FCC Test Report
(15.247, WLAN)

Report No.:	RF150820E01-1
FCC ID:	2AD8UFZPFWFE01
Test Model:	FWFE
Series Model:	FWFI
Received Date:	Aug. 20, 2015
Test Date:	Sep. 24 to Oct. 02, 2015
Issued Date:	Jan. 15, 2016
Applicant:	Nokia Solutions and Networks
Address:	1455 West Shure Drive, Arlington Heights, IL 60004, USA
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.

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Release Control Record

Issue No.	Description	Date Issued
RF150820E01-1	Original release.	Jan. 15, 2016

1 Certificate of Conformity

Product:	Flexi Zone Indoor Pico BTS
Brand:	Nokia
Test Model:	FWFE
Series Model:	FWFI
Sample Status:	MASS-PRODUCTION
Applicant:	Nokia Solutions and Networks
Test Date:	Sep. 24 to Oct. 02, 2015
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

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

Prepared by : _____ , **Date:** Jan. 15, 2016

Lori Chung / Specialist

Approved by : _____ , **Date:** Jan. 15, 2016

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)				
FCC Clause	FCC KDB 558074	Test Item	Result	Remarks
15.207	-	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -3.92dB at 7.20456MHz.
15.205 / 15.209 / 15.247(d)	Section 11, 12 &13	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2483.50MHz.
15.205 / 15.209 / 15.247(d)	Section 11, 12 &13	Conducted Emissions	PASS	Meet the requirement of limit.
15.247(d)	Section 11, 12 &13	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	Section 8.1	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Section 9.2.3.2	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Section 10.5	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	-	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) not a standard connector.

NOTE: 1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.25GHz, and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz. For the 5.15~5.25GHz and 5.725~5.850GHz 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	5.19 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, 15.247)

Product	Flexi Zone Indoor Pico BTS
Brand	Nokia
Test Model	FWFE
Series Model	FWFI
Test Sample S/N	EA152410016
Hardware Version	473236A .101; 473771A.101
Status of EUT	MASS-PRODUCTION
Power Supply Rating	12Vdc from power adapter or 55Vdc from POE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 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 300Mbps VHT mode in 2.4GHz: up to 400Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20), VHT20 7 for 802.11n (HT40), VHT40
Output Power	802.11b: 330.791mW 802.11g: 335.783mW 802.11n (HT20): 340.489mW 802.11n (HT40): 166.374mW
Antenna Type	Refer to note as below
Antenna Connector	Refer to note as below
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. There are WLAN, BT, WWAN and GPS technology used for the EUT.
2. The EUT's spec. as below table:

Model name	Hardware Version	WWAN			Wi-Fi	BT	GPS	Different
		Freq.(MHz)		Band				
FWFE	473236A .101	UL	1932.4~1987.6	2	✓	✓	✓	For marketing requirement
		DL	1852.4-1907.6					
FWFI	473771A.101	UL	1932.4~1987.6	2	✓	✓	✓	For marketing requirement
		DL	1852.4-1907.6					

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

3. The emission of the simultaneous operation (WLAN, BT & WWAN) has been evaluated and no non-compliance was found.
4. The EUT must be supplied with a POE(option) or power adapter as following table:

Power adapter		
Brand	Model No.	Spec.
DVE	DSA-60PFB-12 1 120500	Input: 100-240V, 2.0A, 50/60Hz AC input cable(1.8m, unshielded) Output: 12V, 5A DC output cable(1.2m, unshielded, with one core)

5. The EUT was pre-tested under following test modes :

Test Mode	Description
Mode A	**With POE**
Mode B	With adapter

For the above modes, the worst radaited emission (above 1GHz) test was found in **Mode A**. Therefore only the test data of the modes were recorded in this report.

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

WLAN Antenna Spec.

Antenna No	Brand	Model	Antenna Type	Antenna Connector	Gain(dBi) <Including cable loss>	Cable Length (mm)	Frequency (MHz)
Internal WIFI (Main)	TongDa	T-543-8141037-3	PIFA	i-pex(MHF)	3.3	90	2412~2472
					2.4		5150~5825
Internal WIFI (Aux)	TongDa	T-543-8141037-4	PIFA	i-pex(MHF)	3	70	2412~2472
					2.9		5150~5825

7. The EUT incorporates a MIMO function.

2.4GHz Band

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

Note : 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. (Final test mode refer section 3.2.1)

8. 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, 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≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	With POE
2	-	√	√	-	With adapter

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

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

NOTE: 1. "-"means no effect.

2. This device can be installed in different orientations (wall mounted or tabletop), so had been investigated two different orientations. The worst case was found when positioned on X-plane (for below 1GHz) and Y-plane (for above 1GHz)

Radiated Emission Test (Above 1GHz):

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5
2	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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5
2	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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	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

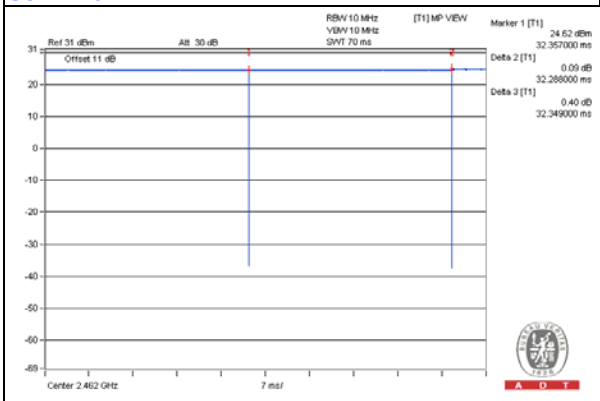
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 66%RH	120Vac, 60Hz	Andy Ho
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Weiwei Lo
PLC	25deg. C, 60%RH 26deg. C, 66%RH	120Vac, 60Hz	Timmy Hu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

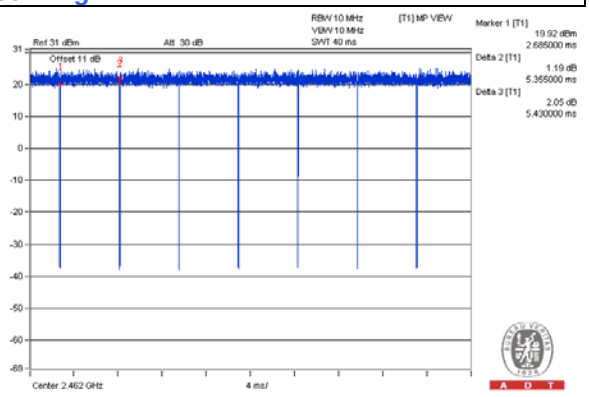
3.3 Duty Cycle of Test Signal

Duty cycle of test signal is ≥ 98 %, duty factor is not required.
802.11b: Duty cycle = 32.288 ms/32.349 ms = 0.998
802.11g: Duty cycle = 5.355 ms/5.43 ms = 0.986
802.11n (HT20): Duty cycle = 4.96 ms/5.02 ms = 0.988
802.11n (HT40): Duty cycle = 2.405 ms/2.447 ms = 0.983

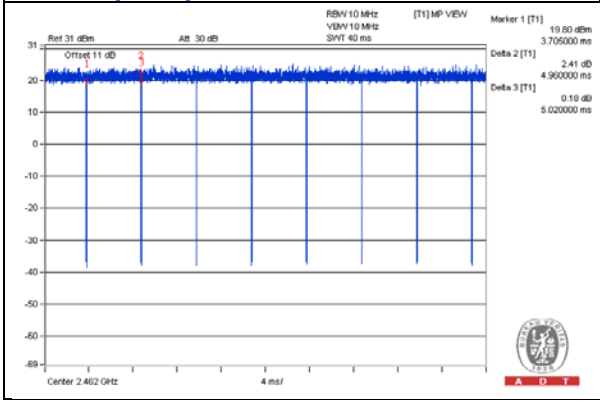
802.11b



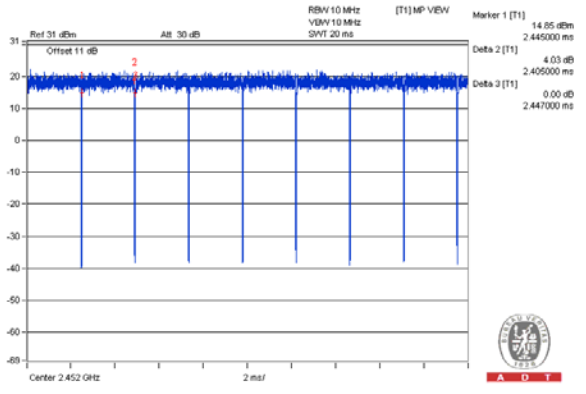
802.11g



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	4YV4VY1	FCC DoC	Provided by Lab
B	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
C	NOTEBOOK COMPUTER	DELL	PP27L	7YLB32S	FCC DoC	Provided by Lab
D	POE ADAPTER	NA	TR60A-POE-L	NA	NA	Provided by Lab

NOTE:

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

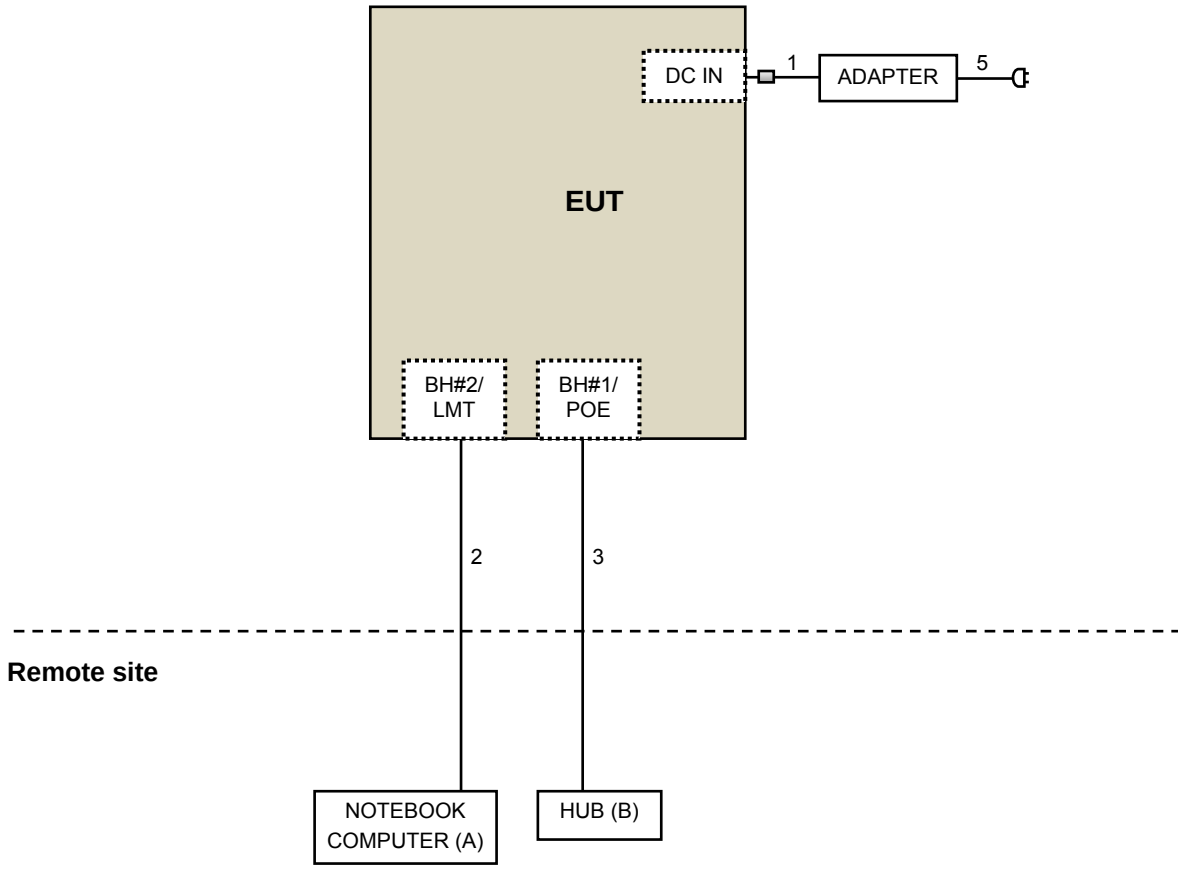
No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC	1	1.2	No	1	Supplied by Client
2	RJ-45	1	10	No	0	Provided by Lab
3	RJ-45	1	10	No	0	Provided by Lab
4	RJ-45	1	3	No	0	Provided by Lab
5	AC	1	1.8	No	0	Supplied by Client

