

FCC Test Report

Report No.: RF151119C17

FCC ID: YHI-NW111

Test Model: NW-111

Received Date: Nov. 19, 2015

Test Date: Nov. 25, 2015 ~ Dec. 15, 2015

Issued Date: Dec. 23, 2015

Applicant: NEXCOM International Co., Ltd.

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R.O.C



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Release Control Record

Issue No.	Description	Date Issued
RF151119C17	Original Release	Dec. 23, 2015

1 Certificate of Conformity

Product: 3x3 11n/g/b/a 2.4/5GHz WiFi Module

Brand: NEXCOM

Test Model: NW-111

Sample Status: Identical Prototype

Applicant: NEXCOM International Co., Ltd.

Test Date: Nov. 25, 2015 ~ Dec. 15, 2015

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

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

Prepared by : Evonne Liu, **Date:** Dec. 23, 2015
Evonne Liu / Specialist

Approved by : Stanley Wu, **Date:** Dec. 23, 2015
Stanley Wu / Assistant Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -13.63 dB at 0.18519 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.00 dB at 2390 MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB 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	No antenna connector is used.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	3x3 11n/g/b/a 2.4/5GHz WiFi Module
Brand	NEXCOM
Test Model	NW-111
Status of EUT	Identical Prototype
Power Supply Rating	3.3 Vdc (Host equipment)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7
Operating Frequency	2412 ~ 2462 MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	536.060 mW
Antenna Type	PIFA antenna with 4.65 dBi gain Dipole antenna with 1.93 dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	N/A

Note:

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

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

- The EUT contains following accessory devices.

Product	Brand	Model	Description
Antenna 1	ARISTOTLE	RFA-25-AP250-70-50	PIFA
Antenna 2	WIESON	GY121L049S-XXX	Dipole

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

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE \geq 1G	RE<1G	PLC	APCM	
A	√	√	√	√	EUT with PIFA Antenna
B	√	√	√	√	EUT with Dipole Antenna

Where **RE \geq 1G**: Radiated Emission above 1 GHz

PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1 GHz

APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Above 1 GHz):

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

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

Radiated Emission Test (Below 1 GHz):

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

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	802.11n (HT20)	1 to 11	1	OFDM	BPSK	MCS0

Power Line Conducted Emission Test:

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

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	802.11n (HT20)	1 to 11	1	OFDM	BPSK	MCS0

Bandedge Measurement:

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
	802.11n (HT20)	1 to 11	1, 11	OFDM	BPSK	MCS0
	802.11n (HT40)	3 to 9	3, 9	OFDM	BPSK	MCS0

Antenna Port Conducted Measurement:

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE \geq 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Toby Tian
APCM	25 deg. C, 65 % RH	3.3 Vdc	Taylor Liu

3.3 Duty Cycle of Test Signal

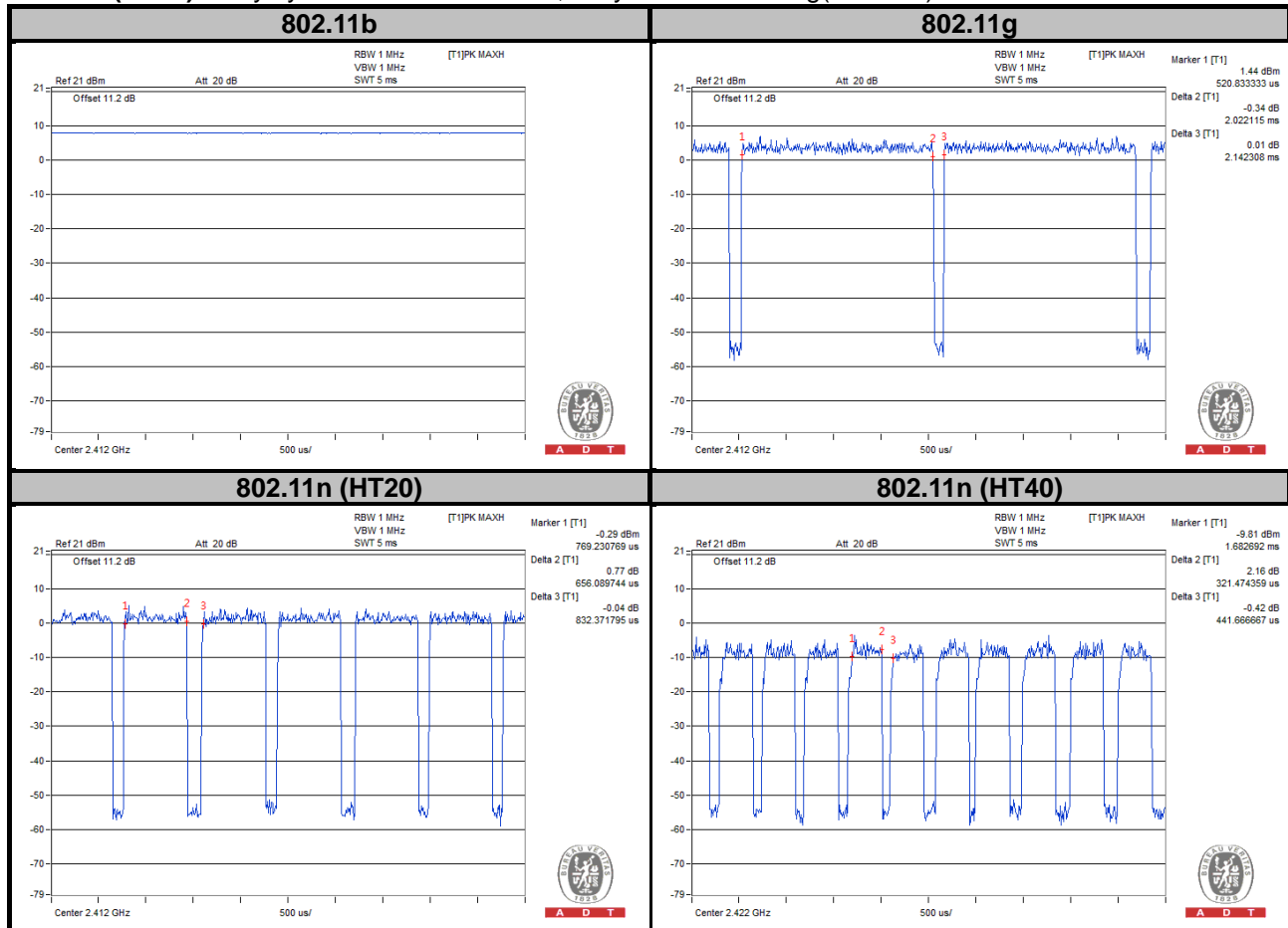
Mode A

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

802.11g: Duty cycle = $2.022/2.142 = 0.943$, Duty factor = $10 * \log(1/0.943) = 0.25$

802.11n (HT20): Duty cycle = $656/832 = 0.788$, Duty factor = $10 * \log(1/0.788) = 1.03$

802.11n (HT40): Duty cycle = $321/441 = 0.727$, Duty factor = $10 * \log(1/0.727) = 1.38$



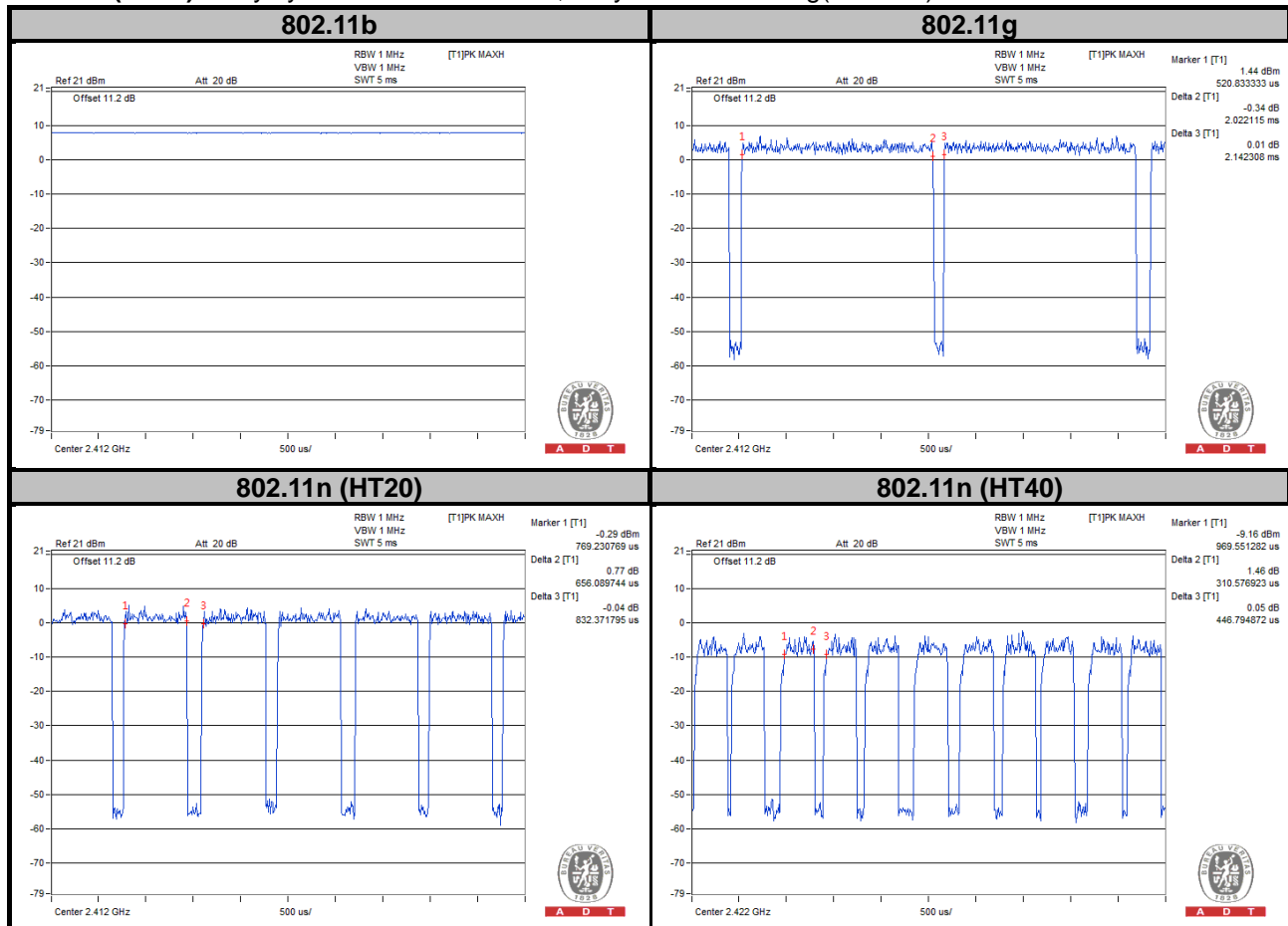
Mode B

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

802.11g: Duty cycle = $2.022/2.142 = 0.943$, Duty factor = $10 \cdot \log(1/0.943) = 0.25$

802.11n (HT20): Duty cycle = $656/832 = 0.788$, Duty factor = $10 \cdot \log(1/0.788) = 1.03$

802.11n (HT40): Duty cycle = $310/446 = 0.695$, Duty factor = $10 \cdot \log(1/0.695) = 1.58$



3.4 Description of Support Units

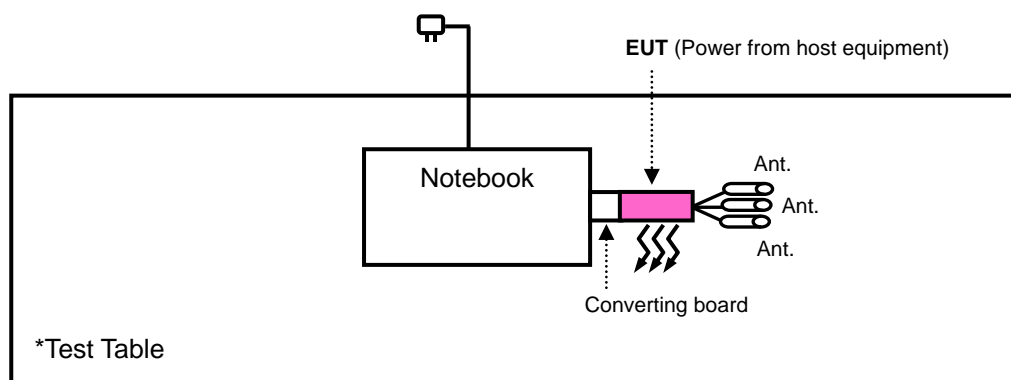
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Notebook	DELL	E6420	D3T96R1	N/A

Note:

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

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 v03r03

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB 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 1000 MHz, 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 20 dB 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 Agilent Technologies	N9038A	MY52260177	May 19, 2015	May 18, 2016
Spectrum Analyzer Rohde & Schwarz	FSV40	100980	Feb. 10, 2015	Feb. 09, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 04, 2015	Feb. 03, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Feb. 04, 2015	Feb. 03, 2016
HORN Antenna ETS-Lindgren	3117	00143293	Jan. 05, 2015	Jan. 04, 2016
Bluetooth Tester	CBT	100980	Apr. 27, 2015	Apr. 26, 2017
Loop Antenna	EM-6879	269	Jul. 31, 2015	Jul. 30, 2016
Agilent Communications Tester-Wireless	8960 Series 10	MY53201073	Jul. 03, 2015	Jul. 02, 2017
Preamplifier Agilent	310N	187226	Jun. 29, 2015	Jun. 28, 2016
Preamplifier Agilent	83017A	MY39501357	Jun. 29, 2015	Jun. 28, 2016
Power Meter Anritsu	ML2495A	1232002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor Anritsu	MA2411B	1207325	Sep. 21, 2015	Sep. 20, 2016
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 27, 2015	Jun. 26, 2016
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 27, 2015	Jun. 26, 2016
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	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 HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The FCC Site Registration No. is 149147.
5. The IC Site Registration No. is IC7450I-1.

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

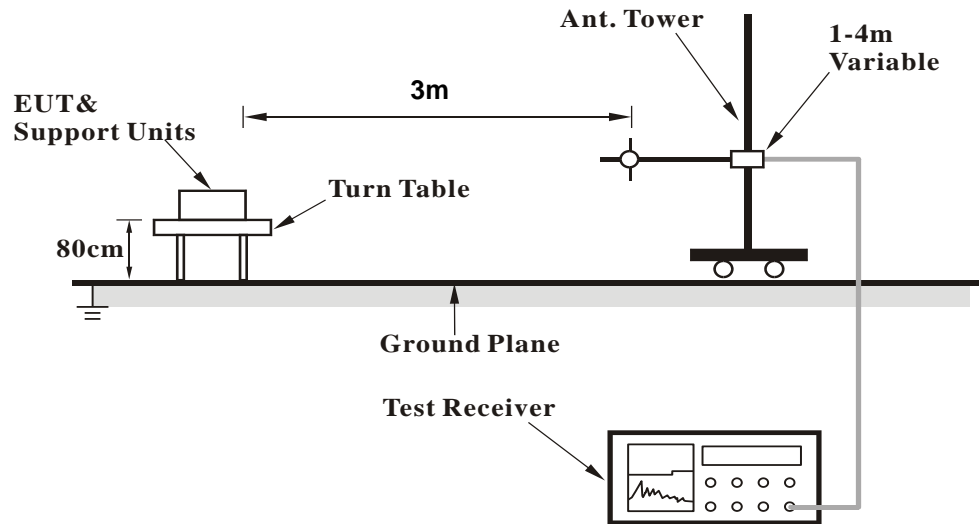
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.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

4.1.4 Deviation from Test Standard

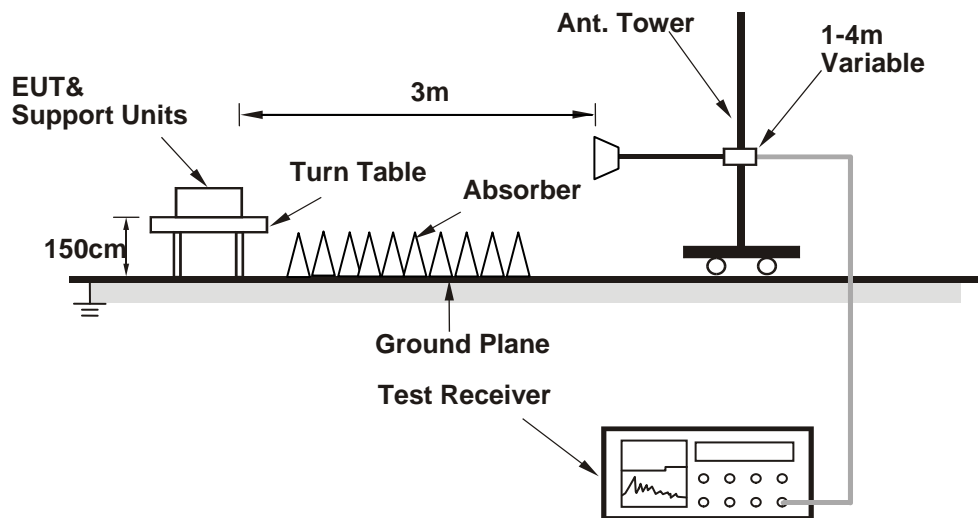
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1 GHz>



<Frequency Range above 1 GHz>



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

4.1.6 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1 GHz Data :

Mode A

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	41.7	39.97	54	-12.3	31.8	5.4	35.47	225	248	Average
2390	56.06	54.33	74	-17.94	31.8	5.4	35.47	225	248	Peak
2412	101.19	99.42			31.81	5.43	35.47	225	248	Average
2412	104.07	102.3			31.81	5.43	35.47	225	248	Peak
2486	41.19	39.2	54	-12.81	31.88	5.53	35.42	225	248	Average
2486	55.81	53.82	74	-18.19	31.88	5.53	35.42	225	248	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2384	48.74	47.05	54	-5.26	31.78	5.4	35.49	100	13	Average
2384	59.42	57.73	74	-14.58	31.78	5.4	35.49	100	13	Peak
2412	108.1	106.33			31.81	5.43	35.47	128	6	Average
2412	111.4	109.63			31.81	5.43	35.47	128	6	Peak
2492	49.84	47.82	54	-4.16	31.9	5.53	35.41	138	13	Average
2492	61.96	59.94	74	-12.04	31.9	5.53	35.41	138	13	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2328	41.17	39.66	54	-12.83	31.73	5.3	35.52	199	86	Average
2328	56.28	54.77	74	-17.72	31.73	5.3	35.52	199	86	Peak
2437	100.72	98.87			31.85	5.46	35.46	199	86	Average
2437	103.67	101.82			31.85	5.46	35.46	199	86	Peak
2484	41.16	39.2	54	-12.84	31.88	5.5	35.42	199	86	Average
2484	56.07	54.11	74	-17.93	31.88	5.5	35.42	199	86	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2382	46.86	45.17	54	-7.14	31.78	5.4	35.49	128	8	Average
2382	59.27	57.58	74	-14.73	31.78	5.4	35.49	128	8	Peak
2437	109.29	107.44			31.85	5.46	35.46	128	8	Average
2437	111.7	109.85			31.85	5.46	35.46	128	8	Peak
2484	44.52	42.56	54	-9.48	31.88	5.5	35.42	128	8	Average
2484	57.94	55.98	74	-16.06	31.88	5.5	35.42	128	8	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2360	41.12	39.49	54	-12.88	31.76	5.37	35.5	210	122	Average
2360	56.24	54.61	74	-17.76	31.76	5.37	35.5	210	122	Peak
2462	102.23	100.3			31.87	5.5	35.44	210	122	Average
2462	105.18	103.25			31.87	5.5	35.44	210	122	Peak
2488	41.81	39.8	54	-12.19	31.9	5.53	35.42	210	122	Average
2488	57.29	55.28	74	-16.71	31.9	5.53	35.42	210	122	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2360	44.48	42.85	54	-9.52	31.76	5.37	35.5	156	19	Average
2360	56.52	54.89	74	-17.48	31.76	5.37	35.5	156	19	Peak
2462	109.62	107.69			31.87	5.5	35.44	156	19	Average
2462	112.92	110.99			31.87	5.5	35.44	156	19	Peak
2484	48.97	47.01	54	-5.03	31.88	5.5	35.42	137	4	Average
2484	61.69	59.73	74	-12.31	31.88	5.5	35.42	137	4	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	42.53	40.8	54	-11.47	31.8	5.4	35.47	268	248	Average
2390	57.68	55.95	74	-16.32	31.8	5.4	35.47	268	248	Peak
2412	96.62	94.85			31.81	5.43	35.47	268	248	Average
2412	103.51	101.74			31.81	5.43	35.47	268	248	Peak
2484	41.64	39.68	54	-12.36	31.88	5.5	35.42	268	248	Average
2484	55.83	53.87	74	-18.17	31.88	5.5	35.42	268	248	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.41	50.68	54	-1.59	31.8	5.4	35.47	100	221	Average
2390	68.26	66.53	74	-5.74	31.8	5.4	35.47	100	221	Peak
2412	103.63	101.86			31.81	5.43	35.47	100	221	Average
2412	111.72	109.95			31.81	5.43	35.47	100	221	Peak
2494	47.47	45.45	54	-6.53	31.9	5.53	35.41	100	221	Average
2494	59.56	57.54	74	-14.44	31.9	5.53	35.41	100	221	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	44.16	42.43	54	-9.84	31.8	5.4	35.47	243	108	Average
2390	57.02	55.29	74	-16.98	31.8	5.4	35.47	243	108	Peak
2437	101.98	100.13			31.85	5.46	35.46	243	108	Average
2437	108.4	106.55			31.85	5.46	35.46	243	108	Peak
2496	44.14	42.12	54	-9.86	31.9	5.53	35.41	243	108	Average
2496	57.3	55.28	74	-16.7	31.9	5.53	35.41	243	108	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	51.13	49.42	54	-2.87	31.8	5.4	35.49	130	8	Average
2388	62.18	60.47	74	-11.82	31.8	5.4	35.49	130	8	Peak
2437	107.74	105.89			31.85	5.46	35.46	126	8	Average
2437	115.22	113.37			31.85	5.46	35.46	126	8	Peak
2484	52.48	50.52	54	-1.52	31.88	5.5	35.42	139	12	Average
2484	64.5	62.54	74	-9.5	31.88	5.5	35.42	139	12	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2318	41.41	39.9	54	-12.59	31.73	5.3	35.52	210	118	Average
2318	56.9	55.39	74	-17.1	31.73	5.3	35.52	210	118	Peak
2462	95.43	93.5			31.87	5.5	35.44	210	118	Average
2462	103.34	101.41			31.87	5.5	35.44	210	118	Peak
2484	44.51	42.55	54	-9.49	31.88	5.5	35.42	210	118	Average
2484	59.2	57.24	74	-14.8	31.88	5.5	35.42	210	118	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2384	43.97	42.28	54	-10.03	31.78	5.4	35.49	139	15	Average
2384	56.67	54.98	74	-17.33	31.78	5.4	35.49	139	15	Peak
2462	103.4	101.47			31.87	5.5	35.44	139	15	Average
2462	110.78	108.85			31.87	5.5	35.44	139	15	Peak
2484	52.83	50.87	54	-1.17	31.88	5.5	35.42	139	15	Average
2484	69.05	67.09	74	-4.95	31.88	5.5	35.42	139	15	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	43.78	42.05	54	-10.22	31.8	5.4	35.47	223	110	Average
2390	58.1	56.37	74	-15.9	31.8	5.4	35.47	223	110	Peak
2412	95.9	94.13			31.81	5.43	35.47	223	110	Average
2412	103.89	102.12			31.81	5.43	35.47	223	110	Peak
2490	42.32	40.31	54	-11.68	31.9	5.53	35.42	223	110	Average
2490	56.4	54.39	74	-17.6	31.9	5.53	35.42	223	110	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.94	51.21	54	-1.06	31.8	5.4	35.47	100	213	Average
2390	69.41	67.68	74	-4.59	31.8	5.4	35.47	100	213	Peak
2412	102.71	100.94			31.81	5.43	35.47	100	213	Average
2412	110.09	108.32			31.81	5.43	35.47	100	213	Peak
2492	47.73	45.71	54	-6.27	31.9	5.53	35.41	100	213	Average
2492	60.59	58.57	74	-13.41	31.9	5.53	35.41	100	213	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2356	43.83	42.2	54	-10.17	31.76	5.37	35.5	243	113	Average
2356	57.44	55.81	74	-16.56	31.76	5.37	35.5	243	113	Peak
2437	97.62	95.77			31.85	5.46	35.46	243	113	Average
2437	105.33	103.48			31.85	5.46	35.46	243	113	Peak
2500	44.22	42.2	54	-9.78	31.9	5.53	35.41	243	113	Average
2500	57.52	55.5	74	-16.48	31.9	5.53	35.41	243	113	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	48.21	46.48	54	-5.79	31.8	5.4	35.47	142	7	Average
2390	60.04	58.31	74	-13.96	31.8	5.4	35.47	142	7	Peak
2437	106.22	104.37			31.85	5.46	35.46	142	7	Average
2437	113.64	111.79			31.85	5.46	35.46	142	7	Peak
2490	51.25	49.24	54	-2.75	31.9	5.53	35.42	142	7	Average
2490	63.22	61.21	74	-10.78	31.9	5.53	35.42	142	7	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2356	43.69	42.06	54	-10.31	31.76	5.37	35.5	196	90	Average
2356	55.96	54.33	74	-18.04	31.76	5.37	35.5	196	90	Peak
2462	94.39	92.46			31.87	5.5	35.44	196	90	Average
2462	102.74	100.81			31.87	5.5	35.44	196	90	Peak
2484	43.66	41.7	54	-10.34	31.88	5.5	35.42	196	90	Average
2484	57.06	55.1	74	-16.94	31.88	5.5	35.42	196	90	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2342	44.02	42.45	54	-9.98	31.74	5.33	35.5	139	12	Average
2342	57.32	55.75	74	-16.68	31.74	5.33	35.5	139	12	Peak
2462	101.24	99.31			31.87	5.5	35.44	139	12	Average
2462	109.93	108			31.87	5.5	35.44	139	12	Peak
2484	52.94	50.98	54	-1.06	31.88	5.5	35.42	139	12	Average
2484	71.71	69.75	74	-2.29	31.88	5.5	35.42	139	12	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	44.69	42.96	54	-9.31	31.8	5.4	35.47	225	112	Average
2390	57.9	56.17	74	-16.1	31.8	5.4	35.47	225	112	Peak
2422	88.68	86.88			31.83	5.43	35.46	225	112	Average
2422	96.67	94.87			31.83	5.43	35.46	225	112	Peak
2494	41.96	39.94	54	-12.04	31.9	5.53	35.41	225	112	Average
2494	56.38	54.36	74	-17.62	31.9	5.53	35.41	225	112	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.58	50.85	54	-1.42	31.8	5.4	35.47	128	12	Average
2390	66.19	64.46	74	-7.81	31.8	5.4	35.47	128	12	Peak
2422	95.12	93.32			31.83	5.43	35.46	128	12	Average
2422	103.8	102			31.83	5.43	35.46	128	12	Peak
2494	43.68	41.66	54	-10.32	31.9	5.53	35.41	128	12	Average
2494	56.83	54.81	74	-17.17	31.9	5.53	35.41	128	12	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2422 MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	42.81	41.08	54	-11.19	31.8	5.4	35.47	243	297	Average
2390	59.59	57.86	74	-14.41	31.8	5.4	35.47	243	297	Peak
2437	93.66	91.81			31.85	5.46	35.46	243	297	Average
2437	101	99.15			31.85	5.46	35.46	243	297	Peak
2492	44.27	42.25	54	-9.73	31.9	5.53	35.41	243	297	Average
2492	56.77	54.75	74	-17.23	31.9	5.53	35.41	243	297	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	45.14	43.43	54	-8.86	31.8	5.4	35.49	140	342	Average
2388	60.64	58.93	74	-13.36	31.8	5.4	35.49	140	342	Peak
2437	100.25	98.4			31.85	5.46	35.46	140	342	Average
2437	108.64	106.79			31.85	5.46	35.46	140	342	Peak
2488	52.85	50.84	54	-1.15	31.9	5.53	35.42	140	342	Average
2488	69.9	67.89	74	-4.1	31.9	5.53	35.42	140	342	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2376	41.55	39.89	54	-12.45	31.78	5.37	35.49	210	116	Average
2376	55.92	54.26	74	-18.08	31.78	5.37	35.49	210	116	Peak
2452	89.31	87.44			31.85	5.46	35.44	210	116	Average
2452	97.05	95.18			31.85	5.46	35.44	210	116	Peak
2484	46.48	44.52	54	-7.52	31.88	5.5	35.42	233	116	Average
2484	60.29	58.33	74	-13.71	31.88	5.5	35.42	233	116	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2380	43.55	41.89	54	-10.45	31.78	5.37	35.49	141	7	Average
2380	56.26	54.6	74	-17.74	31.78	5.37	35.49	141	7	Peak
2452	96.02	94.15			31.85	5.46	35.44	141	7	Average
2452	104.08	102.21			31.85	5.46	35.44	141	7	Peak
2484	52.88	50.92	54	-1.12	31.88	5.5	35.42	109	5	Average
2484	68.63	66.67	74	-5.37	31.88	5.5	35.42	109	5	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2452 MHz: Fundamental frequency.

