FCC Test Report

Report No.:	RF150202C14
FCC ID:	MSQ-RT1D00
Test Model:	RT-AC1200
Series Model:	RT-N600
Received Date:	Feb. 02, 2015
Test Date:	Apr. 13 ~ May 06, 2015
Issued Date:	May 18, 2015
Applicant:	ASUSTeK COMPUTER INC.
Address:	4F, NO. 150, Li-Te Rd. Peitou, Taipei Taiwan
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
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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Release Control Record

Issue No.	Description	Date Issued
RF150202C14	Original release.	May 18, 2015

1 Certificate of Conformity

Product:	Wireless-AC1200 Dual Band USB Router
Brand:	ASUS
Test Model:	RT-AC1200
Series Model:	RT-N600
Sample Status:	Engineering sample
Applicant:	ASUSTeK COMPUTER INC.
Test Date:	Apr. 13 ~ May 06, 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 18, 2015

Pettie Chen / Senior Specialist

Approved by : _____ , **Date:** May 18, 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 -6.22dB at 0.40800MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.7dB at 2483.5MHz.
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	Wireless-AC1200 Dual Band USB Router
Brand	ASUS
Test Model	RT-AC1200
Series Model	RT-N600
Model Difference	Marketing purpose
Status of EUT	Engineering sample
Power Supply Rating	12Vdc (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 802.11n: up to 300.0Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	2.4GHz: 2412 ~ 2462MHz 5.0GHz: 5745 ~ 5825MHz
Number of Channel	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) 5.0GHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
Output Power	2.4GHz: 802.11b: Chain 0: 125.314mW, Chain 1: 113.763mW, Total Power: 239.077mW 802.11g: Chain 0: 122.462mW, Chain 1: 103.514mW, Total Power: 225.976mW 802.11n (HT20): Chain 0: 121.060mW, Chain 1: 102.329mW, Total Power: 223.389mW 802.11n (HT40): Chain 0: 32.285mW, Chain 1: 28.314mW, Total Power: 60.599mW 5.0GHz: 802.11a: Chain 0: 167.109mW, Chain 1: 153.815mW, Total Power: 320.924mW 802.11n (HT20): Chain 0: 131.220mW, Chain 1: 148.936mW, Total Power: 280.156mW 802.11n (HT40): Chain 0: 164.059mW, Chain 1: 161.065mW, Total Power: 325.124mW 802.11ac (VHT80): Chain 0: 118.577mW, Chain 1: 89.331mW, Total Power: 207.908mW
Antenna Type	Dipole antenna with 5dBi gain
Antenna Connector	RSMA

Accessory Device	Adapter
Data Cable Supplied	NA

Note:

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

Modulation Mode	TX Function
802.11b	2TX
802.11g	2TX
802.11a	2TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX
802.11ac (VHT80)	2TX

2. All models are listed as below.

Brand	Model	Difference
ASUS	RT-AC1200	All models are electrically identical, different model names are for marketing purpose.
	RT-N600	

*Model: RT-AC1200 is for the final tests.

3. The EUT uses following adapters.

Adapter 1	
Brand	Shenzhen Gongjin Electronics Co., Ltd.
Model	S18B72-120A150-0K
Input Power	100-240Vac~ 50/60Hz, Max.0.7A
Output Power	12Vdc/ 1.5A
Power Line	1.4m non-shielded without core

Adapter 2	
Brand	Ruide Electronical Industrial Shenzhen Co., Ltd.
Model	RD1201500-C55-1MG
Input Power	100-240Vac~ 50/60Hz, 0.6A Max
Output Power	12Vdc/ 1.5A
Power Line	1.5m non-shielded without core

4. 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

For 2.4GHz:

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		

For 5.0GHz (5745 ~ 5825MHz):

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

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	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from 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 **Z-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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	802.11n (HT40)	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	1	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	1	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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Ted Chang
RE<1G	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
PLC	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
APCM	25deg. C, 60%RH	120Vac, 60Hz	Giyn He

FOR 5.0GHz:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from 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 **Z-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 (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (VHT80)	155	155	OFDM	BPSK	65.0

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 (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (VHT80)	155	155	OFDM	BPSK	65.0

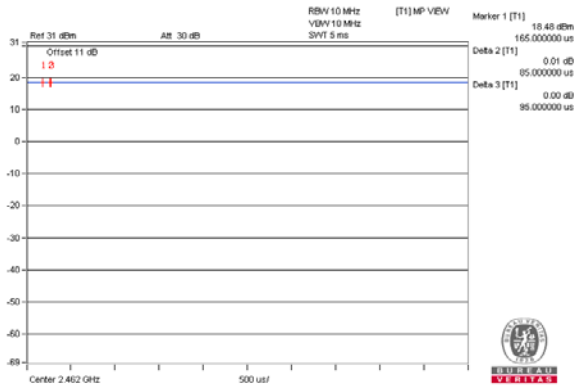
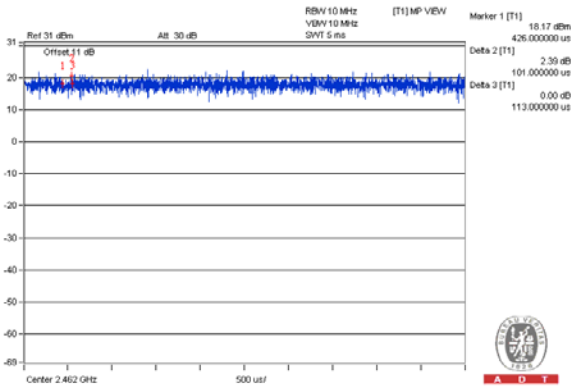
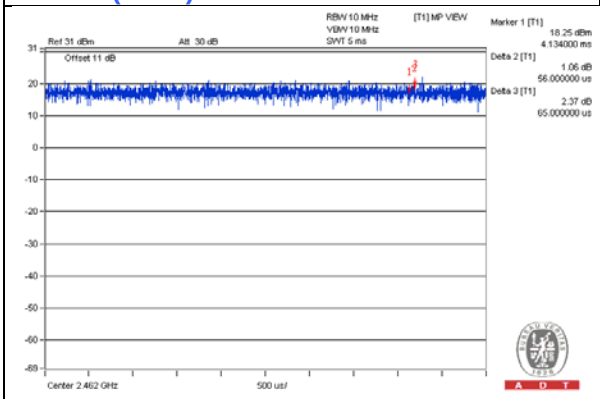
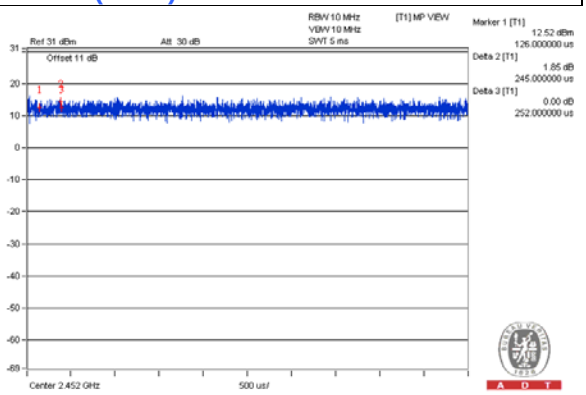
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Ted Chang
RE<1G	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
PLC	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jun Wu

3.3 Duty Cycle of Test Signal

2.4GHz Band:

Duty cycle of test signal is 100 %, duty factor is not required.

802.11b	802.11g
	
802.11n (HT20)	**802.11n (HT40)**
	

5.0GHz Band:

802.11a: Duty cycle = 1.435/1.46 = 0.983

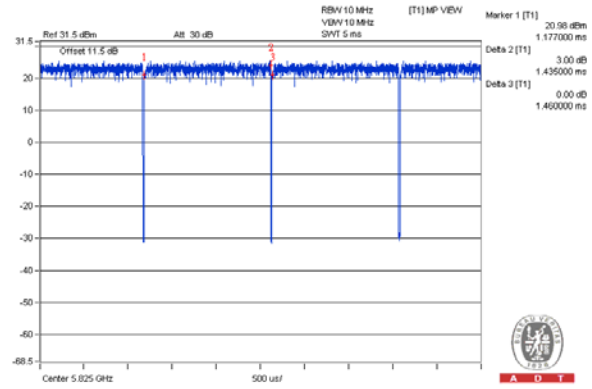
802.11n (HT20): Duty cycle = 1.346/1.363 = 0.988

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

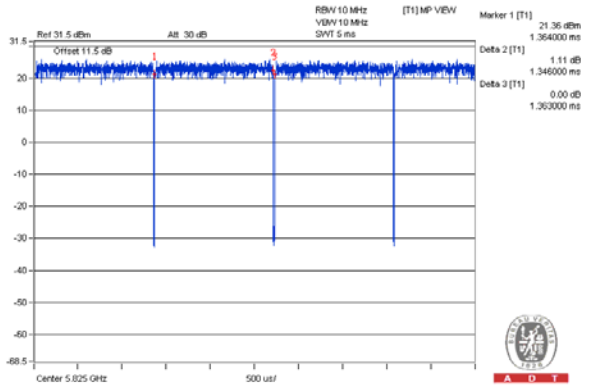
802.11n (HT40): Duty cycle = 0.666/0.682 = 0.977, Duty factor = 10 * log(1/0.977) = 0.10

802.11ac (VHT80): Duty cycle = 0.334/0.35 = 0.954, Duty factor = 10 * log(1/0.954) = 0.20

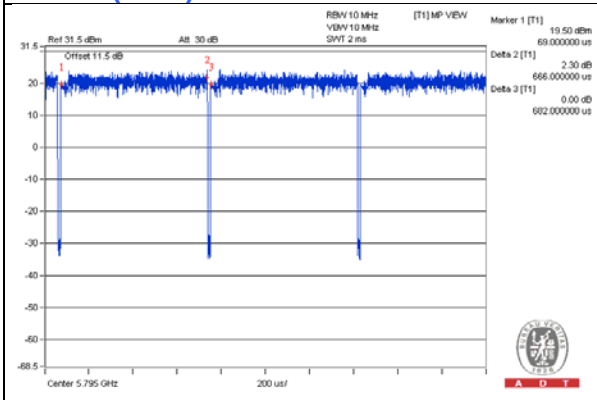
802.11a



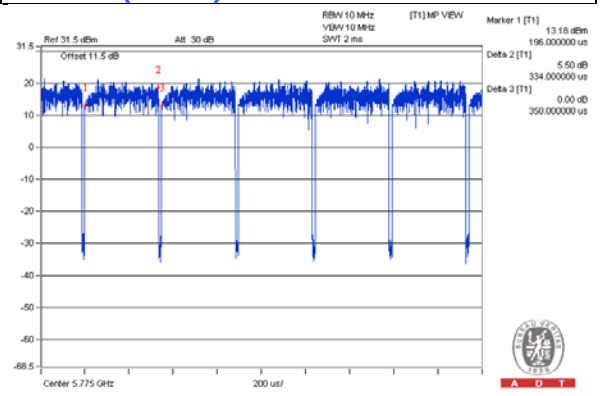
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	D531	CN-0XM006-48643-81 U-2973	QDS-BRCM1020	-
B.	Dongle	SANDISK	SDCZ6-1024	N/A	NA	-
C.	Load	NA	NA	NA	NA	-

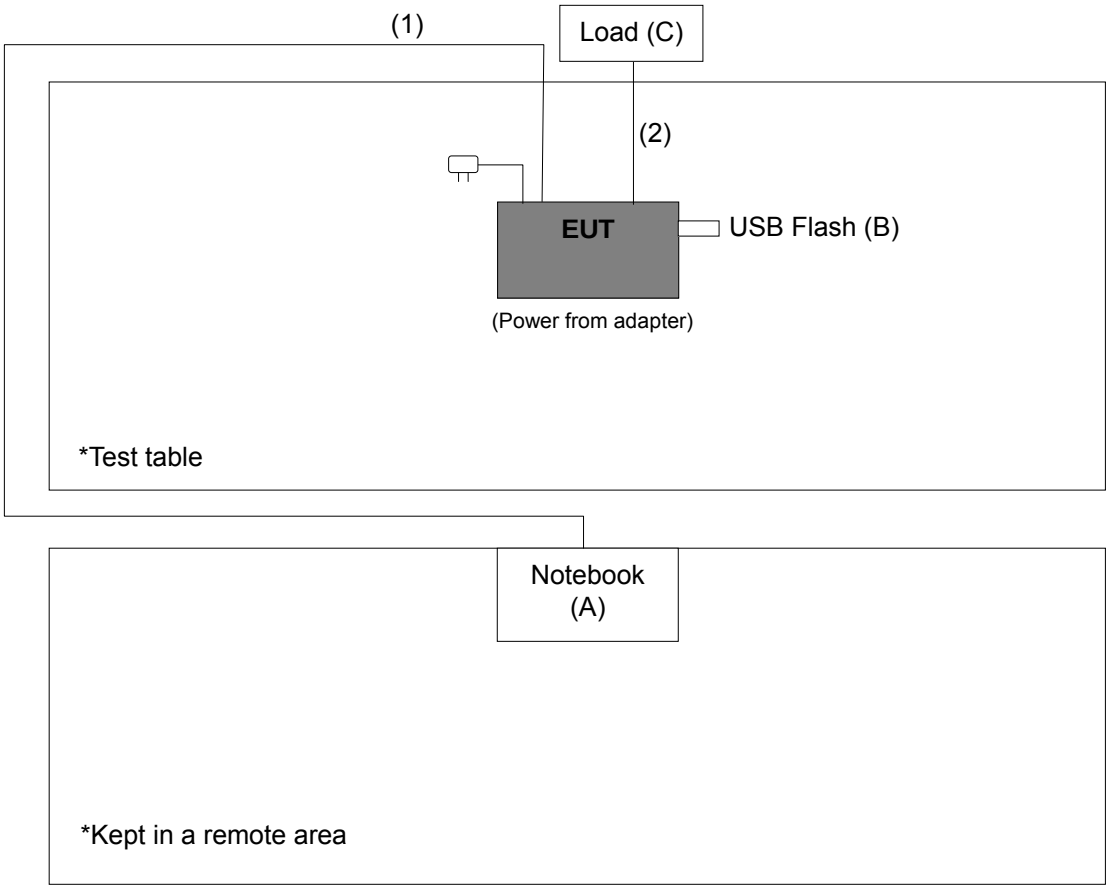
Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45	1	10	N	0	-
2.	RJ45	3	1.8	N	0	-

Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)
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 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:

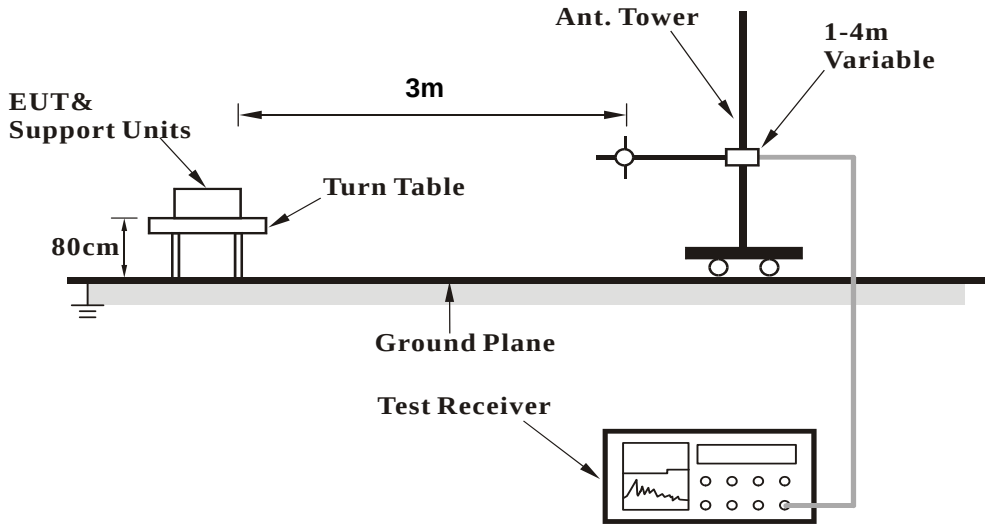
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution 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

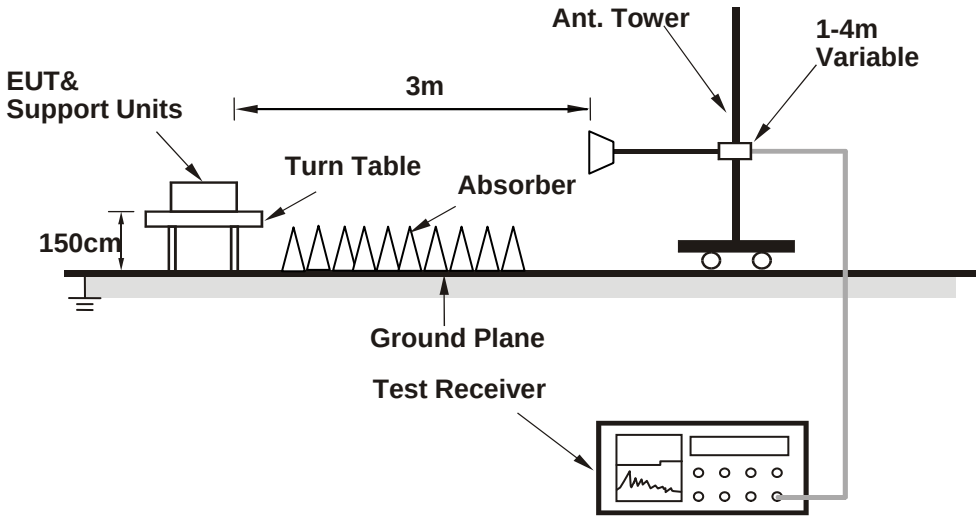
No deviation.

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	58.2 PK	74.0	-15.8	1.03 H	122	25.20	33.00
2	2390.00	46.1 AV	54.0	-7.9	1.03 H	122	13.10	33.00
3	*2412.00	94.5 PK			1.03 H	122	61.40	33.10
4	*2412.00	90.7 AV			1.03 H	122	57.60	33.10
5	4824.00	51.0 PK	74.0	-23.0	1.66 H	78	49.20	1.80
6	4824.00	44.2 AV	54.0	-9.8	1.66 H	78	42.40	1.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.9 PK	74.0	-14.1	1.81 V	204	26.90	33.00
2	2390.00	50.8 AV	54.0	-3.2	1.81 V	204	17.80	33.00
3	*2412.00	108.7 PK			1.65 V	358	75.60	33.10
4	*2412.00	104.9 AV			1.65 V	358	71.80	33.10
5	4824.00	50.7 PK	74.0	-23.3	1.38 V	359	48.90	1.80
6	4824.00	42.6 AV	54.0	-11.4	1.38 V	359	40.80	1.80

REMARKS:

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

CHANNEL	TX Channel 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	98.1 PK			1.02 H	120	64.80	33.30
2	*2437.00	94.2 AV			1.02 H	120	60.90	33.30
3	4874.00	53.5 PK	74.0	-20.5	1.30 H	87	51.60	1.90
4	4874.00	49.2 AV	54.0	-4.8	1.30 H	87	47.30	1.90
5	7311.00	57.1 PK	74.0	-16.9	1.26 H	57	48.60	8.50
6	7311.00	47.0 AV	54.0	-7.0	1.26 H	57	38.50	8.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	112.6 PK			1.78 V	34	79.30	33.30
2	*2437.00	108.8 AV			1.78 V	34	75.50	33.30
3	4874.00	51.6 PK	74.0	-22.4	1.55 V	352	49.70	1.90
4	4874.00	46.3 AV	54.0	-7.7	1.55 V	352	44.40	1.90
5	7311.00	55.5 PK	74.0	-18.5	1.75 V	327	47.00	8.50
6	7311.00	43.7 AV	54.0	-10.3	1.75 V	327	35.20	8.50

REMARKS:

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

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	92.5 PK			1.00 H	116	59.10	33.40
2	*2462.00	88.8 AV			1.00 H	116	55.40	33.40
3	2483.50	58.8 PK	74.0	-15.2	1.00 H	116	25.40	33.40
4	2483.50	46.3 AV	54.0	-7.7	1.00 H	116	12.90	33.40
5	4924.00	50.1 PK	74.0	-23.9	1.05 H	78	48.10	2.00
6	4924.00	42.4 AV	54.0	-11.6	1.05 H	78	40.40	2.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.5 PK			1.74 V	33	73.10	33.40
2	*2462.00	102.7 AV			1.74 V	33	69.30	33.40
3	2483.50	60.3 PK	74.0	-13.7	1.89 V	354	26.90	33.40
4	2483.50	48.2 AV	54.0	-5.8	1.89 V	354	14.80	33.40
5	4924.00	47.5 PK	74.0	-26.5	1.00 V	219	45.50	2.00
6	4924.00	37.0 AV	54.0	-17.0	1.00 V	219	35.00	2.00

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.6 PK	74.0	-16.4	1.00 H	68	24.60	33.00
2	2390.00	45.5 AV	54.0	-8.5	1.00 H	68	12.50	33.00
3	*2412.00	94.9 PK			1.01 H	237	61.80	33.10
4	*2412.00	85.0 AV			1.01 H	237	51.90	33.10
5	4824.00	47.4 PK	74.0	-26.6	1.00 H	25	45.60	1.80
6	4824.00	35.3 AV	54.0	-18.7	1.00 H	25	33.50	1.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.2 PK	74.0	-12.8	1.94 V	224	28.20	33.00
2	2390.00	48.4 AV	54.0	-5.6	1.94 V	224	15.40	33.00
3	*2412.00	107.2 PK			2.19 V	8	74.10	33.10
4	*2412.00	97.7 AV			2.19 V	8	64.60	33.10
5	4824.00	47.3 PK	74.0	-26.7	1.00 V	205	45.50	1.80
6	4824.00	34.4 AV	54.0	-19.6	1.00 V	205	32.60	1.80

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.5 PK	74.0	-16.5	1.78 H	3	24.50	33.00
2	2390.00	45.6 AV	54.0	-8.4	1.78 H	3	12.60	33.00
3	*2437.00	99.6 PK			1.00 H	174	66.30	33.30
4	*2437.00	89.4 AV			1.00 H	174	56.10	33.30
5	2483.50	58.4 PK	74.0	-15.6	1.77 H	6	25.00	33.40
6	2483.50	46.6 AV	54.0	-7.4	1.77 H	6	13.20	33.40
7	4874.00	49.2 PK	74.0	-24.8	1.65 H	18	47.30	1.90
8	4874.00	36.8 AV	54.0	-17.2	1.65 H	18	34.90	1.90
9	7311.00	54.2 PK	74.0	-19.8	1.05 H	64	45.70	8.50
10	7311.00	42.1 AV	54.0	-11.9	1.05 H	64	33.60	8.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.0 PK	74.0	-13.0	1.78 V	6	28.00	33.00
2	2390.00	48.1 AV	54.0	-5.9	1.78 V	6	15.10	33.00
3	*2437.00	114.8 PK			1.78 V	5	81.50	33.30
4	*2437.00	105.1 AV			1.78 V	5	71.80	33.30
5	2483.50	68.0 PK	74.0	-6.0	1.78 V	5	34.60	33.40
6	2483.50	49.9 AV	54.0	-4.1	1.78 V	5	16.50	33.40
7	4874.00	49.2 PK	74.0	-24.8	1.55 V	355	47.30	1.90
8	4874.00	36.1 AV	54.0	-17.9	1.55 V	355	34.20	1.90
9	7311.00	55.1 PK	74.0	-18.9	1.55 V	70	46.60	8.50
10	7311.00	42.0 AV	54.0	-12.0	1.55 V	70	33.50	8.50

REMARKS:

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

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	99.0 PK			1.01 H	249	65.60	33.40
2	*2462.00	89.0 AV			1.01 H	249	55.60	33.40
3	2483.50	58.0 PK	74.0	-16.0	1.01 H	249	24.60	33.40
4	2483.50	45.8 AV	54.0	-8.2	1.01 H	249	12.40	33.40
5	4924.00	47.7 PK	74.0	-26.3	1.02 H	64	45.70	2.00
6	4924.00	34.6 AV	54.0	-19.4	1.02 H	64	32.60	2.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.7 PK			1.75 V	10	74.30	33.40
2	*2462.00	97.7 AV			1.75 V	10	64.30	33.40
3	2483.50	66.2 PK	74.0	-7.8	1.71 V	10	32.80	33.40
4	2483.50	51.3 AV	54.0	-2.7	1.71 V	10	17.90	33.40
5	4924.00	47.3 PK	74.0	-26.7	1.71 V	51	45.30	2.00
6	4924.00	35.5 AV	54.0	-18.5	1.71 V	51	33.50	2.00

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.0 PK	74.0	-17.0	1.17 H	237	24.00	33.00
2	2390.00	45.4 AV	54.0	-8.6	1.17 H	237	12.40	33.00
3	*2412.00	96.6 PK			1.17 H	237	63.50	33.10
4	*2412.00	86.8 AV			1.17 H	237	53.70	33.10
5	4824.00	46.1 PK	74.0	-27.9	1.00 H	44	44.30	1.80
6	4824.00	34.3 AV	54.0	-19.7	1.00 H	44	32.50	1.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.5 PK	74.0	-8.5	1.66 V	9	32.50	33.00
2	2390.00	52.1 AV	54.0	-1.9	1.66 V	9	19.10	33.00
3	*2412.00	111.1 PK			1.64 V	8	78.00	33.10
4	*2412.00	101.8 AV			1.64 V	8	68.70	33.10
5	4824.00	46.8 PK	74.0	-27.2	1.21 V	360	45.00	1.80
6	4824.00	33.8 AV	54.0	-20.2	1.21 V	360	32.00	1.80

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.5 PK	74.0	-16.5	1.01 H	248	24.50	33.00
2	2390.00	45.5 AV	54.0	-8.5	1.01 H	248	12.50	33.00
3	*2437.00	105.0 PK			1.01 H	248	71.70	33.30
4	*2437.00	94.7 AV			1.01 H	248	61.40	33.30
5	2483.50	59.6 PK	74.0	-14.4	1.01 H	248	26.20	33.40
6	2483.50	46.0 AV	54.0	-8.0	1.01 H	248	12.60	33.40
7	4874.00	47.1 PK	74.0	-26.9	1.05 H	64	45.20	1.90
8	4874.00	36.4 AV	54.0	-17.6	1.05 H	64	34.50	1.90
9	7311.00	54.0 PK	74.0	-20.0	1.02 H	64	45.50	8.50
10	7311.00	42.0 AV	54.0	-12.0	1.02 H	64	33.50	8.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.4 PK	74.0	-12.6	1.16 V	0	28.40	33.00
2	2390.00	48.3 AV	54.0	-5.7	1.16 V	0	15.30	33.00
3	*2437.00	115.0 PK			1.54 V	96	81.70	33.30
4	*2437.00	104.9 AV			1.54 V	96	71.60	33.30
5	2483.50	68.4 PK	74.0	-5.6	1.37 V	220	35.00	33.40
6	2483.50	50.1 AV	54.0	-3.9	1.37 V	220	16.70	33.40
7	4874.00	48.9 PK	74.0	-25.1	1.02 V	64	47.00	1.90
8	4874.00	36.4 AV	54.0	-17.6	1.02 V	64	34.50	1.90
9	7311.00	53.7 PK	74.0	-20.3	1.02 V	64	45.20	8.50
10	7311.00	42.0 AV	54.0	-12.0	1.02 V	64	33.50	8.50

REMARKS:

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

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	96.9 PK			1.01 H	247	63.50	33.40
2	*2462.00	86.1 AV			1.01 H	247	52.70	33.40
3	2483.50	57.8 PK	74.0	-16.2	1.01 H	247	24.40	33.40
4	2483.50	45.7 AV	54.0	-8.3	1.01 H	247	12.30	33.40
5	4924.00	47.5 PK	74.0	-26.5	1.02 H	64	45.50	2.00
6	4924.00	34.6 AV	54.0	-19.4	1.02 H	64	32.60	2.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.2 PK			1.27 V	5	73.80	33.40
2	*2462.00	97.6 AV			1.27 V	5	64.20	33.40
3	2483.50	67.6 PK	74.0	-6.4	1.27 V	5	34.20	33.40
4	2483.50	51.6 AV	54.0	-2.4	1.27 V	5	18.20	33.40
5	4924.00	48.0 PK	74.0	-26.0	1.05 V	64	46.00	2.00
6	4924.00	37.4 AV	54.0	-16.6	1.05 V	64	35.40	2.00

REMARKS:

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

802.11n (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	56.6 PK	74.0	-17.4	1.03 H	247	23.60	33.00
2	2390.00	45.7 AV	54.0	-8.3	1.03 H	247	12.70	33.00
3	*2422.00	94.1 PK			1.03 H	247	60.90	33.20
4	*2422.00	83.8 AV			1.03 H	247	50.60	33.20
5	4844.00	47.4 PK	74.0	-26.6	1.05 H	6	45.60	1.80
6	4844.00	34.3 AV	54.0	-19.7	1.05 H	6	32.50	1.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.2 PK	74.0	-10.8	1.65 V	9	30.20	33.00
2	2390.00	50.3 AV	54.0	-3.7	1.65 V	9	17.30	33.00
3	*2422.00	102.2 PK			1.64 V	17	69.00	33.20
4	*2422.00	92.9 AV			1.64 V	17	59.70	33.20
5	4844.00	47.4 PK	74.0	-26.6	1.05 V	64	45.60	1.80
6	4844.00	34.3 AV	54.0	-19.7	1.05 V	64	32.50	1.80

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.0 PK	74.0	-17.0	1.02 H	248	24.00	33.00
2	2390.00	45.5 AV	54.0	-8.5	1.02 H	248	12.50	33.00
3	*2437.00	94.3 PK			1.02 H	248	61.00	33.30
4	*2437.00	83.8 AV			1.02 H	248	50.50	33.30
5	2483.50	58.6 PK	74.0	-15.4	1.02 H	248	25.20	33.40
6	2483.50	46.0 AV	54.0	-8.0	1.02 H	248	12.60	33.40
7	4874.00	47.5 PK	74.0	-26.5	1.02 H	88	45.60	1.90
8	4874.00	34.4 AV	54.0	-19.6	1.02 H	88	32.50	1.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.4 PK	74.0	-14.6	1.12 V	333	26.40	33.00
2	2390.00	48.4 AV	54.0	-5.6	1.12 V	333	15.40	33.00
3	*2437.00	105.3 PK			1.12 V	17	72.00	33.30
4	*2437.00	95.3 AV			1.12 V	17	62.00	33.30
5	2483.50	66.3 PK	74.0	-7.7	1.57 V	219	32.90	33.40
6	2483.50	51.4 AV	54.0	-2.6	1.57 V	219	18.00	33.40
7	4874.00	47.9 PK	74.0	-26.1	1.05 V	64	46.00	1.90
8	4874.00	35.4 AV	54.0	-18.6	1.05 V	64	33.50	1.90

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	93.2 PK			1.02 H	244	59.90	33.30
2	*2452.00	83.0 AV			1.02 H	244	49.70	33.30
3	2483.50	58.4 PK	74.0	-15.6	1.02 H	244	25.00	33.40
4	2483.50	45.8 AV	54.0	-8.2	1.02 H	244	12.40	33.40
5	4904.00	47.2 PK	74.0	-26.8	1.05 H	24	45.20	2.00
6	4904.00	34.5 AV	54.0	-19.5	1.05 H	24	32.50	2.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	101.9 PK			1.29 V	14	68.60	33.30
2	*2452.00	91.9 AV			1.29 V	14	58.60	33.30
3	2483.50	64.8 PK	74.0	-9.2	1.58 V	359	31.40	33.40
4	**2483.50**	**52.3 AV**	**54.0**	**-1.7**	**1.58 V**	**359**	**18.90**	**33.40**
5	4904.00	48.5 PK	74.0	-25.5	1.05 V	64	46.50	2.00
6	4904.00	36.2 AV	54.0	-17.8	1.05 V	64	34.20	2.00

REMARKS:

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

Below 1GHz Data:

802.11g

CHANNEL	TX Channel 1	**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	41.64	22.1 QP	40.0	-17.9	1.99 H	127	36.90	-14.80
2	480.08	32.9 QP	46.0	-13.1	1.99 H	187	42.00	-9.10
3	827.34	33.8 QP	46.0	-12.2	1.00 H	10	36.20	-2.40
4	887.48	29.4 QP	46.0	-16.6	1.00 H	10	31.00	-1.60
5	922.40	30.1 QP	46.0	-15.9	1.00 H	188	30.80	-0.70
6	961.20	48.9 QP	54.0	-5.1	1.00 H	185	49.10	-0.20
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	35.82	34.9 QP	40.0	-5.1	1.00 V	244	50.50	-15.60
2	62.98	34.8 QP	40.0	-5.2	1.00 V	64	50.00	-15.20
3	105.66	32.7 QP	43.5	-10.8	1.00 V	282	50.50	-17.80
4	148.34	31.7 QP	43.5	-11.8	1.00 V	204	45.90	-14.20
5	827.34	35.4 QP	46.0	-10.6	1.99 V	11	37.80	-2.40
6	961.20	49.8 QP	54.0	-4.2	1.00 V	156	50.00	-0.20

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 1	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	103.72	27.0 QP	43.5	-16.5	1.49 H	283	45.30	-18.30
2	128.94	30.0 QP	43.5	-13.5	1.49 H	227	45.50	-15.50
3	299.66	29.2 QP	46.0	-16.8	1.00 H	9	41.80	-12.60
4	480.08	30.7 QP	46.0	-15.3	1.49 H	214	39.80	-9.10
5	932.10	29.4 QP	46.0	-16.6	1.00 H	324	30.00	-0.60
6	961.20	46.5 QP	54.0	-7.5	1.49 H	305	46.70	-0.20
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	35.82	34.7 QP	40.0	-5.3	1.01 V	169	50.30	-15.60
2	64.92	34.6 QP	40.0	-5.4	1.01 V	345	49.90	-15.30
3	103.72	32.8 QP	43.5	-10.7	1.01 V	294	51.10	-18.30
4	142.52	31.4 QP	43.5	-12.1	1.01 V	34	46.00	-14.60
5	935.98	30.2 QP	46.0	-15.8	1.50 V	218	30.80	-0.60
6	961.20	48.0 QP	54.0	-6.0	1.01 V	69	48.20	-0.20

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

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	ESCI	100613	Nov. 11, 2014	Nov. 10, 2015
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 02, 2015	Mar. 01, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 21, 2014	Jul. 20, 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 1.
3. The VCCI Site Registration No. is C-2040.

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.

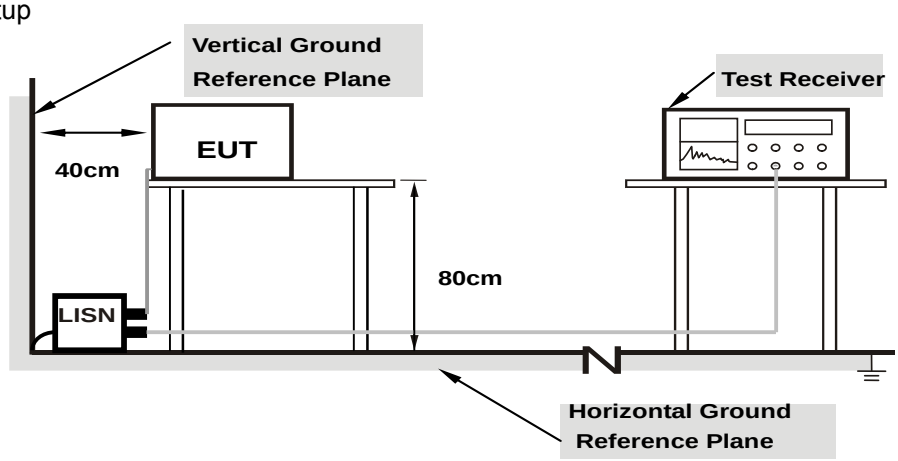
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

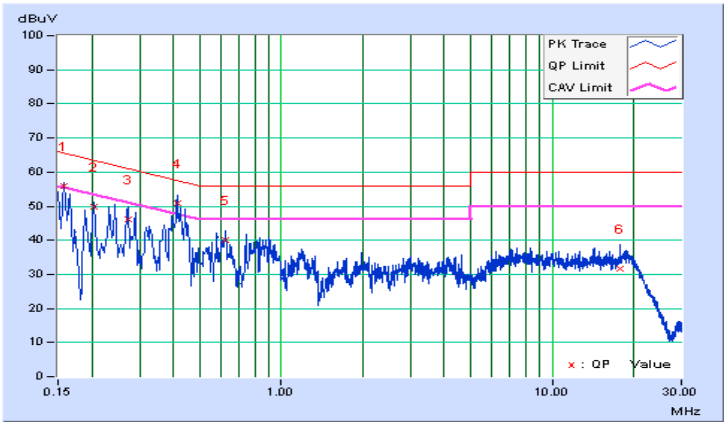
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [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	0.15782	0.05	55.87	42.72	55.92	42.77	65.58	55.58	-9.66	-12.81
2	0.20458	0.06	49.65	36.40	49.71	36.46	63.42	53.42	-13.71	-16.96
3	0.27120	0.06	46.00	31.95	46.06	32.01	61.08	51.08	-15.02	-19.07
4	0.41197	0.06	50.88	40.66	50.94	40.72	57.61	47.61	-6.67	-6.89
5	0.62311	0.07	39.98	29.23	40.05	29.30	56.00	46.00	-15.95	-16.70
6	17.83102	0.80	30.75	25.04	31.55	25.84	60.00	50.00	-28.45	-24.16

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.

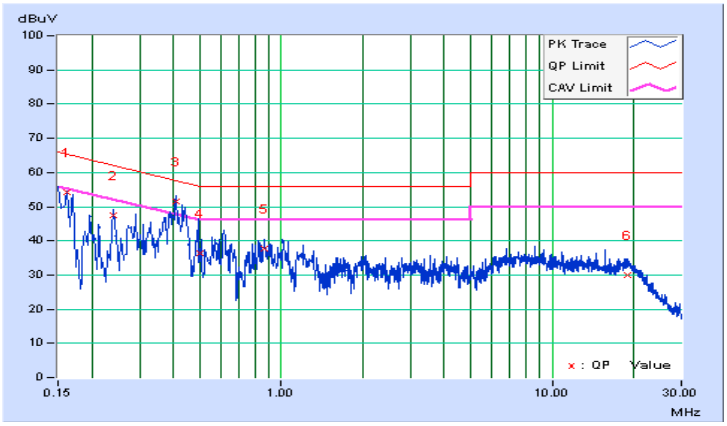


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value [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	0.16173	0.05	54.01	42.27	54.06	42.32	65.37	55.37	-11.31	-13.05
2	0.23993	0.05	47.28	35.04	47.33	35.09	62.10	52.10	-14.77	-17.01
3	0.40800	0.06	51.36	41.85	51.42	41.91	57.69	47.69	-6.27	-5.78
4	0.50000	0.06	36.14	23.54	36.20	23.60	56.00	46.00	-19.80	-22.40
5	0.86553	0.08	37.74	29.82	37.82	29.90	56.00	46.00	-18.18	-16.10
6	19.04703	0.70	29.31	23.80	30.01	24.50	60.00	50.00	-29.99	-25.50

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.

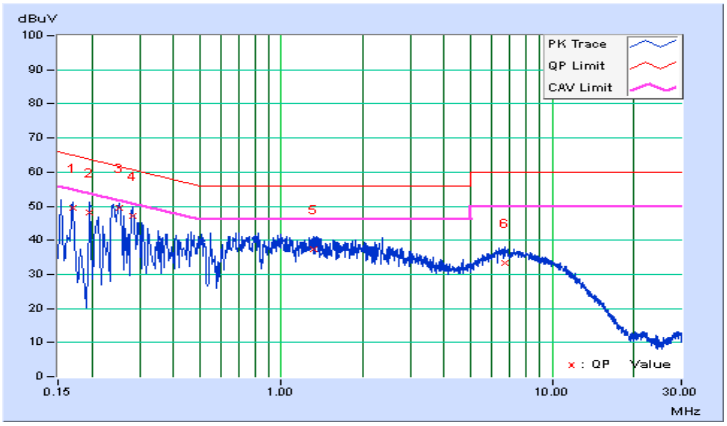


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.16955	0.05	49.32	36.73	49.37	36.78	64.98	54.98	-15.61	-18.20
2	0.19692	0.06	48.20	35.25	48.26	35.31	63.74	53.74	-15.48	-18.43
3	0.25166	0.06	49.29	39.93	49.35	39.99	61.70	51.70	-12.35	-11.71
4	0.28288	0.06	47.10	37.26	47.16	37.32	60.73	50.73	-13.57	-13.41
5	1.32488	0.09	37.15	27.06	37.24	27.15	56.00	46.00	-18.76	-18.85
6	6.73444	0.31	33.13	27.62	33.44	27.93	60.00	50.00	-26.56	-22.07

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.

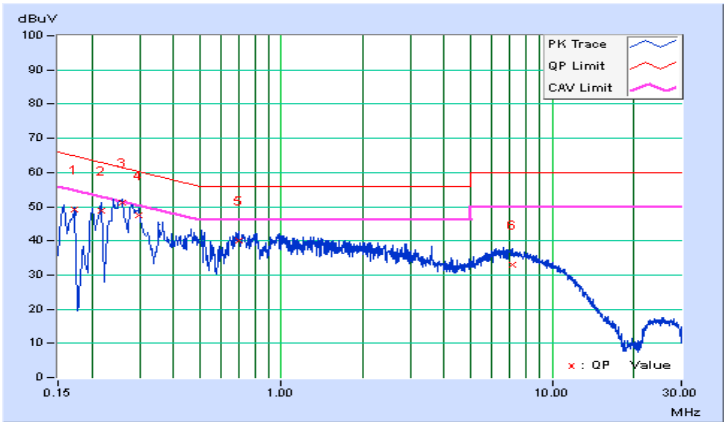


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value [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	0.17237	0.05	49.21	34.81	49.26	34.86	64.85	54.85	-15.59	-19.99
2	0.21621	0.05	48.88	35.64	48.93	35.69	62.96	52.96	-14.03	-17.27
3	0.25796	0.05	51.02	39.28	51.07	39.33	61.50	51.50	-10.42	-12.16
4	0.29819	0.05	47.59	36.36	47.64	36.41	60.29	50.29	-12.65	-13.88
5	0.69349	0.07	40.02	28.55	40.09	28.62	56.00	46.00	-15.91	-17.38
6	7.13717	0.31	32.60	27.70	32.91	28.01	60.00	50.00	-27.09	-21.99

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.

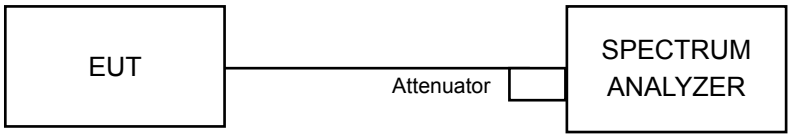


4.3 6dB Bandwidth Measurement

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	9.10	10.02	0.5	PASS
6	2437	10.04	10.04	0.5	PASS
11	2462	9.60	9.11	0.5	PASS

802.11g

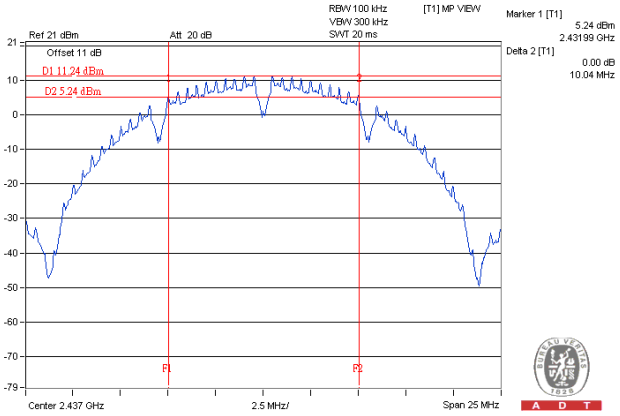
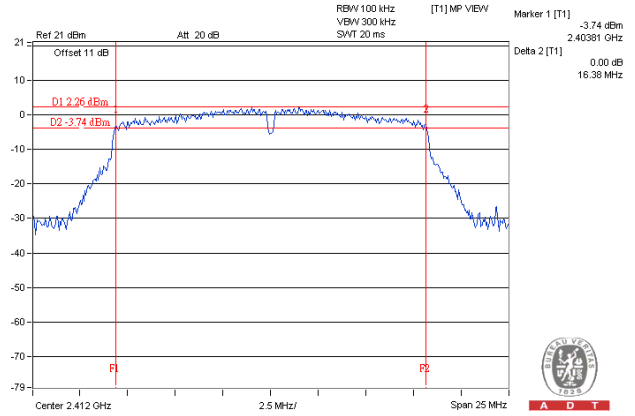
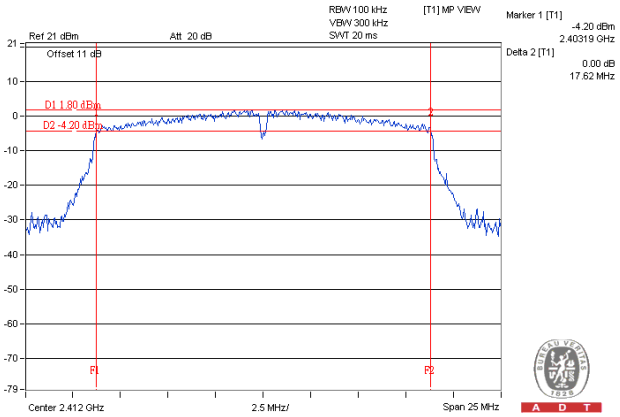
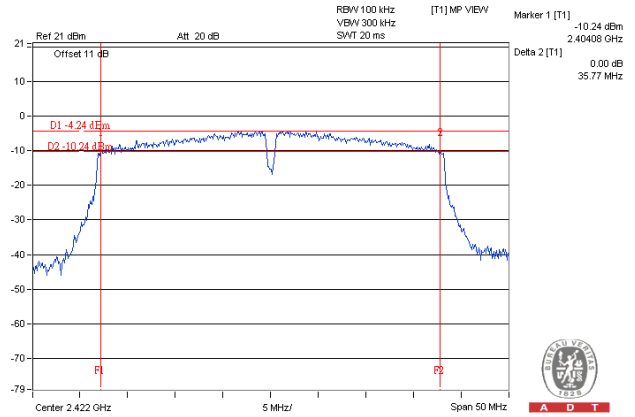
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.38	16.34	0.5	PASS
6	2437	16.36	16.36	0.5	PASS
11	2462	16.34	16.37	0.5	PASS

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.62	17.59	0.5	PASS
6	2437	17.61	17.59	0.5	PASS
11	2462	17.56	17.58	0.5	PASS

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.77	34.58	0.5	PASS
6	2437	35.55	35.69	0.5	PASS
9	2452	35.69	35.20	0.5	PASS

Spectrum Plot of Worst Value	
802.11b	**802.11g**
	
802.11n (HT20)	**802.11n (HT40)**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

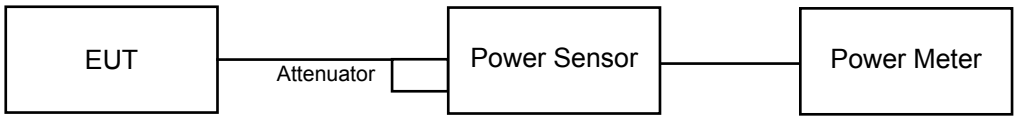
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

FOR AVERAGE POWER

802.11b

Chan.	Freq. (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	16.90	17.20	101.459	20.06	30	Pass
6	2437	20.98	20.56	**239.077**	23.79	30	Pass
11	2462	15.44	14.50	63.179	18.01	30	Pass

802.11g

Chan.	Freq. (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	15.87	15.40	73.311	18.65	30	Pass
6	2437	20.88	20.15	225.976	23.54	30	Pass
11	2462	14.51	13.20	49.142	16.91	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	15.09	14.98	63.762	18.05	30	Pass
6	2437	20.83	20.10	223.389	23.49	30	Pass
11	2462	14.49	13.22	49.108	16.91	30	Pass

802.11n (HT40)

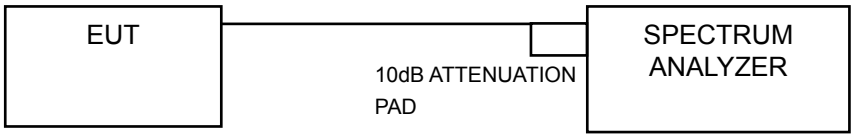
Chan.	Freq. (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	12.76	12.52	36.745	15.65	30	Pass
6	2437	15.09	14.52	60.599	17.82	30	Pass
9	2452	11.74	11.03	27.605	14.41	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-12.86	3.01	-9.85	5.99	Pass
	6	2437	-8.49	3.01	-5.48	5.99	Pass
	11	2462	-13.60	3.01	-10.59	5.99	Pass
1	1	2412	-12.85	3.01	-9.84	5.99	Pass
	6	2437	-8.88	3.01	-5.87	5.99	Pass
	11	2462	-14.29	3.01	-11.28	5.99	Pass

NOTE: Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi, so the power density limit shall be reduced to 8-(8.01-6) = 5.99dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-14.81	3.01	-11.80	5.99	Pass
	6	2437	-9.19	3.01	-6.18	5.99	Pass
	11	2462	-15.48	3.01	-12.47	5.99	Pass
1	1	2412	-14.84	3.01	-11.83	5.99	Pass
	6	2437	-10.06	3.01	-7.05	5.99	Pass
	11	2462	-16.81	3.01	-13.80	5.99	Pass

NOTE: Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi, so the power density limit shall be reduced to 8-(8.01-6) = 5.99dBm.

