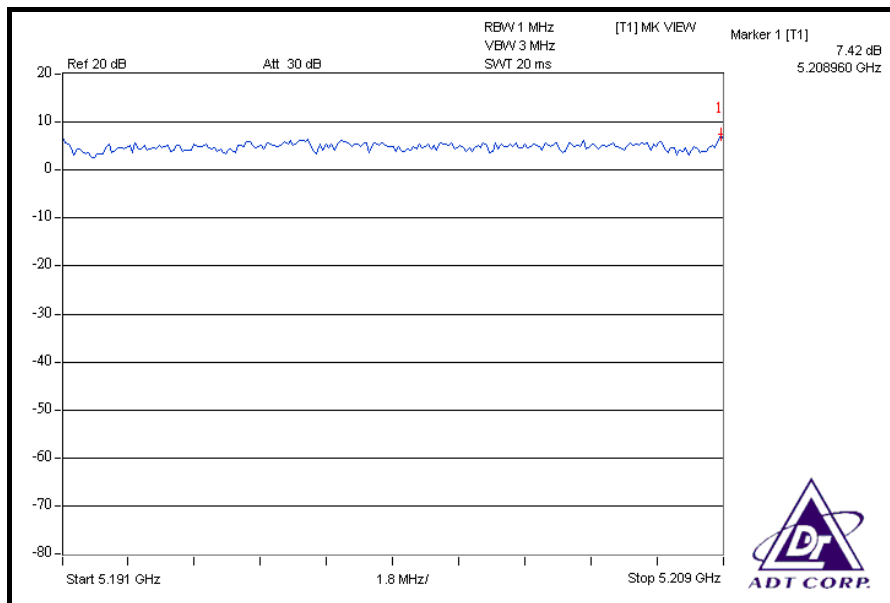
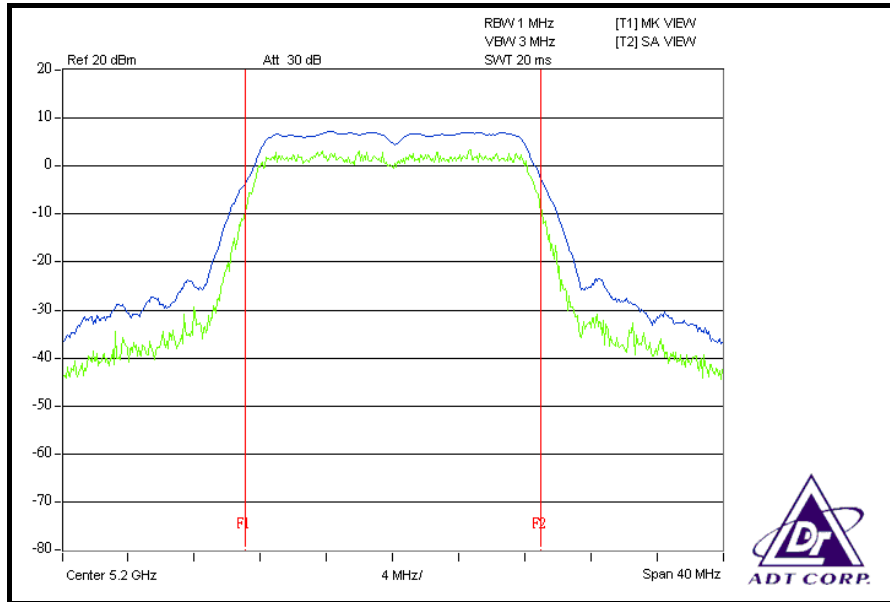
CH 36



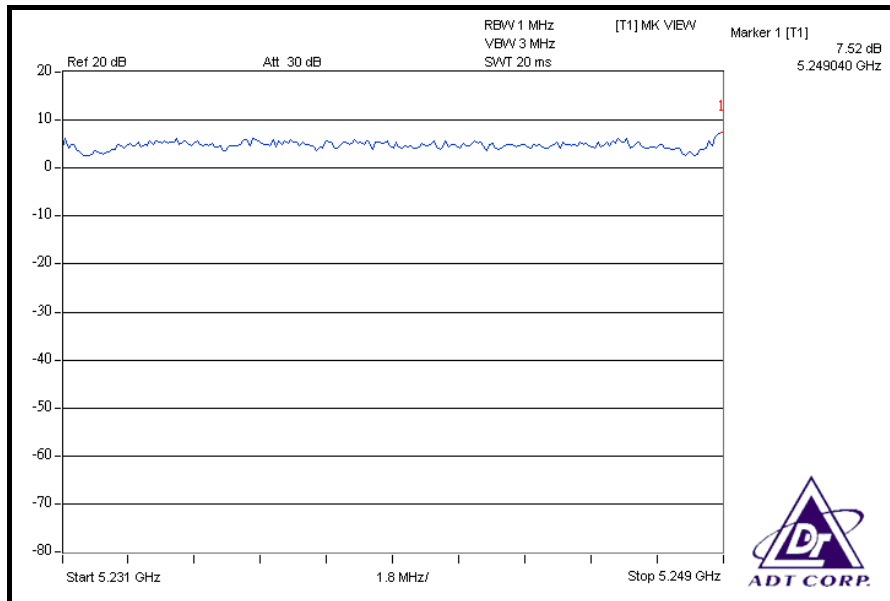
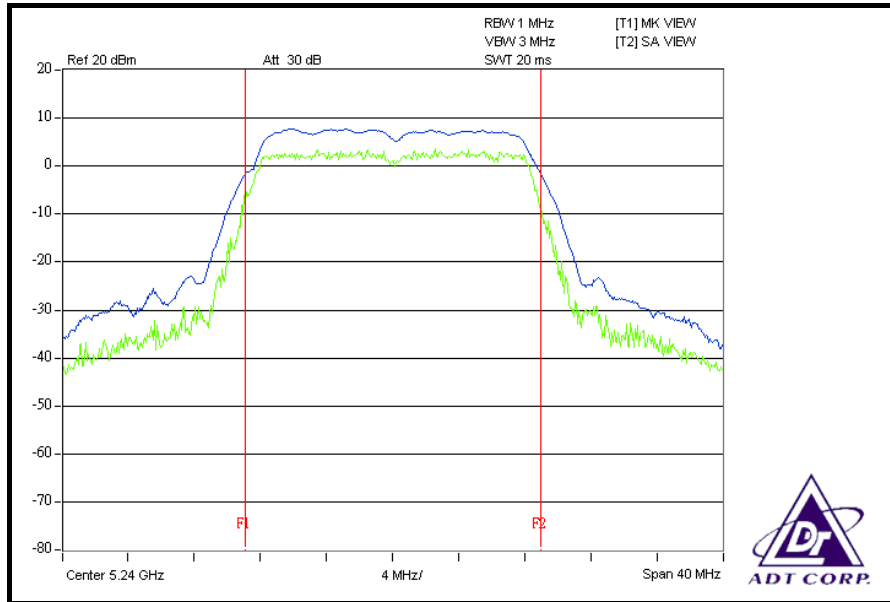


A D T

CH 40



CH 48





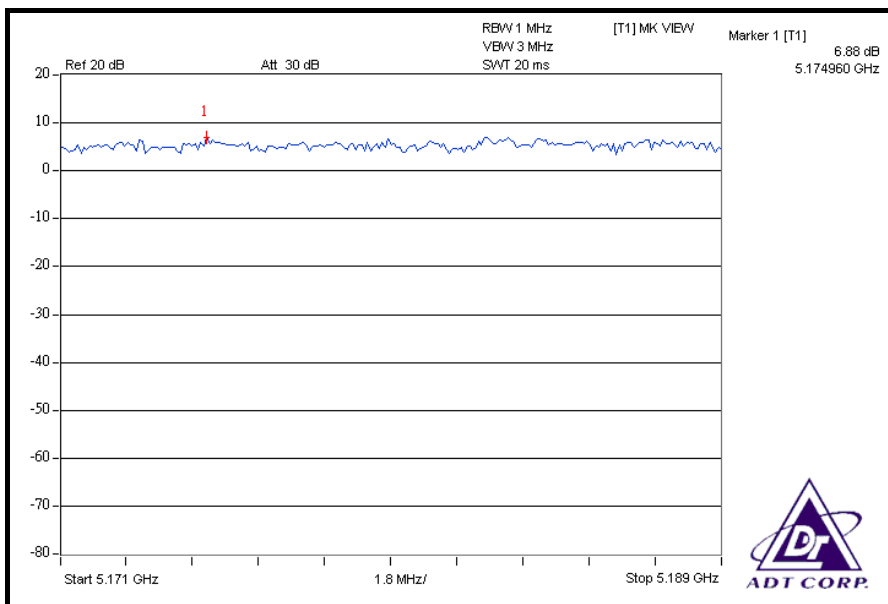
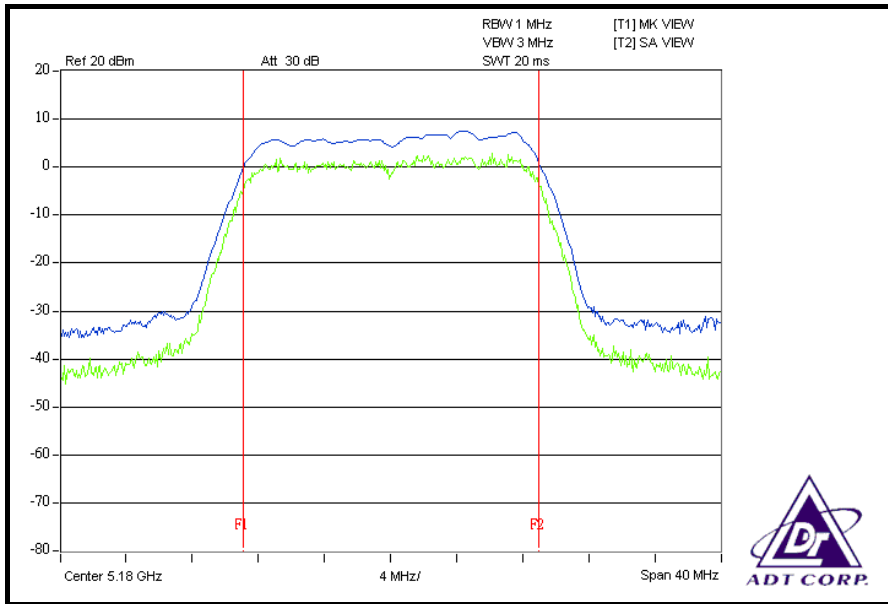
A D T

DRAFT 802.11n (20MHz) OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)		PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1		
36	5180	6.88	6.08	13	PASS
40	5200	6.23	6.17	13	PASS
48	5240	7.19	6.68	13	PASS

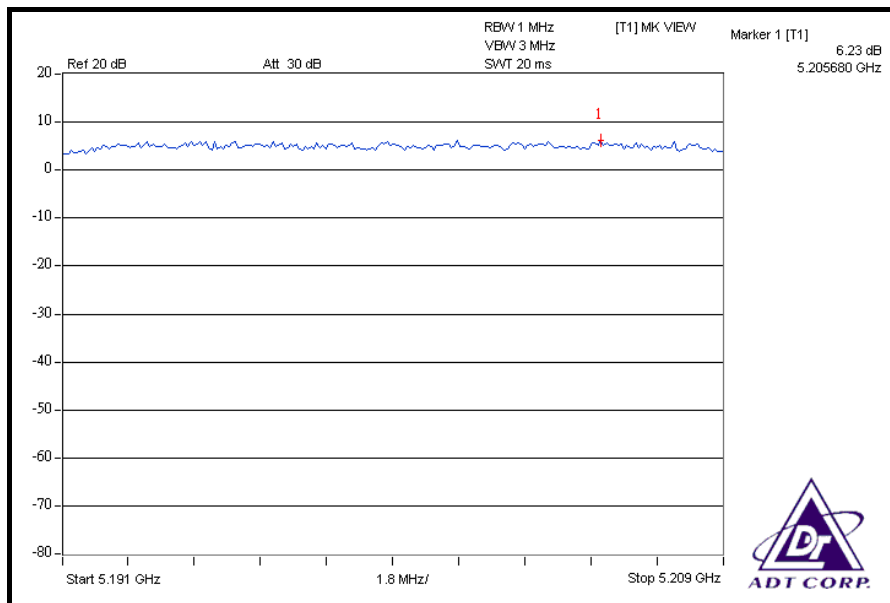
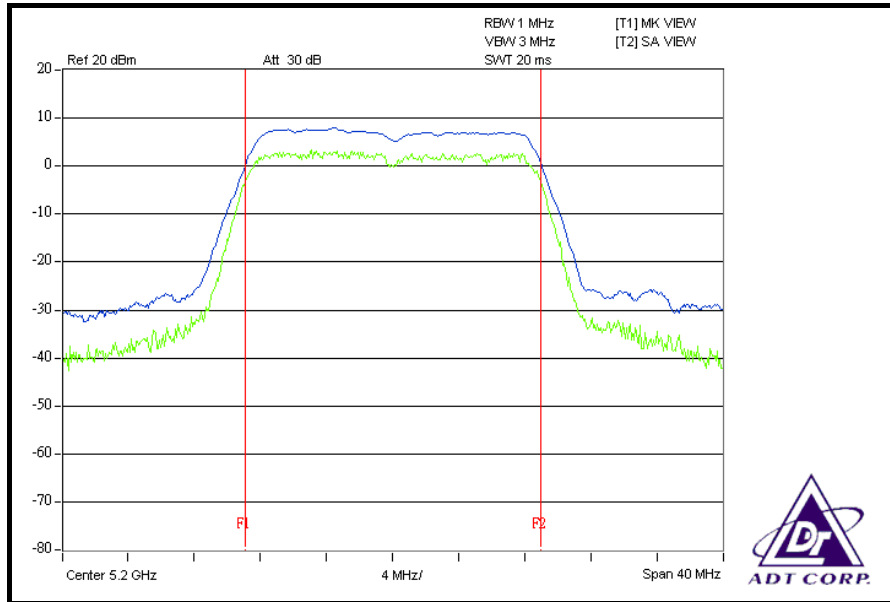
FOR CHAIN 0: CH 36





