FCC Test Report (DFS Band)

Report No.:	RF160219E04A-1
FCC ID:	RSL-AP500
Test Model:	AT-AP500
Received Date:	Mar. 22, 2016
Test Date:	Mar. 22 to June 13, 2016
Issued Date:	Nov. 25, 2016
Applicant:	Allied Telesis K.K.
Address:	2nd TOC Bldg. 7-21-11 Nishi-Gotanda, Shinagawa-ku, Tokyo 141-0031, Japan
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.

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF160219E04A-1	Original release.	Nov. 25, 2016

1 Certificate of Conformity

Product:	Cloud-Managed Enterprise-class Wireless Access Point with IEEE802.11a/b/g/n/ac Dual Radio
Brand:	Allied Telesis
Test Model:	AT-AP500
Sample Status:	ENGINEERING SAMPLE
Applicant:	Allied Telesis K.K.
Test Date:	Mar. 22 to June 13, 2016
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) 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 : Wendy Wu , **Date:** Nov. 25, 2016

Wendy Wu / Specialist

Approved by : , **Date:** Nov. 25, 2016

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -3.29dB at 0.29844MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 5350.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
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.

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

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (DFS Band)

Product	Cloud-Managed Enterprise-class Wireless Access Point with IEEE802.11a/b/g/n/ac Dual Radio
Brand	Allied Telesis
Test Model	AT-AP500
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from Power Adapter or DC 48V from POE Adapter
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1733.3Mbps
Operating Frequency	5.26GHz ~ 5.32GHz, 5.50GHz ~ 5.70GHz
Number of Channel	15 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 7 for 802.11n (HT40), 802.11ac (VHT40) 3 for 802.11ac (VHT80)
Output Power	**5.26GHz ~ 5.32GHz** 183.016mW **5.50GHz ~ 5.70GHz** 249.389mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter (Option) x 1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF160219E04-1 as the following:
   - ◆ Add DFS band <5.26GHz ~ 5.32GHz, 5.5GHz ~ 5.70GHz>
2. According to above condition, all test items need to be performed. And all data weres verified to meet the requirements.
3. 2.4GHz and 5GHz technology can transmit at same time.
4. The EUT could be supplied with a power adapter (Option) or POE adapter (only for test,not for sale) as following table:

Item	Brand	Model No.	Spec.
Power adapter	Elementech	A124-11202050	Input: 100-240V, 0.6A, 50/60Hz Output: 12.0V, 2A DC output cable(1.8m, unshielded)
POE adapter	RUCKUS	GRT-480125A (740-64216-001)	Input: 100-240V, 1.0A, 50/60Hz Output: 48V, 1250mA
From the above adapters, the radiated emission worse case was found in **POE adapter**. Therefore only the test data of the mode was recorded in this report.			

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

2.4GHz					
Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain(dBi) Including cable loss	Connector type
Chain (0)	Aristotle	RFA-02-G133-70B-110R	PIFA	3.1	i-pex(MHF)
Chain (1)		RFA-52-G181-58-90		2.47	
Chain (2)		RFA-02-G133-70B-180		1.75	
5 GHz					
Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain(dBi) Including cable loss	Connector type
Chain (0)	Aristotle	RFA-05-G134-70-230C	PIFA	2.65	i-pex(MHF)
Chain (1)		RFA-52-G181-58-90		5.55	
Chain (2)		RFA-05-G134-70-105C		4.15	
Chain (3)		RFA-05-G134-70-75C		4.04	

6. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	1Tx Fixed Chan 0	3Rx
802.11g	6 ~ 54Mbps	3Tx/2Tx/1Tx diversity	3Rx
802.11n (HT20)	MCS 0~7	3Tx/2Tx/1Tx diversity	3Rx
	MCS 8~15	3Tx/2Tx	3Rx
	MCS 16~23	3Tx	3Rx
802.11n (HT40)	MCS 0~7	3Tx/2Tx/1Tx diversity	3Rx
	MCS 8~15	3Tx/2Tx	3Rx
	MCS 16~23	3Tx	3Rx
VHT20	MCS0~8 Nss=1	3Tx/2Tx/1Tx diversity	3Rx
	MCS0~8 Nss=2	3Tx/2Tx	3Rx
	MCS0~9 Nss=3	3Tx	3Rx
VHT40	MCS0~9 Nss=1	3Tx/2Tx/1Tx diversity	3Rx
	MCS0~9 Nss=2	3Tx/2Tx	3Rx
	MCS0~9 Nss=3	3Tx	3Rx
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	4Tx/3Tx/2Tx/1Tx diversity	4Rx
802.11n (HT20)	MCS 0~7	4Tx/3Tx/2Tx/1Tx diversity	4Rx
	MCS 8~15	4Tx/3Tx/2Tx	4Rx
	MCS 16~23	4Tx/3Tx	4Rx
	MCS 24~31	4Tx	4Rx
802.11n (HT40)	MCS 0~7	4Tx/3Tx/2Tx/1Tx diversity	4Rx
	MCS 8~15	4Tx/3Tx/2Tx	4Rx
	MCS 16~23	4Tx/3Tx	4Rx
	MCS 24~31	4Tx	4Rx
802.11ac (VHT20)	MCS0~8 Nss=1	4Tx/3Tx/2Tx/1Tx diversity	4Rx
	MCS0~8 Nss=2	4Tx/3Tx/2Tx	4Rx
	MCS0~9 Nss=3	4Tx/3Tx	4Rx
	MCS0~8 Nss=4	4Tx	4Rx
802.11ac (VHT40)	MCS0~9 Nss=1	4Tx/3Tx/2Tx/1Tx diversity	4Rx
	MCS0~9 Nss=2	4Tx/3Tx/2Tx	4Rx
	MCS0~9 Nss=3	4Tx/3Tx	4Rx
	MCS0~9 Nss=4	4Tx	4Rx
802.11ac (VHT80)	MCS0~9 Nss=1	4Tx/3Tx/2Tx/1Tx diversity	4Rx
	MCS0~9 Nss=2	4Tx/3Tx/2Tx	4Rx
	MCS0~9 Nss=3	4Tx/3Tx	4Rx
	MCS0~9 Nss=4	4Tx	4Rx
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)			

7. Spurious emission of the simultaneous operation (2.4GHz and 5GHz) has been evaluated and no non-compliance was found.
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 5260 ~ 5320MHz

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

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

FOR 5500 ~ 5700MHz

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

5 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530MHz	122	5610 MHz

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

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
802.11ac (VHT20)		100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 122	106, 102	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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5500-5700	102 to 134	134	OFDM	BPSK	13.5

Power Line Conducted Emission Test:

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

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT40)	5500-5700	102 to 134	134	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

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

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
802.11ac (VHT20)		100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 122	106, 102	OFDM	BPSK	29.3

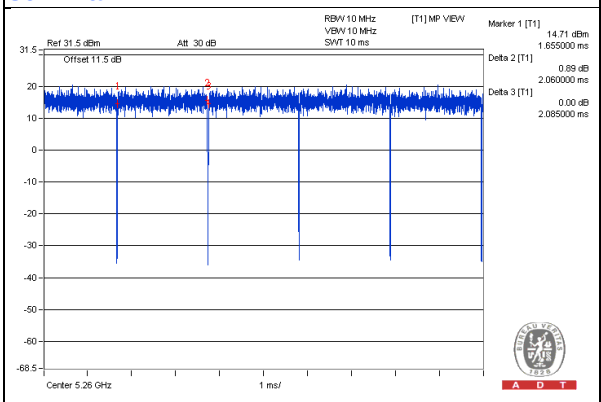
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By	Test Location
RE≥1G	22deg. C, 64%RH	120Vac, 60Hz	Robert Cheng	1
RE<1G	19deg. C, 73%RH	120Vac, 60Hz	Robert Cheng	1
PLC	24deg. C, 61%RH	120Vac, 60Hz	Wythe Lin Eagle Chen	2
APCM	25deg. C, 66%RH	120Vac, 60Hz	Anderson Chen	1

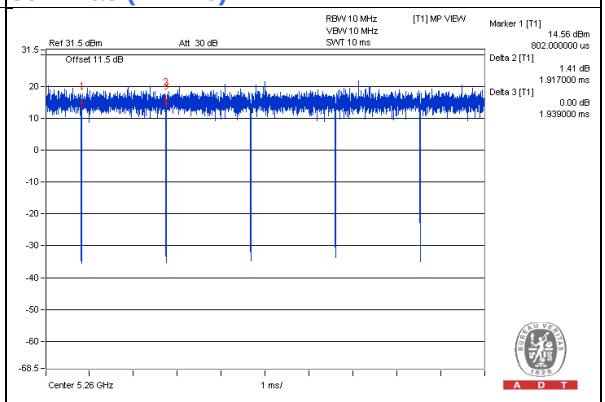
3.3 Duty Cycle of Test Signal

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 = 2.062 ms/2.085 ms = 0.988
802.11ac (VHT20): Duty cycle = 1.917 ms/1.939 ms = 0.989
802.11ac (VHT40): Duty cycle = 0.954 ms/0.972 ms = 0.981
802.11ac (VHT80): Duty cycle = 0.459 ms/0.479 ms = 0.958, Duty factor = 10 * log(1/0.958) = 0.19