802.11n (HT20)

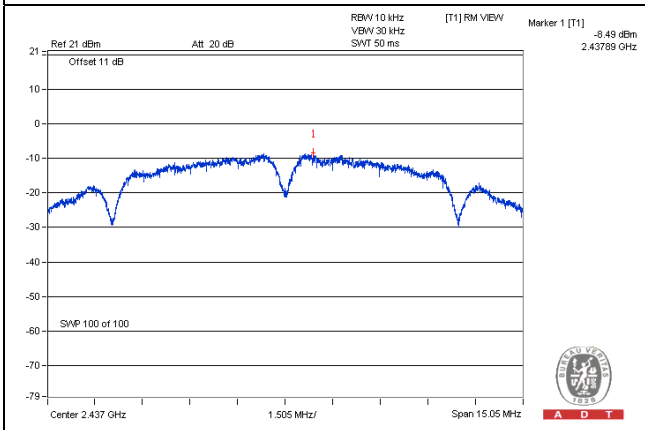
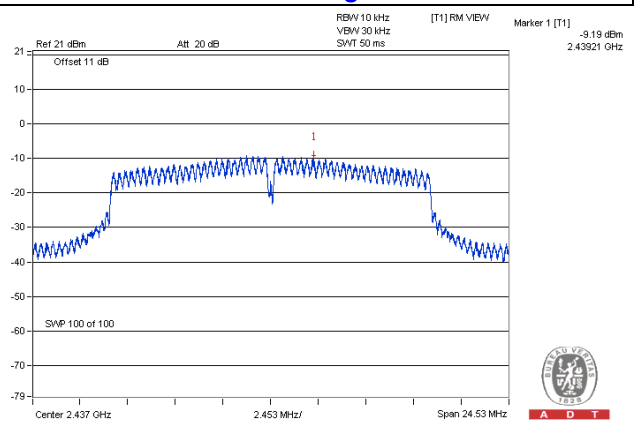
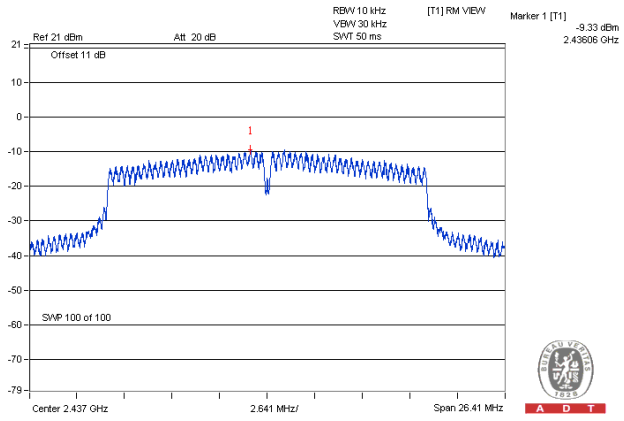
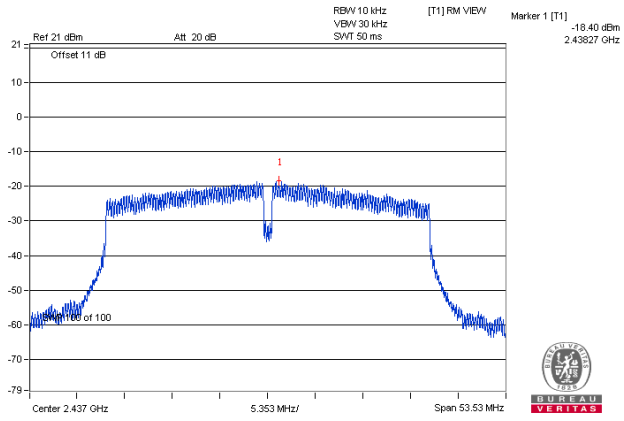
TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-15.09	3.01	-12.08	5.99	Pass
	6	2437	-9.33	3.01	-6.32	5.99	Pass
	11	2462	-16.01	3.01	-13.00	5.99	Pass
1	1	2412	-15.39	3.01	-12.38	5.99	Pass
	6	2437	-10.51	3.01	-7.50	5.99	Pass
	11	2462	-17.20	3.01	-14.19	5.99	Pass

NOTE: Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi, so the power density limit shall be reduced to 8-(8.01-6) = 5.99dBm.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	3	2422	-20.44	3.01	-17.43	5.99	Pass
	6	2437	-18.78	3.01	-15.77	5.99	Pass
	9	2452	-21.20	3.01	-18.19	5.99	Pass
1	3	2422	-20.94	3.01	-17.93	5.99	Pass
	6	2437	-18.40	3.01	-15.39	5.99	Pass
	9	2452	-21.73	3.01	-18.72	5.99	Pass

NOTE: Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi, so the power density limit shall be reduced to 8-(8.01-6) = 5.99dBm.

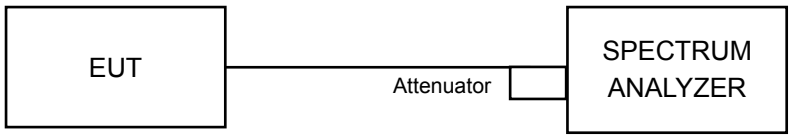
Spectrum Plot of Worst Value	
802.11b	**802.11g**
	
802.11n (HT20)	**802.11n (HT40)**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 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

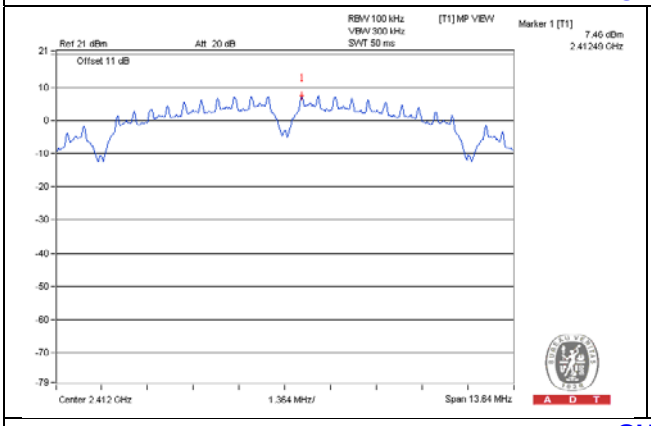
Same as Item 4.3.6

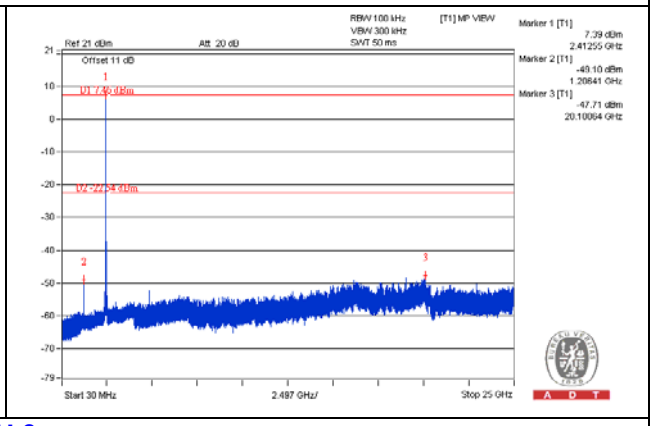
4.6.7 Test Results

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.

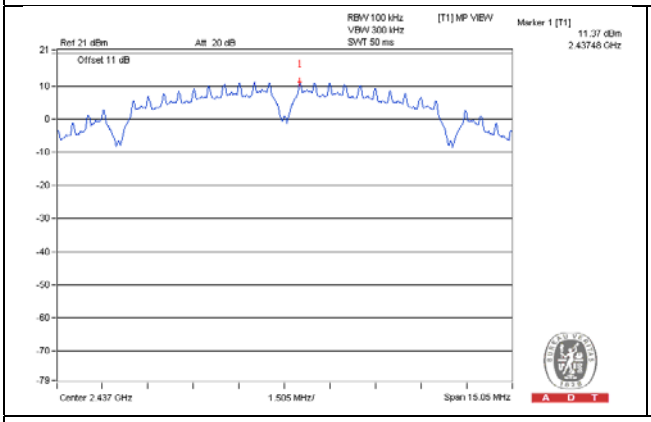
802.11b
CHAIN 0

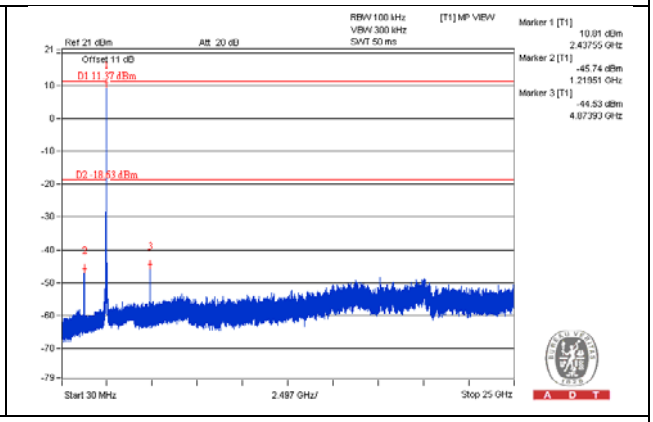
CH 1



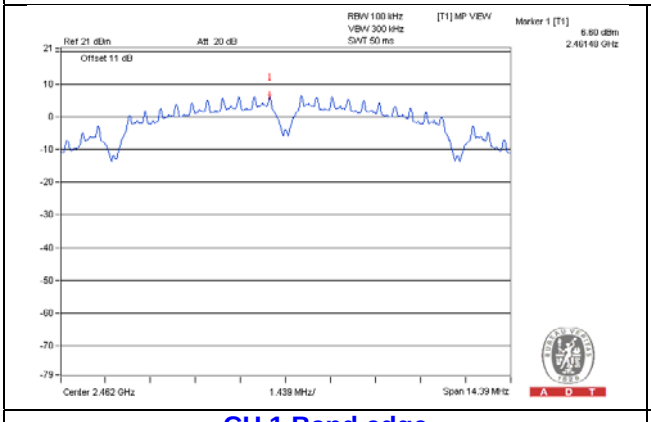


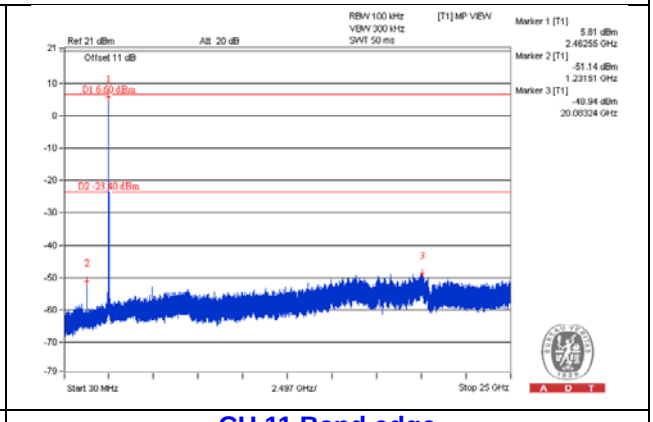
CH 6



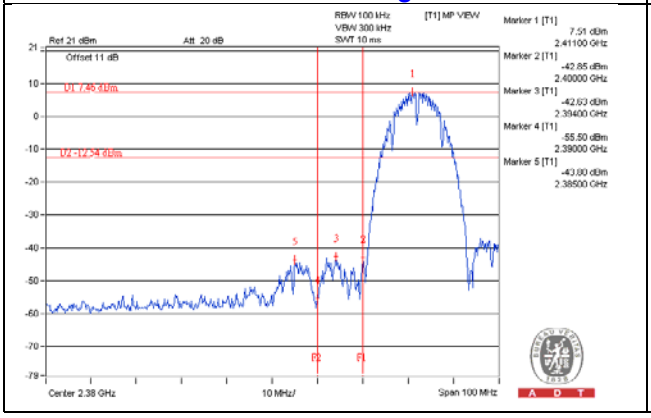


CH 11

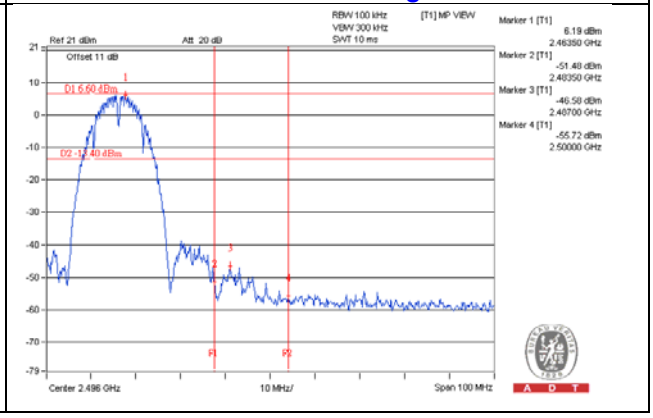




CH 1 Band edge

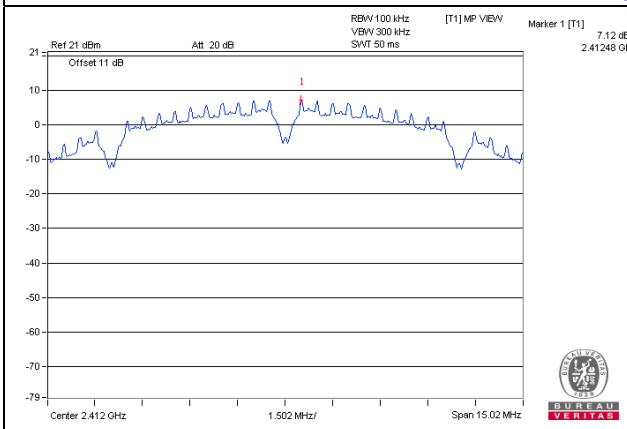


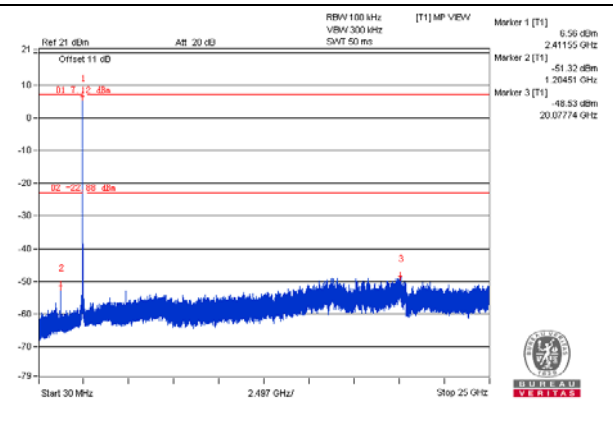
CH 11 Band edge



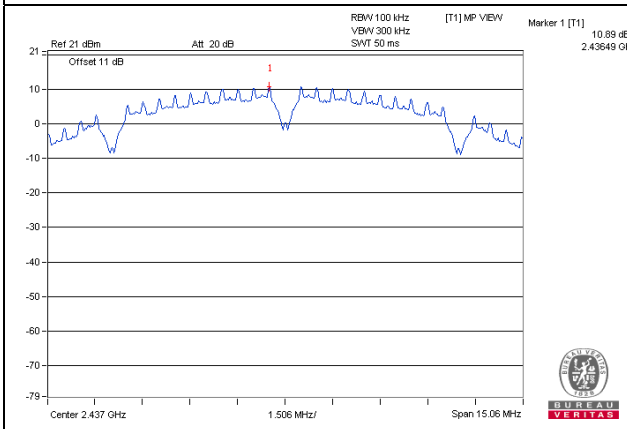
CHAIN 1

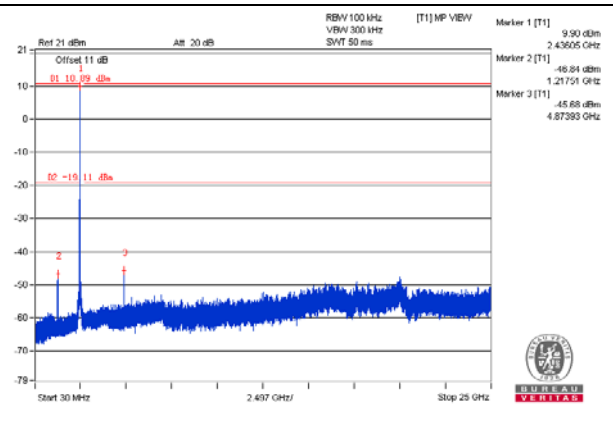
CH 1



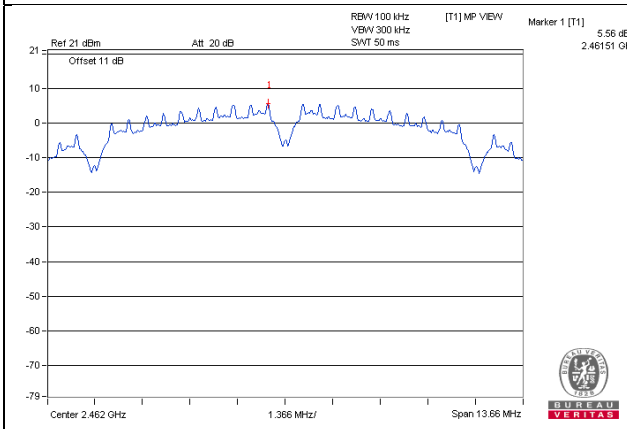


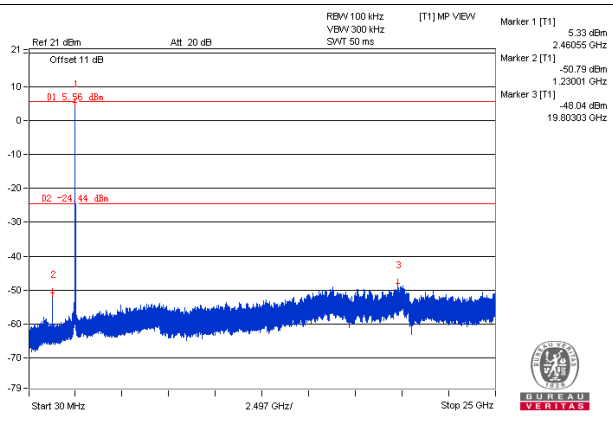
CH 6



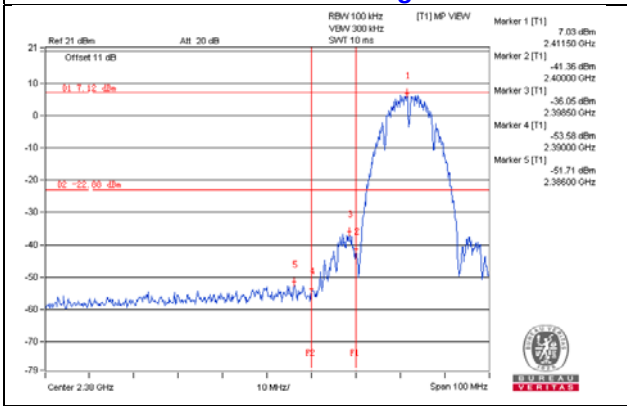


CH 11

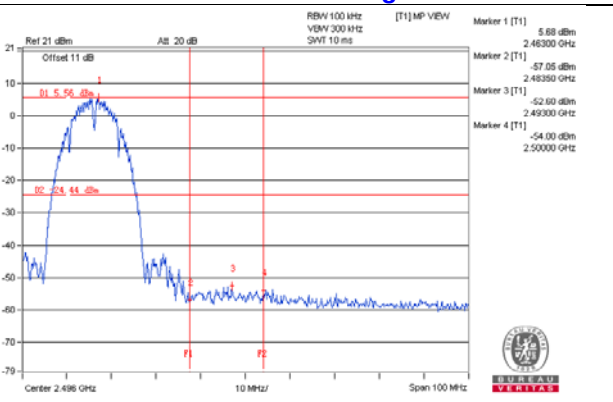




CH 1 Band edge

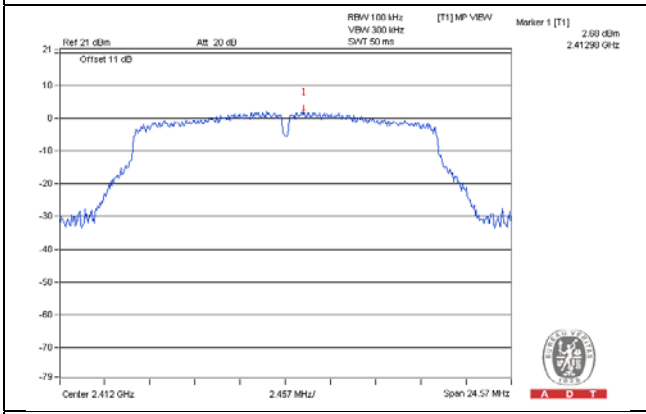


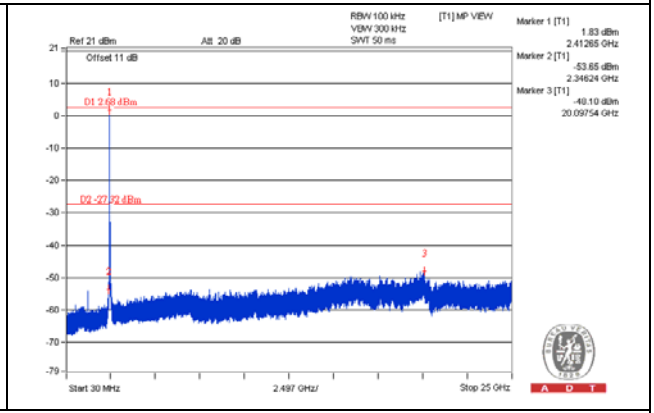
CH 11 Band edge



802.11g
CHAIN 0

CH 1





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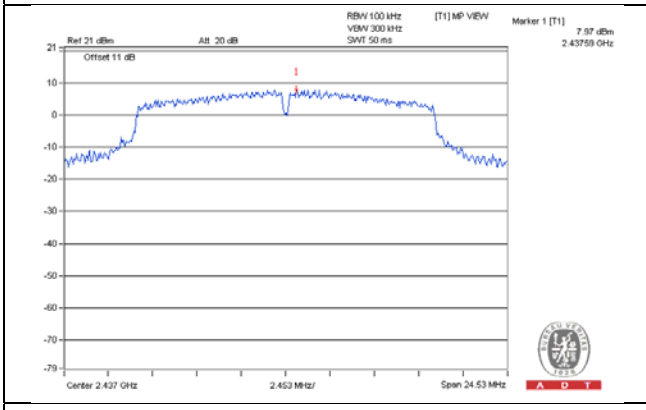

