FCC TEST REPORT (15.407)

REPORT NO.: RF141117E18H-1

MODEL NO.: EX3800

FCC ID: PY315300318

RECEIVED: Nov. 17, 2014

TESTED: Dec. 17, 2014 and Oct. 30 to Nov. 04, 2015

ISSUED: Nov. 11, 2015

APPLICANT: NETGEAR, Inc.

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

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF141117E18H-1	Original release	Nov. 11, 2015

1. CERTIFICATION

PRODUCT:	AC750 Universal Pass Though WiFi Range Extender
BRAND NAME:	NETGEAR
MODEL NO.:	EX3800
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	NETGEAR, Inc.
TESTED:	Dec. 17, 2014 and Oct. 30 to Nov. 04, 2015
STANDARDS:	**FCC Part 15, Subpart E (Section 15.407)** ANSI C63.10-2013

The above equipment (Model: EX3800) 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:** Nov. 11, 2015
(Lori Chung, Specialist)

Approved by : _____ , **Date:** Nov. 11, 2015
(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407 Under New Rule)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.407(b)(6)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -11.83dB at 10.79297MHz
15.407 (b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5150.00MHz
15.407(a/1/2/3)	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.

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

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions	2.86 dB
Radiated emissions (30MHz-1GHz)	5.43 dB
Radiated emissions (1GHz -6GHz)	3.65 dB
Radiated emissions (6GHz -18GHz)	3.88 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	AC750 Universal Pass Though WiFi Range Extender
MODEL NO.	EX3800
POWER SUPPLY	100-250Vac, 0.14A, 50-60Hz
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
MODULATION TECHNOLOGY	DSSS,OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
OPERATING FREQUENCY	**For 15.407** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
	For 15.247 2.412 ~ 2.462GHz
NUMBER OF CHANNEL	**For 15.407** 9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
	For 15.247 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
MAXIMUM OUTPUT POWER	**For 15.407** 802.11a: 306.426mW 802.11ac (VHT20): 281.355mW 802.11ac (VHT40): 152.769mW 802.11ac (VHT80): 45.764mW **For 15.247** 802.11b: 326.715mW 802.11g: 616.958mW 802.11n (HT20): 583.627mW 802.11n (HT40): 419.89mW

ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA

NOTE:

1. 2.4GHz and 5GHz technology can transmit at same time.
2. The antennas provided to the EUT, please refer to the following table:

Ant. No.	Brand	Model	Antenna Gain(dBi) <including cable loss>	Frequency range (GHz ~ GHz)	Antenna Type	Connecter Type	Cable Length (mm)
Antenna R	NETGEAR	NA	3.1	2.4~2.4835	Dipole	i-pex (MHF)	35
			3	5.15~5.25			
			3.2	5.25~5.35			
			3.2	5.47~5.725			
			3.3	5.725~5.85			
Antenna L	NETGEAR	NA	3.2	2.4~2.4835	Dipole	i-pex (MHF)	75
			4	5.15~5.25			
			4	5.25~5.35			
			3.9	5.47~5.725			
			3.1	5.725~5.85			

3. The EUT incorporates a MIMO function.

For 2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
For 5GHz Band			
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS0~8 Nss= 1	2TX	2RX
	MCS0~8 Nss= 2	2TX	2RX
802.11ac (VHT40) & 802.11ac (VHT80)	MCS0~9 Nss= 1	2TX	2RX
	MCS0~9 Nss= 2	2TX	2RX

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

4. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 5150 ~ 5250MHz band:

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 (HT40), 802.11ac (VHT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
42	5210 MHz

Operated in 5725 ~ 5850MHz band:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

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

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
155	5775 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE < 1G	RE ≥ 1G	APCM	
-	√	√	√	√	-

Where **PLC:** Power Line Conducted Emission **RE < 1G:** Radiated Emission below 1GHz

RE ≥ 1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane** .

