

FCC TEST REPORT (15.407)

REPORT NO.: RF960418L24-1

MODEL NO.: WM821-M

RECEIVED: Apr. 18, 2007

TESTED: Apr. 25 ~ Jun. 23, 2007

ISSUED: Jun. 24, 2007

APPLICANT: CyberTAN Technology, Inc.

ADDRESS: No. 99, Park Avenue III Science-based Industrial
Park, Hsinchu, Taiwan (R.O.C.)

ISSUED BY: Advance Data Technology Corporation

LAB ADDRESS: No.47, 14th Ling, Chia Pau Tsuen, Linko Hsiang
244, Taipei Hsien, 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.

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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	9
3.2.2	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	10
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS	14
3.4	DESCRIPTION OF SUPPORT UNITS	14
4.	TEST TYPES AND RESULTS	15
4.1	CONDUCTED EMISSION MEASUREMENT	15
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT.....	15
4.1.2	TEST INSTRUMENTS	15
4.1.3	TEST PROCEDURES	16
4.1.4	DEVIATION FROM TEST STANDARD	16
4.1.5	TEST SETUP	17
4.1.6	EUT OPERATING CONDITIONS	17
4.1.7	TEST RESULTS	18
4.2	RADIATED EMISSION MEASUREMENT	26
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT.....	26
4.2.2	LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS.....	26
4.2.3	TEST INSTRUMENTS	27
4.2.4	TEST PROCEDURES	28
4.2.5	DEVIATION FROM TEST STANDARD	28
4.2.6	TEST SETUP	29
4.2.7	EUT OPERATING CONDITION	29
4.2.8	TEST RESULTS	30
4.3	PEAK TRANSMIT POWER MEASUREMENT	46
4.3.1	LIMITS OF PEAK TRANSMIT POWER MEASUREMENT.....	46
4.3.2	TEST INSTRUMENTS	46
4.3.3	TEST PROCEDURE	46
4.3.4	DEVIATION FROM TEST STANDARD	47
4.3.5	TEST SETUP	47
4.3.6	EUT OPERATING CONDITIONS	47
4.3.7	TEST RESULTS	48
4.4	PEAK POWER EXCURSION MEASUREMENT	72
4.4.1	LIMITS OF PEAK POWER EXCURSION MEASUREMENT.....	72
4.4.2	TEST INSTRUMENTS	72
4.4.3	TEST PROCEDURE	72
4.4.4	DEVIATION FROM TEST STANDARD	73
4.4.5	TEST SETUP	73

4.4.6	EUT OPERATING CONDITIONS	73
4.4.7	TEST RESULTS	74
4.5	PEAK POWER SPECTRAL DENSITY MEASUREMENT	86
4.5.1	LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT	86
4.5.2	TEST INSTRUMENTS	86
4.5.3	TEST PROCEDURES	86
4.5.4	DEVIATION FROM TEST STANDARD	87
4.5.5	TEST SETUP	87
4.5.6	EUT OPERATING CONDITIONS	87
4.5.7	TEST RESULTS	88
4.6	FREQUENCY STABILITY	100
4.6.1	LIMITS OF FREQUENCY STABILITY MEASUREMENT	100
4.6.2	TEST INSTRUMENTS	100
4.6.3	TEST PROCEDURE	100
4.6.4	DEVIATION FROM TEST STANDARD	101
4.6.5	TEST SETUP	101
4.6.6	EUT OPERATING CONDITION	101
4.6.7	TEST RESULTS	102
4.7	BAND EDGES MEASUREMENT	103
4.7.1	TEST INSTRUMENTS	103
4.7.2	TEST PROCEDURE	104
4.7.3	EUT OPERATING CONDITION	105
4.7.4	TEST RESULTS	105
4.8	DYNAMIC FREQUENCY SELECTION	122
4.8.1	OPERATING FREQUENCY OF U-NII DEVICE	123
4.8.2	TEST LIMITS AND RADAR SIGNAL PARAMETERS	123
4.8.3	TEST INSTRUMENTS	126
4.8.4	DESCRIPTION OF SUPPORT UNITS	126
4.8.5	SOFTWARE AND FIRMWARE	126
4.8.6	DESCRIPTION OF AVAILABLE ANTENNAS	126
4.8.7	MAXIMUM AND MINIMUM CONDUCTED POWER	127
4.8.8	MAXIMUM AND MINIMUM E.I.R.P. POWER	127
4.8.9	TEST PROCEDURE	128
4.8.10	DEVIATION FROM TEST STANDARD	130
4.8.11	CONDUCTED TEST SETUP CONFIGURATION	130
4.8.12	LIST OF MEASUREMENTS	131
4.8.13	TEST RESULTS	132
4.9	ANTENNA REQUIREMENT	136
4.9.1	STANDARD APPLICABLE	136
4.9.2	ANTENNA CONNECTED CONSTRUCTION	136
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION	137
6.	INFORMATION ON THE TESTING LABORATORIES	138
	APPENDIX-A	A-1

1. CERTIFICATION

PRODUCT: Wireless 802.11N DUAL BAND MINI PCI MODULE

MODEL: WM821-M

BRAND: CyberTAN

APPLICANT: CyberTAN Technology, Inc.

TEST SAMPLE: ENGINEERING SAMPLE

TESTED: Apr. 25 ~ Jun. 23, 2007

STANDARDS: FCC Part 15, Subpart E (Section 15.407)

FCC 06-96

ANSI C63.4-2003

The above equipment (Model: WM821-M) has been tested by **Advance Data Technology Corporation**, 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 : Rennie Wang , **DATE:** Jun. 24, 2007
Rennie Wang / Senior Specialist

TECHNICAL
ACCEPTANCE : Long Chen , **DATE:** Jun. 24, 2007
Responsible for RF Long Chen / Senior Engineer

APPROVED BY : Gary Chang , **DATE:** Jun. 24, 2007
Gary Chang / Supervisor

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 -19.05dB at 0.154MHz
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 -1.28dB at 5150.00MHz
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.
15.407(h)	Dynamic Frequency Selection	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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.44dB
Radiated emissions	30MHz ~ 200MHz	3.34dB
	200MHz ~ 1000MHz	3.35dB
	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 $k = 2$.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Wireless 802.11N DUAL BAND MINI PCI MODULE
MODEL NO.	WM821-M
FCC ID	N89-WM821M
POWER SUPPLY	3.3Vdc 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 (20MHz): 144.444/ 130.000/ 115.556/ 86.667/ 57.778/ 43.333/ 28.889/ 14.444/ 72.2/ 65.0/ 57.8/ 43.3/ 28.9/ 21.7/ 14.4/ 7.2Mbps Draft 802.11n (40MHz): 300/ 270/ 240/ 180/ 120/ 90/ 60/ 30/ 150/ 135/ 120/ 90/ 60/ 45/ 30/ 15Mbps
FREQUENCY RANGE	2.4GHz: 2400 ~ 2483.5MHz 5.0GHz: 5150 ~ 5250MHz, 5250 ~ 5350MHz, 5470 ~ 5725MHz, 5725 ~ 5850MHz
NUMBER OF CHANNEL	2.4GHz: 11 for 802.11b, 802.11g, draft 802.11n (20MHz) 7 for draft 802.11n (40MHz) 5.0GHz: 8 for 802.11a (5150 ~ 5350MHz) 11 for 802.11a (5470 ~ 5725MHz) 5 for 802.11a (5725 ~ 5850MHz) 4 for draft 802.11n (20MHz), 2 for draft 802.11n (40MHz) (5150 ~ 5250MHz) 5 for draft 802.11n (20MHz), 2 for draft 802.11n (40MHz) (5725 ~ 5850MHz)
OUTPUT POWER	128.094mW for 2400 ~ 2483.5MHz 45.345mW for 5150 ~ 5350MHz 40.272mW for 5470 ~ 5725MHz 90.582mW for 5725 ~ 5850MHz
ANTENNA TYPE	2.4GHz: PIFA antenna with -3.5dBi gain 5.0GHz: PIFA antenna with -4.5dBi gain
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. This report only covered frequency range: 5150 ~ 5350MHz, 5470 ~ 5725MHz. Frequency range: 2400 ~ 2483.5MHz and 5725 ~ 5850MHz showed in another report, which report no. is RF960418L24.
2. The frequency bands used in this EUT are listed as follows:

Frequency Band (MHz)	2400~2483.5	5150~5250	5250~5350	5740~5725	5725~5850
802.11b	√				
802.11g	√				
802.11a		√	√	√	√
Draft 11n(20MHz)	√	√			√
Draft 11n(40MHz)	√	√			√

3. The EUT incorporates a MIMO function. Physically, the card provides two completed transmitters and three receivers.
4. The EUT is 2 * 3 spatial MIMO (2Tx & 3Rx) without beam forming function that only operate dual chain configuration (both chain 0 and chain 1 transceivers are operational).
5. When the EUT operating in 802.11b, 802.11g, 802.11a, the software operation, which is defined by manufacturer, only set single Tx.
6. When the EUT operating in draft 802.11n, the software operation, which is defined by manufacturer, only set 0 ~ 15 of "MCS" (MCS: Modulation and Coding Schemes) for dual Tx.
7. The EUT complies with draft 802.11n standards and backwards compatible with 802.11b, 802.11g, 802.11a products.
8. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 300Mbps.
9. 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

Operated in 5150 ~ 5350MHz

19 channels are provided for 802.11a:

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	5180MHz	5	5260MHz
2	5200MHz	6	5280MHz
3	5220MHz	7	5300MHz
4	5240MHz	8	5320MHz

Operated in 5470 ~ 5725MHz

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
9	5500 MHz	15	5620 MHz
10	5520 MHz	16	5640 MHz
11	5540 MHz	17	5660 MHz
12	5560 MHz	18	5680 MHz
13	5580 MHz	19	5700 MHz
14	5600 MHz		

Operated in 5150 ~ 5250MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	5180MHz	3	5220MHz
2	5200MHz	4	5240MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	5190MHz	2	5230MHz

3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 802.11a 5150 ~ 5350MHz, 5470 ~ 5725MHz:

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

Where **PLC:** Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz

RE≥1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

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)	TX CONDITION
802.11a	1 to 19	1, 9	OFDM	BPSK	6.0	Single

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 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)	TX CONDITION
802.11a	1 to 19	1, 9	OFDM	BPSK	6.0	Single

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 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)	TX CONDITION
802.11a	1 to 19	1, 4, 5, 8, 9, 14, 19	OFDM	BPSK	6.0	Single

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)	TX CONDITION
802.11a	1 to 19	1, 8, 9, 19	OFDM	BPSK	6.0	Single

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)	TX CONDITION
802.11a	1 to 19	1, 4, 5, 8, 9, 14, 19	OFDM	BPSK	6.0	Single

FOR DRAFT 802.11n 5150 ~ 5250MHzMHz:

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

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

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)	TX CONDITION
Draft 802.11n (20MHz)	1 to 4	1	OFDM	BPSK	7.2	Dual
Draft 802.11n (40MHz)	1 to 2	1	OFDM	BPSK	15.0	Dual

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 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)	TX CONDITION
Draft 802.11n (20MHz)	1 to 4	1	OFDM	BPSK	7.2	Dual
Draft 802.11n (40MHz)	1 to 2	1	OFDM	BPSK	15.0	Dual

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 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)	TX CONDITION
Draft 802.11n (20MHz)	1 to 4	1, 2, 4	OFDM	BPSK	7.2	Dual
Draft 802.11n (40MHz)	1 to 2	1, 2	OFDM	BPSK	15.0	Dual

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)	TX CONDITION
Draft 802.11n (20MHz)	1 to 4	1, 4	OFDM	BPSK	7.2	Dual
Draft 802.11n (40MHz)	1 to 2	1, 2	OFDM	BPSK	15.0	Dual

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)	TX CONDITION
Draft 802.11n (20MHz)	1 to 4	1, 2, 4	OFDM	BPSK	7.2	Dual
Draft 802.11n (40MHz)	1 to 2	1, 2	OFDM	BPSK	15.0	Dual

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 COMPUTER	DELL	PP05L	9954115984	E2K24CLNS
2	AUXILIARY EQUIPMENT	NA	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA

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

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	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.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Sep. 25, 2007
RF signal cable Woken	5D-FB	Cable-HYCO3-01	Jan. 06, 2008
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 08, 2008
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jan. 16, 2008
Software ADT	ADT_Cond_V3	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.

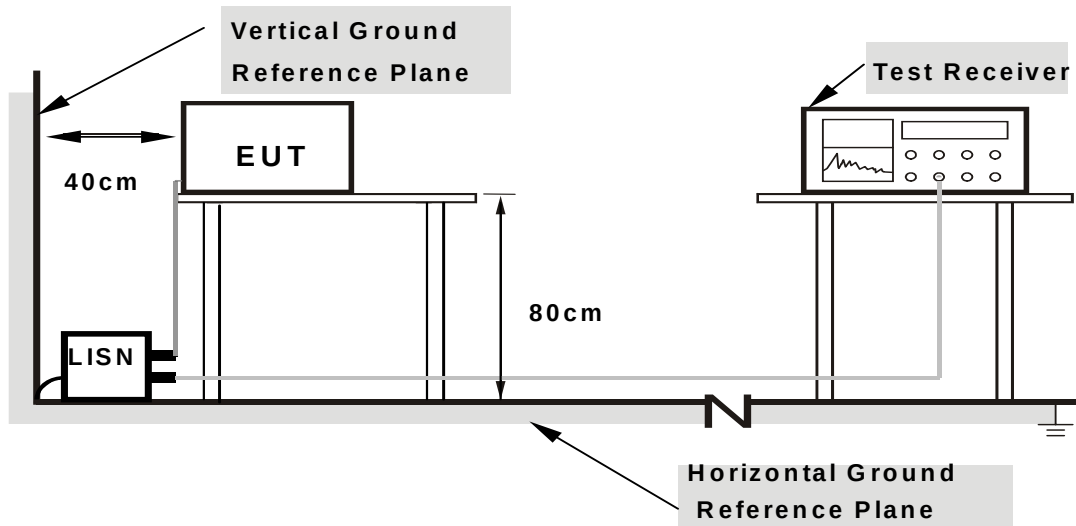
4.1.3 TEST PROCEDURES

- 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.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 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).

4.1.6 EUT OPERATING CONDITIONS

- a. Connected the EUT to notebook via extended card 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.

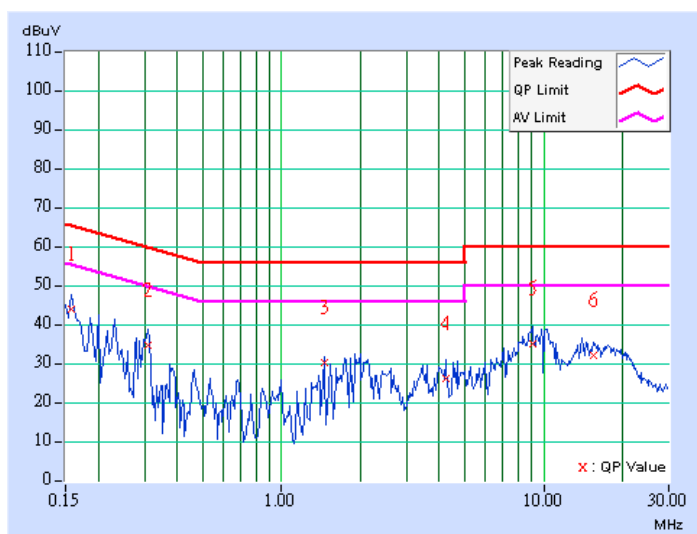
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: 802.11a OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	6.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 985hPa	TESTED BY	Brad Wu

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.10	43.52	-	43.62	-	65.58	55.58	-21.96	-
2	0.310	0.10	34.22	-	34.32	-	59.97	49.97	-25.65	-
3	1.453	0.16	29.92	-	30.08	-	56.00	46.00	-25.92	-
4	4.223	0.28	25.66	-	25.94	-	56.00	46.00	-30.06	-
5	9.082	0.32	34.68	-	35.00	-	60.00	50.00	-25.00	-
6	15.504	0.49	31.63	-	32.12	-	60.00	50.00	-27.88	-

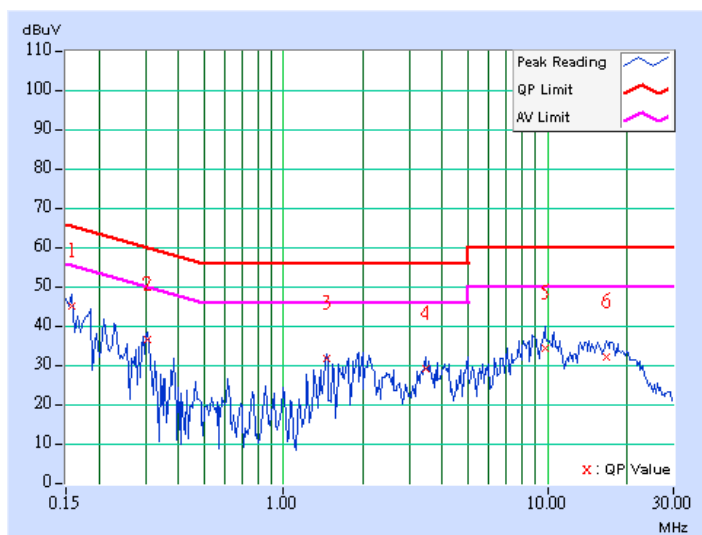
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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 1	PHASE	Line 2
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	6.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 985hPa	TESTED BY	Brad Wu

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.10	44.65	-	44.75	-	65.58	55.58	-20.83	-
2	0.306	0.10	36.26	-	36.36	-	60.07	50.07	-23.71	-
3	1.457	0.21	31.35	-	31.56	-	56.00	46.00	-24.44	-
4	3.461	0.26	28.84	-	29.10	-	56.00	46.00	-26.90	-
5	9.816	0.43	33.88	-	34.31	-	60.00	50.00	-25.69	-
6	16.824	0.51	31.65	-	32.16	-	60.00	50.00	-27.84	-

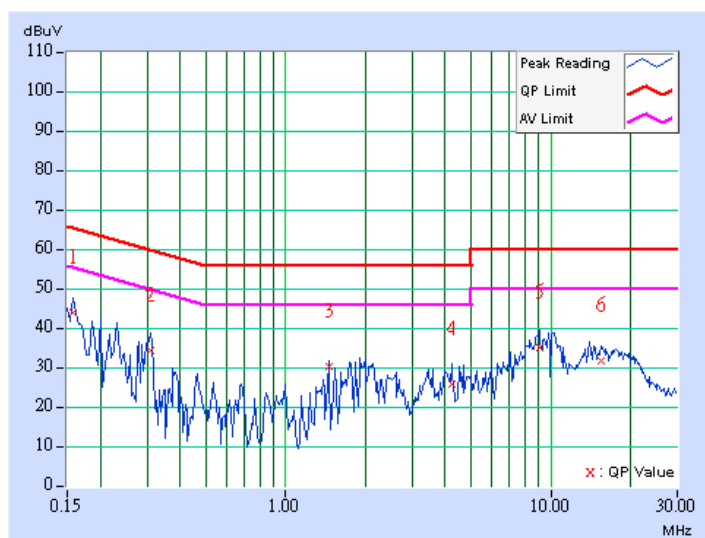
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = 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 9	PHASE	Line 1
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	6.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 985hPa	TESTED BY	Brad Wu

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.10	43.66	-	43.76	-	65.58	55.58	-21.82	-
2	0.310	0.10	34.07	-	34.17	-	59.97	49.97	-25.80	-
3	1.453	0.16	29.87	-	30.03	-	56.00	46.00	-25.97	-
4	4.223	0.28	25.55	-	25.83	-	56.00	46.00	-30.17	-
5	9.082	0.32	34.59	-	34.91	-	60.00	50.00	-25.09	-
6	15.504	0.49	31.52	-	32.01	-	60.00	50.00	-27.99	-

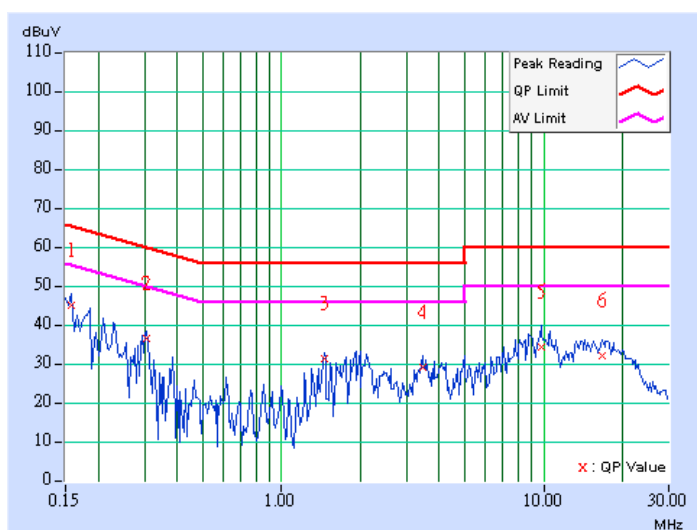
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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 9	PHASE	Line 2
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	6.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 985hPa	TESTED BY	Brad Wu

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.10	44.78	-	44.88	-	65.58	55.58	-20.70	-
2	0.306	0.10	36.18	-	36.28	-	60.07	50.07	-23.79	-
3	1.457	0.21	31.14	-	31.35	-	56.00	46.00	-24.65	-
4	3.461	0.26	28.77	-	29.03	-	56.00	46.00	-26.97	-
5	9.816	0.43	33.88	-	34.31	-	60.00	50.00	-25.69	-
6	16.824	0.51	31.54	-	32.05	-	60.00	50.00	-27.95	-

- 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.

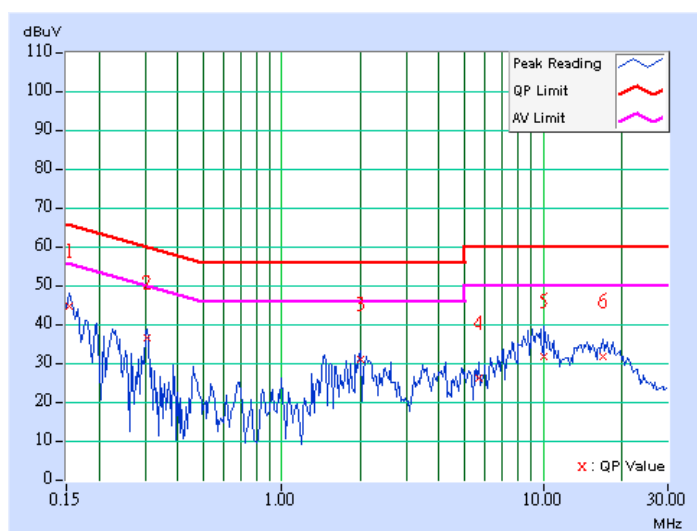


DRAFT 802.11n (20MHz) OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	7.2Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 985hPa	TESTED BY	Brad Wu

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.10	44.35	-	44.45	-	65.79	55.79	-21.34	-
2	0.306	0.10	36.12	-	36.22	-	60.07	50.07	-23.85	-
3	1.996	0.22	30.75	-	30.97	-	56.00	46.00	-25.03	-
4	5.672	0.29	25.70	-	25.99	-	60.00	50.00	-34.01	-
5	10.000	0.33	31.38	-	31.71	-	60.00	50.00	-28.29	-
6	16.832	0.51	31.51	-	32.02	-	60.00	50.00	-27.98	-

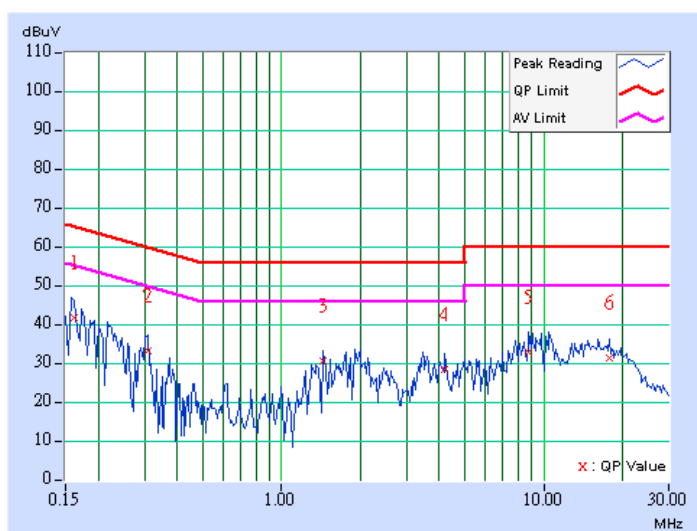
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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 1	PHASE	Line 2
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	7.2Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 985hPa	TESTED BY	Brad Wu

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.10	41.42	-	41.52	-	65.38	55.38	-23.86	-
2	0.310	0.10	32.92	-	33.02	-	59.97	49.97	-26.95	-
3	1.438	0.21	30.33	-	30.54	-	56.00	46.00	-25.46	-
4	4.207	0.29	27.82	-	28.11	-	56.00	46.00	-27.89	-
5	8.773	0.40	32.50	-	32.90	-	60.00	50.00	-27.10	-
6	17.836	0.53	31.01	-	31.54	-	60.00	50.00	-28.46	-

- 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.

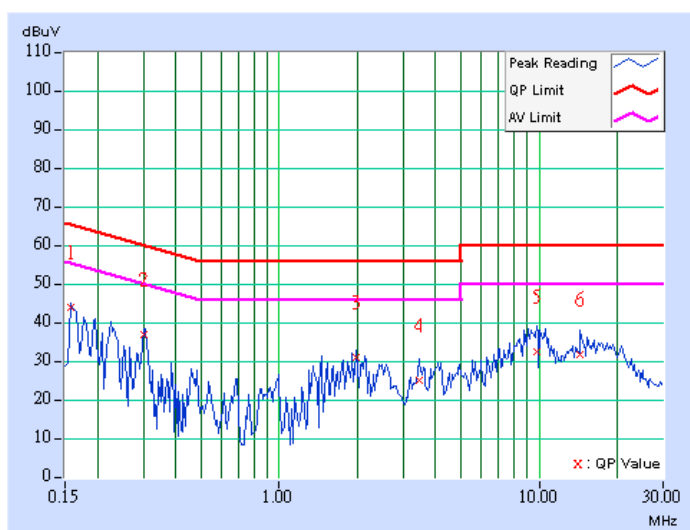


DRAFT 802.11n (40MHz) OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	15.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 985hPa	TESTED BY	Brad Wu

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.10	43.46	-	43.56	-	65.58	55.58	-22.02	-
2	0.302	0.10	36.48	-	36.58	-	60.18	50.18	-23.60	-
3	1.988	0.22	30.62	-	30.84	-	56.00	46.00	-25.16	-
4	3.461	0.26	24.80	-	25.06	-	56.00	46.00	-30.94	-
5	9.754	0.33	32.02	-	32.35	-	60.00	50.00	-27.65	-
6	14.305	0.46	31.45	-	31.91	-	60.00	50.00	-28.09	-

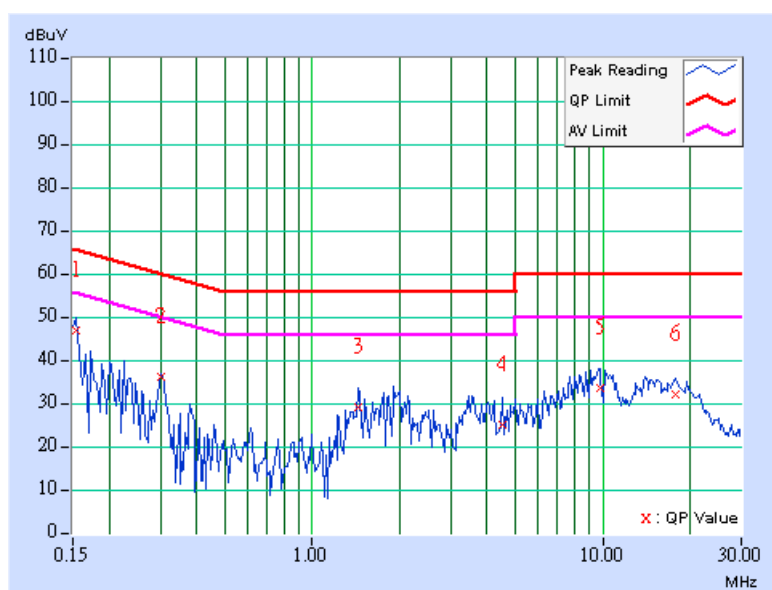
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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 1	PHASE	Line 2
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	15.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 985hPa	TESTED BY	Brad Wu

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.10	46.64	-	46.74	-	65.79	55.79	-19.05	-
2	0.302	0.10	35.75	-	35.85	-	60.18	50.18	-24.33	-
3	1.438	0.21	28.81	-	29.02	-	56.00	46.00	-26.98	-
4	4.520	0.29	24.54	-	24.83	-	56.00	46.00	-31.17	-
5	9.777	0.42	33.28	-	33.70	-	60.00	50.00	-26.30	-
6	17.836	0.53	31.54	-	32.07	-	60.00	50.00	-27.93	-

- 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.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 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.

4.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

FREQUENCIES (MHz)	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBμV/m) *NOTE 3
5150 ~ 5250	-27	68.3
5250 ~ 5350	-27	68.3
5470 ~ 5725	-27 *note 1	68.3
5725 ~ 5825	-17 *note 2	78.3

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:

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

4.2.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Aug. 04, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100025	Oct. 05, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2008
HORN Antenna SCHWARZBECK	9120D	9120D-209	Jun. 27, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 28, 2007
Preamplifier Agilent	8447D	2944A10633	Oct. 26, 2007
Preamplifier Agilent	8449B	3008A01964	Oct. 26, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238137/4	Dec. 11, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	233233/4	Nov. 14, 2007
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	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 3.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The VCCI Site Registration No. is R-237.
5. The IC Site Registration No. is IC3789B-3.

4.2.4 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.

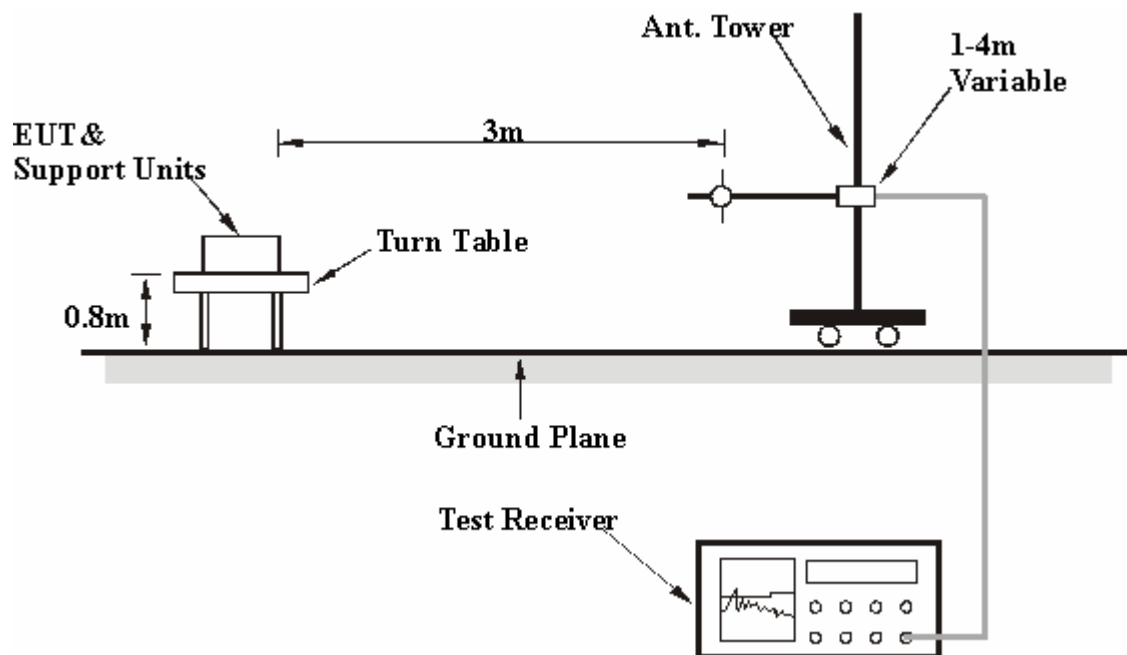
NOTE:

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.

4.2.5 DEVIATION FROM TEST STANDARD

No deviation

4.2.6 TEST SETUP



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

4.2.7 EUT OPERATING CONDITION

Same as 4.1.6

4.2.8 TEST RESULTS

BELOW 1GHz WORST-CASE DATA: 802.11a OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	99.89	36.65 QP	43.50	-6.85	2.50 H	184	26.47	10.18
2	132.95	36.54 QP	43.50	-6.96	2.50 H	154	23.19	13.36
3	166.00	36.76 QP	43.50	-6.74	1.50 H	172	22.71	14.06
4	199.05	34.66 QP	43.50	-8.84	1.50 H	172	23.32	11.34
5	232.11	34.88 QP	46.00	-11.12	1.50 H	352	22.19	12.69
6	265.16	33.63 QP	46.00	-12.37	1.00 H	334	19.62	14.01
7	300.16	31.02 QP	46.00	-14.98	1.00 H	328	15.87	15.14
8	333.21	41.78 QP	46.00	-4.22	1.00 H	205	25.75	16.02
9	399.31	33.32 QP	46.00	-12.68	2.00 H	199	15.70	17.62
10	463.48	32.04 QP	46.00	-13.96	1.50 H	217	12.40	19.64
11	733.73	32.11 QP	46.00	-13.89	1.00 H	313	6.93	25.18

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	31.84	31.27 QP	40.00	-8.73	1.50 V	10	17.73	13.54
2	64.90	27.58 QP	40.00	-12.42	1.00 V	253	14.23	13.35
3	99.89	31.53 QP	43.50	-11.97	1.50 V	10	21.36	10.18
4	132.95	30.28 QP	43.50	-13.22	1.50 V	10	16.92	13.36
5	173.78	30.26 QP	43.50	-13.24	1.00 V	247	16.79	13.47
6	199.05	29.73 QP	43.50	-13.77	1.00 V	208	18.38	11.34
7	333.21	34.29 QP	46.00	-11.71	1.50 V	34	18.26	16.02

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	99.89	36.21 QP	43.50	-7.29	2.00 H	175	26.03	10.18
2	132.95	36.70 QP	43.50	-6.80	2.00 H	7	23.34	13.36
3	166.00	35.99 QP	43.50	-7.51	1.50 H	343	21.93	14.06
4	199.05	33.33 QP	43.50	-10.17	1.50 H	172	21.99	11.34
5	232.11	32.05 QP	46.00	-13.95	1.50 H	151	19.36	12.69
6	333.21	40.12 QP	46.00	-5.88	1.00 H	208	24.10	16.02
7	399.31	33.84 QP	46.00	-12.16	2.00 H	205	16.22	17.62
8	465.42	32.10 QP	46.00	-13.90	2.00 H	211	12.43	19.67
9	599.58	32.12 QP	46.00	-13.88	1.00 H	262	9.67	22.45
10	865.94	31.59 QP	46.00	-14.41	1.50 H	280	4.42	27.16

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	166.00	27.38 QP	43.50	-16.12	1.00 V	277	13.32	14.06
2	199.05	26.65 QP	43.50	-16.85	1.00 V	163	15.31	11.34
3	333.21	34.03 QP	46.00	-11.97	2.00 V	22	18.01	16.02
4	399.31	28.54 QP	46.00	-17.46	1.00 V	202	10.92	17.62
5	465.42	29.92 QP	46.00	-16.08	1.00 V	190	10.25	19.67
6	729.84	31.17 QP	46.00	-14.83	1.50 V	253	6.11	25.06
7	865.94	29.55 QP	46.00	-16.45	1.50 V	286	2.39	27.16
8	928.16	28.34 QP	46.00	-17.66	1.00 V	238	0.33	28.00

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.

DRAFT 802.11n (20MHz) OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	132.95	27.63 QP	43.50	-15.87	1.50 H	10	14.27	13.36
2	166.00	33.14 QP	43.50	-10.36	1.50 H	10	19.08	14.06
3	199.05	33.85 QP	43.50	-9.65	2.50 H	346	22.51	11.34
4	232.11	33.63 QP	46.00	-12.37	1.50 H	349	20.93	12.69
5	265.16	32.58 QP	46.00	-13.42	1.00 H	328	18.56	14.01
6	331.26	41.55 QP	46.00	-4.45	1.00 H	214	25.58	15.97
7	397.37	34.19 QP	46.00	-11.81	2.00 H	205	16.61	17.58
8	465.42	31.69 QP	46.00	-14.31	2.00 H	220	12.02	19.67
9	597.63	30.24 QP	46.00	-15.76	1.00 H	244	7.84	22.40
10	729.84	32.04 QP	46.00	-13.96	1.00 H	298	6.97	25.06
11	862.06	31.86 QP	46.00	-14.14	1.50 H	283	4.75	27.11
12	932.05	32.36 QP	46.00	-13.64	2.50 H	313	4.30	28.06

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	31.84	30.68 QP	40.00	-9.32	1.00 V	10	17.14	13.54
2	64.90	27.87 QP	40.00	-12.13	1.00 V	253	14.52	13.35
3	125.17	30.08 QP	43.50	-13.42	1.00 V	355	17.15	12.93
4	129.06	27.94 QP	43.50	-15.56	1.50 V	358	14.80	13.14
5	166.00	29.74 QP	43.50	-13.76	1.00 V	208	15.69	14.06
6	333.21	35.33 QP	46.00	-10.67	1.50 V	1	19.30	16.02
7	733.73	31.18 QP	46.00	-14.82	1.50 V	256	6.00	25.18
8	930.11	30.39 QP	46.00	-15.61	1.00 V	265	2.36	28.03

- 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.

DRAFT 802.11n (40MHz) OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	99.89	28.11 QP	43.50	-15.39	2.00 H	181	17.93	10.18
2	166.00	32.34 QP	43.50	-11.16	1.50 H	181	18.28	14.06
3	199.05	32.80 QP	43.50	-10.70	1.50 H	346	21.45	11.34
4	232.11	34.20 QP	46.00	-11.80	2.00 H	352	21.50	12.69
5	333.21	41.62 QP	46.00	-4.38	1.00 H	208	25.60	16.02
6	399.31	33.24 QP	46.00	-12.76	2.00 H	211	15.62	17.62
7	465.42	31.36 QP	46.00	-14.64	2.00 H	226	11.69	19.67
8	601.52	30.09 QP	46.00	-15.91	1.50 H	61	7.60	22.49
9	729.84	31.62 QP	46.00	-14.38	1.00 H	316	6.56	25.06
10	862.06	32.29 QP	46.00	-13.71	1.50 H	289	5.17	27.11

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	31.84	30.71 QP	40.00	-9.29	1.00 V	10	17.17	13.54
2	64.90	29.03 QP	40.00	-10.97	1.00 V	265	15.68	13.35
3	125.17	30.59 QP	43.50	-12.91	1.00 V	337	17.67	12.93
4	129.06	28.22 QP	43.50	-15.28	1.00 V	304	15.07	13.14
5	173.78	29.87 QP	43.50	-13.63	1.00 V	202	16.40	13.47
6	333.21	34.28 QP	46.00	-11.72	1.50 V	25	18.26	16.02
7	729.84	31.15 QP	46.00	-14.85	1.50 V	247	6.08	25.06

- 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.

ABOVE 1GHz DATA: 802.11a OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	#5150.00	64.67 PK	74.00	-9.33	1.37 H	225	25.30	39.37
2	#5150.00	50.59 AV	54.00	-3.41	1.37 H	225	11.22	39.37
3	*5180.00	110.19 PK			1.37 H	227	70.80	39.39
4	*5180.00	99.63 AV			1.37 H	227	60.24	39.39
5	10360.00	65.57 PK	68.30	-2.73	1.33 H	177	14.87	50.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	#5150.00	57.73 PK	74.00	-16.27	1.02 V	270	18.36	39.37
2	#5150.00	44.10 AV	54.00	-9.90	1.02 V	270	4.73	39.37
3	*5180.00	105.02 PK			1.04 V	273	65.63	39.39
4	*5180.00	94.61 AV			1.04 V	273	55.22	39.39
5	10360.00	62.79 PK	68.30	-5.51	1.07 V	0	12.09	50.70

- 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 falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	*5240.00	109.00 PK			1.12 H	227	69.44	39.56
2	*5240.00	98.33 AV			1.12 H	227	58.77	39.56
3	10480.00	63.56 PK	68.30	-4.74	1.00 H	35	12.57	50.99

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	*5240.00	104.35 PK			1.13 V	221	64.79	39.56
2	*5240.00	94.08 AV			1.13 V	221	54.52	39.56
3	10480.00	62.30 PK	68.30	-6.00	1.19 V	19	11.31	50.99

- 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 falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 5	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	*5260.00	109.85 PK			1.05 H	218	70.20	39.65
2	*5260.00	99.05 AV			1.05 H	218	59.40	39.65
3	10520.00	64.18 PK	68.30	-4.12	1.00 H	132	13.12	51.06

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	*5260.00	104.21 PK			1.12 V	204	64.56	39.65
2	*5260.00	94.58 AV			1.12 V	204	54.93	39.65
3	10520.00	62.59 PK	68.30	-5.71	1.00 V	126	11.53	51.06

- 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 falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 8	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	*5320.00	109.87 PK			1.04 H	215	70.05	39.82
2	*5320.00	99.56 AV			1.04 H	215	59.74	39.82
3	#5350.00	64.21 PK	74.00	-9.79	1.05 H	210	24.36	39.84
4	#5350.00	49.15 AV	54.00	-4.85	1.05 H	210	9.30	39.84
5	#10640.00	64.85 PK	74.00	-9.15	1.06 H	105	13.71	51.14
6	#10640.00	50.29 AV	54.00	-3.71	1.06 H	105	-0.85	51.14

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	*5320.00	104.74 PK			1.00 V	166	64.92	39.82
2	*5320.00	94.09 AV			1.00 V	166	54.27	39.82
3	#5350.00	60.12 PK	74.00	-13.88	1.00 V	158	20.27	39.84
4	#5350.00	44.23 AV	54.00	-9.77	1.00 V	158	4.38	39.84
5	#10640.00	61.65 PK	74.00	-12.35	1.00 V	22	10.51	51.14
6	#10640.00	48.98 AV	54.00	-5.02	1.00 V	22	-2.16	51.14

- 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 falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	#5460.00	59.24 PK	74.00	-14.76	1.08 H	232	19.31	39.93
2	#5460.00	46.48 AV	54.00	-7.52	1.08 H	232	6.55	39.93
3	5470.00	63.52 PK	68.30	-4.78	1.06 H	203	23.58	39.94
4	*5500.00	108.53 PK			1.06 H	238	68.56	39.97
5	*5500.00	98.51 AV			1.06 H	238	58.54	39.97
6	#11000.00	64.82 PK	74.00	-9.18	1.00 H	215	13.38	51.44
7	#11000.00	51.21 AV	54.00	-2.79	1.00 H	215	-0.23	51.44

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	#5460.00	56.58 PK	74.00	-17.42	1.00 V	126	16.65	39.93
2	#5460.00	43.65 AV	54.00	-10.35	1.00 V	126	3.72	39.93
3	5470.00	60.11 PK	68.30	-8.19	1.05 V	310	20.17	39.94
4	*5500.00	105.87 PK			1.00 V	235		39.97
5	*5500.00	95.96 AV			1.00 V	235		39.97
6	#11000.00	63.87 PK	74.00	-10.13	1.00 V	76	12.43	51.44
7	#11000.00	49.21 AV	54.00	-4.79	1.00 V	76	-2.23	51.44

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 falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 14	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	*5600.00	108.68 PK			1.00 H	126	68.49	40.19
2	*5600.00	98.35 AV			1.00 H	126	58.16	40.19
3	#11200.00	64.05 PK	74.00	-9.95	1.05 H	213	12.57	51.48
4	#11200.00	50.87 AV	54.00	-3.13	1.05 H	213	-0.61	51.48

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	*5600.00	104.35 PK			1.02 V	301	64.16	40.19
2	*5600.00	95.21 AV			1.02 V	301	55.02	40.19
3	#11200.00	61.29 PK	74.00	-12.71	1.08 V	234	9.81	51.48
4	#11200.00	47.51 AV	54.00	-6.49	1.08 V	234	-3.97	51.48

- 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 falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 19	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	*5700.00	109.02 PK			1.06 H	55	68.45	40.57
2	*5700.00	98.64 AV			1.06 H	55	58.07	40.57
3	5725.00	66.28 PK	68.30	-2.02	1.00 H	65	25.64	40.64
4	#11400.00	63.58 PK	74.00	-10.42	1.00 H	263	11.67	51.91
5	#11400.00	50.51 AV	54.00	-3.49	1.00 H	263	-1.40	51.91

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	*5700.00	105.21 PK			1.03 V	215	64.64	40.57
2	*5700.00	95.08 AV			1.03 V	215	54.51	40.57
3	5725.00	65.17 PK	68.30	-3.13	1.02 V	311	24.53	40.64
4	#11400.00	61.32 PK	74.00	-12.68	1.01 V	224	9.41	51.91
5	#11400.00	48.29 AV	54.00	-5.71	1.01 V	224	-3.62	51.91

- 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 falling in the restricted band.