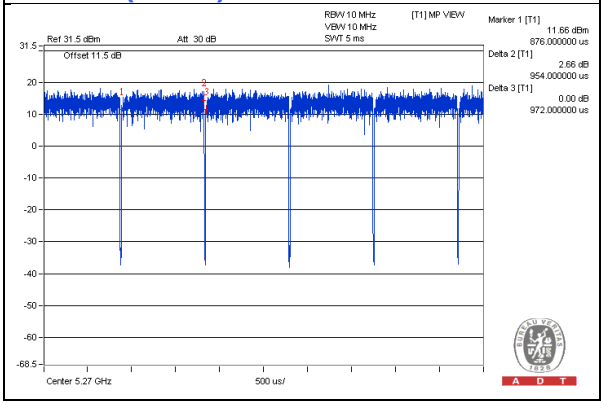
802.11a



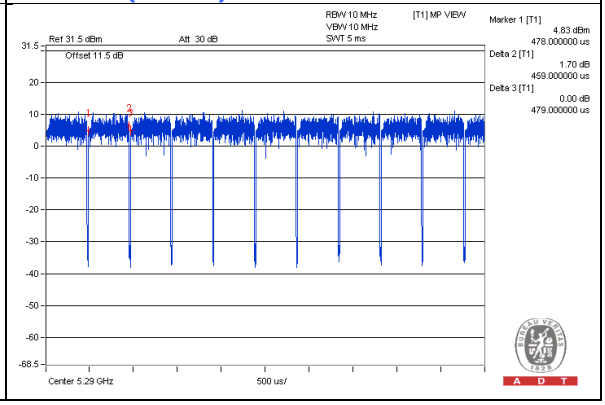
802.11ac (VHT20)



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.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	NOTEBOOK COMPUTER	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
B.	POE	RUCKUS	GRT-480125A (740-64216-001)	NA	NA	Supplied by client

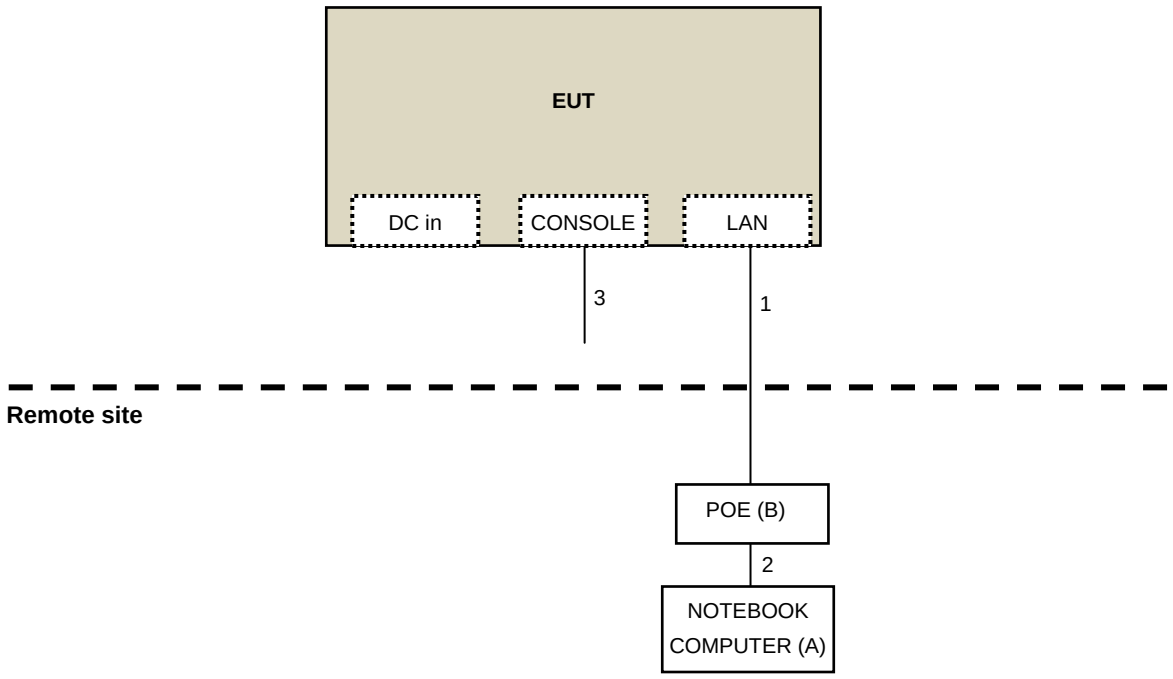
Note:

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

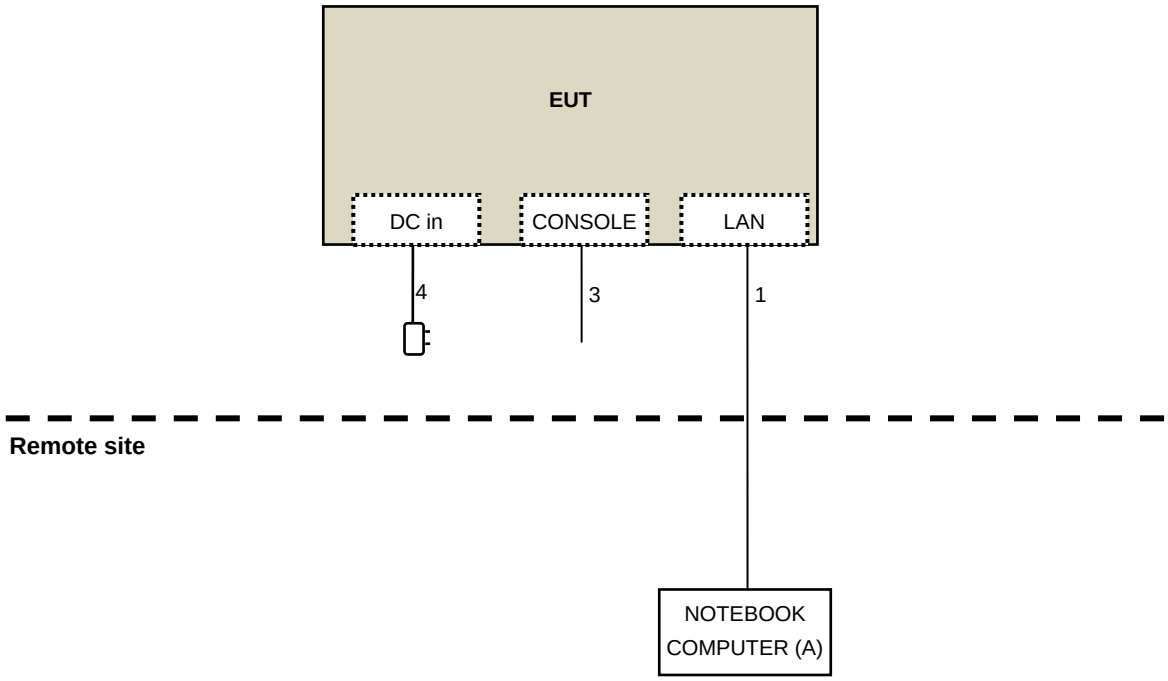
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 cable	1	10	No	0	Provided by Lab
2.	RJ-45 cable	1	3	No	0	Provided by Lab
3.	Console cable	1	1.8	No	0	Provided by Lab
4.	DC cable	1	1.8	No	0	Supplied by client

3.4.1 Configuration of System under Test

For PoE Mode:



For Adapter Mode:



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)
KDB 789033 D02 General UNII Test Procedure New Rules v01r03
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.

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 v01r03			Field Strength at 3m	
			PK:74 (dBµV/m)	AV:54 (dBµV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)		PK:-27 (dBm/MHz)	PK:68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☐	15.407(b)(4)(i)	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2(dBµV/m) *1 PK:105.2 (dBµV/m) *2 PK: 110.8(dBµV/m) *3 PK:122.2 (dBµV/m) *4
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	

*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 07, 2016	May 06, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-156	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 02, 2016	Apr. 01, 2017
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Jan. 20, 2016	Jan. 19, 2017
Pre-Amplifier Agilent	8449B	3008A02465	Apr. 05, 2016	Apr. 04, 2017
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150317 150321 150322	Mar. 30, 2016	Mar. 29, 2017
Spectrum Analyzer Keysight	N9030A	MY54490520	July 26, 2015	July 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017
Power meter Anritsu	ML2495A	1014008	May 5, 2016	May 4, 2017
Power sensor Anritsu	MA2411B	0917122	May 5, 2016	May 4, 2017
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The FCC Site Registration No. is 147459
5 Loop antenna was used for all emissions below 30 MHz.
6. The CANADA Site Registration No. is 20331-1
7. Tested Date: June 04 to 13, 2016

4.1.3 Test Procedure

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:

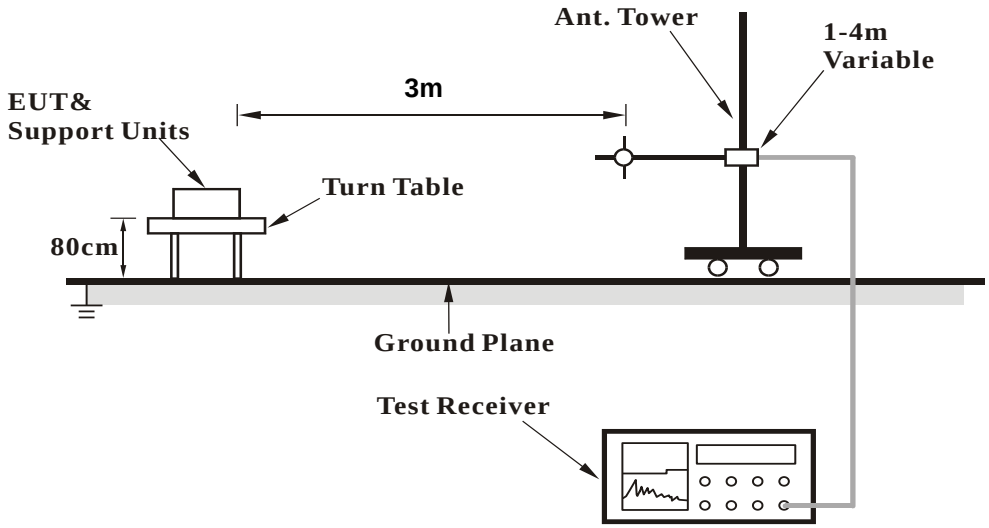
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

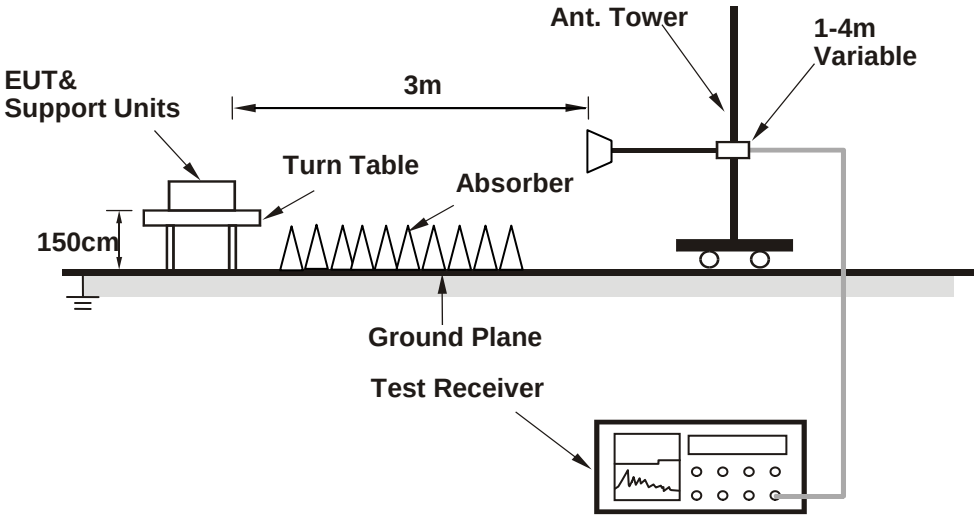
No deviation.

