

FCC Test Report

Report No.: RF150514C34

FCC ID: E2K-APL410BA

Test Model: APL41-0BA

Received Date: May 11, 2015

Test Date: May 13 ~ Jun. 12, 2015

Issued Date: Jun. 16, 2015

Applicant: Dell Inc.

Address: One Dell Way, Round Rock, Texas 78682, USA

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, TAIWAN (R.O.C.)



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

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT	7
3.2 Description of Test Modes	8
3.2.1 Test Mode Applicability and Tested Channel Detail	9
3.3 Duty Cycle of Test Signal	11
3.4 Description of Support Units	12
3.4.1 Configuration of System under Test	12
3.5 General Description of Applied Standards	13
4 Test Types and Results	14
4.1 Radiated Emission and Bandedge Measurement	14
4.1.1 Limits of Radiated Emission and Bandedge Measurement	14
4.1.2 Test Instruments	15
4.1.3 Test Procedures	16
4.1.4 Deviation from Test Standard	16
4.1.5 Test Set Up	17
4.1.6 EUT Operating Conditions	17
4.1.7 Test Results	18
4.2 Conducted Emission Measurement	32
4.2.1 Limits of Conducted Emission Measurement	32
4.2.2 Test Instruments	32
4.2.3 Test Procedures	33
4.2.4 Deviation from Test Standard	33
4.2.5 Test Setup	33
4.2.6 EUT Operating Conditions	33
4.2.7 Test Results	34
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	38
4.3.6 EUT Operating Conditions	38
4.3.7 Test Result	39
4.4 Conducted Output Power Measurement	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
4.5 Power Spectral Density Measurement	44
4.5.1 Limits of Power Spectral Density Measurement	44
4.5.2 Test Setup	44
4.5.3 Test Instruments	44
4.5.4 Test Procedure	44
4.5.5 Deviation from Test Standard	44
4.5.6 EUT Operating Condition	44

4.5.7 Test Results	45
4.6 Conducted Out of Band Emission Measurement.....	48
4.6.1 Limits of Conducted Out of Band Emission Measurement	48
4.6.2 Test Setup.....	48
4.6.3 Test Instruments	48
4.6.4 Test Procedure	48
4.6.5 Deviation from Test Standard	48
4.6.6 EUT Operating Condition	48
4.6.7 Test Results	48
5 Pictures of Test Arrangements.....	61
Appendix – Information on the Testing Laboratories	62



A D T

Release Control Record

Issue No.	Description	Date Issued
RF150514C34	Original release.	Jun. 16, 2015

1 Certificate of Conformity

Product: Wireless Network Security Appliance

Brand: DELL, DELL SONICWALL, SONICWALL

Test Model: APL41-0BA

Sample Status: Engineering sample

Applicant: Dell Inc.

Test Date: May 13 ~ Jun. 12, 2015

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2013

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

Prepared by :  , **Date:** Jun. 16, 2015
Pettie Chen / Senior Specialist

Approved by :  , **Date:** Jun. 16, 2015
Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.99dB at 0.15391MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.8dB at 2483.50MHz.
15.247(d)	Antenna Port Emission	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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless Network Security Appliance
Brand	DELL, DELL SONICWALL, SONICWALL
Test Model	APL41-0BA
Status of EUT	Engineering sample
Power Supply Rating	12Vdc from adapter
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 802.11n: up to 450.0Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	885.048mW
Antenna Type	Dipole antenna with 4dBi gain
Antenna Connector	RSMA
Accessory Device	Adapter
Data Cable Supplied	1.8m RJ45 non-shielded cable without core

Note:

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

Modulation Mode	TX Function
802.11b	3TX
802.11g	3TX
802.11n (HT20)	3TX
802.11n (HT40)	3TX

- The EUT consumes power from the following adapters.

Adapter 1	
Brand	AMIGO
Model	AMS117-1202000F2
Input Power	100-240Vac~50/60Hz, 0.8A Max
Output Power	12Vdc, 2.0A
Power Line	AC: 1.75m non-shielded power cord without core DC: 1.5m power cable with 1 core attached on adapter

Adapter 2	
Brand	Sunny COMPUTER TECHNOLOGY CO., LTD.
Model	SYS1544-2412-T3
Input Power	100-240Vac~, 1.0A MAX, 50-60Hz
Output Power	+12Vdc, 2.0A
Power Line	AC: 1.75m non-shielded power cord without core DC: 1.85m power cable with 1 core attached on adapter

- 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

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

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 (HT40):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from adapter 2

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

Note: 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. "-" means no effect.

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)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	802.11n (HT40)	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)
A, B	802.11g	1 to 11	6	OFDM	BPSK	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)
A, B	802.11g	1 to 11	6	OFDM	BPSK	6.0

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)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
RE<1G	22deg. C, 67%RH	120Vac, 60Hz	Jones Chang
PLC	20deg. C, 70%RH	120Vac, 60Hz	Jones Chang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Antony Lee

3.3 Duty Cycle of Test Signal

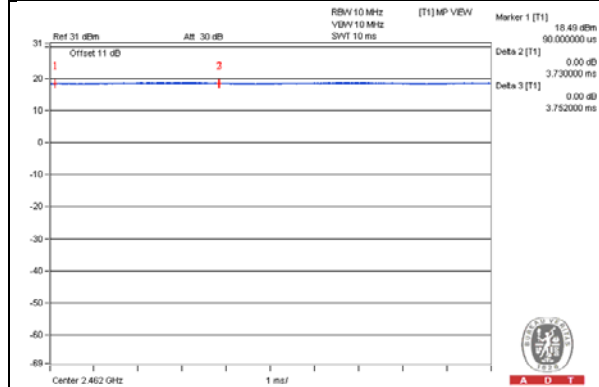
802.11b: Duty cycle = 100%

802.11g: Duty cycle = $2.022/2.082 = 0.971$

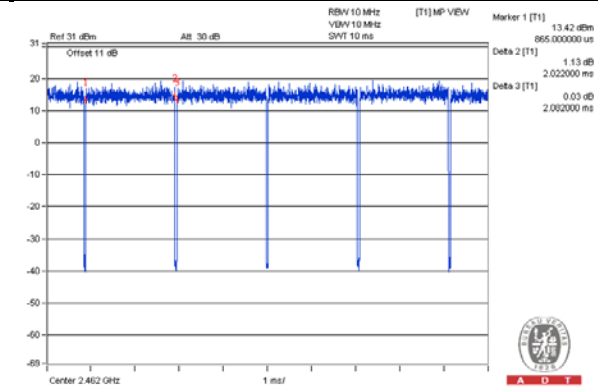
802.11n (HT20): Duty cycle = $1.88/1.932 = 0.973$

802.11n (HT40): Duty cycle = $0.925/0.985 = 0.939$

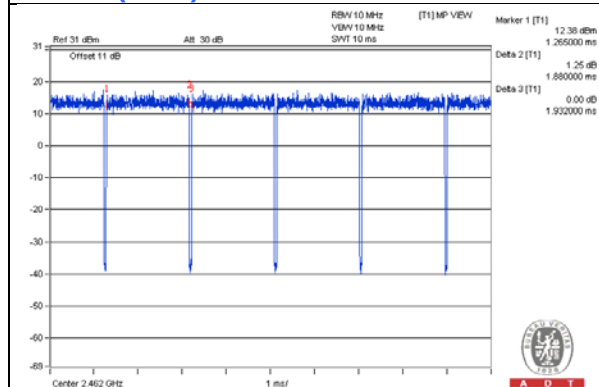
802.11b



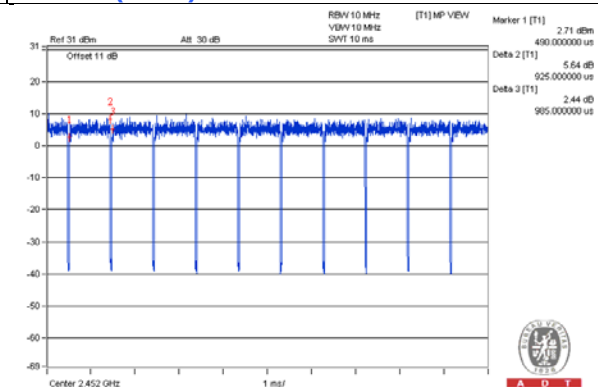
802.11g



802.11n (HT20)



802.11n (HT40)



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	External Hard Disk	WD	WDBACY5000ABL-01	WX51C1245403	NA	-
C.	Load	NA	NA	NA	NA	-

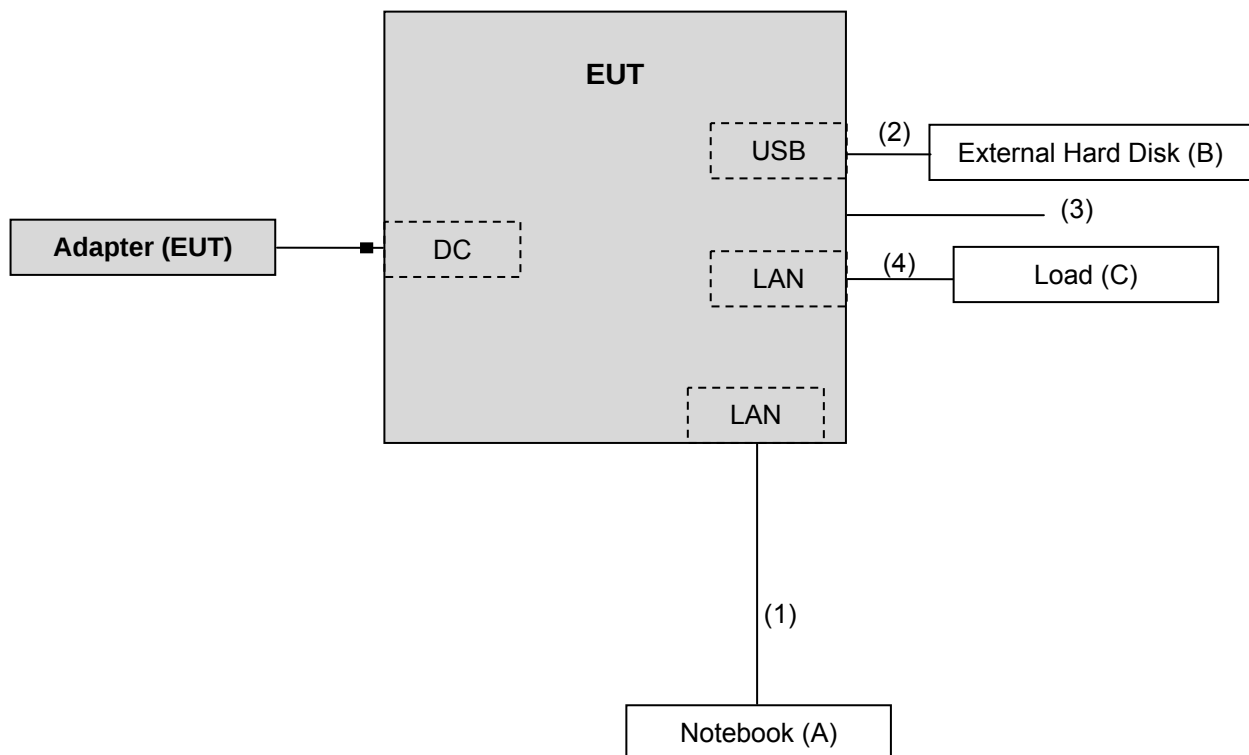
Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	10	N	0	Cat5e
2.	USB cable	1	1.8	Y	0	Cat5e
3.	Console cable	1	1.5	N	0	-
4.	LAN cable	4	1.8	N	0	Cat5e

Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test



3.5 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 v03r02

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

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 20dB 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

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Apr. 10, 2015	Apr. 09, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Aug. 29, 2014	Aug. 28, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	9120D	209	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8447D	2944A10738	Oct.18, 2014	Oct. 17, 2015
Preamplifier Agilent	8449B	3008A01964	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 22, 2014	Aug. 21, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Jul. 26, 2014	Jul. 25, 2015
Power Sensor	MA2411B	0738171	Jul. 26, 2014	Jul. 25, 2015

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 (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

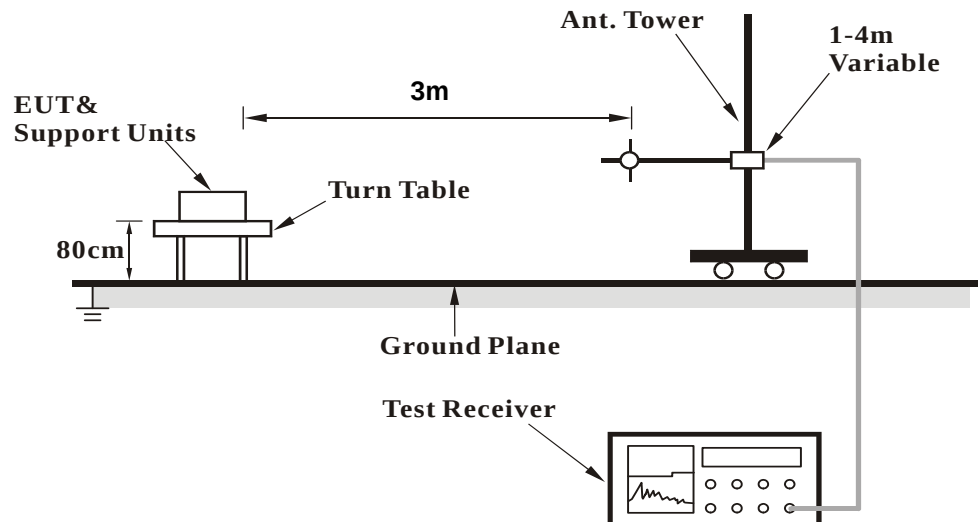
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

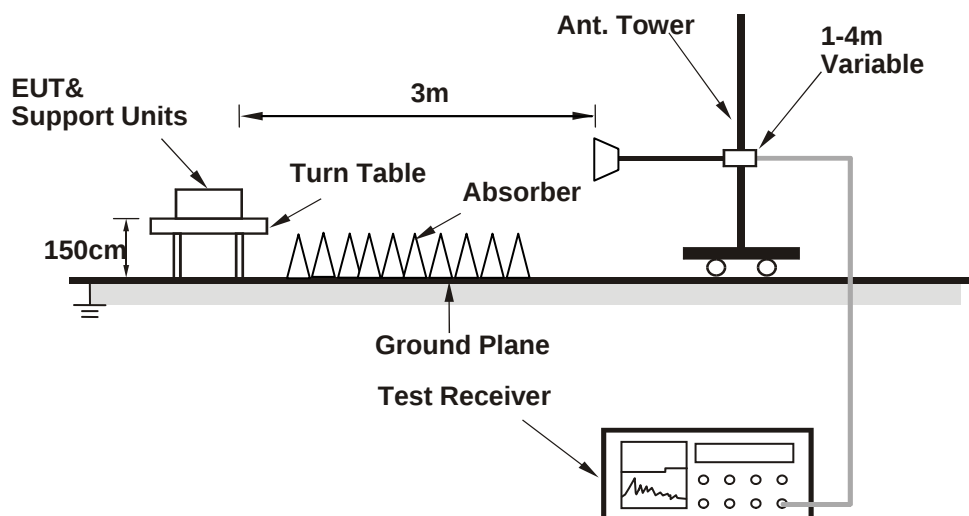
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Prepared notebook to act as communication partner and placed it outside of testing area.
- The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The communication partner sent data to EUT by command "PING".
- The necessary accessories enable the system in full functions.

