

FCC Test Report (15.247)

Report No.: RF150506E05E R1

FCC ID: QISCG1241D

Test Model: CG1241D

Series Model: CG5245

Received Date: May 06, 2015

Test Date: May 29 to July 10, 2015

Issued Date: Aug. 31, 2015

Applicant: Huawei Technologies Co., Ltd.

Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen, China

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

Lab Address: No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin
Chu Hsien 307, Taiwan R.O.C.

Test Location (1): No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin
Chu Hsien 307, Taiwan R.O.C.

Test Location (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin
Chu Hsien 307, Taiwan R.O.C.



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

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT	7
3.2 Description of Test Modes	9
3.2.1 Test Mode Applicability and Tested Channel Detail	10
3.3 Duty Cycle of Test Signal	12
3.4 Description of Support Units	13
3.4.1 Configuration of System under Test	14
3.5 General Description of Applied Standards	15
4 Test Types and Results	16
4.1 Radiated Emission and Bandedge Measurement	16
4.1.1 Limits of Radiated Emission and Bandedge Measurement	16
4.1.2 Test Instruments	17
4.1.3 Test Procedures	19
4.1.4 Deviation from Test Standard	19
4.1.5 Test Setup	20
4.1.6 EUT Operating Conditions	20
4.1.7 Test Results	21
4.2 Conducted Emission Measurement	34
4.2.1 Limits of Conducted Emission Measurement	34
4.2.2 Test Instruments	34
4.2.3 Test Procedures	35
4.2.4 Deviation from Test Standard	35
4.2.5 Test Setup	35
4.2.6 EUT Operating Conditions	35
4.2.7 Test Results (Mode 1)	36
4.2.8 Test Results (Mode 2)	38
4.3 6dB Bandwidth Measurement	40
4.3.1 Limits of 6dB Bandwidth Measurement	40
4.3.2 Test Setup	40
4.3.3 Test Instruments	40
4.3.4 Test Procedure	40
4.3.5 Deviation from Test Standard	40
4.3.6 EUT Operating Conditions	40
4.3.7 Test Result	41
4.4 Conducted Output Power Measurement	43
4.4.1 Limits of Conducted Output Power Measurement	43
4.4.2 Test Setup	43
4.4.3 Test Instruments	43
4.4.4 Test Procedures	43
4.4.5 Deviation from Test Standard	43
4.4.6 EUT Operating Conditions	43
4.4.7 Test Results	44
4.5 Power Spectral Density Measurement	46
4.5.1 Limits of Power Spectral Density Measurement	46
4.5.2 Test Setup	46
4.5.3 Test Instruments	46
4.5.4 Test Procedure	46
4.5.5 Deviation from Test Standard	46

4.5.6 EUT Operating Condition	46
4.5.7 Test Results	47
4.6 Conducted Out of Band Emission Measurement.....	49
4.6.1 Limits of Conducted Out of Band Emission Measurement	49
4.6.2 Test Setup.....	49
4.6.3 Test Instruments	49
4.6.4 Test Procedure	49
4.6.5 Deviation from Test Standard	49
4.6.6 EUT Operating Condition	49
4.6.7 Test Results	49
5 Pictures of Test Arrangements.....	57
Appendix – Information on the Testing Laboratories	58



A D T

Release Control Record

Issue No.	Description	Date Issued
RF150506E05E	Original release.	Aug. 06, 2015
RF150506E05E R1	1. Modified the brand name of EUT. 2. Modified the Model name of EUT. 3. Revised the applicant and FCC ID.	Aug. 31, 2015



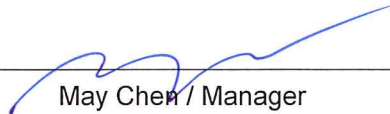
A D T

1 Certificate of Conformity

Product: WiFi EMTA
Brand: Huawei
Test Model: CG1241D
Series Model: CG5245
Sample Status: ENGINEERING SAMPLE
Applicant: Huawei Technologies Co., Ltd.
Test Date: May 29 to July 10, 2015
Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2013

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

Prepared by : , **Date:** Aug. 31, 2015
Lori Chung / Specialist

Approved by : , **Date:** Aug. 31, 2015
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -13.93dB at 16.67969MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2390.00MHz & 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	No antenna connector is used.

NOTE: The EUT was operating in 2400 ~ 2483.5MHz, 5150~5250MHz and 5725~5850MHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz. For the 5150~5250MHz and 5725~5850MHz RF parameters was recorded in another test report.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.65 dB
	6GHz ~ 18GHz	3.88 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	WiFi EMTA
Brand	Huawei
Test Model	CG1241D
Series Model	CG5245
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps
Operating Frequency	For 15.407 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
	For 15.247 2.412 ~ 2.462GHz
Number of Channel	For 15.407 9 for 802.11a, 802.11n (HT20) 4 for 802.11n (HT40)
	For 15.247 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	For 15.407 802.11a: 266.606mW 802.11n (HT20): 252.439mW 802.11n (HT40): 115.994mW
	For 15.247 802.11b: 258.226mW 802.11g: 682.092mW 802.11n (HT20): 612.08mW 802.11n (HT40): 156.884mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

- The EUT has different model names which are identical to each other in all aspects except for the following table:

Brand	Model Name	Description
Huawei	CG1241D	WLAN: 2.4GHz and 5GHz band.
	CG5245	WLAN: 2.4GHz and 5GHz band.
Note: From the above models, model: CG1241D was selected as representative model for the test and its data was recorded in this report.		

- The EUT must be supplied with a power adapter and following two different models could be chosen as following table:

No	Manufacturer	Brand	Model No.	Spec.
1	SHENZHEN HUNTKEY ELECTRIC CO., LTD.	HUAWEI	HW-120200U1W	Input: 100-240V, 0.8A, 50-60Hz Output: 12V, 2A DC output cable: 1.5m, unshielded
2	DONGGUAN SHILONG FUHUA ELECTRONIC CO., LTD	HUAWEI	HW-120200U1W	Input: 100-240V, 0.8A, 50-60Hz Output: 12V, 2A DC output cable: 1.5m, unshielded

For Radiated Emission test, the EUT was pre-tested with adapter 1 & 2, the worst case was found in adapter 2. Therefore only the test data of the adapter 2 was recorded in this report.

- The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.

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

2.4GHz Band						
Antenna No.	PCB Chain No.	Brand	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connector Type
A	Chain (1)	NA	3.76	2.4~2.4835	PCB	None (like solder)
B	Chain (2)	NA	3.87	2.4~2.4835	PCB	None (like solder)

For 802.11b, the worst case was found in Ant. B Chain (2). Therefore only the test data of the mode was recorded in this report.

5GHz Band						
Antenna No.	PCB Chain No.	Brand	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connector Type
C	Chain (1)	Hong-Lin	5.78	5.15~5.85	PCB	i-pex(MHF)
D	Chain (2)	Hong-Lin	4.36	5.15~5.85	PCB	i-pex(MHF)

- The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	1TX (diversity)	1RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX

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

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
1	-	-	√	-	With adapter 1
2	√	√	√	√	With adapter 2

Where RE $\geq$ 1G: Radiated Emission above 1GHz & Bandedge Measurement

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE: "-" means no effect.

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6

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.

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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 75%RH	120Vac, 60Hz	Weiwei Lo
RE<1G	22deg. C, 70%RH	120Vac, 60Hz	Weiwei Lo
PLC	25deg. C, 67%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Tim Ho

3.3 Duty Cycle of Test Signal

If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

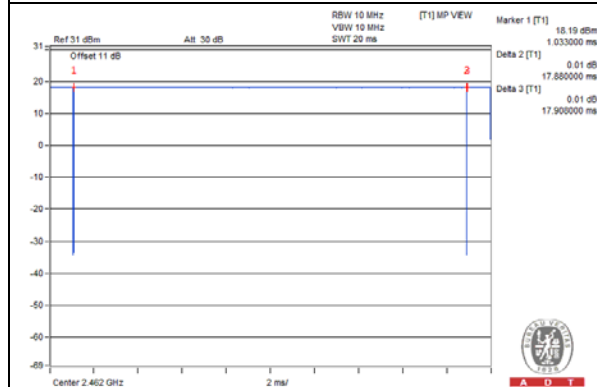
802.11b: Duty cycle = $17.88 \text{ ms} / 17.908 \text{ ms} = 0.998$

802.11g: Duty cycle = $2.968 \text{ ms} / 3.011 \text{ ms} = 0.986$

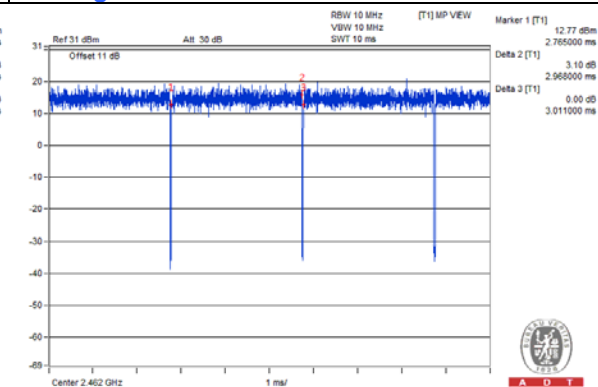
802.11n (HT20): Duty cycle = $2.735 \text{ ms} / 2.765 \text{ ms} = 0.989$

802.11n (HT40): Duty cycle = $1.213 \text{ ms} / 1.253 \text{ ms} = 0.968$, Duty factor = $10 * \log(1/0.968) = 0.1$

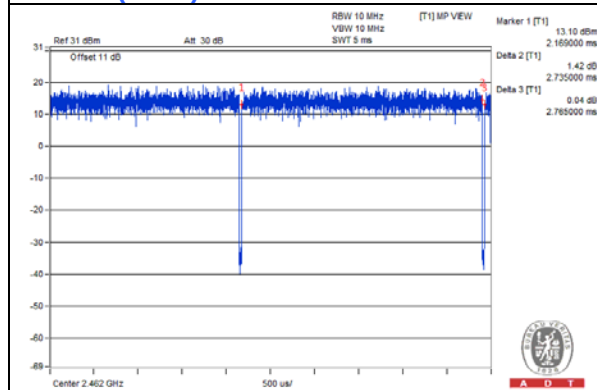
802.11b



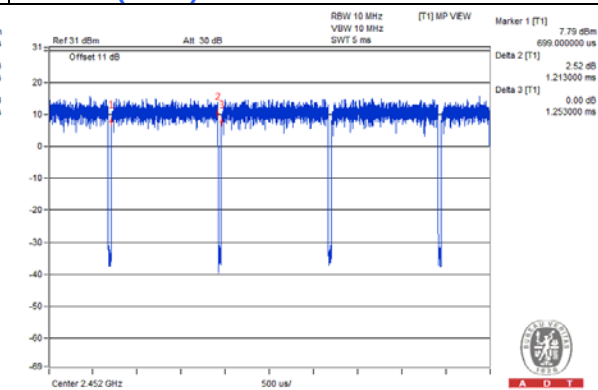
802.11g



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.

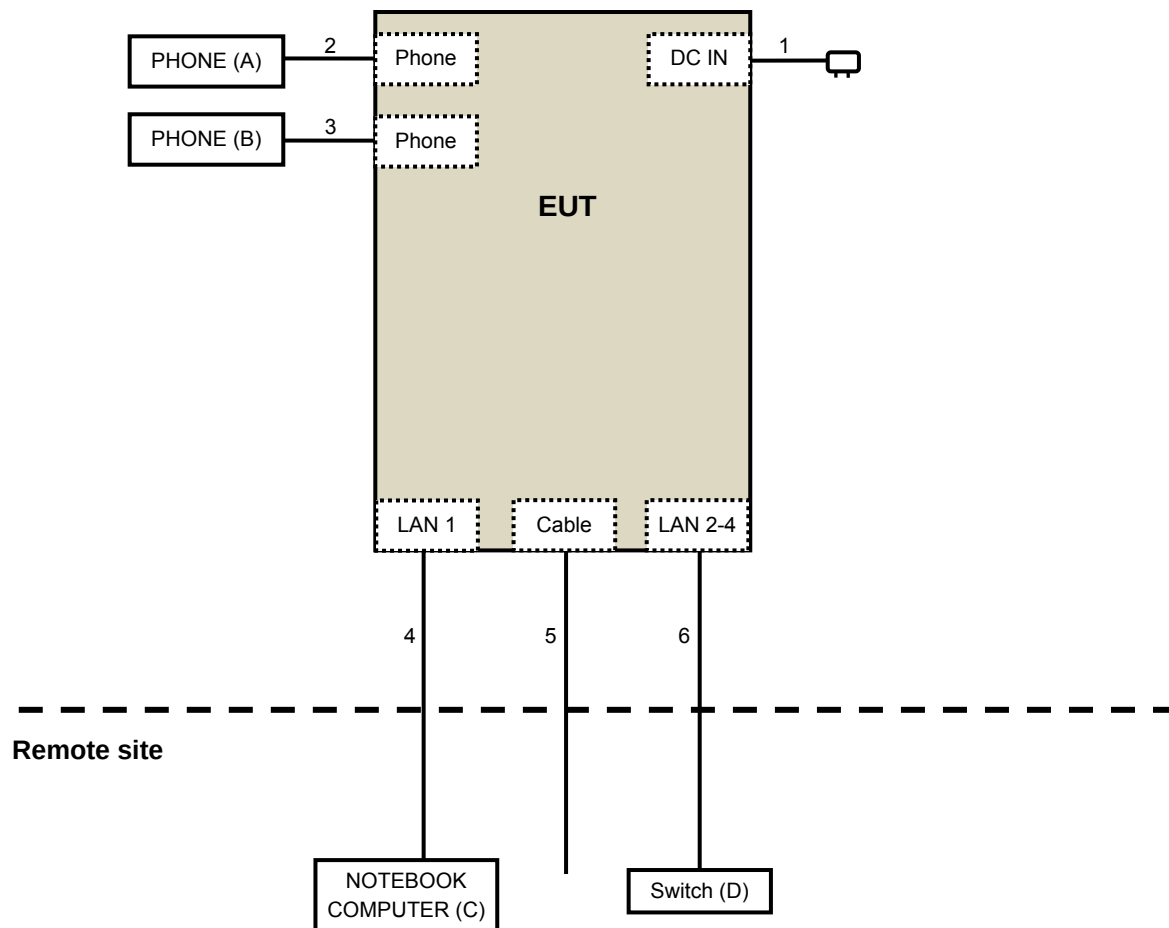
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	PHONE (For conducted emission test)	WONDER	WD-303	7C17KA05211	NA	Provided by Lab
	PHONE (For other test items)	WONDER	WD-303	7C17KA04011	NA	Provided by Lab
B	PHONE (For conducted emission test)	WONDER	WD-303	7C17KA04440	NA	Provided by Lab
	PHONE (For other test items)	WONDER	WD-303	8C17DA02763	NA	Provided by Lab
C	NOTEBOOK COMPUTER	DELL	PP18L	12252644560	FCC DoC	Provided by Lab
D	SWITCH	Linksys	SD208	NA	NA	Provided by Lab

