

FCC TEST REPORT (15.247)

REPORT NO.: RF120720C10E

MODEL NO.: WS-AP3715e

FCC ID: QXO-AP3715E

RECEIVED: Jul. 16, 2012

TESTED: Aug. 20, 2012 ~ Jan. 11, 2013

ISSUED: Apr. 26, 2013

APPLICANT: Enterasys Networks, Inc.

ADDRESS: 9 Northeastern Blvd. Salem, NH 03079

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

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist.,
New Taipei City, Taiwan, R.O.C.

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

This report should not be used by the client to claim
product certification, approval, or endorsement by
TAF or any government agencies.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.



A D T

TABLE OF CONTENTS

RELEASE CONTROL RECORD	5
1. CERTIFICATION.....	6
2. SUMMARY OF TEST RESULTS	7
2.1 MEASUREMENT UNCERTAINTY	7
3. GENERAL INFORMATION.....	8
3.1 GENERAL DESCRIPTION OF EUT.....	8
3.2 DESCRIPTION OF TEST MODES.....	10
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	11
3.3 DESCRIPTION OF SUPPORT UNITS.....	15
3.3.1 CONFIGURATION OF SYSTEM UNDER TEST	15
3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS	16
4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND).....	17
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT	17
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT.....	17
4.1.2 TEST INSTRUMENTS.....	18
4.1.3 TEST PROCEDURES	19
4.1.4 DEVIATION FROM TEST STANDARD	19
4.1.5 TEST SETUP.....	20
4.1.6 EUT OPERATING CONDITIONS	20
4.1.7 TEST RESULTS	21
4.2 CONDUCTED EMISSION MEASUREMENT	34
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	34
4.2.2 TEST INSTRUMENTS.....	34
4.2.3 TEST PROCEDURES	35
4.2.4 DEVIATION FROM TEST STANDARD	35
4.2.5 TEST SETUP	35
4.2.6 EUT OPERATING CONDITIONS	35
4.2.7 TEST RESULTS	36
4.3 6dB BANDWIDTH MEASUREMENT	38
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT.....	38
4.3.2 TEST SETUP.....	38
4.3.3 TEST INSTRUMENTS.....	38
4.3.4 TEST PROCEDURE.....	38
4.3.5 DEVIATION FROM TEST STANDARD	39
4.3.6 EUT OPERATING CONDITIONS	39
4.3.7 TEST RESULTS	40
4.4 CONDUCTED OUTPUT POWER	41
4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	41
4.4.2 TEST SETUP.....	41
4.4.3 TEST INSTRUMENTS.....	41
4.4.4 TEST PROCEDURES	41
4.4.5 DEVIATION FROM TEST STANDARD	41
4.4.6 EUT OPERATING CONDITIONS	41
4.4.7 TEST RESULTS	42



A D T

4.5	POWER SPECTRAL DENSITY MEASUREMENT	43
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	43
4.5.2	TEST SETUP	43
4.5.3	TEST INSTRUMENTS	43
4.5.4	TEST PROCEDURE	43
4.5.5	DEVIATION FROM TEST STANDARD	43
4.5.6	EUT OPERATING CONDITION	43
4.5.7	TEST RESULTS	44
4.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT	46
4.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	46
4.6.2	TEST SETUP	46
4.6.3	TEST INSTRUMENTS	46
4.6.4	TEST PROCEDURE	46
4.6.5	DEVIATION FROM TEST STANDARD	47
4.6.6	EUT OPERATING CONDITION	47
4.6.7	TEST RESULTS	47
4.6.8	TEST RESULTS	48
5.	TEST TYPES AND RESULTS (FOR 5.0GHz BAND)	72
5.1	RADIATED EMISSION MEASUREMENT	72
5.1.1	LIMITS OF RADIATED EMISSION MEASUREMENT	72
5.1.2	TEST INSTRUMENTS	73
5.1.3	TEST PROCEDURES	74
5.1.4	DEVIATION FROM TEST STANDARD	74
5.1.5	TEST SETUP	74
5.1.6	EUT OPERATING CONDITIONS	74
5.1.7	TEST RESULTS	75
5.2	CONDUCTED EMISSION MEASUREMENT	87
5.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	87
5.2.2	TEST INSTRUMENTS	87
5.2.3	TEST PROCEDURES	87
5.2.4	DEVIATION FROM TEST STANDARD	87
5.2.5	TEST SETUP	87
5.2.6	EUT OPERATING CONDITIONS	87
5.2.7	TEST RESULTS	88
5.3	6dB BANDWIDTH MEASUREMENT	90
5.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	90
5.3.2	TEST SETUP	90
5.3.3	TEST INSTRUMENTS	90
5.3.4	TEST PROCEDURE	90
5.3.5	DEVIATION FROM TEST STANDARD	90
5.3.6	EUT OPERATING CONDITIONS	90
5.3.7	TEST RESULTS	91
5.4	CONDUCTED OUTPUT POWER	92
5.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	92
5.4.2	TEST SETUP	92
5.4.3	INSTRUMENTS	92
5.4.4	TEST PROCEDURES	92



A D T

5.4.5	DEVIATION FROM TEST STANDARD	92
5.4.6	EUT OPERATING CONDITIONS	92
5.4.7	TEST RESULTS	93
5.5	POWER SPECTRAL DENSITY MEASUREMENT	94
5.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	94
5.5.2	TEST SETUP	94
5.5.3	TEST INSTRUMENTS	94
5.5.4	TEST PROCEDURE	94
5.5.5	DEVIATION FROM TEST STANDARD	94
5.5.6	EUT OPERATING CONDITION	94
5.5.7	TEST RESULTS	95
5.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT	97
5.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	97
5.6.2	TEST SETUP	97
5.6.3	TEST INSTRUMENTS	97
5.6.4	TEST PROCEDURE	97
5.6.5	DEVIATION FROM TEST STANDARD	97
5.6.6	EUT OPERATING CONDITION	97
5.6.7	TEST RESULTS	97
6.	PHOTOGRAPHS OF THE TEST CONFIGURATION	115
7.	INFORMATION ON THE TESTING LABORATORIES	116
8.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	117



A D T

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120720C10E	Original release	Apr. 26, 2013



A D T

1. CERTIFICATION

PRODUCT: Wireless 802.11 abgn Router

MODEL NO.: WS-AP3715e

BRAND: Enterasys

APPLICANT: Enterasys Networks, Inc.

TESTED: Aug. 20, 2012 ~ Jan. 11, 2013

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC Part 15, Subpart C (Section 15.247)

ANSI C63.10-2009

The above equipment (model: WS-AP3715e) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Ivy Lin , **DATE** : Apr. 26, 2013

Ivy Lin / Specialist

APPROVED BY : Ken Liu , **DATE** : Apr. 26, 2013

Ken Liu / Senior Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.95dB at 0.51838MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.4dB at 5725.00MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is RSMA not a standard connector.

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Wireless 802.11 abgn Router
MODEL NO.	WS-AP3715e
POWER SUPPLY	5Vdc (host equipment)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 450.0Mbps
OPERATING FREQUENCY	2.4GHz: 2412 ~ 2462MHz 5.0GHz: 5745 ~ 5825MHz
NUMBER OF CHANNEL	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) 5.0GHz: 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
OUTPUT POWER	241.28mW for 2412 ~ 2462MHz 143.70mW for 5745 ~ 5825MHz
ANTENNA TYPE	Refer to Note as below
ANTENNA CONNECTOR	Refer to Note as below
DATA CABLE	N/A
I/O PORTS	N/A
ACCESSORY DEVICES	N/A

NOTE:

1. The EUT incorporates a MIMO function. Physically, the EUT provides three completed transmitters and three receivers.

MODULATION MODE	TX FUNCTION
802.11b	3TX
802.11g	3TX
802.11a	1TX/ 3TX
802.11n (20MHz)	3TX
802.11n (40MHz)	3TX

2. The following antenna type is provided to the EUT.

ANTENNA TYPE	ANTENNA CONNECTOR	ANTENNA GAIN (dBi)	
		2.4GHz BAND	5GHz BAND
Dipole	RSMA	3	3

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

3.2 DESCRIPTION OF TEST MODES

FOR 2.4GHz:

11 channels are provided for 802.11b, 802.11g and 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		

7 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

FOR 5.0GHz (5745 ~ 5825MHz):

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 2.4GHz:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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

NOTE:

The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

RADIATED EMISSION TEST (BELOW 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	6	DSSS	DBPSK	6.0

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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	6	DSSS	DBPSK	6.0

BANDEDGE MEASUREMENT:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	3 to 9	3, 9	OFDM	BPSK	15.0

ANTENNA PORT CONDUCTED MEASUREMENT:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ 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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
PLC	25deg. C, 60%RH	120Vac, 60Hz	Antony Lee
APCM	23deg. C, 61%RH	120Vac, 60Hz	Felix Soong

FOR 5.0GHz (5745 ~ 5825MHz):

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Dipole antenna: 3TX
B	√	-	-	√	Dipole antenna: 1TX

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

NOTE:

The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX Function
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0	3TX
B	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0	1TX
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2	3TX
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0	3TX

RADIATED EMISSION TEST (BELOW 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX Function
A	802.11a	149 to 165	165	OFDM	BPSK	6.0	3TX

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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX Function
A	802.11a	149 to 165	165	OFDM	BPSK	6.0	3TX

**A D T****BANDEDGE MEASUREMENT:**

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX Function
A	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0	3TX
B	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0	1TX
A	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	7.2	3TX
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0	3TX

ANTENNA PORT CONDUCTED MEASUREMENT:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ 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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX Function
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0	3TX
B	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0	1TX
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2	3TX
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0	3TX

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin, Haru Yang
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
PLC	25deg. C, 60%RH	120Vac, 60Hz	Antony Lee
APCM	25deg. C, 65%RH	120Vac, 60Hz	Mark Liao

3.3 DESCRIPTION OF SUPPORT UNITS

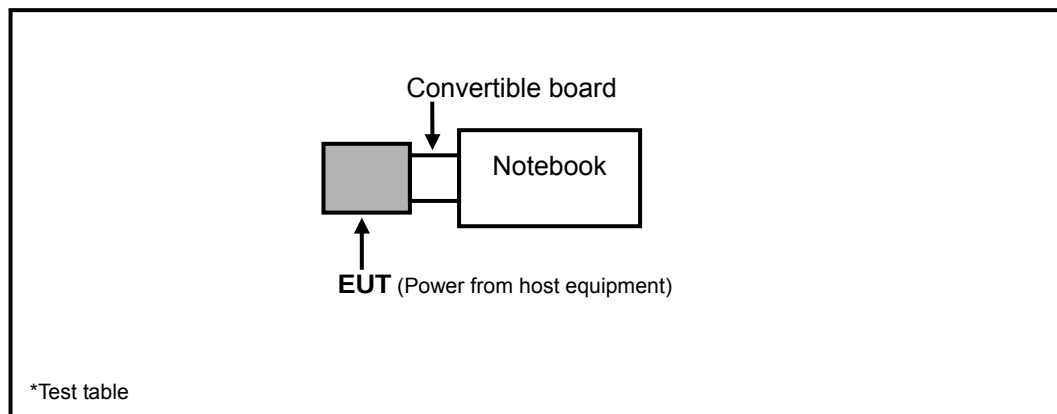
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	E5420	33MLMQ1	NA
2	CONVERTIBLE BOARD	NA	NA	NA	NA

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

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

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST





A D T

3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v02

662911 D01 Multiple Transmitter Output v01 r02

ANSI C63.10-2009

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

4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND)

4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

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. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 TEST INSTRUMENTS

Test Date: Aug. 20 ~ Sep. 11, 2012

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Aug. 06, 2012	Aug. 05, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Feb. 03, 2012	Feb. 02, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	9120D	209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Preamplifier Agilent	8447D	2944A10633	Oct. 29, 2011	Oct. 28, 2012
Preamplifier Agilent	8449B	3008A01964	Oct. 29, 2011	Oct. 28, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250723/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/ 4	Aug. 28, 2012	Aug. 27, 2013
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100	TT93021703	NA	NA
Turn Table Controller ADT.	SC100	SC93021703	NA	NA
High Speed Peak Power Meter	ML2495A	0842014	Apr. 28, 2012	Apr. 27, 2013
Power Sensor	MA2411B	0738404	Apr. 28, 2012	Apr. 27, 2013

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 988962.
 5. The IC Site Registration No. is IC 7450F-3.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

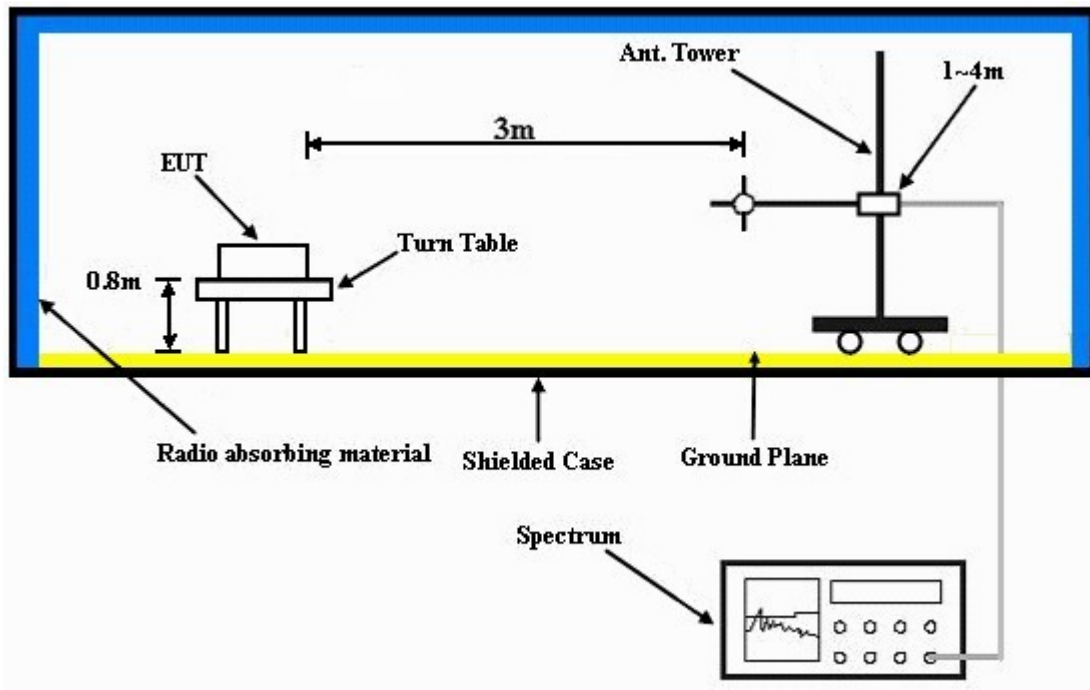
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



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

4.1.6 EUT OPERATING CONDITIONS

- Plugged the EUT into notebook via external board and placed them on the testing table.
- The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the system in full functions.



A D T

4.1.7 TEST RESULTS

802.11b

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

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	51.2 PK	74.0	-22.8	1.75 H	329	19.90	31.30
2	2390.00	39.3 AV	54.0	-14.7	1.75 H	329	8.00	31.30
3	#2400.00	56.4 PK	75.1	-18.7	1.04 H	125	25.10	31.30
4	#2400.00	52.3 AV	71.0	-18.7	1.04 H	125	21.00	31.30
5	*2412.00	105.1 PK			1.00 H	223	73.70	31.40
6	*2412.00	101.0 AV			1.00 H	223	69.60	31.40
7	4824.00	48.4 PK	74.0	-25.6	1.00 H	222	11.20	37.20
8	4824.00	39.4 AV	54.0	-14.6	1.00 H	222	2.20	37.20
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	60.5 PK	74.0	-13.5	1.23 V	259	29.20	31.30
2	2390.00	52.5 AV	54.0	-1.5	1.23 V	259	21.20	31.30
3	#2400.00	69.7 PK	88.4	-18.7	1.39 V	244	38.40	31.30
4	#2400.00	65.7 AV	84.4	-18.7	1.39 V	244	34.40	31.30
5	*2412.00	118.4 PK			1.04 V	59	87.00	31.40
6	*2412.00	114.4 AV			1.04 V	59	83.00	31.40
7	4824.00	52.3 PK	74.0	-21.7	1.00 V	142	15.10	37.20
8	4824.00	48.1 AV	54.0	-5.9	1.00 V	142	10.90	37.20

REMARKS:

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	105.1 PK			1.22 H	222	73.60	31.50
2	*2437.00	100.8 AV			1.22 H	222	69.30	31.50
3	4874.00	49.6 PK	74.0	-24.4	1.09 H	220	12.30	37.30
4	4874.00	41.7 AV	54.0	-12.3	1.09 H	220	4.40	37.30
5	7311.00	51.3 PK	74.0	-22.7	1.04 H	253	7.80	43.50
6	7311.00	38.5 AV	54.0	-15.5	1.04 H	253	-5.00	43.50
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	119.2 PK			1.30 V	250	87.70	31.50
2	*2437.00	114.9 AV			1.30 V	250	83.40	31.50
3	4874.00	55.2 PK	74.0	-18.8	1.40 V	253	17.90	37.30
4	4874.00	52.2 AV	54.0	-1.8	1.40 V	253	14.90	37.30
5	7311.00	51.9 PK	74.0	-22.1	1.00 V	247	8.40	43.50
6	7311.00	40.2 AV	54.0	-13.8	1.00 V	247	-3.30	43.50

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, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	104.6 PK			1.21 H	224	73.00	31.60
2	*2462.00	100.5 AV			1.21 H	224	68.90	31.60
3	2483.50	55.6 PK	74.0	-18.4	1.00 H	360	24.00	31.60
4	2483.50	43.4 AV	54.0	-10.6	1.00 H	360	11.80	31.60
5	4924.00	48.6 PK	74.0	-25.4	1.00 H	348	11.20	37.40
6	4924.00	39.6 AV	54.0	-14.4	1.00 H	348	2.20	37.40
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	118.5 PK			1.05 V	101	86.90	31.60
2	*2462.00	114.1 AV			1.05 V	101	82.50	31.60
3	2483.50	62.4 PK	74.0	-11.6	1.01 V	239	30.80	31.60
4	2483.50	52.7 AV	54.0	-1.3	1.01 V	239	21.10	31.60
5	4924.00	54.9 PK	74.0	-19.1	1.00 V	84	17.50	37.40
6	4924.00	51.8 AV	54.0	-2.2	1.00 V	84	14.40	37.40

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

802.11g

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

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	56.7 PK	74.0	-17.3	1.18 H	360	25.40	31.30
2	2390.00	45.1 AV	54.0	-8.9	1.18 H	360	13.80	31.30
3	#2400.00	68.3 PK	71.6	-3.3	1.08 H	125	37.00	31.30
4	#2400.00	58.2 AV	61.5	-3.3	1.08 H	125	26.90	31.30
5	*2412.00	101.6 PK			1.00 H	223	70.20	31.40
6	*2412.00	91.5 AV			1.00 H	223	60.10	31.40
7	4824.00	46.1 PK	74.0	-27.9	1.04 H	125	8.90	37.20
8	4824.00	33.0 AV	54.0	-21.0	1.04 H	125	-4.20	37.20
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	70.5 PK	74.0	-3.5	1.06 V	243	39.20	31.30
2	2390.00	52.8 AV	54.0	-1.2	1.06 V	243	21.50	31.30
3	#2400.00	79.9 PK	87.2	-7.3	1.49 V	240	48.60	31.30
4	#2400.00	70.5 AV	77.8	-7.3	1.49 V	240	39.20	31.30
5	*2412.00	117.2 PK			1.06 V	250	85.80	31.40
6	*2412.00	107.8 AV			1.06 V	250	76.40	31.40
7	4824.00	47.5 PK	74.0	-26.5	1.15 V	125	10.30	37.20
8	4824.00	33.1 AV	54.0	-20.9	1.15 V	125	-4.10	37.20

REMARKS:

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	55.1 PK	74.0	-18.9	1.10 H	125	23.80	31.30
2	2390.00	43.9 AV	54.0	-10.1	1.10 H	125	12.60	31.30
3	*2437.00	102.4 PK			1.23 H	222	70.90	31.50
4	*2437.00	93.0 AV			1.23 H	222	61.50	31.50
5	2483.50	55.2 PK	74.0	-18.8	1.04 H	136	23.60	31.60
6	2483.50	44.0 AV	54.0	-10.0	1.04 H	136	12.40	31.60
7	4874.00	46.0 PK	74.0	-28.0	1.04 H	112	8.70	37.30
8	4874.00	33.1 AV	54.0	-20.9	1.04 H	112	-4.20	37.30
9	7311.00	51.7 PK	74.0	-22.3	1.10 H	114	8.20	43.50
10	7311.00	38.8 AV	54.0	-15.2	1.10 H	114	-4.70	43.50
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	61.2 PK	74.0	-12.8	1.32 V	234	29.90	31.30
2	2390.00	50.4 AV	54.0	-3.6	1.32 V	234	19.10	31.30
3	*2437.00	119.3 PK			1.29 V	234	87.80	31.50
4	*2437.00	109.9 AV			1.29 V	234	78.40	31.50
5	2483.50	64.9 PK	74.0	-9.1	1.29 V	232	33.30	31.60
6	2483.50	52.9 AV	54.0	-1.1	1.29 V	232	21.30	31.60
7	4874.00	51.4 PK	74.0	-22.6	1.00 V	77	14.10	37.30
8	4874.00	37.1 AV	54.0	-16.9	1.00 V	77	-0.20	37.30
9	7311.00	52.2 PK	74.0	-21.8	1.10 V	114	8.70	43.50
10	7311.00	39.0 AV	54.0	-15.0	1.10 V	114	-4.50	43.50

REMARKS:

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	99.4 PK			1.21 H	222	67.80	31.60
2	*2462.00	90.2 AV			1.21 H	222	58.60	31.60
3	2483.50	55.3 PK	74.0	-18.7	1.00 H	125	23.70	31.60
4	2483.50	44.5 AV	54.0	-9.5	1.00 H	125	12.90	31.60
5	4924.00	46.1 PK	74.0	-27.9	1.10 H	125	8.70	37.40
6	4924.00	33.1 AV	54.0	-20.9	1.10 H	125	-4.30	37.40
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	115.9 PK			1.03 V	103	84.30	31.60
2	*2462.00	106.4 AV			1.03 V	103	74.80	31.60
3	2483.50	70.4 PK	74.0	-3.6	1.04 V	256	38.80	31.60
4	2483.50	52.1 AV	54.0	-1.9	1.04 V	256	20.50	31.60
5	4924.00	46.1 PK	74.0	-27.9	1.04 V	260	8.70	37.40
6	4924.00	34.0 AV	54.0	-20.0	1.04 V	260	-3.40	37.40

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

802.11n (20MHz)

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

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	54.4 PK	74.0	-19.6	1.00 H	115	23.10	31.30
2	2390.00	44.1 AV	54.0	-9.9	1.00 H	115	12.80	31.30
3	#2400.00	63.4 PK	69.6	-6.2	1.01 H	125	32.10	31.30
4	#2400.00	54.5 AV	60.8	-6.3	1.01 H	125	23.20	31.30
5	*2412.00	99.6 PK			1.00 H	221	68.20	31.40
6	*2412.00	90.8 AV			1.00 H	221	59.40	31.40
7	4824.00	45.7 PK	74.0	-28.3	1.12 H	132	8.50	37.20
8	4824.00	32.4 AV	54.0	-21.6	1.12 H	132	-4.80	37.20
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	72.7 PK	74.0	-1.3	1.34 V	245	41.40	31.30
2	2390.00	52.0 AV	54.0	-2.0	1.34 V	245	20.70	31.30
3	#2400.00	77.2 PK	86.0	-8.8	1.37 V	254	45.90	31.30
4	#2400.00	68.7 AV	76.9	-8.2	1.37 V	254	37.40	31.30
5	*2412.00	116.0 PK			1.32 V	232	84.60	31.40
6	*2412.00	106.9 AV			1.32 V	232	75.50	31.40
7	4824.00	46.1 PK	74.0	-27.9	1.10 V	136	8.90	37.20
8	4824.00	33.1 AV	54.0	-20.9	1.10 V	136	-4.10	37.20

REMARKS:

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	55.2 PK	74.0	-18.8	1.10 H	145	23.90	31.30
2	2390.00	43.8 AV	54.0	-10.2	1.10 H	145	12.50	31.30
3	*2437.00	102.3 PK			1.10 H	125	70.80	31.50
4	*2437.00	92.5 AV			1.10 H	125	61.00	31.50
5	2483.50	55.0 PK	74.0	-19.0	1.10 H	153	23.40	31.60
6	2483.50	44.5 AV	54.0	-9.5	1.10 H	153	12.90	31.60
7	4874.00	45.8 PK	74.0	-28.2	1.04 H	214	8.50	37.30
8	4874.00	33.0 AV	54.0	-21.0	1.04 H	214	-4.30	37.30
9	7311.00	50.7 PK	74.0	-23.3	1.01 H	125	7.20	43.50
10	7311.00	38.5 AV	54.0	-15.5	1.01 H	125	-5.00	43.50
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	60.7 PK	74.0	-13.3	1.64 V	248	29.40	31.30
2	2390.00	49.4 AV	54.0	-4.6	1.64 V	248	18.10	31.30
3	*2437.00	118.6 PK			1.29 V	235	87.10	31.50
4	*2437.00	109.5 AV			1.29 V	235	78.00	31.50
5	2483.50	63.7 PK	74.0	-10.3	1.51 V	234	32.10	31.60
6	2483.50	52.3 AV	54.0	-1.7	1.51 V	234	20.70	31.60
7	4874.00	51.3 PK	74.0	-22.7	1.23 V	358	14.00	37.30
8	4874.00	36.3 AV	54.0	-17.7	1.23 V	358	-1.00	37.30
9	7311.00	51.1 PK	74.0	-22.9	1.04 V	126	7.60	43.50
10	7311.00	39.4 AV	54.0	-14.6	1.04 V	126	-4.10	43.50

REMARKS:

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	98.0 PK			1.21 H	221	66.40	31.60
2	*2462.00	89.2 AV			1.21 H	221	57.60	31.60
3	2483.50	55.6 PK	74.0	-18.4	1.04 H	115	24.00	31.60
4	2483.50	43.9 AV	54.0	-10.1	1.04 H	115	12.30	31.60
5	4924.00	45.7 PK	74.0	-28.3	1.10 H	142	8.30	37.40
6	4924.00	32.6 AV	54.0	-21.4	1.10 H	142	-4.80	37.40
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	114.8 PK			1.26 V	56	83.20	31.60
2	*2462.00	105.5 AV			1.26 V	56	73.90	31.60
3	2483.50	72.8 PK	74.0	-1.2	1.26 V	236	41.20	31.60
4	2483.50	51.9 AV	54.0	-2.1	1.26 V	236	20.30	31.60
5	4924.00	46.3 PK	74.0	-27.7	1.02 V	152	8.90	37.40
6	4924.00	32.6 AV	54.0	-21.4	1.02 V	152	-4.80	37.40

