FCC Test Report

Report No.: RF150514C27

FCC ID: PY315100302

Test Model: D7800

Received Date: May 14, 2015

Test Date: May 15 ~ May 22, 2015

Issued Date: May 22, 2015

Applicant: NETGEAR INC.

Address: 350 East Plumeria Drive, San Jose, CA 95134, USA

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

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

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

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

Table of Contents

Release Control Record **5**

1 Certificate of Conformity **6**

2 Summary of Test Results **7**

2.1 Measurement Uncertainty 7
2.2 Modification Record 7

3 General Information **8**

3.1 General Description of EUT 8
3.2 Description of Test Modes 10
3.2.1 Test Mode Applicability and Tested Channel Detail 11
3.3 Duty Cycle of Test Signal 15
3.4 Description of Support Units 19
3.4.1 Configuration of System under Test 19
3.5 General Description of Applied Standards 20

4 Test Types and Results (For 2.4GHz Band) **21**

4.1 Radiated Emission and Bandedge Measurement 21
4.1.1 Limits of Radiated Emission and Bandedge Measurement 21
4.1.2 Test Instruments 22
4.1.3 Test Procedures 23
4.1.4 Deviation from Test Standard 23
4.1.5 Test Set Up 24
4.1.6 EUT Operating Conditions 24
4.1.7 Test Results 25
4.2 Conducted Emission Measurement 39
4.2.1 Limits of Conducted Emission Measurement 39
4.2.2 Test Instruments 39
4.2.3 Test Procedures 40
4.2.4 Deviation from Test Standard 40
4.2.5 Test Setup 40
4.2.6 EUT Operating Conditions 40
4.2.7 Test Results 41
4.3 6dB Bandwidth Measurement 45
4.3.1 Limits of 6dB Bandwidth Measurement 45
4.3.2 Test Setup 45
4.3.3 Test Instruments 45
4.3.4 Test Procedure 45
4.3.5 Deviation fromTest Standard 45
4.3.6 EUT Operating Conditions 45
4.3.7 Test Result 46
4.4 Conducted Output Power Measurement 48
4.4.1 Limits of Conducted Output Power Measurement 48
4.4.2 Test Setup 48
4.4.3 Test Instruments 48
4.4.4 Test Procedures 48
4.4.5 Deviation from Test Standard 48
4.4.6 EUT Operating Conditions 48
4.4.7 Test Results 49
4.5 Power Spectral Density Measurement 50
4.5.1 Limits of Power Spectral Density Measurement 50
4.5.2 Test Setup 50
4.5.3 Test Instruments 50
4.5.4 Test Procedure 50
4.5.5 Deviation from Test Standard 50
4.5.6 EUT Operating Condition 50

4.5.7 Test Results 51
4.6 Conducted Out of Band Emission Measurement 56
4.6.1 Limits of Conducted Out of Band Emission Measurement 56
4.6.2 Test Setup 56
4.6.3 Test Instruments 56
4.6.4 Test Procedure 56
4.6.5 Deviation from Test Standard 57
4.6.6 EUT Operating Condition 57
4.6.7 Test Results 57

5 Test Types and Results (For 5.0GHz Band) 74

5.1 Radiated Emission and Bandedge Measurement 74
5.1.1 Limits of Radiated Emission and Bandedge Measurement 74
5.1.2 Test Instruments 74
5.1.3 Test Procedures 74
5.1.4 Deviation from Test Standard 74
5.1.5 Test Setup 74
5.1.6 EUT Operating Conditions 74
5.1.7 Test Results 75
5.2 Conducted Emission Measurement 86
5.2.1 Limits of Conducted Emission Measurement 86
5.2.2 Test Instruments 86
5.2.3 Test Procedures 86
5.2.4 Deviation from Test Standard 86
5.2.5 Test Setup 86
5.2.6 EUT Operating Conditions 86
5.2.7 Test Results 87
5.3 6dB Bandwidth Measurement 91
5.3.1 Limits of 6dB Bandwidth Measurement 91
5.3.2 Test Setup 91
5.3.3 Test Instruments 91
5.3.4 Test Procedure 91
5.3.5 Deviation fromTest Standard 91
5.3.6 EUT Operating Conditions 91
5.3.7 Test Result 92
5.4 Conducted Output Power Measurement 98
5.4.1 Limits of Conducted Output Power Measurement 98
5.4.2 Test Setup 98
5.4.3 Test Instruments 98
5.4.4 Test Procedures 98
5.4.5 Deviation from Test Standard 98
5.4.6 EUT Operating Conditions 98
5.4.7 Test Results 99
5.5 Power Spectral Density Measurement 102
5.5.1 Limits of Power Spectral Density Measurement 102
5.5.2 Test Setup 102
5.5.3 Test Instruments 102
5.5.4 Test Procedure 102
5.5.5 Deviation from Test Standard 102
5.5.6 EUT Operating Condition 102
5.5.7 Test Results 103
5.6 Conducted Out of Band Emission Measurement 113
5.6.1 Limits of Conducted Out of Band Emission Measurement 113
5.6.2 Test Setup 113
5.6.3 Test Instruments 113
5.6.4 Test Procedure 113
5.6.5 Deviation from Test Standard 113
5.6.6 EUT Operating Condition 113

5.6.7 Test Results 113
6 Pictures of Test Arrangements 148
Appendix – Information on the Testing Laboratories 149

Release Control Record

Issue No.	Description	Date Issued
RF150514C27	Original release	May 22, 2015

1 Certificate of Conformity

Product: AC2600 WiFi VDSL/ADSL Modem Router

Brand: NETGEAR

Test Model: D7800

Sample Status: Engineering sample

Applicant: NETGEAR INC.

Test Date: May 15 ~ May 22, 2015

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

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

Prepared by : _____ , **Date:** May 22, 2015
Polly Chien / Specialist

Approved by : _____ , **Date:** May 22, 2015
Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -12.13dB at 0.37266MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2390.00MHz, 2483.50MHz, 5725.00MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is RSMA not a standard connector.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AC2600 WiFi VDSL/ADSL Modem Router
Brand	NETGEAR
Test Model	D7800
Status of EUT	Engineering sample
Power Supply Rating	12Vdc from adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 600.0Mbps 802.11ac: up to 1300.0Mbps
Operating Frequency	2.4GHz: 2412 ~ 2462MHz 5.0GHz: 5745 ~ 5825MHz
Number of Channel	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) 5.0GHz: 5 for 802.11a, 802.11n (20MHz) , 802.11ac (20MHz) 2 for 802.11n (40MHz), 802.11ac (40MHz) 1 for 802.11ac (80MHz)
Output Power	CDD Mode: 990.687mW for 2412 ~ 2462MHz 996.226mW for 5745 ~ 5825MHz Beamforming_NSS1 Mode: 699.856mW for 5745 ~ 5825MHz Beamforming_NSS2 Mode: 954.470mW for 5745 ~ 5825MHz
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Data Cable Supplied	N/A

Note:

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

Band	Modulation Mode	Beamforming Mode	TX Function
2.4GHz	802.11b	Not Support	4TX
	802.11g	Not Support	4TX
	802.11n (20MHz)	Not Support	4TX
	802.11n (40MHz)	Not Support	4TX
5GHz	802.11a	Not Support	4TX
	802.11n (20MHz)	Support	4TX
	802.11n (40MHz)	Support	4TX
	802.11ac (80MHz)	Support	4TX

* For 2.4GHz Band and 802.11a, the EUT doesn't support Beamforming mode.
* The modulation and bandwidth are similar for 802.11n mode for 20MHz / 40MHz and 802.11ac mode for V20MHz / V40MHz, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)
* For 5GHz band 802.11n and 802.11ac, after pre-tested two modes (with beamforming mode Nss=1 / 2 and CDD mode) found CDD mode was the worst, therefore chosen for final test for radiated emission and power line conducted emission test and presented in the test report.

2. The EUT uses following antennas.

Ant. Type	Connecter Type	Antenna Gain (dBi)				
		2412MHz	2422MHz	2437MHz	2452MHz	2462MHz
Dipole	RSMA	0.21	0.41	0.41	0.21	0.11
		5180MHz	5190MHz	5200MHz	5210MHz	5230MHz
		0.61	0.71	0.71	0.81	0.91
		5240MHz	5745MHz	5755MHz	5775MHz	5785MHz
		0.91	1.61	1.51	1.51	1.51
		5795MHz	5825MHz			
		1.61	1.61			

3. The EUT consumes power from the following adapters.

Adapter 1	
Brand	NETGEAR
Model	MU42-3120350-A1
Part No.	332-10762-01 (LEI)
Input Power	100-240Vac, 50/60Hz, 1.5A
Output Power	12Vdc, 3.5A
Power Line	1.8m cable without core attached on adapter

Adapter 2	
Brand	NETGEAR
Model	2ABN042F NA
Part No.	332-10761-01 (CWT)
Input Power	100-240Vac, 50/60Hz, 1.3A
Output Power	12Vdc, 3.5A
Power Line	1.85m cable without core attached on adapter

3.2 Description of Test Modes

For 2.4GHz:

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

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

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

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

For 5.0GHz (5745 ~ 5825MHz):

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

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

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

FOR 2.4GHz:

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

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

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Note:

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

Radiated Emission Test (Above 1GHz):

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

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

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

Radiated Emission Test (Below 1GHz):

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11g	1 to 11	6	OFDM	BPSK	6.0

Power Line Conducted Emission Test:

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11g	1 to 11	6	OFDM	BPSK	6.0

Antenna Port Conducted Measurement:

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

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

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

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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	26deg. C, 62%RH	120Vac, 60Hz	Alan Wu
RE<1G	27deg. C, 65%RH	120Vac, 60Hz	Chris Lin
PLC	23deg. C, 65%RH	120Vac, 60Hz	Alan Wu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Antony Lee

FOR 5.0GHz:

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

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

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Note:

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

Radiated Emission Test (Above 1GHz):

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (80MHz)	155	155	OFDM	BPSK	130.0

Radiated Emission Test (Below 1GHz):

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

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

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

Power Line Conducted Emission Test:

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

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

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

Antenna Port Conducted Measurement:

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

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (80MHz)	155	155	OFDM	BPSK	130.0

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	26deg. C, 62%RH	120Vac, 60Hz	Alan Wu
RE<1G	27deg. C, 65%RH	120Vac, 60Hz	Chris Lin
PLC	23deg. C, 65%RH	120Vac, 60Hz	Alan Wu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Frank Liu

3.3 Duty Cycle of Test Signal

2.4GHz Band:

802.11b: Duty cycle of test signal is 100 %

Duty cycle of test signal is > 98 %

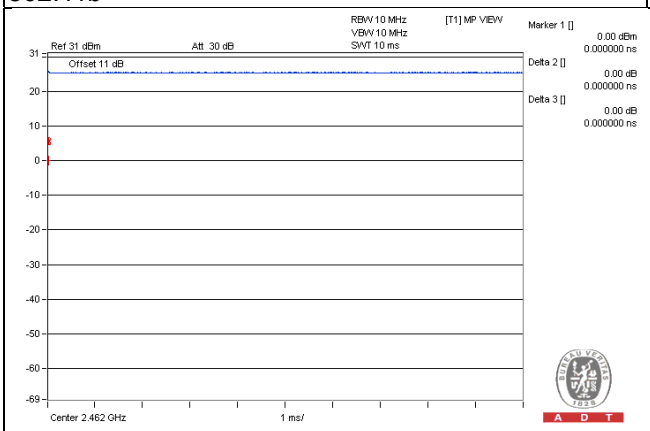
802.11n (20MHz): Duty cycle = 4.997/5.082 = 0.983 > 98 %, duty factor is not required.

Duty cycle of test signal is < 98%

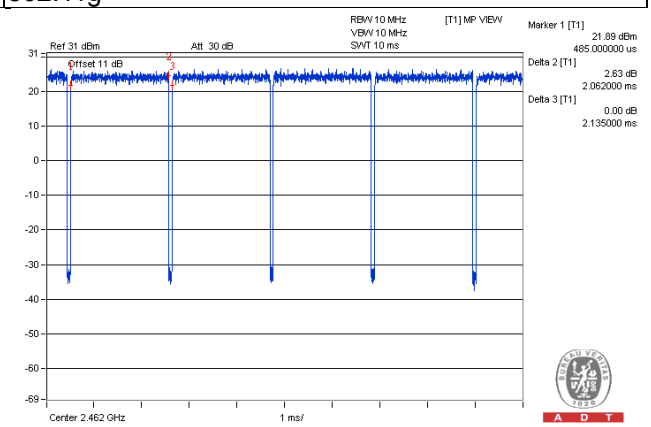
802.11g: Duty cycle = 2.062/2.135 = 0.966, Duty factor = 10 * log(1/0.966) = 0.15

802.11n (40MHz): Duty cycle = 2.425/2.505 = 0.968, Duty factor = 10 * log(1/0.968) = 0.14

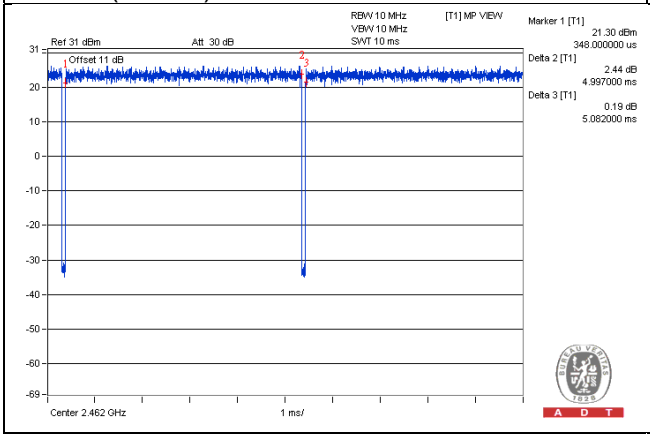
802.11b



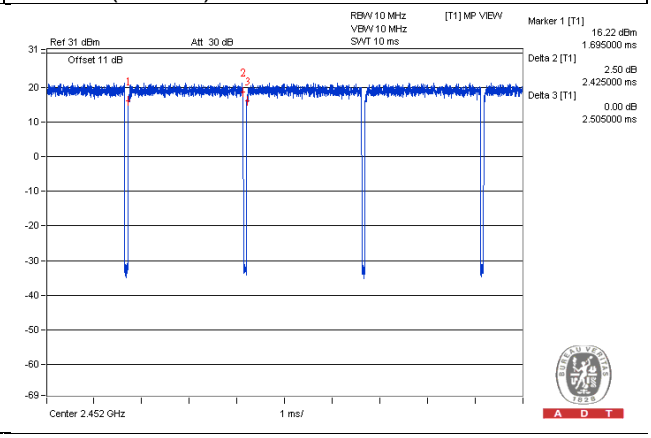
802.11g



802.11n (20MHz)



802.11n (40MHz)



5GHz Band:

CDD Mode

Duty cycle of test signal is < 98%

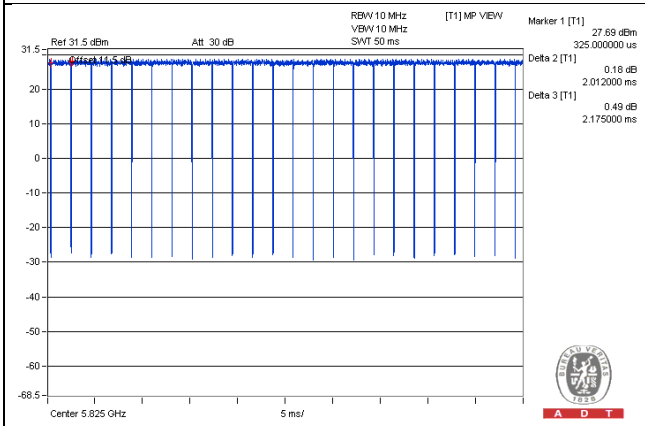
802.11a: Duty cycle = 2.012/2.175 = 0.925, Duty factor = 10 * log(1/0.925) = 0.34

802.11n (20MHz): Duty cycle = 4.963/5.088 = 0.975, Duty factor = 10 * log(1/0.975) = 0.11

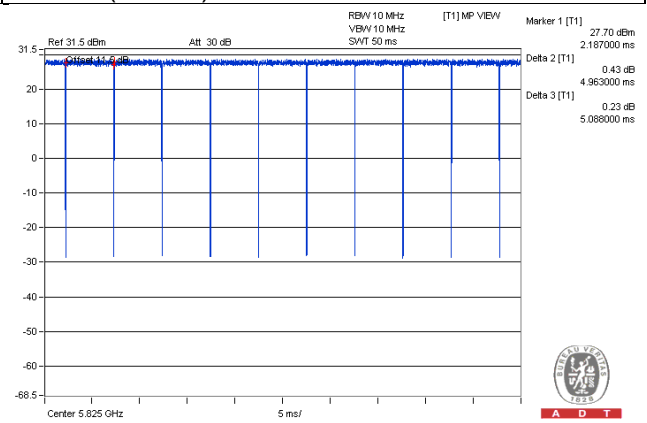
802.11n (40MHz): Duty cycle = 2.363/2.526 = 0.935, Duty factor = 10 * log(1/0.935) = 0.29

802.11ac (80MHz): Duty cycle = 1.075/1.237 = 0.869, Duty factor = 10 * log(1/0.869) = 0.61

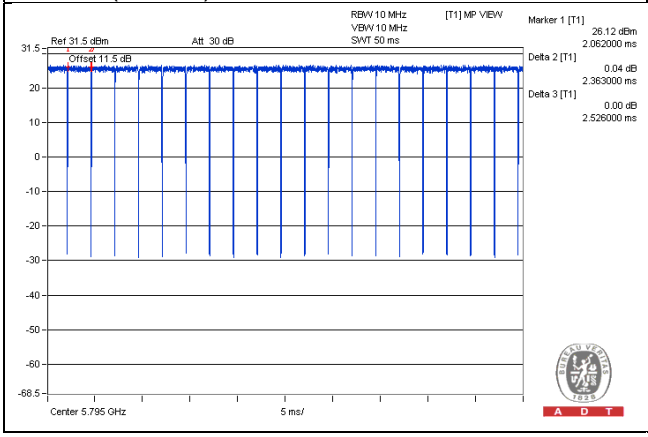
802.11a



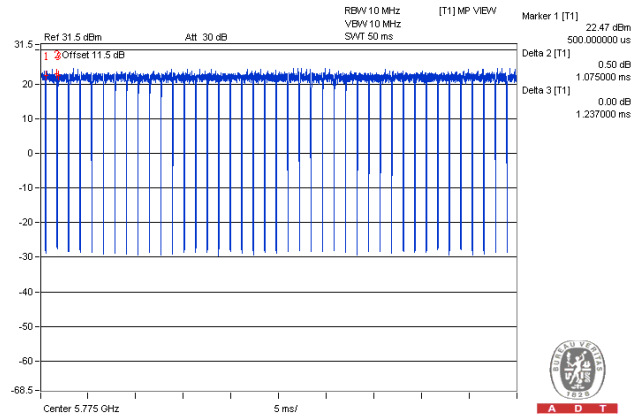
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



Beamforming_NSS1 Mode

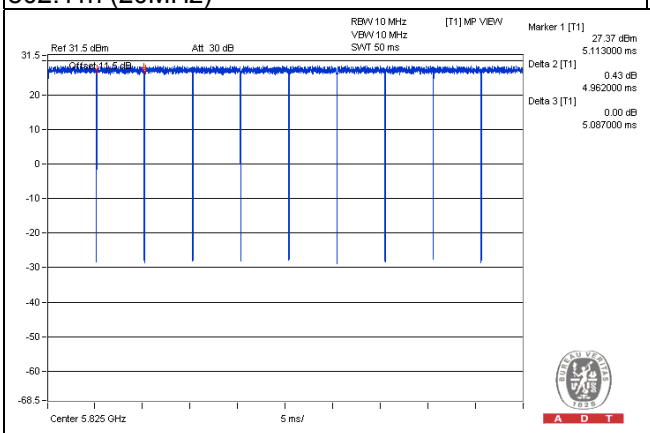
Duty cycle is < 98%, duty factor shall be considered.

802.11n (20MHz): Duty cycle = 4.962/5.087 = 0.975, Duty factor = 10 * log(1/0.975) = 0.11

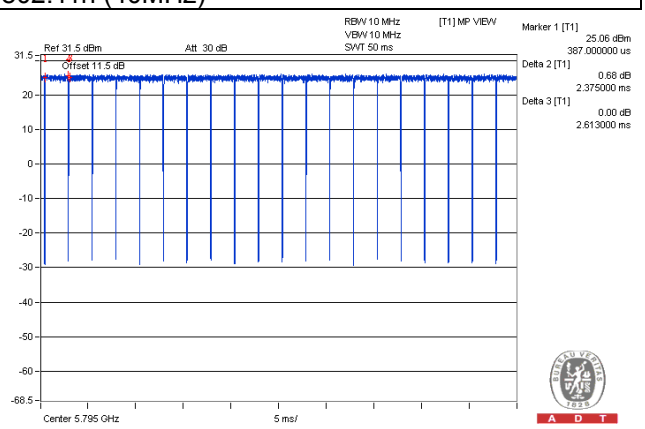
802.11n (40MHz): Duty cycle = 2.375/2.613 = 0.909, Duty factor = 10 * log(1/0.909) = 0.41

802.11ac (80MHz): Duty cycle = 1.112/1.237 = 0.899, Duty factor = 10 * log(1/0.899) = 0.46

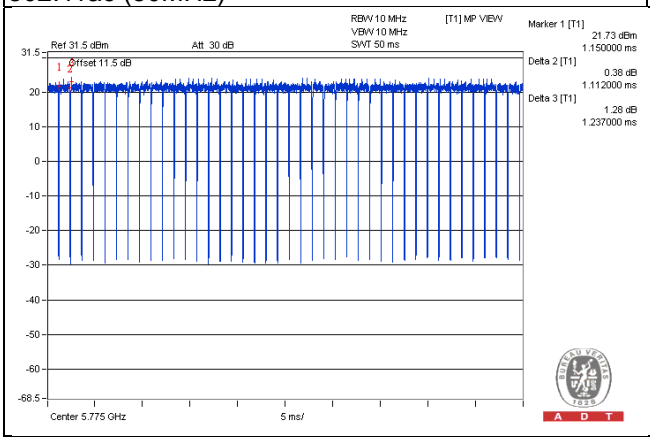
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



Beamforming_NSS2 Mode

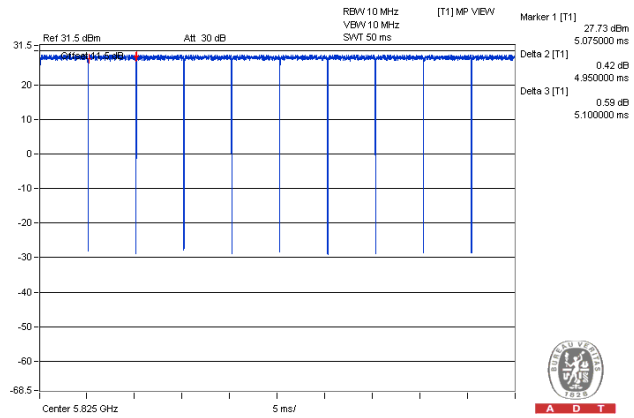
Duty cycle is < 98%, duty factor shall be considered.

802.11n (20MHz): Duty cycle = 4.950/5.100 = 0.971, Duty factor = 10 * log(1/0.971) = 0.13

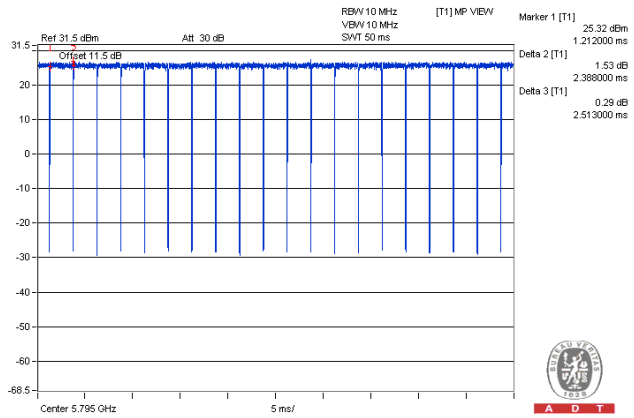
802.11n (40MHz): Duty cycle = 2.388/2.513 = 0.950, Duty factor = 10 * log(1/0.950) = 0.22

802.11ac (80MHz): Duty cycle = 1.074/1.299 = 0.827, Duty factor = 10 * log(1/0.827) = 0.82

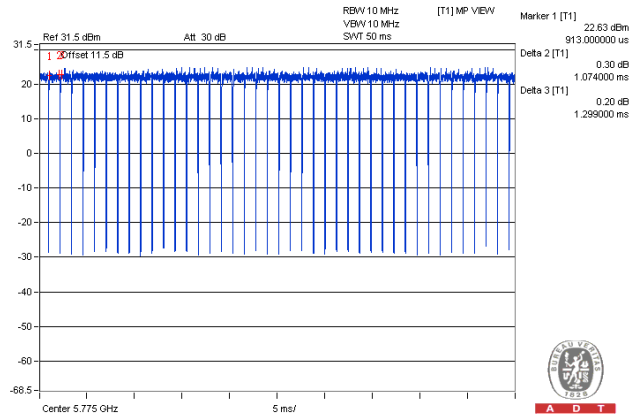
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



3.4 Description of Support Units

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

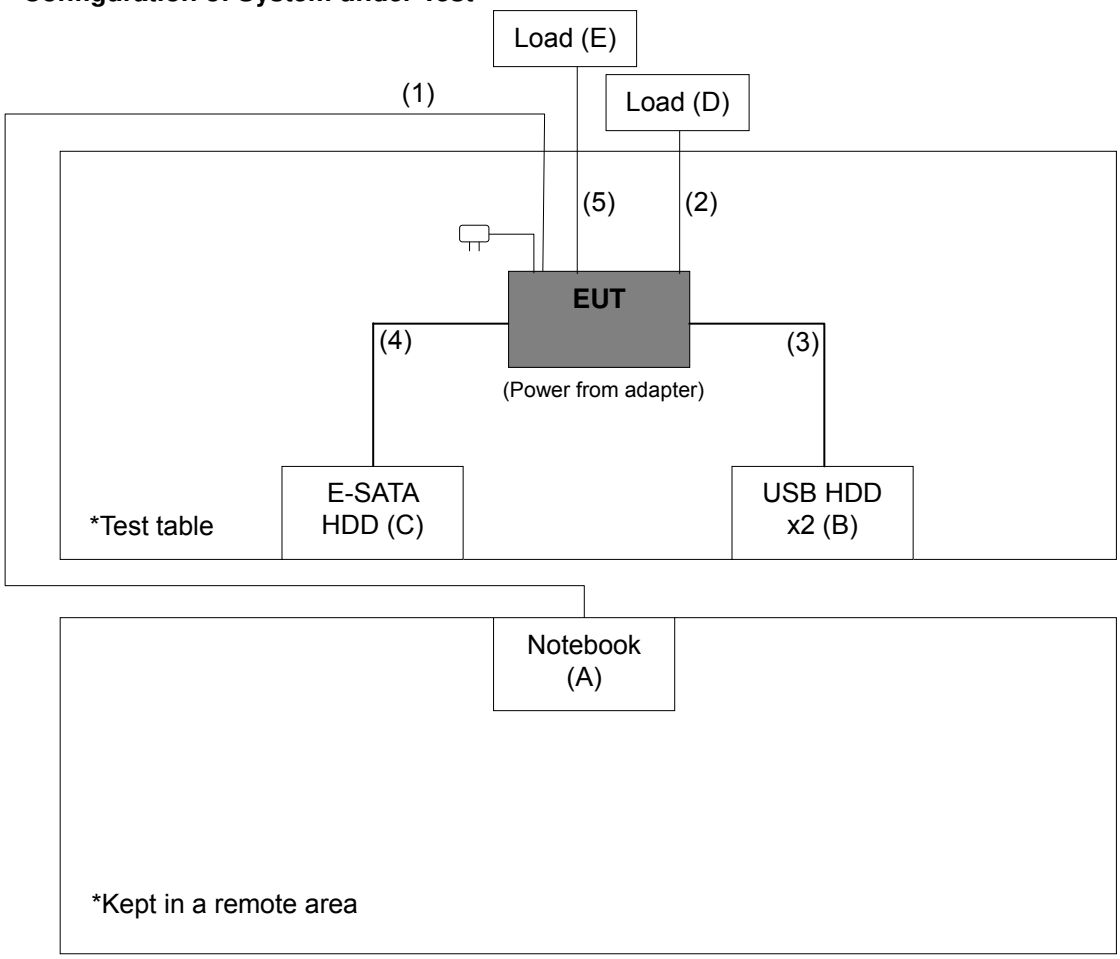
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5420	BPQ8MQ1	FCC DoC Approved	-
B.	USB HDD x 2	WD	WDBACY5000ABL	WX41A81P8576	FCC DoC Approved	-
		WD	WDBACY5000ABL-01	WX51C12T6215	FCC DoC Approved	-
C.	E-SATA HDD	Sarotech	FHD-354US	E80P048380919	FCC DoC Approved	-
D.	Load	NA	NA	NA	NA	-
E.	Load	NA	NA	NA	NA	-

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ 45	1	3	N	0	-
2.	RJ 45	4	1.8	N	0	-
3.	USB	2	1.8	Y	0	-
4.	E-SATA	1	0.5	Y	0	-
5.	RJ 11	1	1.8	N	0	-

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)
558074 D01 DTS Meas Guidance v03r02
662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

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

4 Test Types and Results (For 2.4GHz Band)

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

Note:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 06, 2014	Oct. 05, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jul. 25, 2014	Jul. 24, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01960	Aug. 09, 2014	Aug. 08, 2015
Preamplifier Agilent	8447D	2944A10631	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 09, 2014	Aug. 08, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100.	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2014	Oct. 17, 2015
High Speed Peak Power Meter	ML2495A	0824011	Jul. 26, 2014	Jul. 25, 2015
Power Sensor	MA2411B	0738171	Jul. 26, 2014	Jul. 25, 2015

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 4.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 460141.
5. The IC Site Registration No. is IC7450F-4.

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

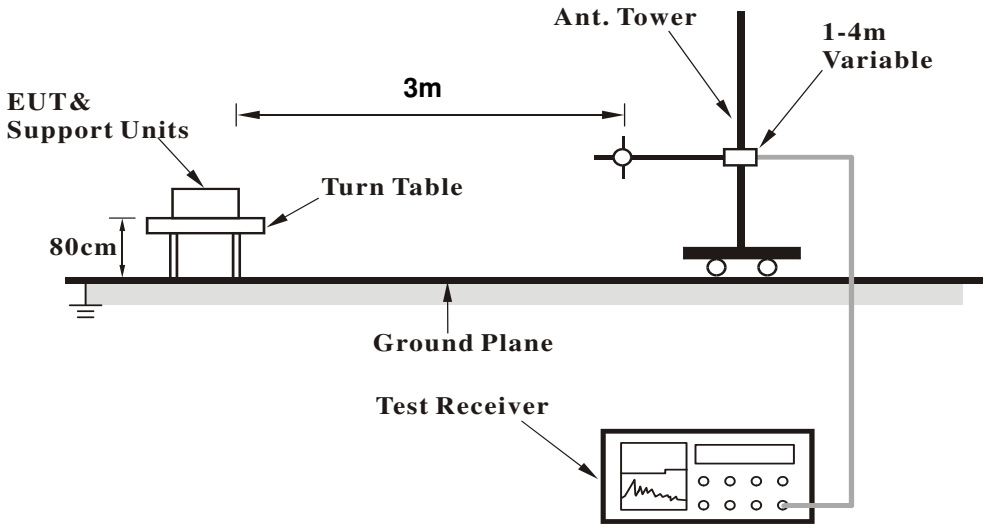
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution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

4.1.4 Deviation from Test Standard

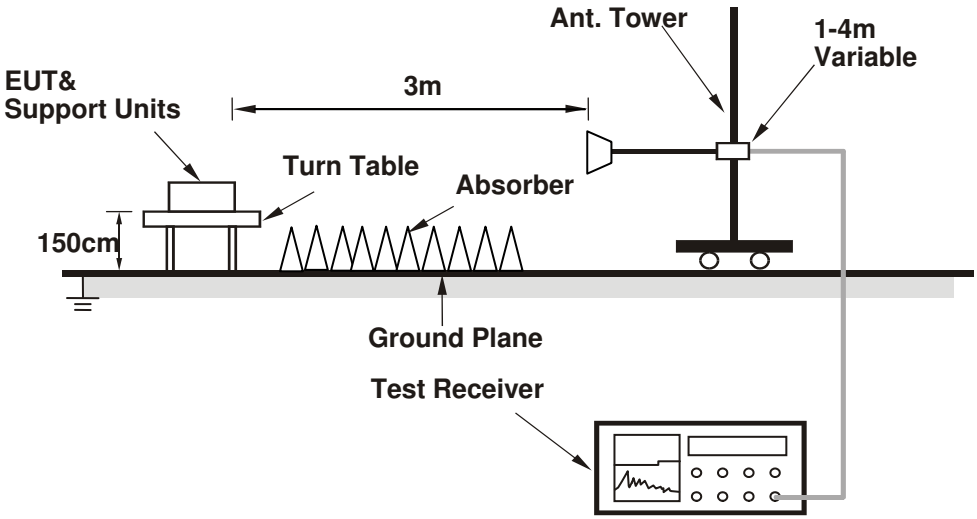
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

Above 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.5 PK	74.0	-15.5	1.00 H	94	26.40	32.10
2	2390.00	45.2 AV	54.0	-8.8	1.00 H	94	13.10	32.10
3	*2412.00	111.0 PK			1.00 H	94	78.80	32.20
4	*2412.00	108.1 AV			1.00 H	94	75.90	32.20
5	4824.00	44.7 PK	74.0	-29.3	1.49 H	141	39.50	5.20
6	4824.00	36.8 AV	54.0	-17.2	1.49 H	141	31.60	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.2 PK	74.0	-8.8	1.03 V	16	33.10	32.10
2	2390.00	50.1 AV	54.0	-3.9	1.03 V	16	18.00	32.10
3	*2412.00	123.9 PK			1.03 V	16	91.70	32.20
4	*2412.00	120.5 AV			1.03 V	16	88.30	32.20
5	4824.00	46.9 PK	74.0	-27.1	1.39 V	244	41.70	5.20
6	4824.00	41.7 AV	54.0	-12.3	1.39 V	244	36.50	5.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	110.8 PK			1.00 H	8	78.60	32.20
2	*2437.00	108.1 AV			1.00 H	8	75.90	32.20
3	4874.00	43.3 PK	74.0	-30.7	1.27 H	138	38.10	5.20
4	4874.00	34.3 AV	54.0	-19.7	1.27 H	138	29.10	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	120.6 PK			1.68 V	356	88.40	32.20
2	*2437.00	117.7 AV			1.68 V	356	85.50	32.20
3	4874.00	44.9 PK	74.0	-29.1	1.01 V	238	39.70	5.20
4	4874.00	35.9 AV	54.0	-18.1	1.01 V	238	30.70	5.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.3 PK			1.33 H	242	79.00	32.30
2	*2462.00	108.4 AV			1.33 H	242	76.10	32.30
3	2483.50	59.5 PK	74.0	-14.5	1.33 H	242	27.20	32.30
4	2483.50	46.4 AV	54.0	-7.6	1.33 H	242	14.10	32.30
5	4924.00	44.6 PK	74.0	-29.4	1.14 H	286	39.30	5.30
6	4924.00	34.8 AV	54.0	-19.2	1.14 H	286	29.50	5.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	121.3 PK			1.02 V	17	89.00	32.30
2	*2462.00	118.4 AV			1.02 V	17	86.10	32.30
3	2483.50	61.4 PK	74.0	-12.6	1.02 V	17	29.10	32.30
4	2483.50	50.9 AV	54.0	-3.1	1.02 V	17	18.60	32.30
5	4924.00	46.9 PK	74.0	-27.1	1.00 V	327	41.60	5.30
6	4924.00	39.6 AV	54.0	-14.4	1.00 V	327	34.30	5.30

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.6 PK	74.0	-7.4	1.00 H	218	34.50	32.10
2	2390.00	50.2 AV	54.0	-3.8	1.00 H	218	18.10	32.10
3	*2412.00	111.4 PK			1.00 H	218	79.20	32.20
4	*2412.00	108.1 AV			1.00 H	218	75.90	32.20
5	4824.00	43.0 PK	74.0	-31.0	1.44 H	130	37.80	5.20
6	4824.00	33.8 AV	54.0	-20.2	1.44 H	130	28.60	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.3 PK	74.0	-1.7	1.00 V	207	40.20	32.10
2	2390.00	53.7 AV	54.0	-0.3	1.00 V	207	21.60	32.10
3	*2412.00	116.6 PK			1.00 V	207	84.40	32.20
4	*2412.00	113.5 AV			1.00 V	207	81.30	32.20
5	4824.00	44.2 PK	74.0	-29.8	1.42 V	229	39.00	5.20
6	4824.00	35.7 AV	54.0	-18.3	1.42 V	229	30.50	5.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	114.6 PK			1.00 H	88	82.40	32.20
2	*2437.00	111.3 AV			1.00 H	88	79.10	32.20
3	4874.00	44.1 PK	74.0	-29.9	1.45 H	120	38.90	5.20
4	4874.00	35.1 AV	54.0	-18.9	1.45 H	120	29.90	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	121.8 PK			1.01 V	160	89.60	32.20
2	*2437.00	118.8 AV			1.01 V	160	86.60	32.20
3	4874.00	45.9 PK	74.0	-28.1	1.26 V	238	40.70	5.20
4	4874.00	37.1 AV	54.0	-16.9	1.26 V	238	31.90	5.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.3 PK			1.00 H	12	80.00	32.30
2	*2462.00	108.9 AV			1.00 H	12	76.60	32.30
3	2483.50	61.1 PK	74.0	-12.9	1.00 H	12	28.80	32.30
4	2483.50	46.6 AV	54.0	-7.4	1.00 H	12	14.30	32.30
5	4924.00	43.3 PK	74.0	-30.7	1.39 H	108	38.00	5.30
6	4924.00	34.0 AV	54.0	-20.0	1.39 H	108	28.70	5.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	117.9 PK			1.48 V	346	85.60	32.30
2	*2462.00	114.8 AV			1.48 V	346	82.50	32.30
3	2483.50	72.6 PK	74.0	-1.4	1.48 V	346	40.30	32.30
4	2483.50	53.7 AV	54.0	-0.3	1.48 V	346	21.40	32.30
5	4924.00	44.3 PK	74.0	-29.7	1.30 V	258	39.00	5.30
6	4924.00	36.1 AV	54.0	-17.9	1.30 V	258	30.80	5.30

REMARKS:

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

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.3 PK	74.0	-11.7	1.03 H	39	30.20	32.10
2	2390.00	47.9 AV	54.0	-6.1	1.03 H	39	15.80	32.10
3	*2412.00	111.7 PK			1.03 H	39	79.50	32.20
4	*2412.00	108.2 AV			1.03 H	39	76.00	32.20
5	4824.00	43.2 PK	74.0	-30.8	1.62 H	130	4.10	39.10
6	4824.00	33.7 AV	54.0	-20.3	1.62 H	130	-5.40	39.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.2 PK	74.0	-3.8	1.00 V	191	38.10	32.10
2	2390.00	53.7 AV	54.0	-0.3	1.00 V	191	21.60	32.10
3	*2412.00	120.3 PK			1.00 V	191	88.10	32.20
4	*2412.00	117.3 AV			1.00 V	191	85.10	32.20
5	4824.00	45.3 PK	74.0	-28.7	1.29 V	220	40.10	5.20
6	4824.00	36.7 AV	54.0	-17.3	1.29 V	220	31.50	5.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	113.6 PK			1.00 H	20	81.40	32.20
2	*2437.00	110.0 AV			1.00 H	20	77.80	32.20
3	4874.00	43.9 PK	74.0	-30.1	1.52 H	141	38.70	5.20
4	4874.00	34.3 AV	54.0	-19.7	1.52 H	141	29.10	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	122.1 PK			1.13 V	192	89.90	32.20
2	*2437.00	118.8 AV			1.13 V	192	86.60	32.20
3	4874.00	46.0 PK	74.0	-28.0	1.31 V	229	40.80	5.20
4	4874.00	37.3 AV	54.0	-16.7	1.31 V	229	32.10	5.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.3 PK			1.50 H	222	79.00	32.30
2	*2462.00	108.1 AV			1.50 H	222	75.80	32.30
3	2483.50	61.3 PK	74.0	-12.7	1.50 H	222	29.00	32.30
4	2483.50	47.0 AV	54.0	-7.0	1.50 H	222	14.70	32.30
5	4924.00	43.4 PK	74.0	-30.6	1.40 H	138	38.10	5.30
6	4924.00	34.0 AV	54.0	-20.0	1.40 H	138	28.70	5.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	116.9 PK			1.13 V	202	84.60	32.30
2	*2462.00	113.9 AV			1.13 V	202	81.60	32.30
3	2483.50	71.3 PK	74.0	-2.7	1.13 V	202	39.00	32.30
4	2483.50	53.6 AV	54.0	-0.4	1.13 V	202	21.30	32.30
5	4924.00	45.4 PK	74.0	-28.6	1.18 V	237	40.10	5.30
6	4924.00	36.7 AV	54.0	-17.3	1.18 V	237	31.40	5.30

REMARKS:

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

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.7 PK	74.0	-11.3	1.00 H	20	30.60	32.10
2	2390.00	49.4 AV	54.0	-4.6	1.00 H	20	17.30	32.10
3	*2422.00	105.1 PK			1.00 H	20	72.90	32.20
4	*2422.00	101.7 AV			1.00 H	20	69.50	32.20
5	4844.00	42.9 PK	74.0	-31.1	1.35 H	133	37.70	5.20
6	4844.00	33.6 AV	54.0	-20.4	1.35 H	133	28.40	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.5 PK	74.0	-4.5	1.01 V	186	37.40	32.10
2	2390.00	53.5 AV	54.0	-0.5	1.01 V	186	21.40	32.10
3	*2422.00	112.7 PK			1.01 V	186	80.50	32.20
4	*2422.00	109.4 AV			1.01 V	186	77.20	32.20
5	4844.00	44.2 PK	74.0	-29.8	1.23 V	262	39.00	5.20
6	4844.00	35.7 AV	54.0	-18.3	1.23 V	262	30.50	5.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.6 PK	74.0	-14.4	1.00 H	145	27.50	32.10
2	2390.00	46.3 AV	54.0	-7.7	1.00 H	145	14.20	32.10
3	*2437.00	107.2 PK			1.00 H	145	75.00	32.20
4	*2437.00	103.7 AV			1.00 H	145	71.50	32.20
5	4874.00	43.2 PK	74.0	-30.8	1.29 H	108	38.00	5.20
6	4874.00	33.7 AV	54.0	-20.3	1.29 H	108	28.50	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.9 PK	74.0	-6.1	1.35 V	1	35.80	32.10
2	**2390.00**	**53.8 AV**	**54.0**	**-0.2**	**1.35 V**	**1**	**21.70**	**32.10**
3	*2437.00	112.8 PK			1.35 V	1	80.60	32.20
4	*2437.00	109.6 AV			1.35 V	1	77.40	32.20
5	4874.00	44.0 PK	74.0	-30.0	1.22 V	209	38.80	5.20
6	4874.00	35.5 AV	54.0	-18.5	1.22 V	209	30.30	5.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	107.6 PK			1.15 H	222	75.40	32.20
2	*2452.00	104.3 AV			1.15 H	222	72.10	32.20
3	2483.50	65.0 PK	74.0	-9.0	1.15 H	222	32.70	32.30
4	2483.50	48.9 AV	54.0	-5.1	1.15 H	222	16.60	32.30
5	4904.00	43.9 PK	74.0	-30.1	1.39 H	100	38.70	5.20
6	4904.00	34.4 AV	54.0	-19.6	1.39 H	100	29.20	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	115.8 PK			1.01 V	14	83.60	32.20
2	*2452.00	112.6 AV			1.01 V	14	80.40	32.20
3	2483.50	73.2 PK	74.0	-0.8	1.01 V	14	40.90	32.30
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.01 V**	**14**	**21.50**	**32.30**
5	4904.00	44.8 PK	74.0	-29.2	1.31 V	240	39.60	5.20
6	4904.00	36.7 AV	54.0	-17.3	1.31 V	240	31.50	5.20

REMARKS:

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

Below 1GHz Data: 802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	138.56	33.2 QP	43.5	-10.3	2.00 H	250	47.60	-14.40
2	287.97	37.6 QP	46.0	-8.4	1.00 H	139	50.40	-12.80
3	375.29	42.9 QP	46.0	-3.1	1.00 H	315	54.10	-11.20
4	417.98	40.6 QP	46.0	-5.4	2.00 H	9	51.10	-10.50
5	625.60	40.4 QP	46.0	-5.6	1.51 H	303	46.70	-6.30
6	875.91	42.2 QP	46.0	-3.8	1.00 H	322	44.40	-2.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	60.95	36.9 QP	40.0	-3.1	1.00 V	282	51.70	-14.80
2	375.29	43.0 QP	46.0	-3.0	1.49 V	97	54.20	-11.20
3	563.51	36.3 QP	46.0	-9.7	1.24 V	12	44.30	-8.00
4	625.60	40.9 QP	46.0	-5.1	1.00 V	74	47.20	-6.30
5	747.85	40.4 QP	46.0	-5.6	1.24 V	12	44.00	-3.60
6	875.91	42.8 QP	46.0	-3.2	1.24 V	41	45.00	-2.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	95.87	33.8 QP	43.5	-9.7	1.99 H	198	53.10	-19.30
2	249.17	35.1 QP	46.0	-10.9	1.24 H	320	49.50	-14.40
3	375.29	42.8 QP	46.0	-3.2	1.00 H	66	54.00	-11.20
4	625.60	40.4 QP	46.0	-5.6	1.24 H	108	46.70	-6.30
5	730.38	40.0 QP	46.0	-6.0	1.00 H	232	44.50	-4.50
6	875.91	42.7 QP	46.0	-3.3	1.00 H	326	44.90	-2.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	55.13	36.0 QP	40.0	-4.0	1.26 V	55	50.20	-14.20
2	375.29	42.3 QP	46.0	-3.7	1.51 V	253	53.50	-11.20
3	625.60	40.7 QP	46.0	-5.3	1.01 V	71	47.00	-6.30
4	730.38	41.0 QP	46.0	-5.0	1.51 V	115	45.50	-4.50
5	835.17	42.2 QP	46.0	-3.8	2.00 V	359	44.80	-2.60
6	875.91	42.2 QP	46.0	-3.8	1.26 V	138	44.40	-2.20

