

FCC Test Report

Report No.: RF150116D04

FCC ID: P27DLC200SUS

Test Model: DLC-200SUS

Series Model: DLC-200Sxxx (where "x" is blank, number or any characters)

Received Date: Jan. 16, 2015

Test Date: Jan. 26 ~ Mar. 17, 2015

Issued Date: Mar. 23, 2015

Applicant: Sercomm Corp.

Address: 8F, No. 3-1, YuangQu St., NanKang, Taipei 115, Taiwan, R.O.C. (NanKang Software Park)

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

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



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	13
3.5 General Description of Applied Standards.....	14
4 Test Types and Results.....	15
4.1 Radiated Emission and Bandedge Measurement.....	15
4.1.1 Limits of Radiated Emission and Bandedge Measurement	15
4.1.2 Test Instruments	16
4.1.3 Test Procedures	17
4.1.4 Deviation from Test Standard	17
4.1.5 Test Set Up.....	18
4.1.6 EUT Operating Conditions	18
4.1.7 Test Results.....	19
4.2 Conducted Emission Measurement	32
4.2.1 Limits of Conducted Emission Measurement.....	32
4.2.2 Test Instruments	32
4.2.3 Test Procedures	33
4.2.4 Deviation from Test Standard	33
4.2.5 Test Setup	33
4.2.6 EUT Operating Conditions	33
4.2.7 Test Results.....	34
4.3 6dB Bandwidth Measurement.....	36
4.3.1 Limits of 6dB Bandwidth Measurement	36
4.3.2 Test Setup	36
4.3.3 Test Instruments.....	36
4.3.4 Test Procedure	36
4.3.5 Deviation from Test Standard	36
4.3.6 EUT Operating Conditions	36
4.3.7 Test Result	37
4.4 Conducted Output Power Measurement.....	39
4.4.1 Limits of Conducted Output Power Measurement	39
4.4.2 Test Setup	39
4.4.3 Test Instruments.....	39
4.4.4 Test Procedures	39
4.4.5 Deviation from Test Standard	39
4.4.6 EUT Operating Conditions	39
4.4.7 Test Results.....	40
4.5 Power Spectral Density Measurement	42
4.5.1 Limits of Power Spectral Density Measurement.....	42
4.5.2 Test Setup	42
4.5.3 Test Instruments.....	42
4.5.4 Test Procedure	42
4.5.5 Deviation from Test Standard	42

4.5.6 EUT Operating Condition.....	42
4.5.7 Test Results.....	43
4.6 Conducted Out of Band Emission Measurement.....	45
4.6.1 Limits of Conducted Out of Band Emission Measurement.....	45
4.6.2 Test Setup	45
4.6.3 Test Instruments.....	45
4.6.4 Test Procedure	45
4.6.5 Deviation from Test Standard	45
4.6.6 EUT Operating Condition.....	45
4.6.7 Test Results.....	45
5 Pictures of Test Arrangements.....	52
Appendix – Information on the Testing Laboratories.....	53



A D T

Release Control Record

Issue No.	Description	Date Issued
RF150116D04	Original release.	Mar. 23, 2015

1 Certificate of Conformity

Product: Digital Life Controller

Brand: Sercomm

Test Model: DLC-200SUS

Series Model: DLC-200Sxxx (where "x" is blank, number or any characters)

Sample Status: Engineering sample

Applicant: Sercomm Corp.

Test Date: Jan. 26 ~ Mar. 17, 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:

Mar. 23, 2015

Celia Chen / Senior Specialist

Approved by :



Date:

Mar. 23, 2015

Rex Lai / Assistant Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.04dB at 0.20477MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.3dB at 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 I-PEX.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT :

Measurement	Frequency	Expended Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	3.43 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1000MHz	4.00 dB
Radiated Emissions above 1 GHz	1GHz ~ 40GHz	3.36 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Digital Life Controller
Brand	Sercomm
Test Model	DLC-200SUS
Series Model	DLC-200Sxxx (where “x” is blank, number or any characters)
Model Difference	Marketing Differentiation
Status of EUT	Engineering sample
Power Supply Rating	55Vdc or 56Vdc from PoE or 7.4Vdc from battery
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b:11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
Output Power	954.793mW
Antenna Type	PIFA antenna with 3.95dBi gain
Antenna Connector	I-PEX
Accessory Device	Refer to note below
Data Cable Supplied	N/A

Note:

1. The EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX

2. The EUT uses following PoE (support unit provided by client) or battery (accessory device).

Support unit		
PoE 1	Brand	Microsemi
	Model	PD-9001GR/AT/AC
	Input Power	100-240V, 50/60Hz, 0.67A
	Output Power	55V, 0.6A
PoE 2	Brand	PHIHONG
	Model	POE31U-1AT(SC)-R
	Input Power	100-240V, 0.8A, 50-60Hz
	Output Power	56V, 0.536A
Accessory device		
Battery	Brand	Simplo
	Model	DLC-200S
	Rating	7.4V, 8100mAh, 59.9Wh

After pre-tested above power source, the **PoE 2** was the worst case, therefore, only its test data was recorded in this report.

3. 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 ³ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where RE³1G: 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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	13.5
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	27.0

Radiated Emission Test (Below 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (HT20)	1 to 11	6	OFDM	BPSK	13.5

Power Line Conducted Emission Test:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (HT20)	1 to 11	6	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	13.5
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	27.0

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (PoE)	TESTED BY
RE ³ 1G	21deg. C, 74%RH	120Vac, 60Hz	Dalen Dai
RE<1G	21deg. C, 70%RH	120Vac, 60Hz	Dalen Dai
PLC	22deg. C, 78%RH	120Vac, 60Hz	Justin Liu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Saxon Lee

3.3 Duty Cycle of Test Signal

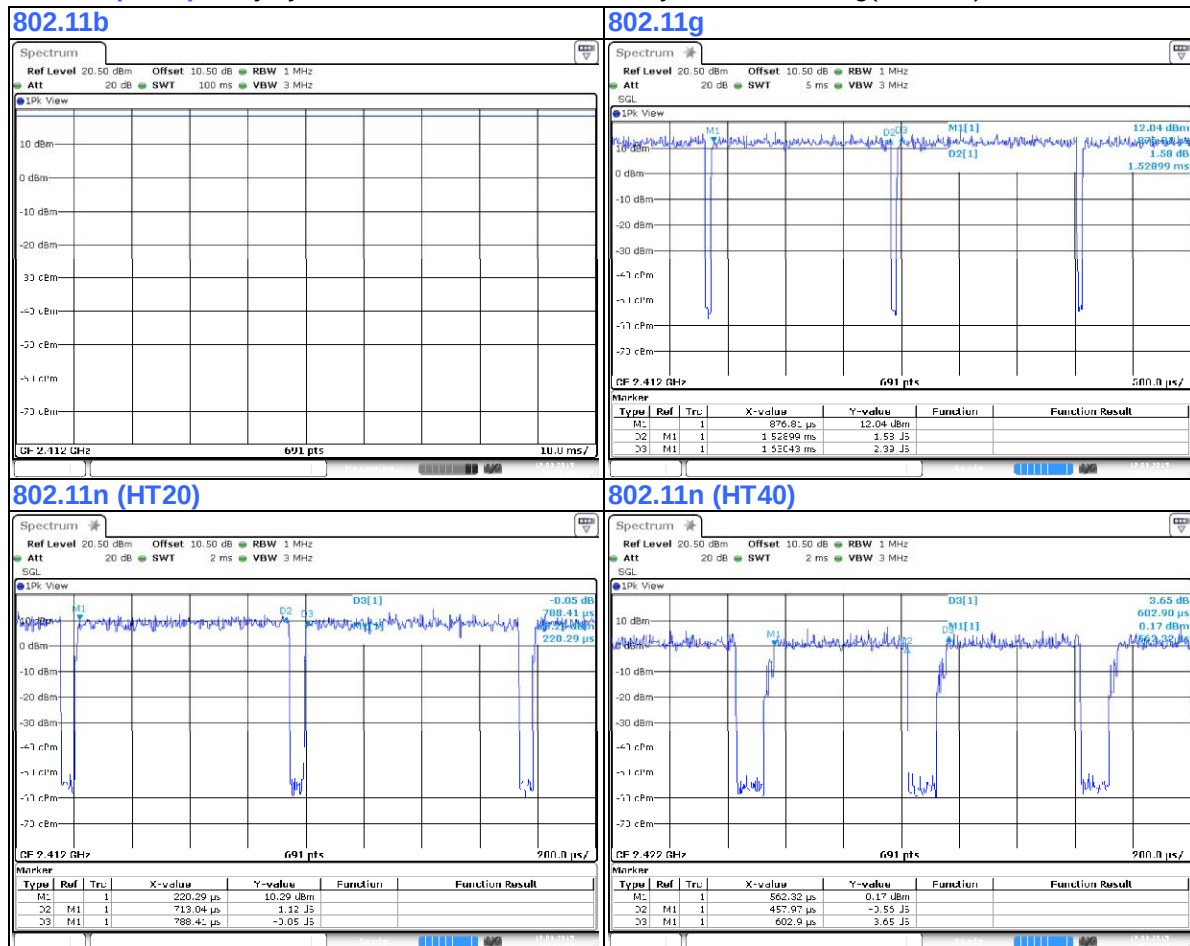
If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

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

802.11g: Duty cycle = $1.528/1.63 = 0.937$, Duty factor = $10 * \log(1/0.937) = 0.28$

802.11n (HT20): Duty cycle = $0.713/0.788 = 0.905$, Duty factor = $10 * \log(1/0.905) = 0.43$

802.11n (HT40): Duty cycle = $0.457/0.602 = 0.759$, Duty factor = $10 * \log(1/0.759) = 1.20$



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.	EUT	Sercomm	DLC-200SUS	-	-	-
B.	PoE	PHIHONG	POE31U-1AT(SC)-R	N/A	N/A	Supplied by client
C.	Notebook	DELL	E5410	BW33YM1	FCC DoC Approved	Provided by Lab