A D T

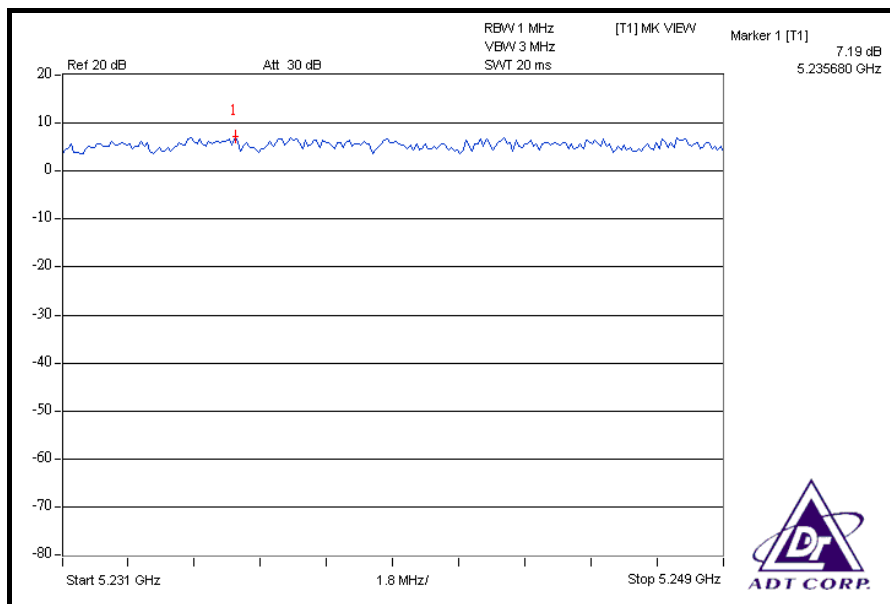
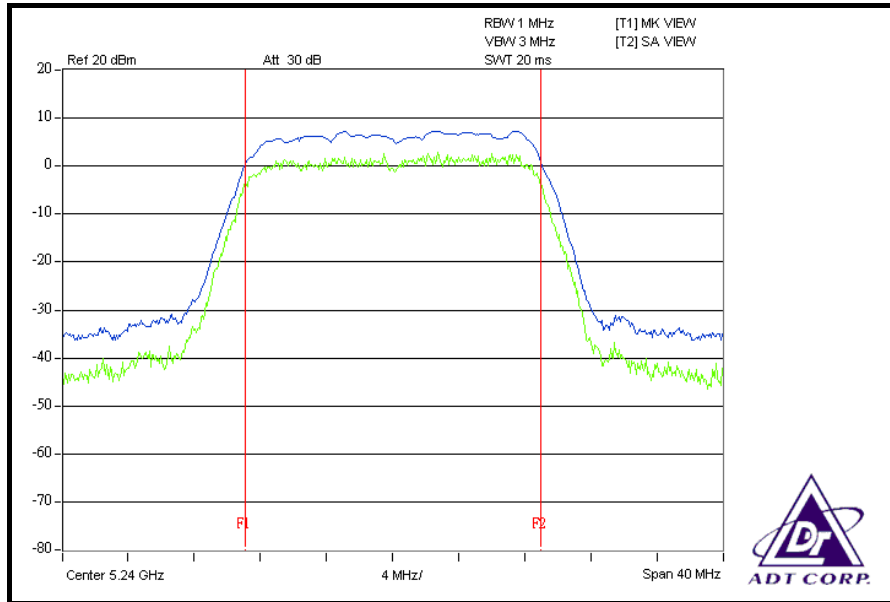
CH 40



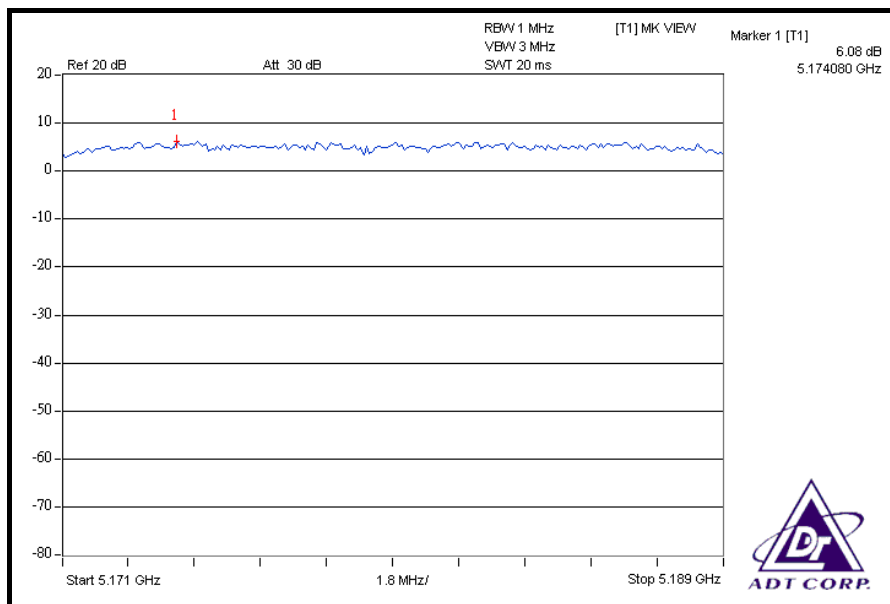
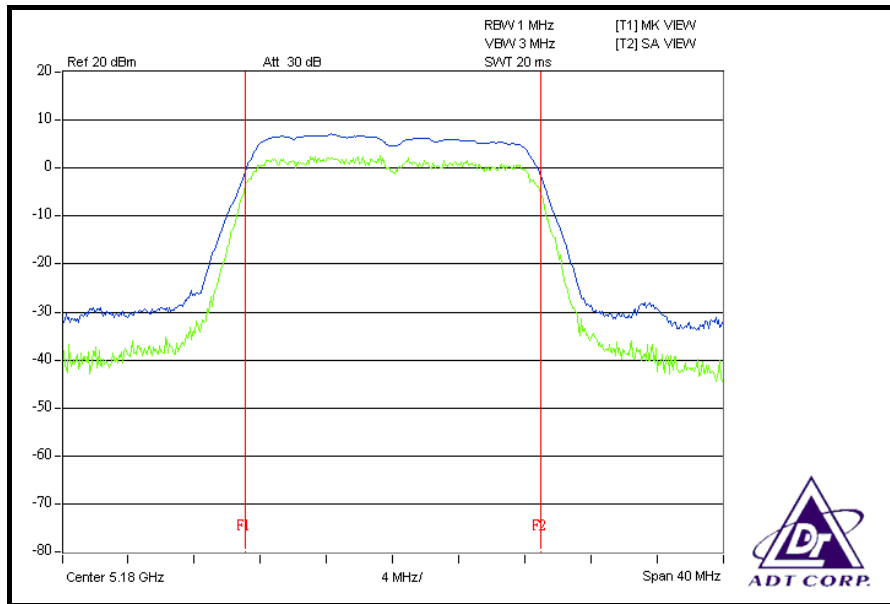


A D T

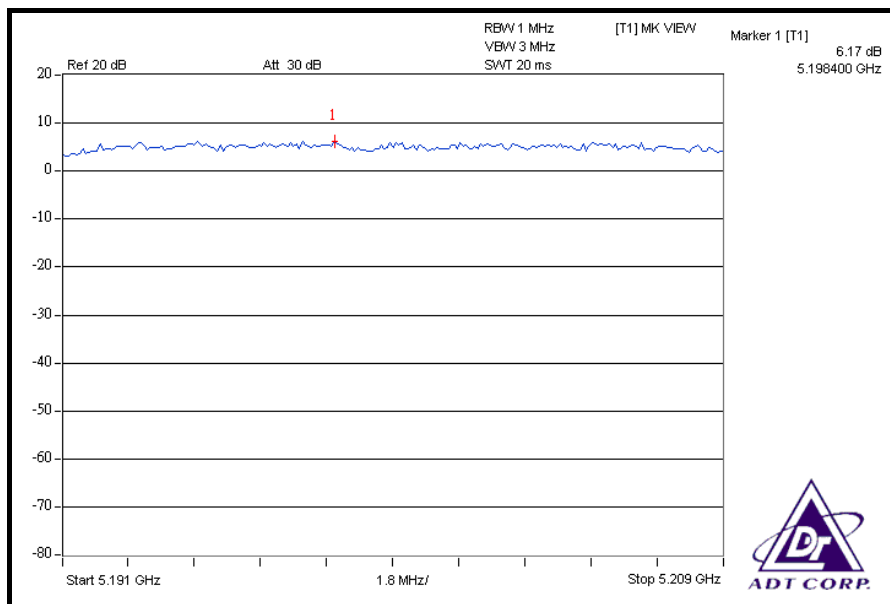
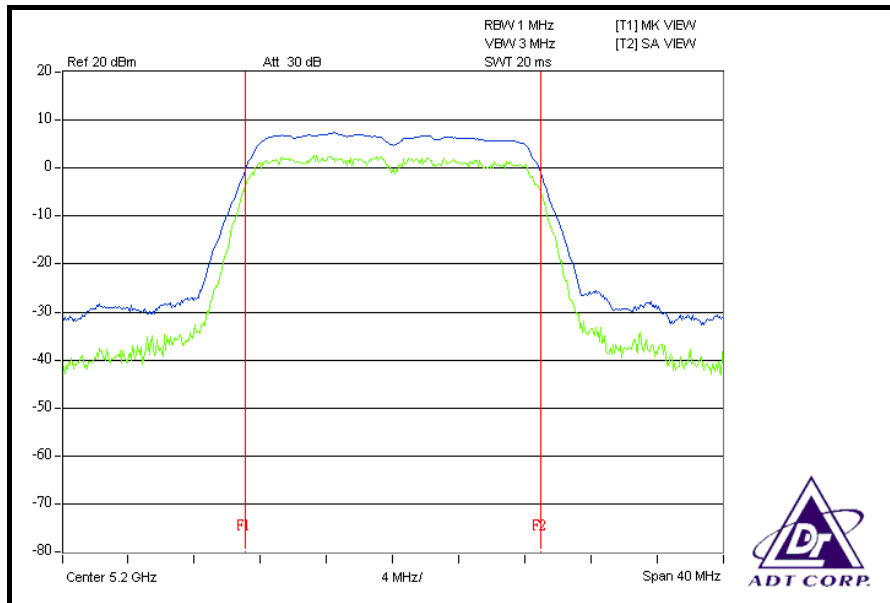
CH 48



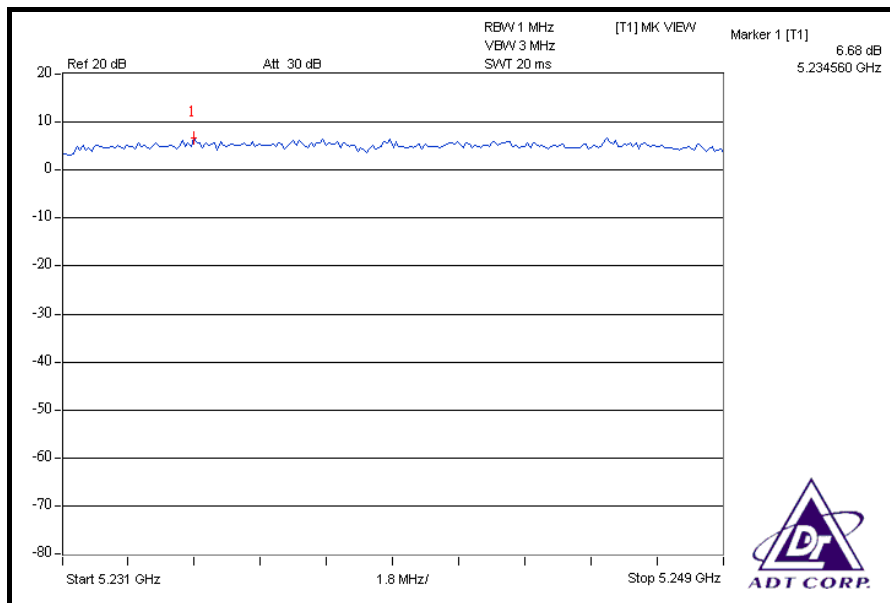
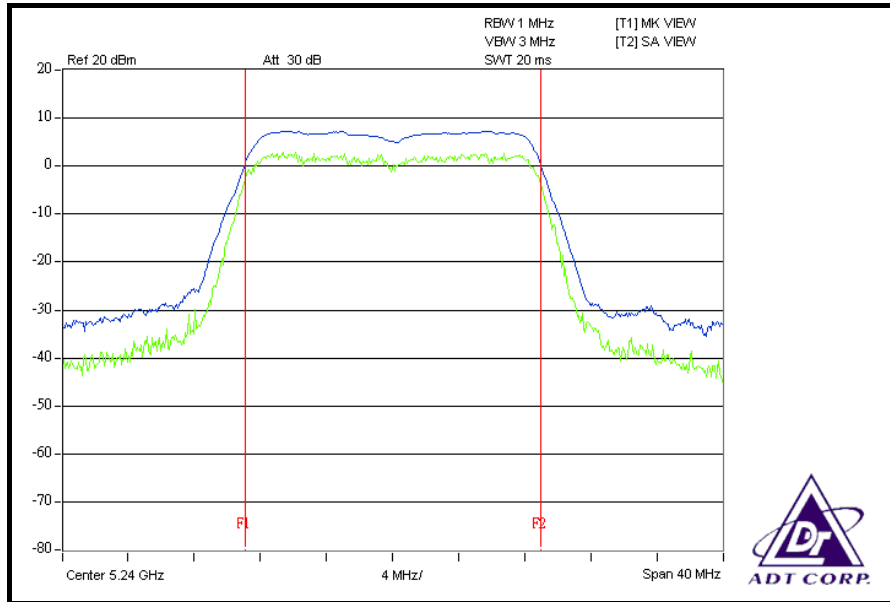
FOR CHAIN 1: CH 36