NOTE:

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

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC	1	1.5	No	0	Supplied by Client
2	RJ11	1	1.8	No	0	Provided by Lab
3	RJ11	1	1.8	No	0	Provided by Lab
4	RJ45	1	10	No	0	Provided by Lab
5	Coaxial	1	10	Yes	0	Provided by Lab
6	RJ45	3	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v03r03

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

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

NOTE:

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

4.1.2 Test Instruments

For above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210105	July 21, 2014	July 20, 2015
Horn_Antenna AISI	AIH.8018	000032009111 0	Feb. 09, 2015	Feb. 08, 2016
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	131205 131216 131217 SNMY23684/ 4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Power Meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power Sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016
Spectrum Analyzer R&S	FSP 40	100060	May 08, 2015	May 07, 2016

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 966 Chamber No. G.
3. The FCC Site Registration No. is 966073.
4. The VCCI Site Registration No. is G-137.
5. The CANADA Site Registration No. is IC 7450H-2.
6. Tested Date: May 29 to June 03, 2015

For below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 09, 2015	Feb. 08, 2016
RF Cable	8D-FB	CHHCAB-001-1 CHHCAB-001-2	Oct. 05, 2014	Oct. 04, 2015
	RF-141	CHHCAB-004	Oct. 05, 2014	Oct. 04, 2015
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	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 966 Chamber No. H.
3. The FCC Site Registration No. is 797305.
4. The CANADA Site Registration No. is IC 7450H-3.
5. Tested Date: July 10, 2015

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

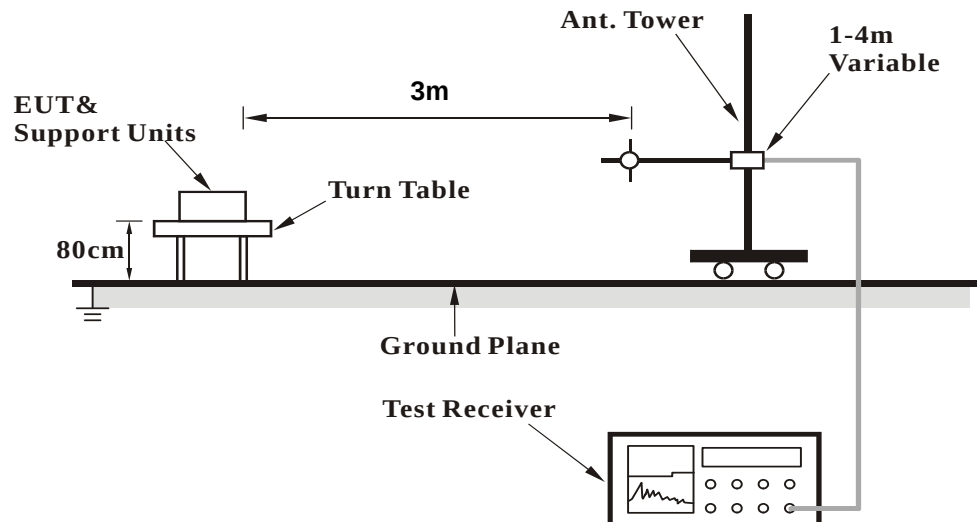
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution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

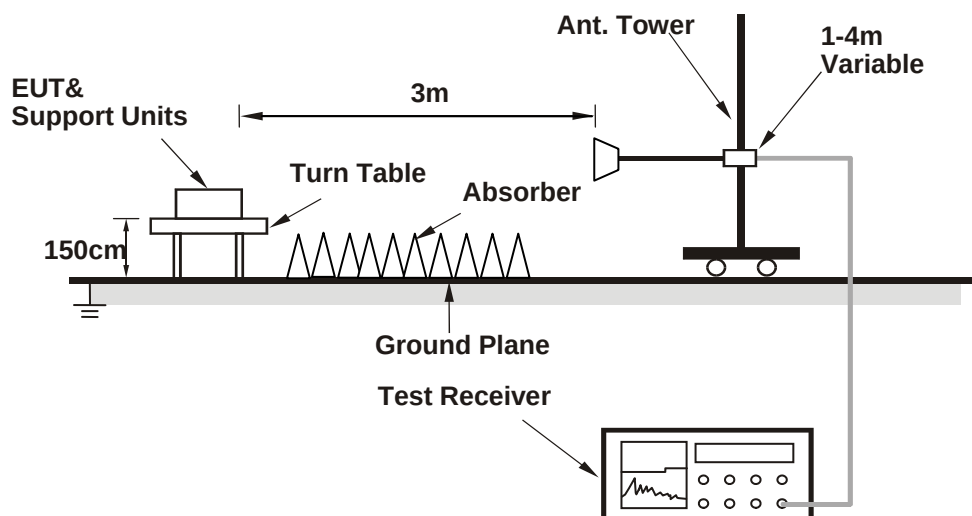
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

1. Connect the EUT with the support unit C (NOTEBOOK COMPUTER) which is placed on remote site.
2. Controlling software (MTool_2.0.1.0.msi) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.0 PK	74.0	-14.0	1.99 H	303	63.19	-3.19
2	2390.00	52.3 AV	54.0	-1.7	1.99 H	303	55.49	-3.19
3	*2412.00	110.1 PK			1.99 H	303	113.23	-3.13
4	*2412.00	107.3 AV			1.99 H	303	110.43	-3.13
5	4824.00	50.1 PK	74.0	-23.9	1.00 H	253	44.13	5.97
6	4824.00	44.3 AV	54.0	-9.7	1.00 H	253	38.33	5.97
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	60.1 PK	74.0	-13.9	1.47 V	50	63.29	-3.19
2	2390.00	53.7 AV	54.0	-0.3	1.47 V	50	56.89	-3.19
3	*2412.00	110.5 PK			1.47 V	50	113.63	-3.13
4	*2412.00	107.9 AV			1.47 V	50	111.03	-3.13
5	4824.00	53.2 PK	74.0	-20.8	1.77 V	101	47.23	5.97
6	4824.00	46.2 AV	54.0	-7.8	1.77 V	101	40.23	5.97

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.1 PK	74.0	-17.9	2.04 H	123	59.29	-3.19
2	2390.00	45.0 AV	54.0	-9.0	2.04 H	123	48.19	-3.19
3	*2437.00	109.5 PK			2.04 H	123	112.54	-3.04
4	*2437.00	108.2 AV			2.04 H	123	111.24	-3.04
5	2483.50	56.5 PK	74.0	-17.5	2.04 H	123	59.37	-2.87
6	2483.50	45.8 AV	54.0	-8.2	2.04 H	123	48.67	-2.87
7	4874.00	54.0 PK	74.0	-20.0	1.38 H	231	47.95	6.05
8	4874.00	47.5 AV	54.0	-6.5	1.38 H	231	41.45	6.05
9	7311.00	57.7 PK	74.0	-16.3	1.21 H	233	46.76	10.94
10	7311.00	46.6 AV	54.0	-7.4	1.21 H	233	35.66	10.94

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	55.6 PK	74.0	-18.4	1.72 V	47	58.79	-3.19
2	2390.00	44.5 AV	54.0	-9.5	1.72 V	47	47.69	-3.19
3	*2437.00	113.5 PK			1.72 V	47	116.54	-3.04
4	*2437.00	110.8 AV			1.72 V	47	113.84	-3.04
5	2483.50	60.4 PK	74.0	-13.6	1.72 V	47	63.27	-2.87
6	2483.50	48.2 AV	54.0	-5.8	1.72 V	47	51.07	-2.87
7	4874.00	54.1 PK	74.0	-19.9	1.89 V	92	48.05	6.05
8	4874.00	50.3 AV	54.0	-3.7	1.89 V	92	44.25	6.05
9	7311.00	57.3 PK	74.0	-16.7	1.89 V	92	46.36	10.94
10	7311.00	46.3 AV	54.0	-7.7	1.89 V	92	35.36	10.94

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.9 PK			1.67 H	108	107.84	-2.94
2	*2462.00	102.9 AV			1.67 H	108	105.84	-2.94
3	2483.50	58.1 PK	74.0	-15.9	1.67 H	108	60.97	-2.87
4	2483.50	49.8 AV	54.0	-4.2	1.67 H	108	52.67	-2.87
5	4924.00	50.8 PK	74.0	-23.2	1.25 H	211	44.73	6.07
6	4924.00	44.6 AV	54.0	-9.4	1.25 H	211	38.53	6.07
7	7386.00	56.6 PK	74.0	-17.4	2.11 H	202	45.18	11.42
8	7386.00	45.8 AV	54.0	-8.2	2.11 H	202	34.38	11.42
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	109.2 PK			1.68 V	47	112.14	-2.94
2	*2462.00	106.4 AV			1.68 V	47	109.34	-2.94
3	4924.00	50.3 PK	74.0	-23.7	1.81 V	87	44.23	6.07
4	4924.00	44.3 AV	54.0	-9.7	1.81 V	87	38.23	6.07
5	7386.00	56.9 PK	74.0	-17.1	1.89 V	96	45.48	11.42
6	7386.00	46.1 AV	54.0	-7.9	1.89 V	96	34.68	11.42

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.3 PK	74.0	-7.7	1.61 H	322	69.49	-3.19
2	2390.00	51.7 AV	54.0	-2.3	1.61 H	322	54.89	-3.19
3	*2412.00	107.0 PK			1.61 H	322	110.13	-3.13
4	*2412.00	97.5 AV			1.61 H	322	100.63	-3.13
5	4824.00	47.3 PK	74.0	-26.7	2.35 H	192	41.33	5.97
6	4824.00	40.1 AV	54.0	-13.9	2.35 H	192	34.13	5.97
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	68.5 PK	74.0	-5.5	1.99 V	43	71.69	-3.19
2	2390.00	53.6 AV	54.0	-0.4	1.99 V	43	56.79	-3.19
3	*2412.00	108.5 PK			2.15 V	172	111.63	-3.13
4	*2412.00	100.2 AV			2.15 V	172	103.33	-3.13
5	4824.00	48.7 PK	74.0	-25.3	2.27 V	172	42.73	5.97
6	4824.00	41.5 AV	54.0	-12.5	2.27 V	172	35.53	5.97

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.7 PK	74.0	-5.3	1.58 H	308	71.89	-3.19
2	2390.00	50.5 AV	54.0	-3.5	1.58 H	308	53.69	-3.19
3	*2437.00	112.4 PK			1.58 H	308	115.44	-3.04
4	*2437.00	105.3 AV			1.58 H	308	108.34	-3.04
5	2483.50	70.2 PK	74.0	-3.8	1.58 H	308	73.07	-2.87
6	2483.50	51.2 AV	54.0	-2.8	1.58 H	308	54.07	-2.87
7	4874.00	48.5 PK	74.0	-25.5	1.63 H	56	42.45	6.05
8	4874.00	40.2 AV	54.0	-13.8	1.63 H	56	34.15	6.05
9	7311.00	52.6 PK	74.0	-21.4	1.38 H	53	41.66	10.94
10	7311.00	43.3 AV	54.0	-10.7	1.38 H	53	32.36	10.94

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.8 PK	74.0	-1.2	1.94 V	166	75.99	-3.19
2	2390.00	52.6 AV	54.0	-1.4	1.94 V	166	55.79	-3.19
3	*2437.00	115.9 PK			2.10 V	131	118.94	-3.04
4	*2437.00	107.8 AV			2.10 V	131	110.84	-3.04
5	2483.50	73.1 PK	74.0	-0.9	2.06 V	173	75.97	-2.87
6	2483.50	53.9 AV	54.0	-0.1	2.06 V	173	56.77	-2.87
7	4874.00	49.5 PK	74.0	-24.5	2.31 V	184	43.45	6.05
8	4874.00	40.2 AV	54.0	-13.8	2.31 V	184	34.15	6.05
9	7311.00	55.5 PK	74.0	-18.5	2.11 V	237	44.56	10.94
10	7311.00	45.5 AV	54.0	-8.5	2.11 V	237	34.56	10.94