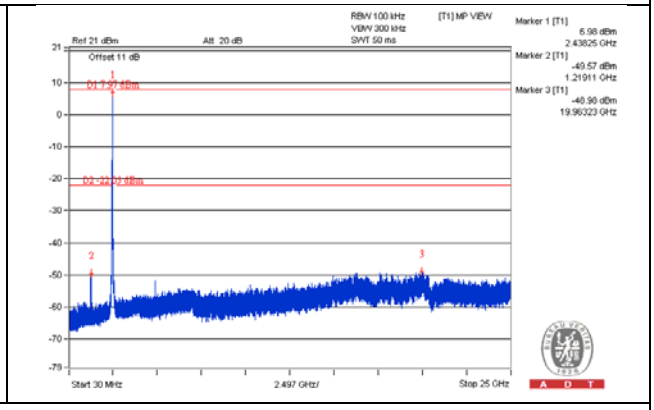

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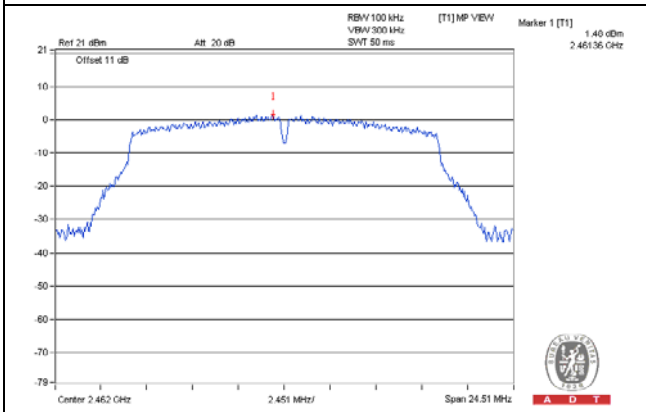

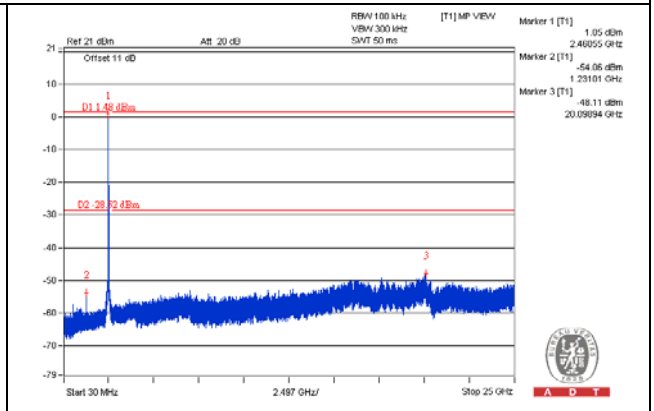

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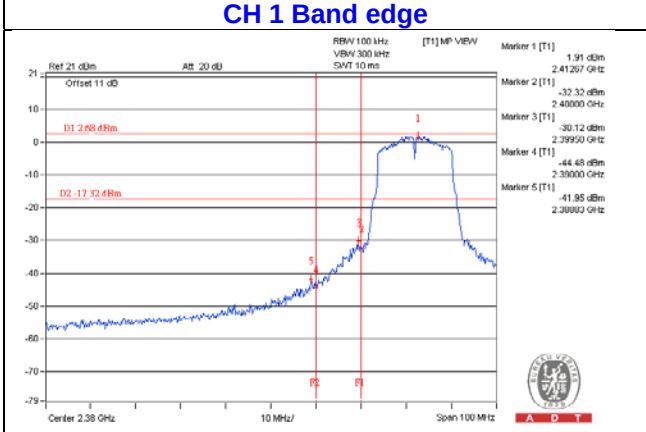

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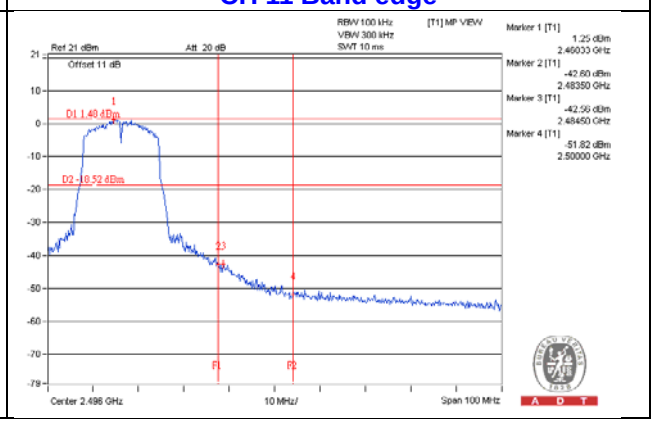
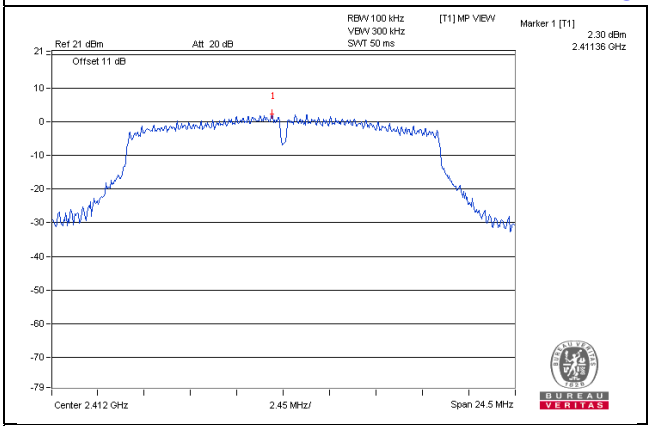
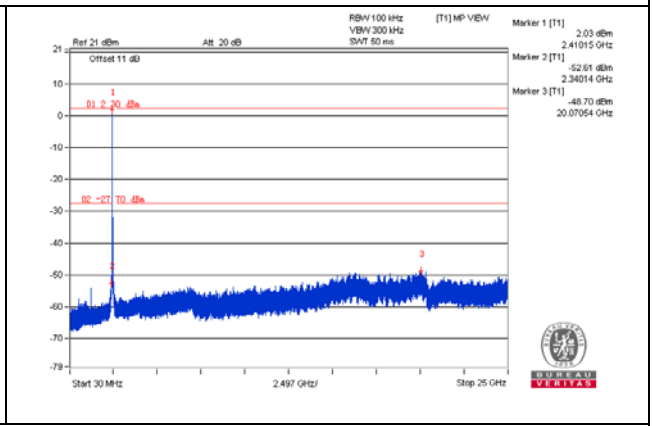


CHAIN 1

CH 1





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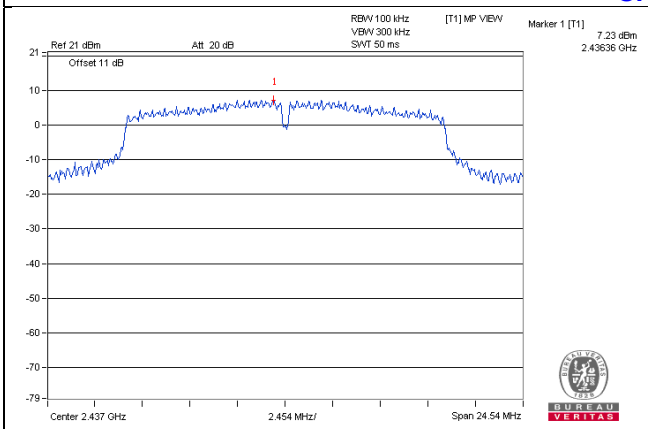

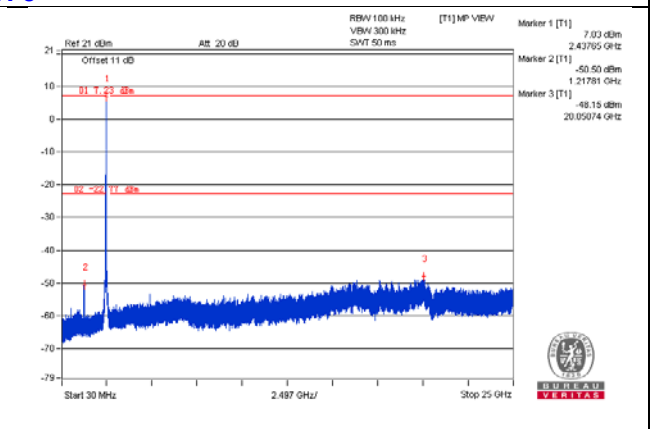

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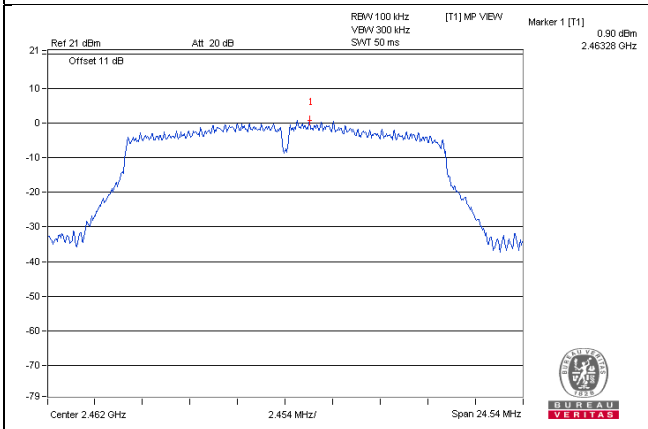

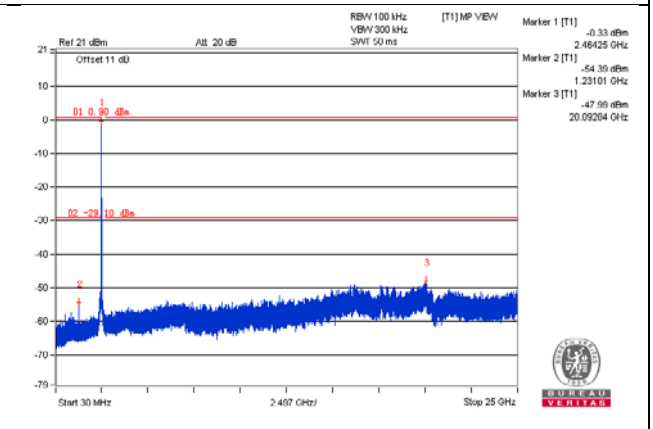

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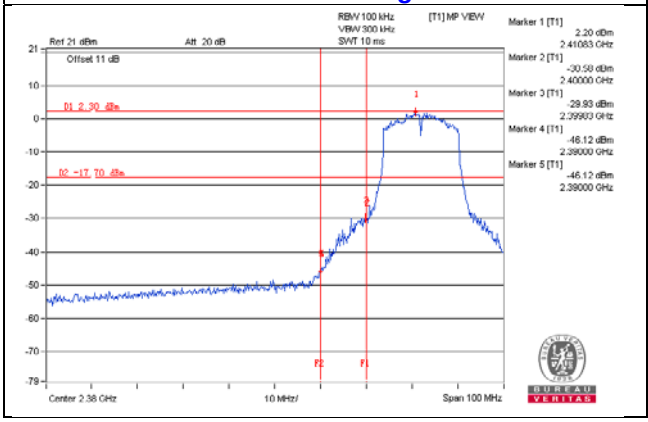
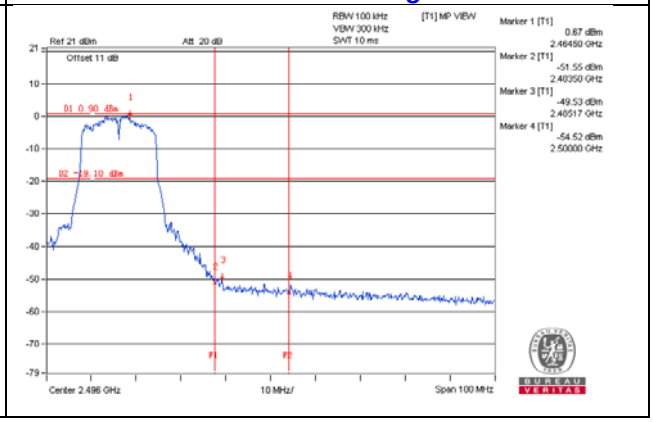
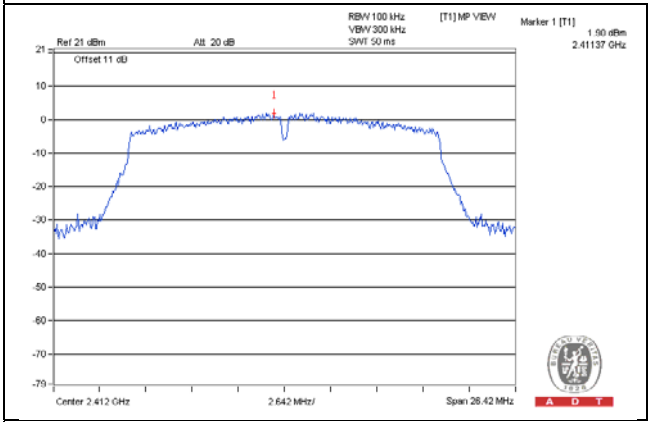


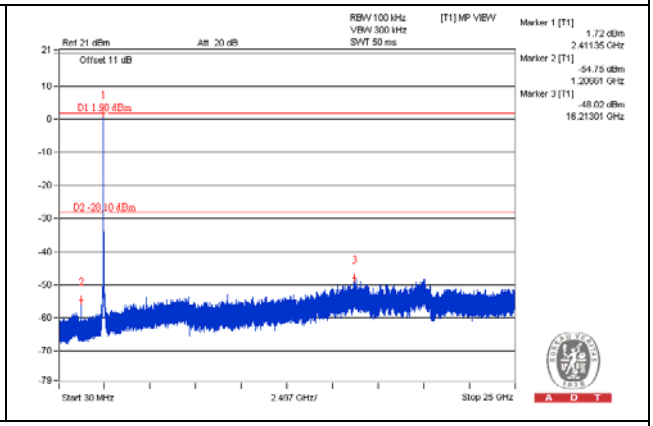
CH 11 Band edge



802.11n (HT20)
CHAIN 0

CH 1





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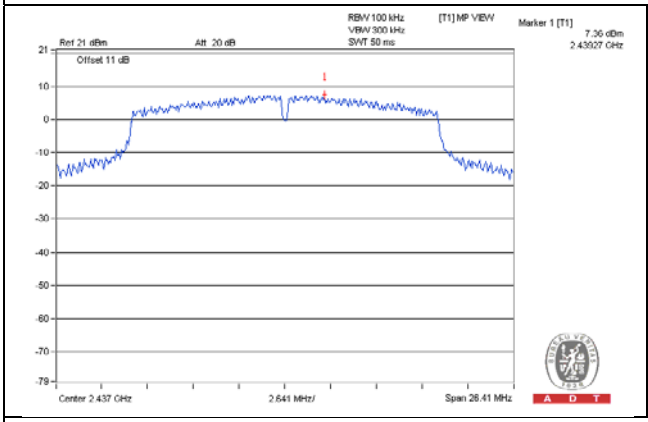

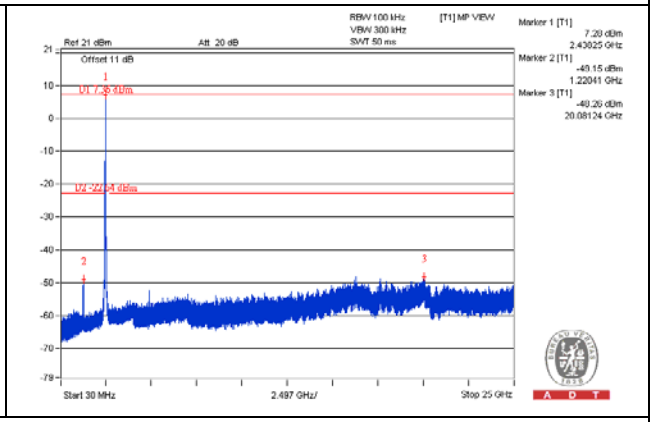

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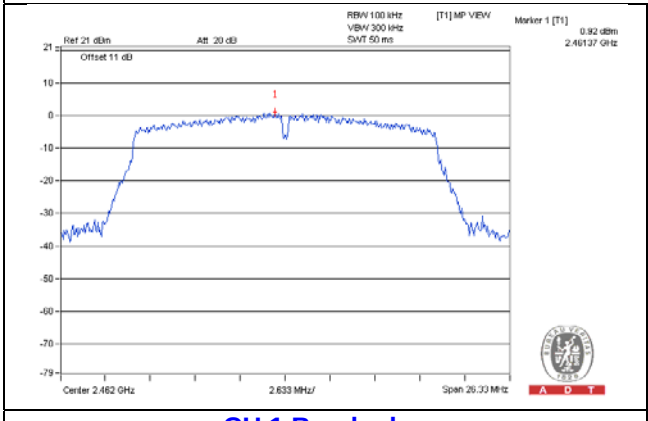

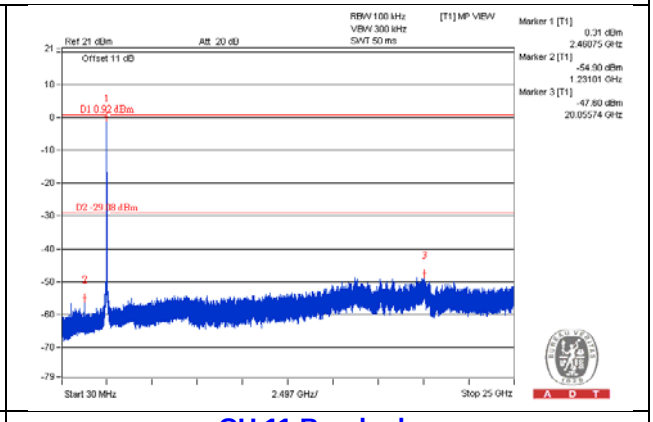

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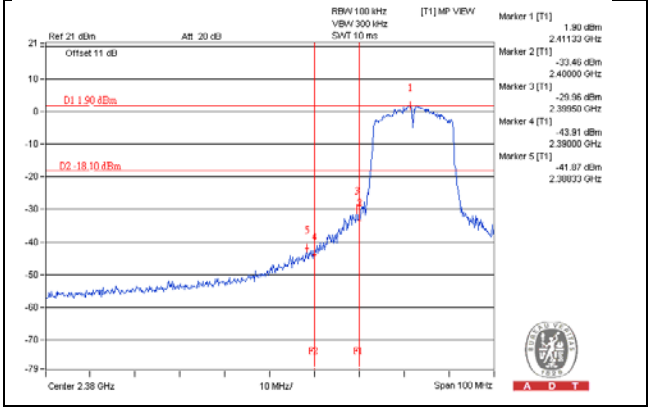

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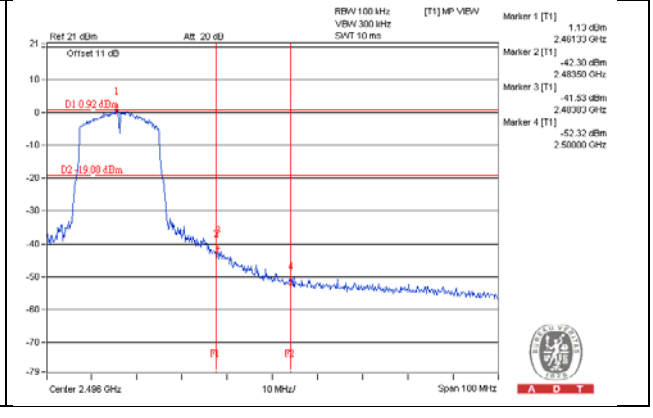
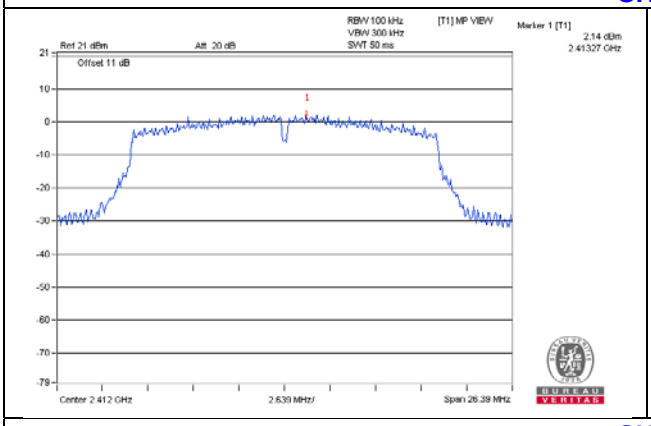
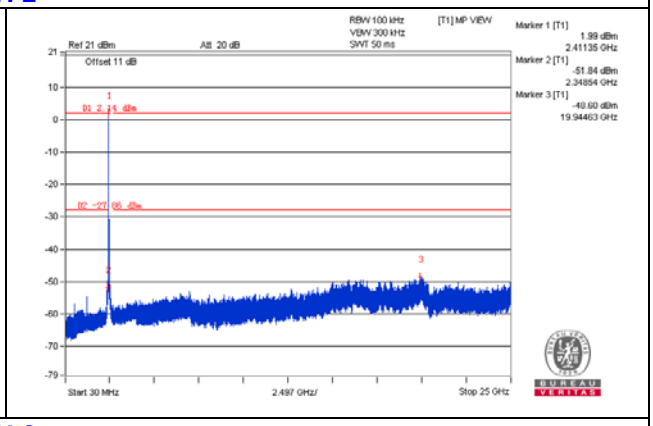


