FCC Test Report

Report No.: RF150422C24

FCC ID: TE7C2600

Test Model: Archer C2600

Received Date: Apr. 22, 2015

Test Date: May 12 ~ May 20, 2015

Issued Date: May 20, 2015

Applicant: TP-LINK TECHNOLOGIES CO., LTD.

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Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF150422C24	Original release	May 20, 2015

1 Certificate of Conformity

Product: AC2600 Wireless Dual Band Gigabit Router

Brand: TP-LINK

Test Model: Archer C2600

Sample Status: Prototype

Applicant: TP-LINK TECHNOLOGIES CO., LTD.

Test Date: May 12 ~ May 20, 2015

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2009

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

Prepared by : _____ , **Date:** May 20, 2015
Pettie Chen / Senior Specialist

Approved by : _____ , **Date:** May 20, 2015
Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -16.38dB at 13.14063MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2390.00MHz.
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 MHF not a standard connector.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AC2600 Wireless Dual Band Gigabit Router
Brand	TP-LINK
Test Model	Archer C2600
Status of EUT	Prototype
Power Supply Rating	12Vdc from adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 800.0Mbps with 256QAM 802.11ac: up to 1733.3Mbps
Operating Frequency	2412 ~ 2462MHz, 5745 ~ 5825MHz
Number of Channel	2412 ~ 2462MHz: 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) 5745 ~ 5825MHz: 5 for 802.11a, 802.11n (20MHz), 802.11ac (20MHz) 2 for 802.11n (40MHz), 802.11ac (40MHz) 1 for 802.11ac (80MHz)
Output Power	2412 ~ 2462MHz: 971.670mW 5745 ~ 5825MHz: 993.523mW
Antenna Type	2412 ~ 2462MHz: Omni-Directional antenna with 3.04dBi gain 5745 ~ 5825MHz: Omni-Directional antenna with 4.15dBi gain
Antenna Connector	i-pex MHF
Accessory Device	1.45m shielded AC power cable without core, adapter
Data Cable Supplied	N/A

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 4 completed transmitters and 4 receivers.

Modulation Mode	TX Function
802.11b	4TX
802.11g	4TX
802.11a	4TX
802.11n (20MHz)	4TX
802.11n (40MHz)	4TX
802.11ac (20MHz)	4TX
802.11ac (40MHz)	4TX
802.11ac (80MHz)	4TX

* The modulation and bandwidth are similar for 802.11n mode for 20MHz / 40MHz and 802.11ac mode for 20MHz / 40MHz, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

2. The EUT uses following adapter.

Adapter	
Brand	Huntkey
Model	HKA04812040-7D
Input Power	100-240Vac~1.2A 50/60Hz
Output Power	12.0Vdc / 4.0A
Power Line	1.8m cable without core attached on adapter

3.2 Description of Test Modes

For 2.4GHz:

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

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

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

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

For 5.0GHz (5745 ~ 5825MHz):

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

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

FOR 2.4GHz:

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.

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

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

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

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.

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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
RE<1G	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
PLC	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Antony Lee

FOR 5.0GHz:

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 **Z-plane**.

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (80MHz)	155	155	OFDM	BPSK	117.0

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

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

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

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

Antenna Port Conducted Measurement:

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

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (80MHz)	155	155	OFDM	BPSK	117.0

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
RE<1G	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
PLC	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Antony Lee

3.3 Duty Cycle of Test Signal

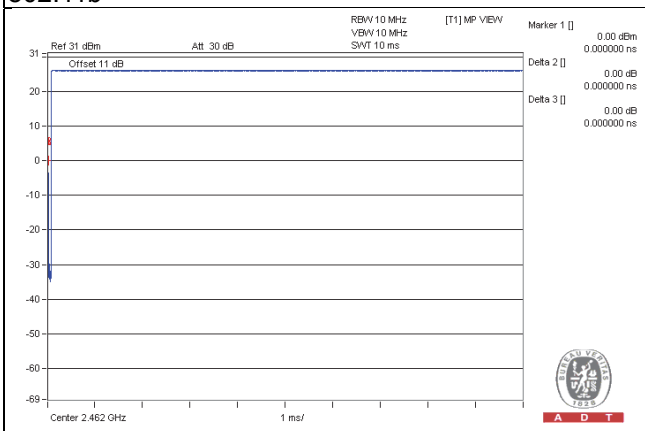
2.4GHz Band:

802.11b: Duty cycle of test signal is 100%, duty factor is not required

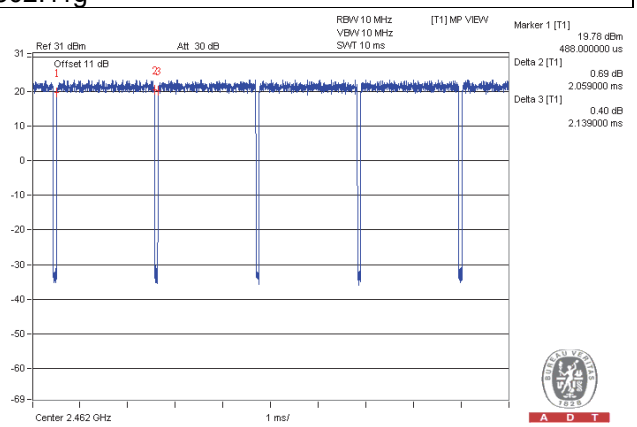
802.11n (20MHz): Duty cycle of test signal is > 98%, duty factor is not required
802.11n (20MHz): Duty cycle = 4.98/5.075= 0.981

802.11g, 802.11n (40MHz): Duty cycle of test signal is < 98 %, duty factor is required
802.11g: Duty cycle = 2.059/2.139= 0.963, Duty factor = 10 * log(1/0.963) = 0.17
802.11n (40MHz): Duty cycle = 2.418/2.515= 0.961, Duty factor = 10 * log(1/0.961) = 0.17

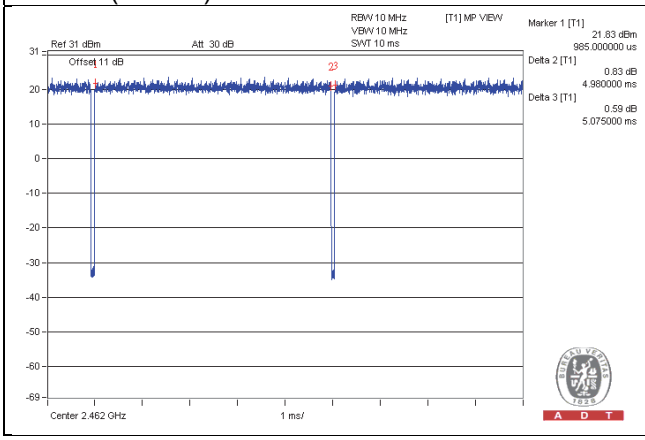
802.11b



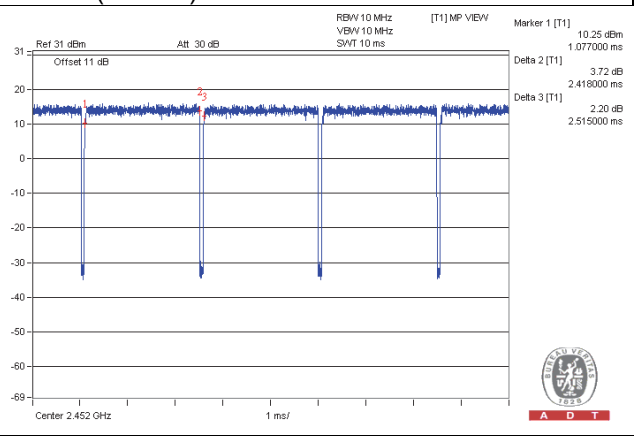
802.11g



802.11n (20MHz)



802.11n (40MHz)



5GHz Band:

Duty cycle of test signal is < 98 %, duty factor is required

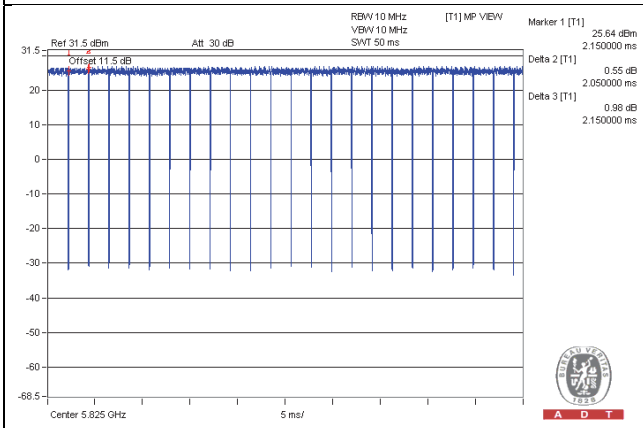
802.11a: Duty cycle = 2.05/2.15= 0.953, Duty factor = 10 * log(1/0.953) = 0.21

802.11n (20MHz): Duty cycle = 4.988/5.15= 0.969, Duty factor = 10 * log(1/0.969) = 0.14

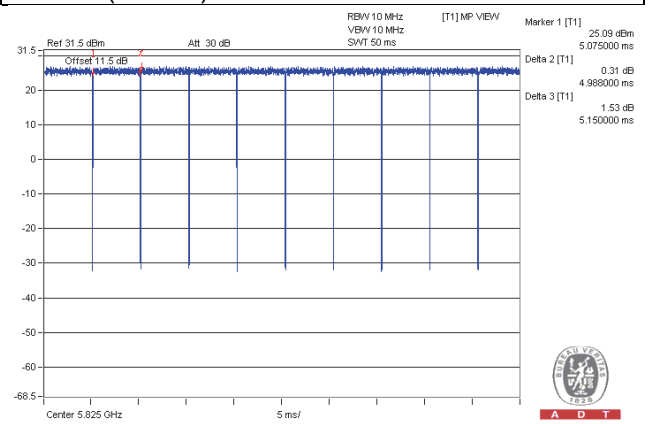
802.11n (40MHz): Duty cycle = 2.363/2.5 = 0.945, Duty factor = 10 * log(1/0.945) = 0.24

802.11ac (80MHz): Duty cycle = 1.099/1.212 = 0.907, Duty factor = 10 * log(1/0.907) = 0.43

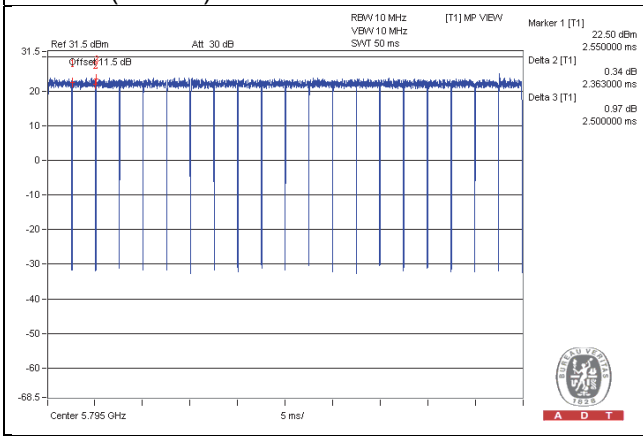
802.11a



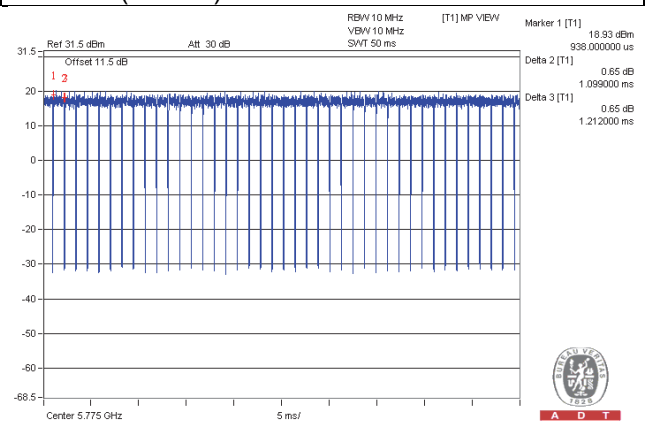
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



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.

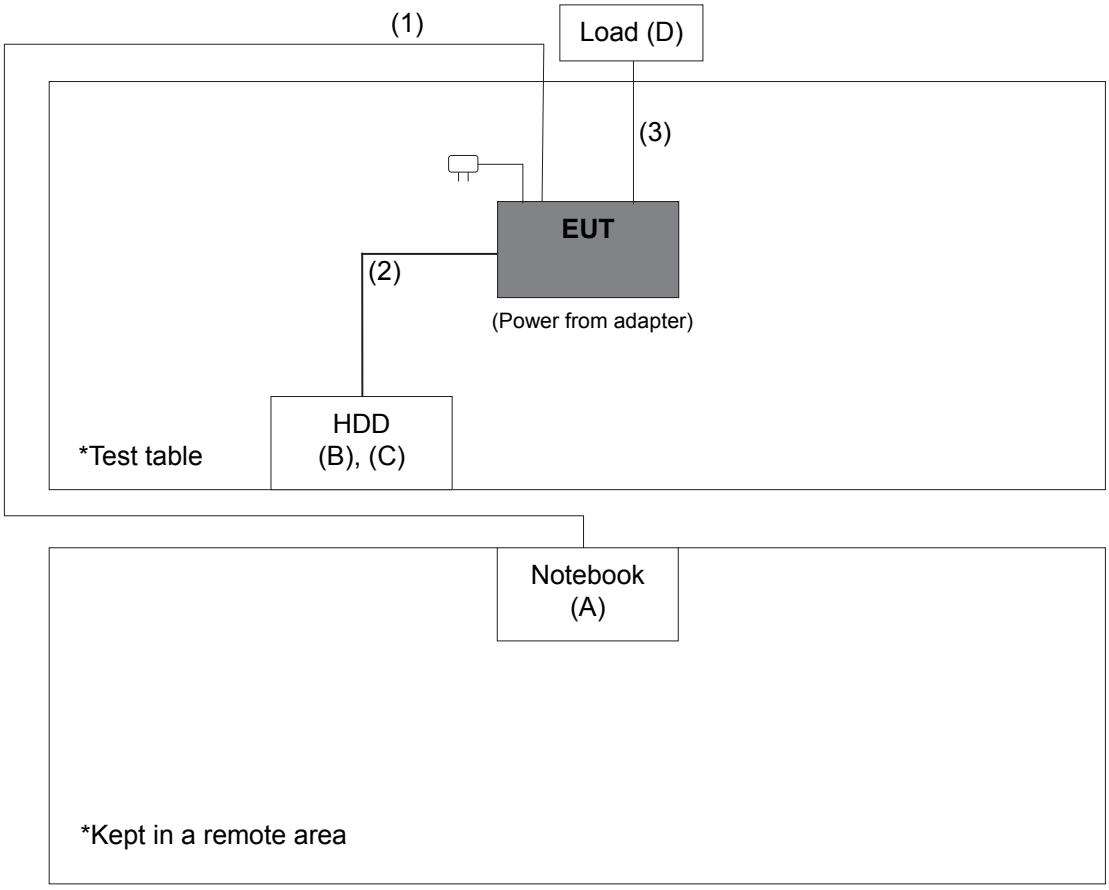
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	D531	CN-0XM006-48643-81 U-2610	QDS-BRCM1020	-
B.	External Hard Disk	WD	WDBACY5000ABL-01	WXS1CC1D3606	NA	-
C.	External Hard Disk	WD	WDBACY5000ABL-01	WX51C1245403	NA	-
D.	Load	NA	NA	NA	NA	-

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ 45	1	10	N	0	-
2.	USB	1	1.8	Y	0	-
3.	RJ 45	4	1.8	N	0	-

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)
558074 D01 DTS Meas Guidance v03r02
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2009

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

Note: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results (FOR 2.4GHz BAND)

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 30dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Apr. 10, 2015	Apr. 09, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Aug. 29, 2014	Aug. 28, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	9120D	209	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8447D	2944A10738	Oct.18, 2014	Oct. 17, 2015
Preamplifier Agilent	8449B	3008A01964	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 22, 2014	Aug. 21, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2014	Oct. 17, 2015
High Speed Peak Power Meter	ML2495A	0824011	Jul. 26, 2014	Jul. 25, 2015
Power Sensor	MA2411B	0738171	Jul. 26, 2014	Jul. 25, 2015

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

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters 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:

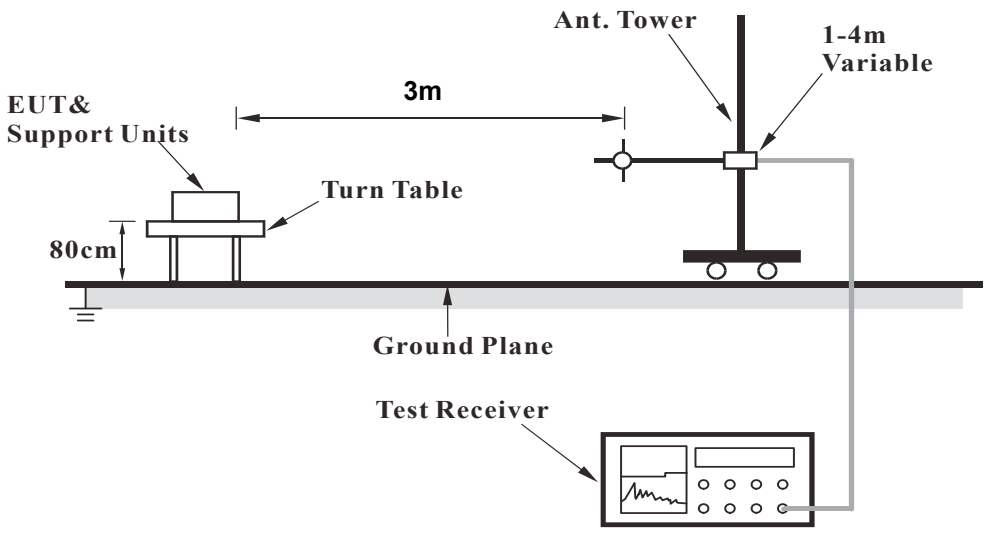
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test. (Tracking Number 307455)
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. 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.
4. 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/duty cycle)).
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
6. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

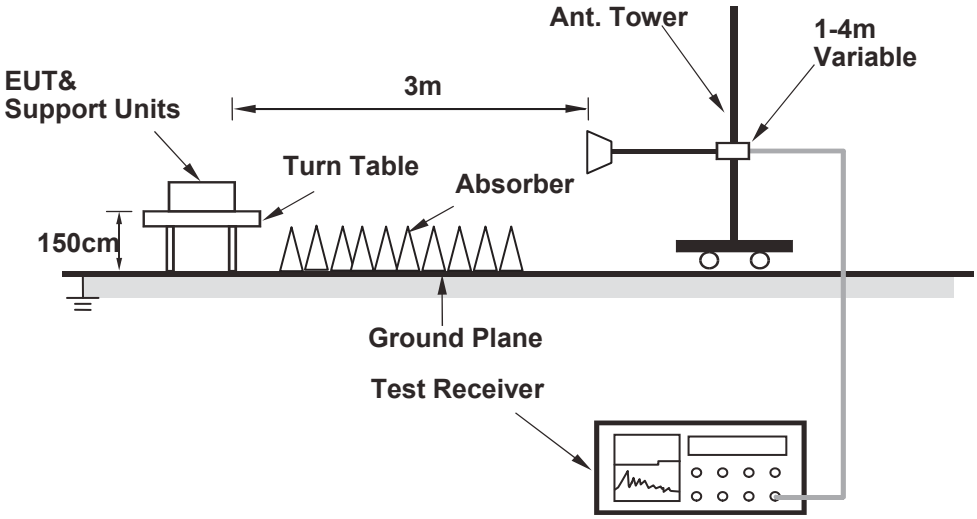
No deviation.

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

a. Placed the EUT on the testing table.
b. Prepared a notebook to act as communication partner and placed it outside of testing area.
c. 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.
d. The communication partner sent data to EUT by command "PING".
e. The necessary accessories enable the system in full functions.

4.1.7 Test Results

Above 1GHz data:

802.11b

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

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	2387.00	55.6 PK	74.0	-18.4	1.13 H	238	23.10	32.50
2	2387.00	45.2 AV	54.0	-8.8	1.13 H	238	12.70	32.50
3	*2412.00	110.6 PK			1.63 H	114	78.00	32.60
4	*2412.00	106.8 AV			1.63 H	114	74.20	32.60
5	4824.00	47.8 PK	74.0	-26.2	1.06 H	47	41.90	5.90
6	4824.00	35.5 AV	54.0	-18.5	1.06 H	47	29.60	5.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.00	61.0 PK	74.0	-13.0	1.73 V	193	28.50	32.50
2	2387.00	53.5 AV	54.0	-0.5	1.73 V	193	21.00	32.50
3	*2412.00	122.8 PK			1.42 V	147	90.20	32.60
4	*2412.00	118.8 AV			1.42 V	147	86.20	32.60
5	4824.00	48.4 PK	74.0	-25.6	1.34 V	302	42.50	5.90
6	4824.00	38.3 AV	54.0	-15.7	1.34 V	302	32.40	5.90

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.6 PK	74.0	-17.4	1.75 H	105	24.10	32.50
2	2390.00	46.0 AV	54.0	-8.0	1.75 H	105	13.50	32.50
3	*2437.00	114.3 PK			1.76 H	103	81.60	32.70
4	*2437.00	110.6 AV			1.76 H	103	77.90	32.70
5	4874.00	49.3 PK	74.0	-24.7	1.10 H	224	43.40	5.90
6	4874.00	41.8 AV	54.0	-12.2	1.10 H	224	35.90	5.90
7	12185.00	58.2 PK	74.0	-15.8	1.14 H	191	41.40	16.80
8	12185.00	45.4 AV	54.0	-8.6	1.14 H	191	28.60	16.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.1 PK	74.0	-14.9	1.70 V	156	26.60	32.50
2	2390.00	52.5 AV	54.0	-1.5	1.70 V	156	20.00	32.50
3	*2437.00	123.4 PK			1.58 V	156	90.70	32.70
4	*2437.00	119.9 AV			1.58 V	156	87.20	32.70
5	4874.00	49.4 PK	74.0	-24.6	1.09 V	74	43.50	5.90
6	4874.00	40.4 AV	54.0	-13.6	1.09 V	74	34.50	5.90
7	12185.00	60.5 PK	74.0	-13.5	1.17 V	73	43.70	16.80
8	12185.00	51.5 AV	54.0	-2.5	1.17 V	73	34.70	16.80

Remarks:

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

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

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	112.9 PK			1.01 H	262	80.30	32.60
2	*2462.00	109.4 AV			1.01 H	262	76.80	32.60
3	2486.00	57.1 PK	74.0	-16.9	1.90 H	249	24.40	32.70
4	2486.00	46.9 AV	54.0	-7.1	1.90 H	249	14.20	32.70
5	4924.00	48.0 PK	74.0	-26.0	1.63 H	189	42.00	6.00
6	4924.00	35.7 AV	54.0	-18.3	1.63 H	189	29.70	6.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	123.0 PK			1.73 V	158	90.40	32.60
2	*2462.00	119.1 AV			1.73 V	158	86.50	32.60
3	2486.00	63.7 PK	74.0	-10.3	1.20 V	149	31.00	32.70
4	2486.00	53.5 AV	54.0	-0.5	1.20 V	149	20.80	32.70
5	4924.00	48.4 PK	74.0	-25.6	1.79 V	337	42.40	6.00
6	4924.00	37.1 AV	54.0	-16.9	1.79 V	337	31.10	6.00

Remarks:

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

802.11g

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

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	57.6 PK	74.0	-16.4	1.89 H	147	25.10	32.50
2	2390.00	45.5 AV	54.0	-8.5	1.89 H	147	13.00	32.50
3	*2412.00	109.5 PK			1.01 H	107	76.90	32.60
4	*2412.00	99.0 AV			1.01 H	107	66.40	32.60
5	4824.00	47.2 PK	74.0	-26.8	1.09 H	214	41.30	5.90
6	4824.00	33.6 AV	54.0	-20.4	1.09 H	214	27.70	5.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.5 PK	74.0	-6.5	1.29 V	160	35.00	32.50
2	2390.00	53.5 AV	54.0	-0.5	1.29 V	160	21.00	32.50
3	*2412.00	118.7 PK			1.60 V	183	86.10	32.60
4	*2412.00	108.2 AV			1.60 V	183	75.60	32.60
5	4824.00	46.9 PK	74.0	-27.1	1.35 V	231	41.00	5.90
6	4824.00	34.0 AV	54.0	-20.0	1.35 V	231	28.10	5.90

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.4 PK	74.0	-17.6	1.19 H	264	23.90	32.50
2	2390.00	46.0 AV	54.0	-8.0	1.19 H	264	13.50	32.50
3	*2437.00	116.4 PK			1.04 H	263	83.70	32.70
4	*2437.00	105.2 AV			1.04 H	263	72.50	32.70
5	4874.00	46.7 PK	74.0	-27.3	1.52 H	50	40.80	5.90
6	4874.00	34.0 AV	54.0	-20.0	1.52 H	50	28.10	5.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.7 PK	74.0	-10.3	2.15 V	160	31.20	32.50
2	2390.00	53.6 AV	54.0	-0.4	2.15 V	160	21.10	32.50
3	*2437.00	126.6 PK			1.56 V	178	93.90	32.70
4	*2437.00	115.8 AV			1.56 V	178	83.10	32.70
5	4874.00	47.2 PK	74.0	-26.8	1.08 V	246	41.30	5.90
6	4874.00	35.7 AV	54.0	-18.3	1.08 V	246	29.80	5.90

Remarks:

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

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

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	110.3 PK			1.02 H	262	77.70	32.60
2	*2462.00	100.2 AV			1.02 H	262	67.60	32.60
3	2483.50	57.4 PK	74.0	-16.6	1.14 H	266	24.70	32.70
4	2483.50	46.4 AV	54.0	-7.6	1.14 H	266	13.70	32.70
5	4924.00	46.9 PK	74.0	-27.1	1.18 H	94	40.90	6.00
6	4924.00	33.9 AV	54.0	-20.1	1.18 H	94	27.90	6.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	118.6 PK			1.71 V	147	86.00	32.60
2	*2462.00	107.9 AV			1.71 V	147	75.30	32.60
3	2483.50	66.3 PK	74.0	-7.7	1.67 V	161	33.60	32.70
4	2483.50	53.6 AV	54.0	-0.4	1.67 V	161	20.90	32.70
5	4924.00	47.1 PK	74.0	-26.9	1.44 V	86	41.10	6.00
6	4924.00	33.8 AV	54.0	-20.2	1.44 V	86	27.80	6.00

Remarks:

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

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.8 PK	74.0	-17.2	1.18 H	81	24.30	32.50
2	2390.00	45.6 AV	54.0	-8.4	1.18 H	81	13.10	32.50
3	*2412.00	108.5 PK			1.01 H	105	75.90	32.60
4	*2412.00	98.0 AV			1.01 H	105	65.40	32.60
5	4824.00	46.6 PK	74.0	-27.4	1.24 H	302	40.70	5.90
6	4824.00	33.9 AV	54.0	-20.1	1.24 H	302	28.00	5.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.9 PK	74.0	-7.1	1.44 V	181	34.40	32.50
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.44 V**	**181**	**21.40**	**32.50**
3	*2412.00	117.8 PK			1.61 V	184	85.20	32.60
4	*2412.00	107.2 AV			1.61 V	184	74.60	32.60
5	4824.00	46.9 PK	74.0	-27.1	1.44 V	242	41.00	5.90
6	4824.00	33.9 AV	54.0	-20.1	1.44 V	242	28.00	5.90

Remarks:

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

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

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	57.5 PK	74.0	-16.5	1.33 H	229	25.00	32.50
2	2390.00	45.6 AV	54.0	-8.4	1.33 H	229	13.10	32.50
3	*2437.00	113.5 PK			1.00 H	291	80.80	32.70
4	*2437.00	103.4 AV			1.00 H	291	70.70	32.70
5	4874.00	47.2 PK	74.0	-26.8	1.24 H	187	41.30	5.90
6	4874.00	34.3 AV	54.0	-19.7	1.24 H	187	28.40	5.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.2 PK	74.0	-8.8	1.62 V	178	32.70	32.50
2	2390.00	53.6 AV	54.0	-0.4	1.62 V	178	21.10	32.50
3	*2437.00	124.2 PK			1.57 V	160	91.50	32.70
4	*2437.00	113.6 AV			1.57 V	160	80.90	32.70
5	4874.00	47.1 PK	74.0	-26.9	1.82 V	244	41.20	5.90
6	4874.00	36.3 AV	54.0	-17.7	1.82 V	244	30.40	5.90

Remarks:

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

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

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	109.0 PK			1.02 H	261	76.40	32.60
2	*2462.00	98.4 AV			1.02 H	261	65.80	32.60
3	2483.50	58.7 PK	74.0	-15.3	1.00 H	297	26.00	32.70
4	2483.50	47.1 AV	54.0	-6.9	1.00 H	297	14.40	32.70
5	4924.00	47.2 PK	74.0	-26.8	1.17 H	94	41.20	6.00
6	4924.00	34.1 AV	54.0	-19.9	1.17 H	94	28.10	6.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	119.5 PK			1.72 V	153	86.90	32.60
2	*2462.00	109.0 AV			1.72 V	153	76.40	32.60
3	2483.50	66.7 PK	74.0	-7.3	1.72 V	167	34.00	32.70
4	2483.50	53.5 AV	54.0	-0.5	1.72 V	167	20.80	32.70
5	4924.00	47.5 PK	74.0	-26.5	1.43 V	89	41.50	6.00
6	4924.00	34.3 AV	54.0	-19.7	1.43 V	89	28.30	6.00

Remarks:

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

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.6 PK	74.0	-15.4	1.06 H	131	26.10	32.50
2	2390.00	47.0 AV	54.0	-7.0	1.06 H	131	14.50	32.50
3	*2422.00	100.3 PK			1.00 H	104	67.70	32.60
4	*2422.00	91.4 AV			1.00 H	104	58.80	32.60
5	4844.00	46.7 PK	74.0	-27.3	1.17 H	105	40.80	5.90
6	4844.00	34.1 AV	54.0	-19.9	1.17 H	105	28.20	5.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.9 PK	74.0	-8.1	1.76 V	138	33.40	32.50
2	2390.00	53.7 AV	54.0	-0.3	1.76 V	138	21.20	32.50
3	*2422.00	111.9 PK			1.72 V	188	79.30	32.60
4	*2422.00	102.3 AV			1.72 V	188	69.70	32.60
5	4844.00	46.9 PK	74.0	-27.1	1.35 V	136	41.00	5.90
6	4844.00	34.1 AV	54.0	-19.9	1.35 V	136	28.20	5.90

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.5 PK	74.0	-17.5	1.21 H	133	24.00	32.50
2	2390.00	45.9 AV	54.0	-8.1	1.21 H	133	13.40	32.50
3	*2437.00	103.5 PK			1.00 H	108	70.80	32.70
4	*2437.00	94.0 AV			1.00 H	108	61.30	32.70
5	4874.00	47.0 PK	74.0	-27.0	1.21 H	69	41.10	5.90
6	4874.00	34.1 AV	54.0	-19.9	1.21 H	69	28.20	5.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.6 PK	74.0	-7.4	1.72 V	196	34.10	32.50
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.72 V**	**196**	**21.40**	**32.50**
3	*2437.00	117.5 PK			1.60 V	177	84.80	32.70
4	*2437.00	107.3 AV			1.60 V	177	74.60	32.70
5	4874.00	47.0 PK	74.0	-27.0	1.79 V	173	41.10	5.90
6	4874.00	36.6 AV	54.0	-17.4	1.79 V	173	30.70	5.90

Remarks:

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

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

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	102.9 PK			2.04 H	263	70.20	32.70
2	*2452.00	93.0 AV			2.04 H	263	60.30	32.70
3	2483.50	59.2 PK	74.0	-14.8	1.62 H	326	26.50	32.70
4	2483.50	47.1 AV	54.0	-6.9	1.62 H	326	14.40	32.70
5	4904.00	46.9 PK	74.0	-27.1	1.32 H	108	41.10	5.80
6	4904.00	34.0 AV	54.0	-20.0	1.32 H	108	28.20	5.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	113.7 PK			1.21 V	153	81.00	32.70
2	*2452.00	103.3 AV			1.21 V	153	70.60	32.70
3	2483.50	69.1 PK	74.0	-4.9	1.71 V	150	36.40	32.70
4	2483.50	53.8 AV	54.0	-0.2	1.71 V	150	21.10	32.70
5	4904.00	47.3 PK	74.0	-26.7	1.14 V	106	41.50	5.80
6	4904.00	34.2 AV	54.0	-19.8	1.14 V	106	28.40	5.80

Remarks:

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

Below 1GHz worst-case data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	375.98	41.0 QP	46.0	-5.0	1.01 H	103	52.00	-11.00
2	710.40	44.2 QP	46.0	-1.8	2.00 H	46	48.50	-4.30
3	749.29	43.8 QP	46.0	-2.2	2.00 H	51	47.10	-3.30
4	785.72	44.4 QP	46.0	-1.6	1.01 H	317	46.70	-2.30
5	844.56	42.6 QP	46.0	-3.4	1.50 H	19	44.30	-1.70
6	875.67	44.2 QP	46.0	-1.8	1.50 H	66	45.30	-1.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	29.90	29.1 QP	40.0	-10.9	1.49 V	7	44.80	-15.70
2	302.10	36.7 QP	46.0	-9.3	1.49 V	170	49.10	-12.40
3	375.98	41.7 QP	46.0	-4.3	1.00 V	140	52.70	-11.00
4	624.85	38.6 QP	46.0	-7.4	1.00 V	331	44.20	-5.60
5	799.84	40.6 QP	46.0	-5.4	1.49 V	7	42.80	-2.20
6	875.67	41.6 QP	46.0	-4.4	1.49 V	186	42.70	-1.10

Remarks:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Apr. 27, 2015	Apr. 26, 2016
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 30, 2014	Dec. 29, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 10, 2014	Jul. 09, 2015
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

4.2.3 Test Procedures

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

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

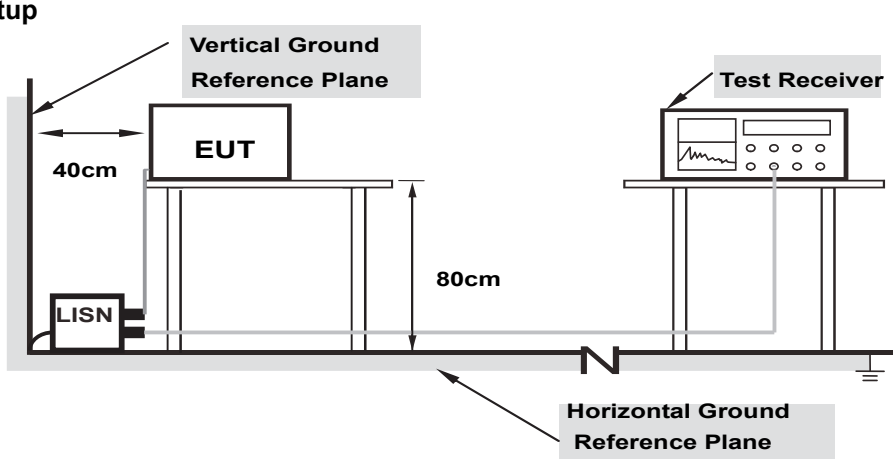
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

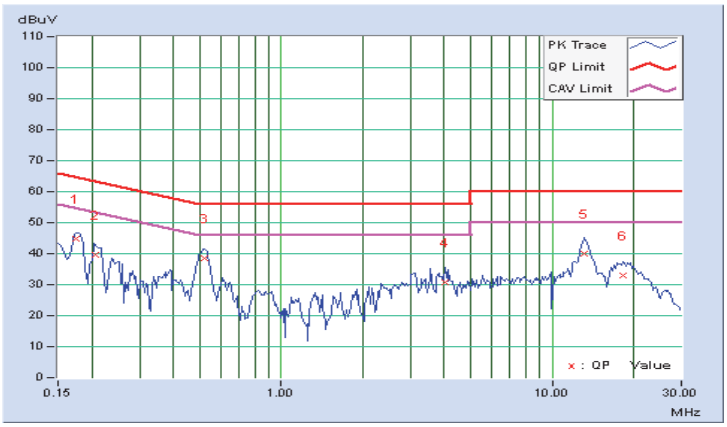
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17479	0.17	44.51	34.00	44.68	34.17	64.73	54.73	-20.05	-20.56
2	0.20724	0.17	39.54	29.14	39.71	29.31	63.32	53.32	-23.60	-24.00
3	0.52109	0.19	38.20	27.43	38.39	27.62	56.00	46.00	-17.61	-18.38
4	4.05469	0.35	30.44	20.96	30.79	21.31	56.00	46.00	-25.21	-24.69
5	**13.14063**	**0.50**	**39.44**	**33.12**	**39.94**	**33.62**	**60.00**	**50.00**	**-20.06**	**-16.38**
6	18.24219	0.59	32.21	26.61	32.80	27.20	60.00	50.00	-27.20	-22.80

Remarks:

