FCC Test Report

Report No.: RF150203C07

FCC ID: TE7TGR1900

Test Model: TGR1900

Received Date: Feb. 03, 2015

Test Date: May 01 ~ May 29, 2015

Issued Date: Jun. 01, 2015

Applicant: TP-LINK TECHNOLOGIES CO., LTD.

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

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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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This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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Release Control Record

Issue No.	Description	Date Issued
RF150203C07	Original release	Jun. 01, 2015

1 Certificate of Conformity

Product: OnHub

Brand: TP-LINK

Test Model: TGR1900

Sample Status: Prototype

Applicant: TP-LINK TECHNOLOGIES CO., LTD.

Test Date: May 01 ~ May 29, 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:** Jun. 01, 2015
Pettie Chen / Senior Specialist

Approved by : _____ , **Date:** Jun. 01, 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 -14.16dB at 0.16200MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.3dB at 2390.00, 2483.50MHz.
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 SMT type Micro coaxial RF Receptacle 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	3.63 dB
	200MHz ~1000MHz	3.64 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	OnHub
Brand	TP-LINK
Test Model	TGR1900
Status of EUT	Prototype
Power Supply Rating	12Vdc from adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 600.0Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	1TX: 167.494mW 3TX: 778.968mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Data Cable Supplied	N/A

Note:

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

WiFi Module	Operation Band	Modulation Mode	TX Function
QCA9880	2.4GHz	802.11b	3TX
		802.11g	3TX
		802.11n(HT20)	3TX
		802.11n(HT40)	3TX
QCA9880	5GHz	802.11a	3TX
		802.11n(HT20)	3TX
		802.11n(HT40)	3TX
		802.11ac(VHT20)	3TX
		802.11ac(VHT40)	3TX
		802.11ac(VHT80)	3TX
QCA9882	2.4GHz	802.11b	1TX
		802.11g	1TX
		802.11n(HT20)	1TX
		802.11n(HT40)	1TX
	5GHz	802.11a	1TX
		802.11n(HT20)	1TX
		802.11n(HT40)	1TX
		802.11ac(VHT20)	1TX
		802.11ac(VHT40)	1TX
		802.11ac(VHT80)	1TX

2. The EUT uses following adapter.

Adapter	
Brand	Ten Pao International Inc.
Model	S048CU1200330
Input Power	100-240Vac~50/60Hz, 1.5A Max
Output Power	12.0Vdc, 3300mA
Power Line	1.55m cable without core attached on adapter

3. The EUT uses following antennas.

Item	WiFi Module Model	Antenna	Antenna Gain	Antenna Connector
2.4G(3TX)	QCA9880	Metalsheet antenna (Chain 0)	7dBi	SMT type Micro coaxial RF Receptacle
		PCB antenna (Chain 1)	2dBi	
		PCB antenna (Chain 2)	2dBi	
5G(3TX)	QCA9880	PCB antenna	3dBi	SMT type Micro coaxial RF Receptacle
2.4G(1TX)	QCA9882	PCB antenna	2dBi	SMT type Micro coaxial RF Receptacle
5G(1TX) (joint use with 2.4G(1TX))	QCA9882	PCB antenna	5dBi	SMT type Micro coaxial RF Receptacle
BT	-	PCB antenna (on board)	3.5dBi	mini RF I connector (internal connection without plug)
ZigBee	-	PCB antenna	2dBi	SMT type Micro coaxial RF Receptacle

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		

3.2.1 Test Mode Applicability and Tested Channel Detail

FOR 2.4GHz:

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

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

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

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.

Radiated Emission Test (Above 1GHz):

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX FUNCTION
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	1TX/3TX
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	1TX/3TX
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2	1TX/3TX
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0	1TX/3TX

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)	TX FUNCTION
-	802.11g	1 to 11	6	OFDM	BPSK	6.0	1TX/3TX

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)	TX FUNCTION
-	802.11g	1 to 11	6	OFDM	BPSK	6.0	1TX/3TX

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)	TX FUNCTION
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	1TX/3TX
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	1TX/3TX
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2	1TX/3TX
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0	1TX/3TX

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 60%RH	120Vac, 60Hz	Ted Chang
RE<1G	25deg. C, 60%RH	120Vac, 60Hz	Ted Chang
PLC	20deg. C, 70%RH	120Vac, 60Hz	Jones Chang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nick Chen

3.3 Duty Cycle of Test Signal

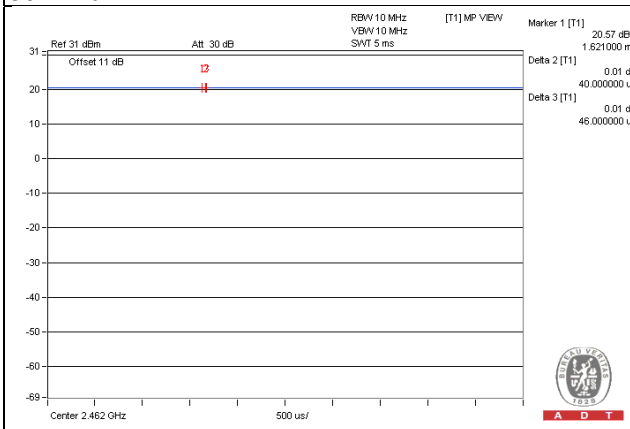
1TX:

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

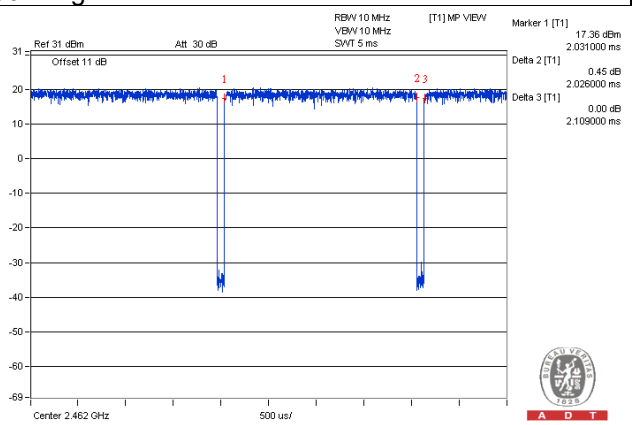
802.11n (HT20): Duty cycle of test signal is > 98%, duty factor is not required
802.11n (HT20): Duty cycle = 4.957/5.045= 0.983

802.11g, 802.11n (HT40): Duty cycle of test signal is < 98 %, duty factor is required
802.11g: Duty cycle = 2.026/2.109= 0.961, Duty factor = 10 * log(1/0.961) = 0.17
802.11n (HT40): Duty cycle = 2.404/2.493= 0.964, Duty factor = 10 * log(1/0.964) = 0.16

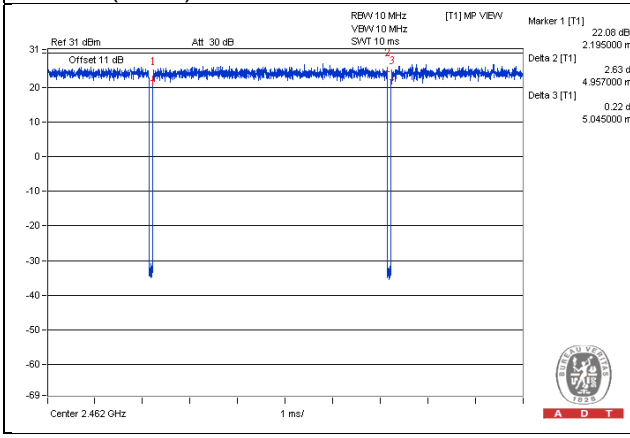
802.11b



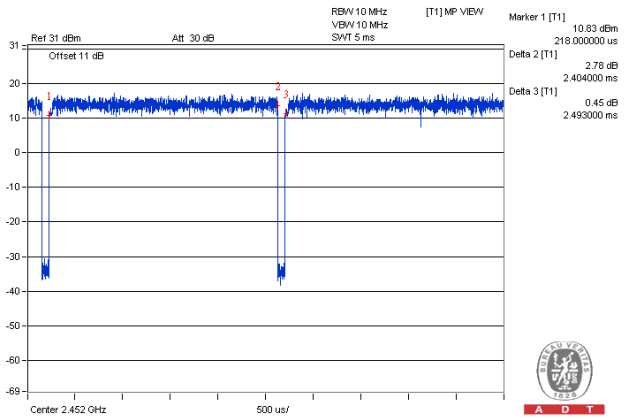
802.11g



802.11n (HT20)



802.11n (HT40)

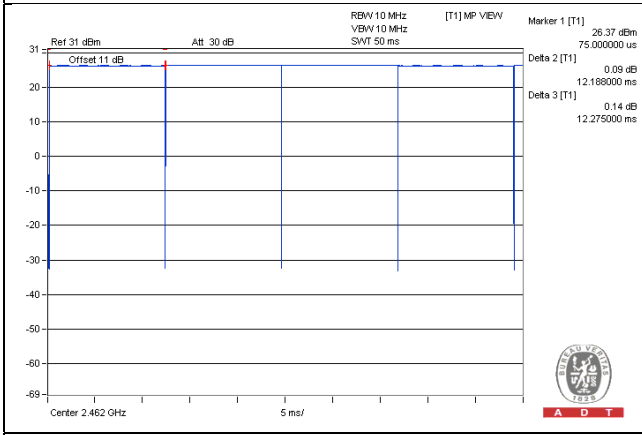


3TX:

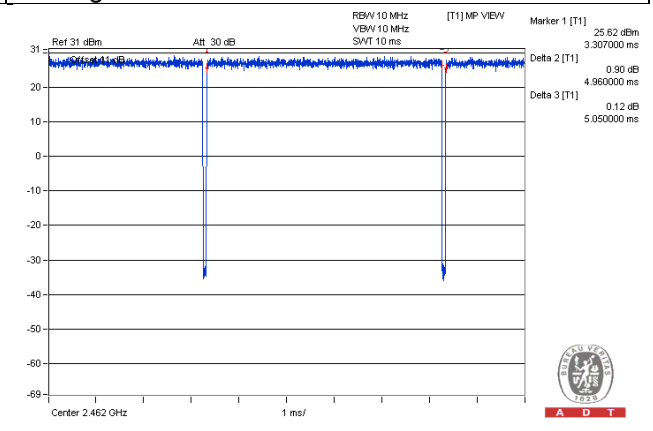
802.11b, 802.11g, 802.11n (HT20): Duty cycle of test signal is > 98%, duty factor is not required
802.11b: Duty cycle = 12.188/12.275= 0.993
802.11g: Duty cycle = 4.96/5.05= 0.982
802.11n (HT20): Duty cycle = 4.958/5.048= 0.982

802.11n (HT40): Duty cycle of test signal is < 98 %, duty factor is required
802.11n (HT40): Duty cycle = 2.408/2.489= 0.967, Duty factor = 10 * log(1/0.967) = 0.14

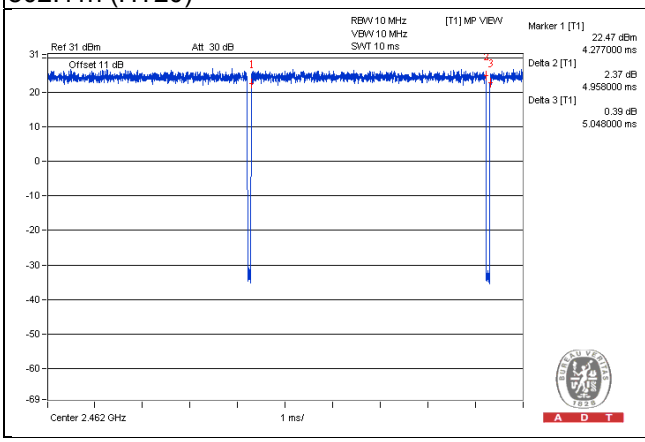
802.11b



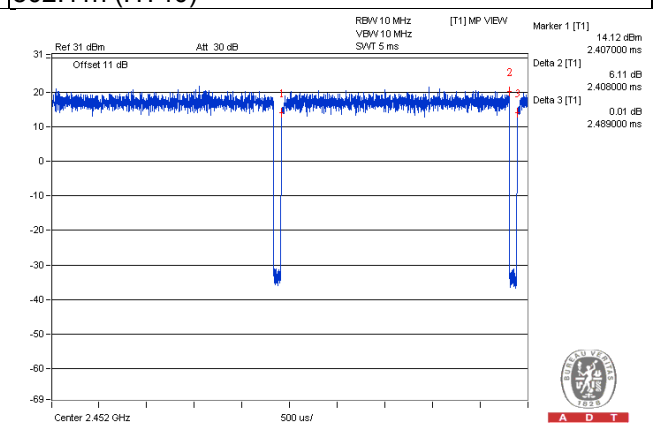
802.11g



802.11n (HT20)



802.11n (HT40)



3.4 Description of Support Units

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

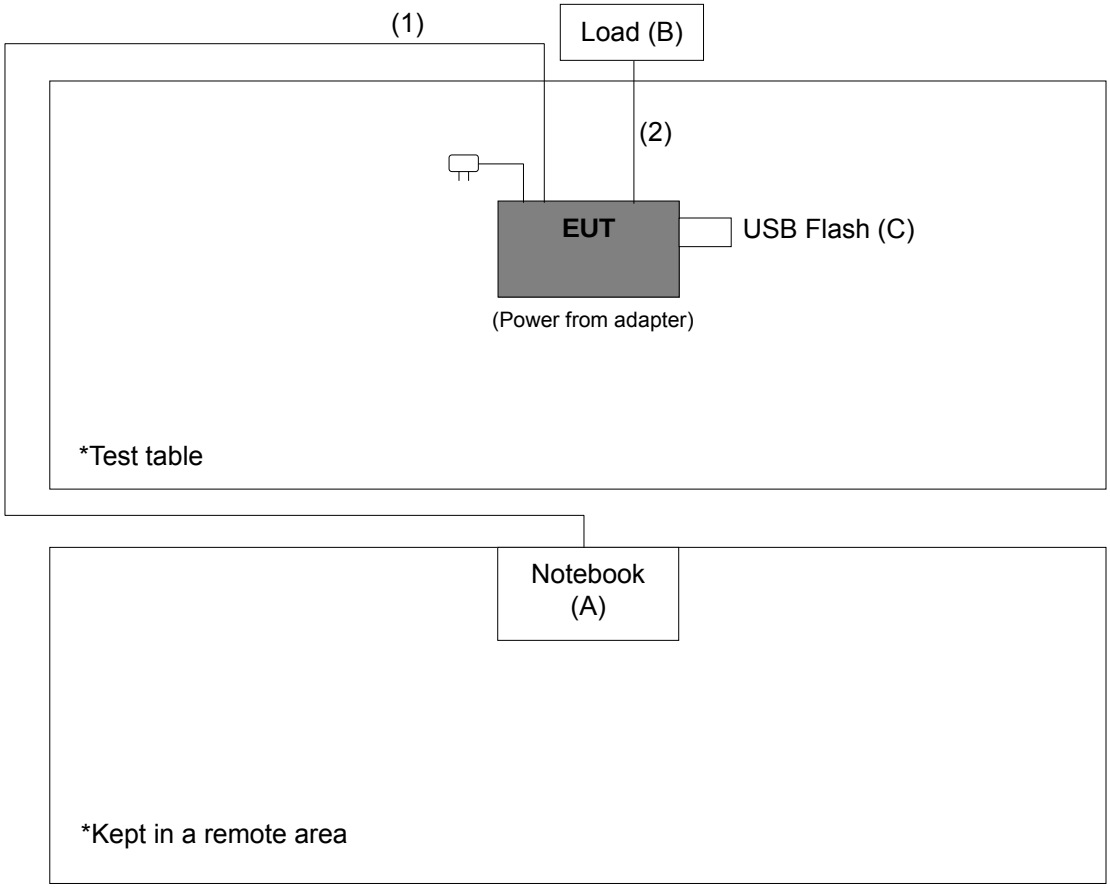
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	D531	CN-0XM006-48643-81 U-2610	QDS-BRCM1020	-
B.	Load	NA	NA	NA	NA	-
C.	USB Flash	SANDISK	SDCZ6-1024	NA	NA	-

Note:

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

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)
558074 D01 DTS Meas Guidance v03r03
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2009

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

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

4 Test Types and Results

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	ESCS30	100289	Dec. 01, 2014	Nov. 30, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Mar. 30, 2015	Mar. 29, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01911	Aug. 09, 2014	Aug. 08, 2015
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	248780/4 309222/4 274092/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable Worken	8D-FB	Cable-CH9-01	Aug. 11, 2014	Aug. 10, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
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 9.
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 215374.
5. The IC Site Registration No. is IC 7450F-9.

4.1.3 Test Procedures

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

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

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

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

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

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

Note:

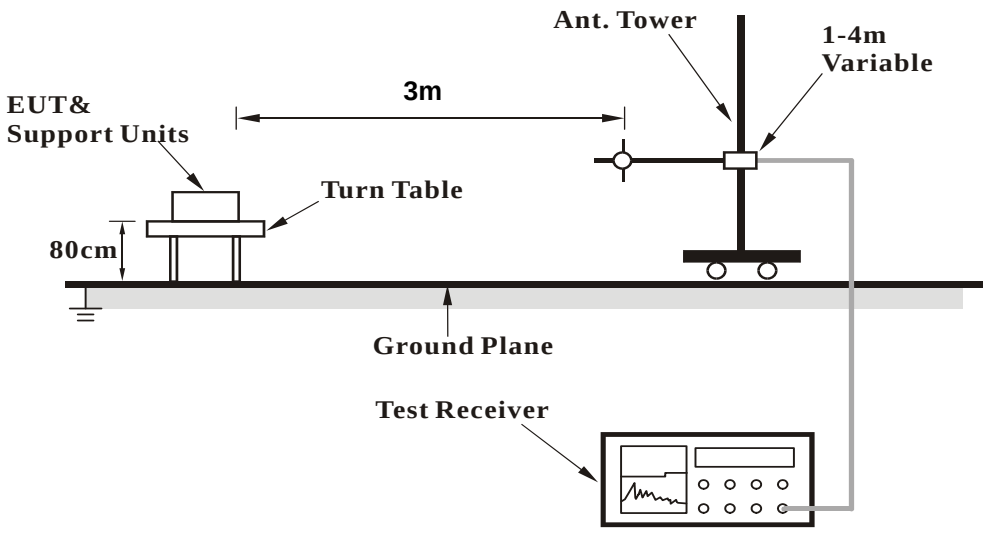
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test. (Tracking Number 307455)
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below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

4.1.4 Deviation from Test Standard

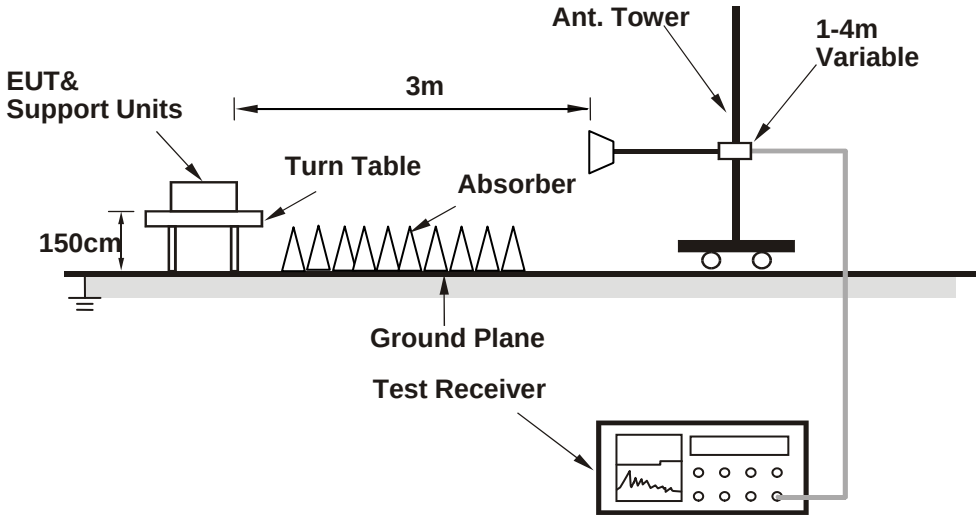
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

1TX

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	61.6 PK	74.0	-12.4	1.00 H	177	28.60	33.00
2	2390.00	53.5 AV	54.0	-0.5	1.00 H	177	20.50	33.00
3	*2412.00	103.9 PK			1.00 H	176	70.80	33.10
4	*2412.00	100.2 AV			1.00 H	176	67.10	33.10
5	4824.00	52.8 PK	74.0	-21.2	2.10 H	35	51.00	1.80
6	4824.00	48.7 AV	54.0	-5.3	2.10 H	35	46.90	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	57.0 PK	74.0	-17.0	1.00 V	58	24.00	33.00
2	2390.00	45.5 AV	54.0	-8.5	1.00 V	58	12.50	33.00
3	*2412.00	95.6 PK			1.61 V	144	62.50	33.10
4	*2412.00	91.9 AV			1.61 V	144	58.80	33.10
5	4824.00	48.6 PK	74.0	-25.4	1.00 V	251	46.80	1.80
6	4824.00	40.6 AV	54.0	-13.4	1.00 V	251	38.80	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.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.2 PK	74.0	-16.8	1.00 H	176	24.20	33.00
2	2390.00	45.8 AV	54.0	-8.2	1.00 H	176	12.80	33.00
3	*2437.00	102.8 PK			1.00 H	174	69.50	33.30
4	*2437.00	99.1 AV			1.00 H	174	65.80	33.30
5	2483.50	57.9 PK	74.0	-16.1	1.00 H	176	24.50	33.40
6	2483.50	45.9 AV	54.0	-8.1	1.00 H	176	12.50	33.40
7	4874.00	55.2 PK	74.0	-18.8	1.00 H	41	53.30	1.90
8	4874.00	51.7 AV	54.0	-2.3	1.00 H	41	49.80	1.90
9	7311.00	59.7 PK	74.0	-14.3	1.03 H	172	51.20	8.50
10	7311.00	53.1 AV	54.0	-0.9	1.03 H	172	44.60	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	56.1 PK	74.0	-17.9	2.16 V	155	23.10	33.00
2	2390.00	45.3 AV	54.0	-8.7	2.16 V	155	12.30	33.00
3	*2437.00	96.1 PK			2.16 V	155	62.80	33.30
4	*2437.00	92.3 AV			2.16 V	155	59.00	33.30
5	2483.50	57.9 PK	74.0	-16.1	2.16 V	155	24.50	33.40
6	2483.50	45.7 AV	54.0	-8.3	2.16 V	155	12.30	33.40
7	4874.00	47.8 PK	74.0	-26.2	1.13 V	18	45.90	1.90
8	4874.00	37.6 AV	54.0	-16.4	1.13 V	18	35.70	1.90
9	7311.00	54.9 PK	74.0	-19.1	1.55 V	235	46.40	8.50
10	7311.00	44.8 AV	54.0	-9.2	1.55 V	235	36.30	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	98.1 PK			1.09 H	10	64.70	33.40
2	*2462.00	94.0 AV			1.09 H	10	60.60	33.40
3	2483.50	60.2 PK	74.0	-13.8	1.09 H	9	26.80	33.40
4	2483.50	51.3 AV	54.0	-2.7	1.09 H	9	17.90	33.40
5	4924.00	51.0 PK	74.0	-23.0	1.00 H	26	49.00	2.00
6	4924.00	45.9 AV	54.0	-8.1	1.00 H	26	43.90	2.00
7	7386.00	59.3 PK	74.0	-14.7	1.01 H	174	51.00	8.30
8	7386.00	52.9 AV	54.0	-1.1	1.01 H	174	44.60	8.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	97.6 PK			1.95 V	143	64.20	33.40
2	*2462.00	93.7 AV			1.95 V	143	60.30	33.40
3	2483.50	60.1 PK	74.0	-13.9	1.95 V	143	26.70	33.40
4	2483.50	50.6 AV	54.0	-3.4	1.95 V	143	17.20	33.40
5	4924.00	49.0 PK	74.0	-25.0	1.26 V	12	47.00	2.00
6	4924.00	41.8 AV	54.0	-12.2	1.26 V	12	39.80	2.00
7	7386.00	57.4 PK	74.0	-16.6	1.16 V	48	49.10	8.30
8	7386.00	49.3 AV	54.0	-4.7	1.16 V	48	41.00	8.30

Remarks:

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

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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	71.4 PK	74.0	-2.6	1.00 H	178	38.40	33.00
2	2390.00	53.5 AV	54.0	-0.5	1.00 H	178	20.50	33.00
3	*2412.00	104.1 PK			1.00 H	176	71.00	33.10
4	*2412.00	93.9 AV			1.00 H	176	60.80	33.10
5	4824.00	47.8 PK	74.0	-26.2	1.05 H	94	46.00	1.80
6	4824.00	35.3 AV	54.0	-18.7	1.05 H	94	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	58.8 PK	74.0	-15.2	1.96 V	142	25.80	33.00
2	2390.00	45.8 AV	54.0	-8.2	1.96 V	142	12.80	33.00
3	*2412.00	95.1 PK			1.96 V	142	62.00	33.10
4	*2412.00	85.6 AV			1.96 V	142	52.50	33.10
5	4824.00	47.5 PK	74.0	-26.5	1.52 V	99	45.70	1.80
6	4824.00	34.3 AV	54.0	-19.7	1.52 V	99	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	71.6 PK	74.0	-2.4	1.00 H	176	38.60	33.00
2	2390.00	53.4 AV	54.0	-0.6	1.00 H	176	20.40	33.00
3	*2437.00	110.2 PK			1.00 H	176	76.90	33.30
4	*2437.00	99.6 AV			1.00 H	176	66.30	33.30
5	2483.50	66.8 PK	74.0	-7.2	1.00 H	173	33.40	33.40
6	2483.50	49.1 AV	54.0	-4.9	1.00 H	173	15.70	33.40
7	4874.00	51.9 PK	74.0	-22.1	1.00 H	34	50.00	1.90
8	4874.00	37.6 AV	54.0	-16.4	1.00 H	34	35.70	1.90
9	7311.00	65.3 PK	74.0	-8.7	1.02 H	171	56.80	8.50
10	7311.00	52.4 AV	54.0	-1.6	1.02 H	171	43.90	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	57.5 PK	74.0	-16.5	1.01 V	119	24.50	33.00
2	2390.00	45.3 AV	54.0	-8.7	1.01 V	119	12.30	33.00
3	*2437.00	97.3 PK			1.01 V	119	64.00	33.30
4	*2437.00	86.9 AV			1.01 V	119	53.60	33.30
5	2483.50	58.7 PK	74.0	-15.3	1.01 V	119	25.30	33.40
6	2483.50	46.3 AV	54.0	-7.7	1.01 V	119	12.90	33.40
7	4874.00	47.4 PK	74.0	-26.6	1.52 V	95	45.50	1.90
8	4874.00	36.4 AV	54.0	-17.6	1.52 V	95	34.50	1.90
9	7311.00	58.1 PK	74.0	-15.9	1.00 V	18	49.60	8.50
10	7311.00	44.5 AV	54.0	-9.5	1.00 V	18	36.00	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	96.8 PK			1.37 H	5	63.40	33.40
2	*2462.00	87.0 AV			1.37 H	5	53.60	33.40
3	2483.50	71.2 PK	74.0	-2.8	1.37 H	5	37.80	33.40
4	**2483.50**	**53.7 AV**	**54.0**	**-0.3**	**1.37 H**	**5**	**20.30**	**33.40**
5	4924.00	48.9 PK	74.0	-25.1	1.52 H	64	46.90	2.00
6	4924.00	35.5 AV	54.0	-18.5	1.52 H	64	33.50	2.00
7	7386.00	57.3 PK	74.0	-16.7	1.01 H	173	49.00	8.30
8	7386.00	43.1 AV	54.0	-10.9	1.01 H	173	34.80	8.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	99.0 PK			1.43 V	155	65.60	33.40
2	*2462.00	88.8 AV			1.43 V	155	55.40	33.40
3	2483.50	67.8 PK	74.0	-6.2	1.43 V	161	34.40	33.40
4	2483.50	50.3 AV	54.0	-3.7	1.43 V	161	16.90	33.40
5	4924.00	47.6 PK	74.0	-26.4	1.59 V	65	45.60	2.00
6	4924.00	35.5 AV	54.0	-18.5	1.59 V	65	33.50	2.00
7	7386.00	54.8 PK	74.0	-19.2	1.25 V	95	46.50	8.30
8	7386.00	41.8 AV	54.0	-12.2	1.25 V	95	33.50	8.30

Remarks:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.3 PK	74.0	-4.7	1.00 H	176	36.30	33.00
2	2390.00	53.3 AV	54.0	-0.7	1.00 H	176	20.30	33.00
3	*2412.00	103.7 PK			1.00 H	176	70.60	33.10
4	*2412.00	93.2 AV			1.00 H	176	60.10	33.10
5	4824.00	47.3 PK	74.0	-26.7	1.52 H	66	45.50	1.80
6	4824.00	34.3 AV	54.0	-19.7	1.52 H	66	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	56.5 PK	74.0	-17.5	1.62 V	128	23.50	33.00
2	2390.00	45.4 AV	54.0	-8.6	1.62 V	128	12.40	33.00
3	*2412.00	94.2 PK			1.62 V	128	61.10	33.10
4	*2412.00	83.9 AV			1.62 V	128	50.80	33.10
5	4824.00	47.5 PK	74.0	-26.5	1.22 V	66	45.70	1.80
6	4824.00	35.3 AV	54.0	-18.7	1.22 V	66	33.50	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	71.0 PK	74.0	-3.0	1.00 H	177	38.00	33.00
2	**2390.00**	**53.7 AV**	**54.0**	**-0.3**	**1.00 H**	**177**	**20.70**	**33.00**
3	*2437.00	107.1 PK			1.00 H	175	73.80	33.30
4	*2437.00	96.4 AV			1.00 H	175	63.10	33.30
5	2483.50	65.6 PK	74.0	-8.4	1.00 H	174	32.20	33.40
6	2483.50	49.6 AV	54.0	-4.4	1.00 H	174	16.20	33.40
7	4874.00	51.6 PK	74.0	-22.4	1.00 H	35	49.70	1.90
8	4874.00	37.1 AV	54.0	-16.9	1.00 H	35	35.20	1.90
9	7311.00	65.5 PK	74.0	-8.5	1.00 H	169	57.00	8.50
10	7311.00	52.6 AV	54.0	-1.4	1.00 H	169	44.10	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	57.5 PK	74.0	-16.5	1.00 V	139	24.50	33.00
2	2390.00	45.5 AV	54.0	-8.5	1.00 V	139	12.50	33.00
3	*2437.00	98.5 PK			1.00 V	139	65.20	33.30
4	*2437.00	88.1 AV			1.00 V	139	54.80	33.30
5	2483.50	61.1 PK	74.0	-12.9	1.00 V	139	27.70	33.40
6	2483.50	47.0 AV	54.0	-7.0	1.00 V	139	13.60	33.40
7	4874.00	47.5 PK	74.0	-26.5	1.52 V	94	45.60	1.90
8	4874.00	35.4 AV	54.0	-18.6	1.52 V	94	33.50	1.90
9	7311.00	58.7 PK	74.0	-15.3	1.52 V	88	50.20	8.50
10	7311.00	45.3 AV	54.0	-8.7	1.52 V	88	36.80	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	101.1 PK			1.51 H	17	67.70	33.40
2	*2462.00	90.8 AV			1.51 H	17	57.40	33.40
3	2483.50	68.4 PK	74.0	-5.6	1.38 H	5	35.00	33.40
4	**2483.50**	**53.7 AV**	**54.0**	**-0.3**	**1.38 H**	**5**	**20.30**	**33.40**
5	4924.00	47.8 PK	74.0	-26.2	1.52 H	99	45.80	2.00
6	4924.00	35.5 AV	54.0	-18.5	1.52 H	99	33.50	2.00
7	7386.00	54.4 PK	74.0	-19.6	1.11 H	162	46.10	8.30
8	7386.00	40.8 AV	54.0	-13.2	1.11 H	162	32.50	8.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	94.0 PK			1.74 V	159	60.60	33.40
2	*2462.00	84.0 AV			1.74 V	159	50.60	33.40
3	2483.50	63.8 PK	74.0	-10.2	1.74 V	159	30.40	33.40
4	2483.50	48.7 AV	54.0	-5.3	1.74 V	159	15.30	33.40
5	4924.00	47.7 PK	74.0	-26.3	1.52 V	96	45.70	2.00
6	4924.00	35.5 AV	54.0	-18.5	1.52 V	96	33.50	2.00
7	7386.00	54.1 PK	74.0	-19.9	1.57 V	84	45.80	8.30
8	7386.00	41.8 AV	54.0	-12.2	1.57 V	84	33.50	8.30

Remarks:

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

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	67.4 PK	74.0	-6.6	1.00 H	177	34.40	33.00
2	2390.00	53.6 AV	54.0	-0.4	1.00 H	177	20.60	33.00
3	*2422.00	96.8 PK			1.00 H	177	63.60	33.20
4	*2422.00	86.4 AV			1.00 H	177	53.20	33.20
5	4844.00	48.4 PK	74.0	-25.6	1.52 H	69	46.60	1.80
6	4844.00	35.3 AV	54.0	-18.7	1.52 H	69	33.50	1.80
7	7266.00	54.4 PK	74.0	-19.6	1.00 H	51	45.90	8.50
8	7266.00	39.0 AV	54.0	-15.0	1.00 H	51	30.50	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	57.3 PK	74.0	-16.7	1.95 V	119	24.30	33.00
2	2390.00	45.4 AV	54.0	-8.6	1.95 V	119	12.40	33.00
3	*2422.00	87.5 PK			1.95 V	119	54.30	33.20
4	*2422.00	77.4 AV			1.95 V	119	44.20	33.20
5	4844.00	48.3 PK	74.0	-25.7	1.52 V	335	46.50	1.80
6	4844.00	35.0 AV	54.0	-19.0	1.52 V	335	33.20	1.80
7	7266.00	53.1 PK	74.0	-20.9	1.58 V	360	44.60	8.50
8	7266.00	40.0 AV	54.0	-14.0	1.58 V	360	31.50	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 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	70.4 PK	74.0	-3.6	1.00 H	177	37.40	33.00
2	2390.00	53.6 AV	54.0	-0.4	1.00 H	177	20.60	33.00
3	*2437.00	101.2 PK			1.00 H	177	67.90	33.30
4	*2437.00	91.0 AV			1.00 H	177	57.70	33.30
5	2483.50	63.9 PK	74.0	-10.1	1.00 H	177	30.50	33.40
6	2483.50	49.2 AV	54.0	-4.8	1.00 H	177	15.80	33.40
7	4874.00	47.5 PK	74.0	-26.5	1.58 H	88	45.60	1.90
8	4874.00	34.4 AV	54.0	-19.6	1.58 H	88	32.50	1.90
9	7311.00	55.2 PK	74.0	-18.8	1.52 H	69	46.70	8.50
10	7311.00	42.0 AV	54.0	-12.0	1.52 H	69	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	58.1 PK	74.0	-15.9	2.35 V	139	25.10	33.00
2	2390.00	46.5 AV	54.0	-7.5	2.35 V	139	13.50	33.00
3	*2437.00	94.0 PK			2.35 V	139	60.70	33.30
4	*2437.00	84.2 AV			2.35 V	139	50.90	33.30
5	2483.50	61.4 PK	74.0	-12.6	2.35 V	139	28.00	33.40
6	2483.50	48.5 AV	54.0	-5.5	2.35 V	139	15.10	33.40
7	4874.00	47.5 PK	74.0	-26.5	1.47 V	88	45.60	1.90
8	4874.00	34.4 AV	54.0	-19.6	1.47 V	88	32.50	1.90
9	7311.00	54.4 PK	74.0	-19.6	1.54 V	99	45.90	8.50
10	7311.00	40.1 AV	54.0	-13.9	1.54 V	99	31.60	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 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	91.9 PK			1.00 H	354	58.60	33.30
2	*2452.00	81.8 AV			1.00 H	354	48.50	33.30
3	2483.50	67.8 PK	74.0	-6.2	1.00 H	354	34.40	33.40
4	2483.50	53.5 AV	54.0	-0.5	1.00 H	354	20.10	33.40
5	4904.00	47.3 PK	74.0	-26.7	1.26 H	99	45.30	2.00
6	4904.00	35.2 AV	54.0	-18.8	1.26 H	99	33.20	2.00
7	7356.00	53.2 PK	74.0	-20.8	1.53 H	63	44.90	8.30
8	7356.00	40.8 AV	54.0	-13.2	1.53 H	63	32.50	8.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	92.7 PK			1.74 V	134	59.40	33.30
2	*2452.00	82.7 AV			1.74 V	134	49.40	33.30
3	2483.50	66.6 PK	74.0	-7.4	1.74 V	134	33.20	33.40
4	2483.50	52.1 AV	54.0	-1.9	1.74 V	134	18.70	33.40
5	4904.00	46.6 PK	74.0	-27.4	1.52 V	334	44.60	2.00
6	4904.00	33.3 AV	54.0	-20.7	1.52 V	334	31.30	2.00
7	7356.00	52.9 PK	74.0	-21.1	1.14 V	221	44.60	8.30
8	7356.00	39.8 AV	54.0	-14.2	1.14 V	221	31.50	8.30

Remarks:

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

Below 1GHz worst-case data:

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	51.34	27.5 QP	40.0	-12.5	1.00 H	153	41.90	-14.40
2	499.48	30.2 QP	46.0	-15.8	1.00 H	146	38.90	-8.70
3	625.58	44.1 QP	46.0	-1.9	1.00 H	175	49.90	-5.80
4	749.74	33.8 QP	46.0	-12.2	1.00 H	309	37.50	-3.70
5	926.28	30.1 QP	46.0	-15.9	1.00 H	330	30.70	-0.60
6	949.56	30.3 QP	46.0	-15.7	1.00 H	156	30.60	-0.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	59.10	32.9 QP	40.0	-7.1	1.00 V	8	47.60	-14.70
2	64.92	29.5 QP	40.0	-10.5	1.00 V	5	44.80	-15.30
3	499.48	38.7 QP	46.0	-7.3	1.00 V	201	47.40	-8.70
4	625.58	40.5 QP	46.0	-5.5	1.00 V	166	46.30	-5.80
5	749.74	35.2 QP	46.0	-10.8	1.00 V	120	38.90	-3.70
6	875.84	39.0 QP	46.0	-7.0	1.00 V	219	40.90	-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

3TX

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	62.7 PK	74.0	-11.3	1.01 H	24	29.70	33.00
2	2390.00	53.2 AV	54.0	-0.8	1.01 H	24	20.20	33.00
3	*2412.00	116.7 PK			1.47 H	28	83.60	33.10
4	*2412.00	112.9 AV			1.47 H	28	79.80	33.10
5	4824.00	50.5 PK	74.0	-23.5	1.32 H	330	48.70	1.80
6	4824.00	45.6 AV	54.0	-8.4	1.32 H	330	43.80	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	57.9 PK	74.0	-16.1	1.06 V	345	24.90	33.00
2	2390.00	47.2 AV	54.0	-6.8	1.06 V	345	14.20	33.00
3	*2412.00	108.8 PK			1.05 V	356	75.70	33.10
4	*2412.00	105.0 AV			1.05 V	356	71.90	33.10
5	4824.00	48.5 PK	74.0	-25.5	1.07 V	269	46.70	1.80
6	4824.00	40.4 AV	54.0	-13.6	1.07 V	269	38.60	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.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.5 PK	74.0	-10.5	1.18 H	10	30.50	33.00
2	2390.00	48.3 AV	54.0	-5.7	1.18 H	10	15.30	33.00
3	*2437.00	122.4 PK			1.44 H	28	89.10	33.30
4	*2437.00	118.4 AV			1.44 H	28	85.10	33.30
5	4874.00	56.9 PK	74.0	-17.1	1.32 H	327	55.00	1.90
6	4874.00	53.2 AV	54.0	-0.8	1.32 H	327	51.30	1.90
7	7311.00	56.4 PK	74.0	-17.6	1.03 H	45	47.90	8.50
8	7311.00	48.0 AV	54.0	-6.0	1.03 H	45	39.50	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	59.8 PK	74.0	-14.2	1.05 V	54	26.80	33.00
2	2390.00	46.6 AV	54.0	-7.4	1.05 V	54	13.60	33.00
3	*2437.00	111.2 PK			1.03 V	110	77.90	33.30
4	*2437.00	107.9 AV			1.03 V	110	74.60	33.30
5	4874.00	53.9 PK	74.0	-20.1	1.00 V	2	52.00	1.90
6	4874.00	49.8 AV	54.0	-4.2	1.00 V	2	47.90	1.90
7	7311.00	56.2 PK	74.0	-17.8	1.83 V	244	47.70	8.50
8	7311.00	46.7 AV	54.0	-7.3	1.83 V	244	38.20	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	115.3 PK			1.00 H	20	81.90	33.40
2	*2462.00	111.7 AV			1.00 H	20	78.30	33.40
3	2483.50	63.4 PK	74.0	-10.6	1.00 H	14	30.00	33.40
4	2483.50	53.0 AV	54.0	-1.0	1.00 H	14	19.60	33.40
5	4924.00	54.1 PK	74.0	-19.9	1.94 H	360	52.10	2.00
6	4924.00	50.9 AV	54.0	-3.1	1.94 H	360	48.90	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	111.8 PK			1.31 V	349	78.40	33.40
2	*2462.00	107.9 AV			1.31 V	349	74.50	33.40
3	2483.50	59.3 PK	74.0	-14.7	1.20 V	63	25.90	33.40
4	2483.50	47.0 AV	54.0	-7.0	1.20 V	63	13.60	33.40
5	4924.00	49.9 PK	74.0	-24.1	1.00 V	351	47.90	2.00
6	4924.00	43.8 AV	54.0	-10.2	1.00 V	351	41.80	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	72.7 PK	74.0	-1.3	1.84 H	10	39.70	33.00
2	2390.00	53.4 AV	54.0	-0.6	1.84 H	10	20.40	33.00
3	*2412.00	115.6 PK			1.00 H	25	82.50	33.10
4	*2412.00	106.0 AV			1.00 H	25	72.90	33.10
5	4824.00	47.3 PK	74.0	-26.7	1.85 H	65	45.50	1.80
6	4824.00	34.3 AV	54.0	-19.7	1.85 H	65	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	58.6 PK	74.0	-15.4	1.06 V	354	25.60	33.00
2	2390.00	48.2 AV	54.0	-5.8	1.06 V	354	15.20	33.00
3	*2412.00	110.4 PK			1.06 V	327	77.30	33.10
4	*2412.00	100.4 AV			1.06 V	327	67.30	33.10
5	4824.00	46.6 PK	74.0	-27.4	1.56 V	352	44.80	1.80
6	4824.00	33.5 AV	54.0	-20.5	1.56 V	352	31.70	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	70.6 PK	74.0	-3.4	1.67 H	1	37.60	33.00
2	2390.00	51.2 AV	54.0	-2.8	1.67 H	1	18.20	33.00
3	*2437.00	124.1 PK			1.43 H	20	90.80	33.30
4	*2437.00	114.1 AV			1.43 H	20	80.80	33.30
5	2483.50	72.5 PK	74.0	-1.5	1.95 H	3	39.10	33.40
6	2483.50	53.2 AV	54.0	-0.8	1.95 H	3	19.80	33.40
7	4874.00	56.4 PK	74.0	-17.6	1.56 H	360	54.50	1.90
8	4874.00	42.5 AV	54.0	-11.5	1.56 H	360	40.60	1.90
9	7311.00	55.2 PK	74.0	-18.8	1.00 H	5	46.70	8.50
10	7311.00	42.1 AV	54.0	-11.9	1.00 H	5	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	1.52 V	34	28.00	33.00
2	2390.00	47.6 AV	54.0	-6.4	1.52 V	34	14.60	33.00
3	*2437.00	115.7 PK			1.03 V	328	82.40	33.30
4	*2437.00	105.0 AV			1.03 V	328	71.70	33.30
5	2483.50	61.3 PK	74.0	-12.7	1.93 V	120	27.90	33.40
6	2483.50	47.6 AV	54.0	-6.4	1.93 V	120	14.20	33.40
7	4874.00	50.0 PK	74.0	-24.0	1.13 V	299	48.10	1.90
8	4874.00	37.5 AV	54.0	-16.5	1.13 V	299	35.60	1.90
9	7311.00	54.2 PK	74.0	-19.8	1.00 V	234	45.70	8.50
10	7311.00	41.5 AV	54.0	-12.5	1.00 V	234	33.00	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	117.1 PK			1.00 H	15	83.70	33.40
2	*2462.00	107.2 AV			1.00 H	15	73.80	33.40
3	2483.50	68.9 PK	74.0	-5.1	1.00 H	13	35.50	33.40
4	2483.50	53.5 AV	54.0	-0.5	1.00 H	13	20.10	33.40
5	4924.00	50.1 PK	74.0	-23.9	1.67 H	4	48.10	2.00
6	4924.00	35.8 AV	54.0	-18.2	1.67 H	4	33.80	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	109.4 PK			1.03 V	335	76.00	33.40
2	*2462.00	99.6 AV			1.03 V	335	66.20	33.40
3	2483.50	65.0 PK	74.0	-9.0	1.02 V	106	31.60	33.40
4	2483.50	49.6 AV	54.0	-4.4	1.02 V	106	16.20	33.40
5	4924.00	46.6 PK	74.0	-27.4	1.52 V	244	44.60	2.00
6	4924.00	34.5 AV	54.0	-19.5	1.52 V	244	32.50	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.

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.6 PK	74.0	-3.4	1.01 H	19	37.60	33.00
2	2390.00	53.4 AV	54.0	-0.6	1.01 H	19	20.40	33.00
3	*2412.00	115.6 PK			1.62 H	20	82.50	33.10
4	*2412.00	105.6 AV			1.62 H	20	72.50	33.10
5	4824.00	47.5 PK	74.0	-26.5	1.00 H	65	45.70	1.80
6	4824.00	34.3 AV	54.0	-19.7	1.00 H	65	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	1.27 V	318	30.20	33.00
2	2390.00	48.6 AV	54.0	-5.4	1.27 V	318	15.60	33.00
3	*2412.00	108.9 PK			1.06 V	341	75.80	33.10
4	*2412.00	98.6 AV			1.06 V	341	65.50	33.10
5	4824.00	48.5 PK	74.0	-25.5	1.05 V	35	46.70	1.80
6	4824.00	33.3 AV	54.0	-20.7	1.05 V	35	31.50	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	73.1 PK	74.0	-0.9	1.70 H	10	40.10	33.00
2	2390.00	53.1 AV	54.0	-0.9	1.70 H	10	20.10	33.00
3	*2437.00	123.0 PK			1.29 H	13	89.70	33.30
4	*2437.00	113.0 AV			1.29 H	13	79.70	33.30
5	2483.50	70.0 PK	74.0	-4.0	1.44 H	18	36.60	33.40
6	2483.50	51.7 AV	54.0	-2.3	1.44 H	18	18.30	33.40
7	4874.00	57.5 PK	74.0	-16.5	1.00 H	64	55.60	1.90
8	4874.00	43.1 AV	54.0	-10.9	1.00 H	64	41.20	1.90
9	7311.00	54.4 PK	74.0	-19.6	1.52 H	68	45.90	8.50
10	7311.00	41.5 AV	54.0	-12.5	1.52 H	68	33.00	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	60.5 PK	74.0	-13.5	1.57 V	84	27.50	33.00
2	2390.00	48.2 AV	54.0	-5.8	1.57 V	84	15.20	33.00
3	*2437.00	114.8 PK			1.18 V	355	81.50	33.30
4	*2437.00	104.4 AV			1.18 V	355	71.10	33.30
5	2483.50	61.4 PK	74.0	-12.6	1.52 V	33	28.00	33.40
6	2483.50	49.1 AV	54.0	-4.9	1.52 V	33	15.70	33.40
7	4874.00	50.4 PK	74.0	-23.6	1.13 V	289	48.50	1.90
8	4874.00	37.2 AV	54.0	-16.8	1.13 V	289	35.30	1.90
9	7311.00	54.1 PK	74.0	-19.9	1.37 V	212	45.60	8.50
10	7311.00	40.4 AV	54.0	-13.6	1.37 V	212	31.90	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	118.4 PK			1.00 H	17	85.00	33.40
2	*2462.00	108.1 AV			1.00 H	17	74.70	33.40
3	2483.50	66.4 PK	74.0	-7.6	1.00 H	354	33.00	33.40
4	2483.50	52.7 AV	54.0	-1.3	1.00 H	354	19.30	33.40
5	4924.00	47.7 PK	74.0	-26.3	1.85 H	96	45.70	2.00
6	4924.00	35.5 AV	54.0	-18.5	1.85 H	96	33.50	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	*2462.00	112.3 PK			1.48 V	343	78.90	33.40
2	*2462.00	101.8 AV			1.48 V	343	68.40	33.40
3	2483.50	63.4 PK	74.0	-10.6	1.44 V	341	30.00	33.40
4	2483.50	49.6 AV	54.0	-4.4	1.44 V	341	16.20	33.40
5	4924.00	47.5 PK	74.0	-26.5	1.58 V	58	45.50	2.00
6	4924.00	34.5 AV	54.0	-19.5	1.58 V	58	32.50	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.

