FCC Test Report

Report No.:	RF160406E07
FCC ID:	I88NBG6617
Test Model:	NBG6617
Received Date:	Apr. 06, 2016
Test Date:	May 25 to June 08, 2016
Issued Date:	July 20, 2016
Applicant:	ZyXEL Communications Corporation
Address:	No.2, Industry East Road IX, Science Park, Hsinchu, Taiwan R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF160406E07	Original release.	July 20, 2016

1 Certificate of Conformity

Product:	AC1300 MU-MIMO Dual-Band Wireless Gigabit Router
Brand:	ZyXEL
Test Model:	NBG6617
Sample Status:	ENGINEERING SAMPLE
Applicant:	ZyXEL Communications Corporation
Test Date:	May 25 to June 08, 2016
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

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

Prepared by : _____ , **Date:** July 20, 2016

Wendy Wu / Specialist

Approved by : _____ , **Date:** July 20, 2016

May Chen / 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 -10.11dB at 0.15391MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 4874.00MHz.
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 UFL not a standard connector.

NOTE: 1. For WLAN: The EUT was operating in 2.412 ~ 2.462GHz, 5.18~5.24 GHz and 5.745~5.825GHz frequencies. This report was recorded the RF parameters including 2.412 ~ 2.462GHz. For the 5.18~5.24 GHz and 5.745~5.825GHz RF parameters was recorded in another test report.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.31 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.40 dB
	6GHz ~ 18GHz	3.73 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AC1300 MU-MIMO Dual-Band Wireless Gigabit Router
Brand	ZyXEL
Test Model	NBG6617
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	**For 15.247:** 2.412 ~ 2.462GHz **For 15.407:** 5.18GHz ~ 5.24GHz and 5.745GHz ~ 5.825GHz
Number of Channel	**For 15.247:** 802.11b, 802.11g, 802.11n (HT20), (VHT20): 11 802.11n (HT40), (VHT40): 7 **For 15.407:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80):2
Output Power	**For 15.247:** 502.41mW **For 15.407:** **5.18GHz ~ 5.24GHz** 453.71mW **5.745GHz ~ 5.825GHz** 454.749mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. 2.4GHz and 5GHz technology can transmit at same time.
2. The EUT power needs to be supplied from adapter, the information is as below table:

Brand	Model No.	Spec.
APD	WA-24Q12R	Input: 100-240V, 0.7A, 50-60Hz Output: 12V, 2.0A DC output cable (1.8m, unshielded)

3. The antennas provided to the EUT, please refer to the following table:

Antenna No	PCB Chain No.	Brand	Model	Antenna Type	Antenna Connector	Gain (dBi)	Frequency (GHz to GHz)
1	Chain 0	ARISTOTLE	RFA-52-Z1-155-165	Dipole	UFL	1.44	2.4~2.4835
				Dipole	UFL	0.37	5.15~5.85
2	Chain 1		RFA-52-Z1-75-95	Dipole	UFL	1.78	2.4~2.4835
				Dipole	UFL	3.23	5.15~5.85

4. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS 0~8, NSS=1	2TX	2RX
	MCS 0~8, NSS=2	2TX	2RX
802.11ac (VHT40)	MCS 0~9, NSS=1	2TX	2RX
	MCS 0~9, NSS=2	2TX	2RX
802.11ac (VHT80)	MCS 0~9, NSS=1	2TX	2RX
	MCS 0~9, NSS=2	2TX	2RX

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.

5. The power setting are list as below:

Modulation Mode	Frequency (MHz)	Power Setting	
		CDD Mode	Beamforming Mode
802.11b	2412	20	-
	2437	21	-
	2462	21	-
802.11g	2412	20	-
	2437	21	-
	2462	19	-
802.11n(HT20)	2412	18	18
	2437	24	24
	2462	20	20
802.11n(HT40)	2422	17	17
	2437	19	19
	2452	15	15

6. The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

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

NOTE: The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-plane**.

Radiated Emission Test (Above 1GHz):

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

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Radiated Emission Test (Below 1GHz):

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

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5

Power Line Conducted Emission Test:

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

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

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

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
Beamforming Mode (Output power only)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

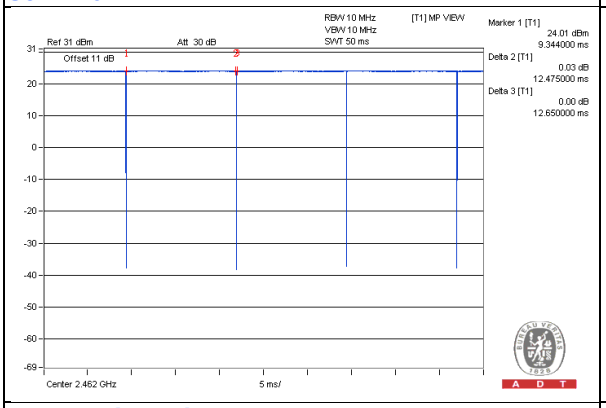
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY	TEST LOCATION
RE≥1G	22deg. C, 65%RH	120Vac, 60Hz	Robert Cheng	1
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Tim Ho	1
PLC	23deg. C, 79%RH	120Vac, 60Hz	Arthur Yang	2
APCM	23deg. C, 66%RH	120Vac, 60Hz	Anderson Chen	1

3.3 Duty Cycle of Test Signal

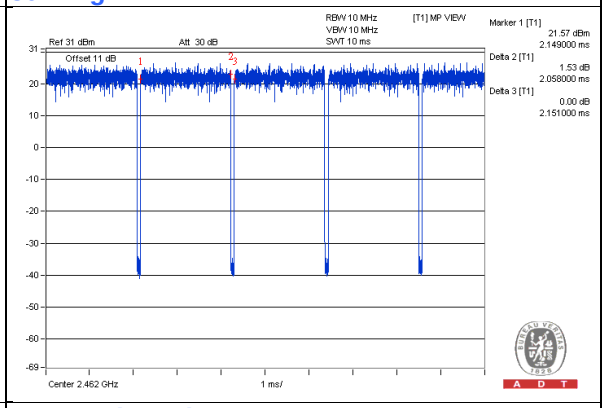
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 12.475/12.65 = 0.986
802.11g: Duty cycle = 2.058/2.151 = 0.957, Duty factor = 10 * log(1/0.957) = 0.19
802.11n (HT20): Duty cycle = 4.998/5.111 = 0.978, Duty factor = 10 * log(1/0.978) = 0.10
802.11n (HT40): Duty cycle = 2.423/2.525 = 0.96, Duty factor = 10 * log(1/0.96) = 0.18

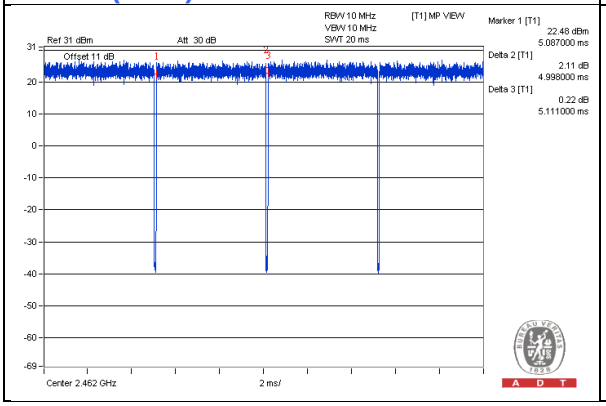
802.11b



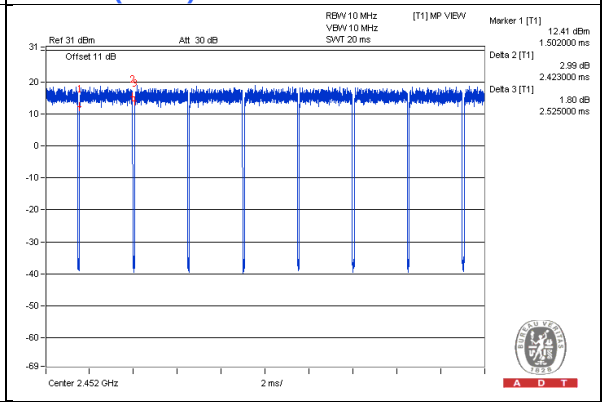
802.11g



802.11n (HT20)



802.11n (HT40)



3.4 Description of Support Units

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

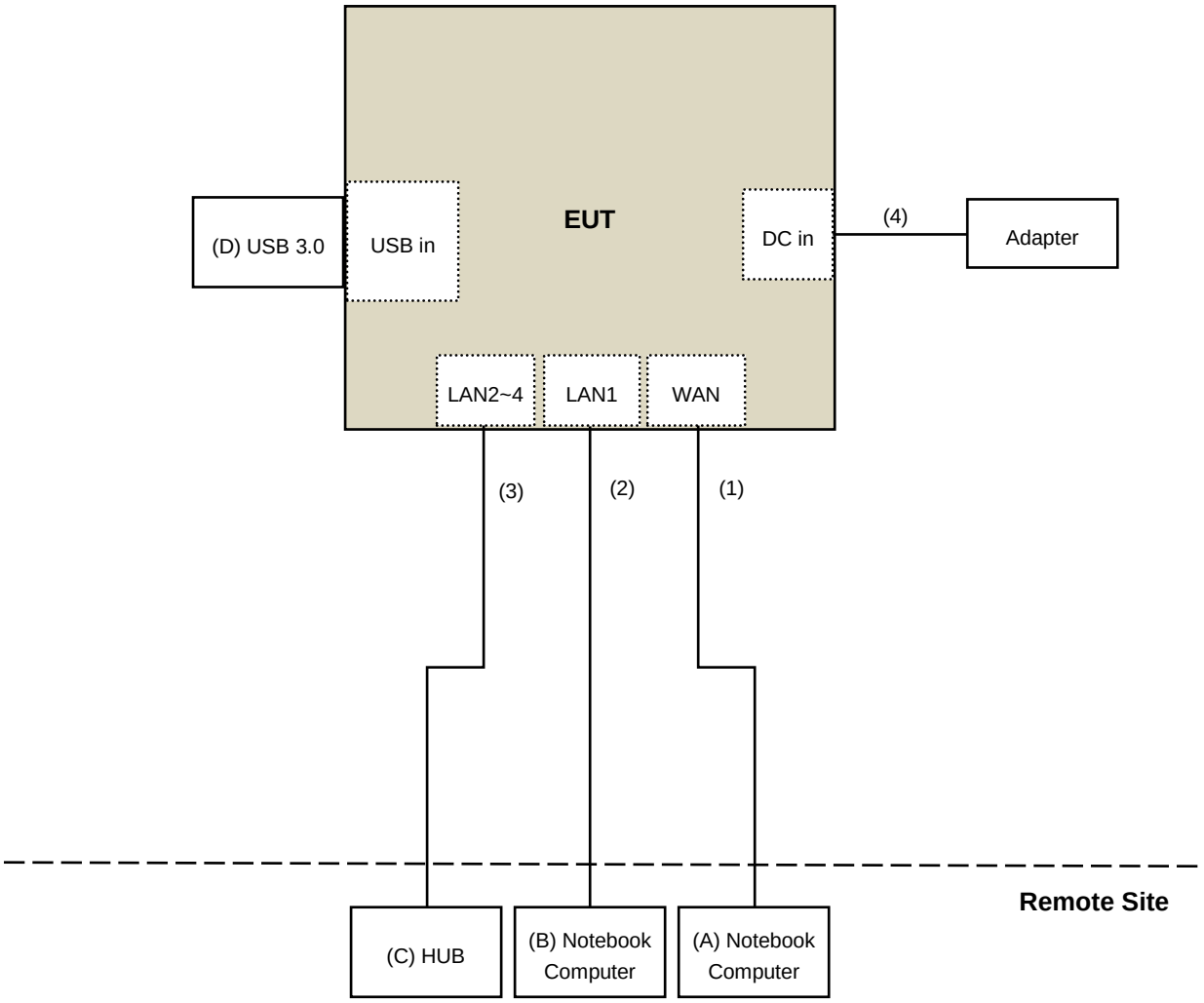
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook Computer	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Notebook Computer	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D.	USB3.0	NA	NA	NA	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	3	10	No	0	Provided by Lab
4.	DC Cable	1	1.8	No	0	Supplied by client

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)
KDB 558074 D01 DTS Meas Guidance v03r05
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 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 20dB under any condition of modulation.

