

## FCC Test Report

**Report No.:** RF160311D14

**FCC ID:** KA2DAP1860A1

**Test Model:** DAP-1860

**Received Date:** Mar. 14, 2016

**Test Date:** Mar. 14 ~ Apr. 19, 2016

**Issued Date:** May 13, 2016

**Applicant:** D-Link Corporation

**Address:** 17595 Mt. Hermann, Fountain Valley, CA 92708, U.S.A.

**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 (R.O.C.)



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### Release Control Record

Issue No.	Description	Date Issued
RF160311D14	Original release.	May 13, 2016

## 1 Certificate of Conformity

**Product:** AC2600 Wi-Fi Range Extender

**Brand:** D-Link

**Test Model:** DAP-1860

**Sample Status:** Engineering sample

**Applicant:** D-Link Corporation

**Test Date:** Mar. 14 ~ Apr. 19, 2016

**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 :**

*Annie Chang*

,

**Date:**

May 13, 2016

Annie Chang / Senior Specialist

**Approved by :**

*Rex Lai*

,

**Date:**

May 13, 2016

Rex Lai / Assistant 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 -13.20dB at 10.86328MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2390.00 MHz, 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 I-PEX 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	Expanded Uncertainty (k=2) ( $\pm$ )
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.78 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1000MHz	4.00 dB
Radiated Emissions above 1 GHz	1GHz ~ 40GHz	3.36 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

Product	AC2600 Wi-Fi Range Extender
Brand	D-Link
Test Model	DAP-1860
Status of EUT	Engineering sample
Power Supply Rating	100-240Vac, 50-60Hz, 0.5A
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 600Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
Output Power	658.312mW
Antenna Type	<b>CDD Mode:</b> PCB antenna with 2dBi gain <b>Beamforming Mode:</b> PCB antenna with 6.96dBi gain
Antenna Connector	I-PEX
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

- The EUT provides 4 completed transmitters and 4 receivers.

Modulation Mode	TX Function	
	2.4GHz (Non-Beamforming)	2.4GHz (Beamforming)
802.11b	4TX	-
802.11g	4TX	-
802.11n (20MHz)	4TX	4TX
802.11n (40MHz)	4TX	4TX

- 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 (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		



### 3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE≥1G**: Radiated Emission above 1GHz & Bandedge Measurement  
**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.

CDD Mode						
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	6.5
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
Beamforming Mode						
EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

#### **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.

CDD Mode						
EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	6	DSSS	DBPSK	1.0

### 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.

CDD Mode						
EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	6	DSSS	DBPSK	1.0

### 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.

CDD Mode						
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	6.5
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
Beamforming Mode						
EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

### Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	15deg. C, 73%RH	120Vac, 60Hz	Aaron You
RE $<$ 1G	15deg. C, 73%RH	120Vac, 60Hz	Aaron You
PLC	23deg. C, 69%RH	120Vac, 60Hz	Ian Chang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Dalen Dai

### 3.3 Duty Cycle of Test Signal

If duty cycle of test signal is  $\geq 98\%$ , duty factor is not required.

If duty cycle of test signal is  $< 98\%$ , duty factor shall be considered.

**802.11b:** Duty cycle of test signal is 100 %

**802.11g:** Duty cycle =  $1.378/1.704 = 0.809$ , Duty factor =  $10 * \log(1/0.809) = 0.92$

**802.11n (HT20):** Duty cycle =  $0.356/0.675 = 0.527$ , Duty factor =  $10 * \log(1/0.527) = 2.78$

**802.11n (HT40):** Duty cycle =  $0.188/0.513 = 0.366$ , Duty factor =  $10 * \log(1/0.366) = 4.36$



### 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	PP27L	8SNZ12S	FCC DoC Approved	Provided by Lab

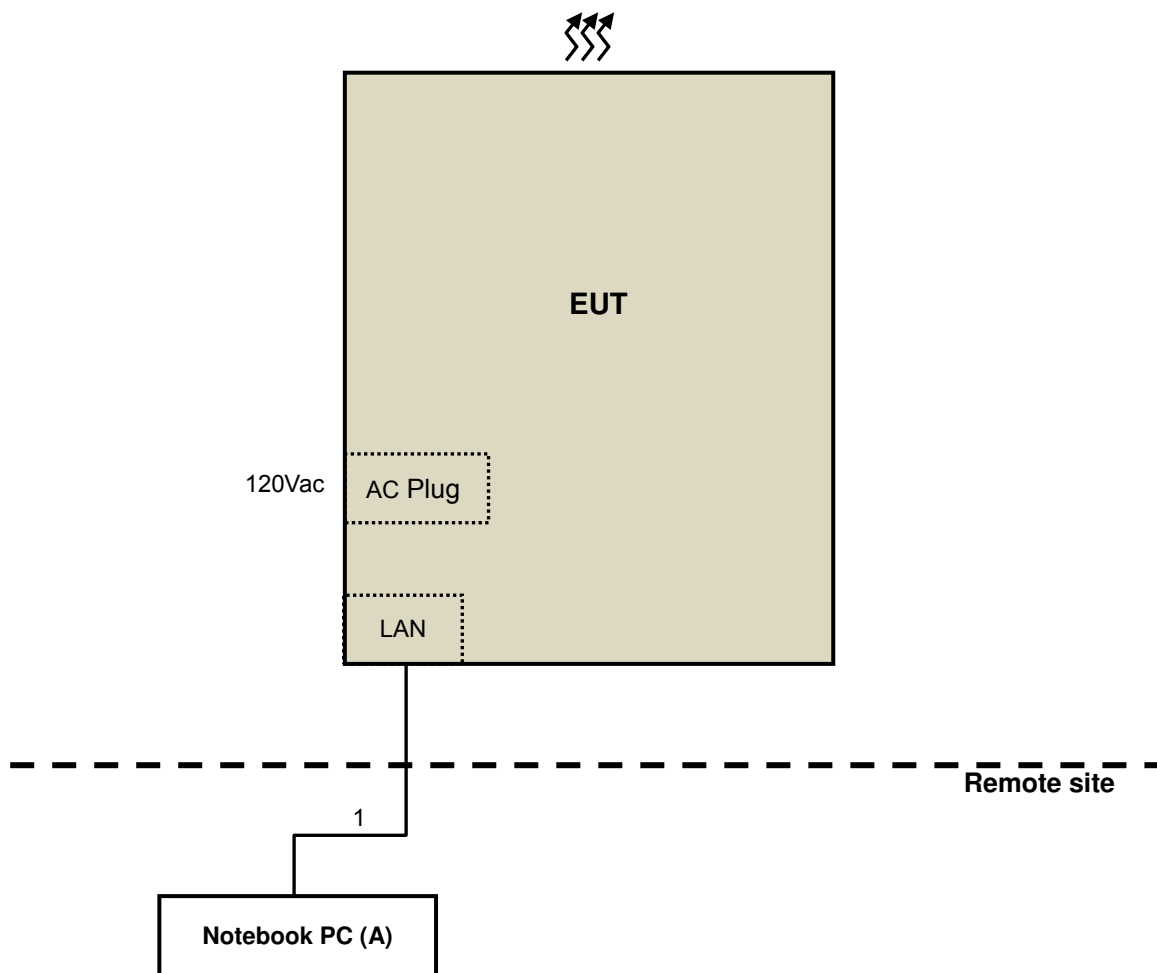
Note:

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.	RJ45 cable	1	10	N	0	Provided by Lab

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)**  
**KDB 558074 D01 DTS Meas Guidance v03r05**  
**KDB 662911 D01 Multiple Transmitter Output v02r01**  
ANSI C63.10-2013

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

## 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.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 26, 2016	Feb. 25, 2017
HP Preamplifier	8449B	3008A01201	Feb. 26, 2016	Feb. 25, 2017
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Mar. 01, 2016	Feb. 28, 2017
Agilent TEST RECEIVER	N9038A	MY51210129	Feb. 02, 2016	Feb. 01, 2017
Schwarzbeck Antenna	VULB 9168	139	Jan. 04, 2016	Jan. 03, 2017
Schwarzbeck Antenna	VHBA 9123	480	May 29, 2015	May 28, 2017
Schwarzbeck Horn Antenna	BBHA-9170	212	Jan. 08, 2016	Jan. 07, 2017
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Jan. 21, 2016	Jan. 20, 2017
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.4	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF104	CABLE-CH6	Aug. 15, 2015	Aug. 14, 2016
SUHNER RF cable With 3dB PAD	SF102	Cable-CH8-3.6m	Aug. 15, 2015	Aug. 14, 2016
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	May 04, 2015	May 03, 2016
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 14, 2015	Jul. 13, 2016
EMCO Horn Antenna	3115	00028257	Jan. 19, 2016	Jan. 18, 2017
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 23, 2015	Sep. 22, 2016
Anritsu Power Sensor	MA2411B	0738404	Apr. 21, 2015	Apr. 20, 2016
Anritsu Power Meter	ML2495A	0842014	Apr. 21, 2015	Apr. 20, 2016

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
  2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  3. The test was performed in Chamber No. 6.
  4. The Industry Canada Reference No. IC 7450E-6.
  5. The FCC Site Registration No. is 447212.

#### 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.

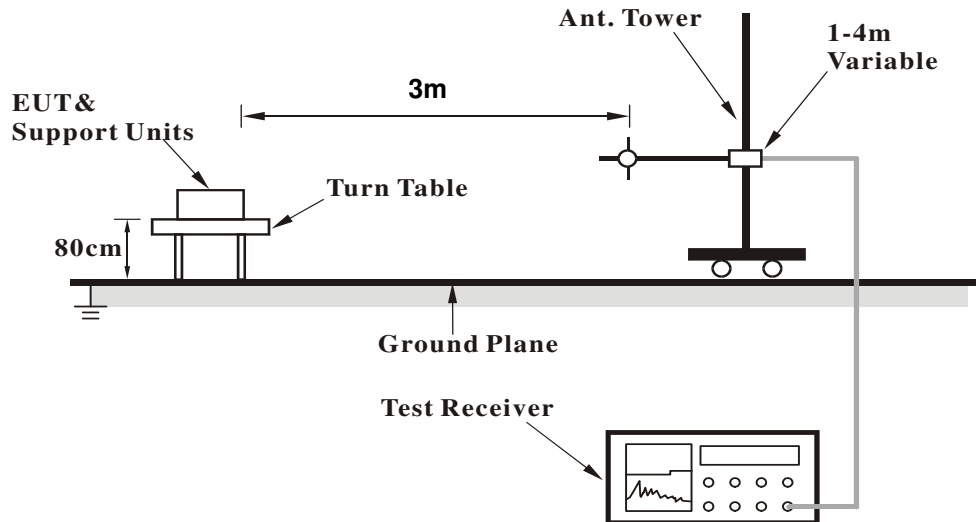
#### 4.1.4 Deviation from Test Standard

No deviation.

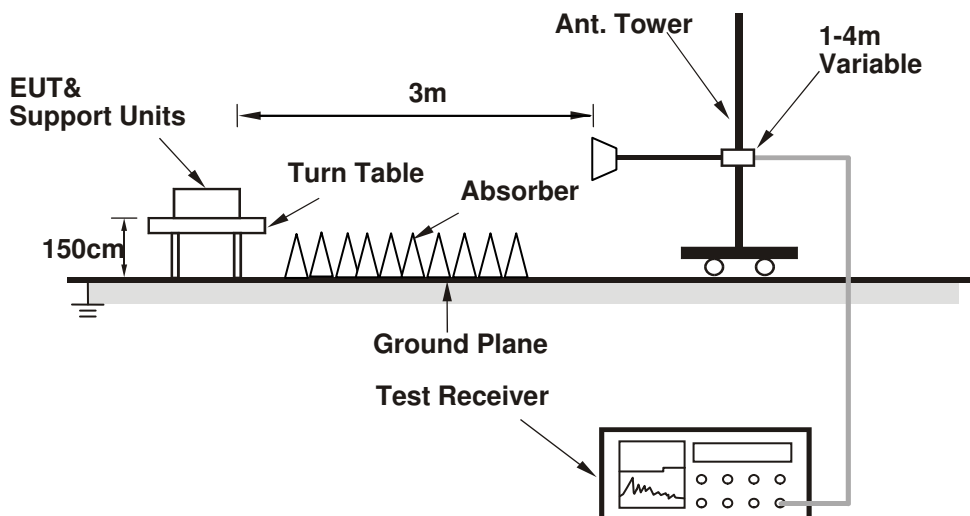


#### 4.1.5 Test Set Up

##### <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

## CDD Mode

## 802.11b

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	61.5 PK	74.0	-12.5	2.08 H	249	60.29	1.19
2	2390.00	52.9 AV	54.0	-1.2	2.08 H	249	51.66	1.19
3	*2412.00	116.2 PK			2.08 H	249	114.82	1.34
4	*2412.00	113.8 AV			2.08 H	249	112.49	1.34
5	4824.00	47.9 PK	74.0	-26.1	2.76 H	152	40.08	7.84
6	4824.00	35.9 AV	54.0	-18.1	2.76 H	152	28.09	7.84

**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	60.3 PK	74.0	-13.7	3.73 V	111	60.27	0.00
2	2390.00	50.1 AV	54.0	-3.9	3.73 V	111	50.13	0.00
3	*2412.00	112.9 PK			3.73 V	111	112.86	0.00
4	*2412.00	110.3 AV			3.73 V	111	110.33	0.00
5	4824.00	47.5 PK	74.0	-26.5	3.97 V	79	47.52	0.00
6	4824.00	35.4 AV	54.0	-18.6	3.97 V	79	35.41	0.00

**REMARKS:**

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

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*2437.00	120.4 PK			2.05 H	241	118.92	1.51
2	*2437.00	117.9 AV			2.05 H	241	116.37	1.51
3	2483.50	60.4 PK	74.0	-13.6	2.05 H	241	58.53	1.83
4	2483.50	52.8 AV	54.0	-1.2	2.05 H	241	50.94	1.83
5	4874.00	48.1 PK	74.0	-25.9	1.53 H	60	40.28	7.82
6	4874.00	33.1 AV	54.0	-20.9	1.53 H	60	25.25	7.82

**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	117.8 PK			4.00 V	107	116.30	1.51
2	*2437.00	115.3 AV			4.00 V	107	113.77	1.51
3	2483.50	55.6 PK	74.0	-18.4	4.00 V	107	53.77	1.83
4	2483.50	48.1 AV	54.0	-5.9	4.00 V	107	46.23	1.83
5	4874.00	47.5 PK	74.0	-26.5	2.05 V	103	39.69	7.82
6	4874.00	33.0 AV	54.0	-21.0	2.05 V	103	25.14	7.82

**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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " \* ": Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
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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	115.8 PK			2.03 H	242	114.12	1.67
2	*2462.00	113.3 AV			2.03 H	242	111.59	1.67
3	2483.50	61.4 PK	74.0	-12.6	2.03 H	242	59.59	1.83
4	2483.50	52.8 AV	54.0	-1.2	2.03 H	242	50.95	1.83
5	4924.00	46.9 PK	74.0	-27.1	1.49 H	60	39.04	7.87
6	4924.00	34.2 AV	54.0	-19.8	1.49 H	60	26.30	7.87

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
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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	111.8 PK			3.96 V	103	110.10	1.67
2	*2462.00	109.3 AV			3.96 V	103	107.64	1.67
3	2483.50	59.6 PK	74.0	-14.4	3.96 V	103	57.75	1.83
4	2483.50	47.5 AV	54.0	-6.5	3.96 V	103	45.66	1.83
5	4924.00	46.6 PK	74.0	-27.4	2.23 V	320	38.70	7.87
6	4924.00	32.8 AV	54.0	-21.2	2.23 V	320	24.91	7.87

**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) – Pre-Amplifier 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

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	72.6 PK	74.0	-1.4	2.53 H	92	71.43	1.19
2	2390.00	53.0 AV	54.0	-1.0	2.53 H	92	51.81	1.19
3	*2412.00	118.3 PK			2.53 H	92	116.93	1.34
4	*2412.00	108.6 AV			2.53 H	92	107.24	1.34
5	4824.00	48.6 PK	74.0	-25.5	1.58 H	26	40.71	7.84
6	4824.00	34.5 AV	54.0	-19.5	1.58 H	26	26.64	7.84

**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	66.3 PK	74.0	-7.7	3.69 V	148	65.08	1.19
2	2390.00	47.7 AV	54.0	-6.3	3.69 V	148	46.50	1.19
3	*2412.00	111.3 PK			3.69 V	148	109.96	1.34
4	*2412.00	100.8 AV			3.72 V	111	99.47	1.34
5	4824.00	48.4 PK	74.0	-25.6	1.56 V	173	40.60	7.84
6	4824.00	34.3 AV	54.0	-19.7	1.56 V	173	26.50	7.84

**REMARKS:**

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
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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	122.3 PK			2.05 H	244	120.79	1.51
2	*2437.00	112.4 AV			2.05 H	244	110.84	1.51
3	4874.00	46.5 PK	74.0	-27.5	1.64 H	184	38.72	7.82
4	4874.00	34.0 AV	54.0	-20.1	1.64 H	184	26.13	7.82

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
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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	119.3 PK			3.99 V	115	117.74	1.51
2	*2437.00	109.1 AV			3.99 V	115	107.62	1.51
3	4874.00	46.1 PK	74.0	-28.0	3.56 V	340	38.23	7.82
4	4874.00	33.7 AV	54.0	-20.3	3.56 V	340	25.88	7.82

**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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " \* ": Fundamental frequency.

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	113.2 PK			2.25 H	241	111.57	1.67
2	*2462.00	103.6 AV			2.25 H	241	101.89	1.67
3	2483.50	72.9 PK	74.0	-1.1	2.25 H	241	71.10	1.83
4	2483.50	52.8 AV	54.0	-1.2	2.25 H	241	50.96	1.83
5	4924.00	48.2 PK	74.0	-25.8	2.73 H	85	40.36	7.87
6	4924.00	33.3 AV	54.0	-20.7	2.73 H	85	25.43	7.87

**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	109.8 PK			4.00 V	121	108.10	1.67
2	*2462.00	99.9 AV			4.00 V	121	98.22	1.67
3	2483.50	58.9 PK	74.0	-15.1	4.00 V	121	57.04	1.83
4	2483.50	43.6 AV	54.0	-10.4	4.00 V	121	41.81	1.83
5	4924.00	46.9 PK	74.0	-27.1	1.70 V	117	38.99	7.87
6	4924.00	33.2 AV	54.0	-20.8	1.70 V	117	25.36	7.87

**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) – Pre-Amplifier 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 (20MHz)**

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	72.7 PK	74.0	-1.3	2.77 H	212	71.53	1.19
2	2390.00	49.0 AV	54.0	-5.0	2.77 H	212	47.82	1.19
3	*2412.00	114.6 PK			2.77 H	212	113.24	1.34
4	*2412.00	103.3 AV			2.77 H	212	101.98	1.34
5	4824.00	47.8 PK	74.0	-26.2	2.03 H	360	39.94	7.84
6	4824.00	35.7 AV	54.0	-18.3	2.03 H	360	27.88	7.84

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	66.4 PK	74.0	-7.6	3.06 V	89	65.23	1.19
2	2390.00	47.1 AV	54.0	-6.9	3.06 V	89	45.92	1.19
3	*2412.00	110.0 PK			3.06 V	89	108.62	1.34
4	*2412.00	98.2 AV			3.06 V	89	96.89	1.34
5	4824.00	47.5 PK	74.0	-26.5	2.01 V	281	39.66	7.84
6	4824.00	35.2 AV	54.0	-18.9	2.01 V	281	27.31	7.84

**REMARKS:**

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



<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*2437.00	120.1 PK			2.10 H	259	118.60	1.51
2	*2437.00	108.1 AV			2.10 H	259	106.62	1.51
3	4874.00	47.9 PK	74.0	-26.1	1.89 H	219	40.12	7.82
4	4874.00	35.2 AV	54.0	-18.8	1.89 H	219	27.40	7.82

**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	117.7 PK			4.00 V	110	116.22	1.51
2	*2437.00	106.3 AV			4.00 V	110	104.76	1.51
3	4874.00	47.7 PK	74.0	-26.3	1.71 V	357	39.87	7.82
4	4874.00	34.9 AV	54.0	-19.1	1.71 V	357	27.05	7.82

**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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " \* ": Fundamental frequency.