Mode B

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	47.74	46.01	54	-6.26	31.8	5.4	35.47	111	210	Average
2390	60.5	58.77	74	-13.5	31.8	5.4	35.47	111	210	Peak
2412	108.9	107.13			31.81	5.43	35.47	125	22	Average
2412	111.47	109.7			31.81	5.43	35.47	125	22	Peak
2484	46.75	44.79	54	-7.25	31.88	5.5	35.42	125	22	Average
2484	59.94	57.98	74	-14.06	31.88	5.5	35.42	125	22	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	43.27	41.56	54	-10.73	31.8	5.4	35.49	132	247	Average
2388	57.94	56.23	74	-16.06	31.8	5.4	35.49	132	247	Peak
2412	106.24	104.47			31.81	5.43	35.47	132	247	Average
2412	108.85	107.08			31.81	5.43	35.47	132	247	Peak
2500	40.91	38.89	54	-13.09	31.9	5.53	35.41	132	247	Average
2500	56.39	54.37	74	-17.61	31.9	5.53	35.41	132	247	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2386	46.51	44.8	54	-7.49	31.8	5.4	35.49	124	24	Average
2386	58.97	57.26	74	-15.03	31.8	5.4	35.49	124	24	Peak
2437	108.54	106.69			31.85	5.46	35.46	124	23	Average
2437	111.23	109.38			31.85	5.46	35.46	124	23	Peak
2498	44.9	42.88	54	-9.1	31.9	5.53	35.41	124	23	Average
2498	57.68	55.66	74	-16.32	31.9	5.53	35.41	124	23	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	40.97	39.26	54	-13.03	31.8	5.4	35.49	132	210	Average
2388	56.16	54.45	74	-17.84	31.8	5.4	35.49	132	210	Peak
2437	106.21	104.36			31.85	5.46	35.46	132	210	Average
2437	108.79	106.94			31.85	5.46	35.46	132	210	Peak
2490	42	39.99	54	-12	31.9	5.53	35.42	132	210	Average
2490	56.85	54.84	74	-17.15	31.9	5.53	35.42	132	210	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2386	46.88	45.17	54	-7.12	31.8	5.4	35.49	108	26	Average
2386	58.49	56.78	74	-15.51	31.8	5.4	35.49	108	26	Peak
2462	109.05	107.12			31.87	5.5	35.44	108	26	Average
2462	111.52	109.59			31.87	5.5	35.44	108	26	Peak
2492	47.14	45.12	54	-6.86	31.9	5.53	35.41	121	26	Average
2492	61.29	59.27	74	-12.71	31.9	5.53	35.41	121	26	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2382	44.27	42.58	54	-9.73	31.78	5.4	35.49	131	247	Average
2382	56.66	54.97	74	-17.34	31.78	5.4	35.49	131	247	Peak
2462	106.24	104.31			31.87	5.5	35.44	131	247	Average
2462	108.6	106.67			31.87	5.5	35.44	131	247	Peak
2498	41.82	39.8	54	-12.18	31.9	5.53	35.41	131	247	Average
2498	56.28	54.26	74	-17.72	31.9	5.53	35.41	131	247	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.28	50.55	54	-1.72	31.8	5.4	35.47	125	26	Average
2390	67.54	65.81	74	-6.46	31.8	5.4	35.47	125	26	Peak
2412	103.42	101.65			31.81	5.43	35.47	125	26	Average
2412	110.55	108.78			31.81	5.43	35.47	125	26	Peak
2494	45.94	43.92	54	-8.06	31.9	5.53	35.41	125	26	Average
2494	58.42	56.4	74	-15.58	31.9	5.53	35.41	125	26	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	45.34	43.61	54	-8.66	31.8	5.4	35.47	132	247	Average
2390	62.33	60.6	74	-11.67	31.8	5.4	35.47	132	247	Peak
2412	99.2	97.43			31.81	5.43	35.47	132	247	Average
2412	107.98	106.21			31.81	5.43	35.47	132	247	Peak
2500	41.85	39.83	54	-12.15	31.9	5.53	35.41	132	247	Average
2500	56.38	54.36	74	-17.62	31.9	5.53	35.41	132	247	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2386	50.8	49.09	54	-3.2	31.8	5.4	35.49	124	25	Average
2386	62.88	61.17	74	-11.12	31.8	5.4	35.49	124	25	Peak
2437	105.27	103.42			31.85	5.46	35.46	124	27	Average
2437	113.51	111.66			31.85	5.46	35.46	124	27	Peak
2484	51.71	49.75	54	-2.29	31.88	5.5	35.42	107	18	Average
2484	64.16	62.2	74	-9.84	31.88	5.5	35.42	107	18	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	44.17	42.44	54	-9.83	31.8	5.4	35.47	132	208	Average
2390	56.33	54.6	74	-17.67	31.8	5.4	35.47	132	208	Peak
2437	102.03	100.18			31.85	5.46	35.46	132	208	Average
2437	110.21	108.36			31.85	5.46	35.46	132	208	Peak
2484	45.2	43.24	54	-8.8	31.88	5.5	35.42	132	208	Average
2484	58.62	56.66	74	-15.38	31.88	5.5	35.42	132	208	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2374	45.45	43.79	54	-8.55	31.78	5.37	35.49	107	13	Average
2374	57.53	55.87	74	-16.47	31.78	5.37	35.49	107	13	Peak
2462	102.71	100.78			31.87	5.5	35.44	107	13	Average
2462	110.51	108.58			31.87	5.5	35.44	107	13	Peak
2484	52.97	51.01	54	-1.03	31.88	5.5	35.42	107	13	Average
2484	71.55	69.59	74	-2.45	31.88	5.5	35.42	107	13	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	42.11	40.38	54	-11.89	31.8	5.4	35.47	132	207	Average
2390	56.39	54.66	74	-17.61	31.8	5.4	35.47	132	207	Peak
2462	99.66	97.73			31.87	5.5	35.44	132	207	Average
2462	107.85	105.92			31.87	5.5	35.44	132	207	Peak
2484	46.14	44.18	54	-7.86	31.88	5.5	35.42	132	207	Average
2484	64.22	62.26	74	-9.78	31.88	5.5	35.42	132	207	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	53	51.27	54	-1	31.8	5.4	35.47	131	45	Average
2390	66.67	64.94	74	-7.33	31.8	5.4	35.47	131	45	Peak
2412	102.51	100.74			31.81	5.43	35.47	131	45	Average
2412	110.69	108.92			31.81	5.43	35.47	131	45	Peak
2494	45.32	43.3	54	-8.68	31.9	5.53	35.41	131	45	Average
2494	57.87	55.85	74	-16.13	31.9	5.53	35.41	131	45	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	46.54	44.81	54	-7.46	31.8	5.4	35.47	132	247	Average
2390	62.39	60.66	74	-11.61	31.8	5.4	35.47	132	247	Peak
2412	99.35	97.58			31.81	5.43	35.47	132	247	Average
2412	107.21	105.44			31.81	5.43	35.47	132	247	Peak
2498	41.61	39.59	54	-12.39	31.9	5.53	35.41	132	247	Average
2498	56.83	54.81	74	-17.17	31.9	5.53	35.41	132	247	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	50.54	48.81	54	-3.46	31.8	5.4	35.47	124	25	Average
2390	66.63	64.9	74	-7.37	31.8	5.4	35.47	124	25	Peak
2437	104.34	102.49			31.85	5.46	35.46	124	25	Average
2437	112.65	110.8			31.85	5.46	35.46	124	25	Peak
2490	51.7	49.69	54	-2.3	31.9	5.53	35.42	121	25	Average
2490	65.92	63.91	74	-8.08	31.9	5.53	35.42	121	25	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	44.01	42.28	54	-9.99	31.8	5.4	35.47	132	208	Average
2390	58.41	56.68	74	-15.59	31.8	5.4	35.47	132	208	Peak
2437	101.05	99.2			31.85	5.46	35.46	132	208	Average
2437	109.75	107.9			31.85	5.46	35.46	132	208	Peak
2484	45.25	43.29	54	-8.75	31.88	5.5	35.42	132	208	Average
2484	59.53	57.57	74	-14.47	31.88	5.5	35.42	132	208	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	45.01	43.3	54	-8.99	31.8	5.4	35.49	107	20	Average
2388	58.65	56.94	74	-15.35	31.8	5.4	35.49	107	20	Peak
2462	101.41	99.48			31.87	5.5	35.44	107	20	Average
2462	109.44	107.51			31.87	5.5	35.44	107	20	Peak
2484	52.74	50.78	54	-1.26	31.88	5.5	35.42	107	20	Average
2484	70.61	68.65	74	-3.39	31.88	5.5	35.42	107	20	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2386	41.79	40.08	54	-12.21	31.8	5.4	35.49	132	207	Average
2386	56.7	54.99	74	-17.3	31.8	5.4	35.49	132	207	Peak
2462	98.62	96.69			31.87	5.5	35.44	132	207	Average
2462	106.64	104.71			31.87	5.5	35.44	132	207	Peak
2484	46.82	44.86	54	-7.18	31.88	5.5	35.42	132	207	Average
2484	60.38	58.42	74	-13.62	31.88	5.5	35.42	132	207	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.38	50.65	54	-1.62	31.8	5.4	35.47	125	216	Average
2390	67.15	65.42	74	-6.85	31.8	5.4	35.47	125	216	Peak
2422	96.9	95.1			31.83	5.43	35.46	125	216	Average
2422	105.85	104.05			31.83	5.43	35.46	125	216	Peak
2492	43.38	41.36	54	-10.62	31.9	5.53	35.41	125	216	Average
2492	57.37	55.35	74	-16.63	31.9	5.53	35.41	125	216	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	47.29	45.56	54	-6.71	31.8	5.4	35.47	132	247	Average
2390	62.52	60.79	74	-11.48	31.8	5.4	35.47	132	247	Peak
2422	94.96	93.16			31.83	5.43	35.46	132	247	Average
2422	102.19	100.39			31.83	5.43	35.46	132	247	Peak
2484	42.02	40.06	54	-11.98	31.88	5.5	35.42	132	247	Average
2484	57.51	55.55	74	-16.49	31.88	5.5	35.42	132	247	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2422 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	50.18	48.45	54	-3.82	31.8	5.4	35.47	111	9	Average
2390	66.04	64.31	74	-7.96	31.8	5.4	35.47	111	9	Peak
2437	97.29	95.44			31.85	5.46	35.46	111	9	Average
2437	104.69	102.84			31.85	5.46	35.46	111	9	Peak
2484	45.5	43.54	54	-8.5	31.88	5.5	35.42	111	9	Average
2484	57.51	55.55	74	-16.49	31.88	5.5	35.42	111	9	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	43.82	42.09	54	-10.18	31.8	5.4	35.47	132	208	Average
2390	57.74	56.01	74	-16.26	31.8	5.4	35.47	132	208	Peak
2437	93.99	92.14			31.85	5.46	35.46	132	208	Average
2437	101.07	99.22			31.85	5.46	35.46	132	208	Peak
2484	45.78	43.82	54	-8.22	31.88	5.5	35.42	132	208	Average
2484	60.42	58.46	74	-13.58	31.88	5.5	35.42	132	208	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	44.97	43.24	54	-9.03	31.8	5.4	35.47	107	18	Average
2390	56.84	55.11	74	-17.16	31.8	5.4	35.47	107	18	Peak
2452	94.87	93			31.85	5.46	35.44	107	18	Average
2452	102.37	100.5			31.85	5.46	35.44	107	18	Peak
2484	52.88	50.92	54	-1.12	31.88	5.5	35.42	107	18	Average
2484	67.59	65.63	74	-6.41	31.88	5.5	35.42	107	18	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2384	43.15	41.46	54	-10.85	31.78	5.4	35.49	132	205	Average
2384	55.29	53.6	74	-18.71	31.78	5.4	35.49	132	205	Peak
2452	91.4	89.53			31.85	5.46	35.44	132	205	Average
2452	99.6	97.73			31.85	5.46	35.44	132	205	Peak
2484	47.69	45.73	54	-6.31	31.88	5.5	35.42	132	205	Average
2484	63	61.04	74	-11	31.88	5.5	35.42	132	205	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2452 MHz: Fundamental frequency.

9 kHz ~ 30 MHz DATA:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz WORST-CASE DATA:

Mode A

802.11n (HT20)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	30 MHz ~ 1 GHz
INPUT POWER	120 Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65 % RH	TESTED BY	Karl Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
99.93	41.9	60.6	43.5	-1.6	12.28	1.28	32.26	136	257	Peak
199.29	40.44	60.01	43.5	-3.06	11.08	1.65	32.3	145	128	Peak
300	43.77	60.82	46	-2.23	13.06	2.03	32.14	162	120	Peak
499.5	31.42	44.54	46	-14.58	16.35	2.63	32.1	145	120	Peak
749.4	42.62	51.74	46	-3.38	19.81	3.22	32.15	164	212	Peak
871.2	43.61	50.58	46	-2.39	21.25	3.44	31.66	197	120	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
99.66	33.53	52.23	43.5	-9.97	12.28	1.28	32.26	176	194	Peak
199.29	32.46	52.03	43.5	-11.04	11.08	1.65	32.3	164	128	Peak
250.05	25.62	43.55	46	-20.38	12.32	1.85	32.1	166	121	Peak
499.5	31.05	44.17	46	-14.95	16.35	2.63	32.1	114	281	Peak
622	34.16	45.25	46	-11.84	18.15	2.93	32.17	165	250	Peak
750.1	39.01	48.13	46	-6.99	19.81	3.22	32.15	174	341	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value

Mode B

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	30 MHz ~ 1 GHz
INPUT POWER	120 Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Quasi-peak (QP)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65 % RH	TESTED BY	Karl Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
99.93	41.78	60.48	43.5	-1.72	12.28	1.28	32.26	165	230	Peak
199.83	41.15	60.72	43.5	-2.35	11.08	1.65	32.3	175	120	Peak
298.92	44.04	61.11	46	-1.96	13.04	2.03	32.14	145	121	QP
499.5	33.25	46.37	46	-12.75	16.35	2.63	32.1	145	120	Peak
750.1	44.04	53.16	46	-1.96	19.81	3.22	32.15	167	220	Peak
874.7	43.87	50.73	46	-2.13	21.29	3.49	31.64	169	121	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
99.66	33.91	52.61	43.5	-9.59	12.28	1.28	32.26	174	128	Peak
200.1	33.83	53.4	43.5	-9.67	11.08	1.65	32.3	163	308	Peak
300	34.79	51.84	46	-11.21	13.06	2.03	32.14	166	128	Peak
499.5	32	45.12	46	-14	16.35	2.63	32.1	163	142	Peak
750.1	39.14	48.26	46	-6.86	19.81	3.22	32.15	181	121	Peak
874.7	37.8	44.66	46	-8.2	21.29	3.49	31.64	135	128	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
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 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 16, 2015	Nov. 15, 2016
RF signal cable Woken	5D-FB	Cable-cond1-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2015	Feb. 25, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 24, 2015	Jul. 23, 2016
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 1.

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

4.2.3 Test Procedures

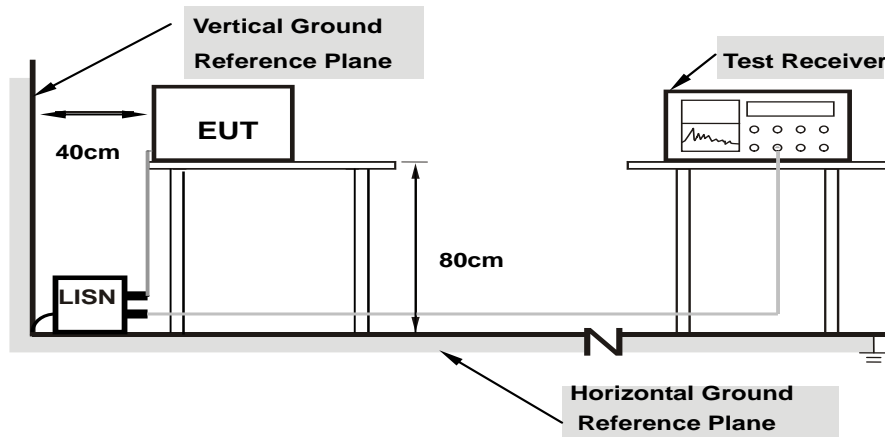
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.2.7 Test Results

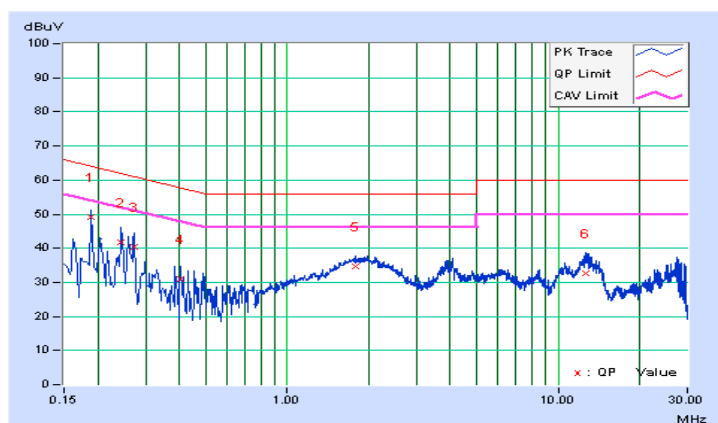
Mode A

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2015/12/15

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18910	9.84	39.48	24.77	49.32	34.61	64.08	54.08	-14.76	-19.47
2	0.24384	9.85	31.84	16.43	41.69	26.28	61.96	51.96	-20.28	-25.69
3	0.27120	9.85	30.65	15.79	40.50	25.64	61.08	51.08	-20.58	-25.44
4	0.40415	9.88	21.20	7.41	31.08	17.29	57.77	47.77	-26.69	-30.48
5	1.78436	9.98	24.84	14.40	34.82	24.38	56.00	46.00	-21.18	-21.62
6	12.61117	10.66	21.98	16.36	32.64	27.02	60.00	50.00	-27.36	-22.98

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

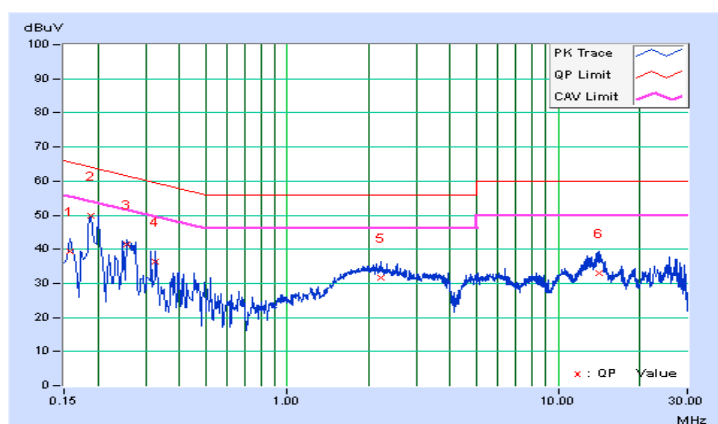


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2015/12/15

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	9.82	29.65	14.85	39.47	24.67	65.58	55.58	-26.11	-30.91
2	0.18803	9.83	39.97	24.46	49.80	34.29	64.12	54.12	-14.33	-19.84
3	0.25593	9.84	31.47	17.02	41.31	26.86	61.56	51.56	-20.25	-24.70
4	0.32595	9.86	26.47	12.19	36.33	22.05	59.55	49.55	-23.22	-27.50
5	2.22230	10.01	21.64	11.61	31.65	21.62	56.00	46.00	-24.35	-24.38
6	14.26510	10.67	22.44	15.45	33.11	26.12	60.00	50.00	-26.89	-23.88

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



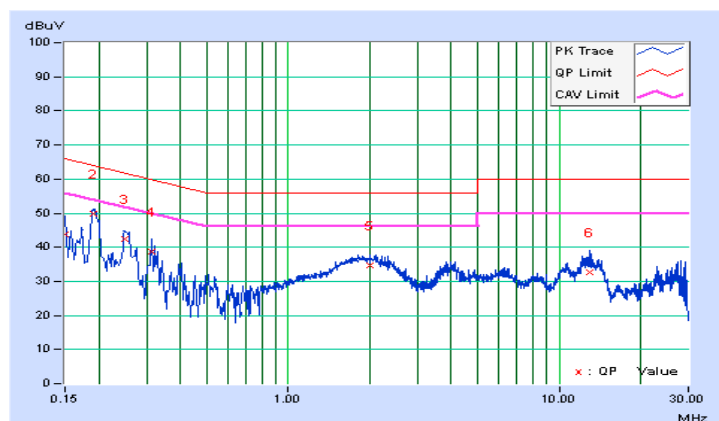
Mode B

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2015/12/15

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.82	33.79	19.35	43.61	29.17	66.00	56.00	-22.39	-26.83
2	0.19153	9.84	39.94	25.50	49.78	35.34	63.97	53.97	-14.19	-18.63
3	0.24796	9.85	32.67	18.18	42.52	28.03	61.83	51.83	-19.31	-23.80
4	0.31422	9.86	28.78	14.33	38.64	24.19	59.86	49.86	-21.22	-25.67
5	1.99943	10.00	24.82	15.37	34.82	25.37	56.00	46.00	-21.18	-20.63
6	13.00999	10.69	21.89	16.02	32.58	26.71	60.00	50.00	-27.42	-23.29

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

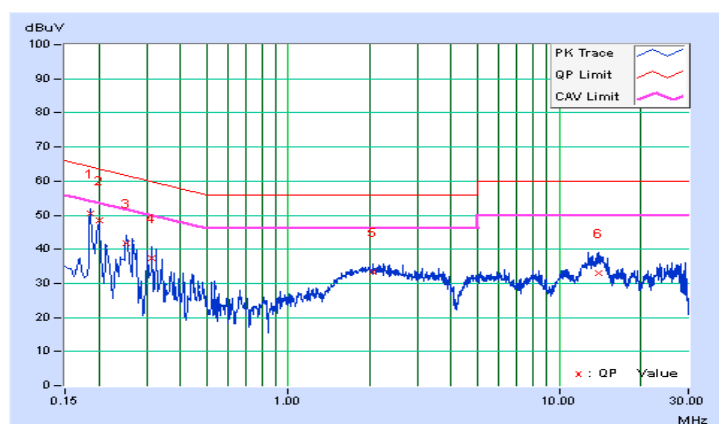


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2015/12/15

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18519	9.83	40.79	24.02	50.62	33.85	64.25	54.25	-13.63	-20.40
2	0.19978	9.83	38.51	23.03	48.34	32.86	63.62	53.62	-15.28	-20.76
3	0.25166	9.84	31.97	17.27	41.81	27.11	61.70	51.70	-19.89	-24.59
4	0.31422	9.86	27.47	12.90	37.33	22.76	59.86	49.86	-22.53	-27.10
5	2.05808	9.99	23.31	13.44	33.30	23.43	56.00	46.00	-22.70	-22.57
6	13.94839	10.66	22.26	15.09	32.92	25.75	60.00	50.00	-27.08	-24.25

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

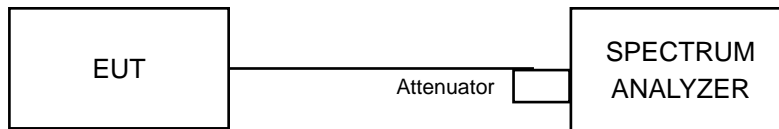


4.3 6 dB Bandwidth Measurement

4.3.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

- Set resolution bandwidth (RBW) = 100 kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

Mode A

802.11b

Channel	Frequency (MHz)	6 db Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	10.13	10.11	10.09	0.5	Pass
6	2437	10.12	10.11	10.12	0.5	Pass
11	2462	10.11	10.12	10.12	0.5	Pass

802.11g

Channel	Frequency (MHz)	6 db Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	16.39	16.41	16.39	0.5	Pass
6	2437	16.39	16.39	16.40	0.5	Pass
11	2462	16.40	16.40	16.43	0.5	Pass

802.11n (HT20)

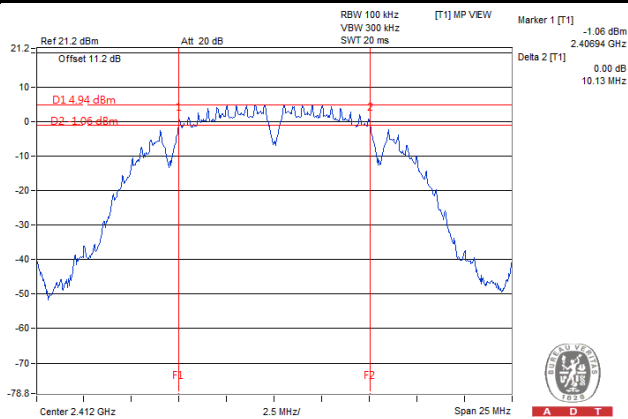
Channel	Frequency (MHz)	6 db Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	17.55	17.62	17.61	0.5	Pass
6	2437	17.61	17.63	17.62	0.5	Pass
11	2462	17.62	17.65	17.62	0.5	Pass

802.11n (HT40)

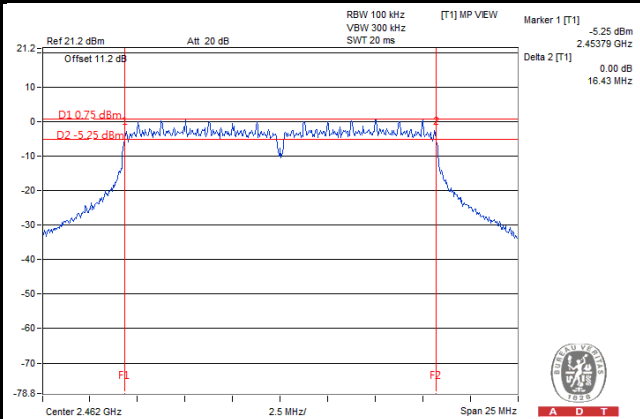
Channel	Frequency (MHz)	6 db Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
3	2422	36.39	36.46	36.42	0.5	Pass
6	2437	36.38	36.45	36.39	0.5	Pass
9	2452	36.42	36.47	36.41	0.5	Pass

Spectrum Plot of Worst Value

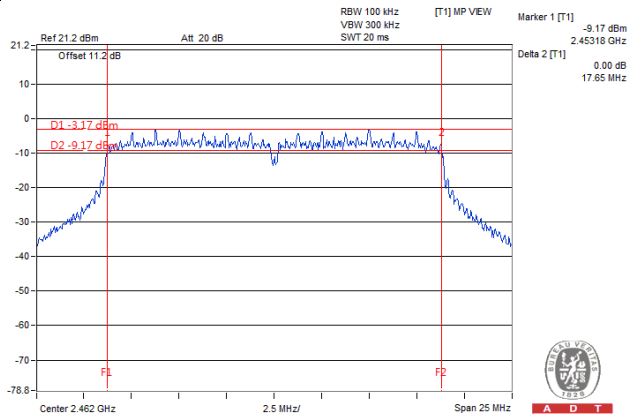
802.11b



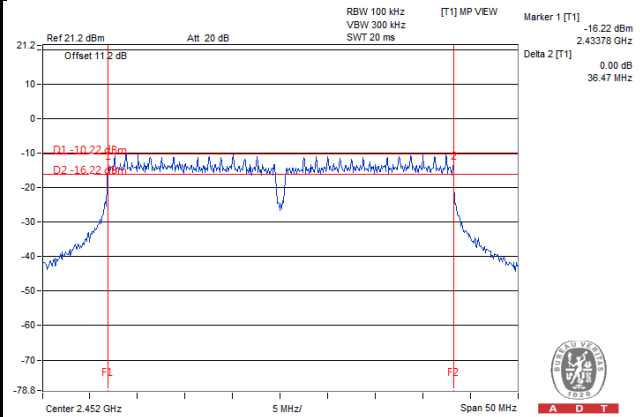
802.11g



802.11n (HT20)



802.11n (HT40)



Mode B

802.11b

Channel	Frequency (MHz)	6 db Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	10.13	10.11	10.09	0.5	Pass
6	2437	10.12	10.11	10.12	0.5	Pass
11	2462	10.11	10.12	10.12	0.5	Pass

802.11g

Channel	Frequency (MHz)	6 db Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	16.39	16.41	16.39	0.5	Pass
6	2437	16.39	16.39	16.40	0.5	Pass
11	2462	16.40	16.40	16.43	0.5	Pass

802.11n (HT20)

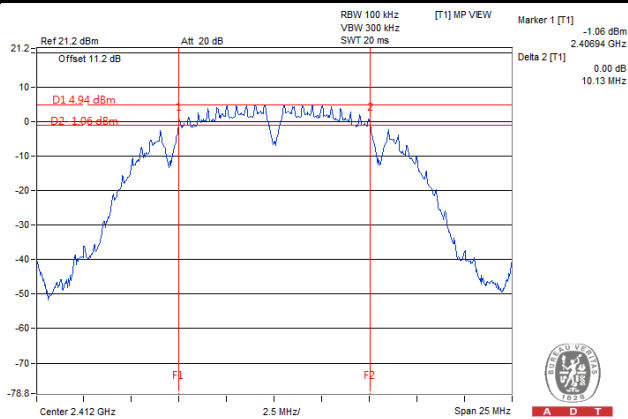
Channel	Frequency (MHz)	6 db Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	17.55	17.62	17.61	0.5	Pass
6	2437	17.61	17.63	17.62	0.5	Pass
11	2462	17.61	17.63	17.62	0.5	Pass

802.11n (HT40)

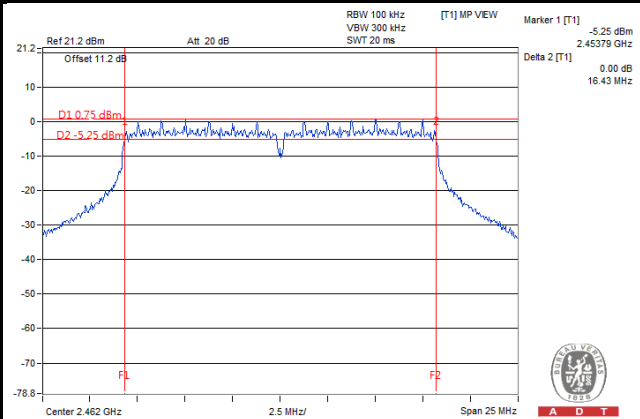
Channel	Frequency (MHz)	6 db Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
3	2422	36.43	36.47	36.43	0.5	Pass
6	2437	36.39	36.46	36.43	0.5	Pass
9	2452	36.42	36.47	36.42	0.5	Pass

Spectrum Plot of Worst Value

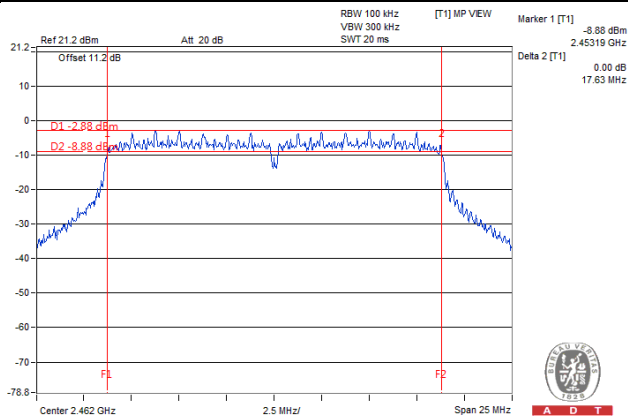
802.11b



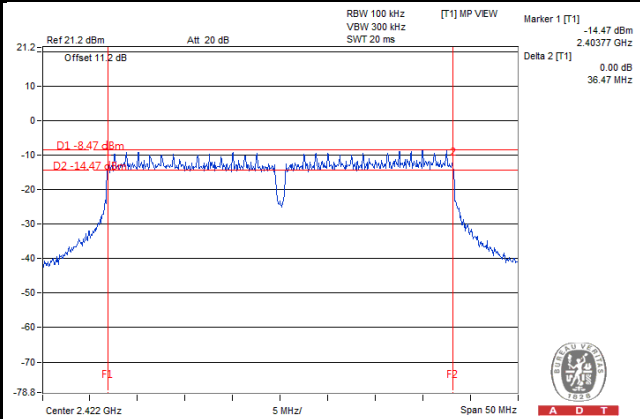
802.11g



802.11n (HT20)



802.11n (HT40)



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 (30 dBm)

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

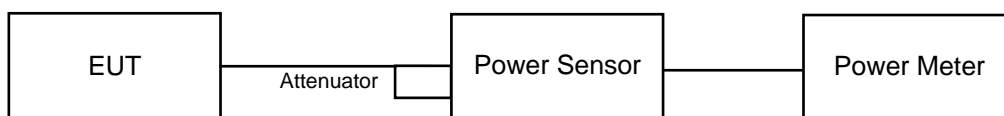
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

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

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

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

4.4.7 Test Results

Mode A

802.11b

Channel	Frequency (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	17.10	14.40	16.87	127.469	21.05	30	Pass
6	2437	17.14	14.13	17.08	128.693	21.10	30	Pass
11	2462	16.62	14.01	17.33	125.172	20.98	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	21.80	19.31	21.01	362.849	25.60	30	Pass
6	2437	22.66	21.60	23.16	536.060	27.29	30	Pass
11	2462	22.04	19.74	21.93	410.100	26.13	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	21.33	18.56	20.47	319.040	25.04	30	Pass
6	2437	22.72	21.28	22.97	519.497	27.16	30	Pass
11	2462	21.17	18.37	20.96	324.363	25.11	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	18.23	14.65	17.60	153.246	21.85	30	Pass
6	2437	21.98	20.38	21.72	415.499	26.19	30	Pass
9	2452	18.18	14.52	17.33	148.155	21.71	30	Pass

Mode B

802.11b

Channel	Frequency (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	17.10	14.40	16.87	127.469	21.05	30	Pass
6	2437	17.14	14.13	17.08	128.693	21.10	30	Pass
11	2462	16.62	14.01	17.33	125.172	20.98	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	21.80	19.31	21.01	362.849	25.60	30	Pass
6	2437	22.66	21.60	23.16	536.060	27.29	30	Pass
11	2462	22.04	19.74	21.93	410.100	26.13	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	21.33	18.56	20.47	319.040	25.04	30	Pass
6	2437	22.72	21.28	22.97	519.497	27.16	30	Pass
11	2462	21.90	19.07	21.48	376.210	25.75	30	Pass

802.11n (HT40)

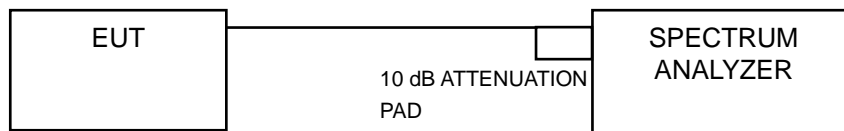
Channel	Frequency (MHz)	Peak Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	19.22	15.54	18.77	194.706	22.89	30	Pass
6	2437	21.90	19.29	21.25	373.152	25.72	30	Pass
9	2452	18.41	14.15	17.74	154.773	21.90	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8 dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

Mode A

802.11b

TX Chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-9.57	4.77	-4.80	4.58	Pass
	6	2437	-9.40	4.77	-4.63	4.58	Pass
	11	2462	-9.50	4.77	-4.73	4.58	Pass
1	1	2412	-11.24	4.77	-6.47	4.58	Pass
	6	2437	-12.16	4.77	-7.39	4.58	Pass
	11	2462	-11.70	4.77	-6.93	4.58	Pass
2	1	2412	-9.21	4.77	-4.44	4.58	Pass
	6	2437	-8.75	4.77	-3.98	4.58	Pass
	11	2462	-9.10	4.77	-4.33	4.58	Pass

NOTE: Directional gain = 4.65 dBi + 10log(3) = 9.42 dBi > 6 dBi , so the power density limit shall be reduced to 8-(9.42-6) = 4.58 dBm.