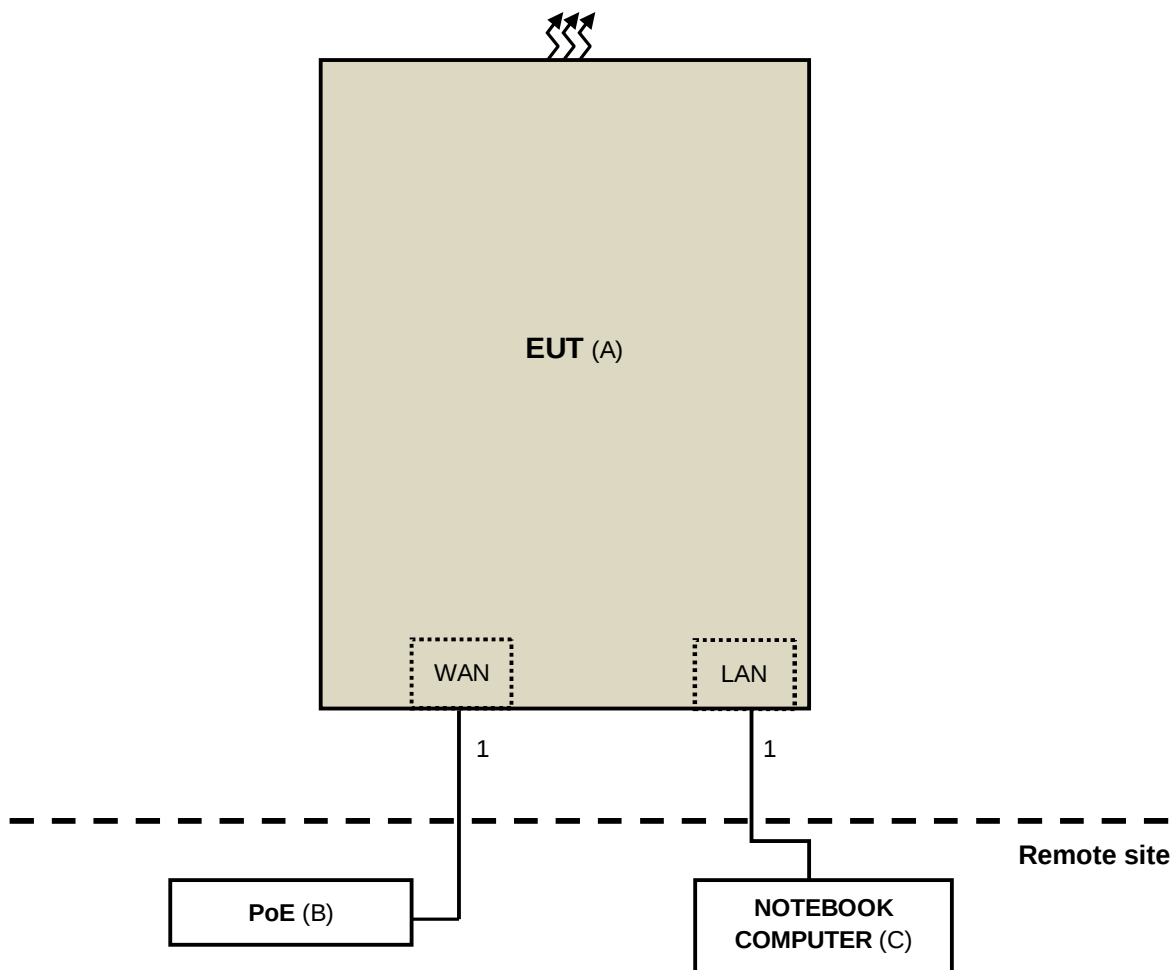
Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	2	10	N	0	Provided by Lab

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v03r02

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

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

4 Test Types and Results

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 26, 2015	Feb. 25, 2016
HP Preamplifier	8449B	3008A01201	Feb. 26, 2015	Feb. 25, 2016
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Mar. 01, 2015	Feb. 28, 2016
Agilent Spectrum	E4446A	MY51100050	Oct. 24, 2014	Oct. 23, 2015
Agilent TEST RECEIVER	N9038A	MY51210129	Jan. 20, 2015	Jan. 19, 2016
Schwarzbeck Antenna	VULB 9168	139	Feb. 04, 2015	Feb. 03, 2016
Schwarzbeck Antenna	VHBA 9123	480	May 29, 2013	May 28, 2015
Schwarzbeck Horn Antenna	BBHA-9170	212	Feb. 09, 2015	Feb. 08, 2016
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Feb. 10, 2015	Feb. 09, 2016
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	ADT_Radiated_V7.6.15.9.4	NA	NA	NA
SUHNER RF cable	SF104	CABLE-CH6	Aug. 15, 2014	Aug. 14, 2015
SUHNER RF cable	SF102	Cable-CH8-3.6m	Aug. 15, 2014	Aug. 14, 2015
EMCO Horn Antenna	3115	00028257	Feb. 05, 2015	Feb. 04, 2016
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 29, 2014	Sep. 28, 2015
Anritsu Power Sensor	MA2411B	0738404	Apr. 21, 2014	Apr. 20, 2015
Anritsu Power Meter	ML2495A	0842014	Apr. 21, 2014	Apr. 20, 2015

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
 2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 3. The test was performed in Chamber No. 6.
 4. The Industry Canada Reference No. IC 7450E-6.
 5. The FCC Site Registration No. is 447212.

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:

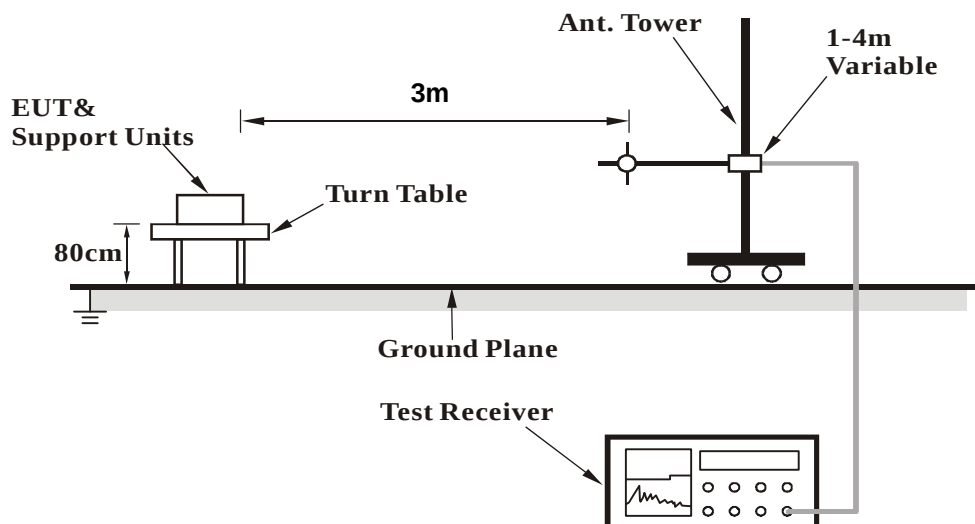
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution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

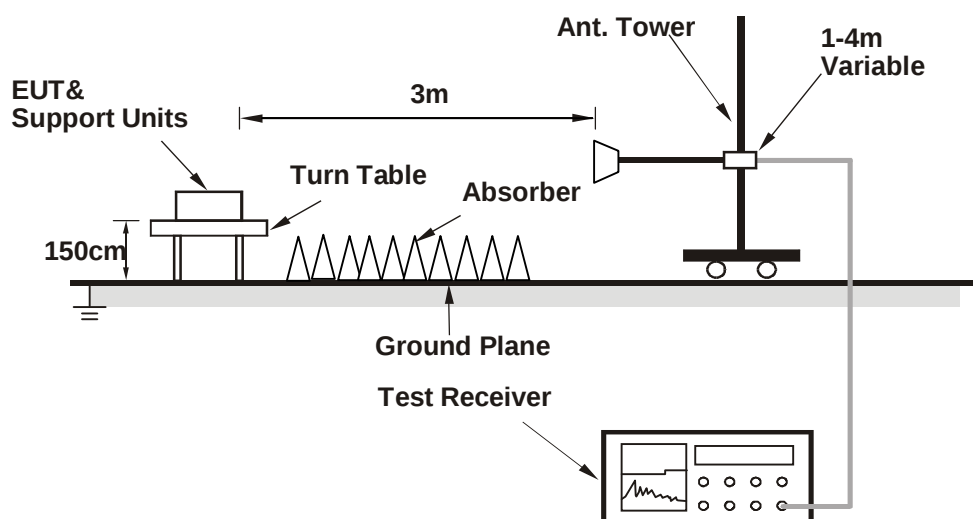
No deviation.

4.1.5 Test 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

- Placed the EUT on the testing table.
- Prepared notebooks to act as communication partner and placed it outside of testing area.
- 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.
- The necessary accessories enable the system in full functions.

4.1.7 Test Results

BELOW 1GHz WORST-CASE DATA

802.11n (20MHz)

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	33.47	28.5 QP	40.0	-11.5	1.66 H	68	43.77	-15.28
2	113.03	34.9 QP	43.5	-8.6	1.71 H	360	51.48	-16.62
3	143.34	32.2 QP	43.5	-11.3	1.59 H	124	46.15	-13.92
4	450.01	35.4 QP	46.0	-10.6	1.00 H	336	44.49	-9.07
5	499.96	39.5 QP	46.0	-6.5	1.43 H	78	47.89	-8.35
6	780.05	39.2 QP	46.0	-6.8	1.38 H	70	42.28	-3.11
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	34.99	33.5 QP	40.0	-6.5	1.49 V	250	48.65	-15.15
2	113.52	36.6 QP	43.5	-6.9	1.62 V	250	53.21	-16.60
3	143.34	28.7 QP	43.5	-14.8	1.38 V	69	42.64	-13.92
4	500.01	32.4 QP	46.0	-13.6	1.48 V	20	40.77	-8.35
5	780.03	33.5 QP	46.0	-12.5	1.00 V	143	36.65	-3.11
6	899.99	31.6 QP	46.0	-14.4	1.77 V	344	32.92	-1.36

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

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	61.4 PK	74.0	-12.6	1.00 H	301	65.74	-4.34
2	2390.00	48.3 AV	54.0	-5.7	1.00 H	301	52.66	-4.34
3	*2412.00	109.4 PK			1.00 H	301	113.59	-4.21
4	*2412.00	105.0 AV			1.00 H	301	109.17	-4.21
5	4824.00	50.7 PK	74.0	-23.3	1.34 H	196	47.76	2.95
6	4824.00	48.1 AV	54.0	-5.9	1.34 H	196	45.13	2.95
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	62.5 PK	74.0	-11.5	1.44 V	317	66.85	-4.34
2	2390.00	49.4 AV	54.0	-4.6	1.44 V	317	53.75	-4.34
3	*2412.00	112.4 PK			1.44 V	317	116.58	-4.21
4	*2412.00	108.7 AV			1.44 V	317	112.92	-4.21
5	4824.00	49.3 PK	74.0	-24.7	1.77 V	338	46.32	2.95
6	4824.00	46.9 AV	54.0	-7.1	1.77 V	338	43.98	2.95

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": 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	*2437.00	108.2 PK			1.00 H	295	112.33	-4.09
2	*2437.00	104.4 AV			1.00 H	295	108.46	-4.09
3	4874.00	54.5 PK	74.0	-19.5	1.73 H	42	51.47	3.06
4	4874.00	50.7 AV	54.0	-3.3	1.73 H	42	47.61	3.06
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	110.8 PK			1.62 V	327	114.91	-4.09
2	*2437.00	107.2 AV			1.62 V	327	111.27	-4.09
3	4874.00	54.0 PK	74.0	-20.1	1.49 V	347	50.89	3.06
4	4874.00	49.8 AV	54.0	-4.2	1.49 V	347	46.71	3.06