CH 40



CH 48





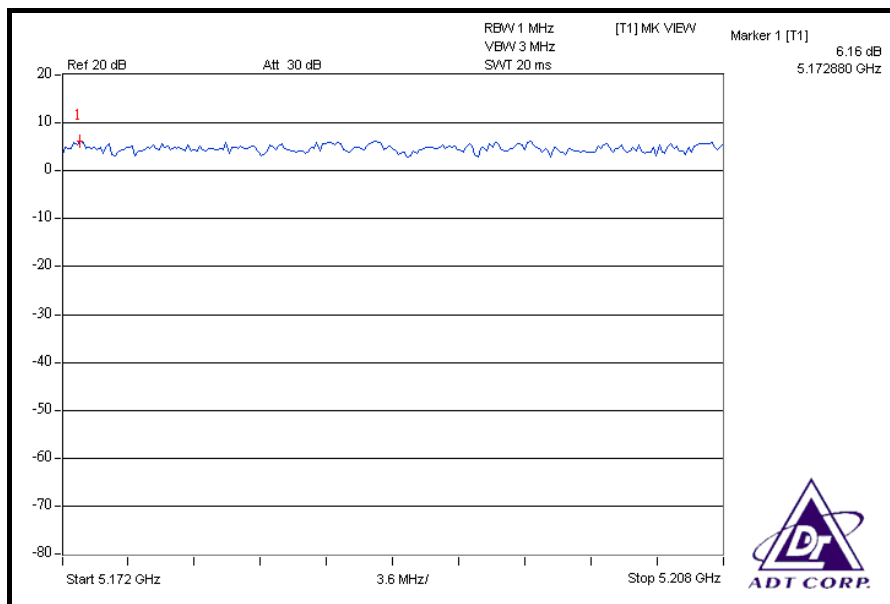
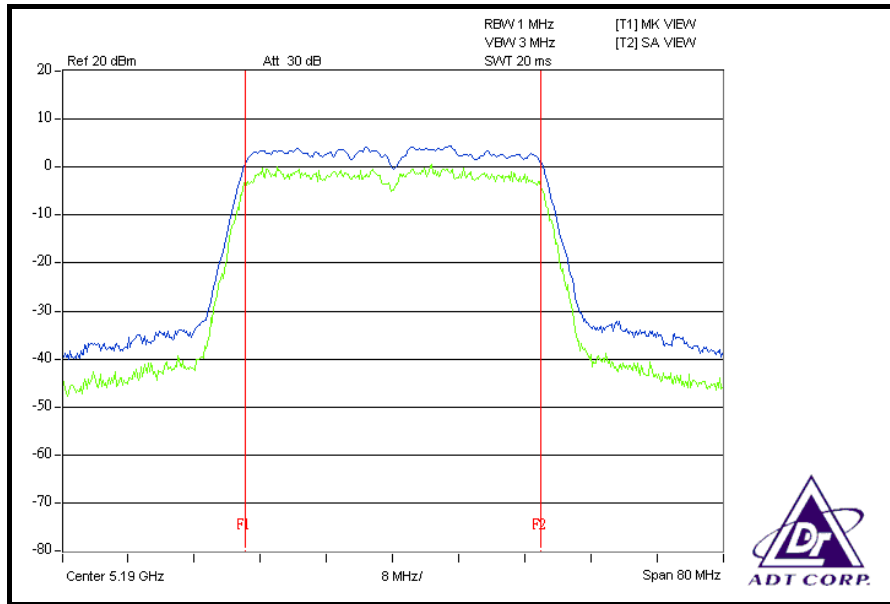
A D T

DRAFT 802.11n (40MHz) OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)		PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1		
38	5190	6.16	6.33	13	PASS
46	5230	6.76	7.17	13	PASS

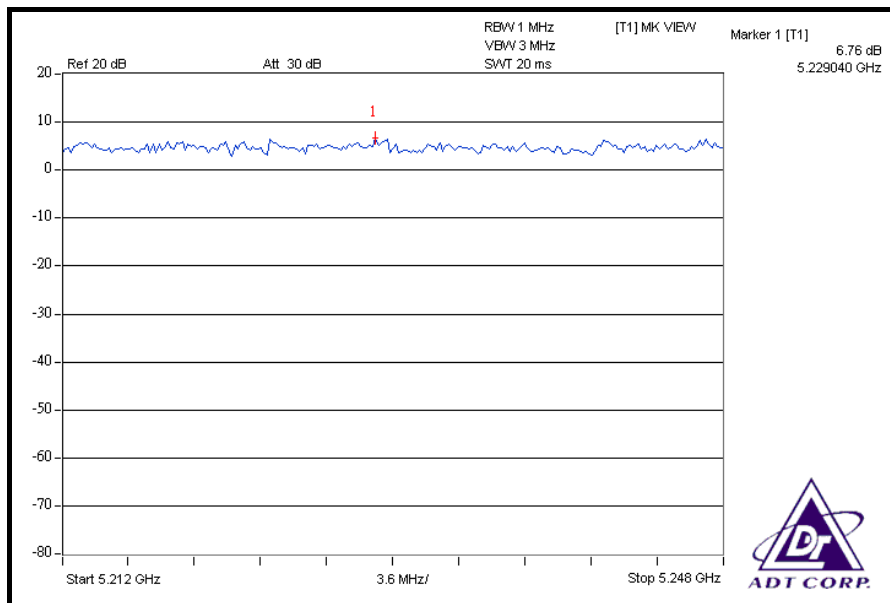
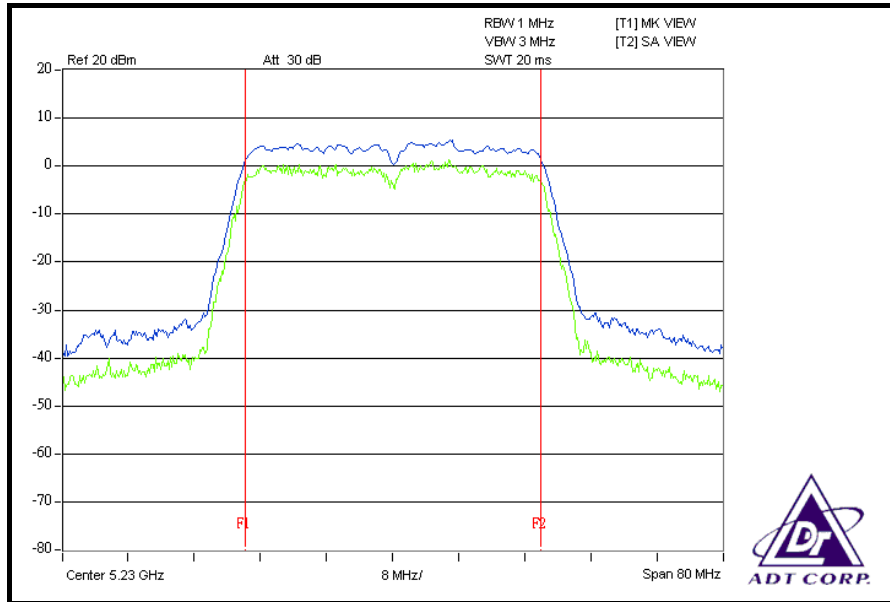
FOR CHAIN 0: CH 38



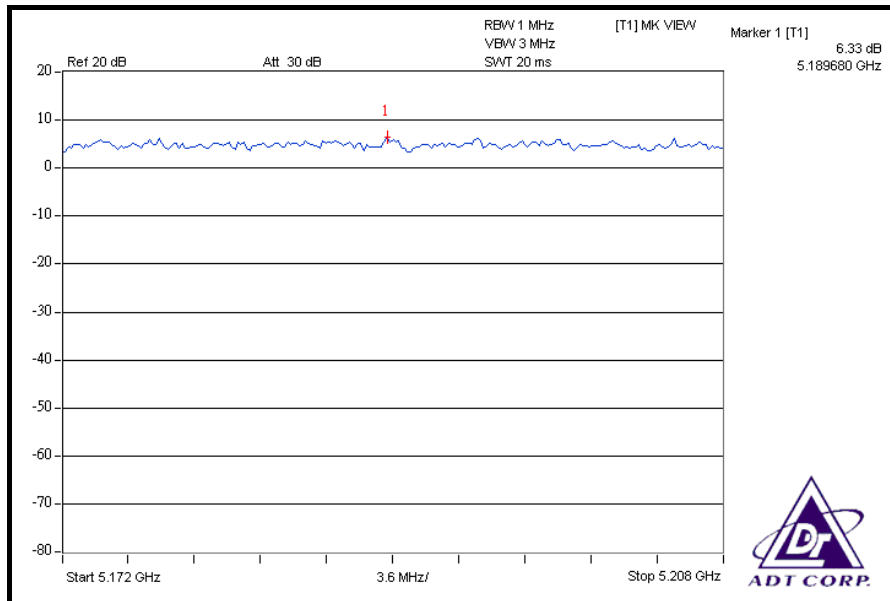
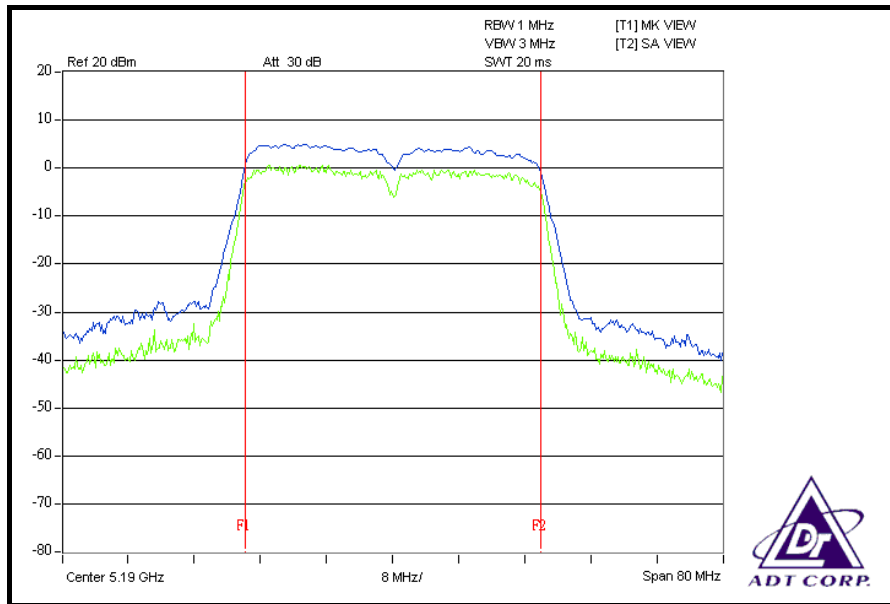


A D T

CH 46



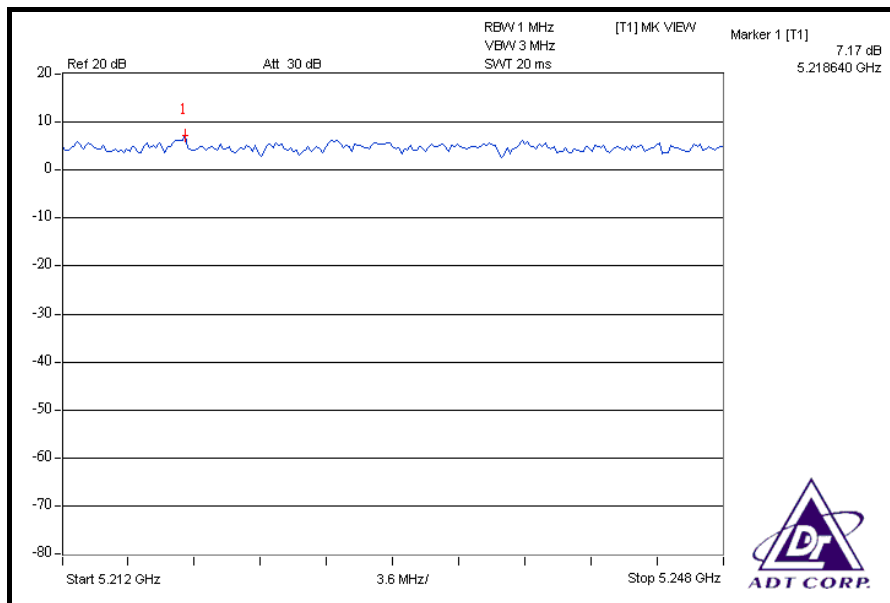
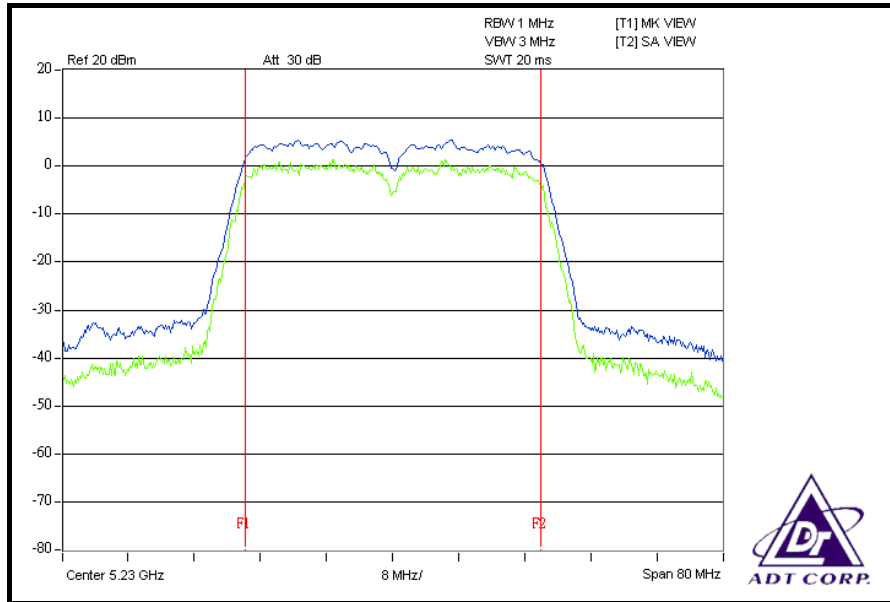
FOR CHAIN 1: CH 38





