FCC Test Report

(15.407, WLAN)

Report No.:	RF150326E02-2
FCC ID:	2AD8UFZPFWIC01
Test Model:	FWIC
Received Date:	Mar. 26, 2015
Test Date:	Apr. 14 to May 07, 2015
Issued Date:	May 21, 2015
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:	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (1):	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF150326E02-2	Original release.	May 21, 2015

1 Certificate of Conformity

Product:	Flexi Zone Indoor Pico BTS
Brand:	Nokia
Test Model:	FWIC
Sample Status:	ENGINEERING SAMPLE
Applicant:	Nokia Solutions and Networks
Test Date:	Apr. 14 to May 07, 2015
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2009

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

Prepared by : _____ , **Date:** May 21, 2015

Midoli Peng / Specialist

Approved by : _____ , **Date:** May 21, 2015

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)				
FCC Clause	FCC KDB 789033	Test Item	Result	Remarks
15.407(b)(6)	-	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -3.86dB at 25.79688MHz.
15.407(b) (1/2/3/4/6)	Section G	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5715.00MHz.
15.407(b) (1/2/3/4/6)	Section G	Conducted Emissions	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Section E.3	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Section F	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(e)	Section C.2	6dB bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
-	Section D	Occupied Bandwidth Measurement	PASS	Meet the requirement.
15.407(g)	-	Frequency Stability	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 5.15~5.25GHz and 5.725~5.850GHz. For the 2400 ~ 2483.5MHz 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	5.43 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.72 dB
	6GHz ~ 18GHz	4.00 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, 15.407)

Product	Flexi Zone Indoor Pico BTS
Brand	Nokia
Test Model	FWIC
Test Sample S/N	EA150710164
Hardware Version	472942A
Software Version	Operating SW: FB_FZM_PS_LFS_OS_2014_05_59-0-g927a301 WiFi module SW: 9.8.1.0.14302702
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter or 55Vdc from POE
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	5.18GHz ~ 5.24GHz, 5.745GHz ~ 5.825GHz
Number of Channel	9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
Output Power	802.11a: 293.786mW 802.11ac (VHT20): 297.873mW 802.11ac (VHT40): 293.813mW 802.11ac (VHT80): 73.162mW
Antenna Type	Refer to note as below
Antenna Connector	Refer to note as below
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

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

Model name	LTE			Wi-Fi	BT	GPS
	Freq.(MHz)		Band			
FWIC	DL	BW 5MHz : 2112.5~2152.5	4 (AWS)	✓	✓	✓
		BW 10MHz : 2115~2150				
		BW 15MHz : 2117.5~2174.5				
		BW 20MHz : 2120~2145				

3. The emission of the simultaneous operation (WLAN, BT & LTE) 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-60PFE-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:

LTE Antenna Spec.

Antenna No	Brand	Model	Antenna Type	Antenna Connector	Gain(dBi) <Including cable loss>	Cable Length (mm)	Frequency (MHz)
Internal LTE (Main)	TongDa	T-543-8141050-6	PIFA	i-pex(MHF)	4.9	50	1710~2390 (Band 4)
Internal LTE (Aux)		T-543-8141050-7			4.6	190	1710~2390 (Band 4)

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

GPS Antenna Spec.

Antenna No	Brand	Model	Antenna Type	Antenna Connector	Gain(dBi) <Including cable loss>	Cable Length (mm)	Frequency (MHz)
External GPS Ant	TongDa	T-543-8141037-9	ElecPatch	SMA Male	4.0	9140 ± 100	GPS：1575.42 ± 3 MHz Glonass：1602 ± 8 MHz

BT Antenna Spec.

Antenna No	Brand	Model	Antenna Type	Antenna Connector	Gain(dBi) <Including cable loss>	Cable Length (mm)	Frequency (MHz)
Internal BT Ant	INPAQ	Fz PICO	Chip	NA	-1.22	NA	2400~2500

The EUT incorporates a MIMO function.

5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	2Tx	2Rx
802.11n (HT20)	MCS 0~7	2Tx	2Rx
	MCS 8~15	2Tx	2Rx
802.11n (HT40)	MCS 0~7	2Tx	2Rx
	MCS 8~15	2Tx	2Rx
802.11ac (VHT20)	MCS 0~8, Nss=1	2Tx	2Rx
	MCS 0~8, Nss=2	2Tx	2Rx
802.11ac (VHT40)	MCS 0~9, Nss=1	2Tx	2Rx
	MCS 0~9, Nss=2	2Tx	2Rx
802.11ac (VHT80)	MCS 0~9, Nss=1	2Tx	2Rx
	MCS 0~9, Nss=2	2TX	2RX

* 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

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (40MHz), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (40MHz), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

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 **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 Y-plane

Radiated Emission Test (Above 1GHz):

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

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
	802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11ac (VHT20)	5745-5825	149 to 165	149	OFDM	BPSK	6.5
2	802.11ac (VHT20)	5745-5825	149 to 165	149	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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11ac (VHT20)	5745-5825	149 to 165	149	OFDM	BPSK	6.5
2	802.11ac (VHT20)	5745-5825	149 to 165	149	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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
	802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

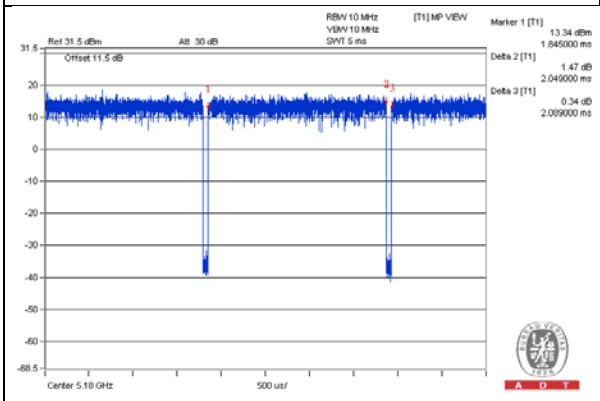
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 68%RH	120Vac, 60Hz	Gary Cheng
RE<1G	23deg. C, 68%RH	120Vac, 60Hz	Jason Huang
PLC	25deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

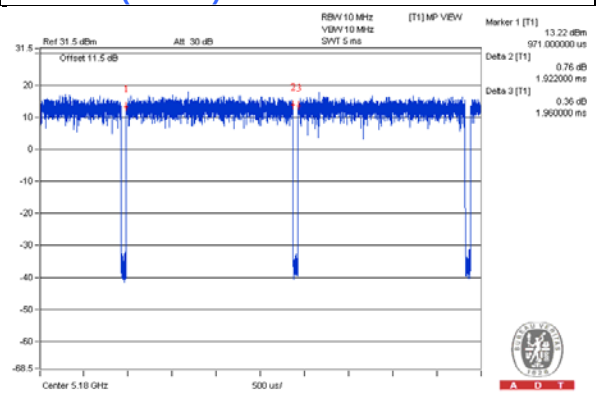
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.049 ms/2.089 ms = 0.981
802.11ac (VHT20): Duty cycle = 1.922 ms/1.96 ms = 0.981
802.11ac (VHT40): Duty cycle = 0.934 ms/0.997 ms = 0.937, Duty factor = 10 * log(1/0.937) = 0.28
802.11ac (VHT80): Duty cycle = 0.431 ms/0.512 ms = 0.842, Duty factor = 10 * log(1/0.842) = 0.75

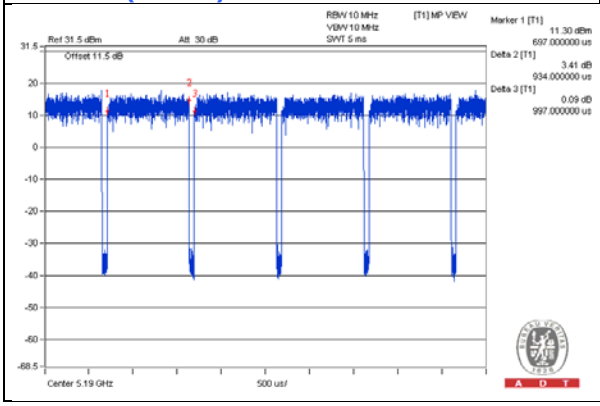
802.11a



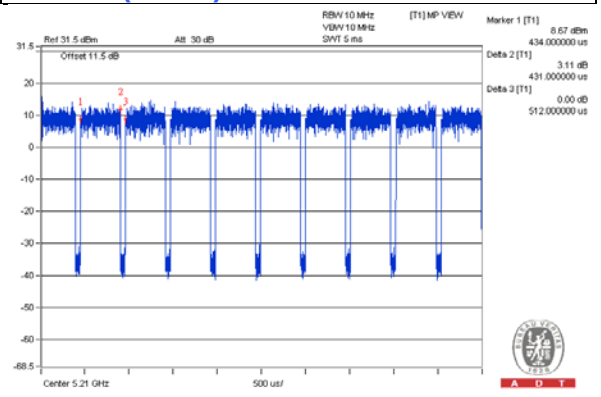
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
B	NOTEBOOK COMPUTER	DELL	E6420	H62T3R1	FCC DoC	Provided by Lab
C	POE ADAPTER	NA	PD-7001G	D11326441001235A01	FCC DoC	Provided by Lab

NOTE:

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

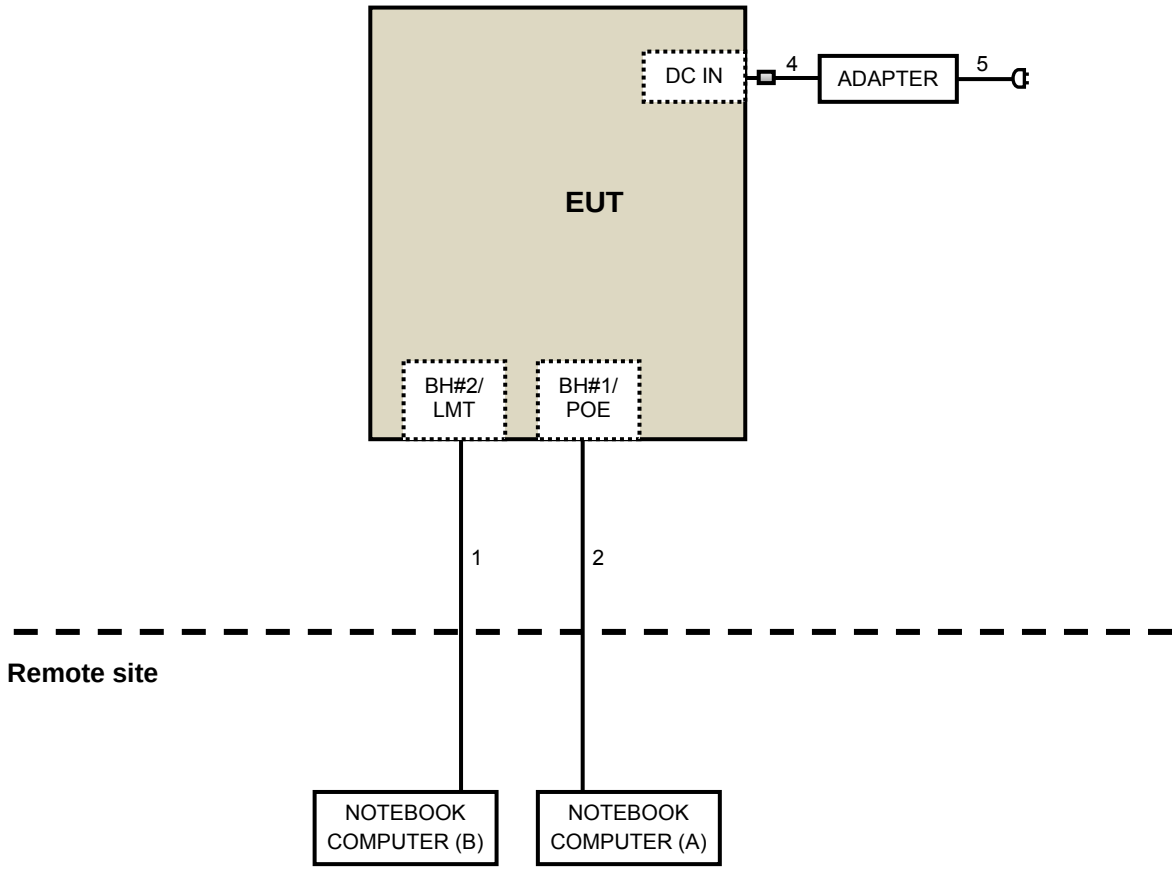
No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	RJ-45	1	10	No	0	Provided by Lab
2	RJ-45	1	10	No	0	Provided by Lab
3	RJ-45	1	1.5	No	0	Provided by Lab
4	DC	1	1.2	No	1	Supplied by Client
5	AC	1	1.8	Yes	0	Supplied by Client