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

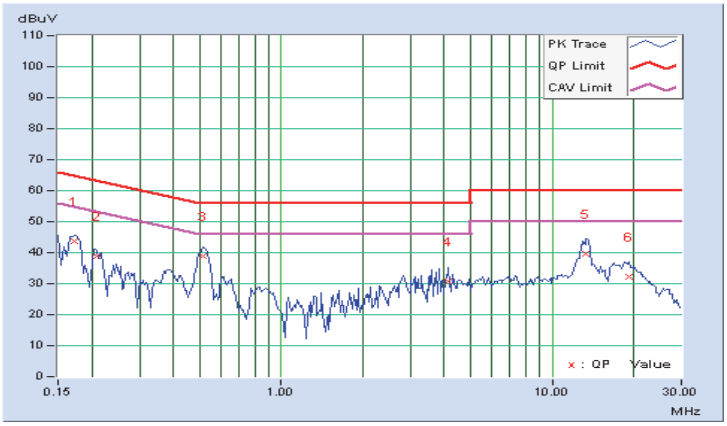


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	0.18	43.38	33.59	43.56	33.77	64.79	54.79	-21.24	-21.03
2	0.20859	0.18	38.63	30.20	38.81	30.38	63.26	53.26	-24.45	-22.88
3	0.51328	0.21	38.78	28.82	38.99	29.03	56.00	46.00	-17.01	-16.97
4	4.11719	0.38	30.43	19.57	30.81	19.95	56.00	46.00	-25.19	-26.05
5	13.38672	0.61	39.12	32.44	39.73	33.05	60.00	50.00	-20.27	-16.95
6	19.15625	0.77	31.31	25.86	32.08	26.63	60.00	50.00	-27.92	-23.37

Remarks:

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

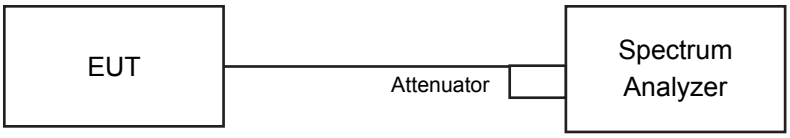


4.3 6dB Bandwidth Measurement

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

558074 D01 DTS Meas Guidance v03r02 section 8.1

a. Set resolution bandwidth (RBW) = 100kHz

b. Set the video bandwidth (VBW) ≥ 3 x 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 fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	8.10	8.16	7.63	8.08	0.5	Pass
6	2437	8.10	8.10	8.11	7.62	0.5	Pass
11	2462	8.11	8.12	9.05	7.61	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	15.95	16.01	15.50	16.32	0.5	Pass
6	2437	16.37	16.07	15.74	16.36	0.5	Pass
11	2462	15.56	16.33	16.37	15.97	0.5	Pass

802.11n (20MHz)

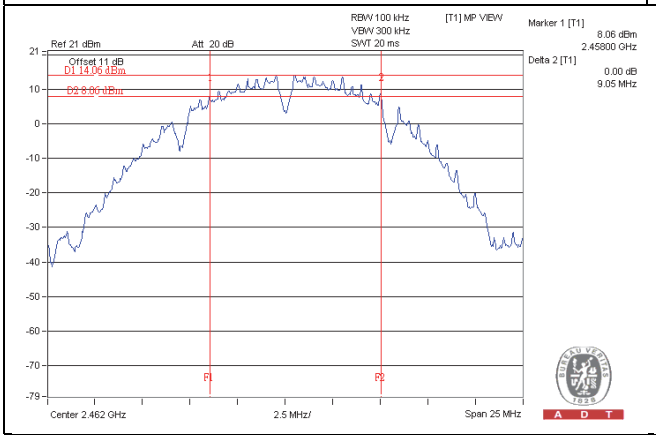
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	16.32	16.39	15.17	16.89	0.5	Pass
6	2437	17.58	17.61	16.93	17.55	0.5	Pass
11	2462	15.98	17.22	17.20	16.32	0.5	Pass

802.11n (40MHz)

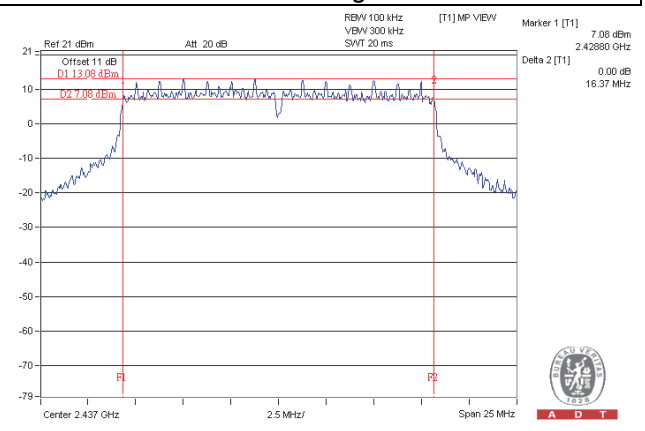
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
3	2422	35.21	35.17	35.24	35.28	0.5	Pass
6	2437	36.40	35.42	35.81	36.35	0.5	Pass
9	2452	35.79	35.79	35.17	35.21	0.5	Pass

Spectrum Plot of Worst Value

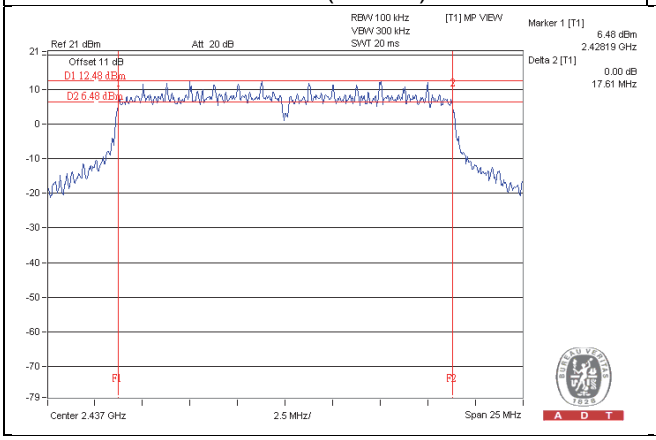
802.11b



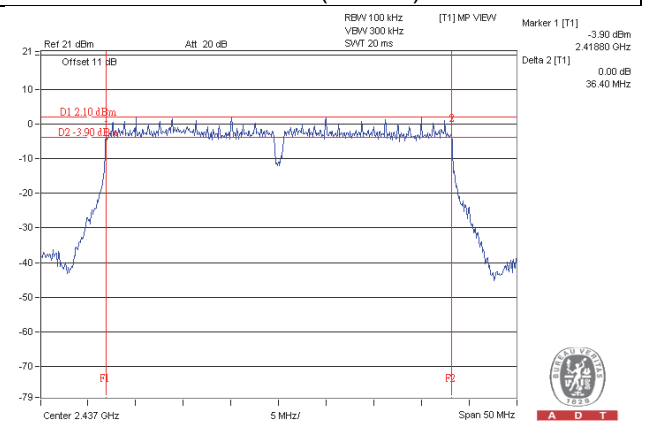
802.11g



802.11n (20MHz)



802.11n (40MHz)



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

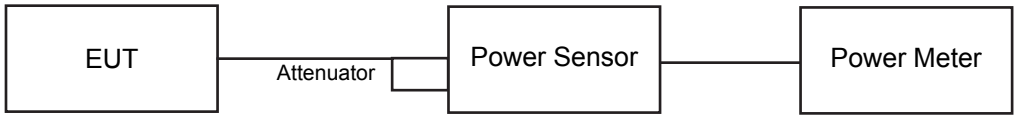
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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 $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

558074 D01 DTS Meas Guidance v03r02 section 9.2.3.2
An average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power senso and set the detector to AVERAGE. 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

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	22.62	22.89	23.06	22.96	777.345	28.91	30	Pass
6	2437	23.97	23.83	23.97	23.64	**971.670**	29.88	30	Pass
11	2462	23.30	23.21	23.39	23.33	856.758	29.33	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	17.81	17.93	17.74	17.60	239.455	23.79	30	Pass
6	2437	23.84	23.49	23.55	23.67	924.733	29.66	30	Pass
11	2462	17.63	17.76	17.68	17.99	239.212	23.79	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	16.45	16.57	16.60	16.62	181.180	22.58	30	Pass
6	2437	23.48	23.38	23.28	23.23	863.807	29.36	30	Pass
11	2462	16.87	16.90	17.12	17.19	201.502	23.04	30	Pass

802.11n (40MHz)

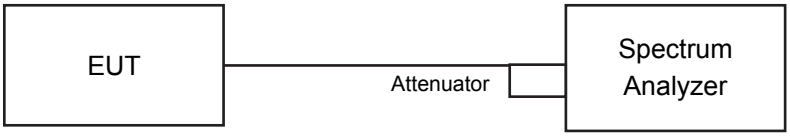
Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	13.06	13.21	13.18	12.70	80.589	19.06	30	Pass
6	2437	15.80	15.93	15.76	15.93	154.037	21.88	30	Pass
9	2452	13.82	14.38	14.13	14.18	103.579	20.15	30	Pass

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

558074 D01 DTS Meas Guidance v03r02 section 10.3
For AVG. power (duty cycle ≥ 98%)

a. Set instrument center frequency to DTS channel center frequency.

b. Set span to at least 1.5 times the OBW.

c. Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .

d. Set VBW ≥3 x RBW.

e. Detector = power averaging (RMS) or sample detector (when RMS not available).

f. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.

g. Sweep time = auto couple.

h. Employ trace averaging (RMS) mode over a minimum of 100 traces.

i. Use the peak marker function to determine the maximum amplitude level.

For AVG. power (duty cycle < 98%)

a. Measure the duty cycle (x).

b. Set instrument center frequency to DTS channel center frequency.

c. Set span to at least 1.5 times the OBW.

d. Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.

e. Set VBW ≥3 x RBW.

f. Detector = power averaging (RMS) or sample detector (when RMS not available).

g. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.

h. Sweep time = auto couple.

i. Do not use sweep triggering. Allow sweep to “free run”.

j. Employ trace averaging (RMS) mode over a minimum of 100 traces.

k. Use the peak marker function to determine the maximum amplitude level.

l. Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-3.79	6.02	2.23	4.94	Pass
	6	2437	-3.30	6.02	2.72	4.94	Pass
	11	2462	-3.39	6.02	2.63	4.94	Pass
1	1	2412	-4.04	6.02	1.98	4.94	Pass
	6	2437	-3.53	6.02	2.49	4.94	Pass
	11	2462	-4.19	6.02	1.83	4.94	Pass
2	1	2412	-5.07	6.02	0.95	4.94	Pass
	6	2437	-4.44	6.02	1.58	4.94	Pass
	11	2462	-4.05	6.02	1.97	4.94	Pass
3	1	2412	-4.17	6.02	1.85	4.94	Pass
	6	2437	-2.52	6.02	3.50	4.94	Pass
	11	2462	-2.54	6.02	3.48	4.94	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.04dBi + 10log(4) = 9.06dBi > 6dBi, so the power density limit shall be reduced to 8-(9.06-6) = 4.94dBm.

802.11g

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/10kHz)	Pass / Fail
0	1	2412	-12.08	6.02	0.17	-5.89	4.94	Pass
	6	2437	-6.57	6.02	0.17	-0.38	4.94	Pass
	11	2462	-10.93	6.02	0.17	-4.74	4.94	Pass
1	1	2412	-13.42	6.02	0.17	-7.23	4.94	Pass
	6	2437	-7.36	6.02	0.17	-1.17	4.94	Pass
	11	2462	-12.65	6.02	0.17	-6.46	4.94	Pass
2	1	2412	-13.05	6.02	0.17	-6.86	4.94	Pass
	6	2437	-7.25	6.02	0.17	-1.06	4.94	Pass
	11	2462	-13.48	6.02	0.17	-7.29	4.94	Pass
3	1	2412	-12.23	6.02	0.17	-6.04	4.94	Pass
	6	2437	-6.41	6.02	0.17	-0.22	4.94	Pass
	11	2462	-11.57	6.02	0.17	-5.38	4.94	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.04dBi + 10log(4) = 9.06dBi > 6dBi, so the power density limit shall be reduced to 8-(9.06-6) = 4.94dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/10kHz)	Pass / Fail
0	1	2412	-13.16	6.02	-7.14	4.94	4.94	Pass
	6	2437	-6.18	6.02	-0.16	4.94	4.94	Pass
	11	2462	-11.91	6.02	-5.89	4.94	4.94	Pass
1	1	2412	-14.76	6.02	-8.74	4.94	4.94	Pass
	6	2437	-8.34	6.02	-2.32	4.94	4.94	Pass
	11	2462	-13.60	6.02	-7.58	4.94	4.94	Pass
2	1	2412	-13.13	6.02	-7.11	4.94	4.94	Pass
	6	2437	-7.67	6.02	-1.65	4.94	4.94	Pass
	11	2462	-14.10	6.02	-8.08	4.94	4.94	Pass
3	1	2412	-13.94	6.02	-7.92	4.94	4.94	Pass
	6	2437	-6.84	6.02	-0.82	4.94	4.94	Pass
	11	2462	-12.84	6.02	-6.82	4.94	4.94	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.04dBi + 10log(4) = 9.06dBi > 6dBi, so the power density limit shall be reduced to 8-(9.06-6) = 4.94dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

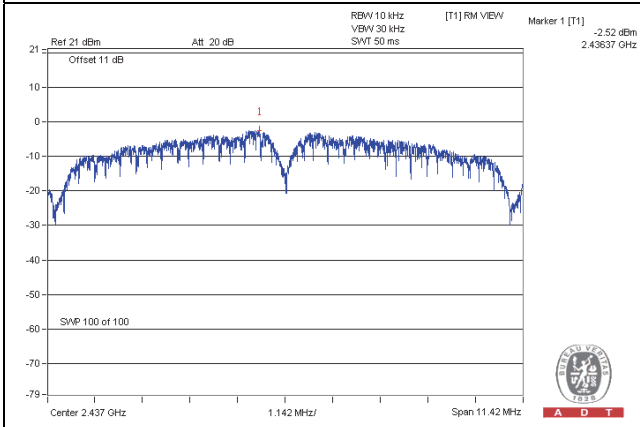
TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/10kHz)	Pass / Fail
0	3	2422	-19.64	6.02	0.17	-13.45	4.94	Pass
	6	2437	-16.67	6.02	0.17	-10.48	4.94	Pass
	9	2452	-18.16	6.02	0.17	-11.97	4.94	Pass
1	3	2422	-21.70	6.02	0.17	-15.51	4.94	Pass
	6	2437	-19.22	6.02	0.17	-13.03	4.94	Pass
	9	2452	-20.36	6.02	0.17	-14.17	4.94	Pass
2	3	2422	-21.26	6.02	0.17	-15.07	4.94	Pass
	6	2437	-18.84	6.02	0.17	-12.65	4.94	Pass
	9	2452	-19.36	6.02	0.17	-13.17	4.94	Pass
3	3	2422	-19.79	6.02	0.17	-13.60	4.94	Pass
	6	2437	-18.17	6.02	0.17	-11.98	4.94	Pass
	9	2452	-18.23	6.02	0.17	-12.04	4.94	Pass

Note:

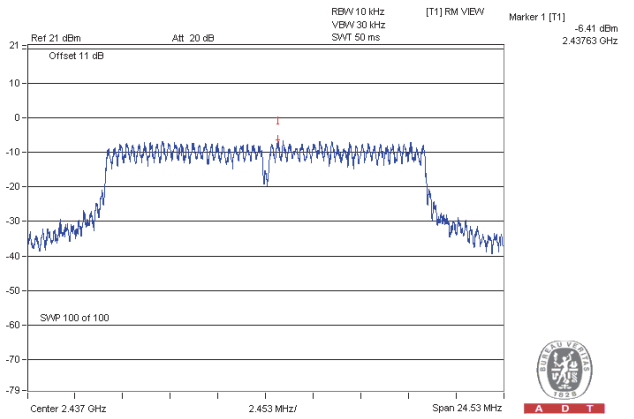
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.04dBi + 10log(4) = 9.06dBi > 6dBi, so the power density limit shall be reduced to 8-(9.06-6) = 4.94dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

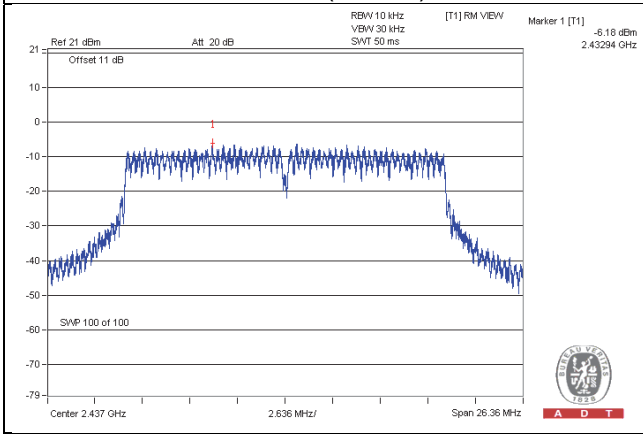
802.11b



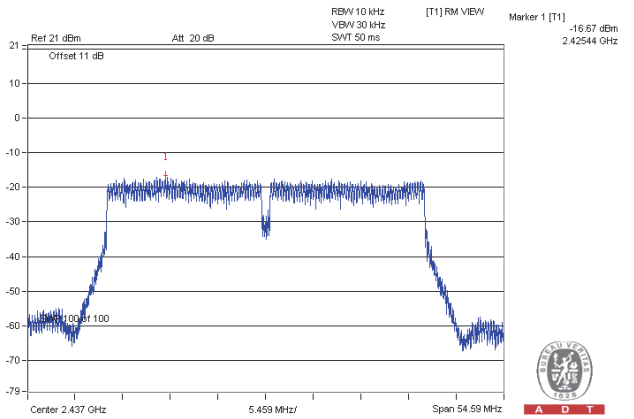
802.11g



802.11n (20MHz)



802.11n (40MHz)

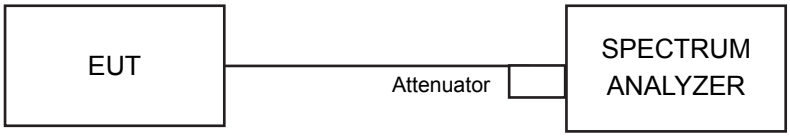


4.6 Conducted Out of Band Emission Measurement

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

558074 D01 DTS Meas Guidance v03r02 section 11.2

a. Set the RBW = 100 kHz.

b. Set the VBW ≥ 300 kHz.

c. Detector = peak.

d. Sweep time = auto couple.

e. Trace mode = max hold.

f. Allow trace to fully stabilize.

g. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

558074 D01 DTS Meas Guidance v03r02 section 11.3

a. Set RBW = 100 kHz.

b. Set VBW ≥ 300 kHz.

c. Detector = peak.

d. Sweep = auto couple.

e. Trace Mode = max hold.

f. Allow trace to fully stabilize.

g. 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

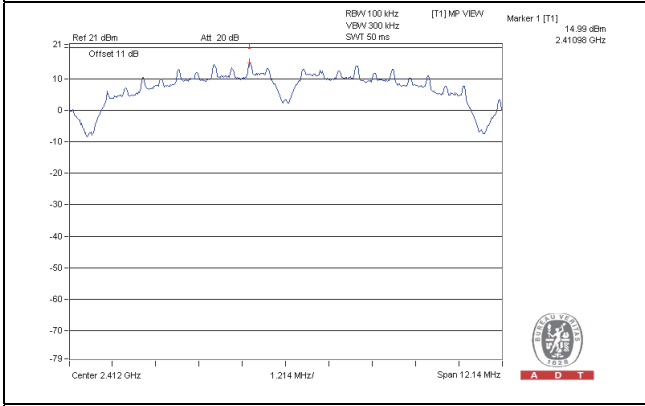
4.6.7 Test Results

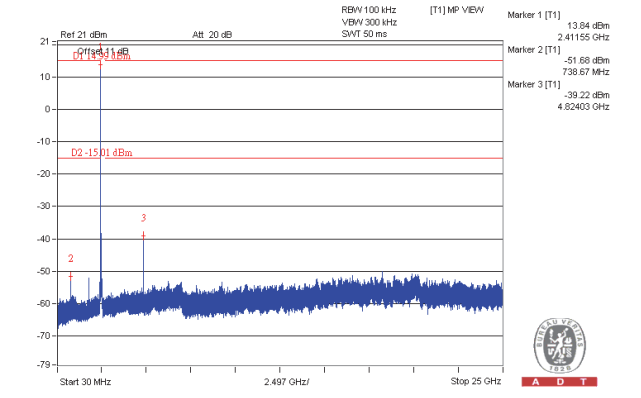
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

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.