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 07, 2016	May 06, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-156	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 02, 2016	Apr. 01, 2017
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Jan. 20, 2016	Jan. 19, 2017
Pre-Amplifier Agilent	8449B	3008A02465	Apr. 05, 2016	Apr. 04, 2017
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150317 150321 150322	Mar. 30, 2016	Mar. 29, 2017
Spectrum Analyzer Keysight	N9030A	MY54490520	July 26, 2015	July 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017
Power meter Anritsu	ML2495A	1014008	May 05, 2016	May 04, 2017
Power sensor Anritsu	MA2411B	0917122	May 05, 2016	May 04, 2017

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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The FCC Site Registration No. is 147459
5 Loop antenna was used for all emissions below 30 MHz.
6. The CANADA Site Registration No. is 20331-1
7. Tested Date: May 25 to June 08, 2016

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

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

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

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

Note:

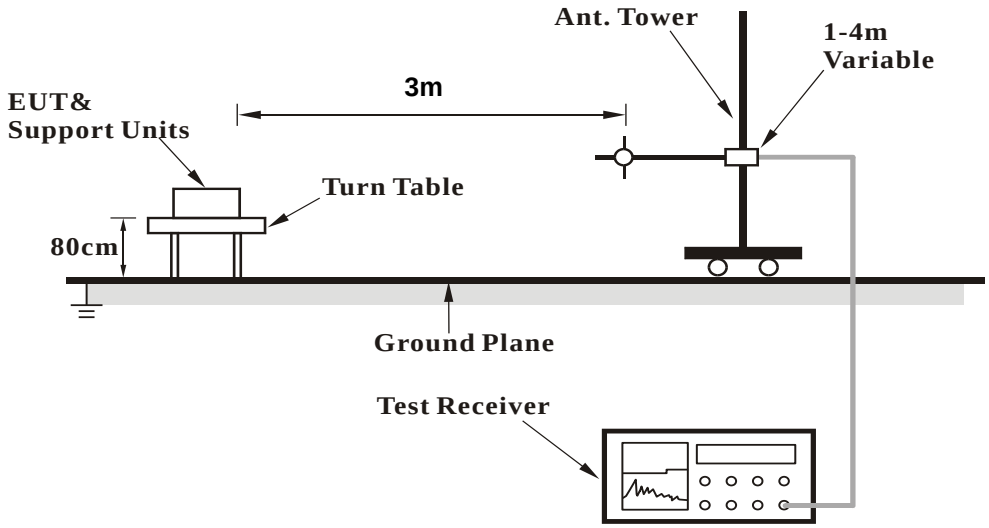
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

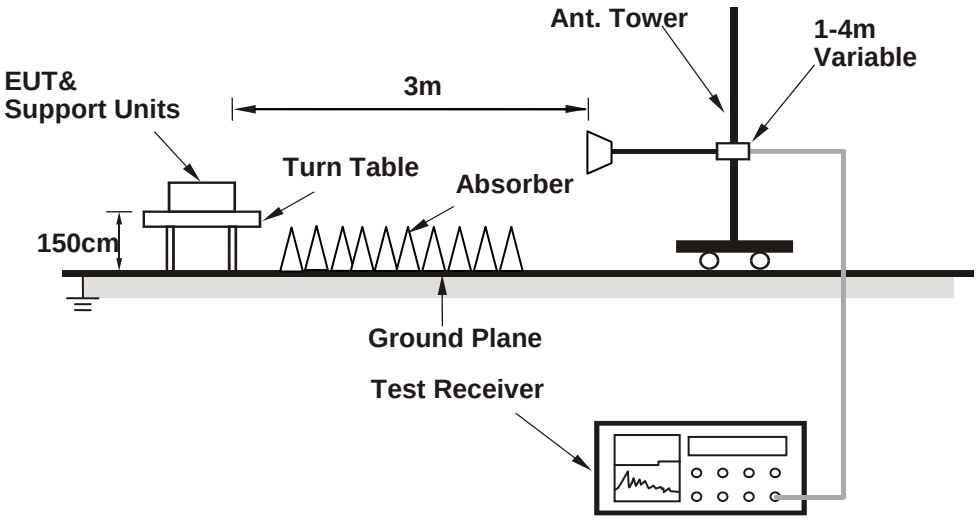
No deviation.

4.1.5 Test Setup

<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

For CDD operation :

a. Connected the EUT with the Notebook Computer which is placed on remote site.

b. Contorlling software (QAC RCT V3.0.187.0) has been activated to set the EUT on specific status.

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	48.9 PK	74.0	-25.1	1.76 H	302	54.5	-5.6
2	2390.00	36.7 AV	54.0	-17.3	1.76 H	302	42.3	-5.6
3	*2412.00	102.1 PK			1.76 H	302	107.6	-5.5
4	*2412.00	98.9 AV			1.76 H	302	104.4	-5.5
5	4824.00	53.2 PK	74.0	-20.8	1.09 H	152	52.3	0.9
6	4824.00	50.7 AV	54.0	-3.3	1.09 H	152	49.8	0.9
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	52.6 PK	74.0	-21.4	1.96 V	207	58.2	-5.6
2	2390.00	41.5 AV	54.0	-12.5	1.96 V	207	47.1	-5.6
3	*2412.00	117.2 PK			1.96 V	207	122.7	-5.5
4	*2412.00	113.5 AV			1.96 V	207	119.0	-5.5
5	4824.00	55.6 PK	74.0	-18.4	2.55 V	25	54.7	0.9
6	4824.00	53.8 AV	54.0	-0.2	2.55 V	25	52.9	0.9

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	103.4 PK			1.70 H	315	108.8	-5.4
2	*2437.00	100.0 AV			1.70 H	315	105.4	-5.4
3	4874.00	53.3 PK	74.0	-20.7	1.04 H	128	52.3	1.0
4	4874.00	50.5 AV	54.0	-3.5	1.04 H	128	49.5	1.0
5	7311.00	48.0 PK	74.0	-26.0	1.70 H	315	40.4	7.6
6	7311.00	35.5 AV	54.0	-18.5	1.70 H	315	27.9	7.6
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	118.7 PK			2.25 V	128	124.1	-5.4
2	*2437.00	115.5 AV			2.25 V	128	120.9	-5.4
3	4874.00	56.4 PK	74.0	-17.6	1.39 V	26	55.4	1.0
4	**4874.00**	**53.9 AV**	**54.0**	**-0.1**	**1.39 V**	**26**	**52.9**	**1.0**
5	7311.00	50.0 PK	74.0	-24.0	1.39 V	11	42.4	7.6
6	7311.00	44.2 AV	54.0	-9.8	1.39 V	11	36.6	7.6

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	103.7 PK			1.73 H	304	109.0	-5.3
2	*2462.00	100.2 AV			1.73 H	304	105.5	-5.3
3	2483.50	48.8 PK	74.0	-25.2	1.73 H	304	54.1	-5.3
4	2483.50	36.7 AV	54.0	-17.3	1.73 H	304	42.0	-5.3
5	4924.00	53.2 PK	74.0	-20.8	1.03 H	138	51.9	1.3
6	4924.00	50.4 AV	54.0	-3.6	1.03 H	138	49.1	1.3
7	7386.00	48.0 PK	74.0	-26.0	1.49 H	211	40.3	7.7
8	7386.00	35.8 AV	54.0	-18.2	1.49 H	211	28.1	7.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	118.8 PK			2.00 V	208	124.1	-5.3
2	*2462.00	115.5 AV			2.00 V	208	120.8	-5.3
3	2483.50	58.3 PK	74.0	-15.7	2.00 V	208	63.6	-5.3
4	2483.50	44.5 AV	54.0	-9.5	2.00 V	208	49.8	-5.3
5	4924.00	55.1 PK	74.0	-18.9	1.42 V	33	53.8	1.3
6	4924.00	53.5 AV	54.0	-0.5	1.42 V	33	52.2	1.3
7	7386.00	48.6 PK	74.0	-25.4	1.60 V	360	40.9	7.7
8	7386.00	40.1 AV	54.0	-13.9	1.60 V	360	32.4	7.7

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	65.3 PK	74.0	-8.7	1.74 H	307	70.9	-5.6
2	2390.00	49.6 AV	54.0	-4.4	1.74 H	307	55.2	-5.6
3	*2412.00	102.3 PK			1.74 H	307	107.8	-5.5
4	*2412.00	90.2 AV			1.74 H	307	95.7	-5.5
5	4824.00	60.0 PK	74.0	-14.0	1.08 H	139	59.1	0.9
6	4824.00	46.7 AV	54.0	-7.3	1.08 H	139	45.8	0.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.3 PK	74.0	-2.7	1.99 V	176	76.9	-5.6
2	2390.00	53.5 AV	54.0	-0.5	1.99 V	176	59.1	-5.6
3	*2412.00	117.7 PK			1.99 V	176	123.2	-5.5
4	*2412.00	104.9 AV			1.99 V	176	110.4	-5.5
5	4824.00	62.8 PK	74.0	-11.2	1.28 V	360	61.9	0.9
6	4824.00	50.0 AV	54.0	-4.0	1.28 V	360	49.1	0.9

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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.7 PK	74.0	-18.3	1.73 H	305	61.3	-5.6
2	2390.00	42.8 AV	54.0	-11.2	1.73 H	305	48.4	-5.6
3	*2437.00	102.9 PK			1.73 H	305	108.3	-5.4
4	*2437.00	91.8 AV			1.73 H	305	97.2	-5.4
5	2483.50	54.5 PK	74.0	-19.5	1.73 H	305	59.8	-5.3
6	2483.50	42.7 AV	54.0	-11.3	1.73 H	305	48.0	-5.3
7	4874.00	60.1 PK	74.0	-13.9	1.03 H	133	59.1	1.0
8	4874.00	46.8 AV	54.0	-7.2	1.03 H	133	45.8	1.0
9	7311.00	63.4 PK	74.0	-10.6	1.00 H	134	55.8	7.6
10	7311.00	49.1 AV	54.0	-4.9	1.00 H	134	41.5	7.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.6 PK	74.0	-13.4	1.44 V	204	66.2	-5.6
2	2390.00	46.7 AV	54.0	-7.3	1.44 V	204	52.3	-5.6
3	*2437.00	119.5 PK			1.44 V	204	124.9	-5.4
4	*2437.00	107.1 AV			1.44 V	204	112.5	-5.4
5	2483.50	59.2 PK	74.0	-14.8	1.44 V	204	64.5	-5.3
6	2483.50	46.8 AV	54.0	-7.2	1.44 V	204	52.1	-5.3
7	4874.00	64.7 PK	74.0	-9.3	1.50 V	344	63.7	1.0
8	4874.00	51.3 AV	54.0	-2.7	1.50 V	344	50.3	1.0
9	7311.00	67.6 PK	74.0	-6.4	1.53 V	14	60.0	7.6
10	7311.00	53.3 AV	54.0	-0.7	1.53 V	14	45.7	7.6