NOTE:

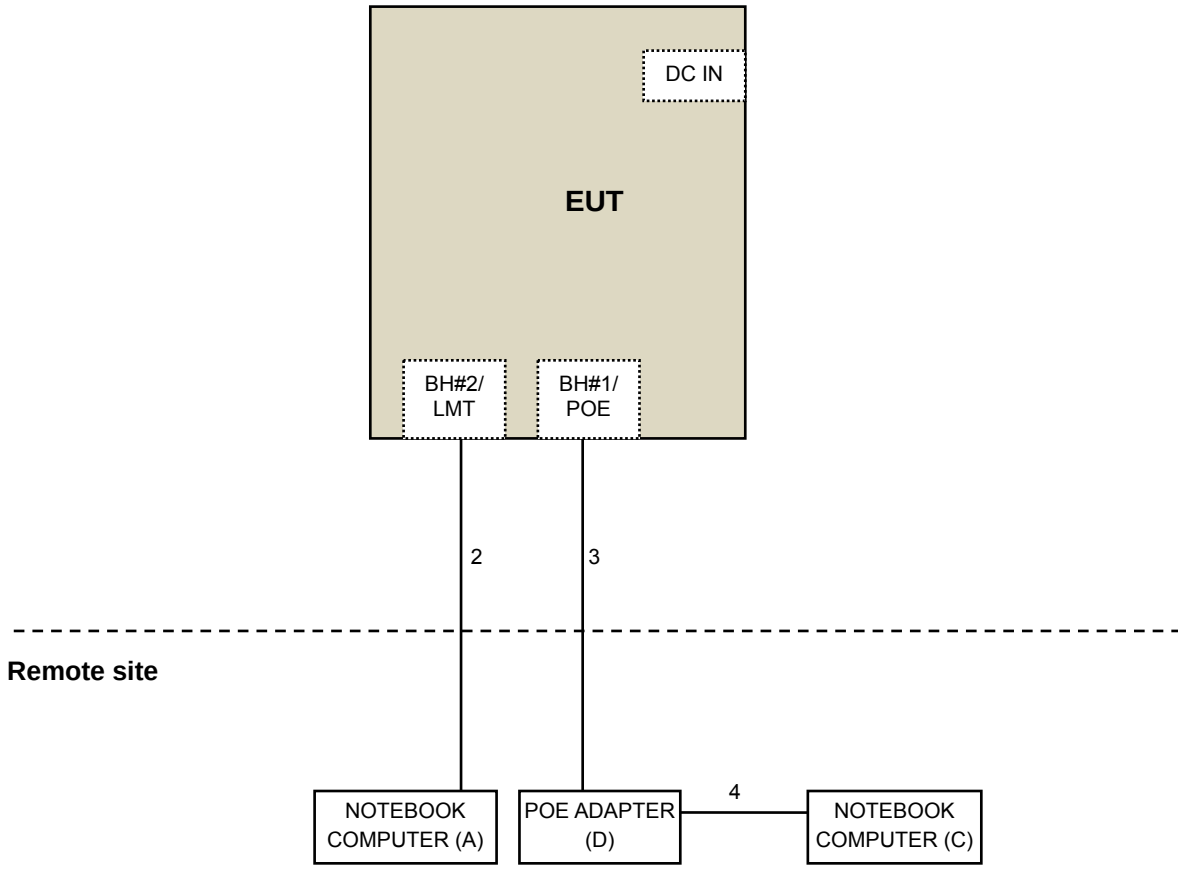
1. The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

For Adapter mode:



For POE mode:


DC IN
EUT
BH#2/
LMT
BH#1/
POE
2
3
Remote site
NOTEBOOK
COMPUTER (A)
POE ADAPTER
(D)
4
NOTEBOOK
COMPUTER (C)

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 v03r04
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. 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-1000VH2B	AMP-ZFL-06	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Feb. 03, 2015	Feb. 02, 2016
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 03, 2015	Apr. 02, 2016
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Feb. 06, 2015	Feb. 05, 2016
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. 31, 2015	Mar. 30, 2016
Spectrum Analyzer R&S	FSV40	100964	June 26, 2015	June 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 104	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

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: Sep. 24 to 30, 2015

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:

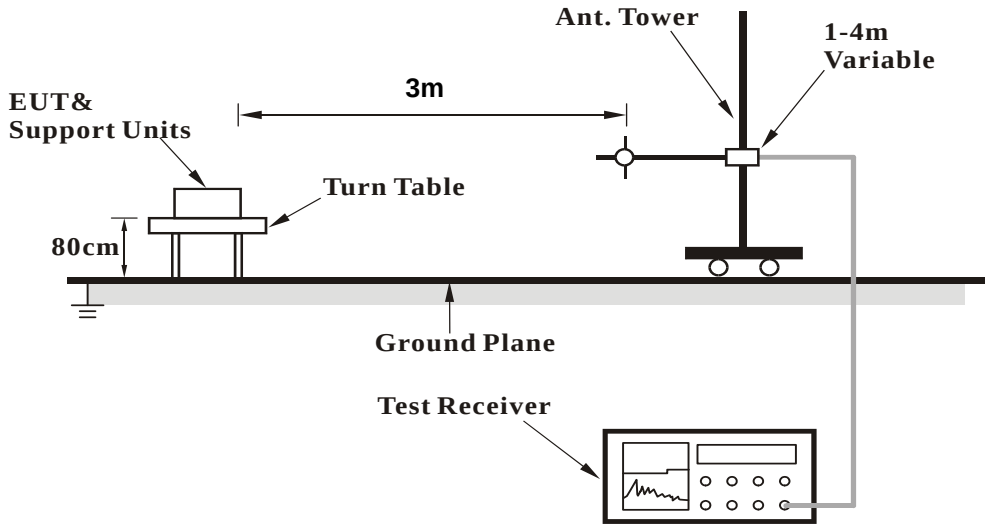
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

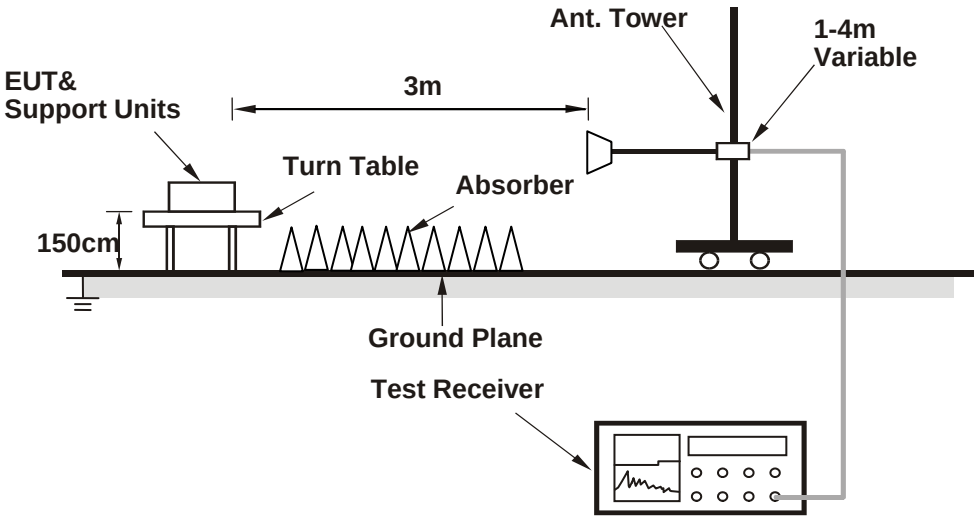
No deviation.

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

For adapter mode:

1. Connect the EUT with the support unit A (Notebook Computer) which is placed in remote site.
2. The communication partner run test program “Cart type command [Cart command_(FZI).txt]” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

For POE mode:

1. Connect the EUT with the support units A &C (Notebook Computer) which is placed in remote site.
2. The communication partner run test program “Cart type command [Cart command_(FZI).txt]” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 Test Results (Mode 1)

Above 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.6 PK	74.0	-15.4	1.30 H	50	60.64	-2.04
2	2390.00	45.1 AV	54.0	-8.9	1.30 H	50	47.14	-2.04
3	*2412.00	114.6 PK			1.30 H	50	116.58	-1.98
4	*2412.00	111.5 AV			1.30 H	50	113.48	-1.98
5	4824.00	55.7 PK	74.0	-18.3	1.33 H	357	49.26	6.44
6	4824.00	53.6 AV	54.0	-0.4	1.33 H	357	47.16	6.44
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.6 PK	74.0	-16.4	1.30 V	45	59.64	-2.04
2	2390.00	44.1 AV	54.0	-9.9	1.30 V	45	46.14	-2.04
3	*2412.00	113.2 PK			1.30 V	45	115.18	-1.98
4	*2412.00	109.6 AV			1.30 V	45	111.58	-1.98
5	4824.00	51.3 PK	74.0	-22.7	1.57 V	30	44.86	6.44
6	4824.00	48.2 AV	54.0	-5.8	1.57 V	30	41.76	6.44

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	111.7 PK			1.45 H	60	113.63	-1.93
2	*2437.00	109.4 AV			1.45 H	60	111.33	-1.93
3	4874.00	55.7 PK	74.0	-18.3	1.31 H	355	49.03	6.67
4	4874.00	53.8 AV	54.0	-0.2	1.31 H	355	47.13	6.67
5	7311.00	49.4 PK	74.0	-24.6	1.60 H	316	35.59	13.81
6	7311.00	38.6 AV	54.0	-15.4	1.60 H	316	24.79	13.81
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	110.2 PK			1.44 V	298	112.13	-1.93
2	*2437.00	107.6 AV			1.44 V	298	109.53	-1.93
3	4874.00	55.7 PK	74.0	-18.3	1.61 V	19	49.03	6.67
4	4874.00	53.8 AV	54.0	-0.2	1.61 V	19	47.13	6.67
5	7311.00	50.6 PK	74.0	-23.4	2.20 V	38	36.79	13.81
6	7311.00	39.4 AV	54.0	-14.6	2.20 V	38	25.59	13.81

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.6 PK			1.22 H	62	113.48	-1.88
2	*2462.00	109.0 AV			1.22 H	62	110.88	-1.88
3	2483.50	58.9 PK	74.0	-15.1	1.22 H	62	60.73	-1.83
4	2483.50	45.2 AV	54.0	-8.8	1.22 H	62	47.03	-1.83
5	4924.00	55.5 PK	74.0	-18.5	1.62 H	351	48.64	6.86
6	4924.00	53.5 AV	54.0	-0.5	1.62 H	351	46.64	6.86
7	7386.00	52.3 PK	74.0	-21.7	2.07 H	73	38.50	13.80
8	7386.00	44.5 AV	54.0	-9.5	2.07 H	73	30.70	13.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	110.7 PK			1.43 V	344	112.58	-1.88
2	*2462.00	107.1 AV			1.43 V	344	108.98	-1.88
3	2483.50	58.0 PK	74.0	-16.0	1.43 V	344	59.83	-1.83
4	2483.50	44.7 AV	54.0	-9.3	1.43 V	344	46.53	-1.83
5	4924.00	51.0 PK	74.0	-23.0	1.52 V	33	44.14	6.86
6	4924.00	48.2 AV	54.0	-5.8	1.52 V	33	41.34	6.86
7	7386.00	52.4 PK	74.0	-21.6	2.19 V	26	38.60	13.80
8	7386.00	45.7 AV	54.0	-8.3	2.19 V	26	31.90	13.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.6 PK	74.0	-1.4	1.97 H	60	74.64	-2.04
2	2390.00	53.7 AV	54.0	-0.3	1.97 H	60	55.74	-2.04
3	*2412.00	115.4 PK			1.97 H	60	117.38	-1.98
4	*2412.00	104.2 AV			1.97 H	60	106.18	-1.98
5	4824.00	56.5 PK	74.0	-17.5	1.29 H	360	50.06	6.44
6	4824.00	40.7 AV	54.0	-13.3	1.29 H	360	34.26	6.44
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	71.0 PK	74.0	-3.0	1.66 V	31	73.04	-2.04
2	2390.00	52.7 AV	54.0	-1.3	1.66 V	31	54.74	-2.04
3	*2412.00	112.6 PK			1.66 V	31	114.58	-1.98
4	*2412.00	101.7 AV			1.66 V	31	103.68	-1.98
5	4824.00	54.5 PK	74.0	-19.5	1.60 V	16	48.06	6.44
6	4824.00	40.3 AV	54.0	-13.7	1.60 V	16	33.86	6.44

