

FCC Test Report

Report No.: RF160322E08

FCC ID: 2ABTEG2100

Test Model: Fios-G2100

Received Date: Mar. 22, 2016

Test Date: June 02 to July 06, 2016

Issued Date: Aug. 16, 2016

Applicant: Verizon Online LLC

Address: 1300 I Street NW, Room 400W, Washington, District of Columbia, 20005
United State

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

Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan R.O.C.

Test Location (1): E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan R.O.C.

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



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

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT (WLAN)	7
3.2 Description of Test Modes	10
3.2.1 Test Mode Applicability and Tested Channel Detail	11
3.3 Duty Cycle of Test Signal	13
3.4 Description of Support Units	14
3.4.1 Configuration of System under Test	15
3.5 General Description of Applied Standards	16
4 Test Types and Results	17
4.1 Radiated Emission and Bandedge Measurement	17
4.1.1 Limits of Radiated Emission and Bandedge Measurement	17
4.1.2 Test Instruments	18
4.1.3 Test Procedures	19
4.1.4 Deviation from Test Standard	19
4.1.5 Test Setup	20
4.1.6 EUT Operating Conditions	20
4.1.7 Test Results	21
4.2 Conducted Emission Measurement	34
4.2.1 Limits of Conducted Emission Measurement	34
4.2.2 Test Instruments	34
4.2.3 Test Procedures	35
4.2.4 Deviation from Test Standard	35
4.2.5 Test Setup	35
4.2.6 EUT Operating Conditions	35
4.2.7 Test Results	36
4.3 6dB Bandwidth Measurement	38
4.3.1 Limits of 6dB Bandwidth Measurement	38
4.3.2 Test Setup	38
4.3.3 Test Instruments	38
4.3.4 Test Procedure	38
4.3.5 Deviation from Test Standard	38
4.3.6 EUT Operating Conditions	38
4.3.7 Test Result	39
4.4 Conducted Output Power Measurement	41
4.4.1 Limits of Conducted Output Power Measurement	41
4.4.2 Test Setup	41
4.4.3 Test Instruments	41
4.4.4 Test Procedures	41
4.4.5 Deviation from Test Standard	41
4.4.6 EUT Operating Conditions	41
4.4.7 Test Results	42
4.5 Power Spectral Density Measurement	43
4.5.1 Limits of Power Spectral Density Measurement	43
4.5.2 Test Setup	43
4.5.3 Test Instruments	43
4.5.4 Test Procedure	43
4.5.5 Deviation from Test Standard	43
4.5.6 EUT Operating Condition	43

4.5.7 Test Results	44
4.6 Conducted Out of Band Emission Measurement	47
4.6.1 Limits of Conducted Out of Band Emission Measurement.....	47
4.6.2 Test Setup.....	47
4.6.3 Test Instruments	47
4.6.4 Test Procedure	47
4.6.5 Deviation from Test Standard	47
4.6.6 EUT Operating Condition	47
4.6.7 Test Results	47
5 Pictures of Test Arrangements.....	60
Appendix – Information on the Testing Laboratories	61

Release Control Record

Issue No.	Description	Date Issued
RF160322E08	Original release.	Aug. 16, 2016

1 Certificate of Conformity

Product: Fios-G2100

Brand: Verizon

Test Model: Fios-G2100

Sample Status: R&D SAMPLE

Applicant: Verizon Online LLC

Test Date: June 02 to July 06, 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:

Aug. 16, 2016

Claire Kuan / Specialist

Approved by :



Date:

Aug. 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 -9.29dB at 24.00000MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2390.00MHz and 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(MHF) not a standard connector.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 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 (WLAN)

Product	Fios-G2100
Brand	Verizon
Test Model	Fios-G2100
Status of EUT	R&D SAMPLE
Power Supply Rating	DC 19V from Adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
Operating Frequency	2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.18 ~ 5.24GHz and 5.745 ~ 5.825GHz
Number of Channel	2.4GHz: 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 5GHz: 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	2.4GHz: 985.723mW 5GHz: CDD Mode: 5.18GHz ~ 5.24GHz: 813.01mW 5.745GHz ~ 5.825GHz: 675.244mW SDM Mode: 5.18GHz ~ 5.24GHz: 813.01mW 5.745GHz ~ 5.825GHz: 675.244Mw Beamforming Mode: 5.18GHz ~ 5.24GHz: 813.01mW 5.745GHz ~ 5.825GHz: 675.244mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Cable Supplied	NA

Note:

1. Simultaneously transmission condition.

Condition	Technology				
1	WLAN (2.4GHz)	WLAN (5GHz)	Zigbee	Z-wave	DECT 6.0

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

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

WLAN					
5GHz					
Antenna No.	Transmitter Circuit	Antenna Gain(dBi)	Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
1	Chain (0)	4.37	5150~5250	PCB	i-pex(MHF)
		4.92	5250~5350		
		4.23	5470~5725		
		4.23	5725~5850		
2	Chain (1)	4.13	5150~5250	PCB	i-pex(MHF)
		4.06	5250~5350		
		4.03	5470~5725		
		4.03	5725~5850		
3	Chain (2)	3.01	5150~5250	PCB	i-pex(MHF)
		3.72	5250~5350		
		4.79	5470~5725		
		4.71	5725~5850		
4	Chain (3)	3.87	5150~5250	PCB	i-pex(MHF)
		4.26	5250~5350		
		4.61	5470~5725		
		4.3	5725~5850		
2.4GHz					
Antenna No.	Transmitter Circuit	Antenna Gain(dBi)	Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
5	Chain (0)	3.9	2400~2483.5	PCB	i-pex(MHF)
6	Chain (1)	5.1			
7	Chain (2)	3.95			
8	Chain (3)	3.51			
DECT					
Antenna No.	Antenna Gain(dBi)		Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
9	5.46		1920~1930	Embedded	NA
10	5.46		1920~1930	Embedded	NA
Z-wave					
Antenna No.	Antenna Gain(dBi)		Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
11	1.02		908~916	On Board Printed	NA
Zigbee					
Antenna No.	Antenna Gain(dBi)		Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
12	4.23		2400~2483.5	On Board Printed	NA
Note 1. For WLAN 2.4GHz will fix transmission on Chain (0), Chain (1) and Chain (2).					

Note 1. For WLAN 2.4GHz will fix transmission on Chain (0), Chain (1) and Chain (2).

3. The EUT must be supplied with a adapter as following table:

Brand	Model No.	Spec.	Remark
Verizon	ADP-57AR A	Input: 105-125Vac, 1.5A, 60Hz AC input cable: Unshielded, 3ft Output: 19Vdc, 3.0A DC output cable: Unshielded, 1.8m	DELTA

4. The EUT incorporates a MIMO function.

2.4GHz			
Modulation Mode	Data Rate (MCS)	TX & RX Configuration	
802.11b	1 ~ 11Mbps	3TX	4RX
802.11g	6 ~ 54Mbps	3TX	4RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	3TX	4RX
	MCS 8~15	3TX	4RX
	MCS 16~23	3TX	4RX
VHT20	MCS0~8 Nss=1	3TX	4RX
	MCS0~8 Nss=2	3TX	4RX
	MCS0~9 Nss=3	3TX	4RX
VHT40	MCS0~9 Nss=1	3TX	4RX
	MCS0~9 Nss=2	3TX	4RX
	MCS0~9 Nss=3	3TX	4RX
5GHz			
Modulation Mode	Data Rate (MCS)	TX & RX Configuration	
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11ac (VHT20)	MCS0~8 Nss=1	4TX	4RX
	MCS0~8 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~8 Nss=4	4TX	4RX
802.11ac (VHT40) & 802.11ac (VHT80)	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~9 Nss=4	4TX	4RX

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 802.11 b/g modulation mode.

5. 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), VHT20:

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), VHT40:

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

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	6	DSSS	DBPSK	1

Power Line Conducted Emission Test:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	6	DSSS	DBPSK	1

Antenna Port Conducted Measurement:

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

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

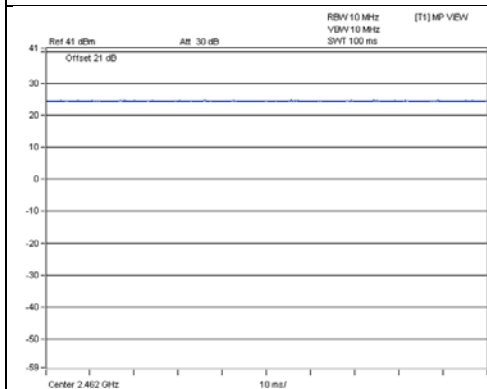
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	20deg. C, 70%RH	120Vac, 60Hz	Russell Yeh
RE<1G	20deg. C, 70%RH	120Vac, 60Hz	Russell Yeh
PLC	24deg. C, 62%RH	120Vac, 60Hz	Jyunchun Lin
APCM	18deg. C, 64%RH	120Vac, 60Hz	Anderson Chen

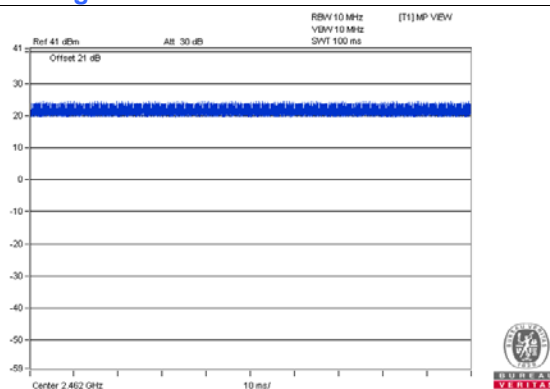
3.3 Duty Cycle of Test Signal

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

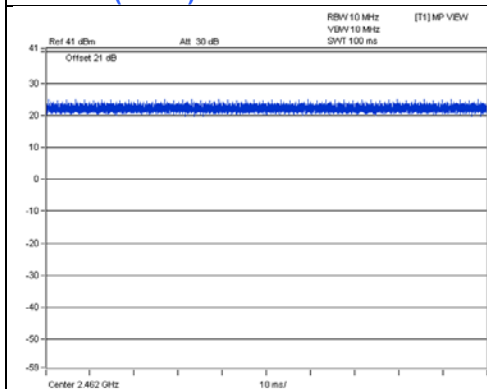
802.11b



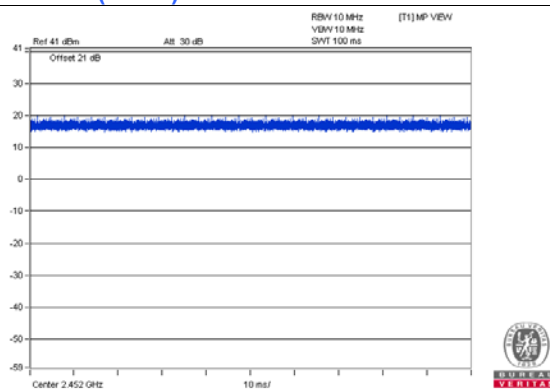
802.11g



802.11n (HT20)



802.11n (HT40)