A D T

CH 46





A D T

4.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	4dBm

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

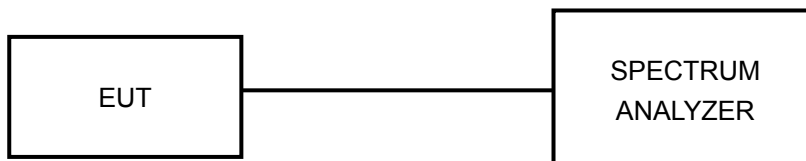
4.5.3 TEST PROCEDURES

- a. The transmitter output was connected to the spectrum analyzer.
- b. Set RBW = 1MHz, VBW = 3MHz. The PPSD is the highest level found across the emission in any 1MHz band.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

Same as 5.3.6.



ADT

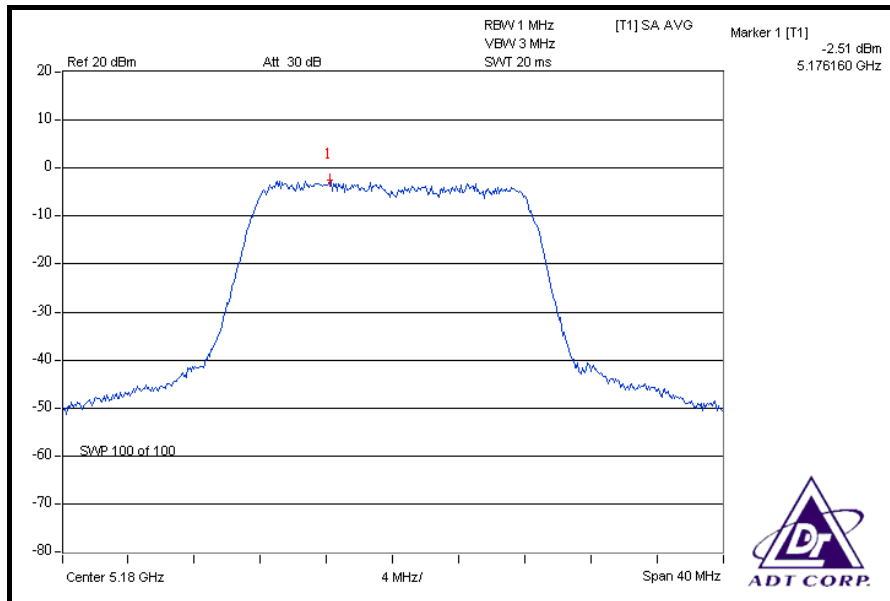
4.5.7 TEST RESULTS

802.11a OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1 MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	-2.51	4	PASS
40	5200	-2.82	4	PASS
48	5240	-2.37	4	PASS

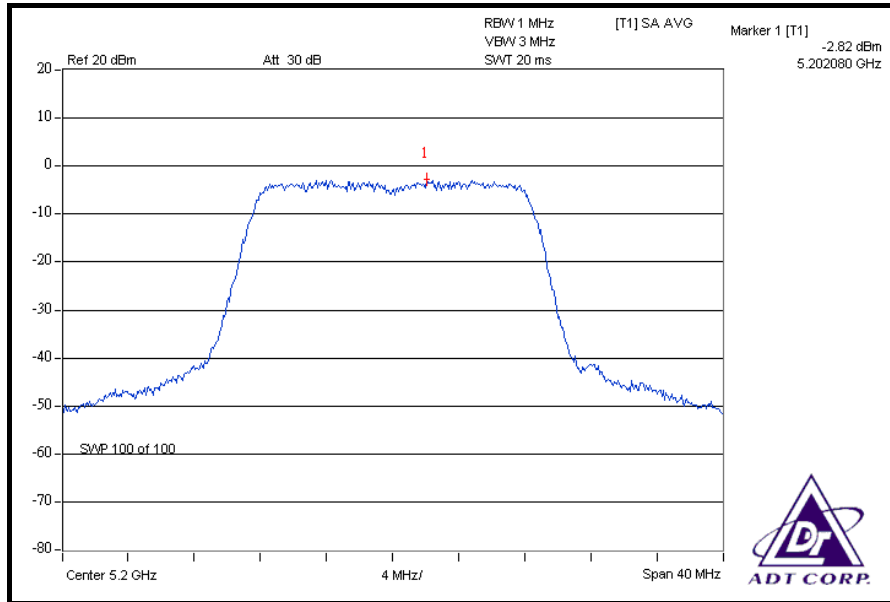
CH 36



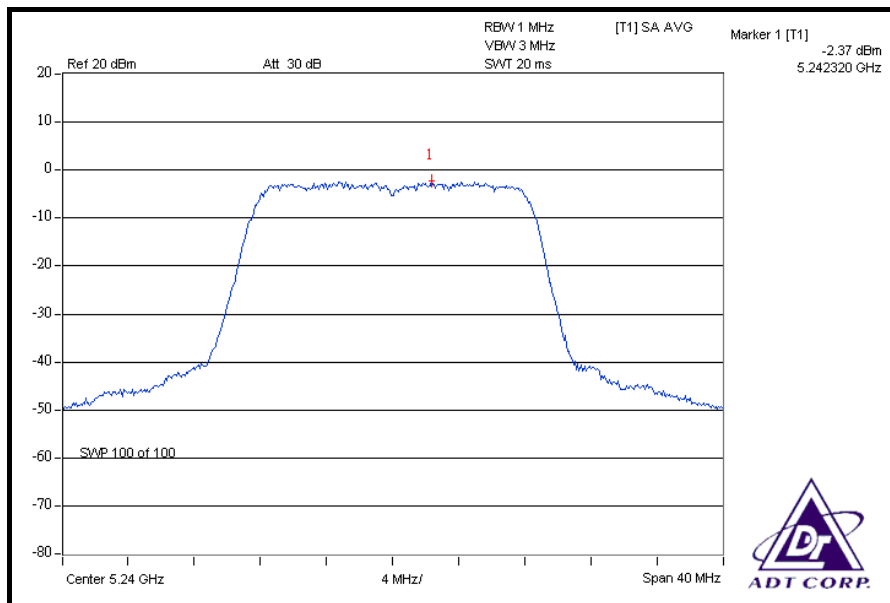


A D T

CH 40



CH 48





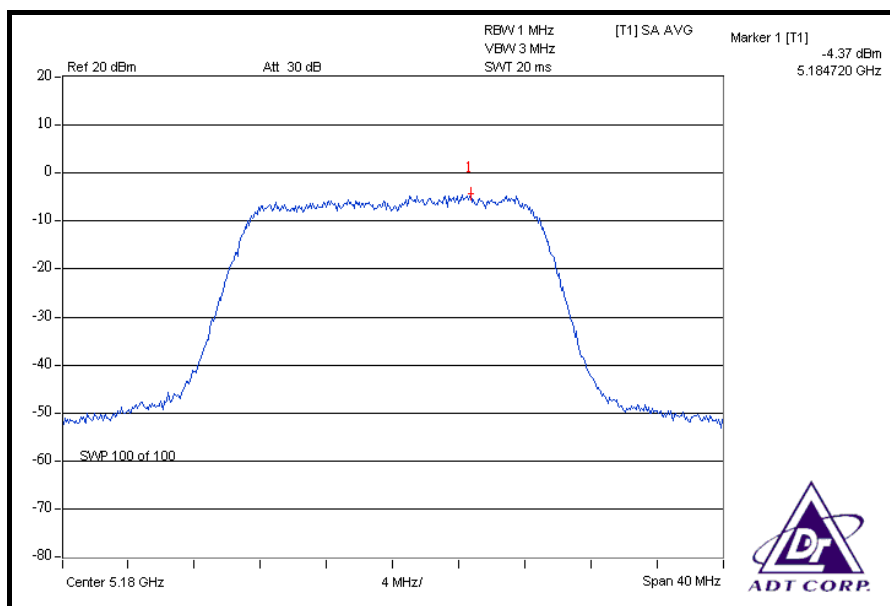
ADT

DRAFT 802.11n (20MHz) OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	-4.37	-3.26	0.838	-0.77	4	PASS
40	5200	-3.69	-3.06	0.922	-0.35	4	PASS
48	5240	-3.88	-2.82	0.932	-0.31	4	PASS