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	115.7 PK			2.49 H	263	114.03	1.67
2	*2462.00	104.9 AV			2.49 H	263	103.25	1.67
3	2483.50	72.7 PK	74.0	-1.3	2.49 H	263	70.90	1.83
4	2483.50	49.9 AV	54.0	-4.1	2.49 H	263	48.09	1.83
5	4924.00	47.9 PK	74.0	-26.1	2.21 H	357	39.99	7.87
6	4924.00	35.7 AV	54.0	-18.3	2.21 H	357	27.83	7.87

**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	108.4 PK			2.74 V	199	106.76	1.67
2	*2462.00	97.2 AV			2.74 V	199	95.56	1.67
3	2483.50	68.8 PK	74.0	-5.2	2.74 V	199	66.97	1.83
4	2483.50	47.1 AV	54.0	-6.9	2.74 V	199	45.28	1.83
5	4924.00	47.5 PK	74.0	-26.6	1.97 V	278	39.58	7.87
6	4924.00	34.9 AV	54.0	-19.1	1.97 V	278	26.99	7.87

**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) – Pre-Amplifier 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 (40MHz)**

<b>CHANNEL</b>	TX Channel 3	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	72.7 PK	74.0	-1.3	2.79 H	220	71.47	1.19
2	2390.00	48.0 AV	54.0	-6.1	2.79 H	220	46.76	1.19
3	*2422.00	109.8 PK			2.79 H	220	108.39	1.40
4	*2422.00	99.8 AV			2.79 H	220	98.40	1.40
5	4844.00	47.4 PK	74.0	-26.6	2.28 H	198	39.53	7.84
6	4844.00	34.9 AV	54.0	-19.1	2.28 H	198	27.08	7.84

**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	68.2 PK	74.0	-5.8	3.32 V	142	67.03	1.19
2	2390.00	45.8 AV	54.0	-8.2	3.32 V	142	44.63	1.19
3	*2422.00	104.1 PK			3.32 V	142	102.71	1.40
4	*2422.00	94.1 AV			3.32 V	142	92.67	1.40
5	4844.00	47.1 PK	74.0	-26.9	3.24 V	86	39.25	7.84
6	4844.00	34.7 AV	54.0	-19.3	3.24 V	86	26.87	7.84

**REMARKS:**

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

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	72.9 PK	74.0	-1.1	2.26 H	215	71.67	1.19
2	2390.00	49.0 AV	54.0	-5.0	2.26 H	215	47.77	1.19
3	*2437.00	114.2 PK			2.26 H	215	112.67	1.51
4	*2437.00	103.4 AV			2.26 H	215	101.88	1.51
5	2483.50	70.0 PK	74.0	-4.0	2.26 H	215	68.13	1.83
6	2483.50	47.1 AV	54.0	-6.9	2.26 H	215	45.28	1.83
7	4874.00	47.9 PK	74.0	-26.1	2.05 H	178	40.12	7.82
8	4874.00	35.3 AV	54.0	-18.7	2.05 H	178	27.51	7.82

**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	69.6 PK	74.0	-4.4	3.64 V	138	68.37	1.19
2	2390.00	45.9 AV	54.0	-8.1	3.64 V	138	44.69	1.19
3	*2437.00	109.8 PK			3.64 V	138	108.24	1.51
4	*2437.00	99.4 AV			3.64 V	138	97.85	1.51
5	2483.50	64.6 PK	74.0	-9.4	3.64 V	138	62.77	1.83
6	2483.50	44.0 AV	54.0	-10.0	3.64 V	138	42.15	1.83
7	4874.00	47.7 PK	74.0	-26.3	3.30 V	90	39.88	7.82
8	4874.00	34.9 AV	54.0	-19.2	3.30 V	90	27.03	7.82

**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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " \* ": Fundamental frequency.

<b>CHANNEL</b>	TX Channel 9	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	110.0 PK			2.26 H	221	108.43	1.61
2	*2452.00	99.8 AV			2.26 H	221	98.22	1.61
3	2483.50	73.0 PK	74.0	-1.0	2.26 H	221	71.16	1.83
4	2483.50	47.6 AV	54.0	-6.4	2.26 H	221	45.75	1.83
5	4904.00	47.4 PK	74.0	-26.6	1.99 H	203	39.62	7.81
6	4904.00	34.8 AV	54.0	-19.2	1.99 H	203	27.00	7.81

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	104.2 PK			3.82 V	200	102.61	1.61
2	*2452.00	94.1 AV			3.82 V	200	92.44	1.61
3	2483.50	65.0 PK	74.0	-9.0	3.82 V	200	63.20	1.83
4	2483.50	45.4 AV	54.0	-8.6	3.82 V	200	43.57	1.83
5	4904.00	47.4 PK	74.0	-26.6	3.11 V	107	39.58	7.81
6	4904.00	34.7 AV	54.0	-19.4	3.11 V	107	26.84	7.81

**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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " \* ": Fundamental frequency.

## Beamforming Mode

### 802.11n (20MHz)

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	72.9 PK	74.0	-1.1	1.50 H	97	73.18	-0.31
2	2390.00	52.1 AV	54.0	-1.9	1.50 H	97	52.44	-0.31
3	*2412.00	115.7 PK			1.50 H	97	115.91	-0.17
4	*2412.00	105.7 AV			1.50 H	97	105.82	-0.17
5	4824.00	46.7 PK	74.0	-27.3	2.31 H	255	40.60	6.10
6	4824.00	33.7 AV	54.0	-20.3	2.31 H	255	27.64	6.10

#### 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	2390.00	69.2 PK	74.0	-4.8	1.56 V	186	69.49	-0.31
2	2390.00	52.4 AV	54.0	-1.6	1.56 V	186	52.73	-0.31
3	*2412.00	111.5 PK			1.56 V	186	111.67	-0.17
4	*2412.00	95.0 AV			1.56 V	186	95.13	-0.17
5	4824.00	45.6 PK	74.0	-28.4	1.78 V	88	39.46	6.10
6	4824.00	31.9 AV	54.0	-22.1	1.78 V	88	25.80	6.10

#### 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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " \* ": Fundamental frequency.

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*2437.00	116.9 PK			1.90 H	160	116.95	-0.01
2	*2437.00	107.9 AV			1.90 H	160	107.87	-0.01
3	4874.00	46.5 PK	74.0	-27.5	1.64 H	191	40.37	6.14
4	4874.00	32.9 AV	54.0	-21.1	1.64 H	191	26.79	6.14

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	113.6 PK			2.61 V	188	113.64	-0.01
2	*2437.00	106.2 AV			2.61 V	188	106.21	-0.01
3	4874.00	46.0 PK	74.0	-28.0	1.98 V	46	39.84	6.14
4	4874.00	31.8 AV	54.0	-22.2	1.98 V	46	25.68	6.14

**REMARKS:**

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

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	115.5 PK			2.40 H	263	115.32	0.15
2	*2462.00	104.8 AV			2.40 H	263	104.65	0.15
3	2483.50	71.8 PK	74.0	-2.3	2.40 H	263	71.46	0.29
4	2483.50	52.9 AV	54.0	-1.2	2.40 H	263	52.56	0.29
5	4924.00	47.3 PK	74.0	-26.7	2.51 H	332	41.06	6.21
6	4924.00	33.1 AV	54.0	-20.9	2.51 H	332	26.89	6.21

**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	106.5 PK			1.94 V	208	106.35	0.15
2	*2462.00	95.0 AV			1.94 V	208	94.87	0.15
3	2483.50	67.2 PK	74.0	-6.9	1.94 V	208	66.86	0.29
4	2483.50	48.1 AV	54.0	-5.9	1.94 V	208	47.84	0.29
5	4924.00	45.0 PK	74.0	-29.0	1.98 V	41	38.79	6.21
6	4924.00	30.7 AV	54.0	-23.3	1.98 V	41	24.51	6.21

**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) – Pre-Amplifier 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 (40MHz)**

<b>CHANNEL</b>	TX Channel 3	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	72.8 PK	74.0	-1.2	1.50 H	96	73.08	-0.31
2	2390.00	52.8 AV	54.0	-1.2	1.50 H	96	53.08	-0.31
3	*2422.00	114.5 PK			1.50 H	96	114.65	-0.11
4	*2422.00	104.3 AV			1.50 H	96	104.43	-0.11
5	4844.00	46.4 PK	74.0	-27.6	1.64 H	205	40.25	6.12
6	4844.00	34.0 AV	54.0	-20.0	1.64 H	205	27.85	6.12

**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	66.7 PK	74.0	-7.3	1.95 V	287	66.98	-0.31
2	2390.00	49.5 AV	54.0	-4.5	1.95 V	287	49.85	-0.31
3	*2422.00	103.4 PK			2.31 V	100	103.52	-0.11
4	*2422.00	92.5 AV			2.31 V	100	92.62	-0.11
5	4844.00	45.6 PK	74.0	-28.4	1.78 V	178	39.46	6.12
6	4844.00	32.1 AV	54.0	-21.9	1.78 V	178	26.02	6.12

**REMARKS:**

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

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	65.8 PK	74.0	-8.2	2.28 H	181	66.13	-0.31
2	2390.00	52.4 AV	54.0	-1.6	2.28 H	181	52.74	-0.31
3	*2437.00	111.6 PK			2.28 H	181	111.57	-0.01
4	*2437.00	103.1 AV			2.28 H	181	103.14	-0.01
5	2483.50	68.5 PK	74.0	-5.5	2.28 H	181	68.25	0.29
6	2483.50	50.4 AV	54.0	-3.6	2.28 H	181	50.12	0.29
7	4874.00	46.4 PK	74.0	-27.6	1.69 H	36	40.25	6.14
8	4874.00	34.0 AV	54.0	-20.0	1.69 H	36	27.88	6.14

**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	2.06 V	194	60.83	-0.31
2	2390.00	46.3 AV	54.0	-7.7	2.06 V	194	46.62	-0.31
3	*2437.00	101.3 PK			2.06 V	194	101.26	-0.01
4	*2437.00	92.4 AV			2.06 V	194	92.36	-0.01
5	2483.50	60.1 PK	74.0	-13.9	2.06 V	194	59.78	0.29
6	2483.50	46.5 AV	54.0	-7.5	2.06 V	194	46.17	0.29
7	4874.00	45.6 PK	74.0	-28.5	1.58 V	156	39.41	6.14
8	4874.00	32.2 AV	54.0	-21.8	1.58 V	156	26.03	6.14

**REMARKS:**

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

<b>CHANNEL</b>	TX Channel 9	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	108.7 PK			1.63 H	126	108.62	0.09
2	*2452.00	98.3 AV			1.63 H	126	98.25	0.09
3	2483.50	72.0 PK	74.0	-2.0	1.63 H	126	71.74	0.29
4	2483.50	52.3 AV	54.0	-1.7	1.63 H	126	52.03	0.29
5	4904.00	46.9 PK	74.0	-27.1	1.86 H	209	40.71	6.16
6	4904.00	34.0 AV	54.0	-20.0	1.86 H	209	27.86	6.16

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	97.6 PK			3.21 V	170	97.46	0.09
2	*2452.00	85.5 AV			3.21 V	170	85.36	0.09
3	2483.50	60.7 PK	74.0	-13.4	3.21 V	170	60.36	0.29
4	2483.50	44.6 AV	54.0	-9.5	3.21 V	170	44.26	0.29
5	4904.00	44.8 PK	74.0	-29.2	1.52 V	22	38.62	6.16
6	4904.00	30.8 AV	54.0	-23.2	1.52 V	22	24.63	6.16

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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 WORST-CASE DATA**
**802.11b**

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	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	35.29	26.0 QP	40.0	-14.0	4.00 H	127	37.00	-11.03
2	163.52	25.9 QP	43.5	-17.6	4.00 H	227	35.28	-9.35
3	400.15	34.5 QP	46.0	-11.5	2.38 H	264	39.98	-5.46
4	508.02	36.6 QP	46.0	-9.4	1.27 H	225	39.91	-3.31
5	799.94	35.0 QP	46.0	-11.0	1.10 H	99	33.49	1.54
6	895.63	35.8 QP	46.0	-10.2	1.00 H	70	32.73	3.05
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	35.29	33.7 QP	40.0	-6.3	1.48 V	77	44.77	-11.03
2	81.80	28.9 QP	40.0	-11.1	1.12 V	301	43.23	-14.37
3	140.39	26.4 QP	43.5	-17.1	1.00 V	149	36.46	-10.08
4	368.53	37.6 QP	46.0	-8.4	1.63 V	284	43.99	-6.38
5	606.86	31.5 QP	46.0	-14.5	2.49 V	137	32.92	-1.43
6	799.60	34.1 QP	46.0	-11.9	2.82 V	199	32.55	1.55

**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) – Pre-Amplifier 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.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESCS 30	100276	Apr. 12, 2016	Apr. 11, 2017
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ENV216	101197	Apr. 27, 2015	Apr. 26, 2016
LISN With Adapter (for EUT)	AD10	C10Ada-002	Apr. 27, 2015	Apr. 26, 2016
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100218	Nov. 25, 2015	Nov. 24, 2016
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 06, 2015	May 05, 2016
Software	Cond_V7.3.7	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C10.01	Feb. 15, 2016	Feb. 14, 2017
SUHNTER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-011484	May 19, 2015	May 18, 2016
ROHDE & SCHWARZ Artificial Mains Network (For TV EUT)	ESH3-Z5	100220	Nov. 13, 2015	Nov. 12, 2016
LISN With Adapter (for TV EUT)	100220	N/A	Nov. 13, 2015	Nov. 12, 2016

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 Shielded Room No. 10.

3. The VCCI Site Registration No. C-1852.

4. Tested Date: Apr. 19, 2016.

#### 4.2.3 Test Procedures

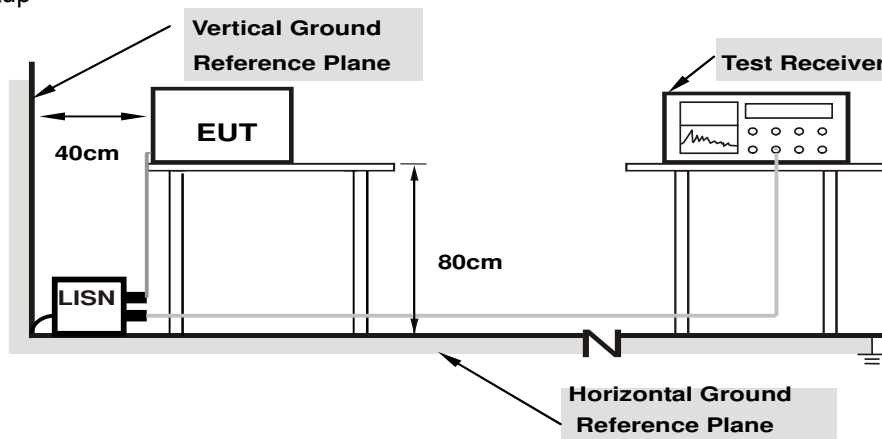
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance 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

#### CDD Mode

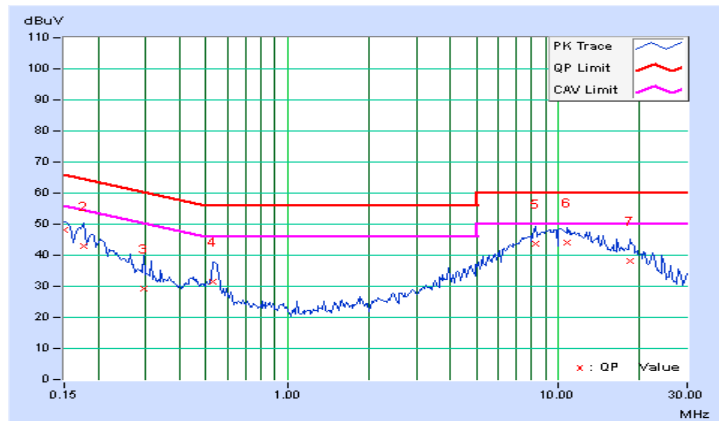
#### 802.11b

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.66	38.54	24.84	48.20	34.50	66.00	56.00	-17.80	-21.50
2	0.17734	9.65	33.40	16.46	43.05	26.11	64.61	54.61	-21.55	-28.49
3	0.29453	9.66	19.47	2.41	29.13	12.07	60.40	50.40	-31.26	-38.32
4	0.52891	9.70	21.92	15.07	31.62	24.77	56.00	46.00	-24.38	-21.23
5	8.30078	10.07	33.68	25.69	43.75	35.76	60.00	50.00	-16.25	-14.24
<b>6</b>	<b>10.86328</b>	<b>10.12</b>	<b>33.94</b>	<b>26.68</b>	<b>44.06</b>	<b>36.80</b>	<b>60.00</b>	<b>50.00</b>	<b>-15.94</b>	<b>-13.20</b>
7	18.49219	10.29	28.04	20.51	38.33	30.80	60.00	50.00	-21.67	-19.20

#### 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

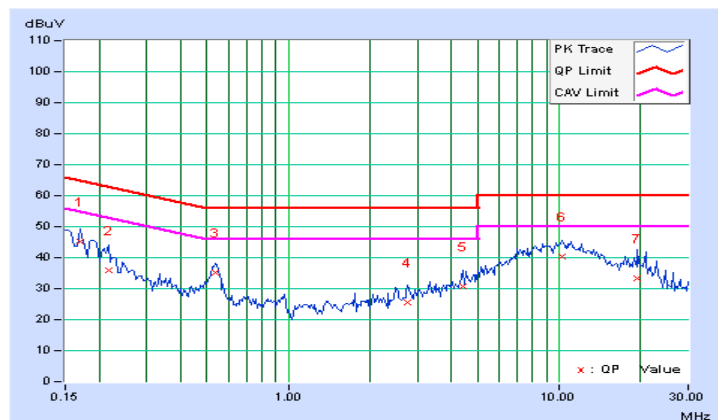


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16953	9.69	35.62	19.35	45.31	29.04	64.98	54.98	-19.67	-25.94
2	0.21641	9.69	26.25	8.73	35.94	18.42	62.96	52.96	-27.01	-34.53
3	0.54063	9.74	25.62	21.03	35.36	30.77	56.00	46.00	-20.64	-15.23
4	2.77344	9.98	15.42	9.67	25.40	19.65	56.00	46.00	-30.60	-26.35
5	4.40625	10.12	20.64	12.27	30.76	22.39	56.00	46.00	-25.24	-23.61
6	10.27344	10.21	30.09	23.18	40.30	33.39	60.00	50.00	-19.70	-16.61
7	19.44531	10.36	22.84	15.44	33.20	25.80	60.00	50.00	-26.80	-24.20

**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



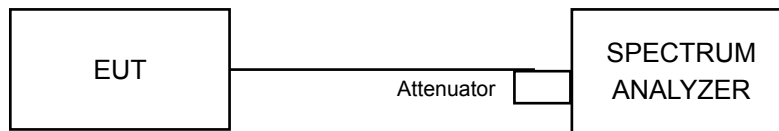


### 4.3 6dB Bandwidth Measurement

#### 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

- a. Set resolution bandwidth (RBW) = 100kHz
- b. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. 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

**CDD Mode**
**802.11b**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	9.13	9.59	9.10	9.60	0.5	Pass
6	2437	10.15	10.14	10.15	10.14	0.5	Pass
11	2462	9.06	8.12	9.11	9.11	0.5	Pass

**802.11g**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	15.17	15.15	15.16	15.16	0.5	Pass
6	2437	15.14	15.18	15.14	15.18	0.5	Pass
11	2462	15.17	15.17	15.17	15.17	0.5	Pass

**802.11n (20MHz)**

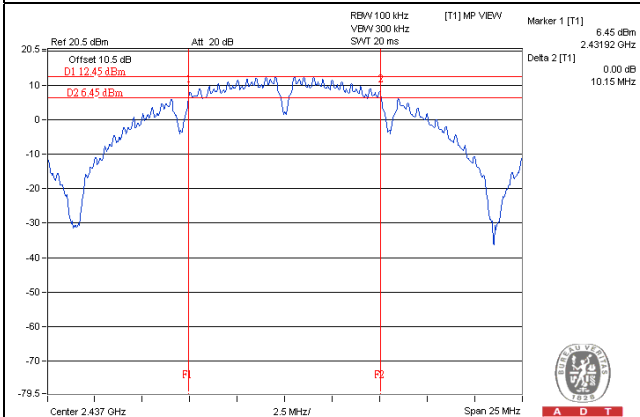
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	15.17	15.17	15.17	15.17	0.5	Pass
6	2437	15.19	15.18	15.18	15.17	0.5	Pass
11	2462	15.17	15.17	15.17	15.17	0.5	Pass

**802.11n (40MHz)**

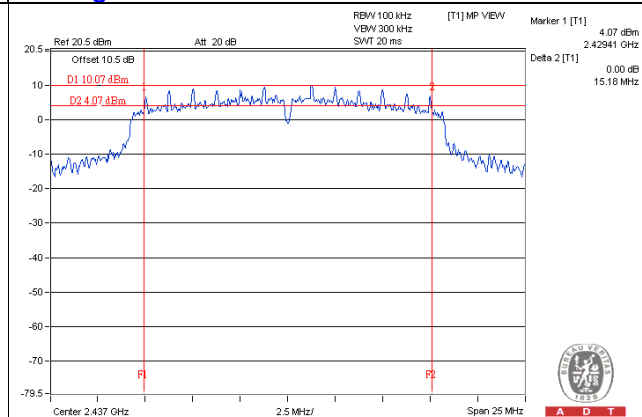
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
3	2422	35.17	35.19	35.20	35.19	0.5	Pass
6	2437	35.12	35.18	35.18	35.15	0.5	Pass
9	2452	35.19	35.19	35.19	35.14	0.5	Pass

### SPECTRUM PLOT OF WORST VALUE

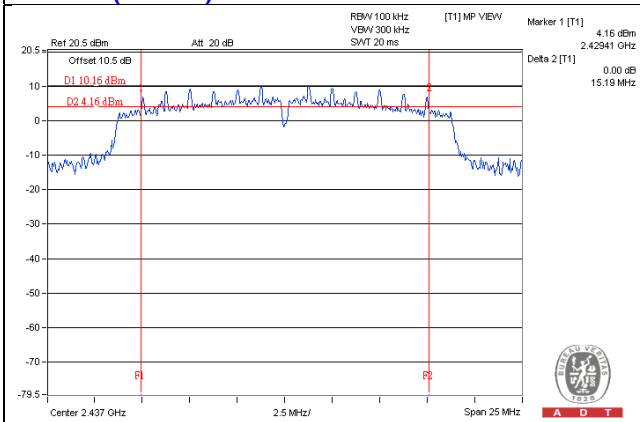
#### 802.11b



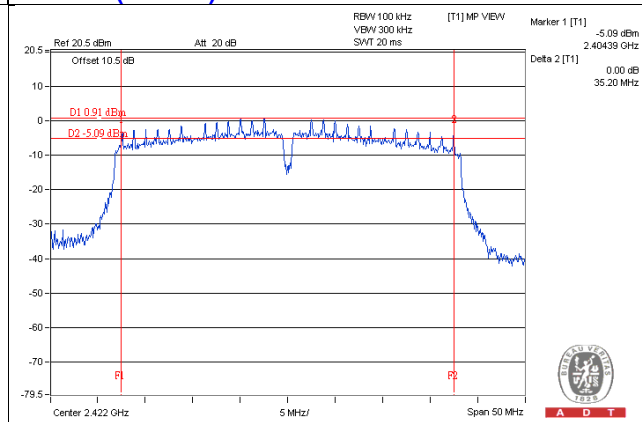
#### 802.11g



#### 802.11n (20MHz)



#### 802.11n (40MHz)



## 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,

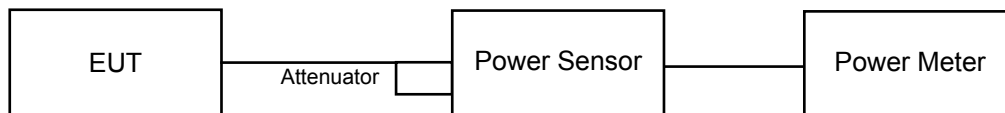
Array Gain = 0 dB (i.e., no array gain) for  $NANT \leq 4$ ;

Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  MHz for any NANT;

Array Gain =  $5 \log(NANT/NSS)$  dB or 3 dB, whichever is less for 20-MHz channel widths with  $NANT \geq 5$ .