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.2 PK	74.0	-14.8	1.97 H	59	61.24	-2.04
2	2390.00	46.1 AV	54.0	-7.9	1.97 H	59	48.14	-2.04
3	*2437.00	118.1 PK			1.97 H	59	120.03	-1.93
4	*2437.00	107.6 AV			1.97 H	59	109.53	-1.93
5	2483.50	64.2 PK	74.0	-9.8	1.97 H	59	66.03	-1.83
6	2483.50	47.7 AV	54.0	-6.3	1.97 H	59	49.53	-1.83
7	4874.00	54.7 PK	74.0	-19.3	1.30 H	355	48.03	6.67
8	4874.00	40.7 AV	54.0	-13.3	1.30 H	355	34.03	6.67
9	7311.00	48.8 PK	74.0	-25.2	1.55 H	314	34.99	13.81
10	7311.00	34.4 AV	54.0	-19.6	1.55 H	314	20.59	13.81
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.6 PK	74.0	-16.4	1.67 V	48	59.64	-2.04
2	2390.00	44.7 AV	54.0	-9.3	1.67 V	48	46.74	-2.04
3	*2437.00	115.2 PK			1.67 V	48	117.13	-1.93
4	*2437.00	103.8 AV			1.67 V	48	105.73	-1.93
5	2483.50	62.8 PK	74.0	-11.2	1.67 V	48	64.63	-1.83
6	2483.50	46.2 AV	54.0	-7.8	1.67 V	48	48.03	-1.83
7	4874.00	56.5 PK	74.0	-17.5	1.62 V	25	49.83	6.67
8	4874.00	40.2 AV	54.0	-13.8	1.62 V	25	33.53	6.67
9	7311.00	48.9 PK	74.0	-25.1	1.43 V	194	35.09	13.81
10	7311.00	33.6 AV	54.0	-20.4	1.43 V	194	19.79	13.81

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.2 PK			2.53 H	62	117.08	-1.88
2	*2462.00	102.8 AV			2.53 H	62	104.68	-1.88
3	2483.50	73.4 PK	74.0	-0.6	2.53 H	62	75.23	-1.83
4	2483.50	53.2 AV	54.0	-0.8	2.53 H	62	55.03	-1.83
5	4924.00	55.1 PK	74.0	-18.9	1.27 H	354	48.24	6.86
6	4924.00	41.2 AV	54.0	-12.8	1.27 H	354	34.34	6.86
7	7386.00	49.0 PK	74.0	-25.0	1.52 H	305	35.20	13.80
8	7386.00	34.8 AV	54.0	-19.2	1.52 H	305	21.00	13.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.2 PK			1.51 V	69	114.08	-1.88
2	*2462.00	100.2 AV			1.51 V	69	102.08	-1.88
3	2483.50	71.5 PK	74.0	-2.5	1.51 V	69	73.33	-1.83
4	2483.50	52.1 AV	54.0	-1.9	1.51 V	69	53.93	-1.83
5	4924.00	52.3 PK	74.0	-21.7	1.47 V	31	45.44	6.86
6	4924.00	40.0 AV	54.0	-14.0	1.47 V	31	33.14	6.86
7	7386.00	47.9 PK	74.0	-26.1	2.20 V	33	34.10	13.80
8	7386.00	34.1 AV	54.0	-19.9	2.20 V	33	20.30	13.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.8 PK	74.0	-2.2	1.92 H	72	73.84	-2.04
2	2390.00	53.5 AV	54.0	-0.5	1.92 H	72	55.54	-2.04
3	*2412.00	116.3 PK			1.92 H	72	118.28	-1.98
4	*2412.00	105.1 AV			1.92 H	72	107.08	-1.98
5	4824.00	56.4 PK	74.0	-17.6	1.34 H	352	49.96	6.44
6	4824.00	40.6 AV	54.0	-13.4	1.34 H	352	34.16	6.44
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	69.8 PK	74.0	-4.2	1.57 V	301	71.84	-2.04
2	2390.00	50.6 AV	54.0	-3.4	1.57 V	301	52.64	-2.04
3	*2412.00	115.6 PK			1.57 V	301	117.58	-1.98
4	*2412.00	101.7 AV			1.57 V	301	103.68	-1.98
5	4824.00	55.0 PK	74.0	-19.0	1.62 V	29	48.56	6.44
6	4824.00	40.8 AV	54.0	-13.2	1.62 V	29	34.36	6.44

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.5 PK	74.0	-14.5	1.31 H	62	61.54	-2.04
2	2390.00	46.0 AV	54.0	-8.0	1.31 H	62	48.04	-2.04
3	*2437.00	118.1 PK			1.31 H	62	120.03	-1.93
4	*2437.00	108.1 AV			1.31 H	62	110.03	-1.93
5	2483.50	62.6 PK	74.0	-11.4	1.31 H	62	64.43	-1.83
6	2483.50	46.8 AV	54.0	-7.2	1.31 H	62	48.63	-1.83
7	4874.00	55.0 PK	74.0	-19.0	1.28 H	339	48.33	6.67
8	4874.00	41.1 AV	54.0	-12.9	1.28 H	339	34.43	6.67
9	7311.00	48.4 PK	74.0	-25.6	1.58 H	309	34.59	13.81
10	7311.00	34.0 AV	54.0	-20.0	1.58 H	309	20.19	13.81
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	54.7 PK	74.0	-19.3	1.62 V	289	56.74	-2.04
2	2390.00	41.7 AV	54.0	-12.3	1.62 V	289	43.74	-2.04
3	*2437.00	114.2 PK			1.62 V	289	116.13	-1.93
4	*2437.00	103.8 AV			1.62 V	289	105.73	-1.93
5	2483.50	58.2 PK	74.0	-15.8	1.62 V	289	60.03	-1.83
6	2483.50	43.3 AV	54.0	-10.7	1.62 V	289	45.13	-1.83
7	4874.00	56.4 PK	74.0	-17.6	1.59 V	7	49.73	6.67
8	4874.00	40.2 AV	54.0	-13.8	1.59 V	7	33.53	6.67
9	7311.00	58.2 PK	74.0	-15.8	2.23 V	45	44.39	13.81
10	7311.00	33.9 AV	54.0	-20.1	2.23 V	45	20.09	13.81

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.7 PK			2.29 H	65	113.58	-1.88
2	*2462.00	103.1 AV			2.29 H	65	104.98	-1.88
3	2483.50	73.3 PK	74.0	-0.7	2.29 H	65	75.13	-1.83
4	2483.50	53.6 AV	54.0	-0.4	2.29 H	65	55.43	-1.83
5	4924.00	54.8 PK	74.0	-19.2	1.24 H	343	47.94	6.86
6	4924.00	41.1 AV	54.0	-12.9	1.24 H	343	34.24	6.86
7	7386.00	48.9 PK	74.0	-25.1	1.52 H	302	35.10	13.80
8	7386.00	34.4 AV	54.0	-19.6	1.52 H	302	20.60	13.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.5 PK			1.48 V	323	113.38	-1.88
2	*2462.00	100.7 AV			1.48 V	323	102.58	-1.88
3	2483.50	71.4 PK	74.0	-2.6	1.48 V	323	73.23	-1.83
4	2483.50	51.0 AV	54.0	-3.0	1.48 V	323	52.83	-1.83
5	4924.00	51.8 PK	74.0	-22.2	1.44 V	34	44.94	6.86
6	4924.00	39.7 AV	54.0	-14.3	1.44 V	34	32.84	6.86
7	7386.00	47.5 PK	74.0	-26.5	2.16 V	39	33.70	13.80
8	7386.00	33.7 AV	54.0	-20.3	2.16 V	39	19.90	13.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.0 PK	74.0	-2.0	1.30 H	65	74.04	-2.04
2	2390.00	53.4 AV	54.0	-0.6	1.30 H	65	55.44	-2.04
3	*2422.00	110.8 PK			1.30 H	65	112.76	-1.96
4	*2422.00	100.9 AV			1.30 H	65	102.86	-1.96
5	4844.00	55.5 PK	74.0	-18.5	1.23 H	356	48.97	6.53
6	4844.00	41.3 AV	54.0	-12.7	1.23 H	356	34.77	6.53
7	7266.00	49.4 PK	74.0	-24.6	1.55 H	303	35.52	13.88
8	7266.00	35.0 AV	54.0	-19.0	1.55 H	303	21.12	13.88
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.7 PK	74.0	-5.3	1.41 V	321	70.74	-2.04
2	2390.00	51.2 AV	54.0	-2.8	1.41 V	321	53.24	-2.04
3	*2422.00	108.6 PK			1.41 V	321	110.56	-1.96
4	*2422.00	96.4 AV			1.41 V	321	98.36	-1.96
5	4844.00	52.5 PK	74.0	-21.5	1.50 V	25	45.97	6.53
6	4844.00	40.1 AV	54.0	-13.9	1.50 V	25	33.57	6.53
7	7266.00	48.0 PK	74.0	-26.0	2.24 V	20	34.12	13.88
8	7266.00	34.0 AV	54.0	-20.0	2.24 V	20	20.12	13.88

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	66.8 PK	74.0	-7.2	1.56 H	42	68.84	-2.04
2	2390.00	47.9 AV	54.0	-6.1	1.56 H	42	49.94	-2.04
3	*2437.00	111.0 PK			1.56 H	42	112.93	-1.93
4	*2437.00	101.2 AV			1.56 H	42	103.13	-1.93
5	2483.50	73.4 PK	74.0	-0.6	1.56 H	42	75.23	-1.83
6	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**1.56 H**	**42**	**55.73**	**-1.83**
7	4874.00	55.9 PK	74.0	-18.1	1.21 H	347	49.23	6.67
8	4874.00	41.5 AV	54.0	-12.5	1.21 H	347	34.83	6.67
9	7311.00	49.5 PK	74.0	-24.5	1.52 H	292	35.69	13.81
10	7311.00	35.3 AV	54.0	-18.7	1.52 H	292	21.49	13.81
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.3 PK	74.0	-8.7	1.61 V	324	67.34	-2.04
2	2390.00	44.3 AV	54.0	-9.7	1.61 V	324	46.34	-2.04
3	*2437.00	109.1 PK			1.61 V	324	111.03	-1.93
4	*2437.00	97.6 AV			1.61 V	324	99.53	-1.93
5	2483.50	70.1 PK	74.0	-3.9	1.61 V	324	71.93	-1.83
6	2483.50	49.7 AV	54.0	-4.3	1.61 V	324	51.53	-1.83
7	4874.00	56.8 PK	74.0	-17.2	1.59 V	20	50.13	6.67
8	4874.00	40.6 AV	54.0	-13.4	1.59 V	20	33.93	6.67
9	7311.00	48.6 PK	74.0	-25.4	2.22 V	45	34.79	13.81
10	7311.00	33.3 AV	54.0	-20.7	2.22 V	45	19.49	13.81