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	108.0 PK			1.00 H	301	111.93	-3.95
2	*2462.00	103.6 AV			1.00 H	301	107.54	-3.95
3	2483.50	57.8 PK	74.0	-16.2	1.00 H	301	61.67	-3.85
4	2483.50	44.6 AV	54.0	-9.4	1.00 H	301	48.43	-3.85
5	4924.00	51.5 PK	74.0	-22.5	1.27 H	173	48.33	3.21
6	4924.00	48.8 AV	54.0	-5.2	1.27 H	173	45.61	3.21
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	110.4 PK			1.24 V	318	114.36	-3.95
2	*2462.00	107.0 AV			1.24 V	318	110.91	-3.95
3	2483.50	59.1 PK	74.0	-14.9	1.24 V	318	62.93	-3.85
4	2483.50	48.0 AV	54.0	-6.0	1.24 V	318	51.82	-3.85
5	4924.00	50.4 PK	74.0	-23.6	1.64 V	341	47.16	3.21
6	4924.00	47.6 AV	54.0	-6.4	1.64 V	341	44.39	3.21

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	69.0 PK	74.0	-5.0	1.02 H	303	73.35	-4.34
2	2390.00	46.9 AV	54.0	-7.1	1.02 H	303	51.27	-4.34
3	*2412.00	108.5 PK			1.02 H	303	112.72	-4.21
4	*2412.00	97.7 AV			1.02 H	303	101.88	-4.21
5	4824.00	49.6 PK	74.0	-24.4	1.07 H	315	46.68	2.95
6	4824.00	33.8 AV	54.0	-20.2	1.07 H	315	30.84	2.95
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	72.2 PK	74.0	-1.8	1.40 V	311	76.55	-4.34
2	2390.00	50.8 AV	54.0	-3.2	1.40 V	311	55.18	-4.34
3	*2412.00	112.3 PK			1.40 V	311	116.51	-4.21
4	*2412.00	101.5 AV			1.40 V	311	105.66	-4.21
5	4824.00	46.8 PK	74.0	-27.2	1.08 V	227	43.85	2.95
6	4824.00	32.9 AV	54.0	-21.1	1.08 V	227	29.96	2.95

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	*2437.00	111.1 PK			1.01 H	308	115.17	-4.09
2	*2437.00	100.3 AV			1.01 H	308	104.38	-4.09
3	4874.00	54.0 PK	74.0	-20.0	1.15 H	320	50.93	3.06
4	4874.00	35.2 AV	54.0	-18.8	1.15 H	320	32.17	3.06
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	113.8 PK			1.26 V	314	117.92	-4.09
2	*2437.00	102.8 AV			1.26 V	314	106.88	-4.09
3	4874.00	51.0 PK	74.0	-23.0	1.04 V	231	47.93	3.06
4	4874.00	33.6 AV	54.0	-20.4	1.04 V	231	30.55	3.06

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	108.3 PK			1.03 H	310	112.26	-3.95
2	*2462.00	97.6 AV			1.03 H	310	101.51	-3.95
3	2483.50	69.1 PK	74.0	-4.9	1.03 H	310	72.94	-3.85
4	2483.50	46.2 AV	54.0	-7.8	1.03 H	310	50.06	-3.85
5	4924.00	50.3 PK	74.0	-23.7	1.03 H	327	47.13	3.21
6	4924.00	34.8 AV	54.0	-19.2	1.03 H	327	31.59	3.21
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	112.0 PK			1.44 V	320	115.92	-3.95
2	*2462.00	100.3 AV			1.44 V	320	104.28	-3.95
3	2483.50	72.3 PK	74.0	-1.7	1.44 V	320	76.17	-3.85
4	2483.50	49.4 AV	54.0	-4.6	1.44 V	320	53.27	-3.85
5	4924.00	47.6 PK	74.0	-26.4	1.06 V	209	44.39	3.21
6	4924.00	33.3 AV	54.0	-20.7	1.06 V	209	30.07	3.21

REMARKS:

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

802.11n (20MHz)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
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	72.2 PK	74.0	-1.9	1.31 H	287	76.49	-4.34
2	2390.00	48.8 AV	54.0	-5.2	1.31 H	287	53.14	-4.34
3	*2412.00	113.5 PK			1.31 H	287	117.72	-4.21
4	*2412.00	101.7 AV			1.31 H	287	105.95	-4.21
5	4824.00	57.1 PK	74.0	-16.9	1.13 H	219	54.11	2.95
6	4824.00	47.4 AV	54.0	-6.6	1.13 H	219	44.46	2.95
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	69.3 PK	74.0	-4.7	1.40 V	327	73.61	-4.34
2	2390.00	45.0 AV	54.0	-9.0	1.40 V	327	49.36	-4.34
3	*2412.00	110.6 PK			1.40 V	327	114.84	-4.21
4	*2412.00	98.0 AV			1.40 V	327	102.17	-4.21
5	4824.00	53.3 PK	74.0	-20.7	1.31 V	277	50.32	2.95
6	4824.00	44.0 AV	54.0	-10.0	1.31 V	277	41.05	2.95

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	*2437.00	114.6 PK			1.27 H	288	118.69	-4.09
2	*2437.00	102.3 AV			1.27 H	288	106.34	-4.09
3	4874.00	65.0 PK	74.0	-9.1	2.19 H	171	61.89	3.06
4	4874.00	52.3 AV	54.0	-1.7	2.19 H	171	49.26	3.06
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	112.6 PK			1.35 V	305	116.67	-4.09
2	*2437.00	100.2 AV			1.35 V	305	104.27	-4.09
3	4874.00	63.3 PK	74.0	-10.7	1.85 V	35	60.27	3.06
4	4874.00	50.9 AV	54.0	-3.1	1.85 V	35	47.85	3.06

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	112.5 PK			1.68 H	295	116.43	-3.95
2	*2462.00	100.9 AV			1.68 H	295	104.81	-3.95
3	2483.50	72.0 PK	74.0	-2.0	1.68 H	295	75.89	-3.85
4	2483.50	50.5 AV	54.0	-3.5	1.68 H	295	54.39	-3.85
5	4924.00	63.7 PK	74.0	-10.3	1.94 H	188	60.53	3.21
6	4924.00	48.3 AV	54.0	-5.7	1.94 H	188	45.12	3.21
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	110.1 PK			1.38 V	294	114.06	-3.95
2	*2462.00	98.9 AV			1.38 V	294	102.84	-3.95
3	2483.50	68.8 PK	74.0	-5.2	1.38 V	294	72.67	-3.85
4	2483.50	48.2 AV	54.0	-5.8	1.38 V	294	52.01	-3.85
5	4924.00	60.7 PK	74.0	-13.3	1.77 V	27	57.53	3.21
6	4924.00	46.8 AV	54.0	-7.2	1.77 V	27	43.62	3.21

REMARKS:

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

802.11n (40MHz)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
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	69.1 PK	74.0	-4.9	1.00 H	290	73.46	-4.34
2	2390.00	52.0 AV	54.0	-2.0	1.00 H	290	56.37	-4.34
3	*2422.00	112.0 PK			1.00 H	290	116.19	-4.16
4	*2422.00	97.7 AV			1.00 H	290	101.87	-4.16
5	4844.00	59.9 PK	74.0	-14.1	1.27 H	210	56.94	2.99
6	4844.00	46.2 AV	54.0	-7.9	1.27 H	210	43.16	2.99
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.4 PK	74.0	-8.6	1.42 V	316	69.73	-4.34
2	2390.00	49.3 AV	54.0	-4.7	1.42 V	316	53.64	-4.34
3	*2422.00	109.5 PK			1.42 V	316	113.64	-4.16
4	*2422.00	96.8 AV			1.42 V	316	100.95	-4.16
5	4844.00	57.3 PK	74.0	-16.7	1.38 V	281	54.27	2.99
6	4844.00	45.0 AV	54.0	-9.0	1.38 V	281	42.03	2.99

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	*2437.00	114.8 PK			1.00 H	288	118.90	-4.09
2	*2437.00	101.5 AV			1.00 H	288	105.62	-4.09
3	4874.00	65.2 PK	74.0	-8.8	1.14 H	227	62.14	3.06
4	4874.00	52.3 AV	54.0	-1.7	1.14 H	227	49.27	3.06
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	111.7 PK			1.39 V	322	115.82	-4.09
2	*2437.00	98.2 AV			1.39 V	322	102.31	-4.09
3	4874.00	61.5 PK	74.0	-12.5	1.22 V	197	58.45	3.06
4	4874.00	49.2 AV	54.0	-4.8	1.22 V	197	46.17	3.06

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	111.8 PK			1.28 H	286	115.84	-4.01
2	*2452.00	97.6 AV			1.28 H	286	101.63	-4.01
3	2483.50	69.7 PK	74.0	-4.3	1.28 H	286	73.58	-3.85
4	2483.50	52.7 AV	54.0	-1.3	1.28 H	286	56.56	-3.85
5	4904.00	59.9 PK	74.0	-14.1	1.08 H	217	56.77	3.14
6	4904.00	45.8 AV	54.0	-8.2	1.08 H	217	42.65	3.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	109.3 PK			1.41 V	318	113.35	-4.01
2	*2452.00	96.2 AV			1.41 V	318	100.21	-4.01
3	2483.50	66.3 PK	74.0	-7.7	1.41 V	318	70.11	-3.85
4	2483.50	50.1 AV	54.0	-3.9	1.41 V	318	53.98	-3.85
5	4904.00	58.2 PK	74.0	-15.8	1.22 V	239	55.03	3.14
6	4904.00	44.5 AV	54.0	-9.5	1.22 V	239	41.38	3.14

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.

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.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESCS 30	100292	Dec. 18, 2014	Dec. 17, 2015
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	100104	Dec. 04, 2014	Dec. 03, 2015
LISN With Adapter (for EUT)	AD10	C09Ada-001	Dec. 04, 2014	Dec. 03, 2015
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	847265/023	Oct. 21, 2014	Oct. 20, 2015
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 08, 2014	May 07, 2015
Software	ADT_Cond_V7.3.7	NA	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C09.01	Feb. 20, 2014	Feb. 19, 2015
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010789	May 20, 2014	May 19, 2015
ROHDE & SCHWARZ Artificial Mains Network (For TV EUT)	ESH3-Z5	100220	Nov. 20, 2014	Nov. 19, 2015
LISN With Adapter (for TV EUT)	100220	N/A	Nov. 20, 2014	Nov. 19, 2015

Notes: 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 Shielded Room No. 9.