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	68.7 PK	74.0	-5.3	1.33 H	6	35.70	33.00
2	2390.00	53.5 AV	54.0	-0.5	1.33 H	6	20.50	33.00
3	*2422.00	109.6 PK			1.77 H	10	76.40	33.20
4	*2422.00	99.5 AV			1.77 H	10	66.30	33.20
5	4844.00	47.5 PK	74.0	-26.5	1.54 H	88	45.70	1.80
6	4844.00	34.3 AV	54.0	-19.7	1.54 H	88	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	61.9 PK	74.0	-12.1	1.49 V	0	28.90	33.00
2	2390.00	48.7 AV	54.0	-5.3	1.49 V	0	15.70	33.00
3	*2422.00	101.2 PK			1.05 V	331	68.00	33.20
4	*2422.00	91.2 AV			1.05 V	331	58.00	33.20
5	4844.00	46.4 PK	74.0	-27.6	1.52 V	57	44.60	1.80
6	4844.00	33.1 AV	54.0	-20.9	1.52 V	57	31.30	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	69.9 PK	74.0	-4.1	1.66 H	0	36.90	33.00
2	2390.00	53.5 AV	54.0	-0.5	1.66 H	0	20.50	33.00
3	*2437.00	113.1 PK			1.00 H	12	79.80	33.30
4	*2437.00	103.7 AV			1.00 H	12	70.40	33.30
5	2483.50	61.0 PK	74.0	-13.0	1.77 H	354	27.60	33.40
6	2483.50	47.7 AV	54.0	-6.3	1.77 H	354	14.30	33.40
7	4874.00	48.5 PK	74.0	-25.5	1.52 H	65	46.60	1.90
8	4874.00	34.2 AV	54.0	-19.8	1.52 H	65	32.30	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	58.8 PK	74.0	-15.2	1.05 V	36	25.80	33.00
2	2390.00	47.9 AV	54.0	-6.1	1.05 V	36	14.90	33.00
3	*2437.00	104.2 PK			1.05 V	261	70.90	33.30
4	*2437.00	94.1 AV			1.05 V	261	60.80	33.30
5	2483.50	59.0 PK	74.0	-15.0	1.52 V	33	25.60	33.40
6	2483.50	46.6 AV	54.0	-7.4	1.52 V	33	13.20	33.40
7	4874.00	46.8 PK	74.0	-27.2	1.59 V	65	44.90	1.90
8	4874.00	33.4 AV	54.0	-20.6	1.59 V	65	31.50	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	110.6 PK			1.42 H	16	77.30	33.30
2	*2452.00	100.8 AV			1.42 H	16	67.50	33.30
3	2483.50	69.9 PK	74.0	-4.1	1.44 H	334	36.50	33.40
4	2483.50	53.4 AV	54.0	-0.6	1.44 H	334	20.00	33.40
5	4904.00	47.7 PK	74.0	-26.3	1.52 H	8	45.70	2.00
6	4904.00	35.5 AV	54.0	-18.5	1.52 H	8	33.50	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	104.0 PK			1.48 V	342	70.70	33.30
2	*2452.00	94.0 AV			1.48 V	342	60.70	33.30
3	2483.50	64.0 PK	74.0	-10.0	1.43 V	10	30.60	33.40
4	2483.50	49.9 AV	54.0	-4.1	1.43 V	10	16.50	33.40
5	4904.00	47.8 PK	74.0	-26.2	1.52 V	84	45.80	2.00
6	4904.00	33.2 AV	54.0	-20.8	1.52 V	84	31.20	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 worst-case data:

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	499.48	29.3 QP	46.0	-16.7	1.00 H	140	38.00	-8.70
2	625.58	43.5 QP	46.0	-2.5	1.00 H	172	49.30	-5.80
3	749.74	34.6 QP	46.0	-11.4	1.00 H	304	38.30	-3.70
4	875.84	34.2 QP	46.0	-11.8	1.50 H	149	36.10	-1.90
5	918.52	30.0 QP	46.0	-16.0	1.50 H	290	30.80	-0.80
6	947.62	29.9 QP	46.0	-16.1	1.00 H	56	30.20	-0.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	53.28	33.7 QP	40.0	-6.3	1.00 V	290	47.90	-14.20
2	62.98	29.2 QP	40.0	-10.8	1.00 V	171	44.40	-15.20
3	499.48	40.0 QP	46.0	-6.0	1.00 V	196	48.70	-8.70
4	625.58	42.5 QP	46.0	-3.5	1.00 V	113	48.30	-5.80
5	749.74	36.3 QP	46.0	-9.7	1.50 V	273	40.00	-3.70
6	875.84	37.9 QP	46.0	-8.1	1.00 V	216	39.80	-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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

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

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

4.2.3 Test Procedures

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

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

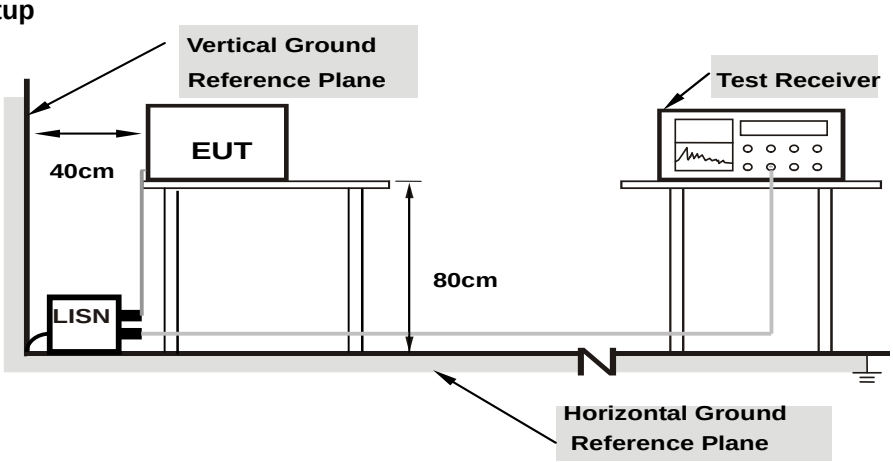
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

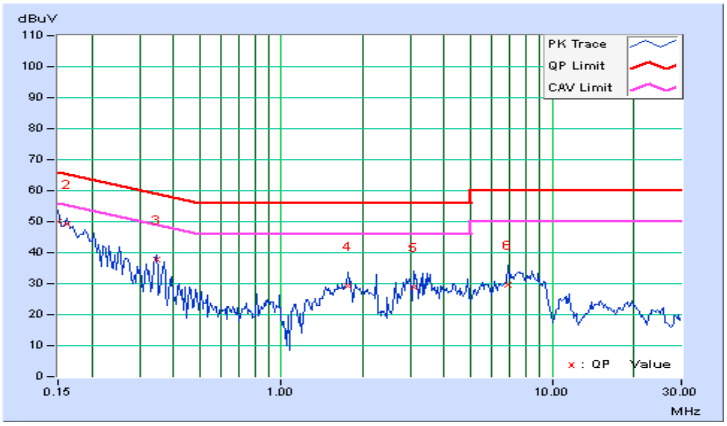
1TX

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.19	49.67	29.99	49.86	30.18	66.00	56.00	-16.14	-25.82
2	0.16172	0.20	49.21	35.31	49.41	35.51	65.38	55.38	-15.97	-19.87
3	0.34531	0.20	37.42	31.46	37.62	31.66	59.07	49.07	-21.45	-17.41
4	1.75781	0.35	28.89	20.79	29.24	21.14	56.00	46.00	-26.76	-24.86
5	3.07813	0.40	28.56	20.98	28.96	21.38	56.00	46.00	-27.04	-24.62
6	6.86328	0.46	29.22	20.55	29.68	21.01	60.00	50.00	-30.32	-28.99

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.

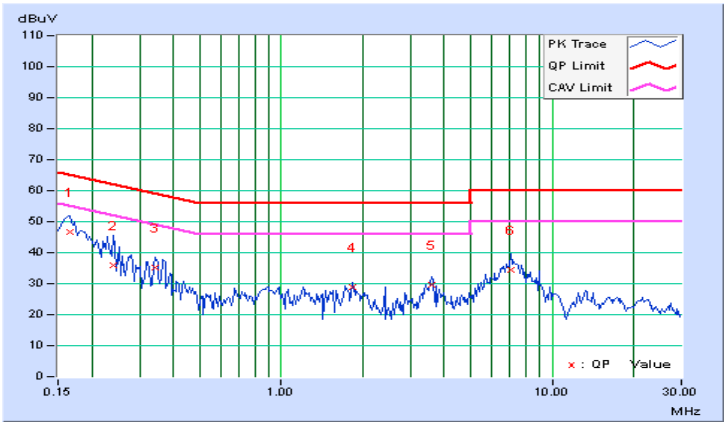


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.21	46.48	33.99	46.69	34.20	65.18	55.18	-18.49	-20.98
2	0.23984	0.23	35.56	20.35	35.79	20.58	62.10	52.10	-26.32	-31.53
3	0.34141	0.24	34.97	30.24	35.21	30.48	59.17	49.17	-23.96	-18.69
4	1.83594	0.39	28.32	21.64	28.71	22.03	56.00	46.00	-27.29	-23.97
5	3.58203	0.45	29.05	18.93	29.50	19.38	56.00	46.00	-26.50	-26.62
6	7.07422	0.52	33.92	28.10	34.44	28.62	60.00	50.00	-25.56	-21.38

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.



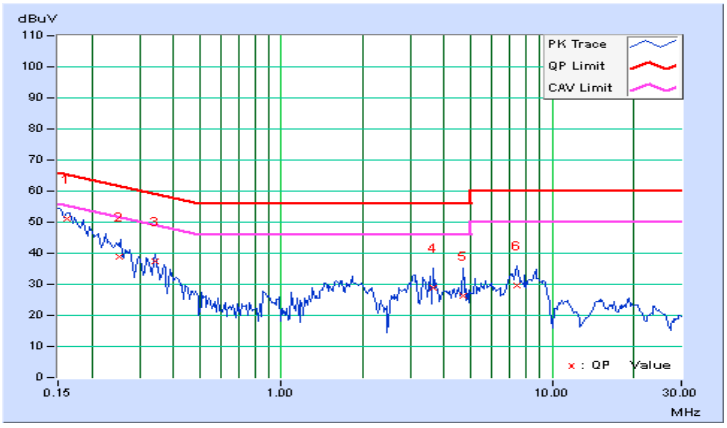
3TX

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.16200**	**0.20**	**51.00**	**37.81**	**51.20**	**38.01**	**65.36**	**55.36**	**-14.16**	**-17.35**
2	0.25292	0.20	38.66	27.85	38.86	28.05	61.66	51.66	-22.80	-23.61
3	0.34406	0.20	37.23	30.94	37.43	31.14	59.10	49.10	-21.67	-17.96
4	3.63672	0.42	28.49	18.54	28.91	18.96	56.00	46.00	-27.09	-27.04
5	4.69922	0.44	25.96	18.35	26.40	18.79	56.00	46.00	-29.60	-27.21
6	7.46094	0.47	29.04	21.92	29.51	22.39	60.00	50.00	-30.49	-27.61

Remarks:

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

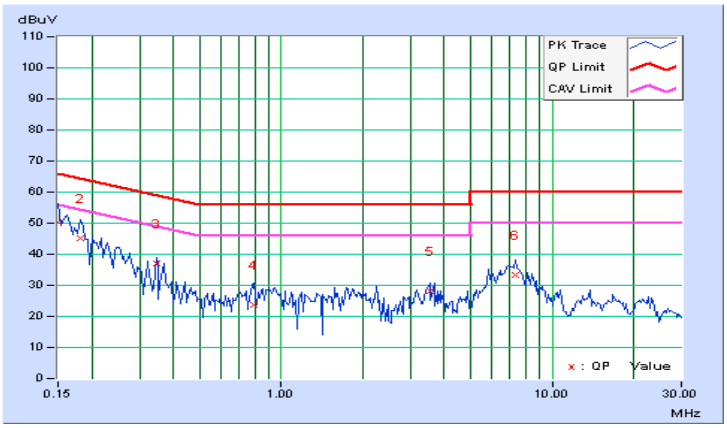


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.20	50.13	29.61	50.33	29.81	66.00	56.00	-15.67	-26.19
2	0.18125	0.21	44.81	33.01	45.02	33.22	64.43	54.43	-19.40	-21.20
3	0.34531	0.24	36.81	32.68	37.05	32.92	59.07	49.07	-22.02	-16.15
4	0.79063	0.29	23.25	15.55	23.54	15.84	56.00	46.00	-32.46	-30.16
5	3.52734	0.45	27.74	19.12	28.19	19.57	56.00	46.00	-27.81	-26.43
6	7.35547	0.52	32.94	27.38	33.46	27.90	60.00	50.00	-26.54	-22.10

Remarks:

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

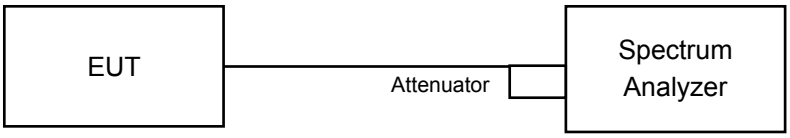


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

558074 D01 DTS Meas Guidance v03r02 section 8.1

a. Set resolution bandwidth (RBW) = 100kHz

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

c. Trace mode = max hold.

d. Sweep = auto couple.

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

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

1TX

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	10.12	0.5	PASS
6	2437	10.12	0.5	PASS
11	2462	10.12	0.5	PASS

802.11g

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

802.11n (HT20)

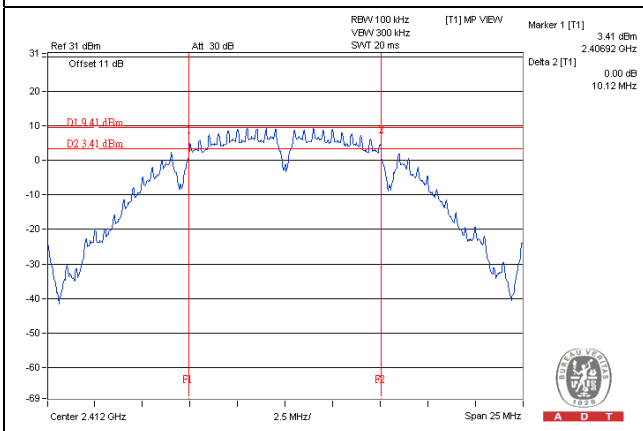
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.57	0.5	Pass
6	2437	17.58	0.5	Pass
11	2462	17.31	0.5	Pass

802.11n (HT40)

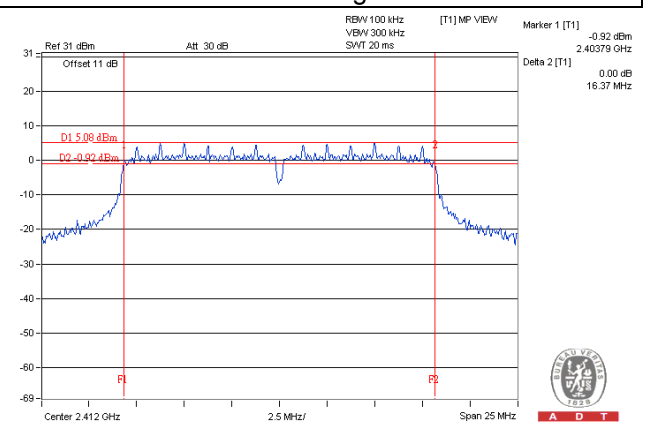
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	35.82	0.5	Pass
6	2437	35.57	0.5	Pass
9	2452	35.93	0.5	Pass

Spectrum Plot of Worst Value

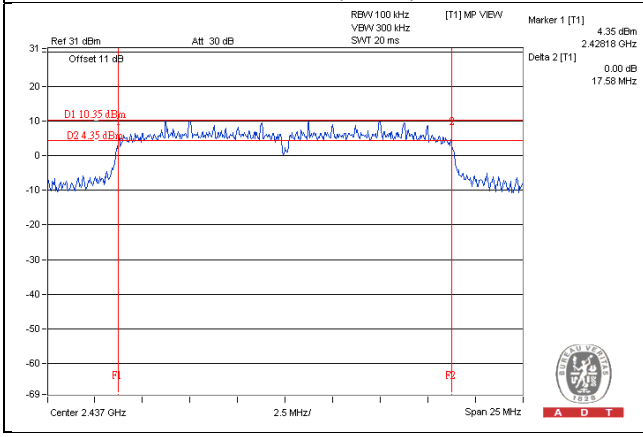
802.11b



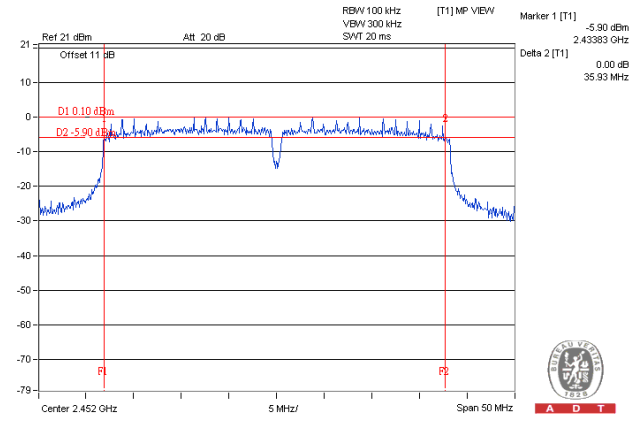
802.11g



802.11n (HT20)



802.11n (HT40)



3TX

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	10.12	10.12	10.11	0.5	Pass
6	2437	10.12	10.12	10.13	0.5	Pass
11	2462	10.13	10.10	10.11	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	16.36	16.37	16.39	0.5	Pass
6	2437	16.33	16.38	16.38	0.5	Pass
11	2462	16.37	16.38	16.39	0.5	Pass

802.11n (HT20)

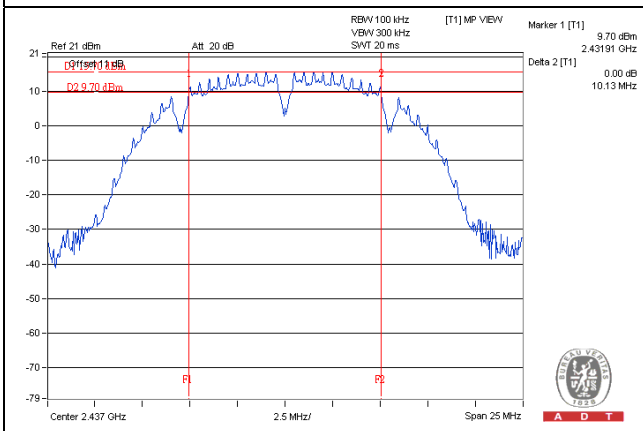
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	17.23	17.58	17.58	0.5	Pass
6	2437	17.08	17.19	17.34	0.5	Pass
11	2462	17.56	17.19	17.57	0.5	Pass

802.11n (HT40)

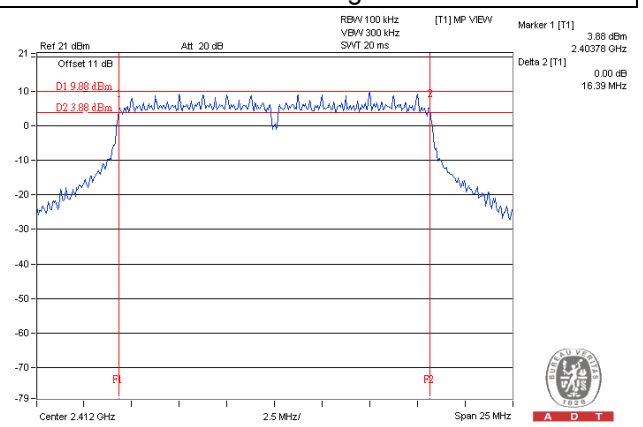
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
3	2422	35.59	35.22	35.35	0.5	Pass
6	2437	35.96	36.11	36.34	0.5	Pass
9	2452	36.35	35.24	35.82	0.5	Pass

Spectrum Plot of Worst Value

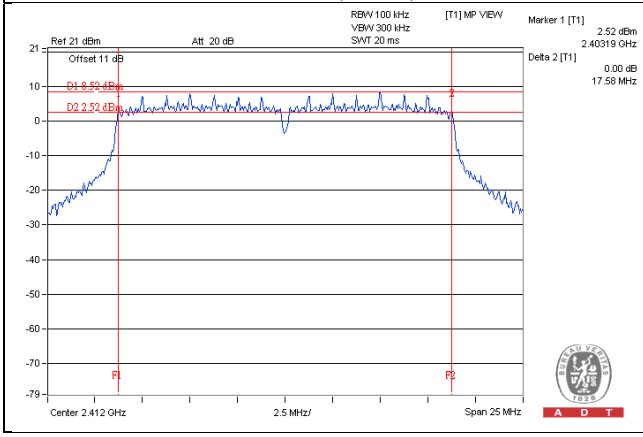
802.11b



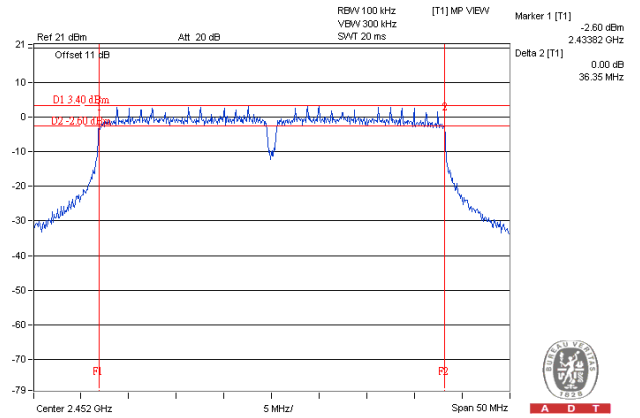
802.11g



802.11n (HT20)



802.11n (HT40)



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

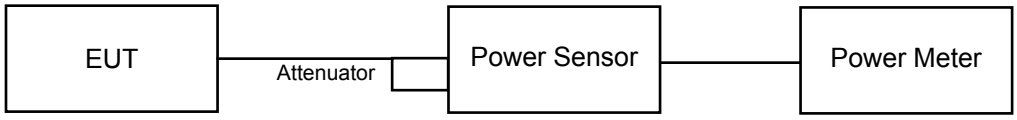
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

1TX

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	66.527	18.23	30	Pass
6	2437	76.913	18.86	30	Pass
11	2462	84.723	19.28	30	Pass

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	42.170	16.25	30	Pass
6	2437	158.489	22.00	30	Pass
11	2462	46.026	16.63	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	33.343	15.23	30	Pass
6	2437	**167.494**	22.24	30	Pass
11	2462	33.113	15.20	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass/Fail
3	2422	16.406	12.15	30	Pass
6	2437	45.499	16.58	30	Pass
9	2452	28.774	14.59	30	Pass

3TX

802.11b

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	24.61	24.06	23.46	765.571	28.84	29	Pass
6	2437	24.24	24.26	23.89	777.053	28.90	29	Pass
11	2462	24.48	24.26	23.65	**778.968**	28.92	29	Pass

Note: Max. Gain: 7dBi > 6dBi, so the power limit shall be reduced to 30-(7-6) = 29dBm.

802.11g

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	22.01	21.07	20.48	398.479	26.00	29	Pass
6	2437	24.39	24.01	23.71	761.520	28.82	29	Pass
11	2462	23.16	21.96	21.42	502.726	27.01	29	Pass

Note: Max. Gain: 7dBi > 6dBi, so the power limit shall be reduced to 30-(7-6) = 29dBm.

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	21.21	20.05	19.58	324.070	25.11	29	Pass
6	2437	24.22	24.28	23.66	764.432	28.83	29	Pass
11	2462	21.09	21.01	20.36	363.355	25.60	29	Pass

Note: Max. Gain: 7dBi > 6dBi, so the power limit shall be reduced to 30-(7-6) = 29dBm.