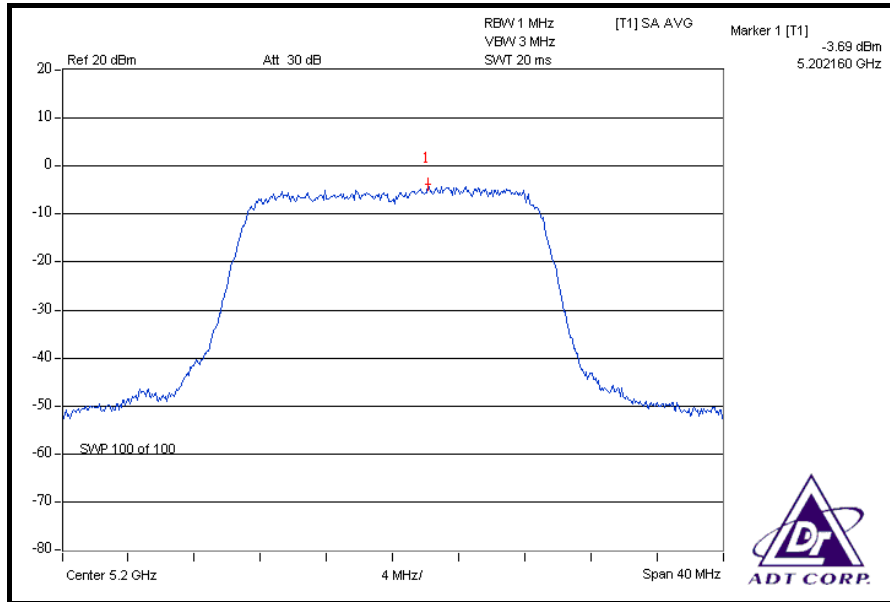
FOR CHAIN 0: CH 36



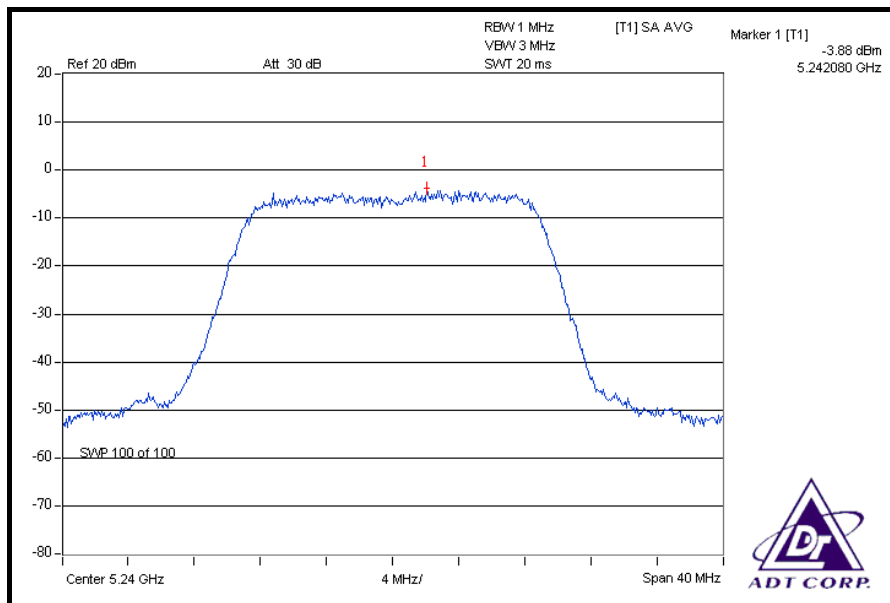


A D T

CH 40



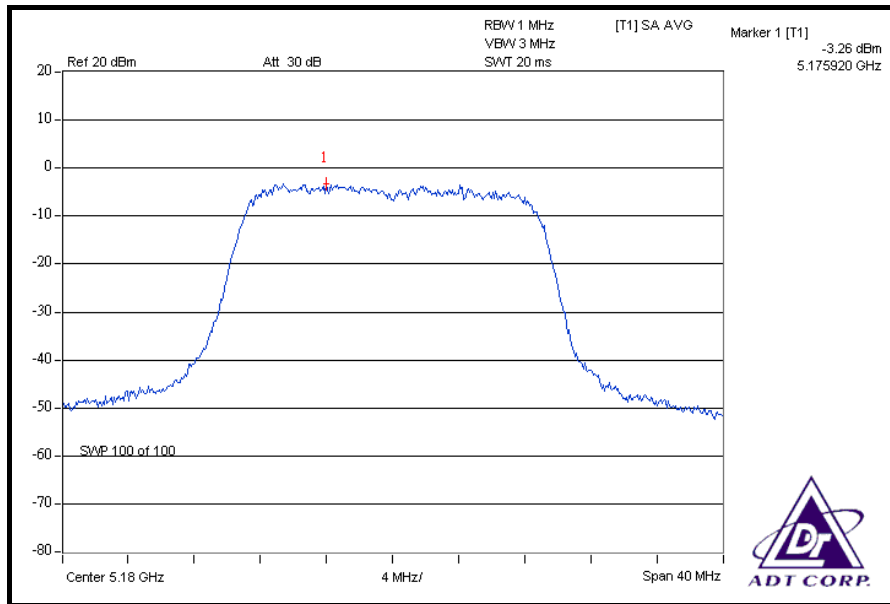
CH 48



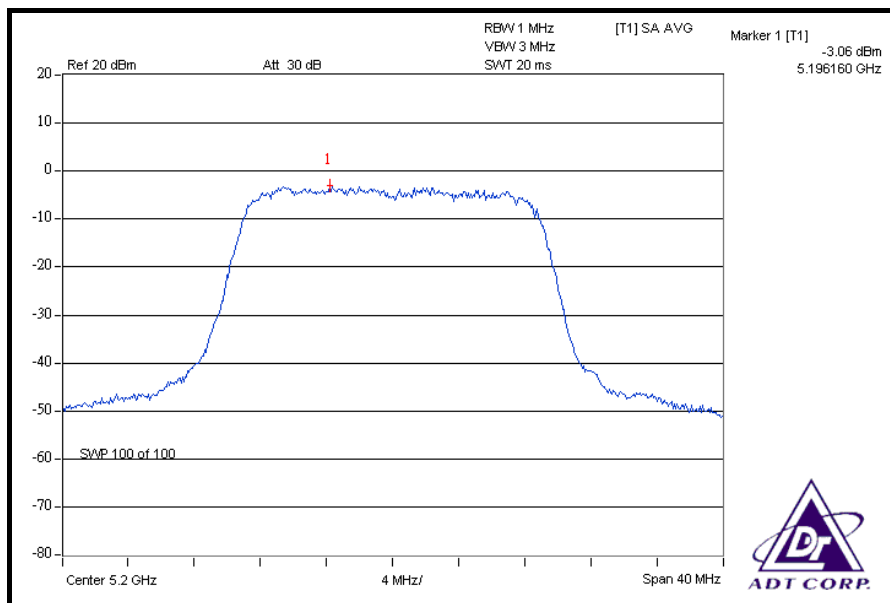


A D T

FOR CHAIN 1: CH 36



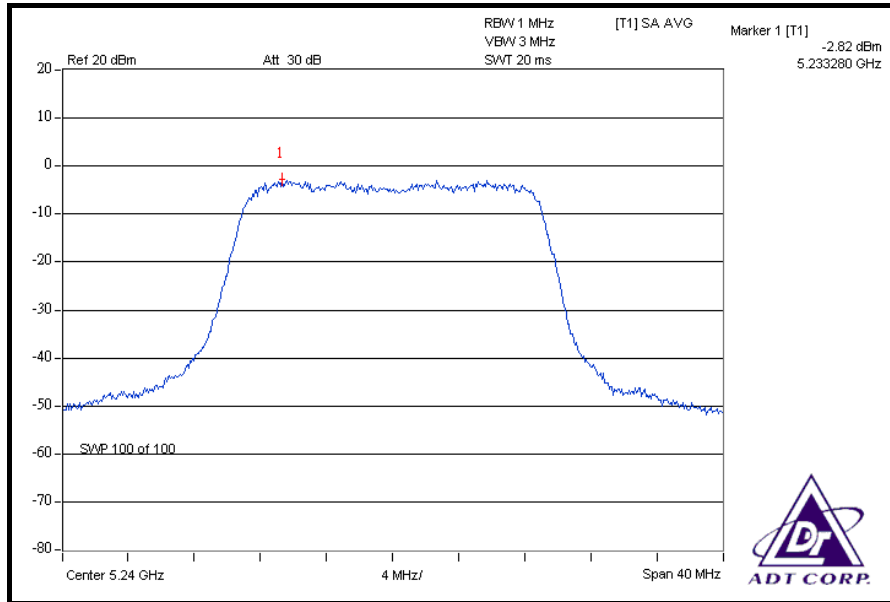
CH 40





A D T

CH 48





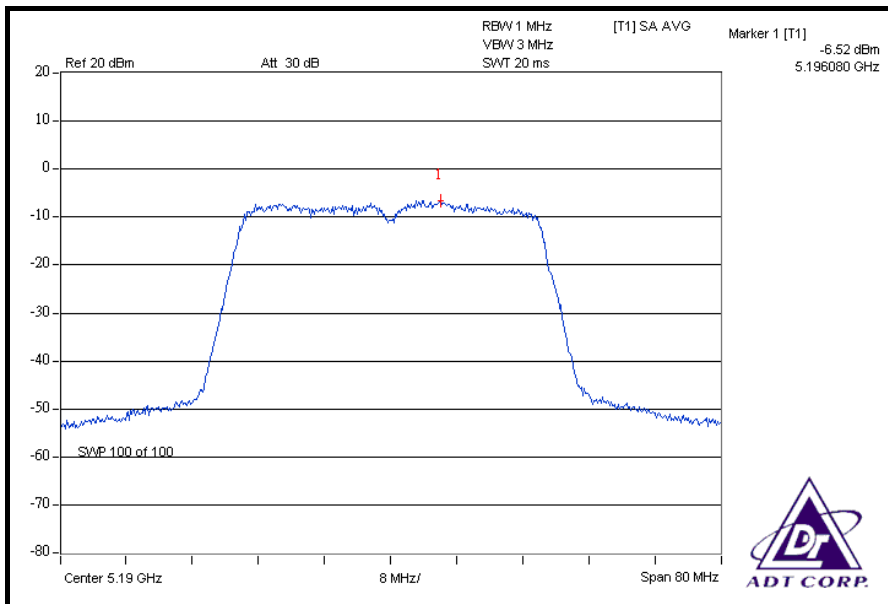
ADT

DRAFT 802.11n (40MHz) OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	26deg.C, 66%RH, 1024hPa
TESTED BY	Brad Wu		

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
38	5190	-6.52	-5.10	0.532	-2.74	4	PASS
46	5230	-5.85	-5.33	0.553	-2.57	4	PASS

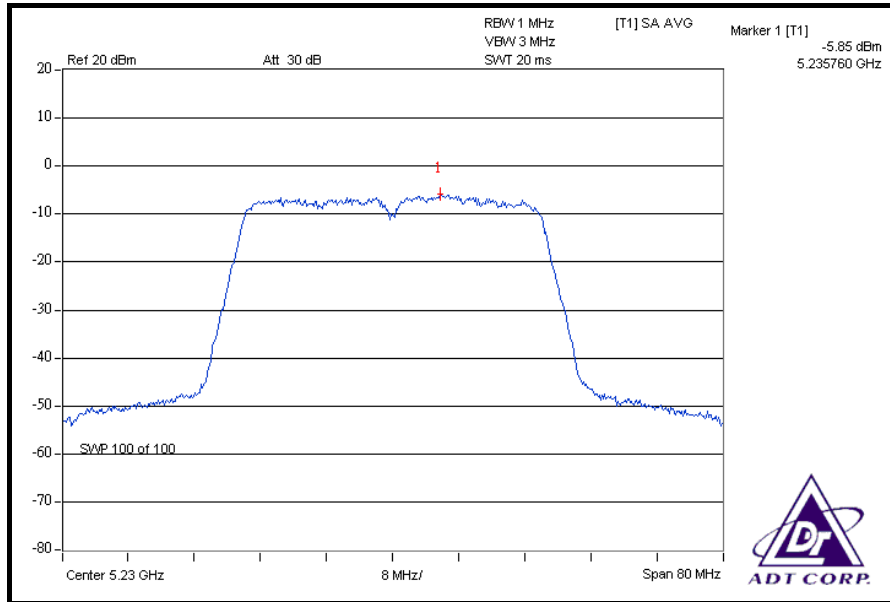
FOR CHAIN 0: CH 38



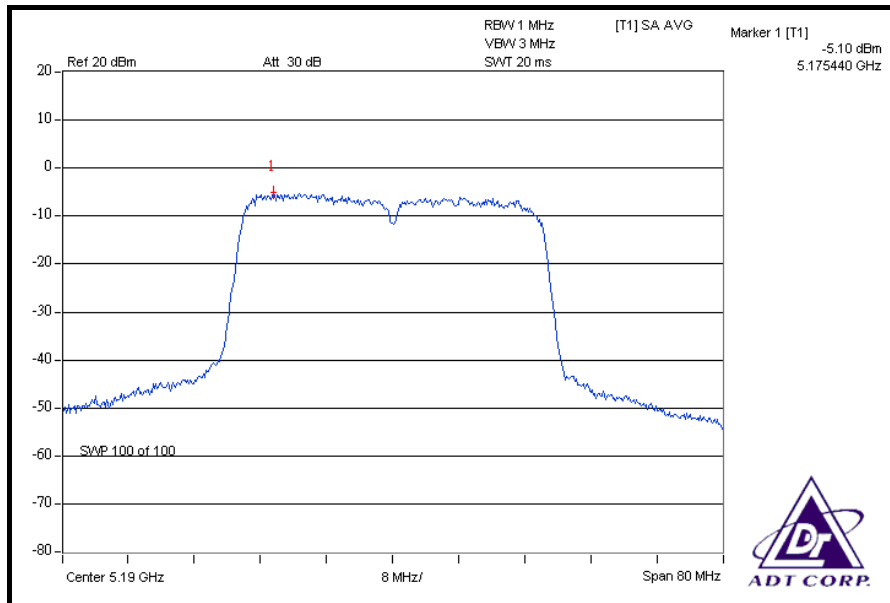


A D T

CH 46



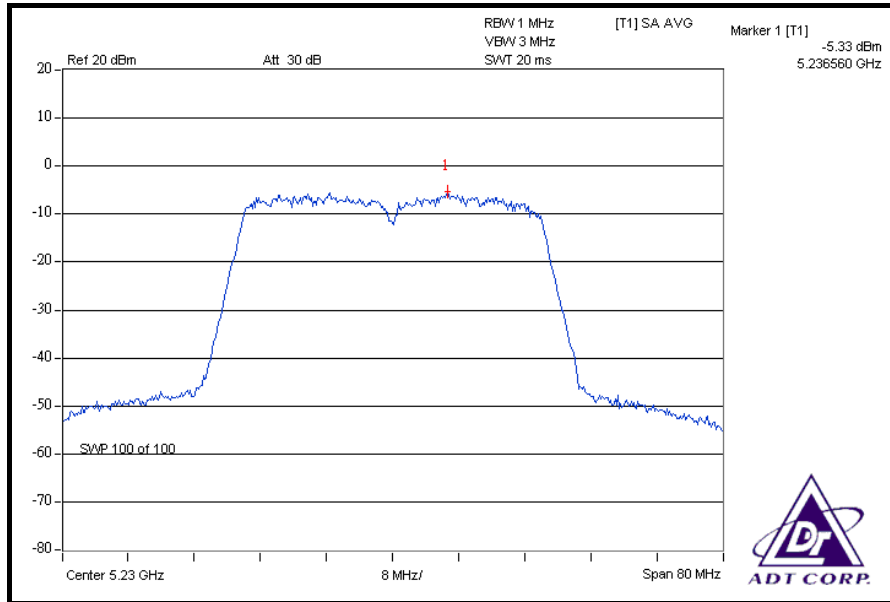
FOR CHAIN 1: CH 38





A D T

CH 46





4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within +/- 0.02% of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
ANRITSU SPECTRUM ANALYZER	MS2667C	M10281	Nov. 21, 2008	Nov. 20, 2009
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W981030	Jun. 28, 2008	Jun. 27, 2009

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

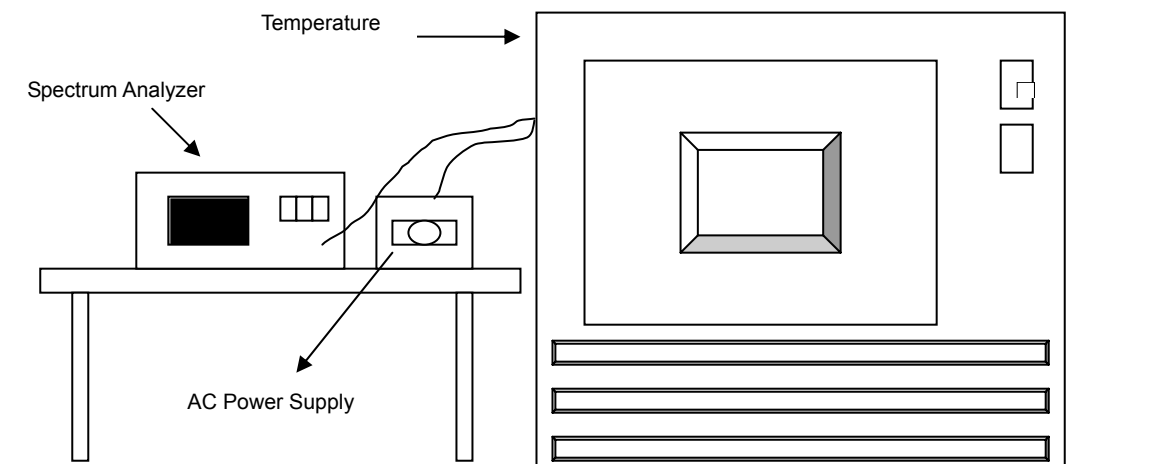
4.6.3 TEST PROCEDURE

- a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- b. Turn the EUT on and couple its output to a spectrum analyzer.
- c. Turn the EUT off and set the chamber to the highest temperature specified.
- d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.1.6.