3. The VCCI Site Registration No. C-1312.

4.2.3 Test Procedures

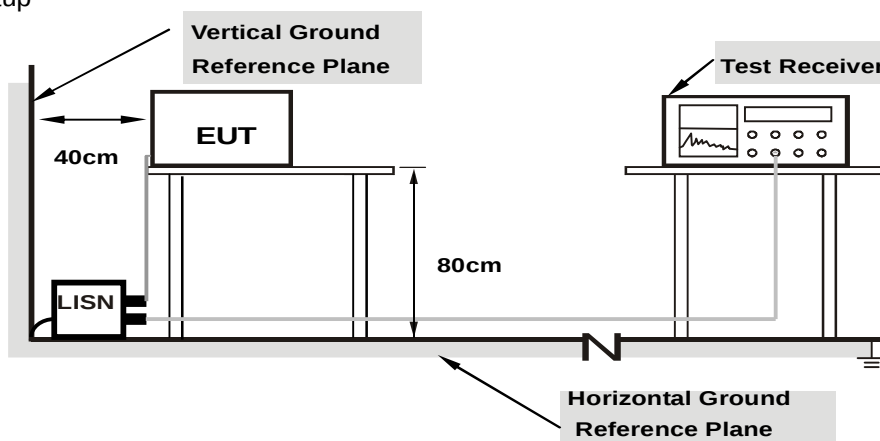
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

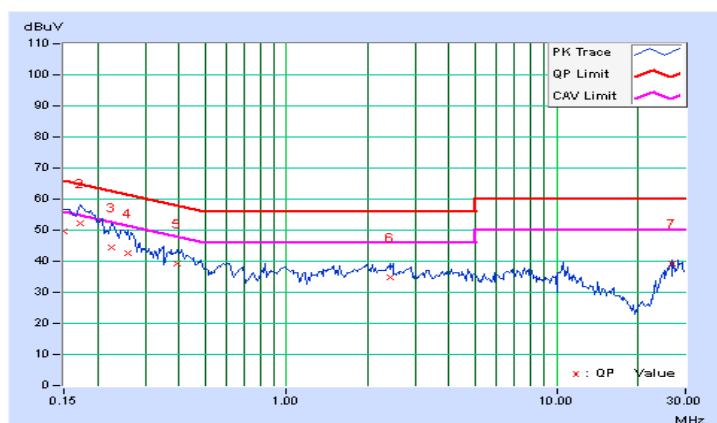
4.2.7 Test Results

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

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	0.15000	0.20	49.53	31.08	49.73	31.28	66.00	56.00	-16.27	-24.72
2	0.17344	0.20	51.99	30.02	52.19	30.22	64.79	54.79	-12.60	-24.57
3	0.22422	0.21	44.27	23.91	44.48	24.12	62.66	52.66	-18.18	-28.54
4	0.25938	0.22	42.29	25.15	42.51	25.37	61.45	51.45	-18.94	-26.08
5	0.39219	0.25	38.87	27.01	39.12	27.26	58.02	48.02	-18.90	-20.76
6	2.41406	0.40	34.57	23.20	34.97	23.60	56.00	46.00	-21.03	-22.40
7	26.60938	1.03	38.37	34.78	39.40	35.81	60.00	50.00	-20.60	-14.19

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

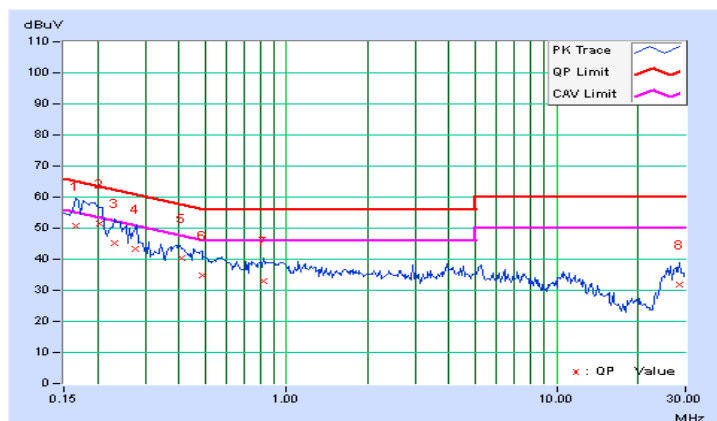


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	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	0.21	50.41	33.50	50.62	33.71	65.18	55.18	-14.56	-21.47
2	0.20477	0.22	51.15	31.45	51.37	31.67	63.41	53.41	-12.04	-21.74
3	0.23203	0.23	44.98	25.45	45.21	25.68	62.38	52.38	-17.17	-26.70
4	0.27509	0.24	43.13	27.74	43.37	27.98	60.96	50.96	-17.60	-22.99
5	0.41027	0.26	39.93	30.64	40.19	30.90	57.64	47.64	-17.45	-16.74
6	0.48594	0.27	34.37	22.38	34.64	22.65	56.24	46.24	-21.60	-23.59
7	0.82578	0.31	32.48	20.22	32.79	20.53	56.00	46.00	-23.21	-25.47
8	28.50391	0.50	31.47	26.19	31.97	26.69	60.00	50.00	-28.03	-23.31

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

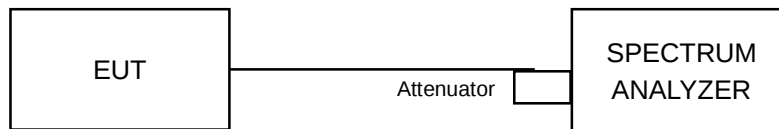


4.3 6dB Bandwidth Measurement

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	8.10	0.5	PASS
6	2437	8.11	0.5	PASS
11	2462	8.09	0.5	PASS

802.11g

Channel	Frequency (MHz)	6db Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.40	0.5	PASS
6	2437	16.44	0.5	PASS
11	2462	16.40	0.5	PASS

802.11n (HT20)

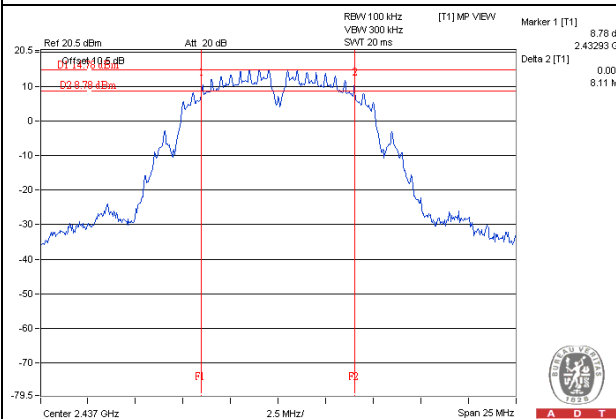
Channel	Frequency (MHz)	6db Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		CHAIN 0	CHAIN 1		
1	2412	17.22	17.64	0.5	Pass
6	2437	17.66	17.69	0.5	Pass
11	2462	17.62	17.64	0.5	Pass

802.11n (HT40)

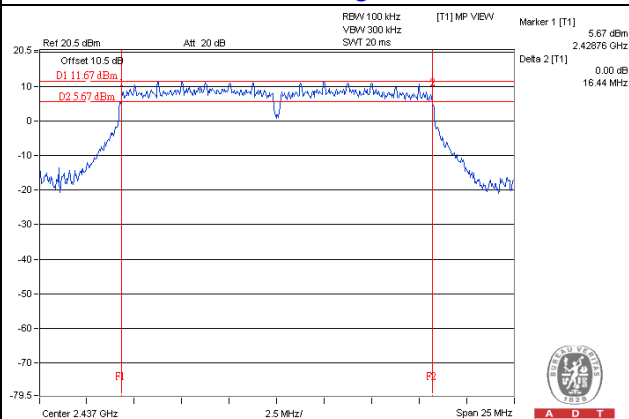
Channel	Frequency (MHz)	6db Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		CHAIN 0	CHAIN 1		
3	2422	35.24	35.57	0.5	Pass
6	2437	36.15	36.34	0.5	Pass
9	2452	35.27	36.06	0.5	Pass

Spectrum Plot of Worst Value

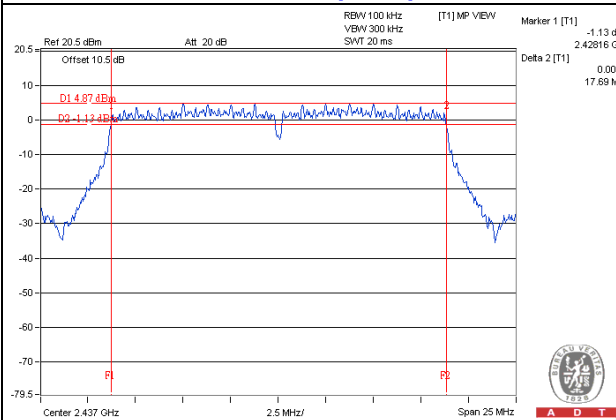
802.11b



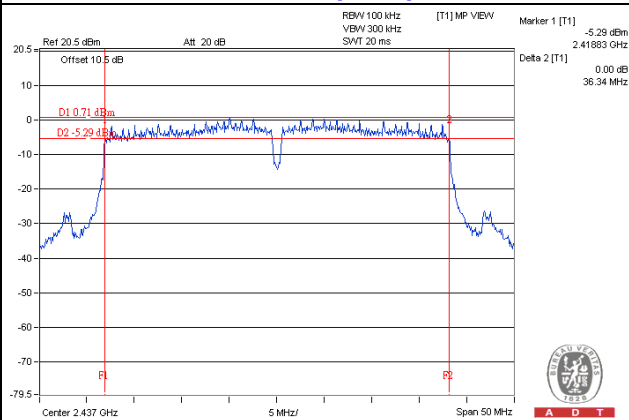
802.11g



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,

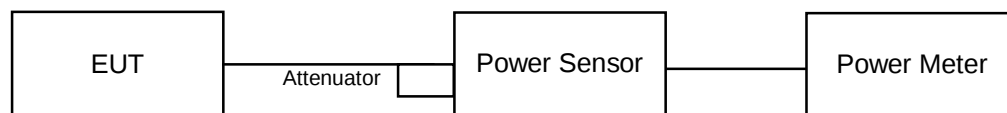
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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	587.489	27.69	30	Pass
6	2437	564.937	27.52	30	Pass
11	2462	473.151	26.75	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	727.780	28.62	30	Pass
6	2437	928.966	29.68	30	Pass
11	2462	688.652	28.38	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	25.85	27.06	892.751	29.51	30	Pass
6	2437	26.31	27.22	954.793	29.80	30	Pass
11	2462	25.74	26.99	875.008	29.42	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	26.31	26.88	915.091	29.61	30	Pass
6	2437	26.49	26.83	927.604	29.67	30	Pass
9	2452	26.24	26.71	889.540	29.49	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	246.604	23.92
6	2437	231.739	23.65
11	2462	202.302	23.06

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	125.314	20.98
6	2437	138.676	21.42
11	2462	100.462	20.02

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	17.45	18.38	124.455	20.95
6	2437	17.68	18.42	128.116	21.08
11	2462	16.92	17.46	104.923	20.21

802.11n (HT40)

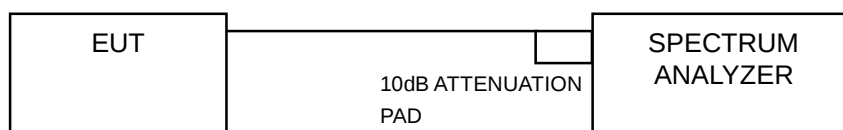
Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	16.15	17.06	92.026	19.64
6	2437	15.93	16.69	85.840	19.34
9	2452	15.78	16.38	81.295	19.10

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	2.83	8	Pass
6	2437	1.83	8	Pass
11	2462	1.26	8	Pass

802.11g

Channel	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Pass /Fail
1	2412	-4.55	8	Pass
6	2437	-1.74	8	Pass
11	2462	-5.25	8	Pass

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	-9.78	3.01	-6.77	7.04	Pass
	6	2437	-9.24	3.01	-6.23	7.04	Pass
	11	2462	-10.61	3.01	-7.60	7.04	Pass
1	1	2412	-8.45	3.01	-5.44	7.04	Pass
	6	2437	-8.95	3.01	-5.94	7.04	Pass
	11	2462	-9.80	3.01	-6.79	7.04	Pass

NOTE: Directional gain = 3.95dBi + 10log(2) = 6.96dBi > 6dBi , so the power density limit shall be reduced to 8-(6.96-6) = 7.04dBm.