POWER LINE CONDUCTED EMISSION TEST:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	36 to 48 & 149 to 165	48	OFDM	BPSK	6

RADIATED EMISSION TEST (BELOW 1 GHz):

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	36 to 48 & 149 to 165	48	OFDM	BPSK	6

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	38 to 46 & 151 to 159	38, 46, 151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	42, 155	42, 155	OFDM	BPSK	29.3

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	38 to 46 & 151 to 159	38, 46, 151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	42, 155	42, 155	OFDM	BPSK	29.3

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	25deg. C, 67%RH	120Vac, 60Hz	Eagle Chen
RE<1G	25deg. C, 70%RH	120Vac, 60Hz	Robert Cheng
RE≥1G	24deg. C, 67%RH	120Vac, 60Hz	Weiwei Lo
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)

789033 D02 General UNII Test Procedures New Rules v01

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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

3.4 DUTY CYCLE OF TEST SIGNAL

If duty cycle of test signal is ≥ 98 %, duty factor is not required.

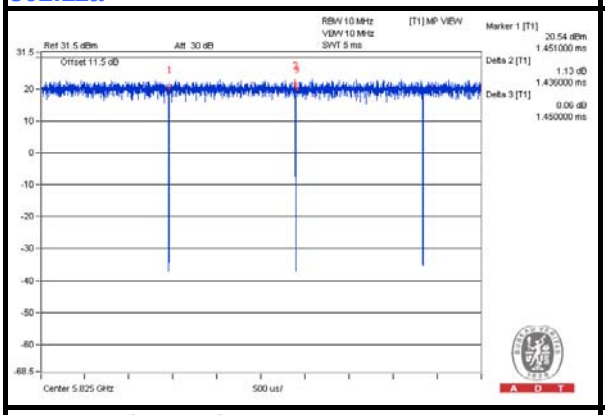
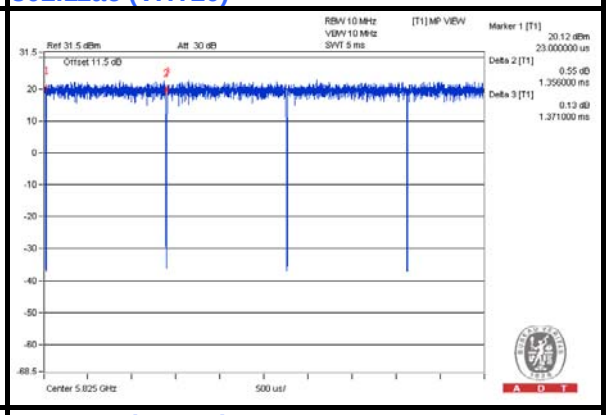
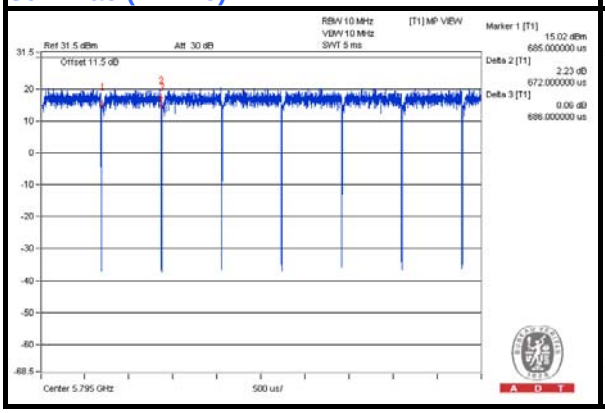
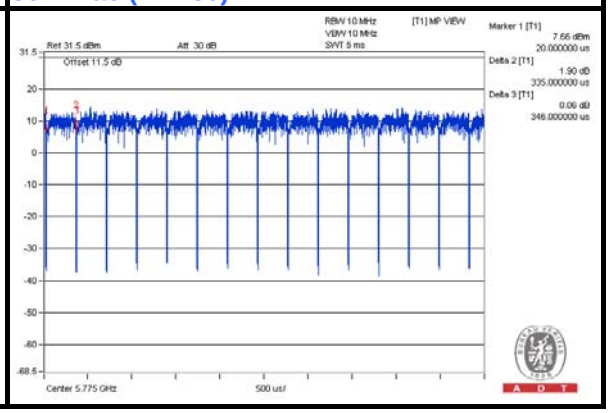
If duty cycle of test signal is < 98 %, duty factor shall be considered.