NOTE:

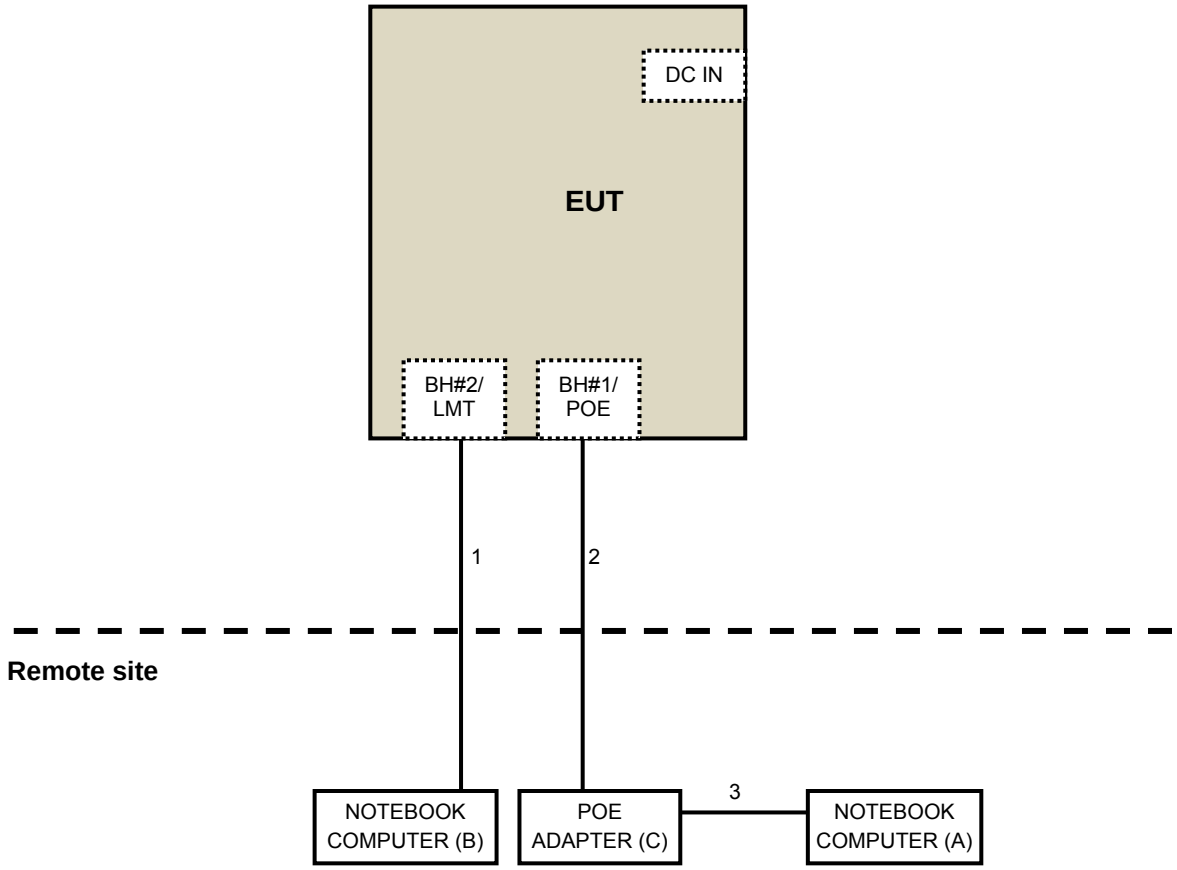
1. The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

For Adapter mode:



For POE mode:


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

3.5 General Description of Applied Standard

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 E (15.407)
789033 D02 General UNII Test Procedure New Rules v01
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2009

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.

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.

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	**LIMIT**	
789033 D02 General UNII Test Procedure New Rules v01	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	**EIRP LIMIT**	**EQUIVALENT FIELD STRENGTH AT 3m**
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) [*1] PK:-17 (dBm/MHz) [*2]	PK: 68.2(dBμV/m) [*1] PK:78.2 (dBμV/m) [*2]

NOTE: [*1] beyond 10MHz of the band edge [*2] within 10 MHz of band edge

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts).

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-04	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 06, 2015	Feb. 05, 2016
RF Cable	NA	CHHCAB_001	Oct. 05, 2014	Oct. 04, 2015
Horn_Antenna AISI	AIH.8018	0000220091110	Aug. 26, 2014	Aug. 25, 2015
Pre-Amplifier Agilent	8449B	300801923	Oct. 28, 2014	Oct. 27, 2015
RF Cable	NA	131206 131213 131215 SNMY23685/4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Aug. 26, 2014	Aug. 25, 2015
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5 The CANADA Site Registration No. is IC 7450H-3.
6 Tested Date: Apr. 14 to May 06, 2015

4.1.3 Test Procedure

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

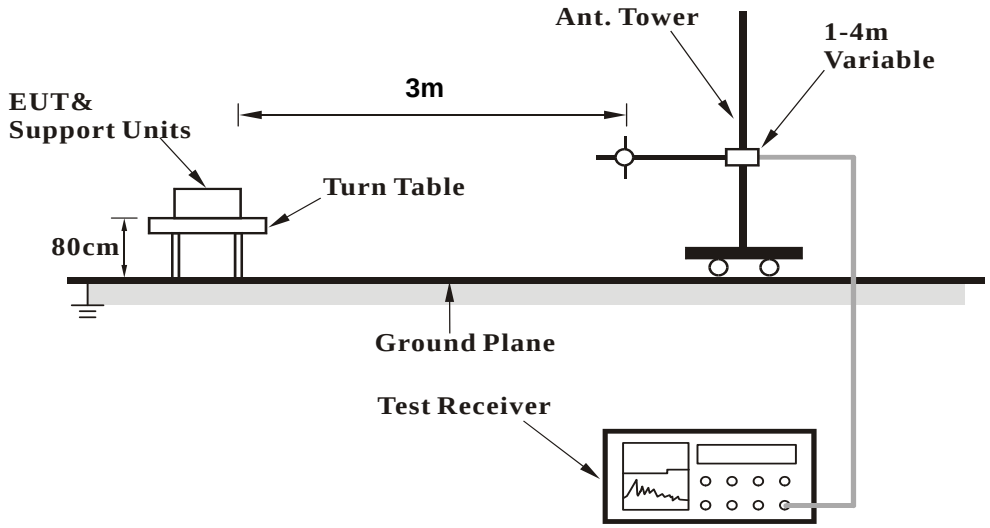
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution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

4.1.4 Deviation from Test Standard

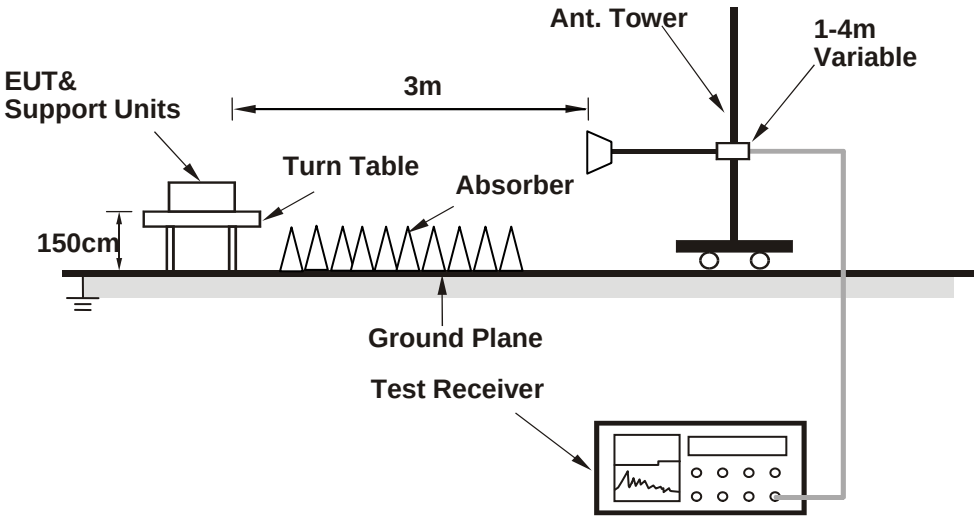
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Condition

1. Connect the EUT with the support units A-B (Notebook Computer) which is placed in remote site.
2. The communication partner run test program “cart.exe[art2_ver_4_9_575_5]” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 Test Results (Mode 1)

ABOVE 1GHz DATA：

802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	57.1 PK	74.0	-16.9	1.98 H	338	53.26	3.84
2	5150.00	47.6 AV	54.0	-6.4	1.98 H	338	43.76	3.84
3	*5180.00	110.1 PK			1.98 H	338	106.18	3.92
4	*5180.00	99.4 AV			1.98 H	338	95.48	3.92
5	#10360.00	53.3 PK	74.0	-20.7	1.00 H	53	43.87	9.43
6	#10360.00	41.5 AV	54.0	-12.5	1.00 H	53	32.07	9.43
7	15540.00	58.4 PK	74.0	-15.6	1.06 H	336	44.37	14.03
8	15540.00	46.6 AV	54.0	-7.4	1.06 H	336	32.57	14.03
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	5150.00	54.1 PK	74.0	-19.9	1.55 V	328	50.26	3.84
2	5150.00	41.6 AV	54.0	-12.4	1.55 V	328	37.76	3.84
3	*5180.00	106.1 PK			1.55 V	328	102.18	3.92
4	*5180.00	96.1 AV			1.55 V	328	92.18	3.92
5	#10360.00	52.8 PK	74.0	-21.2	1.13 V	206	43.37	9.43
6	#10360.00	40.0 AV	54.0	-14.0	1.13 V	206	30.57	9.43
7	15540.00	58.8 PK	74.0	-15.2	1.16 V	15	44.77	14.03
8	15540.00	46.7 AV	54.0	-7.3	1.16 V	15	32.67	14.03

