

FCC TEST REPORT (15.247)

REPORT NO.: RF980302H02

MODEL NO.: AR5BDT92

RECEIVED: Mar. 04, 2009

TESTED: Mar. 14 to 16, 2009

ISSUED: Mar. 19, 2009

APPLICANT: Atheros Communications, Inc.

ADDRESS: 5480 Great America Parkway, Santa Clara,
CA 95054

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

TEST LOCATION: No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung
Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien
307, Taiwan

This test report consists of 195 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.



Table of Contents

1.	CERTIFICATION	6
2.	SUMMARY OF TEST RESULTS	7
2.1	MEASUREMENT UNCERTAINTY	9
3.	GENERAL INFORMATION	10
3.1	GENERAL DESCRIPTION OF EUT	10
3.2	DESCRIPTION OF ANTENNA	13
3.2.1	STANDARD APPLICABLE	13
3.2.2	ANTENNA CONNECTED CONSTRUCTION	13
3.3	DESCRIPTION OF TEST MODES	14
3.3.1	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:	15
3.4	GENERAL DESCRIPTION OF APPLIED STANDARDS	19
3.5	DESCRIPTION OF SUPPORT UNITS	20
3.6	CONFIGURATION OF SYSTEM UNDER TEST	20
4.	TEST TYPES AND RESULTS (802.11b & g, 2400 ~ 2483.5MHz Band)	21
4.1	CONDUCTED EMISSION MEASUREMENT	21
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	21
4.1.2	TEST INSTRUMENTS	21
4.1.3	TEST PROCEDURES	22
4.1.4	DEVIATION FROM TEST STANDARD	22
4.1.5	TEST SETUP	23
4.1.6	EUT OPERATING CONDITIONS	23
4.1.7	TEST RESULTS	24
4.2	RADIATED EMISSION MEASUREMENT	26
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	26
4.2.2	TEST INSTRUMENTS	27
4.2.3	TEST PROCEDURES	28
4.2.4	DEVIATION FROM TEST STANDARD	28
4.2.5	TEST SETUP	29
4.2.6	EUT OPERATING CONDITIONS	29
	Below 1GHz Test Data	30
4.2.7	TEST RESULTS	30
	Above 1GHz Test Data	31
4.2.8	TEST RESULTS	31
4.3	6dB BANDWIDTH MEASUREMENT	59
4.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	59
4.3.2	TEST INSTRUMENTS	59



4.3.3	TEST PROCEDURE	60
4.3.4	DEVIATION FROM TEST STANDARD	60
4.3.5	TEST SETUP	60
4.3.6	EUT OPERATING CONDITIONS	60
4.3.7	TEST RESULTS	61
4.4	MAXIMUM PEAK OUTPUT POWER	69
4.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	69
4.4.2	INSTRUMENTS	69
4.4.3	TEST PROCEDURES	70
4.4.4	DEVIATION FROM TEST STANDARD	70
4.4.5	TEST SETUP	70
4.4.6	EUT OPERATING CONDITIONS	70
4.4.7	TEST RESULTS	71
4.5	AVERAGE OUTPUT POWER	73
4.5.1	FOR REFERENCE	73
4.5.2	TEST INSTRUMENTS	73
4.5.3	TEST PROCEDURES	74
4.5.4	TEST SETUP	74
4.5.5	EUT OPERATING CONDITIONS	74
4.5.6	TEST RESULTS	75
4.6	POWER SPECTRAL DENSITY MEASUREMENT	77
4.6.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	77
4.6.2	TEST INSTRUMENTS	77
4.6.3	TEST PROCEDURE	78
4.6.4	DEVIATION FROM TEST STANDARD	78
4.6.5	TEST SETUP	78
4.6.6	EUT OPERATING CONDITION	78
4.6.7	TEST RESULTS	79
4.7	CONDUCTED OUT-BAND EMISSION MEASUREMENT	107
4.7.1	LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT	107
4.7.2	TEST INSTRUMENTS	107
4.7.3	TEST PROCEDURE	107
4.7.4	DEVIATION FROM TEST STANDARD	108
4.7.5	EUT OPERATING CONDITION	108
4.7.6	TEST RESULTS	108
5.	TEST TYPES AND RESULTS (802.11a, 5725~5850MHz Band)	125
5.1	CONDUCTED EMISSION MEASUREMENT	125
5.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	125



A D T

5.1.2	TEST INSTRUMENTS	125
5.1.3	TEST PROCEDURES	126
5.1.4	DEVIATION FROM TEST STANDARD	126
5.1.5	TEST SETUP	127
5.1.6	EUT OPERATING CONDITIONS	127
5.1.7	TEST RESULTS	128
5.2	RADIATED EMISSION MEASUREMENT	130
5.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	130
5.2.2	TEST INSTRUMENTS	131
5.2.3	TEST PROCEDURES	132
5.2.4	DEVIATION FROM TEST STANDARD	132
5.2.5	TEST SETUP	133
5.2.6	EUT OPERATING CONDITIONS	133
	Below 1GHz Test Data	134
5.2.7	TEST RESULTS	134
	Above 1GHz Test Data	135
5.2.8	TEST RESULTS	135
5.3	6dB BANDWIDTH MEASUREMENT	143
5.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	143
5.3.2	TEST INSTRUMENTS	143
5.3.3	TEST PROCEDURE	144
5.3.4	DEVIATION FROM TEST STANDARD	144
5.3.5	TEST SETUP	144
5.3.6	EUT OPERATING CONDITIONS	144
5.3.7	TEST RESULTS	145
5.4	MAXIMUM PEAK OUTPUT POWER	151
5.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	151
5.4.2	INSTRUMENTS	151
5.4.3	TEST PROCEDURES	152
5.4.4	DEVIATION FROM TEST STANDARD	152
5.4.5	TEST SETUP	152
5.4.6	EUT OPERATING CONDITIONS	152
5.4.7	TEST RESULTS	153
5.5	AVERAGE OUTPUT POWER	155
5.5.1	FOR REFERENCE	155
5.5.2	TEST INSTRUMENTS	155
5.5.3	TEST PROCEDURES	156
5.5.4	TEST SETUP	156



A D T

5.5.5	EUT OPERATING CONDITIONS	156
5.5.6	TEST RESULTS	157
5.6	POWER SPECTRAL DENSITY MEASUREMENT	159
5.6.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	159
5.6.2	TEST INSTRUMENTS	159
5.6.3	TEST PROCEDURE	160
5.6.4	DEVIATION FROM TEST STANDARD	160
5.6.5	TEST SETUP	160
5.6.6	EUT OPERATING CONDITION	160
5.6.7	TEST RESULTS	161
5.7	CONDUCTED OUT-BAND EMISSION MEASUREMENT	179
5.7.1	LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT	179
5.7.2	TEST INSTRUMENTS	179
5.7.3	TEST PROCEDURE	180
5.7.4	DEVIATION FROM TEST STANDARD	180
5.7.5	EUT OPERATING CONDITION	180
5.7.6	TEST RESULTS	181
6.	INFORMATION ON THE TESTING LABORATORIES	194
7.	APPENDIX-A- MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	195

1. CERTIFICATION

PRODUCT: 802.11n 2x2 Minicard
BRAND NAME: Atheros
MODEL NO.: AR5BDT92
TEST SAMPLE: R&D SAMPLE
TESTED: Mar. 14 to 16, 2009
APPLICANT: Atheros Communications, Inc.
STANDARDS: FCC Part 15, Subpart C (Section 15.247),
ANSI C63.4-2003

The above equipment (Model: AR5BDT92) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and was in 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 : Midoli Peng , **DATE:** Mar. 19, 2009
(Midoli Peng, Specialist)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** Mar. 19, 2009
Responsible for RF (Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** Mar. 19, 2009
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 802.11b & g, 2412~2462MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.96dB at 0.194MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 4824.00MHz / 4924.00MHz / 2390.00MHz / 2483.50MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.



A D T

For 802.11a, 5725~5850MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.34dB at 0.197MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -0.44dB at 5460.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

NOTE:

1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz and 5.725~5.850GHz. For the 5.15~5.35GHz and 5.47~5.725GHz RF parameters was recorded in another test report.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.44 dB
Radiated emissions (30MHz-1GHz)	3.94 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	802.11n 2x2 Minicard
MODEL NO.	AR5BDT92
FCC ID	PPD-AR5BDT92
POWER SUPPLY	DC 3.3V 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 / 5.5 / 2 / 1Mbps 802.11a / g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps HT20 MCS0~7 (800ns GI): 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5Mbps. HT20 MCS8~15 (800ns GI): 130 / 117 / 104 / 78 / 52 / 39 / 26 / 13Mbps. HT40 MCS0~7 (800ns GI): 135 / 121.5 / 108 / 81 / 54 / 40.5 / 27 / 13.5Mbps. HT40 MCS8~15 (800ns GI): 270 / 243 / 216 / 162 / 108 / 81 / 54 / 27Mbps. HT40 MCS0~7 (400ns GI): 150 / 135 / 120 / 90 / 60 / 45 / 30 / 15 HT40 MCS8~15 (400ns GI): 300 / 270 / 240 / 180 / 120 / 90 / 60 / 30
FREQUENCY RANGE	For 15.407 802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.70GHz For 15.247 802.11b & 802.11g: 2412 ~ 2462MHz 802.11a: 5.745 ~ 5.825GHz

NUMBER OF CHANNEL	For 15.407 19 for 802.11a, draft 802.11n (20MHz) 9 for draft 802.11n (40MHz)
	For 15.247(2.4GHz) 11 for 802.11b, 802.11g, draft 802.11n (20MHz) 7 for draft 802.11n (40MHz)
	For 15.247(5GHz) 5 for 802.11a, draft 802.11n (20MHz) 2 for draft 802.11n (40MHz)
MAXIMUM OUTPUT POWER	For 15.407 802.11a: 101.983mW draft 802.11n (20MHz): 112.601mW draft 802.11n (40MHz): 106.796mW For 15.247(2.4GHz) 802.11b: 214.815mW 802.11g: 785.481mW draft 802.11n (20MHz): 784.234mW draft 802.11n (40MHz): 882.267mW For 15.247(5GHz) 802.11a: 414.769mW draft 802.11n (20MHz): 417.146mW draft 802.11n (40MHz): 433.680mW
ANTENNA TYPE	Please see note 1
DATA CABLE	NA
I/O PORT	NA
ASSOCIATED DEVICES	NA

NOTE:

- There are two antennas provided to this EUT, please refer to the following table:

Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi) For 2.4GHz	Antenna Gain (dBi) For 5GHz	Antenna Connector
Chain(0)	Tyco	1513327-1	Dipole	3	4	RPSMA
Chain(1)	Tyco	1513327-1	Dipole	3	4	RPSMA

- The EUT incorporates CDD function with 802.11a, 802.11b, 802.11g and MIMO function with draft 802.11n .

3. The EUT is 2 * 2 spatial MIMO (2Tx & 2Rx) without beam forming function. The antenna configurations are two transmitter antennas and two receiver antennas, as there are 2 Dipole antennas. Spatial multiplexing modes for simultaneous transmission using 2 antennas, and for simultaneous receiver using 2 antennas. The 11a and 11bg legacy mode is limited to single transmitter only.
4. When the EUT operating in draft 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
5. The EUT have MIMO power save mode, one transmitter may be active (chain 0) while other is inactive (chain 1). Output power is no different compared to operation when both transmitter chains are active. Transmitter power is not increased or decreased for chain 0 when in single chain mode, compared to dual chain active mode.
6. The EUT complies with draft 802.11n standards and backwards compatible with 802.11a, 802.11b, 802.11g products.
7. The EUT was pre-tested under the following modes:

Test Mode	Data rate
Mode A	400ns GI
Mode B	800ns GI

From the above modes, the worst case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

8. The EUT was pre-tested under the following versions:

Test Version	Description
Version A	With RPSMA connector
Version B	Without RPSMA connector

From the above Versions, the worst case was found in **Version B**. Therefore only the test data of the version was recorded in this report.

(Both with RPSMA and without RPSMA connector boards were evaluated on conducted emissions and radiated emission (antenna gain was used in section 3.1(1)) test to find the worst case.)

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 ANTENNA

3.2.1 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 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

3.2.2 ANTENNA CONNECTED CONSTRUCTION

There are two antennas provided to this EUT, please refer to the following table:

Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi) For 2.4GHz	Antenna Gain (dBi) For 5GHz	Antenna Connector
Chain(0)	Tyco	1513327-1	Dipole	3	4	RPSMA
Chain(1)	Tyco	1513327-1	Dipole	3	4	RPSMA

3.3 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

Eleven channels are provided for 802.11b, 802.11g, draft 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	2437MHz		

Operated in 5725 ~ 5850MHz band:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	5745 MHz	4	5805 MHz
2	5765 MHz	5	5825 MHz
3	5785 MHz		

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

CHANNEL	FREQUENCY
1	5755 MHz
2	5795 MHz

3.3.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

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

ANTENNA COMBINATION MODE:

COMBINATION MODE	OPERATION MODE	CHAIN(0) (TX)	CHAIN(1) (TX)
A	802.11a	√	√
B	802.11b	√	√
C	802.11g	√	√
D	DRAFT 802.11n(20MHz)	√	√
E	DRAFT 802.11n(40MHz)	√	√

Note:

1. The above information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.
2. Antenna 1 and Antenna 2 are Dipole antennas.

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 COMBINATION
For 2.4 GHz 802.11b	1 to 11	1	DSSS	DBPSK	1	B
For 5 GHz 802.11a	1 to 5	1	OFDM	BPSK	6	A

RADIATED EMISSION TEST (BELOW 1 GHz):

- ☒ 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 COMBINATION
For 2.4 GHz 802.11b	1 to 11	1	DSSS	DBPSK	1	B
For 5 GHz 802.11a	1 to 5	1	OFDM	BPSK	6	A

RADIATED EMISSION TEST (ABOVE 1 GHz):

☒ 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 COMBINATION
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	B
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	C
For 2.4 GHz Draft 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	D
For 2.4 GHz Draft 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	E
802.11a	1 to 5	1, 3, 5	OFDM	BPSK	6	A
For 5 GHz Draft 802.11n (20MHz)	1 to 5	1, 3, 5	OFDM	BPSK	6.5	D
For 5 GHz Draft 802.11n (40MHz)	1 to 2	1, 2	OFDM	BPSK	13.5	E

CONDUCTED OUT-BAND EMISSION 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 COMBINATION
802.11b	1 to 11	1, 11	DSSS	DBPSK	1	B
802.11g	1 to 11	1, 11	OFDM	BPSK	6	C
For 2.4 GHz Draft 802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5	D
For 2.4 GHz Draft 802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	13.5	E
802.11a	1 to 5	1, 5	OFDM	BPSK	6	A
For 5 GHz Draft 802.11n (20MHz)	1 to 5	1, 5	OFDM	BPSK	6.5	D
For 5 GHz Draft 802.11n (40MHz)	1 to 2	1, 2	OFDM	BPSK	13.5	E

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 COMBINATION
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	B
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	C
For 2.4 GHz Draft 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	D
For 2.4 GHz Draft 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	E
802.11a	1 to 5	1,3, 5	OFDM	BPSK	6	A
For 5 GHz Draft 802.11n (20MHz)	1 to 5	1,3, 5	OFDM	BPSK	6.5	D
For 5 GHz Draft 802.11n (40MHz)	1 to 2	1, 2	OFDM	BPSK	13.5	E

3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an 802.11n 2x2 Minicard. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C. (15.247)

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.

3.5 DESCRIPTION OF SUPPORT UNITS

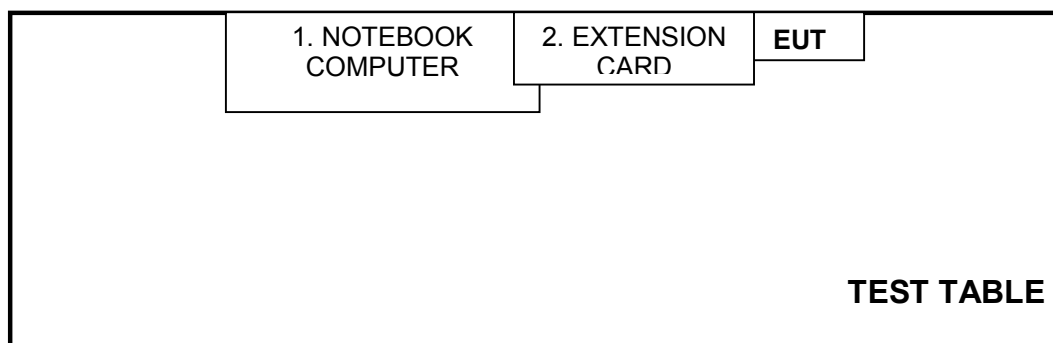
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	Lenovo	0769	L3-BE248 08/01	FCC DoC
2	EXTENSION CARD	Atheros	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).

3.6 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS (802.11b & g, 2400 ~ 2483.5MHz Band)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 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 DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	April 01, 2008	Mar. 31, 2009
Line-Impedance Stabilization Network (for EUT)	ENV-216	100071	Nov. 26, 2008	Nov. 25, 2009
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 05, 2008	Nov. 04, 2009
RF Cable (JYEBAO)	5DFB	COBCAB-001	Aug 15, 2008	Aug 14, 2009
50 ohms Terminator	50	3	Nov. 05, 2008	Nov. 04, 2009
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. B.
3. The VCCI Con B Registration No. is C-2193.

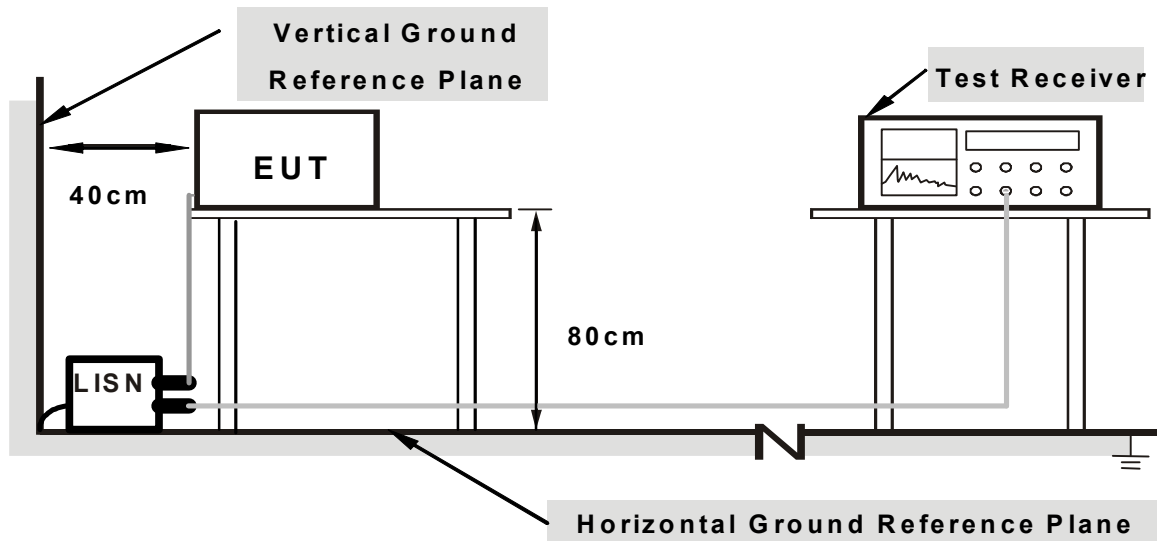
4.1.3 TEST PROCEDURES

- 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) were 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 related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

- Connect the EUT with support unit 1 (Notebook computer) which placed on a testing table.
- Support unit 1 (Notebook computer) run test program “ART V0 9 b4” to allow EUT to transmit continuously at specific channel frequency.

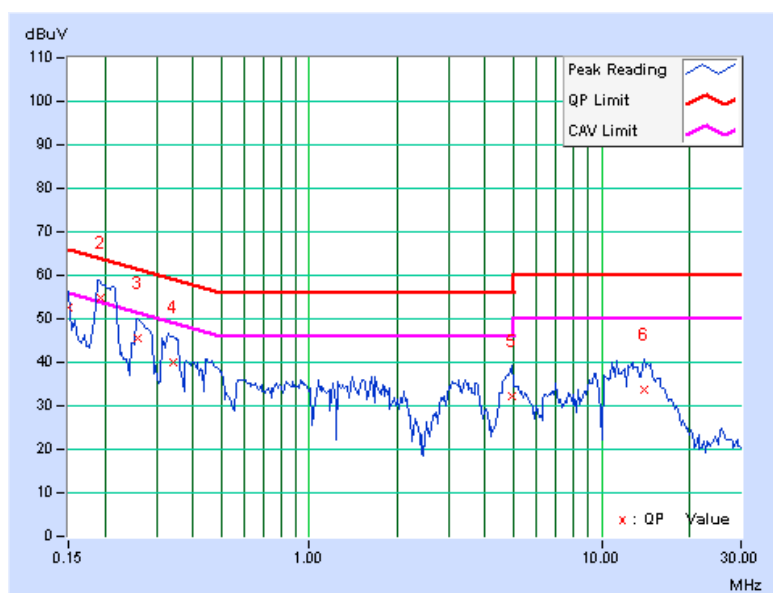
4.1.7 TEST RESULTS

802.11b DSSS MODULATION :

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line (L)
MODULATION TYPE	DBPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	1Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	22deg. C, 67%RH, 962hPa	TESTED BY	Phoenix Huang

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor (dB)	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. (dB)	AV. (dB)
1	0.150	0.19	52.48	-	52.67	-	66.00	56.00	-13.33	-
2	0.194	0.22	54.67	39.93	54.89	40.15	63.85	53.85	-8.96	-13.70
3	0.259	0.29	45.29	-	45.58	-	61.45	51.45	-15.87	-
4	0.341	0.39	39.56	-	39.95	-	59.17	49.17	-19.22	-
5	4.934	0.60	31.72	-	32.32	-	56.00	46.00	-23.68	-
6	14.055	1.02	32.86	-	33.88	-	60.00	50.00	-26.12	-

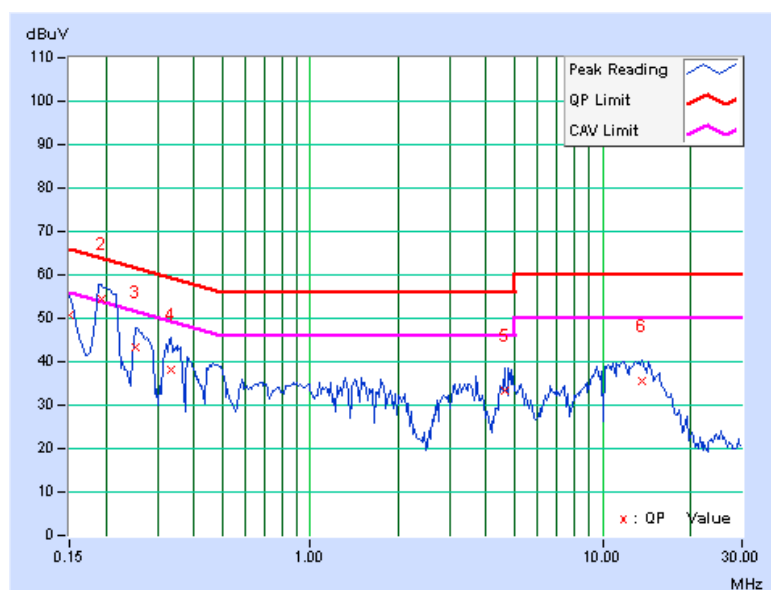
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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	Neutral (N)
MODULATION TYPE	DBPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	1Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	22deg. C, 67%RH, 962hPa	TESTED BY	Phoenix Huang

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor (dB)	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. (dB)	AV. (dB)
1	0.150	0.12	50.44	-	50.56	-	66.00	56.00	-15.44	-
2	0.193	0.15	54.31	38.53	54.46	38.68	63.91	53.91	-9.45	-15.23
3	0.252	0.21	43.14	-	43.35	-	61.71	51.71	-18.35	-
4	0.334	0.32	37.94	-	38.26	-	59.36	49.36	-21.10	-
5	4.609	0.52	32.73	-	33.25	-	56.00	46.00	-22.75	-
6	13.570	0.79	34.65	-	35.44	-	60.00	50.00	-24.56	-

- 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 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 09, 2008	Dec.08, 2009
HP Pre_Amplifier	8449B	3008A01923	Nov. 10, 2008	Nov. 09, 2009
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 09, 2008	Sep. 08, 2009
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 30, 2008	April 29, 2009
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 09, 2008	Dec. 08, 2009
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2009	Jan. 21, 2010
RF Switches	EMH-011	08009	Oct. 07, 2008	Oct. 06, 2009
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 15, 2008	Aug. 14, 2009
RF Cable	8DFB	STCCAB-30M-1GHz	Oct. 07, 2008	Oct. 06, 2009
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in Open Site No. C.

4. The FCC Site Registration No. is 656396.

5. The VCCI Site Registration No. is R-1626.

6. The CANADA Site Registration No. is IC 7450G-3.

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. 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.

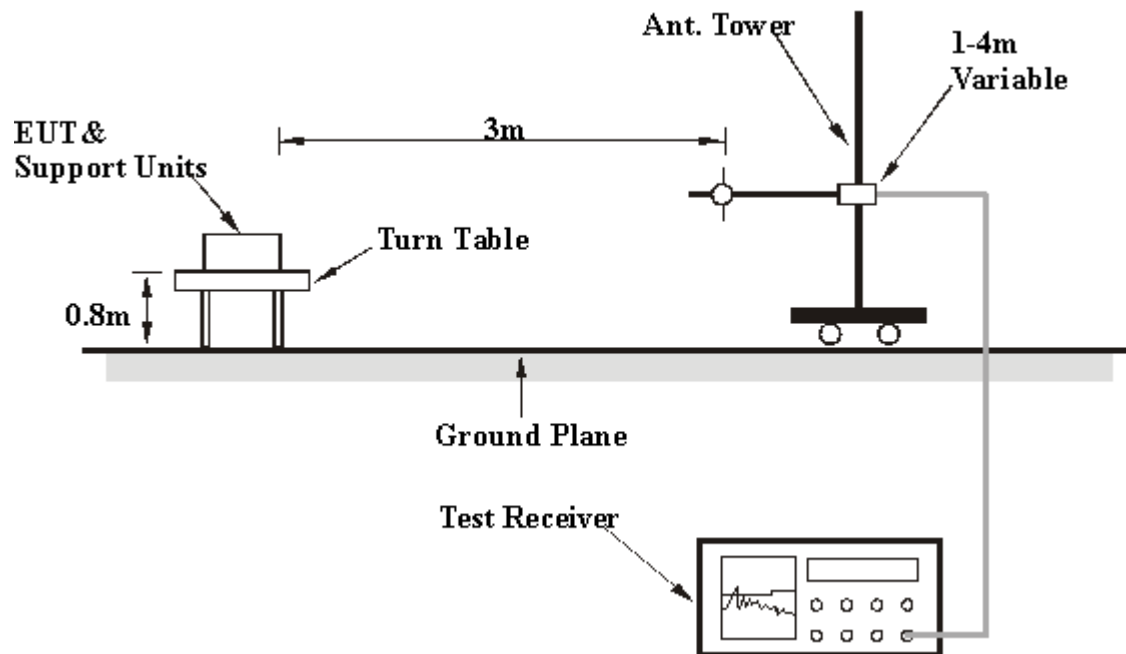
NOTE:

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 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6



A D T

Below 1GHz Test Data

4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA : 802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	157.52	38.87 QP	43.50	-4.63	1.64 H	244	25.05	13.82
2	166.44	41.55 QP	43.50	-1.95	1.57 H	74	28.03	13.52
3	299.82	44.47 QP	46.00	-1.53	1.00 H	100	27.92	16.55
4	399.67	42.68 QP	46.00	-3.32	2.13 H	153	23.93	18.75
5	499.68	40.12 QP	46.00	-5.88	1.55 H	133	18.86	21.26
6	899.41	36.36 QP	46.00	-9.64	1.00 H	255	7.89	28.47
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	33.34	35.88 QP	40.00	-4.12	1.01 V	60	22.27	13.61
2	133.53	35.26 QP	43.50	-8.24	1.00 V	48	20.65	14.61
3	299.75	33.72 QP	46.00	-12.28	1.48 V	307	16.71	17.01
4	399.65	40.67 QP	46.00	-5.33	2.00 V	160	19.54	21.13
5	675.25	32.06 QP	46.00	-13.94	1.55 V	340	5.58	26.48
6	899.41	33.78 QP	46.00	-12.22	1.58 V	226	2.78	31.00

- 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.



A D T

Above 1GHz Test Data

4.2.8 TEST RESULTS

802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2386.00	53.02 PK	74.00	-20.98	1.33 H	57	22.97	30.05
2	2386.00	42.26 AV	54.00	-11.74	1.33 H	57	12.21	30.05
3	*2412.00	102.88 PK			1.30 H	79	72.73	30.15
4	*2412.00	97.81 AV			1.30 H	79	67.66	30.15
5	4824.00	52.48 PK	74.00	-21.52	1.79 H	298	17.02	35.46
6	4824.00	50.10 AV	54.00	-3.90	1.79 H	298	14.64	35.46
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2386.00	62.58 PK	74.00	-11.42	1.24 V	227	32.53	30.05
2	2386.00	47.17 AV	54.00	-6.83	1.24 V	227	17.12	30.05
3	*2412.00	113.15 PK			1.30 V	218	83.00	30.15
4	*2412.00	108.55 AV			1.30 V	218	78.40	30.15
5	4824.00	56.40 PK	74.00	-17.60	1.14 V	232	20.94	35.46
6	4824.00	53.50 AV	54.00	-0.50	1.14 V	232	18.04	35.46

- 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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	101.70 PK			1.25 H	89	71.46	30.24
2	*2437.00	98.30 AV			1.25 H	89	68.06	30.24
3	4874.00	51.39 PK	74.00	-22.61	1.74 H	227	15.84	35.55
4	4874.00	49.18 AV	54.00	-4.82	1.74 H	227	13.63	35.55
5	7311.00	48.51 PK	74.00	-25.49	1.15 H	122	6.47	42.04
6	7311.00	37.51 AV	54.00	-16.49	1.15 H	122	-4.53	42.04
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	113.73 PK			1.33 V	127	83.49	30.24
2	*2437.00	109.22 AV			1.33 V	127	78.98	30.24
3	4874.00	55.98 PK	74.00	-18.02	1.35 V	269	20.43	35.55
4	4874.00	52.89 AV	54.00	-1.11	1.35 V	269	17.34	35.55
5	7311.00	50.80 PK	74.00	-23.20	1.64 V	19	8.76	42.04
6	7311.00	39.20 AV	54.00	-14.80	1.64 V	19	-2.84	42.04

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.



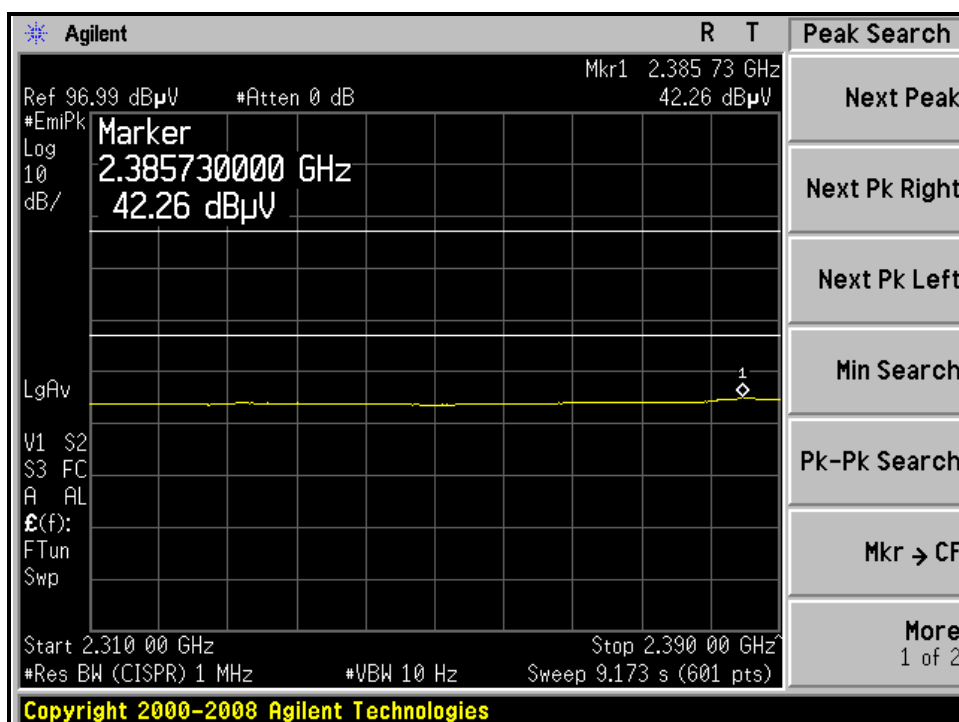
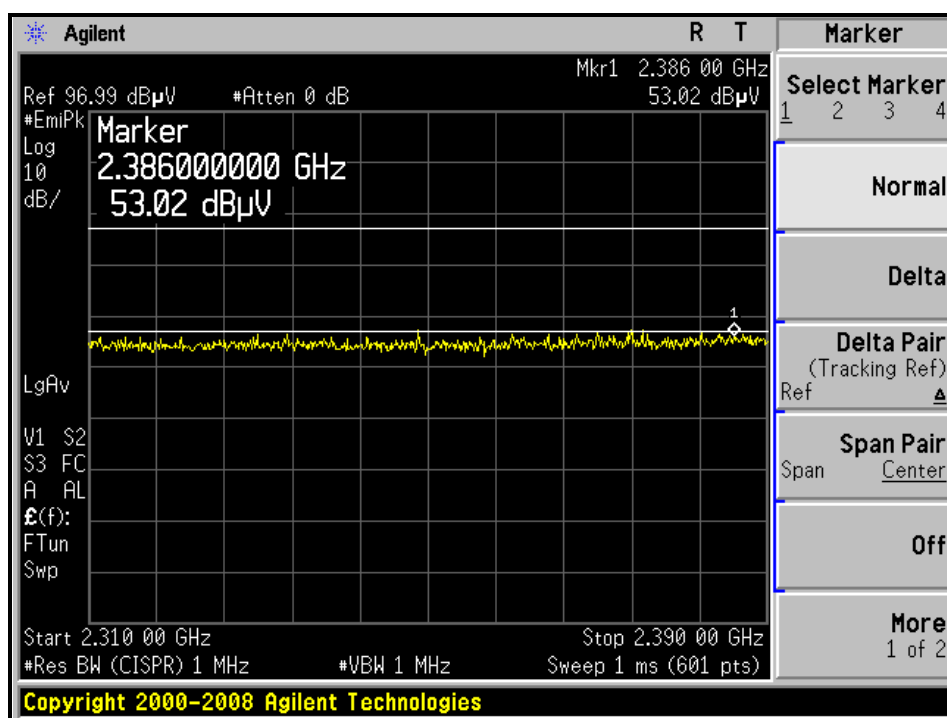
A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.10 PK			1.08 H	209	69.76	30.34
2	*2462.00	96.32 AV			1.08 H	209	65.98	30.34
3	2499.00	56.31 PK	74.00	-17.69	1.09 H	215	25.82	30.49
4	2499.00	42.43 AV	54.00	-11.57	1.09 H	215	11.94	30.49
5	4924.00	51.48 PK	74.00	-22.52	1.19 H	150	15.85	35.63
6	4924.00	48.46 AV	54.00	-5.54	1.19 H	150	12.83	35.63
7	7386.00	48.62 PK	74.00	-25.38	1.30 H	118	6.39	42.23
8	7386.00	39.19 AV	54.00	-14.81	1.30 H	118	-3.04	42.23
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.69 PK			1.00 V	198	82.35	30.34
2	*2462.00	108.47 AV			1.00 V	198	78.13	30.34
3	2488.00	63.53 PK	74.00	-10.47	1.00 V	196	33.09	30.44
4	2488.00	45.294 AV	54.00	-8.17	1.00 V	196	14.85	30.44
5	4924.00	56.27 PK	74.00	-17.73	1.33 V	267	20.64	35.63
6	4924.00	53.50 AV	54.00	-0.50	1.33 V	267	17.87	35.63
7	7386.00	53.20 PK	74.00	-20.80	1.36 V	357	10.97	42.23
8	7386.00	42.70 AV	54.00	-11.30	1.36 V	357	0.47	42.23

- 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.

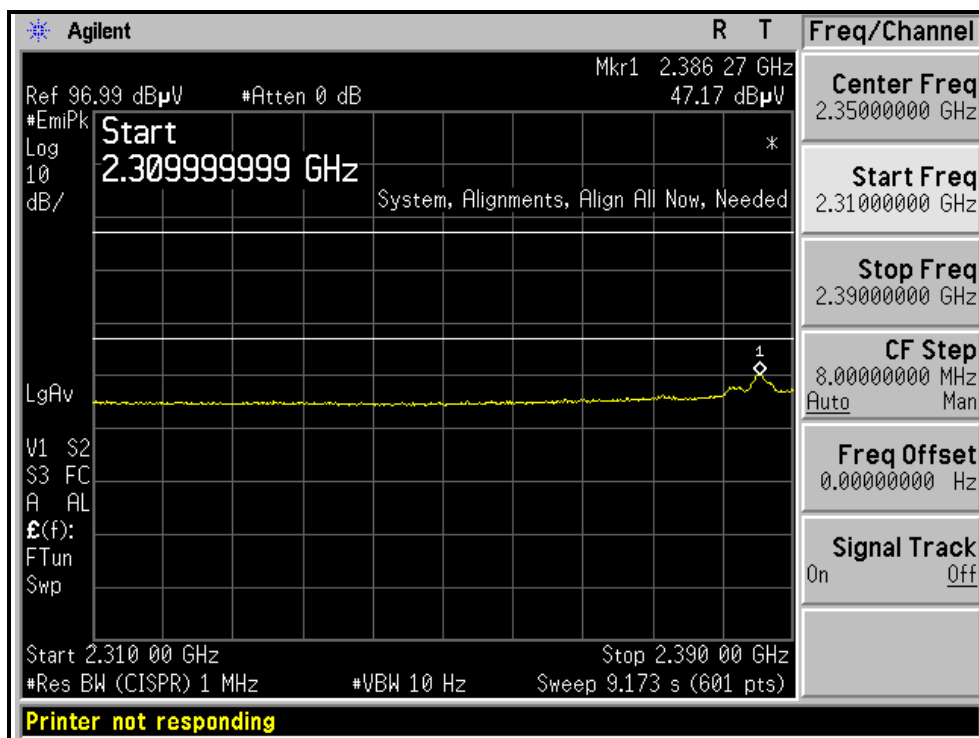
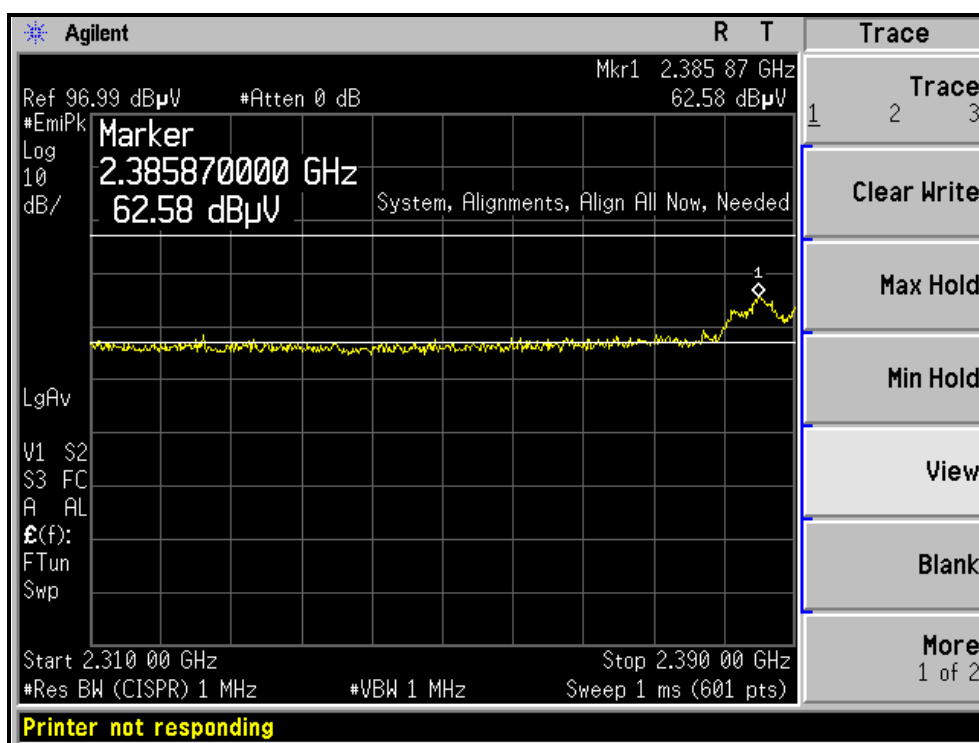
RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL)



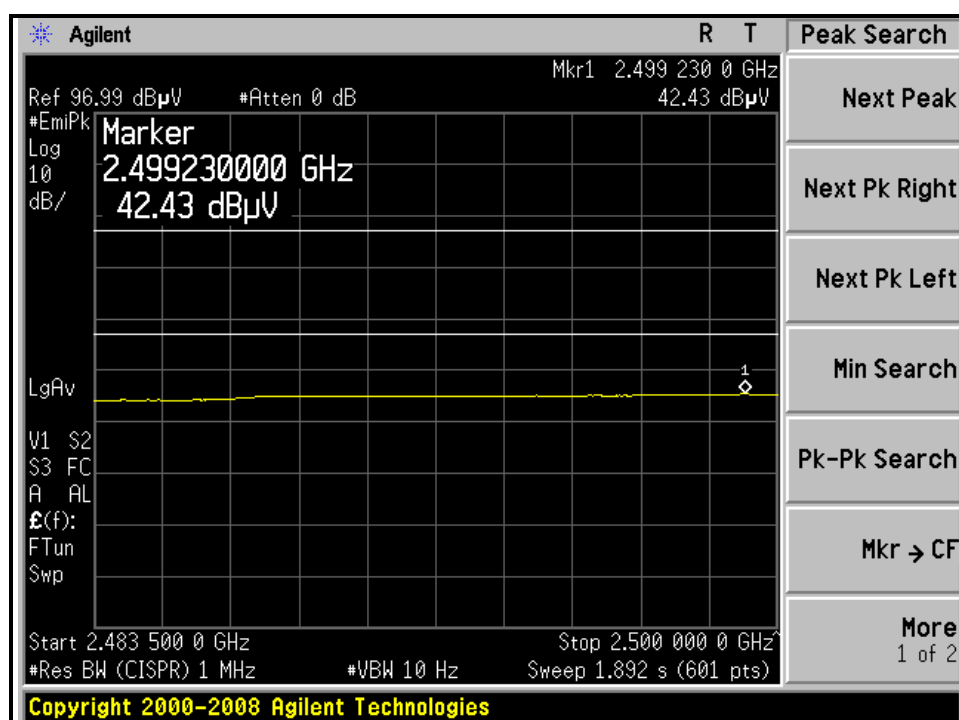
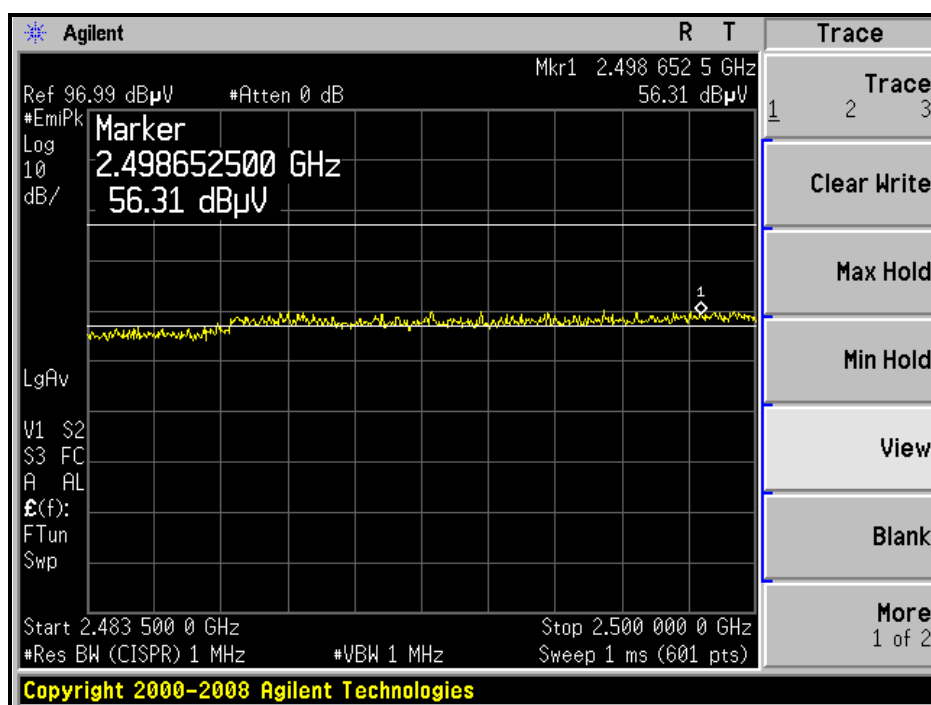


A D T

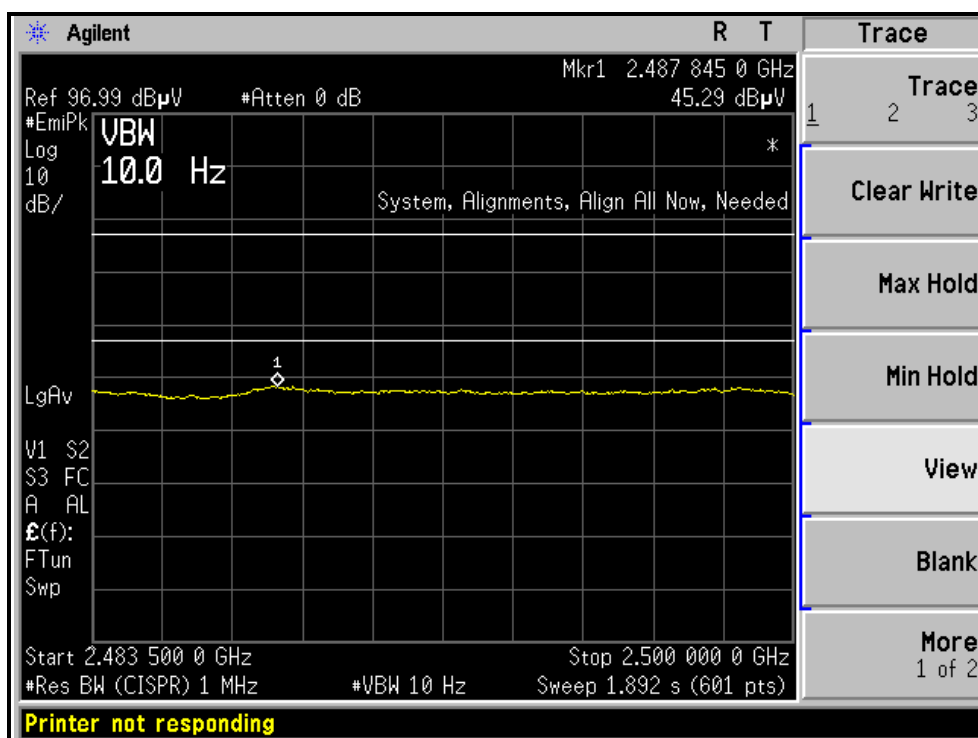
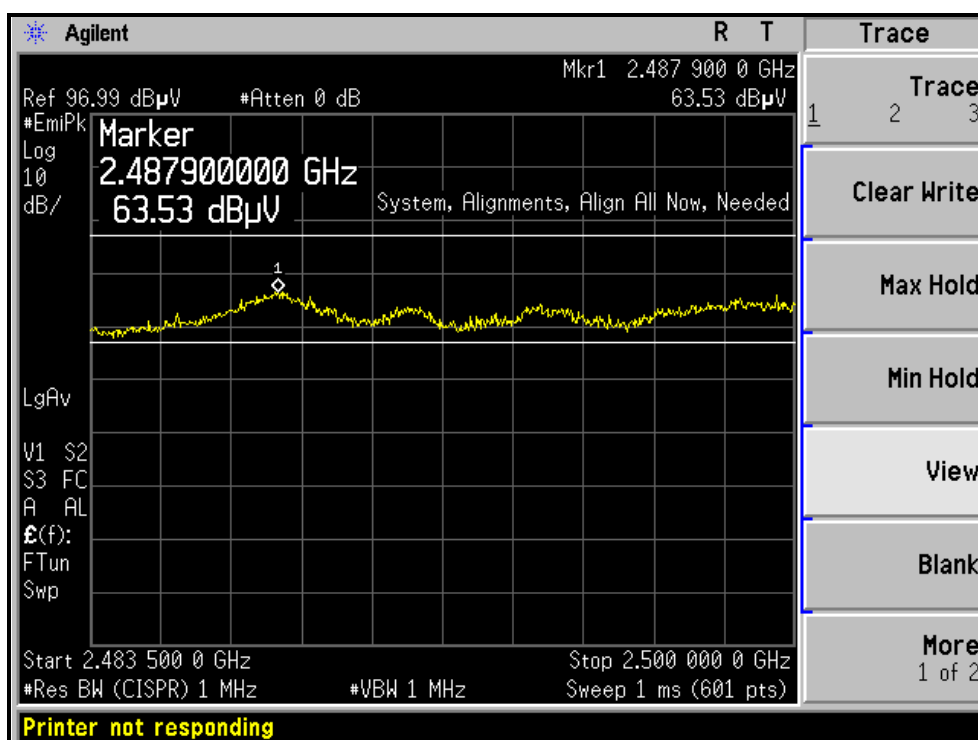
RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL)



RESTRICTED BANDEDGE (802.11b MODE,CH11, HORIZONTAL)



RESTRICTED BANDEDGE (802.11b MODE,CH11, VERTICAL)





A D T

802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.91 PK	74.00	-9.09	1.84 H	236	34.85	30.06
2	2390.00	48.45 AV	54.00	-5.55	1.84 H	236	18.39	30.06
3	*2412.00	107.49 PK			1.89 H	198	77.34	30.15
4	*2412.00	98.06 AV			1.89 H	198	67.91	30.15
5	4824.00	48.60 PK	74.00	-25.40	1.34 H	270	13.14	35.46
6	4824.00	39.42 AV	54.00	-14.58	1.34 H	270	3.96	35.46
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.87 PK	74.00	-1.13	1.34 V	93	42.81	30.06
2	2390.00	52.20 AV	54.00	-1.80	1.34 V	93	22.14	30.06
3	*2412.00	115.37 PK			1.35 V	93	85.22	30.15
4	*2412.00	103.25 AV			1.35 V	93	73.10	30.15
5	4824.00	50.20 PK	74.00	-23.80	2.19 V	350	14.74	35.46
6	4824.00	35.80 AV	54.00	-18.20	2.19 V	350	0.34	35.46

- 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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	106.80 PK			1.80 H	279	76.56	30.24
2	*2437.00	96.20 AV			1.80 H	279	65.96	30.24
3	4874.00	51.78 PK	74.00	-22.22	1.30 H	249	16.23	35.55
4	4874.00	40.73 AV	54.00	-13.27	1.30 H	249	5.18	35.55
5	7311.00	54.07 PK	74.00	-19.93	1.30 H	120	12.03	42.04
6	7311.00	41.29 AV	54.00	-12.71	1.30 H	120	-0.75	42.04
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	116.03 PK			1.00 V	139	85.79	30.24
2	*2437.00	104.07 AV			1.00 V	139	73.83	30.24
3	4874.00	52.75 PK	74.00	-21.25	1.66 V	326	17.20	35.55
4	4874.00	37.42 AV	54.00	-16.58	1.66 V	326	1.87	35.55
5	7311.00	56.90 PK	74.00	-17.10	1.06 V	50	14.86	42.04
6	7311.00	41.20 AV	54.00	-12.80	1.06 V	50	-0.84	42.04

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.