For power measurements on all other devices: Array Gain =  $10 \log(NANT/NSS)$  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

#### CDD Mode

#### FOR AVERAGE POWER

#### 802.11b

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	20.13	19.40	19.72	19.93	382.292	25.82	30	Pass
6	2437	22.17	21.87	22.24	22.36	<b>658.312</b>	28.18	30	Pass
11	2462	19.01	18.59	18.89	18.86	306.252	24.86	30	Pass

#### 802.11g

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	18.17	17.49	18.21	18.76	263.104	24.20	30	Pass
6	2437	20.61	20.37	20.89	20.78	466.391	26.69	30	Pass
11	2462	14.34	13.74	14.02	13.89	100.549	20.02	30	Pass

#### 802.11n (20MHz)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	17.24	16.60	17.28	17.75	211.697	23.26	30	Pass
6	2437	20.69	20.36	20.82	21.98	504.405	27.03	30	Pass
11	2462	16.92	16.95	17.32	17.64	210.776	23.24	30	Pass

#### 802.11n (40MHz)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	14.44	13.99	14.47	15.38	115.362	20.62	30	Pass
6	2437	17.51	17.13	17.76	18.67	241.331	23.83	30	Pass
9	2452	15.19	15.01	15.48	15.79	137.982	21.40	30	Pass

### Beamforming Mode

#### FOR AVERAGE POWER

##### 802.11n (20MHz)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	16.37	16.08	16.29	16.41	170.214	22.31	30	Pass
6	2437	20.54	20.03	20.62	20.01	429.509	26.33	30	Pass
11	2462	14.36	14.15	14.40	14.29	107.687	20.32	30	Pass

##### 802.11n (40MHz)

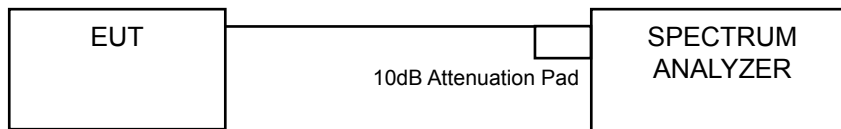
Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	12.18	11.85	12.20	12.16	64.871	18.12	30	Pass
6	2437	16.24	16.03	16.17	16.29	166.120	22.20	30	Pass
9	2452	13.62	13.38	13.21	13.57	88.483	19.47	30	Pass

## 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

Refer to section 4.1.2 to get information of above instrument.

### 4.5.4 Test Procedure

- a. Set analyzer center frequency to DTS channel center frequency.
- b. Set the span to 1.5 times the DTS bandwidth.
- c. Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d. Set the VBW  $\geq 3 \times \text{RBW}$ .
- e. Detector = peak.
- f. Sweep time = auto couple.
- g. Trace mode = max hold.
- h. Allow trace to fully stabilize.
- i. 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

##### CDD Mode 802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Duty Factor	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-6.43	6.02	0	-0.41	5.98	Pass
	6	2437	-3.88	6.02	0	2.14	5.98	Pass
	11	2462	-8.35	6.02	0	-2.33	5.98	Pass
1	1	2412	-6.47	6.02	0	-0.45	5.98	Pass
	6	2437	-4.60	6.02	0	1.42	5.98	Pass
	11	2462	-8.26	6.02	0	-2.24	5.98	Pass
2	1	2412	-5.78	6.02	0	0.24	5.98	Pass
	6	2437	-3.51	6.02	0	2.51	5.98	Pass
	11	2462	-7.29	6.02	0	-1.27	5.98	Pass
3	1	2412	-7.21	6.02	0	-1.19	5.98	Pass
	6	2437	-3.75	6.02	0	2.27	5.98	Pass
	11	2462	-6.92	6.02	0	-0.90	5.98	Pass

##### NOTE:

- Directional gain =  $2\text{dBi} + 10\log(4) = 8.02\text{dBi} > 6\text{dBi}$ , so the power spectral density limit shall be reduced to  $8 - (8.02 - 6) = 5.98\text{dBm}$ .
- Refer to section 3.3 for duty cycle spectrum plot.

##### 802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Duty Factor	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-7.42	6.02	0.92	-0.48	5.98	Pass
	6	2437	-6.51	6.02	0.92	0.43	5.98	Pass
	11	2462	-13.69	6.02	0.92	-6.75	5.98	Pass
1	1	2412	-7.96	6.02	0.92	-1.02	5.98	Pass
	6	2437	-5.77	6.02	0.92	1.17	5.98	Pass
	11	2462	-13.45	6.02	0.92	-6.51	5.98	Pass
2	1	2412	-7.75	6.02	0.92	-0.81	5.98	Pass
	6	2437	-6.93	6.02	0.92	0.01	5.98	Pass
	11	2462	-14.20	6.02	0.92	-7.26	5.98	Pass
3	1	2412	-6.04	6.02	0.92	0.90	5.98	Pass
	6	2437	-6.90	6.02	0.92	0.04	5.98	Pass
	11	2462	-13.94	6.02	0.92	-7.00	5.98	Pass

##### NOTE:

- Directional gain =  $2\text{dBi} + 10\log(4) = 8.02\text{dBi} > 6\text{dBi}$ , so the power spectral density limit shall be reduced to  $8 - (8.02 - 6) = 5.98\text{dBm}$ .
- Refer to section 3.3 for duty cycle spectrum plot.



### 802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Duty Factor	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-8.44	6.02	2.78	0.36	5.98	Pass
	6	2437	-5.78	6.02	2.78	3.02	5.98	Pass
	11	2462	-9.74	6.02	2.78	-0.94	5.98	Pass
1	1	2412	-8.70	6.02	2.78	0.10	5.98	Pass
	6	2437	-5.73	6.02	2.78	3.07	5.98	Pass
	11	2462	-11.00	6.02	2.78	-2.20	5.98	Pass
2	1	2412	-8.58	6.02	2.78	0.22	5.98	Pass
	6	2437	-6.48	6.02	2.78	2.32	5.98	Pass
	11	2462	-10.32	6.02	2.78	-1.52	5.98	Pass
3	1	2412	-8.40	6.02	2.78	0.40	5.98	Pass
	6	2437	-6.83	6.02	2.78	1.97	5.98	Pass
	11	2462	-10.98	6.02	2.78	-2.18	5.98	Pass

**NOTE:**

1. Directional gain =  $2\text{dBi} + 10\log(4) = 8.02\text{dBi} > 6\text{dBi}$ , so the power spectral density limit shall be reduced to  $8 - (8.02 - 6) = 5.98\text{dBm}$ .
2. Refer to section 3.3 for duty cycle spectrum plot.

### 802.11n (40MHz)

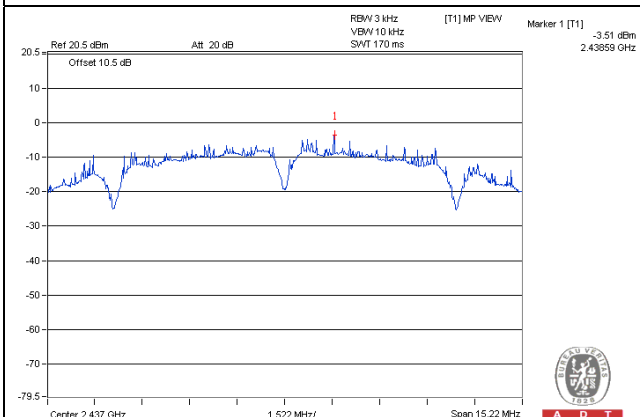
TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Duty Factor	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	3	2422	-14.35	6.02	4.36	-3.97	5.98	Pass
	6	2437	-9.36	6.02	4.36	1.02	5.98	Pass
	9	2452	-14.99	6.02	4.36	-4.61	5.98	Pass
1	3	2422	-15.78	6.02	4.36	-5.40	5.98	Pass
	6	2437	-8.81	6.02	4.36	1.57	5.98	Pass
	9	2452	-14.82	6.02	4.36	-4.44	5.98	Pass
2	3	2422	-14.77	6.02	4.36	-4.39	5.98	Pass
	6	2437	-10.42	6.02	4.36	-0.04	5.98	Pass
	9	2452	-14.97	6.02	4.36	-4.59	5.98	Pass
3	3	2422	-15.67	6.02	4.36	-5.29	5.98	Pass
	6	2437	-9.04	6.02	4.36	1.34	5.98	Pass
	9	2452	-14.90	6.02	4.36	-4.52	5.98	Pass

**NOTE:**

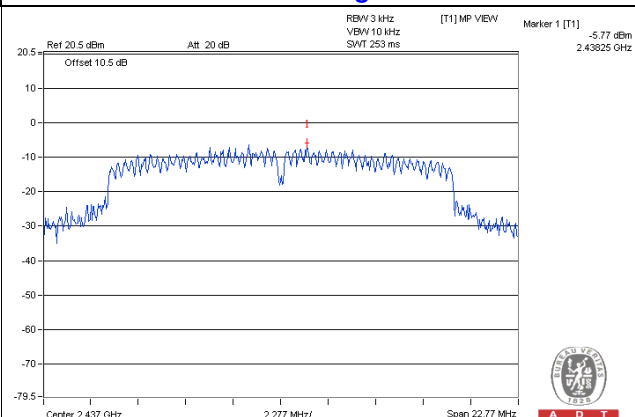
1. Directional gain =  $2\text{dBi} + 10\log(4) = 8.02\text{dBi} > 6\text{dBi}$ , so the power spectral density limit shall be reduced to  $8 - (8.02 - 6) = 5.98\text{dBm}$ .
2. Refer to section 3.3 for duty cycle spectrum plot.

### Spectrum Plot of Worst Value

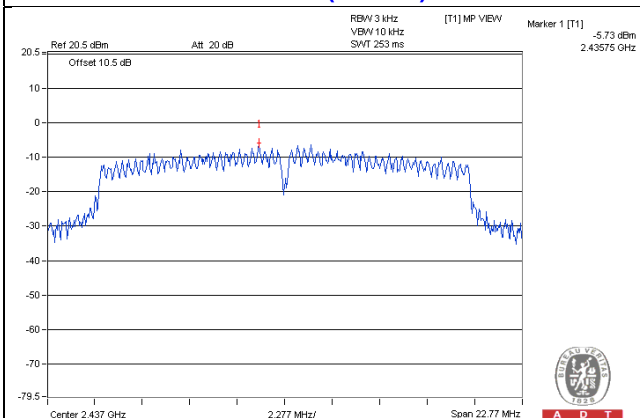
#### 802.11b



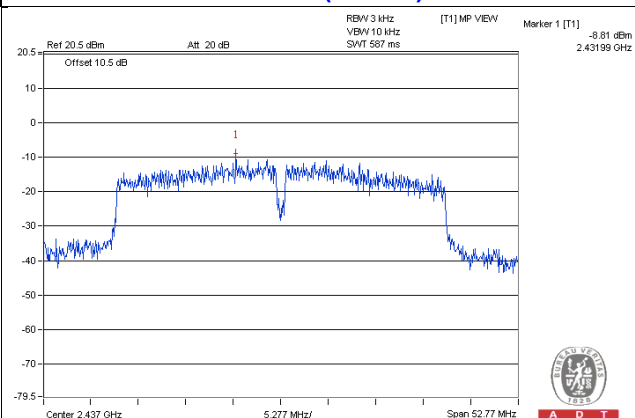
#### 802.11g



#### 802.11n (20MHz)



#### 802.11n (40MHz)

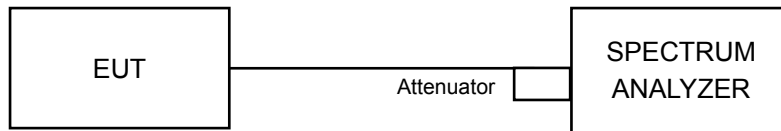


## 4.6 Conducted Out of Band Emission Measurement

### 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. 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

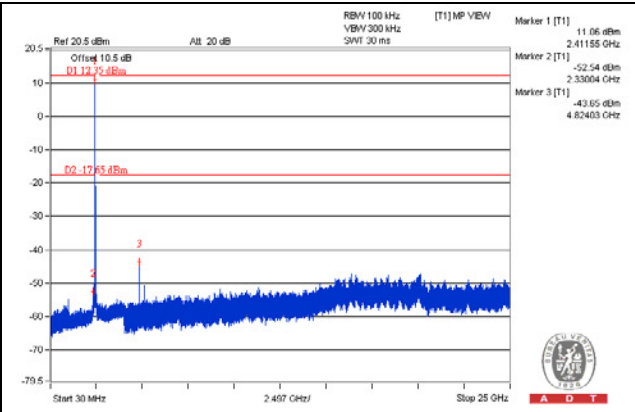
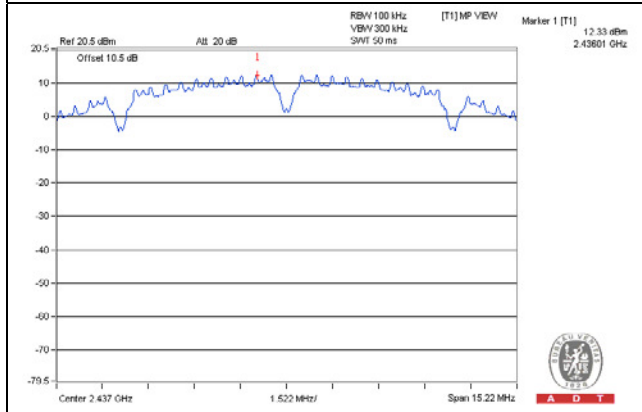
Same as Item 4.3.6

### 4.6.7 Test Results

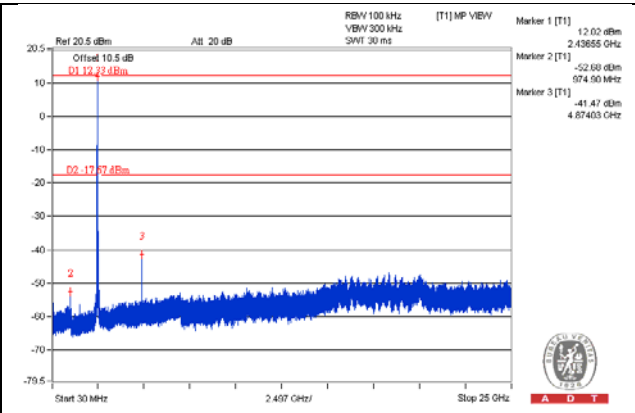
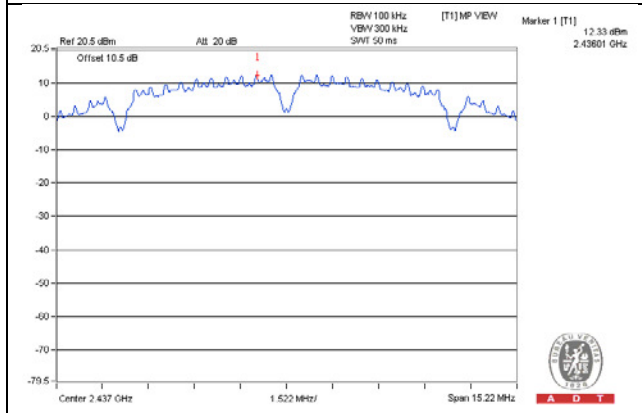
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11b: CHAIN 0

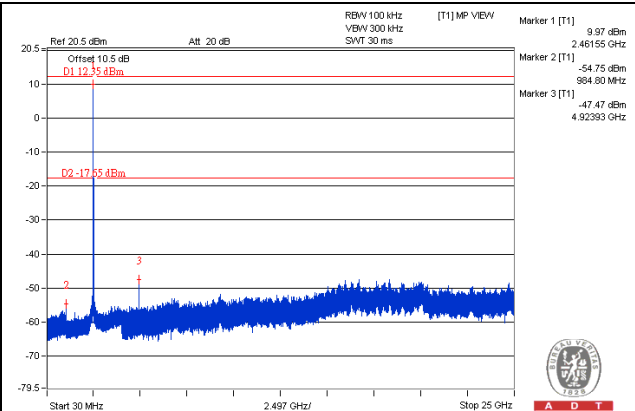
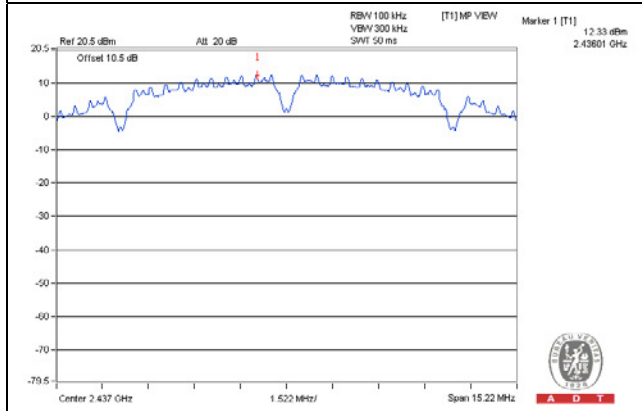
CH 1