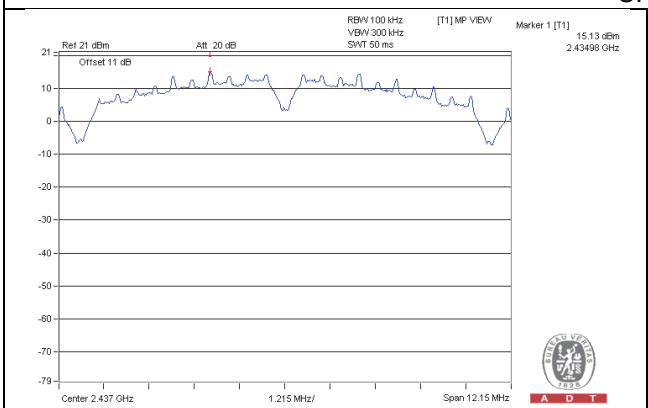
802.11b_CHAIN 0

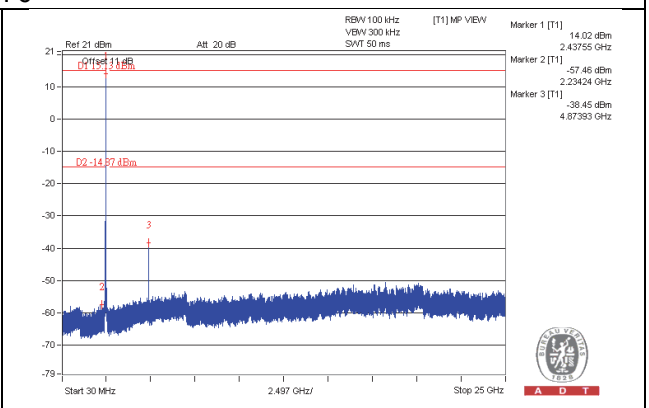
CH 1



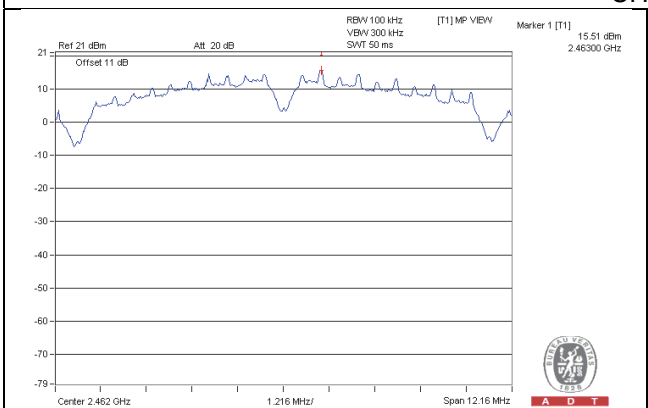


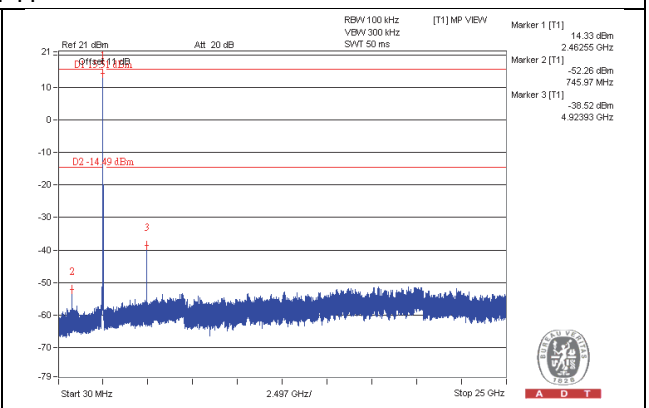
CH 6



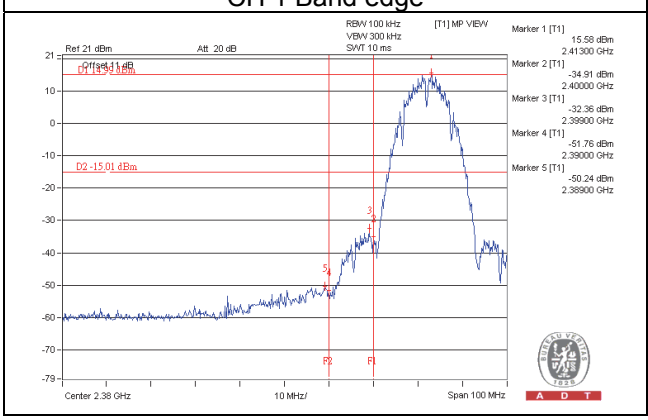


CH 11

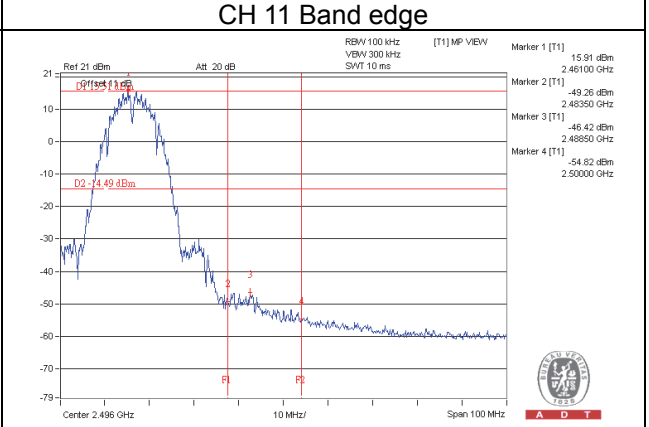




CH 1 Band edge

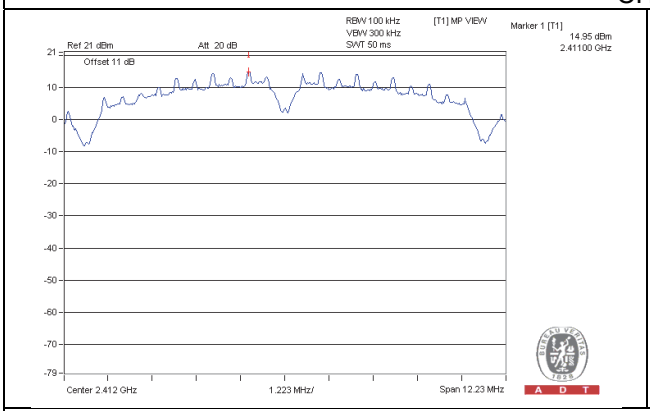


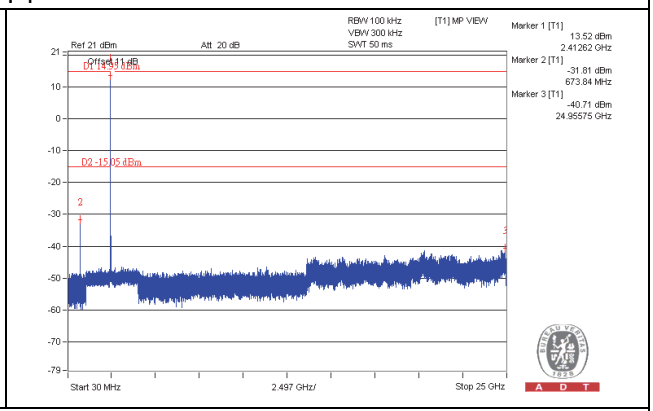
CH 11 Band edge



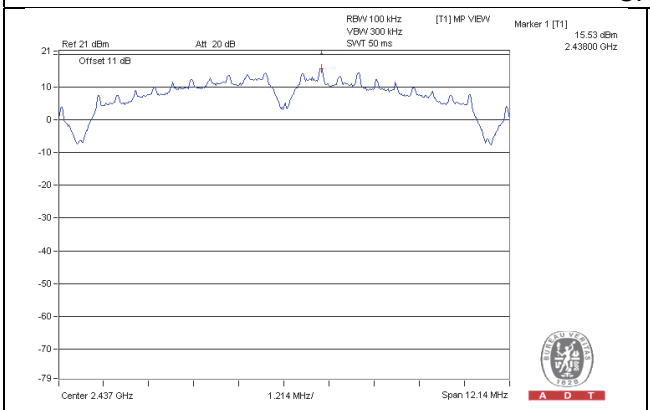
802.11b_CHAIN 1

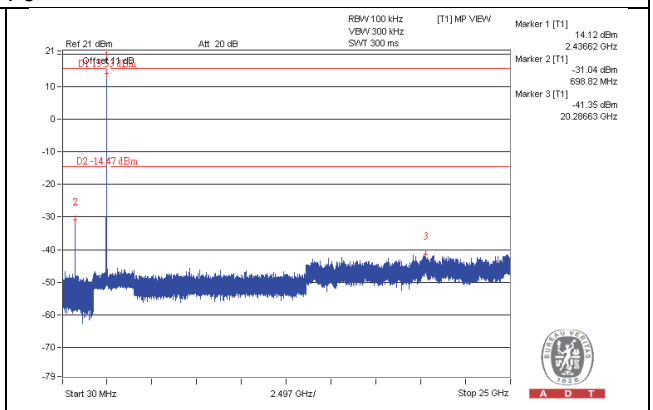
CH 1



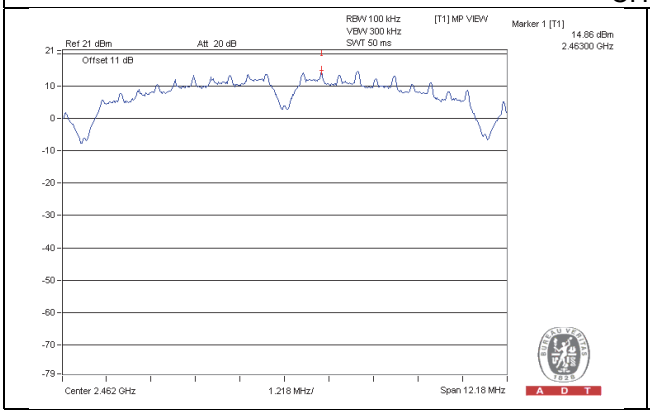


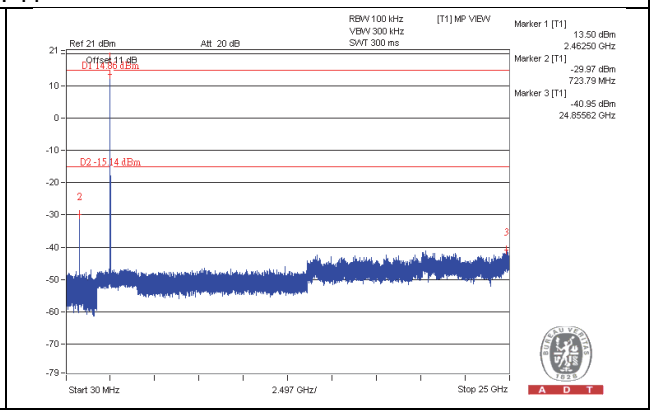
CH 6



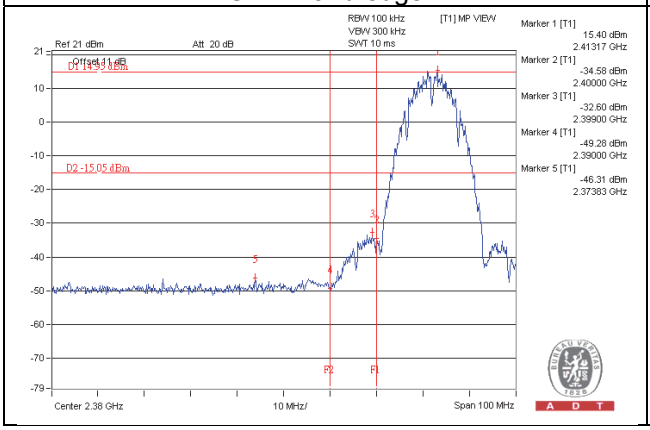


CH 11

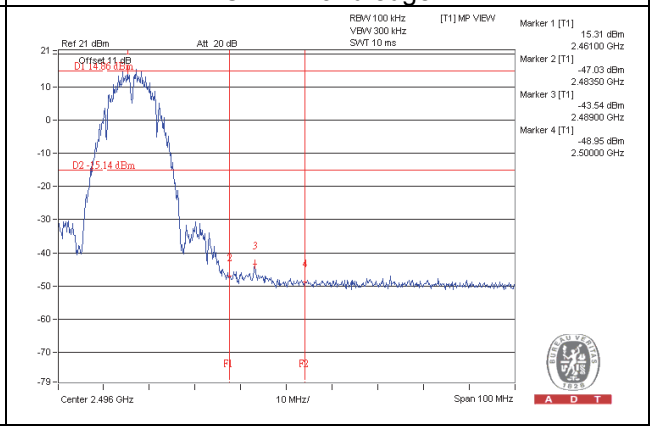




CH 1 Band edge

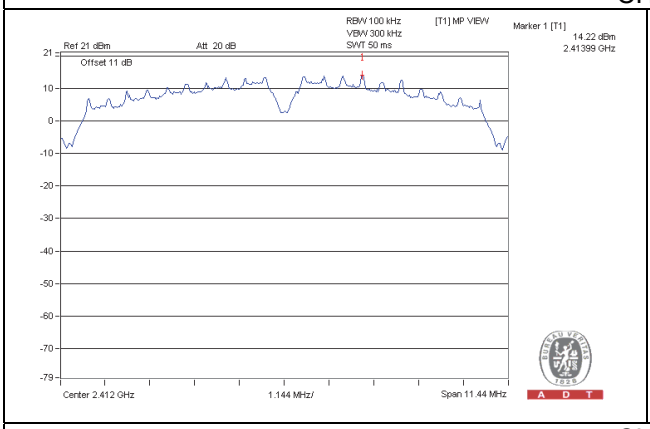


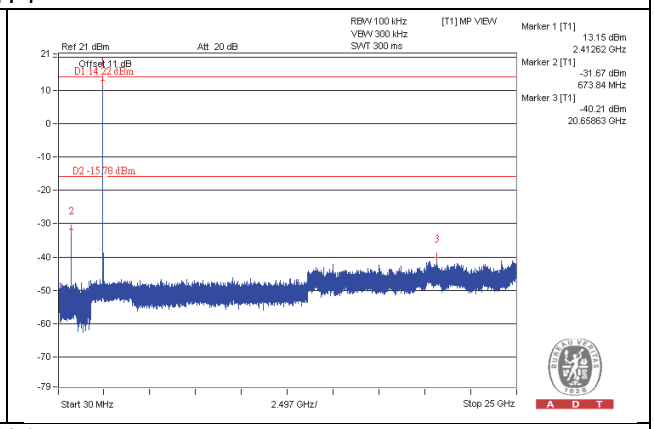
CH 11 Band edge



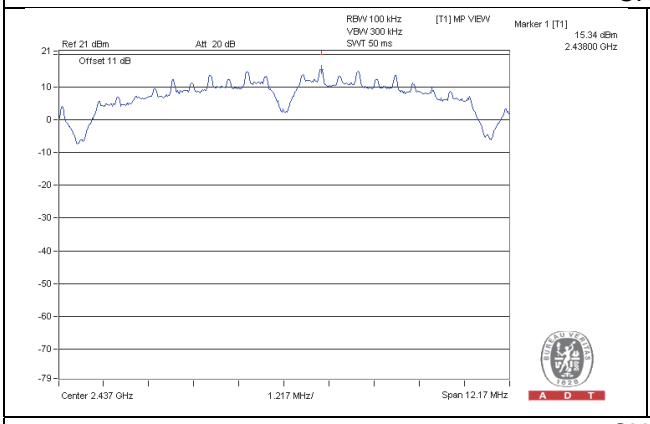
802.11b_CHAIN 2

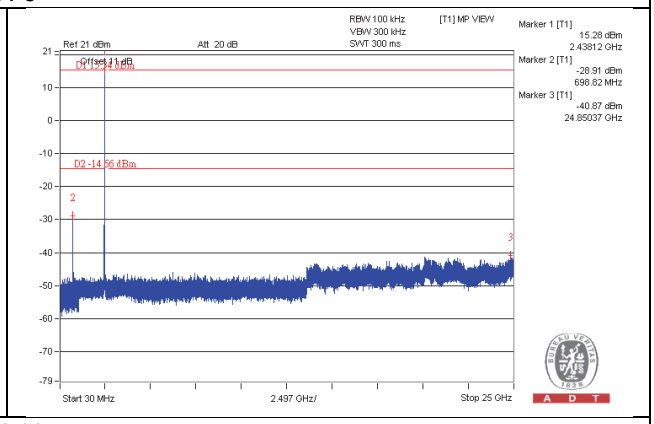
CH 1



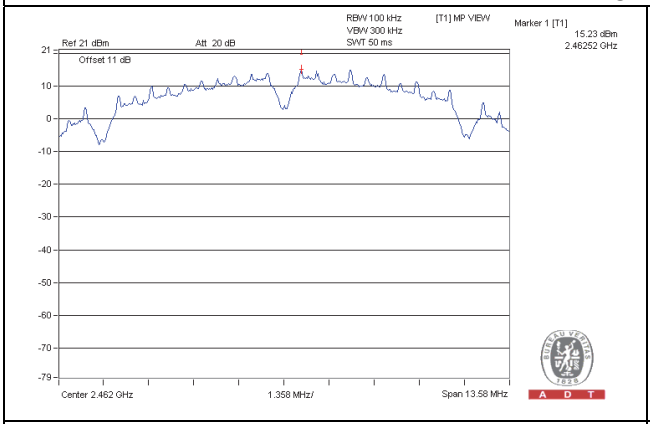


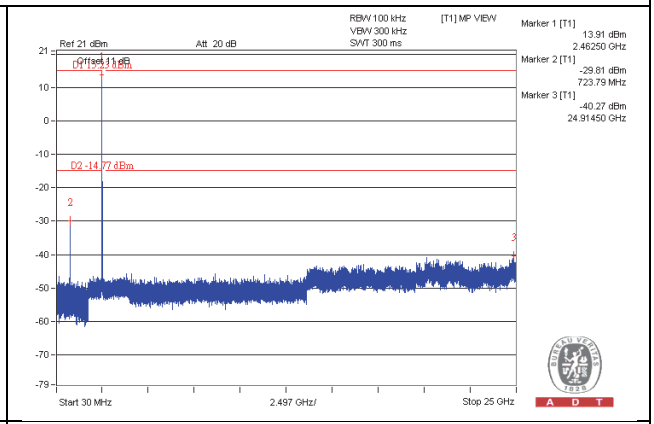
CH 6



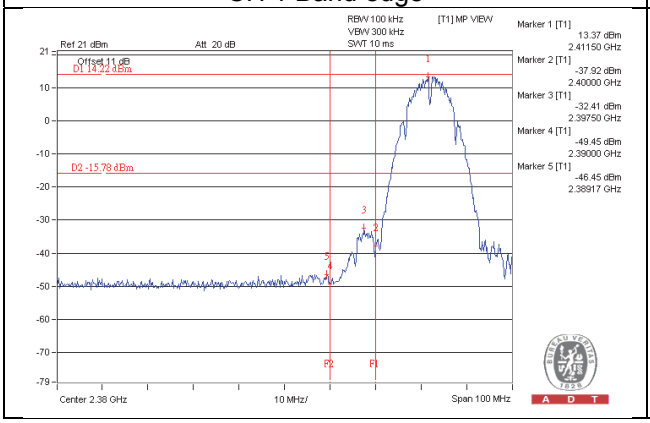


CH 11





CH 1 Band edge



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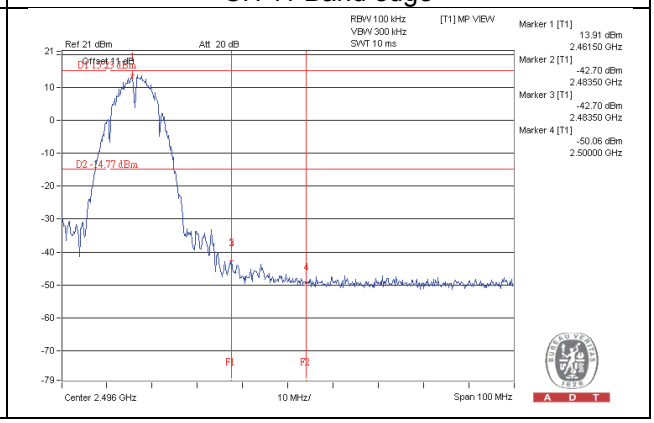
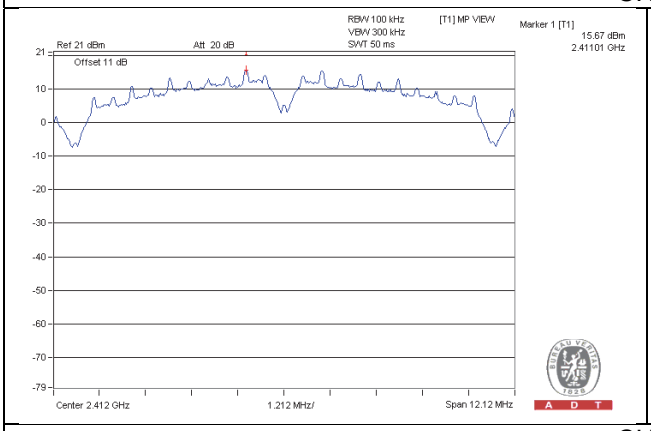
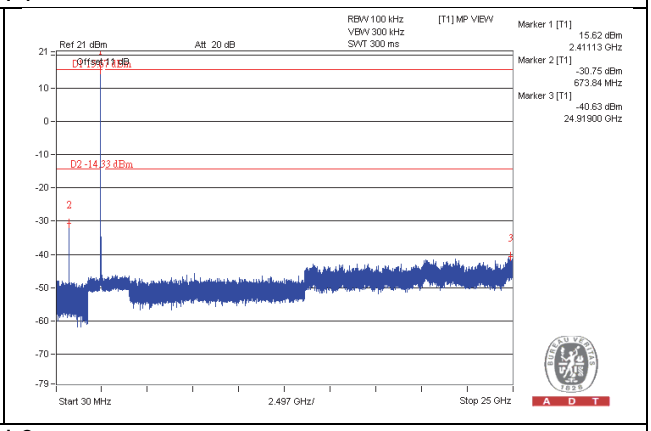


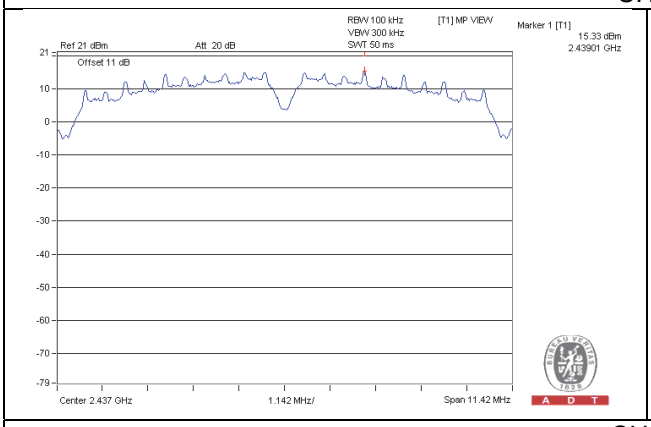
802.11b_CHAIN 3

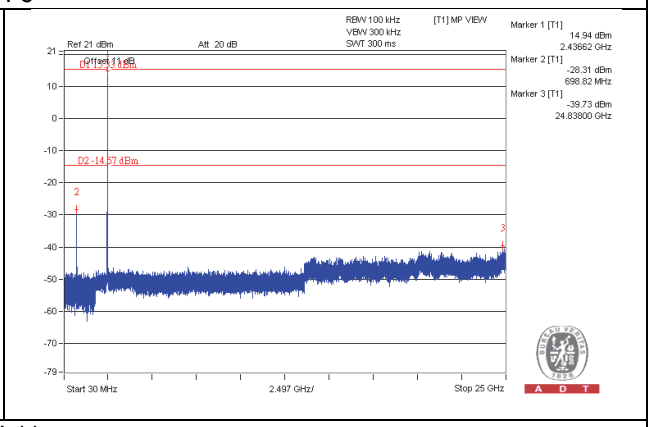
CH 1





CH 6





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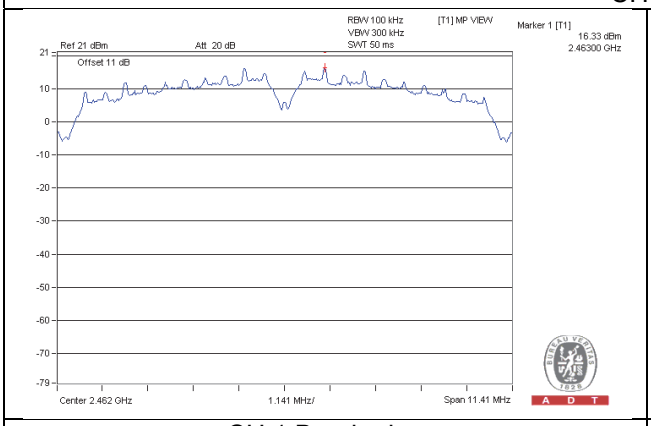

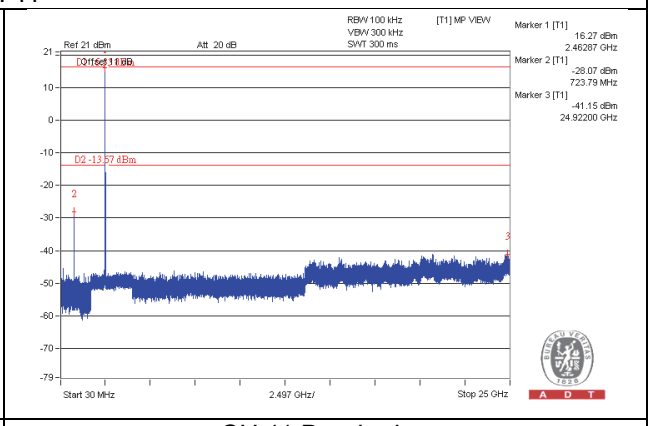

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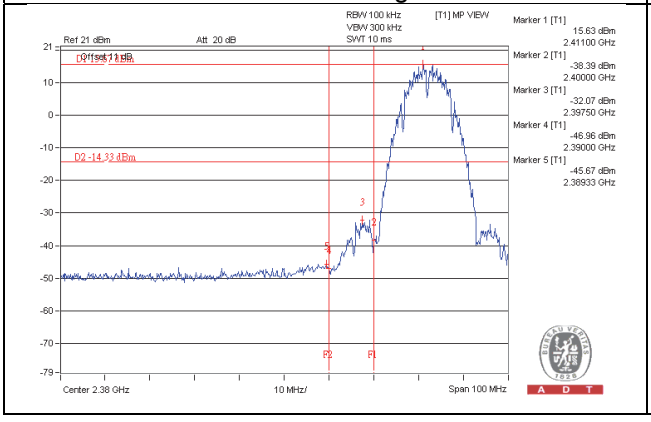

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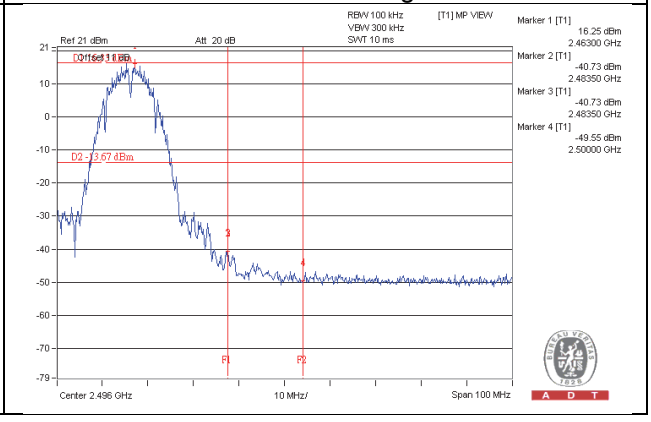
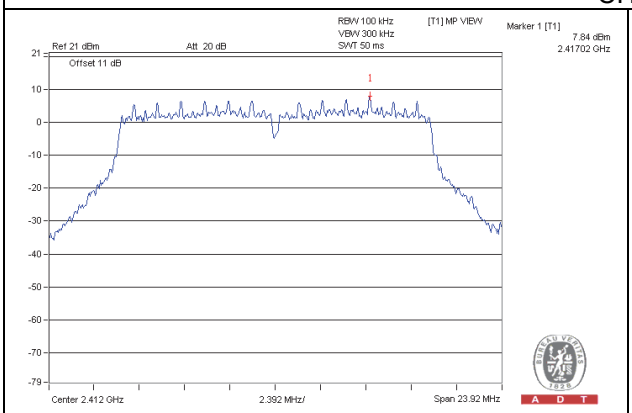
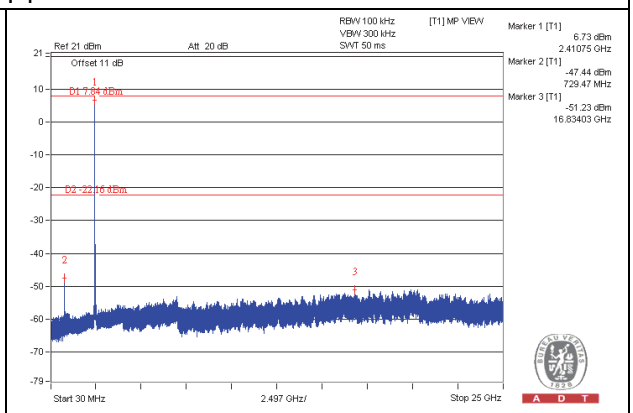


802.11g_CHAIN 0

CH 1





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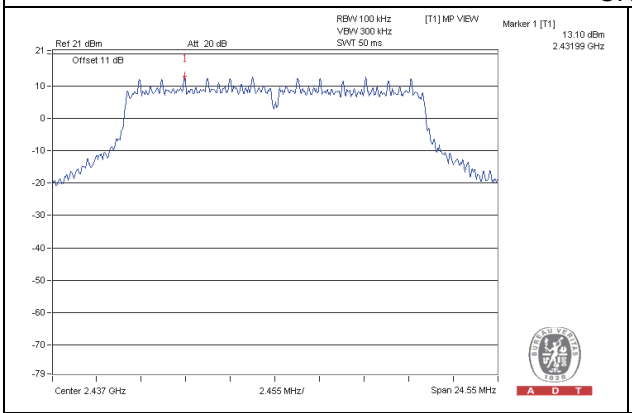

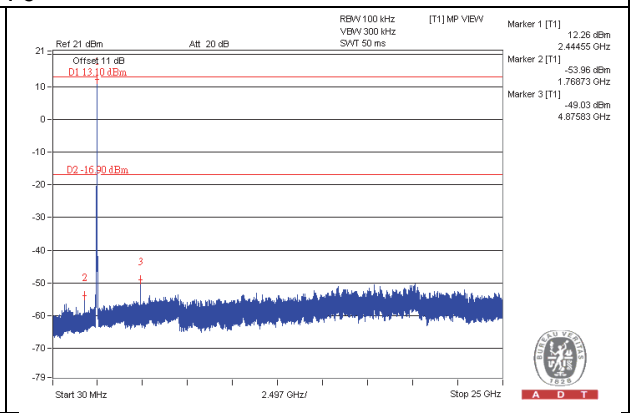

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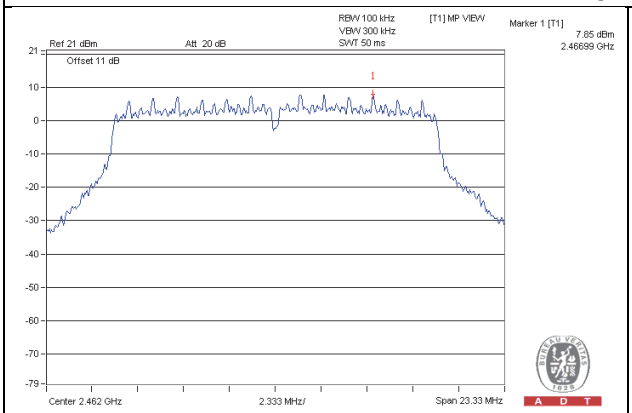

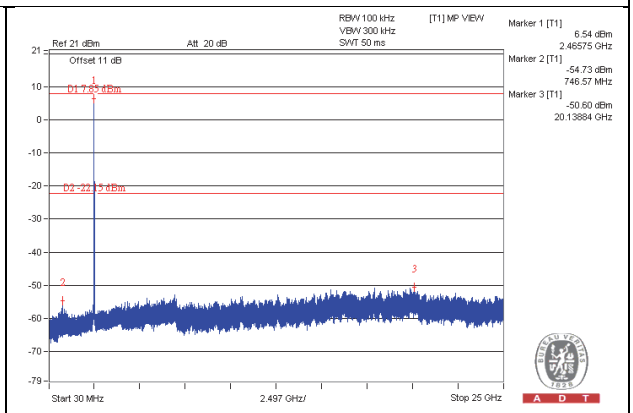

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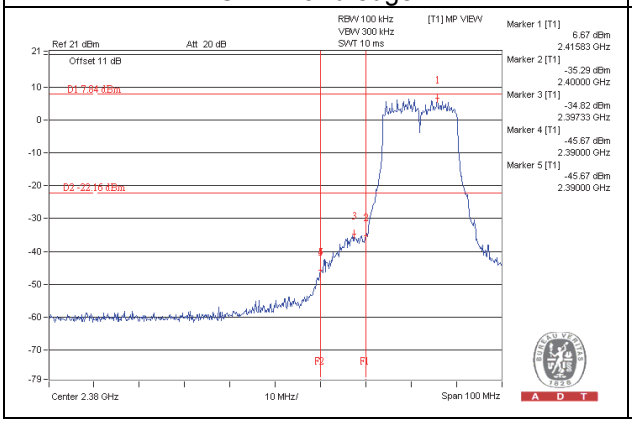

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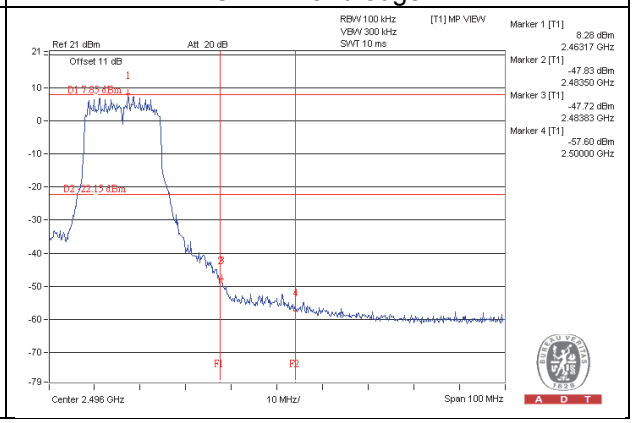
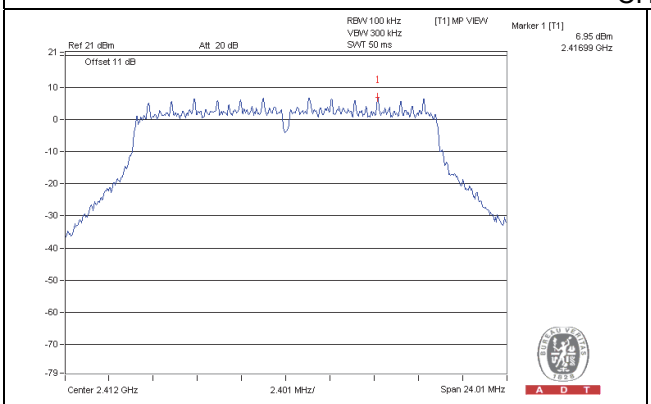
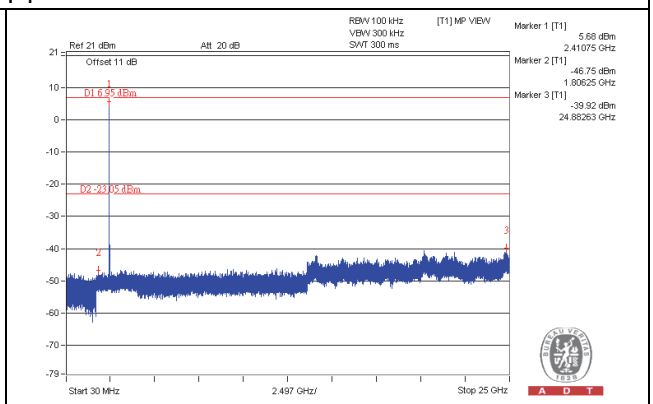


802.11g_CHAIN 1

CH 1





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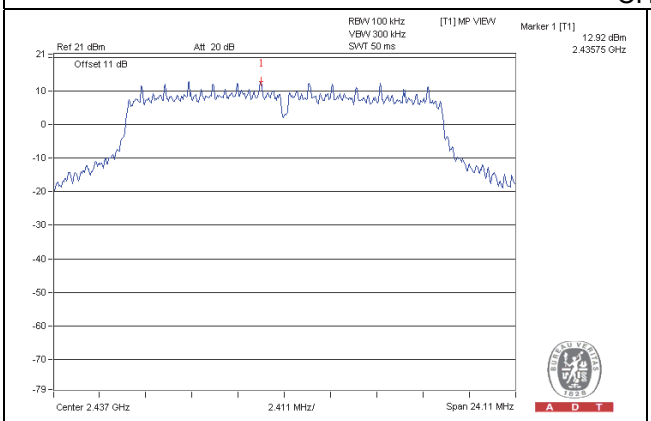

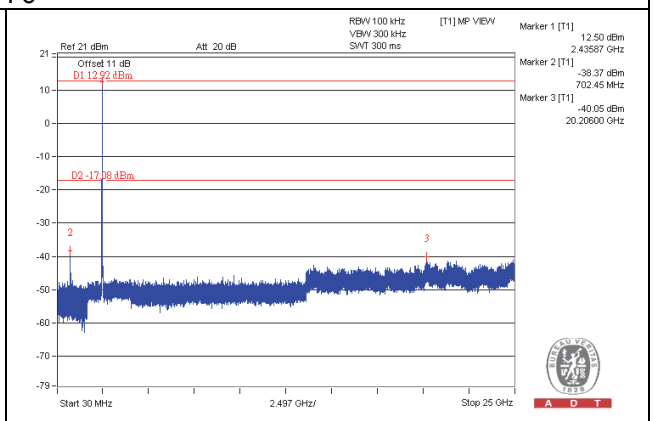

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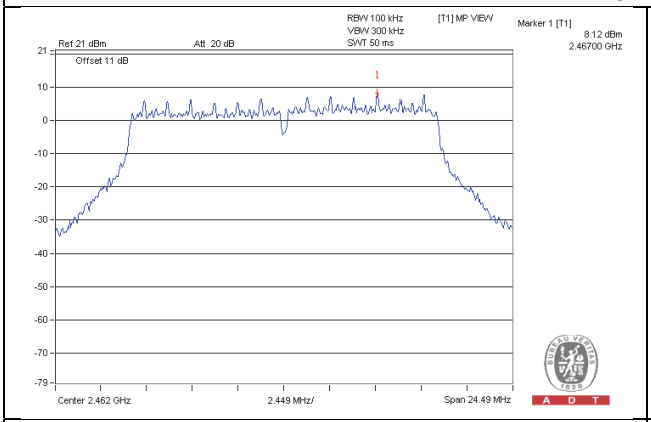

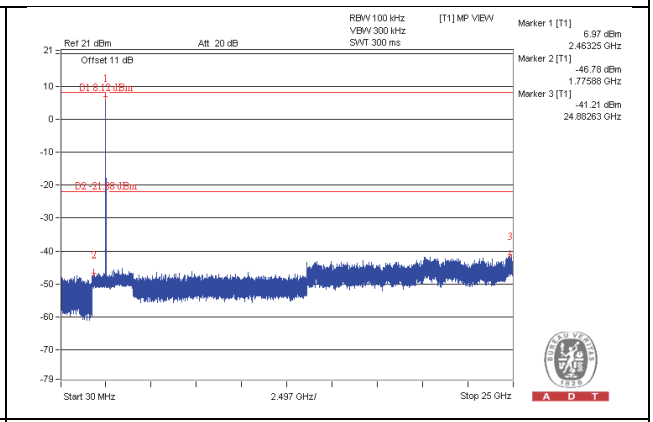

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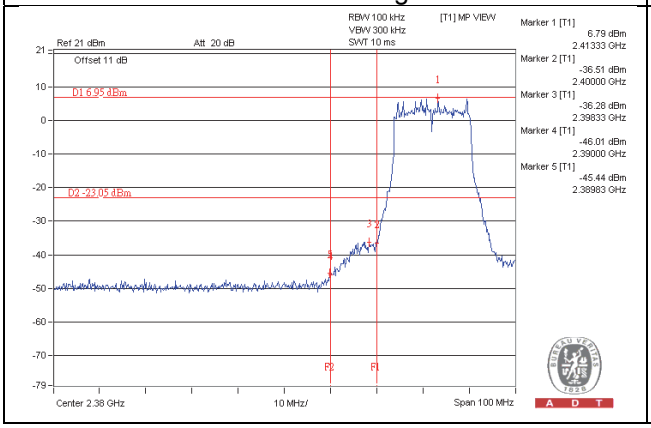

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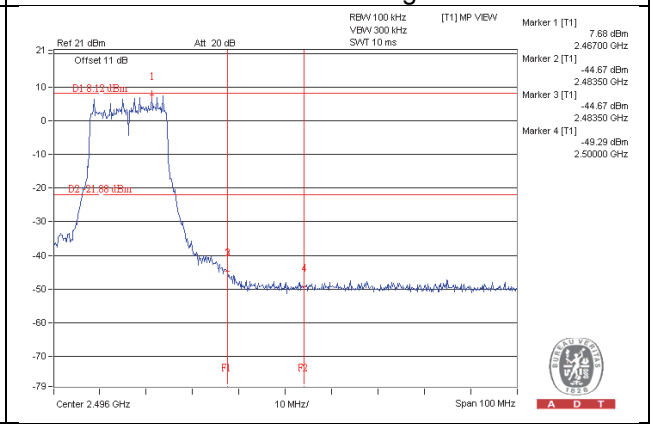
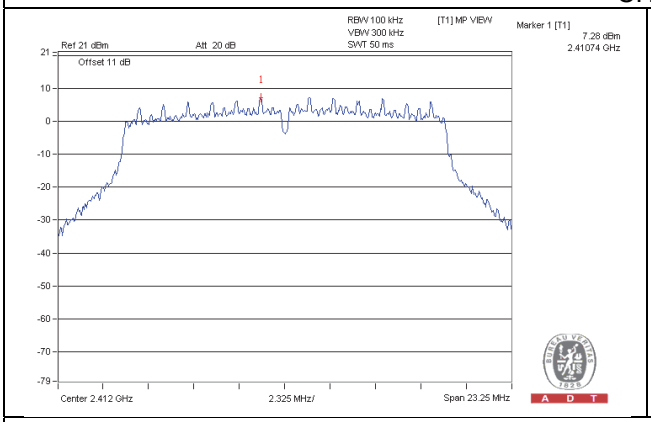
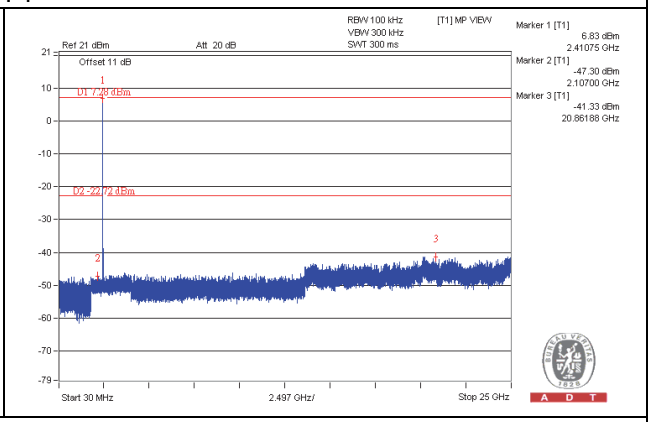


802.11g_CHAIN 2

CH 1





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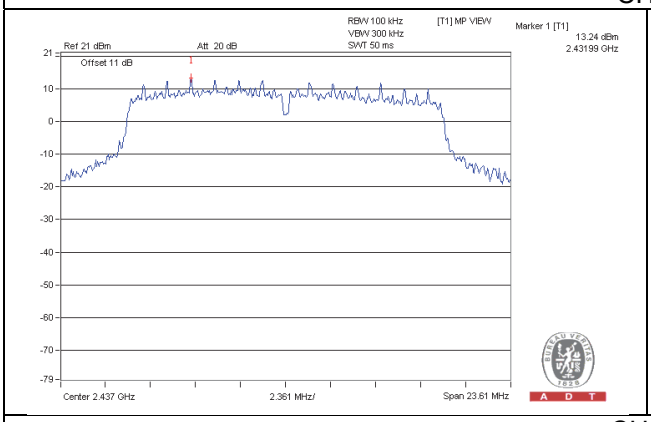

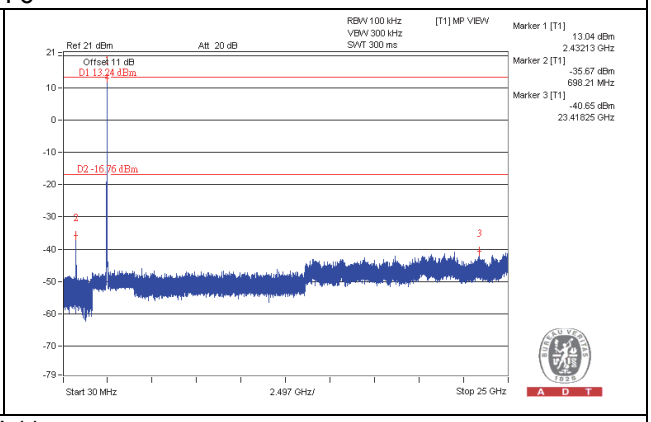

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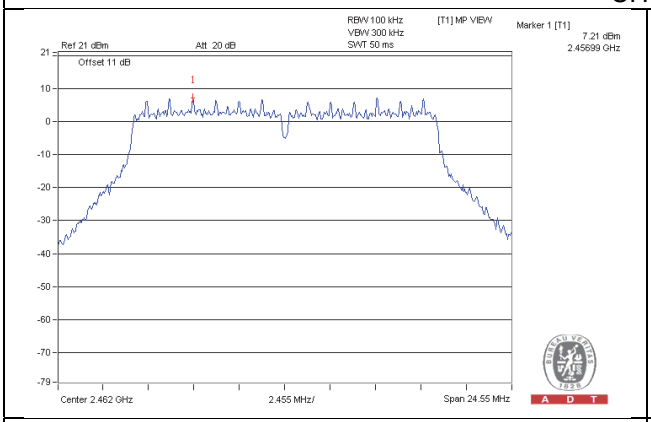

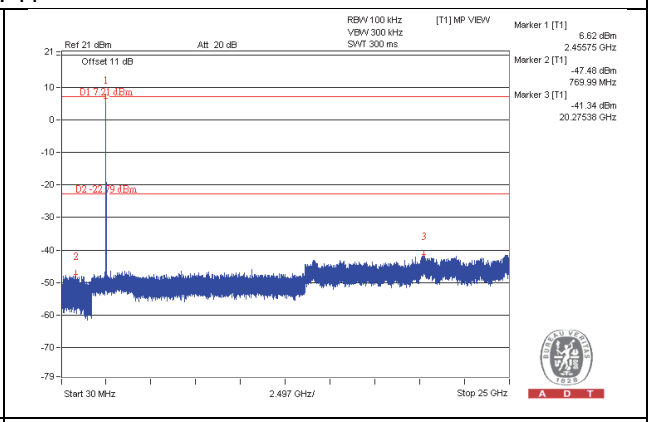

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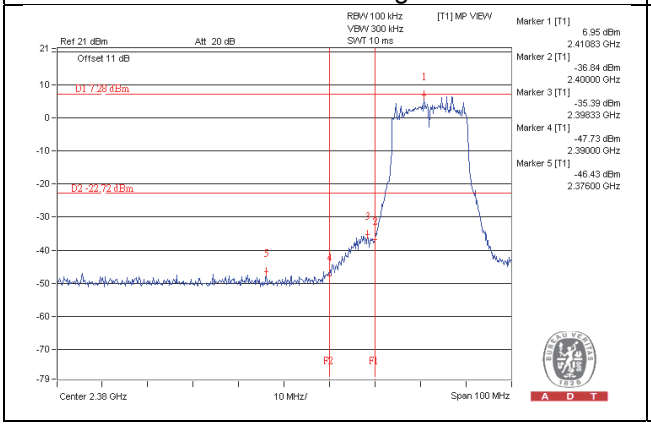

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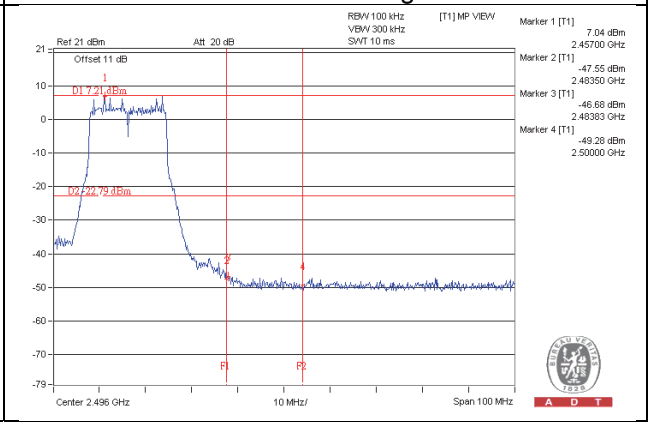
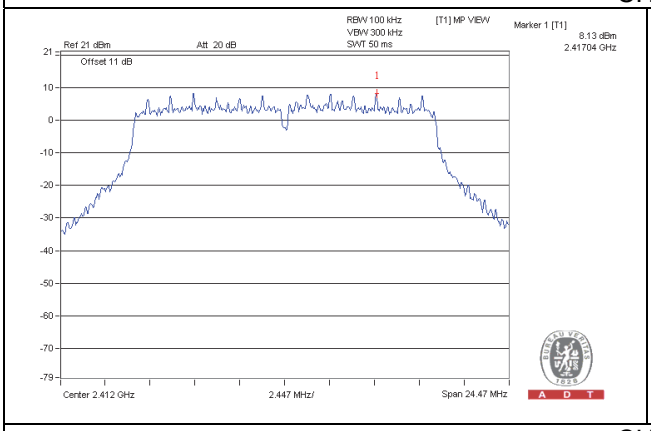
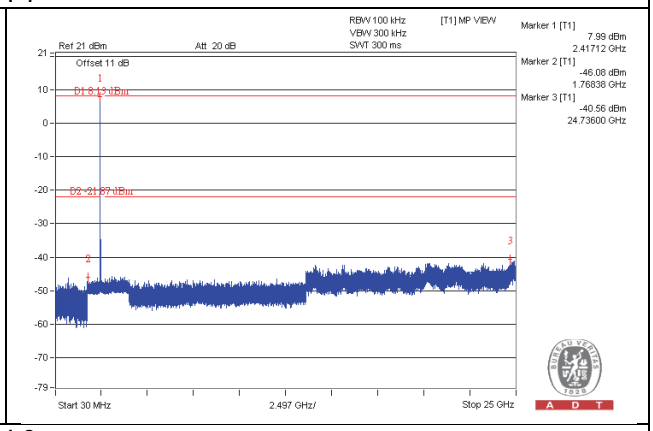


802.11g_CHAIN 3

CH 1





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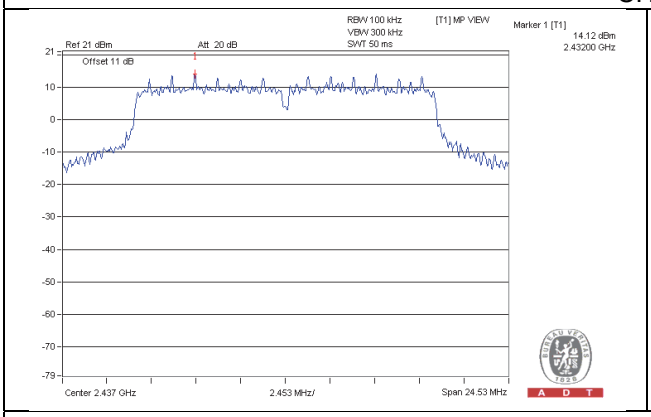

