

FCC Test Report

Report No.: RF151005E12

FCC ID: MCQ-50M1899

Test Model: 50001899-03

Series Model: 50001899-XX (X=0~9)

Received Date: Oct. 05, 2015

Test Date: Oct. 21, 2015 to Jan. 07, 2016

Issued Date: May 16, 2016

Applicant: Digi International Inc.

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

Issue No.	Description	Date Issued
RF151005E12	Original release.	May 16, 2016

1 Certificate of Conformity

Product: TransPort LR54

Brand: Digi International

Test Model: 50001899-03

Series Model: 50001899-XX (X=0~9)

Sample Status: ENGINEERING SAMPLE

Applicant: Digi International Inc.

Test Date: Oct. 21, 2015 to Jan. 07, 2016

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10: 2013

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

Prepared by :  , **Date:** May 16, 2016
Claire Kuan / Specialist

Approved by :  , **Date:** May 16, 2016
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.65dB at 0.50938MHz.
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 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 R-SMA not a standard connector.

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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.31 dB
Radiated Emissions above 1 GHz	1GHz ~6GHz	3.40 dB
	6GHz ~ 18GHz	3.73 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	TransPort LR54
Brand	Digi International
Test Model	50001899-03
Series Model	50001899-XX (X=0~9)
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 256QAM for OFDM in 11ac mode
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	For 15.407 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), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
	For 15.247 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)

Output Power	5GHz: 5GHz (5.18 ~ 5.24GHz): 802.11a: 139.959mW 5GHz (5.745 ~ 5.825GHz): 802.11a: 174.985mW CDD Mode: 5GHz (5.18 ~ 5.24GHz): 802.11ac (VHT20): 307.971mW 802.11ac (VHT40): 139.274mW 802.11ac (VHT80): 44.268mW 5GHz (5.745 ~ 5.825GHz): 802.11ac (VHT20): 351.295mW 802.11ac (VHT40): 173.657mW 802.11ac (VHT80): 46.281mW Beamforming Mode: 5GHz (5.18 ~ 5.24GHz): 802.11ac (VHT20): 307.971mW 802.11ac (VHT40): 139.274mW 802.11ac (VHT80): 44.268mW 5GHz (5.745 ~ 5.825GHz): 802.11ac (VHT20): 351.295mW 802.11ac (VHT40): 173.657mW 802.11ac (VHT80): 46.281mW
	2.4GHz: 802.11b: 229.087mW 802.11g: 295.121mW CDD Mode: 802.11n(HT20): 651.784mW 802.11n(HT40): 449.869mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

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

Brand Name	Model No.	Description
Digi International	50001899-03	For marketing requirement
	50001899-XX (X=0~9)	

From the above models, model: 50001899-03 was selected as representative model for the test and its data was recorded in this report.

- There are WLAN(2.4GHz/5GHz), WWAN(3G) and LTE(4G) technology used for the EUT.
- The emission of the simultaneous operation (WLAN, WWAN(3G) and LTE(4G)) has been evaluated and no non-compliance was found.
- The EUT could be supplied with a power adapter as the following table:

Brand	Model No.	Spec.
MASS POWER	NBS30D120200M2	AC I/P: 100-240V, 50/60Hz, 0.8A AC input cable (Unshielded, 1.4m) DC O/P: 12V, 2A DC output cable (Unshielded, 1.5m)

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

WLAN Antenna Spec.				
Transmitter Circuit	Antenna Type	Antenna Connector	Gain(dBi) including cable loss	Frequency (MHz to MHz)
Chain (0)	Dipole	R-SMA	4.6	2400~2483.5
			6.3	5150~5850
Chain (1)	Dipole	R-SMA	5	2400~2483.5
			7.4	5150~5850
WWAN Antenna Spec.				
Transmitter Circuit	Antenna Type	Antenna Connector	Gain(dBi) including cable loss	Frequency (MHz to MHz)
Chain (0)	Dipole	SMA	4.18	1850 to 1915
			2.59	824 to 849
			5.12	1710 to 1785
			3.33	816 to 824
			2.22	777 to 787
			1.97	699 to 716
			1.0	2300 to 2325
			4.11	2496 to 2690
Chain (1)	Dipole	SMA	3.6	1850 to 1915
			2.47	824 to 849
			5.14	1710 to 1785
			3.2	816 to 824
			1.6	777 to 787
			1.6	699 to 716
			1.0	2300 to 2325
			3.56	2496 to 2690
Note: From the above antenna sets, the Chain (1) was selected as representative antenna for the 802.11a/b/g test and its data was recorded in this report.				

6. The EUT incorporates a MIMO function with beamforming.

2.4GHz			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	1TX diversity	1RX
802.11g	6 ~ 54Mbps	1TX diversity	1RX
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			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	1TX diversity	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
802.11ac (VHT40)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
802.11ac (VHT80)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX

Note: 1. The modulation and bandwidth are similar for 802.11n mode for 20MHz / 40MHz and 802.11ac mode for 20MHz / 40MHz, therefore investigated worst case to representative mode in test report.
2. All of modulation mode support beamforming function except 2.4GHz & 802.11a modulation mode.

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

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

Radiated Emission Test (Above 1GHz):

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

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

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

Radiated Emission Test (Below 1GHz):

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

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

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

Power Line Conducted Emission Test:

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

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

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

Antenna Port Conducted Measurement:

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

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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 62%RH	120Vac, 60Hz	Jyunchun
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
PLC	25deg. C, 54%RH	120Vac, 60Hz	Jason Huang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

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.

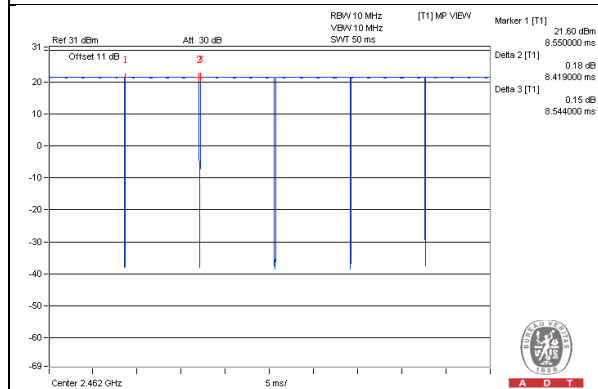
802.11b: Duty cycle = $8.419/8.544 = 0.985$

802.11g: Duty cycle = $1.395/1.438 = 0.97$, Duty factor = $10 * \log(1/0.97) = 0.1$

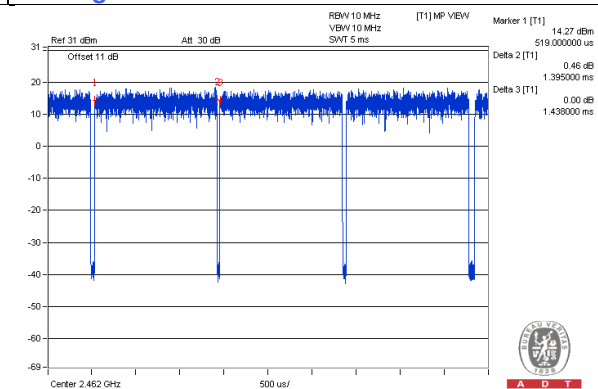
802.11n (HT20): Duty cycle = $1.306/1.386 = 0.942$, Duty factor = $10 * \log(1/0.942) = 0.3$

802.11n (HT40): Duty cycle = $0.648/0.692 = 0.936$, Duty factor = $10 * \log(1/0.936) = 0.3$

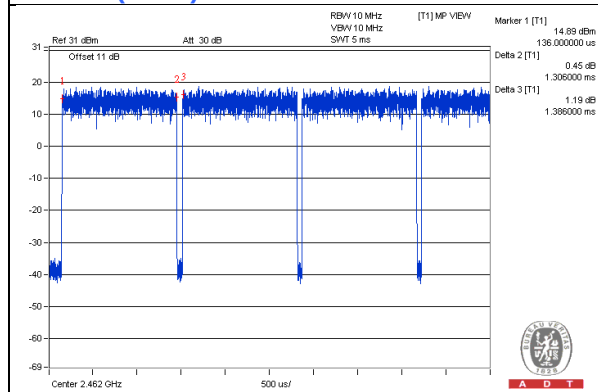
802.11b



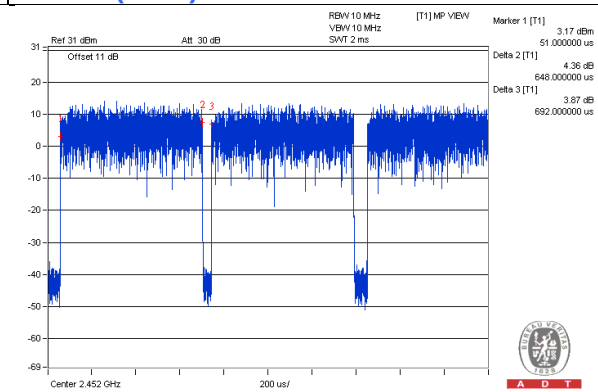
802.11g



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.

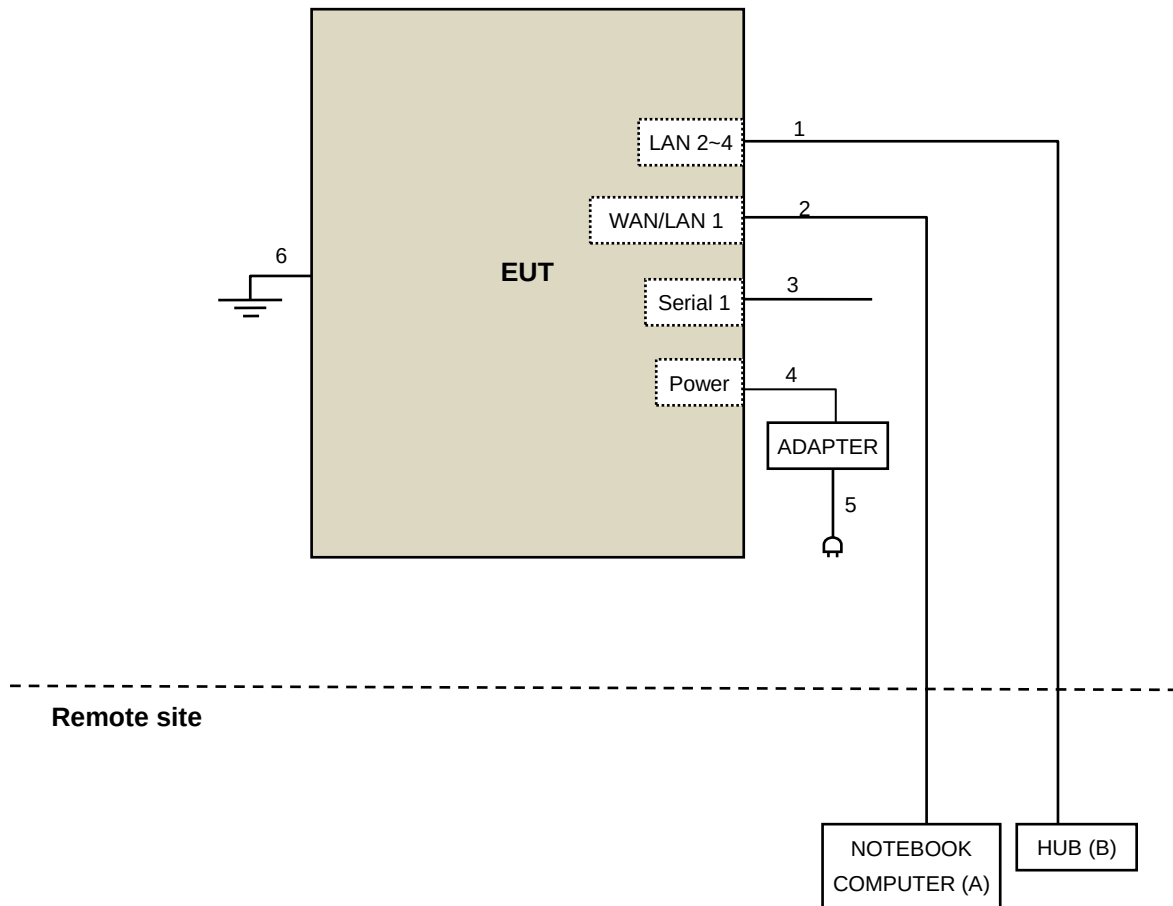
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
B	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab

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	RJ45	3	10	No	0	Provided by Lab
2	RJ45	1	10	No	0	Provided by Lab
3	CONSOLE	1	1.8	No	0	Provided by Lab
4	AC	1	1.4	No	0	Supplied by Client
5	DC	1	1.5	No	0	Supplied by Client
6	GROUND	1	3	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)

KDB 558074 D01 DTS Meas Guidance v03r05

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 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

Below 1GHz test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Pre-Amplifier ^(*) EMCI	EMC001340	980142	Jan. 13, 2014	Jan. 12, 2016
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2015	Jan. 17, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-07	May 08, 2015	May 07, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	138	Feb. 03, 2015	Feb. 02, 2016
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 03, 2015	Apr. 02, 2016
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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
- 3 Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 3.
5. The FCC Site Registration No. is 147459
- 6 The CANADA Site Registration No. is 20331-1
- 7 Tested Date: Oct. 21, 2015

Above 1GHz test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Feb. 05, 2015	Feb. 04, 2016
Pre-Amplifier Agilent	8449B	3008A02465	Apr. 06, 2015	Apr. 05, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150317 150321 150322	Mar. 31, 2015	Mar. 30, 2016
Spectrum Analyzer Keysight	N9030A	MY54490520	July 26, 2015	July 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 16, 2015	Jan. 15, 2016
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Feb. 05, 2015	Feb. 04, 2016
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 17, 2015	Jan. 16, 2016
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	FSP40	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. 3.
3. The FCC Site Registration No. is 147459
4. The CANADA Site Registration No. is 20331-1
5. Tested Date: Dec. 30, 2015 to Jan. 06, 2016

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

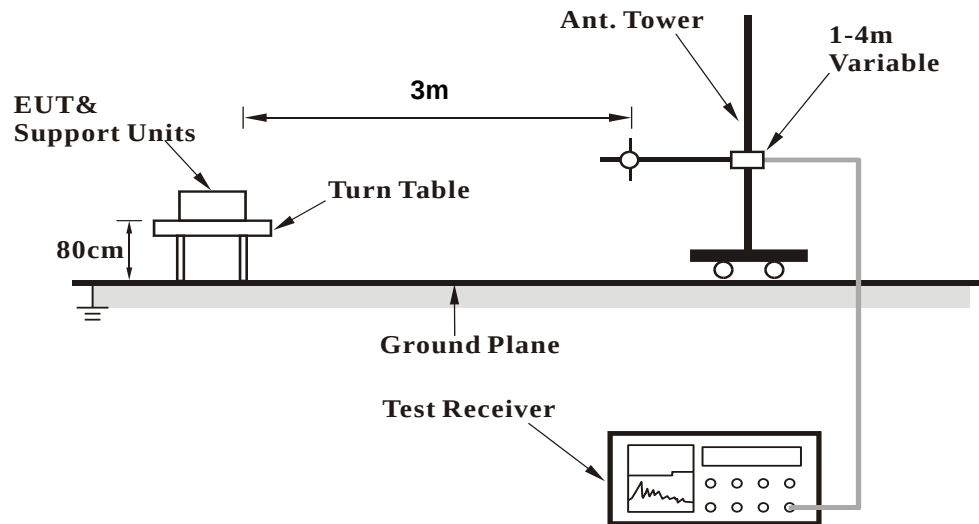
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

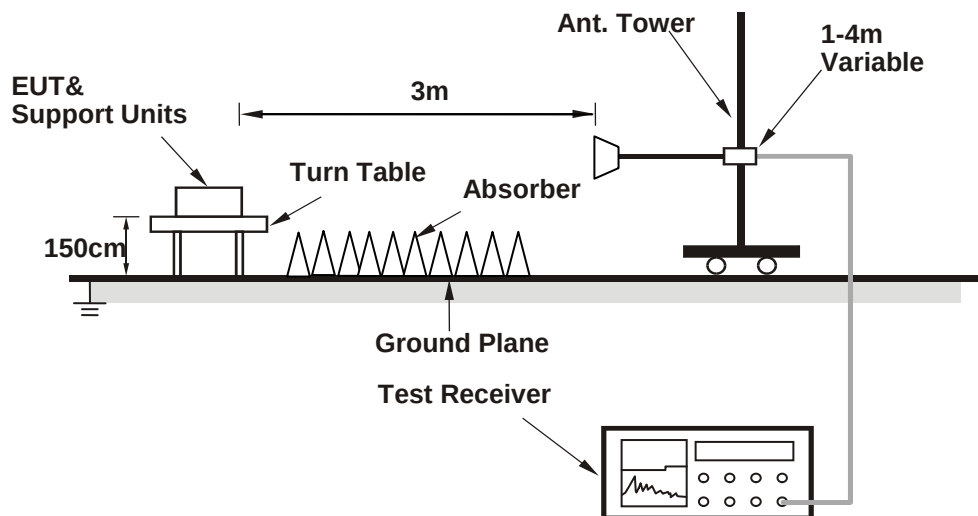
No deviation.

4.1.5 Test 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

1. Connect the EUT with the support unit A (Notebook Computer) which is placed on remote site.
2. Controlling software (QATool_Dbg.exe_V0.0.0.70) 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	2387.23	56.3 PK	74.0	-17.7	1.07 H	84	57.75	-1.45
2	2387.23	48.3 AV	54.0	-5.7	1.07 H	84	49.75	-1.45
3	*2412.00	104.2 PK			1.08 H	222	105.58	-1.38
4	*2412.00	100.7 AV			1.08 H	222	102.08	-1.38
5	4824.00	43.0 PK	74.0	-31.0	1.07 H	12	35.91	7.09
6	4824.00	34.8 AV	54.0	-19.2	1.07 H	12	27.71	7.09
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	2387.23	58.1 PK	74.0	-15.9	1.07 V	84	59.55	-1.45
2	2387.23	53.2 AV	54.0	-0.8	1.07 V	84	54.65	-1.45
3	*2412.00	115.6 PK			1.07 V	84	116.98	-1.38
4	*2412.00	112.6 AV			1.07 V	84	113.98	-1.38
5	4824.00	48.1 PK	74.0	-25.9	1.07 V	29	41.01	7.09
6	4824.00	44.0 AV	54.0	-10.0	1.07 V	29	36.91	7.09

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	2388.00	63.6 PK	74.0	-10.4	1.07 H	233	65.04	-1.44
2	2388.00	45.8 AV	54.0	-8.2	1.07 H	233	47.24	-1.44
3	*2437.00	102.7 PK			1.07 H	233	104.02	-1.32
4	*2437.00	99.2 AV			1.07 H	233	100.52	-1.32
5	2483.50	63.7 PK	74.0	-10.3	1.07 H	233	64.91	-1.21
6	2483.50	48.6 AV	54.0	-5.4	1.07 H	233	49.81	-1.21
7	4874.00	43.2 PK	74.0	-30.8	1.00 H	16	35.95	7.25
8	4874.00	35.0 AV	54.0	-19.0	1.00 H	16	27.75	7.25
9	7311.00	45.1 PK	74.0	-28.9	1.14 H	154	30.65	14.45
10	7311.00	32.1 AV	54.0	-21.9	1.14 H	154	17.65	14.45

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	2388.00	65.7 PK	74.0	-8.3	1.00 V	80	67.14	-1.44
2	2388.00	50.6 AV	54.0	-3.4	1.00 V	80	52.04	-1.44
3	*2437.00	114.1 PK			1.00 V	80	115.42	-1.32
4	*2437.00	111.1 AV			1.00 V	80	112.42	-1.32
5	2483.50	65.9 PK	74.0	-8.1	1.00 V	80	67.11	-1.21
6	2483.50	53.4 AV	54.0	-0.6	1.00 V	80	54.61	-1.21
7	4874.00	47.6 PK	74.0	-26.4	1.00 V	17	40.35	7.25
8	4874.00	43.7 AV	54.0	-10.3	1.00 V	17	36.45	7.25
9	7311.00	45.1 PK	74.0	-28.9	1.21 V	162	30.65	14.45
10	7311.00	32.2 AV	54.0	-21.8	1.21 V	162	17.75	14.45

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	100.4 PK			1.11 H	237	101.66	-1.26
2	*2462.00	97.1 AV			1.11 H	237	98.36	-1.26
3	2488.78	57.5 PK	74.0	-16.5	1.11 H	237	58.69	-1.19
4	2488.78	48.5 AV	54.0	-5.5	1.11 H	237	49.69	-1.19
5	4924.00	43.0 PK	74.0	-31.0	1.06 H	27	35.55	7.45
6	4924.00	35.0 AV	54.0	-19.0	1.06 H	27	27.55	7.45
7	7386.00	45.1 PK	74.0	-28.9	1.15 H	139	30.58	14.52
8	7386.00	32.2 AV	54.0	-21.8	1.15 H	139	17.68	14.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.8 PK			1.00 V	86	113.06	-1.26
2	*2462.00	108.9 AV			1.00 V	86	110.16	-1.26
3	2488.78	59.4 PK	74.0	-14.6	1.00 V	86	60.59	-1.19
4	2488.78	53.2 AV	54.0	-0.8	1.00 V	86	54.39	-1.19
5	4924.00	48.1 PK	74.0	-25.9	1.10 V	16	40.65	7.45
6	4924.00	44.0 AV	54.0	-10.0	1.10 V	16	36.55	7.45
7	7386.00	45.1 PK	74.0	-28.9	1.24 V	161	30.58	14.52
8	7386.00	32.5 AV	54.0	-21.5	1.24 V	161	17.98	14.52

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	68.6 PK	74.0	-5.4	1.11 H	228	70.03	-1.43
2	2390.00	48.3 AV	54.0	-5.7	1.11 H	228	49.73	-1.43
3	*2412.00	103.3 PK			1.11 H	228	104.68	-1.38
4	*2412.00	91.1 AV			1.11 H	228	92.48	-1.38
5	4824.00	45.3 PK	74.0	-28.7	1.04 H	41	38.21	7.09
6	4824.00	32.2 AV	54.0	-21.8	1.04 H	41	25.11	7.09
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.8 PK	74.0	-3.2	1.04 V	83	72.23	-1.43
2	2390.00	53.3 AV	54.0	-0.7	1.04 V	83	54.73	-1.43
3	*2412.00	114.7 PK			1.04 V	83	116.08	-1.38
4	*2412.00	102.9 AV			1.04 V	83	104.28	-1.38
5	4824.00	50.1 PK	74.0	-23.9	1.05 V	4	43.01	7.09
6	4824.00	38.7 AV	54.0	-15.3	1.05 V	4	31.61	7.09