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	107.8 PK			1.70 H	43	109.70	-1.90
2	*2452.00	98.7 AV			1.70 H	43	100.60	-1.90
3	2483.50	73.7 PK	74.0	-0.3	1.70 H	43	75.53	-1.83
4	2483.50	53.6 AV	54.0	-0.4	1.70 H	43	55.43	-1.83
5	4904.00	55.3 PK	74.0	-18.7	1.22 H	349	48.48	6.82
6	4904.00	41.6 AV	54.0	-12.4	1.22 H	349	34.78	6.82
7	7356.00	48.6 PK	74.0	-25.4	1.53 H	312	34.79	13.81
8	7356.00	34.5 AV	54.0	-19.5	1.53 H	312	20.69	13.81
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	106.4 PK			1.54 V	320	108.30	-1.90
2	*2452.00	95.4 AV			1.54 V	320	97.30	-1.90
3	2483.50	70.2 PK	74.0	-3.8	1.54 V	320	72.03	-1.83
4	2483.50	48.7 AV	54.0	-5.3	1.54 V	320	50.53	-1.83
5	4904.00	52.6 PK	74.0	-21.4	1.44 V	41	45.78	6.82
6	4904.00	40.4 AV	54.0	-13.6	1.44 V	41	33.58	6.82
7	7356.00	47.7 PK	74.0	-26.3	2.19 V	49	33.89	13.81
8	7356.00	34.2 AV	54.0	-19.8	2.19 V	49	20.39	13.81

REMARKS:

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

Below 1GHz Data:

802.11n (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	165.99	33.9 QP	43.5	-9.6	1.50 H	75	47.00	-13.13
2	232.34	35.2 QP	46.0	-10.8	1.50 H	70	50.60	-15.37
3	299.32	37.6 QP	46.0	-8.4	1.00 H	38	50.21	-12.60
4	500.01	36.7 QP	46.0	-9.3	1.50 H	232	44.45	-7.77
5	697.89	35.8 QP	46.0	-10.2	1.00 H	184	39.55	-3.74
6	921.62	41.4 QP	46.0	-4.6	2.00 H	140	41.64	-0.20
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	165.99	35.2 QP	43.5	-8.3	1.00 V	263	48.35	-13.13
2	232.78	31.5 QP	46.0	-14.5	1.00 V	329	46.87	-15.33
3	299.32	33.7 QP	46.0	-12.3	1.50 V	360	46.33	-12.60
4	500.01	32.1 QP	46.0	-13.9	1.00 V	28	39.90	-7.77
5	697.02	35.7 QP	46.0	-10.3	1.50 V	136	39.44	-3.74
6	921.62	41.7 QP	46.0	-4.3	2.00 V	49	41.91	-0.20

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

4.1.8 Test Results (Mode 2)

Below 1GHz 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	99.89	31.0 QP	43.5	-12.5	1.50 H	75	48.81	-17.85
2	154.21	35.3 QP	43.5	-8.3	2.00 H	283	48.28	-13.03
3	233.60	33.8 QP	46.0	-12.2	1.50 H	286	49.02	-15.26
4	350.00	32.9 QP	46.0	-13.1	1.00 H	67	44.29	-11.36
5	650.02	35.1 QP	46.0	-10.9	1.50 H	184	39.38	-4.30
6	921.62	42.0 QP	46.0	-4.0	1.50 H	225	42.19	-0.20
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	66.04	36.8 QP	40.0	-3.2	2.00 V	348	51.39	-14.60
2	149.80	31.0 QP	43.5	-12.6	1.00 V	341	44.45	-13.50
3	306.69	31.7 QP	46.0	-14.3	1.50 V	150	44.03	-12.30
4	550.02	31.8 QP	46.0	-14.2	2.00 V	152	38.59	-6.77
5	650.02	31.0 QP	46.0	-15.0	1.00 V	172	35.34	-4.30
6	921.62	40.1 QP	46.0	-5.9	1.00 V	116	40.28	-0.20

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	E1-011311	09	Nov. 27, 2014	Nov. 26, 2015
50 ohms Terminator	E1-011315	13	Dec. 12, 2014	Dec. 11, 2015
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Sep. 30 to Oct. 02, 2015

4.2.3 Test Procedures

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

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

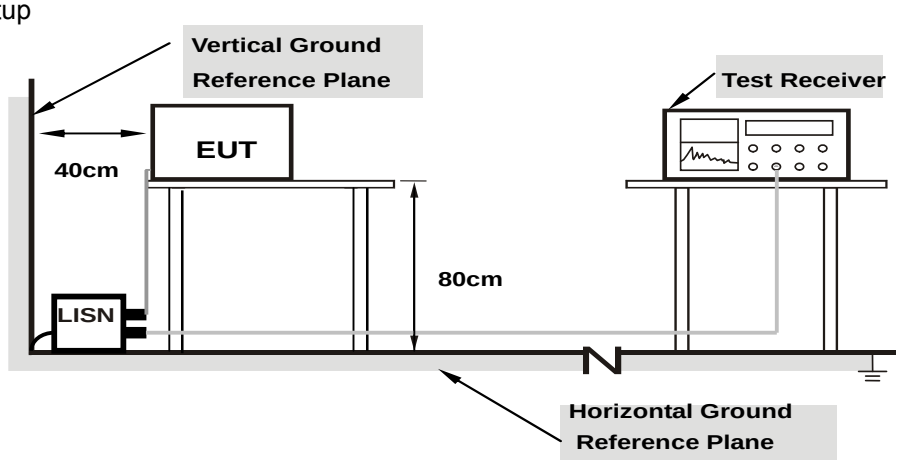
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

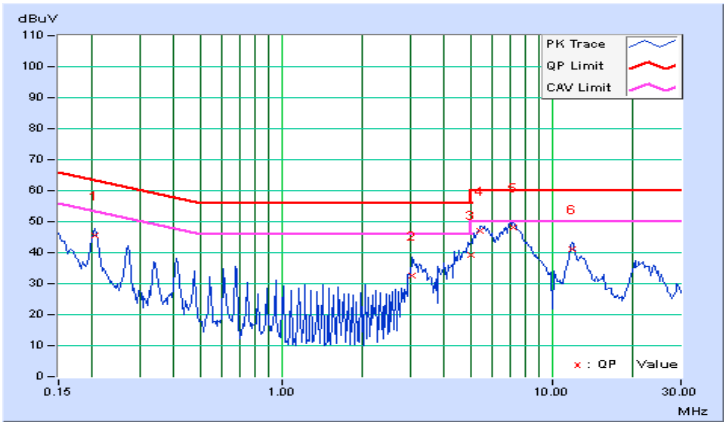
4.2.7 Test Results (Mode 1)

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.20469	0.12	45.60	37.53	45.72	37.65	63.42	53.42	-17.70	-15.77
2	3.05859	0.25	32.42	25.57	32.67	25.82	56.00	46.00	-23.33	-20.18
3	5.00000	0.32	39.08	33.88	39.40	34.20	56.00	46.00	-16.60	-11.80
4	5.43797	0.34	46.73	44.97	47.07	45.31	60.00	50.00	-12.93	-4.69
5	**7.20456**	**0.41**	**47.64**	**45.67**	**48.05**	**46.08**	**60.00**	**50.00**	**-11.95**	**-3.92**
6	11.84016	0.58	40.54	37.58	41.12	38.16	60.00	50.00	-18.88	-11.84

Remarks:

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

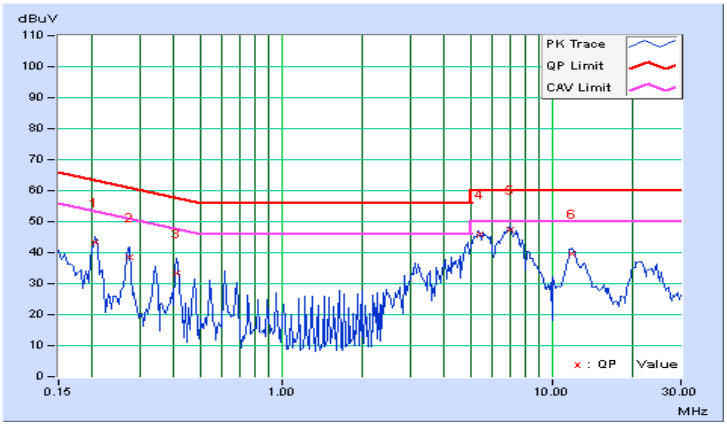


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.20469	0.10	43.27	36.13	43.37	36.23	63.42	53.42	-20.05	-17.19
2	0.27500	0.11	38.39	31.71	38.50	31.82	60.97	50.97	-22.47	-19.15
3	0.41156	0.12	33.29	26.75	33.41	26.87	57.62	47.62	-24.21	-20.75
4	5.39509	0.35	45.62	43.75	45.97	44.10	60.00	50.00	-14.03	-5.90
5	7.02981	0.41	46.85	45.05	47.26	45.46	60.00	50.00	-12.74	-4.54
6	11.92578	0.59	38.98	23.64	39.57	24.23	60.00	50.00	-20.43	-25.77

Remarks:

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



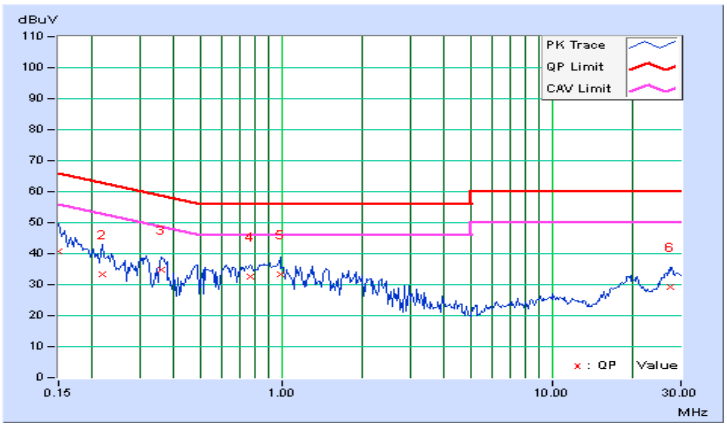
4.2.8 Test Results (Mode 2)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.11	40.47	24.81	40.58	24.92	66.00	56.00	-25.42	-31.08
2	0.21641	0.12	33.23	18.51	33.35	18.63	62.96	52.96	-29.60	-34.32
3	0.36094	0.14	34.65	28.74	34.79	28.88	58.71	48.71	-23.92	-19.83
4	0.76328	0.16	32.37	24.65	32.53	24.81	56.00	46.00	-23.47	-21.19
5	0.99375	0.17	33.00	23.14	33.17	23.31	56.00	46.00	-22.83	-22.69
6	27.28125	1.05	28.27	23.76	29.32	24.81	60.00	50.00	-30.68	-25.19

REMARKS:

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

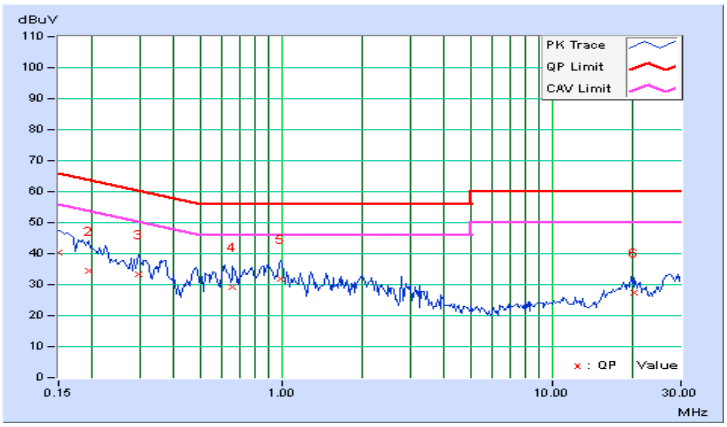


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.09	40.15	24.26	40.24	24.35	66.00	56.00	-25.76	-31.65
2	0.19297	0.10	34.29	17.96	34.39	18.06	63.91	53.91	-29.52	-35.85
3	0.29844	0.11	33.08	24.27	33.19	24.38	60.29	50.29	-27.10	-25.91
4	0.66172	0.14	29.08	18.98	29.22	19.12	56.00	46.00	-26.78	-26.88
5	0.98984	0.16	31.68	20.81	31.84	20.97	56.00	46.00	-24.16	-25.03
6	20.26172	0.86	26.61	22.78	27.47	23.64	60.00	50.00	-32.53	-26.36