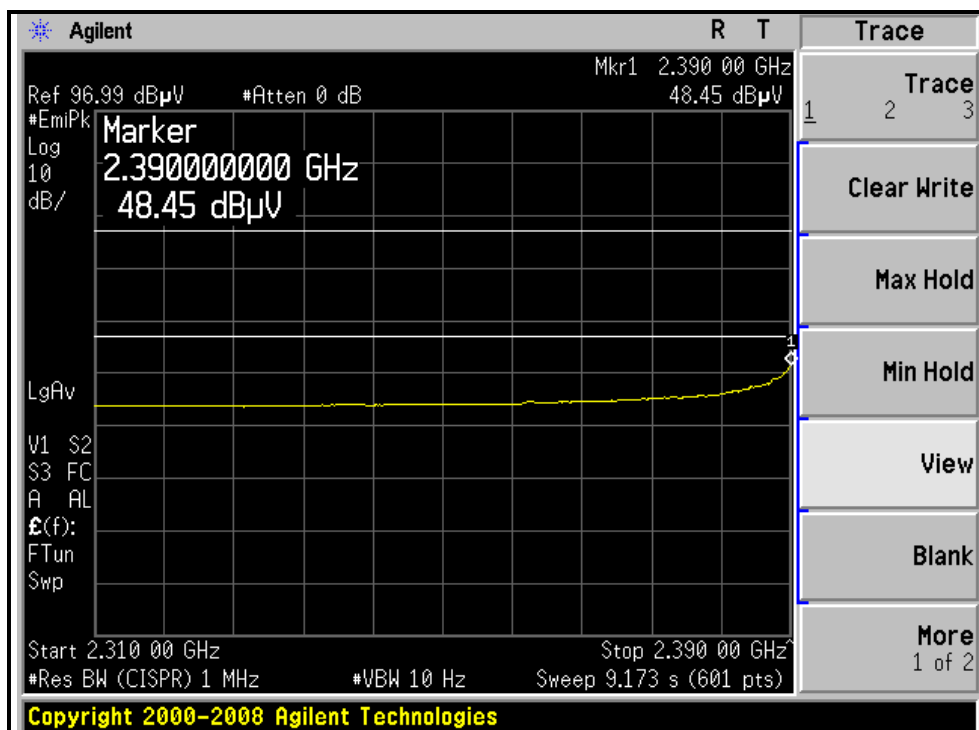
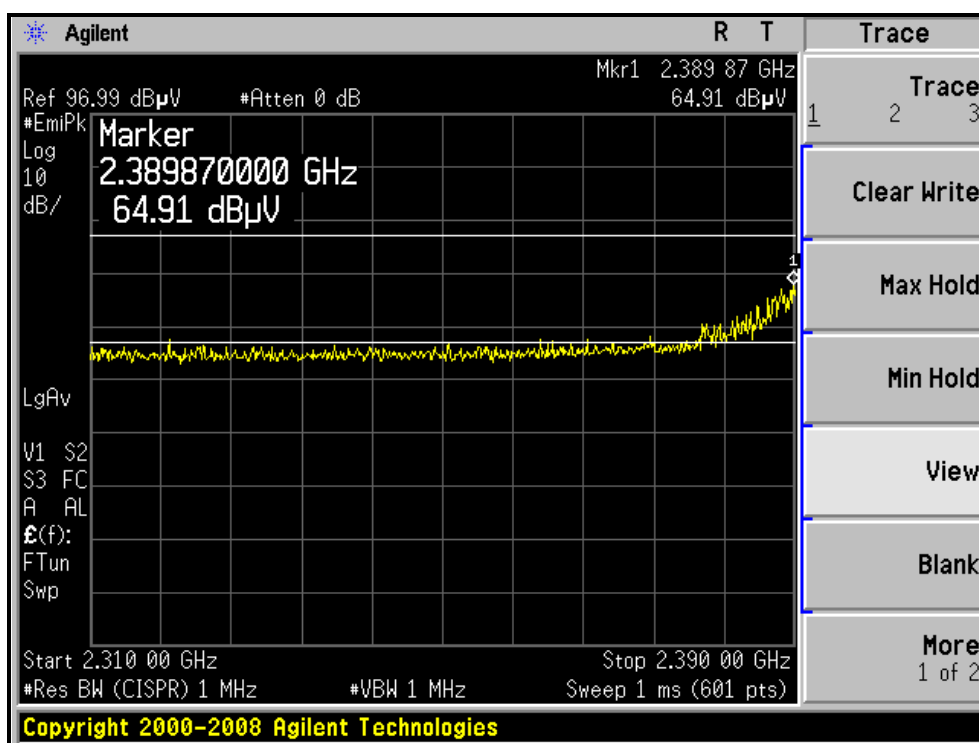
A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.48 PK			1.90 H	207	74.14	30.34
2	*2462.00	94.99 AV			1.90 H	207	64.65	30.34
3	2483.50	53.85 PK	74.00	-20.15	1.88 H	245	23.42	30.43
4	2483.50	43.60 AV	54.00	-10.40	1.88 H	245	13.17	30.43
5	4924.00	48.62 PK	74.00	-25.38	1.60 H	147	12.99	35.63
6	4924.00	37.40 AV	54.00	-16.60	1.60 H	147	1.77	35.63
7	7386.00	49.62 PK	74.00	-24.38	1.77 H	189	7.39	42.23
8	7386.00	38.74 AV	54.00	-15.26	1.77 H	189	-3.49	42.23
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.65 PK			1.52 V	250	83.31	30.34
2	*2462.00	101.56 AV			1.52 V	250	71.22	30.34
3	2483.50	71.67 PK	74.00	-2.33	1.52 V	98	41.24	30.43
4	2483.50	49.30 AV	54.00	-4.70	1.52 V	98	8.87	30.43
5	4924.00	50.00 PK	74.00	-24.00	1.95 V	311	14.37	35.63
6	4924.00	35.40 AV	54.00	-18.60	1.95 V	311	-0.23	35.63
7	7386.00	51.10 PK	74.00	-22.90	1.35 V	12	8.87	42.23
8	7386.00	38.50 AV	54.00	-15.50	1.35 V	12	-3.73	42.23

- 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.

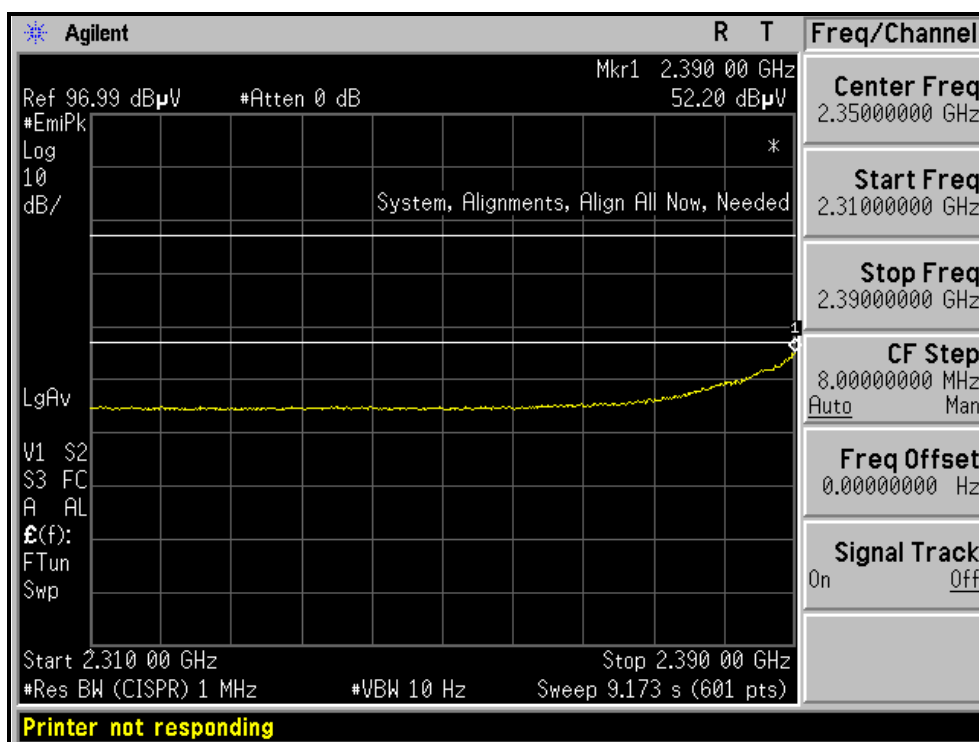
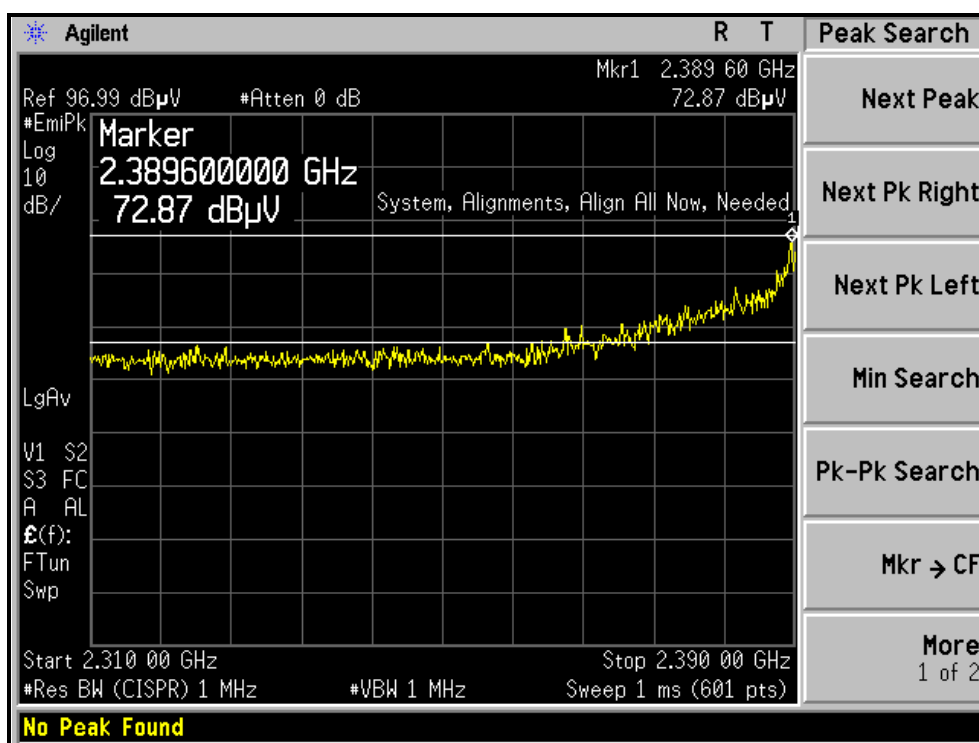
RESTRICTED BANDEDGE (802.11g MODE,CH1, HORIZONTAL)



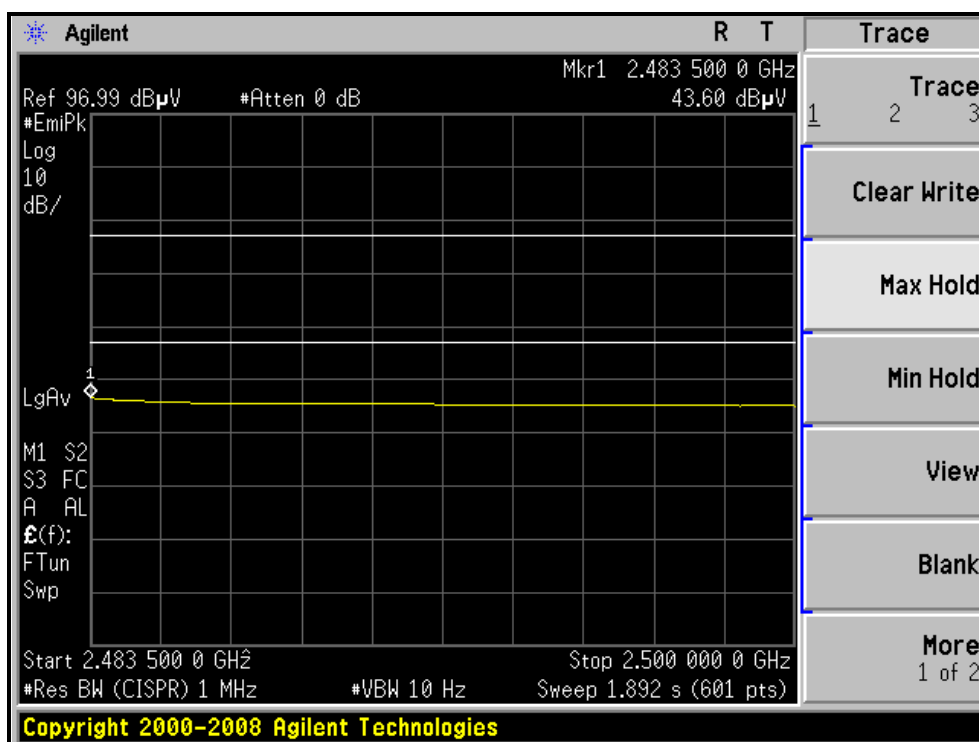
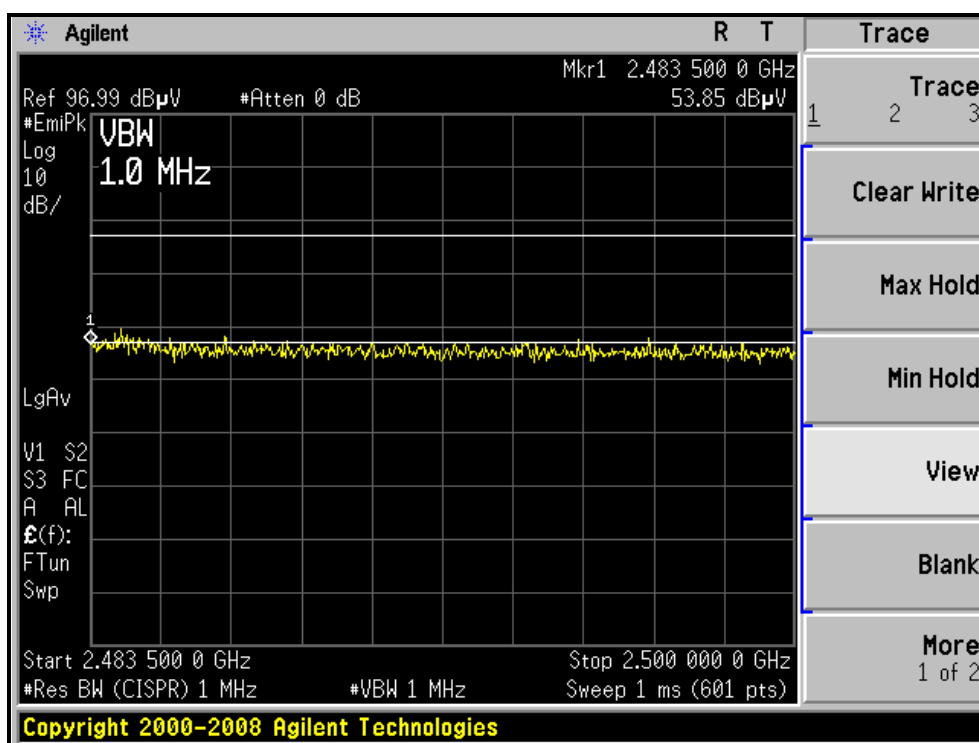


A D T

RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL)



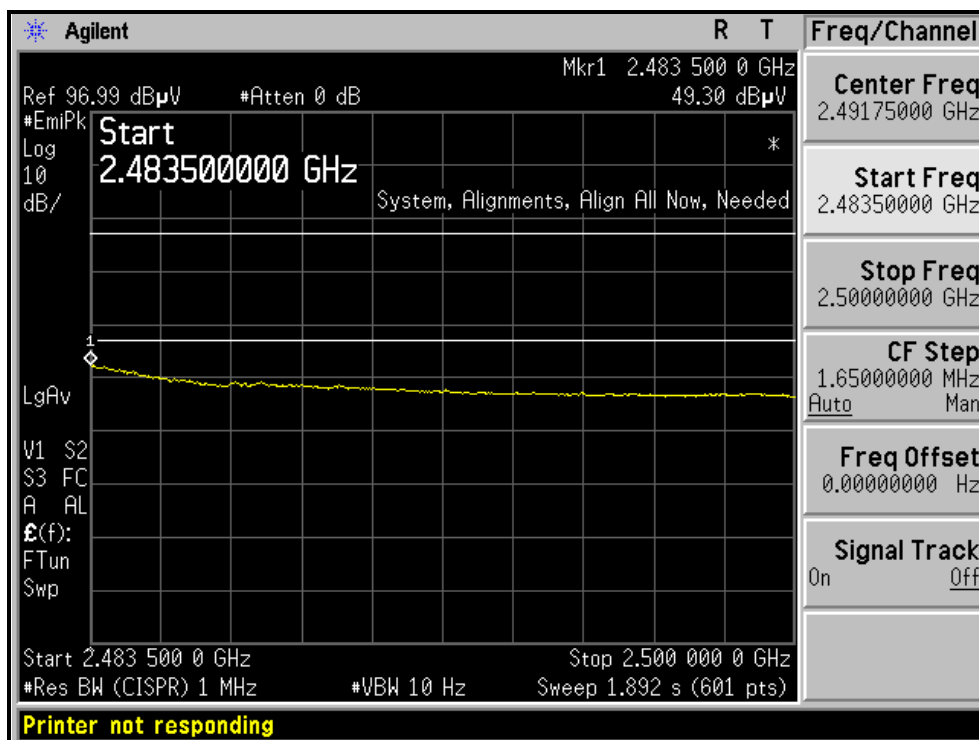
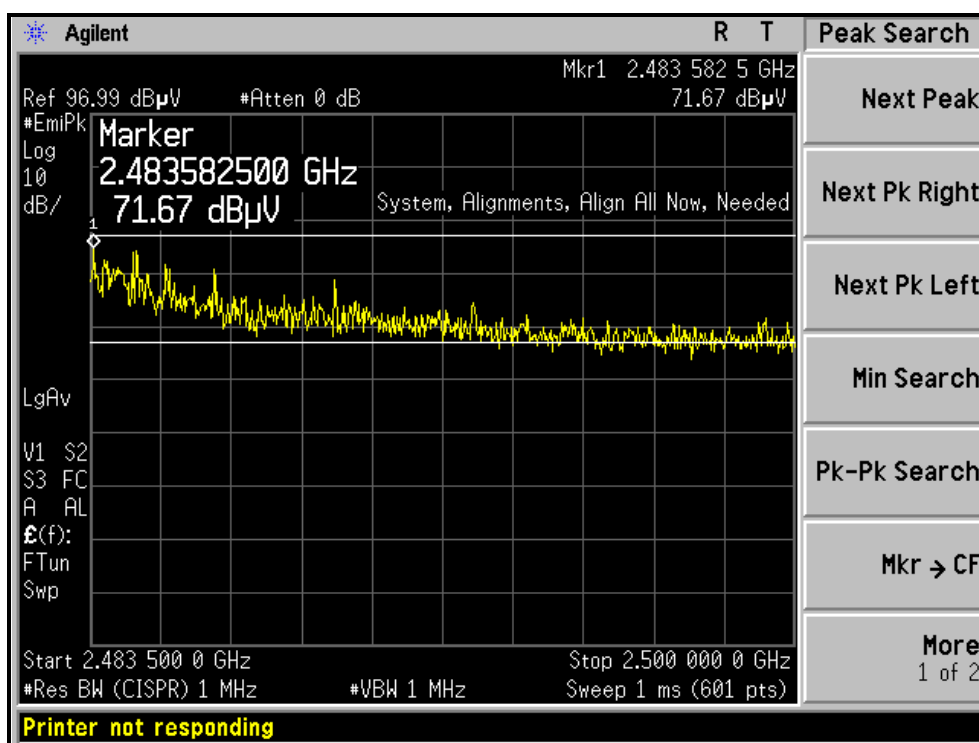
RESTRICTED BANDEDGE (802.11g MODE,CH11, HORIZONTAL)





A D T

RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL)





A D T

DRAFT 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.59 PK	74.00	-5.41	1.86 H	237	38.53	30.06
2	2390.00	51.27 AV	54.00	-2.73	1.86 H	237	21.21	30.06
3	*2412.00	107.70 PK			1.77 H	206	77.55	30.15
4	*2412.00	97.91 AV			1.77 H	206	67.76	30.15
5	4824.00	52.95 PK	74.00	-21.05	1.90 H	263	17.49	35.46
6	4824.00	40.50 AV	54.00	-13.50	1.90 H	263	5.04	35.46
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.53PK	74.00	-1.47	1.29 V	196	42.47	30.06
2	2390.00	52.41 AV	54.00	-1.59	1.29 V	196	22.35	30.06
3	*2412.00	114.22 PK			1.28 V	218	84.07	30.15
4	*2412.00	102.02 AV			1.28 V	218	71.87	30.15
5	4824.00	52.70 PK	74.00	-21.30	1.37 V	0	17.24	35.46
6	4824.00	37.10 AV	54.00	-16.90	1.37 V	0	1.64	35.46

- 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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	107.20 PK			1.77 H	290	76.96	30.24
2	*2437.00	99.40 AV			1.77 H	290	69.16	30.24
3	4874.00	52.18 PK	74.00	-21.82	1.52 H	128	16.63	35.55
4	4874.00	41.46 AV	54.00	-12.54	1.52 H	128	5.91	35.55
5	7311.00	53.16 PK	74.00	-20.84	1.33 H	118	11.12	42.04
6	7311.00	40.70 AV	54.00	-13.30	1.33 H	118	-1.34	42.04
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	116.10 PK			1.64 V	76	85.86	30.24
2	*2437.00	105.42 AV			1.64 V	76	75.18	30.24
3	4874.00	53.80 PK	74.00	-20.20	1.33 V	0	18.25	35.55
4	4874.00	39.00 AV	54.00	-15.00	1.33 V	0	3.45	35.55
5	7311.00	58.70 PK	74.00	-15.30	1.48 V	318	16.66	42.04
6	7311.00	41.20 AV	54.00	-12.80	1.48 V	318	-0.84	42.04

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.



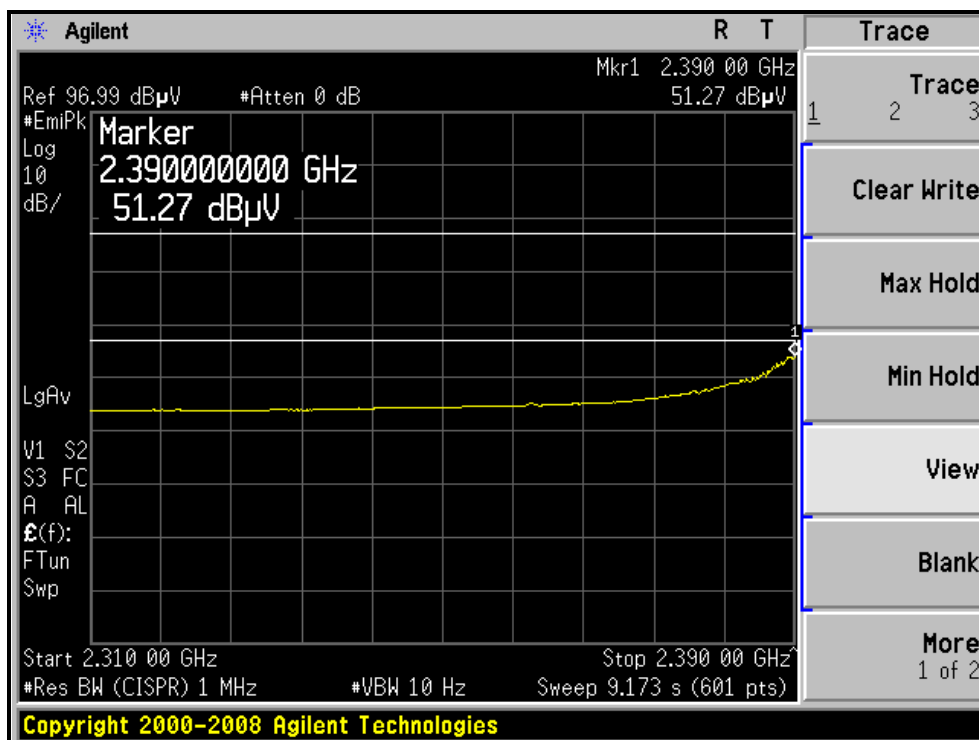
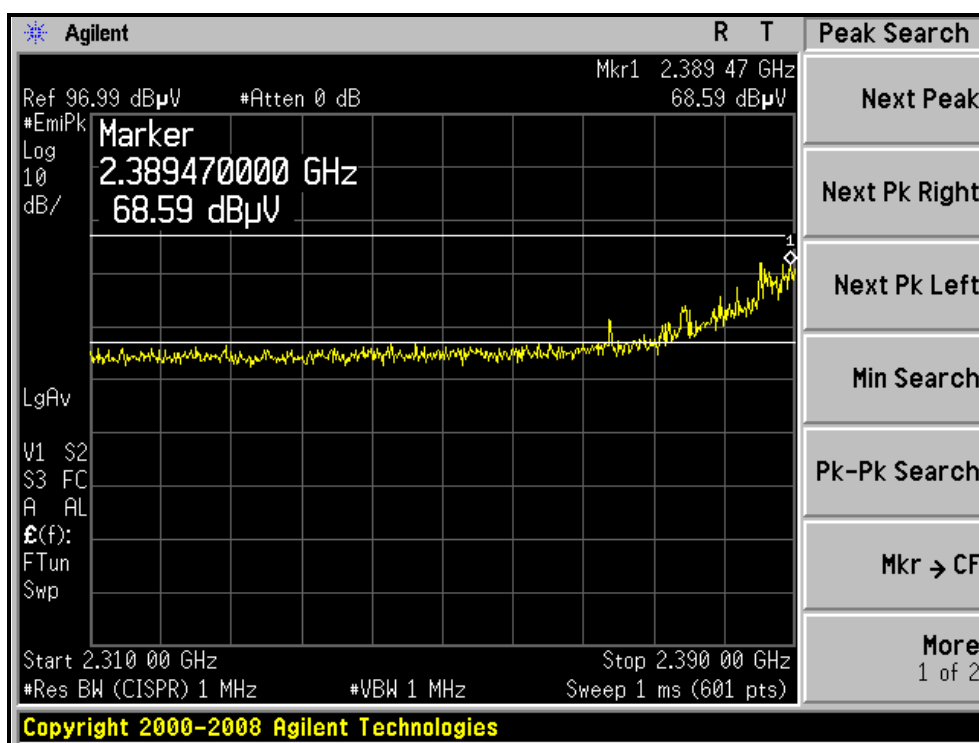
A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.40 PK			1.72 H	208	76.06	30.34
2	*2462.00	95.53 AV			1.72 H	208	65.19	30.34
3	2483.50	67.64 PK	74.00	-6.36	1.89 H	230	37.21	30.43
4	2483.50	45.06 AV	54.00	-8.94	1.89 H	230	14.63	30.43
5	4924.00	49.81 PK	74.00	-24.19	1.45 H	148	14.18	35.63
6	4924.00	38.22 AV	54.00	-15.78	1.45 H	148	2.59	35.63
7	7386.00	49.51 PK	74.00	-24.49	1.50 H	277	7.28	42.23
8	7386.00	37.20 AV	54.00	-16.80	1.50 H	277	-5.03	42.23
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.12 PK			1.00 V	196	82.78	30.34
2	*2462.00	101.14 AV			1.00 V	196	70.80	30.34
3	2483.50	73.04 PK	74.00	-0.96	1.20 V	217	42.61	30.43
4	2483.50	51.17AV	54.00	-2.83	1.20 V	217	20.74	30.43
5	4924.00	50.30 PK	74.00	-23.70	1.35 V	1	14.67	35.63
6	4924.00	35.60 AV	54.00	-18.40	1.35 V	1	-0.03	35.63
7	7386.00	51.90 PK	74.00	-22.10	1.45 V	326	9.67	42.23
8	7386.00	36.70 AV	54.00	-17.30	1.45 V	326	-5.53	42.23

- 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.

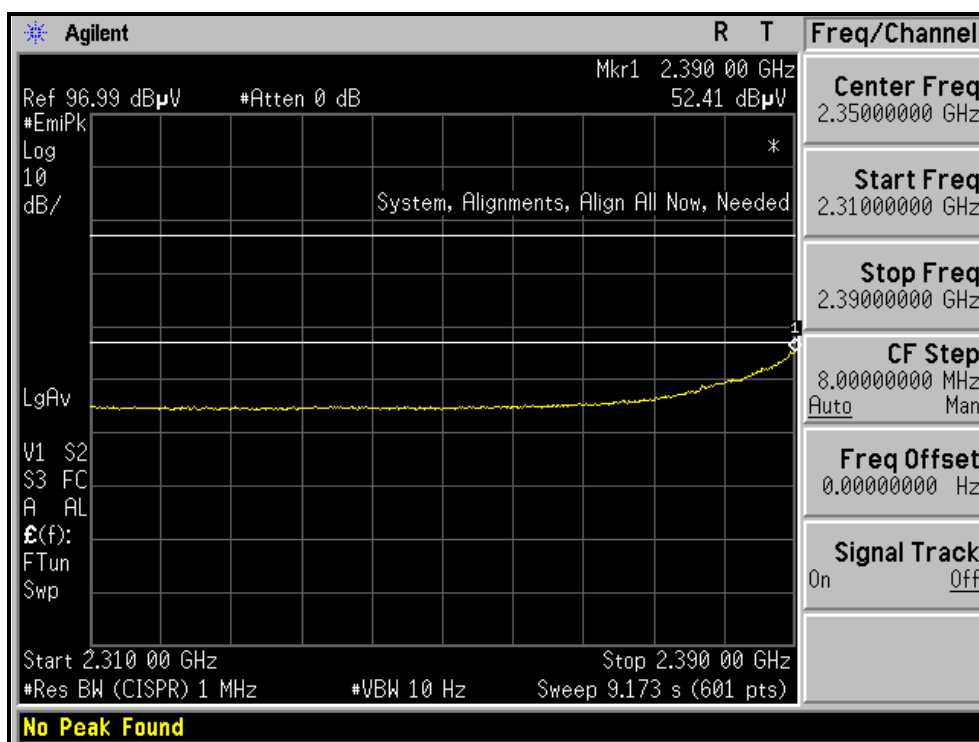
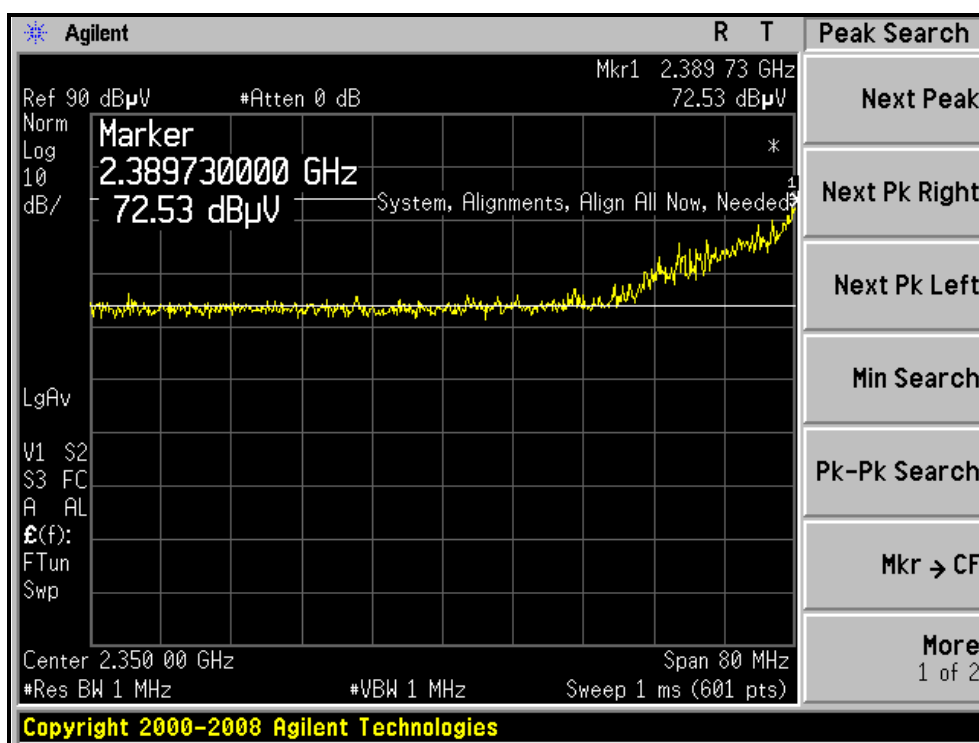
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH1, HORIZONTAL)





A D T

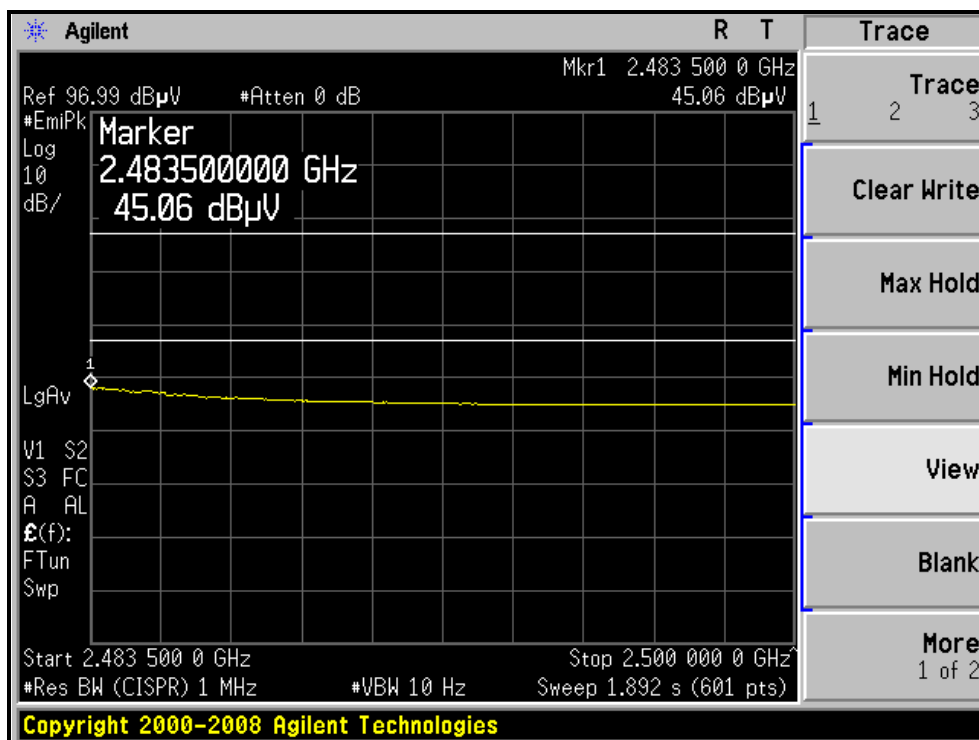
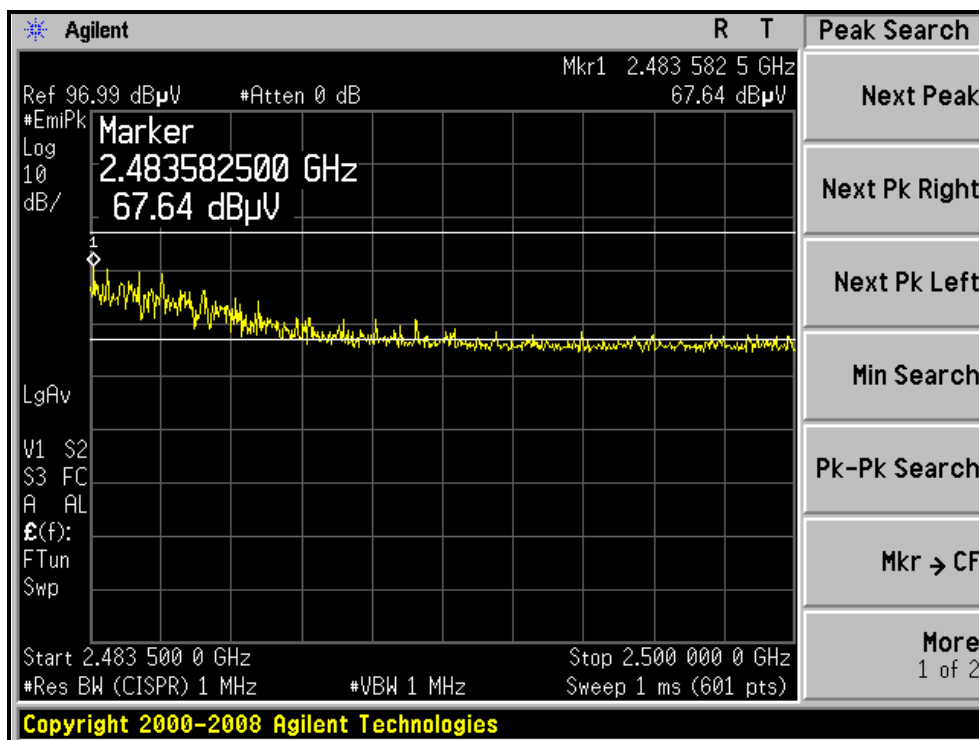
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH1, VERTICAL)





A D T

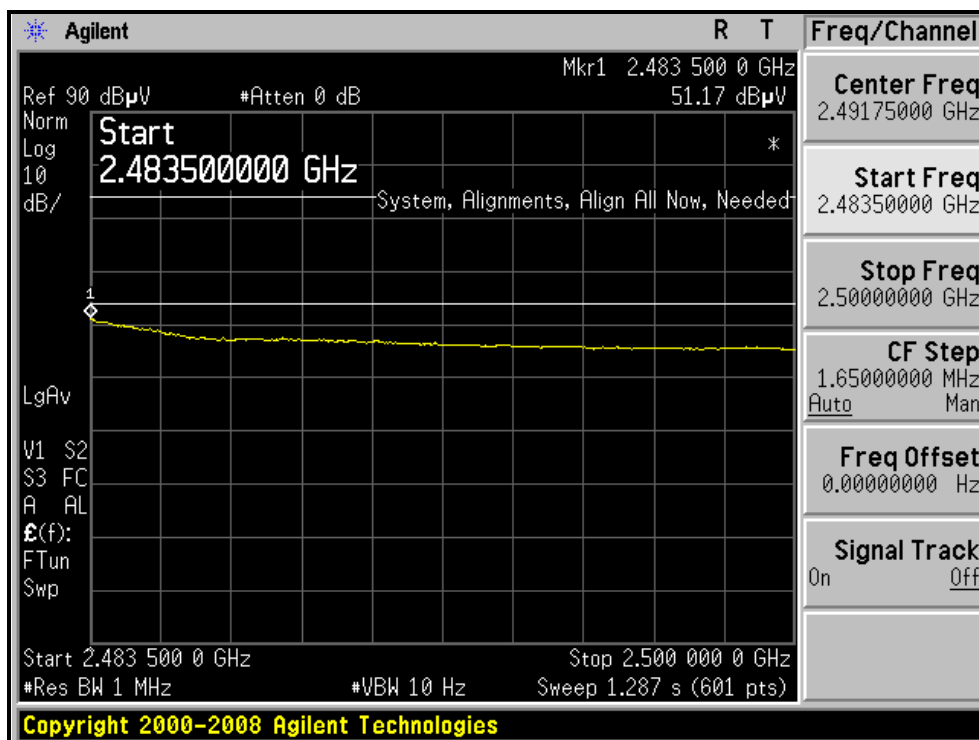
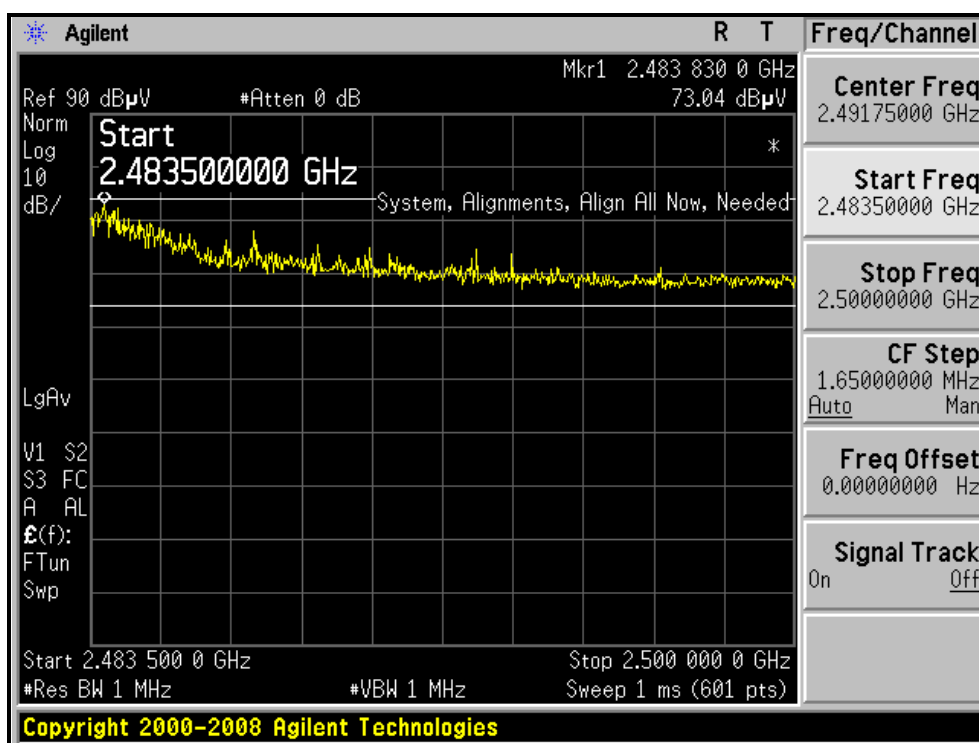
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH11, HORIZONTAL)





A D T

RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH11, VERTICAL)





A D T

DRAFT 802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.72 PK	74.00	-10.28	1.90 H	247	33.66	30.06
2	2390.00	48.14 AV	54.00	-5.86	1.90 H	247	18.08	30.06
3	*2422.00	99.76 PK			1.92 H	303	69.57	30.19
4	*2422.00	89.90 AV			1.92 H	303	59.71	30.19
5	4844.00	48.60 PK	74.00	-25.40	1.84 H	154	13.10	35.50
6	4844.00	37.20 AV	54.00	-16.80	1.84 H	154	1.70	35.50
7	7266.00	45.93 PK	74.00	-28.07	1.30 H	21	4.00	41.93
8	7266.00	35.90 AV	54.00	-18.10	1.30 H	21	-6.03	41.93
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.77 PK	74.00	-3.23	1.35 V	261	40.71	30.06
2	2390.00	52.51 AV	54.00	-1.49	1.35 V	261	22.45	30.06
3	*2422.00	108.16 PK			1.61 V	76	77.97	30.19
4	*2422.00	95.40 AV			1.61 V	76	65.21	30.19
5	4844.00	46.40 PK	74.00	-27.60	1.39 V	1	10.90	35.50
6	4844.00	33.00 AV	54.00	-21.00	1.39 V	1	-2.50	35.50
7	7266.00	49.70 PK	74.00	-24.30	1.34 V	3	7.77	41.93
8	7266.00	36.60 AV	54.00	-17.40	1.34 V	3	-5.33	41.93

- 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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.30 PK	74.00	-5.70	1.87 H	241	38.24	30.06
2	2390.00	50.29 AV	54.00	-3.71	1.87 H	241	20.23	30.06
3	*2437.00	105.35 PK			1.89 H	274	75.11	30.24
4	*2437.00	95.89 AV			1.89 H	274	65.65	30.24
5	2483.50	67.08 PK	74.00	-6.92	1.87 H	42	36.65	30.43
6	2483.50	49.77 AV	54.00	-4.23	1.87 H	42	19.34	30.43
7	4874.00	53.73 PK	74.00	-20.27	1.51 H	267	18.18	35.55
8	4874.00	41.26 AV	54.00	-12.74	1.51 H	267	5.71	35.55
9	7311.00	46.09 PK	74.00	-27.91	1.70 H	288	4.05	42.04
10	7311.00	35.10 AV	54.00	-18.90	1.70 H	288	-6.94	42.04
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.64 PK	74.00	-2.36	1.28 V	114	41.58	30.06
2	2390.00	53.50 AV	54.00	-0.50	1.28 V	114	23.44	30.06
3	*2437.00	113.30 PK			1.65 V	73	83.06	30.24
4	*2437.00	101.30 AV			1.65 V	73	71.06	30.24
5	2483.50	73.50 PK	74.00	-0.50	1.54 V	325	43.07	30.43
6	2483.50	53.30 AV	54.00	-0.70	1.54 V	325	22.87	30.43
7	4874.00	53.11 PK	74.00	-20.89	1.35 V	2	17.56	35.55
8	4874.00	37.20 AV	54.00	-16.80	1.35 V	2	1.65	35.55
9	7311.00	55.80 PK	74.00	-18.20	1.53 V	0	13.76	42.04
10	7311.00	41.30 AV	54.00	-12.70	1.53 V	0	-0.74	42.04

- 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.