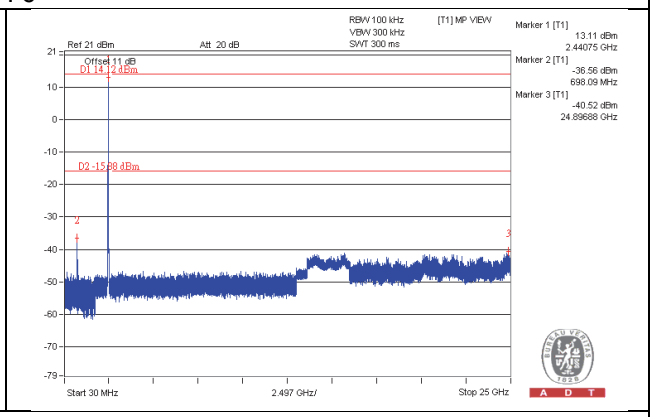

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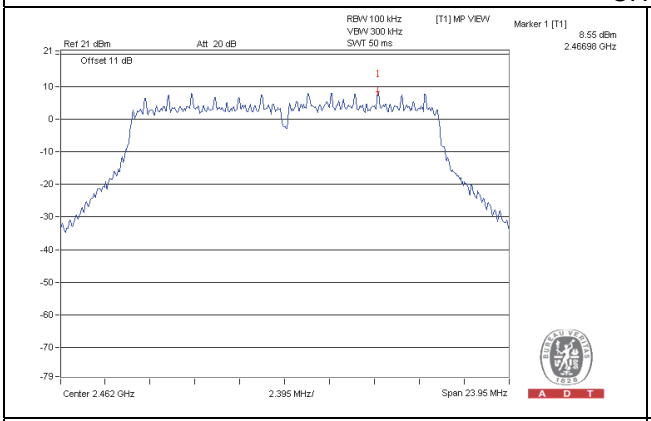
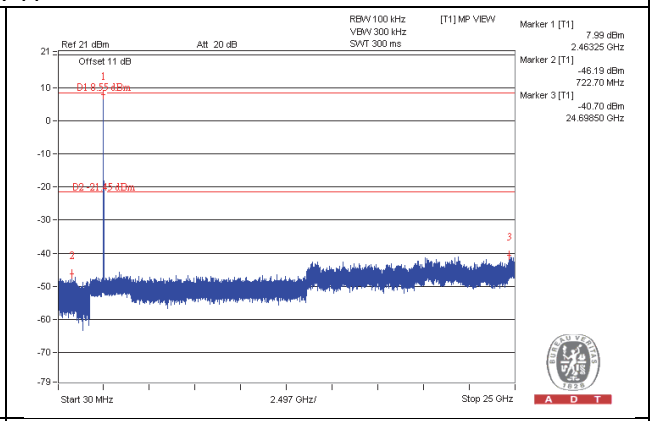
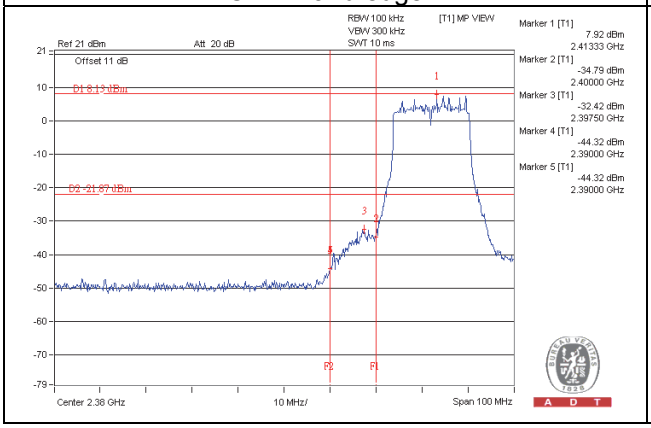
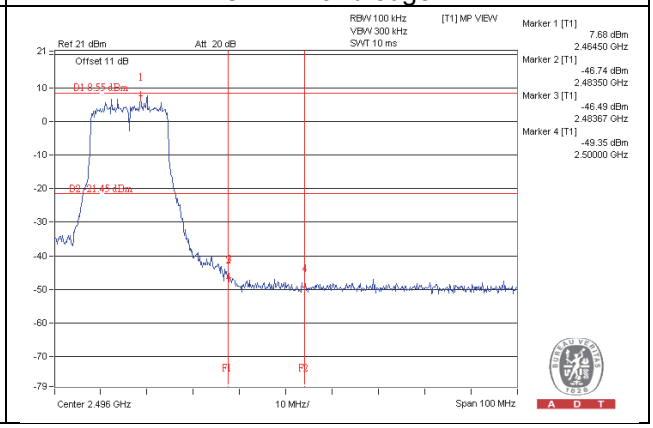




CH 1 Band edge

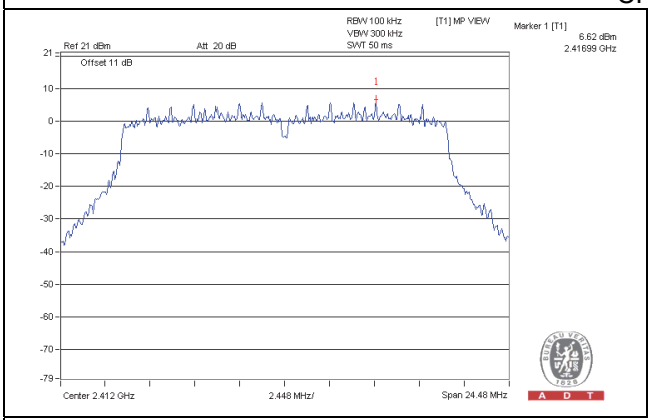


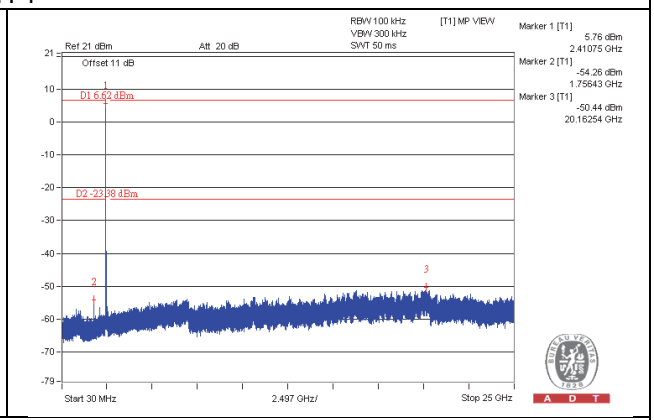
CH 11 Band edge



802.11n (20MHz)_CHAIN 0

CH 1





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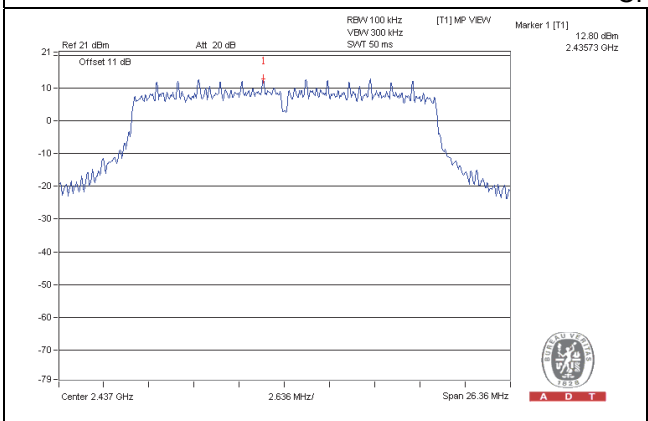

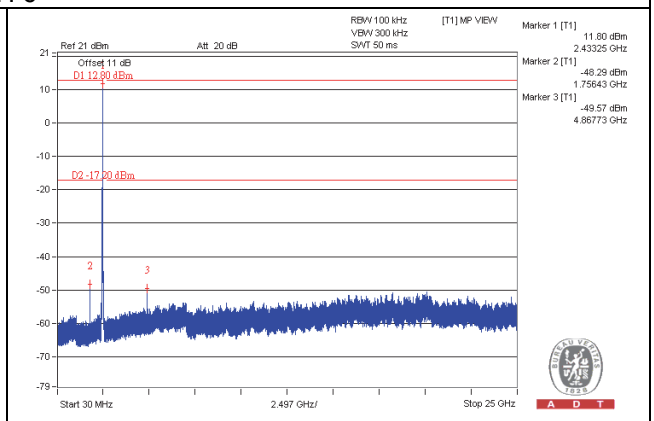

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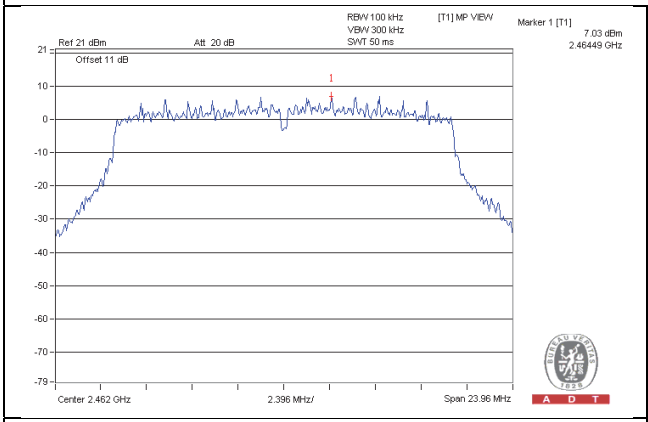
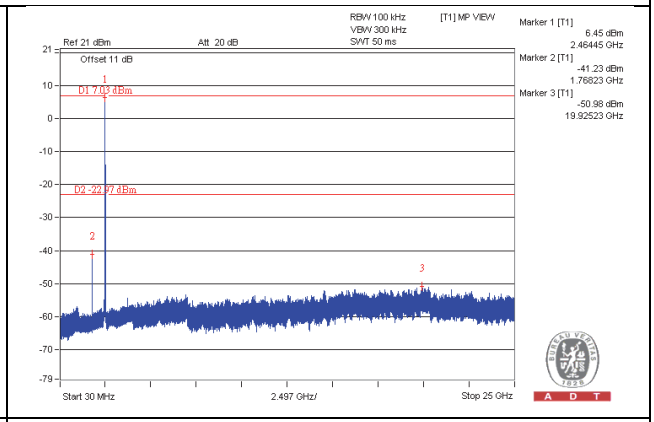
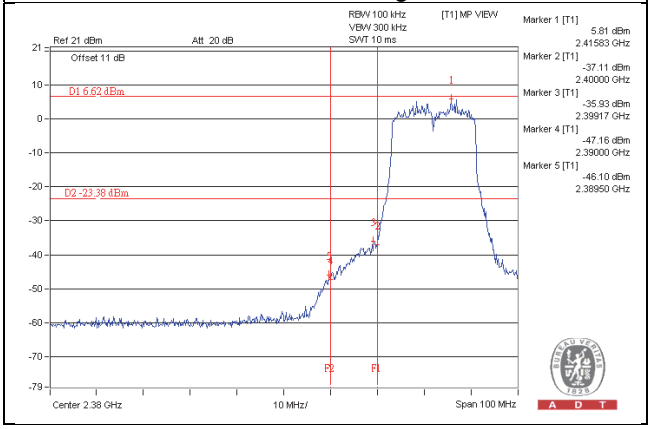
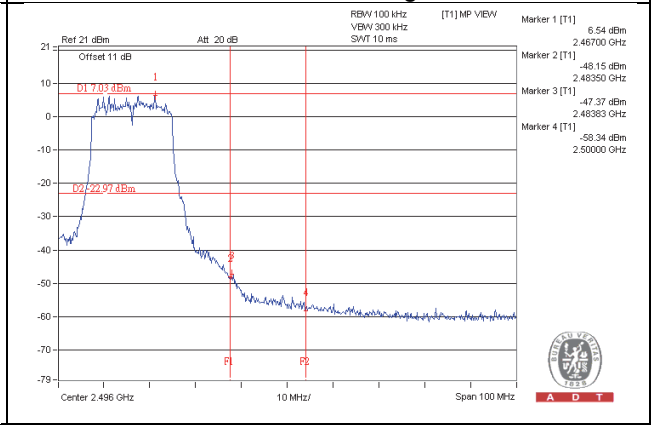




CH 1 Band edge

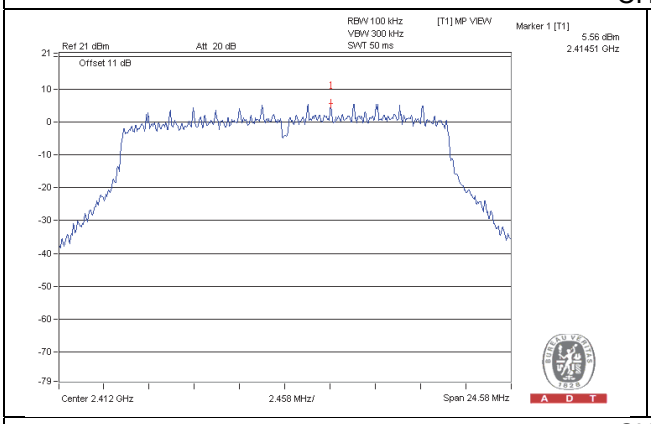


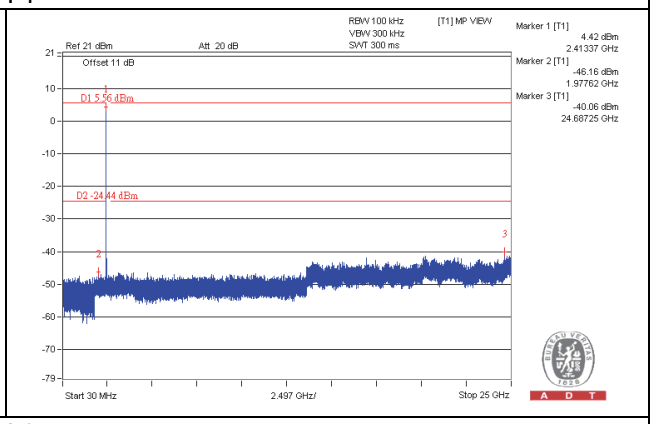
CH 11 Band edge



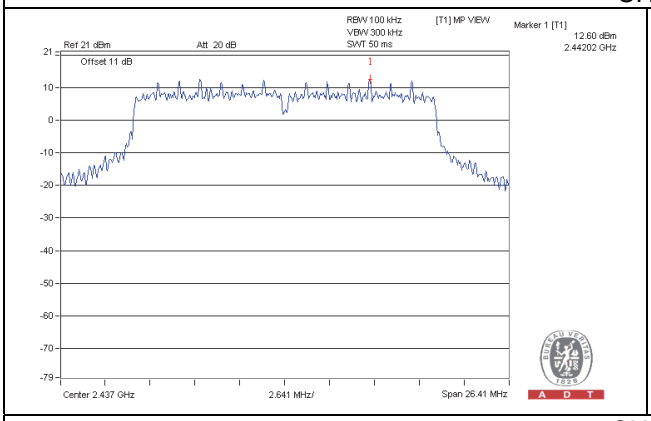
802.11n (20MHz)_CHAIN 1

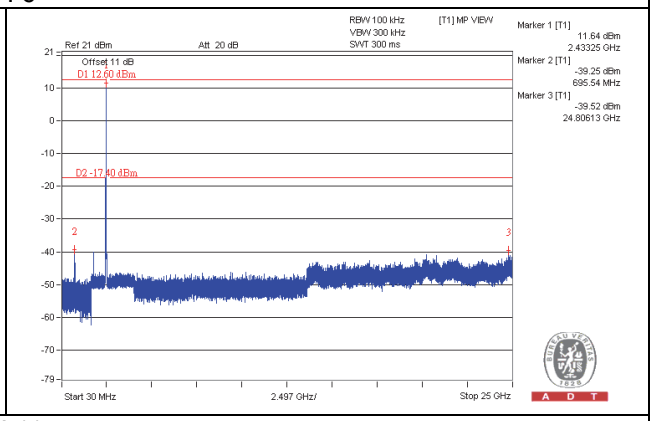
CH 1





CH 6





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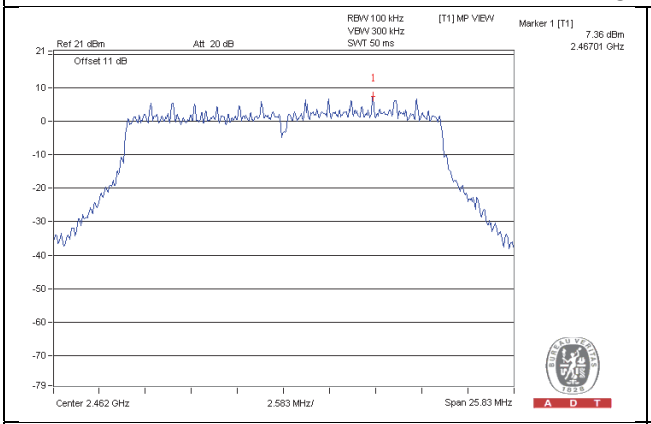
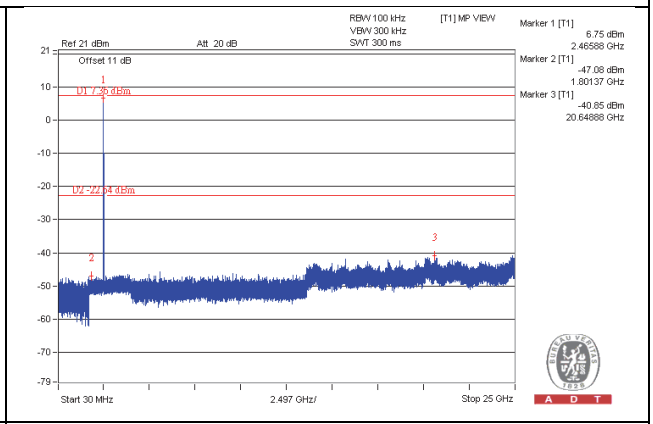
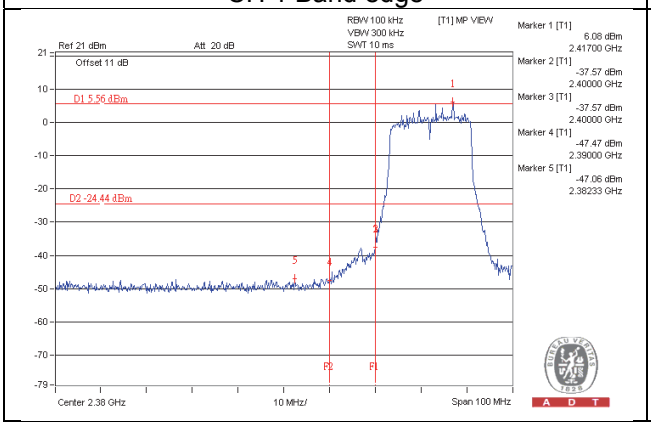
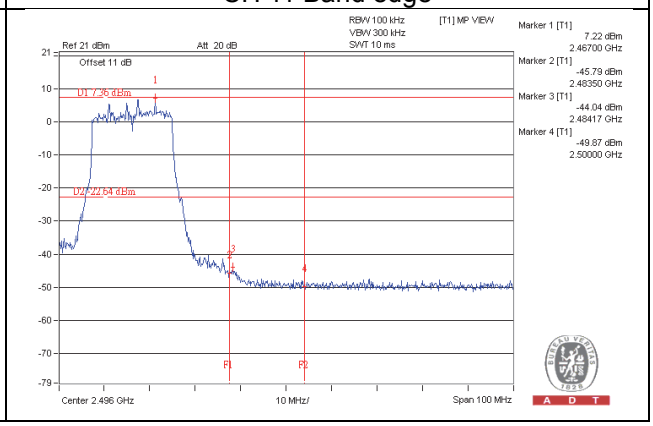




CH 1 Band edge

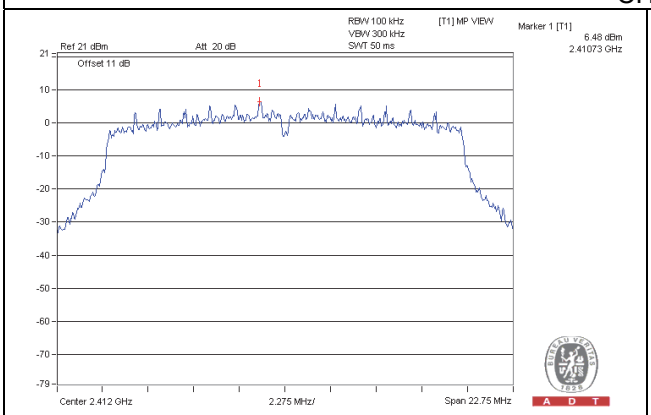


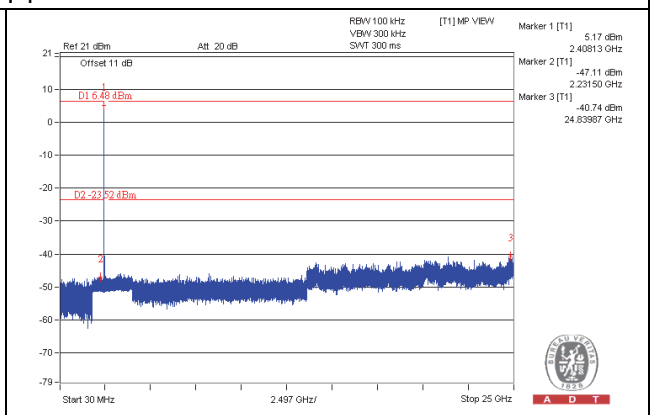
CH 11 Band edge



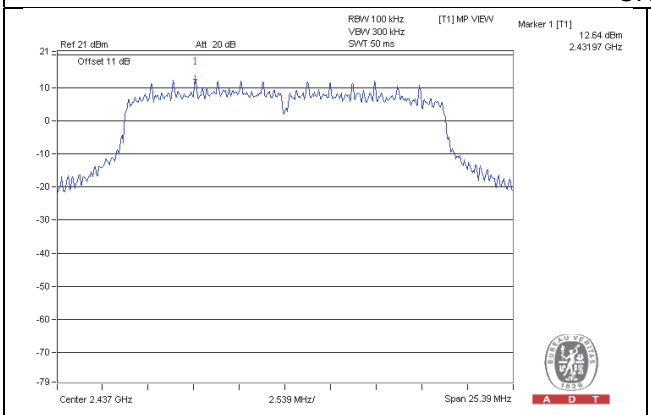
802.11n (20MHz)_CHAIN 2

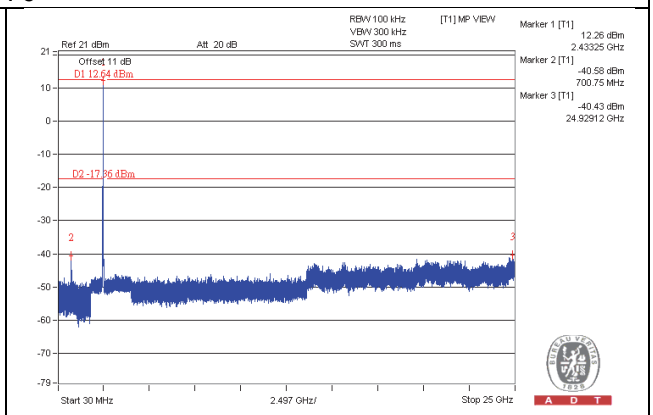
CH 1



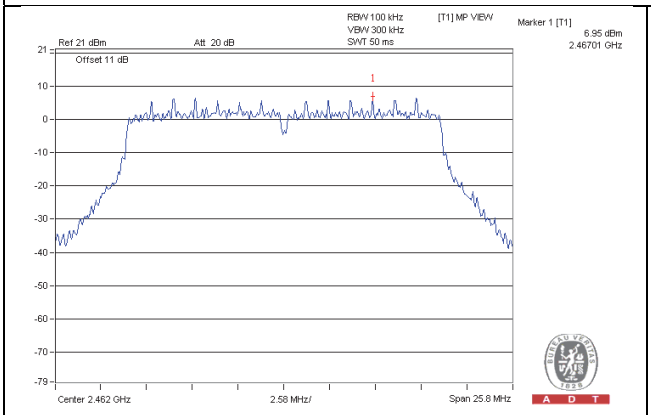


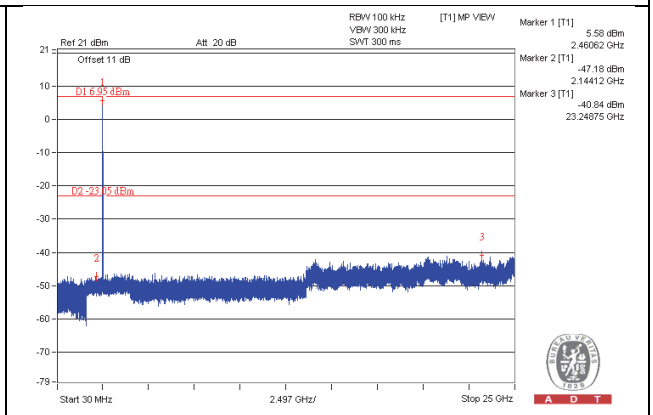
CH 6



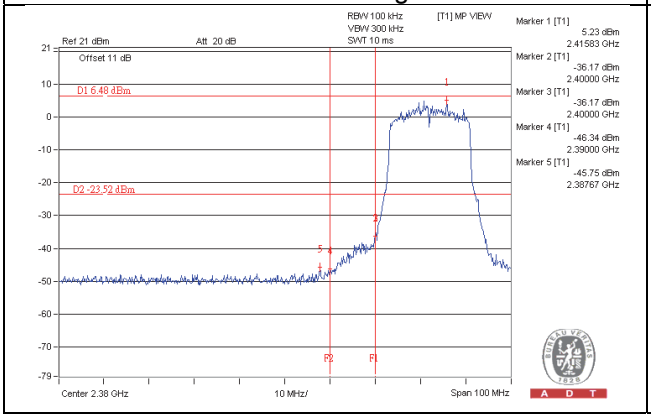


CH 11





CH 1 Band edge



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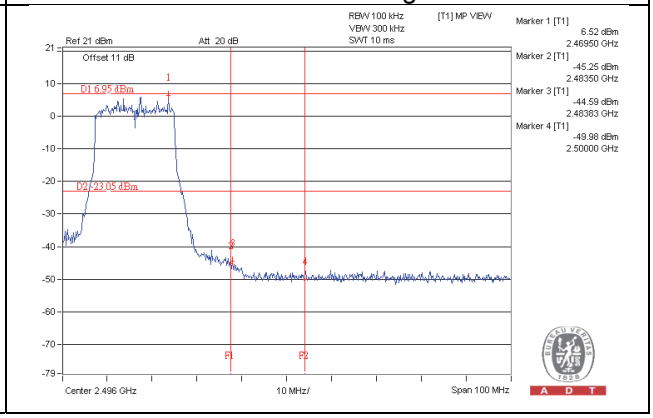
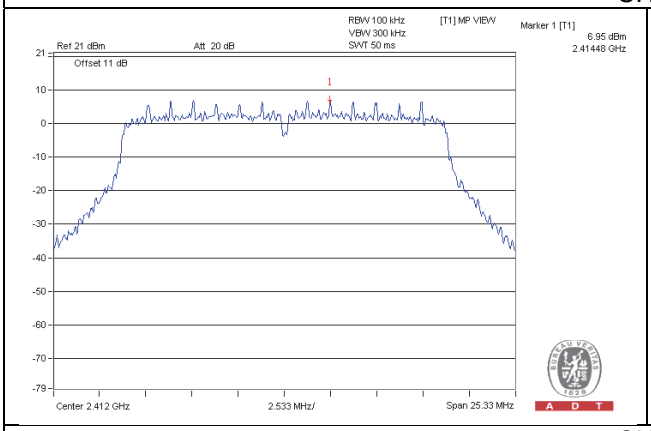
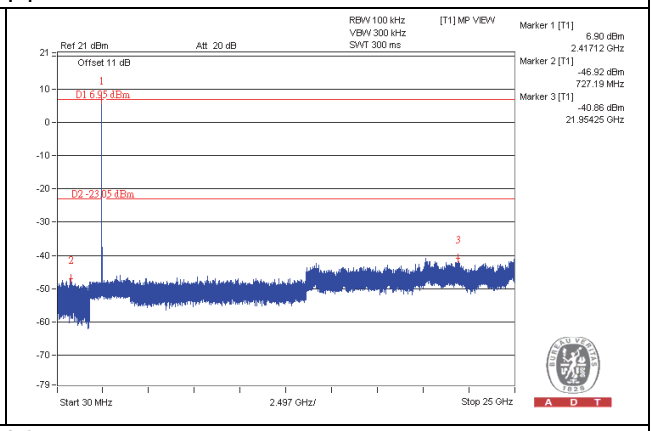


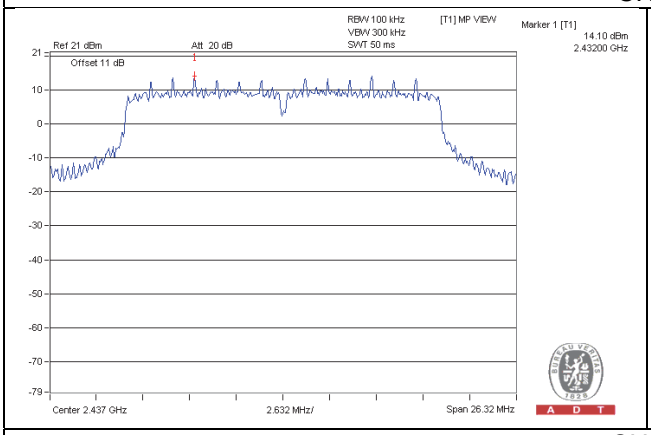
802.11n (20MHz)_CHAIN 3

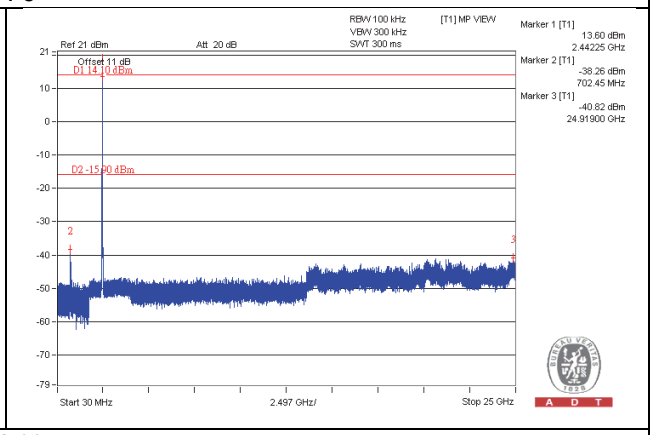
CH 1



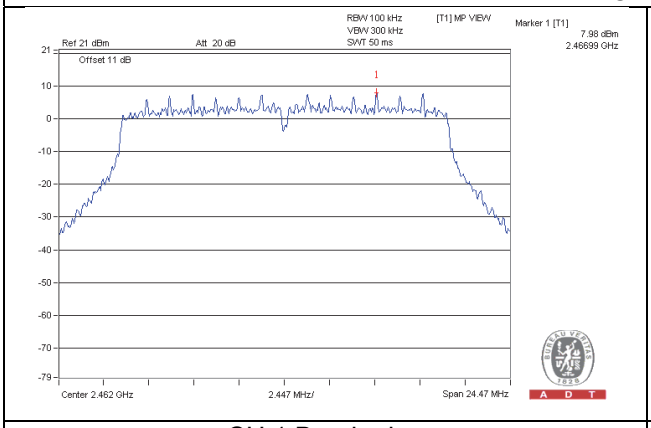


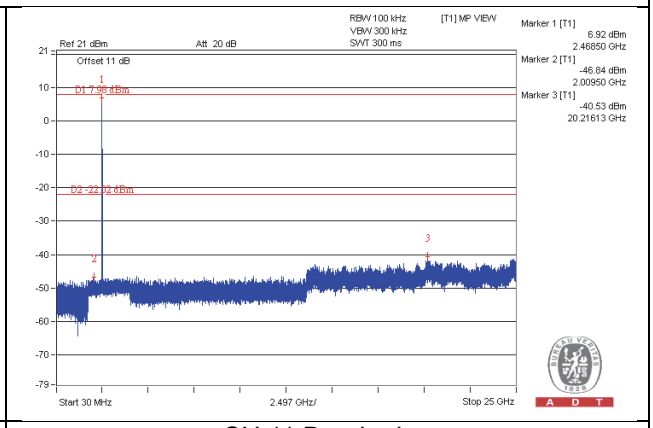
CH 6



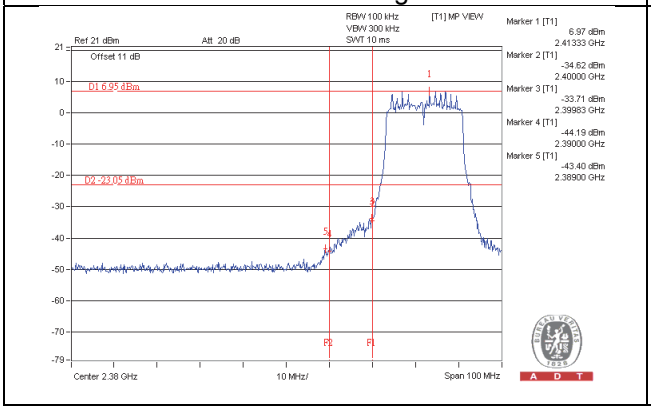


CH 11

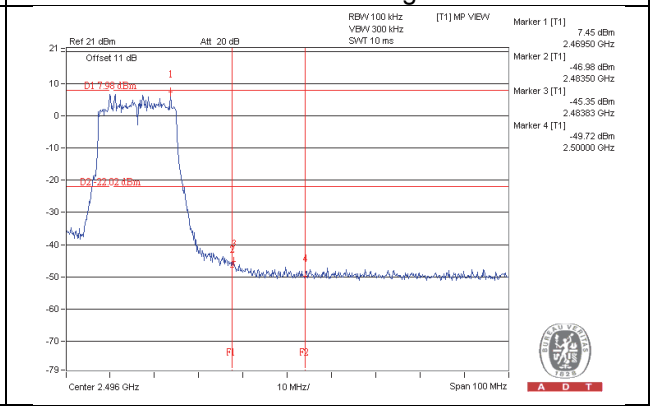




CH 1 Band edge

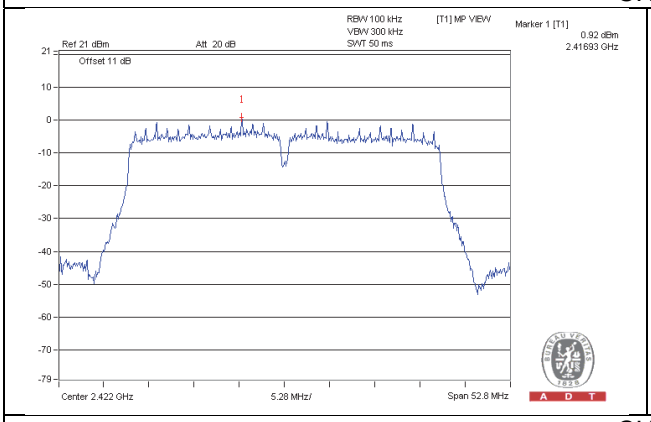


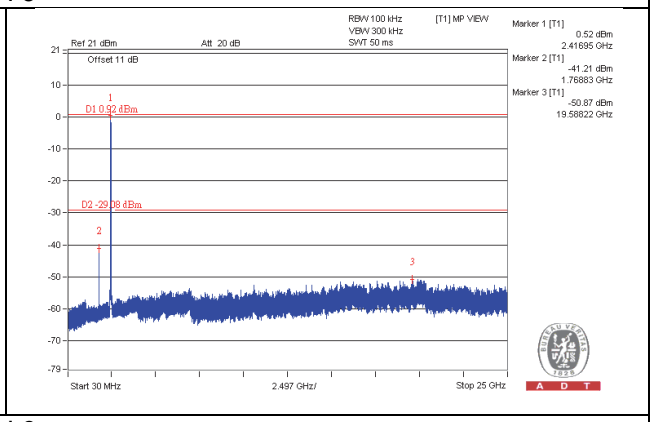
CH 11 Band edge



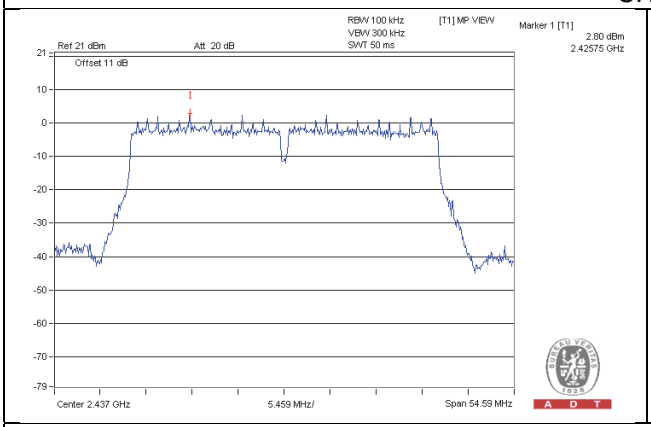
802.11n (40MHz)_CHAIN 0

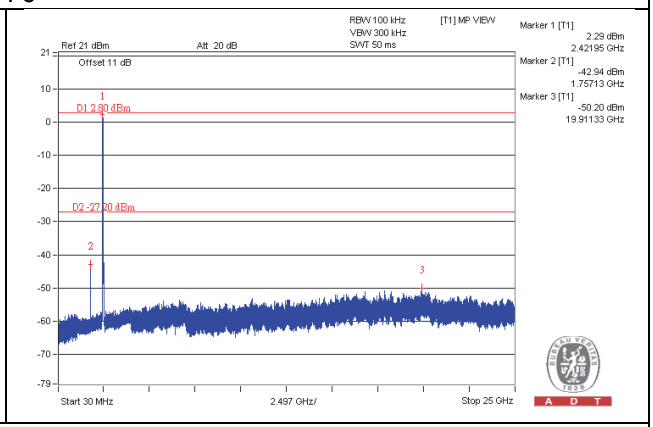
CH 3



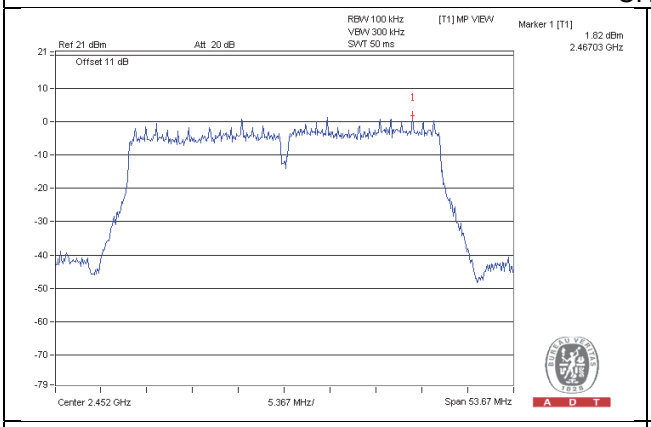


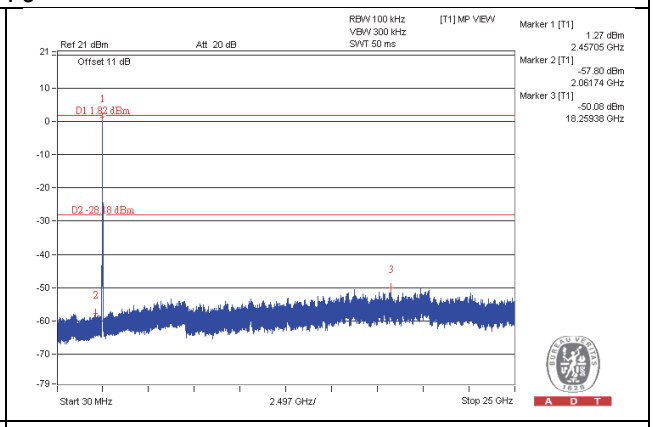
CH 6



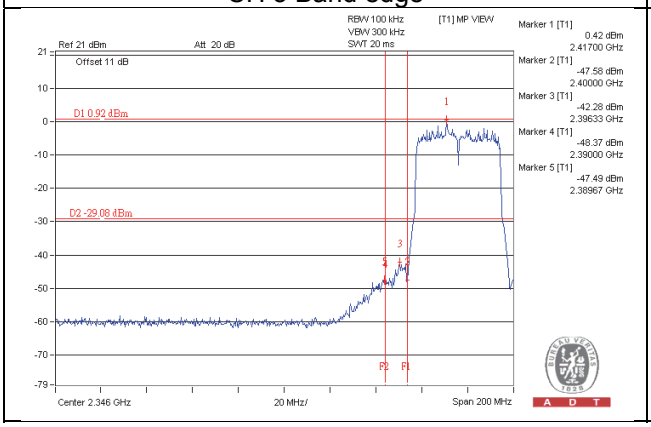


CH 9





CH 3 Band edge



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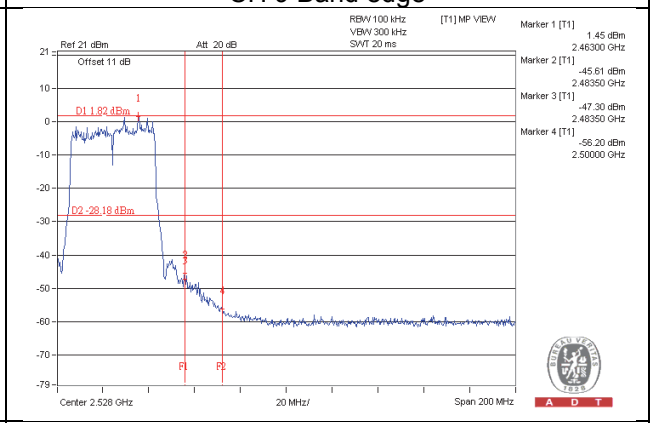
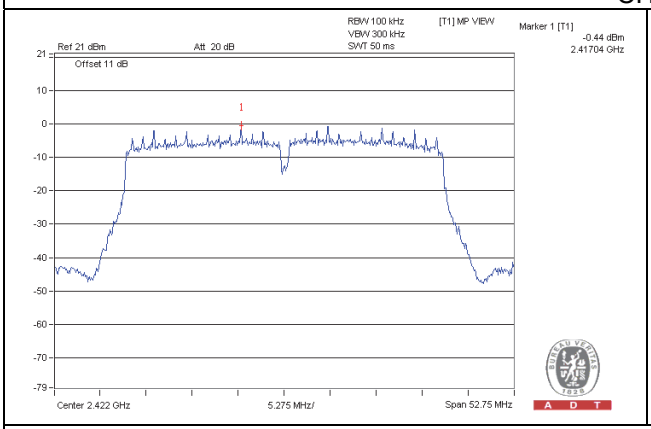
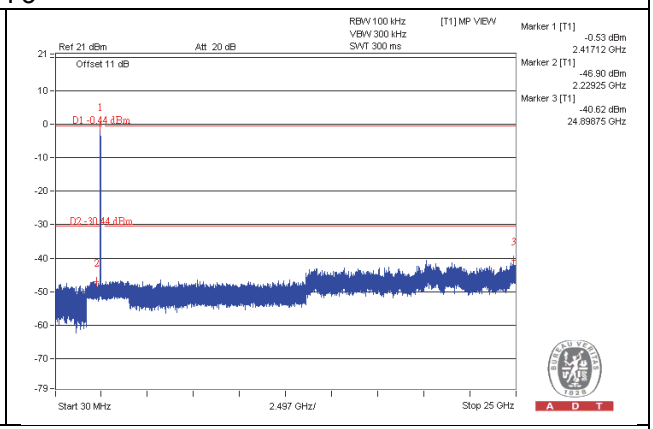