4.1.7 Test Results

Above 1GHz Data :

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	2330.00	55.2 PK	74.0	-18.8	1.15 H	154	23.00	32.20
2	2330.00	45.2 AV	54.0	-8.8	1.15 H	154	13.00	32.20
3	2386.00	56.2 PK	74.0	-17.8	1.22 H	82	23.70	32.50
4	2386.00	44.8 AV	54.0	-9.2	1.22 H	82	12.30	32.50
5	*2412.00	104.3 PK			1.32 H	157	71.70	32.60
6	*2412.00	100.2 AV			1.32 H	157	67.60	32.60
7	4824.00	46.8 PK	74.0	-27.2	1.35 H	200	40.90	5.90
8	4824.00	36.0 AV	54.0	-18.0	1.35 H	200	30.10	5.90
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	2330.00	61.5 PK	74.0	-12.5	1.63 V	155	29.30	32.20
2	2330.00	52.1 AV	54.0	-1.9	1.63 V	155	19.90	32.20
3	2386.00	61.0 PK	74.0	-13.0	1.83 V	156	28.50	32.50
4	2386.00	51.4 AV	54.0	-2.6	1.83 V	156	18.90	32.50
5	*2412.00	115.9 PK			1.59 V	172	83.30	32.60
6	*2412.00	112.2 AV			1.59 V	172	79.60	32.60
7	4824.00	54.2 PK	74.0	-19.8	1.53 V	284	48.30	5.90
8	4824.00	47.7 AV	54.0	-6.3	1.53 V	284	41.80	5.90

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	2355.00	56.4 PK	74.0	-17.6	1.35 H	220	24.00	32.40
2	2355.00	44.9 AV	54.0	-9.1	1.35 H	220	12.50	32.40
3	*2437.00	107.6 PK			1.54 H	203	74.90	32.70
4	*2437.00	103.8 AV			1.54 H	203	71.10	32.70
5	2483.50	56.4 PK	74.0	-17.6	1.16 H	246	23.70	32.70
6	2483.50	45.4 AV	54.0	-8.6	1.16 H	246	12.70	32.70
7	4874.00	47.2 PK	74.0	-26.8	1.15 H	321	41.30	5.90
8	4874.00	35.3 AV	54.0	-18.7	1.15 H	321	29.40	5.90
9	7311.00	52.2 PK	74.0	-21.8	1.13 H	74	40.50	11.70
10	7311.00	40.6 AV	54.0	-13.4	1.13 H	74	28.90	11.70

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	2355.00	62.1 PK	74.0	-11.9	1.47 V	166	29.70	32.40
2	2355.00	52.6 AV	54.0	-1.4	1.47 V	166	20.20	32.40
3	*2437.00	119.9 PK			1.58 V	157	87.20	32.70
4	*2437.00	116.0 AV			1.58 V	157	83.30	32.70
5	2483.50	61.3 PK	74.0	-12.7	1.45 V	162	28.60	32.70
6	2483.50	50.8 AV	54.0	-3.2	1.45 V	162	18.10	32.70
7	4874.00	55.5 PK	74.0	-18.5	1.47 V	347	49.60	5.90
8	4874.00	52.2 AV	54.0	-1.8	1.47 V	347	46.30	5.90
9	7311.00	56.6 PK	74.0	-17.4	1.58 V	103	44.90	11.70
10	7311.00	49.9 AV	54.0	-4.1	1.58 V	103	38.20	11.70

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	105.1 PK			1.51 H	202	72.50	32.60
2	*2462.00	101.3 AV			1.51 H	202	68.70	32.60
3	2483.50	56.8 PK	74.0	-17.2	1.18 H	159	24.10	32.70
4	2483.50	44.9 AV	54.0	-9.1	1.18 H	159	12.20	32.70
5	2500.00	57.0 PK	74.0	-17.0	1.06 H	156	24.20	32.80
6	2500.00	45.8 AV	54.0	-8.2	1.06 H	156	13.00	32.80
7	4924.00	47.4 PK	74.0	-26.6	1.03 H	30	41.40	6.00
8	4924.00	35.8 AV	54.0	-18.2	1.03 H	30	29.80	6.00
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	*2462.00	114.8 PK			1.56 V	174	82.20	32.60
2	*2462.00	111.1 AV			1.56 V	184	78.50	32.60
3	2483.50	61.6 PK	74.0	-12.4	1.74 V	162	28.90	32.70
4	2483.50	51.9 AV	54.0	-2.1	1.74 V	162	19.20	32.70
5	2500.00	61.8 PK	74.0	-12.2	1.60 V	174	29.00	32.80
6	2500.00	52.4 AV	54.0	-1.6	1.60 V	174	19.60	32.80
7	4924.00	52.5 PK	74.0	-21.5	1.52 V	290	46.50	6.00
8	4924.00	46.0 AV	54.0	-8.0	1.52 V	290	40.00	6.00

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.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	60.5 PK	74.0	-13.5	1.56 H	202	28.00	32.50
2	2390.00	45.8 AV	54.0	-8.2	1.56 H	202	13.30	32.50
3	*2412.00	102.7 PK			1.32 H	158	70.10	32.60
4	*2412.00	92.1 AV			1.32 H	158	59.50	32.60
5	4824.00	46.1 PK	74.0	-27.9	1.06 H	152	40.20	5.90
6	4824.00	33.2 AV	54.0	-20.8	1.06 H	152	27.30	5.90
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	72.6 PK	74.0	-1.4	1.62 V	174	40.10	32.50
2	2390.00	52.9 AV	54.0	-1.1	1.62 V	174	20.40	32.50
3	*2412.00	113.6 PK			1.60 V	177	81.00	32.60
4	*2412.00	103.9 AV			1.60 V	177	71.30	32.60
5	4824.00	53.2 PK	74.0	-20.8	1.53 V	4	47.30	5.90
6	4824.00	41.0 AV	54.0	-13.0	1.53 V	4	35.10	5.90

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	56.5 PK	74.0	-17.5	1.30 H	22	24.00	32.50
2	2390.00	45.3 AV	54.0	-8.7	1.30 H	22	12.80	32.50
3	*2437.00	105.0 PK			1.35 H	2	72.30	32.70
4	*2437.00	96.5 AV			1.35 H	2	63.80	32.70
5	2483.50	55.2 PK	74.0	-18.8	1.30 H	19	22.50	32.70
6	2483.50	45.8 AV	54.0	-8.2	1.30 H	19	13.10	32.70
7	4874.00	50.4 PK	74.0	-23.6	1.26 H	301	44.50	5.90
8	4874.00	39.7 AV	54.0	-14.3	1.26 H	301	33.80	5.90
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	67.9 PK	74.0	-6.1	1.62 V	174	35.40	32.50
2	2390.00	52.3 AV	54.0	-1.7	1.62 V	174	19.80	32.50
3	*2437.00	120.3 PK			1.58 V	175	87.60	32.70
4	*2437.00	110.7 AV			1.58 V	175	78.00	32.70
5	2483.50	67.3 PK	74.0	-6.7	1.56 V	174	34.60	32.70
6	2483.50	52.7 AV	54.0	-1.3	1.56 V	174	20.00	32.70
7	4874.00	52.3 PK	74.0	-21.7	1.51 V	227	46.40	5.90
8	4874.00	42.6 AV	54.0	-11.4	1.51 V	227	36.70	5.90

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.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	102.9 PK			1.51 H	200	70.30	32.60
2	*2462.00	93.4 AV			1.51 H	200	60.80	32.60
3	2483.50	58.0 PK	74.0	-16.0	1.16 H	157	25.30	32.70
4	2483.50	45.4 AV	54.0	-8.6	1.16 H	157	12.70	32.70
5	4924.00	47.5 PK	74.0	-26.5	1.41 H	214	41.50	6.00
6	4924.00	34.6 AV	54.0	-19.4	1.41 H	214	28.60	6.00
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	*2462.00	114.1 PK			1.72 V	176	81.50	32.60
2	*2462.00	104.9 AV			1.72 V	176	72.30	32.60
3	2483.50	72.2 PK	74.0	-1.8	1.64 V	349	39.50	32.70
4	2483.50	51.1 AV	54.0	-2.9	1.64 V	349	18.40	32.70
5	4924.00	54.0 PK	74.0	-20.0	1.72 V	19	48.00	6.00
6	4924.00	42.2 AV	54.0	-11.8	1.72 V	19	36.20	6.00

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.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	59.0 PK	74.0	-15.0	1.06 H	262	26.50	32.50
2	2390.00	46.1 AV	54.0	-7.9	1.06 H	262	13.60	32.50
3	*2412.00	98.6 PK			1.19 H	258	66.00	32.60
4	*2412.00	88.7 AV			1.19 H	258	56.10	32.60
5	4824.00	46.7 PK	74.0	-27.3	1.16 H	187	40.80	5.90
6	4824.00	33.8 AV	54.0	-20.2	1.16 H	187	27.90	5.90
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	72.0 PK	74.0	-2.0	1.64 V	175	39.50	32.50
2	2390.00	52.6 AV	54.0	-1.4	1.64 V	175	20.10	32.50
3	*2412.00	113.2 PK			1.60 V	175	80.60	32.60
4	*2412.00	103.3 AV			1.60 V	175	70.70	32.60
5	4824.00	53.6 PK	74.0	-20.4	1.68 V	201	47.70	5.90
6	4824.00	41.8 AV	54.0	-12.2	1.68 V	201	35.90	5.90

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	56.8 PK	74.0	-17.2	1.22 H	213	24.30	32.50
2	2390.00	45.4 AV	54.0	-8.6	1.22 H	213	12.90	32.50
3	*2437.00	106.6 PK			1.52 H	201	73.90	32.70
4	*2437.00	97.0 AV			1.52 H	201	64.30	32.70
5	2483.50	57.0 PK	74.0	-17.0	1.16 H	191	24.30	32.70
6	2483.50	45.5 AV	54.0	-8.5	1.16 H	191	12.80	32.70
7	4874.00	47.5 PK	74.0	-26.5	1.11 H	138	41.60	5.90
8	4874.00	34.3 AV	54.0	-19.7	1.11 H	138	28.40	5.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.1 PK	74.0	-2.9	1.64 V	178	38.60	32.50
2	2390.00	52.9 AV	54.0	-1.1	1.64 V	178	20.40	32.50
3	*2437.00	118.5 PK			1.72 V	161	85.80	32.70
4	*2437.00	108.7 AV			1.72 V	161	76.00	32.70
5	2483.50	67.8 PK	74.0	-6.2	1.64 V	0	35.10	32.70
6	2483.50	52.8 AV	54.0	-1.2	1.64 V	0	20.10	32.70
7	4874.00	53.8 PK	74.0	-20.2	1.49 V	208	47.90	5.90
8	4874.00	43.3 AV	54.0	-10.7	1.49 V	208	37.40	5.90

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.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.6 PK			1.00 H	201	68.00	32.60
2	*2462.00	91.3 AV			1.00 H	201	58.70	32.60
3	2483.50	56.5 PK	74.0	-17.5	1.34 H	199	23.80	32.70
4	2483.50	45.4 AV	54.0	-8.6	1.34 H	199	12.70	32.70
5	4924.00	47.6 PK	74.0	-26.4	1.17 H	140	41.60	6.00
6	4924.00	34.5 AV	54.0	-19.5	1.17 H	140	28.50	6.00
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	*2462.00	113.1 PK			1.70 V	168	80.50	32.60
2	*2462.00	104.0 AV			1.70 V	168	71.40	32.60
3	2483.50	72.7 PK	74.0	-1.3	1.68 V	171	40.00	32.70
4	2483.50	51.1 AV	54.0	-2.9	1.68 V	171	18.40	32.70
5	4924.00	52.7 PK	74.0	-21.3	1.56 V	215	46.70	6.00
6	4924.00	41.6 AV	54.0	-12.4	1.56 V	215	35.60	6.00

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.

802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	58.5 PK	74.0	-15.5	1.09 H	201	26.00	32.50
2	2390.00	46.6 AV	54.0	-7.4	1.09 H	201	14.10	32.50
3	*2422.00	94.2 PK			1.03 H	201	61.60	32.60
4	*2422.00	85.3 AV			1.03 H	201	52.70	32.60
5	4844.00	46.1 PK	74.0	-27.9	1.14 H	138	40.20	5.90
6	4844.00	33.8 AV	54.0	-20.2	1.14 H	138	27.90	5.90
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	72.0 PK	74.0	-2.0	1.62 V	179	39.50	32.50
2	2390.00	53.0 AV	54.0	-1.0	1.62 V	179	20.50	32.50
3	*2422.00	107.8 PK			1.77 V	178	75.20	32.60
4	*2422.00	98.4 AV			1.77 V	178	65.80	32.60
5	4844.00	52.0 PK	74.0	-22.0	1.61 V	209	46.10	5.90
6	4844.00	41.7 AV	54.0	-12.3	1.61 V	209	35.80	5.90

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 of the restricted band.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	55.6 PK	74.0	-18.4	1.17 H	218	23.10	32.50
2	2390.00	45.5 AV	54.0	-8.5	1.17 H	218	13.00	32.50
3	*2437.00	98.7 PK			1.04 H	200	66.00	32.70
4	*2437.00	90.4 AV			1.04 H	200	57.70	32.70
5	2483.50	55.9 PK	74.0	-18.1	1.11 H	197	23.20	32.70
6	2483.50	45.8 AV	54.0	-8.2	1.11 H	197	13.10	32.70
7	4874.00	47.2 PK	74.0	-26.8	1.21 H	128	41.30	5.90
8	4874.00	34.7 AV	54.0	-19.3	1.21 H	128	28.80	5.90
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	68.8 PK	74.0	-5.2	1.70 V	165	36.30	32.50
2	2390.00	50.3 AV	54.0	-3.7	1.70 V	165	17.80	32.50
3	*2437.00	113.2 PK			1.75 V	165	80.50	32.70
4	*2437.00	102.5 AV			1.75 V	165	69.80	32.70
5	2483.50	70.5 PK	74.0	-3.5	1.70 V	173	37.80	32.70
6	2483.50	52.3 AV	54.0	-1.7	1.70 V	173	19.60	32.70
7	4874.00	53.8 PK	74.0	-20.2	1.55 V	212	47.90	5.90
8	4874.00	43.5 AV	54.0	-10.5	1.55 V	212	37.60	5.90

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.

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	93.5 PK			1.00 H	201	60.80	32.70
2	*2452.00	85.3 AV			1.00 H	201	52.60	32.70
3	2483.50	59.0 PK	74.0	-15.0	1.00 H	200	26.30	32.70
4	2483.50	46.3 AV	54.0	-7.7	1.00 H	200	13.60	32.70
5	4904.00	46.4 PK	74.0	-27.6	1.14 H	136	40.60	5.80
6	4904.00	34.4 AV	54.0	-19.6	1.14 H	136	28.60	5.80
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	107.8 PK			1.57 V	169	75.10	32.70
2	*2452.00	98.2 AV			1.57 V	169	65.50	32.70
3	2483.50	73.2 PK	74.0	-0.8	1.69 V	170	40.50	32.70
4	2483.50	53.0 AV	54.0	-1.0	1.69 V	170	20.30	32.70
5	4904.00	51.5 PK	74.0	-22.5	1.51 V	211	45.70	5.80
6	4904.00	41.1 AV	54.0	-12.9	1.51 V	211	35.30	5.80

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. " * ": Fundamental frequency.

Below 1GHz Data:

Test Mode A

802.11g

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

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	103.78	32.9 QP	43.5	-10.6	2.00 H	93	51.20	-18.30
2	375.98	36.9 QP	46.0	-9.1	1.00 H	124	47.90	-11.00
3	500.42	34.6 QP	46.0	-11.4	2.00 H	147	43.00	-8.40
4	624.85	36.8 QP	46.0	-9.2	1.50 H	174	42.40	-5.60
5	751.23	35.1 QP	46.0	-10.9	1.50 H	16	38.30	-3.20
6	875.67	37.5 QP	46.0	-8.5	1.00 H	141	38.60	-1.10
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	37.68	36.6 QP	40.0	-3.4	1.50 V	19	51.90	-15.30
2	49.34	35.8 QP	40.0	-4.2	2.00 V	326	50.20	-14.40
3	61.01	33.2 QP	40.0	-6.8	2.00 V	354	48.00	-14.80
4	375.98	31.7 QP	46.0	-14.3	1.50 V	218	42.70	-11.00
5	500.42	35.6 QP	46.0	-10.4	1.00 V	168	44.00	-8.40
6	624.85	33.8 QP	46.0	-12.2	1.00 V	8	39.40	-5.60

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

Test Mode B

802.11g

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

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	92.12	35.7 QP	43.5	-7.8	1.99 H	93	55.70	-20.00
2	375.98	33.6 QP	46.0	-12.4	1.00 H	107	44.60	-11.00
3	500.42	32.3 QP	46.0	-13.7	1.99 H	356	40.70	-8.40
4	624.85	36.6 QP	46.0	-9.4	1.50 H	175	42.20	-5.60
5	751.23	35.1 QP	46.0	-10.9	1.50 H	15	38.30	-3.20
6	875.67	37.9 QP	46.0	-8.1	1.50 H	133	39.00	-1.10
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	39.62	36.4 QP	40.0	-3.6	1.00 V	6	51.40	-15.00
2	49.34	36.2 QP	40.0	-3.8	1.00 V	6	50.60	-14.40
3	375.98	32.0 QP	46.0	-14.0	1.50 V	205	43.00	-11.00
4	500.42	36.8 QP	46.0	-9.2	1.00 V	100	45.20	-8.40
5	624.85	33.0 QP	46.0	-13.0	1.00 V	12	38.60	-5.60
6	1000.10	38.2 QP	54.0	-15.8	1.00 V	288	37.40	0.80

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 11, 2014	Nov. 10, 2015
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 02, 2015	Mar. 01, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 21, 2014	Jul. 20, 2015
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Notes: 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 1.