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	15.69	15.77	15.33	108.944	20.37	29	Pass
6	2437	18.78	18.74	18.32	218.246	23.39	29	Pass
9	2452	18.99	18.75	18.21	220.461	23.43	29	Pass

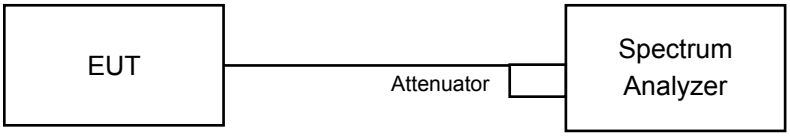
Note: Max. Gain: 7dBi > 6dBi, so the power limit shall be reduced to 30-(7-6) = 29dBm.

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

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

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

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

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

d. Set VBW ≥3 x RBW.

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

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

g. Sweep time = auto couple.

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

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

For AVG. power (duty cycle < 98%)

a. Measure the duty cycle (x).

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

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

d. Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.

e. Set VBW ≥3 x RBW.

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

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

h. Sweep time = auto couple.

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

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

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

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

1TX

802.11b

Channel	Freq. (MHz)	PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-10.75	8	Pass
6	2437	-10.74	8	Pass
11	2462	-9.95	8	Pass

802.11g

Channel	Freq. (MHz)	PSD (dBm/10kHz)	Duty Factor	PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-15.19	0.17	-15.02	8	Pass
6	2437	-8.49	0.17	-8.32	8	Pass
11	2462	-14.67	0.17	-14.50	8	Pass

802.11n (HT20)

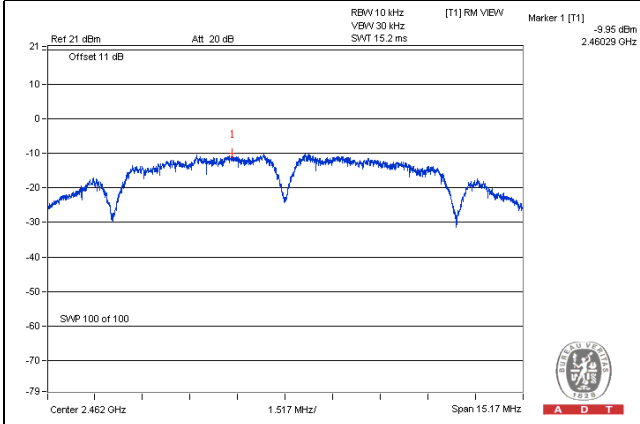
Channel	Freq. (MHz)	PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-16.51	8	Pass
6	2437	-7.04	8	Pass
11	2462	-15.98	8	Pass

802.11n (HT40)

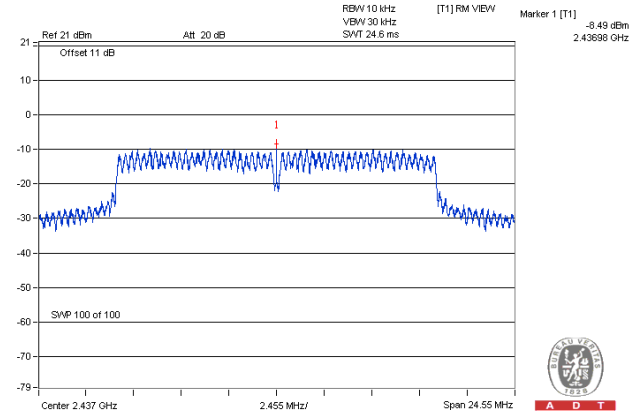
Channel	Freq. (MHz)	PSD (dBm/10kHz)	Duty Factor	PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
3	2422	-23.27	0.16	-23.11	8	Pass
6	2437	-17.87	0.16	-17.71	8	Pass
9	2452	-19.98	0.16	-19.82	8	Pass

Spectrum Plot of Worst Value

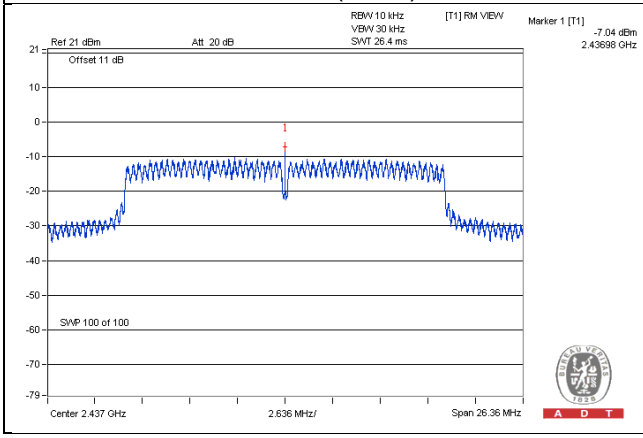
802.11b



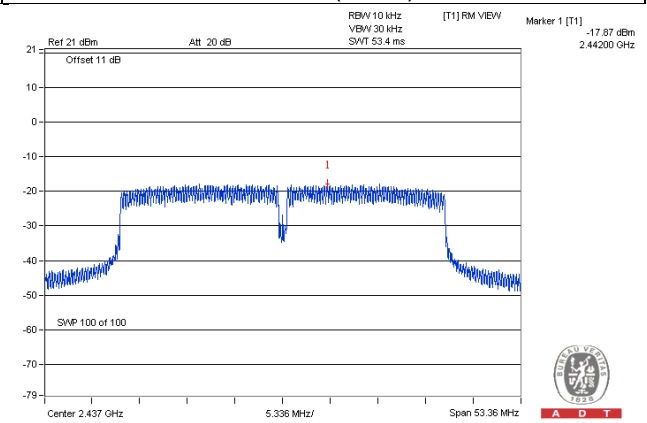
802.11g



802.11n (HT20)



802.11n (HT40)



3TX

802.11b

TX chain	Chan.	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-6.08	4.77	-1.31	5.23	Pass
	6	2437	-3.57	4.77	1.20	5.23	Pass
	11	2462	-5.18	4.77	-0.41	5.23	Pass
1	1	2412	-6.49	4.77	-1.72	5.23	Pass
	6	2437	-4.13	4.77	0.64	5.23	Pass
	11	2462	-6.06	4.77	-1.29	5.23	Pass
2	1	2412	-6.66	4.77	-1.89	5.23	Pass
	6	2437	-10.10	4.77	-5.33	5.23	Pass
	11	2462	-5.48	4.77	-0.71	5.23	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/10} + 10^{G2/10} + \ldots + 10^{GN/10})/N_{ANT}$] = 8.77dBi > 6dBi, so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.

802.11g

TX chain	Chan.	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-10.52	4.77	-5.75	5.23	Pass
	6	2437	-5.95	4.77	-1.18	5.23	Pass
	11	2462	-8.17	4.77	-3.40	5.23	Pass
1	1	2412	-10.17	4.77	-5.40	5.23	Pass
	6	2437	-6.15	4.77	-1.38	5.23	Pass
	11	2462	-8.67	4.77	-3.90	5.23	Pass
2	1	2412	-10.50	4.77	-5.73	5.23	Pass
	6	2437	-6.03	4.77	-1.26	5.23	Pass
	11	2462	-8.57	4.77	-3.80	5.23	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/10} + 10^{G2/10} + \ldots + 10^{GN/10})/N_{ANT}$] = 8.77dBi > 6dBi, so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-11.61	4.77	-6.84	5.23	Pass
	6	2437	-5.46	4.77	-0.69	5.23	Pass
	11	2462	-9.95	4.77	-5.18	5.23	Pass
1	1	2412	-12.55	4.77	-7.78	5.23	Pass
	6	2437	-6.88	4.77	-2.11	5.23	Pass
	11	2462	-10.42	4.77	-5.65	5.23	Pass
2	1	2412	-11.66	4.77	-6.89	5.23	Pass
	6	2437	-6.66	4.77	-1.89	5.23	Pass
	11	2462	-10.51	4.77	-5.74	5.23	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[($10^{G1/10}$ + $10^{G2/10}$ + … + $10^{GN/10}$)/N_{ANT}] = 8.77dBi > 6dBi, so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.

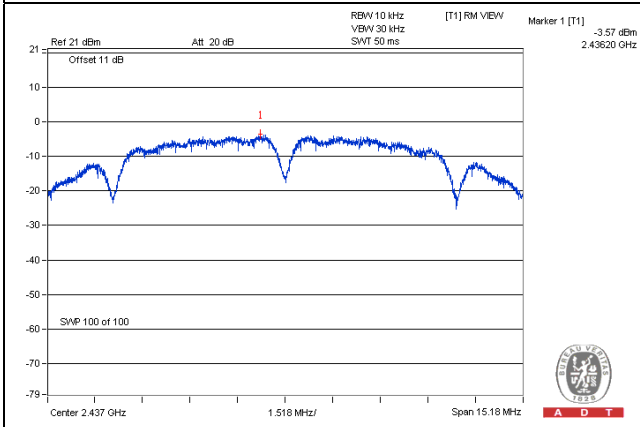
802.11n (HT40)

TX chain	Chan.	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass / Fail
0	3	2422	-18.36	4.77	0.14	-13.45	5.23	Pass
	6	2437	-15.51	4.77	0.14	-10.60	5.23	Pass
	9	2452	-17.12	4.77	0.14	-12.21	5.23	Pass
1	3	2422	-19.26	4.77	0.14	-14.35	5.23	Pass
	6	2437	-15.92	4.77	0.14	-11.01	5.23	Pass
	9	2452	-17.47	4.77	0.14	-12.56	5.23	Pass
2	3	2422	-19.59	4.77	0.14	-14.68	5.23	Pass
	6	2437	-16.05	4.77	0.14	-11.14	5.23	Pass
	9	2452	-17.53	4.77	0.14	-12.62	5.23	Pass

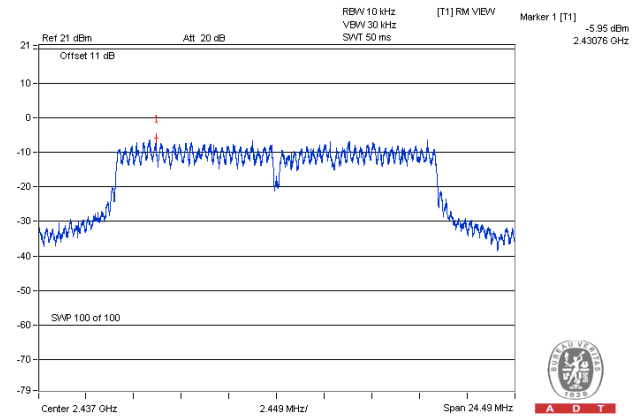
Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[($10^{G1/10}$ + $10^{G2/10}$ + … + $10^{GN/10}$)/N_{ANT}] = 8.77dBi > 6dBi, so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

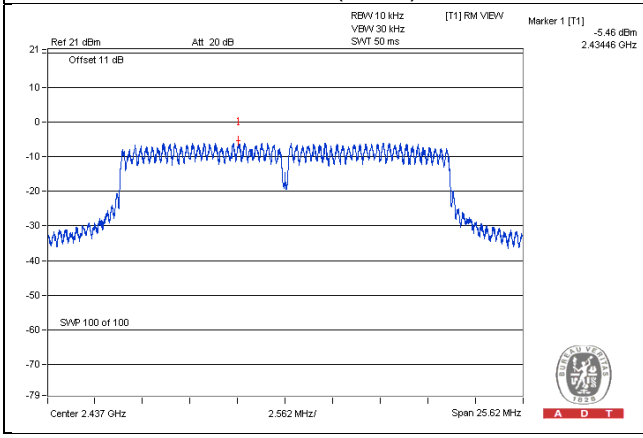
802.11b



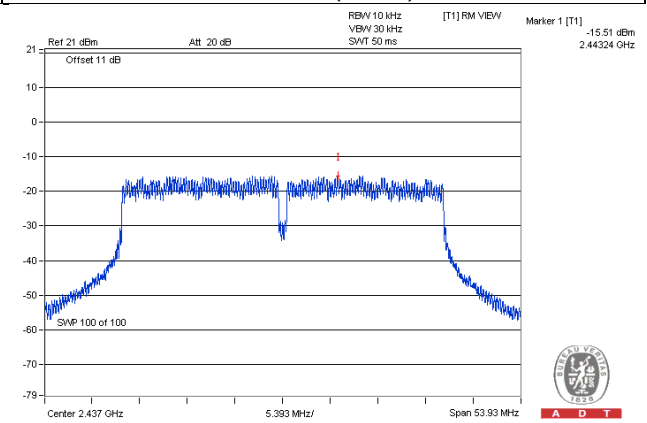
802.11g



802.11n (HT20)



802.11n (HT40)

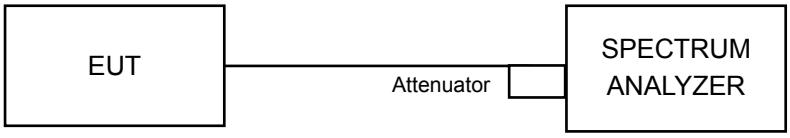


4.6 Conducted Out of Band Emission Measurement

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

558074 D01 DTS Meas Guidance v03r02 section 11.2

a. Set the RBW = 100 kHz.

b. Set the VBW ≥ 300 kHz.

c. Detector = peak.

d. Sweep time = auto couple.

e. Trace mode = max hold.

f. Allow trace to fully stabilize.

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

MEASUREMENT PROCEDURE OOBE

558074 D01 DTS Meas Guidance v03r02 section 11.3

a. Set RBW = 100 kHz.

b. Set VBW ≥ 300 kHz.

c. Detector = peak.

d. Sweep = auto couple.

e. Trace Mode = max hold.

f. Allow trace to fully stabilize.

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as Item 4.3.6

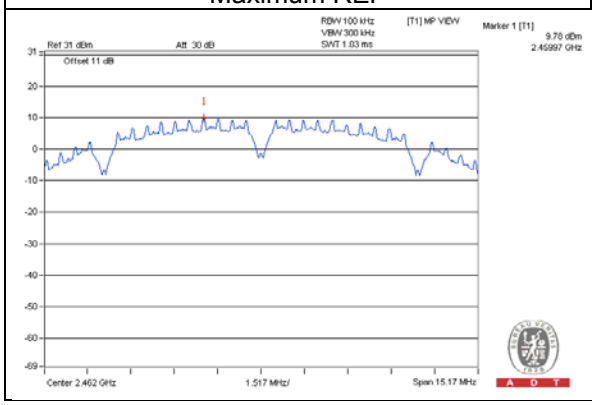
4.6.7 Test Results

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

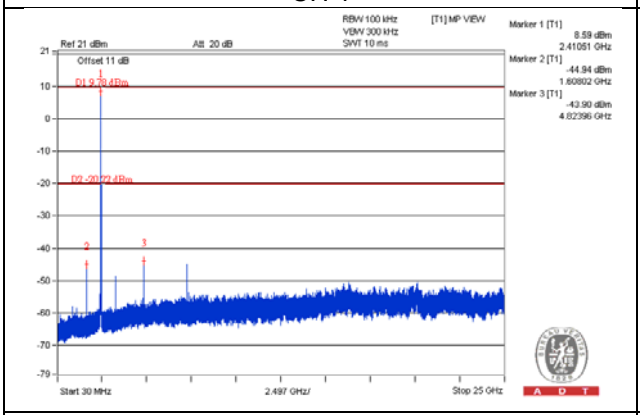
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

1TX
802.11b

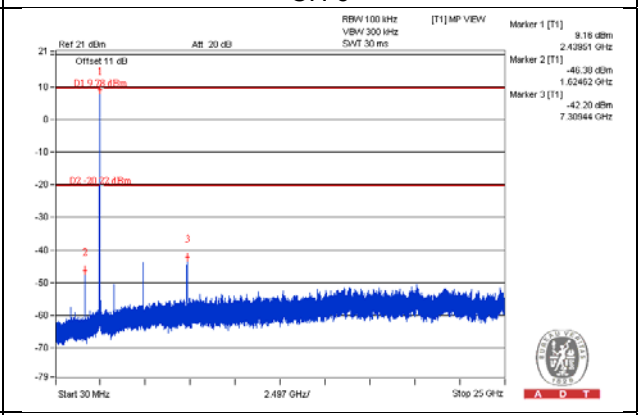
Maximum REF



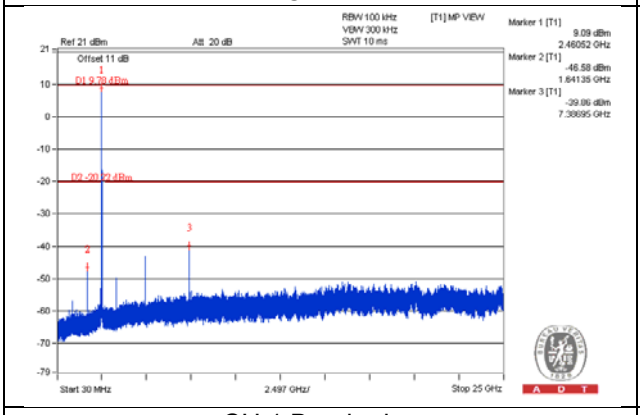
CH 1



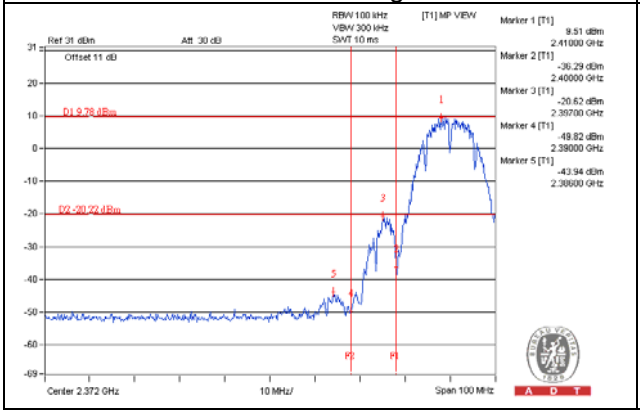
CH 6



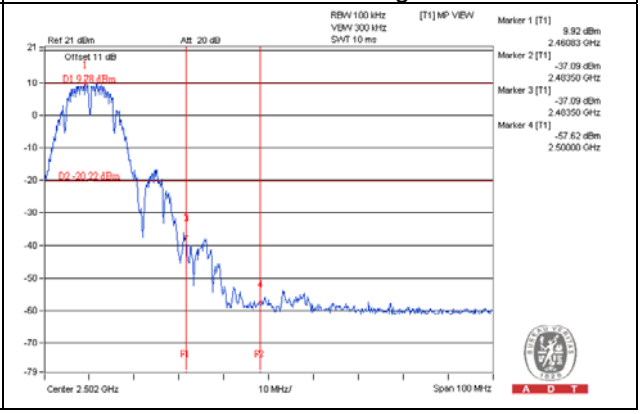
CH 11



CH 1 Band edge

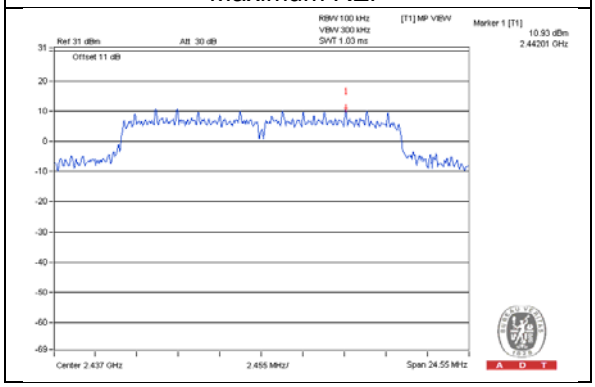


CH 11 Band edge

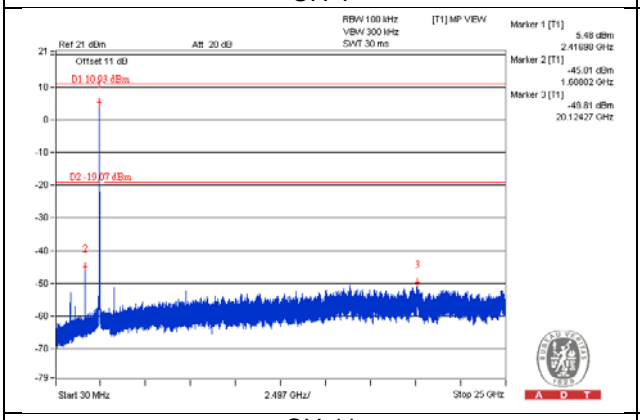


802.11g

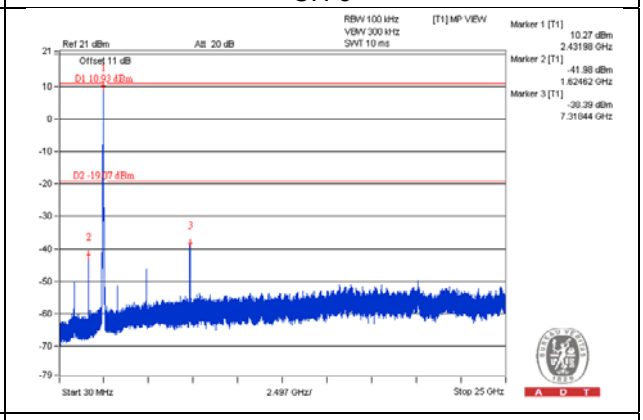
Maximum REF



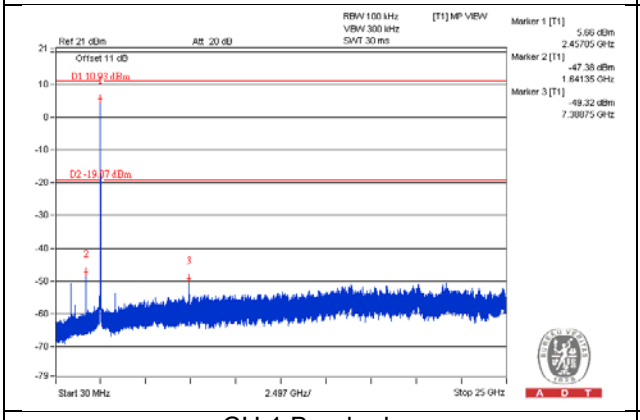
CH 1



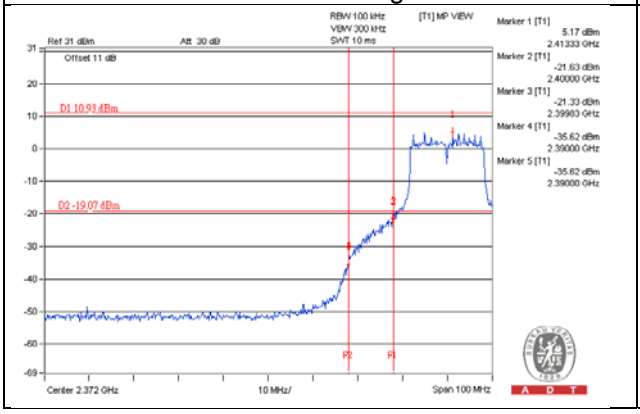
CH 6



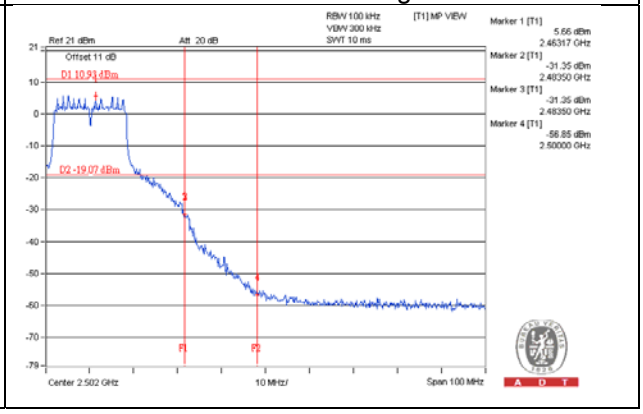
CH 11



CH 1 Band edge

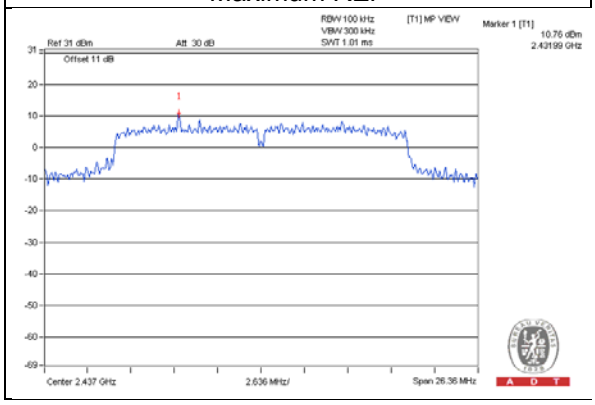


CH 11 Band edge

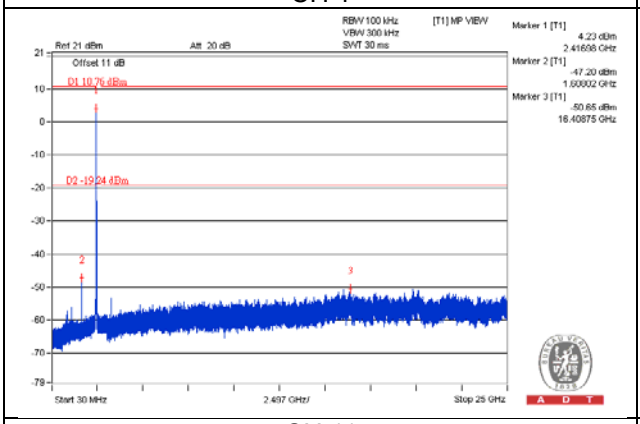


802.11n (HT20)