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5200.00	109.2 PK			1.98 H	337	105.24	3.96
2	*5200.00	99.3 AV			1.98 H	337	95.34	3.96
3	#10400.00	53.7 PK	74.0	-20.3	1.01 H	78	44.25	9.45
4	#10400.00	41.4 AV	54.0	-12.6	1.01 H	78	31.95	9.45
5	15600.00	58.0 PK	74.0	-16.0	1.17 H	332	43.82	14.18
6	15600.00	46.4 AV	54.0	-7.6	1.17 H	332	32.22	14.18
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	*5200.00	106.0 PK			1.53 V	337	102.04	3.96
2	*5200.00	95.9 AV			1.53 V	337	91.94	3.96
3	#10400.00	53.6 PK	74.0	-20.4	1.16 V	217	44.15	9.45
4	#10400.00	40.8 AV	54.0	-13.2	1.16 V	217	31.35	9.45
5	15600.00	58.2 PK	74.0	-15.8	1.12 V	12	44.02	14.18
6	15600.00	46.6 AV	54.0	-7.4	1.12 V	12	32.42	14.18

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5240.00	109.9 PK			1.07 H	360	105.95	3.95
2	*5240.00	99.0 AV			1.07 H	360	95.05	3.95
3	5350.00	57.2 PK	74.0	-16.8	1.07 H	360	53.13	4.07
4	5350.00	45.8 AV	54.0	-8.2	1.07 H	360	41.73	4.07
5	#10480.00	53.4 PK	74.0	-20.6	1.03 H	72	43.73	9.67
6	#10480.00	41.3 AV	54.0	-12.7	1.03 H	72	31.63	9.67
7	15720.00	59.0 PK	74.0	-15.0	1.05 H	309	45.11	13.89
8	15720.00	47.2 AV	54.0	-6.8	1.05 H	309	33.31	13.89
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	105.8 PK			1.54 V	307	101.85	3.95
2	*5240.00	95.8 AV			1.54 V	307	91.85	3.95
3	5350.00	56.7 PK	74.0	-17.3	1.70 V	33	52.63	4.07
4	5350.00	44.2 AV	54.0	-9.8	1.70 V	33	40.13	4.07
5	#10480.00	52.8 PK	74.0	-21.2	1.09 V	219	43.13	9.67
6	#10480.00	40.3 AV	54.0	-13.7	1.09 V	219	30.63	9.67
7	15720.00	57.8 PK	74.0	-16.2	1.17 V	0	43.91	13.89
8	15720.00	45.9 AV	54.0	-8.1	1.17 V	0	32.01	13.89

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5715.00	63.2 PK	74.0	-10.8	1.70 H	33	58.72	4.48
2	#5715.00	51.6 AV	54.0	-2.4	1.70 H	33	47.12	4.48
3	#5725.00	77.6 PK	78.2	-0.6	1.70 H	33	73.10	4.50
4	*5745.00	116.1 PK			1.70 H	33	111.61	4.49
5	*5745.00	106.2 AV			1.70 H	33	101.71	4.49
6	11490.00	60.7 PK	74.0	-13.3	1.30 H	315	50.66	10.04
7	11490.00	48.4 AV	54.0	-5.6	1.30 H	315	38.36	10.04
8	#17235.00	63.8 PK	74.0	-10.2	1.61 H	140	45.24	18.56
9	#17235.00	51.1 AV	54.0	-2.9	1.61 H	140	32.54	18.56
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	#5715.00	60.2 PK	74.0	-13.8	1.58 V	325	55.72	4.48
2	#5715.00	49.4 AV	54.0	-4.6	1.58 V	325	44.92	4.48
3	#5725.00	74.6 PK	78.2	-3.6	1.58 V	325	70.10	4.50
4	*5745.00	114.1 PK			1.58 V	325	109.61	4.49
5	*5745.00	104.2 AV			1.58 V	325	99.71	4.49
6	11490.00	62.9 PK	74.0	-11.1	2.14 V	360	52.86	10.04
7	11490.00	50.3 AV	54.0	-3.7	2.14 V	360	40.26	10.04
8	#17235.00	64.0 PK	74.0	-10.0	1.96 V	348	45.44	18.56
9	#17235.00	51.9 AV	54.0	-2.1	1.96 V	348	33.34	18.56

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5715.00	59.0 PK	74.0	-15.0	1.03 H	32	54.52	4.48
2	#5715.00	45.5 AV	54.0	-8.5	1.03 H	32	41.02	4.48
3	#5725.00	67.7 PK	78.2	-10.5	1.12 H	13	63.20	4.50
4	*5785.00	116.4 PK			1.65 H	31	111.90	4.50
5	*5785.00	106.2 AV			1.65 H	31	101.70	4.50
6	11570.00	60.5 PK	74.0	-13.5	1.28 H	302	50.42	10.08
7	11570.00	48.0 AV	54.0	-6.0	1.28 H	302	37.92	10.08
8	#17355.00	64.1 PK	74.0	-9.9	1.65 H	132	45.20	18.90
9	#17355.00	51.4 AV	54.0	-2.6	1.65 H	132	32.50	18.90
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	#5715.00	60.0 PK	74.0	-14.0	1.13 V	191	55.52	4.48
2	#5715.00	43.6 AV	54.0	-10.4	1.13 V	191	39.12	4.48
3	#5725.00	60.2 PK	78.2	-18.0	1.20 V	171	55.70	4.50
4	*5785.00	114.2 PK			1.53 V	333	109.70	4.50
5	*5785.00	104.5 AV			1.53 V	333	100.00	4.50
6	11570.00	62.6 PK	74.0	-11.4	2.13 V	349	52.52	10.08
7	11570.00	50.1 AV	54.0	-3.9	2.13 V	349	40.02	10.08
8	#17355.00	63.4 PK	74.0	-10.6	2.02 V	345	44.50	18.90
9	#17355.00	51.6 AV	54.0	-2.4	2.02 V	345	32.70	18.90

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5825.00	116.1 PK			1.70 H	28	111.57	4.53
2	*5825.00	106.1 AV			1.70 H	28	101.57	4.53
3	#5850.00	67.8 PK	78.2	-10.4	1.70 H	28	63.23	4.57
4	#5860.00	61.3 PK	74.0	-12.7	1.70 H	28	56.71	4.59
5	#5860.00	50.1 AV	54.0	-3.9	1.70 H	28	45.51	4.59
6	11650.00	59.9 PK	74.0	-14.1	1.31 H	304	49.93	9.97
7	11650.00	48.1 AV	54.0	-5.9	1.31 H	304	38.13	9.97
8	#17475.00	63.8 PK	74.0	-10.2	1.57 H	150	44.69	19.11
9	#17475.00	50.9 AV	54.0	-3.1	1.57 H	150	31.79	19.11
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	113.7 PK			1.56 V	332	109.17	4.53
2	*5825.00	104.3 AV			1.56 V	332	99.77	4.53
3	#5850.00	67.6 PK	78.2	-10.6	1.03 V	163	63.03	4.57
4	#5860.00	59.1 PK	74.0	-14.9	1.10 V	184	54.51	4.59
5	#5860.00	49.5 AV	54.0	-4.5	1.10 V	184	44.91	4.59
6	11650.00	62.6 PK	74.0	-11.4	2.10 V	360	52.63	9.97
7	11650.00	50.1 AV	54.0	-3.9	2.10 V	360	40.13	9.97
8	#17475.00	63.2 PK	74.0	-10.8	1.86 V	336	44.09	19.11
9	#17475.00	51.7 AV	54.0	-2.3	1.86 V	336	32.59	19.11

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.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	56.3 PK	74.0	-17.7	1.93 H	341	52.46	3.84
2	5150.00	47.1 AV	54.0	-6.9	1.93 H	341	43.26	3.84
3	*5180.00	109.7 PK			2.00 H	275	105.78	3.92
4	*5180.00	99.0 AV			2.00 H	275	95.08	3.92
5	#10360.00	54.6 PK	74.0	-19.4	1.00 H	68	45.17	9.43
6	#10360.00	42.2 AV	54.0	-11.8	1.00 H	68	32.77	9.43
7	15540.00	58.0 PK	74.0	-16.0	1.08 H	329	43.97	14.03
8	15540.00	46.2 AV	54.0	-7.8	1.08 H	329	32.17	14.03
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	5150.00	53.7 PK	74.0	-20.3	1.48 V	332	49.86	3.84
2	5150.00	41.2 AV	54.0	-12.8	1.48 V	332	37.36	3.84
3	*5180.00	106.1 PK			1.50 V	315	102.18	3.92
4	*5180.00	96.1 AV			1.50 V	315	92.18	3.92
5	#10360.00	52.5 PK	74.0	-21.5	1.09 V	227	43.07	9.43
6	#10360.00	39.8 AV	54.0	-14.2	1.09 V	227	30.37	9.43
7	15540.00	58.3 PK	74.0	-15.7	1.06 V	0	44.27	14.03
8	15540.00	46.2 AV	54.0	-7.8	1.06 V	0	32.17	14.03

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5200.00	110.0 PK			2.02 H	268	106.04	3.96
2	*5200.00	99.4 AV			2.02 H	268	95.44	3.96
3	#10400.00	53.4 PK	74.0	-20.6	1.10 H	67	43.95	9.45
4	#10400.00	40.9 AV	54.0	-13.1	1.10 H	67	31.45	9.45
5	15600.00	59.6 PK	74.0	-14.4	1.07 H	327	45.42	14.18
6	15600.00	47.4 AV	54.0	-6.6	1.07 H	327	33.22	14.18
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	*5200.00	105.4 PK			1.58 V	332	101.44	3.96
2	*5200.00	95.9 AV			1.58 V	332	91.94	3.96
3	#10400.00	53.6 PK	74.0	-20.4	1.14 V	235	44.15	9.45
4	#10400.00	40.8 AV	54.0	-13.2	1.14 V	235	31.35	9.45
5	15600.00	57.7 PK	74.0	-16.3	1.09 V	0	43.52	14.18
6	15600.00	45.9 AV	54.0	-8.1	1.09 V	0	31.72	14.18

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5240.00	109.7 PK			1.78 H	360	105.75	3.95
2	*5240.00	99.3 AV			1.78 H	360	95.35	3.95
3	5350.00	61.7 PK	74.0	-12.3	1.78 H	360	57.63	4.07
4	5350.00	47.4 AV	54.0	-6.6	1.78 H	360	43.33	4.07
5	#10480.00	53.7 PK	74.0	-20.3	1.00 H	59	44.03	9.67
6	#10480.00	41.7 AV	54.0	-12.3	1.00 H	59	32.03	9.67
7	15720.00	58.3 PK	74.0	-15.7	1.02 H	360	44.41	13.89
8	15720.00	46.9 AV	54.0	-7.1	1.02 H	360	33.01	13.89
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	105.1 PK			1.52 V	342	101.15	3.95
2	*5240.00	95.2 AV			1.52 V	342	91.25	3.95
3	5350.00	53.8 PK	74.0	-20.2	1.54 V	303	49.73	4.07
4	5350.00	41.3 AV	54.0	-12.7	1.54 V	303	37.23	4.07
5	#10480.00	53.4 PK	74.0	-20.6	1.12 V	239	43.73	9.67
6	#10480.00	40.6 AV	54.0	-13.4	1.12 V	239	30.93	9.67
7	15720.00	57.8 PK	74.0	-16.2	1.13 V	0	43.91	13.89
8	15720.00	46.4 AV	54.0	-7.6	1.13 V	0	32.51	13.89