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

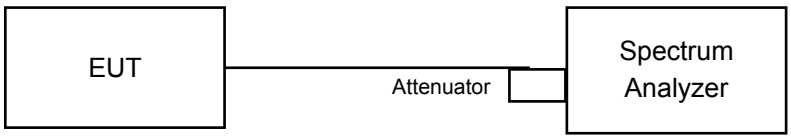


4.3 6dB Bandwidth Measurement

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

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

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	6.07	6.11	0.5	Pass
6	2437	6.09	6.11	0.5	Pass
11	2462	6.55	6.08	0.5	Pass

802.11g

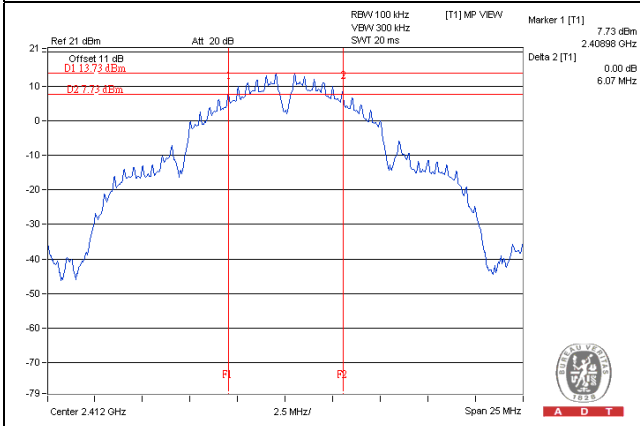
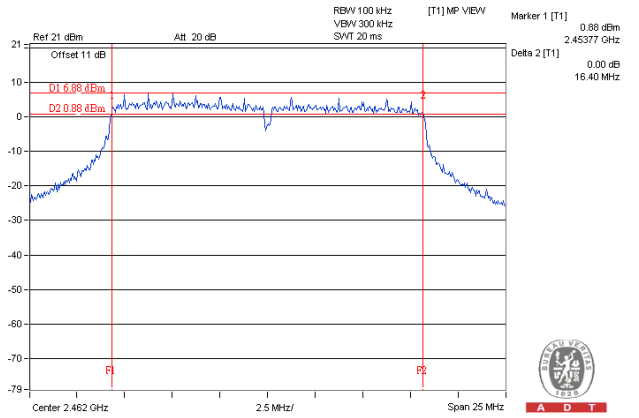
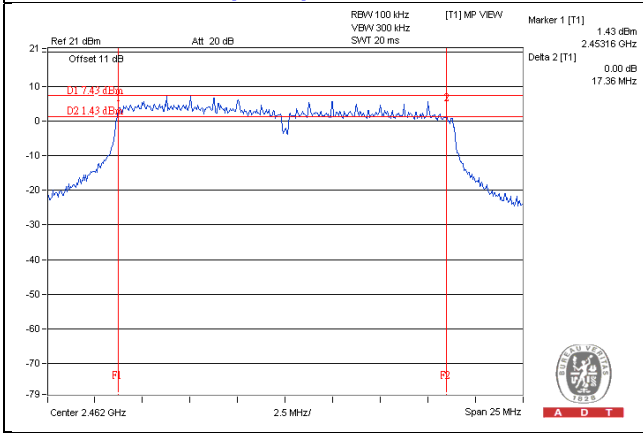
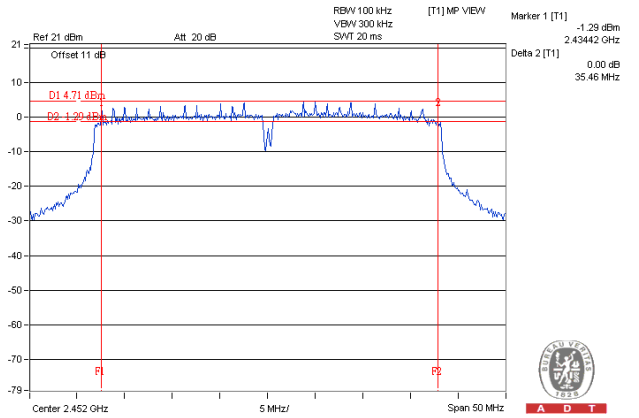
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.40	16.40	0.5	Pass
6	2437	16.43	16.41	0.5	Pass
11	2462	16.40	16.42	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.39	17.61	0.5	Pass
6	2437	17.65	17.65	0.5	Pass
11	2462	17.57	17.36	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.67	36.16	0.5	Pass
6	2437	36.47	36.16	0.5	Pass
9	2452	35.46	35.85	0.5	Pass

Spectrum Plot of Worst Value	
802.11b – Chain 0: CH 1	**802.11g – Chain 0: CH 11**
	
802.11n (HT20) – Chain 1: CH 11	**802.11n (HT40) – Chain 0: CH 9**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

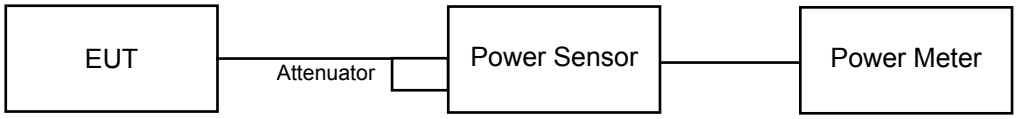
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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 ≤ 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 ≥ 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 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

802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.21	20.56	218.717	23.40	30	Pass
6	2437	22.23	22.14	330.791	25.20	30	Pass
11	2462	21.75	21.06	277.268	24.43	30	Pass

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.02	20.49	212.406	23.27	30	Pass
6	2437	22.30	22.20	335.783	25.26	30	Pass
11	2462	18.88	18.49	147.9	21.70	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.05	21.32	262.869	24.20	30	Pass
6	2437	22.39	22.23	340.489	25.32	30	Pass
11	2462	18.37	17.71	127.727	21.06	30	Pass

802.11n (HT40)

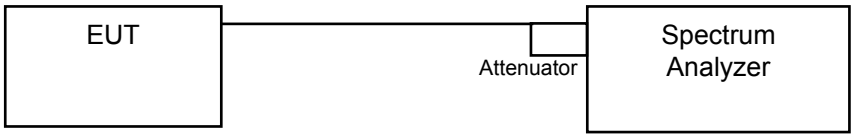
Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.55	18.89	149.06	21.73	30	Pass
6	2437	19.27	19.13	166.374	22.21	30	Pass
9	2452	18.30	17.81	128.003	21.07	30	Pass

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

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

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)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-5.99	3.01	-2.98	7.84	Pass
	6	2437	-4.86	3.01	-1.85	7.84	Pass
	11	2462	-5.18	3.01	-2.17	7.84	Pass
1	1	2412	-5.43	3.01	-2.42	7.84	Pass
	6	2437	-5.02	3.01	-2.01	7.84	Pass
	11	2462	-5.46	3.01	-2.45	7.84	Pass

Note: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.16dBi > 6dBi , so the power limit shall be reduced to 30-(6.16-6) = 7.84dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-9.62	3.01	-6.61	7.84	Pass
	6	2437	-7.75	3.01	-4.74	7.84	Pass
	11	2462	-11.94	3.01	-8.93	7.84	Pass
1	1	2412	-9.60	3.01	-6.59	7.84	Pass
	6	2437	-6.41	3.01	-3.40	7.84	Pass
	11	2462	-11.22	3.01	-8.21	7.84	Pass

Note: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.16dBi > 6dBi , so the power limit shall be reduced to 30-(6.16-6) = 7.84dBm.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-7.40	3.01	-4.39	7.84	Pass
	6	2437	-8.33	3.01	-5.32	7.84	Pass
	11	2462	-12.12	3.01	-9.11	7.84	Pass
1	1	2412	-4.43	3.01	-1.42	7.84	Pass
	6	2437	-8.62	3.01	-5.61	7.84	Pass
	11	2462	-11.58	3.01	-8.57	7.84	Pass

Note: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.16dBi > 6dBi , so the power limit shall be reduced to 30-(6.16-6) = 7.84dBm.

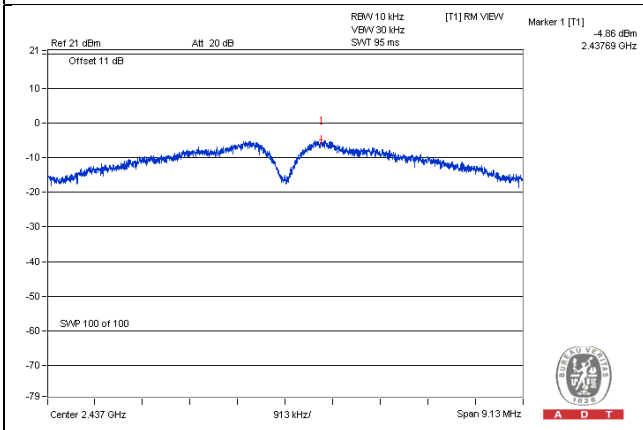
802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	3	2422	-14.08	3.01	-11.07	7.84	Pass
	6	2437	-10.64	3.01	-7.63	7.84	Pass
	9	2452	-9.56	3.01	-6.55	7.84	Pass
1	3	2422	-7.78	3.01	-4.77	7.84	Pass
	6	2437	-10.38	3.01	-7.37	7.84	Pass
	9	2452	-13.94	3.01	-10.93	7.84	Pass

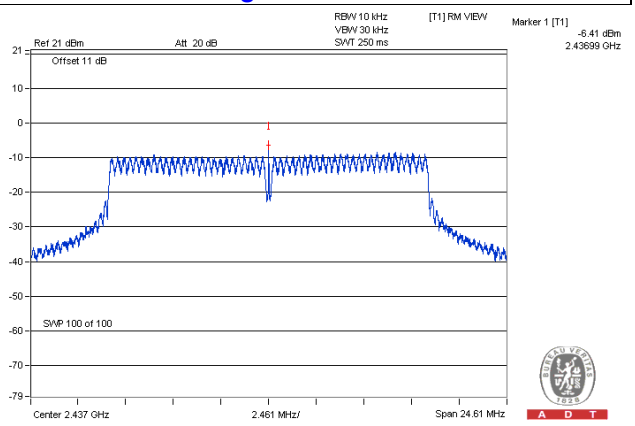
Note: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$)^2 / 2] = 6.16dBi > 6dBi , so the power limit shall be reduced to 30-(6.16-6) = 7.84dBm.

Spectrum Plot of Worst Value

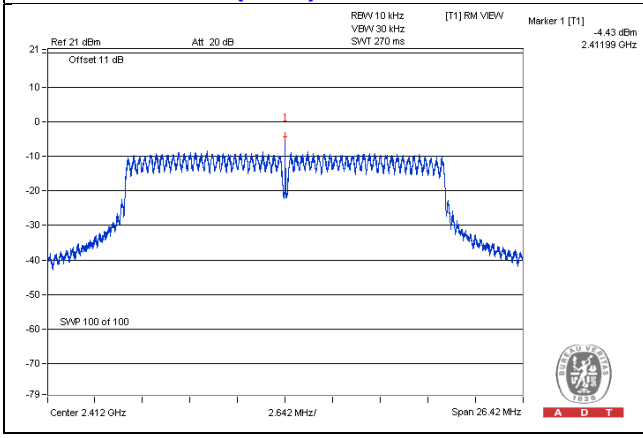
802.11b – Chain 0: CH 6



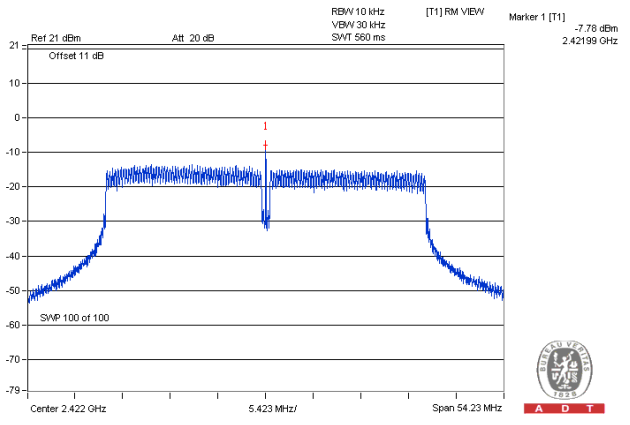
802.11g – Chain 1: CH 6



802.11n (HT20) – Chain 1: CH 1



802.11n (HT40) – Chain 1: CH 3

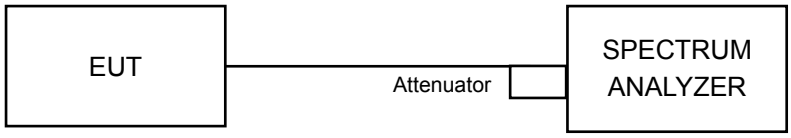


4.6 Conducted Out of Band Emission Measurement

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 ≥ 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 ≥ 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

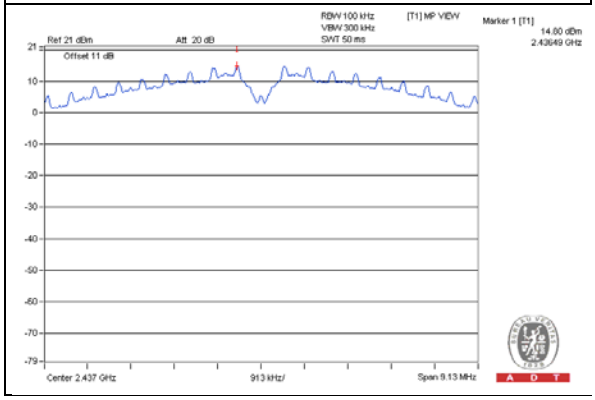
Same as Item 4.3.6

4.6.7 Test Results (Overall Spurious Emission Test)

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.