802.11g

TX Chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-14.60	4.77	-9.83	4.58	Pass
	6	2437	-10.50	4.77	-5.73	4.58	Pass
	11	2462	-14.15	4.77	-9.38	4.58	Pass
1	1	2412	-16.18	4.77	-11.41	4.58	Pass
	6	2437	-13.55	4.77	-8.78	4.58	Pass
	11	2462	-16.14	4.77	-11.37	4.58	Pass
2	1	2412	-14.40	4.77	-9.63	4.58	Pass
	6	2437	-10.57	4.77	-5.80	4.58	Pass
	11	2462	-12.91	4.77	-8.14	4.58	Pass

NOTE: Directional gain = 4.65 dBi + 10log(3) = 9.42 dBi > 6 dBi , so the power density limit shall be reduced to 8-(9.42-6) = 4.58 dBm.

802.11n (HT20)

TX Chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-15.00	4.77	-10.23	4.58	Pass
	6	2437	-12.48	4.77	-7.71	4.58	Pass
	11	2462	-14.99	4.77	-10.22	4.58	Pass
1	1	2412	-17.66	4.77	-12.89	4.58	Pass
	6	2437	-14.87	4.77	-10.10	4.58	Pass
	11	2462	-18.34	4.77	-13.57	4.58	Pass
2	1	2412	-15.37	4.77	-10.60	4.58	Pass
	6	2437	-12.07	4.77	-7.30	4.58	Pass
	11	2462	-14.92	4.77	-10.15	4.58	Pass

NOTE: Directional gain = 4.65 dBi + 10log(3) = 9.42 dBi > 6 dBi , so the power density limit shall be reduced to 8-(9.42-6) = 4.58 dBm.

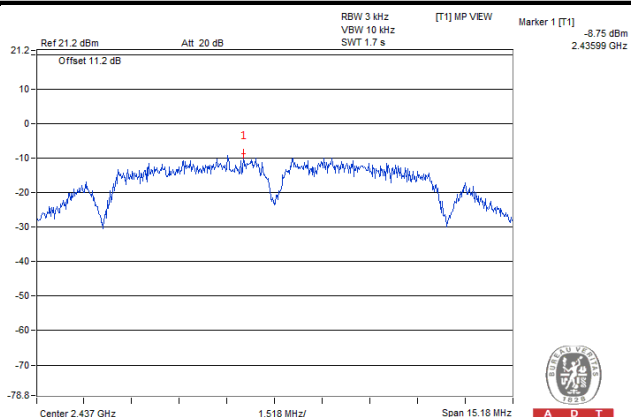
802.11n (HT40)

TX Chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	3	2422	-21.24	4.77	-16.47	4.58	Pass
	6	2437	-15.24	4.77	-10.47	4.58	Pass
	9	2452	-21.57	4.77	-16.80	4.58	Pass
1	3	2422	-24.56	4.77	-19.79	4.58	Pass
	6	2437	-19.30	4.77	-14.53	4.58	Pass
	9	2452	-24.76	4.77	-19.99	4.58	Pass
2	3	2422	-22.88	4.77	-18.11	4.58	Pass
	6	2437	-17.55	4.77	-12.78	4.58	Pass
	9	2452	-22.20	4.77	-17.43	4.58	Pass

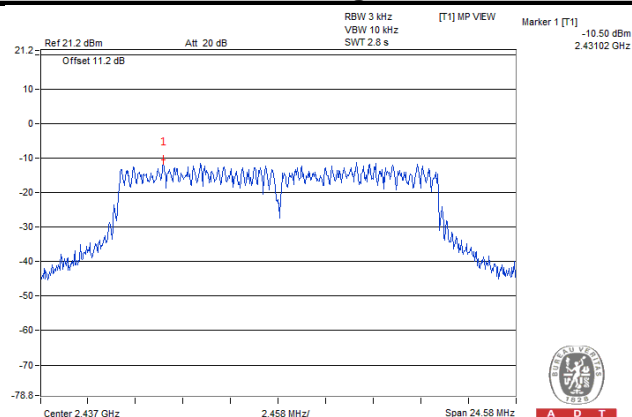
NOTE: Directional gain = 4.65 dBi + 10log(3) = 9.42 dBi > 6 dBi , so the power density limit shall be reduced to 8-(9.42-6) = 4.58 dBm.

Spectrum Plot of Worst Value

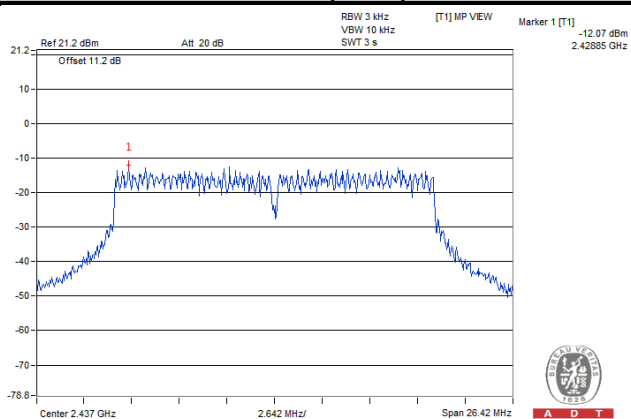
802.11b



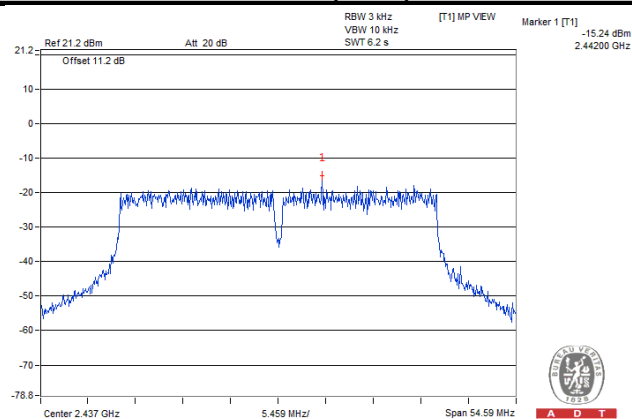
802.11g



802.11n (HT20)



802.11n (HT40)



Mode B

802.11b

TX Chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-9.57	4.77	-4.80	7.30	Pass
	6	2437	-9.40	4.77	-4.63	7.30	Pass
	11	2462	-9.50	4.77	-4.73	7.30	Pass
1	1	2412	-11.24	4.77	-6.47	7.30	Pass
	6	2437	-12.16	4.77	-7.39	7.30	Pass
	11	2462	-11.70	4.77	-6.93	7.30	Pass
2	1	2412	-9.21	4.77	-4.44	7.30	Pass
	6	2437	-8.75	4.77	-3.98	7.30	Pass
	11	2462	-9.10	4.77	-4.33	7.30	Pass

NOTE: Directional gain = 1.93 dBi + 10log(3) = 6.70 dBi > 6 dBi , so the power density limit shall be reduced to 8-(6.70-6) = 7.30 dBm.

802.11g

TX Chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-14.60	4.77	-9.83	7.30	Pass
	6	2437	-10.50	4.77	-5.73	7.30	Pass
	11	2462	-14.15	4.77	-9.38	7.30	Pass
1	1	2412	-16.18	4.77	-11.41	7.30	Pass
	6	2437	-13.55	4.77	-8.78	7.30	Pass
	11	2462	-16.14	4.77	-11.37	7.30	Pass
2	1	2412	-14.40	4.77	-9.63	7.30	Pass
	6	2437	-10.57	4.77	-5.80	7.30	Pass
	11	2462	-12.91	4.77	-8.14	7.30	Pass

NOTE: Directional gain = 1.93 dBi + 10log(3) = 6.70 dBi > 6 dBi , so the power density limit shall be reduced to 8-(6.70-6) = 7.30 dBm.

802.11n (HT20)

TX Chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-15.00	4.77	-10.23	7.30	Pass
	6	2437	-12.48	4.77	-7.71	7.30	Pass
	11	2462	-14.78	4.77	-10.01	7.30	Pass
1	1	2412	-17.66	4.77	-12.89	7.30	Pass
	6	2437	-14.87	4.77	-10.10	7.30	Pass
	11	2462	-18.14	4.77	-13.37	7.30	Pass
2	1	2412	-15.37	4.77	-10.60	7.30	Pass
	6	2437	-12.07	4.77	-7.30	7.30	Pass
	11	2462	-13.12	4.77	-8.35	7.30	Pass

NOTE: Directional gain = 1.93 dBi + 10log(3) = 6.70 dBi > 6 dBi , so the power density limit shall be reduced to 8-(6.70-6) = 7.30 dBm.

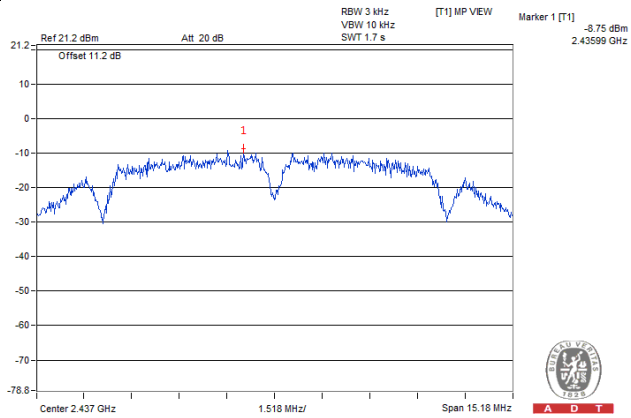
802.11n (HT40)

TX Chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	3	2422	-20.70	4.77	-15.93	7.30	Pass
	6	2437	-15.88	4.77	-11.11	7.30	Pass
	9	2452	-21.54	4.77	-16.77	7.30	Pass
1	3	2422	-23.23	4.77	-18.46	7.30	Pass
	6	2437	-19.44	4.77	-14.67	7.30	Pass
	9	2452	-23.67	4.77	-18.90	7.30	Pass
2	3	2422	-20.95	4.77	-16.18	7.30	Pass
	6	2437	-17.78	4.77	-13.01	7.30	Pass
	9	2452	-20.68	4.77	-15.91	7.30	Pass

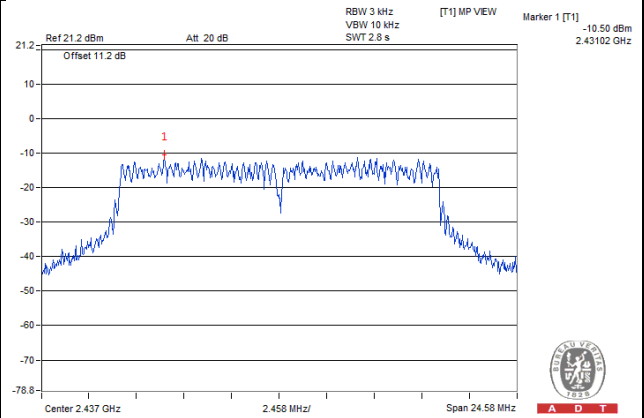
NOTE: Directional gain = 1.93 dBi + 10log(3) = 6.70 dBi > 6 dBi , so the power density limit shall be reduced to 8-(6.70-6) = 7.30 dBm.

Spectrum Plot of Worst Value

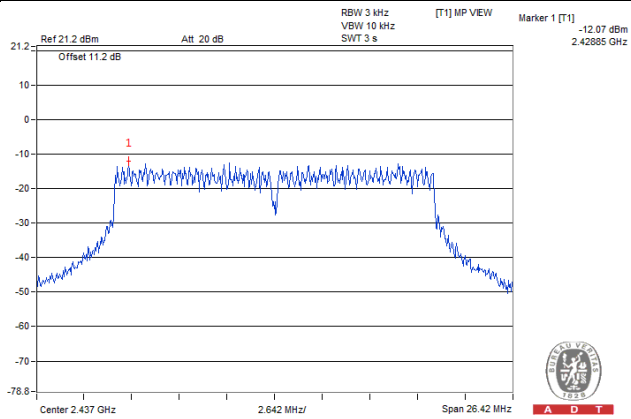
802.11b



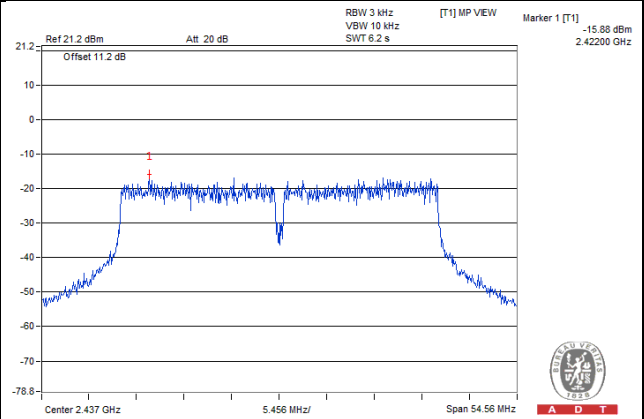
802.11g



802.11n (HT20)



802.11n (HT40)

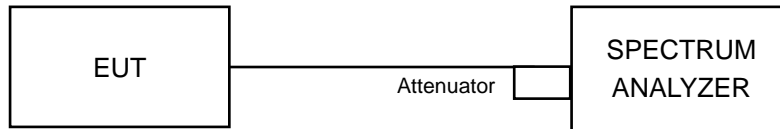


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

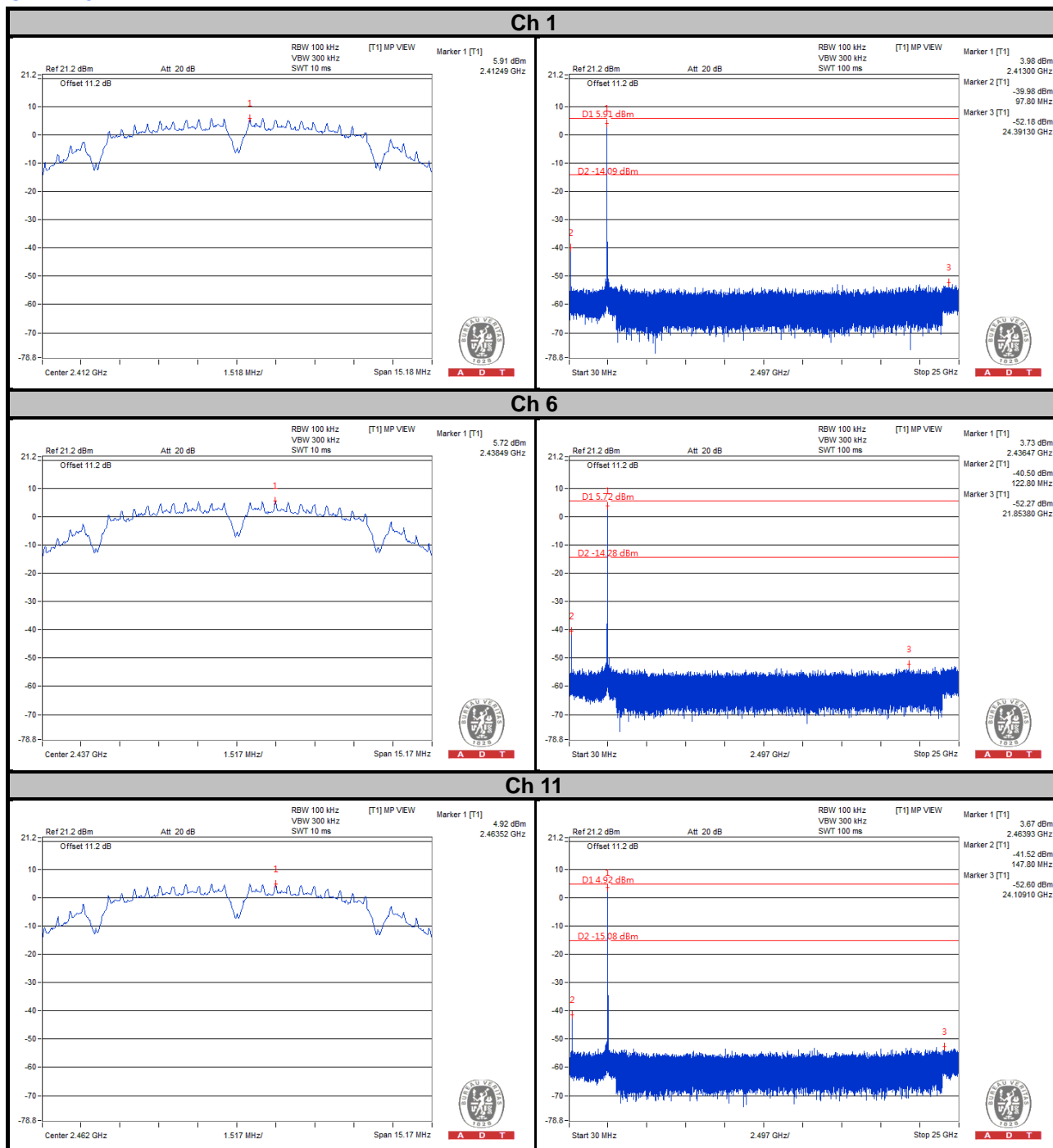
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

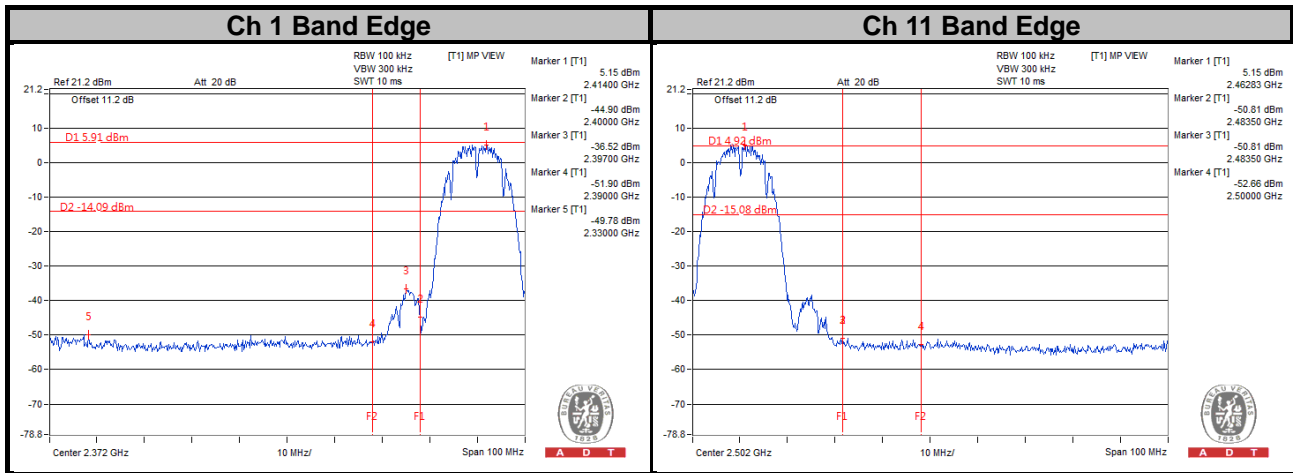
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20 dB offset below D1. It shows compliance with the requirement.

Mode A

802.11b

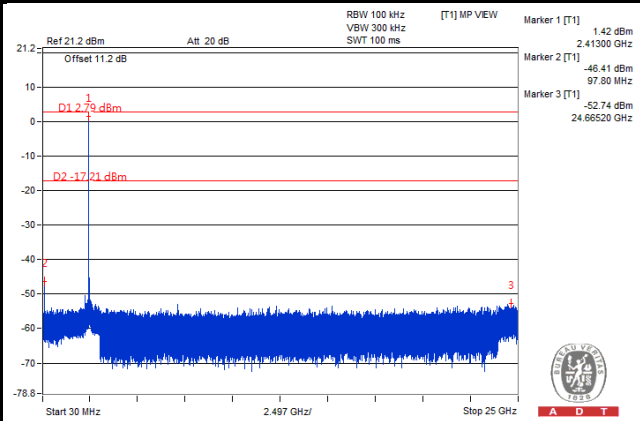
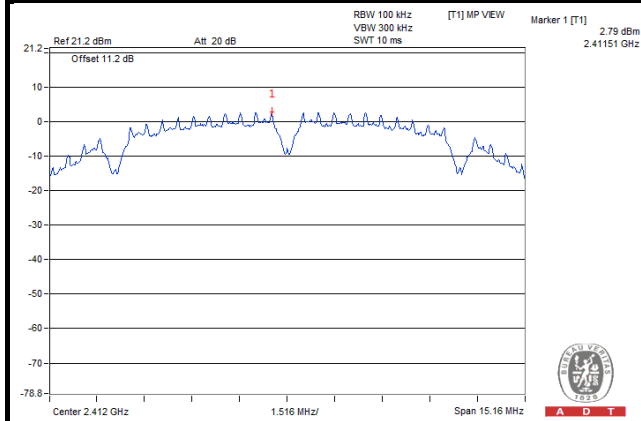
CHAIN 0



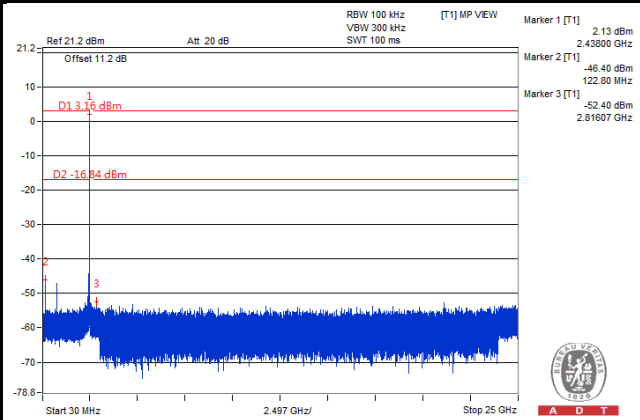
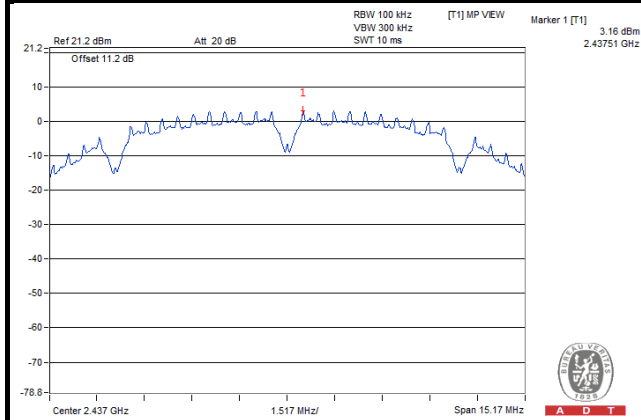


CHAIN 1

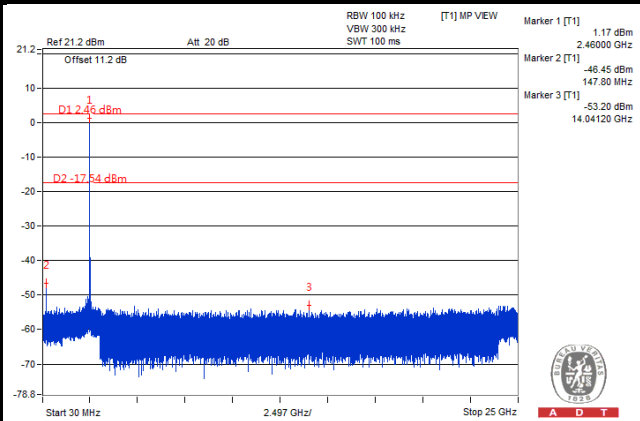
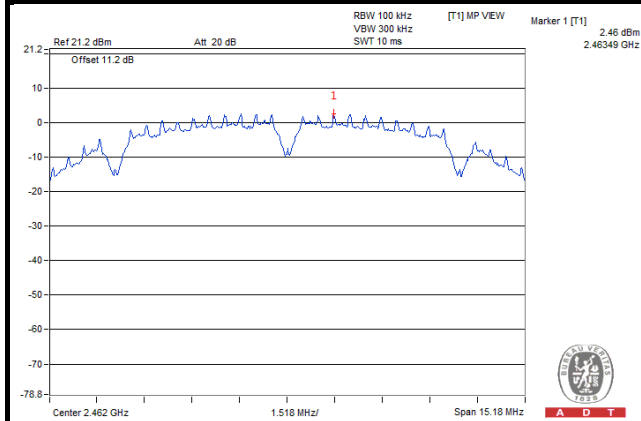
Ch 1