A D T

4.6.7 TEST RESULTS

OPERATING FREQUENCY: 5200MHz						LIMIT: ± 0.01%			
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5199.998975	-0.0000197	5199.998014	-0.0000382	5200.001037	0.0000199	5199.999069	-0.0000179
	110.0	5199.983518	-0.0003170	5200.003552	0.0000683	5199.983827	-0.0003110	5199.983140	-0.0003242
	93.5	5199.986806	-0.0002537	5200.006501	0.0001250	5199.986867	-0.0002526	5199.986939	-0.0002512
40	126.5	5199.979272	-0.0003986	5199.999029	-0.0000187	5199.978961	-0.0004046	5199.979048	-0.0004029
	110.0	5199.984768	-0.0002929	5200.004963	0.0000954	5199.985211	-0.0002844	5199.984732	-0.0002936
	93.5	5199.996926	-0.0000591	5200.016731	0.0003218	5199.996721	-0.0000631	5199.996764	-0.0000622
30	126.5	5199.979793	-0.0003886	5200.000049	0.0000009	5199.980472	-0.0003755	5199.980087	-0.0003829
	110.0	5199.986201	-0.0002654	5200.005764	0.0001108	5199.986002	-0.0002692	5199.986194	-0.0002655
	93.5	5200.004259	0.0000819	5200.023841	0.0004585	5200.003922	0.0000754	5200.004138	0.0000796
20	126.5	5199.987035	-0.0002493	5200.006487	0.0001248	5199.986685	-0.0002561	5199.987037	-0.0002493
	110.0	5199.987309	-0.0002441	5200.007545	0.0001451	5199.987958	-0.0002316	5199.987346	-0.0002433
	93.5	5200.011437	0.0002199	5200.031945	0.0006143	5200.011884	0.0002285	5200.011547	0.0002221
10	126.5	5199.994719	-0.0001016	5200.013791	0.0002652	5199.994387	-0.0001079	5199.994461	-0.0001065
	110.0	5200.002641	0.0000508	5200.022811	0.0004387	5200.002784	0.0000535	5200.002605	0.0000501
	93.5	5200.018002	0.0003462	5200.038013	0.0007310	5200.017248	0.0003317	5200.017736	0.0003411
0	126.5	5199.997711	-0.0000440	5200.017716	0.0003407	5199.997740	-0.0000435	5199.997662	-0.0000450
	110.0	5200.009778	0.0001880	5200.029481	0.0005669	5200.010115	0.0001945	5200.010213	0.0001964
	93.5	5200.024281	0.0004669	5200.044222	0.0008504	5200.023762	0.0004570	5200.024321	0.0004677
-10	126.5	5200.010218	0.0001965	5200.029881	0.0005746	5200.010263	0.0001974	5200.010033	0.0001929
	110.0	5200.016784	0.0003228	5200.037230	0.0007160	5200.016506	0.0003174	5200.016746	0.0003220
	93.5	5200.030839	0.0005931	5200.051117	0.0009830	5200.031262	0.0006012	5200.030899	0.0005942
-20	126.5	5200.015116	0.0002907	5200.035446	0.0006817	5200.014808	0.0002848	5200.015559	0.0002992
	110.0	5200.020701	0.0003981	5200.039894	0.0007672	5200.020267	0.0003898	5200.020609	0.0003963
	93.5	5200.034876	0.0006707	5200.055248	0.0010625	5200.034769	0.0006686	5200.034988	0.0006728
-30	126.5	5200.020899	0.0004019	5200.040773	0.0007841	5200.020230	0.0003890	5200.020716	0.0003984
	110.0	5200.034868	0.0006705	5200.054789	0.0010536	5200.034985	0.0006728	5200.034447	0.0006624
	93.5	5200.037790	0.0007267	5200.057610	0.0011079	5200.037829	0.0007275	5200.037735	0.0007257



A D T

4.7 BAND EDGES MEASUREMENT

4.7.1 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
FOR CONDUCTED MEASUREMENT:				
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009
FOR RADIATED MEASUREMENT:				
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 02, 2008	Dec. 01, 2009
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 30, 2008	Apr. 29, 2009
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-408	Jan. 22, 2008	Jan. 21, 2009
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 07, 2008	Jan. 06, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	274041/4	Aug. 21, 2008	Aug. 20, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	283397/4	Aug. 21, 2008	Aug. 20, 2009
Software ADT.	ADT_Radiated_V7.6	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table ADT.	TT100.	TT93021704	NA	NA
Turn Table Controller ADT.	SC100.	SC93021704	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	07026401	Aug. 27, 2008	Aug. 26, 2009

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.7.2 TEST PROCEDURE

FOR CONDUCTED MEASUREMENT:

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

FOR RADIATED MEASUREMENT:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. Set both RBW and VBW of spectrum analyzer to 1MHz and 3MHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz

4.7.3 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



4.7.4 TEST RESULTS

For signals in the restricted bands above and below the 5.15 to 5.25GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak field strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Peak RBW = 1MHz, VBW = 3MHz) are attached on the following pages.

802.11a OFDM MODULATION

Channel 36 (5180MHz)

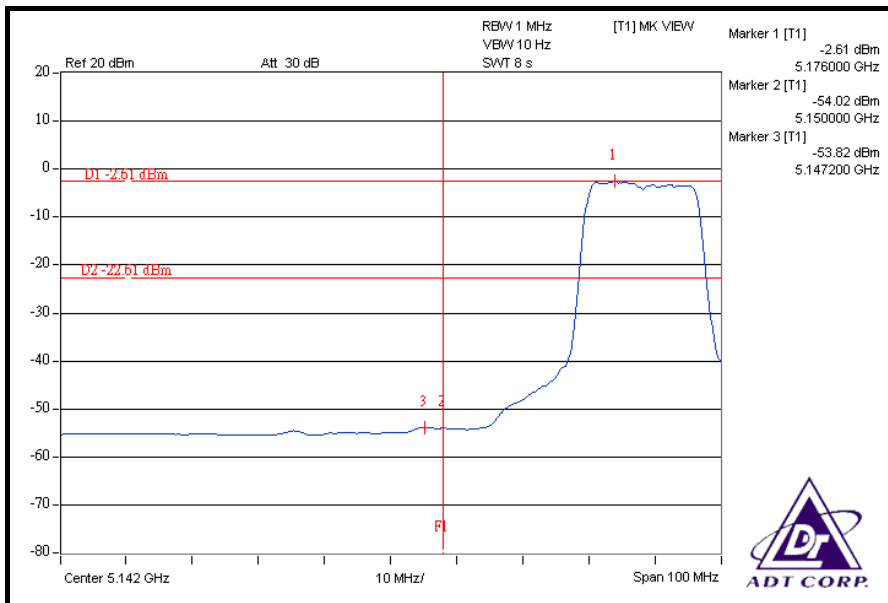
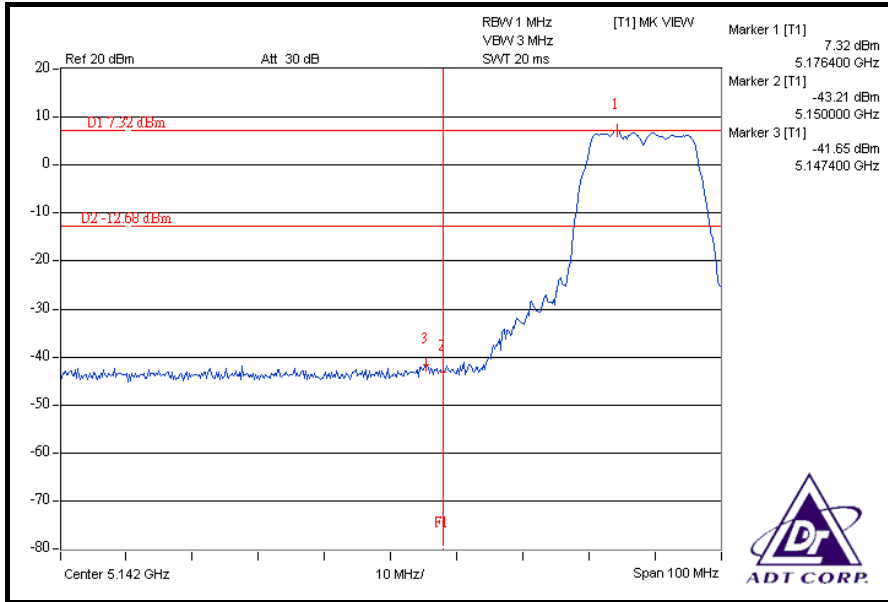
The band edge emission plot on the next page shows 48.97dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 36 is 101.30dBuV/m (Peak), so the maximum field strength in restrict band is $101.30 - 48.97 = 52.33$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next page shows 51.21dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 36 is 90.95dBuV/m (Average), so the maximum field strength in restrict band is $90.95 - 51.21 = 39.74$ dBuV/m which is under 54dBuV/m limit.

Channel 48 (5240MHz)

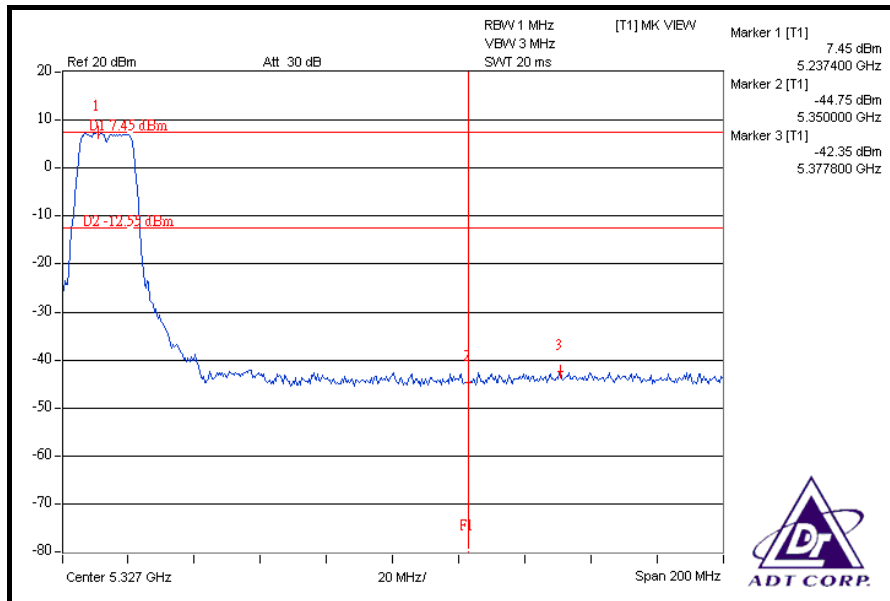
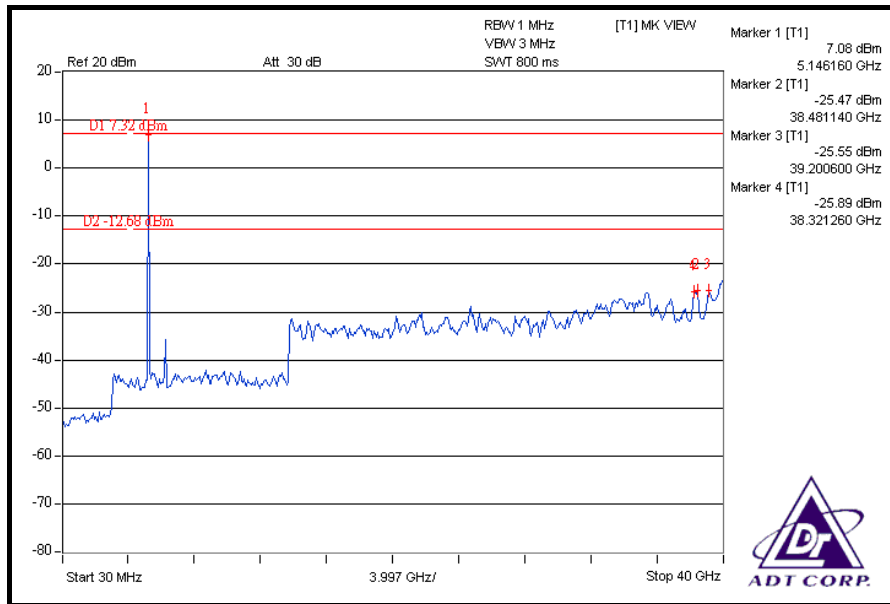
The band edge emission plot on the next second page shows 49.80dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 48 is 101.62dBuV/m (Peak), so the maximum field strength in restrict band is $101.62 - 49.80 = 51.82$ dBuV/m which is under 74dBuV/m limit.