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 Condition

1. Connect the EUT with the support unit A (Notebook Computer) which is placed on remote site.
2. Controlling software (Mtool.exe [V2.0.2.7]) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

CHANNEL	TX Channel 52	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	4967.00	51.4 PK	74.0	-22.6	1.07 H	24	48.8	2.6
2	4967.00	40.6 AV	54.0	-13.4	1.07 H	24	38.0	2.6
3	*5260.00	109.8 PK			1.07 H	24	106.5	3.3
4	*5260.00	99.3 AV			1.07 H	24	96.0	3.3
5	#10520.00	50.3 PK	74.0	-23.7	1.06 H	68	36.2	14.1
6	#10520.00	39.4 AV	54.0	-14.6	1.06 H	68	25.3	14.1
7	15780.00	50.1 PK	74.0	-23.9	1.01 H	21	34.9	15.2
8	15780.00	39.1 AV	54.0	-14.9	1.01 H	21	23.9	15.2
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	4967.00	50.8 PK	74.0	-23.2	2.72 V	360	48.2	2.6
2	4967.00	44.0 AV	54.0	-10.0	2.72 V	360	41.4	2.6
3	*5260.00	110.6 PK			2.72 V	360	107.3	3.3
4	*5260.00	101.4 AV			2.72 V	360	98.1	3.3
5	#10520.00	50.0 PK	74.0	-24.0	3.13 V	356	35.9	14.1
6	#10520.00	39.6 AV	54.0	-14.4	3.13 V	356	25.5	14.1
7	15780.00	50.3 PK	74.0	-23.7	2.79 V	131	35.1	15.2
8	15780.00	39.3 AV	54.0	-14.7	2.79 V	131	24.1	15.2

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 60	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	*5300.00	109.5 PK			1.12 H	19	106.2	3.3
2	*5300.00	99.1 AV			1.12 H	19	95.8	3.3
3	10600.00	50.1 PK	74.0	-23.9	1.11 H	64	35.8	14.3
4	10600.00	39.1 AV	54.0	-14.9	1.11 H	64	24.8	14.3
5	15900.00	49.6 PK	74.0	-24.4	1.00 H	17	34.5	15.1
6	15900.00	38.6 AV	54.0	-15.4	1.00 H	17	23.5	15.1
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	*5300.00	110.8 PK			2.77 V	349	107.5	3.3
2	*5300.00	101.6 AV			2.77 V	349	98.3	3.3
3	10600.00	50.2 PK	74.0	-23.8	3.16 V	360	35.9	14.3
4	10600.00	40.0 AV	54.0	-14.0	3.16 V	360	25.7	14.3
5	15900.00	50.6 PK	74.0	-23.4	2.78 V	118	35.5	15.1
6	15900.00	39.8 AV	54.0	-14.2	2.78 V	118	24.7	15.1

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 64	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	*5320.00	110.0 PK			1.05 H	19	106.5	3.5
2	*5320.00	99.4 AV			1.05 H	19	95.9	3.5
3	5350.00	51.6 PK	74.0	-22.4	1.05 H	19	48.1	3.5
4	5350.00	41.0 AV	54.0	-13.0	1.05 H	19	37.5	3.5
5	10640.00	49.8 PK	74.0	-24.2	1.09 H	82	35.5	14.3
6	10640.00	39.1 AV	54.0	-14.9	1.09 H	82	24.8	14.3
7	15960.00	50.3 PK	74.0	-23.7	1.00 H	10	35.2	15.1
8	15960.00	39.3 AV	54.0	-14.7	1.00 H	10	24.2	15.1
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	*5320.00	111.0 PK			2.68 V	360	107.5	3.5
2	*5320.00	101.8 AV			2.68 V	360	98.3	3.5
3	5350.00	54.7 PK	74.0	-19.3	2.68 V	360	51.2	3.5
4	5350.00	43.5 AV	54.0	-10.5	2.68 V	360	40.0	3.5
5	10640.00	49.5 PK	74.0	-24.5	3.18 V	353	35.2	14.3
6	10640.00	39.3 AV	54.0	-14.7	3.18 V	353	25.0	14.3
7	15960.00	50.3 PK	74.0	-23.7	2.74 V	144	35.2	15.1
8	15960.00	39.4 AV	54.0	-14.6	2.74 V	144	24.3	15.1

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 100	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	5426.00	51.5 PK	74.0	-22.5	1.08 H	26	47.8	3.7
2	5426.00	40.6 AV	54.0	-13.4	1.08 H	26	36.9	3.7
3	*5500.00	110.1 PK			1.08 H	26	106.3	3.8
4	*5500.00	99.5 AV			1.08 H	26	95.7	3.8
5	11000.00	50.3 PK	74.0	-23.7	1.05 H	58	35.1	15.2
6	11000.00	39.5 AV	54.0	-14.5	1.05 H	58	24.3	15.2
7	#16500.00	49.8 PK	74.0	-24.2	1.01 H	16	32.4	17.4
8	#16500.00	39.0 AV	54.0	-15.0	1.01 H	16	21.6	17.4
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	5426.00	57.5 PK	74.0	-16.5	2.67 V	360	53.8	3.7
2	5426.00	45.5 AV	54.0	-8.5	2.67 V	360	41.8	3.7
3	*5500.00	110.5 PK			2.69 V	360	106.7	3.8
4	*5500.00	101.0 AV			2.69 V	360	97.2	3.8
5	11000.00	49.8 PK	74.0	-24.2	3.11 V	360	34.6	15.2
6	11000.00	39.3 AV	54.0	-14.7	3.11 V	360	24.1	15.2
7	#16500.00	50.2 PK	74.0	-23.8	2.84 V	128	32.8	17.4
8	#16500.00	39.2 AV	54.0	-14.8	2.84 V	128	21.8	17.4

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 116	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	*5580.00	109.7 PK			1.06 H	26	105.8	3.9
2	*5580.00	99.0 AV			1.06 H	26	95.1	3.9
3	11160.00	50.3 PK	74.0	-23.7	1.04 H	58	35.1	15.2
4	11160.00	39.7 AV	54.0	-14.3	1.04 H	58	24.5	15.2
5	#16740.00	50.4 PK	74.0	-23.6	1.00 H	15	32.1	18.3
6	#16740.00	39.4 AV	54.0	-14.6	1.00 H	15	21.1	18.3
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	*5580.00	110.8 PK			2.71 V	357	106.9	3.9
2	*5580.00	101.6 AV			2.71 V	357	97.7	3.9
3	11160.00	50.1 PK	74.0	-23.9	3.19 V	342	34.9	15.2
4	11160.00	39.9 AV	54.0	-14.1	3.19 V	342	24.7	15.2
5	#16740.00	50.5 PK	74.0	-23.5	2.78 V	134	32.2	18.3
6	#16740.00	39.4 AV	54.0	-14.6	2.78 V	134	21.1	18.3

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 140	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	*5700.00	109.9 PK			1.11 H	23	105.7	4.2
2	*5700.00	99.2 AV			1.11 H	23	95.0	4.2
3	#5725.00	51.7 PK	74.0	-22.3	1.11 H	23	47.5	4.2
4	#5725.00	40.7 AV	54.0	-13.3	1.11 H	23	36.5	4.2
5	11400.00	50.1 PK	74.0	-23.9	1.00 H	81	34.6	15.5
6	11400.00	39.1 AV	54.0	-14.9	1.00 H	81	23.6	15.5
7	#17100.00	50.7 PK	74.0	-23.3	1.00 H	24	30.6	20.1
8	#17100.00	39.5 AV	54.0	-14.5	1.00 H	24	19.4	20.1
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	*5700.00	110.5 PK			2.74 V	360	106.3	4.2
2	*5700.00	101.2 AV			2.74 V	360	97.0	4.2
3	#5725.00	56.8 PK	74.0	-17.2	2.74 V	360	52.6	4.2
4	#5725.00	44.4 AV	54.0	-9.6	2.74 V	360	40.2	4.2
5	11400.00	49.5 PK	74.0	-24.5	3.07 V	360	34.0	15.5
6	11400.00	39.1 AV	54.0	-14.9	3.07 V	360	23.6	15.5
7	#17100.00	50.6 PK	74.0	-23.4	2.84 V	126	30.5	20.1
8	#17100.00	39.4 AV	54.0	-14.6	2.84 V	126	19.3	20.1