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	102.1 PK			1.68 H	305	107.4	-5.3
2	*2462.00	90.7 AV			1.68 H	305	96.0	-5.3
3	2483.50	65.2 PK	74.0	-8.8	1.68 H	305	70.5	-5.3
4	2483.50	49.2 AV	54.0	-4.8	1.68 H	305	54.5	-5.3
5	4924.00	60.3 PK	74.0	-13.7	1.09 H	126	59.0	1.3
6	4924.00	46.8 AV	54.0	-7.2	1.09 H	126	45.5	1.3
7	7386.00	59.1 PK	74.0	-14.9	1.00 H	128	51.4	7.7
8	7386.00	44.3 AV	54.0	-9.7	1.00 H	128	36.6	7.7
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	117.5 PK			1.80 V	205	122.8	-5.3
2	*2462.00	105.2 AV			1.80 V	205	110.5	-5.3
3	2483.50	71.7 PK	74.0	-2.3	1.80 V	205	77.0	-5.3
4	2483.50	53.2 AV	54.0	-0.8	1.80 V	205	58.5	-5.3
5	4924.00	61.0 PK	74.0	-13.0	1.38 V	346	59.7	1.3
6	4924.00	48.1 AV	54.0	-5.9	1.38 V	346	46.8	1.3
7	7386.00	61.4 PK	74.0	-12.6	1.57 V	14	53.7	7.7
8	7386.00	47.7 AV	54.0	-6.3	1.57 V	14	40.0	7.7

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 (HT20)

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	65.6 PK	74.0	-8.4	1.75 H	295	71.2	-5.6
2	2390.00	49.8 AV	54.0	-4.2	1.75 H	295	55.4	-5.6
3	*2412.00	101.6 PK			1.75 H	295	107.1	-5.5
4	*2412.00	90.1 AV			1.75 H	295	95.6	-5.5
5	4824.00	59.4 PK	74.0	-14.6	1.04 H	126	58.5	0.9
6	4824.00	46.3 AV	54.0	-7.7	1.04 H	126	45.4	0.9
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	1.62 V	191	75.1	-5.6
2	2390.00	53.0 AV	54.0	-1.0	1.62 V	191	58.6	-5.6
3	*2412.00	116.3 PK			1.62 V	191	121.8	-5.5
4	*2412.00	105.1 AV			1.62 V	191	110.6	-5.5
5	4824.00	62.8 PK	74.0	-11.2	1.25 V	360	61.9	0.9
6	4824.00	50.0 AV	54.0	-4.0	1.25 V	360	49.1	0.9

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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.5 PK	74.0	-19.5	1.74 H	315	60.1	-5.6
2	2390.00	42.4 AV	54.0	-11.6	1.74 H	315	48.0	-5.6
3	*2437.00	106.2 PK			1.71 H	315	111.6	-5.4
4	*2437.00	95.8 AV			1.71 H	315	101.2	-5.4
5	2483.50	55.9 PK	74.0	-18.1	1.72 H	297	61.2	-5.3
6	2483.50	43.0 AV	54.0	-11.0	1.72 H	297	48.3	-5.3
7	4874.00	60.0 PK	74.0	-14.0	1.01 H	121	59.0	1.0
8	4874.00	46.5 AV	54.0	-7.5	1.01 H	121	45.5	1.0
9	7311.00	59.2 PK	74.0	-14.8	1.05 H	144	51.6	7.6
10	7311.00	45.3 AV	54.0	-8.7	1.05 H	144	37.7	7.6
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	70.1 PK	74.0	-3.9	1.46 V	202	75.7	-5.6
2	2390.00	51.4 AV	54.0	-2.6	1.46 V	202	57.0	-5.6
3	*2437.00	121.6 PK			1.46 V	202	127.0	-5.4
4	*2437.00	110.0 AV			1.46 V	202	115.4	-5.4
5	2483.50	68.9 PK	74.0	-5.1	1.46 V	202	74.2	-5.3
6	2483.50	50.8 AV	54.0	-3.2	1.46 V	202	56.1	-5.3
7	4874.00	64.9 PK	74.0	-9.1	1.43 V	342	63.9	1.0
8	4874.00	50.5 AV	54.0	-3.5	1.43 V	342	49.5	1.0
9	7311.00	61.9 PK	74.0	-12.1	1.53 V	14	54.3	7.6
10	7311.00	47.5 AV	54.0	-6.5	1.53 V	14	39.9	7.6

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	102.5 PK			1.65 H	292	107.8	-5.3
2	*2462.00	91.2 AV			1.65 H	292	96.5	-5.3
3	2483.50	64.9 PK	74.0	-9.1	1.67 H	317	70.2	-5.3
4	2483.50	48.8 AV	54.0	-5.2	1.67 H	317	54.1	-5.3
5	4924.00	59.8 PK	74.0	-14.2	1.13 H	115	58.5	1.3
6	4924.00	46.5 AV	54.0	-7.5	1.13 H	115	45.2	1.3
7	7386.00	59.1 PK	74.0	-14.9	1.04 H	115	51.4	7.7
8	7386.00	44.3 AV	54.0	-9.7	1.04 H	115	36.6	7.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	118.3 PK			1.98 V	191	123.6	-5.3
2	*2462.00	106.7 AV			1.98 V	191	112.0	-5.3
3	2483.50	70.7 PK	74.0	-3.3	1.98 V	191	76.0	-5.3
4	2483.50	53.0 AV	54.0	-1.0	1.98 V	191	58.3	-5.3
5	4924.00	61.2 PK	74.0	-12.8	1.33 V	348	59.9	1.3
6	4924.00	48.4 AV	54.0	-5.6	1.33 V	348	47.1	1.3
7	7386.00	61.3 PK	74.0	-12.7	1.58 V	15	53.6	7.7
8	7386.00	47.7 AV	54.0	-6.3	1.58 V	15	40.0	7.7

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 (HT40)

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	66.7 PK	74.0	-7.3	1.68 H	327	72.3	-5.6
2	2390.00	49.4 AV	54.0	-4.6	1.68 H	327	55.0	-5.6
3	*2422.00	97.6 PK			1.68 H	327	103.0	-5.4
4	*2422.00	87.1 AV			1.68 H	327	92.5	-5.4
5	4844.00	56.7 PK	74.0	-17.3	1.00 H	121	55.8	0.9
6	4844.00	43.2 AV	54.0	-10.8	1.00 H	121	42.3	0.9
7	7266.00	55.9 PK	74.0	-18.1	1.04 H	133	48.2	7.7
8	7266.00	42.9 AV	54.0	-11.1	1.04 H	133	35.2	7.7
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	70.8 PK	74.0	-3.2	1.98 V	194	76.4	-5.6
2	2390.00	53.0 AV	54.0	-1.0	1.98 V	194	58.6	-5.6
3	*2422.00	111.5 PK			1.98 V	194	116.9	-5.4
4	*2422.00	102.3 AV			1.98 V	194	107.7	-5.4
5	4844.00	57.2 PK	74.0	-16.8	1.34 V	321	56.3	0.9
6	4844.00	44.2 AV	54.0	-9.8	1.34 V	321	43.3	0.9
7	7266.00	56.4 PK	74.0	-17.6	1.59 V	30	48.7	7.7
8	7266.00	43.2 AV	54.0	-10.8	1.59 V	30	35.5	7.7

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	67.2 PK	74.0	-6.8	1.77 H	320	72.8	-5.6
2	2390.00	49.7 AV	54.0	-4.3	1.77 H	320	55.3	-5.6
3	*2437.00	97.9 PK			1.77 H	320	103.3	-5.4
4	*2437.00	87.5 AV			1.77 H	320	92.9	-5.4
5	2483.50	66.2 PK	74.0	-7.8	1.77 H	320	71.5	-5.3
6	2483.50	49.1 AV	54.0	-4.9	1.77 H	320	54.4	-5.3
7	4874.00	56.2 PK	74.0	-17.8	1.00 H	113	55.2	1.0
8	4874.00	42.8 AV	54.0	-11.2	1.00 H	113	41.8	1.0
9	7311.00	55.4 PK	74.0	-18.6	1.11 H	146	47.8	7.6
10	7311.00	42.6 AV	54.0	-11.4	1.11 H	146	35.0	7.6
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	72.8 PK	74.0	-1.2	1.49 V	202	78.4	-5.6
2	2390.00	53.7 AV	54.0	-0.3	1.49 V	202	59.3	-5.6
3	*2437.00	113.5 PK			1.49 V	202	118.9	-5.4
4	*2437.00	102.5 AV			1.49 V	202	107.9	-5.4
5	2483.50	71.0 PK	74.0	-3.0	1.49 V	202	76.3	-5.3
6	2483.50	53.2 AV	54.0	-0.8	1.49 V	202	58.5	-5.3
7	4874.00	57.7 PK	74.0	-16.3	1.29 V	326	56.7	1.0
8	4874.00	44.4 AV	54.0	-9.6	1.29 V	326	43.4	1.0
9	7311.00	56.4 PK	74.0	-17.6	1.64 V	42	48.8	7.6
10	7311.00	43.5 AV	54.0	-10.5	1.64 V	42	35.9	7.6

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	95.6 PK			1.71 H	301	101.0	-5.4
2	*2452.00	85.7 AV			1.71 H	301	91.1	-5.4
3	2483.50	67.5 PK	74.0	-6.5	1.71 H	301	72.8	-5.3
4	2483.50	50.0 AV	54.0	-4.0	1.71 H	301	55.3	-5.3
5	4904.00	56.5 PK	74.0	-17.5	1.00 H	123	55.3	1.2
6	4904.00	43.2 AV	54.0	-10.8	1.00 H	123	42.0	1.2
7	7356.00	55.3 PK	74.0	-18.7	1.04 H	150	47.6	7.7
8	7356.00	42.4 AV	54.0	-11.6	1.04 H	150	34.7	7.7
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	109.4 PK			2.20 V	140	114.8	-5.4
2	*2452.00	100.2 AV			2.20 V	140	105.6	-5.4
3	2483.50	66.3 PK	74.0	-7.7	2.20 V	140	71.6	-5.3
4	2483.50	53.0 AV	54.0	-1.0	2.20 V	140	58.3	-5.3
5	4904.00	58.4 PK	74.0	-15.6	1.35 V	310	57.2	1.2
6	4904.00	44.8 AV	54.0	-9.2	1.35 V	310	43.6	1.2
7	7356.00	55.9 PK	74.0	-18.1	1.60 V	56	48.2	7.7
8	7356.00	43.2 AV	54.0	-10.8	1.60 V	56	35.5	7.7

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:

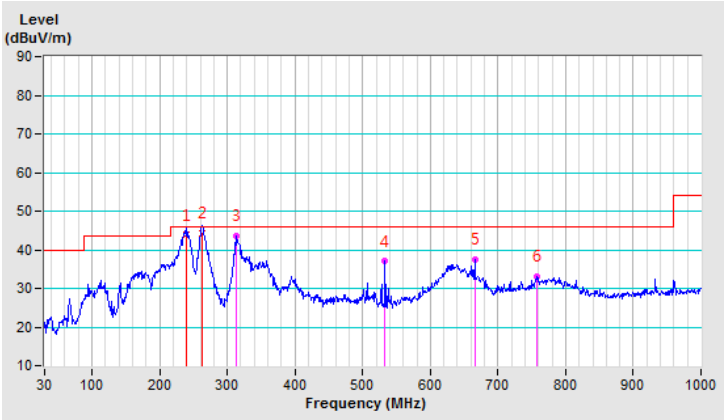
802.11n (HT20)

CHANNEL	TX Channel 6	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	239.04	43.8 QP	46.0	-2.2	1.10 H	42	53.7	-9.9
2	262.74	44.3 QP	46.0	-1.7	1.06 H	63	53.2	-8.9
3	313.85	43.5 QP	46.0	-2.5	1.00 H	330	50.5	-7.0
4	532.80	37.0 QP	46.0	-9.0	1.50 H	47	38.9	-1.9
5	665.47	37.6 QP	46.0	-8.4	1.00 H	195	36.8	0.8
6	757.67	33.1 QP	46.0	-12.9	1.00 H	189	30.4	2.7

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

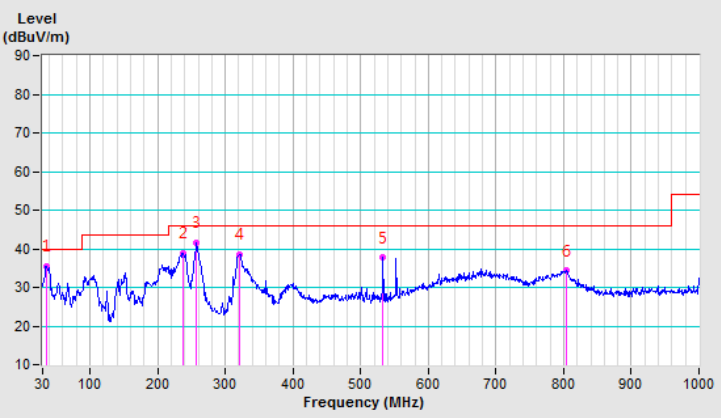


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	below 1GHz		

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	36.50	35.5 QP	40.0	-4.5	1.00 V	128	45.1	-9.6
2	237.82	38.9 QP	46.0	-7.1	1.00 V	293	48.9	-10.0
3	257.61	41.7 QP	46.0	-4.3	2.00 V	30	50.9	-9.2
4	320.18	38.6 QP	46.0	-7.4	1.50 V	360	45.4	-6.8
5	532.80	37.7 QP	46.0	-8.3	1.00 V	192	39.6	-1.9
6	803.72	34.3 QP	46.0	-11.7	1.50 V	109	31.1	3.2

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.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 09, 2016	May 08, 2017
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 01, 2015	Aug. 31, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 08, 2016	Mar. 07, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-002	Sep. 14, 2015	Sep. 13, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 23, 2015	Sep. 22, 2016
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2015	Sep. 30, 2016
50 ohms Terminator	E1-011315	13	Dec. 11 2015	Dec. 10 2016
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: May 26, 2016

4.2.3 Test Procedures

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

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

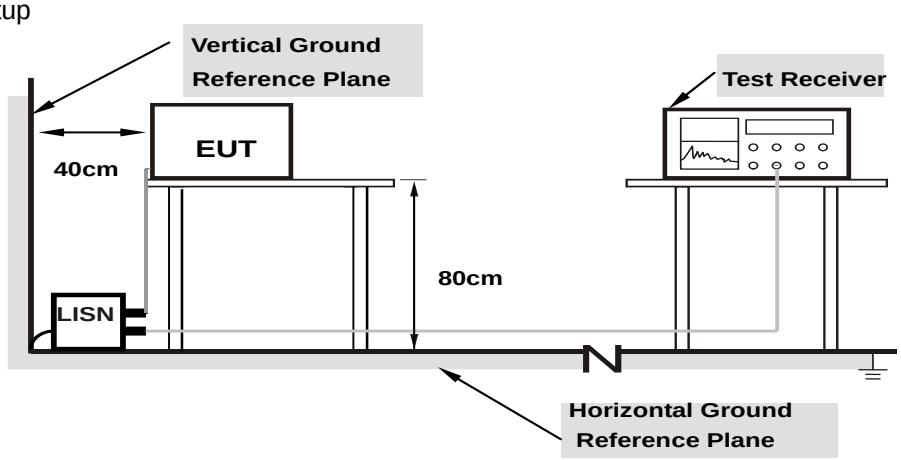
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

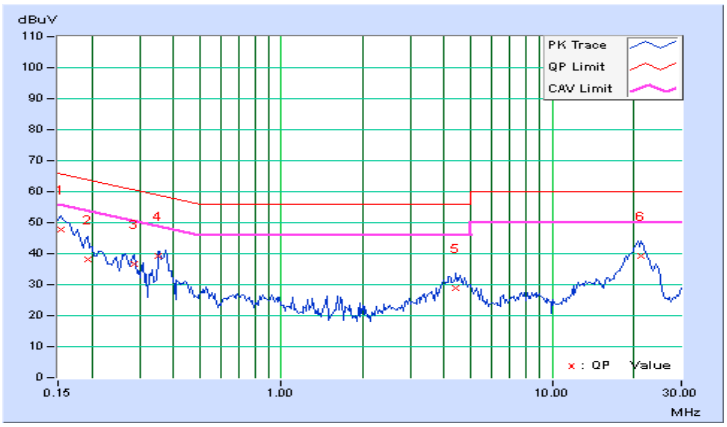
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [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	0.15391	10.44	37.49	26.64	47.93	37.08	65.79	55.79	-17.86	-18.71
2	0.19297	10.41	27.83	19.90	38.24	30.31	63.91	53.91	-25.67	-23.60
3	0.28672	10.41	26.10	22.11	36.51	32.52	60.62	50.62	-24.11	-18.10
4	0.35313	10.42	28.99	27.04	39.41	37.46	58.89	48.89	-19.48	-11.43
5	4.42969	10.65	18.32	11.13	28.97	21.78	56.00	46.00	-27.03	-24.22
6	21.26953	11.51	27.75	19.90	39.26	31.41	60.00	50.00	-20.74	-18.59

REMARKS:

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

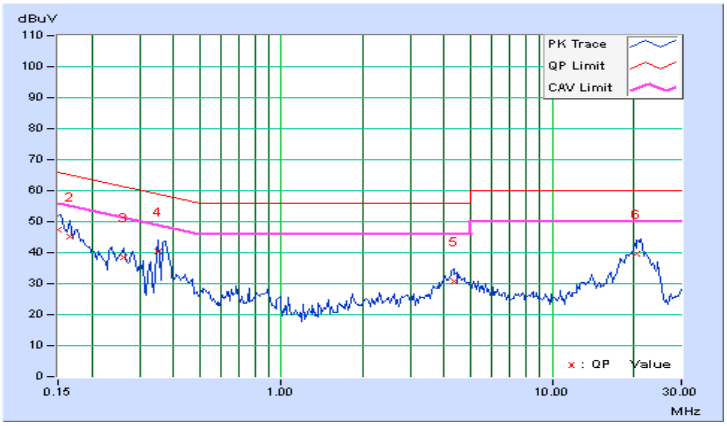


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [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	0.15000	10.44	36.83	27.48	47.27	37.92	66.00	56.00	-18.73	-18.08
2	0.16562	10.45	34.74	23.66	45.19	34.11	65.18	55.18	-19.99	-21.07
3	0.26328	10.46	28.10	23.62	38.56	34.08	61.33	51.33	-22.77	-17.25
4	**0.34922**	**10.47**	**29.82**	**28.40**	**40.29**	**38.87**	**58.98**	**48.98**	**-18.69**	**-10.11**
5	4.33594	10.74	19.91	13.22	30.65	23.96	56.00	46.00	-25.35	-22.04
6	20.55078	11.50	28.20	19.82	39.70	31.32	60.00	50.00	-20.30	-18.68

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.

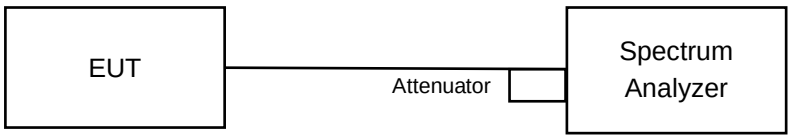


4.3 6dB Bandwidth Measurement

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		
1	2412	8.15	8.14	0.5	Pass
6	2437	8.11	8.05	0.5	Pass
11	2462	7.61	8.60	0.5	Pass

802.11g

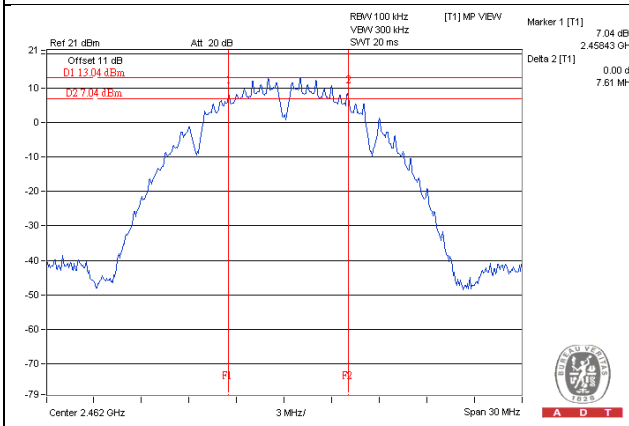
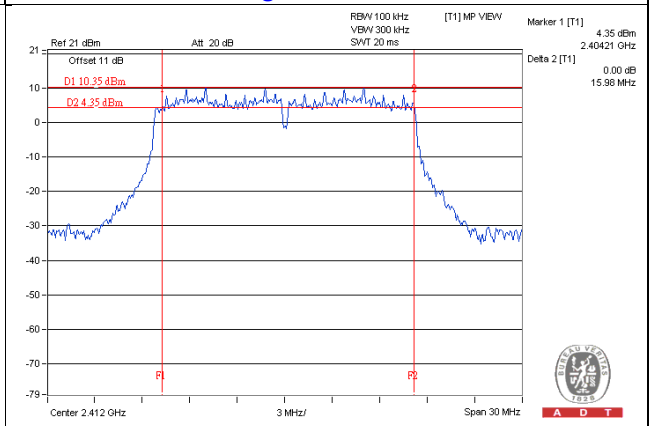
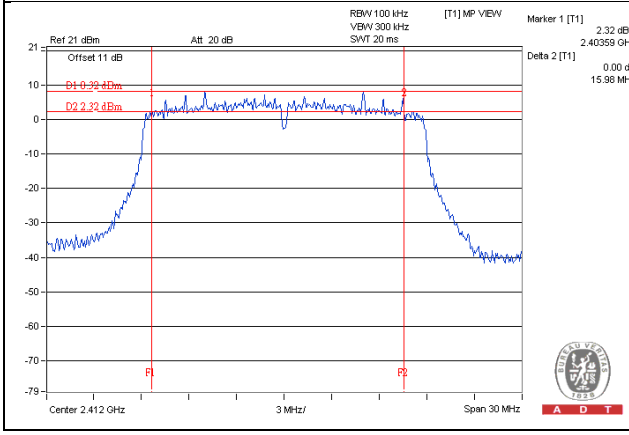
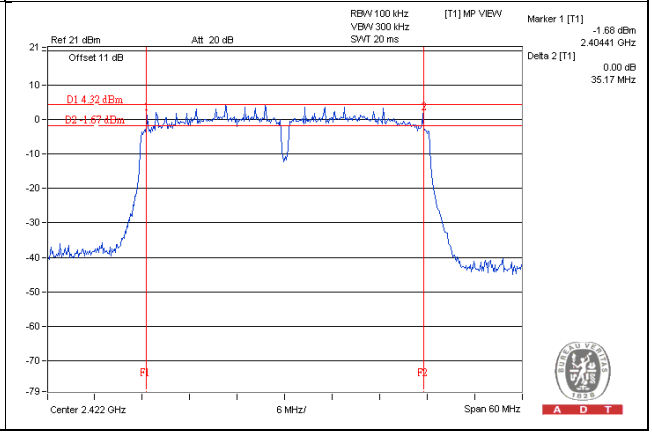
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.41	15.98	0.5	Pass
6	2437	16.40	16.37	0.5	Pass
11	2462	16.38	16.35	0.5	Pass