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	61.3 PK	74.0	-12.7	1.06 H	217	62.73	-1.43
2	2390.00	42.6 AV	54.0	-11.4	1.06 H	217	44.03	-1.43
3	*2437.00	107.8 PK			1.06 H	217	109.12	-1.32
4	*2437.00	94.8 AV			1.06 H	217	96.12	-1.32
5	2483.50	69.1 PK	74.0	-4.9	1.06 H	217	70.31	-1.21
6	2483.50	46.4 AV	54.0	-7.6	1.06 H	217	47.61	-1.21
7	4874.00	45.3 PK	74.0	-28.7	1.04 H	34	38.05	7.25
8	4874.00	32.3 AV	54.0	-21.7	1.04 H	34	25.05	7.25
9	7311.00	45.1 PK	74.0	-28.9	1.20 H	154	30.65	14.45
10	7311.00	32.0 AV	54.0	-22.0	1.20 H	154	17.55	14.45

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.4 PK	74.0	-10.6	1.02 V	79	64.83	-1.43
2	2390.00	47.5 AV	54.0	-6.5	1.02 V	79	48.93	-1.43
3	*2437.00	119.2 PK			1.02 V	79	120.52	-1.32
4	*2437.00	106.6 AV			1.02 V	79	107.92	-1.32
5	2483.50	71.1 PK	74.0	-2.9	1.02 V	79	72.31	-1.21
6	2483.50	51.3 AV	54.0	-2.7	1.02 V	79	52.51	-1.21
7	4874.00	50.3 PK	74.0	-23.7	1.00 V	6	43.05	7.25
8	4874.00	39.1 AV	54.0	-14.9	1.00 V	6	31.85	7.25
9	7311.00	45.2 PK	74.0	-28.8	1.20 V	167	30.75	14.45
10	7311.00	32.2 AV	54.0	-21.8	1.20 V	167	17.75	14.45

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	100.9 PK			1.16 H	239	102.16	-1.26
2	*2462.00	89.3 AV			1.16 H	239	90.56	-1.26
3	2483.50	69.5 PK	74.0	-4.5	1.16 H	239	70.71	-1.21
4	2483.50	48.9 AV	54.0	-5.1	1.16 H	239	50.11	-1.21
5	4924.00	45.2 PK	74.0	-28.8	1.08 H	28	37.75	7.45
6	4924.00	32.1 AV	54.0	-21.9	1.08 H	28	24.65	7.45
7	7386.00	45.4 PK	74.0	-28.6	1.12 H	145	30.88	14.52
8	7386.00	32.4 AV	54.0	-21.6	1.12 H	145	17.88	14.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.3 PK			1.03 V	83	113.56	-1.26
2	*2462.00	101.0 AV			1.03 V	83	102.26	-1.26
3	2483.50	71.5 PK	74.0	-2.5	1.03 V	83	72.71	-1.21
4	2483.50	53.6 AV	54.0	-0.4	1.03 V	83	54.81	-1.21
5	4924.00	50.7 PK	74.0	-23.3	1.03 V	19	43.25	7.45
6	4924.00	39.2 AV	54.0	-14.8	1.03 V	19	31.75	7.45
7	7386.00	45.3 PK	74.0	-28.7	1.16 V	169	30.78	14.52
8	7386.00	32.4 AV	54.0	-21.6	1.16 V	169	17.88	14.52

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	2388.58	68.7 PK	74.0	-5.3	1.12 H	219	70.14	-1.44
2	2388.58	49.6 AV	54.0	-4.4	1.12 H	219	51.04	-1.44
3	*2412.00	104.2 PK			1.12 H	219	105.58	-1.38
4	*2412.00	93.1 AV			1.12 H	219	94.48	-1.38
5	4824.00	45.0 PK	74.0	-29.0	1.10 H	42	37.91	7.09
6	4824.00	31.7 AV	54.0	-22.3	1.10 H	42	24.61	7.09
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	2388.58	70.6 PK	74.0	-3.4	1.23 V	274	72.04	-1.44
2	2388.58	53.8 AV	54.0	-0.2	1.23 V	274	55.24	-1.44
3	*2412.00	115.6 PK			1.23 V	274	116.98	-1.38
4	*2412.00	104.7 AV			1.23 V	274	106.08	-1.38
5	4824.00	50.3 PK	74.0	-23.7	1.02 V	6	43.21	7.09
6	4824.00	38.9 AV	54.0	-15.1	1.02 V	6	31.81	7.09

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	2388.64	64.2 PK	74.0	-9.8	1.16 H	223	65.64	-1.44
2	2388.64	46.1 AV	54.0	-7.9	1.16 H	223	47.54	-1.44
3	*2437.00	112.1 PK			1.16 H	223	113.42	-1.32
4	*2437.00	100.8 AV			1.16 H	223	102.12	-1.32
5	2483.50	70.1 PK	74.0	-3.9	1.16 H	223	71.31	-1.21
6	2483.50	49.1 AV	54.0	-4.9	1.16 H	223	50.31	-1.21
7	4874.00	45.1 PK	74.0	-28.9	1.11 H	35	37.85	7.25
8	4874.00	32.2 AV	54.0	-21.8	1.11 H	35	24.95	7.25
9	7311.00	44.7 PK	74.0	-29.3	1.10 H	162	30.25	14.45
10	7311.00	31.6 AV	54.0	-22.4	1.10 H	162	17.15	14.45

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	2388.64	66.3 PK	74.0	-7.7	1.18 V	269	67.74	-1.44
2	2388.64	51.0 AV	54.0	-3.0	1.18 V	269	52.44	-1.44
3	*2437.00	123.5 PK			1.18 V	269	124.82	-1.32
4	*2437.00	112.4 AV			1.18 V	269	113.72	-1.32
5	2483.50	72.3 PK	74.0	-1.7	1.18 V	269	73.51	-1.21
6	2483.50	53.3 AV	54.0	-0.7	1.18 V	269	54.51	-1.21
7	4874.00	50.3 PK	74.0	-23.7	1.02 V	15	43.05	7.25
8	4874.00	38.7 AV	54.0	-15.3	1.02 V	15	31.45	7.25
9	7311.00	45.0 PK	74.0	-29.0	1.24 V	158	30.55	14.45
10	7311.00	32.4 AV	54.0	-21.6	1.24 V	158	17.95	14.45

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	100.9 PK			1.16 H	233	102.16	-1.26
2	*2462.00	90.6 AV			1.16 H	233	91.86	-1.26
3	2484.11	69.2 PK	74.0	-4.8	1.16 H	233	70.41	-1.21
4	2484.11	49.7 AV	54.0	-4.3	1.16 H	233	50.91	-1.21
5	4924.00	45.2 PK	74.0	-28.8	1.05 H	18	37.75	7.45
6	4924.00	32.3 AV	54.0	-21.7	1.05 H	18	24.85	7.45
7	7386.00	44.7 PK	74.0	-29.3	1.15 H	148	30.18	14.52
8	7386.00	32.0 AV	54.0	-22.0	1.15 H	148	17.48	14.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.3 PK			1.16 V	293	113.56	-1.26
2	*2462.00	102.2 AV			1.16 V	293	103.46	-1.26
3	2484.11	71.4 PK	74.0	-2.6	1.16 V	293	72.61	-1.21
4	2484.11	53.8 AV	54.0	-0.2	1.16 V	293	55.01	-1.21
5	4924.00	50.0 PK	74.0	-24.0	1.07 V	10	42.55	7.45
6	4924.00	38.7 AV	54.0	-15.3	1.07 V	10	31.25	7.45
7	7386.00	45.1 PK	74.0	-28.9	1.20 V	178	30.58	14.52
8	7386.00	32.2 AV	54.0	-21.8	1.20 V	178	17.68	14.52

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	2388.34	69.1 PK	74.0	-4.9	1.11 H	234	70.54	-1.44
2	2388.34	48.6 AV	54.0	-5.4	1.11 H	234	50.04	-1.44
3	*2422.00	98.6 PK			1.11 H	234	99.96	-1.36
4	*2422.00	86.6 AV			1.11 H	234	87.96	-1.36
5	4844.00	45.0 PK	74.0	-29.0	1.03 H	32	37.85	7.15
6	4844.00	32.1 AV	54.0	-21.9	1.03 H	32	24.95	7.15
7	7266.00	45.1 PK	74.0	-28.9	1.12 H	150	30.53	14.57
8	7266.00	32.2 AV	54.0	-21.8	1.12 H	150	17.63	14.57

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	2388.34	71.3 PK	74.0	-2.7	1.22 V	270	72.74	-1.44
2	2388.34	52.7 AV	54.0	-1.3	1.22 V	270	54.14	-1.44
3	*2422.00	110.0 PK			1.22 V	270	111.36	-1.36
4	*2422.00	98.2 AV			1.22 V	270	99.56	-1.36
5	4844.00	50.8 PK	74.0	-23.2	1.02 V	17	43.65	7.15
6	4844.00	39.1 AV	54.0	-14.9	1.02 V	17	31.95	7.15
7	7266.00	44.8 PK	74.0	-29.2	1.18 V	157	30.23	14.57
8	7266.00	31.8 AV	54.0	-22.2	1.18 V	157	17.23	14.57

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	2388.38	64.8 PK	74.0	-9.2	1.06 H	220	66.24	-1.44
2	2388.38	42.6 AV	54.0	-11.4	1.06 H	220	44.04	-1.44
3	*2437.00	103.6 PK			1.06 H	220	104.92	-1.32
4	*2437.00	92.4 AV			1.06 H	220	93.72	-1.32
5	2483.50	68.1 PK	74.0	-5.9	1.06 H	220	69.31	-1.21
6	2483.50	49.5 AV	54.0	-4.5	1.06 H	220	50.71	-1.21
7	4874.00	45.2 PK	74.0	-28.8	1.04 H	12	37.95	7.25
8	4874.00	32.4 AV	54.0	-21.6	1.04 H	12	25.15	7.25
9	7311.00	45.6 PK	74.0	-28.4	1.15 H	165	31.15	14.45
10	7311.00	32.6 AV	54.0	-21.4	1.15 H	165	18.15	14.45

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	2388.38	66.9 PK	74.0	-7.1	1.16 V	268	68.34	-1.44
2	2388.38	48.3 AV	54.0	-5.7	1.16 V	268	49.74	-1.44
3	*2437.00	115.0 PK			1.16 V	268	116.32	-1.32
4	*2437.00	104.0 AV			1.16 V	268	105.32	-1.32
5	2483.50	70.0 PK	74.0	-4.0	1.16 V	268	71.21	-1.21
6	2483.50	53.6 AV	54.0	-0.4	1.16 V	268	54.81	-1.21
7	4874.00	50.4 PK	74.0	-23.6	1.09 V	22	43.15	7.25
8	4874.00	39.0 AV	54.0	-15.0	1.09 V	22	31.75	7.25
9	7311.00	45.1 PK	74.0	-28.9	1.17 V	171	30.65	14.45
10	7311.00	32.0 AV	54.0	-22.0	1.17 V	171	17.55	14.45

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	99.9 PK			1.06 H	222	101.18	-1.28
2	*2452.00	87.7 AV			1.06 H	222	88.98	-1.28
3	2483.50	70.6 PK	74.0	-3.4	1.06 H	222	71.81	-1.21
4	2483.50	50.0 AV	54.0	-4.0	1.06 H	222	51.21	-1.21
5	4904.00	45.9 PK	74.0	-28.1	1.04 H	28	38.54	7.36
6	4904.00	32.6 AV	54.0	-21.4	1.04 H	28	25.24	7.36
7	7356.00	44.5 PK	74.0	-29.5	1.15 H	145	30.00	14.50
8	7356.00	31.7 AV	54.0	-22.3	1.15 H	145	17.20	14.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	111.3 PK			1.18 V	272	112.58	-1.28
2	*2452.00	99.3 AV			1.18 V	272	100.58	-1.28
3	2483.50	72.5 PK	74.0	-1.5	1.18 V	272	73.71	-1.21
4	2483.50	53.9 AV	54.0	-0.1	1.18 V	272	55.11	-1.21
5	4904.00	50.0 PK	74.0	-24.0	1.13 V	11	42.64	7.36
6	4904.00	38.7 AV	54.0	-15.3	1.13 V	11	31.34	7.36
7	7356.00	44.8 PK	74.0	-29.2	1.23 V	173	30.30	14.50
8	7356.00	31.9 AV	54.0	-22.1	1.23 V	173	17.40	14.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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 WORST-CASE DATA