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 52	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	5100.00	51.0 PK	74.0	-23.0	1.03 H	10	48.2	2.8
2	5100.00	40.3 AV	54.0	-13.7	1.03 H	10	37.5	2.8
3	*5260.00	110.0 PK			1.03 H	10	106.7	3.3
4	*5260.00	99.2 AV			1.03 H	10	95.9	3.3
5	#10520.00	49.8 PK	74.0	-24.2	1.04 H	66	35.7	14.1
6	#10520.00	39.1 AV	54.0	-14.9	1.04 H	66	25.0	14.1
7	15780.00	50.5 PK	74.0	-23.5	1.03 H	32	35.3	15.2
8	15780.00	39.2 AV	54.0	-14.8	1.03 H	32	24.0	15.2
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	5100.00	51.1 PK	74.0	-22.9	2.76 V	360	48.3	2.8
2	5100.00	44.1 AV	54.0	-9.9	2.76 V	360	41.3	2.8
3	*5260.00	111.2 PK			2.69 V	360	107.9	3.3
4	*5260.00	101.8 AV			2.69 V	360	98.5	3.3
5	#10520.00	49.3 PK	74.0	-24.7	3.07 V	353	35.2	14.1
6	#10520.00	39.2 AV	54.0	-14.8	3.07 V	353	25.1	14.1
7	15780.00	50.6 PK	74.0	-23.4	2.80 V	142	35.4	15.2
8	15780.00	39.6 AV	54.0	-14.4	2.80 V	142	24.4	15.2

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 60	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	*5300.00	109.3 PK			1.11 H	10	106.0	3.3
2	*5300.00	99.0 AV			1.11 H	10	95.7	3.3
3	10600.00	49.8 PK	74.0	-24.2	1.09 H	74	35.5	14.3
4	10600.00	39.0 AV	54.0	-15.0	1.09 H	74	24.7	14.3
5	15900.00	50.4 PK	74.0	-23.6	1.04 H	33	35.3	15.1
6	15900.00	39.2 AV	54.0	-14.8	1.04 H	33	24.1	15.1
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	*5300.00	110.8 PK			2.73 V	351	107.5	3.3
2	*5300.00	101.3 AV			2.73 V	351	98.0	3.3
3	10600.00	50.5 PK	74.0	-23.5	3.08 V	360	36.2	14.3
4	10600.00	40.0 AV	54.0	-14.0	3.08 V	360	25.7	14.3
5	15900.00	50.2 PK	74.0	-23.8	2.82 V	120	35.1	15.1
6	15900.00	39.3 AV	54.0	-14.7	2.82 V	120	24.2	15.1

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 64	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	*5320.00	109.3 PK			1.03 H	21	105.8	3.5
2	*5320.00	98.8 AV			1.03 H	21	95.3	3.5
3	5350.00	51.3 PK	74.0	-22.7	1.03 H	21	47.8	3.5
4	5350.00	40.6 AV	54.0	-13.4	1.03 H	21	37.1	3.5
5	10640.00	50.3 PK	74.0	-23.7	1.04 H	54	36.0	14.3
6	10640.00	39.6 AV	54.0	-14.4	1.04 H	54	25.3	14.3
7	15960.00	49.8 PK	74.0	-24.2	1.00 H	9	34.7	15.1
8	15960.00	38.7 AV	54.0	-15.3	1.00 H	9	23.6	15.1
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	*5320.00	110.7 PK			2.74 V	356	107.2	3.5
2	*5320.00	101.3 AV			2.74 V	356	97.8	3.5
3	5350.00	55.2 PK	74.0	-18.8	2.74 V	356	51.7	3.5
4	5350.00	43.8 AV	54.0	-10.2	2.74 V	356	40.3	3.5
5	10640.00	50.0 PK	74.0	-24.0	3.10 V	348	35.7	14.3
6	10640.00	39.7 AV	54.0	-14.3	3.10 V	348	25.4	14.3
7	15960.00	49.9 PK	74.0	-24.1	2.79 V	138	34.8	15.1
8	15960.00	39.0 AV	54.0	-15.0	2.79 V	138	23.9	15.1

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 100	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	5426.00	51.3 PK	74.0	-22.7	1.01 H	39	47.6	3.7
2	5426.00	40.8 AV	54.0	-13.2	1.01 H	39	37.1	3.7
3	*5500.00	109.9 PK			1.01 H	39	106.1	3.8
4	*5500.00	99.5 AV			1.01 H	39	95.7	3.8
5	11000.00	50.9 PK	74.0	-23.1	1.06 H	81	35.7	15.2
6	11000.00	39.8 AV	54.0	-14.2	1.06 H	81	24.6	15.2
7	#16500.00	50.1 PK	74.0	-23.9	1.07 H	25	32.7	17.4
8	#16500.00	39.3 AV	54.0	-14.7	1.07 H	25	21.9	17.4
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	5426.00	54.8 PK	74.0	-19.2	2.73 V	355	51.1	3.7
2	5426.00	43.9 AV	54.0	-10.1	2.73 V	355	40.2	3.7
3	*5500.00	110.8 PK			2.73 V	355	107.0	3.8
4	*5500.00	101.3 AV			2.73 V	355	97.5	3.8
5	11000.00	49.8 PK	74.0	-24.2	3.12 V	357	34.6	15.2
6	11000.00	39.2 AV	54.0	-14.8	3.12 V	357	24.0	15.2
7	#16500.00	50.5 PK	74.0	-23.5	2.73 V	122	33.1	17.4
8	#16500.00	39.6 AV	54.0	-14.4	2.73 V	122	22.2	17.4

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 116	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	*5580.00	110.1 PK			1.03 H	32	106.2	3.9
2	*5580.00	99.5 AV			1.03 H	32	95.6	3.9
3	11160.00	50.0 PK	74.0	-24.0	1.05 H	65	34.8	15.2
4	11160.00	39.1 AV	54.0	-14.9	1.05 H	65	23.9	15.2
5	#16740.00	50.6 PK	74.0	-23.4	1.06 H	27	32.3	18.3
6	#16740.00	39.5 AV	54.0	-14.5	1.06 H	27	21.2	18.3
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	*5580.00	111.3 PK			2.73 V	351	107.4	3.9
2	*5580.00	101.9 AV			2.73 V	351	98.0	3.9
3	11160.00	50.3 PK	74.0	-23.7	3.16 V	346	35.1	15.2
4	11160.00	40.0 AV	54.0	-14.0	3.16 V	346	24.8	15.2
5	#16740.00	50.0 PK	74.0	-24.0	2.74 V	143	31.7	18.3
6	#16740.00	39.2 AV	54.0	-14.8	2.74 V	143	20.9	18.3

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 140	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	*5700.00	109.6 PK			1.05 H	21	105.4	4.2
2	*5700.00	98.8 AV			1.05 H	21	94.6	4.2
3	#5725.00	51.7 PK	74.0	-22.3	1.05 H	21	47.5	4.2
4	#5725.00	41.0 AV	54.0	-13.0	1.05 H	21	36.8	4.2
5	11400.00	50.8 PK	74.0	-23.2	1.03 H	81	35.3	15.5
6	11400.00	39.7 AV	54.0	-14.3	1.03 H	81	24.2	15.5
7	#17100.00	49.9 PK	74.0	-24.1	1.00 H	29	29.8	20.1
8	#17100.00	38.9 AV	54.0	-15.1	1.00 H	29	18.8	20.1
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	*5700.00	110.0 PK			2.72 V	360	105.8	4.2
2	*5700.00	100.7 AV			2.72 V	360	96.5	4.2
3	#5725.00	56.5 PK	74.0	-17.5	2.68 V	360	52.3	4.2
4	#5725.00	44.4 AV	54.0	-9.6	2.68 V	360	40.2	4.2
5	11400.00	50.2 PK	74.0	-23.8	3.13 V	347	34.7	15.5
6	11400.00	39.9 AV	54.0	-14.1	3.13 V	347	24.4	15.5
7	#17100.00	50.5 PK	74.0	-23.5	2.79 V	121	30.4	20.1
8	#17100.00	39.6 AV	54.0	-14.4	2.79 V	121	19.5	20.1

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 54	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	5117.00	51.4 PK	74.0	-22.6	1.10 H	30	48.5	2.9
2	5117.00	40.5 AV	54.0	-13.5	1.10 H	30	37.6	2.9
3	*5270.00	106.8 PK			1.10 H	30	103.5	3.3
4	*5270.00	96.2 AV			1.10 H	30	92.9	3.3
5	#10540.00	50.0 PK	74.0	-24.0	1.09 H	55	35.8	14.2
6	#10540.00	39.3 AV	54.0	-14.7	1.09 H	55	25.1	14.2
7	15810.00	50.0 PK	74.0	-24.0	1.00 H	8	35.0	15.0
8	15810.00	39.1 AV	54.0	-14.9	1.00 H	8	24.1	15.0
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	5117.00	57.8 PK	74.0	-16.2	2.41 V	360	54.9	2.9
2	5117.00	46.5 AV	54.0	-7.5	2.41 V	360	43.6	2.9
3	*5270.00	110.1 PK			2.41 V	360	106.8	3.3
4	*5270.00	99.7 AV			2.41 V	360	96.4	3.3
5	#10540.00	49.9 PK	74.0	-24.1	3.16 V	347	35.7	14.2
6	#10540.00	39.7 AV	54.0	-14.3	3.16 V	347	25.5	14.2
7	15810.00	50.0 PK	74.0	-24.0	2.73 V	139	35.0	15.0
8	15810.00	39.1 AV	54.0	-14.9	2.73 V	139	24.1	15.0

REMARKS:

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

CHANNEL	TX Channel 62	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	*5310.00	105.7 PK			1.05 H	13	102.3	3.4
2	*5310.00	94.1 AV			1.05 H	13	90.7	3.4
3	5350.00	63.1 PK	74.0	-10.9	1.05 H	13	59.6	3.5
4	5350.00	48.2 AV	54.0	-5.8	1.05 H	13	44.7	3.5
5	10620.00	50.0 PK	74.0	-24.0	1.09 H	62	35.7	14.3
6	10620.00	39.1 AV	54.0	-14.9	1.09 H	62	24.8	14.3
7	15930.00	50.0 PK	74.0	-24.0	1.05 H	16	34.9	15.1
8	15930.00	39.1 AV	54.0	-14.9	1.05 H	16	24.0	15.1
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	*5310.00	108.7 PK			2.68 V	170	105.3	3.4
2	*5310.00	97.6 AV			2.68 V	170	94.2	3.4
3	5350.00	70.2 PK	74.0	-3.8	2.68 V	170	66.7	3.5
4	**5350.00**	**53.0 AV**	**54.0**	**-1.0**	**2.68 V**	**170**	**49.5**	**3.5**
5	10620.00	49.6 PK	74.0	-24.4	3.12 V	360	35.3	14.3
6	10620.00	39.1 AV	54.0	-14.9	3.12 V	360	24.8	14.3
7	15930.00	50.1 PK	74.0	-23.9	2.83 V	123	35.0	15.1
8	15930.00	39.2 AV	54.0	-14.8	2.83 V	123	24.1	15.1