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

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	54.5 PK	74.0	-19.5	1.10 H	125	23.20	31.30
2	2390.00	44.4 AV	54.0	-9.6	1.10 H	125	13.10	31.30
3	#2400.00	61.5 PK	63.0	-1.5	1.00 H	0	30.20	31.30
4	#2400.00	53.1 AV	54.6	-1.5	1.00 H	0	21.80	31.30
5	*2422.00	93.0 PK			1.00 H	223	61.60	31.40
6	*2422.00	84.6 AV			1.00 H	223	53.20	31.40
7	4844.00	45.9 PK	74.0	-28.1	1.00 H	125	8.60	37.30
8	4844.00	33.7 AV	54.0	-20.3	1.00 H	125	-3.60	37.30
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	66.1 PK	74.0	-7.9	1.29 V	243	34.80	31.30
2	2390.00	49.5 AV	54.0	-4.5	1.29 V	243	18.20	31.30
3	#2400.00	75.1 PK	76.6	-1.5	1.35 V	266	43.80	31.30
4	#2400.00	66.7 AV	68.2	-1.5	1.35 V	266	35.40	31.30
5	*2422.00	106.6 PK			1.05 V	234	75.20	31.40
6	*2422.00	98.2 AV			1.05 V	234	66.80	31.40
7	4844.00	46.5 PK	74.0	-27.5	1.04 V	125	9.20	37.30
8	4844.00	32.2 AV	54.0	-21.8	1.04 V	125	-5.10	37.30

REMARKS:

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	55.3 PK	74.0	-18.7	1.10 H	123	24.00	31.30
2	2390.00	43.7 AV	54.0	-10.3	1.10 H	123	12.40	31.30
3	*2437.00	96.4 PK			1.21 H	222	64.90	31.50
4	*2437.00	87.8 AV			1.21 H	222	56.30	31.50
5	2483.50	55.2 PK	74.0	-18.8	1.10 H	147	23.60	31.60
6	2483.50	43.9 AV	54.0	-10.1	1.10 H	147	12.30	31.60
7	4874.00	45.2 PK	74.0	-28.8	1.07 H	123	7.90	37.30
8	4874.00	33.1 AV	54.0	-20.9	1.07 H	123	-4.20	37.30
9	7311.00	50.9 PK	74.0	-23.1	1.04 H	123	7.40	43.50
10	7311.00	38.4 AV	54.0	-15.6	1.04 H	123	-5.10	43.50
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	61.1 PK	74.0	-12.9	1.11 V	267	29.80	31.30
2	2390.00	48.2 AV	54.0	-5.8	1.11 V	267	16.90	31.30
3	*2437.00	109.5 PK			1.04 V	125	78.00	31.50
4	*2437.00	102.1 AV			1.04 V	125	70.60	31.50
5	2483.50	69.0 PK	74.0	-5.0	1.26 V	232	37.40	31.60
6	2483.50	52.8 AV	54.0	-1.2	1.26 V	232	21.20	31.60
7	4874.00	45.7 PK	74.0	-28.3	1.02 V	136	8.40	37.30
8	4874.00	33.2 AV	54.0	-20.8	1.02 V	136	-4.10	37.30
9	7311.00	50.5 PK	74.0	-23.5	1.10 V	126	7.00	43.50
10	7311.00	39.0 AV	54.0	-15.0	1.10 V	126	-4.50	43.50

REMARKS:

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	94.4 PK			1.19 H	224	62.90	31.50
2	*2452.00	84.1 AV			1.19 H	224	52.60	31.50
3	2483.50	59.0 PK	74.0	-15.0	1.20 H	227	27.40	31.60
4	2483.50	46.0 AV	54.0	-8.0	1.20 H	227	14.40	31.60
5	4924.00	45.3 PK	74.0	-28.7	1.02 H	113	7.90	37.40
6	4924.00	32.1 AV	54.0	-21.9	1.02 H	113	-5.30	37.40
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	107.7 PK			1.06 V	236	76.20	31.50
2	*2452.00	98.5 AV			1.06 V	236	67.00	31.50
3	2483.50	71.7 PK	74.0	-2.3	1.22 V	236	40.10	31.60
4	2483.50	52.9 AV	54.0	-1.1	1.22 V	236	21.30	31.60
5	4924.00	44.3 PK	74.0	-29.7	1.01 V	126	6.90	37.40
6	4924.00	32.5 AV	54.0	-21.5	1.01 V	126	-4.90	37.40

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

BELOW 1GHz WORST-CASE DATA : 802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	142.67	35.1 QP	43.5	-8.4	1.24 H	8	21.40	13.70
2	239.88	38.7 QP	46.0	-7.3	1.24 H	60	26.10	12.60
3	300.16	44.7 QP	46.0	-1.3	1.00 H	154	29.70	15.00
4	335.15	38.4 QP	46.0	-7.6	1.00 H	163	22.50	15.90
5	667.63	37.0 QP	46.0	-9.0	1.24 H	214	14.30	22.70
6	700.68	44.7 QP	46.0	-1.3	1.24 H	195	21.70	23.00
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	99.89	31.6 QP	43.5	-11.9	1.00 V	78	22.20	9.40
2	166.00	29.2 QP	43.5	-14.3	1.00 V	73	15.40	13.80
3	239.88	30.0 QP	46.0	-16.0	1.00 V	126	17.40	12.60
4	300.16	39.2 QP	46.0	-6.8	1.24 V	91	24.20	15.00
5	663.74	35.5 QP	46.0	-10.5	1.00 V	65	12.80	22.70
6	836.78	37.4 QP	46.0	-8.6	1.00 V	97	11.30	26.10

REMARKS:

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

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.2.2 TEST INSTRUMENTS

Test Date: Nov. 27, 2012

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Nov. 09, 2012	Nov. 08, 2013
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 29, 2011	Dec. 28, 2012
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 30, 2011	Dec. 29, 2012
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 06, 2012	Jul. 05, 2013
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

4.2.3 TEST PROCEDURES

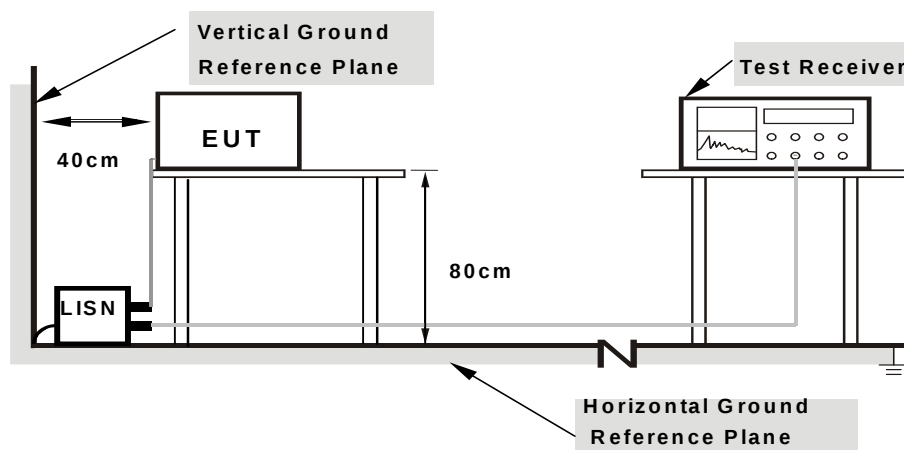
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

4.2.7 TEST RESULTS

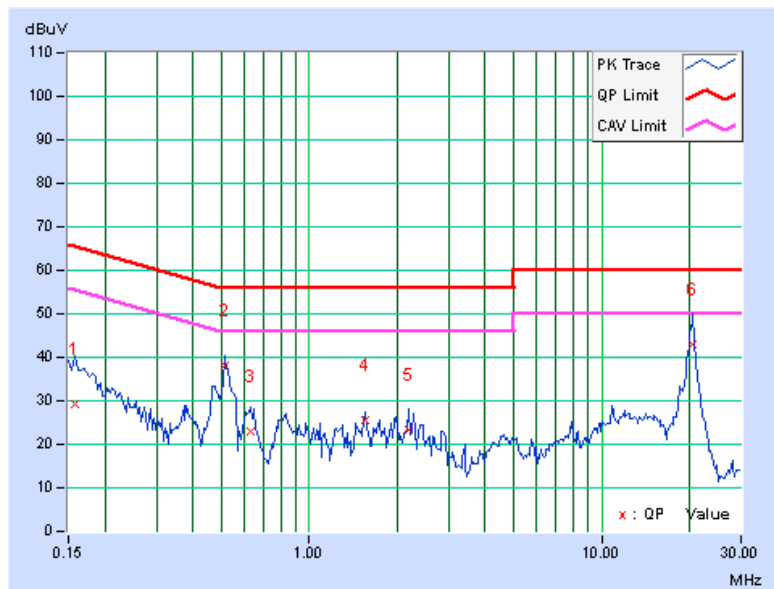
CONDUCTED WORST-CASE DATA : 802.11b

PHASE	Line 1	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.15	29.26	15.57	29.41	15.72	65.58	55.58	-36.17	-39.86
2	0.51710	0.17	38.11	36.74	38.28	36.91	56.00	46.00	-17.72	-9.09
3	0.62656	0.18	22.74	17.95	22.92	18.13	56.00	46.00	-33.08	-27.87
4	1.55078	0.23	25.36	22.46	25.59	22.69	56.00	46.00	-30.41	-23.31
5	2.19922	0.27	22.92	17.93	23.19	18.20	56.00	46.00	-32.81	-27.80
6	20.50000	0.62	42.48	37.42	43.10	38.04	60.00	50.00	-16.90	-11.96

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

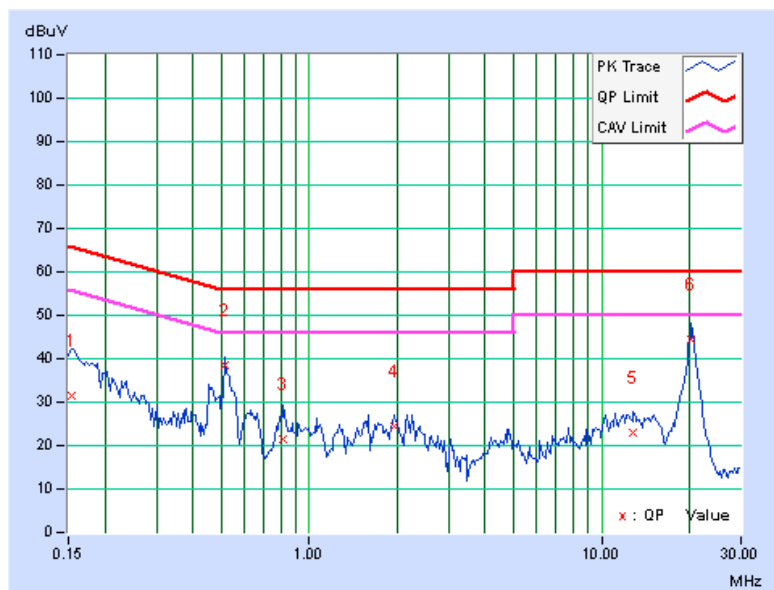


PHASE	Line 2	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.13	31.48	17.86	31.61	17.99	65.79	55.79	-34.18	-37.80
2	0.51710	0.17	38.21	36.86	38.38	37.03	56.00	46.00	-17.62	-8.97
3	0.81797	0.18	21.31	17.95	21.49	18.13	56.00	46.00	-34.51	-27.87
4	1.95703	0.26	24.34	16.80	24.60	17.06	56.00	46.00	-31.40	-28.94
5	12.87500	0.55	22.47	16.59	23.02	17.14	60.00	50.00	-36.98	-32.86
6	20.30078	0.71	43.84	38.10	44.55	38.81	60.00	50.00	-15.45	-11.19

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

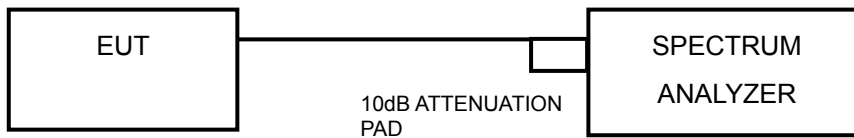


4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Test Date: Jan. 11, 2013

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100040	Jul. 16, 2012	Jul. 15, 2013

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

4.3.4 TEST PROCEDURE

- Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

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

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	10.09	10.11	10.11	0.5	PASS
6	2437	10.13	10.15	10.13	0.5	PASS
11	2462	10.11	10.13	10.12	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.61	16.63	16.61	0.5	PASS
6	2437	16.64	16.60	16.61	0.5	PASS
11	2462	16.60	16.61	16.61	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.87	17.83	17.82	0.5	PASS
6	2437	17.84	17.85	17.85	0.5	PASS
11	2462	17.85	17.79	17.83	0.5	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	36.62	36.66	36.66	0.5	PASS
6	2437	36.61	36.70	36.69	0.5	PASS
9	2452	36.63	36.67	36.66	0.5	PASS

4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)
Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

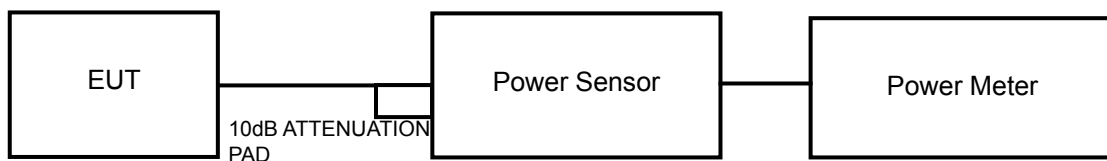
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT} / N_{SS})$ dB.

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.4 TEST PROCEDURES

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

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

4.4.7 TEST RESULTS

802.11b

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	19.09	18.84	18.98	236.72	23.74	30	PASS
6	2437	19.55	18.94	18.62	241.28	23.83	30	PASS
11	2462	18.34	18.28	18.68	209.32	23.21	30	PASS

802.11g

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	14.68	14.61	14.90	89.19	19.50	30	PASS
6	2437	17.04	16.30	16.10	133.98	21.27	30	PASS
11	2462	13.04	13.37	13.34	63.44	18.02	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	13.43	13.26	13.64	66.33	18.22	30	PASS
6	2437	16.74	16.32	16.04	130.24	21.15	30	PASS
11	2462	12.14	12.58	13.06	54.71	17.38	30	PASS

802.11n (40MHz)

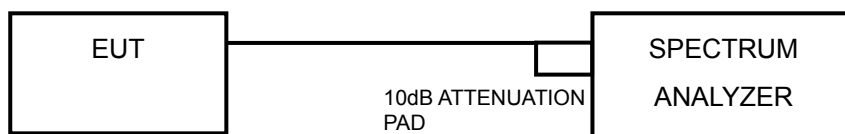
CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
3	2422	7.81	7.38	7.88	17.65	12.47	30	PASS
6	2437	11.87	11.30	11.95	44.54	16.49	30	PASS
9	2452	8.66	8.42	8.26	20.99	13.22	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Test Date: Jan. 11, 2013

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100040	Jul. 16, 2012	Jul. 15, 2013

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

4.5.4 TEST PROCEDURE

- Set the RBW = 3 kHz, VBW = 10 kHz, Detector = peak.
- Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-5.37	4.77	-0.60	6.23	PASS
	6	2437	-5.07	4.77	-0.30	6.23	PASS
	11	2462	-4.22	4.77	0.55	6.23	PASS
1	1	2412	-4.37	4.77	0.40	6.23	PASS
	6	2437	-4.68	4.77	0.09	6.23	PASS
	11	2462	-5.44	4.77	-0.67	6.23	PASS
2	1	2412	-4.85	4.77	-0.08	6.23	PASS
	6	2437	-4.97	4.77	-0.20	6.23	PASS
	11	2462	-5.12	4.77	-0.35	6.23	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(3) = 7.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(7.77-6) = 6.23\text{dBm}$.

802.11g

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-11.13	4.77	-6.36	6.23	PASS
	6	2437	-8.89	4.77	-4.12	6.23	PASS
	11	2462	-13.03	4.77	-8.26	6.23	PASS
1	1	2412	-11.36	4.77	-6.59	6.23	PASS
	6	2437	-9.35	4.77	-4.58	6.23	PASS
	11	2462	-11.89	4.77	-7.12	6.23	PASS
2	1	2412	-9.87	4.77	-5.10	6.23	PASS
	6	2437	-9.10	4.77	-4.33	6.23	PASS
	11	2462	-12.04	4.77	-7.27	6.23	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(3) = 7.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(7.77-6) = 6.23\text{dBm}$.

802.11n (20MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-11.69	4.77	-6.92	6.23	PASS
	6	2437	-8.52	4.77	-3.75	6.23	PASS
	11	2462	-12.34	4.77	-7.57	6.23	PASS
1	1	2412	-12.28	4.77	-7.51	6.23	PASS
	6	2437	-10.35	4.77	-5.58	6.23	PASS
	11	2462	-13.11	4.77	-8.34	6.23	PASS
2	1	2412	-11.47	4.77	-6.70	6.23	PASS
	6	2437	-10.36	4.77	-5.59	6.23	PASS
	11	2462	-13.82	4.77	-9.05	6.23	PASS

NOTE: Directional gain = 3dBi + 10log(3) = 7.77dBi > 6dBi , so the power density limit shall be reduced to 8-(7.77-6) = 6.23dBm.

802.11n (40MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-20.12	4.77	-15.35	6.23	PASS
	6	2437	-17.20	4.77	-12.43	6.23	PASS
	9	2452	-19.30	4.77	-14.53	6.23	PASS
1	3	2422	-21.66	4.77	-16.89	6.23	PASS
	6	2437	-16.42	4.77	-11.65	6.23	PASS
	9	2452	-21.05	4.77	-16.28	6.23	PASS
2	3	2422	-20.63	4.77	-15.86	6.23	PASS
	6	2437	-14.95	4.77	-10.18	6.23	PASS
	9	2452	-20.62	4.77	-15.85	6.23	PASS

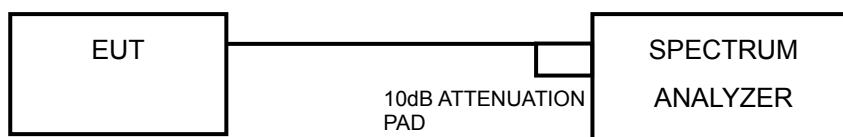
NOTE: Directional gain = 3dBi + 10log(3) = 7.77dBi > 6dBi , so the power density limit shall be reduced to 8-(7.77-6) = 6.23dBm.

4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq$ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW $\geq$ 300 kHz.
3. Set span to encompass the spectrum to be examined.
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.7 TEST RESULTS

The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit. Only worst data of each operating mode is presented.

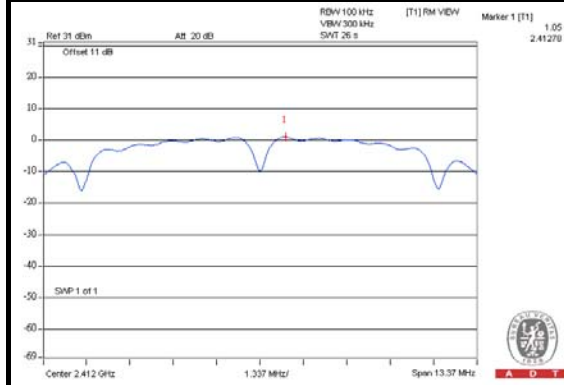
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

4.6.8 TEST RESULTS

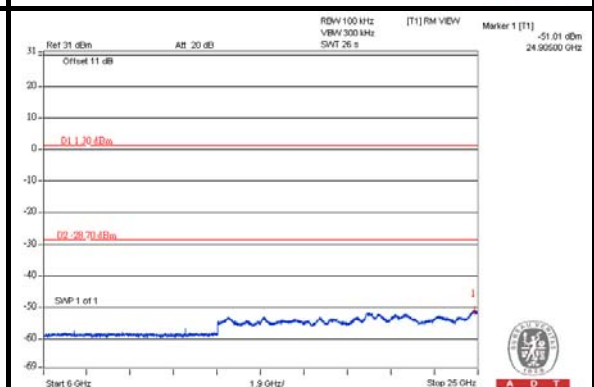
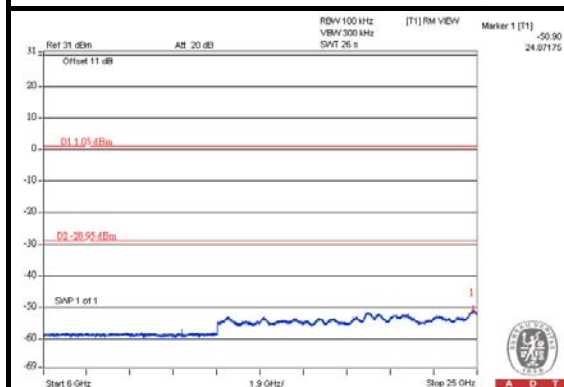
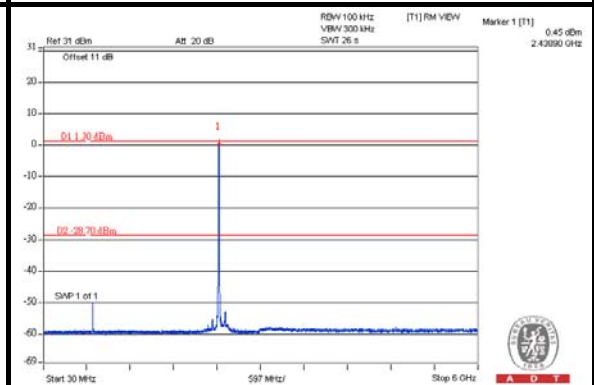
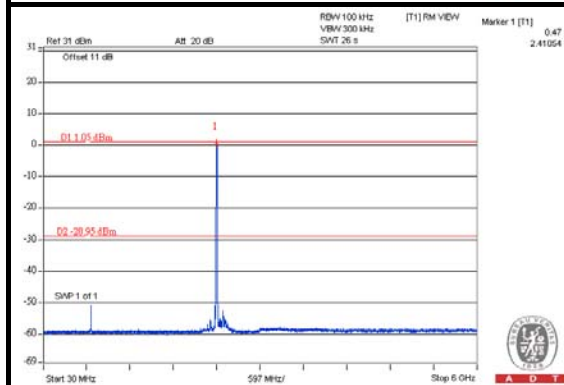
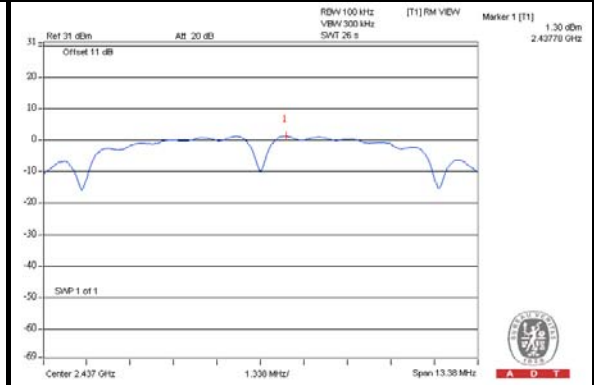
802.11b

CHAIN 0

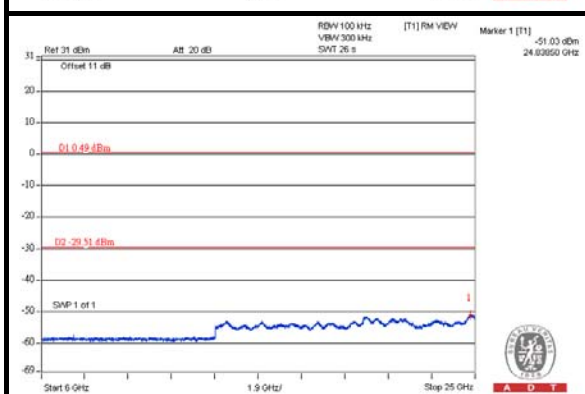
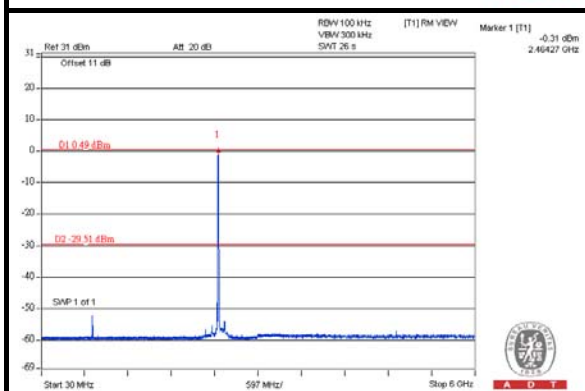
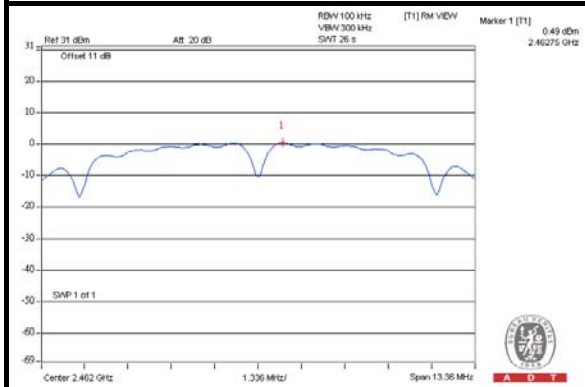
CH 1