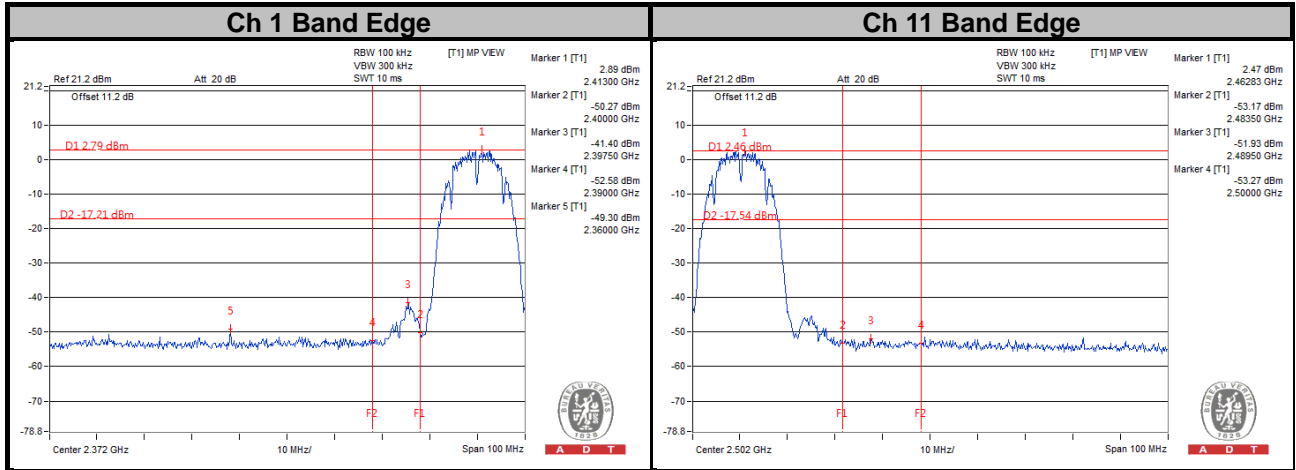


Ch 6



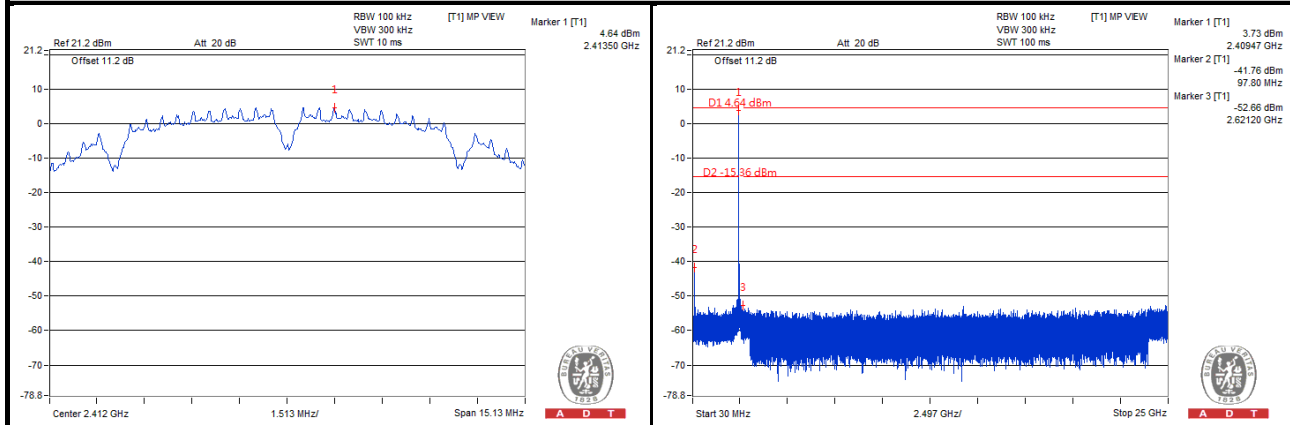
Ch 11



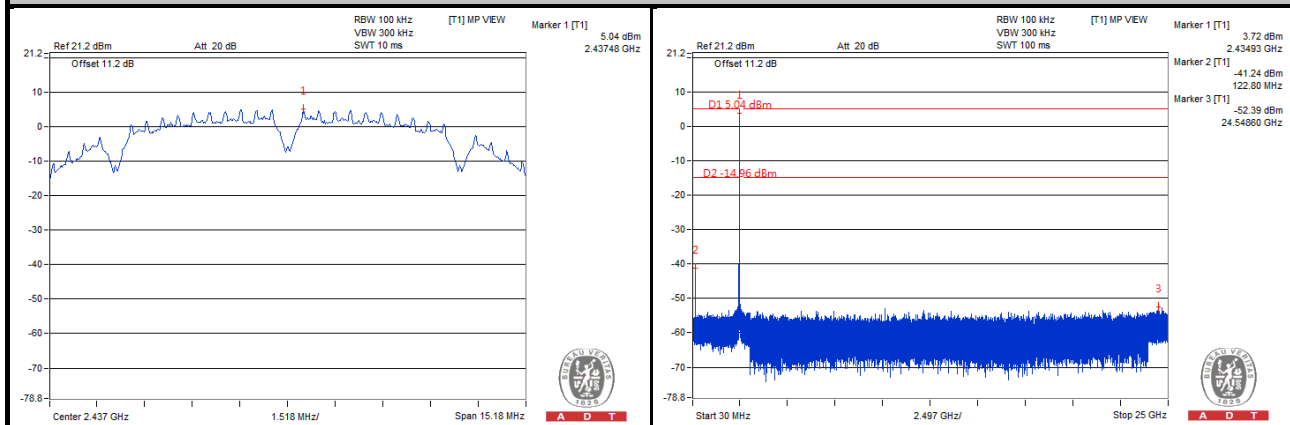


CHAIN 2

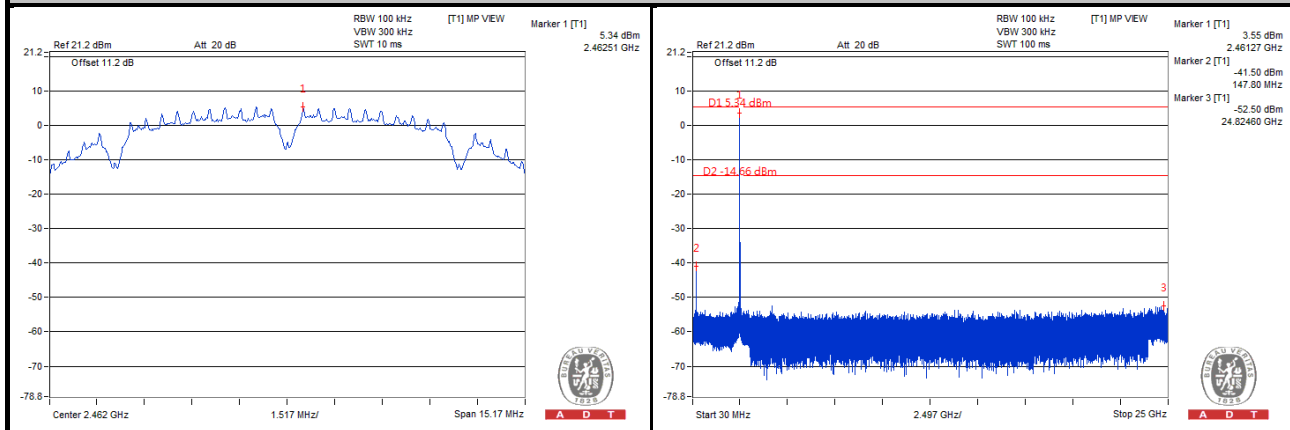
Ch 1

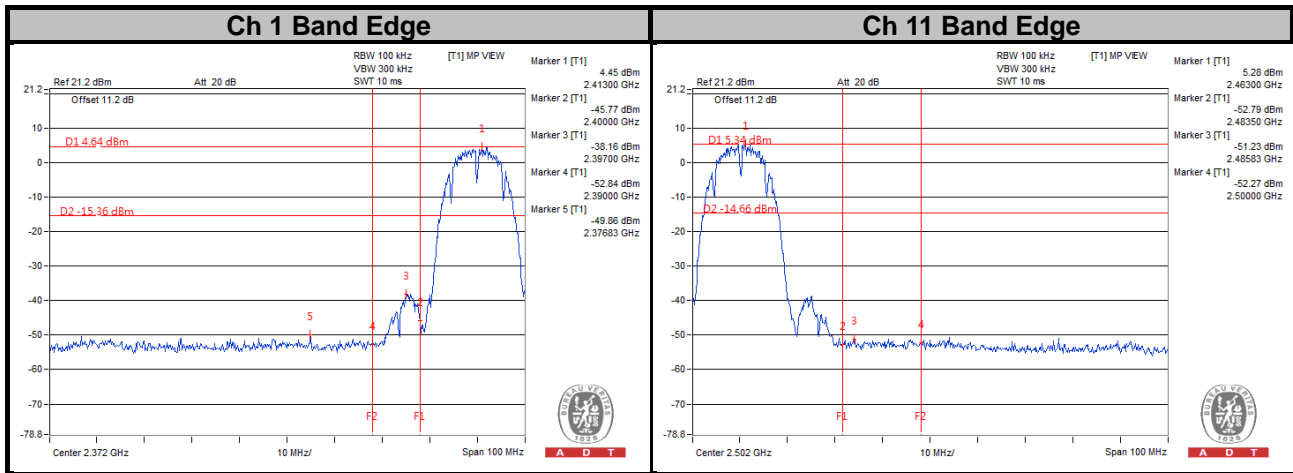


Ch 6



Ch 11

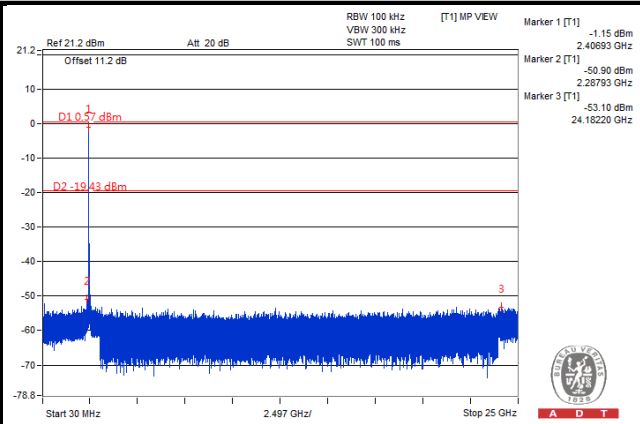
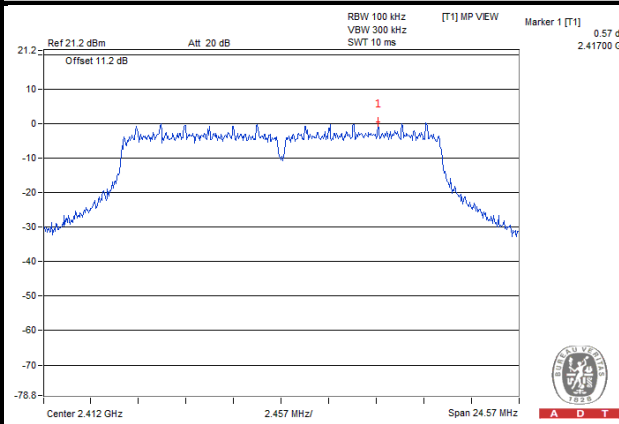




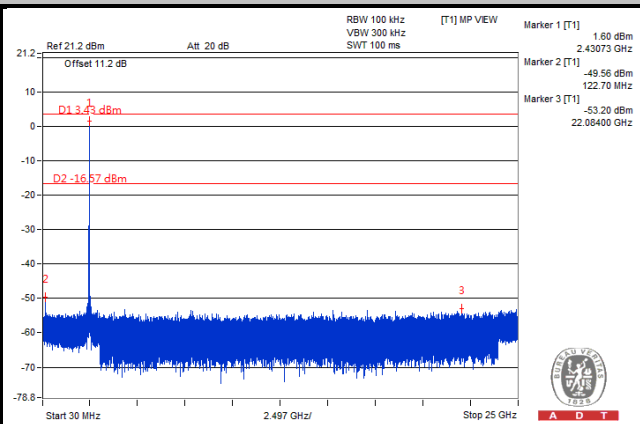
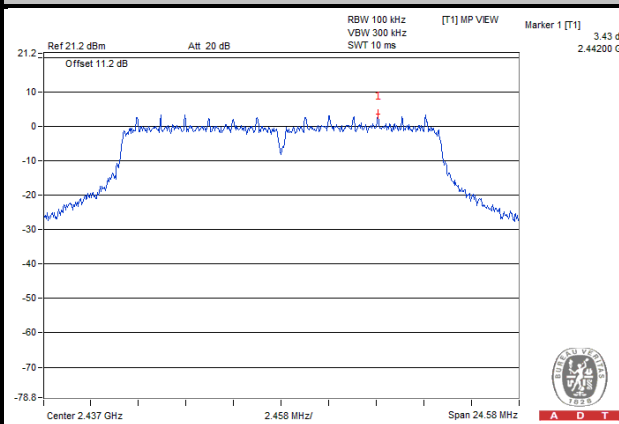
802.11g

CHAIN 0

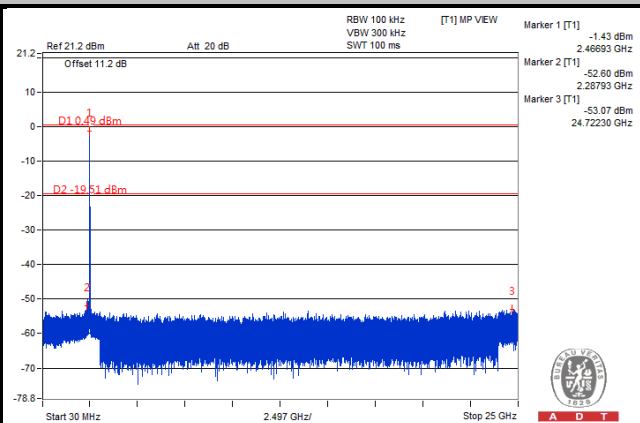
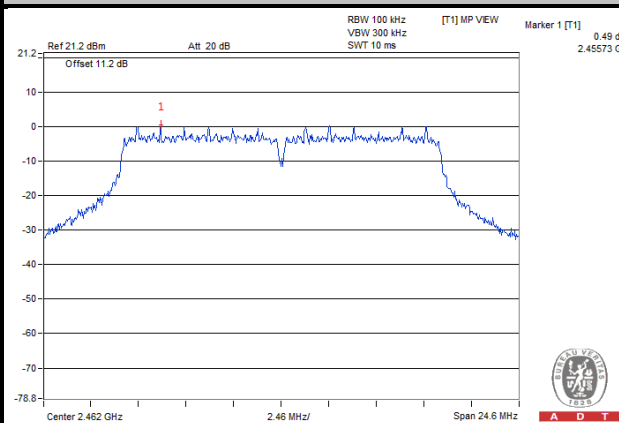
Ch 1

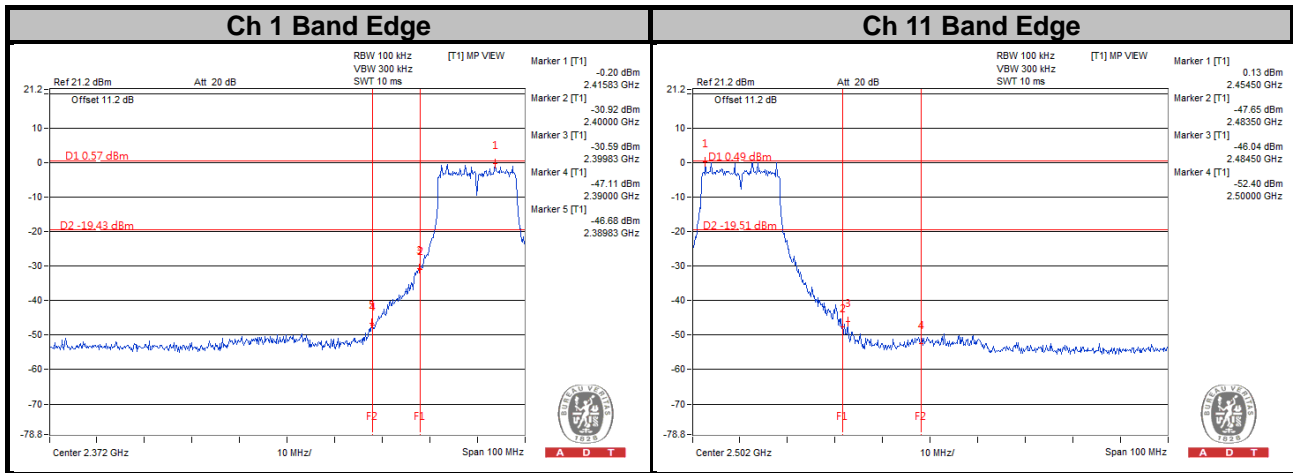


Ch 6



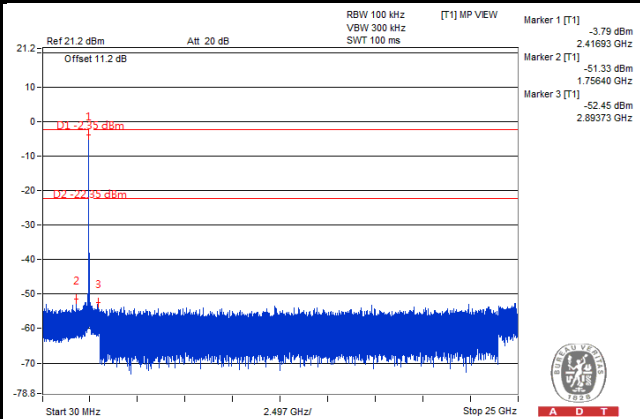
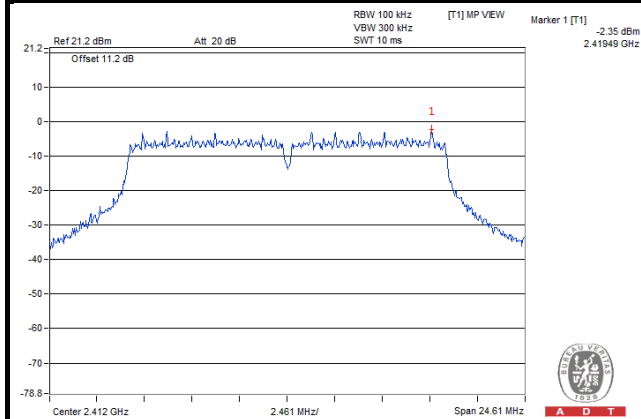
Ch 11



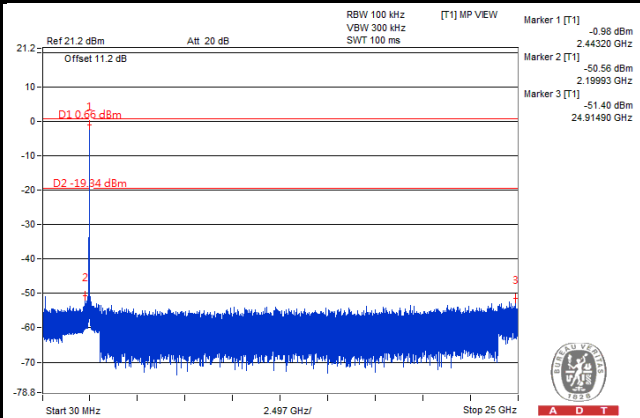
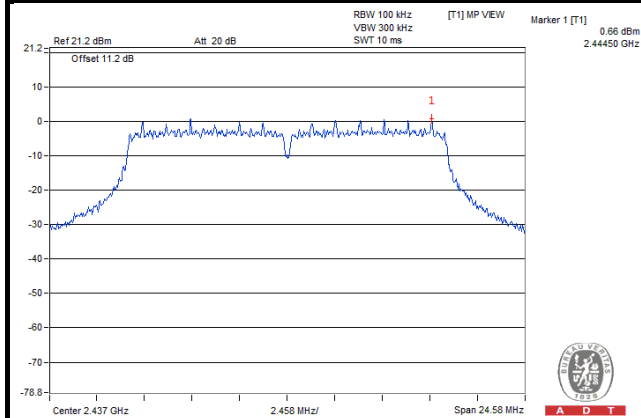


CHAIN 1

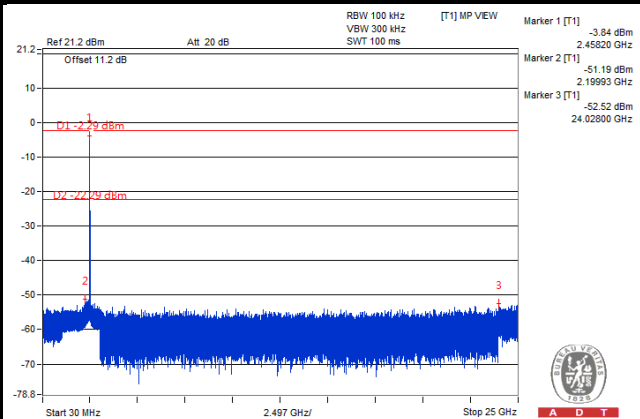
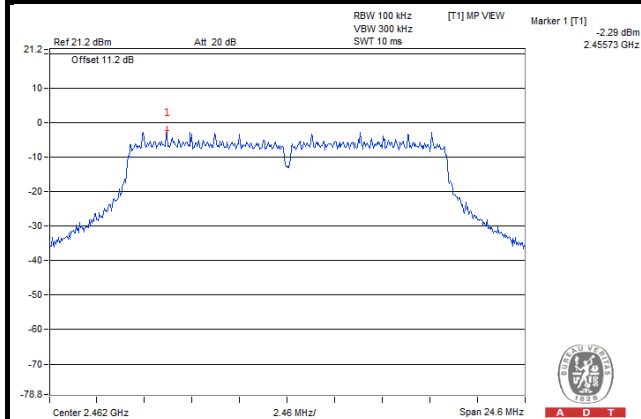
Ch 1

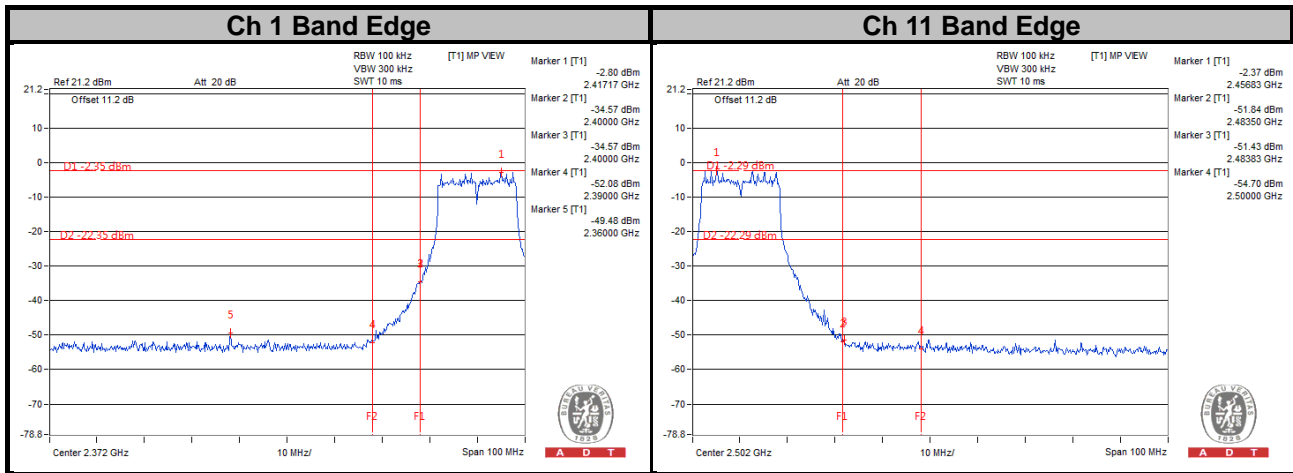


Ch 6



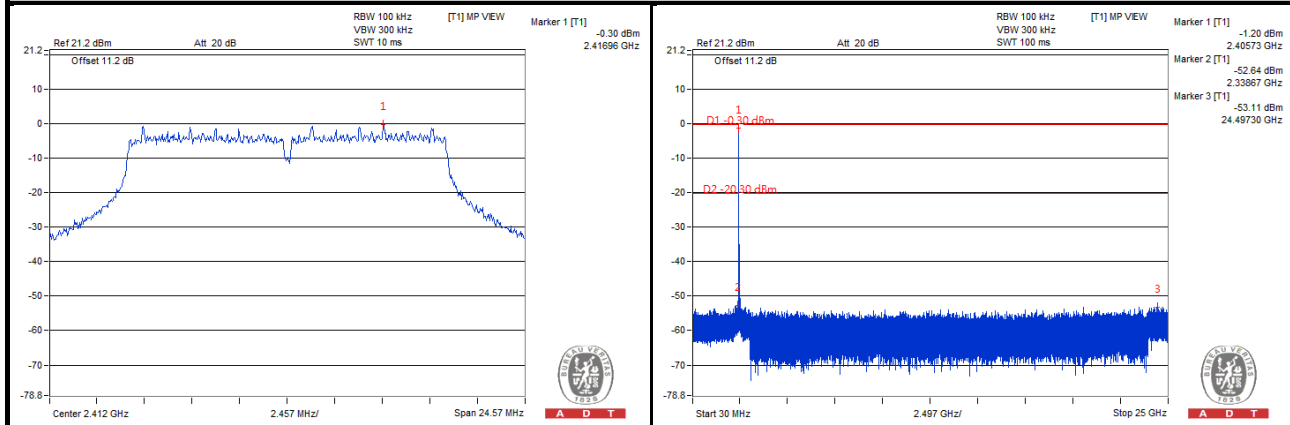
Ch 11



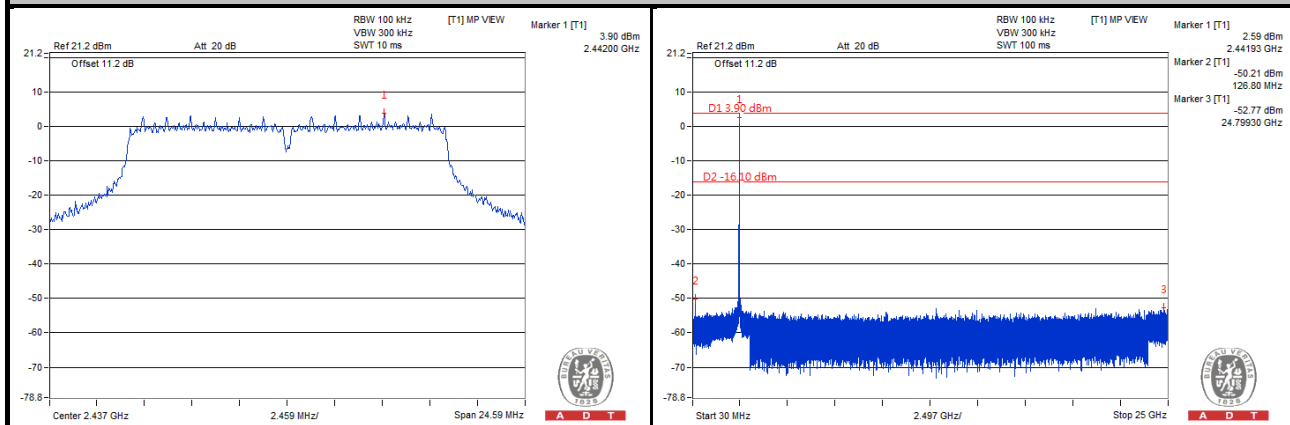


CHAIN 2

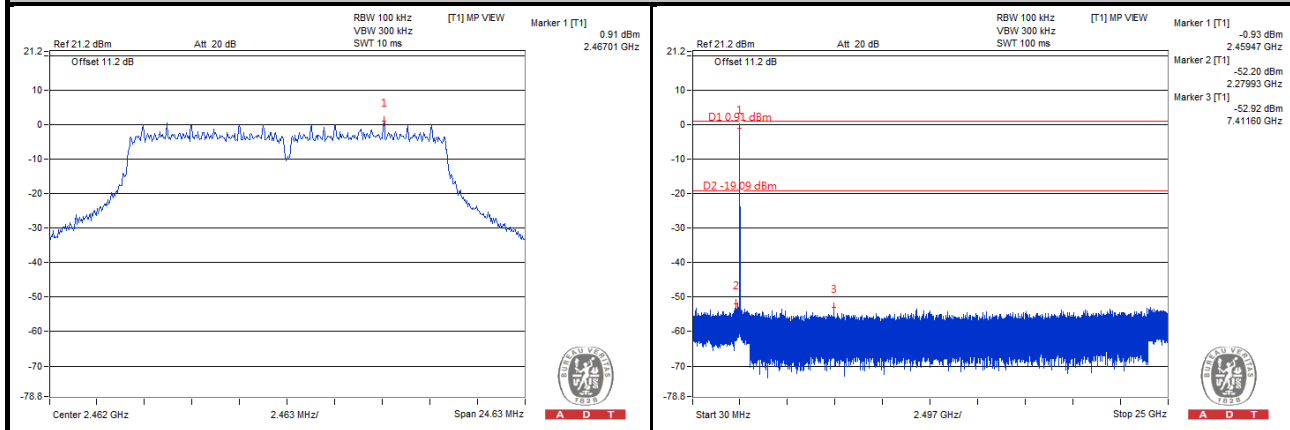
Ch 1

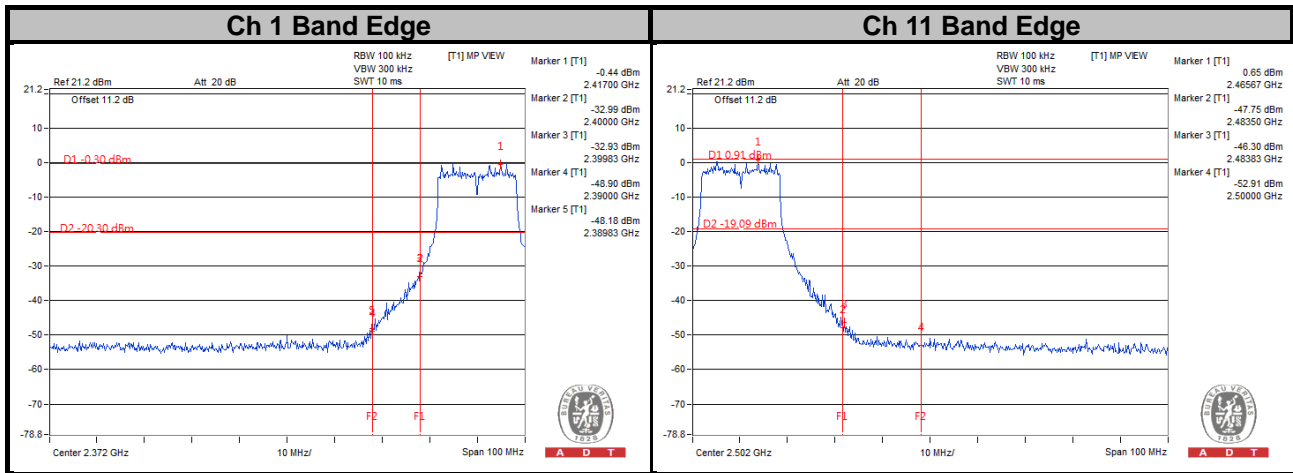


Ch 6



Ch 11

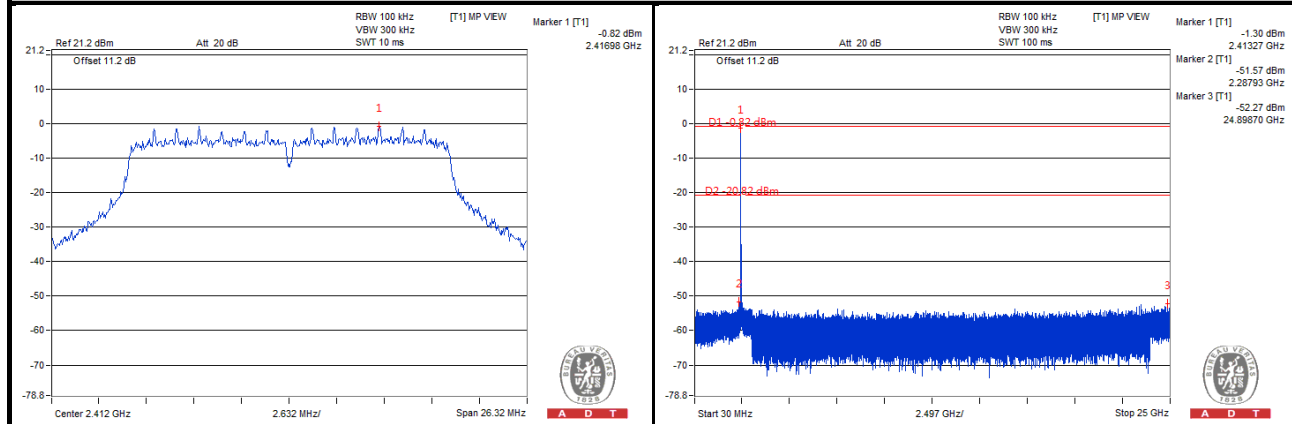




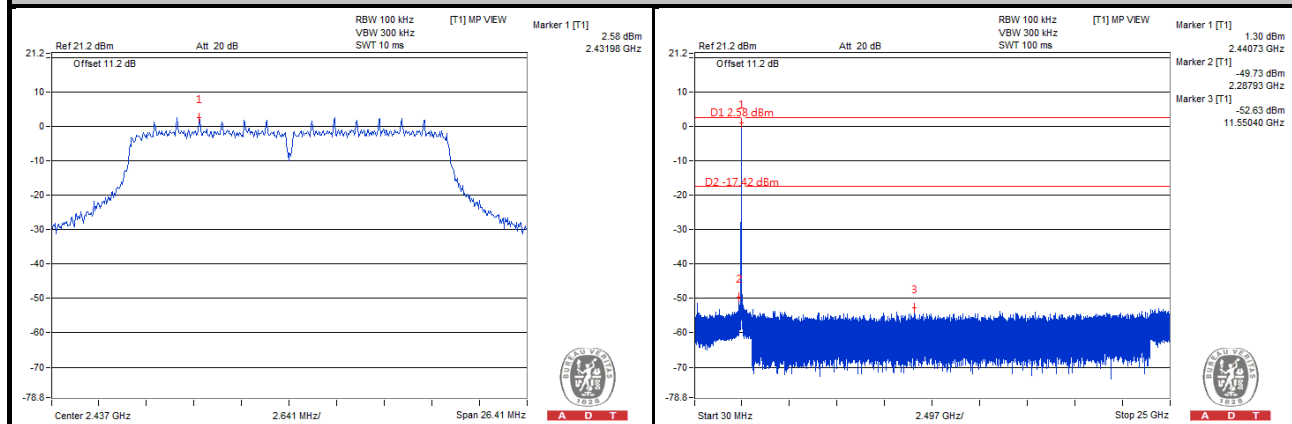
802.11n (HT20)