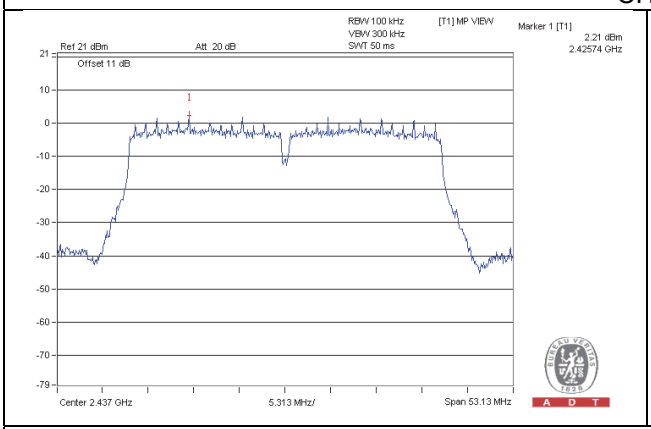
802.11n (40MHz)_CHAIN 1

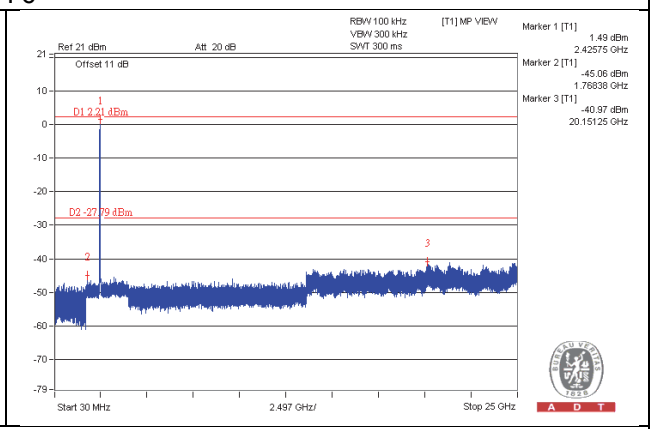
CH 3





CH 6





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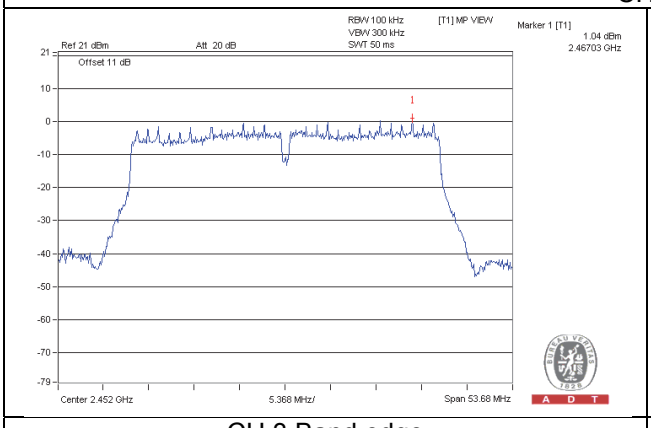
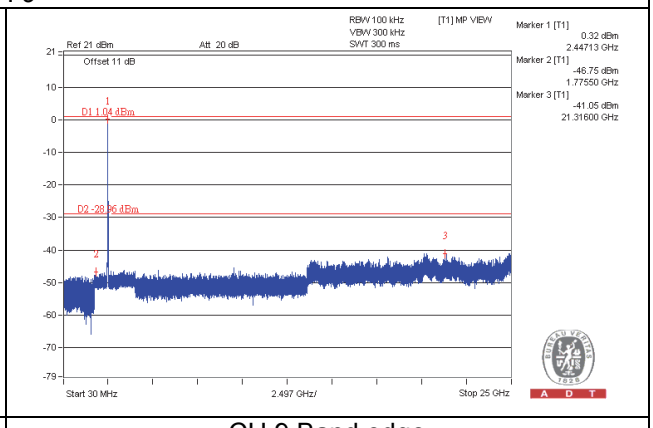
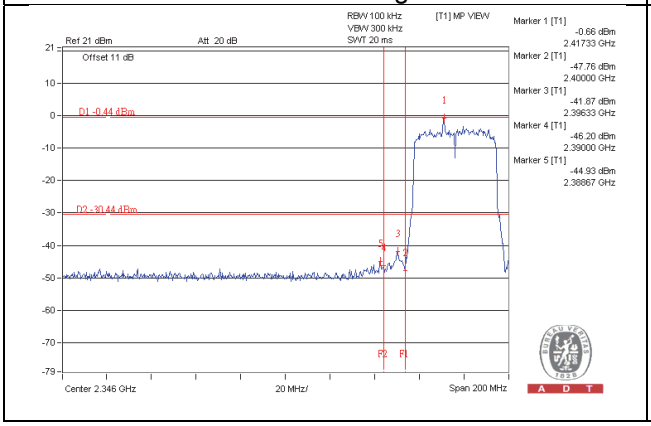




CH 3 Band edge



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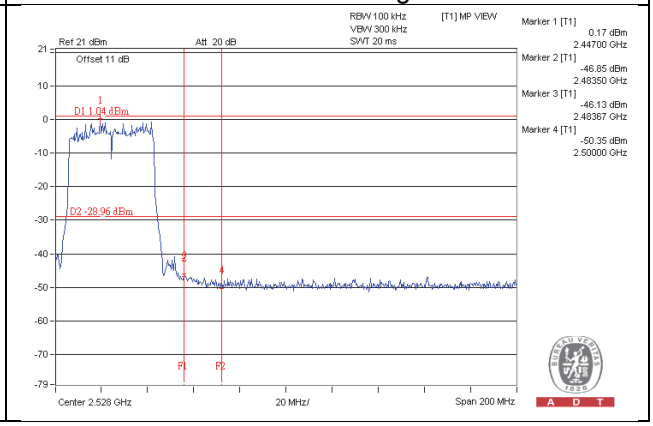
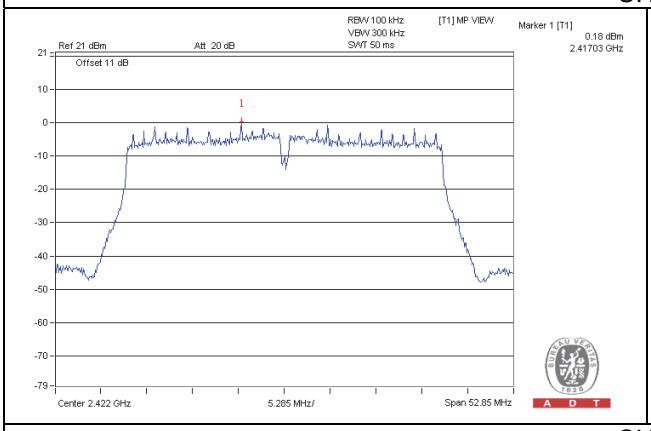
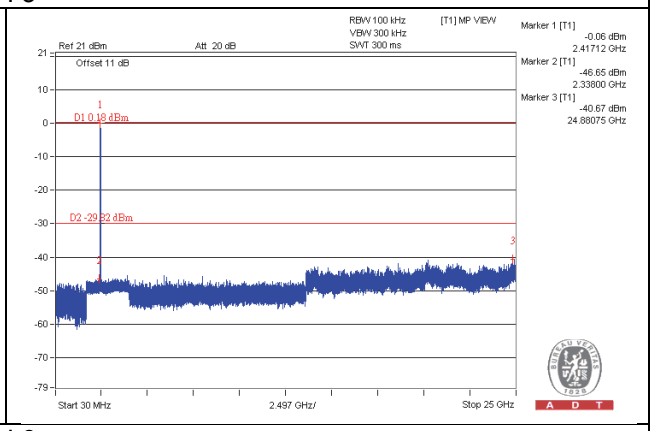


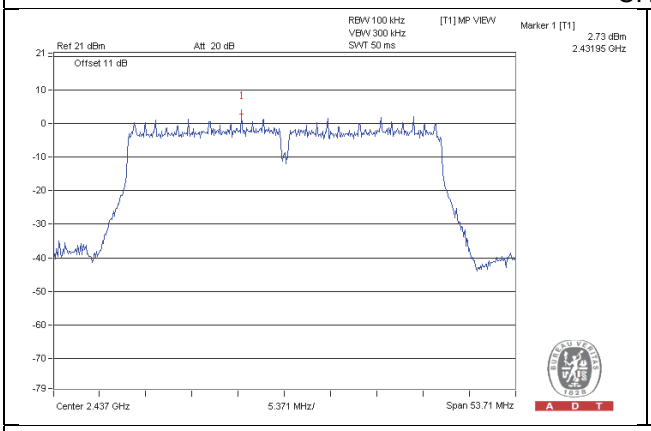
802.11n (40MHz)_CHAIN 2

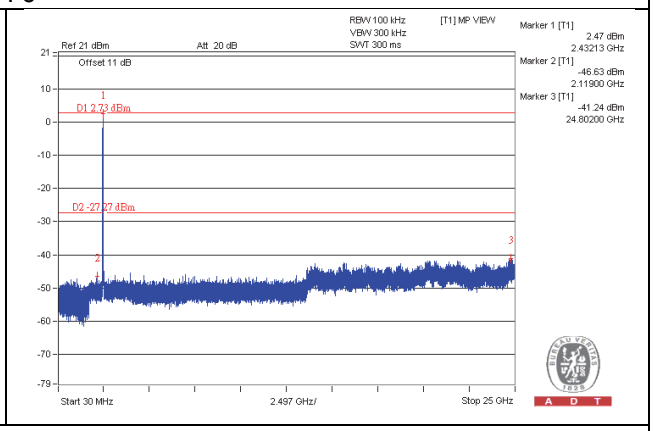
CH 3





CH 6





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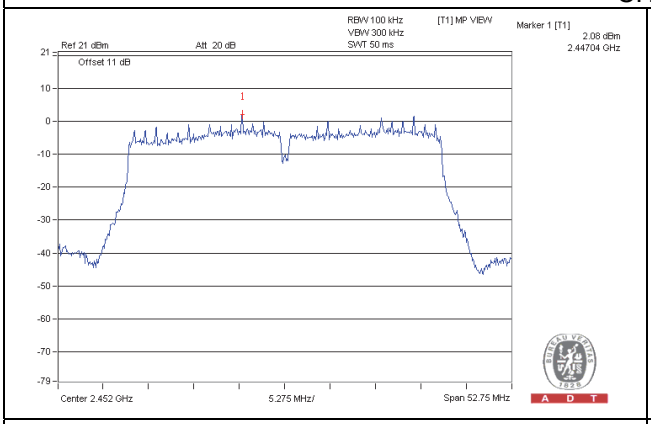
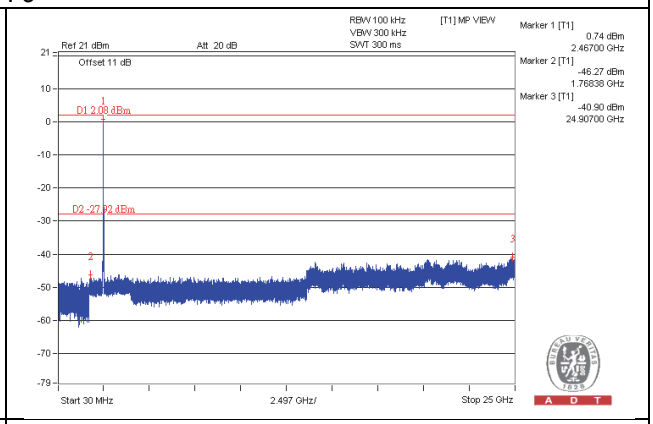
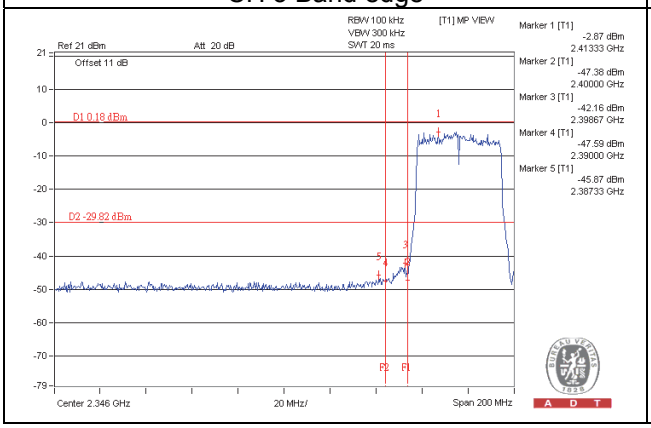
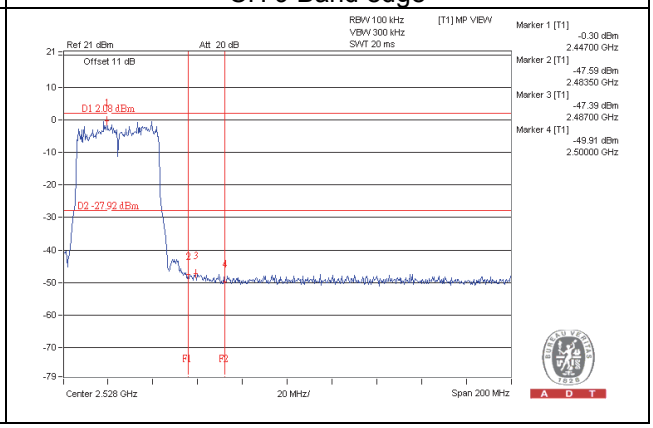




CH 3 Band edge

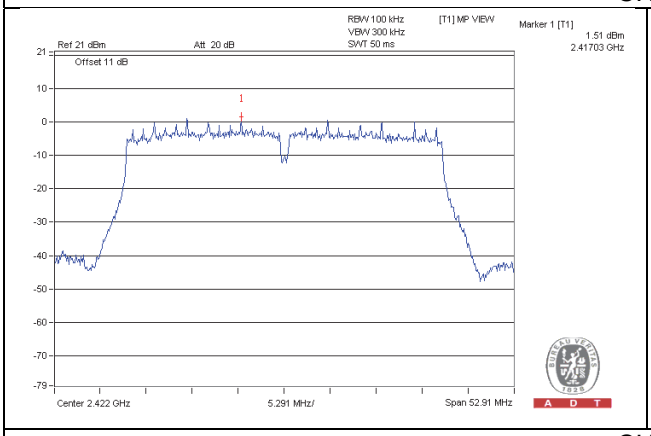


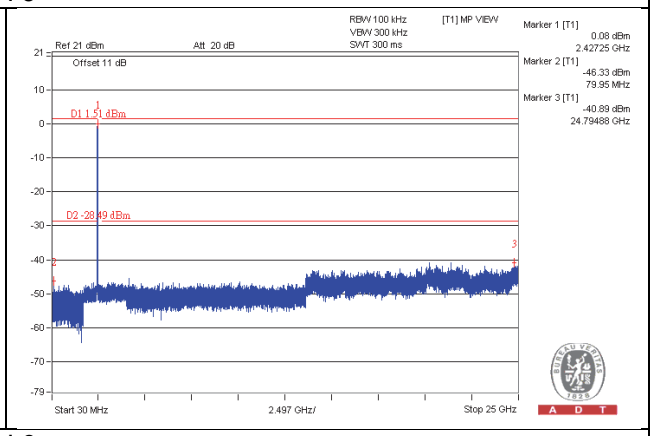
CH 9 Band edge



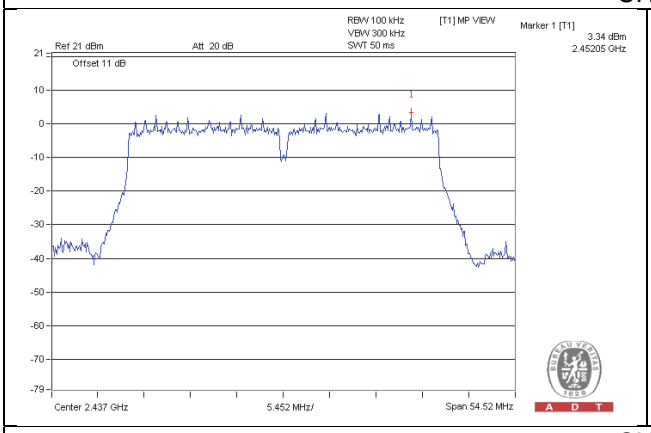
802.11n (40MHz)_CHAIN 3

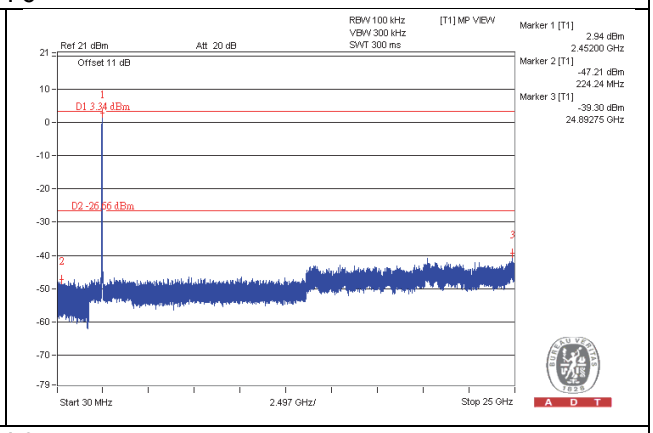
CH 3



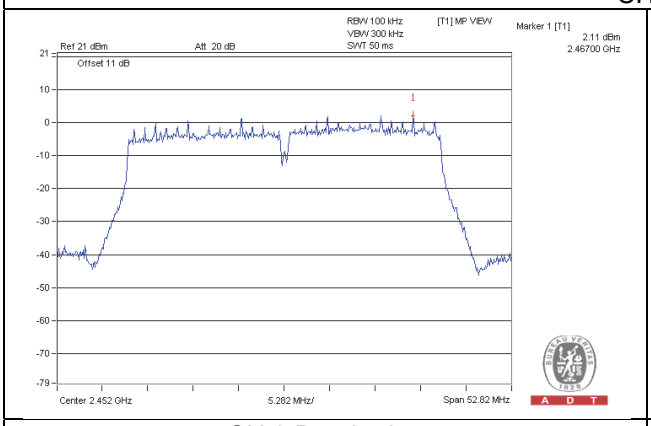


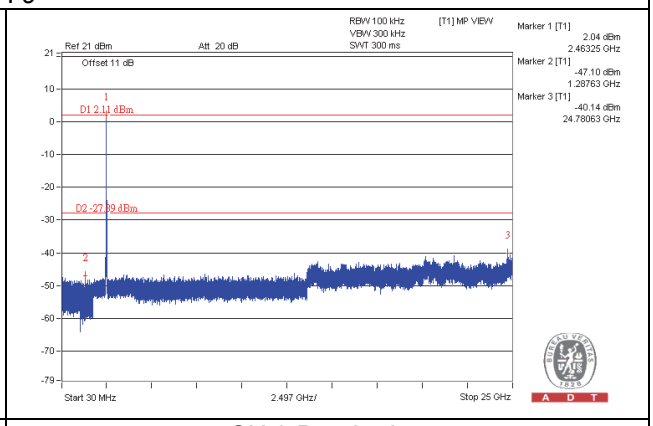
CH 6



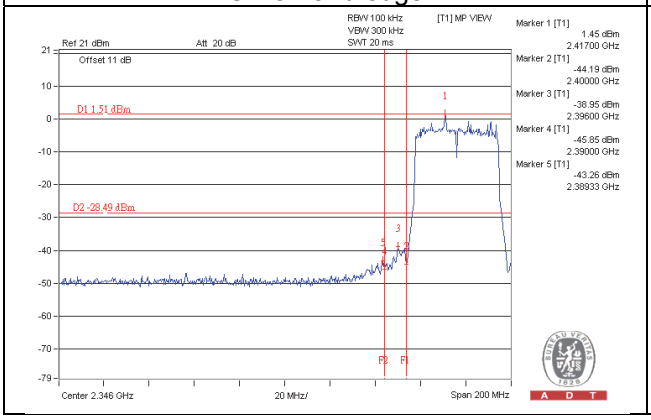


CH 9

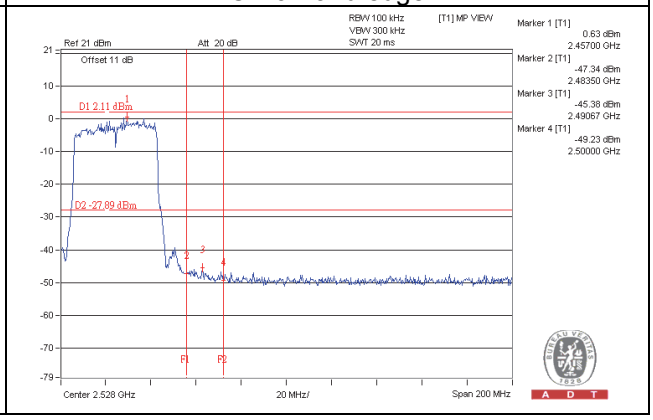




CH 3 Band edge



CH 9 Band edge



5 Test Types and Results (FOR 5.0GHz BAND)

5.1 Radiated Emission and Bandedge Measurement

5.1.1 Limits of Radiated Emission and Bandedge Measurement

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

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 30dB under any condition of modulation.

5.1.2 Test Instruments

Same as item 4.1.2.

5.1.3 Test Procedures

Same as item 4.1.3.

5.1.4 Deviation from Test Standard

No deviation.

5.1.5 Test Set Up

Same as item 4.1.5.

5.1.6 EUT Operating Conditions

Same as item 4.1.6.

5.1.7 Test Results

Above 1GHz data:

802.11a

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	80.9 PK	81.4	-0.5	1.48 H	177	74.10	6.80
2	#5725.00	70.5 AV	71.0	-0.5	1.48 H	177	63.70	6.80
3	*5745.00	111.4 PK			1.64 H	127	71.00	40.40
4	*5745.00	101.0 AV			1.64 H	127	60.60	40.40
5	11490.00	62.6 PK	74.0	-11.4	1.07 H	147	44.20	18.40
6	11490.00	49.5 AV	54.0	-4.5	1.07 H	147	31.10	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	96.8 PK	97.3	-0.5	2.12 V	28	90.00	6.80
2	#5725.00	86.7 AV	87.2	-0.5	2.12 V	28	79.90	6.80
3	*5745.00	127.3 PK			2.22 V	25	86.90	40.40
4	*5745.00	117.2 AV			2.22 V	25	76.80	40.40
5	11490.00	64.2 PK	74.0	-9.8	1.13 V	205	45.80	18.40
6	11490.00	51.5 AV	54.0	-2.5	1.13 V	205	33.10	18.40

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.
7. The limit value is defined as per 15.247.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	112.8 PK			2.33 H	25	72.30	40.50
2	*5785.00	102.4 AV			2.33 H	25	61.90	40.50
3	11570.00	65.8 PK	74.0	-8.2	1.17 H	212	47.40	18.40
4	11570.00	52.5 AV	54.0	-1.5	1.17 H	212	34.10	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	127.1 PK			2.18 V	30	86.70	40.40
2	*5785.00	117.1 AV			2.18 V	30	76.70	40.40
3	11570.00	66.2 PK	74.0	-7.8	1.00 V	154	47.80	18.40
4	11570.00	53.5 AV	54.0	-0.5	1.00 V	154	35.10	18.40

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	110.5 PK			1.00 H	26	70.00	40.50
2	*5825.00	100.5 AV			1.00 H	26	60.00	40.50
3	#5850.00	70.3 PK	80.5	-10.2	1.10 H	39	63.40	6.90
4	#5850.00	60.3 AV	70.5	-10.2	1.10 H	39	53.40	6.90
5	11650.00	63.7 PK	74.0	-10.3	1.47 H	213	44.80	18.90
6	11650.00	51.5 AV	54.0	-2.5	1.47 H	213	32.60	18.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	127.3 PK			2.24 V	340	86.80	40.50
2	*5825.00	117.1 AV			2.24 V	340	76.60	40.50
3	#5850.00	87.1 PK	97.3	-10.2	2.10 V	209	80.20	6.90
4	#5850.00	76.9 AV	87.1	-10.2	2.10 V	209	70.00	6.90
5	11650.00	66.7 PK	74.0	-7.3	1.75 V	143	47.80	18.90
6	11650.00	53.5 AV	54.0	-0.5	1.75 V	143	34.60	18.90

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.
7. The limit value is defined as per 15.247.

802.11n (20MHz)

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	79.3 PK	79.5	-0.2	2.47 H	302	72.50	6.80
2	#5725.00	68.9 AV	69.1	-0.2	2.47 H	302	62.10	6.80
3	*5745.00	109.5 PK			1.90 H	359	69.10	40.40
4	*5745.00	99.1 AV			1.90 H	359	58.70	40.40
5	11490.00	61.2 PK	74.0	-12.8	1.47 H	194	42.80	18.40
6	11490.00	48.9 AV	54.0	-5.1	1.47 H	194	30.50	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	97.7 PK	97.9	-0.2	2.02 V	346	90.90	6.80
2	#5725.00	86.7 AV	86.9	-0.2	2.02 V	346	79.90	6.80
3	*5745.00	127.9 PK			2.20 V	343	87.50	40.40
4	*5745.00	116.9 AV			2.20 V	343	76.50	40.40
5	11490.00	64.4 PK	74.0	-9.6	1.12 V	163	46.00	18.40
6	11490.00	51.6 AV	54.0	-2.4	1.12 V	163	33.20	18.40

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.
7. The limit value is defined as per 15.247.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	114.1 PK			2.31 H	24	73.60	40.50
2	*5785.00	103.4 AV			2.31 H	24	62.90	40.50
3	11570.00	63.3 PK	74.0	-10.7	2.31 H	217	44.90	18.40
4	11570.00	49.8 AV	54.0	-4.2	2.31 H	217	31.40	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	127.7 PK			2.26 V	342	87.20	40.50
2	*5785.00	117.3 AV			2.26 V	342	76.80	40.50
3	11570.00	65.7 PK	74.0	-8.3	1.54 V	138	47.30	18.40
4	11570.00	53.5 AV	54.0	-0.5	1.54 V	138	35.10	18.40

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	114.1 PK			2.32 H	23	73.60	40.50
2	*5825.00	103.3 AV			2.32 H	23	62.80	40.50
3	#5850.00	76.6 PK	84.1	-7.5	2.32 H	23	69.70	6.90
4	#5850.00	65.8 AV	73.3	-7.5	2.32 H	23	58.90	6.90
5	11650.00	62.6 PK	74.0	-11.4	1.36 H	153	43.70	18.90
6	11650.00	50.6 AV	54.0	-3.4	1.36 H	153	31.70	18.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	128.2 PK			2.23 V	171	87.70	40.50
2	*5825.00	117.0 AV			2.23 V	171	76.50	40.50
3	#5850.00	90.7 PK	98.2	-7.5	2.29 V	167	83.80	6.90
4	#5850.00	79.5 AV	87.0	-7.5	2.29 V	167	72.60	6.90
5	11650.00	66.9 PK	74.0	-7.1	2.07 V	131	48.00	18.90
6	11650.00	53.6 AV	54.0	-0.4	2.07 V	131	34.70	18.90

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.
7. The limit value is defined as per 15.247.

802.11n (40MHz)

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	78.5 PK	78.7	-0.2	2.35 H	23	71.70	6.80
2	#5725.00	68.5 AV	68.7	-0.2	2.35 H	23	61.70	6.80
3	*5755.00	108.7 PK			2.35 H	23	68.20	40.50
4	*5755.00	98.7 AV			2.35 H	23	58.20	40.50
5	11510.00	60.0 PK	74.0	-14.0	1.33 H	152	41.70	18.30
6	11510.00	48.7 AV	54.0	-5.3	1.33 H	152	30.40	18.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	92.5 PK	92.7	-0.2	2.12 V	306	85.70	6.80
2	#5725.00	83.2 AV	83.4	-0.2	2.12 V	306	76.40	6.80
3	*5755.00	122.7 PK			2.30 V	329	82.20	40.50
4	*5755.00	113.4 AV			2.30 V	329	72.90	40.50
5	11510.00	62.1 PK	74.0	-11.9	1.09 V	161	43.80	18.30
6	11510.00	50.0 AV	54.0	-4.0	1.09 V	161	31.70	18.30

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.
7. The limit value is defined as per 15.247.

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	109.4 PK			2.47 H	21	68.90	40.50
2	*5795.00	99.5 AV			2.47 H	21	59.00	40.50
3	#5850.00	74.1 PK	79.4	-5.3	2.47 H	21	67.20	6.90
4	#5850.00	64.2 AV	69.5	-5.3	2.47 H	21	57.30	6.90
5	11590.00	60.5 PK	74.0	-13.5	1.19 H	213	42.00	18.50
6	11590.00	48.8 AV	54.0	-5.2	1.19 H	213	30.30	18.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	124.5 PK			2.36 V	342	84.00	40.50
2	*5795.00	114.7 AV			2.36 V	342	74.20	40.50
3	#5850.00	89.2 PK	94.5	-5.3	2.36 V	342	82.30	6.90
4	#5850.00	79.4 AV	84.7	-5.3	2.36 V	342	72.50	6.90
5	11590.00	64.2 PK	74.0	-9.8	1.24 V	153	45.70	18.50
6	11590.00	53.5 AV	54.0	-0.5	1.24 V	153	35.00	18.50

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.
7. The limit value is defined as per 15.247.

802.11ac (80MHz)

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	71.5 PK	71.7	-0.2	1.03 H	25	64.70	6.80
2	#5725.00	61.7 AV	61.9	-0.2	1.03 H	25	54.90	6.80
3	*5775.00	101.7 PK			1.00 H	22	61.20	40.50
4	*5775.00	91.9 AV			1.00 H	22	51.40	40.50
5	#5850.00	66.4 PK	71.7	-5.3	1.00 H	18	59.50	6.90
6	#5850.00	56.6 AV	61.9	-5.3	1.00 H	18	49.70	6.90
7	11550.00	60.0 PK	74.0	-14.0	1.46 H	81	41.60	18.40
8	11550.00	47.2 AV	54.0	-6.8	1.46 H	81	28.80	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	87.7 PK	87.9	-0.2	2.21 V	247	80.90	6.80
2	#5725.00	78.7 AV	78.9	-0.2	2.21 V	247	71.90	6.80
3	*5775.00	117.9 PK			2.27 V	297	77.40	40.50
4	*5775.00	108.9 AV			2.27 V	297	68.40	40.50
5	#5850.00	82.6 PK	87.9	-5.3	2.56 V	342	75.70	6.90
6	#5850.00	73.6 AV	78.9	-5.3	2.56 V	342	66.70	6.90
7	11550.00	61.7 PK	74.0	-12.3	1.08 V	162	43.30	18.40
8	11550.00	48.5 AV	54.0	-5.5	1.08 V	162	30.10	18.40

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.
7. The limit value is defined as per 15.247.

Below 1GHz worst-case data:

802.11a

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.12	32.9 QP	40.0	-7.1	1.99 H	115	47.50	-14.60
2	375.98	39.6 QP	46.0	-6.4	1.00 H	320	50.60	-11.00
3	691.86	40.8 QP	46.0	-5.2	1.04 H	33	45.50	-4.70
4	771.33	42.5 QP	46.0	-3.5	1.00 H	28	45.10	-2.60
5	819.28	41.3 QP	46.0	-4.7	1.00 H	349	43.40	-2.10
6	875.67	41.3 QP	46.0	-4.7	1.00 H	349	42.40	-1.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	31.84	34.5 QP	40.0	-5.5	1.01 V	18	50.60	-16.10
2	375.98	44.4 QP	46.0	-1.6	1.01 V	335	55.40	-11.00
3	624.85	42.6 QP	46.0	-3.4	2.00 V	10	48.20	-5.60
4	782.34	42.5 QP	46.0	-3.5	2.00 V	148	44.90	-2.40
5	792.06	41.2 QP	46.0	-4.8	2.00 V	141	43.50	-2.30
6	875.67	44.6 QP	46.0	-1.4	1.49 V	16	45.70	-1.10

Remarks:

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

5.2 Conducted Emission Measurement

5.2.1 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.