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	38.74	28.8 QP	40.0	-11.2	1.00 H	64	42.73	-13.97
2	62.79	29.3 QP	40.0	-10.7	1.25 H	154	43.44	-14.17
3	208.22	30.0 QP	43.5	-13.5	1.25 H	264	46.54	-16.56
4	324.43	36.2 QP	46.0	-9.8	1.00 H	39	47.75	-11.57
5	500.05	34.4 QP	46.0	-11.6	1.75 H	356	42.21	-7.77
6	637.28	31.0 QP	46.0	-15.0	1.25 H	64	35.62	-4.58
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	41.94	30.3 QP	40.0	-9.7	1.00 V	26	43.94	-13.65
2	63.01	29.7 QP	40.0	-10.3	1.25 V	310	43.87	-14.14
3	196.55	27.0 QP	43.5	-16.5	1.00 V	307	43.45	-16.42
4	327.75	35.3 QP	46.0	-10.7	1.50 V	14	46.86	-11.59
5	500.05	34.8 QP	46.0	-11.2	1.00 V	68	42.56	-7.77
6	644.56	29.7 QP	46.0	-16.3	1.50 V	360	34.03	-4.36

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

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. 01, 2015	Aug. 31, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 23, 2015	Sep. 22, 2016
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2015	Sep. 30, 2016
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: Jan. 07, 2016

4.2.3 Test Procedures

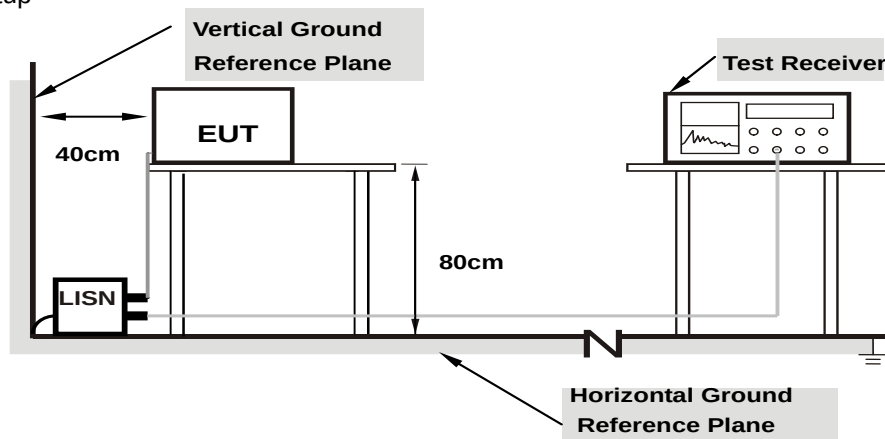
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

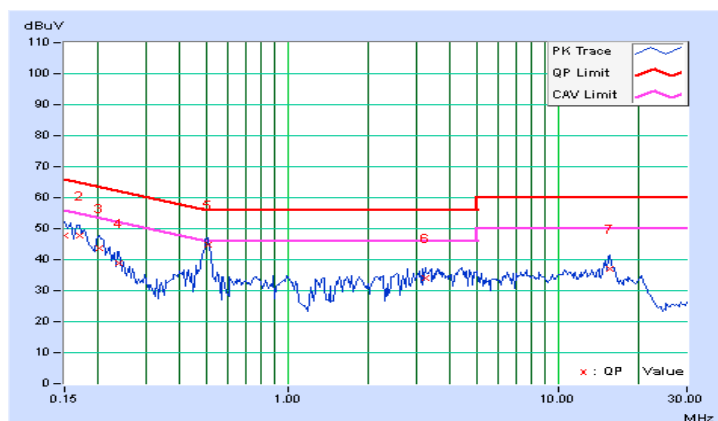
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.26	37.63	23.75	47.89	34.01	66.00	56.00	-18.11	-21.99
2	0.16953	10.24	37.62	25.53	47.86	35.77	64.98	54.98	-17.12	-19.21
3	0.20078	10.22	33.53	22.51	43.75	32.73	63.58	53.58	-19.83	-20.85
4	0.23984	10.22	28.55	18.47	38.77	28.69	62.10	52.10	-23.33	-23.41
5	0.50938	10.23	34.68	27.12	44.91	37.35	56.00	46.00	-11.09	-8.65
6	3.23828	10.32	23.70	14.97	34.02	25.29	56.00	46.00	-21.98	-20.71
7	15.49609	10.78	26.30	17.26	37.08	28.04	60.00	50.00	-22.92	-21.96

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.

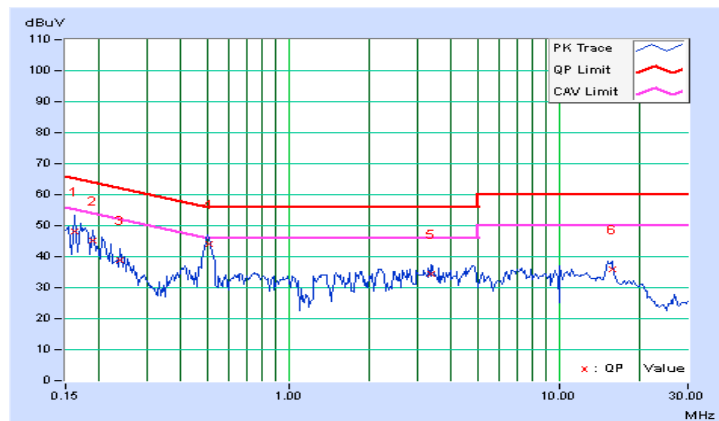


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	10.23	38.06	27.30	48.29	37.53	65.38	55.38	-17.08	-17.84
2	0.18906	10.21	35.04	24.40	45.25	34.61	64.08	54.08	-18.83	-19.47
3	0.23984	10.20	28.63	18.09	38.83	28.29	62.10	52.10	-23.27	-23.81
4	0.50938	10.21	34.01	26.74	44.22	36.95	56.00	46.00	-11.78	-9.05
5	3.38672	10.33	24.28	15.48	34.61	25.81	56.00	46.00	-21.39	-20.19
6	15.74219	10.81	25.21	17.25	36.02	28.06	60.00	50.00	-23.98	-21.94

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.

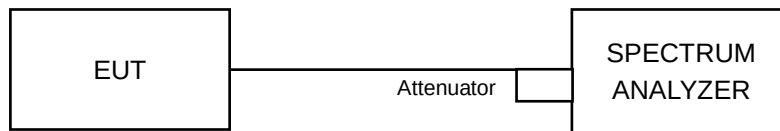


4.3 6dB Bandwidth Measurement

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	9.14	0.5	PASS
6	2437	11.07	0.5	PASS
11	2462	9.65	0.5	PASS

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.07	0.5	PASS
6	2437	15.17	0.5	PASS
11	2462	15.14	0.5	PASS

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		CHAIN 0	CHAIN 1		
1	2412	15.10	12.63	0.5	Pass
6	2437	15.15	15.18	0.5	Pass
11	2462	15.09	15.15	0.5	Pass

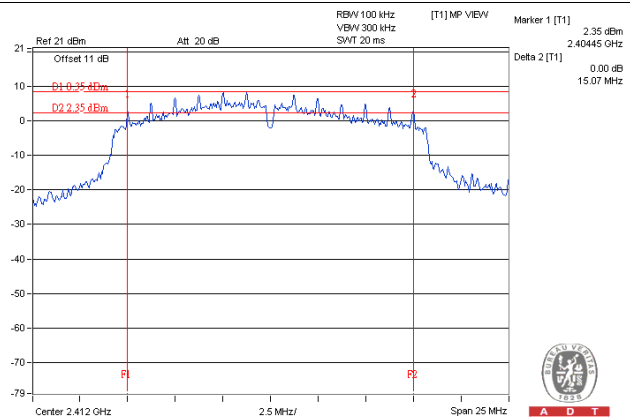
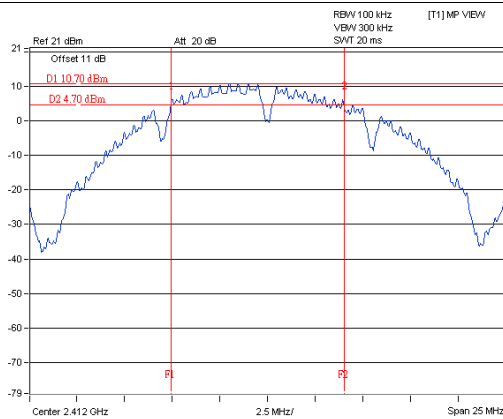
802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		CHAIN 0	CHAIN 1		
3	2422	35.18	35.19	0.5	Pass
6	2437	28.91	28.90	0.5	Pass
9	2452	35.13	32.67	0.5	Pass

Spectrum Plot of Worst Value

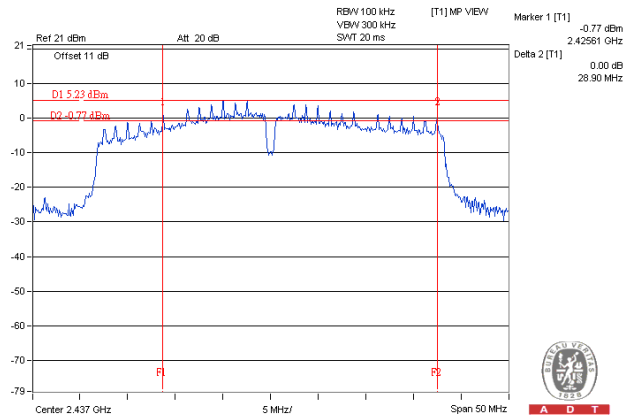
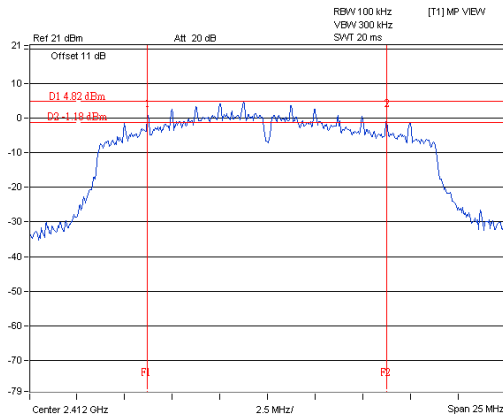
802.11b / CH 1

802.11g / CH 1



802.11n (HT20) / Chain 1_CH1

802.11n (HT40) / Chain 1_CH6



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,

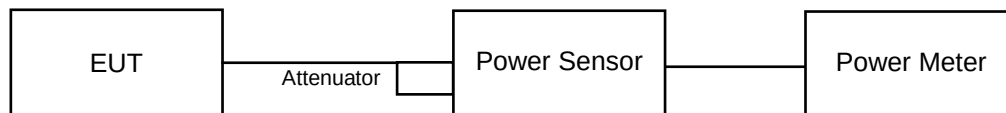
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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	121.339	20.84	30	Pass
6	2437	229.087	23.60	30	Pass
11	2462	93.541	19.71	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	144.544	21.60	30	Pass
6	2437	295.121	24.70	30	Pass
11	2462	126.765	21.03	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	21.42	22.44	314.064	24.97	30	Pass
6	2437	25.05	25.21	651.784	28.14	30	Pass
11	2462	20.38	19.98	208.685	23.19	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	19.37	20.27	192.911	22.85	30	Pass
6	2437	23.45	23.59	449.869	26.53	30	Pass
9	2452	20.48	20.11	214.251	23.31	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	129.42	21.12
6	2437	169.824	22.30
11	2462	65.163	18.14