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.3 PK			1.85 H	325	109.24	-2.94
2	*2462.00	98.5 AV			1.85 H	325	101.44	-2.94
3	2483.50	67.3 PK	74.0	-6.7	1.85 H	325	70.17	-2.87
4	2483.50	52.5 AV	54.0	-1.5	1.85 H	325	55.37	-2.87
5	4924.00	50.3 PK	74.0	-23.7	1.35 H	321	44.23	6.07
6	4924.00	38.5 AV	54.0	-15.5	1.35 H	321	32.43	6.07
7	7386.00	56.8 PK	74.0	-17.2	2.17 H	219	45.38	11.42
8	7386.00	47.7 AV	54.0	-6.3	2.17 H	219	36.28	11.42
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	108.9 PK			2.10 V	170	111.84	-2.94
2	*2462.00	100.3 AV			2.10 V	170	103.24	-2.94
3	2483.50	70.3 PK	74.0	-3.7	2.22 V	6	73.17	-2.87
4	2483.50	53.9 AV	54.0	-0.1	2.22 V	6	56.77	-2.87
5	4924.00	51.5 PK	74.0	-22.5	1.76 V	122	45.43	6.07
6	4924.00	39.4 AV	54.0	-14.6	1.76 V	122	33.33	6.07
7	7386.00	56.8 PK	74.0	-17.2	2.15 V	230	45.38	11.42
8	7386.00	47.8 AV	54.0	-6.2	2.15 V	230	36.38	11.42

REMARKS:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.3 PK	74.0	-8.7	1.91 H	96	68.49	-3.19
2	2390.00	53.2 AV	54.0	-0.8	1.91 H	96	56.39	-3.19
3	*2412.00	107.2 PK			1.91 H	96	110.33	-3.13
4	*2412.00	98.6 AV			1.91 H	96	101.73	-3.13
5	4824.00	49.5 PK	74.0	-24.5	1.20 H	151	43.53	5.97
6	4824.00	38.4 AV	54.0	-15.6	1.20 H	151	32.43	5.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.7 PK	74.0	-4.3	2.09 V	164	72.89	-3.19
2	2390.00	53.8 AV	54.0	-0.2	2.09 V	164	56.99	-3.19
3	*2412.00	107.4 PK			2.00 V	164	110.53	-3.13
4	*2412.00	99.5 AV			2.00 V	164	102.63	-3.13
5	4824.00	49.7 PK	74.0	-24.3	1.76 V	165	43.73	5.97
6	4824.00	38.3 AV	54.0	-15.7	1.76 V	165	32.33	5.97

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2310.00	62.3 PK	74.0	-11.7	1.88 H	92	65.68	-3.38
2	2310.00	46.4 AV	54.0	-7.6	1.88 H	92	49.78	-3.38
3	*2437.00	114.2 PK			1.88 H	92	117.24	-3.04
4	*2437.00	105.9 AV			1.88 H	92	108.94	-3.04
5	2483.50	66.5 PK	74.0	-7.5	1.88 H	92	69.37	-2.87
6	2483.50	50.6 AV	54.0	-3.4	1.88 H	92	53.47	-2.87
7	4874.00	49.6 PK	74.0	-24.4	1.14 H	167	43.55	6.05
8	4874.00	38.3 AV	54.0	-15.7	1.14 H	167	32.25	6.05
9	7311.00	56.8 PK	74.0	-17.2	1.54 H	243	45.86	10.94
10	7311.00	46.7 AV	54.0	-7.3	1.54 H	243	35.76	10.94

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	2310.00	72.6 PK	74.0	-1.4	1.94 V	177	75.98	-3.38
2	2310.00	51.8 AV	54.0	-2.2	1.94 V	177	55.18	-3.38
3	*2437.00	114.9 PK			1.92 V	162	117.94	-3.04
4	*2437.00	106.4 AV			1.92 V	162	109.44	-3.04
5	2483.50	70.6 PK	74.0	-3.4	1.98 V	177	73.47	-2.87
6	2483.50	53.2 AV	54.0	-0.8	1.98 V	177	56.07	-2.87
7	4874.00	52.1 PK	74.0	-21.9	1.63 V	144	46.05	6.05
8	4874.00	41.8 AV	54.0	-12.2	1.63 V	144	35.75	6.05
9	7311.00	57.5 PK	74.0	-16.5	2.17 V	212	46.56	10.94
10	7311.00	48.8 AV	54.0	-5.2	2.17 V	212	37.86	10.94

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.2 PK			1.92 H	100	110.14	-2.94
2	*2462.00	98.4 AV			1.92 H	100	101.34	-2.94
3	2483.50	66.5 PK	74.0	-7.5	1.92 H	100	69.37	-2.87
4	2483.50	52.5 AV	54.0	-1.5	1.92 H	100	55.37	-2.87
5	4924.00	48.9 PK	74.0	-25.1	1.25 H	135	42.83	6.07
6	4924.00	38.1 AV	54.0	-15.9	1.25 H	135	32.03	6.07
7	7386.00	56.9 PK	74.0	-17.1	2.15 H	221	45.48	11.42
8	7386.00	48.1 AV	54.0	-5.9	2.15 H	221	36.68	11.42
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.6 PK			2.04 V	156	110.54	-2.94
2	*2462.00	99.7 AV			2.04 V	156	102.64	-2.94
3	2483.50	70.2 PK	74.0	-3.8	1.84 V	160	73.07	-2.87
4	2483.50	53.9 AV	54.0	-0.1	1.84 V	160	56.77	-2.87
5	4924.00	49.4 PK	74.0	-24.6	1.44 V	158	43.33	6.07
6	4924.00	38.3 AV	54.0	-15.7	1.44 V	158	32.23	6.07
7	7386.00	56.4 PK	74.0	-17.6	2.12 V	221	44.98	11.42
8	7386.00	47.3 AV	54.0	-6.7	2.12 V	221	35.88	11.42

REMARKS:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.5 PK	74.0	-10.5	1.77 H	306	66.69	-3.19
2	2390.00	49.0 AV	54.0	-5.0	1.77 H	306	52.19	-3.19
3	*2422.00	99.8 PK			1.77 H	306	102.89	-3.09
4	*2422.00	93.2 AV			1.77 H	306	96.29	-3.09
5	4844.00	48.2 PK	74.0	-25.8	1.23 H	147	42.21	5.99
6	4844.00	37.5 AV	54.0	-16.5	1.23 H	147	31.51	5.99
7	7266.00	55.2 PK	74.0	-18.8	2.07 H	251	44.31	10.89
8	7266.00	45.3 AV	54.0	-8.7	2.07 H	251	34.41	10.89
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.3 PK	74.0	-3.7	2.01 V	164	73.49	-3.19
2	2390.00	53.5 AV	54.0	-0.5	2.01 V	164	56.69	-3.19
3	*2422.00	103.9 PK			2.04 V	46	106.99	-3.09
4	*2422.00	94.0 AV			2.04 V	46	97.09	-3.09
5	4844.00	49.0 PK	74.0	-25.0	1.80 V	138	43.01	5.99
6	4844.00	38.1 AV	54.0	-15.9	1.80 V	138	32.11	5.99
7	7266.00	56.7 PK	74.0	-17.3	2.14 V	227	45.81	10.89
8	7266.00	47.7 AV	54.0	-6.3	2.14 V	227	36.81	10.89

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.2 PK	74.0	-12.8	1.76 H	299	64.39	-3.19
2	2390.00	48.5 AV	54.0	-5.5	1.76 H	299	51.69	-3.19
3	*2437.00	104.5 PK			1.76 H	299	107.54	-3.04
4	*2437.00	95.2 AV			1.76 H	299	98.24	-3.04
5	2483.50	65.5 PK	74.0	-8.5	1.76 H	299	68.37	-2.87
6	2483.50	51.5 AV	54.0	-2.5	1.76 H	299	54.37	-2.87
7	4874.00	50.0 PK	74.0	-24.0	1.26 H	158	43.95	6.05
8	4874.00	38.7 AV	54.0	-15.3	1.26 H	158	32.65	6.05
9	7311.00	57.0 PK	74.0	-17.0	2.11 H	227	46.06	10.94
10	7311.00	48.0 AV	54.0	-6.0	2.11 H	227	37.06	10.94

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.3 PK	74.0	-2.7	2.17 V	179	74.49	-3.19
2	2390.00	53.9 AV	54.0	-0.1	2.17 V	179	57.09	-3.19
3	*2437.00	106.4 PK			2.18 V	11	109.44	-3.04
4	*2437.00	96.3 AV			2.18 V	11	99.34	-3.04
5	2483.50	69.3 PK	74.0	-4.7	1.76 V	44	72.17	-2.87
6	2483.50	53.1 AV	54.0	-0.9	1.76 V	44	55.97	-2.87
7	4874.00	51.1 PK	74.0	-22.9	2.05 V	167	45.05	6.05
8	4874.00	40.9 AV	54.0	-13.1	2.05 V	167	34.85	6.05
9	7311.00	56.3 PK	74.0	-17.7	2.20 V	233	45.36	10.94
10	7311.00	47.6 AV	54.0	-6.4	2.20 V	233	36.66	10.94

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	100.5 PK			1.77 H	303	103.48	-2.98
2	*2452.00	93.5 AV			1.77 H	303	96.48	-2.98
3	2483.50	68.5 PK	74.0	-5.5	1.77 H	303	71.37	-2.87
4	2483.50	52.9 AV	54.0	-1.1	1.77 H	303	55.77	-2.87
5	4904.00	50.1 PK	74.0	-23.9	1.18 H	157	44.02	6.08
6	4904.00	38.8 AV	54.0	-15.2	1.18 H	157	32.72	6.08
7	7356.00	57.1 PK	74.0	-16.9	2.18 H	219	45.88	11.22
8	7356.00	48.2 AV	54.0	-5.8	2.18 H	219	36.98	11.22
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	102.8 PK			2.04 V	132	105.78	-2.98
2	*2452.00	93.9 AV			2.04 V	132	96.88	-2.98
3	2483.50	70.2 PK	74.0	-3.8	2.01 V	156	73.07	-2.87
4	2483.50	53.6 AV	54.0	-0.4	2.01 V	156	56.47	-2.87
5	4904.00	49.2 PK	74.0	-24.8	1.86 V	147	43.12	6.08
6	4904.00	38.3 AV	54.0	-15.7	1.86 V	147	32.22	6.08
7	7356.00	56.4 PK	74.0	-17.6	2.10 V	221	45.18	11.22
8	7356.00	47.3 AV	54.0	-6.7	2.10 V	221	36.08	11.22

REMARKS:

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

Below 1GHz Data:

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	149.21	32.1 QP	43.5	-11.4	1.00 H	85	44.90	-12.81
2	250.00	38.6 QP	46.0	-7.4	1.50 H	79	52.45	-13.87
3	374.98	34.3 QP	46.0	-11.7	2.00 H	59	44.48	-10.22
4	625.00	38.4 QP	46.0	-7.6	1.50 H	331	42.74	-4.33
5	875.02	39.1 QP	46.0	-6.9	1.50 H	337	39.47	-0.33
6	1000.00	37.4 QP	54.0	-16.7	1.50 H	360	35.68	1.67
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	62.49	34.8 QP	40.0	-5.2	1.50 V	276	49.19	-14.40
2	250.00	34.7 QP	46.0	-11.3	1.00 V	126	48.55	-13.87
3	374.98	34.1 QP	46.0	-11.9	1.00 V	24	44.36	-10.22
4	625.00	40.8 QP	46.0	-5.2	1.00 V	360	45.15	-4.33
5	749.98	32.0 QP	46.0	-14.0	1.50 V	317	33.95	-1.99
6	875.02	39.4 QP	46.0	-6.6	1.00 V	262	39.72	-0.33

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 06, 2015	May 05, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: July 09, 2015

4.2.3 Test Procedures

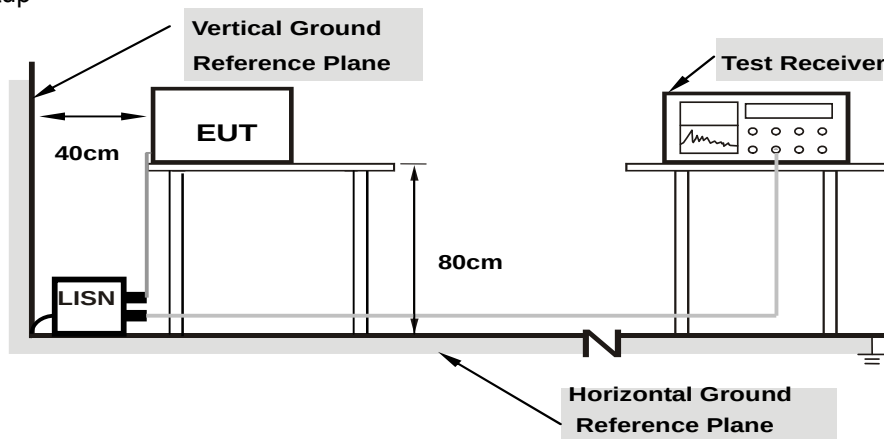
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