5.2.2 Test Instruments

Same as item 4.2.2.

5.2.3 Test Procedures

Same as item 4.2.3.

5.2.4 Deviation from Test Standard

No deviation.

5.2.5 Test Setup

Same as item 4.2.5

5.2.6 EUT Operating Conditions

Same as item 4.1.6.

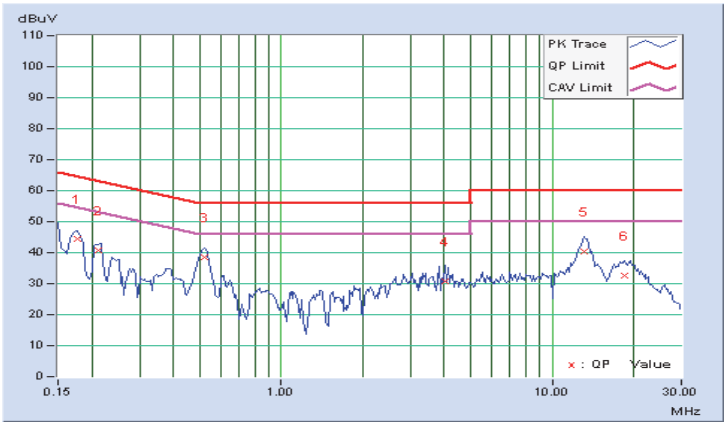
5.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	0.17	44.15	33.49	44.32	33.66	64.61	54.61	-20.29	-20.95
2	0.21132	0.17	40.59	30.32	40.76	30.49	63.15	53.15	-22.39	-22.66
3	0.52109	0.19	38.22	27.13	38.41	27.32	56.00	46.00	-17.59	-18.68
4	4.03906	0.35	30.30	21.20	30.65	21.55	56.00	46.00	-25.35	-24.45
5	13.18359	0.50	39.84	33.02	40.34	33.52	60.00	50.00	-19.66	-16.48
6	18.58594	0.60	32.03	26.59	32.63	27.19	60.00	50.00	-27.37	-22.81

Remarks:

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

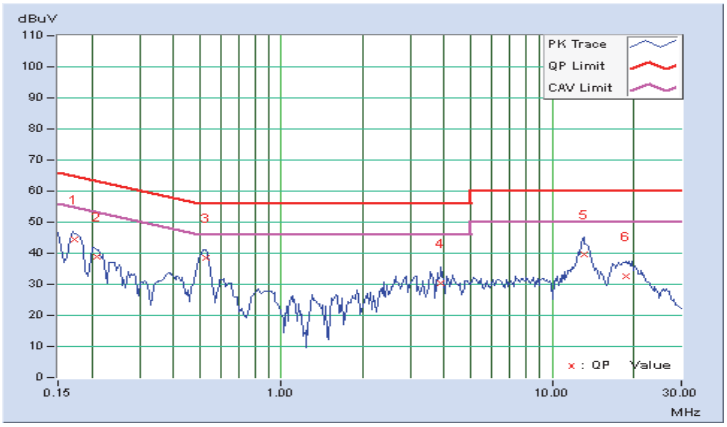


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17335	0.18	44.14	34.20	44.32	34.38	64.80	54.80	-20.48	-20.42
2	0.20851	0.18	38.56	29.79	38.74	29.97	63.26	53.26	-24.52	-23.29
3	0.52500	0.21	38.42	27.95	38.63	28.16	56.00	46.00	-17.37	-17.84
4	3.90234	0.38	29.97	18.41	30.35	18.79	56.00	46.00	-25.65	-27.21
5	13.07031	0.60	38.99	32.43	39.59	33.03	60.00	50.00	-20.41	-16.97
6	18.71875	0.75	31.85	26.52	32.60	27.27	60.00	50.00	-27.40	-22.73

Remarks:

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



5.3 6dB Bandwidth Measurement

5.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 Test Setup

Same as item 4.3.2.

5.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.3.4 Test Procedure

Same as item 4.3.4.

5.3.5 Deviation fromTest Standard

No deviation.

5.3.6 EUT Operating Conditions

Same as item 4.3.6.

5.3.7 Test Result

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.35	16.10	16.34	16.38	0.5	Pass
157	5785	16.34	16.07	16.33	16.36	0.5	Pass
165	5825	16.35	16.10	16.33	16.34	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		
149	5745	17.60	16.96	17.60	17.57	0.5	Pass
157	5785	17.63	17.22	16.96	17.19	0.5	Pass
165	5825	17.62	16.95	17.59	17.61	0.5	Pass

802.11n (40MHz)

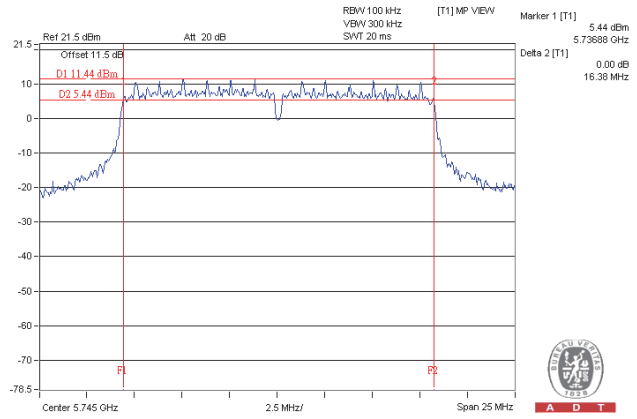
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	35.79	36.01	35.38	36.42	0.5	Pass
159	5795	36.12	35.19	36.37	35.24	0.5	Pass

802.11ac (80MHz)

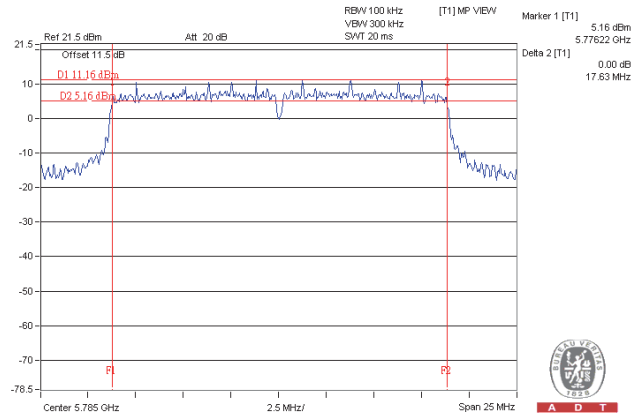
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	76.62	76.19	76.63	76.63	0.5	Pass

Spectrum Plot of Worst Value

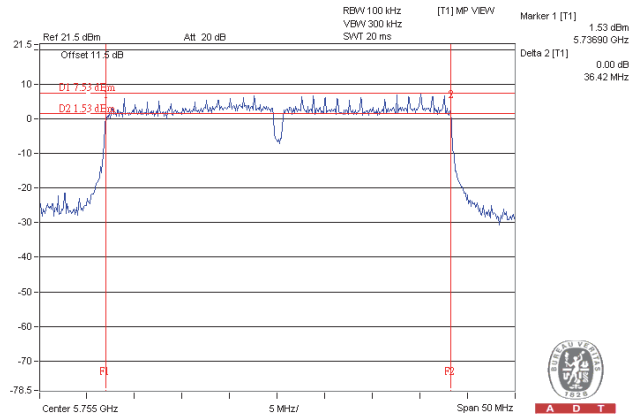
802.11a



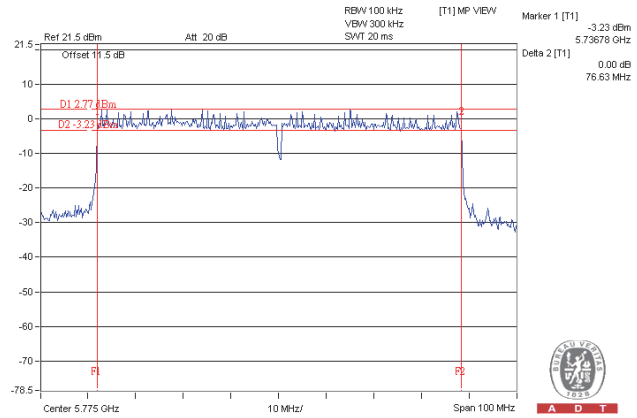
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



5.4 Conducted Output Power

5.4.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

5.4.2 Test Setup

Same as Item 4.5.2.

5.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.4.4 Test Procedures

Same as Item 4.5.4.

5.4.5 Deviation from Test Standard

No deviation.

5.4.6 EUT Operating Conditions

Same as Item 4.5.6.

5.4.7 Test Results

802.11a

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	23.05	22.89	23.88	24.02	893.064	29.51	30.00	Pass
157	5785	23.63	23.26	23.95	23.94	938.566	29.72	30.00	Pass
165	5825	23.91	23.51	23.94	23.88	962.510	29.83	30.00	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				
149	5745	22.91	22.97	23.82	23.87	878.359	29.44	30.00	Pass
157	5785	23.61	23.04	23.95	23.99	929.911	29.68	30.00	Pass
165	5825	23.89	23.35	23.86	23.81	944.834	29.75	30.00	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				
151	5755	21.91	21.83	22.90	22.79	692.736	28.41	30.00	Pass
159	5795	23.86	23.53	24.24	24.14	**993.523**	29.97	30.00	Pass

802.11ac (80MHz)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	21.10	20.85	21.69	21.57	541.564	27.34	30.00	Pass

5.5 Power Spectral Density Measurement

5.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 Test Setup

Same as item 4.6.2.

5.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.5.4 Test Procedure

Same as item 4.6.4.

5.5.5 Deviation from Test Standard

No deviation.

5.5.6 EUT Operating Condition

Same as Item 4.3.6

5.5.7 Test Results

802.11a

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/10kHz)	Pass / Fail
0	149	5745	-8.81	6.02	0.21	-2.58	3.83	Pass
	157	5785	-8.54	6.02	0.21	-2.31	3.83	Pass
	165	5825	-8.19	6.02	0.21	-1.96	3.83	Pass
1	149	5745	-9.19	6.02	0.21	-2.96	3.83	Pass
	157	5785	-9.03	6.02	0.21	-2.80	3.83	Pass
	165	5825	-9.08	6.02	0.21	-2.85	3.83	Pass
2	149	5745	-8.35	6.02	0.21	-2.12	3.83	Pass
	157	5785	-8.30	6.02	0.21	-2.07	3.83	Pass
	165	5825	-8.12	6.02	0.21	-1.89	3.83	Pass
3	149	5745	-8.45	6.02	0.21	-2.22	3.83	Pass
	157	5785	-7.96	6.02	0.21	-1.73	3.83	Pass
	165	5825	-8.49	6.02	0.21	-2.26	3.83	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.15dBi + 10log(4) = 10.17dBi > 6dBi, so the power density limit shall be reduced to 8-(10.17-6) = 3.83dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/10kHz)	Pass / Fail
0	149	5745	-8.98	6.02	0.14	-2.82	3.83	Pass
	157	5785	-9.05	6.02	0.14	-2.89	3.83	Pass
	165	5825	-8.66	6.02	0.14	-2.50	3.83	Pass
1	149	5745	-8.92	6.02	0.14	-2.76	3.83	Pass
	157	5785	-8.75	6.02	0.14	-2.59	3.83	Pass
	165	5825	-8.83	6.02	0.14	-2.67	3.83	Pass
2	149	5745	-8.09	6.02	0.14	-1.93	3.83	Pass
	157	5785	-7.85	6.02	0.14	-1.69	3.83	Pass
	165	5825	-8.56	6.02	0.14	-2.40	3.83	Pass
3	149	5745	-7.79	6.02	0.14	-1.63	3.83	Pass
	157	5785	-8.39	6.02	0.14	-2.23	3.83	Pass
	165	5825	-8.57	6.02	0.14	-2.41	3.83	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.15dBi + 10log(4) = 10.17dBi > 6dBi, so the power density limit shall be reduced to 8-(10.17-6) = 3.83dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/10kHz)	Pass / Fail
0	151	5755	-13.82	6.02	0.24	-7.56	3.83	Pass
	159	5795	-11.86	6.02	0.24	-5.60	3.83	Pass
1	151	5755	-13.91	6.02	0.24	-7.65	3.83	Pass
	159	5795	-12.42	6.02	0.24	-6.16	3.83	Pass
2	151	5755	-13.11	6.02	0.24	-6.85	3.83	Pass
	159	5795	-11.95	6.02	0.24	-5.69	3.83	Pass
3	151	5755	-12.73	6.02	0.24	-6.47	3.83	Pass
	159	5795	-12.18	6.02	0.24	-5.92	3.83	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.15dBi + 10log(4) = 10.17dBi > 6dBi, so the power density limit shall be reduced to 8-(10.17-6) = 3.83dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

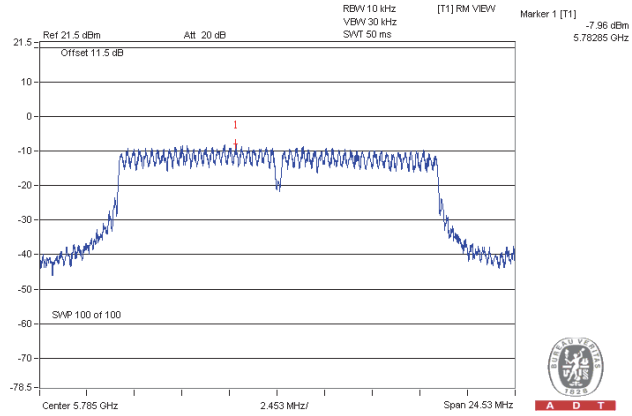
802.11ac (80MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/10kHz)	Pass / Fail
0	155	5775	-18.69	6.02	0.43	-12.24	3.83	Pass
1	155	5775	-18.11	6.02	0.43	-11.66	3.83	Pass
2	155	5775	-18.01	6.02	0.43	-11.56	3.83	Pass
3	155	5775	-18.17	6.02	0.43	-11.72	3.83	Pass

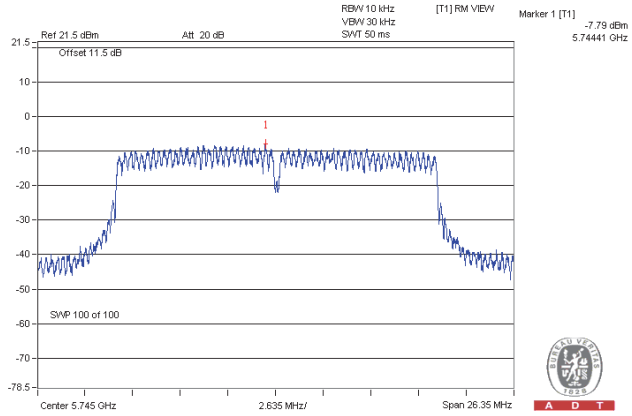
Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.15dBi + 10log(4) = 10.17dBi > 6dBi, so the power density limit shall be reduced to 8-(10.17-6) = 3.83dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

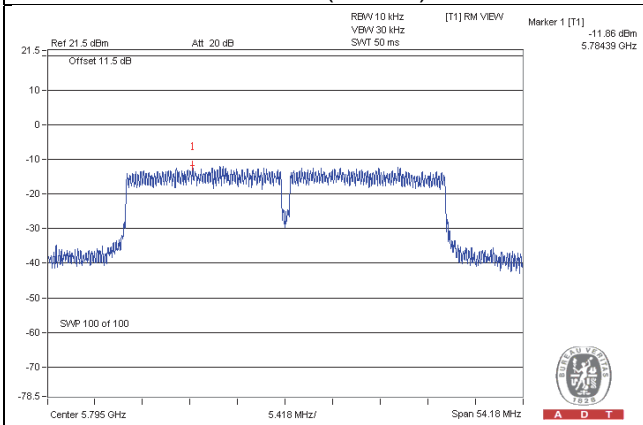
802.11a



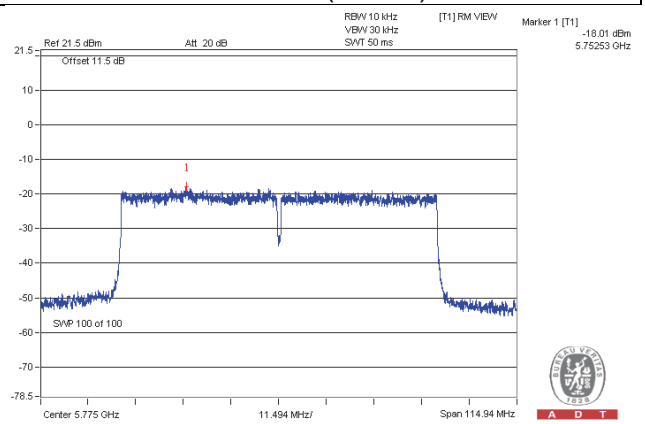
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



5.6 Conducted Out of Band Emission Measurement

5.6.1 Limits of Conducted Out of Band Emission Measurement

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

5.6.2 Test Setup

Same as Item 4.7.2

5.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.6.4 Test Procedure

Same as Item 4.7.4

5.6.5 Deviation from Test Standard

No deviation.

5.6.6 EUT Operating Condition

Same as Item 4.3.6

5.6.7 Test Results

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

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

802.11a_CHAIN 0

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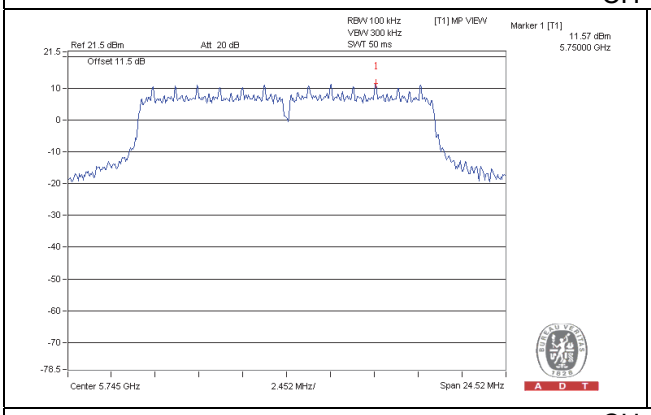

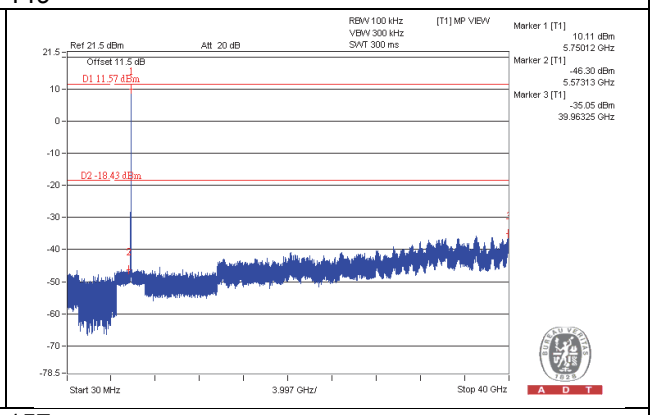

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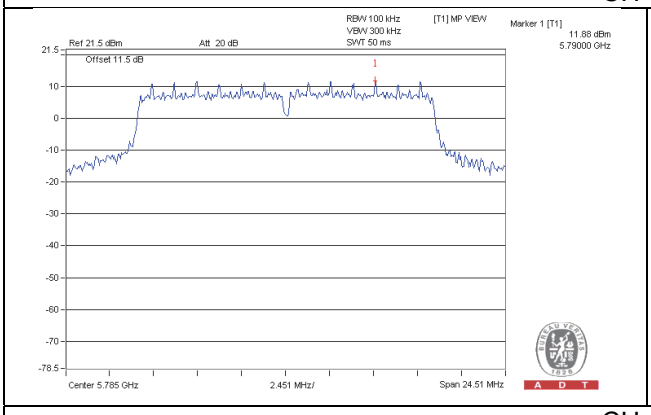
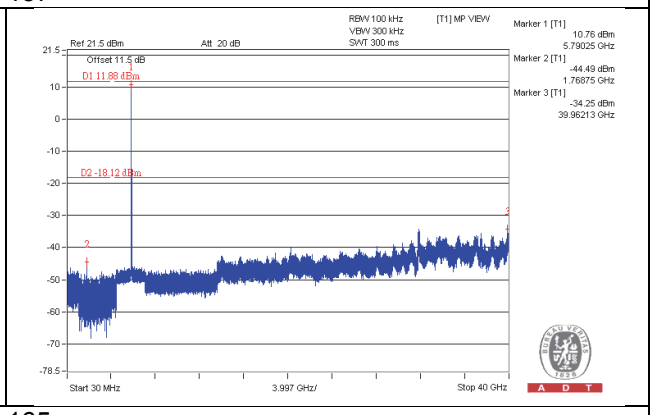
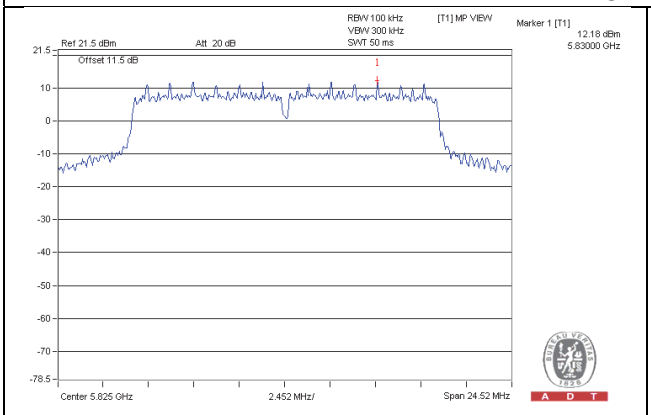
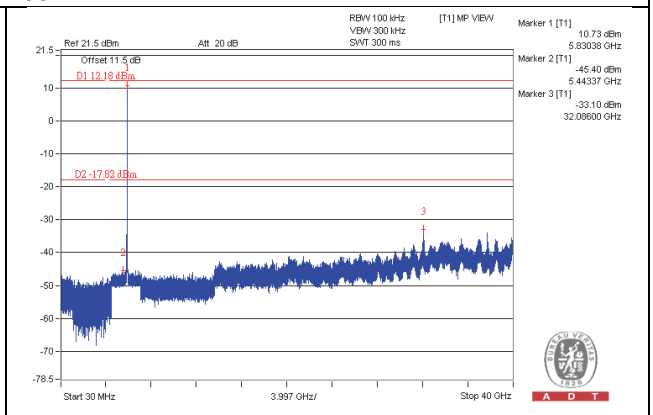