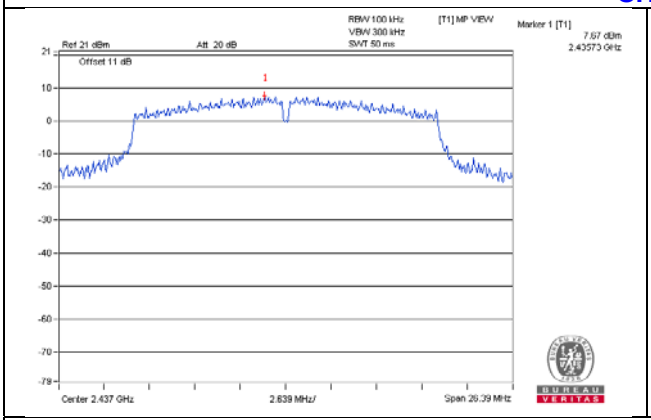
CHAIN 1

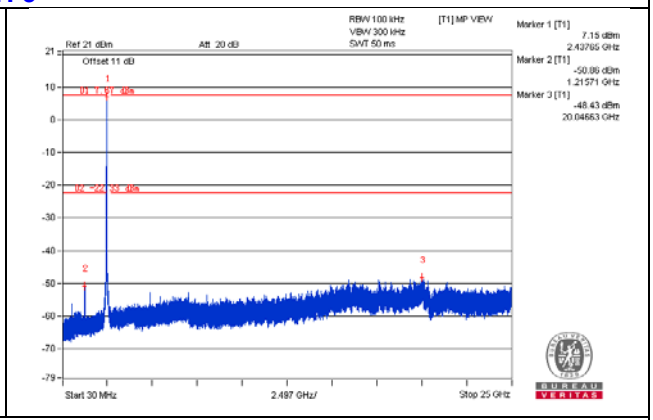
CH 1





CH 6





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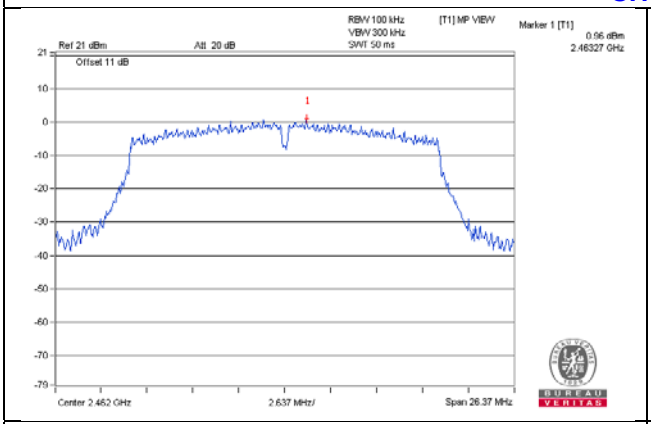

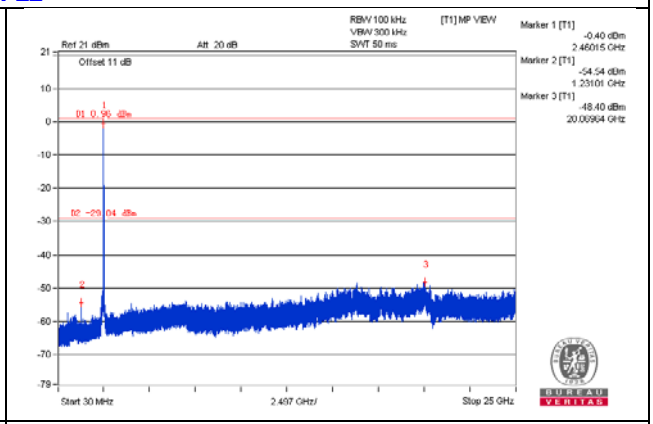

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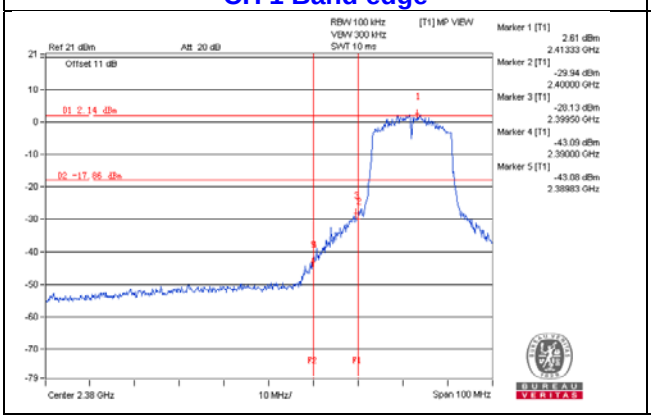

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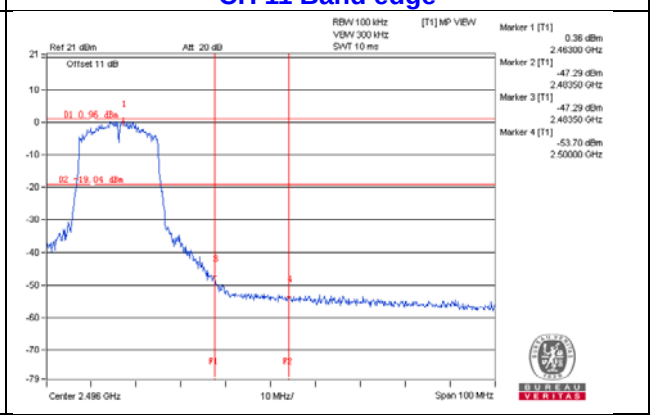

802.11n (HT40)
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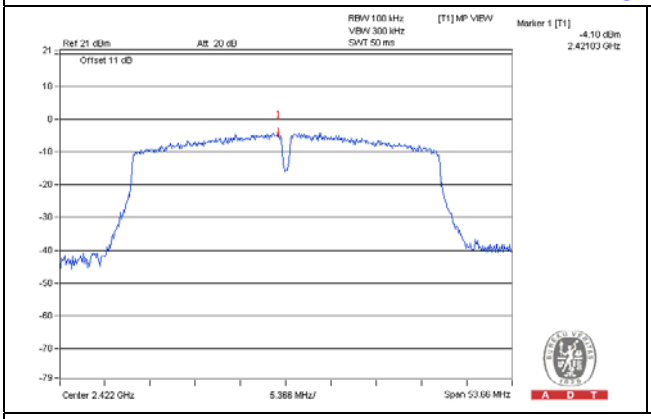

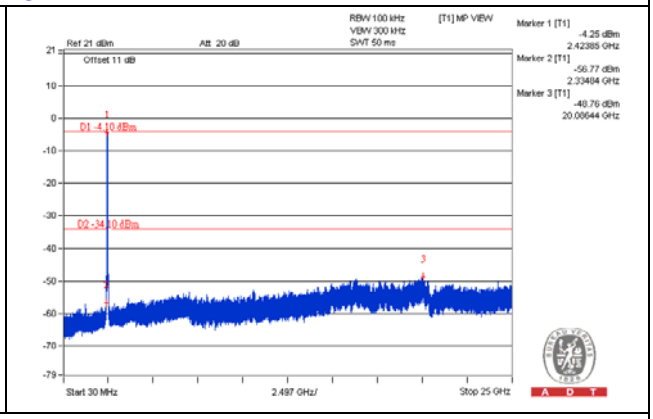

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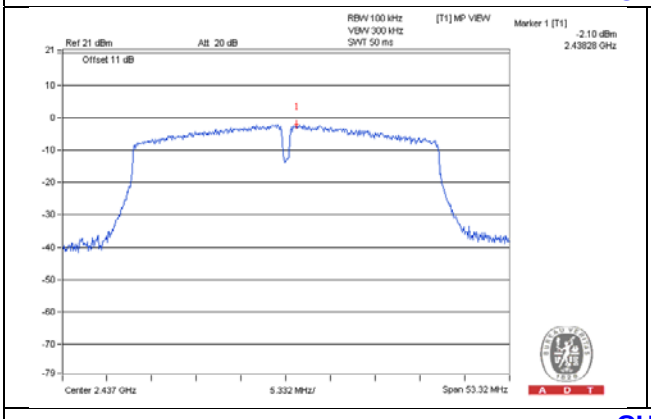
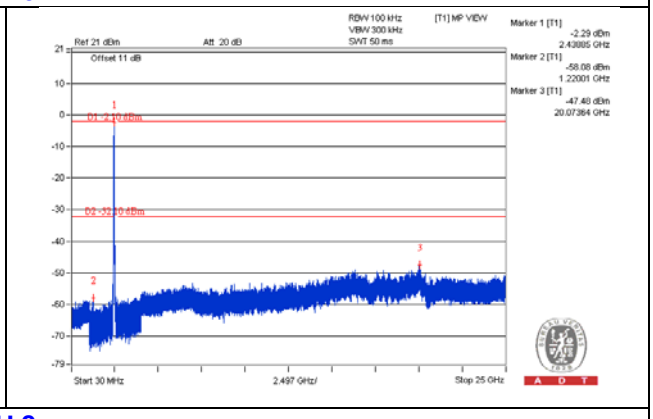
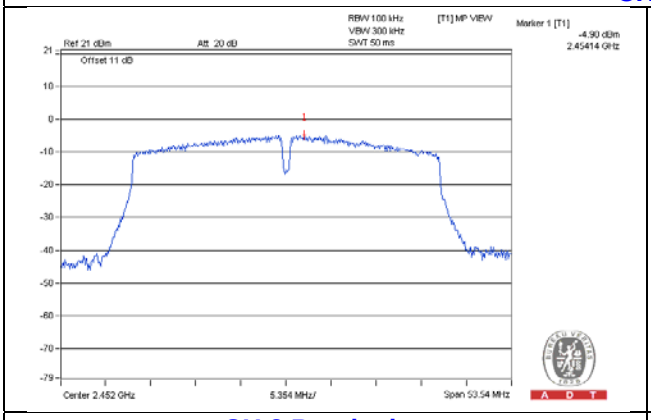
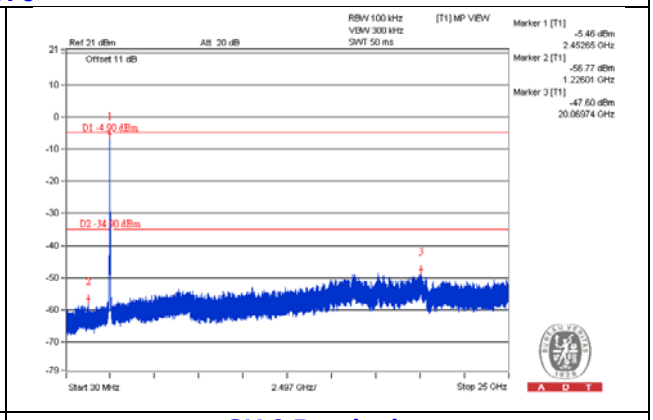




CH 9





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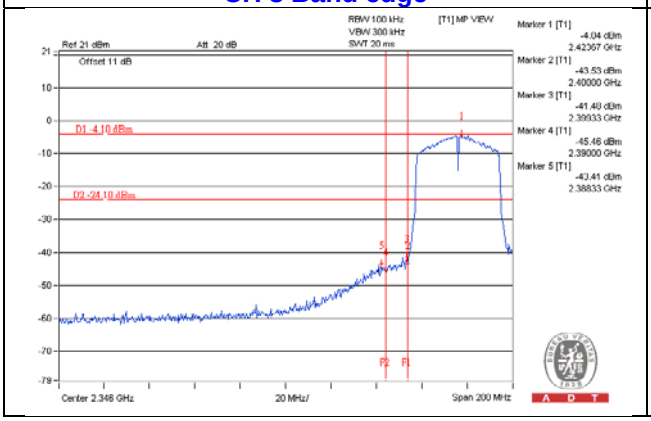

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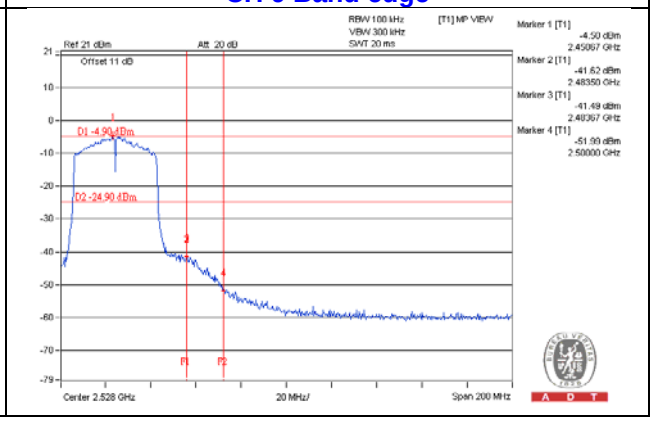

CHAIN 1

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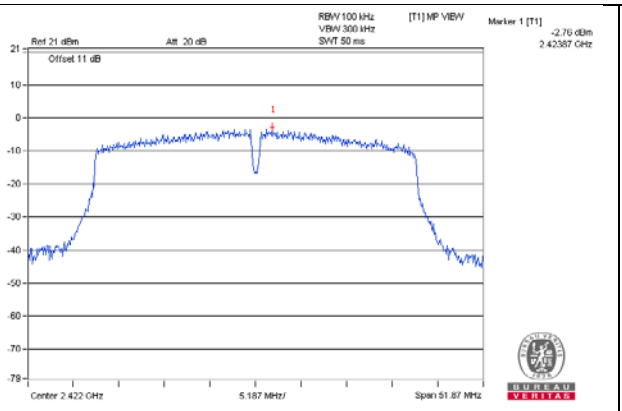

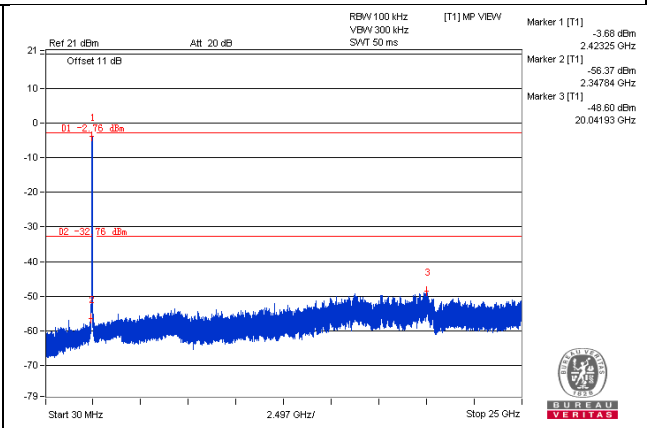

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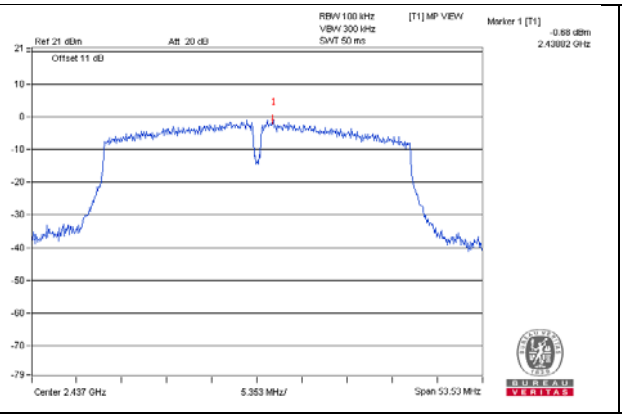

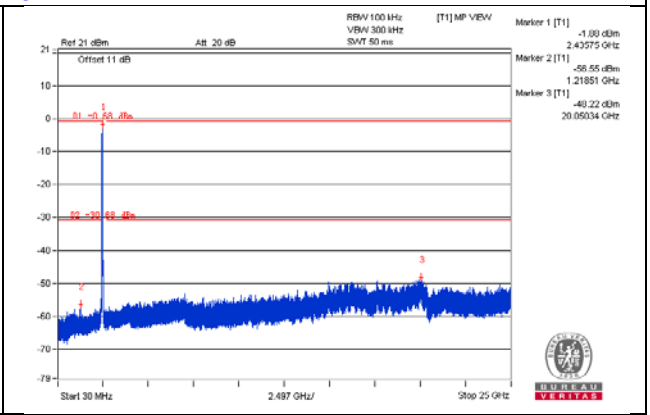

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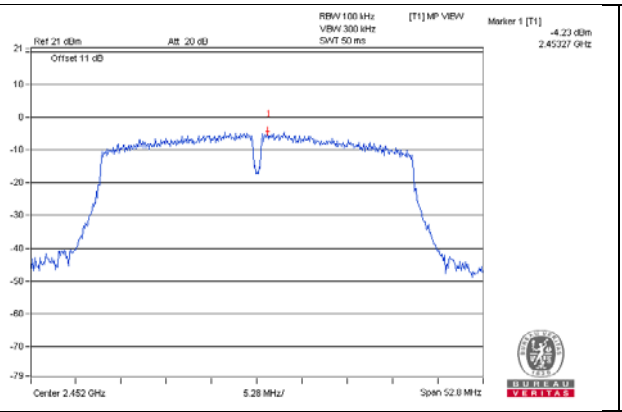
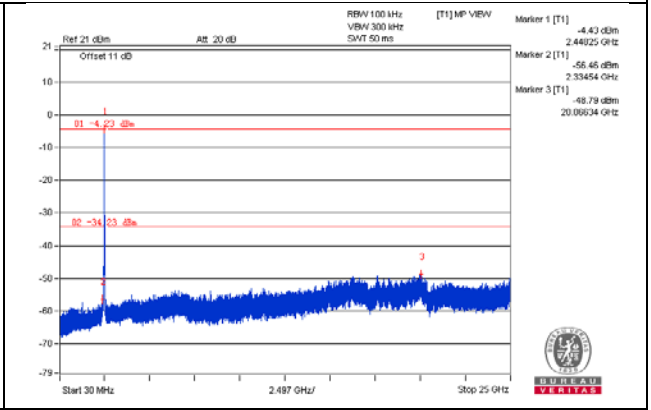
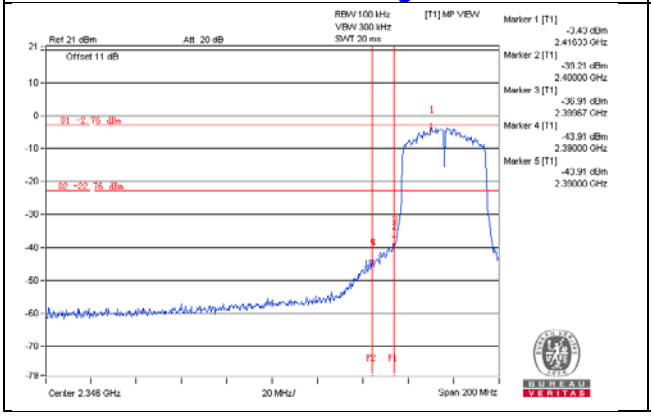
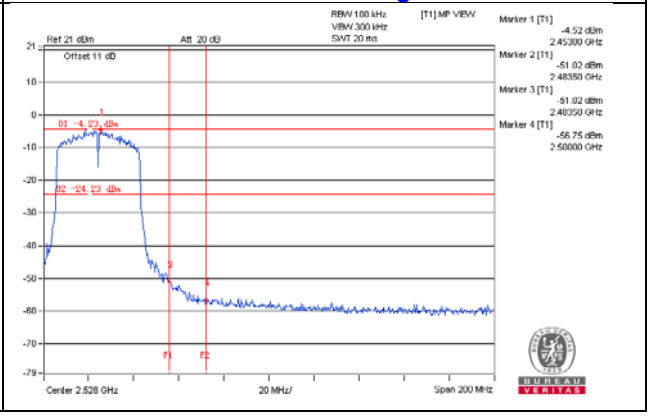




CH 3 Band edge



CH 9 Band edge



5 Test Types and Results (For 5.0GHz Band)

5.1 Radiated Emission and Bandedge Measurement

5.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

Note:

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

5.1.2 Test Instruments

Same as item 4.1.2.

5.1.3 Test Procedures

Same as item 4.1.3.

5.1.4 Deviation from Test Standard

No deviation.

5.1.5 Test 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	70.8 PK	73.7	-2.9	1.64 H	222	29.90	40.90
2	#5725.00	61.0 AV	63.9	-2.9	1.64 H	222	20.10	40.90
3	*5745.00	103.7 PK			1.62 H	219	62.70	41.00
4	*5745.00	93.9 AV			1.62 H	219	52.90	41.00
5	11490.00	67.0 PK	74.0	-7.0	1.02 H	354	51.10	15.90
6	11490.00	51.3 AV	54.0	-2.7	1.02 H	354	35.40	15.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	85.9 PK	88.8	-2.9	1.64 V	222	45.00	40.90
2	#5725.00	75.9 AV	78.8	-2.9	1.64 V	222	35.00	40.90
3	*5745.00	118.8 PK			1.94 V	355	77.80	41.00
4	*5745.00	108.8 AV			1.94 V	355	67.80	41.00
5	11490.00	66.0 PK	74.0	-8.0	1.11 V	25	50.10	15.90
6	11490.00	51.9 AV	54.0	-2.1	1.11 V	25	36.00	15.90

REMARKS:

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

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	102.4 PK			1.02 H	220	61.30	41.10
2	*5785.00	92.4 AV			1.02 H	220	51.30	41.10
3	11570.00	65.8 PK	74.0	-8.2	1.05 H	32	50.20	15.60
4	11570.00	51.6 AV	54.0	-2.4	1.05 H	32	36.00	15.60
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	117.9 PK			1.57 V	198	76.80	41.10
2	*5785.00	108.1 AV			1.57 V	198	67.00	41.10
3	11570.00	65.2 PK	74.0	-8.8	1.00 V	2	49.60	15.60
4	11570.00	50.2 AV	54.0	-3.8	1.00 V	2	34.60	15.60

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	101.6 PK			1.05 H	218	60.50	41.10
2	*5825.00	91.6 AV			1.05 H	218	50.50	41.10
3	#5850.00	56.9 PK	71.6	-14.7	1.55 H	218	15.70	41.20
4	#5850.00	46.9 AV	61.6	-14.7	1.55 H	218	5.70	41.20
5	11650.00	66.1 PK	74.0	-7.9	1.03 H	22	50.50	15.60
6	11650.00	51.7 AV	54.0	-2.3	1.03 H	22	36.10	15.60
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	115.8 PK			1.57 V	156	74.70	41.10
2	*5825.00	105.7 AV			1.57 V	156	64.60	41.10
3	#5850.00	71.1 PK	85.8	-14.7	1.55 V	218	29.90	41.20
4	#5850.00	61.0 AV	75.7	-14.7	1.55 V	218	19.80	41.20
5	11650.00	65.3 PK	74.0	-8.7	1.09 V	2	49.70	15.60
6	11650.00	50.8 AV	54.0	-3.2	1.09 V	2	35.20	15.60

REMARKS:

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

802.11n (HT20)

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	73.0 PK	74.0	-1.0	1.05 H	360	32.10	40.90
2	#5725.00	62.8 AV	63.8	-1.0	1.05 H	360	21.90	40.90
3	*5745.00	104.0 PK			1.63 H	211	63.00	41.00
4	*5745.00	93.8 AV			1.63 H	211	52.80	41.00
5	11490.00	66.4 PK	74.0	-7.6	1.11 H	11	50.50	15.90
6	11490.00	51.5 AV	54.0	-2.5	1.11 H	11	35.60	15.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	85.8 PK	86.8	-1.0	1.00 V	51	44.90	40.90
2	#5725.00	75.9 AV	76.9	-1.0	1.00 V	51	35.00	40.90
3	*5745.00	116.8 PK			1.71 V	194	75.80	41.00
4	*5745.00	106.9 AV			1.71 V	194	65.90	41.00
5	11490.00	67.1 PK	74.0	-6.9	1.02 V	348	51.20	15.90
6	11490.00	52.0 AV	54.0	-2.0	1.02 V	348	36.10	15.90

REMARKS:

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

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	103.0 PK			1.05 H	94	61.90	41.10
2	*5785.00	92.9 AV			1.05 H	94	51.80	41.10
3	11570.00	65.9 PK	74.0	-8.1	1.05 H	64	50.30	15.60
4	11570.00	51.7 AV	54.0	-2.3	1.05 H	64	36.10	15.60
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	118.4 PK			1.57 V	199	77.30	41.10
2	*5785.00	108.6 AV			1.57 V	199	67.50	41.10
3	11570.00	65.4 PK	74.0	-8.6	1.00 V	334	49.80	15.60
4	11570.00	50.6 AV	54.0	-3.4	1.00 V	334	35.00	15.60