CHAIN 0

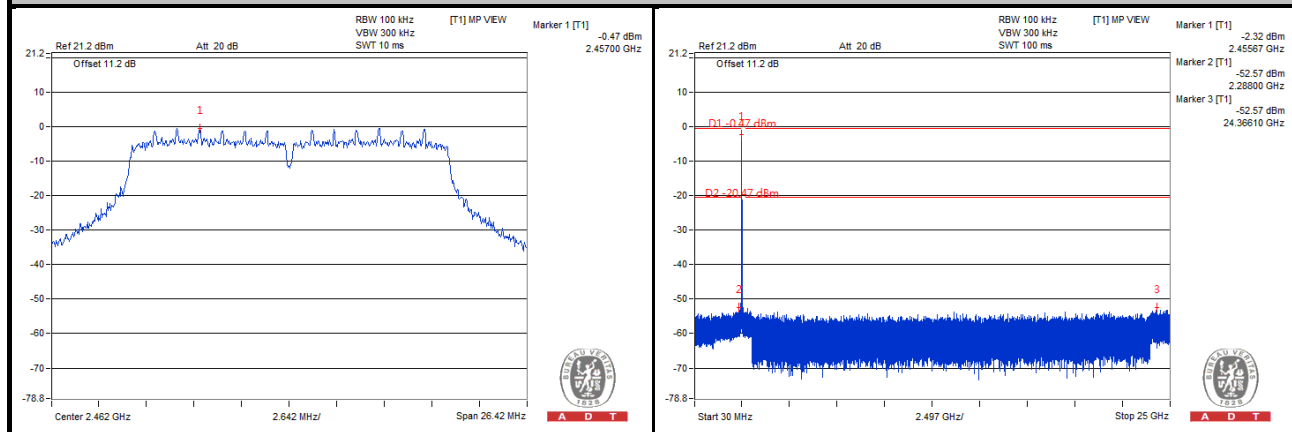
Ch 1

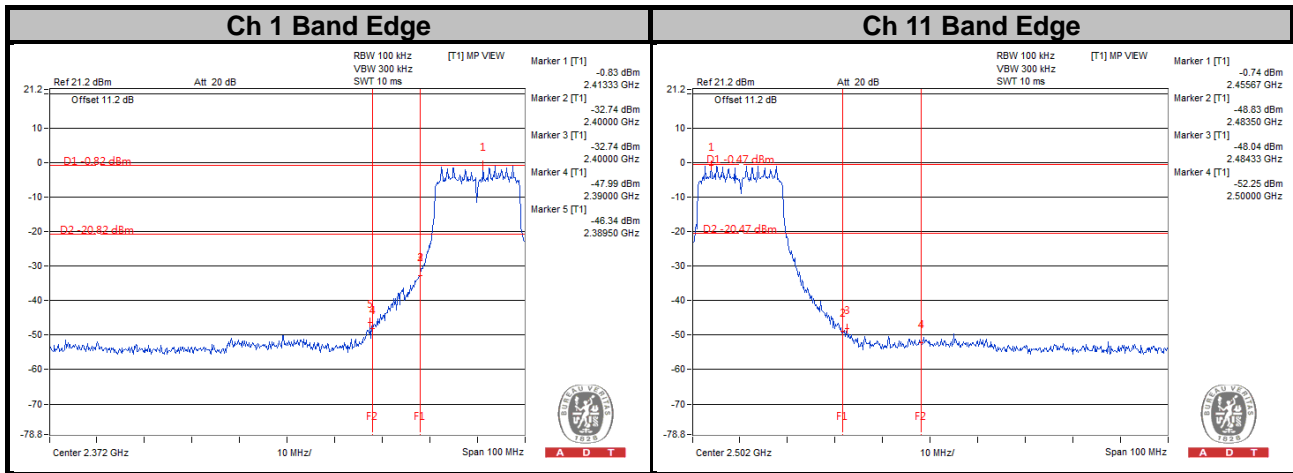


Ch 6



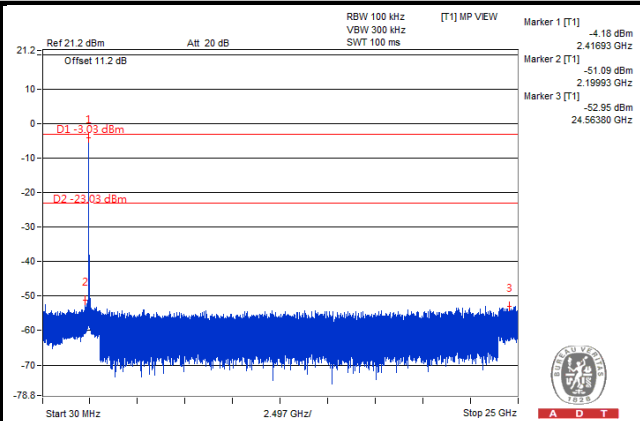
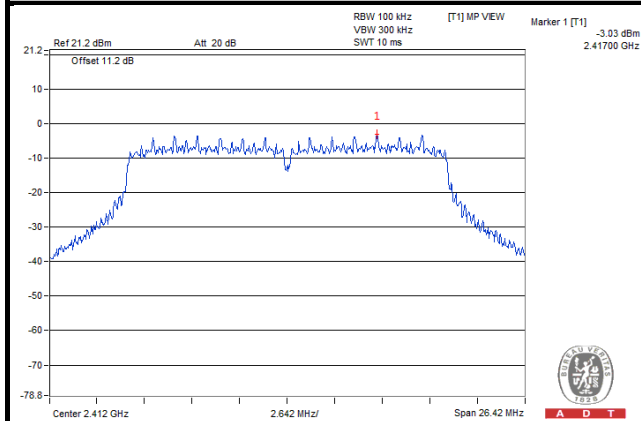
Ch 11



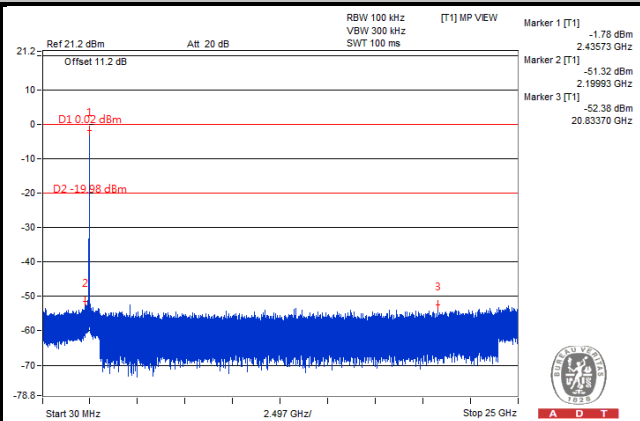
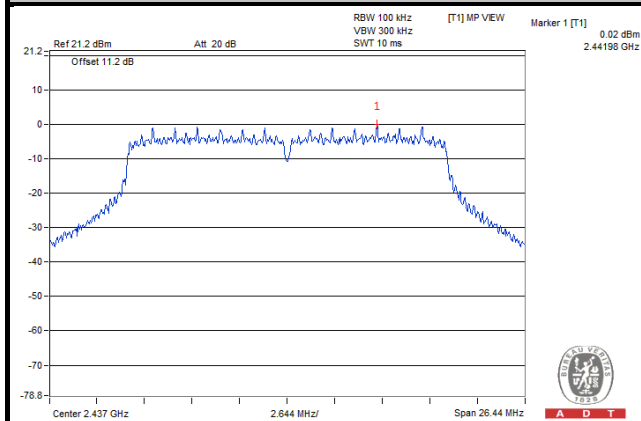


CHAIN 1

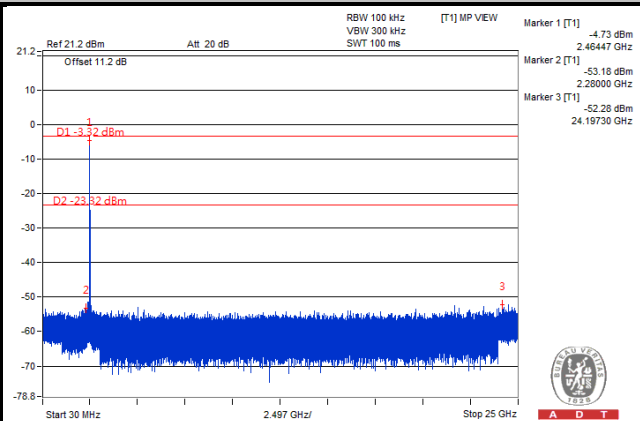
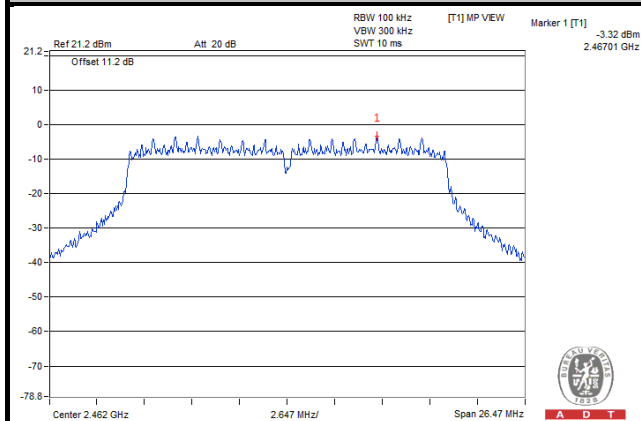
Ch 1

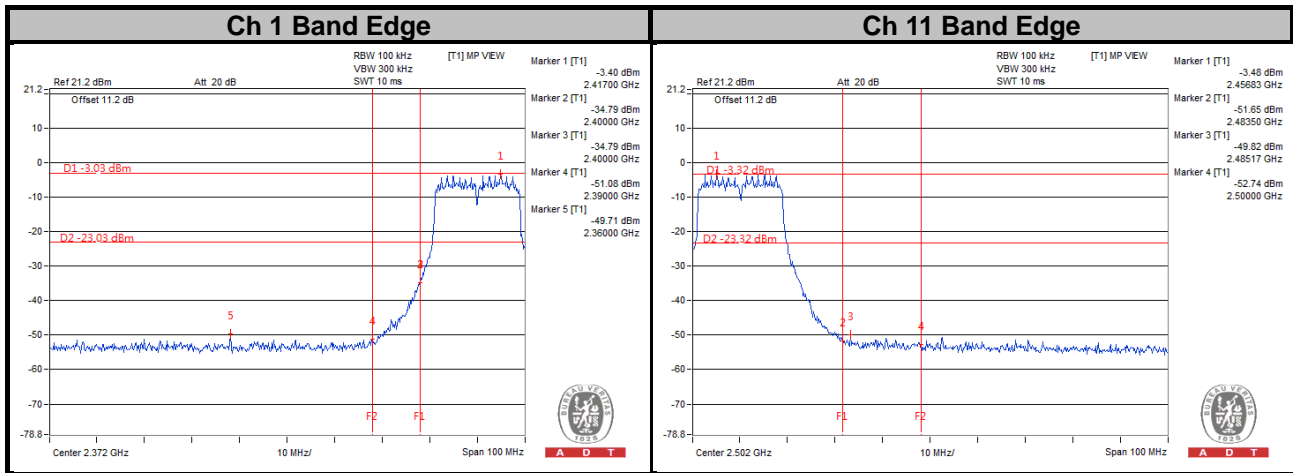


Ch 6



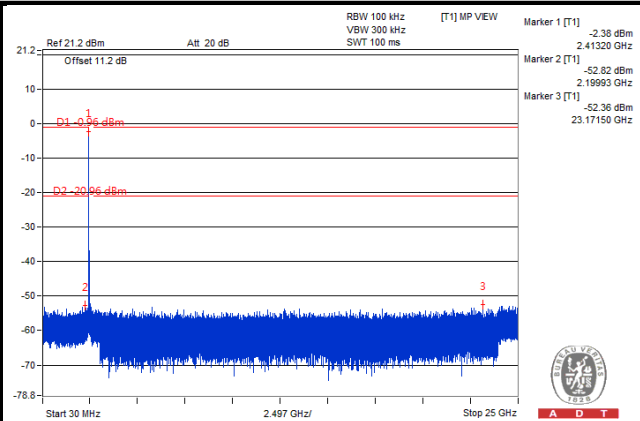
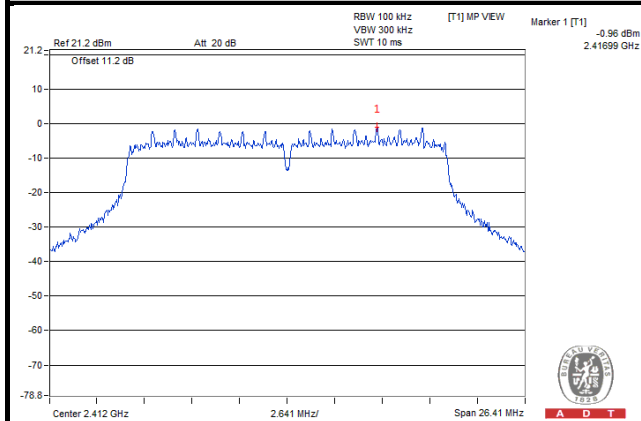
Ch 11



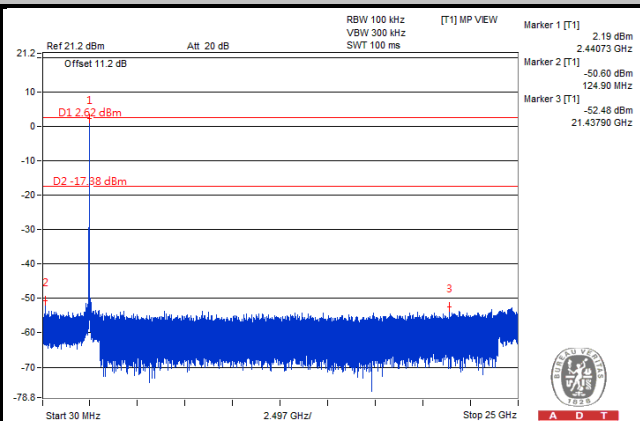
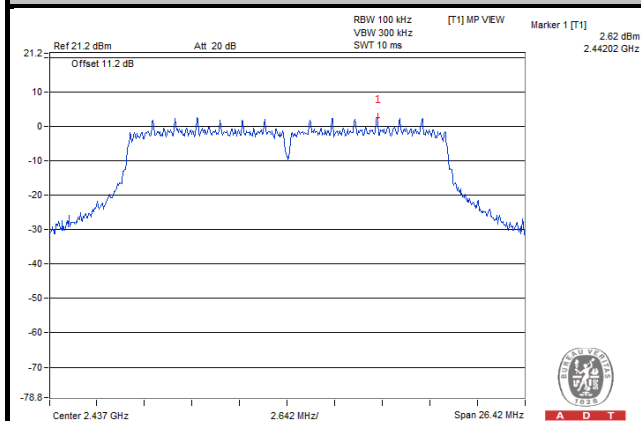


CHAIN 2

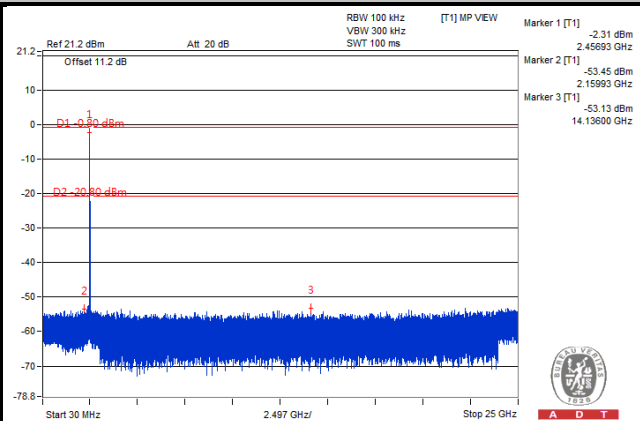
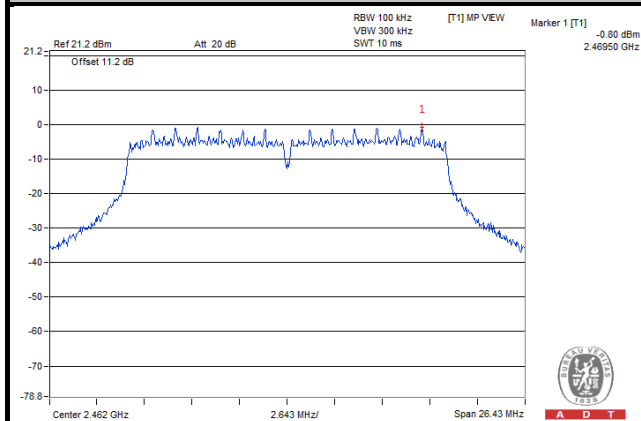
Ch 1

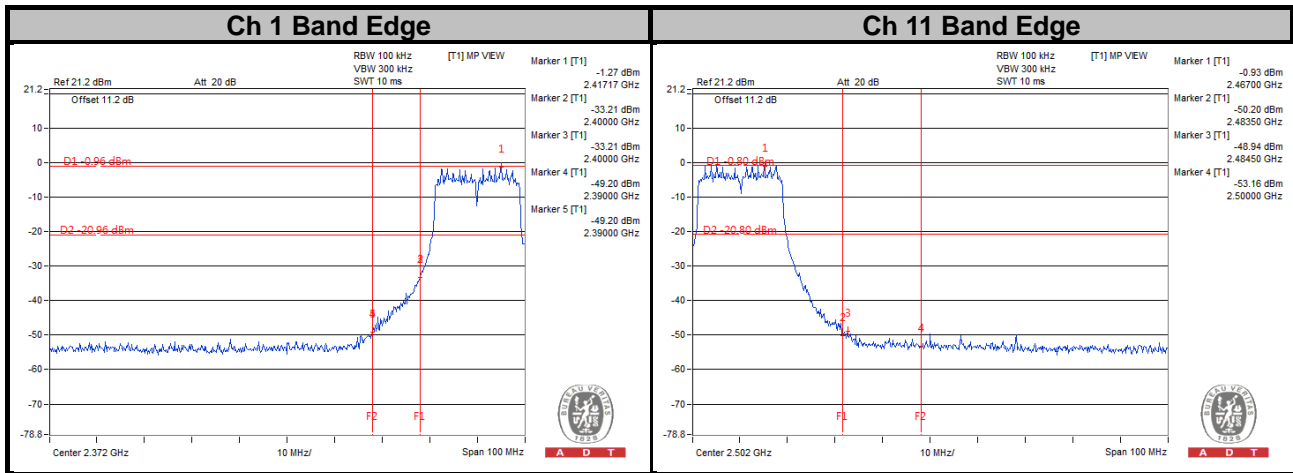


Ch 6



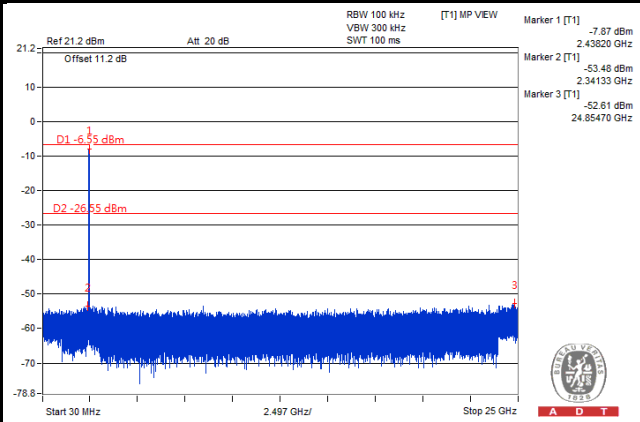
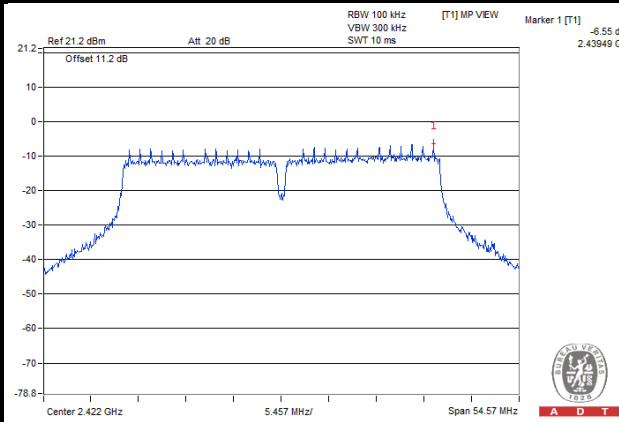
Ch 11



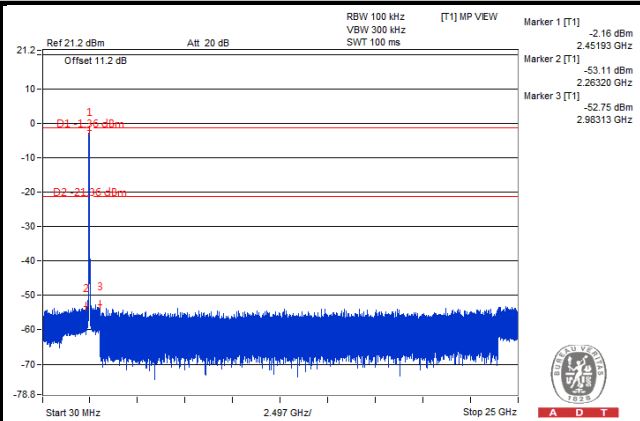
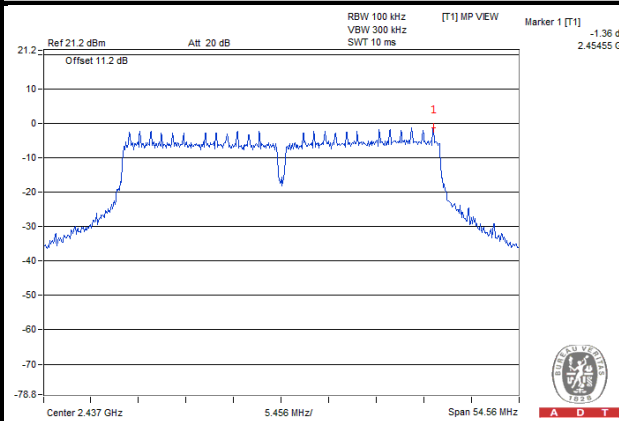


802.11n (HT40) CHAIN 0

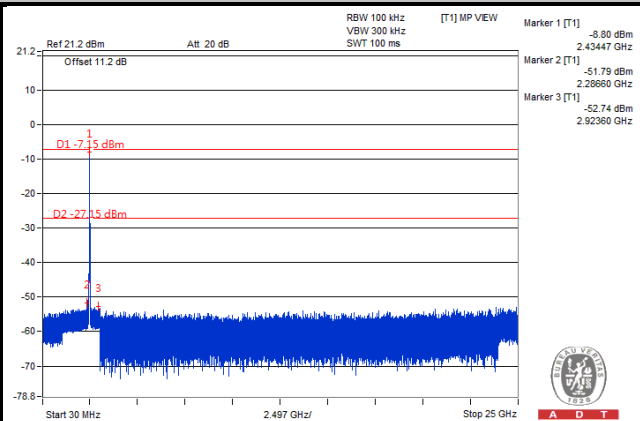
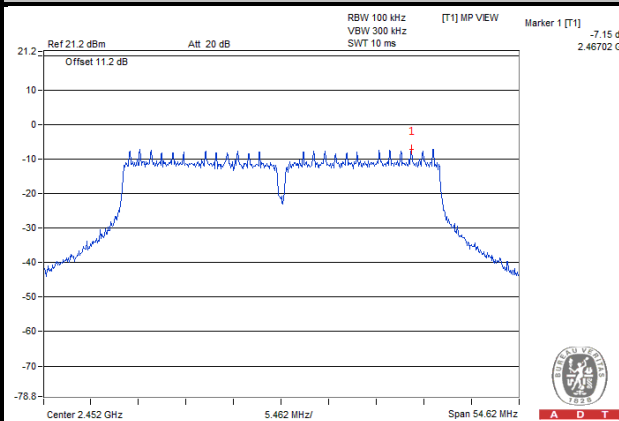
Ch 3