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 102	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	#5470.00	62.5 PK	74.0	-11.5	1.08 H	30	58.8	3.7
2	#5470.00	47.8 AV	54.0	-6.2	1.08 H	30	44.1	3.7
3	*5510.00	103.7 PK			1.08 H	30	99.9	3.8
4	*5510.00	92.5 AV			1.08 H	30	88.7	3.8
5	11020.00	50.6 PK	74.0	-23.4	1.08 H	54	35.5	15.1
6	11020.00	39.4 AV	54.0	-14.6	1.08 H	54	24.3	15.1
7	#16530.00	49.8 PK	74.0	-24.2	1.01 H	27	32.3	17.5
8	#16530.00	39.0 AV	54.0	-15.0	1.01 H	27	21.5	17.5
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	#5470.00	70.2 PK	74.0	-3.8	2.37 V	170	66.5	3.7
2	#5470.00	52.9 AV	54.0	-1.1	2.37 V	170	49.2	3.7
3	*5510.00	107.2 PK			2.37 V	170	103.4	3.8
4	*5510.00	95.7 AV			2.37 V	170	91.9	3.8
5	11020.00	50.1 PK	74.0	-23.9	3.14 V	353	35.0	15.1
6	11020.00	39.4 AV	54.0	-14.6	3.14 V	353	24.3	15.1
7	#16530.00	50.3 PK	74.0	-23.7	2.83 V	133	32.8	17.5
8	#16530.00	39.4 AV	54.0	-14.6	2.83 V	133	21.9	17.5

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 110	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	*5550.00	106.4 PK			1.06 H	6	102.5	3.9
2	*5550.00	95.2 AV			1.06 H	6	91.3	3.9
3	11100.00	50.5 PK	74.0	-23.5	1.10 H	59	35.4	15.1
4	11100.00	39.9 AV	54.0	-14.1	1.10 H	59	24.8	15.1
5	#16650.00	49.6 PK	74.0	-24.4	1.03 H	16	31.6	18.0
6	#16650.00	38.6 AV	54.0	-15.4	1.03 H	16	20.6	18.0
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	*5550.00	110.0 PK			2.93 V	357	106.1	3.9
2	*5550.00	98.4 AV			2.93 V	357	94.5	3.9
3	11100.00	50.1 PK	74.0	-23.9	3.13 V	359	35.0	15.1
4	11100.00	39.6 AV	54.0	-14.4	3.13 V	359	24.5	15.1
5	#16650.00	50.5 PK	74.0	-23.5	2.78 V	131	32.5	18.0
6	#16650.00	39.5 AV	54.0	-14.5	2.78 V	131	21.5	18.0

REMARKS:

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

CHANNEL	TX Channel 134	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	*5670.00	106.1 PK			1.08 H	35	102.1	4.0
2	*5670.00	95.1 AV			1.08 H	35	91.1	4.0
3	#5725.00	51.9 PK	74.0	-22.1	1.08 H	35	47.7	4.2
4	#5725.00	40.9 AV	54.0	-13.1	1.08 H	35	36.7	4.2
5	11340.00	50.8 PK	74.0	-23.2	1.00 H	59	35.5	15.3
6	11340.00	39.9 AV	54.0	-14.1	1.00 H	59	24.6	15.3
7	#17010.00	50.3 PK	74.0	-23.7	1.00 H	27	30.4	19.9
8	#17010.00	39.4 AV	54.0	-14.6	1.00 H	27	19.5	19.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	110.4 PK			2.90 V	356	106.4	4.0
2	*5670.00	98.6 AV			2.90 V	356	94.6	4.0
3	#5725.00	64.0 PK	74.0	-10.0	2.90 V	356	59.8	4.2
4	#5725.00	45.6 AV	54.0	-8.4	2.90 V	356	41.4	4.2
5	11340.00	50.0 PK	74.0	-24.0	3.17 V	340	34.7	15.3
6	11340.00	39.6 AV	54.0	-14.4	3.17 V	340	24.3	15.3
7	#17010.00	50.5 PK	74.0	-23.5	2.73 V	133	30.6	19.9
8	#17010.00	39.7 AV	54.0	-14.3	2.73 V	133	19.8	19.9

REMARKS:

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

802.11ac (VHT80)

CHANNEL	TX Channel 58	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	50.9 PK	74.0	-23.1	1.11 H	7	47.9	3.0
2	5150.00	40.2 AV	54.0	-13.8	1.11 H	7	37.2	3.0
3	*5290.00	102.1 PK			1.11 H	7	98.8	3.3
4	*5290.00	90.1 AV			1.11 H	7	86.8	3.3
5	5350.00	63.5 PK	74.0	-10.5	1.11 H	7	60.0	3.5
6	5350.00	48.3 AV	54.0	-5.7	1.11 H	7	44.8	3.5
7	#10580.00	50.4 PK	74.0	-23.6	1.00 H	84	36.1	14.3
8	#10580.00	39.6 AV	54.0	-14.4	1.00 H	84	25.3	14.3
9	15870.00	50.4 PK	74.0	-23.6	1.04 H	25	35.4	15.0
10	15870.00	39.5 AV	54.0	-14.5	1.04 H	25	24.5	15.0
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	56.6 PK	74.0	-17.4	2.44 V	172	53.6	3.0
2	5150.00	44.8 AV	54.0	-9.2	2.44 V	172	41.8	3.0
3	*5290.00	105.6 PK			2.44 V	172	102.3	3.3
4	*5290.00	93.6 AV			2.44 V	172	90.3	3.3
5	5350.00	70.2 PK	74.0	-3.8	2.44 V	172	66.7	3.5
6	**5350.00**	**53.0 AV**	**54.0**	**-1.0**	**2.44 V**	**172**	**49.5**	**3.5**
7	#10580.00	49.6 PK	74.0	-24.4	3.15 V	356	35.3	14.3
8	#10580.00	39.5 AV	54.0	-14.5	3.15 V	356	25.2	14.3
9	15870.00	50.0 PK	74.0	-24.0	2.82 V	120	35.0	15.0
10	15870.00	39.2 AV	54.0	-14.8	2.82 V	120	24.2	15.0

REMARKS:

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

CHANNEL	TX Channel 106	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	#5470.00	63.6 PK	74.0	-10.4	1.04 H	29	59.9	3.7
2	#5470.00	48.5 AV	54.0	-5.5	1.04 H	29	44.8	3.7
3	*5530.00	102.1 PK			1.04 H	29	98.2	3.9
4	*5530.00	88.9 AV			1.04 H	29	85.0	3.9
5	11060.00	50.2 PK	74.0	-23.8	1.02 H	54	35.1	15.1
6	11060.00	39.4 AV	54.0	-14.6	1.02 H	54	24.3	15.1
7	#16590.00	50.4 PK	74.0	-23.6	1.03 H	23	32.7	17.7
8	#16590.00	39.4 AV	54.0	-14.6	1.03 H	23	21.7	17.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	67.3 PK	74.0	-6.7	2.47 V	169	63.6	3.7
2	#5470.00	52.8 AV	54.0	-1.2	2.47 V	169	49.1	3.7
3	*5530.00	105.5 PK			2.47 V	169	101.6	3.9
4	*5530.00	92.2 AV			2.47 V	169	88.3	3.9
5	11060.00	50.1 PK	74.0	-23.9	3.07 V	360	35.0	15.1
6	11060.00	39.6 AV	54.0	-14.4	3.07 V	360	24.5	15.1
7	#16590.00	50.2 PK	74.0	-23.8	2.82 V	128	32.5	17.7
8	#16590.00	39.0 AV	54.0	-15.0	2.82 V	128	21.3	17.7

REMARKS:

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

CHANNEL	TX Channel 122	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	#5468.00	62.1 PK	74.0	-11.9	1.03 H	17	58.4	3.7
2	#5468.00	47.3 AV	54.0	-6.7	1.03 H	17	43.6	3.7
3	*5610.00	97.3 PK			1.03 H	17	93.4	3.9
4	*5610.00	94.6 AV			1.03 H	17	90.7	3.9
5	#5725.00	62.8 PK	74.0	-11.2	1.03 H	17	58.6	4.2
6	#5725.00	47.8 AV	54.0	-6.2	1.03 H	17	43.6	4.2
7	11220.00	50.5 PK	74.0	-23.5	1.10 H	81	35.3	15.2
8	11220.00	39.4 AV	54.0	-14.6	1.10 H	81	24.2	15.2
9	#16830.00	49.8 PK	74.0	-24.2	1.01 H	14	31.3	18.5
10	#16830.00	38.7 AV	54.0	-15.3	1.01 H	14	20.2	18.5
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	#5468.00	64.9 PK	74.0	-9.1	2.30 V	174	61.2	3.7
2	#5468.00	51.3 AV	54.0	-2.7	2.30 V	174	47.6	3.7
3	*5610.00	100.9 PK			2.30 V	174	97.0	3.9
4	*5610.00	98.1 AV			2.30 V	174	94.2	3.9
5	#5725.00	69.2 PK	74.0	-4.8	2.30 V	174	65.0	4.2
6	#5725.00	51.9 AV	54.0	-2.1	2.30 V	174	47.7	4.2
7	11220.00	50.1 PK	74.0	-23.9	3.15 V	356	34.9	15.2
8	11220.00	39.6 AV	54.0	-14.4	3.15 V	356	24.4	15.2
9	#16830.00	50.4 PK	74.0	-23.6	2.74 V	123	31.9	18.5
10	#16830.00	39.7 AV	54.0	-14.3	2.74 V	123	21.2	18.5