3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

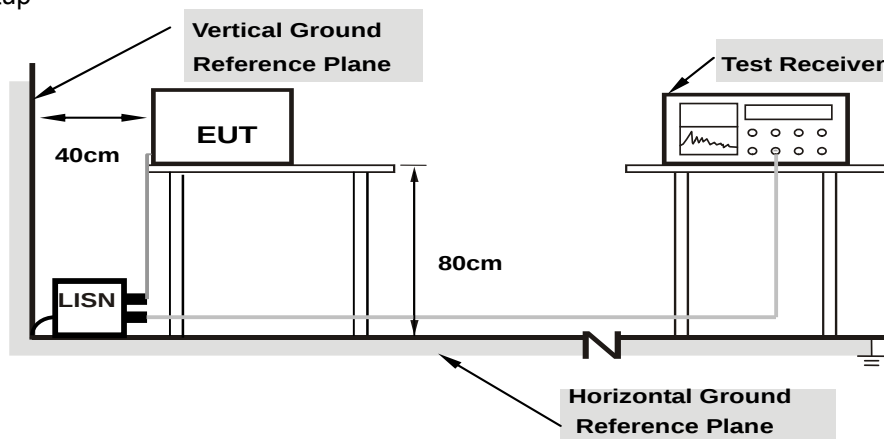
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance 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: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

Test Mode A

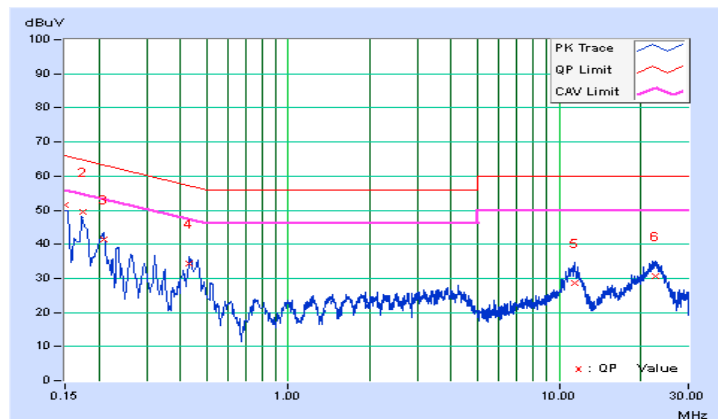
802.11g

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	----------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.05	51.44	41.32	51.49	41.37	66.00	56.00	-14.51	-14.63
2	0.17374	0.05	49.40	41.67	49.45	41.72	64.78	54.78	-15.32	-13.05
3	0.20838	0.06	41.28	31.52	41.34	31.58	63.27	53.27	-21.93	-21.69
4	0.43235	0.06	34.41	28.99	34.47	29.05	57.21	47.21	-22.74	-18.16
5	11.45381	0.52	28.20	22.92	28.72	23.44	60.00	50.00	-31.28	-26.56
6	22.56212	0.97	29.83	24.66	30.80	25.63	60.00	50.00	-29.20	-24.37

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.

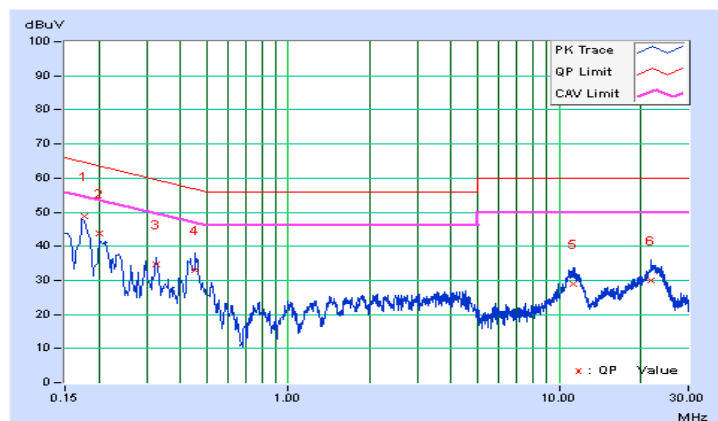


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17737	0.05	48.73	40.50	48.78	40.55	64.61	54.61	-15.83	-14.06
2	0.20084	0.05	43.78	34.85	43.83	34.90	63.58	53.58	-19.75	-18.68
3	0.32595	0.06	34.69	25.48	34.75	25.54	59.55	49.55	-24.81	-24.02
4	0.45498	0.06	33.05	26.87	33.11	26.93	56.78	46.78	-23.67	-19.85
5	11.26222	0.46	28.64	23.22	29.10	23.68	60.00	50.00	-30.90	-26.32
6	21.81922	0.76	29.36	24.13	30.12	24.89	60.00	50.00	-29.88	-25.11

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.



Test Mode B

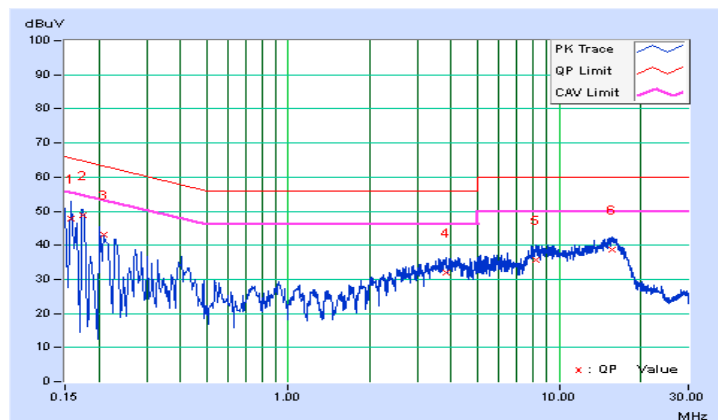
802.11g

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	----------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	0.05	47.61	29.13	47.66	29.18	65.58	55.58	-17.92	-26.40
2	0.17374	0.05	48.85	33.25	48.90	33.30	64.78	54.78	-15.87	-21.47
3	0.20893	0.06	42.94	27.67	43.00	27.73	63.25	53.25	-20.25	-25.52
4	3.82540	0.18	31.68	24.42	31.86	24.60	56.00	46.00	-24.14	-21.40
5	8.17332	0.37	35.35	29.01	35.72	29.38	60.00	50.00	-24.28	-20.62
6	15.66097	0.70	37.96	32.25	38.66	32.95	60.00	50.00	-21.34	-17.05

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.

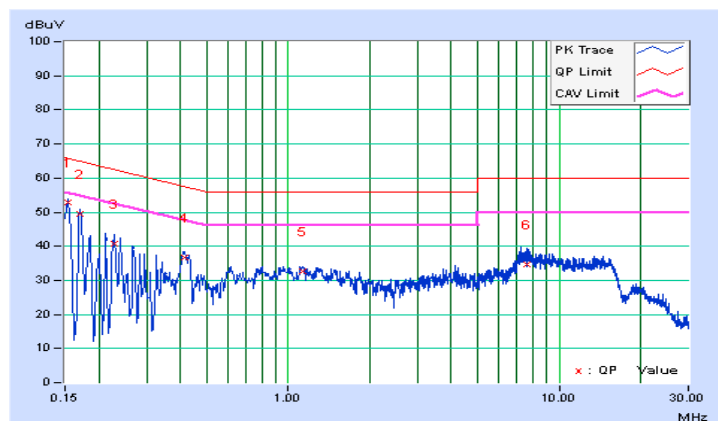


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.05	52.75	36.86	52.80	36.91	65.79	55.79	-12.99	-18.88
2	0.16967	0.05	49.28	32.04	49.33	32.09	64.98	54.98	-15.65	-22.89
3	0.22820	0.05	40.71	26.46	40.76	26.51	62.51	52.51	-21.75	-26.00
4	0.41233	0.06	36.61	26.07	36.67	26.13	57.60	47.60	-20.93	-21.47
5	1.13141	0.08	32.42	26.17	32.50	26.25	56.00	46.00	-23.50	-19.75
6	7.65329	0.33	34.36	27.71	34.69	28.04	60.00	50.00	-25.31	-21.96

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.

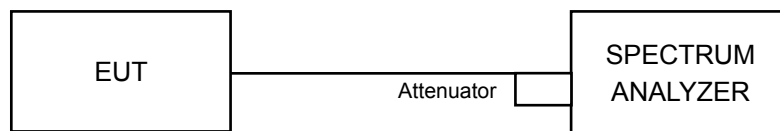


4.3 6dB Bandwidth Measurement

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

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

- Set resolution bandwidth (RBW) = 100kHz
- 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 Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	10.14	10.13	10.14	0.5	PASS
6	2437	10.12	10.11	10.12	0.5	PASS
11	2462	10.10	10.12	10.12	0.5	PASS

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.40	16.40	16.40	0.5	PASS
6	2437	16.38	16.38	16.40	0.5	PASS
11	2462	16.40	16.37	16.39	0.5	PASS

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.63	17.62	17.63	0.5	PASS
6	2437	17.60	17.60	17.60	0.5	PASS
11	2462	17.60	17.35	17.61	0.5	PASS

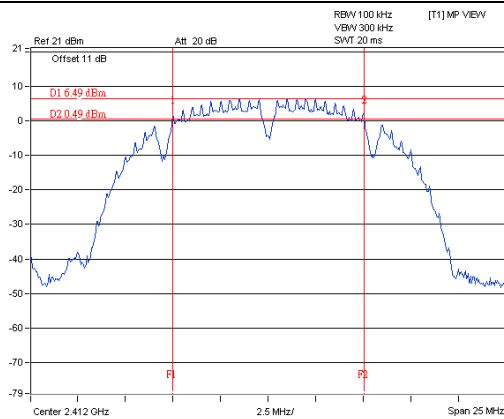
802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	36.12	36.45	36.49	0.5	PASS
6	2437	36.17	36.38	36.41	0.5	PASS
9	2452	36.13	36.17	36.45	0.5	PASS

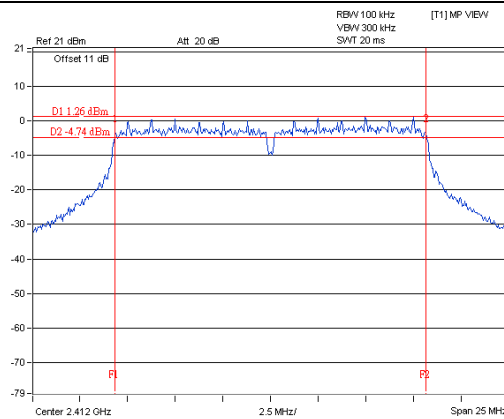
Spectrum Plot of Worst Value

802.11b

802.11g



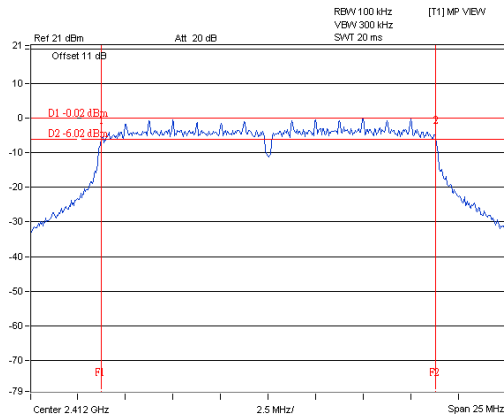
A D T



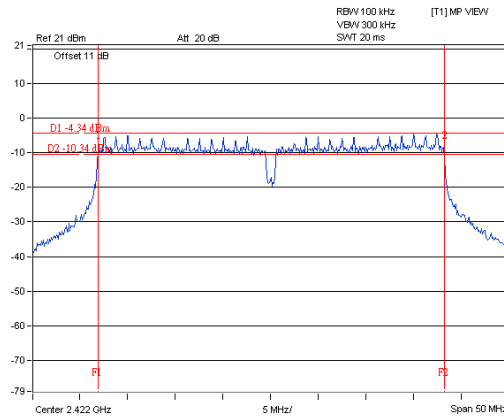
A D T

802.11n (HT20)

802.11n (HT40)



A D T



A D T

4.4 Conducted Output Power Measurement

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 Method of conducted output power measurement on IEEE 802.11 devices,

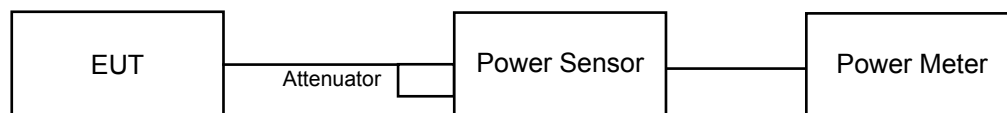
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

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

FOR PEAK POWER

802.11b

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	19.31	20.07	21.44	326.251	25.14	30	Pass
6	2437	21.29	21.62	22.41	453.978	26.57	30	Pass
11	2462	19.42	19.54	21.04	304.505	24.84	30	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	21.21	22.54	23.00	511.129	27.09	30	Pass
6	2437	24.48	24.52	25.07	885.048	29.47	30	Pass
11	2462	21.13	20.47	22.38	414.129	26.17	30	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	19.36	20.65	21.44	341.759	25.34	30	Pass
6	2437	24.46	24.29	25.08	869.895	29.39	30	Pass
11	2462	20.56	21.06	21.88	395.577	25.97	30	Pass

802.11n (HT40)

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	18.00	18.27	20.35	238.632	23.78	30	Pass
6	2437	21.77	22.61	23.14	538.767	27.31	30	Pass
9	2452	18.21	18.23	18.25	199.583	23.00	30	Pass

FOR AVERAGE POWER

802.11b

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1	Chain 2		
1	2412	17.05	17.68	19.00	188.746	22.76
6	2437	18.64	19.30	20.30	265.380	24.24
11	2462	17.00	16.70	18.74	171.710	22.35

802.11g

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1	Chain 2		
1	2412	13.43	14.42	15.23	83.041	19.19
6	2437	18.44	18.23	19.65	228.607	23.59
11	2462	13.13	13.14	14.85	71.714	18.56

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1	Chain 2		
1	2412	12.37	13.27	14.14	64.432	18.09
6	2437	18.42	18.55	19.83	237.277	23.75
11	2462	12.79	12.68	14.28	64.338	18.08

802.11n (HT40)

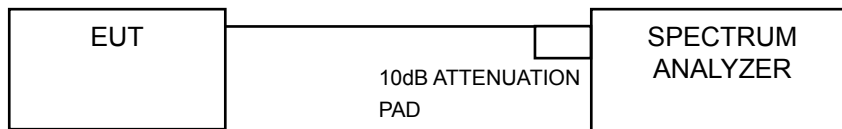
Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1	Chain 2		
3	2422	9.21	10.09	10.77	30.486	14.84
6	2437	12.58	13.59	14.23	67.454	18.29
9	2452	8.64	9.23	10.55	27.036	14.32

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

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

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)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-6.99	4.77	-2.22	5.23	Pass
	6	2437	-5.25	4.77	-0.48	5.23	Pass
	11	2462	-7.81	4.77	-3.04	5.23	Pass
1	1	2412	-8.08	4.77	-3.31	5.23	Pass
	6	2437	-5.98	4.77	-1.21	5.23	Pass
	11	2462	-7.16	4.77	-2.39	5.23	Pass
2	1	2412	-7.17	4.77	-2.40	5.23	Pass
	6	2437	-5.58	4.77	-0.81	5.23	Pass
	11	2462	-8.28	4.77	-3.51	5.23	Pass

NOTE:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 4dBi + 10log(3) = 8.77dBi, so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-13.91	4.77	-9.14	5.23	Pass
	6	2437	-8.89	4.77	-4.12	5.23	Pass
	11	2462	-12.52	4.77	-7.75	5.23	Pass
1	1	2412	-13.33	4.77	-8.56	5.23	Pass
	6	2437	-8.86	4.77	-4.09	5.23	Pass
	11	2462	-13.44	4.77	-8.67	5.23	Pass
2	1	2412	-12.54	4.77	-7.77	5.23	Pass
	6	2437	-9.38	4.77	-4.61	5.23	Pass
	11	2462	-12.32	4.77	-7.55	5.23	Pass

NOTE:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 4dBi + 10log(3) = 8.77dBi, so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-15.71	4.77	-10.94	5.23	Pass
	6	2437	-8.01	4.77	-3.24	5.23	Pass
	11	2462	-14.73	4.77	-9.96	5.23	Pass
1	1	2412	-14.35	4.77	-9.58	5.23	Pass
	6	2437	-10.11	4.77	-5.34	5.23	Pass
	11	2462	-14.58	4.77	-9.81	5.23	Pass
2	1	2412	-13.48	4.77	-8.71	5.23	Pass
	6	2437	-7.54	4.77	-2.77	5.23	Pass
	11	2462	-13.88	4.77	-9.11	5.23	Pass

NOTE:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 4dBi + 10log(3) = 8.77dBi, so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	3	2422	-23.21	4.77	-18.44	5.23	Pass
	6	2437	-19.34	4.77	-14.57	5.23	Pass
	9	2452	-23.00	4.77	-18.23	5.23	Pass
1	3	2422	-21.52	4.77	-16.75	5.23	Pass
	6	2437	-17.40	4.77	-12.63	5.23	Pass
	9	2452	-21.96	4.77	-17.19	5.23	Pass
2	3	2422	-20.99	4.77	-16.22	5.23	Pass
	6	2437	-16.90	4.77	-12.13	5.23	Pass
	9	2452	-20.66	4.77	-15.89	5.23	Pass

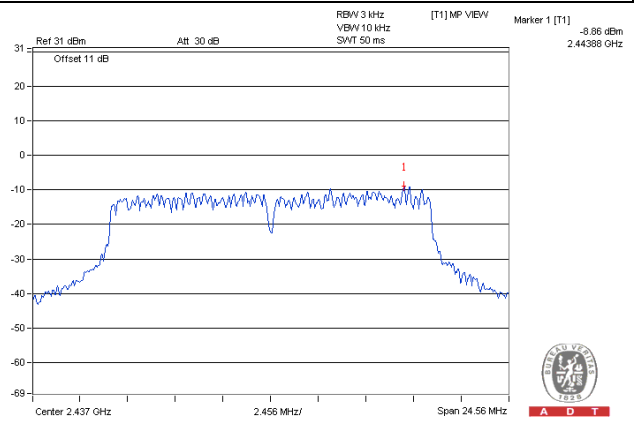
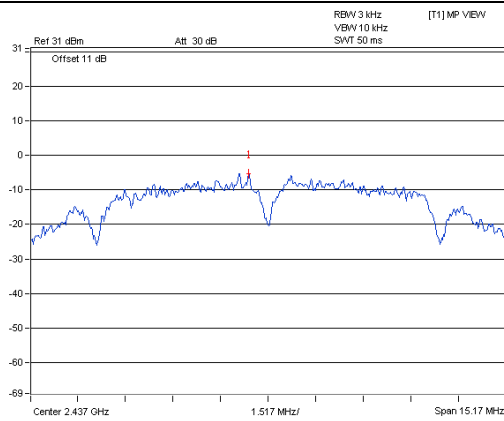
NOTE:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 4dBi + 10log(3) = 8.77dBi, so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.