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	47.315	16.75
6	2437	139.316	21.44
11	2462	35.156	15.46

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	14.22	14.58	55.132	17.41
6	2437	21.98	21.26	291.421	24.65
11	2462	12.33	12.18	33.62	15.27

802.11n (HT40)

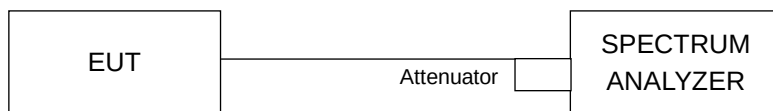
Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	11.75	12.25	31.75	15.02
6	2437	17.01	17.15	102.114	20.09
9	2452	12.48	12.26	34.528	15.38

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/10kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-6.29	8	Pass
6	2437	-3.33	8	Pass
11	2462	-5.97	8	Pass

802.11g

Channel	Freq. (MHz)	PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-8.08	8	Pass
6	2437	-5.16	8	Pass
11	2462	-10.28	8	Pass

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/10k Hz)	10 log (N=2) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-11.48	3.01	-8.47	6.19	Pass
	6	2437	-5.00	3.01	-1.99	6.19	Pass
	11	2462	-14.46	3.01	-11.45	6.19	Pass
1	1	2412	-11.14	3.01	-8.13	6.19	Pass
	6	2437	-5.10	3.01	-2.09	6.19	Pass
	11	2462	-14.09	3.01	-11.08	6.19	Pass

NOTE: Directional gain = $10 \log[(10^{G_{1/20}} + 10^{G_{2/20}})^2 / 2] = 7.81\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8 - (7.81 - 6) = 6.19\text{dBm}$.

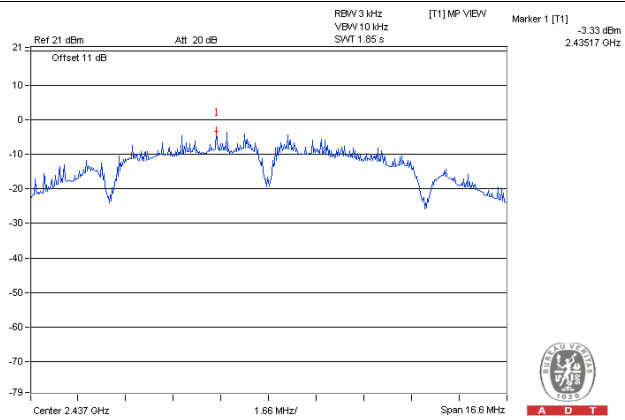
802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/10k Hz)	10 log (N=2) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-18.18	3.01	-15.17	6.19	Pass
	6	2437	-11.91	3.01	-8.90	6.19	Pass
	9	2452	-16.38	3.01	-13.37	6.19	Pass
1	3	2422	-18.61	3.01	-15.60	6.19	Pass
	6	2437	-11.94	3.01	-8.93	6.19	Pass
	9	2452	-16.18	3.01	-13.17	6.19	Pass

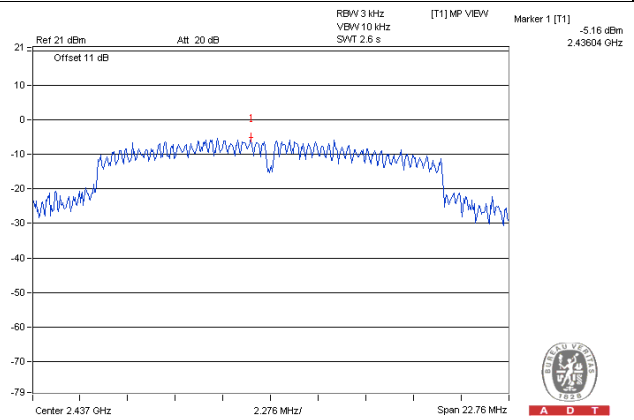
NOTE: Directional gain = $10 \log[(10^{G_{1/20}} + 10^{G_{2/20}})^2 / 2] = 7.81\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8 - (7.81 - 6) = 6.19\text{dBm}$.

Spectrum Plot of Worst Value

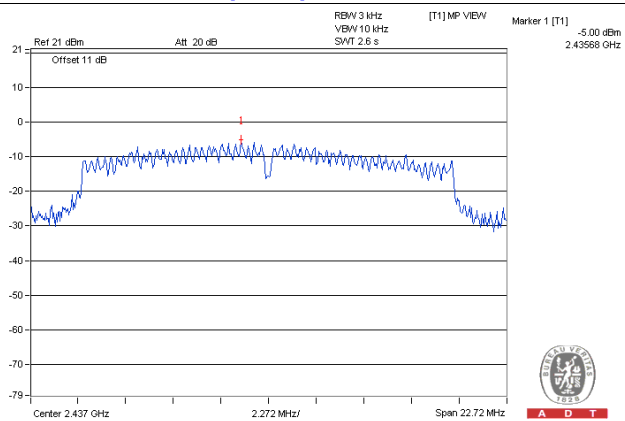
802.11b / CH6



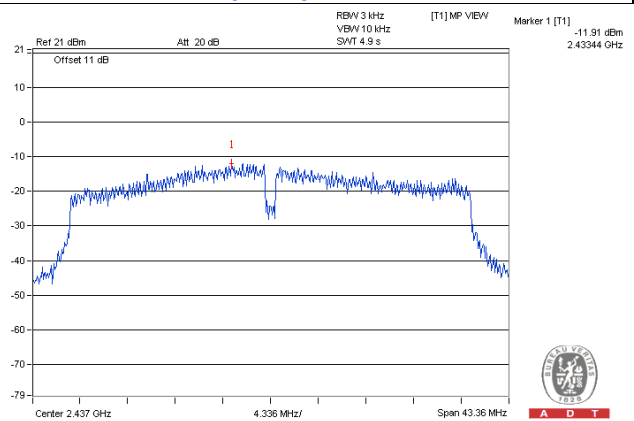
802.11g / CH6



802.11n (HT20) / Chain 0_CH6



802.11n (HT40) / Chain 0_CH6

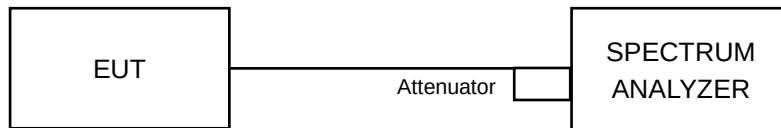


4.6 Conducted Out of Band Emission Measurement

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

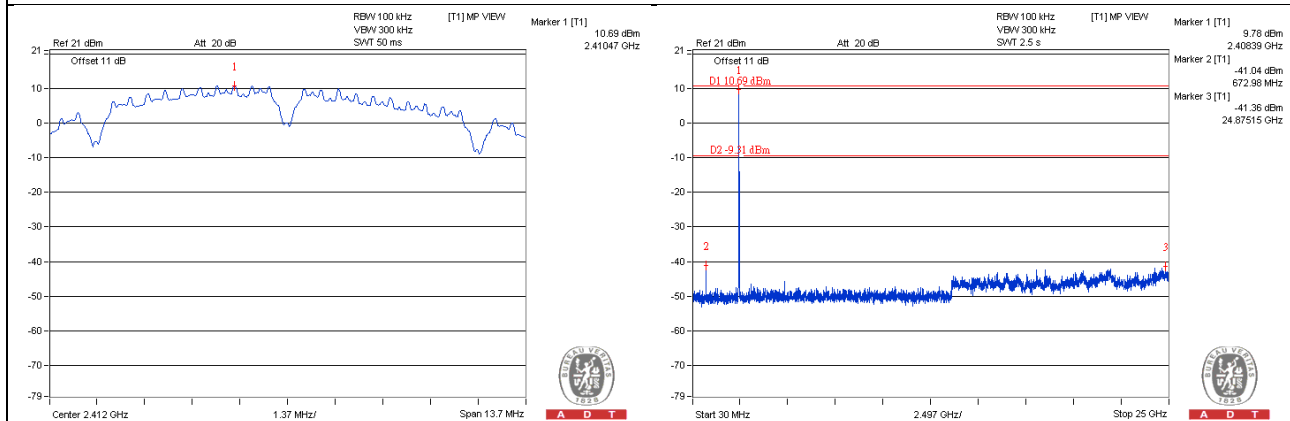
Same as Item 4.3.6

4.6.7 Test Results

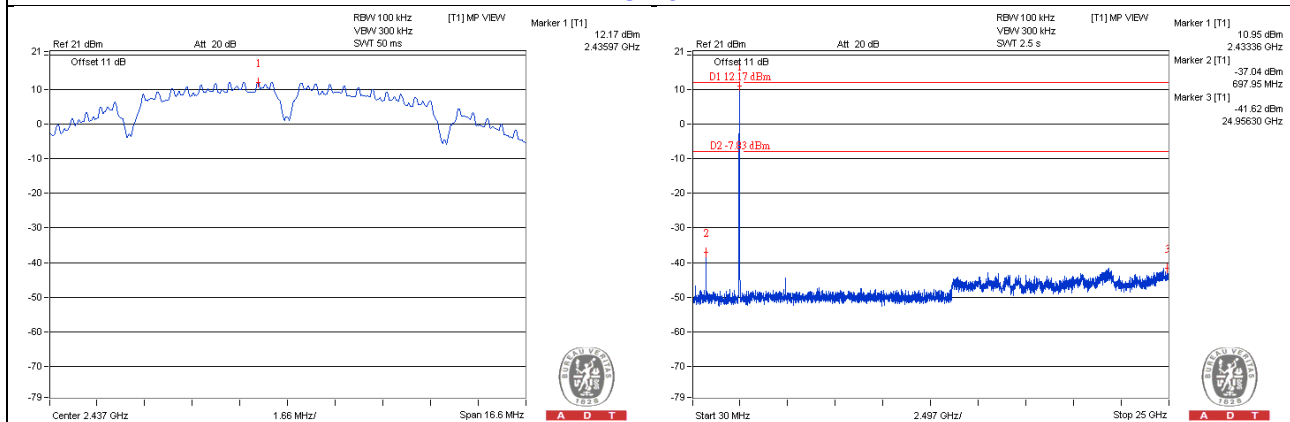
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