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5715.00	65.2 PK	74.0	-8.8	2.07 H	28	60.72	4.48
2	#5715.00	53.3 AV	54.0	-0.7	2.07 H	28	48.82	4.48
3	#5725.00	77.8 PK	78.2	-0.4	2.07 H	28	73.30	4.50
4	*5745.00	117.2 PK			2.07 H	28	112.71	4.49
5	*5745.00	106.8 AV			2.07 H	28	102.31	4.49
6	11490.00	60.4 PK	74.0	-13.6	1.30 H	326	50.36	10.04
7	11490.00	48.4 AV	54.0	-5.6	1.30 H	326	38.36	10.04
8	#17235.00	63.5 PK	74.0	-10.5	1.64 H	128	44.94	18.56
9	#17235.00	50.8 AV	54.0	-3.2	1.64 H	128	32.24	18.56
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	#5715.00	59.9 PK	74.0	-14.1	1.15 V	185	55.42	4.48
2	#5715.00	50.2 AV	54.0	-3.8	1.15 V	185	45.72	4.48
3	#5725.00	67.2 PK	78.2	-11.0	1.06 V	172	62.70	4.50
4	*5745.00	112.9 PK			1.58 V	327	108.41	4.49
5	*5745.00	103.0 AV			1.58 V	327	98.51	4.49
6	11490.00	62.7 PK	74.0	-11.3	2.17 V	331	52.66	10.04
7	11490.00	50.1 AV	54.0	-3.9	2.17 V	331	40.06	10.04
8	#17235.00	64.1 PK	74.0	-9.9	2.00 V	354	45.54	18.56
9	#17235.00	51.8 AV	54.0	-2.2	2.00 V	354	33.24	18.56

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	#5715.00	63.6 PK	74.0	-10.4	2.07 H	26	59.12	4.48
2	#5715.00	50.7 AV	54.0	-3.3	2.07 H	26	46.22	4.48
3	#5725.00	62.7 PK	78.2	-15.5	2.07 H	26	58.20	4.50
4	*5785.00	116.2 PK			2.07 H	26	111.70	4.50
5	*5785.00	106.4 AV			2.07 H	26	101.90	4.50
6	11570.00	59.8 PK	74.0	-14.2	1.27 H	312	49.72	10.08
7	11570.00	47.4 AV	54.0	-6.6	1.27 H	312	37.32	10.08
8	#17355.00	63.9 PK	74.0	-10.1	1.56 H	137	45.00	18.90
9	#17355.00	51.4 AV	54.0	-2.6	1.56 H	137	32.50	18.90
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	#5715.00	59.4 PK	74.0	-14.6	1.12 V	204	54.92	4.48
2	#5715.00	49.9 AV	54.0	-4.1	1.12 V	204	45.42	4.48
3	#5725.00	67.3 PK	78.2	-10.9	1.03 V	144	62.80	4.50
4	*5785.00	114.0 PK			1.53 V	339	109.50	4.50
5	*5785.00	104.5 AV			1.53 V	339	100.00	4.50
6	11570.00	62.0 PK	74.0	-12.0	2.09 V	342	51.92	10.08
7	11570.00	49.9 AV	54.0	-4.1	2.09 V	342	39.82	10.08
8	#17355.00	64.3 PK	74.0	-9.7	1.95 V	343	45.40	18.90
9	#17355.00	52.2 AV	54.0	-1.8	1.95 V	343	33.30	18.90

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5825.00	116.5 PK			2.01 H	30	111.97	4.53
2	*5825.00	106.6 AV			2.01 H	30	102.07	4.53
3	#5850.00	69.2 PK	78.2	-9.0	2.01 H	30	64.63	4.57
4	#5860.00	62.0 PK	74.0	-12.0	2.01 H	30	57.41	4.59
5	#5860.00	51.2 AV	54.0	-2.8	2.01 H	30	46.61	4.59
6	11650.00	60.7 PK	74.0	-13.3	1.25 H	326	50.73	9.97
7	11650.00	48.5 AV	54.0	-5.5	1.25 H	326	38.53	9.97
8	#17475.00	62.5 PK	74.0	-11.5	1.59 H	133	43.39	19.11
9	#17475.00	50.1 AV	54.0	-3.9	1.59 H	133	30.99	19.11
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	114.0 PK			1.54 V	325	109.47	4.53
2	*5825.00	104.0 AV			1.54 V	325	99.47	4.53
3	#5850.00	67.4 PK	78.2	-10.8	1.06 V	173	62.83	4.57
4	#5860.00	59.8 PK	74.0	-14.2	1.16 V	192	55.21	4.59
5	#5860.00	50.0 AV	54.0	-4.0	1.16 V	192	45.41	4.59
6	11650.00	62.7 PK	74.0	-11.3	2.09 V	351	52.73	9.97
7	11650.00	50.6 AV	54.0	-3.4	2.09 V	351	40.63	9.97
8	#17475.00	63.6 PK	74.0	-10.4	1.99 V	357	44.49	19.11
9	#17475.00	50.7 AV	54.0	-3.3	1.99 V	357	31.59	19.11

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.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	60.4 PK	74.0	-13.6	1.92 H	320	56.56	3.84
2	5150.00	50.1 AV	54.0	-3.9	1.92 H	320	46.26	3.84
3	*5190.00	109.1 PK			1.91 H	360	105.16	3.94
4	*5190.00	98.6 AV			1.91 H	360	94.66	3.94
5	#10380.00	53.7 PK	74.0	-20.3	1.01 H	51	44.26	9.44
6	#10380.00	41.8 AV	54.0	-12.2	1.01 H	51	32.36	9.44
7	15570.00	58.2 PK	74.0	-15.8	1.05 H	337	44.09	14.11
8	15570.00	46.5 AV	54.0	-7.5	1.05 H	337	32.39	14.11
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.1 PK	74.0	-15.9	1.79 V	294	54.26	3.84
2	5150.00	46.2 AV	54.0	-7.8	1.79 V	294	42.36	3.84
3	*5190.00	104.7 PK			1.43 V	330	100.76	3.94
4	*5190.00	94.8 AV			1.43 V	330	90.86	3.94
5	#10380.00	53.8 PK	74.0	-20.2	1.07 V	232	44.36	9.44
6	#10380.00	40.6 AV	54.0	-13.4	1.07 V	232	31.16	9.44
7	15570.00	57.8 PK	74.0	-16.2	1.13 V	0	43.69	14.11
8	15570.00	46.3 AV	54.0	-7.7	1.13 V	0	32.19	14.11

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5230.00	109.2 PK			1.89 H	360	105.24	3.96
2	*5230.00	98.9 AV			1.89 H	360	94.94	3.96
3	5350.00	52.1 PK	74.0	-21.9	1.89 H	360	48.03	4.07
4	5350.00	42.3 AV	54.0	-11.7	1.89 H	360	38.23	4.07
5	#10460.00	53.3 PK	74.0	-20.7	1.01 H	79	43.69	9.61
6	#10460.00	41.3 AV	54.0	-12.7	1.01 H	79	31.69	9.61
7	15690.00	58.5 PK	74.0	-15.5	1.11 H	329	44.60	13.90
8	15690.00	46.6 AV	54.0	-7.4	1.11 H	329	32.70	13.90
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	*5230.00	104.8 PK			1.37 V	324	100.84	3.96
2	*5230.00	94.8 AV			1.37 V	324	90.84	3.96
3	5350.00	51.4 PK	74.0	-22.6	1.60 V	330	47.33	4.07
4	5350.00	41.5 AV	54.0	-12.5	1.60 V	330	37.43	4.07
5	#10460.00	53.8 PK	74.0	-20.2	1.11 V	227	44.19	9.61
6	#10460.00	40.9 AV	54.0	-13.1	1.11 V	227	31.29	9.61
7	15690.00	57.8 PK	74.0	-16.2	1.08 V	0	43.90	13.90
8	15690.00	45.8 AV	54.0	-8.2	1.08 V	0	31.90	13.90

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5715.00	68.1 PK	74.0	-5.9	2.17 H	28	63.62	4.48
2	**#5715.00**	**53.9 AV**	**54.0**	**-0.1**	**2.17 H**	**28**	**49.42**	**4.48**
3	#5725.00	75.9 PK	78.2	-2.3	2.17 H	28	71.40	4.50
4	*5755.00	109.4 PK			2.17 H	28	104.91	4.49
5	*5755.00	97.1 AV			2.17 H	28	92.61	4.49
6	11510.00	57.2 PK	74.0	-16.8	1.14 H	329	47.15	10.05
7	11510.00	45.0 AV	54.0	-9.0	1.14 H	329	34.95	10.05
8	#17265.00	59.3 PK	74.0	-14.7	1.24 H	315	40.66	18.64
9	#17265.00	47.3 AV	54.0	-6.7	1.24 H	315	28.66	18.64
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	#5715.00	68.6 PK	74.0	-5.4	1.20 V	183	64.12	4.48
2	#5715.00	52.1 AV	54.0	-1.9	1.20 V	183	47.62	4.48
3	#5725.00	68.8 PK	78.2	-9.4	1.16 V	188	64.30	4.50
4	*5755.00	106.9 PK			1.50 V	301	102.41	4.49
5	*5755.00	94.8 AV			1.50 V	301	90.31	4.49
6	11510.00	57.5 PK	74.0	-16.5	1.00 V	23	47.45	10.05
7	11510.00	45.2 AV	54.0	-8.8	1.00 V	23	35.15	10.05
8	#17265.00	60.4 PK	74.0	-13.6	1.04 V	12	41.76	18.64
9	#17265.00	47.4 AV	54.0	-6.6	1.04 V	12	28.76	18.64

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5795.00	112.1 PK			2.13 H	24	107.59	4.51
2	*5795.00	100.8 AV			2.13 H	24	96.29	4.51
3	#5850.00	64.1 PK	78.2	-14.1	2.13 H	24	59.53	4.57
4	#5860.00	60.9 PK	74.0	-13.1	2.13 H	24	56.31	4.59
5	#5860.00	49.6 AV	54.0	-4.4	2.13 H	24	45.01	4.59
6	11590.00	56.8 PK	74.0	-17.2	1.20 H	305	46.71	10.09
7	11590.00	44.8 AV	54.0	-9.2	1.20 H	305	34.71	10.09
8	#17385.00	59.2 PK	74.0	-14.8	1.22 H	339	40.20	19.00
9	#17385.00	47.2 AV	54.0	-6.8	1.22 H	339	28.20	19.00
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	*5795.00	109.8 PK			1.58 V	310	105.29	4.51
2	*5795.00	97.1 AV			1.58 V	310	92.59	4.51
3	#5850.00	62.4 PK	78.2	-15.8	1.00 V	135	57.83	4.57
4	#5860.00	56.7 PK	74.0	-17.3	1.00 V	177	52.11	4.59
5	#5860.00	44.3 AV	54.0	-9.7	1.00 V	177	39.71	4.59
6	11590.00	58.1 PK	74.0	-15.9	1.00 V	37	48.01	10.09
7	11590.00	45.5 AV	54.0	-8.5	1.00 V	37	35.41	10.09
8	#17385.00	61.1 PK	74.0	-12.9	1.00 V	11	42.10	19.00
9	#17385.00	48.2 AV	54.0	-5.8	1.00 V	11	29.20	19.00

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.
6. " # ": The radiated frequency is out of the restricted band.