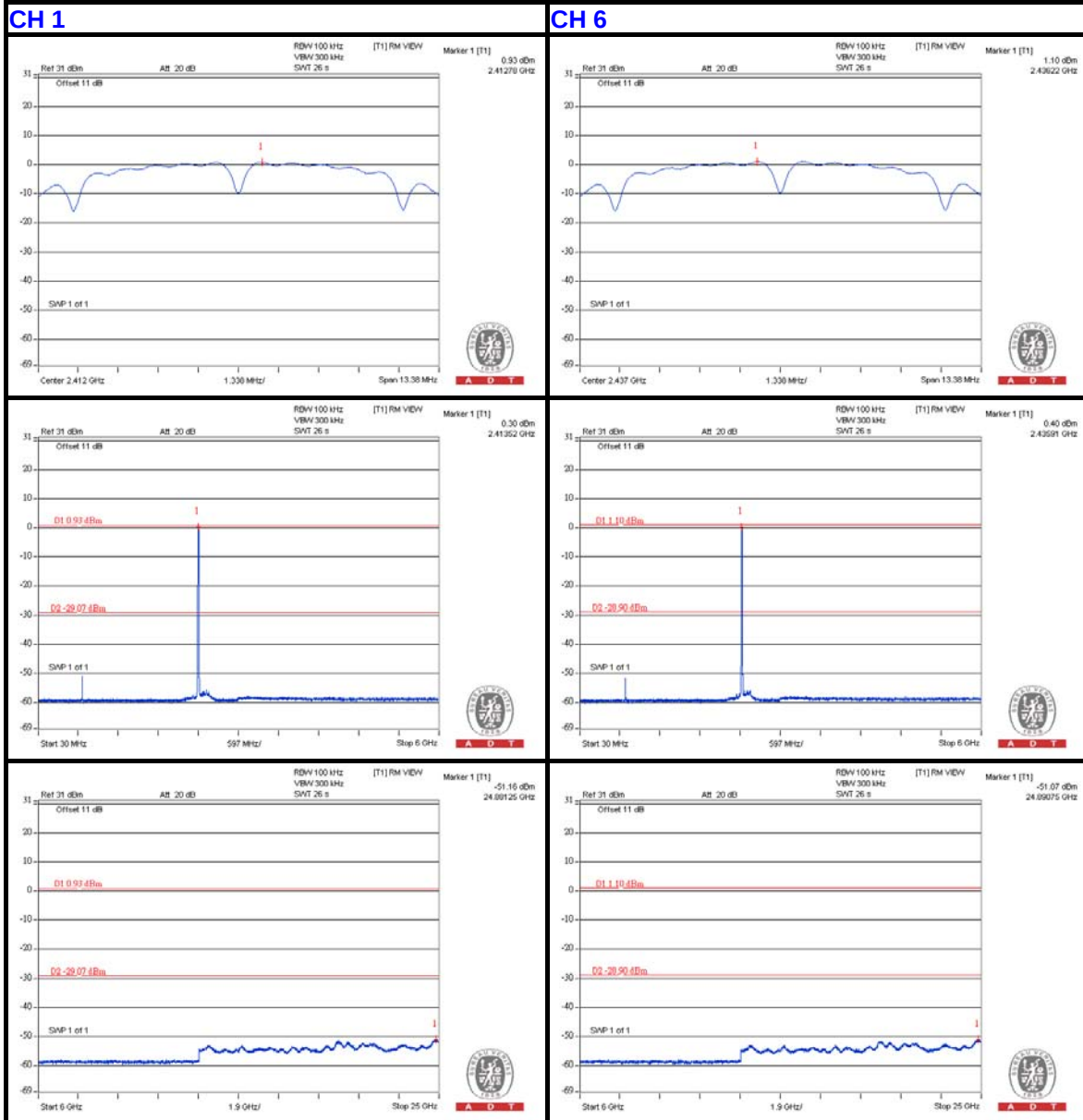
CH 6



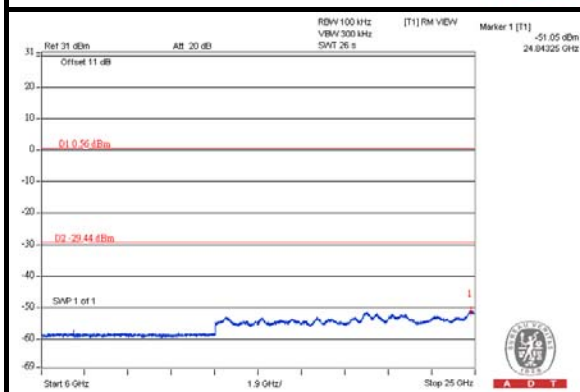
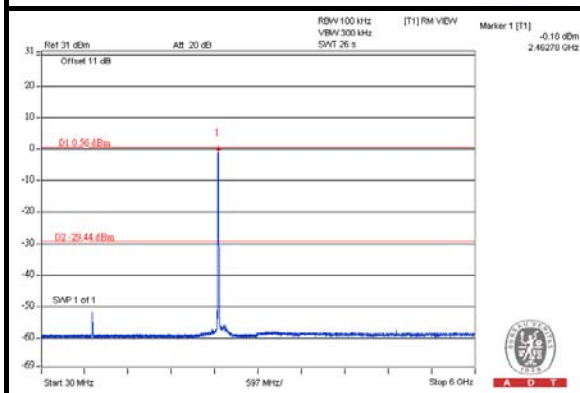
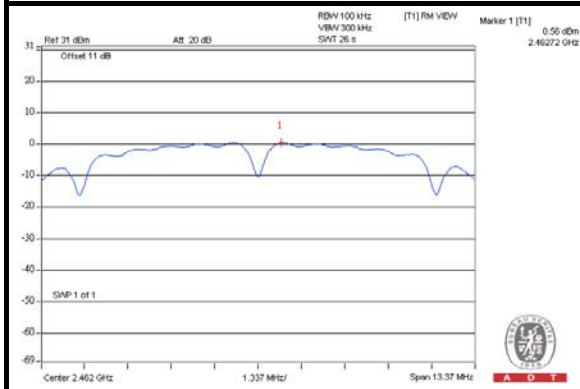
CH 11



CHAIN 1

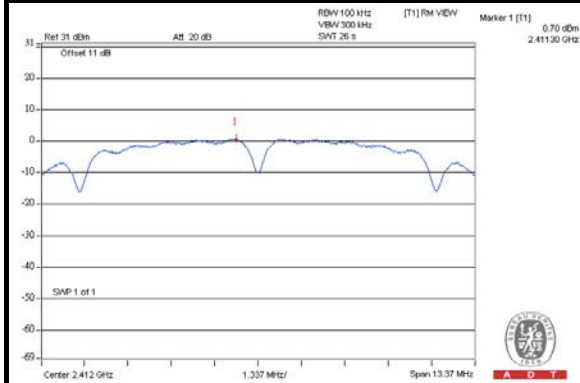


CH 11

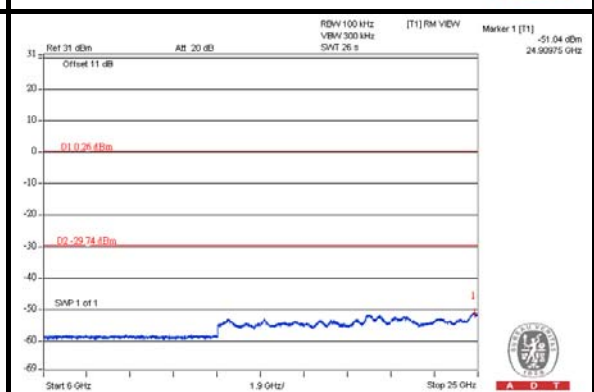
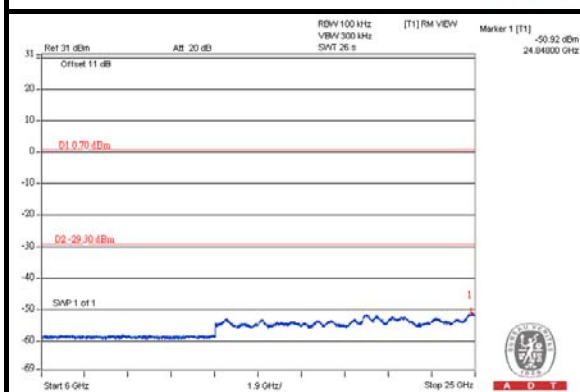
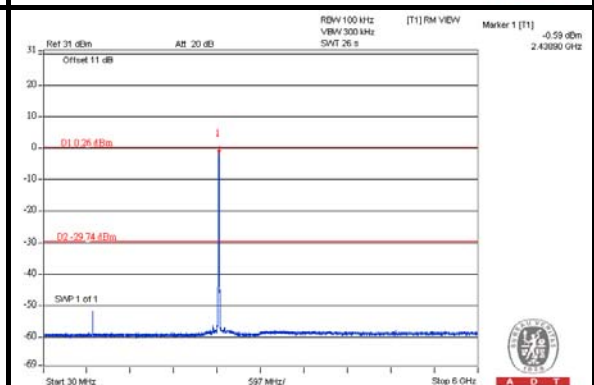
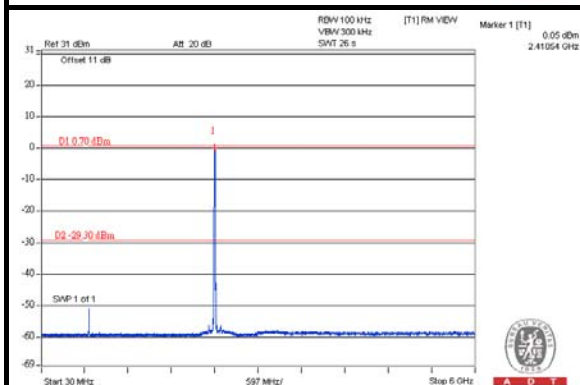
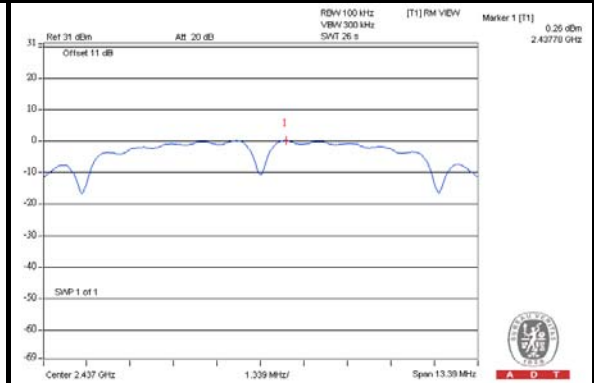


CHAIN 2

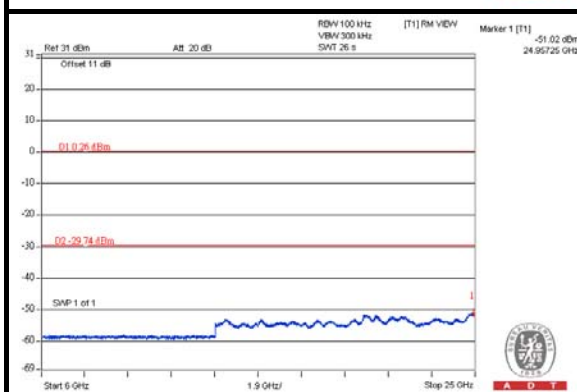
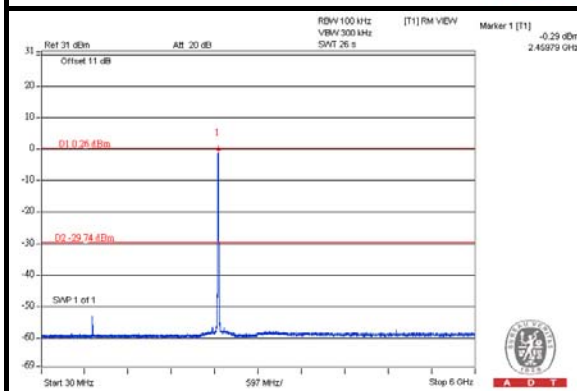
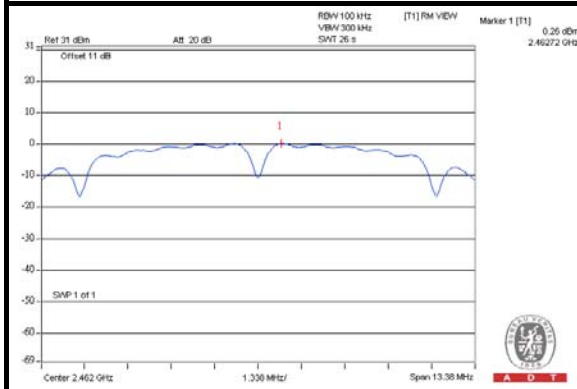
CH 1



CH 6

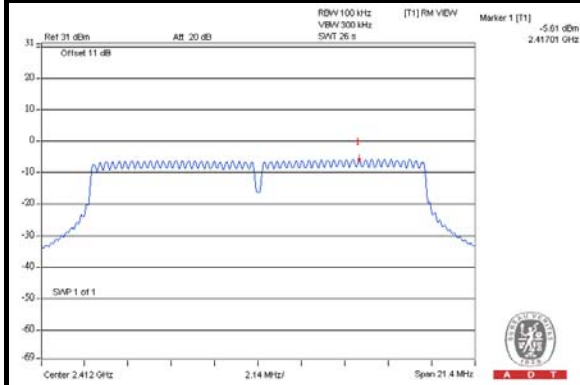


CH 11

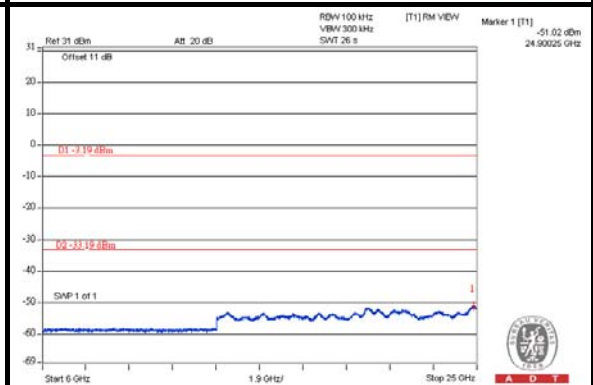
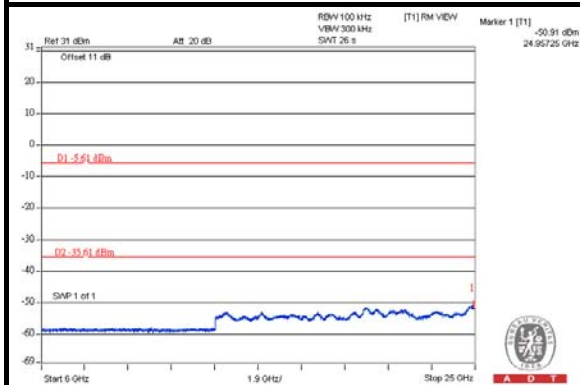
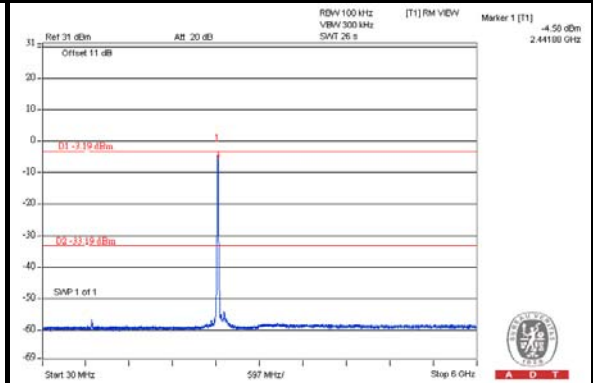
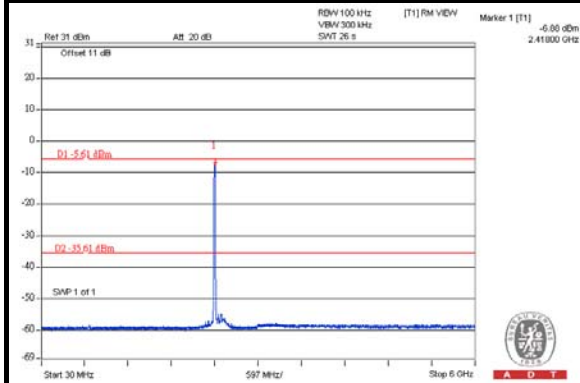
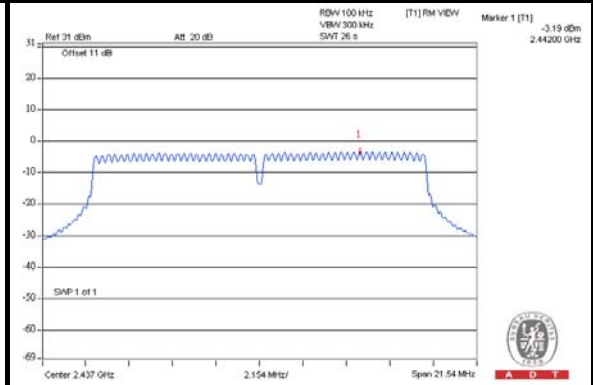


802.11g
CHAIN 0

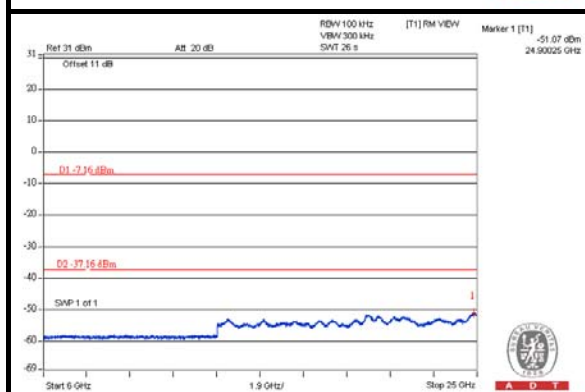
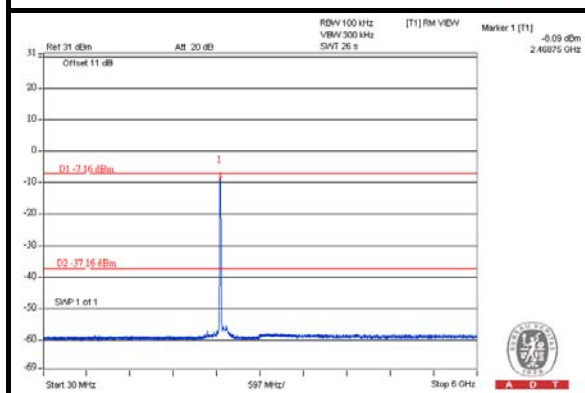
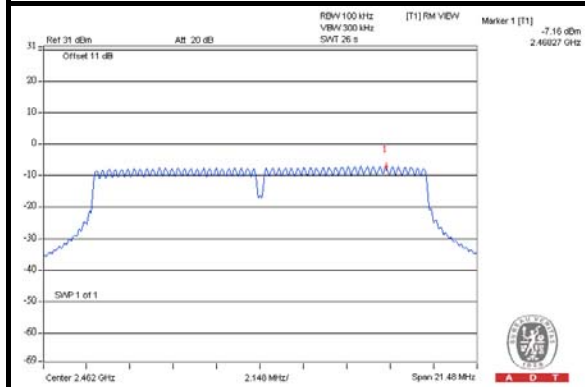
CH 1



CH 6

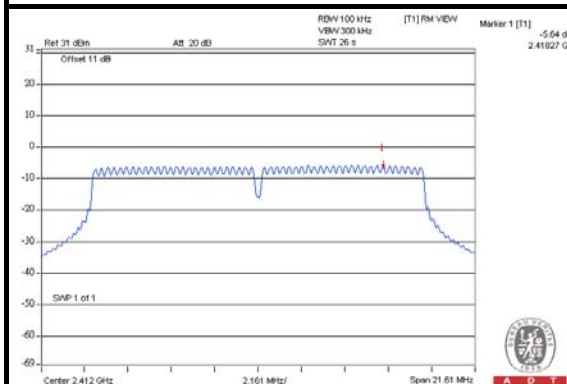


CH 11

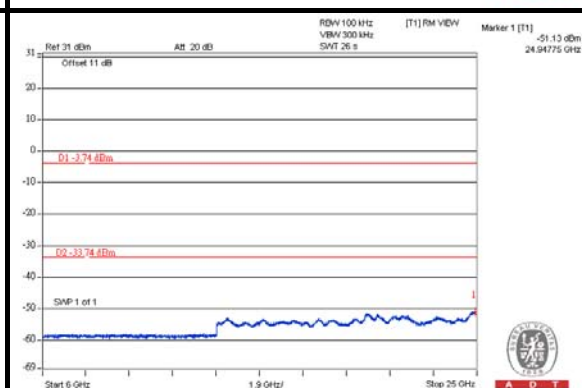
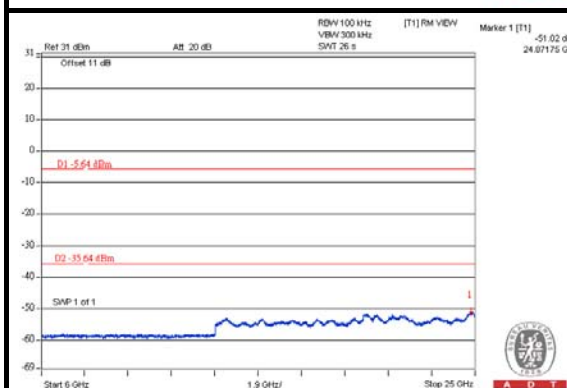
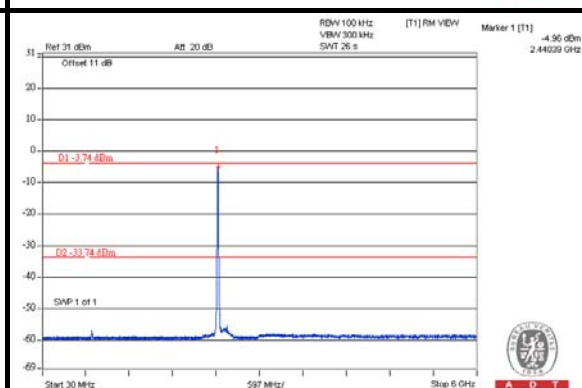
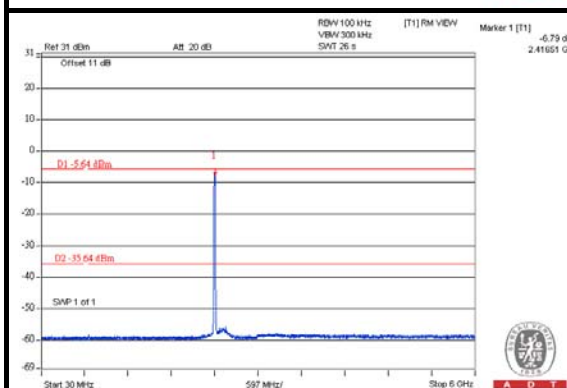
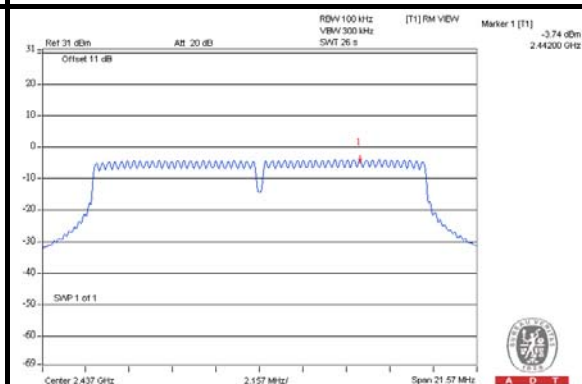


CHAIN 1

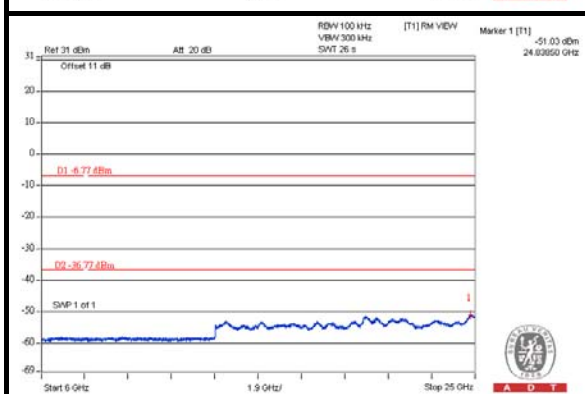
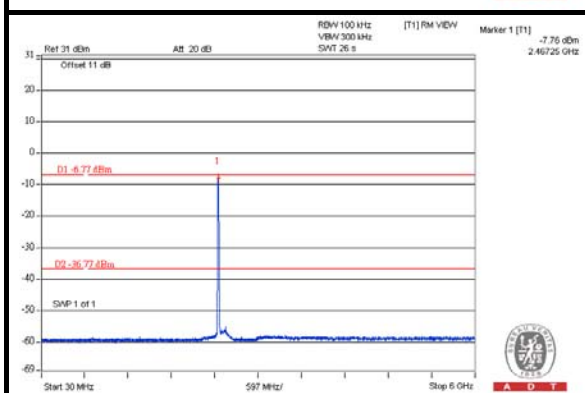
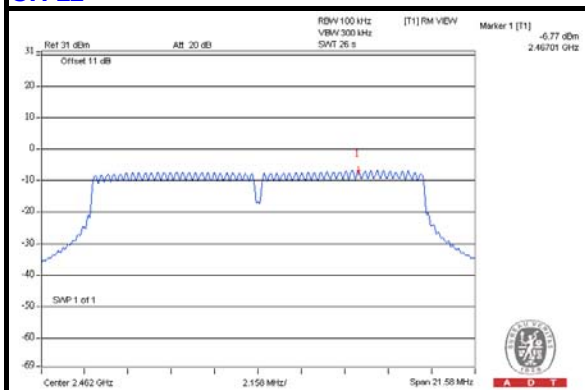
CH 1



CH 6

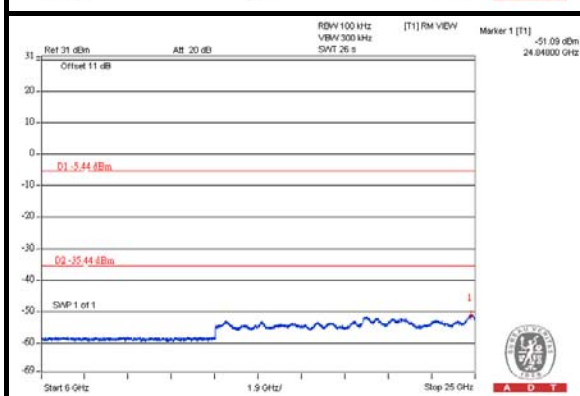
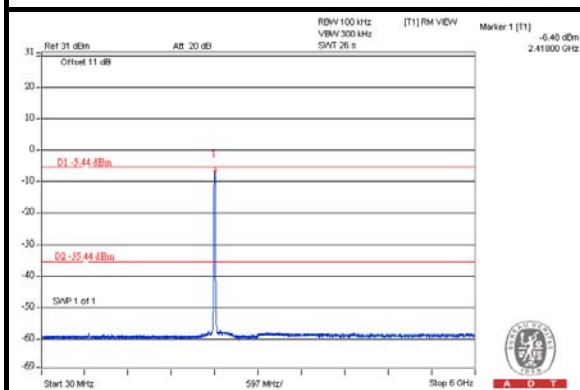
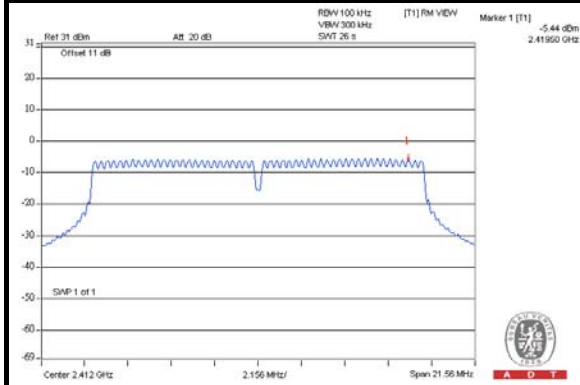