3.4 Description of Support Units

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

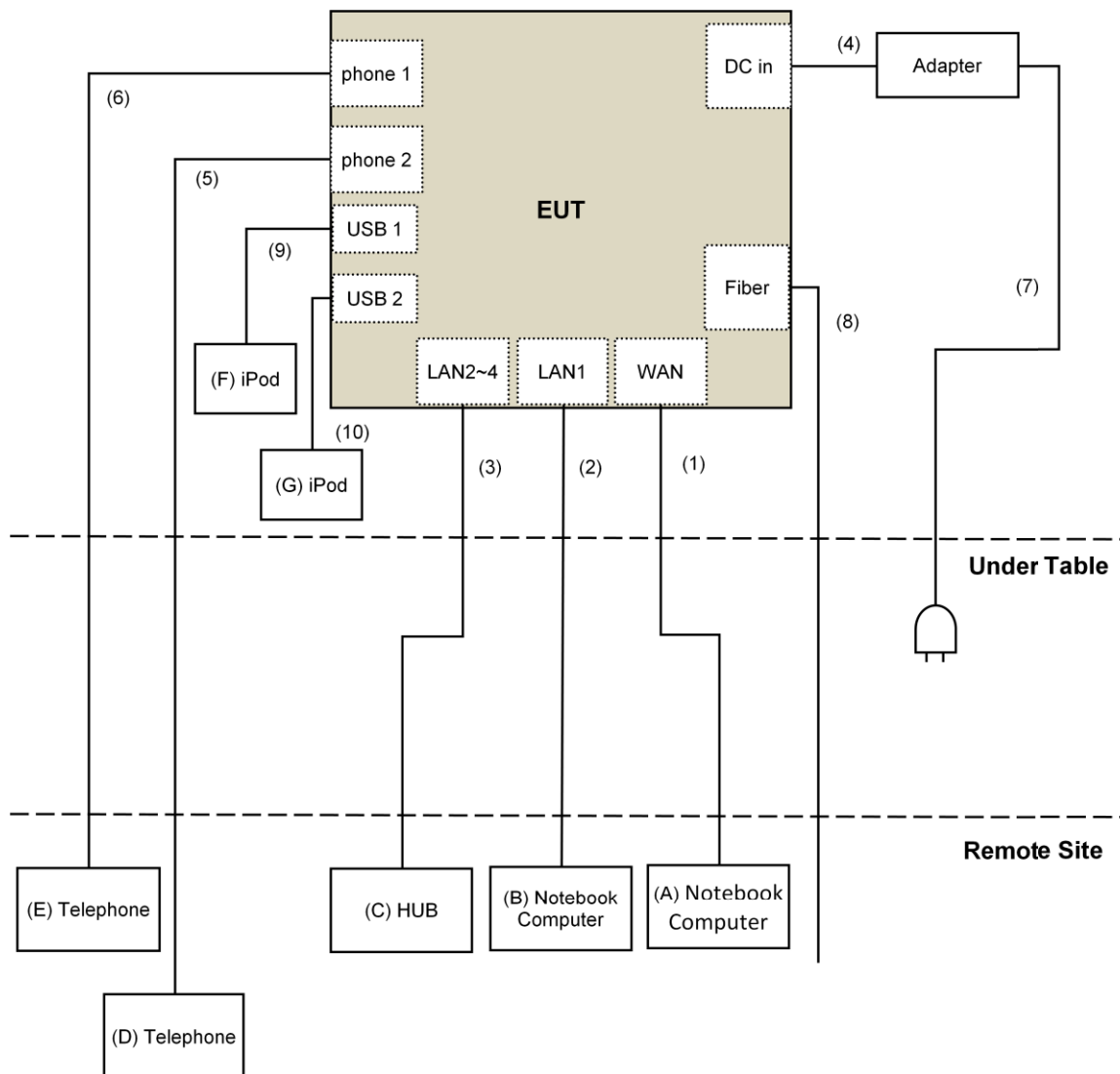
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook Computer	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Notebook Computer	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D.	Telephone	DAISHO	DS-03	NA	NA	Provided by Lab
E.	Telephone	ROMEO	TE-812	97280903	NA	Provided by Lab
F.	iPod	Apple	MC749TA/A	CC4DMFJUDFDM	NA	Provided by Lab
G.	iPod	Apple	MC749TA/A	CC4DN25WDFDM	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45	1	10	No	0	Provided by Lab
2.	RJ-45	1	10	No	0	Provided by Lab
3.	RJ-45	3	10	No	0	Provided by Lab
4.	DC	1	1.8	No	0	Supplied by client
5.	RJ-11	1	10	No	0	Provided by Lab
6.	RJ-11	1	10	No	0	Provided by Lab
7.	AC	1	3ft	No	0	Provided by Lab
8.	Fiber	1	10	No	0	Provided by Lab
9.	USB	1	0.1	Yes	0	Provided by Lab
10.	USB	1	0.1	Yes	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.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier ^(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 02, 2016	Apr. 01, 2017
Horn Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 30, 2016	Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017
Power meter Anritsu	ML2495A	1014008	May 05, 2016	May 04, 2017
Power sensor Anritsu	MA2411B	0917122	May 05, 2016	May 04, 2017

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. 4.
5. The FCC Site Registration No. is 292998
6. The CANADA Site Registration No. is 20331-2
7. Tested Date: June 02 to July 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:

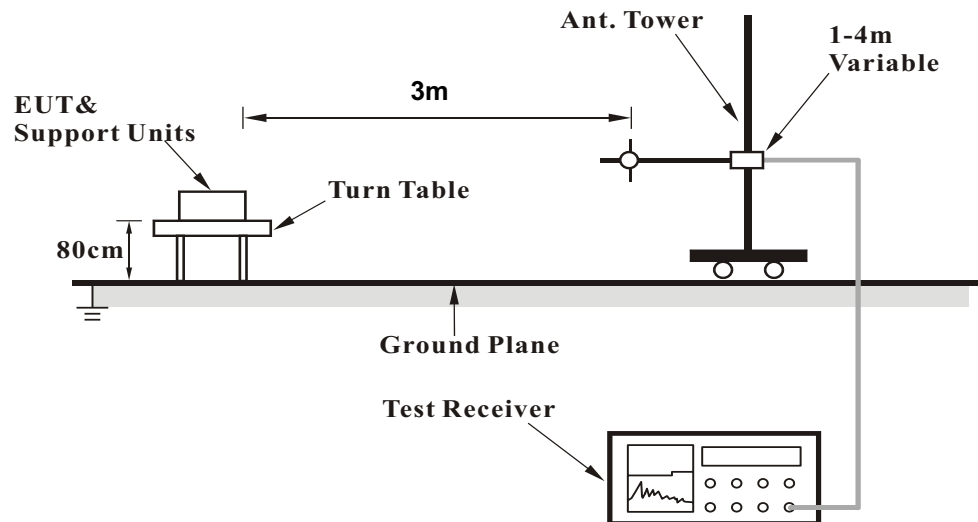
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

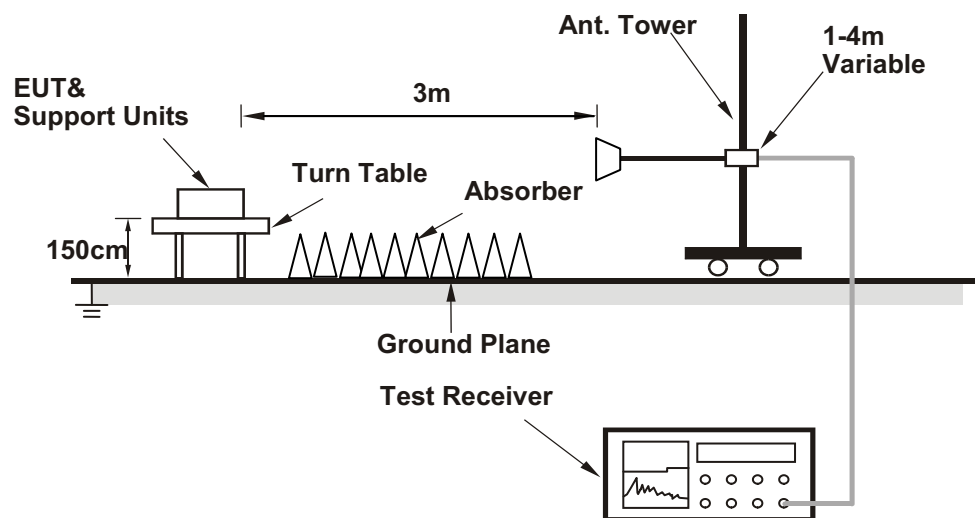
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

1. Connect the EUT with the Notebook Computer which is placed on remote site.
2. Controlling software (Telnet paste 2.4G.txt command) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.1 PK	74.0	-11.9	2.02 H	230	67.7	-5.6
2	2390.00	50.9 AV	54.0	-3.1	2.02 H	230	56.5	-5.6
3	*2412.00	117.3 PK			2.02 H	230	122.8	-5.5
4	*2412.00	113.3 AV			2.02 H	230	118.8	-5.5
5	4824.00	52.8 PK	74.0	-21.2	1.74 H	297	51.9	0.9
6	4824.00	43.6 AV	54.0	-10.4	1.74 H	297	42.7	0.9
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	66.8 PK	74.0	-7.2	1.00 V	255	72.4	-5.6
2	2390.00	53.9 AV	54.0	-0.1	1.00 V	255	59.5	-5.6
3	*2412.00	119.0 PK			1.00 V	255	124.5	-5.5
4	*2412.00	114.9 AV			1.00 V	255	120.4	-5.5
5	4824.00	53.1 PK	74.0	-20.9	1.75 V	270	52.2	0.9
6	4824.00	43.9 AV	54.0	-10.1	1.75 V	270	43.0	0.9

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	62.1 PK	74.0	-11.9	2.06 H	88	67.7	-5.6
2	2390.00	50.2 AV	54.0	-3.8	2.06 H	88	55.8	-5.6
3	*2437.00	123.8 PK			2.06 H	88	129.2	-5.4
4	*2437.00	120.1 AV			2.06 H	88	125.5	-5.4
5	2483.50	65.1 PK	74.0	-8.9	2.06 H	88	70.4	-5.3
6	2483.50	52.2 AV	54.0	-1.8	2.06 H	88	57.5	-5.3
7	4874.00	52.8 PK	74.0	-21.2	1.78 H	302	51.8	1.0
8	4874.00	43.7 AV	54.0	-10.3	1.78 H	302	42.7	1.0
9	7311.00	56.6 PK	74.0	-17.4	1.56 H	21	49.0	7.6
10	7311.00	45.7 AV	54.0	-8.3	1.56 H	21	38.1	7.6

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	62.4 PK	74.0	-11.6	1.71 V	235	68.0	-5.6
2	2390.00	51.4 AV	54.0	-2.6	1.71 V	235	57.0	-5.6
3	*2437.00	125.0 PK			1.71 V	235	130.4	-5.4
4	*2437.00	121.3 AV			1.71 V	235	126.7	-5.4
5	2483.50	65.1 PK	74.0	-8.9	1.71 V	235	70.4	-5.3
6	2483.50	53.4 AV	54.0	-0.6	1.71 V	235	58.7	-5.3
7	4874.00	53.2 PK	74.0	-20.8	1.75 V	258	52.2	1.0
8	4874.00	44.1 AV	54.0	-9.9	1.75 V	258	43.1	1.0
9	7311.00	59.3 PK	74.0	-14.7	1.58 V	235	51.7	7.6
10	7311.00	48.9 AV	54.0	-5.1	1.58 V	235	41.3	7.6

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	119.2 PK			2.02 H	81	124.5	-5.3
2	*2462.00	115.3 AV			2.02 H	81	120.6	-5.3
3	2483.50	67.2 PK	74.0	-6.8	2.02 H	81	72.5	-5.3
4	2483.50	52.2 AV	54.0	-1.8	2.02 H	81	57.5	-5.3
5	4924.00	52.1 PK	74.0	-21.9	1.82 H	296	50.8	1.3
6	4924.00	42.7 AV	54.0	-11.3	1.82 H	296	41.4	1.3
7	7386.00	56.9 PK	74.0	-17.1	1.52 H	36	49.2	7.7
8	7386.00	46.2 AV	54.0	-7.8	1.52 H	36	38.5	7.7

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	119.6 PK			1.40 V	256	124.9	-5.3
2	*2462.00	115.5 AV			1.40 V	256	120.8	-5.3
3	2483.50	64.6 PK	74.0	-9.4	1.40 V	256	69.9	-5.3
4	2483.50	53.9 AV	54.0	-0.1	1.40 V	256	59.2	-5.3
5	4924.00	53.7 PK	74.0	-20.3	1.69 V	257	52.4	1.3
6	4924.00	44.4 AV	54.0	-9.6	1.69 V	257	43.1	1.3
7	7386.00	58.9 PK	74.0	-15.1	1.52 V	246	51.2	7.7
8	7386.00	48.5 AV	54.0	-5.5	1.52 V	246	40.8	7.7

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	68.9 PK	74.0	-5.1	2.13 H	74	74.5	-5.6
2	2390.00	52.6 AV	54.0	-1.4	2.13 H	74	58.2	-5.6
3	*2412.00	118.2 PK			2.13 H	74	123.7	-5.5
4	*2412.00	107.8 AV			2.13 H	74	113.3	-5.5
5	4824.00	45.9 PK	74.0	-28.1	1.73 H	311	45.0	0.9
6	4824.00	35.5 AV	54.0	-18.5	1.73 H	311	34.6	0.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.7 PK	74.0	-4.3	1.53 V	205	75.3	-5.6
2	2390.00	53.2 AV	54.0	-0.8	1.53 V	205	58.8	-5.6
3	*2412.00	119.0 PK			1.53 V	205	124.5	-5.5
4	*2412.00	108.2 AV			1.53 V	205	113.7	-5.5
5	4824.00	47.2 PK	74.0	-26.8	1.78 V	263	46.3	0.9
6	4824.00	36.5 AV	54.0	-17.5	1.78 V	263	35.6	0.9

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	60.8 PK	74.0	-13.2	2.09 H	105	66.4	-5.6
2	2390.00	46.2 AV	54.0	-7.8	2.09 H	105	51.8	-5.6
3	*2437.00	116.5 PK			2.09 H	105	121.9	-5.4
4	*2437.00	108.5 AV			2.09 H	105	113.9	-5.4
5	2483.50	64.2 PK	74.0	-9.8	2.09 H	105	69.5	-5.3
6	2483.50	48.7 AV	54.0	-5.3	2.09 H	105	54.0	-5.3
7	4874.00	50.1 PK	74.0	-23.9	1.80 H	298	49.1	1.0
8	4874.00	38.2 AV	54.0	-15.8	1.80 H	298	37.2	1.0
9	7311.00	48.7 PK	74.0	-25.3	1.60 H	16	41.1	7.6
10	7311.00	39.4 AV	54.0	-14.6	1.60 H	16	31.8	7.6