802. 11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.64	15.98	0.5	Pass
6	2437	17.65	16.98	0.5	Pass
11	2462	17.65	16.41	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.17	35.25	0.5	Pass
6	2437	35.44	35.38	0.5	Pass
9	2452	35.27	35.29	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH11	**802.11g / Chain 1 : CH1**
	
802.11n (HT20) / Chain 1 : CH1	**802.11n (HT40) / Chain 0 : CH3**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

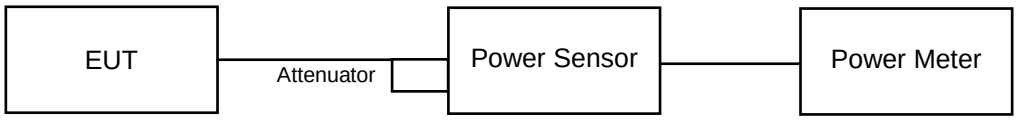
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

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

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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 power level.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

For CDD operation :

c. Connected the EUT with the Notebook Computer which is placed on remote site.
d. Contorlling software (QAC RCT V3.0.187.0) has been activated to set the EUT on specific status.

For Tx-BF operation :

a. Connected the EUT with the WLAN client card which is placed after the antenna tower
b. .Tx-BF command (iwpriv) and iperf.exe has been activated to set the EUT on specific status.

4.4.7 Test Results

CDD Mode

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	21.02	21.97	283.872	24.53
6	2437	22.46	21.64	322.079	25.08
11	2462	22.14	21.71	311.934	24.94

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	20.37	20.36	217.536	23.38
6	2437	21.38	21.29	271.99	24.35
11	2462	19.42	19.20	170.674	22.32

CDD Mode / Beamforming Mode

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	18.43	18.61	142.274	21.53
6	2437	23.95	24.05	502.41	27.01
11	2462	20.33	20.40	217.543	23.38

Note: 1. For Beamforming mode : Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 4.62dBi < 6dBi , so the power limit shall not to be reduced.

802.11n (HT40)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	17.51	17.54	113.118	20.54
6	2437	19.72	19.56	184.121	22.65
9	2452	15.56	15.47	71.212	18.53

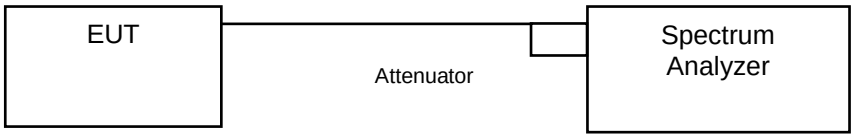
Note: 1. For Beamforming mode : Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 4.62dBi < 6dBi , so the power limit shall not to be reduced.

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 802.11b

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 802.11g, 802.11n (HT20), 802.11n (HT40)

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/10kHz)	10 log (N=2) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-5.64	3.01	-2.63	8.00	Pass
	6	2437	-5.55	3.01	-2.54	8.00	Pass
	11	2462	-5.63	3.01	-2.62	8.00	Pass
1	1	2412	-6.00	3.01	-2.99	8.00	Pass
	6	2437	-4.68	3.01	-1.67	8.00	Pass
	11	2462	-5.25	3.01	-2.24	8.00	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 4.62dBi < 6dBi , so the power density limit shall not be reduced.

802.11g

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/10kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.92	3.01	0.19	-5.72	8.00	Pass
	6	2437	-8.80	3.01	0.19	-5.60	8.00	Pass
	11	2462	-9.64	3.01	0.19	-6.44	8.00	Pass
1	1	2412	-7.79	3.01	0.19	-4.59	8.00	Pass
	6	2437	-7.19	3.01	0.19	-3.99	8.00	Pass
	11	2462	-8.98	3.01	0.19	-5.78	8.00	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 4.62dBi < 6dBi , so the power density limit shall not be reduced.

802.11n (HT20)

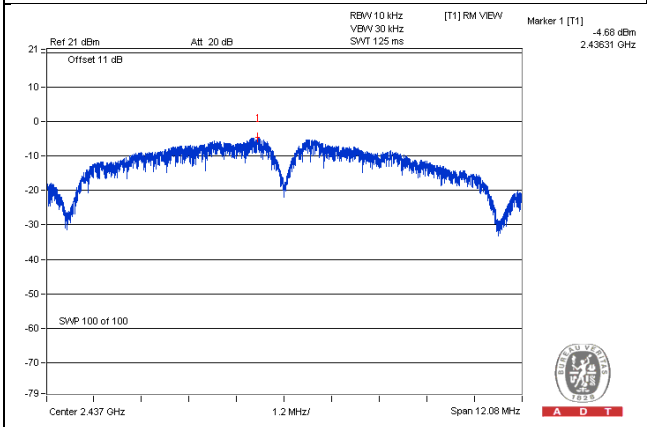
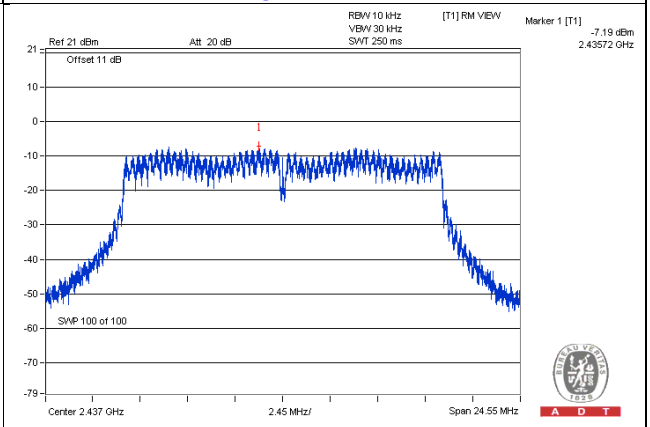
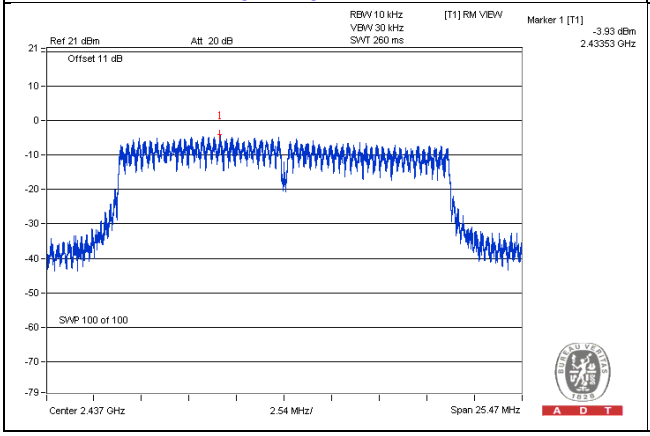
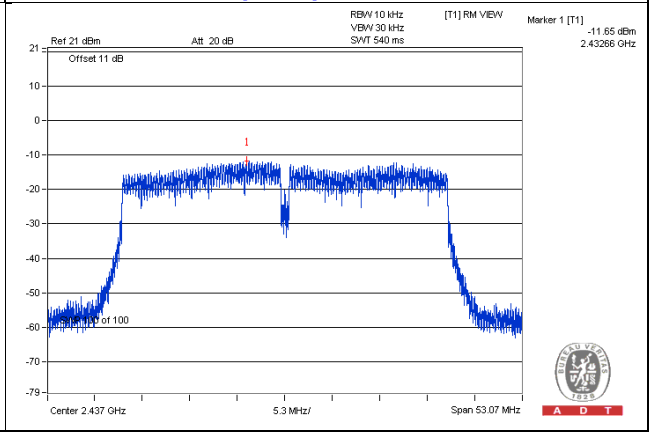
TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/10kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-10.65	3.01	0.10	-7.54	8.00	Pass
	6	2437	-6.03	3.01	0.10	-2.92	8.00	Pass
	11	2462	-8.37	3.01	0.10	-5.26	8.00	Pass
1	1	2412	-9.55	3.01	0.10	-6.44	8.00	Pass
	6	2437	-3.93	3.01	0.10	-0.82	8.00	Pass
	11	2462	-6.72	3.01	0.10	-3.61	8.00	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 4.62dBi < 6dBi , so the power density limit shall not be reduced.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/10kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-13.54	3.01	0.18	-10.35	8.00	Pass
	6	2437	-12.81	3.01	0.18	-9.62	8.00	Pass
	9	2452	-15.71	3.01	0.18	-12.52	8.00	Pass
1	3	2422	-14.08	3.01	0.18	-10.89	8.00	Pass
	6	2437	-11.65	3.01	0.18	-8.46	8.00	Pass
	9	2452	-15.53	3.01	0.18	-12.34	8.00	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 4.62dBi < 6dBi , so the power density limit shall not be reduced.