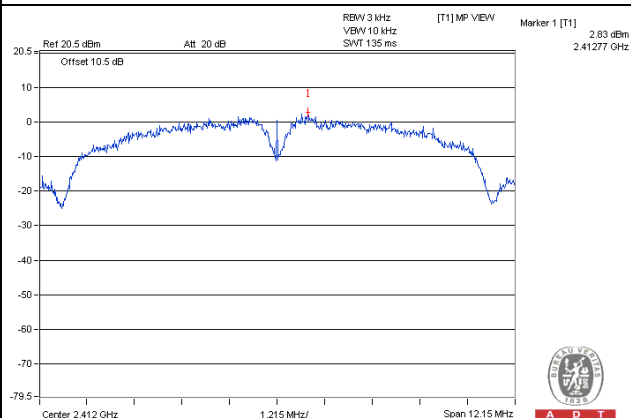
802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	3	2422	-13.78	3.01	-10.77	7.04	Pass
	6	2437	-13.04	3.01	-10.03	7.04	Pass
	9	2452	-13.88	3.01	-10.87	7.04	Pass
1	3	2422	-11.61	3.01	-8.60	7.04	Pass
	6	2437	-12.90	3.01	-9.89	7.04	Pass
	9	2452	-13.51	3.01	-10.50	7.04	Pass

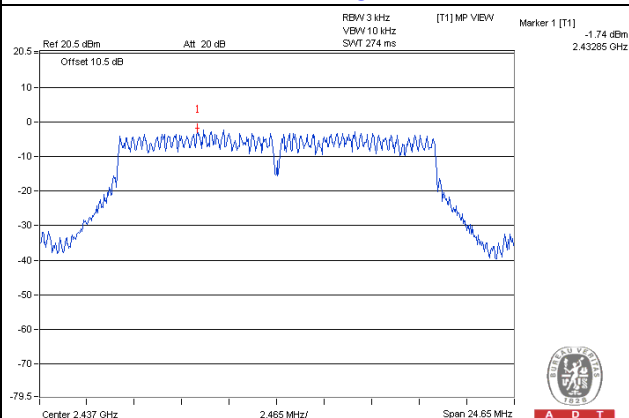
NOTE: Directional gain = 3.95dBi + 10log(2) = 6.96dBi > 6dBi , so the power density limit shall be reduced to 8-(6.96-6) = 7.04dBm.

Spectrum Plot of Worst Value

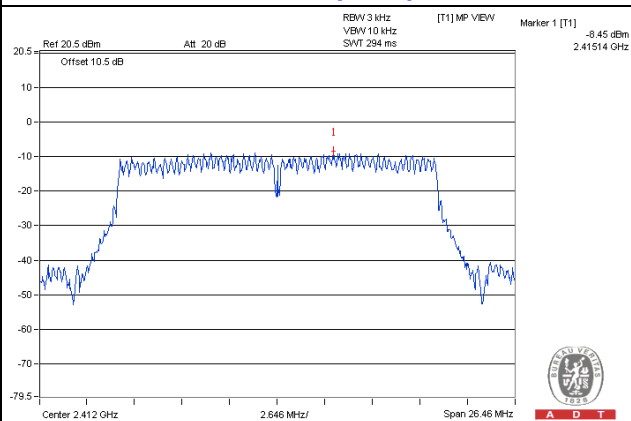
802.11b



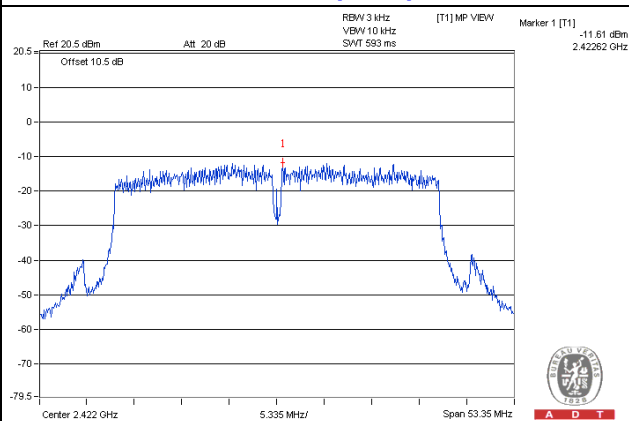
802.11g



802.11n (HT20)



802.11n (HT40)

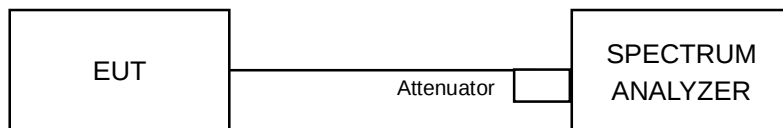


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 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

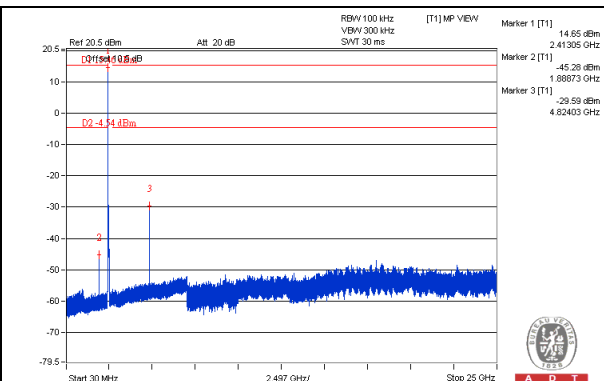
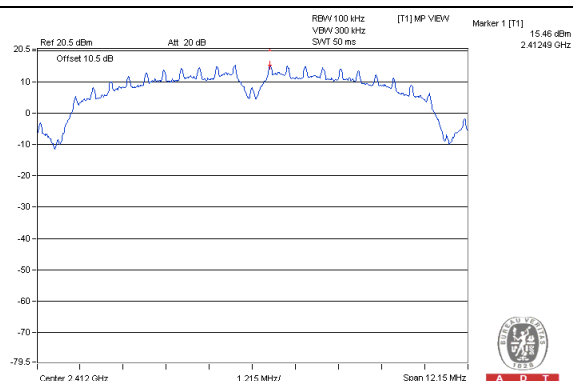
Same as Item 4.3.6

4.6.7 Test Results

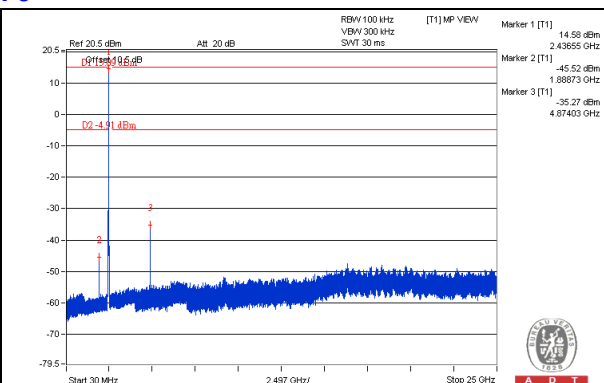
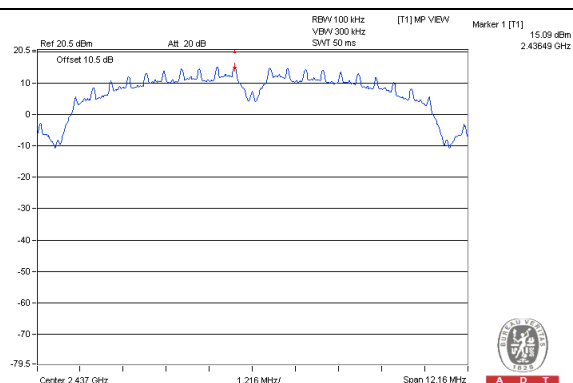
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

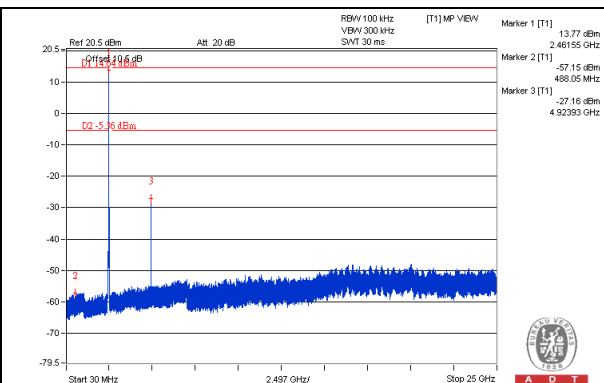
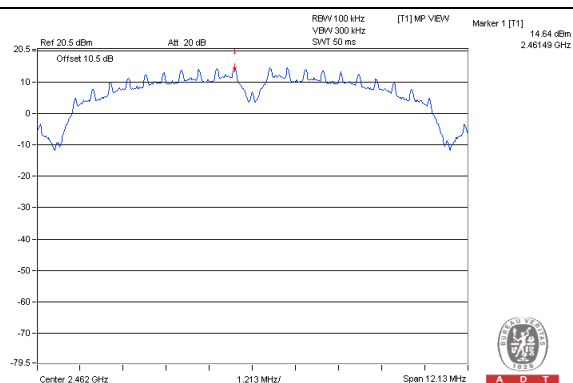
CH 1