Spectrum Plot of Worst Value

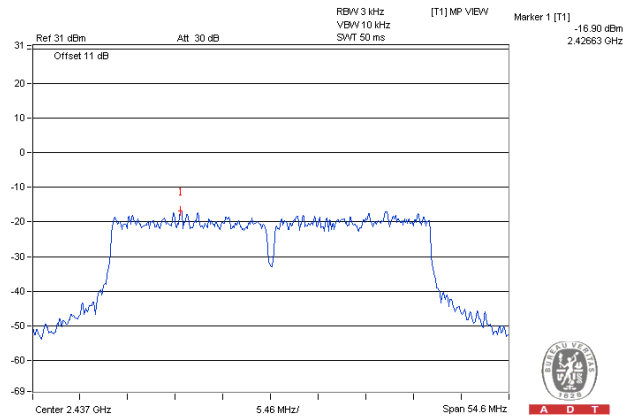
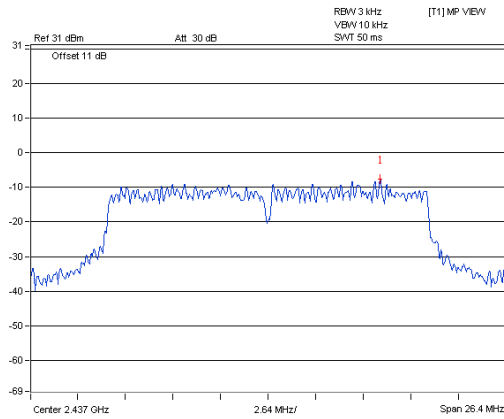
802.11b

802.11g



802.11n (HT20)

802.11n (HT40)

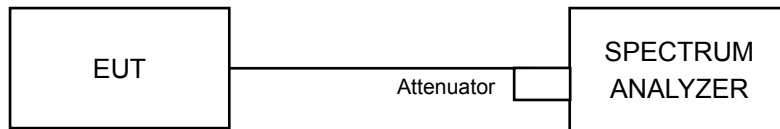


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20dB 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. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

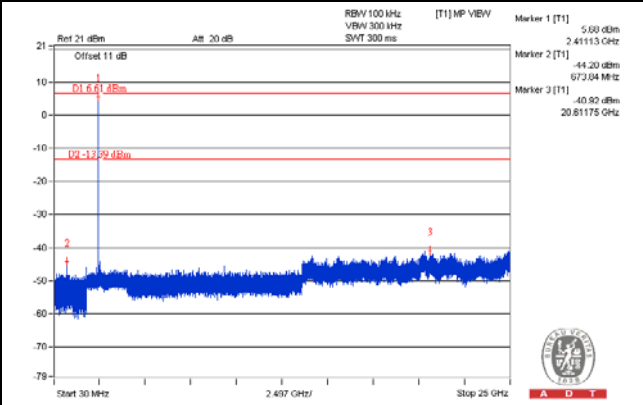
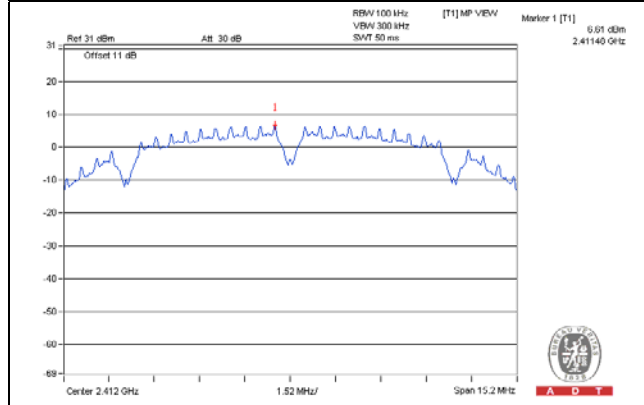
Same as Item 4.3.6

4.6.7 Test Results

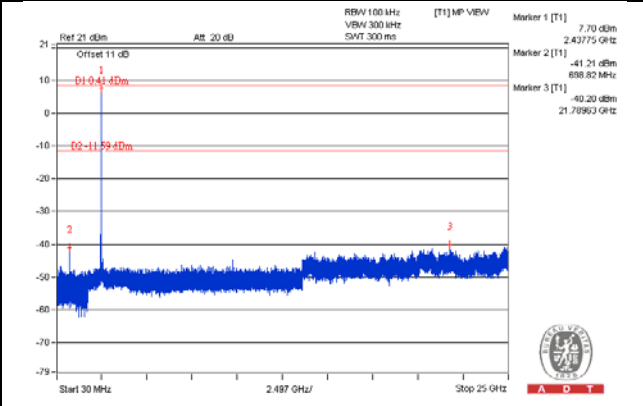
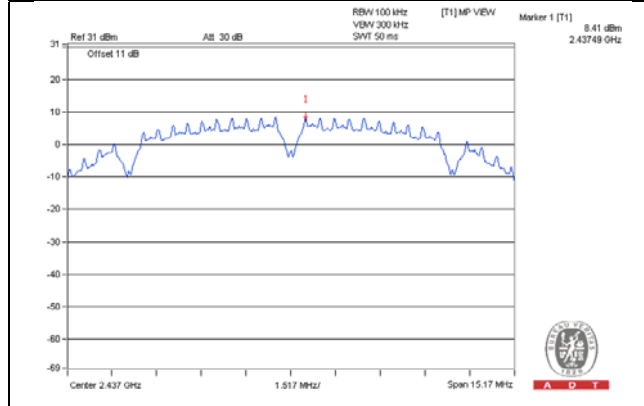
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b CHAIN 0

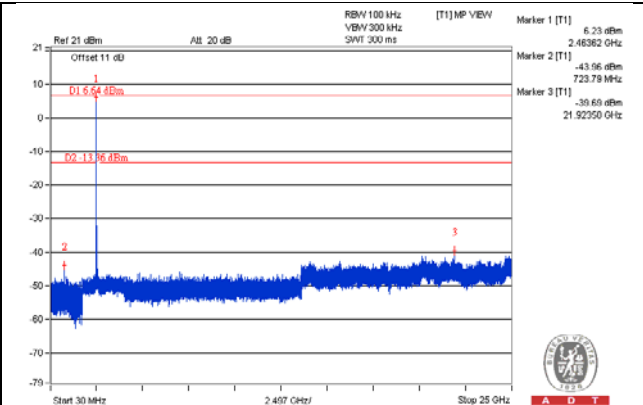
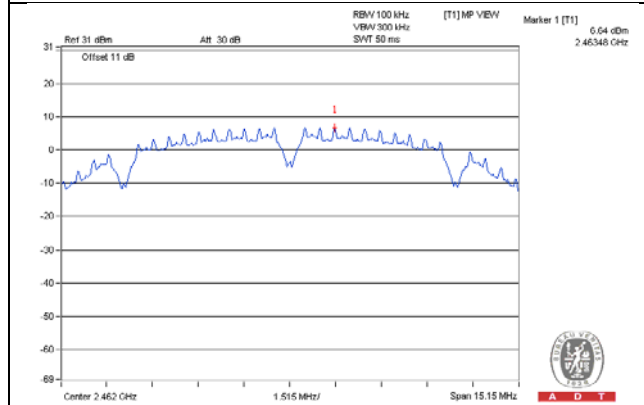
CH 1



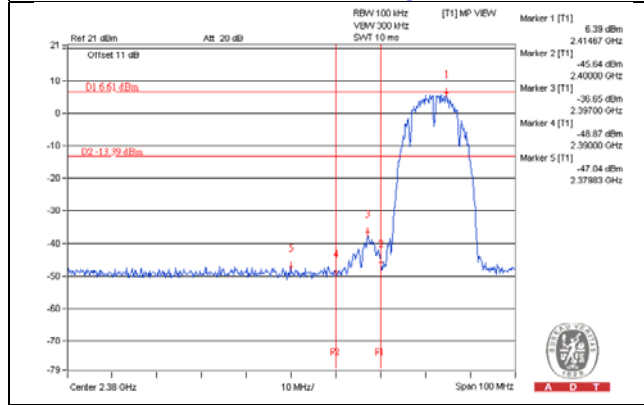
CH 6



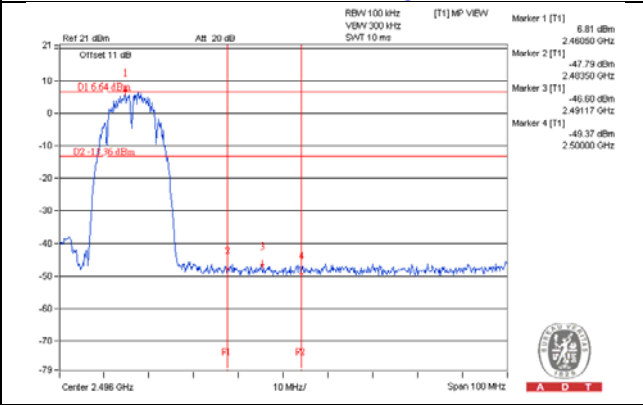
CH 11



CH 1 Band edge

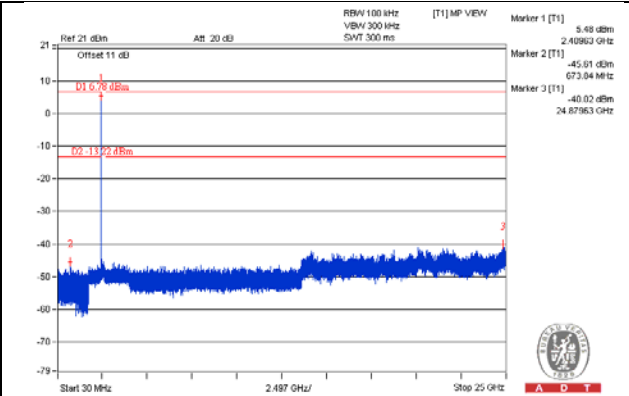
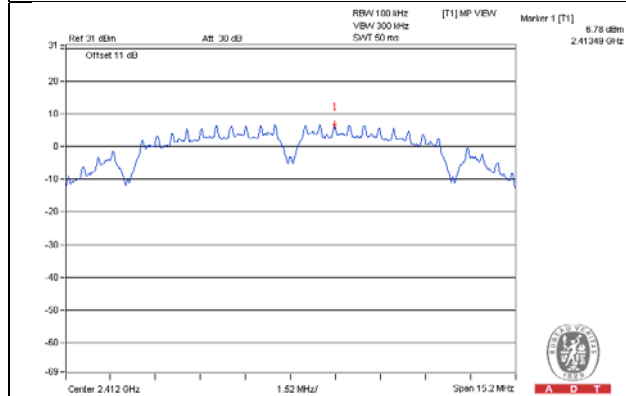


CH 11 Band edge

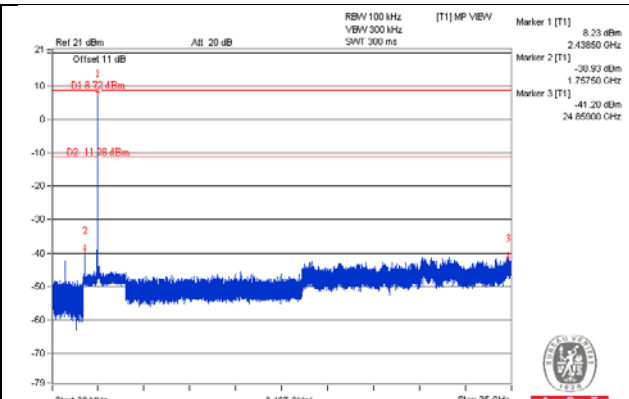
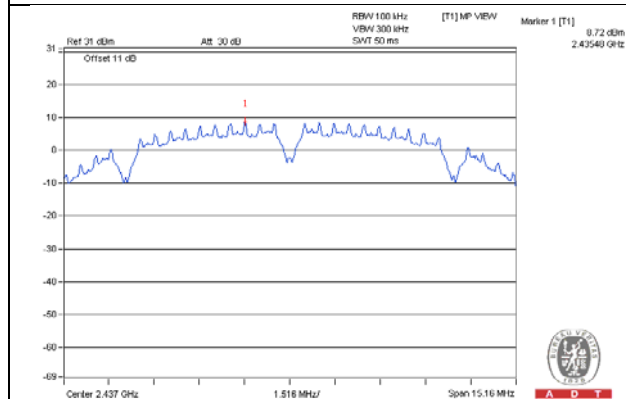


CHAIN 1

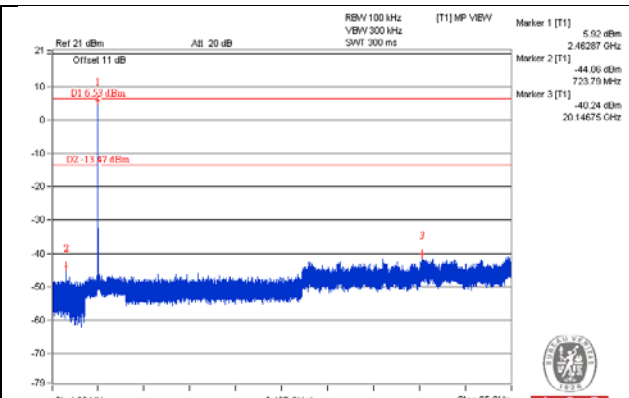
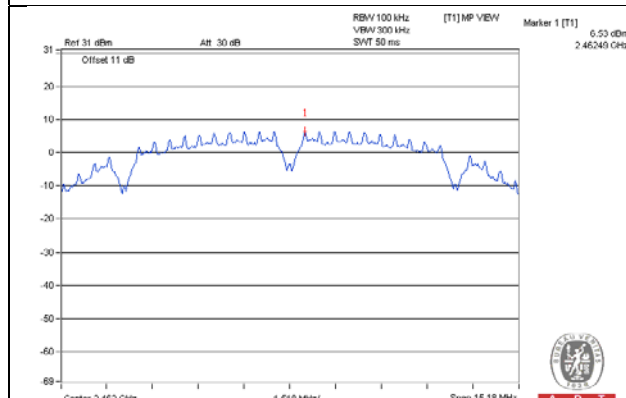
CH 1



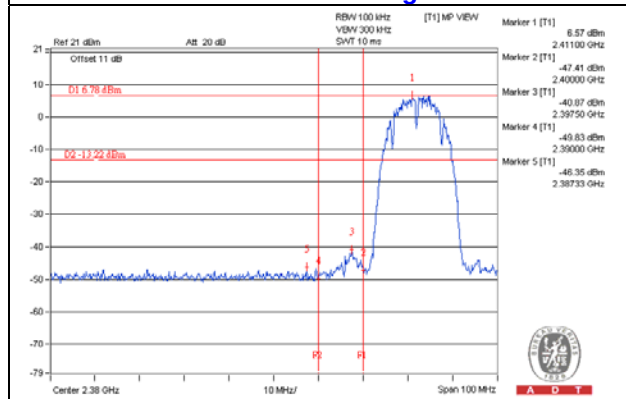
CH 6



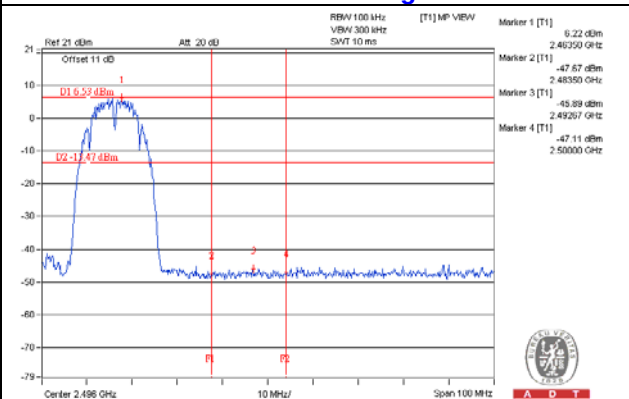
CH 11



CH 1 Band edge

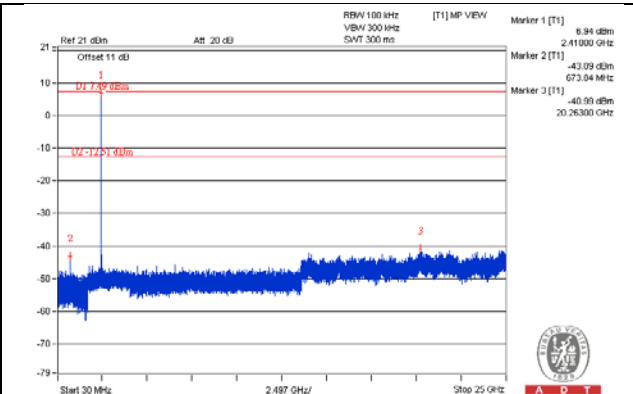
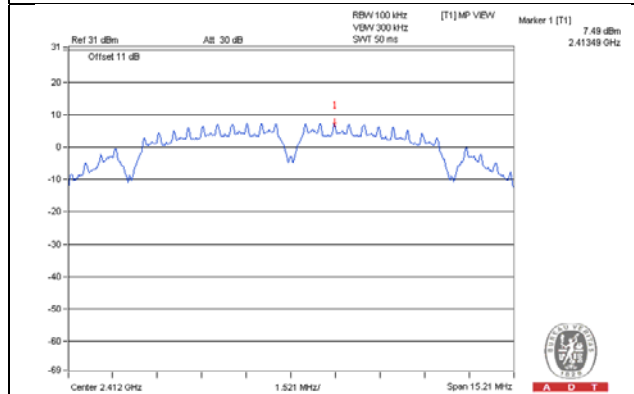