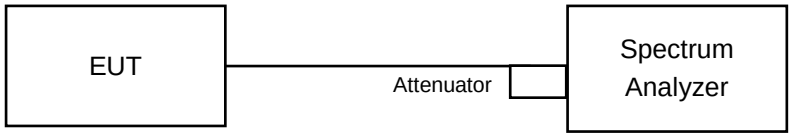
Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH6	**802.11g / Chain 1 : CH6**
	
802.11n (HT20) / Chain 1 : CH6	**802.11n (HT40) / Chain 1 : CH6**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

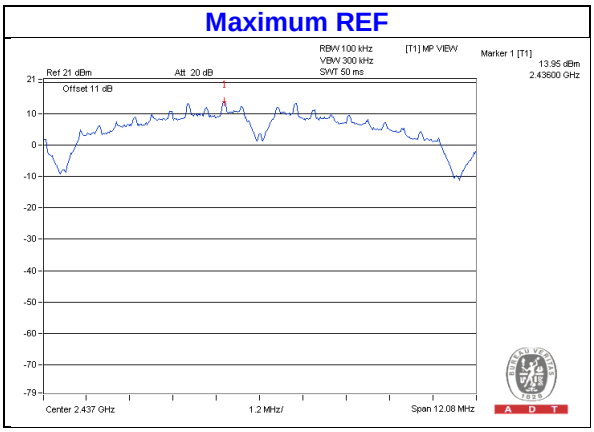
Same as Item 4.3.6

4.6.7 Test Results

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

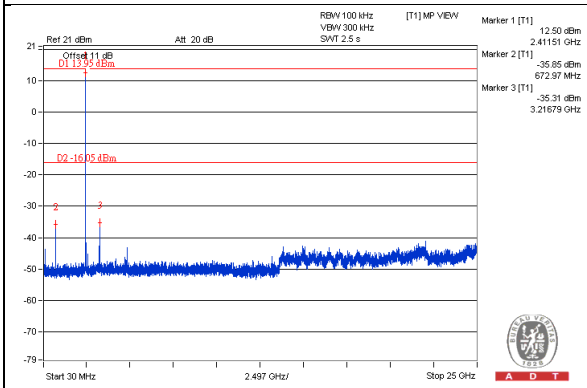
802.11b

Maximum REF

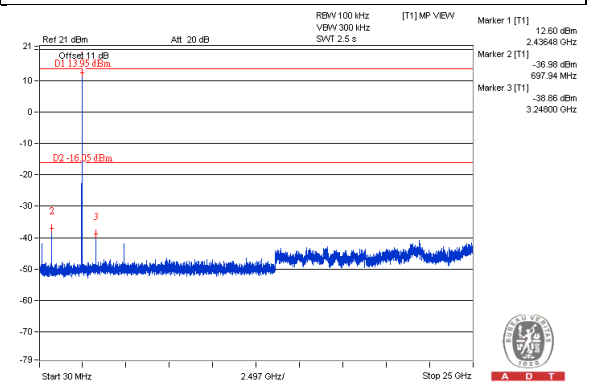


CHAIN 0

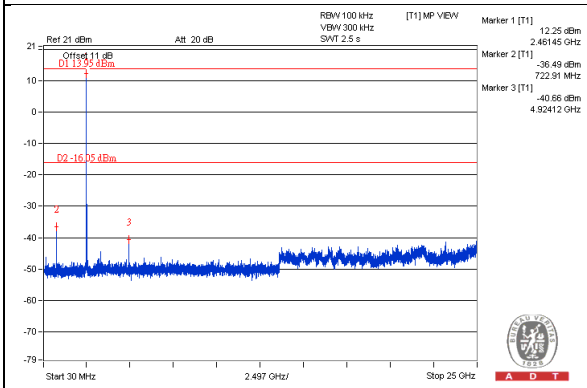
CH 1



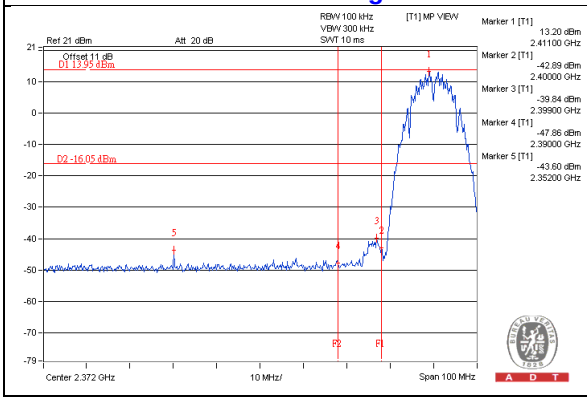
CH 6



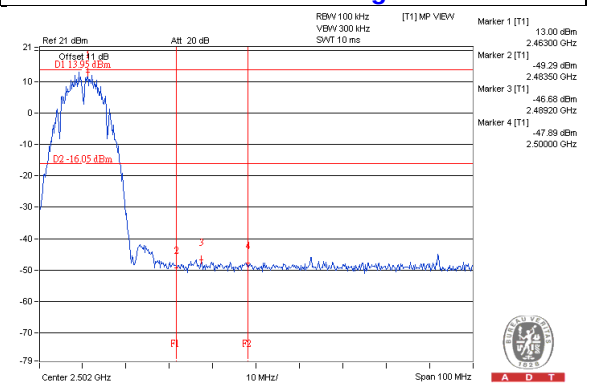
CH 11



CH 1 Band edge

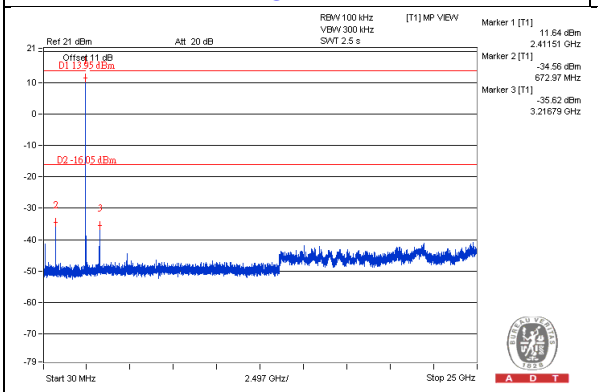


CH 11 Band edge

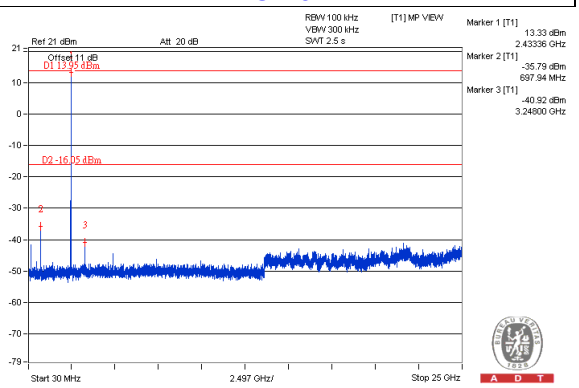


CHAIN 1

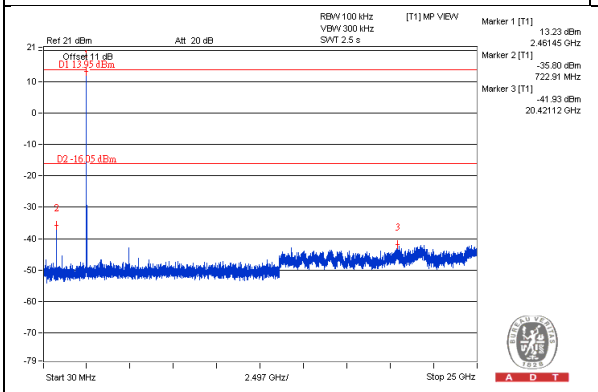
CH 1