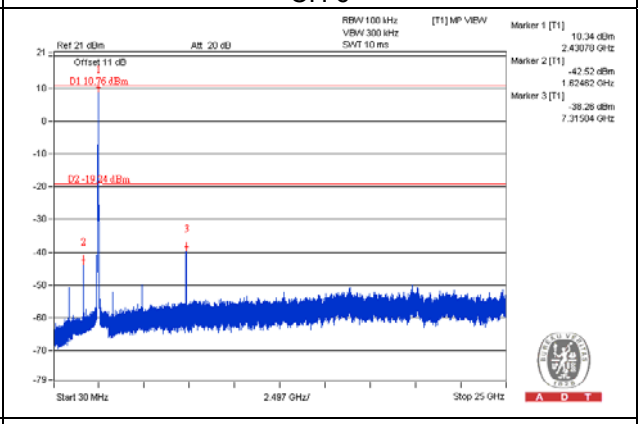
Maximum REF



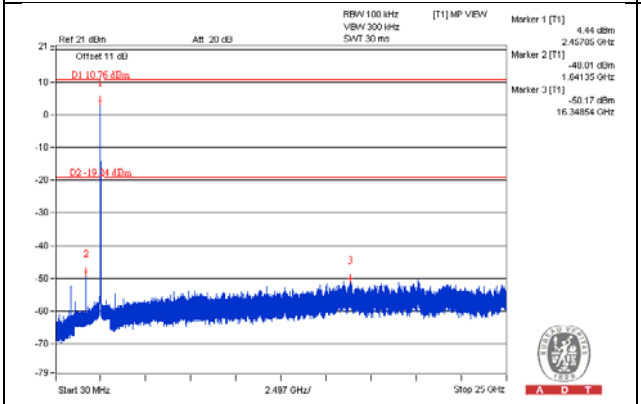
CH 1



CH 6



CH 11



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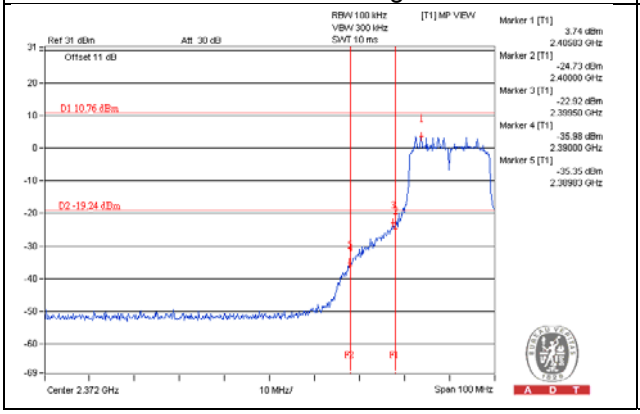
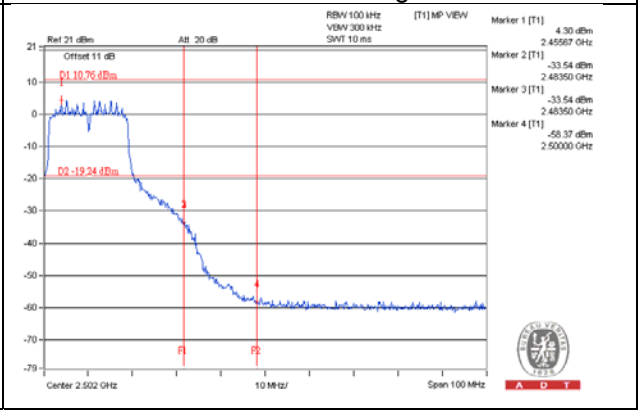
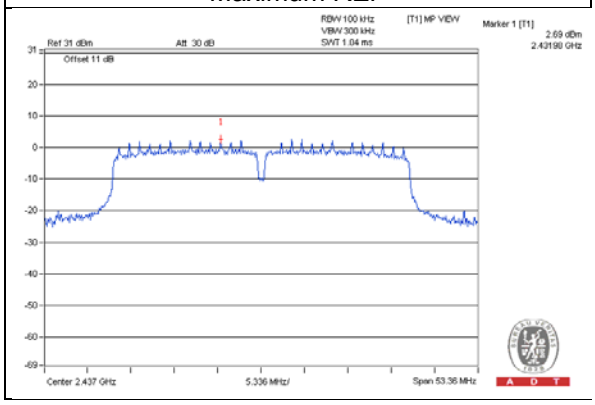


CH 11 Band edge

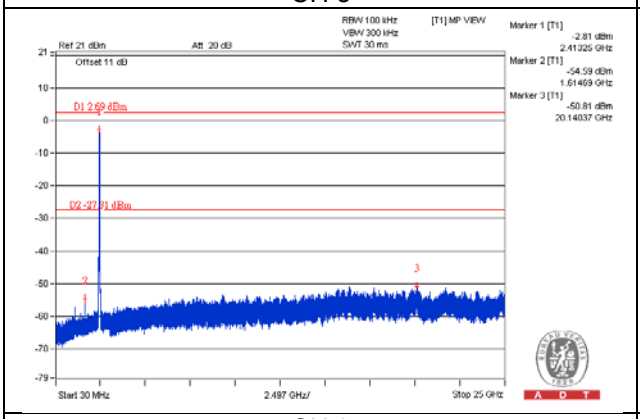


802.11n (HT40)

Maximum REF



CH 3



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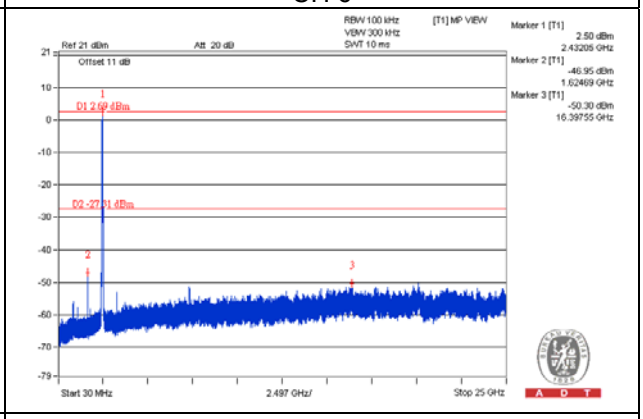
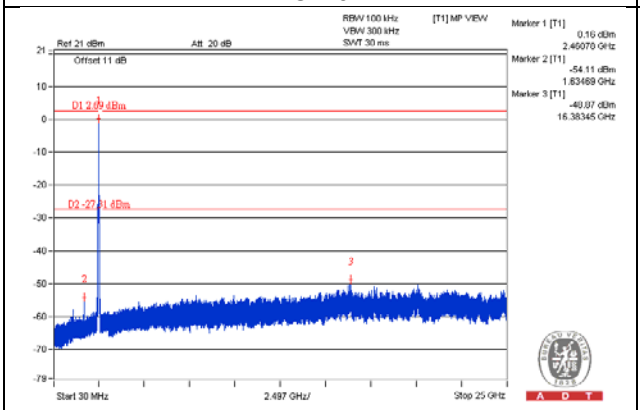
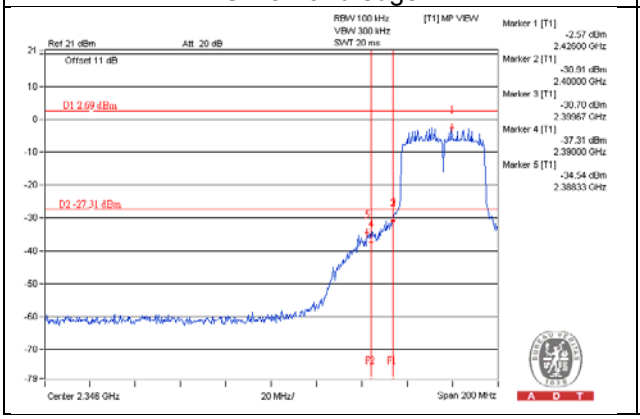


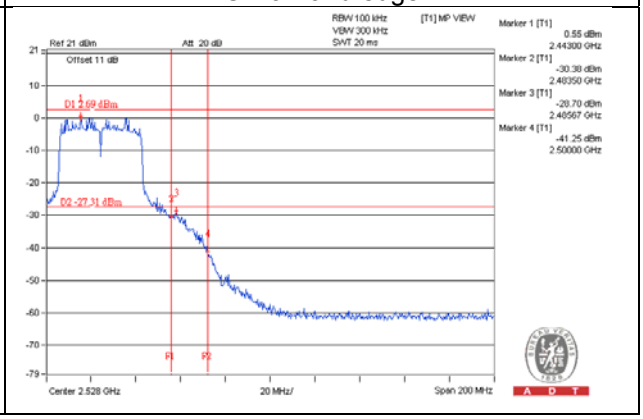
CH 9



CH 3 Band edge



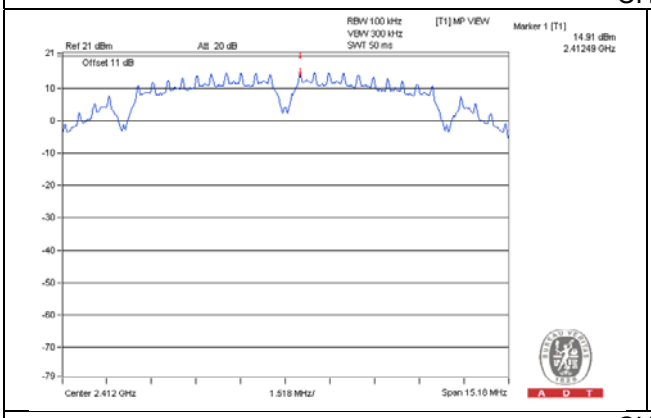
CH 9 Band edge

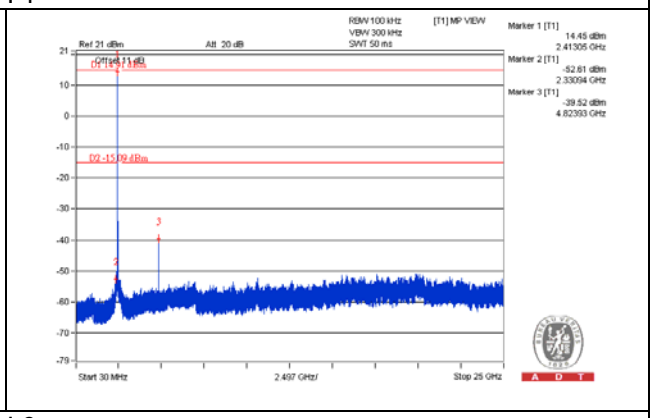


3TX

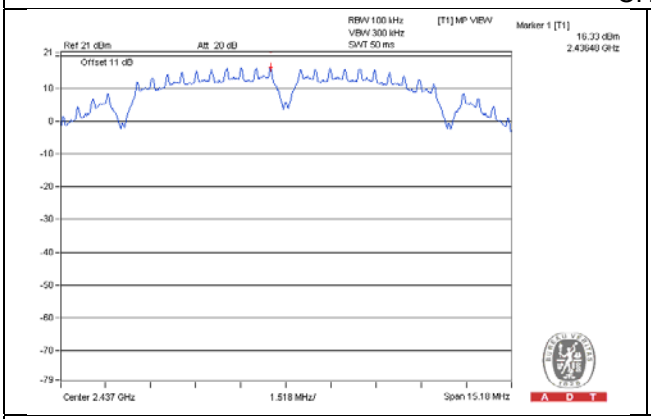
802.11b_CHAIN 0

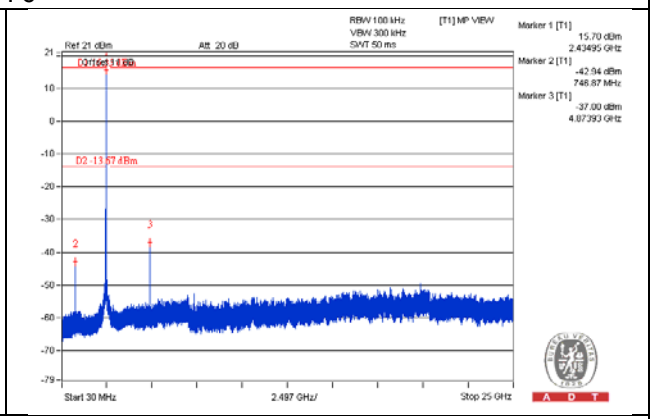
CH 1



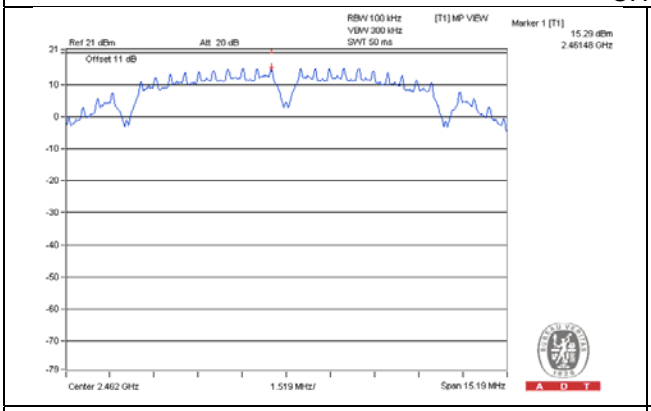


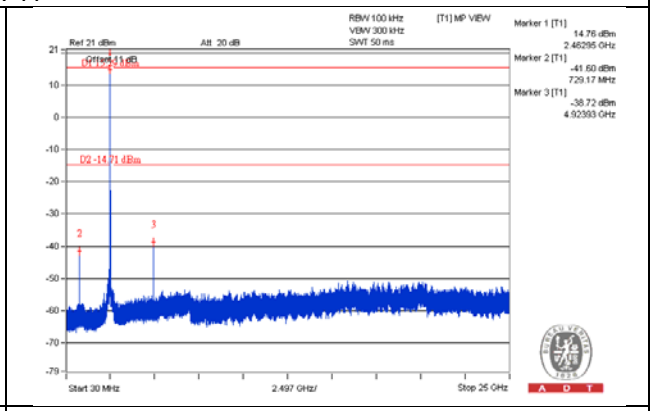
CH 6



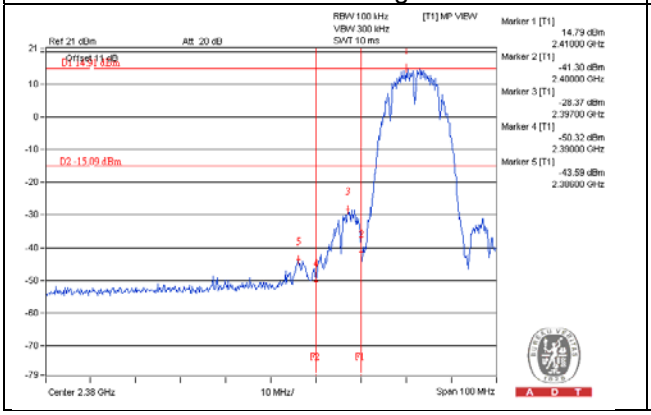


CH 11

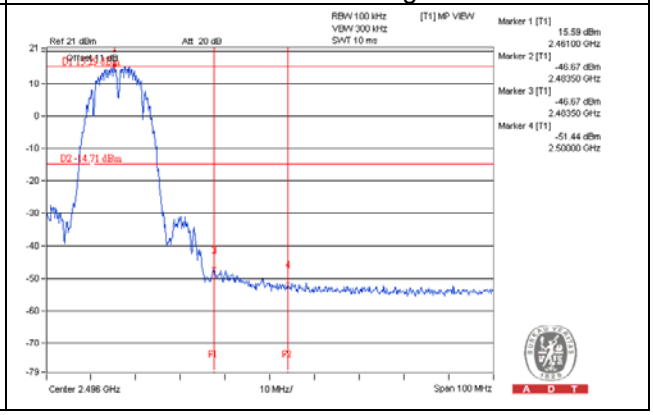




CH 1 Band edge

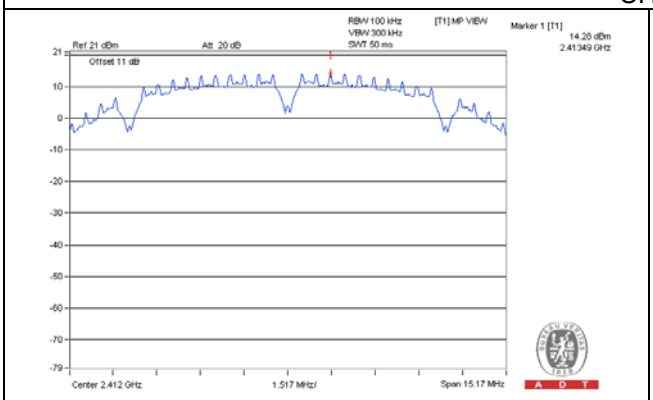


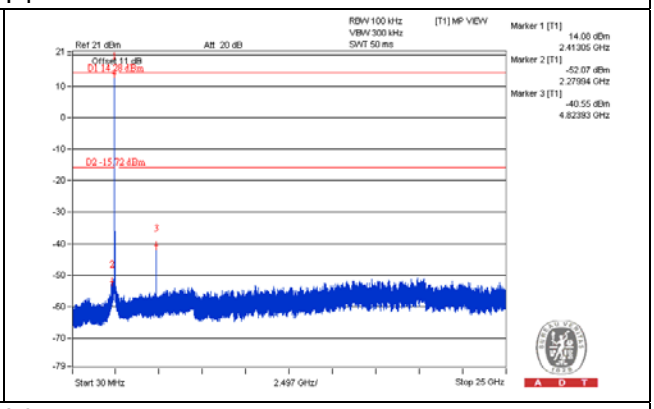
CH 11 Band edge



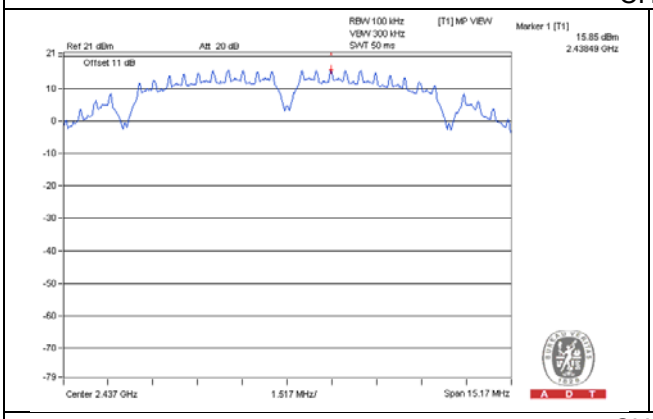
802.11b_CHAIN 1

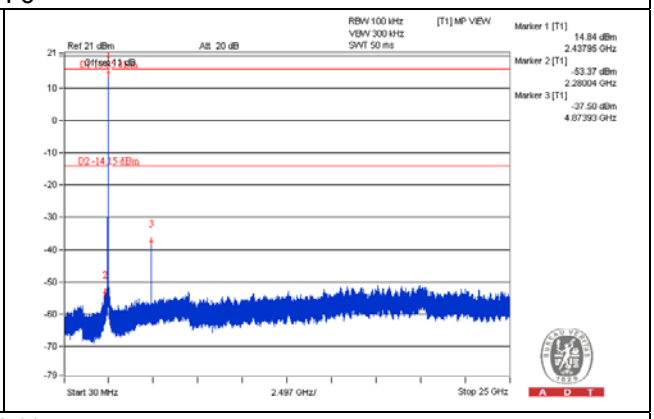
CH 1



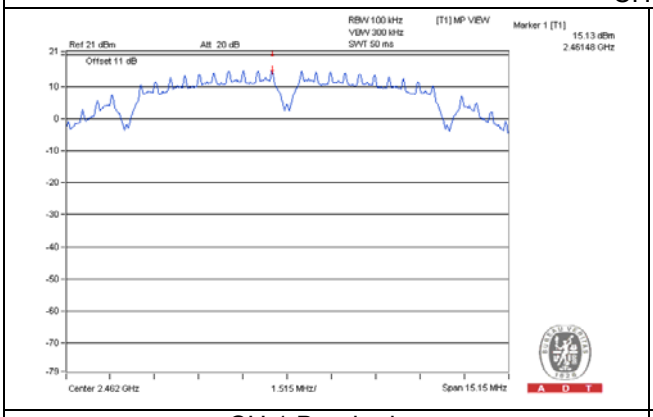


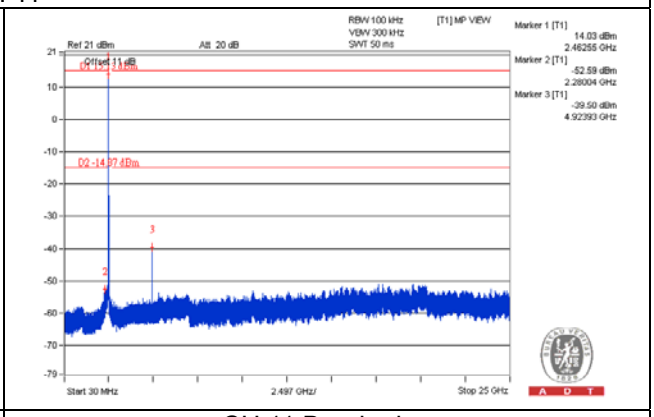
CH 6





CH 11





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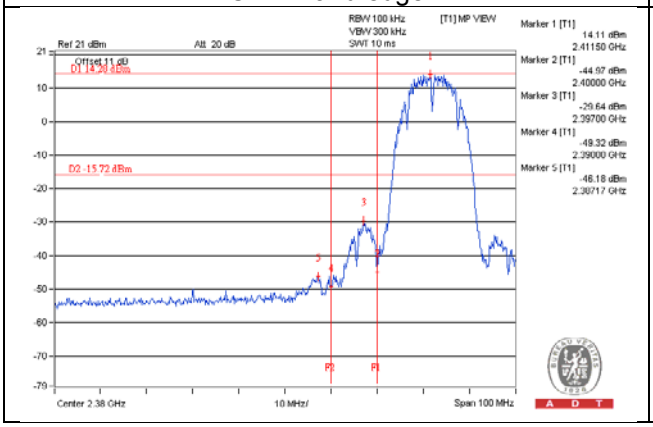

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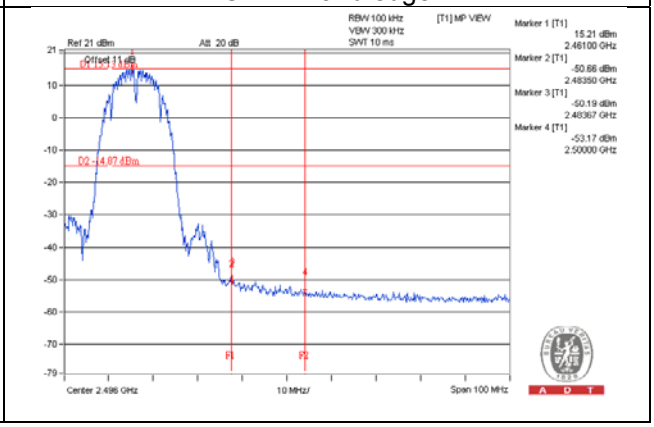
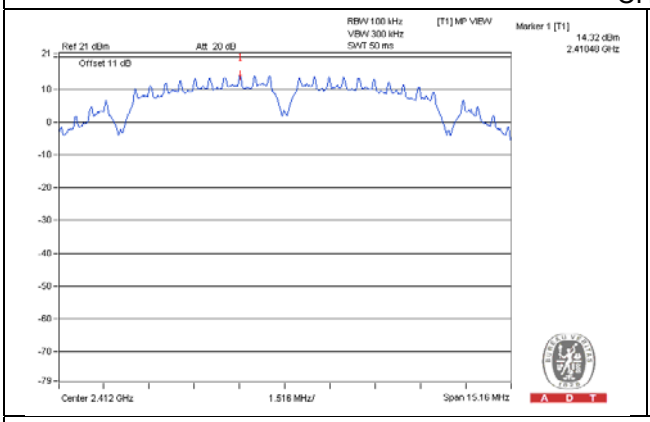
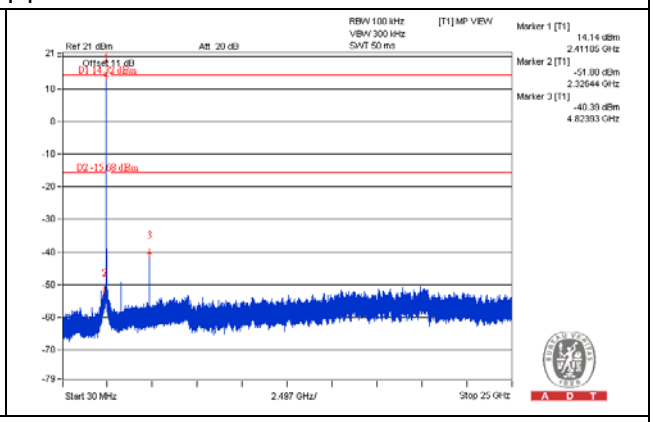