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

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

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

4.2.3 Test Procedures

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

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

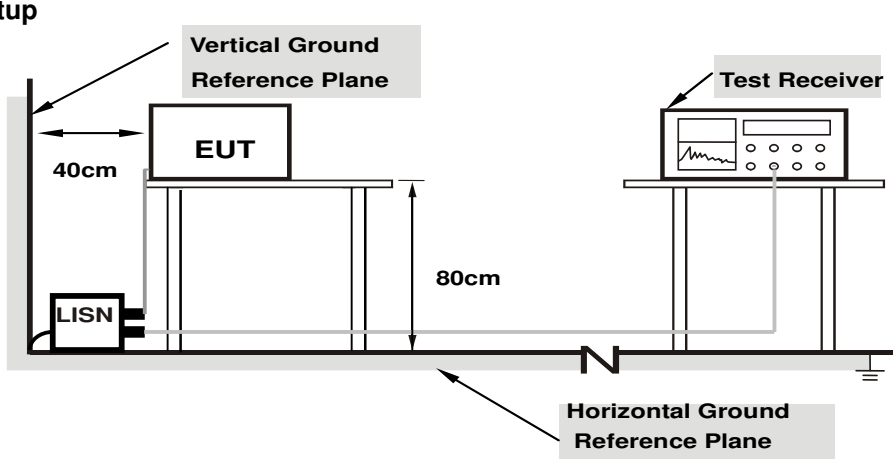
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

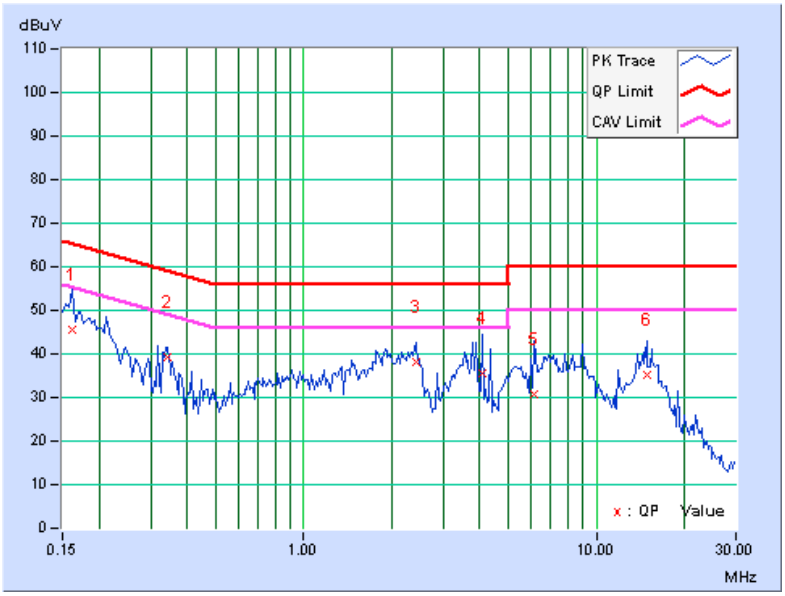
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.20	45.29	33.92	45.49	34.12	65.38	55.38	-19.89	-21.26
2	0.34141	0.20	39.22	33.85	39.42	34.05	59.17	49.17	-19.75	-15.12
3	2.41406	0.37	37.63	28.37	38.00	28.74	56.00	46.00	-18.00	-17.26
4	4.06641	0.43	35.13	24.43	35.56	24.86	56.00	46.00	-20.44	-21.14
5	6.13281	0.45	30.32	23.58	30.77	24.03	60.00	50.00	-29.23	-25.97
6	14.84766	0.58	34.77	30.70	35.35	31.28	60.00	50.00	-24.65	-18.72

Remarks:

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

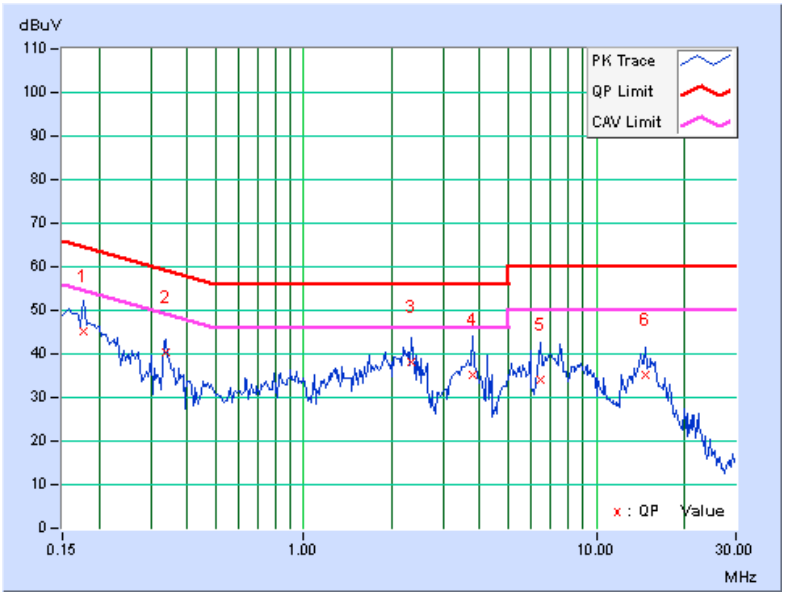


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	0.21	45.14	32.07	45.35	32.28	64.61	54.61	-19.26	-22.33
2	0.33750	0.24	40.26	35.85	40.50	36.09	59.26	49.26	-18.76	-13.17
3	2.33594	0.41	37.88	29.65	38.29	30.06	56.00	46.00	-17.71	-15.94
4	3.78125	0.45	34.80	27.67	35.25	28.12	56.00	46.00	-20.75	-17.88
5	6.44922	0.50	33.64	28.27	34.14	28.77	60.00	50.00	-25.86	-21.23
6	14.72266	0.70	34.47	30.89	35.17	31.59	60.00	50.00	-24.83	-18.41

Remarks:

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

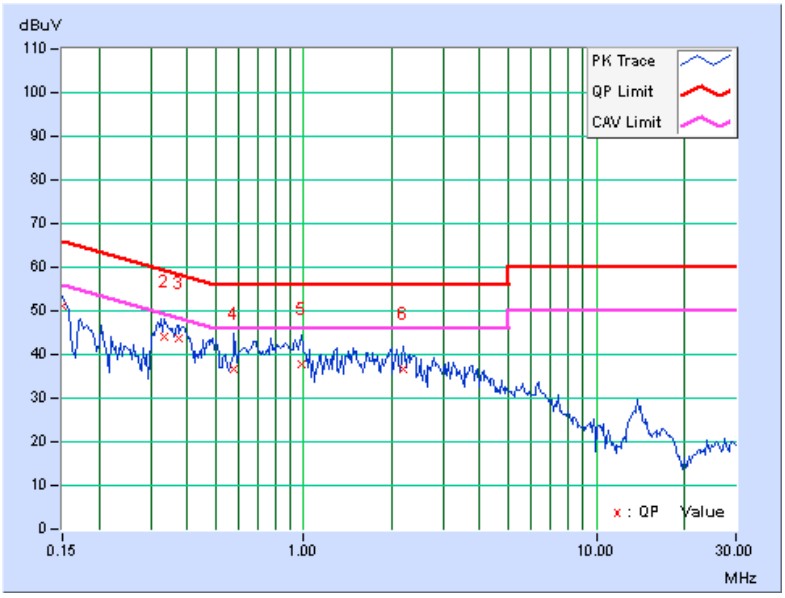


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.19	50.96	37.62	51.15	37.81	66.00	56.00	-14.85	-18.19
2	0.33359	0.20	44.04	34.98	44.24	35.18	59.36	49.36	-15.12	-14.18
3	0.37266	0.20	43.62	35.38	43.82	35.58	58.44	48.44	-14.62	-12.86
4	0.57969	0.23	36.46	26.18	36.69	26.41	56.00	46.00	-19.31	-19.59
5	0.97813	0.30	37.58	29.19	37.88	29.49	56.00	46.00	-18.12	-16.51
6	2.19922	0.37	36.15	28.73	36.52	29.10	56.00	46.00	-19.48	-16.90

Remarks:

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

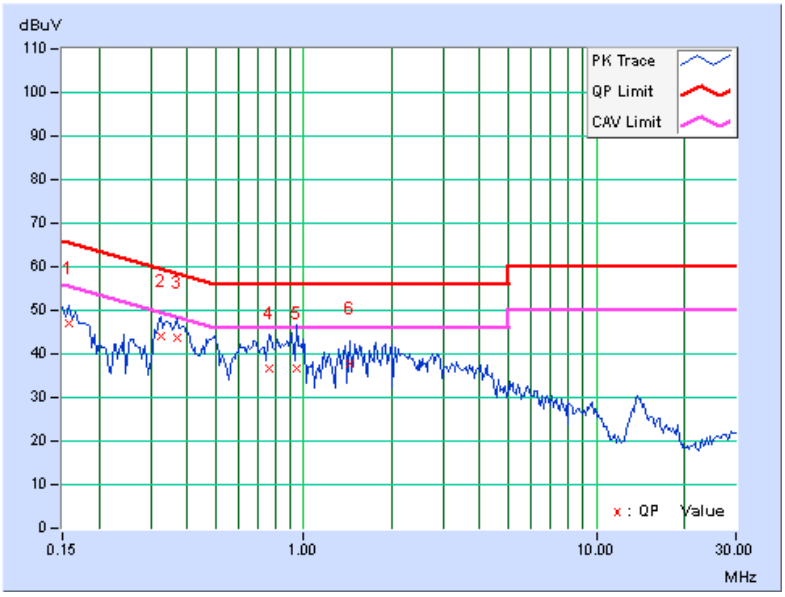


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.21	46.82	28.18	47.03	28.39	65.58	55.58	-18.55	-27.19
2	0.32578	0.24	43.84	33.64	44.08	33.88	59.56	49.56	-15.48	-15.68
3	0.36875	0.25	43.43	33.86	43.68	34.11	58.53	48.53	-14.85	-14.42
4	0.75938	0.29	36.46	25.49	36.75	25.78	56.00	46.00	-19.25	-20.22
5	0.95078	0.31	36.40	27.10	36.71	27.41	56.00	46.00	-19.29	-18.59
6	1.43359	0.35	37.61	29.22	37.96	29.57	56.00	46.00	-18.04	-16.43

Remarks:

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

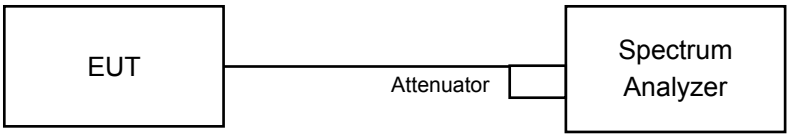


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz

b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.

c. Trace mode = max hold.

d. Sweep = auto couple.

e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	8.11	8.10	8.13	7.10	0.5	Pass
6	2437	8.11	8.11	8.14	7.05	0.5	Pass
11	2462	8.11	7.58	7.11	8.52	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	16.38	16.36	15.17	15.18	0.5	Pass
6	2437	16.08	16.05	16.33	16.36	0.5	Pass
11	2462	16.35	16.36	15.75	16.37	0.5	Pass

802.11n (20MHz)

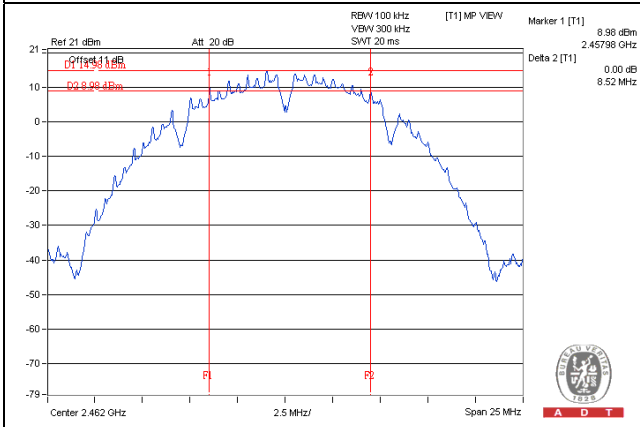
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	17.26	17.17	15.18	15.15	0.5	Pass
6	2437	17.23	16.57	15.74	17.58	0.5	Pass
11	2462	17.24	17.22	15.95	17.59	0.5	Pass

802.11n (40MHz)

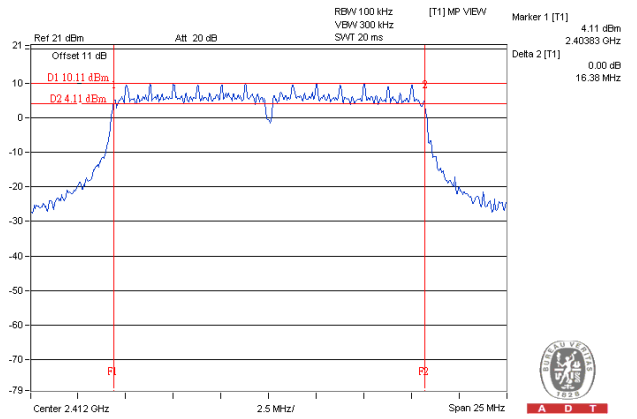
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
3	2422	35.87	35.27	35.15	35.37	0.5	Pass
6	2437	35.80	35.45	35.81	35.24	0.5	Pass
9	2452	35.80	35.40	35.16	35.19	0.5	Pass

Spectrum Plot of Worst Value

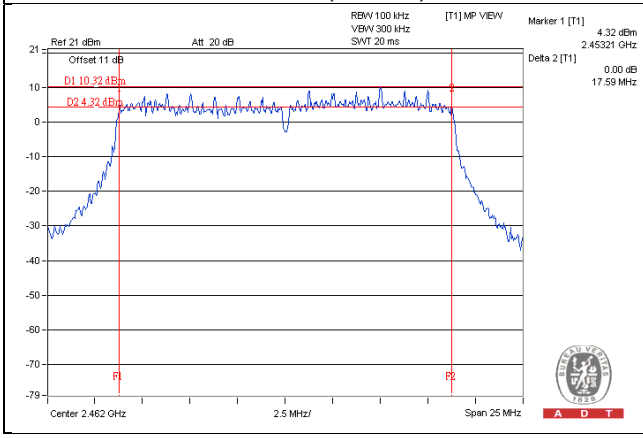
802.11b



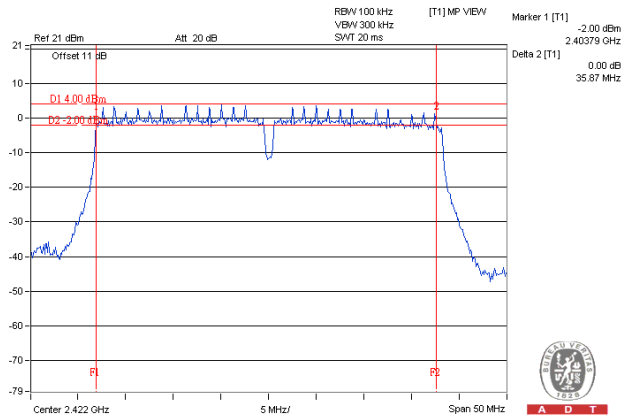
802.11g



802.11n (20MHz)



802.11n (40MHz)



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

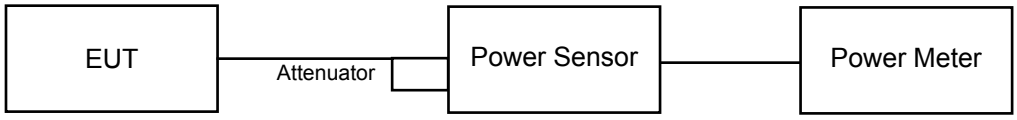
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

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

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

802.11b

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	23.96	23.71	23.85	23.52	951.415	29.78	30	Pass
6	2437	23.91	23.70	23.96	23.53	954.770	29.80	30	Pass
11	2462	23.94	23.64	23.84	23.58	949.085	29.77	30	Pass

802.11g

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	21.04	21.13	21.29	21.01	517.544	27.14	30	Pass
6	2437	24.00	23.81	24.38	23.52	**990.687**	29.96	30	Pass
11	2462	20.58	20.55	21.17	20.67	475.388	26.77	30	Pass

802.11n (20MHz)

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	21.49	21.48	21.45	21.22	553.605	27.43	30	Pass
6	2437	24.07	23.86	24.21	23.45	983.432	29.93	30	Pass
11	2462	20.66	20.58	20.32	20.72	456.380	26.59	30	Pass

802.11n (40MHz)

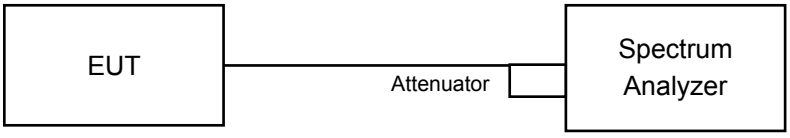
Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	18.03	17.88	18.29	17.91	254.164	24.05	30	Pass
6	2437	19.72	19.91	19.86	19.77	383.375	25.84	30	Pass
9	2452	19.28	18.95	19.16	18.79	321.344	25.07	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For AVG. power (duty cycle ≥ 98%)

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

For AVG. power (duty cycle < 98%)

a) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-3.48	6.02	2.54	7.77	Pass
	6	2437	-3.20	6.02	2.82	7.57	Pass
	11	2462	-4.53	6.02	1.49	7.87	Pass
1	1	2412	-4.31	6.02	1.71	7.77	Pass
	6	2437	-3.91	6.02	2.11	7.57	Pass
	11	2462	-4.70	6.02	1.32	7.87	Pass
2	1	2412	-3.69	6.02	2.33	7.77	Pass
	6	2437	-3.34	6.02	2.68	7.57	Pass
	11	2462	-4.48	6.02	1.54	7.87	Pass
3	1	2412	-3.30	6.02	2.72	7.77	Pass
	6	2437	-3.01	6.02	3.01	7.57	Pass
	11	2462	-3.82	6.02	2.20	7.87	Pass

Note:

2412MHz: Directional gain = 0.21dBi + 10log(4) = 6.23dBi > 6dBi, so the power density limit shall be reduced to 8-(6.23-6) = 7.77dBm.

2437MHz: Directional gain = 0.41dBi + 10log(4) = 6.43dBi > 6dBi, so the power density limit shall be reduced to 8-(6.43-6) = 7.57dBm.

2462MHz: Directional gain = 0.11dBi + 10log(4) = 6.13dBi > 6dBi, so the power density limit shall be reduced to 8-(6.13-6) = 7.87dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-8.93	6.02	-2.91	0.15	-2.76	7.77	Pass
	6	2437	-6.35	6.02	-0.33	0.15	-0.18	7.57	Pass
	11	2462	-9.83	6.02	-3.81	0.15	-3.66	7.87	Pass
1	1	2412	-8.92	6.02	-2.90	0.15	-2.75	7.77	Pass
	6	2437	-6.56	6.02	-0.54	0.15	-0.39	7.57	Pass
	11	2462	-9.46	6.02	-3.44	0.15	-3.29	7.87	Pass
2	1	2412	-8.28	6.02	-2.26	0.15	-2.11	7.77	Pass
	6	2437	-6.15	6.02	-0.13	0.15	0.02	7.57	Pass
	11	2462	-8.36	6.02	-2.34	0.15	-2.19	7.87	Pass
3	1	2412	-8.72	6.02	-2.70	0.15	-2.55	7.77	Pass
	6	2437	-6.27	6.02	-0.25	0.15	-0.10	7.57	Pass
	11	2462	-8.91	6.02	-2.89	0.15	-2.74	7.87	Pass

Note:

1. 2412MHz: Directional gain = 0.21dBi + 10log(4) = 6.23dBi > 6dBi, so the power density limit shall be reduced to 8-(6.23-6) = 7.77dBm.

   2437MHz: Directional gain = 0.41dBi + 10log(4) = 6.43dBi > 6dBi, so the power density limit shall be reduced to 8-(6.43-6) = 7.57dBm.

   2462MHz: Directional gain = 0.11dBi + 10log(4) = 6.13dBi > 6dBi, so the power density limit shall be reduced to 8-(6.13-6) = 7.87dBm.

2. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-8.57	6.02	-2.55	7.77	Pass
	6	2437	-5.71	6.02	0.31	7.57	Pass
	11	2462	-9.28	6.02	-3.26	7.87	Pass
1	1	2412	-8.75	6.02	-2.73	7.77	Pass
	6	2437	-6.08	6.02	-0.06	7.57	Pass
	11	2462	-9.37	6.02	-3.35	7.87	Pass
2	1	2412	-8.07	6.02	-2.05	7.77	Pass
	6	2437	-5.70	6.02	0.32	7.57	Pass
	11	2462	-7.93	6.02	-1.91	7.87	Pass
3	1	2412	-8.09	6.02	-2.07	7.77	Pass
	6	2437	-5.93	6.02	0.09	7.57	Pass
	11	2462	-8.60	6.02	-2.58	7.87	Pass

Note:

2412MHz: Directional gain = 0.21dBi + 10log(4) = 6.23dBi > 6dBi, so the power density limit shall be reduced to 8-(6.23-6) = 7.77dBm.

2437MHz: Directional gain = 0.41dBi + 10log(4) = 6.43dBi > 6dBi, so the power density limit shall be reduced to 8-(6.43-6) = 7.57dBm.

2462MHz: Directional gain = 0.11dBi + 10log(4) = 6.13dBi > 6dBi, so the power density limit shall be reduced to 8-(6.13-6) = 7.87dBm.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	3	2422	-14.90	6.02	-8.88	0.14	-8.74	7.77	Pass
	6	2437	-13.08	6.02	-7.06	0.14	-6.92	7.57	Pass
	9	2452	-14.24	6.02	-8.22	0.14	-8.08	7.87	Pass
1	3	2422	-15.73	6.02	-9.71	0.14	-9.57	7.77	Pass
	6	2437	-12.72	6.02	-6.70	0.14	-6.56	7.57	Pass
	9	2452	-14.22	6.02	-8.20	0.14	-8.06	7.87	Pass
2	3	2422	-14.89	6.02	-8.87	0.14	-8.73	7.77	Pass
	6	2437	-11.94	6.02	-5.92	0.14	-5.78	7.57	Pass
	9	2452	-12.91	6.02	-6.89	0.14	-6.75	7.87	Pass
3	3	2422	-14.11	6.02	-8.09	0.14	-7.95	7.77	Pass
	6	2437	-12.42	6.02	-6.40	0.14	-6.26	7.57	Pass
	9	2452	-13.26	6.02	-7.24	0.14	-7.10	7.87	Pass

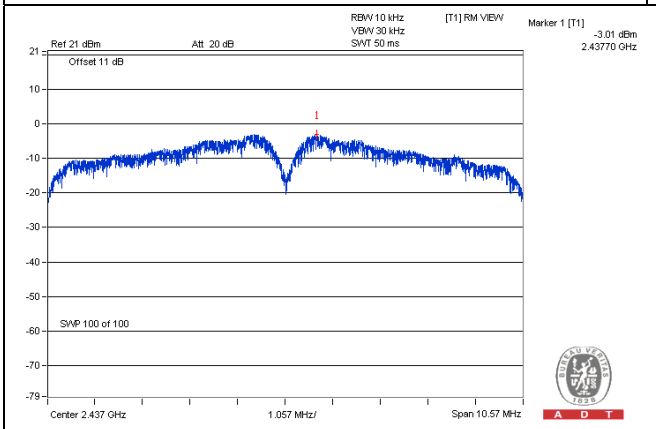
Note:

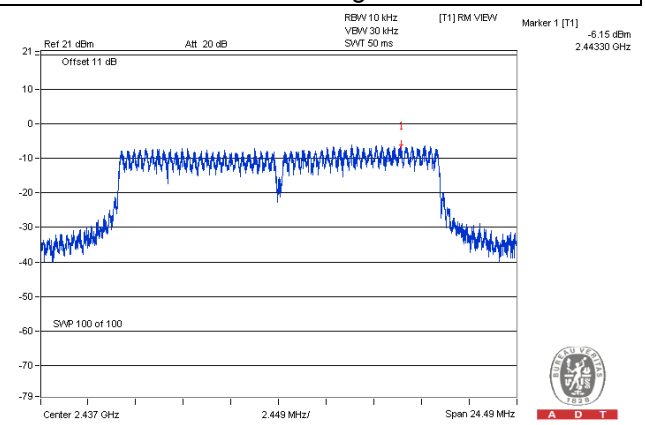
1. 2422MHz: Directional gain = 0.21dBi + 10log(4) = 6.23dBi > 6dBi, so the power density limit shall be reduced to 8-(6.23-6) = 7.77dBm.

   2437MHz: Directional gain = 0.41dBi + 10log(4) = 6.43dBi > 6dBi, so the power density limit shall be reduced to 8-(6.43-6) = 7.57dBm.

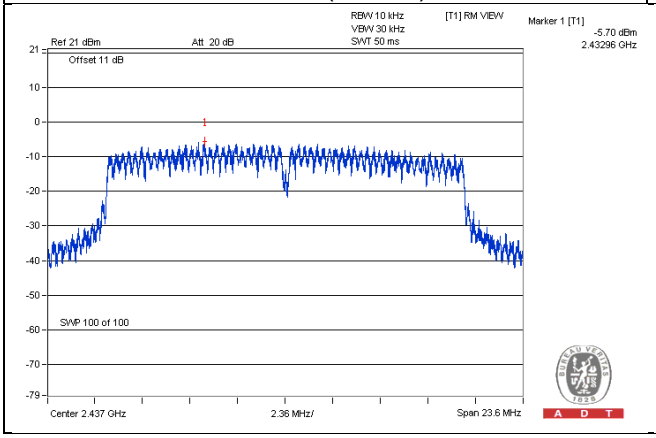
   2452MHz: Directional gain = 0.11dBi + 10log(4) = 6.13dBi > 6dBi, so the power density limit shall be reduced to 8-(6.13-6) = 7.87dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

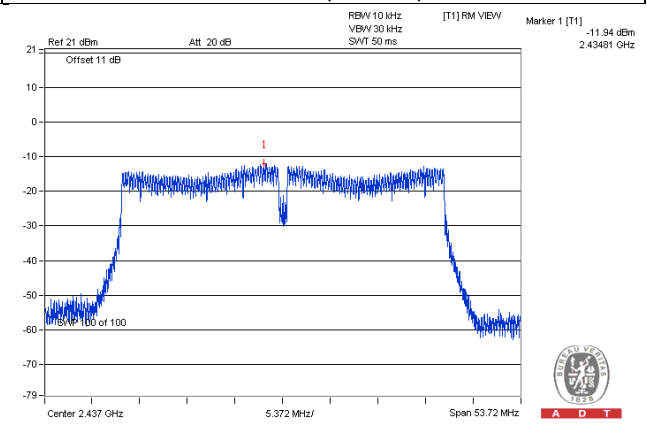
Spectrum Plot of Worst Value	
802.11b	802.11g





802.11n (20MHz)	802.11n (40MHz)



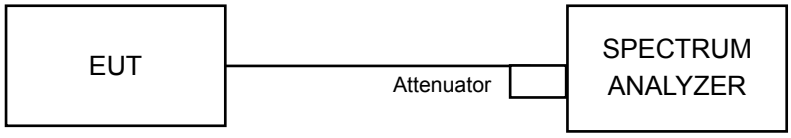


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

a. Set the RBW = 100 kHz.

b. Set the VBW ≥ 300 kHz.

c. Detector = average.

d. Sweep time = auto couple.

e. Trace mode = max hold.

f. Allow trace to fully stabilize.

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

MEASUREMENT PROCEDURE OOBE

a. Set RBW = 100 kHz.

b. Set VBW ≥ 300 kHz.

c. Detector = peak.

d. Sweep = auto couple.

e. Trace Mode = max hold.

f. Allow trace to fully stabilize.

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as Item 4.3.6

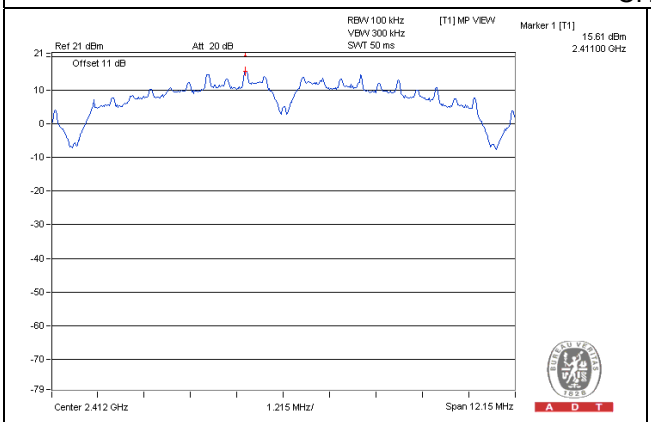
4.6.7 Test Results

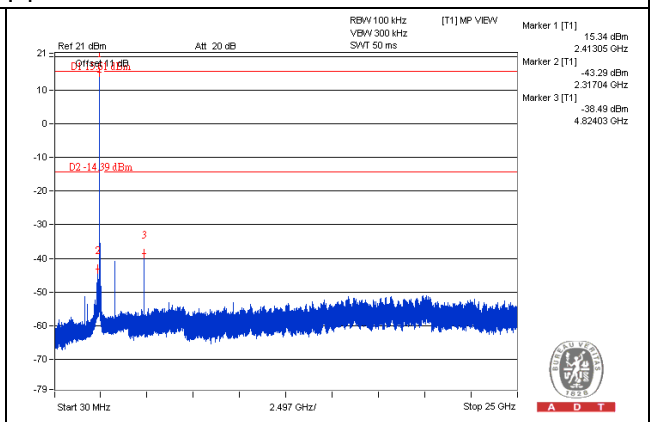
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