DRAFT 802.11n (20MHz) OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	#5150.00	66.07 PK	74.00	-7.93	1.15 H	13	26.70	39.37
2	#5150.00	48.55 AV	54.00	-5.45	1.15 H	13	9.18	39.37
3	*5180.00	109.14 PK			1.18 H	10	69.75	39.39
4	*5180.00	99.40 AV			1.18 H	10	60.01	39.39
5	10360.00	64.10 PK	68.30	-4.20	1.21 H	0	13.40	50.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	#5150.00	62.85 PK	74.00	-11.15	1.00 V	213	23.48	39.37
2	#5150.00	48.23 AV	54.00	-5.77	1.00 V	213	8.86	39.37
3	*5180.00	106.58 PK			1.13 V	215	67.19	39.39
4	*5180.00	97.15 AV			1.13 V	215	57.76	39.39
5	10360.00	62.88 PK	68.30	-5.42	1.28 V	359	12.18	50.70

- 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 falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	*5200.00	109.63 PK			1.15 H	3	70.23	39.40
2	*5200.00	99.93 AV			1.15 H	3	60.53	39.40
3	10400.00	64.75 PK	68.30	-3.55	1.19 H	22	13.99	50.76

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	*5200.00	106.98 PK			1.15 V	205	67.58	39.40
2	*5200.00	97.47 AV			1.15 V	205	58.07	39.40
3	10400.00	63.12 PK	68.30	-5.18	1.19 V	345	12.36	50.76

- 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 falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	*5240.00	109.32 PK			1.17 H	348	69.76	39.56
2	*5240.00	98.91 AV			1.17 H	348	59.35	39.56
3	#5350.00	65.18 PK	74.00	-8.82	1.08 H	342	25.34	39.84
4	#5350.00	48.25 AV	54.00	-5.75	1.08 H	342	8.41	39.84
5	10480.00	65.28 PK	68.30	-3.02	1.50 H	100	14.29	50.99

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	*5240.00	106.69 PK			1.15 V	223	67.13	39.56
2	*5240.00	97.24 AV			1.15 V	223	57.68	39.56
3	#5350.00	60.85 PK	74.00	-13.15	1.12 V	325	21.01	39.84
4	#5350.00	47.98 AV	54.00	-6.02	1.12 V	325	8.13	39.84
5	10480.00	63.24 PK	68.30	-5.06	1.21 V	59	12.25	50.99

- 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 falling in the restricted band.

DRAFT 802.11n (40MHz) OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	#5150.00	66.41 PK	74.00	-7.59	1.10 H	347	27.04	39.37
2	#5150.00	52.72 AV	54.00	-1.28	1.10 H	347	13.35	39.37
3	*5190.00	105.54 PK			1.09 H	341	66.15	39.39
4	*5190.00	95.87 AV			1.09 H	341	56.48	39.39
5	10380.00	61.62 PK	68.30	-6.68	1.10 H	21	10.89	50.73

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	#5150.00	63.12 PK	74.00	-10.88	1.02 V	344	23.75	39.37
2	#5150.00	49.58 AV	54.00	-4.42	1.02 V	344	10.21	39.37
3	*5190.00	101.72 PK			1.02 V	344	62.33	39.39
4	*5190.00	92.01 AV			1.02 V	344	52.62	39.39
5	10380.00	61.47 PK	68.30	-6.83	1.02 V	199	10.74	50.73

- 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 falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1005hPa	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m								
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	*5230.00	107.53 PK			1.08 H	352	68.01	39.52
2	*5230.00	97.44 AV			1.08 H	352	57.92	39.52
3	#5350.00	66.35 PK	74.00	-7.65	1.05 H	345	26.50	39.84
4	#5350.00	52.62 AV	54.00	-1.38	1.05 H	345	12.77	39.84
5	10460.00	63.98 PK	68.30	-4.32	1.08 H	243	13.05	50.93

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m								
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	*5230.00	103.51 PK			1.05 V	348	63.99	39.52
2	*5230.00	93.78 AV			1.05 V	348	54.26	39.52
3	#5350.00	63.05 PK	74.00	-10.95	1.03 V	350	23.20	39.84
4	#5350.00	49.42 AV	54.00	-4.58	1.03 V	350	9.58	39.84
5	10460.00	62.68 PK	68.30	-5.62	1.05 V	204	11.75	50.93

- 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 falling in the restricted band.

4.3 PEAK TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.250 ~ 5.350GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.470 ~ 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB

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

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Apr. 11, 2008

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

4.3.3 TEST PROCEDURE

- The transmitter output was connected to the spectrum analyzer.
- Set span to encompass the entire emission bandwidth of the signal.
- Set RBW to 1MHz, VBW to 300kHz.
- Using the spectrum analyzer's channel power measurement function to measure the output power.

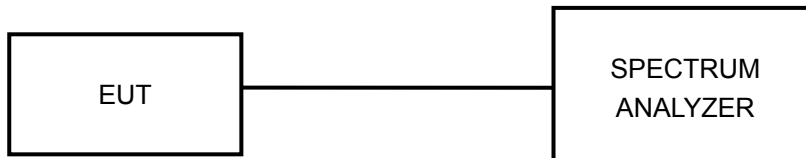
NOTE: The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

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.

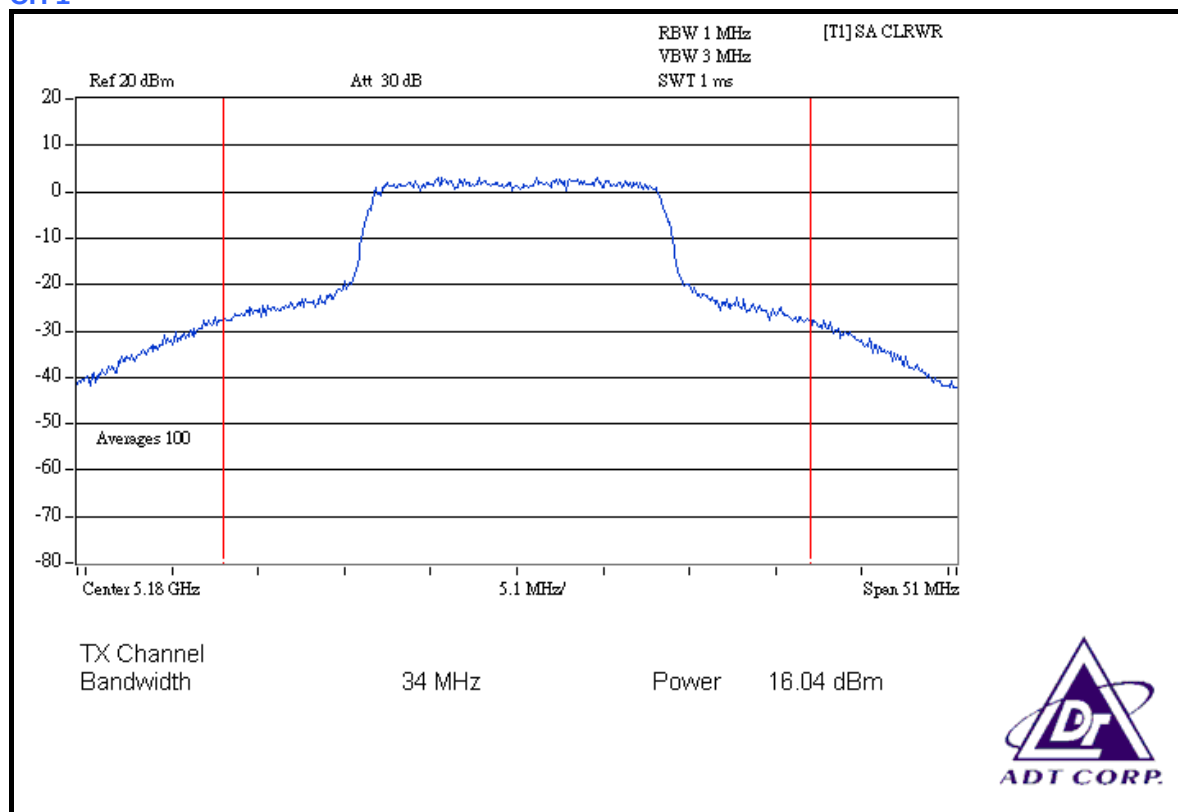
4.3.7 TEST RESULTS

PEAK POWER OUTPUT: 802.11a OFDM MODULATION:

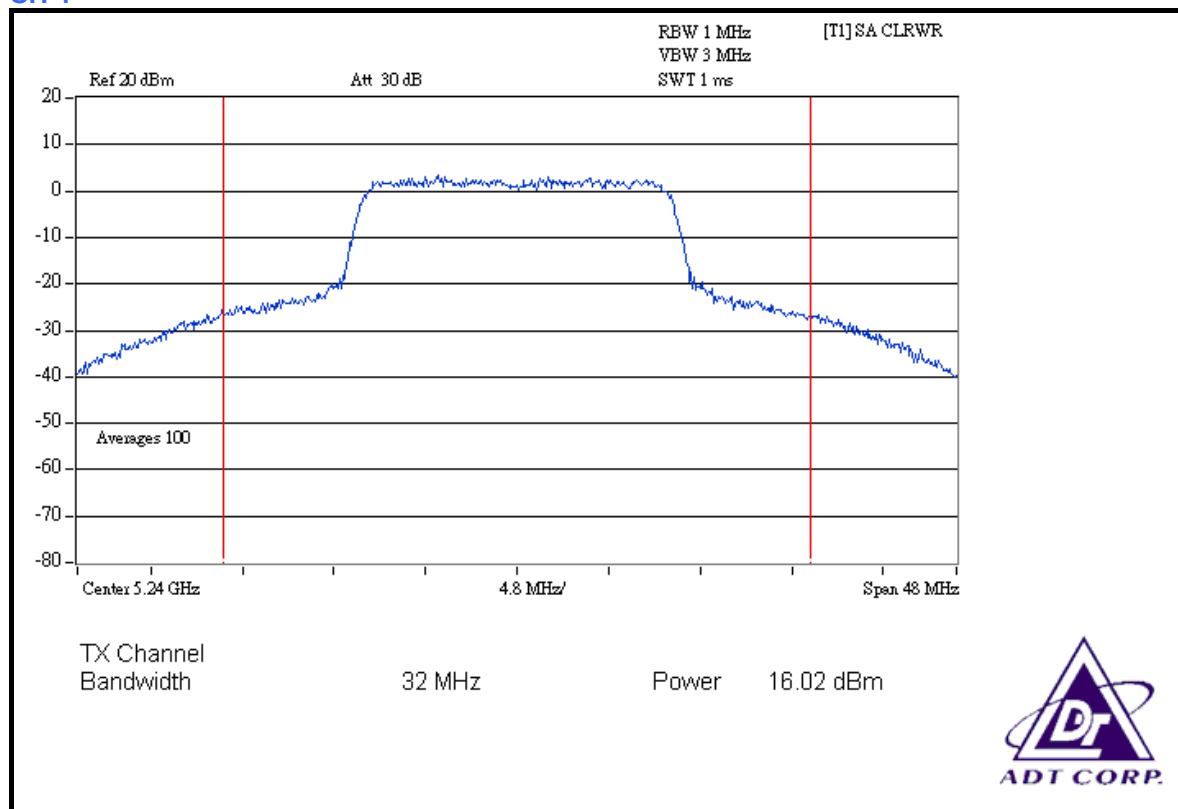
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	5180	40.179	16.04	17.00	PASS
4	5240	39.994	16.02	17.00	PASS
5	5260	40.551	16.08	24.00	PASS
8	5320	39.902	16.01	24.00	PASS
9	5500	40.272	16.05	24.00	PASS
14	5600	39.994	16.02	24.00	PASS
19	5700	39.811	16.00	24.00	PASS

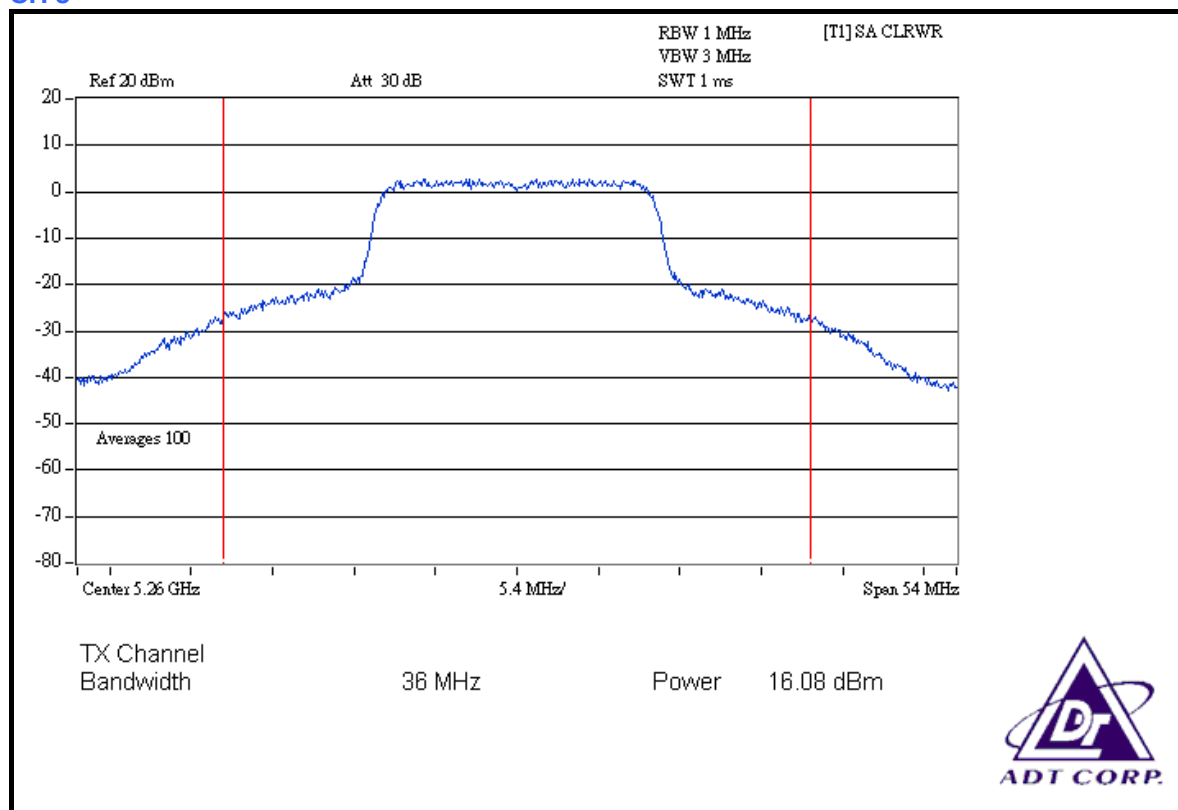
CH 1



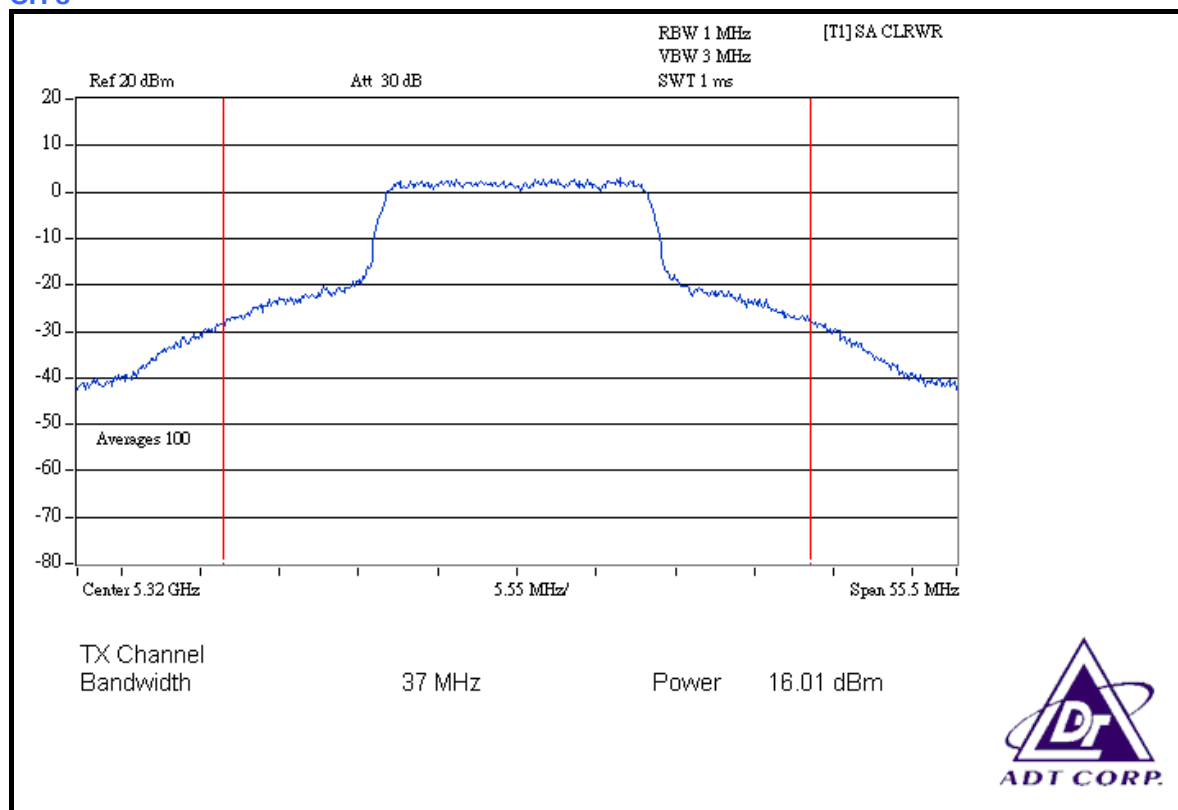
CH 4



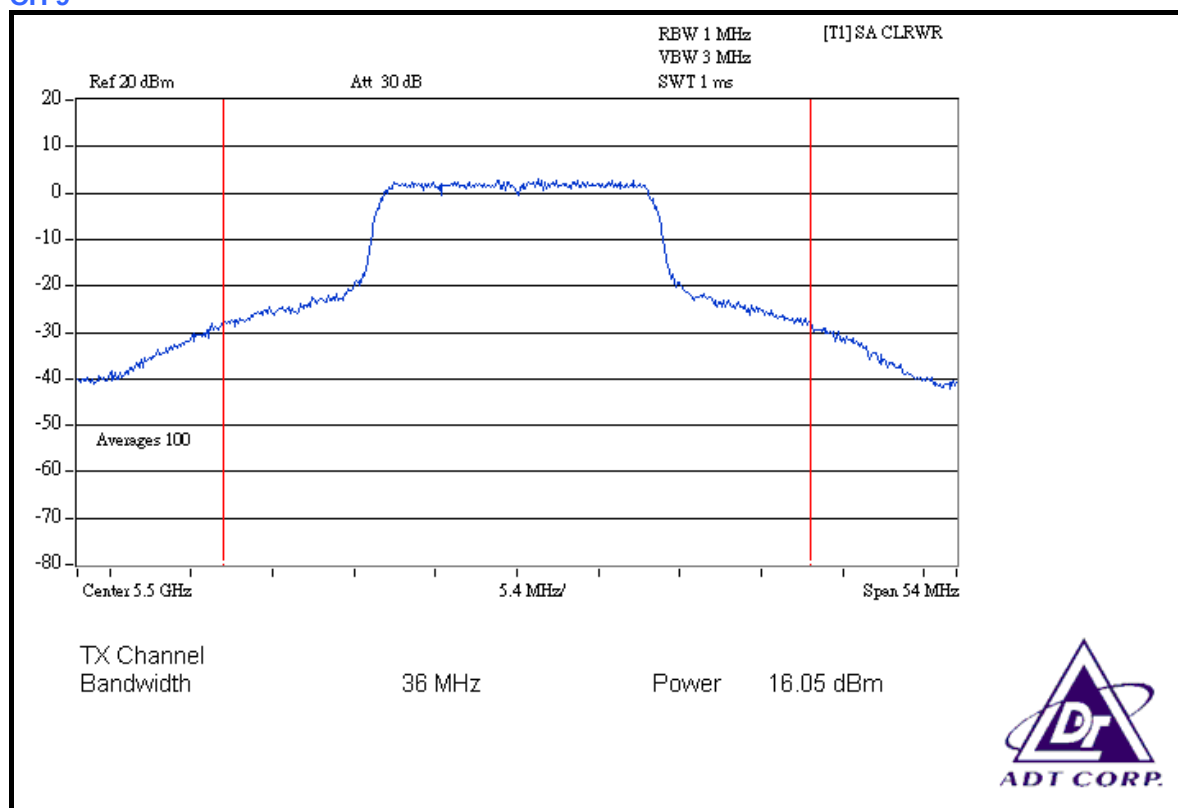
CH 5



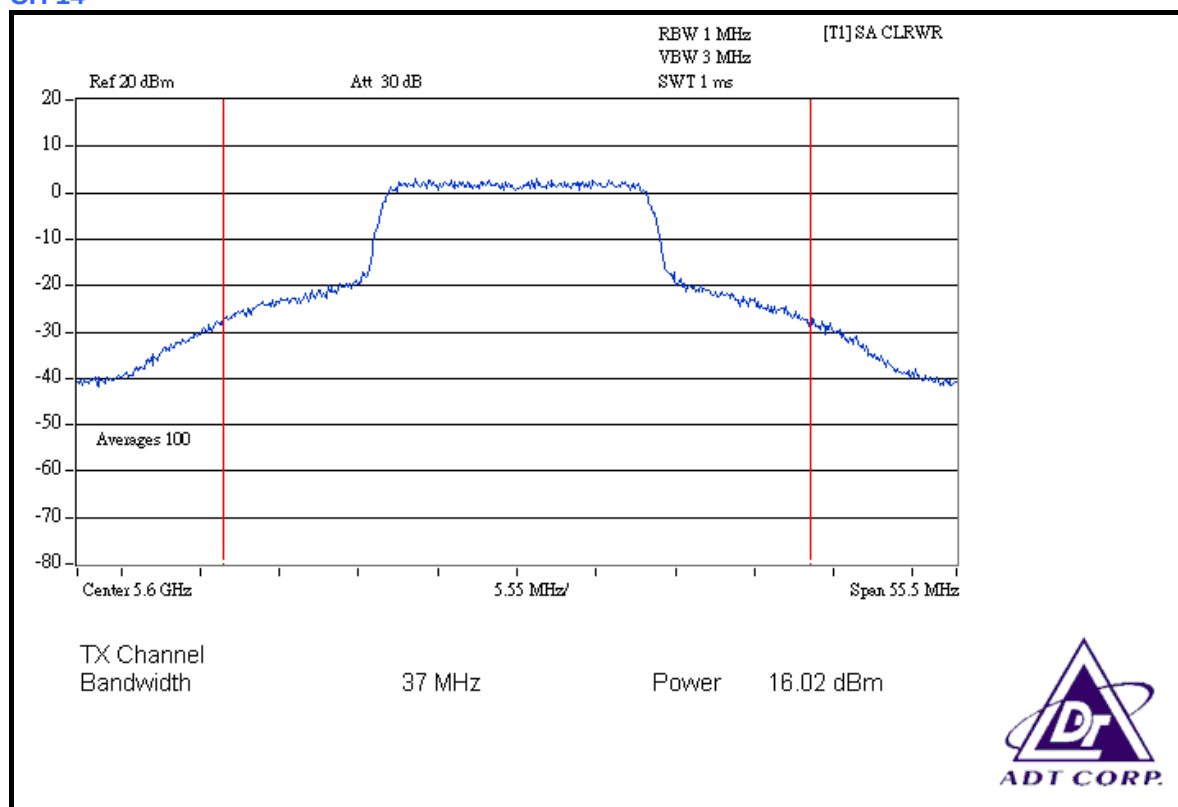
CH 8



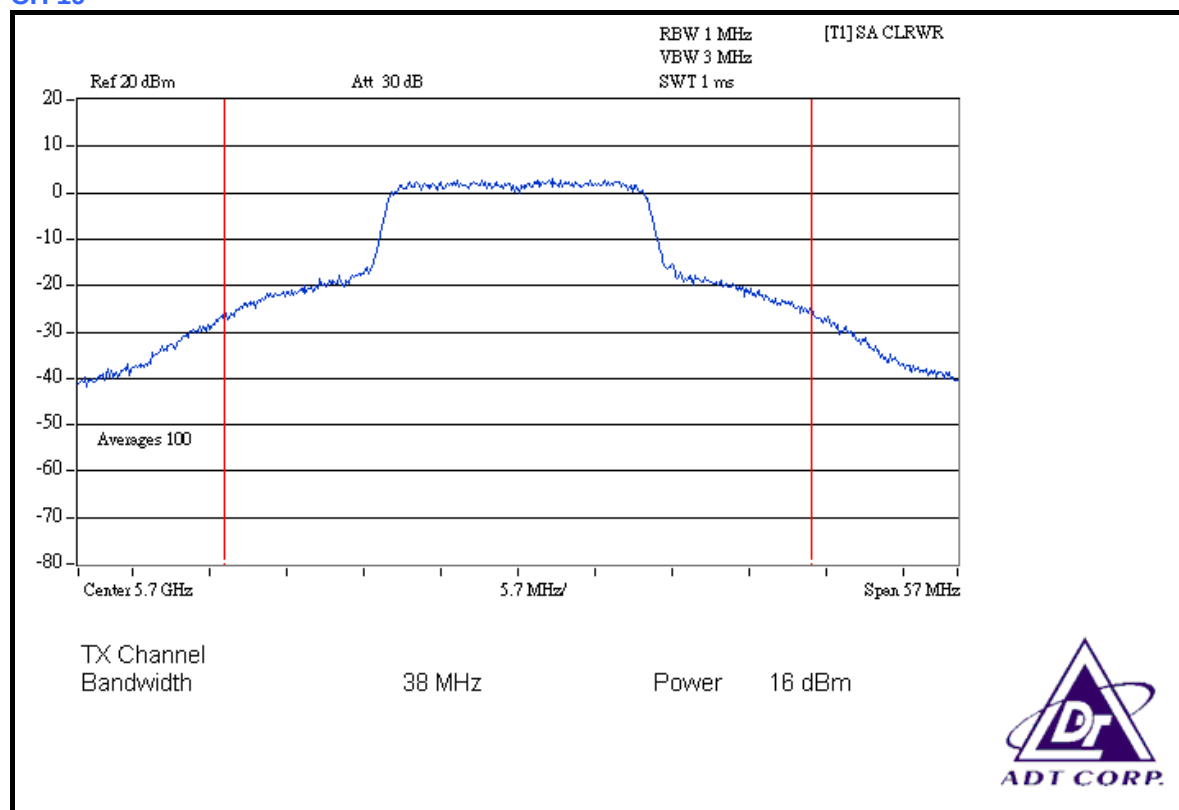
CH 9



CH 14



CH 19

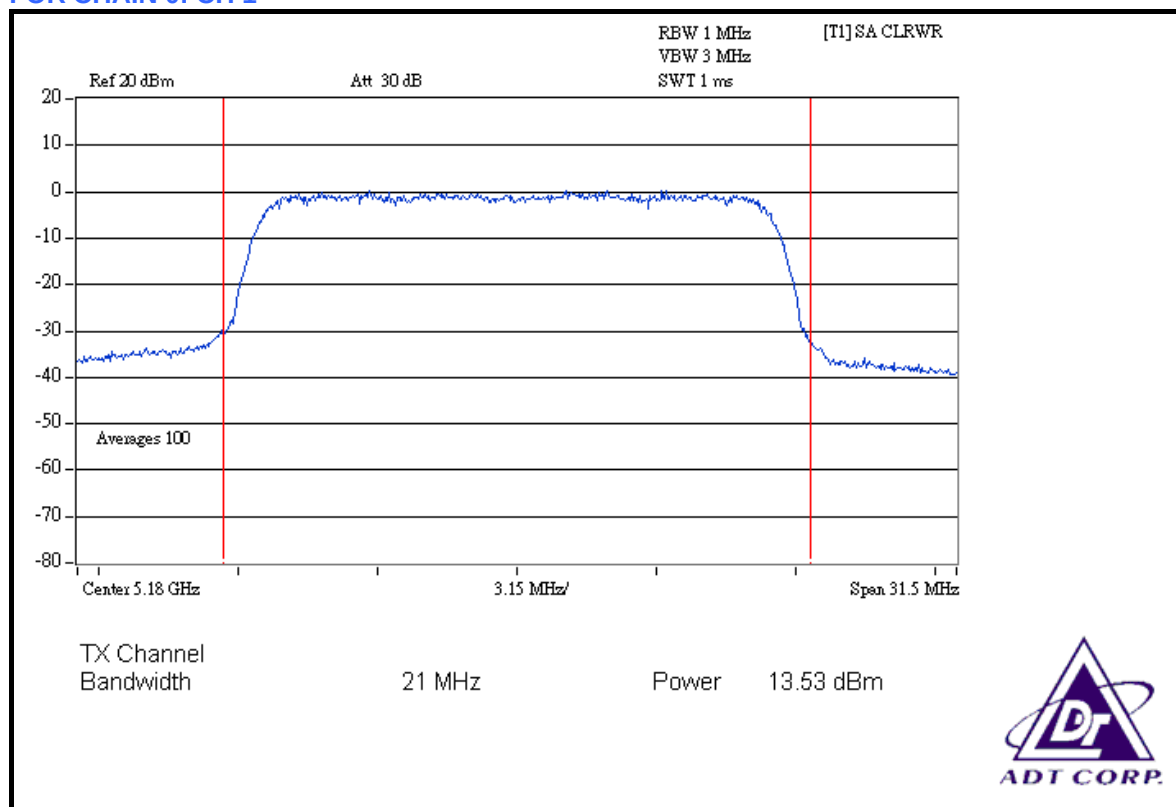


DRAFT 802.11n (20MHz) OFDM MODULATION:

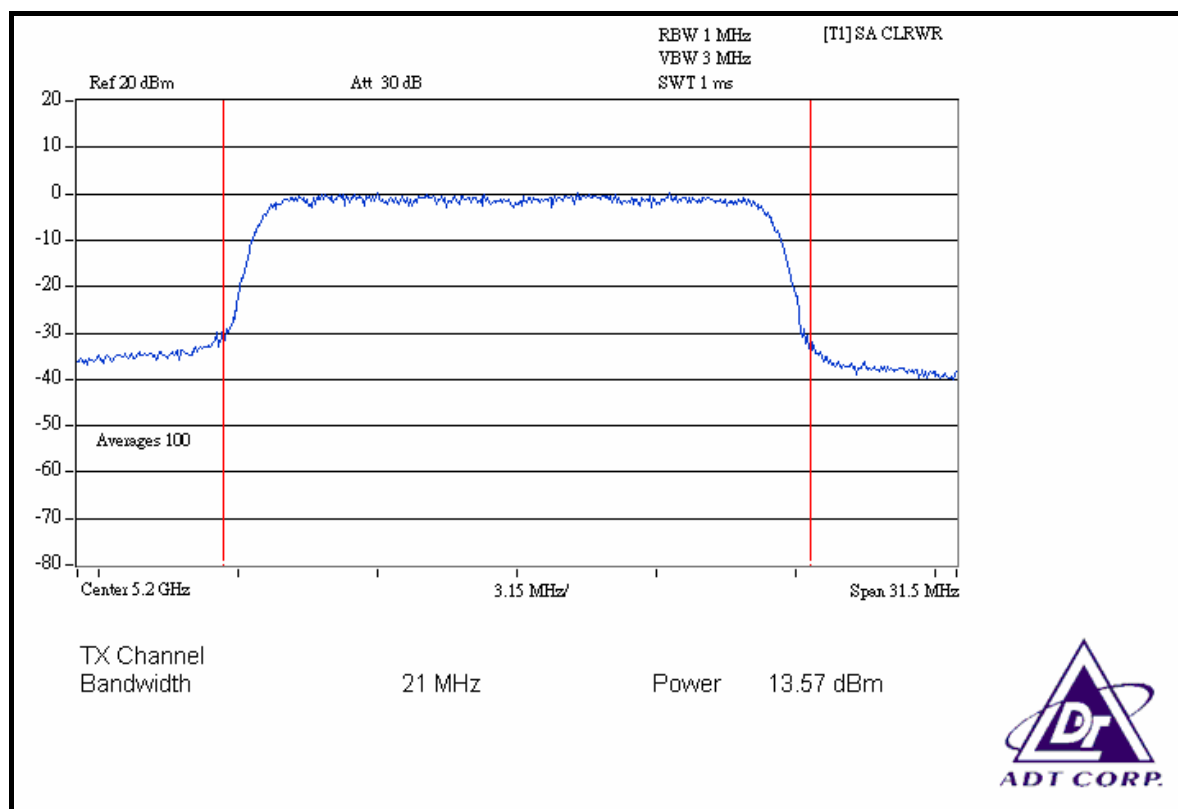
MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (mW)		PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	5180	22.542	22.803	13.53	13.58	45.345	16.57	30	PASS
2	5200	22.751	22.542	13.57	13.53	45.293	16.56	30	PASS
4	5240	22.491	22.646	13.52	13.55	45.137	16.55	30	PASS

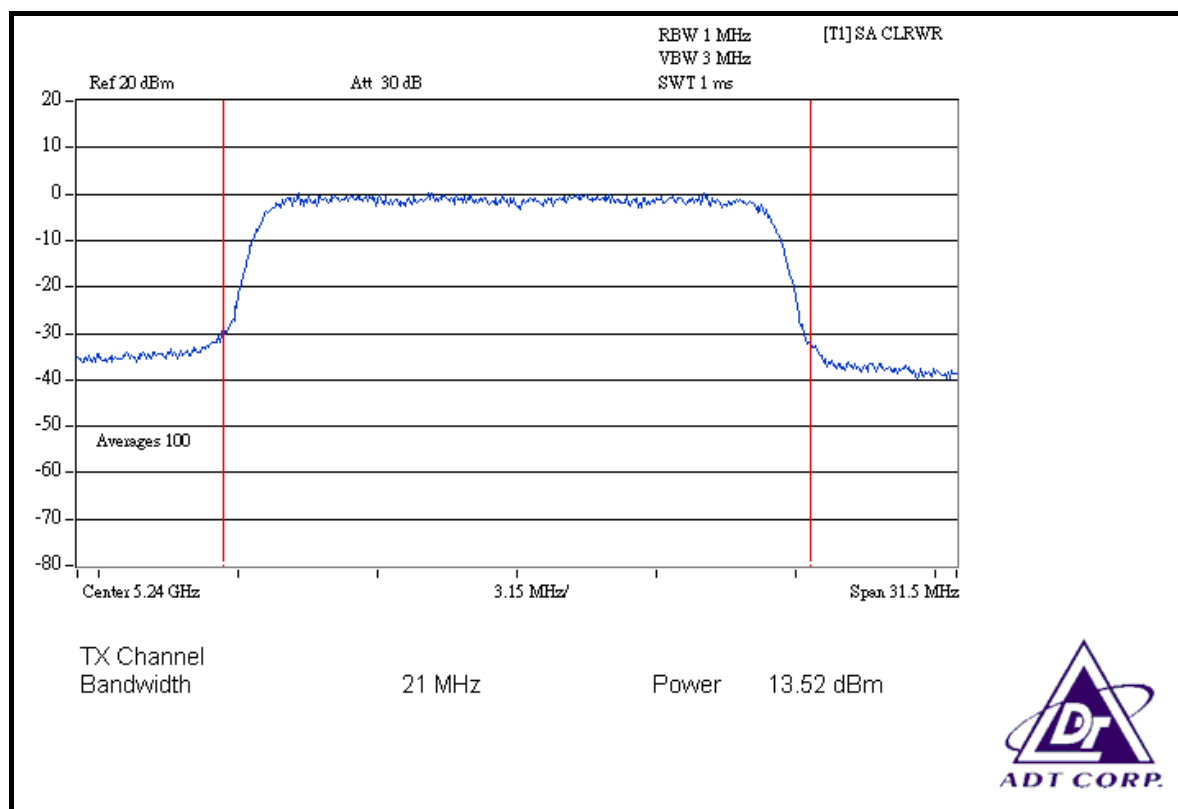
FOR CHAIN 0: CH 1



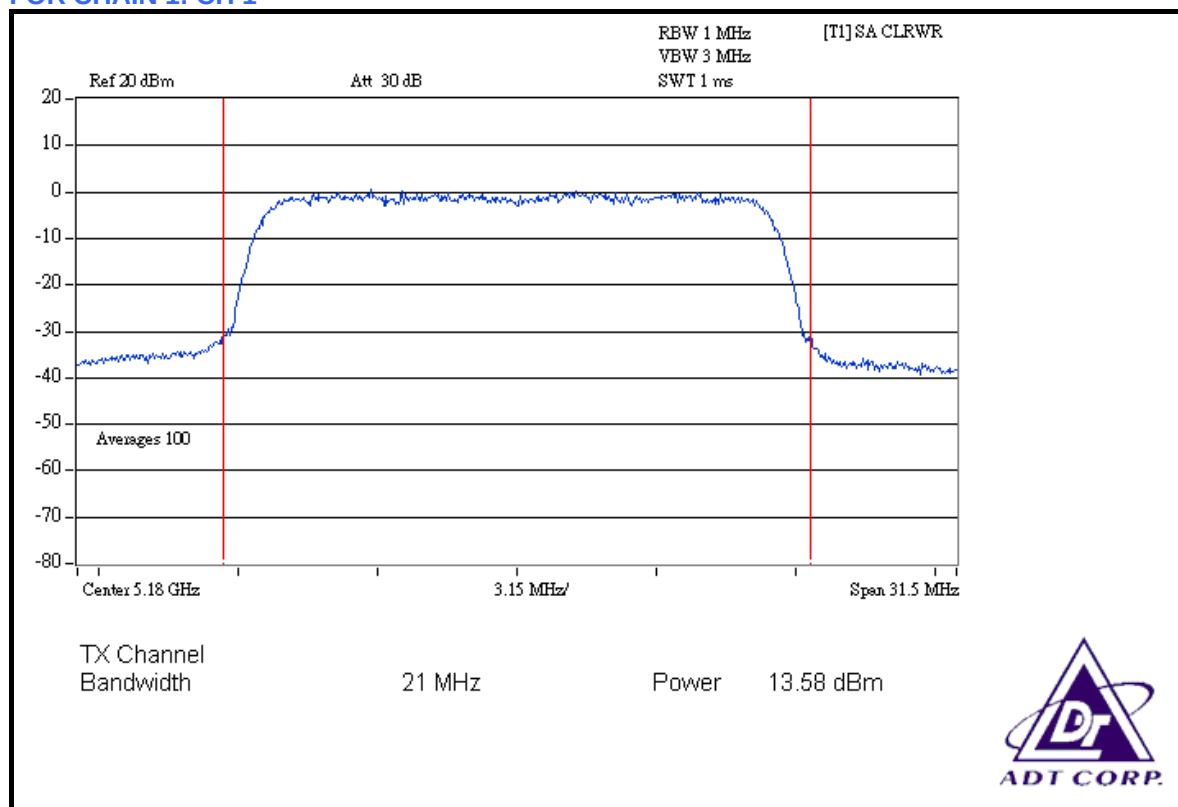
CH 2



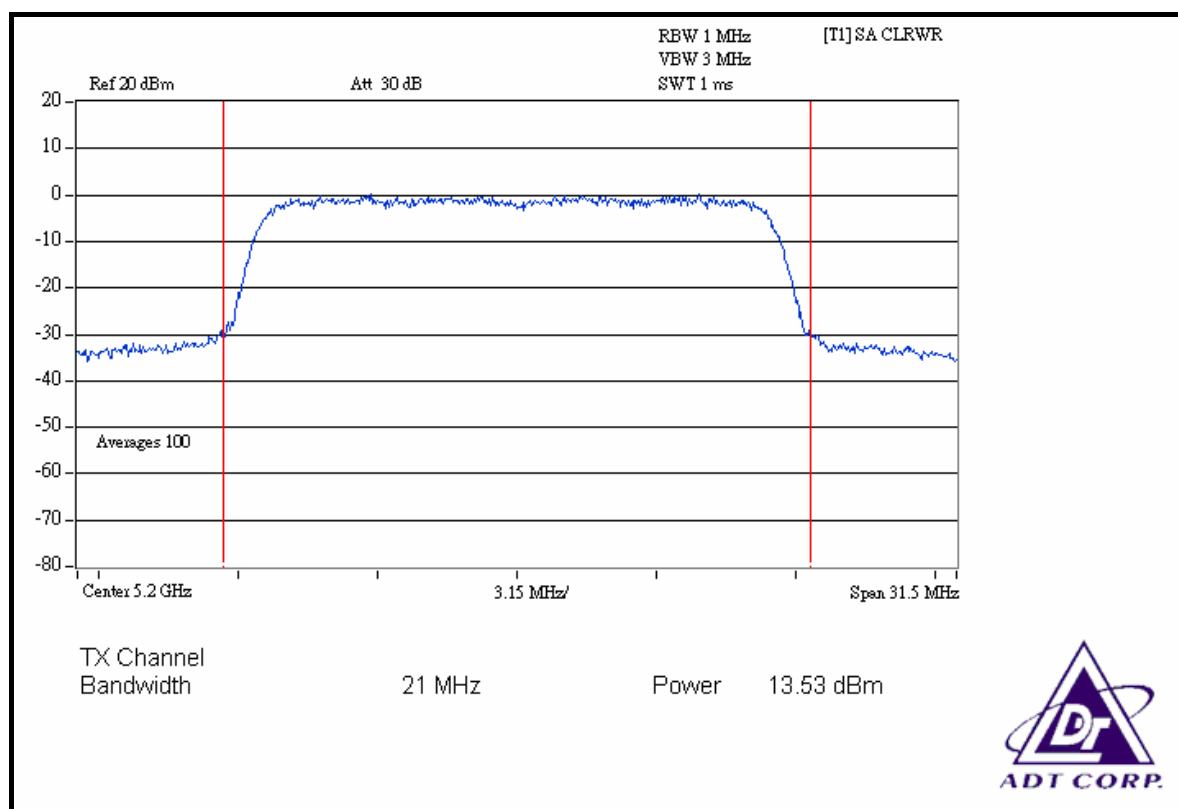
CH 4



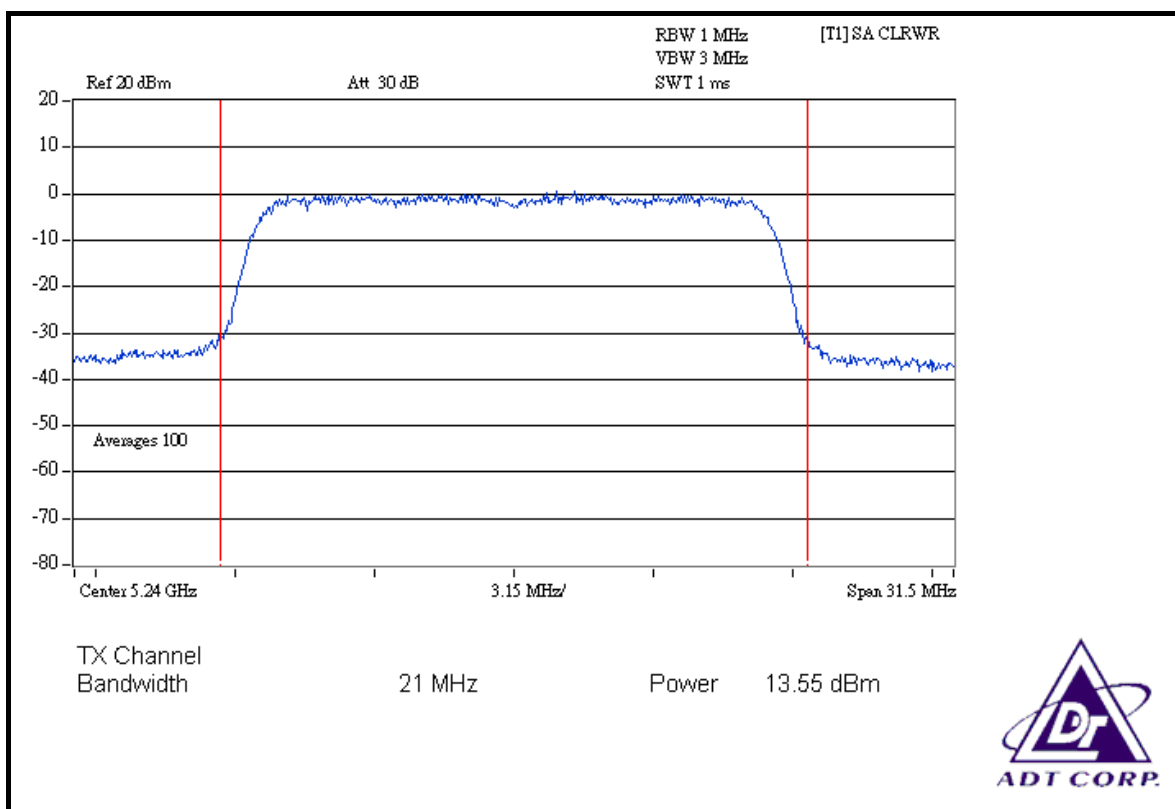
FOR CHAIN 1: CH 1



CH 2



CH 4

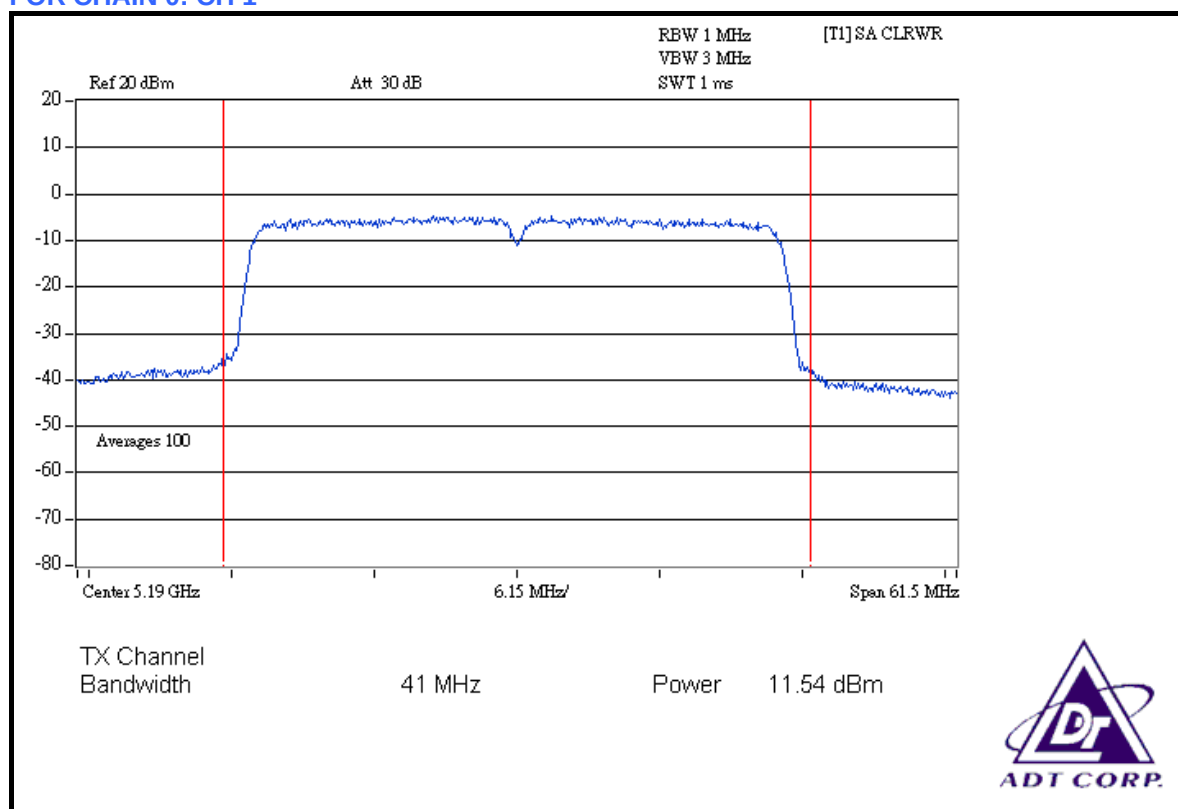


DRAFT 802.11n (40MHz) OFDM MODULATION:

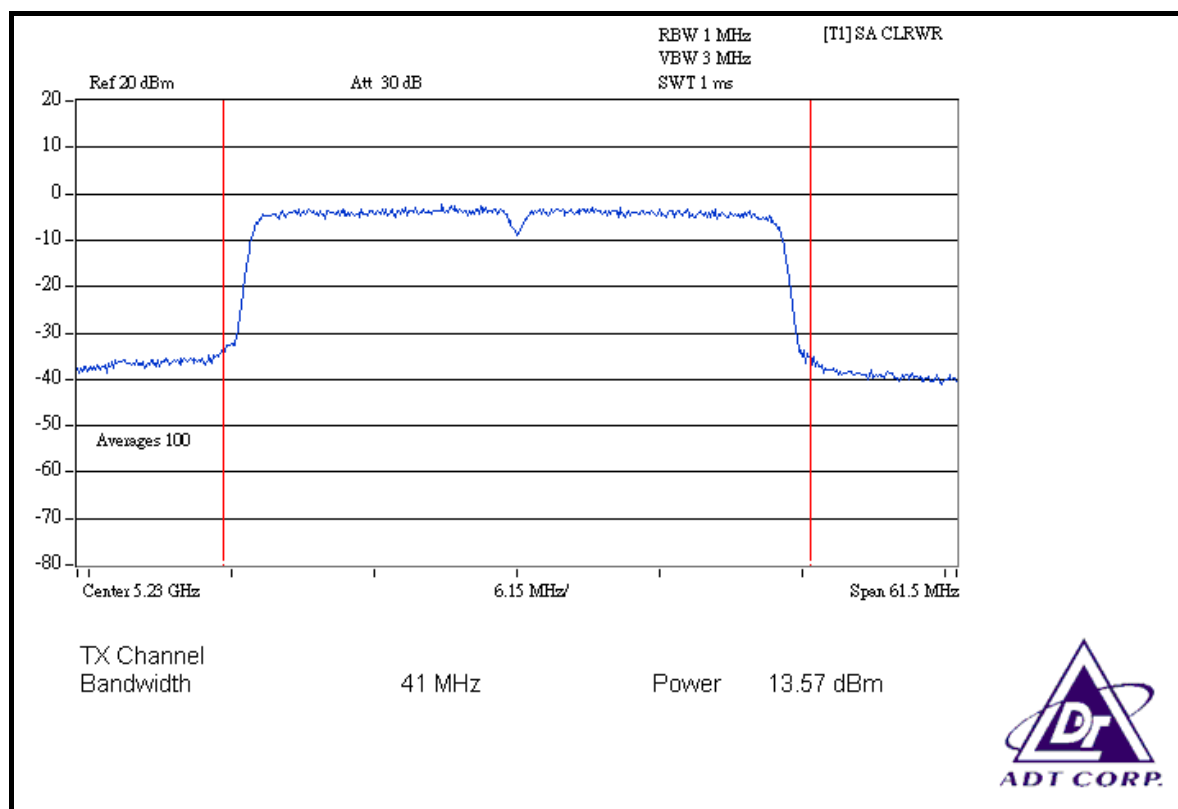
MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (mW)		PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	5190	14.256	14.289	11.54	11.55	28.545	14.56	30	PASS
2	5230	22.751	22.387	13.57	13.50	45.138	16.55	30	PASS

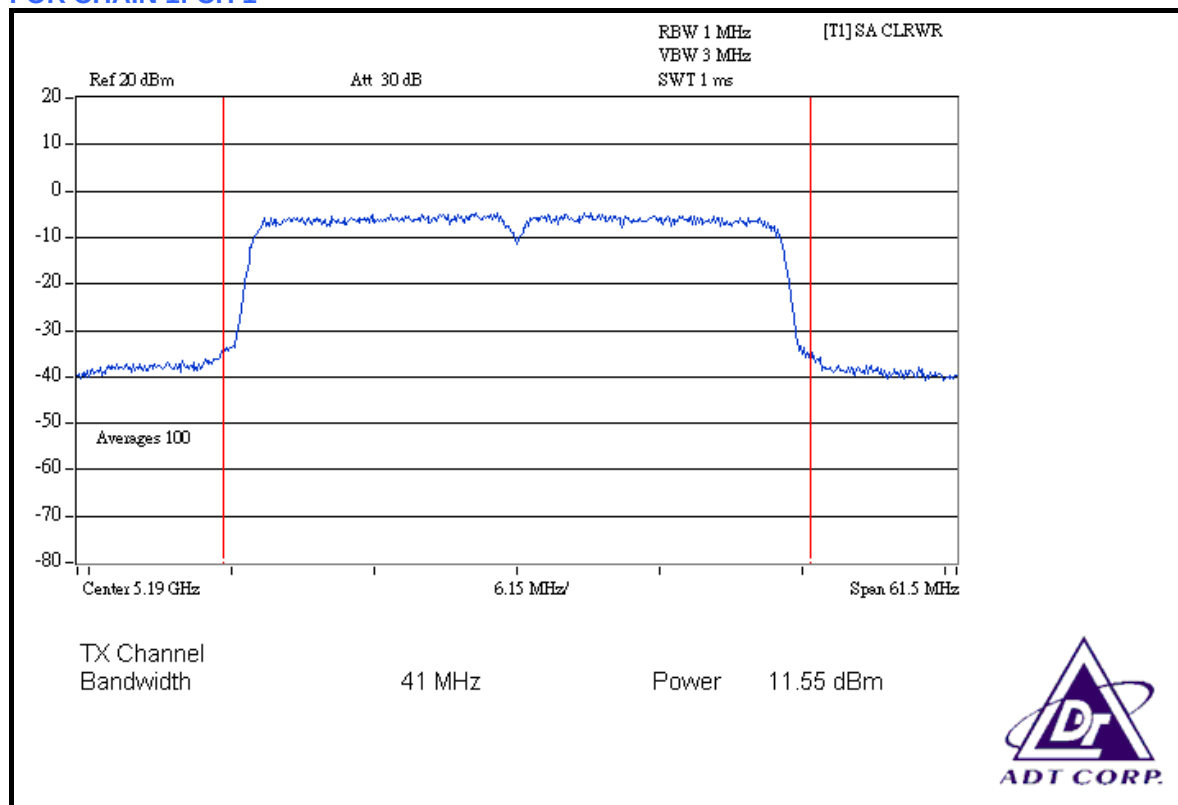
FOR CHAIN 0: CH 1



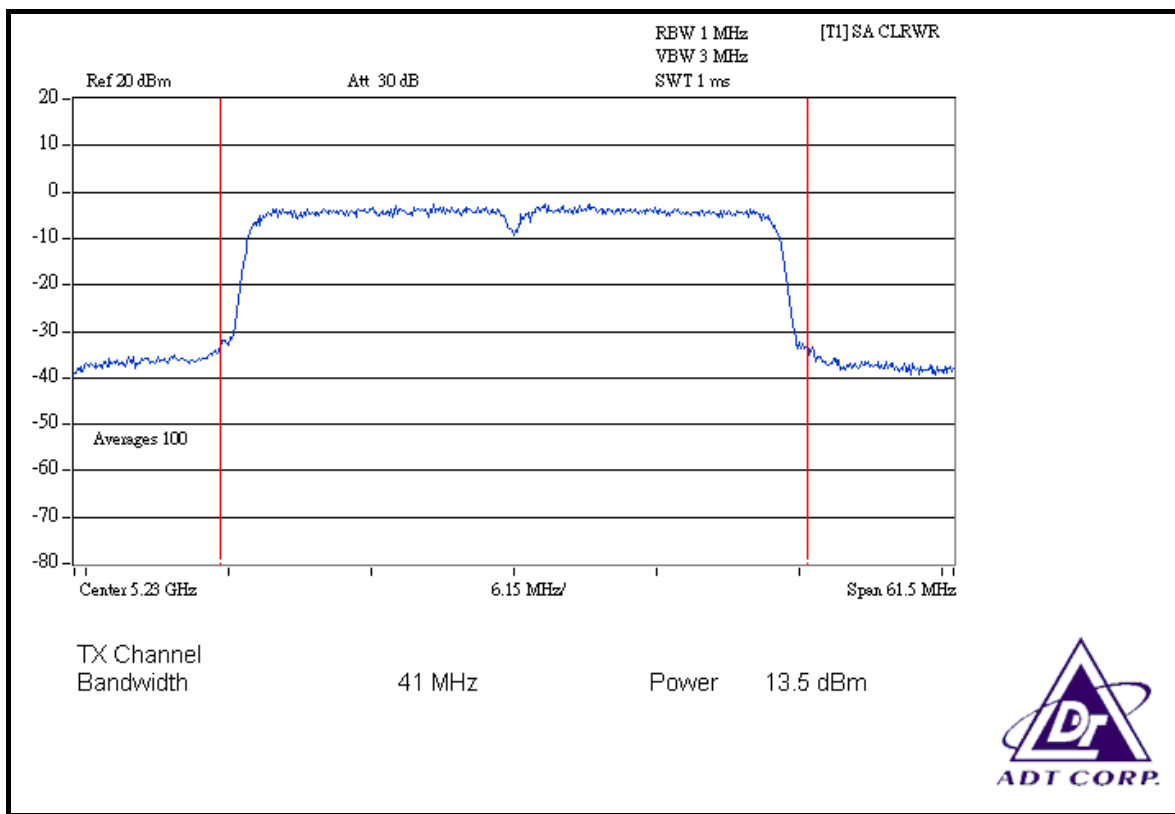
CH 2



FOR CHAIN 1: CH 1



CH 2

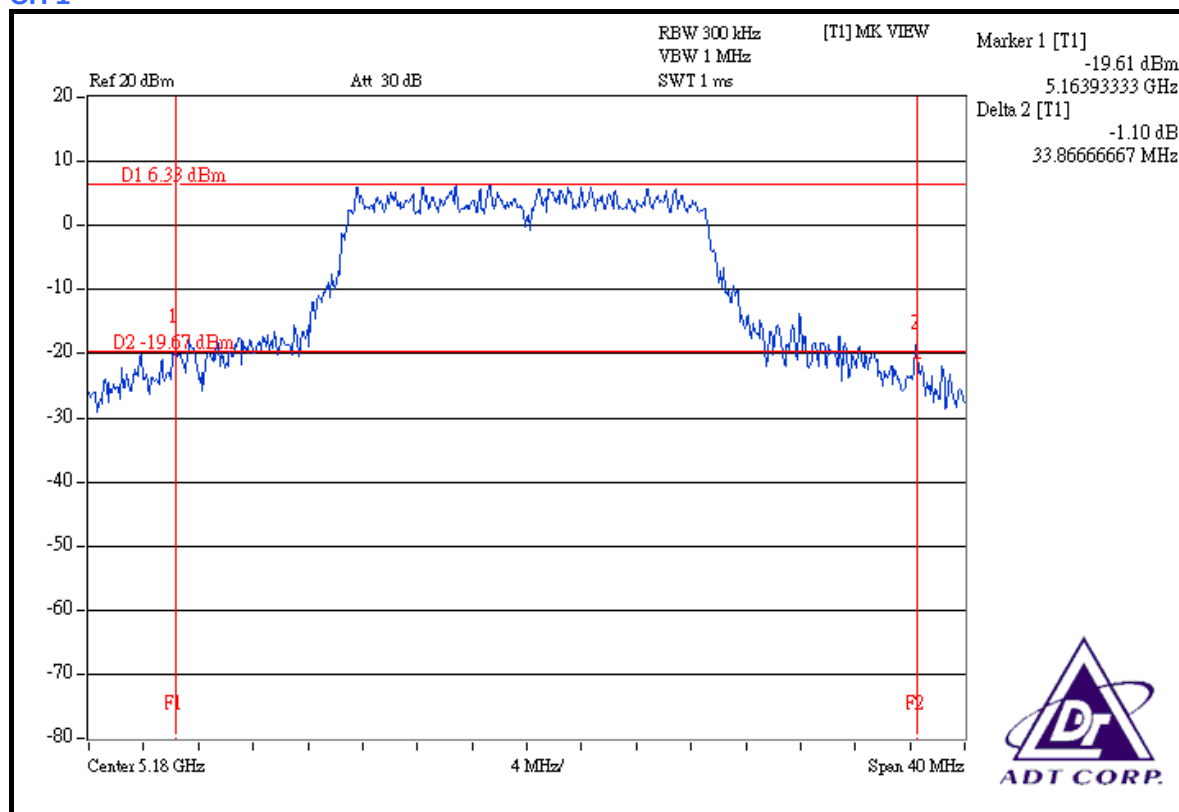


26dB OCCUPIED BANDWIDTH: 802.11a OFDM MODULATION:

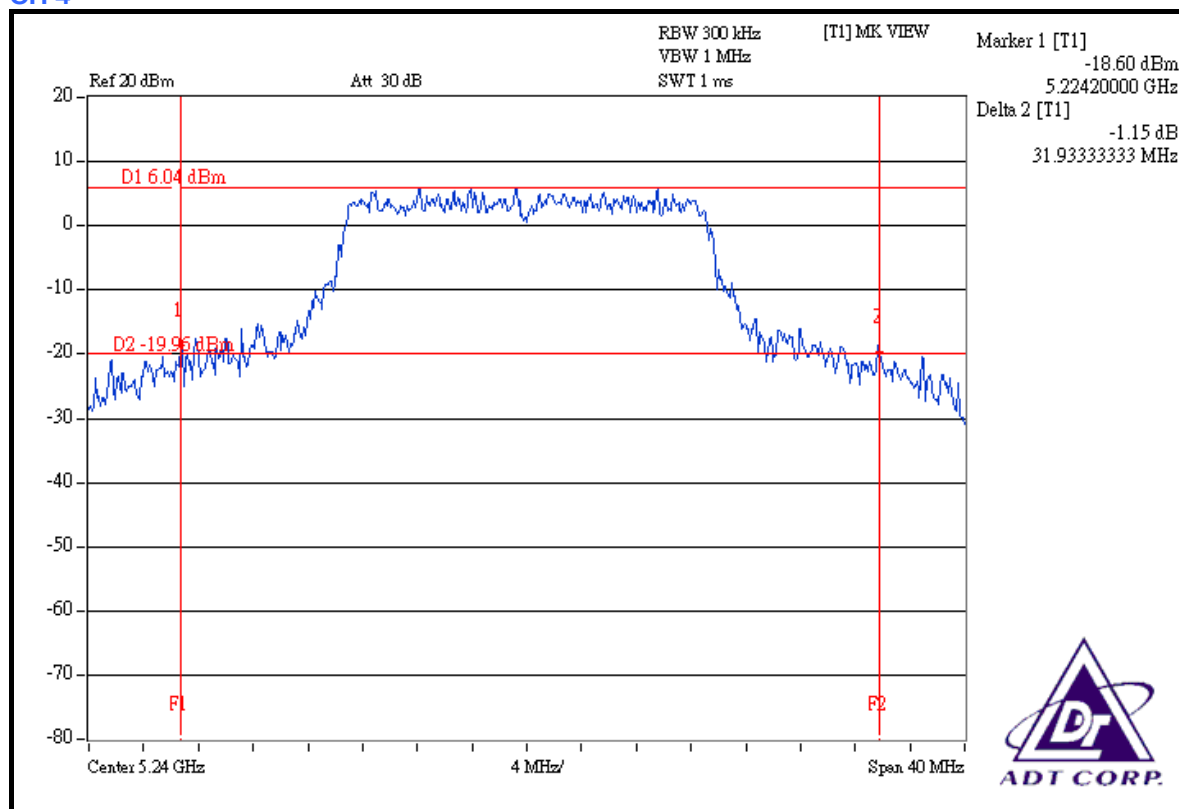
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)	PASS / FAIL
1	5180	33.86	PASS
4	5240	31.93	PASS
5	5260	35.53	PASS
8	5320	36.20	PASS
9	5500	35.46	PASS
14	5600	36.40	PASS
19	5700	37.86	PASS

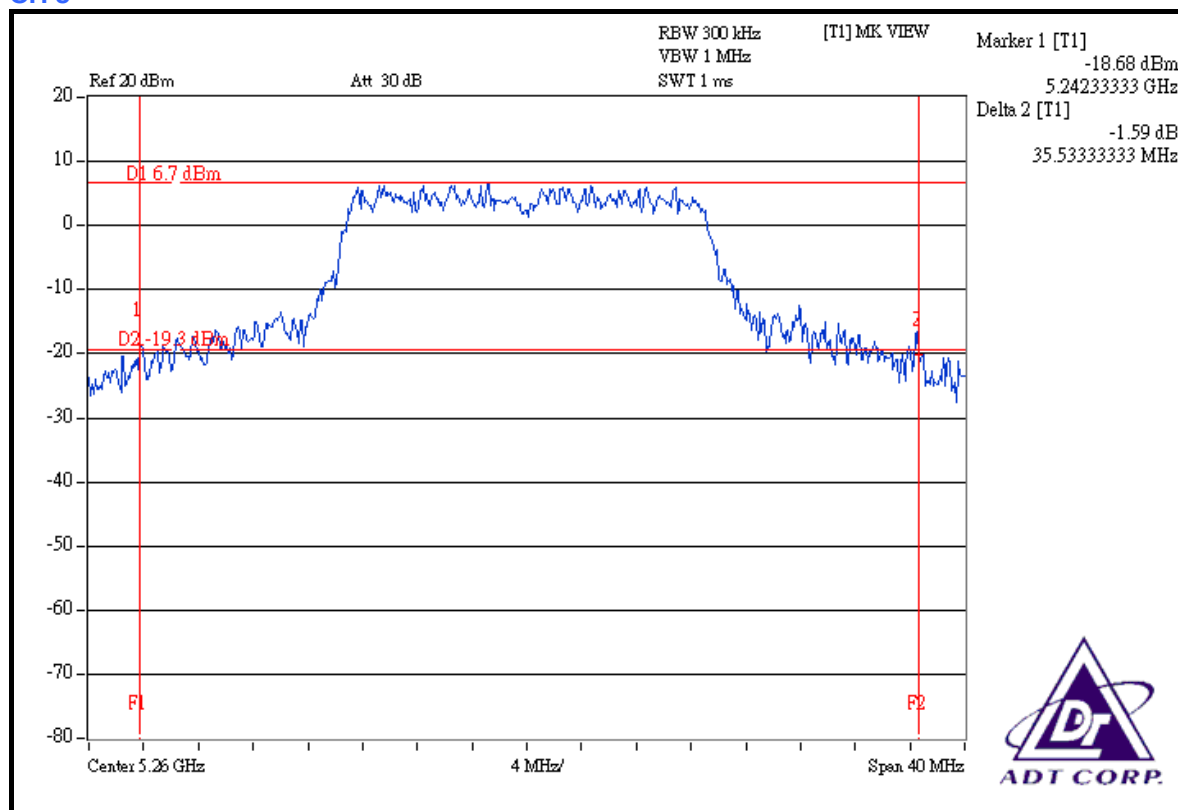
CH 1



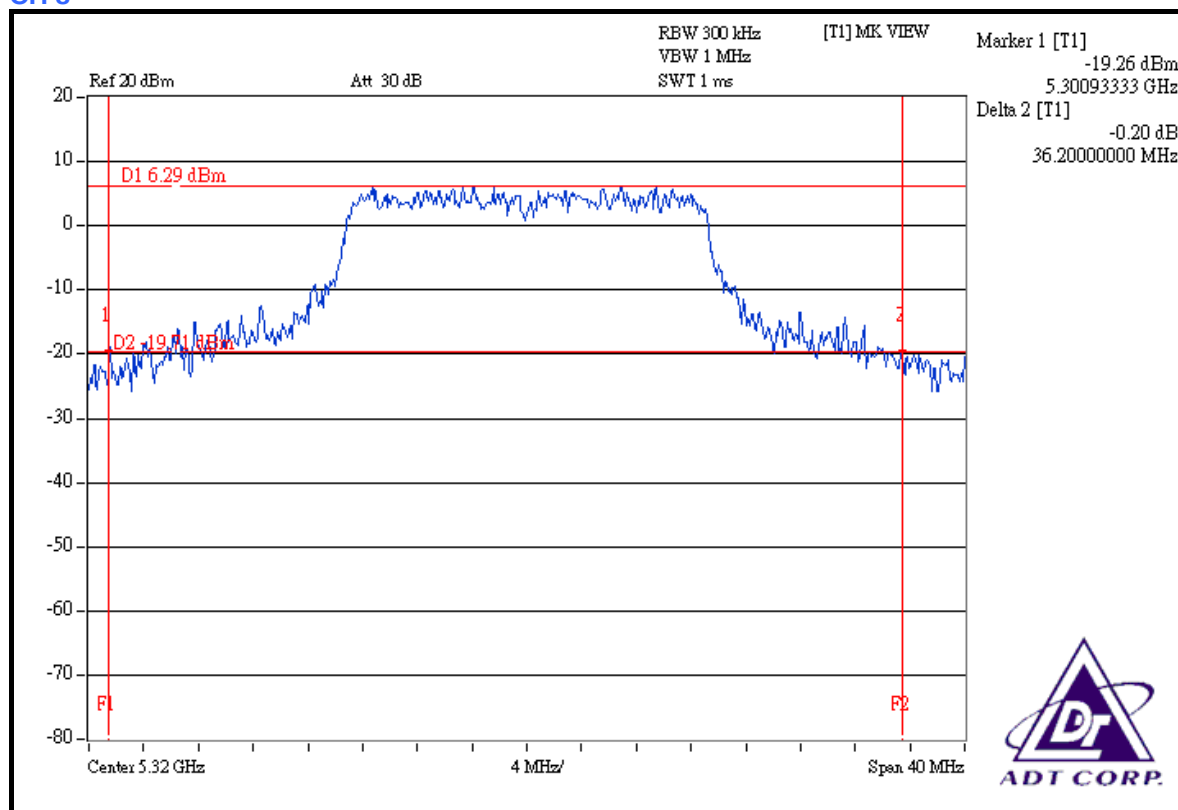
CH 4



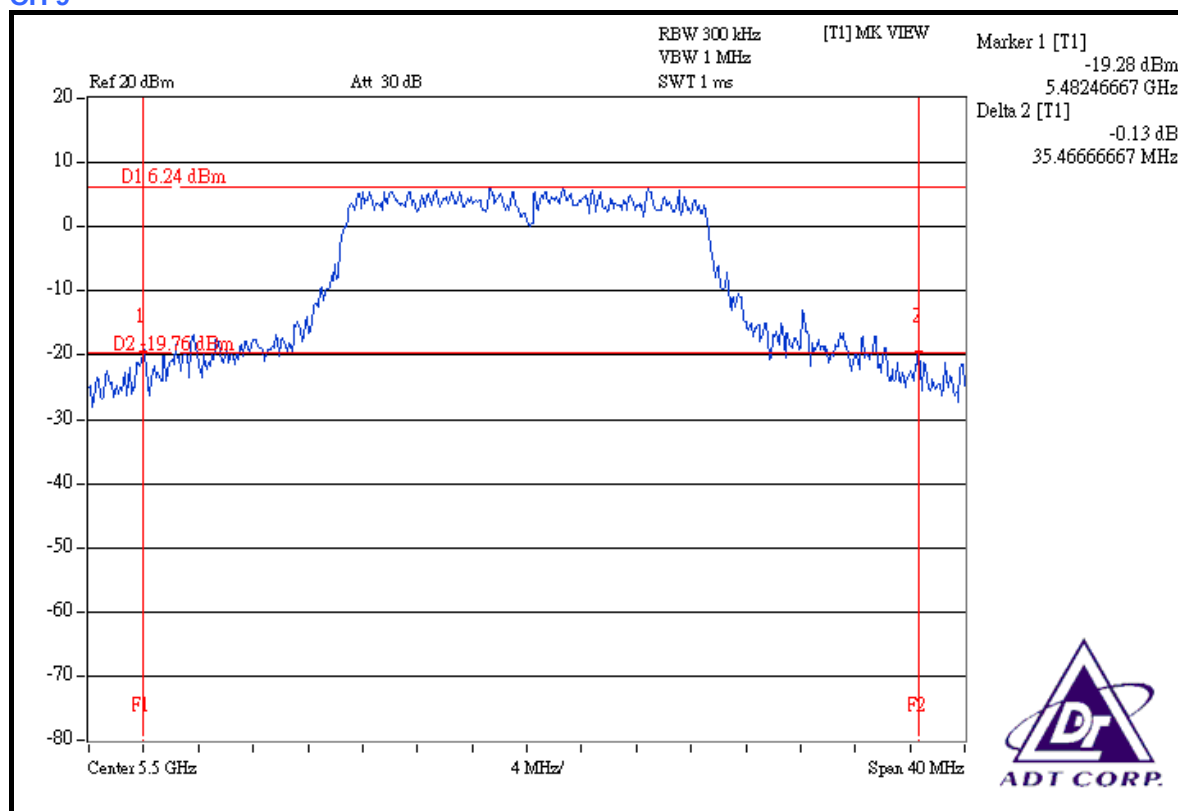
CH 5



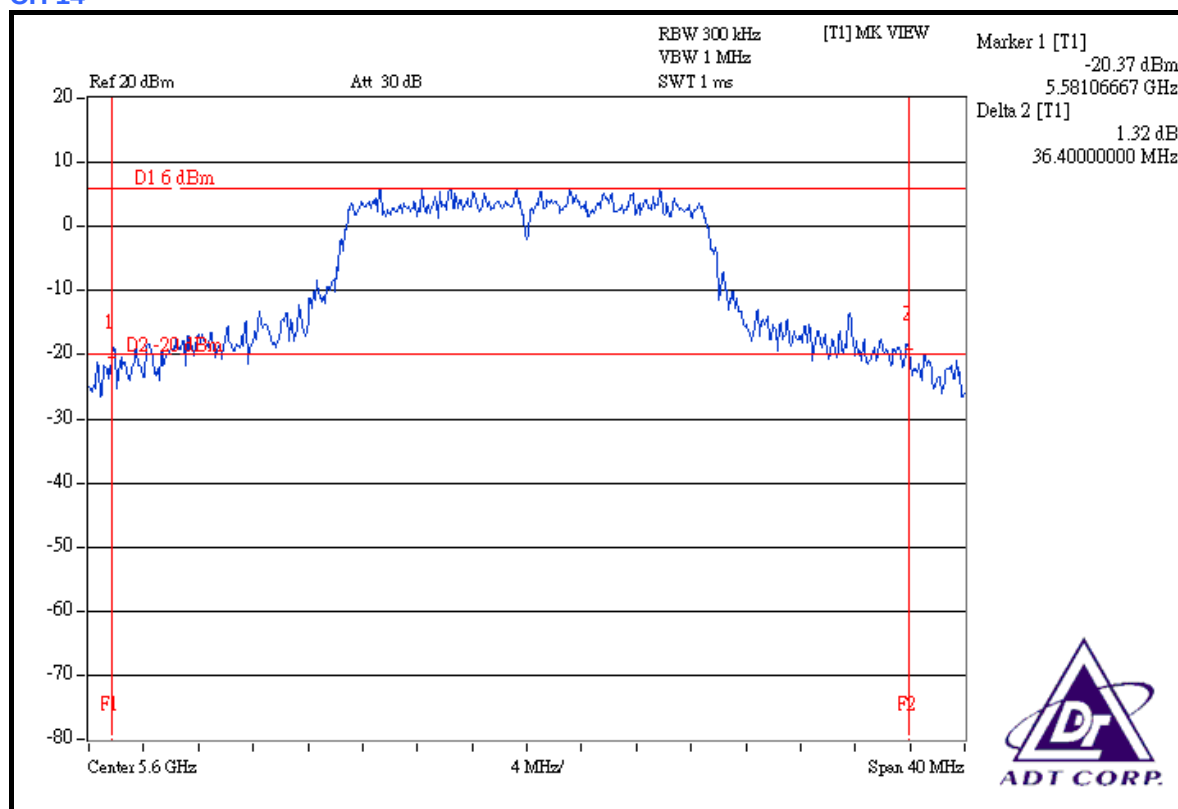
CH 8



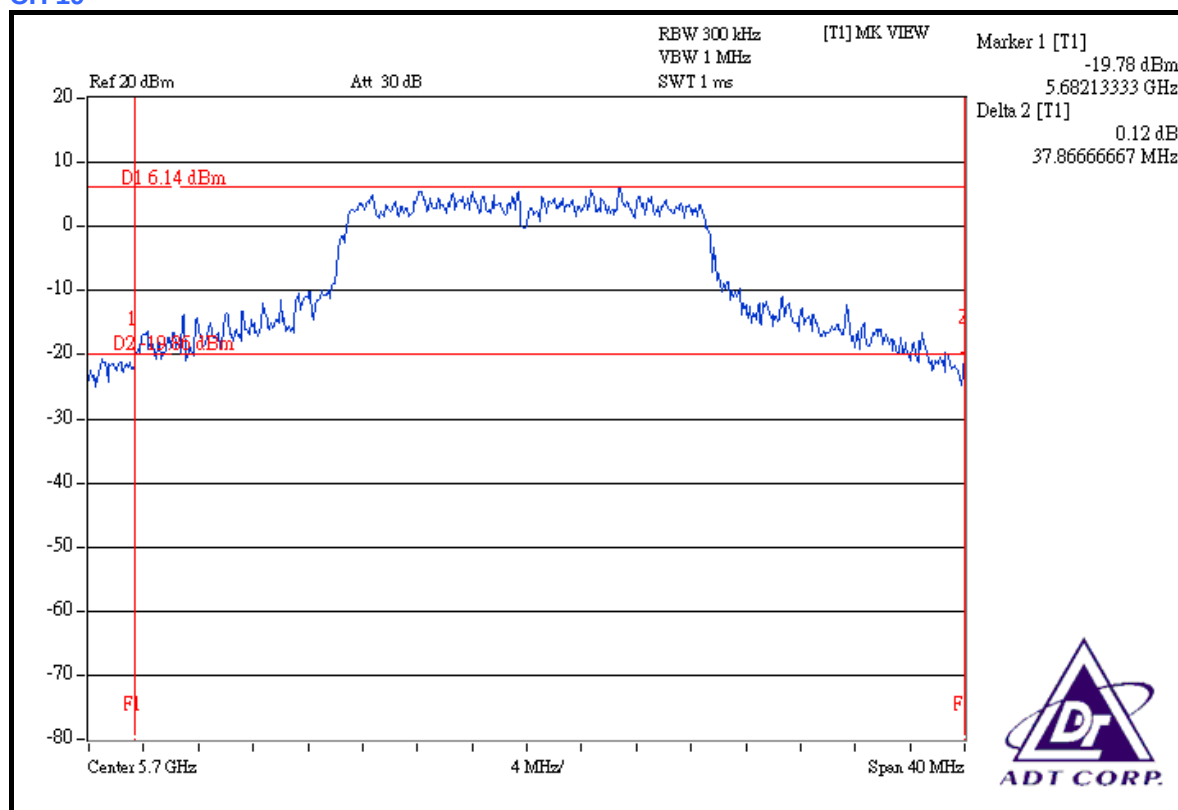
CH 9



CH 14



CH 19

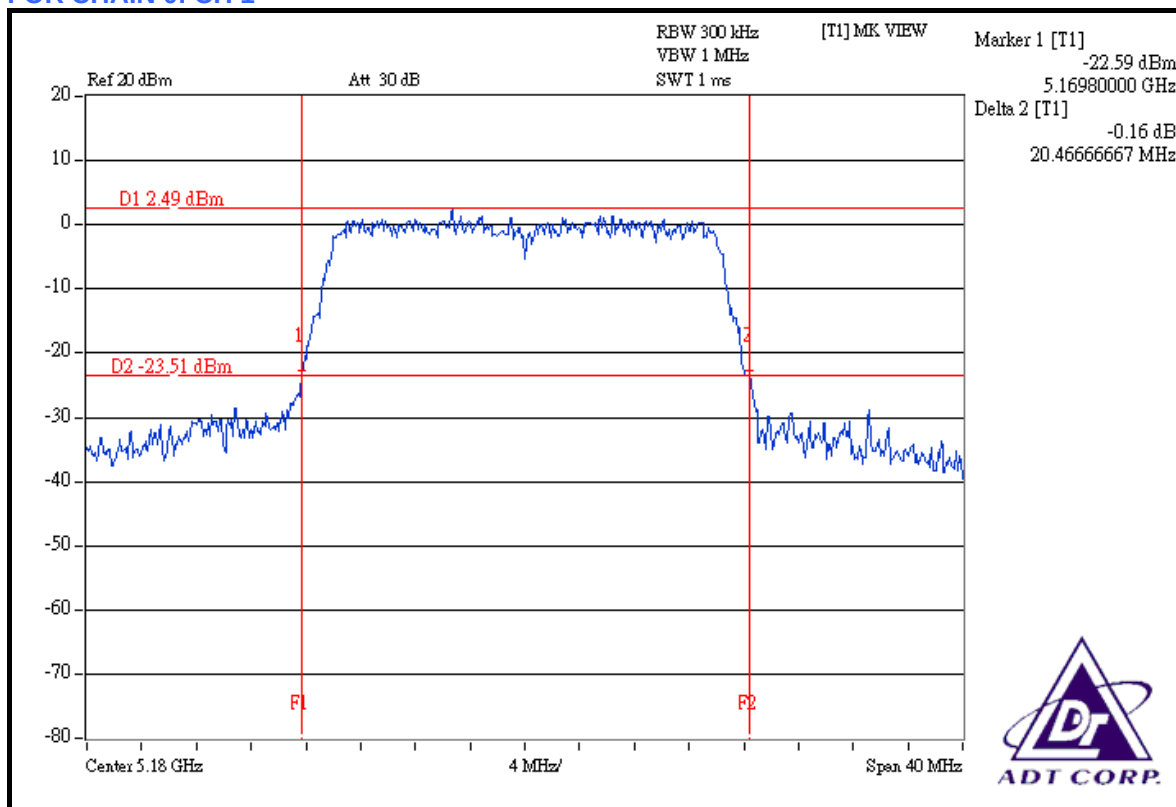


DRAFT 802.11n (20MHz) OFDM MODULATION:

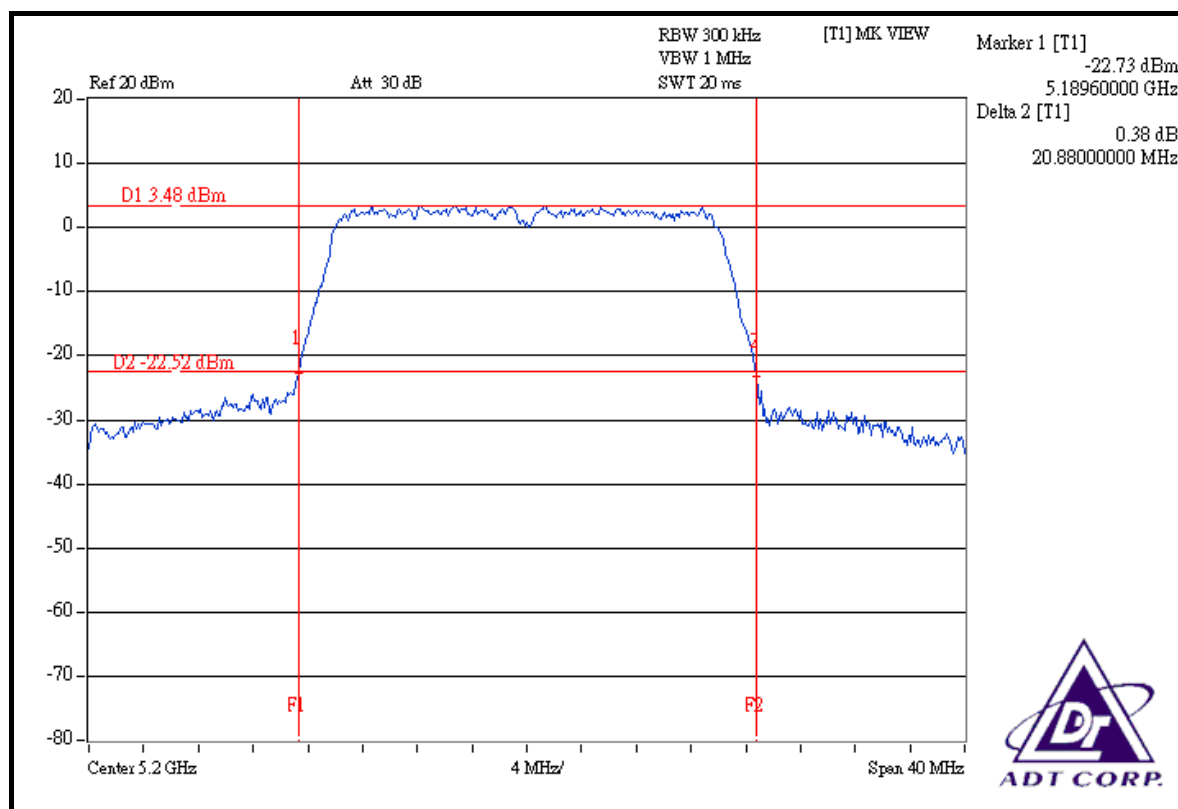
MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
1	5180	20.46	20.33	PASS
2	5200	20.88	20.56	PASS
4	5240	20.20	20.26	PASS