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	100.2 PK			1.00 H	211	59.10	41.10
2	*5825.00	90.3 AV			1.00 H	211	49.20	41.10
3	#5850.00	58.0 PK	70.2	-12.2	1.68 H	172	16.80	41.20
4	#5850.00	48.1 AV	60.3	-12.2	1.68 H	172	6.90	41.20
5	11650.00	67.3 PK	74.0	-6.7	1.04 H	30	51.70	15.60
6	11650.00	51.5 AV	54.0	-2.5	1.04 H	30	35.90	15.60
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	116.4 PK			1.63 V	209	75.30	41.10
2	*5825.00	106.4 AV			1.63 V	209	65.30	41.10
3	#5850.00	74.2 PK	86.4	-12.2	1.68 V	172	33.00	41.20
4	#5850.00	64.2 AV	76.4	-12.2	1.68 V	172	23.00	41.20
5	11650.00	67.5 PK	74.0	-6.5	1.00 V	15	51.90	15.60
6	11650.00	51.7 AV	54.0	-2.3	1.00 V	15	36.10	15.60

REMARKS:

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

802.11n (HT40)

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	64.2 PK	66.8	-2.6	1.74 H	202	23.30	40.90
2	#5725.00	54.8 AV	57.4	-2.6	1.74 H	202	13.90	40.90
3	*5755.00	96.8 PK			1.03 H	224	55.80	41.00
4	*5755.00	87.4 AV			1.03 H	224	46.40	41.00
5	11510.00	59.7 PK	74.0	-14.3	1.05 H	64	44.00	15.70
6	11510.00	48.2 AV	54.0	-5.8	1.05 H	64	32.50	15.70
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	#5725.00	80.0 PK	82.6	-2.6	1.72 V	202	39.10	40.90
2	#5725.00	70.1 AV	72.7	-2.6	1.72 V	202	29.20	40.90
3	*5755.00	112.6 PK			1.63 V	160	71.60	41.00
4	*5755.00	102.7 AV			1.63 V	160	61.70	41.00
5	11510.00	61.4 PK	74.0	-12.6	1.12 V	334	45.70	15.70
6	11510.00	47.9 AV	54.0	-6.1	1.12 V	334	32.20	15.70

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)
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	98.6 PK			1.19 H	201	57.50	41.10
2	*5795.00	89.7 AV			1.19 H	201	48.60	41.10
3	#5850.00	60.8 PK	68.6	-7.8	1.56 H	195	19.60	41.20
4	#5850.00	51.9 AV	59.7	-7.8	1.56 H	195	10.70	41.20
5	11590.00	65.9 PK	74.0	-8.1	1.01 H	32	50.30	15.60
6	11590.00	51.2 AV	54.0	-2.8	1.01 H	32	35.60	15.60
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	115.9 PK			1.84 V	182	74.80	41.10
2	*5795.00	105.9 AV			1.84 V	182	64.80	41.10
3	#5850.00	78.1 PK	85.9	-7.8	1.56 V	195	36.90	41.20
4	#5850.00	68.1 AV	75.9	-7.8	1.56 V	195	26.90	41.20
5	11590.00	62.4 PK	74.0	-11.6	1.00 V	352	46.80	15.60
6	11590.00	49.0 AV	54.0	-5.0	1.00 V	352	33.40	15.60

REMARKS:

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

802.11ac (VHT80)

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	63.1 PK	65.0	-1.9	1.79 H	8	22.20	40.90
2	#5725.00	53.6 AV	55.5	-1.9	1.79 H	8	12.70	40.90
3	*5775.00	95.0 PK			1.33 H	346	54.00	41.00
4	*5775.00	85.5 AV			1.33 H	346	44.50	41.00
5	#5850.00	57.3 PK	65.0	-7.7	1.79 H	8	16.10	41.20
6	#5850.00	47.8 AV	55.5	-7.7	1.79 H	8	6.60	41.20
7	11550.00	61.3 PK	74.0	-12.7	1.05 H	34	45.70	15.60
8	11550.00	48.1 AV	54.0	-5.9	1.05 H	34	32.50	15.60
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	77.2 PK	79.1	-1.9	1.79 V	8	36.30	40.90
2	#5725.00	67.2 AV	69.1	-1.9	1.79 V	8	26.30	40.90
3	*5775.00	109.1 PK			1.77 V	172	68.10	41.00
4	*5775.00	99.1 AV			1.77 V	172	58.10	41.00
5	#5850.00	71.4 PK	79.1	-7.7	1.79 V	8	30.20	41.20
6	#5850.00	61.4 AV	69.1	-7.7	1.79 V	8	20.20	41.20
7	11550.00	60.5 PK	74.0	-13.5	1.05 V	66	44.90	15.60
8	11550.00	49.1 AV	54.0	-4.9	1.05 V	66	33.50	15.60

REMARKS:

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

BELOW 1GHz WORST-CASE DATA

802.11a

CHANNEL	TX Channel 149	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		
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	43.58	22.6 QP	40.0	-17.4	2.00 H	122	37.20	-14.60
2	94.02	25.7 QP	43.5	-17.8	2.00 H	281	45.20	-19.50
3	480.08	32.6 QP	46.0	-13.4	2.00 H	1	41.70	-9.10
4	906.88	29.7 QP	46.0	-16.3	1.01 H	11	30.90	-1.20
5	937.92	29.0 QP	46.0	-17.0	2.00 H	144	29.50	-0.50
6	961.20	49.0 QP	54.0	-5.0	1.01 H	183	49.20	-0.20
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	35.82	35.8 QP	40.0	-4.2	1.00 V	141	51.40	-15.60
2	62.98	33.4 QP	40.0	-6.6	1.00 V	271	48.60	-15.20
3	103.72	31.8 QP	43.5	-11.7	1.00 V	280	50.10	-18.30
4	148.34	32.1 QP	43.5	-11.4	1.00 V	200	46.30	-14.20
5	922.40	30.2 QP	46.0	-15.8	1.99 V	15	30.90	-0.70
6	961.20	48.6 QP	54.0	-5.4	1.00 V	156	48.80	-0.20

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	31.94	30.4 QP	40.0	-9.6	1.50 H	221	46.50	-16.10
2	103.72	27.2 QP	43.5	-16.3	1.50 H	274	45.50	-18.30
3	850.62	29.0 QP	46.0	-17.0	1.50 H	306	31.10	-2.10
4	895.24	28.7 QP	46.0	-17.3	1.50 H	89	30.10	-1.40
5	930.16	29.2 QP	46.0	-16.8	1.50 H	205	29.80	-0.60
6	961.20	47.2 QP	54.0	-6.8	1.50 H	306	47.40	-0.20
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	35.82	34.9 QP	40.0	-5.1	1.01 V	139	50.50	-15.60
2	64.92	32.9 QP	40.0	-7.1	1.01 V	332	48.20	-15.30
3	103.72	33.7 QP	43.5	-9.8	1.01 V	267	52.00	-18.30
4	142.52	31.1 QP	43.5	-12.4	1.01 V	58	45.70	-14.60
5	935.98	29.8 QP	46.0	-16.2	1.01 V	165	30.40	-0.60
6	961.20	47.6 QP	54.0	-6.4	1.01 V	46	47.80	-0.20

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 item 4.1.6.

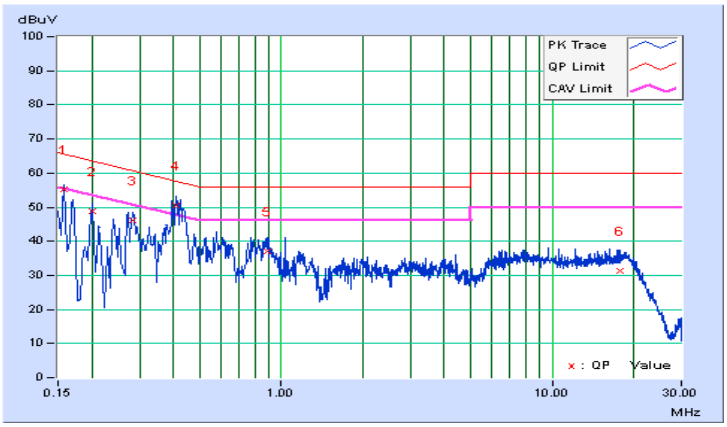
5.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value		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	0.15782	0.05	55.12	42.11	55.17	42.16	65.58	55.58	-10.41	-13.42
2	0.20084	0.06	48.71	36.47	48.77	36.53	63.58	53.58	-14.81	-17.05
3	0.28288	0.06	46.15	35.92	46.21	35.98	60.73	50.73	-14.52	-14.75
4	0.40806	0.06	50.55	40.88	50.61	40.94	57.69	47.69	-7.08	-6.75
5	0.88899	0.08	36.96	27.85	37.04	27.93	56.00	46.00	-18.96	-18.07
6	17.87012	0.80	30.64	25.15	31.44	25.95	60.00	50.00	-28.56	-24.05

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.

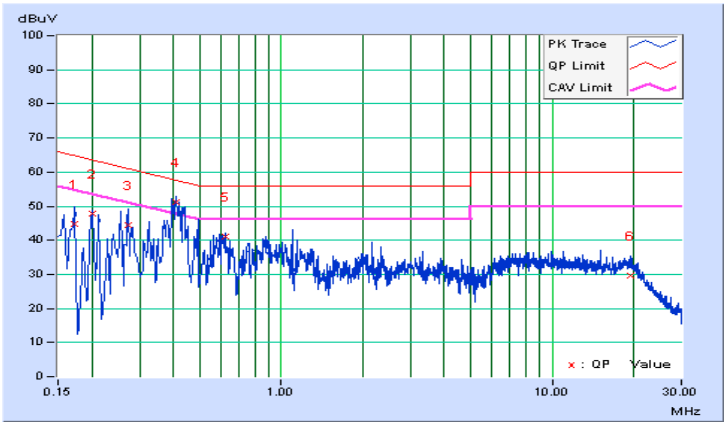


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	A		

No	Freq.	Corr. Factor	Reading Value [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	0.17346	0.05	44.70	25.61	44.75	25.66	64.79	54.79	-20.04	-29.13
2	0.20084	0.05	47.76	35.51	47.81	35.56	63.58	53.58	-15.77	-18.02
3	0.27121	0.05	44.39	29.83	44.44	29.88	61.08	51.08	-16.64	-21.20
4	**0.40800**	**0.06**	**51.17**	**41.41**	**51.23**	**41.47**	**57.69**	**47.69**	**-6.46**	**-6.22**
5	0.61920	0.07	41.15	31.10	41.22	31.17	56.00	46.00	-14.78	-14.83
6	19.57488	0.72	28.78	23.24	29.50	23.96	60.00	50.00	-30.50	-26.04

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.

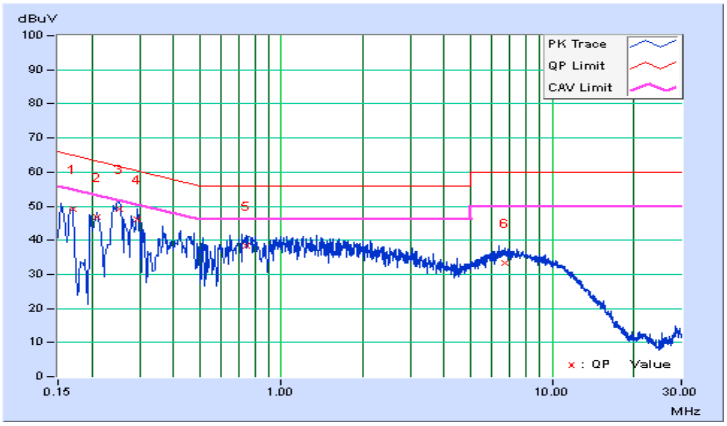


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	B		

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	0.16955	0.05	49.07	36.32	49.12	36.37	64.98	54.98	-15.86	-18.61
2	0.20865	0.06	46.61	36.69	46.67	36.75	63.26	53.26	-16.59	-16.51
3	0.25125	0.06	49.23	39.88	49.29	39.94	61.72	51.72	-12.43	-11.78
4	0.29467	0.06	46.00	35.34	46.06	35.40	60.39	50.39	-14.33	-14.99
5	0.74432	0.07	38.29	27.10	38.36	27.17	56.00	46.00	-17.64	-18.83
6	6.72271	0.31	33.16	28.00	33.47	28.31	60.00	50.00	-26.53	-21.69

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.

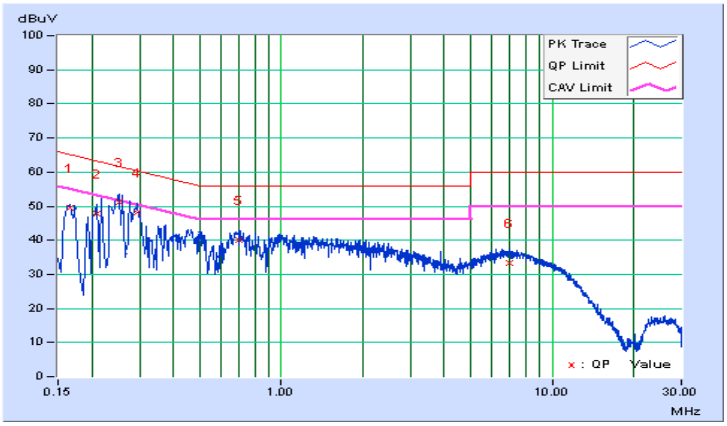


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	B		

No	Freq.	Corr. Factor	Reading Value [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	0.16526	0.05	49.47	38.12	49.52	38.17	65.20	55.20	-15.68	-17.03
2	0.20865	0.05	47.78	38.09	47.83	38.14	63.26	53.26	-15.43	-15.12
3	0.25125	0.05	51.22	41.36	51.27	41.41	61.72	51.72	-10.44	-10.30
4	0.29467	0.05	48.06	37.19	48.11	37.24	60.39	50.39	-12.28	-13.15
5	0.69349	0.07	40.05	28.60	40.12	28.67	56.00	46.00	-15.88	-17.33
6	6.96513	0.30	33.12	28.02	33.42	28.32	60.00	50.00	-26.58	-21.68

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.



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

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.50	15.21	0.5	Pass
157	5785	15.53	15.40	0.5	Pass
165	5825	16.32	16.30	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.49	15.76	0.5	Pass
157	5785	15.51	15.80	0.5	Pass
165	5825	16.93	16.31	0.5	Pass

802.11n (HT40)

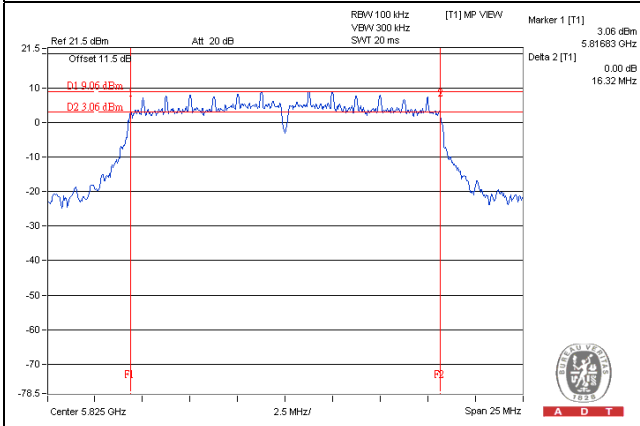
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.34	35.33	0.5	Pass
159	5795	35.28	35.24	0.5	Pass

802.11ac (VHT80)

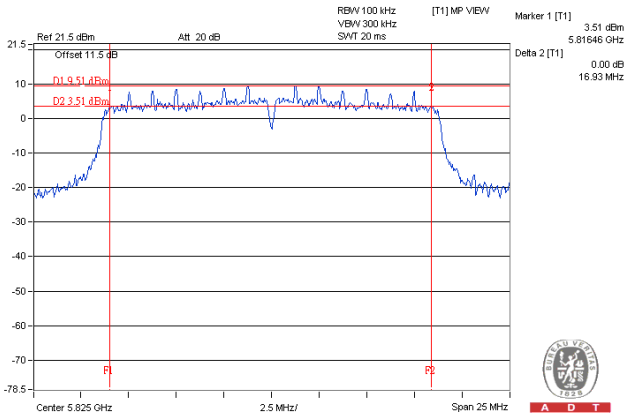
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.24	75.32	0.5	Pass

SPECTRUM PLOT OF WORST VALUE

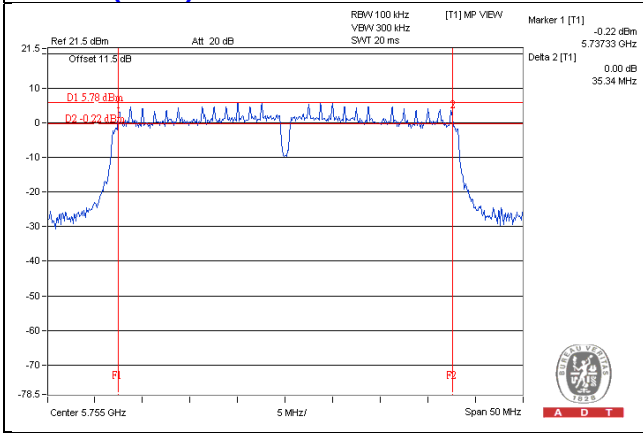
802.11a



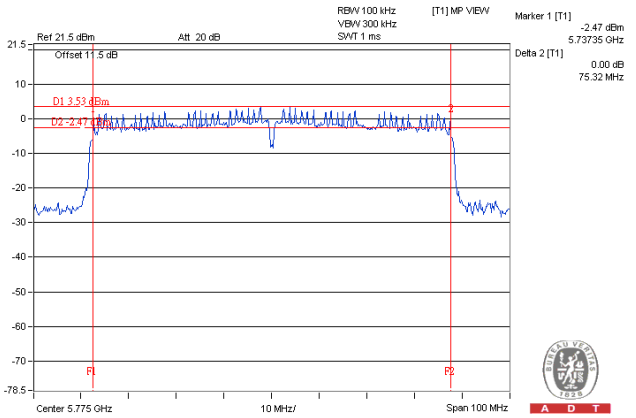
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



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

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

5.4.2 Test Setup

Same as item 4.4.2.

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

POWER OUTPUT:

802.11a

Channel	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
149	5745	22.23	21.87	320.924	25.06	30	Pass
157	5785	21.38	21.07	265.342	24.24	30	Pass
165	5825	19.86	20.05	197.986	22.97	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
149	5745	21.18	21.73	280.156	24.47	30	Pass
157	5785	21.25	21.34	269.496	24.31	30	Pass
165	5825	20.51	20.45	223.377	23.49	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
151	5755	21.40	19.90	235.762	23.72	30	Pass
159	5795	22.15	22.07	325.124	25.12	30	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
155	5775	20.74	19.51	207.908	23.18	30	Pass

5.5 Power Spectral Density Measurement

5.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 Test Setup

Same as Item 4.5.2

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

802.11a

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-7.64	3.01	-4.63	5.99	PASS
	157	5785	-7.75	3.01	-4.74	5.99	PASS
	165	5825	-9.74	3.01	-6.73	5.99	PASS
1	149	5745	-7.30	3.01	-4.29	5.99	PASS
	157	5785	-8.27	3.01	-5.26	5.99	PASS
	165	5825	-9.33	3.01	-6.32	5.99	PASS

NOTE: Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 8-(8.01-6) = 5.99dBm.

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-7.53	3.01	-4.52	5.99	PASS
	157	5785	-8.19	3.01	-5.18	5.99	PASS
	165	5825	-9.13	3.01	-6.12	5.99	PASS
1	149	5745	-7.24	3.01	-4.23	5.99	PASS
	157	5785	-7.88	3.01	-4.87	5.99	PASS
	165	5825	-9.23	3.01	-6.22	5.99	PASS

NOTE: Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 8-(8.01-6) = 5.99dBm.

802.11n (HT40)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-13.13	3.01	0.10	-10.02	5.99	PASS
	159	5795	-11.19	3.01	0.10	-8.08	5.99	PASS
1	151	5755	-12.99	3.01	0.10	-9.88	5.99	PASS
	159	5795	-10.35	3.01	0.10	-7.24	5.99	PASS

NOTE: Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 8-(8.01-6) = 5.99dBm.

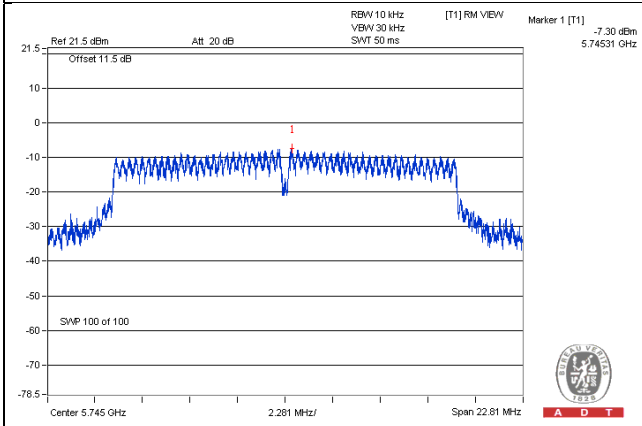
802.11ac (VHT80)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	155	5775	-16.94	3.01	0.20	-13.73	5.99	PASS
1	155	5775	-16.14	3.01	0.20	-12.93	5.99	PASS

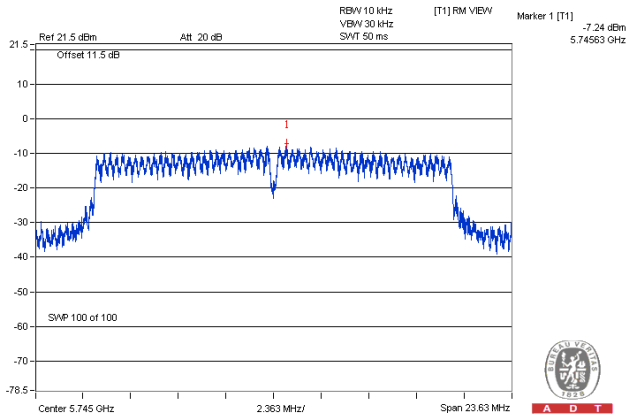
NOTE: Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 8-(8.01-6) = 5.99dBm.