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

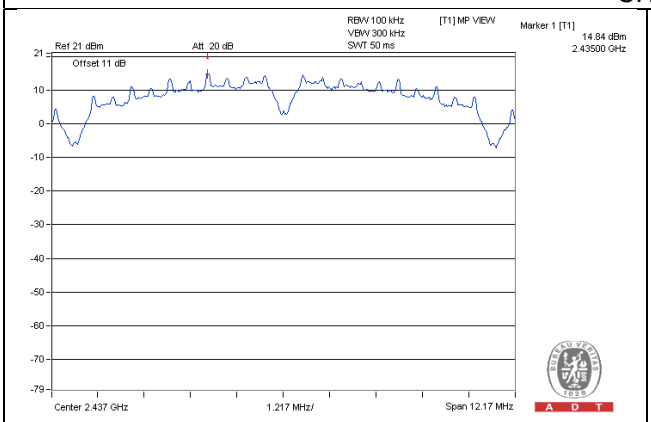
802.11b_Chain 0

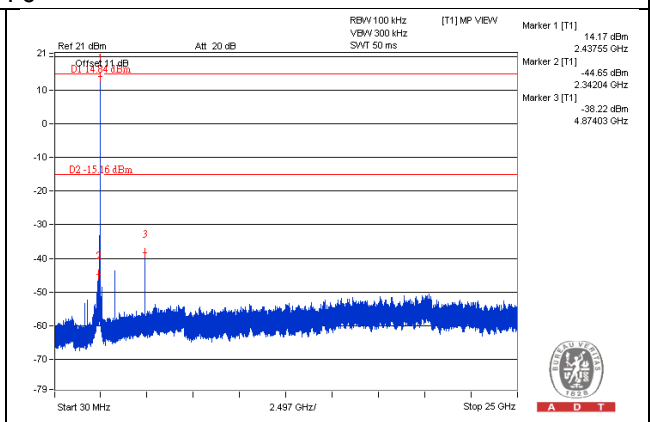
CH 1



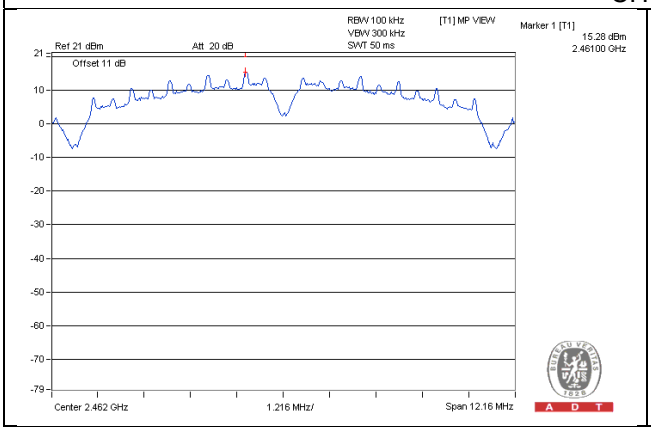


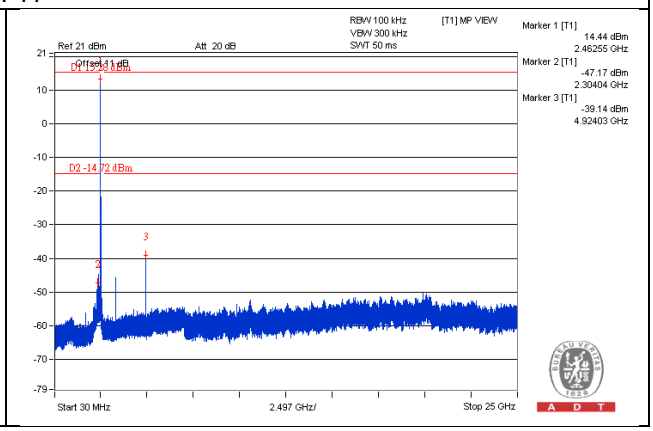
CH 6





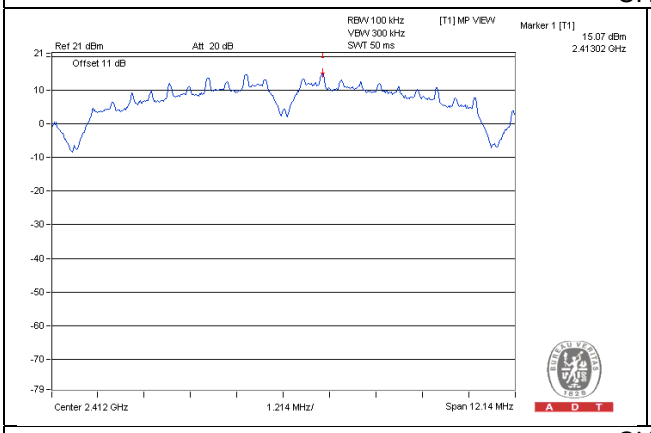
CH 11

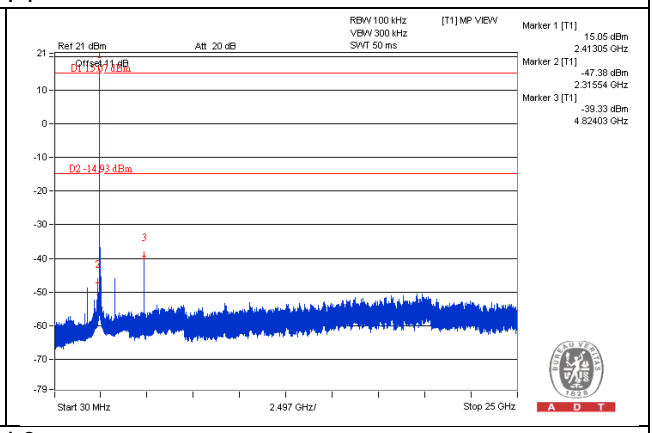




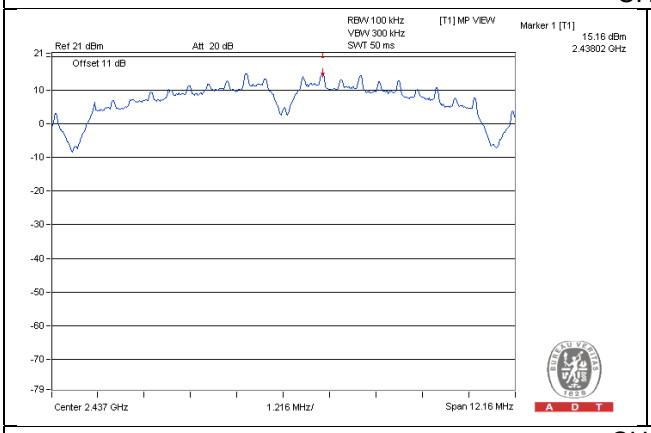
802.11b_Chain 1

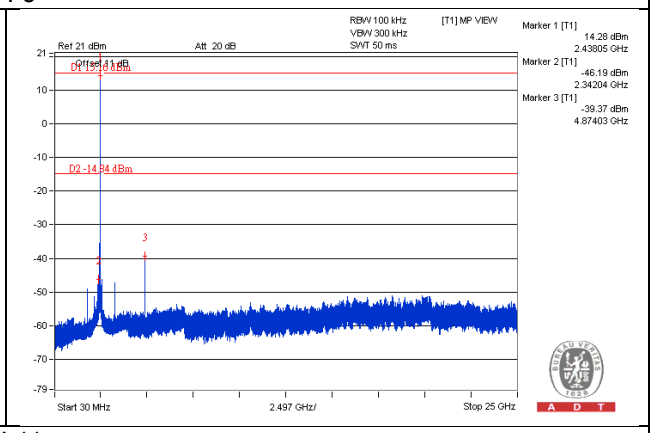
CH 1



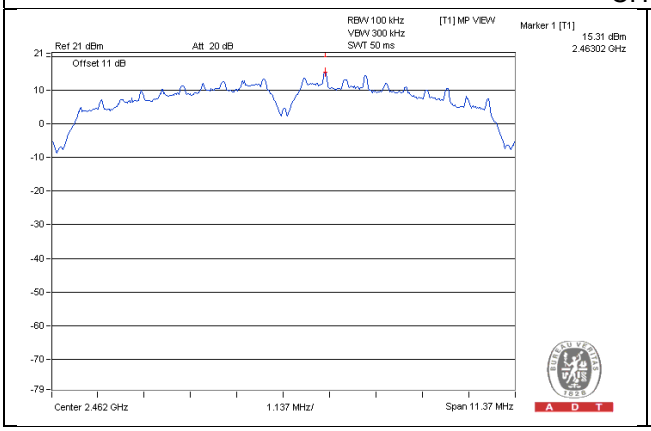


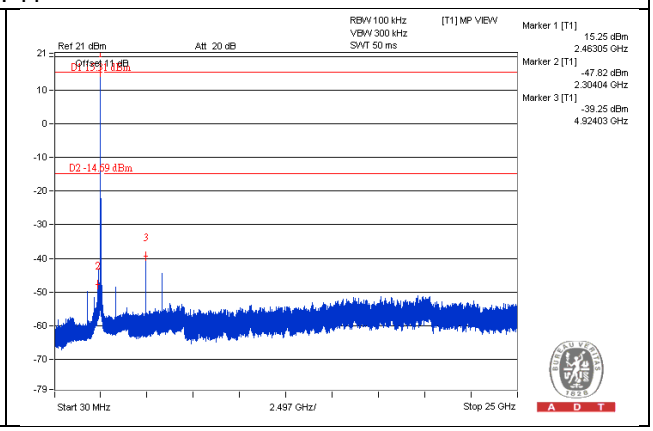
CH 6





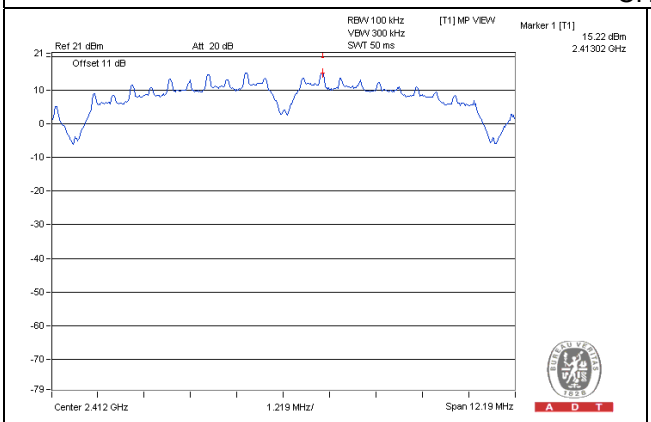
CH 11

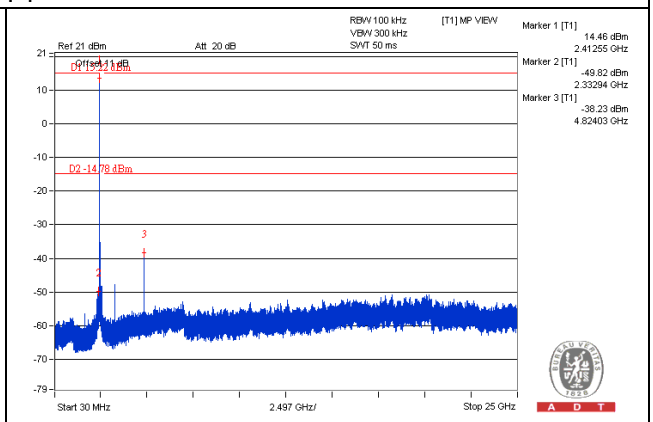




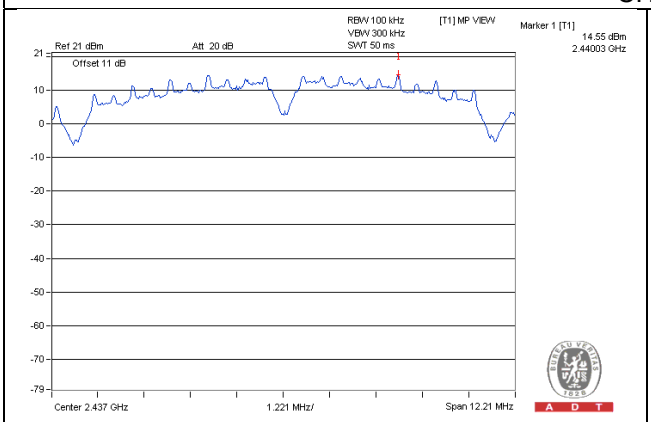
802.11b_Chain 2

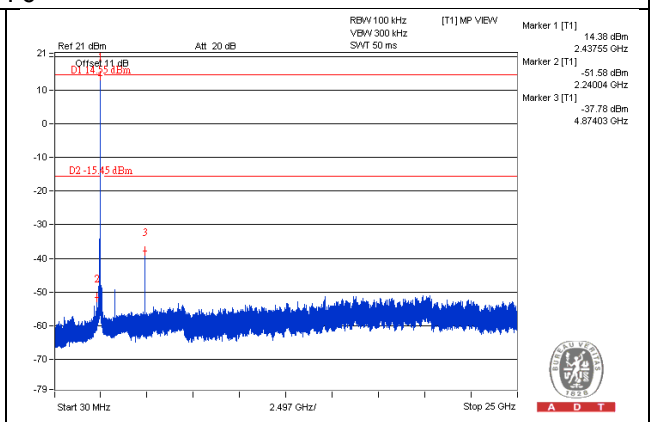
CH 1



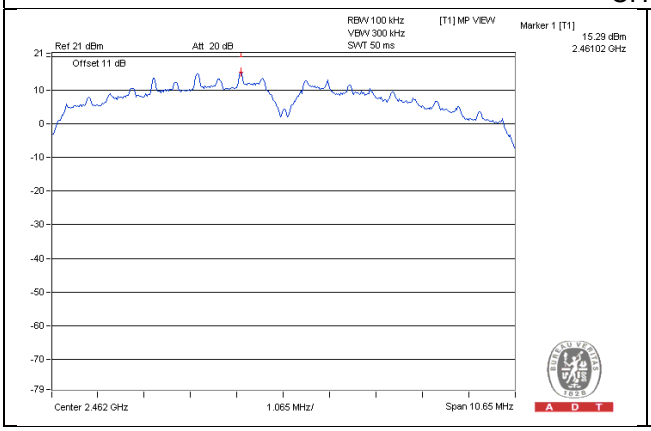


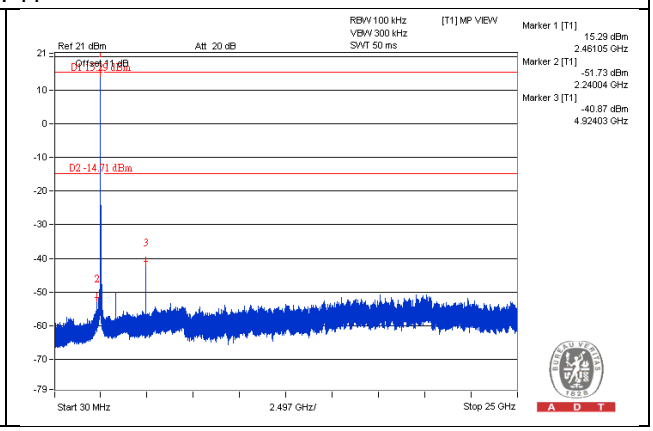
CH 6





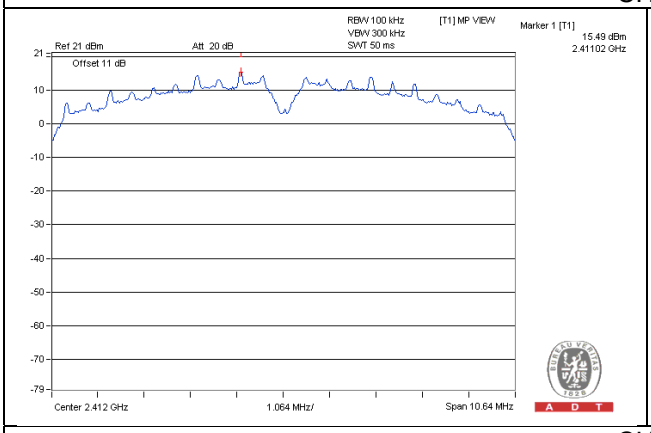
CH 11

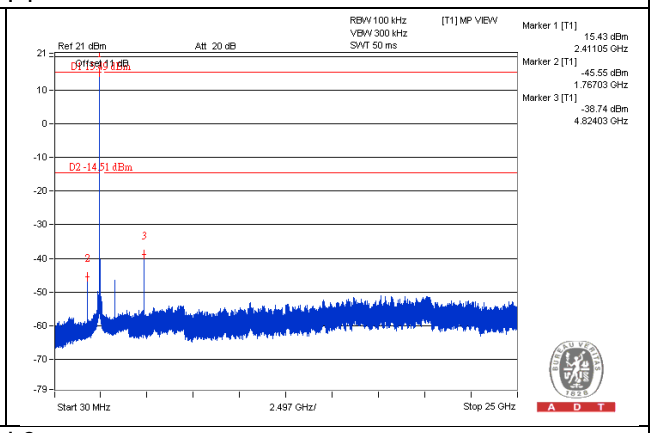




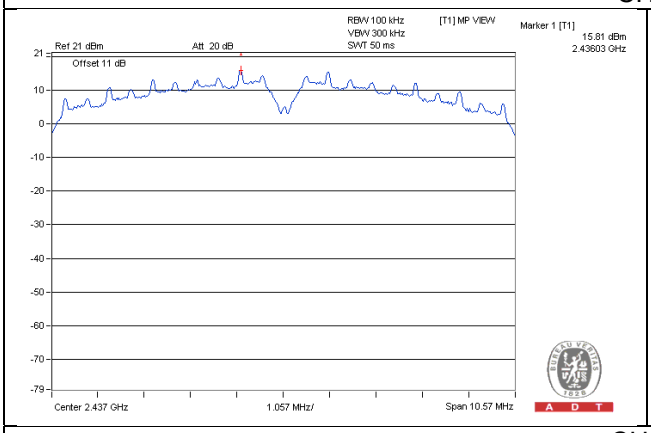
802.11b_Chain 3

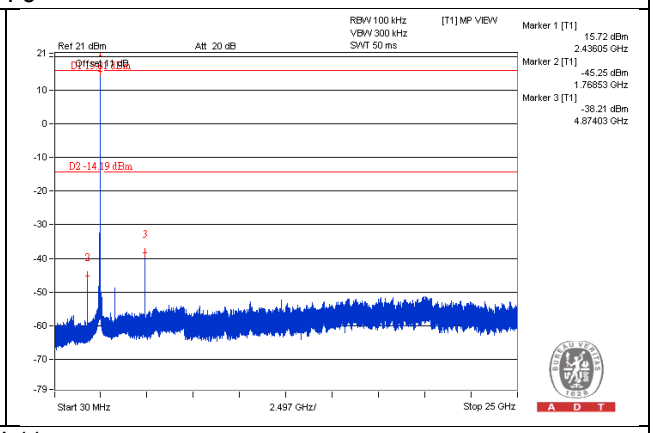
CH 1



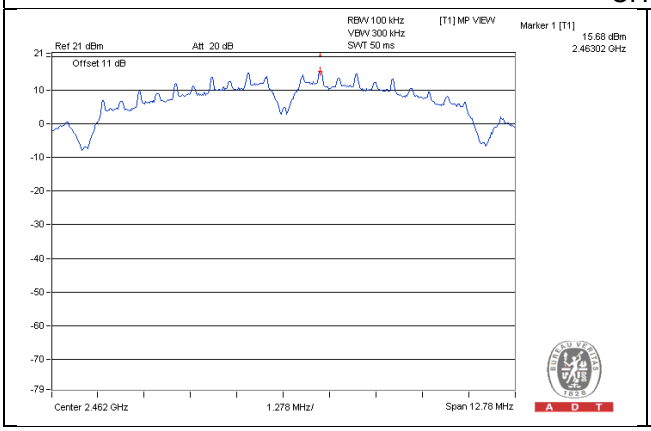


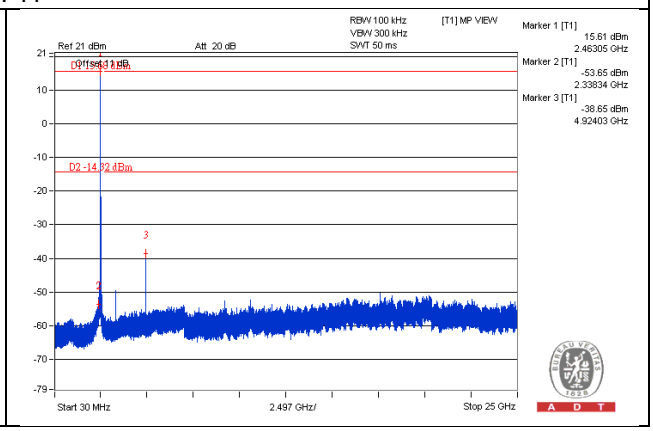
CH 6





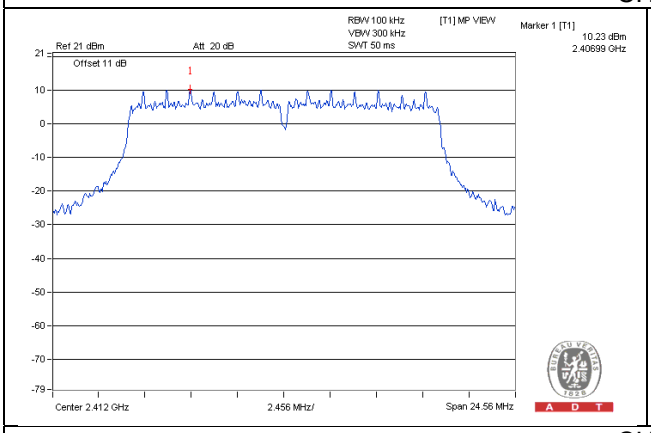
CH 11

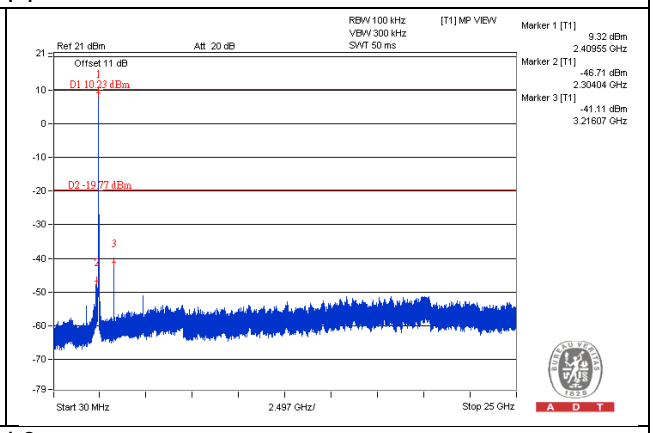




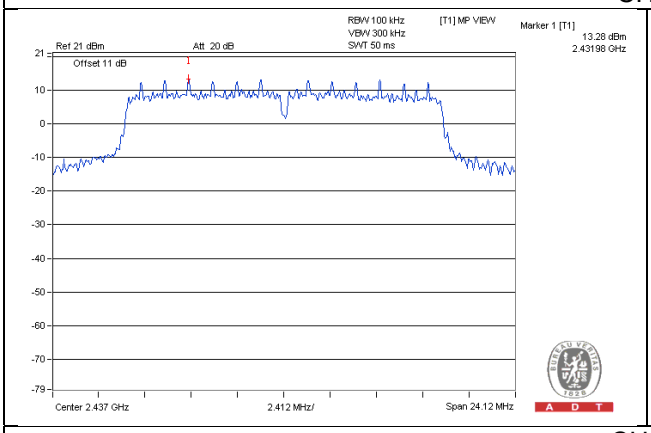
802.11g_Chain 0

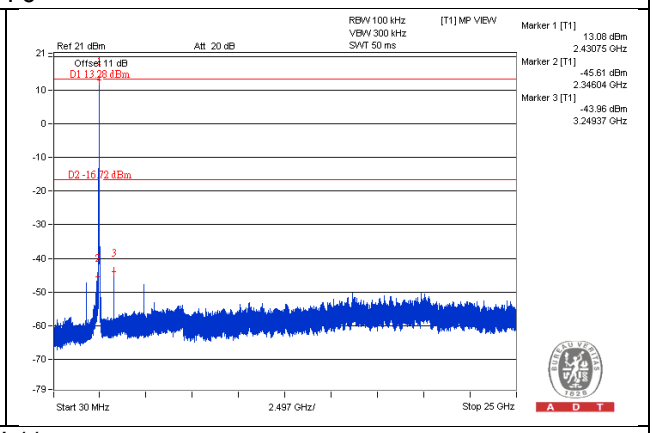
CH 1



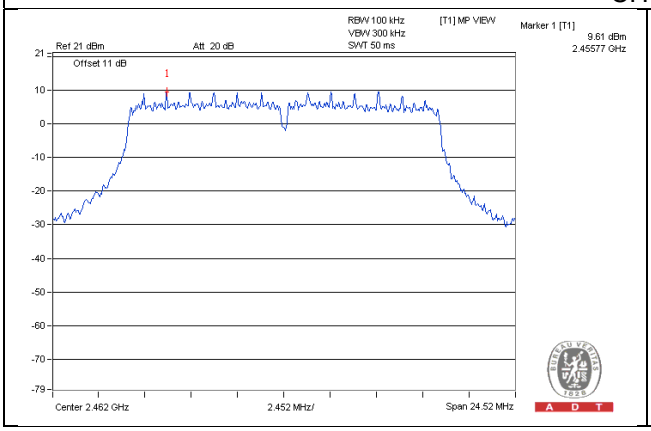


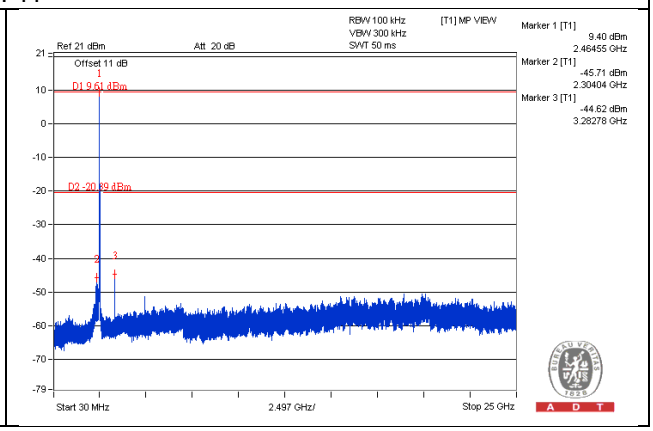
CH 6





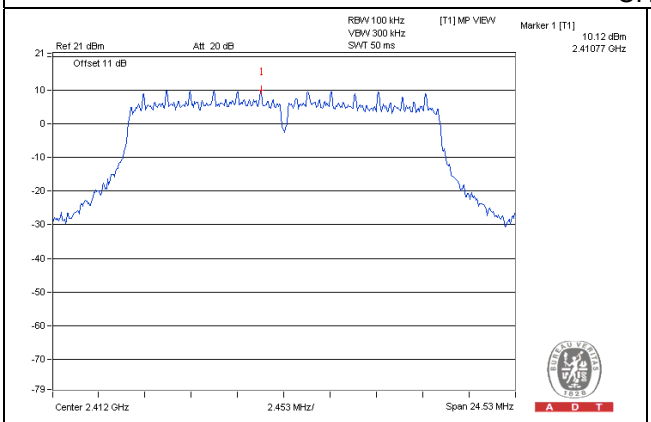
CH 11

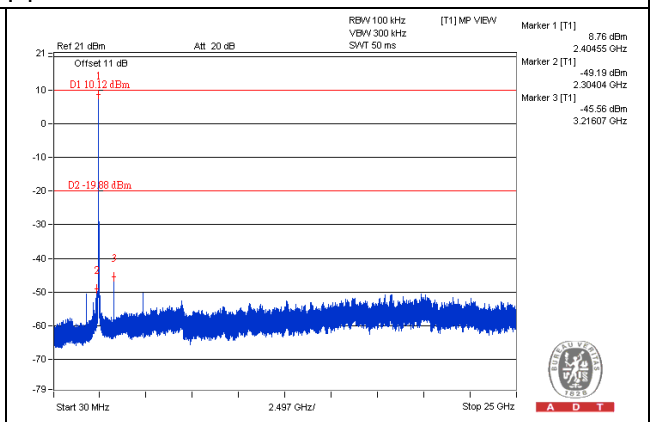




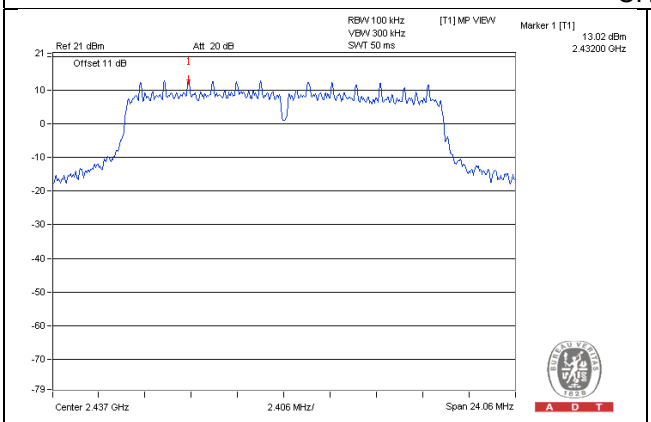
802.11g_Chain 1

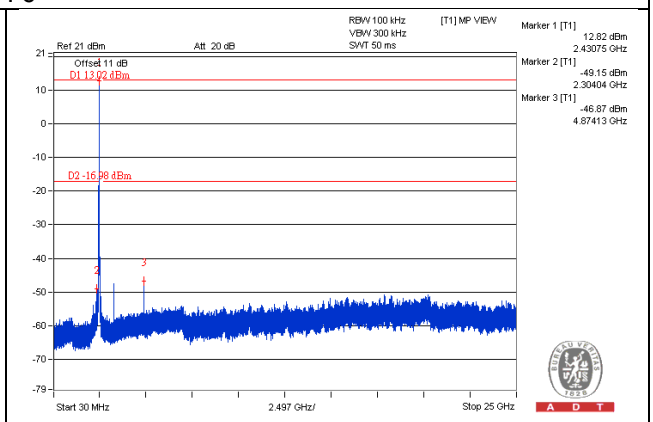
CH 1



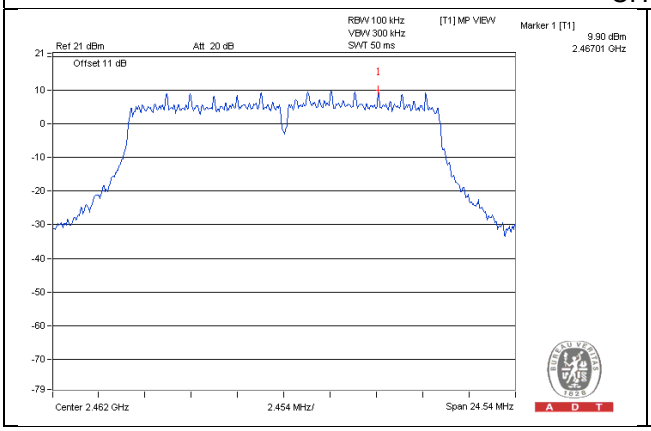


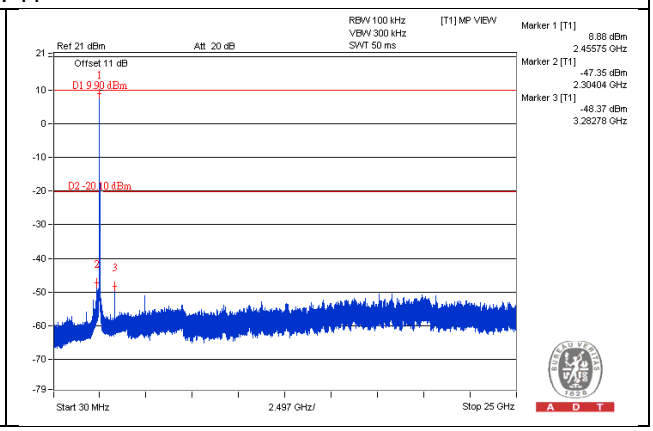
CH 6





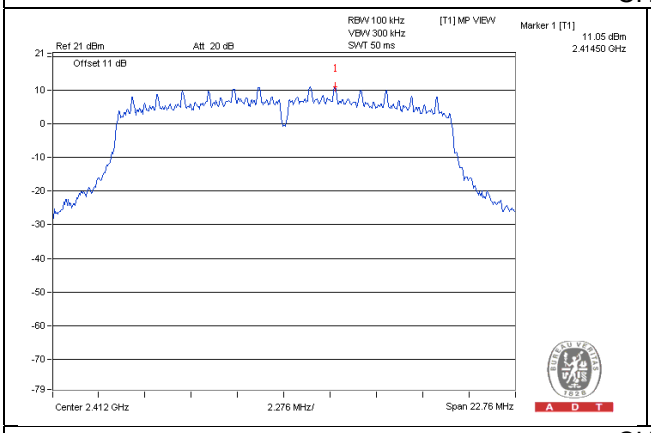
CH 11

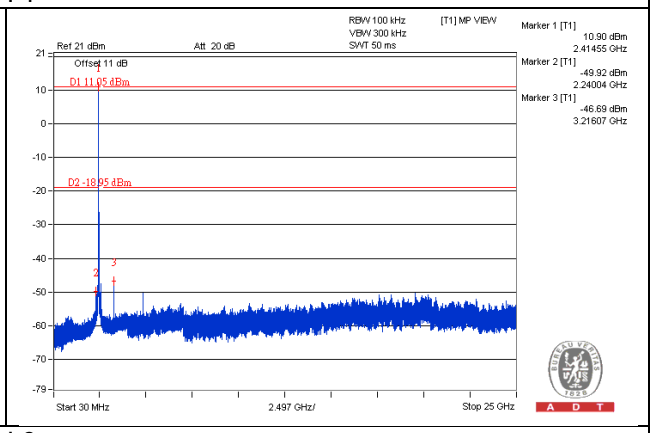




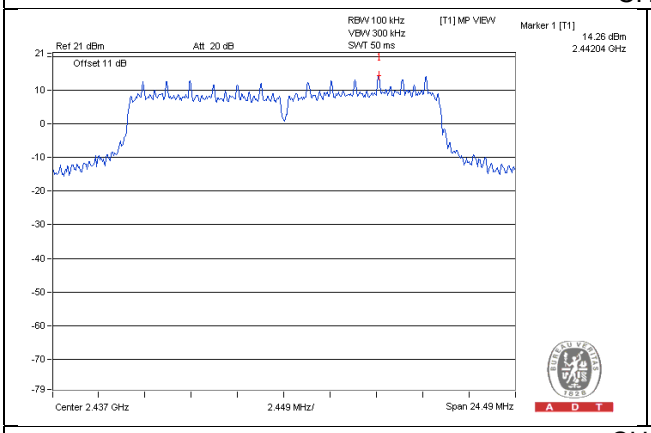
802.11g_Chain 2

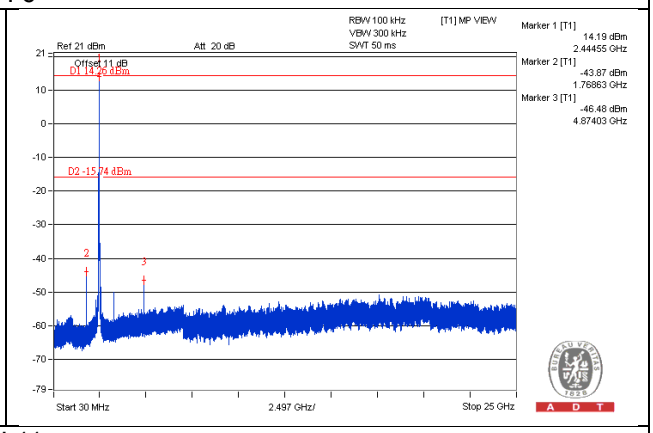
CH 1



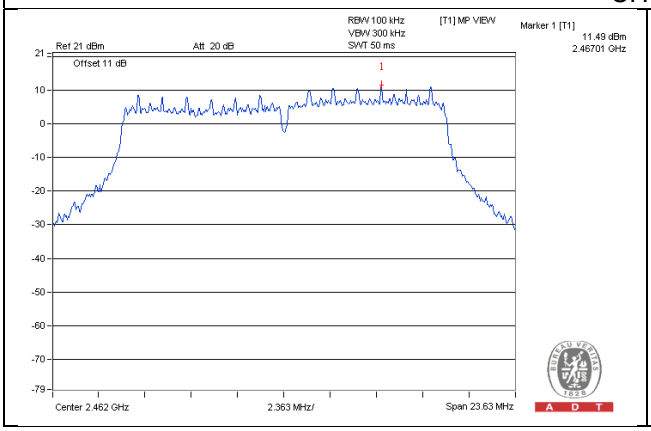


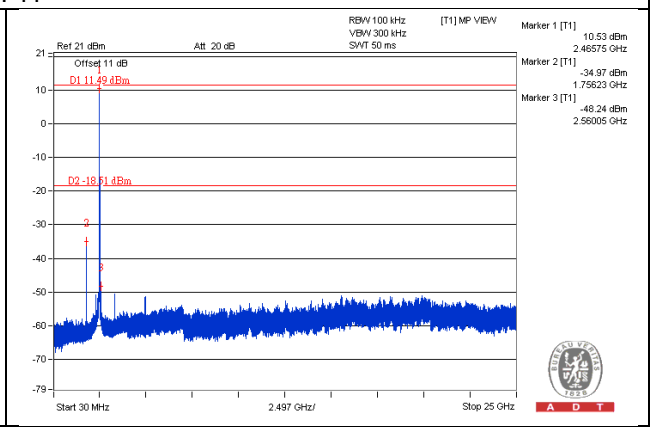
CH 6





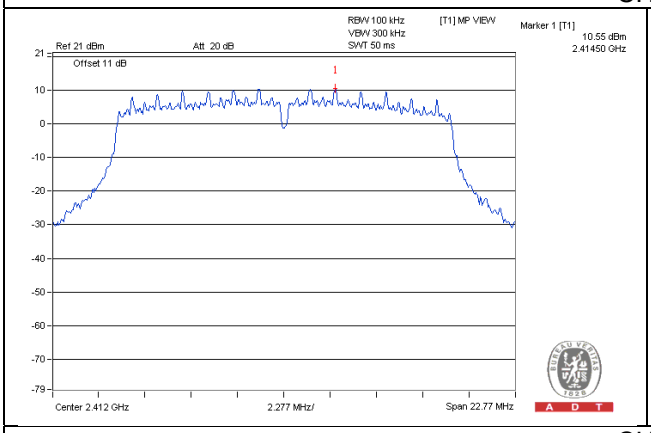
CH 11

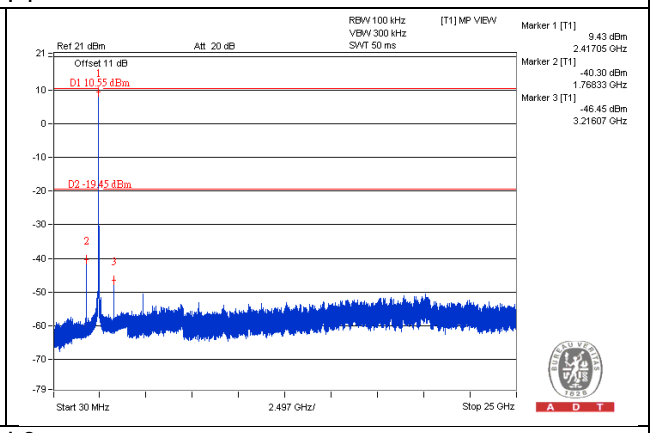




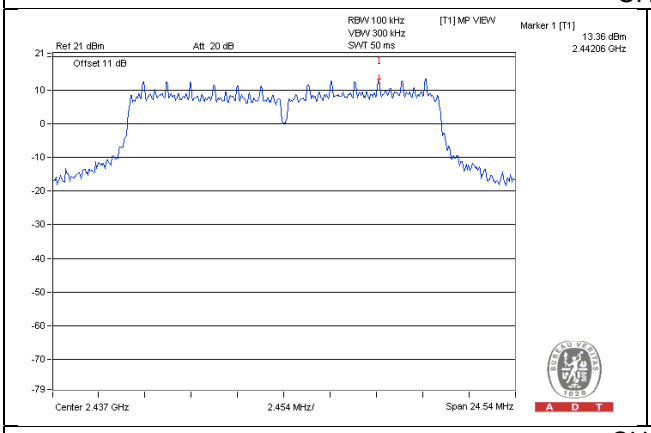
802.11g_Chain 3

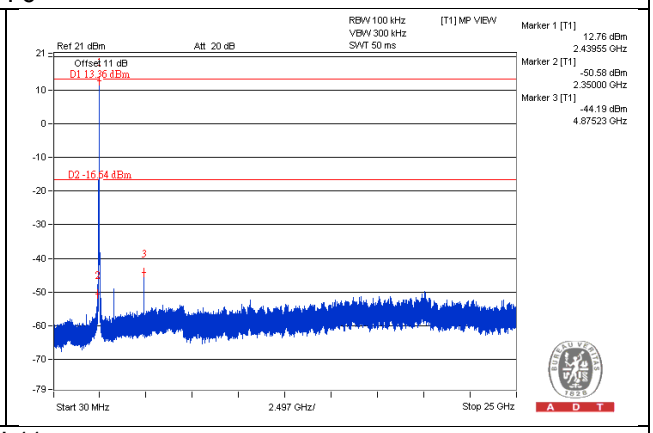
CH 1



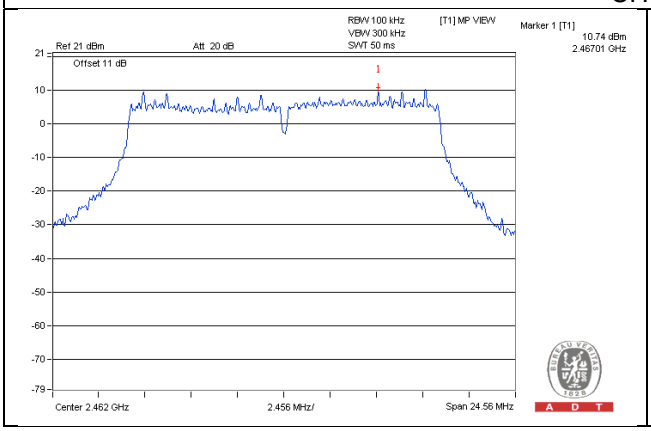


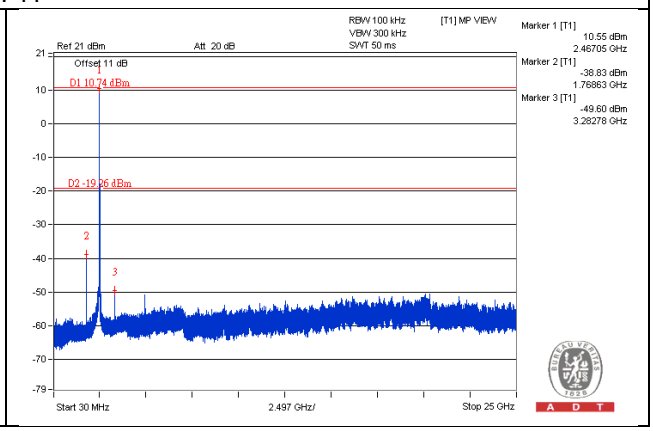
CH 6





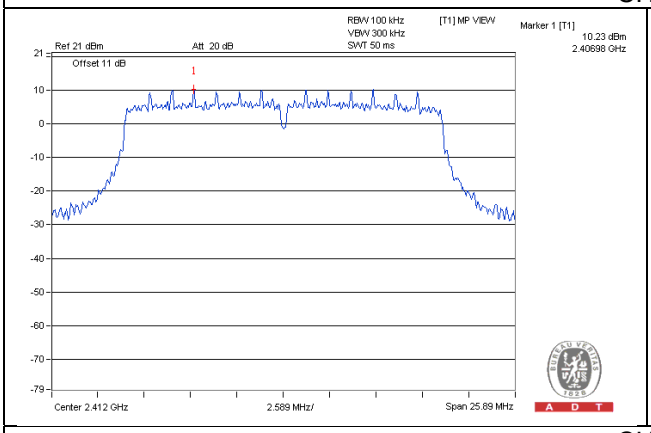
CH 11

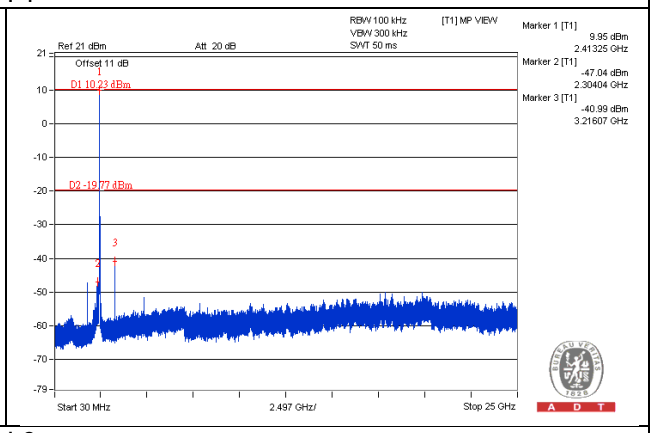




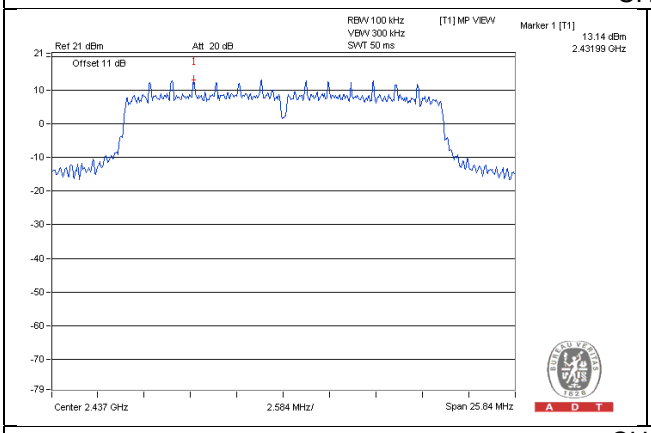
802.11n (20MHz)_Chain 0

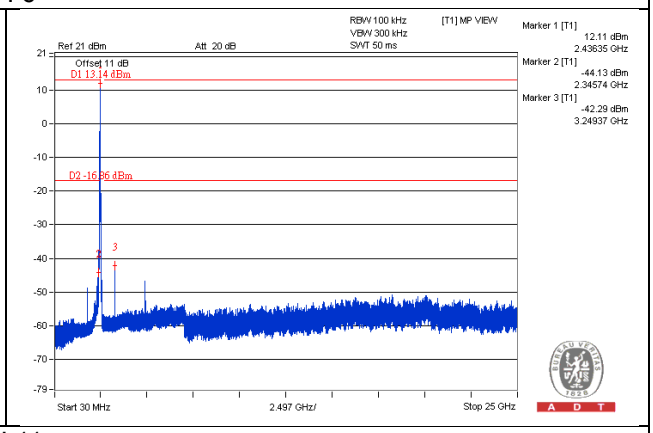
CH 1



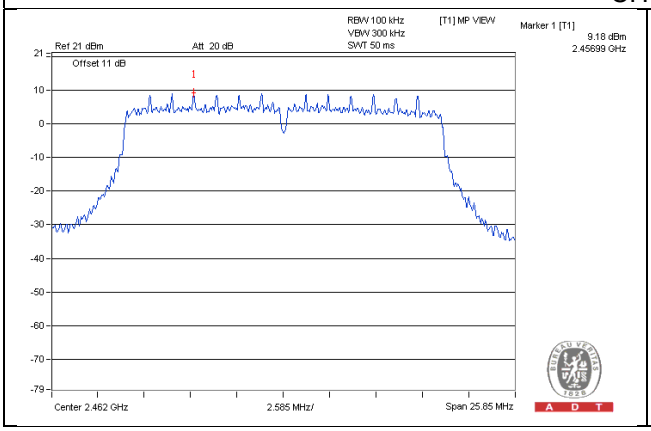


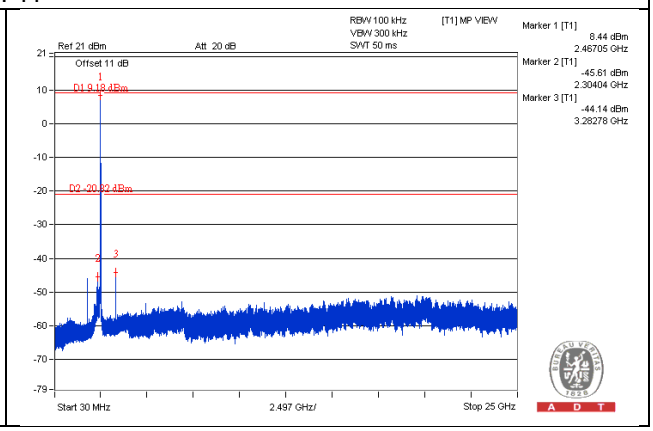
CH 6





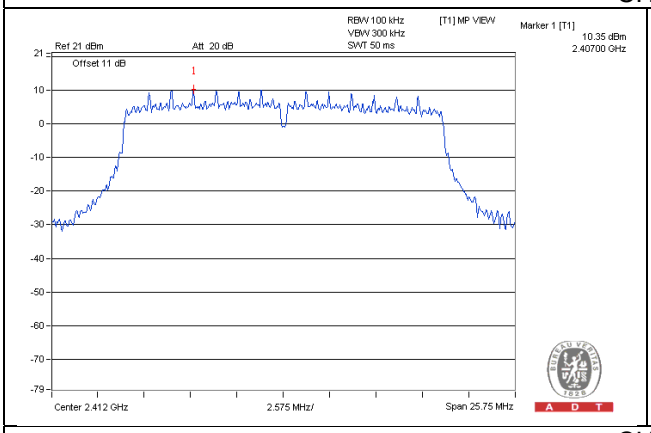
CH 11

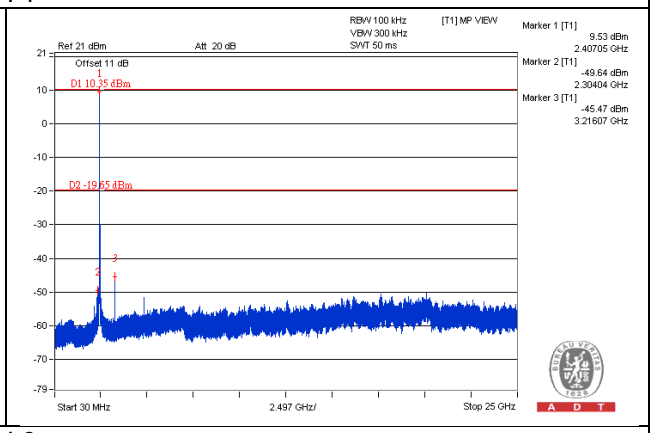




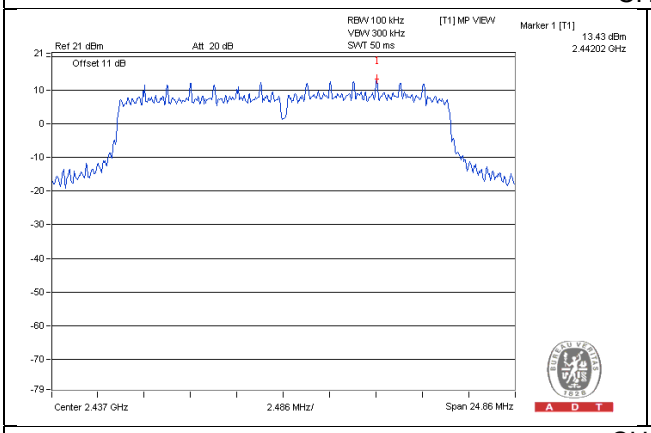
802.11n (20MHz)_Chain 1

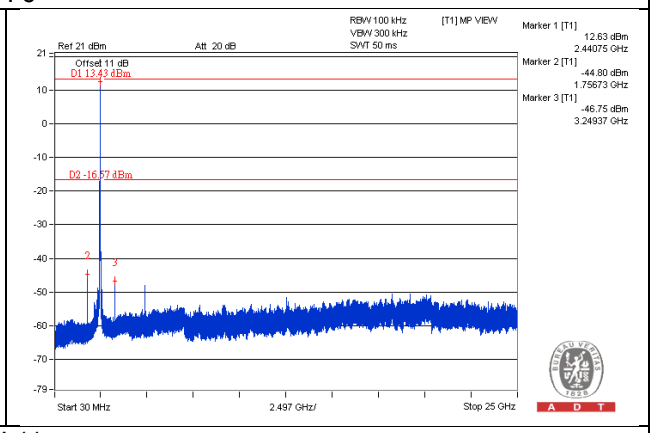
CH 1



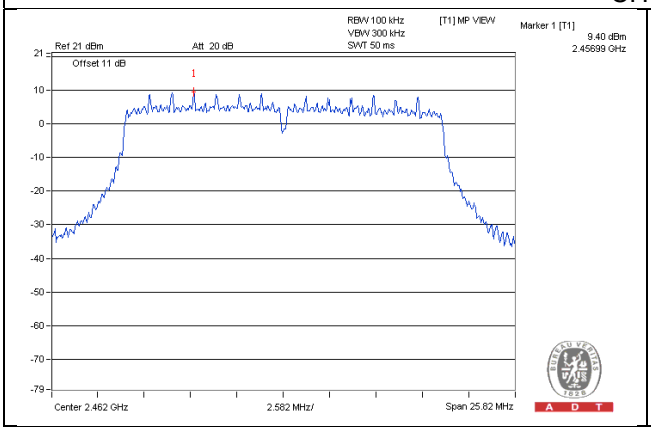


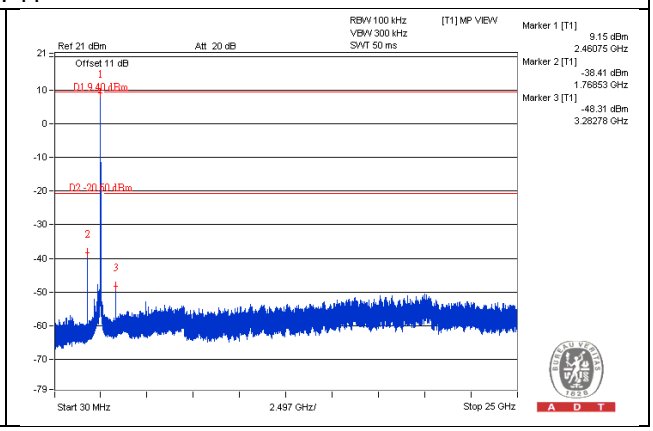
CH 6





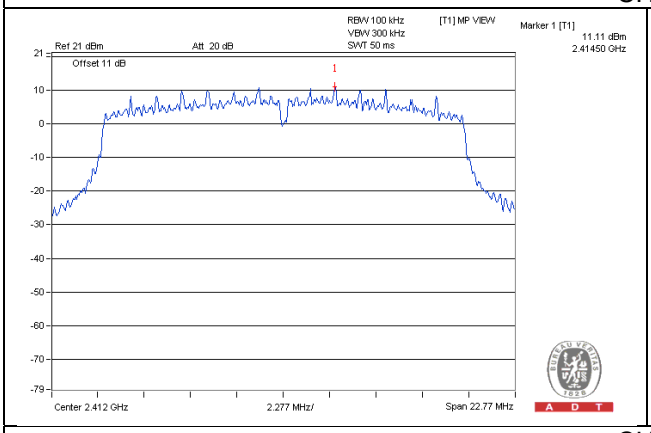
CH 11

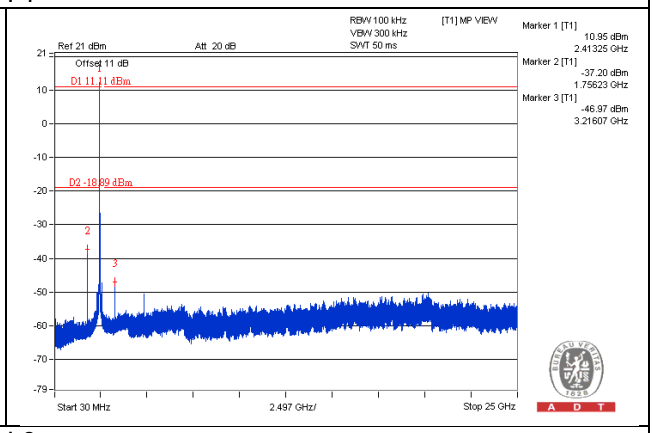




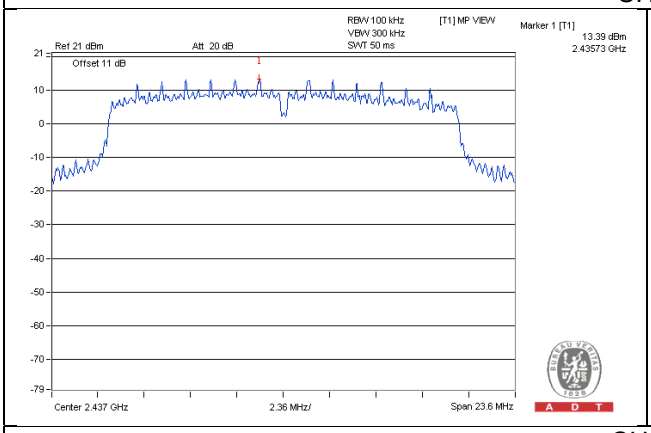
802.11n (20MHz)_Chain 2

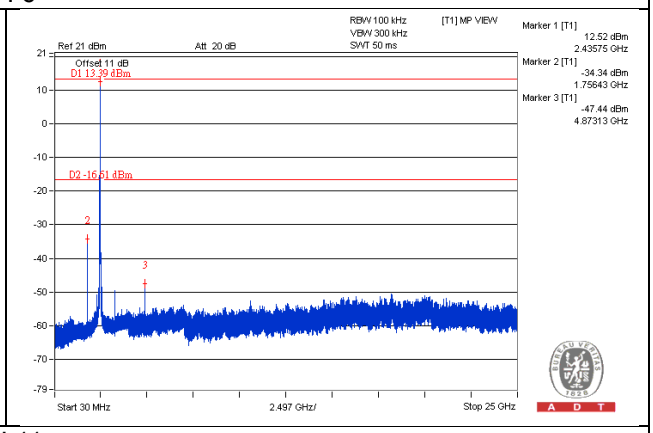
CH 1



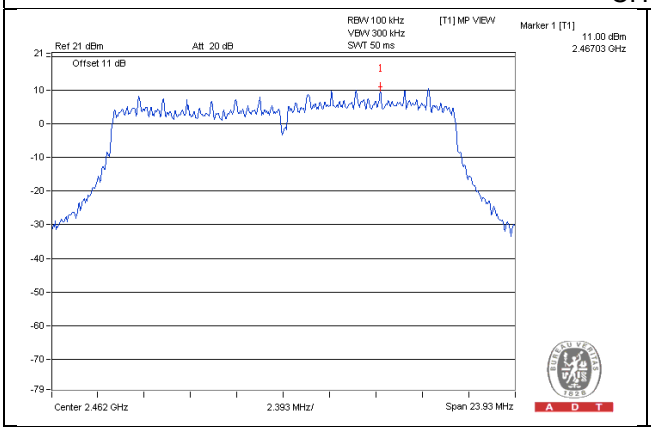


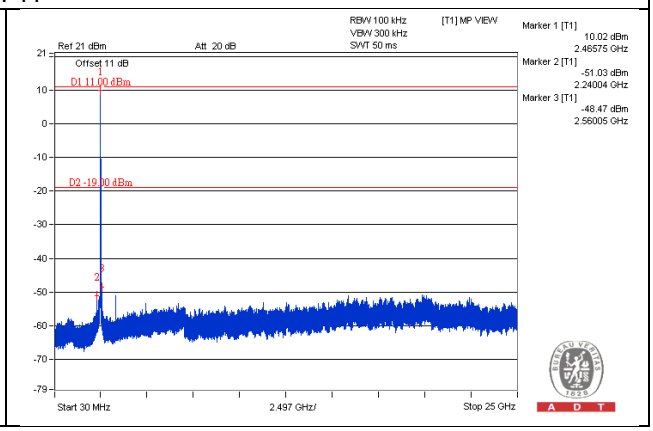
CH 6





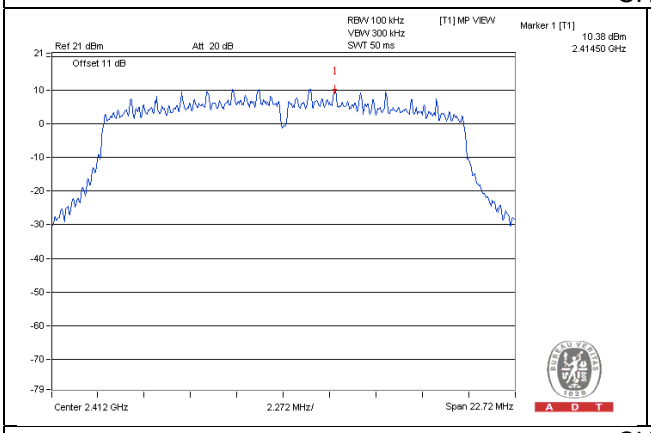
CH 11

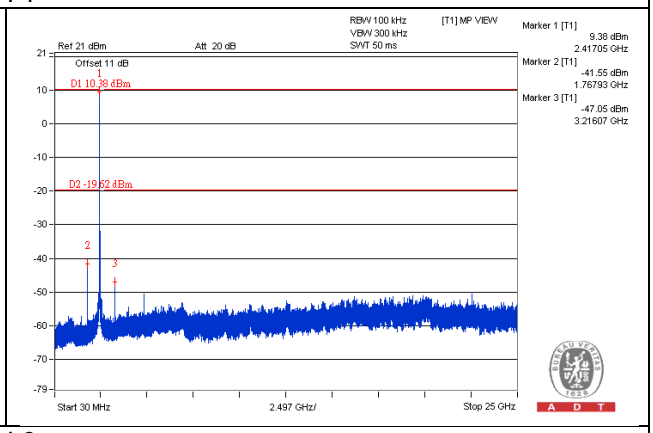




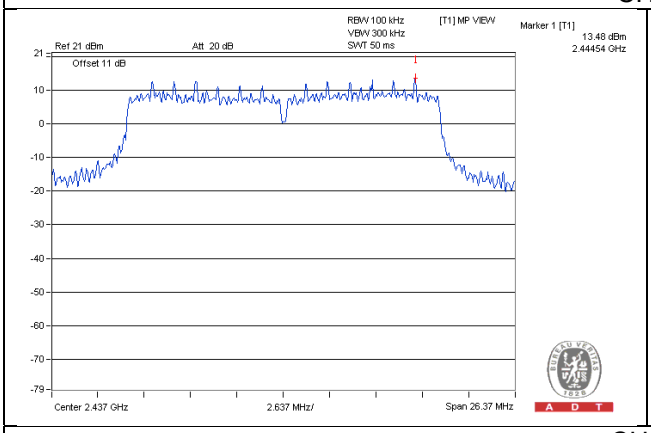
802.11n (20MHz)_Chain 3

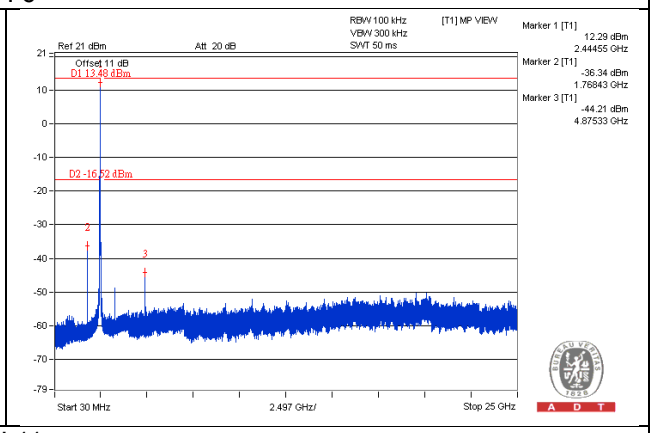
CH 1



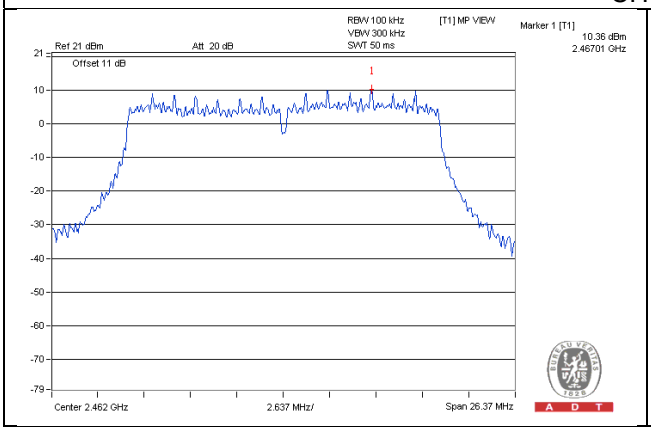


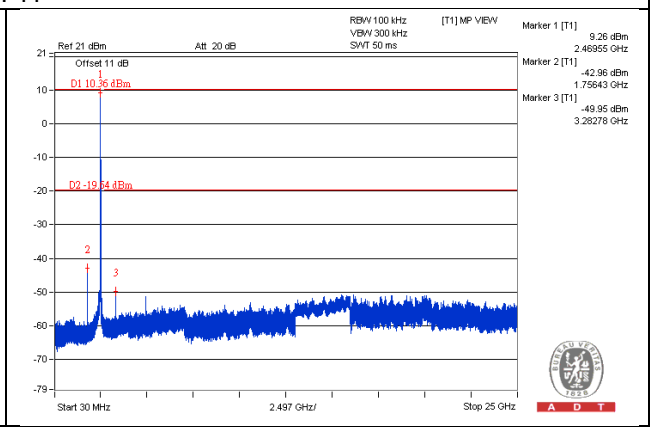
CH 6





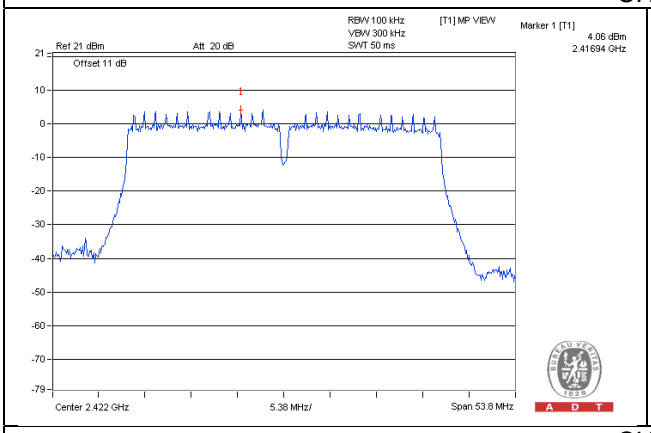
CH 11

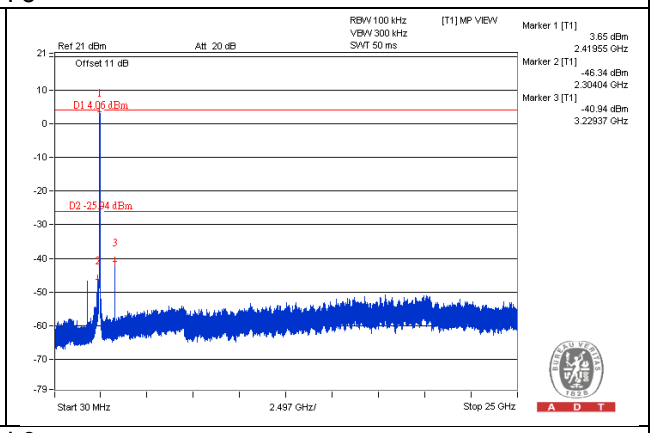




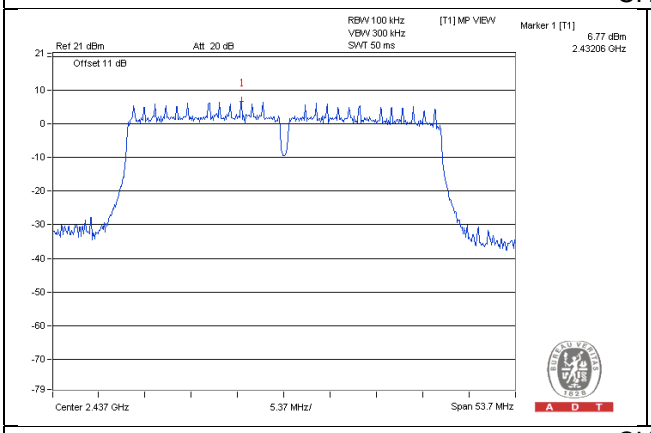
802.11n (40MHz)_Chain 0

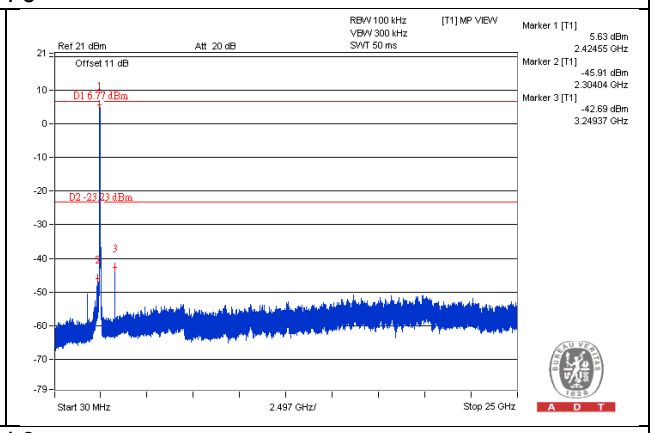
CH 3



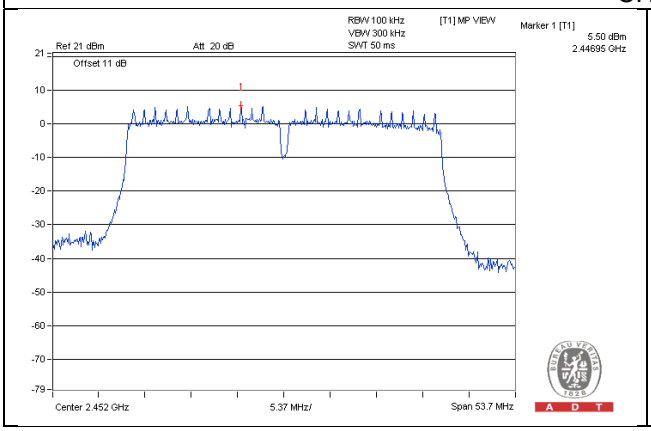


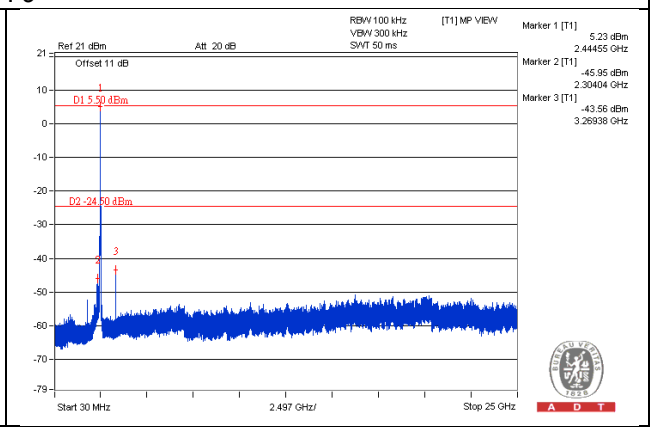
CH 6





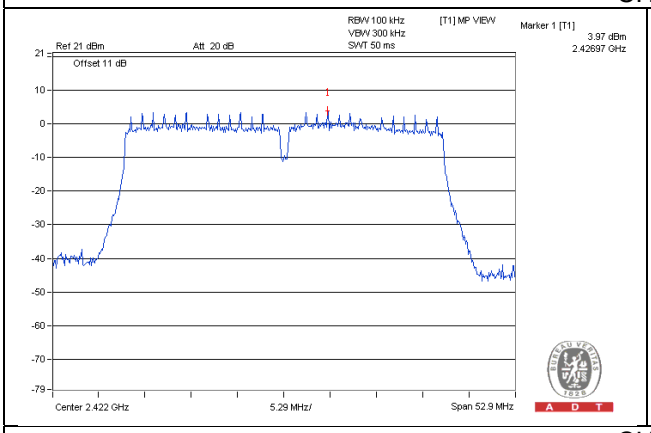
CH 9

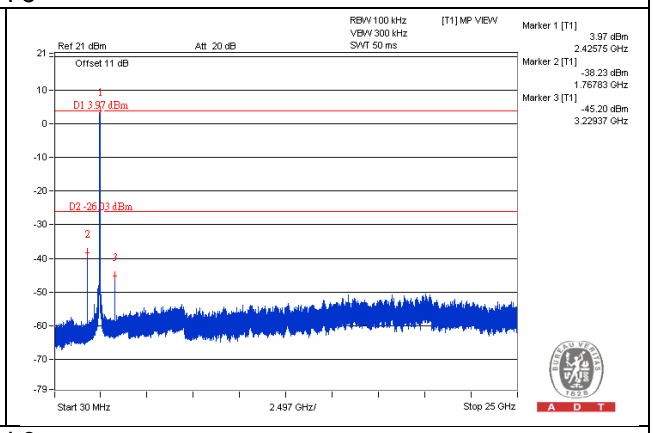




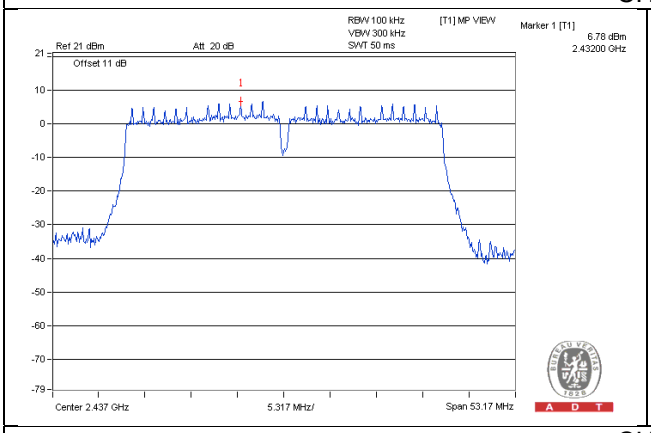
802.11n (40MHz)_Chain 1

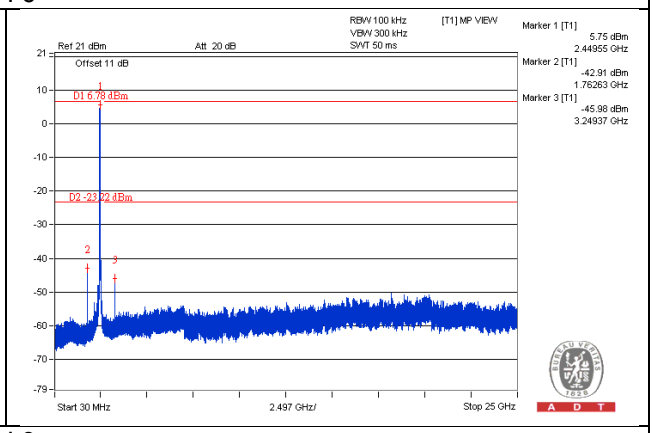
CH 3



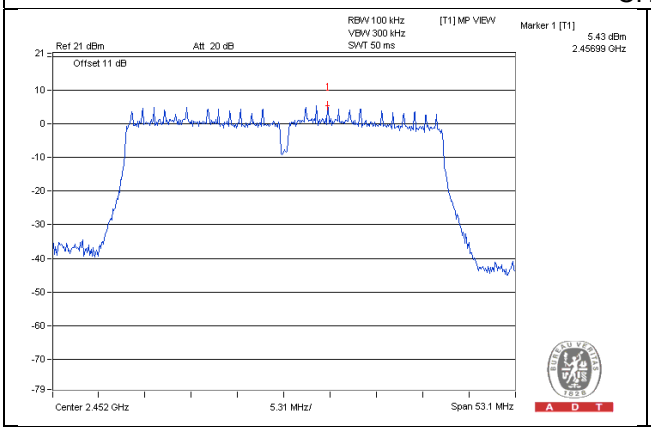


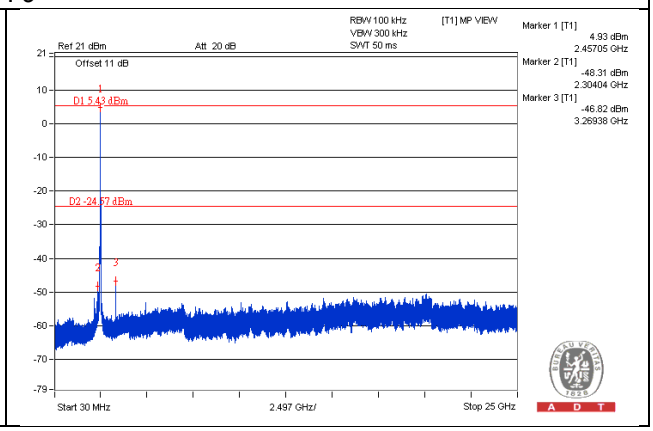
CH 6





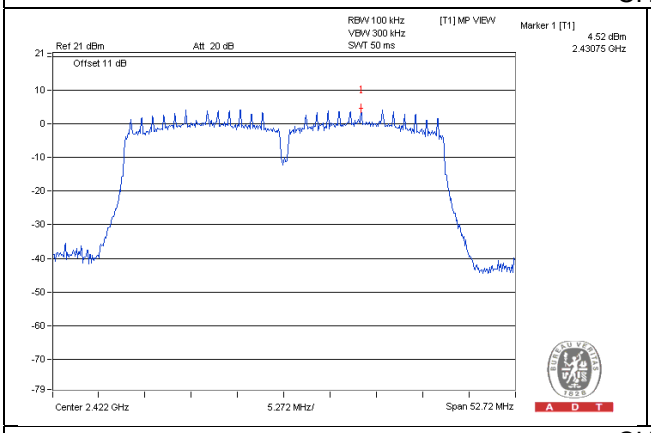
CH 9

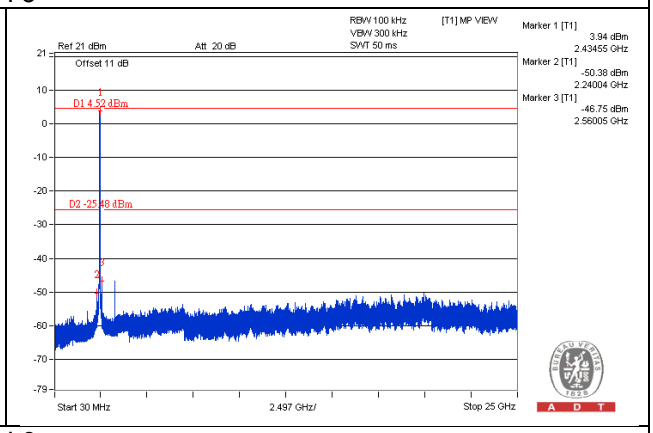




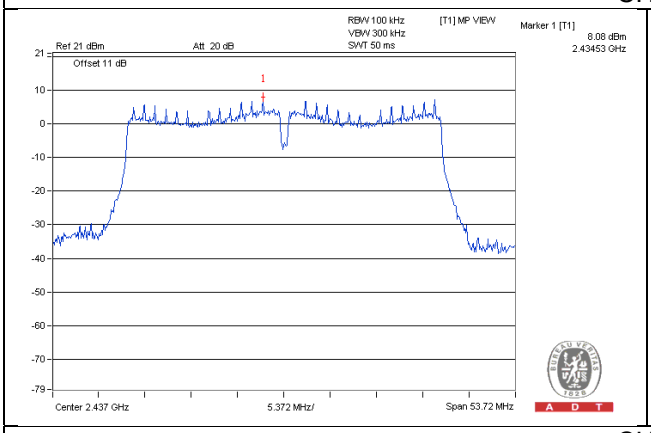
802.11n (40MHz)_Chain 2

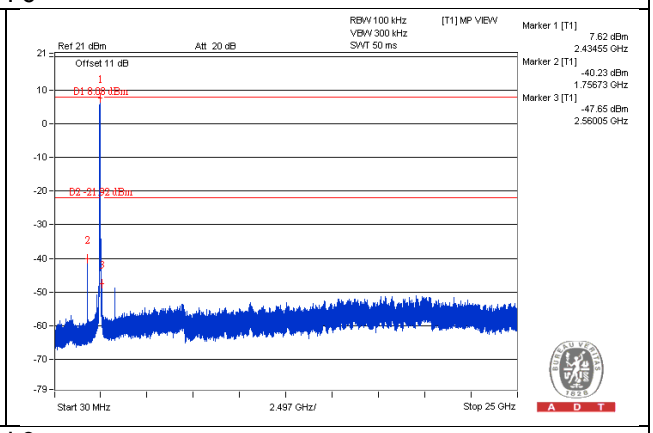
CH 3



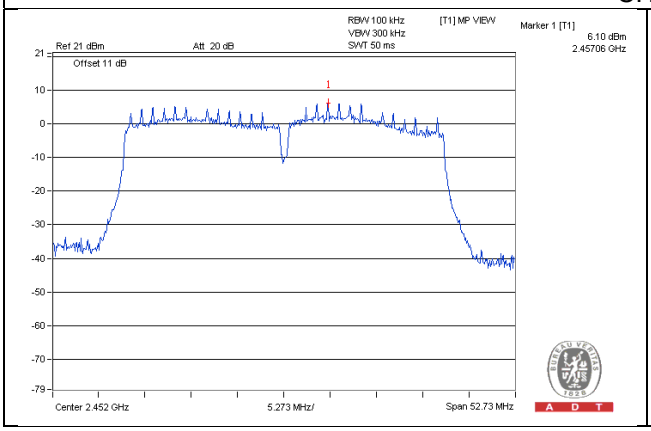


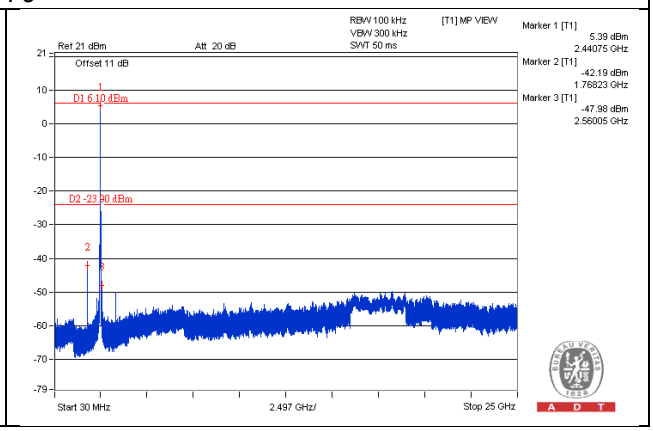
CH 6





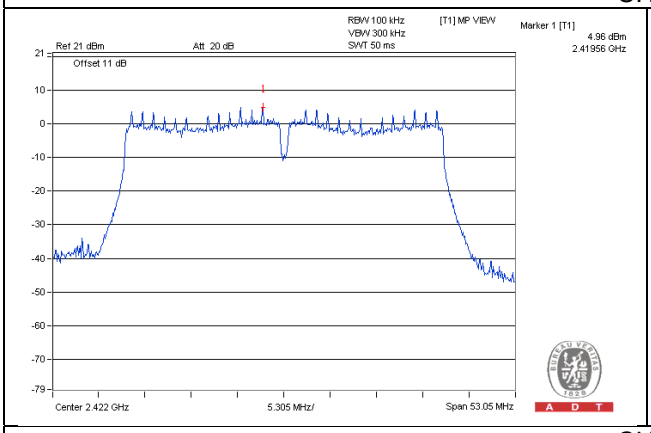
CH 9

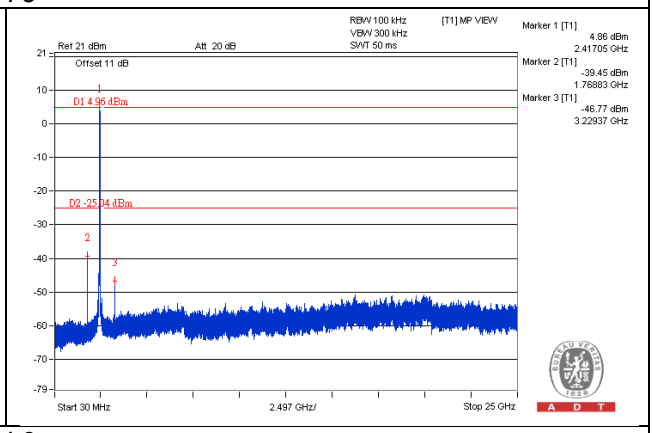




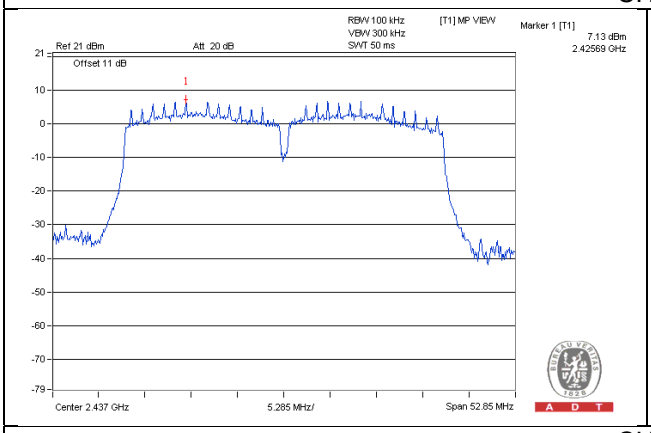
802.11n (40MHz)_Chain 3

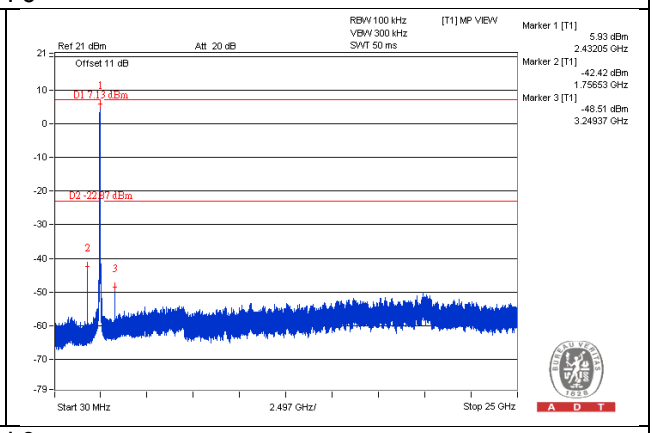
CH 3



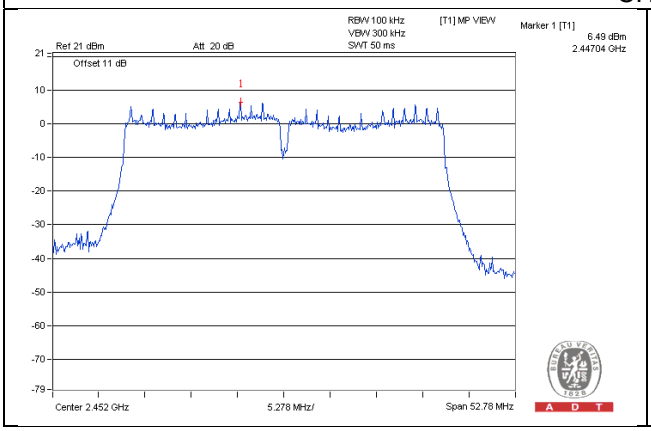


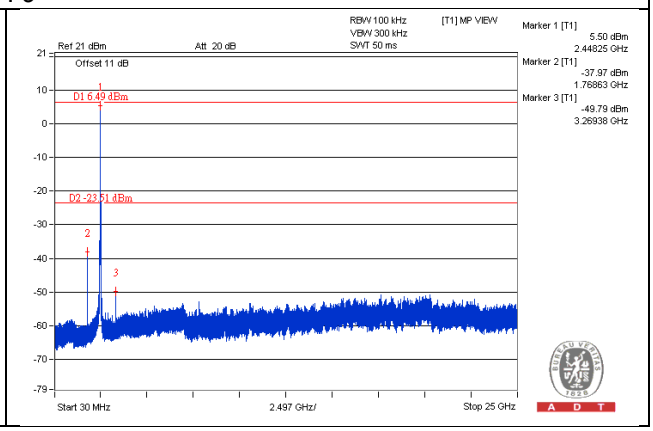
CH 6





CH 9





5 Test Types and Results (For 5.0GHz Band)

5.1 Radiated Emission and Bandedge Measurement

5.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

Note:

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

5.1.2 Test Instruments

Same as item 4.1.2.

5.1.3 Test Procedures

Same as item 4.1.3.

5.1.4 Deviation from Test Standard

No deviation.

5.1.5 Test Setup

Same as item 4.1.5.

5.1.6 EUT Operating Conditions

Same as item 4.1.6.

5.1.7 Test Results

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	77.9 PK	78.2	-0.3	1.00 H	289	71.60	6.30
2	#5725.00	67.9 AV	68.2	-0.3	1.00 H	289	61.60	6.30
3	*5745.00	108.2 PK			1.00 H	289	67.90	40.30
4	*5745.00	98.2 AV			1.00 H	289	57.90	40.30
5	11490.00	58.2 PK	74.0	-15.8	1.68 H	279	41.00	17.20
6	11490.00	46.0 AV	54.0	-8.0	1.68 H	279	28.80	17.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	92.4 PK	92.7	-0.3	1.71 V	347	86.10	6.30
2	#5725.00	82.4 AV	82.7	-0.3	1.71 V	347	76.10	6.30
3	*5745.00	122.7 PK			1.71 V	347	82.40	40.30
4	*5745.00	112.7 AV			1.71 V	347	72.40	40.30
5	11490.00	60.4 PK	74.0	-13.6	1.00 V	173	43.20	17.20
6	11490.00	48.1 AV	54.0	-5.9	1.00 V	173	30.90	17.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	109.5 PK			1.00 H	289	69.10	40.40
2	*5785.00	99.9 AV			1.00 H	289	59.50	40.40
3	11570.00	61.0 PK	74.0	-13.0	1.03 H	260	43.70	17.30
4	11570.00	47.7 AV	54.0	-6.3	1.03 H	260	30.40	17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	124.4 PK			1.87 V	341	84.00	40.40
2	*5785.00	113.6 AV			1.87 V	341	73.20	40.40
3	11570.00	65.8 PK	74.0	-8.2	1.00 V	25	48.50	17.30
4	11570.00	52.3 AV	54.0	-1.7	1.00 V	25	35.00	17.30

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	110.2 PK			1.11 H	220	69.70	40.50
2	*5825.00	99.7 AV			1.11 H	220	59.20	40.50
3	#5850.00	69.9 PK	80.2	-10.3	1.11 H	220	63.30	6.60
4	#5850.00	59.4 AV	69.7	-10.3	1.11 H	220	52.80	6.60
5	11650.00	61.5 PK	74.0	-12.5	1.10 H	261	43.80	17.70
6	11650.00	48.1 AV	54.0	-5.9	1.10 H	261	30.40	17.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	124.8 PK			1.79 V	346	84.30	40.50
2	*5825.00	114.5 AV			1.79 V	346	74.00	40.50
3	#5850.00	84.5 PK	94.8	-10.3	1.79 V	346	77.90	6.60
4	#5850.00	74.2 AV	84.5	-10.3	1.79 V	346	67.60	6.60
5	11650.00	65.2 PK	74.0	-8.8	2.23 V	24	47.50	17.70
6	11650.00	51.8 AV	54.0	-2.2	2.23 V	24	34.10	17.70

REMARKS:

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

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	76.0 PK	76.3	-0.3	1.00 H	287	69.70	6.30
2	#5725.00	64.9 AV	65.2	-0.3	1.00 H	287	58.60	6.30
3	*5745.00	106.3 PK			1.00 H	287	66.00	40.30
4	*5745.00	95.2 AV			1.00 H	287	54.90	40.30
5	11490.00	57.7 PK	74.0	-16.3	1.38 H	228	40.50	17.20
6	11490.00	45.9 AV	54.0	-8.1	1.38 H	228	28.70	17.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	91.0 PK	91.3	-0.3	1.72 V	346	84.70	6.30
2	#5725.00	79.3 AV	79.6	-0.3	1.72 V	346	73.00	6.30
3	*5745.00	121.3 PK			1.72 V	346	81.00	40.30
4	*5745.00	109.6 AV			1.72 V	346	69.30	40.30
5	11490.00	61.4 PK	74.0	-12.6	2.20 V	17	44.20	17.20
6	11490.00	49.1 AV	54.0	-4.9	2.20 V	17	31.90	17.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	109.6 PK			1.00 H	290	69.20	40.40