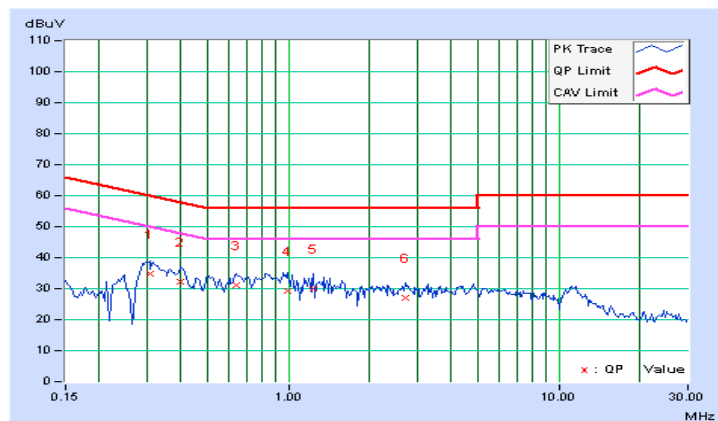
4.2.7 Test Results (Mode 1)

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.30625	0.16	34.56	21.44	34.72	21.60	60.07	50.07	-25.35	-28.47
2	0.40000	0.17	32.14	19.50	32.31	19.67	57.85	47.85	-25.54	-28.18
3	0.64219	0.18	30.86	21.26	31.04	21.44	56.00	46.00	-24.96	-24.56
4	0.98984	0.20	29.14	20.20	29.34	20.40	56.00	46.00	-26.66	-25.60
5	1.24219	0.21	29.96	21.14	30.17	21.35	56.00	46.00	-25.83	-24.65
6	2.70313	0.30	26.74	20.12	27.04	20.42	56.00	46.00	-28.96	-25.58

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

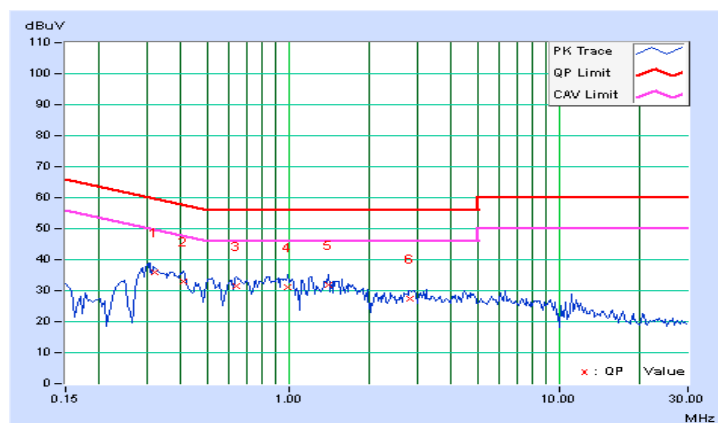


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.31903	0.17	35.70	25.42	35.87	25.59	59.73	49.73	-23.86	-24.14
2	0.40781	0.19	32.92	21.82	33.11	22.01	57.69	47.69	-24.58	-25.68
3	0.63828	0.21	31.34	20.94	31.55	21.15	56.00	46.00	-24.45	-24.85
4	0.99766	0.24	30.90	21.74	31.14	21.98	56.00	46.00	-24.86	-24.02
5	1.40234	0.26	31.54	24.10	31.80	24.36	56.00	46.00	-24.20	-21.64
6	2.83203	0.35	26.98	20.52	27.33	20.87	56.00	46.00	-28.67	-25.13

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



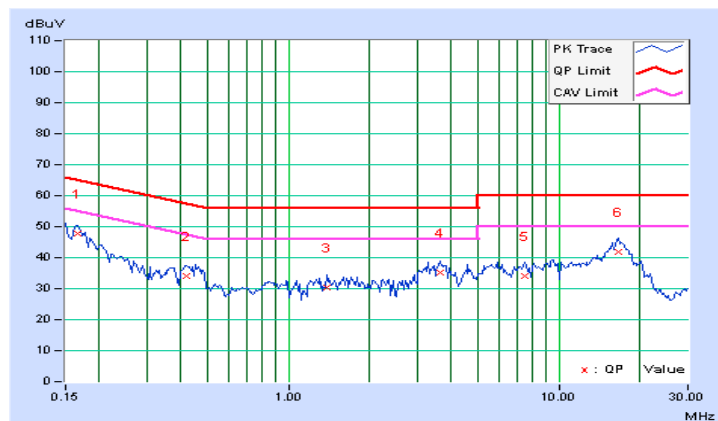
4.2.8 Test Results (Mode 2)

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.14	47.82	38.54	47.96	38.68	65.18	55.18	-17.21	-16.49
2	0.41953	0.17	34.06	25.48	34.23	25.65	57.46	47.46	-23.23	-21.81
3	1.37891	0.22	30.28	23.02	30.50	23.24	56.00	46.00	-25.50	-22.76
4	3.63672	0.36	34.90	28.78	35.26	29.14	56.00	46.00	-20.74	-16.86
5	7.46875	0.59	33.62	27.70	34.21	28.29	60.00	50.00	-25.79	-21.71
6	16.67969	0.99	40.68	35.08	41.67	36.07	60.00	50.00	-18.33	-13.93

Remarks:

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

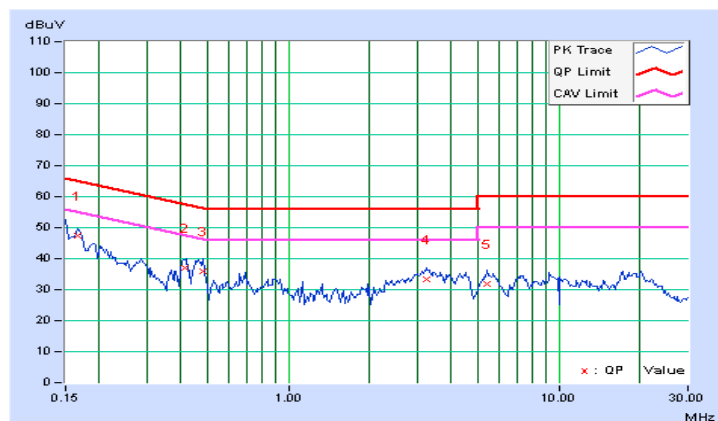


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.14	47.42	37.80	47.56	37.94	65.18	55.18	-17.61	-17.23
2	0.41478	0.19	37.00	26.50	37.19	26.69	57.55	47.55	-20.36	-20.86
3	0.48203	0.20	35.66	25.90	35.86	26.10	56.30	46.30	-20.45	-20.21
4	3.22266	0.37	32.94	26.40	33.31	26.77	56.00	46.00	-22.69	-19.23
5	5.44141	0.51	31.50	25.02	32.01	25.53	60.00	50.00	-27.99	-24.47

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

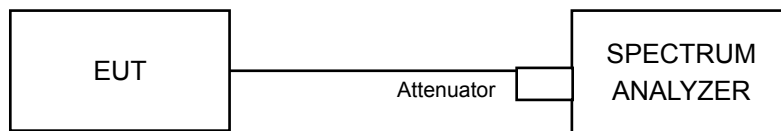


4.3 6dB Bandwidth Measurement

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

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	8.11	0.5	Pass
6	2437	8.12	0.5	Pass
11	2462	8.11	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.16	15.18	0.5	Pass
6	2437	15.19	15.17	0.5	Pass
11	2462	15.49	15.16	0.5	Pass

802.11n (HT20)

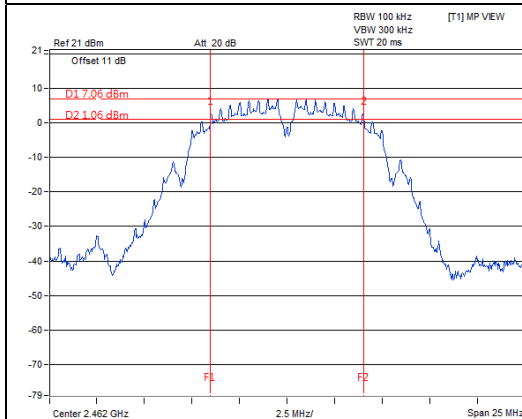
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.09	16.58	0.5	Pass
6	2437	15.18	16.71	0.5	Pass
11	2462	15.17	16.12	0.5	Pass

802.11n (HT40)

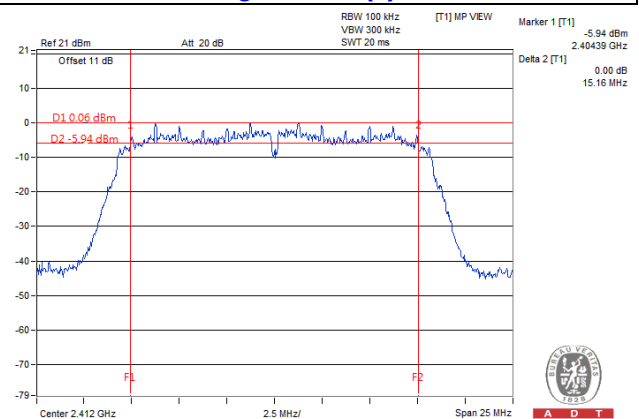
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	36.45	36.47	0.5	Pass
6	2437	36.41	36.45	0.5	Pass
9	2452	36.44	36.48	0.5	Pass

Spectrum Plot of Worst Value

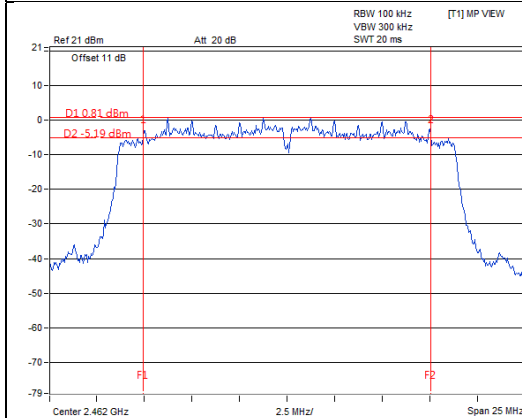
802.11b – CH 11



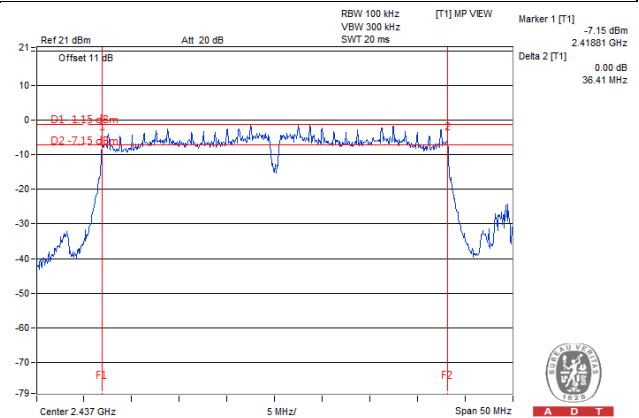
802.11g – Chain (0): CH 1



802.11n (HT20) – Chain (0): CH 11



802.11n (HT40) – Chain (0): CH 6



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

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

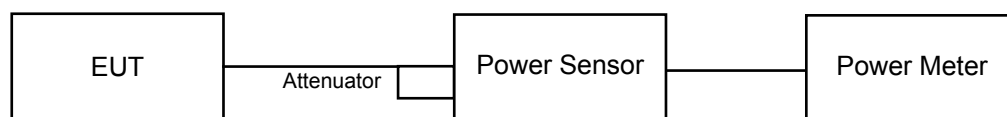
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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

Array Gain = $5 \log(NANT/NSS)$ dB or 3 dB, whichever is less for 20-MHz channel widths with $NANT \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(NANT/NSS)$ dB.

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

FOR PEAK POWER

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	94.406	19.75	30	Pass
6	2437	258.226	24.12	30	Pass
11	2462	80.538	19.06	30	Pass

802.11g

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.71	17.67	117.499	20.70	30	Pass
6	2437	25.49	25.16	682.092	28.34	30	Pass
11	2462	19.23	19.11	165.223	22.18	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.41	17.69	128.092	21.08	30	Pass
6	2437	25.11	24.59	612.08	27.87	30	Pass
11	2462	17.24	17.33	107.041	20.30	30	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	16.87	16.01	88.543	19.47	30	Pass
6	2437	18.88	19.01	156.884	21.96	30	Pass
9	2452	17.55	17.45	112.475	20.51	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	39.084	15.92
6	2437	107.399	20.31
11	2462	32.810	15.16

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	10.72	10.55	23.153	13.65
6	2437	19.34	18.56	157.680	21.98
11	2462	12.13	12.01	32.216	15.08

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	11.18	10.64	24.710	13.93
6	2437	18.22	17.63	124.317	20.95
11	2462	10.99	10.66	24.201	13.84

802.11n (HT40)

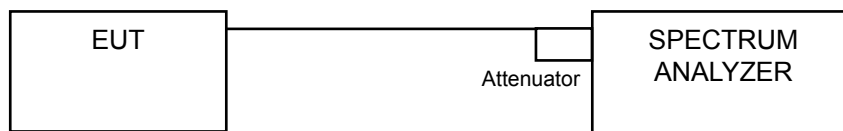
Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	9.67	8.85	16.942	12.29
6	2437	12.00	12.53	33.755	15.28
9	2452	10.29	10.01	20.714	13.16

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

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Channel	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Pass /Fail
1	2412	-3.99	8	Pass
6	2437	0.49	8	Pass
11	2462	-4.75	8	Pass

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-12.06	3.01	-9.05	7.17	Pass
	6	2437	-4.07	3.01	-1.06	7.17	Pass
	11	2462	-12.02	3.01	-9.01	7.17	Pass
1	1	2412	-12.99	3.01	-9.98	7.17	Pass
	6	2437	-4.41	3.01	-1.40	7.17	Pass
	11	2462	-11.47	3.01	-8.46	7.17	Pass

NOTE: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.83\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(6.83-6) = 7.17\text{dBm}$.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-11.61	3.01	-8.60	7.17	Pass
	6	2437	-4.47	3.01	-1.46	7.17	Pass
	11	2462	-11.54	3.01	-8.53	7.17	Pass
1	1	2412	-11.52	3.01	-8.51	7.17	Pass
	6	2437	-4.39	3.01	-1.38	7.17	Pass
	11	2462	-11.61	3.01	-8.60	7.17	Pass

NOTE: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.83\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(6.83-6) = 7.17\text{dBm}$.