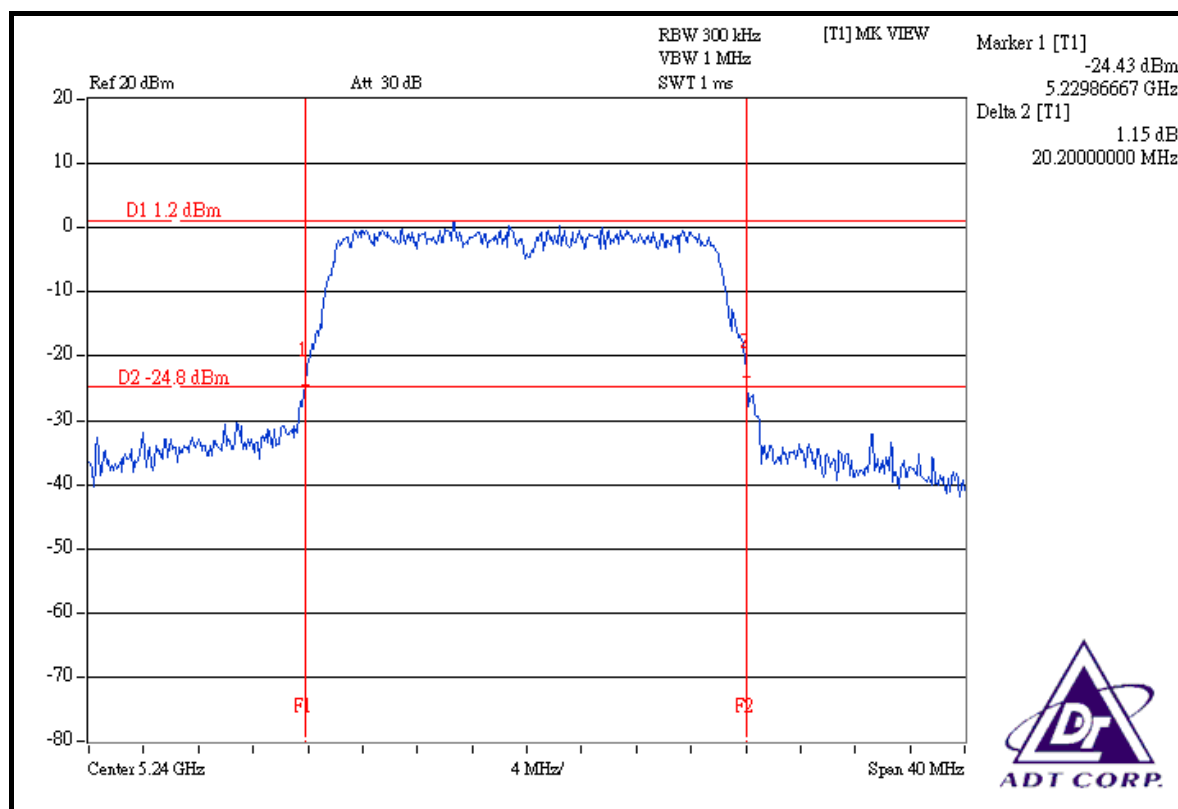
FOR CHAIN 0: CH 1



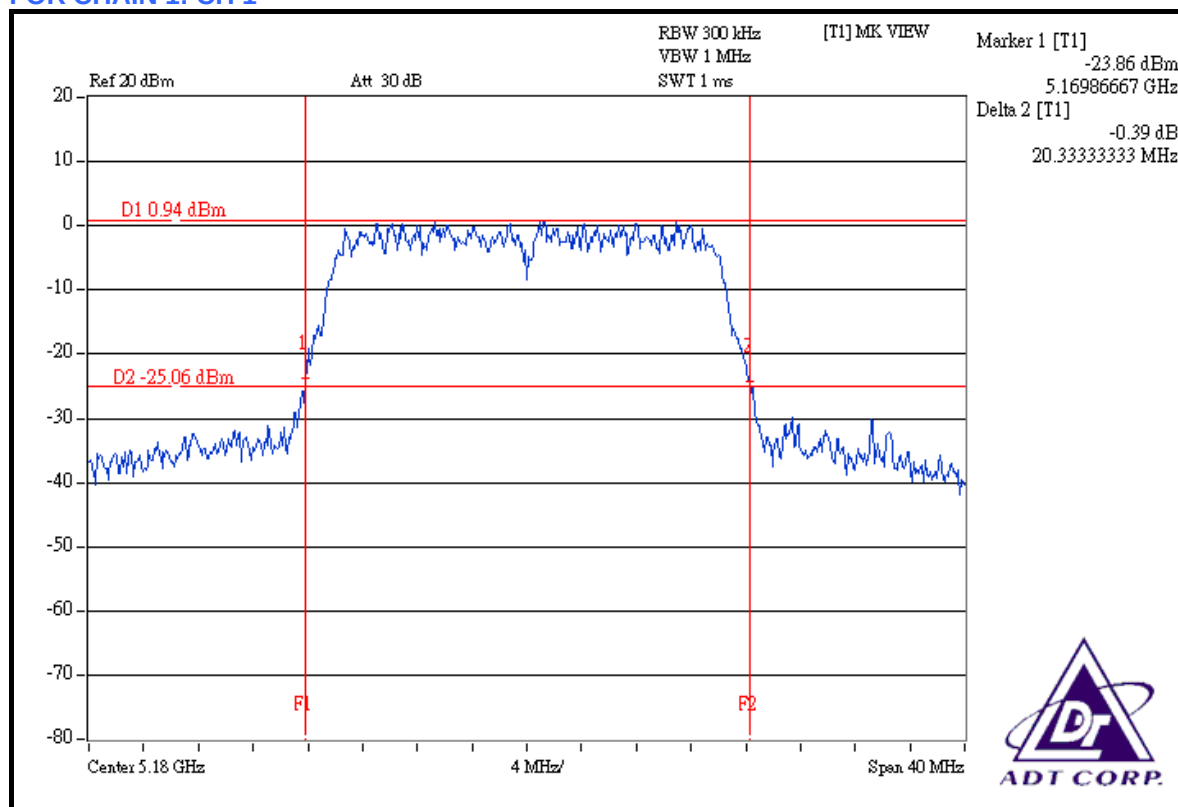
CH 2



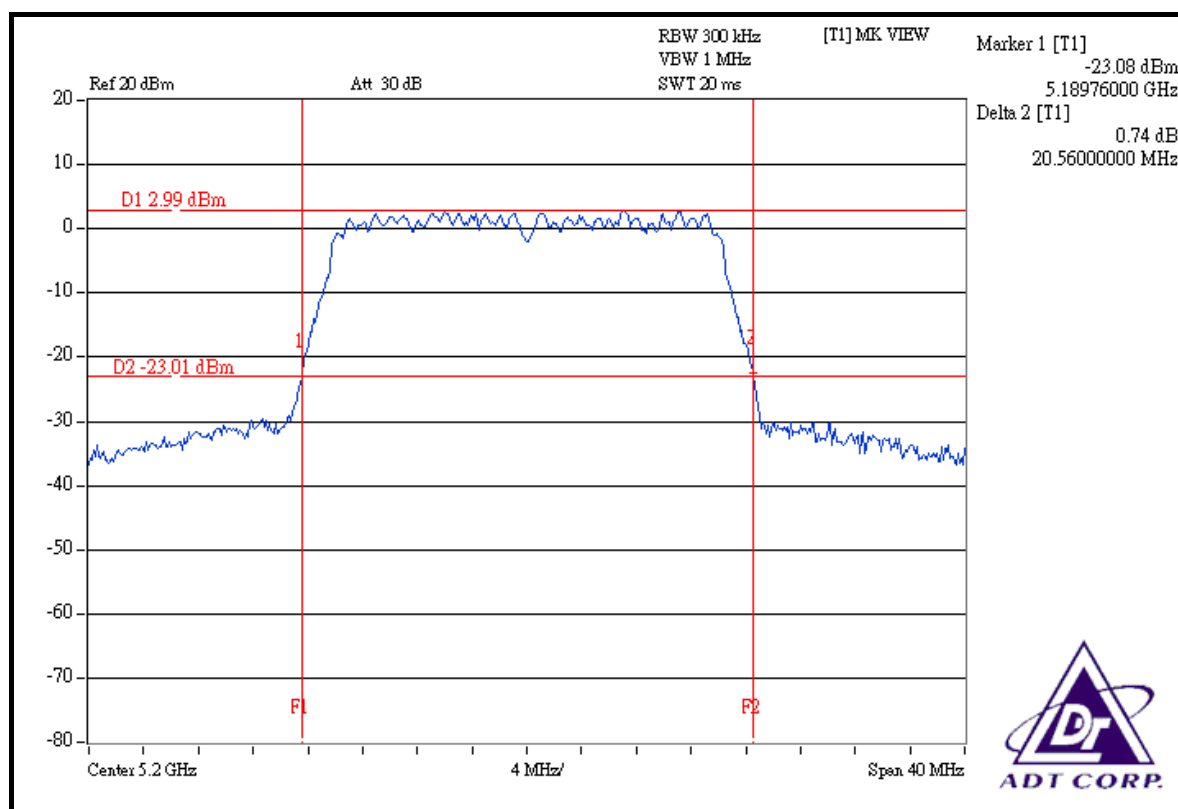
CH 4



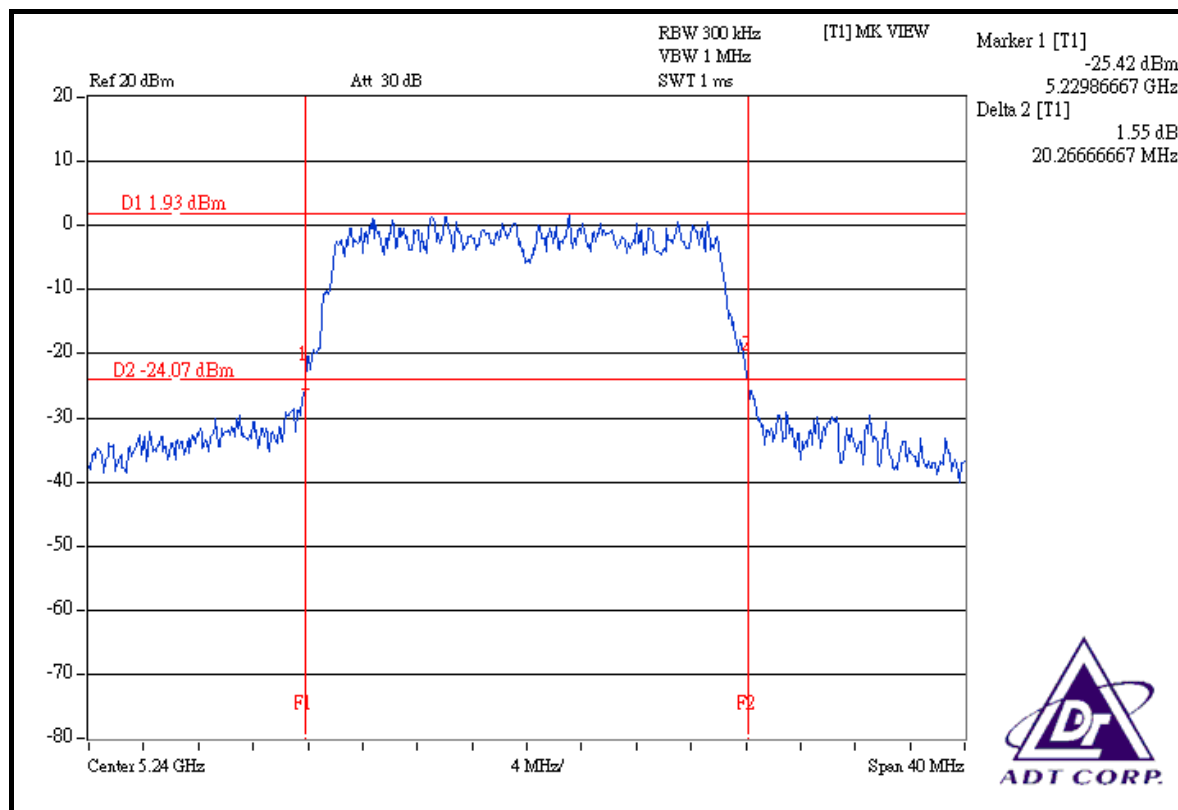
FOR CHAIN 1: CH 1



CH 2



CH 4

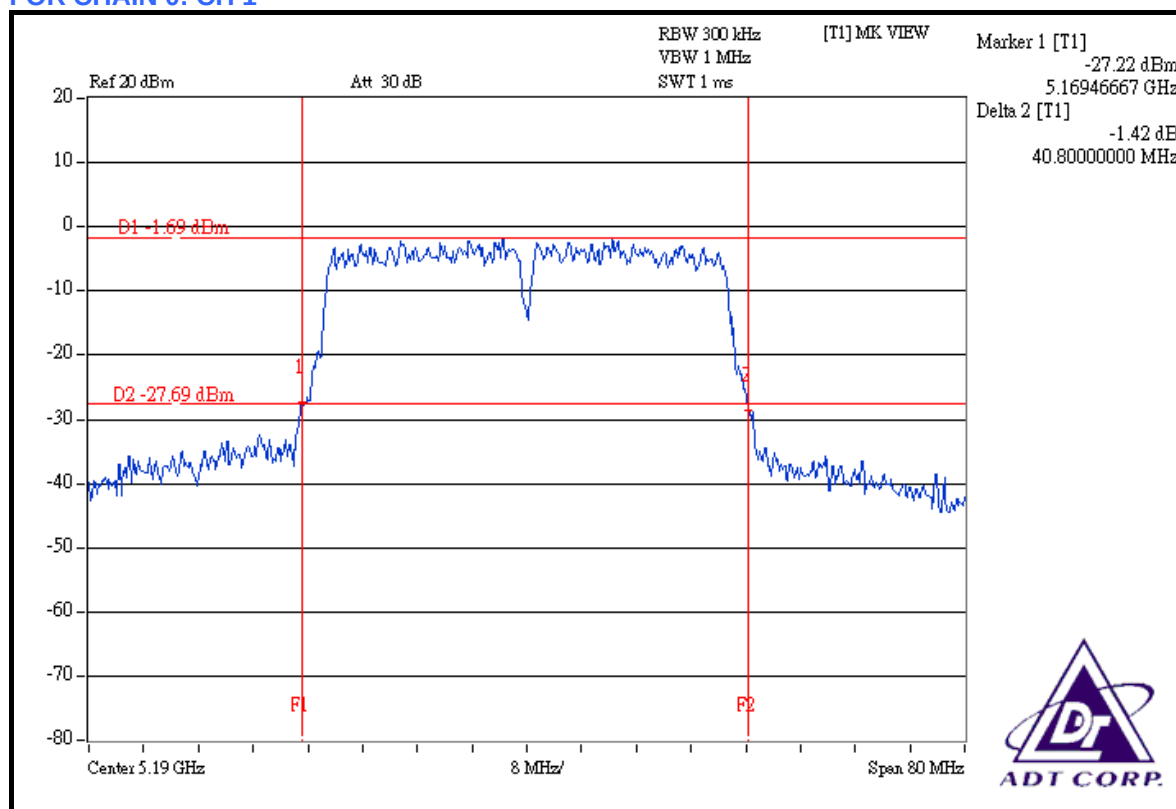


DRAFT 802.11n (40MHz) OFDM MODULATION:

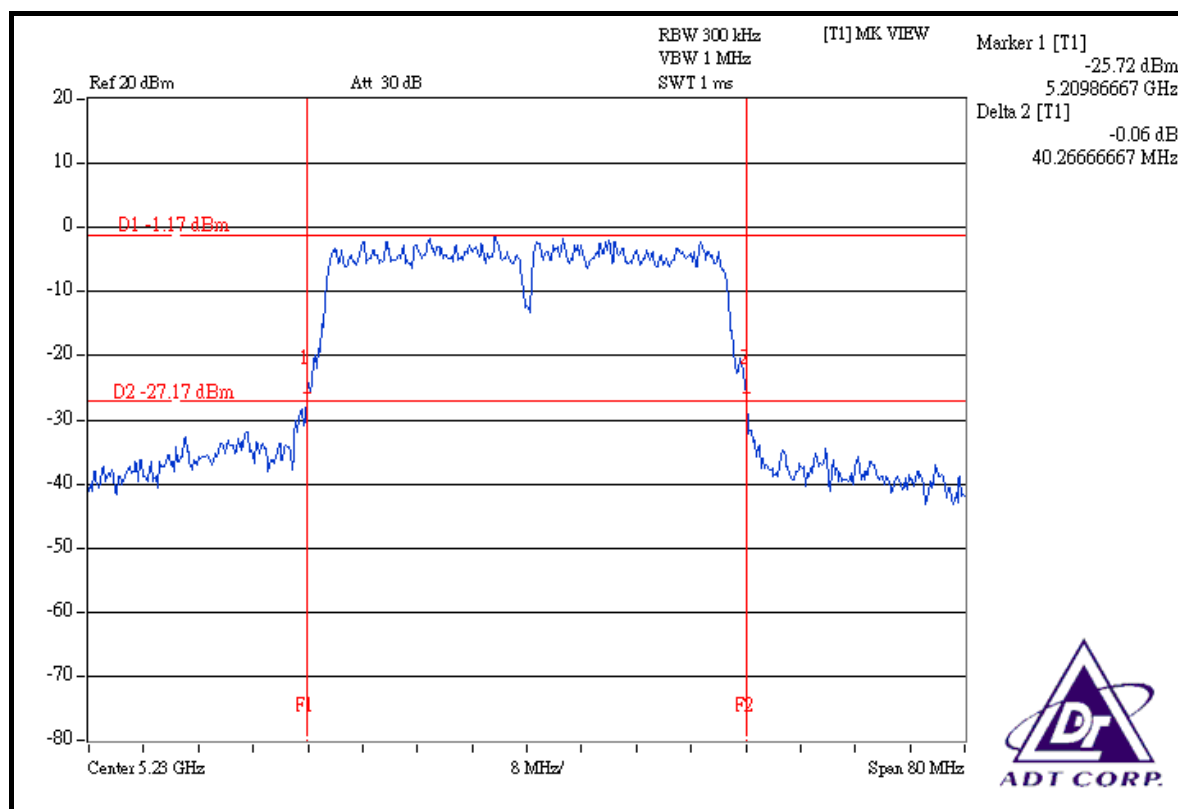
MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
1	5190	40.80	40.66	PASS
2	5230	40.26	40.26	PASS

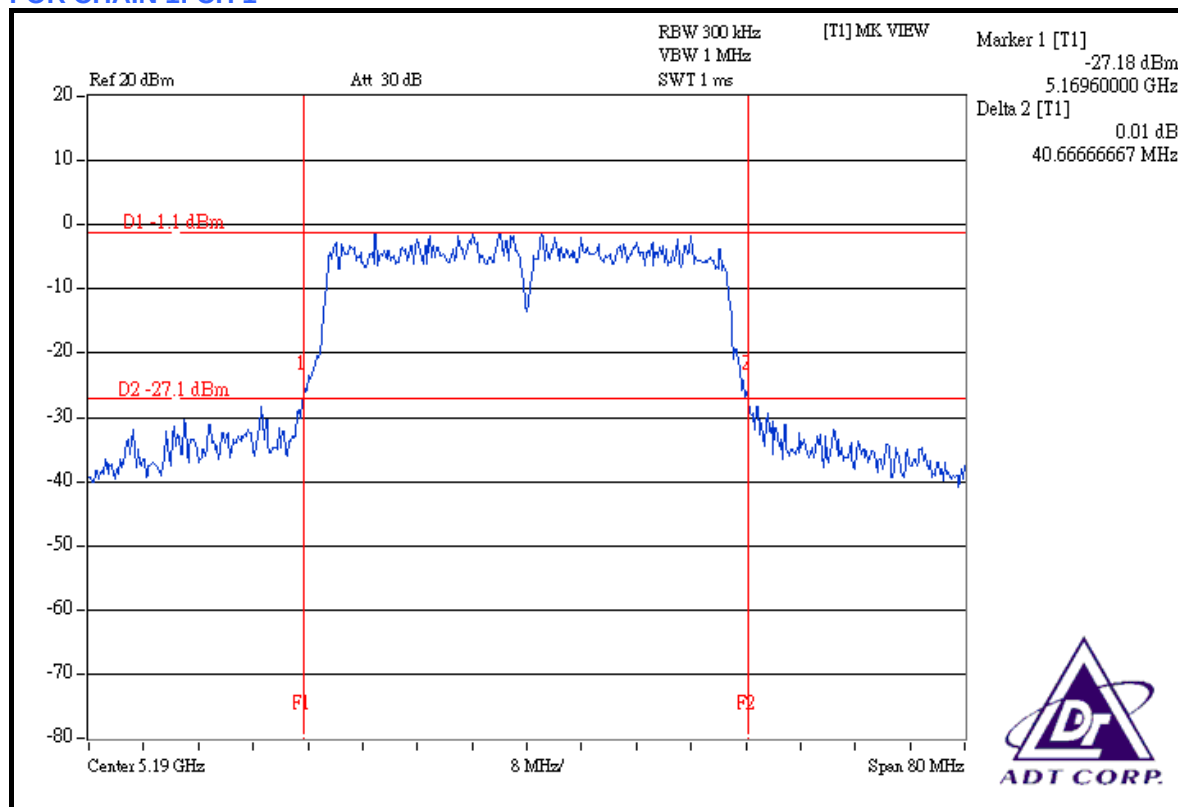
FOR CHAIN 0: CH 1



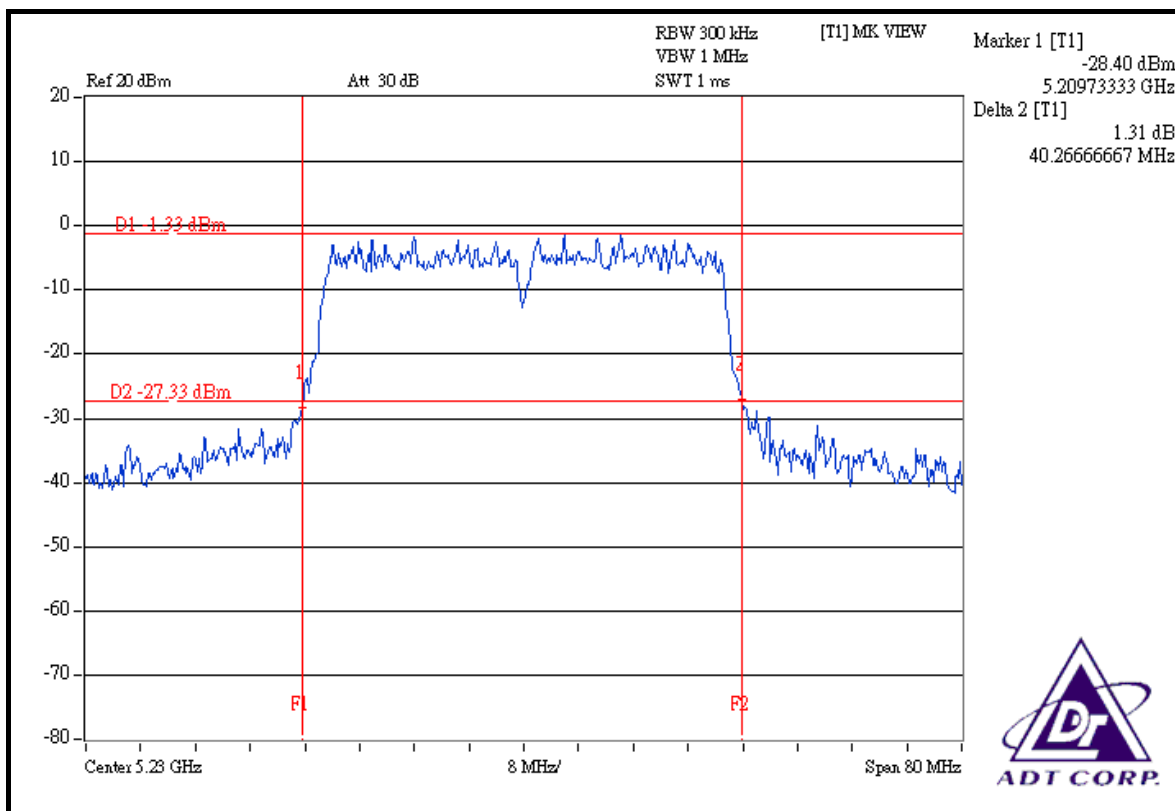
CH 2



FOR CHAIN 1: CH 1



CH 2



4.4 PEAK POWER EXCURSION MEASUREMENT

4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	13dB
5.250 ~ 5.350GHz	13dB
5.470 ~ 5.725GHz	13dB

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Apr. 11, 2008

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

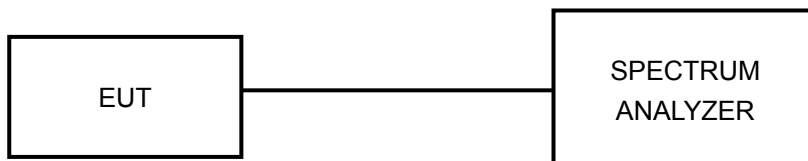
4.4.3 TEST PROCEDURE

- The transmitter output was connected to the spectrum analyzer.
- Set the spectrum bandwidth span to view the entire spectrum.
- Using peak detector and Max-hold function for Trace 1 (RB = 1MHz, VB = 3MHz) and 2 (RB = 1MHz, VB = 300kHz).
- The largest difference between Trace 1 and Trace 2 in any 1MHz band on any frequency was recorded.

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.

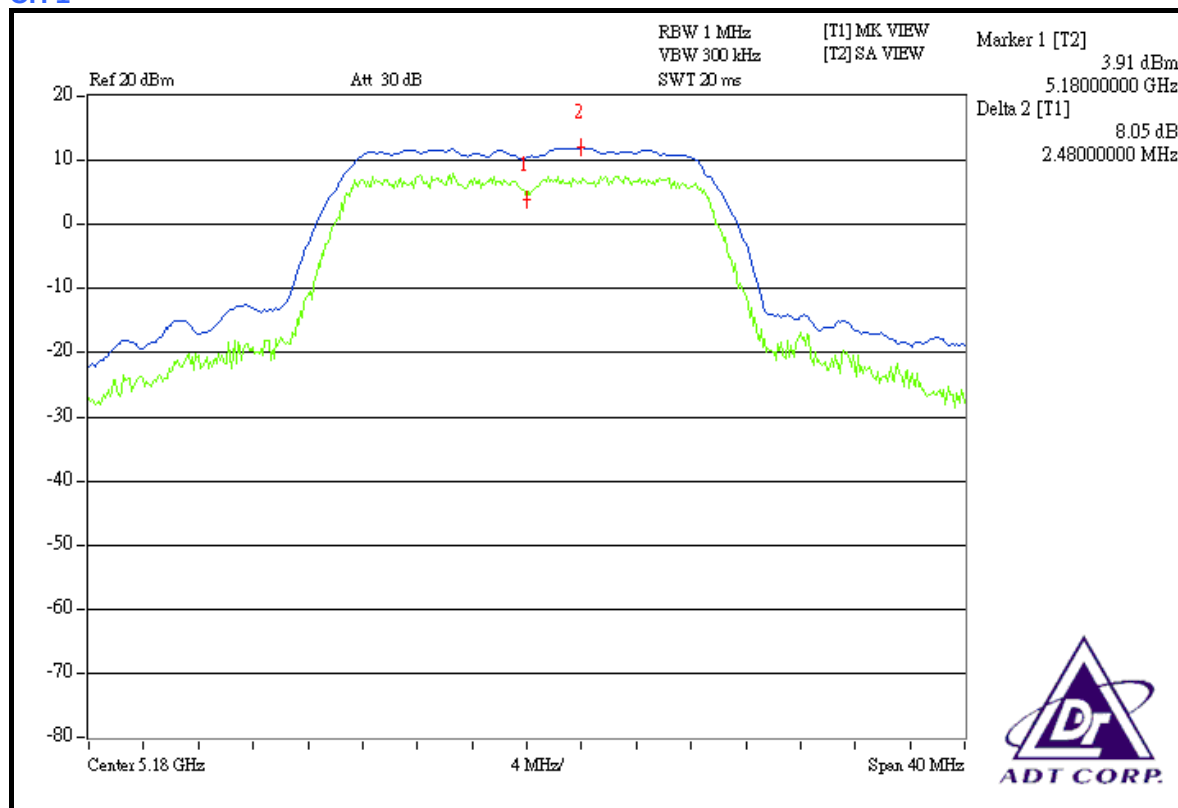
4.4.7 TEST RESULTS

802.11a OFDM MODULATION:

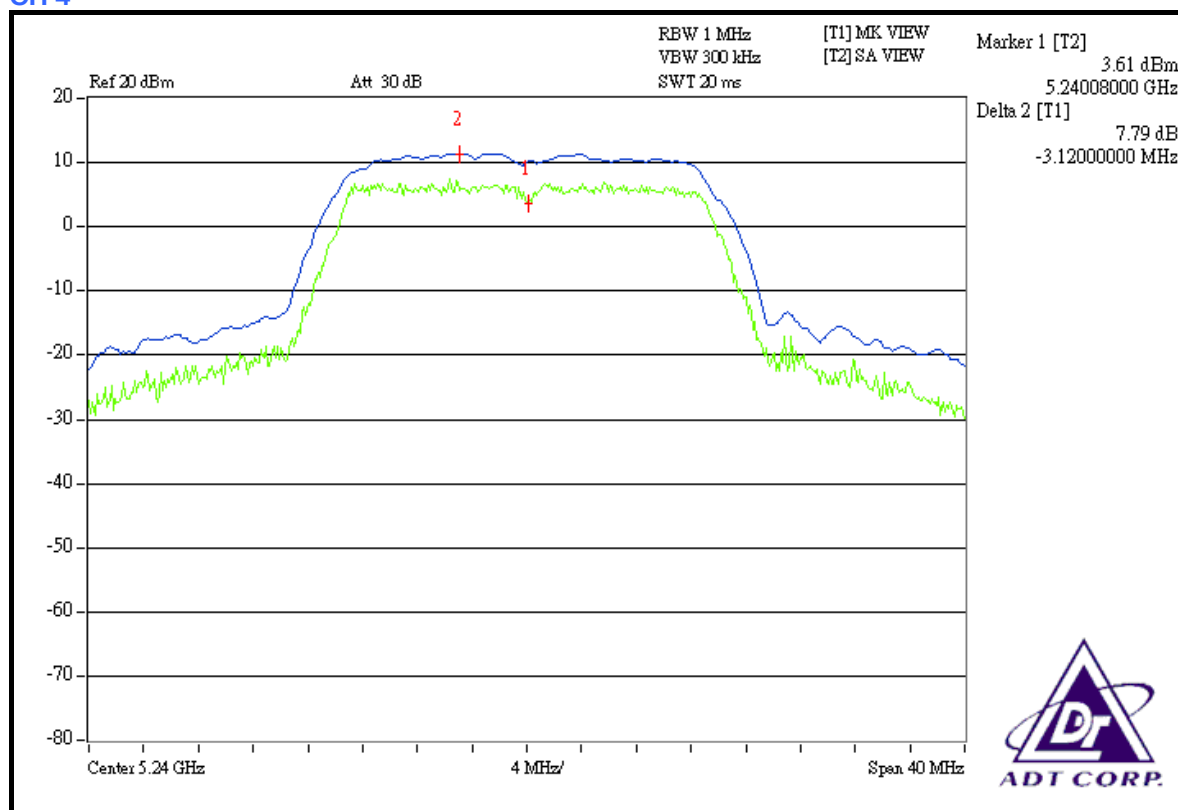
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK TO AVERAGE EXCURSION LIMIT (dB)	PASS / FAIL
1	5180	8.05	13	PASS
4	5240	7.79	13	PASS
5	5260	7.29	13	PASS
8	5320	7.84	13	PASS
9	5500	7.69	13	PASS
14	5600	7.81	13	PASS
19	5700	8.15	13	PASS

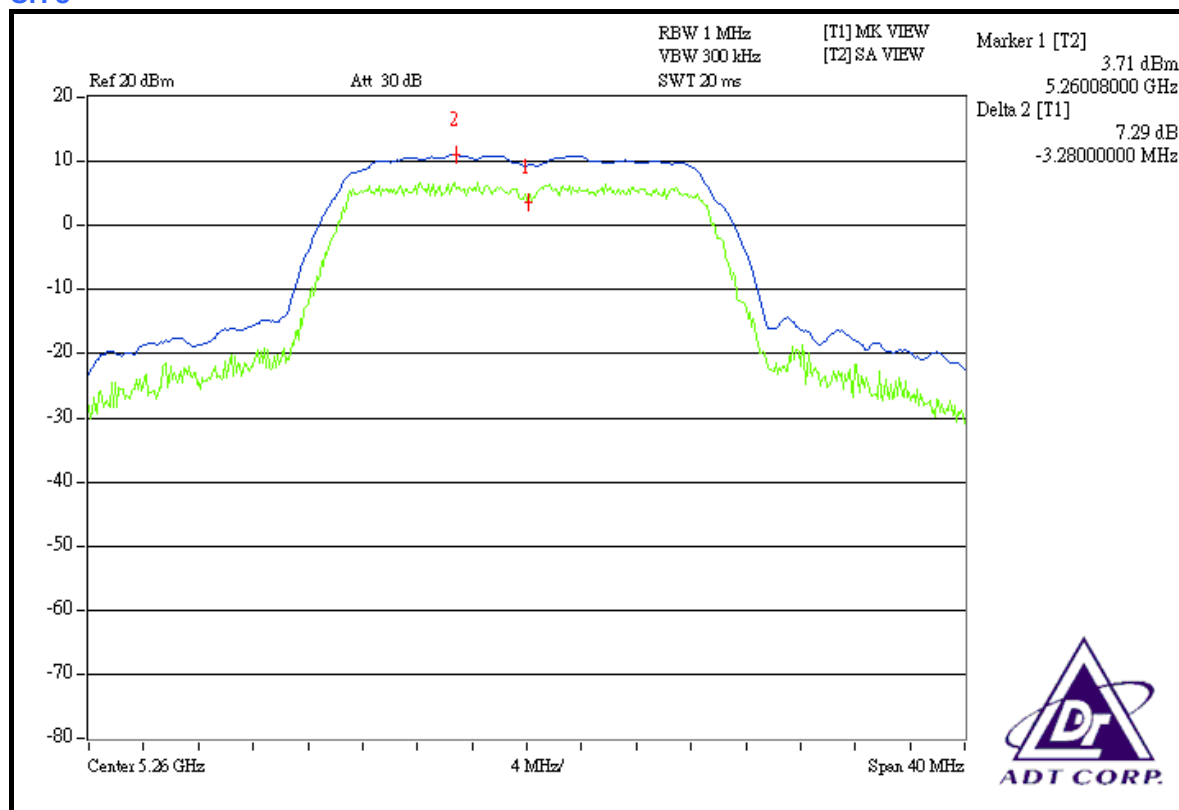
CH 1



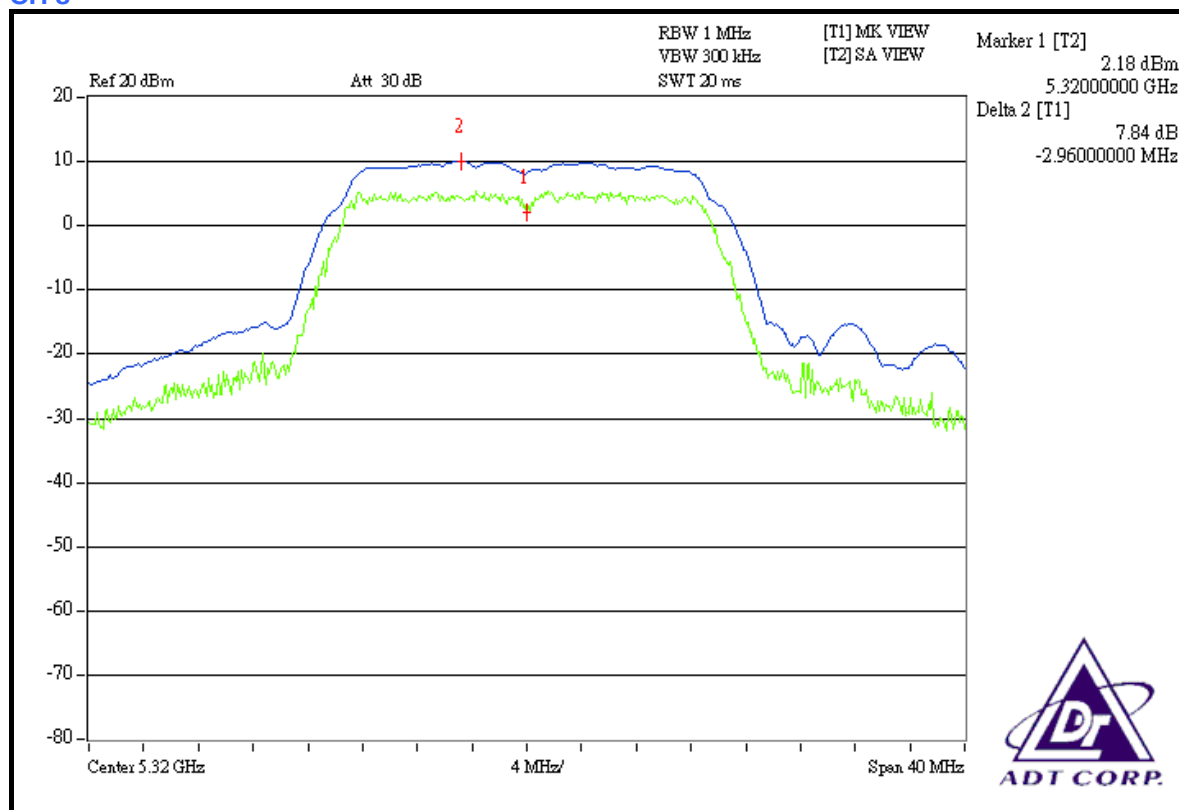
CH 4



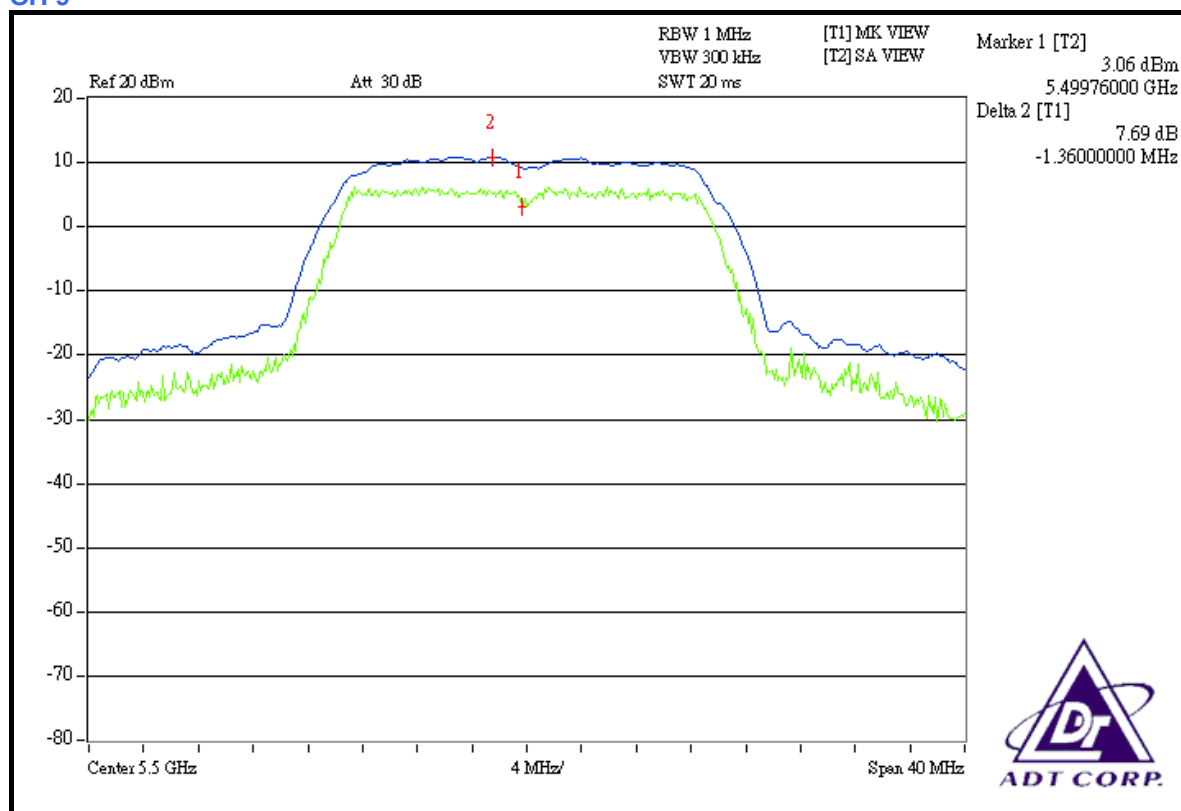
CH 5



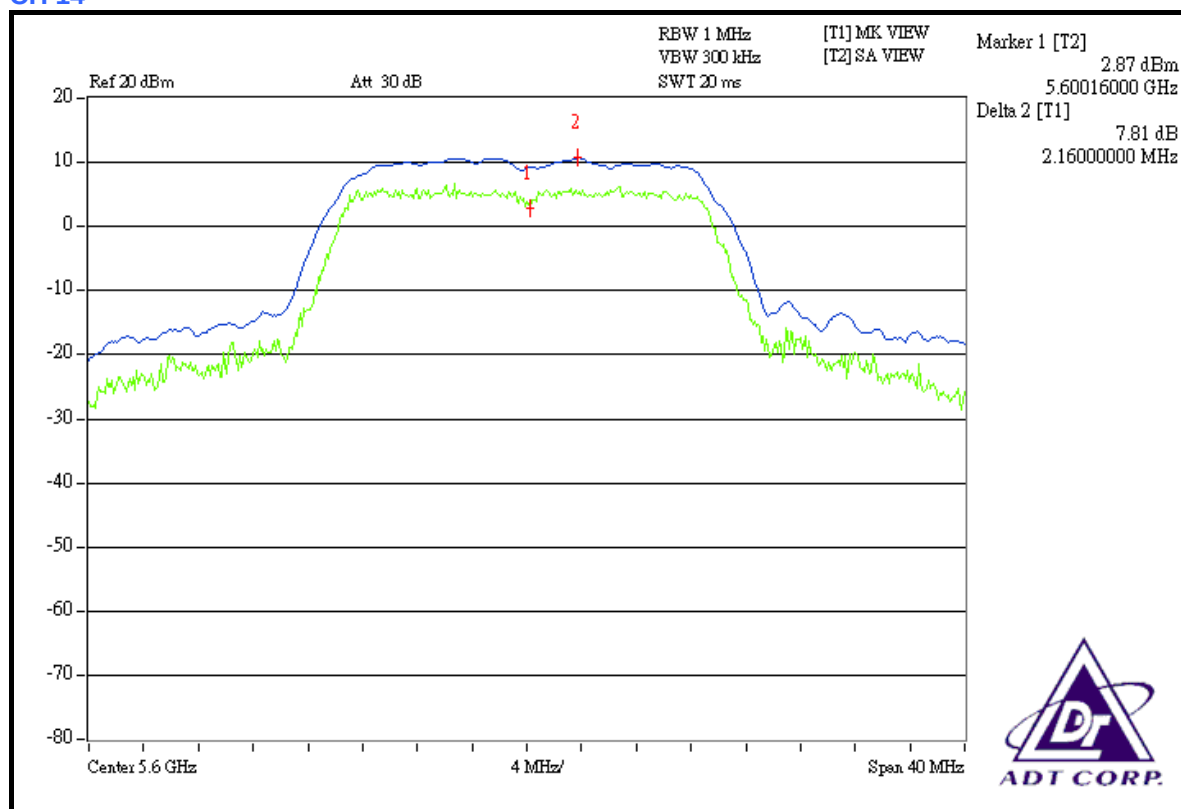
CH 8



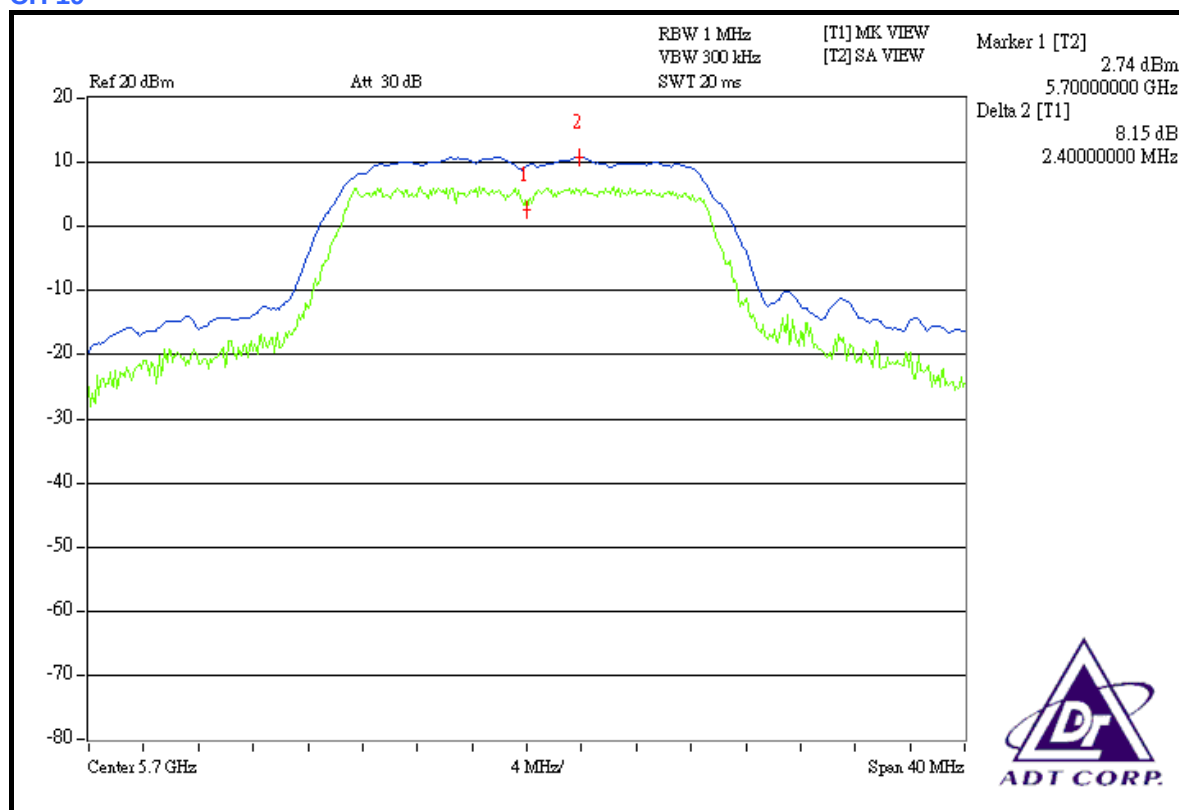
CH 9



CH 14



CH 19

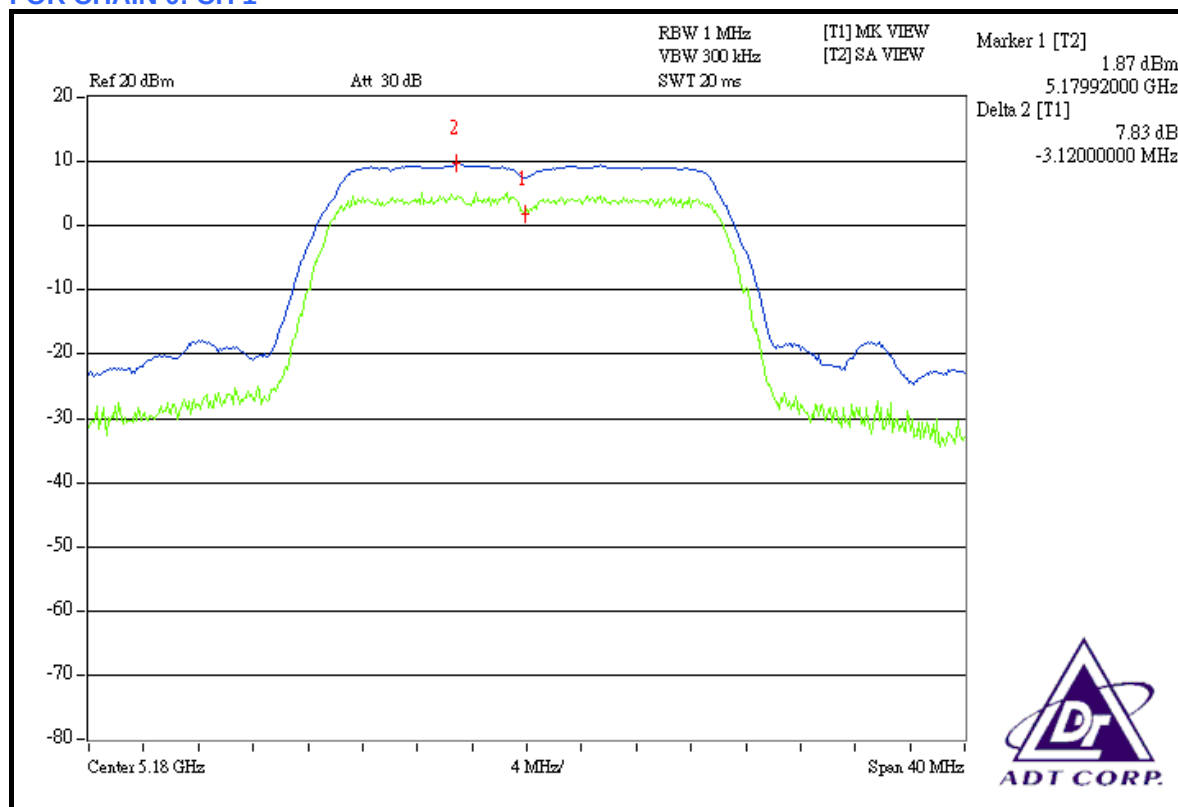


DRAFT 802.11n (20MHz) OFDM MODULATION:

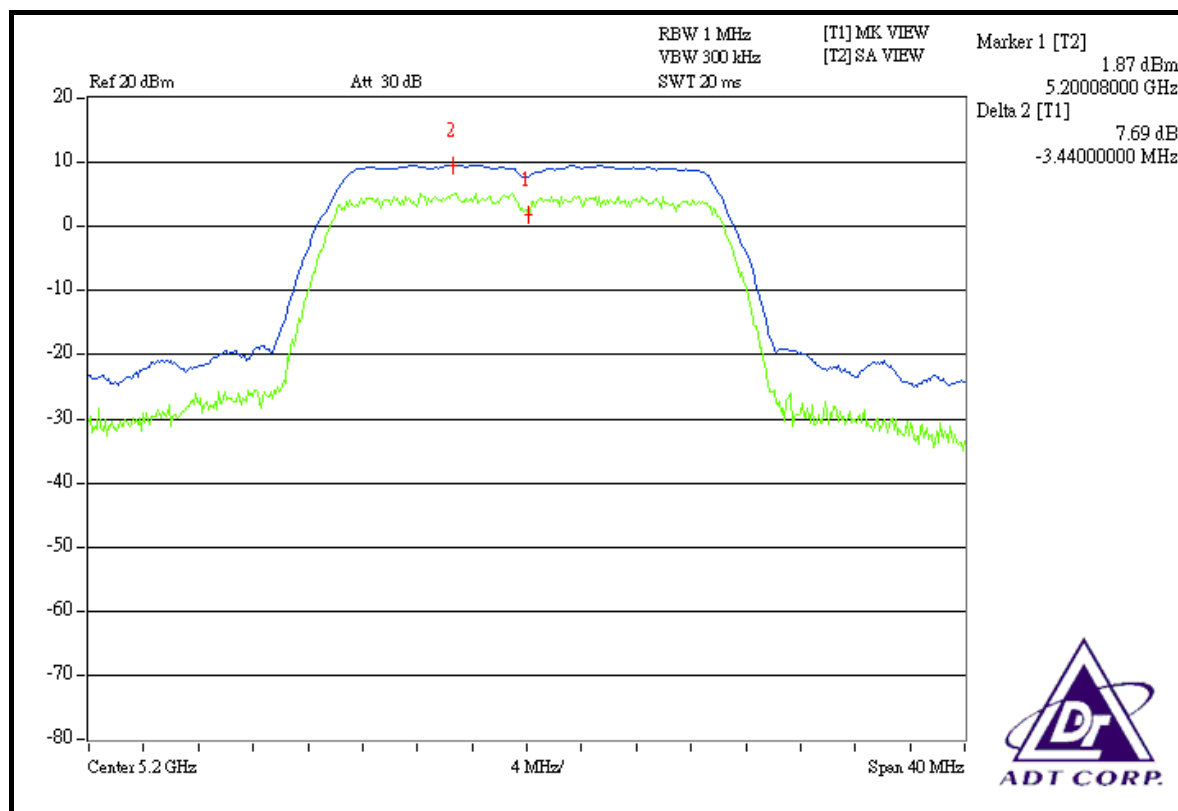
MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)		PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1		
1	5180	7.83	8.19	13	PASS
2	5200	7.69	8.41	13	PASS
4	5240	7.80	8.37	13	PASS

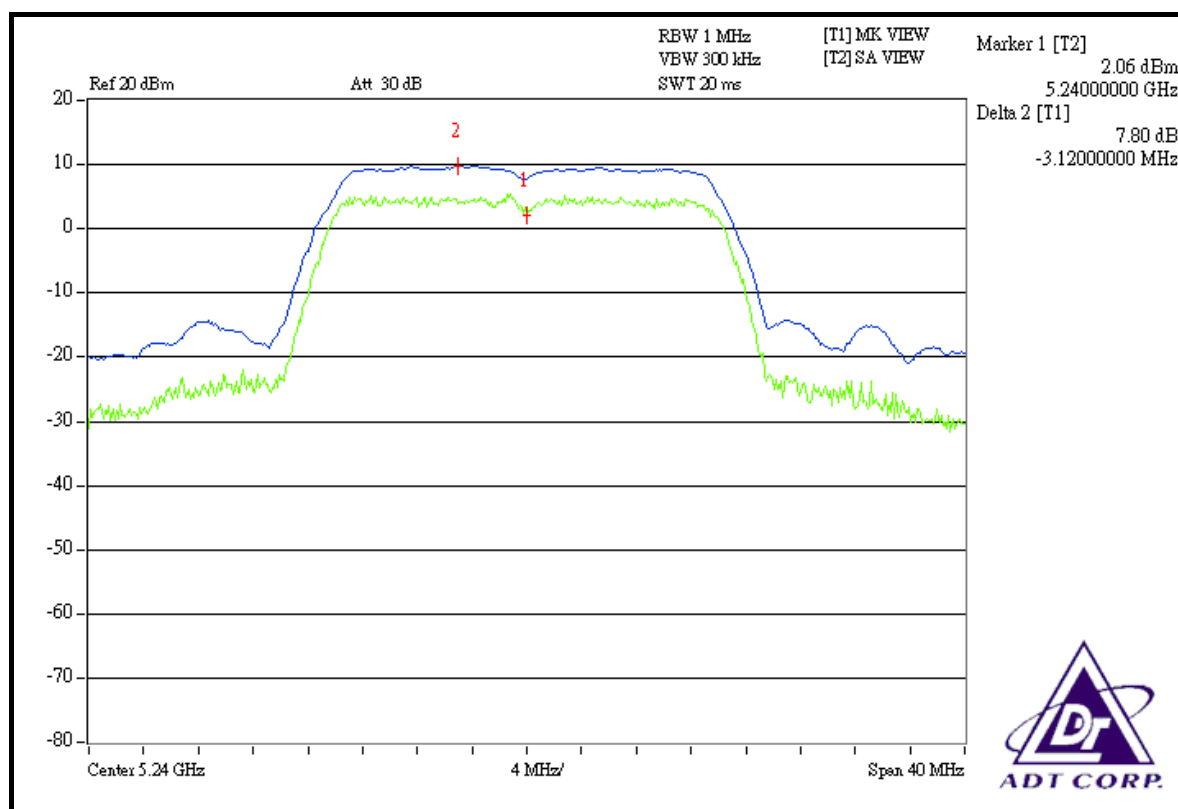
FOR CHAIN 0: CH 1



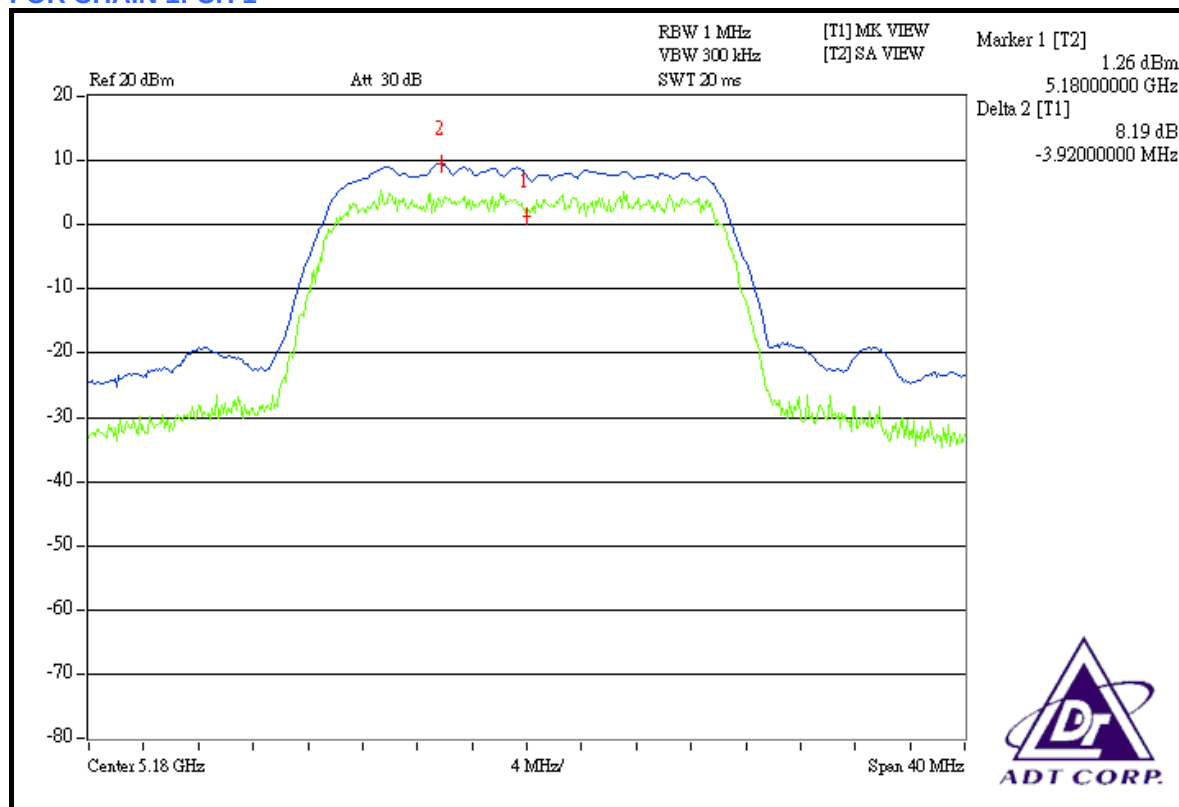
CH 2



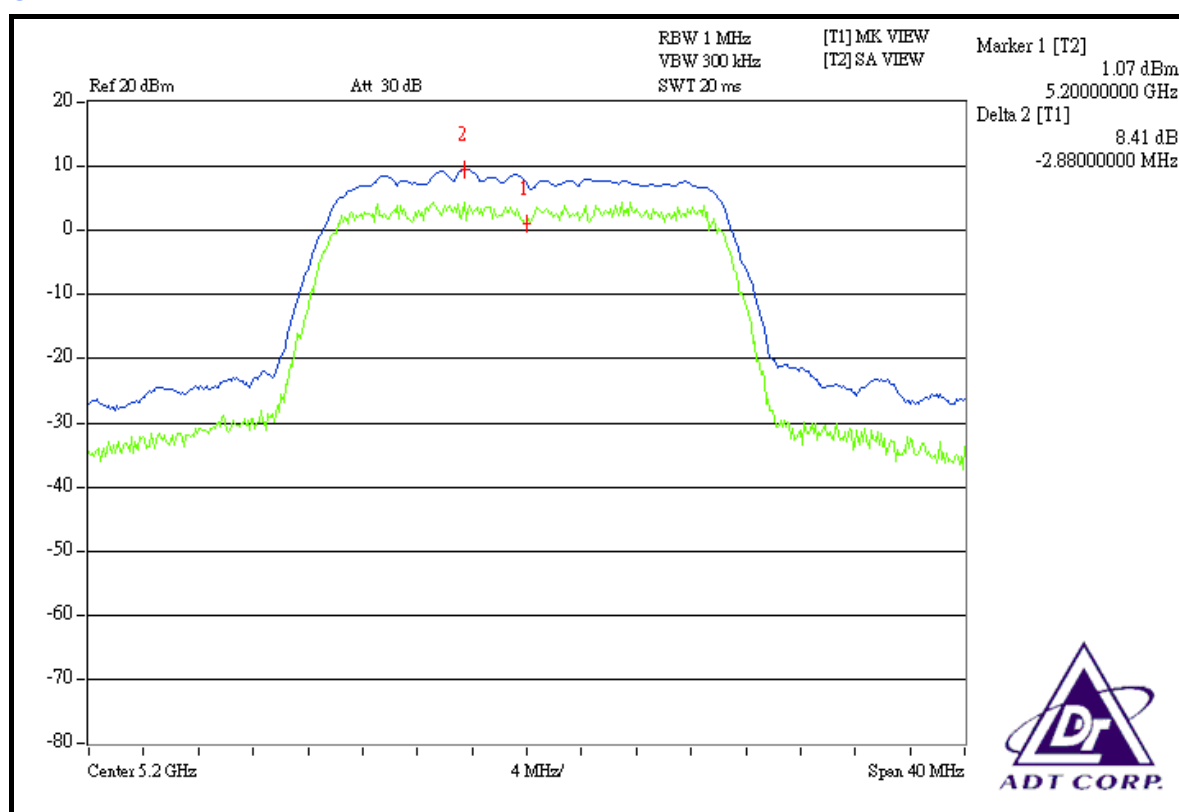
CH 4



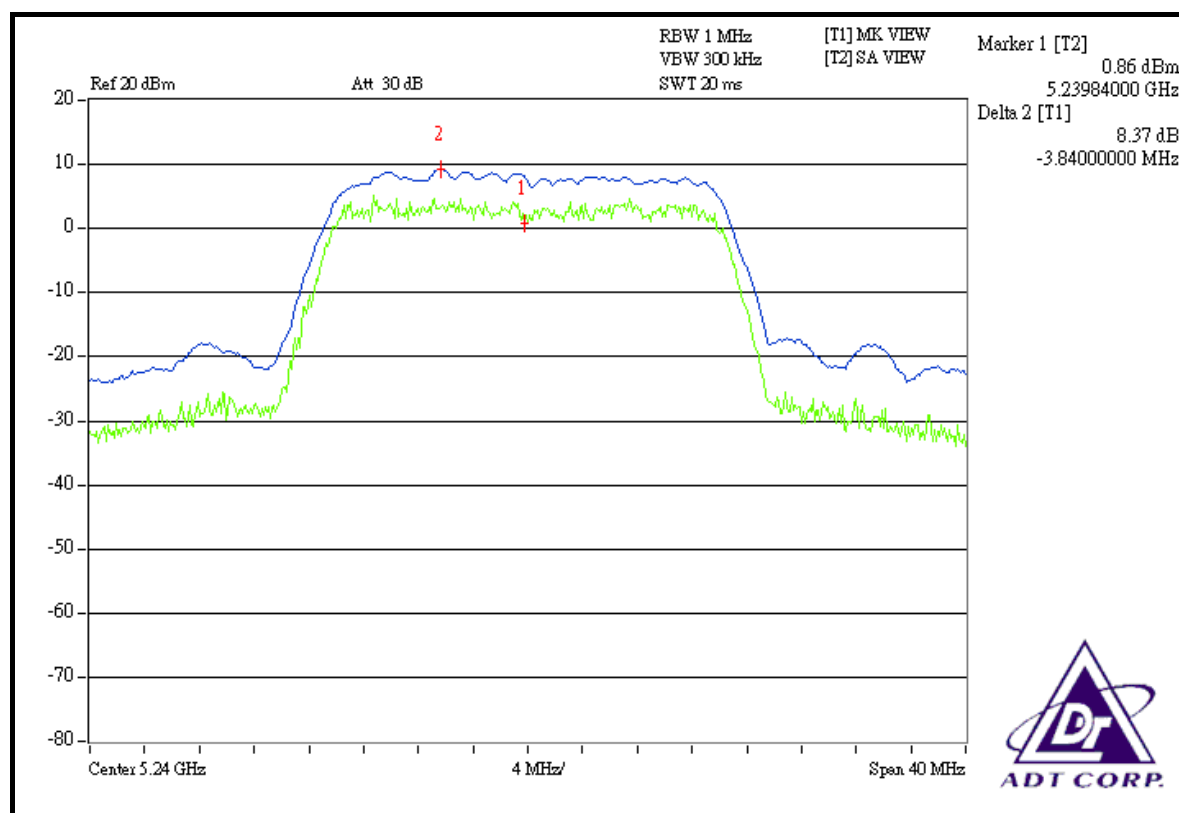
FOR CHAIN 1: CH 1



CH 2



CH 4

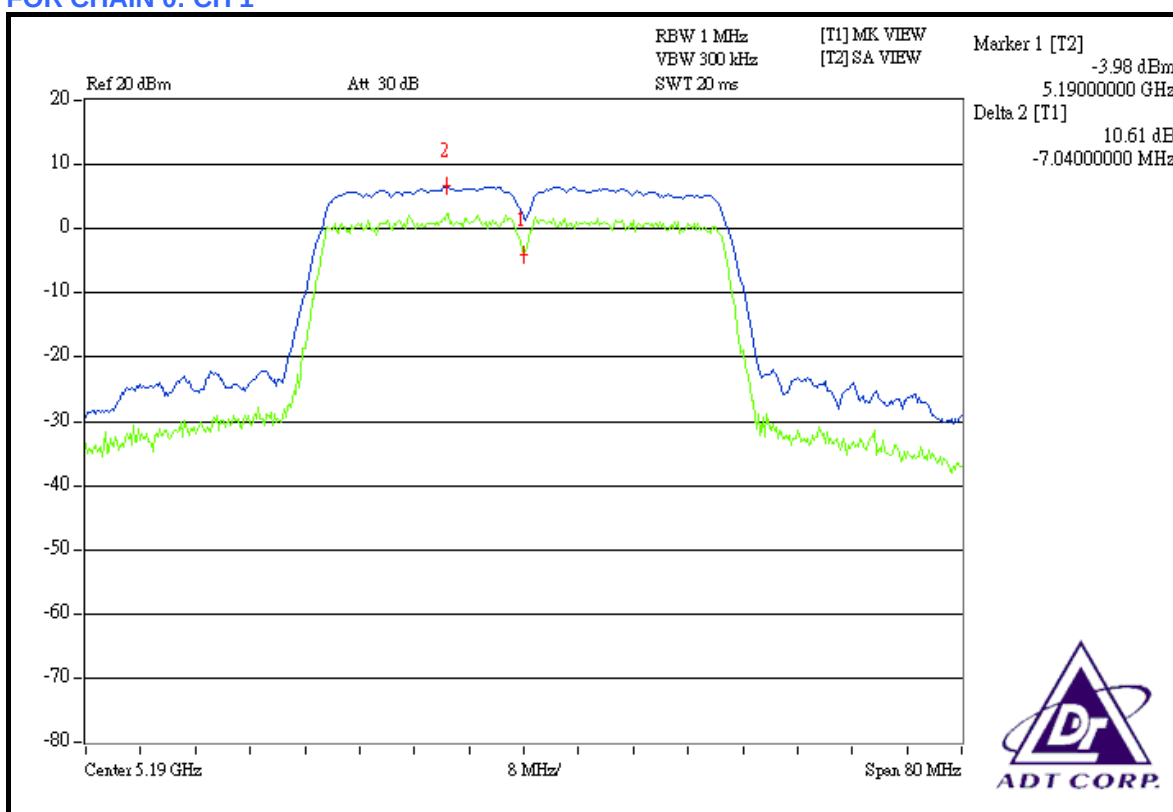


DRAFT 802.11n (40MHz) OFDM MODULATION:

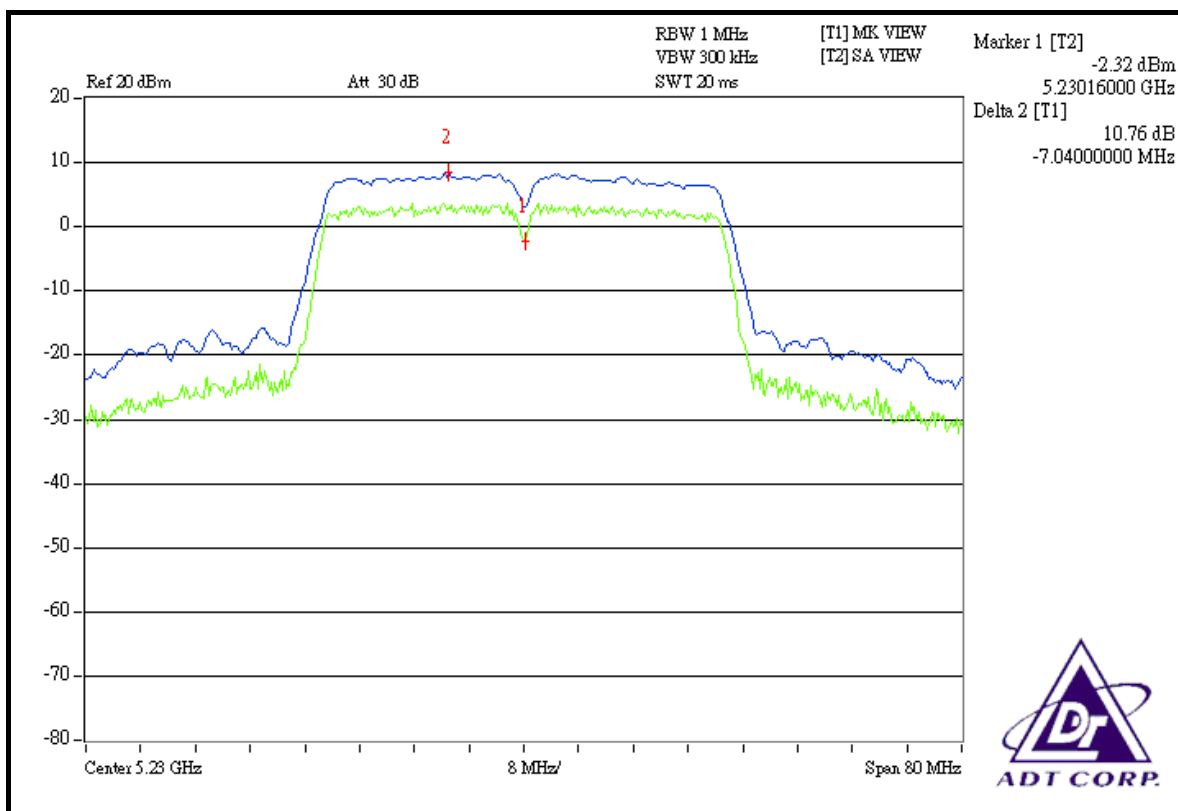
MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)		PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1		
1	5190	10.61	11.14	13	PASS
2	5230	10.76	11.16	13	PASS

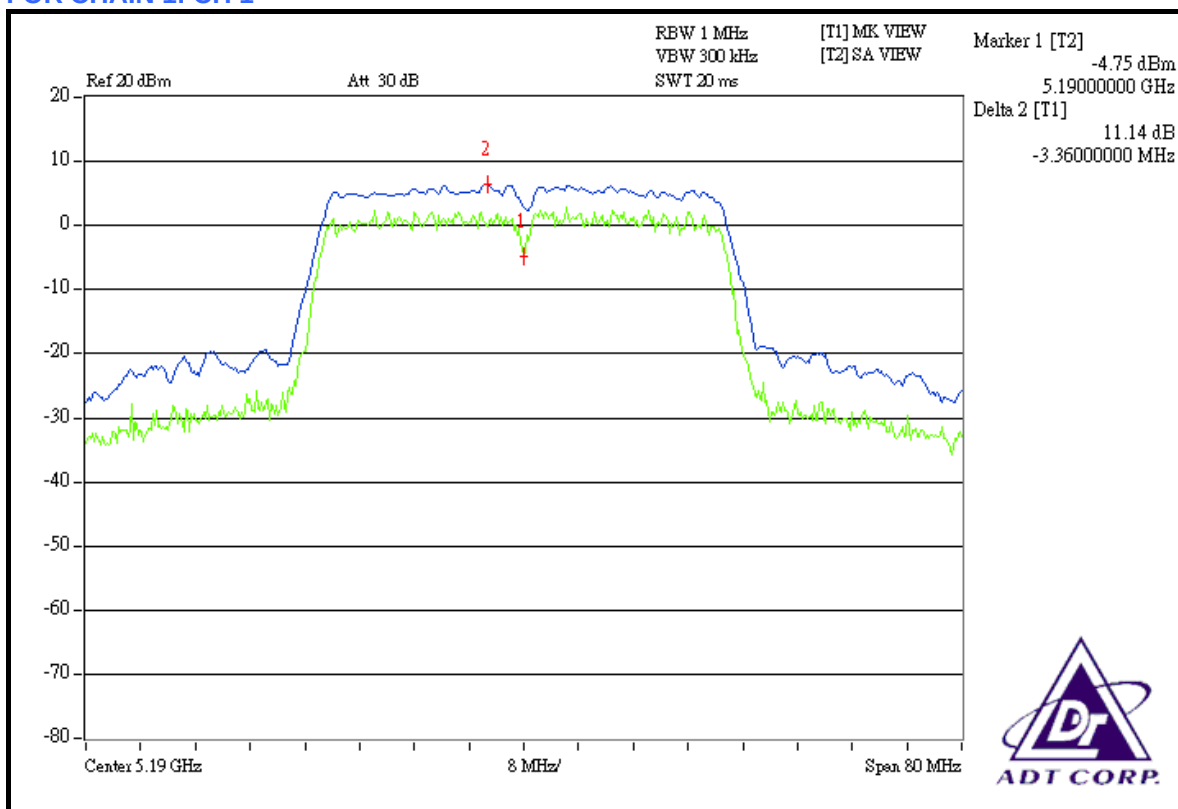
FOR CHAIN 0: CH 1



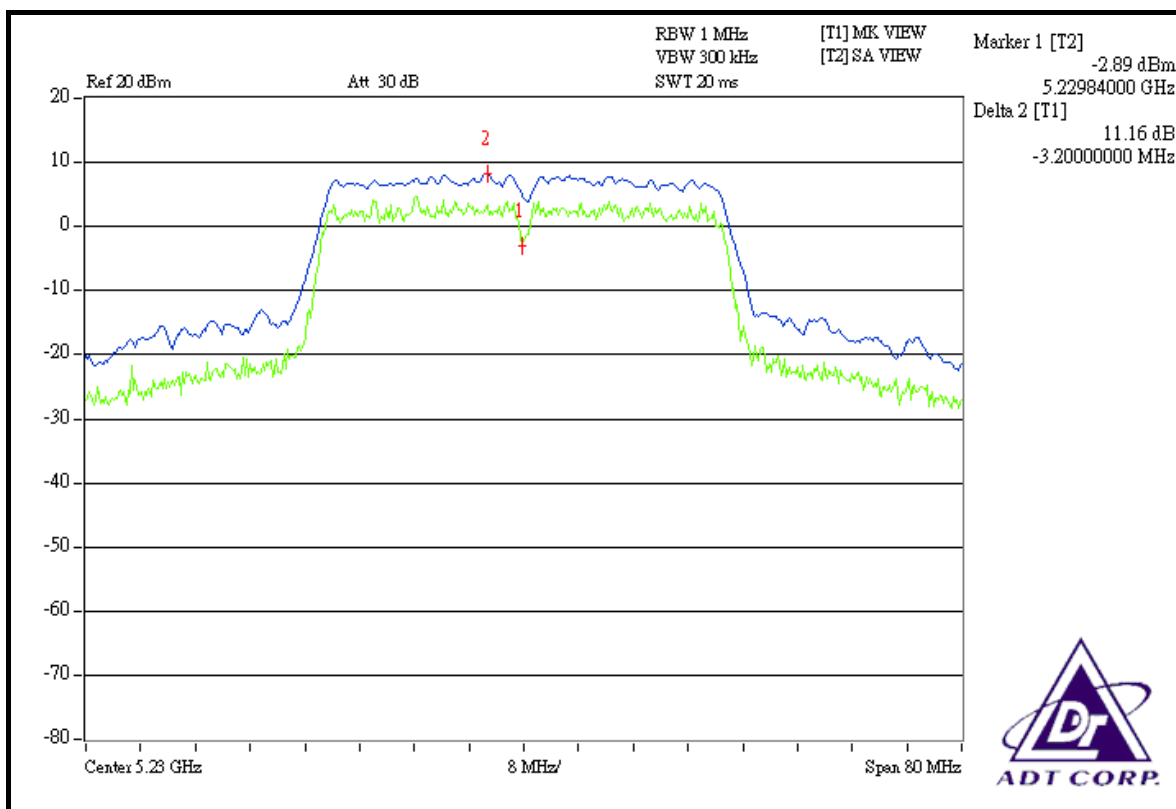
CH 2



FOR CHAIN 1: CH 1



CH 2



4.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	4dBm
5.250 ~ 5.350GHz	11dBm
5.470 ~ 5.725GHz	11dBm

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Apr. 11, 2008

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

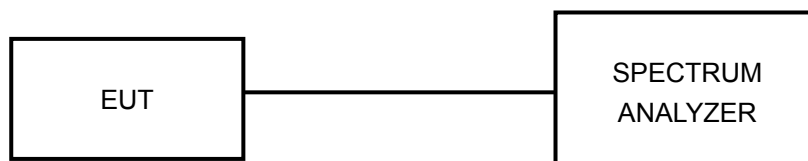
4.5.3 TEST PROCEDURES

- The transmitter output was connected to the spectrum analyzer.
- 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

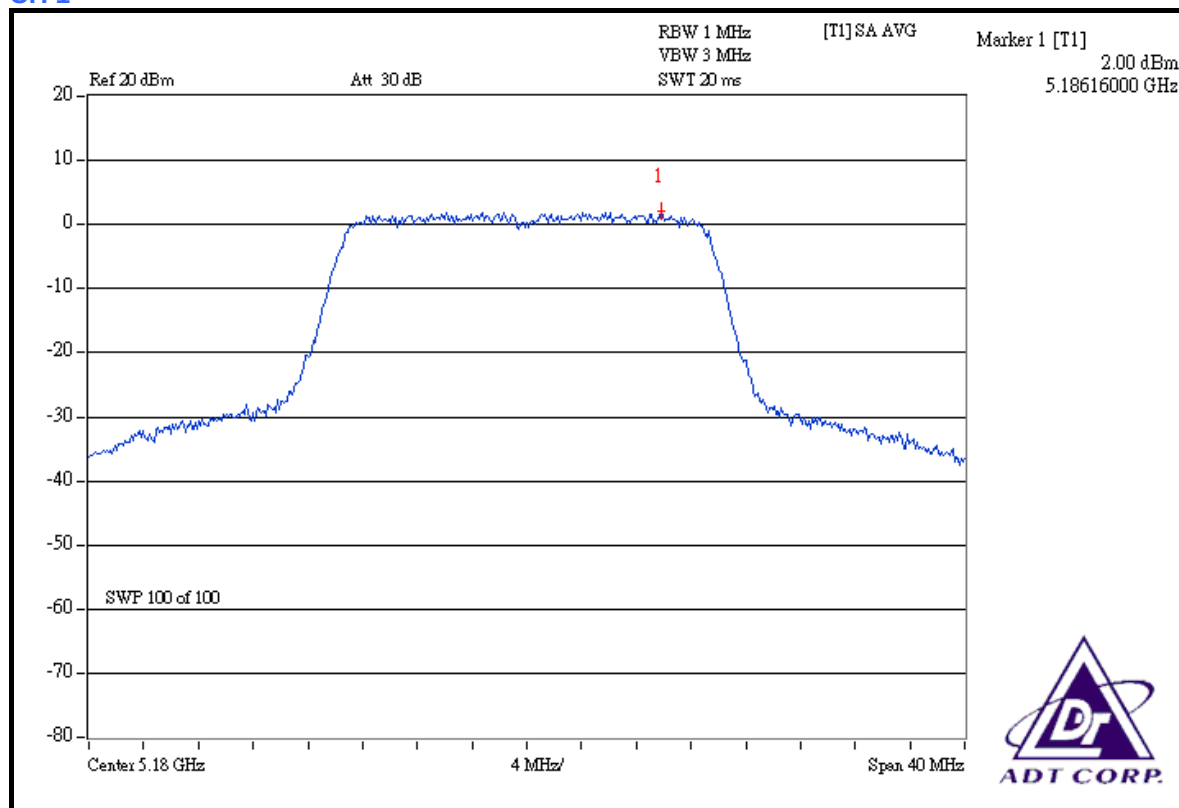
4.5.7 TEST RESULTS

802.11a OFDM MODULATION:

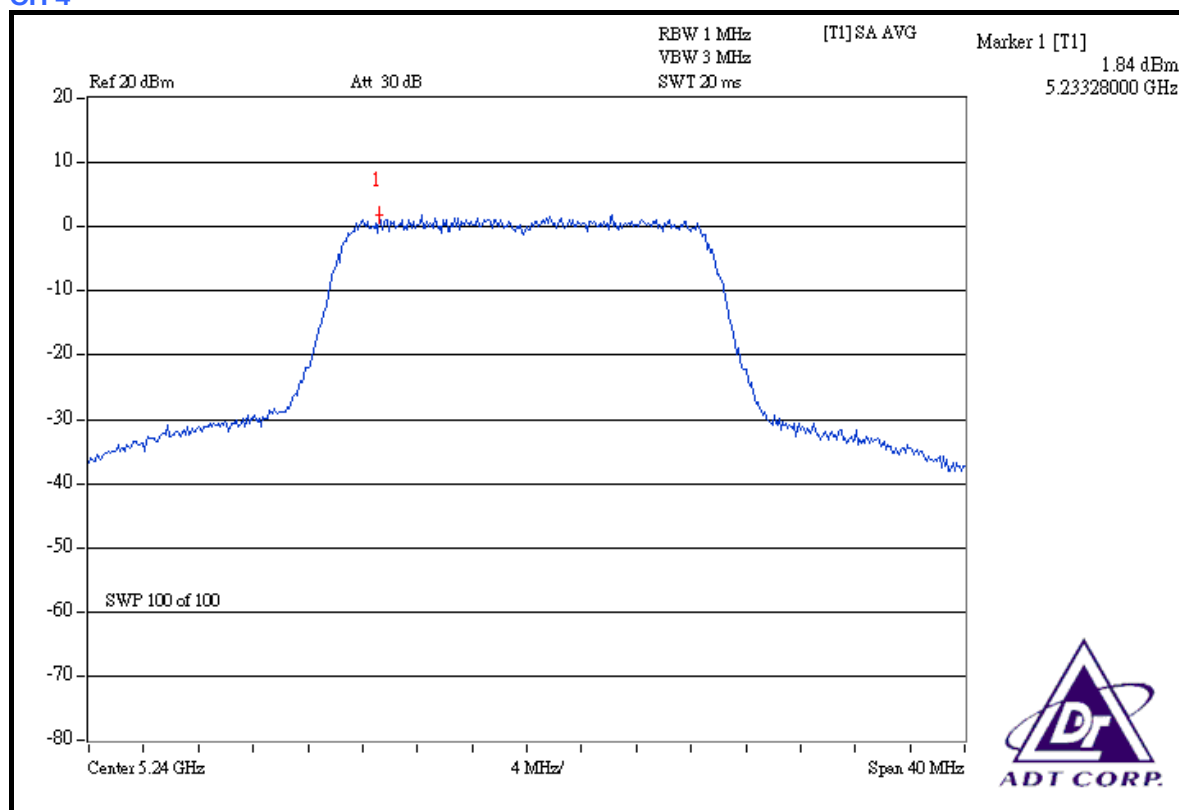
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	5180	2.00	4	PASS
4	5240	1.84	4	PASS
5	5260	1.94	11	PASS
8	5320	1.88	11	PASS
9	5500	1.00	11	PASS
14	5600	0.81	11	PASS
19	5700	0.85	11	PASS

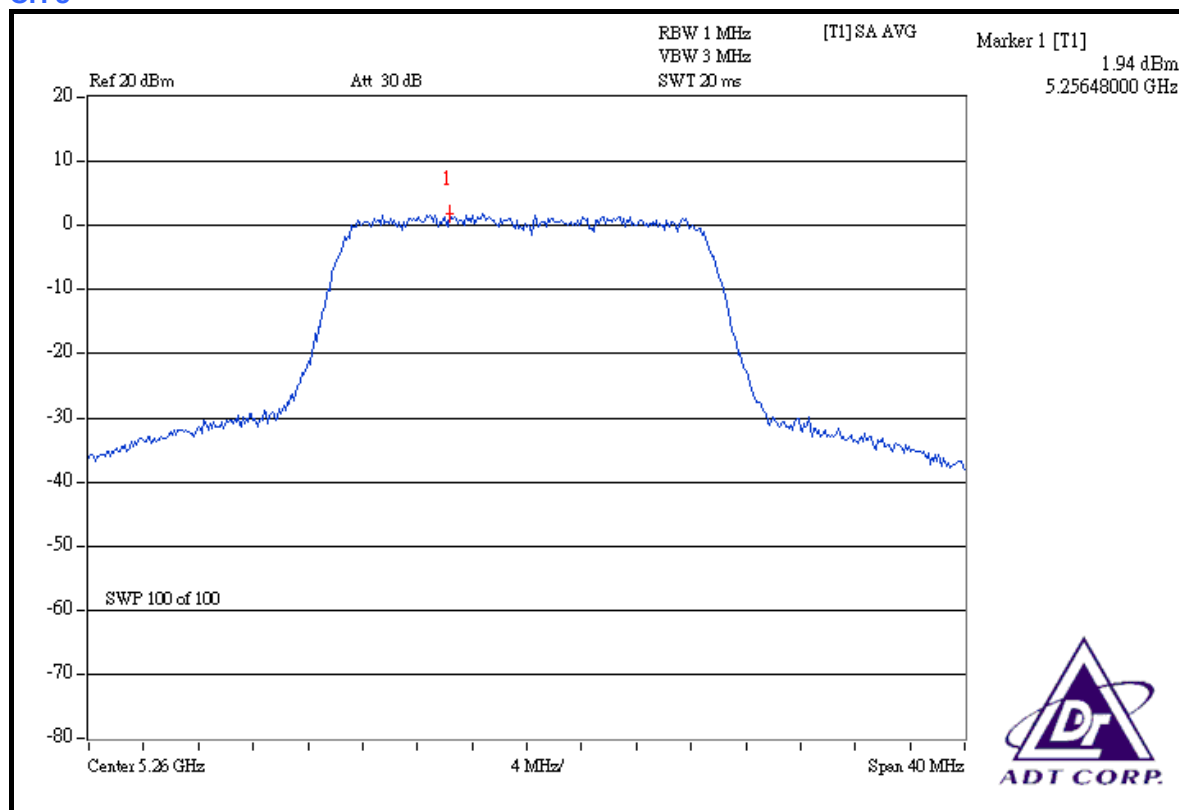
CH 1



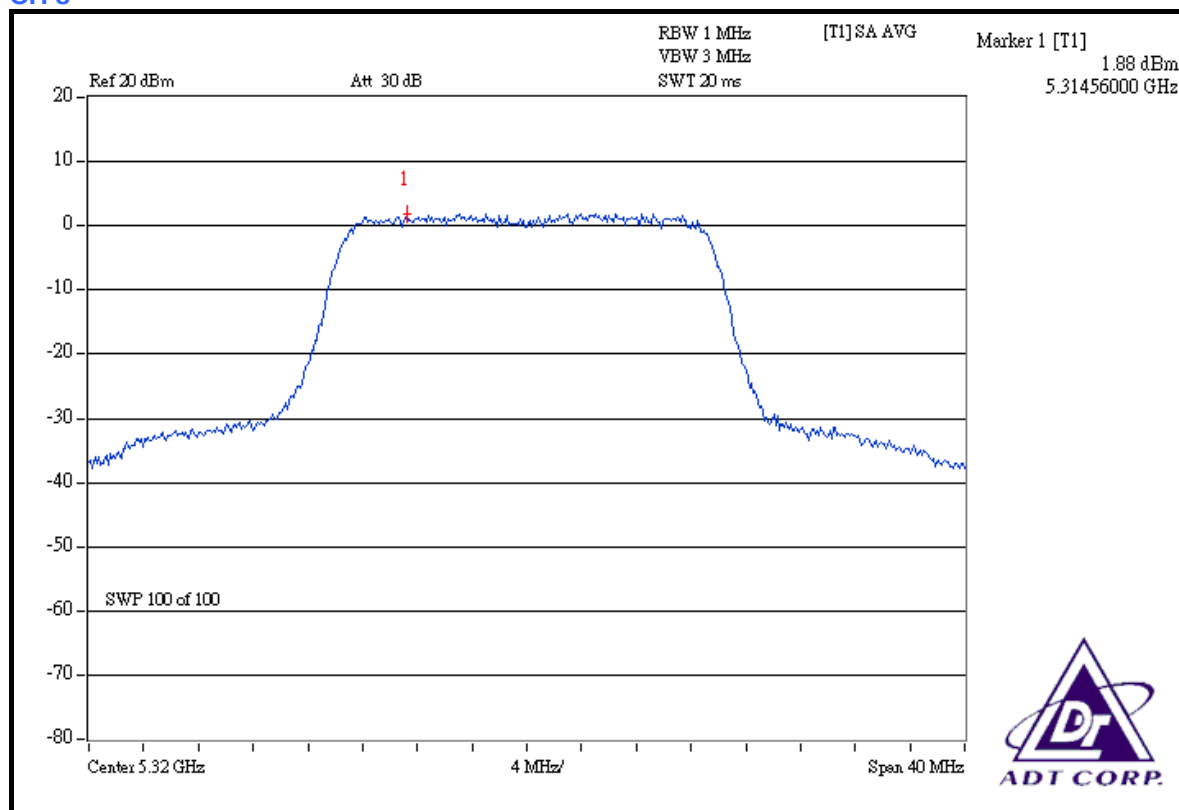
CH 4



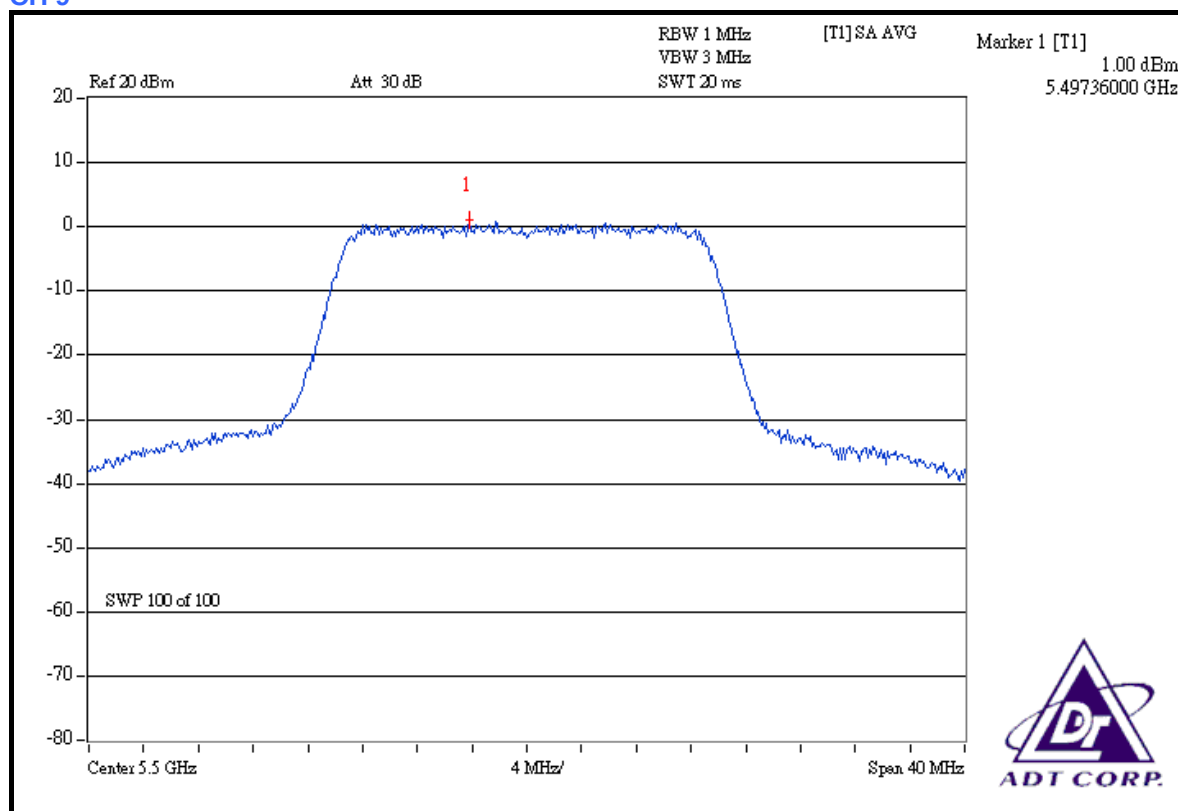
CH 5



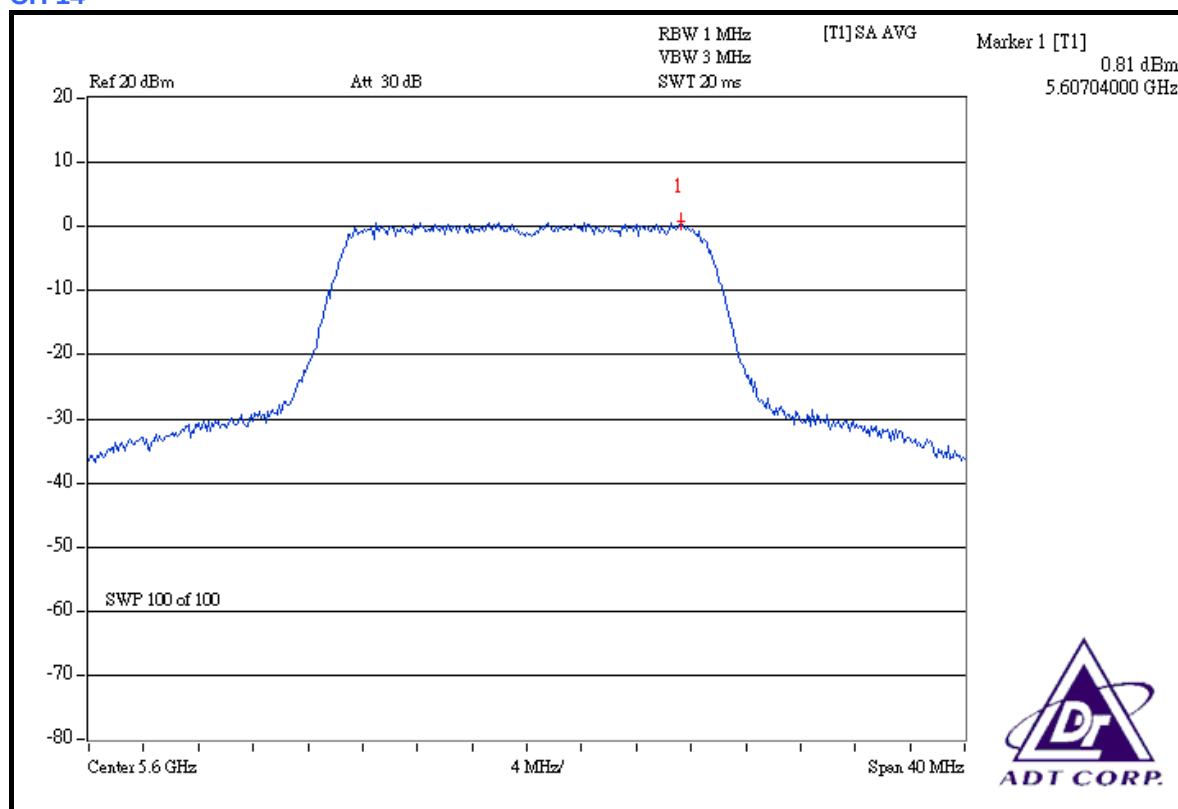
CH 8



CH 9



CH 14

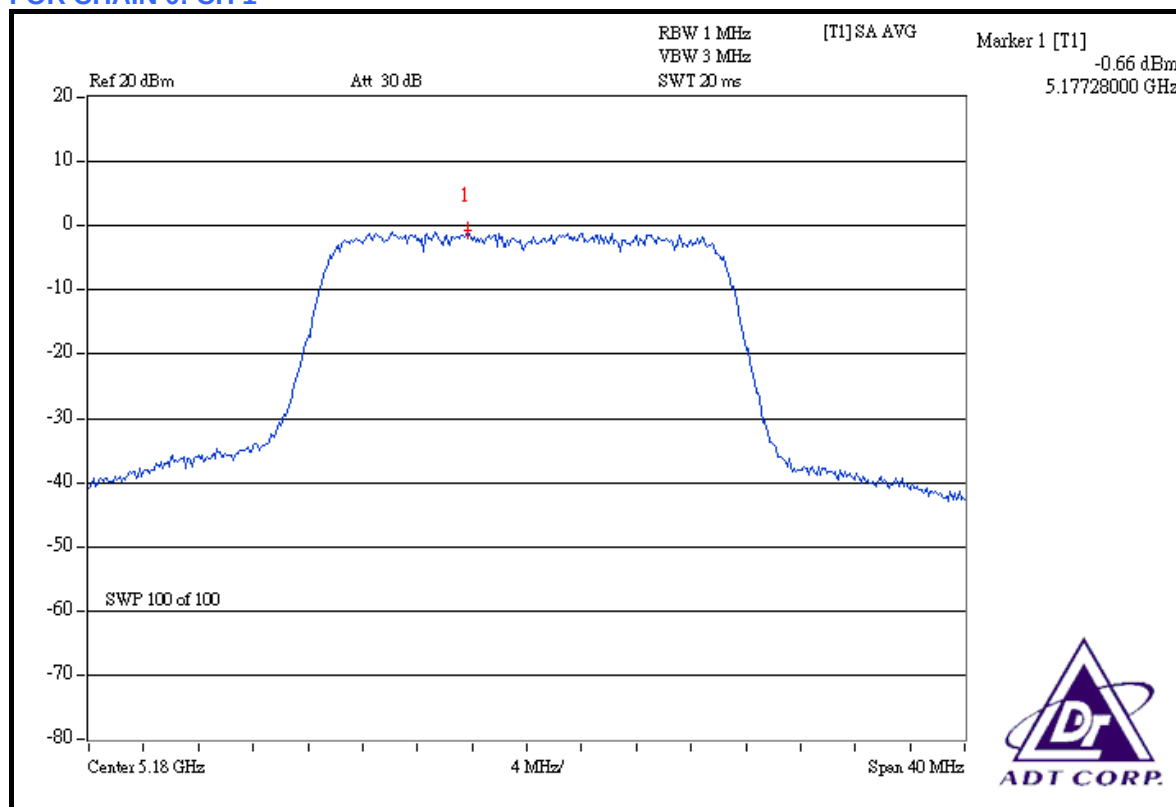


DRAFT 802.11n (20MHz) OFDM MODULATION:

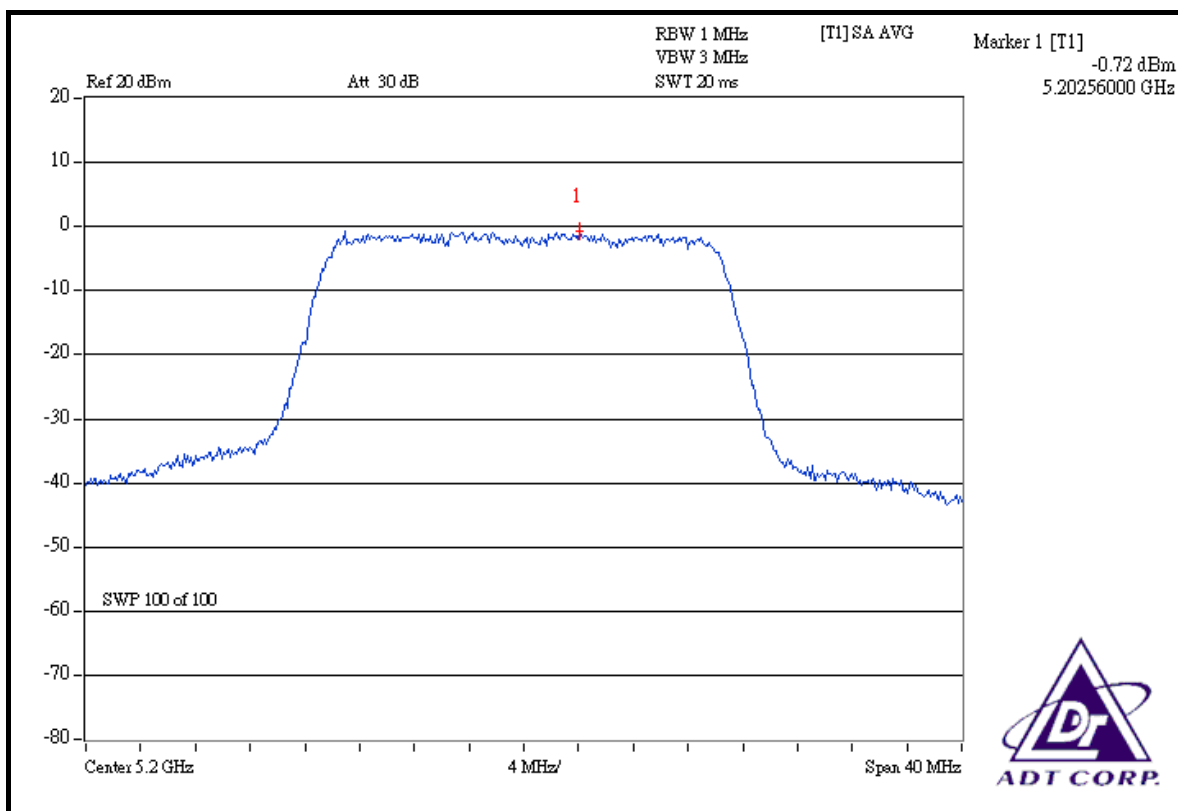
MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (mW)		RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	5180	0.859	0.598	-0.66	-2.23	1.457	1.64	4	PASS
2	5200	0.847	0.611	-0.72	-2.14	1.458	1.64	4	PASS
4	5240	0.883	0.577	-0.54	-2.39	1.460	1.64	4	PASS

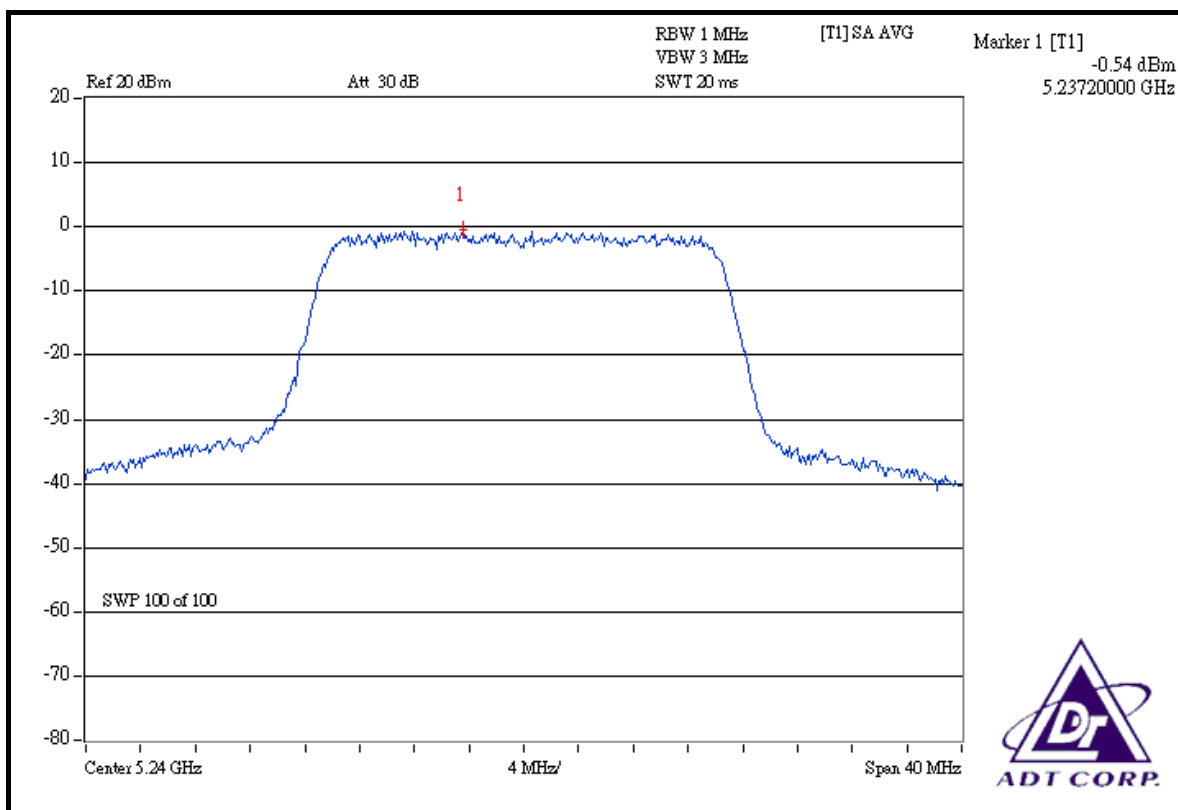
FOR CHAIN 0: CH 1



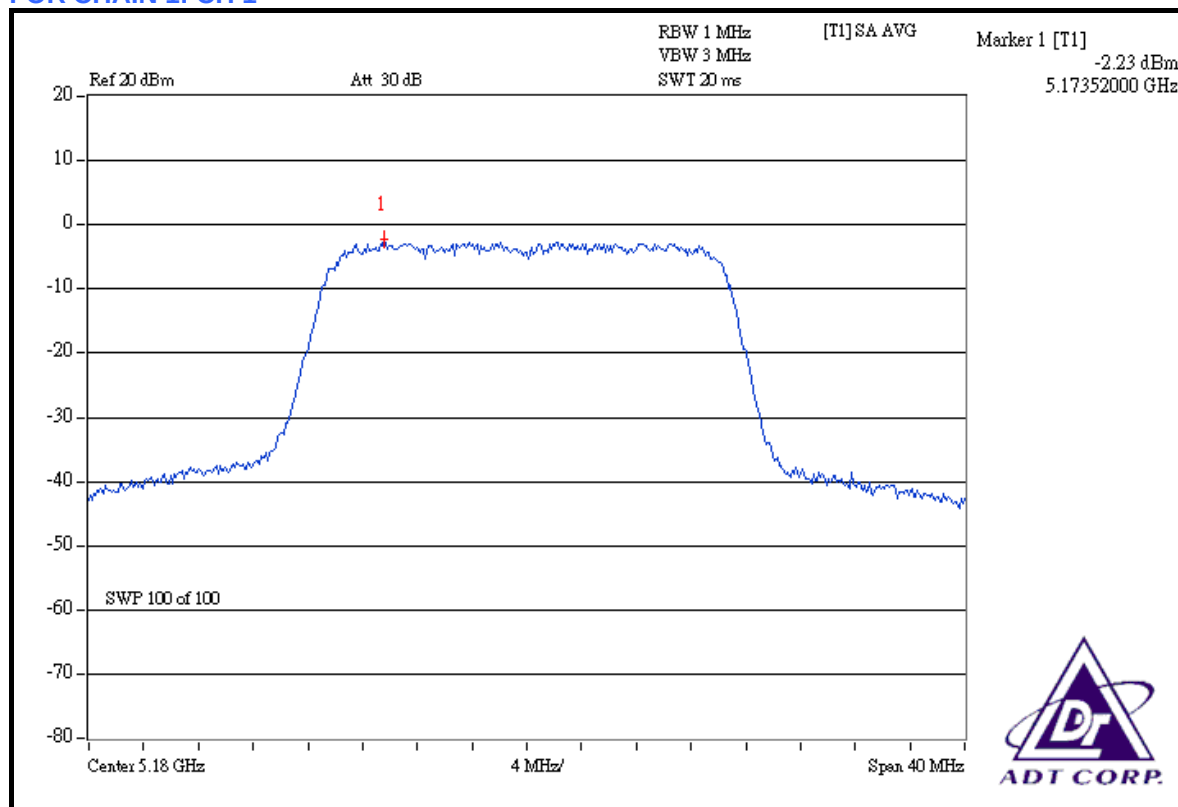
CH 2



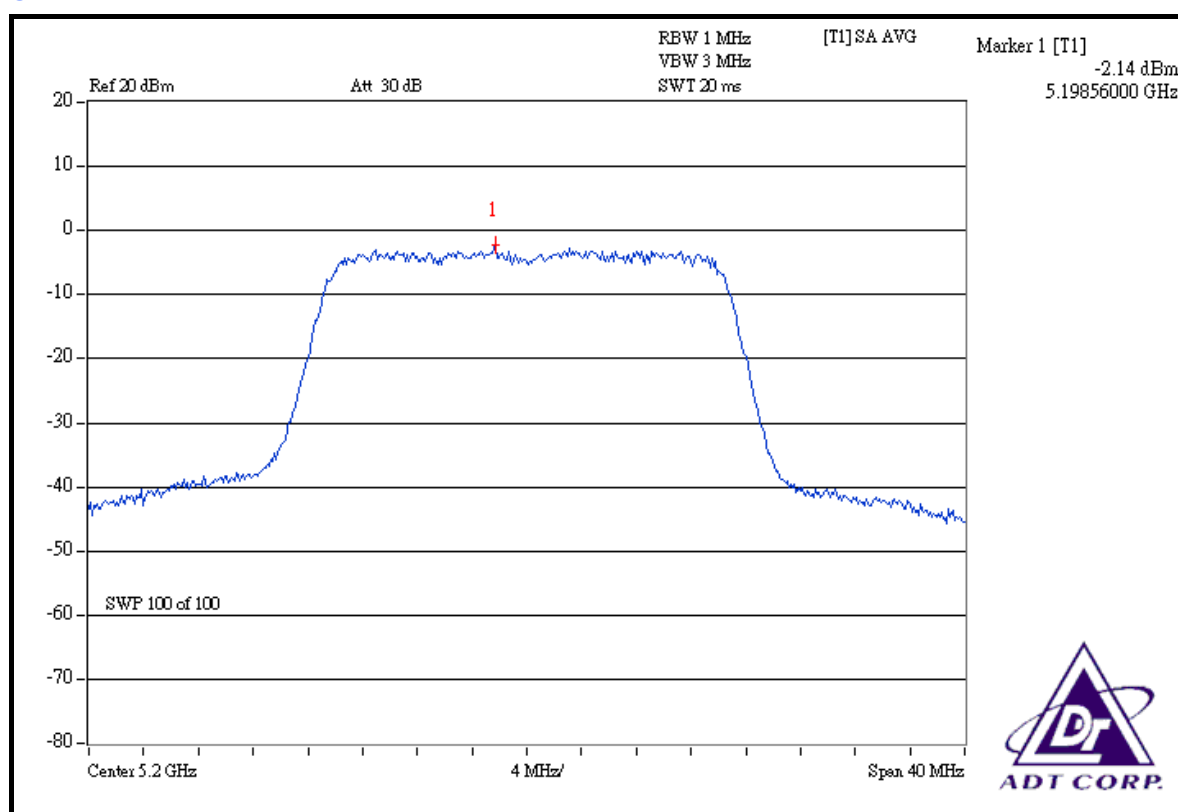
CH 4



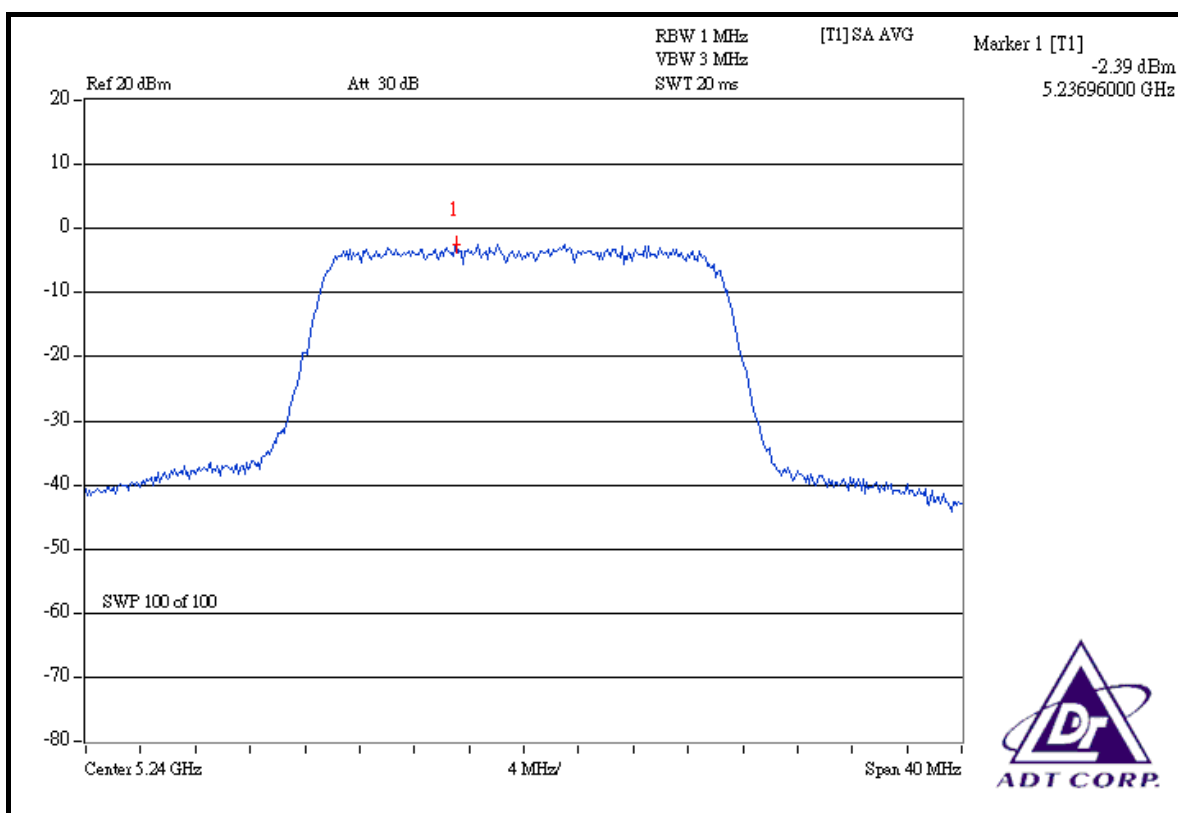
FOR CHAIN 1: CH 1



CH 2



CH 4

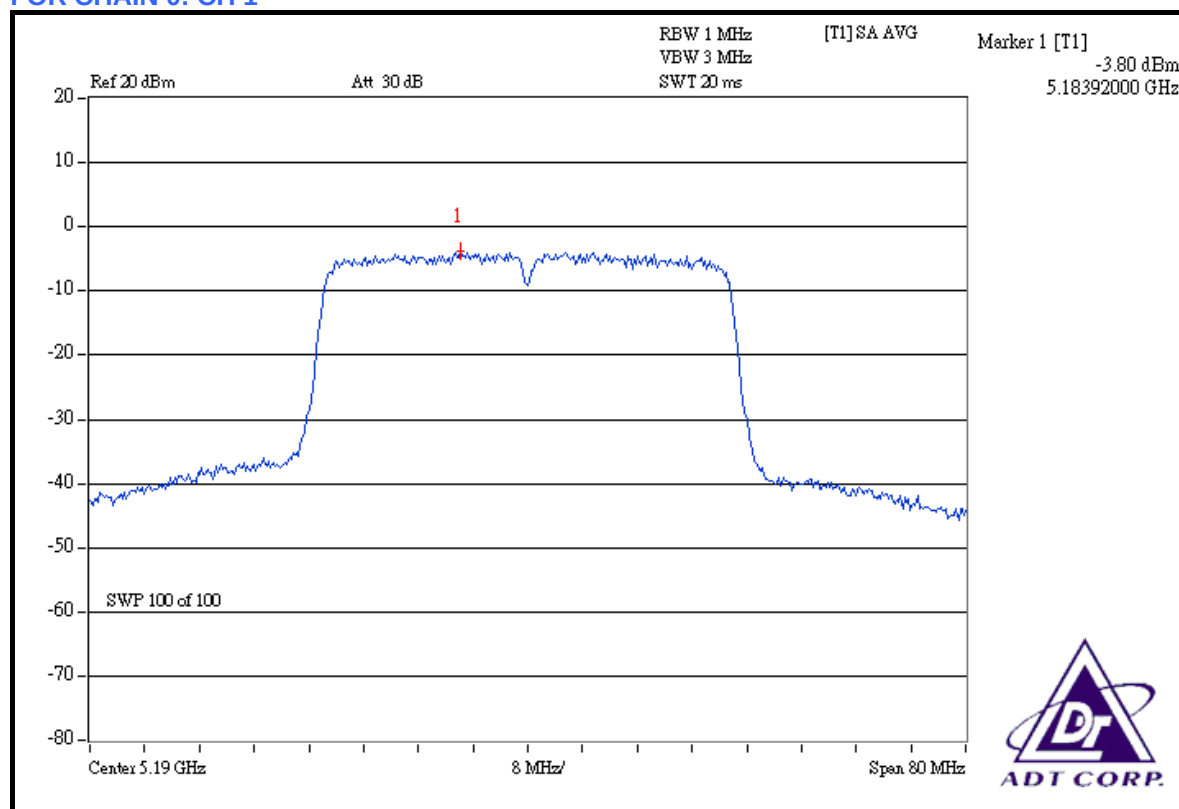


DRAFT 802.11n (40MHz) OFDM MODULATION:

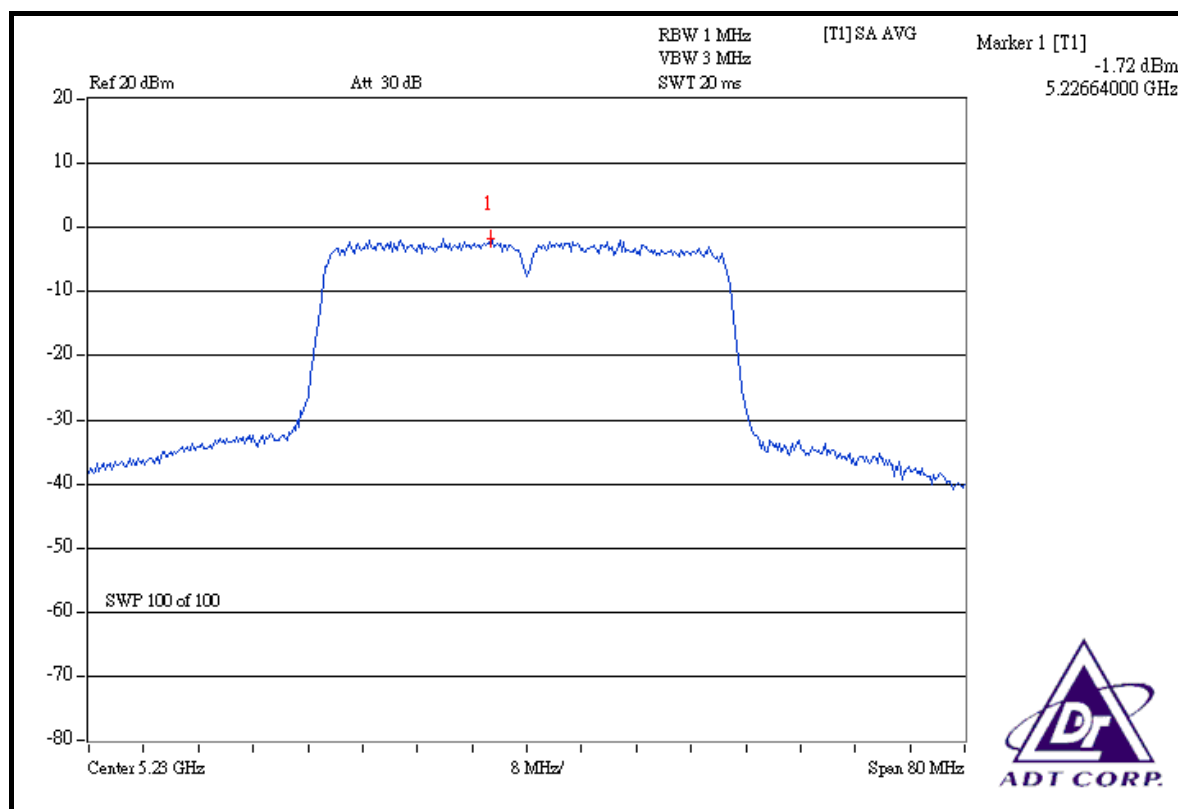
MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (mW)		RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1				
1	5190	0.417	0.355	-3.80	-4.50	0.772	-1.13	4	PASS
2	5230	0.673	0.546	-1.72	-2.63	1.219	0.86	4	PASS

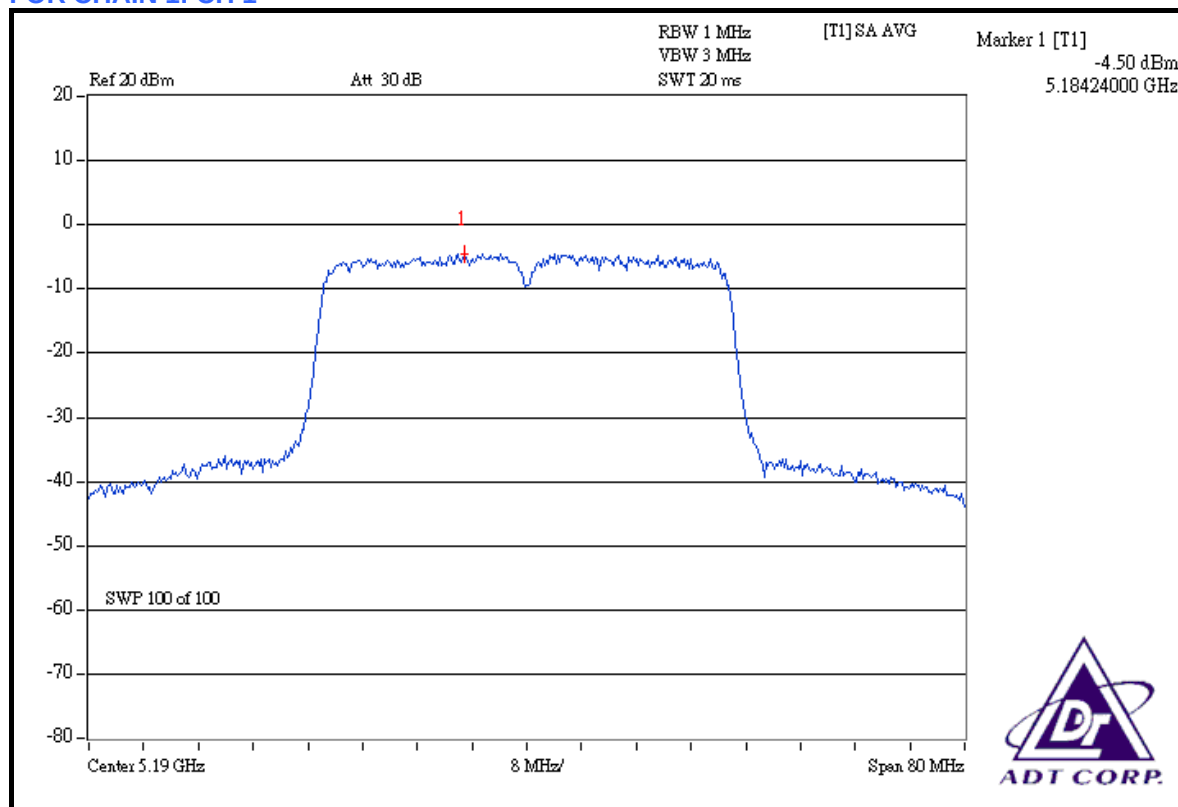
FOR CHAIN 0: CH 1



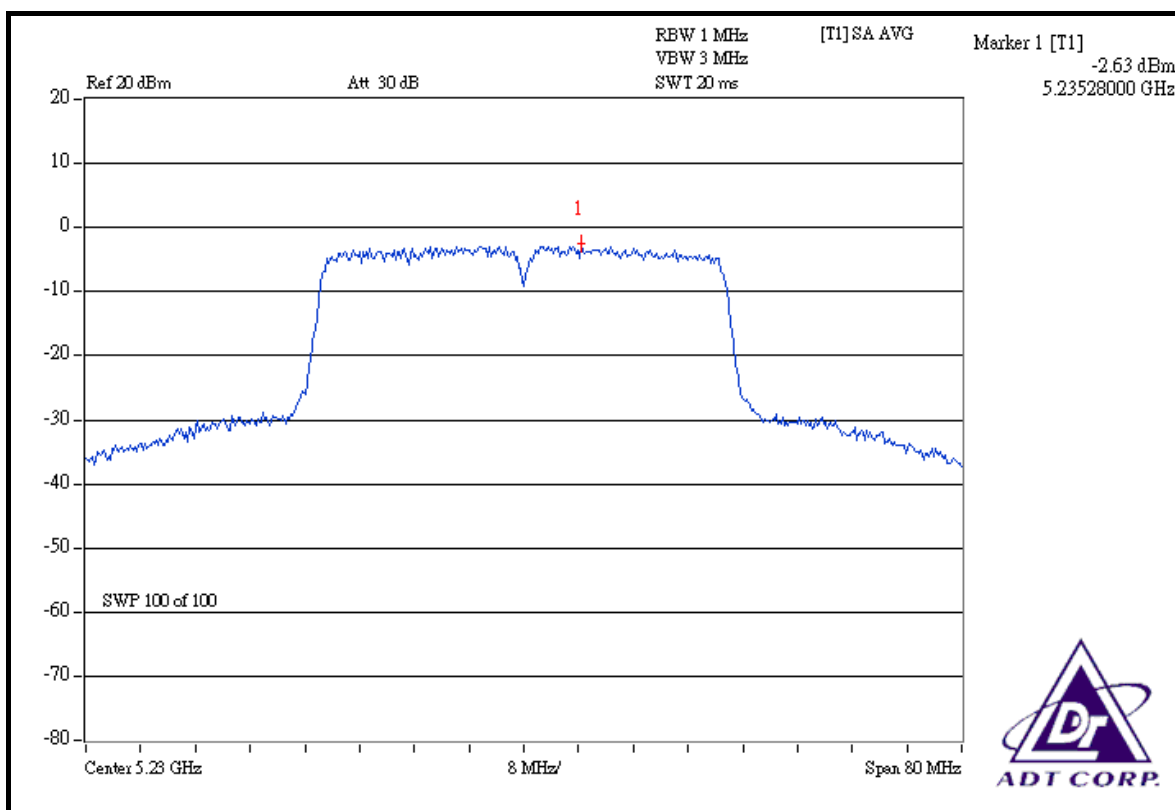
CH 2



FOR CHAIN 1: CH 1



CH 2



4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.02\%$ 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.	CALIBRATED UNTIL
ANRITSU SPECTRUM ANALYZER	MS2667C	M10281	Mar. 07, 2008
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W981030	Jul. 10, 2007

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

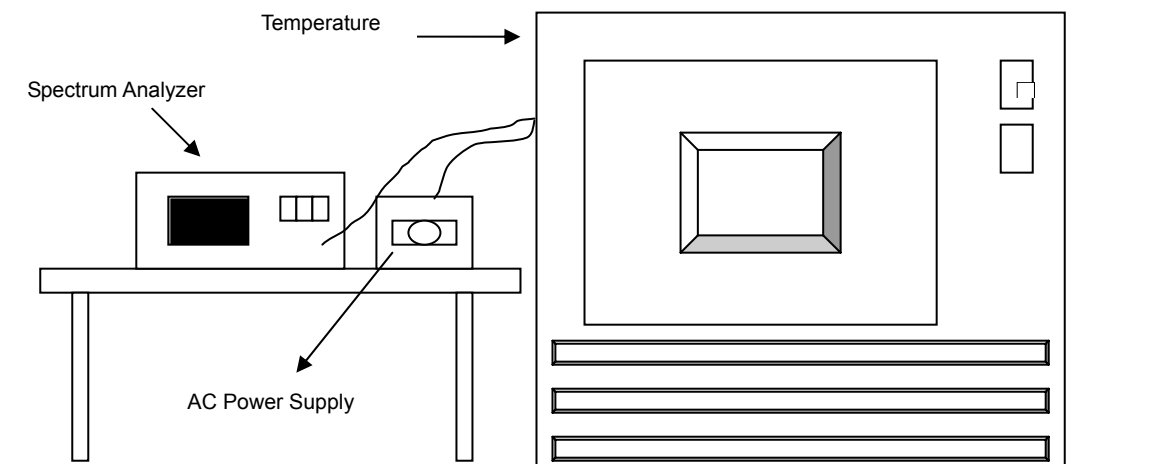
4.6.3 TEST PROCEDURE

- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- 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.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- 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

4.6.7 TEST RESULTS

OPERATING FREQUENCY: 5320MHz						LIMIT: $\pm 0.01\%$			
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5319.9120	-0.0016541	5319.9239	-0.0014305	5319.9476	-0.0009850	5319.9481	-0.0009756
	110.0	5319.9280	-0.0013534	5319.9351	-0.0012199	5319.9511	-0.0009192	5319.9524	-0.0008947
	93.5	5319.9312	-0.0012932	5319.9358	-0.0012068	5319.9563	-0.0008214	5319.9589	-0.0007726
40	126.5	5319.9231	-0.0014455	5319.9324	-0.0012707	5319.9521	-0.0009004	5319.9534	-0.0008759
	110.0	5319.9294	-0.0013271	5319.9412	-0.0011053	5319.9569	-0.0008102	5319.9575	-0.0007989
	93.5	5319.9410	-0.0011090	5319.9491	-0.0009568	5319.9598	-0.0007556	5319.9641	-0.0006748
30	126.5	5319.9244	-0.0014211	5319.9385	-0.0011560	5319.9578	-0.0007932	5319.9596	-0.0007594
	110.0	5319.9302	-0.0013120	5319.9541	-0.0008628	5319.9654	-0.0006504	5319.9596	-0.0007594
	93.5	5319.9482	-0.0009737	5319.9625	-0.0007049	5319.9665	-0.0006297	5319.9698	-0.0005677
20	126.5	5319.9314	-0.0012895	5319.9424	-0.0010827	5319.9611	-0.0007312	5319.9647	-0.0006635
	110.0	5319.9300	-0.0013158	5319.9598	-0.0007556	5319.9689	-0.0005846	5319.9691	-0.0005808
	93.5	5319.9560	-0.0008271	5319.9710	-0.0005451	5319.9704	-0.0005564	5319.9725	-0.0005169
10	126.5	5319.9384	-0.0011579	5319.9532	-0.0008797	5319.9685	-0.0005921	5319.9711	-0.0005432
	110.0	5319.9471	-0.0009944	5319.9641	-0.0006748	5319.9708	-0.0005489	5319.9725	-0.0005169
	93.5	5319.9621	-0.0007124	5319.9758	-0.0004549	5319.9785	-0.0004041	5319.9825	-0.0003289
0	126.5	5319.9421	-0.0010883	5319.9602	-0.0007481	5319.9721	-0.0005244	5319.9765	-0.0004417
	110.0	5319.9589	-0.0007726	5319.9696	-0.0005714	5319.9789	-0.0003966	5319.9796	-0.0003835
	93.5	5319.9686	-0.0005902	5319.9789	-0.0003966	5319.9809	-0.0003590	5319.9852	-0.0002782
-10	126.5	5319.9546	-0.0008534	5319.9657	-0.0006447	5319.9789	-0.0003966	5319.9814	-0.0003496
	110.0	5319.9613	-0.0007274	5319.9757	-0.0004568	5319.9821	-0.0003365	5319.9863	-0.0002575
	93.5	5319.9759	-0.0004530	5319.9821	-0.0003365	5319.9858	-0.0002669	5319.9896	-0.0001955
-20	126.5	5319.9596	-0.0007594	5319.9721	-0.0005244	5319.9824	-0.0003308	5319.9865	-0.0002538
	110.0	5319.9660	-0.0006391	5319.9801	-0.0003741	5319.9886	-0.0002143	5319.9895	-0.0001974
	93.5	5319.9798	-0.0003797	5319.9895	-0.0001974	5319.9898	-0.0001917	5319.9905	-0.0001786
-30	126.5	5319.9649	-0.0006598	5319.9789	-0.0003966	5319.9887	-0.0002124	5319.9889	-0.0002086
	110.0	5319.9793	-0.0003891	5319.9852	-0.0002782	5319.9911	-0.0001673	5319.9935	-0.0001222
	93.5	5319.9824	-0.0003308	5319.9947	-0.0000996	5319.9952	-0.0000902	5319.9967	-0.0000620

4.7 BAND EDGES MEASUREMENT

4.7.1 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
802.11a:			
R&S SPECTRUM ANALYZER	FSP40	100040	Apr. 11, 2008
DRAFT 802.11n (20MHz), DRAFT 802.11n (40MHz):			
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Aug. 04, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100025	Oct. 05, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2008
HORN Antenna SCHWARZBECK	9120D	9120D-209	Jun. 27, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 28, 2007
Preamplifier Agilent	8447D	2944A10633	Oct. 26, 2007
Preamplifier Agilent	8449B	3008A01964	Oct. 26, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238137/4	Dec. 11, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	233233/4	Nov. 14, 2007
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA

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

802.11a:

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 1MHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

DRAFT 802.11n (20MHz), DRAFT 802.11n (40MHz):

- 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 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 5.35GHz 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:

FOR FREQUENCY BAND: 5.150 ~ 5.350GHz

Channel 1 (5180MHz)

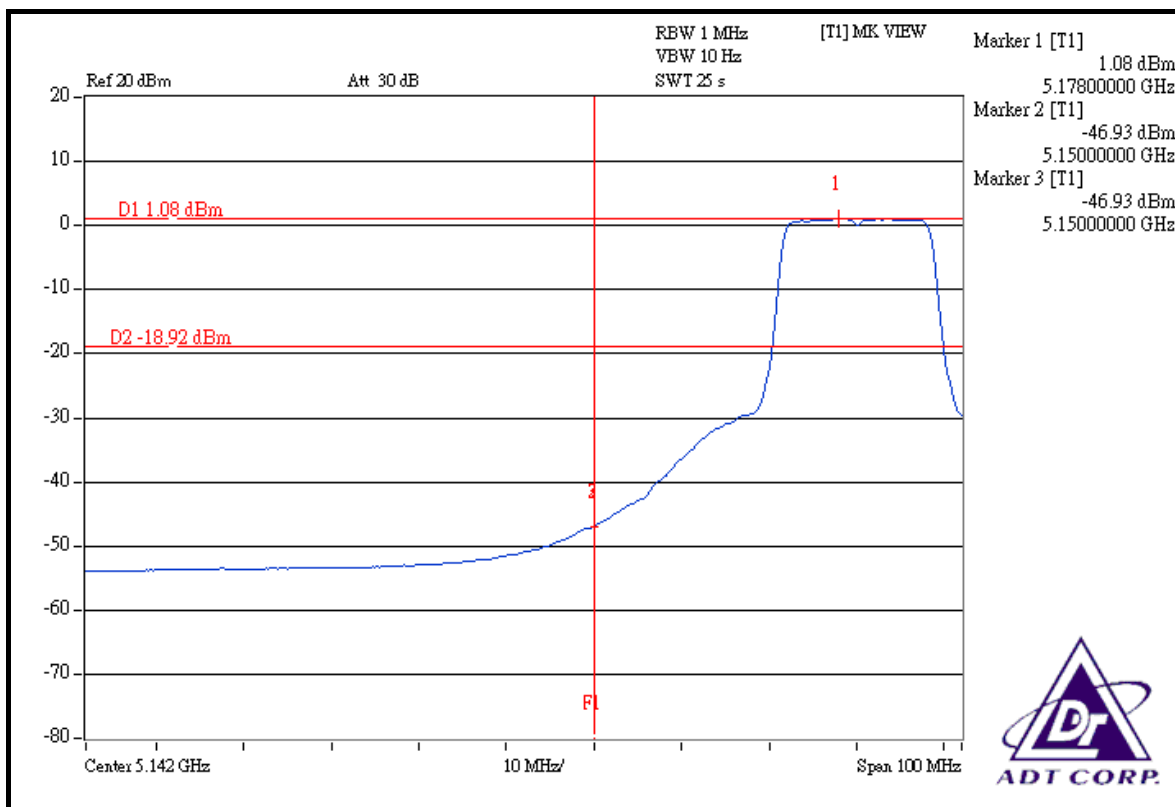
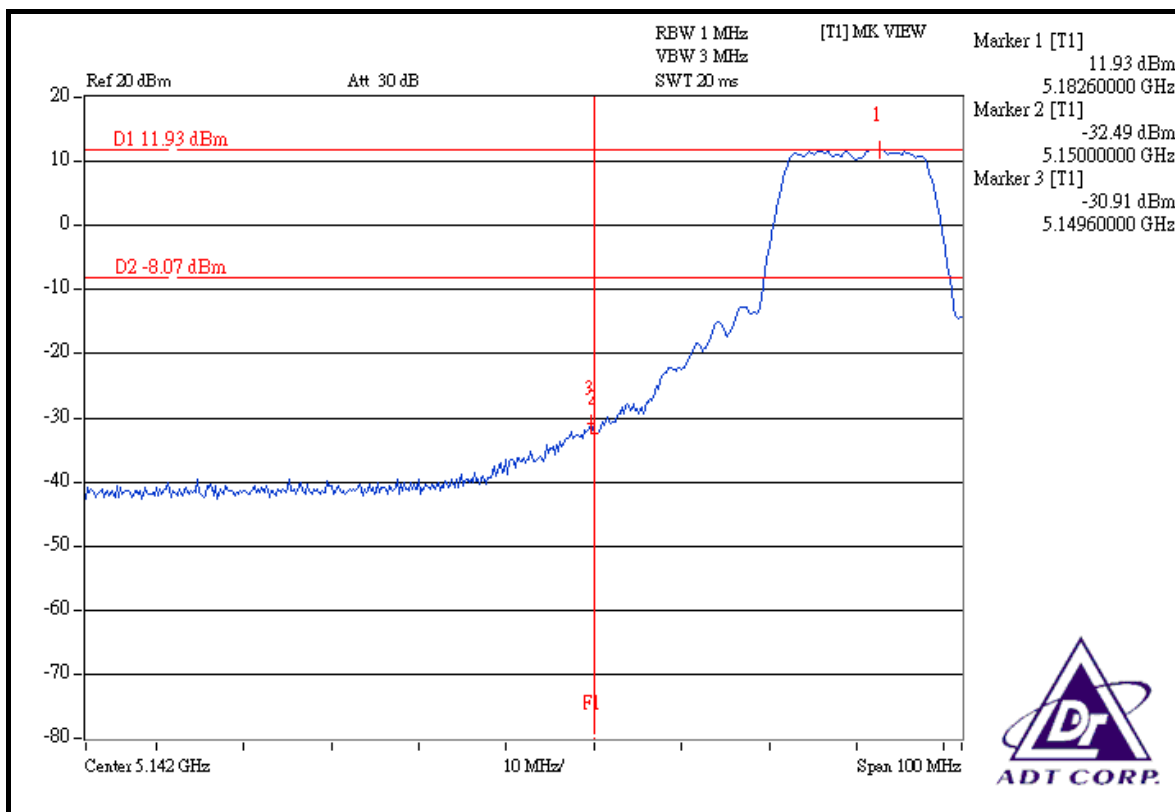
The band edge emission plot on the next page shows 42.84dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 110.19dBuV/m (Peak), so the maximum field strength in restrict band is $110.19 - 42.84 = 67.35\text{dBuV/m}$ which is under 74dBuV/m limit.