2	*5785.00	98.4 AV			1.00 H	290	58.00	40.40
3	11570.00	60.8 PK	74.0	-13.2	1.08 H	258	43.50	17.30
4	11570.00	47.8 AV	54.0	-6.2	1.08 H	258	30.50	17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	123.6 PK			1.87 V	340	83.20	40.40
2	*5785.00	111.5 AV			1.87 V	340	71.10	40.40
3	11570.00	64.4 PK	74.0	-9.6	2.35 V	29	47.10	17.30
4	11570.00	51.3 AV	54.0	-2.7	2.35 V	29	34.00	17.30

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	108.5 PK			1.02 H	212	68.00	40.50
2	*5825.00	97.1 AV			1.02 H	212	56.60	40.50
3	#5850.00	69.6 PK	78.5	-8.9	1.02 H	212	63.00	6.60
4	#5850.00	58.2 AV	67.1	-8.9	1.02 H	212	51.60	6.60
5	11650.00	61.3 PK	74.0	-12.7	1.00 H	229	43.60	17.70
6	11650.00	48.0 AV	54.0	-6.0	1.00 H	229	30.30	17.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	124.8 PK			1.79 V	347	84.30	40.50
2	*5825.00	112.5 AV			1.79 V	347	72.00	40.50
3	#5850.00	85.9 PK	94.8	-8.9	1.79 V	347	79.30	6.60
4	#5850.00	73.6 AV	82.5	-8.9	1.79 V	347	67.00	6.60
5	11650.00	64.5 PK	74.0	-9.5	2.23 V	24	46.80	17.70
6	11650.00	51.3 AV	54.0	-2.7	2.23 V	24	33.60	17.70

REMARKS:

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

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**#5725.00**	**73.0 PK**	**73.2**	**-0.2**	**1.00 H**	**290**	**66.70**	**6.30**
2	**#5725.00**	**63.6 AV**	**63.8**	**-0.2**	**1.00 H**	**290**	**57.30**	**6.30**
3	*5755.00	103.2 PK			1.00 H	290	62.90	40.30
4	*5755.00	93.8 AV			1.00 H	290	53.50	40.30
5	11510.00	57.4 PK	74.0	-16.6	1.72 H	284	40.30	17.10
6	11510.00	45.3 AV	54.0	-8.7	1.72 H	284	28.20	17.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**#5725.00**	**87.6 PK**	**87.8**	**-0.2**	**1.73 V**	**346**	**81.30**	**6.30**
2	**#5725.00**	**77.7 AV**	**77.9**	**-0.2**	**1.73 V**	**346**	**71.40**	**6.30**
3	*5755.00	117.8 PK			1.73 V	346	77.50	40.30
4	*5755.00	107.9 AV			1.73 V	346	67.60	40.30
5	11510.00	61.8 PK	74.0	-12.2	1.03 V	187	44.70	17.10
6	11510.00	49.1 AV	54.0	-4.9	1.03 V	187	32.00	17.10

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	106.3 PK			1.00 H	211	65.90	40.40
2	*5795.00	95.6 AV			1.00 H	211	55.20	40.40
3	#5850.00	72.5 PK	76.3	-3.8	1.00 H	211	65.90	6.60
4	#5850.00	61.8 AV	65.6	-3.8	1.00 H	211	55.20	6.60
5	11590.00	59.8 PK	74.0	-14.2	1.13 H	270	42.60	17.20
6	11590.00	46.2 AV	54.0	-7.8	1.13 H	270	29.00	17.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	120.5 PK			1.78 V	346	80.10	40.40
2	*5795.00	110.2 AV			1.78 V	346	69.80	40.40
3	#5850.00	86.7 PK	90.5	-3.8	1.78 V	346	80.10	6.60
4	#5850.00	76.4 AV	80.2	-3.8	1.78 V	346	69.80	6.60
5	11590.00	64.0 PK	74.0	-10.0	2.28 V	28	46.80	17.20
6	11590.00	50.7 AV	54.0	-3.3	2.28 V	28	33.50	17.20

REMARKS:

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

802.11ac (80MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	68.4 PK	68.7	-0.3	1.00 H	289	62.10	6.30
2	#5725.00	58.7 AV	59.0	-0.3	1.00 H	289	52.40	6.30
3	*5775.00	98.7 PK			1.00 H	289	58.30	40.40
4	*5775.00	89.0 AV			1.00 H	289	48.60	40.40
5	11550.00	57.7 PK	74.0	-16.3	1.73 H	302	40.60	17.10
6	11550.00	45.8 AV	54.0	-8.2	1.73 H	302	28.70	17.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	84.0 PK	84.3	-0.3	1.78 V	347	77.70	6.30
2	#5725.00	73.9 AV	74.2	-0.3	1.78 V	347	67.60	6.30
3	*5775.00	114.3 PK			1.78 V	347	73.90	40.40
4	*5775.00	104.2 AV			1.78 V	347	63.80	40.40
5	11550.00	60.4 PK	74.0	-13.6	1.00 V	200	43.30	17.10
6	11550.00	47.7 AV	54.0	-6.3	1.00 V	200	30.60	17.10

REMARKS:

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

Below 1GHz Data: 802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	136.62	32.6 QP	43.5	-10.9	1.99 H	110	47.30	-14.70
2	287.97	36.2 QP	46.0	-9.8	1.24 H	162	49.00	-12.80
3	375.29	43.0 QP	46.0	-3.0	1.00 H	321	54.20	-11.20
4	414.10	41.1 QP	46.0	-4.9	1.99 H	12	51.70	-10.60
5	625.60	40.5 QP	46.0	-5.5	1.49 H	316	46.80	-6.30
6	875.91	39.1 QP	46.0	-6.9	1.00 H	331	41.30	-2.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	59.01	35.0 QP	40.0	-5.0	1.01 V	18	49.40	-14.40
2	287.97	38.4 QP	46.0	-7.6	1.51 V	243	51.20	-12.80
3	375.29	42.9 QP	46.0	-3.1	1.51 V	90	54.10	-11.20
4	625.60	40.5 QP	46.0	-5.5	1.01 V	63	46.80	-6.30
5	722.62	39.9 QP	46.0	-6.1	1.01 V	198	44.70	-4.80
6	875.91	42.8 QP	46.0	-3.2	1.25 V	57	45.00	-2.20

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	93.93	33.5 QP	43.5	-10.0	2.00 H	226	52.80	-19.30
2	256.93	34.9 QP	46.0	-11.1	1.51 H	12	49.20	-14.30
3	375.29	42.7 QP	46.0	-3.3	1.01 H	68	53.90	-11.20
4	625.60	40.2 QP	46.0	-5.8	1.26 H	106	46.50	-6.30
5	747.85	40.4 QP	46.0	-5.6	1.26 H	126	44.00	-3.60
6	875.91	42.8 QP	46.0	-3.2	1.01 H	222	45.00	-2.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	59.01	35.3 QP	40.0	-4.7	1.99 V	34	49.70	-14.40
2	375.29	42.2 QP	46.0	-3.8	1.49 V	266	53.40	-11.20
3	625.60	40.5 QP	46.0	-5.5	1.00 V	77	46.80	-6.30
4	743.97	42.1 QP	46.0	-3.9	1.00 V	148	45.80	-3.70
5	833.23	40.4 QP	46.0	-5.6	1.99 V	266	43.10	-2.70
6	875.91	42.8 QP	46.0	-3.2	1.24 V	130	45.00	-2.20

Remarks:

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

5.2 Conducted Emission Measurement

5.2.1 Limits of Conducted Emission Measurement

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

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

5.2.2 Test Instruments

Same as item 4.2.2.

5.2.3 Test Procedures

Same as item 4.2.3.

5.2.4 Deviation from Test Standard

No deviation.

5.2.5 Test Setup

Same as item 4.2.5.

5.2.6 EUT Operating Conditions

Same as 4.1.6.

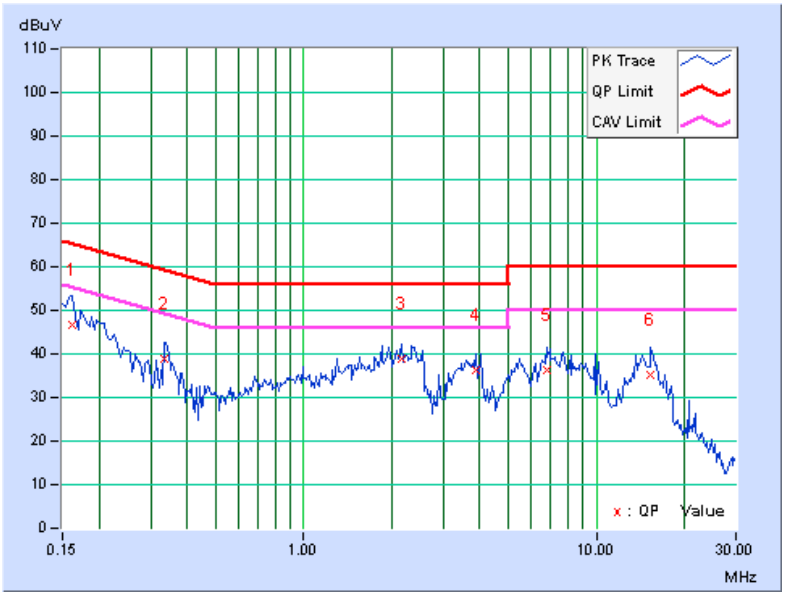
5.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.20	46.41	34.74	46.61	34.94	65.38	55.38	-18.77	-20.44
2	0.33359	0.20	38.74	33.92	38.94	34.12	59.36	49.36	-20.42	-15.24
3	2.15234	0.37	38.34	30.32	38.71	30.69	56.00	46.00	-17.29	-15.31
4	3.87500	0.43	36.05	27.84	36.48	28.27	56.00	46.00	-19.52	-17.73
5	6.79297	0.46	35.92	31.36	36.38	31.82	60.00	50.00	-23.62	-18.18
6	15.32813	0.59	34.47	30.48	35.06	31.07	60.00	50.00	-24.94	-18.93

Remarks:

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

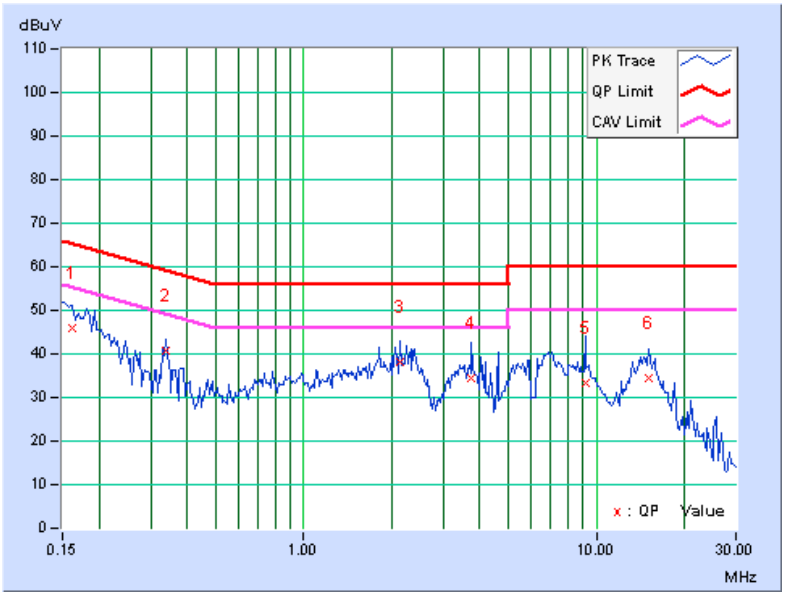


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.21	45.68	33.74	45.89	33.95	65.38	55.38	-19.49	-21.43
2	0.33750	0.24	40.32	36.20	40.56	36.44	59.26	49.26	-18.70	-12.82
3	2.14063	0.40	37.66	29.56	38.06	29.96	56.00	46.00	-17.94	-16.04
4	3.75391	0.45	34.09	27.96	34.54	28.41	56.00	46.00	-21.46	-17.59
5	9.21094	0.56	32.91	28.08	33.47	28.64	60.00	50.00	-26.53	-21.36
6	15.16406	0.71	33.80	29.89	34.51	30.60	60.00	50.00	-25.49	-19.40

Remarks:

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

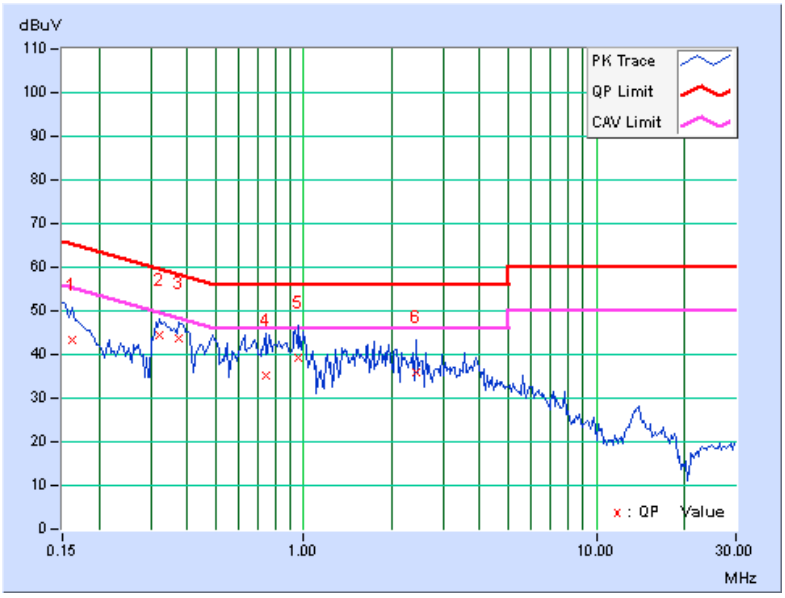


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.20	43.23	23.77	43.43	23.97	65.38	55.38	-21.95	-31.41
2	0.32188	0.20	44.21	36.11	44.41	36.31	59.66	49.66	-15.25	-13.35
3	**0.37266**	**0.20**	**43.53**	**36.11**	**43.73**	**36.31**	**58.44**	**48.44**	**-14.71**	**-12.13**
4	0.73984	0.26	34.80	23.64	35.06	23.90	56.00	46.00	-20.94	-22.10
5	0.95859	0.29	39.02	27.77	39.31	28.06	56.00	46.00	-16.69	-17.94
6	2.43359	0.38	35.60	27.90	35.98	28.28	56.00	46.00	-20.02	-17.72

Remarks:

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

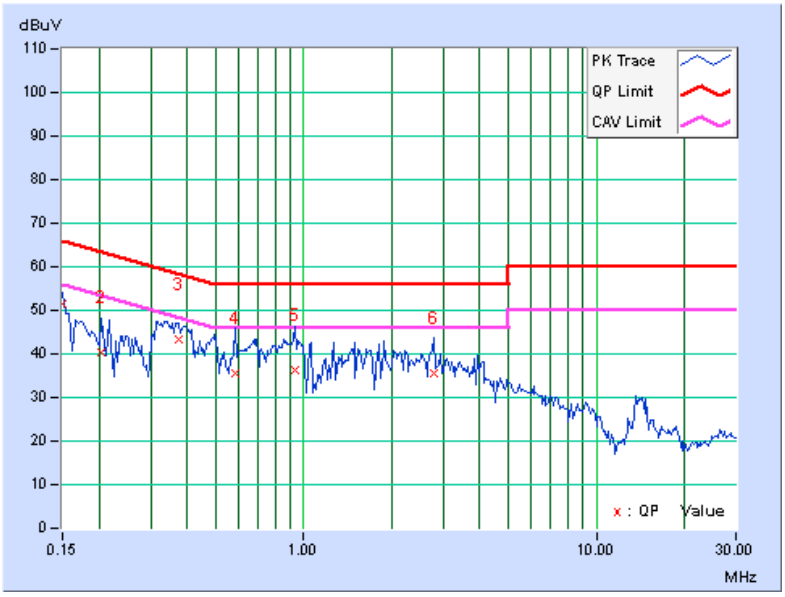


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.20	51.34	37.84	51.54	38.04	66.00	56.00	-14.46	-17.96
2	0.20469	0.22	40.28	24.02	40.50	24.24	63.42	53.42	-22.92	-29.18
3	0.37656	0.25	42.99	35.00	43.24	35.25	58.35	48.35	-15.12	-13.11
4	0.58750	0.27	35.16	25.84	35.43	26.11	56.00	46.00	-20.57	-19.89
5	0.93516	0.30	35.96	25.43	36.26	25.73	56.00	46.00	-19.74	-20.27
6	2.77344	0.42	34.97	28.57	35.39	28.99	56.00	46.00	-20.61	-17.01

Remarks:

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



5.3 6dB Bandwidth Measurement

5.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 Test Setup

Same as item 4.3.2.

5.3.3 Test Instruments

Same as item 4.3.3.

5.3.4 Test Procedure

Same as item 4.3.4.

5.3.5 Deviation fromTest Standard

No deviation.

5.3.6 EUT Operating Conditions

Same as item 4.3.3.