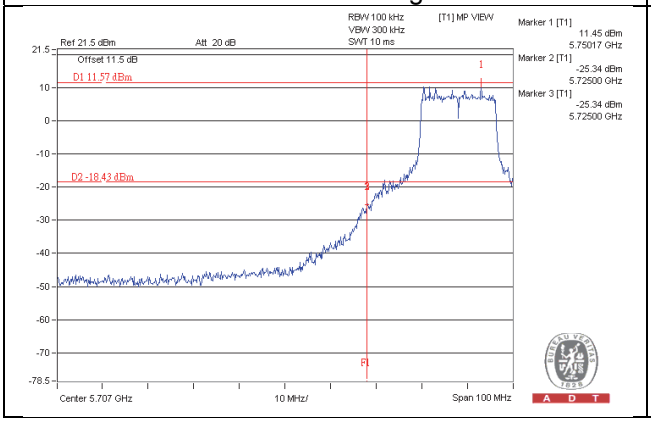


CH 165

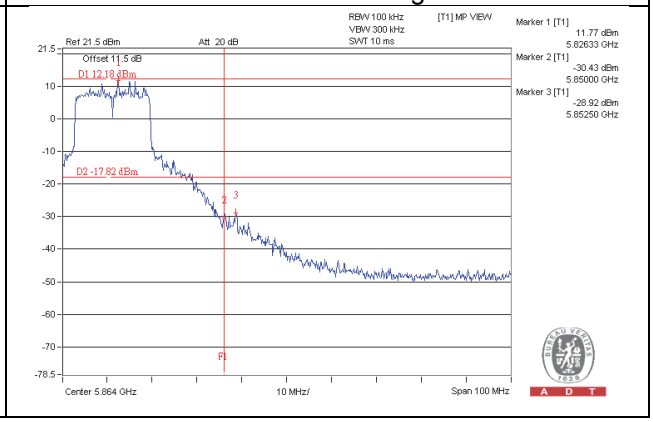




CH 149 Band edge

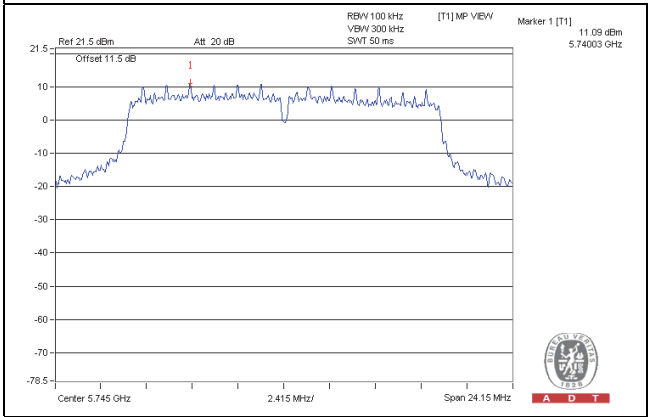


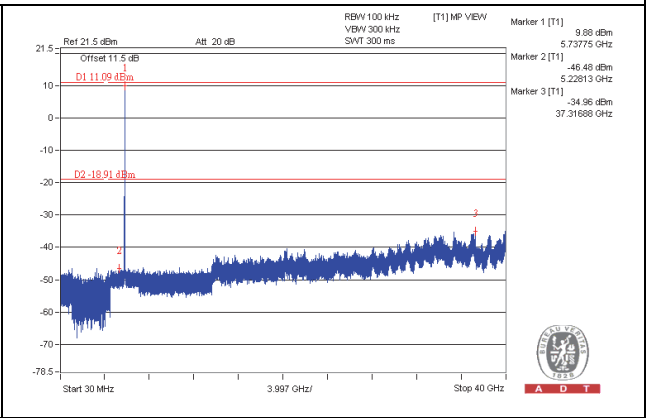
CH 165 Band edge



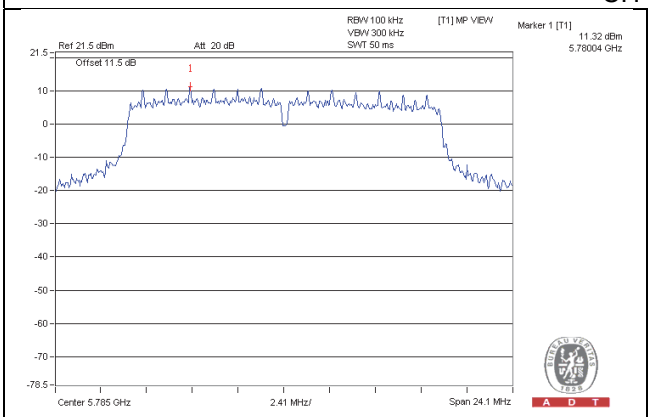
802.11a_CHAIN 1

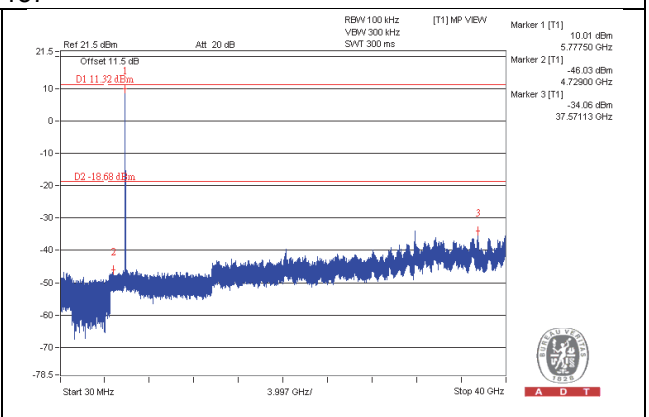
CH 149



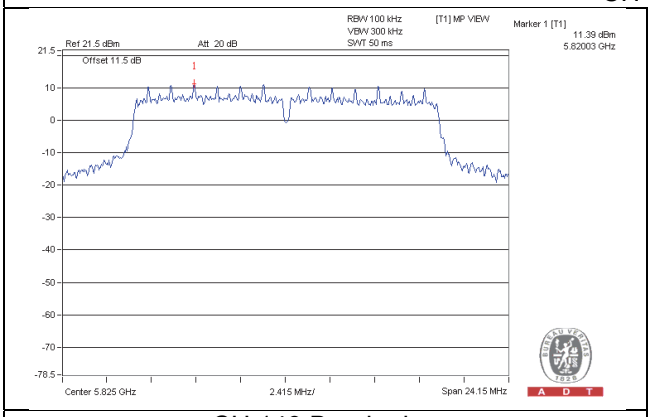


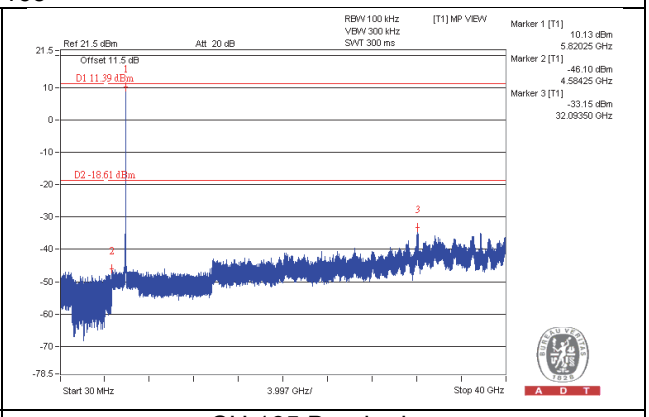
CH 157



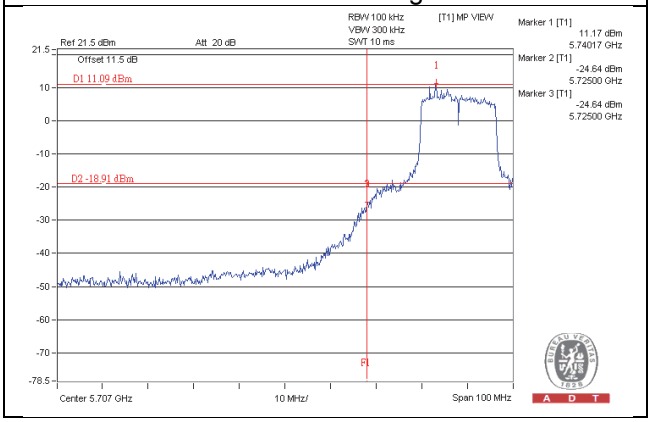


CH 165

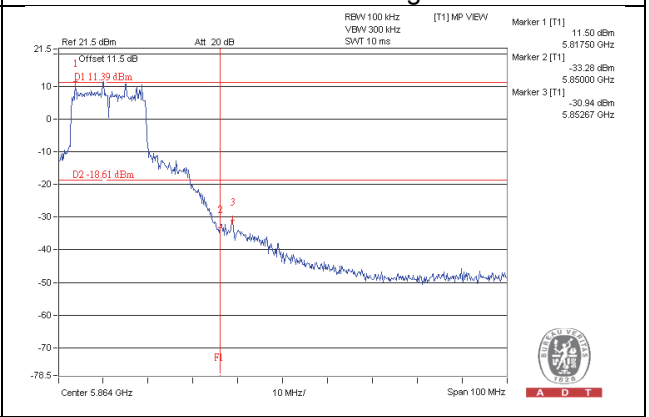




CH 149 Band edge

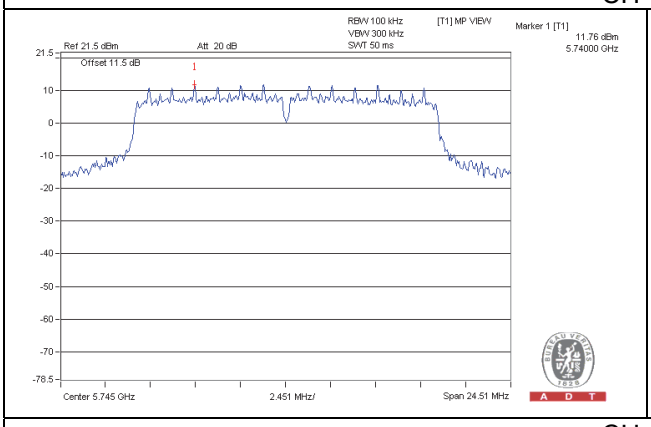


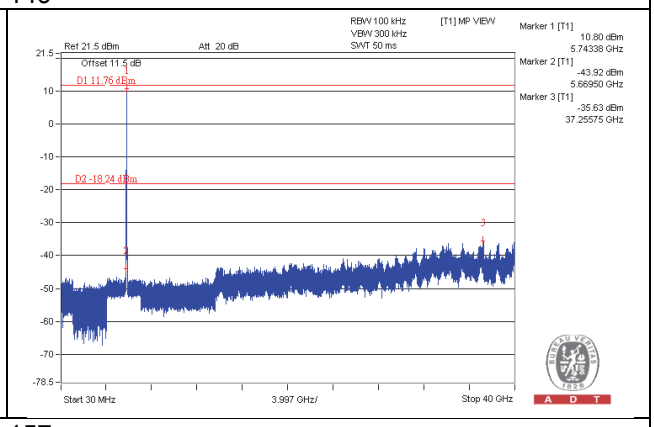
CH 165 Band edge



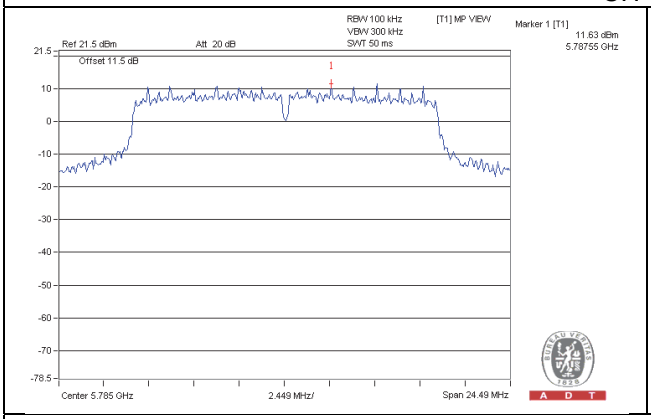
802.11a_CHAIN 2

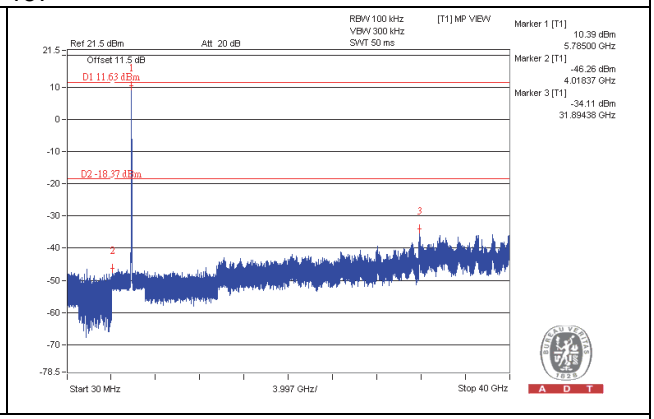
CH 149



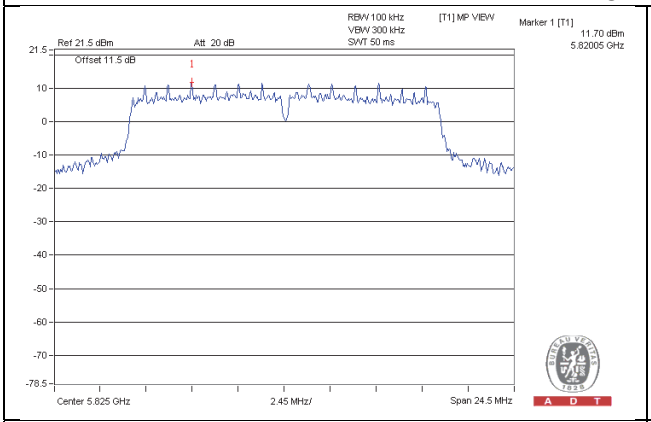


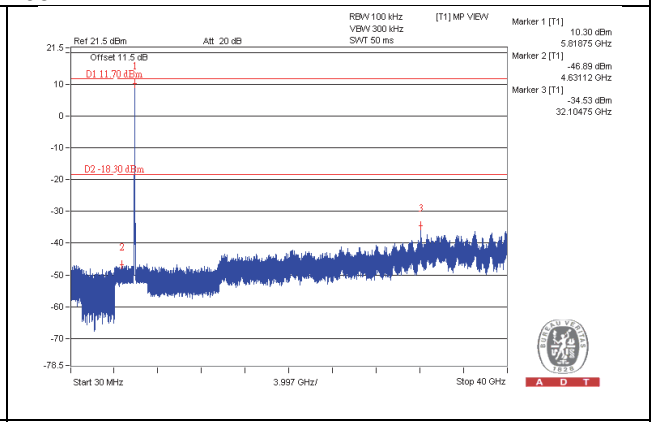
CH 157



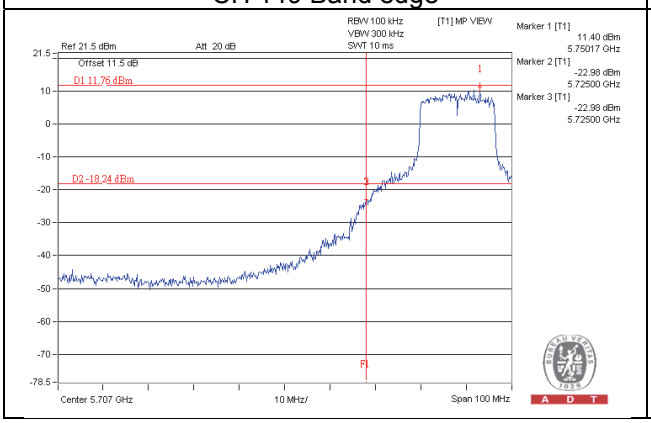


CH 165

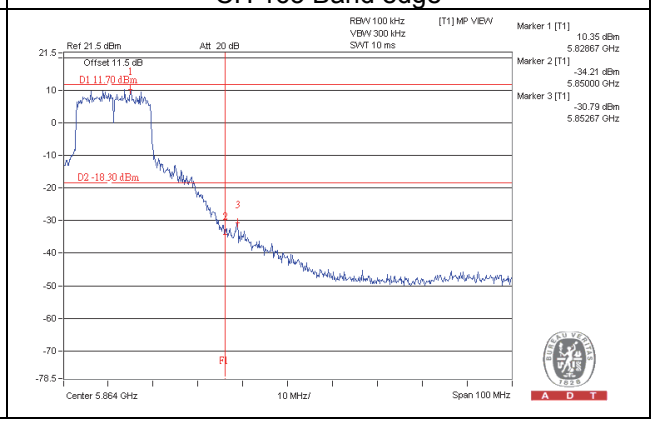




CH 149 Band edge

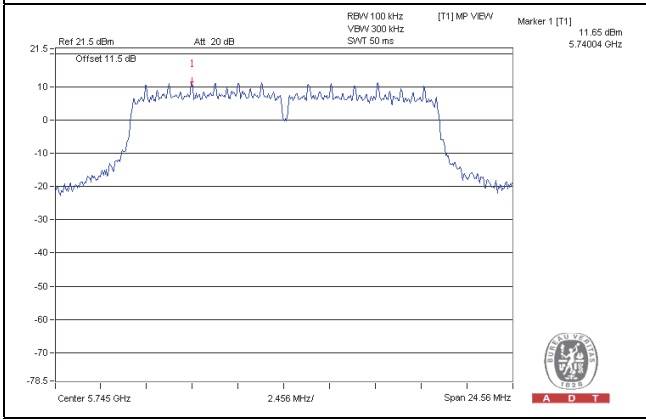


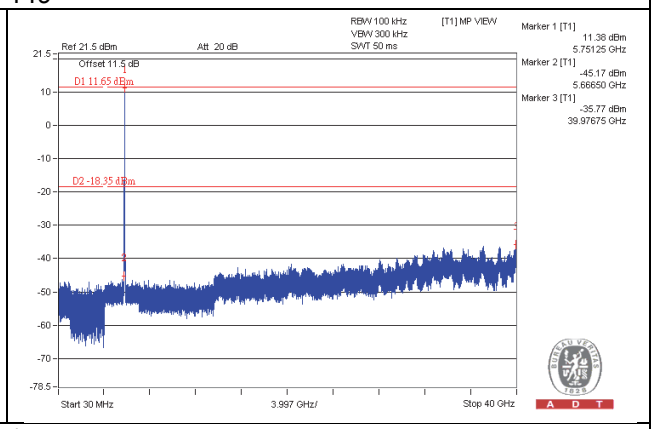
CH 165 Band edge



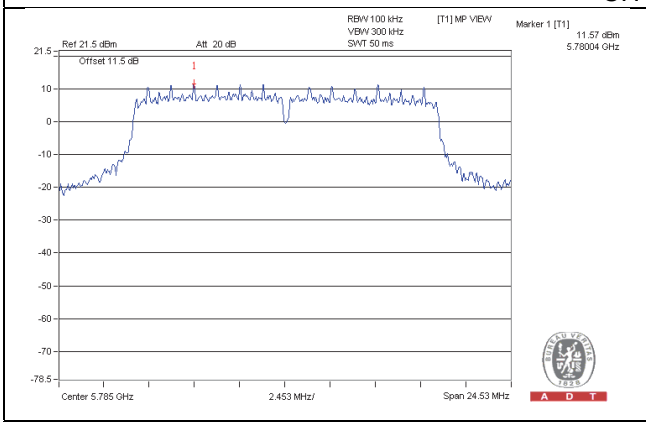
802.11a_CHAIN 3

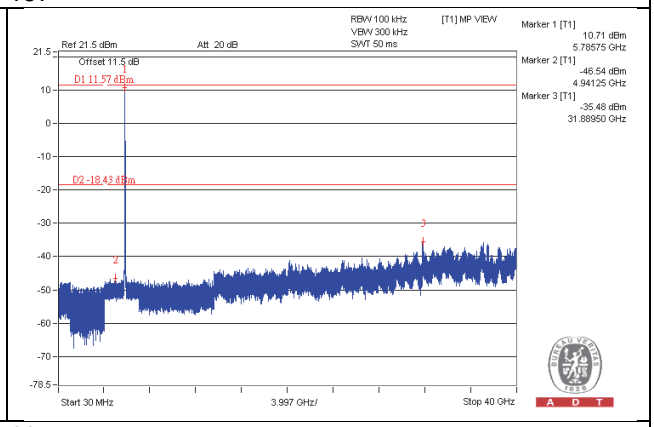
CH 149





CH 157





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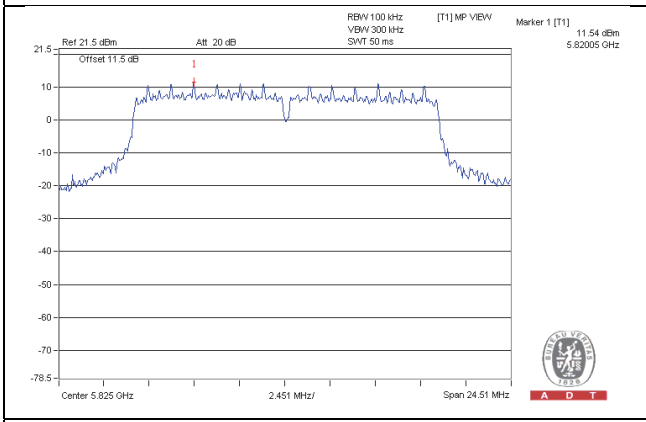
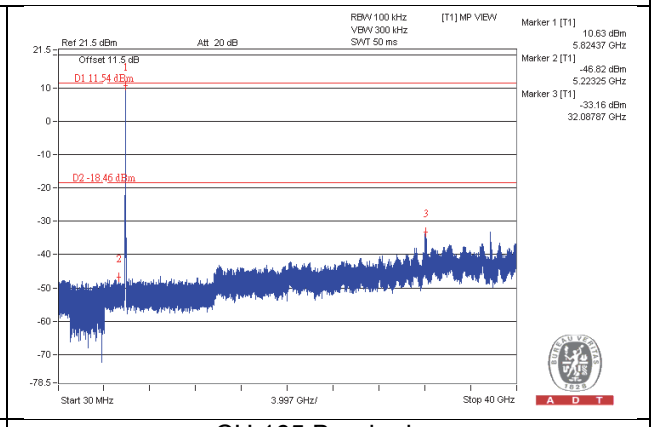
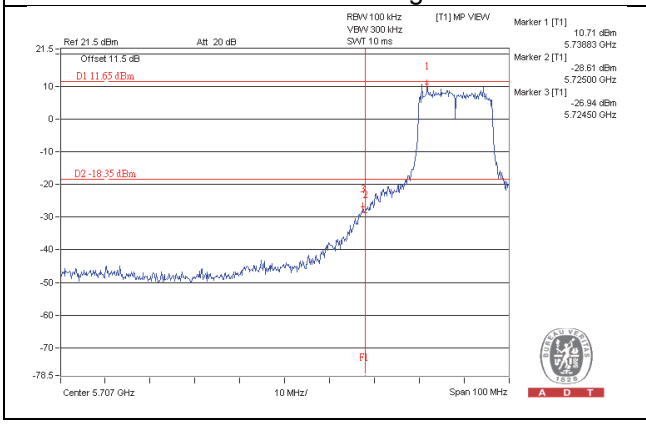
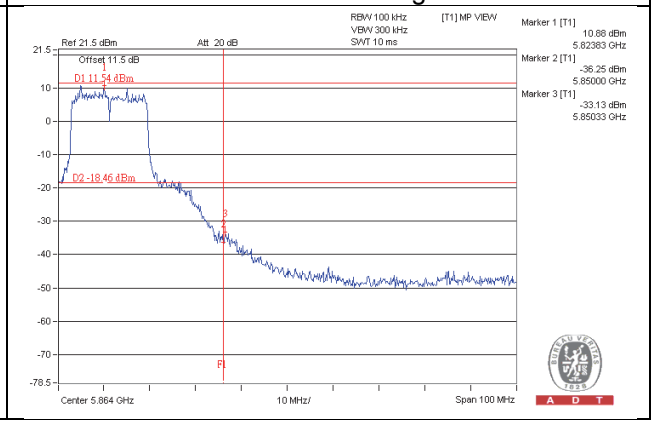




CH 149 Band edge

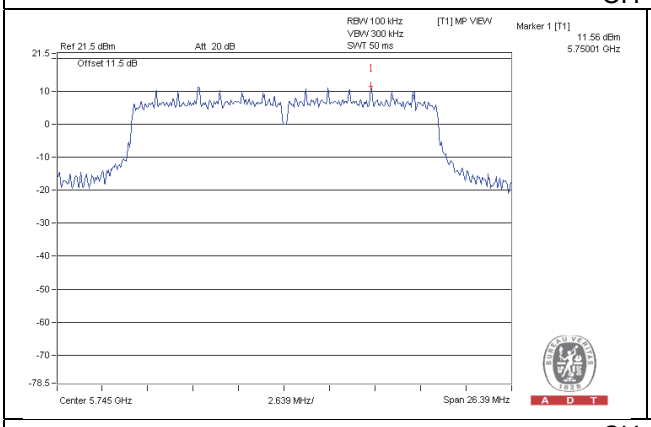


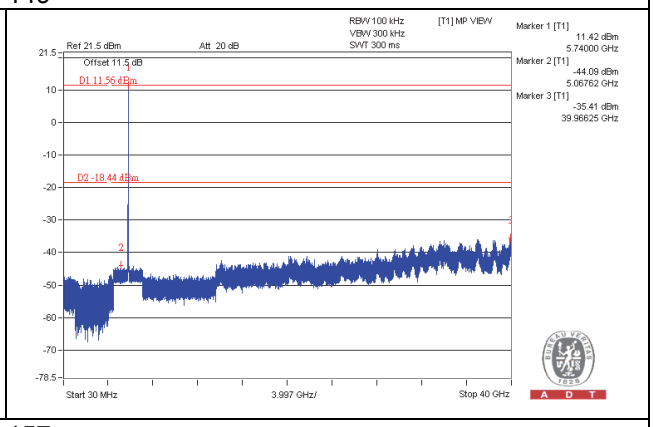
CH 165 Band edge



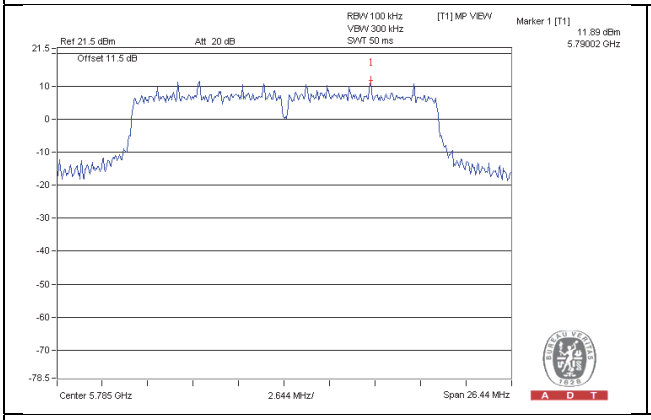
802.11n (20MHz)_CHAIN 0

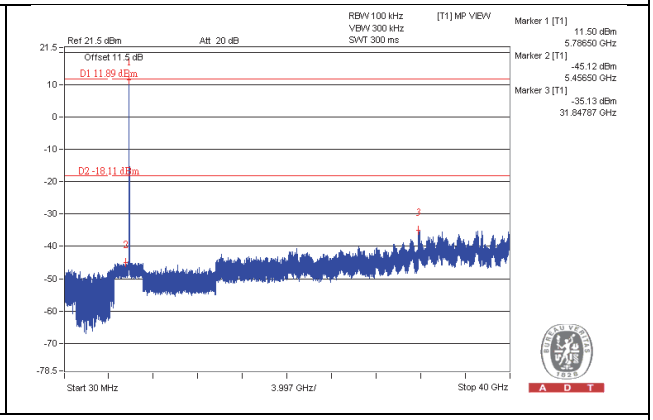
CH 149



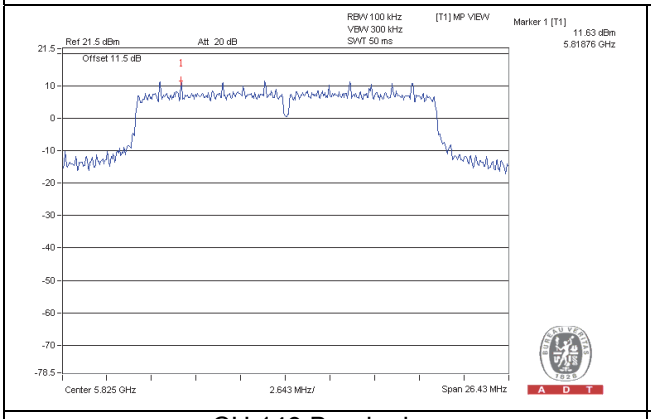


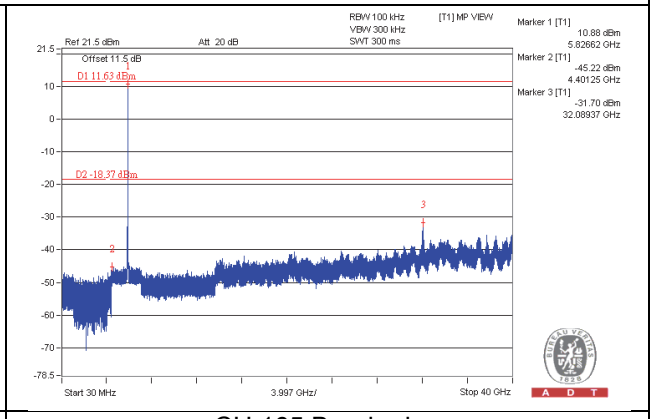
CH 157



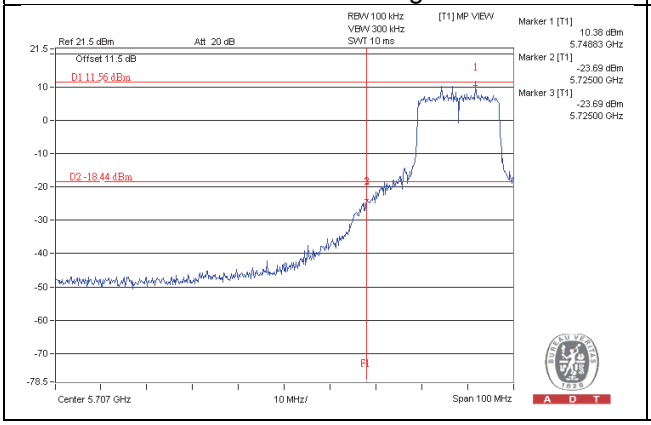


CH 165

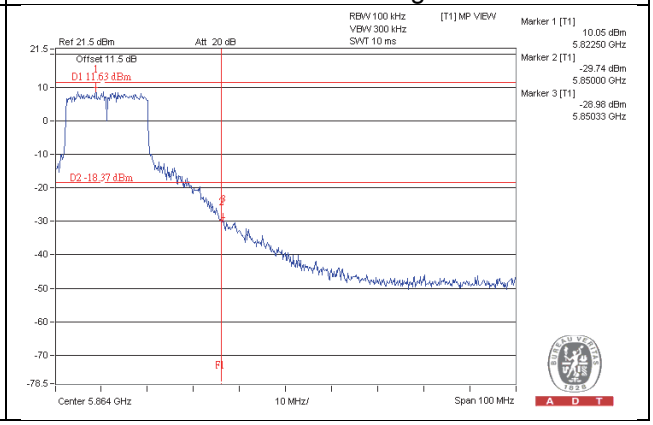




CH 149 Band edge

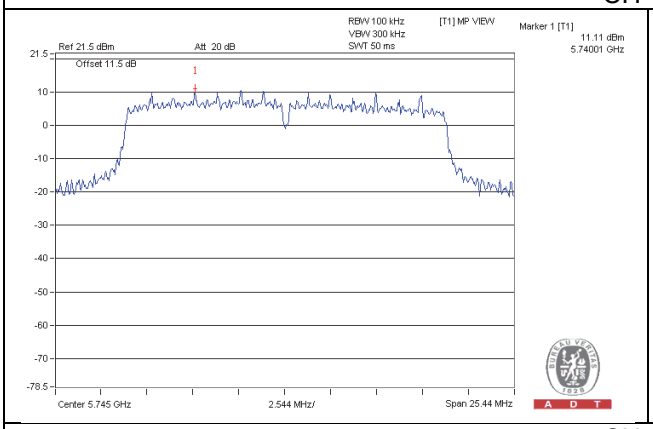


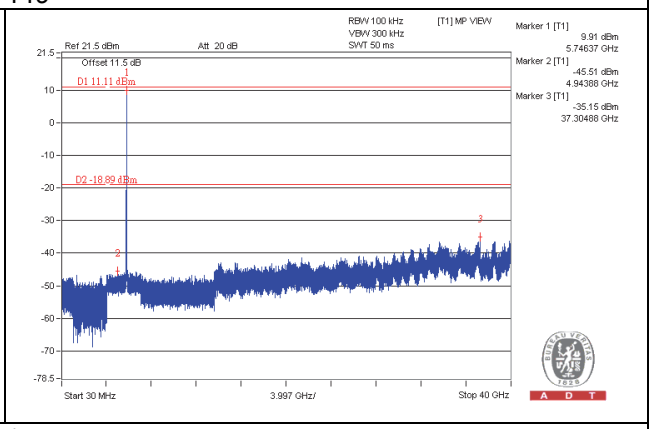
CH 165 Band edge



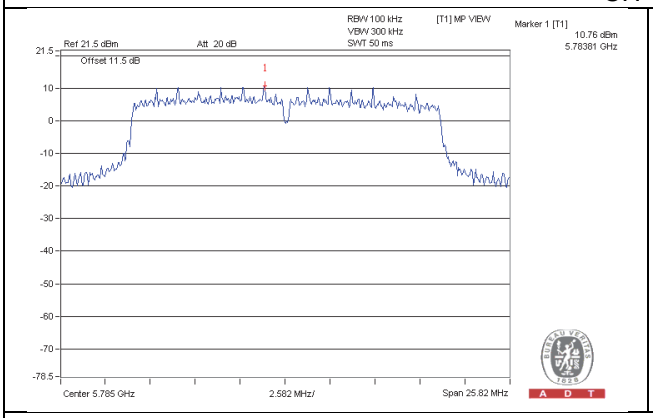
802.11n (20MHz)_CHAIN 1

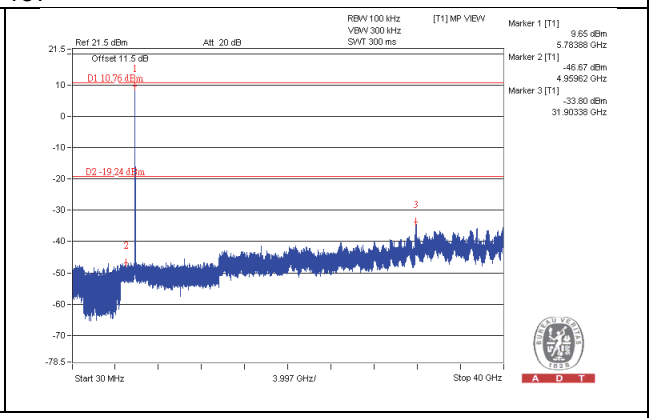
CH 149



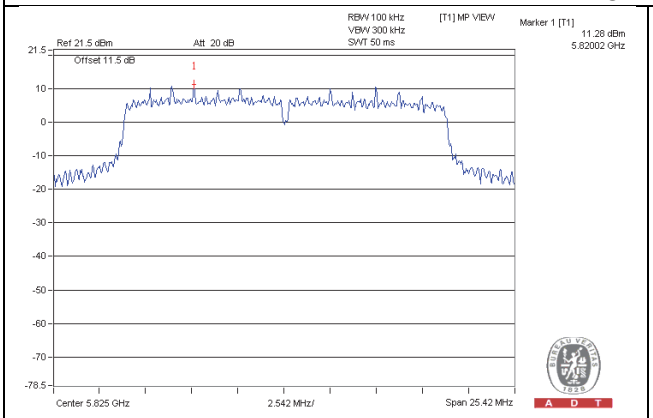


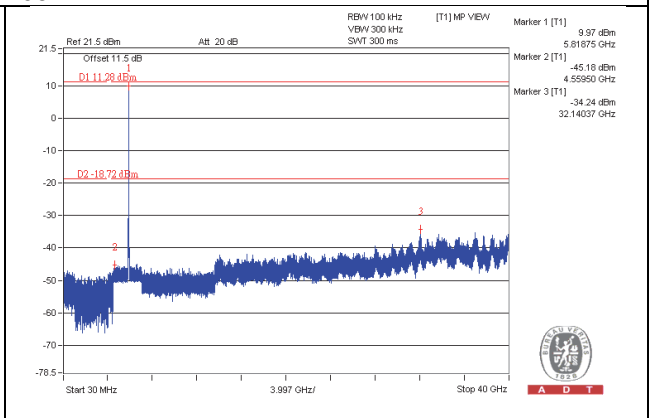
CH 157



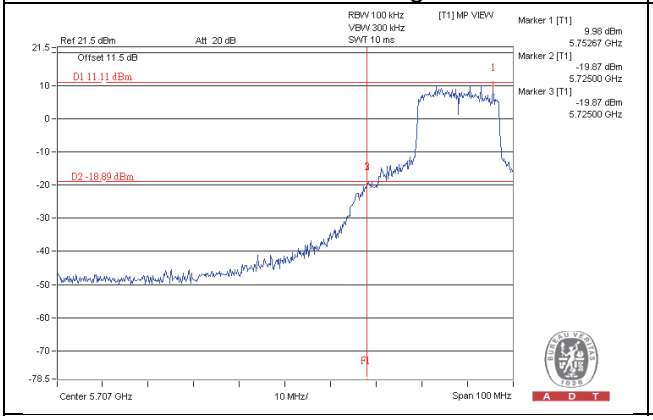


CH 165

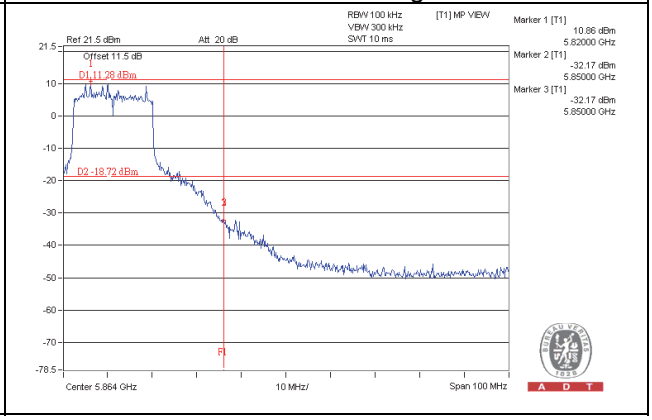




CH 149 Band edge

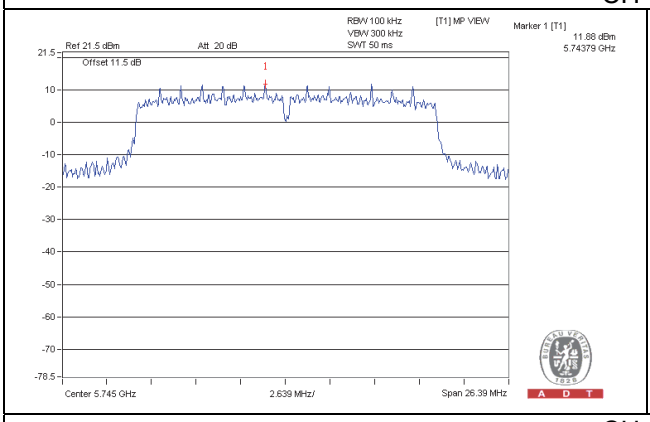


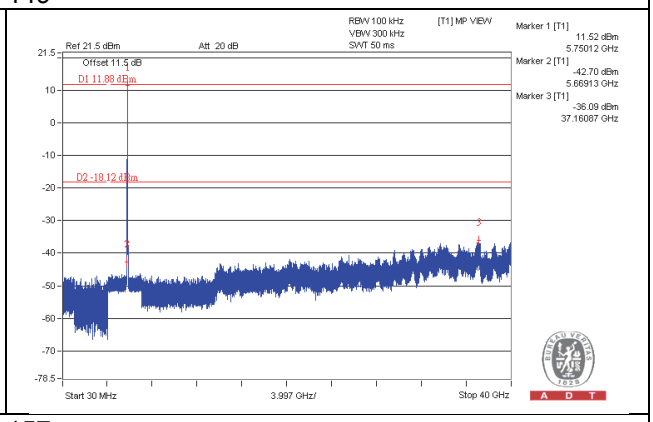
CH 165 Band edge



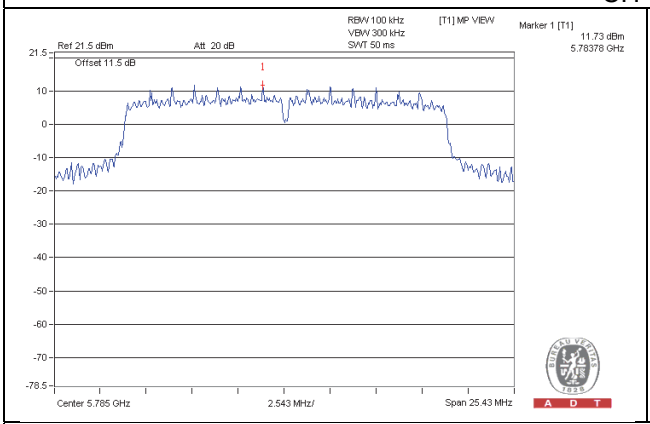
802.11n (20MHz)_CHAIN 2

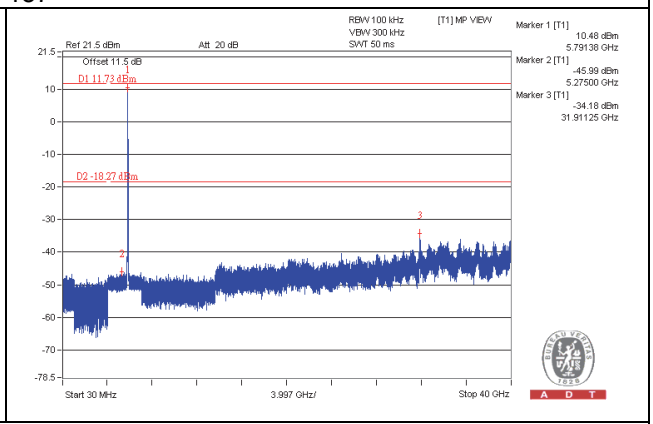
CH 149





CH 157





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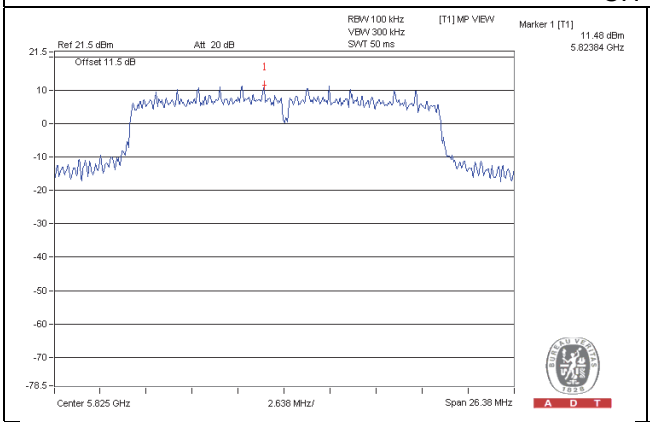
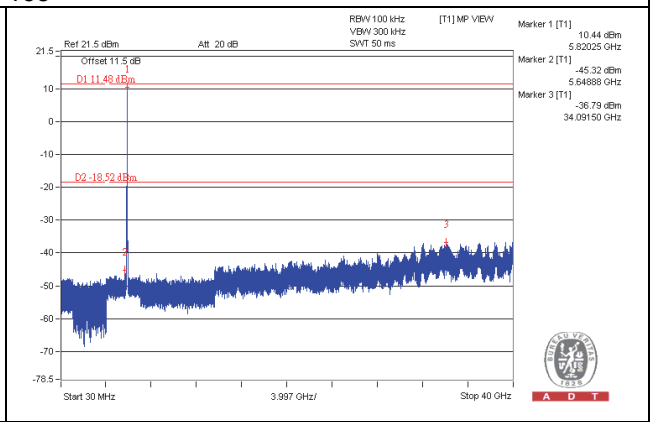
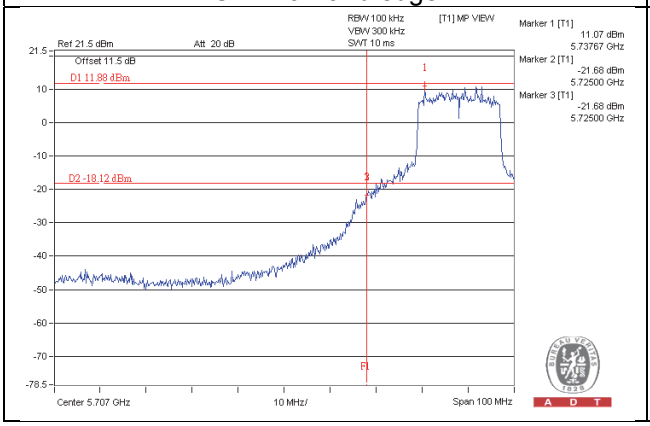
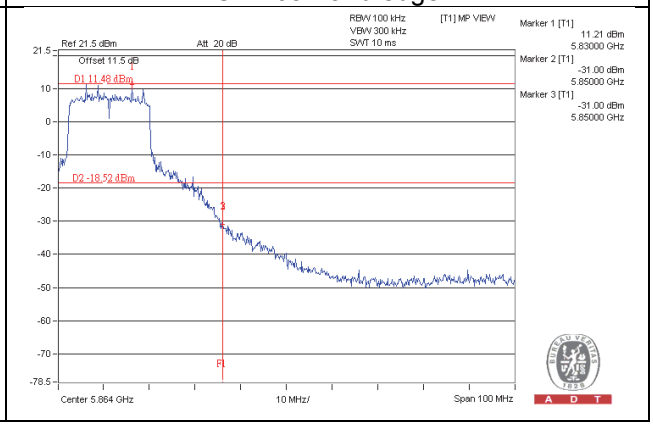