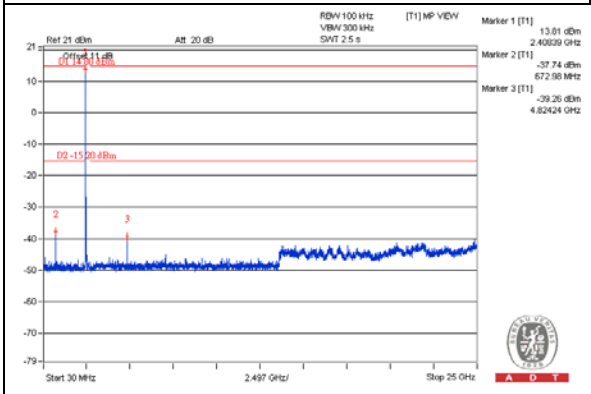
802.11b

Maximum REF

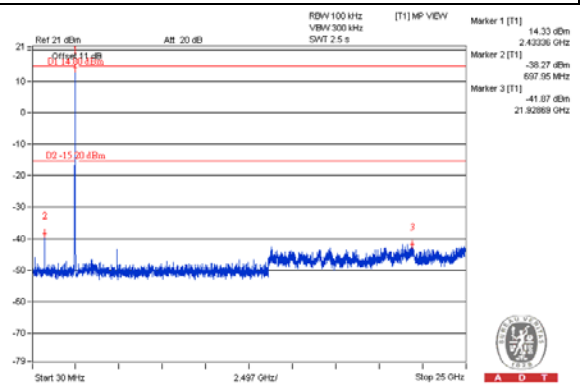


Chain 0

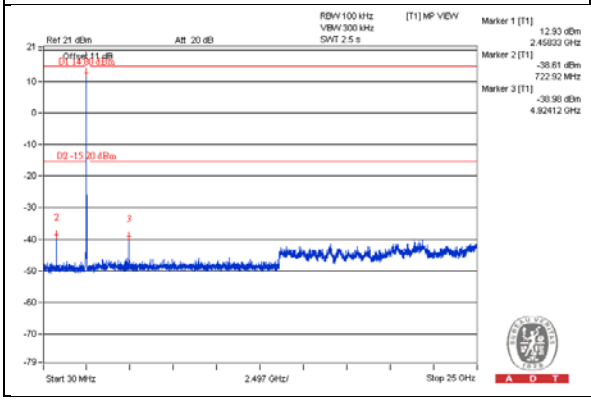
CH 1



CH 6

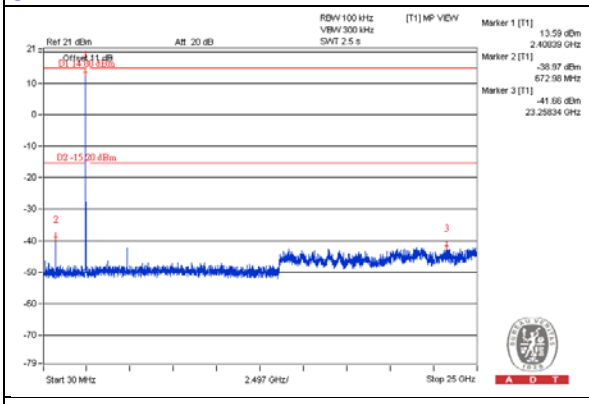


CH 11

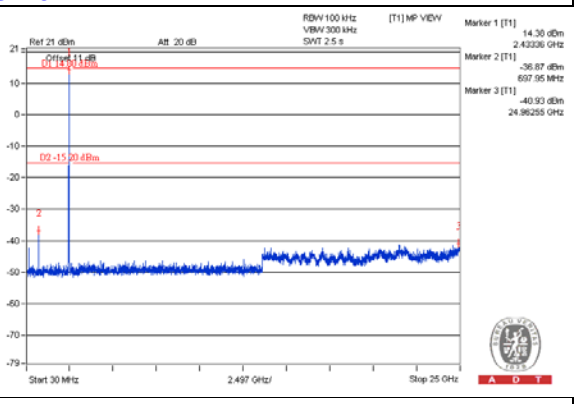


Chain 1

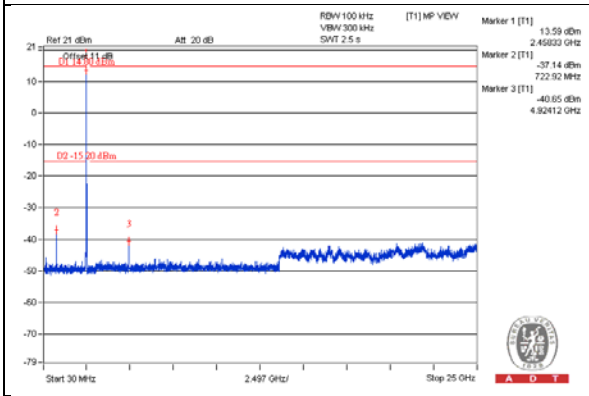
CH 1



CH 6

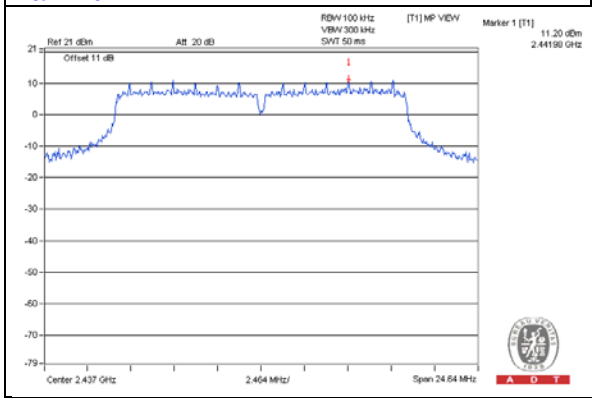


CH 11



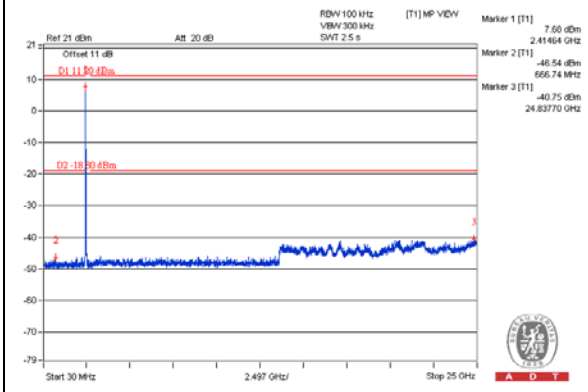
802.11g

Maximum REF

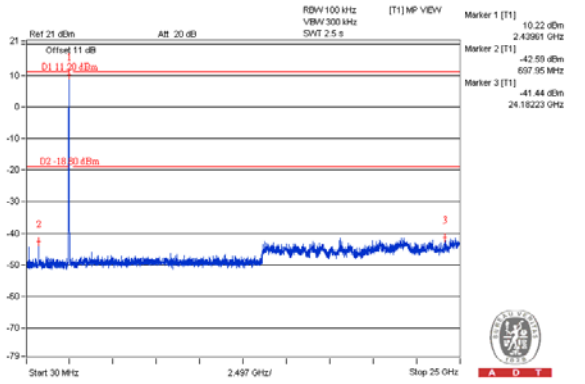


Chain 0

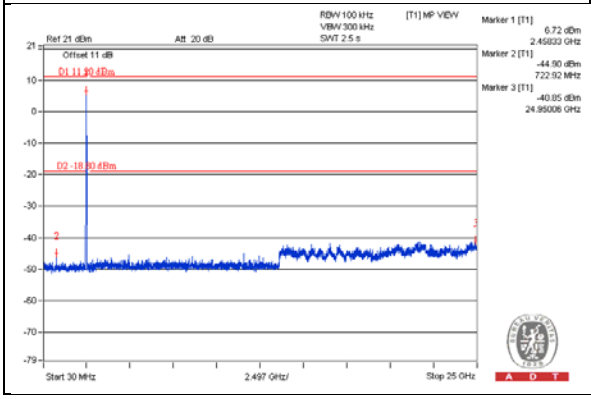
CH 1

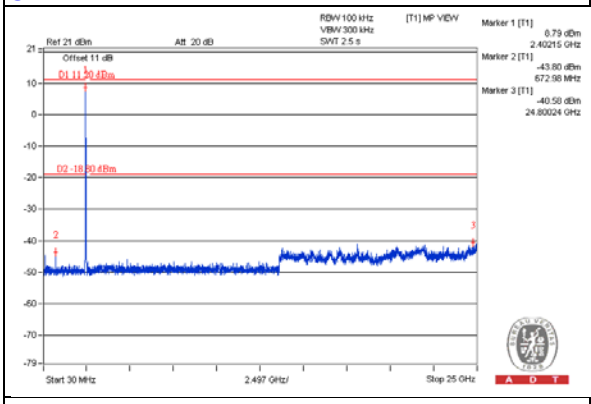
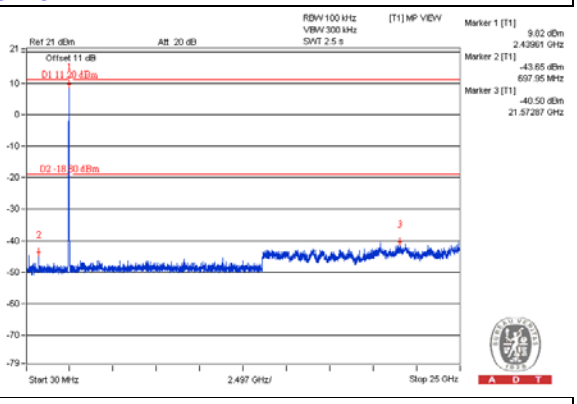
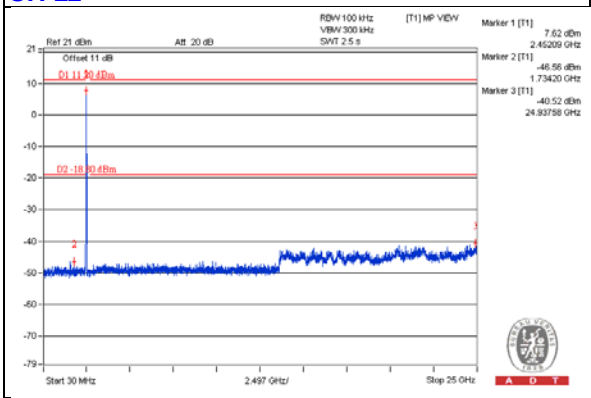