5.3.7 Test Result

CDD Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	15.94	15.96	16.34	16.05	0.5	PASS
157	5785	16.34	16.37	16.36	16.07	0.5	PASS
165	5825	16.32	16.09	16.36	16.36	0.5	PASS

802.11n (20MHz)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.98	17.59	17.57	16.59	0.5	PASS
157	5785	17.21	17.60	17.62	16.85	0.5	PASS
165	5825	17.21	17.57	17.61	17.59	0.5	PASS

802.11n (40MHz)

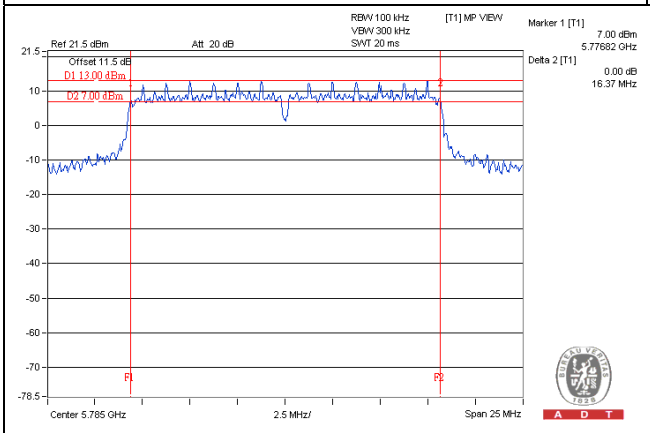
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	35.87	35.33	35.31	35.36	0.5	PASS
159	5795	35.81	35.26	35.55	35.42	0.5	PASS

802.11ac (80MHz)

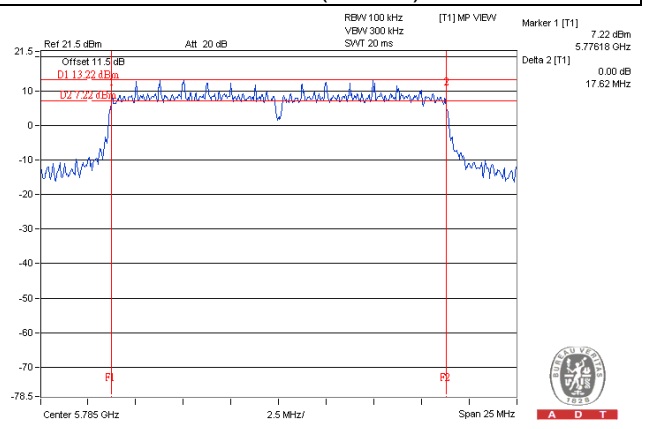
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	76.01	76.41	75.66	76.09	0.5	PASS

Spectrum Plot of Worst Value

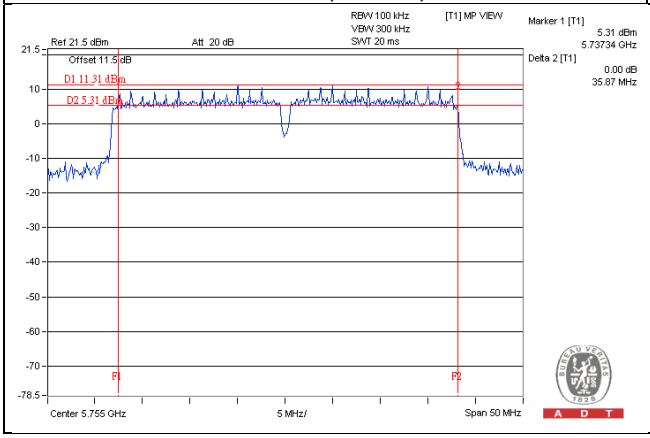
802.11a



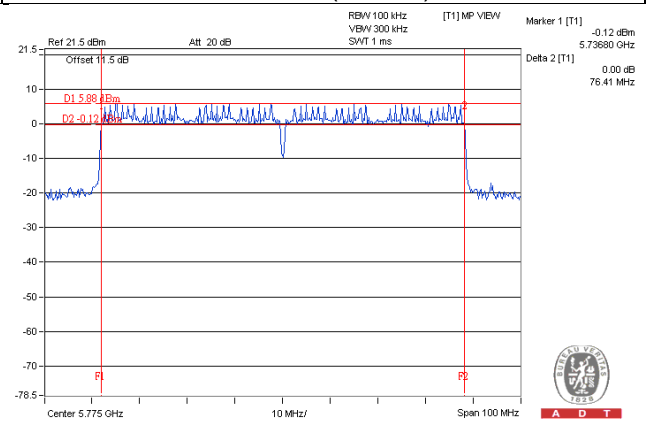
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



Beamforming_NSS1 Mode

802.11n (20MHz)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	17.60	17.59	17.34	16.82	0.5	PASS
157	5785	17.19	17.57	17.59	17.57	0.5	PASS
165	5825	17.18	16.95	17.61	17.58	0.5	PASS

802.11n (40MHz)

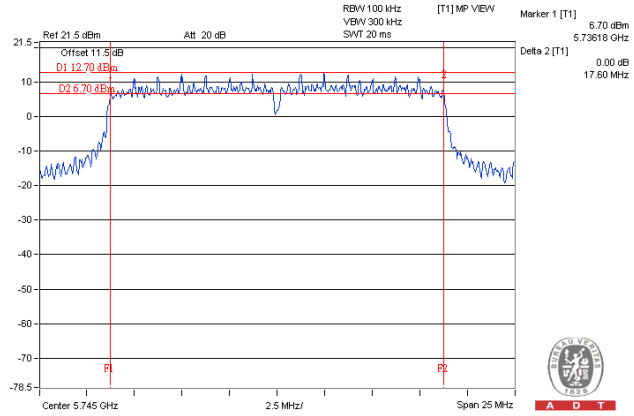
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	35.81	36.40	35.45	35.51	0.5	PASS
159	5795	35.80	35.48	35.51	35.76	0.5	PASS

802.11ac (80MHz)

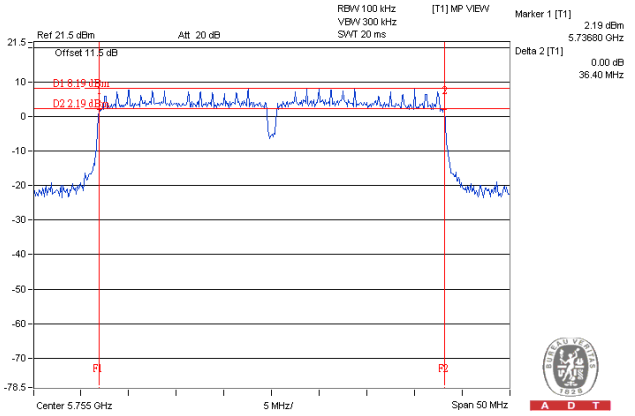
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	76.02	76.42	75.99	76.09	0.5	PASS

Spectrum Plot of Worst Value

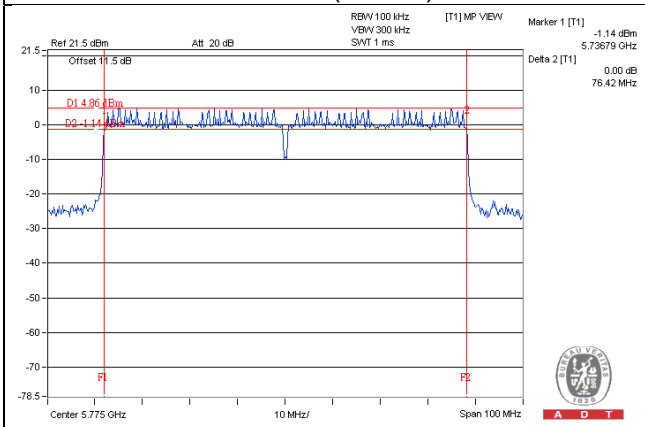
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



Beamforming_NSS2 Mode

802.11n (20MHz)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.95	16.24	17.59	16.82	0.5	PASS
157	5785	16.95	17.00	17.59	16.98	0.5	PASS
165	5825	16.96	16.93	17.60	17.62	0.5	PASS

802.11n (40MHz)

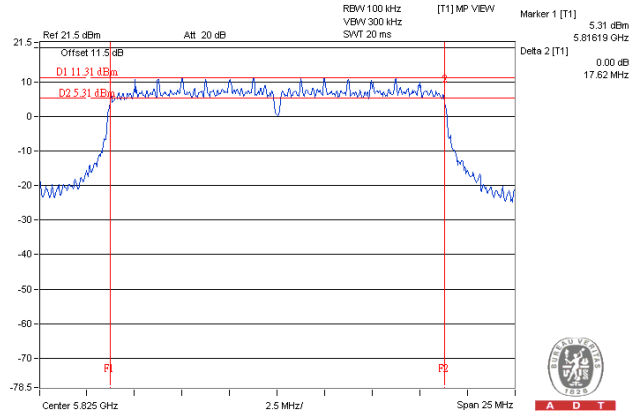
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	36.04	35.83	35.29	35.35	0.5	PASS
159	5795	36.04	35.74	35.25	35.28	0.5	PASS

802.11ac (80MHz)

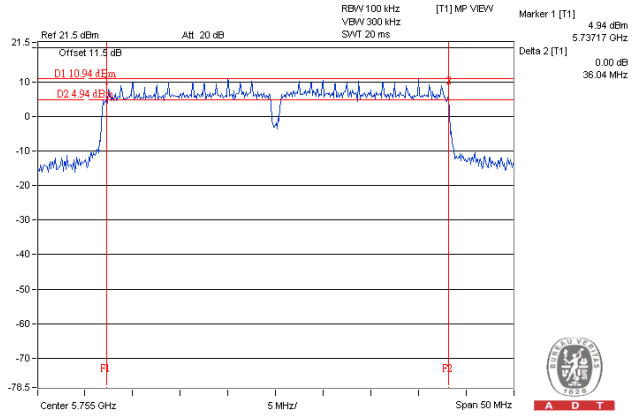
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	76.01	76.11	75.97	76.10	0.5	PASS

Spectrum Plot of Worst Value

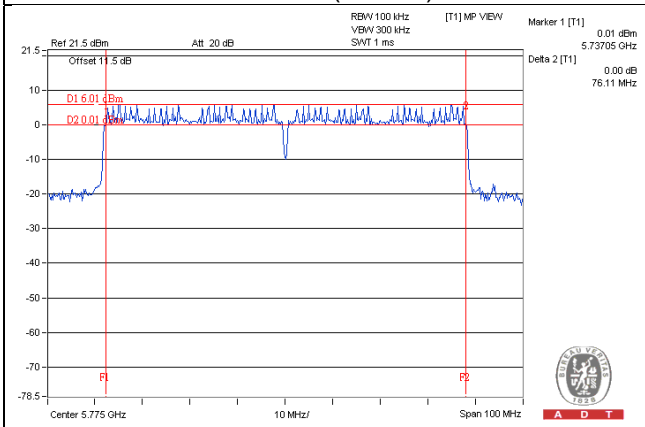
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



5.4 Conducted Output Power Measurement

5.4.1 Limits of Conducted Output Power Measurement

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

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

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

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

5.4.2 Test Setup

Same as item 4.4.2.

5.4.3 Test Instruments

Same as item 4.4.3.

5.4.4 Test Procedures

Same as item 4.4.4.

5.4.5 Deviation from Test Standard

No deviation.

5.4.6 EUT Operating Conditions

Same as item 4.4.6.

5.4.7 Test Results

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	23.91	23.58	24.06	23.85	971.415	29.87	30	Pass
157	5785	23.79	24.03	24.51	23.41	994.030	29.97	30	Pass
165	5825	23.77	23.69	24.43	23.82	990.439	29.96	30	Pass

802.11n (20MHz)

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	23.58	23.81	23.86	23.64	942.896	29.74	30	Pass
157	5785	23.98	24.09	23.78	23.95	993.577	29.97	30	Pass
165	5825	23.97	24.02	23.96	23.79	990.025	29.96	30	Pass

802.11n (40MHz)

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	23.65	24.03	23.35	23.38	918.712	29.63	30	Pass
159	5795	23.98	24.06	23.91	23.90	**996.226**	29.98	30	Pass

802.11ac (80MHz)

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	22.46	21.88	22.01	22.35	661.014	28.20	30	Pass

Beamforming_NSS1 Mode

802.11n (20MHz)

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	22.29	22.27	22.54	22.24	685.056	28.36	28.37	Pass
157	5785	22.02	22.39	22.44	22.83	**699.856**	28.45	28.47	Pass
165	5825	22.11	22.22	22.34	22.65	684.753	28.36	28.37	Pass

Note:

5745MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power limit shall be reduced to 30-(7.63-6) = 28.37dBm.

5785MHz: Directional gain = 1.51dBi + 10log(4) = 7.53dBi > 6dBi, so the power limit shall be reduced to 30-(7.53-6) = 28.47dBm.

5825MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power limit shall be reduced to 30-(7.63-6) = 28.37dBm.

802.11n (40MHz)

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	21.83	22.34	21.83	21.95	632.881	28.01	28.47	Pass
159	5795	22.13	22.52	22.18	22.42	681.732	28.34	28.37	Pass

Note:

5755MHz: Directional gain = 1.51dBi + 10log(4) = 7.53dBi > 6dBi, so the power limit shall be reduced to 30-(7.53-6) = 28.47dBm.

5795MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power limit shall be reduced to 30-(7.63-6) = 28.37dBm.

802.11ac (80MHz)

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	20.76	21.14	21.39	20.82	507.643	27.06	28.37	Pass

Note:

5775MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power limit shall be reduced to 30-(7.63-6) = 28.37dBm.

Beamforming_NSS2 Mode

802.11n (20MHz)

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	23.15	23.62	23.59	23.72	900.747	29.55	30	Pass
157	5785	22.81	23.51	24.31	23.46	906.967	29.58	30	Pass
165	5825	22.61	23.49	24.52	23.67	921.695	29.65	30	Pass

Note:

5745MHz: Directional gain = 1.61dBi + 10log(4/2) = 4.62dBi < 6dBi, so the power limit no need to reduced.

5785MHz: Directional gain = 1.51dBi + 10log(4/2) = 4.52dBi < 6dBi, so the power limit no need to reduced.

5825MHz: Directional gain = 1.61dBi + 10log(4/2) = 4.62dBi < 6dBi, so the power limit no need to reduced.

802.11n (40MHz)

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	23.92	24.01	23.98	23.14	**954.470**	29.80	30	Pass
159	5795	23.42	24.05	23.22	23.48	906.621	29.57	30	Pass

Note:

5755MHz: Directional gain = 1.51dBi + 10log(4/2) = 4.52dBi < 6dBi, so the power limit no need to reduced.

5795MHz: Directional gain = 1.61dBi + 10log(4/2) = 4.62dBi < 6dBi, so the power limit no need to reduced.

802.11ac (80MHz)

Chan.	Chan. Freq. (MHz)	AVG. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	21.91	22.12	22.33	22.34	660.567	28.20	30	Pass

Note:

5775MHz: Directional gain = 1.61dBi + 10log(4/2) = 4.62dBi < 6dBi, so the power limit no need to reduced.

5.5 Power Spectral Density Measurement

5.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 Test Setup

Same as Item 4.5.2

5.5.3 Test Instruments

Same as Item 4.5.3

5.5.4 Test Procedure

Same as Item 4.5.4

5.5.5 Deviation from Test Standard

No deviation.

5.5.6 EUT Operating Condition

Same as Item 4.3.6

5.5.7 Test Results

CDD Mode

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	149	5745	-2.50	6.02	3.52	0.34	3.86	6.37	Pass
	157	5785	-2.01	6.02	4.01	0.34	4.35	6.47	Pass
	165	5825	-1.79	6.02	4.23	0.34	4.57	6.37	Pass
1	149	5745	-2.39	6.02	3.63	0.34	3.97	6.37	Pass
	157	5785	-2.44	6.02	3.58	0.34	3.92	6.47	Pass
	165	5825	-2.61	6.02	3.41	0.34	3.75	6.37	Pass
2	149	5745	-2.89	6.02	3.13	0.34	3.47	6.37	Pass
	157	5785	-2.88	6.02	3.14	0.34	3.48	6.47	Pass
	165	5825	-2.97	6.02	3.05	0.34	3.39	6.37	Pass
3	149	5745	-2.92	6.02	3.10	0.34	3.44	6.37	Pass
	157	5785	-3.21	6.02	2.81	0.34	3.15	6.47	Pass
	165	5825	-4.20	6.02	1.82	0.34	2.16	6.37	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5745MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power density limit shall be reduced to 8-(7.63-6) = 6.37dBm.

   5785MHz: Directional gain = 1.51dBi + 10log(4) = 7.53dBi > 6dBi, so the power density limit shall be reduced to 8-(7.53-6) = 6.47dBm.

   5825MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power density limit shall be reduced to 8-(7.63-6) = 6.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	149	5745	-2.31	6.02	3.71	0.11	3.82	6.37	Pass
	157	5785	-3.04	6.02	2.98	0.11	3.09	6.47	Pass
	165	5825	-2.63	6.02	3.39	0.11	3.50	6.37	Pass
1	149	5745	-3.28	6.02	2.74	0.11	2.85	6.37	Pass
	157	5785	-3.61	6.02	2.41	0.11	2.52	6.47	Pass
	165	5825	-3.41	6.02	2.61	0.11	2.72	6.37	Pass
2	149	5745	-3.43	6.02	2.59	0.11	2.70	6.37	Pass
	157	5785	-1.90	6.02	4.12	0.11	4.23	6.47	Pass
	165	5825	-2.61	6.02	3.41	0.11	3.52	6.37	Pass
3	149	5745	-3.60	6.02	2.42	0.11	2.53	6.37	Pass
	157	5785	-3.96	6.02	2.06	0.11	2.17	6.47	Pass
	165	5825	-4.85	6.02	1.17	0.11	1.28	6.37	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5745MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power density limit shall be reduced to 8-(7.63-6) = 6.37dBm.

   5785MHz: Directional gain = 1.51dBi + 10log(4) = 7.53dBi > 6dBi, so the power density limit shall be reduced to 8-(7.53-6) = 6.47dBm.

   5825MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power density limit shall be reduced to 8-(7.63-6) = 6.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	151	5755	-4.77	6.02	1.25	0.29	1.54	6.47	Pass
	159	5795	-4.66	6.02	1.36	0.29	1.65	6.37	Pass
1	151	5755	-5.88	6.02	0.14	0.29	0.43	6.47	Pass
	159	5795	-6.13	6.02	-0.11	0.29	0.18	6.37	Pass
2	151	5755	-5.86	6.02	0.16	0.29	0.45	6.47	Pass
	159	5795	-5.75	6.02	0.27	0.29	0.56	6.37	Pass
3	151	5755	-6.54	6.02	-0.52	0.29	-0.23	6.47	Pass
	159	5795	-6.27	6.02	-0.25	0.29	0.04	6.37	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5755MHz: Directional gain = 1.51dBi + 10log(4) = 7.53dBi > 6dBi, so the power density limit shall be reduced to 8-(7.53-6) = 6.47dBm.

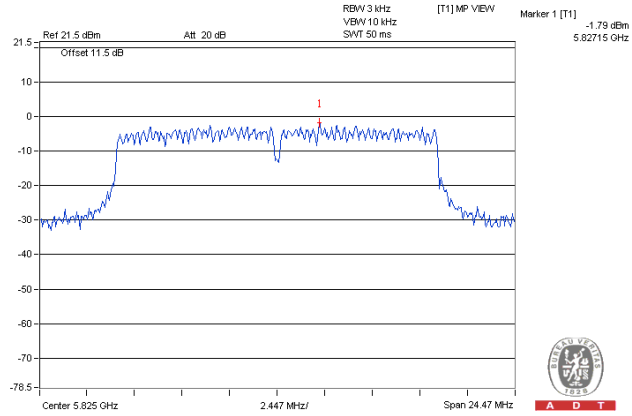
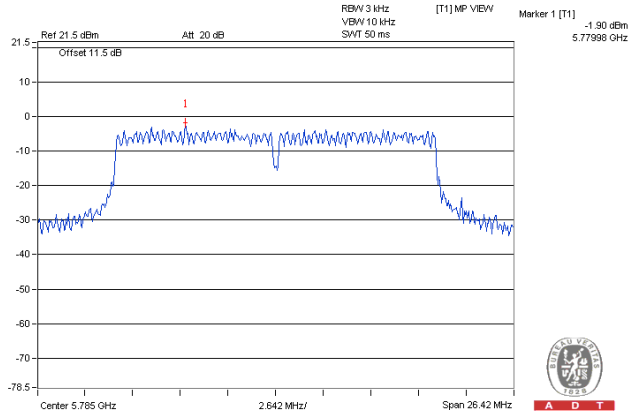
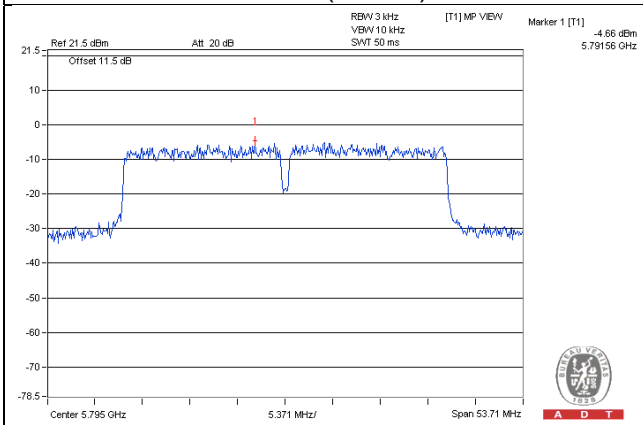
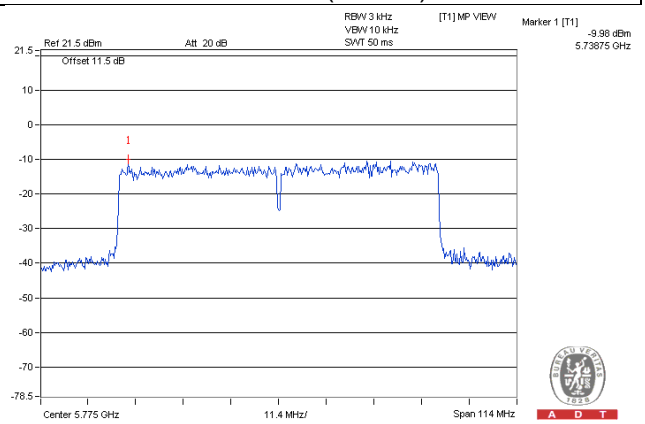
   5795MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power density limit shall be reduced to 8-(7.63-6) = 6.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (80MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	155	5775	-9.98	6.02	-3.96	0.61	-3.35	6.37	Pass
1	155	5775	-10.83	6.02	-4.81	0.61	-4.20	6.37	Pass
2	155	5775	-10.68	6.02	-4.66	0.61	-4.05	6.37	Pass
3	155	5775	-11.73	6.02	-5.71	0.61	-5.10	6.37	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5775MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power density limit shall be reduced to 8-(7.63-6) = 6.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a	802.11n (20MHz)
	
802.11n (40MHz)	802.11ac (80MHz)
	

Beamforming_NSS1 Mode

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	149	5745	-3.82	6.02	2.20	0.11	2.31	6.37	Pass
	157	5785	-3.25	6.02	2.77	0.11	2.88	6.47	Pass
	165	5825	-3.56	6.02	2.46	0.11	2.57	6.37	Pass
1	149	5745	-4.56	6.02	1.46	0.11	1.57	6.37	Pass
	157	5785	-4.66	6.02	1.36	0.11	1.47	6.47	Pass
	165	5825	-4.04	6.02	1.98	0.11	2.09	6.37	Pass
2	149	5745	-4.28	6.02	1.74	0.11	1.85	6.37	Pass
	157	5785	-4.18	6.02	1.84	0.11	1.95	6.47	Pass
	165	5825	-4.87	6.02	1.15	0.11	1.26	6.37	Pass
3	149	5745	-4.94	6.02	1.08	0.11	1.19	6.37	Pass
	157	5785	-4.59	6.02	1.43	0.11	1.54	6.47	Pass
	165	5825	-5.27	6.02	0.75	0.11	0.86	6.37	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5745MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power density limit shall be reduced to 8-(7.63-6) = 6.37dBm.

   5785MHz: Directional gain = 1.51dBi + 10log(4) = 7.53dBi > 6dBi, so the power density limit shall be reduced to 8-(7.53-6) = 6.47dBm.

   5825MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power density limit shall be reduced to 8-(7.63-6) = 6.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	151	5755	-7.11	6.02	-1.09	0.41	-0.68	6.47	Pass
	159	5795	-5.88	6.02	0.14	0.41	0.55	6.37	Pass
1	151	5755	-6.85	6.02	-0.83	0.41	-0.42	6.47	Pass
	159	5795	-6.92	6.02	-0.90	0.41	-0.49	6.37	Pass
2	151	5755	-8.03	6.02	-2.01	0.41	-1.60	6.47	Pass
	159	5795	-6.93	6.02	-0.91	0.41	-0.50	6.37	Pass
3	151	5755	-7.80	6.02	-1.78	0.41	-1.37	6.47	Pass
	159	5795	-7.89	6.02	-1.87	0.41	-1.46	6.37	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5755MHz: Directional gain = 1.51dBi + 10log(4) = 7.53dBi > 6dBi, so the power density limit shall be reduced to 8-(7.53-6) = 6.47dBm.

   5795MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power density limit shall be reduced to 8-(7.63-6) = 6.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (80MHz)

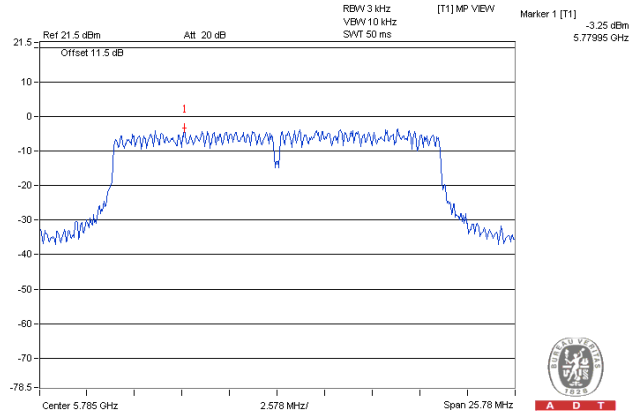
TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	155	5775	-11.37	6.02	-5.35	0.46	-4.89	6.37	Pass
1	155	5775	-12.22	6.02	-6.20	0.46	-5.74	6.37	Pass
2	155	5775	-12.09	6.02	-6.07	0.46	-5.61	6.37	Pass
3	155	5775	-12.67	6.02	-6.65	0.46	-6.19	6.37	Pass

Note:

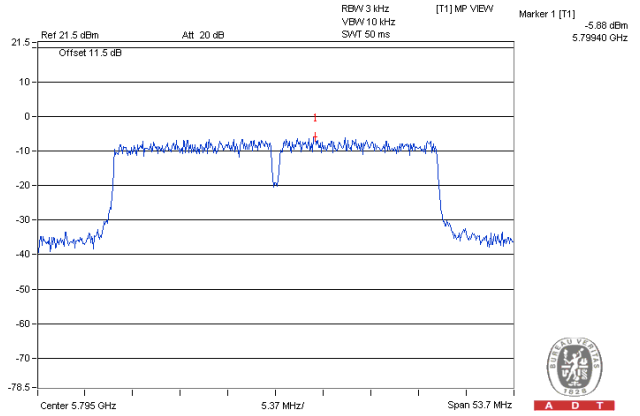
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5775MHz: Directional gain = 1.61dBi + 10log(4) = 7.63dBi > 6dBi, so the power density limit shall be reduced to 8-(7.63-6) = 6.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

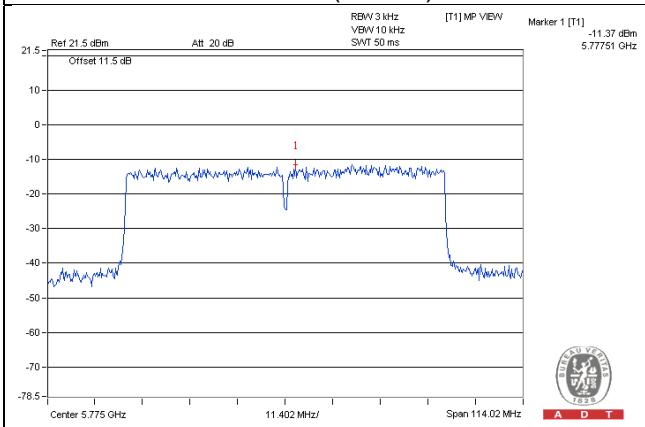
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



Beamforming_NSS2 Mode

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	149	5745	-3.48	6.02	2.54	0.13	2.67	8.00	Pass
	157	5785	-2.97	6.02	3.05	0.13	3.18	8.00	Pass
	165	5825	-1.62	6.02	4.40	0.13	4.53	8.00	Pass
1	149	5745	-3.62	6.02	2.40	0.13	2.53	8.00	Pass
	157	5785	-3.74	6.02	2.28	0.13	2.41	8.00	Pass
	165	5825	-3.08	6.02	2.94	0.13	3.07	8.00	Pass
2	149	5745	-3.46	6.02	2.56	0.13	2.69	8.00	Pass
	157	5785	-3.85	6.02	2.17	0.13	2.30	8.00	Pass
	165	5825	-3.64	6.02	2.38	0.13	2.51	8.00	Pass
3	149	5745	-3.99	6.02	2.03	0.13	2.16	8.00	Pass
	157	5785	-4.31	6.02	1.71	0.13	1.84	8.00	Pass
	165	5825	-4.46	6.02	1.56	0.13	1.69	8.00	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5745MHz: Directional gain = 1.61dBi + 10log(4/2) = 4.62dBi < 6dBi, so the power density limit no need to reduced.

   5785MHz: Directional gain = 1.51dBi + 10log(4/2) = 4.52dBi < 6dBi, so the power density limit no need to reduced.

   5825MHz: Directional gain = 1.61dBi + 10log(4/2) = 4.62dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	151	5755	-4.97	6.02	1.05	0.22	1.27	8.00	Pass
	159	5795	-4.57	6.02	1.45	0.22	1.67	8.00	Pass
1	151	5755	-5.25	6.02	0.77	0.22	0.99	8.00	Pass
	159	5795	-4.76	6.02	1.26	0.22	1.48	8.00	Pass
2	151	5755	-5.22	6.02	0.80	0.22	1.02	8.00	Pass
	159	5795	-5.98	6.02	0.04	0.22	0.26	8.00	Pass
3	151	5755	-6.76	6.02	-0.74	0.22	-0.52	8.00	Pass
	159	5795	-6.15	6.02	-0.13	0.22	0.09	8.00	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5755MHz: Directional gain = 1.51dBi + 10log(4/2) = 4.52dBi < 6dBi, so the power density limit no need to reduced.

   5795MHz: Directional gain = 1.61dBi + 10log(4/2) = 4.62dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (80MHz)

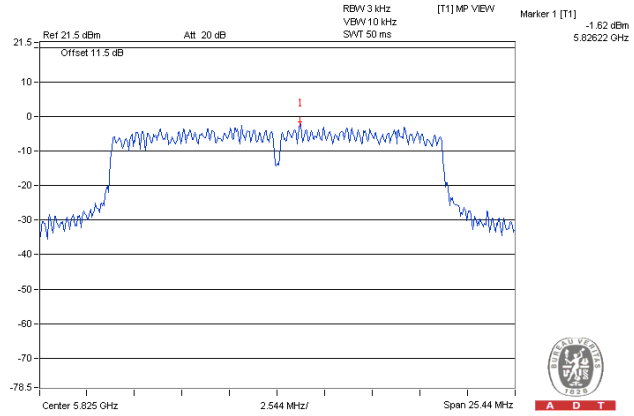
TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD w/o duty factor (dBm)	Duty factor	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	155	5775	-10.12	6.02	-4.10	0.82	-3.28	8.00	Pass
1	155	5775	-11.21	6.02	-5.19	0.82	-4.37	8.00	Pass
2	155	5775	-11.05	6.02	-5.03	0.82	-4.21	8.00	Pass
3	155	5775	-11.07	6.02	-5.05	0.82	-4.23	8.00	Pass

Note:

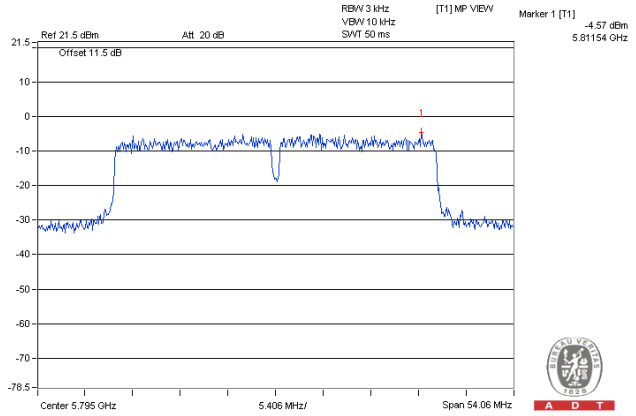
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5775MHz: Directional gain = 1.61dBi + 10log(4/2) = 4.62dBi < 6dBi, so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

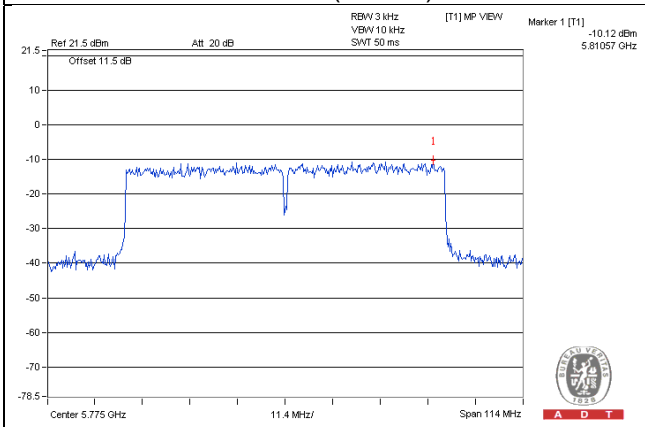
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



5.6 Conducted Out of Band Emission Measurement

5.6.1 Limits of Conducted Out of Band Emission Measurement

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

5.6.2 Test Setup

Same as Item 4.6.2

5.6.3 Test Instruments

Same as Item 4.6.3

5.6.4 Test Procedure

Same as Item 4.6.4

5.6.5 Deviation from Test Standard

No deviation.

5.6.6 EUT Operating Condition

Same as Item 4.3.6

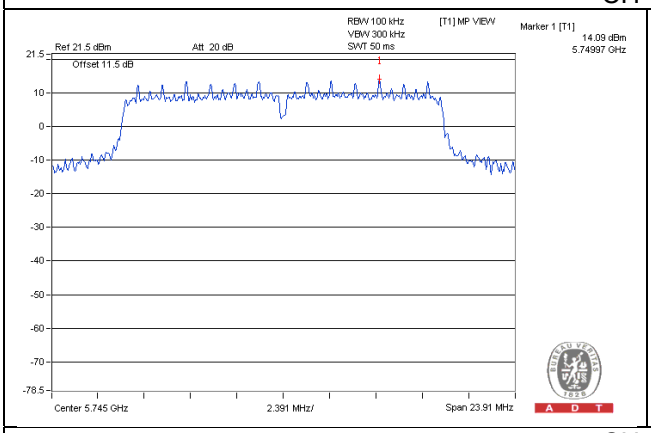
5.6.7 Test Results

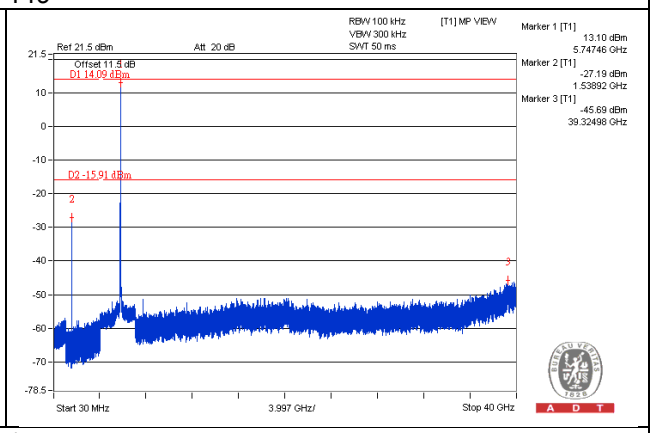
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