SPECTRUM PLOT OF WORST VALUE

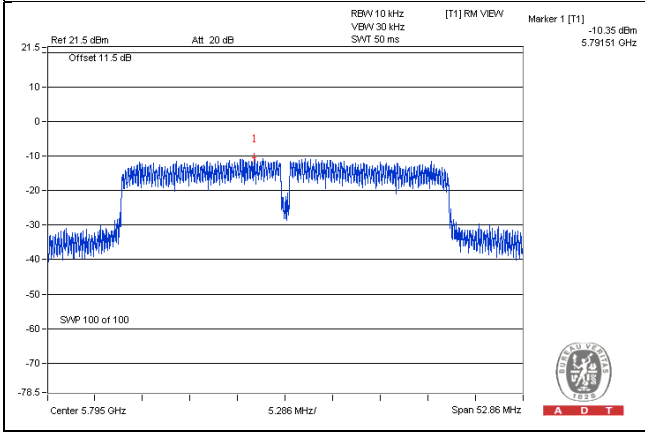
802.11a



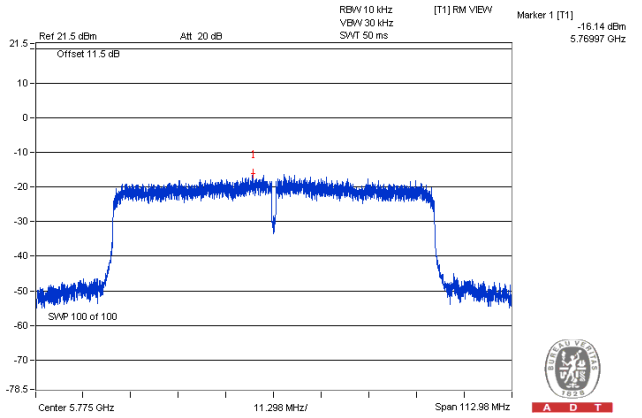
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



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

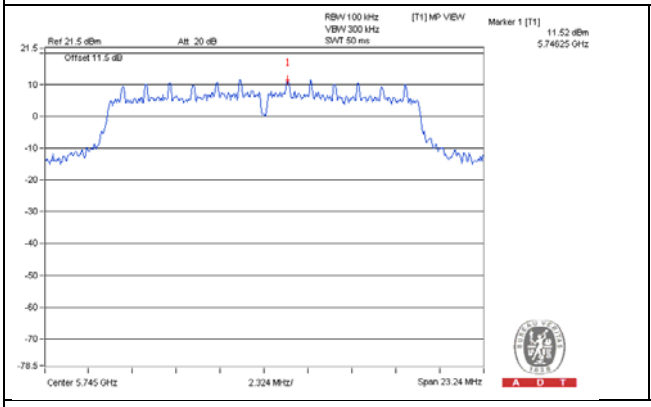
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

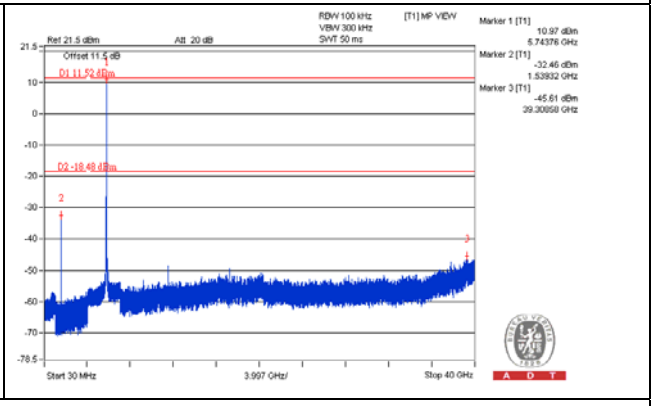
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11a