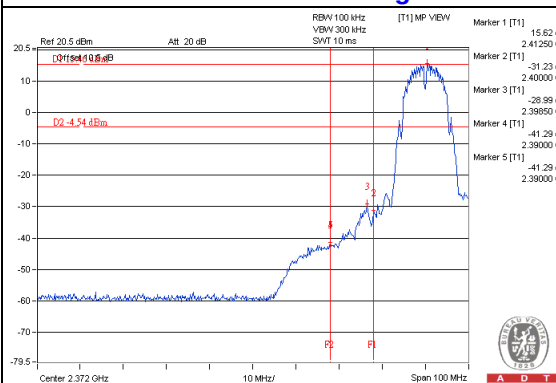
CH 6



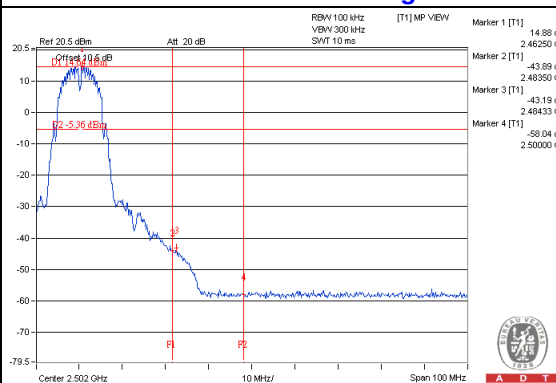
CH 11



CH 1 Band edge

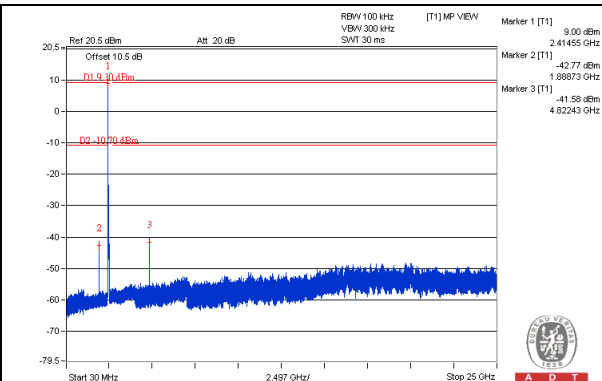
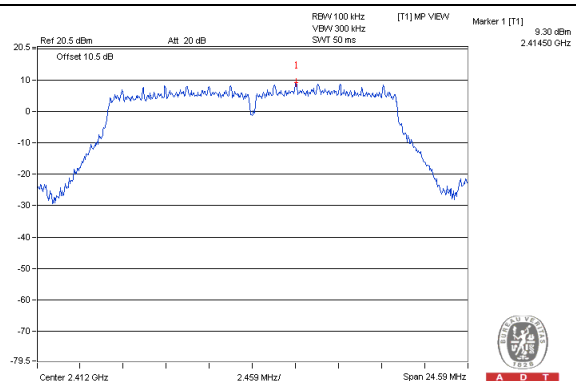


CH 11 Band edge

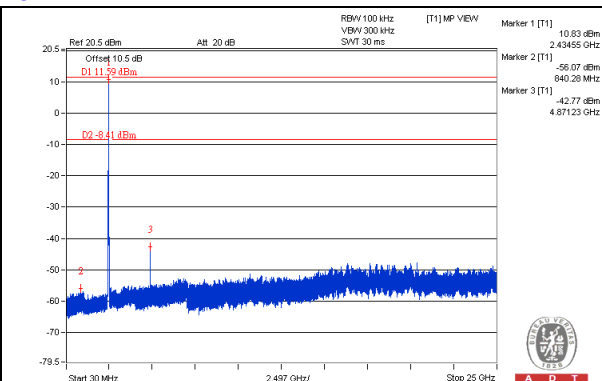
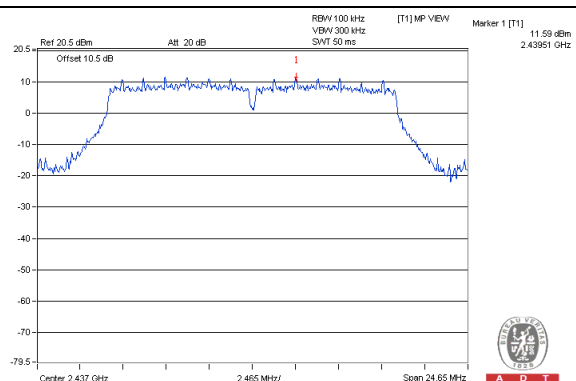


802.11g

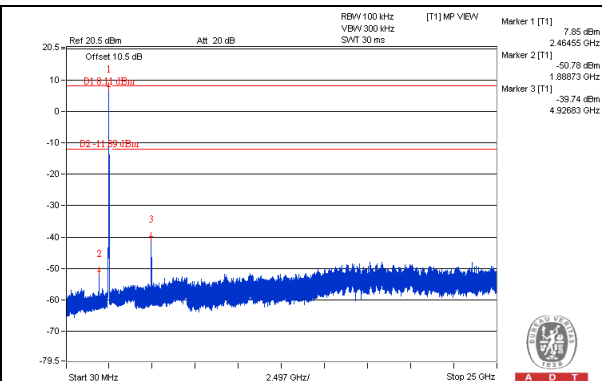
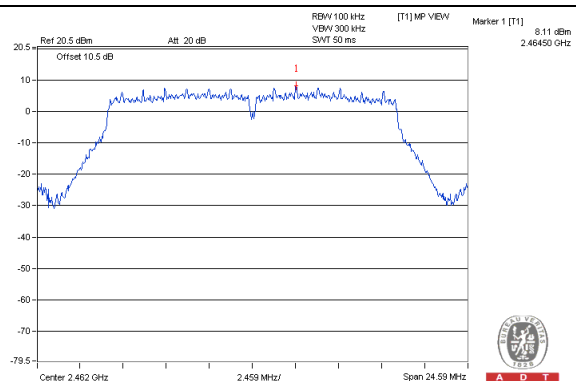
CH 1



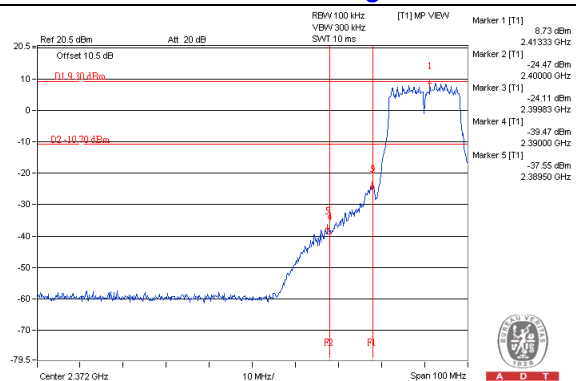
CH 6



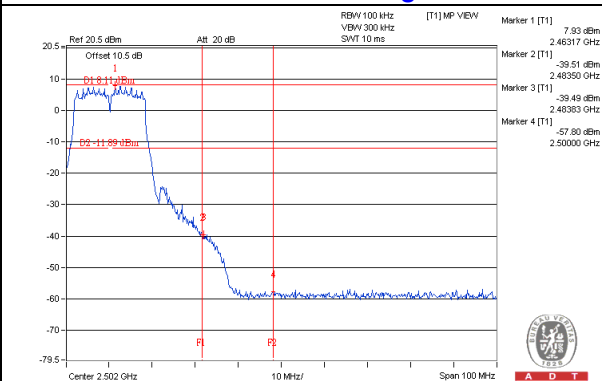
CH 11



CH 1 Band edge

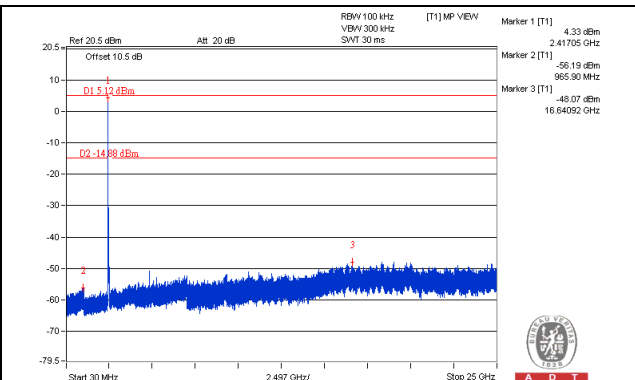
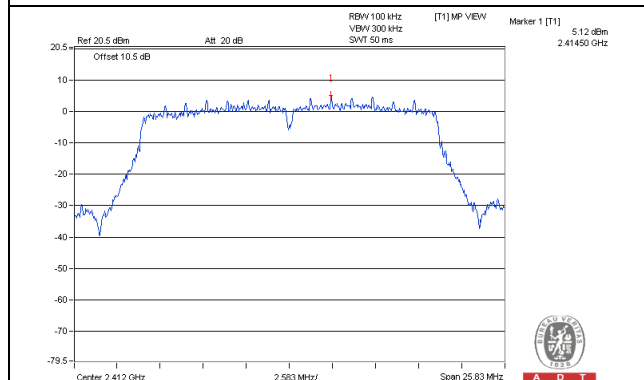


CH 11 Band edge

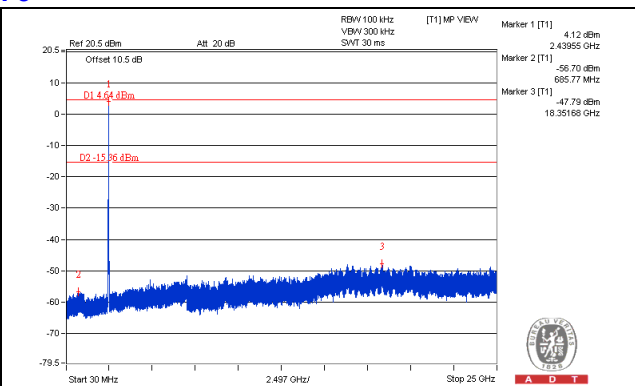
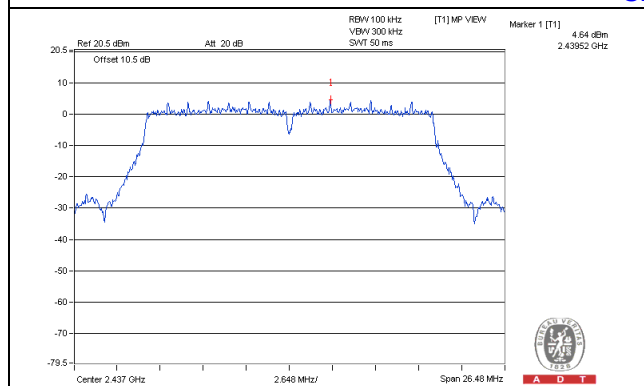


802.11n (HT20) CHAIN 0

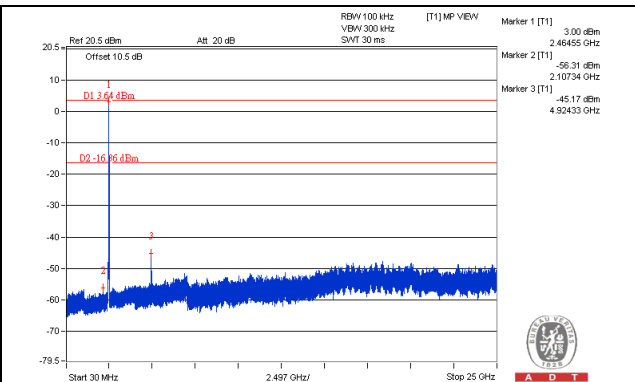
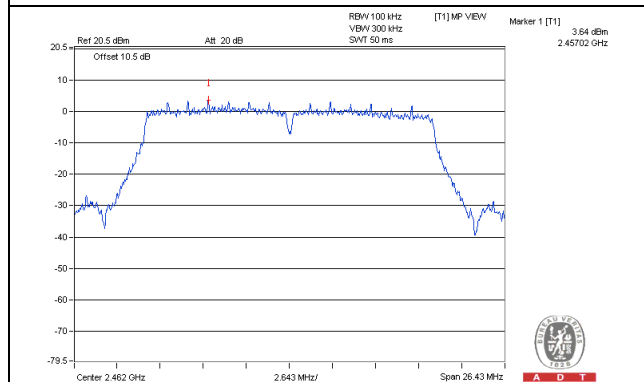
CH 1