CH 149 Band edge

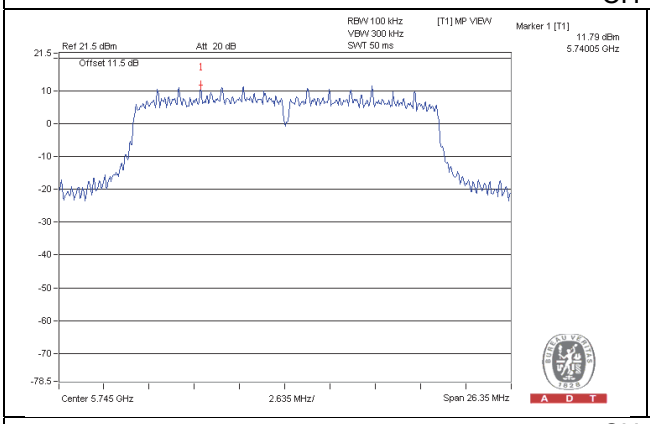


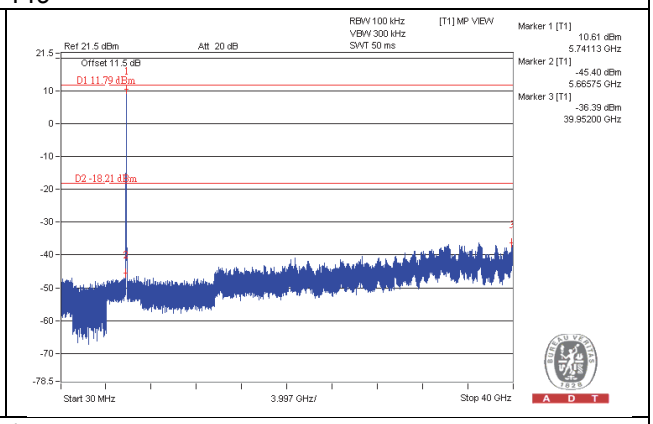
CH 165 Band edge



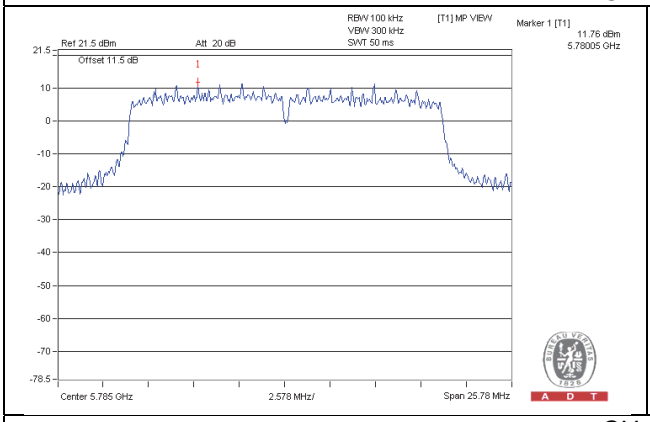
802.11n (20MHz)_CHAIN 3

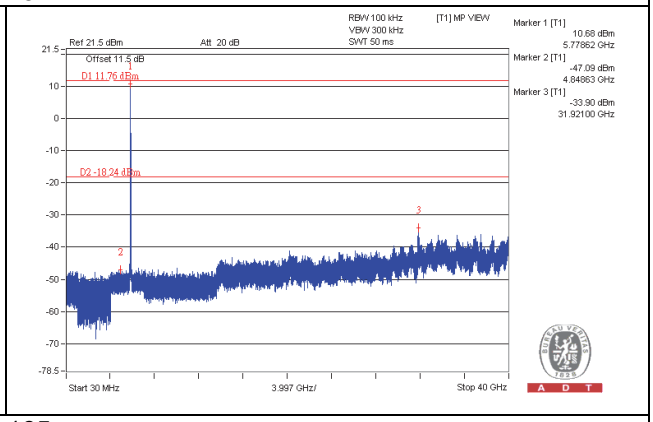
CH 149



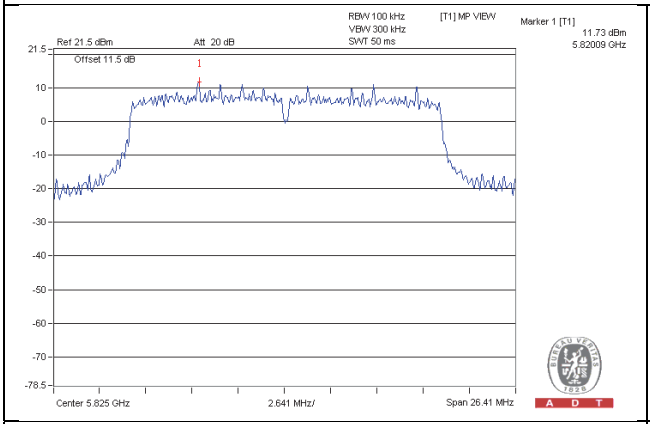


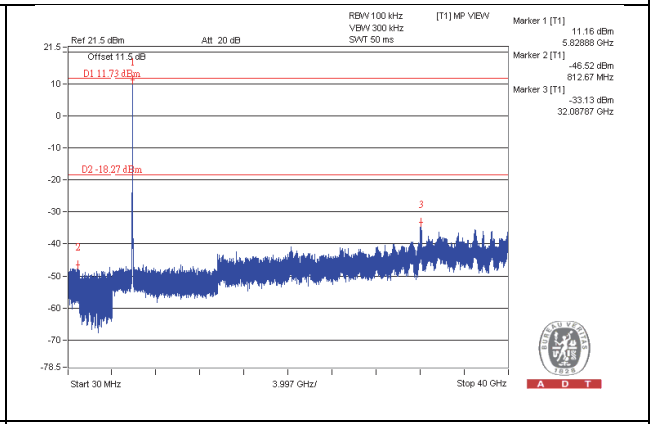
CH 157



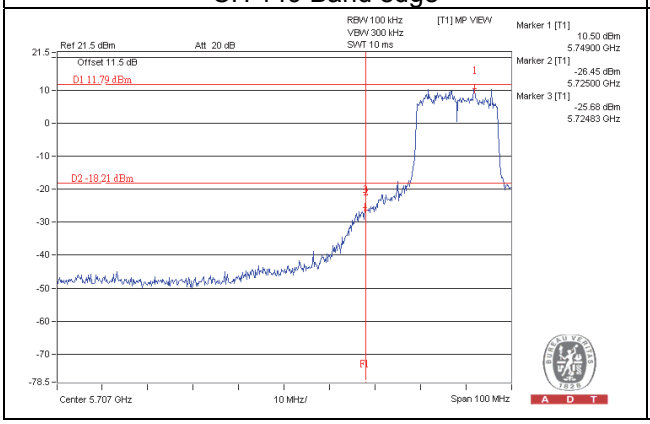


CH 165

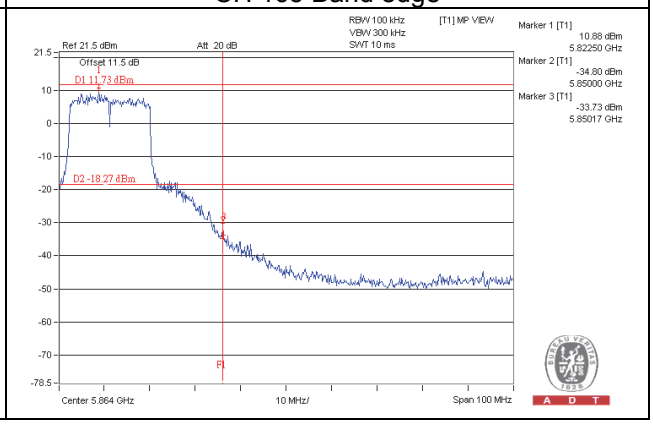




CH 149 Band edge

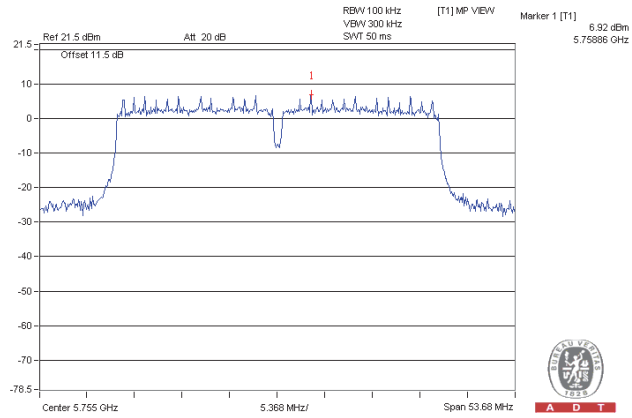


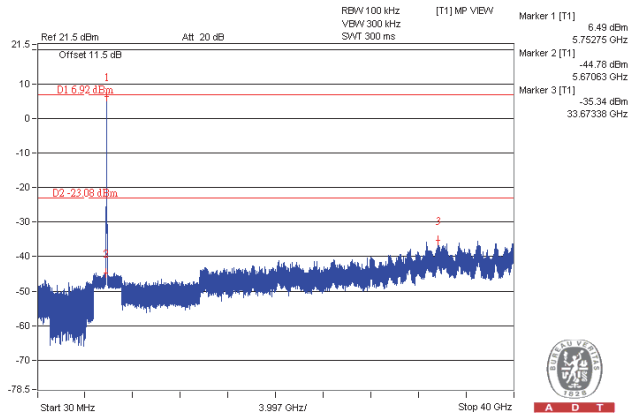
CH 165 Band edge



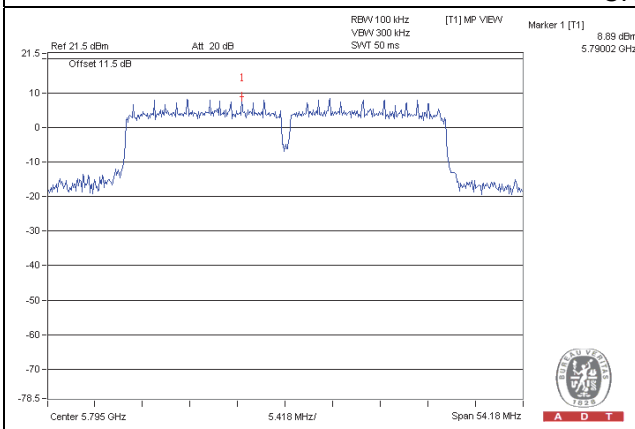
802.11n (40MHz)_CHAIN 0

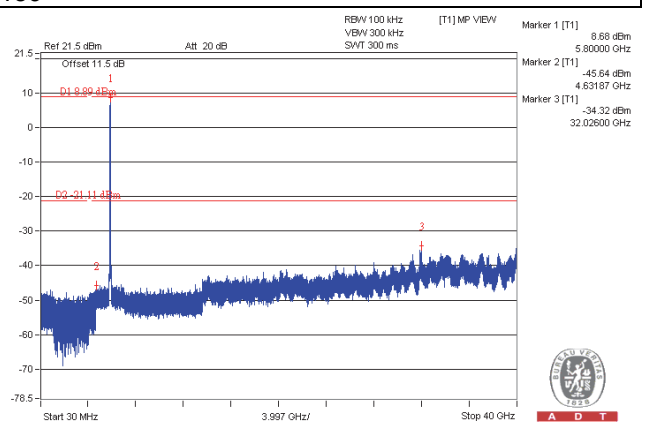
CH 151



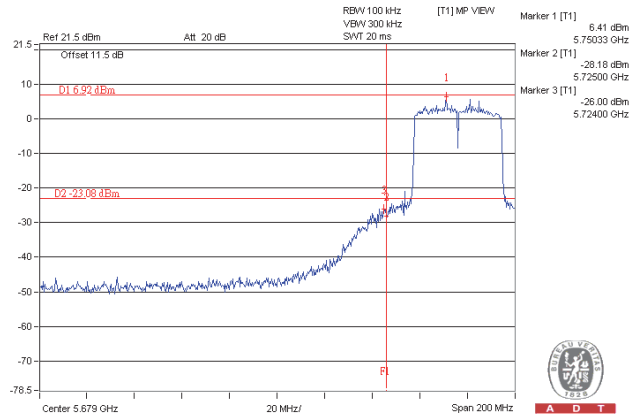


CH 159

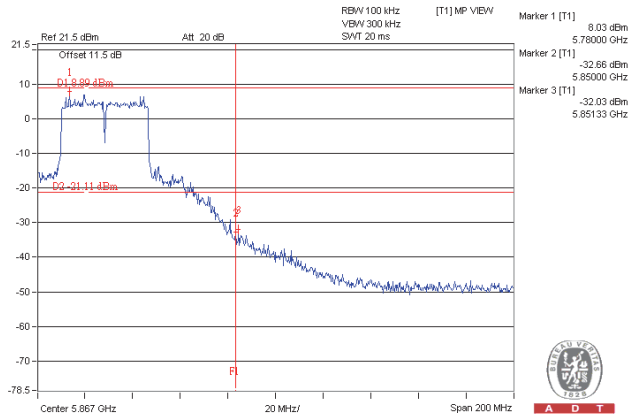




CH 151 Band edge

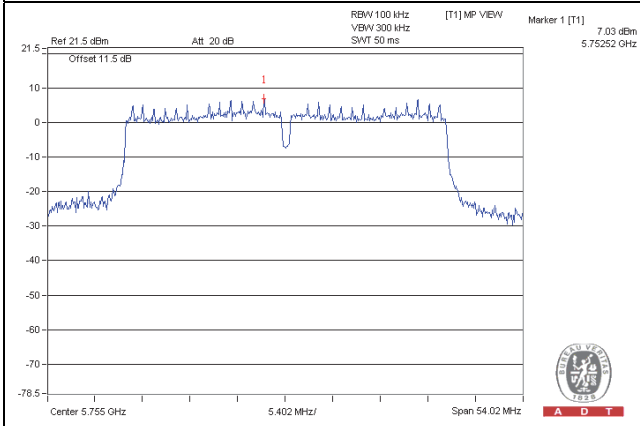


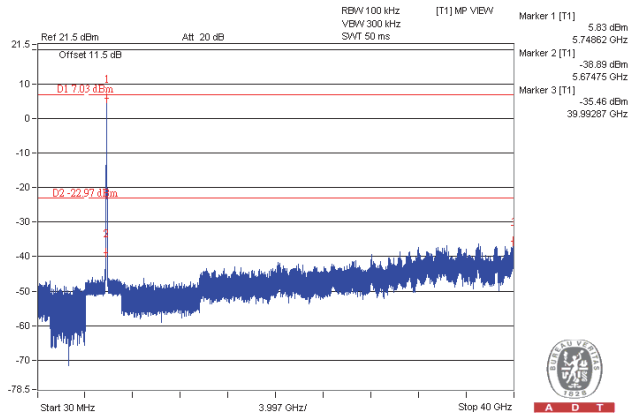
CH 159 Band edge



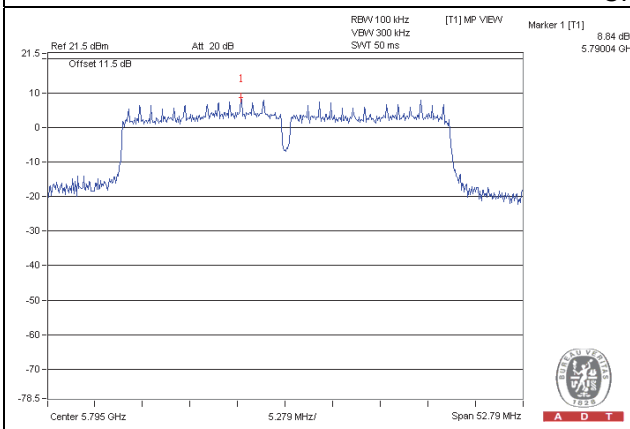
802.11n (40MHz)_CHAIN 1

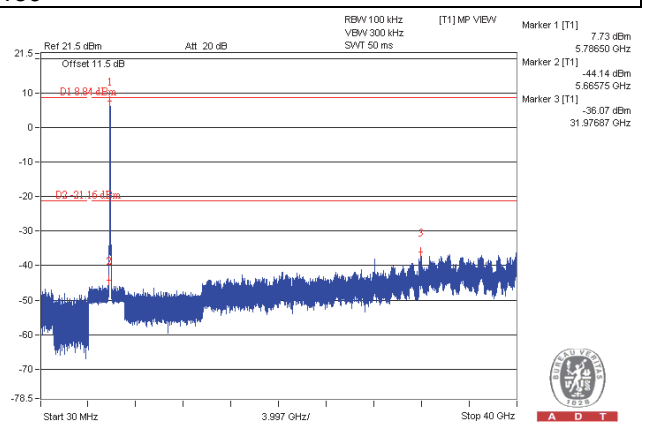
CH 151



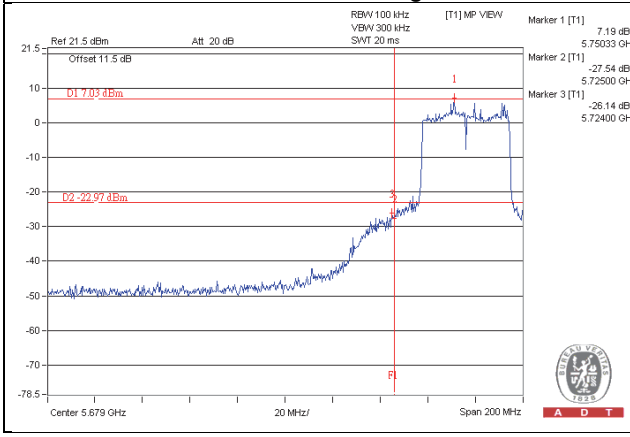


CH 159

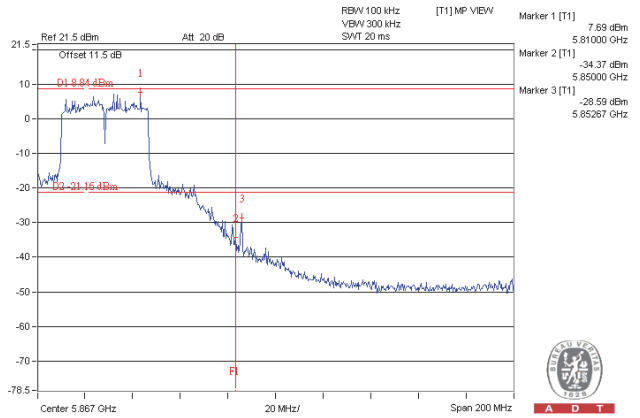




CH 151 Band edge

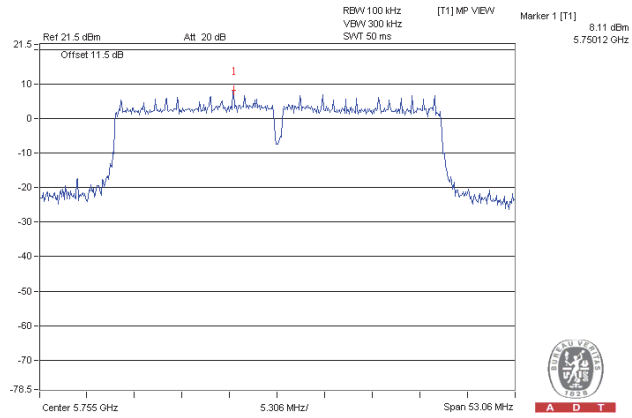


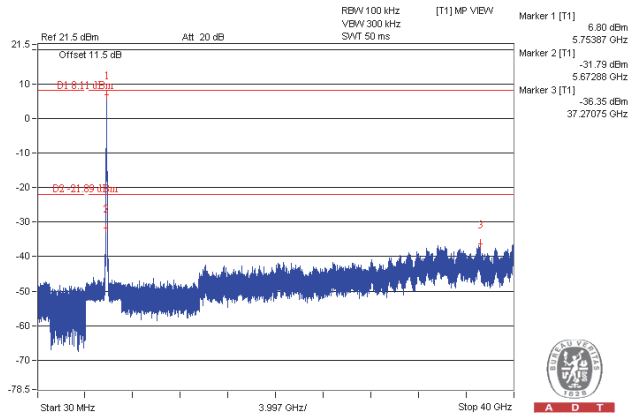
CH 159 Band edge



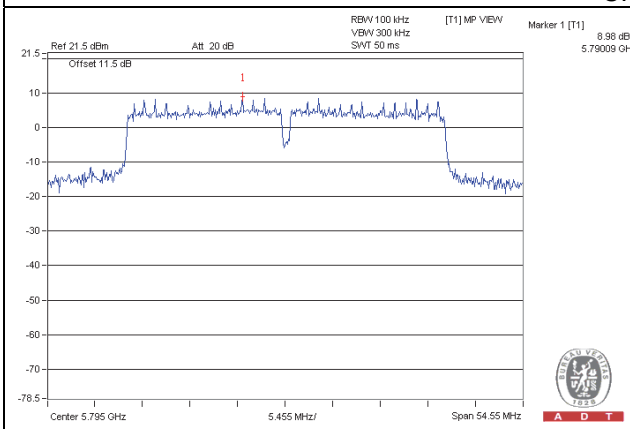
802.11n (40MHz)_CHAIN 2

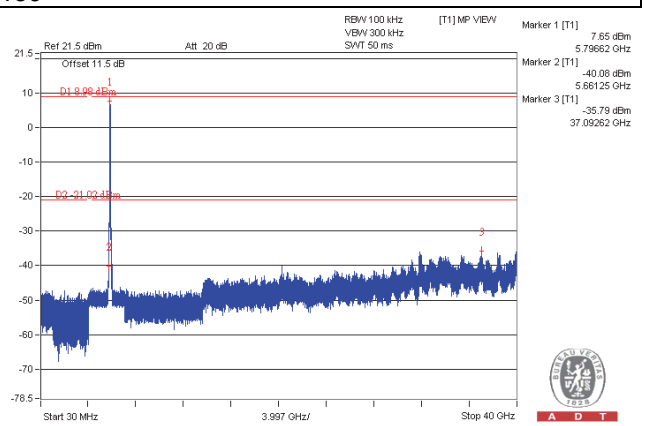
CH 151



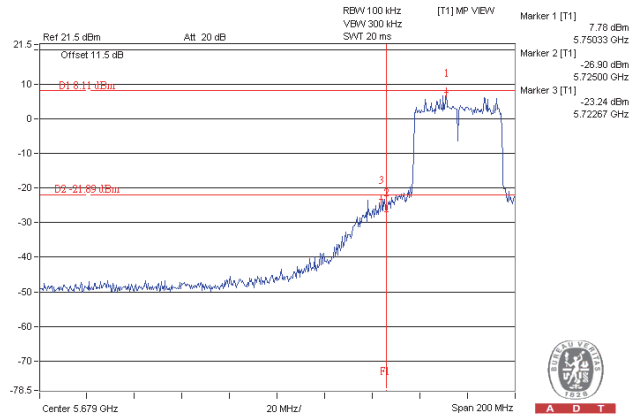


CH 159

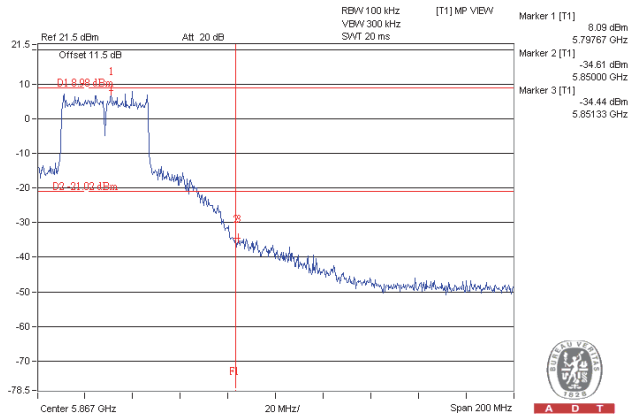




CH 151 Band edge

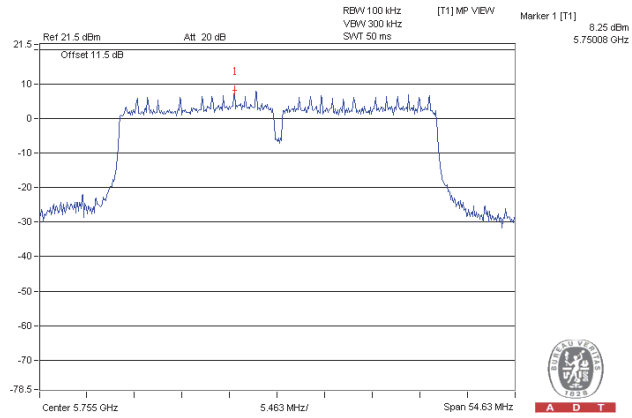


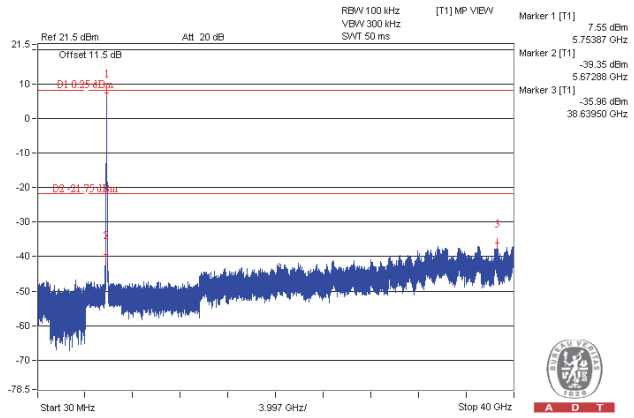
CH 159 Band edge



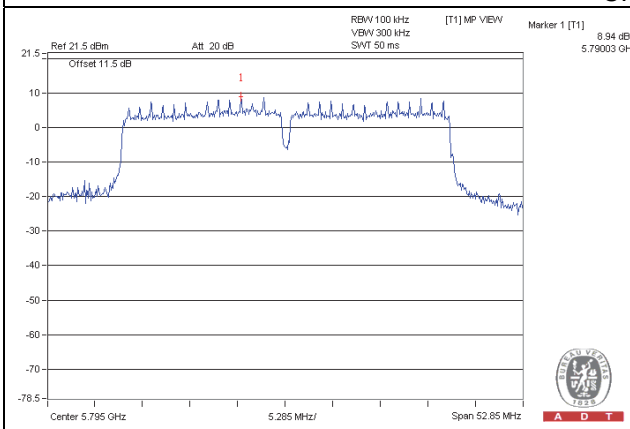
802.11n (40MHz)_CHAIN 3

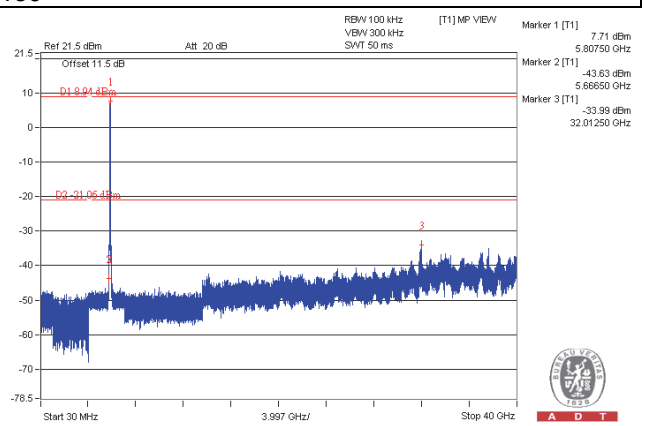
CH 151



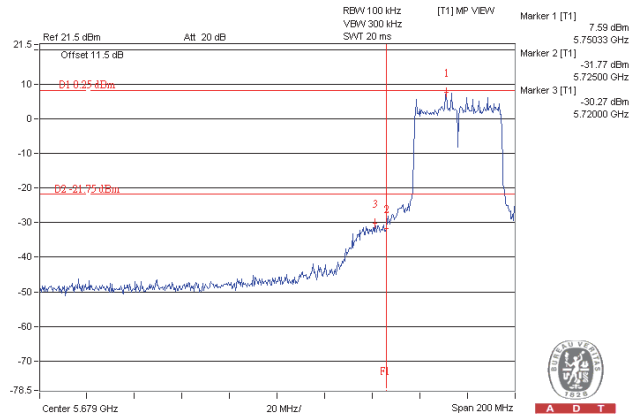


CH 159

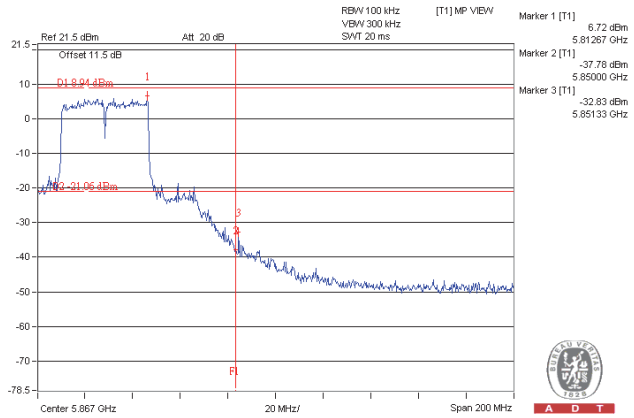




CH 151 Band edge

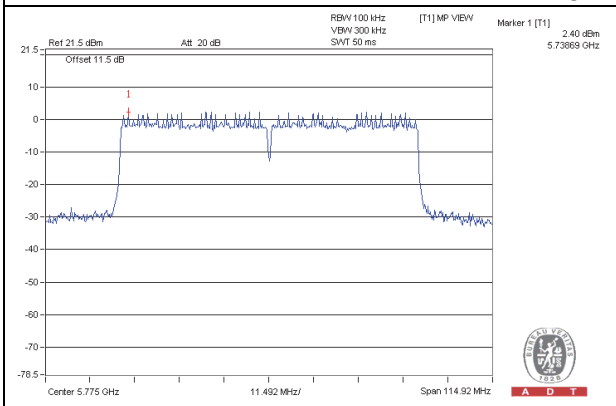


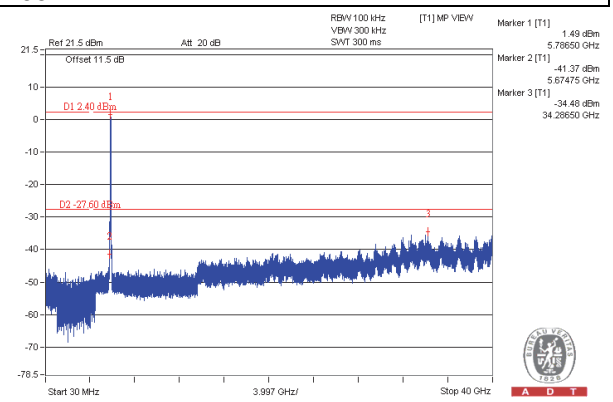
CH 159 Band edge



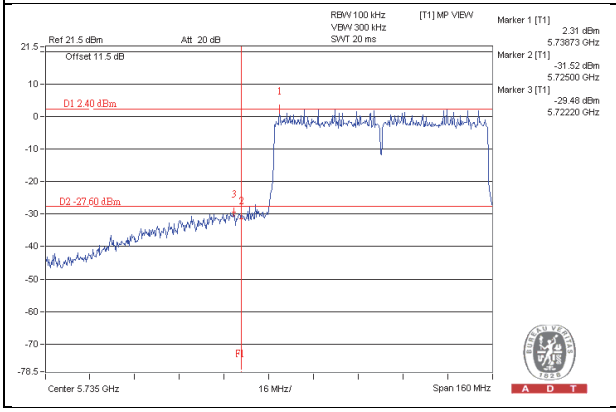
802.11ac (80MHz)_CHAIN 0

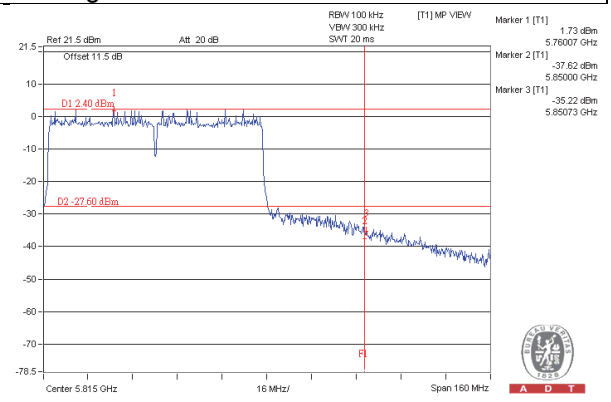
CH 155





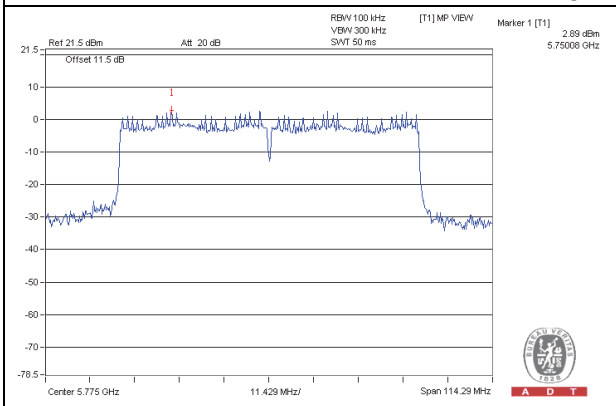
CH 155 Band edge

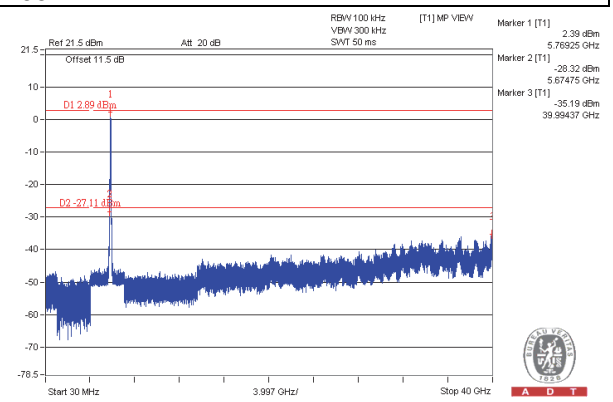




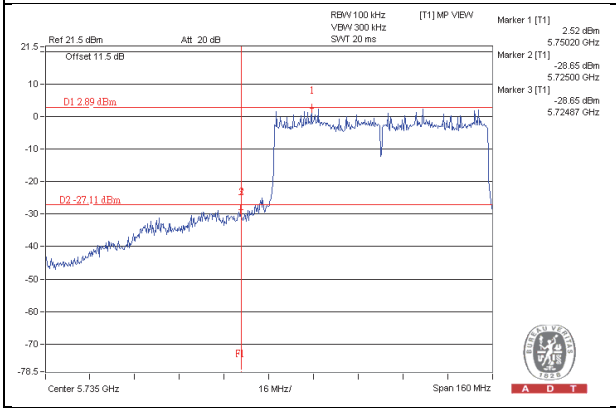
802.11ac (80MHz)_CHAIN 1

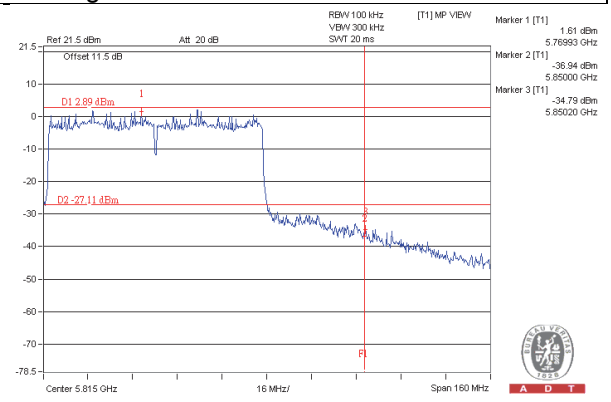
CH 155





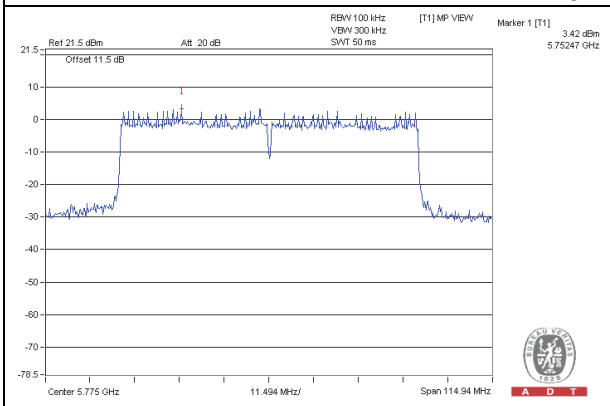
CH 155 Band edge

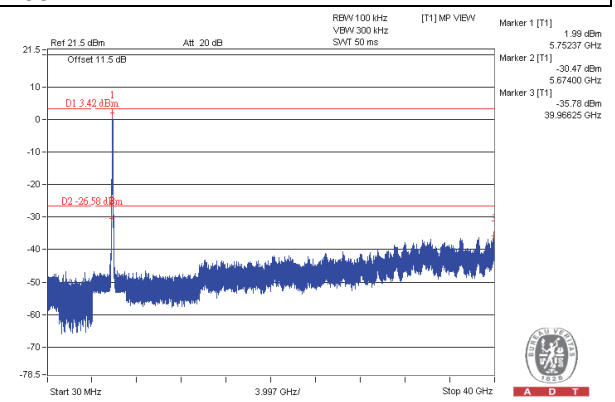




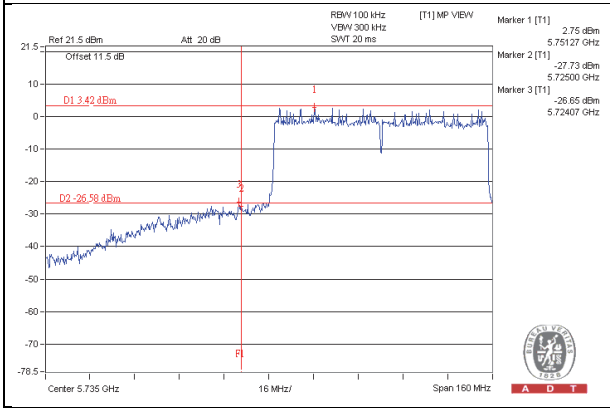
802.11ac (80MHz)_CHAIN 2

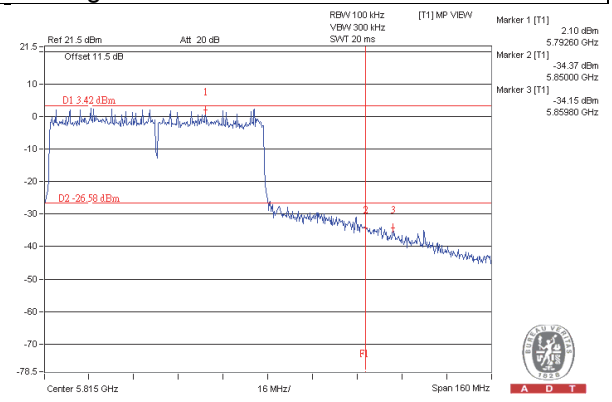
CH 155





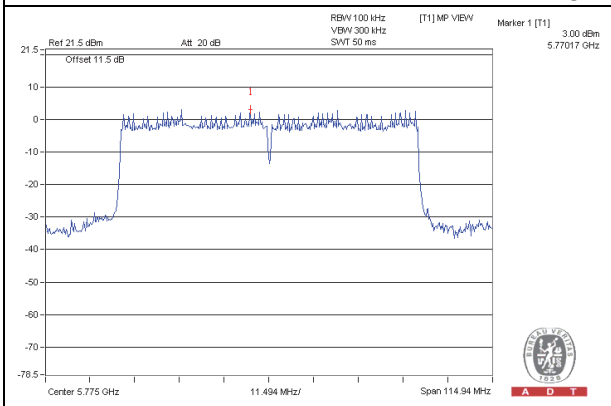
CH 155 Band edge

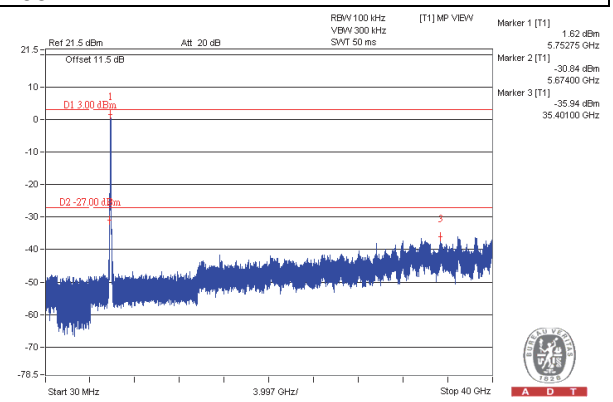




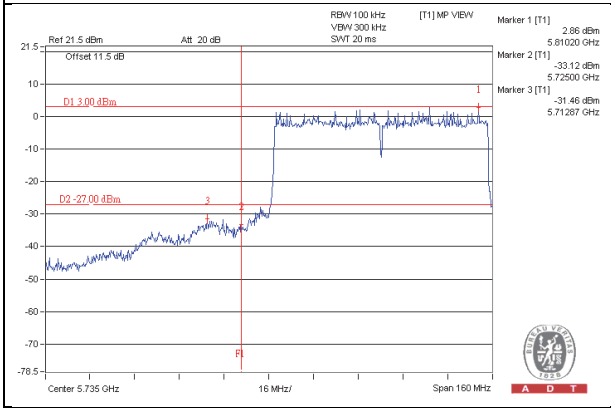
802.11ac (80MHz)_CHAIN 3

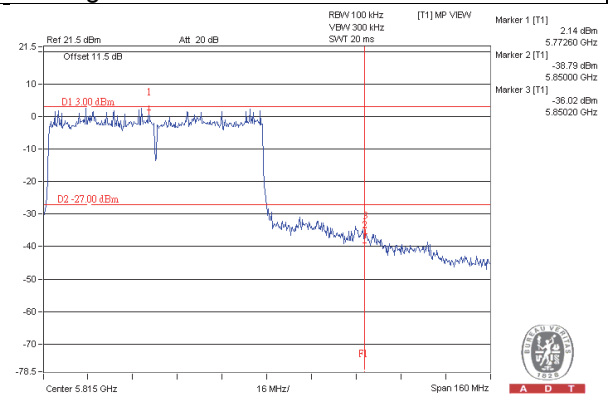
CH 155





CH 155 Band edge





6 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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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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