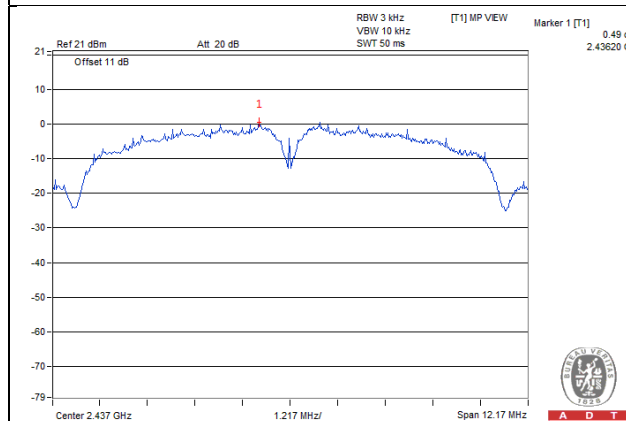
802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	3	2422	-16.00	3.01	-12.99	7.17	Pass
	6	2437	-14.06	3.01	-11.05	7.17	Pass
	9	2452	-15.18	3.01	-12.17	7.17	Pass
1	3	2422	-17.05	3.01	-14.04	7.17	Pass
	6	2437	-13.31	3.01	-10.30	7.17	Pass
	9	2452	-15.69	3.01	-12.68	7.17	Pass

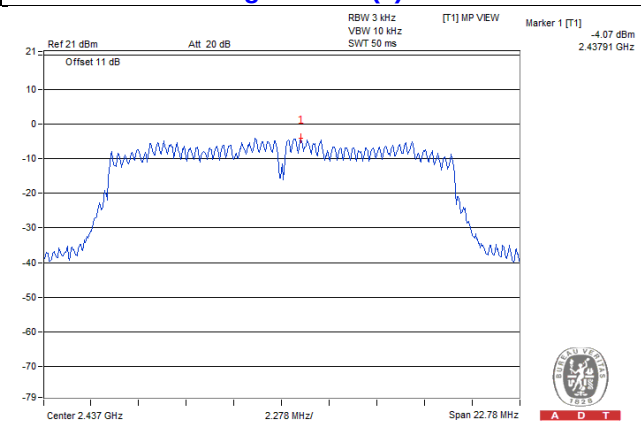
NOTE: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.83\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(6.83-6) = 7.17\text{dBm}$.

Spectrum Plot of Worst Value

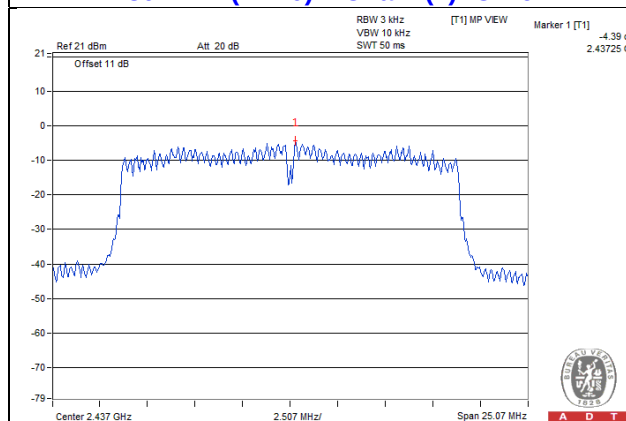
802.11b – CH 6



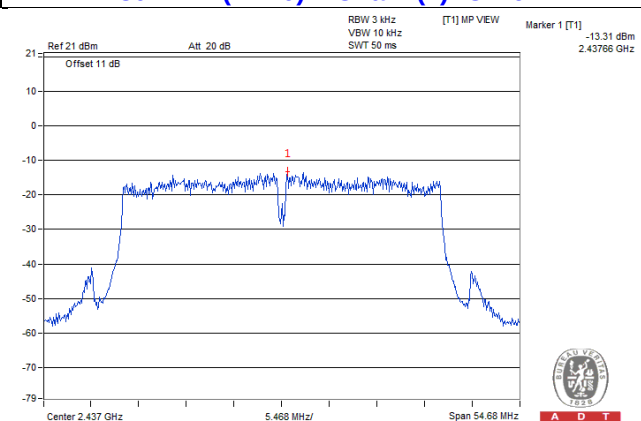
802.11g – Chain (0): CH 6



802.11n (HT20) – Chain (1): CH 6



802.11n (HT40) – Chain (1): CH 6

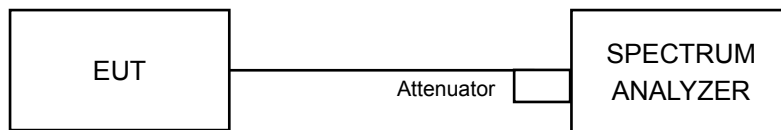


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOB

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

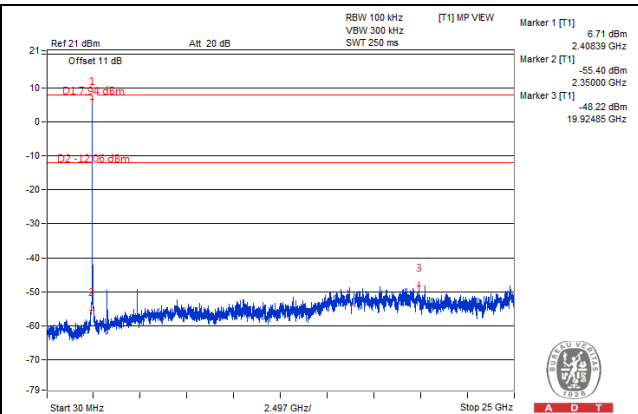
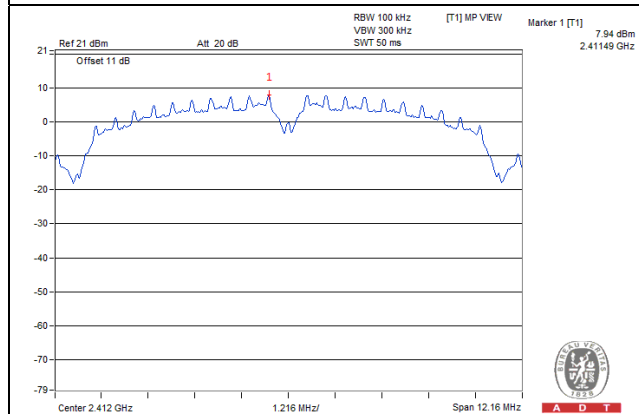
Same as Item 4.3.6

4.6.7 Test Results

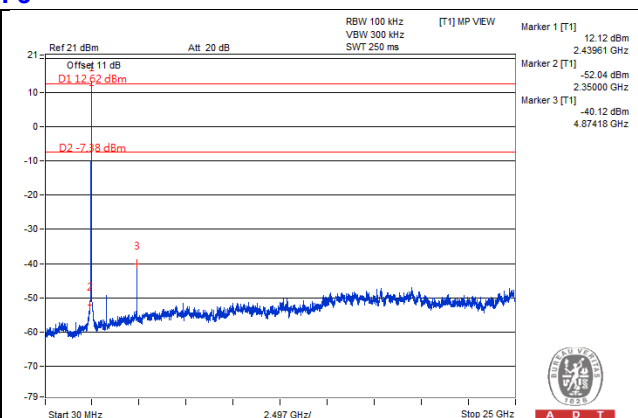
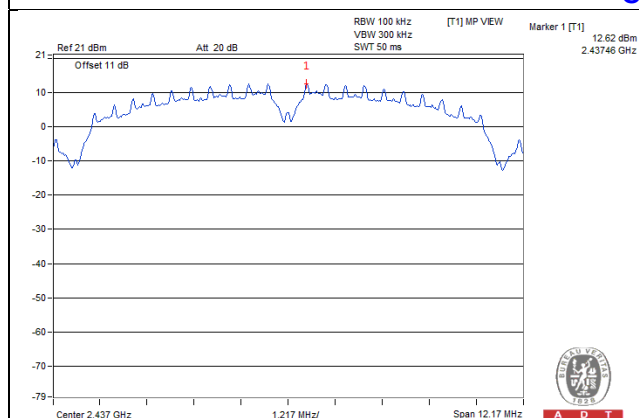
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

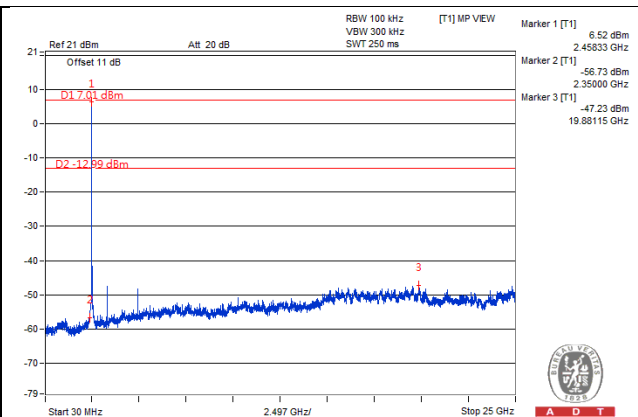
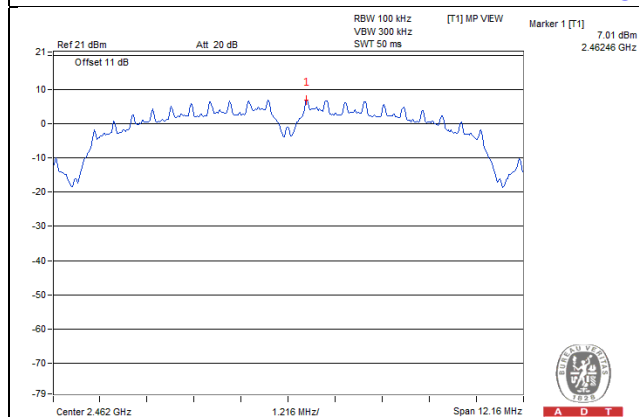
CH 1



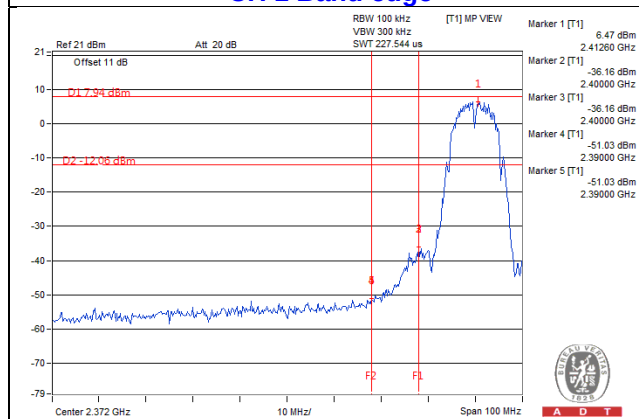
CH 6



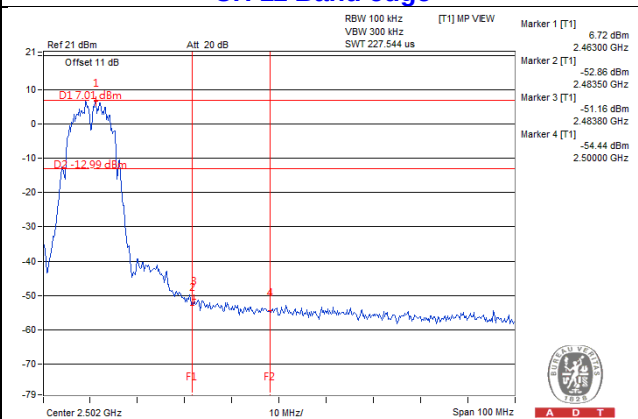
CH 11



CH 1 Band edge



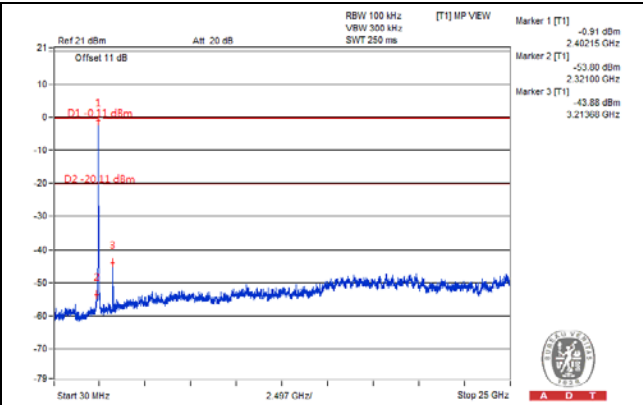
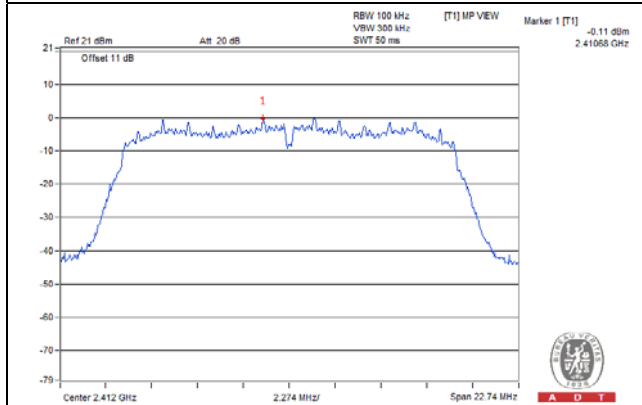
CH 11 Band edge