CH 11

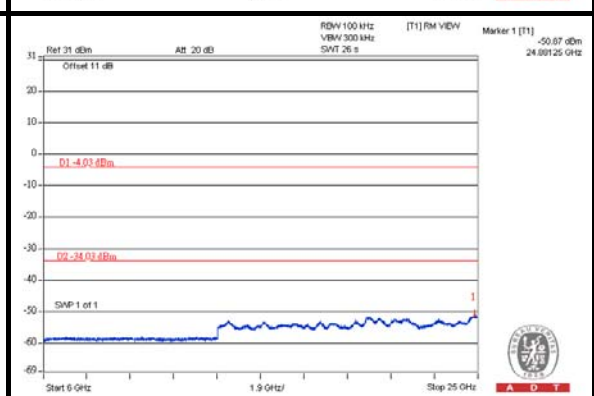
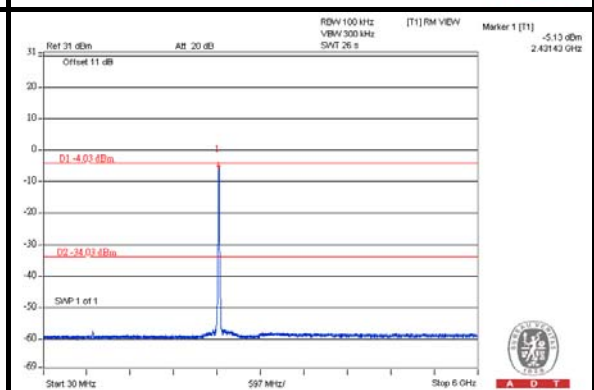
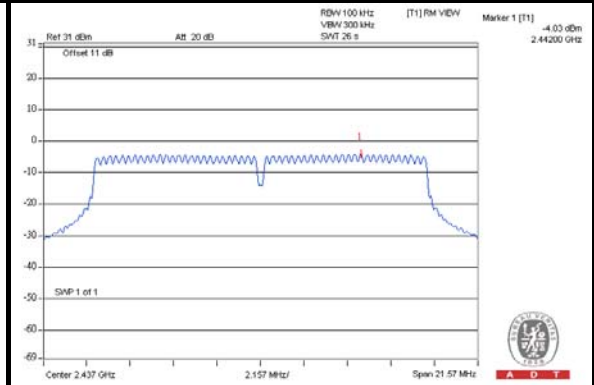


CHAIN 2

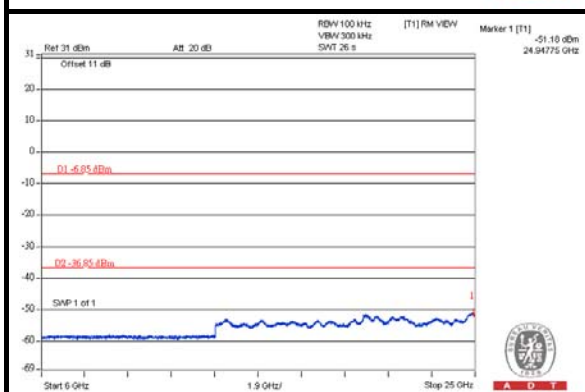
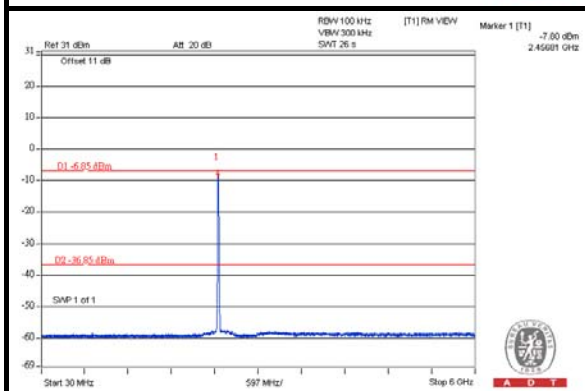
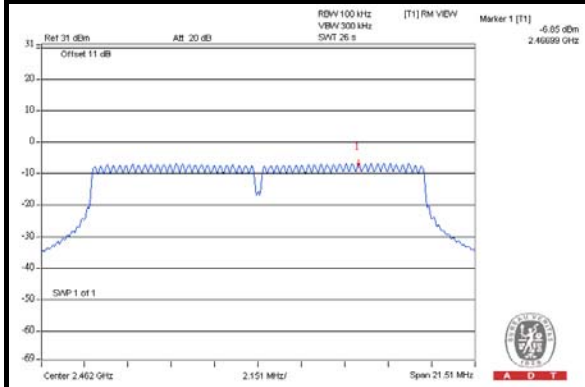
CH 1



CH 6

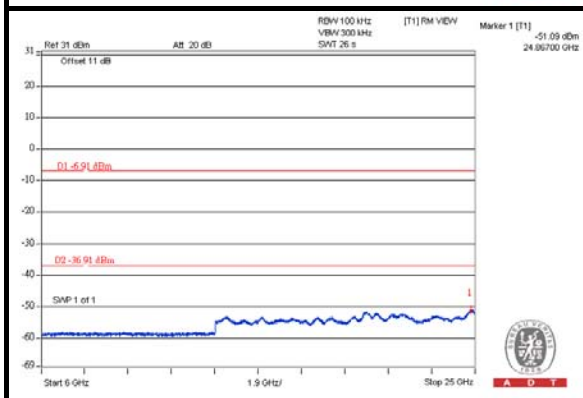
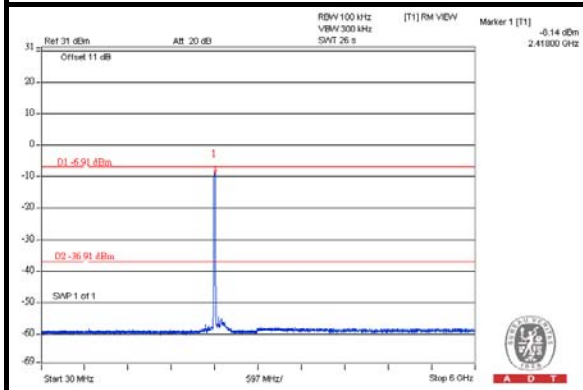
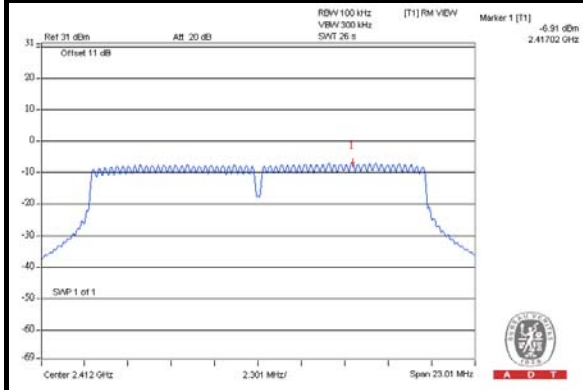


CH 11

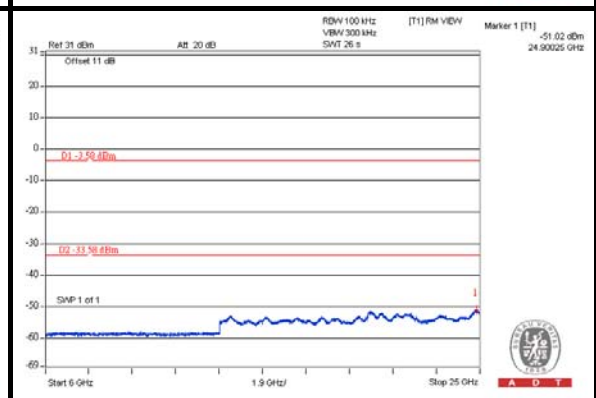
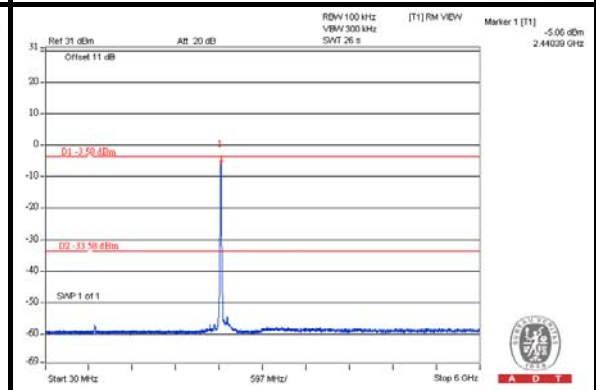
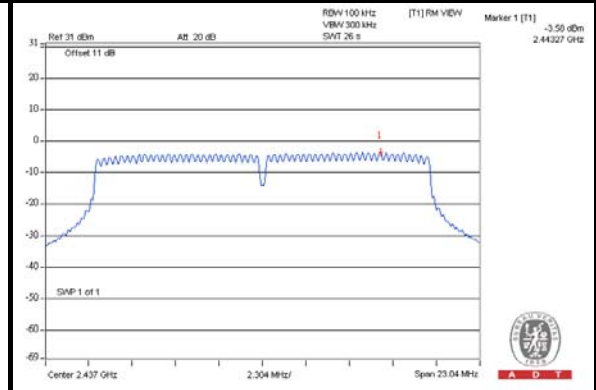


802.11n (20MHz) CHAIN 0

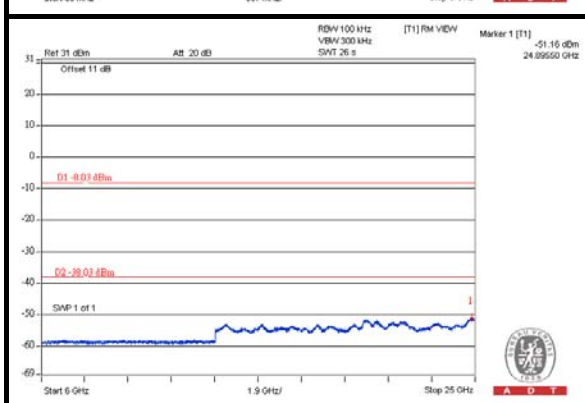
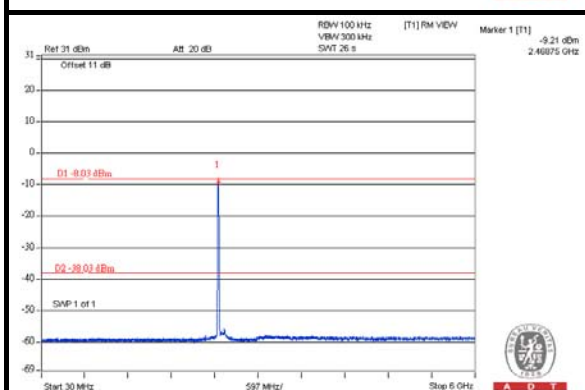
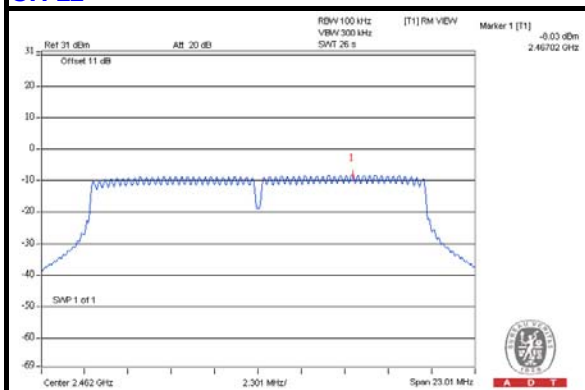
CH 1



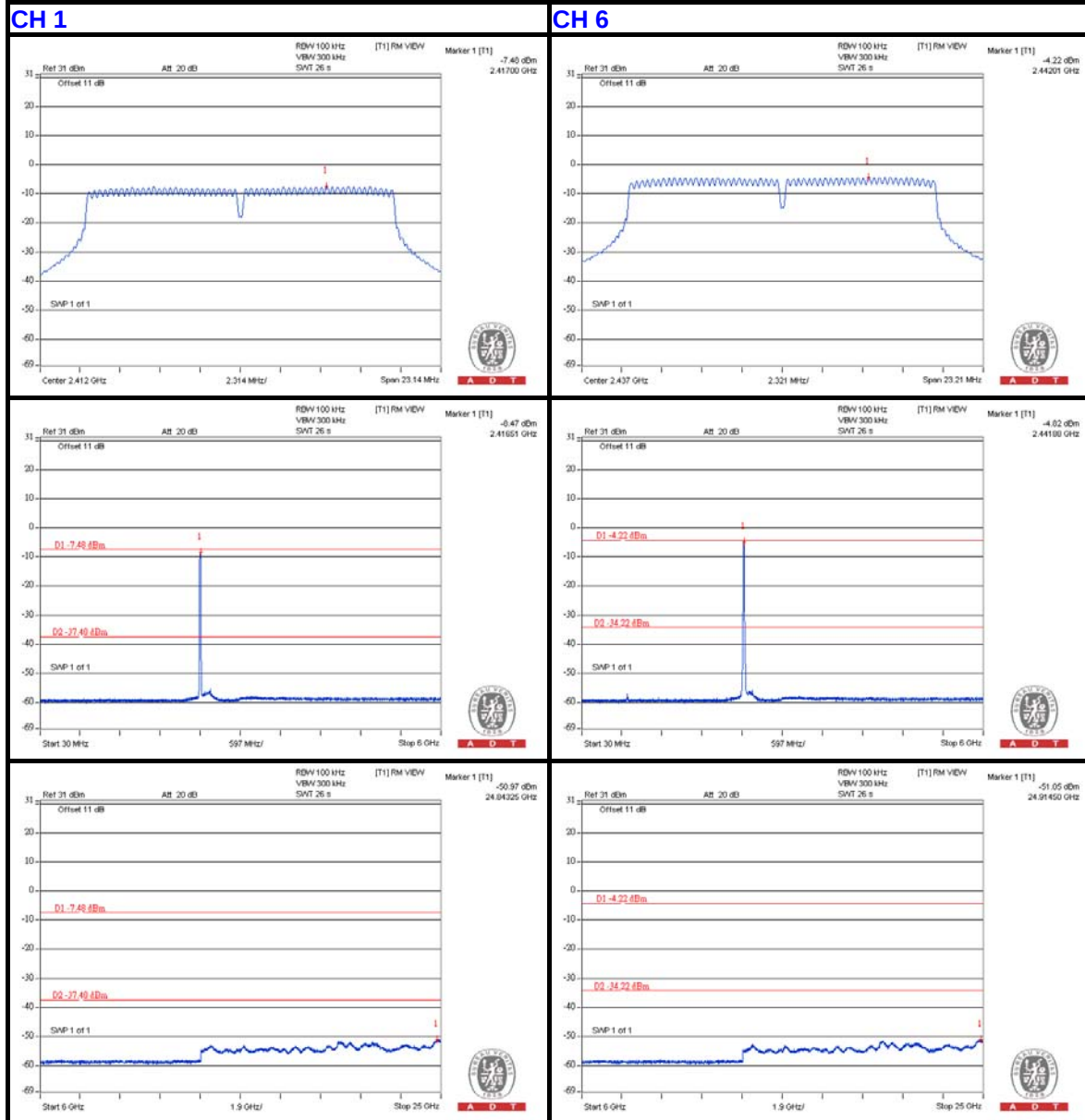
CH 6



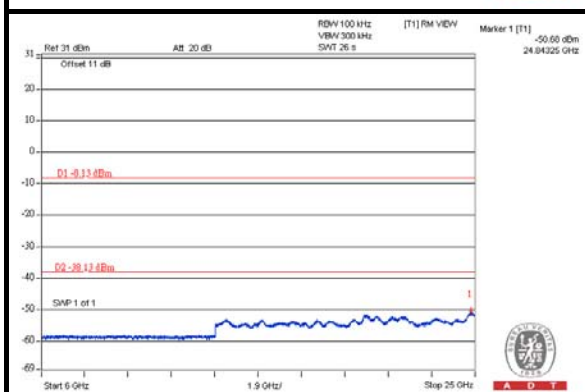
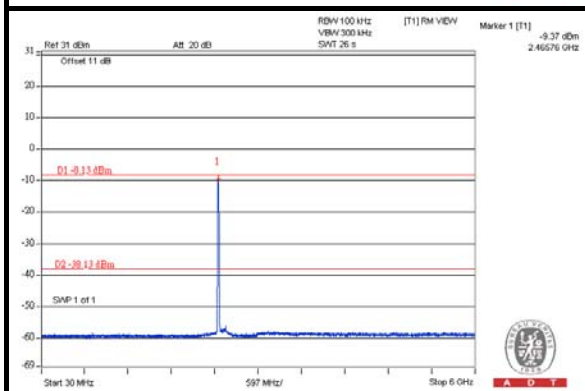
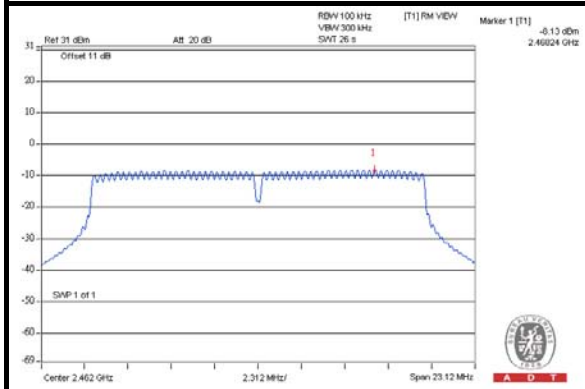
CH 11



CHAIN 1

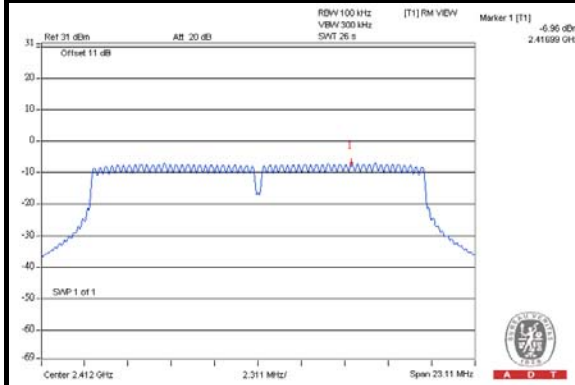


CH 11

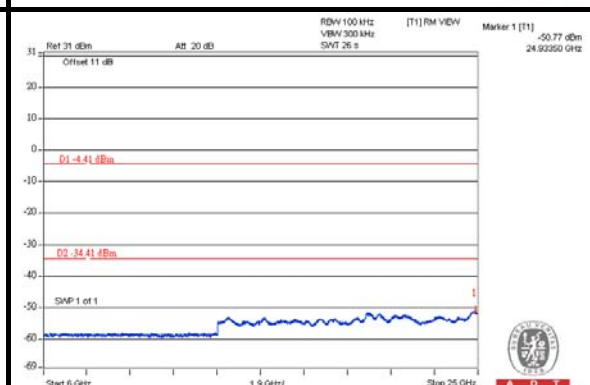
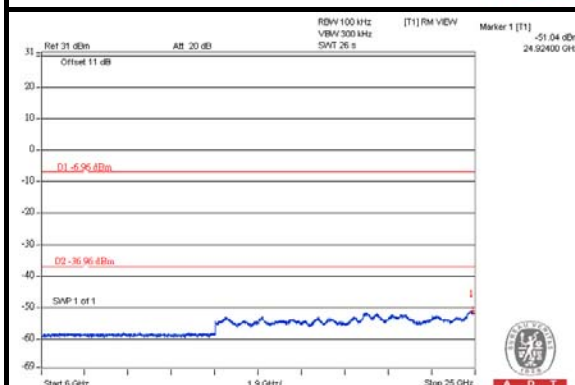
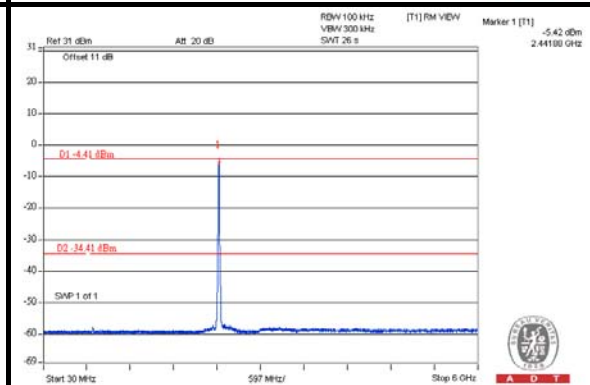
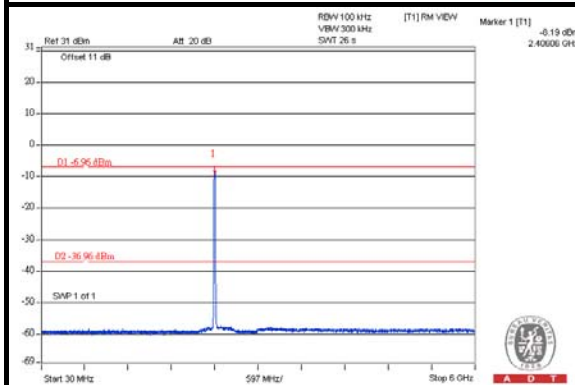
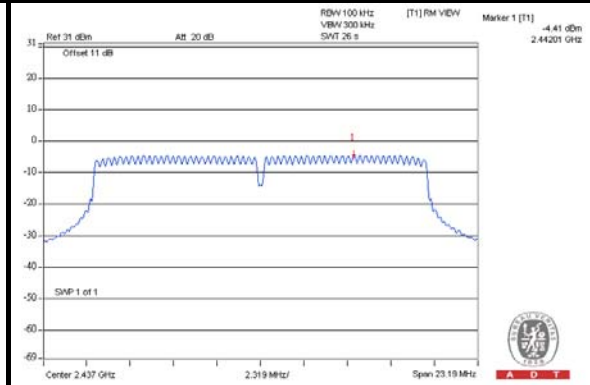


CHAIN 2

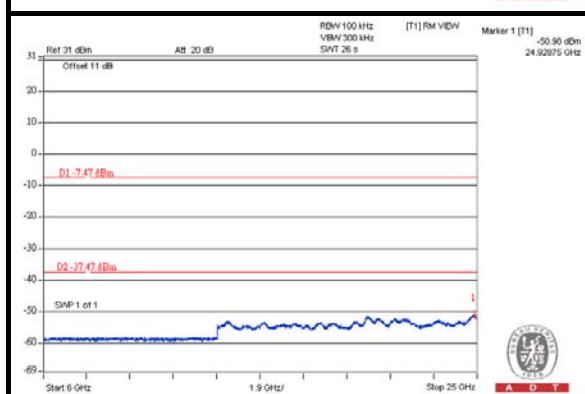
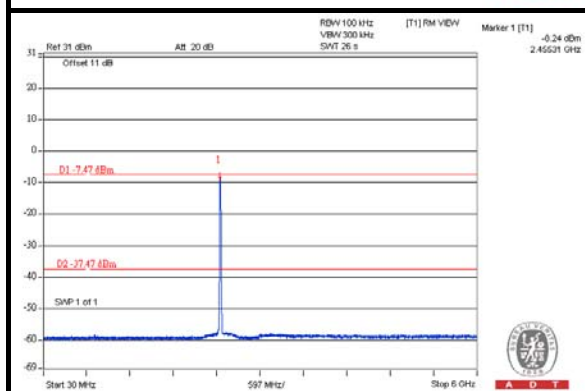
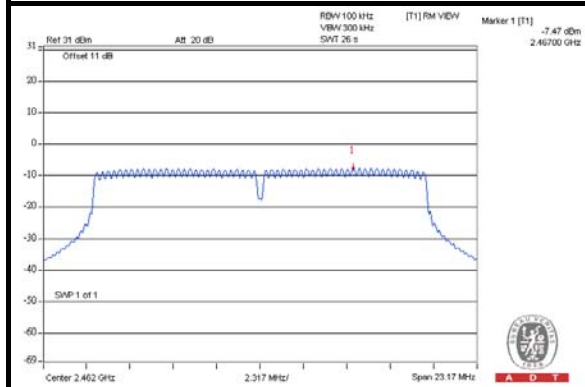
CH 1



CH 6

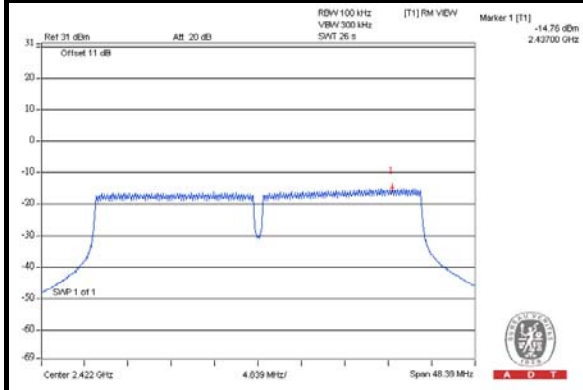


CH 11

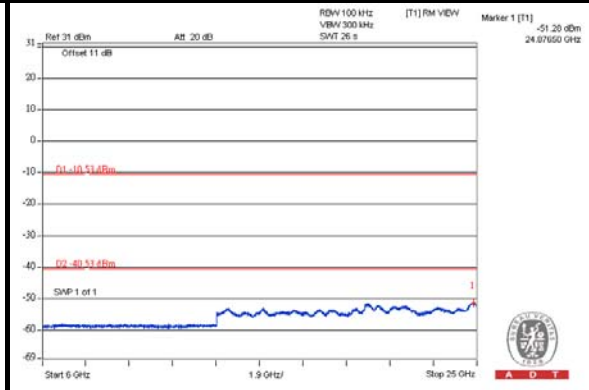
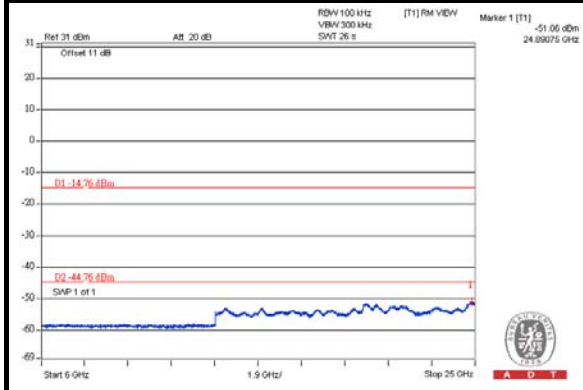
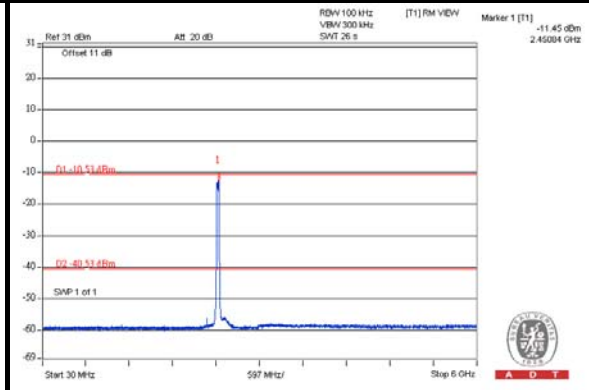
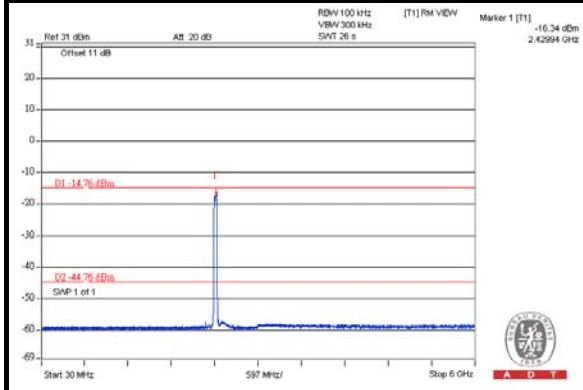
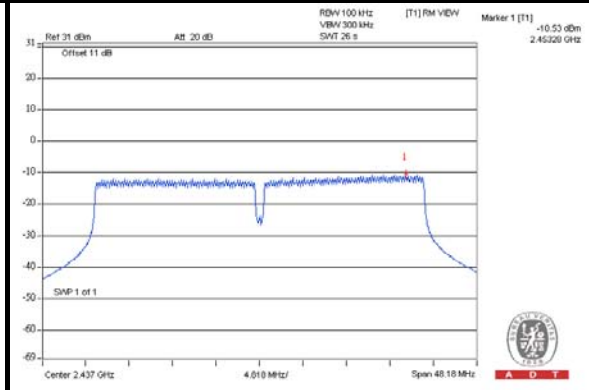