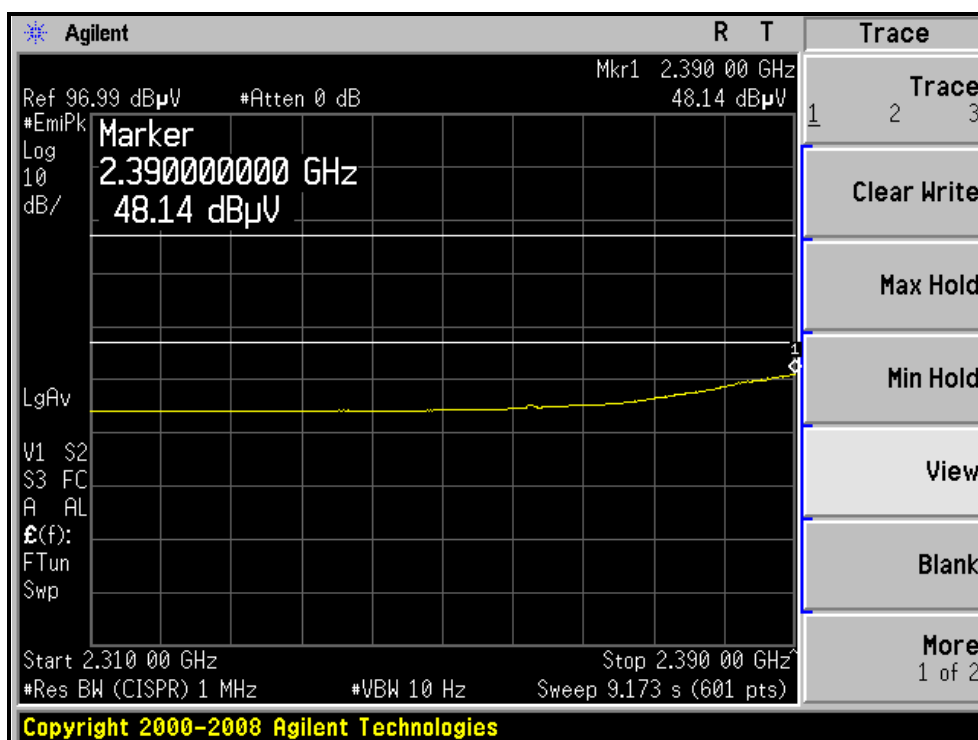
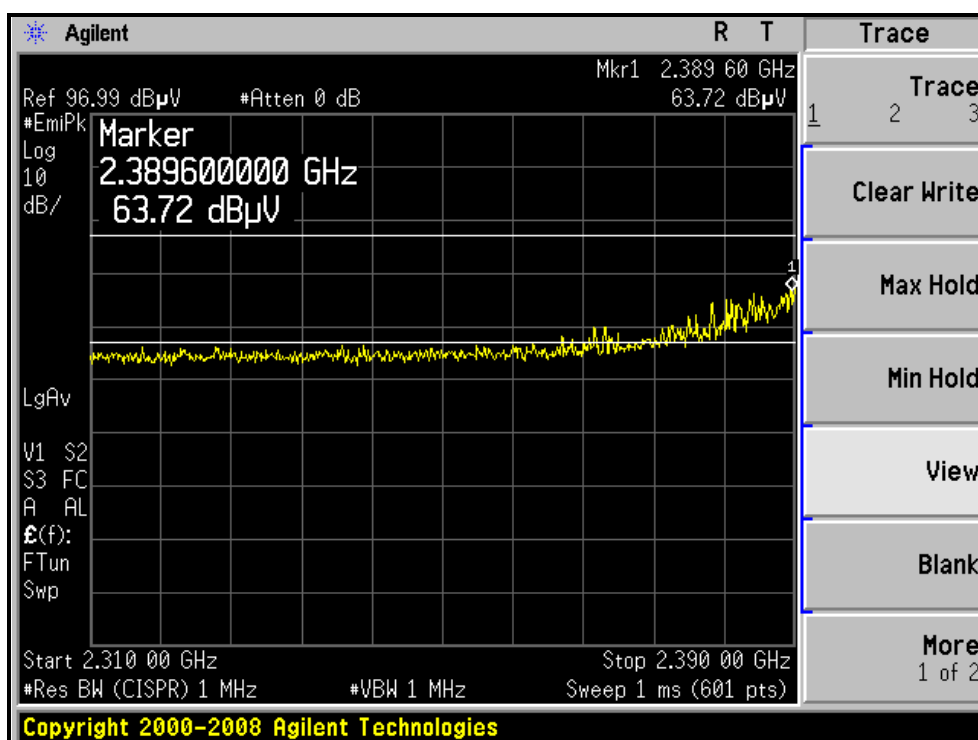
A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Wen Yu

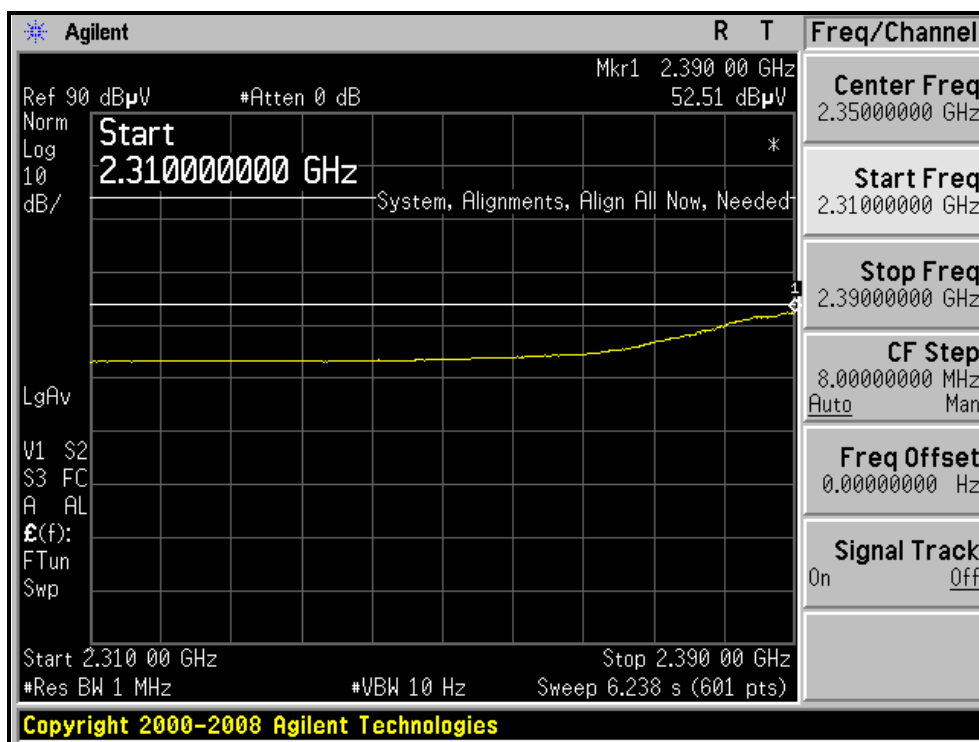
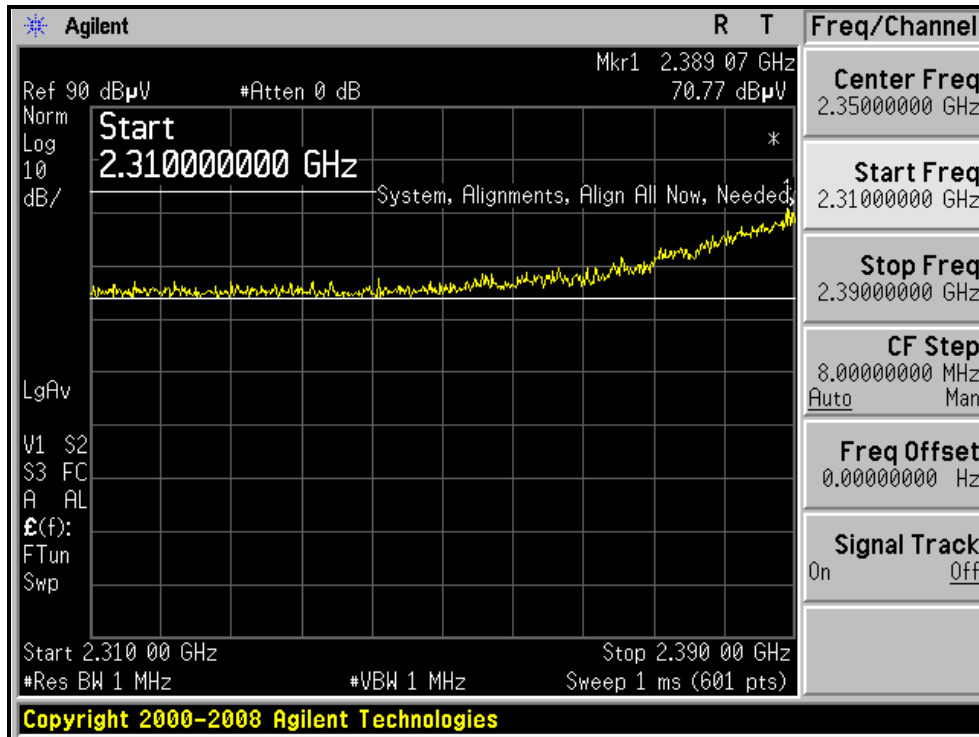
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	100.08 PK			1.71 H	258	69.78	30.30
2	*2452.00	90.30 AV			1.71 H	258	60.00	30.30
3	2483.50	67.26 PK	74.00	-6.74	1.71 H	227	36.83	30.43
4	2483.50	46.14 AV	54.00	-7.86	1.71 H	227	15.71	30.43
5	4904.00	47.90 PK	74.00	-26.10	1.50 H	170	12.30	35.60
6	4904.00	35.60 AV	54.00	-18.40	1.50 H	170	0.00	35.60
7	7356.00	50.40 PK	74.00	-23.60	1.80 H	29	8.24	42.16
8	7356.00	37.80 AV	54.00	-16.20	1.80 H	29	-4.36	42.16
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	108.00 PK			1.64 V	73	77.70	30.30
2	*2452.00	96.30 AV			1.64 V	73	66.00	30.30
3	2483.50	73.49 PK	74.00	-0.51	1.29 V	92	43.06	30.43
4	2483.50	52.95 AV	54.00	-1.05	1.29 V	92	22.52	30.43
5	4904.00	47.20 PK	74.00	-26.80	1.34 V	0	11.60	35.60
6	4904.00	33.60 AV	54.00	-20.40	1.34 V	0	-2.00	35.60
7	7356.00	50.50 PK	74.00	-23.50	1.27 V	5	8.34	42.16
8	7356.00	37.20 AV	54.00	-16.80	1.27 V	5	-4.96	42.16

- 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.

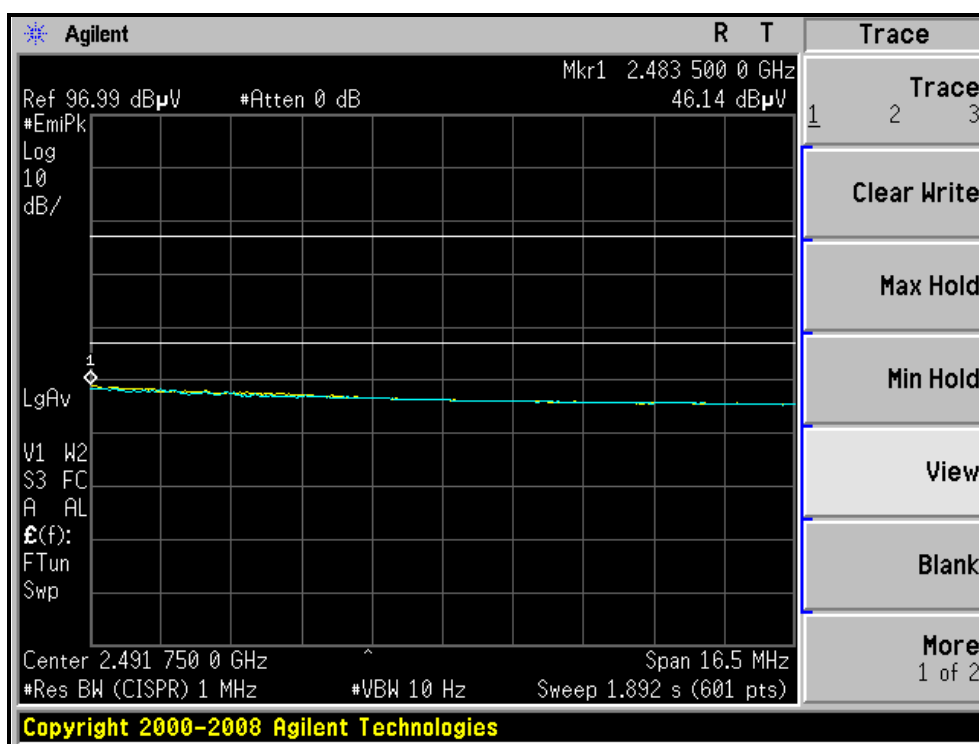
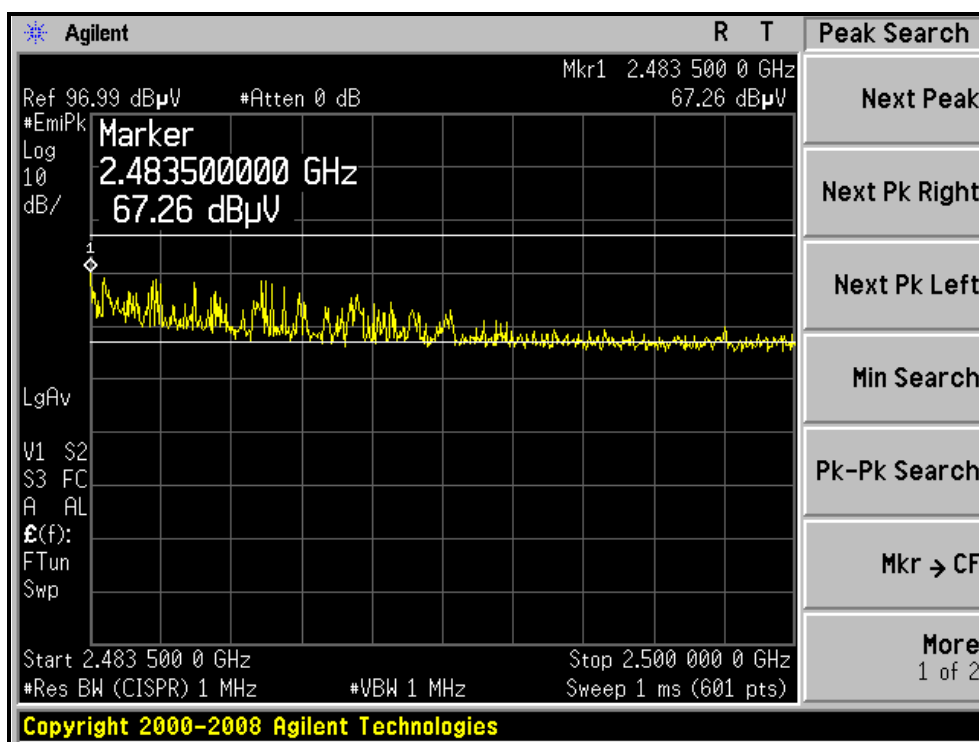
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH1, HORIZONTAL)



RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH1, VERTICAL)



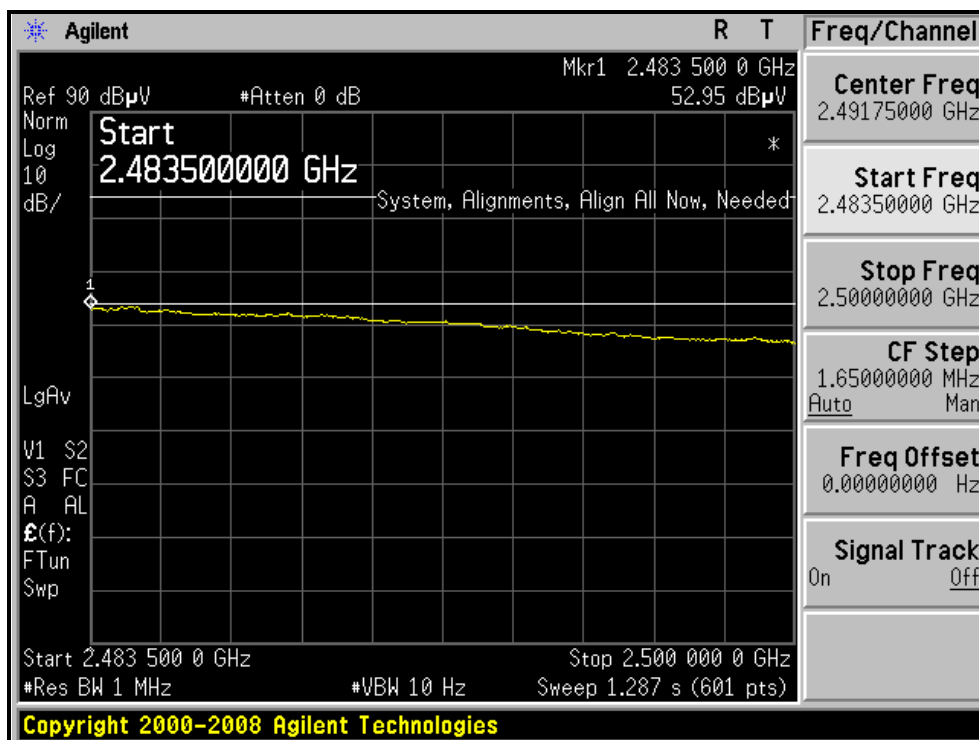
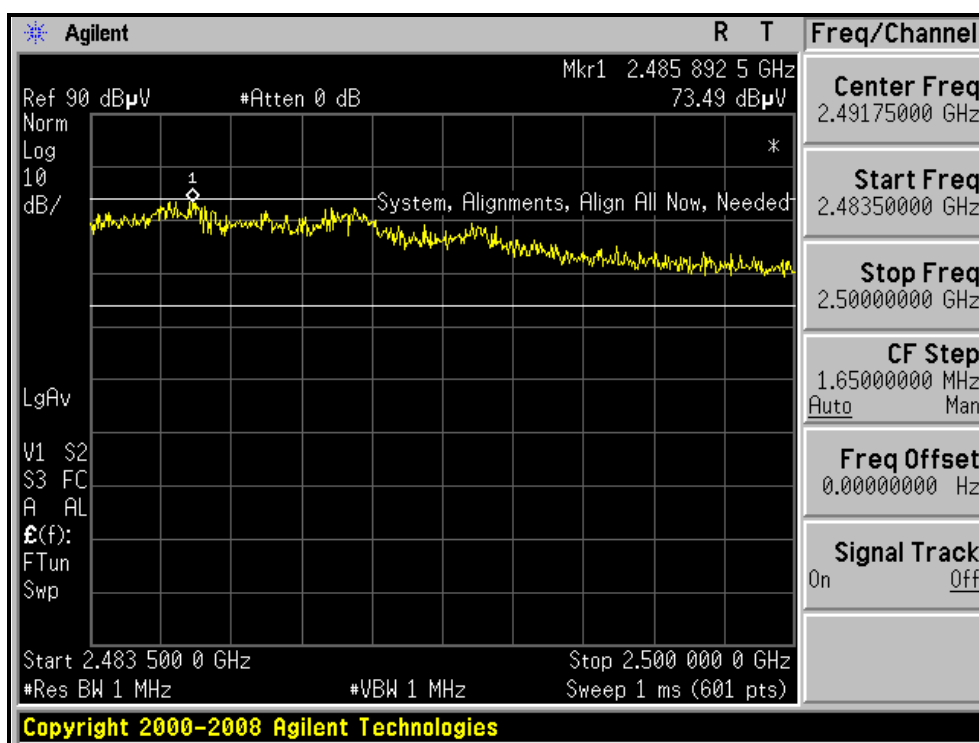
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH7, HORIZONTAL)





A D T

RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH7, VERTICAL)



4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

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

4.3.3 TEST PROCEDURE

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

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 lowest, middle and highest channel frequencies individually.

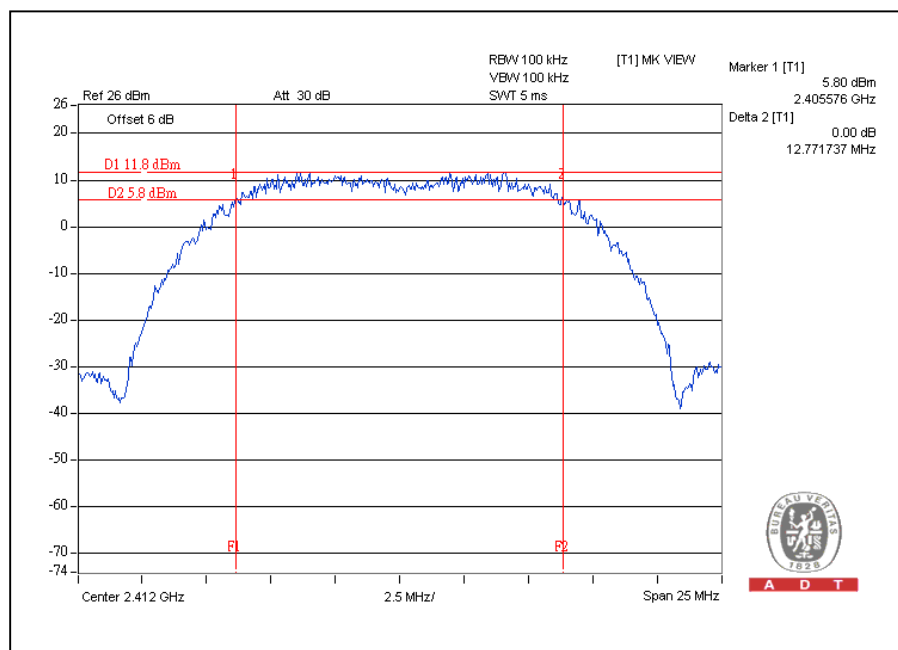
4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

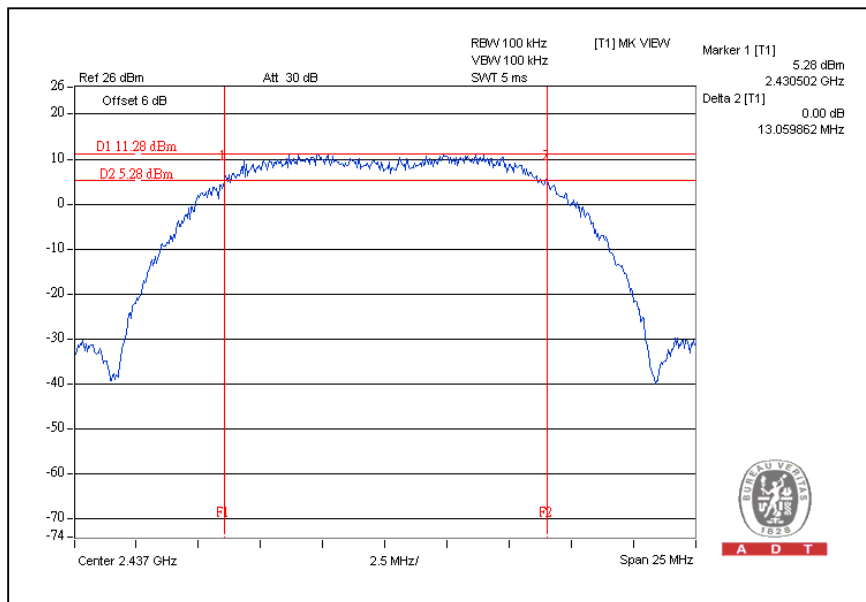
MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	12.77	0.5	PASS
6	2437	13.06	0.5	PASS
11	2462	13.26	0.5	PASS

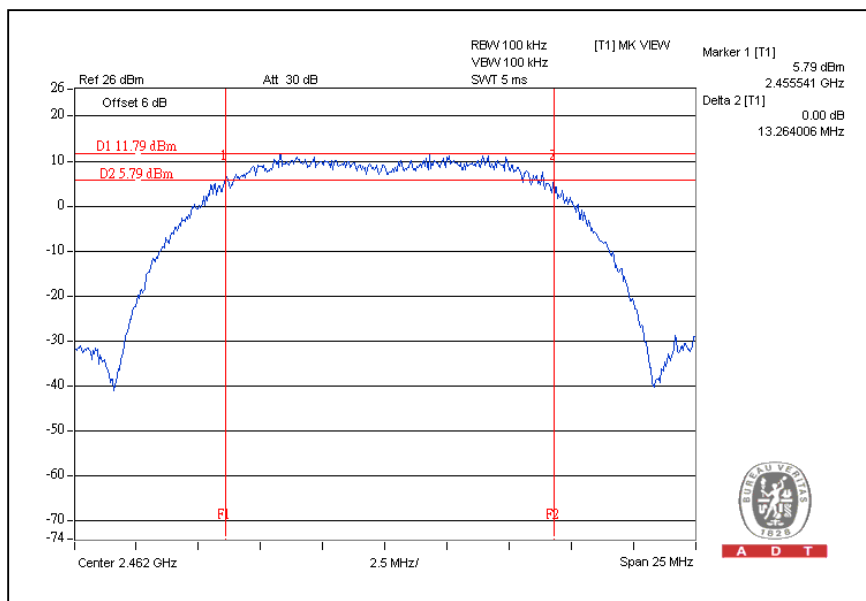
CH1



CH6



CH11

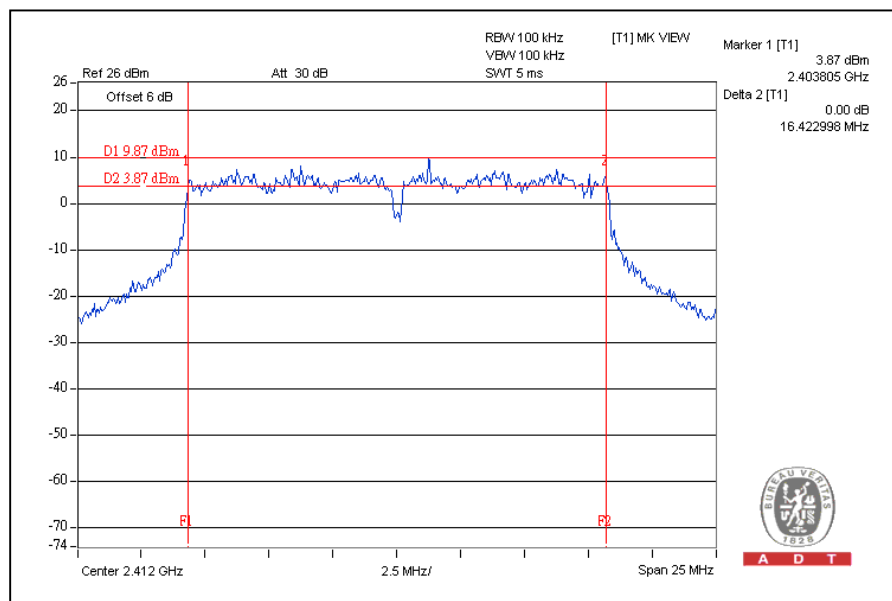


802.11g OFDM MODULATION:

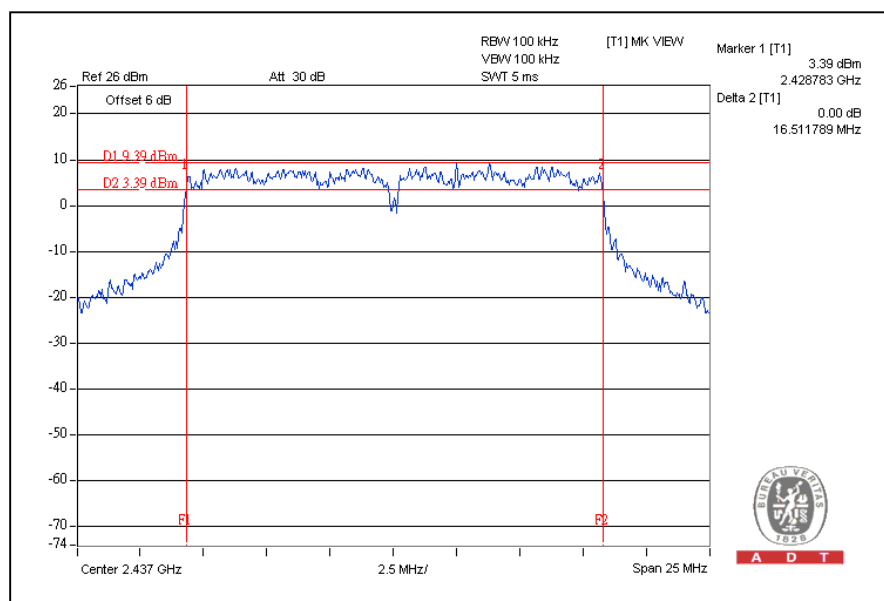
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.42	0.5	PASS
6	2437	16.51	0.5	PASS
11	2462	16.38	0.5	PASS

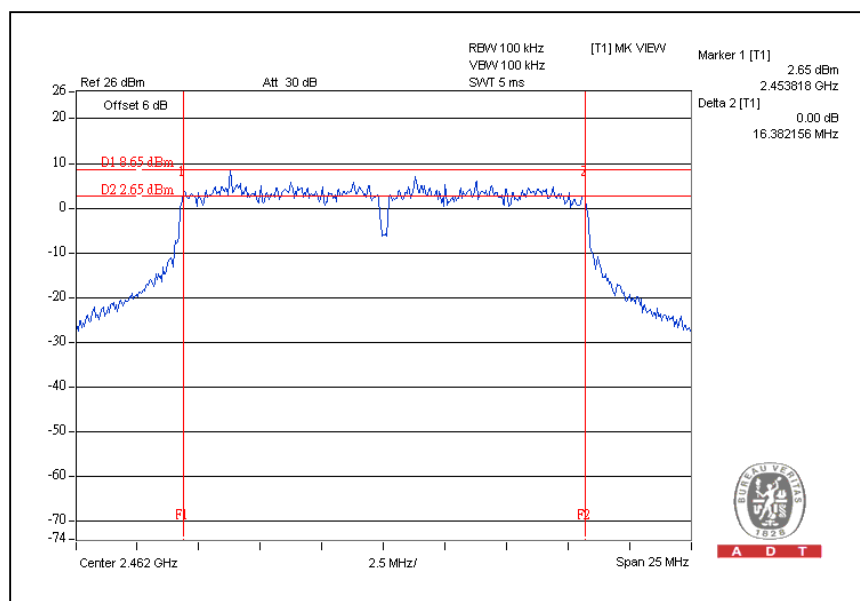
CH1



CH6



CH11

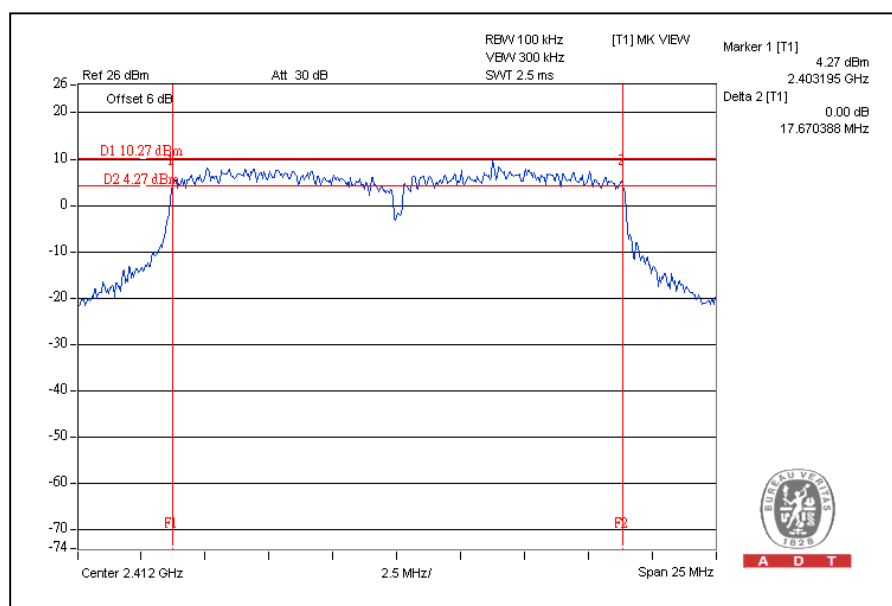


DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.67	0.5	PASS
6	2437	17.69	0.5	PASS
11	2462	17.66	0.5	PASS

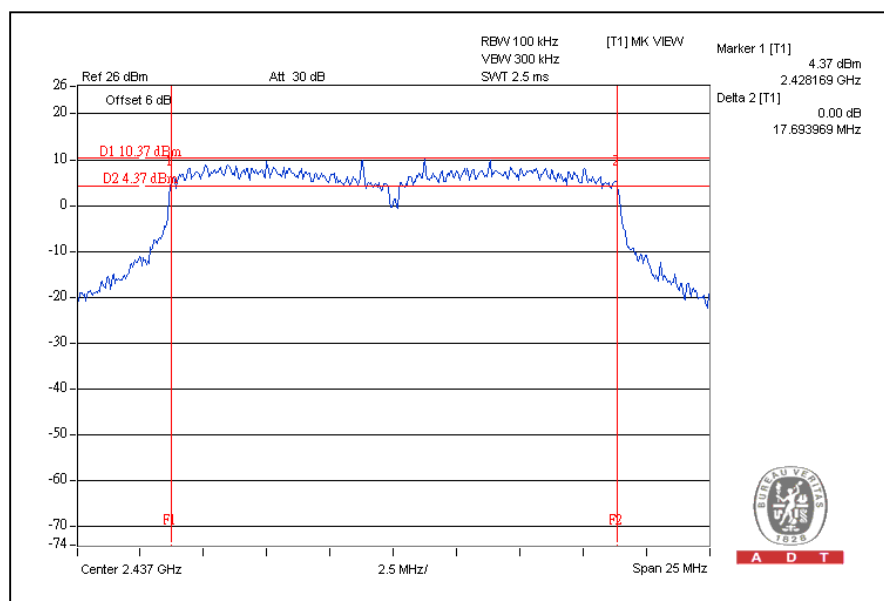
CH1



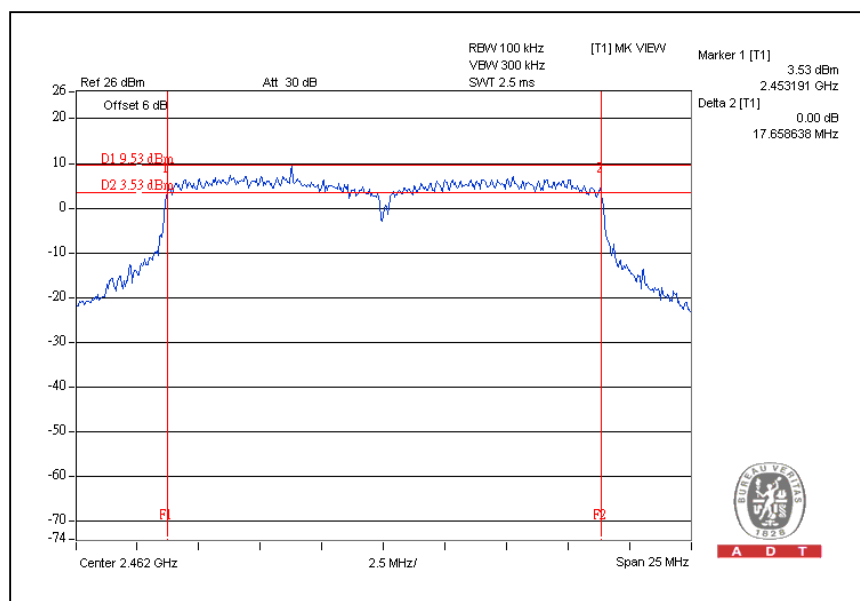


A D T

CH6



CH11

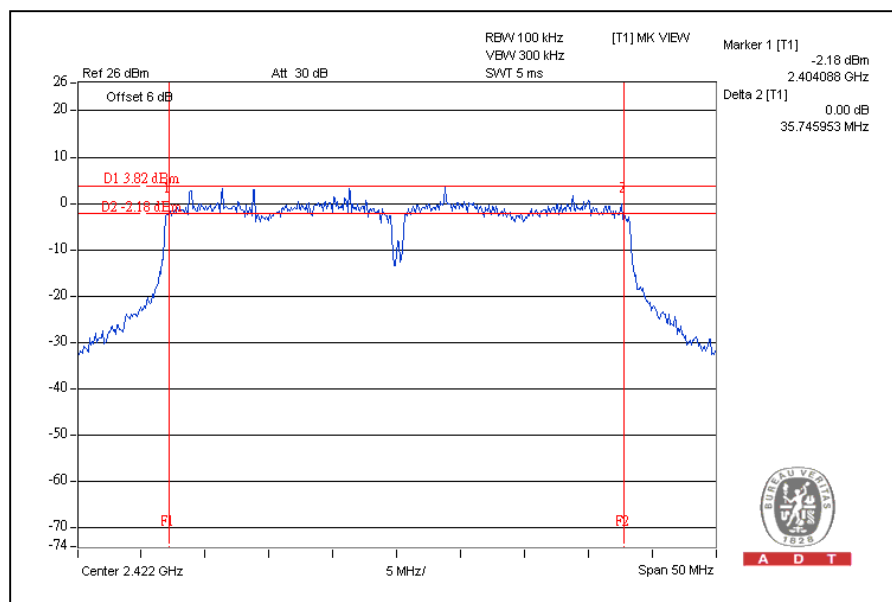


DRAFT 802.11n (40MHz) OFDM MODULATION:

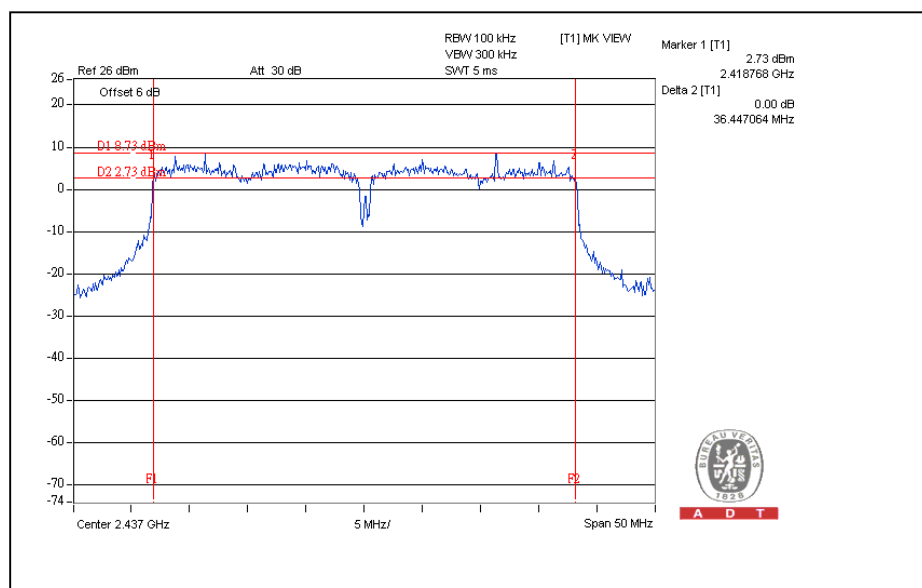
MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2422	35.75	0.5	PASS
4	2437	36.45	0.5	PASS
7	2452	36.07	0.5	PASS

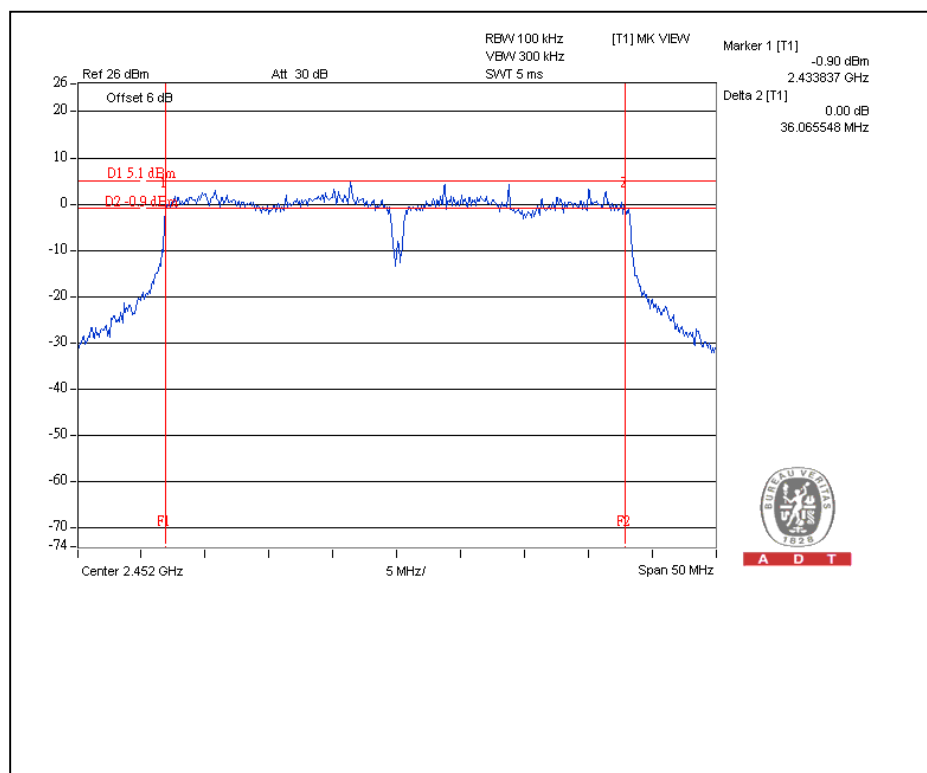
CH1



CH4



CH7



4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	June 14, 2008	June 13, 2009
Pulse Power Sensor	MA2411B	0738172	April 17, 2008	April 16, 2009

NOTE:

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

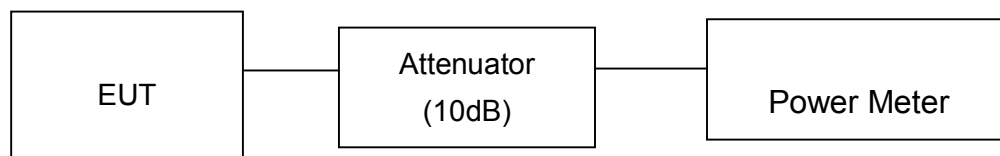
4.4.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator; the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



A D T

4.4.7 TEST RESULTS

802.11b DSSS MODULATION:

MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (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	2412	100.000	114.815	20.00	20.60	214.815	23.32	30	PASS
6	2437	101.625	92.045	20.07	19.64	193.670	22.87	30	PASS
11	2462	92.257	91.201	19.65	19.60	183.458	22.64	30	PASS

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi)=6

The effective legacy gain is 6dBi, therefore the limit doesn't reduce.

802.11g OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (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	2412	331.131	338.065	25.20	25.29	669.196	28.26	30	PASS
6	2437	364.754	420.727	25.62	26.24	785.481	28.95	30	PASS
11	2462	279.254	308.319	24.46	24.89	587.573	27.69	30	PASS

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi)=6

The effective legacy gain is 6dBi, therefore the limit doesn't reduce.



A D T

DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (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	2412	343.558	394.457	25.36	25.96	738.015	28.68	30	PASS
6	2437	374.973	409.261	25.74	26.12	784.234	28.94	30	PASS
11	2462	301.995	314.775	24.80	24.98	616.770	27.90	30	PASS

DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (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	2422	243.220	276.058	23.86	24.41	519.278	27.15	30	PASS
4	2437	410.204	472.063	26.13	26.74	882.267	29.46	30	PASS
7	2452	254.683	300.608	24.06	24.78	555.291	27.45	30	PASS

4.5 AVERAGE OUTPUT POWER

4.5.1 FOR REFERENCE.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	June 14, 2008	June 13, 2009
Pulse Power Sensor	MA2411B	0738172	April 17, 2008	April 16, 2009

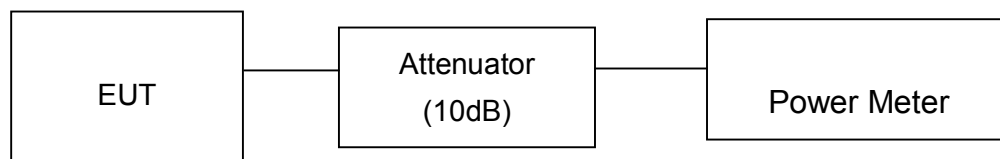
NOTE:

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

4.5.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator, the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the average power level.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5



A D T

4.5.6 TEST RESULTS

802.11b DSSS MODULATION:

MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		TOTAL PEAK POWER (dBm)
		CHAIN(0)	CHAIN(1)	
1	2412	17.39	17.98	20.4
6	2437	17.37	17.18	20.38
11	2462	17.13	17.21	20.14

802.11g OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		TOTAL PEAK POWER (dBm)
		CHAIN(0)	CHAIN(1)	
1	2412	16.00	16.01	19.015
6	2437	17.74	17.83	20.796
11	2462	14.42	15.13	17.800



A D T

DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		TOTAL PEAK POWER (dBm)
		CHAIN(0)	CHAIN(1)	
1	2412	16.73	17.23	19.997
6	2437	17.84	17.64	20.751
11	2462	15.22	15.30	18.270

DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		TOTAL PEAK POWER (dBm)
		CHAIN(0)	CHAIN(1)	
1	2422	12.28	12.55	15.427
4	2437	17.42	17.56	20.501
7	2452	12.76	13.44	16.124

4.6 POWER SPECTRAL DENSITY MEASUREMENT

4.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

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

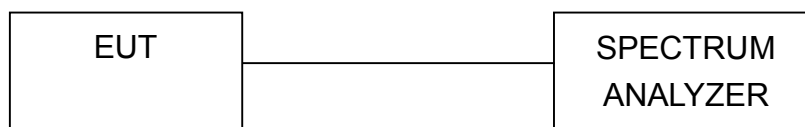
4.6.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.
2. The measurement include through a combiner with both chain and each chain when operate simultaneously.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6



A D T

4.6.7 TEST RESULTS

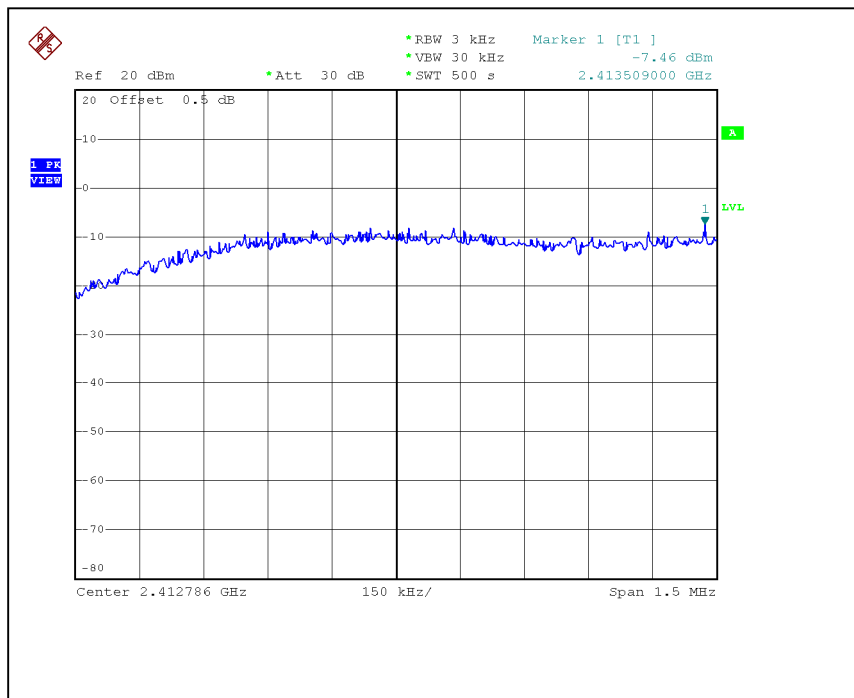
802.11b DSSS MODULATION:

MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 962hPa
TESTED BY	Wen Yu		

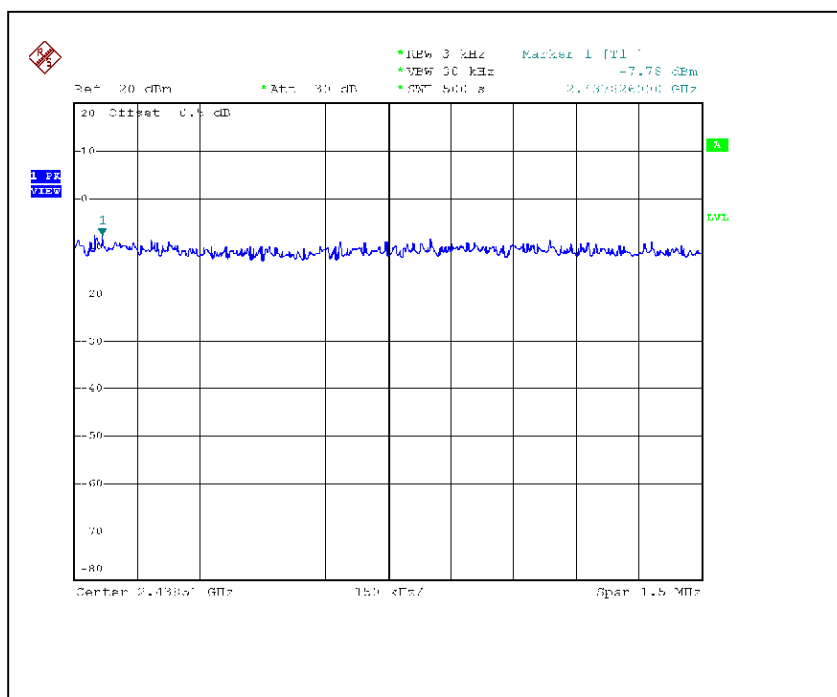
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY –With Combiner(dBm)	* TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	-7.46	-6.91	-0.36	-4.17	8	PASS
6	2437	-7.78	-7.72	-1.79	-4.74	8	PASS
11	2462	-8.96	-8.95	-0.80	-5.95	8	PASS

* Aggregate PSD across transmitters in linear power units across each transmitter output.