CDD Mode

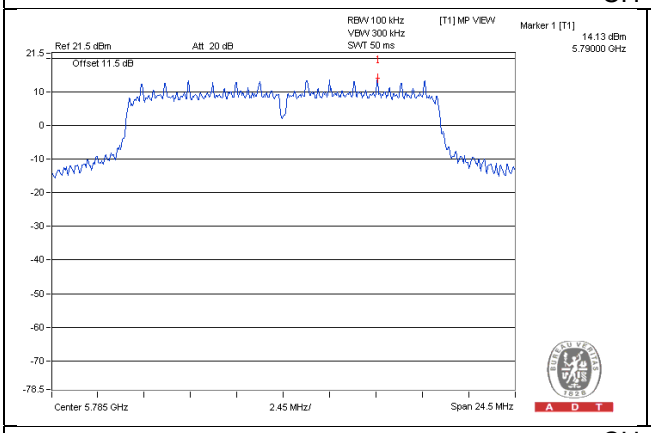
802.11a_Chain 0

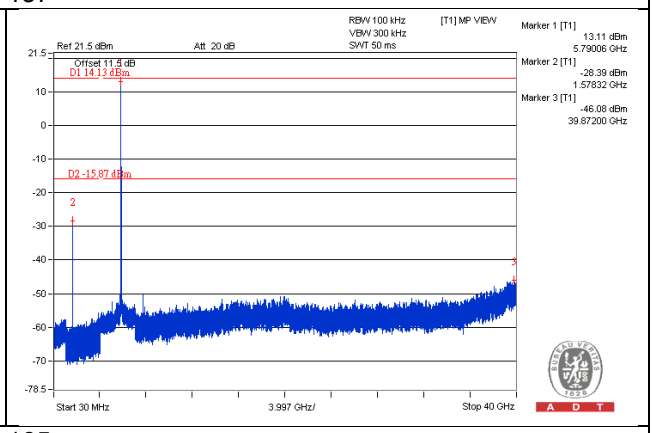
CH 149



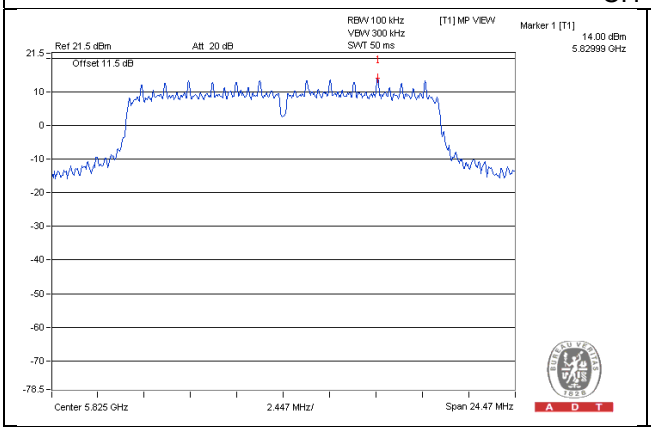


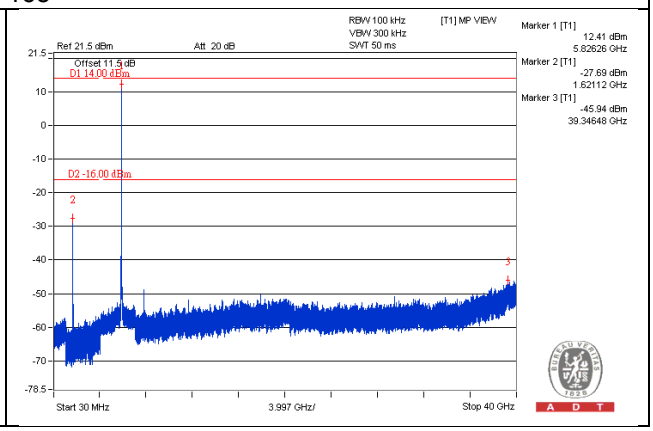
CH 157





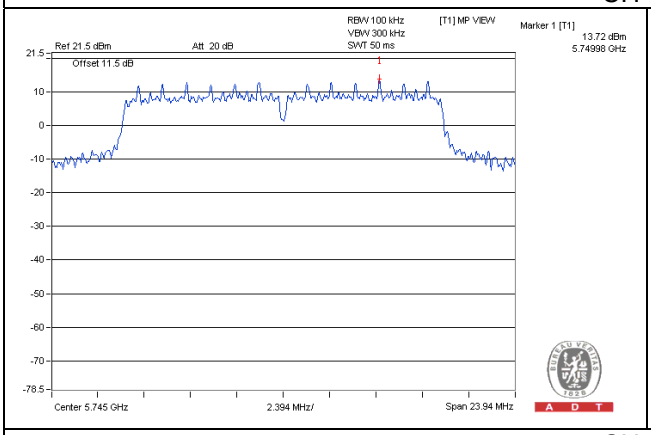
CH 165

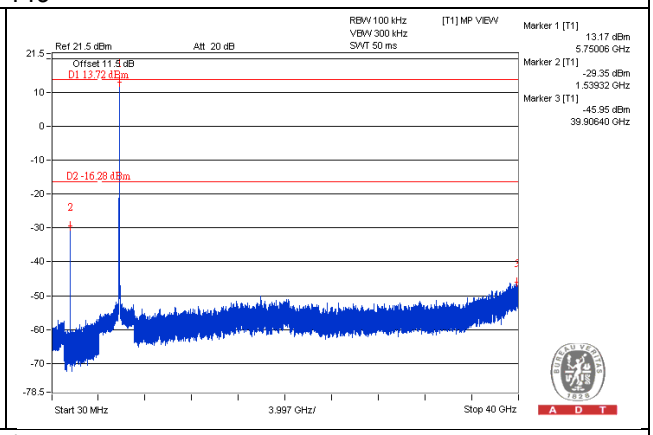




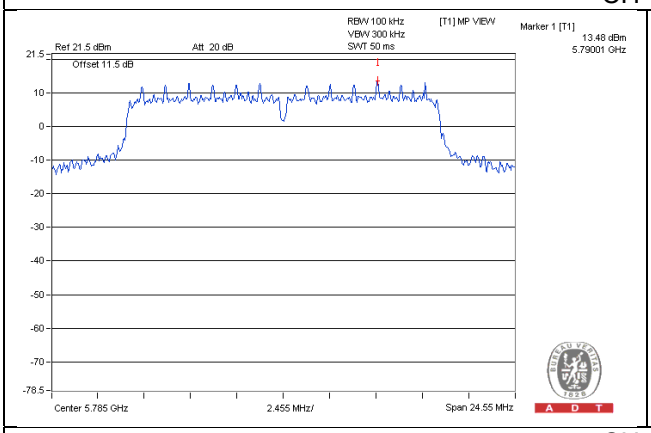
802.11a_Chain 1

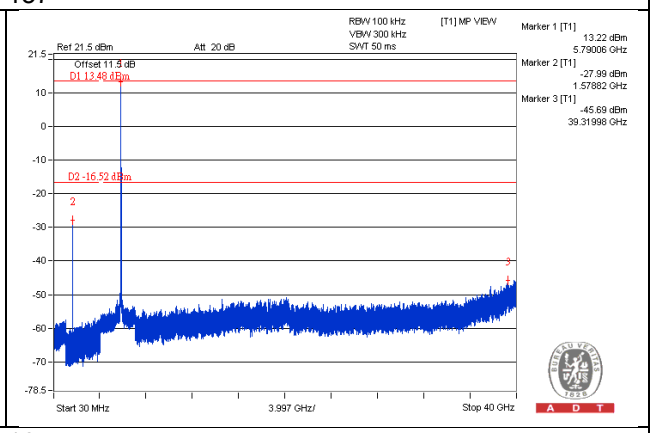
CH 149



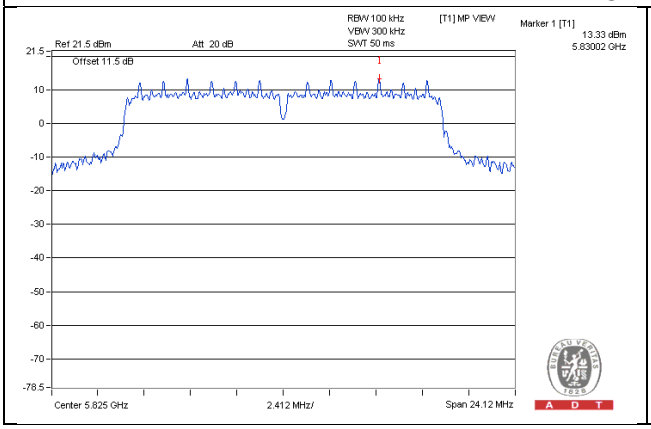


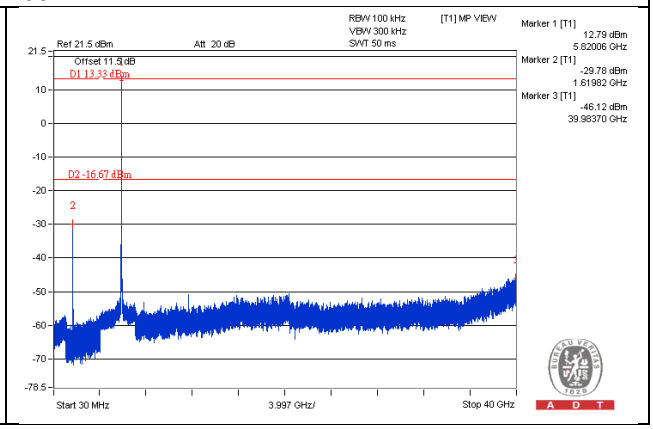
CH 157





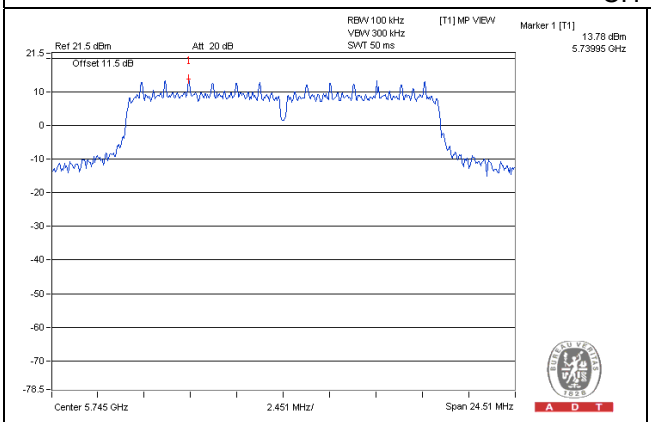
CH 165

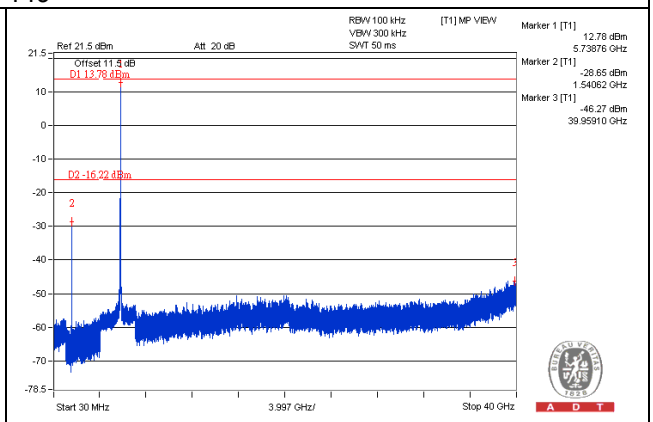




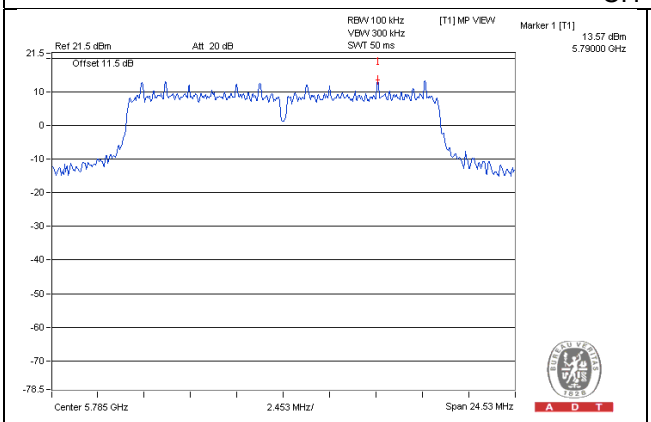
802.11a_Chain 2

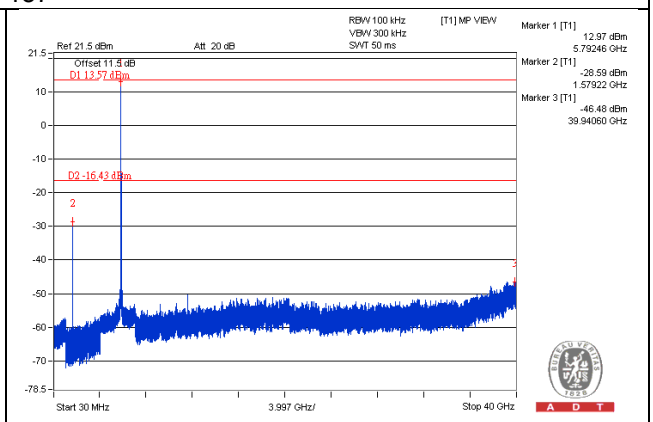
CH 149



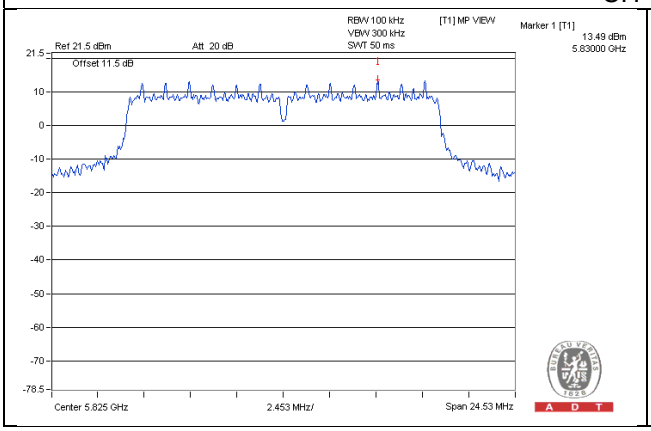


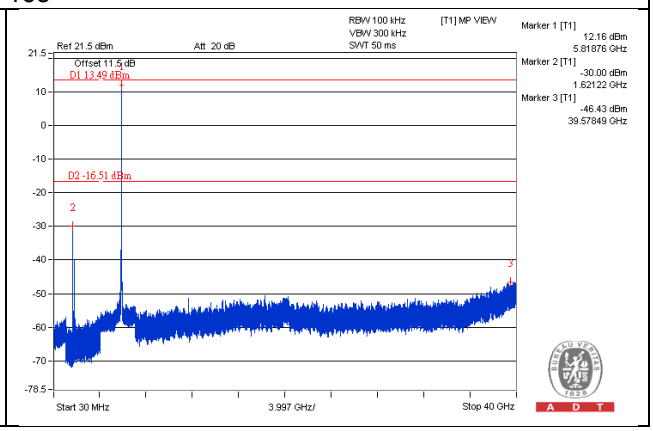
CH 157





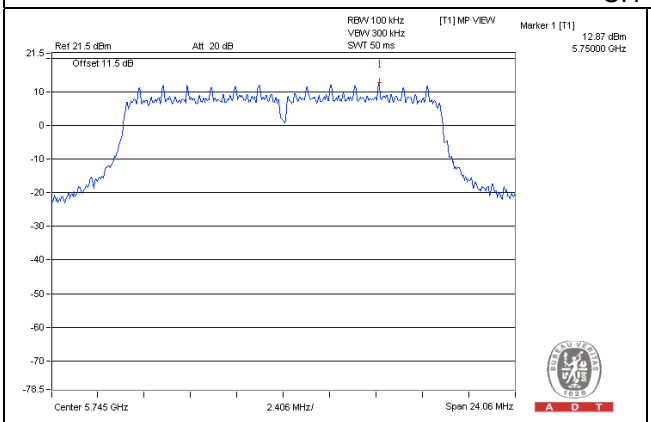
CH 165

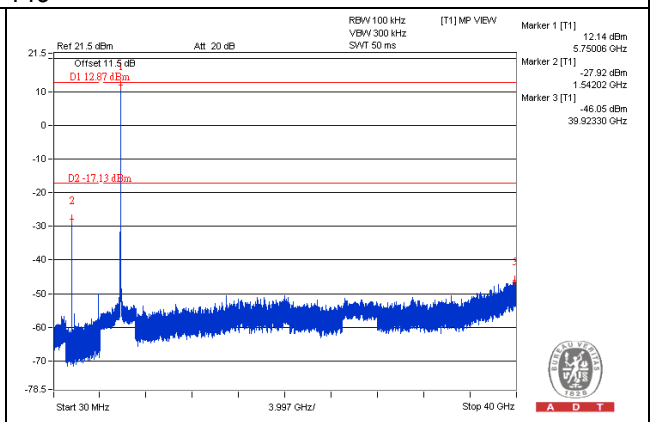




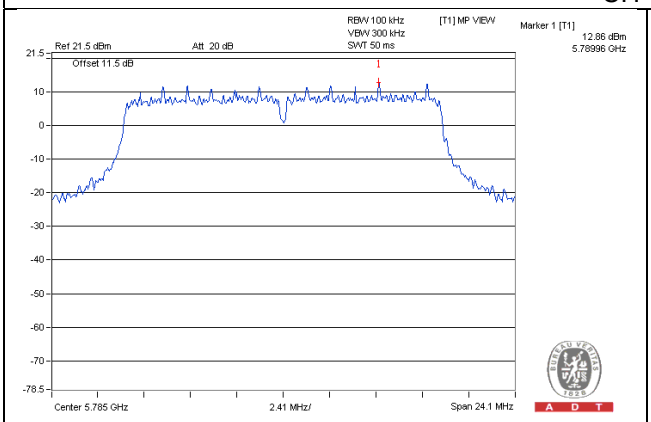
802.11a_Chain 3

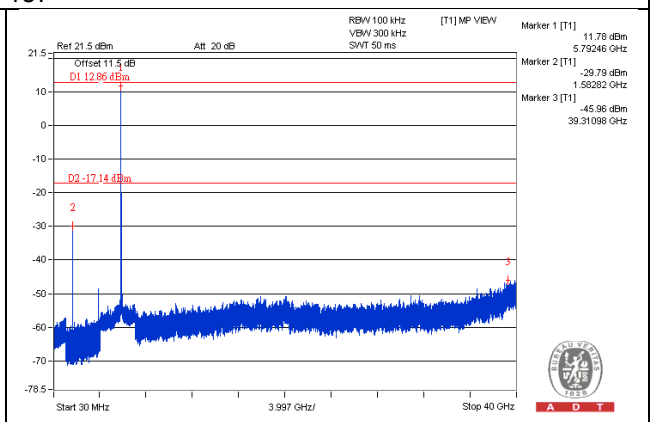
CH 149



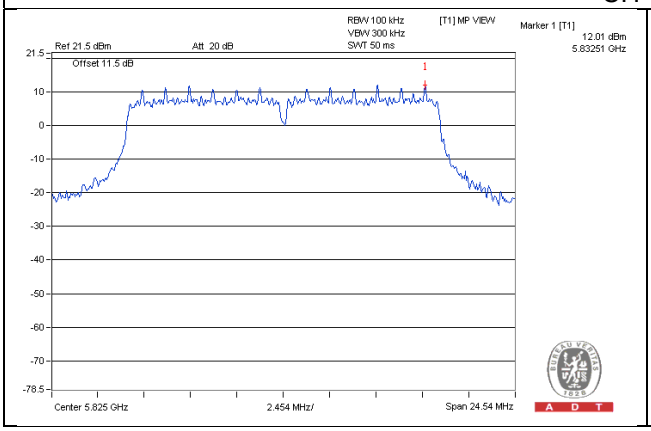


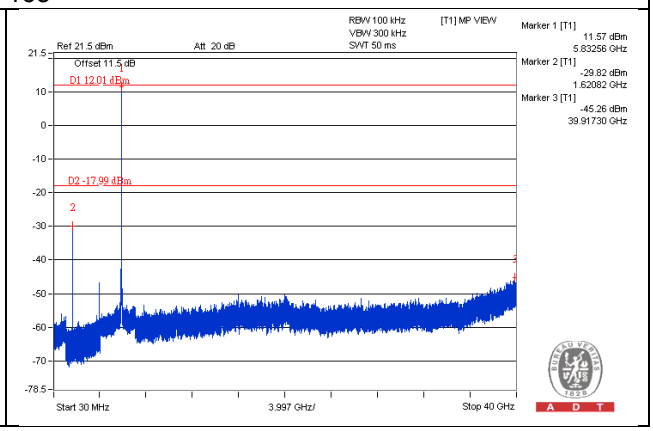
CH 157





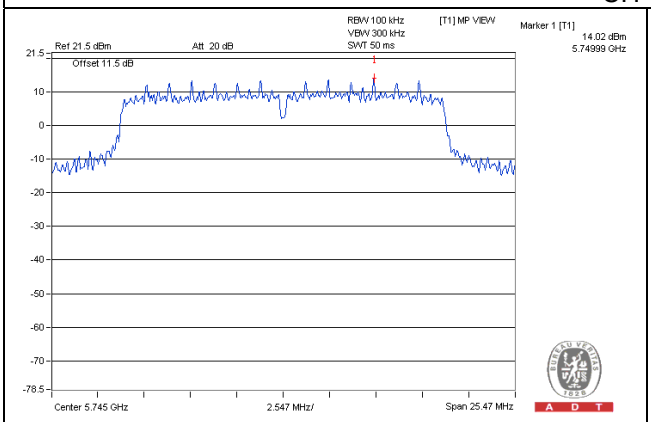
CH 165

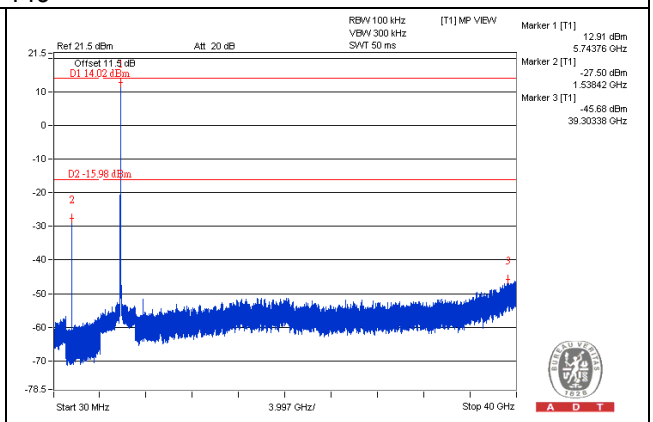




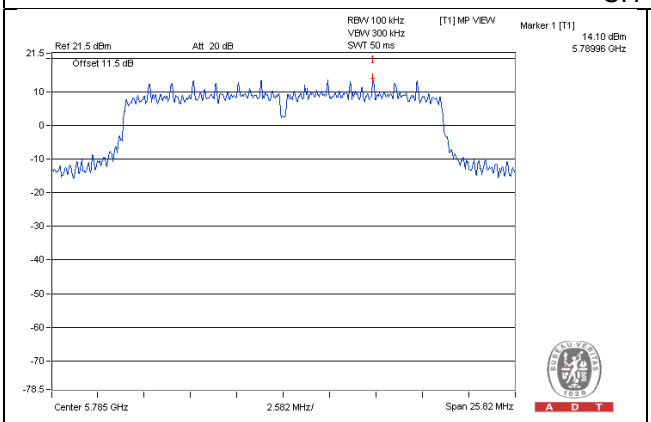
802.11n (20MHz)_Chain 0

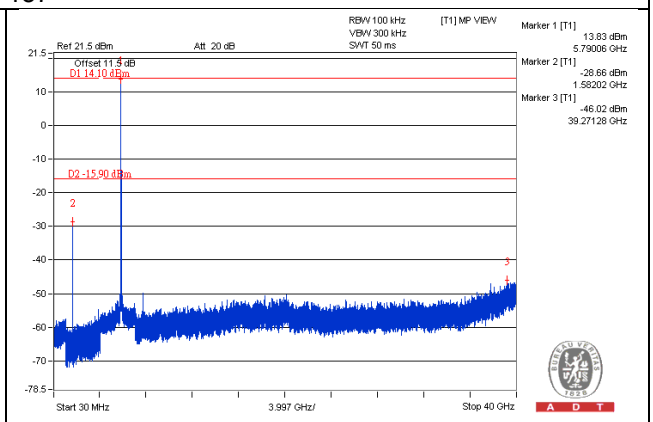
CH 149



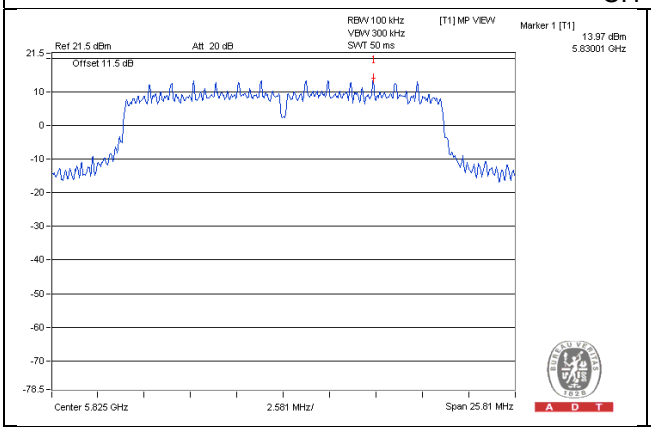


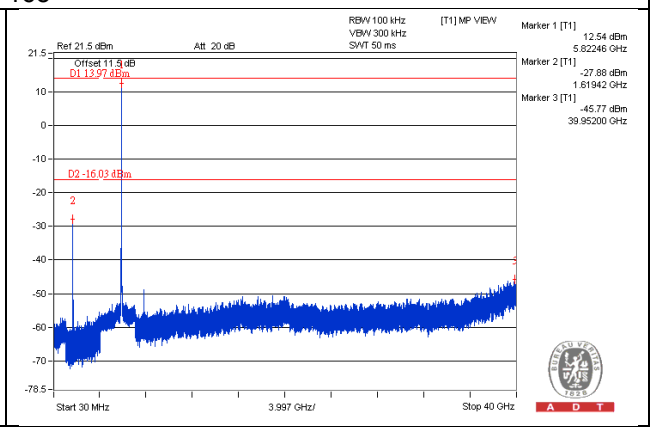
CH 157





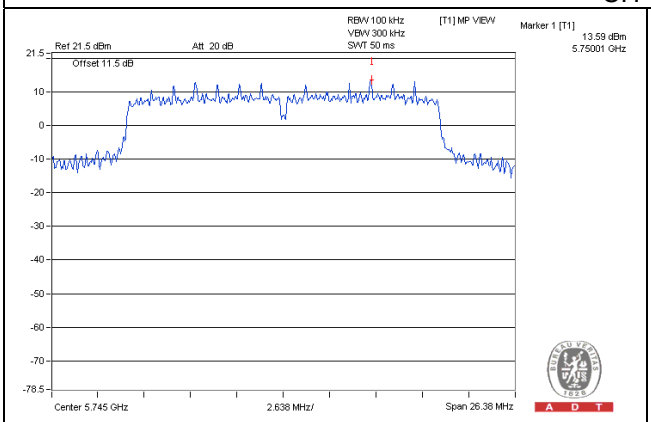
CH 165

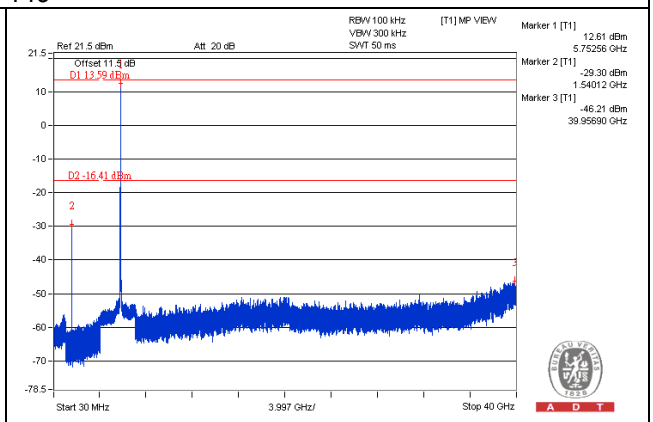




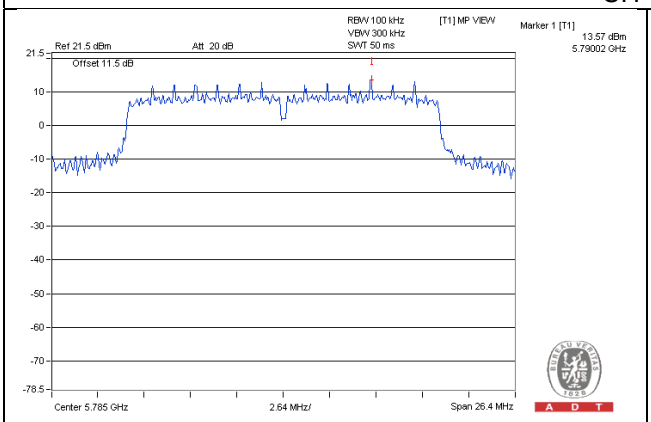
802.11n (20MHz)_Chain 1

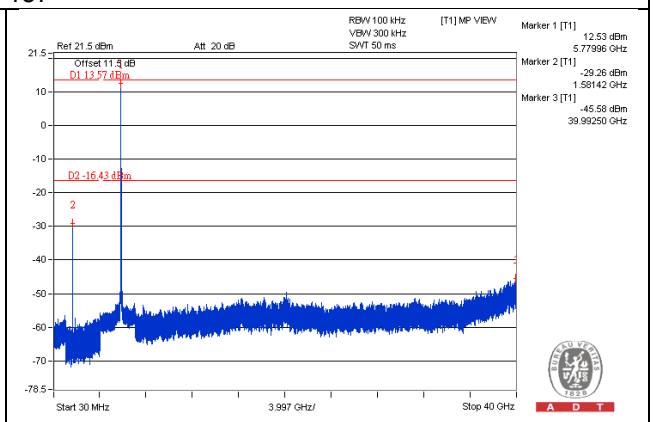
CH 149



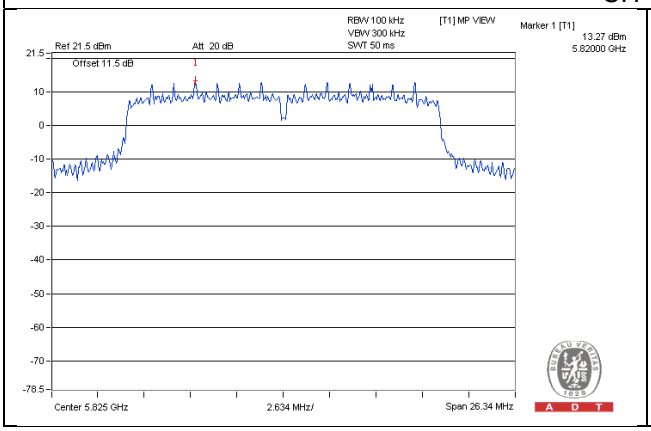


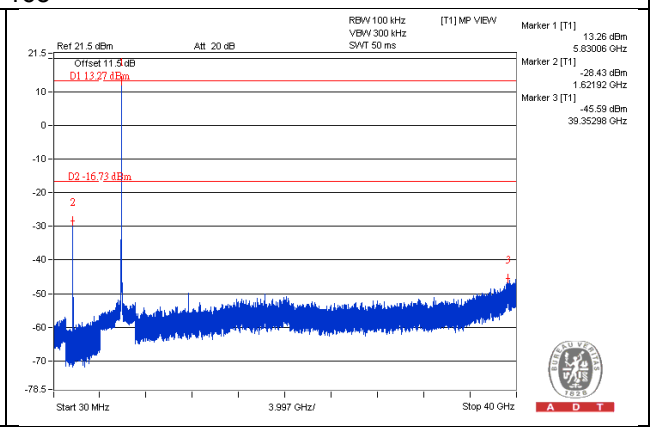
CH 157





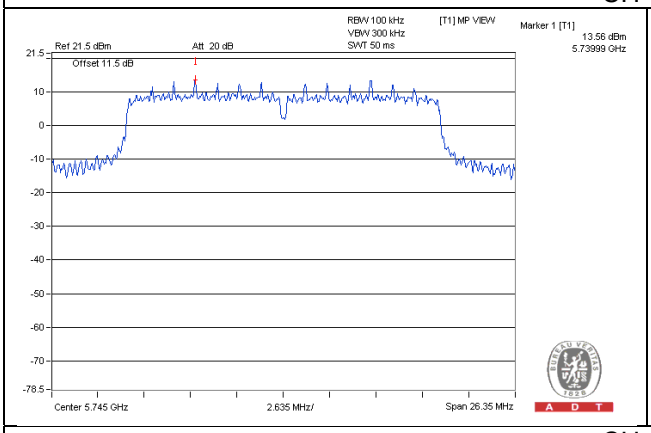
CH 165

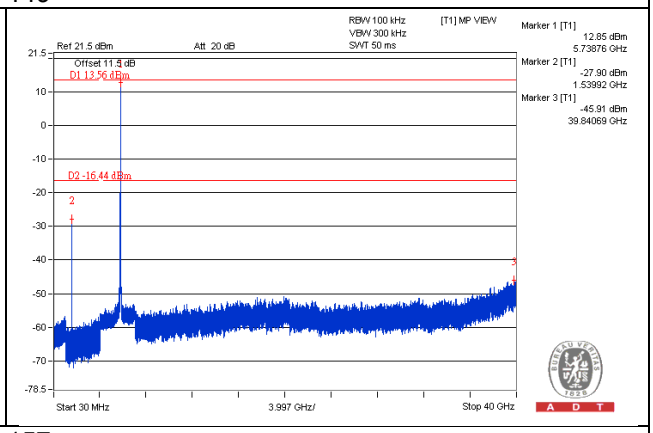




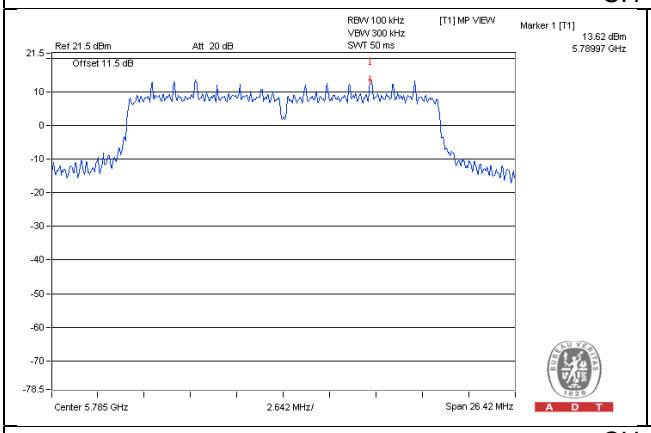
802.11n (20MHz)_Chain 2

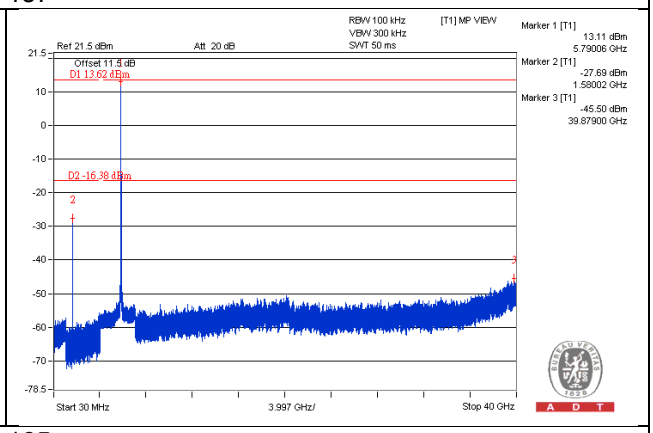
CH 149



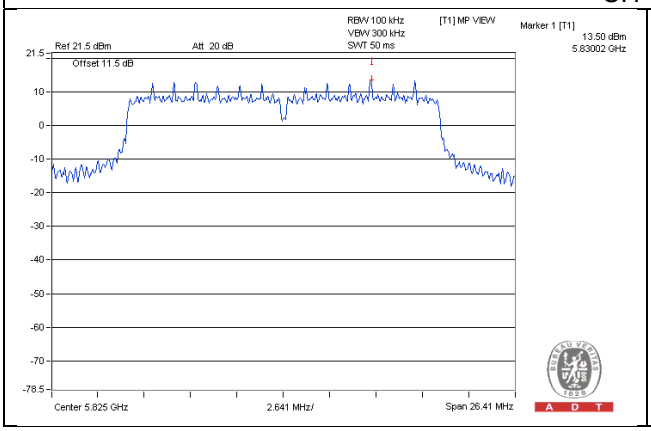


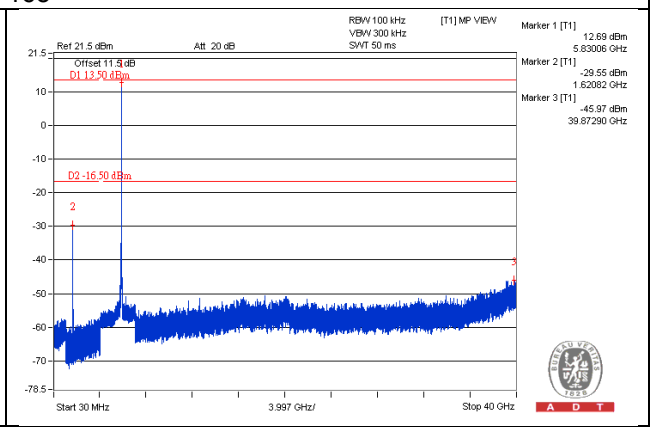
CH 157





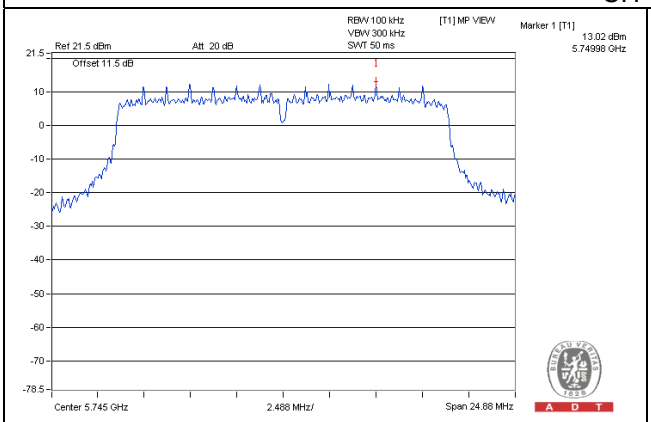
CH 165

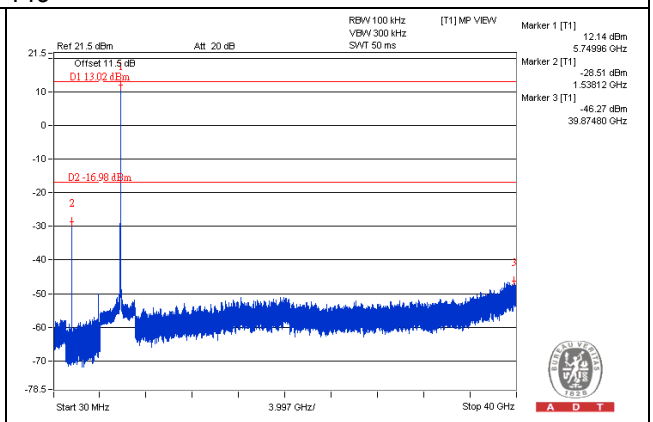




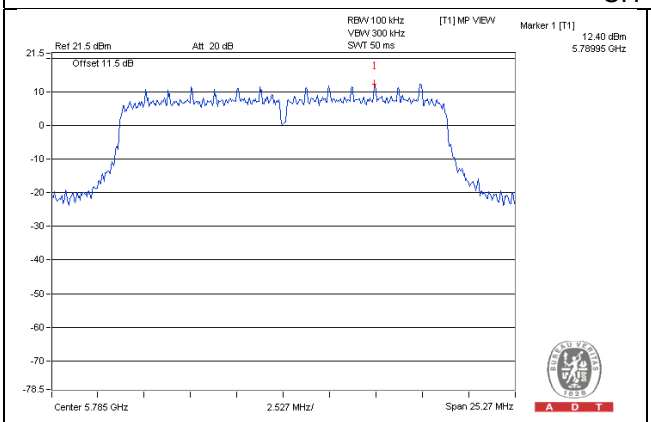
802.11n (20MHz)_Chain 3

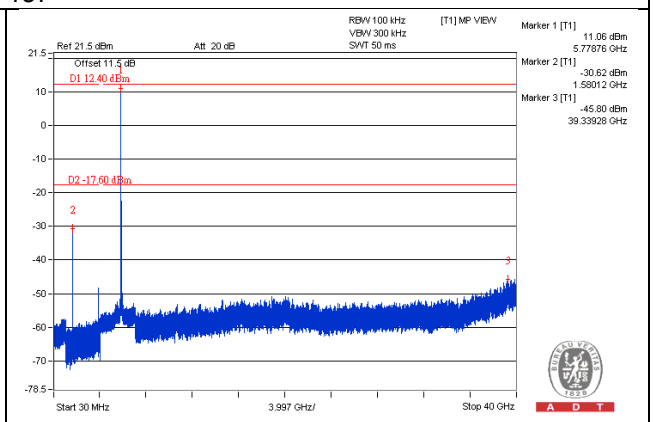
CH 149



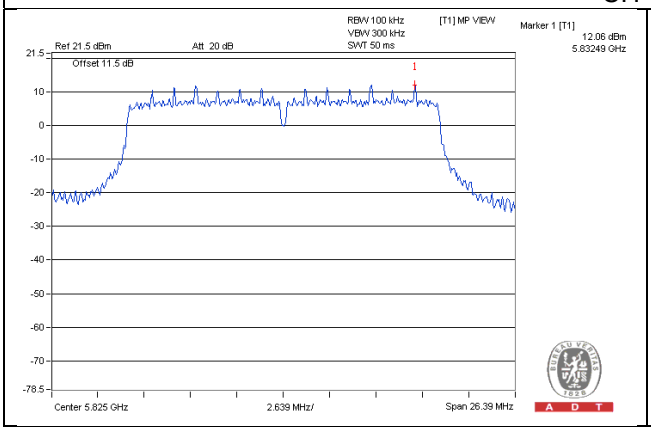


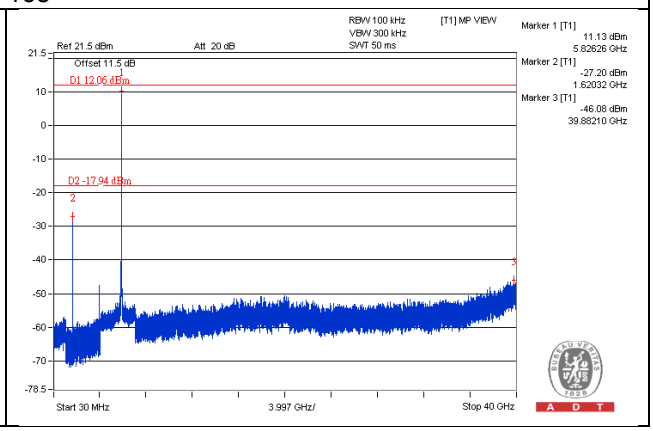
CH 157





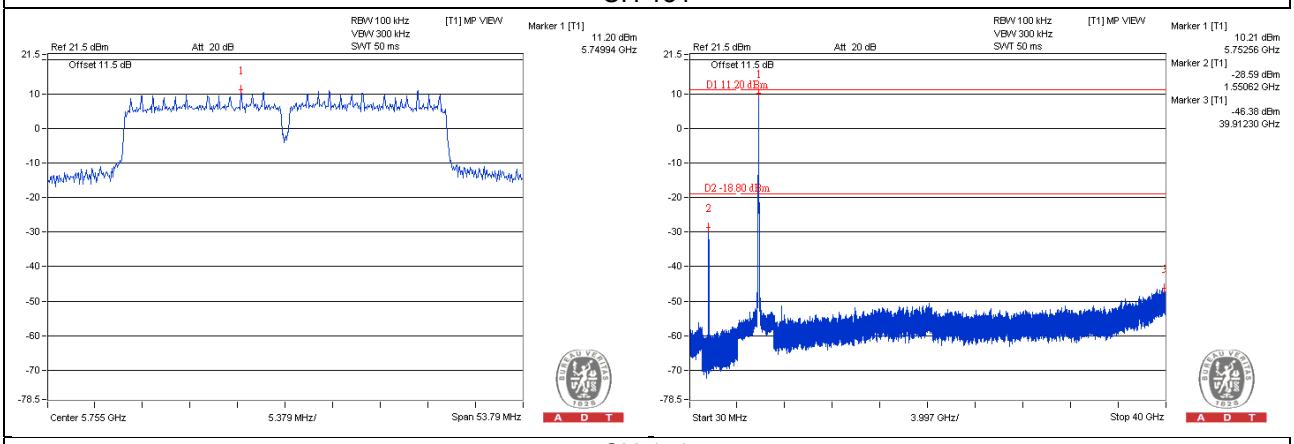
CH 165



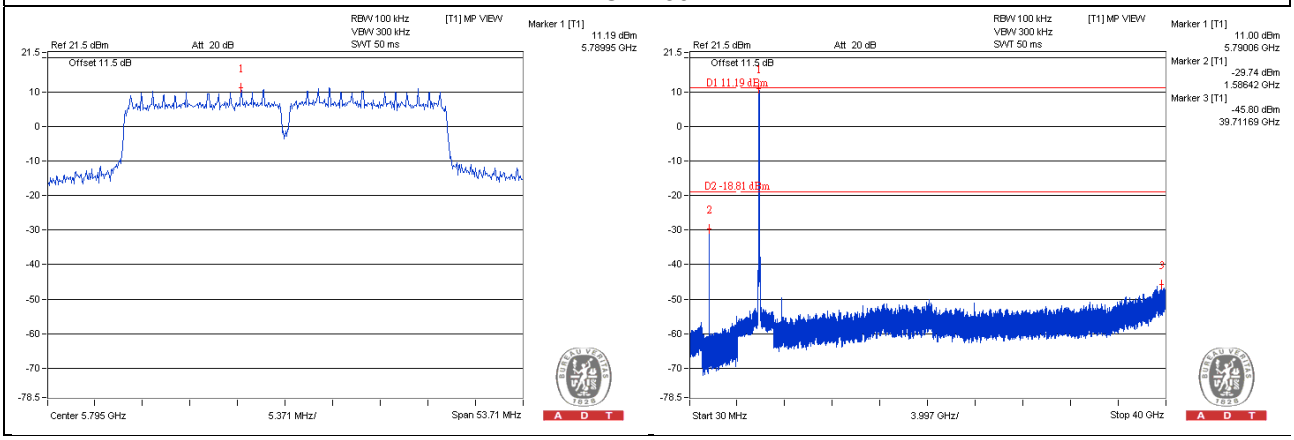


802.11n (40MHz)_Chain 0

CH 151

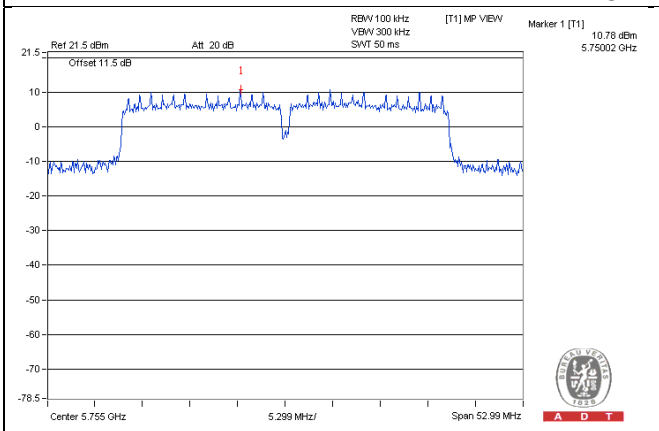