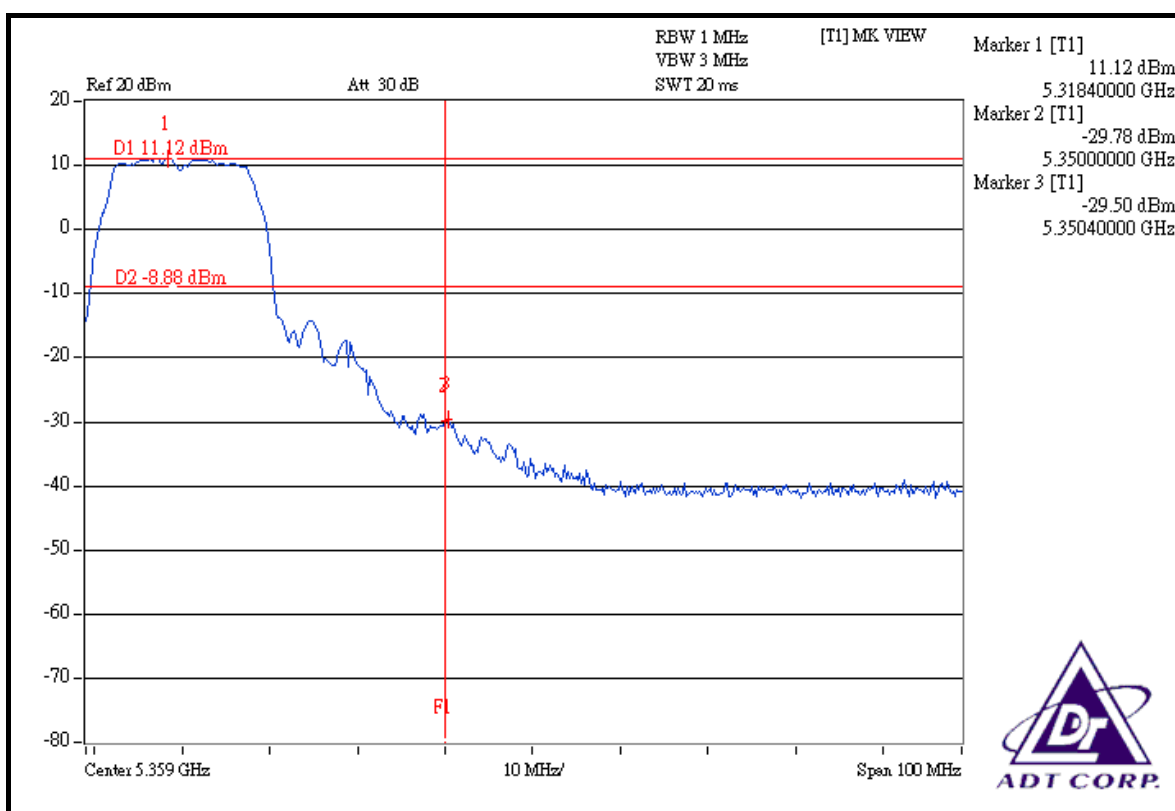
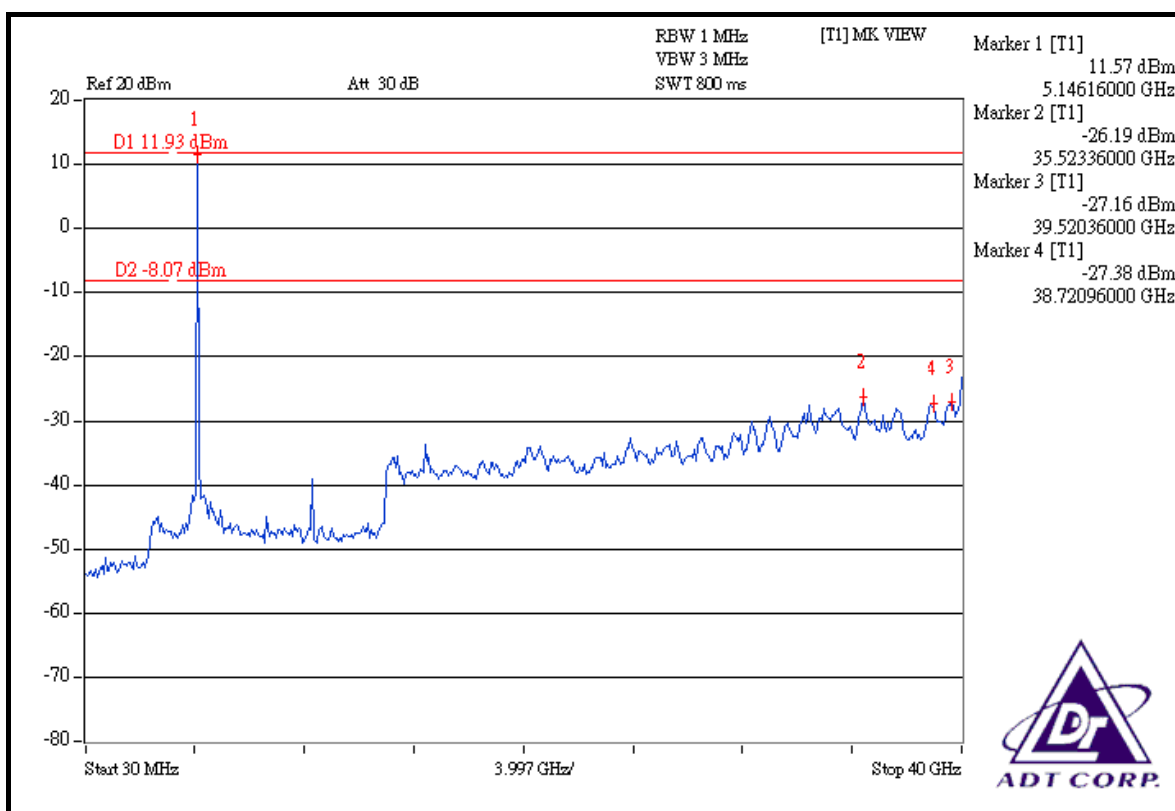
The band edge emission plot on the next page shows 48.01dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 99.63dBuV/m (Average), so the maximum field strength in restrict band is $99.63 - 48.01 = 51.62\text{dBuV/m}$ which is under 54dBuV/m limit.

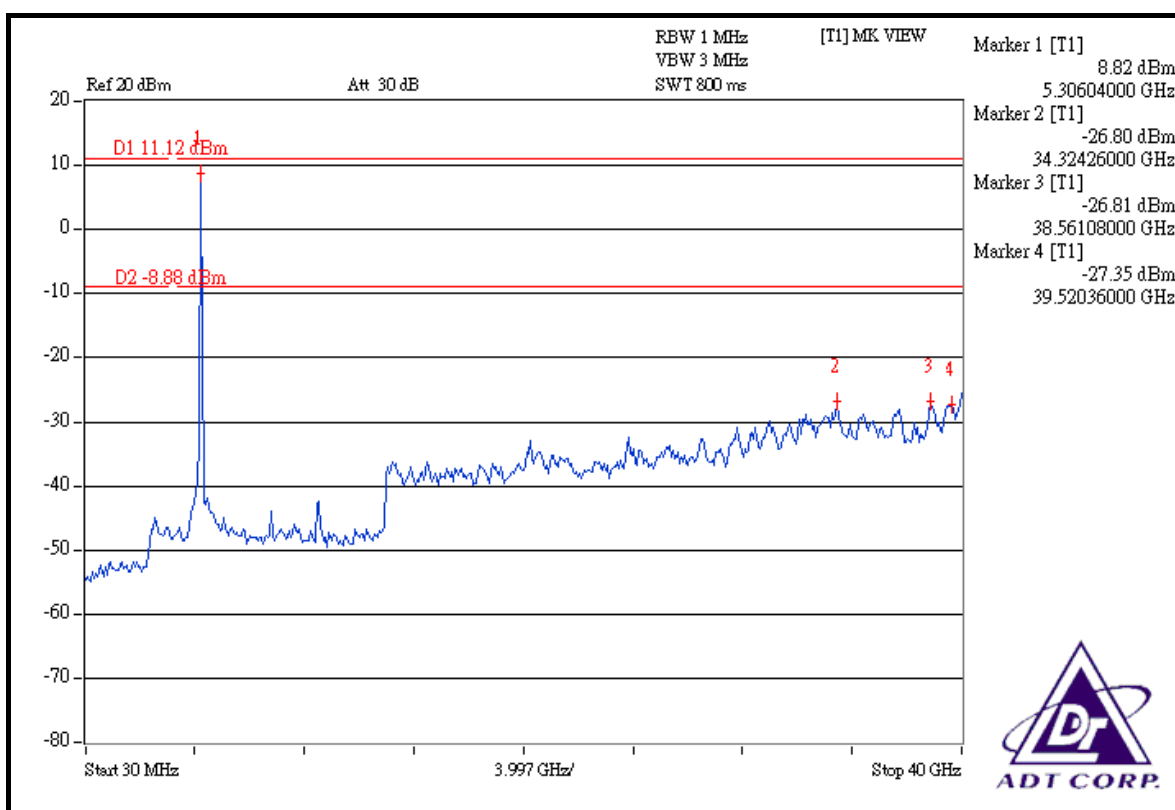
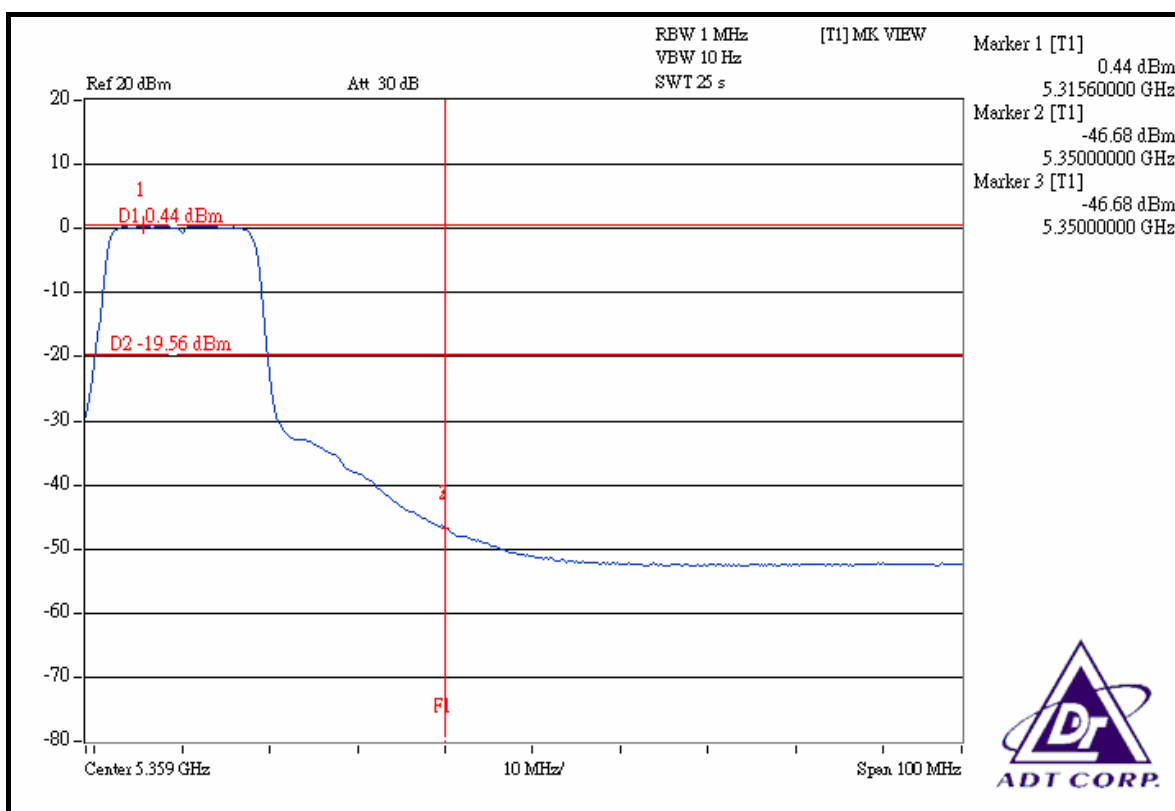
Channel 8 (5320MHz)

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 8 is 109.87dBuV/m (Peak), so the maximum field strength in restrict band is $109.87 - 40.62 = 69.25\text{dBuV/m}$ which is under 74dBuV/m limit.

The band edge emission plot on the next page shows 47.12dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 99.56dBuV/m (Average), so the maximum field strength in restrict band is $99.56 - 47.12 = 52.44\text{dBuV/m}$ which is under 54dBuV/m limit.







FOR FREQUENCY BAND: 5.470 ~ 5.725GHz

Channel 9 (5500MHz)

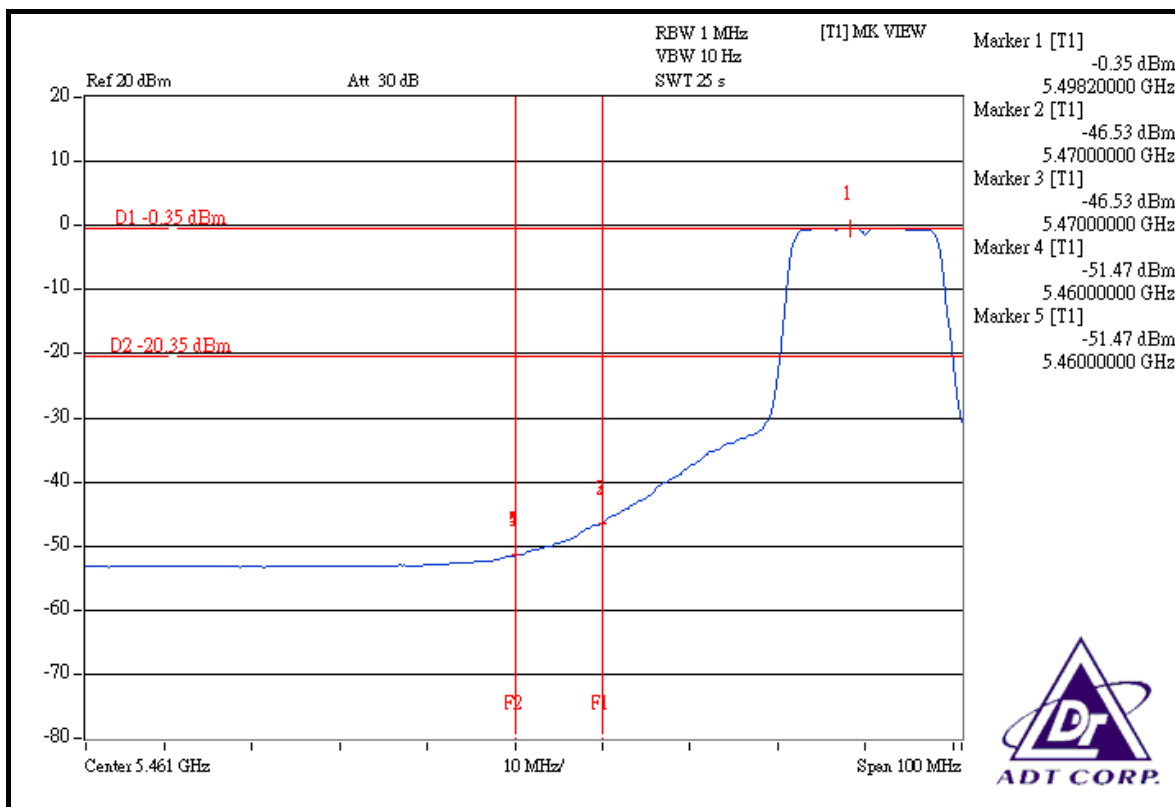
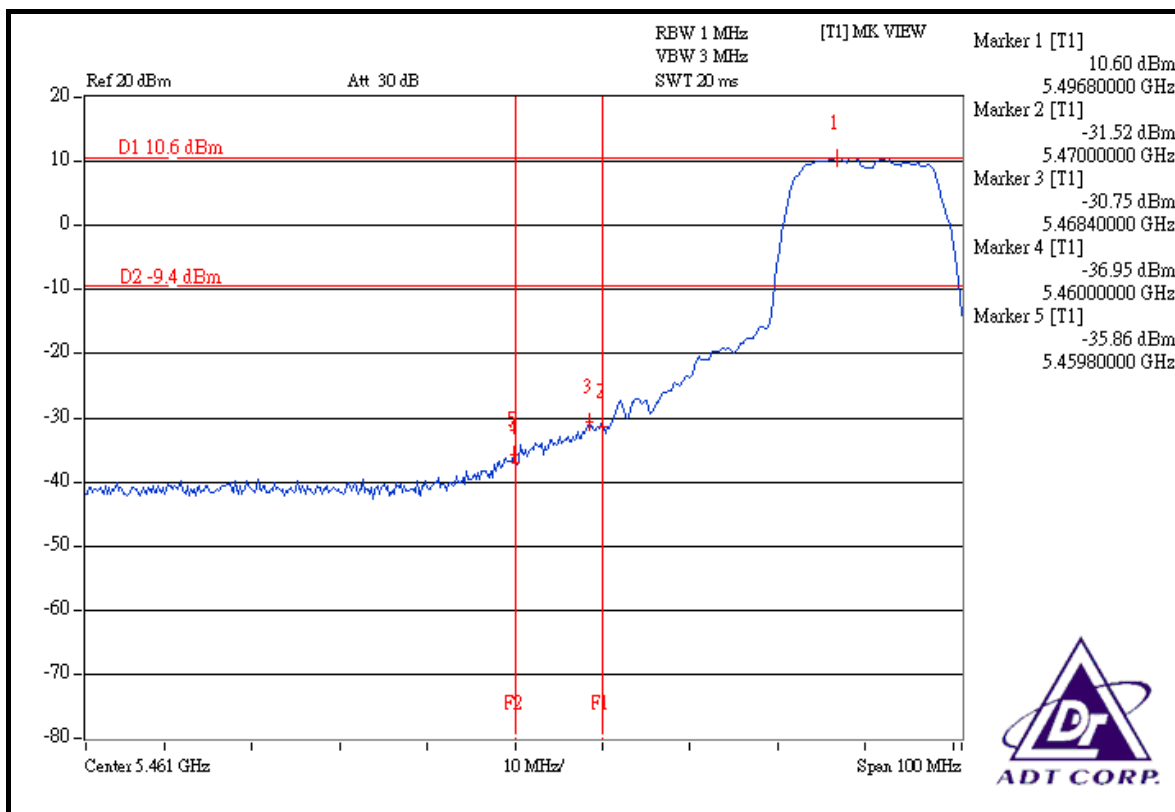
The band edge emission plot (5.470GHz) on the next page shows 41.35dBc between carrier maximum power and local maximum emission out of band emission. The emission of carrier strength list in the test result of channel 9 is 108.53dBuV/m (Peak), so the maximum field strength out of band emission is $108.53 - 41.35 = 67.18\text{dBuV/m}$ which is under 68.3dBuV/m limit.

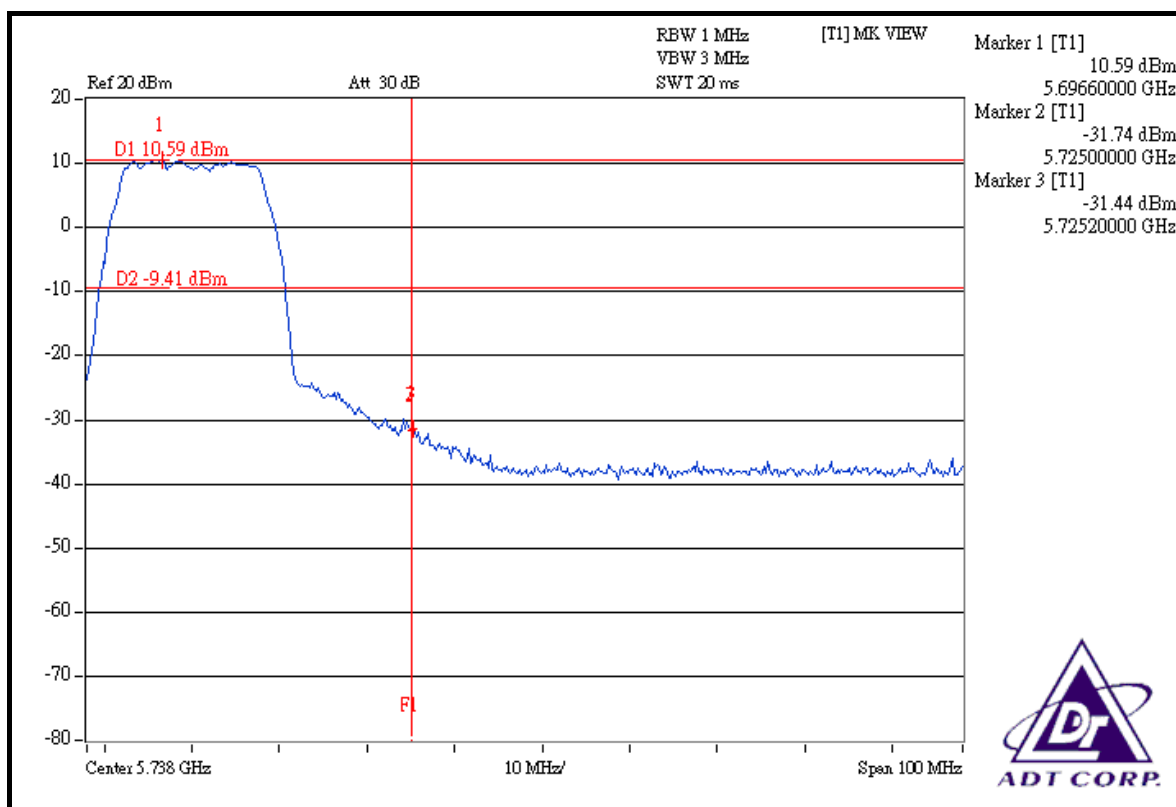
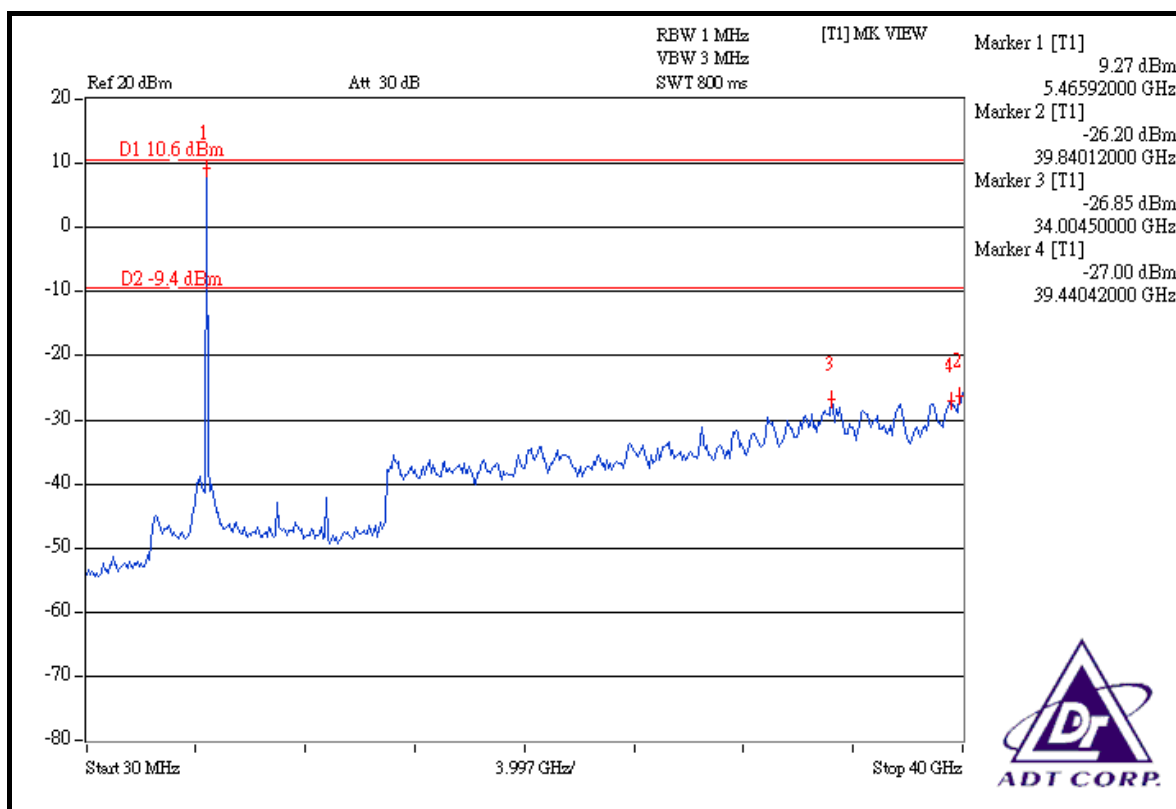
The band edge emission plot (5.460GHz) on the next page shows 46.46dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 9 is 108.53dBuV/m (Peak), so the maximum field strength in restrict band is $108.53 - 46.46 = 62.07\text{dBuV/m}$ which is under 74dBuV/m limit.

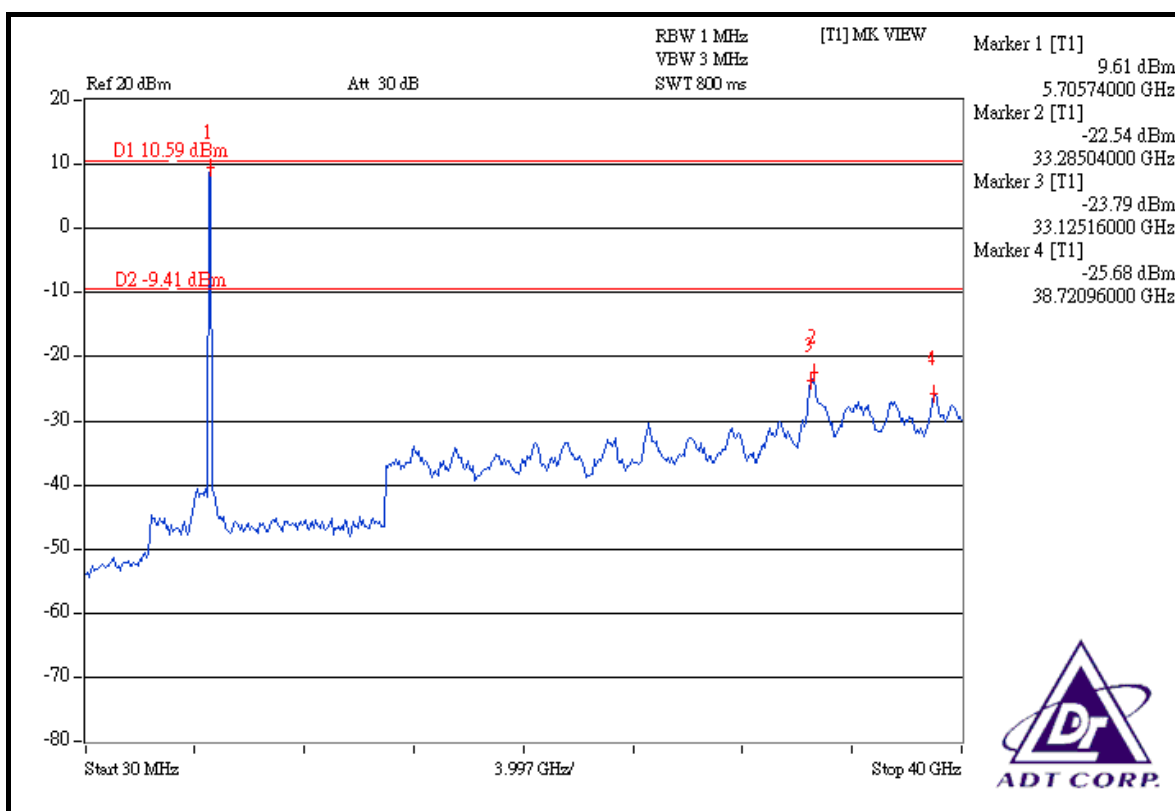
The band edge emission plot (5.460GHz) on the next page shows 51.12dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 9 is 98.51dBuV/m (Average), so the maximum field strength in restrict band is $98.51 - 51.12 = 47.39\text{dBuV/m}$ which is under 54dBuV/m limit.

Channel 19 (5700MHz)

The band edge emission plot on the next second page shows 42.03dBc between carrier maximum power and local maximum emission out of band emission. The emission of carrier strength list in the test result of channel 19 is 109.02dBuV/m (Peak), so the maximum field strength out of band emission is $109.02 - 42.03 = 66.99\text{dBuV/m}$ which is under 68.3dBuV/m limit.







DRAFT 802.11n (20MHz) OFDM MODULATION:

Channel 1 (5180MHz)

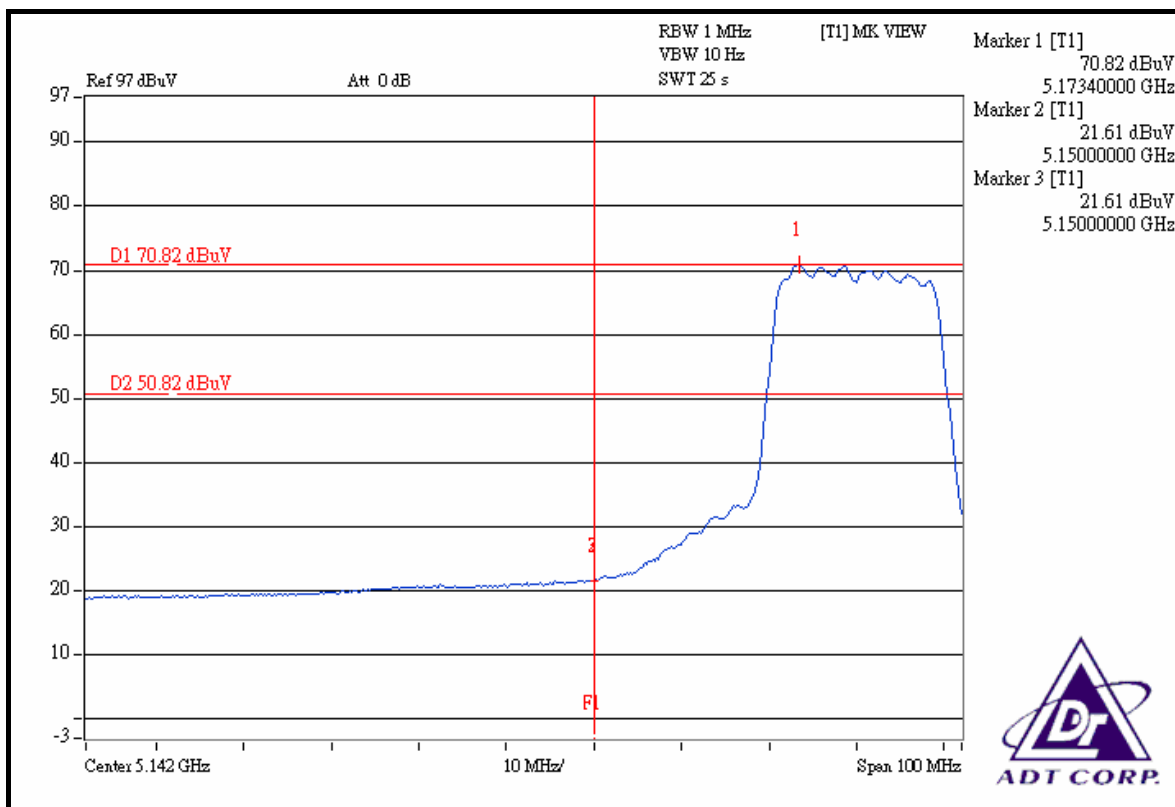
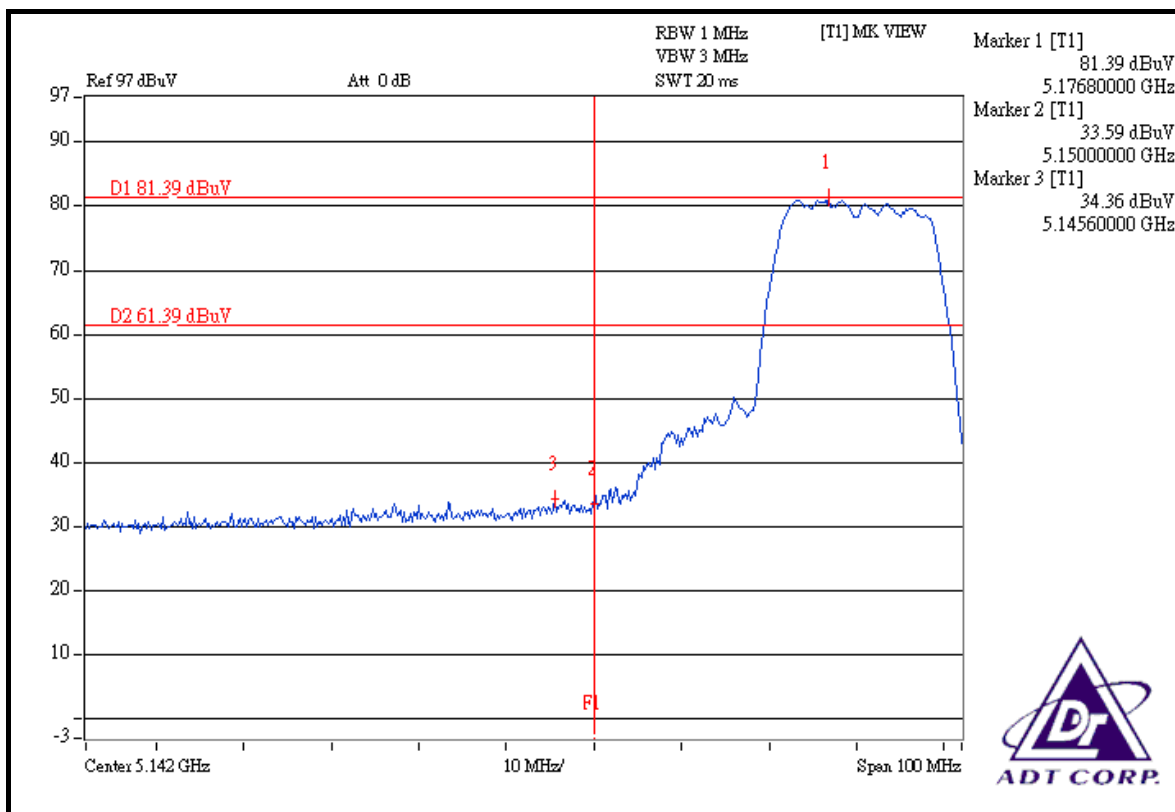
The band edge emission plot on the next page shows 47.03dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 109.14dBuV/m (Peak), so the maximum field strength in restrict band is $109.14 - 47.03 = 62.11\text{dBuV/m}$ which is under 74dBuV/m limit.

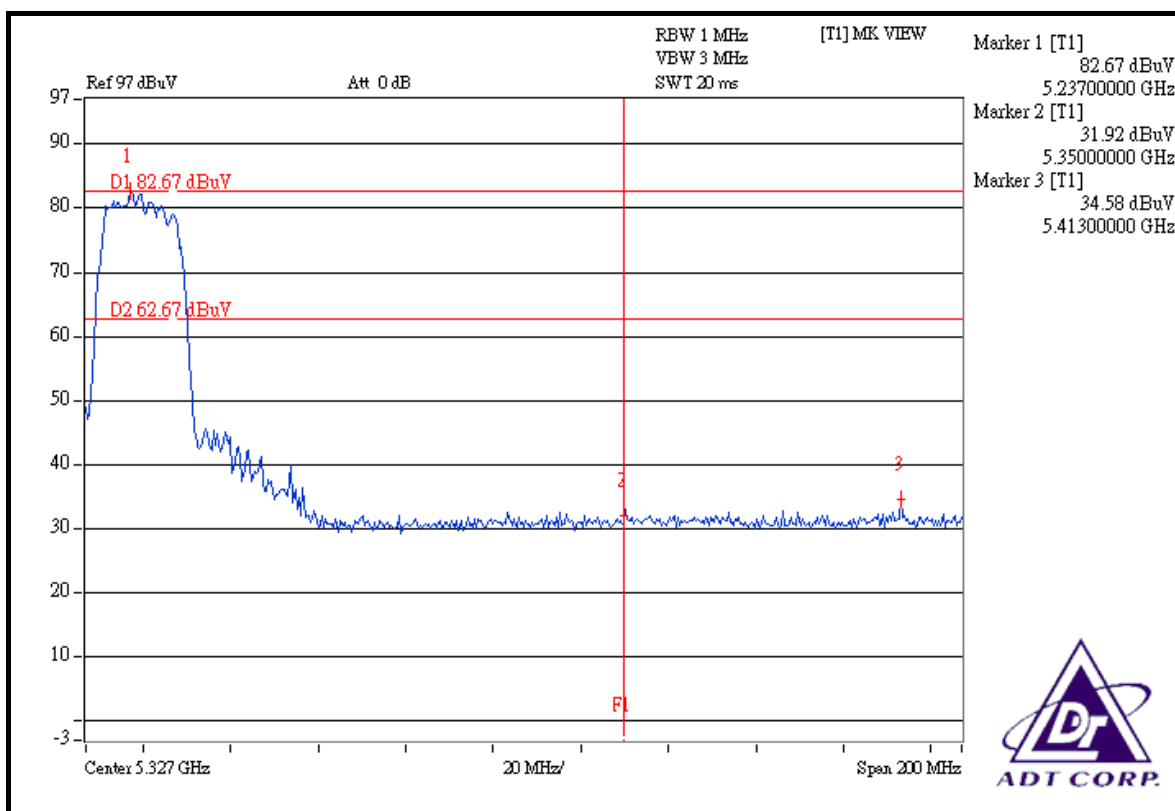
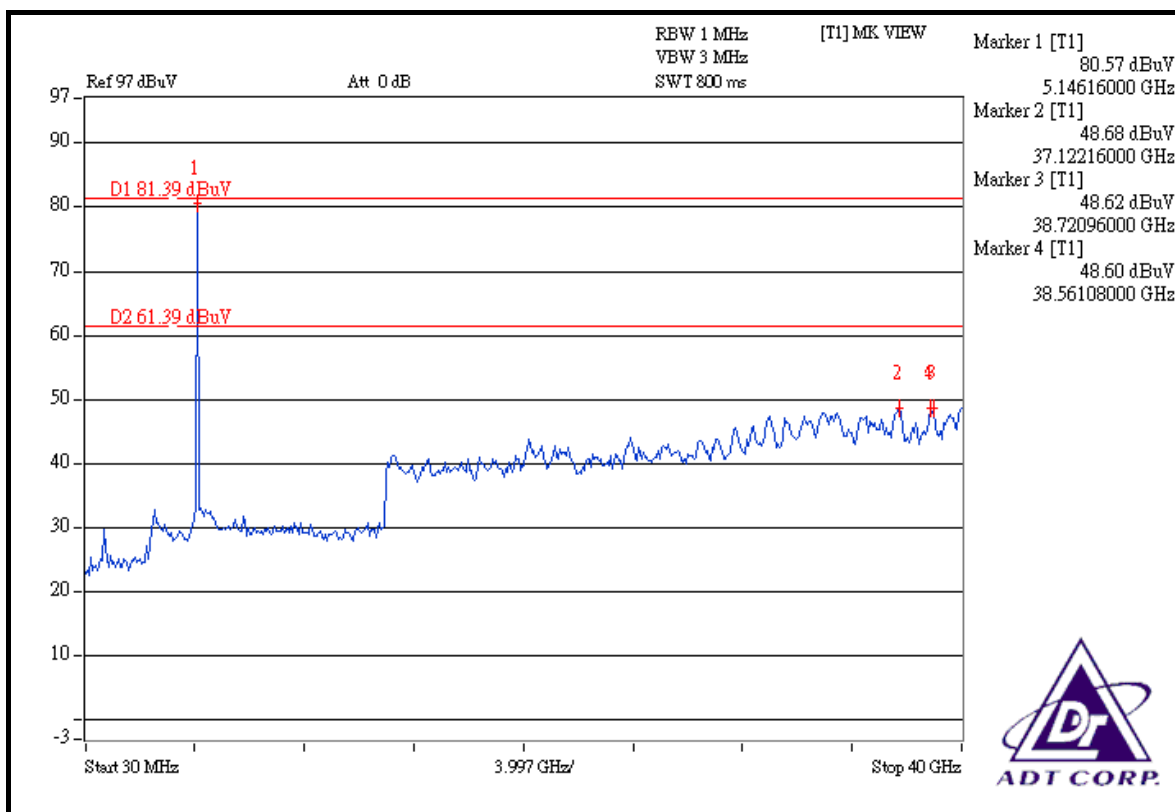
The band edge emission plot on the next page shows 49.21dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 99.40dBuV/m (Average), so the maximum field strength in restrict band is $99.40 - 49.21 = 50.19\text{dBuV/m}$ which is under 54dBuV/m limit.

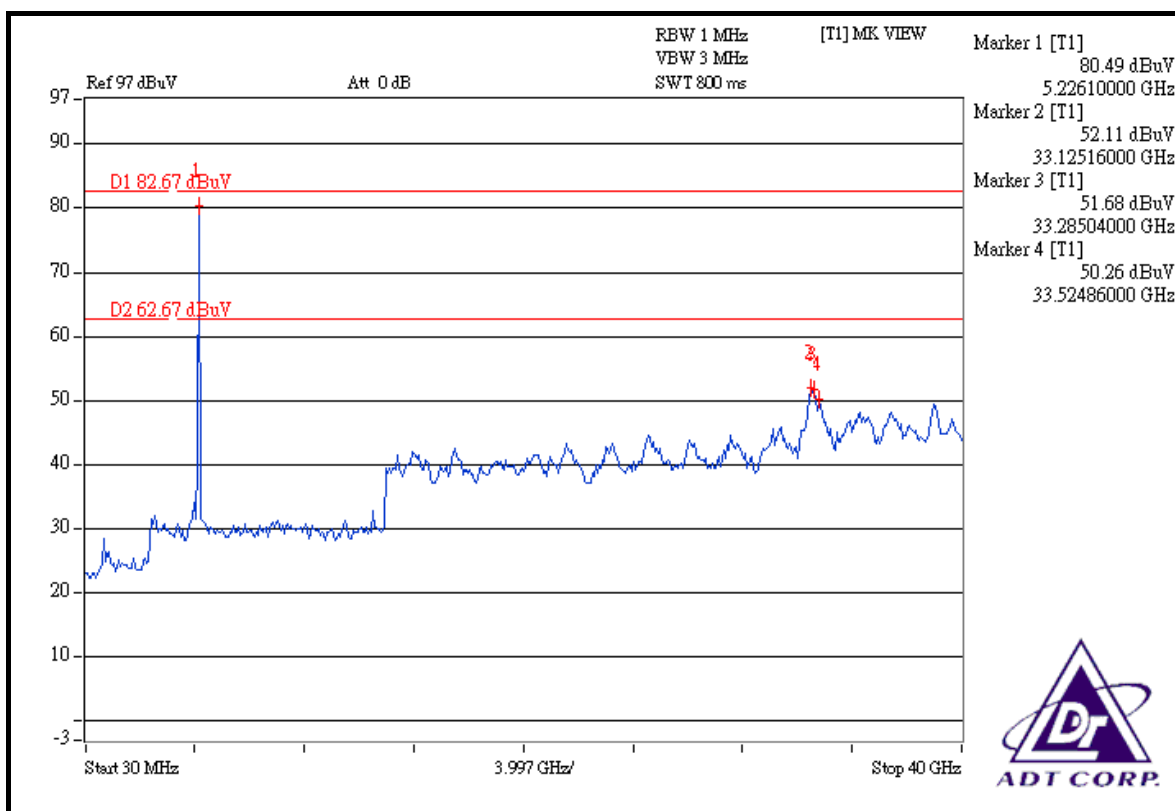
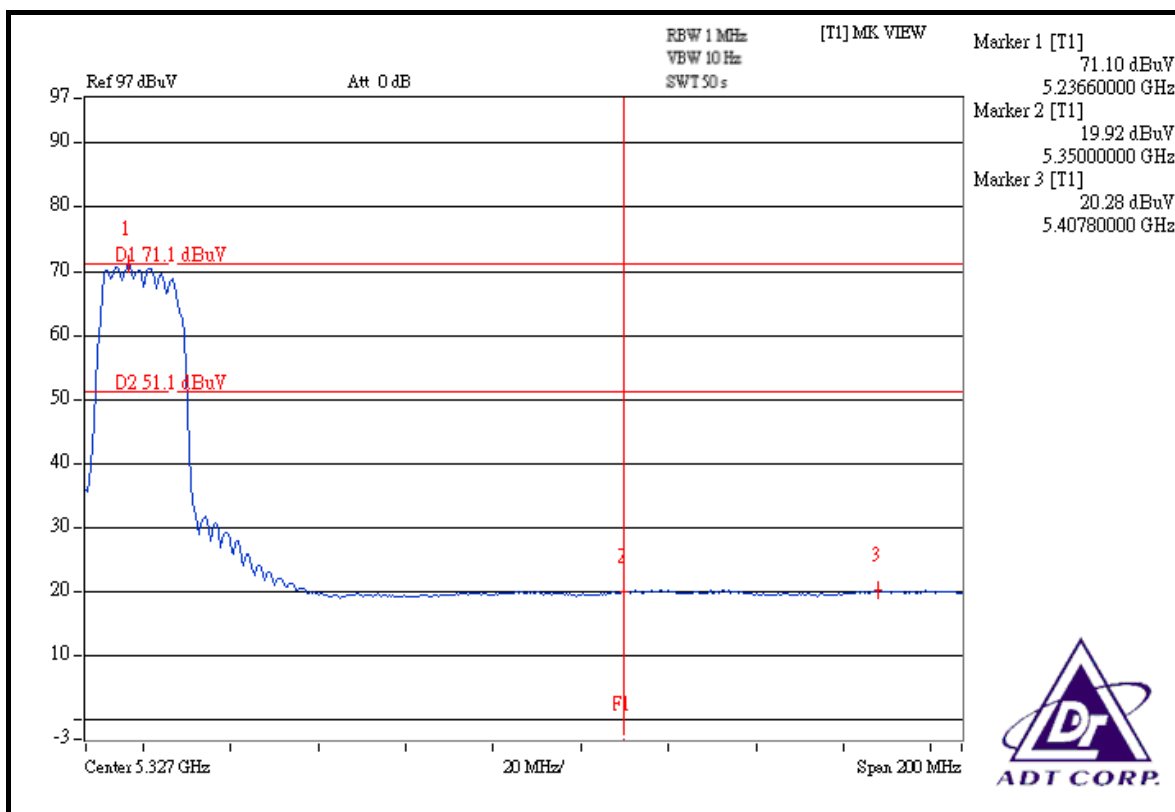
Channel 4 (5240MHz)

The band edge emission plot on the next page shows 48.09dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 4 is 109.32dBuV/m (Peak), so the maximum field strength in restrict band is $109.32 - 48.09 = 61.23\text{dBuV/m}$ which is under 74dBuV/m limit.