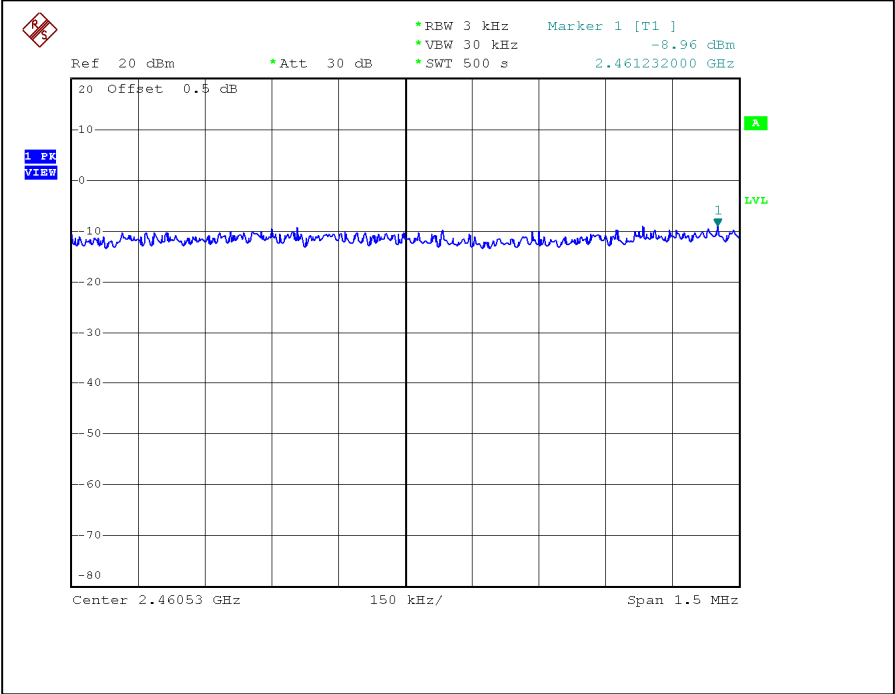
For Chain (0): CH1



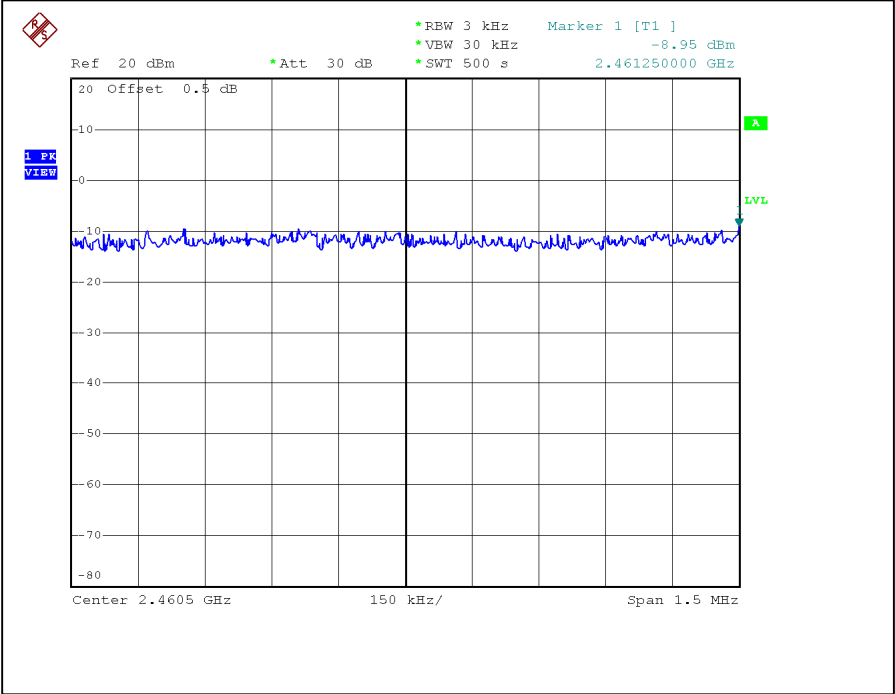
CH6



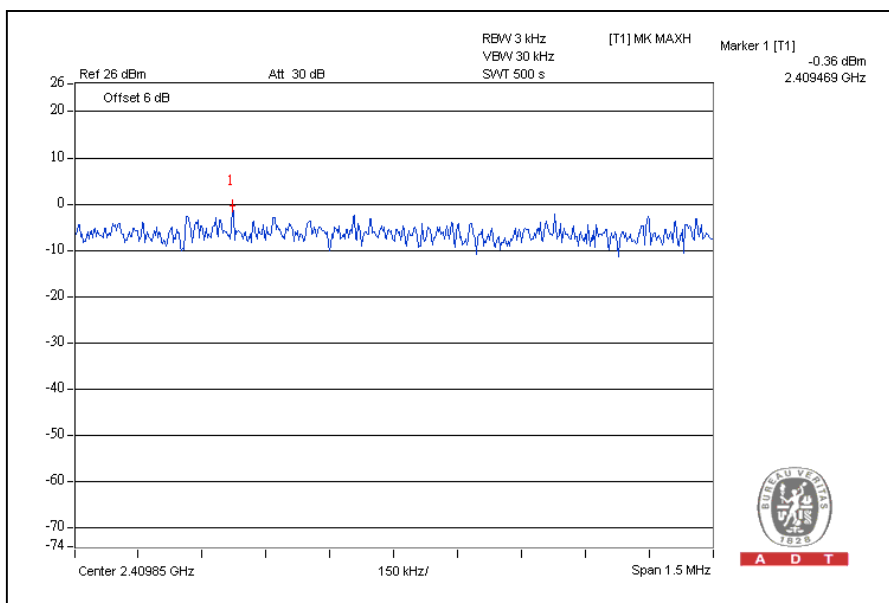
CH11



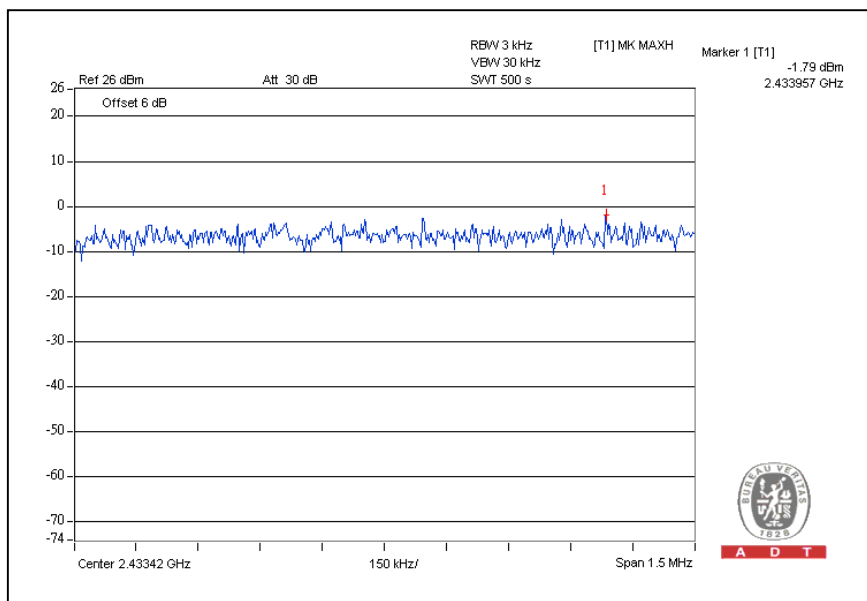
CH11



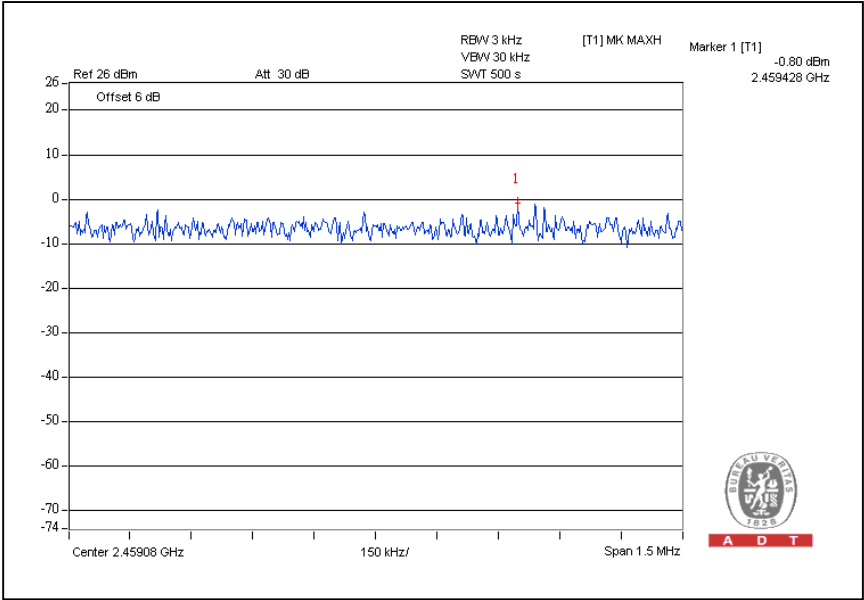
With Combiner : CH1



CH 6



CH11





A D T

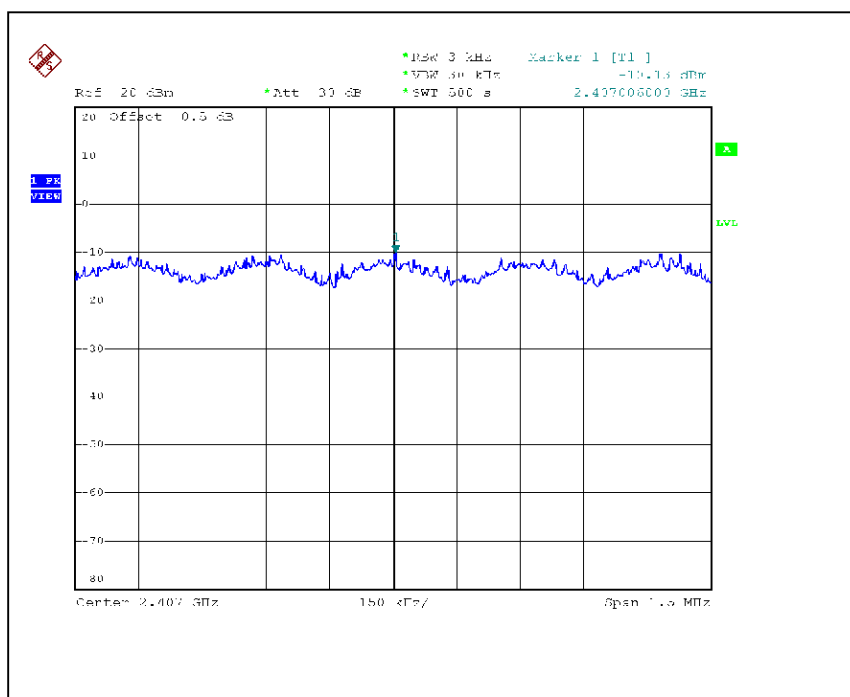
802.11g OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

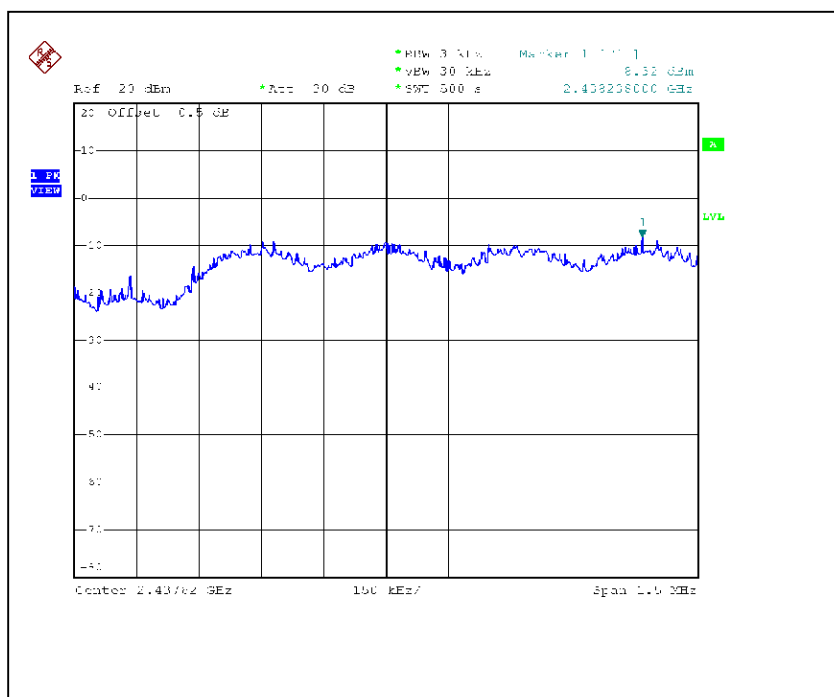
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY –With Combiner(dBm)	* TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	-10.13	-9.66	-4.16	-6.88	8	PASS
6	2437	-8.32	-7.64	-1.96	-4.96	8	PASS
11	2462	-11.05	-10.95	-6.33	-7.99	8	PASS

* Aggregate PSD across transmitters in linear power units across each transmitter output.

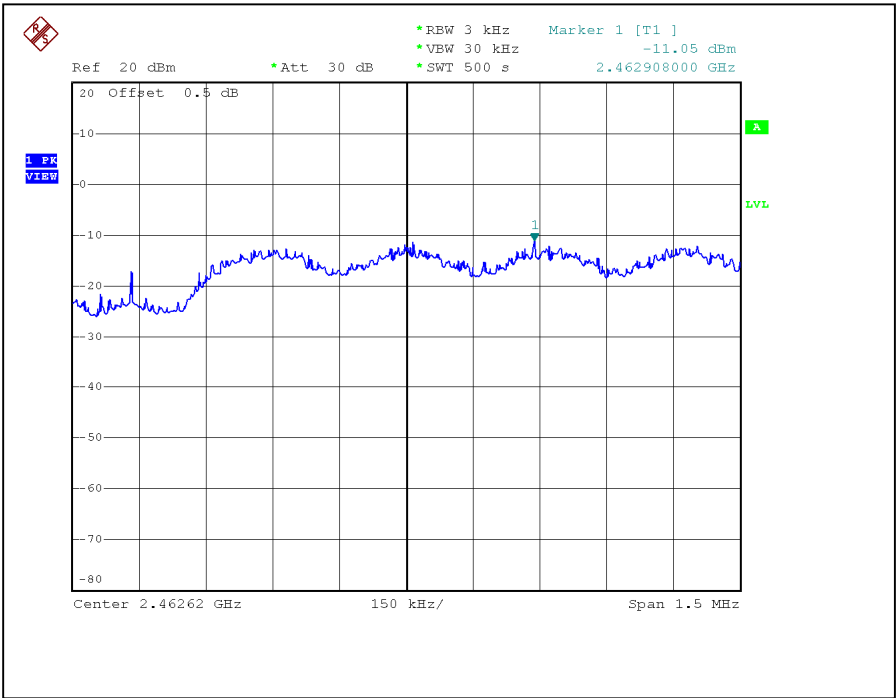
For Chain (0): CH1



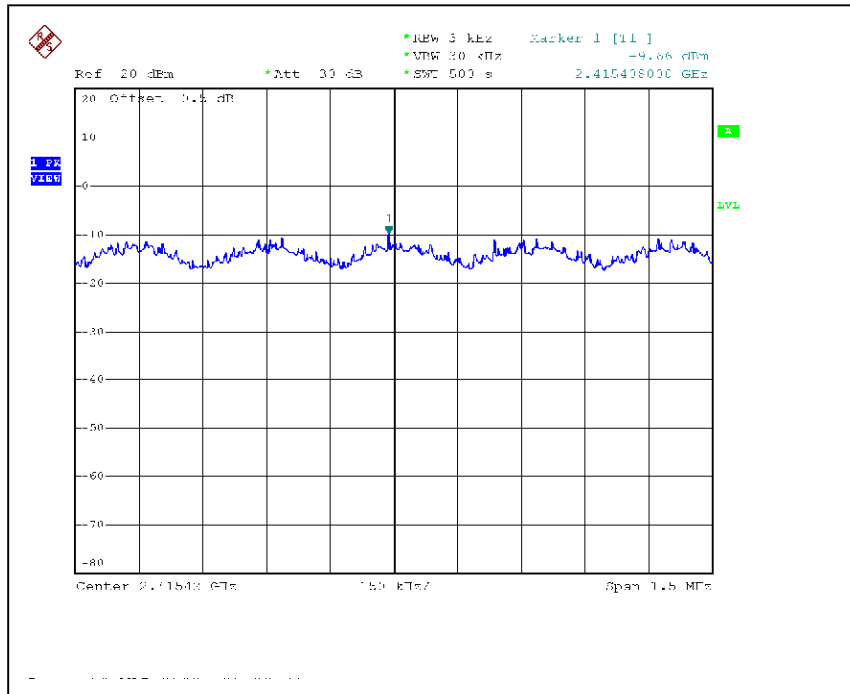
CH6



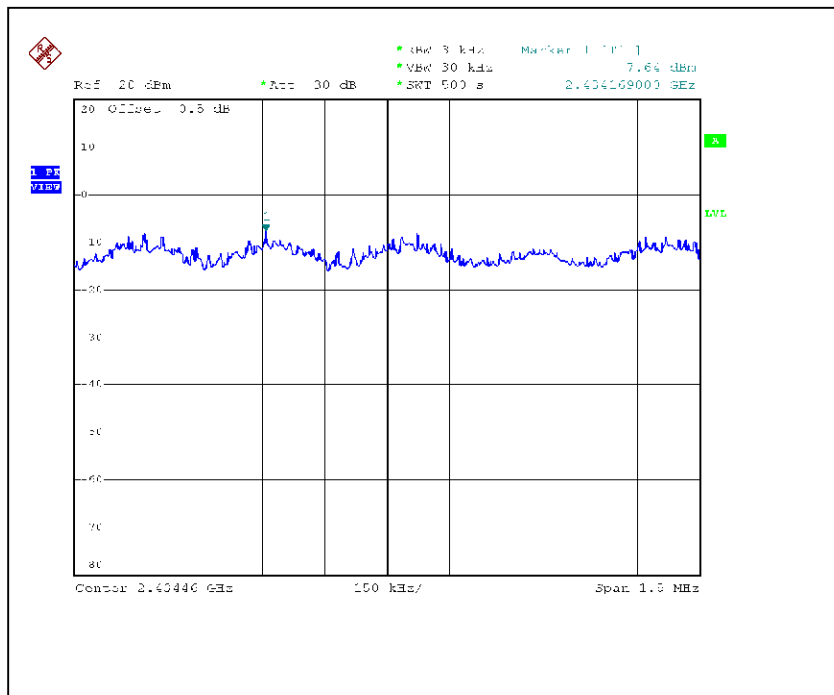
CH11



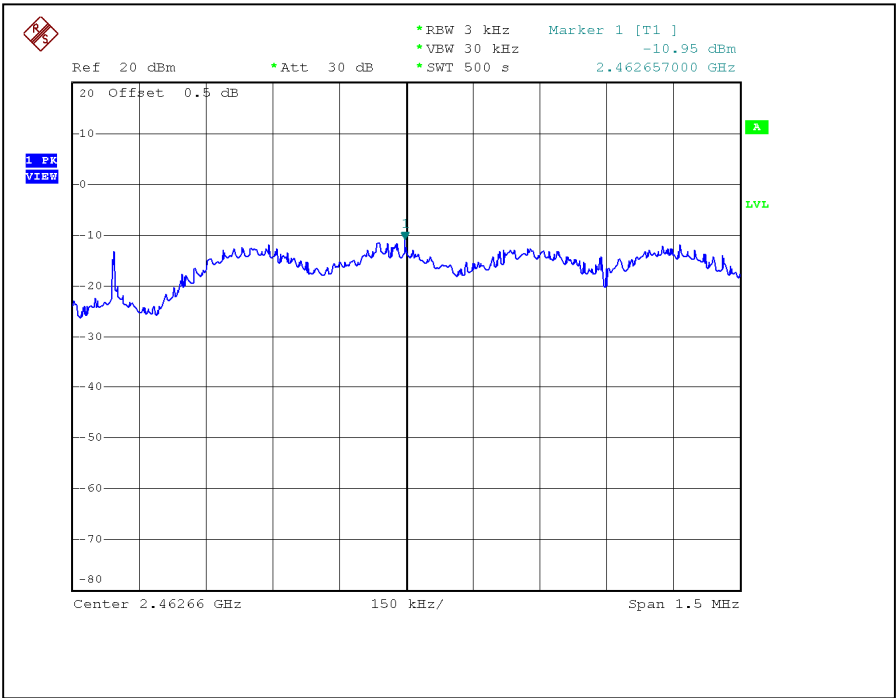
For Chain (1): CH1



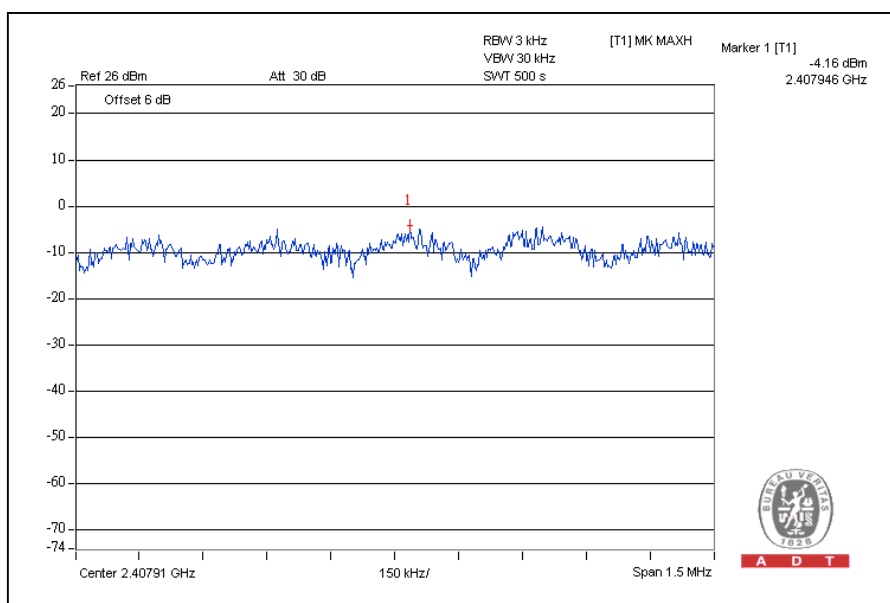
CH6



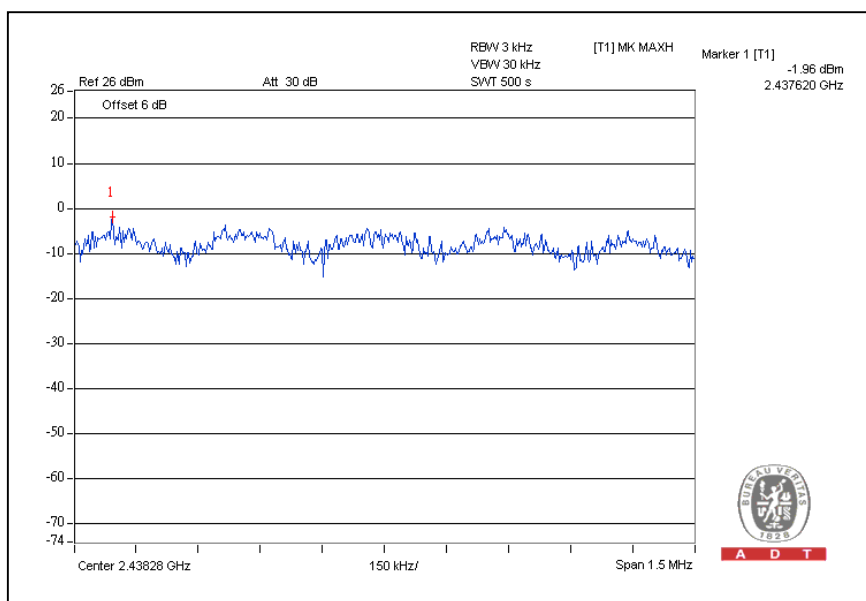
CH11



With Combiner : CH1



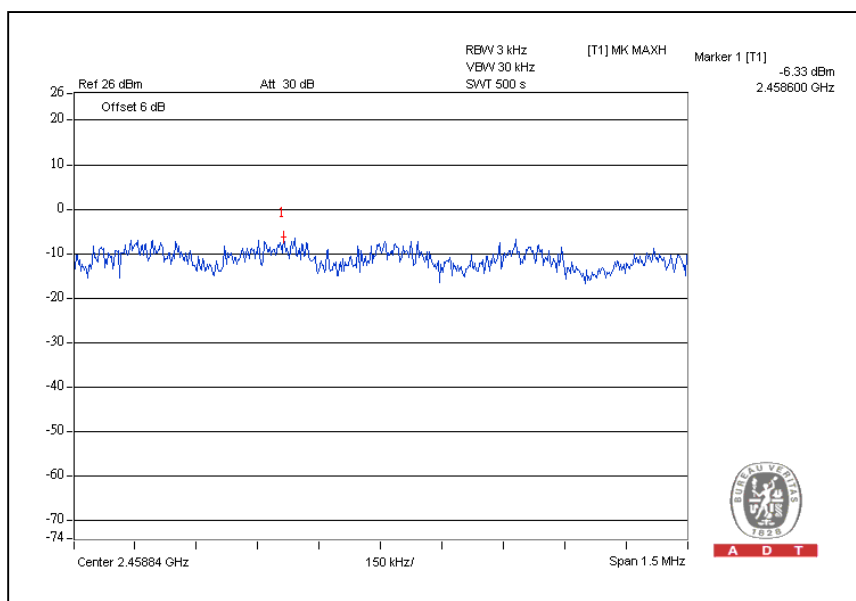
CH 6





A D T

CH11





A D T

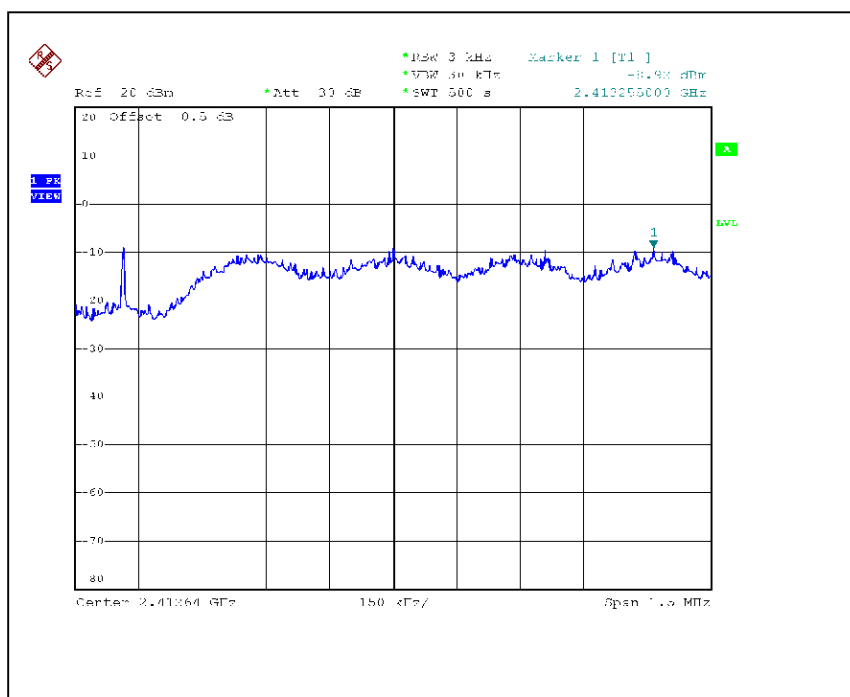
DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23 deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

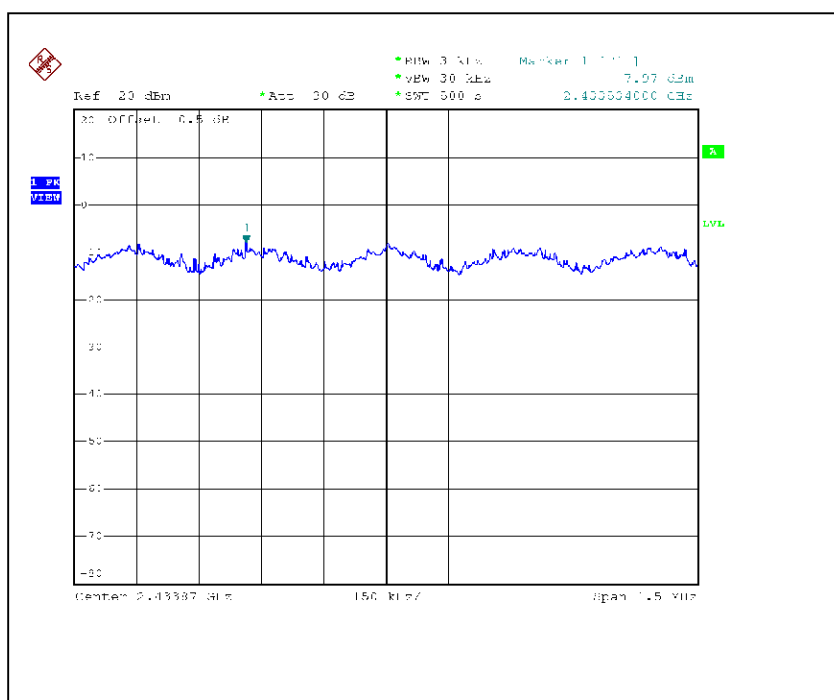
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY -With Combiner(dBm)	* TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	-8.92	-8.57	-4.09	-5.73	8	PASS
6	2437	-7.97	-7.82	-3.06	-4.88	8	PASS
11	2462	-10.42	-10.93	-2.93	-7.64	8	PASS

* Aggregate PSD across transmitters in linear power units across each transmitter output.

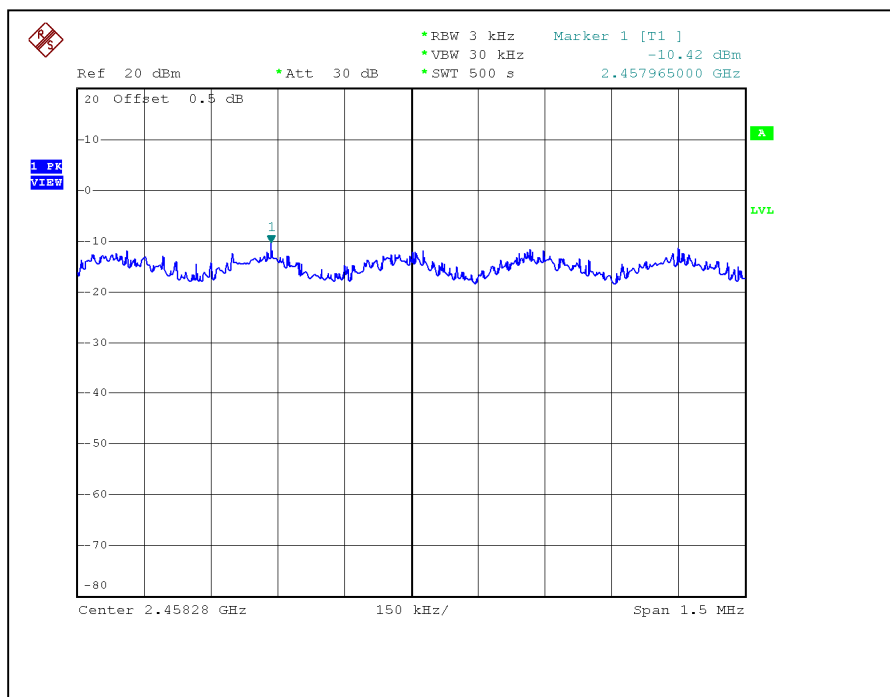
For Chain (0): CH1



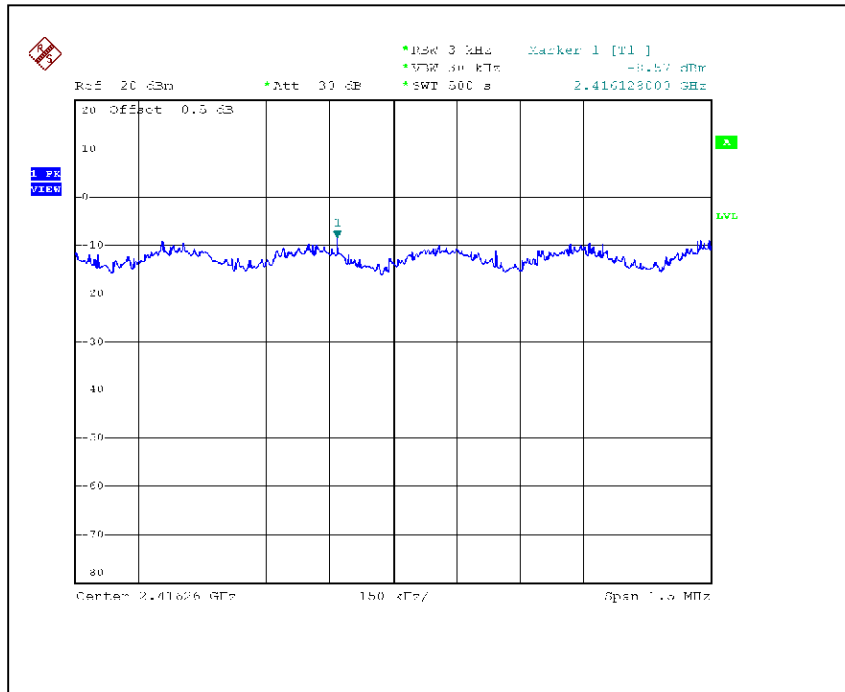
CH6



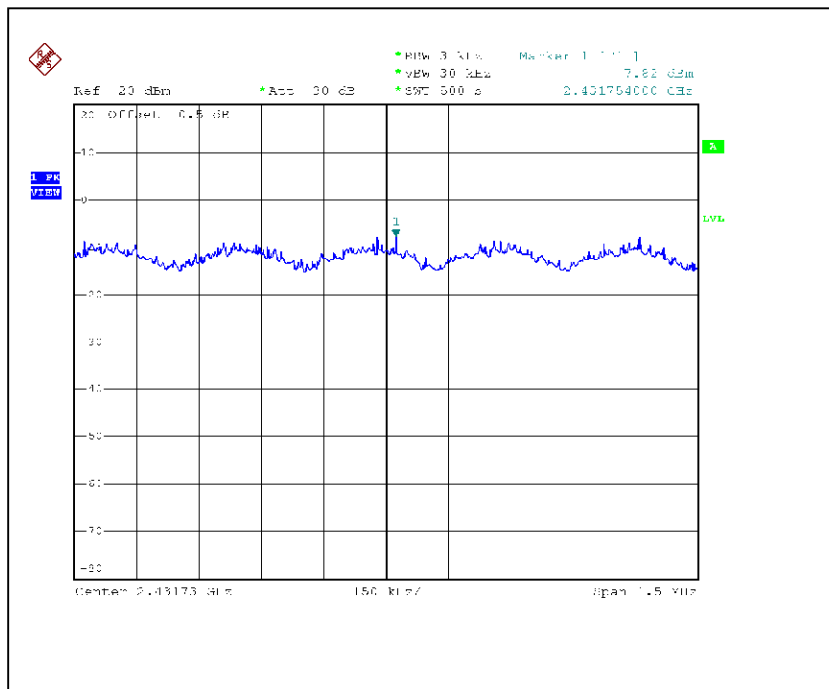
CH11



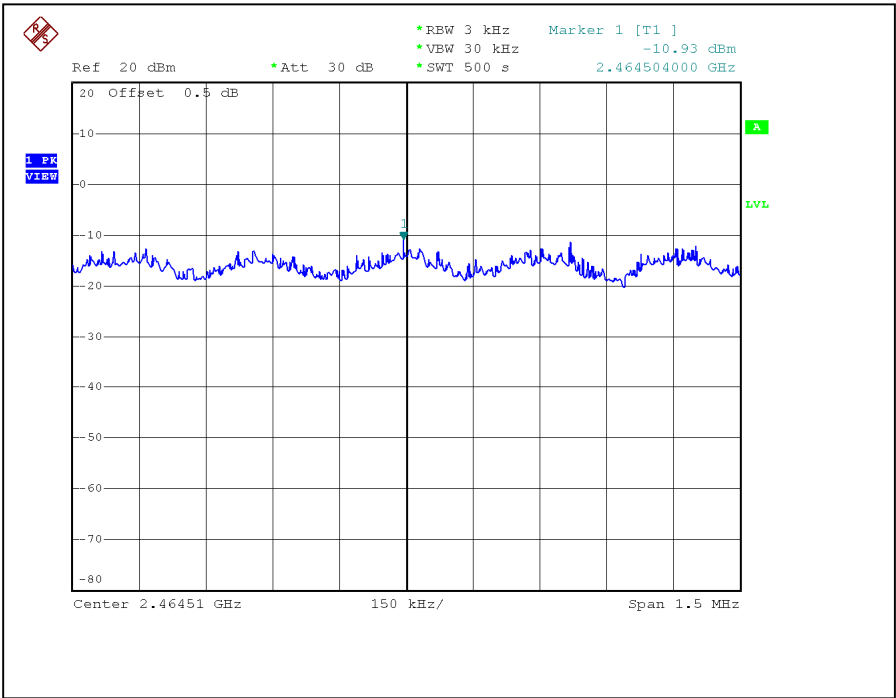
For Chain (1): CH1



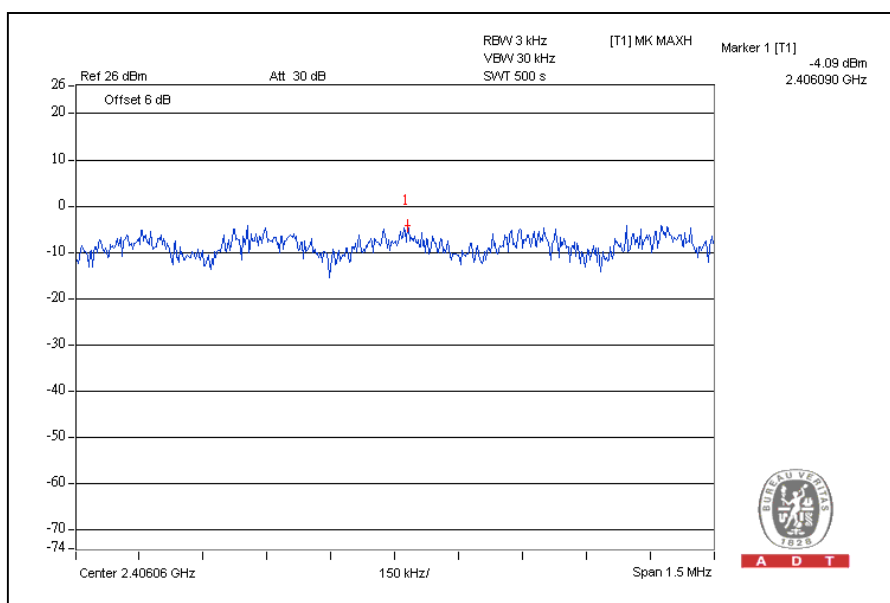
CH6



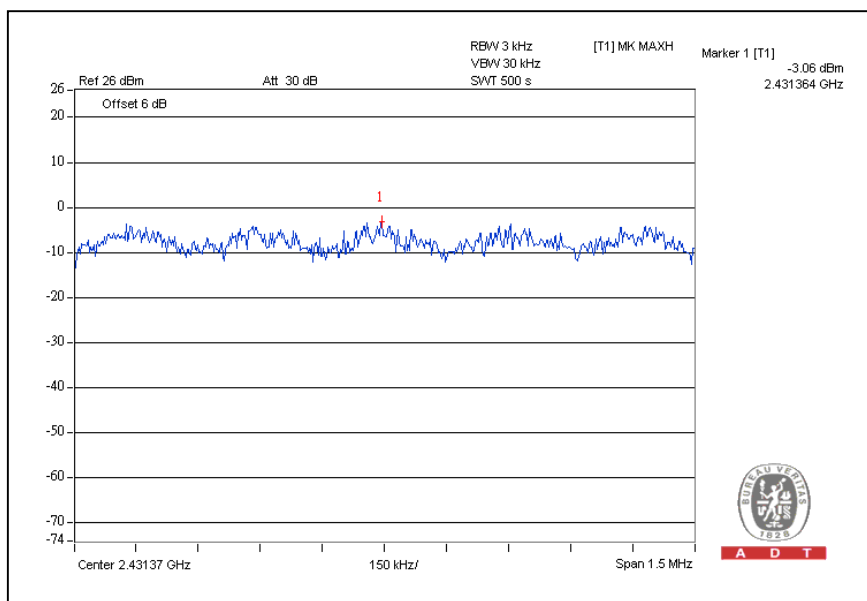
CH11



With Combiner : CH1



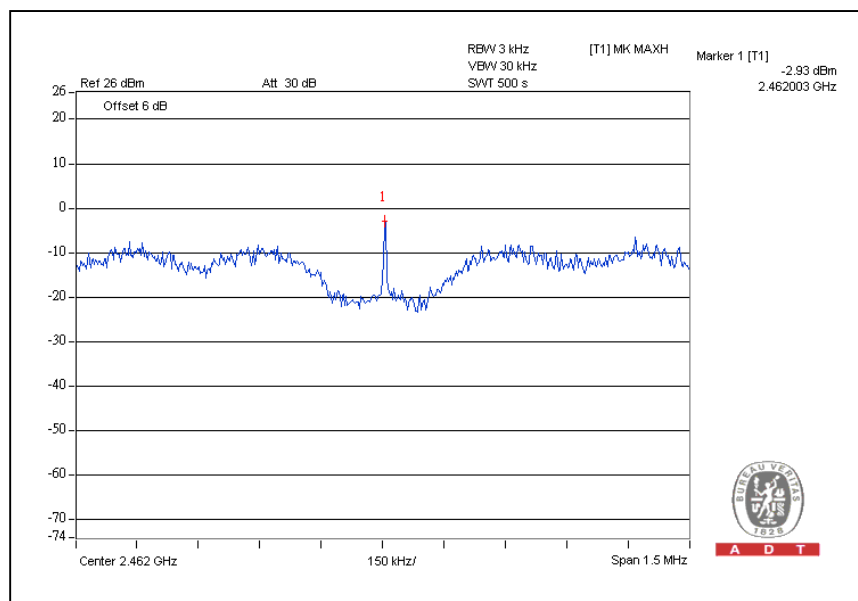
CH 6





A D T

CH11





A D T

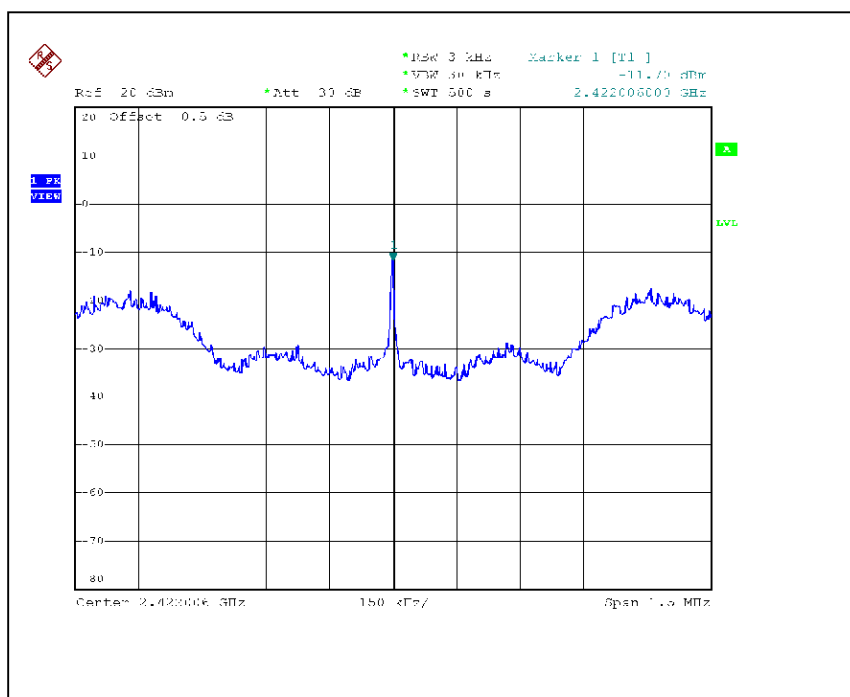
DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 962hPa
TESTED BY	Wen Yu		

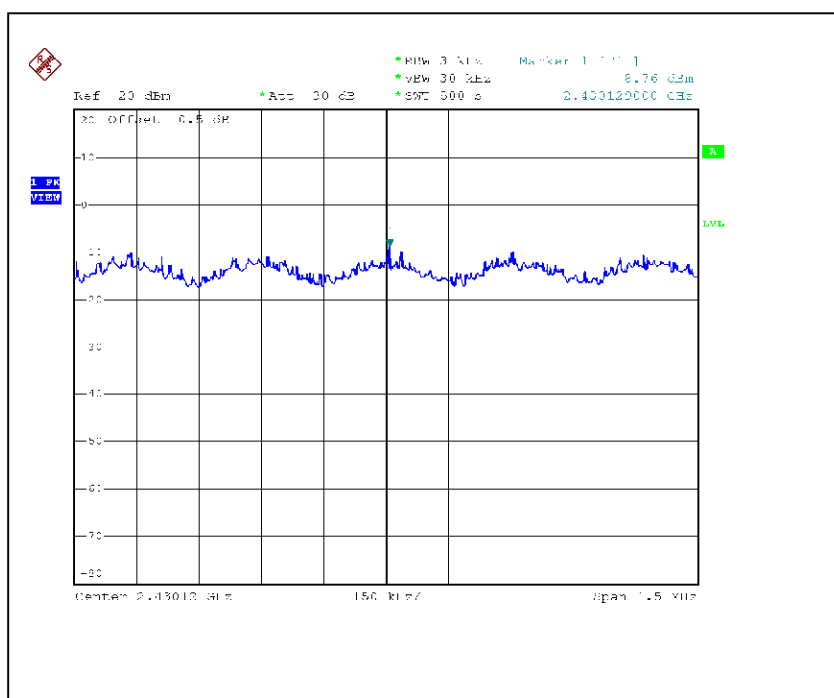
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY –With Combiner(dBm)	* TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2422	-11.70	-14.35	-10.80	-9.79	8	PASS
4	2437	-8.76	-10.74	-5.12	-6.64	8	PASS
7	2452	-11.66	-14.39	-9.53	-9.83	8	PASS

* Aggregate PSD across transmitters in linear power units across each transmitter output.