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 Data:

802.11ac (VHT40)

CHANNEL	TX Channel 134	**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	43.67	26.7 QP	40.0	-13.3	1.24 H	100	35.1	-8.4
2	150.45	25.2 QP	43.5	-18.3	1.74 H	300	33.6	-8.4
3	367.81	24.8 QP	46.0	-21.2	1.42 H	344	30.5	-5.7
4	631.24	31.7 QP	46.0	-14.3	1.64 H	300	31.1	0.6
5	827.34	35.5 QP	46.0	-10.5	1.85 H	244	32.1	3.4
6	996.70	36.8 QP	54.0	-17.2	1.74 H	145	31.6	5.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	41.71	33.6 QP	40.0	-6.4	1.24 V	241	42.2	-8.6
2	79.61	35.5 QP	40.0	-4.5	1.42 V	244	47.6	-12.1
3	117.41	30.3 QP	43.5	-13.2	1.42 V	300	41.1	-10.8
4	221.35	23.4 QP	46.0	-22.6	1.42 V	301	34.5	-11.1
5	274.34	22.4 QP	46.0	-23.6	1.42 V	301	30.6	-8.2
6	800.21	30.6 QP	46.0	-15.4	1.84 V	301	27.6	3.0

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	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. 08, 2016	Mar. 07, 2017
50 ohms Terminator	N/A	EMC-03	Sep. 23, 2015	Sep. 22, 2016
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2015	Sep. 30, 2016
50 ohms Terminator	E1-011315	13	Dec. 11 2015	Dec. 10 2016
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: Mar. 22, 2016

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.

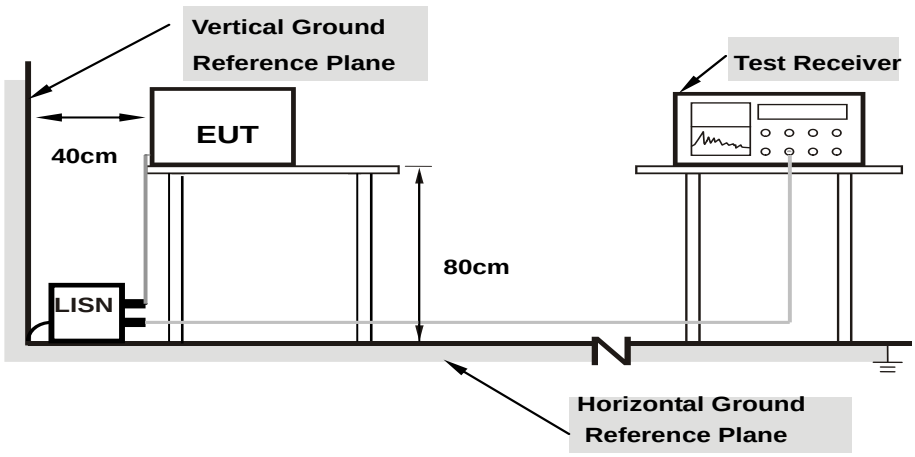
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

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.

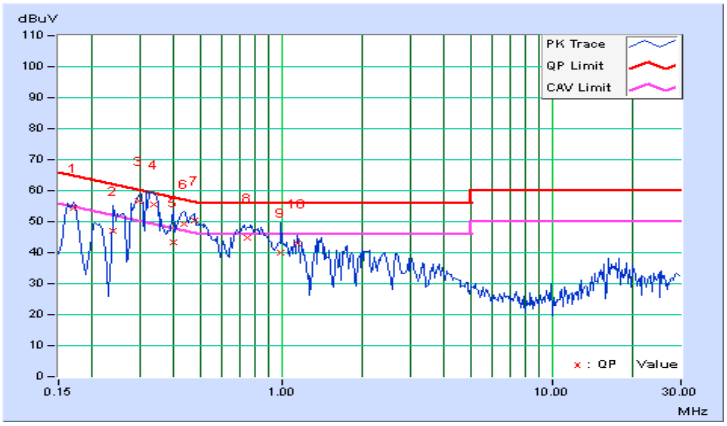
4.2.7 Test Results (Mode 1)

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

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	0.16953	10.31	44.03	39.62	54.34	49.93	64.98	54.98	-10.65	-5.06
2	0.23984	10.28	36.90	23.88	47.18	34.16	62.10	52.10	-14.92	-17.94
3	**0.29844**	**10.29**	**46.51**	**36.71**	**56.80**	**47.00**	**60.29**	**50.29**	**-3.49**	**-3.29**
4	0.33750	10.29	45.33	35.27	55.62	45.56	59.26	49.26	-3.64	-3.70
5	0.39609	10.30	33.18	15.22	43.48	25.52	57.93	47.93	-14.46	-22.42
6	0.43516	10.30	39.08	26.40	49.38	36.70	57.15	47.15	-7.78	-10.46
7	0.47422	10.29	39.95	30.23	50.24	40.52	56.44	46.44	-6.20	-5.92
8	0.75156	10.26	34.64	24.86	44.90	35.12	56.00	46.00	-11.10	-10.88
9	0.99766	10.23	29.73	19.65	39.96	29.88	56.00	46.00	-16.04	-16.12
10	1.14453	10.23	32.66	24.99	42.89	35.22	56.00	46.00	-13.11	-10.78

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.

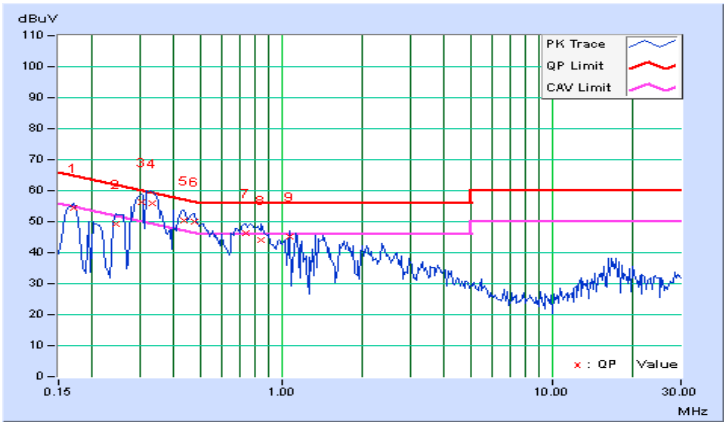


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.16953	10.29	44.23	40.04	54.52	50.33	64.98	54.98	-10.47	-4.66
2	0.24375	10.26	38.94	28.86	49.20	39.12	61.97	51.97	-12.76	-12.84
3	**0.30234**	**10.27**	**45.98**	**36.62**	**56.25**	**46.89**	**60.18**	**50.18**	**-3.93**	**-3.29**
4	0.33359	10.27	45.59	35.28	55.86	45.55	59.36	49.36	-3.50	-3.81
5	0.43516	10.28	39.93	27.59	50.21	37.87	57.15	47.15	-6.95	-9.29
6	0.47813	10.27	39.85	28.25	50.12	38.52	56.37	46.37	-6.25	-7.85
7	0.73594	10.25	36.14	26.25	46.39	36.50	56.00	46.00	-9.61	-9.50
8	0.84531	10.24	33.68	25.47	43.92	35.71	56.00	46.00	-12.08	-10.29
9	1.07813	10.22	35.10	26.87	45.32	37.09	56.00	46.00	-10.68	-8.91
1	0.16953	10.29	44.23	40.04	54.52	50.33	64.98	54.98	-10.47	-4.66

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.



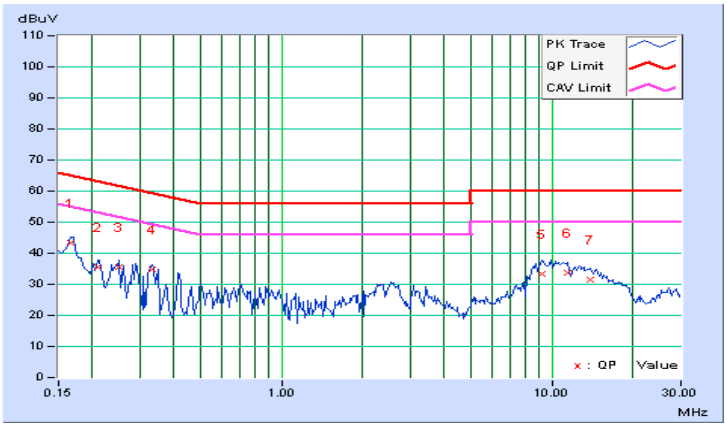
4.2.8 Test Results (Mode 2)

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	0.16587	10.31	33.20	24.14	43.51	34.45	65.16	55.16	-21.65	-20.71
2	0.20859	10.28	25.24	16.04	35.52	26.32	63.26	53.26	-27.74	-26.94
3	0.25156	10.29	25.32	18.98	35.61	29.27	61.71	51.71	-26.10	-22.44
4	0.33359	10.29	24.36	23.07	34.65	33.36	59.36	49.36	-24.71	-16.00
5	9.18359	10.53	22.64	12.71	33.17	23.24	60.00	50.00	-26.83	-26.76
6	11.44141	10.61	23.05	13.32	33.66	23.93	60.00	50.00	-26.34	-26.07
7	13.87109	10.73	20.64	11.98	31.37	22.71	60.00	50.00	-28.63	-27.29

REMARKS:

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

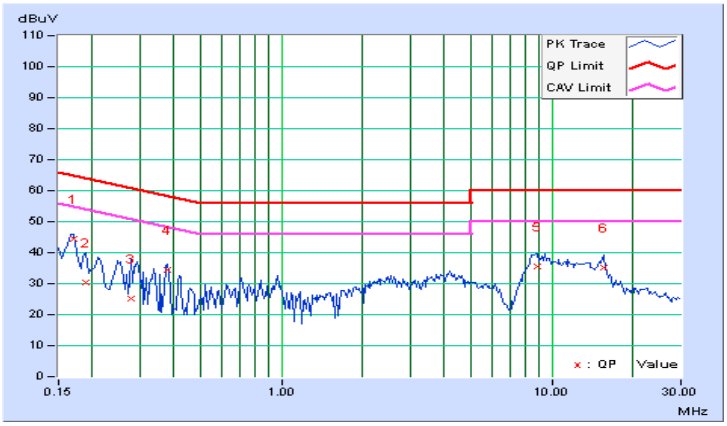


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	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	0.16953	10.29	34.29	24.08	44.58	34.37	64.98	54.98	-20.41	-20.62
2	0.18906	10.27	20.06	2.03	30.33	12.30	64.08	54.08	-33.75	-41.78
3	0.27891	10.27	14.99	1.86	25.26	12.13	60.85	50.85	-35.59	-38.72
4	0.37656	10.28	24.29	24.08	34.57	34.36	58.35	48.35	-23.79	-14.00
5	8.86719	10.53	24.89	16.27	35.42	26.80	60.00	50.00	-24.58	-23.20
6	15.50000	10.83	24.53	16.98	35.36	27.81	60.00	50.00	-24.64	-22.19

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.