The band edge emission plot on the next page shows 50.82dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 4 is 98.91dBuV/m (Average), so the maximum field strength in restrict band is $98.91 - 50.82 = 48.09\text{dBuV/m}$ which is under 54dBuV/m limit.







DRAFT 802.11n (40MHz) OFDM MODULATION:

Channel 1 (5190MHz)

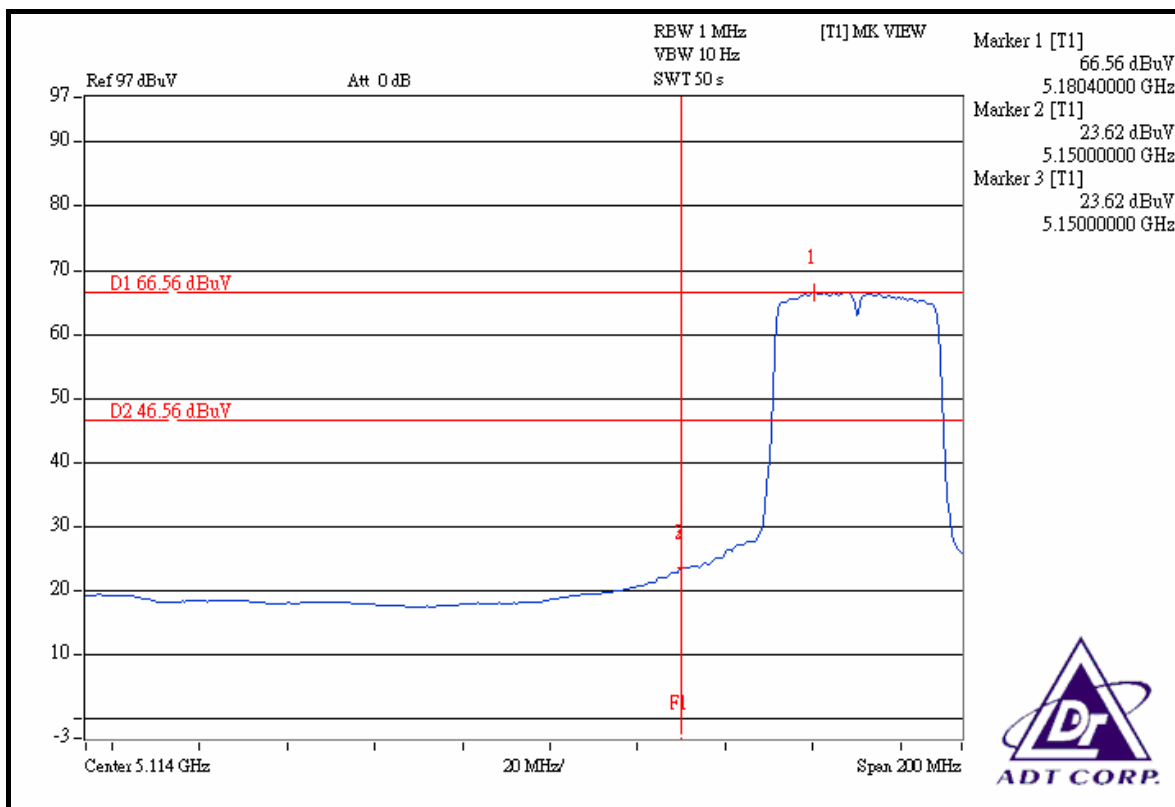
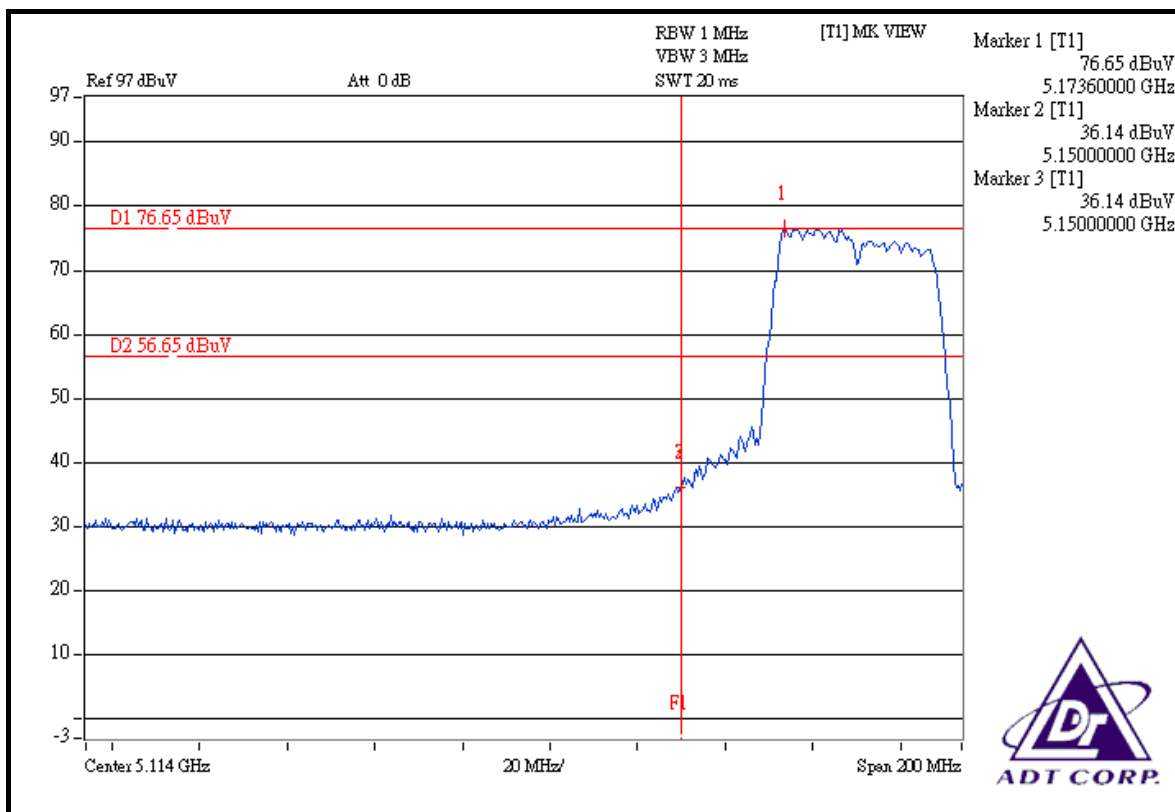
The band edge emission plot on the next page shows 40.51dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 105.54dBuV/m (Peak), so the maximum field strength in restrict band is $105.54 - 40.51 = 65.03\text{dBuV/m}$ which is under 74dBuV/m limit.

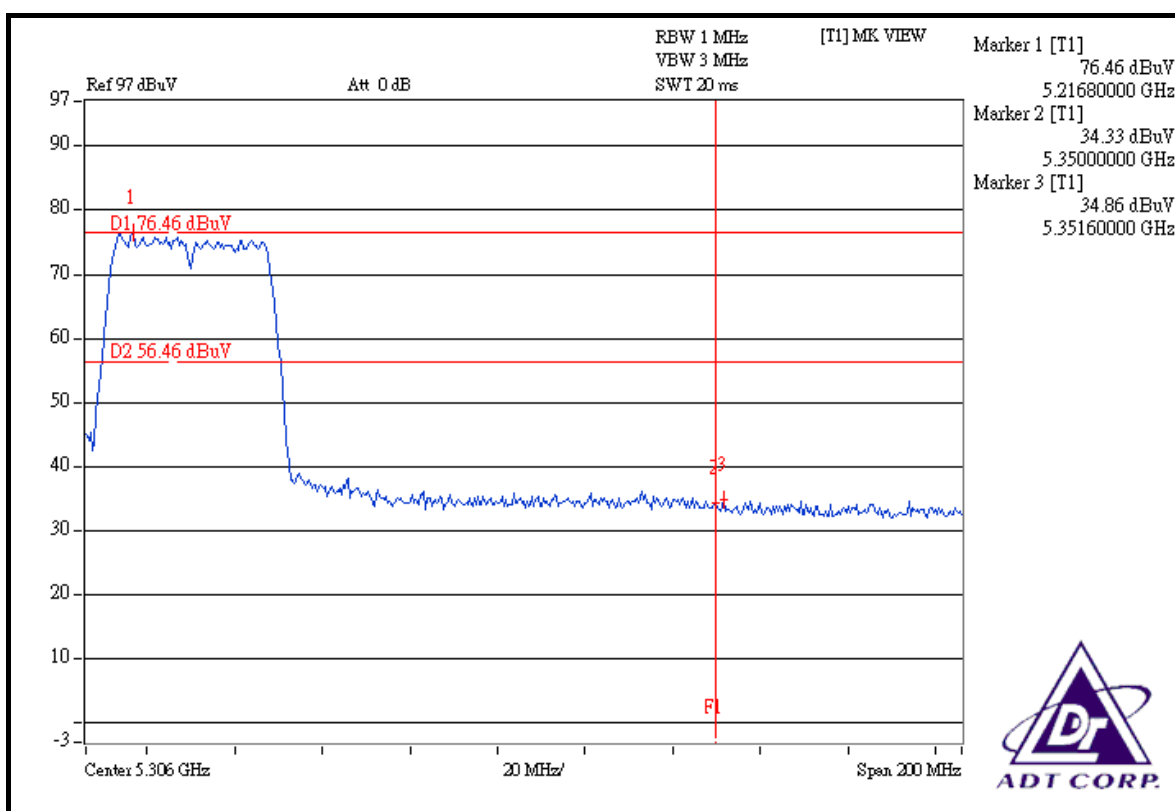
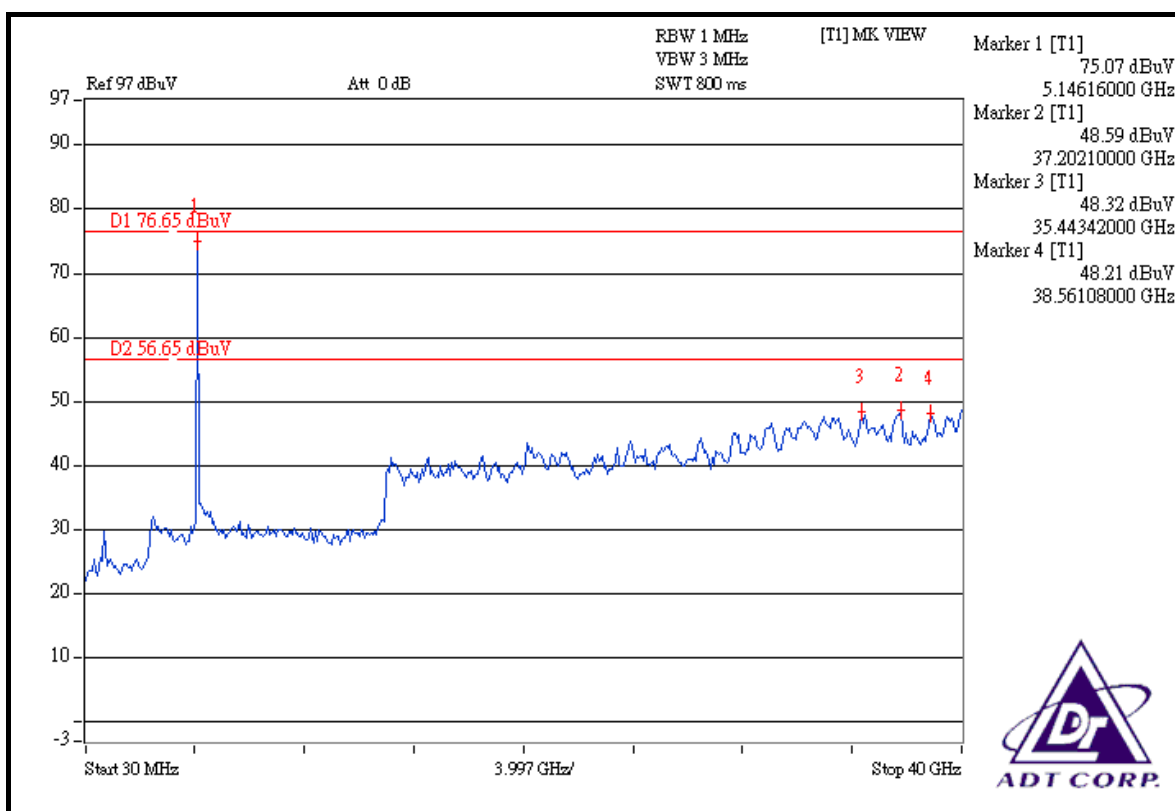
The band edge emission plot on the next page shows 42.94dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 95.87dBuV/m (Average), so the maximum field strength in restrict band is $95.87 - 42.94 = 52.93\text{dBuV/m}$ which is under 54dBuV/m limit.

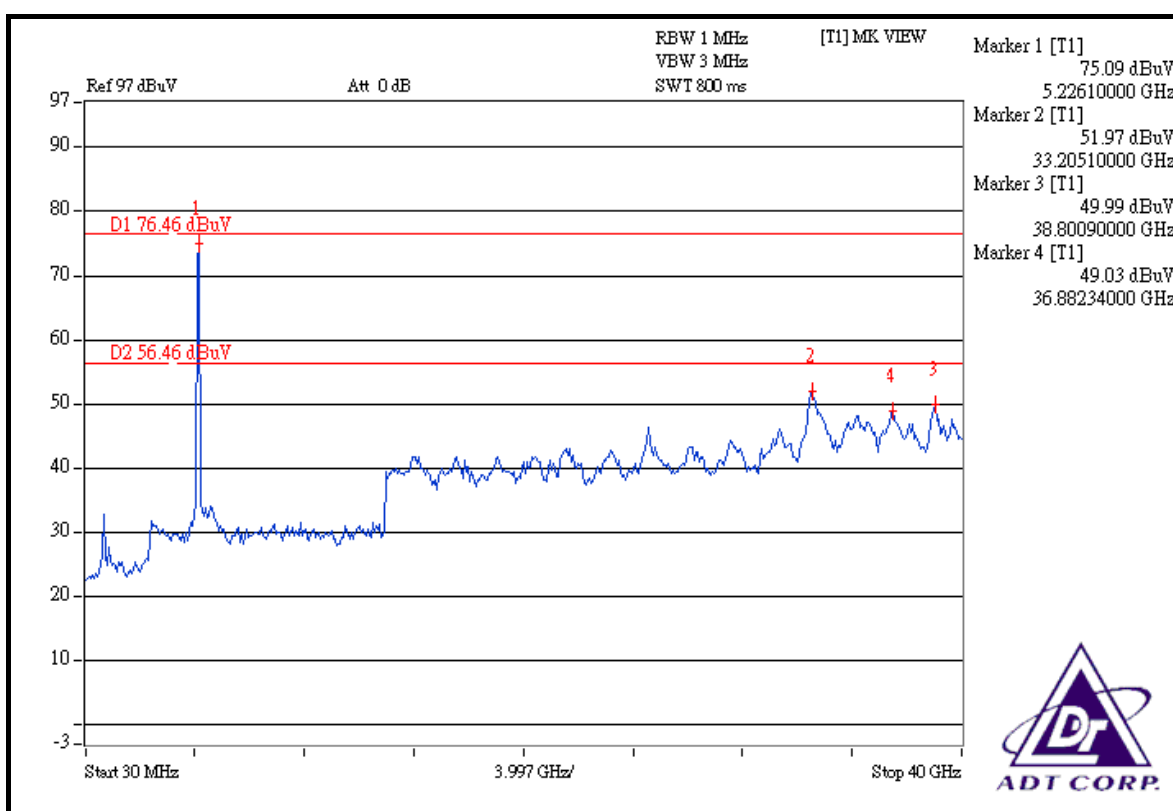
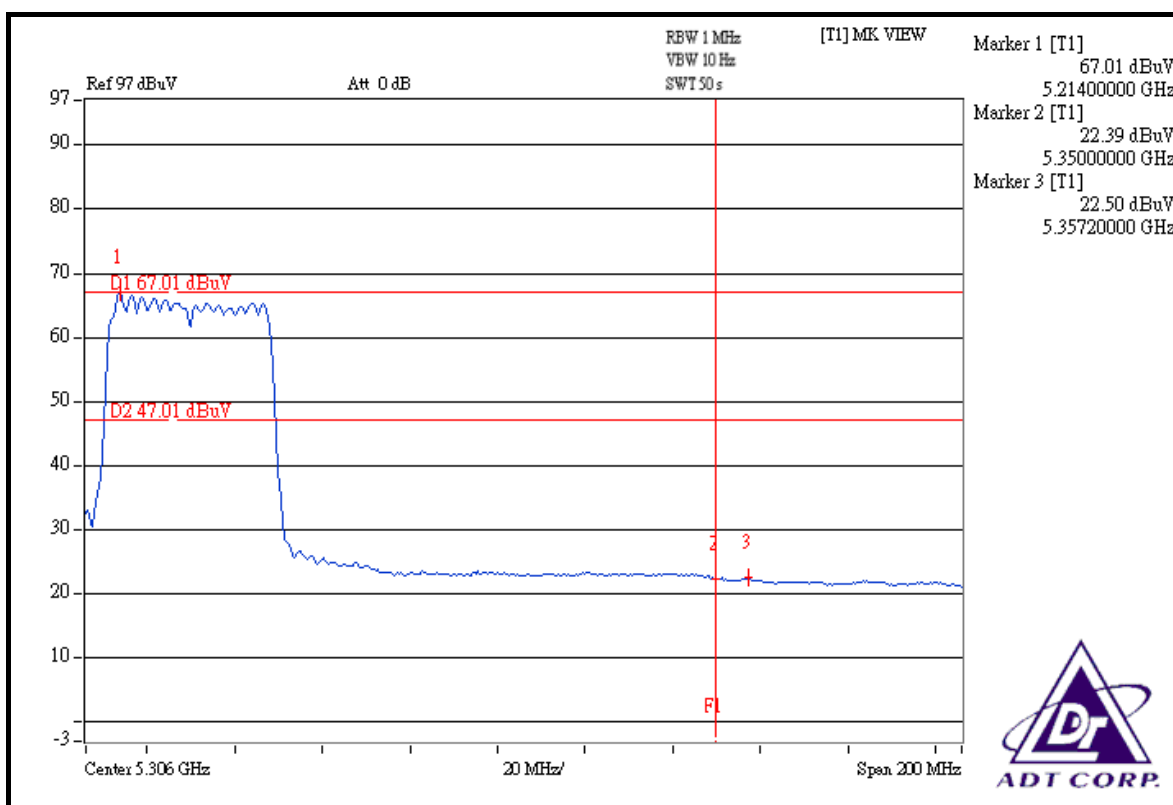
Channel 2 (5230MHz)

The band edge emission plot on the next page shows 41.60dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 2 is 107.53dBuV/m (Peak), so the maximum field strength in restrict band is $107.53 - 41.60 = 65.93\text{dBuV/m}$ which is under 74dBuV/m limit.

The band edge emission plot on the next page shows 44.51dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 2 is 97.44dBuV/m (Average), so the maximum field strength in restrict band is $97.44 - 44.51 = 52.93\text{dBuV/m}$ which is under 54dBuV/m limit.







4.8 DYNAMIC FREQUENCY SELECTION

The manufacturer shall state whether the UUT is capable of operating as a Master and/or a Client. If the UUT is capable of operating in more than one operating mode then each operating mode shall be tested separately. See tables 1 and 2 for the applicability of DFS requirements for each of the operational modes.

Table 1: Applicability of DFS requirements prior to use a channel

Requirement	Operational Mode		
	Master	Client without radar detection	Client with radar detection
Non-Occupancy Period	✓	Not required	✓
DFS Detection Threshold	✓	Not required	✓
Channel Availability Check Time	✓	Not required	Not required
Uniform Spreading	✓	Not required	Not required
U-NII Detection Bandwidth	✓	Not required	✓

Table 2: Applicability of DFS requirements during normal operation.

Requirement	Operational Mode		
	Master	Client without radar detection	Client with radar detection
DFS Detection Threshold	✓	Not required	✓
Channel Closing Transmission Time	✓	✓	✓
Channel Move Time	✓	✓	✓
U-NII Detection Bandwidth	✓	Not required	✓

4.8.1 OPERATING FREQUENCY OF U-NII DEVICE

Table 3: Operating frequency range of UUT.

Operational Mode	Operating Frequency Range	
	5250~5350MHz	5470~5725MHz
Master	Not Apply	Not Apply
Client with ad hoc function	Not Apply	Not Apply
Client with radar detection	Not Apply	Not Apply
Client without radar detection and ad hoc function	✓	✓

4.8.2 TEST LIMITS AND RADAR SIGNAL PARAMETERS

DETECTION THRESHOLD VALUES

Table 4: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection.

Maximum Transmit Power	Value (See Notes 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.
 Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Table 5: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 80% of the UNII 99% transmission power bandwidth. See Note 3.
Note 1: The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows: • For the Short Pulse Radar Test Signals this instant is the end of the Burst. • For the Frequency Hopping radar Test Signal, this instant is the end of the last radar Burst generated. • For the Long Pulse Radar Test Signal this instant is the end of the 12 second period defining the Radar Waveform. Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the U-NII Detection Bandwidth detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

PARAMETERS OF DFS TEST SIGNALS

Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of MPEG file.

Table 6: Short Pulse Radar Test Waveforms.

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Table 7: Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 8: Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

4.8.3 TEST INSTRUMENTS

Table 9: Test instruments list.

DESCRIPTION & MANUFACTURER	MODEL NO.	BRAND	CALIBRATED UNTIL
R&S Spectrum analyzer	FSP40	R&S	Apr. 11, 2008
Signal generator	8645A	Agilent	May. 27, 2008
Oscilloscope	TDS 5104	Tektronix	Aug. 28. 2007

4.8.4 DESCRIPTION OF SUPPORT UNITS

Table 10: Support Unit information.

No.	Product	Brand	Model No.	ID
1	802.11a/b/g Access Point	Cisco	AIR-AP1242AG-A-K9	LDK102056
Software/Firmware Version: C1240-K9W7-TAR.123-11.JA				

4.8.5 SOFTWARE AND FIRMWARE

Table 11: The software/firmware version for EUT.

No.	Product	Model No.	Software/Firmware Version
1	802.11N MPCl Client	WM821-M	C1240-K9W7-TAR.123-11.JA

4.8.6 DESCRIPTION OF AVAILABLE ANTENNAS

Table 12: Antenna list.

Antenna	Type	Operation Frequency Range	Max. Gain(dBi)
AS47a (Ant 1)	PIFA	2.4GHz to 2.5GHz, 5150MHz to 5825MHz	-4.5dBi
AS47a (Ant 2)	PIFA	2.4GHz to 2.5GHz, 5150MHz to 5825MHz	-4.5dBi
AS47a (Ant 3)	PIFA	2.4GHz to 2.5GHz, 5150MHz to 5825MHz	-4.5dBi

4.8.7 MAXIMUM AND MINIMUM CONDUCTED POWER

Table 13: The measured conducted output power.

Frequency Band(MHZ)	MAX. Power		MIN. Power	
	Output Power(dBm)	Output Power(mW)	Output Power(dBm)	Output Power(mW)
5250~5350MHz	16.08	40.55	12	15.84
5470~5725MHz	16.05	40.27	12	15.84

4.8.8 MAXIMUM AND MINIMUM E.I.R.P. POWER

Table 14: The E.I.R.P output power list.

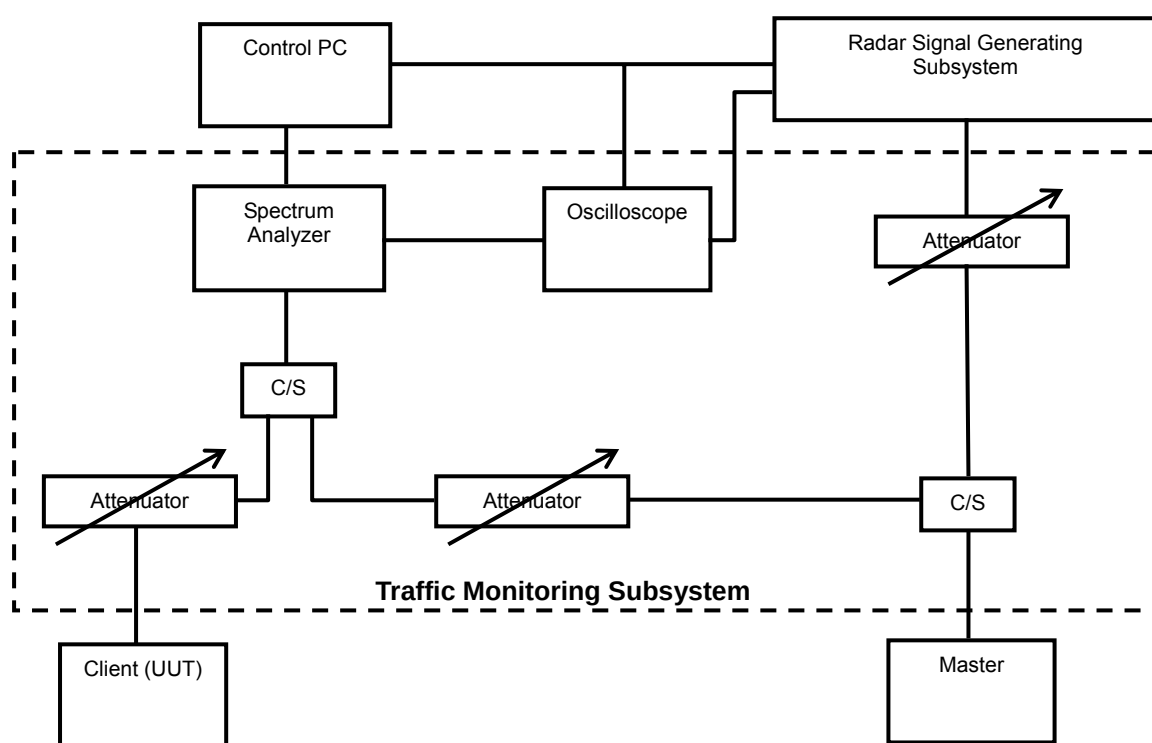
Frequency Band(MHZ)	MAX. Power		MIN. Power	
	Output Power(dBm)	Output Power(mW)	Output Power(dBm)	Output Power(mW)
5250~5350MHz	11.58	14.38	7.5	5.62
5470~5725MHz	11.55	14.28	7.5	5.62

4.8.9 TEST PROCEDURE

ADT DFS Measurement System:

A complete ADT DFS Measurement System consists of two subsystems: (1) the Radar Signal Generating Subsystem and (2) the Traffic Monitoring Subsystem. The control PC is necessary for generating the Radar waveforms in Table 6, 7 and 8. The traffic monitoring subsystem is specified to the type of unit under test (UUT).

Conducted setup configuration of ADT DFS Measurement System

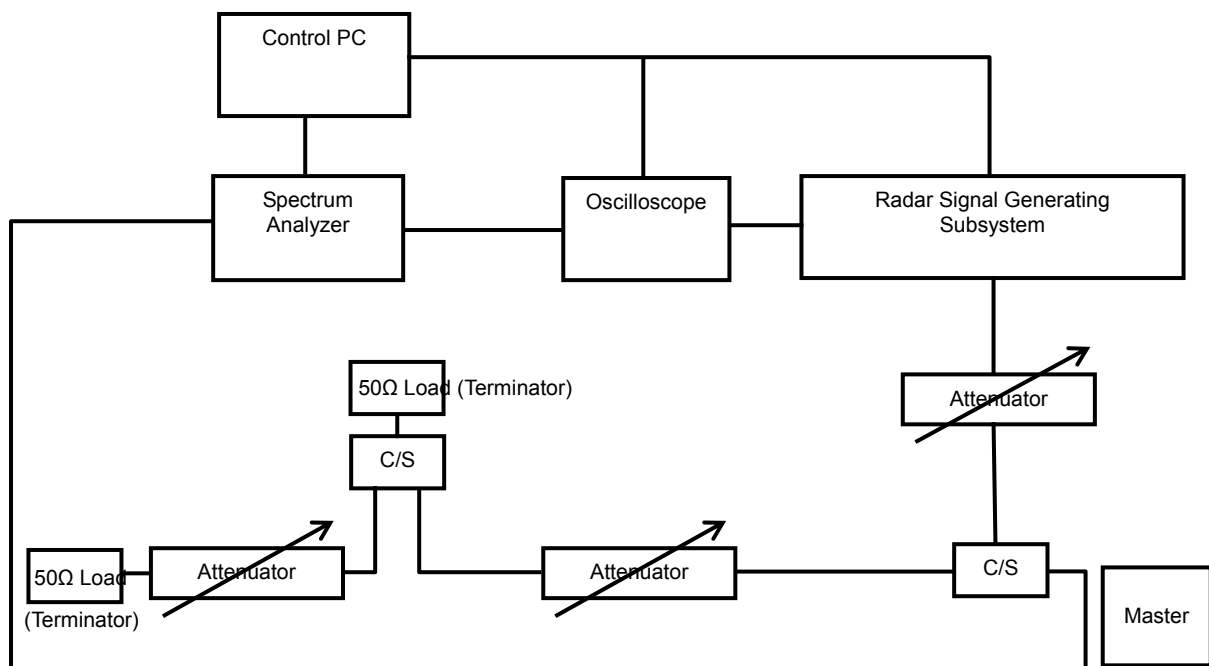


The test transmission will always be from the Master Device to the Client Device. While the Client device is set up to associate with the Master device and play the MPEG file (6 $\frac{1}{2}$ Magic Hours) from Master device, the designated MPEG test file and instructions are located at: <http://ntiacsd.ntia.doc.gov/dfs/>.

Calibration of DFS Detection Threshold Level:

The measured channel is 5320MHz. The radar signal was the same as transmitted channels, and injected into the antenna port of AP (master), measured the channel closing transmission time and channel move time. The Required detection threshold is -58dBm ($= -62 + 1 + 3$)dBm. The calibrated conducted detection threshold level is set to -59dBm . The tested level is lower than required level hence it provides margin to the limit.

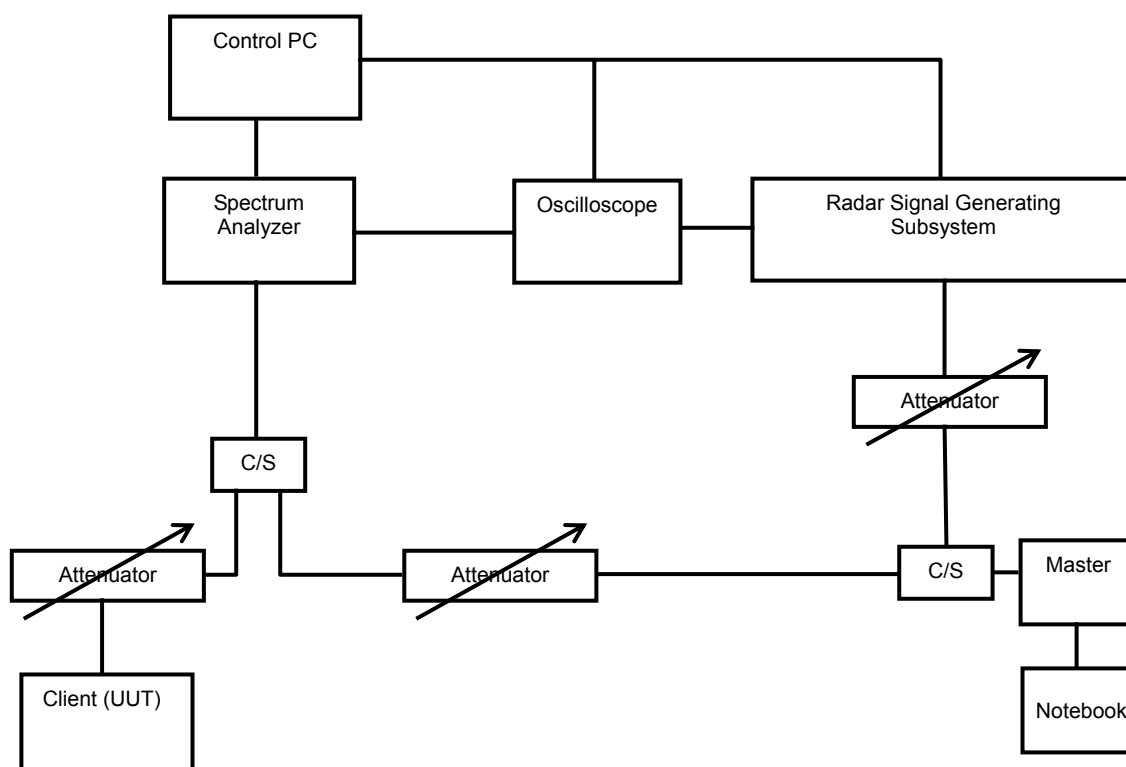
Conducted setup configuration of Calibration of DFS Detection Threshold Level



4.8.10 DEVIATION FROM TEST STANDARD

No deviation.

4.8.11 CONDUCTED TEST SETUP CONFIGURATION



The UUT is a U-NII Device operating in Client mode without Radar Detection function. The radar test signals are injected into the Master Device.

4.8.12 LIST OF MEASUREMENTS

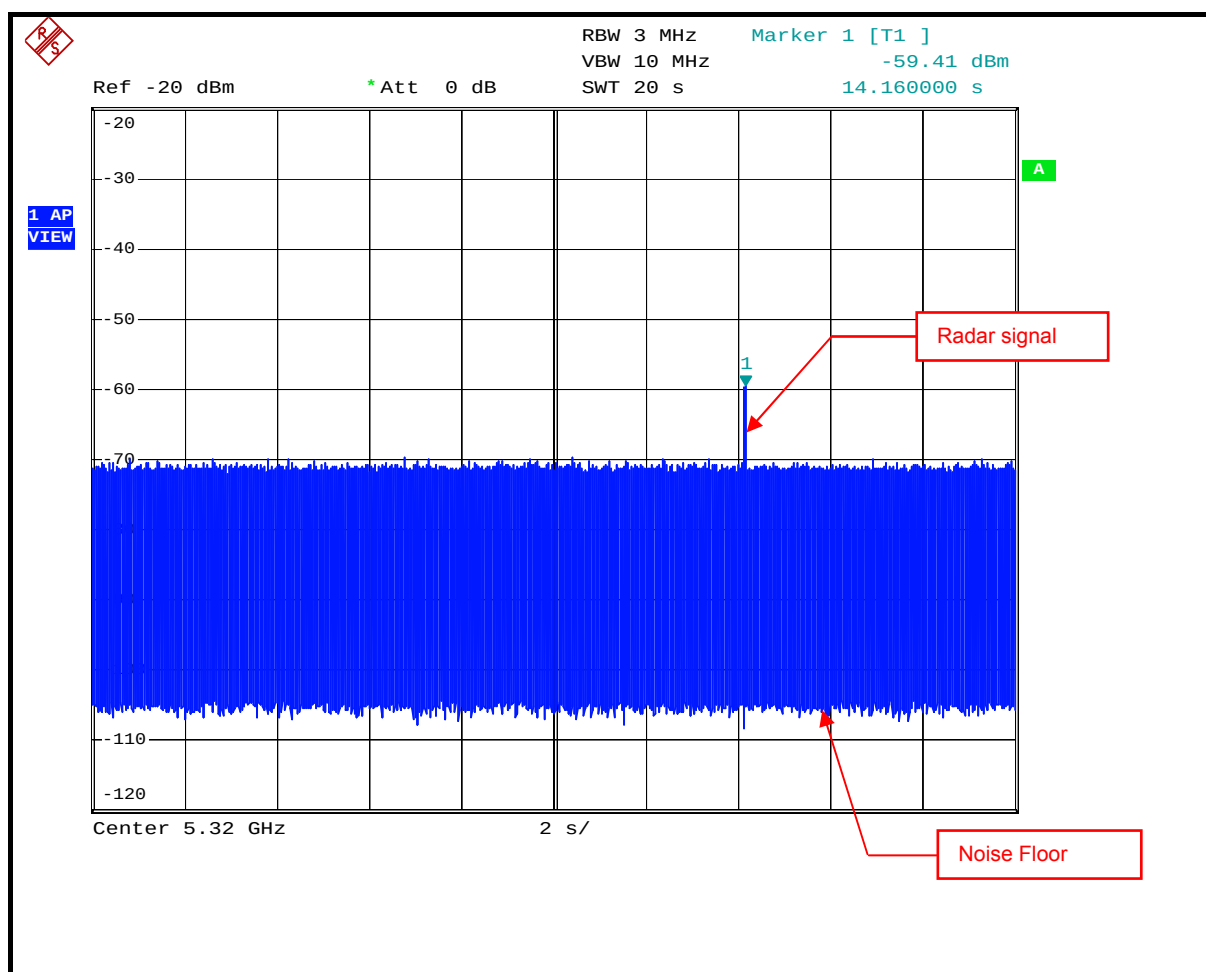
The UUT (WM821-M) is capable of operating as a Client (without radar detection).

Clause	Test Parameter	Remarks	Pass/Fail
15.407	Channel Availability Check Time	Not Required	NA
15.407	In-Service Monitoring	Not Required	NA
15.407	Channel Move Time	Applicable	Pass
15.407	Channel Closing Transmission Time	Applicable	Pass
15.407	Non- Occupancy Period	Not Required	NA
15.407	Uniform Spreading	Not Required	NA

4.8.13 TEST RESULTS

DETECTION THRESHOLD VALUES INJECTED INTO AP

For a detection threshold level of -62dBm and the AP antenna gain is 3dBi . The Radar Burst signal level to the AP connector is -59dBm .

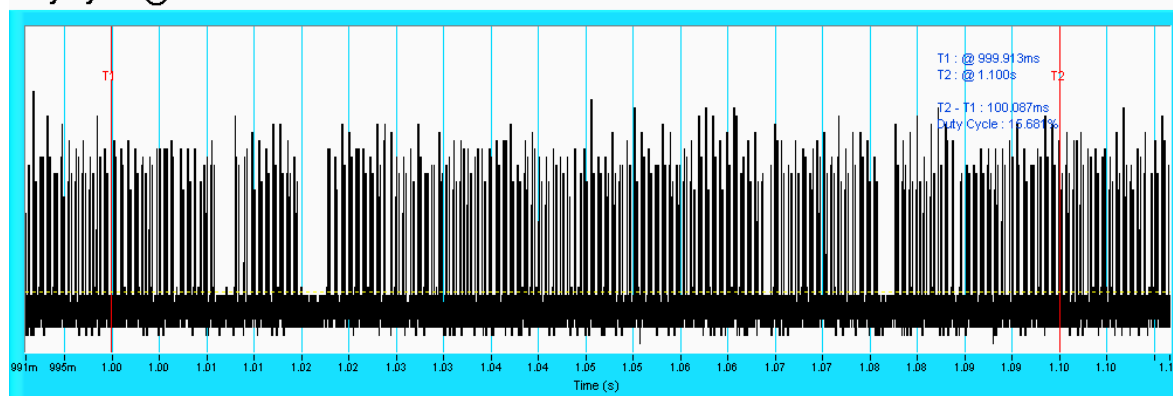


Radar Signal 1

Channel Closing Transmission and Channel Move Time

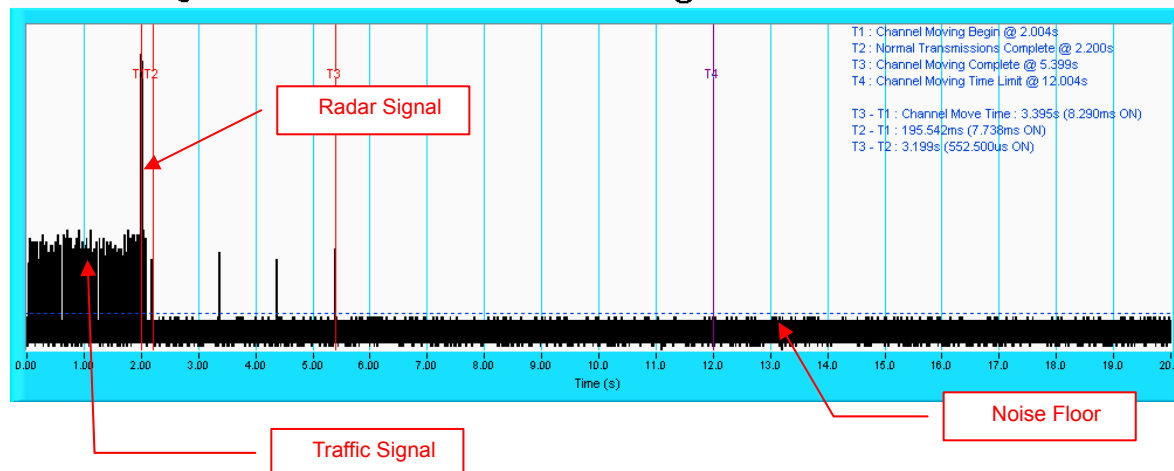
WLAN TRAFFIC

Duty Cycle @ CH064 - 5320MHz

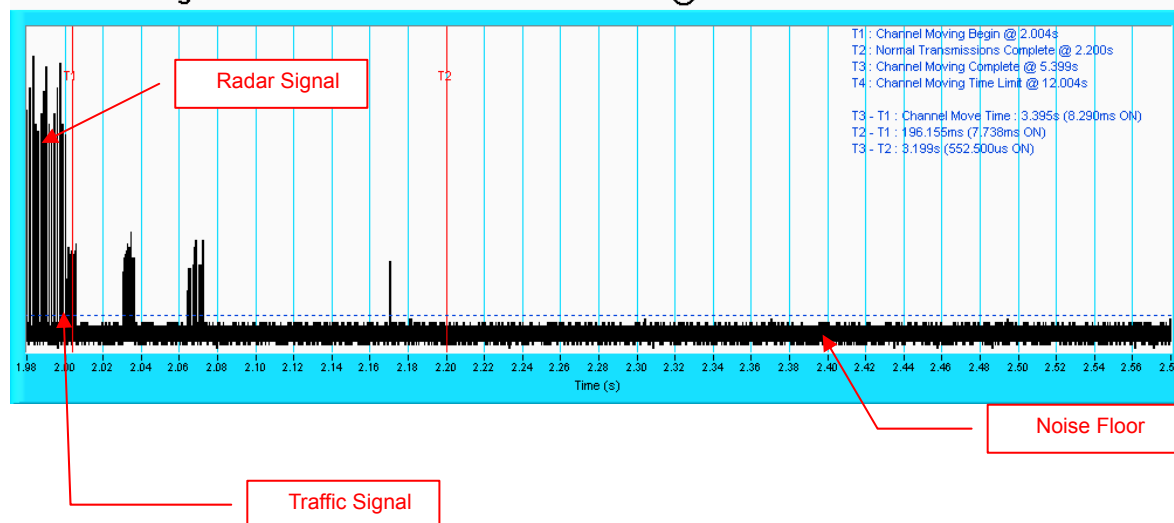


NOTE: T1 denotes the start of duty cycle period is 1.0th second. T2 denotes the end of duty cycle period is 1.1th second. T2 – T1= 0.1 seconds. Duty Cycle = 15.681%

Channel Closing Transmission Time & Channel Move Time @ CH064 - 5320MHz



Channel Closing Transmission Time & Channel Move Time @ CH064 - 5320MHz



Radar signal 1

NOTE: T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200ms from T1. T3 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

Type 1 Radar Statistical Performances				
Trial #	Pulses per Burst	Pulse Width (s)	PRI (s)	Detection
1	18	1.0u	1.428m	Yes
2	18	1.0u	1.428m	Yes
3	18	1.0u	1.428m	Yes
4	18	1.0u	1.428m	No
5	18	1.0u	1.428m	Yes
6	18	1.0u	1.428m	Yes
7	18	1.0u	1.428m	No
8	18	1.0u	1.428m	No
9	18	1.0u	1.428m	Yes
10	18	1.0u	1.428m	Yes
11	18	1.0u	1.428m	Yes
12	18	1.0u	1.428m	Yes
13	18	1.0u	1.428m	Yes
14	18	1.0u	1.428m	Yes
15	18	1.0u	1.428m	Yes
16	18	1.0u	1.428m	Yes
17	18	1.0u	1.428m	Yes
18	18	1.0u	1.428m	Yes
19	18	1.0u	1.428m	Yes
20	18	1.0u	1.428m	No
21	18	1.0u	1.428m	Yes
22	18	1.0u	1.428m	Yes
23	18	1.0u	1.428m	Yes
24	18	1.0u	1.428m	Yes
25	18	1.0u	1.428m	Yes
26	18	1.0u	1.428m	Yes
27	18	1.0u	1.428m	Yes
28	18	1.0u	1.428m	No
29	18	1.0u	1.428m	Yes
30	18	1.0u	1.428m	Yes
Detection Rate: 83.3 %				

4.9 ANTENNA REQUIREMENT

4.9.1 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.

4.9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is PIFA antenna with Ipex connector. The maximum Gain of the antenna is -4.5dBi.

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., 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, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, NCC
Netherlands	Telefication
Singapore	PSB , 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.

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.