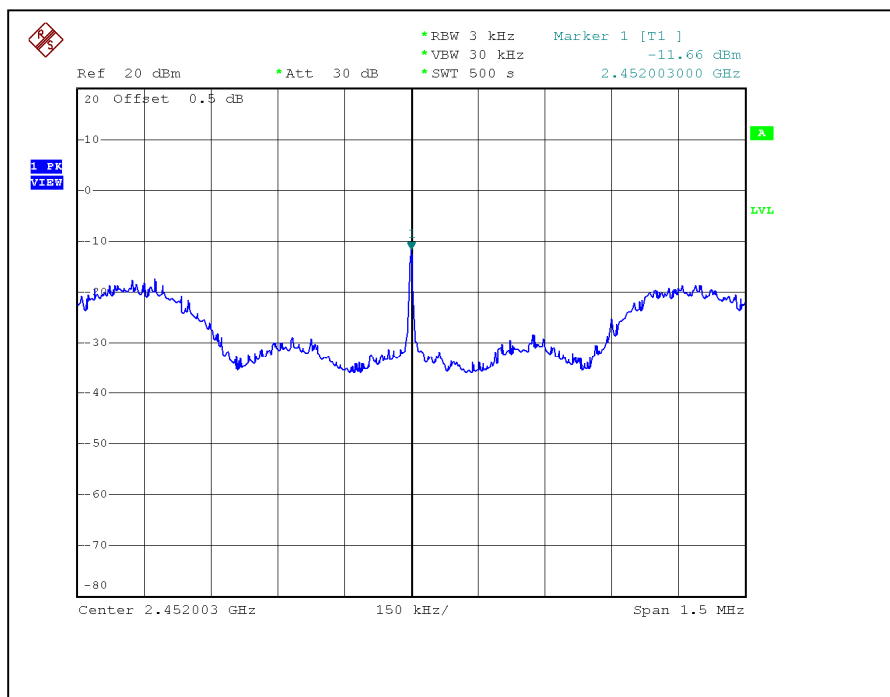
For Chain (0): CH1



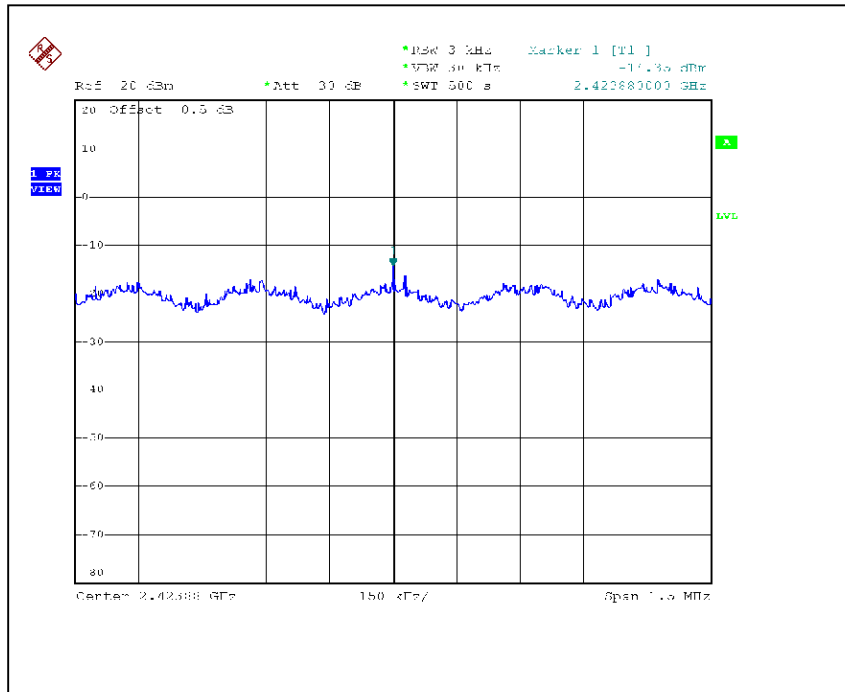
CH4



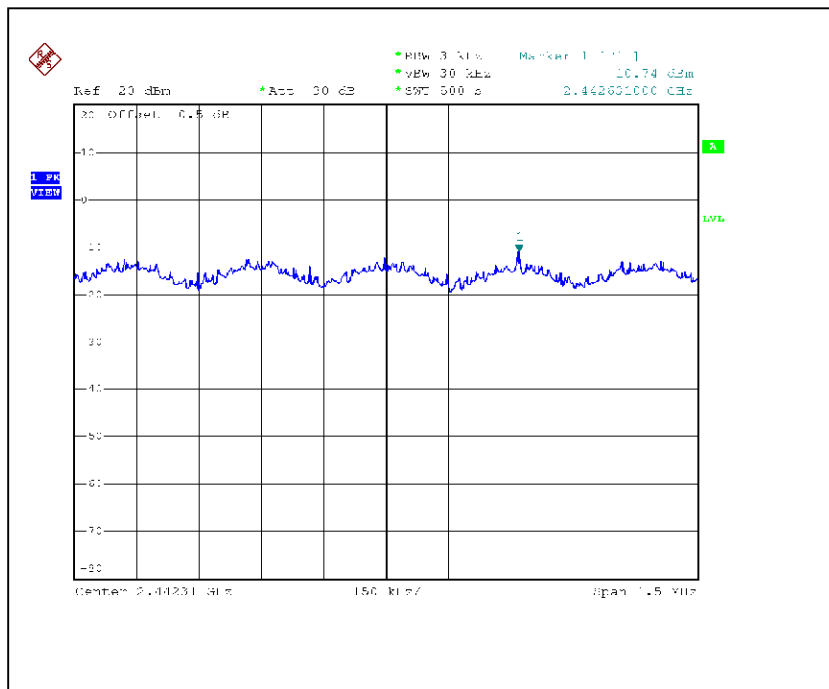
CH7



For Chain (1): CH1



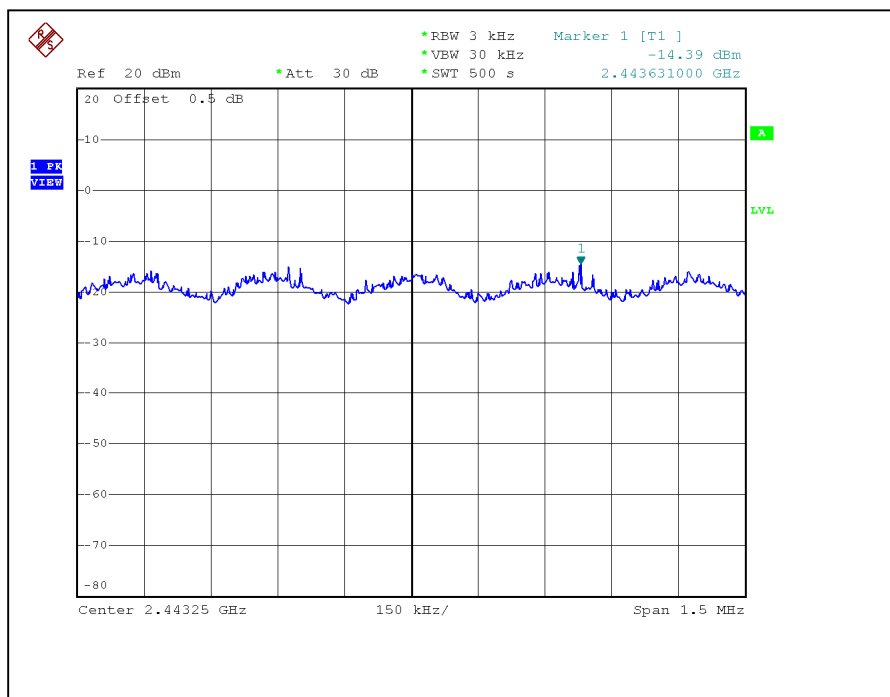
CH4



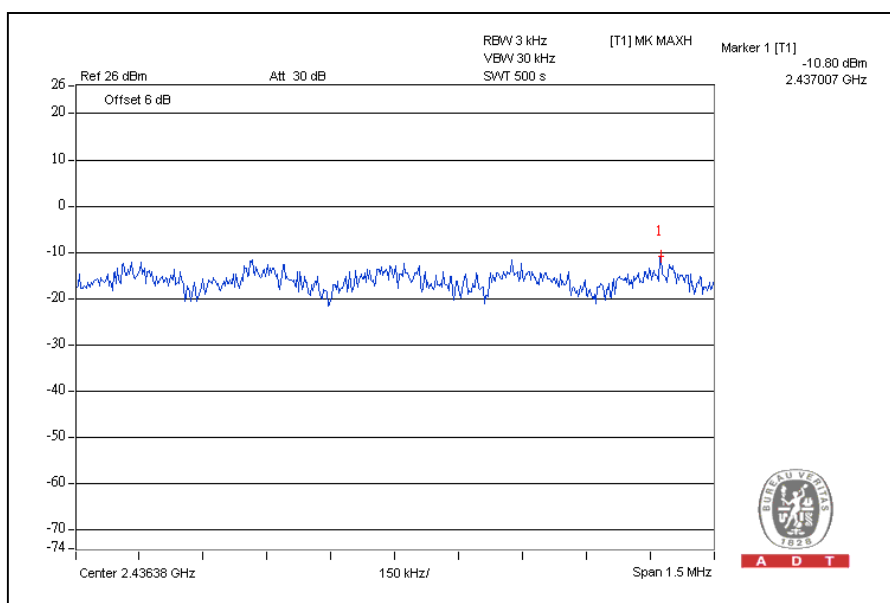


A D T

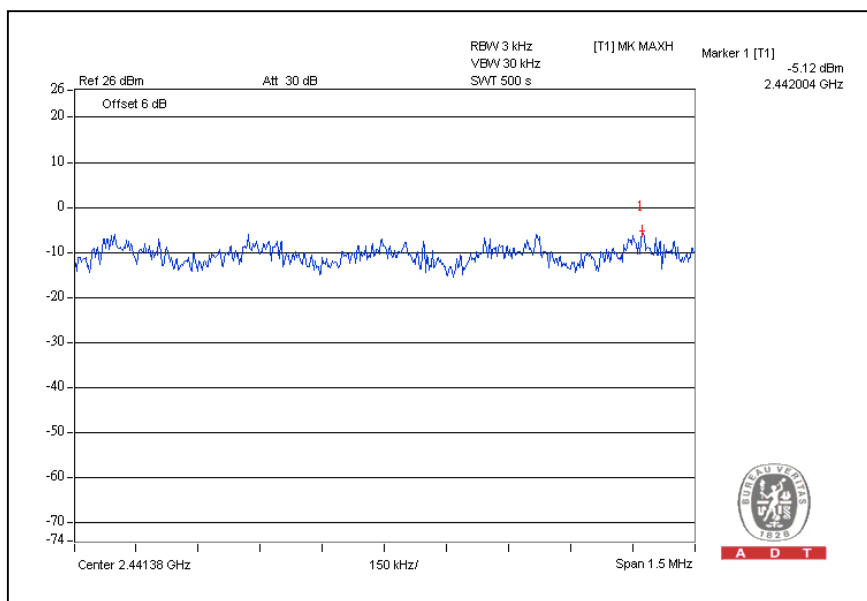
CH7



With Combiner : CH1



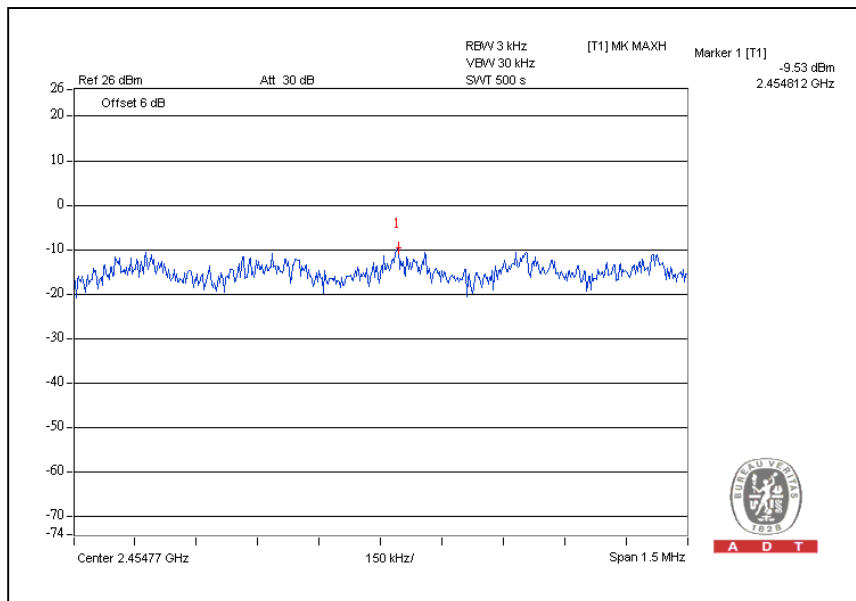
CH 4





A D T

CH7



4.7 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.7.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100KHz Resolution Bandwidth).

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

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

4.7.3 TEST PROCEDURE

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

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

2. The measurement includes through a combiner with both chain and each chain when operate simultaneously.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 EUT OPERATING CONDITION

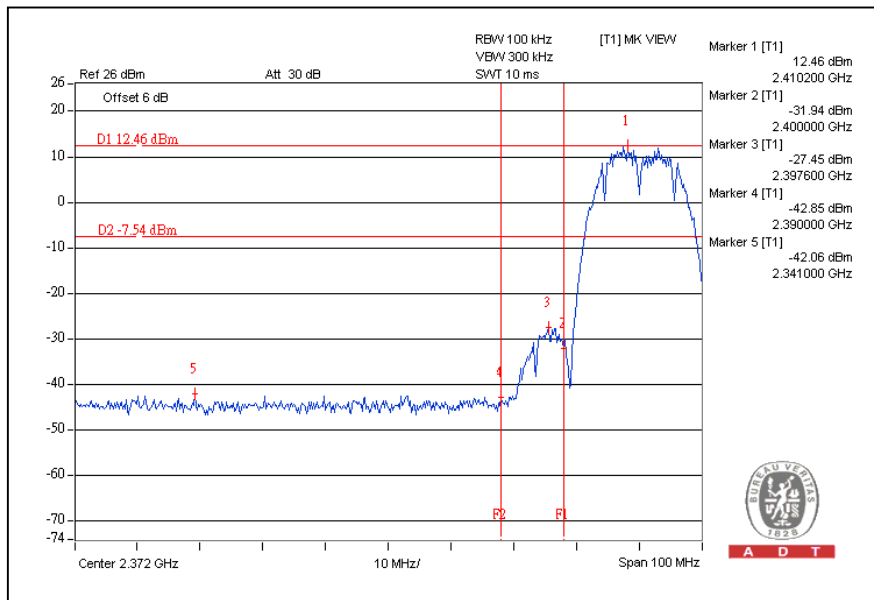
Same as Item 4.3.6

4.7.6 TEST RESULTS

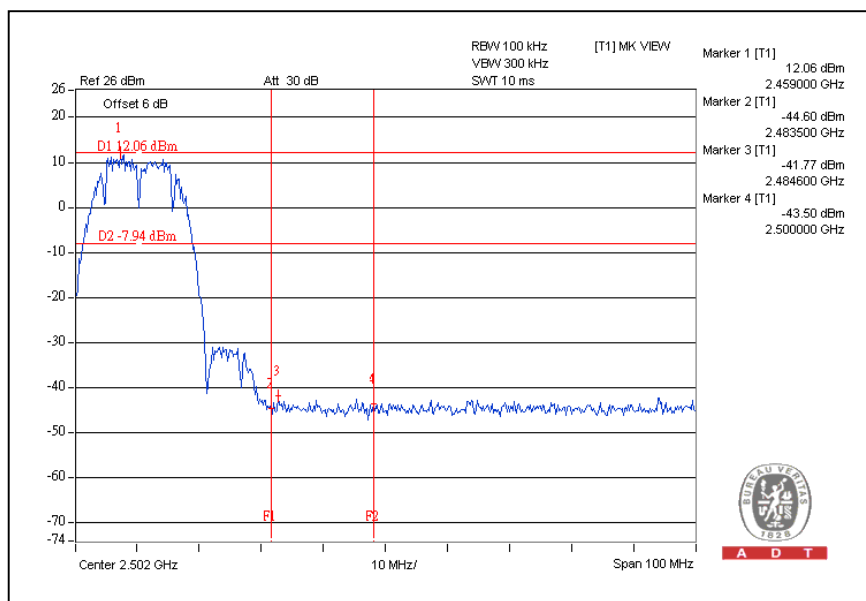
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

802.11b DSSS MODULATION:

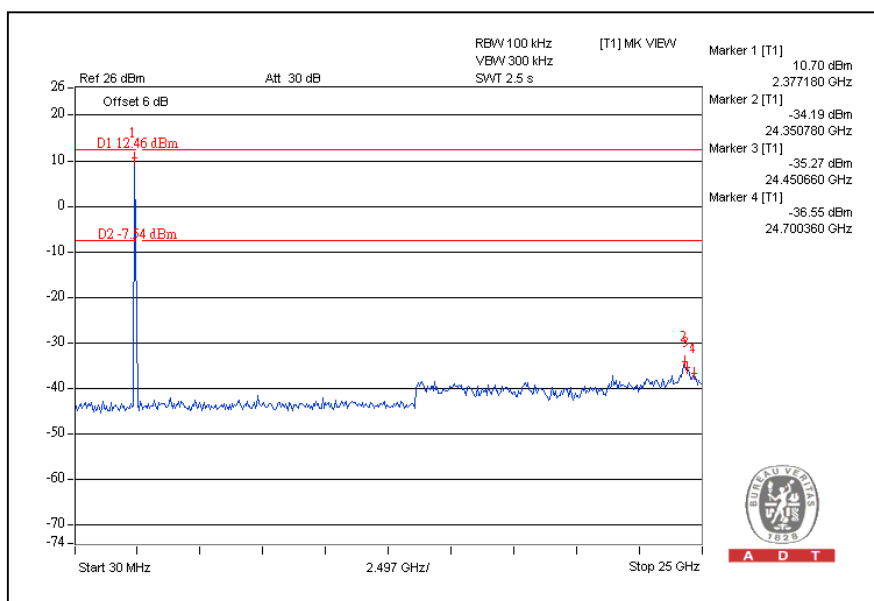
With combiner: CH1



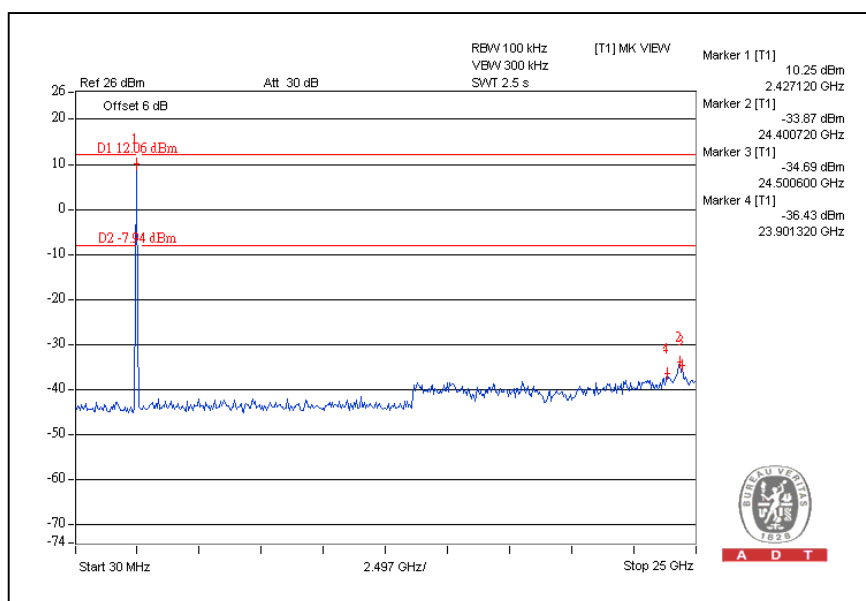
CH11



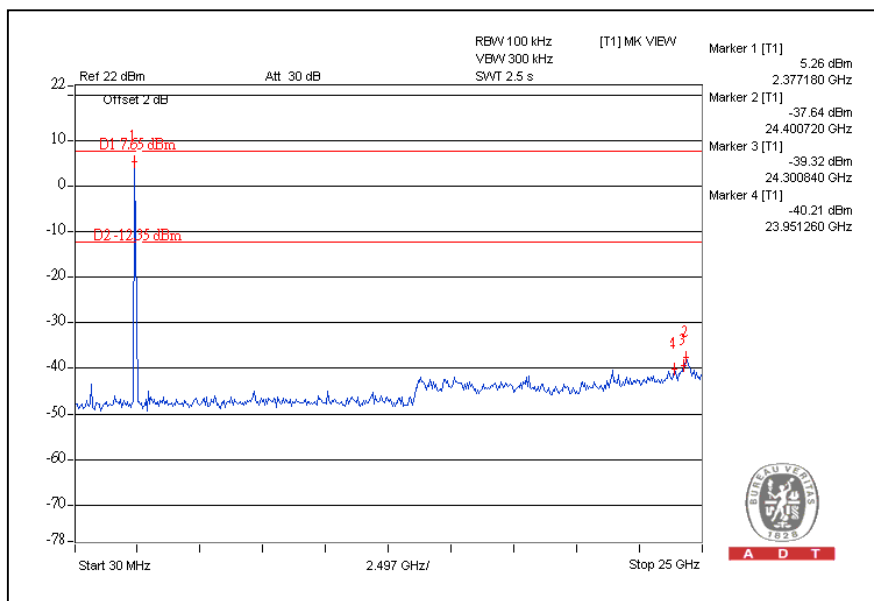
With combiner: CH1



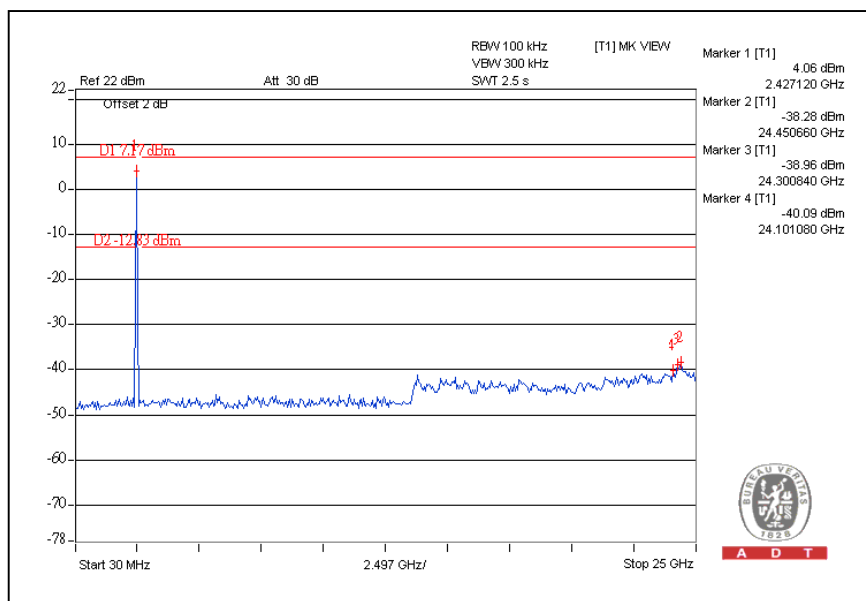
CH11



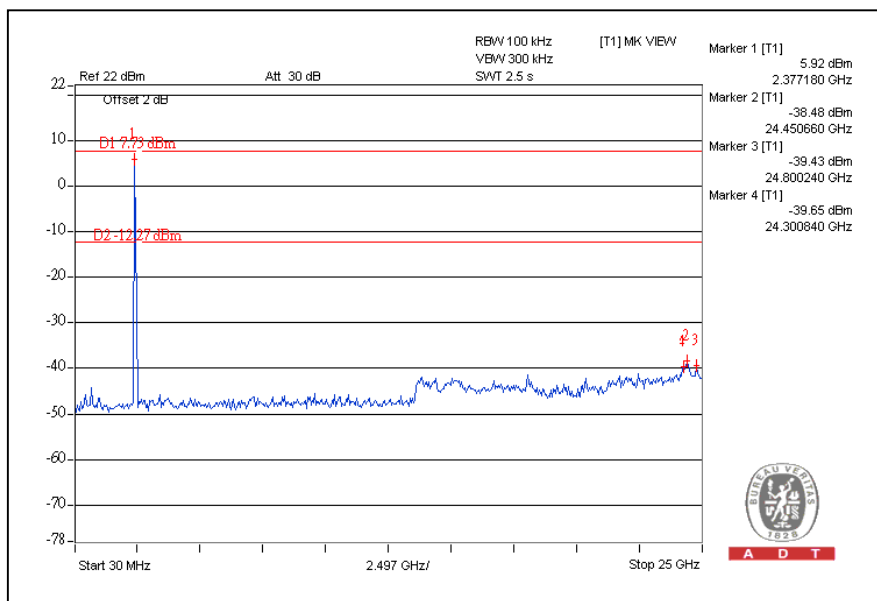
For Chain 0: CH1



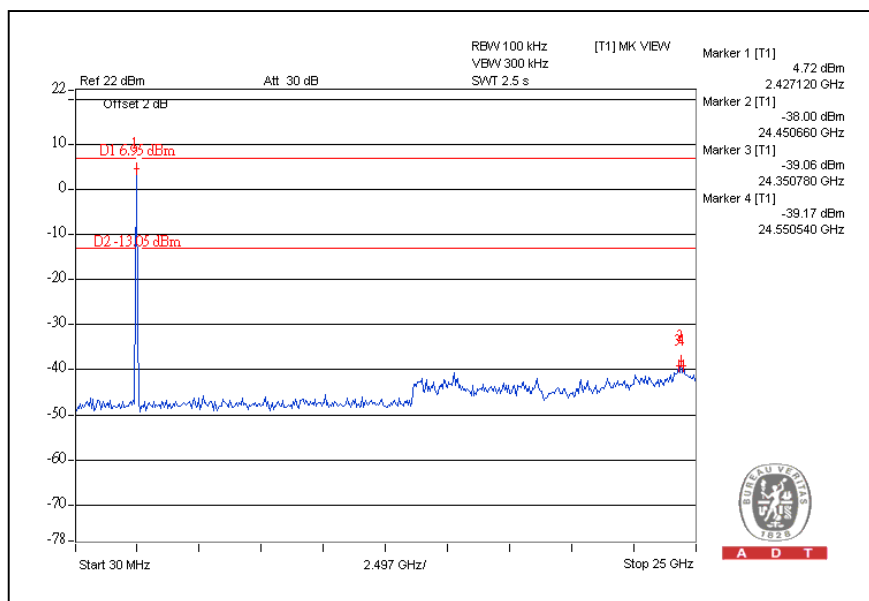
CH11



For Chain 1: CH1

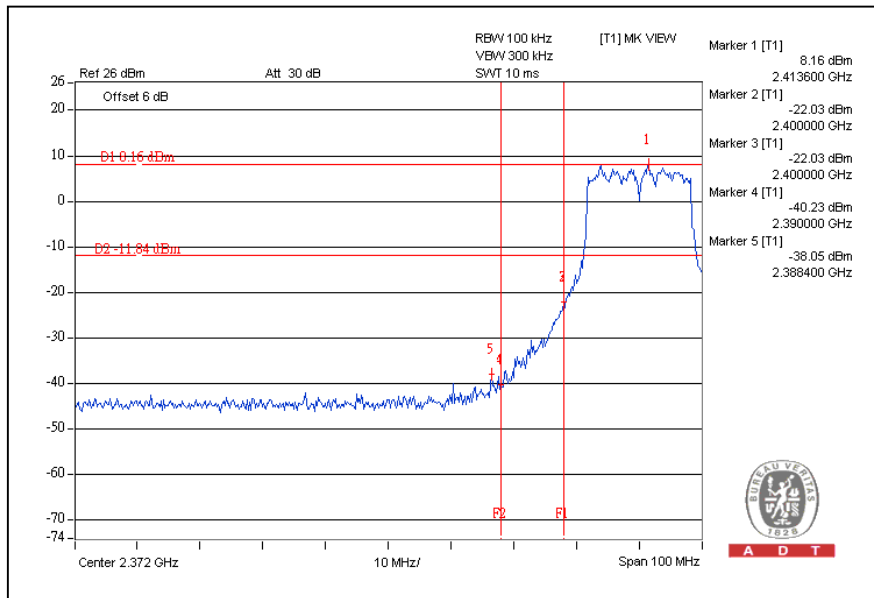


CH11

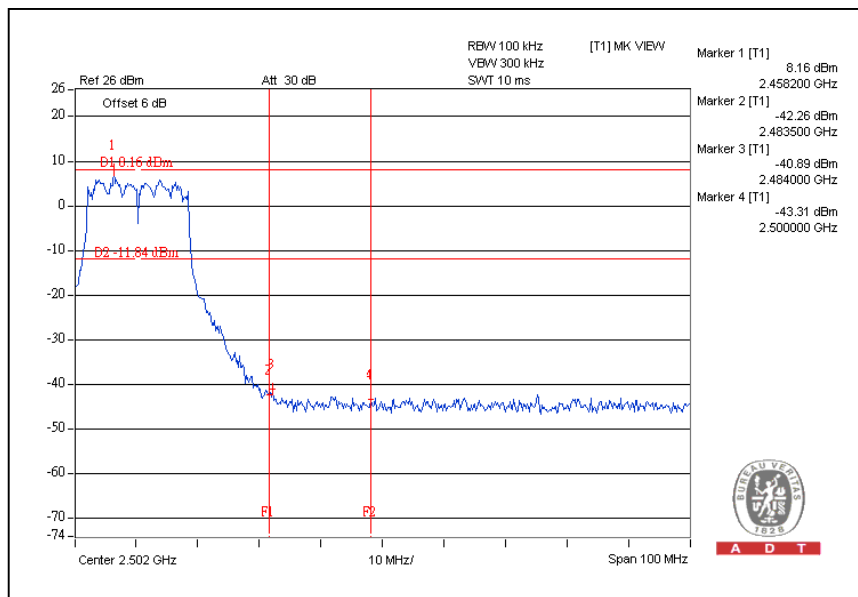


802.11g OFDM MODULATION:

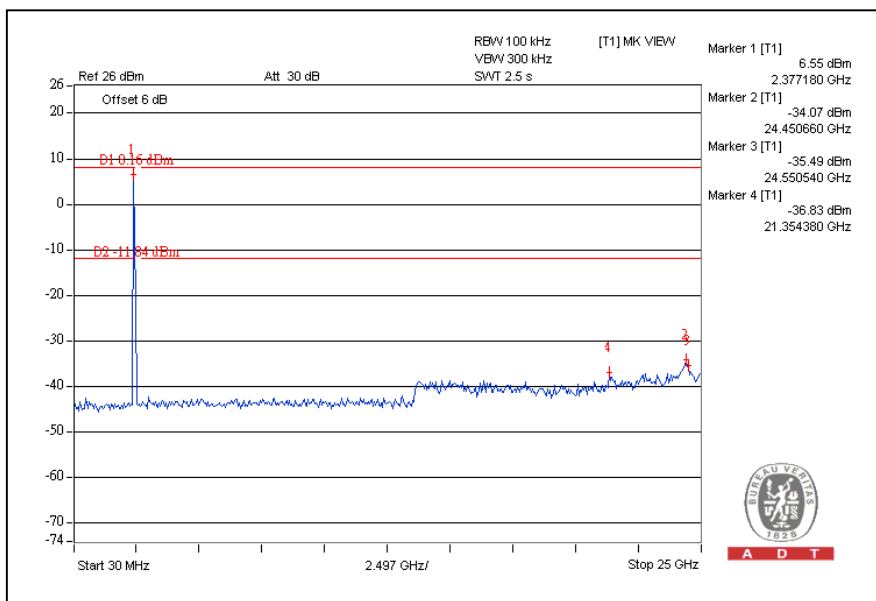
With combiner:CH1



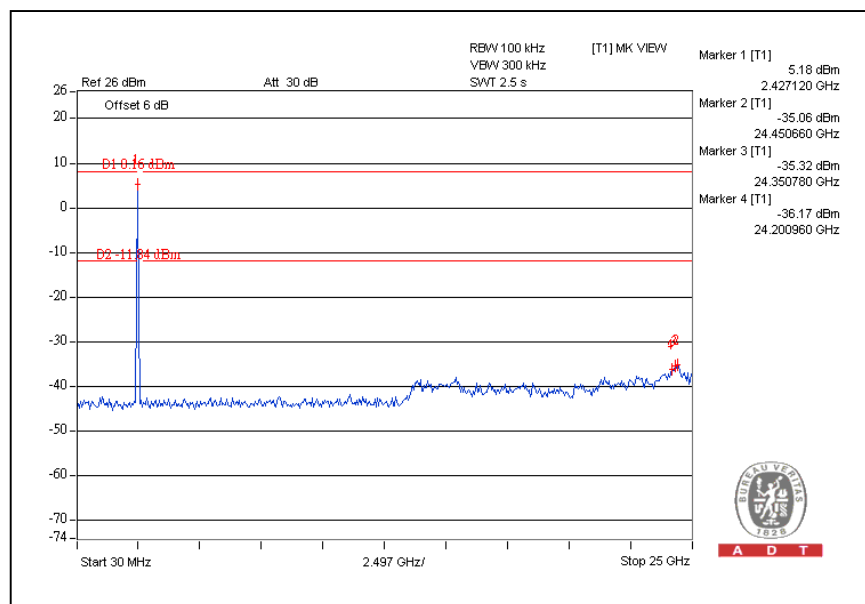
CH11



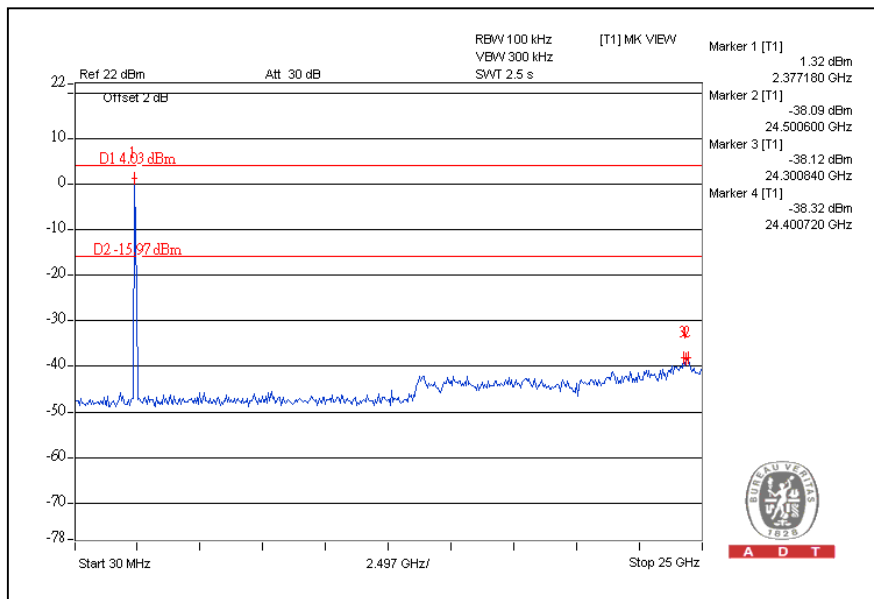
With combiner:CH1



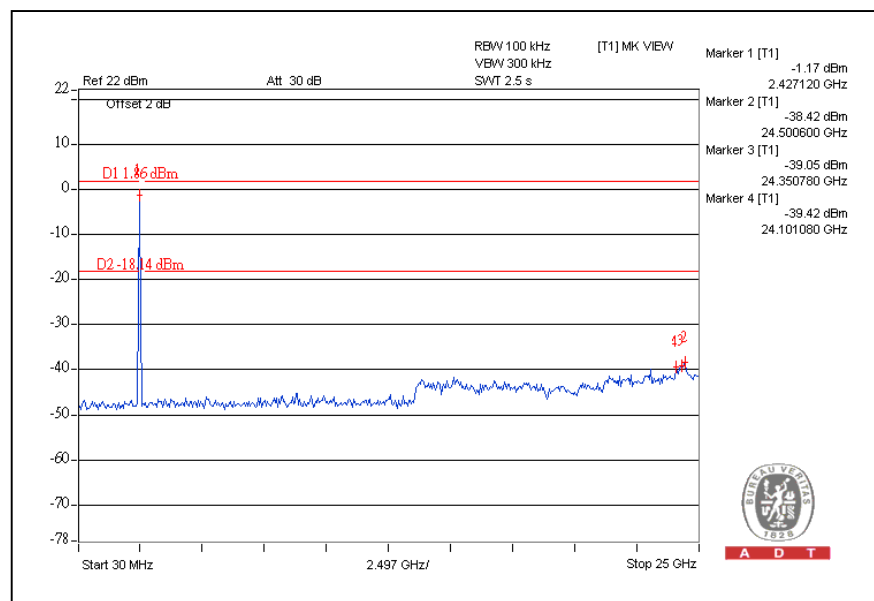
CH11



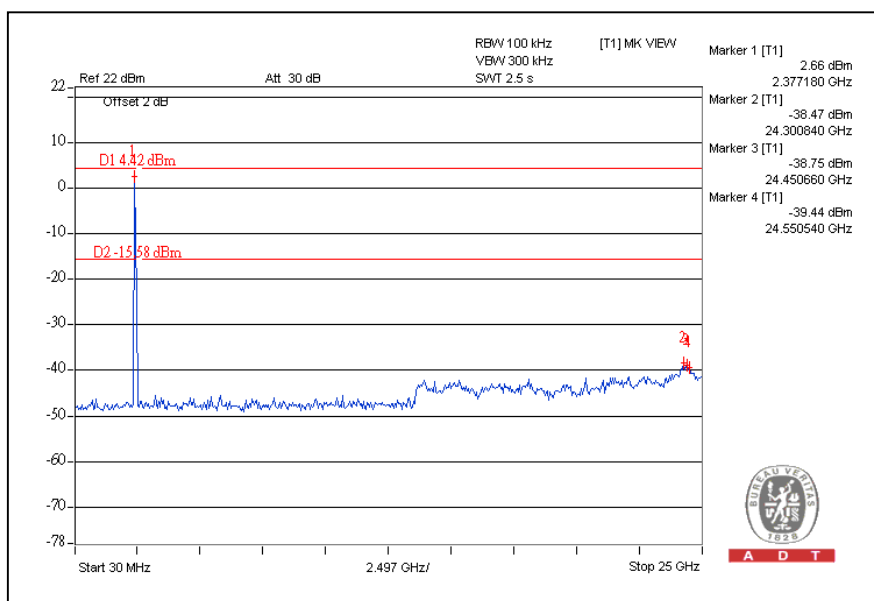
For Chain 0: CH1



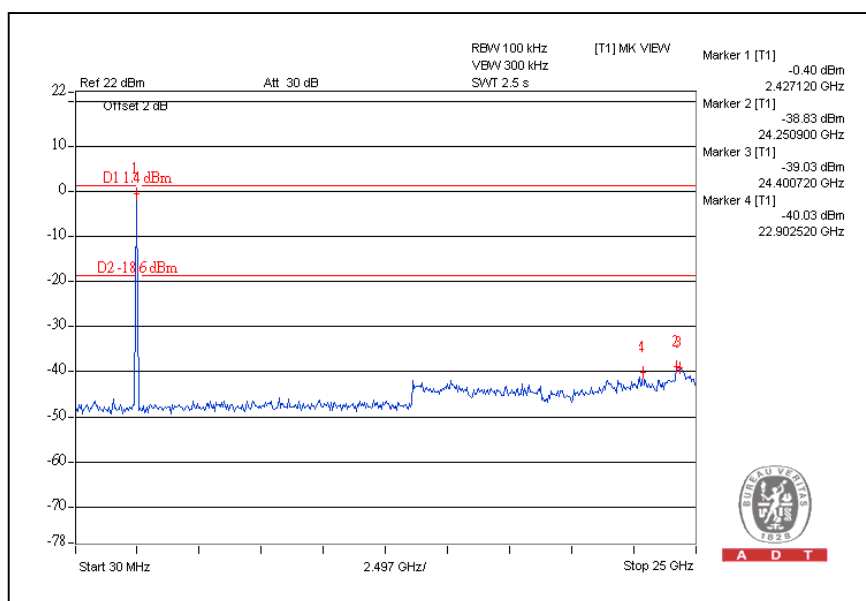
CH11



For Chain 1: CH1

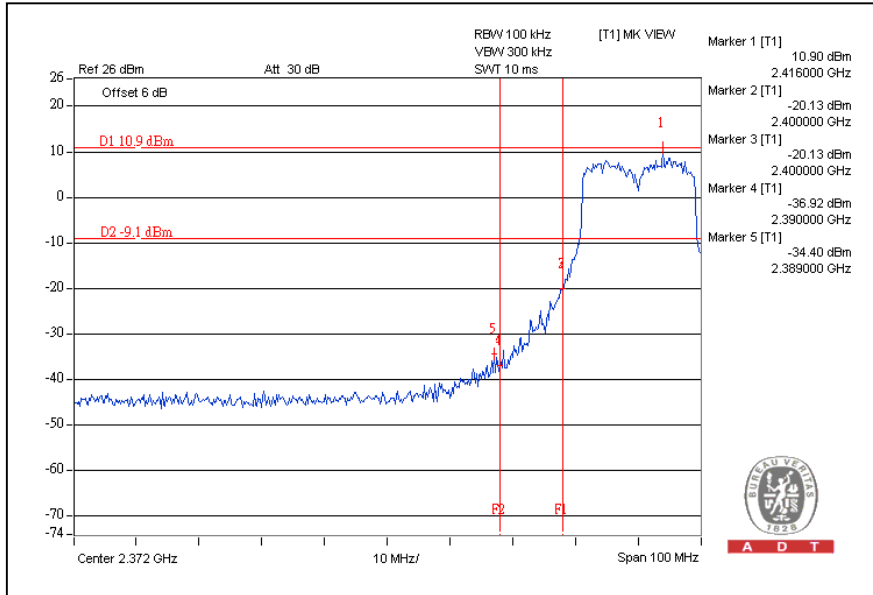


CH11

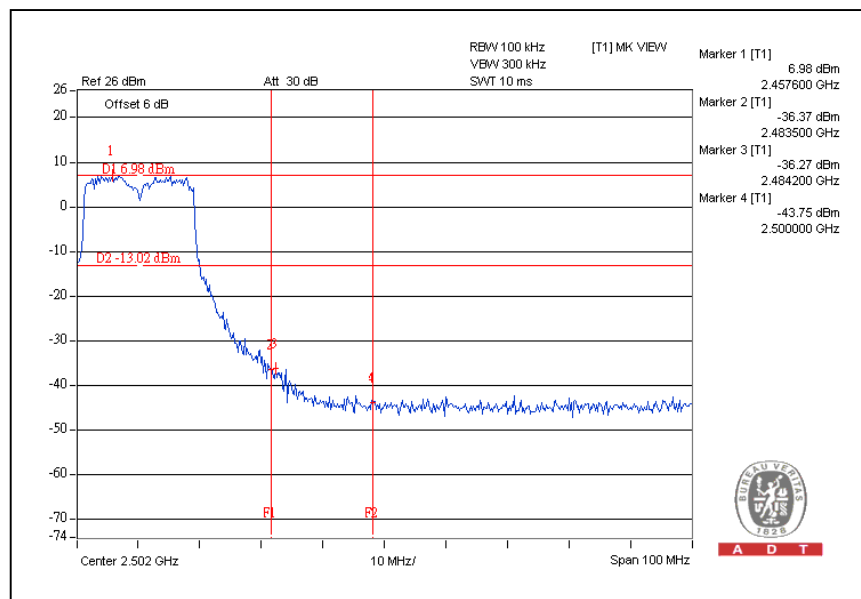


DRAFT 802.11n (20MHz) OFDM MODULATION:

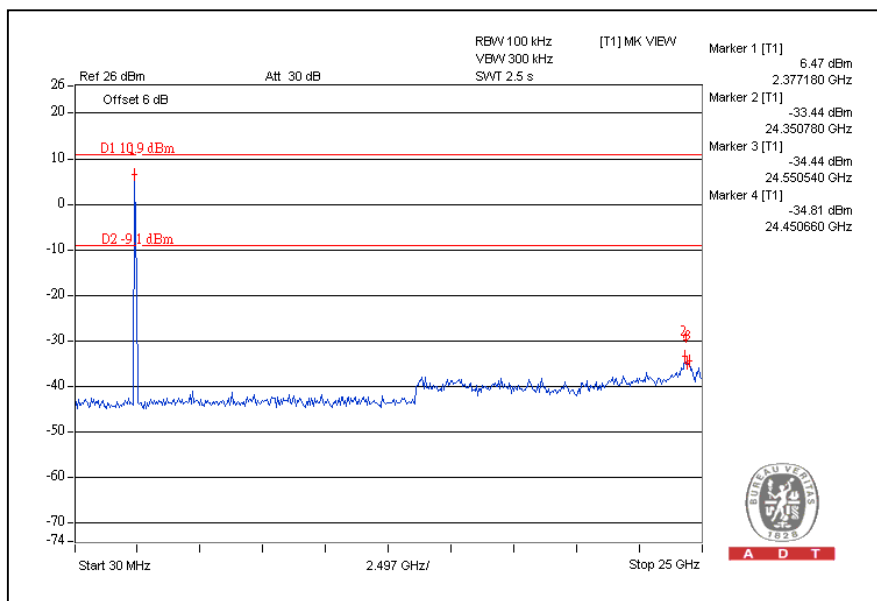
With combiner:CH1



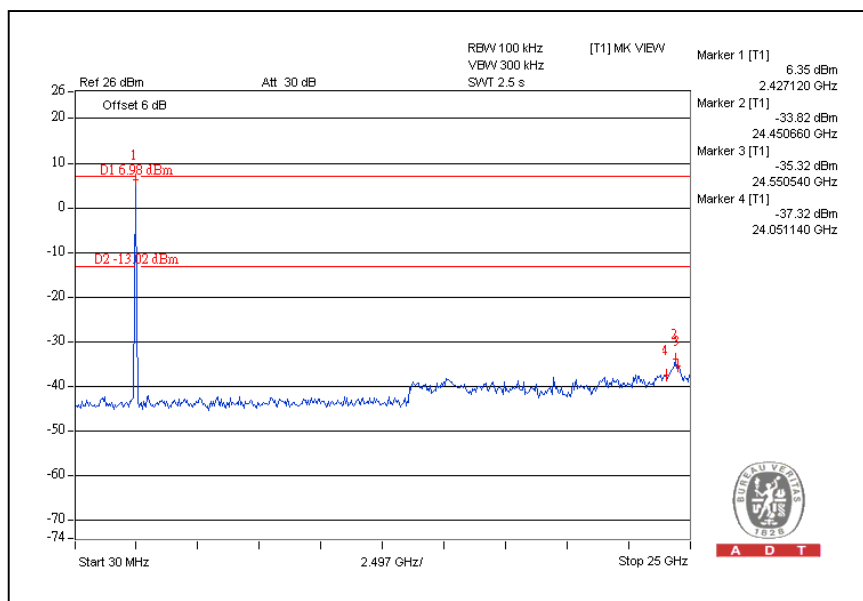
CH11



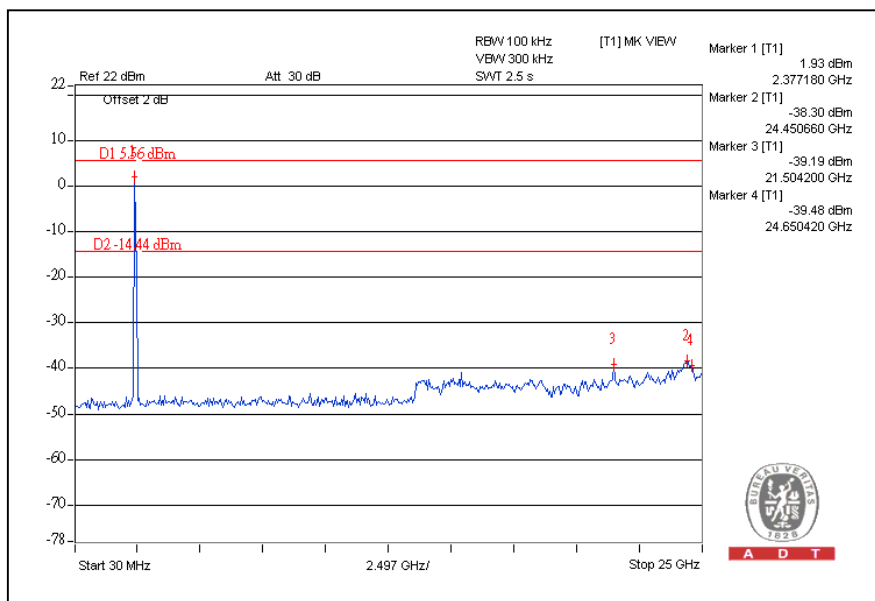
With combiner:CH1



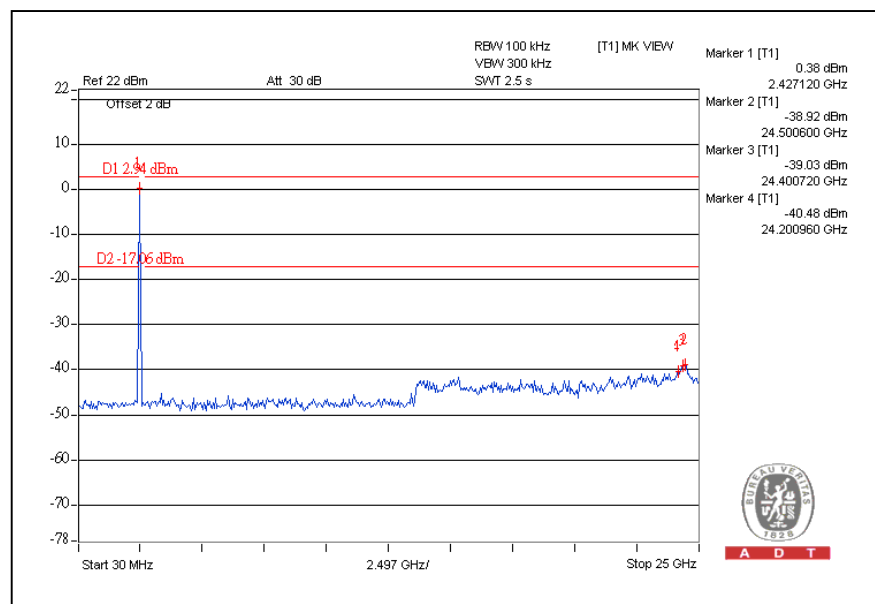
CH11



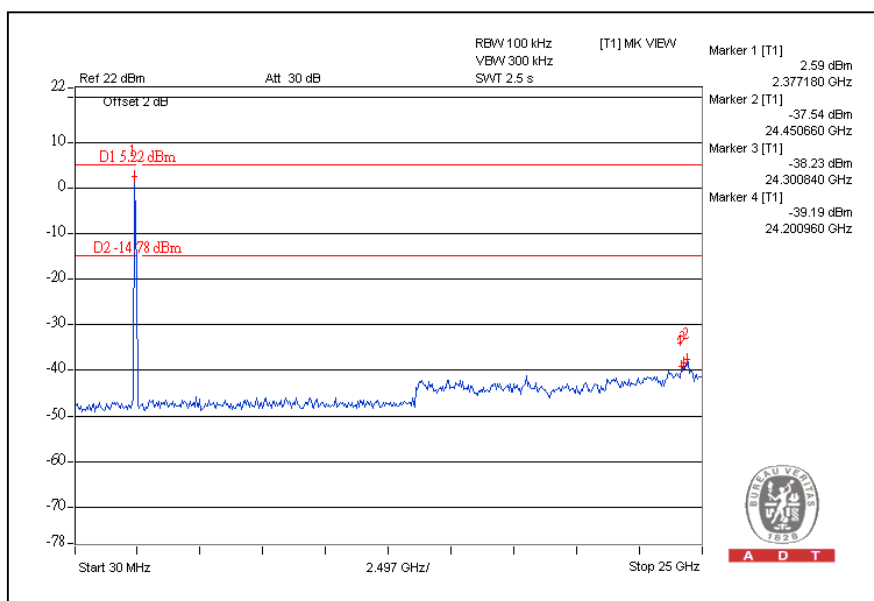
For Chain 0: CH1



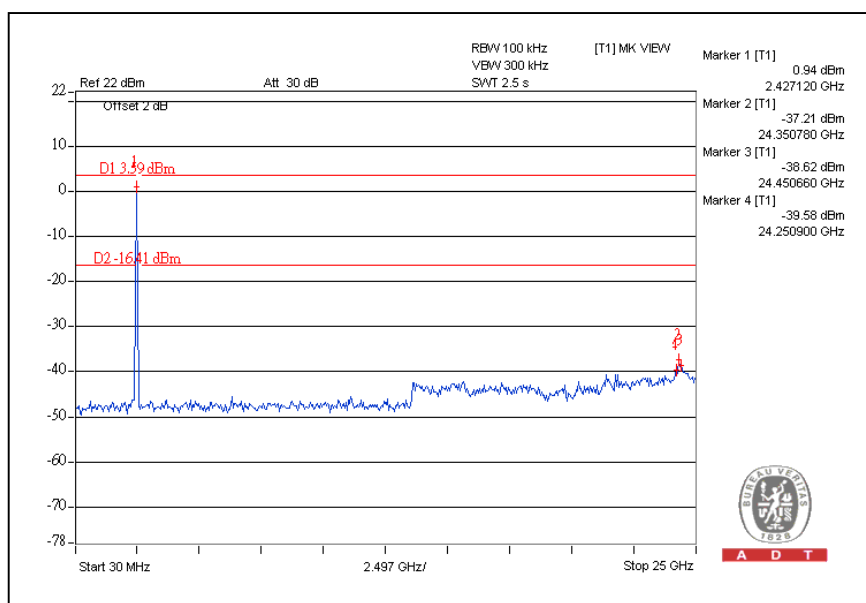
CH11



For Chain 1: CH1

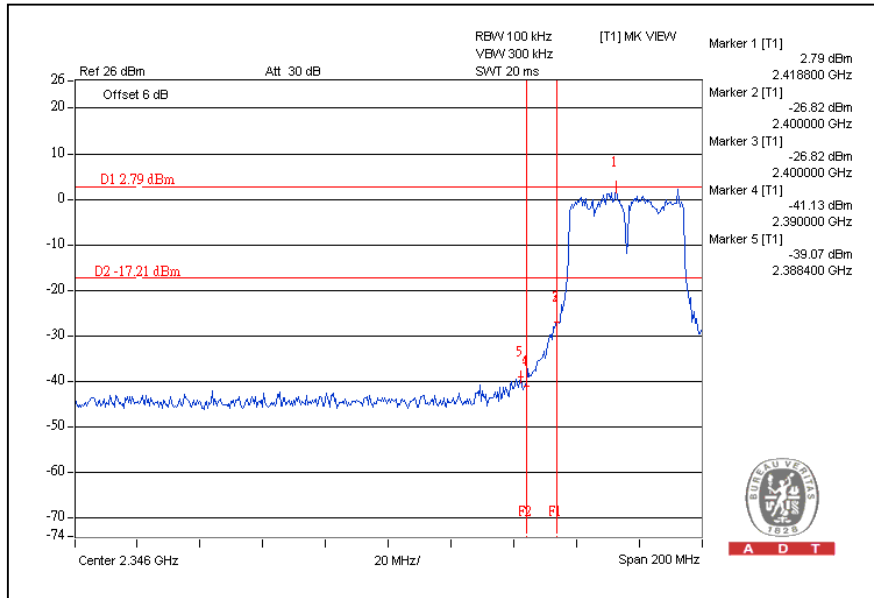


CH11

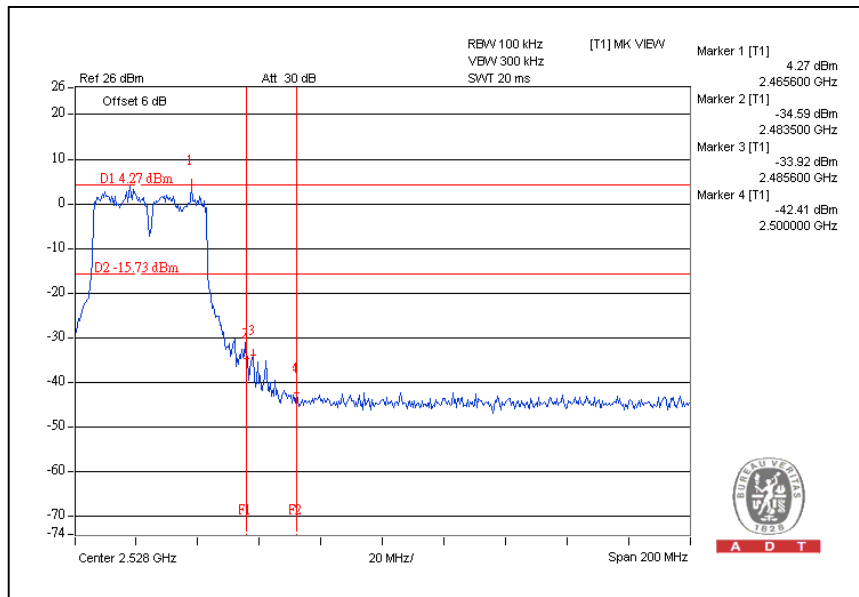


DRAFT 802.11n (40MHz) OFDM MODULATION:

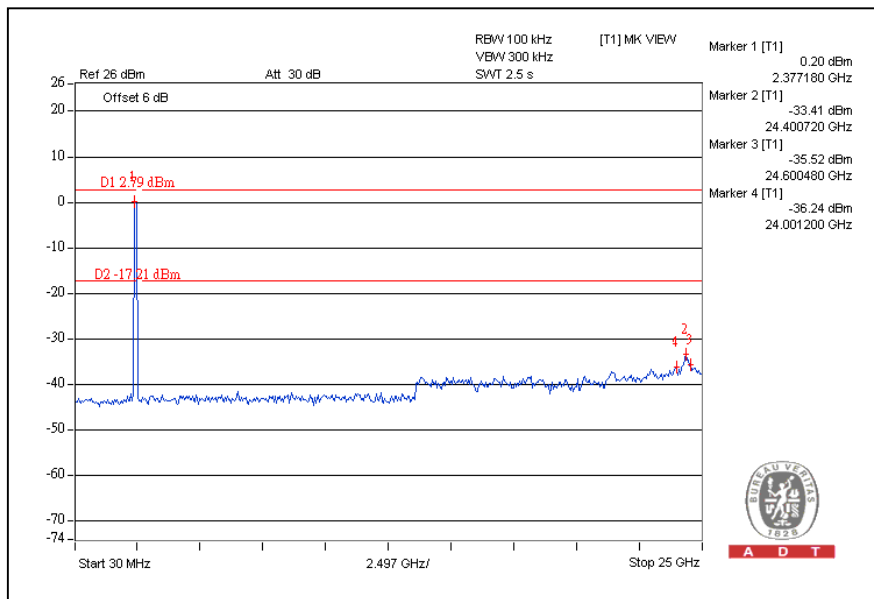
With combiner:CH1



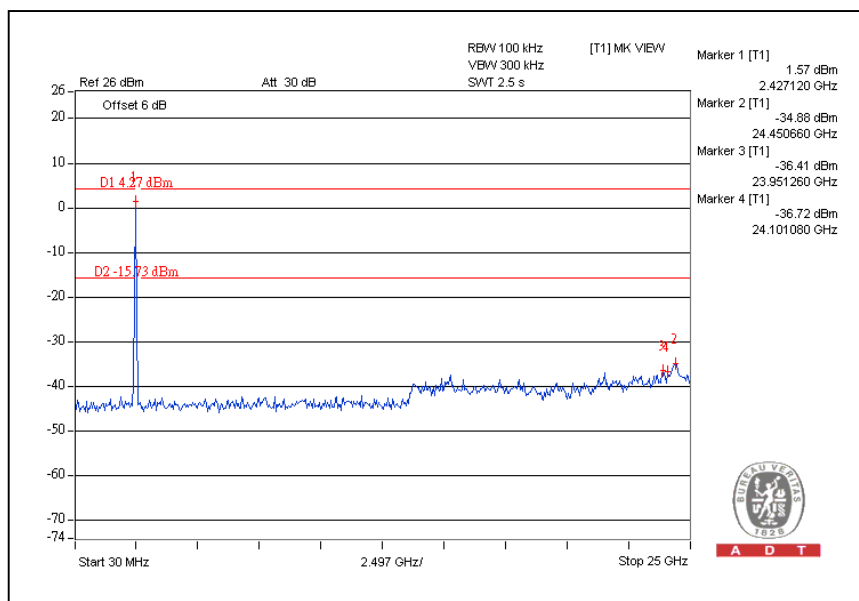
CH7



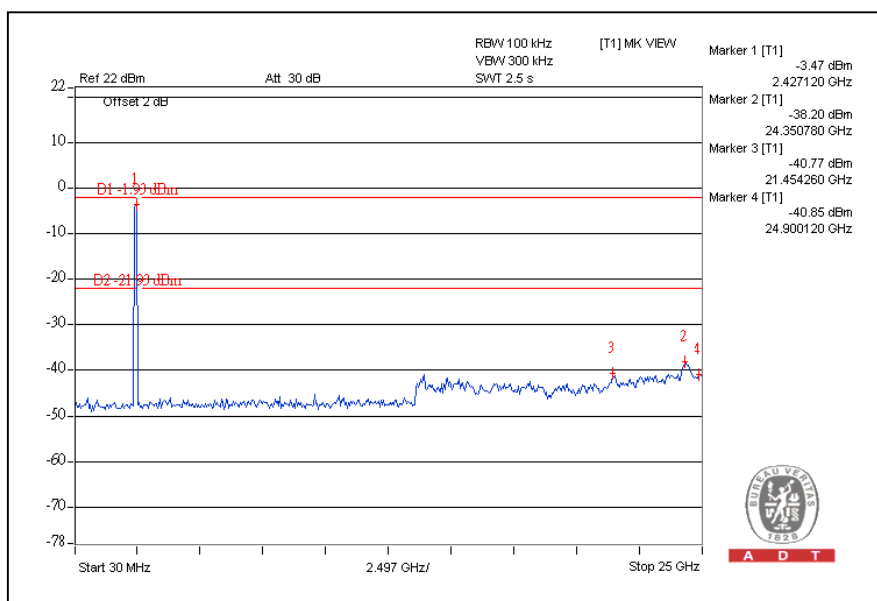
With combiner:CH1



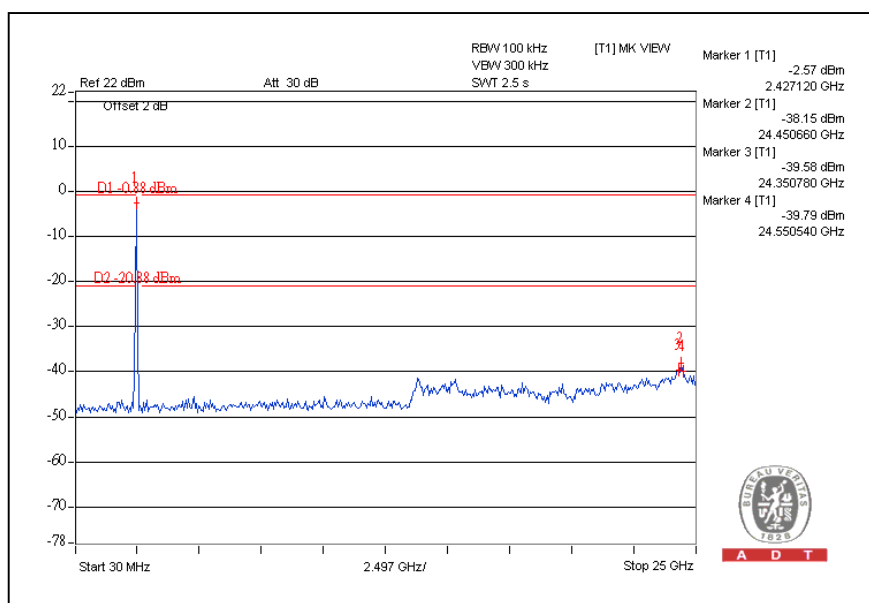
CH7



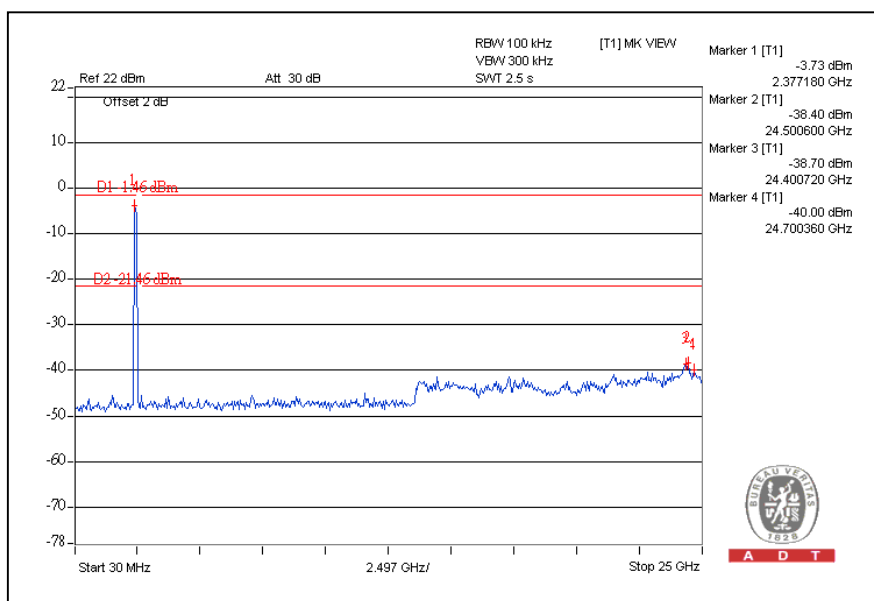
For Chain 0: CH1



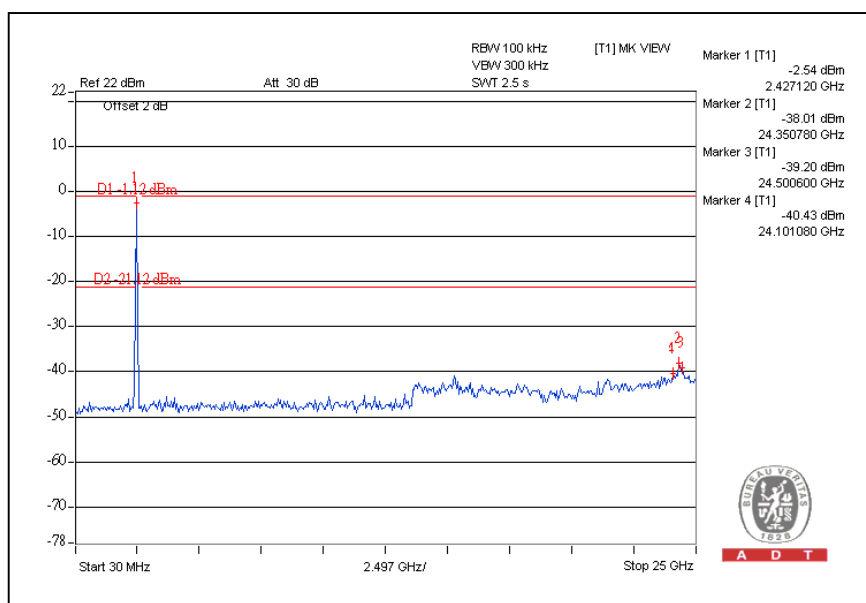
CH7



For Chain 1: CH1



CH7





A D T

5. TEST TYPES AND RESULTS (802.11a, 5725~5850MHz Band)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 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 0.50 MHz.
 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.

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	April 01, 2008	Mar. 31, 2009
Line-Impedance Stabilization Network (for EUT)	ENV-216	100071	Nov. 26, 2008	Nov. 25, 2009
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 05, 2008	Nov. 04, 2009
RF Cable (JYEBAO)	5DFB	COBCAB-001	Aug 15, 2008	Aug 14, 2009
50 ohms Terminator	50	3	Nov. 05, 2008	Nov. 04, 2009
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. B.
3. The VCCI Con B Registration No. is C-2193.

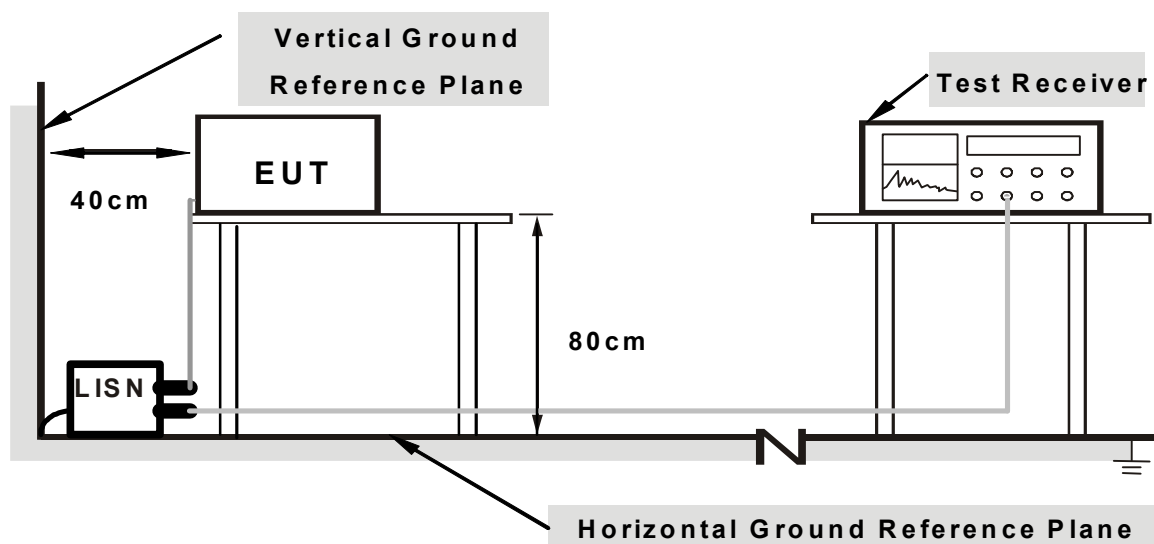
5.1.3 TEST PROCEDURES

- 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) were not recorded.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 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 related item – Photographs of the Test Configuration.

5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

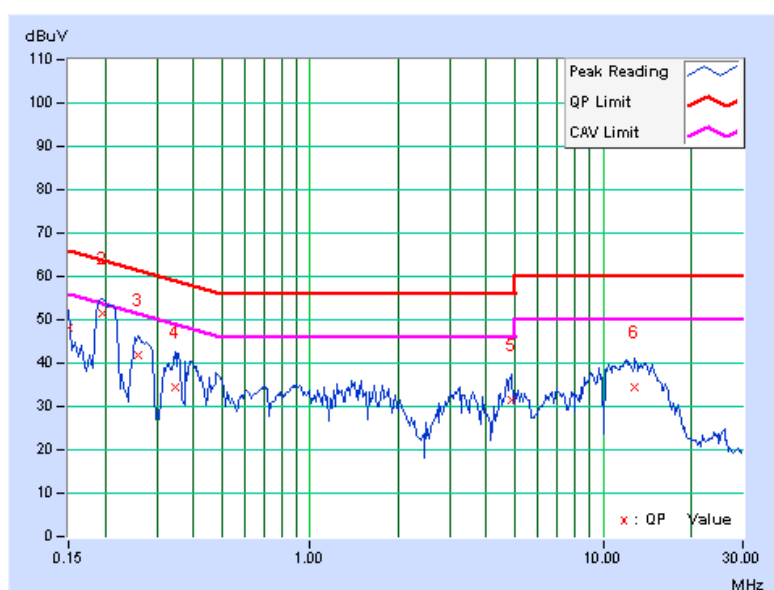
5.1.7 TEST RESULTS

802.11a OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line (L)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	22deg. C, 67%RH, 962hPa	TESTED BY	Phoenix Huang

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.19	47.94	-	48.13	-	66.00	56.00	-17.87	-
2	0.197	0.22	51.18	-	51.40	-	63.74	53.74	-12.34	-
3	0.259	0.29	41.70	-	41.99	-	61.45	51.45	-19.46	-
4	0.345	0.39	34.12	-	34.51	-	59.07	49.07	-24.56	-
5	4.863	0.60	30.71	-	31.31	-	56.00	46.00	-24.69	-
6	12.855	0.93	33.54	-	34.47	-	60.00	50.00	-25.53	-

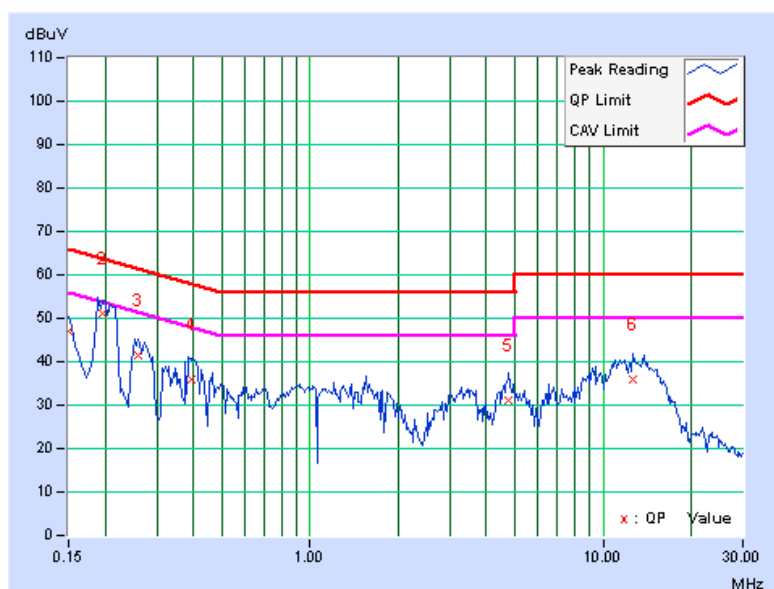
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = 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	Neutral (N)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	22deg. C, 67%RH, 962hPa	TESTED BY	Phoenix Huang

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.12	46.90	-	47.02	-	66.00	56.00	-18.98	-
2	0.197	0.15	50.87	-	51.02	-	63.74	53.74	-12.72	-
3	0.259	0.22	41.36	-	41.58	-	61.45	51.45	-19.87	-
4	0.396	0.40	35.51	-	35.91	-	57.93	47.93	-22.03	-
5	4.762	0.52	30.52	-	31.04	-	56.00	46.00	-24.96	-
6	12.621	0.74	35.09	-	35.83	-	60.00	50.00	-24.17	-

- 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.



5.2 RADIATED EMISSION MEASUREMENT

5.2.1 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.

5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 9, 2008	Dec. 8, 2009
HP Pre_Amplifier	8449B	3008A01923	Nov. 10, 2008	Nov. 9, 2009
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 9, 2008	Sep. 8, 2009
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 30, 2008	April 29, 2009
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 09, 2008	Dec. 08, 2009
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2009	Jan. 21, 2010
RF Switches	EMH-011	08009	Oct. 07, 2008	Oct. 06, 2009
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 15, 2008	Aug. 14, 2009
RF Cable	8DFB	STCCAB-30M-1GHz	Oct. 07, 2008	Oct. 06, 2009
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in Open Site No. C.

4. The FCC Site Registration No. is 656396.

5. The VCCI Site Registration No. is R-1626.

6. The CANADA Site Registration No. is IC 7450G-3.

5.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 1 or 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.
- g. Shorter measurement distances may be used to improve the measurement system's noise floor. As Subpart E description is based on the measurement in distance of 3 meters, the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

Test value at 3-meter distance (dBuV)

= Test value at 1 meter distance (dBuV) -20log(3/1)(dB)

= Test value at 1 meter distance (dBuV) -9.54(dB)

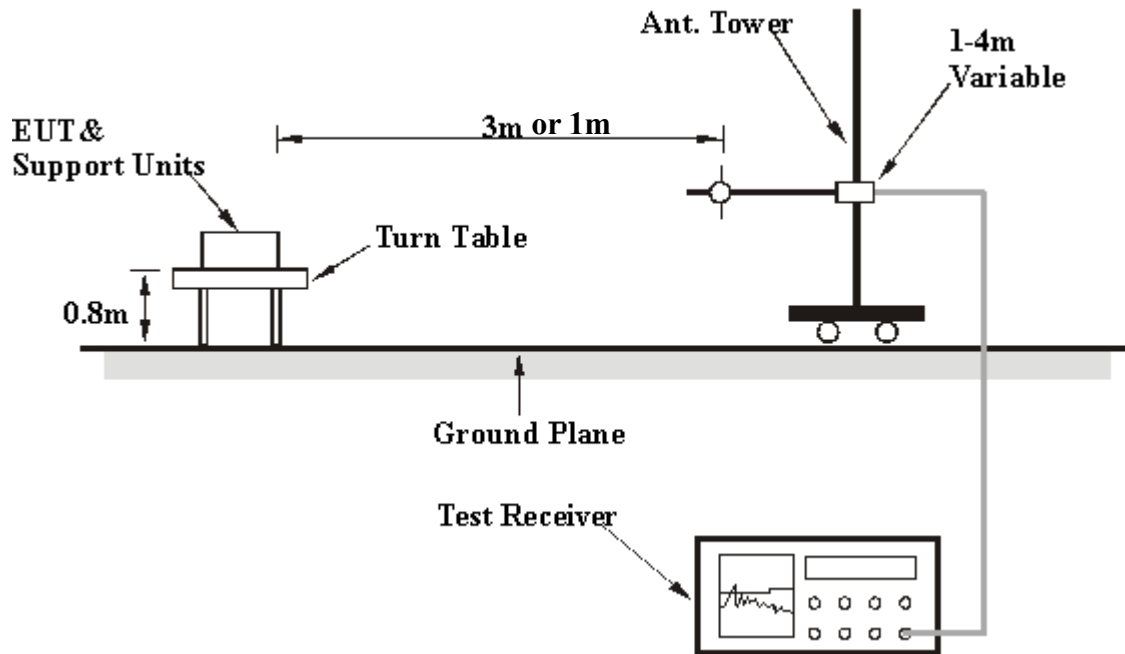
NOTE:

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 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

5.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6



A D T

Below 1GHz Test Data

5.2.7 TEST RESULTS

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	166.52	41.06 QP	43.50	-2.44	1.52 H	77	27.54	13.52
2	299.74	44.88 QP	46.00	-1.12	1.02 H	41	28.33	16.55
3	399.66	43.21 QP	46.00	-2.79	2.02 H	165	24.46	18.75
4	499.68	40.21 QP	46.00	-5.79	1.59 H	139	18.95	21.26
5	719.89	35.62 QP	46.00	-10.38	1.02 H	315	9.86	25.76
6	899.36	37.14 QP	46.00	-8.86	1.05 H	227	8.67	28.47
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.34	35.58 QP	40.00	-4.42	1.00 V	56	21.97	13.61
2	133.53	35.44 QP	43.50	-8.06	1.00 V	55	20.83	14.61
3	299.75	34.08 QP	46.00	-11.92	1.45 V	298	17.07	17.01
4	399.65	41.63 QP	46.00	-4.37	1.98 V	170	20.50	21.13
5	675.25	31.89 QP	46.00	-14.11	1.53 V	332	5.41	26.48
6	899.41	34.04 QP	46.00	-11.96	1.55 V	220	3.04	31.00

- 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.



A D T

Above 1GHz Test Data

5.2.8 TEST RESULTS

802.11a OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M									
NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	116.50 PK	106.96 PK			1.03 H	158	79.29	37.21
2	*5745.00	105.20 AV	95.66 AV			1.03 H	158	67.99	37.21
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M									
NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	125.60 PK	116.06 PK			1.19 V	331	88.39	37.21
2	*5745.00	112.40 AV	102.86 AV			1.19 V	331	75.19	37.21

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3830.00	55.20 PK	74.00	-18.80	1.28 H	24	22.03	33.17
2	3830.00	49.30 AV	54.00	-4.70	1.28 H	24	16.13	33.17
3	11490.00	61.10 PK	74.00	-12.90	1.29 H	244	14.07	47.03
4	11490.00	49.10 AV	54.00	-4.90	1.29 H	244	2.07	47.03
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3830.00	57.10 PK	74.00	-16.90	1.21 V	119	23.93	33.17
2	3830.00	51.70 AV	54.00	-2.30	1.21 V	119	18.53	33.17
3	11490.00	61.80 PK	74.00	-12.20	1.81 V	212	14.77	47.03
4	11490.00	45.60 AV	54.00	-8.40	1.81 V	212	-1.43	47.03

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.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. Limit line converted to account for 1-meter measurement distance.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M									
NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	68.70 PK	59.16 PK	74.00	-14.84	1.03 H	164	32.20	36.50
2	5460.00	59.10 AV	49.56 AV	54.00	-4.44	1.03 H	164	22.60	36.50
3	*5785.00	116.90 PK	107.36 PK			1.04 H	162	79.59	37.31
4	*5785.00	105.40 AV	95.86 AV			1.04 H	162	68.09	37.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M									
NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	74.10 PK	64.56 PK	74.00	-9.44	1.19 V	323	37.60	36.50
2	5460.00	62.30 AV	52.76 AV	54.00	-1.24	1.19 V	323	25.80	36.50
3	*5785.00	125.90 PK	116.36 PK			1.18 V	327	88.59	37.31
4	*5785.00	112.80 AV	103.26 AV			1.18 V	327	75.49	37.31

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3856.00	55.10 PK	74.00	-18.90	1.24 H	33	21.86	33.24
2	3856.00	49.80 AV	54.00	-4.20	1.24 H	33	16.56	33.24
3	11570.00	61.40 PK	74.00	-12.60	1.34 H	253	14.43	46.97
4	11570.00	49.20 AV	54.00	-4.80	1.34 H	253	2.23	46.97

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3856.00	57.20 PK	74.00	-16.80	1.23 V	71	23.96	33.24
2	3856.00	50.40 AV	54.00	-3.60	1.23 V	71	17.16	33.24
3	11570.00	62.10 PK	74.00	-11.90	1.87 V	210	15.13	46.97
4	11570.00	46.10 AV	54.00	-7.90	1.87 V	210	-0.87	46.97

- 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 limit value is defined as per 15.247.
 7. Limit line converted to account for 1-meter measurement distance.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 5	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M									
NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	69.20 PK	59.66 PK	74.00	-14.34	1.04 H	167	32.70	36.50
2	5460.00	59.30 AV	49.76 AV	54.00	-4.24	1.04 H	167	22.80	36.50
3	*5825.00	117.20 PK	107.66 PK			1.05 H	166	79.78	37.42
4	*5825.00	105.80 AV	96.26 AV			1.05 H	166	68.38	37.42

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M									
NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	74.80 PK	65.26 PK	74.00	-8.74	1.18 V	325	38.30	36.50
2	5460.00	62.40 AV	52.86 AV	54.00	-1.14	1.18 V	325	25.90	36.50
3	*5825.00	125.70 PK	116.16 PK			1.16 V	320	88.28	37.42
4	*5825.00	112.60 AV	103.06 AV			1.16 V	320	75.18	37.42

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3883.00	57.30 PK	74.00	-16.70	1.31 H	37	23.99	33.31
2	3883.00	51.20 AV	54.00	-2.80	1.31 H	37	17.89	33.31
3	11610.00	61.60 PK	74.00	-12.40	1.35 H	245	14.67	46.93
4	11610.00	49.20 AV	54.00	-4.80	1.35 H	245	2.27	46.93

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3883.00	59.10 PK	74.00	-14.90	1.20 V	58	25.79	33.31
2	3883.00	53.50 AV	54.00	-0.50	1.20 V	58	20.19	33.31
3	11610.00	62.30 PK	74.00	-11.70	1.83 V	222	15.37	46.93
4	11610.00	46.70 AV	54.00	-7.30	1.83 V	222	-0.23	46.93

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 limit value is defined as per 15.247.

7. Limit line converted to account for 1-meter measurement distance.



A D T

DRAFT 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M									
NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	116.20 PK	106.66 PK			1.04 H	139	78.99	37.21
2	*5745.00	102.30 AV	92.76 AV			1.04 H	139	65.09	37.21
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M									
NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	122.80 PK	113.26 PK			1.13 V	306	85.59	37.21
2	*5745.00	110.60 AV	101.06 AV			1.13 V	306	73.39	37.21

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3830.00	54.20 PK	74.00	-19.80	1.14 H	32	21.03	33.17
2	3830.00	49.50 AV	54.00	-4.50	1.14 H	32	16.33	33.17
3	11490.00	61.80 PK	74.00	-12.20	1.25 H	230	14.77	47.03
4	11490.00	51.60 AV	54.00	-2.40	1.25 H	230	4.57	47.03
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3830.00	57.10 PK	74.00	-16.90	1.21 V	74	23.93	33.17
2	3830.00	52.40 AV	54.00	-1.60	1.21 V	74	19.23	33.17
3	11490.00	64.30 PK	74.00	-9.70	1.87 V	269	17.27	47.03
4	11490.00	50.40 AV	54.00	-3.60	1.87 V	269	3.37	47.03

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.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. Limit line converted to account for 1-meter measurement distance.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M

NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	69.20 PK	59.66 PK	74.00	-14.34	1.04 H	147	32.70	36.50
2	5460.00	57.30 AV	47.76 AV	54.00	-6.24	1.04 H	147	20.80	36.50
3	*5785.00	115.90 PK	106.36 PK			1.05 H	142	78.59	37.31
4	*5785.00	102.10 AV	92.56 AV			1.05 H	142	64.79	37.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M

NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	74.80 PK	65.26 PK	74.00	-8.74	1.17 V	312	38.30	36.50
2	5460.00	62.30 AV	52.76 AV	54.00	-1.24	1.17 V	312	25.80	36.50
3	*5785.00	122.60 PK	113.06 PK			1.14 V	320	85.29	37.31
4	*5785.00	110.30 AV	100.74 AV			1.14 V	320	72.99	37.31

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3856.00	55.10 PK	74.00	-18.90	1.13 H	69	21.86	33.24
2	3856.00	50.10 AV	54.00	-3.90	1.13 H	69	16.86	33.24
3	11570.00	62.40 PK	74.00	-11.60	1.21 H	248	15.43	46.97
4	11570.00	52.10 AV	54.00	-1.90	1.21 H	248	5.13	46.97

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3856.00	57.90 PK	74.00	-16.10	1.24 V	79	24.66	33.24
2	3856.00	52.80 AV	54.00	-1.20	1.24 V	79	19.56	33.24
3	11570.00	65.10 PK	74.00	-8.90	1.92 V	273	18.13	46.97
4	11570.00	51.20 AV	54.00	-2.80	1.92 V	273	4.23	46.97

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 limit value is defined as per 15.247.

7. Limit line converted to account for 1-meter measurement distance.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 5	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M									
NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	70.20 PK	60.66 PK	74.00	-13.34	1.06 H	153	33.70	36.50
2	5460.00	58.10 AV	48.56 AV	54.00	-5.40	1.06 H	153	21.60	36.50
3	*5825.00	116.40 PK	106.86 PK			1.00 H	150	78.98	37.42
4	*5825.00	102.40 AV	92.86 AV			1.00 H	150	64.98	37.42

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M									
NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	75.40 PK	65.86 PK	74.00	-8.14	1.18 V	344	38.90	36.50
2	5460.00	63.10 AV	53.56 AV	54.00	-0.44	1.18 V	344	26.60	36.50
3	*5825.00	122.00 PK	112.46 PK			1.15 V	325	84.58	37.42
4	*5825.00	110.00 AV	100.46 AV			1.15 V	325	72.58	37.42

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3883.00	56.30 PK	74.00	-17.70	1.15 H	72	22.99	33.31
2	3883.00	51.20 AV	54.00	-2.80	1.15 H	72	17.89	33.31
3	11610.00	63.00 PK	74.00	-11.00	1.21 H	247	16.07	46.93
4	11610.00	52.30 AV	54.00	-1.70	1.21 H	247	5.37	46.93

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3883.00	58.53 PK	74.00	-15.47	1.19 V	61	25.22	33.31
2	3883.00	53.45 AV	54.00	-0.55	1.19 V	61	20.14	33.31
3	11610.00	65.40 PK	74.00	-8.60	1.95 V	285	18.47	46.93
4	11610.00	51.70 AV	54.00	-2.30	1.95 V	285	4.77	46.93

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 limit value is defined as per 15.247.

7. Limit line converted to account for 1-meter measurement distance.



A D T

DRAFT 802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M

NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5394.00	70.20 PK	60.66 PK	74.00	-13.34	1.04 H	158	33.81	36.39
2	5394.00	58.30 AV	48.76 AV	54.00	-5.24	1.04 H	158	21.91	36.39
3	*5755.00	112.30 PK	102.76 PK			1.02 H	164	75.07	37.23
4	*5755.00	101.20 AV	91.66 AV			1.02 H	164	63.97	37.23

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M

NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5394.00	75.76 PK	66.22 PK	74.00	-7.78	1.16 V	322	39.37	36.39
2	5394.00	62.80 AV	53.26 AV	54.00	-0.74	1.16 V	322	26.41	36.39
3	*5755.00	119.50 PK	109.96 PK			1.18 V	326	82.27	37.23
4	*5755.00	108.40 AV	98.86 AV			1.18 V	326	71.17	37.23

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3836.00	54.10 PK	74.00	-19.90	1.24 H	37	20.91	33.19
2	3836.00	49.20 AV	54.00	-4.80	1.24 H	37	16.01	33.19
3	11510.00	58.70 PK	74.00	-15.30	1.21 H	241	11.68	47.02
4	11510.00	46.10 AV	54.00	-7.90	1.21 H	241	-0.92	47.02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3836.00	56.30 PK	74.00	-17.70	1.26 V	68	23.11	33.19
2	3836.00	51.40 AV	54.00	-2.60	1.26 V	68	18.21	33.19
3	11510.00	60.70 PK	74.00	-13.30	1.87 V	287	13.68	47.02
4	11510.00	46.30 AV	54.00	-7.70	1.87 V	287	-0.72	47.02

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.

5. “ * ”: Fundamental frequency.

6. The limit value is defined as per 15.247.

7. Limit line converted to account for 1-meter measurement distance.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	13deg. C, 70%RH 962hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M

NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5423.00	70.40 PK	60.86 PK	74.00	-13.14	1.09 H	154	33.96	36.44
2	5423.00	58.70 AV	49.16 AV	54.00	-4.84	1.09 H	154	22.26	36.44
3	*5795.00	112.90 PK	103.36 PK			1.04 H	167	75.56	37.34
4	*5795.00	101.60 AV	92.06 AV			1.04 H	167	64.26	37.34

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M

NO.	FREQ. (MHz)	EMISSION LEVEL at 1m (dBuV/m)	EMISSION LEVEL at 3m (dBuV/m)	LIMIT at 3m (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5423.00	75.30 PK	65.76 PK	74.00	-8.24	1.16 V	320	38.86	36.44
2	5423.00	62.75 AV	53.21 AV	54.00	-0.79	1.16 V	320	26.31	36.44
3	*5795.00	120.10 PK	110.56 PK			1.17 V	324	82.76	37.34
4	*5795.00	108.80 AV	99.26 AV			1.17 V	324	71.46	37.34

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3863.40	54.60 PK	74.00	-19.40	1.21 H	39	21.34	33.26
2	3863.40	49.80 AV	54.00	-4.20	1.21 H	39	16.54	33.26
3	11590.00	59.70 PK	74.00	-14.30	1.23 H	248	12.75	46.95
4	11590.00	46.80 AV	54.00	-7.20	1.23 H	248	-0.15	46.95

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3863.40	57.40 PK	74.00	-16.60	1.21 V	72	24.14	33.26
2	3863.40	52.30 AV	54.00	-1.70	1.21 V	72	19.04	33.26
3	11590.00	63.80 PK	74.00	-10.20	1.88 V	281	16.85	46.95
4	11590.00	48.80 AV	54.00	-5.20	1.88 V	281	1.85	46.95

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 limit value is defined as per 15.247.
7. Limit line converted to account for 1-meter measurement distance.

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

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

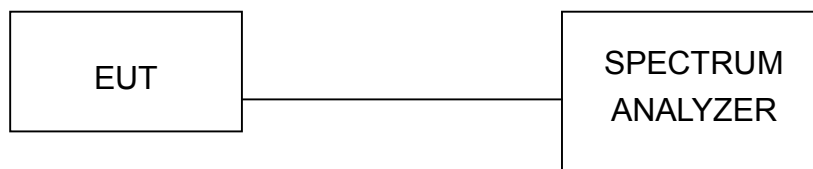
5.3.3 TEST PROCEDURE

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

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

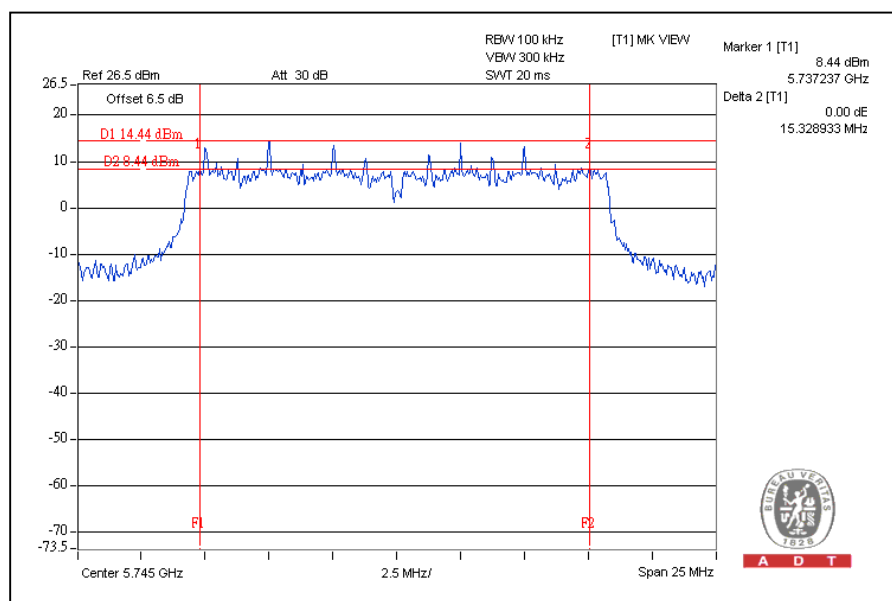
5.3.7 TEST RESULTS

802.11a OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	5745	15.33	0.5	PASS
3	5785	15.70	0.5	PASS
5	5825	16.05	0.5	PASS

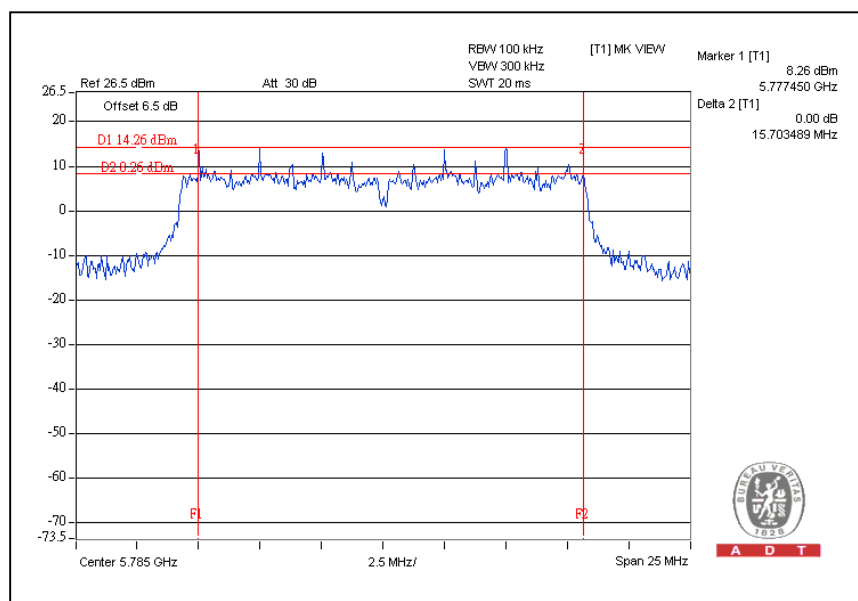
CH1



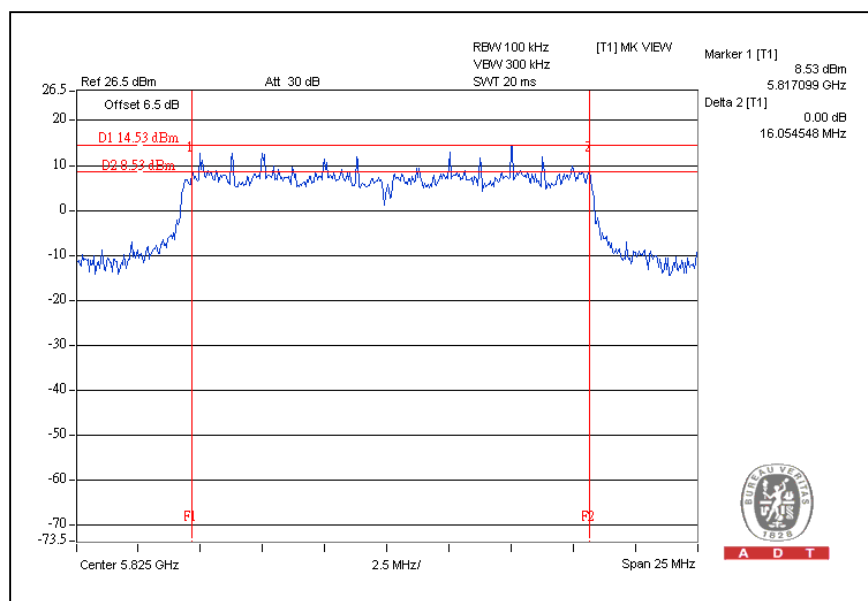


A D T

CH3



CH5





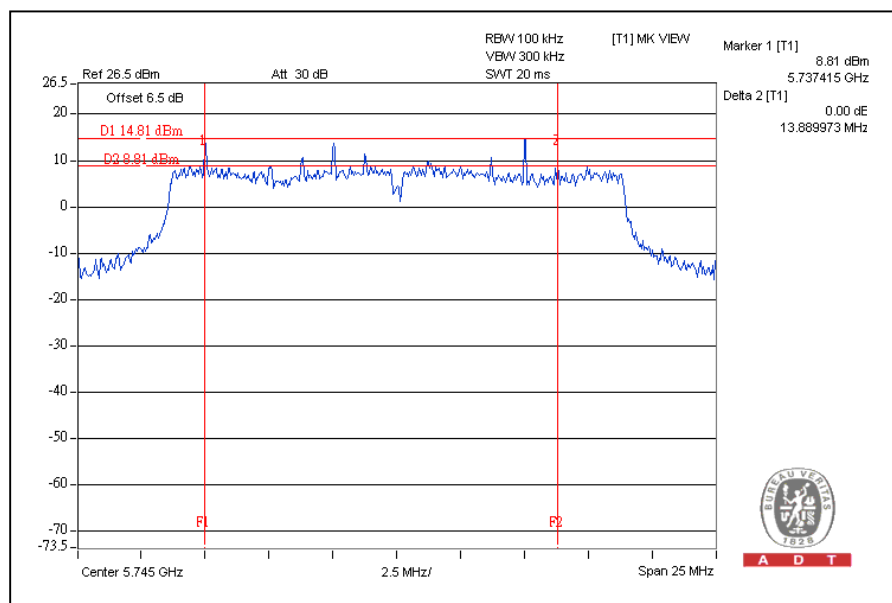
A D T

DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	5745	13.89	0.5	PASS
3	5785	17.19	0.5	PASS
5	5825	15.24	0.5	PASS