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

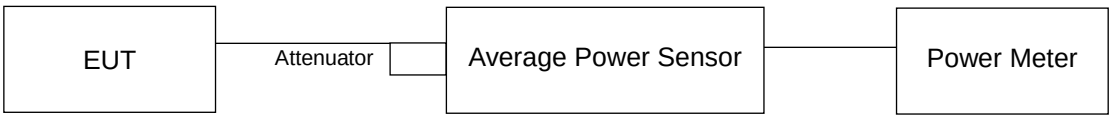
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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 $N_{ANT} \geq 5$.

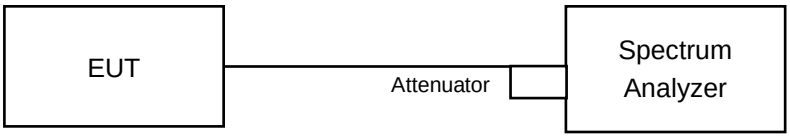
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT



FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

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.

FOR 26dB OCCUPIED BANDWIDTH

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%.

4.3.5 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

802.11a

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
52	5260	13.88	13.44	13.61	13.76	93.243	19.70	24.00	Pass
60	5300	13.91	13.43	13.66	13.73	93.465	19.71	24.00	Pass
64	5320	13.96	13.41	13.64	13.77	93.761	19.72	24.00	Pass
100	5500	13.89	13.86	13.81	13.30	94.237	19.74	24.00	Pass
116	5580	13.96	13.69	13.84	13.41	94.415	19.75	24.00	Pass
140	5700	13.94	13.62	13.67	13.46	93.251	19.70	24.00	Pass

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	21.94	21.68	21.57	21.47
60	5300	21.90	21.68	21.62	21.50
64	5320	21.91	21.75	21.49	21.48
100	5500	21.74	21.72	21.56	21.50
116	5580	21.86	21.78	21.50	21.55
140	5700	21.76	21.64	21.59	21.55

Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.47	24.31 > 24
60	5300	21.50	24.32 > 24
64	5320	21.48	24.32 > 24
100	5500	21.50	24.32 > 24
116	5580	21.50	24.32 > 24
140	5700	21.55	24.33 > 24

802.11ac (VHT20)

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
52	5260	13.84	13.54	13.56	13.94	94.277	19.74	24.00	Pass
60	5300	13.92	13.51	13.61	13.73	93.665	19.72	24.00	Pass
64	5320	13.96	13.53	13.59	13.82	94.386	19.75	24.00	Pass
100	5500	13.96	13.81	13.91	13.37	95.264	19.79	24.00	Pass
116	5580	13.92	13.72	13.87	13.39	94.415	19.75	24.00	Pass
140	5700	13.93	13.66	13.71	13.46	93.622	19.71	24.00	Pass

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	21.83	21.80	21.64	21.69
60	5300	22.09	21.61	21.71	21.71
64	5320	21.91	21.78	21.77	21.57
100	5500	22.13	21.75	21.76	21.74
116	5580	22.03	21.62	22.00	21.95
140	5700	21.94	21.75	21.77	21.76

Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.64	24.35 > 24
60	5300	21.71	24.34 > 24
64	5320	21.57	24.33 > 24
100	5500	21.74	24.37 > 24
116	5580	21.62	24.34 > 24
140	5700	21.75	24.37 > 24

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
54	5270	16.72	16.65	16.39	16.65	183.016	22.62	24.00	Pass
62	5310	14.26	14.09	14.06	14.07	103.309	20.14	24.00	Pass
102	5510	13.78	13.21	13.25	13.12	86.466	19.37	24.00	Pass
110	5550	16.93	16.83	16.81	16.31	188.241	22.75	24.00	Pass
134	5670	16.82	16.73	16.89	16.62	189.967	22.79	24.00	Pass

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
54	5270	55.48	60.63	52.12	41.35
62	5310	41.59	41.61	41.60	40.84
102	5510	41.50	41.44	41.41	41.23
110	5550	52.42	64.90	55.79	50.20
134	5670	55.24	47.64	62.80	52.40

Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.35	27.16 > 24
62	5310	40.84	27.11 > 24
102	5510	41.23	27.15 > 24
110	5550	50.20	28.00 > 24
134	5670	47.64	27.77 > 24

802.11ac (VHT80)

OUTPUT POWER:

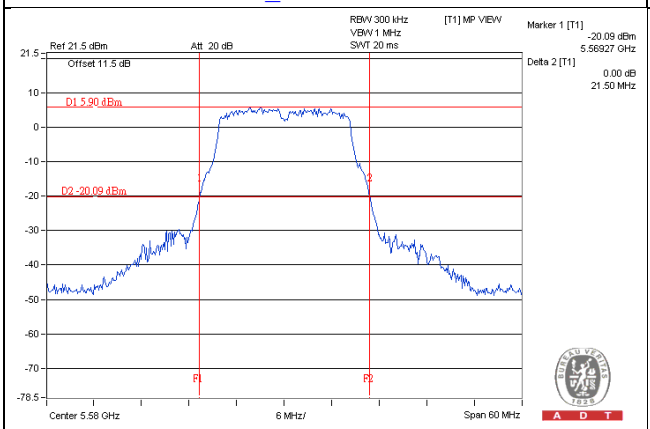
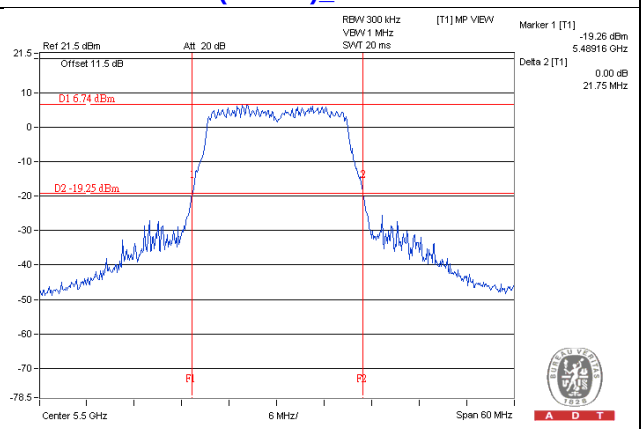
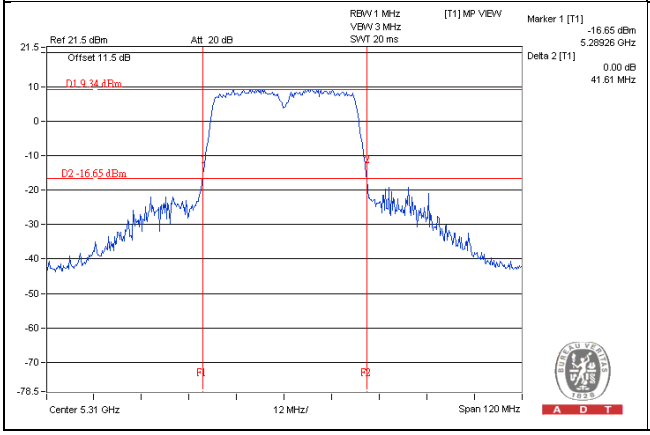
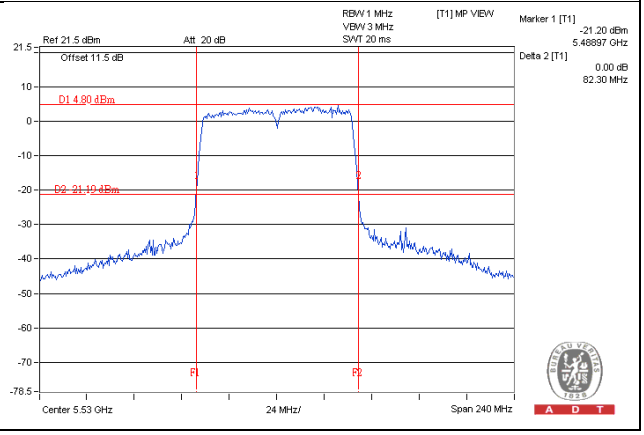
Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	12.26	11.88	12.03	11.97	63.943	18.06	24.00	Pass
106	5530	11.96	11.65	11.79	10.97	57.93	17.63	24.00	Pass
122	5610	18.28	17.82	18.21	17.43	249.389	23.97	24.00	Pass

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	82.63	82.37	81.97	82.27
106	5530	82.71	82.30	82.44	82.20
122	5610	123.49	113.56	108.64	86.48

Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	81.97	30.13 > 24
106	5530	82.20	30.14 > 24
122	5610	86.48	30.36 > 24

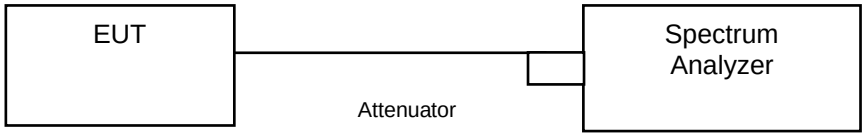
Spectrum Plot of Worst Value	
802.11a_Chain 2 / CH116	**802.11ac (VHT20)_Chain 1 / CH100**
	