802.11b_CHAIN 2

CH 1





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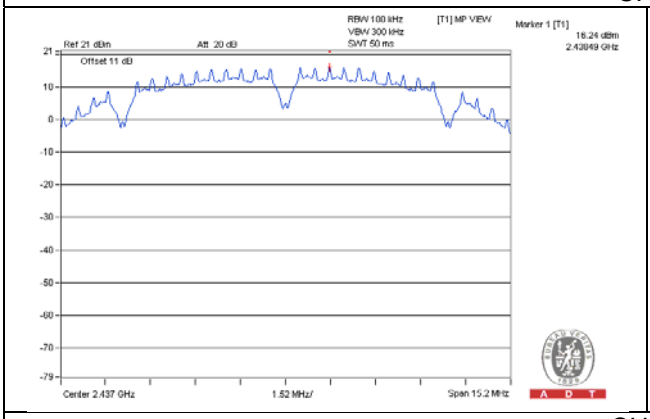

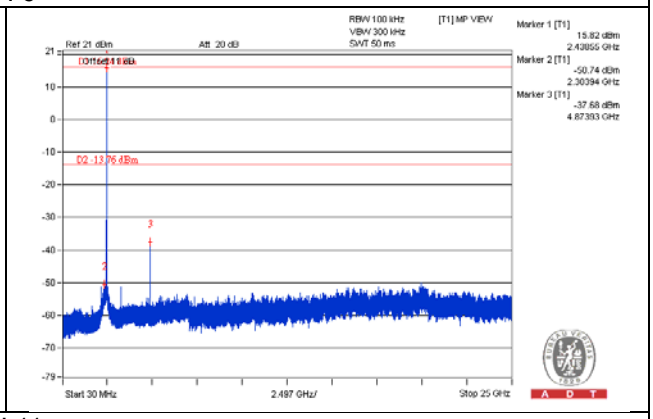

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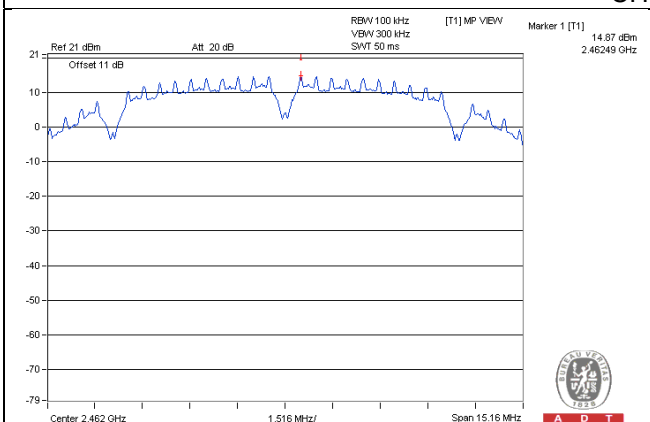

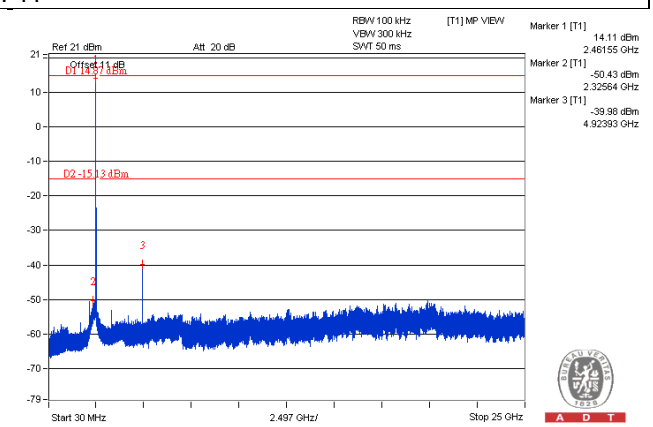

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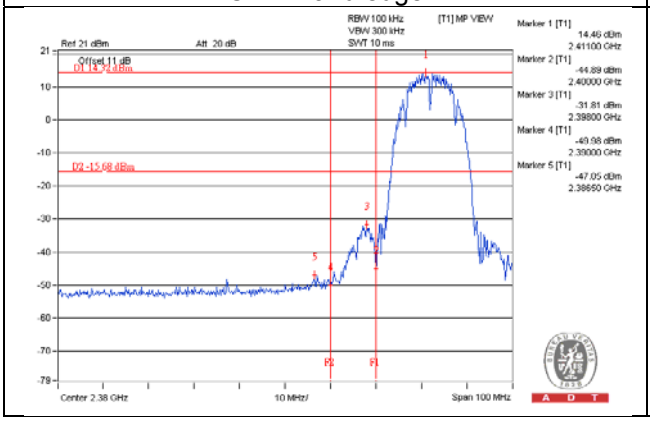

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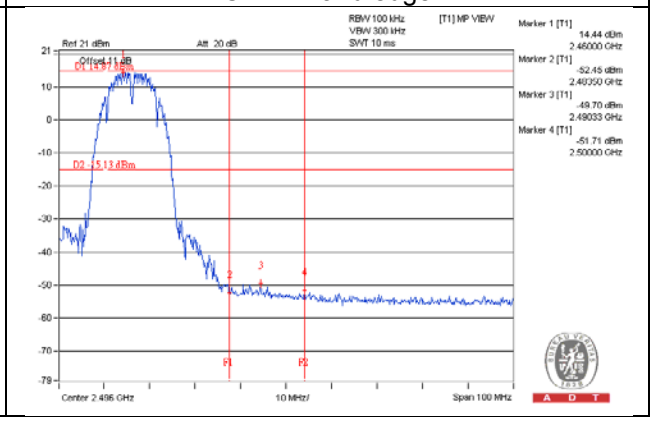
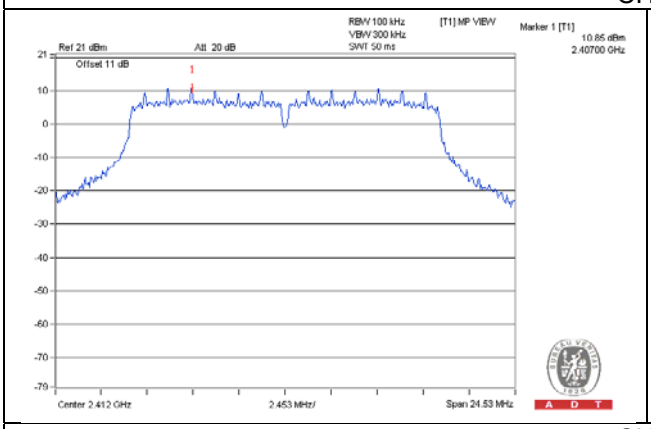
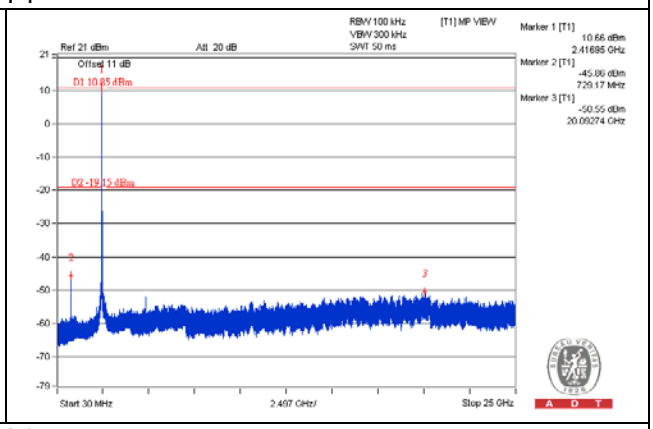


802.11g_CHAIN 0

CH 1





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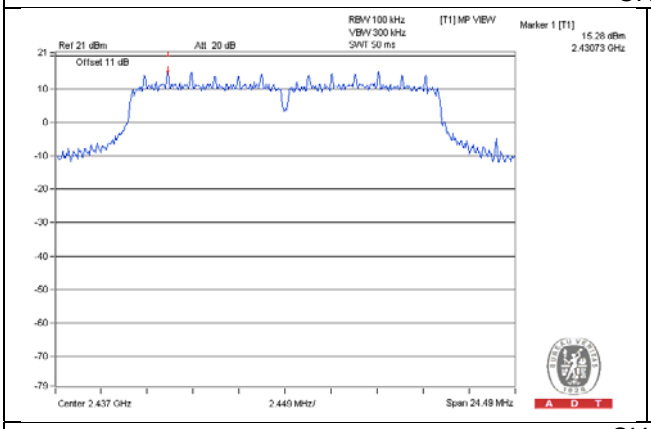

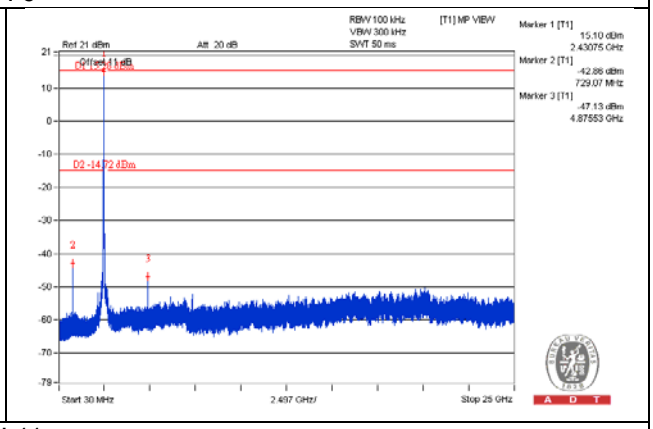

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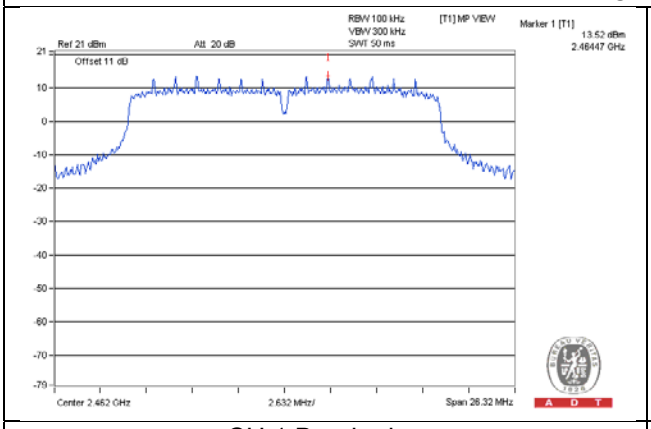

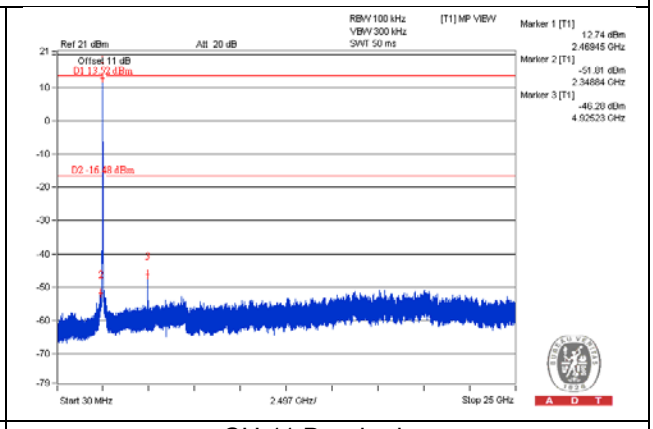

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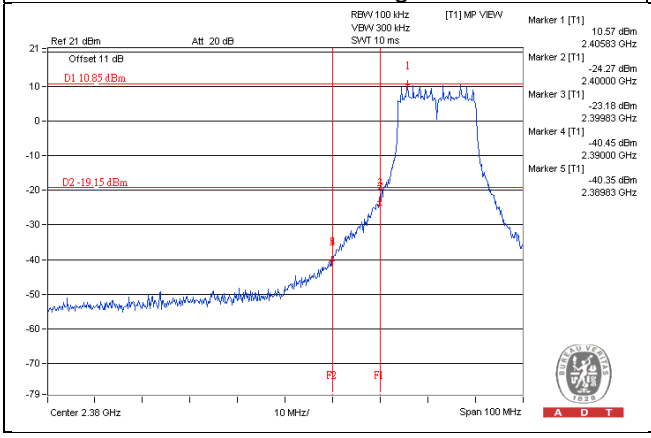

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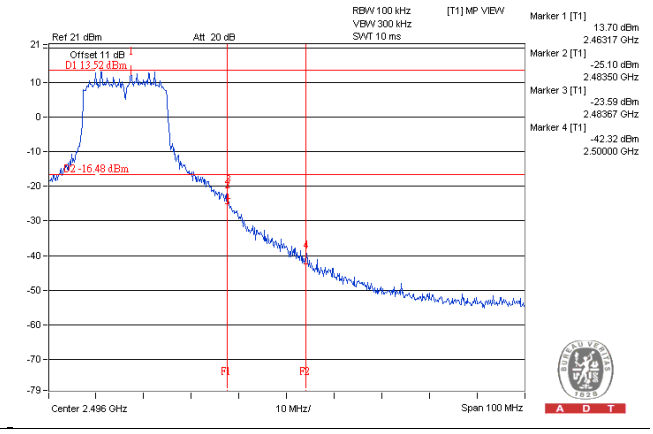
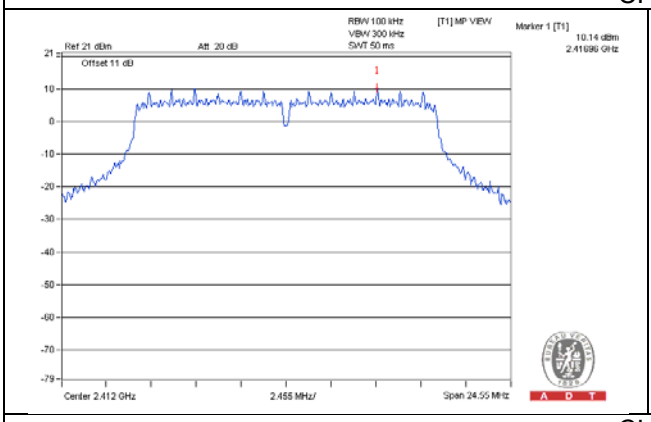
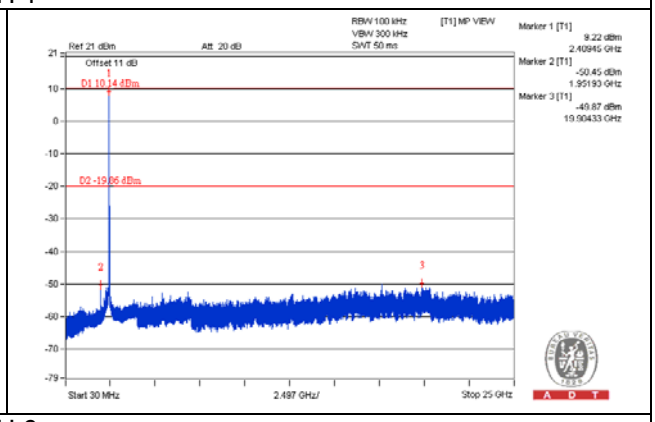


802.11g_CHAIN 1

CH 1





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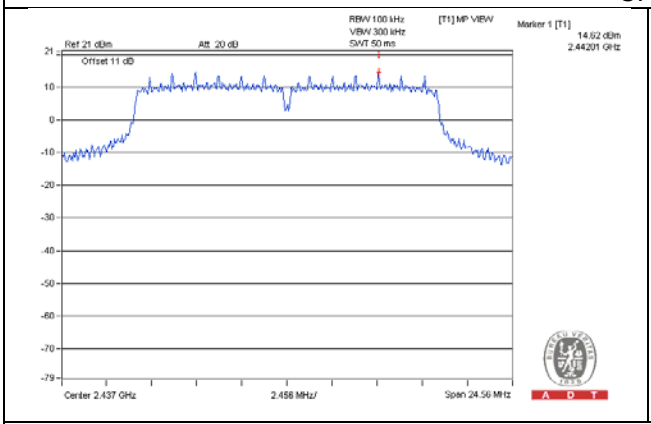

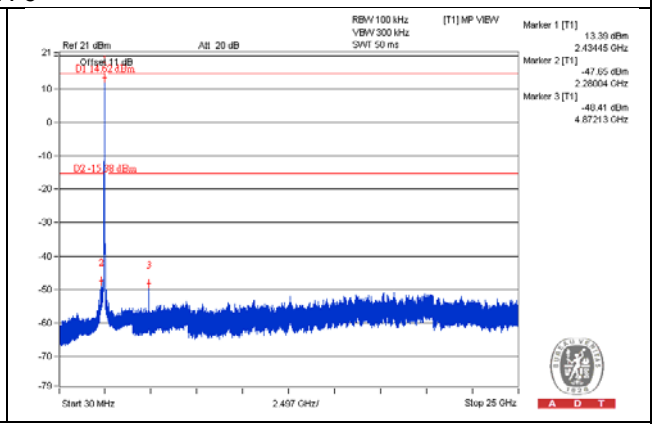

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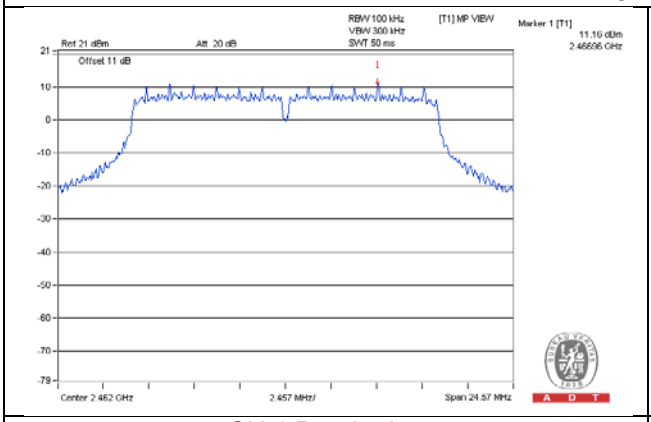

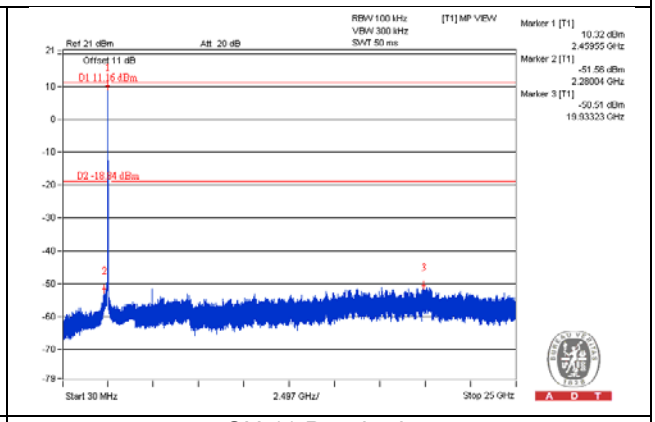

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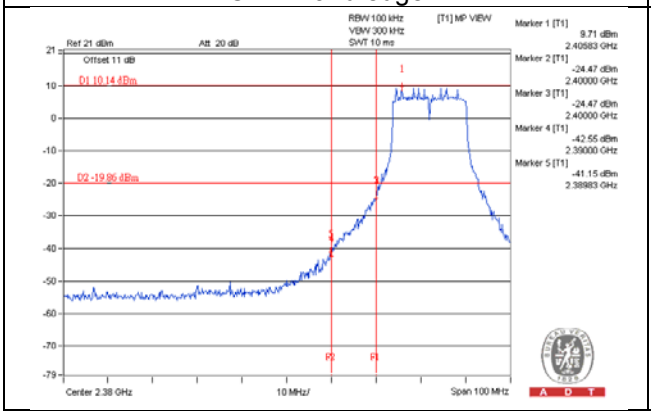

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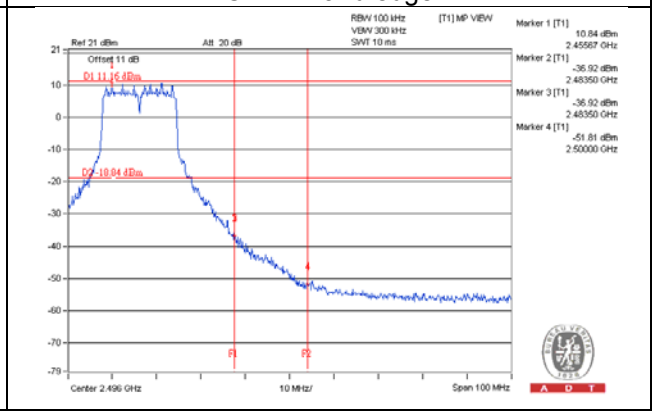
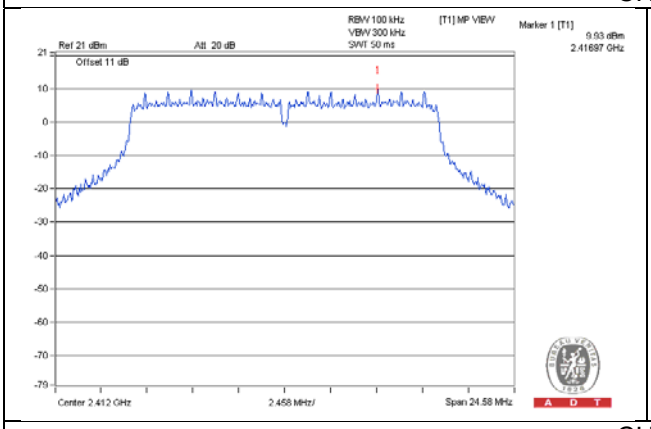
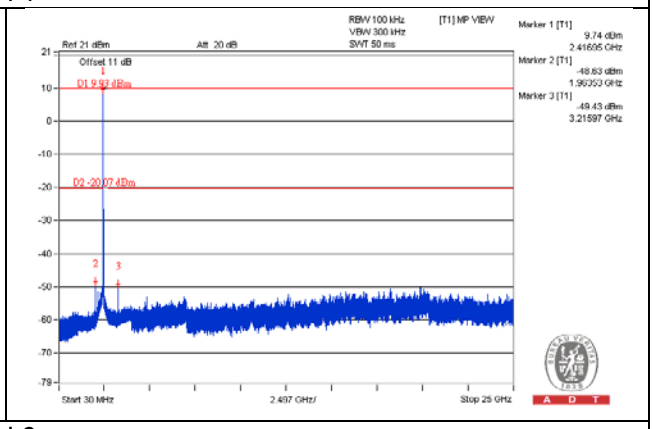


802.11g_CHAIN 2

CH 1





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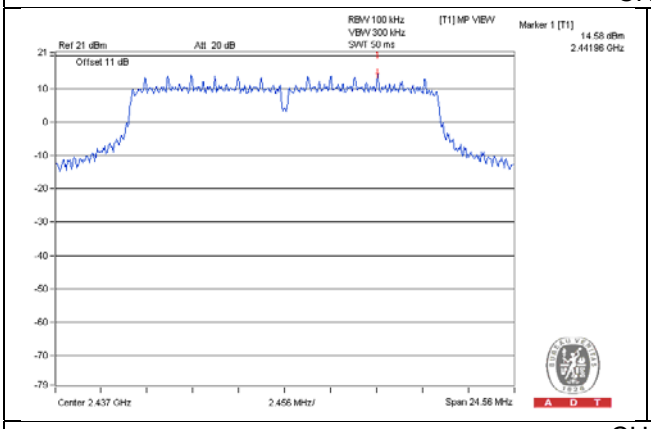