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	67.2 PK	74.0	-6.8	1.89 V	179	72.8	-5.6
2	2390.00	51.1 AV	54.0	-2.9	1.89 V	179	56.7	-5.6
3	*2437.00	124.6 PK			1.89 V	179	130.0	-5.4
4	*2437.00	114.5 AV			1.89 V	179	119.9	-5.4
5	2483.50	73.2 PK	74.0	-0.8	1.89 V	179	78.5	-5.3
6	2483.50	53.9 AV	54.0	-0.1	1.89 V	179	59.2	-5.3
7	4874.00	51.3 PK	74.0	-22.7	1.70 V	245	50.3	1.0
8	4874.00	40.5 AV	54.0	-13.5	1.70 V	245	39.5	1.0
9	7311.00	52.1 PK	74.0	-21.9	1.61 V	224	44.5	7.6
10	7311.00	42.4 AV	54.0	-11.6	1.61 V	224	34.8	7.6

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	118.2 PK			2.08 H	104	123.5	-5.3
2	*2462.00	108.1 AV			2.08 H	104	113.4	-5.3
3	2483.50	66.8 PK	74.0	-7.2	2.08 H	104	72.1	-5.3
4	2483.50	51.7 AV	54.0	-2.3	2.08 H	104	57.0	-5.3
5	4924.00	46.1 PK	74.0	-27.9	1.77 H	287	44.8	1.3
6	4924.00	35.6 AV	54.0	-18.4	1.77 H	287	34.3	1.3
7	7386.00	47.6 PK	74.0	-26.4	1.55 H	13	39.9	7.7
8	7386.00	39.2 AV	54.0	-14.8	1.55 H	13	31.5	7.7

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	118.5 PK			1.95 V	180	123.8	-5.3
2	*2462.00	109.1 AV			1.95 V	180	114.4	-5.3
3	2483.50	70.1 PK	74.0	-3.9	1.95 V	180	75.4	-5.3
4	2483.50	53.8 AV	54.0	-0.2	1.95 V	180	59.1	-5.3
5	4924.00	47.1 PK	74.0	-26.9	1.79 V	268	45.8	1.3
6	4924.00	36.2 AV	54.0	-17.8	1.79 V	268	34.9	1.3
7	7386.00	48.8 PK	74.0	-25.2	1.63 V	244	41.1	7.7
8	7386.00	39.3 AV	54.0	-14.7	1.63 V	244	31.6	7.7

REMARKS:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.8 PK	74.0	-6.2	2.08 H	69	73.4	-5.6
2	2390.00	51.3 AV	54.0	-2.7	2.08 H	69	56.9	-5.6
3	*2412.00	117.3 PK			2.08 H	69	122.8	-5.5
4	*2412.00	106.4 AV			2.08 H	69	111.9	-5.5
5	4824.00	46.2 PK	74.0	-27.8	1.88 H	307	45.3	0.9
6	4824.00	35.7 AV	54.0	-18.3	1.88 H	307	34.8	0.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.8 PK	74.0	-2.2	1.48 V	253	77.4	-5.6
2	2390.00	53.7 AV	54.0	-0.3	1.48 V	253	59.3	-5.6
3	*2412.00	118.6 PK			1.48 V	253	124.1	-5.5
4	*2412.00	107.1 AV			1.48 V	253	112.6	-5.5
5	4824.00	47.3 PK	74.0	-26.7	1.76 V	269	46.4	0.9
6	4824.00	36.6 AV	54.0	-17.4	1.76 V	269	35.7	0.9

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	65.2 PK	74.0	-8.8	2.02 H	95	70.8	-5.6
2	2390.00	48.4 AV	54.0	-5.6	2.02 H	95	54.0	-5.6
3	*2437.00	113.7 PK			2.02 H	95	119.1	-5.4
4	*2437.00	105.2 AV			2.02 H	95	110.6	-5.4
5	2483.50	66.4 PK	74.0	-7.6	2.02 H	95	71.7	-5.3
6	2483.50	49.8 AV	54.0	-4.2	2.02 H	95	55.1	-5.3
7	4874.00	49.6 PK	74.0	-24.4	1.85 H	300	48.6	1.0
8	4874.00	37.8 AV	54.0	-16.2	1.85 H	300	36.8	1.0
9	7311.00	49.4 PK	74.0	-24.6	1.60 H	16	41.8	7.6
10	7311.00	39.8 AV	54.0	-14.2	1.60 H	16	32.2	7.6

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	1.04 V	250	74.9	-5.6
2	2390.00	51.1 AV	54.0	-2.9	1.04 V	250	56.7	-5.6
3	*2437.00	123.2 PK			1.04 V	250	128.6	-5.4
4	*2437.00	111.7 AV			1.04 V	250	117.1	-5.4
5	2483.50	71.1 PK	74.0	-2.9	1.04 V	250	76.4	-5.3
6	2483.50	53.5 AV	54.0	-0.5	1.04 V	250	58.8	-5.3
7	4874.00	50.5 PK	74.0	-23.5	1.76 V	253	49.5	1.0
8	4874.00	39.9 AV	54.0	-14.1	1.76 V	253	38.9	1.0
9	7311.00	51.7 PK	74.0	-22.3	1.62 V	236	44.1	7.6
10	7311.00	42.1 AV	54.0	-11.9	1.62 V	236	34.5	7.6

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	111.8 PK			1.96 H	97	117.1	-5.3
2	*2462.00	103.3 AV			1.96 H	97	108.6	-5.3
3	2483.50	66.1 PK	74.0	-7.9	1.96 H	97	71.4	-5.3
4	2483.50	49.3 AV	54.0	-4.7	1.96 H	97	54.6	-5.3
5	4924.00	46.4 PK	74.0	-27.6	1.80 H	312	45.1	1.3
6	4924.00	35.6 AV	54.0	-18.4	1.80 H	312	34.3	1.3
7	7386.00	47.3 PK	74.0	-26.7	1.64 H	22	39.6	7.7
8	7386.00	38.9 AV	54.0	-15.1	1.64 H	22	31.2	7.7

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	120.0 PK			1.73 V	181	125.3	-5.3
2	*2462.00	109.1 AV			1.73 V	181	114.4	-5.3
3	2483.50	70.1 PK	74.0	-3.9	1.73 V	181	75.4	-5.3
4	2483.50	53.9 AV	54.0	-0.1	1.73 V	181	59.2	-5.3
5	4924.00	47.5 PK	74.0	-26.5	1.76 V	253	46.2	1.3
6	4924.00	36.7 AV	54.0	-17.3	1.76 V	253	35.4	1.3
7	7386.00	48.6 PK	74.0	-25.4	1.58 V	236	40.9	7.7
8	7386.00	39.1 AV	54.0	-14.9	1.58 V	236	31.4	7.7

REMARKS:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.5 PK	74.0	-1.5	2.09 H	80	78.1	-5.6
2	2390.00	53.9 AV	54.0	-0.1	2.09 H	80	59.5	-5.6
3	*2422.00	111.3 PK			2.09 H	80	116.7	-5.4
4	*2422.00	98.2 AV			2.09 H	80	103.6	-5.4
5	4844.00	46.3 PK	74.0	-27.7	1.78 H	293	45.4	0.9
6	4844.00	35.7 AV	54.0	-18.3	1.78 H	293	34.8	0.9
7	7266.00	48.4 PK	74.0	-25.6	1.54 H	23	40.7	7.7
8	7266.00	39.7 AV	54.0	-14.3	1.54 H	23	32.0	7.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.1 PK	74.0	-2.9	1.27 V	250	76.7	-5.6
2	2390.00	53.5 AV	54.0	-0.5	1.27 V	250	59.1	-5.6
3	*2422.00	110.0 PK			1.27 V	250	115.4	-5.4
4	*2422.00	97.8 AV			1.27 V	250	103.2	-5.4
5	4844.00	46.5 PK	74.0	-27.5	1.77 V	244	45.6	0.9
6	4844.00	35.7 AV	54.0	-18.3	1.77 V	244	34.8	0.9
7	7266.00	47.3 PK	74.0	-26.7	1.63 V	249	39.6	7.7
8	7266.00	38.9 AV	54.0	-15.1	1.63 V	249	31.2	7.7

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	64.2 PK	74.0	-9.8	1.53 H	291	69.8	-5.6
2	2390.00	53.8 AV	54.0	-0.2	1.53 H	291	59.4	-5.6
3	*2437.00	115.4 PK			1.53 H	291	120.8	-5.4
4	*2437.00	101.5 AV			1.53 H	291	106.9	-5.4
5	2483.50	65.4 PK	74.0	-8.6	1.53 H	291	70.7	-5.3
6	2483.50	48.4 AV	54.0	-5.6	1.53 H	291	53.7	-5.3
7	4874.00	46.0 PK	74.0	-28.0	1.82 H	289	45.0	1.0
8	4874.00	35.7 AV	54.0	-18.3	1.82 H	289	34.7	1.0
9	7311.00	47.7 PK	74.0	-26.3	1.62 H	21	40.1	7.6
10	7311.00	39.5 AV	54.0	-14.5	1.62 H	21	31.9	7.6

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	70.4 PK	74.0	-3.6	1.41 V	263	76.0	-5.6
2	2390.00	53.3 AV	54.0	-0.7	1.41 V	263	58.9	-5.6
3	*2437.00	115.4 PK			1.41 V	263	120.8	-5.4
4	*2437.00	101.0 AV			1.41 V	263	106.4	-5.4
5	2483.50	69.1 PK	74.0	-4.9	1.41 V	263	74.4	-5.3
6	2483.50	51.8 AV	54.0	-2.2	1.41 V	263	57.1	-5.3
7	4874.00	46.3 PK	74.0	-27.7	1.73 V	254	45.3	1.0
8	4874.00	35.7 AV	54.0	-18.3	1.73 V	254	34.7	1.0
9	7311.00	47.3 PK	74.0	-26.7	1.62 V	231	39.7	7.6
10	7311.00	38.8 AV	54.0	-15.2	1.62 V	231	31.2	7.6

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	113.5 PK			1.94 H	98	118.9	-5.4
2	*2452.00	101.5 AV			1.94 H	98	106.9	-5.4
3	2483.50	70.0 PK	74.0	-4.0	1.94 H	98	75.3	-5.3
4	2483.50	53.9 AV	54.0	-0.1	1.94 H	98	59.2	-5.3
5	4904.00	46.1 PK	74.0	-27.9	1.72 H	307	44.9	1.2
6	4904.00	35.7 AV	54.0	-18.3	1.72 H	307	34.5	1.2
7	7356.00	47.3 PK	74.0	-26.7	1.53 H	23	39.6	7.7
8	7356.00	38.8 AV	54.0	-15.2	1.53 H	23	31.1	7.7

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	114.6 PK			1.47 V	262	120.0	-5.4
2	*2452.00	100.2 AV			1.47 V	262	105.6	-5.4
3	2483.50	69.1 PK	74.0	-4.9	1.47 V	262	74.4	-5.3
4	2483.50	53.1 AV	54.0	-0.9	1.47 V	262	58.4	-5.3
5	4904.00	46.3 PK	74.0	-27.7	1.80 V	267	45.1	1.2
6	4904.00	35.6 AV	54.0	-18.4	1.80 V	267	34.4	1.2
7	7356.00	47.7 PK	74.0	-26.3	1.56 V	238	40.0	7.7
8	7356.00	39.0 AV	54.0	-15.0	1.56 V	238	31.3	7.7

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.