802.11n (40MHz) CHAIN 0

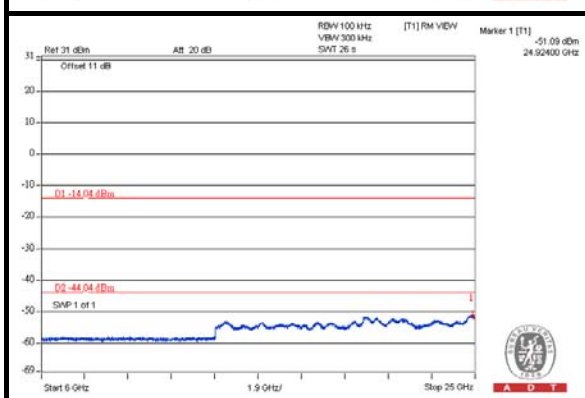
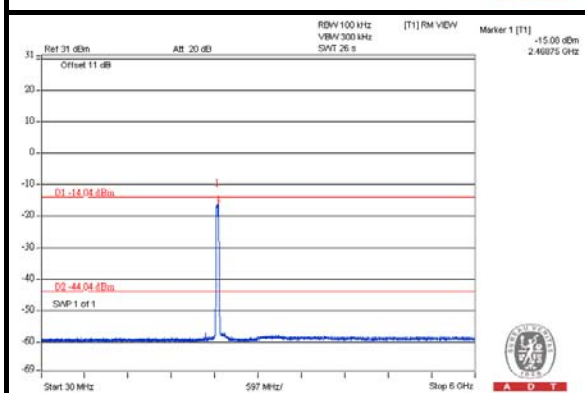
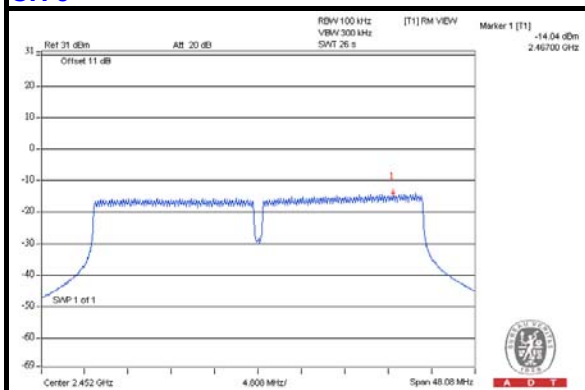
CH 3



CH 6

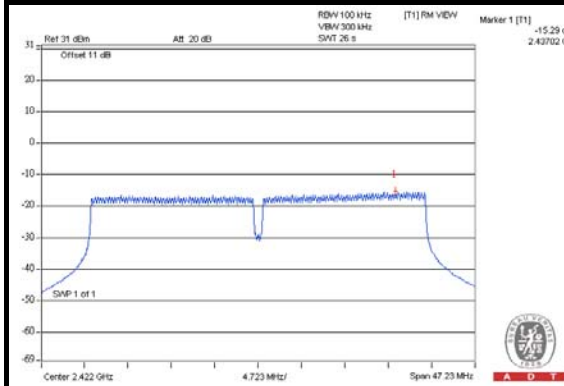


CH 9

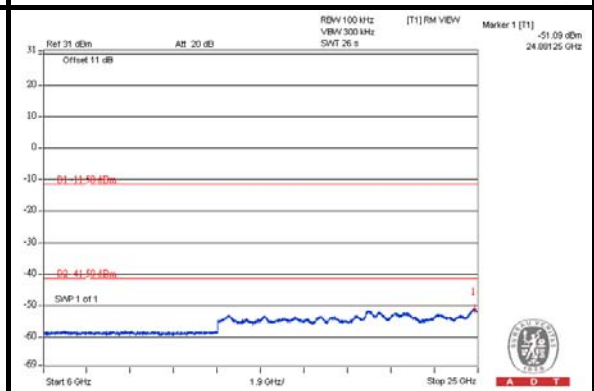
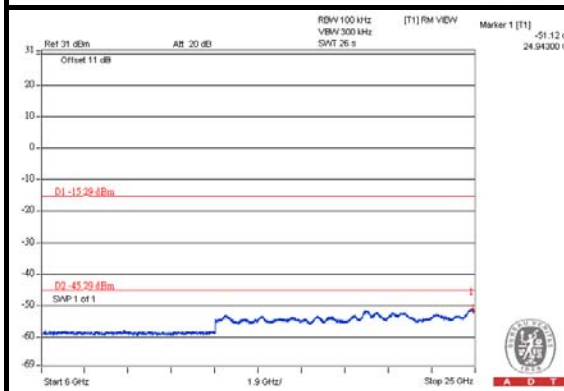
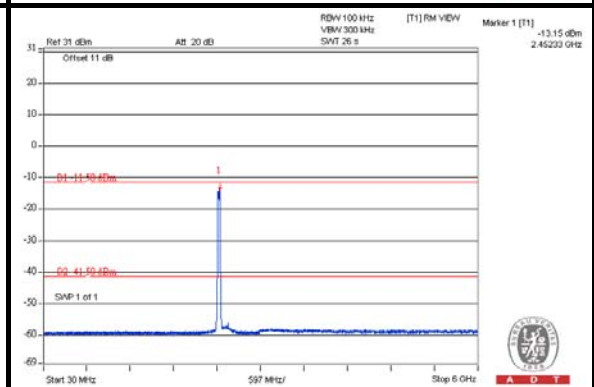
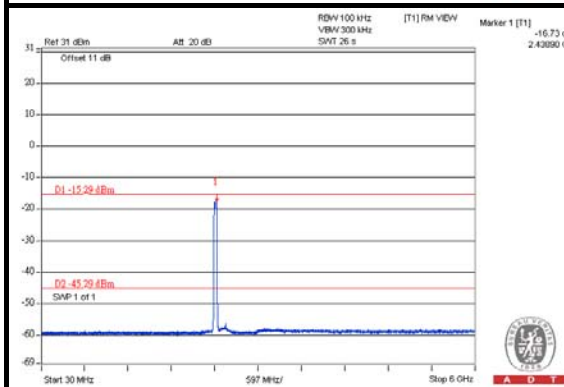
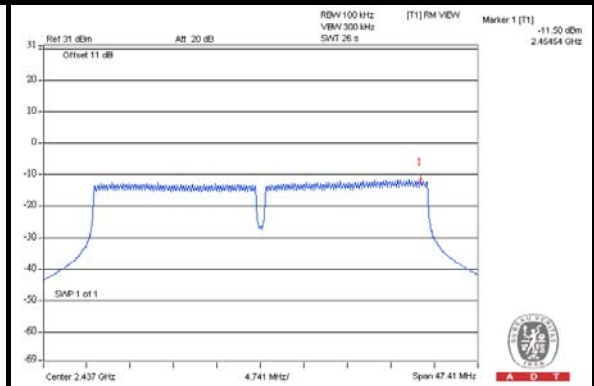


CHAIN 1

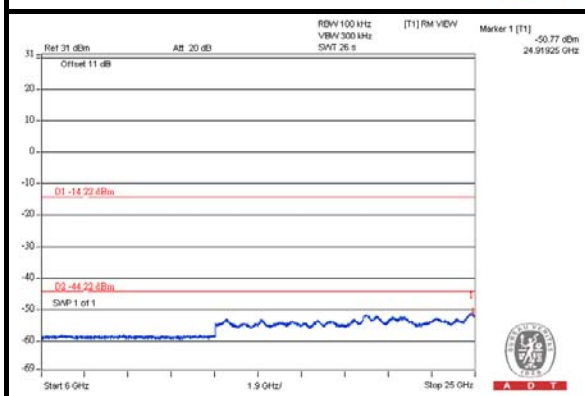
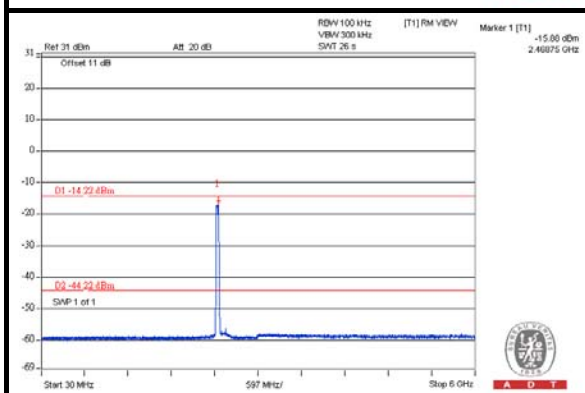
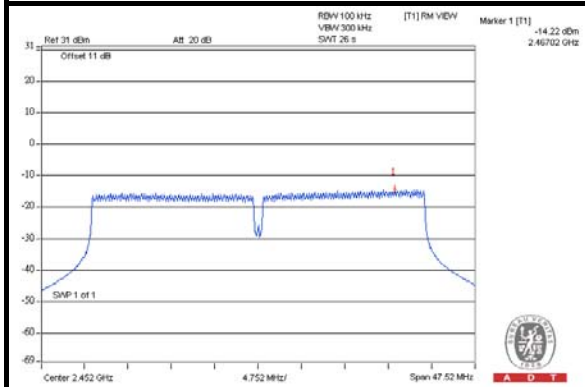
CH 3



CH 6

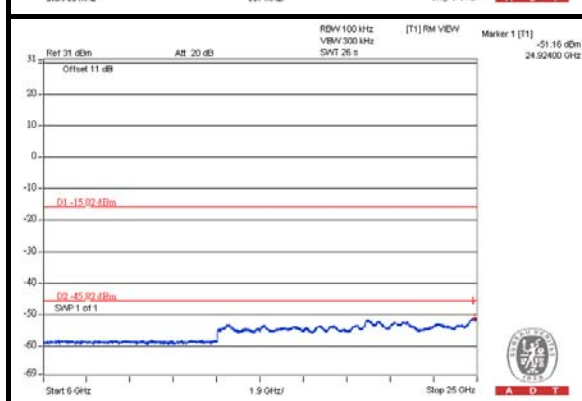
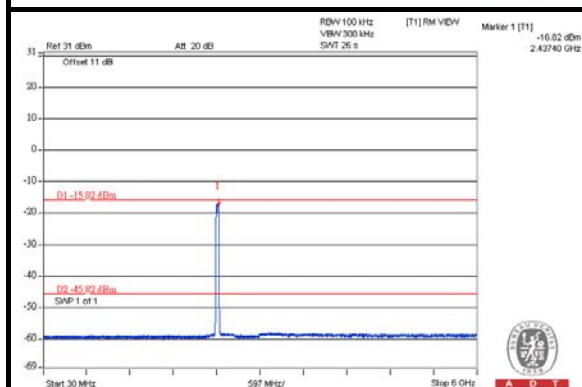
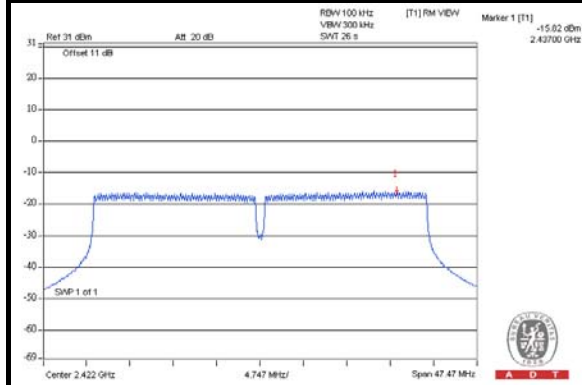


CH 9

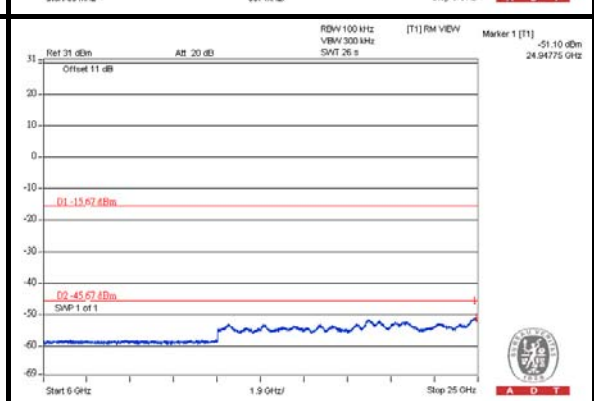
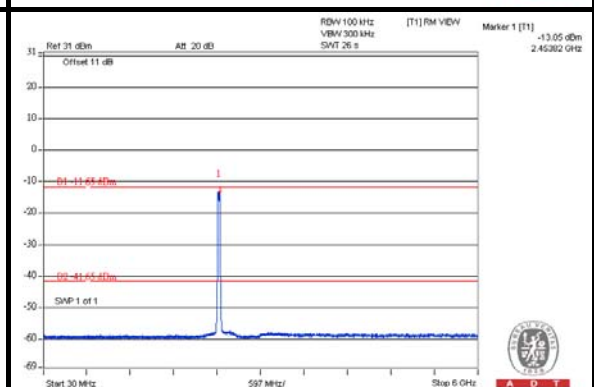
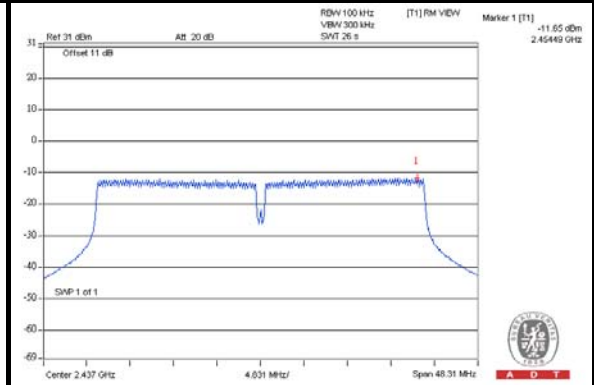


CHAIN 2

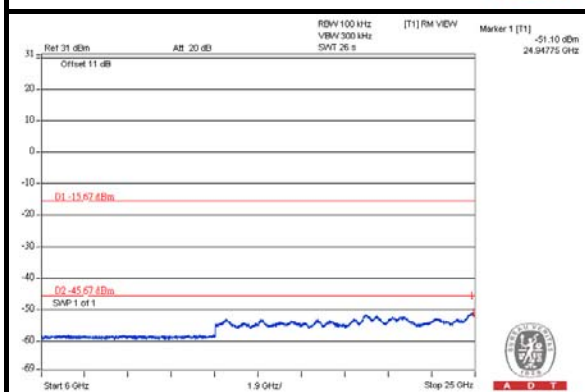
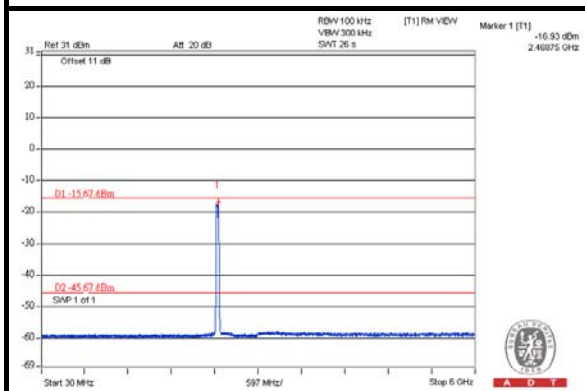
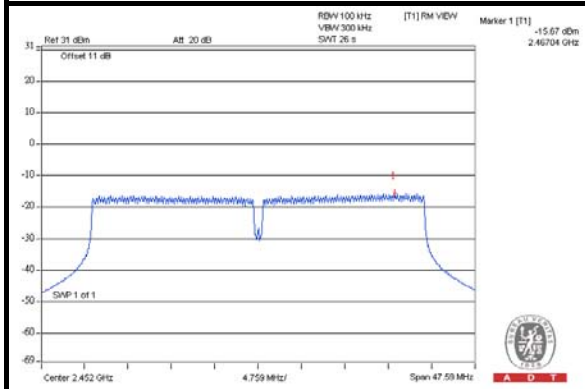
CH 3



CH 6



CH 9



5. TEST TYPES AND RESULTS (FOR 5.0GHz BAND)

5.1 RADIATED EMISSION MEASUREMENT

5.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

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. 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.

5.1.2 TEST INSTRUMENTS

Test Date: Aug. 20 ~ Sep. 11, 2012

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Aug. 06, 2012	Aug. 05, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Feb. 03, 2012	Feb. 02, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	9120D	209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Preamplifier Agilent	8447D	2944A10633	Oct. 29, 2011	Oct. 28, 2012
Preamplifier Agilent	8449B	3008A01964	Oct. 29, 2011	Oct. 28, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250723/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/ 4	Aug. 28, 2012	Aug. 27, 2013
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100	TT93021703	NA	NA
Turn Table Controller ADT.	SC100	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 29, 2011	Oct. 28, 2012
High Speed Peak Power Meter	ML2495A	0842014	Apr. 28, 2012	Apr. 27, 2013
Power Sensor	MA2411B	0738404	Apr. 28, 2012	Apr. 27, 2013

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 988962.
 5. The IC Site Registration No. is IC 7450F-3.

5.1.3 TEST PROCEDURES

Same as item 4.1.3.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation.

5.1.5 TEST SETUP

Same as item 4.1.5.

5.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6.



A D T

5.1.7 TEST RESULTS

802.11a_3TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin
TEST MODE	A		

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	#5725.00	65.0 PK	69.1	-4.1	1.00 H	56	26.20	38.80
2	#5725.00	53.4 AV	57.5	-4.1	1.00 H	56	14.60	38.80
3	*5745.00	99.1 PK			1.00 H	56	60.30	38.80
4	*5745.00	87.5 AV			1.00 H	56	48.70	38.80
5	11490.00	60.0 PK	74.0	-14.0	1.05 H	136	9.90	50.10
6	11490.00	48.4 AV	54.0	-5.6	1.05 H	136	1.70	50.10
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	#5725.00	79.9 PK	83.0	-3.1	1.34 V	346	41.10	38.80
2	#5725.00	67.8 AV	70.9	-3.1	1.34 V	346	29.00	38.80
3	*5745.00	113.0 PK			1.05 V	152	74.20	38.80
4	*5745.00	100.9 AV			1.05 V	152	62.10	38.80
5	11490.00	59.6 PK	74.0	-14.4	1.04 V	125	9.50	50.10
6	11490.00	47.5 AV	54.0	-6.5	1.04 V	125	-2.60	50.10

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. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin
TEST MODE	A		

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	*5785.00	100.5 PK			1.00 H	306	61.60	38.90
2	*5785.00	89.1 AV			1.00 H	306	50.20	38.90
3	11570.00	58.3 PK	74.0	-15.7	1.06 H	136	8.30	50.00
4	11570.00	45.6 AV	54.0	-8.4	1.06 H	136	-4.40	50.00
5	#17355.00	64.4 PK	70.5	-6.1	1.12 H	153	11.30	53.10
6	#17355.00	51.2 AV	59.1	-7.9	1.12 H	153	-1.90	53.10
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	*5785.00	115.4 PK			1.01 V	80	76.50	38.90
2	*5785.00	102.9 AV			1.01 V	80	64.00	38.90
3	11570.00	59.0 PK	74.0	-15.0	1.01 V	125	9.00	50.00
4	11570.00	46.3 AV	54.0	-7.7	1.01 V	125	-3.70	50.00
5	#17355.00	63.9 PK	85.4	-21.5	1.10 V	135	10.80	53.10
6	#17355.00	51.1 AV	72.9	-21.8	1.10 V	135	-2.00	53.10

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. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin
TEST MODE	A		

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	*5825.00	97.7 PK			1.00 H	300	58.80	38.90
2	*5825.00	87.9 AV			1.00 H	300	49.00	38.90
3	#5850.00	53.6 PK	67.7	-14.1	1.04 H	123	14.60	39.00
4	#5850.00	43.8 AV	57.9	-14.1	1.04 H	123	4.80	39.00
5	11650.00	58.8 PK	74.0	-15.2	1.10 H	132	8.80	50.00
6	11650.00	46.2 AV	54.0	-7.8	1.10 H	132	-3.80	50.00
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	*5825.00	111.7 PK			1.20 V	171	72.80	38.90
2	*5825.00	101.7 AV			1.20 V	171	62.80	38.90
3	#5850.00	67.6 PK	81.7	-14.1	1.19 V	154	28.60	39.00
4	#5850.00	57.6 AV	71.7	-14.1	1.19 V	154	18.60	39.00
5	11650.00	60.3 PK	74.0	-13.7	1.04 V	136	10.30	50.00
6	11650.00	46.9 AV	54.0	-7.1	1.04 V	136	-3.10	50.00

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.
5. “ * ”: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

802.11a_1TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Haru Yang
TEST MODE	B		

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	#5725.00	65.2 PK	68.8	-3.6	1.36 H	187	26.20	39.00
2	#5725.00	54.9 AV	58.5	-3.6	1.36 H	187	15.90	39.00
3	*5745.00	98.8 PK			1.36 H	187	59.80	39.00
4	*5745.00	88.5 AV			1.36 H	187	49.50	39.00
5	11490.00	59.7 PK	74.0	-14.3	1.00 H	284	9.40	50.30
6	11490.00	47.4 AV	54.0	-6.6	1.00 H	284	-2.90	50.30
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	#5725.00	78.8 PK	79.2	-0.4	1.02 V	76	39.80	39.00
2	#5725.00	68.1 AV	68.5	-0.4	1.02 V	76	29.10	39.00
3	*5745.00	109.2 PK			1.25 V	109	70.20	39.00
4	*5745.00	98.5 AV			1.25 V	109	59.50	39.00
5	11490.00	59.6 PK	74.0	-14.4	1.04 V	93	9.30	50.30
6	11490.00	47.7 AV	54.0	-6.3	1.04 V	93	-2.60	50.30

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. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Haru Yang
TEST MODE	B		

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	*5785.00	99.1 PK			1.22 H	360	60.00	39.10
2	*5785.00	89.9 AV			1.22 H	360	50.80	39.10
3	11570.00	58.1 PK	74.0	-15.9	1.10 H	125	7.90	50.20
4	11570.00	45.8 AV	54.0	-8.2	1.10 H	125	-4.40	50.20
5	#17355.00	64.2 PK	69.1	-4.9	1.05 H	136	10.20	54.00
6	#17355.00	51.7 AV	59.9	-8.2	1.05 H	136	-2.30	54.00
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	#5725.00	62.3 PK	80.8	-18.5	1.30 V	239	23.30	39.00
2	#5725.00	51.4 AV	69.9	-18.5	1.30 V	239	12.40	39.00
3	*5785.00	110.8 PK			1.30 V	239	71.70	39.10
4	*5785.00	99.9 AV			1.30 V	239	60.80	39.10
5	11570.00	59.7 PK	74.0	-14.3	1.00 V	98	9.50	50.20
6	11570.00	47.5 AV	54.0	-6.5	1.00 V	98	-2.70	50.20

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. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Haru Yang
TEST MODE	B		

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	*5825.00	99.2 PK			1.00 H	181	60.10	39.10
2	*5825.00	88.7 AV			1.00 H	181	49.60	39.10
3	#5850.00	65.2 PK	69.2	-4.0	1.00 H	181	26.00	39.20
4	#5850.00	54.8 AV	58.7	-3.9	1.00 H	181	15.60	39.20
5	11650.00	58.2 PK	74.0	-15.8	1.10 H	125	8.00	50.20
6	11650.00	45.4 AV	54.0	-8.6	1.10 H	125	-4.80	50.20
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	*5825.00	109.9 PK			1.01 V	265	70.80	39.10
2	*5825.00	99.2 AV			1.01 V	265	60.10	39.10
3	#5850.00	77.0 PK	79.9	-2.9	1.01 V	265	37.80	39.20
4	#5850.00	66.2 AV	69.2	-3.0	1.01 V	265	27.00	39.20
5	11650.00	58.0 PK	74.0	-16.0	1.04 V	136	7.80	50.20
6	11650.00	45.4 AV	54.0	-8.6	1.04 V	136	-4.80	50.20

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. “#”:The radiated frequency is out the restricted band.