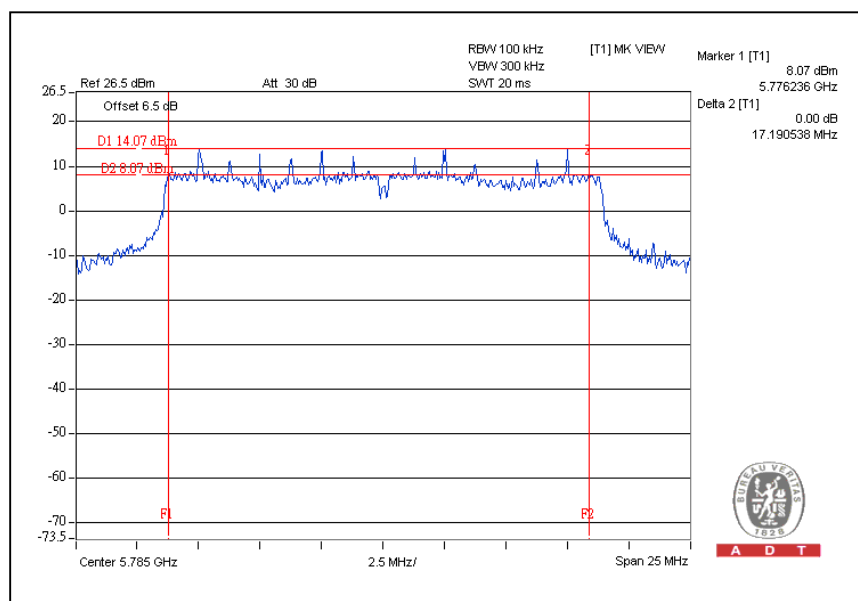
CH1



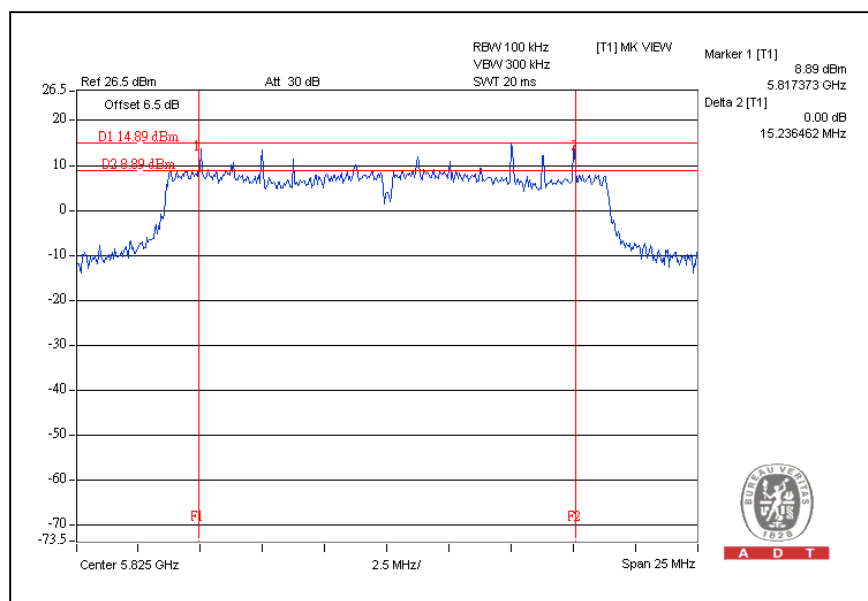


A D T

CH3



CH5





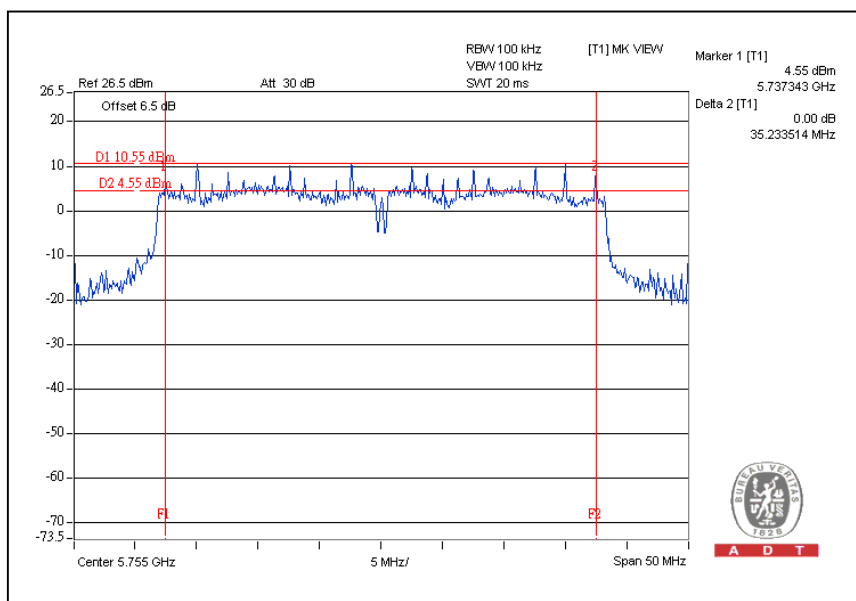
A D T

DRAFT 802.11n (40MHz) OFDM MODULATION:

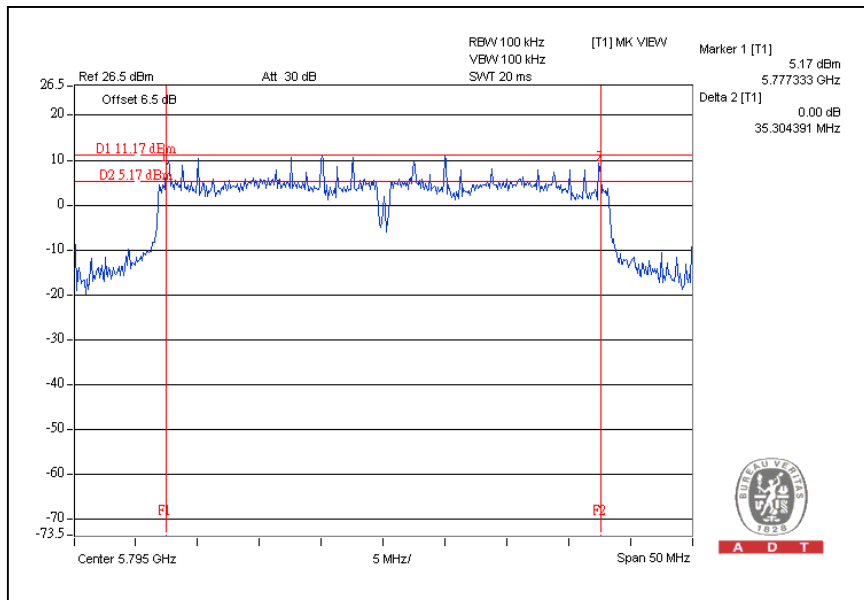
MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	5755	35.23	0.5	PASS
2	5795	35.30	0.5	PASS

CH1



CH2



5.4 MAXIMUM PEAK OUTPUT POWER

5.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

5.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	June 14, 2008	June 13, 2009
Pulse Power Sensor	MA2411B	0738172	April 17, 2008	April 16, 2009

NOTE:

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

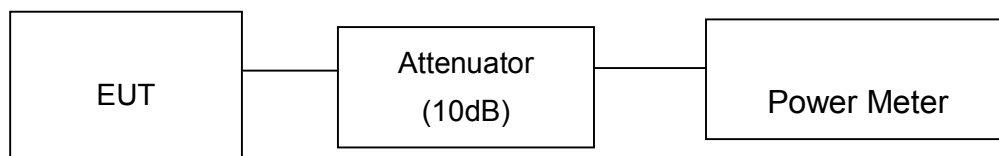
5.4.3 TEST PROCEDURES

3. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
4. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
5. Adjusted the power to have the same reading on oscilloscope. Record the power level.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



A D T

5.4.7 TEST RESULTS

802.11a OFDM modulation

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (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	5745	199.986	214.783	23.01	23.32	414.769	26.18	29	PASS
3	5785	195.434	205.116	22.91	23.12	400.550	26.03	29	PASS
5	5825	183.231	193.197	22.63	22.86	376.428	25.76	29	PASS

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi)=7

The effective legacy gain is 7dBi, therefore the limit reduce to 29dBm

DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 54%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (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	5745	201.372	215.774	23.04	23.34	417.146	26.20	30	PASS
3	5785	193.197	213.304	22.86	23.29	406.501	26.09	30	PASS
5	5825	179.887	197.242	22.55	22.95	377.129	25.76	30	PASS



A D T

DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (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	5755	211.349	222.331	23.25	23.47	433.680	26.37	30	PASS
2	5795	197.242	212.324	22.95	23.27	409.566	26.12	30	PASS

5.5 AVERAGE OUTPUT POWER

5.5.1 For reference.

5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	June 14, 2008	June 13, 2009
Pulse Power Sensor	MA2411B	0738172	April 17, 2008	April 16, 2009

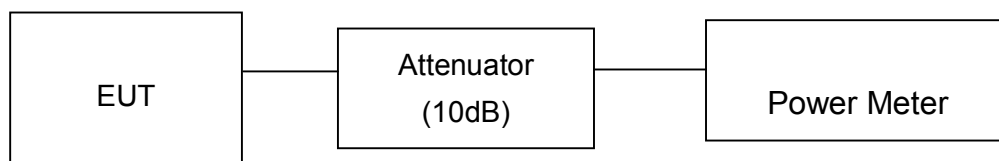
NOTE:

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

5.5.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator, the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the average power level.

5.5.4 TEST SETUP



5.5.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

5.5.6 TEST RESULTS

802.11a OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		TOTAL AVERAGE POWER (dBm)
		CHAIN(0)	CHAIN(1)	
1	5745	17.21	17.46	20.347
3	5785	17.28	17.61	20.458
5	5825	17.34	17.71	20.539

DRAFT 802.11n (20MHz) OFDM modulation:

MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		TOTAL AVERAGE POWER (dBm)
		CHAIN(0)	CHAIN(1)	
1	5745	17.03	17.51	20.287
3	5785	17.02	17.91	20.498
5	5825	17.1	17.91	20.534



A D T

DRAFT 802.11n (40MHz) OFDM modulation:

MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 962hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		TOTAL AVERAGE POWER (dBm)
		CHAIN(0)	CHAIN(1)	
1	5755	17.19	19.94	21.789
2	5795	17.26	18.02	20.667

5.6 POWER SPECTRAL DENSITY MEASUREMENT

5.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

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

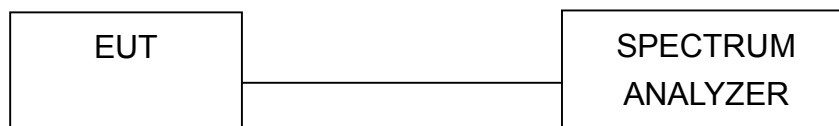
5.6.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.
2. The measurement include through a combiner with both chain and each chain when operate simultaneously.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6



A D T

5.6.7 TEST RESULTS

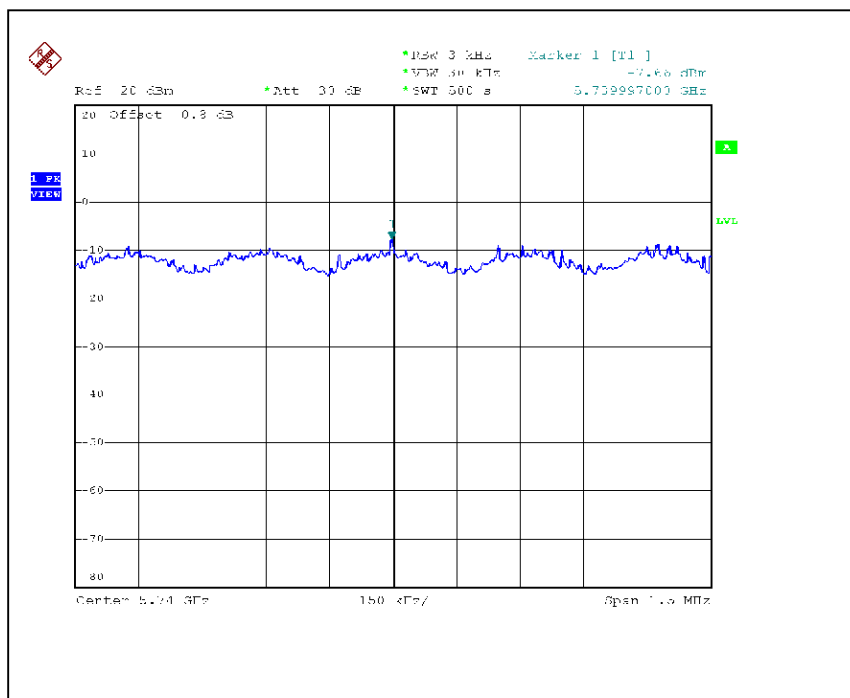
802.11a OFDM modulation

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

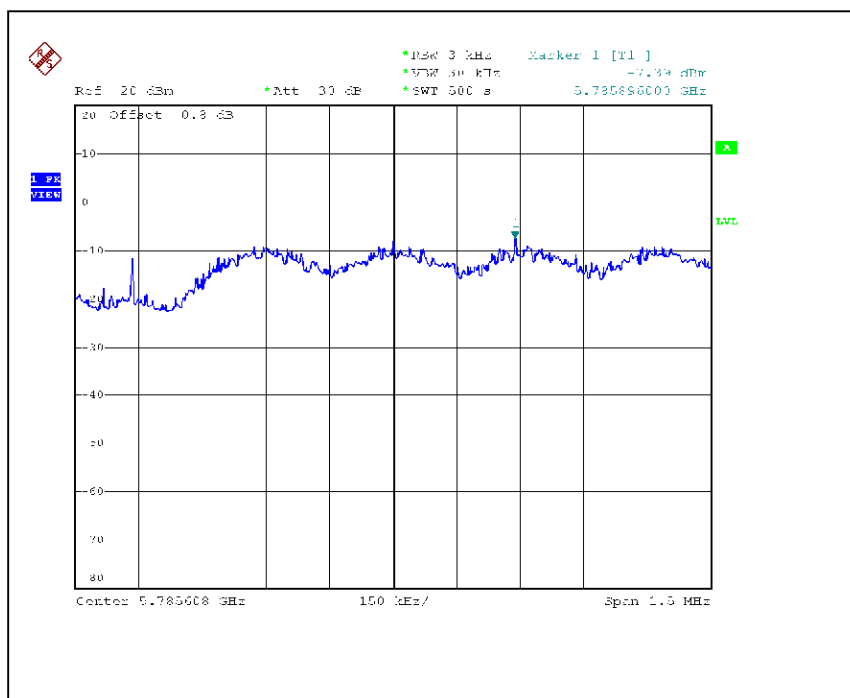
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY –With Combiner(dBm)	* TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	5745	-7.66	-8.54	-0.39	-5.07	8	PASS
3	5785	-7.39	-7.27	-3.19	-4.33	8	PASS
5	5825	-8.51	-7.14	1.12	-4.76	8	PASS

* Aggregate PSD across transmitters in linear power units across each transmitter output.

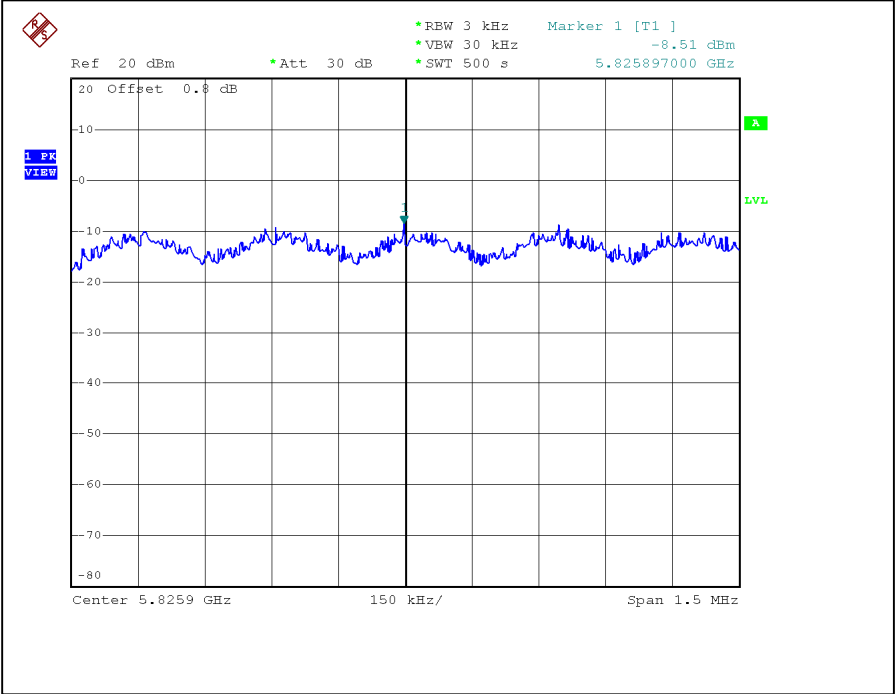
For Chain (0): CH1



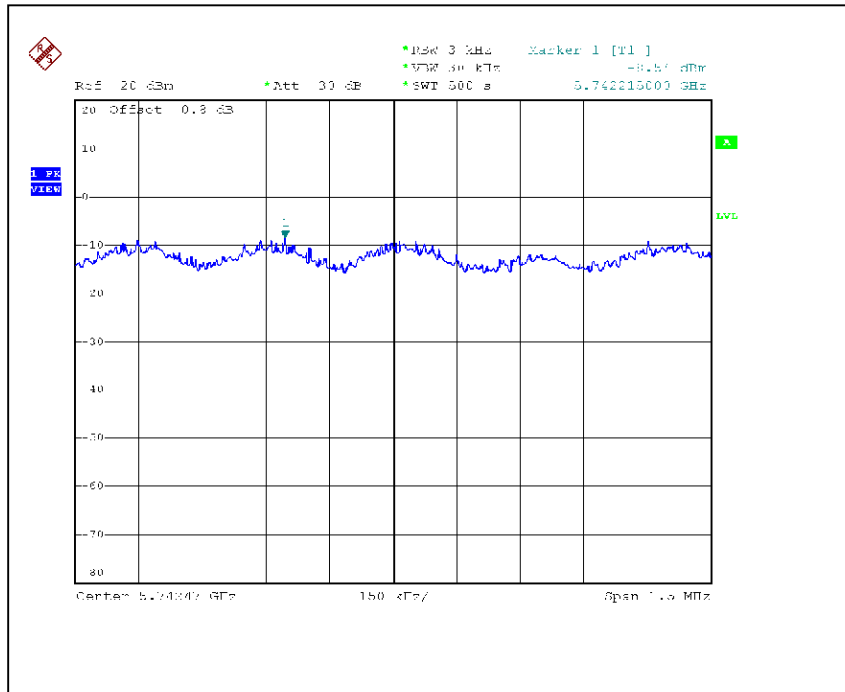
CH3



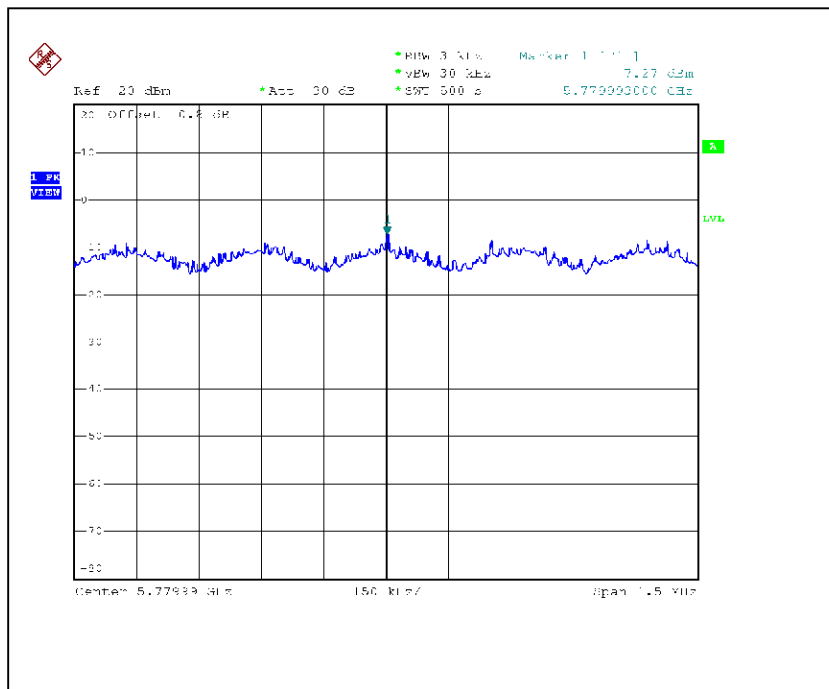
CH5



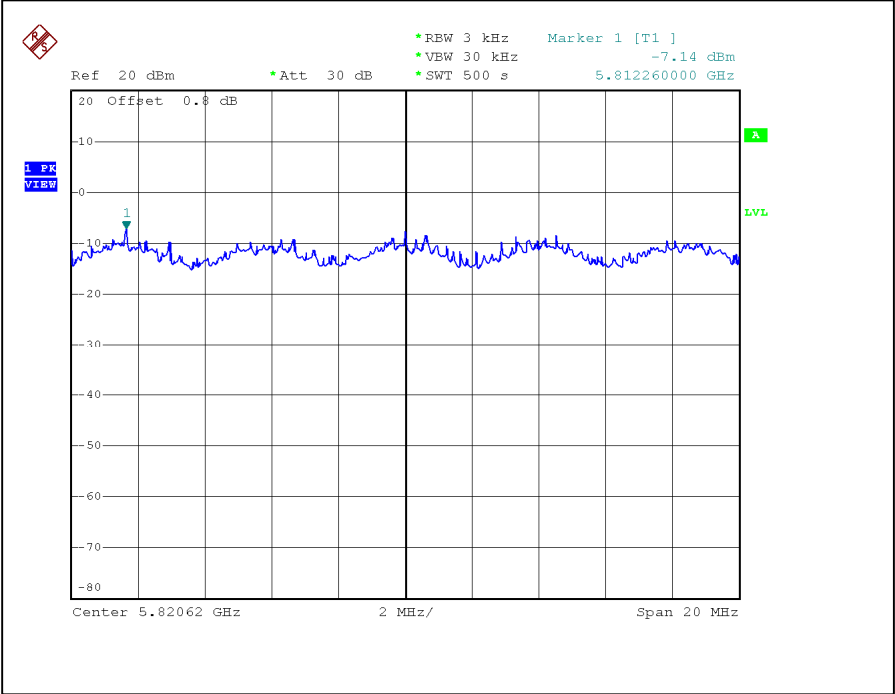
For Chain (1): CH1



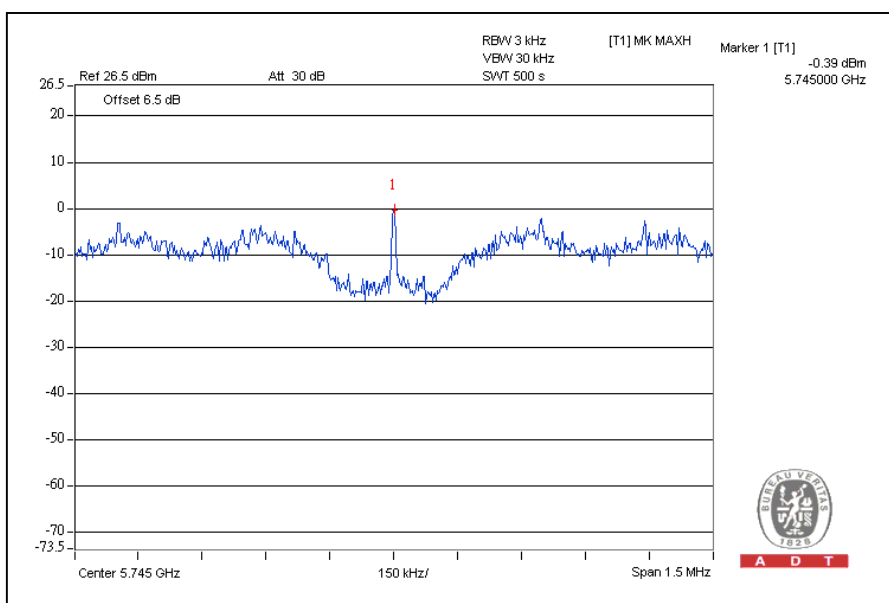
CH3



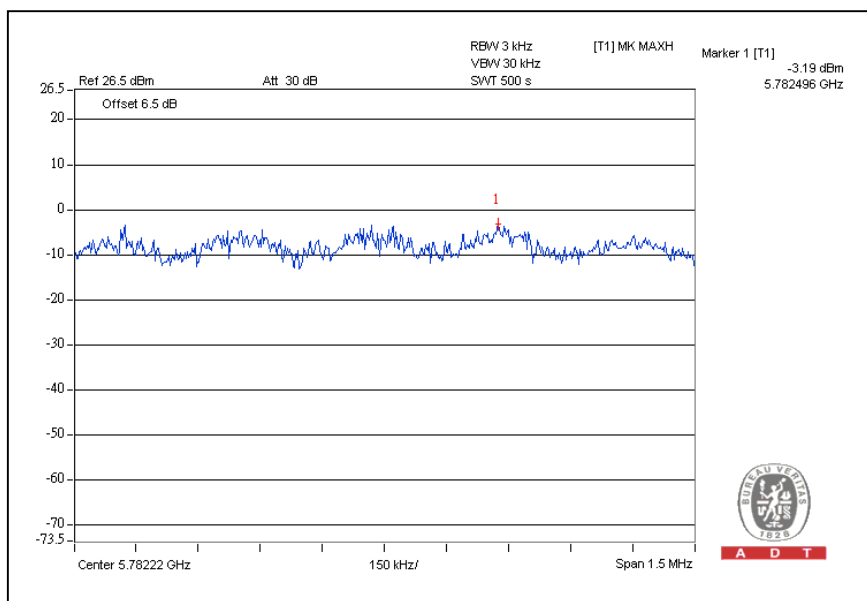
CH5



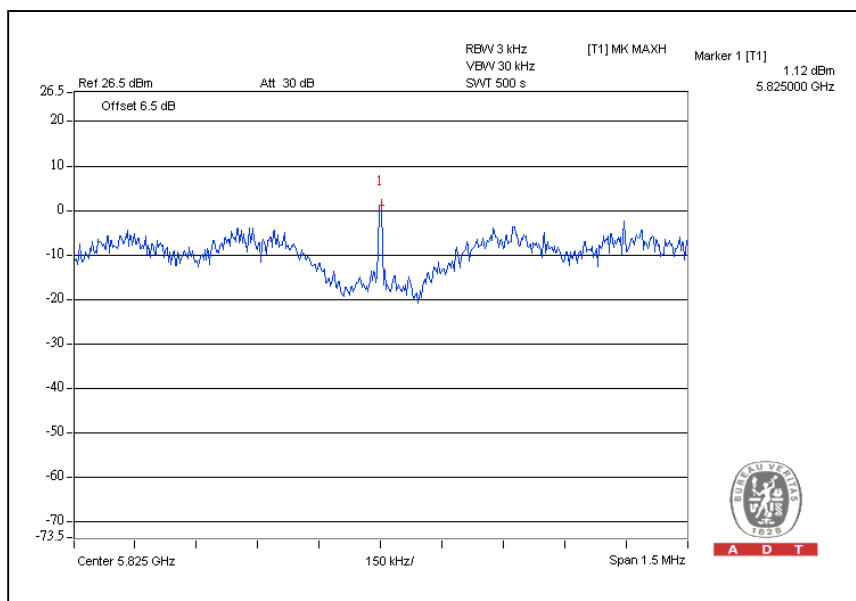
With Combiner : CH1



CH 3



CH 5





A D T

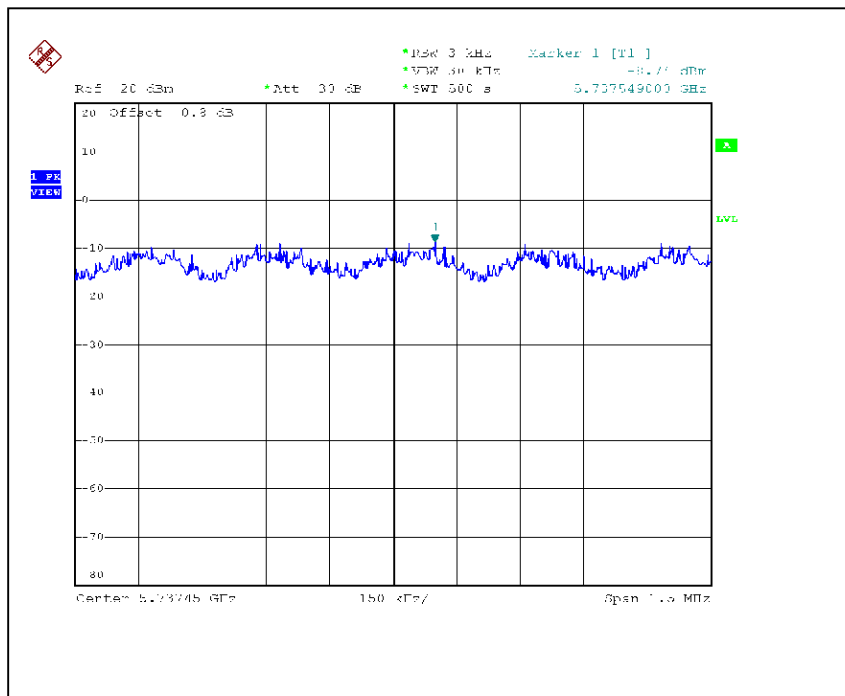
DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 54%RH, 962hPa
TESTED BY	Wen Yu		

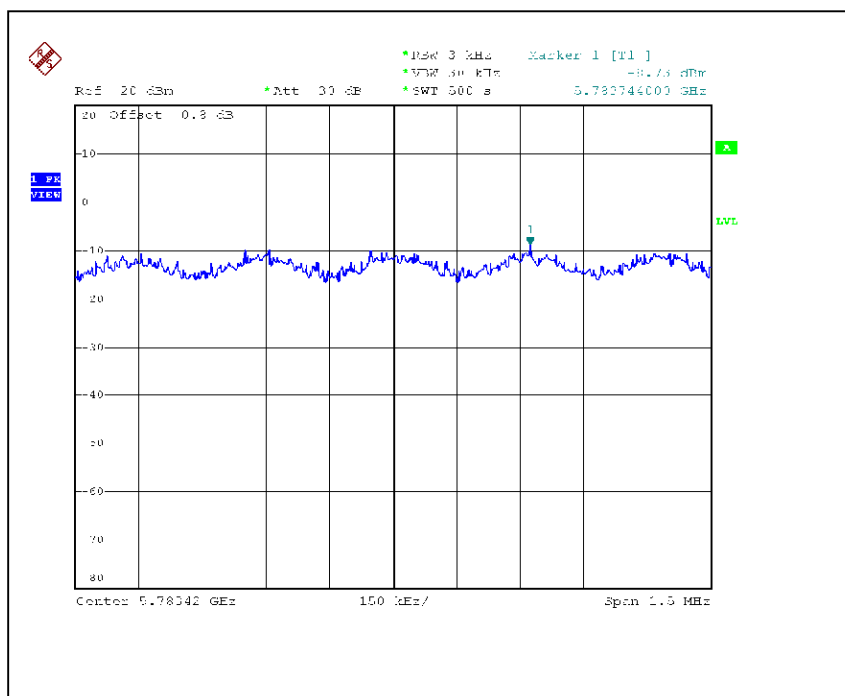
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY –With Combiner(dBm)	* TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	5745	-8.74	-8.44	-0.74	-5.58	8	PASS
3	5785	-8.73	-8.39	0.43	-5.54	8	PASS
5	5825	-8.94	-8.16	-2.68	-5.51	8	PASS

* Aggregate PSD across transmitters in linear power units across each transmitter output.

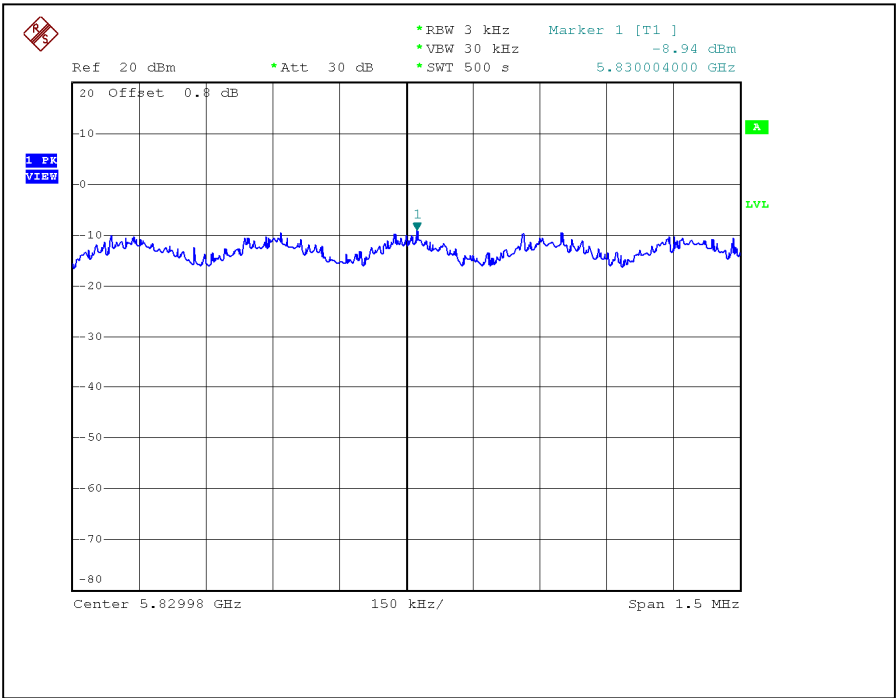
For Chain (0): CH1



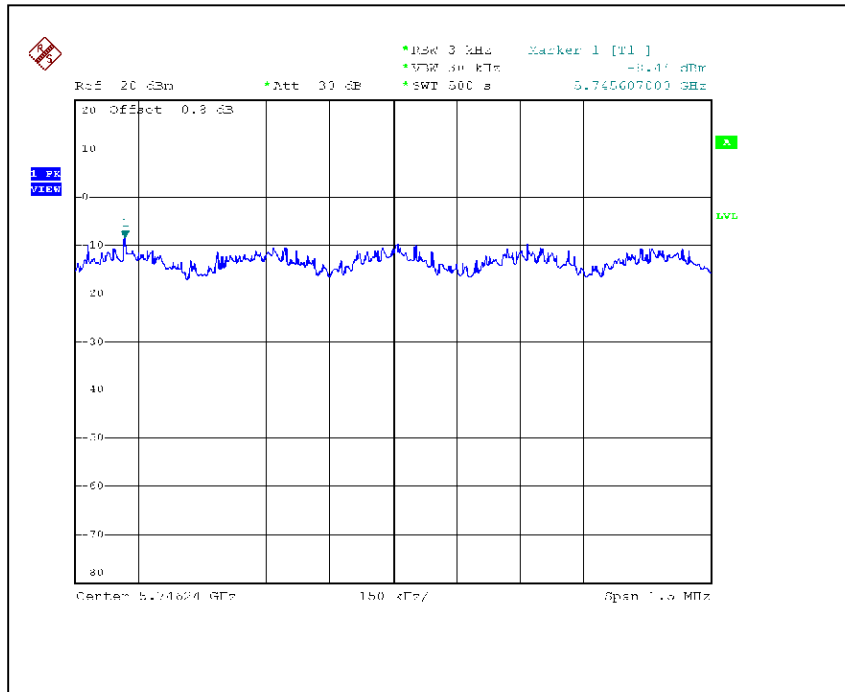
CH3



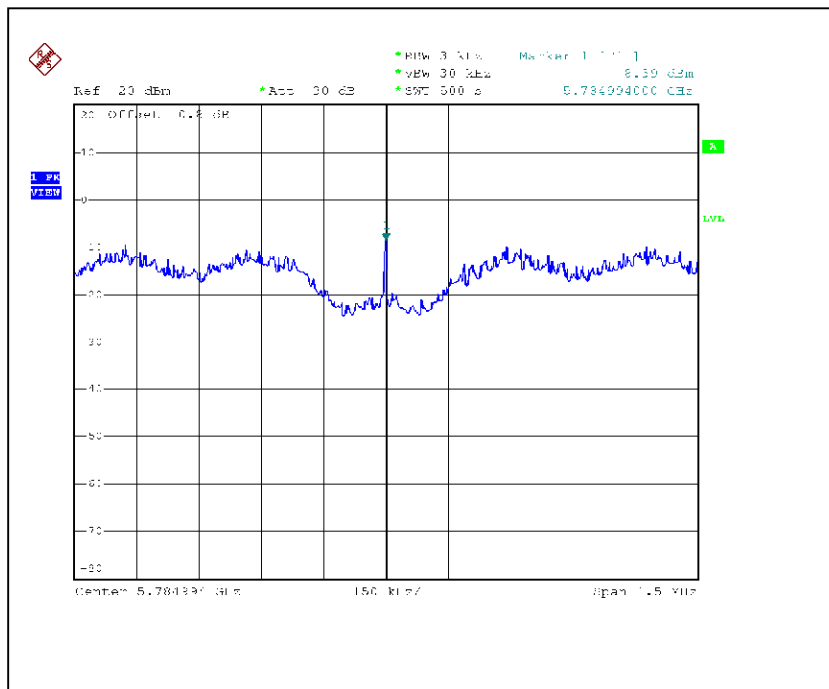
CH5



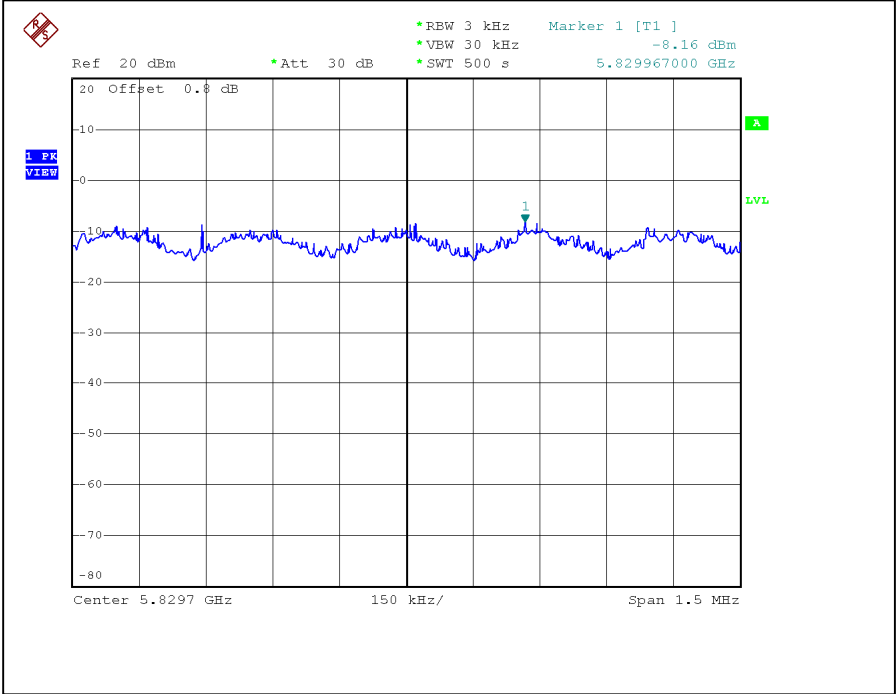
For Chain (1): CH1



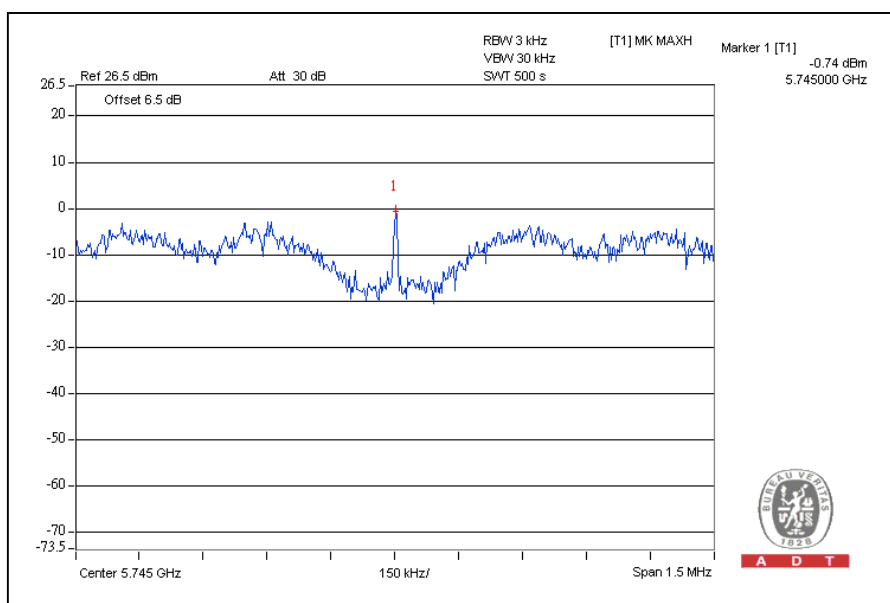
CH3



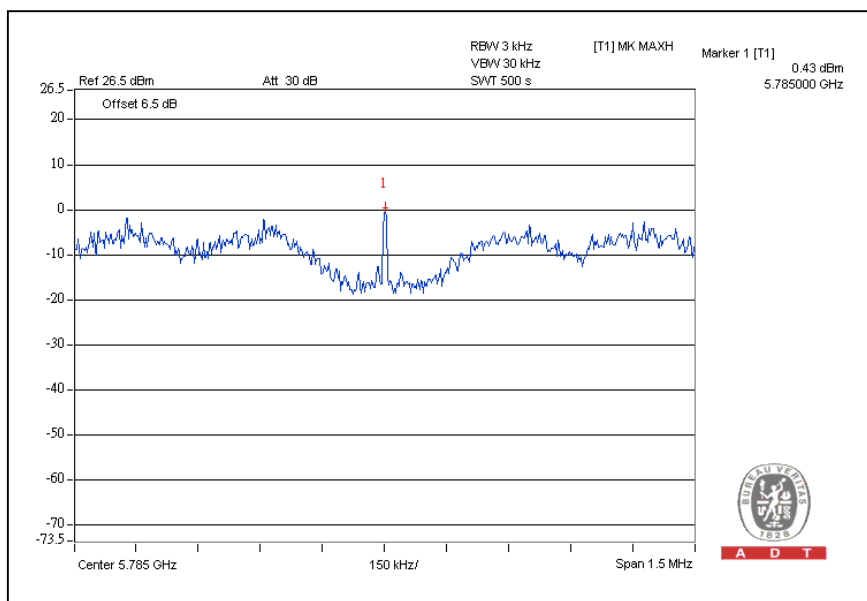
CH5



With Combiner : CH1



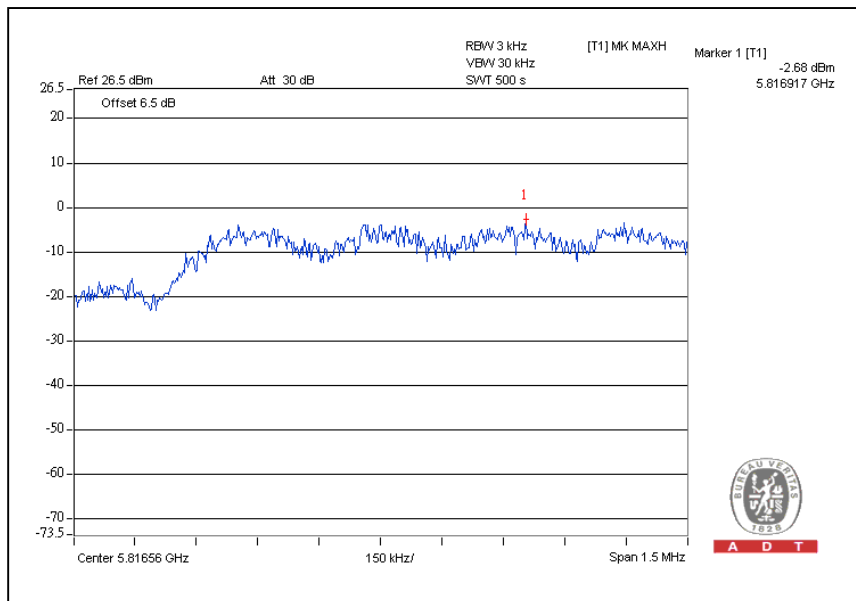
CH 3





A D T

CH 5





A D T

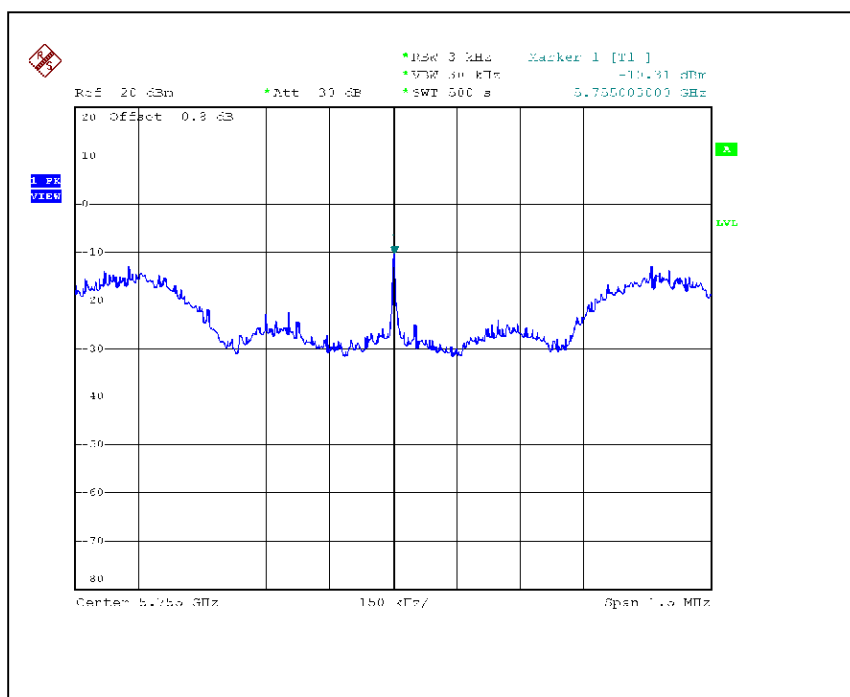
DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 962hPa
TESTED BY	Wen Yu		

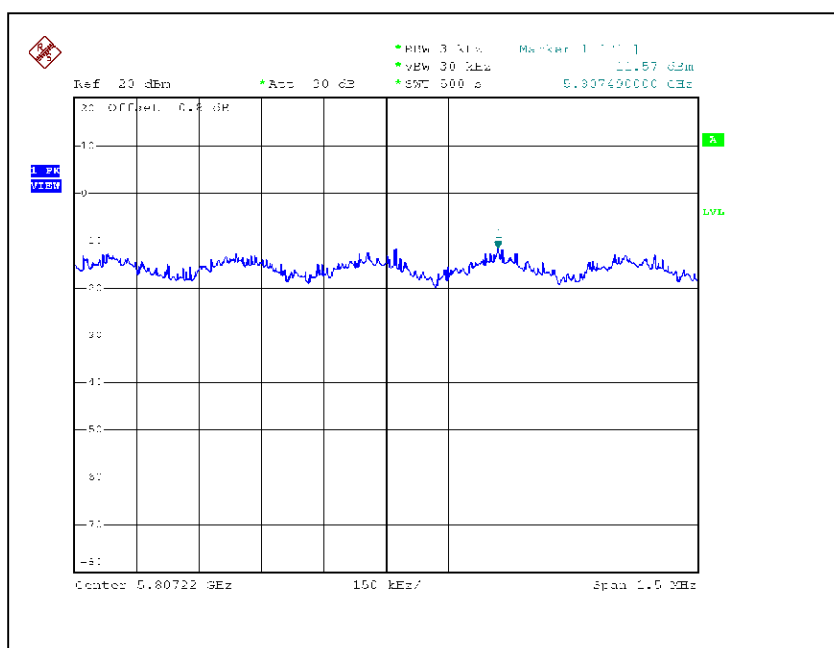
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY –With Combiner(dBm)	* TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	5755	-10.31	-7.06	-1.99	-5.38	8	PASS
2	5795	-11.57	-8.16	-4.79	-6.52	8	PASS

* Aggregate PSD across transmitters in linear power units across each transmitter output.