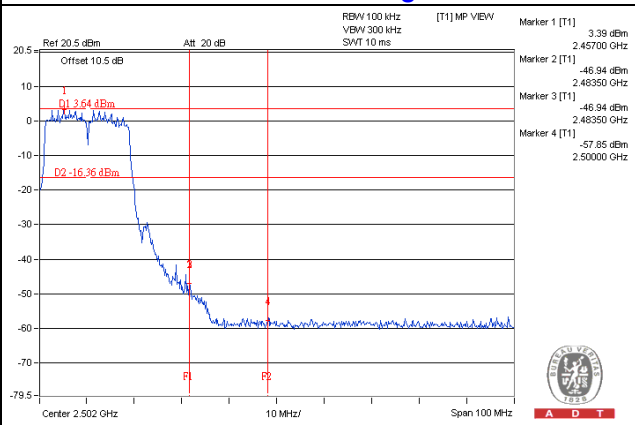
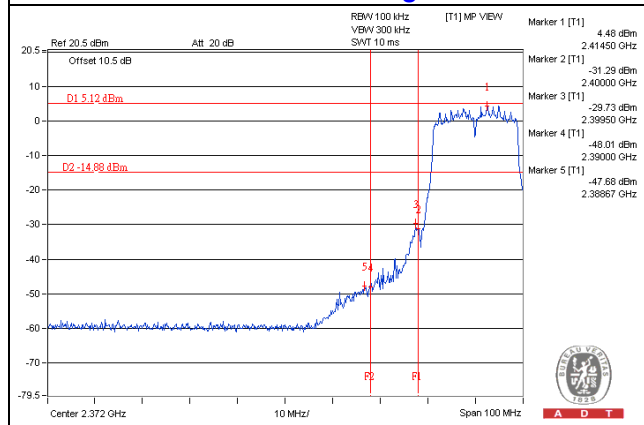
CH 6



CH 11

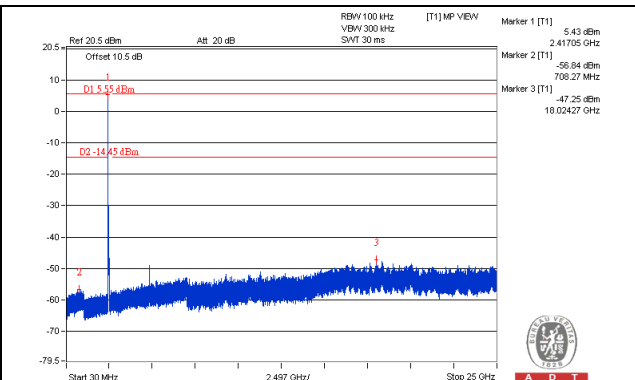
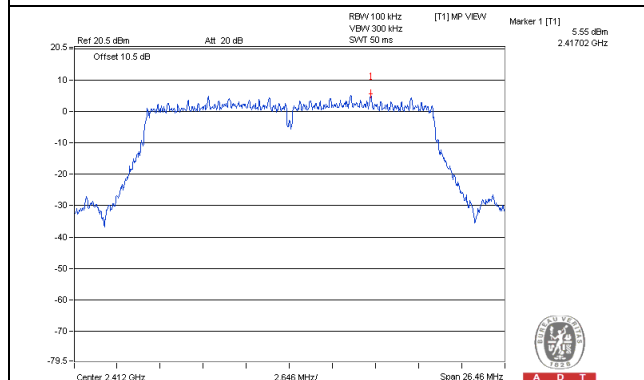


CH 1 Band edge

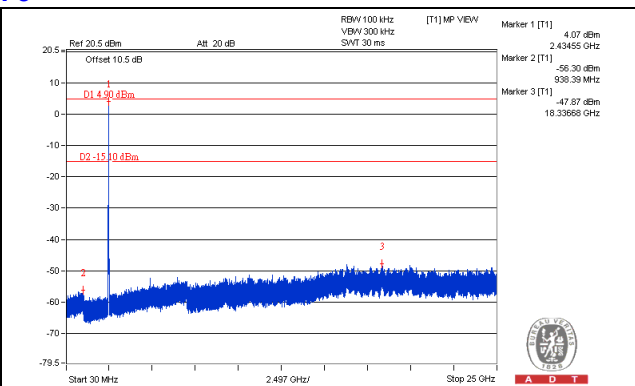
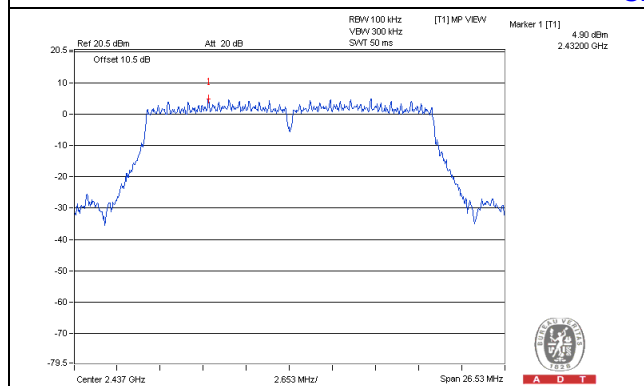


CHAIN 1

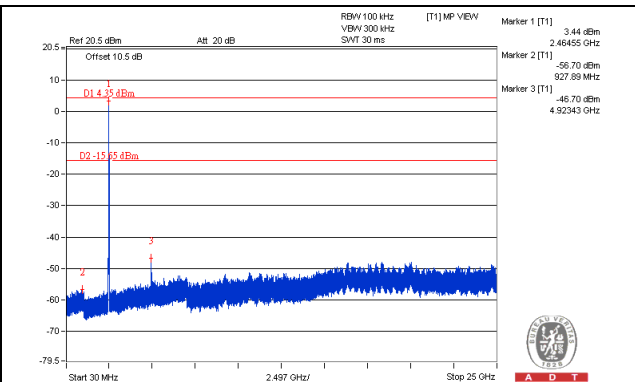
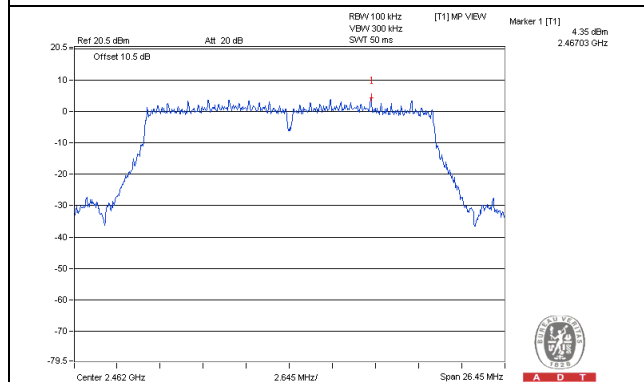
CH 1



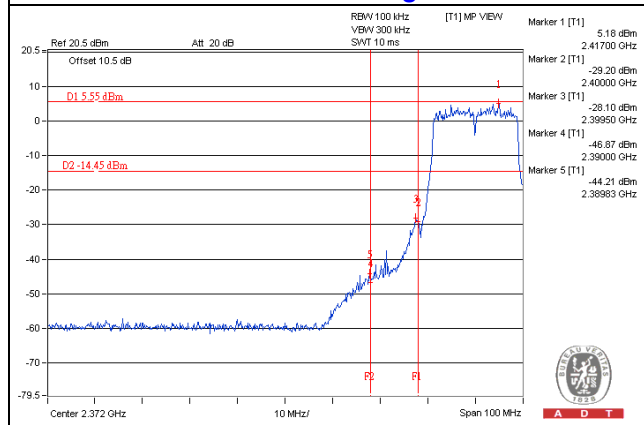
CH 6



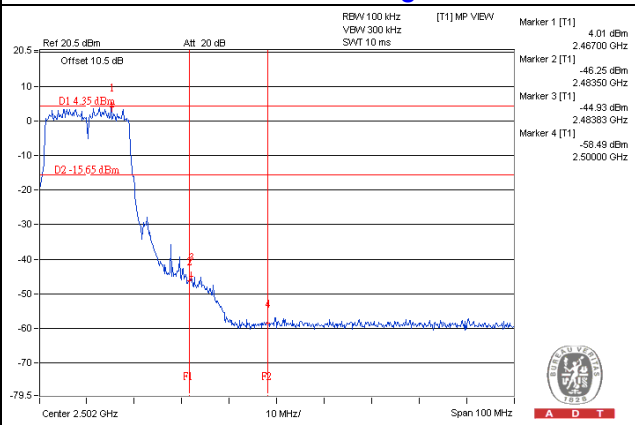
CH 11



CH 1 Band edge

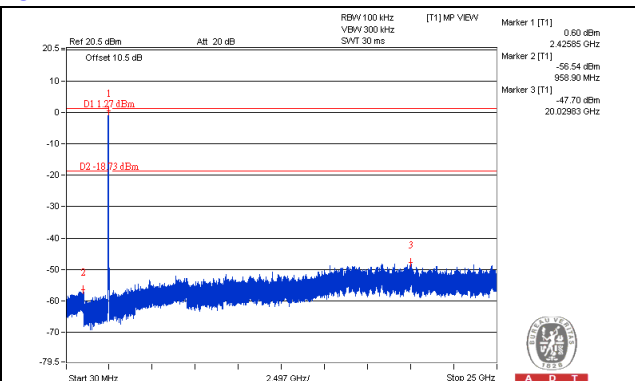
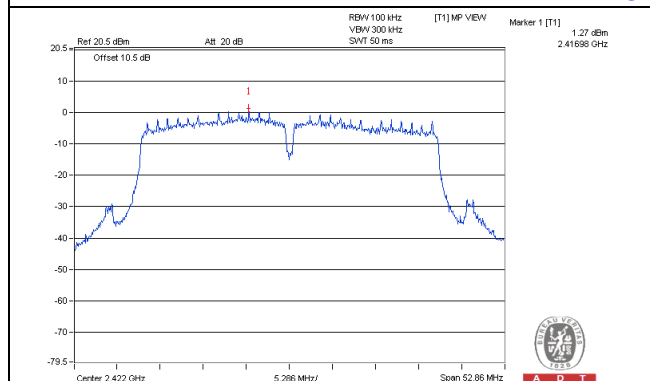


CH 11 Band edge

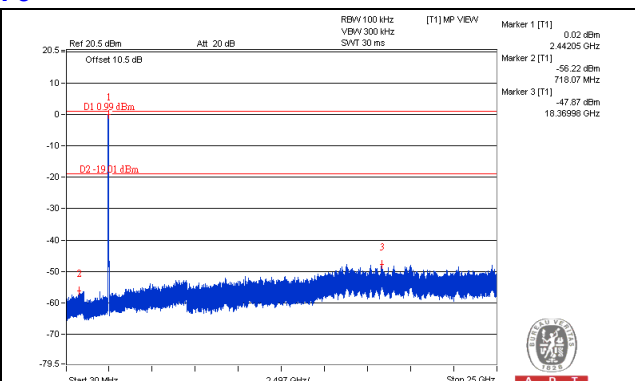
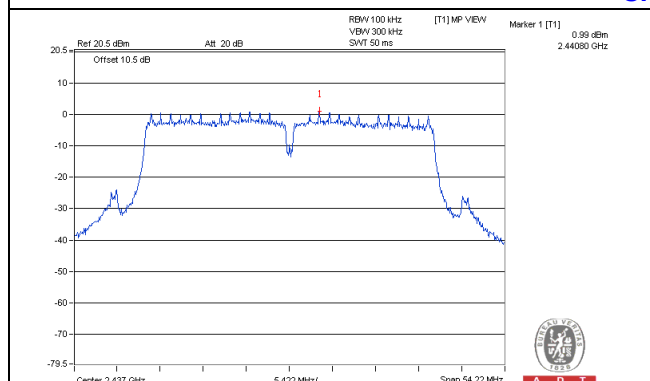