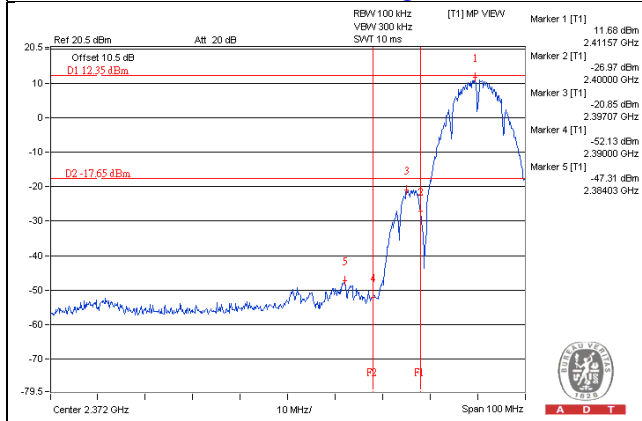
CH 6



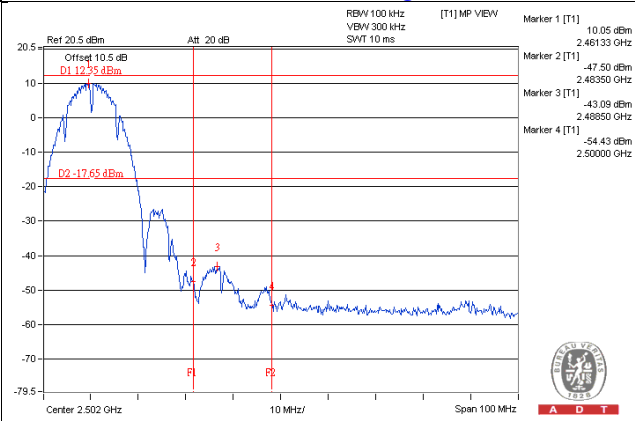
CH 11



CH 1 Band edge

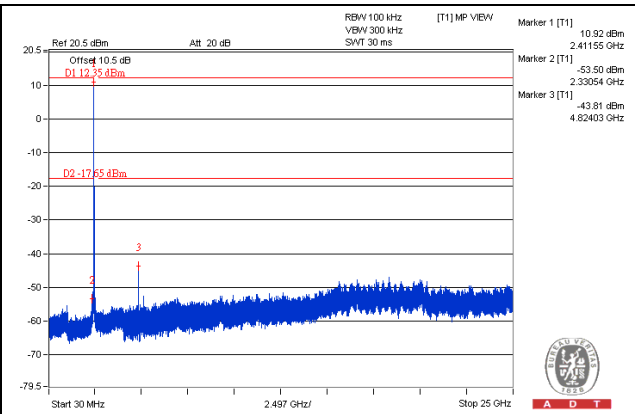
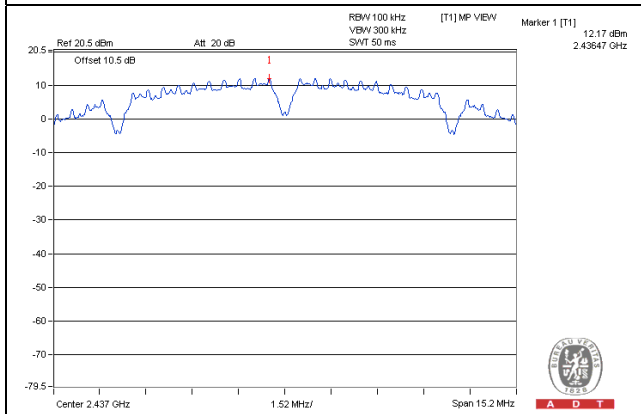


CH 11 Band edge

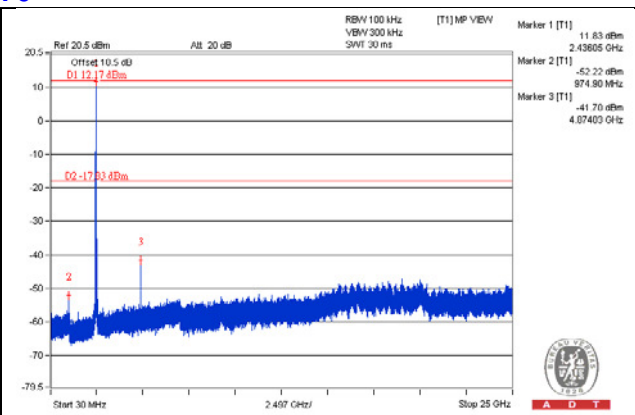
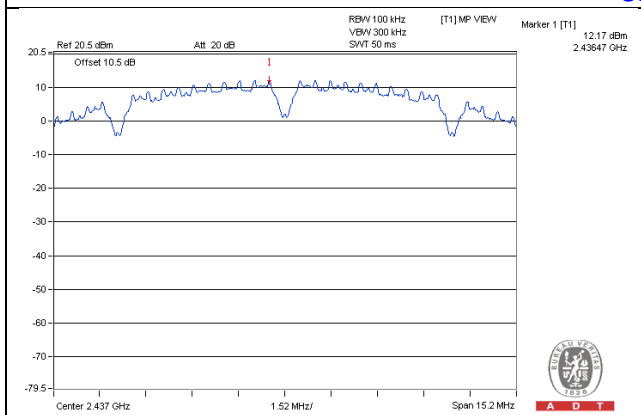


CHAIN 1

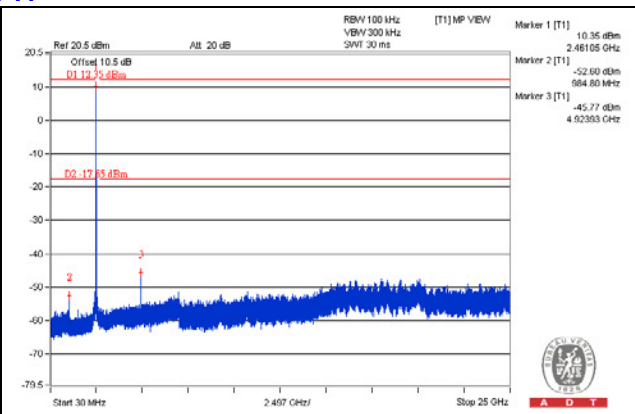
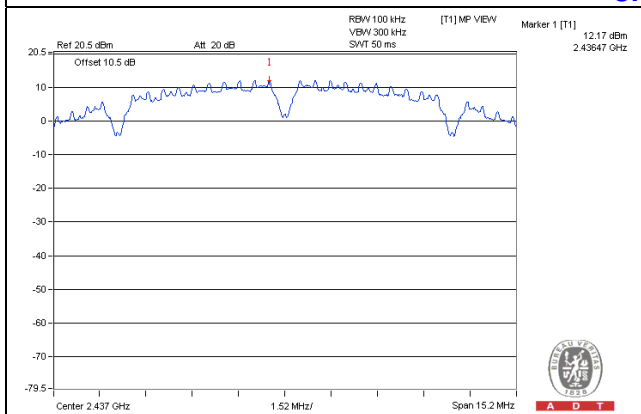
CH 1



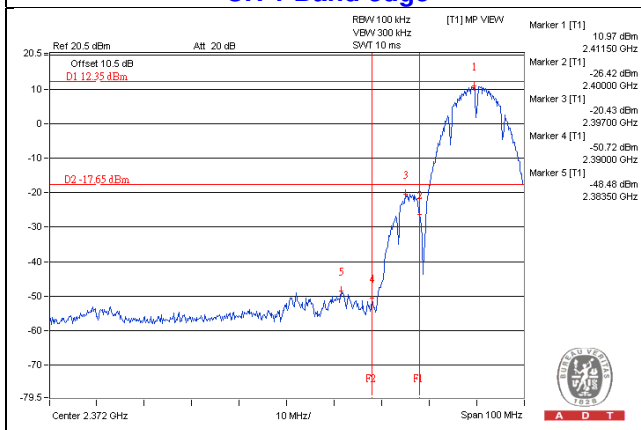
CH 6



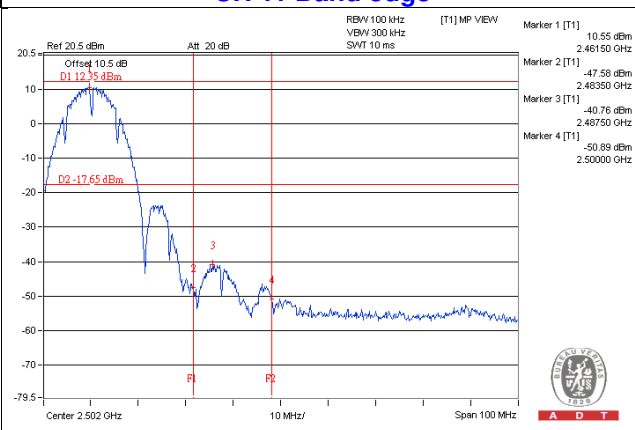
CH 11



CH 1 Band edge

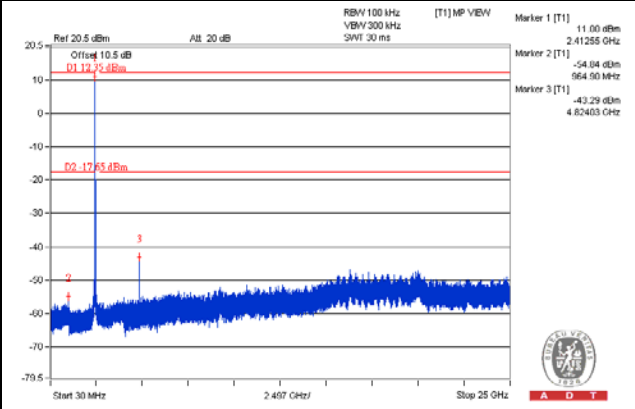
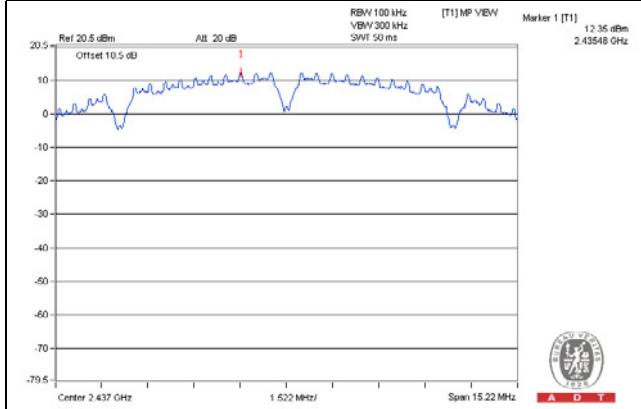


CH 11 Band edge

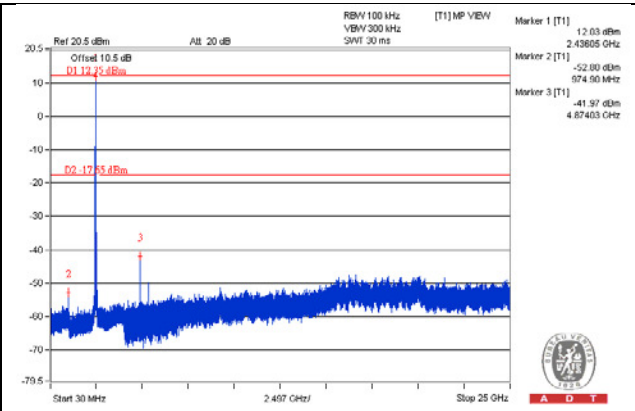
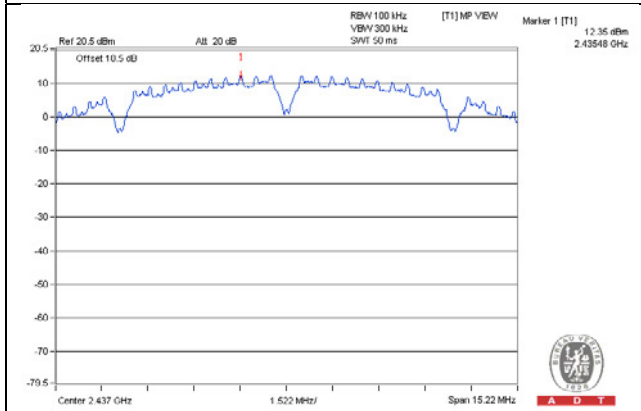


### CHAIN 2

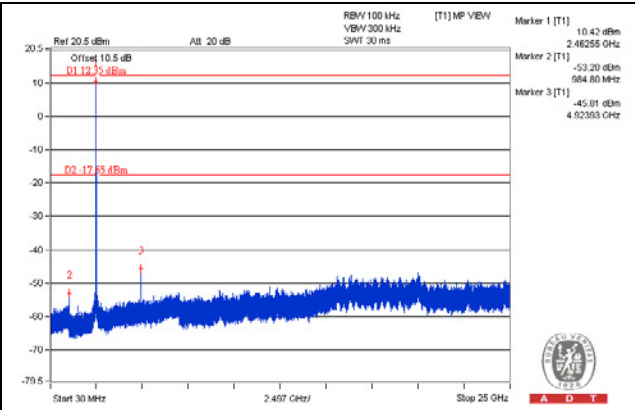
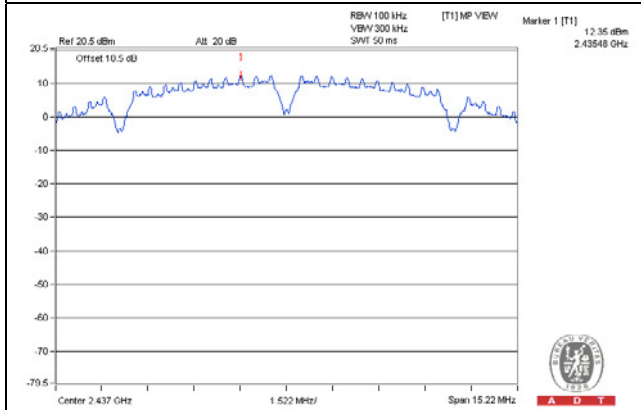
#### CH 1



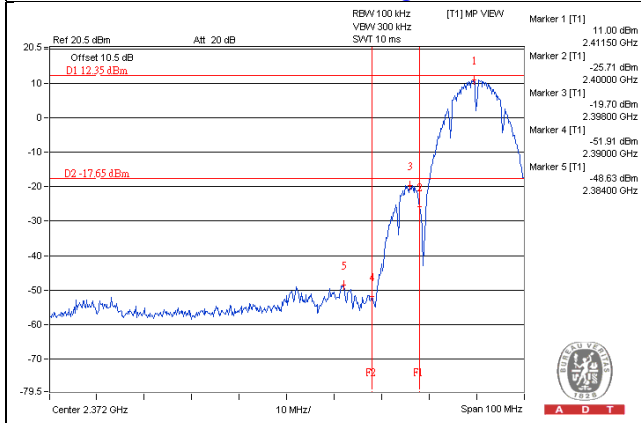
#### CH 6



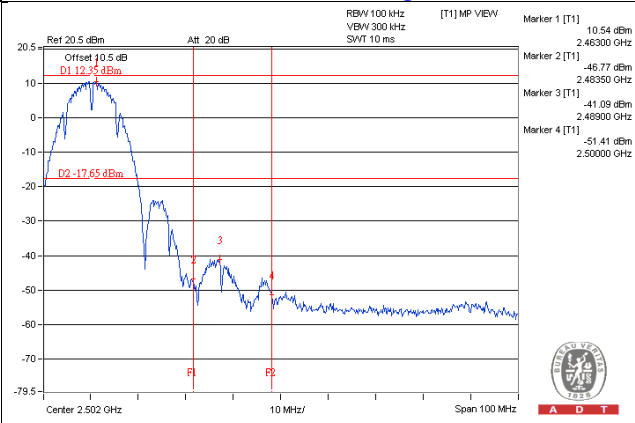
#### CH 11



#### CH 1 Band edge

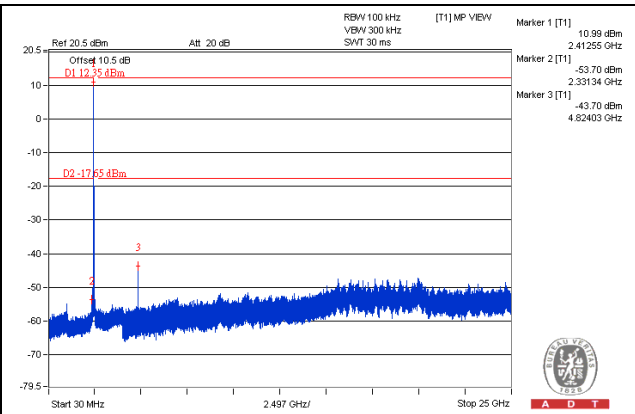
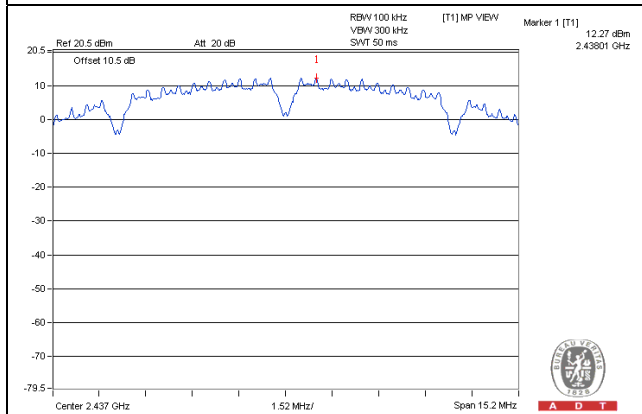


#### CH 11 Band edge

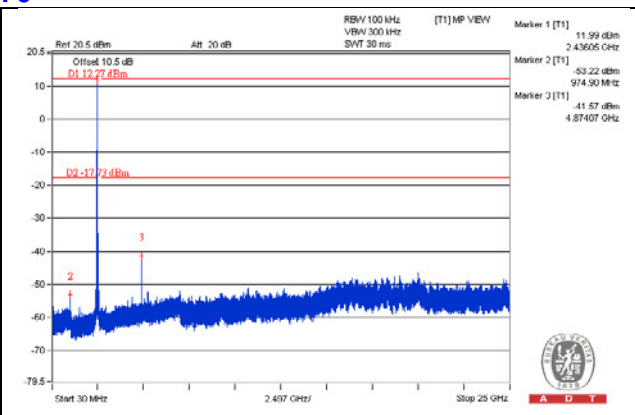
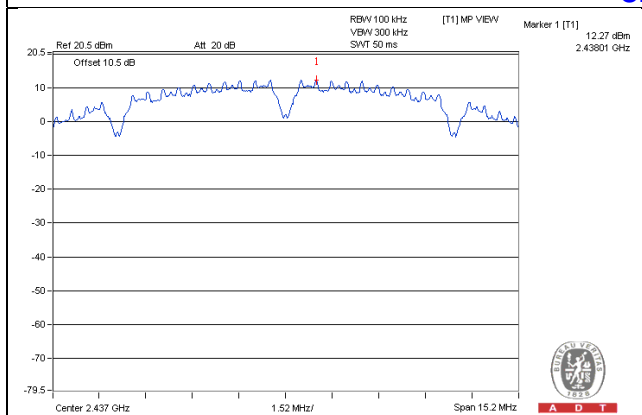


### CHAIN 3

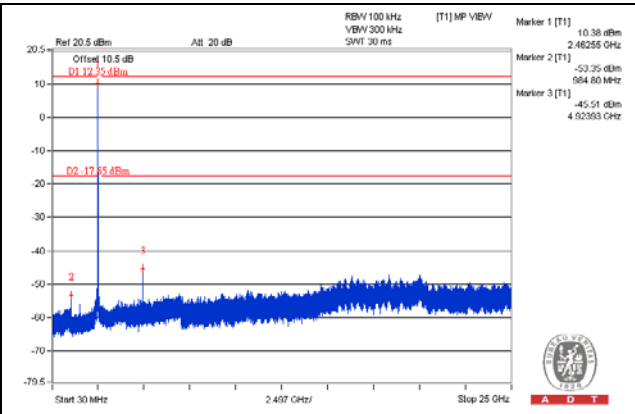
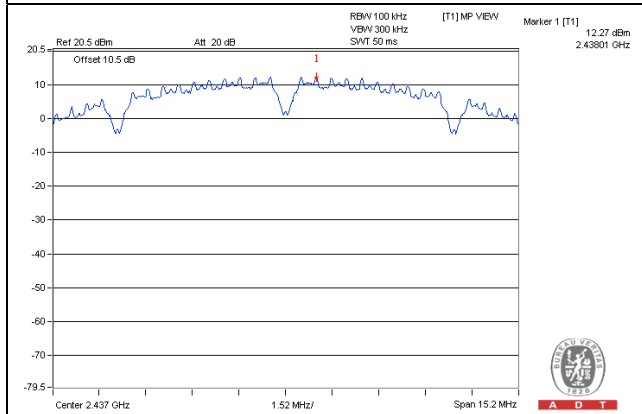
#### CH 1