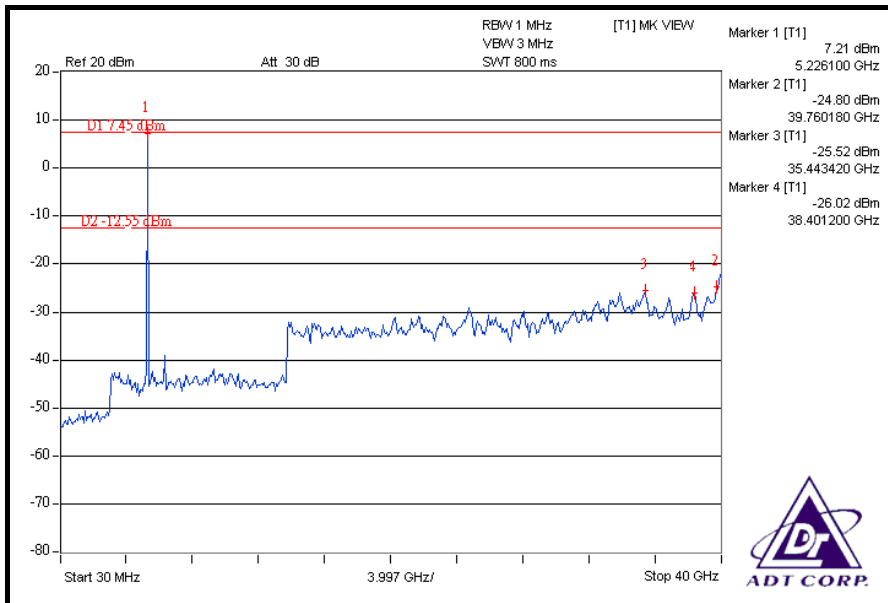
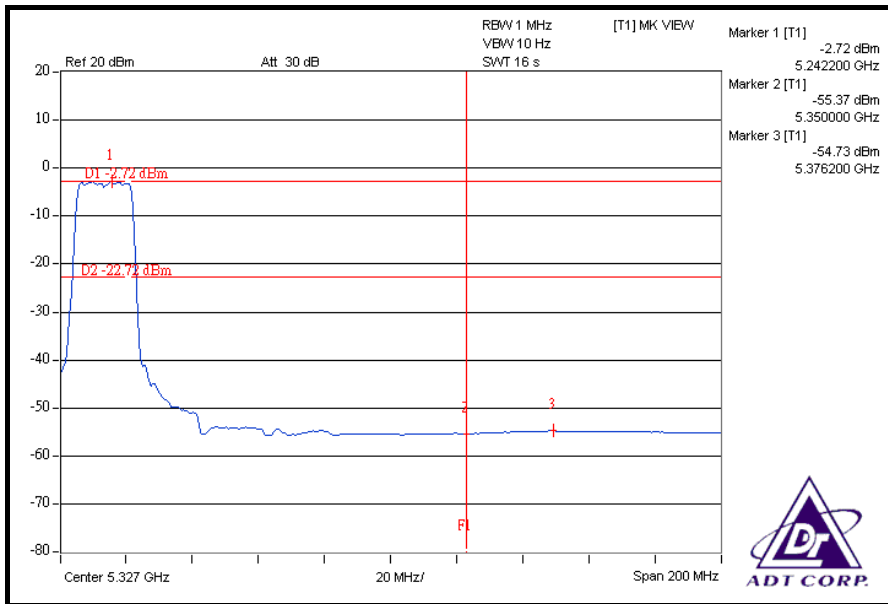
The band edge emission plot on the next third page shows 52.01dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 48 is 91.27dBuV/m (Average), so the maximum field strength in restrict band is $91.27 - 52.01 = 39.26$ dBuV/m which is under 54dBuV/m limit.





A D T







DRAFT 802.11n (20MHz) OFDM MODULATION

Channel 36 (5180MHz)

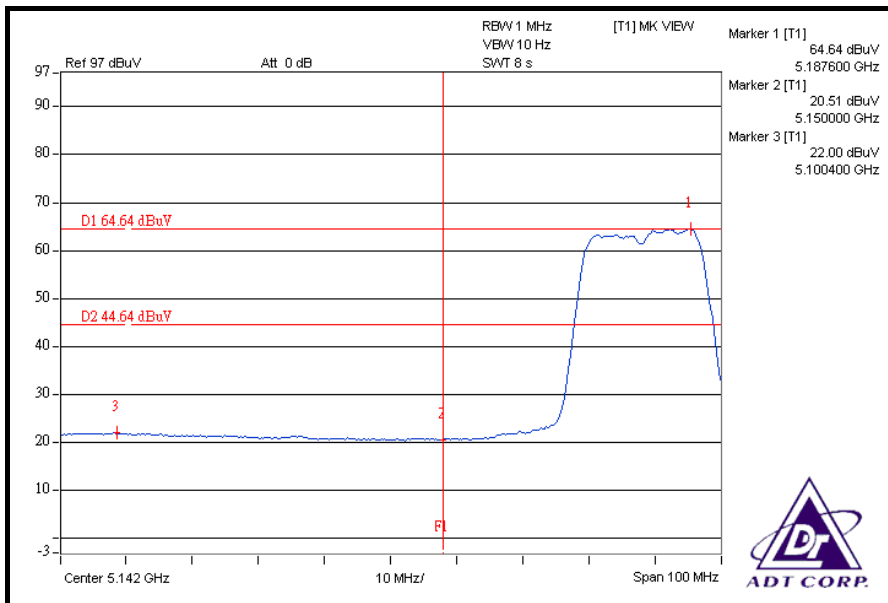
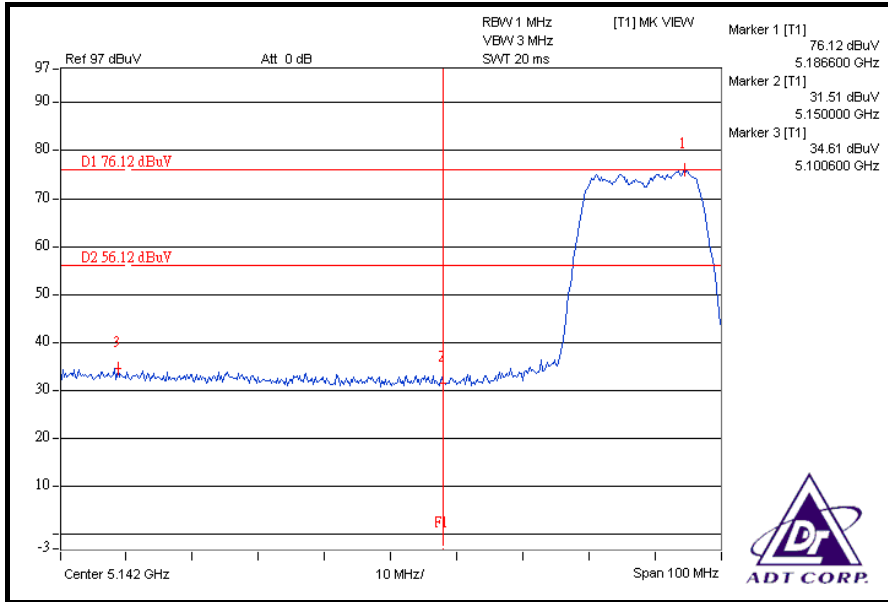
The band edge emission plot on the next page shows 41.51dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 36 is 103.63dBuV/m (Peak), so the maximum field strength in restrict band is $103.63 - 41.51 = 62.12$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next page shows 42.64dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 36 is 93.28dBuV/m (Average), so the maximum field strength in restrict band is $93.28 - 42.64 = 50.64$ dBuV/m which is under 54dBuV/m limit.

Channel 48 (5240MHz)

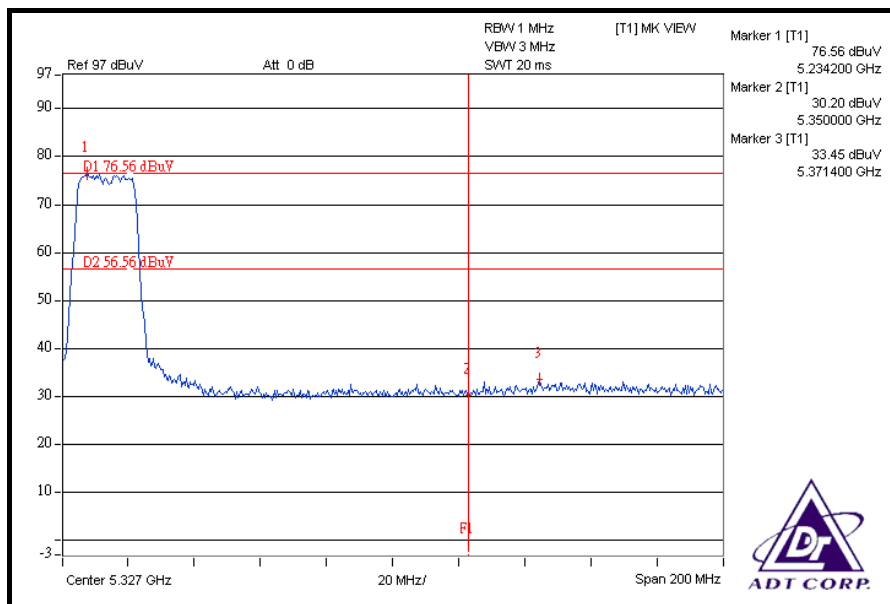
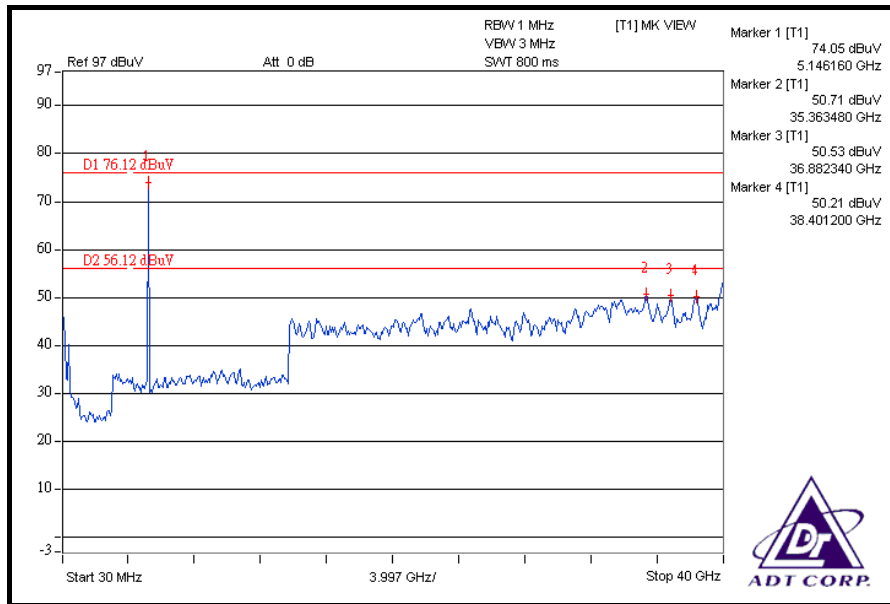
The band edge emission plot on the next second page shows 43.11dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 48 is 104.13dBuV/m (Peak), so the maximum field strength in restrict band is $104.13 - 43.11 = 61.02$ dBuV/m which is under 74dBuV/m limit.