802.11n (HT40) CHAIN 0

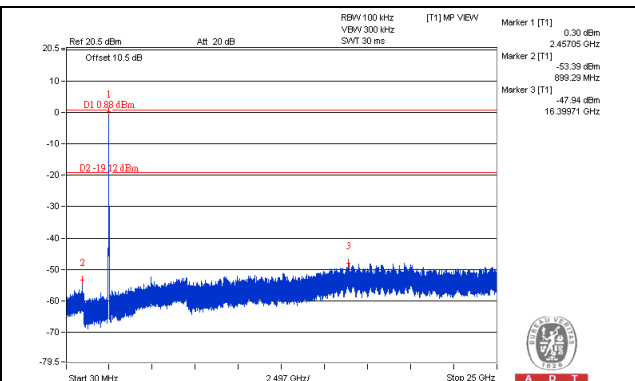
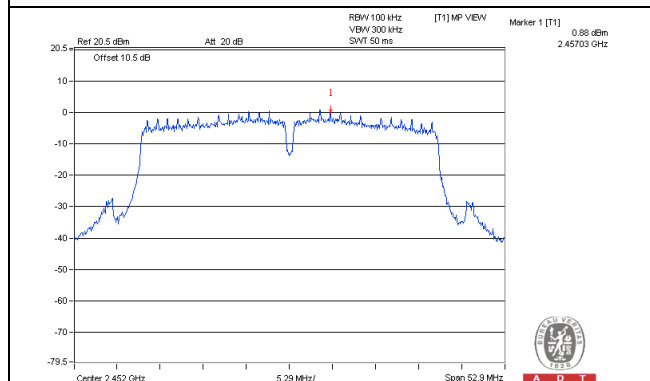
CH 3



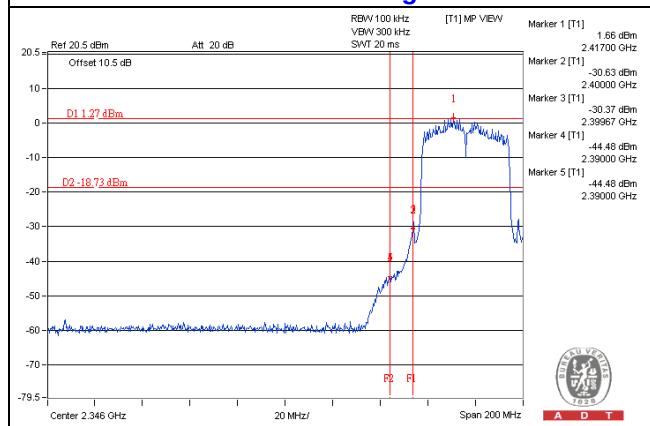
CH 6



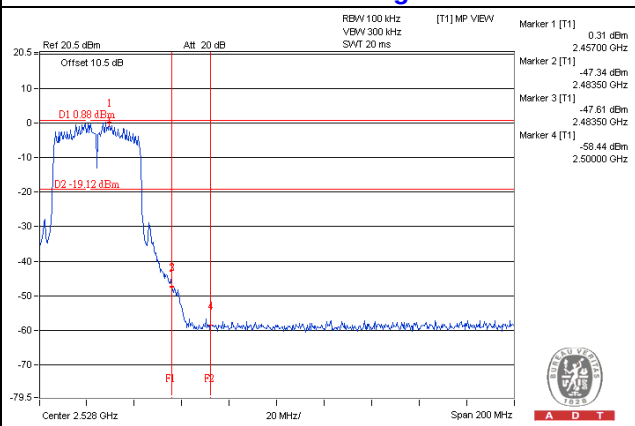
CH 9



CH 3 Band edge

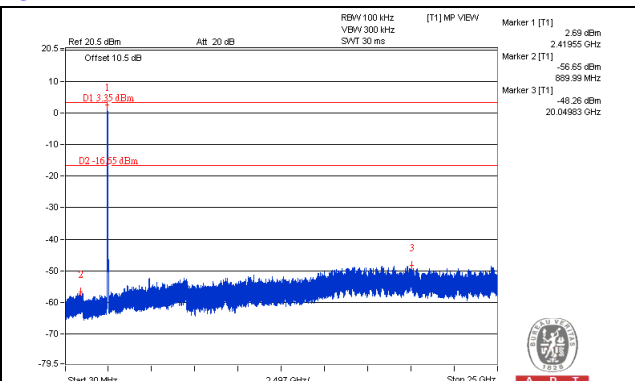
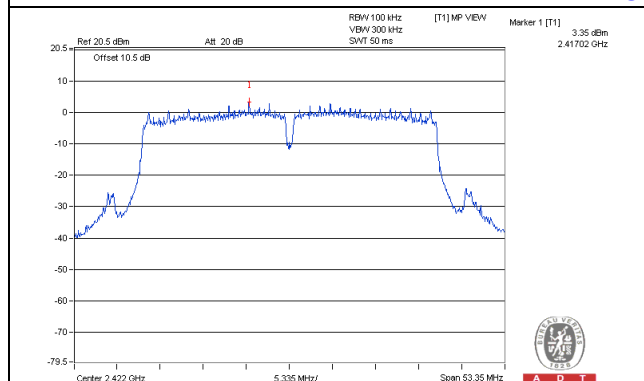


CH 9 Band edge

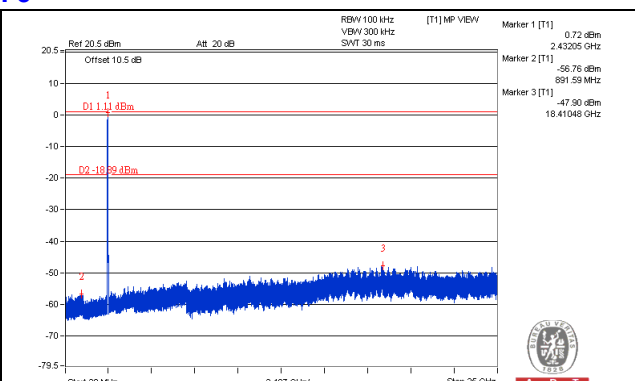
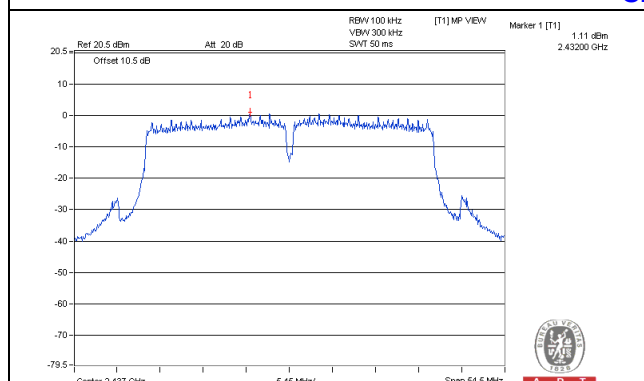


CHAIN 1

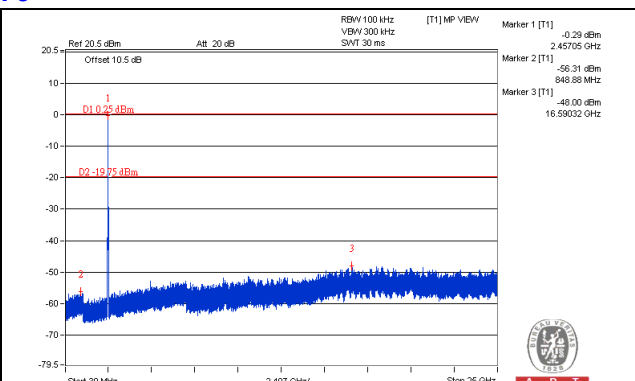
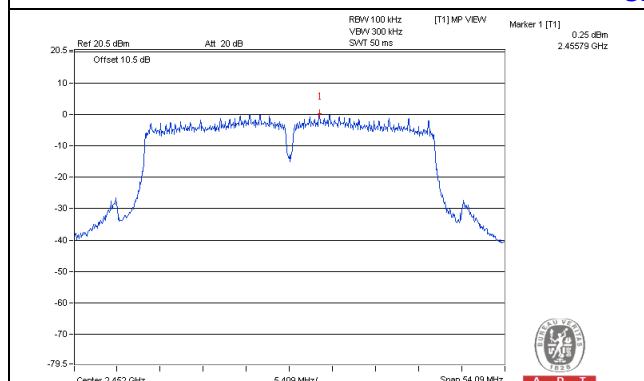
CH 3



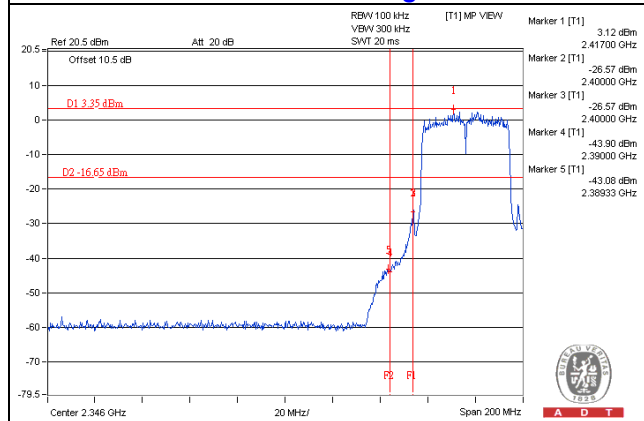
CH 6



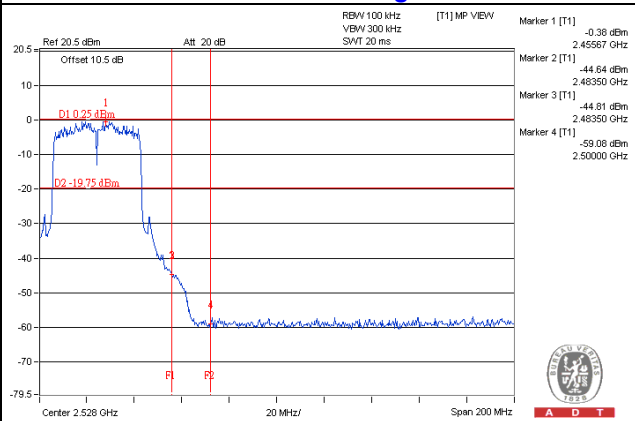
CH 9



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 ---