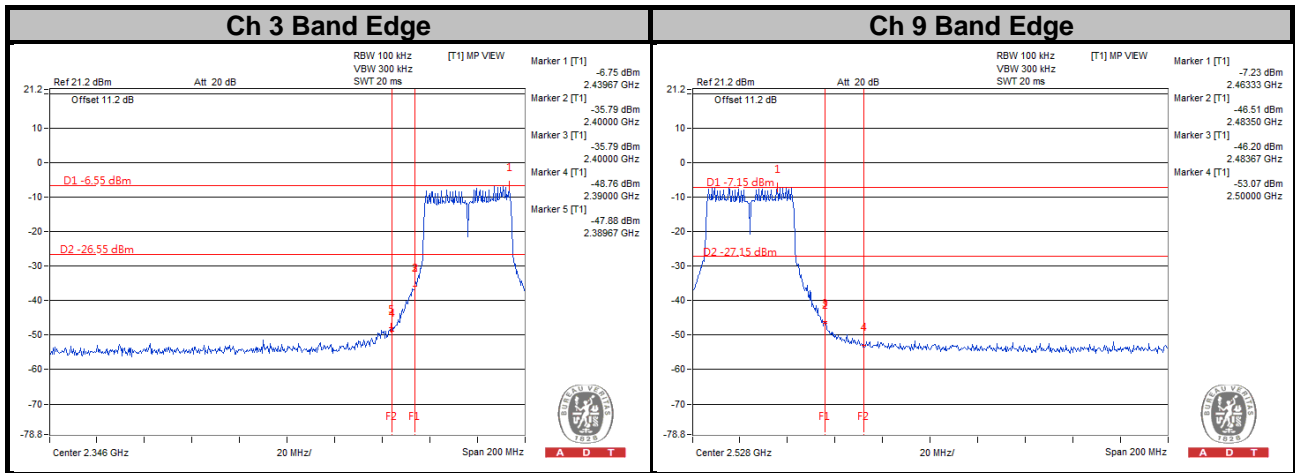


Ch 6



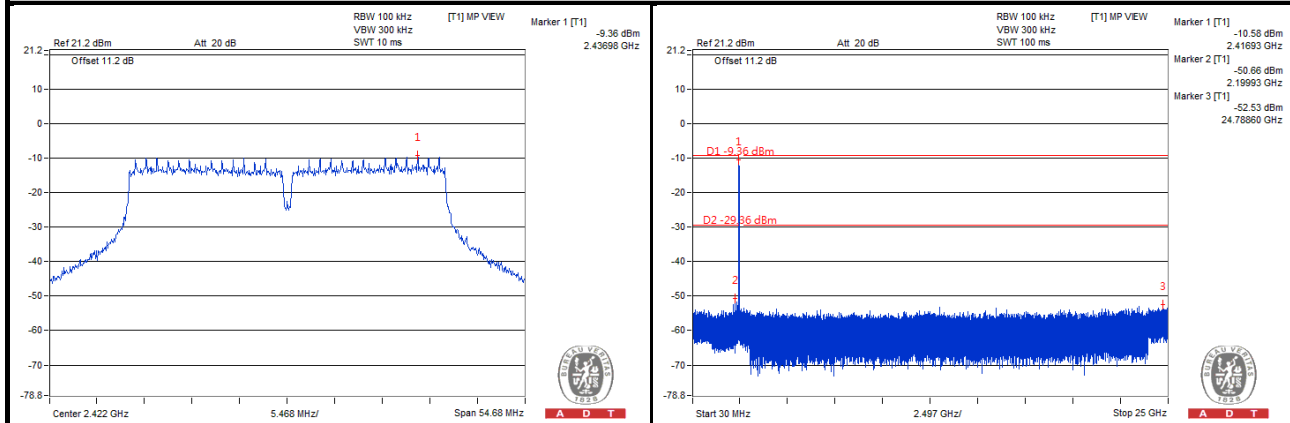
Ch 9



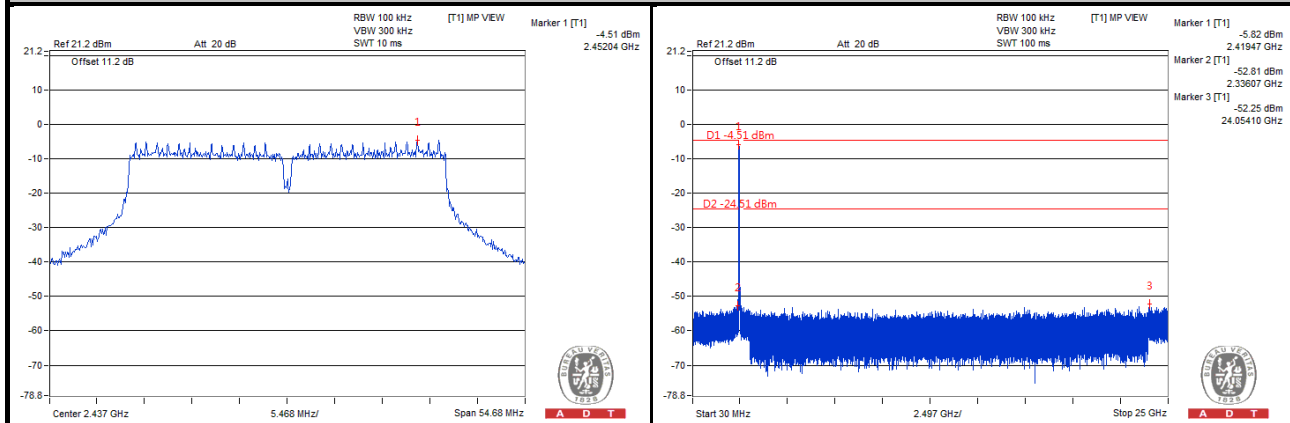


CHAIN 1

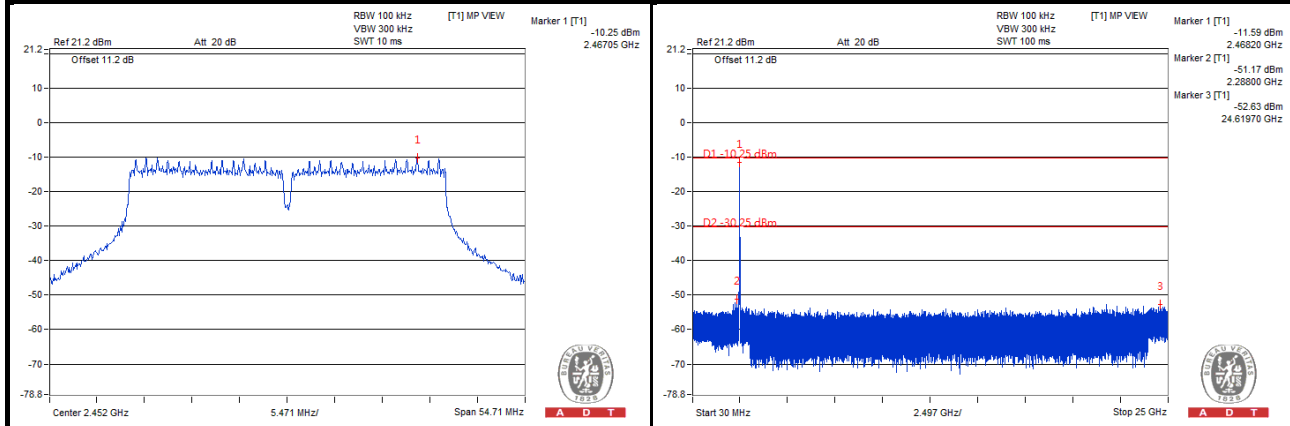
Ch 3

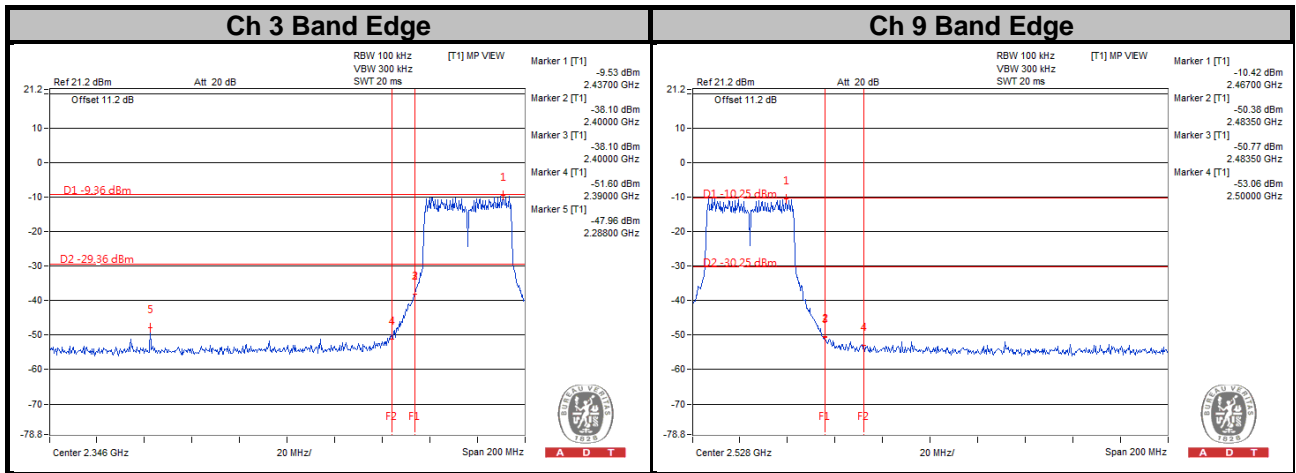


Ch 6



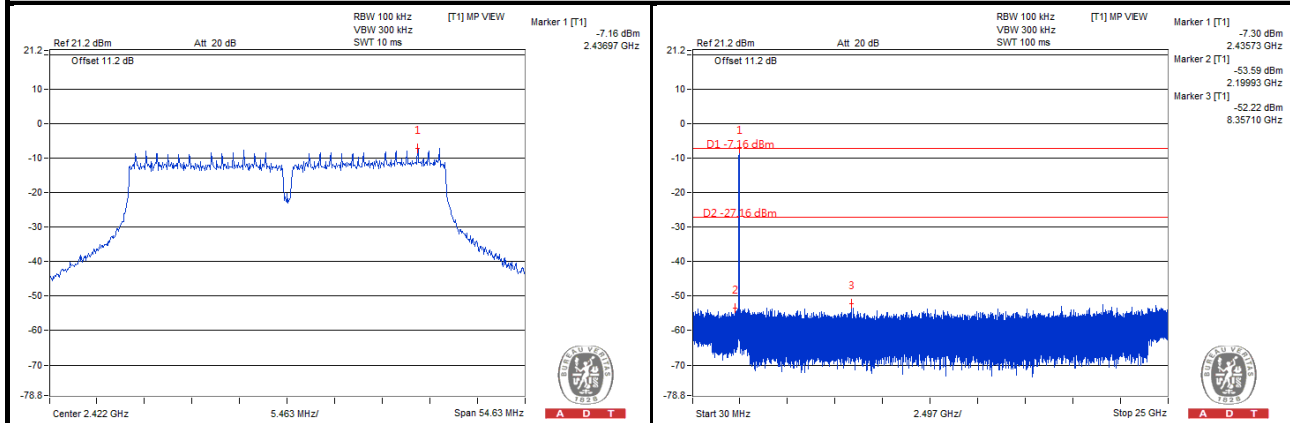
Ch 9



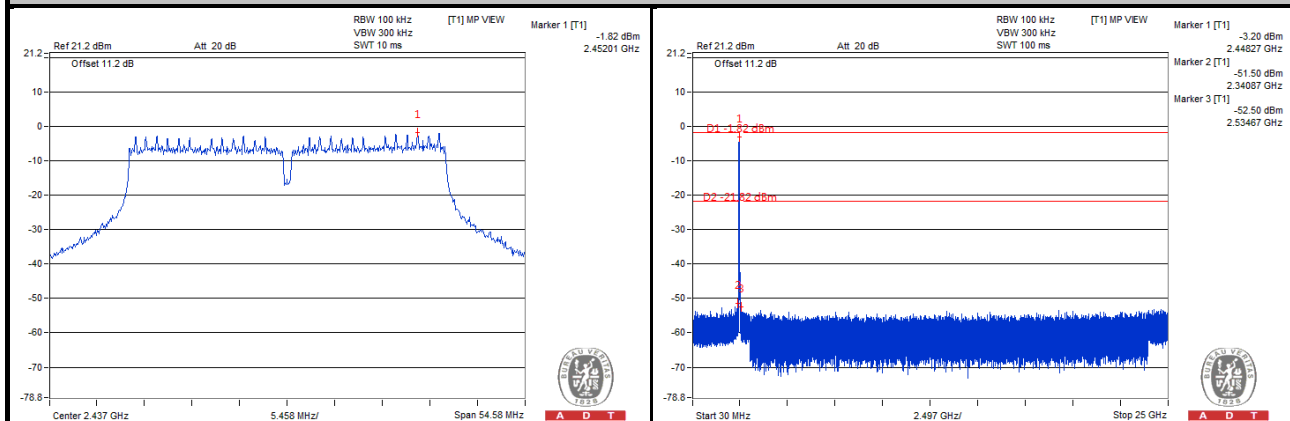


CHAIN 2

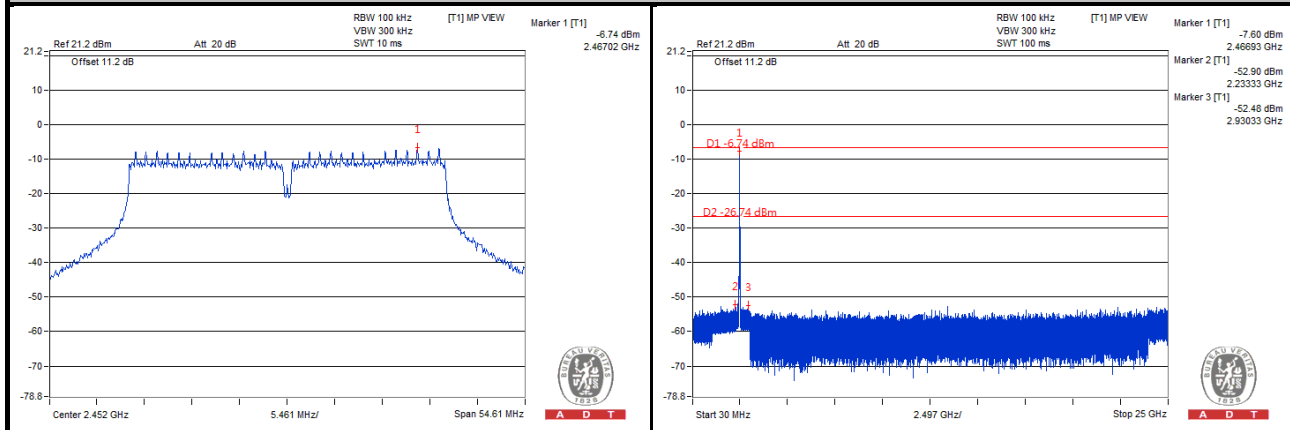
Ch 3

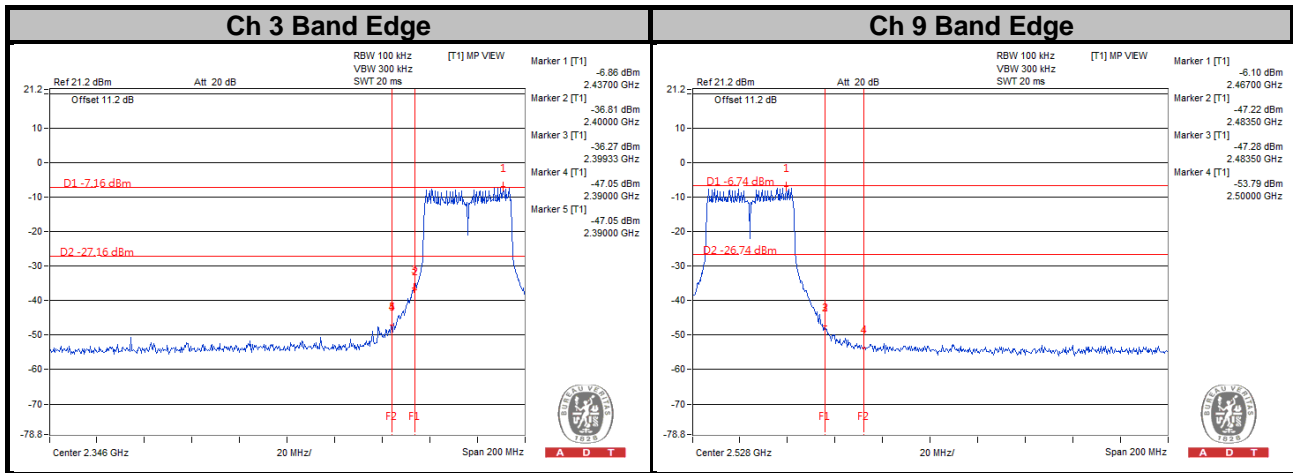


Ch 6



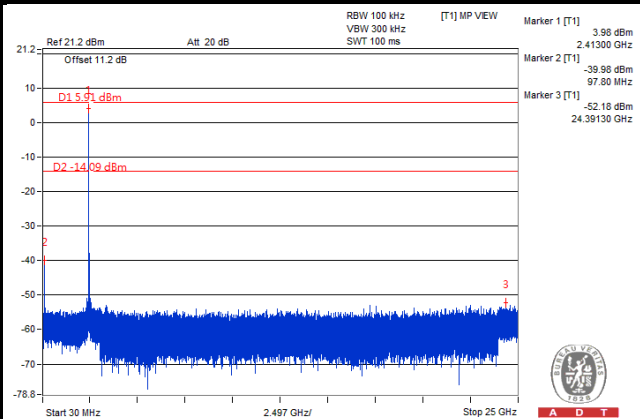
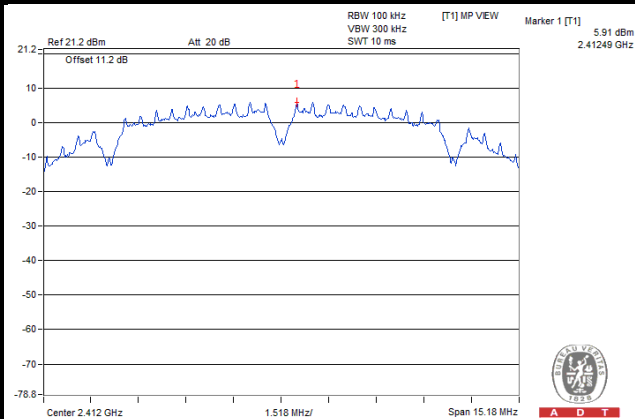
Ch 9



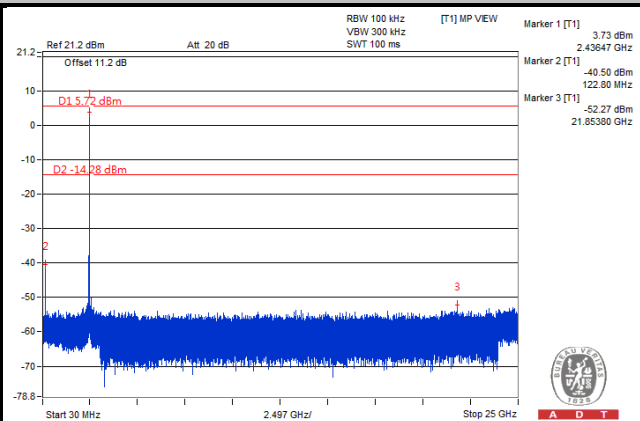
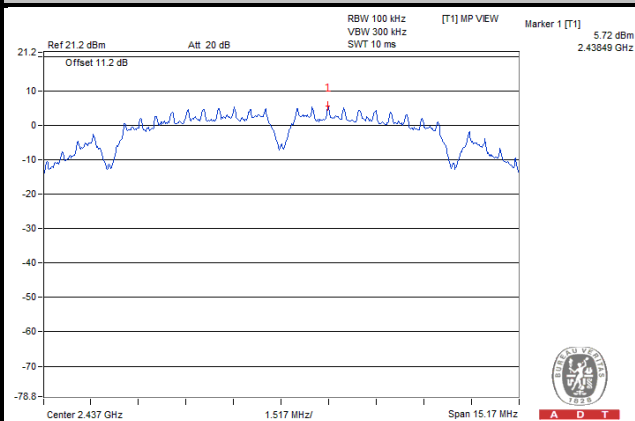


Mode B
802.11b
CHAIN 0

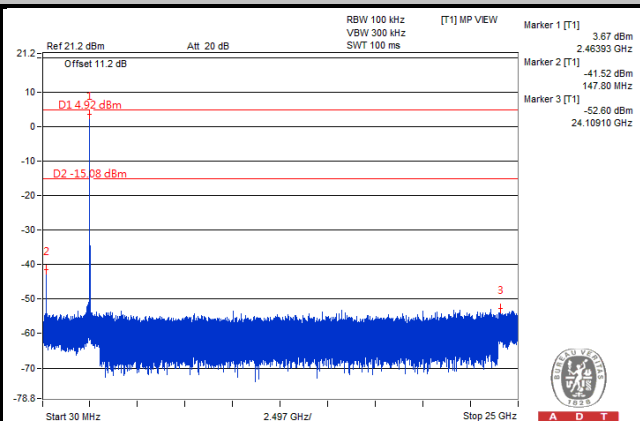
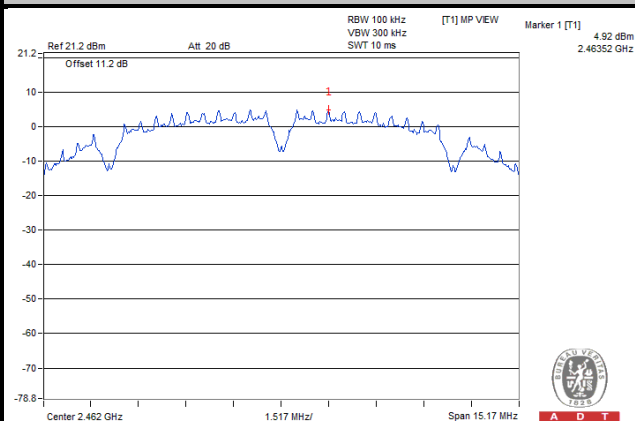
Ch 1

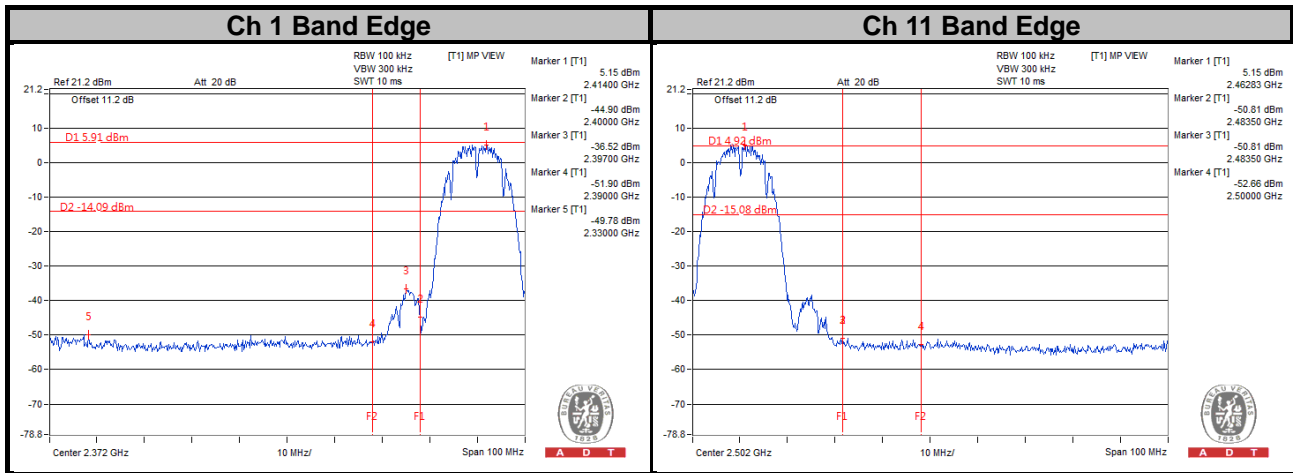


Ch 6



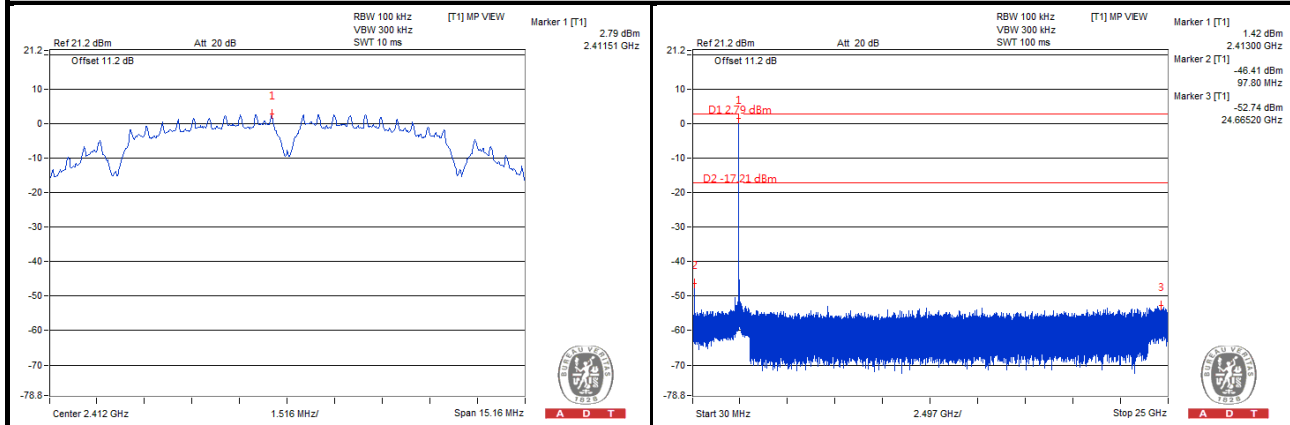
Ch 11



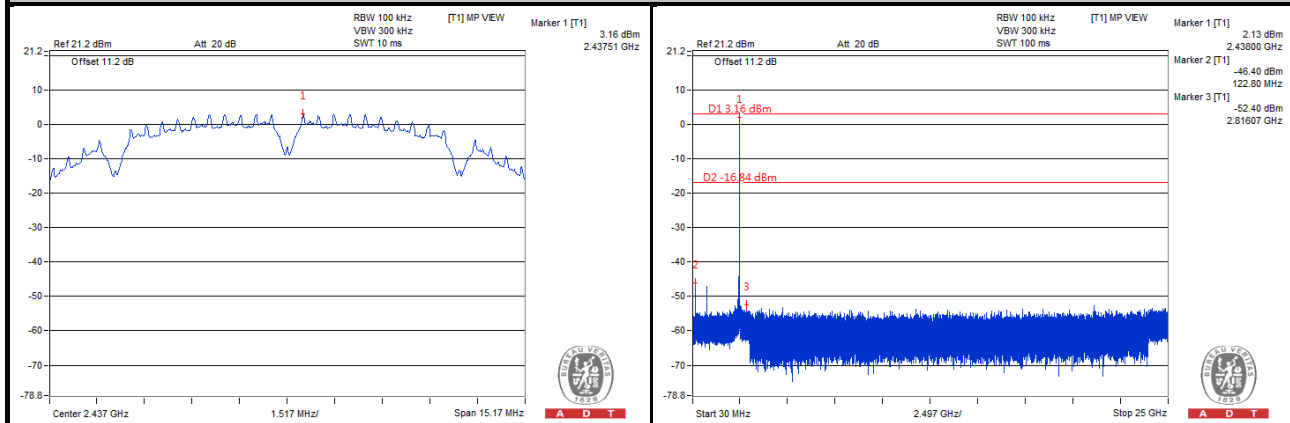


CHAIN 1

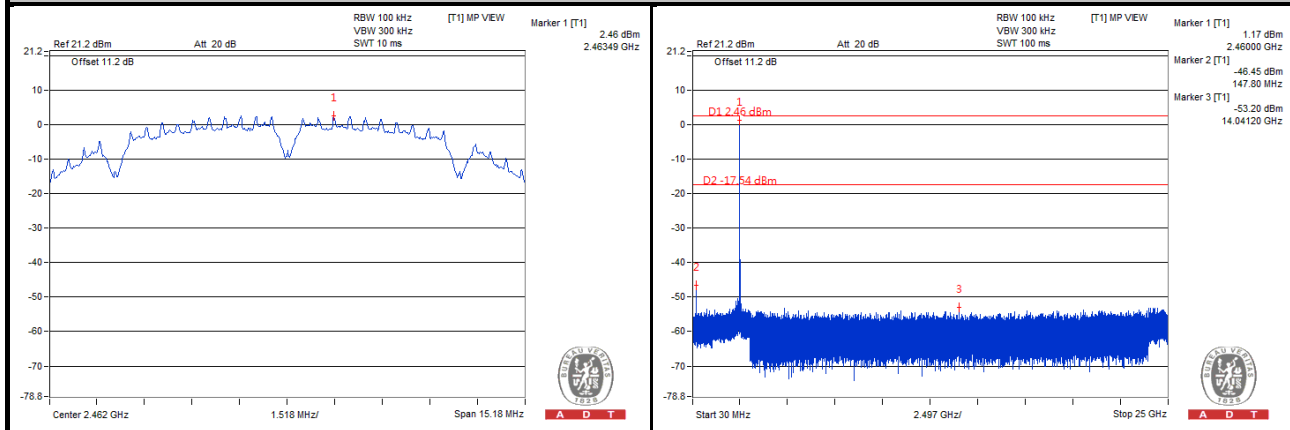
Ch 1

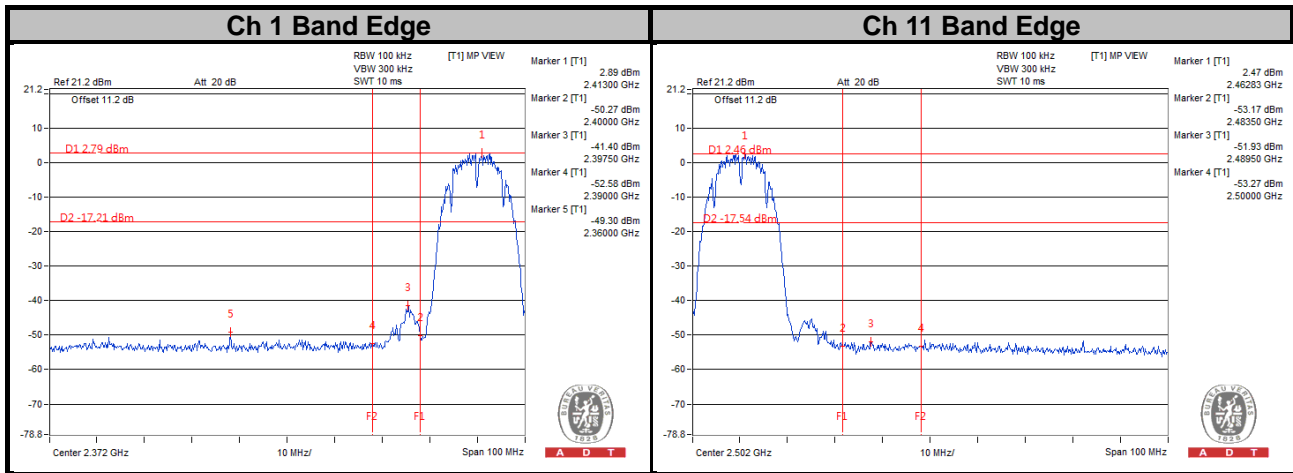


Ch 6



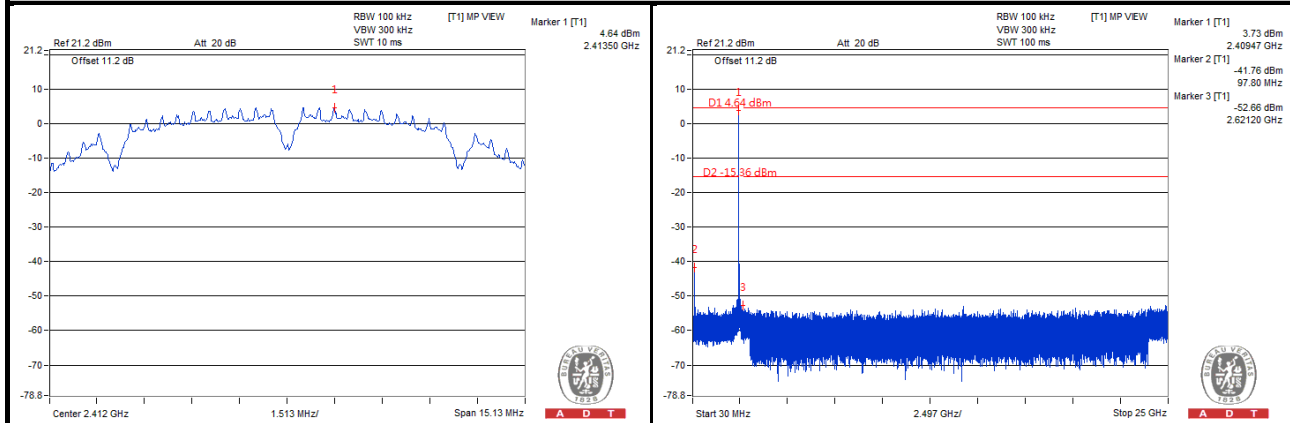
Ch 11



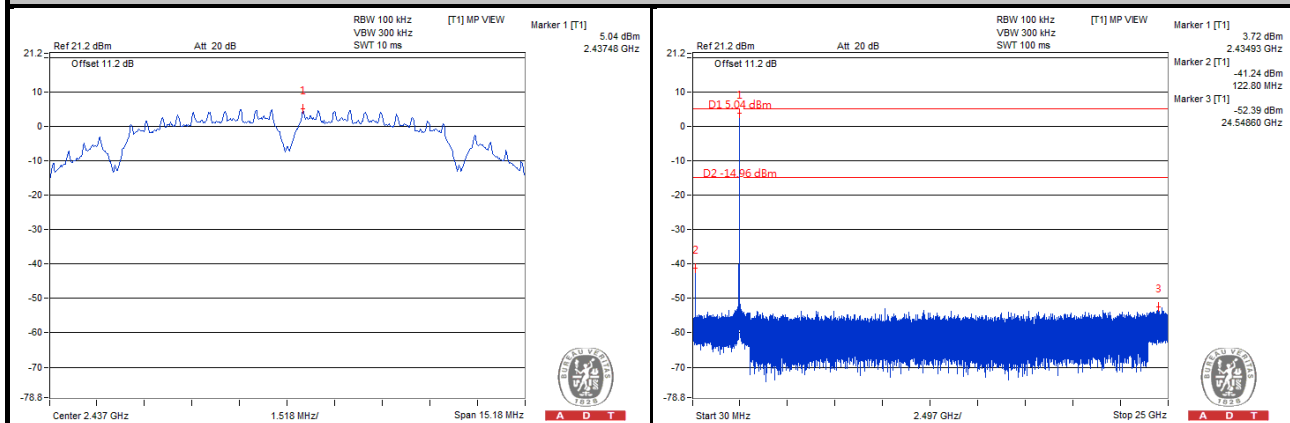


CHAIN 2

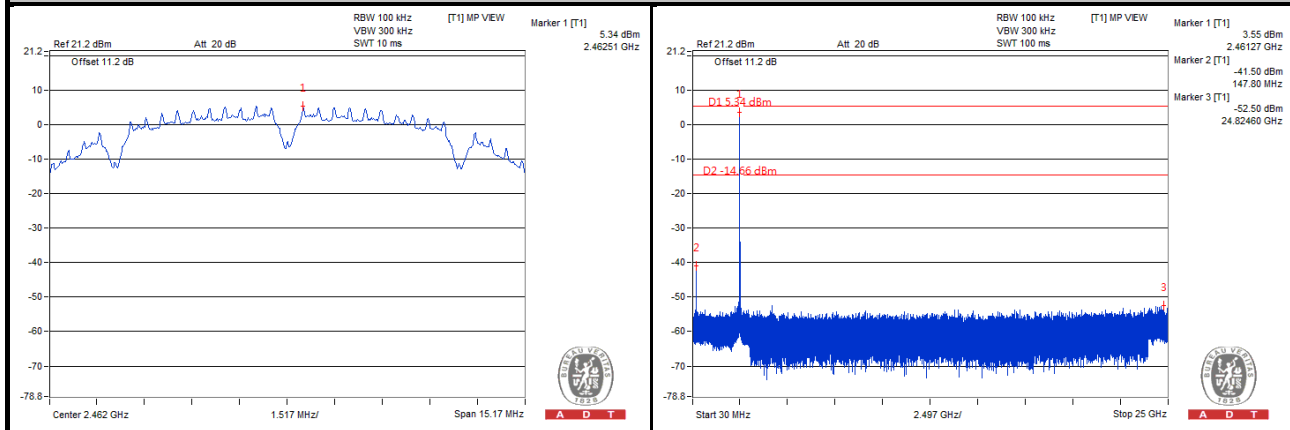
Ch 1

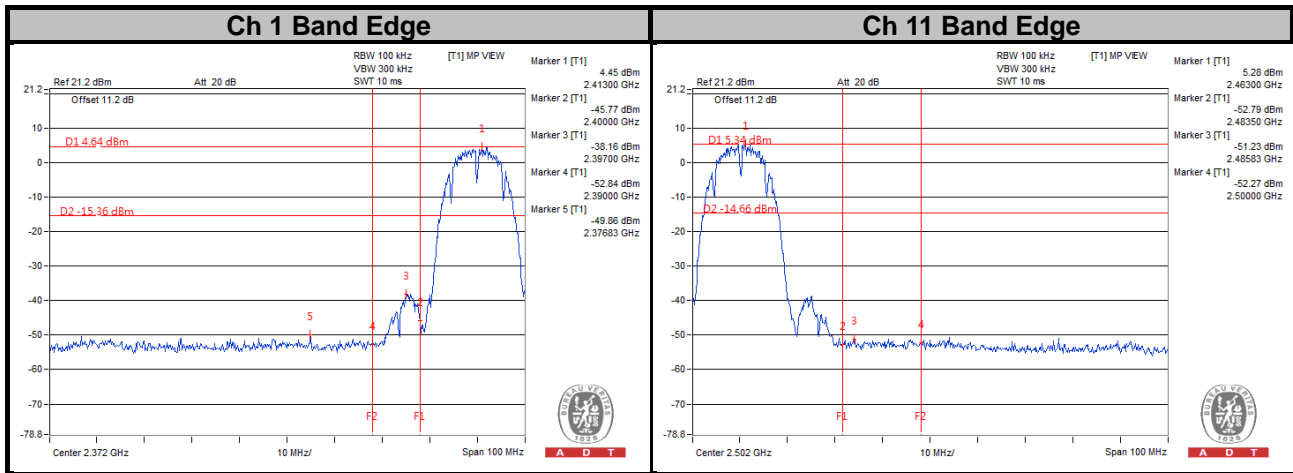


Ch 6



Ch 11

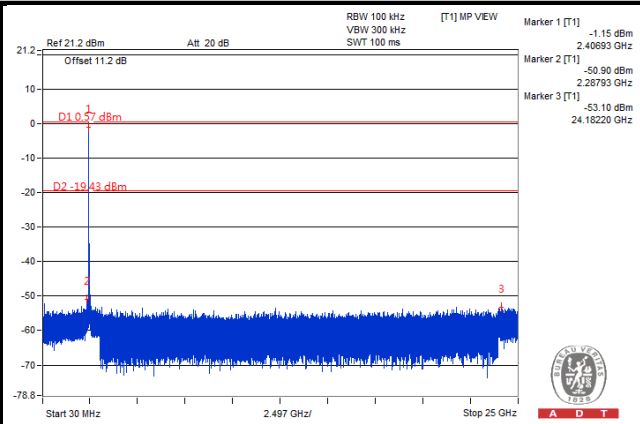
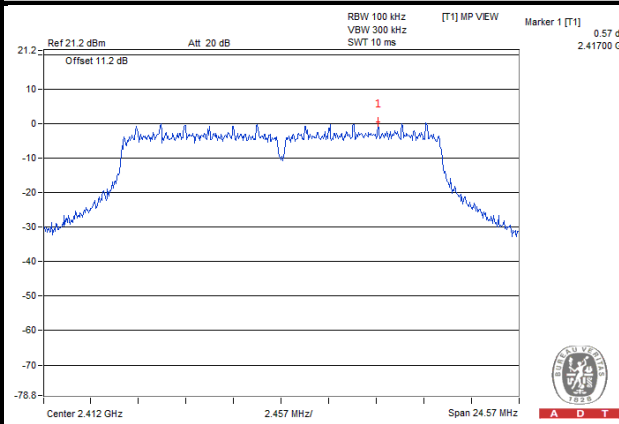