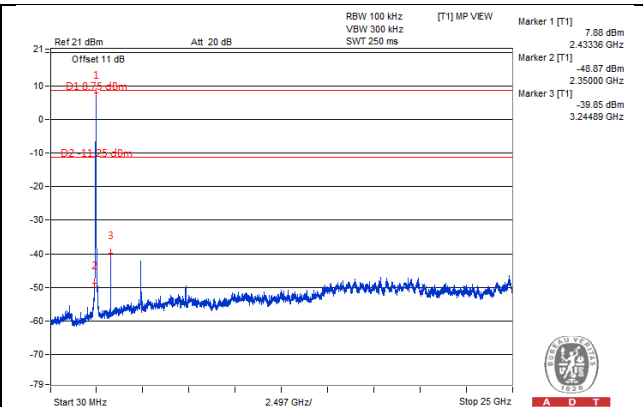
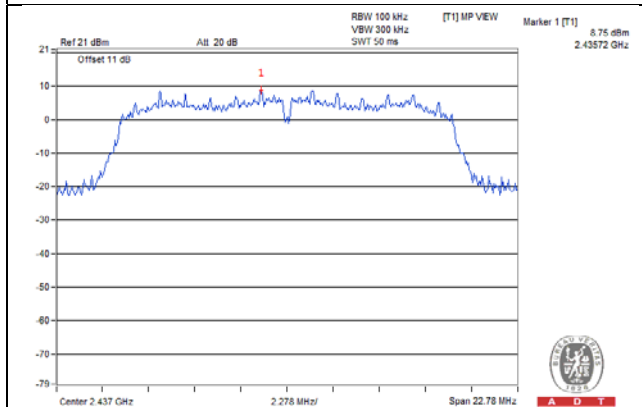
802.11g

Chain 0

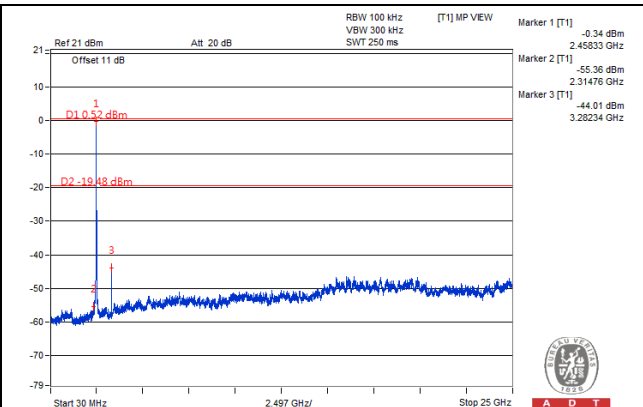
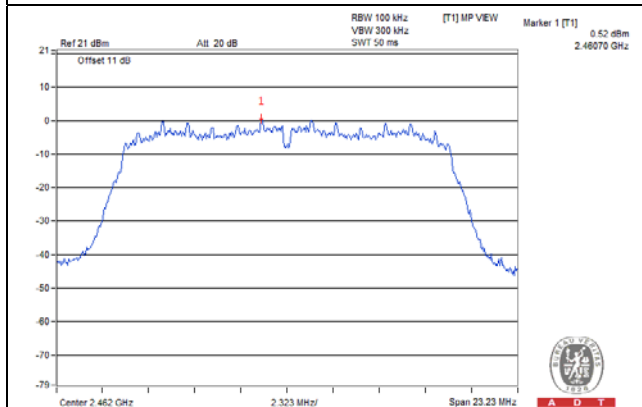
CH 1



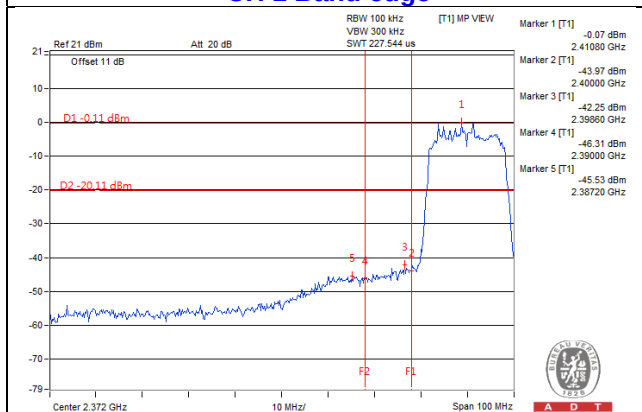
CH 6



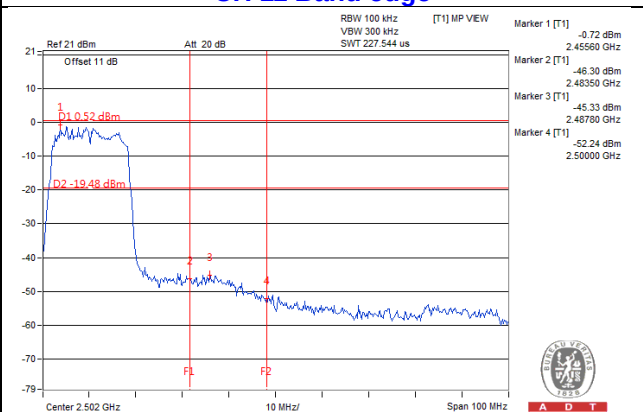
CH 11



CH 1 Band edge

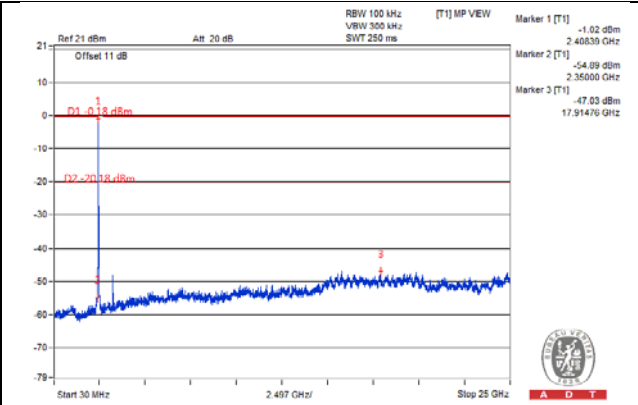
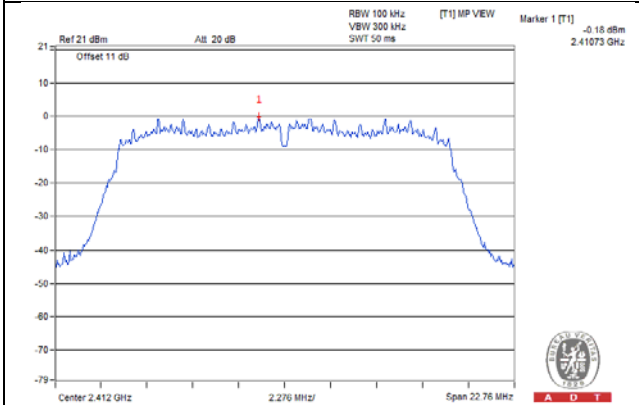


CH 11 Band edge

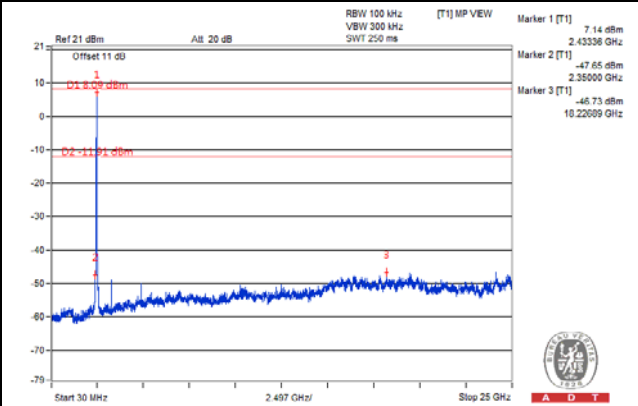
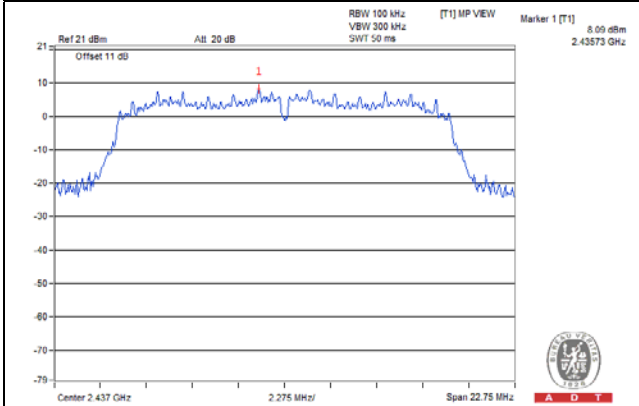


Chain 1

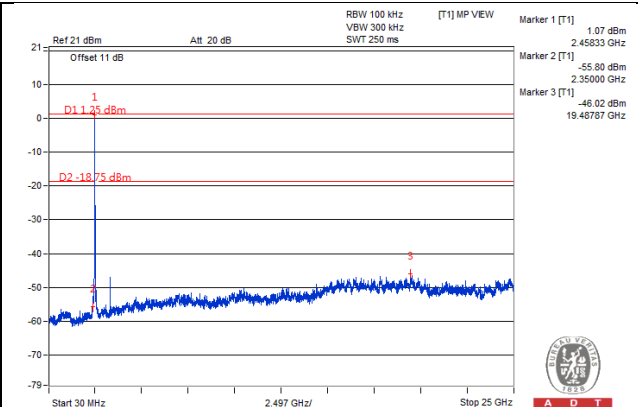
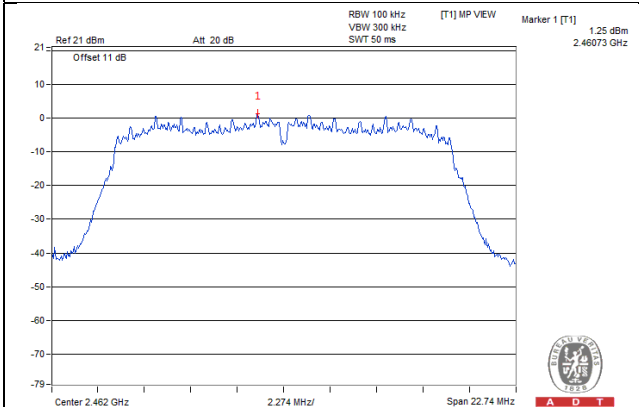
CH 1