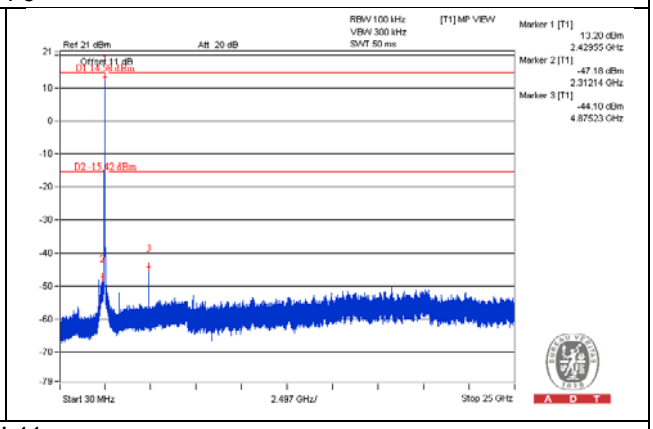

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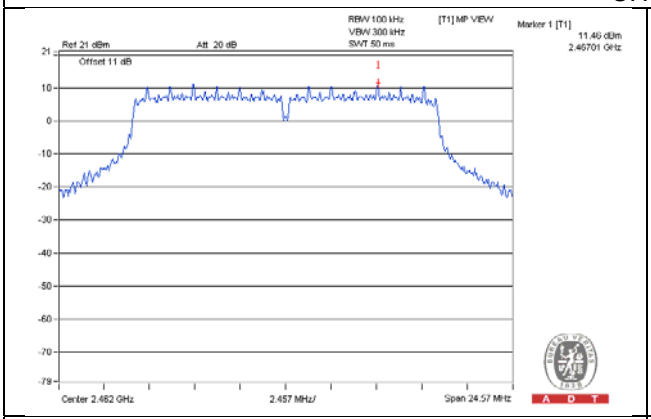

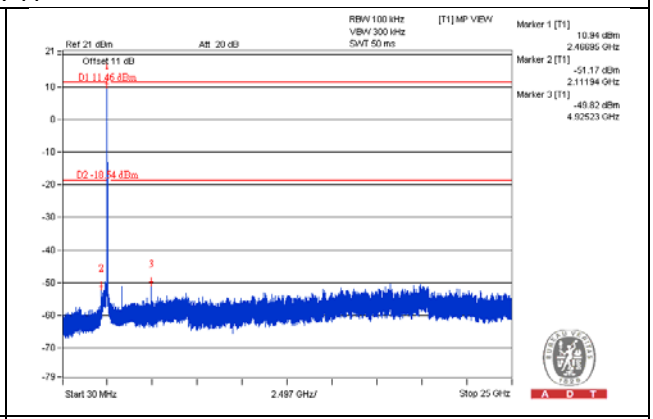

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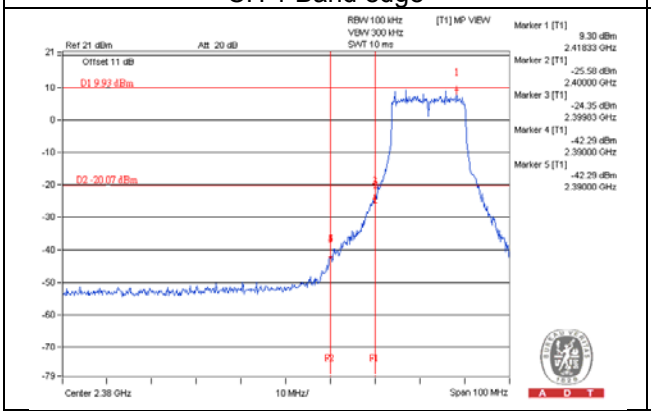

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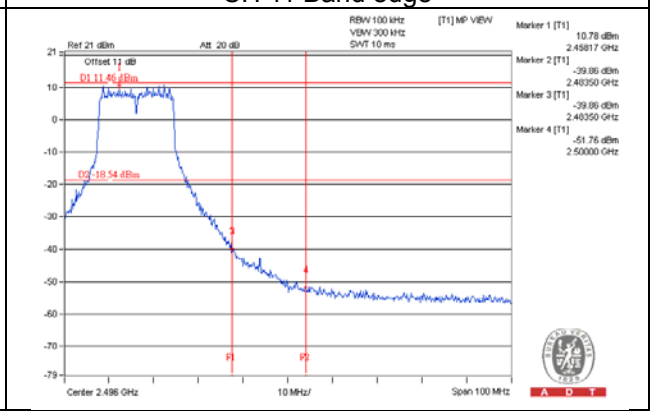
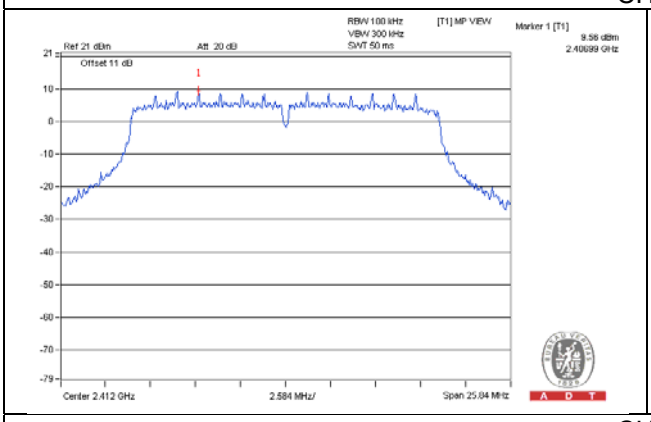
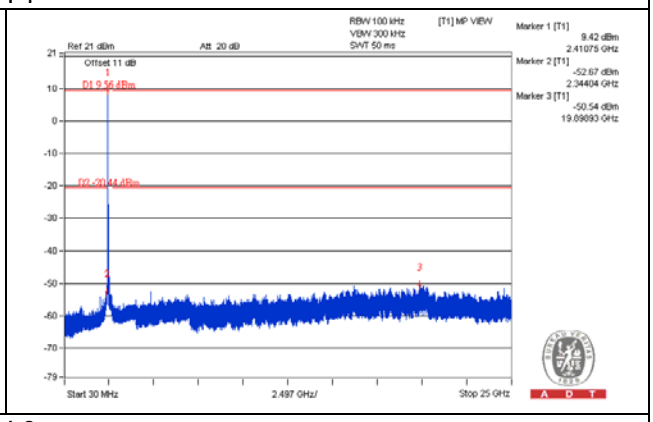


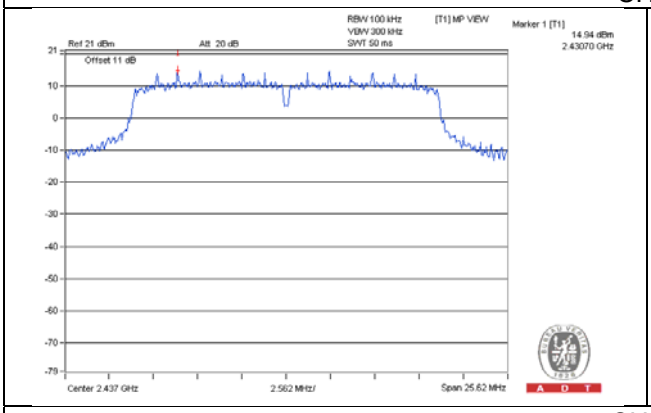
802.11n (HT20)_CHAIN 0

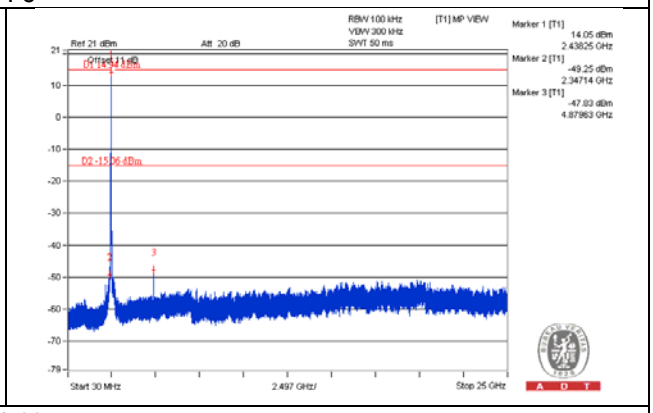
CH 1





CH 6





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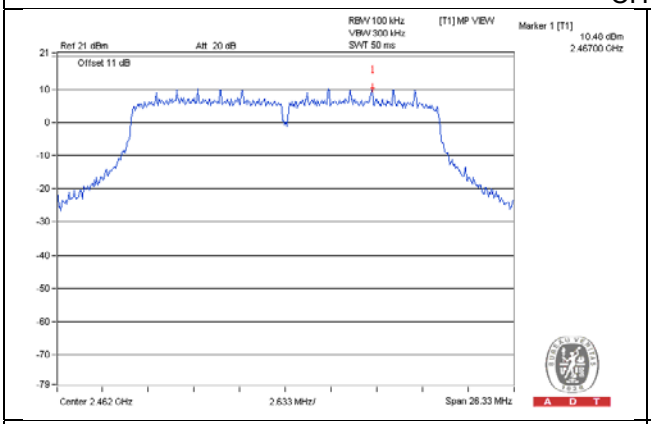

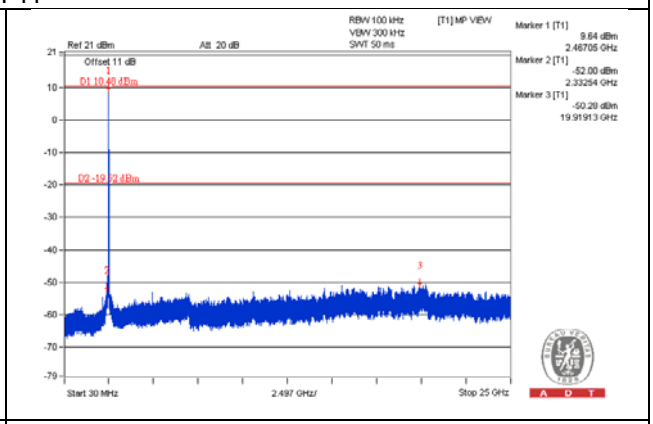

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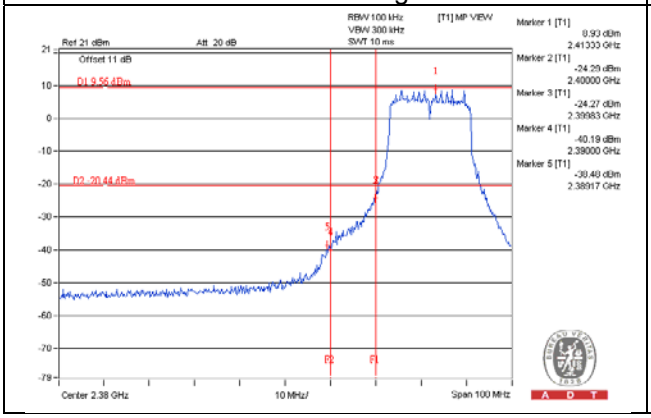

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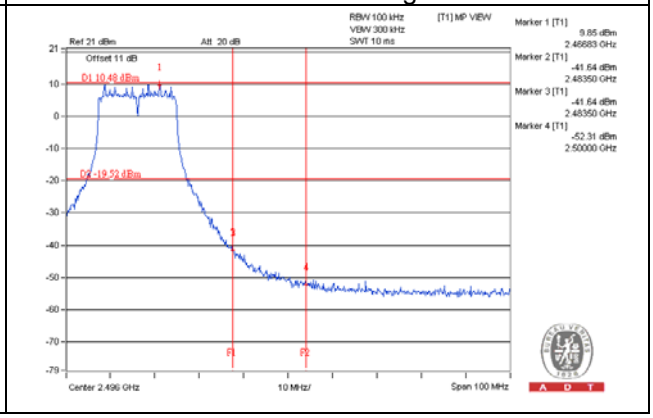
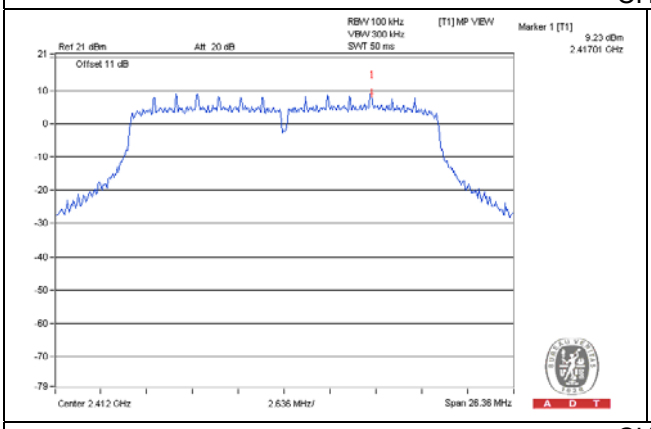
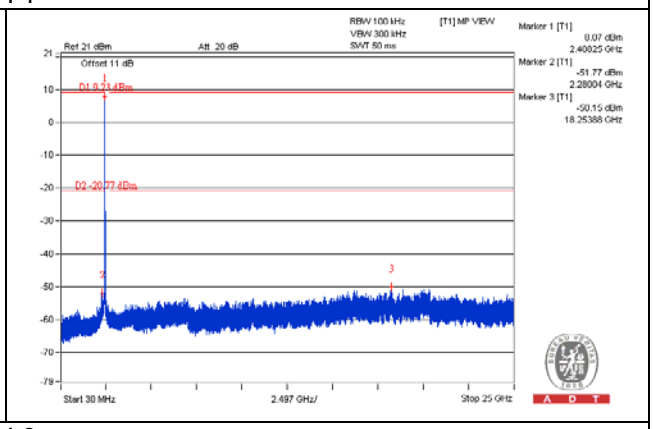


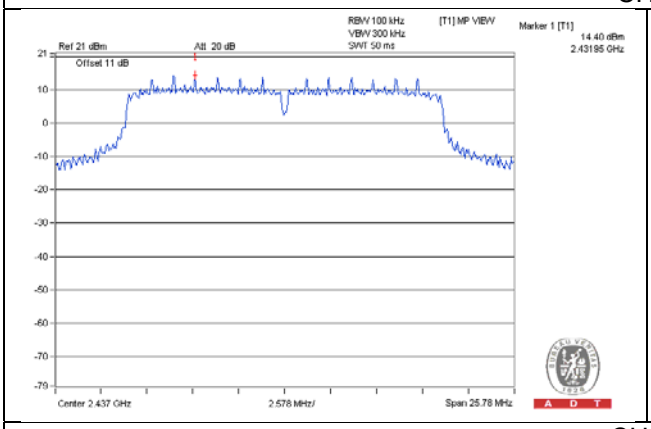
802.11n (HT20)_CHAIN 1

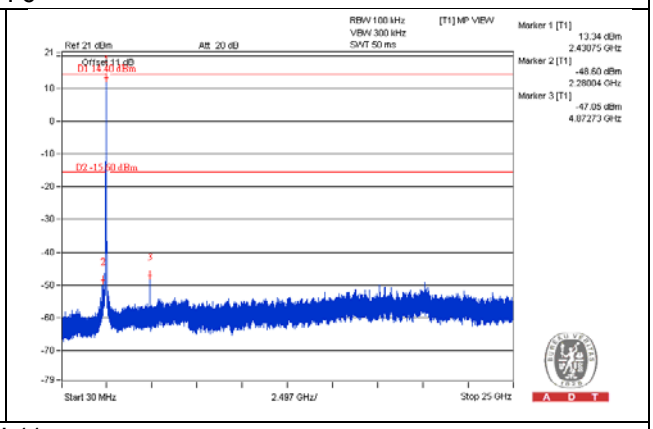
CH 1





CH 6





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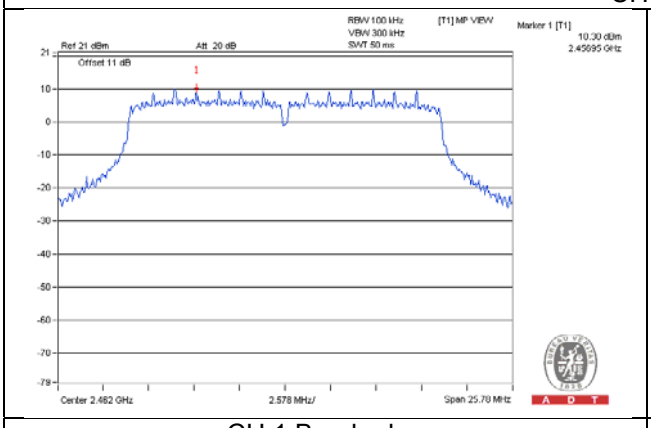
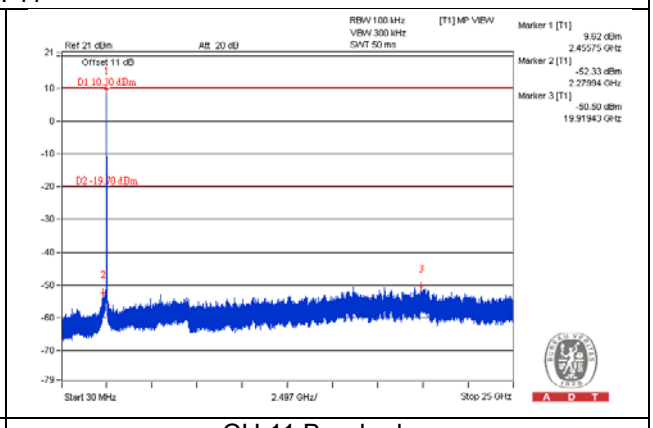
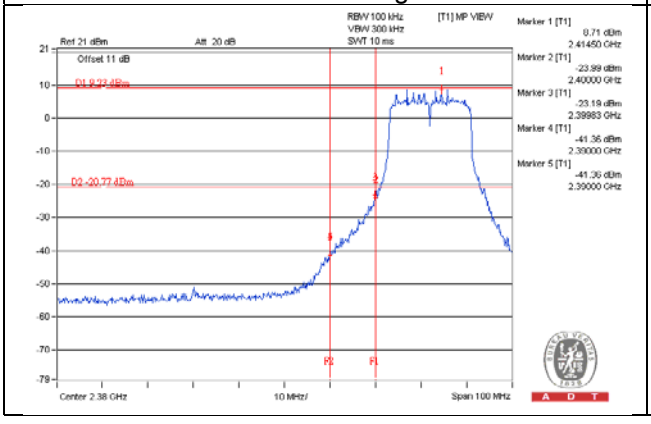
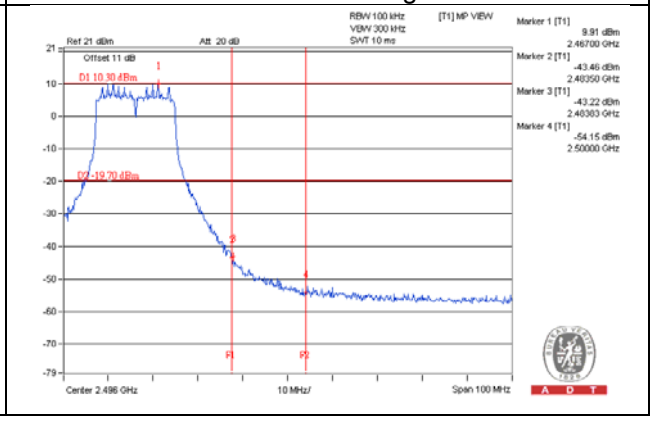




CH 1 Band edge

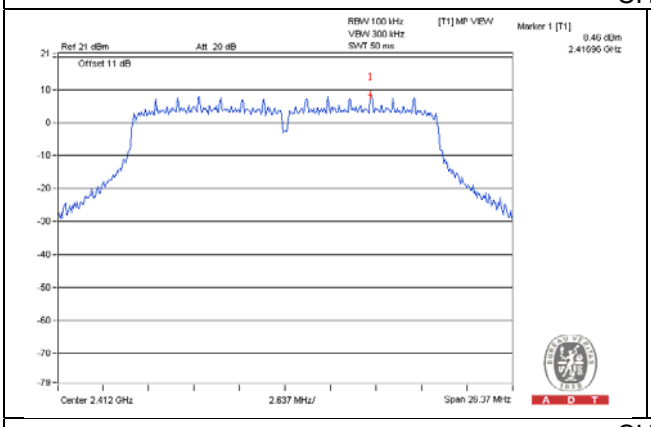


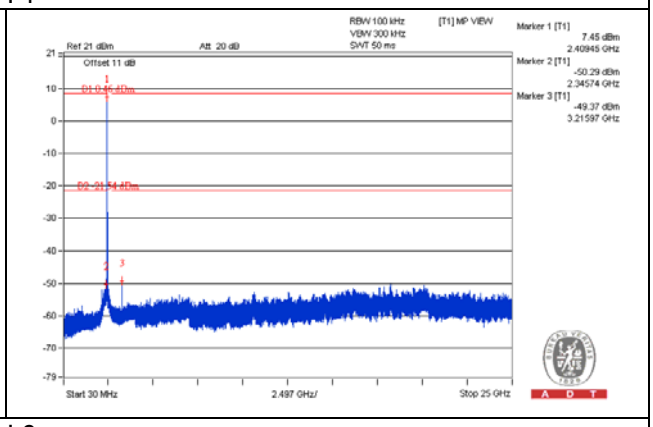
CH 11 Band edge



802.11n (HT20)_CHAIN 2

CH 1





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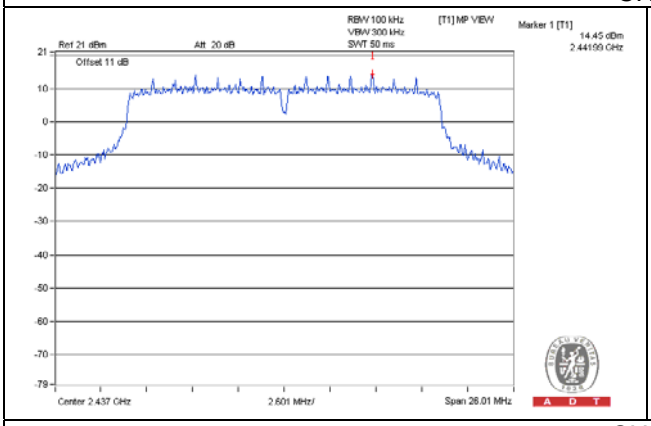

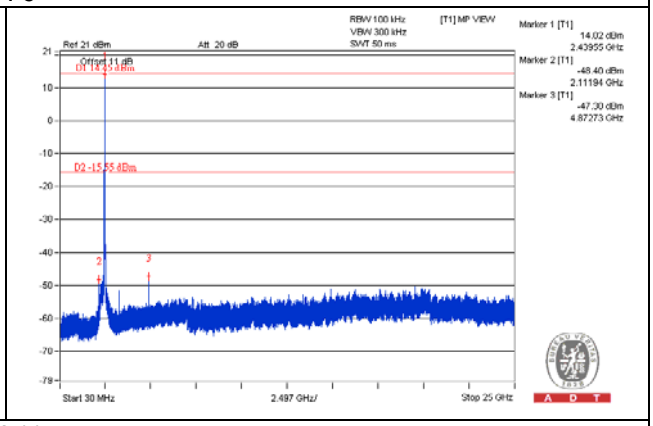

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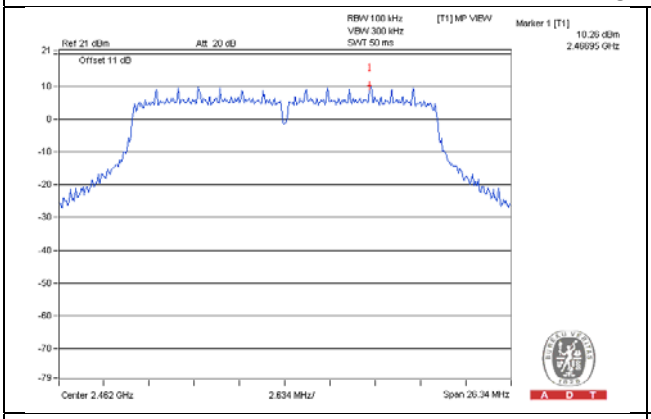