TX_Low

BELOW 1GHz WORST-CASE DATA

802.11b

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	39.63	34.4 QP	40.0	-5.6	1.00 H	58	43.4	-9.0
2	250.00	41.5 QP	46.0	-4.5	1.00 H	98	51.5	-10.0
3	375.00	37.8 QP	46.0	-8.2	1.00 H	360	43.9	-6.1
4	500.01	34.5 QP	46.0	-11.5	1.00 H	229	37.2	-2.7
5	625.01	43.2 QP	46.0	-2.8	1.00 H	18	43.2	0.0
6	750.01	39.5 QP	46.0	-6.5	1.00 H	360	37.6	1.9
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	84.85	35.2 QP	40.0	-4.8	1.00 V	281	49.5	-14.3
2	108.86	33.1 QP	43.5	-10.4	1.00 V	0	44.6	-11.5
3	250.00	37.5 QP	46.0	-8.5	1.00 V	326	47.5	-10.0
4	375.00	38.5 QP	46.0	-7.5	1.00 V	315	44.6	-6.1
5	500.01	41.7 QP	46.0	-4.3	1.00 V	298	44.4	-2.7
6	625.00	43.5 QP	46.0	-2.5	1.00 V	228	43.5	0.0

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	847124/029	Oct. 23, 2015	Oct. 22, 2016
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 28, 2015	Oct. 27, 2016
RF Cable	5D-FB	COACAB-002	Mar. 04, 2016	Mar. 03, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	Jun. 20, 2016	Jun. 19, 2017
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. 1.
3. Tested Date: June 21, 2016

4.2.3 Test Procedures

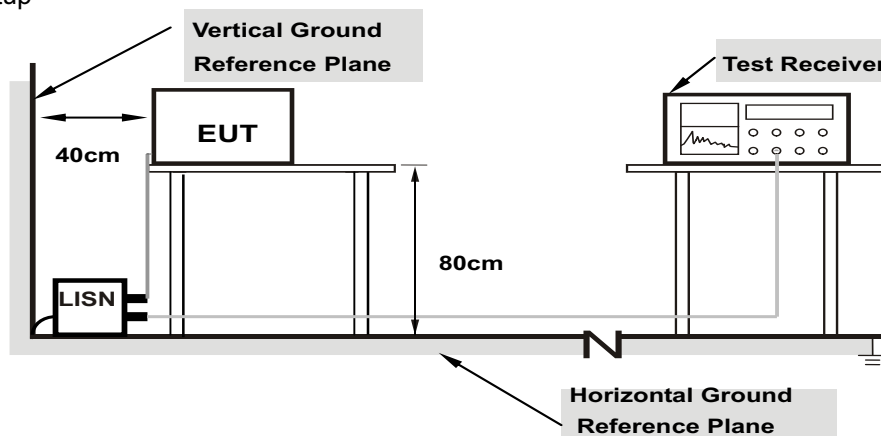
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

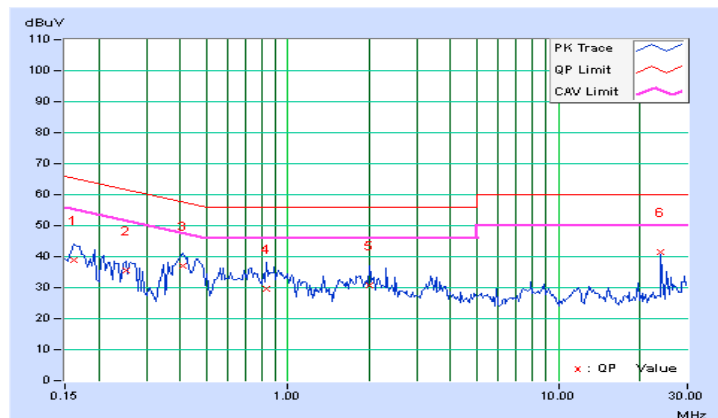
4.2.7 Test Results

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

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	0.16172	10.21	28.66	11.72	38.87	21.93	65.38	55.38	-26.50	-33.44
2	0.25156	10.22	25.38	18.05	35.60	28.27	61.71	51.71	-26.11	-23.44
3	0.40781	10.22	26.94	17.03	37.16	27.25	57.69	47.69	-20.53	-20.44
4	0.83359	10.25	19.37	11.94	29.62	22.19	56.00	46.00	-26.38	-23.81
5	2.01172	10.31	20.57	14.28	30.88	24.59	56.00	46.00	-25.12	-21.41
6	24.00000	11.43	29.98	29.28	41.41	40.71	60.00	50.00	-18.59	-9.29

REMARKS:

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

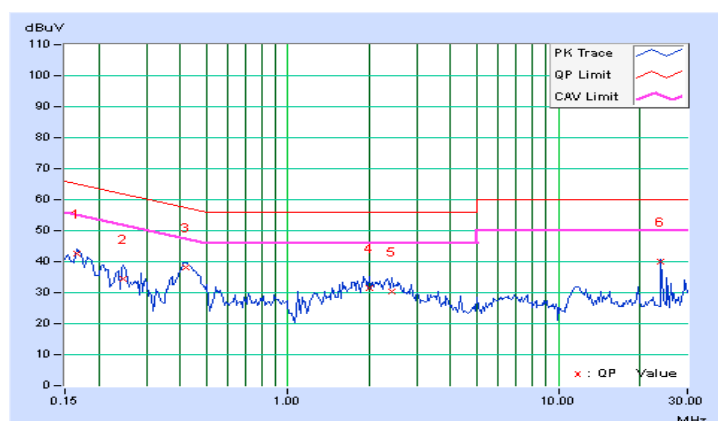


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [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	0.16562	10.20	32.21	16.76	42.41	26.96	65.18	55.18	-22.77	-28.22
2	0.24766	10.21	24.35	15.25	34.56	25.46	61.84	51.84	-27.28	-26.38
3	0.41953	10.20	27.86	21.04	38.06	31.24	57.46	47.46	-19.40	-16.22
4	2.00000	10.29	21.36	15.57	31.65	25.86	56.00	46.00	-24.35	-20.14
5	2.43359	10.28	20.06	14.41	30.34	24.69	56.00	46.00	-25.66	-21.31
6	24.00000	11.13	28.87	28.24	40.00	39.37	60.00	50.00	-20.00	-10.63

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.

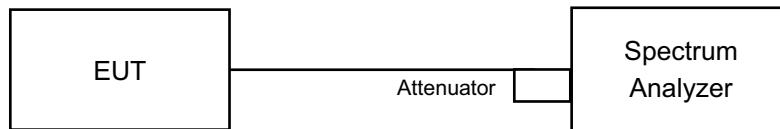


4.3 6dB Bandwidth Measurement

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
		Chain 0	Chain 1	Chain 2		
1	2412	10.19	10.18	10.18	0.5	Pass
6	2437	10.15	10.15	10.15	0.5	Pass
11	2462	10.15	10.15	10.15	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	16.56	16.58	16.56	0.5	Pass
6	2437	16.57	16.57	16.56	0.5	Pass
11	2462	16.56	16.57	16.56	0.5	Pass

802.11n (HT20)

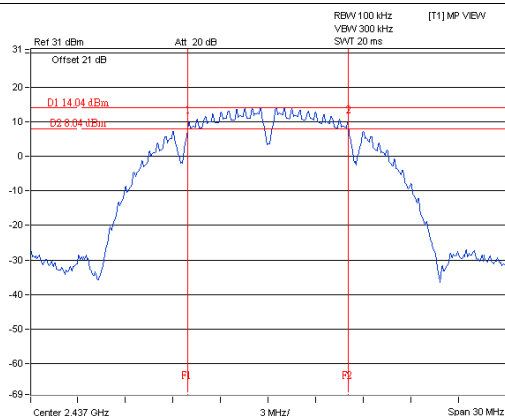
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	17.72	17.71	17.71	0.5	Pass
6	2437	17.73	17.71	17.72	0.5	Pass
11	2462	17.72	17.73	17.72	0.5	Pass

802.11n (HT40)

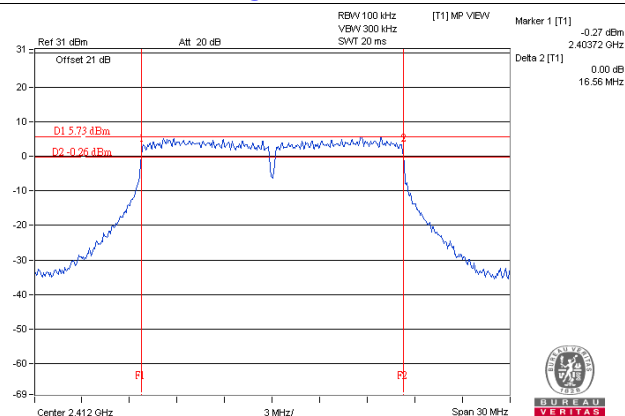
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
3	2422	36.57	36.59	36.59	0.5	Pass
6	2437	36.59	36.59	36.61	0.5	Pass
9	2452	36.59	36.58	36.61	0.5	Pass

Spectrum Plot of Worst Value

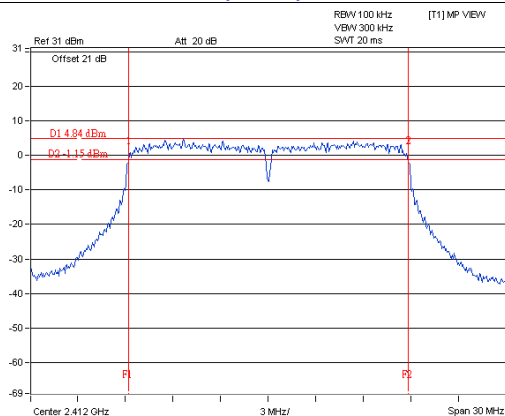
802.11b / Chain 0 : CH6



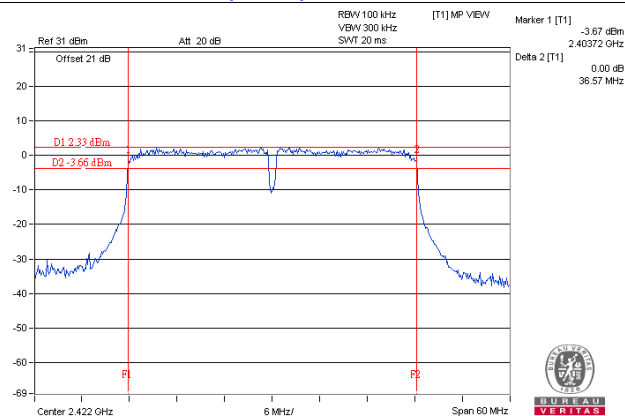
802.11g / Chain 0 : CH1



802.11n (HT20) / Chain 1 : CH1



802.11n (HT40) / Chain 0 : CH3



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

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

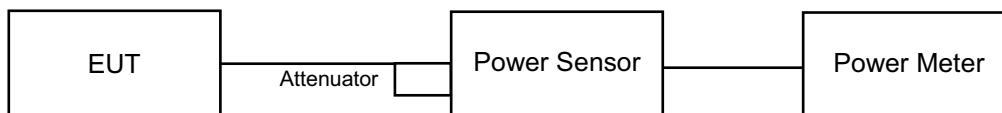
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

An average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power 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

802.11b

Chan.	Freq. (MHz)	Avg. Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	24.70	24.60	24.95	896.132	29.52	30	Pass
6	2437	25.58	24.76	25.12	985.723	29.94	30	Pass
11	2462	23.76	22.28	23.50	630.6	28.00	30	Pass

802.11g

Chan.	Freq. (MHz)	Avg. Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	20.30	20.64	20.86	344.929	25.38	30	Pass
6	2437	25.32	24.98	25.13	981.02	29.92	30	Pass
11	2462	19.20	19.22	19.87	263.787	24.21	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Avg. Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	20.20	19.52	20.06	295.64	24.71	30	Pass
6	2437	25.24	24.56	25.39	965.893	29.85	30	Pass
11	2462	19.93	19.76	19.99	292.795	24.67	30	Pass

802.11n (HT40)

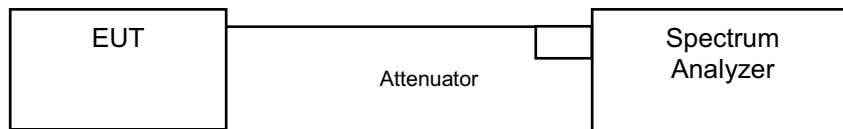
Chan.	Freq. (MHz)	Avg. Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	20.19	19.23	20.12	291.027	24.64	30	Pass
6	2437	20.88	20.13	21.43	364.496	25.62	30	Pass
9	2452	18.39	17.92	18.10	195.533	22.91	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set VBW $\geq 3 \times \text{RBW}$.
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- Sweep time = auto couple.
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=3) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-3.56	4.77	1.21	8.00	Pass
	6	2437	-3.53	4.77	1.24	8.00	Pass
	11	2462	-5.13	4.77	-0.36	8.00	Pass
1	1	2412	-4.96	4.77	-0.19	8.00	Pass
	6	2437	-4.75	4.77	0.02	8.00	Pass
	11	2462	-6.07	4.77	-1.30	8.00	Pass
2	1	2412	-3.93	4.77	0.84	8.00	Pass
	6	2437	-4.04	4.77	0.73	8.00	Pass
	11	2462	-5.36	4.77	-0.59	8.00	Pass

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=3) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-9.92	4.77	-5.15	8.00	Pass
	6	2437	-5.07	4.77	-0.30	8.00	Pass
	11	2462	-10.98	4.77	-6.21	8.00	Pass
1	1	2412	-9.53	4.77	-4.76	8.00	Pass
	6	2437	-5.75	4.77	-0.98	8.00	Pass
	11	2462	-10.74	4.77	-5.97	8.00	Pass
2	1	2412	-9.32	4.77	-4.55	8.00	Pass
	6	2437	-5.41	4.77	-0.64	8.00	Pass
	11	2462	-10.12	4.77	-5.35	8.00	Pass

802.11n (HT20)