CH 11 Band edge

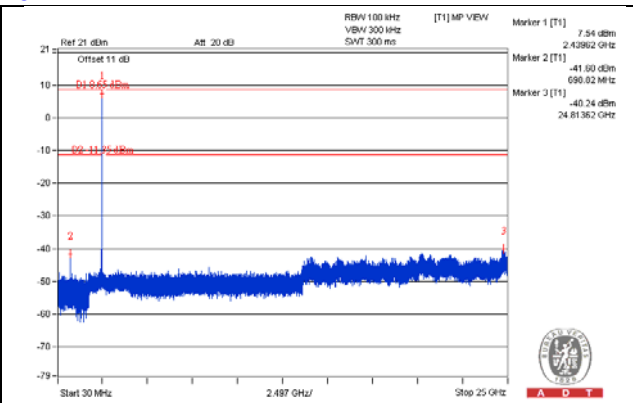
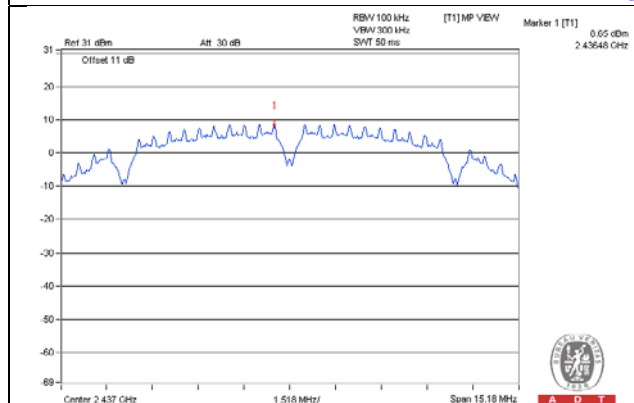


CHAIN 2

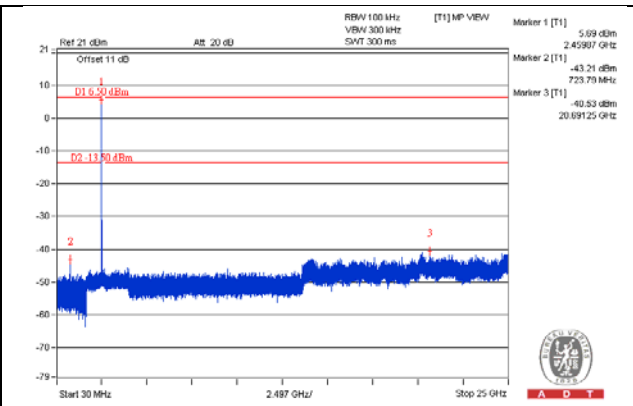
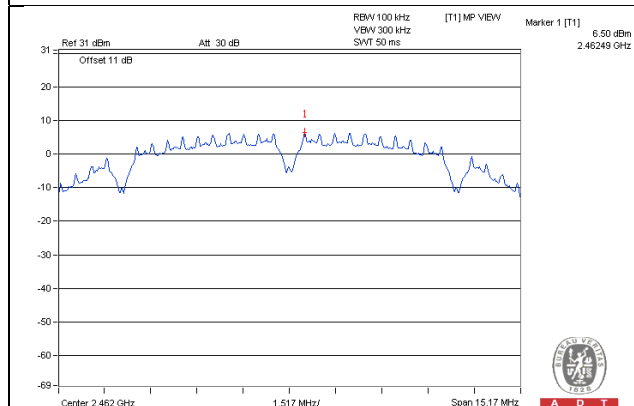
CH 1



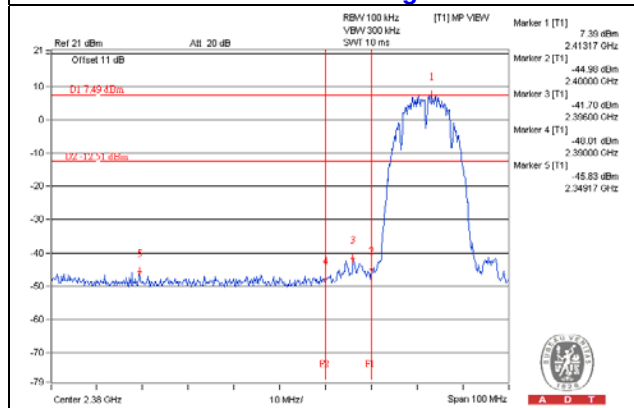
CH 6



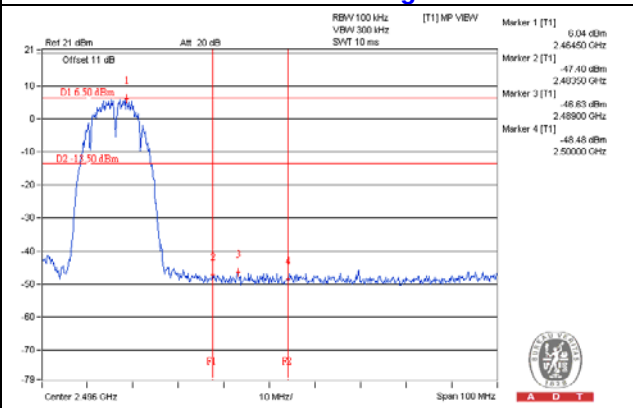
CH 11



CH 1 Band edge

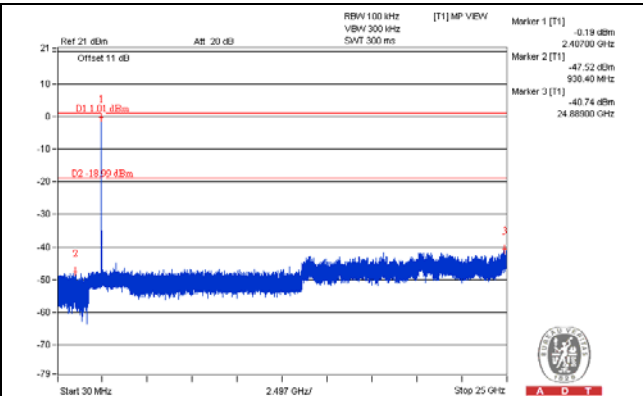
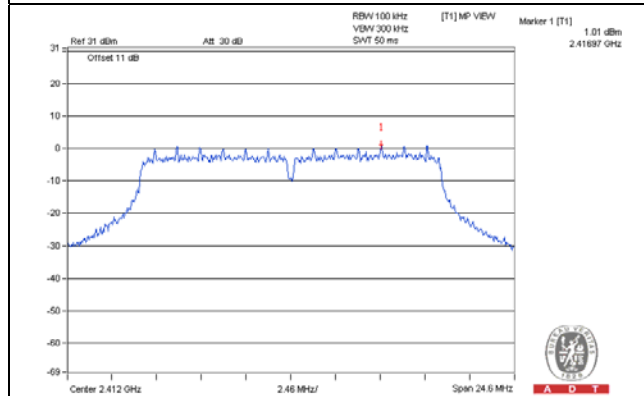


CH 11 Band edge

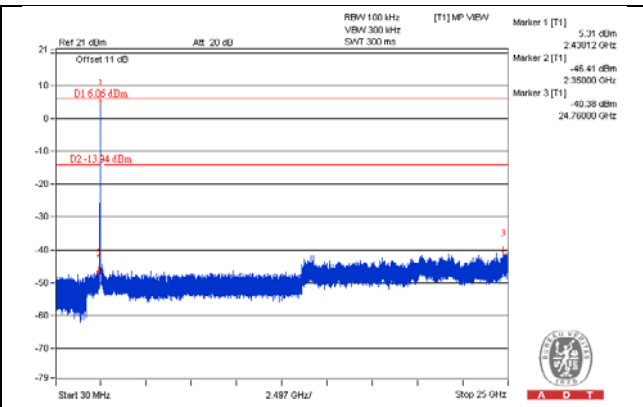
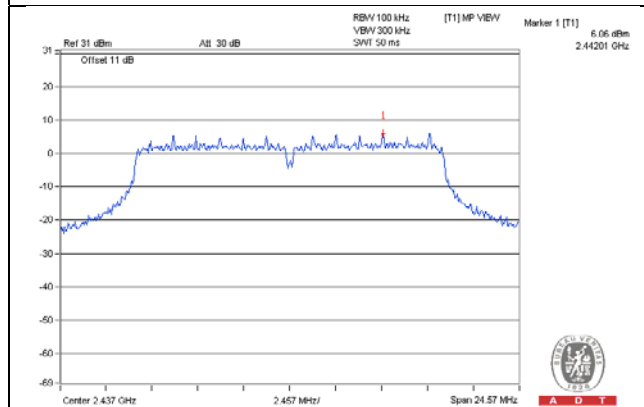


802.11g CHAIN 0

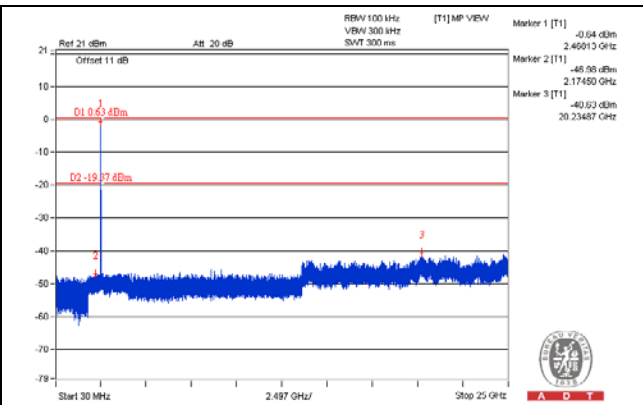
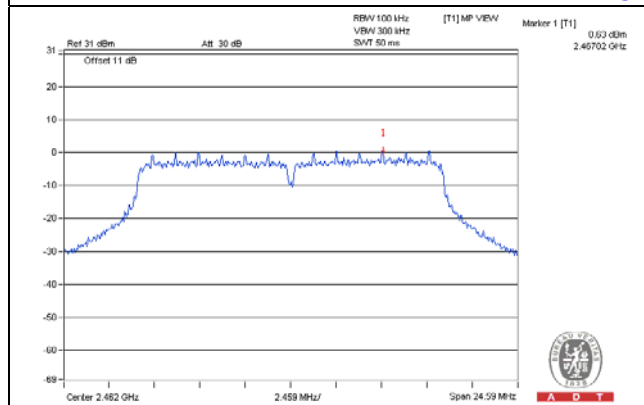
CH 1



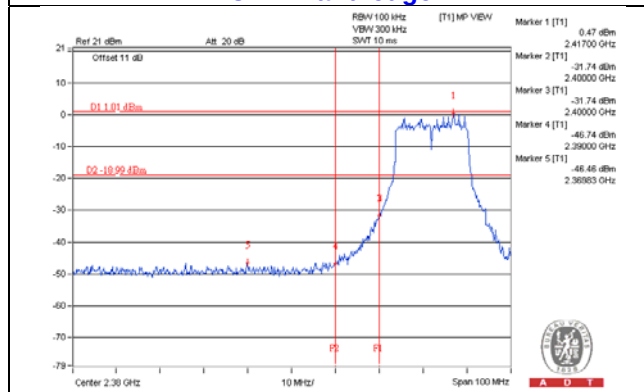
CH 6



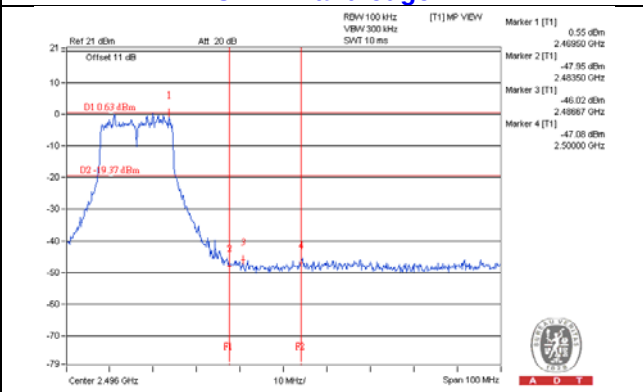
CH 11



CH 1 Band edge

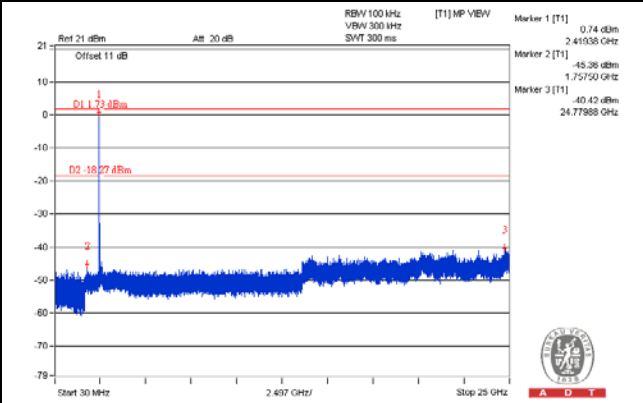
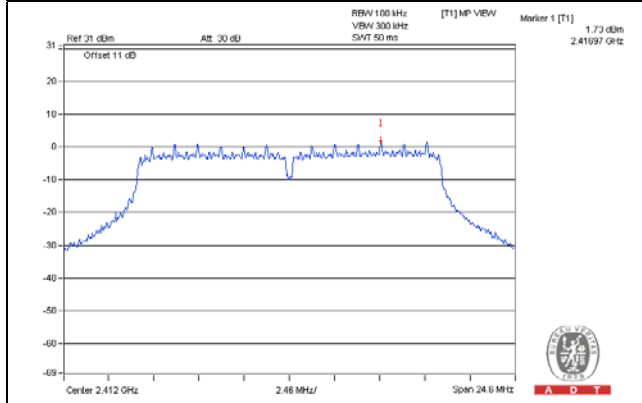


CH 11 Band edge

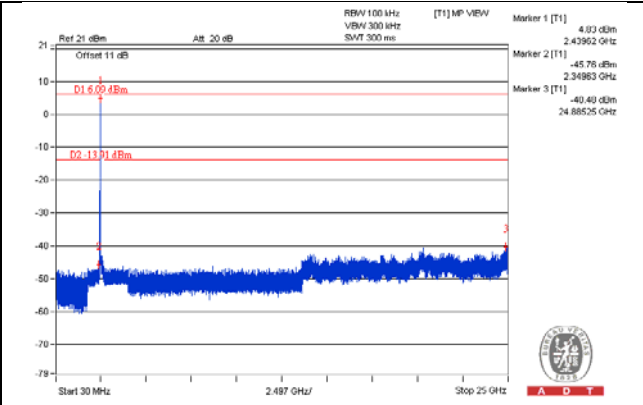
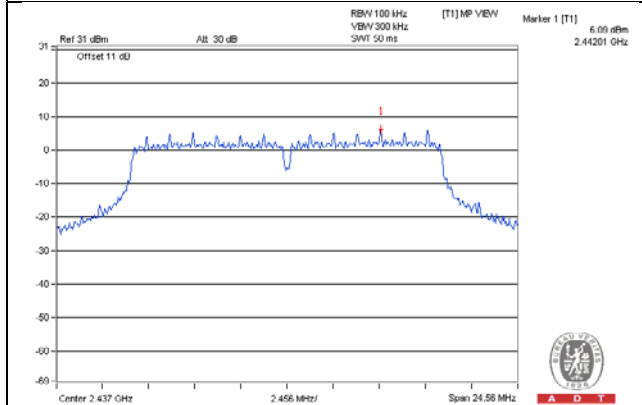