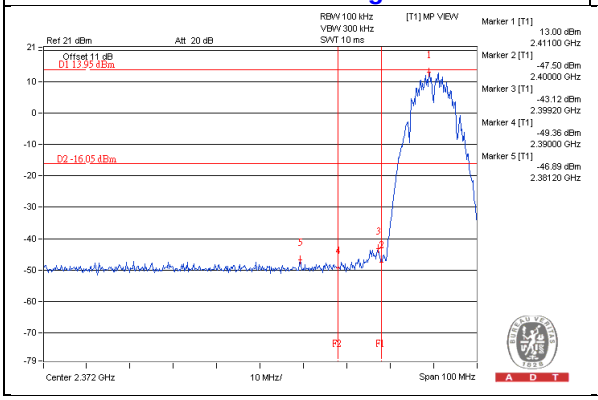
CH 6



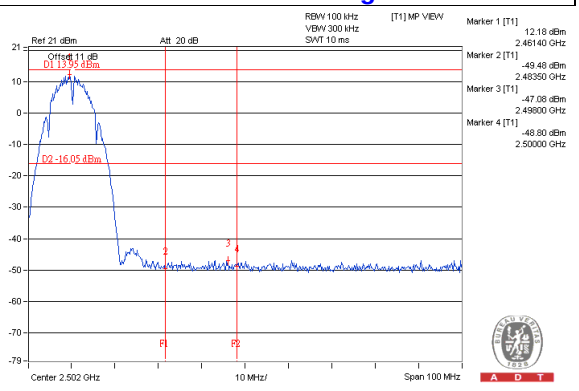
CH 11



CH 1 Band edge

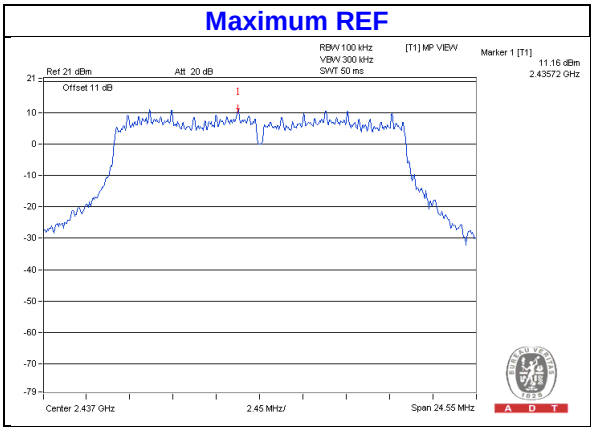


CH 11 Band edge



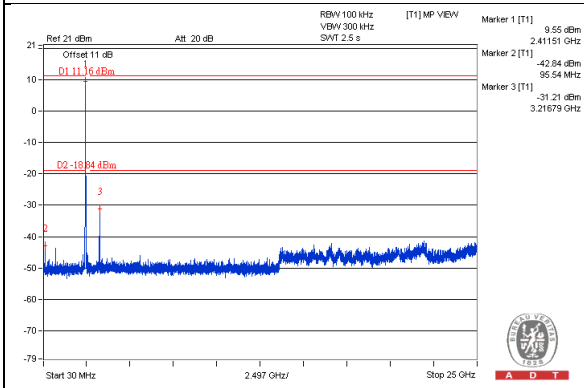
802.11g

Maximum REF

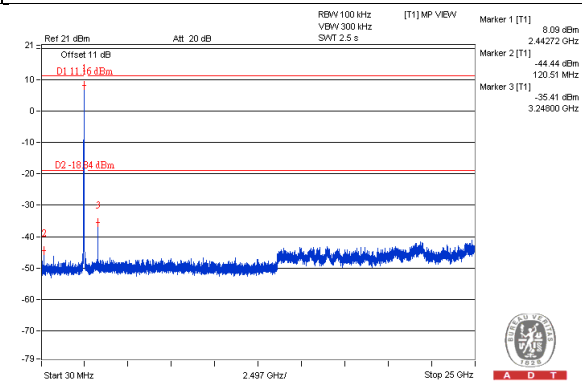


CHAIN 0

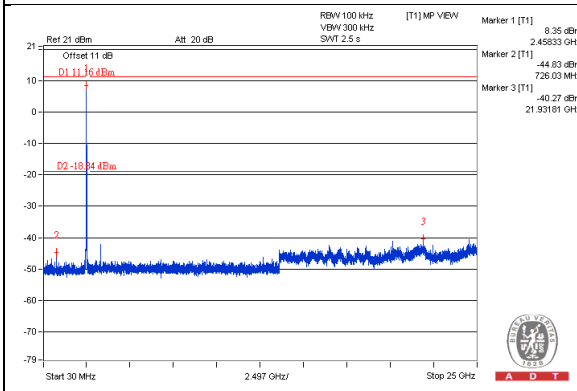
CH 1



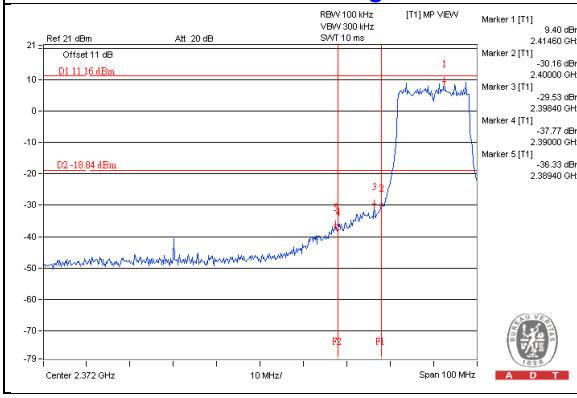
CH 6



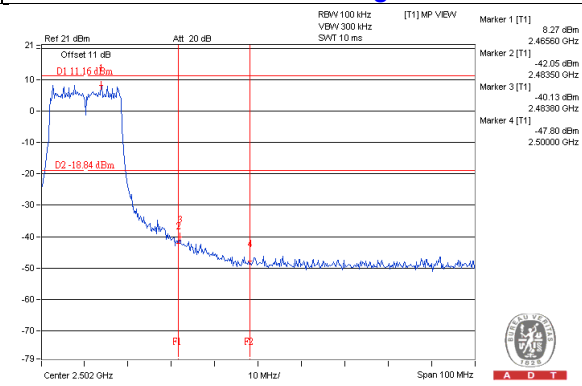
CH 11



CH 1 Band edge

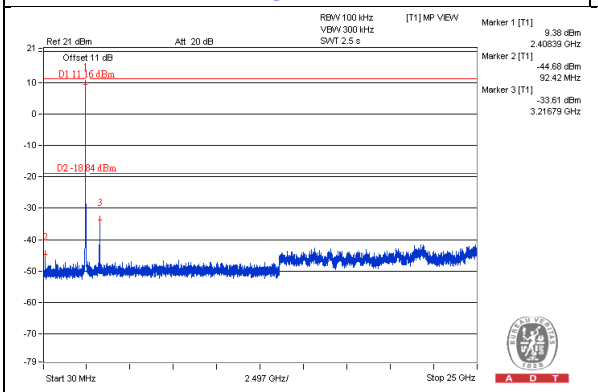


CH 11 Band edge

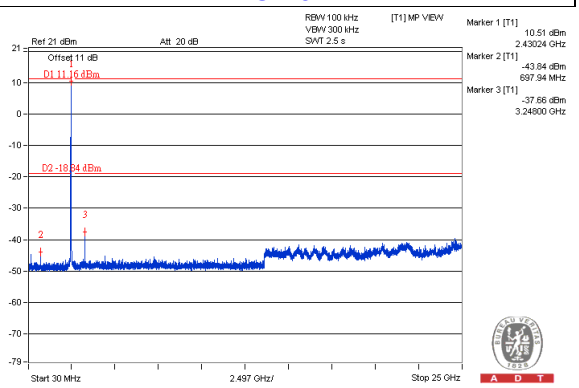


CHAIN 1

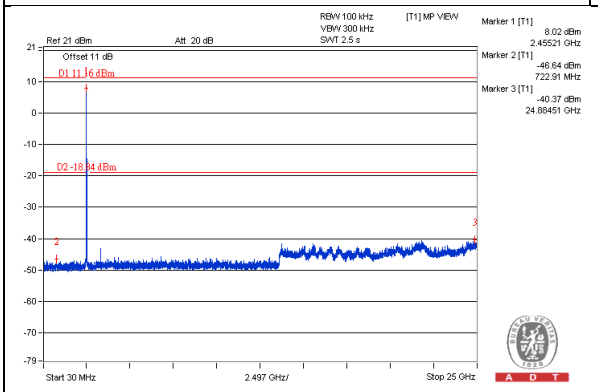
CH 1



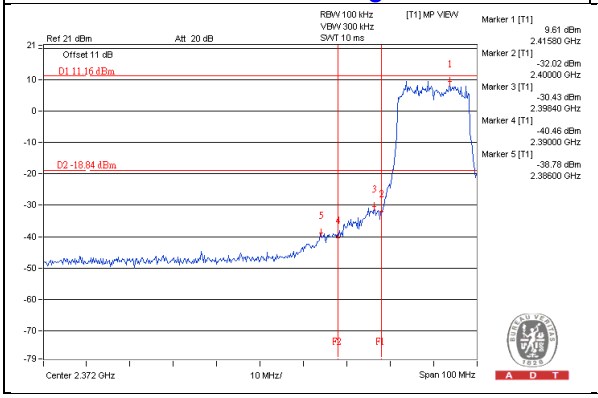
CH 6



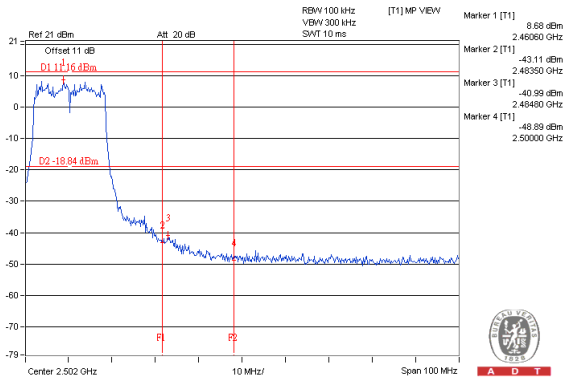
CH 11



CH 1 Band edge

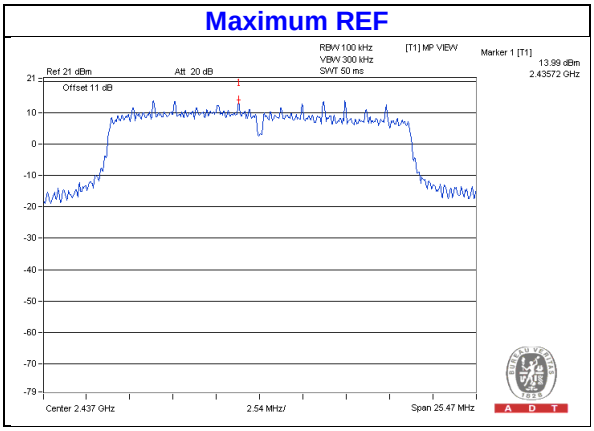


CH 11 Band edge



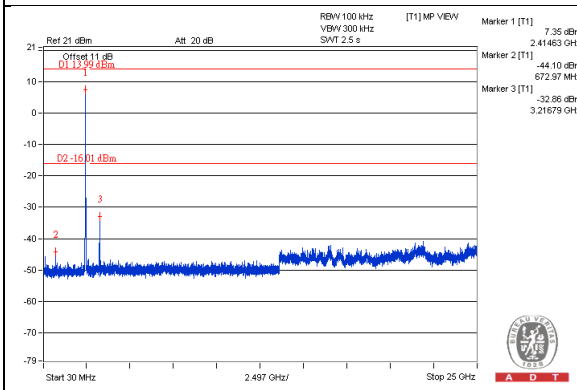
802.11n (HT20)