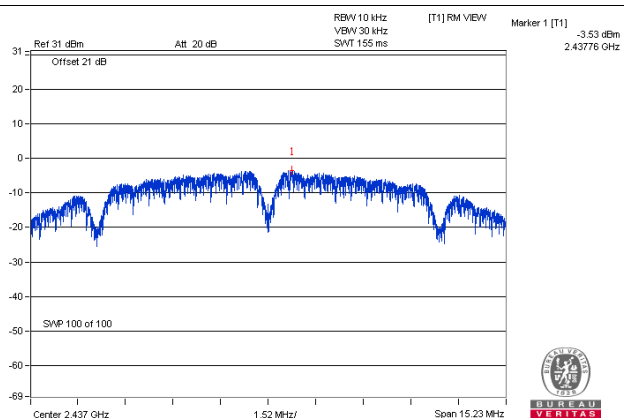
TX chain	Channel	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=3) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-9.88	4.77	-5.11	8.00	Pass
	6	2437	-5.49	4.77	-0.72	8.00	Pass
	11	2462	-10.73	4.77	-5.96	8.00	Pass
1	1	2412	-11.09	4.77	-6.32	8.00	Pass
	6	2437	-5.48	4.77	-0.71	8.00	Pass
	11	2462	-10.47	4.77	-5.70	8.00	Pass
2	1	2412	-9.63	4.77	-4.86	8.00	Pass
	6	2437	-5.52	4.77	-0.75	8.00	Pass
	11	2462	-10.71	4.77	-5.94	8.00	Pass

802.11n (HT40)

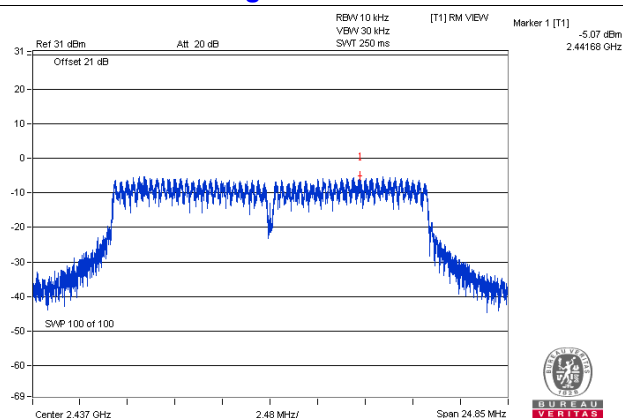
TX chain	Channel	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=3) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-12.17	4.77	-7.40	8.00	Pass
	6	2437	-12.74	4.77	-7.97	8.00	Pass
	9	2452	-15.80	4.77	-11.03	8.00	Pass
1	3	2422	-13.70	4.77	-8.93	8.00	Pass
	6	2437	-13.00	4.77	-8.23	8.00	Pass
	9	2452	-15.74	4.77	-10.97	8.00	Pass
2	3	2422	-13.41	4.77	-8.64	8.00	Pass
	6	2437	-12.56	4.77	-7.79	8.00	Pass
	9	2452	-15.20	4.77	-10.43	8.00	Pass

Spectrum Plot of Worst Value

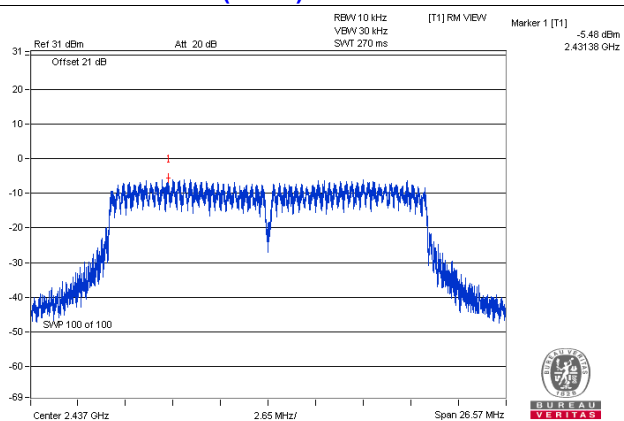
802.11b / Chain 0 : CH6



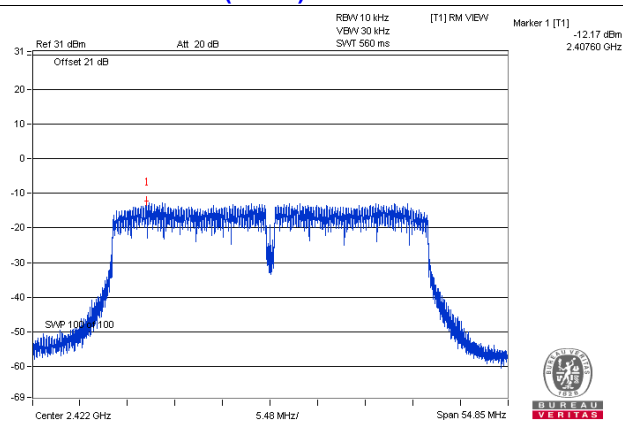
802.11g / Chain 0 : CH6



802.11n (HT20) / Chain 1 : CH6



802.11n (HT40) / Chain 0 : CH3

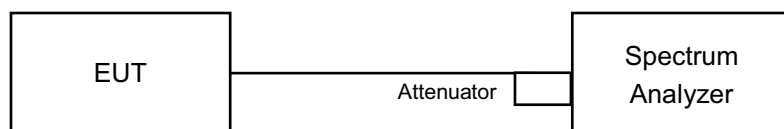


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq$ 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 OOBE

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.

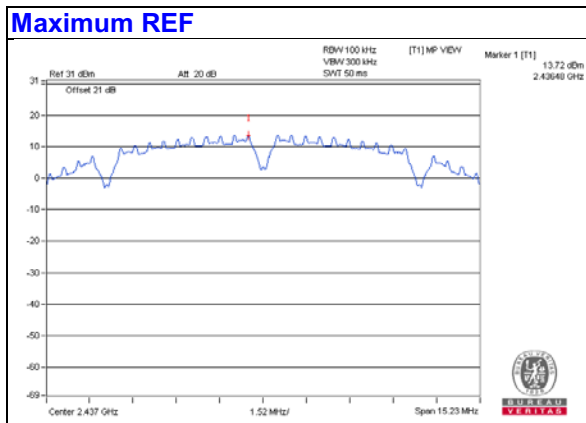
4.6.6 EUT Operating Condition

Same as Item 4.3.6

4.6.7 Test Results

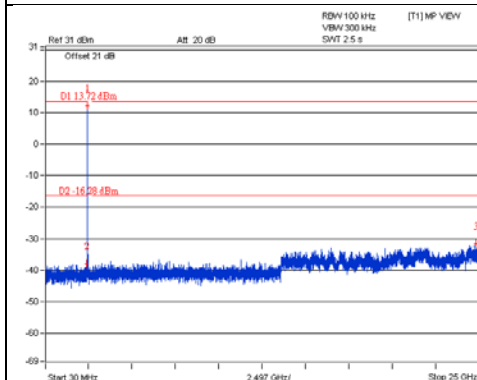
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11b