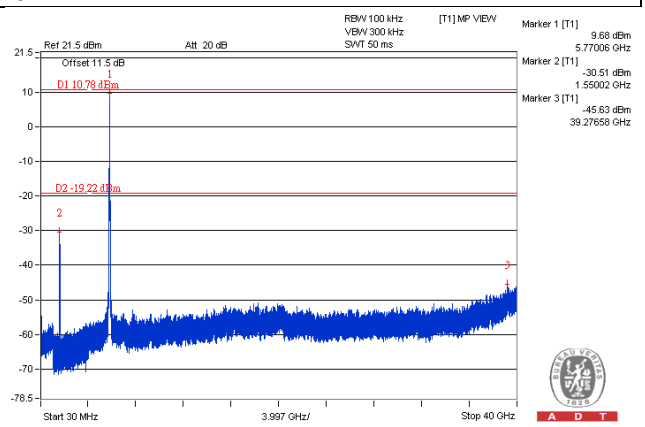
CH 159



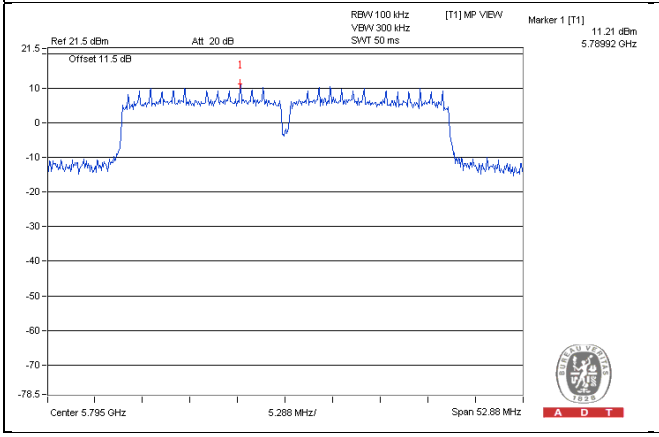
802.11n (40MHz)_Chain 1

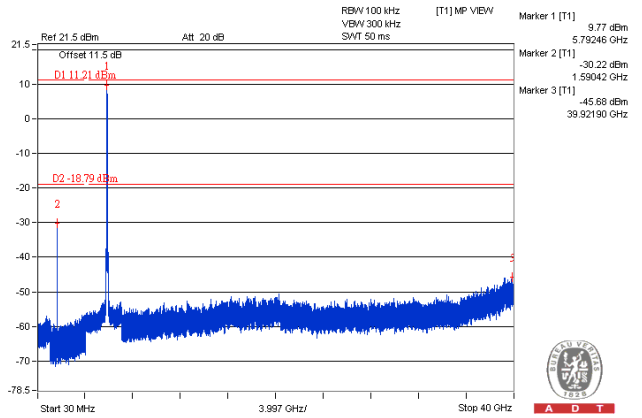
CH 151





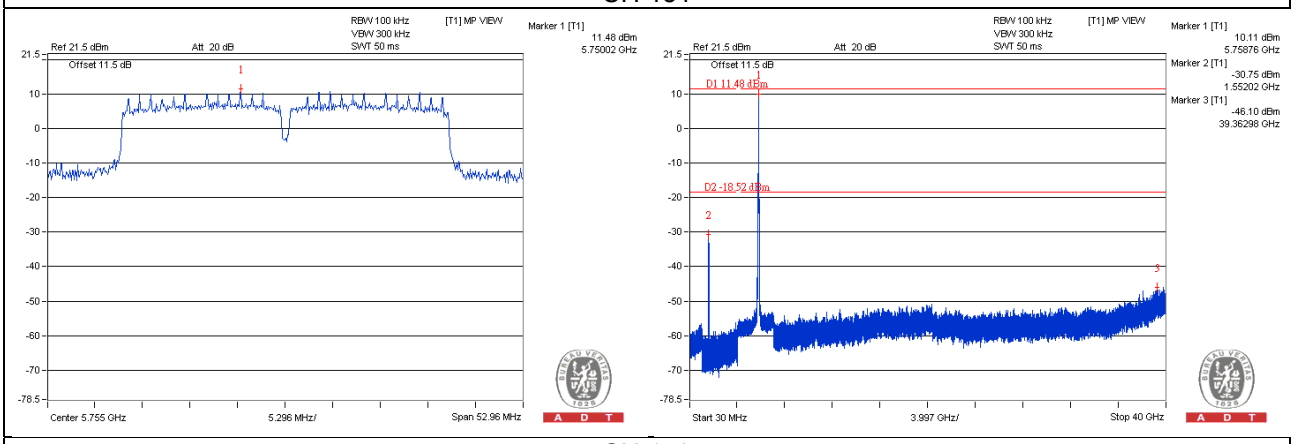
CH 159



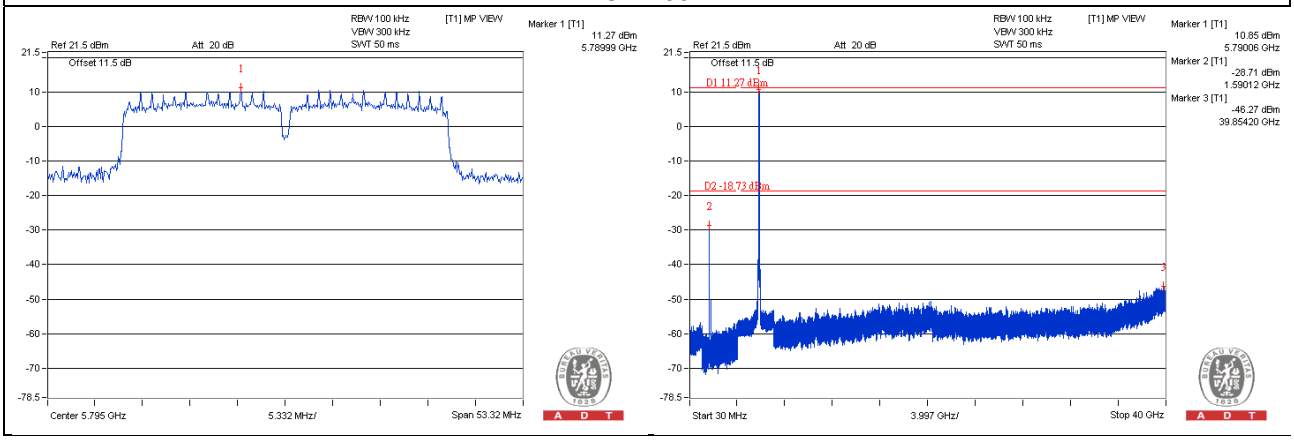


802.11n (40MHz)_Chain 2

CH 151

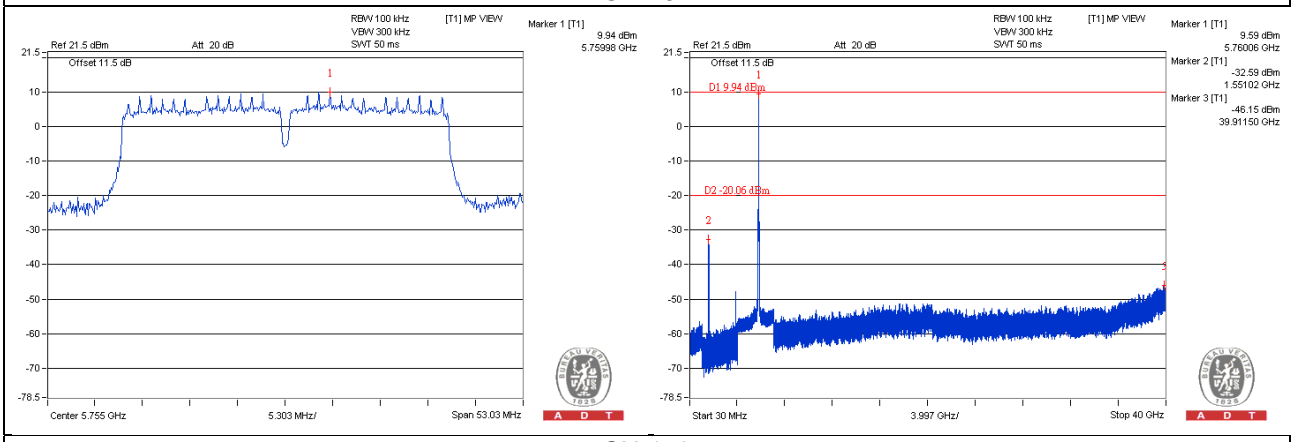


CH 159

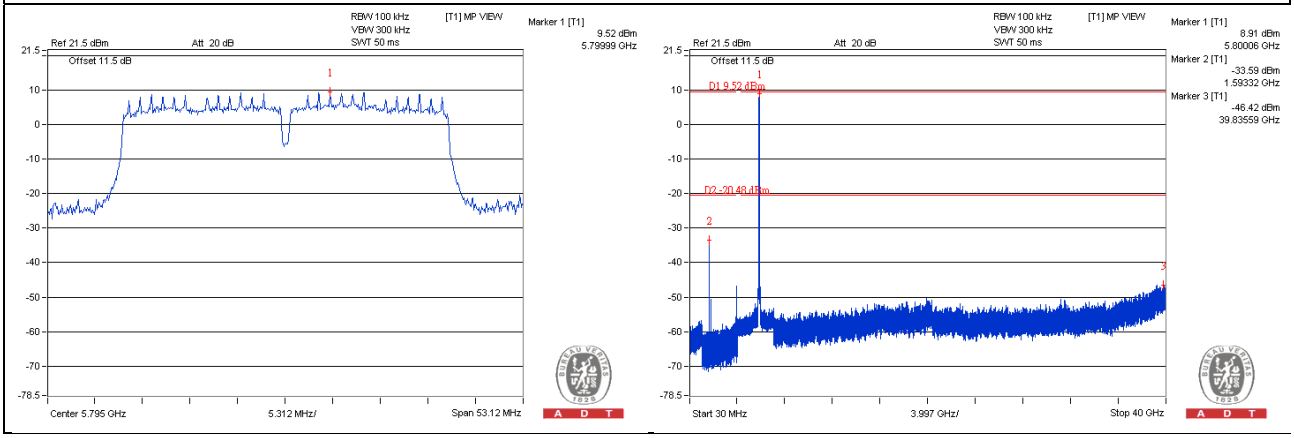


802.11n (40MHz)_Chain 3

CH 151

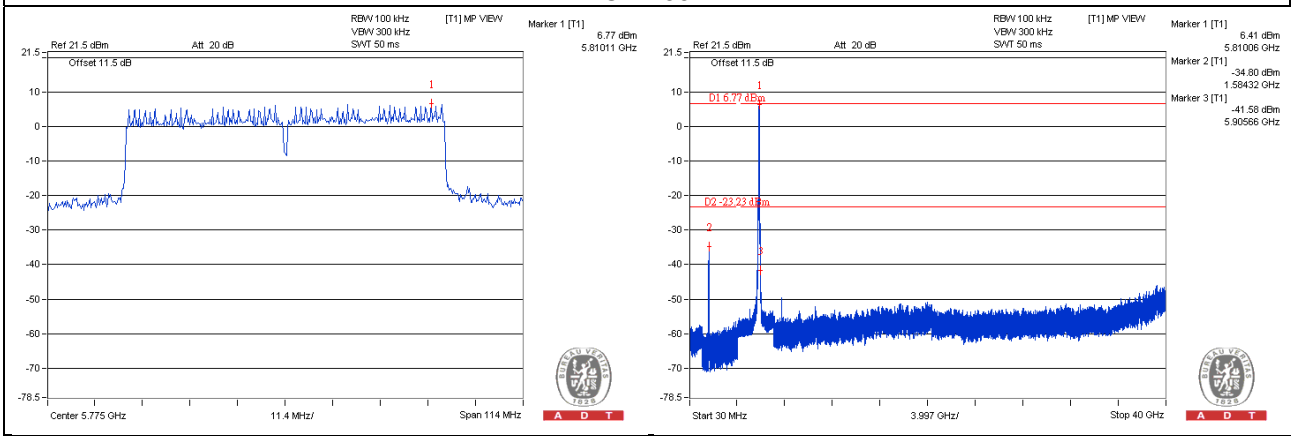


CH 159



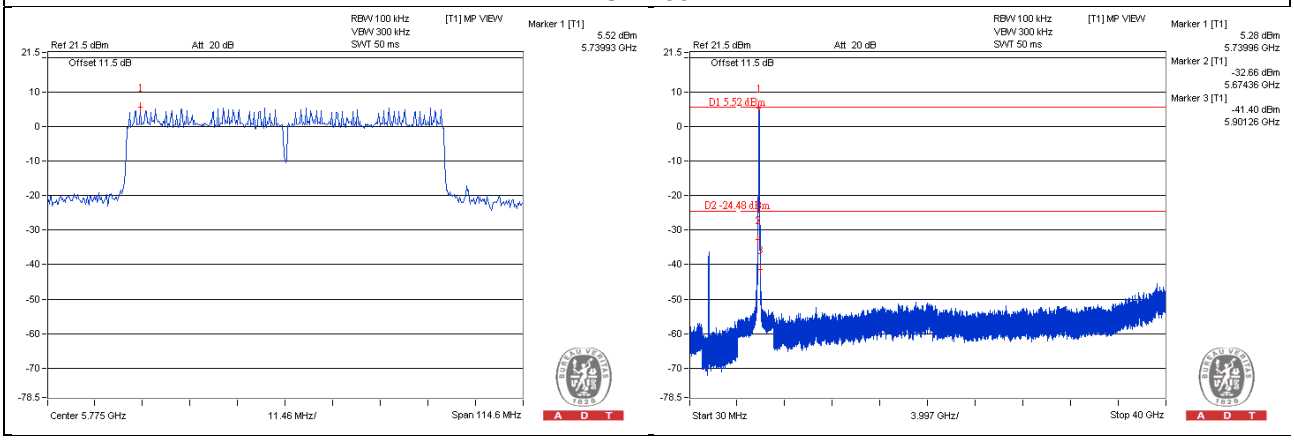
802.11ac (80MHz)_Chain 0

CH 155



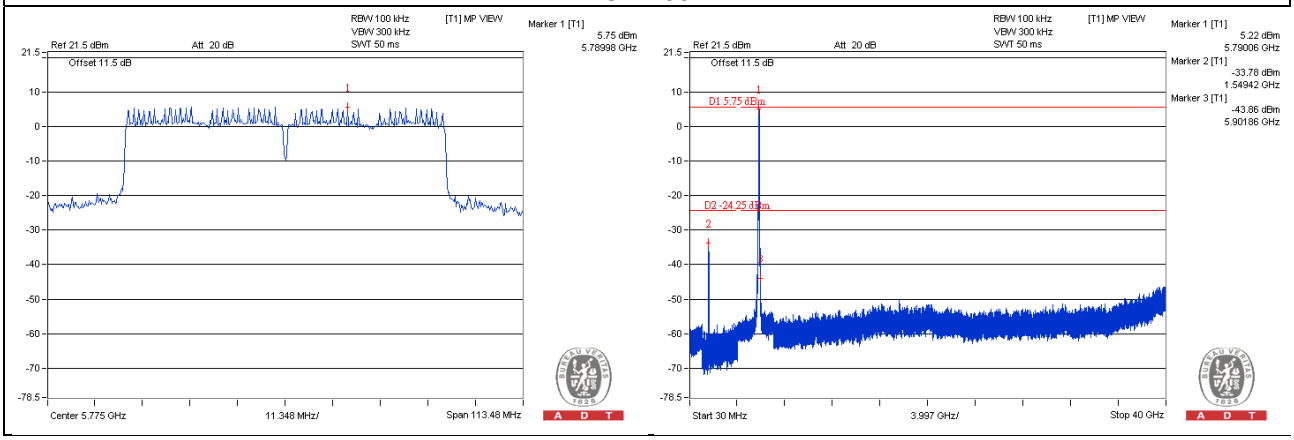
802.11ac (80MHz)_Chain 1

CH 155



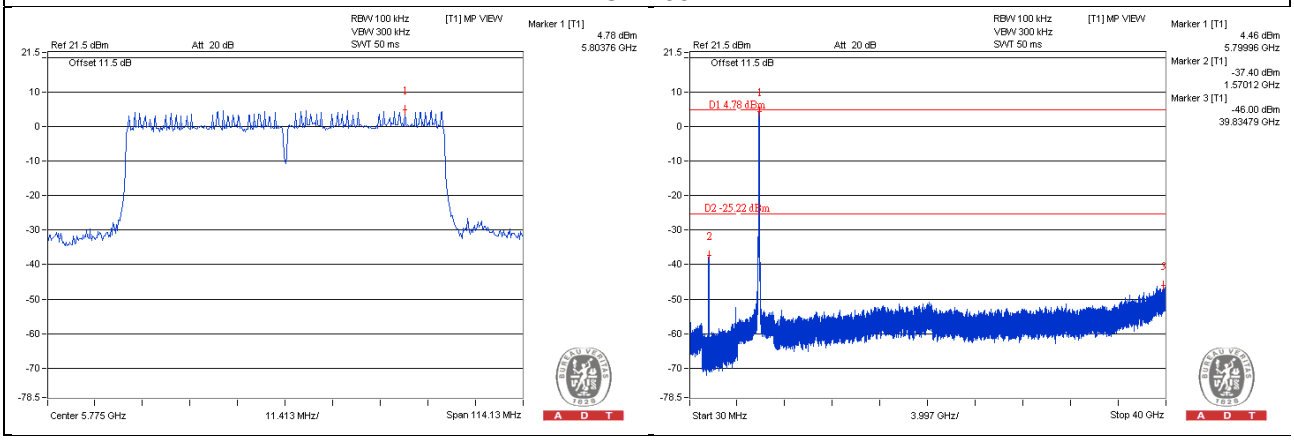
802.11ac (80MHz)_Chain 2

CH 155



802.11ac (80MHz)_Chain 3

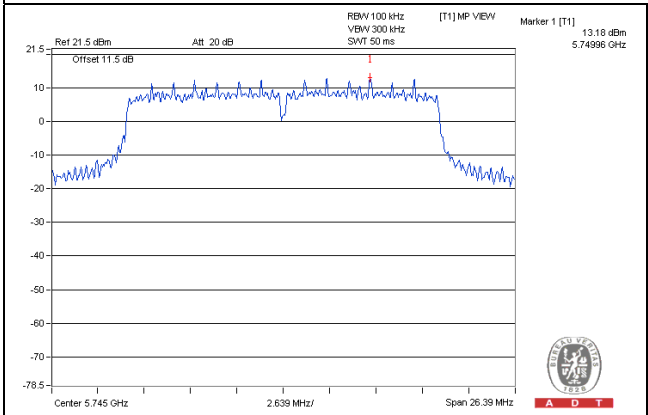
CH 155

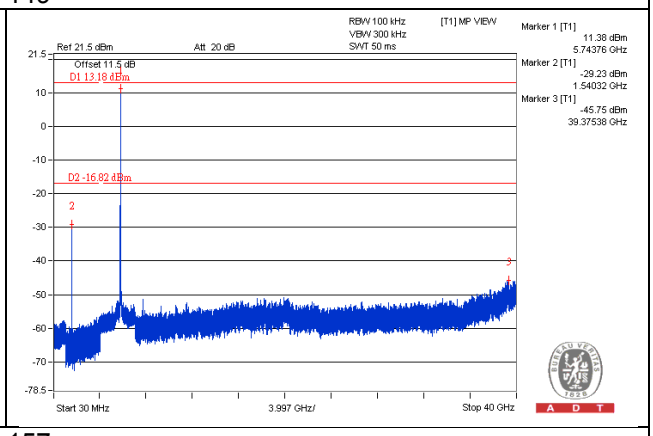


Beamforming_NSS1 Mode

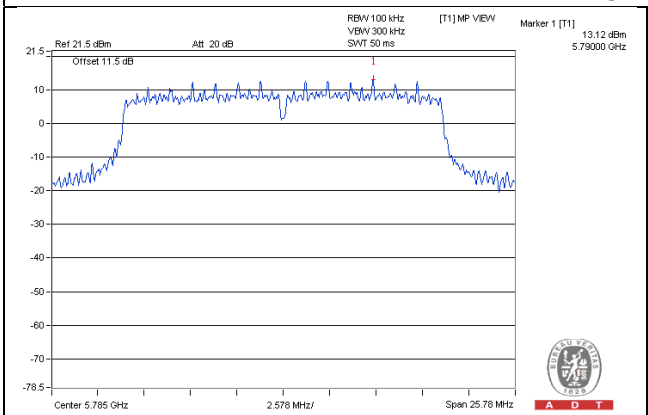
802.11n (20MHz)_Chain 0

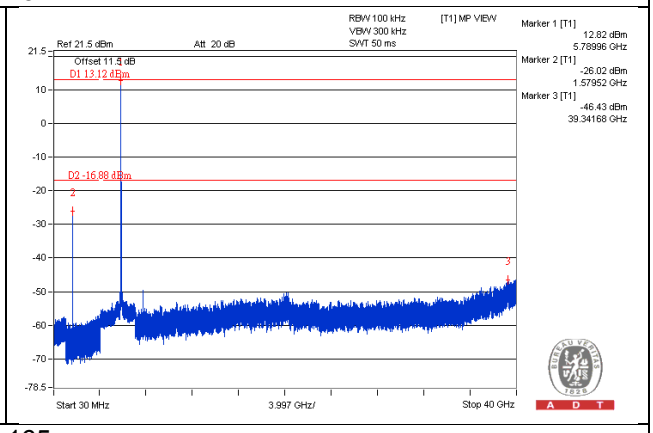
CH 149



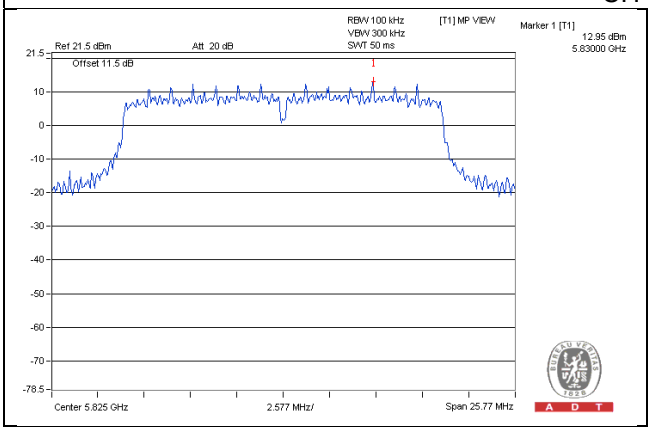


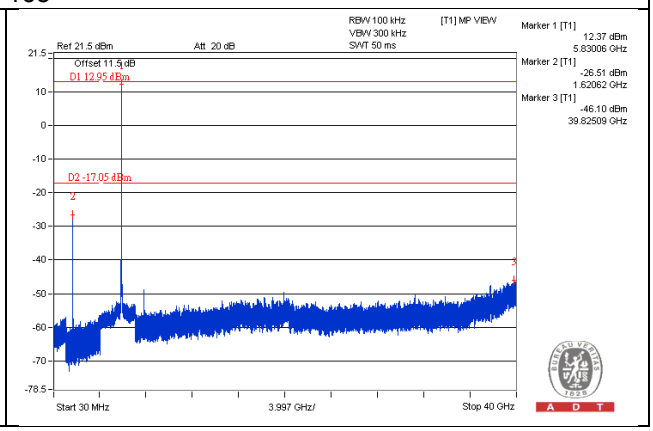
CH 157





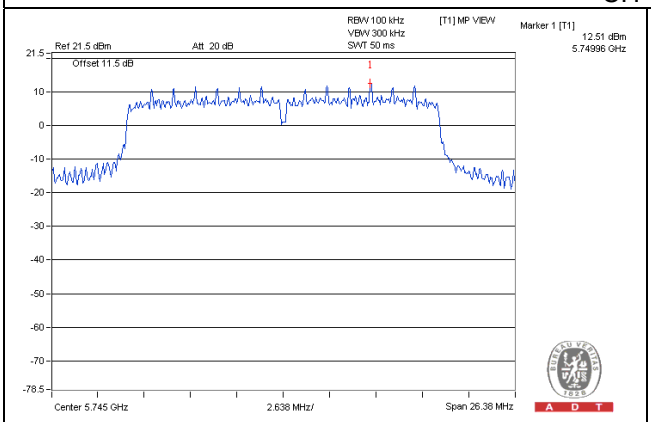
CH 165

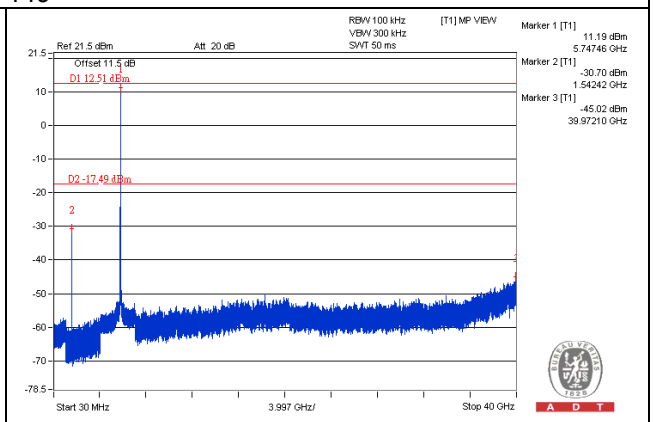




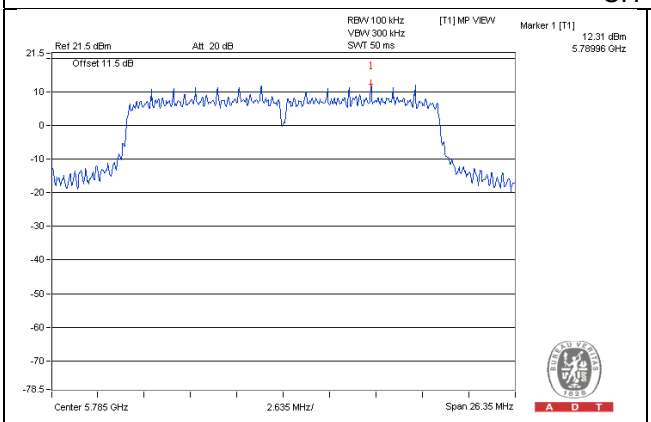
802.11n (20MHz)_Chain 1

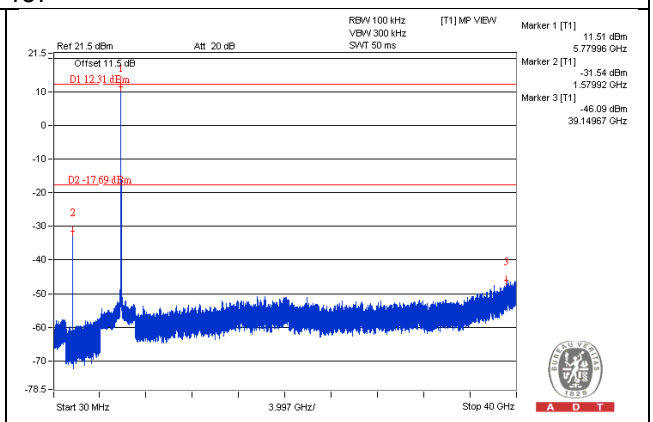
CH 149



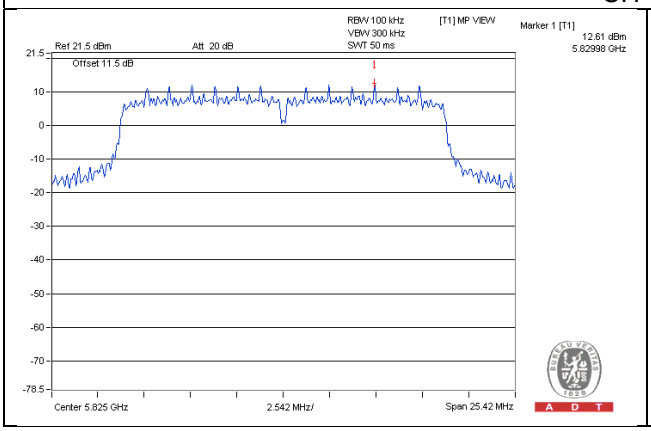


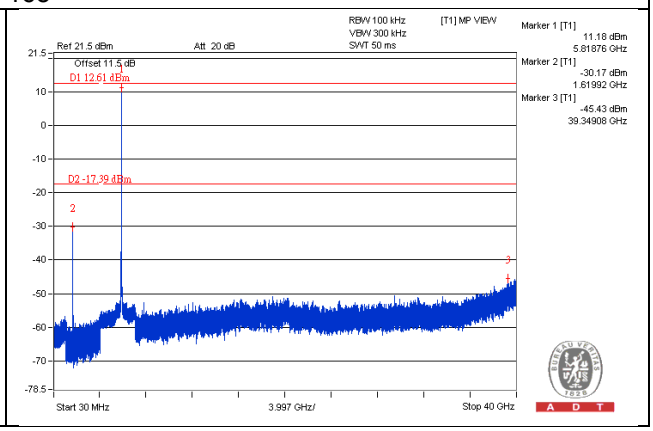
CH 157





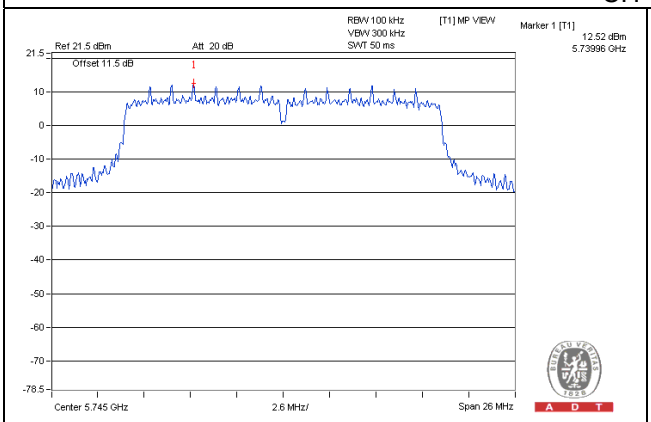
CH 165

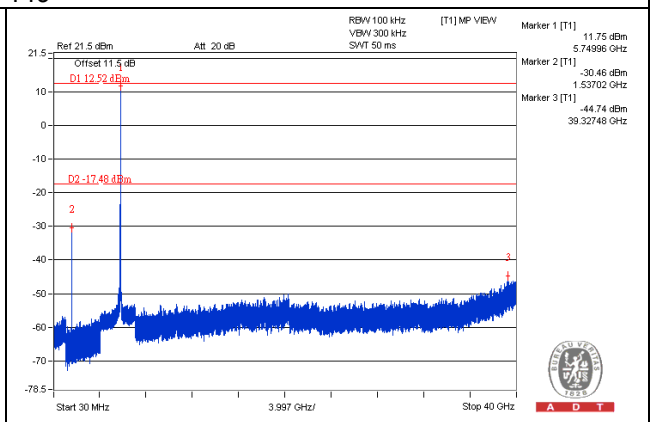




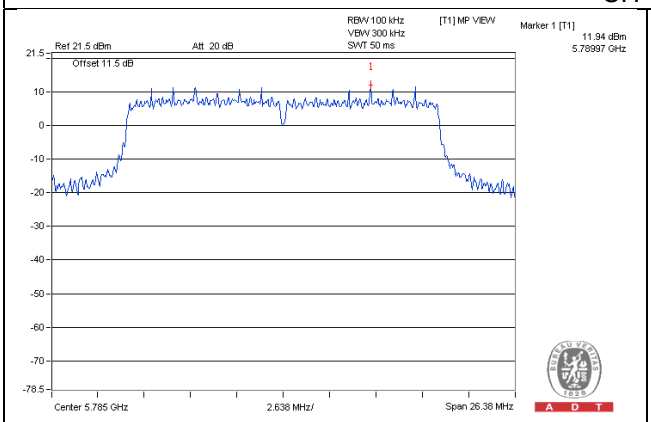
802.11n (20MHz)_Chain 2

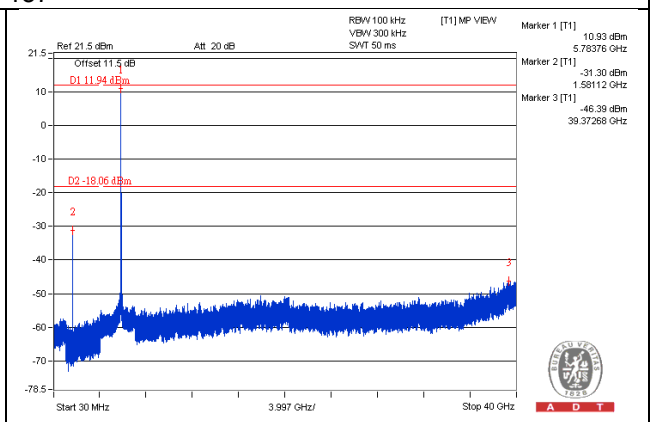
CH 149



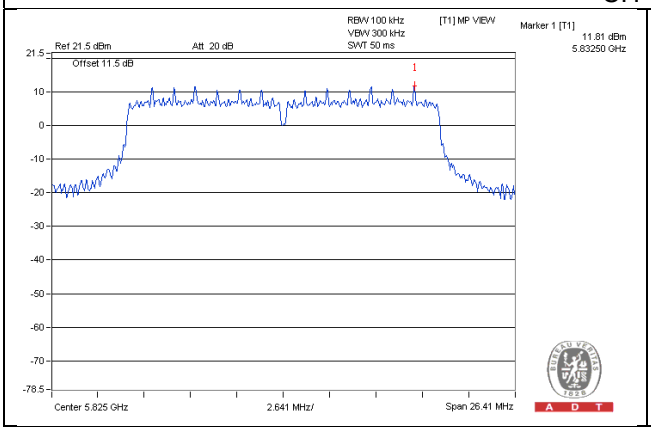


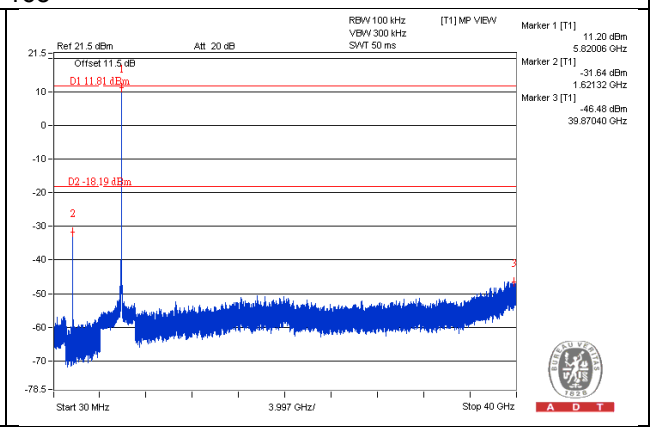
CH 157





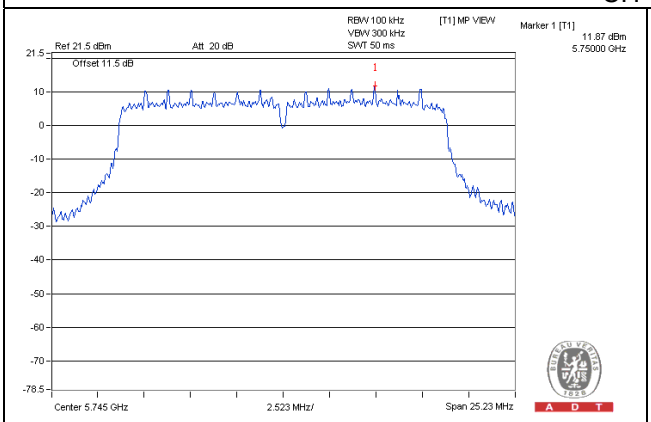
CH 165

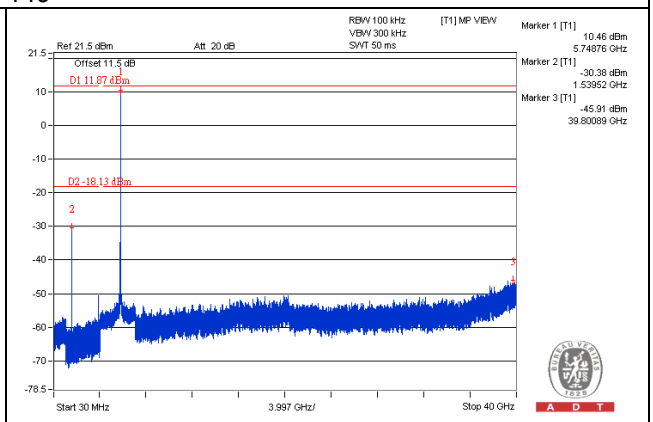




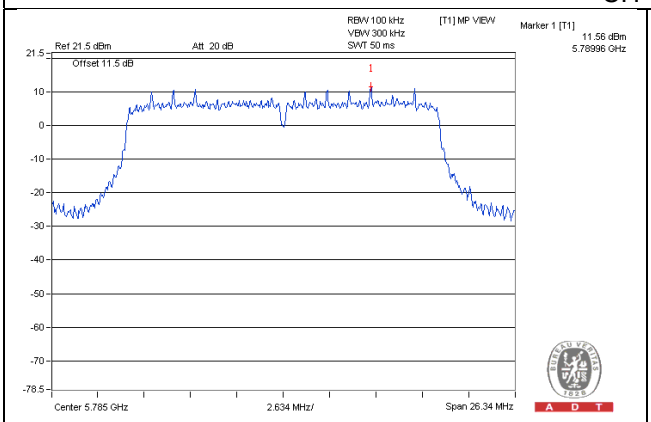
802.11n (20MHz)_Chain 3

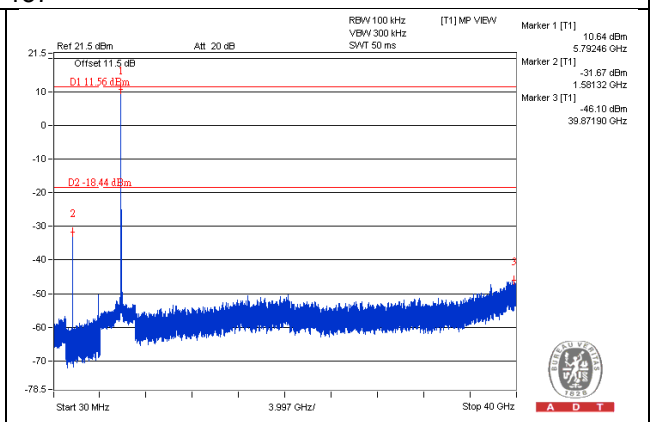
CH 149



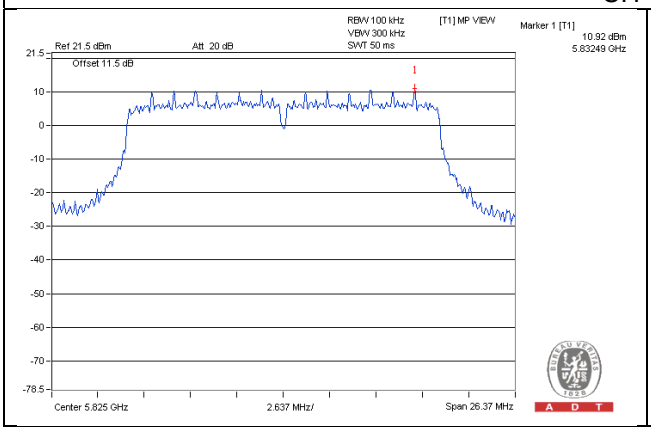


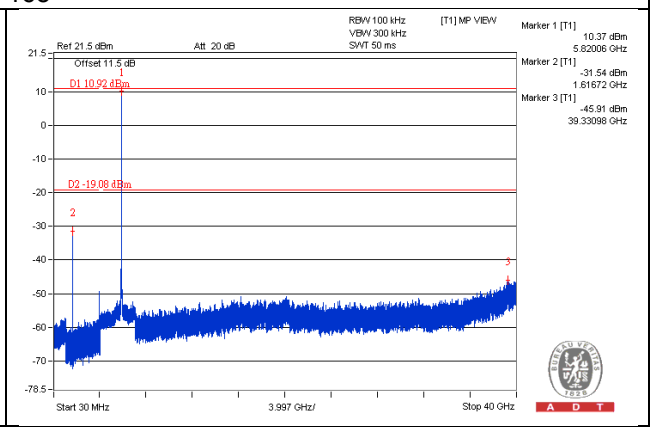
CH 157





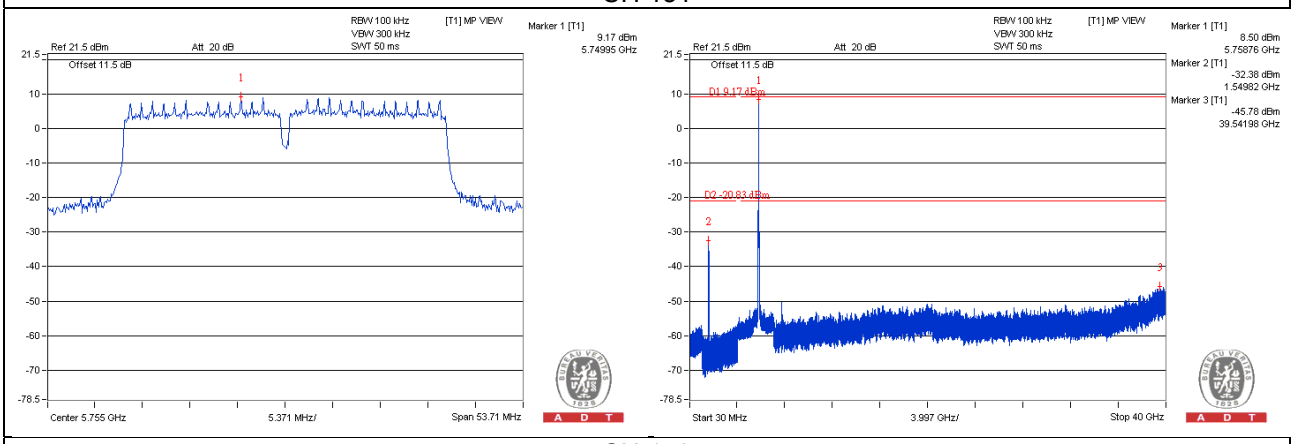
CH 165



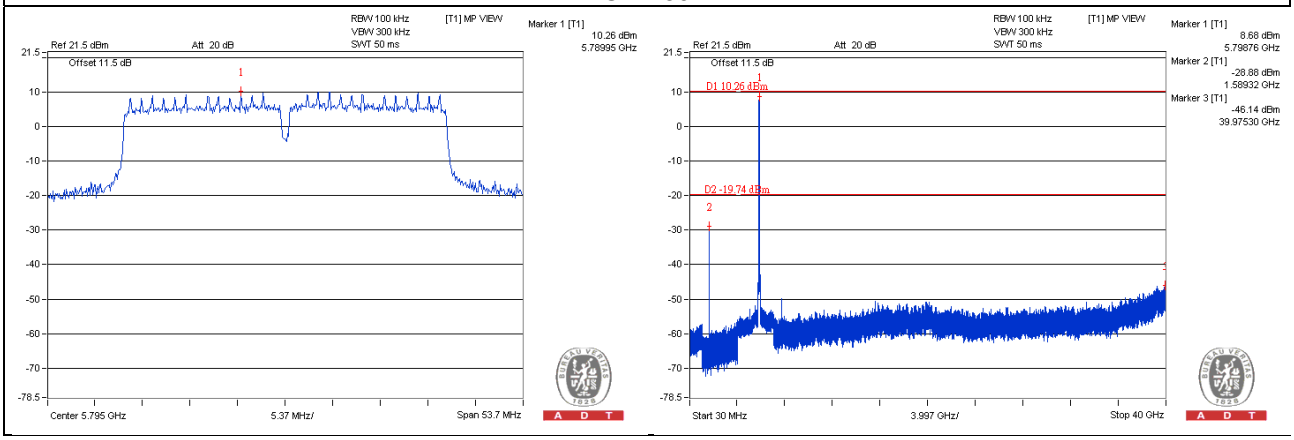


802.11n (40MHz)_Chain 0

CH 151

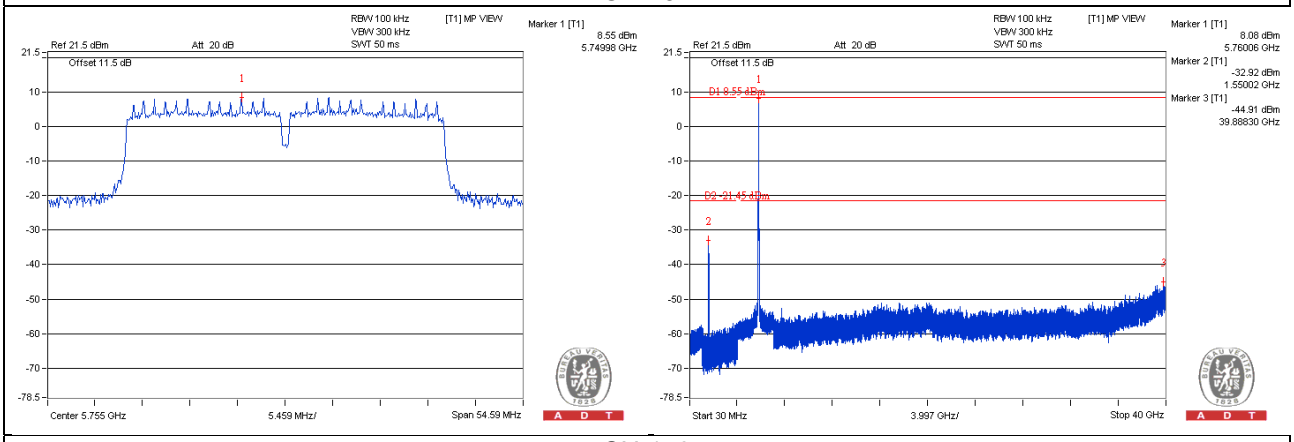


CH 159

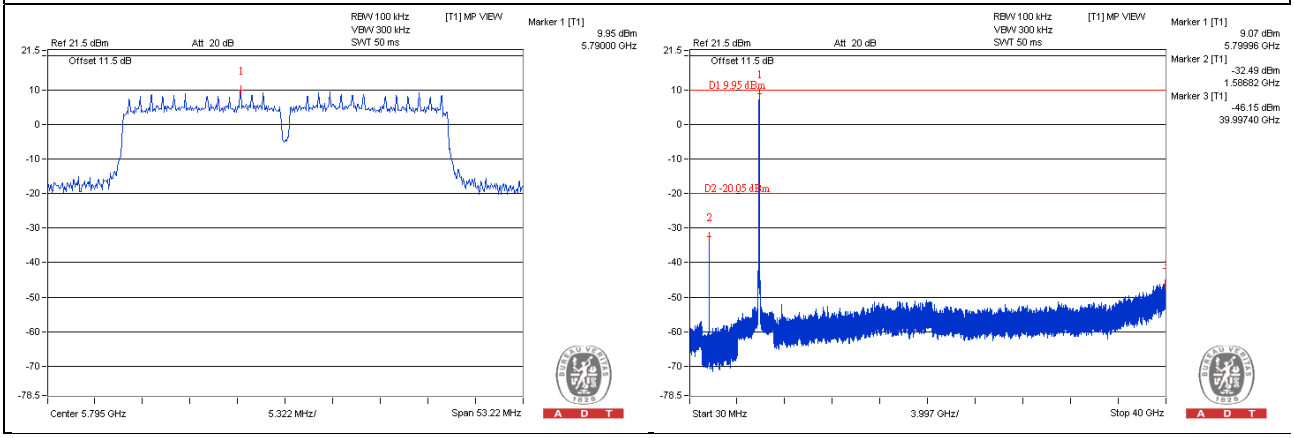


802.11n (40MHz)_Chain 1

CH 151

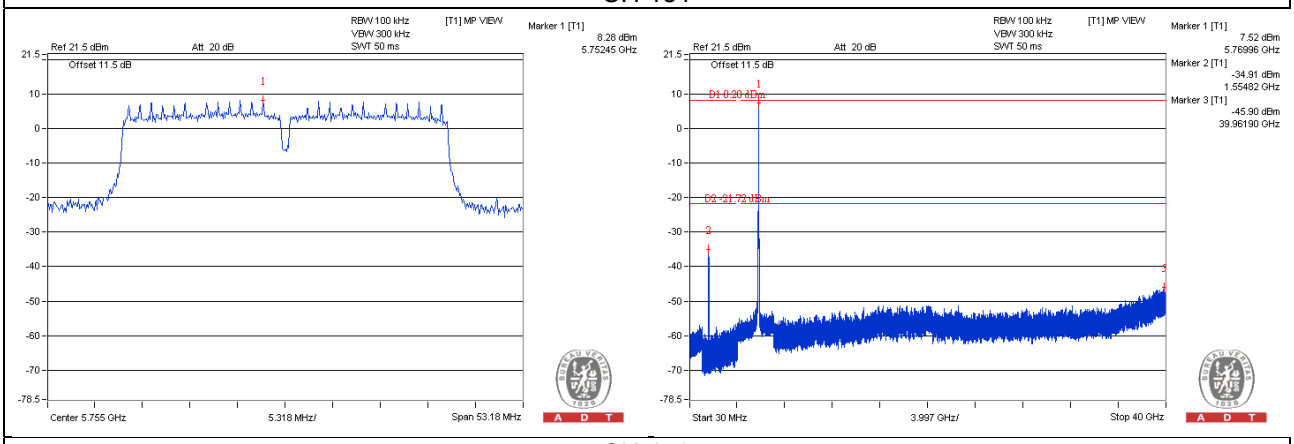


CH 159

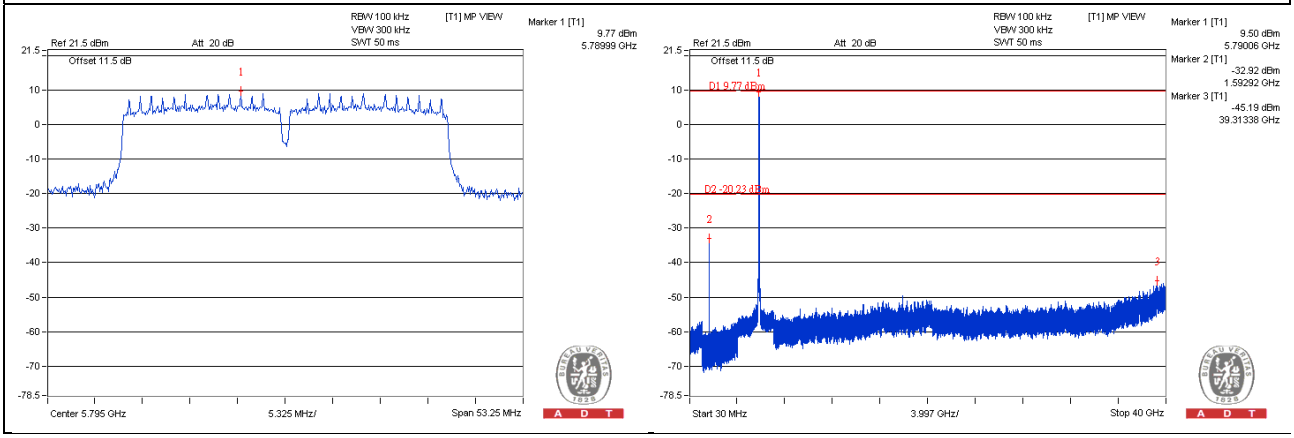


802.11n (40MHz)_Chain 2

CH 151

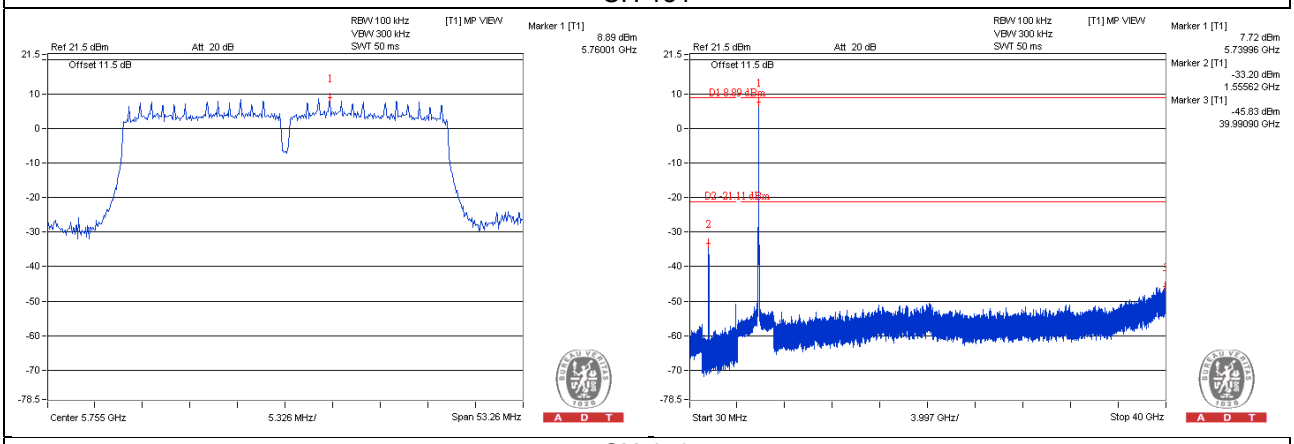


CH 159

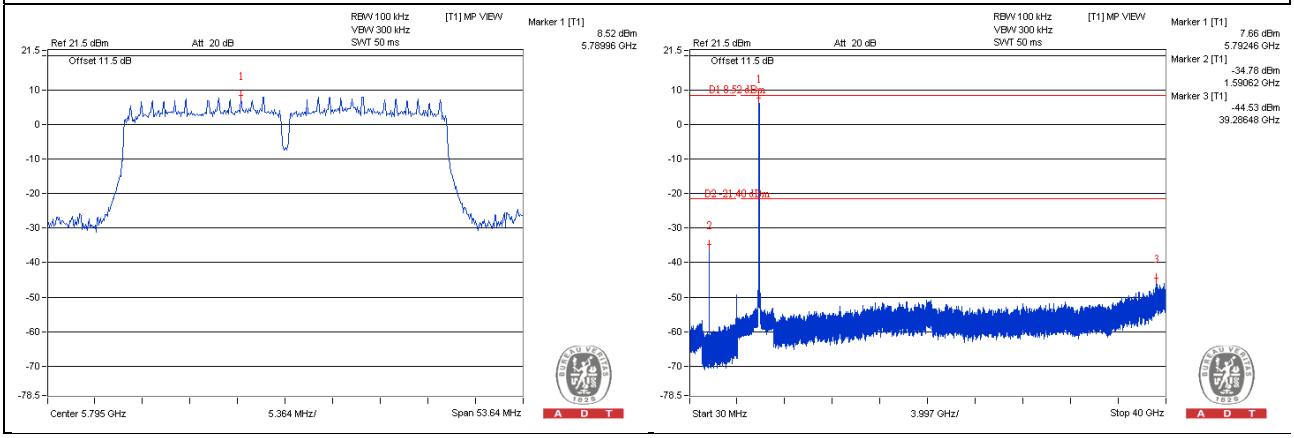


802.11n (40MHz)_Chain 3

CH 151

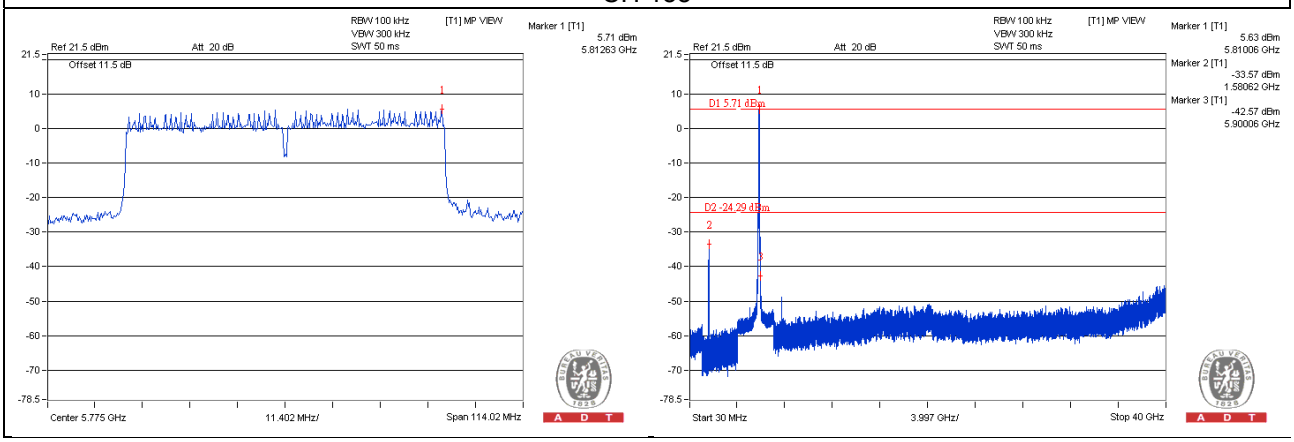