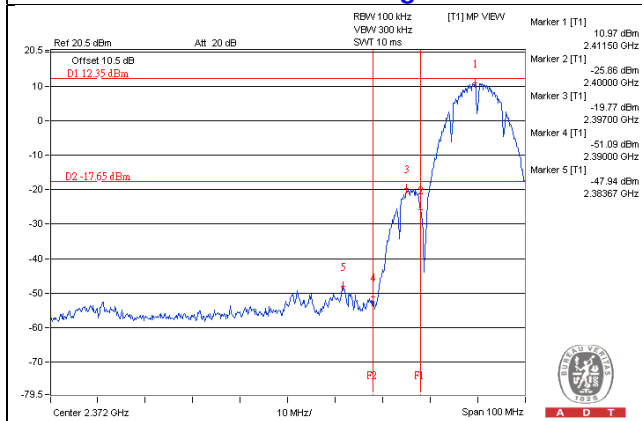
#### CH 6



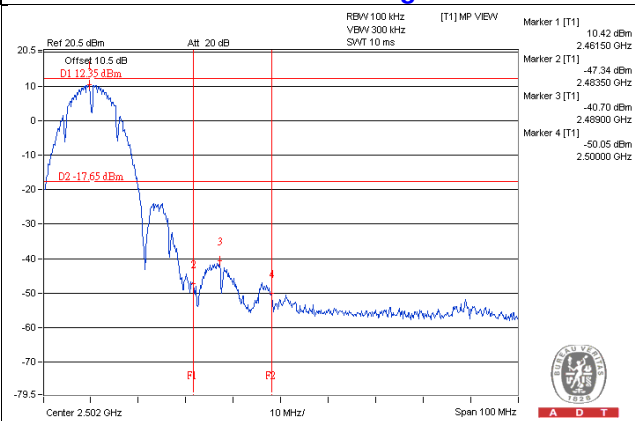
#### CH 11



#### CH 1 Band edge

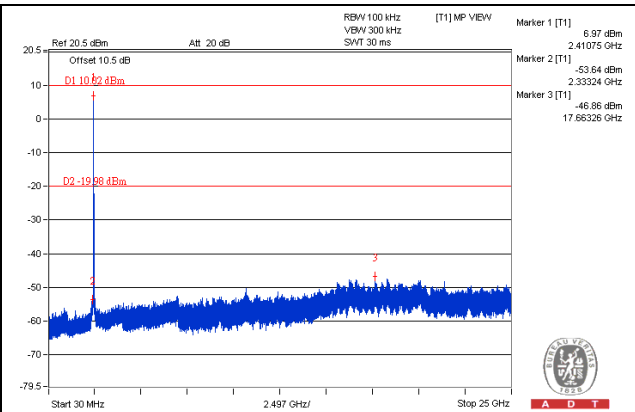
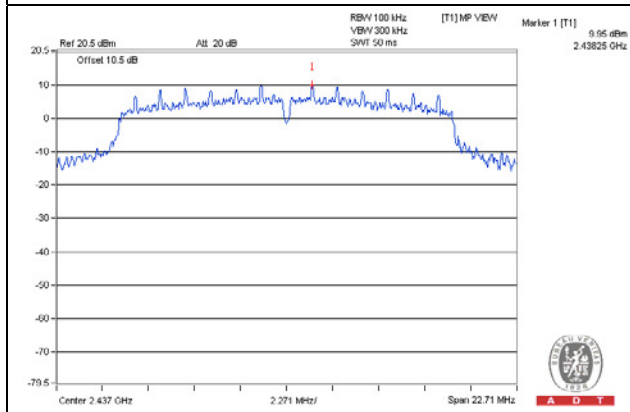


#### CH 11 Band edge

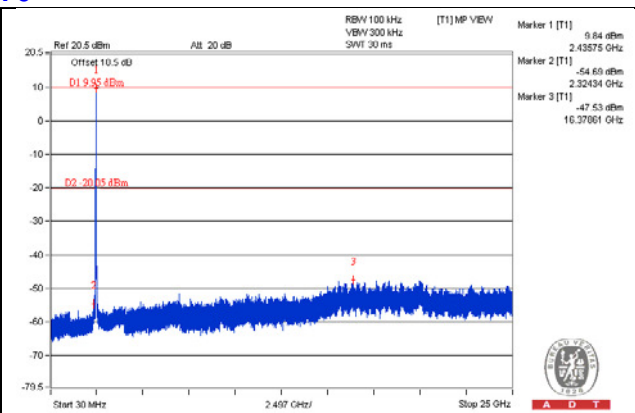
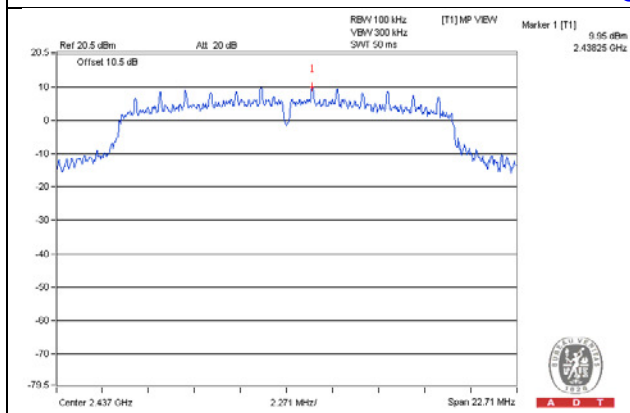


### 802.11g CHAIN 0

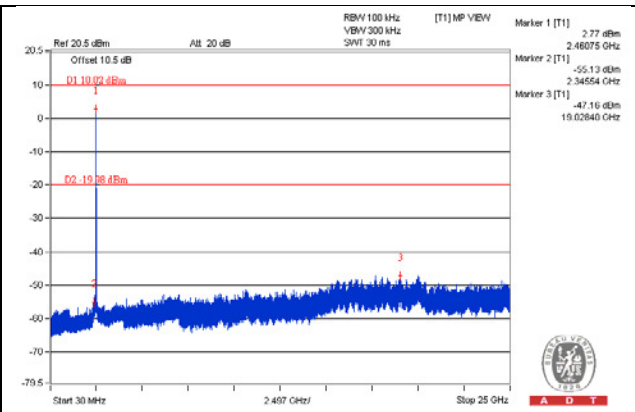
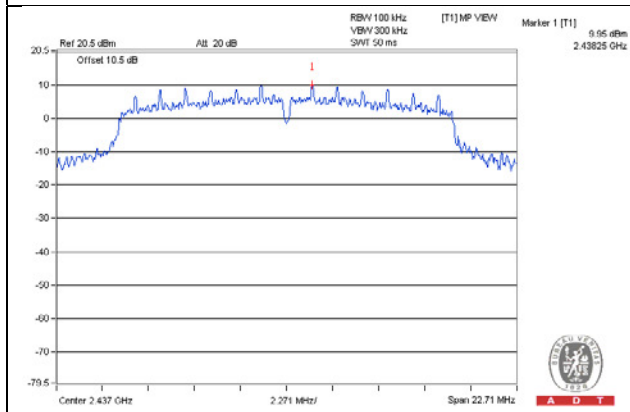
#### CH 1



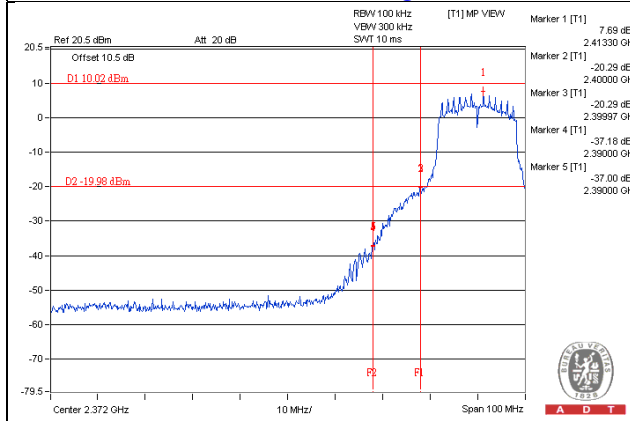
#### CH 6



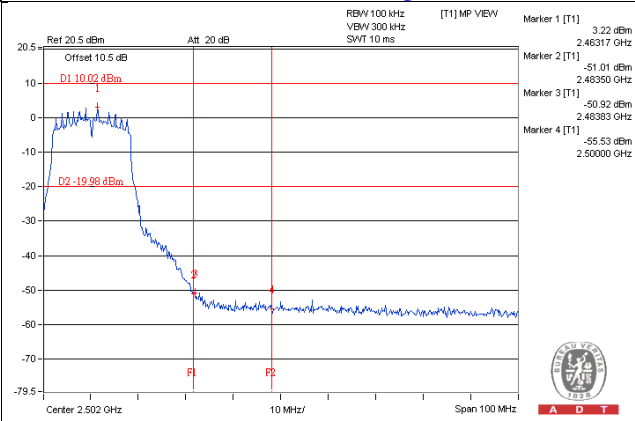
#### CH 11



#### CH 1 Band edge



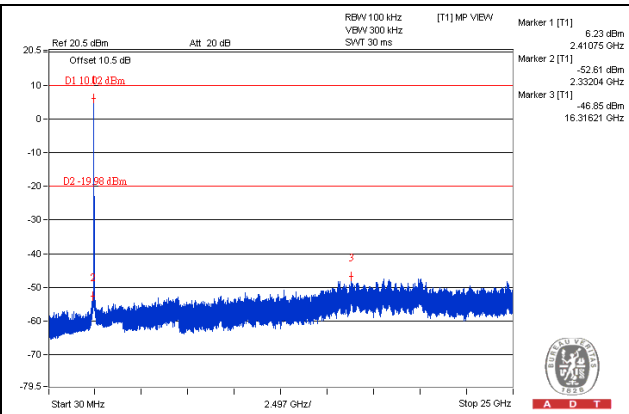
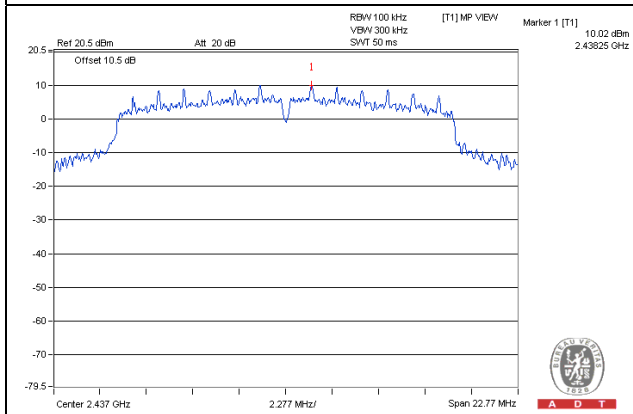
#### CH 11 Band edge



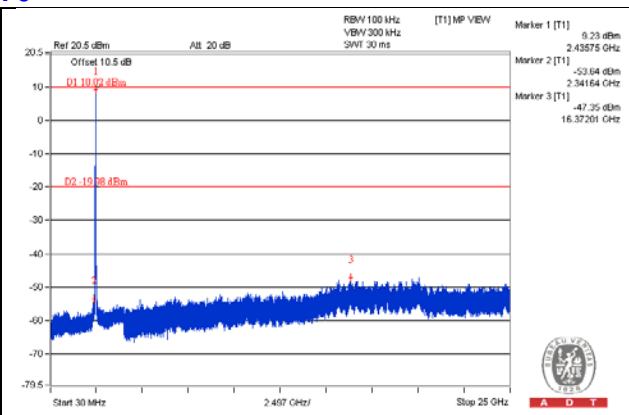
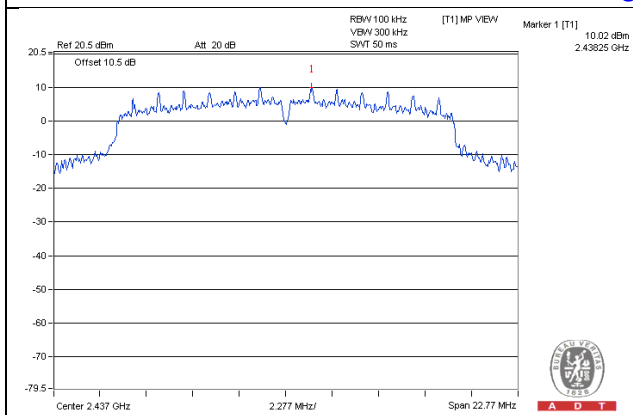


### CHAIN 1

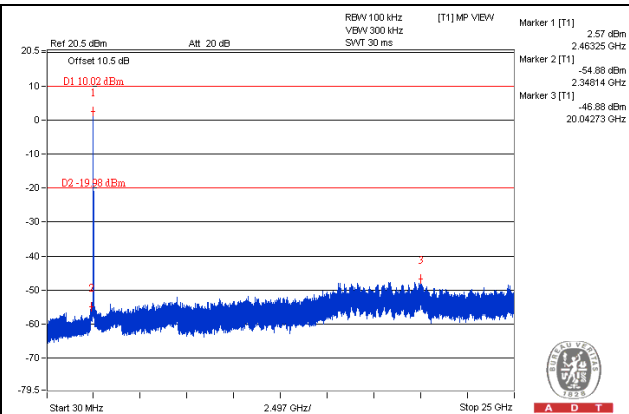
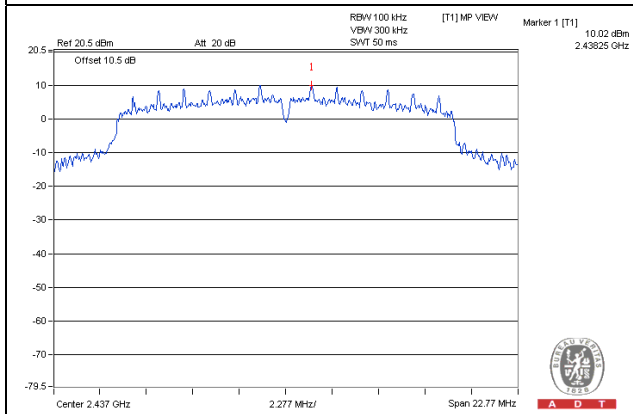
#### CH 1



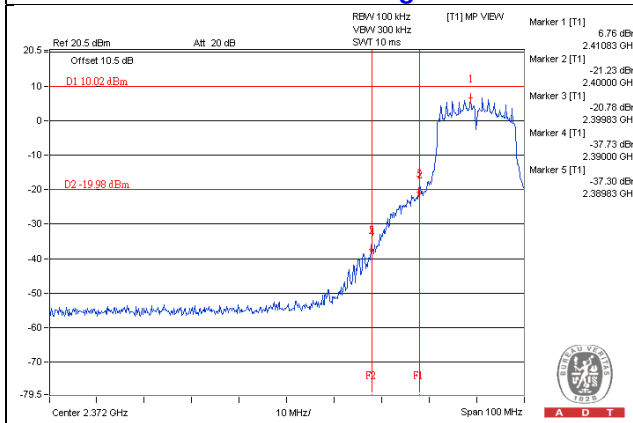
#### CH 6



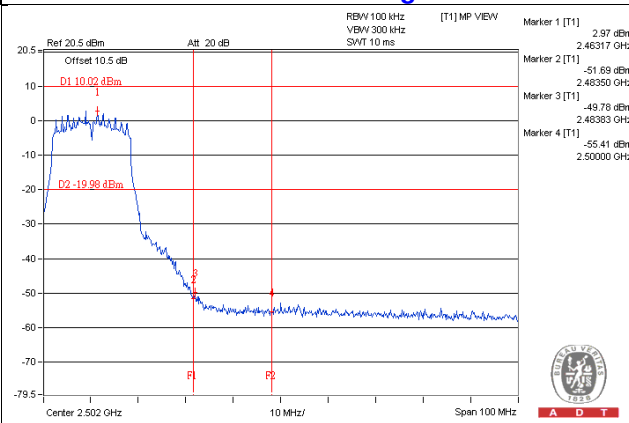
#### CH 11



#### CH 1 Band edge

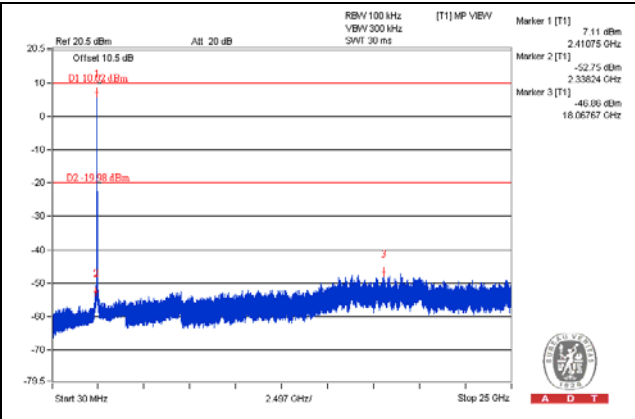
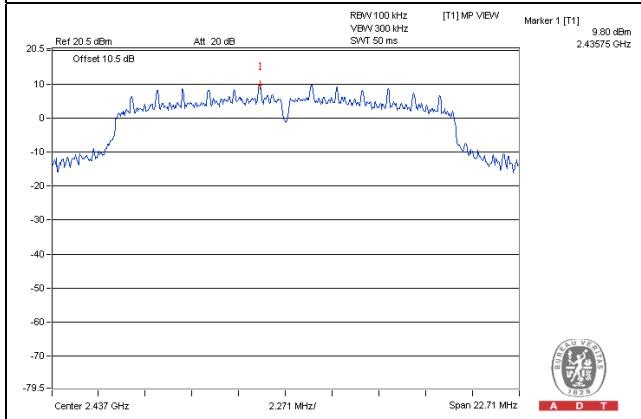


#### CH 11 Band edge

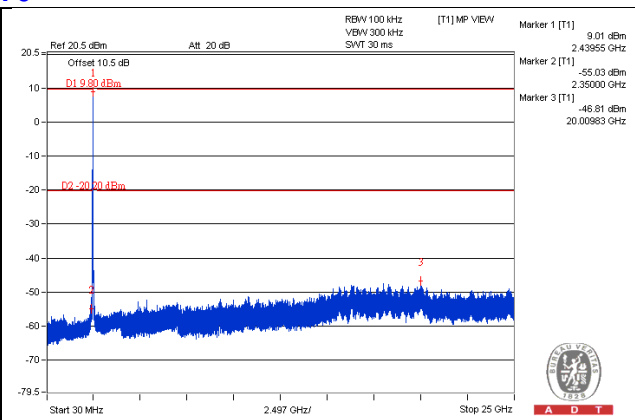
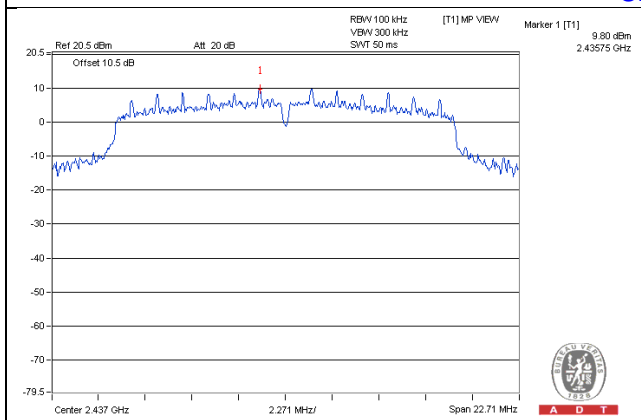


CHAIN 2

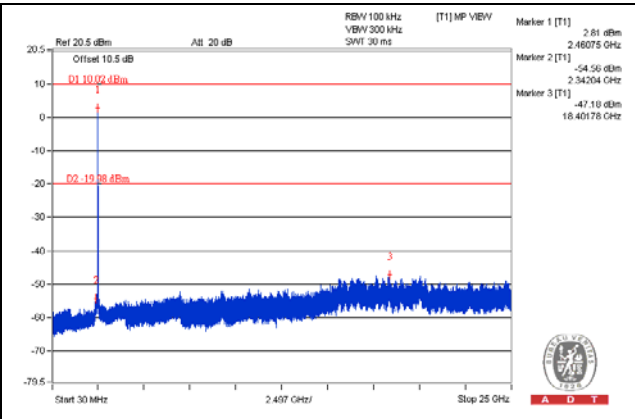
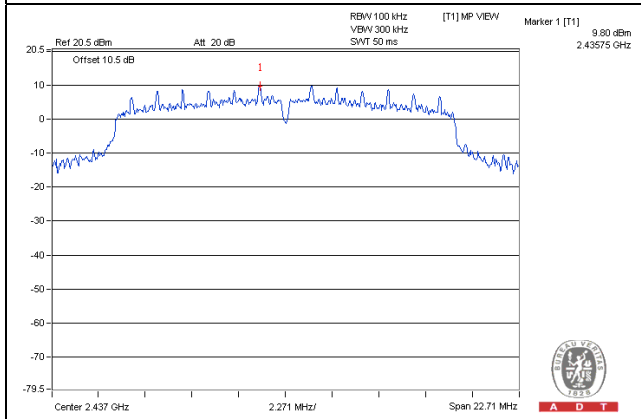
CH 1