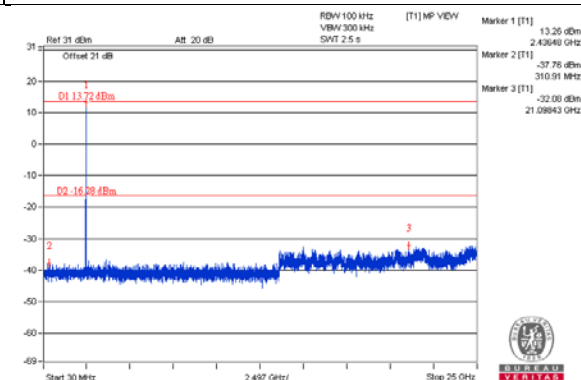


Chain 0

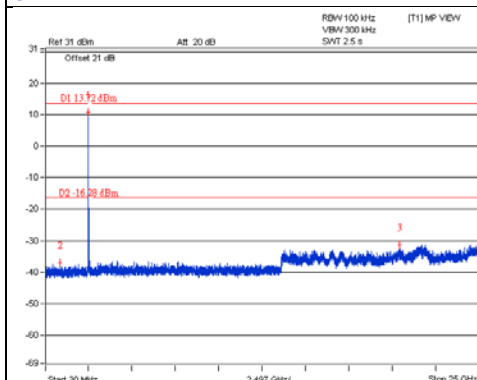
CH 1



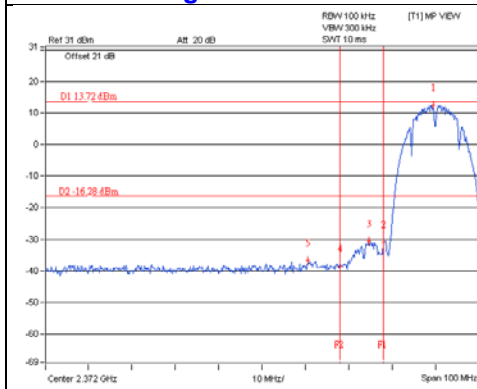
CH 6



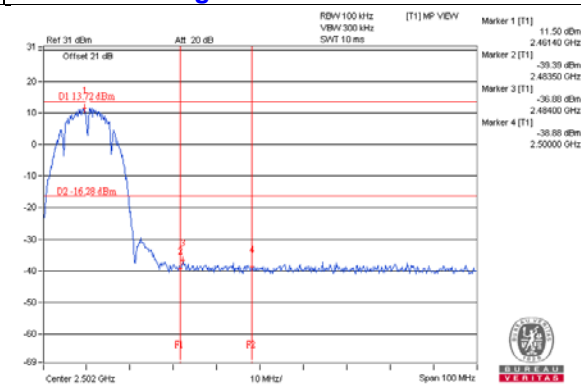
CH 11



CH 1 Band edge

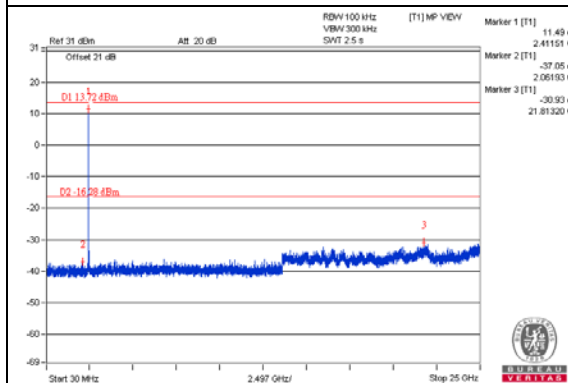


CH 11 Band edge

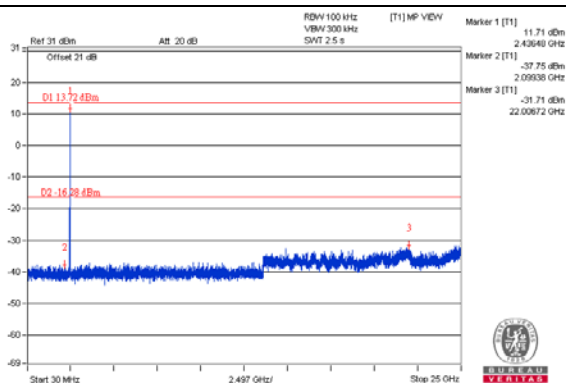


Chain 1

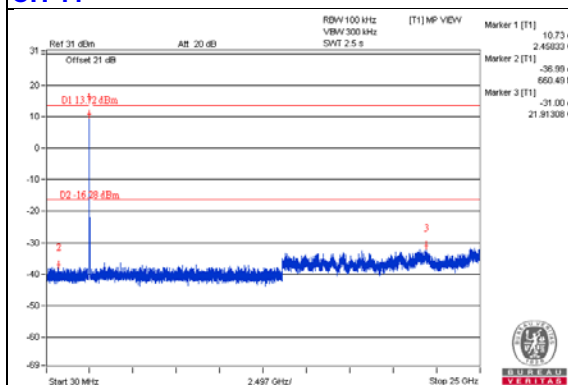
CH 1



CH 6

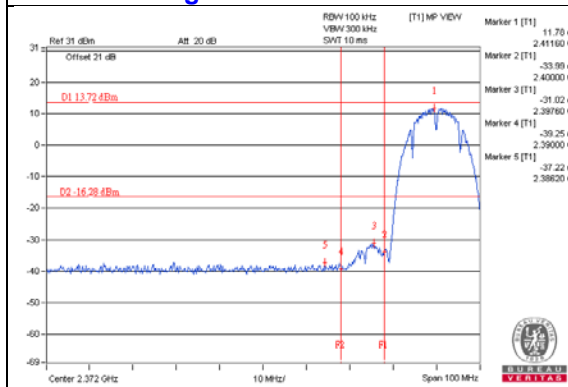


CH 11

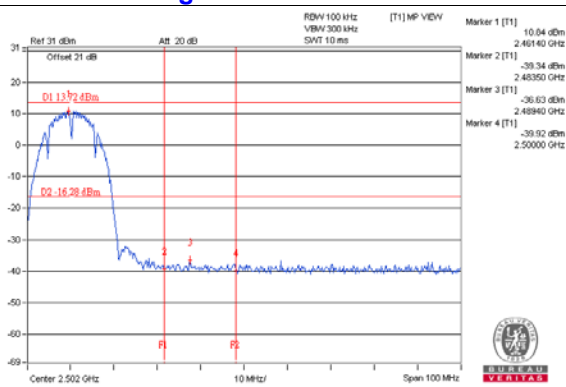


CH 11 Band edge

CH 1 Band edge

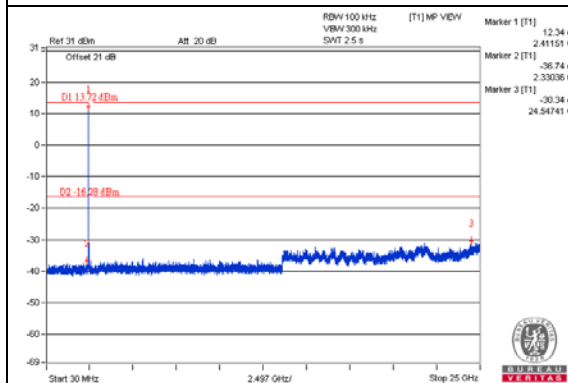


CH 11 Band edge

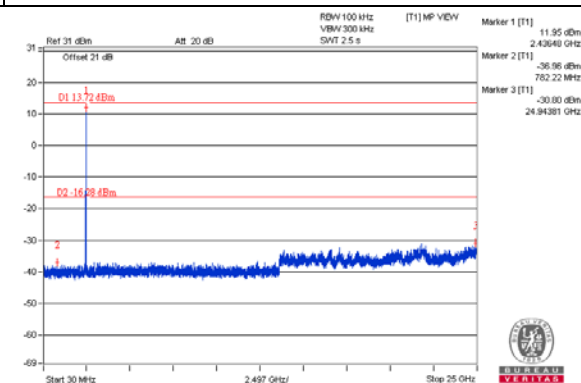


Chain 2

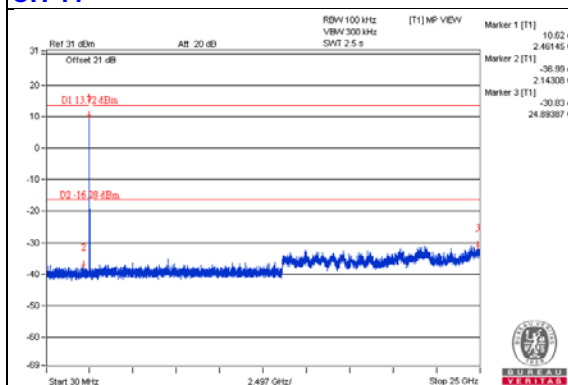
CH 1



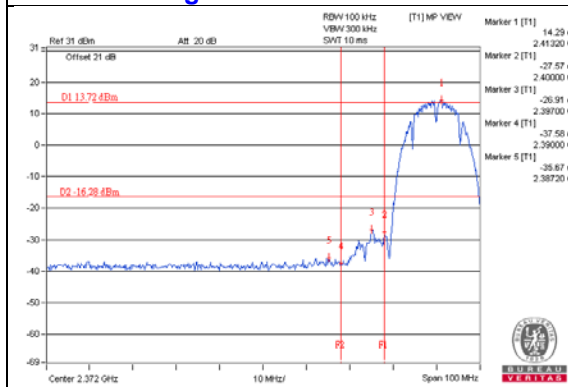
CH 6



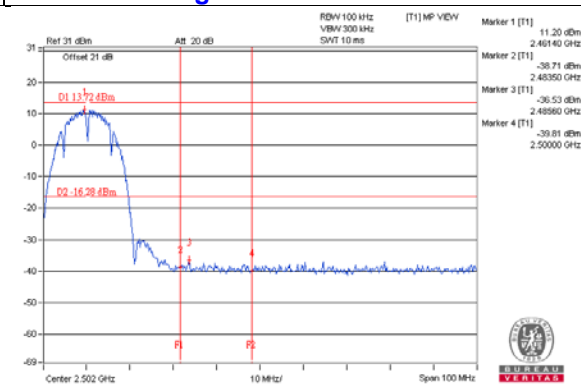
CH 11



CH 1 Band edge

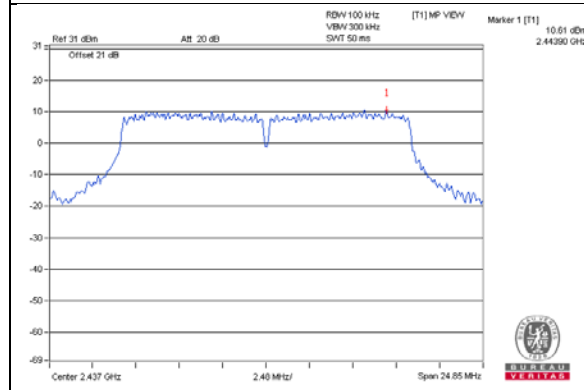


CH 11 Band edge



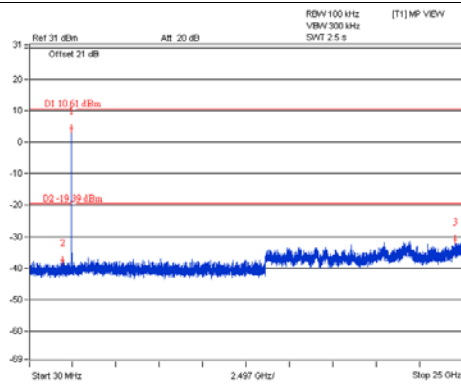
802.11g

Maximum REF

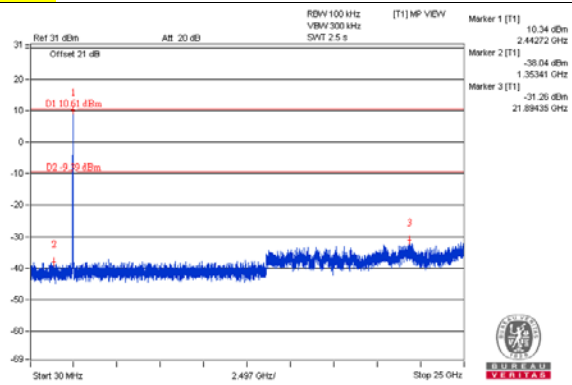


Chain 0

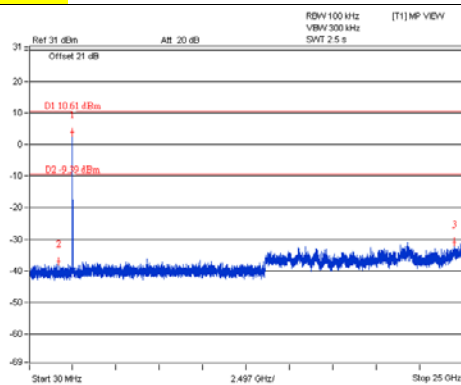
CH 1



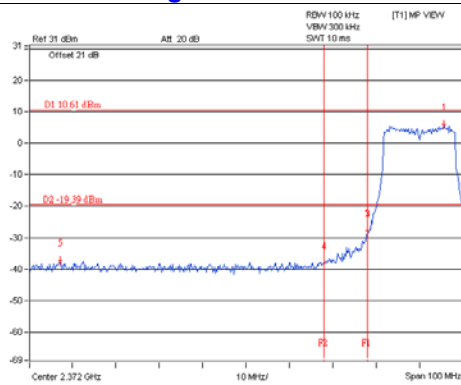
CH 6



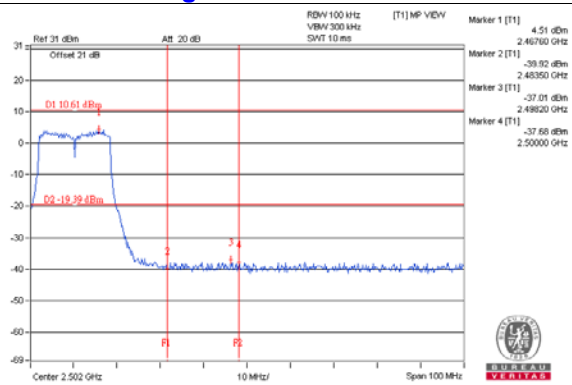
CH 11



CH 1 Band edge