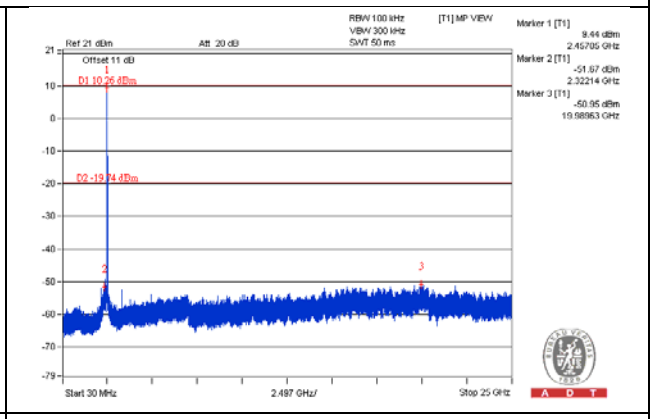

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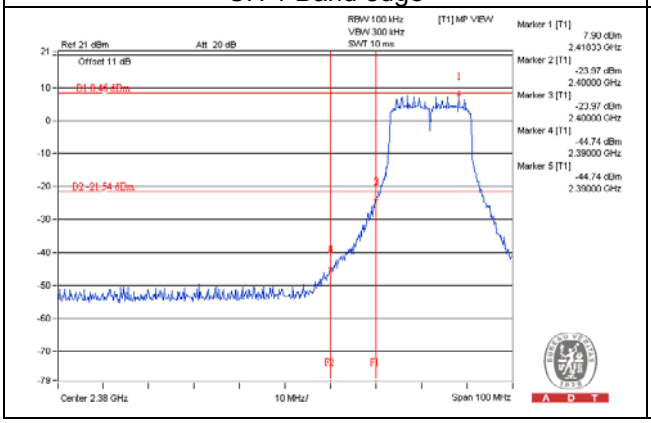

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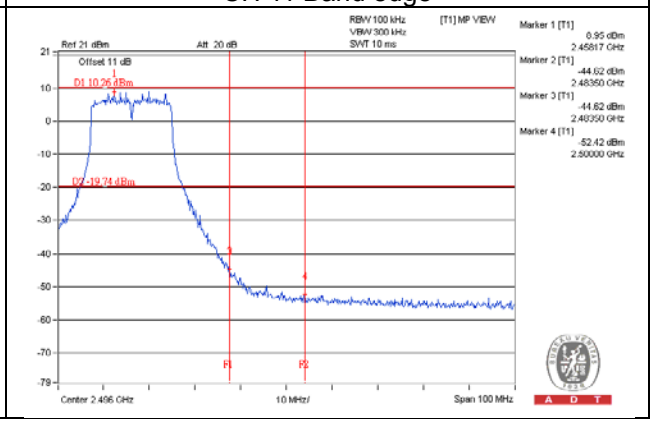
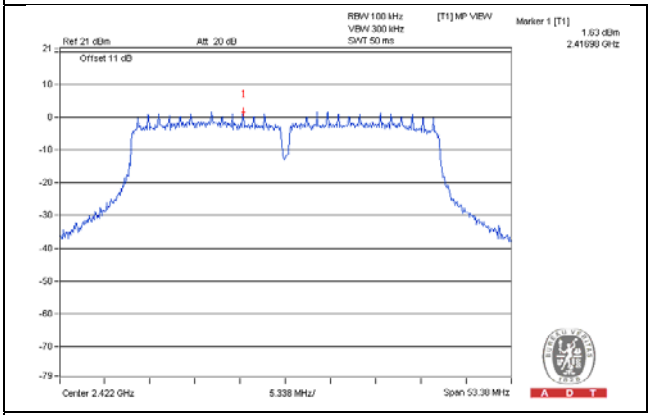
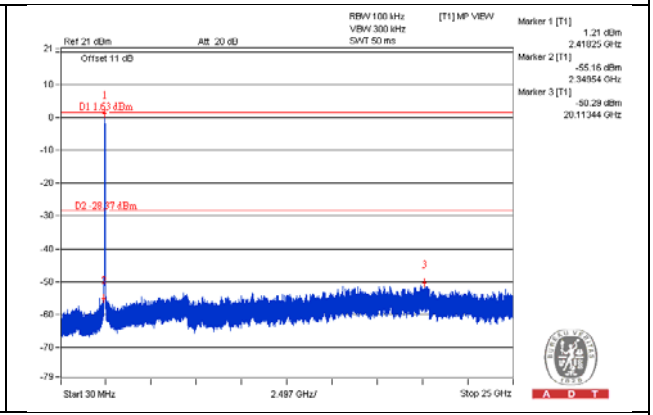


802.11n (HT40)_CHAIN 0

CH 3





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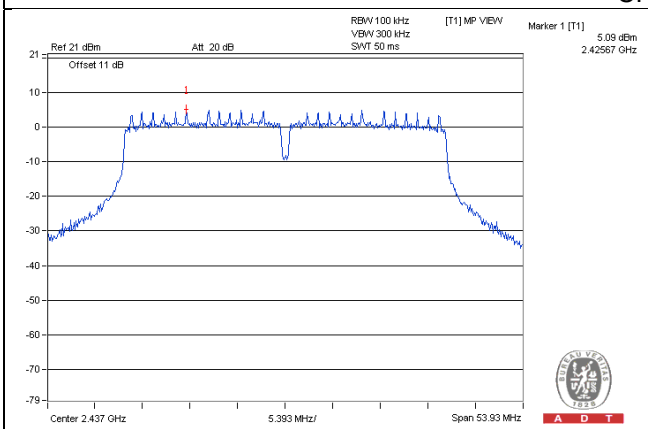

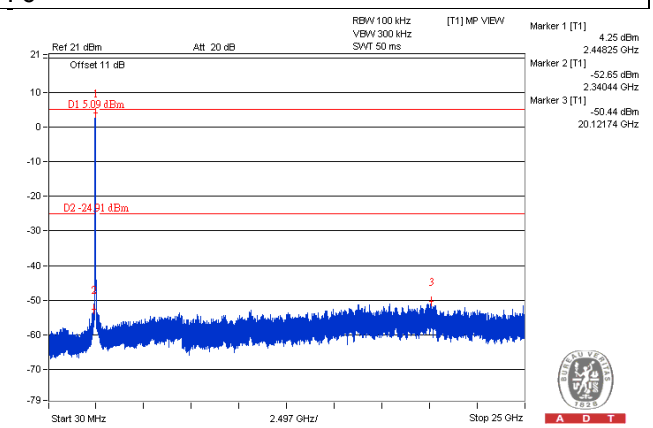

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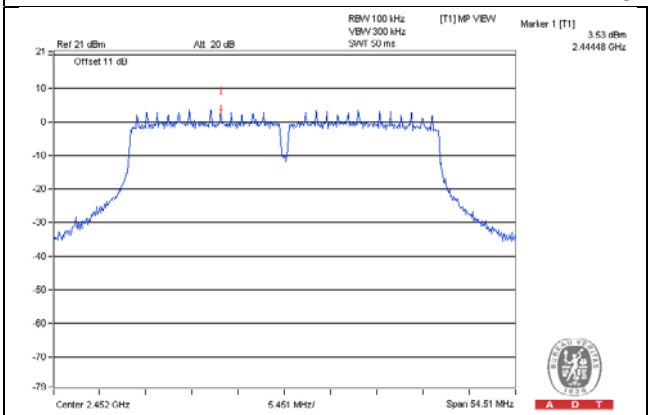

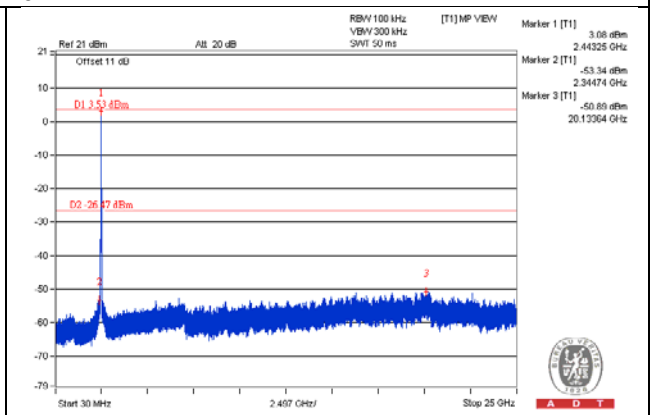

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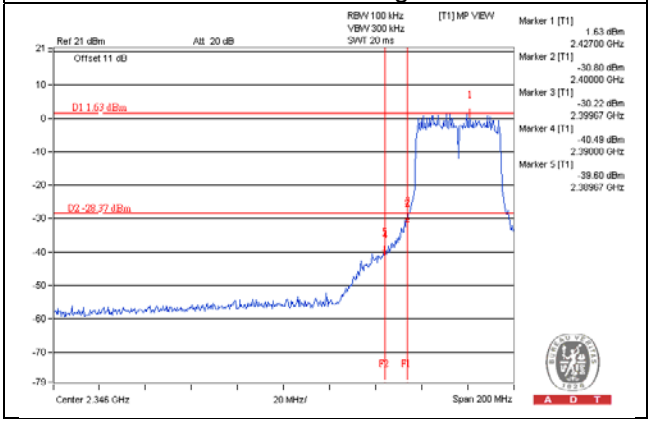

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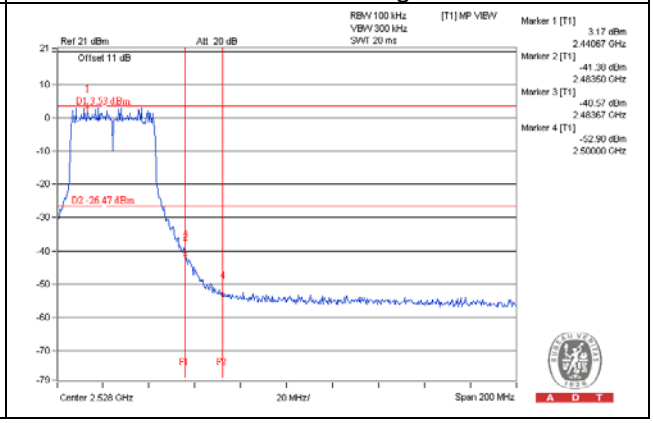
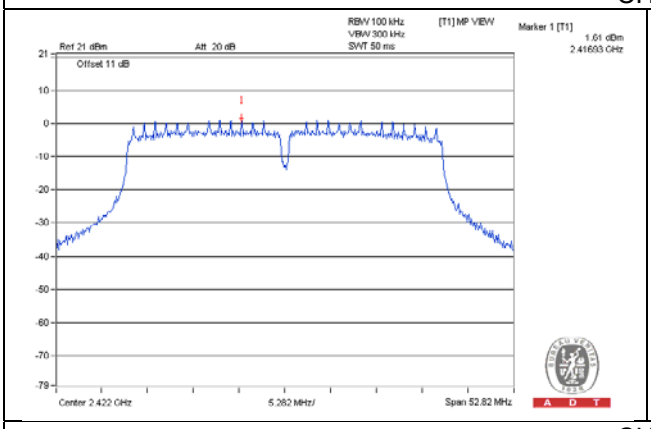
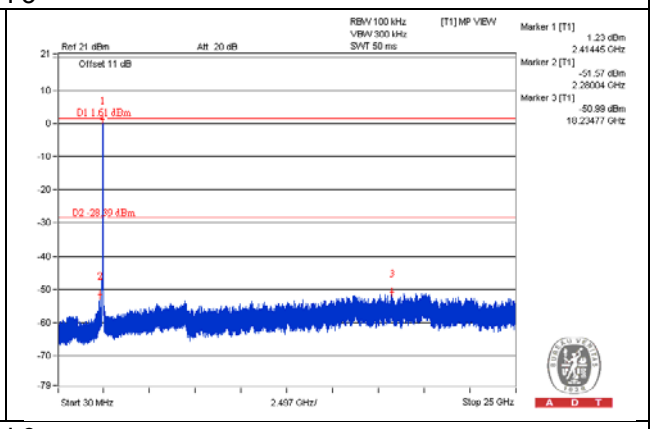


802.11n (HT40)_CHAIN 1

CH 3





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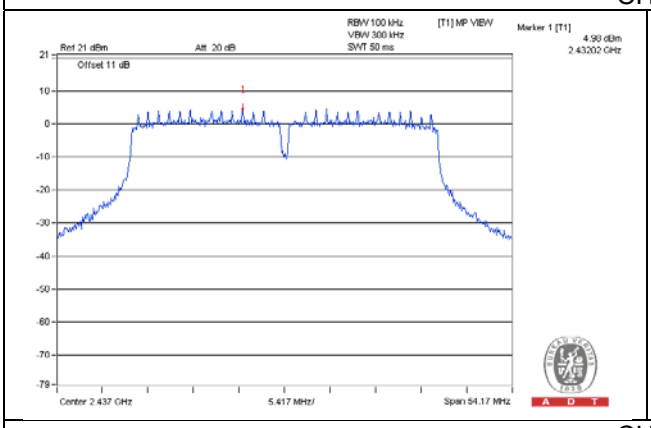

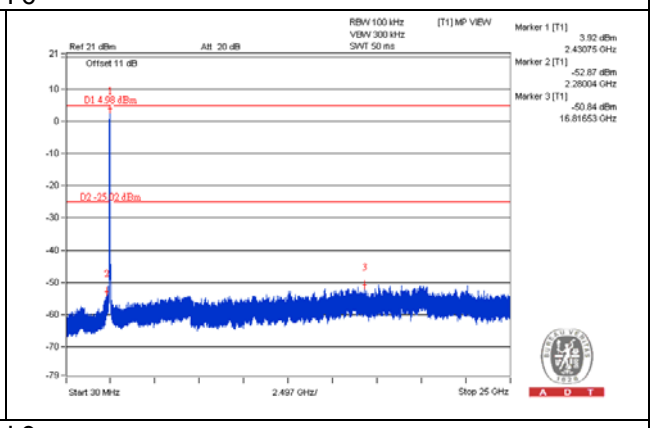

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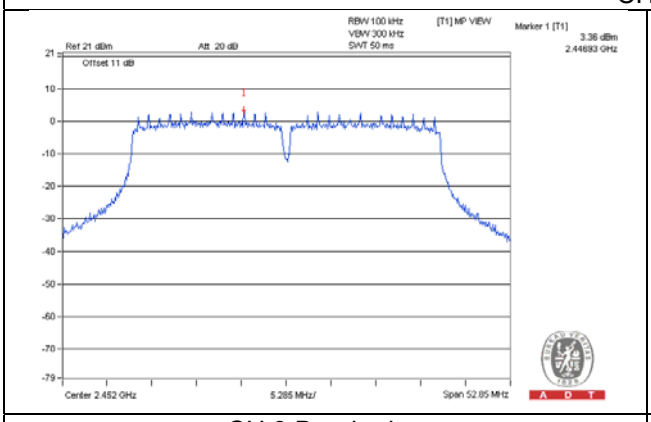

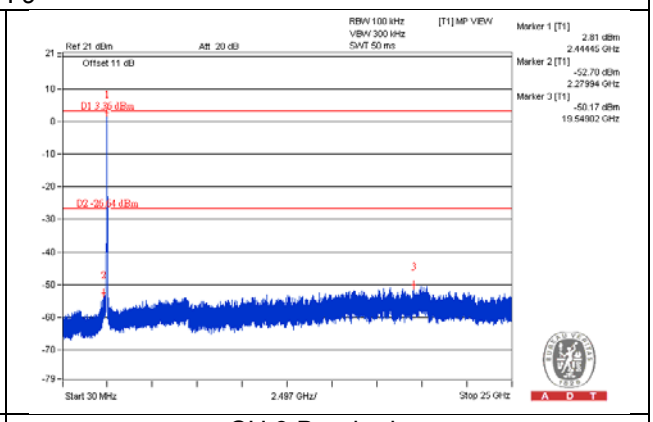

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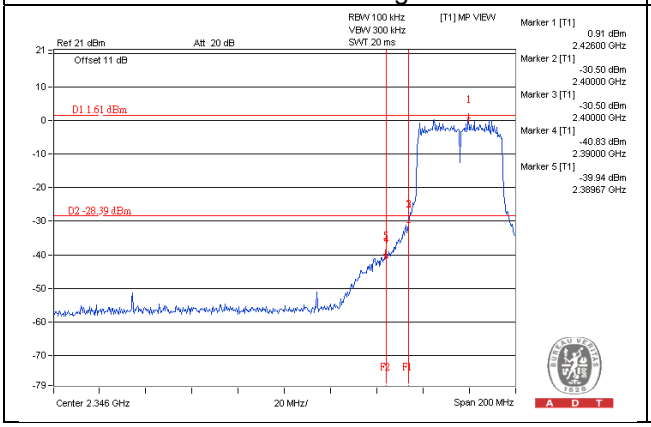

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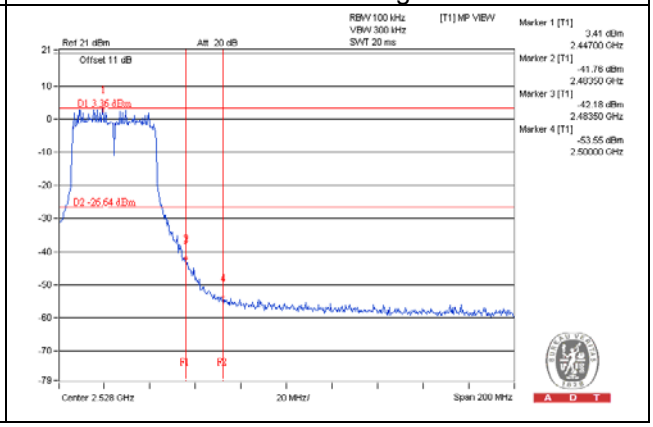
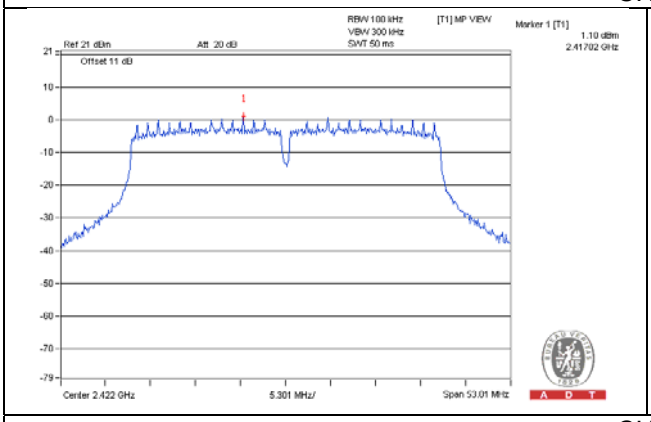
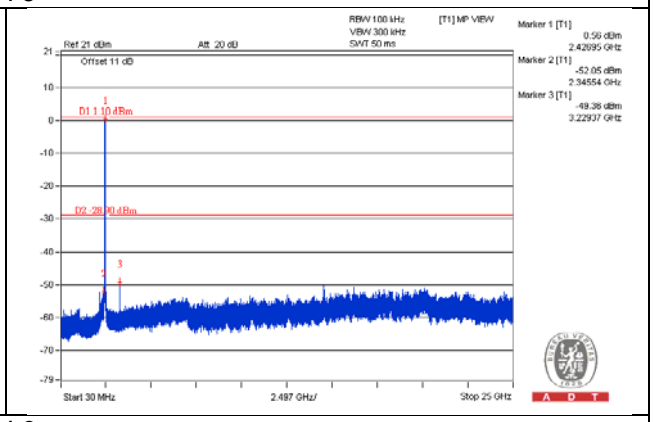


802.11n (HT40)_CHAIN 2

CH 3





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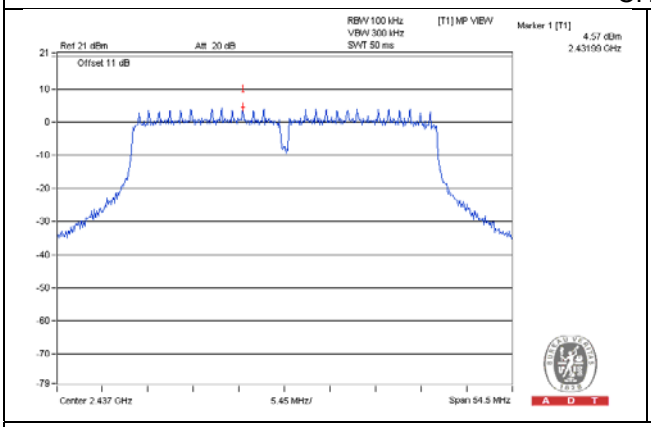

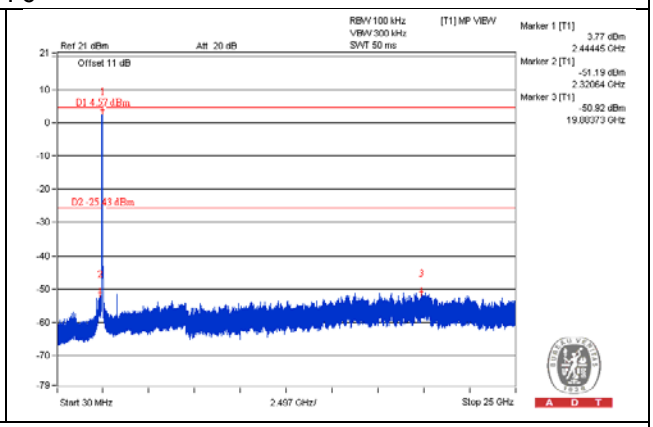

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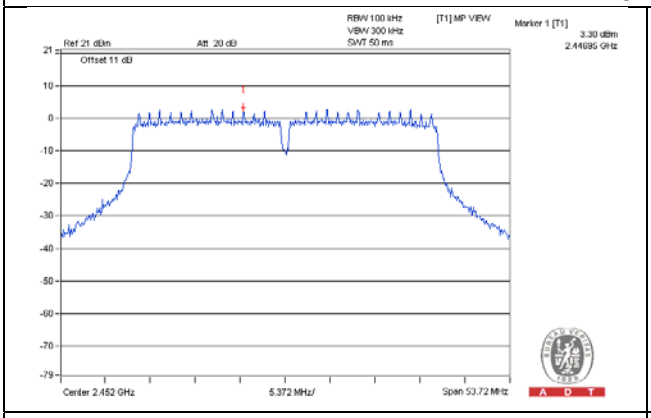

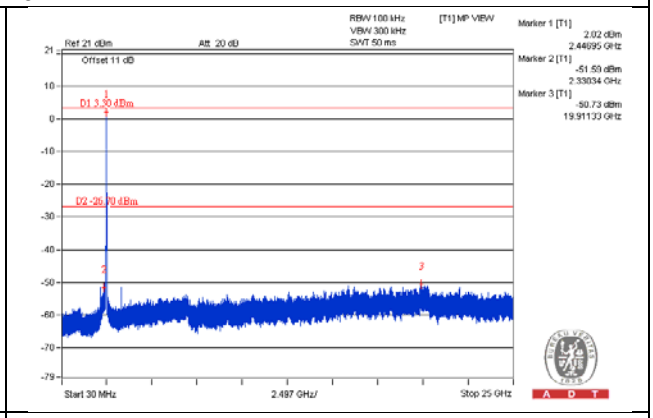

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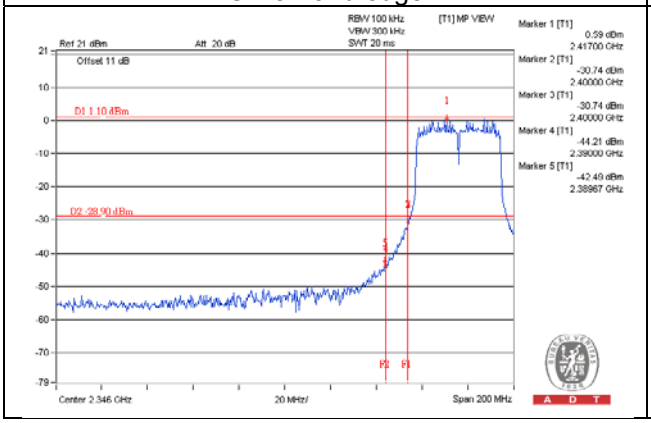

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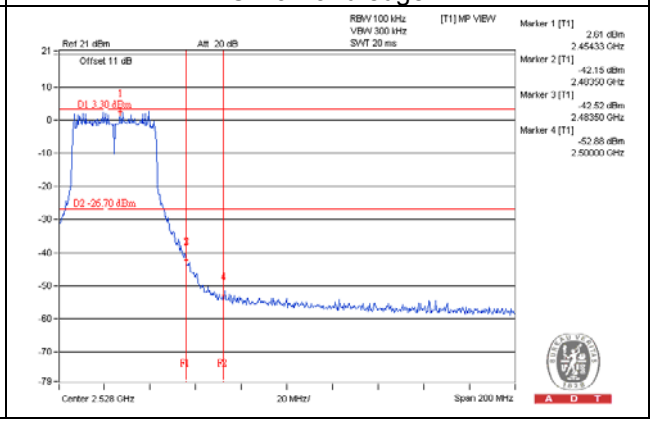

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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

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

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