A D T

802.11n (20MHz)_3TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin
TEST MODE	A		

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	#5725.00	65.0 PK	68.1	-3.1	1.00 H	56	26.20	38.80
2	#5725.00	53.4 AV	56.5	-3.1	1.00 H	56	14.60	38.80
3	*5745.00	98.1 PK			1.00 H	56	59.30	38.80
4	*5745.00	86.5 AV			1.00 H	56	47.70	38.80
5	11490.00	60.0 PK	74.0	-14.0	1.05 H	136	9.90	50.10
6	11490.00	48.4 AV	54.0	-5.6	1.05 H	136	-1.70	50.10
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	#5725.00	79.9 PK	83.0	-3.1	1.34 V	346	41.10	38.80
2	#5725.00	67.8 AV	70.9	-3.1	1.34 V	346	29.00	38.80
3	*5745.00	113.0 PK			1.05 V	152	74.20	38.80
4	*5745.00	100.9 AV			1.05 V	152	62.10	38.80
5	11490.00	59.6 PK	74.0	-14.4	1.04 V	125	9.50	50.10
6	11490.00	47.5 AV	54.0	-6.5	1.04 V	125	-2.60	50.10

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. "#": The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin
TEST MODE	A		

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	#5725.00	65.0 PK	69.1	-4.1	1.00 H	56	26.20	38.80
2	#5725.00	53.4 AV	57.5	-4.1	1.00 H	56	14.60	38.80
3	*5745.00	99.1 PK			1.00 H	56	60.30	38.80
4	*5745.00	87.5 AV			1.00 H	56	48.70	38.80
5	11490.00	60.0 PK	74.0	-14.0	1.05 H	136	9.90	50.10
6	11490.00	48.4 AV	54.0	-5.6	1.05 H	136	-1.70	50.10
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	*5785.00	115.4 PK			1.01 V	80	76.50	38.90
2	*5785.00	102.9 AV			1.01 V	80	64.00	38.90
3	11570.00	59.0 PK	74.0	-15.0	1.10 V	125	9.00	50.00
4	11570.00	46.3 AV	54.0	-7.7	1.10 V	125	-3.70	50.00
5	#17355.00	63.9 PK	85.4	-20.5	1.01 V	135	10.80	53.10
6	#17355.00	51.1 AV	72.9	-21.8	1.01 V	135	-2.00	53.10

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. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin
TEST MODE	A		

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	*5825.00	100.3 PK			1.00 H	305	61.40	38.90
2	*5825.00	88.7 AV			1.00 H	305	49.80	38.90
3	#5850.00	59.0 PK	70.3	-11.3	1.04 H	132	20.00	39.00
4	#5850.00	47.4 AV	58.7	-11.3	1.04 H	132	8.40	39.00
5	11650.00	59.4 PK	74.0	-14.6	1.04 H	163	9.40	50.00
6	11650.00	48.0 AV	54.0	-6.0	1.04 H	163	-2.00	50.00
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	*5825.00	114.1 PK			1.01 V	74	75.20	38.90
2	*5825.00	101.8 AV			1.01 V	74	62.90	38.90
3	#5850.00	75.3 PK	84.1	-8.8	1.04 V	213	36.30	39.00
4	#5850.00	63.0 AV	71.8	-8.8	1.04 V	213	24.00	39.00
5	11650.00	58.9 PK	74.0	-15.1	1.10 V	152	8.90	50.00
6	11650.00	46.9 AV	54.0	-7.1	1.10 V	152	-3.10	50.00

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.
5. “ * ”: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

802.11n (40MHz)_3TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin
TEST MODE	A		

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	#5725.00	62.5 PK	64.7	-2.2	1.10 H	125	23.70	38.80
2	#5725.00	50.5 AV	52.7	-2.2	1.10 H	125	11.70	38.80
3	*5755.00	94.7 PK			1.02 H	82	55.90	38.80
4	*5755.00	82.7 AV			1.02 H	82	43.90	38.80
5	11510.00	59.4 PK	74.0	-14.6	1.10 H	125	9.30	50.10
6	11510.00	47.3 AV	54.0	-6.7	1.10 H	125	-2.80	50.10
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	#5725.00	77.3 PK	79.5	-2.2	1.00 V	73	38.50	38.80
2	#5725.00	64.7 AV	66.9	-2.2	1.00 V	73	25.90	38.80
3	*5755.00	109.5 PK			1.00 V	73	70.70	38.80
4	*5755.00	96.9 AV			1.00 V	73	58.10	38.80
5	11510.00	60.2 PK	74.0	-13.8	1.10 V	125	10.10	50.10
6	11510.00	47.5 AV	54.0	-6.5	1.10 V	125	-2.60	50.10

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. "#": The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin
TEST MODE	A		

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	*5795.00	97.3 PK			1.66 H	73	58.40	38.90
2	*5795.00	85.3 AV			1.66 H	73	46.40	38.90
3	#5850.00	55.8 PK	67.3	-11.5	1.04 H	123	16.80	39.00
4	#5850.00	43.8 AV	55.3	-11.5	1.04 H	123	4.80	39.00
5	11590.00	59.4 PK	74.0	-14.6	1.10 H	125	9.40	50.00
6	11590.00	46.4 AV	54.0	-7.6	1.10 H	125	-3.60	50.00
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	*5795.00	113.4 PK			1.00 V	80	74.50	38.90
2	*5795.00	100.7 AV			1.00 V	80	61.80	38.90
3	#5850.00	67.9 PK	83.4	-15.5	1.10 V	78	28.90	39.00
4	#5850.00	55.2 AV	70.7	-15.5	1.10 V	78	16.20	39.00
5	11590.00	59.4 PK	74.0	-14.6	1.10 V	136	9.40	50.00
6	11590.00	48.1 AV	54.0	-5.9	1.10 V	136	-1.90	50.00

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.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11a_3TX

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin
TEST MODE	A		

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	99.89	33.3 QP	43.5	-10.2	1.49 H	42	23.90	9.40
2	166.00	38.1 QP	43.5	-5.4	1.49 H	15	24.30	13.80
3	199.05	35.5 QP	43.5	-8.0	1.00 H	196	24.40	11.10
4	298.21	44.8 QP	46.0	-1.2	1.00 H	158	29.90	14.90
5	667.63	37.1 QP	46.0	-8.9	1.00 H	69	14.40	22.70
6	700.68	41.5 QP	46.0	-4.5	1.00 H	183	18.50	23.00
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	99.89	31.6 QP	43.5	-11.9	1.00 V	54	22.20	9.40
2	300.16	37.8 QP	46.0	-8.2	1.49 V	108	22.80	15.00
3	335.15	32.5 QP	46.0	-13.5	1.49 V	168	16.60	15.90
4	663.74	33.9 QP	46.0	-12.1	1.00 V	65	11.20	22.70
5	696.79	36.8 QP	46.0	-9.2	1.00 V	106	13.80	23.00
6	900.94	37.6 QP	46.0	-8.4	1.49 V	93	10.80	26.80

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.

5.2 CONDUCTED EMISSION MEASUREMENT

5.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

5.2.2 TEST INSTRUMENTS

Same as item 4.2.2.

5.2.3 TEST PROCEDURES

Same as item 4.2.3.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

5.2.5 TEST SETUP

Same as item 4.2.5.

5.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

5.2.7 TEST RESULTS

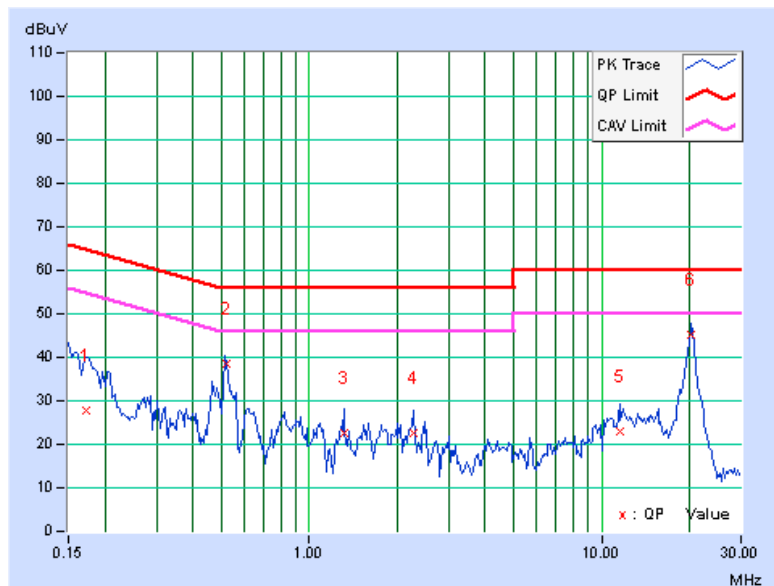
CONDUCTED WORST-CASE DATA : 802.11a

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	0.15	27.46	14.03	27.61	14.18	64.79	54.79	-37.18	-40.61
2	0.51837	0.17	38.19	36.76	38.36	36.93	56.00	46.00	-17.64	-9.07
3	1.31250	0.21	22.21	17.51	22.42	17.72	56.00	46.00	-33.58	-28.28
4	2.26563	0.27	22.39	16.09	22.66	16.36	56.00	46.00	-33.34	-29.64
5	11.54688	0.46	22.43	15.82	22.89	16.28	60.00	50.00	-37.11	-33.72
6	20.23047	0.63	44.40	37.45	45.03	38.08	60.00	50.00	-14.97	-11.92

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

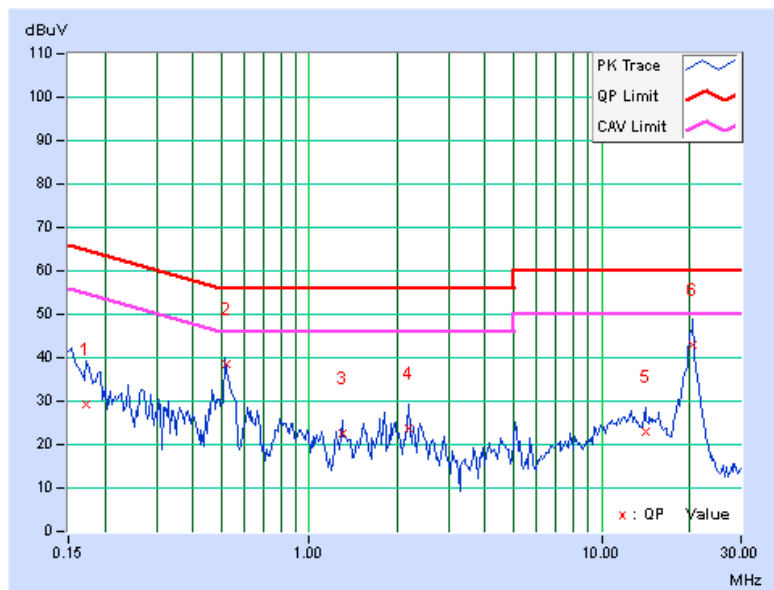


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	0.13	29.15	14.79	29.28	14.92	64.79	54.79	-35.51	-39.87
2	0.51838	0.17	38.51	36.88	38.68	37.05	56.00	46.00	-17.32	-8.95
3	1.29297	0.21	22.36	18.20	22.57	18.41	56.00	46.00	-33.43	-27.59
4	2.20313	0.27	23.28	18.17	23.55	18.44	56.00	46.00	-32.45	-27.56
5	14.08984	0.58	22.39	15.99	22.97	16.57	60.00	50.00	-37.03	-33.43
6	20.51953	0.71	42.15	37.03	42.86	37.74	60.00	50.00	-17.14	-12.26

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

5.3.2 TEST SETUP

Same as item 4.3.2.

5.3.3 TEST INSTRUMENTS

Refer to section 4.3.3 to get information of above instrument.

5.3.4 TEST PROCEDURE

Same as item 4.3.4.

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

Same as item 4.3.6.

5.3.7 TEST RESULTS

802.11a

1TX

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.56	0.5	PASS
157	5785	16.56	0.5	PASS
165	5825	16.57	0.5	PASS

3TX

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.59	16.57	16.61	0.5	PASS
157	5785	16.58	16.62	16.57	0.5	PASS
165	5825	16.57	16.56	16.60	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.77	17.79	17.80	0.5	PASS
157	5785	17.76	17.73	17.74	0.5	PASS
165	5825	17.72	17.84	17.69	0.5	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	36.62	36.59	36.58	0.5	PASS
159	5795	36.59	36.58	36.60	0.5	PASS

5.4 CONDUCTED OUTPUT POWER

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 5725 –5850 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

5.4.2 TEST SETUP

Same as Item 4.4.2.

5.4.3 INSTRUMENTS

Refer to section 5.1.2 to get information of above instrument.

5.4.4 TEST PROCEDURES

Same as Item 4.4.4.

5.4.5 DEVIATION FROM TEST STANDARD

No deviation.

5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

5.4.7 TEST RESULTS

802.11a

1TX

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	LIMIT (dBm)	PASS/FAIL
149	5745	49.20	16.92	30	PASS
157	5785	68.55	18.36	30	PASS
165	5825	76.21	18.82	30	PASS

3TX

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	16.61	15.83	16.19	125.69	20.99	30	PASS
157	5785	17.13	16.69	16.51	143.08	21.56	30	PASS
165	5825	17.12	16.40	16.86	143.70	21.57	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	16.11	15.58	15.45	112.05	20.49	30	PASS
157	5785	16.68	16.67	16.51	137.78	21.39	30	PASS
165	5825	17.18	16.29	16.14	135.91	21.33	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
151	5755	13.97	13.04	13.66	68.31	18.34	30	PASS
159	5795	17.13	15.79	15.36	123.93	20.93	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST SETUP

Same as item 4.5.2.

5.5.3 TEST INSTRUMENTS

Refer to section 4.5.3 to get information of above instrument.

5.5.4 TEST PROCEDURE.

Same as item 4.5.4.

5.5.5 DEVIATION FROM TEST STANDARD

No deviation.

5.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.

5.5.7 TEST RESULTS

802.11a

1TX

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
149	5745	-9.08	8	PASS
157	5785	-8.84	8	PASS
165	5825	-8.22	8	PASS

3TX

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-9.52	4.77	-4.75	6.23	PASS
	157	5785	-9.27	4.77	-4.50	6.23	PASS
	165	5825	-9.02	4.77	-4.25	6.23	PASS
1	149	5745	-8.76	4.77	-3.99	6.23	PASS
	157	5785	-9.19	4.77	-4.42	6.23	PASS
	165	5825	-10.05	4.77	-5.28	6.23	PASS
2	149	5745	-10.06	4.77	-5.29	6.23	PASS
	157	5785	-7.20	4.77	-2.43	6.23	PASS
	165	5825	-9.83	4.77	-5.06	6.23	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(3) = 7.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8 - (7.77 - 6) = 6.23\text{dBm}$.

802.11n (20MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-9.01	4.77	-4.24	6.23	PASS
	157	5785	-8.74	4.77	-3.97	6.23	PASS
	165	5825	-9.40	4.77	-4.63	6.23	PASS
1	149	5745	-10.52	4.77	-5.75	6.23	PASS
	157	5785	-10.72	4.77	-5.95	6.23	PASS
	165	5825	-9.39	4.77	-4.62	6.23	PASS
2	149	5745	-9.26	4.77	-4.49	6.23	PASS
	157	5785	-9.56	4.77	-4.79	6.23	PASS
	165	5825	-9.71	4.77	-4.94	6.23	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(3) = 7.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8 - (7.77 - 6) = 6.23\text{dBm}$.



A D T

802.11n (40MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-14.54	4.77	-9.77	6.23	PASS
	159	5795	-11.35	4.77	-6.58	6.23	PASS
1	151	5755	-14.87	4.77	-10.10	6.23	PASS
	159	5795	-12.54	4.77	-7.77	6.23	PASS
2	151	5755	-15.21	4.77	-10.44	6.23	PASS
	159	5795	-13.68	4.77	-8.91	6.23	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(3) = 7.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(7.77-6) = 6.23\text{dBm}$.

5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.6.2 TEST SETUP

Same as Item 4.6.2

5.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.6.4 TEST PROCEDURE

Same as Item 4.6.4

5.6.5 DEVIATION FROM TEST STANDARD

No deviation.

5.6.6 EUT OPERATING CONDITION

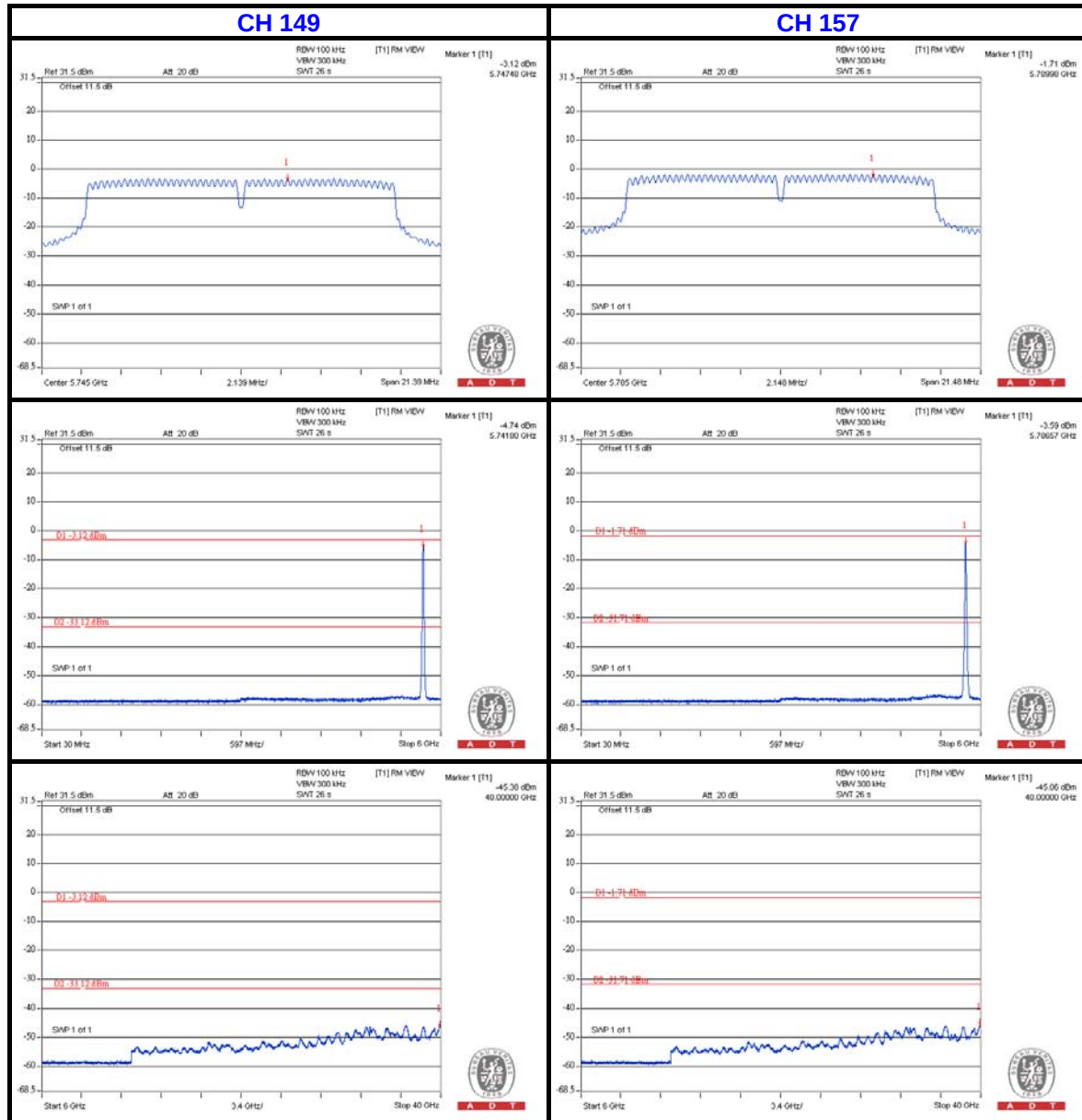
Same as Item 4.3.6

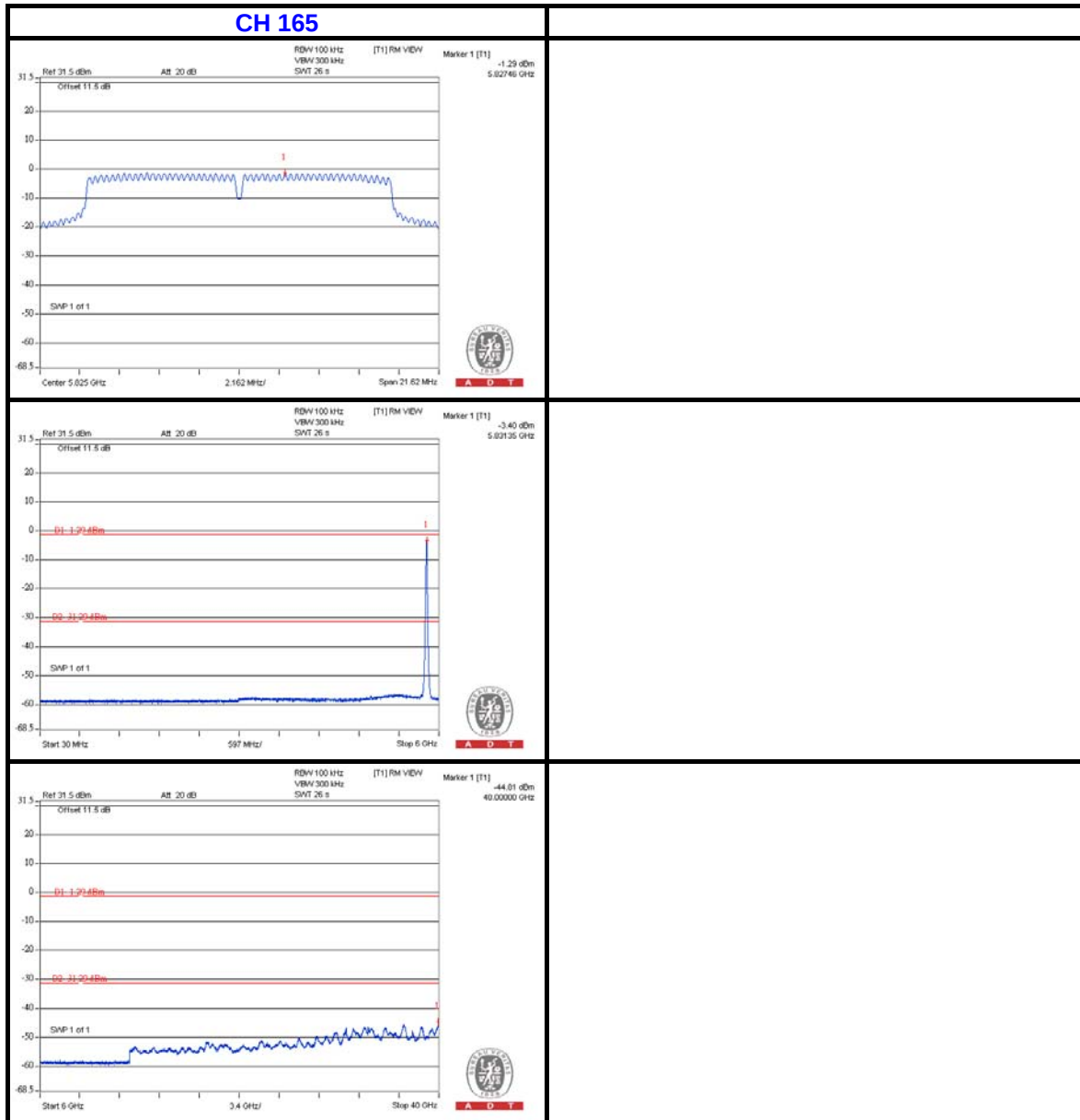
5.6.7 TEST RESULTS

The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit. Only worst data of each operating mode is presented.