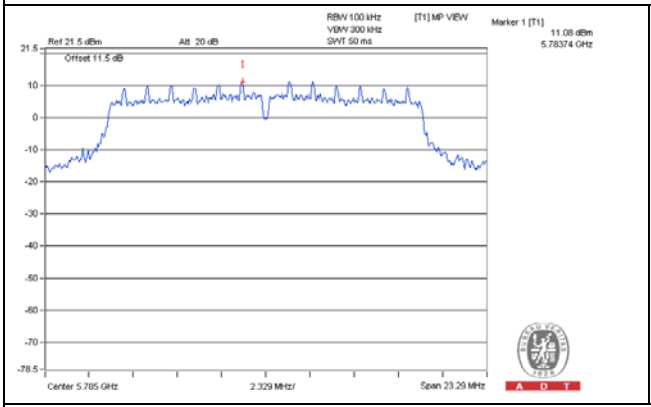
CHAIN 0

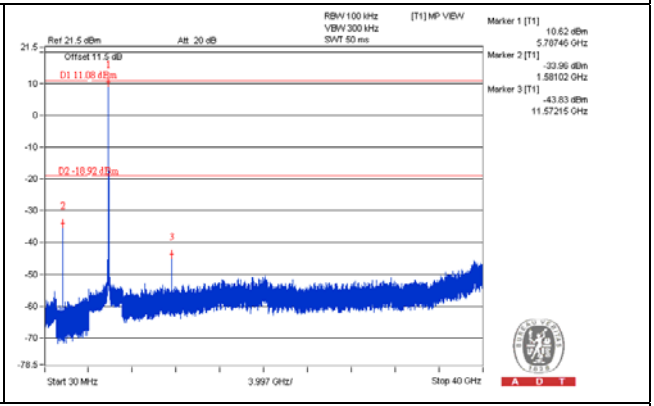
CH 149



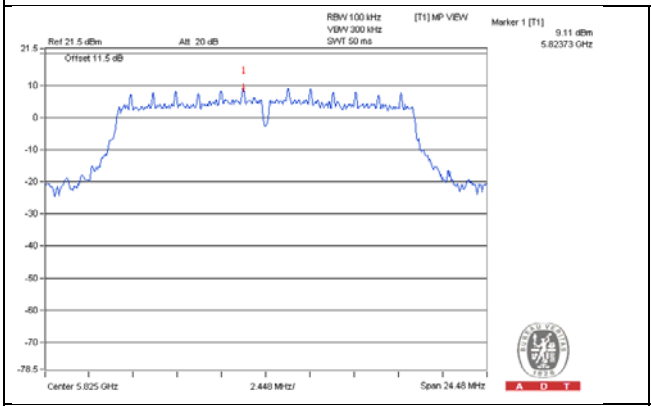


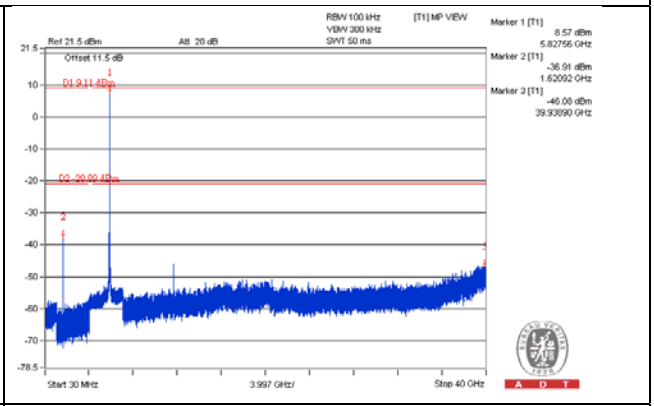
CH 157



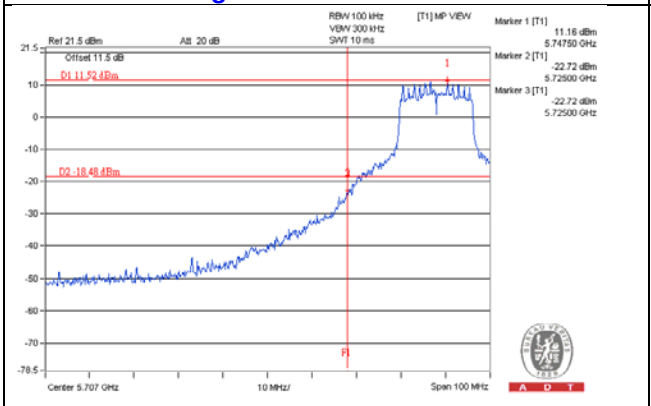


CH 165

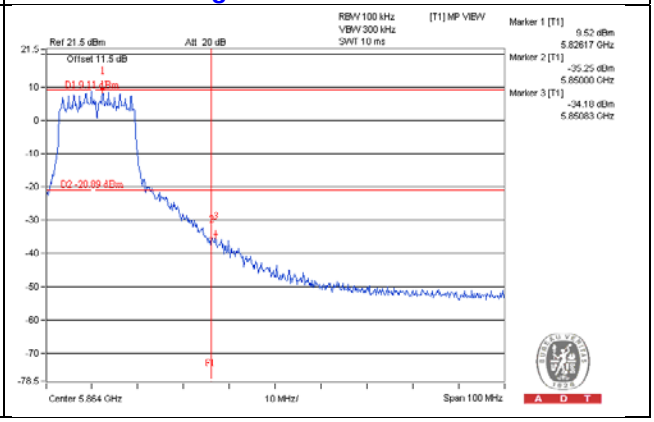




CH 149 Band edge

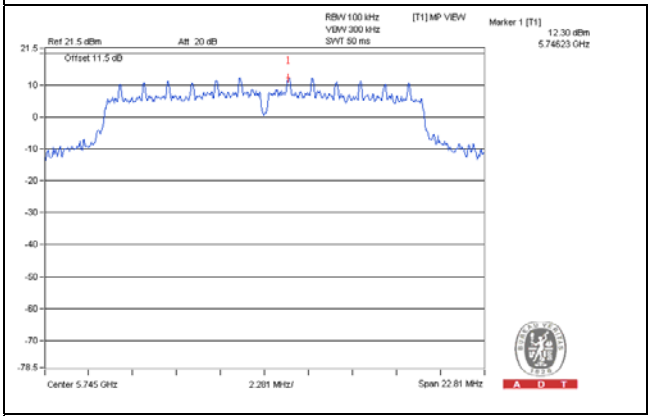


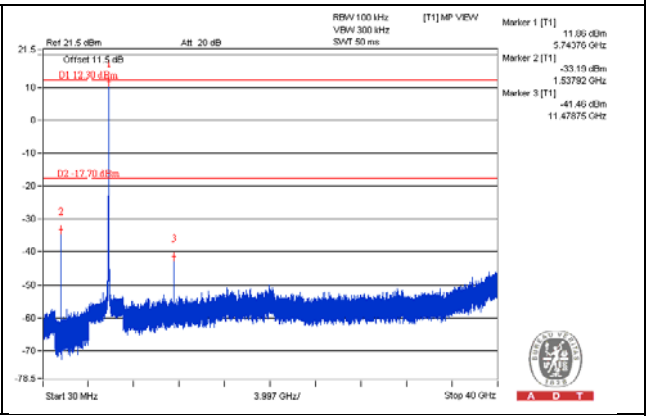
CH 165 Band edge



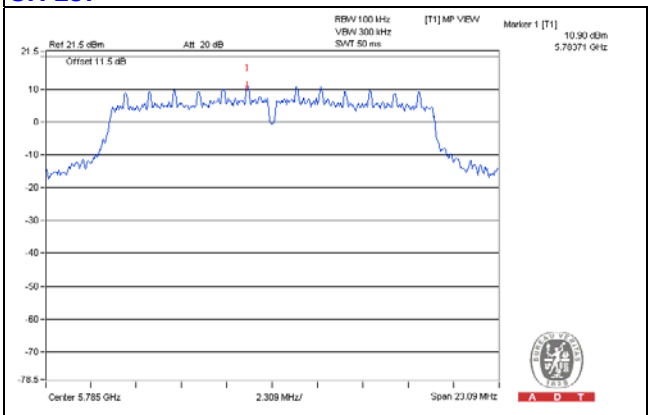
CHAIN 1

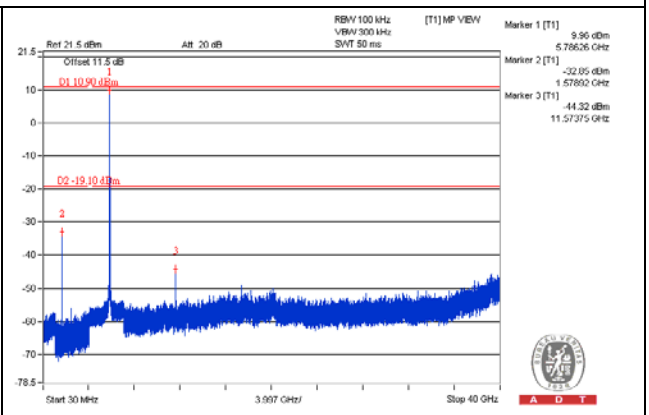
CH 149



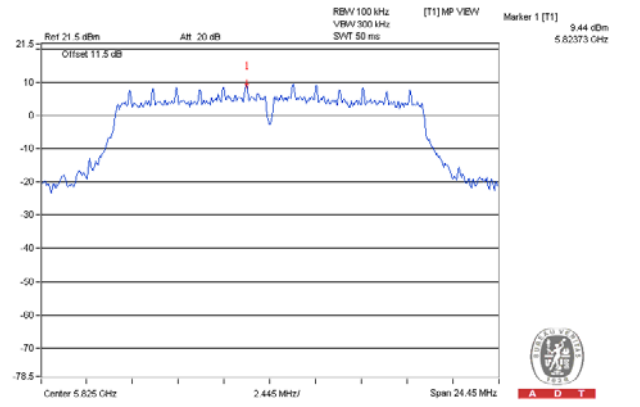


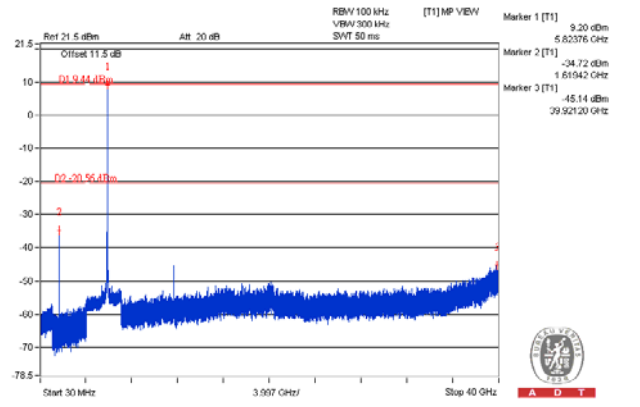
CH 157



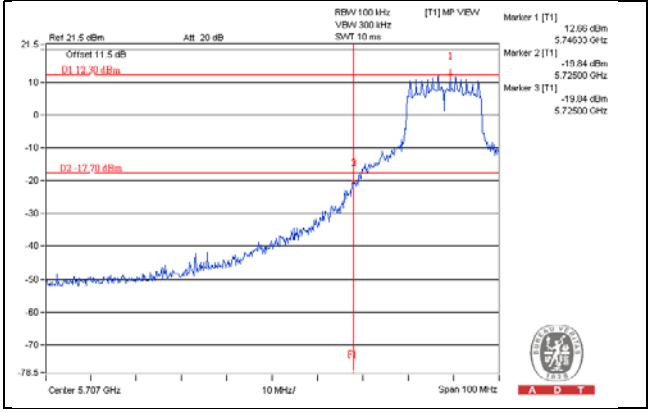


CH 165

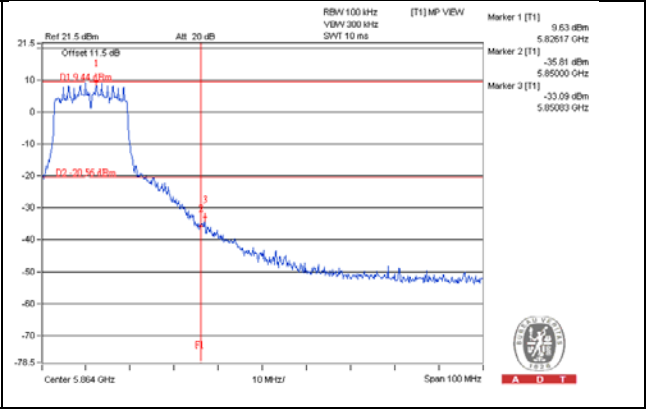




CH 149 Band edge

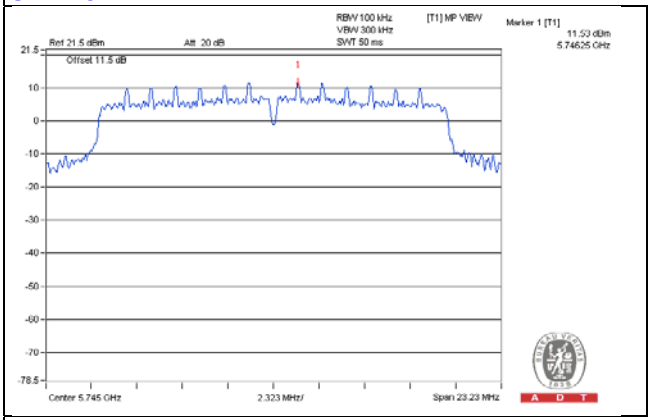


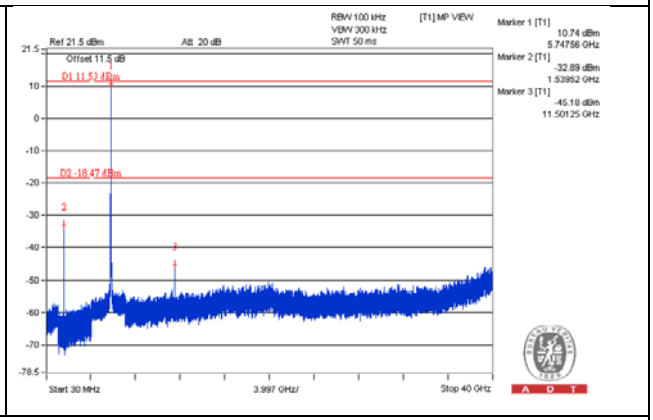
CH 165 Band edge



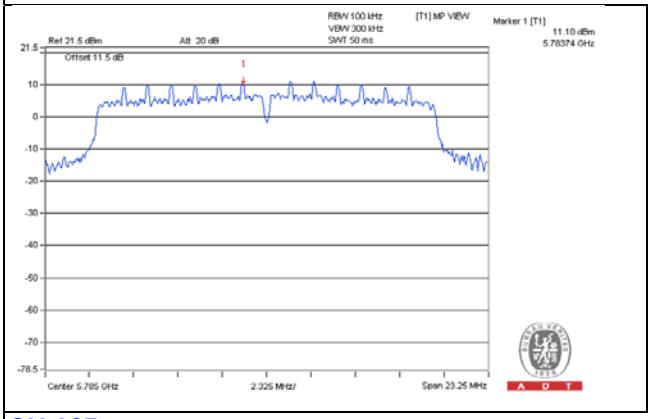
802.11n (HT20)
CHAIN 0

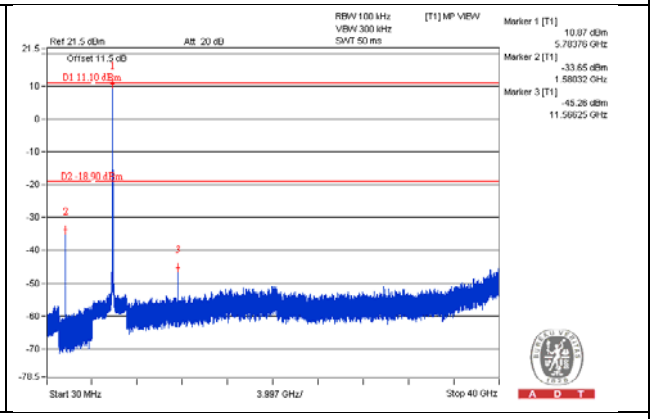
CH 149



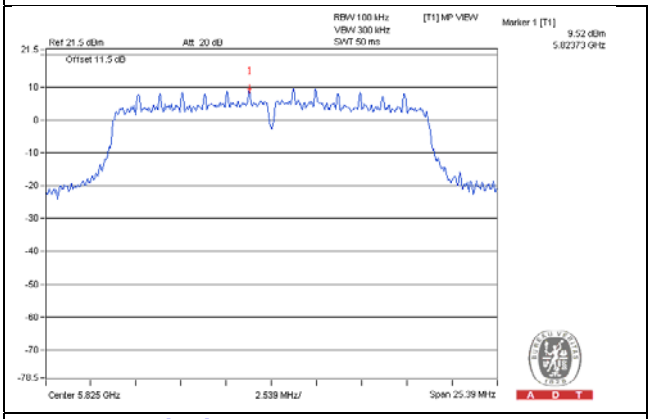


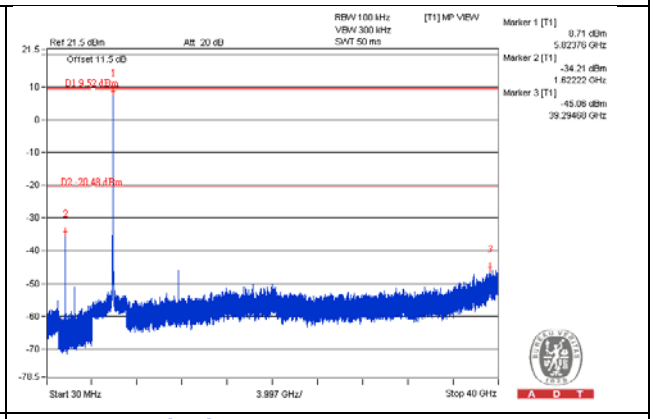
CH 157



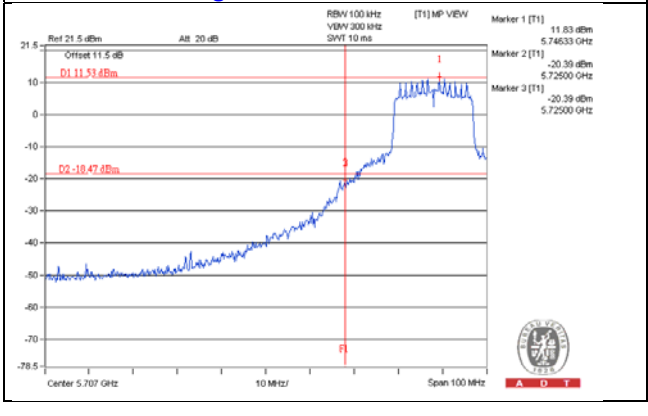


CH 165

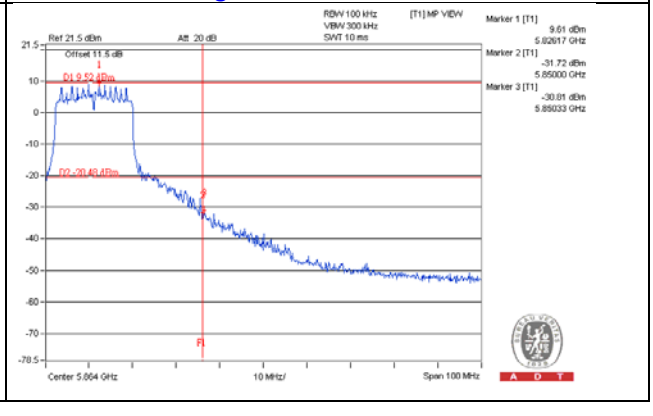




CH 149 Band edge

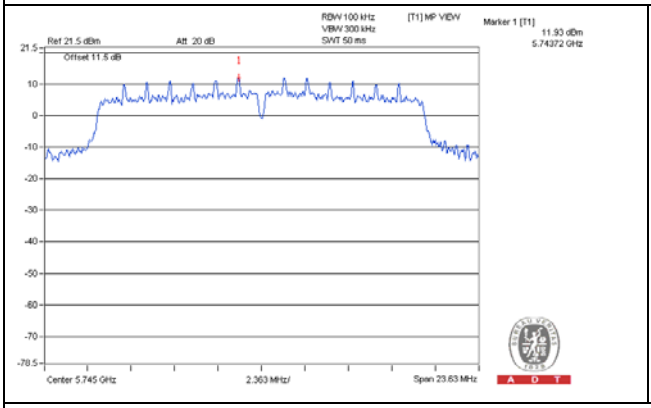


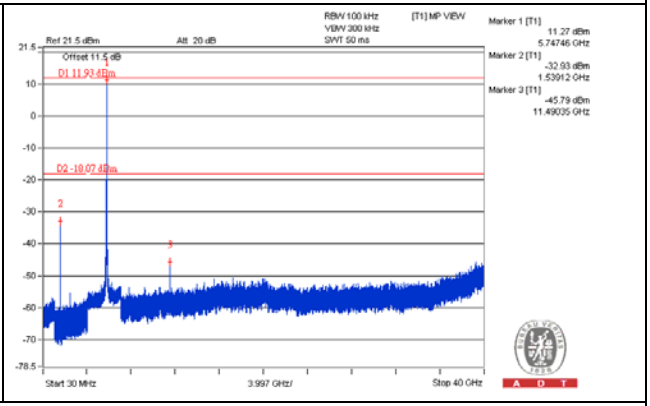
CH 165 Band edge



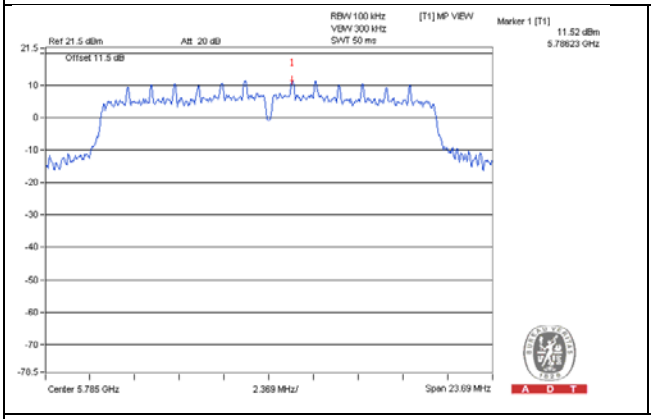
CHAIN 1

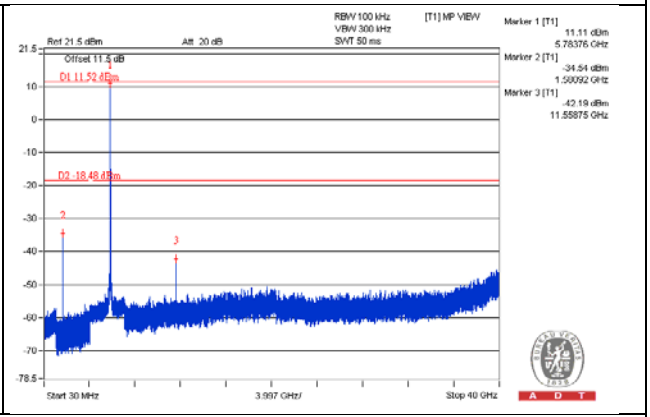
CH 149



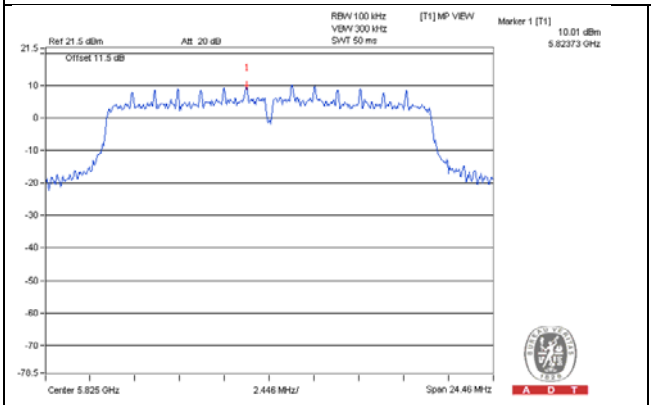


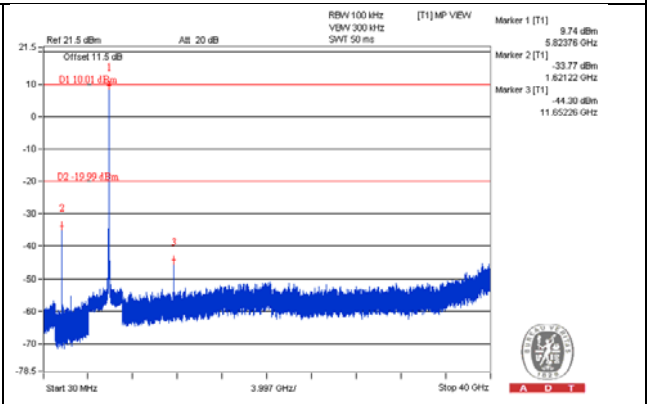
CH 157



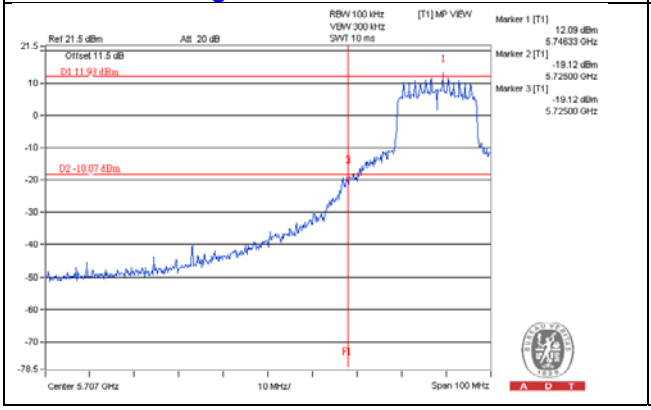


CH 165

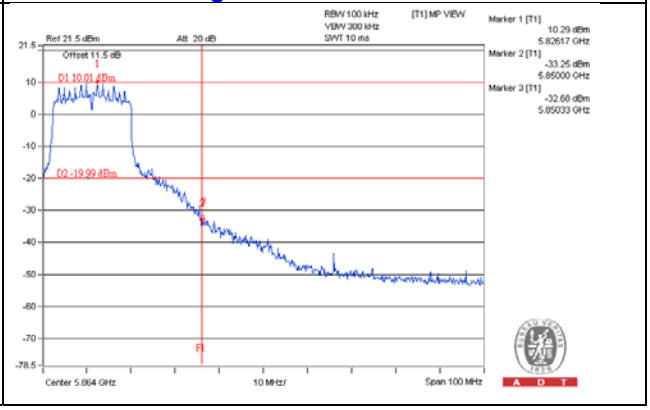




CH 149 Band edge

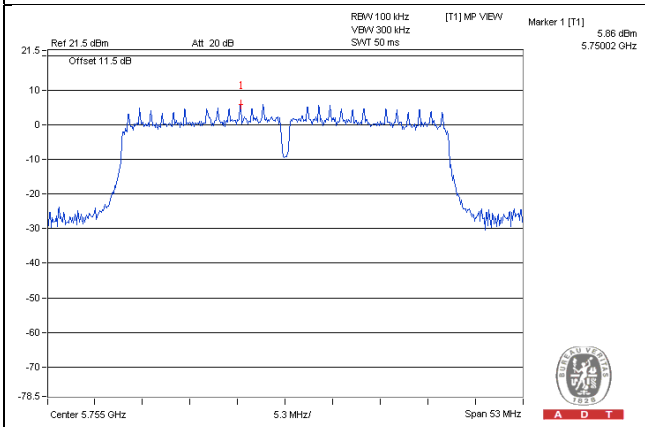


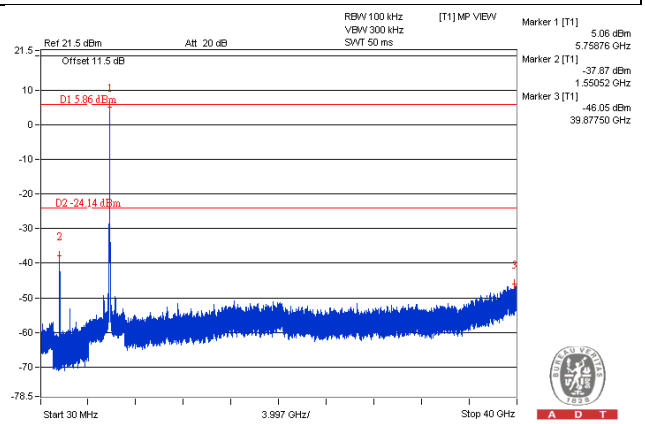
CH 165 Band edge



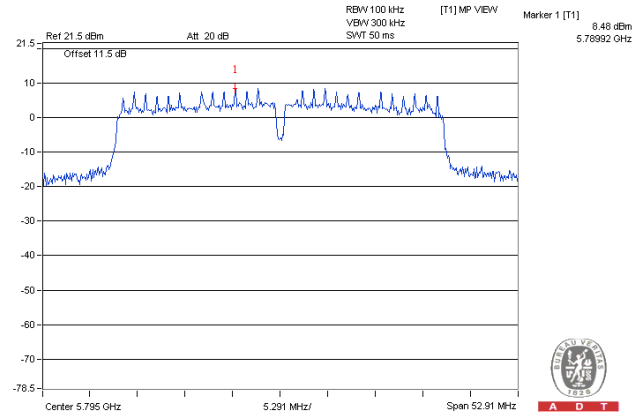
802.11n (HT40)
CHAIN 0

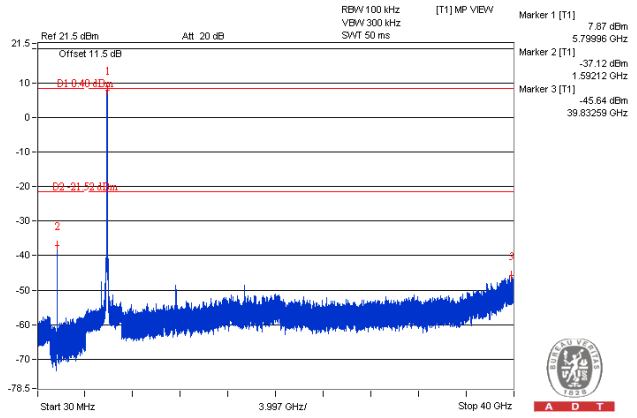
CH 151



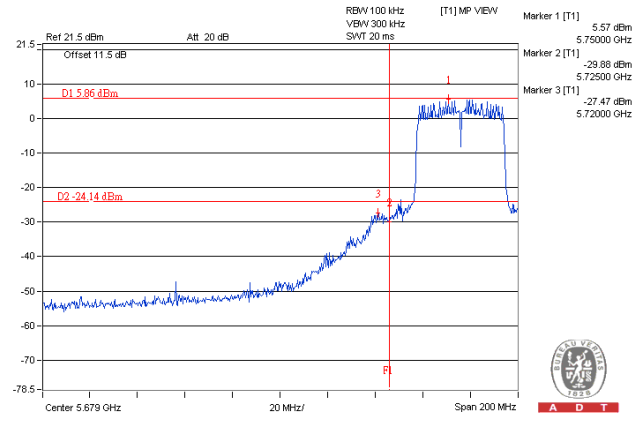


CH 159

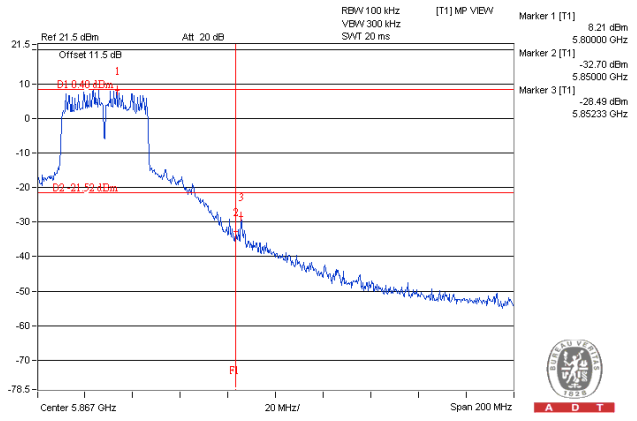




CH 151 Band edge

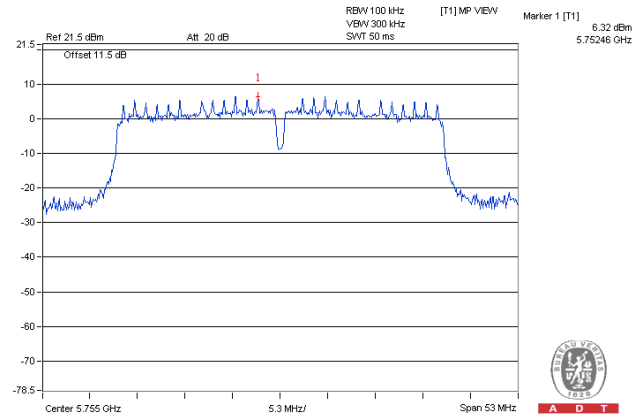


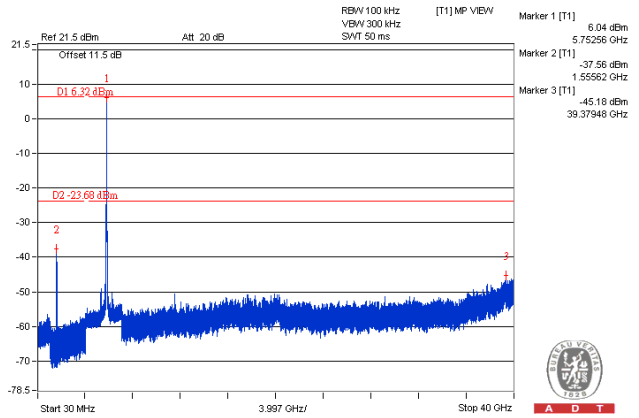
CH 159 Band edge



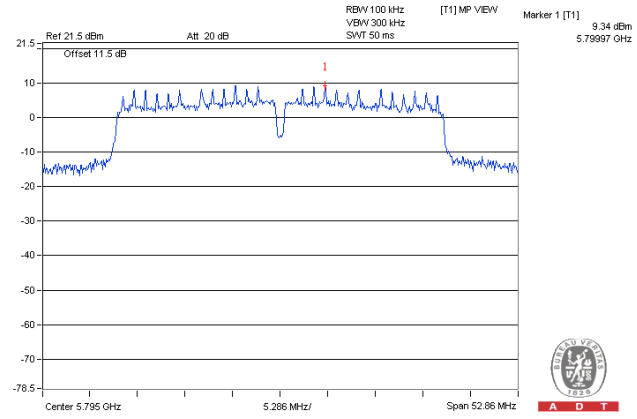
CHAIN 1

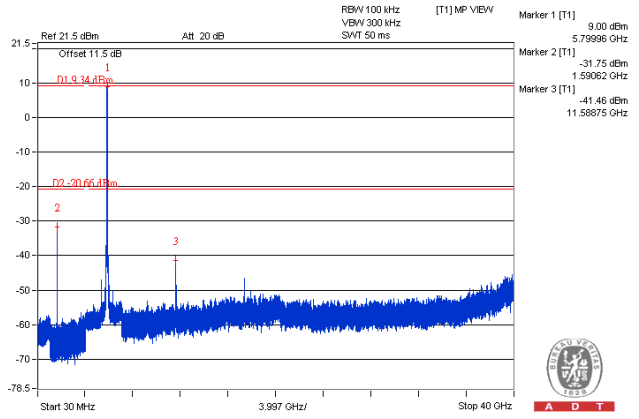
CH 151



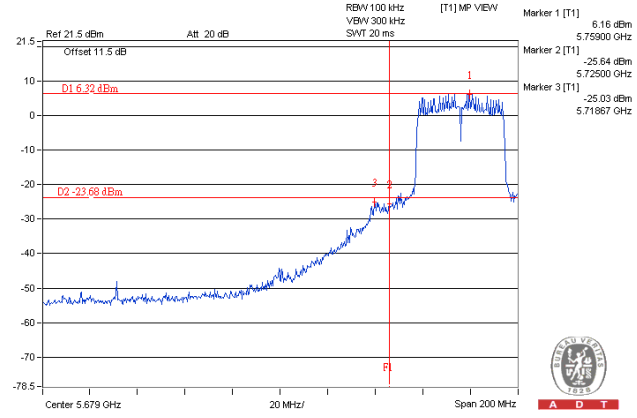


CH 159

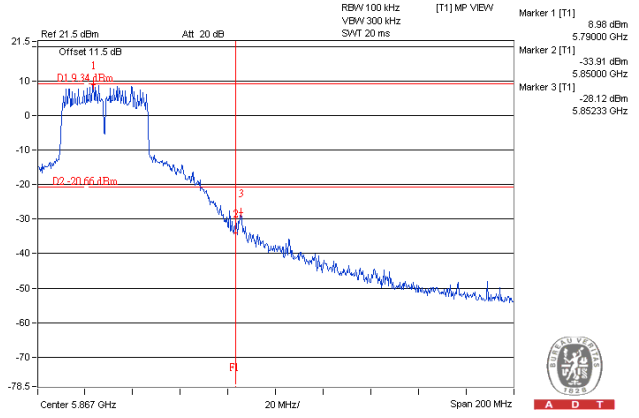




CH 151 Band edge

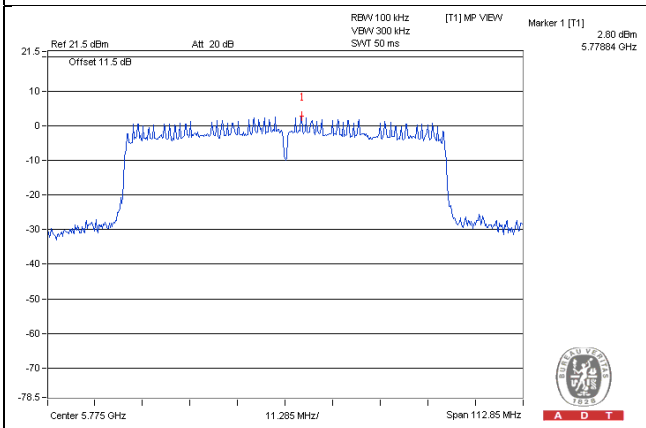


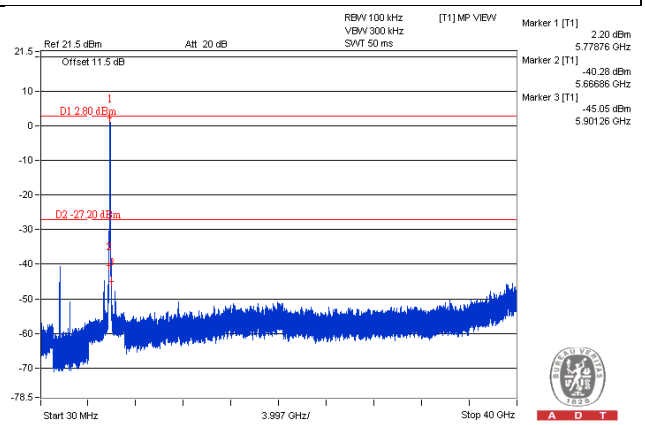
CH 159 Band edge



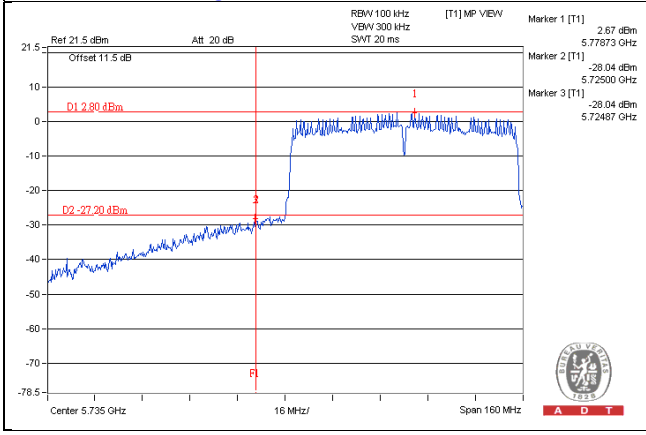
802.11ac (VHT80)
CHAIN 0

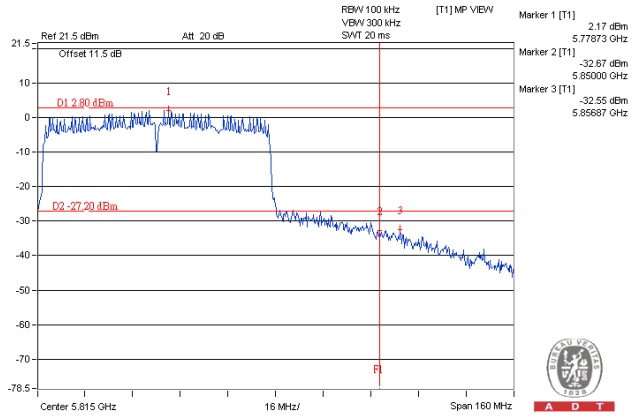
CH 155





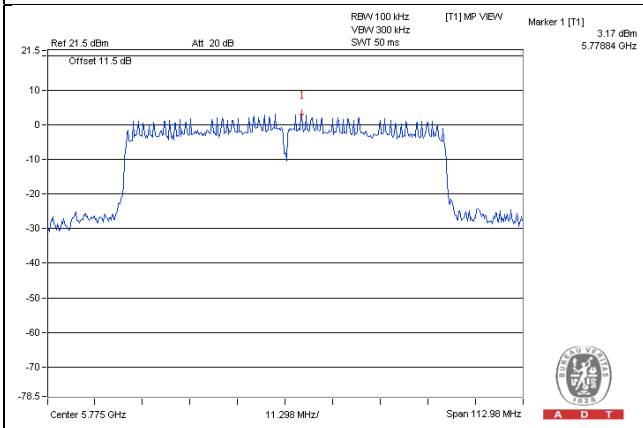
CH 155 Band edge

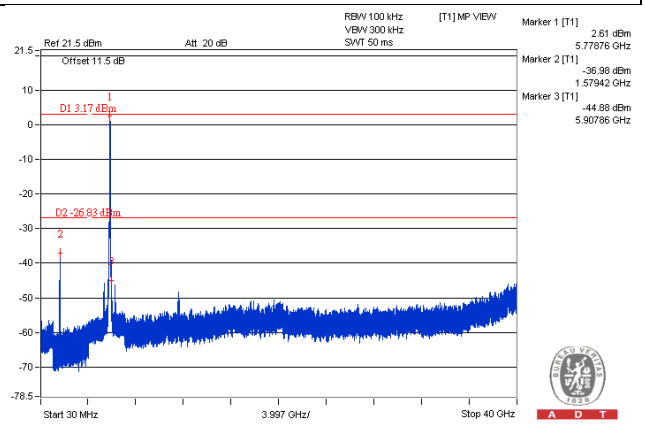




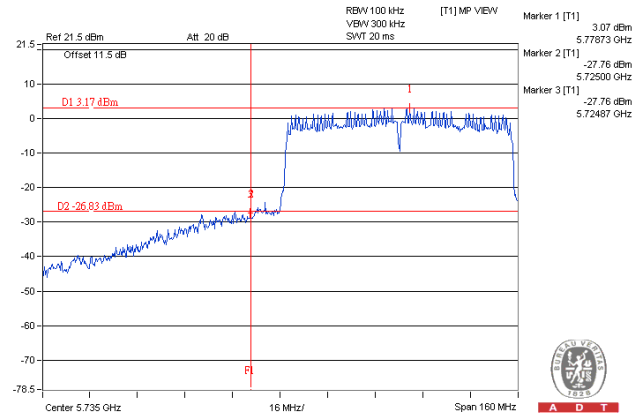
CHAIN 1

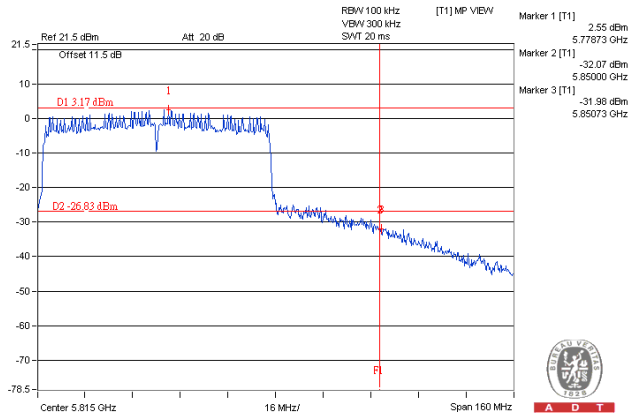
CH 155





CH 155 Band edge





6 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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Fax: 886-2-26051924

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

Hwa Ya EMC/RF/Safety Lab
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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.

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