Maximum REF

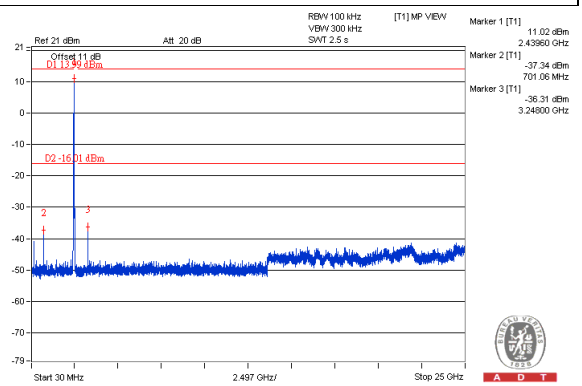


CHAIN 0

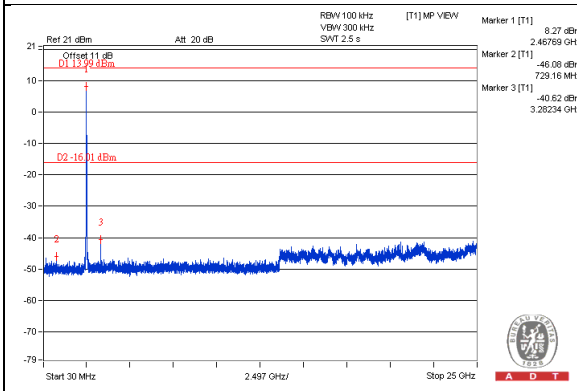
CH 1



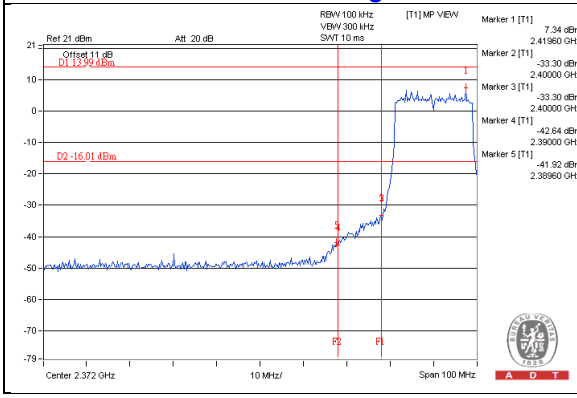
CH 6



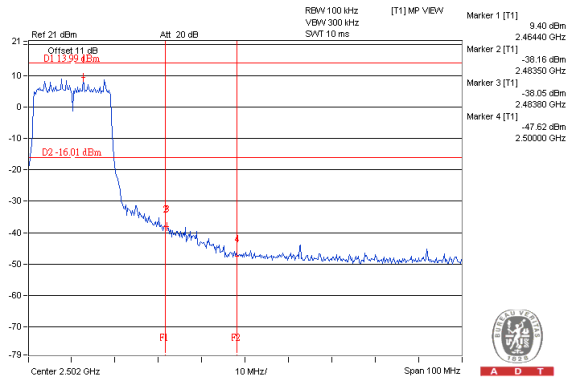
CH 11



CH 1 Band edge

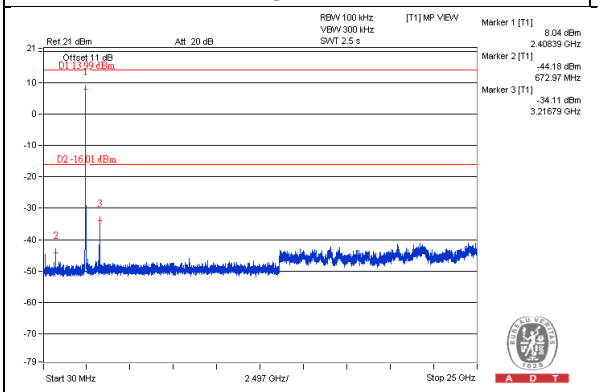


CH 11 Band edge

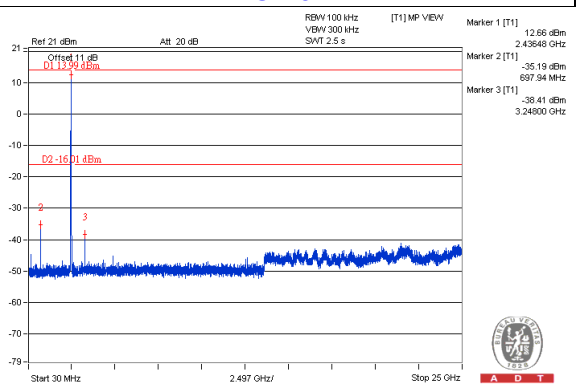


CHAIN 1

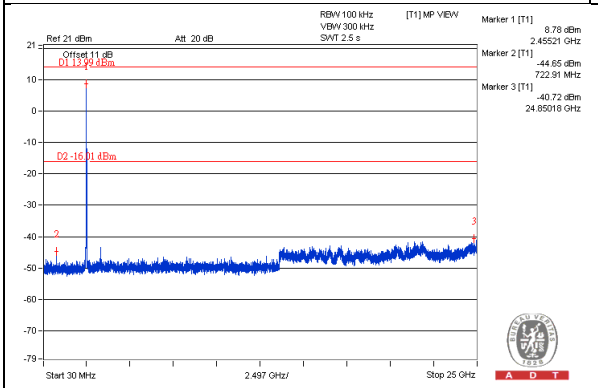
CH 1



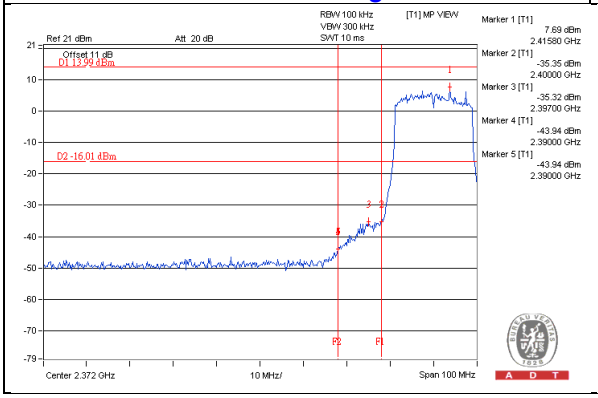
CH 6



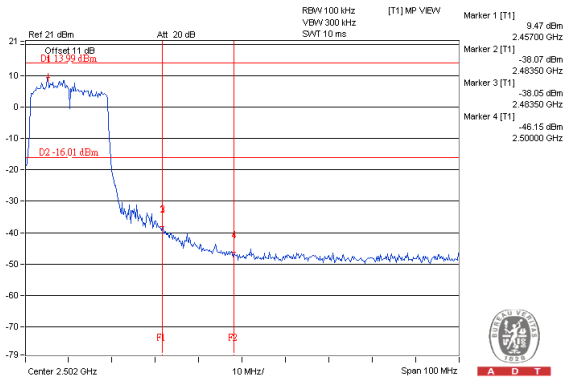
CH 11



CH 1 Band edge

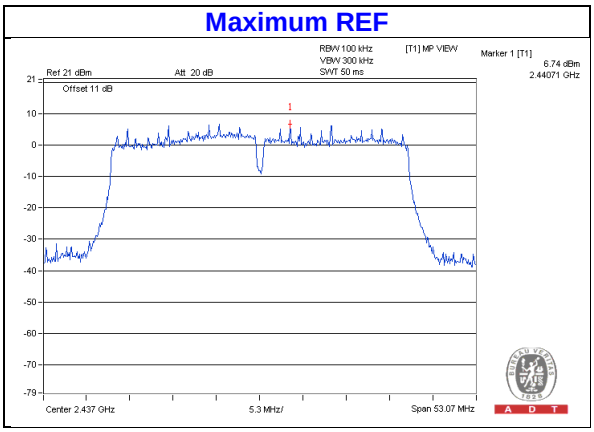


CH 11 Band edge



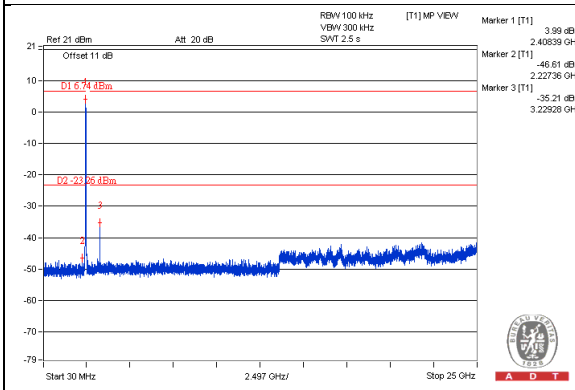
802.11n (HT40)

Maximum REF

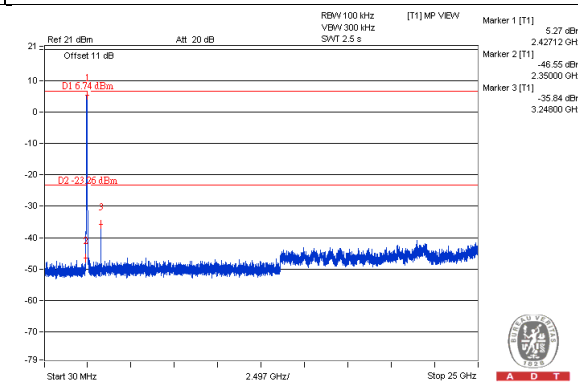


CHAIN 0

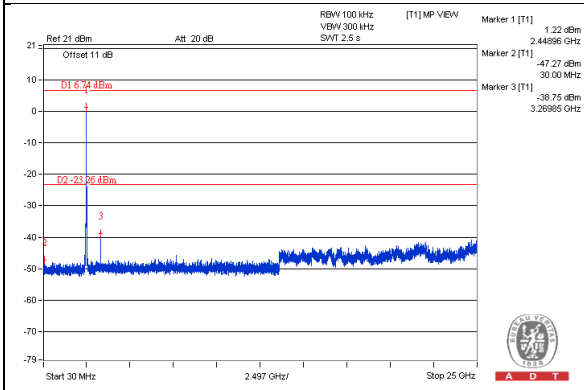
CH 3



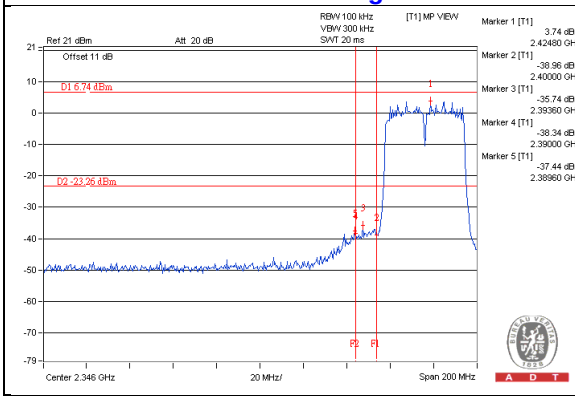
CH 6



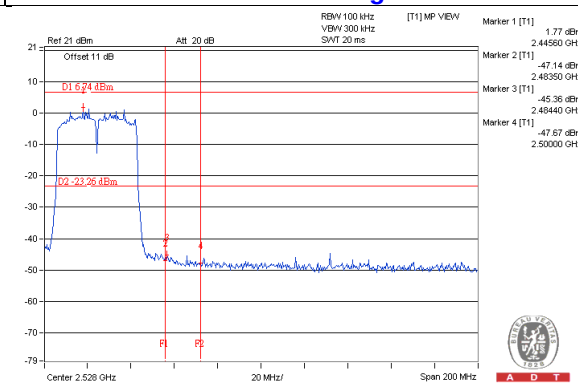
CH 9



CH 3 Band edge

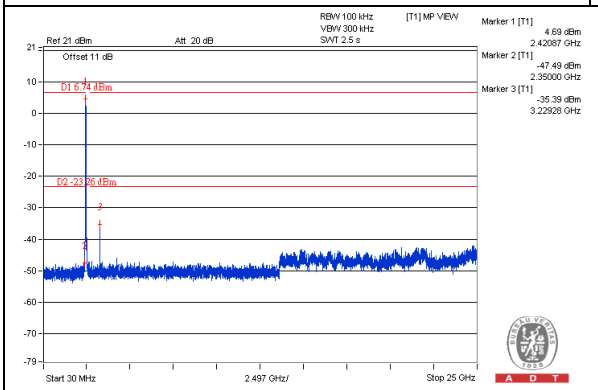


CH 9 Band edge

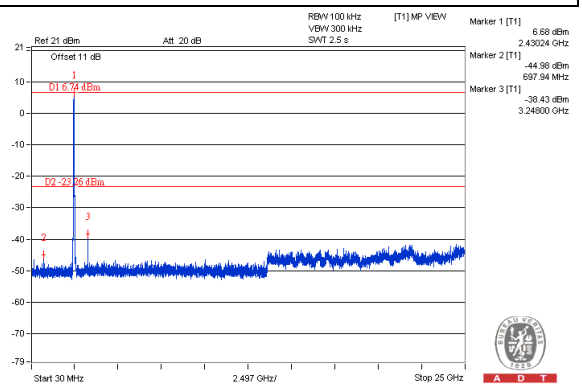


CHAIN 1

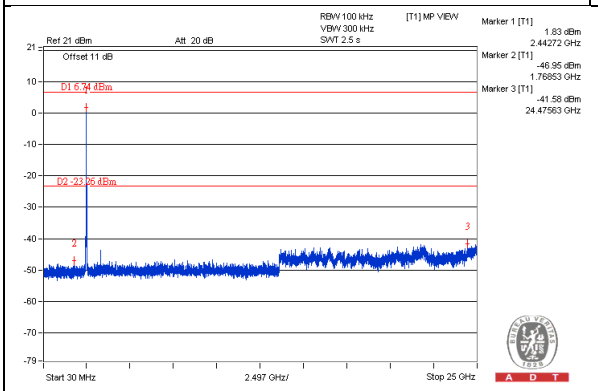
CH 3



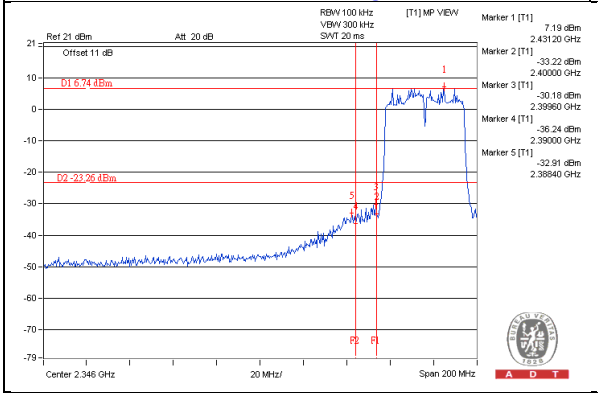
CH 6



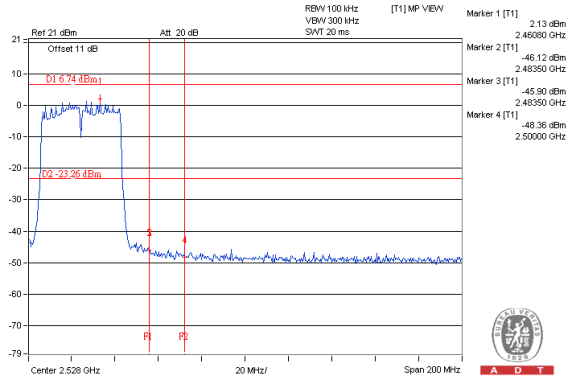
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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Web Site: www.bureauveritas-adt.com

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

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