8802.11ac (VHT40) _Chain 1 / CH62	**802.11ac (VHT80) _Chain 1 / CH106**
	

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

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

Using method SA-1

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

Using method SA-2

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 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

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm)				Total Power Density (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
52	5260	-0.13	0.01	-0.11	0.25	6.03	6.82	Pass
60	5300	0.23	0.29	0.29	0.65	6.39	6.82	Pass
64	5320	0.40	0.52	0.41	0.54	6.49	6.82	Pass
100	5500	0.31	0.16	0.27	0.08	6.23	6.82	Pass
116	5580	0.22	0.17	0.46	0.14	6.27	6.82	Pass
140	5700	-0.24	-0.36	-0.33	0.00	5.79	6.82	Pass

Note: 1. Method a) 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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 10.18dBi > 6dBi , so the power density limit shall be reduced to 11-(10.18-6) = 6.82dBm.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm)				Total Power Density (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
52	5260	-0.17	0.19	-0.37	-0.01	5.94	6.82	Pass
60	5300	0.04	-0.05	-0.06	0.07	6.02	6.82	Pass
64	5320	0.05	-0.07	0.06	0.27	6.10	6.82	Pass
100	5500	0.11	-0.11	-0.26	-0.20	5.91	6.82	Pass
116	5580	-0.08	-0.09	-0.19	0.21	5.99	6.82	Pass
140	5700	-0.28	-0.01	-0.91	-0.45	5.62	6.82	Pass

Note: 1. Method a) 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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 10.18dBi > 6dBi , so the power density limit shall be reduced to 11-(10.18-6) = 6.82dBm.

802.11ac (VHT40)

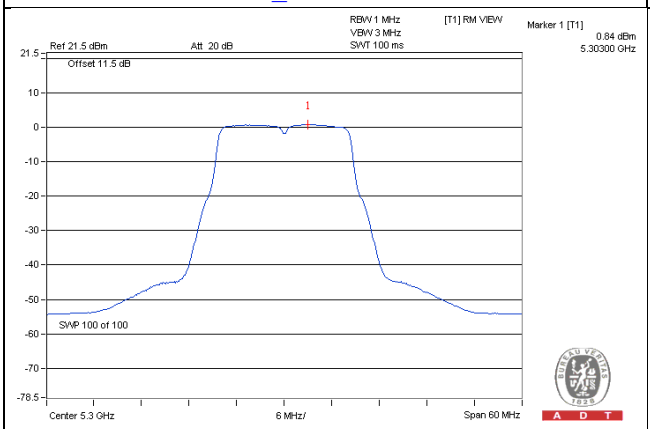
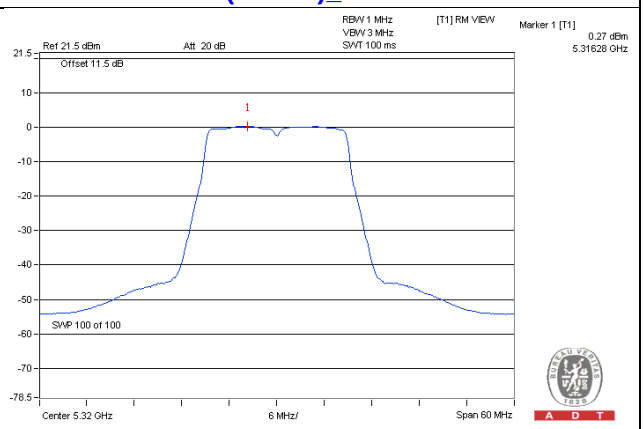
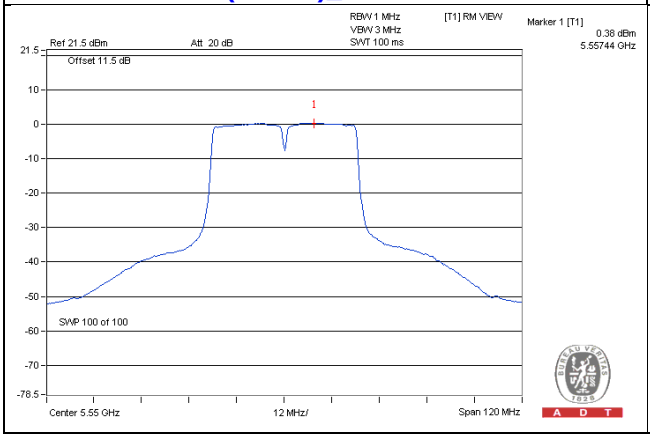
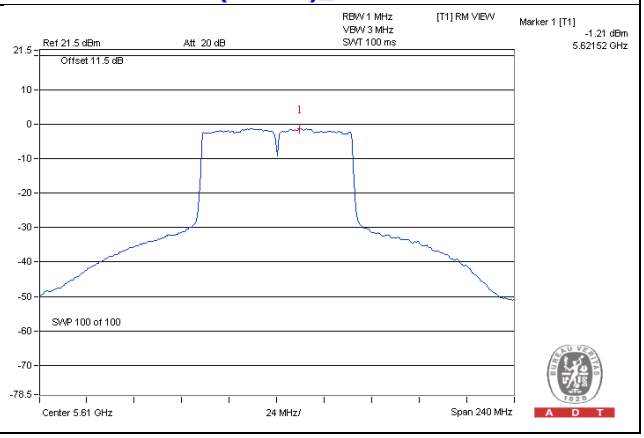
Chan.	Chan. Freq. (MHz)	PSD (dBm)				Total Power Density (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
54	5270	-0.39	0.16	-0.30	-0.06	5.88	6.82	Pass
62	5310	-2.55	-2.43	-2.65	0.11	4.31	6.82	Pass
102	5510	-2.98	-2.77	-2.99	-2.96	3.10	6.82	Pass
110	5550	-0.06	0.21	0.22	0.34	6.20	6.82	Pass
134	5670	-0.12	-0.95	-0.73	-0.16	5.55	6.82	Pass

Note: 1. Method a) 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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 10.18dBi > 6dBi , so the power density limit shall be reduced to 11-(10.18-6) = 6.82dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)				Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	-7.48	-7.45	-7.72	-7.51	0.19	-1.33	6.82	Pass
106	5530	-7.52	-6.95	-7.52	-7.68	0.19	-1.20	6.82	Pass
122	5610	-1.47	-1.35	-1.84	-2.16	0.19	4.51	6.82	Pass

Note: 1. Method a) 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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 10.18dBi > 6dBi , so the power density limit shall be reduced to 11-(10.18-6) = 6.82dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

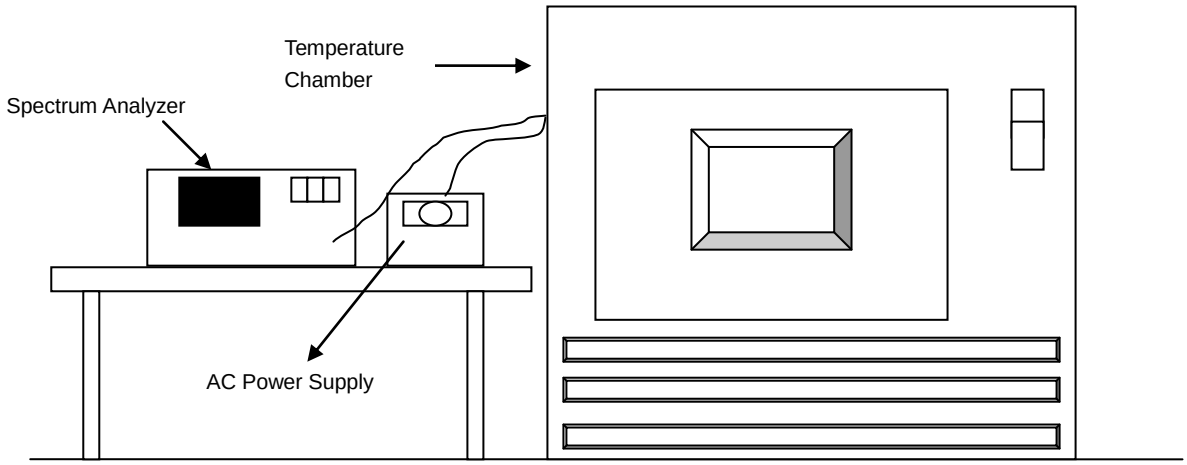
Spectrum Plot of Worst Value	
802.11a_Chain 3 / CH60	**802.11ac (VHT20)_Chain 3 / CH64**
	
802.11ac (VHT40)_Chain 3 / CH110	**802.11ac (VHT80)_Chain 1 / CH122**
	

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

Frequency Stability Versus Temp.									
Operating Frequency: 5260 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5259.9982	Pass	5259.9995	Pass	5259.9956	Pass	5259.9998	Pass
40	120	5260.0106	Pass	5260.0073	Pass	5260.0104	Pass	5260.0104	Pass
30	120	5260.0104	Pass	5260.0119	Pass	5260.0124	Pass	5260.0123	Pass
20	120	5259.9872	Pass	5259.9849	Pass	5259.9885	Pass	5259.9843	Pass
10	120	5259.9917	Pass	5259.9912	Pass	5259.9904	Pass	5259.9873	Pass
0	120	5259.9747	Pass	5259.9764	Pass	5259.9771	Pass	5259.9779	Pass
-10	120	5260.0109	Pass	5260.0139	Pass	5260.0121	Pass	5260.0125	Pass
-20	120	5260.0065	Pass	5260.0094	Pass	5260.0063	Pass	5260.0064	Pass
-30	120	5259.9798	Pass	5259.9799	Pass	5259.9773	Pass	5259.98	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5260 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5259.9866	Pass	5259.9843	Pass	5259.9881	Pass	5259.984	Pass
	120	5259.9872	Pass	5259.9849	Pass	5259.9885	Pass	5259.9843	Pass
	102	5259.9876	Pass	5259.9852	Pass	5259.9891	Pass	5259.9837	Pass

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

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