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11a_1TX

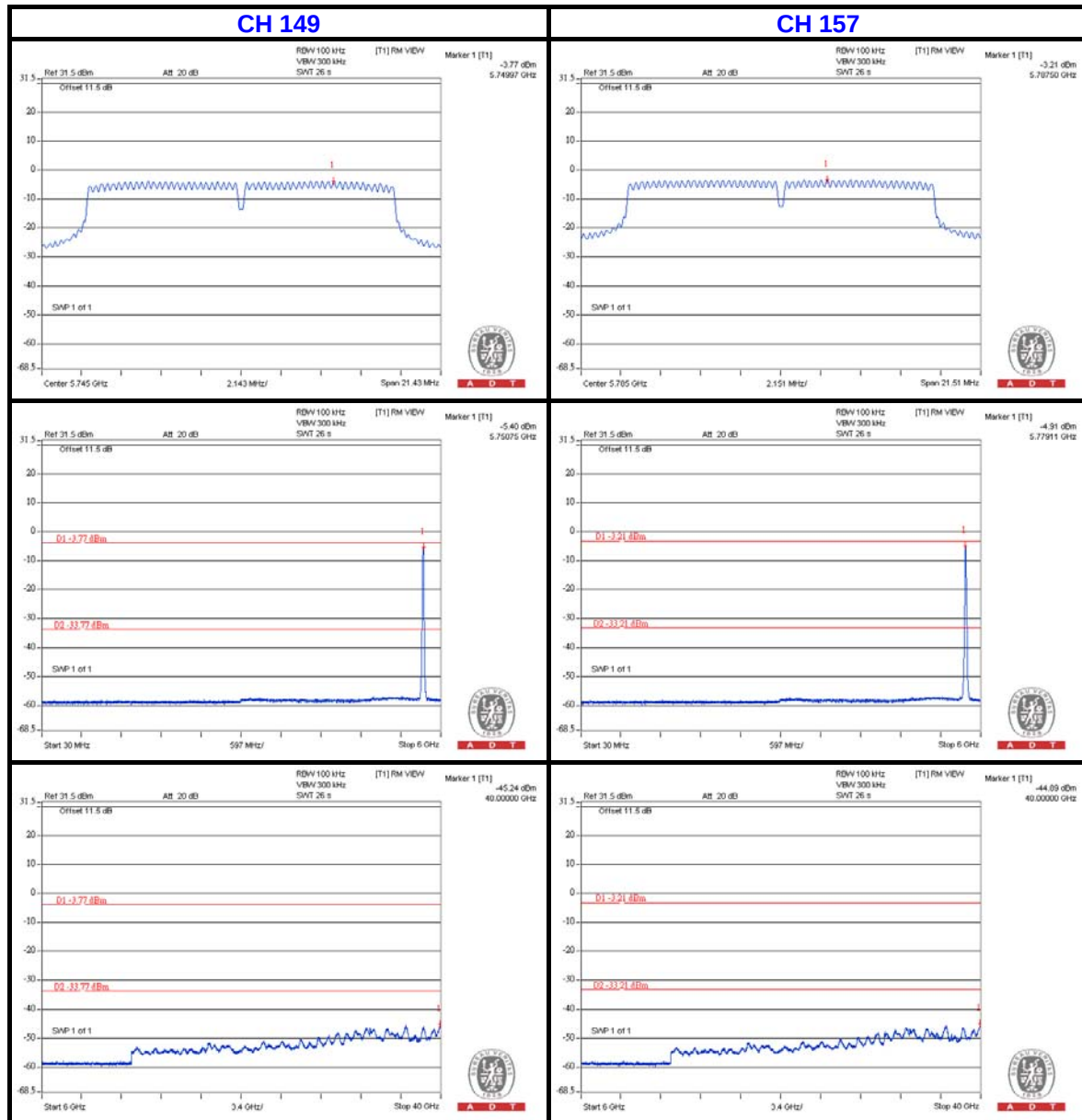


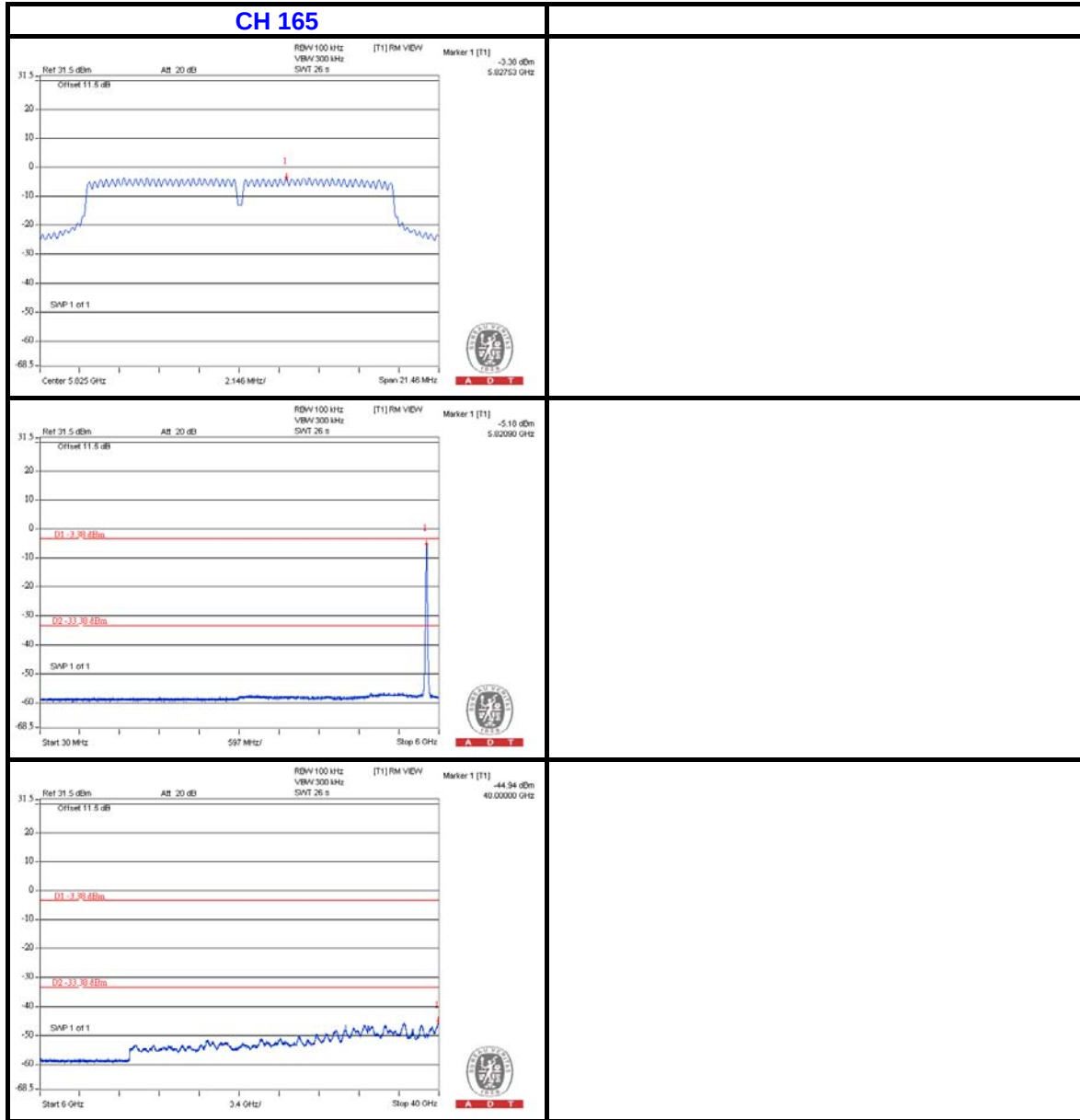




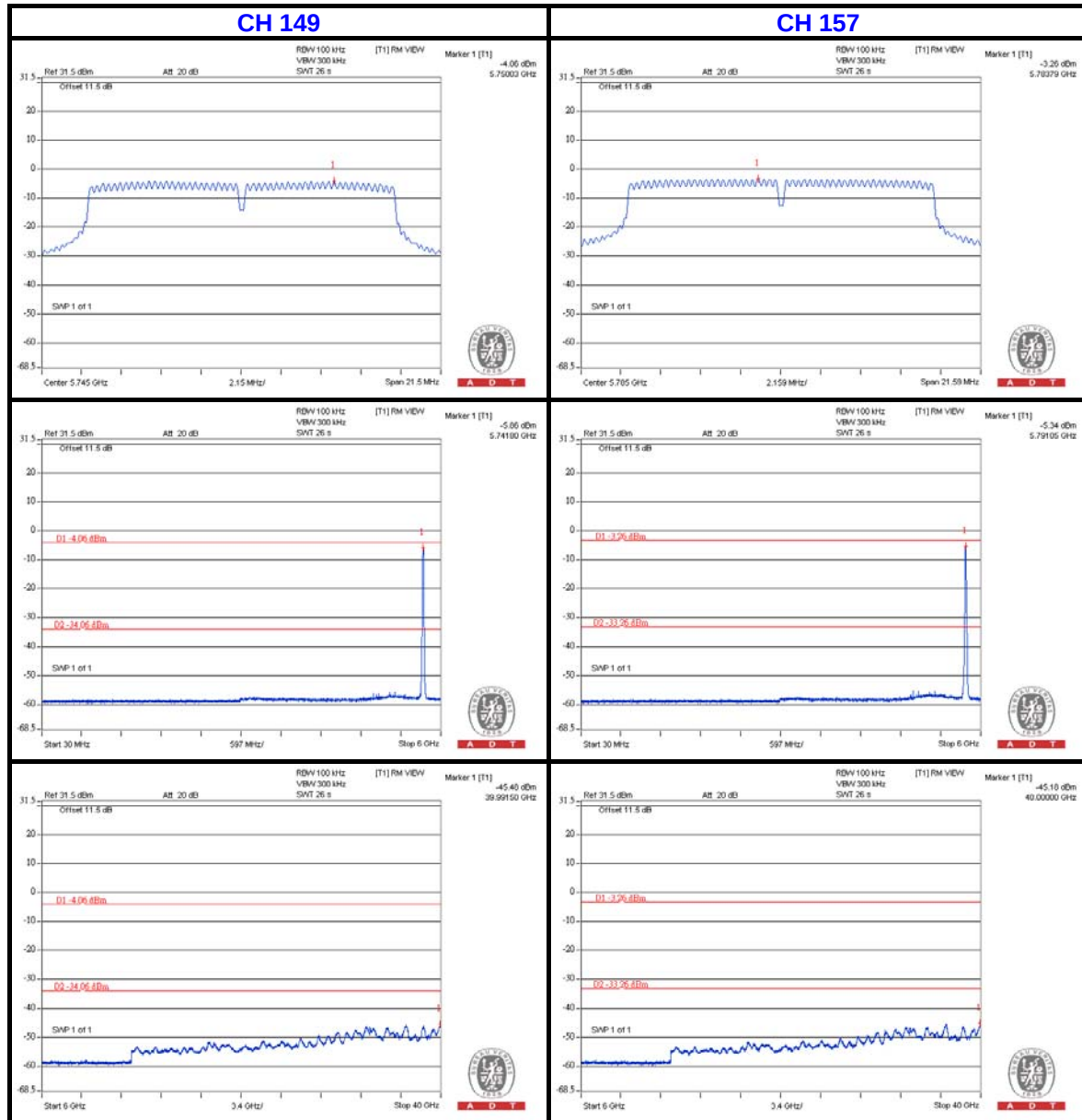
A D T

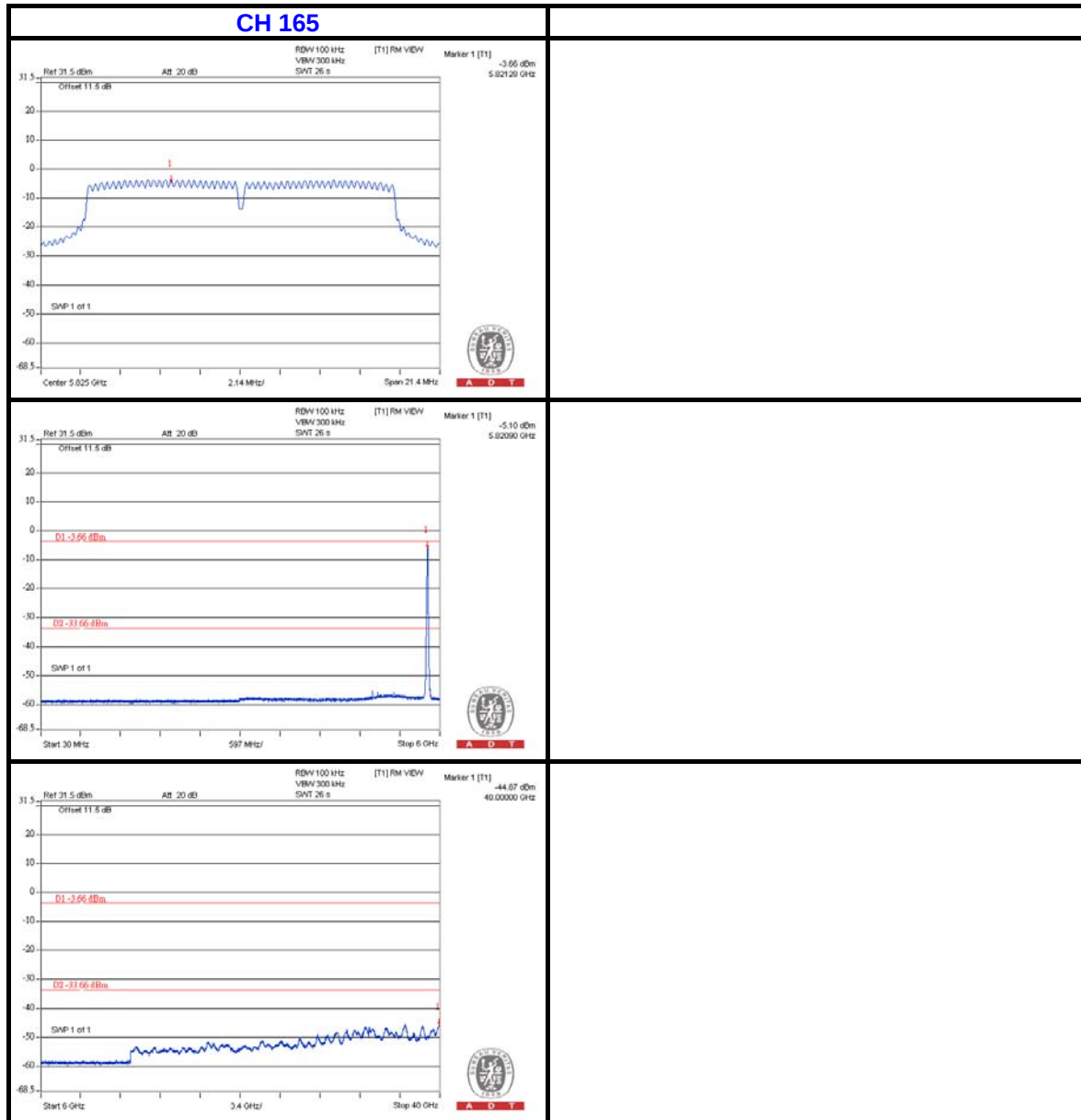
802.11a_3TX
CHAIN 0



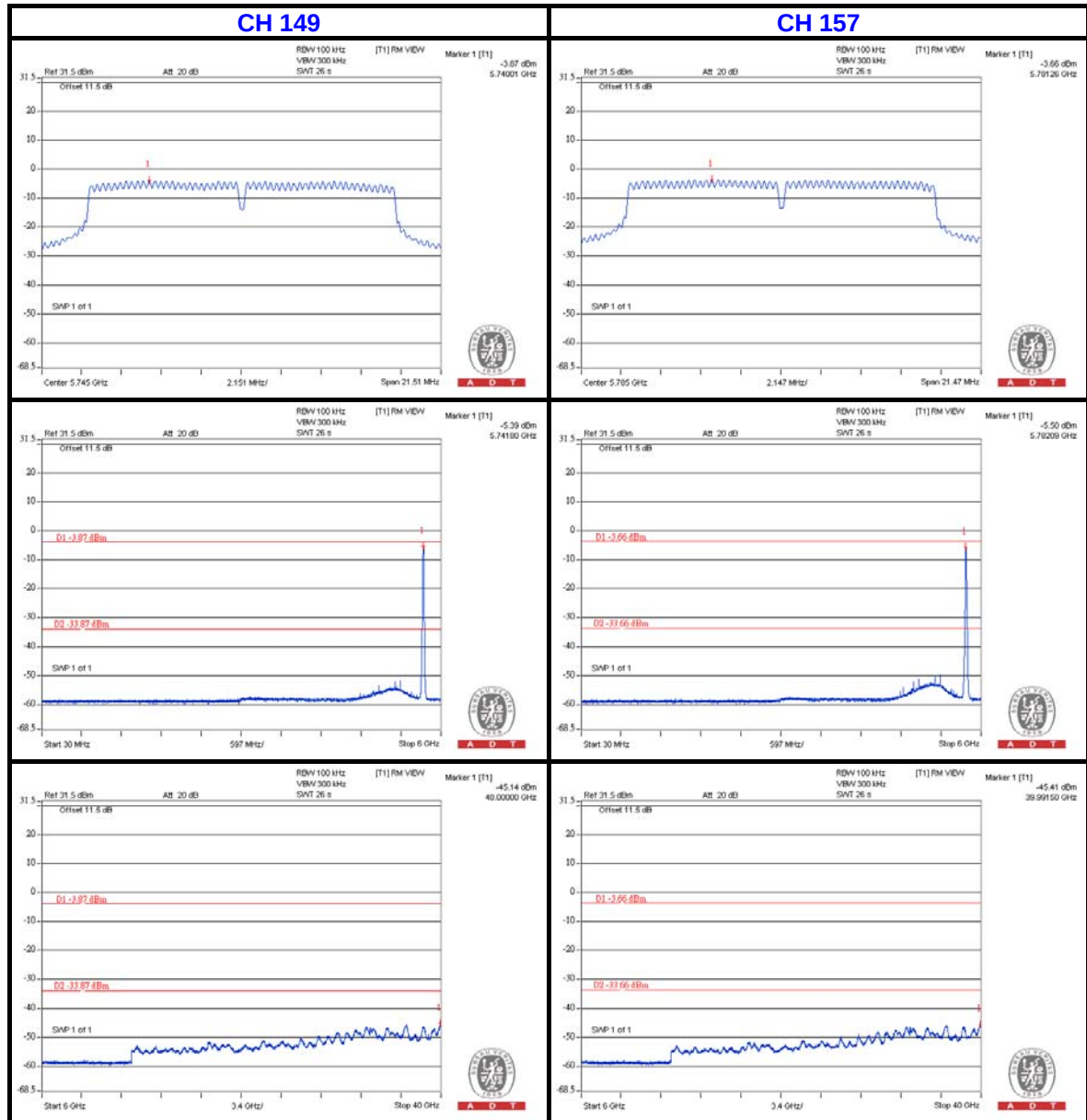


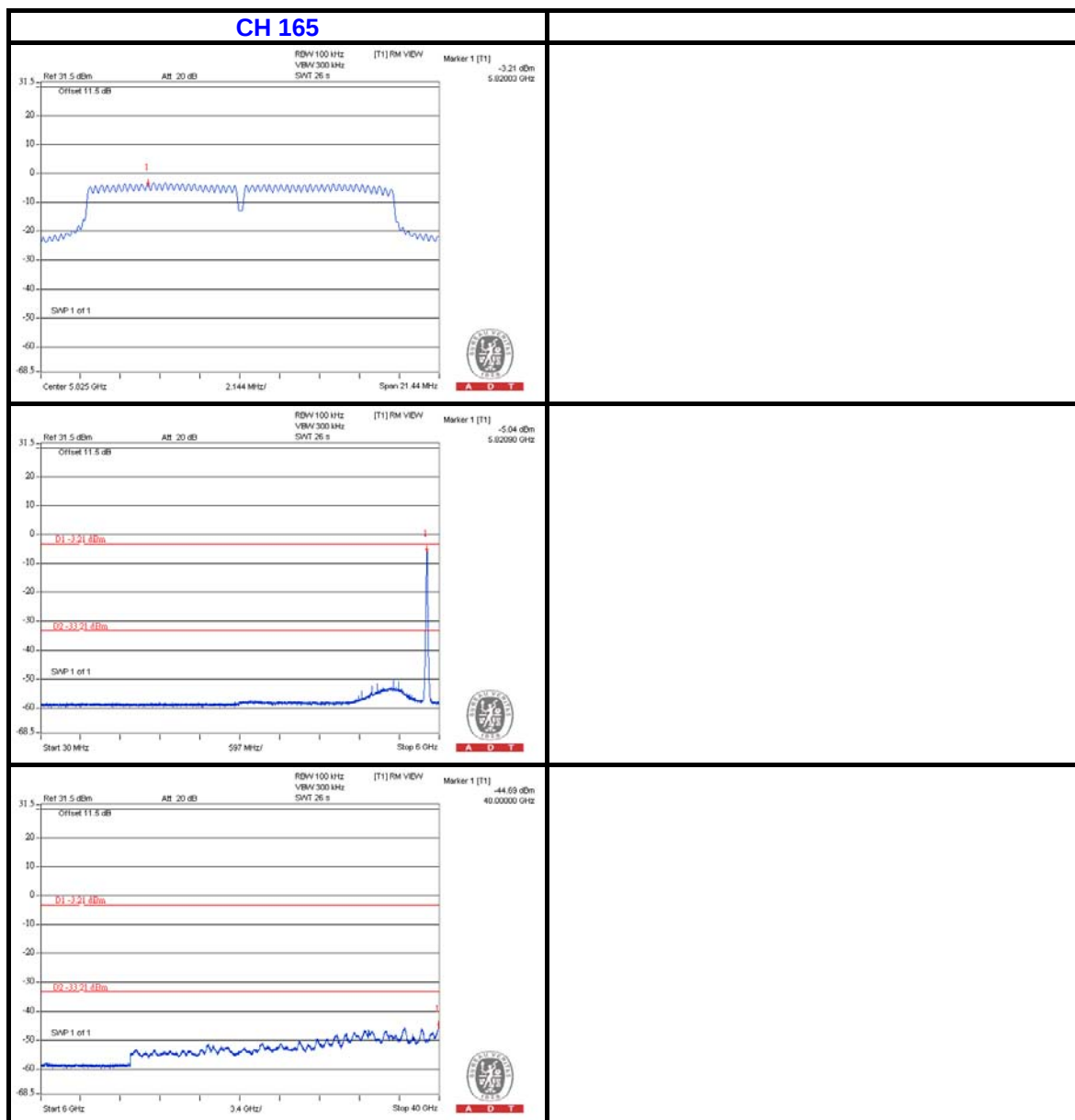
CHAIN 1





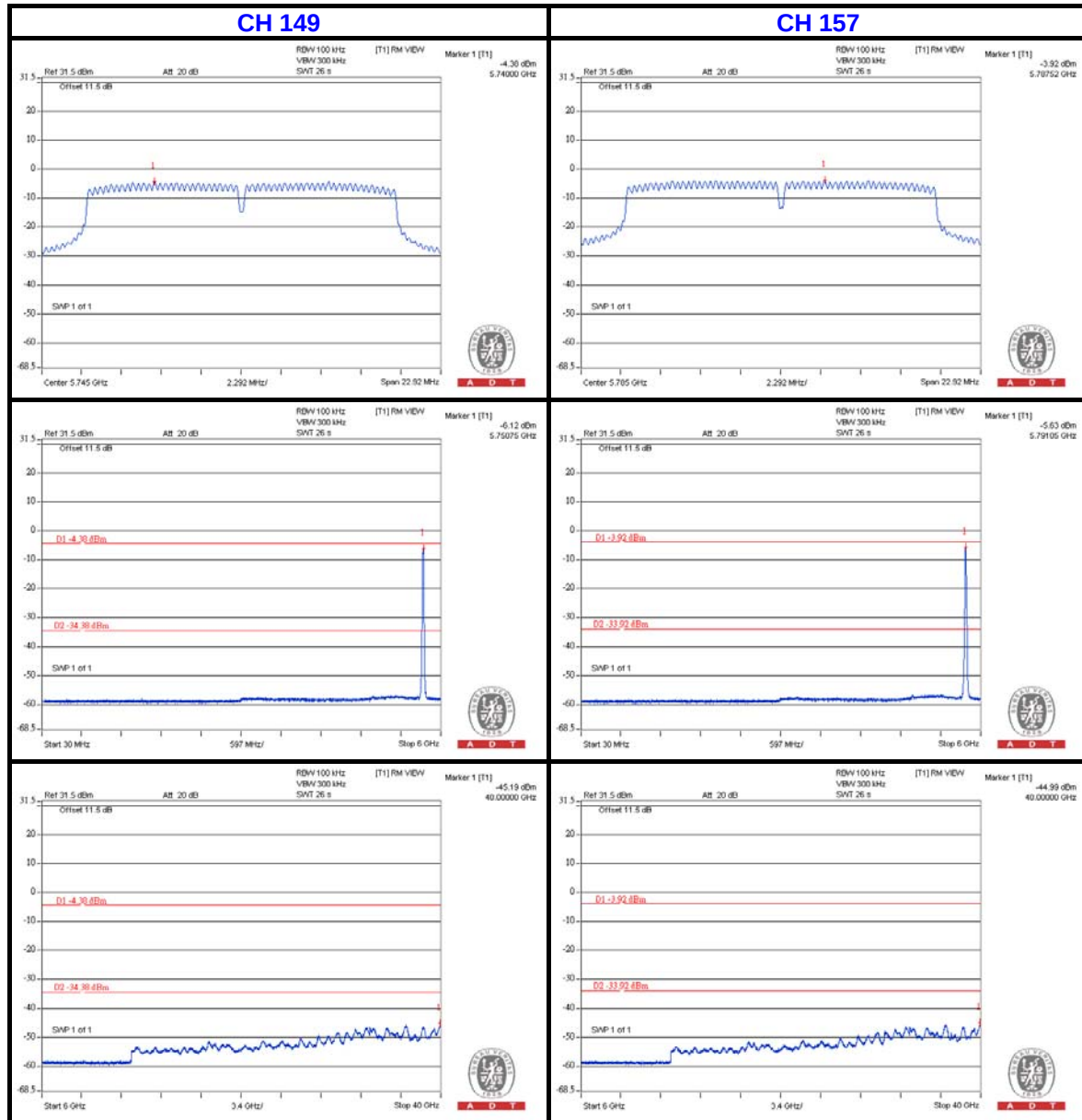
CHAIN 2

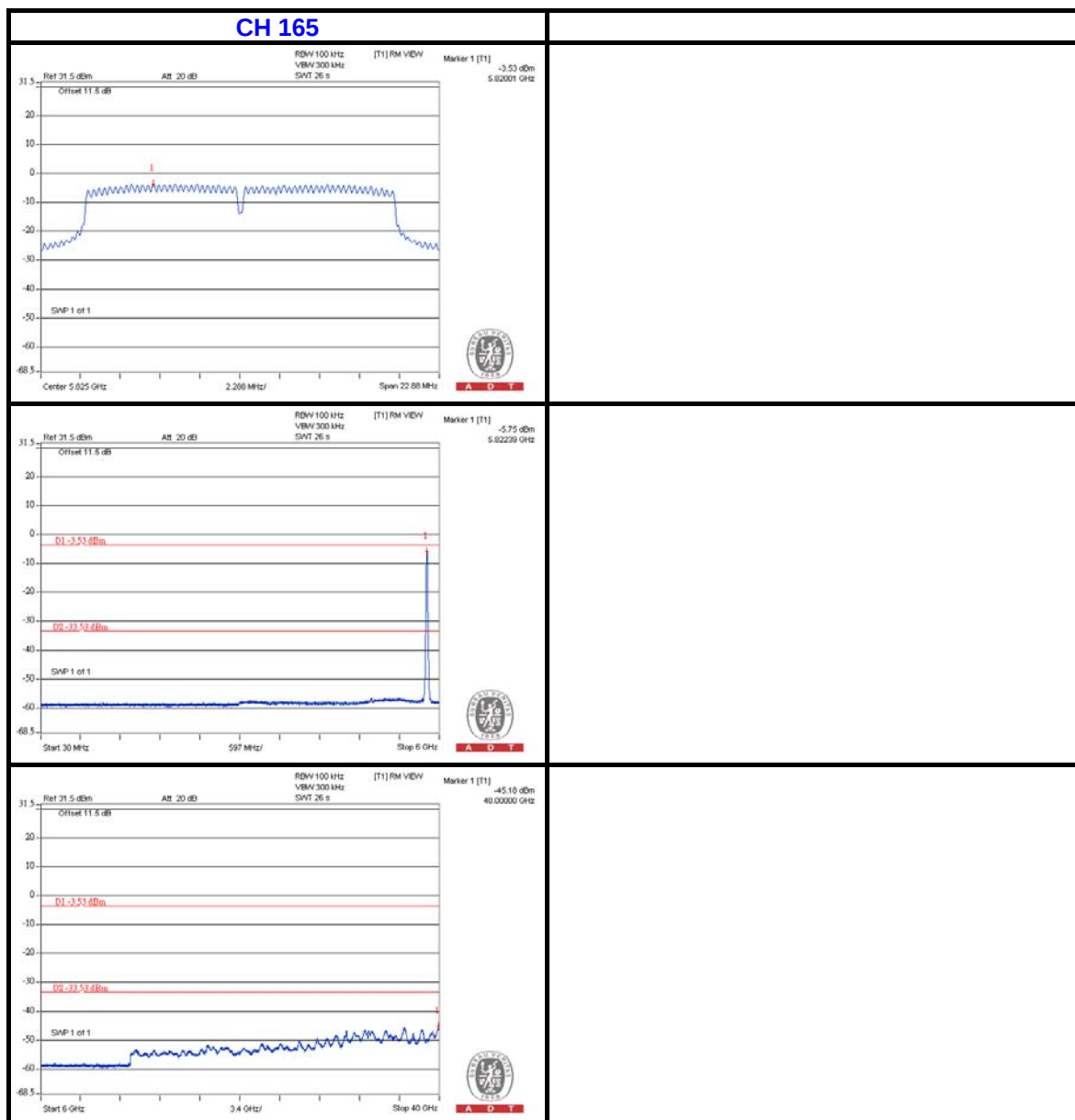




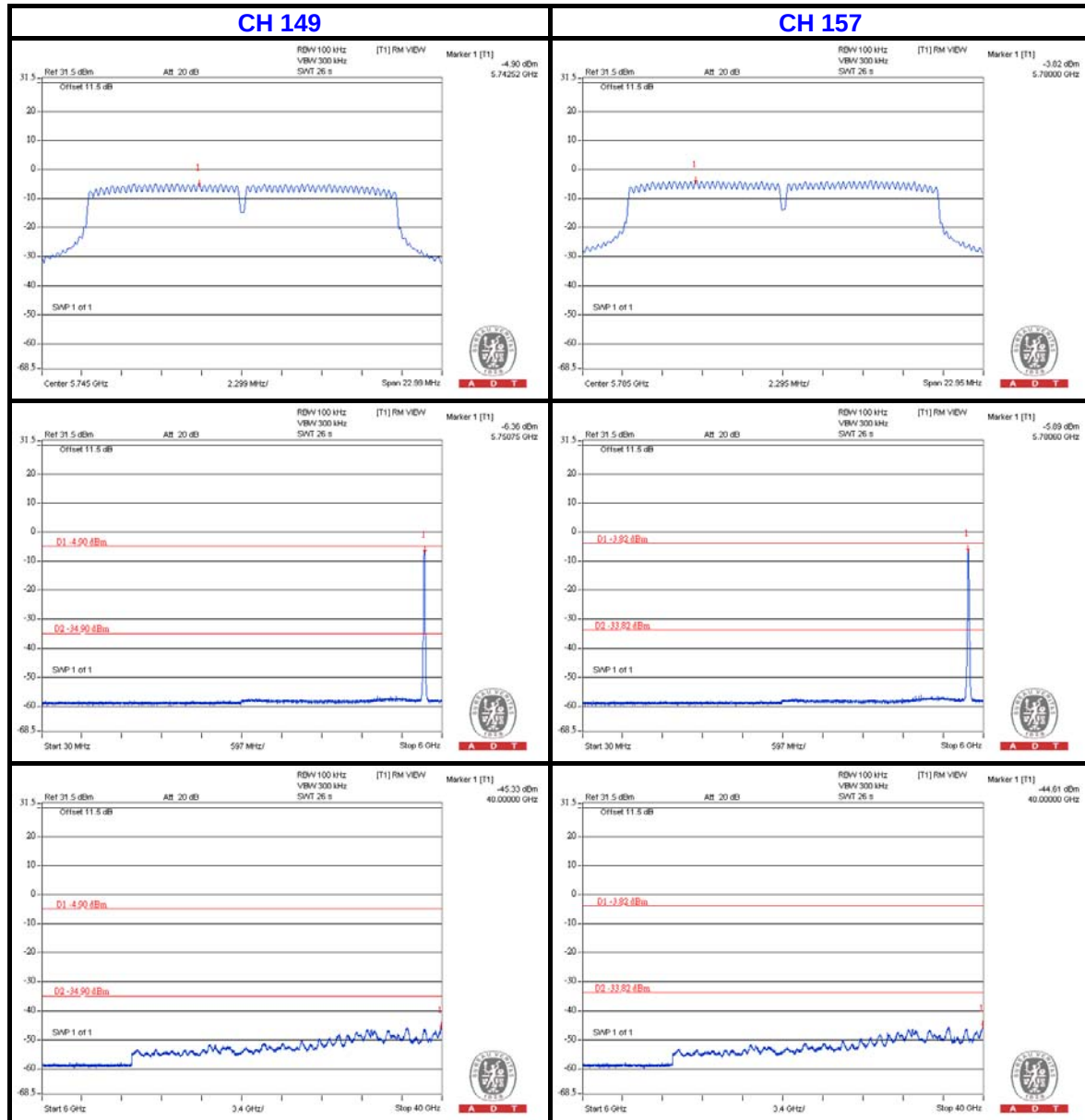
802.11n (20MHz)