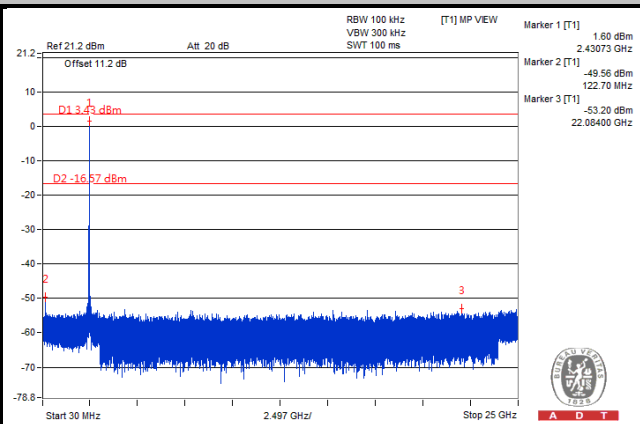
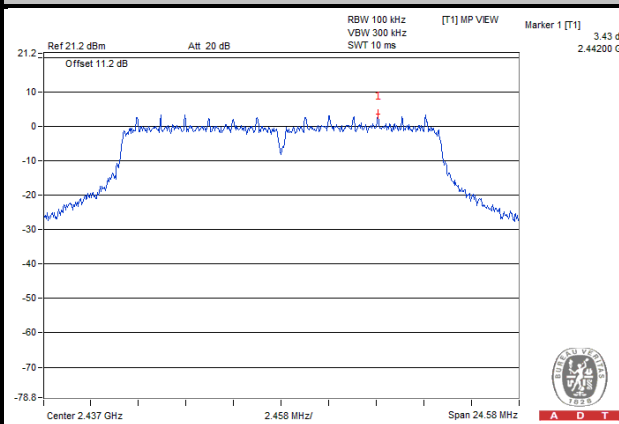
802.11g

CHAIN 0

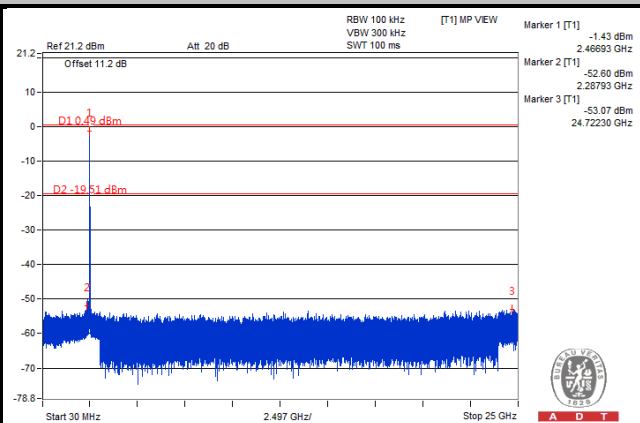
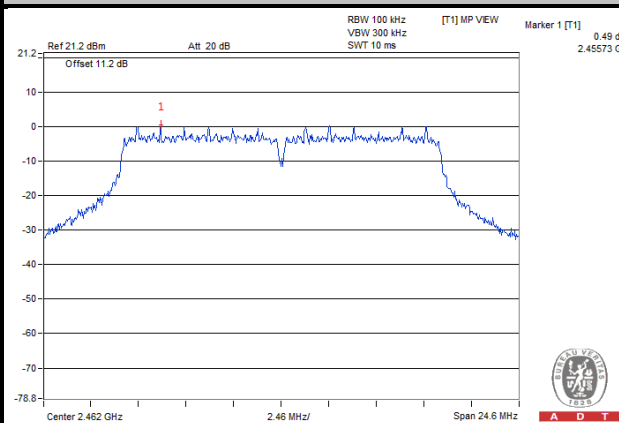
Ch 1

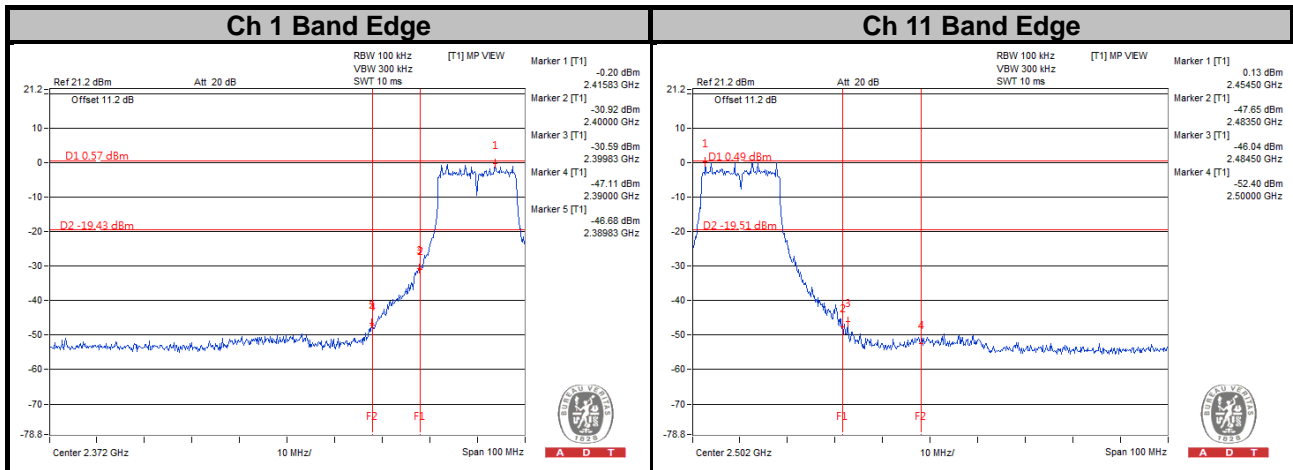


Ch 6



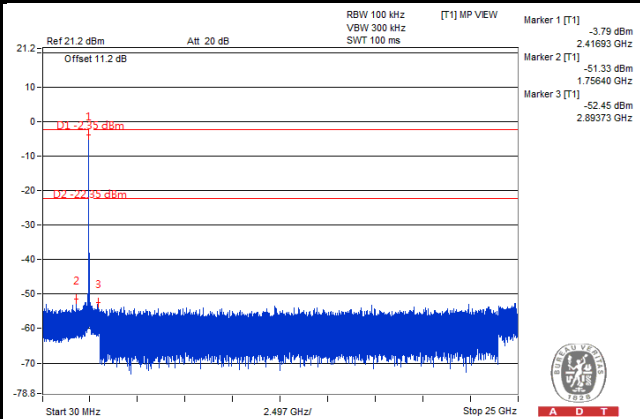
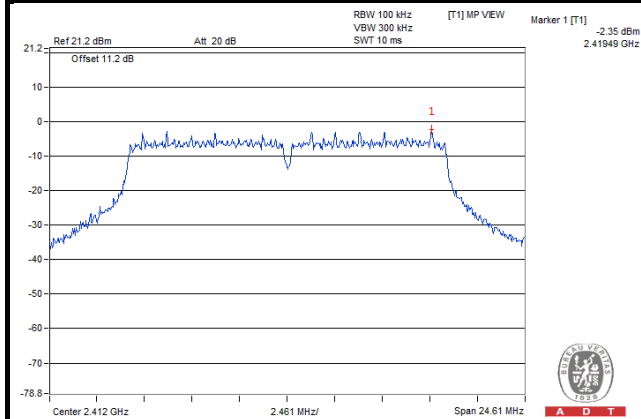
Ch 11



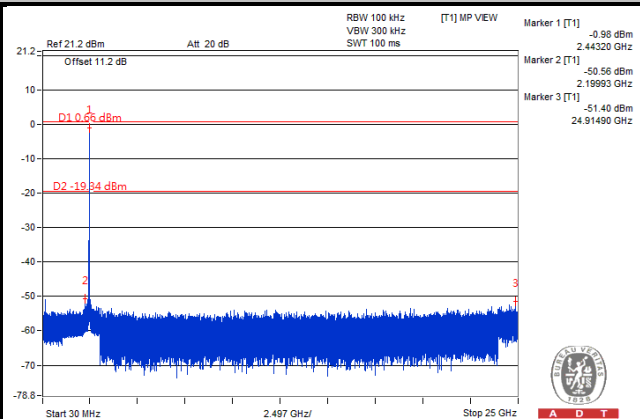
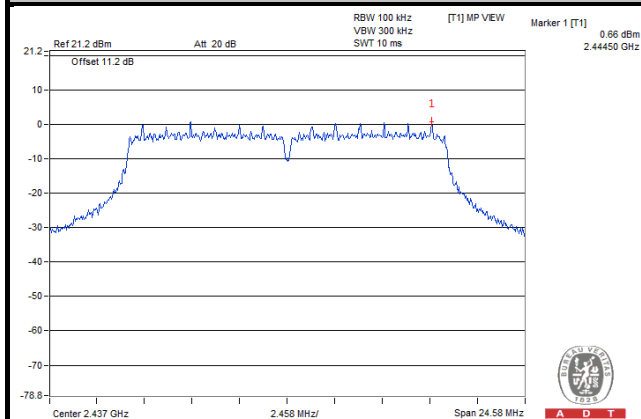


CHAIN 1

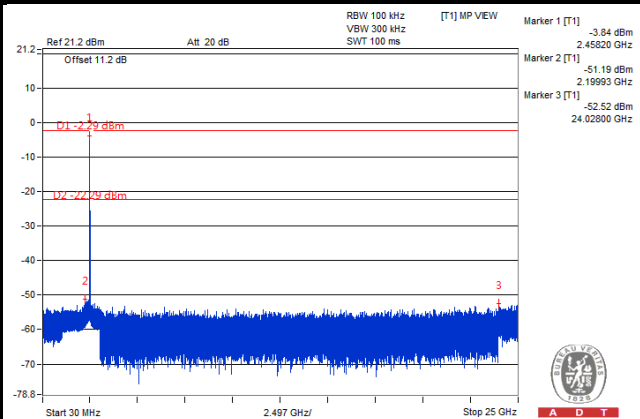
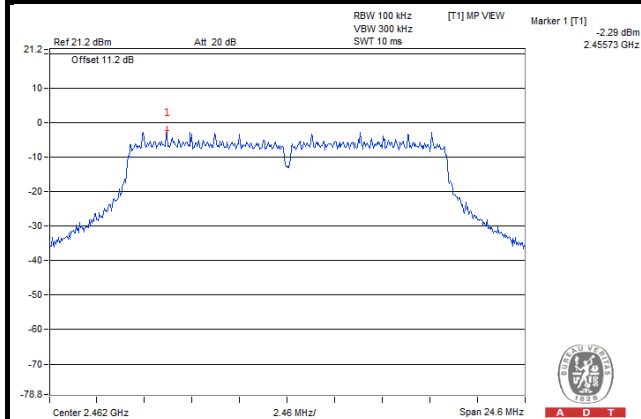
Ch 1

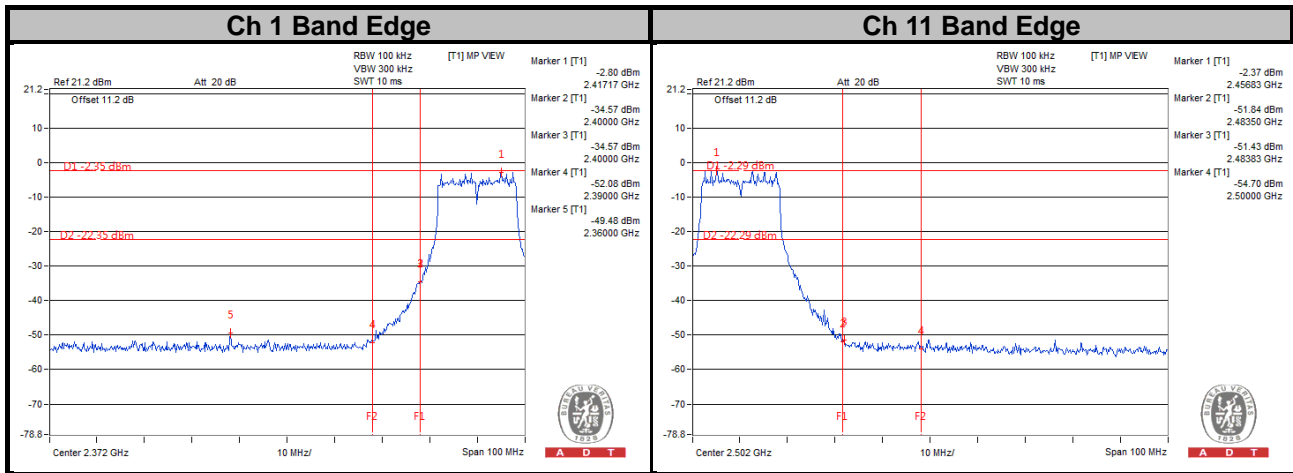


Ch 6



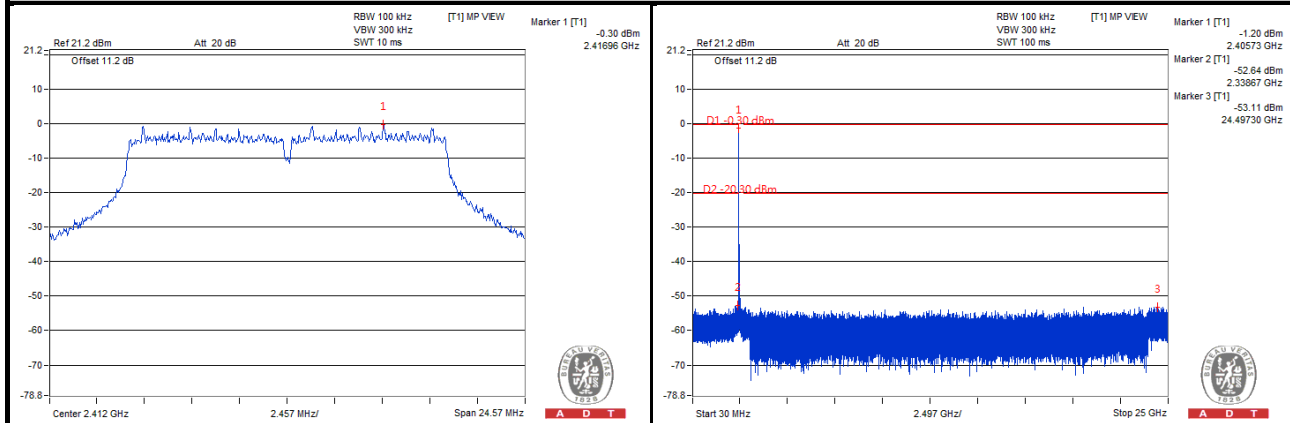
Ch 11



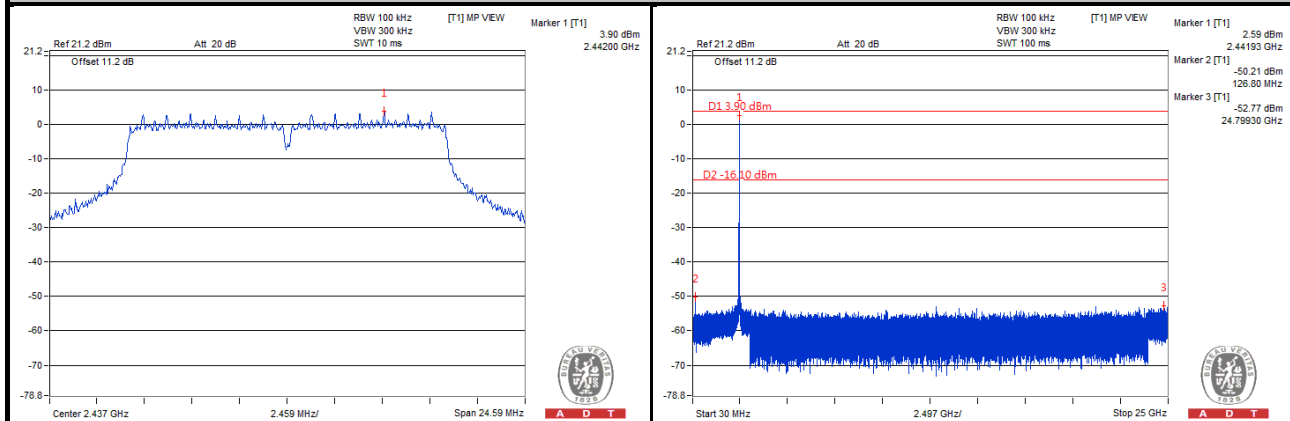


CHAIN 2

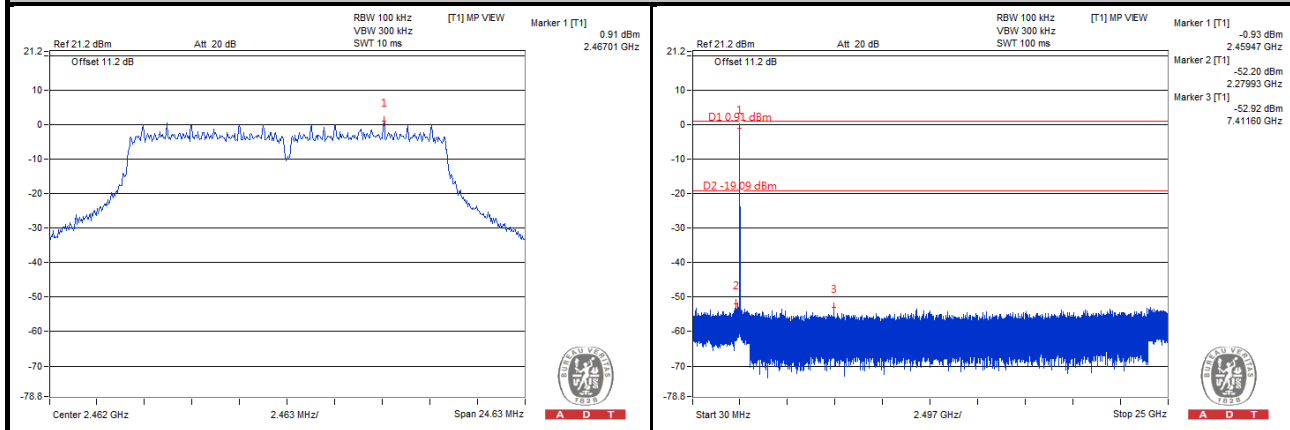
Ch 1

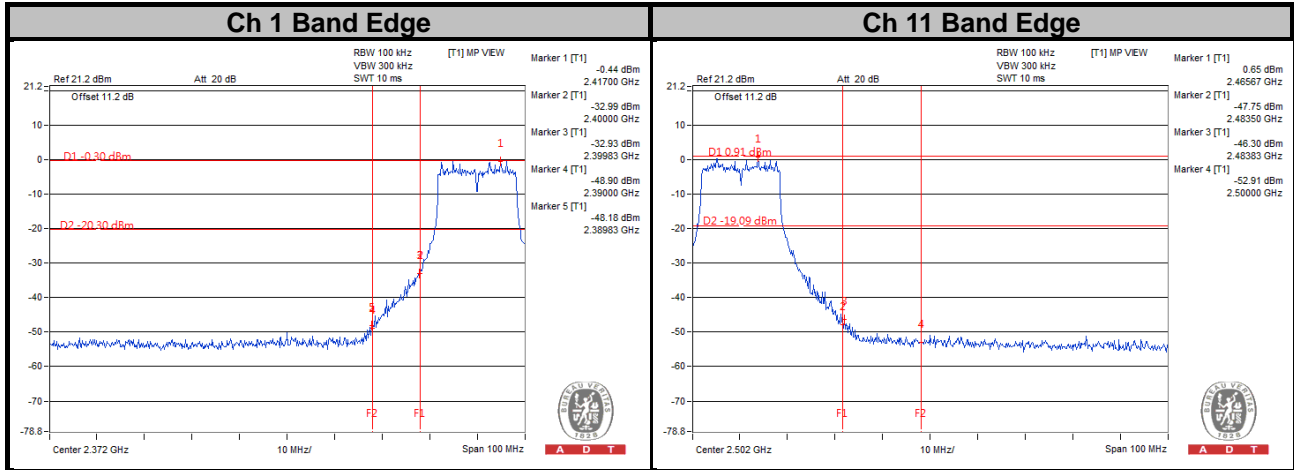


Ch 6



Ch 11

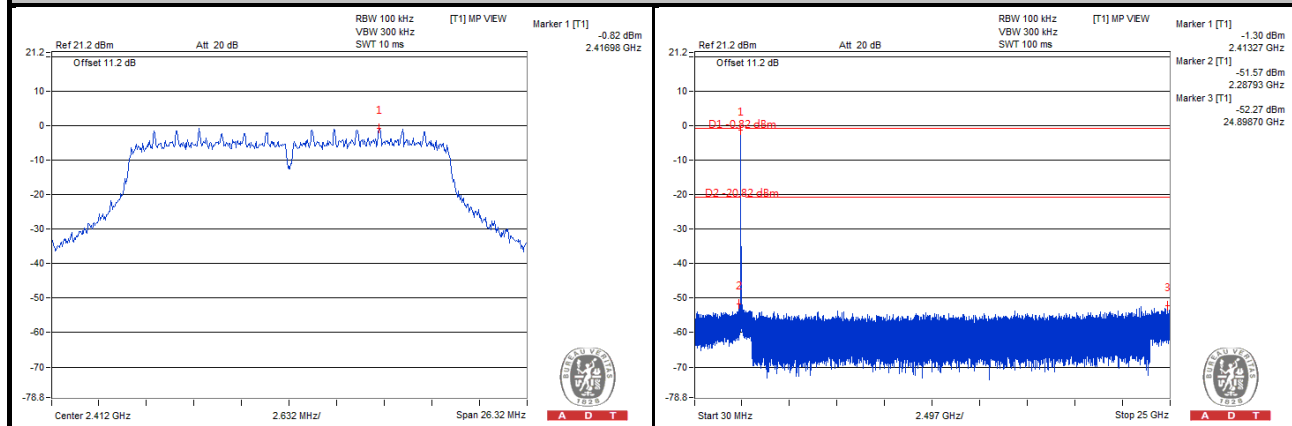




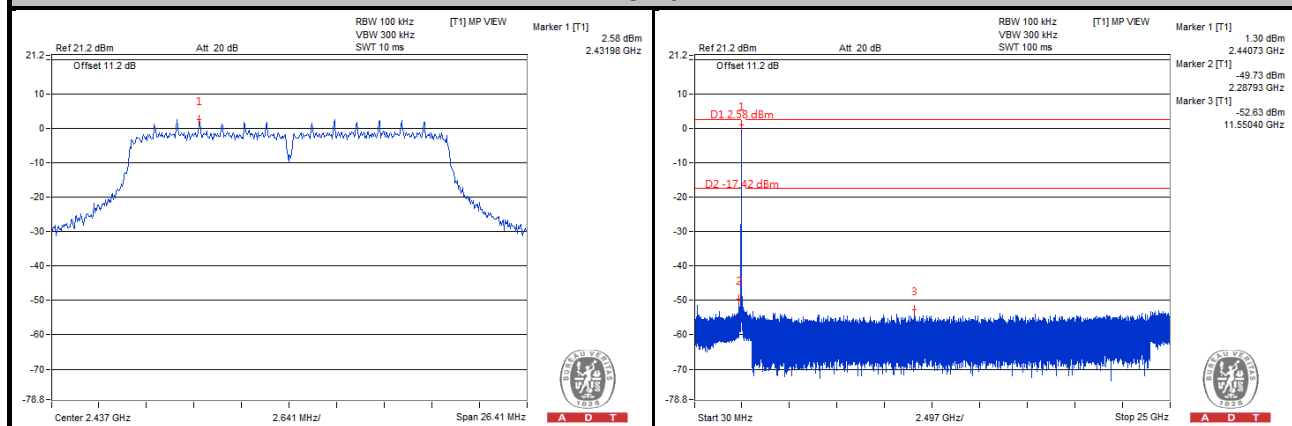
802.11n (HT20)

CHAIN 0

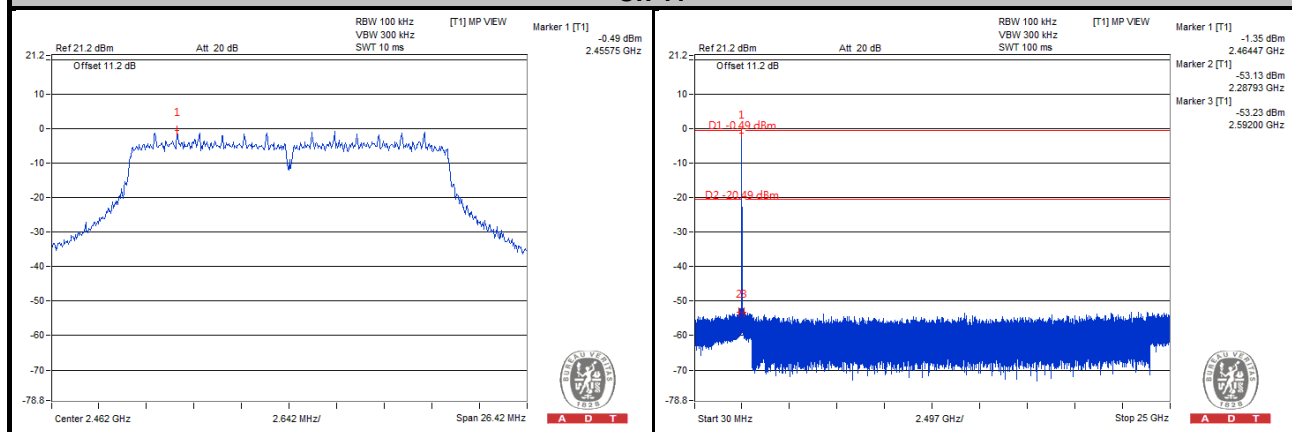
Ch 1

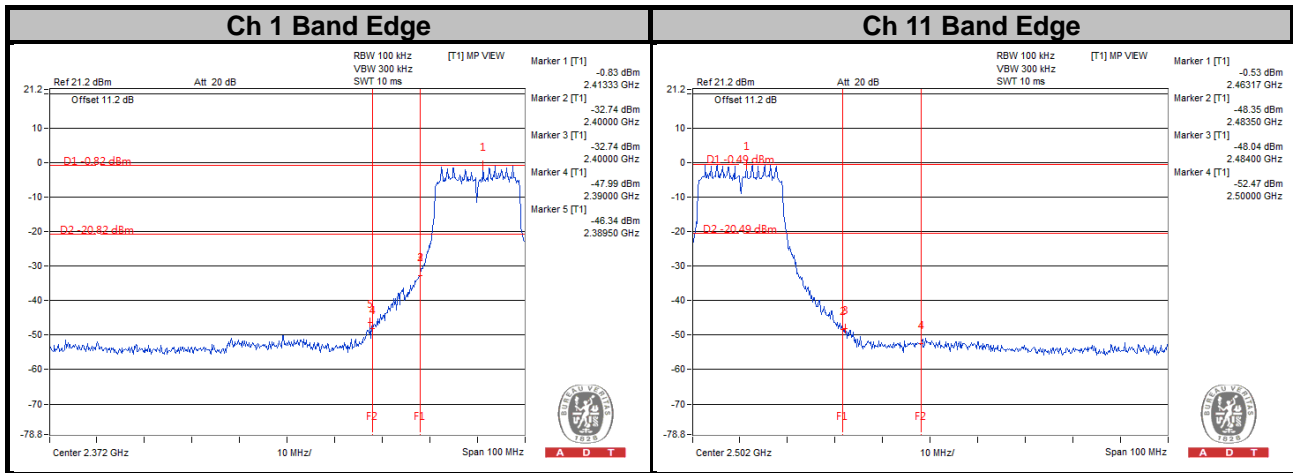


Ch 6



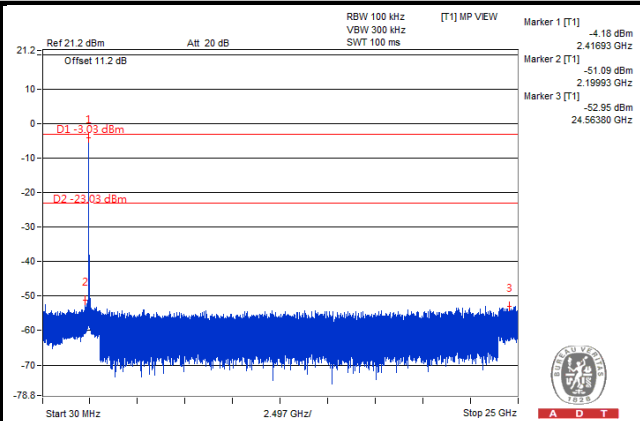
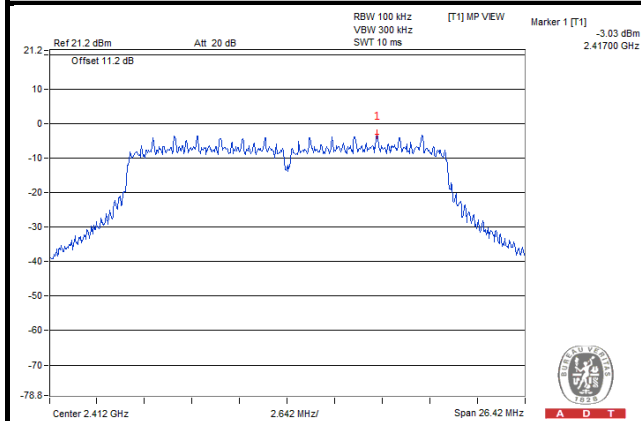
Ch 11



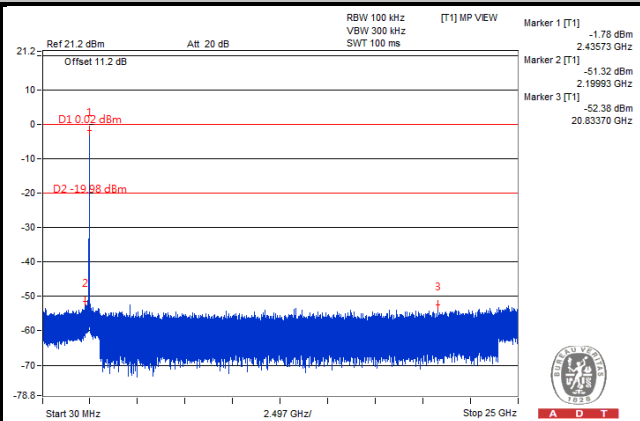
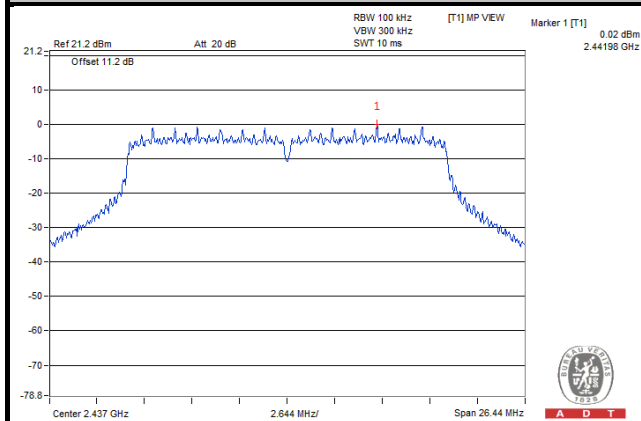


CHAIN 1

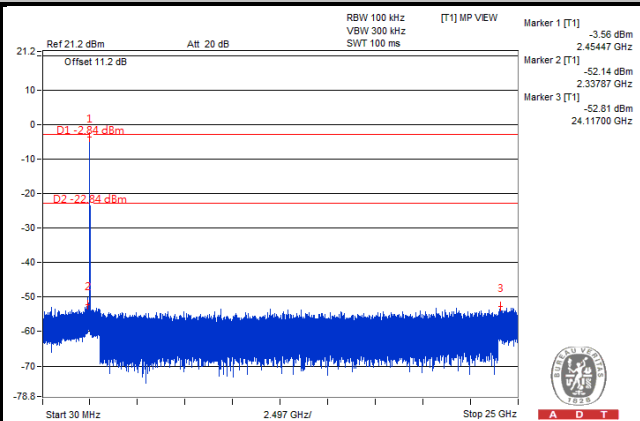
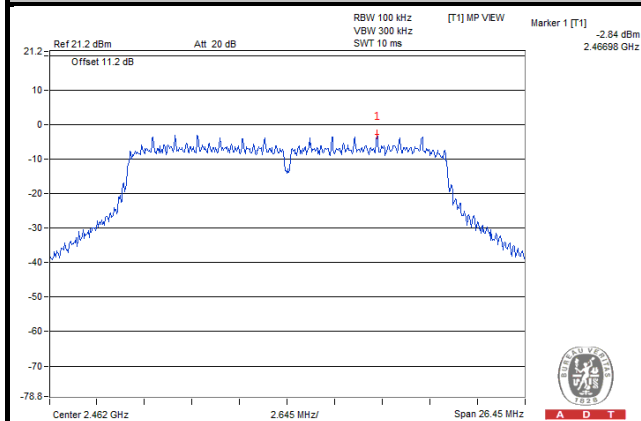
Ch 1