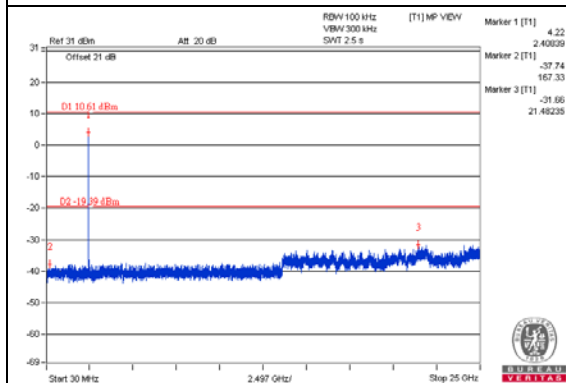


CH 11 Band edge

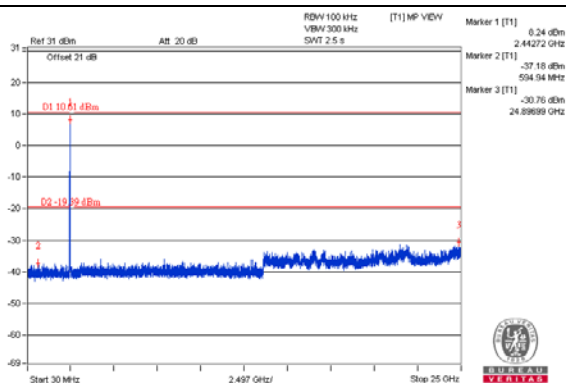


Chain 1

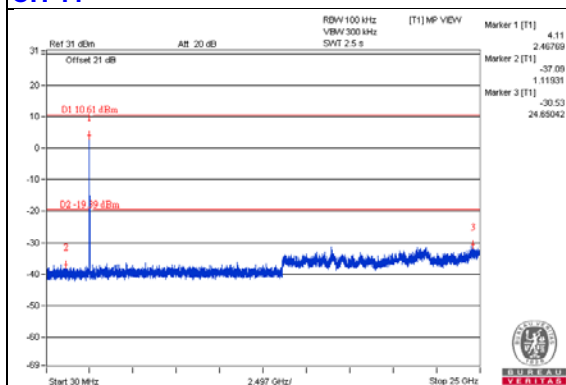
CH 1



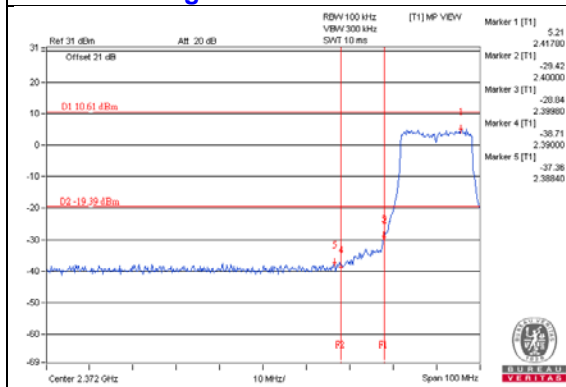
CH 6



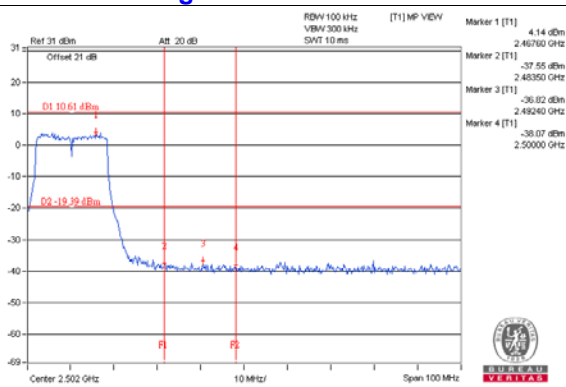
CH 11



CH 1 Band edge

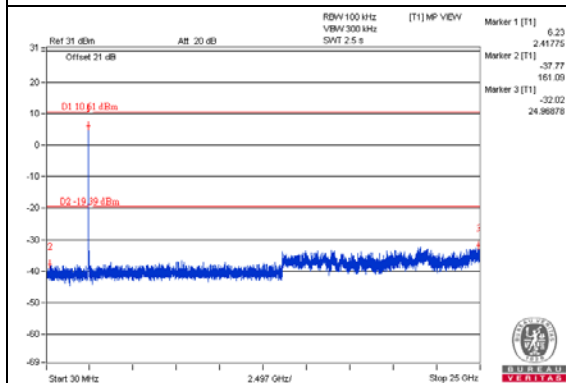


CH 11 Band edge

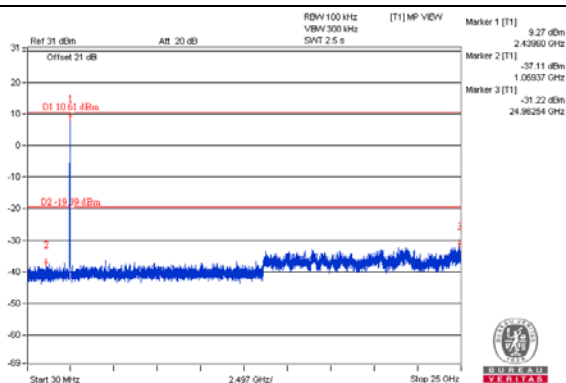


Chain 2

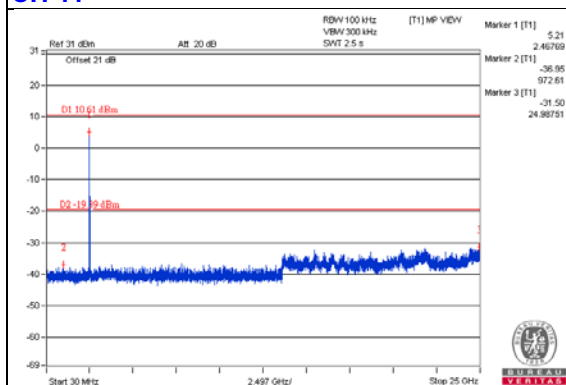
CH 1



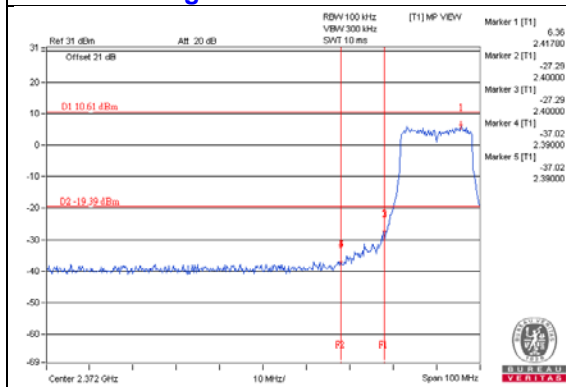
CH 6



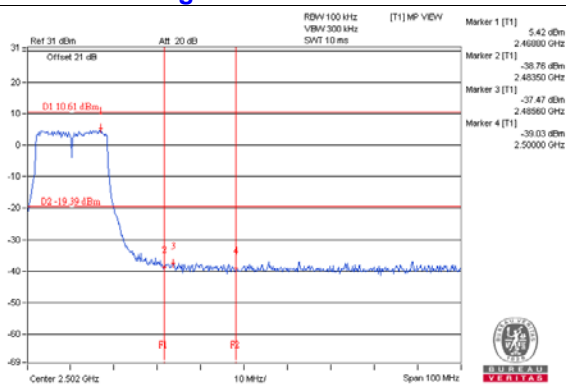
CH 11



CH 1 Band edge

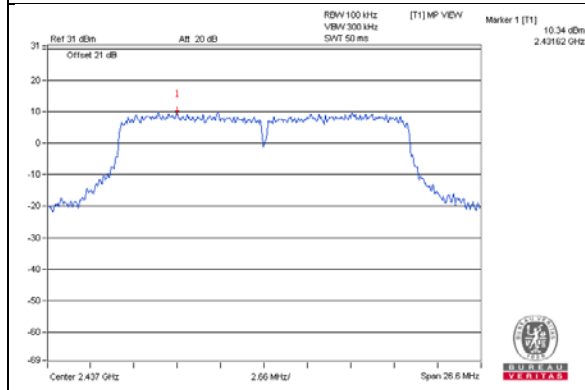


CH 11 Band edge



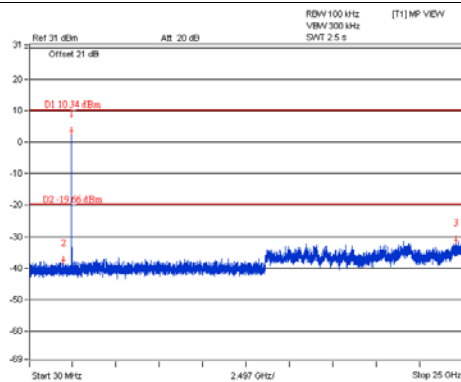
802.11n (HT20)

Maximum REF

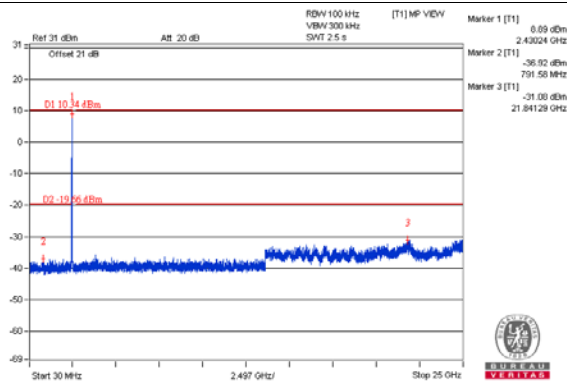


Chain 0

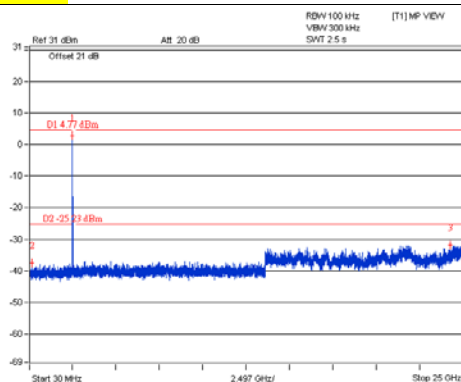
CH 1



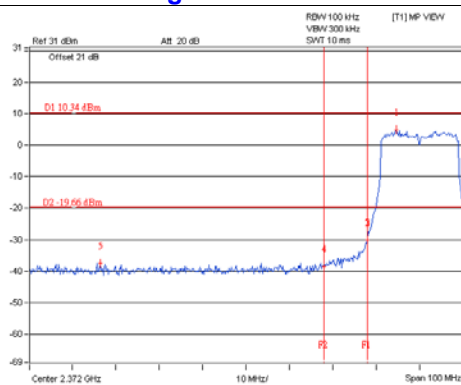
CH 6



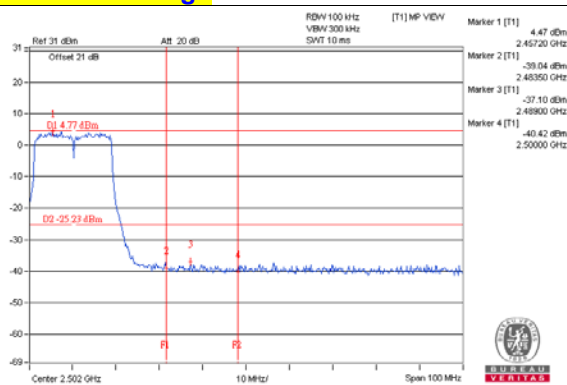
CH 11



CH 1 Band edge

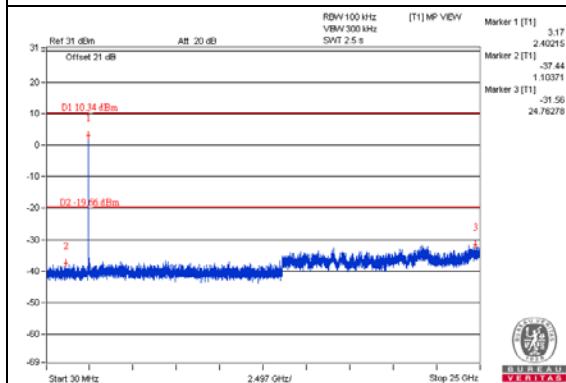


CH 11 Band edge

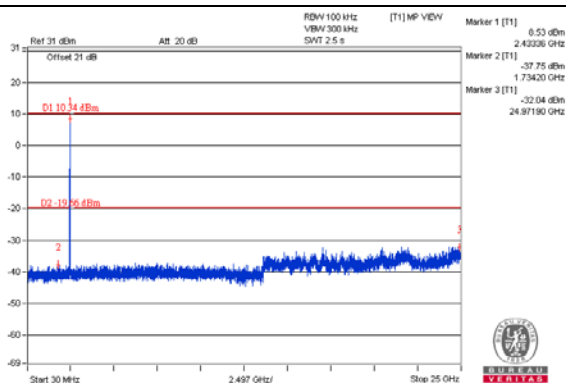


Chain 1

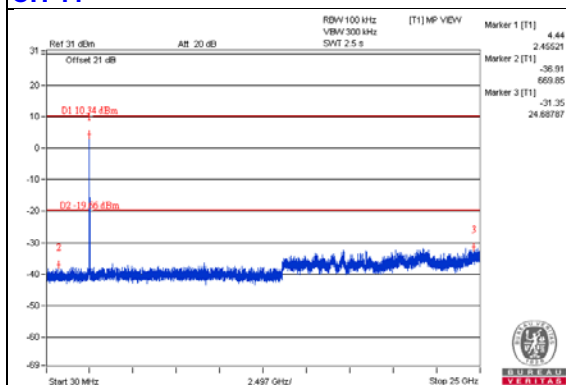
CH 1



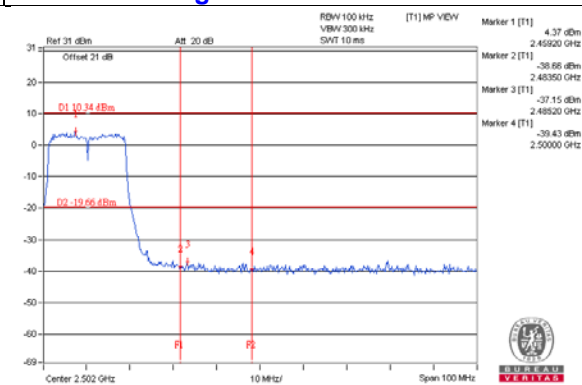
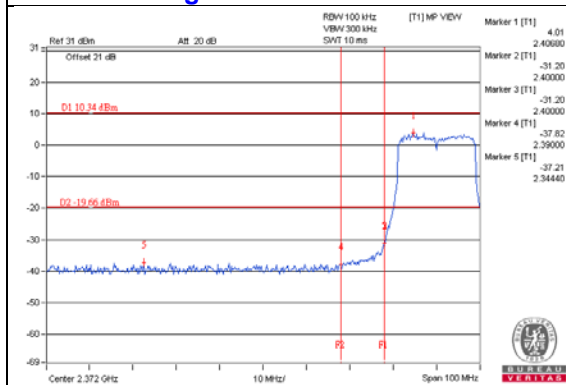
CH 6