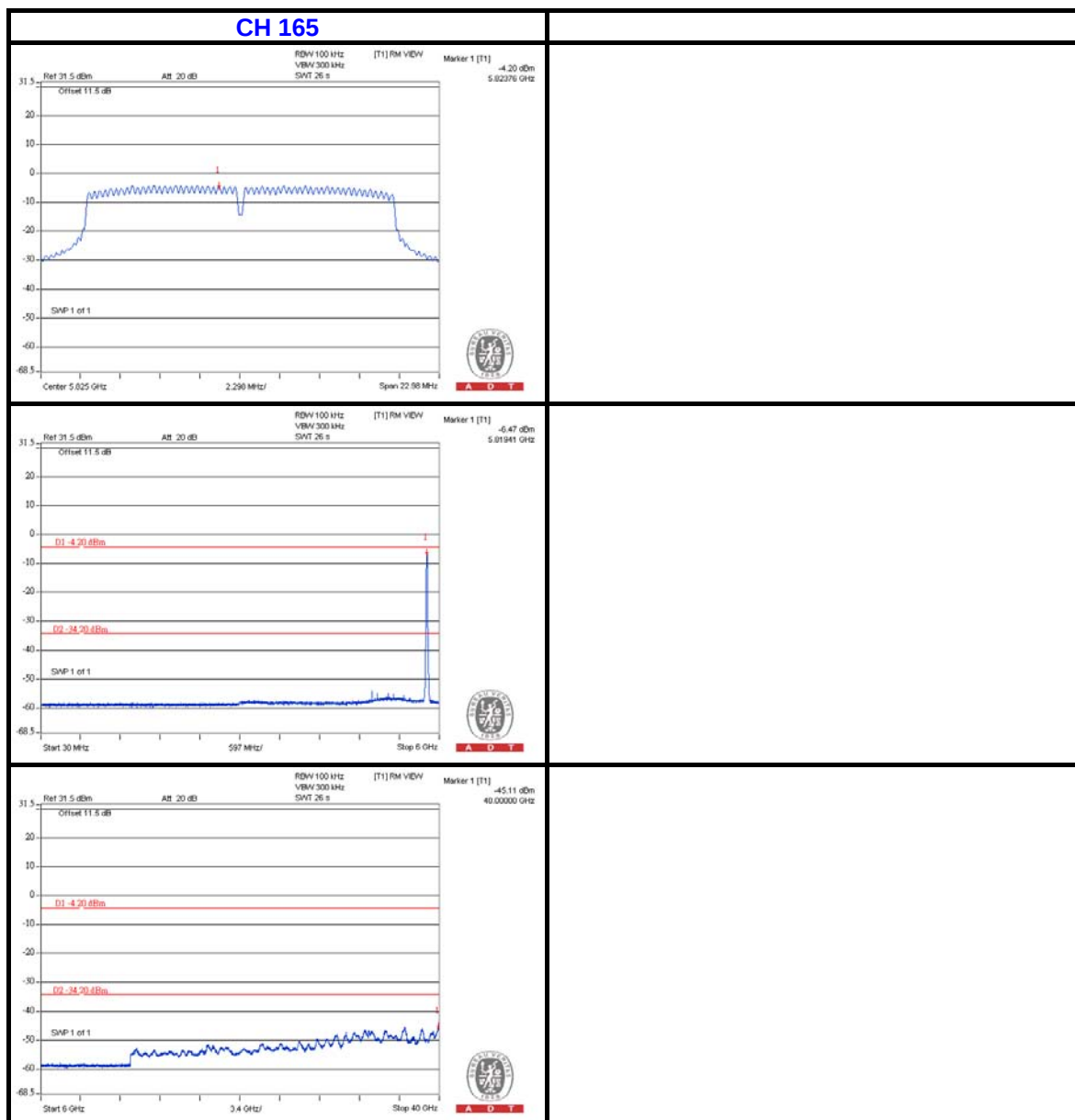
CHAIN 0



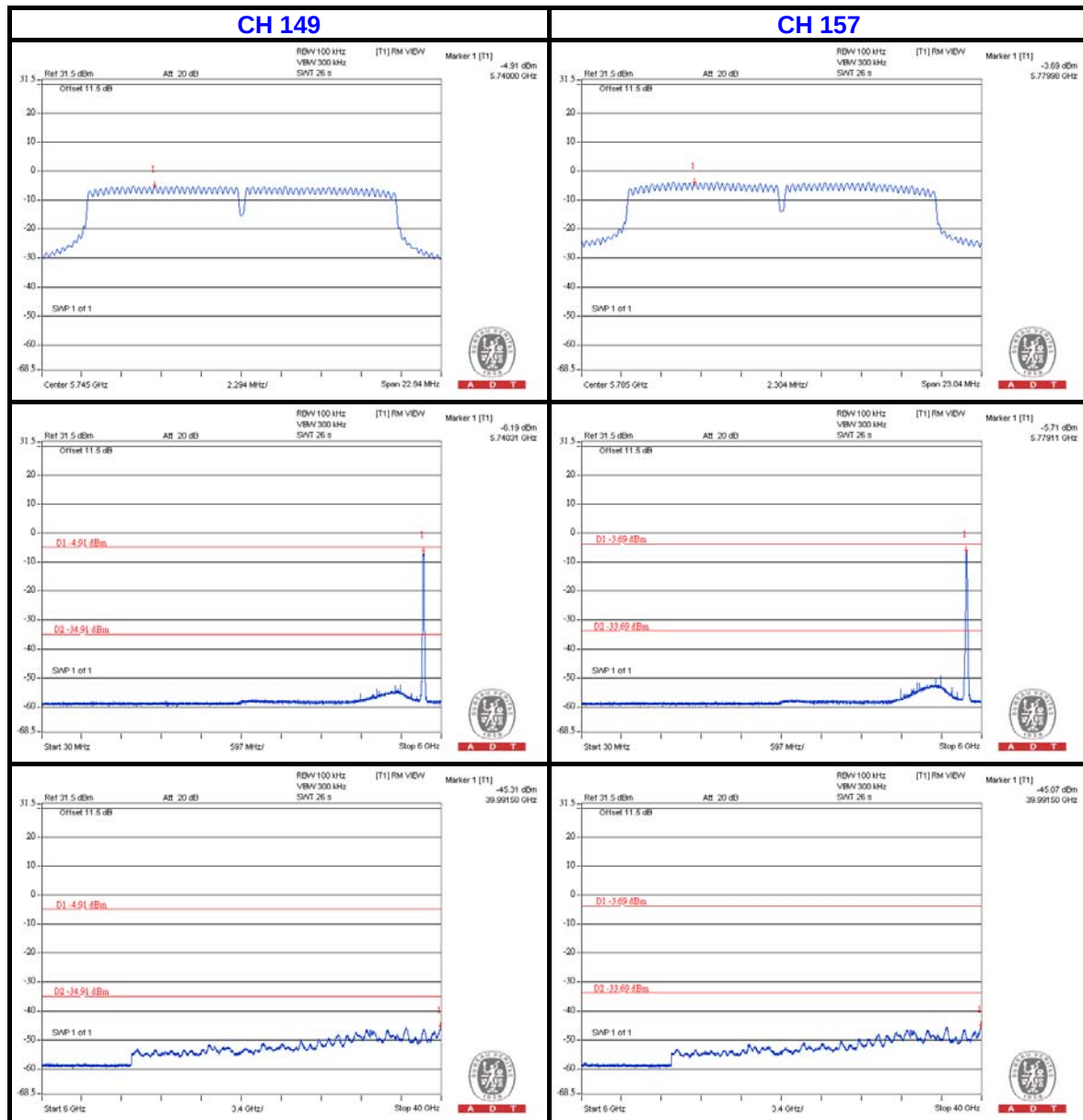


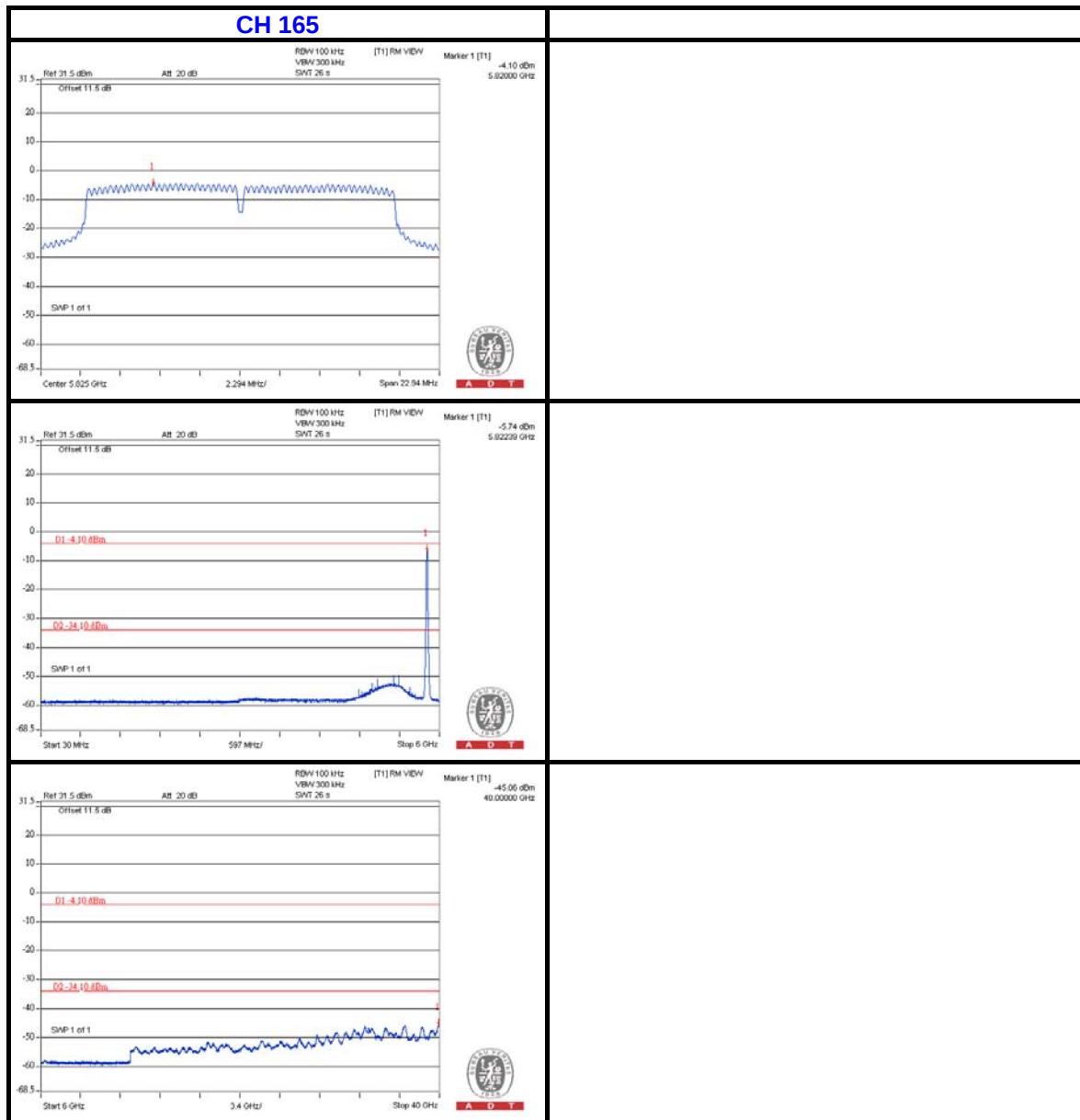
CHAIN 1



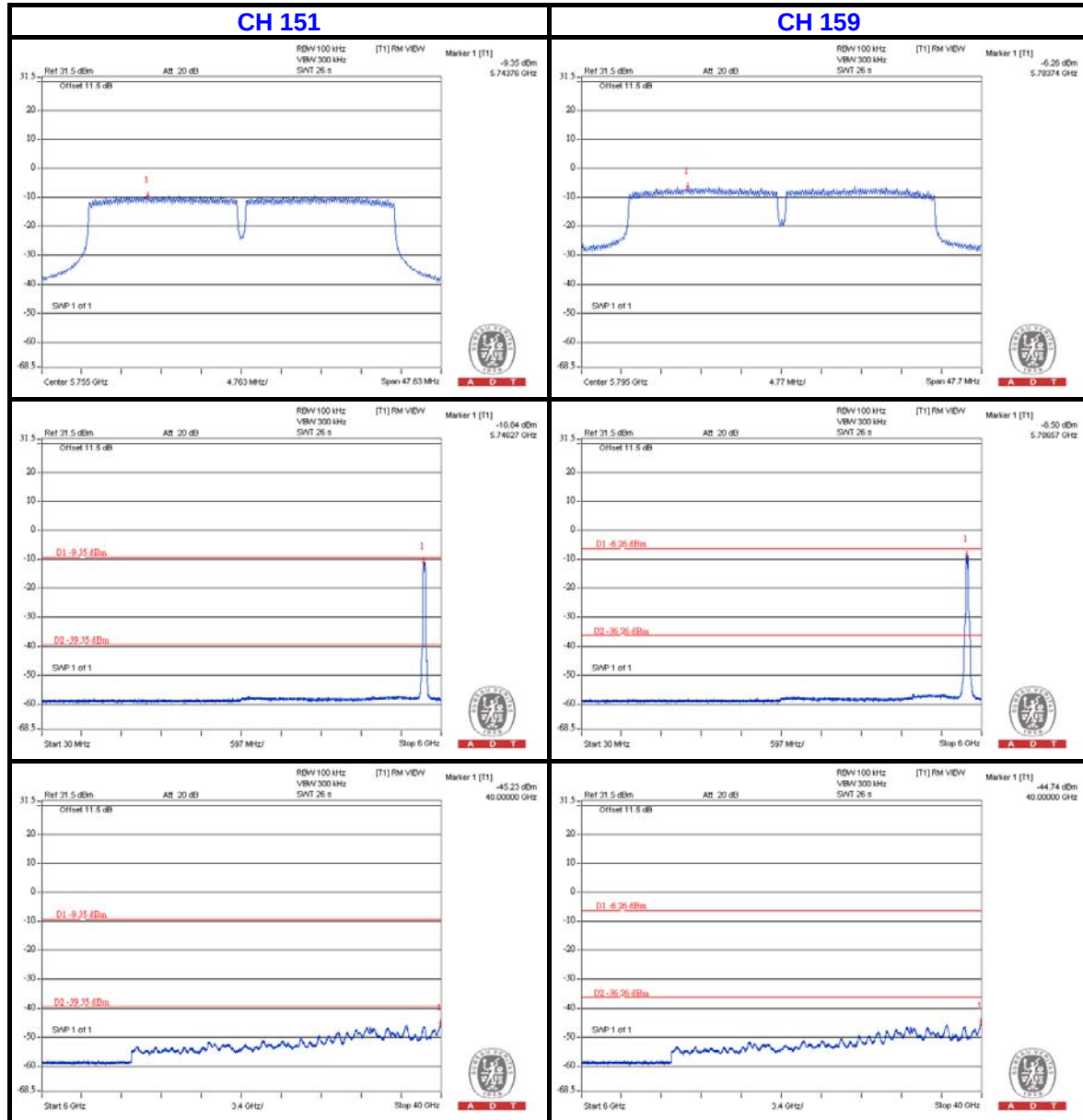


CHAIN 2

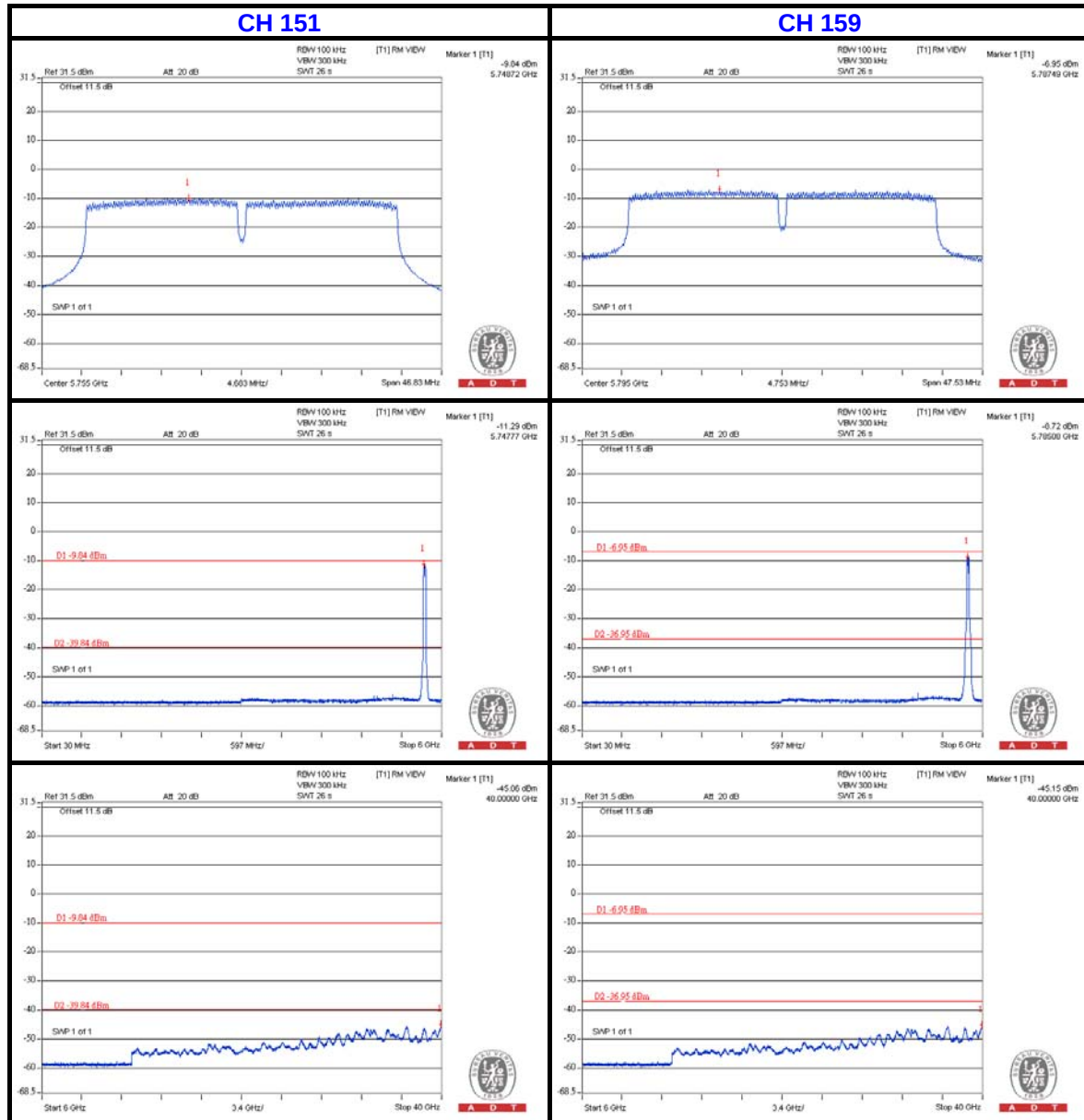




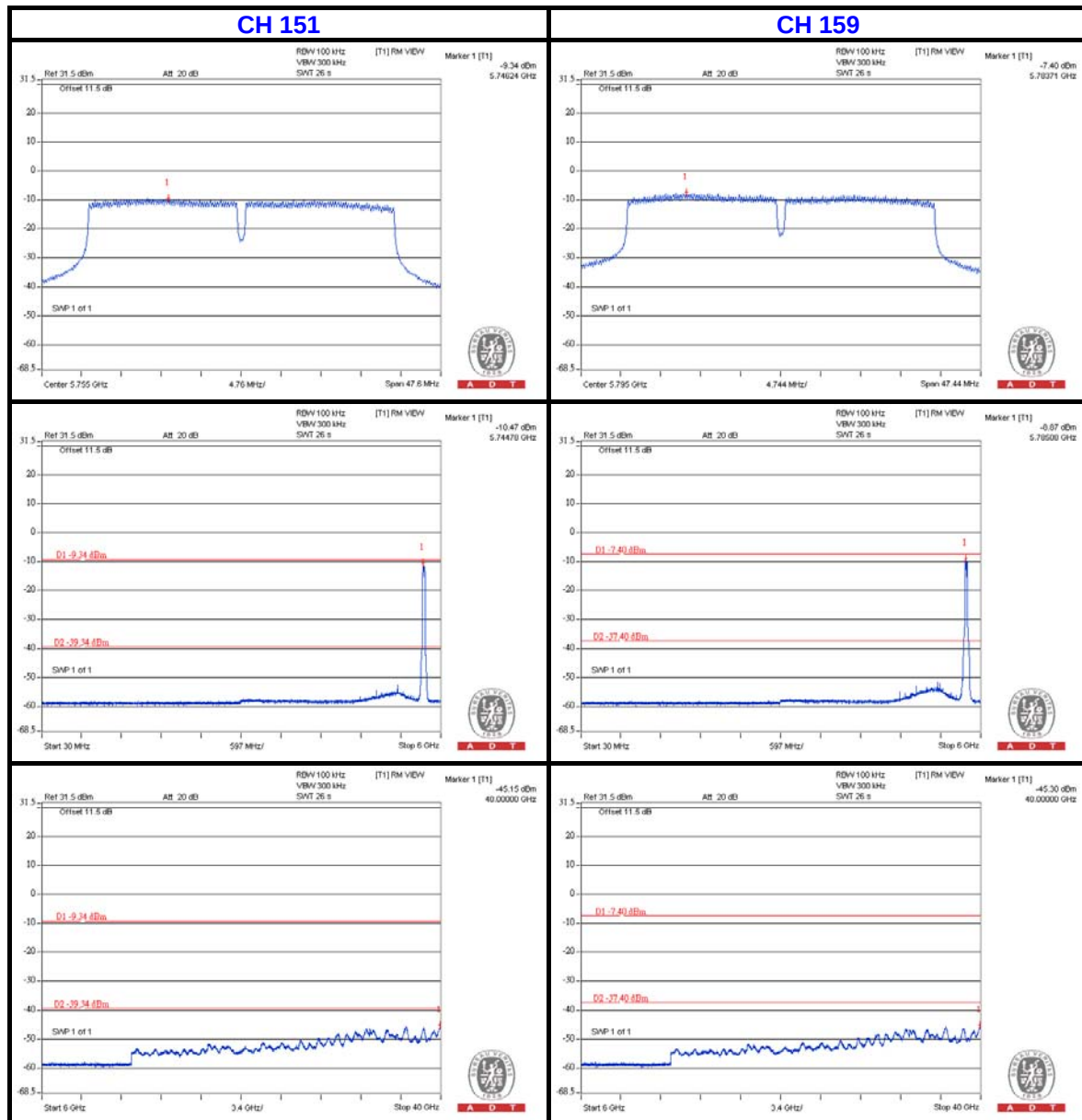
802.11n (40MHz)
CHAIN 0



CHAIN 1



CHAIN 2



6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



A D T

7. 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 according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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



A D T

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

No modifications were made to the EUT by the lab during the test.

---END---