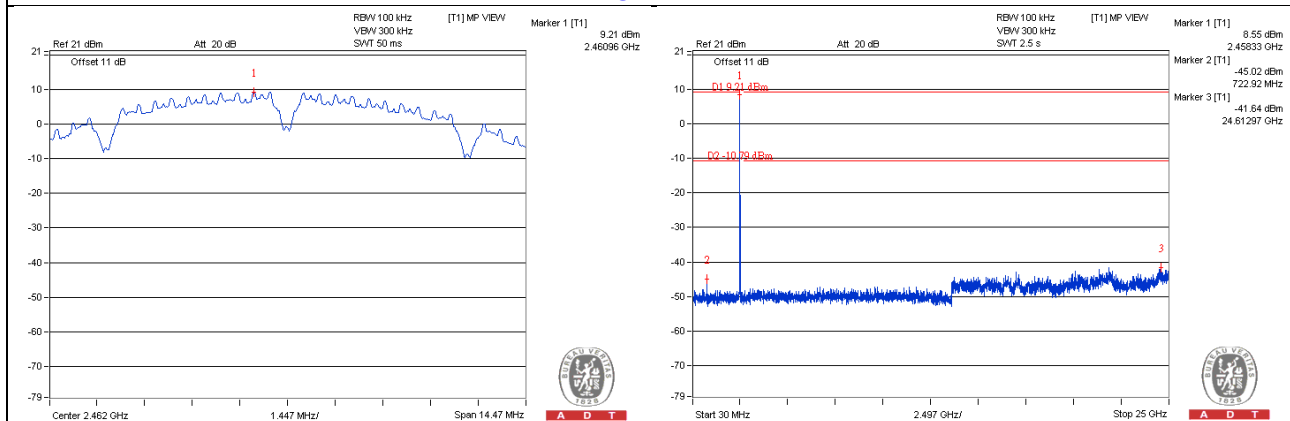
CH 1



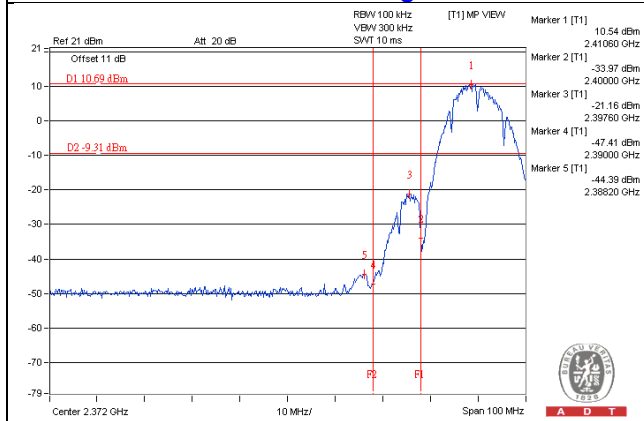
CH 6



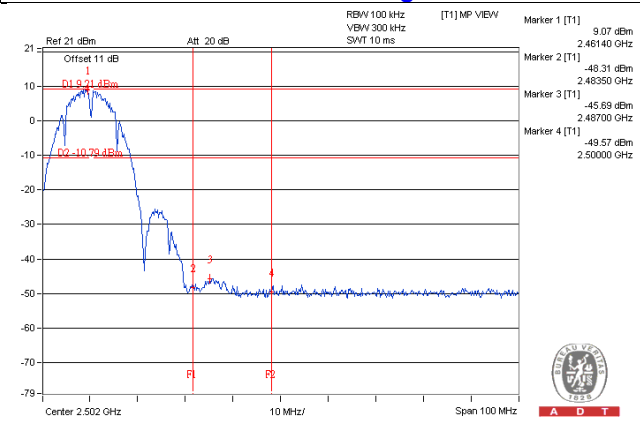
CH 11



CH 1 Band edge

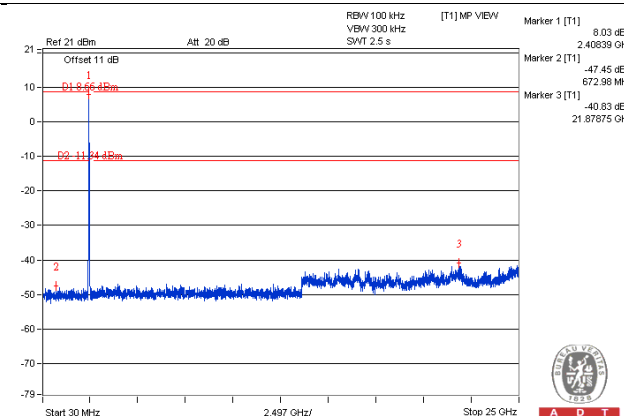
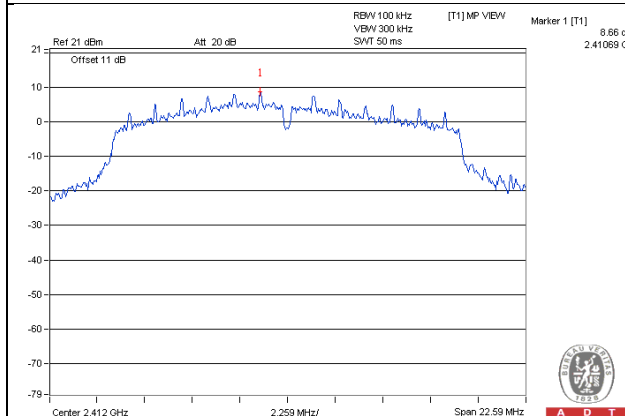


CH 11 Band edge

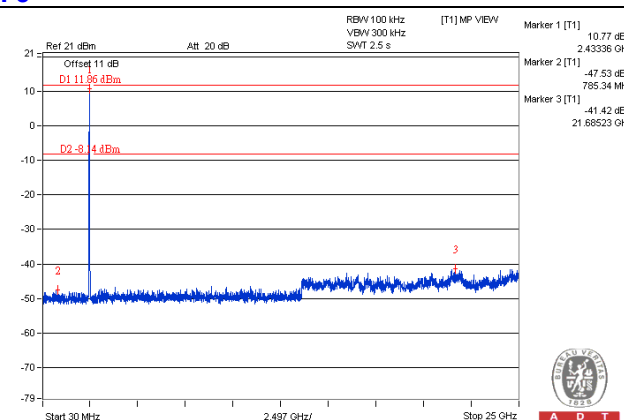
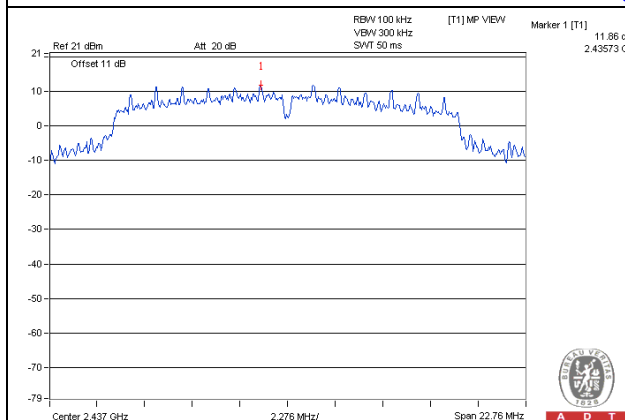


802.11g

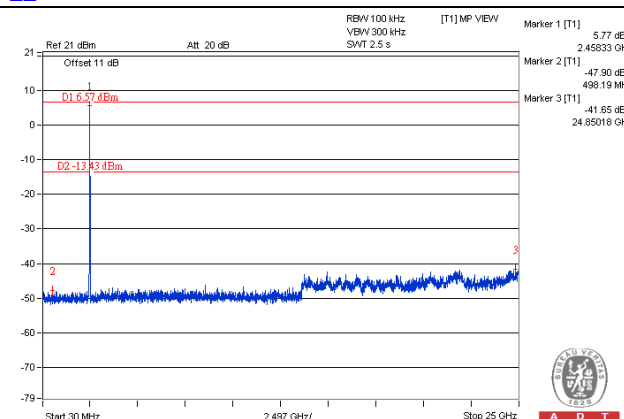
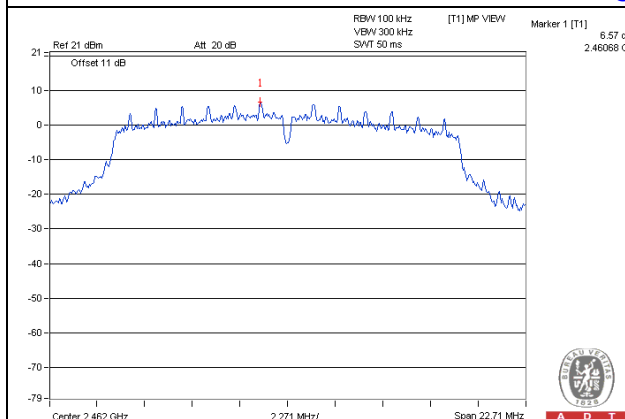
CH 1