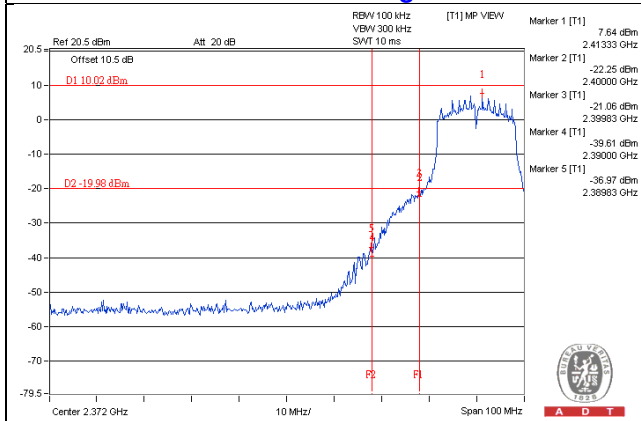
CH 6



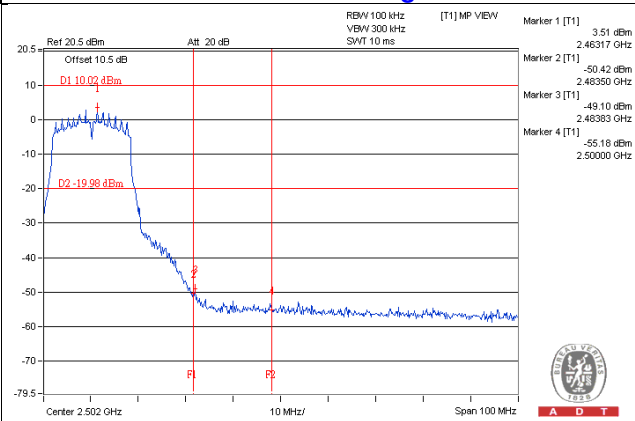
CH 11



CH 1 Band edge

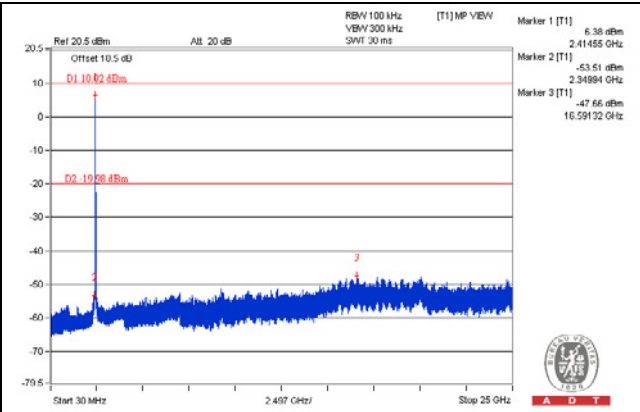
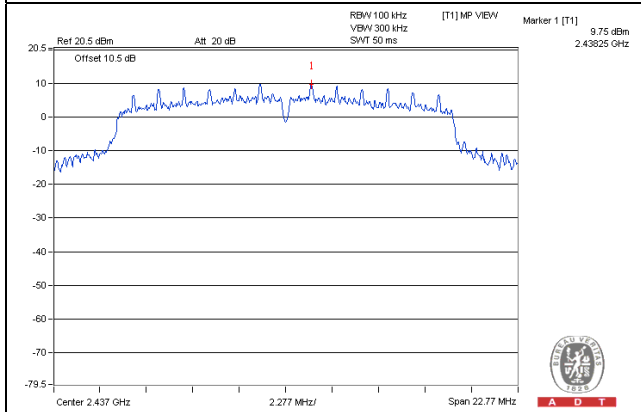


CH 11 Band edge

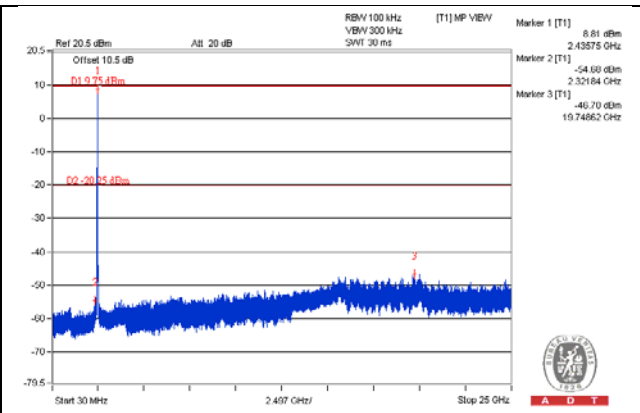
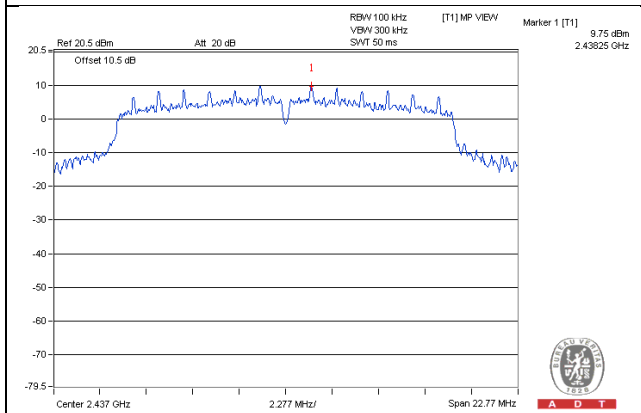


### CHAIN 3

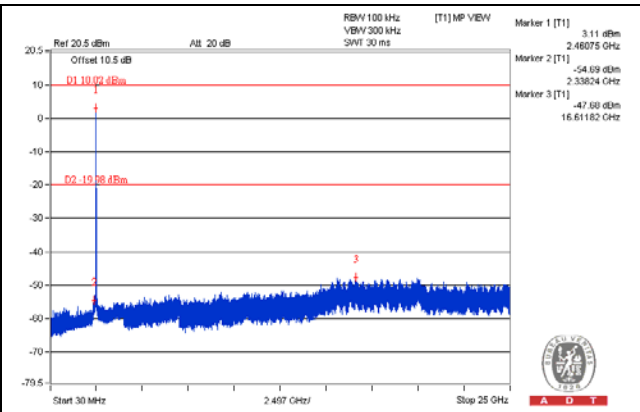
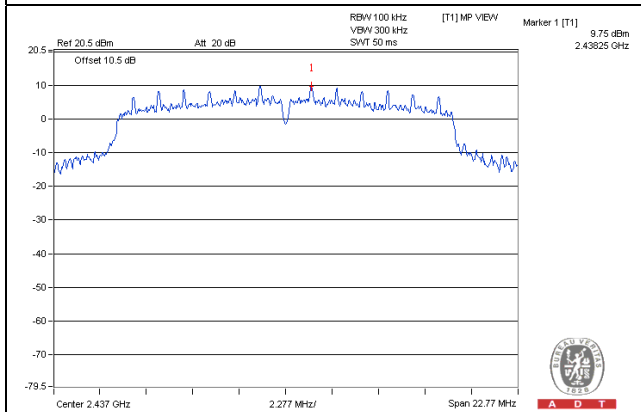
#### CH 1



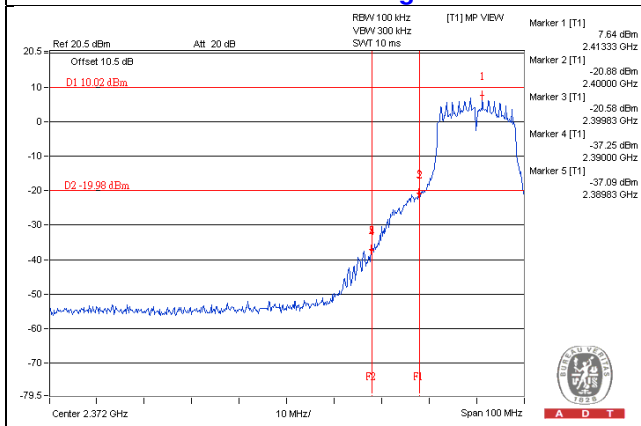
#### CH 6



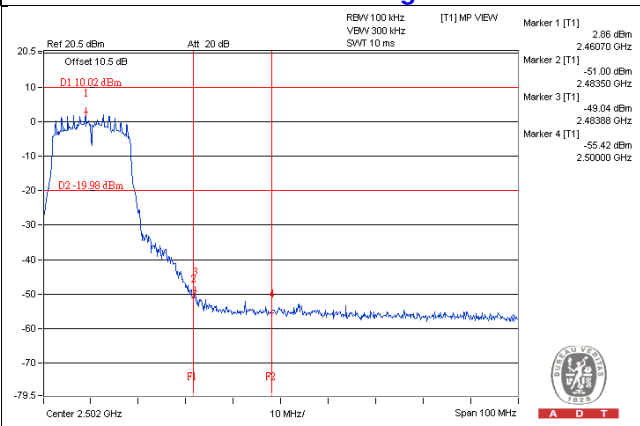
#### CH 11



#### CH 1 Band edge

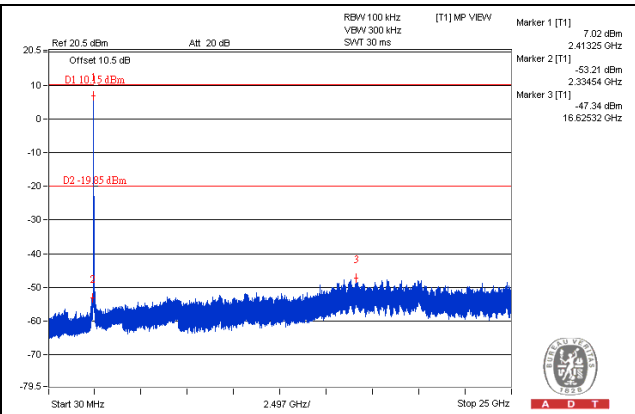
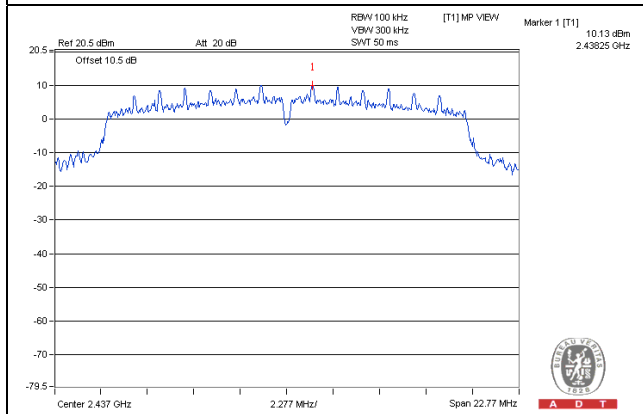


#### CH 11 Band edge

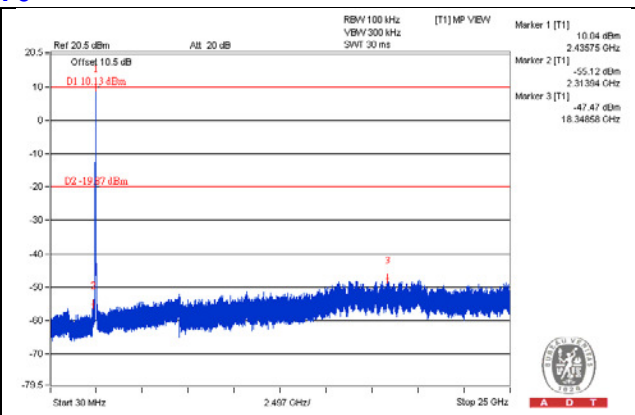
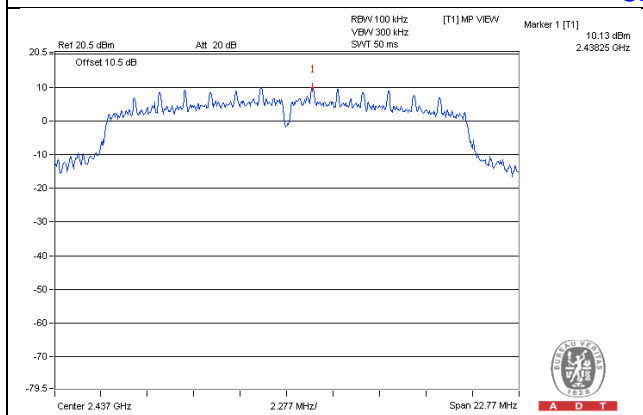


### 802.11n (20MHz): CHAIN 0

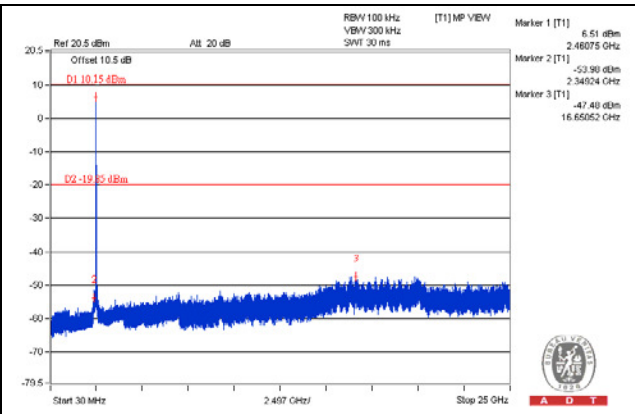
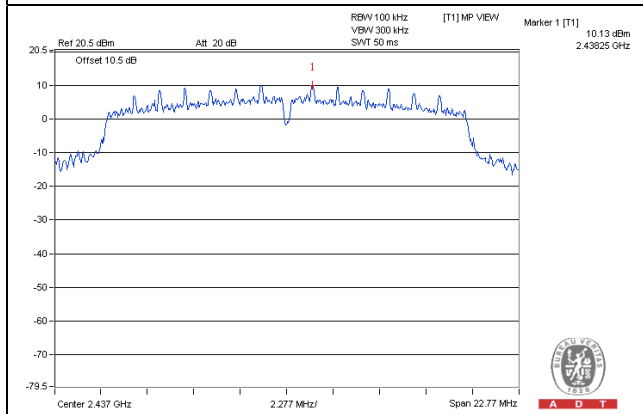
#### CH 1



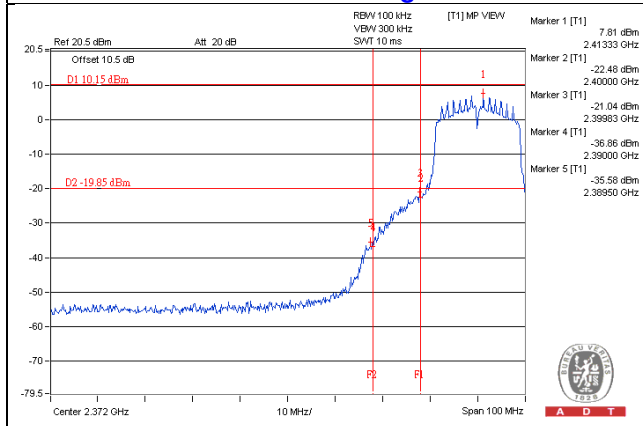
#### CH 6



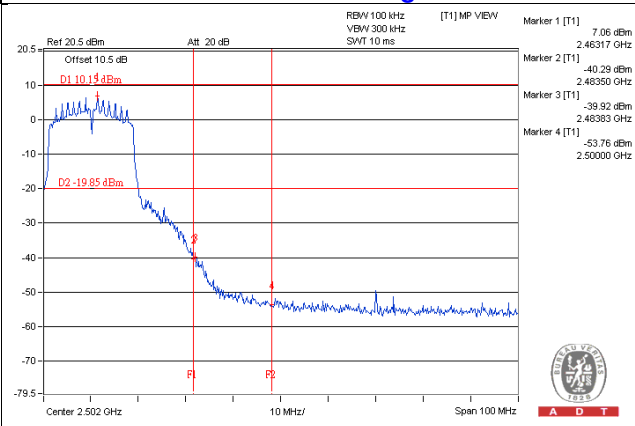
#### CH 11



#### CH 1 Band edge

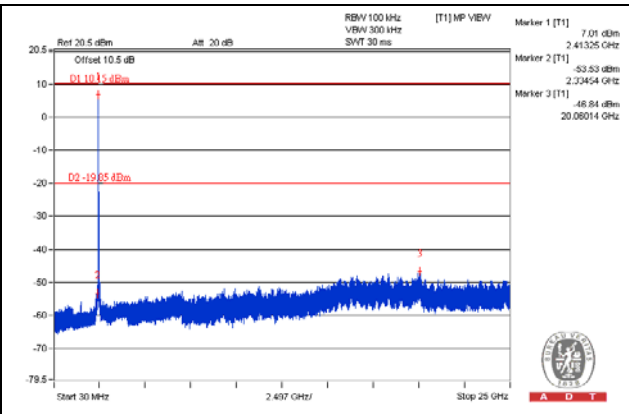
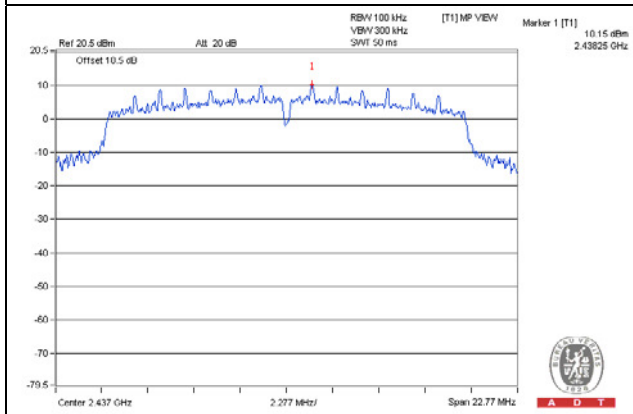


#### CH 11 Band edge

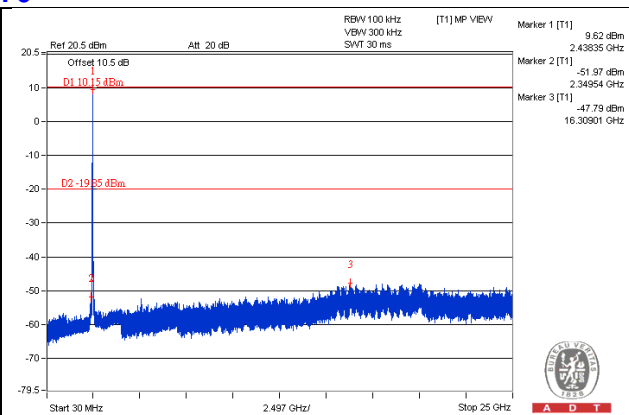
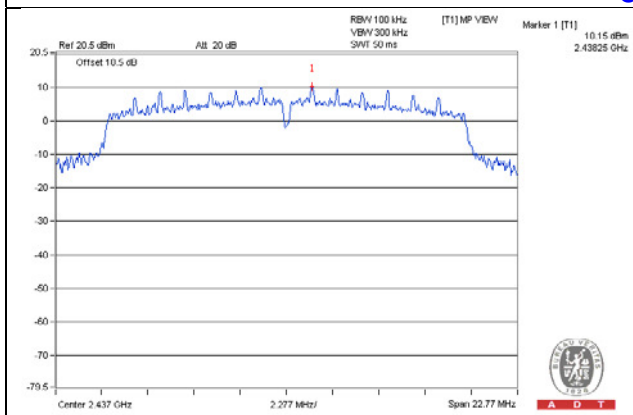


CHAIN 1

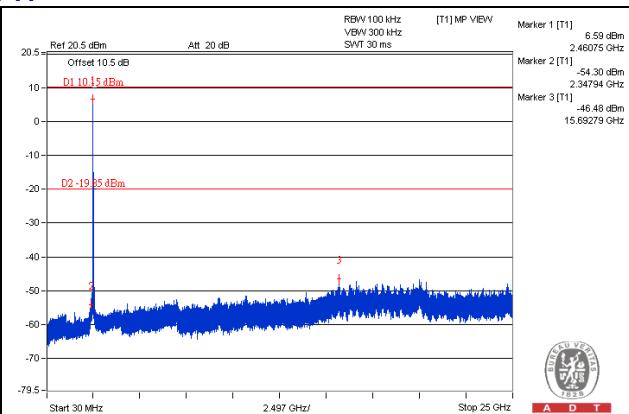
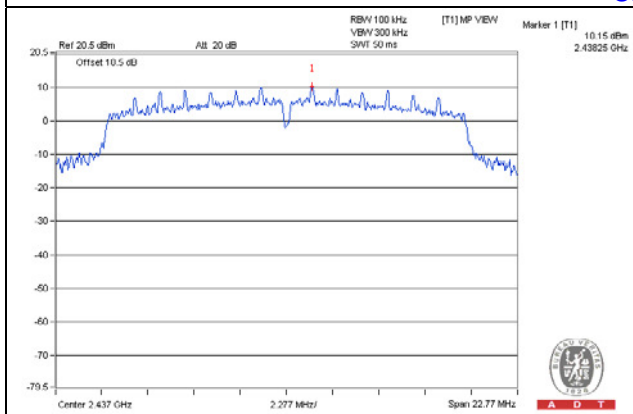
CH 1