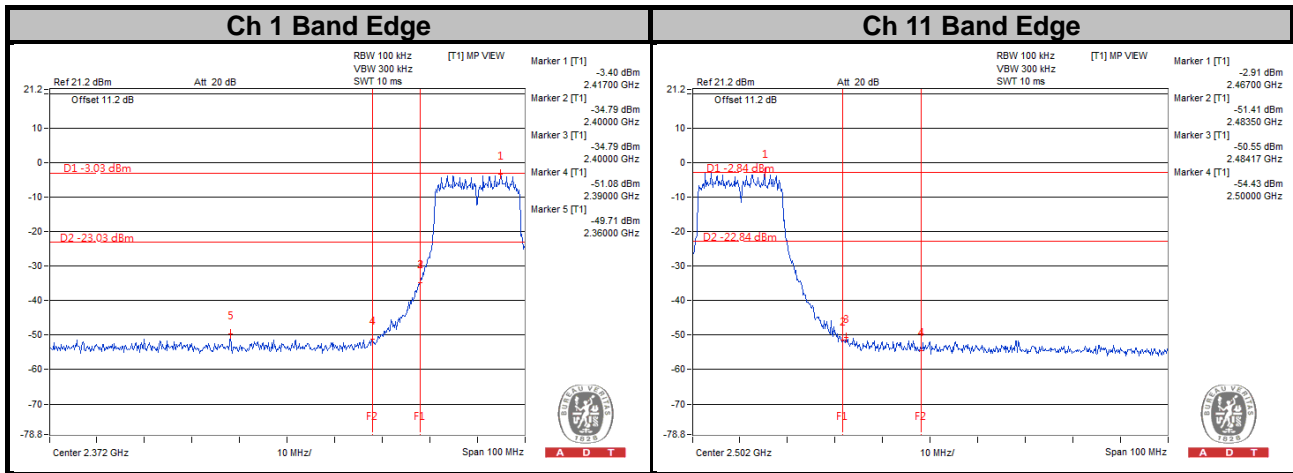


Ch 6



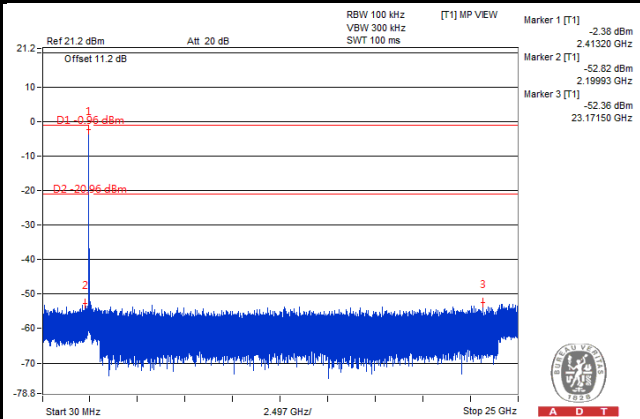
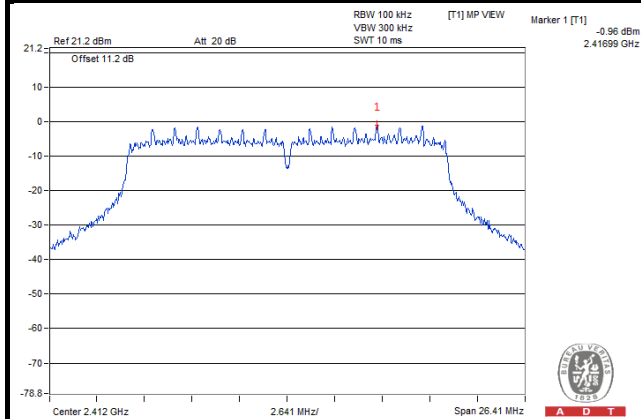
Ch 11



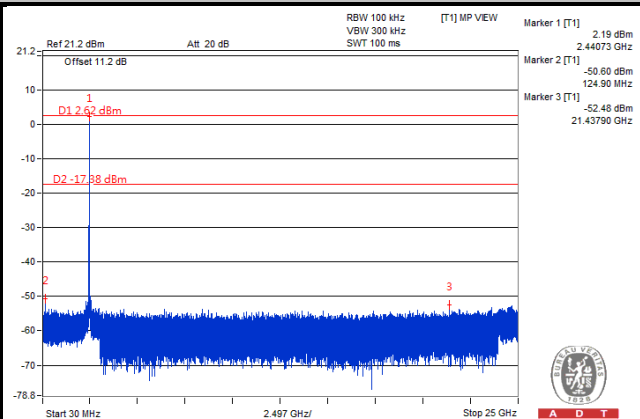
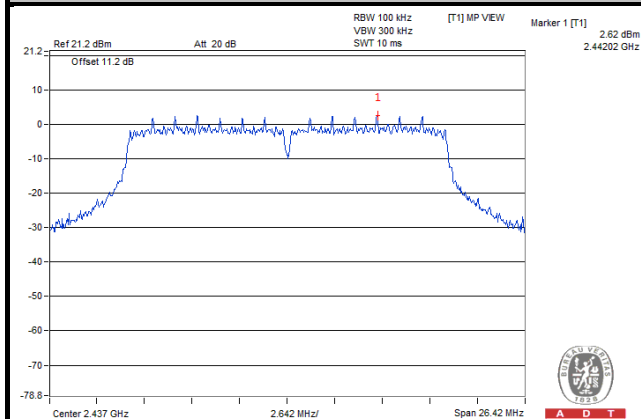


CHAIN 2

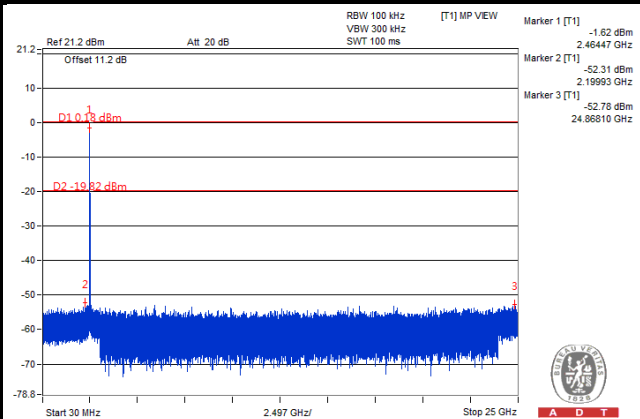
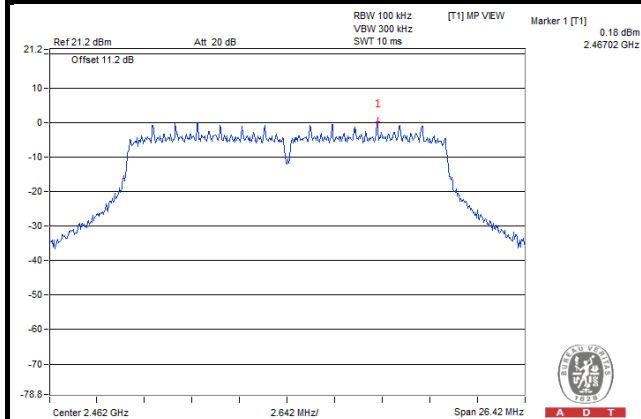
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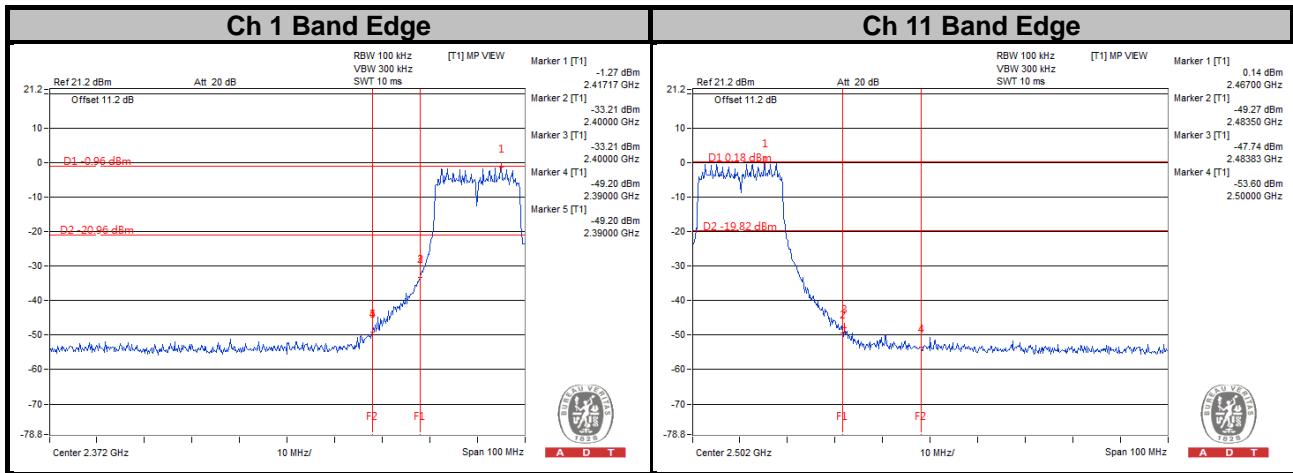


Ch 6



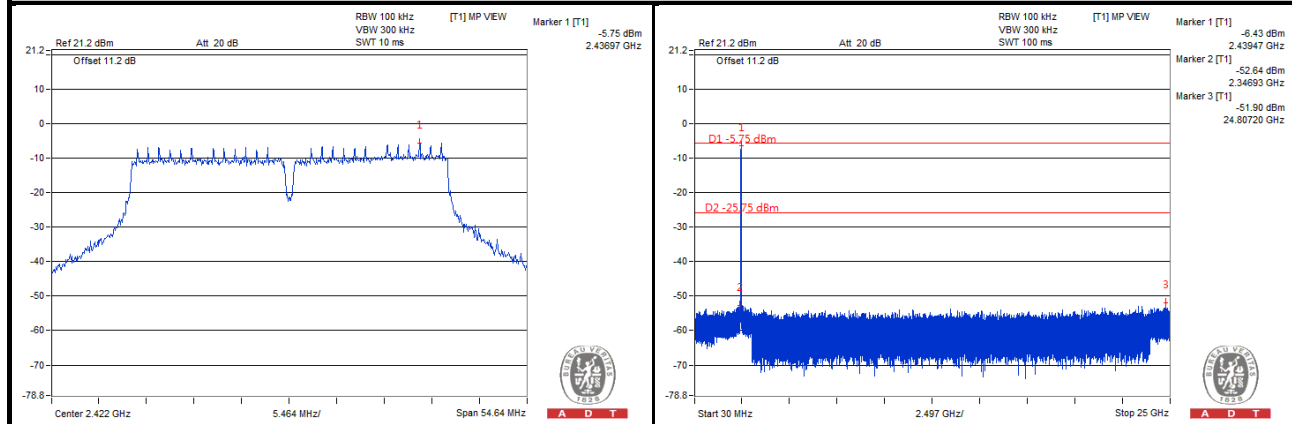
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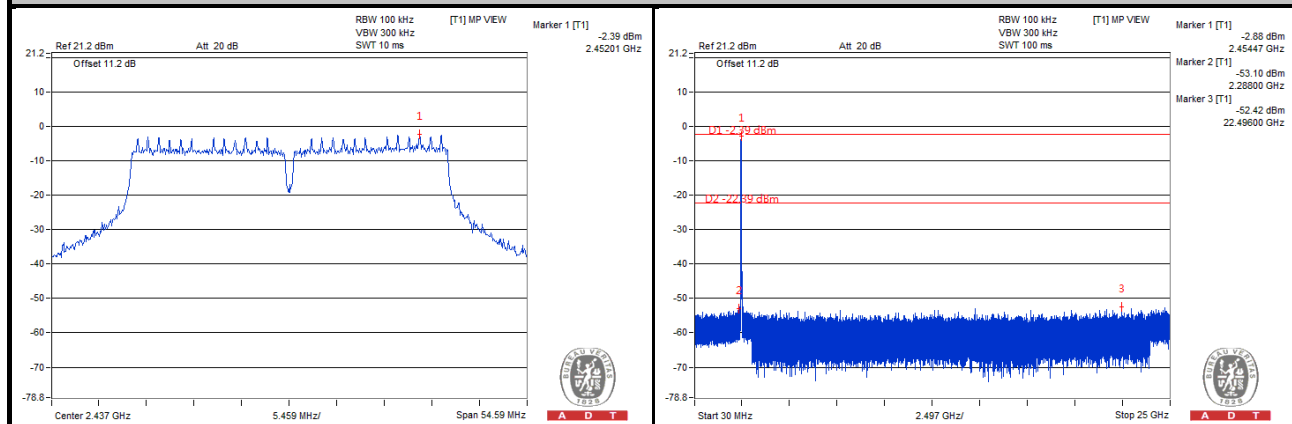


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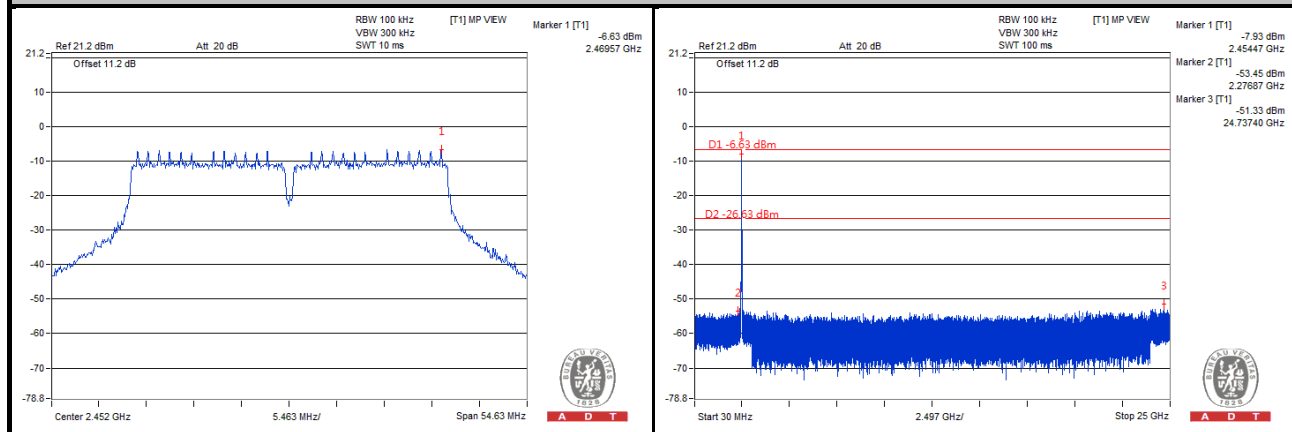
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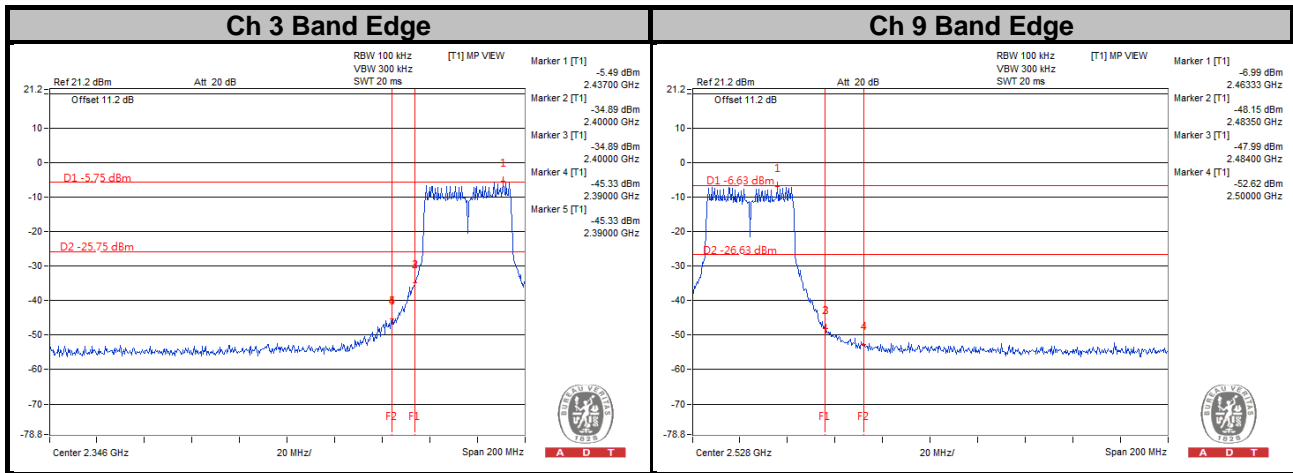


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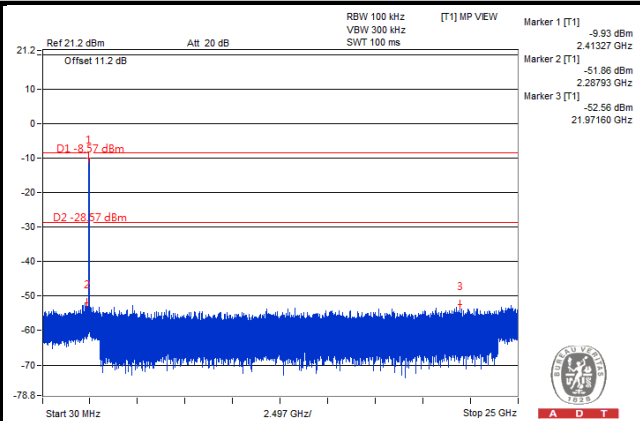
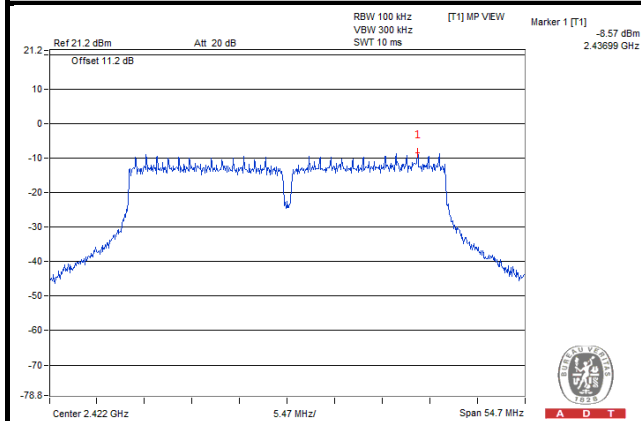
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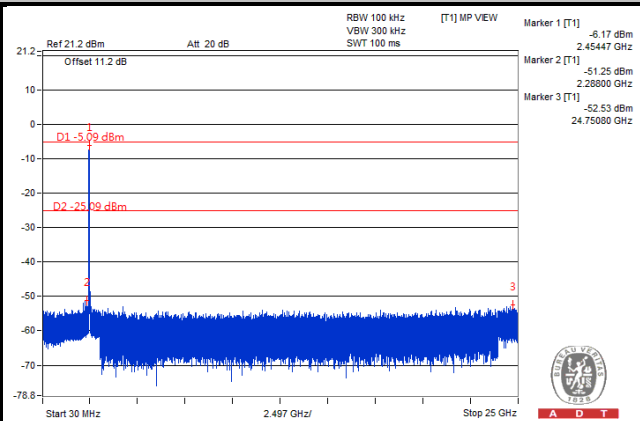
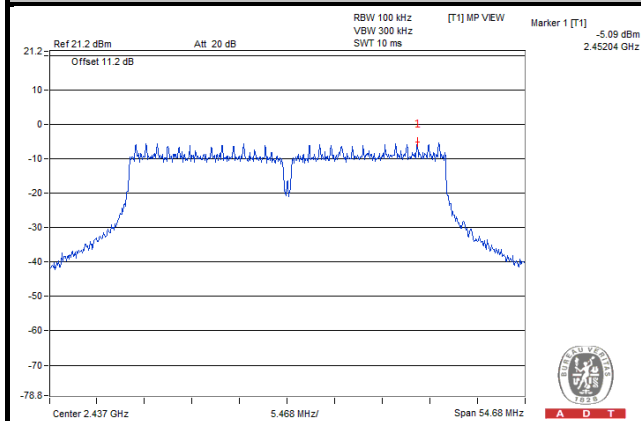


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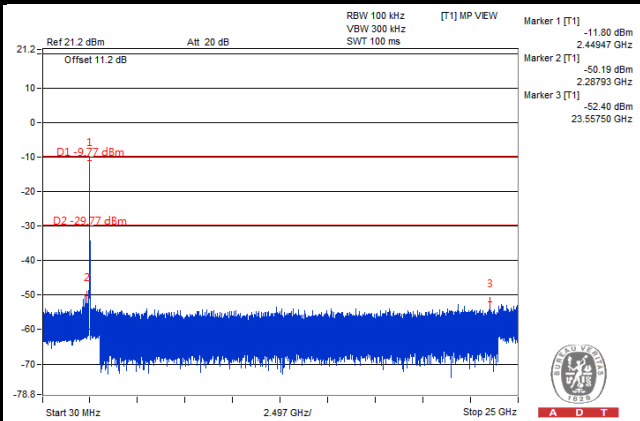
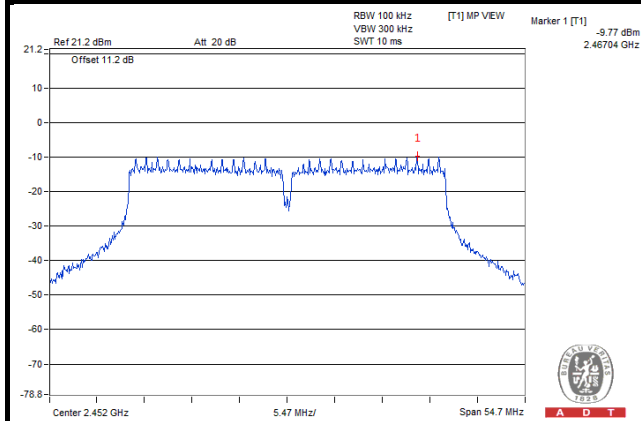
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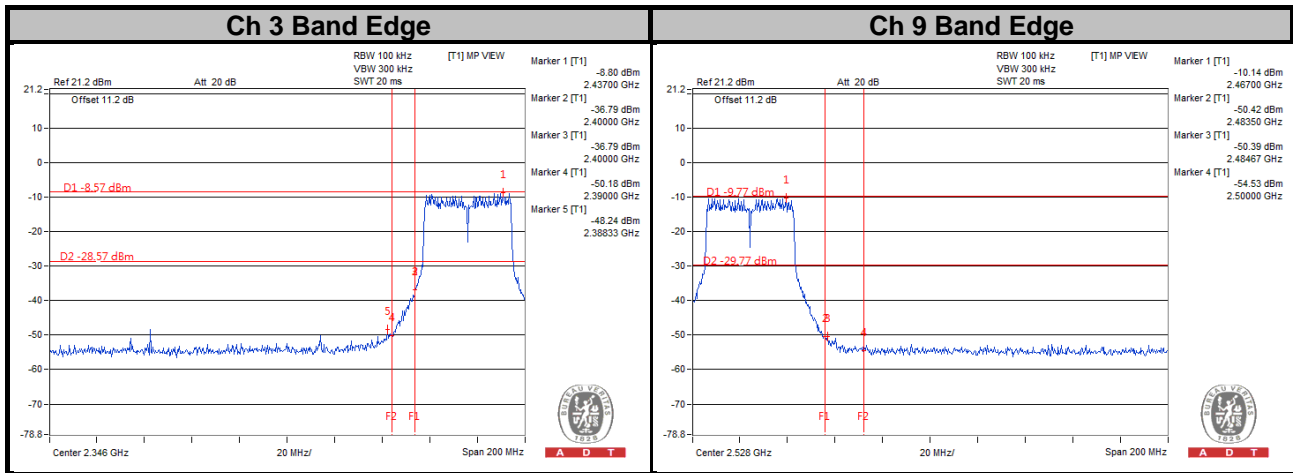


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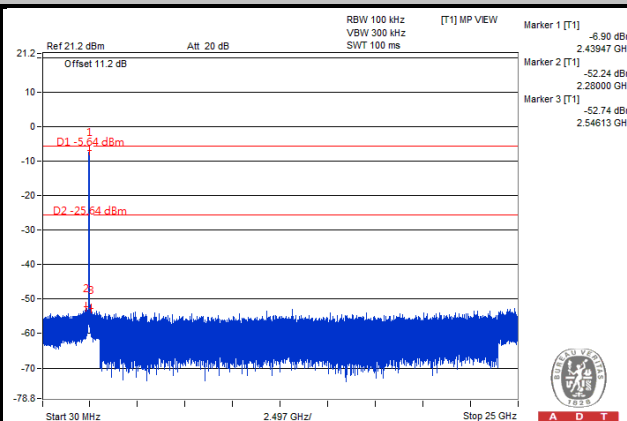
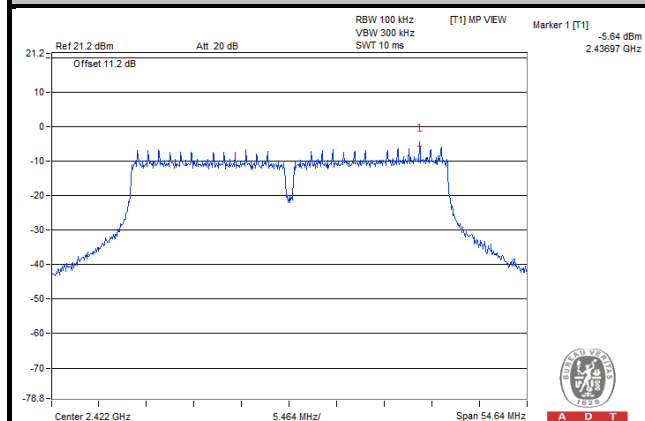
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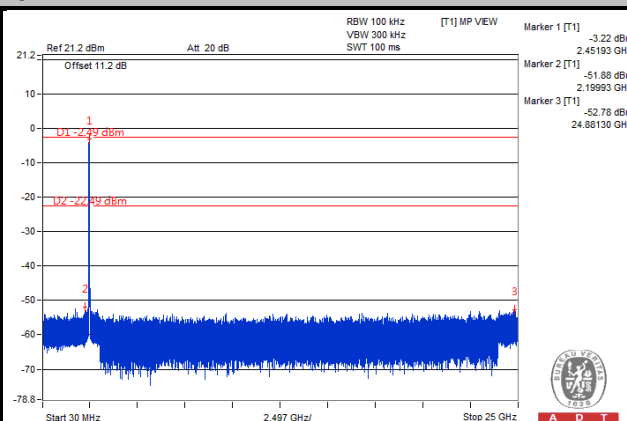
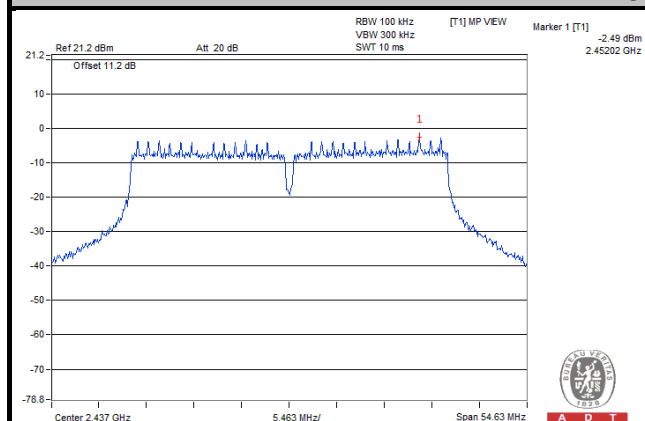


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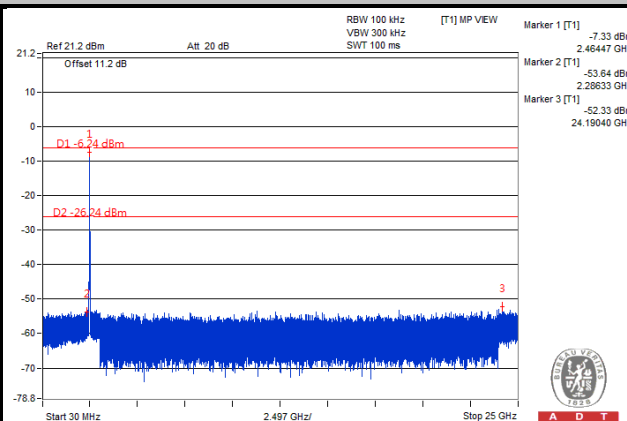
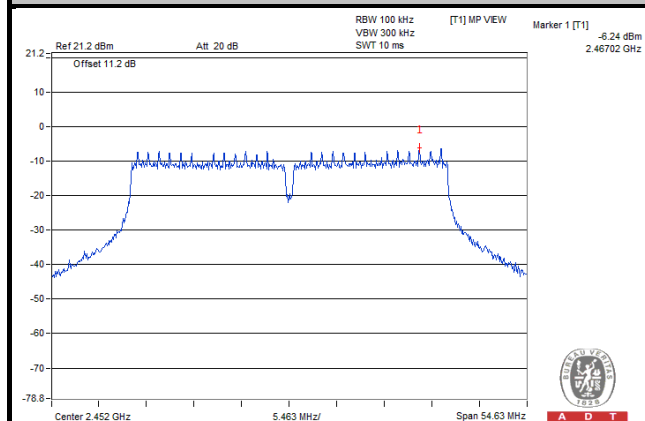
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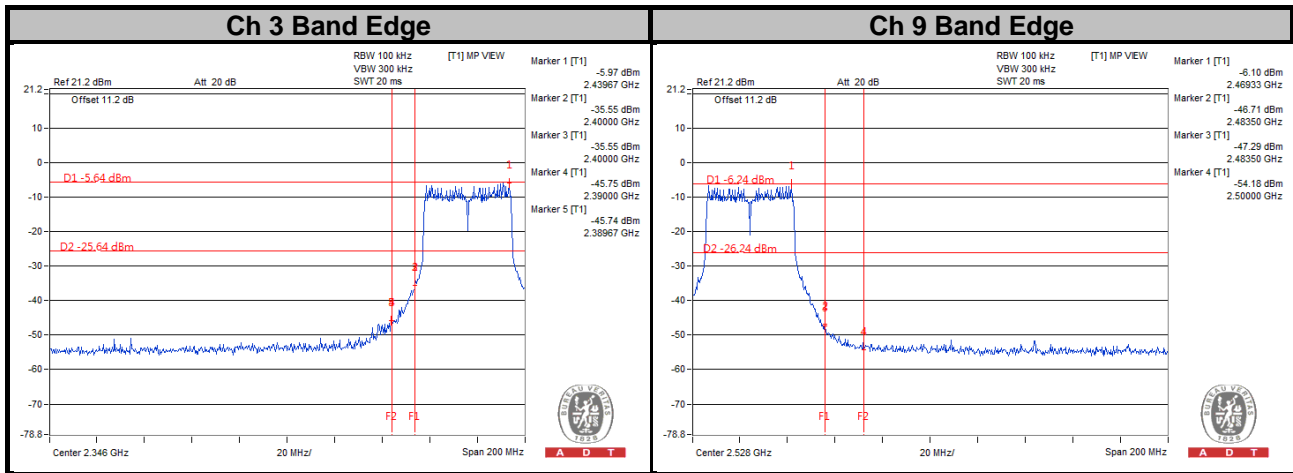


Ch 6



Ch 9





5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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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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