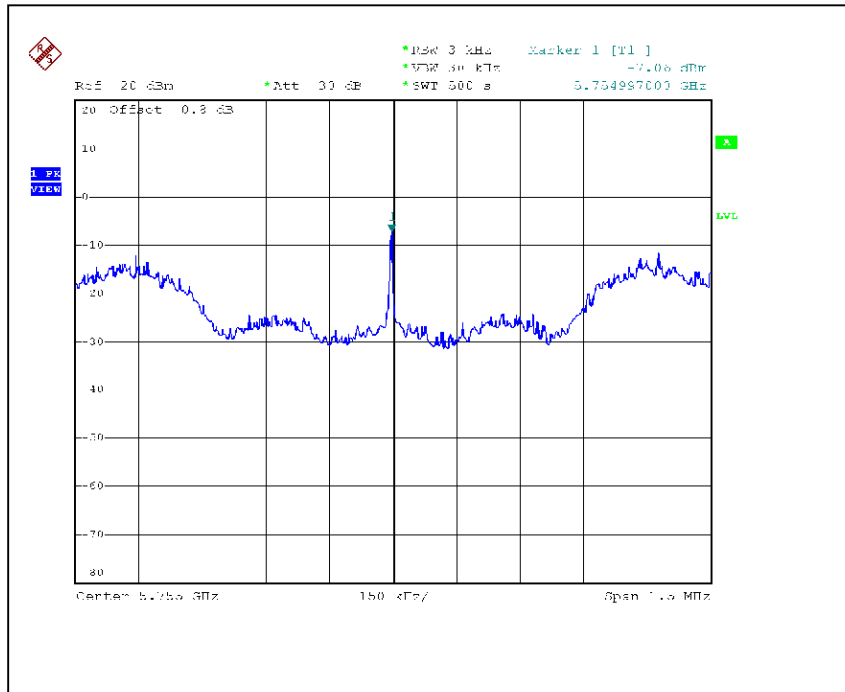
For Chain (0): CH1



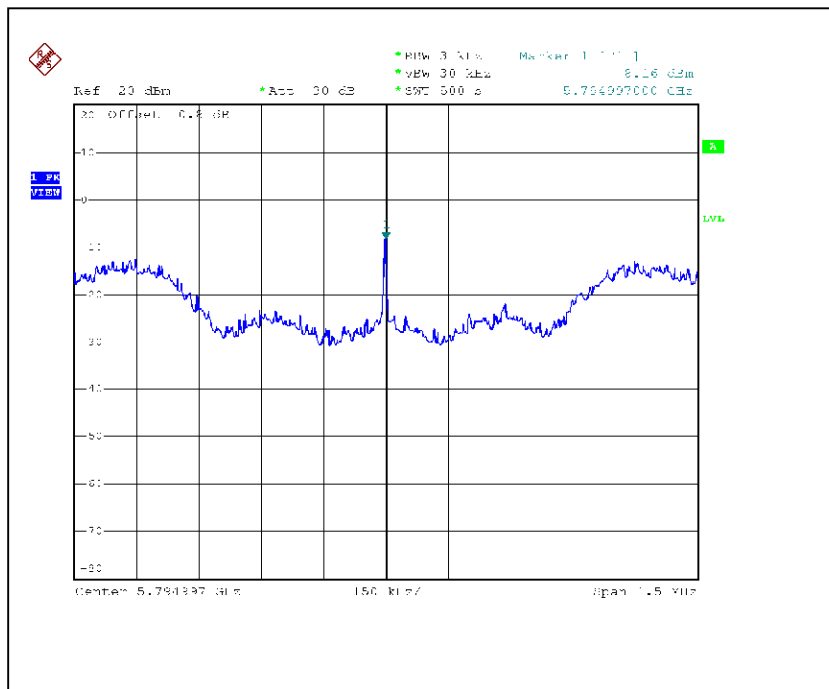
CH2



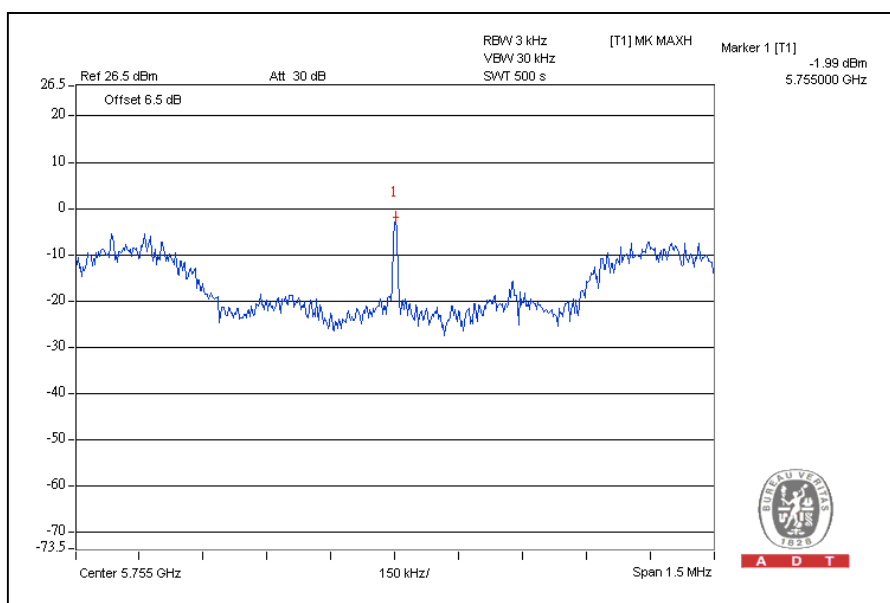
For Chain (1): CH1



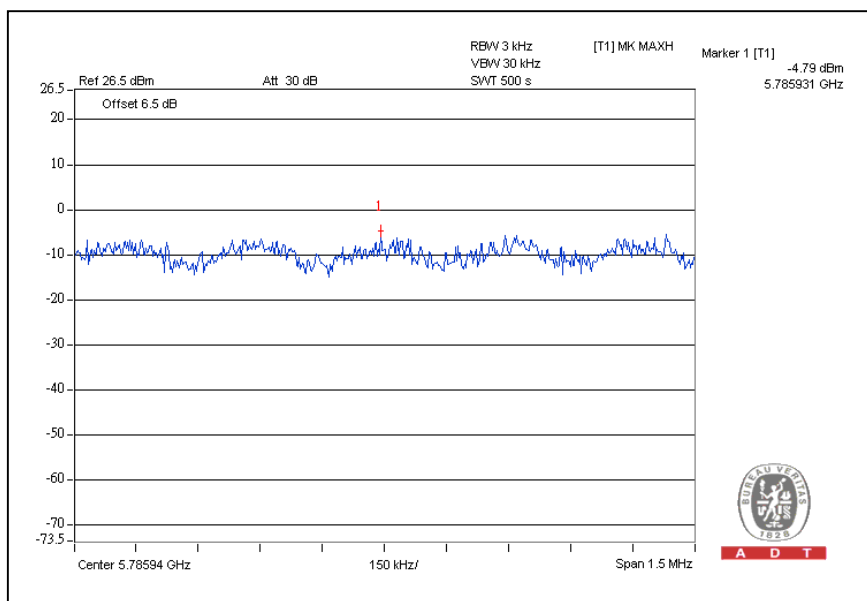
CH2



With Combiner : CH1



CH 2



5.7 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.7.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

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

5.7.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.
2. The measurement include through a combiner with both chain and each chain when operate simultaneously.

5.7.4 DEVIATION FROM TEST STANDARD

No deviation

5.7.5 EUT OPERATING CONDITION

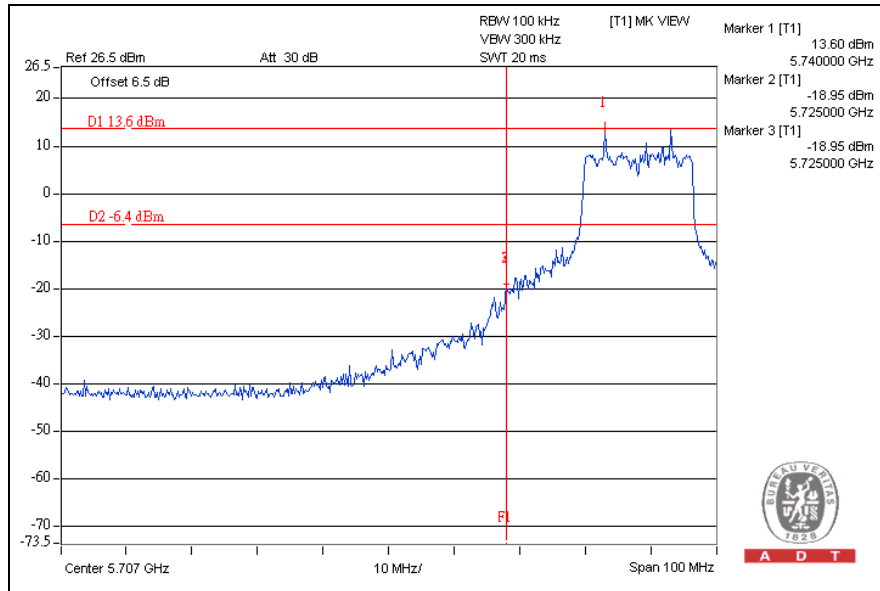
Same as Item 4.3.6

5.7.6 TEST RESULTS

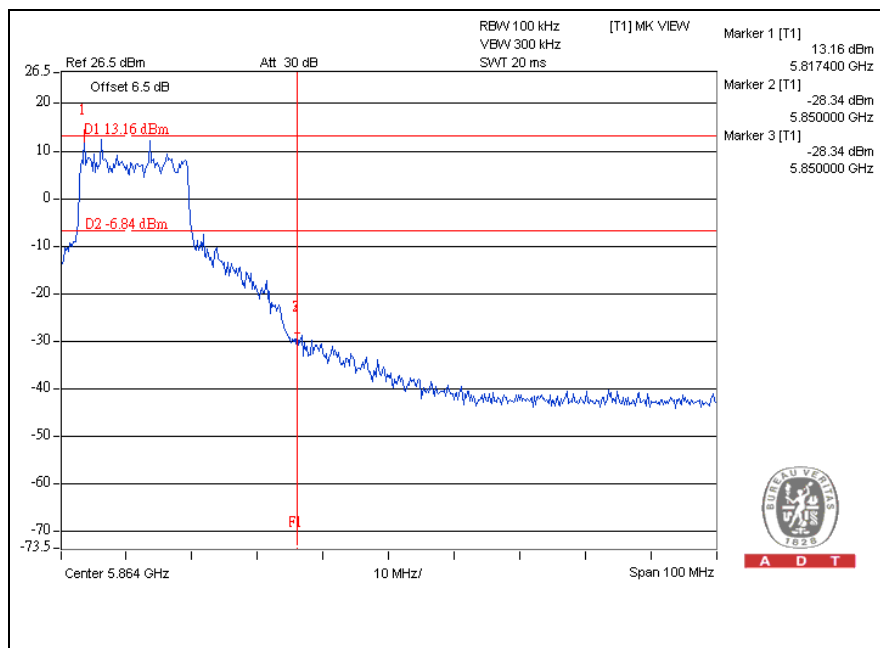
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).

802.11a OFDM modulation

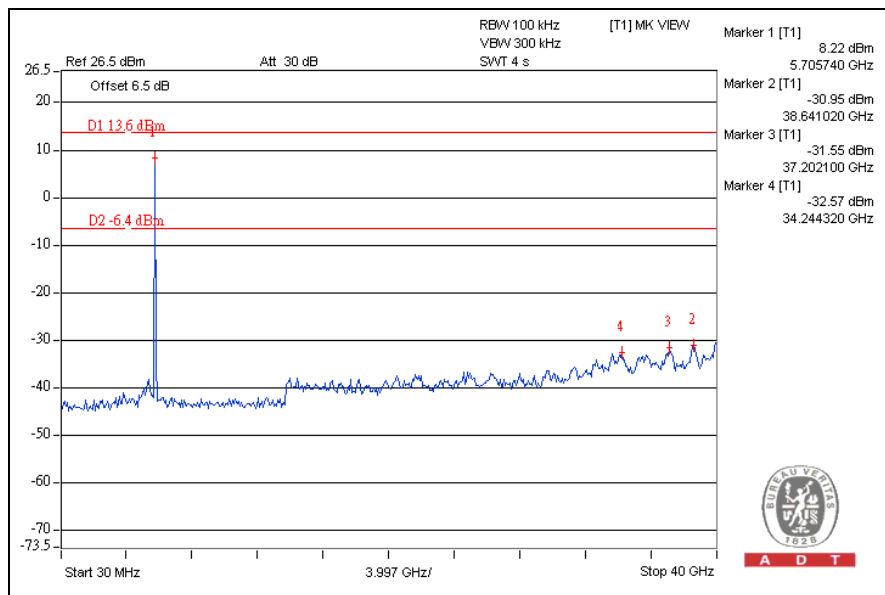
With combiner: CH1



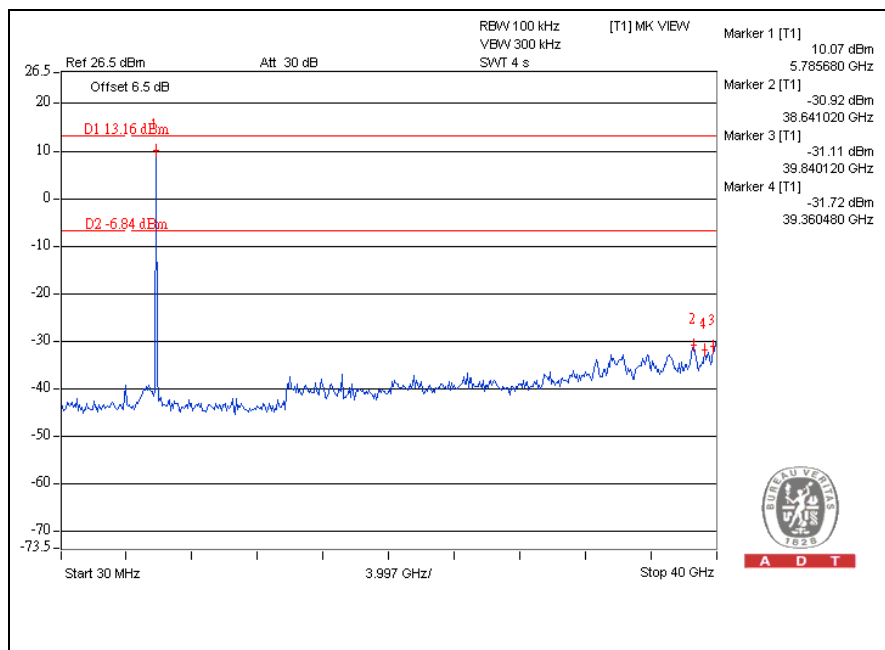
CH5



With combiner: CH1



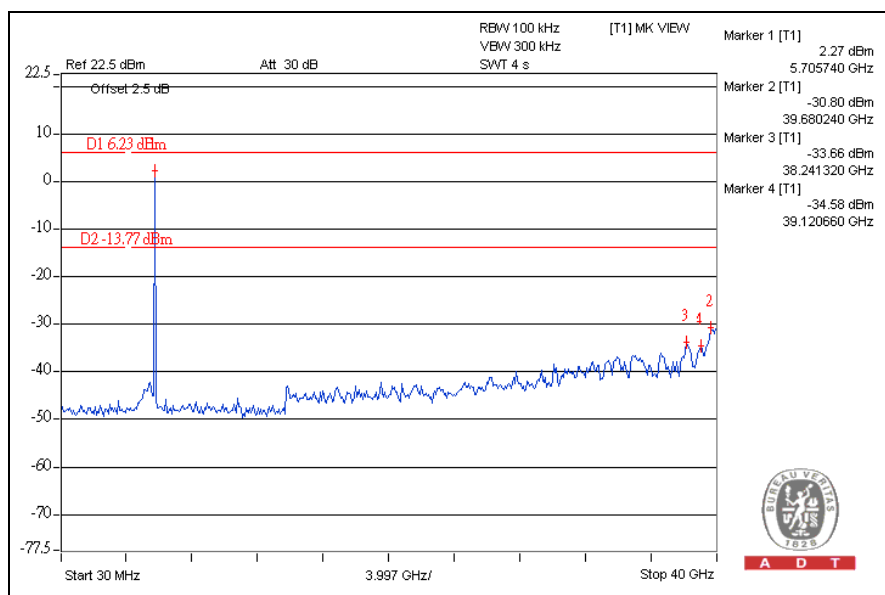
CH5



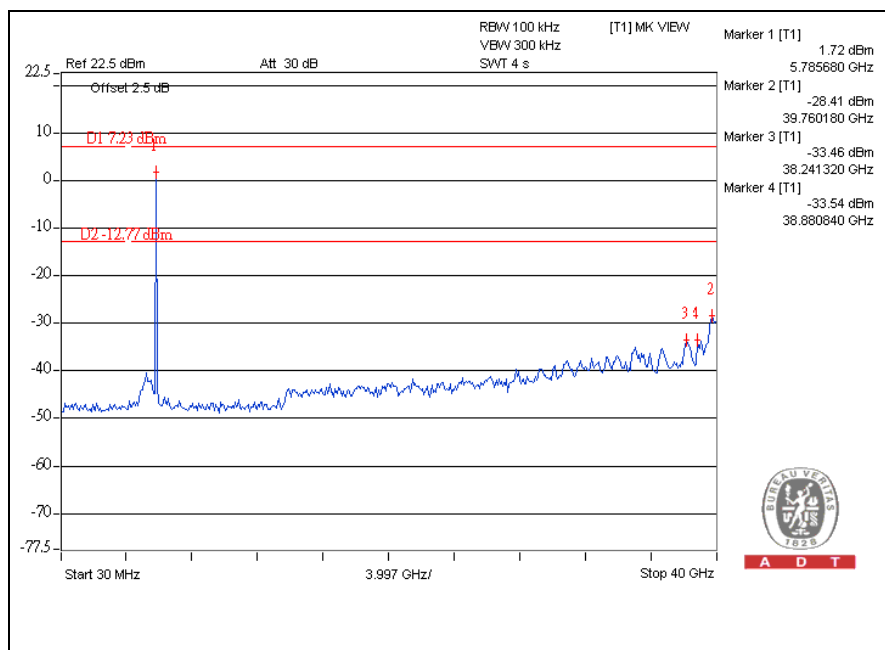


A D T

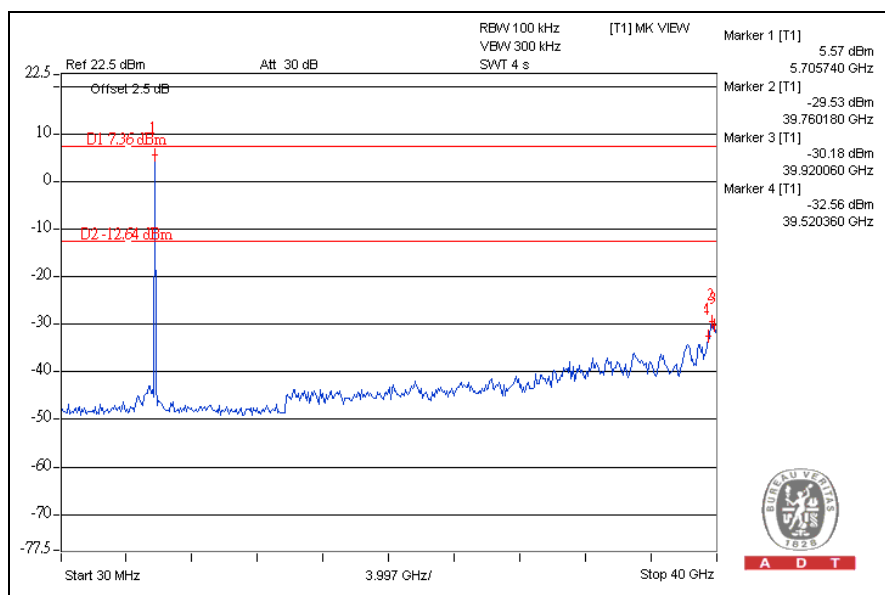
For Chain 0: CH1



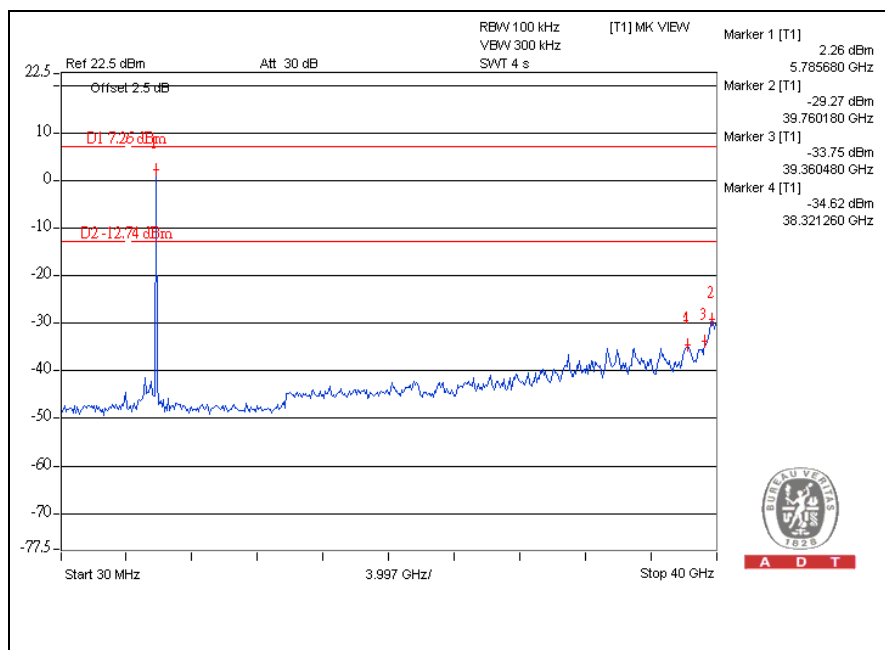
CH5



For Chain 1: CH1

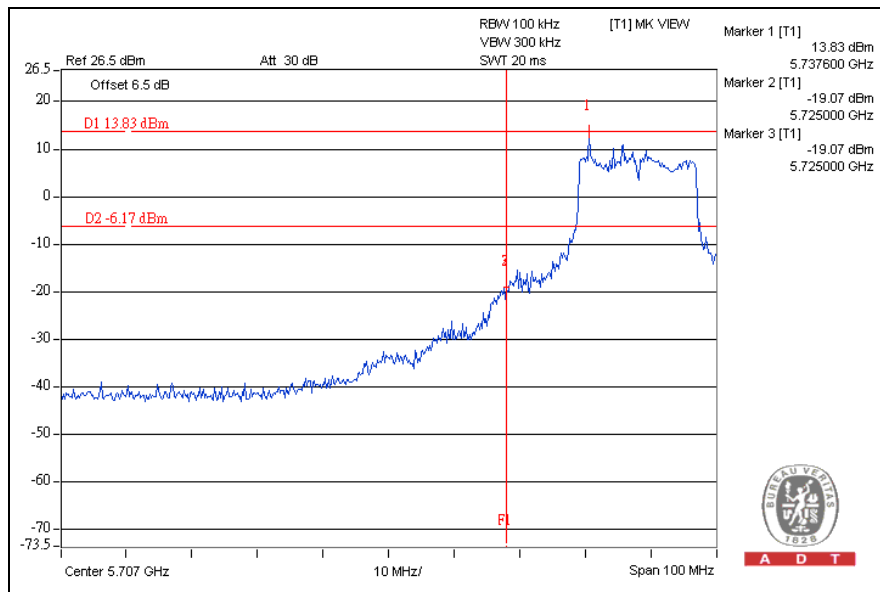


CH5

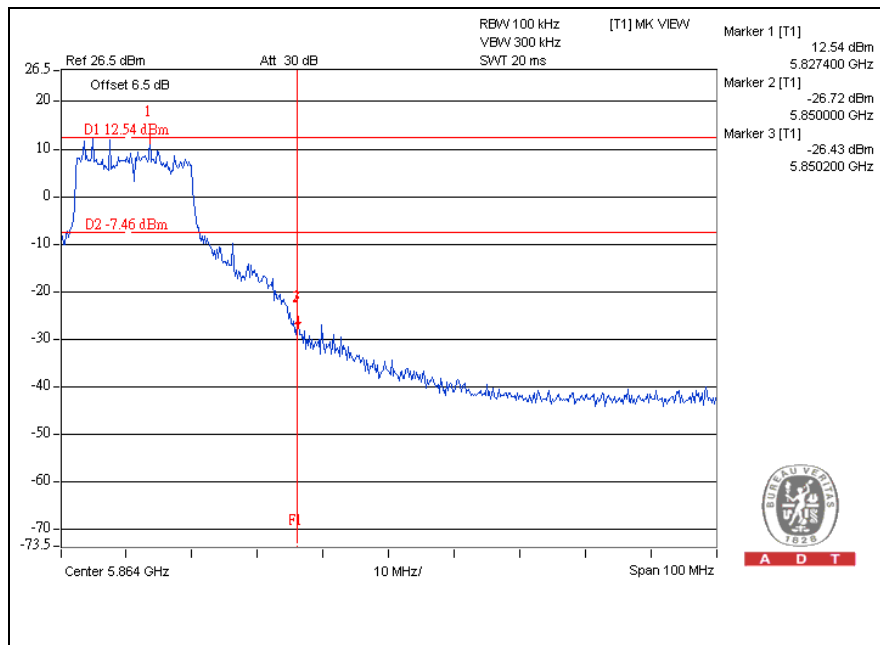


DRAFT 802.11n (20MHz) OFDM MODULATION:

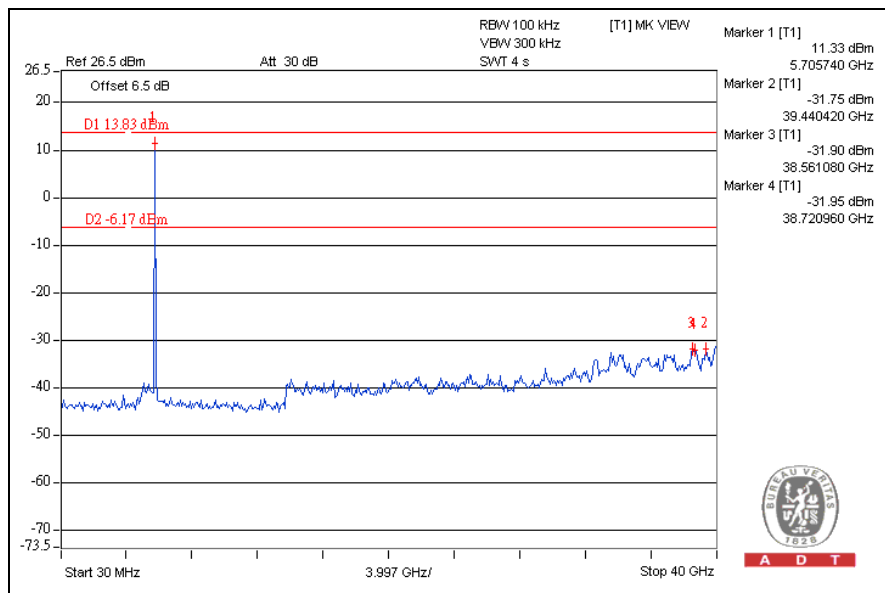
With combiner:CH1



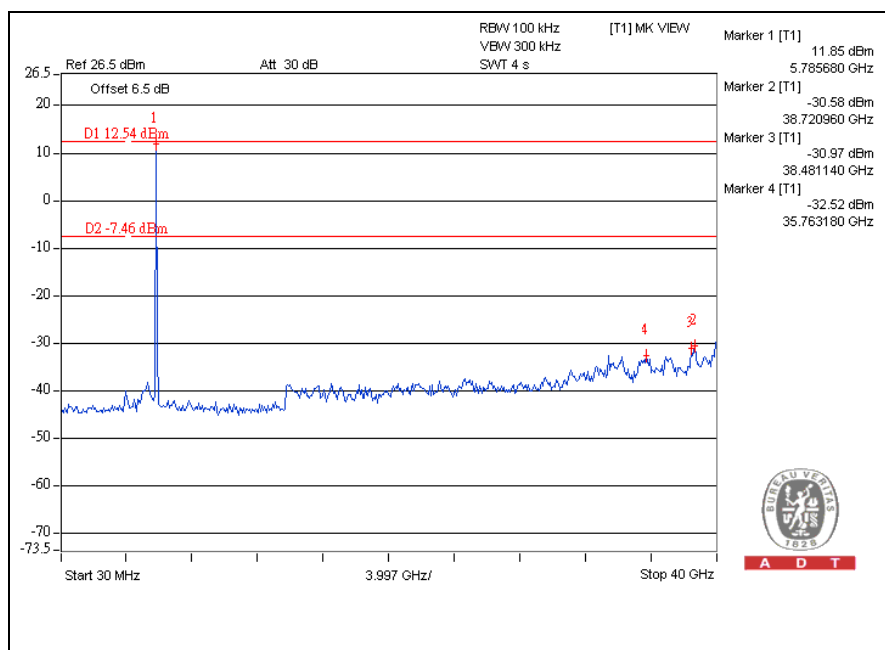
CH5



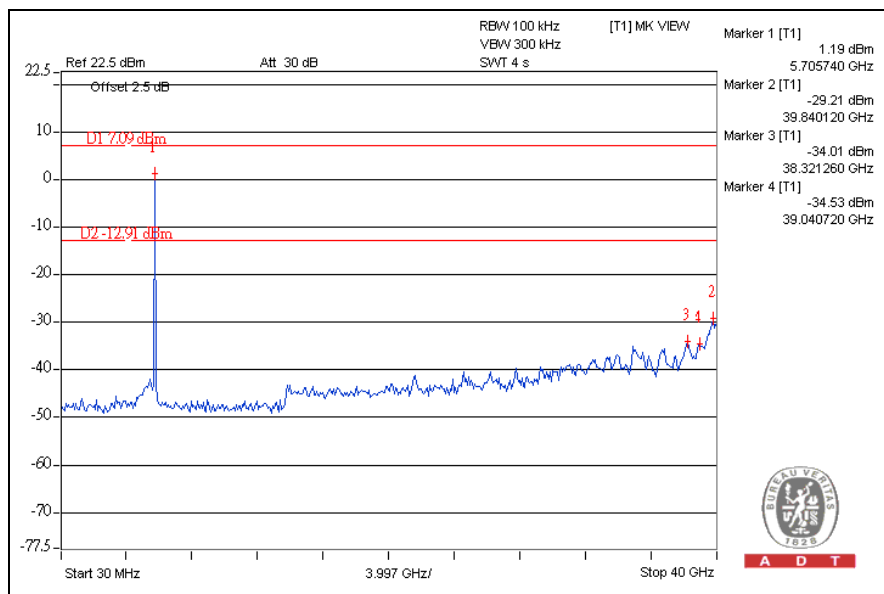
With combiner:CH1



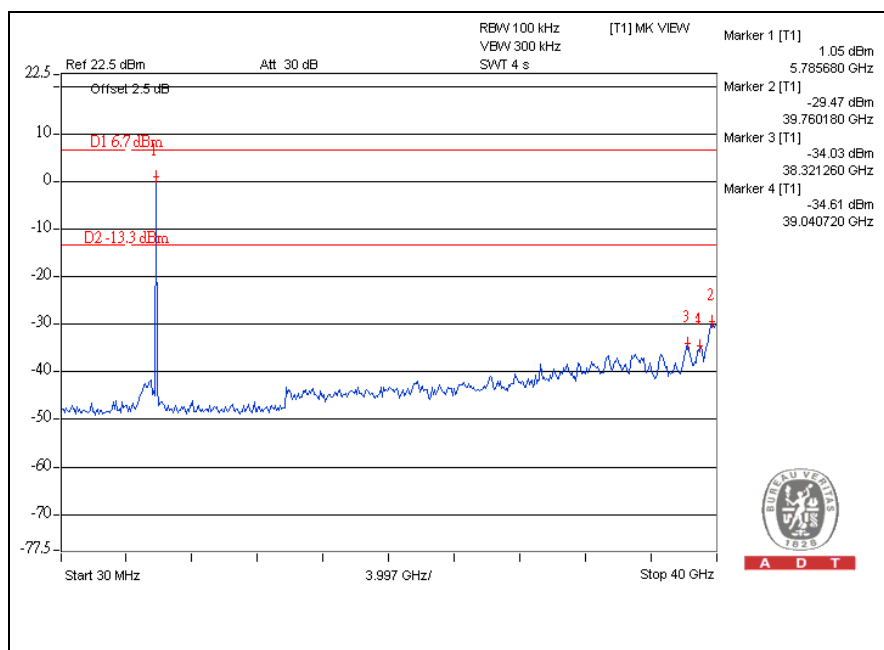
CH5



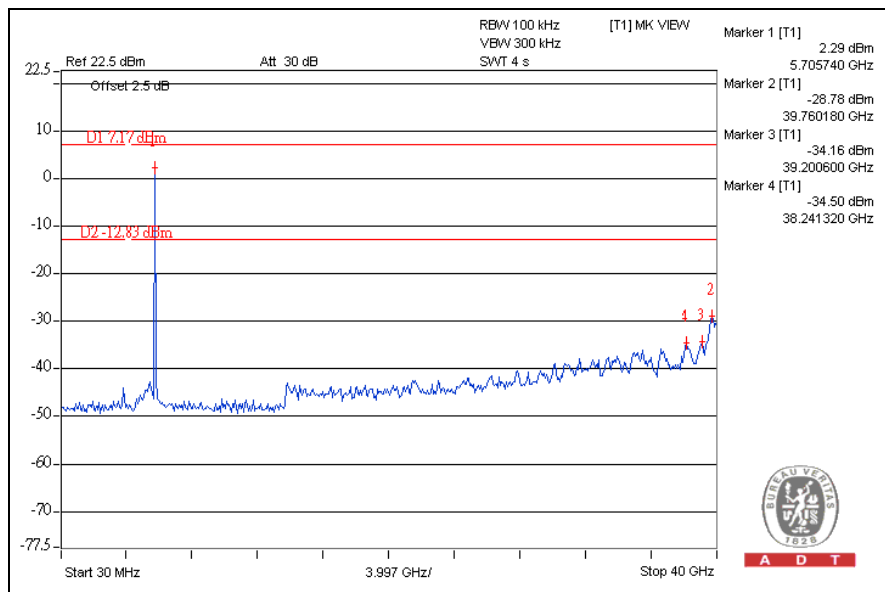
For Chain 0: CH1



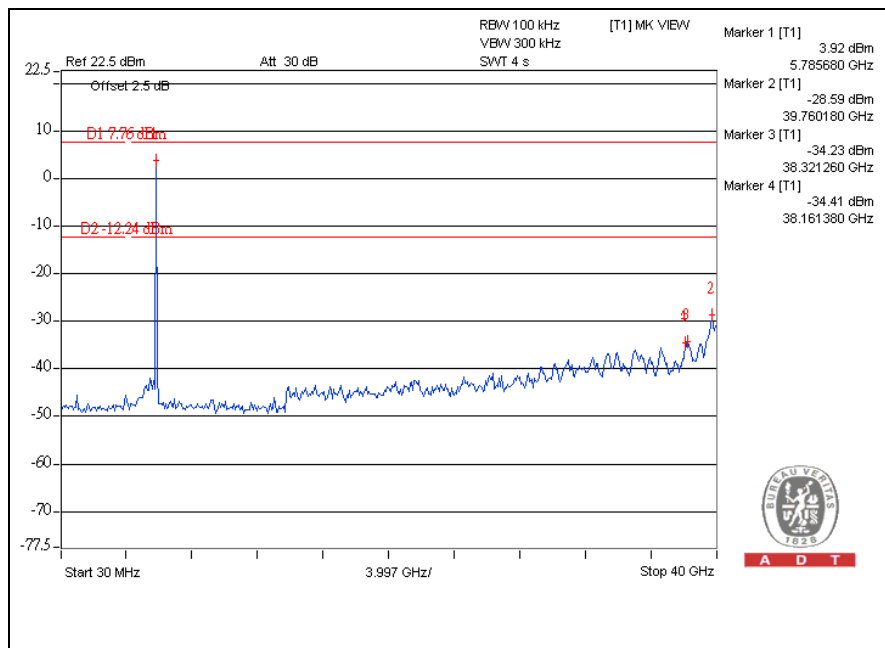
CH5



For Chain 1: CH1

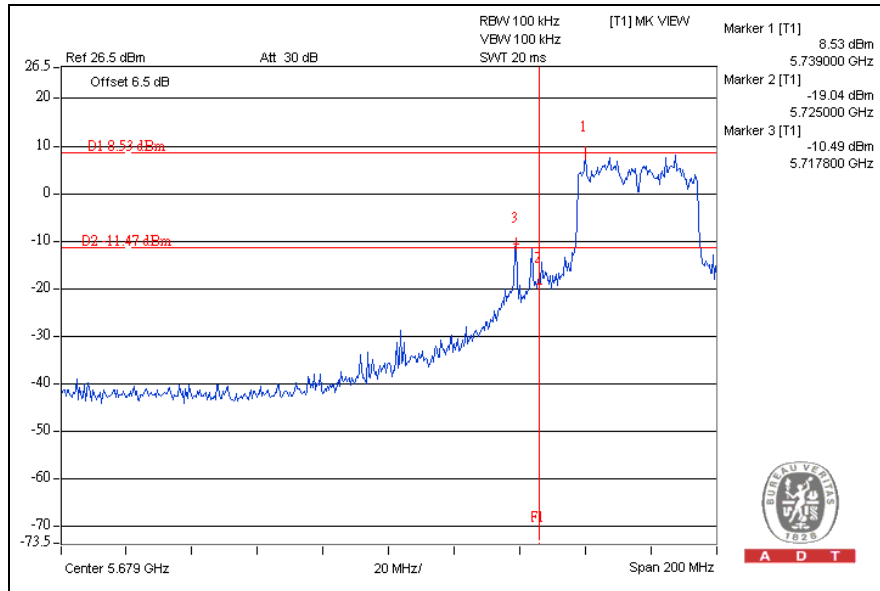


CH5

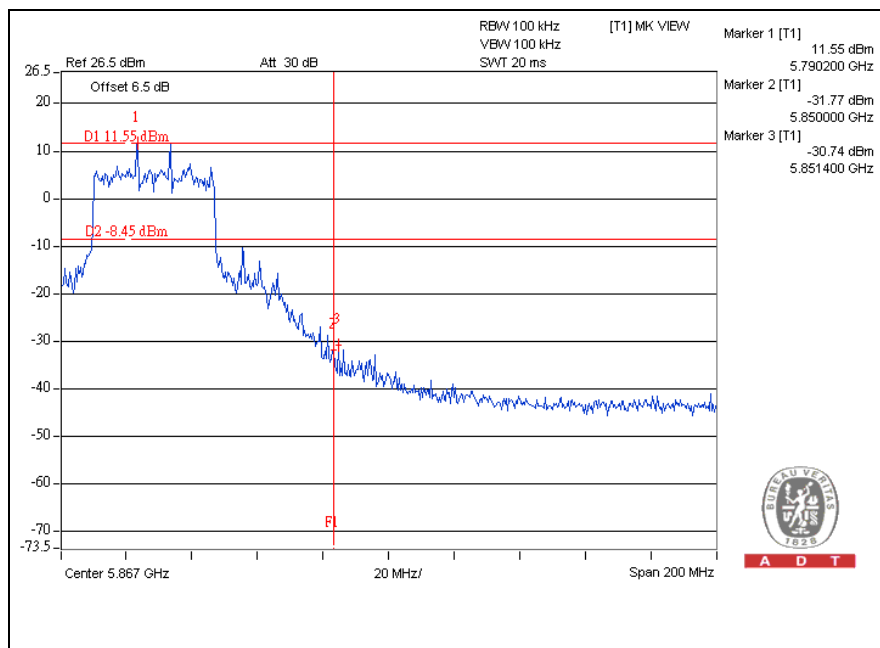


DRAFT 802.11n (40MHz) OFDM MODULATION:

With combiner: CH1



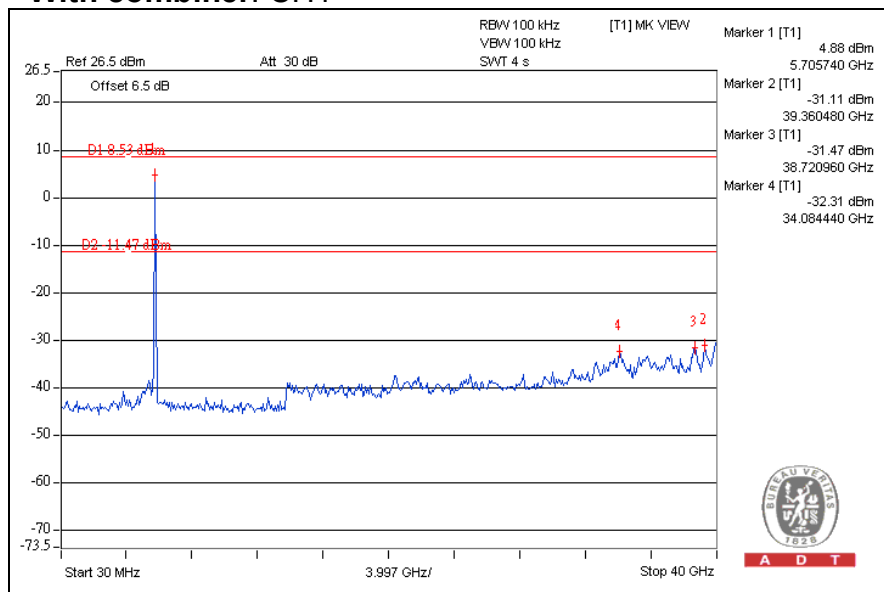
CH2





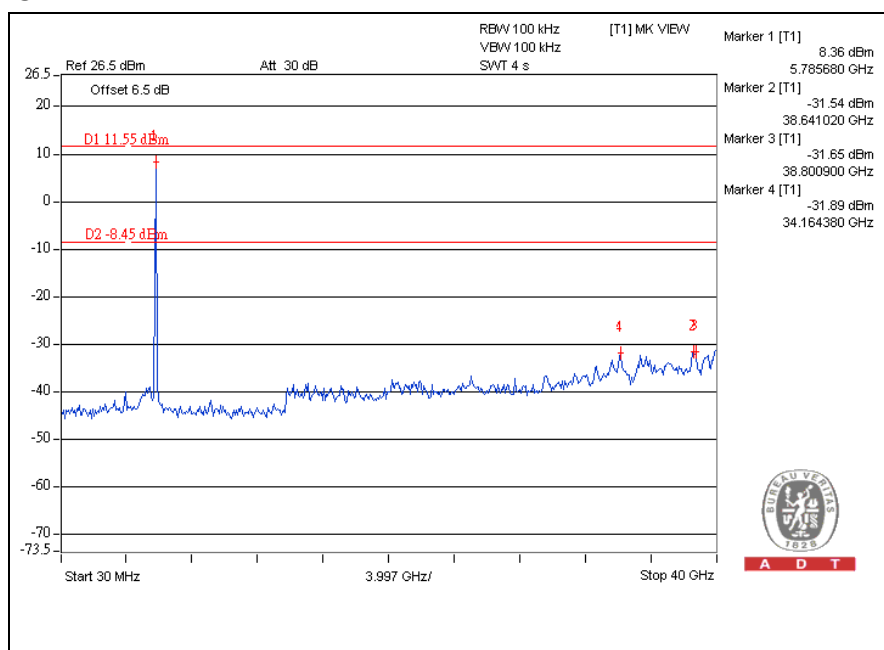
A D T

With combiner: CH1



A D T

CH2

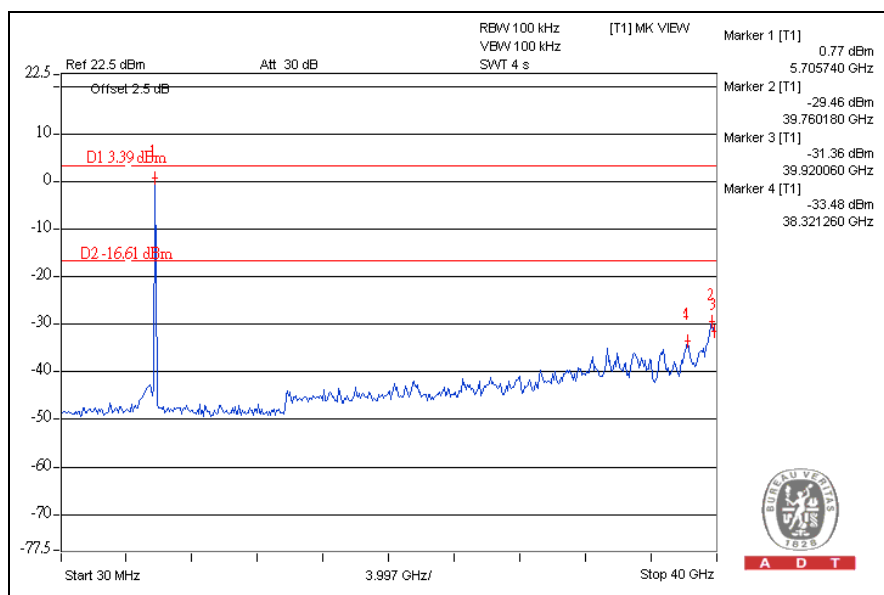


A D T

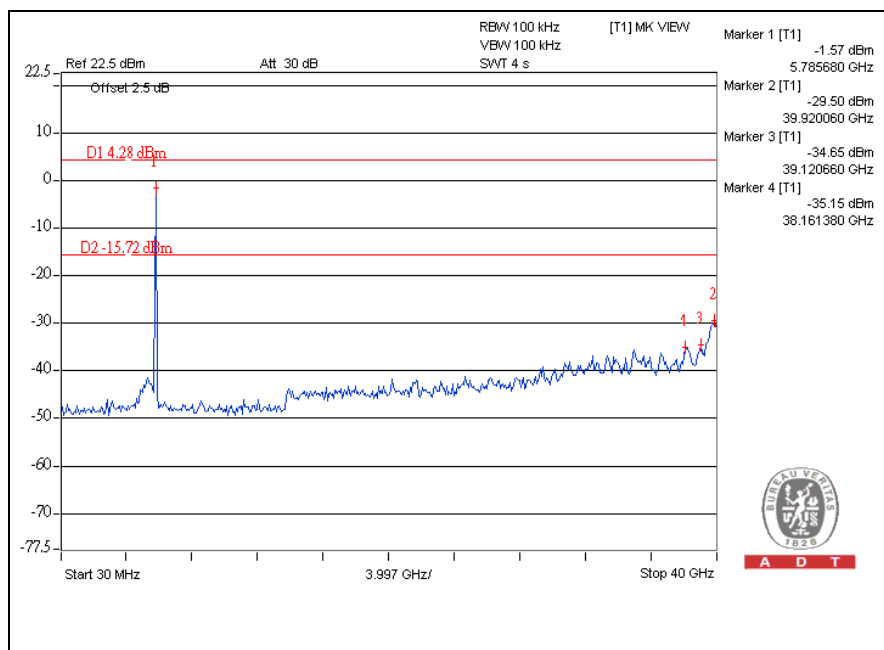


A D T

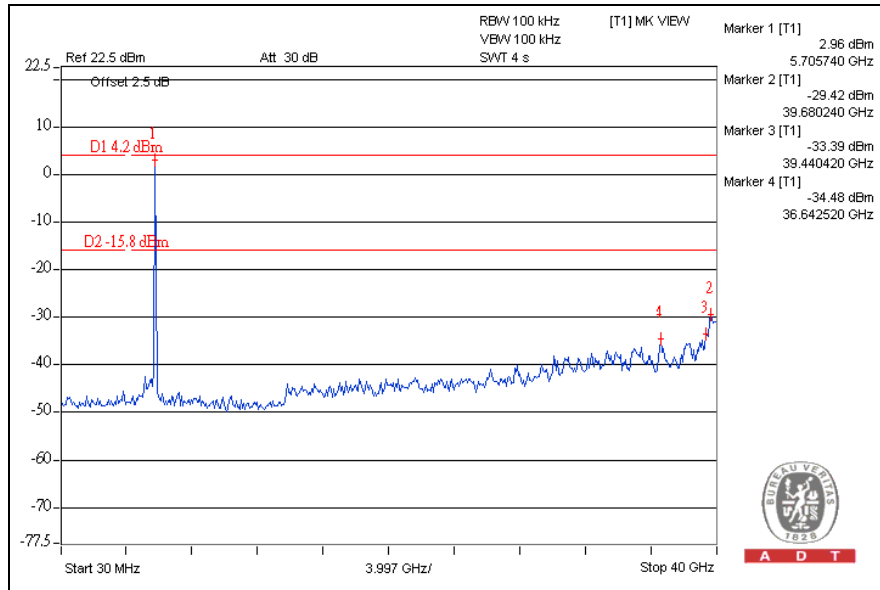
For Chain 0: CH1



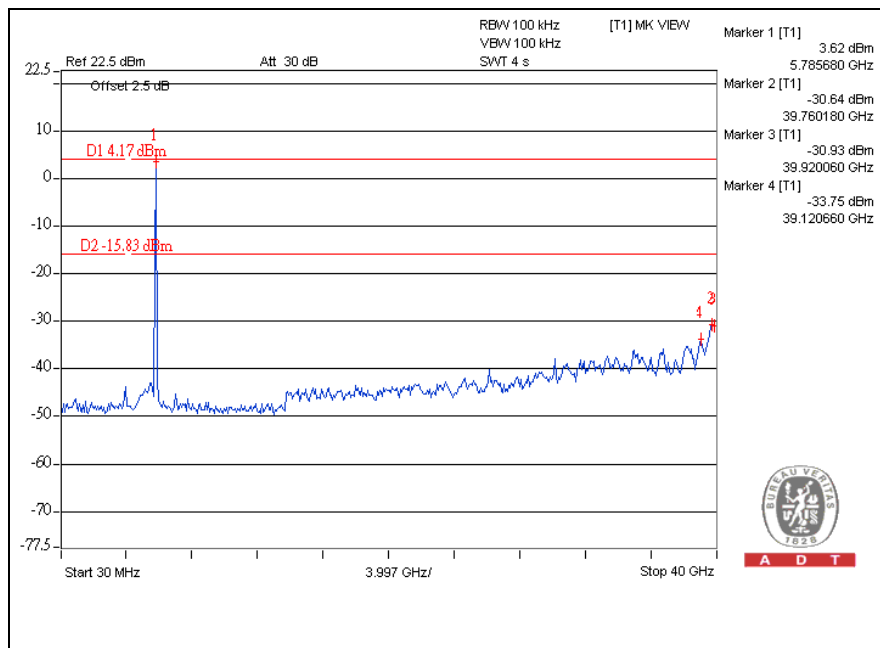
CH2



For Chain 1: CH1



CH2



6. INFORMATION ON THE TESTING LABORATORIES

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

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

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

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

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

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

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

Web Site: www.adt.com.tw

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



A D T

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

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

---END---