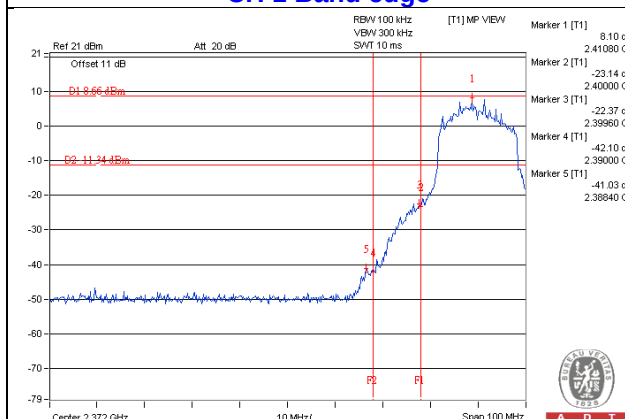
CH 6



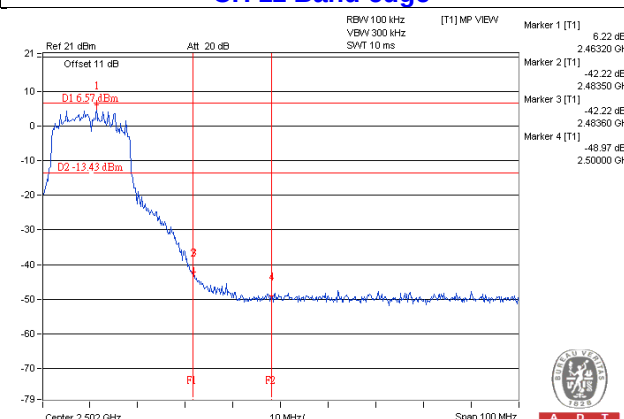
CH 11



CH 1 Band edge

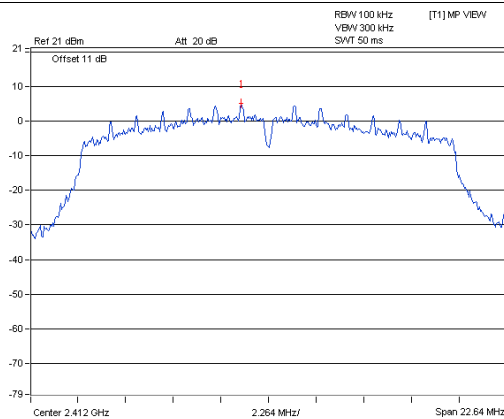


CH 11 Band edge

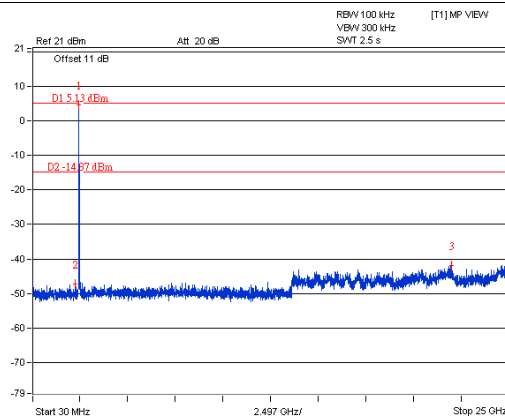


802.11n (HT20) CHAIN 0

CH 1

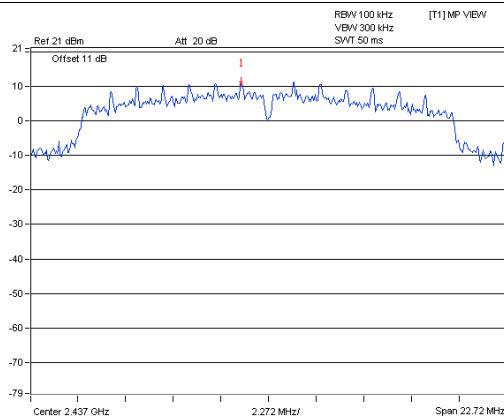


A D T

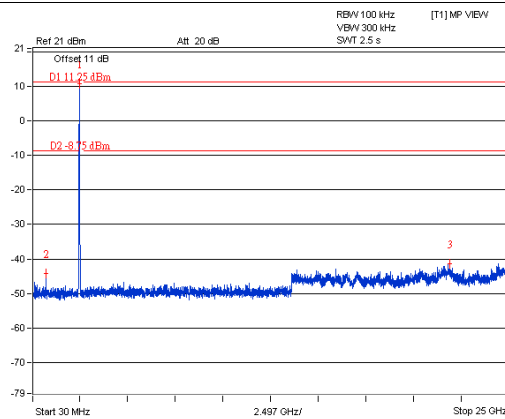


A D T

CH 6

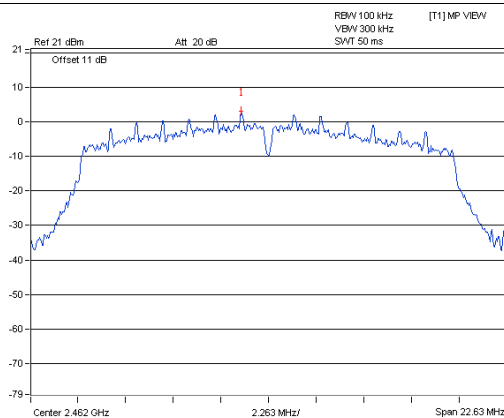


A D T

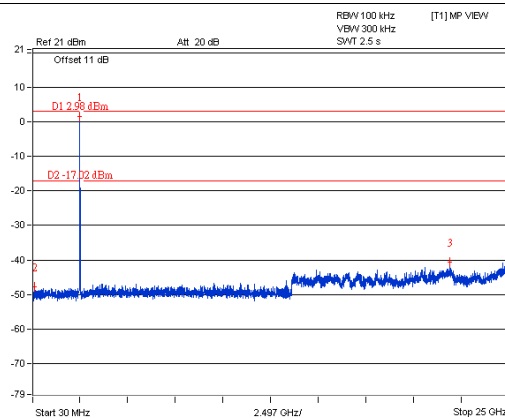


A D T

CH 11

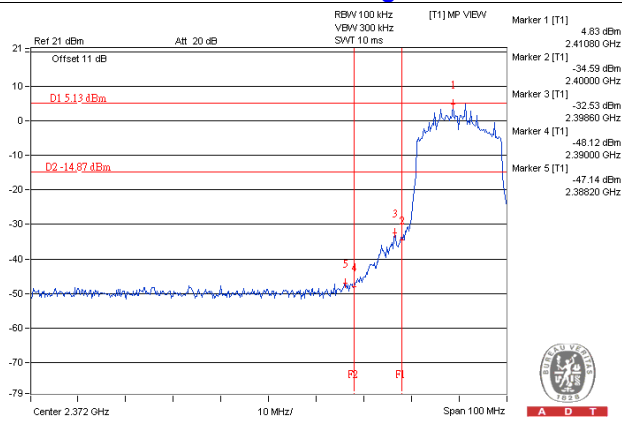


A D T

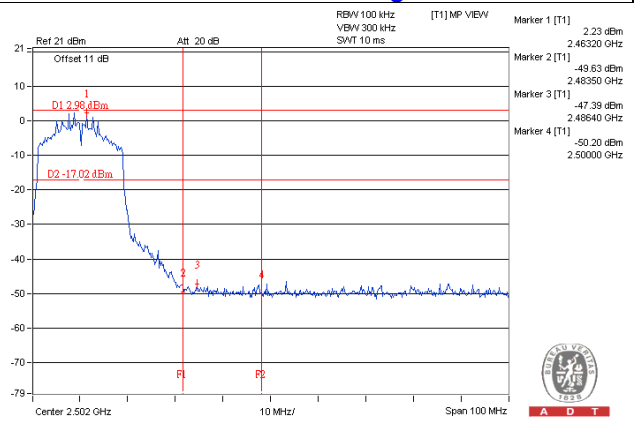


A D T

CH 1 Band edge

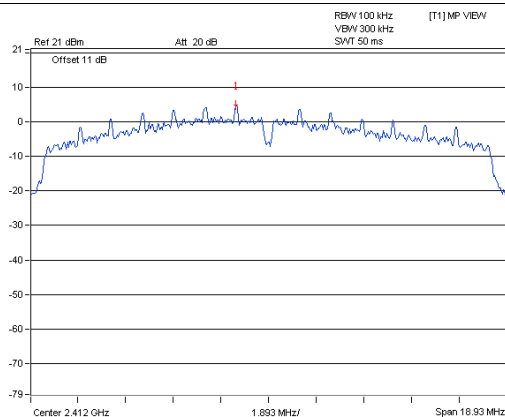


CH 11 Band edge

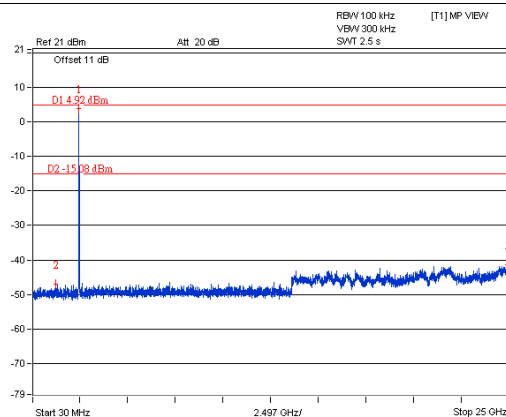


CHAIN 1

CH 1

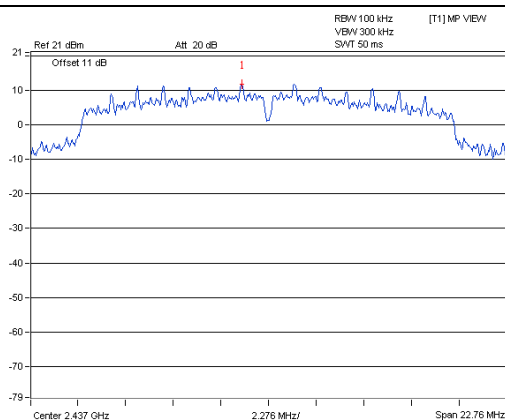


A D T

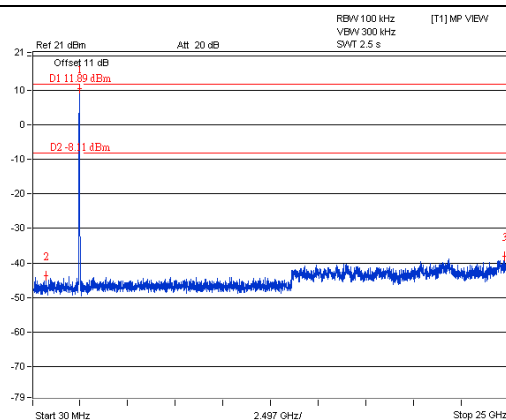


A D T

CH 6

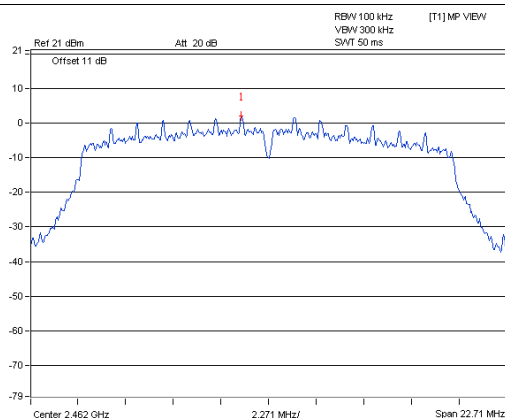


A D T

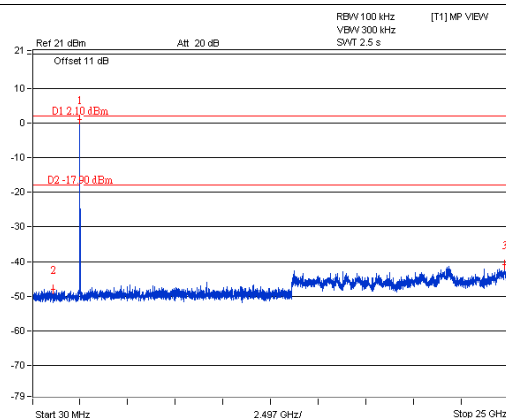


A D T

CH 11



A D T

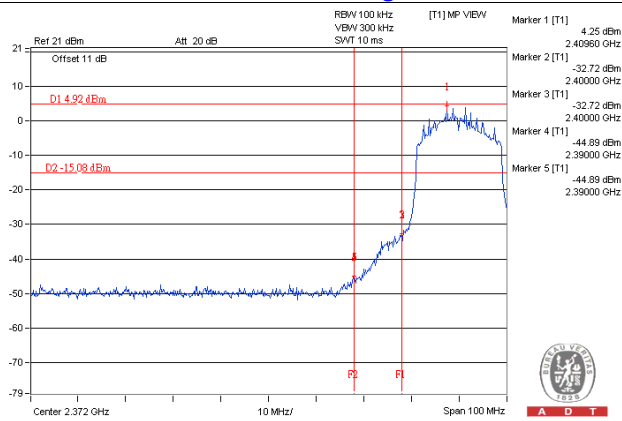


A D T

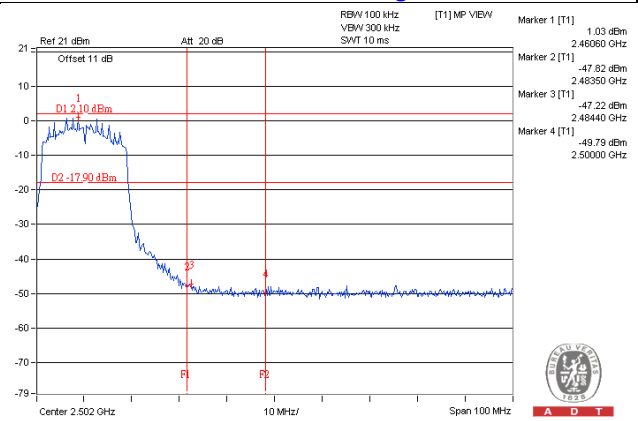


A D T

CH 1 Band edge

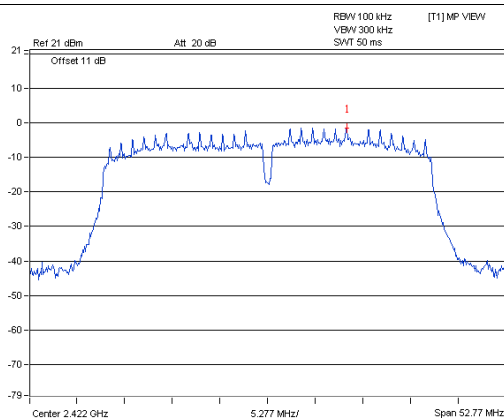


CH 11 Band edge

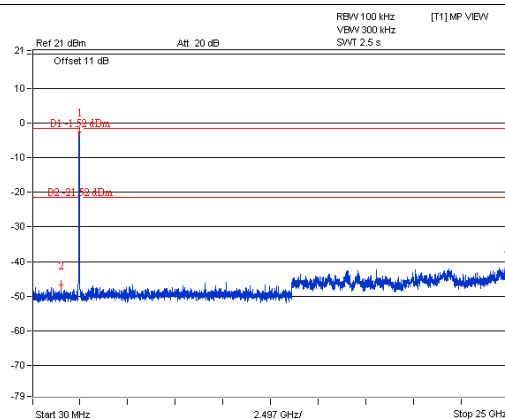


802.11n (HT40) CHAIN 0