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CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	67.2 PK	74.0	-6.8	1.70 H	360	63.36	3.84
2	5150.00	53.5 AV	54.0	-0.5	1.70 H	360	49.66	3.84
3	*5210.00	104.6 PK			1.70 H	360	100.64	3.96
4	*5210.00	93.1 AV			1.70 H	360	89.14	3.96
5	5350.00	56.5 PK	74.0	-17.5	1.70 H	360	52.43	4.07
6	5350.00	44.8 AV	54.0	-9.2	1.70 H	360	40.73	4.07
7	#10420.00	53.2 PK	74.0	-20.8	1.09 H	61	43.70	9.50
8	#10420.00	41.2 AV	54.0	-12.8	1.09 H	61	31.70	9.50
9	15630.00	58.5 PK	74.0	-15.5	1.07 H	321	44.41	14.09
10	15630.00	46.3 AV	54.0	-7.7	1.07 H	321	32.21	14.09
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.3 PK	74.0	-16.7	1.80 V	310	53.46	3.84
2	5150.00	43.9 AV	54.0	-10.1	1.80 V	310	40.06	3.84
3	*5210.00	100.4 PK			1.50 V	341	96.44	3.96
4	*5210.00	89.1 AV			1.50 V	341	85.14	3.96
5	5350.00	53.5 PK	74.0	-20.5	1.14 V	245	49.43	4.07
6	5350.00	40.9 AV	54.0	-13.1	1.14 V	245	36.83	4.07
7	#10420.00	52.9 PK	74.0	-21.1	1.12 V	222	43.40	9.50
8	#10420.00	40.3 AV	54.0	-13.7	1.12 V	222	30.80	9.50
9	15630.00	58.4 PK	74.0	-15.6	1.10 V	20	44.31	14.09
10	15630.00	47.0 AV	54.0	-7.0	1.10 V	20	32.91	14.09

REMARKS:

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

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	#5715.00	68.1 PK	74.0	-5.9	2.09 H	37	63.62	4.48
2	#5715.00	53.5 AV	54.0	-0.5	2.09 H	37	49.02	4.48
3	#5725.00	76.2 PK	78.2	-2.0	2.09 H	37	71.70	4.50
4	*5775.00	106.0 PK			2.09 H	37	101.51	4.49
5	*5775.00	92.5 AV			2.09 H	37	88.01	4.49
6	#5850.00	65.4 PK	78.2	-12.8	2.09 H	37	60.83	4.57
7	#5860.00	60.3 PK	74.0	-13.7	2.09 H	37	55.71	4.59
8	#5860.00	48.4 AV	54.0	-5.6	2.09 H	37	43.81	4.59
9	11550.00	57.3 PK	74.0	-16.7	1.25 H	332	47.23	10.07
10	11550.00	44.2 AV	54.0	-9.8	1.25 H	332	34.13	10.07
11	#17325.00	60.5 PK	74.0	-13.5	1.19 H	323	41.68	18.82
12	#17325.00	48.8 AV	54.0	-5.2	1.19 H	323	29.98	18.82
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	#5715.00	67.3 PK	74.0	-6.7	1.49 V	275	62.82	4.48
2	#5715.00	52.2 AV	54.0	-1.8	1.49 V	275	47.72	4.48
3	#5725.00	74.4 PK	78.2	-3.8	1.50 V	285	69.90	4.50
4	*5775.00	103.4 PK			1.51 V	295	98.91	4.49
5	*5775.00	90.1 AV			1.51 V	295	85.61	4.49
6	#5850.00	62.6 PK	78.2	-15.6	1.00 V	167	58.03	4.57
7	#5860.00	56.2 PK	74.0	-17.8	1.00 V	190	51.61	4.59
8	#5860.00	43.8 AV	54.0	-10.2	1.00 V	190	39.21	4.59
9	11550.00	56.6 PK	74.0	-17.4	1.00 V	38	46.53	10.07
10	11550.00	43.8 AV	54.0	-10.2	1.00 V	38	33.73	10.07
11	#17325.00	60.2 PK	74.0	-13.8	1.08 V	12	41.38	18.82
12	#17325.00	47.4 AV	54.0	-6.6	1.08 V	12	28.58	18.82

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.
6. " # ": The radiated frequency is out of the restricted band.

BELOW 1GHz WORST-CASE DATA

802.11ac (VHT20)

CHANNEL	TX Channel 149	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	73.41	24.6 QP	40.0	-15.4	1.50 H	223	40.70	-16.10
2	108.34	28.2 QP	43.5	-15.3	1.50 H	72	44.43	-16.20
3	125.01	27.2 QP	43.5	-16.3	1.50 H	72	41.85	-14.62
4	250.00	25.8 QP	46.0	-20.2	1.00 H	73	39.71	-13.87
5	325.03	30.2 QP	46.0	-15.8	1.00 H	99	41.15	-10.93
6	608.00	35.2 QP	46.0	-10.8	1.50 H	311	39.71	-4.48
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	37.32	35.2 QP	40.0	-4.8	1.20 V	149	49.21	-14.03
2	73.46	32.2 QP	40.0	-7.8	1.20 V	3	48.34	-16.11
3	125.01	25.8 QP	43.5	-17.7	1.20 V	221	40.40	-14.62
4	172.89	26.6 QP	43.5	-16.9	1.50 V	360	40.30	-13.68
5	275.75	25.9 QP	46.0	-20.1	1.50 V	360	38.74	-12.82
6	400.06	27.6 QP	46.0	-18.4	1.20 V	349	37.26	-9.62

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 WORST-CASE DATA

802.11ac (VHT20)

CHANNEL	TX Channel 149	**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	125.01	29.9 QP	43.5	-13.6	1.50 H	283	44.49	-14.62
2	153.58	34.5 QP	43.5	-9.0	1.50 H	285	47.34	-12.83
3	301.60	34.6 QP	46.0	-11.5	1.00 H	44	46.39	-11.84
4	550.02	35.6 QP	46.0	-10.4	1.50 H	221	41.93	-6.30
5	614.43	34.2 QP	46.0	-11.8	1.50 H	219	38.57	-4.39
6	921.62	40.5 QP	46.0	-5.5	1.50 H	224	39.60	0.86
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	48.14	33.4 QP	40.0	-6.6	1.00 V	170	46.65	-13.22
2	155.62	29.2 QP	43.5	-14.3	1.00 V	45	42.13	-12.96
3	275.02	30.7 QP	46.0	-15.3	1.00 V	127	43.55	-12.85
4	550.02	31.4 QP	46.0	-14.6	1.50 V	353	37.71	-6.30
5	600.02	32.4 QP	46.0	-13.6	1.00 V	340	37.13	-4.69
6	921.62	37.5 QP	46.0	-8.5	1.00 V	360	36.66	0.86

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 ROHDE & SCHWARZ	ESCS 30	847124/029	Oct. 22, 2014	Oct. 21, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable (JYEBAO)	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: May 07, 2015

4.2.3 Test Procedure

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.

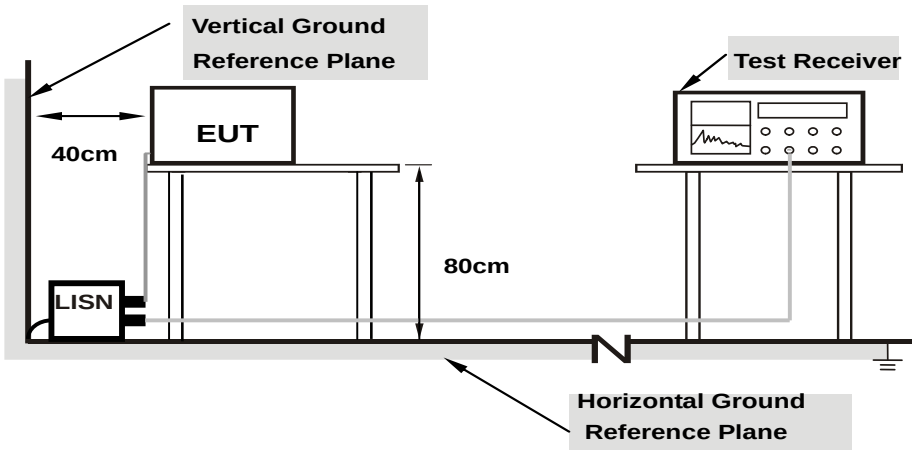
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

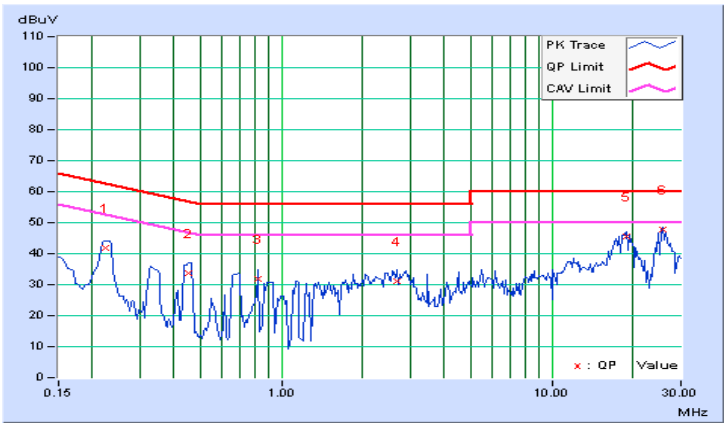
4.2.7 Test Results (Mode 1)

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	0.22422	0.09	41.75	32.88	41.84	32.97	62.66	52.66	-20.82	-19.69
2	0.45078	0.10	33.61	26.14	33.71	26.24	56.86	46.86	-23.15	-20.62
3	0.81797	0.12	31.87	31.36	31.99	31.48	56.00	46.00	-24.01	-14.52
4	2.66016	0.19	31.01	19.98	31.20	20.17	56.00	46.00	-24.80	-25.83
5	18.82422	0.67	44.84	44.42	45.51	45.09	60.00	50.00	-14.49	-4.91
6	25.78125	0.83	46.81	45.25	47.64	46.08	60.00	50.00	-12.36	-3.92