CH 11

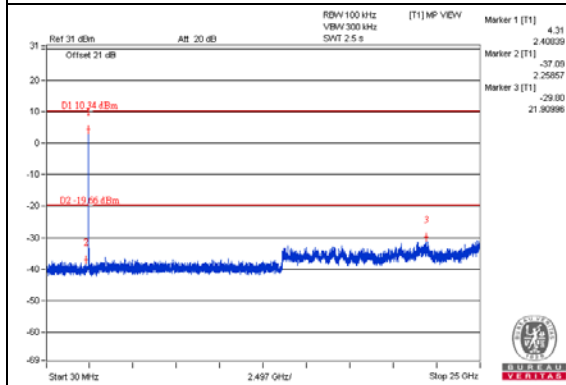


CH 11 Band edge

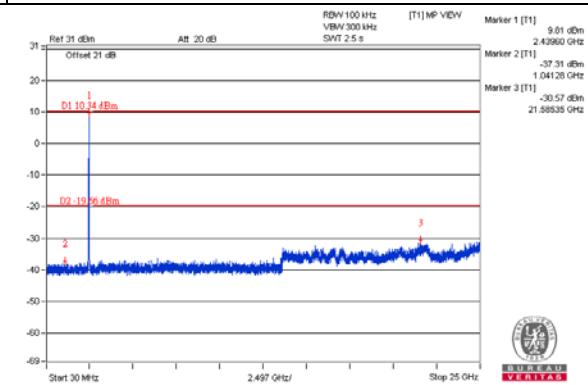


Chain 2

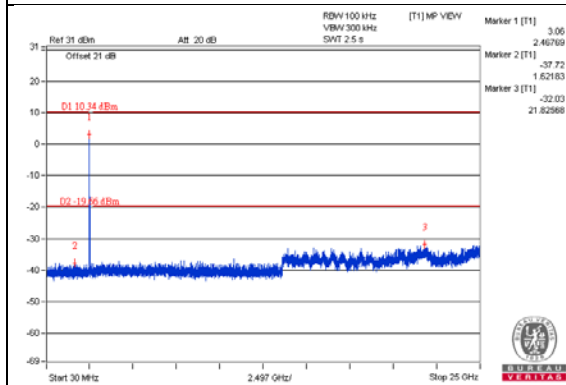
CH 1



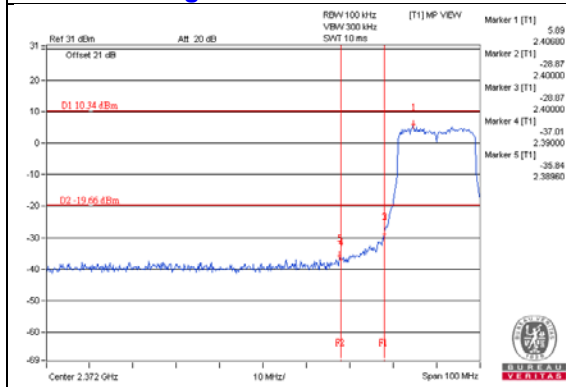
CH 6



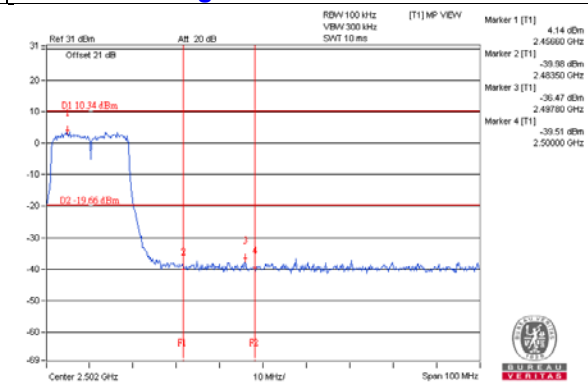
CH 11



CH 1 Band edge

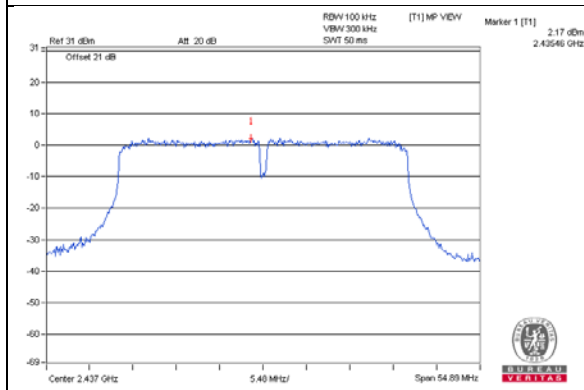


CH 11 Band edge



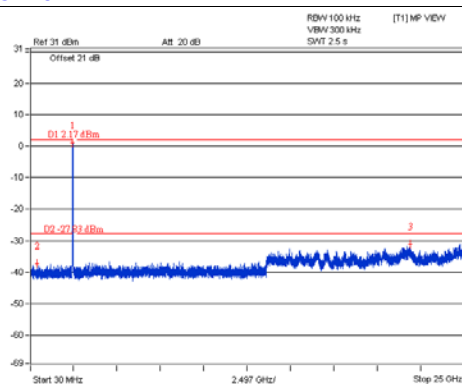
802.11n (HT40)

Maximum REF

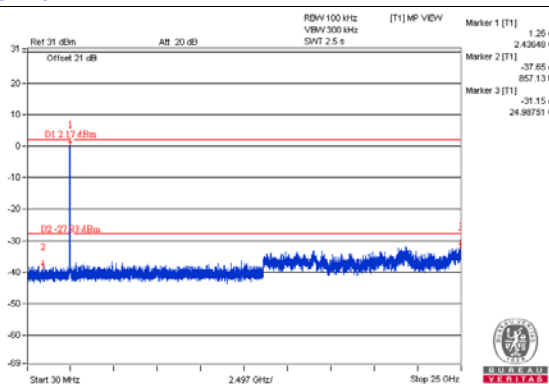


Chain 0

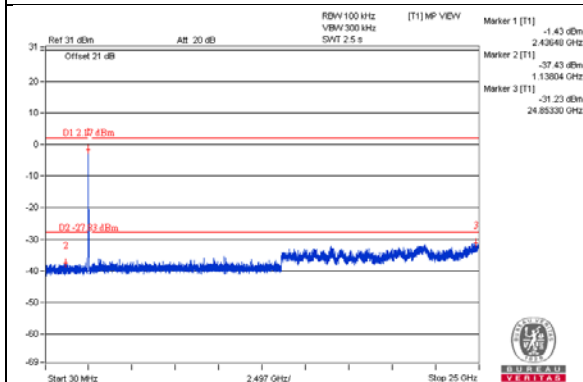
CH 3



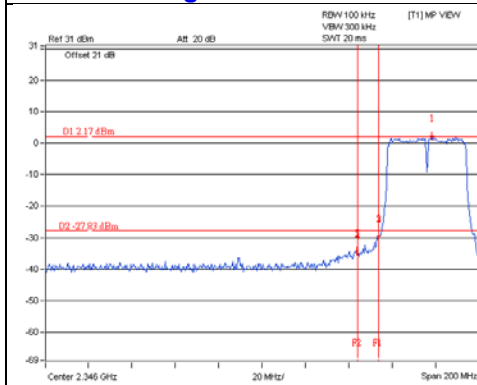
CH 6



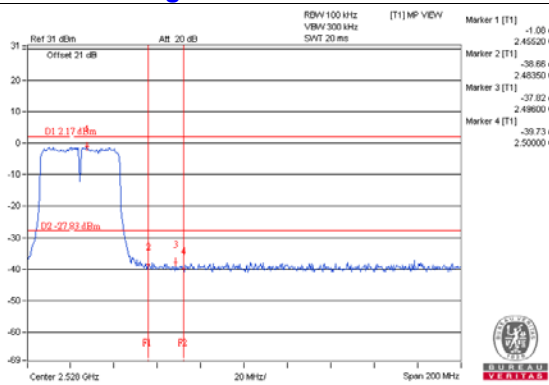
CH 9



CH 3 Band edge

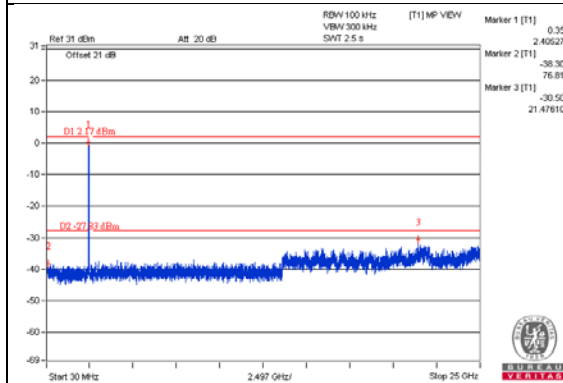


CH 9 Band edge

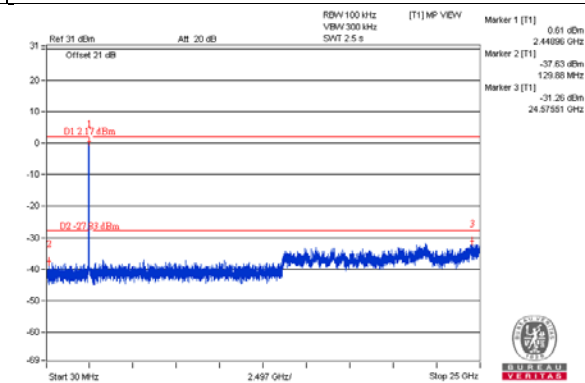


Chain 1

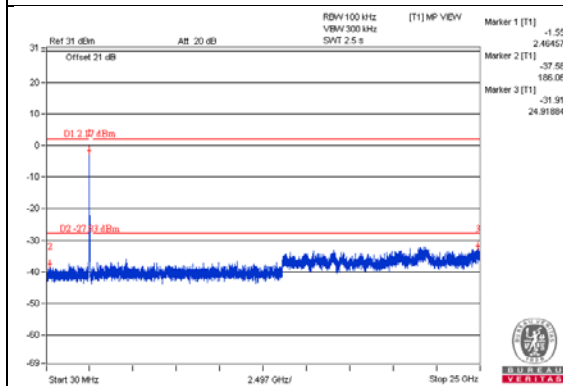
CH 3



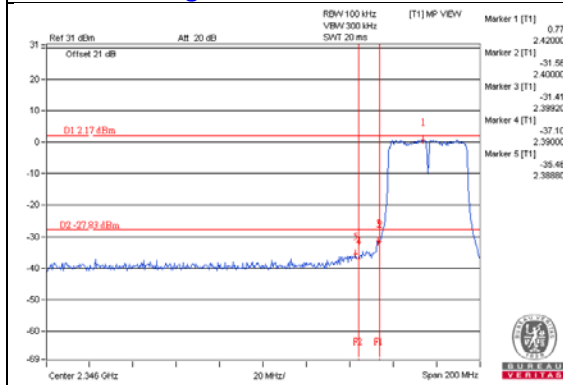
CH 6



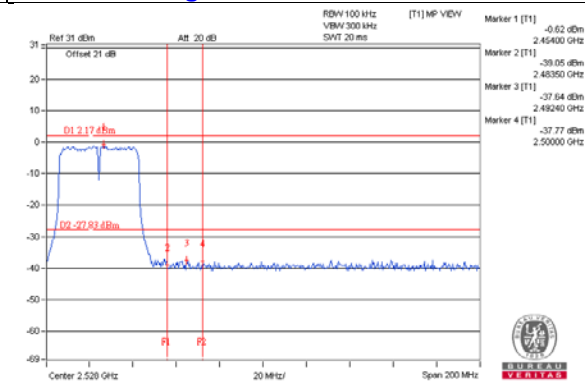
CH 9



CH 3 Band edge

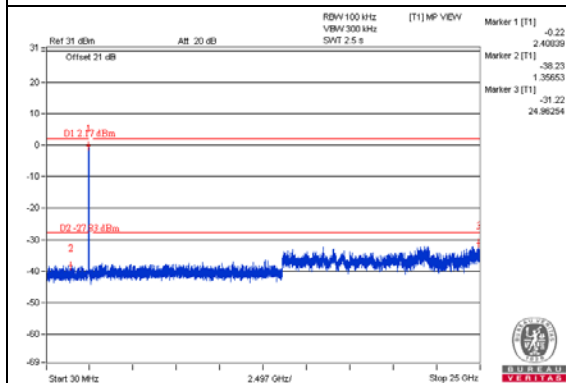


CH 9 Band edge

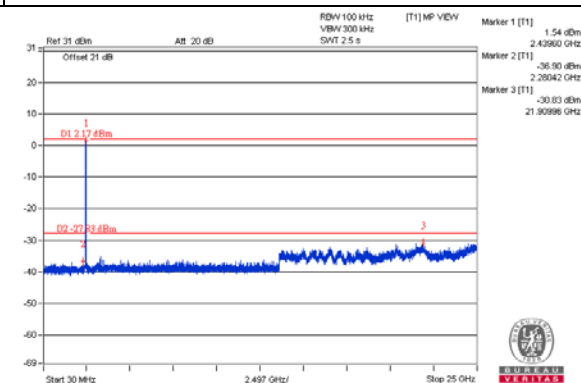


Chain 2

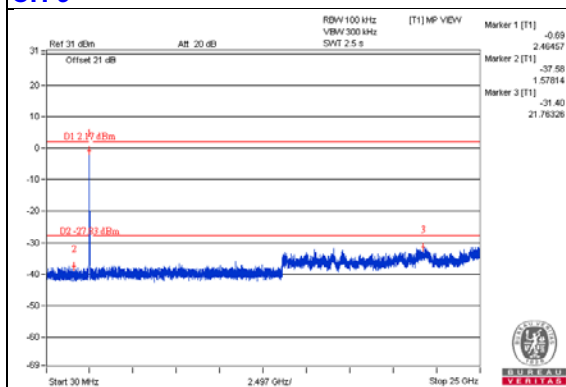
CH 3



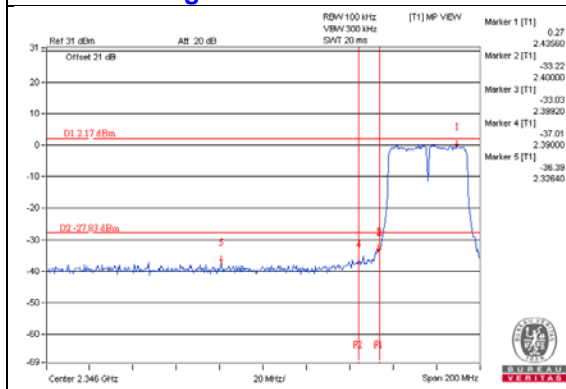
CH 6



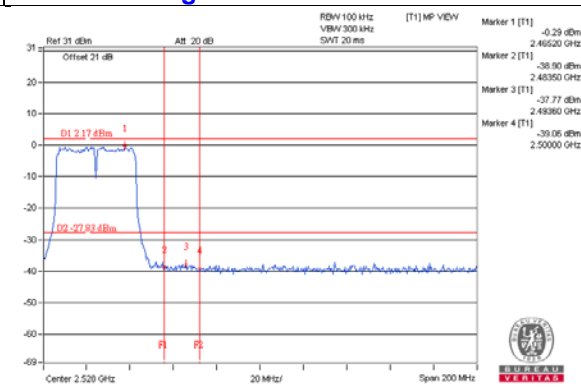
CH 9



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: 886-3-6668565

Fax: 886-3-6668323

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 ---