CH 3

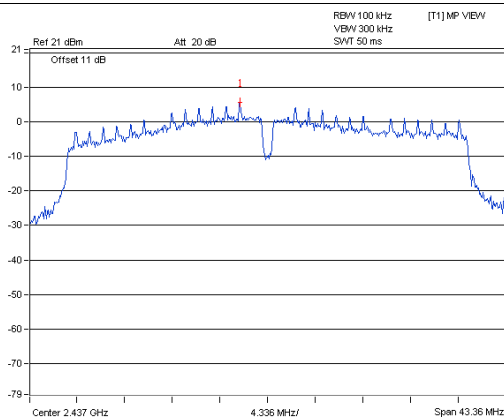


A D T

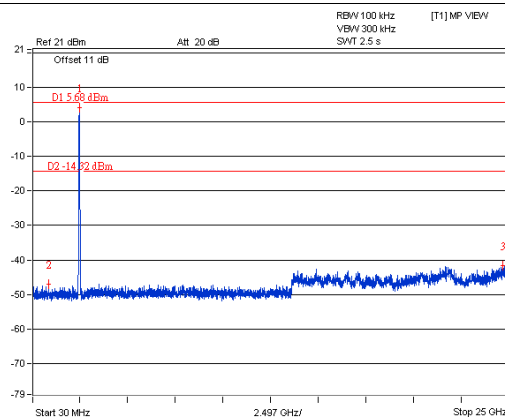


A D T

CH 6

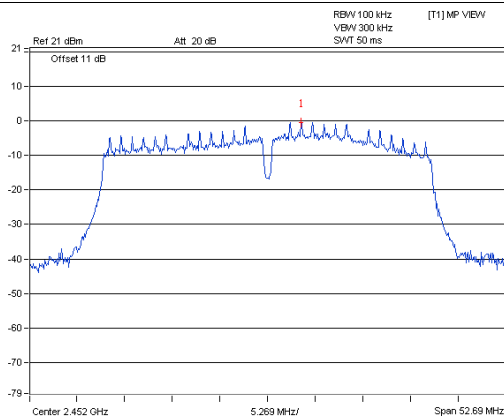


A D T

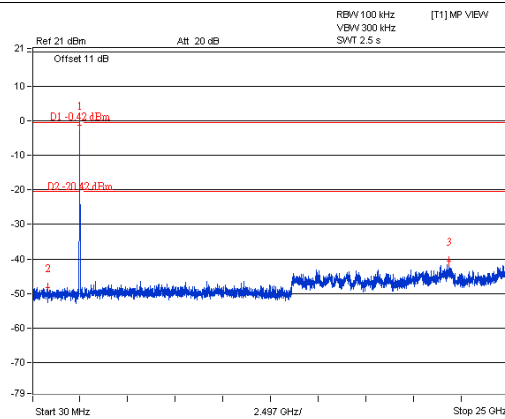


A D T

CH 9

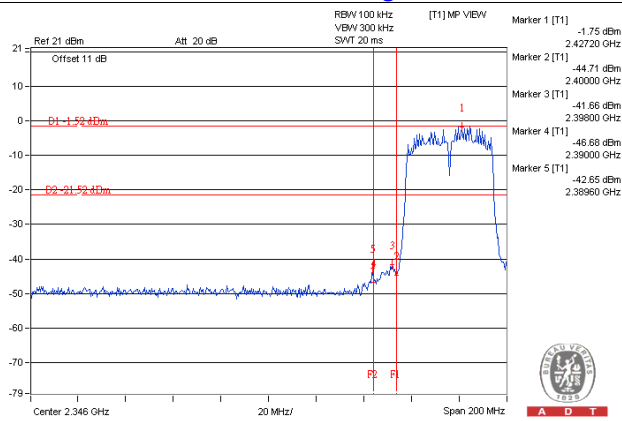


A D T

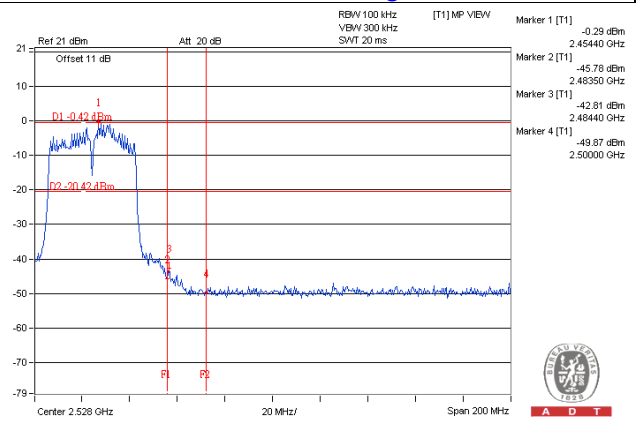


A D T

CH 3 Band edge

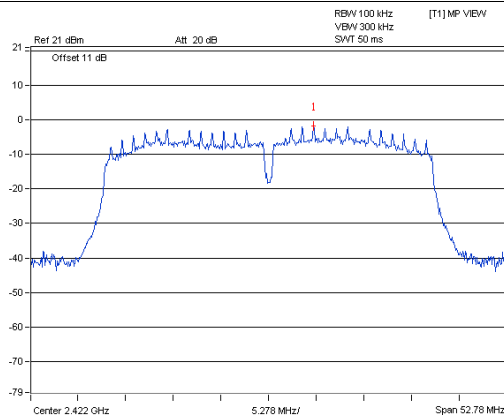


CH 9 Band edge

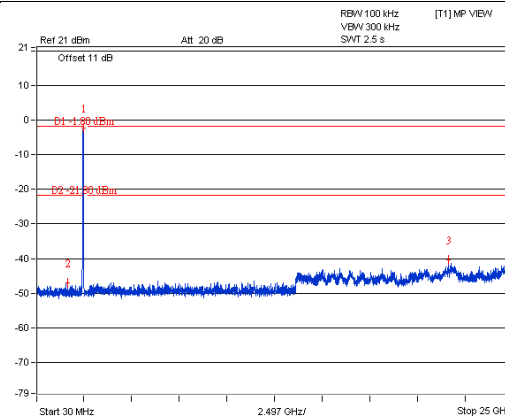


CHAIN 1

CH 3



A D T

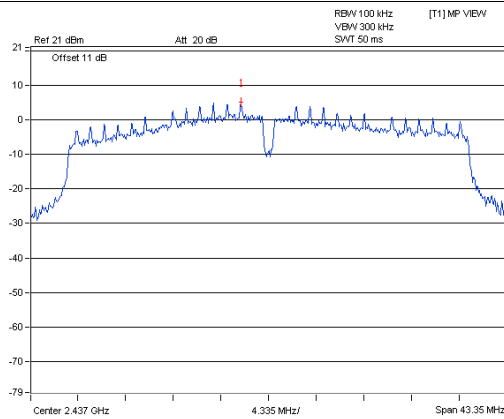


A D T

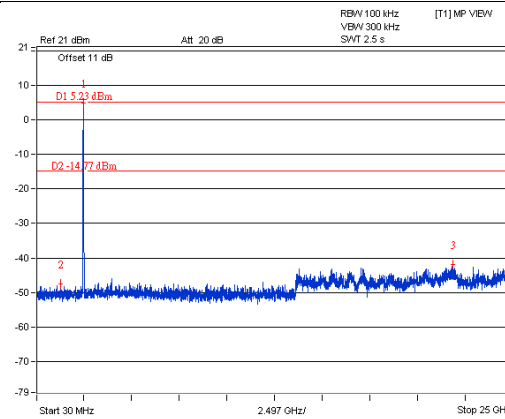
Marker 2 [T1] -47.12 dBm 1.59687 GHz

Marker 3 [T1] -40.49 dBm 21.66651 GHz

CH 6



A D T

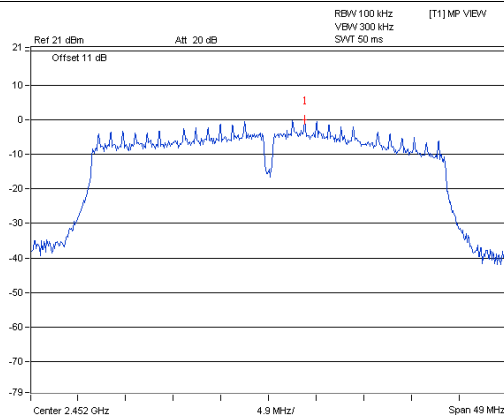


A D T

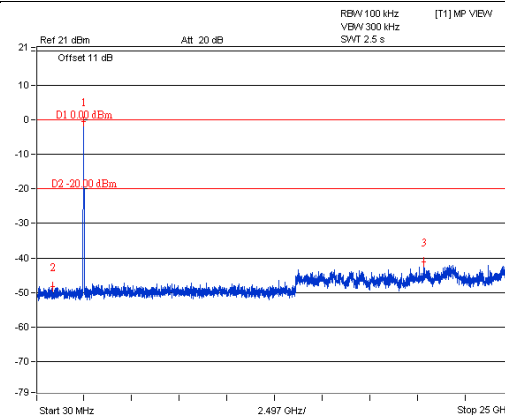
Marker 2 [T1] -47.50 dBm 1.22232 GHz

Marker 3 [T1] -41.97 dBm 21.88499 GHz

CH 9



A D T



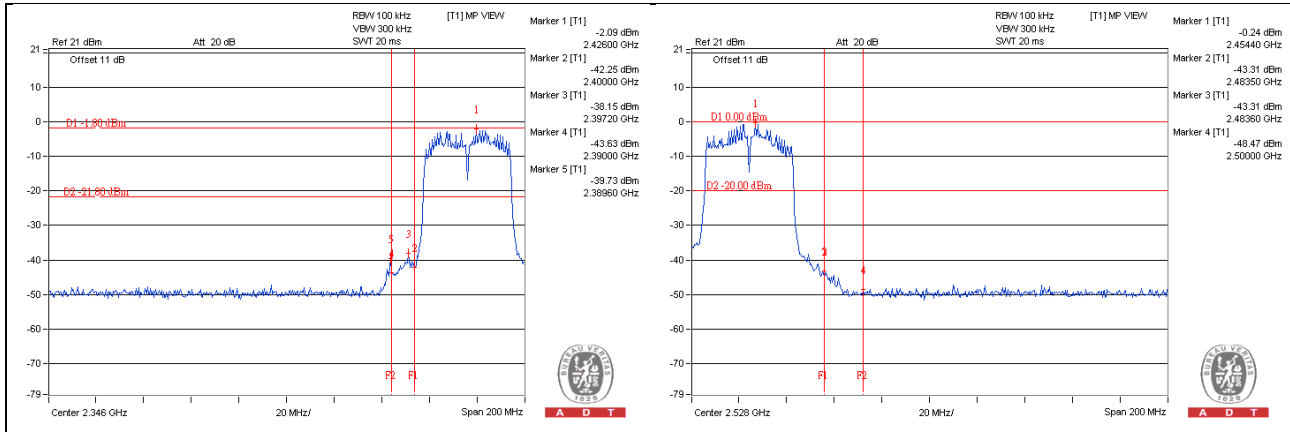
A D T

Marker 2 [T1] -48.24 dBm 829.04 MHz

Marker 3 [T1] -41.15 dBm 20.36807 GHz

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: 886-3-6668565

Fax: 886-3-6668323

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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 ---