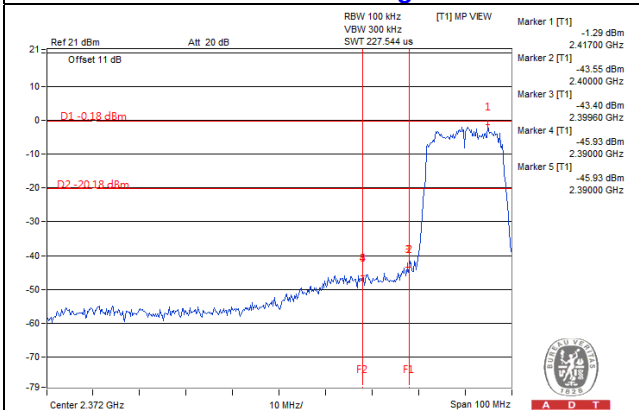
CH 6



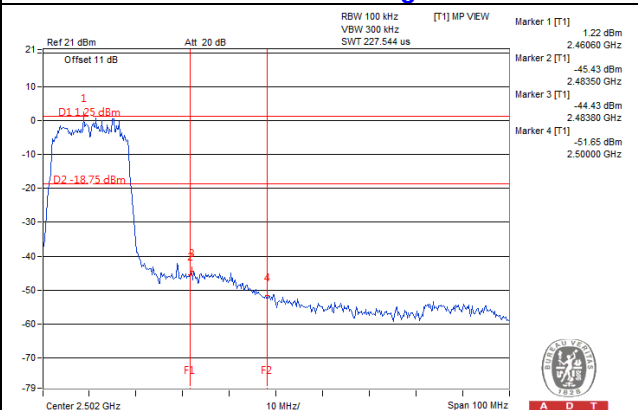
CH 11



CH 1 Band edge



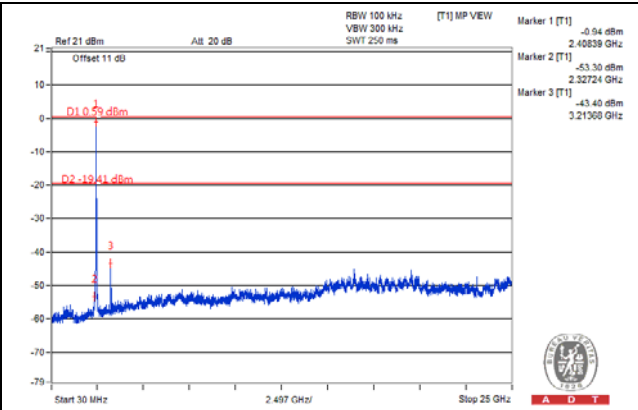
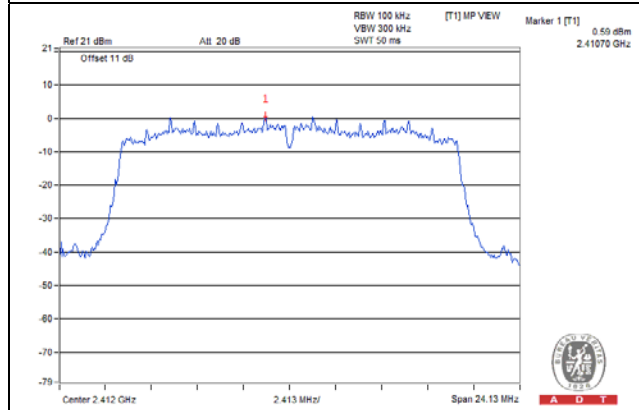
CH 11 Band edge



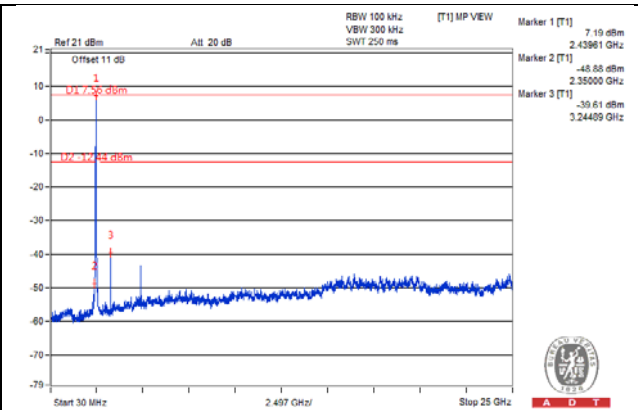
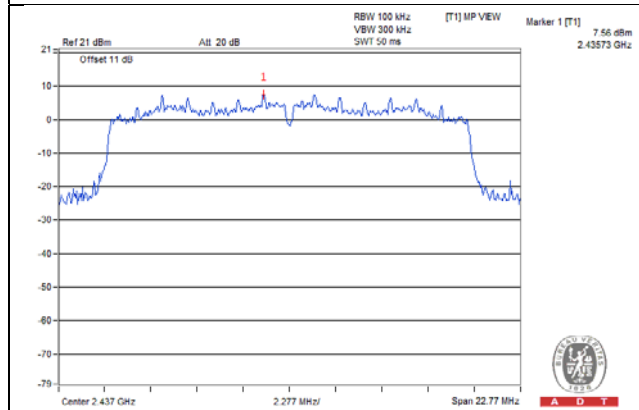
802.11n (HT20)

Chain 0

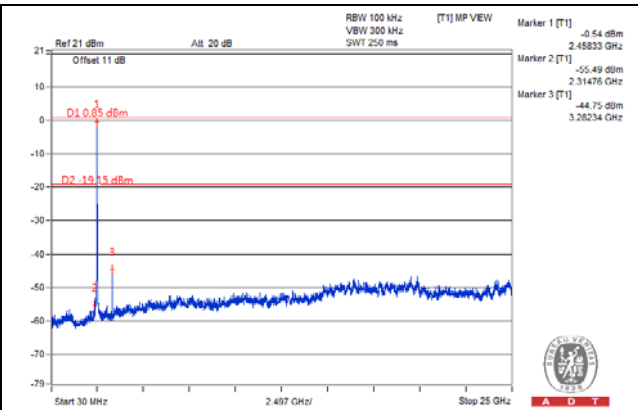
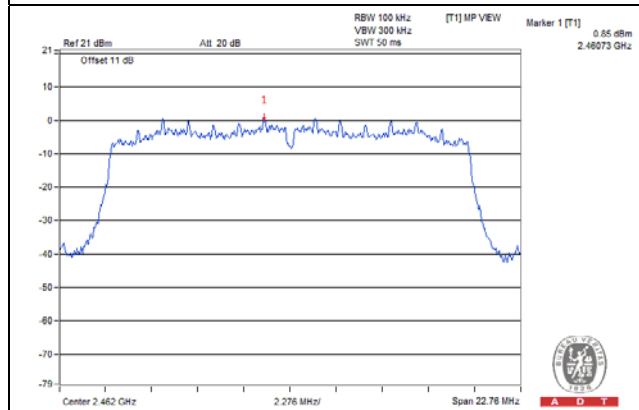
CH 1



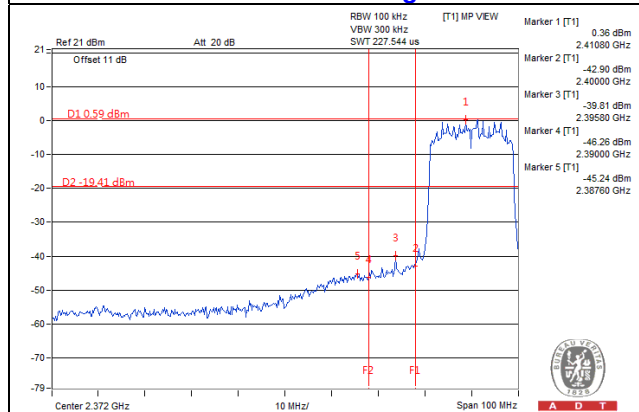
CH 6



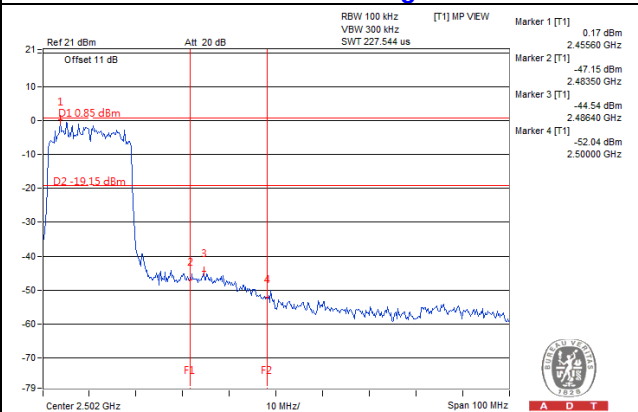
CH 11



CH 1 Band edge

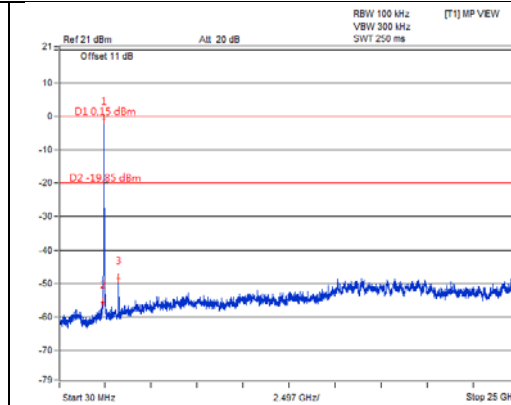
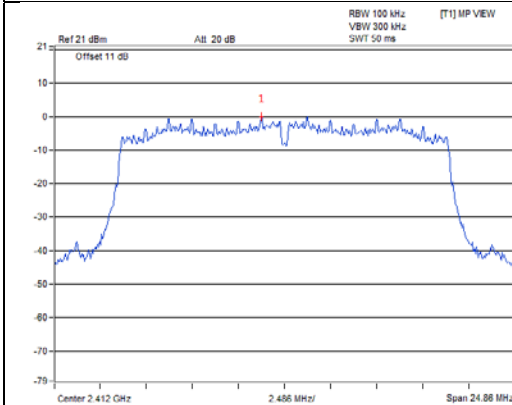


CH 11 Band edge

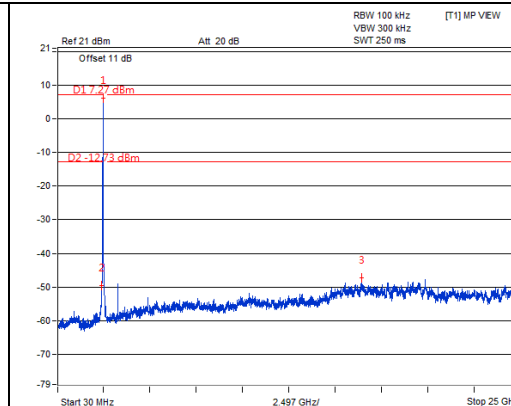
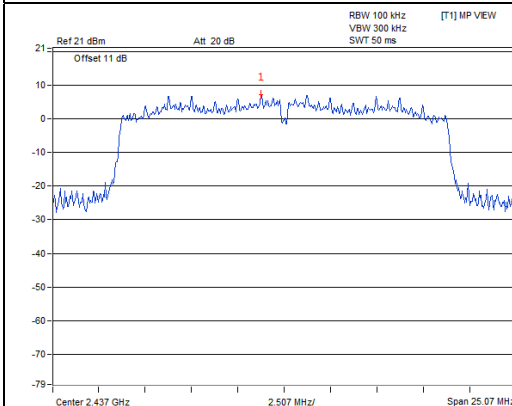


Chain 1

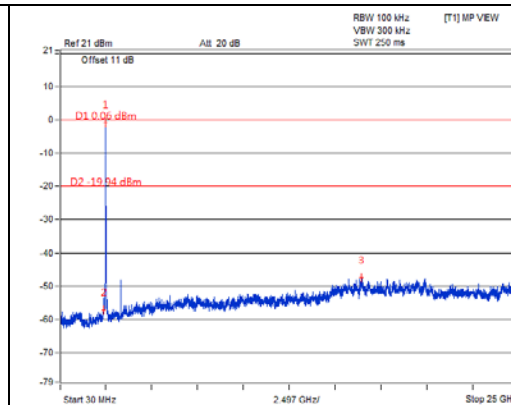
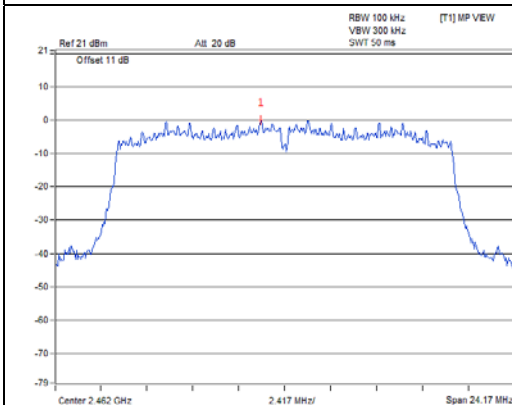
CH 1



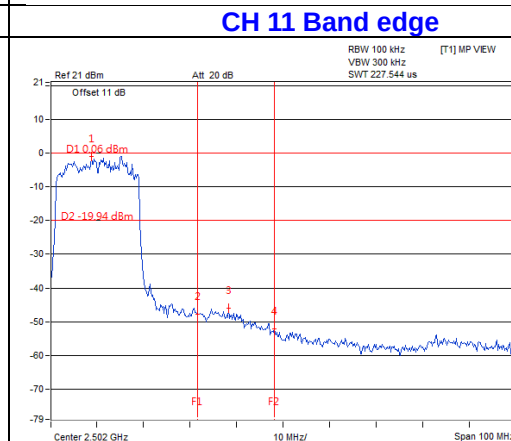
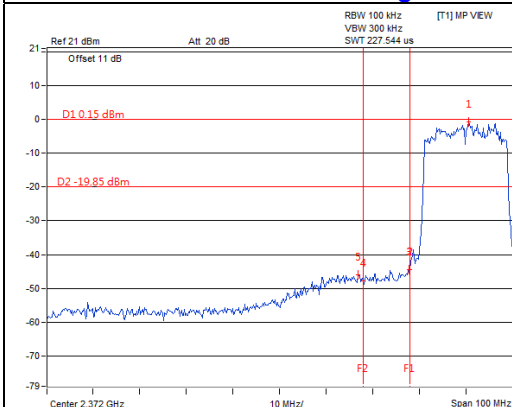
CH 6