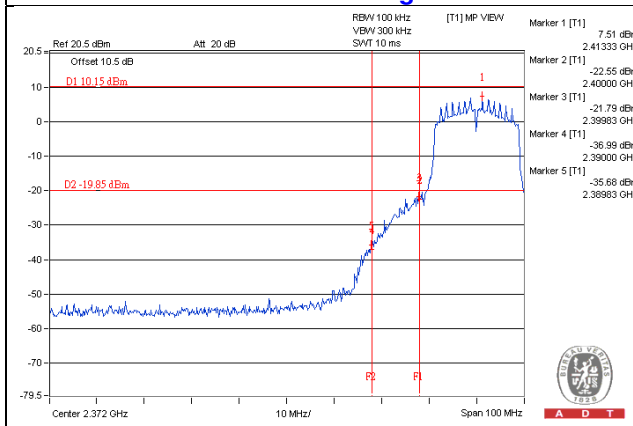
CH 6



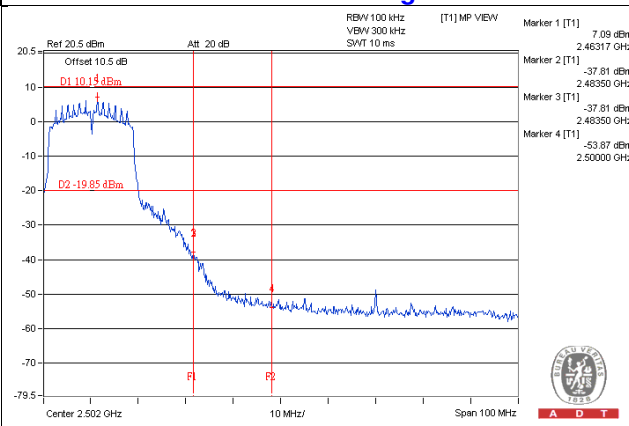
CH 11



CH 1 Band edge

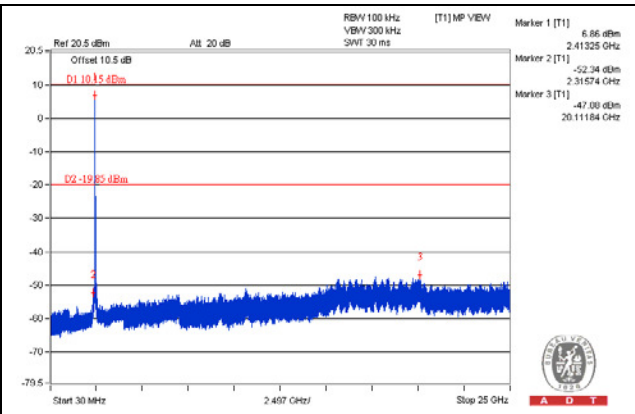
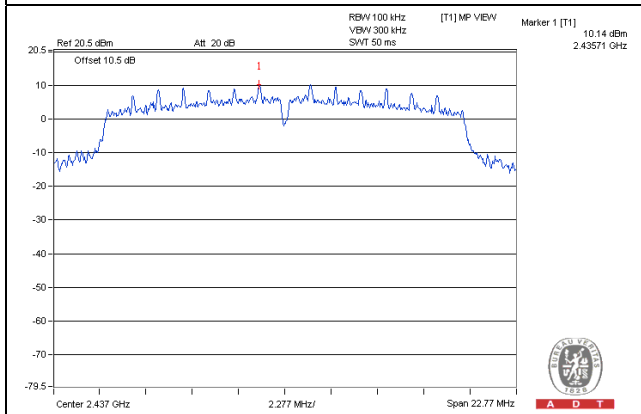


CH 11 Band edge

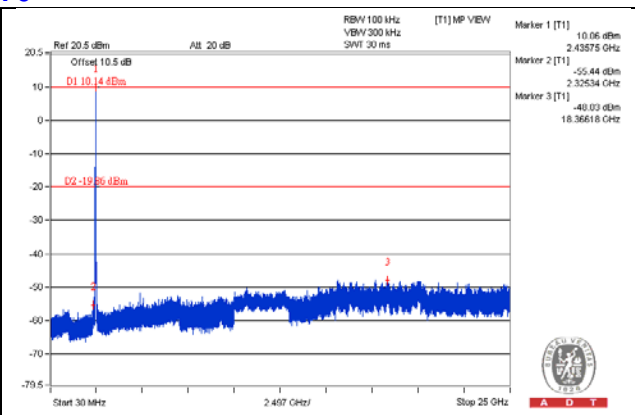
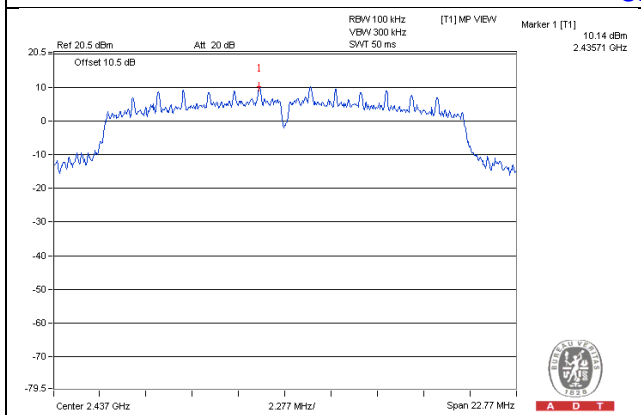


### CHAIN 2

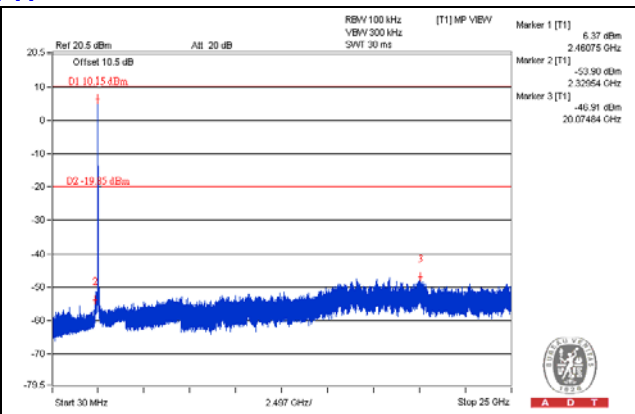
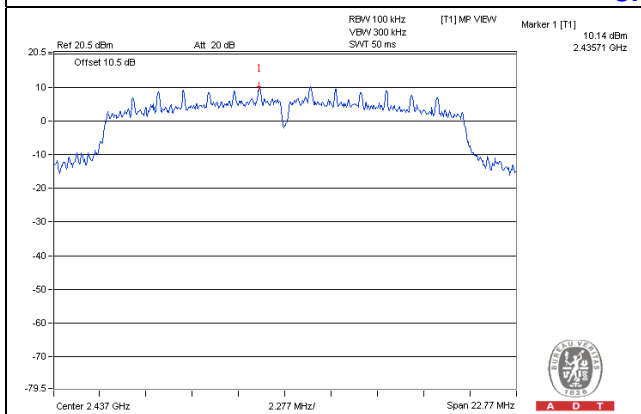
#### CH 1



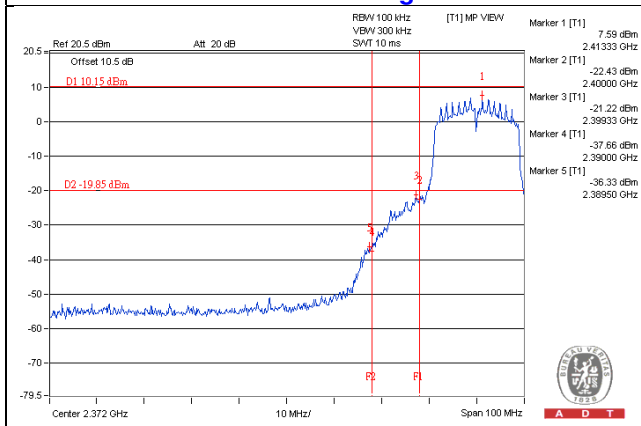
#### CH 6



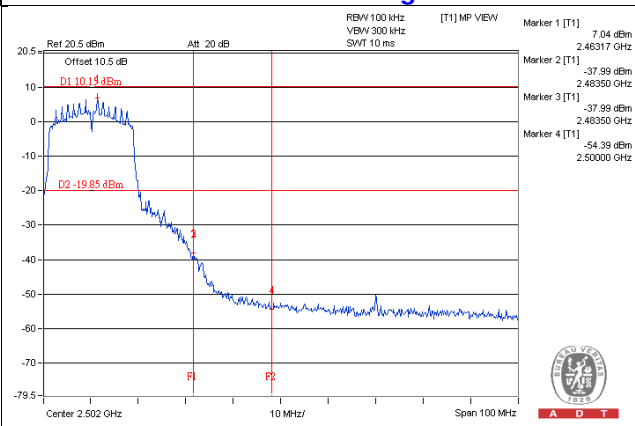
#### CH 11



#### CH 1 Band edge

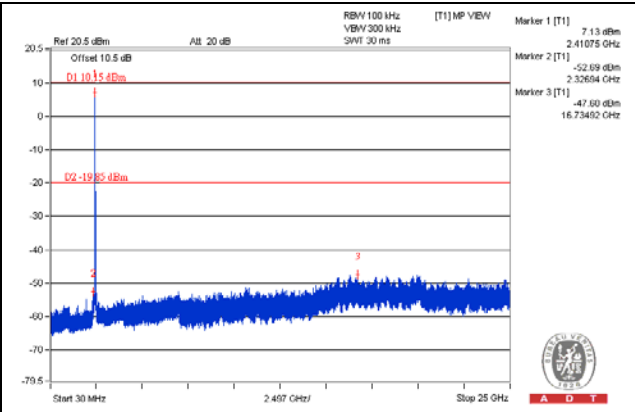
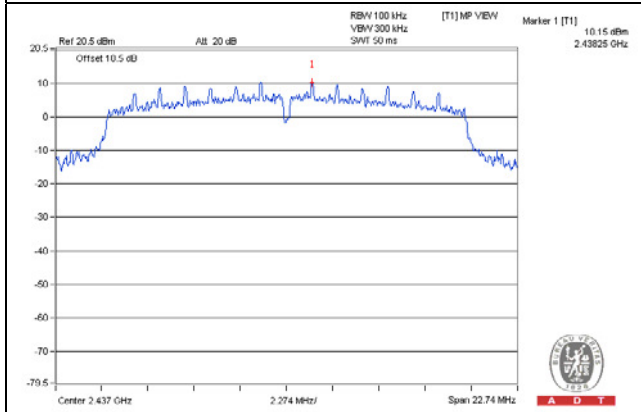


#### CH 11 Band edge

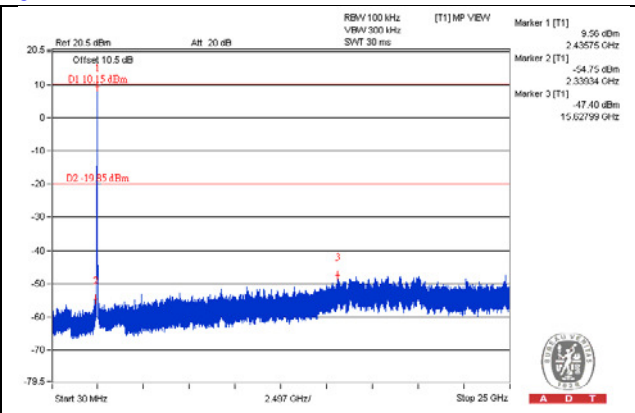
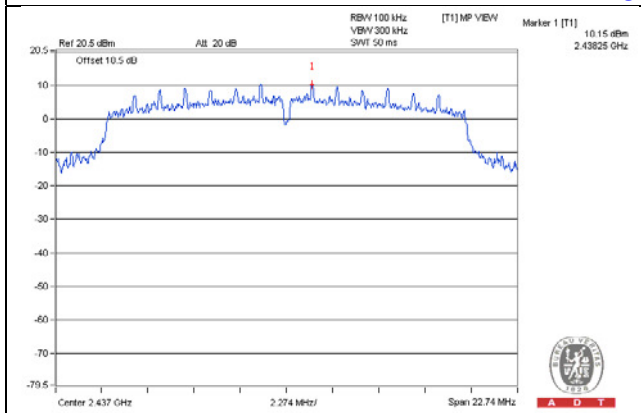


### CHAIN 3

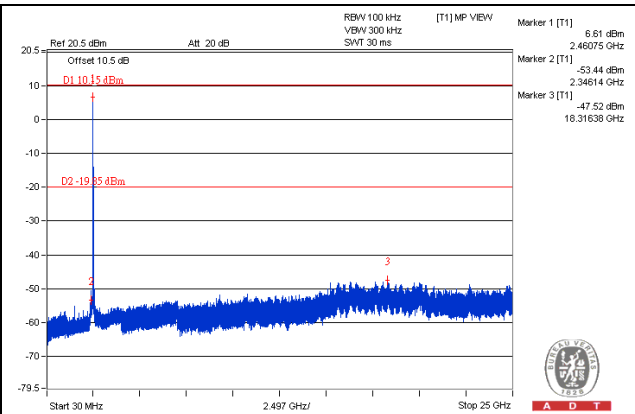
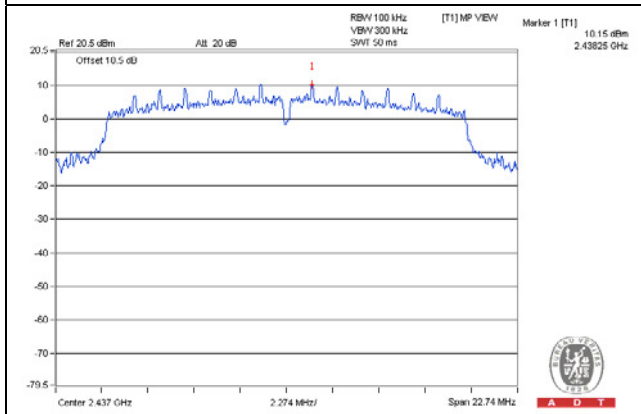
#### CH 1



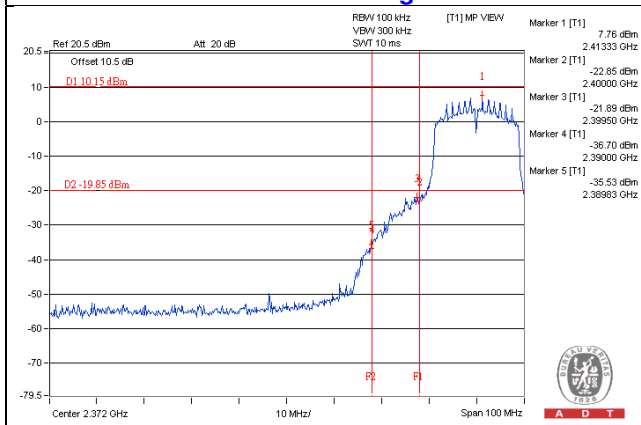
#### CH 6



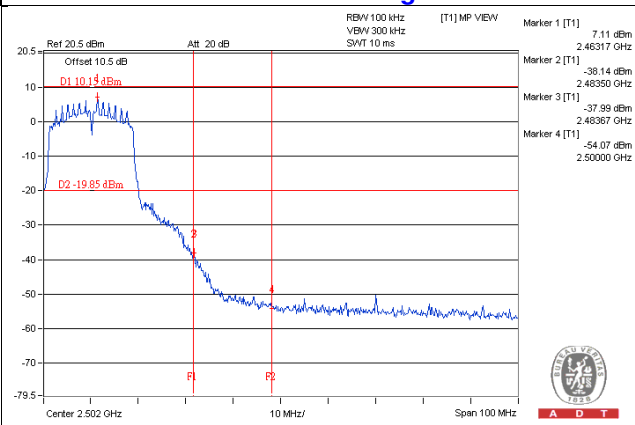
#### CH 11



#### CH 1 Band edge

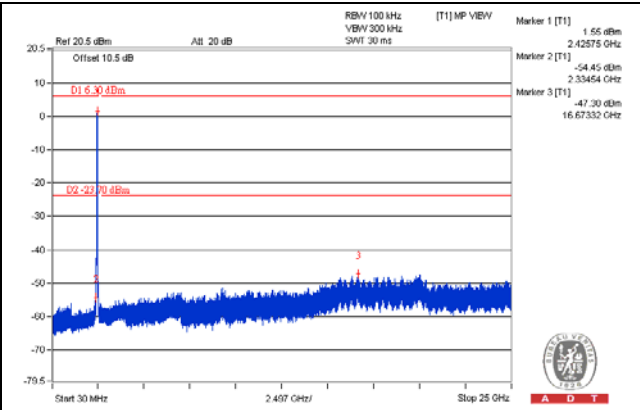
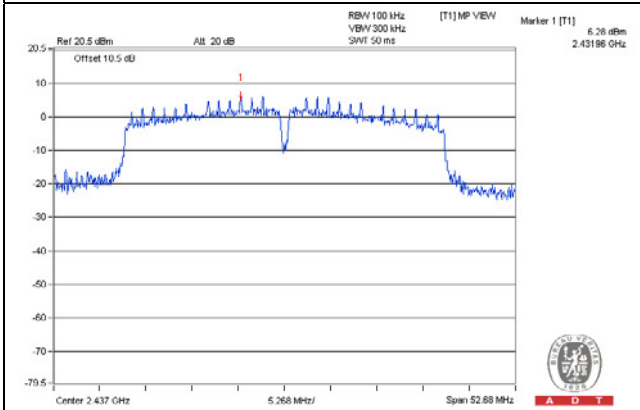


#### CH 11 Band edge

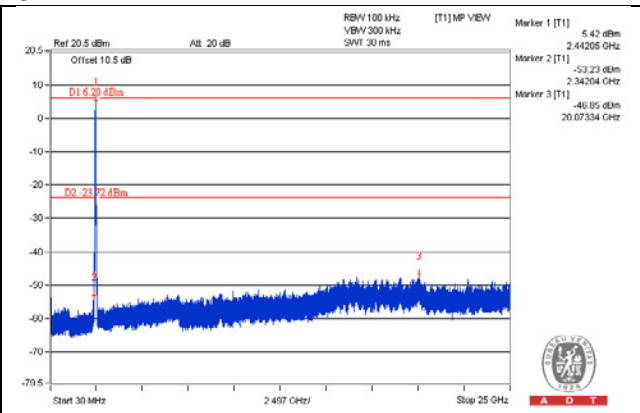
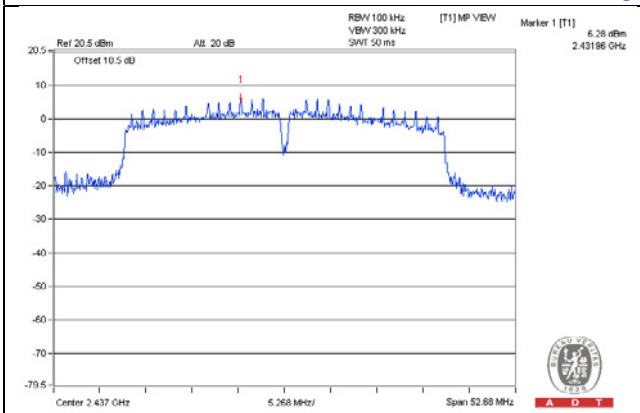


### 802.11n (40MHz): CHAIN 0

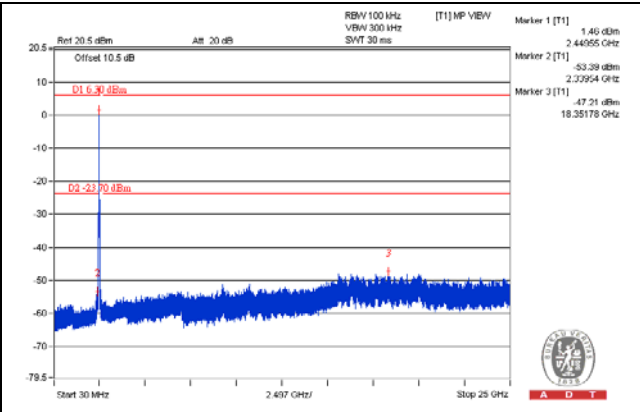
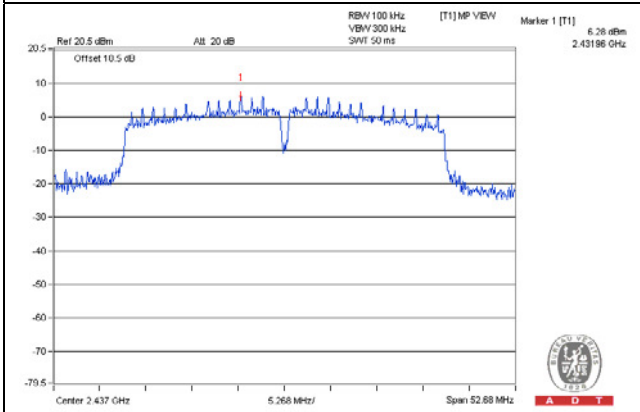
#### CH 3