CH 6



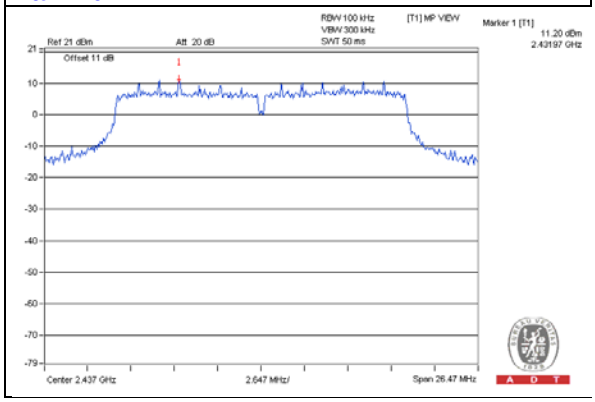
CH 11



Chain 1	
CH 1	CH 6
	
CH 11	
	

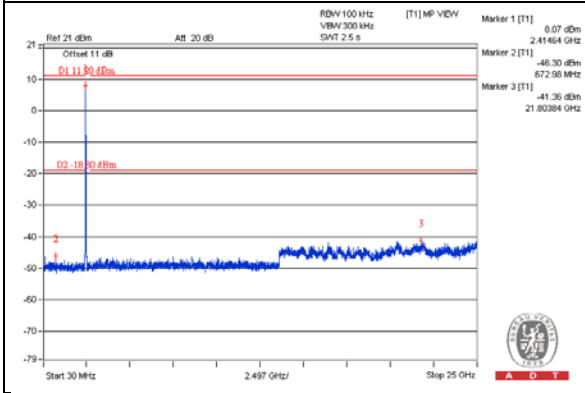
802.11n (HT20)

Maximum REF

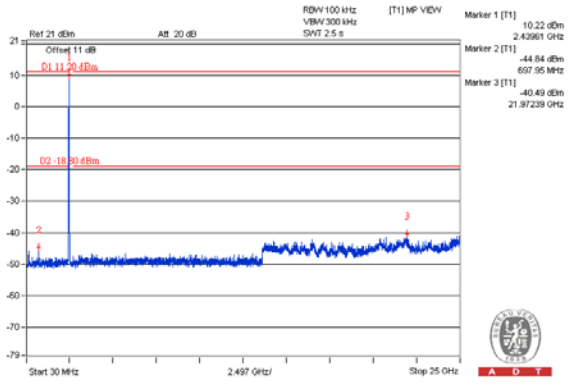


Chain 0

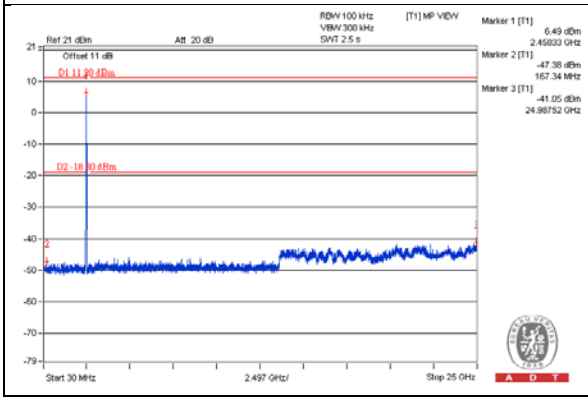
CH 1



CH 6

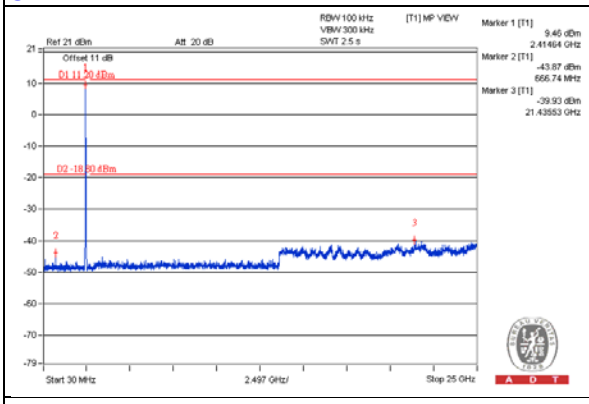


CH 11

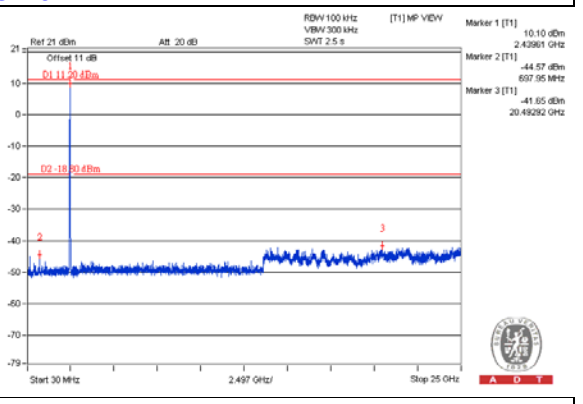


Chain 1

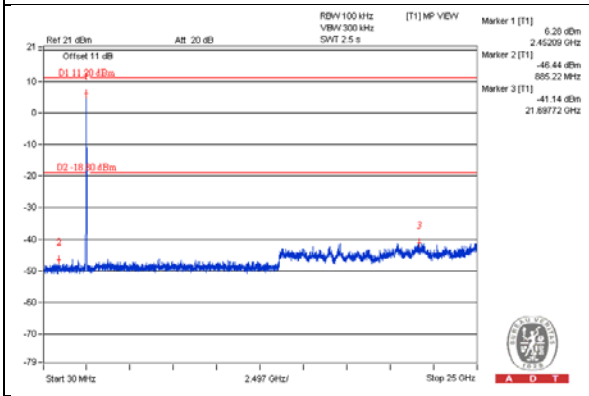
CH 1



CH 6

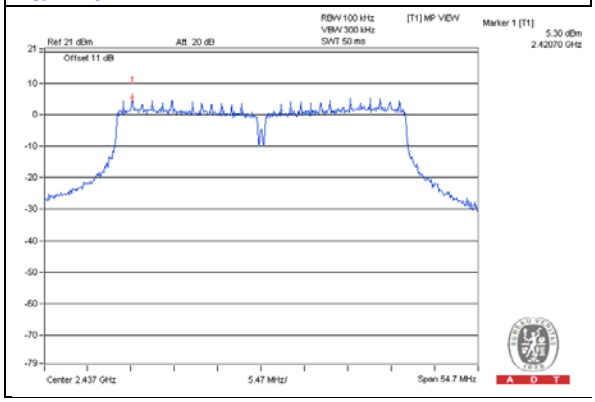


CH 11



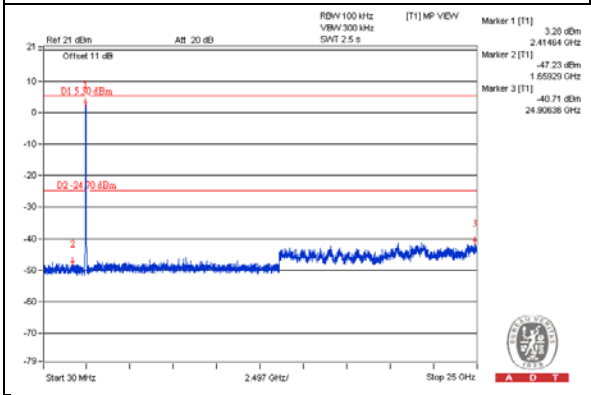
802.11n (HT40)

Maximum REF

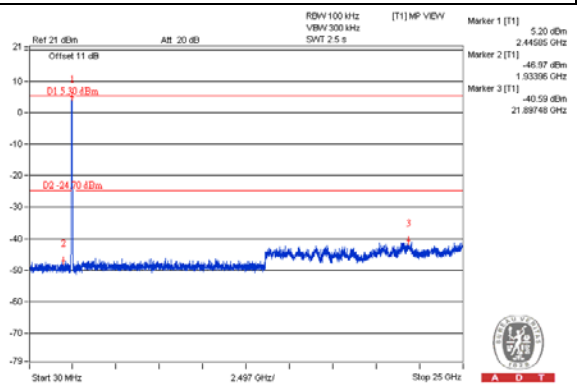


Chain 0

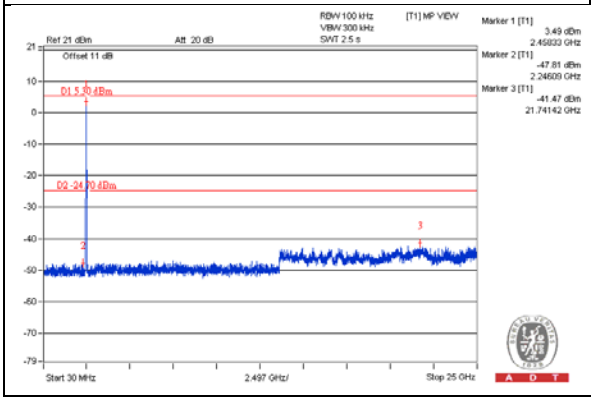
CH 3



CH 6

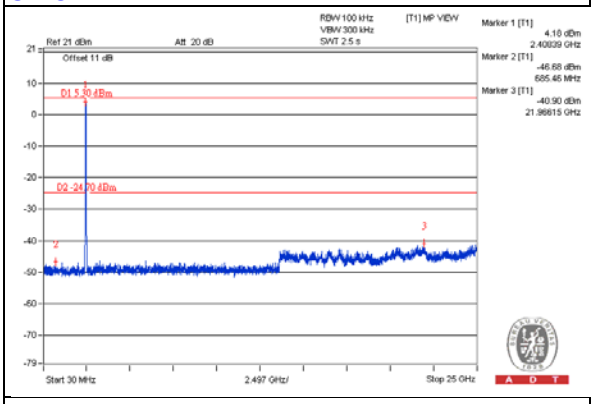


CH 9

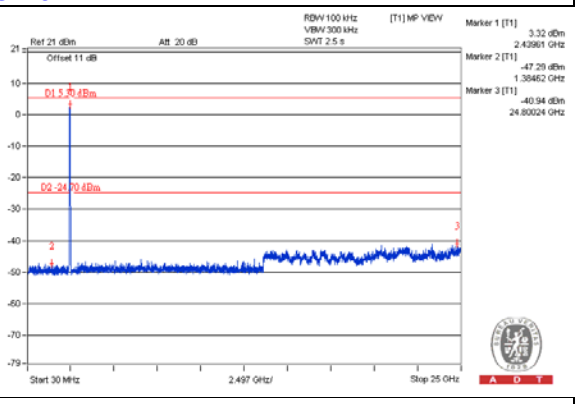


Chain 1

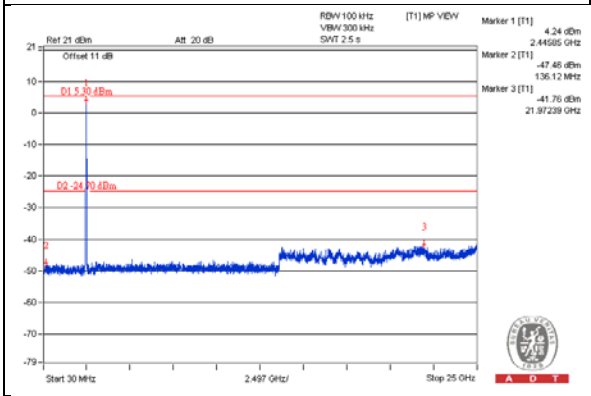
CH 3



CH 6



CH 9



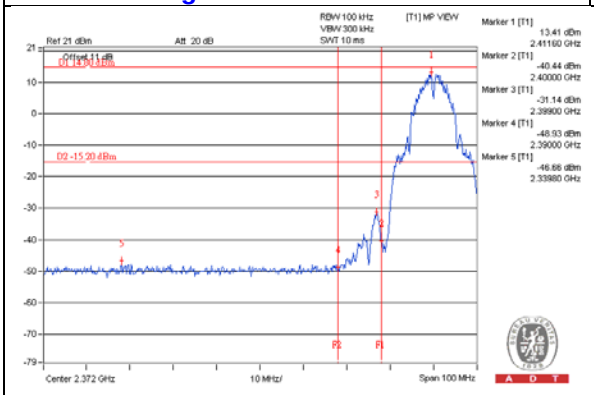
4.6.8 Test Results (Band Edge Test)

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.