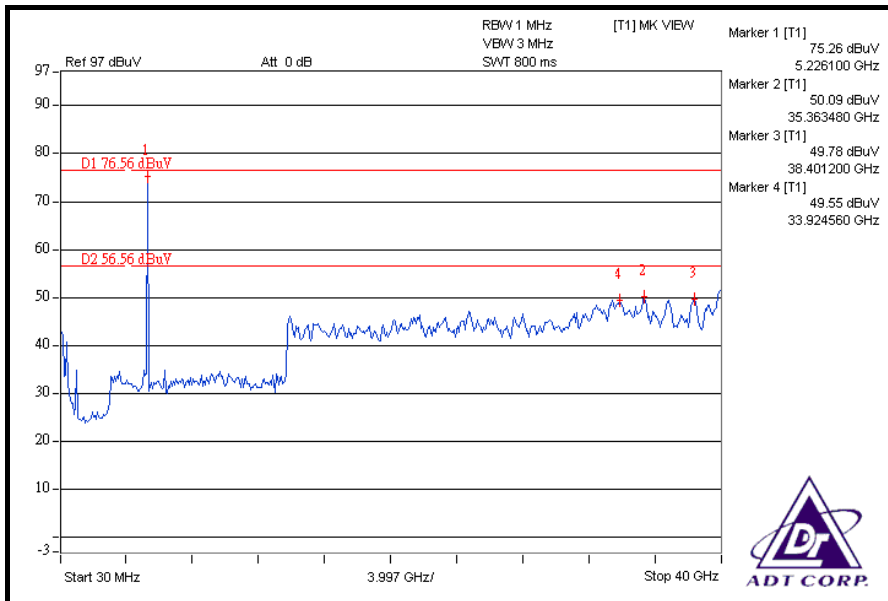
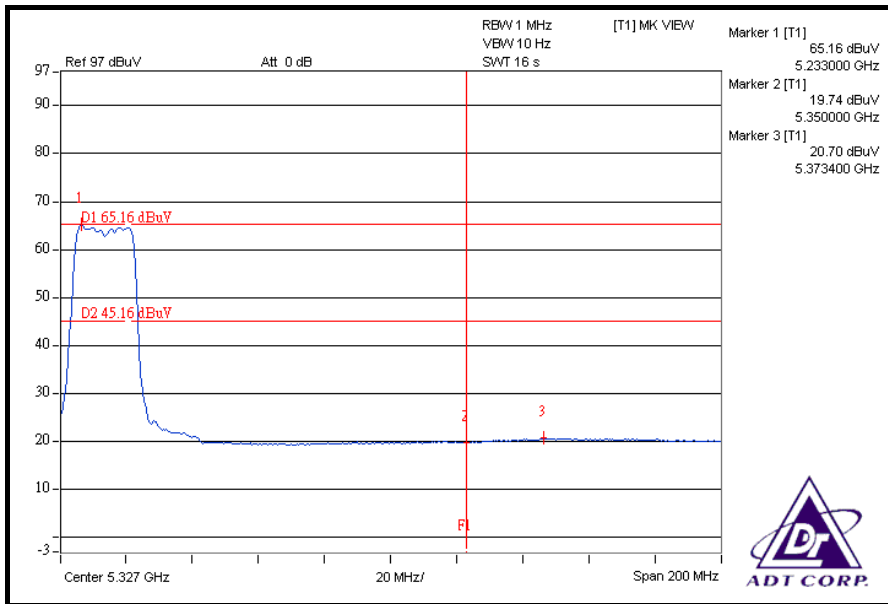
The band edge emission plot on the next third page shows 44.46dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 48 is 93.81dBuV/m (Average), so the maximum field strength in restrict band is $93.81 - 44.46 = 49.35$ dBuV/m which is under 54dBuV/m limit.





A D T







A D T

DRAFT 802.11n (40MHz) OFDM MODULATION

Channel 38 (5190MHz)

The band edge emission plot on the next page shows 40.00dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 38 is 102.34dBuV/m (Peak), so the maximum field strength in restrict band is $102.34 - 40.00 = 62.34$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next page shows 40.62dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 38 is 91.60dBuV/m (Average), so the maximum field strength in restrict band is $91.60 - 40.62 = 50.98$ dBuV/m which is under 54dBuV/m limit.

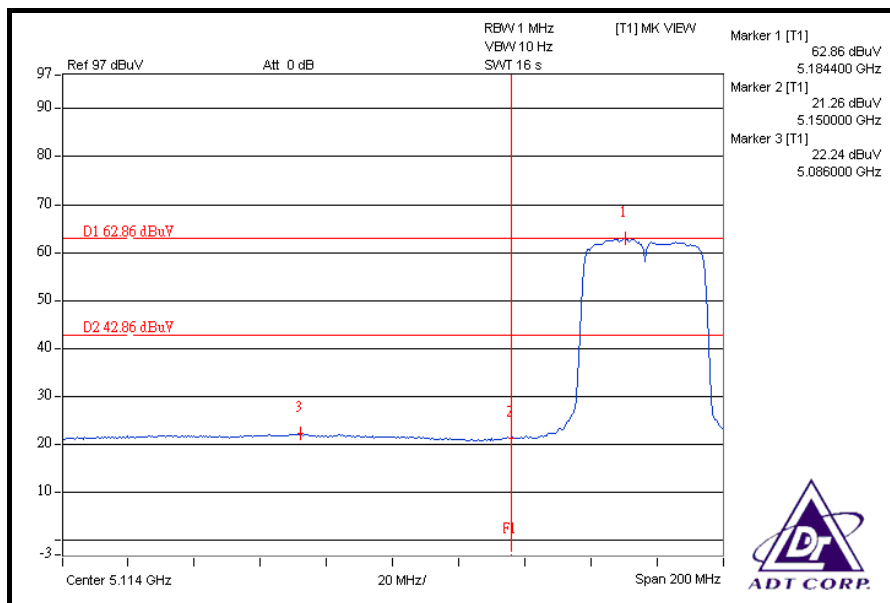
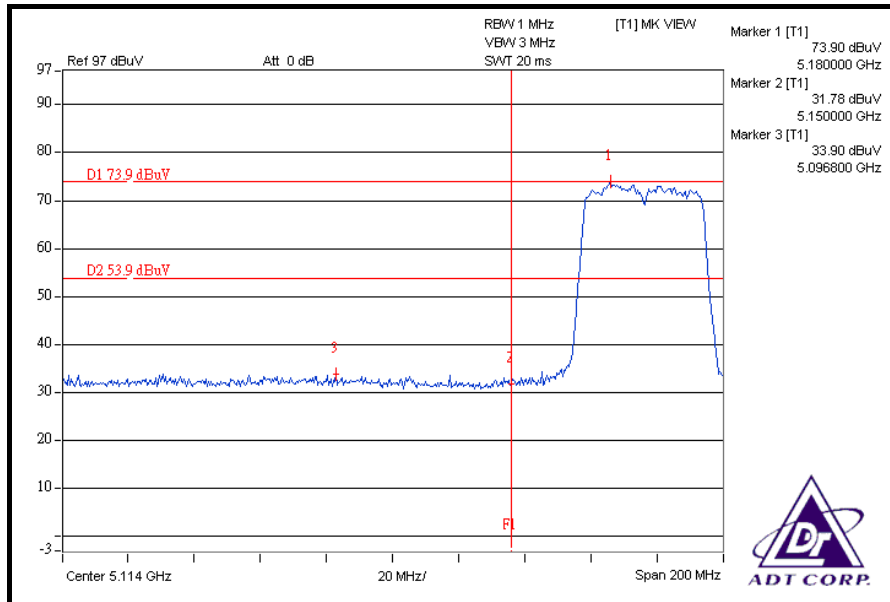
Channel 46 (5230MHz)

The band edge emission plot on the next second page shows 41.47dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 46 is 102.46dBuV/m (Peak), so the maximum field strength in restrict band is $102.46 - 41.47 = 60.99$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 42.27dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 46 is 91.75dBuV/m (Average), so the maximum field strength in restrict band is $91.75 - 42.27 = 49.48$ dBuV/m which is under 54dBuV/m limit.

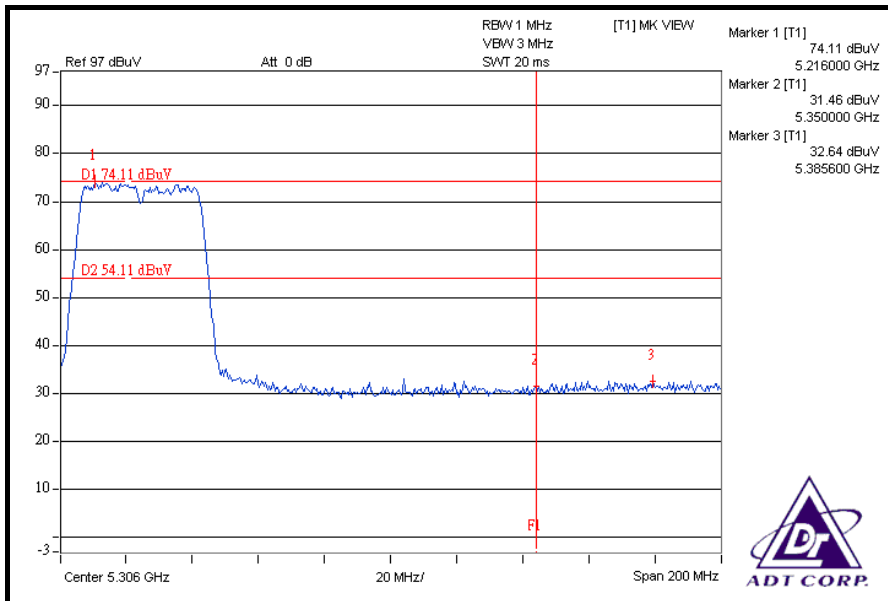
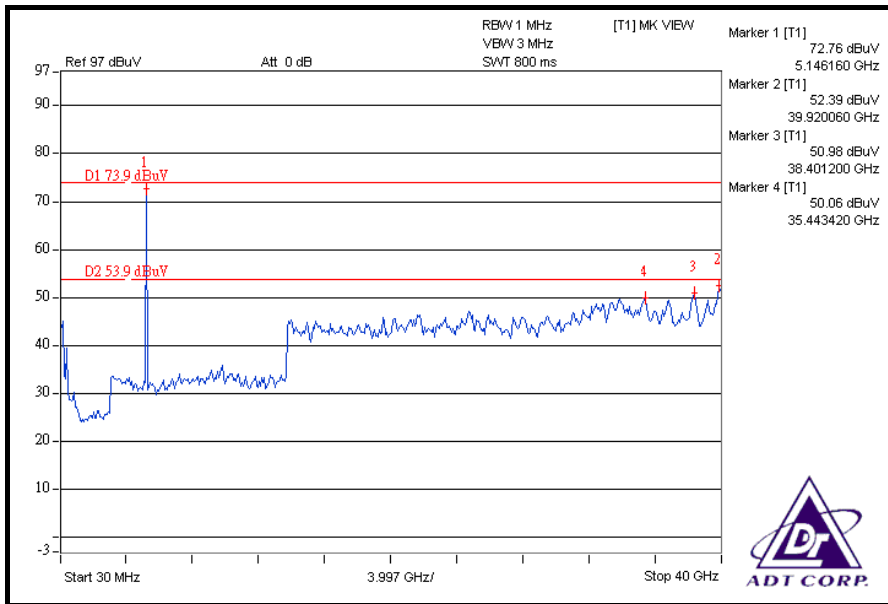


A D T



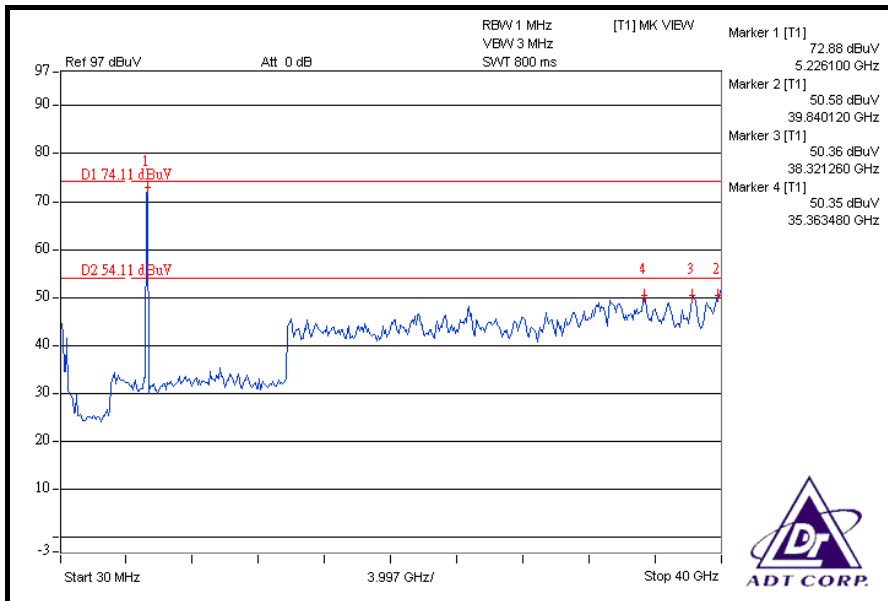
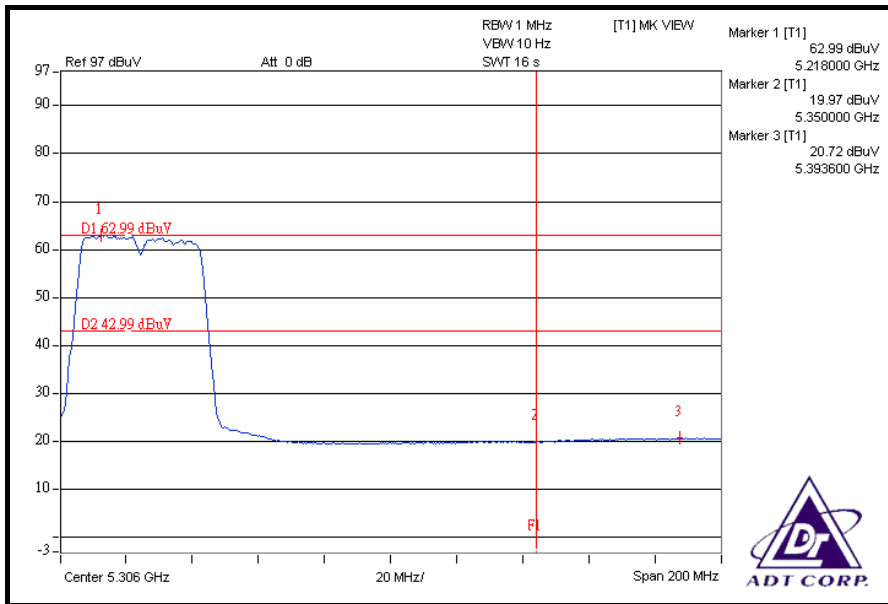


A D T





A D T





A D T

4.8 ANTENNA REQUIREMENT

4.8.1 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 15.407(a), 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.

4.8.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Printed antenna without antenna connector. The maximum gain of the antenna is 4dBi.



A D T

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



A D T

6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	GOST-ASIA(MOU)
Russia	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.



A D T

7. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---