CHAIN 1

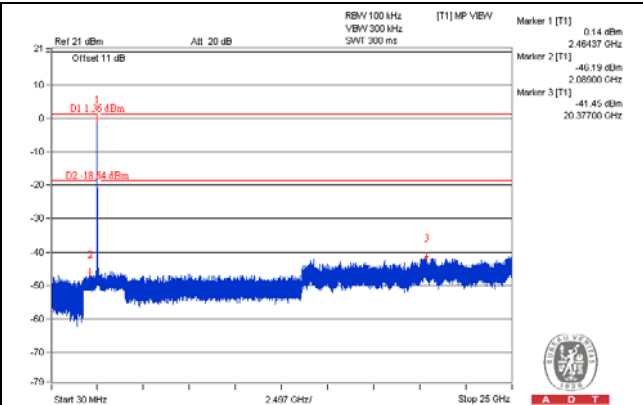
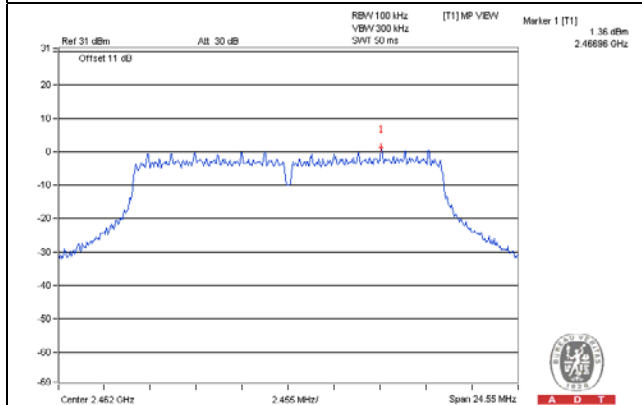
CH 1



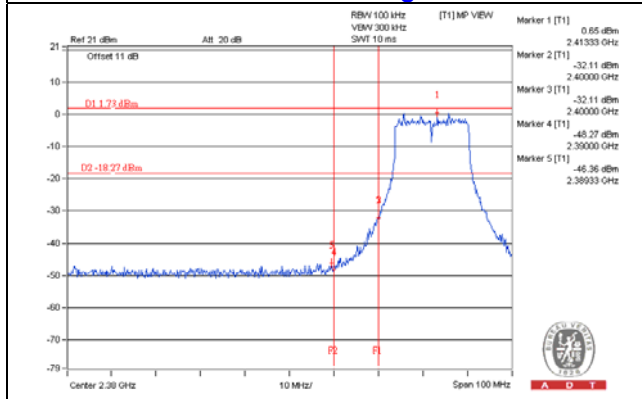
CH 6



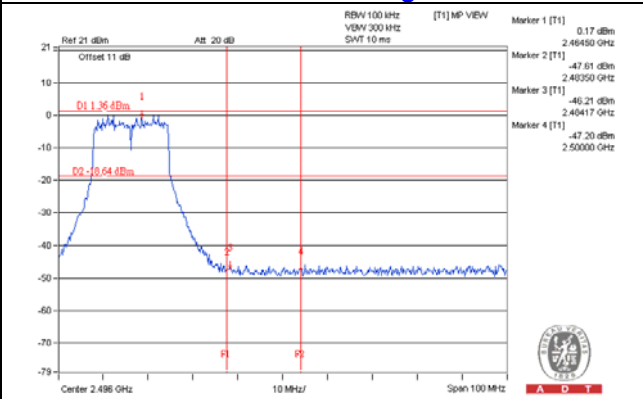
CH 11



CH 1 Band edge

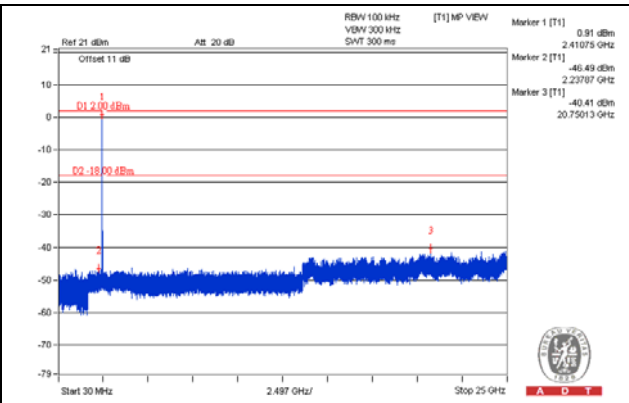
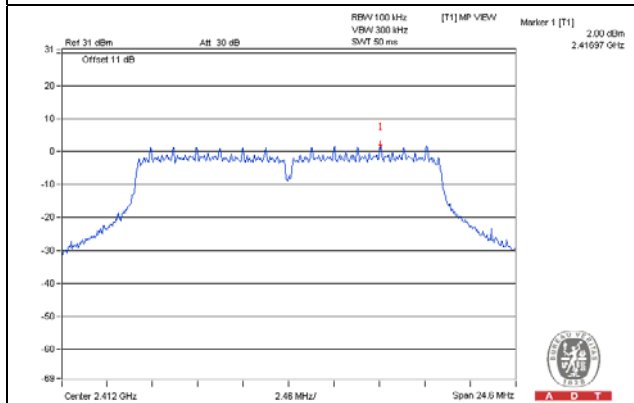


CH 11 Band edge

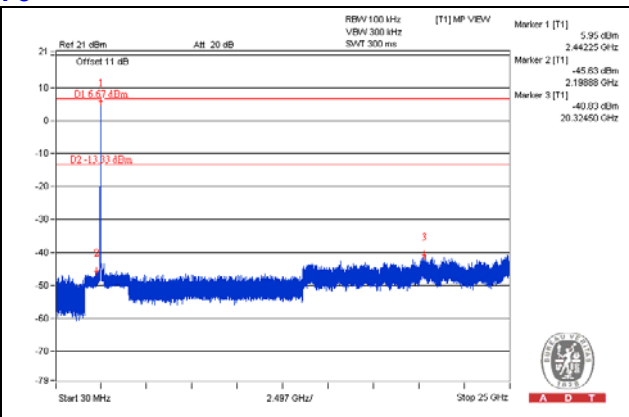
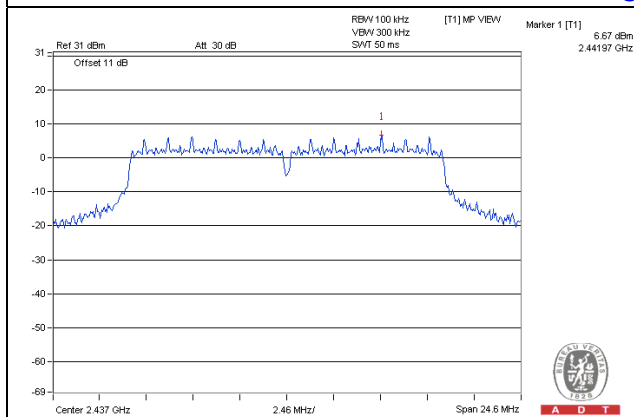


CHAIN 2

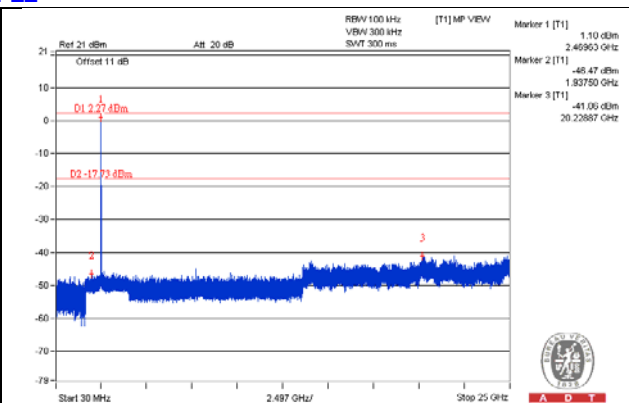
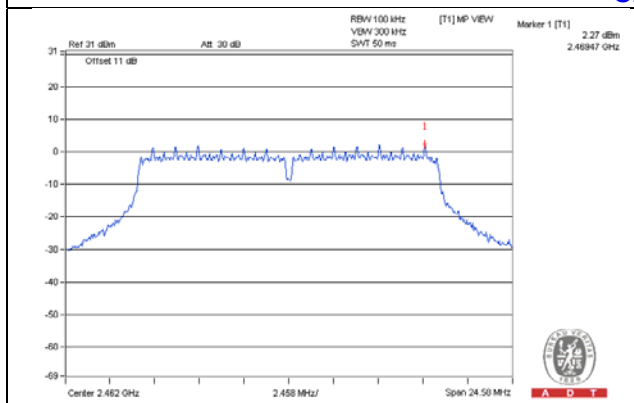
CH 1



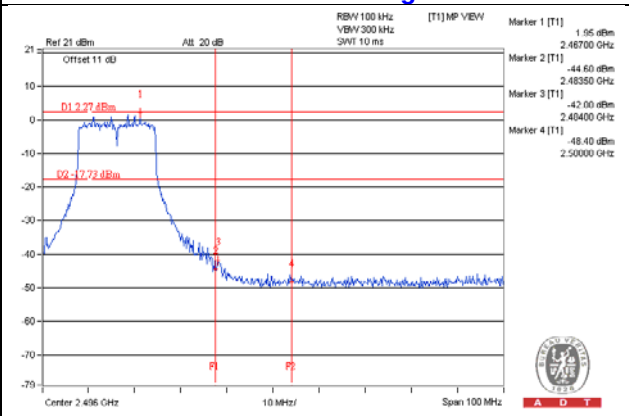
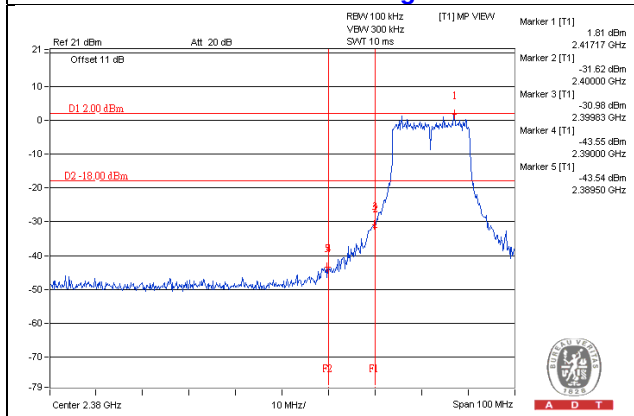
CH 6



CH 11

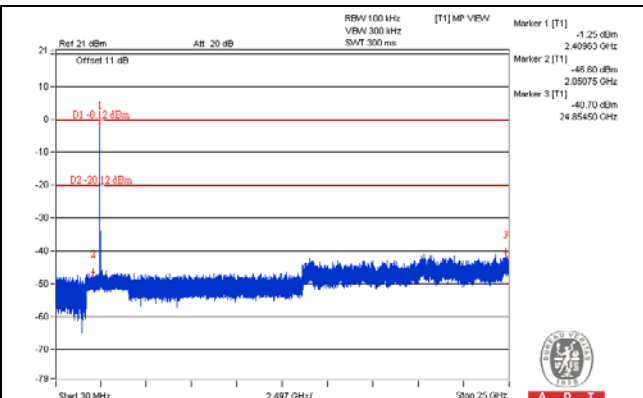
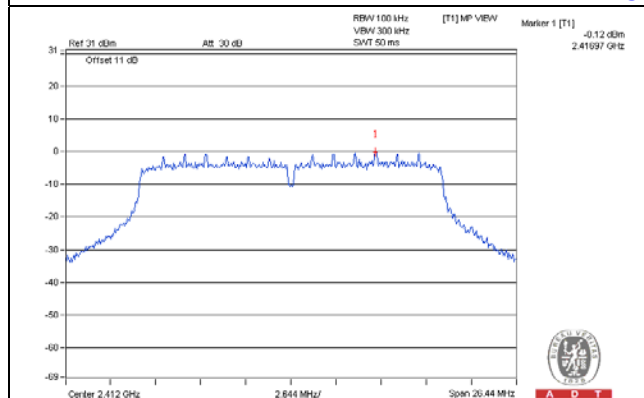


CH 1 Band edge

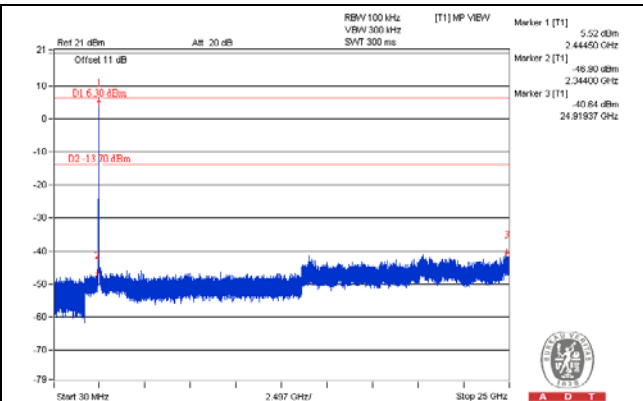
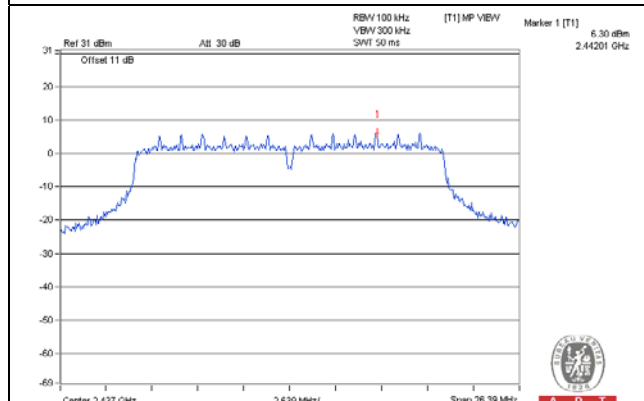


802.11n (HT20) CHAIN 0

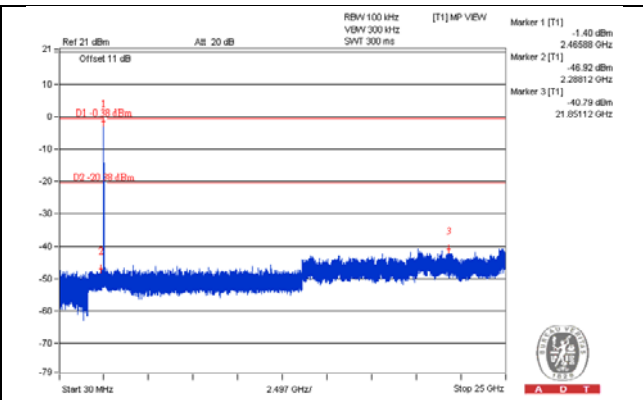
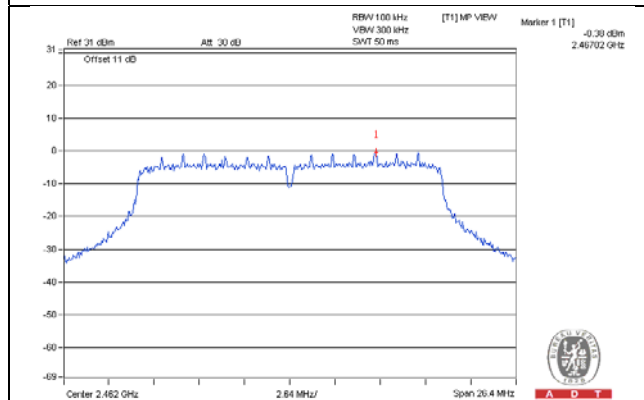
CH 1



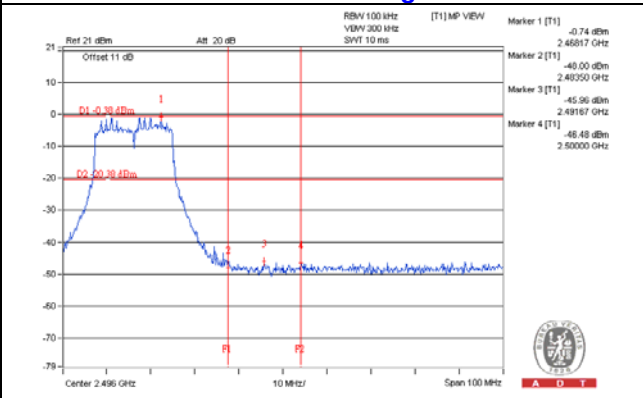
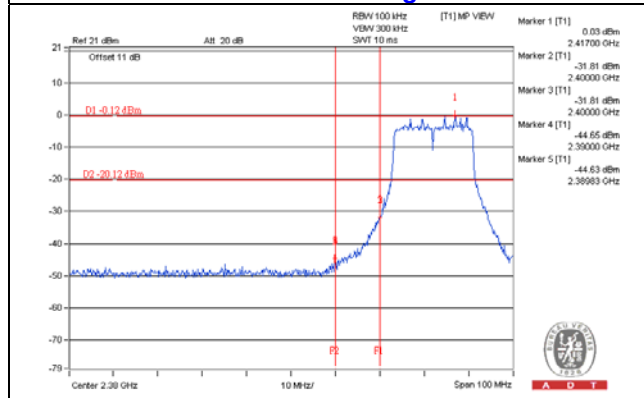
CH 6