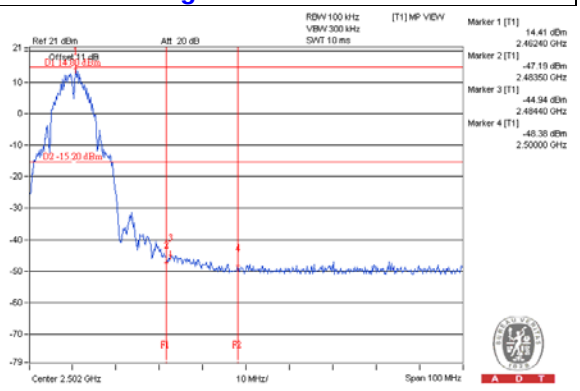
802.11b

Chain 0

CH 1 Band edge

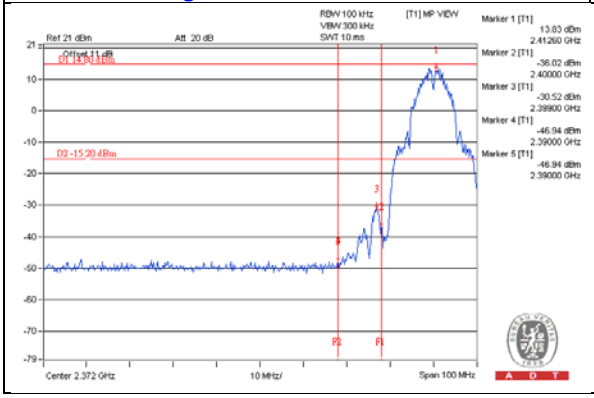


CH 11 Band edge

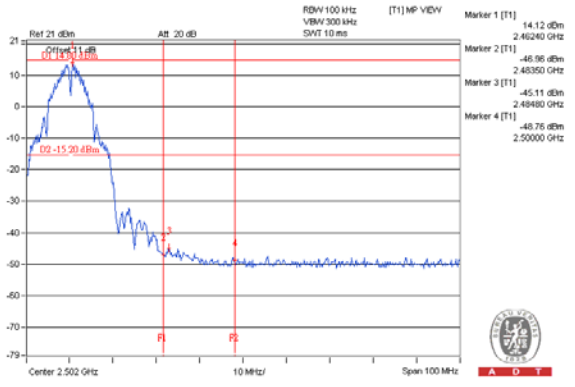


Chain 1

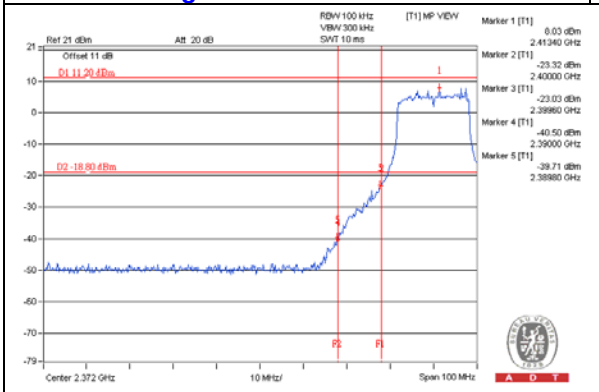
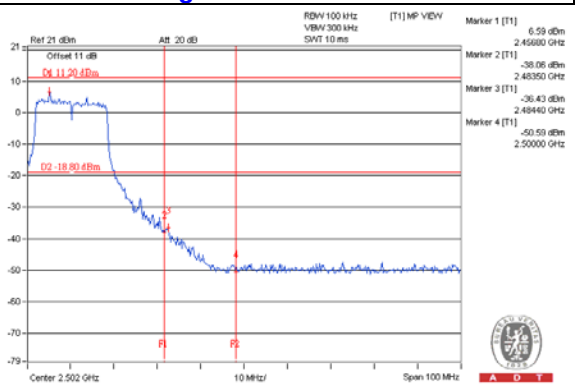
CH 1 Band edge

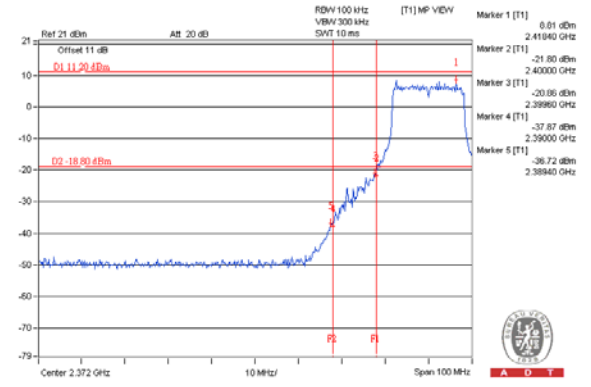
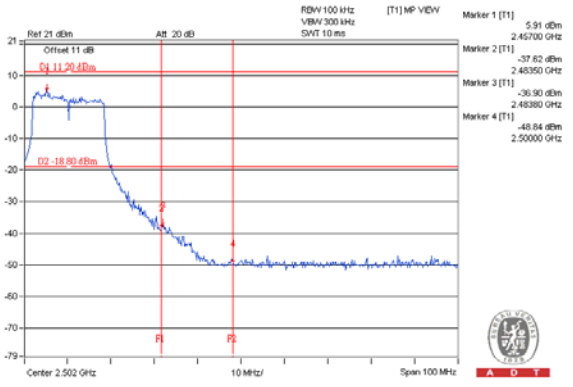


CH 11 Band edge

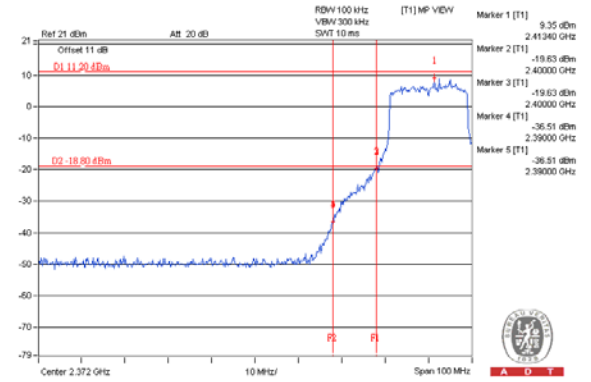
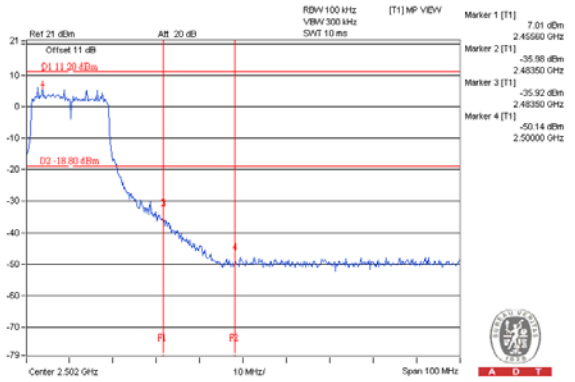
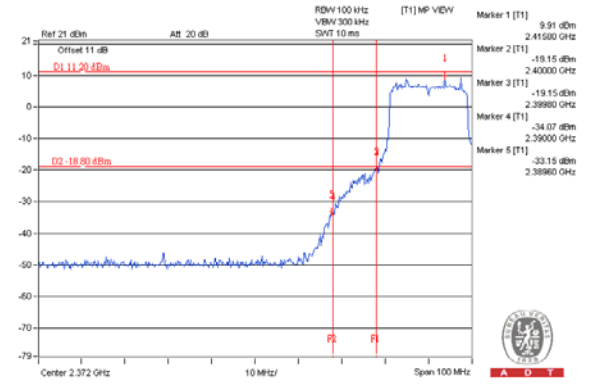
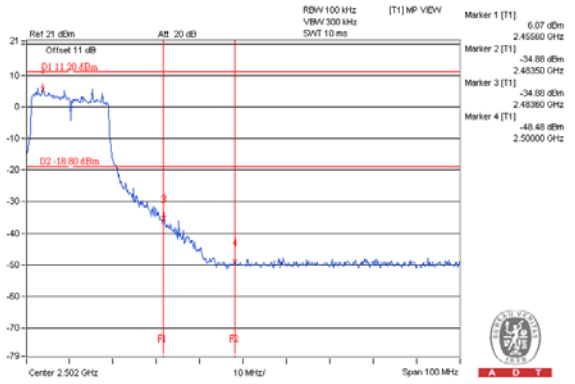


802.11g

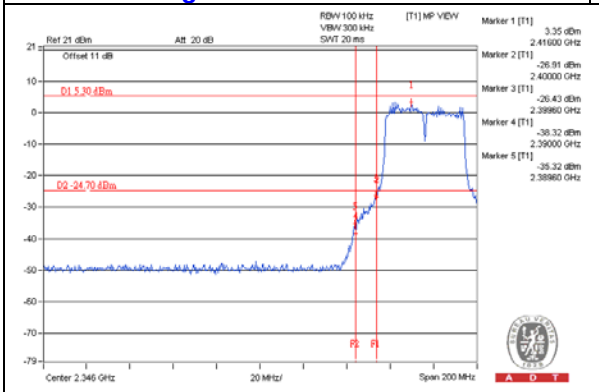
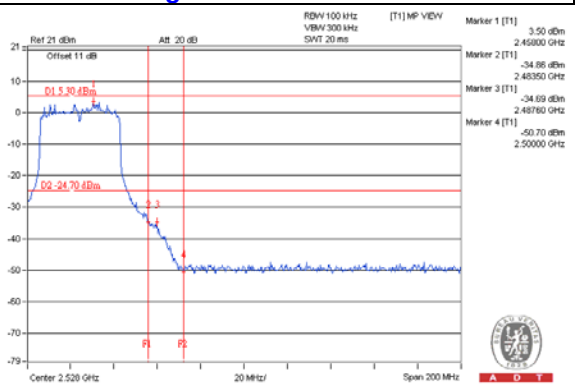
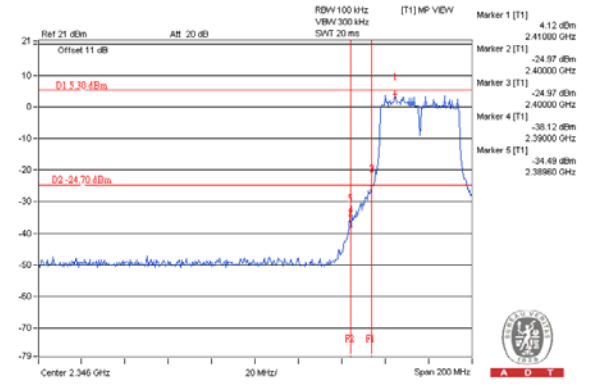
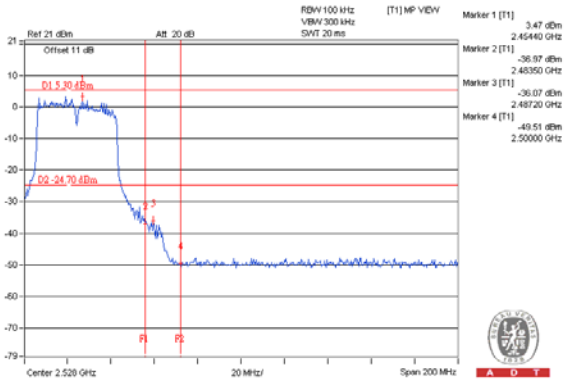
Chain 0	
CH 1 Band edge	CH 11 Band edge
	

Chain 1	
CH 1 Band edge	CH 11 Band edge
	

802.11n (HT20)

Chain 0	
CH 1 Band edge	**CH 11 Band edge**
	
Chain 1	
CH 1 Band edge	**CH 11 Band edge**
	

802.11n (HT40)

Chain 0	
CH 3 Band edge	CH 9 Band edge
	
Chain 1	
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:

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Web Site: www.bureauveritas-adt.com

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

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