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

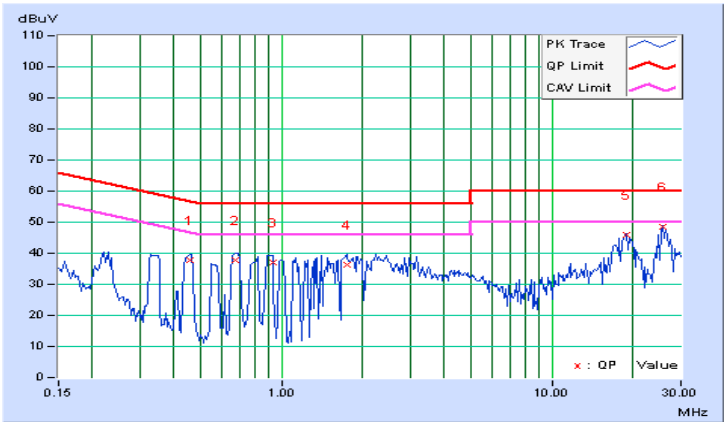


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.45859	0.10	37.75	31.08	37.85	31.18	56.72	46.72	-18.87	-15.54
2	0.67734	0.11	37.80	27.97	37.91	28.08	56.00	46.00	-18.09	-17.92
3	0.92734	0.13	37.00	25.74	37.13	25.87	56.00	46.00	-18.87	-20.13
4	1.73828	0.16	36.25	22.18	36.41	22.34	56.00	46.00	-19.59	-23.66
5	18.83594	0.71	45.31	44.48	46.02	45.19	60.00	50.00	-13.98	-4.81
6	**25.79688**	**0.88**	**47.78**	**45.26**	**48.66**	**46.14**	**60.00**	**50.00**	**-11.34**	**-3.86**

Remarks:

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



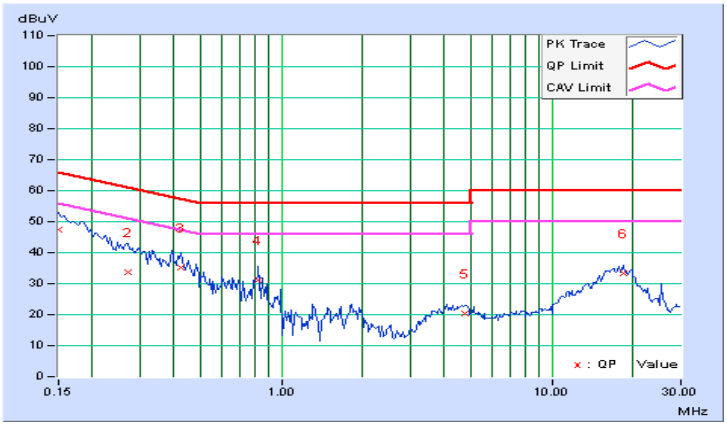
4.2.8 Test Results (Mode 2)

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.08	47.25	37.10	47.33	37.18	66.00	56.00	-18.67	-18.82
2	0.27109	0.09	33.62	24.28	33.71	24.37	61.08	51.08	-27.37	-26.71
3	0.42344	0.10	35.11	28.33	35.21	28.43	57.38	47.38	-22.17	-18.95
4	0.82188	0.12	30.88	19.37	31.00	19.49	56.00	46.00	-25.00	-26.51
5	4.79297	0.25	20.03	14.76	20.28	15.01	56.00	46.00	-35.72	-30.99
6	18.30469	0.66	32.64	27.10	33.30	27.76	60.00	50.00	-26.70	-22.24

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

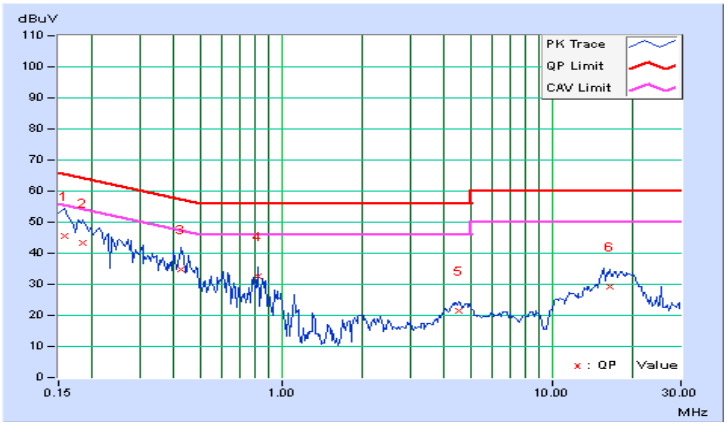


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15781	0.08	45.66	32.57	45.74	32.65	65.58	55.58	-19.84	-22.93
2	0.18516	0.08	43.23	34.59	43.31	34.67	64.25	54.25	-20.94	-19.58
3	0.42734	0.10	34.57	27.87	34.67	27.97	57.30	47.30	-22.63	-19.33
4	0.81797	0.12	32.63	20.72	32.75	20.84	56.00	46.00	-23.25	-25.16
5	4.51563	0.25	21.41	16.36	21.66	16.61	56.00	46.00	-34.34	-29.39
6	16.37109	0.64	28.56	23.71	29.20	24.35	60.00	50.00	-30.80	-25.65

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 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 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.

4.3.2 Test Setup

4.3.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power Meter Anritsu	ML2495A	1014008	Apr. 30, 2014	Apr. 29, 2015
Power Sensor Anritsu	MA2411B	0917122	Apr. 30, 2014	Apr. 29, 2015

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Apr. 17, 2015

4.3.4 Test Procedure

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

POWER OUTPUT:

802.11a

CHAN.	FREQ. (MHz)	MAXIMUM CONDUCTED POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	13.86	13.78	48.2	16.83	30	PASS
40	5200	13.81	13.70	47.486	16.77	30	PASS
48	5240	13.82	13.80	48.087	16.82	30	PASS
149	5745	21.70	21.54	290.472	24.63	30	PASS
157	5785	21.72	21.60	293.138	24.67	30	PASS
165	5825	21.68	21.66	293.786	24.68	30	PASS

802.11ac (VHT20)

CHAN.	FREQ. (MHz)	MAXIMUM CONDUCTED POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	13.83	13.81	48.199	16.83	30	PASS
40	5200	13.81	13.76	47.812	16.80	30	PASS
48	5240	13.87	13.72	47.928	16.81	30	PASS
149	5745	21.72	21.74	297.873	24.74	30	PASS
157	5785	21.62	21.64	291.092	24.64	30	PASS
165	5825	21.67	21.74	296.172	24.72	30	PASS

802.11ac (VHT40)

CHAN.	FREQ. (MHz)	MAXIMUM CONDUCTED POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
38	5190	16.82	16.70	94.858	19.77	30	PASS
46	5230	16.78	16.51	92.414	19.66	30	PASS
151	5755	19.66	19.25	176.61	22.47	30	PASS
159	5795	21.73	21.61	293.813	24.68	30	PASS

802.11ac (VHT80)

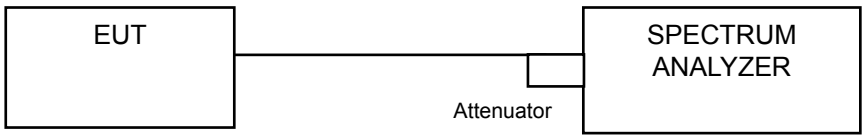
CHAN.	CHAN. FREQ. (MHz)	MAXIMUM CONDUCTED POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
42	5210	13.78	13.79	47.811	16.80	30	PASS
155	5775	15.78	15.48	73.162	18.64	30	PASS

4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
	√	Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A	---		11dBm/ MHz
U-NII-2C	---		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

4.4.2 Test Setup



4.4.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Apr. 17, 2015

4.4.4 Test Procedure

For U-NII-1 band:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and for duty cycle of test signal is < 98% add 10 log (1/duty cycle)

For U-NII-3 band:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and for duty cycle of test signal is < 98% add 10 log (1/duty cycle)

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-1 Band

802.11a

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
36	5180	-1.05	-1.13	1.92	17	PASS
40	5200	-1.07	-1.18	1.89	17	PASS
48	5240	-0.98	-1.27	1.89	17	PASS

NOTE: 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit shall not be reduced.

802.11ac (VHT20)

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
36	5180	-8.23	-1.45	-0.62	17	PASS
40	5200	-1.64	-1.54	1.42	17	PASS
48	5240	-1.53	-1.54	1.48	17	PASS

NOTE: 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit shall not be reduced.

802.11ac (VHT40)

CHAN.	FREQ. (MHz)	PSD W/O DUTY FACTOR (dBm)		DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
38	5190	-1.37	-1.69	0.28	1.77	17	PASS
46	5230	-1.37	-1.39	0.28	1.91	17	PASS

NOTE: 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

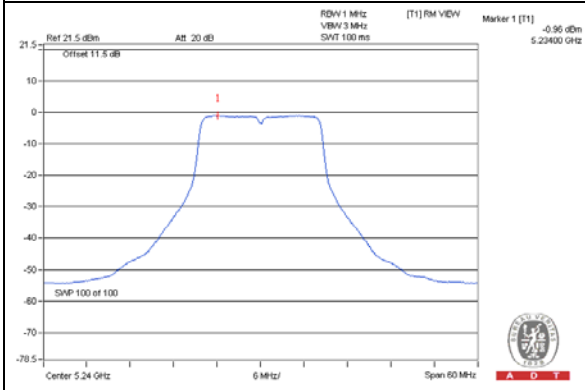
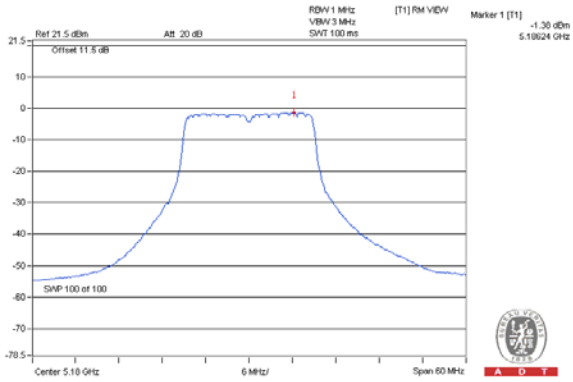
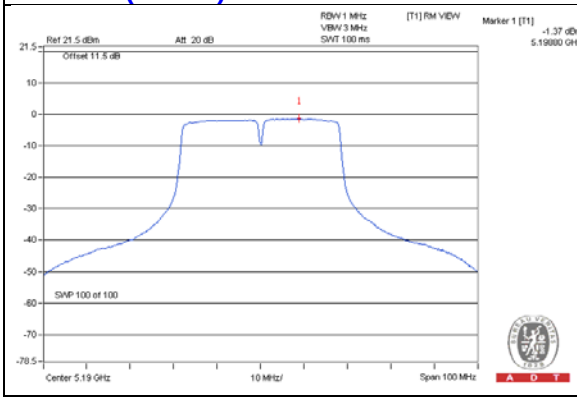
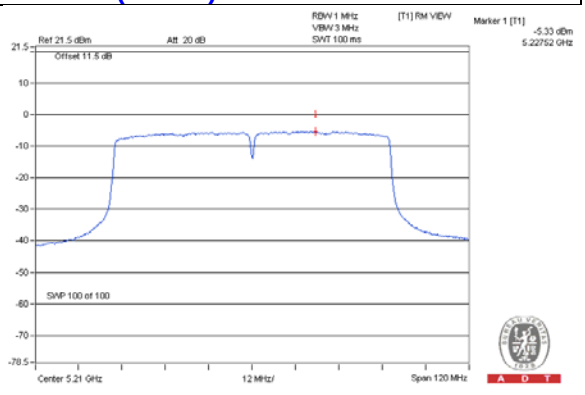
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

CHAN.	FREQ. (MHz)	PSD W/O DUTY FACTOR (dBm)		DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
42	5210	-5.33	-5.63	0.75	-1.72	17	PASS

NOTE: 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE	
802.11a: Chain 0 / CH 48	802.11ac (VHT20): Chain 1 / CH 36
	
802.11ac (VHT40): Chain 0 / CH 38	802.11ac (VHT80): Chain 0 / CH 42
	

For U-NII-3 Band

802.11a

TX chain	Channel	Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	PASS /FAIL
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-0.57	1.65	3.01	4.66	30	PASS
	157	5785	-1.10	1.12	3.01	4.13	30	PASS
	165	5825	-1.01	1.21	3.01	4.22	30	PASS
1	149	5745	-0.77	1.45	3.01	4.46	30	PASS
	157	5785	-1.50	0.72	3.01	3.73	30	PASS
	165	5825	-1.42	0.80	3.01	3.81	30	PASS

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit shall not be reduced.