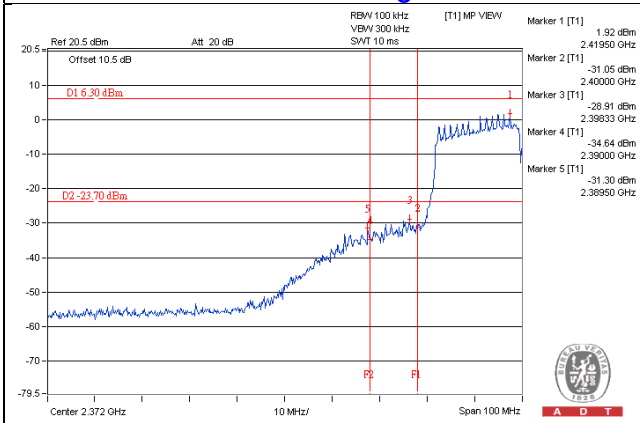
#### CH 6



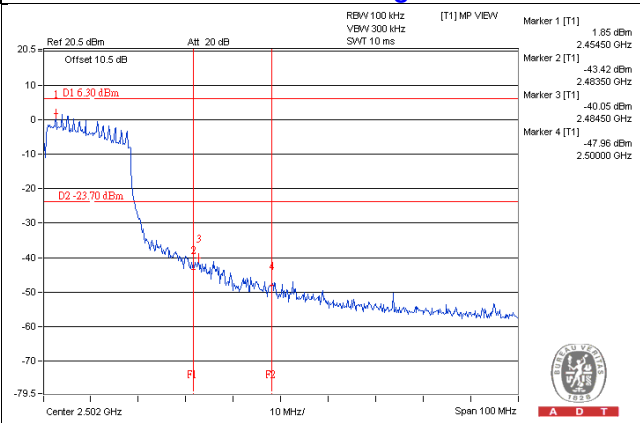
#### CH 9



#### CH 3 Band edge



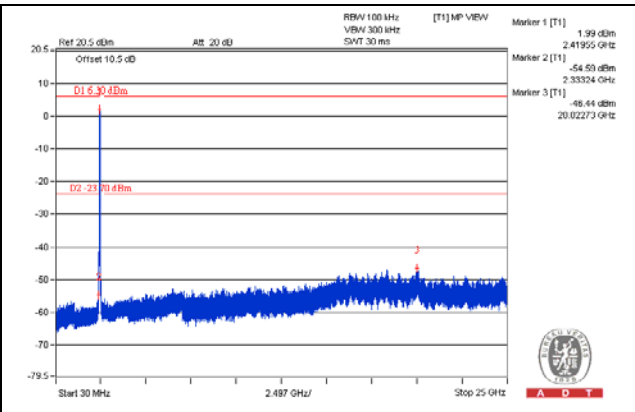
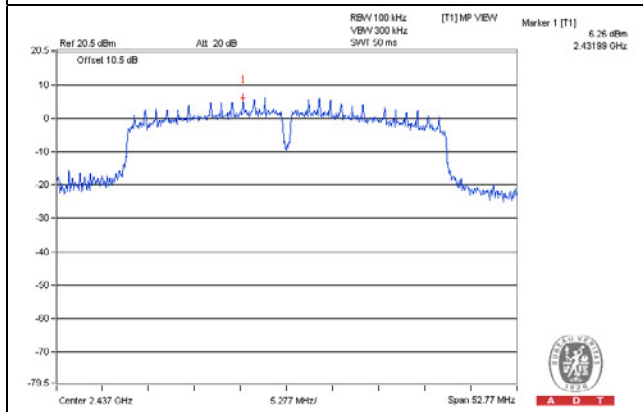
#### CH 9 Band edge



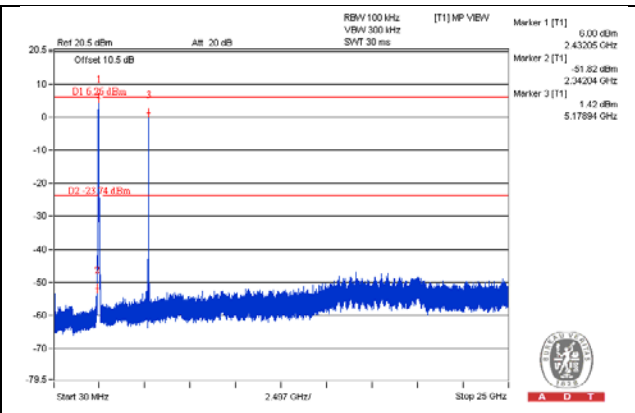
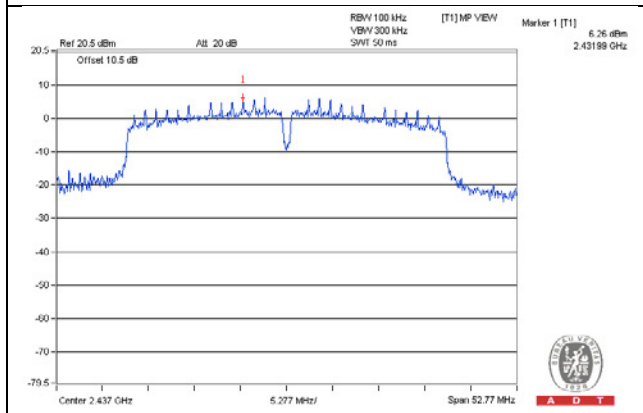


# CHAIN 1

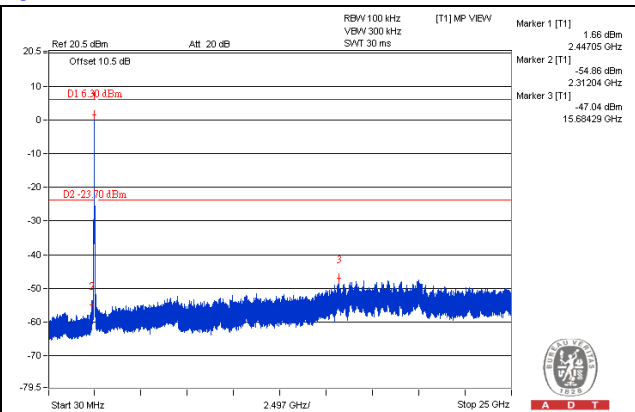
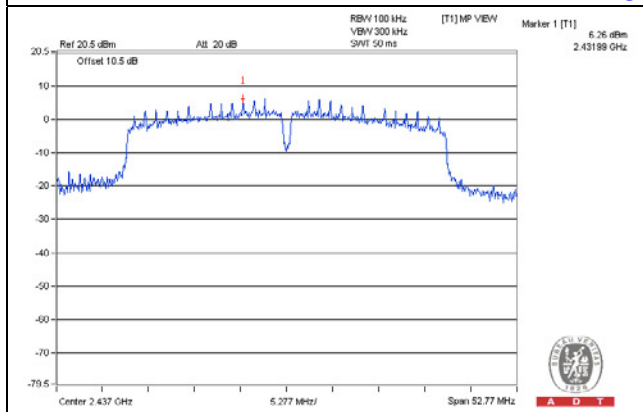
## CH 3



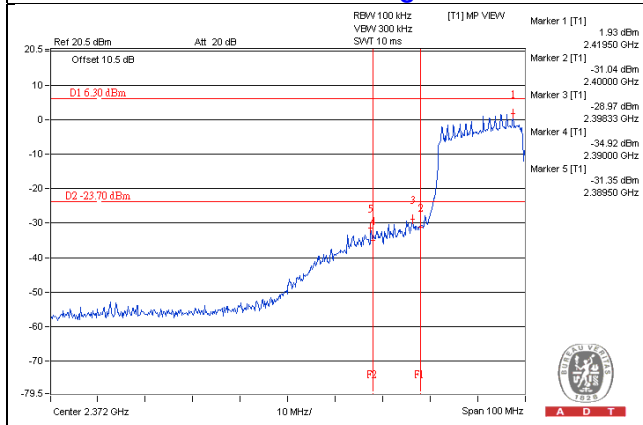
## CH 6



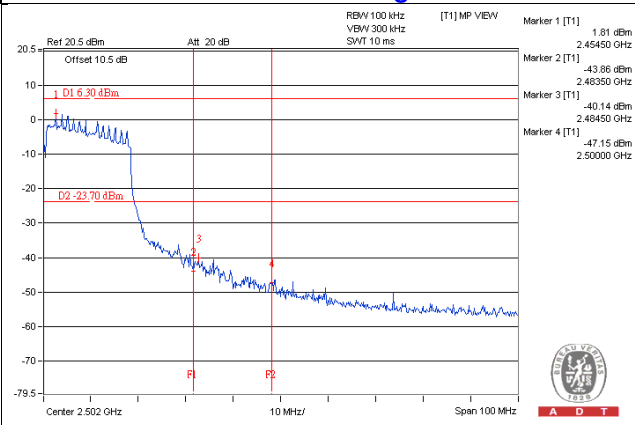
## CH 9



## CH 3 Band edge

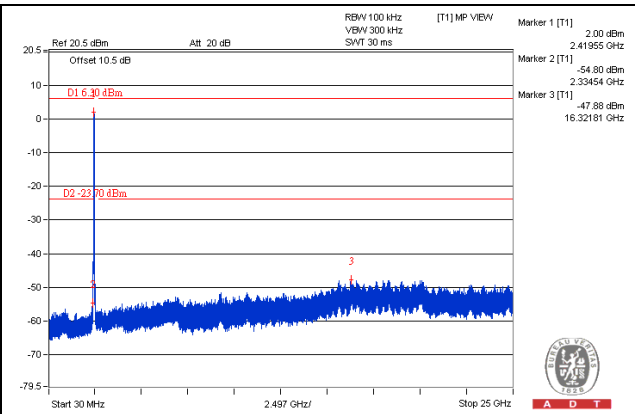
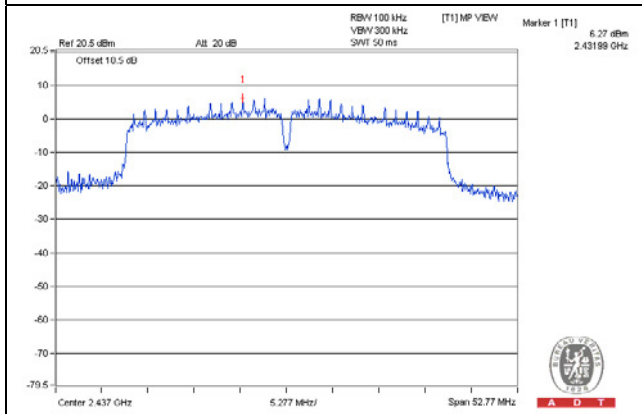


## CH 9 Band edge

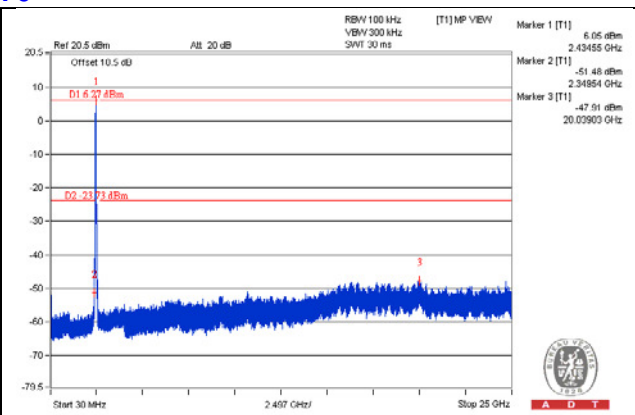
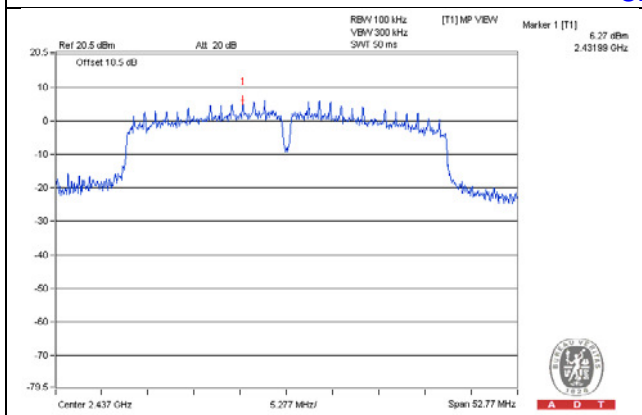


CHAIN 2

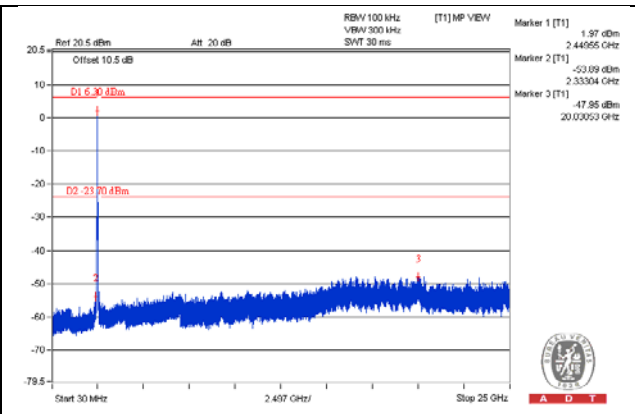
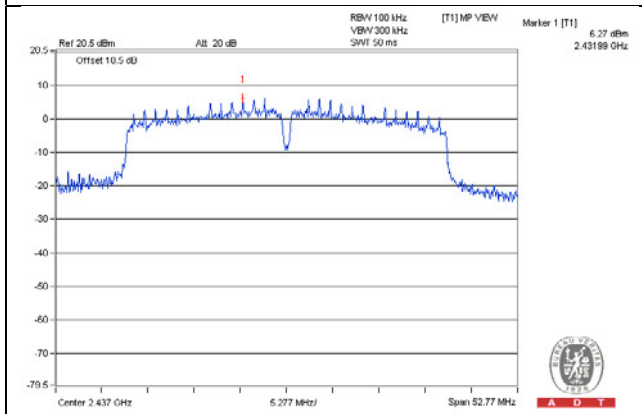
CH 3



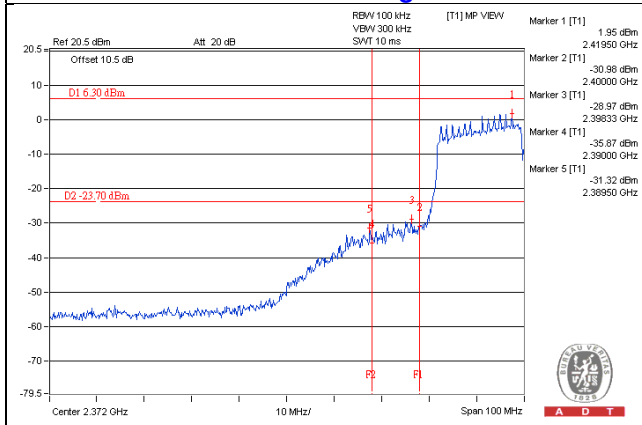
CH 6



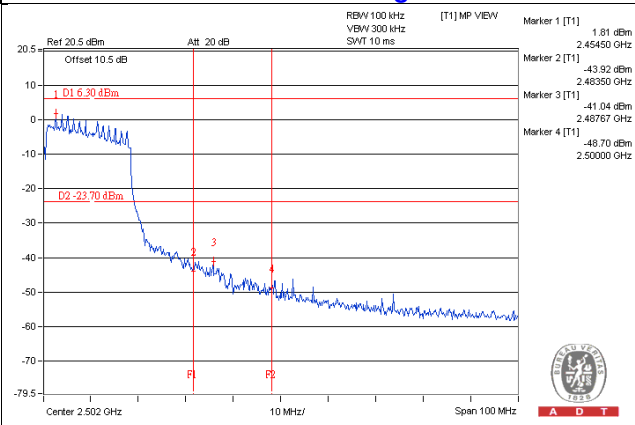
CH 9



CH 3 Band edge

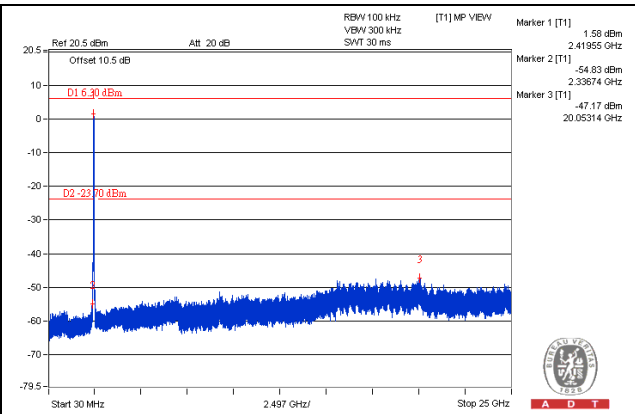
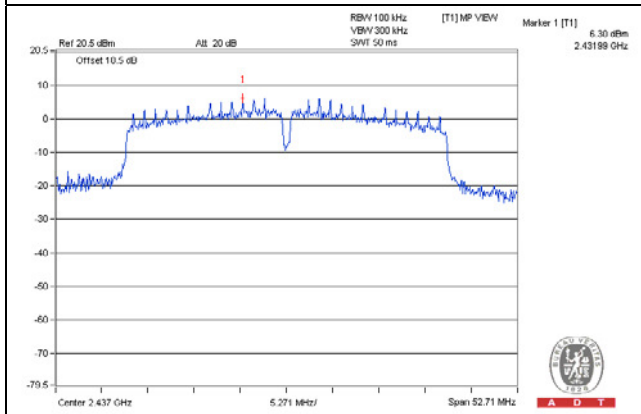


CH 9 Band edge

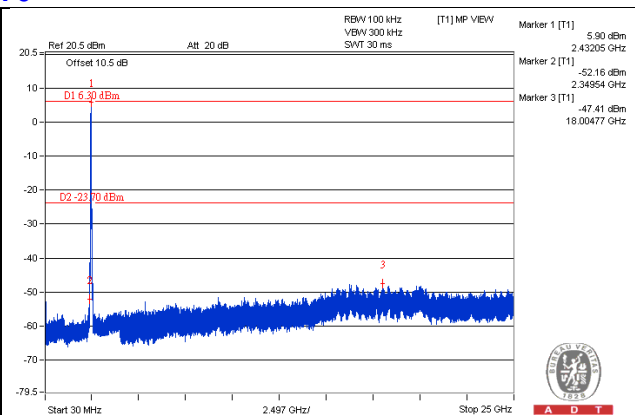
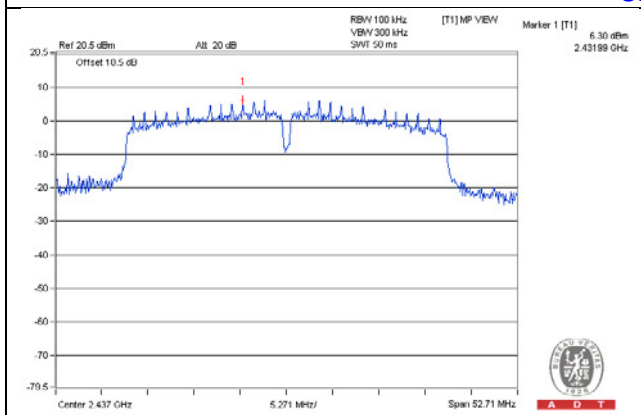


CHAIN 3

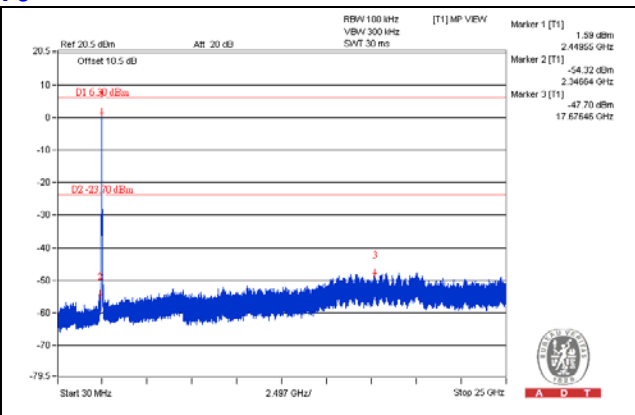
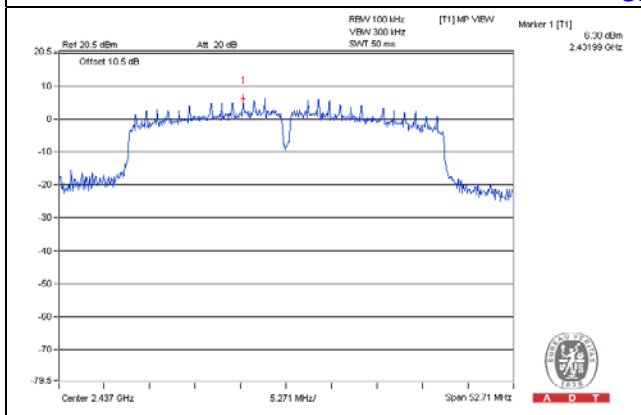
CH 3



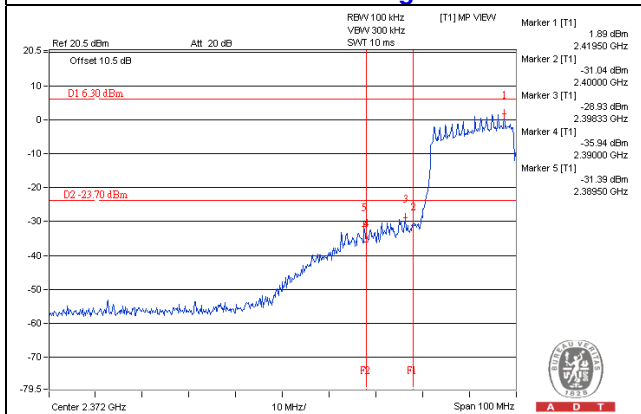
CH 6



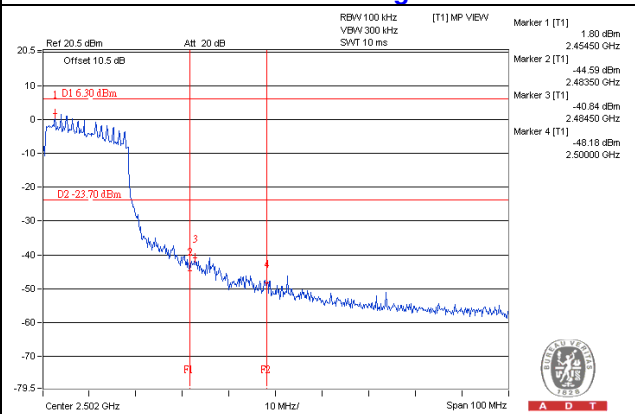
CH 9



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:

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

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