CH 11

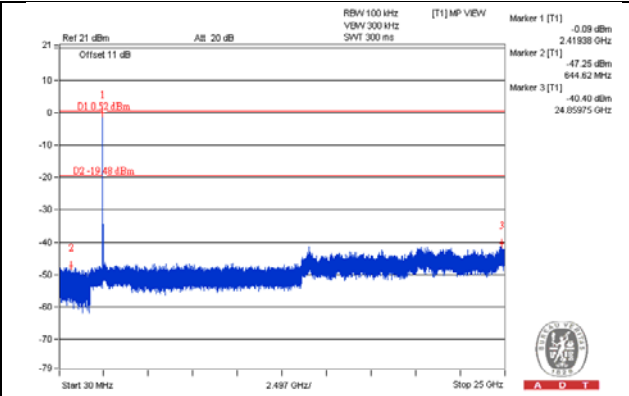
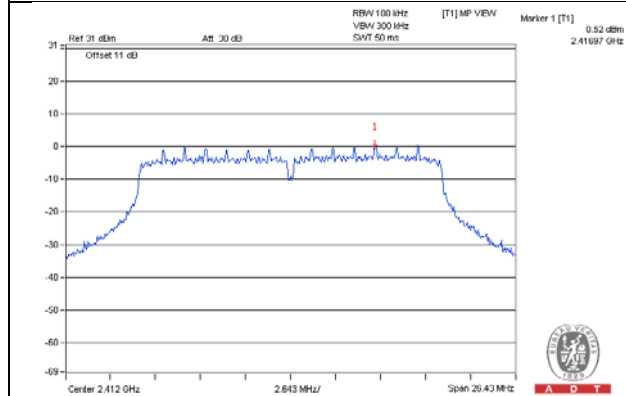


CH 1 Band edge

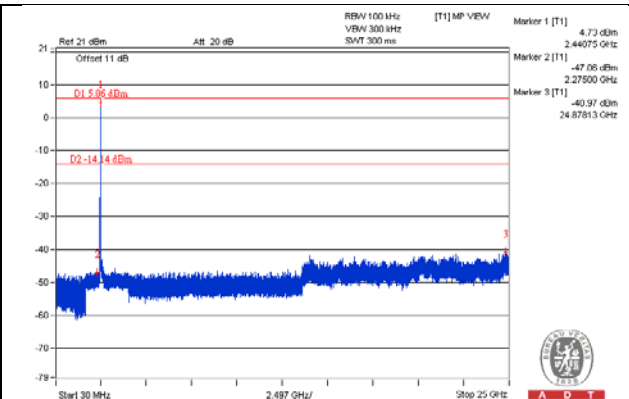
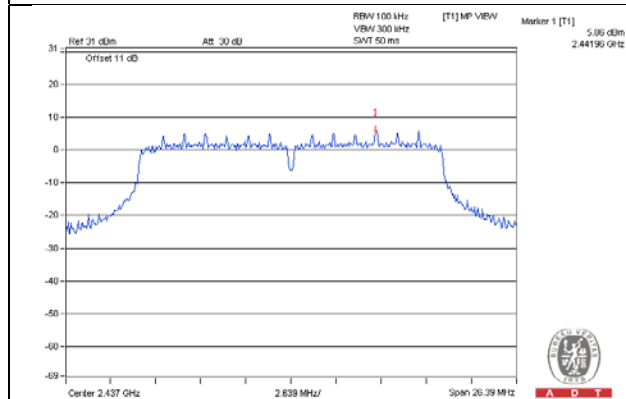


CHAIN 1

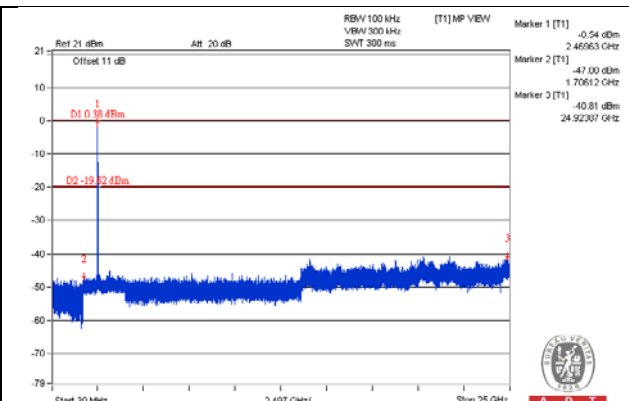
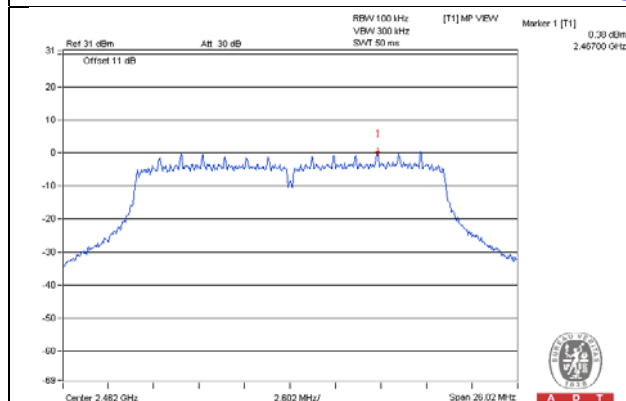
CH 1



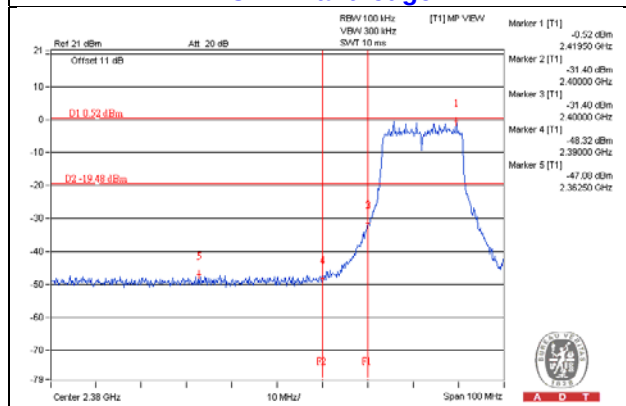
CH 6



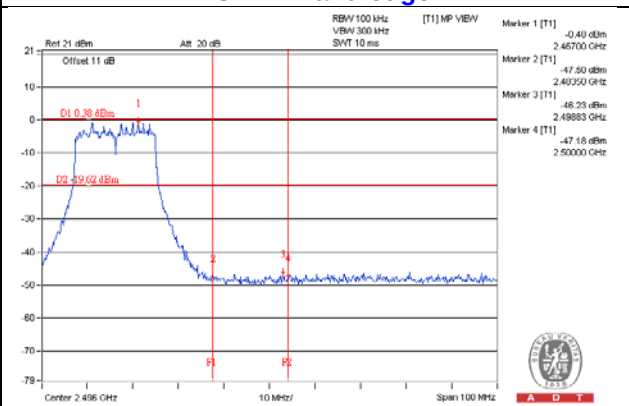
CH 11



CH 1 Band edge

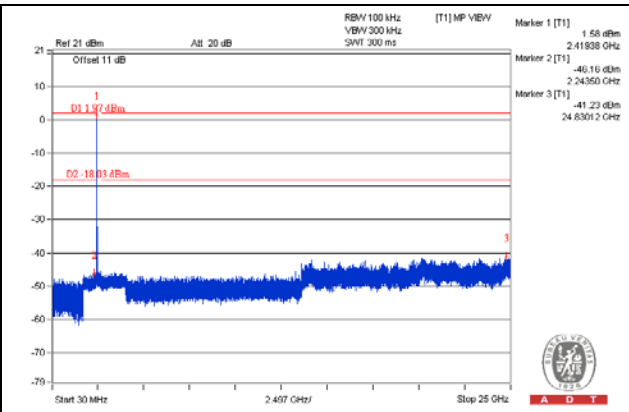
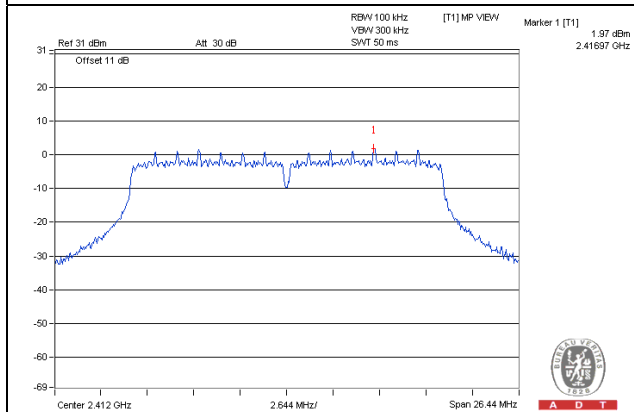


CH 11 Band edge

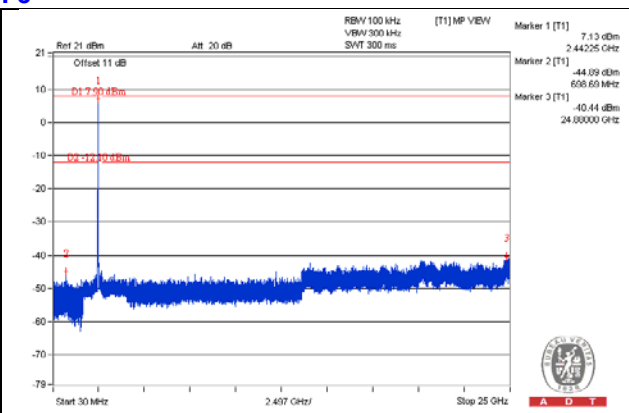
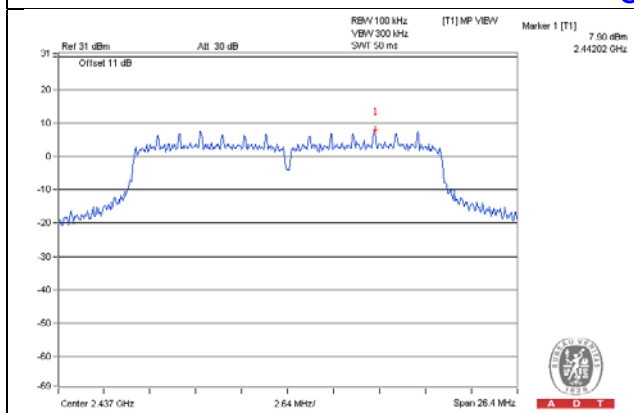


CHAIN 2

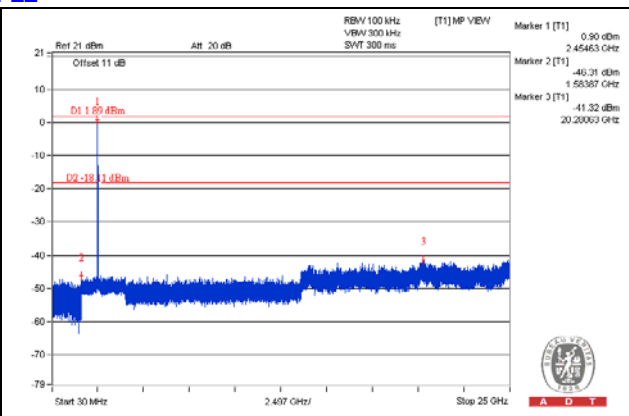
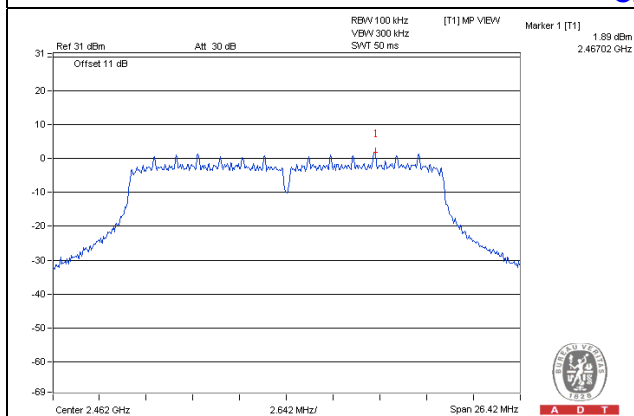
CH 1



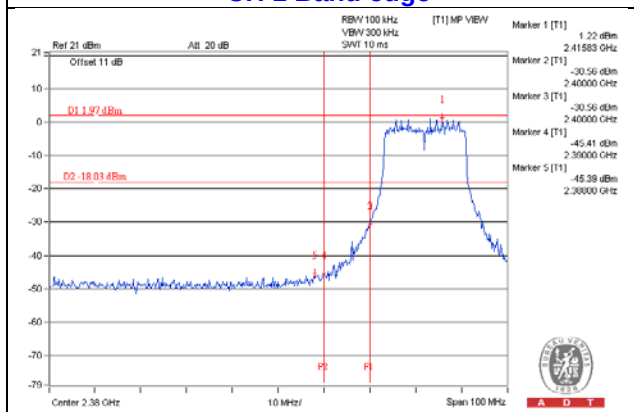
CH 6



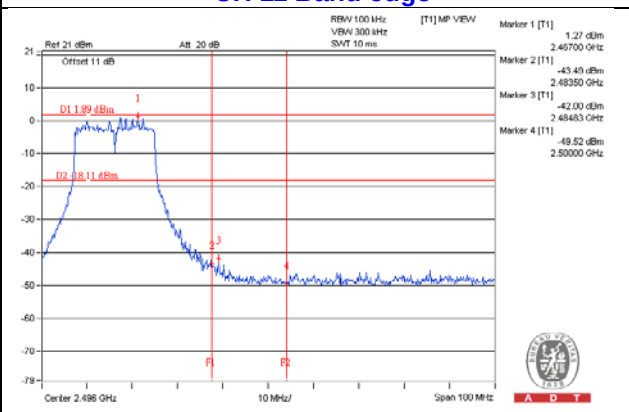
CH 11



CH 1 Band edge

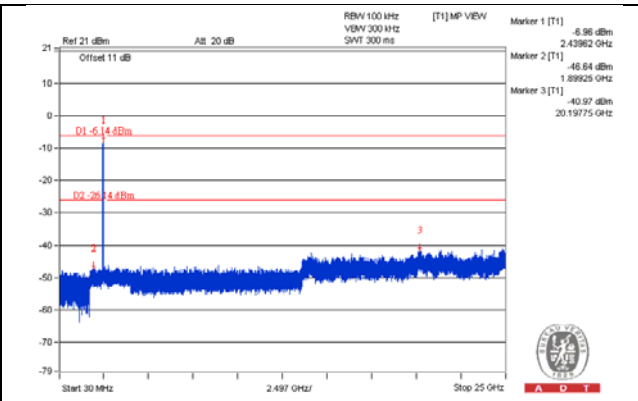
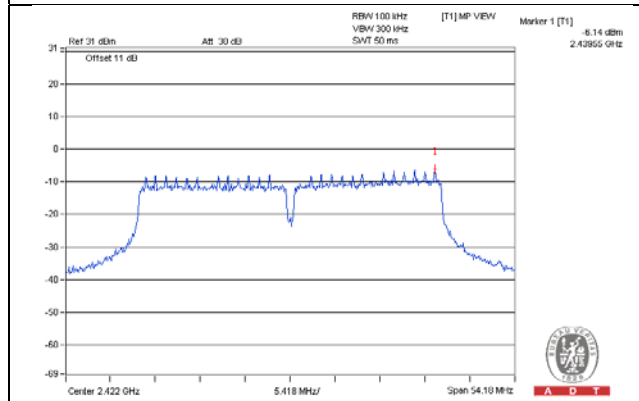


CH 11 Band edge

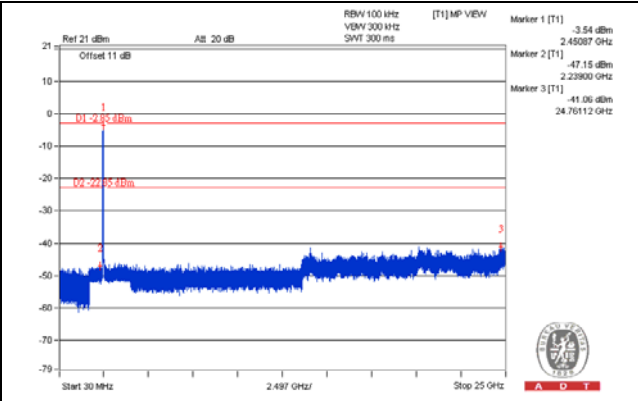
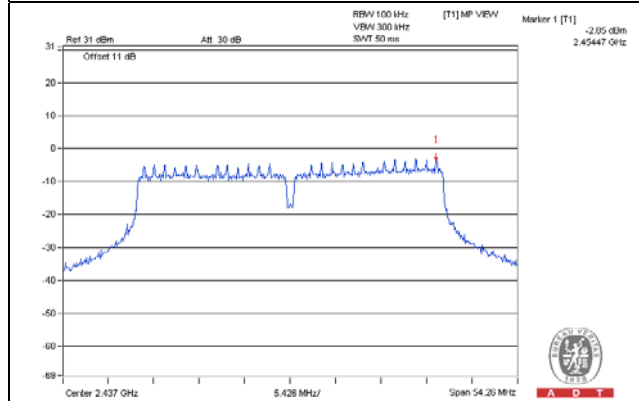