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	PASS /FAIL
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-0.94	1.28	3.01	4.29	30	PASS
	157	5785	-1.44	0.78	3.01	3.79	30	PASS
	165	5825	-1.55	0.67	3.01	3.68	30	PASS
1	149	5745	-1.19	1.03	3.01	4.04	30	PASS
	157	5785	-1.69	0.53	3.01	3.54	30	PASS
	165	5825	-1.76	0.46	3.01	3.47	30	PASS

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit shall not be reduced.

802.11ac (VHT40)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR		10 log (N=2) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-3.77	-1.55	3.01	0.28	1.74	30	PASS
	159	5795	-4.08	-1.86	3.01	0.28	1.43	30	PASS
1	151	5755	-6.95	-4.73	3.01	0.28	-1.44	30	PASS
	159	5795	-4.59	-2.37	3.01	0.28	0.92	30	PASS

NOTE: 1. Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$)^2 / 2] = 5.66dBi < 6dBi, so the power density limit shall not be reduced.

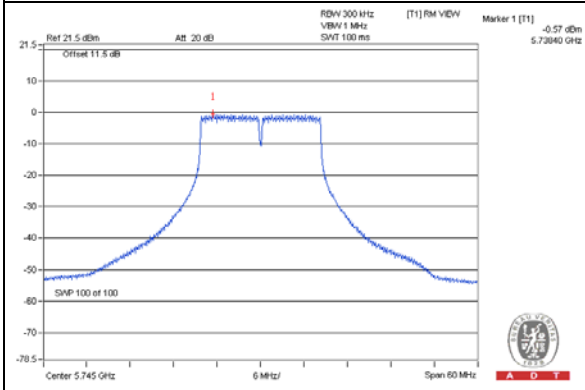
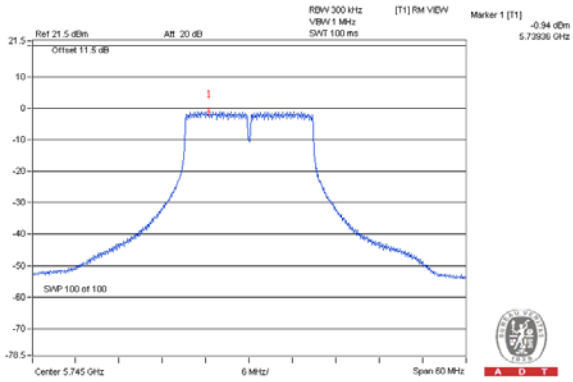
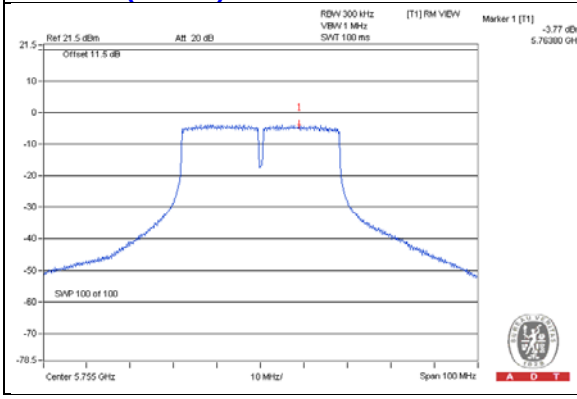
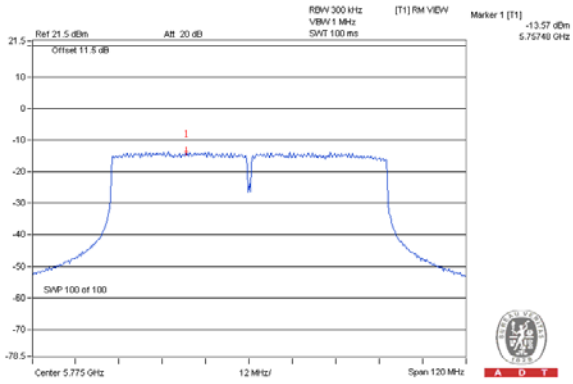
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR		10 log (N=2) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-13.57	-11.35	3.01	0.75	-7.59	30	PASS
1	155	5775	-14.15	-11.93	3.01	0.75	-8.17	30	PASS

NOTE: 1. Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$)^2 / 2] = 5.66dBi < 6dBi, so the power density limit shall not be reduced.

2. Refer to section 3.3 for duty cycle spectrum plot.

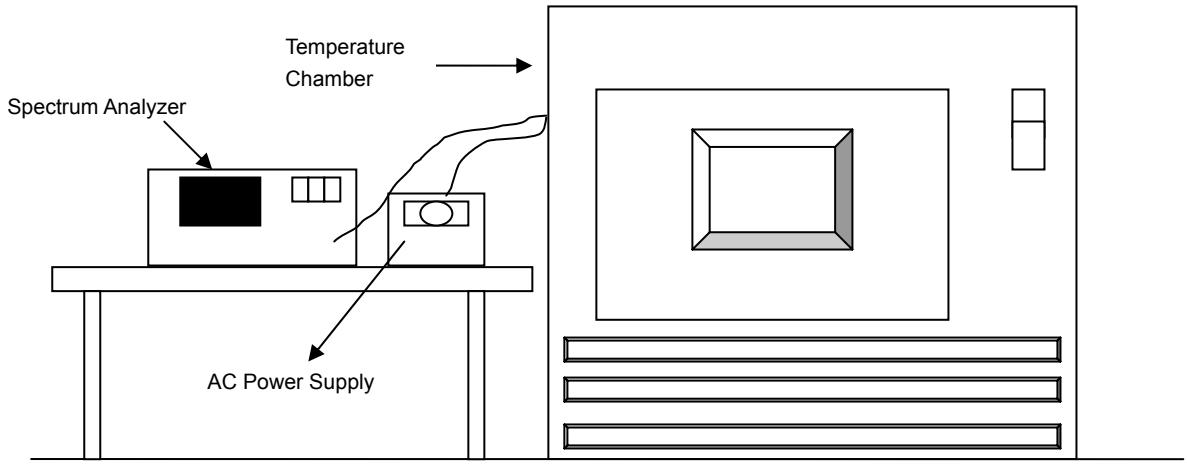
SPECTRUM PLOT OF WORST VALUE	
802.11a: Chain 0 / CH 149	802.11ac (VHT20): Chain 0 / CH 149
	
802.11ac (VHT40): Chain 0 / CH 151	802.11ac (VHT80): Chain 0 / CH 155
	

4.5 Frequency Stability Measurement

4.5.1 Limits of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation

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. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.5.7 Test Results

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5180MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5180.003	0.00006	5180.0005	0.00001	5180.0001	0.00000	5179.9997	-0.00001
40	120	5180.023	0.00044	5180.0239	0.00046	5180.0232	0.00045	5180.0213	0.00041
30	120	5179.9915	-0.00016	5179.9935	-0.00013	5179.9911	-0.00017	5179.9912	-0.00017
20	120	5179.9914	-0.00017	5179.993	-0.00014	5179.9903	-0.00019	5179.9912	-0.00017
10	120	5179.9877	-0.00024	5179.9854	-0.00028	5179.9847	-0.00030	5179.9844	-0.00030
0	120	5179.9776	-0.00043	5179.9752	-0.00048	5179.9782	-0.00042	5179.9739	-0.00050
-10	120	5180.005	0.00010	5180.0044	0.00008	5180.0026	0.00005	5180.0019	0.00004
-20	120	5180.0195	0.00038	5180.0196	0.00038	5180.0218	0.00042	5180.0231	0.00045
-30	120	5180.0035	0.00007	5180.0043	0.00008	5180.0062	0.00012	5180.0034	0.00007

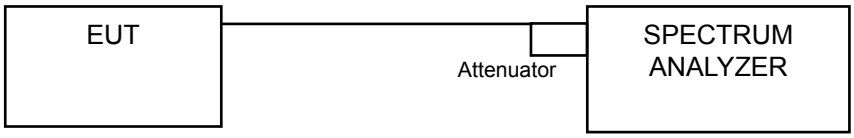
FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5180MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9922	-0.00015	5179.9926	-0.00014	5179.9893	-0.00021	5179.9917	-0.00016
	120	5179.9914	-0.00017	5179.993	-0.00014	5179.9903	-0.00019	5179.9912	-0.00017
	102	5179.9918	-0.00016	5179.9928	-0.00014	5179.9896	-0.00020	5179.9904	-0.00019

4.6 6dB Bandwidth Measurment

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Apr. 17, 2015

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.39	16.41	0.5	PASS
157	5785	16.42	16.41	0.5	PASS
165	5825	16.40	16.42	0.5	PASS

802.11ac (VHT20)

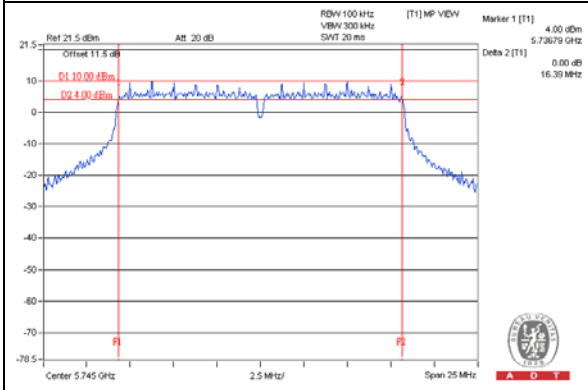
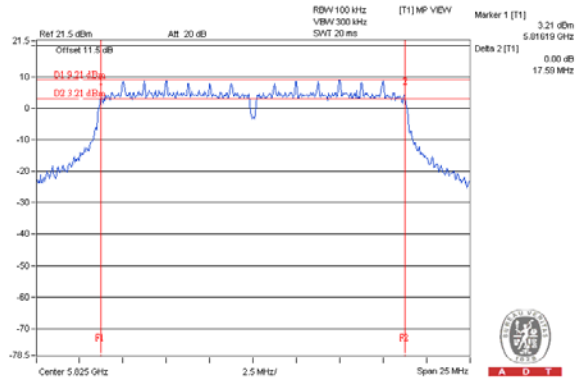
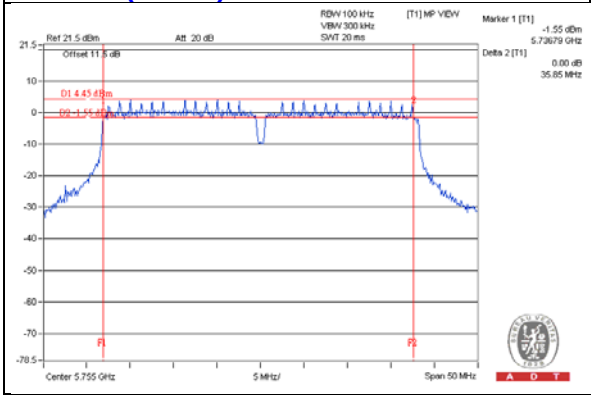
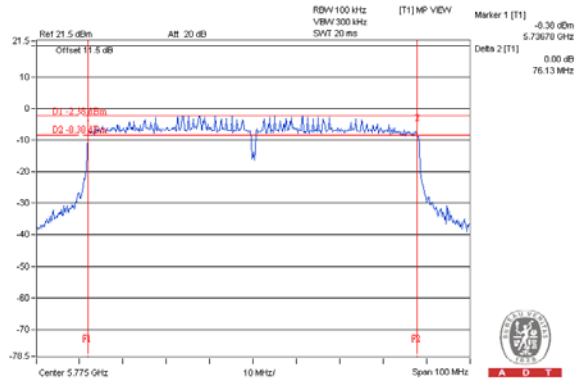
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	17.64	17.63	0.5	PASS
157	5785	17.64	17.61	0.5	PASS
165	5825	17.60	17.59	0.5	PASS