CH 159



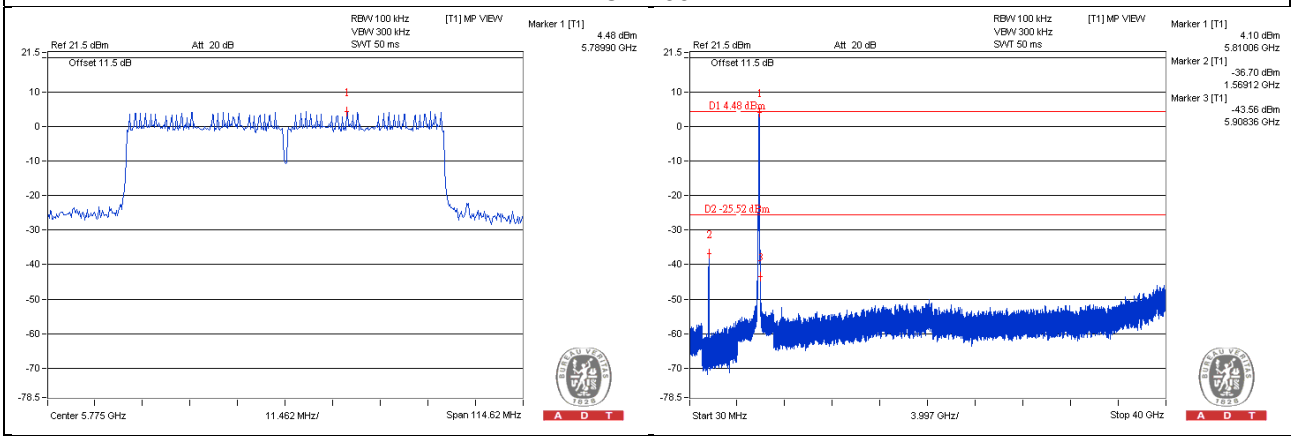
802.11ac (80MHz)_Chain 0

CH 155



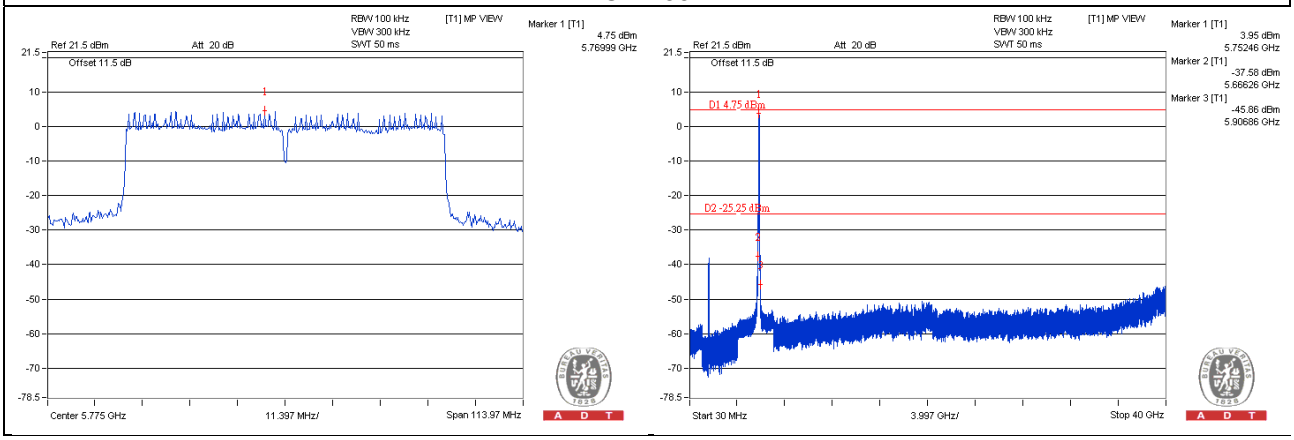
802.11ac (80MHz)_Chain 1

CH 155



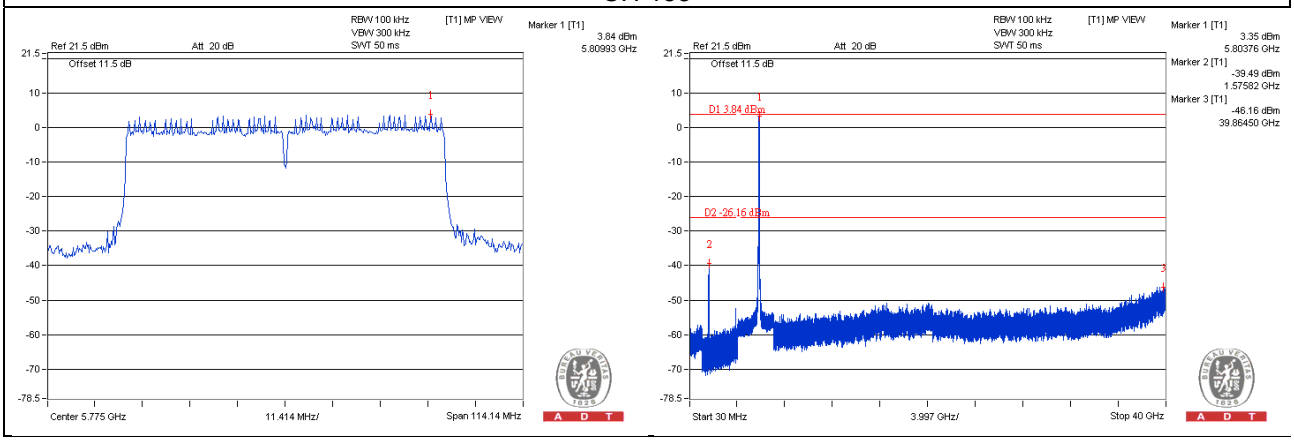
802.11ac (80MHz)_Chain 2

CH 155



802.11ac (80MHz)_Chain 3

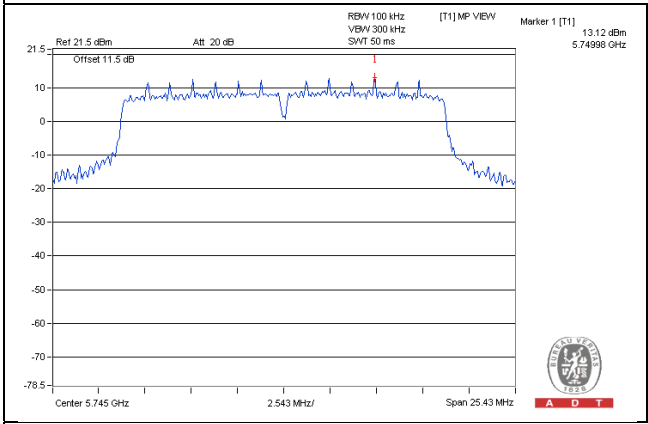
CH 155

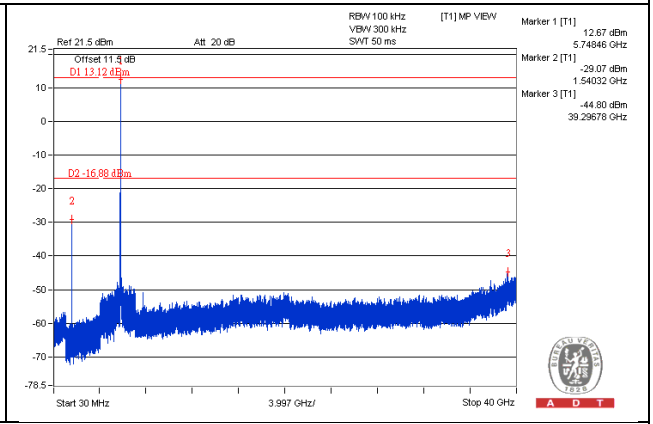


Beamforming_NSS2 Mode

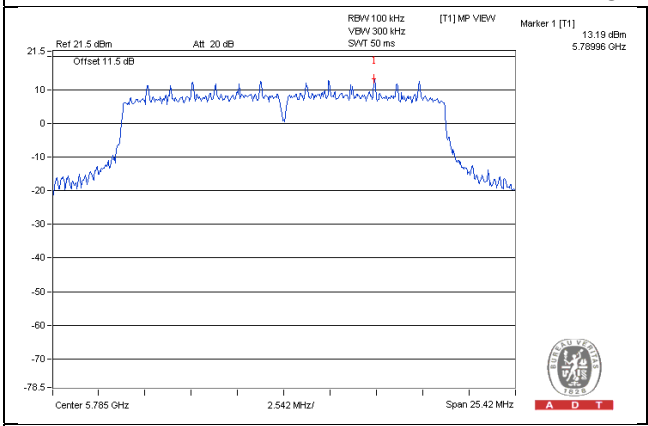
802.11n (20MHz)_Chain 0

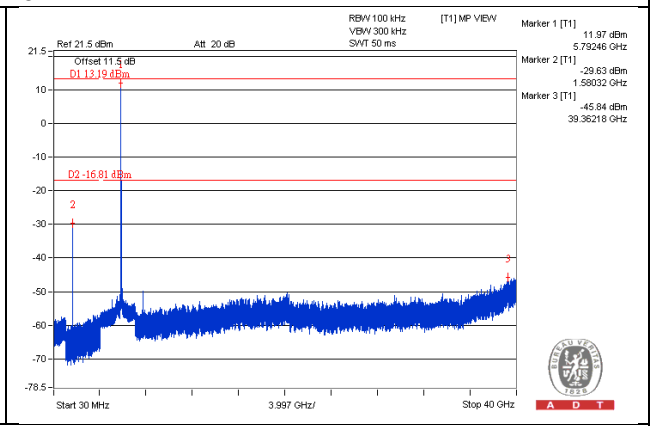
CH 149



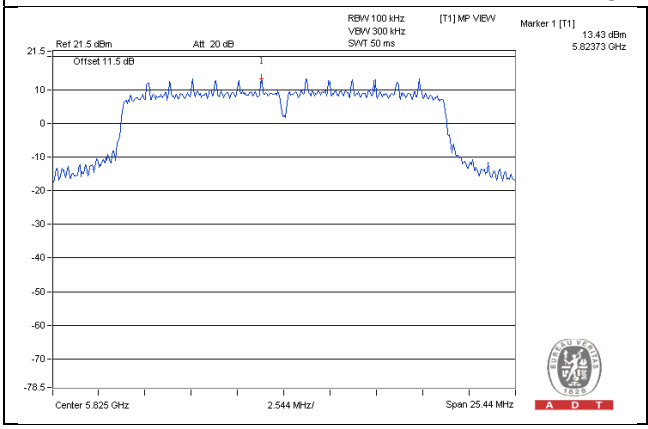


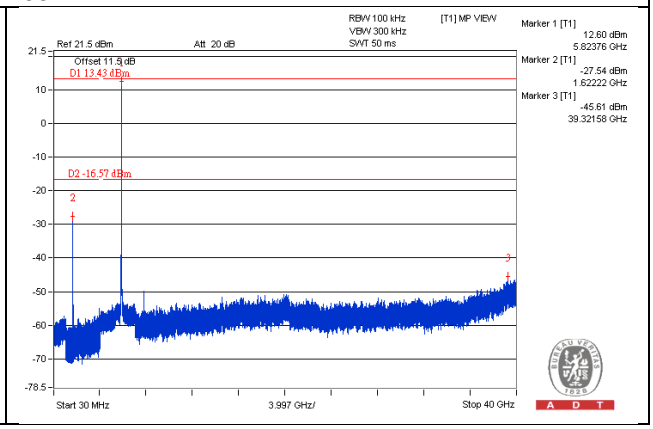
CH 157





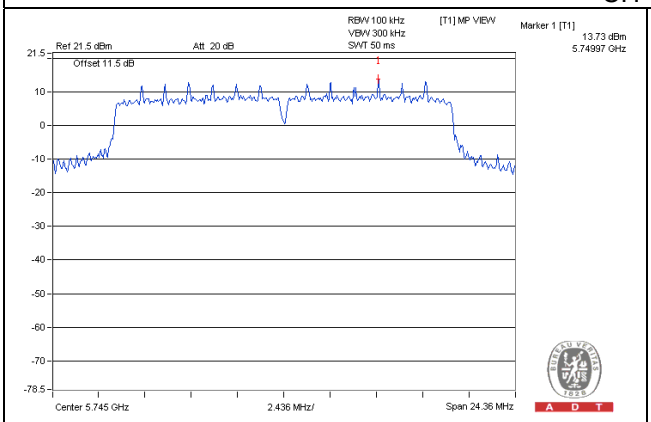
CH 165

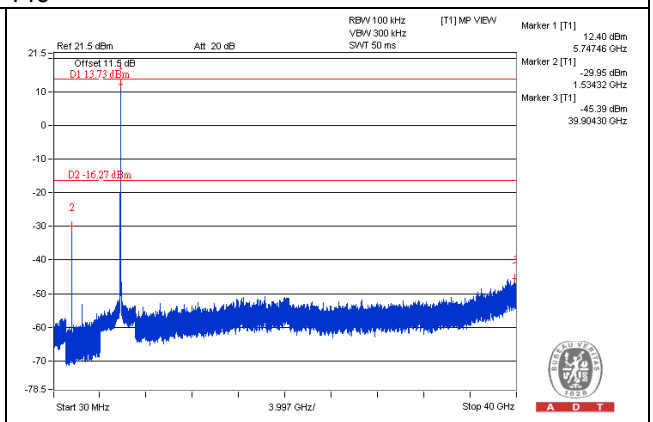




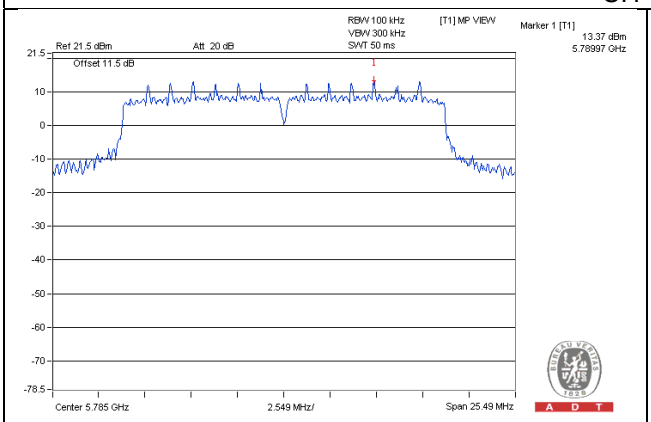
802.11n (20MHz)_Chain 1

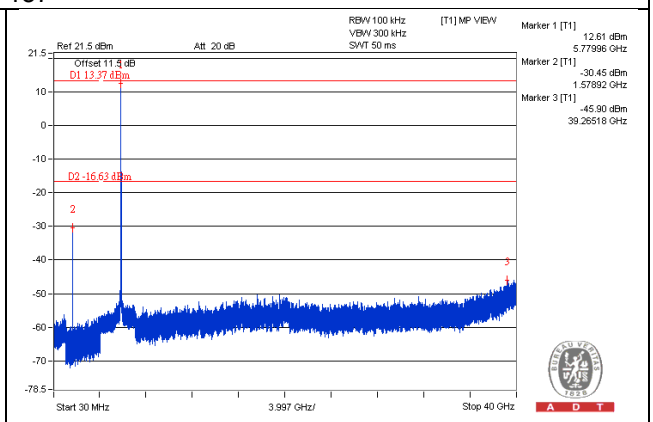
CH 149



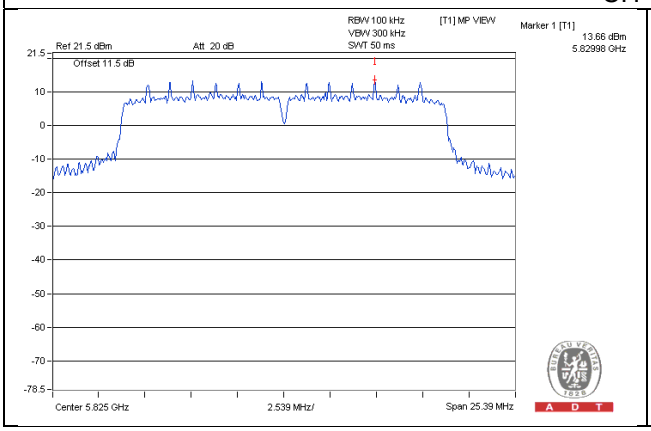


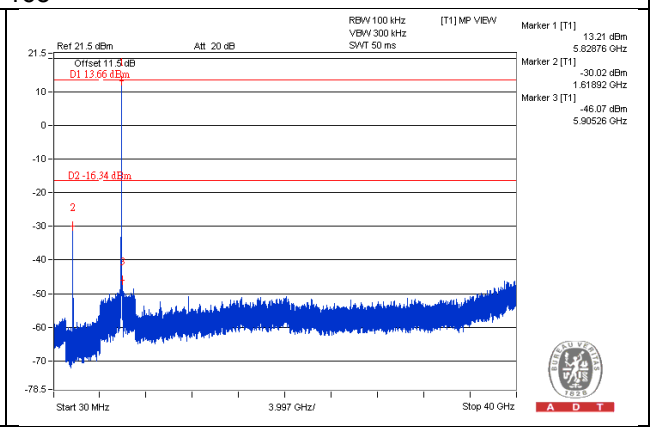
CH 157





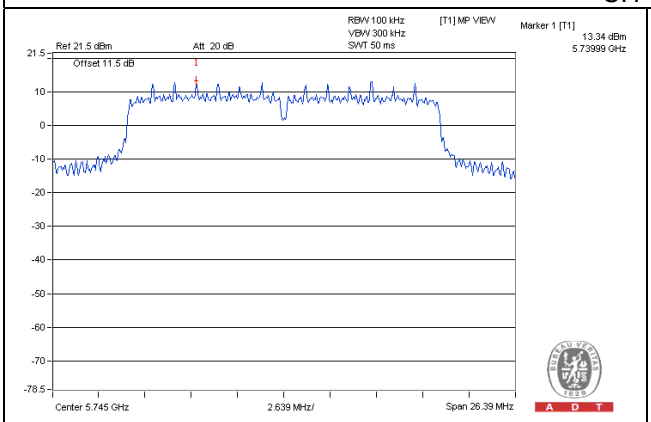
CH 165

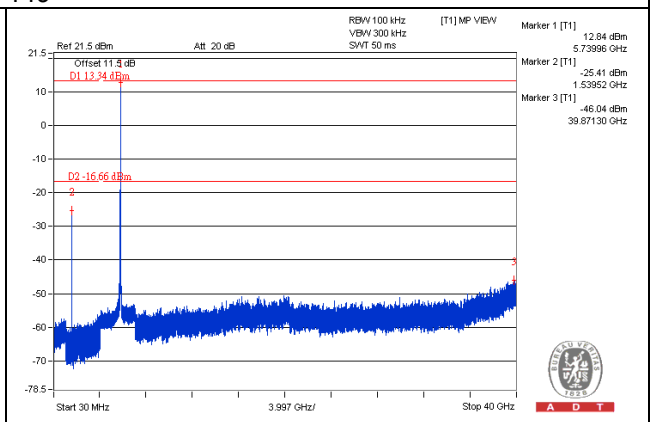




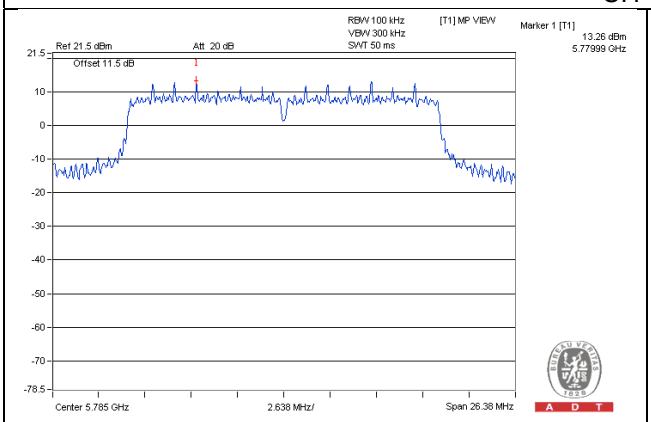
802.11n (20MHz)_Chain 2

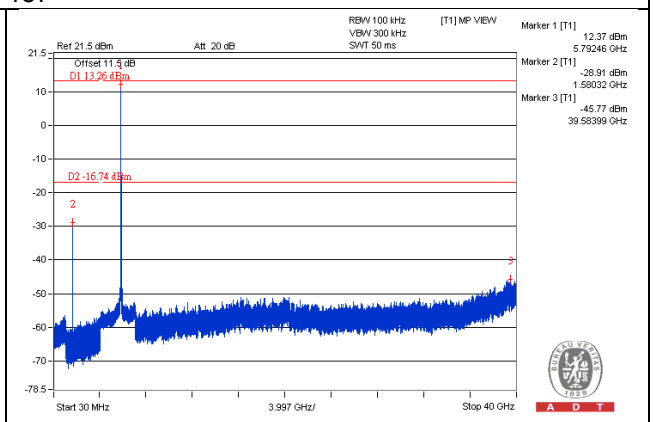
CH 149



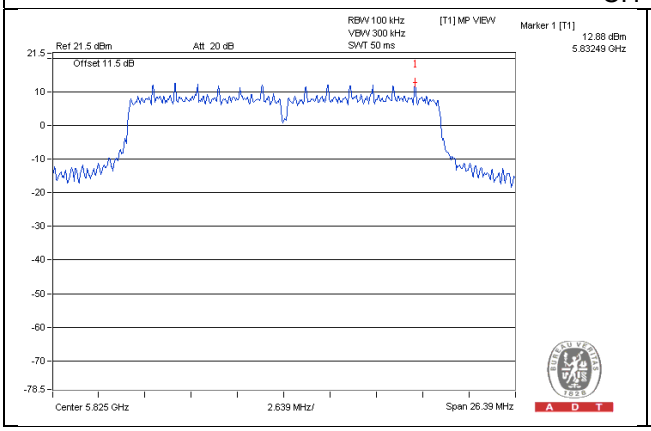


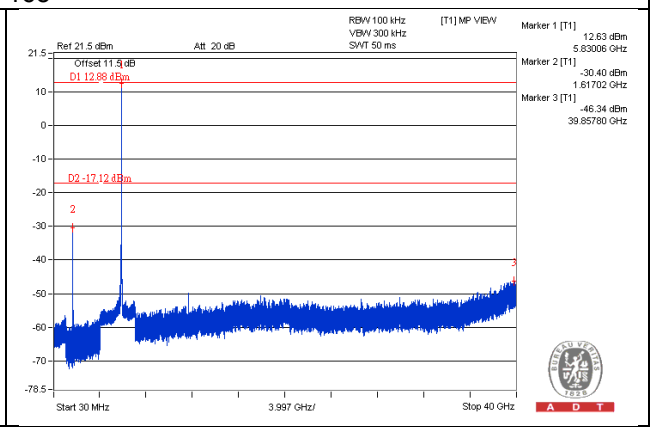
CH 157





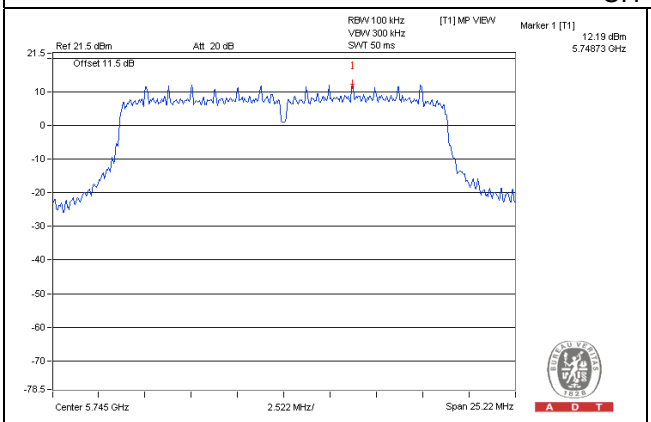
CH 165

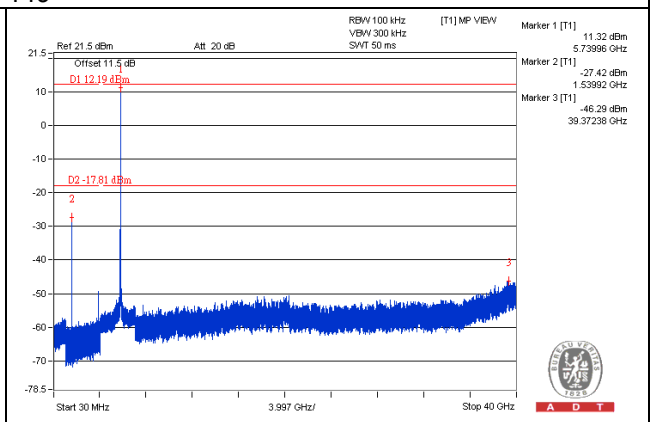




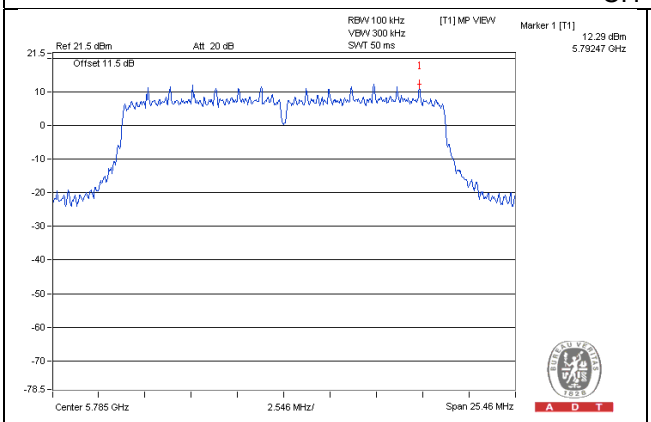
802.11n (20MHz)_Chain 3

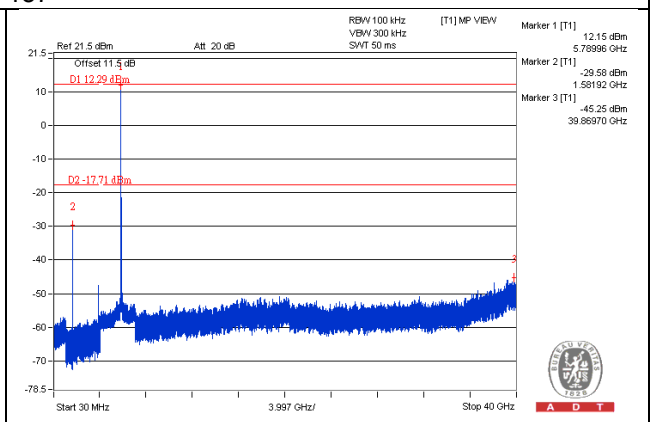
CH 149



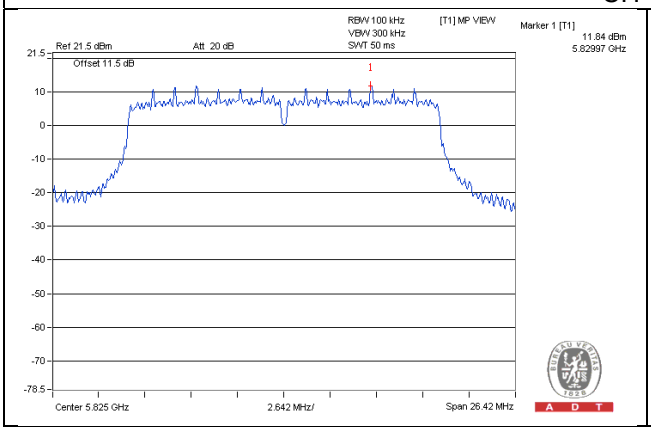


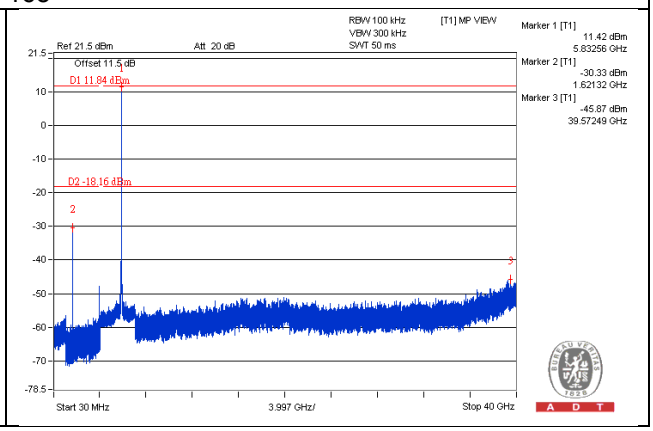
CH 157





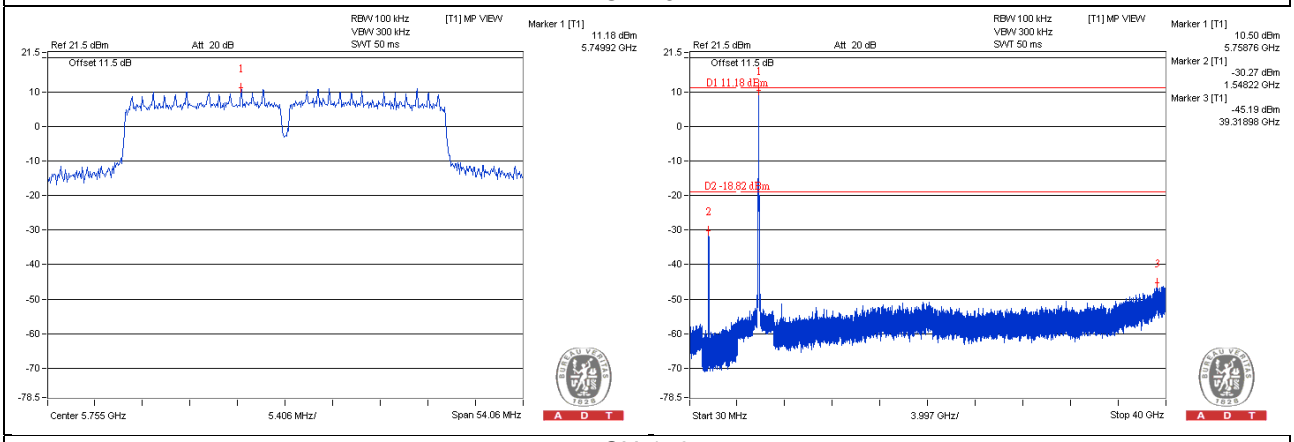
CH 165



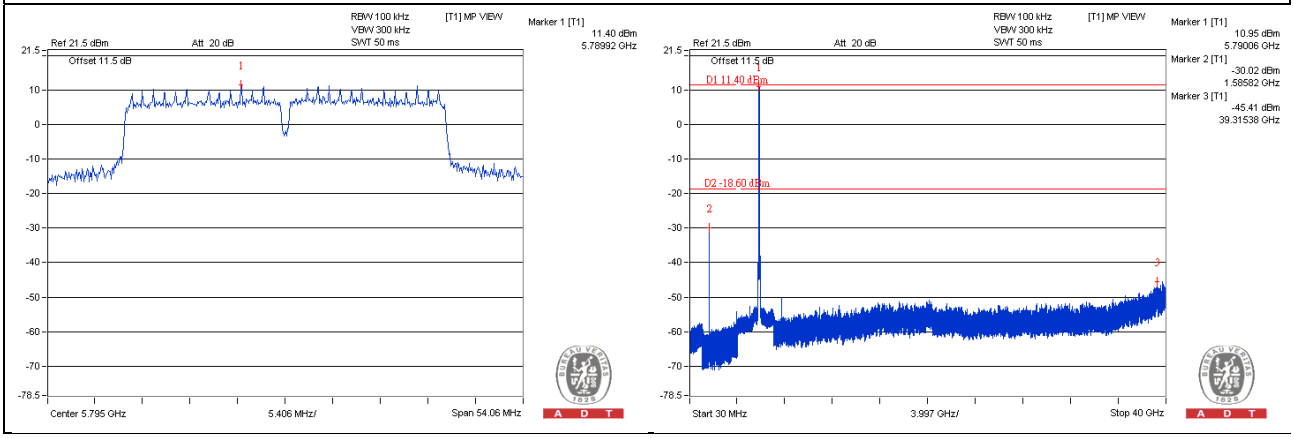


802.11n (40MHz)_Chain 0

CH 151

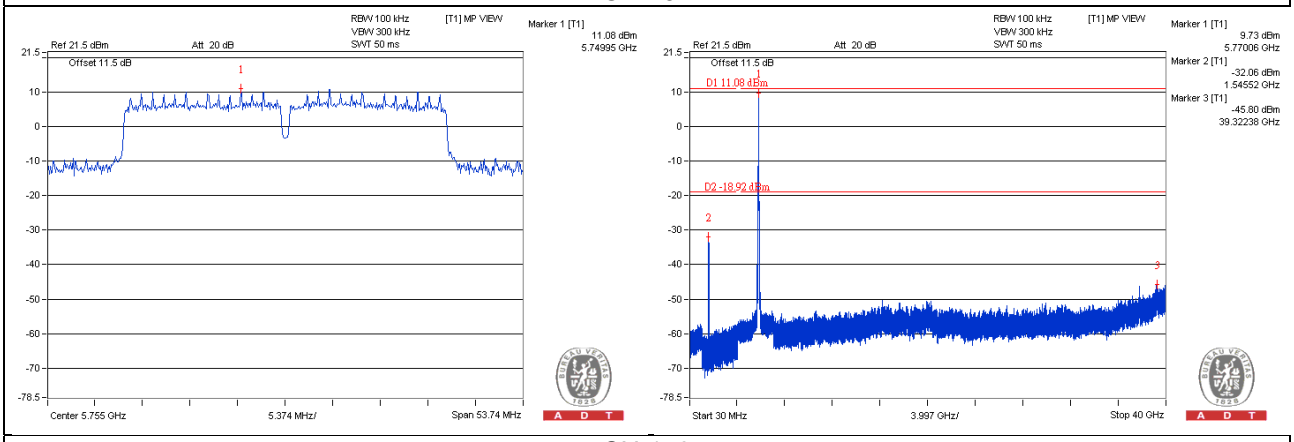


CH 159

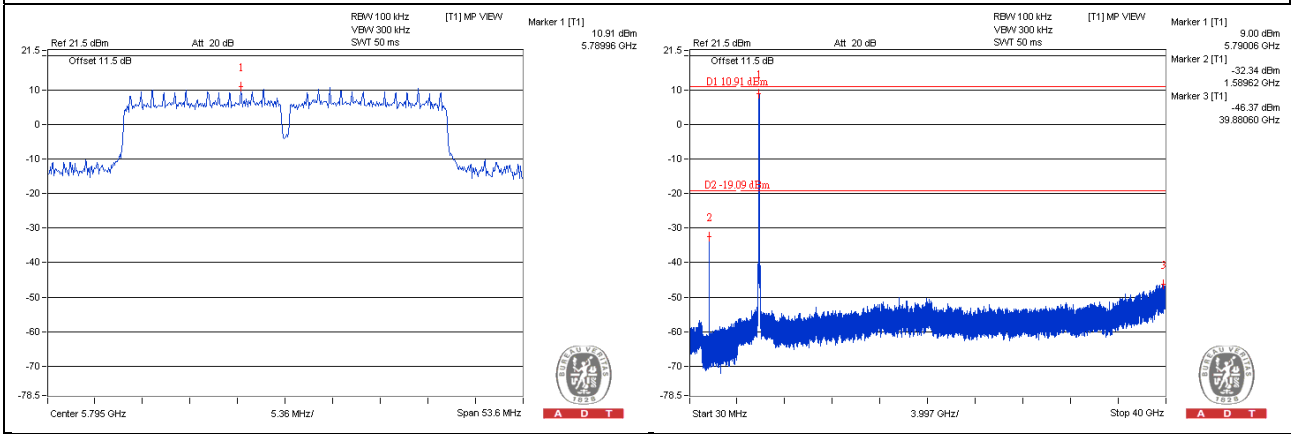


802.11n (40MHz)_Chain 1

CH 151

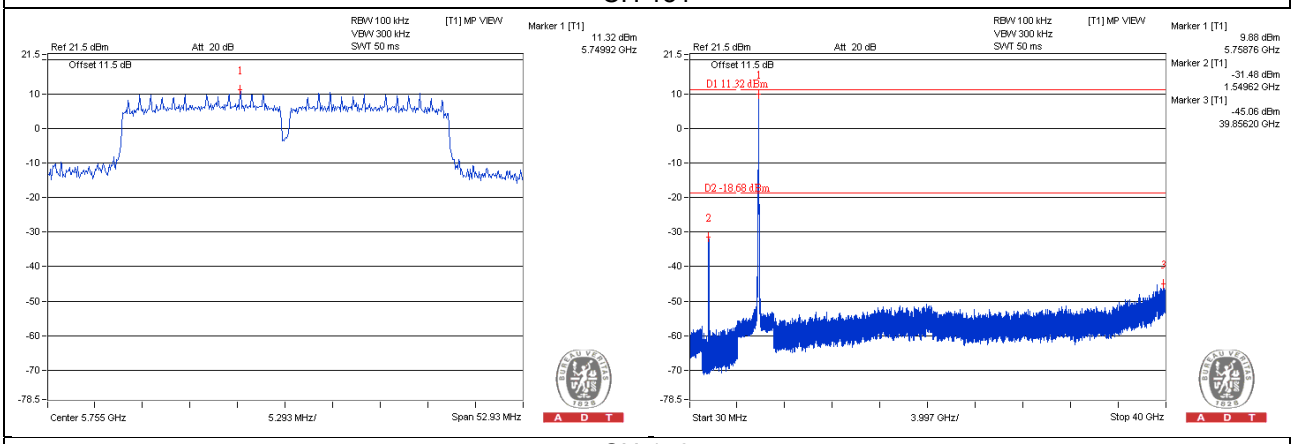


CH 159

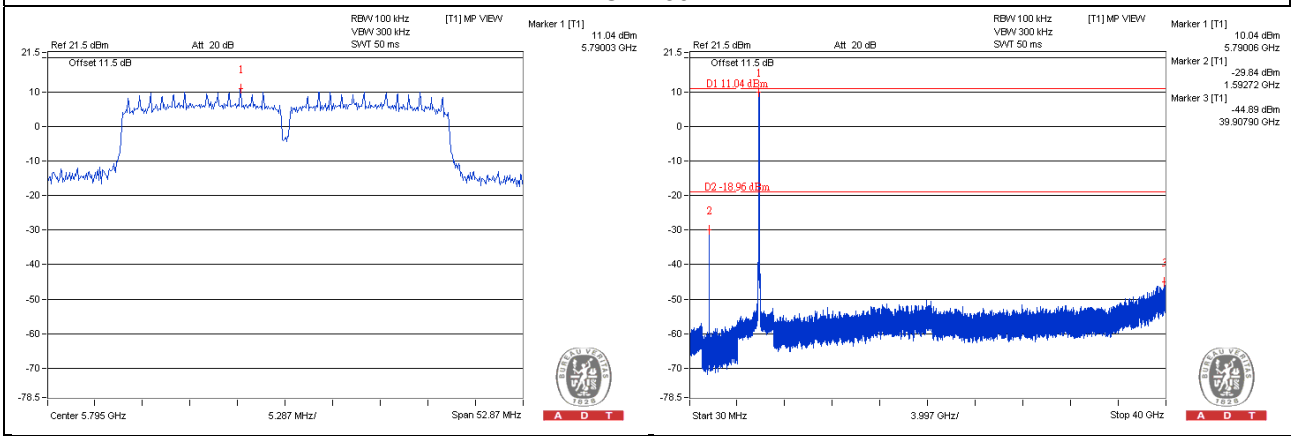


802.11n (40MHz)_Chain 2

CH 151

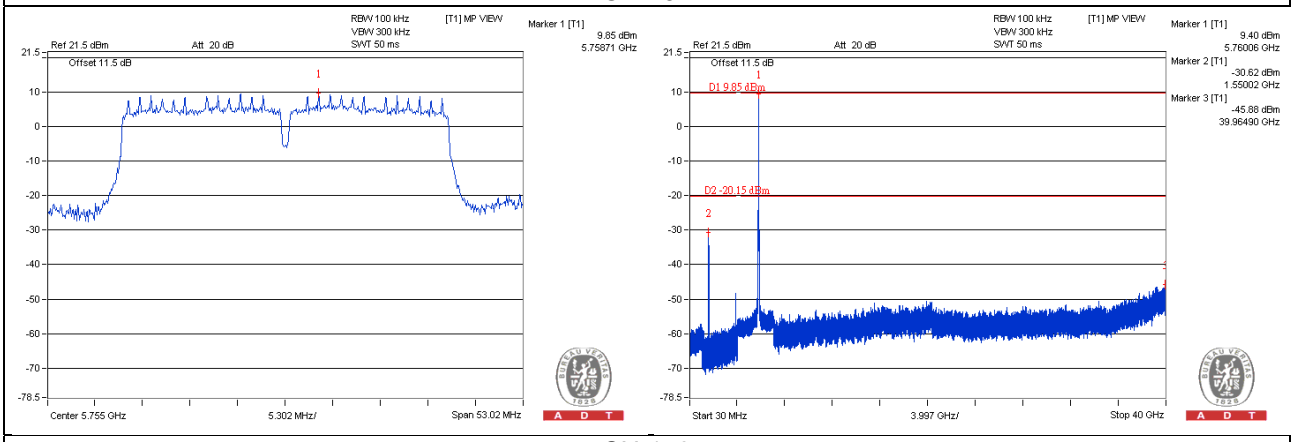


CH 159

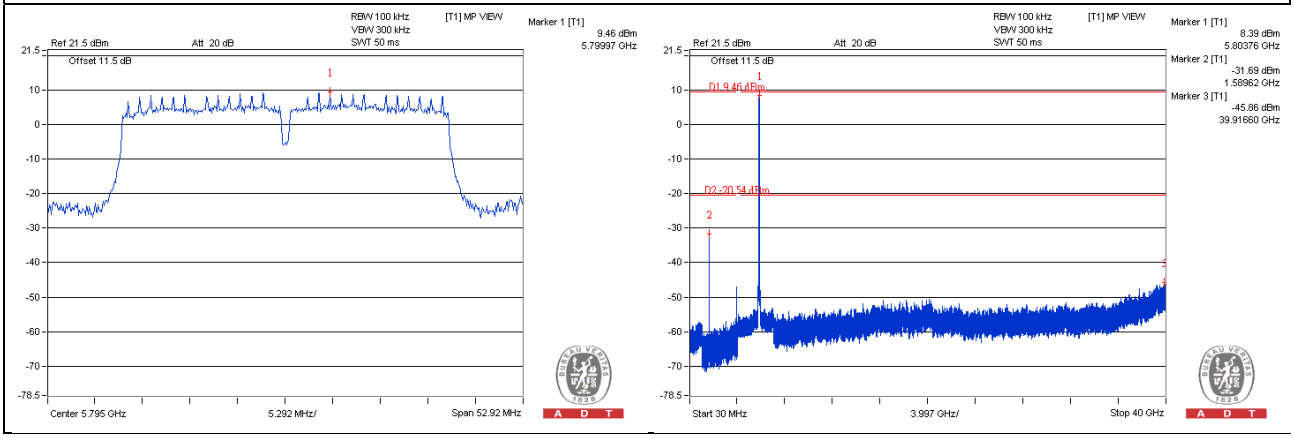


802.11n (40MHz)_Chain 3

CH 151

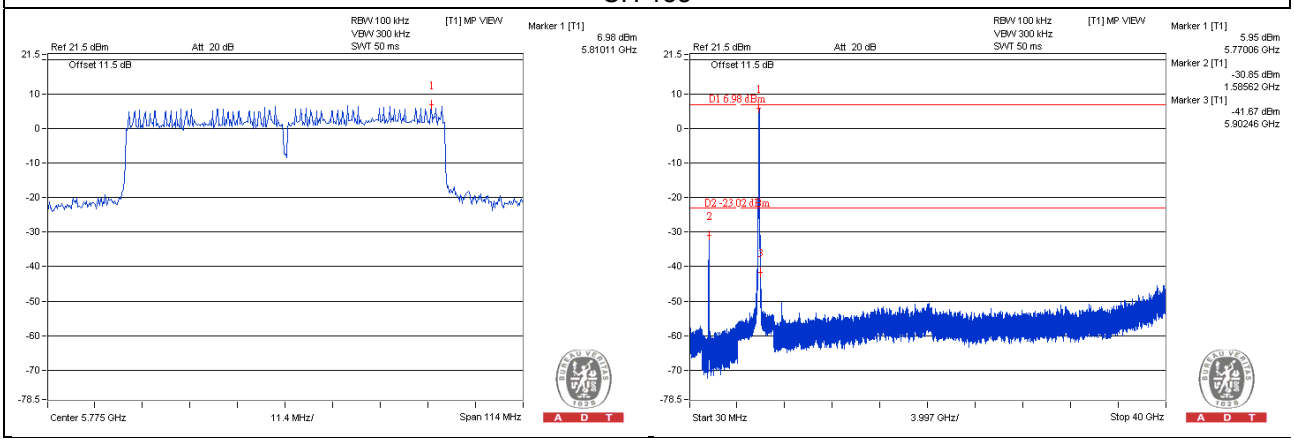


CH 159



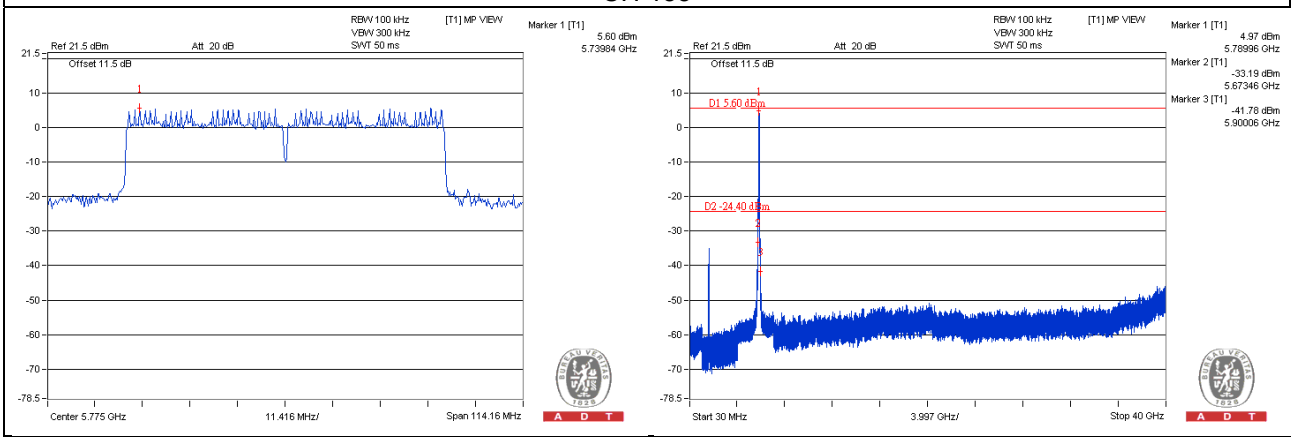
802.11ac (80MHz)_Chain 0

CH 155



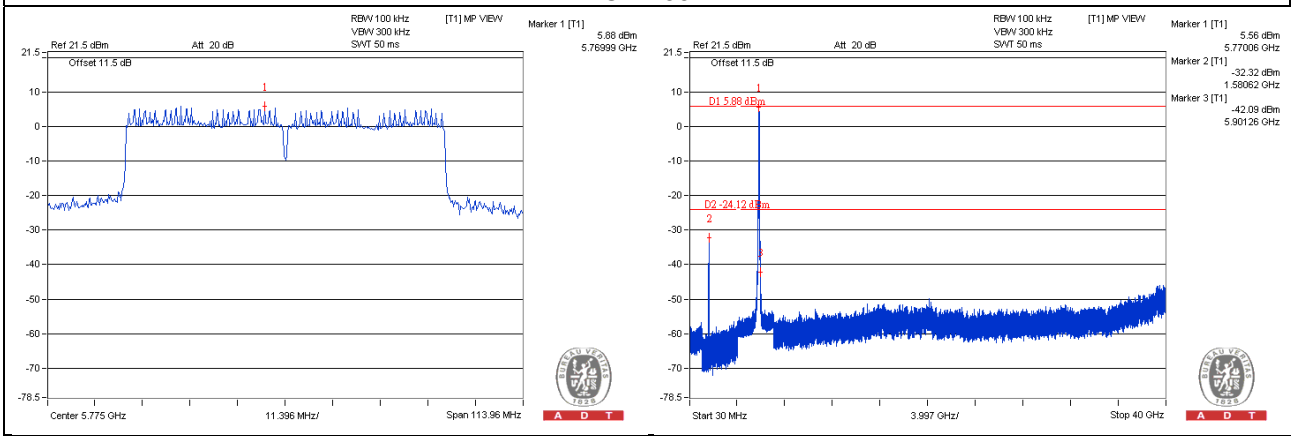
802.11ac (80MHz)_Chain 1

CH 155



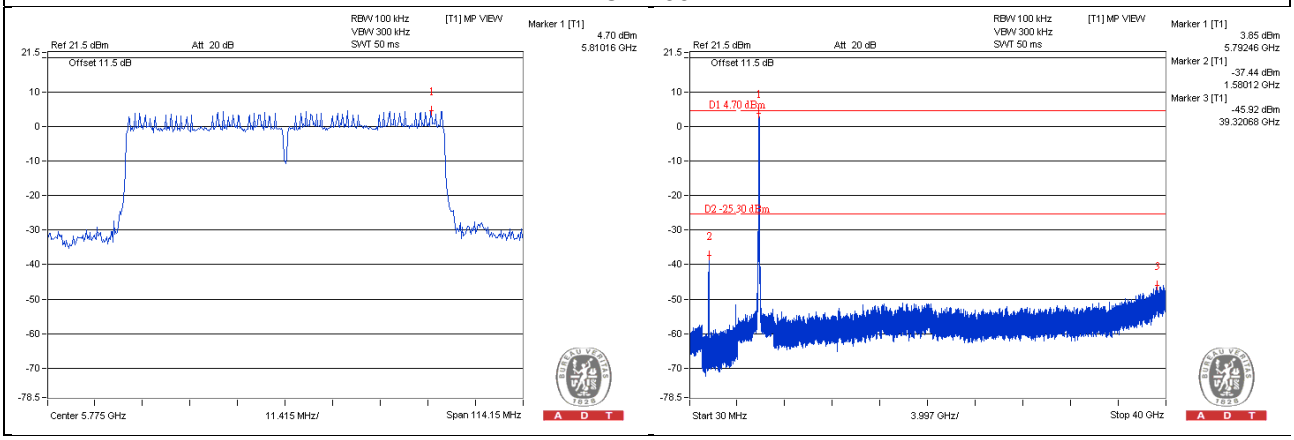
802.11ac (80MHz)_Chain 2

CH 155



802.11ac (80MHz)_Chain 3

CH 155



6 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

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

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

--- END ---