802.11n (HT40) CHAIN 0

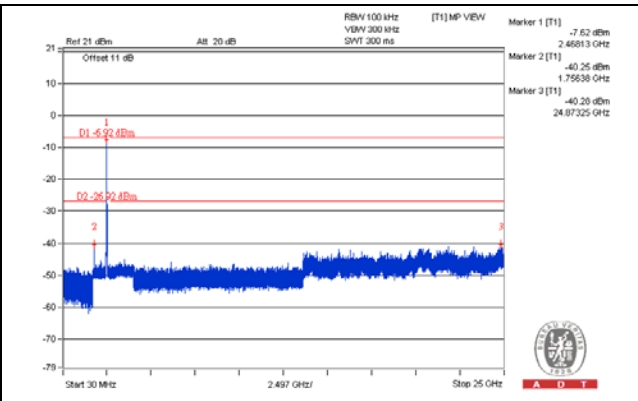
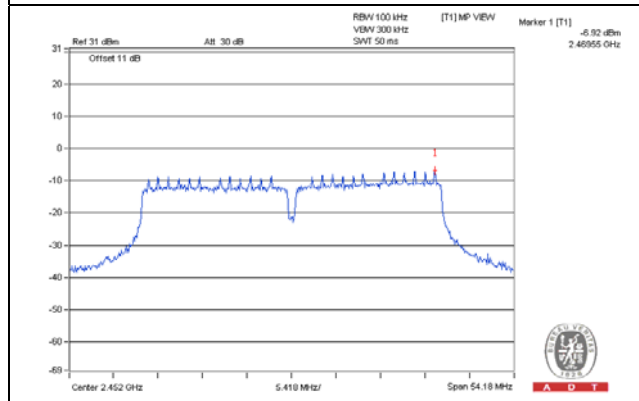
CH 3



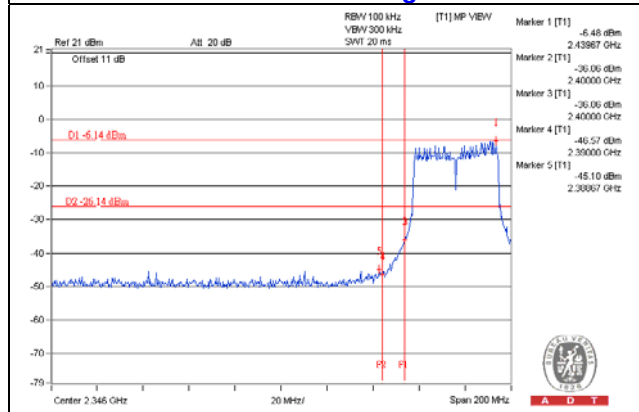
CH 6



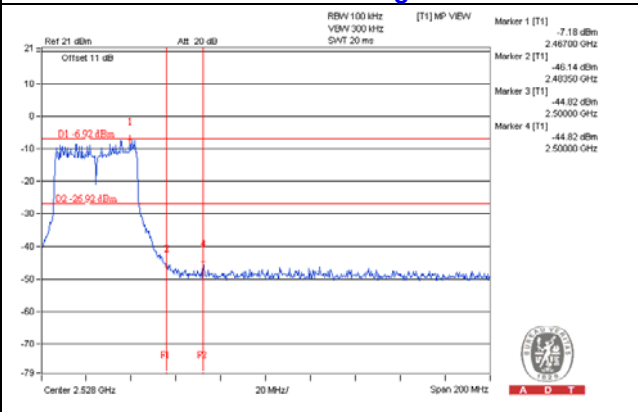
CH 9



CH 3 Band edge

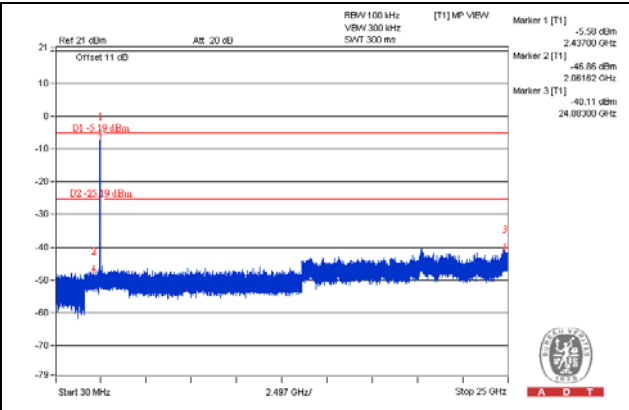
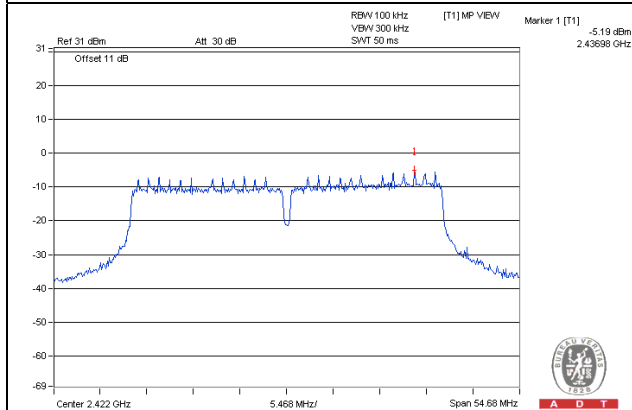


CH 9 Band edge

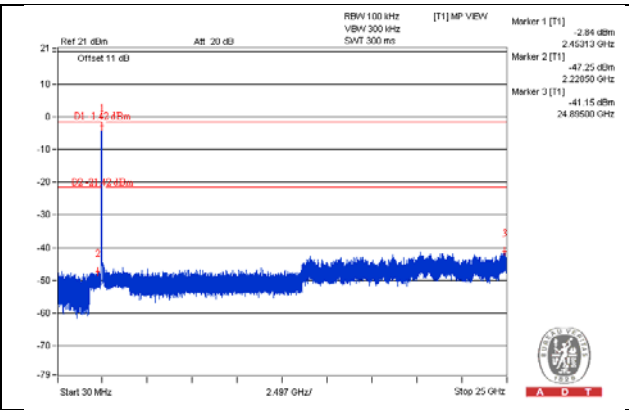
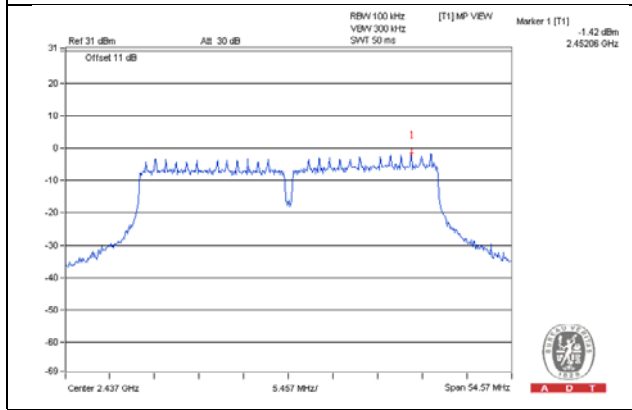


CHAIN 1

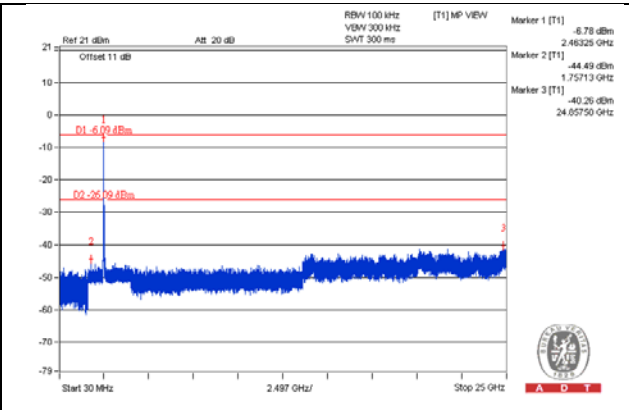
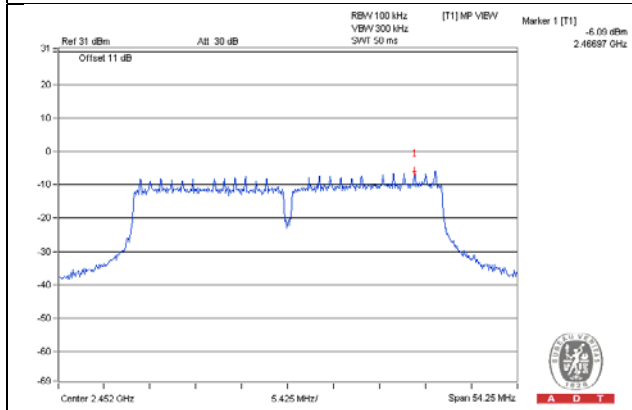
CH 3



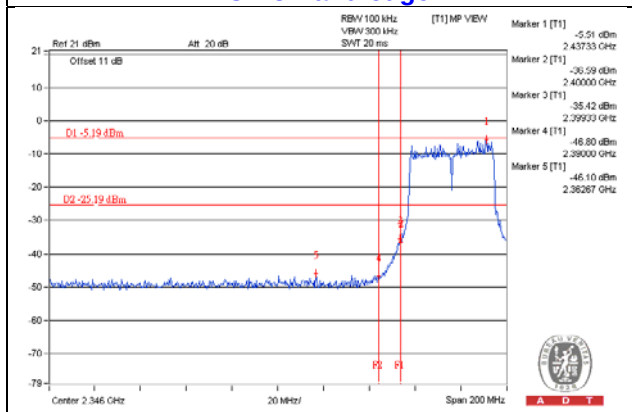
CH 6



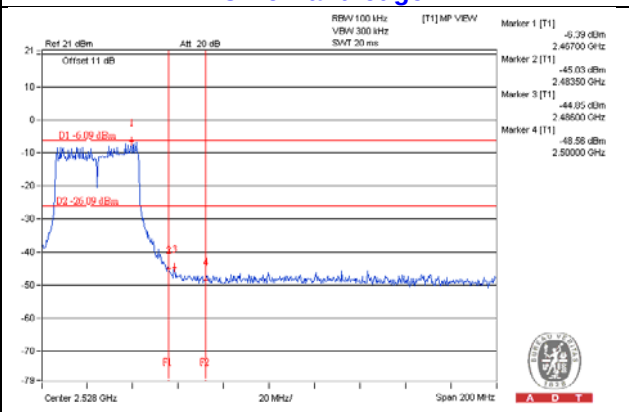
CH 9



CH 3 Band edge

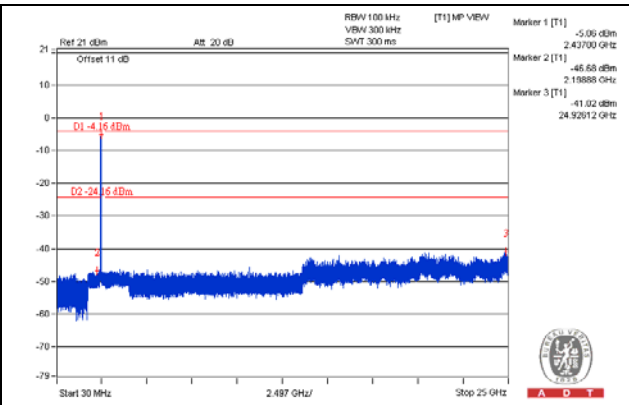
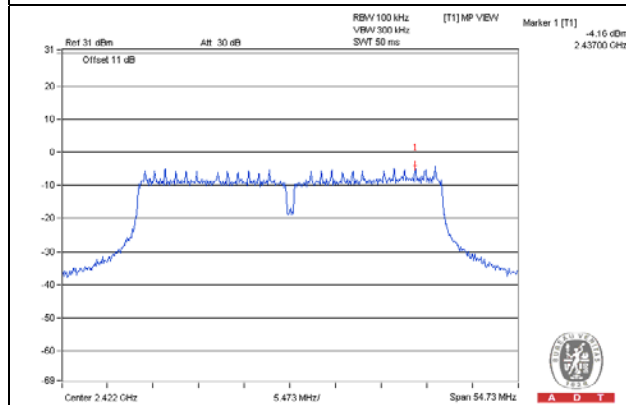


CH 9 Band edge

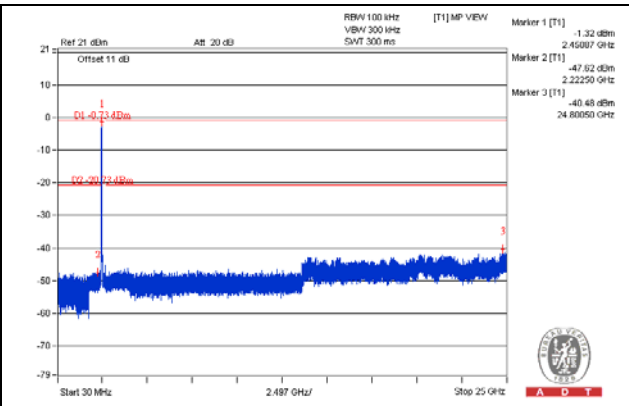
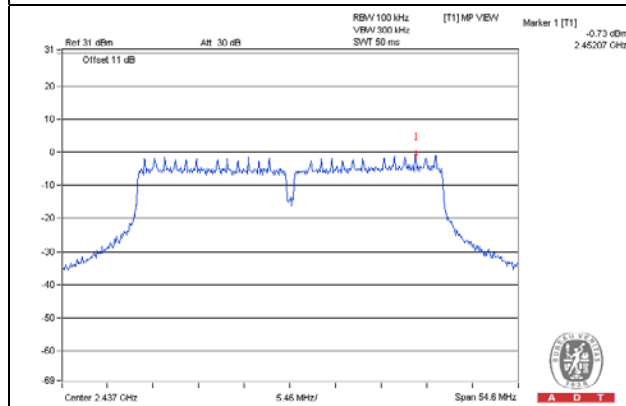


CHAIN 2

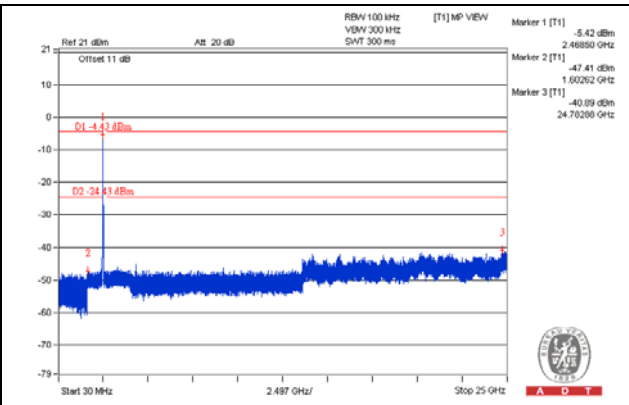
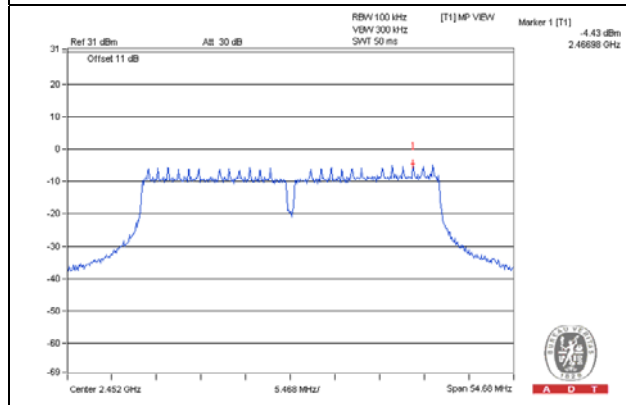
CH 3



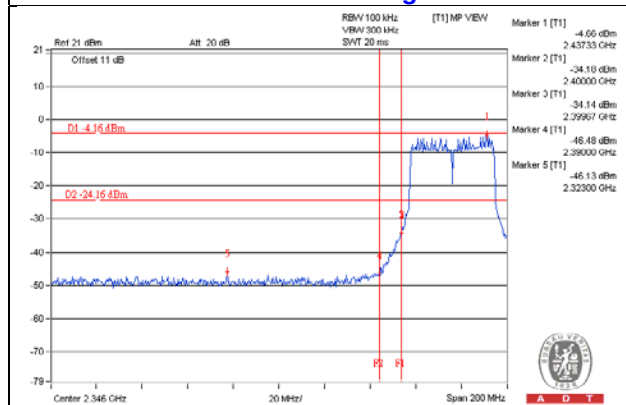
CH 6



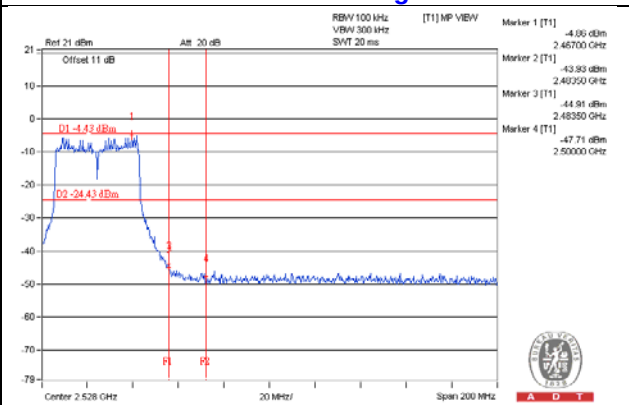
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

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

Appendix – 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/Telecom Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety 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.

--- END ---