802.11ac (VHT40)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	36.11	35.85	0.5	PASS
159	5795	36.16	35.85	0.5	PASS

802.11ac (VHT80)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
155	5775	76.13	76.36	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11a: Chain 0 / CH 149	802.11ac (VHT20): Chain 1 / CH 165
	
802.11ac (VHT40): Chain 1 / CH 151	802.11ac (VHT80): Chain 0 / CH 155
	

4.7 Occupied Bandwidth Measurement

4.7.1 Test Setup

4.7.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Apr. 17, 2015

4.7.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to PEAK. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.7.4 Deviation from Test Standard

No deviation.

4.7.5 EUT Operating Conditions

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

4.7.6 Test Results

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.80	16.68
40	5200	16.80	16.68
48	5240	16.68	16.68
149	5745	16.80	16.68
157	5785	16.68	16.68
165	5825	16.80	16.68

802.11ac (VHT20)

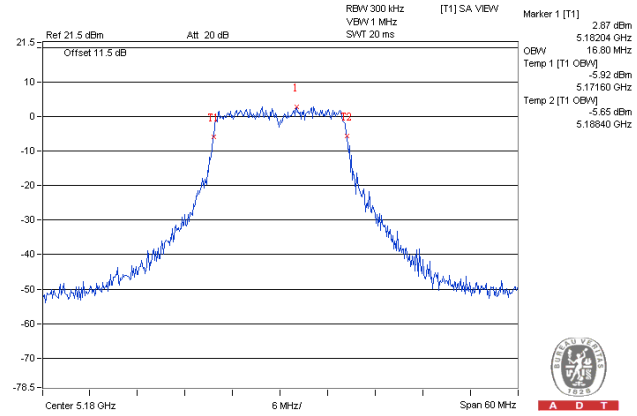
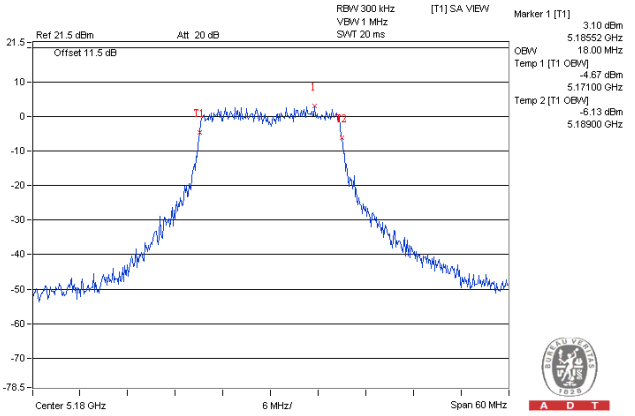
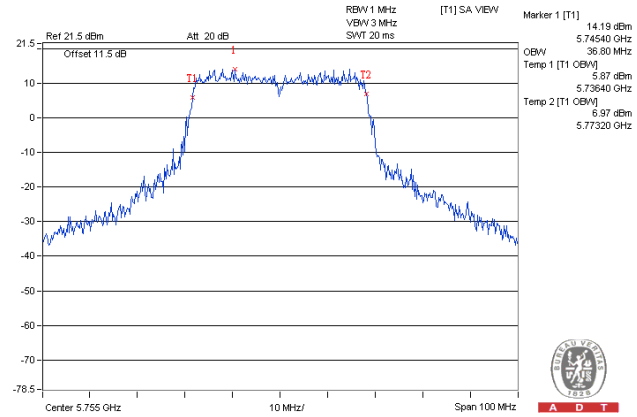
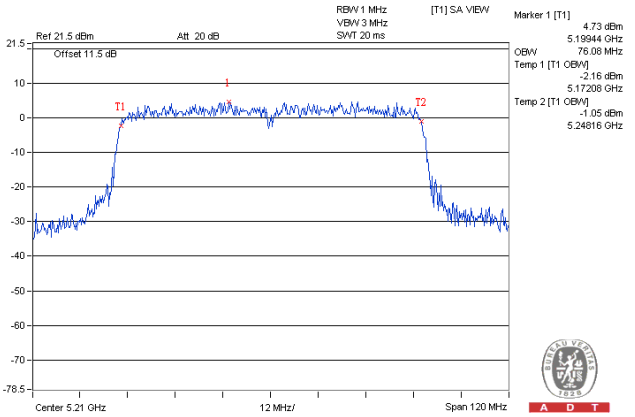
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.88	18.00
40	5200	17.88	17.88
48	5240	17.88	17.88
149	5745	17.88	17.88
157	5785	17.88	17.88
165	5825	17.88	17.88

802.11ac (VHT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.60	36.60
46	5230	36.60	36.60
151	5755	36.80	36.60
159	5795	36.80	36.80

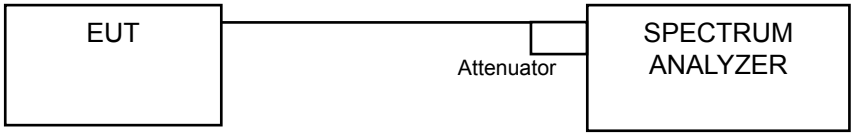
802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	76.08	75.84
155	5775	76.08	76.08

Spectrum Plot of Worst Value	
802.11a: Chain 0 / CH36	**802.11ac (VHT20): Chain 1 / CH36**
	
802.11ac (VHT40): Chain 0 / CH151	**802.11ac (VHT80): Chain 0 / CH42**
	

4.8 26dB Bandwidth Measurment

4.8.1 Test Setup



4.8.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Apr. 17, 2015

4.8.3 Test Procedure

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.8.4 Deviation from Test Standard

No deviation.

4.8.5 EUT Operating Condition

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

4.8.6 Test Results

802.11a

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	21.91	22.08
40	5200	22.44	22.43
48	5240	22.23	21.97
149	5745	19.94	19.44
157	5785	20.36	20.63
165	5825	19.91	21.17

802.11ac (VHT20)

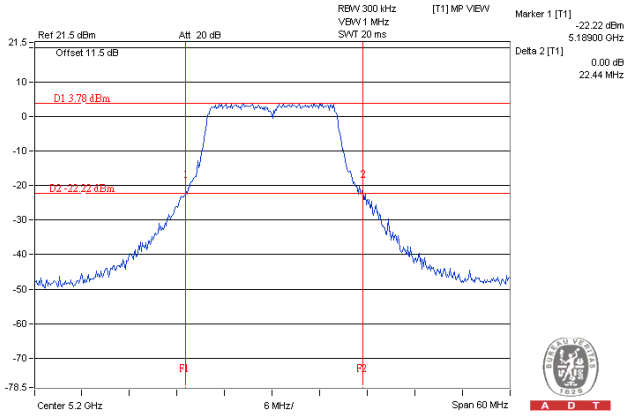
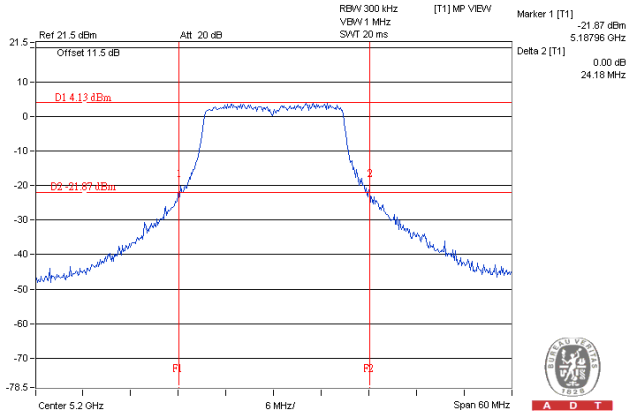
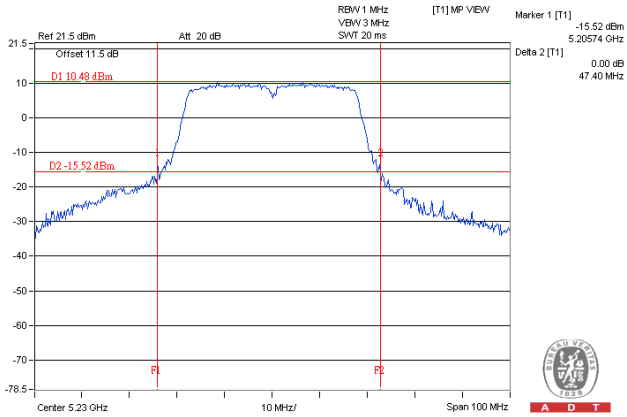
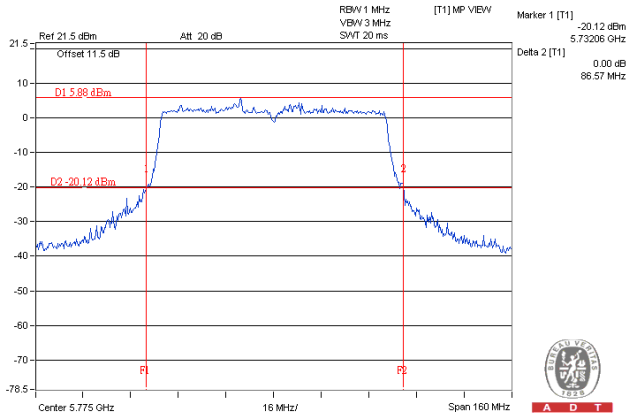
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	23.16	23.32
40	5200	23.11	24.18
48	5240	22.88	23.36
149	5745	22.01	20.11
157	5785	21.13	20.55
165	5825	21.82	20.91

802.11ac (VHT40)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	46.04	46.35
46	5230	46.01	47.40
151	5755	45.45	45.49
159	5795	45.91	45.77

802.11ac (VHT80)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	85.10	86.55
155	5775	86.22	86.57

Spectrum Plot of Worst Value	
802.11a: Chain 0 / CH40	**802.11ac (VHT20): Chain 1 / CH40**
	
802.11ac (VHT40): Chain 1 / CH46	**802.11ac (VHT80): Chain 1 / CH155**
	

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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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.

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