CH 11



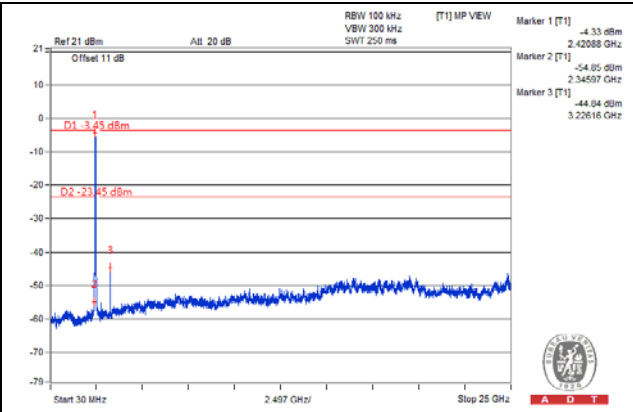
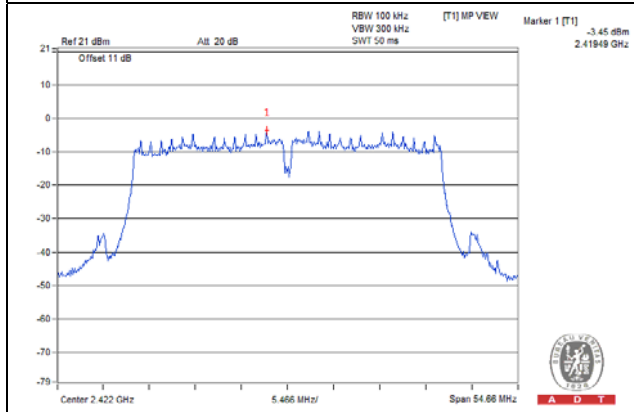
CH 1 Band edge



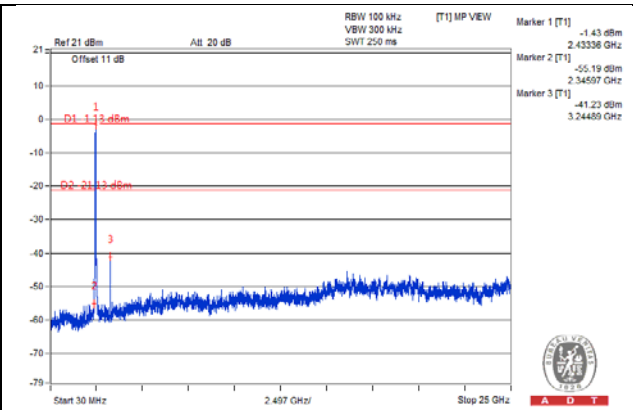
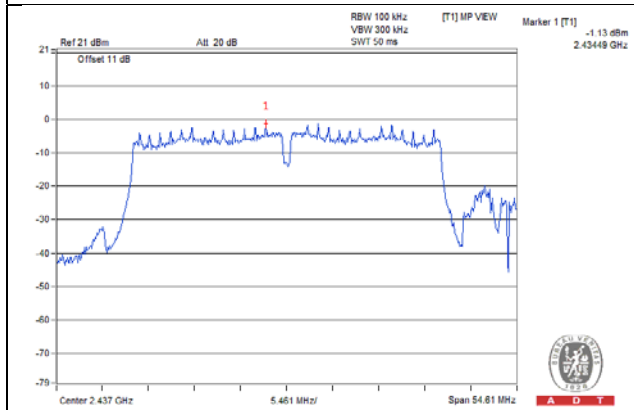
802.11n (HT40)

Chain 0

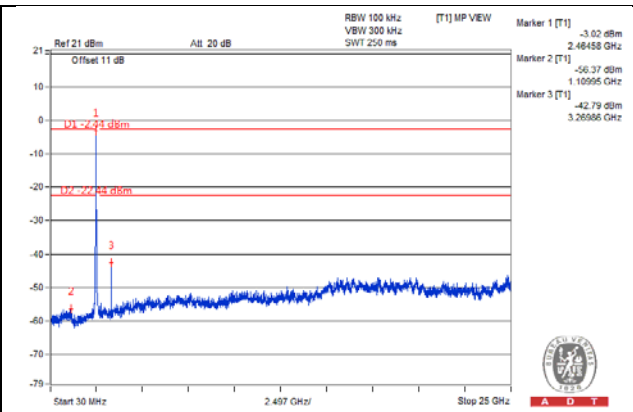
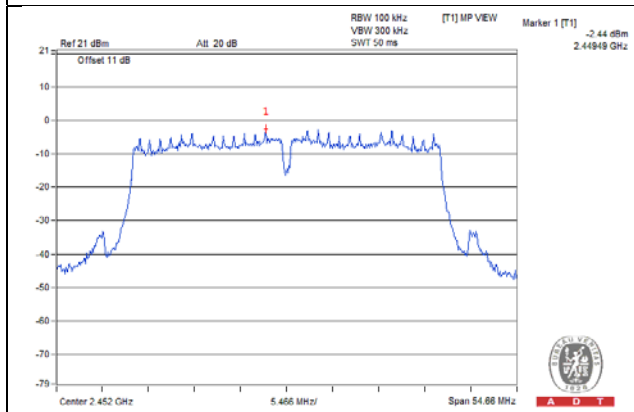
CH 3



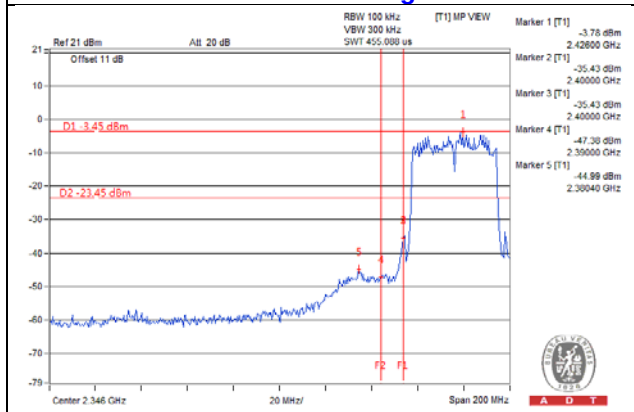
CH 6



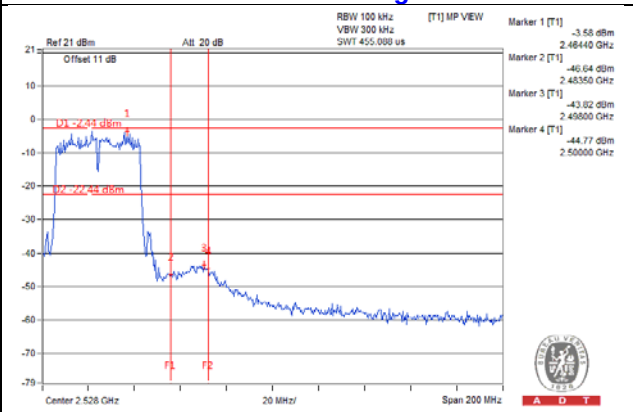
CH 9



CH 3 Band edge

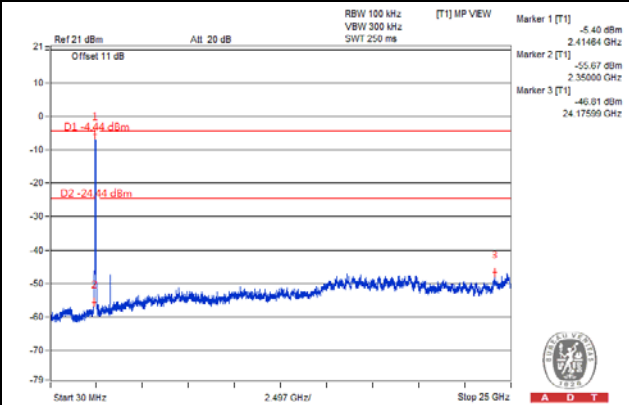
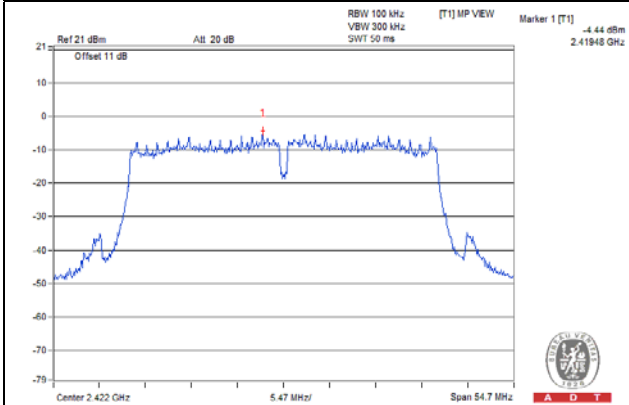


CH 9 Band edge

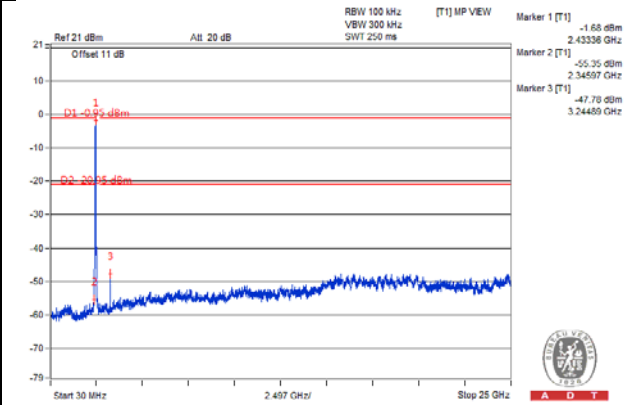
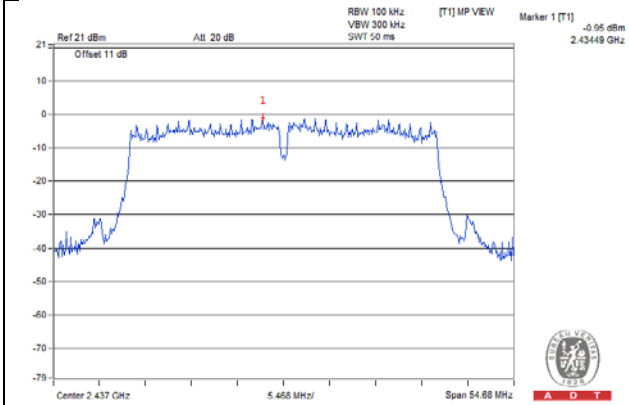


Chain 1

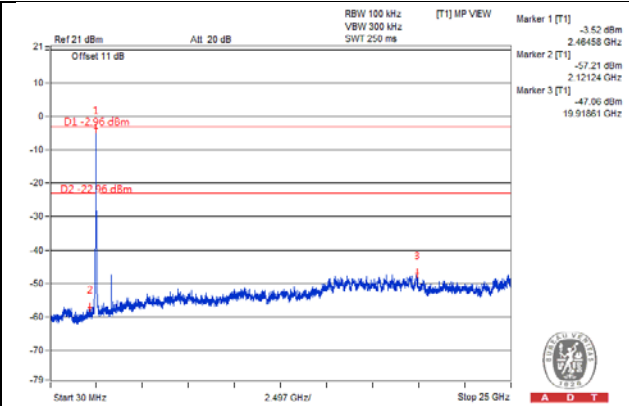
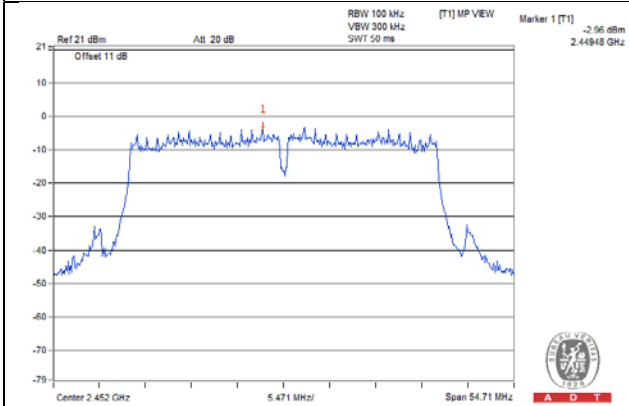
CH 3



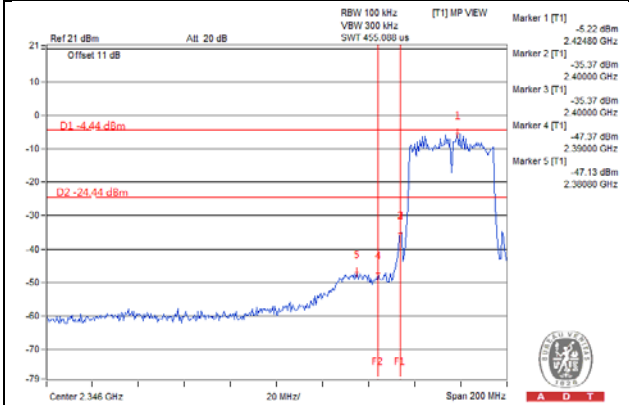
CH 6



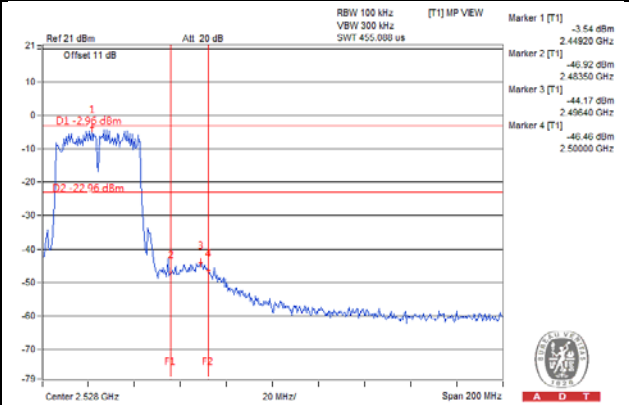
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---