802.11a: Duty cycle = 1.436 ms/1.45 ms = 0.99

802.11ac (VHT20): Duty cycle = 1.356 ms/1.371 ms = 0.989

802.11ac (VHT40): Duty cycle = 0.672 ms/0.686 ms = 0.98

802.11ac (VHT80): Duty cycle = 0.335 ms/0.346 ms = 0.968, Duty factor = 10 * log(1/0.968) = 0.14

802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	**802.11ac (VHT80)**
	

3.5 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.

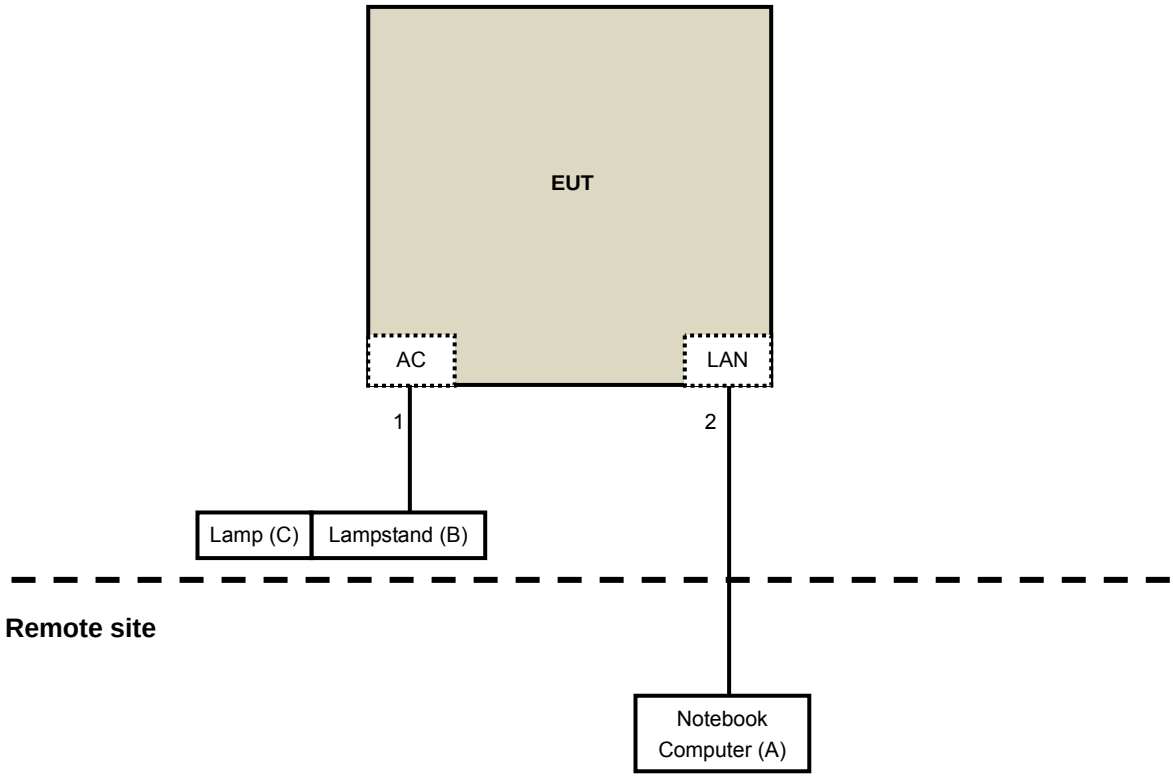
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	Notebook Computer	DELL	PP32LA	HSLB32S	FCC DoC	Provided by Lab
B	Lampstand	NA	NA	NA	NA	Provided by Lab
C	Lamp	NA	NA	NA	NA	Provided by Lab

NOTE:

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

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	AC	1	0.7	No	0	Provided by Lab
2	RJ45	1	10	No	0	Provided by Lab

3.6 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	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 0.50 MHz.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100287	Apr. 17, 2015	Apr. 16, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-523	Oct. 02, 2015	Oct. 01, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable	5D-FB	COACAB-001	May 25, 2015	May 24, 2016
50 ohms Terminator	50	3	Oct. 21, 2015	Oct. 20, 2016
50 ohms Terminator	N/A	EMC-01	Oct. 01, 2015	Sep. 30, 2016
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.
4. Tested Date: Oct. 30, 2015

4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN.

b. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

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

d. The frequency range from 150kHz to 30MHz was searched. Emission level under (Limit – 20dB) was not recorded.

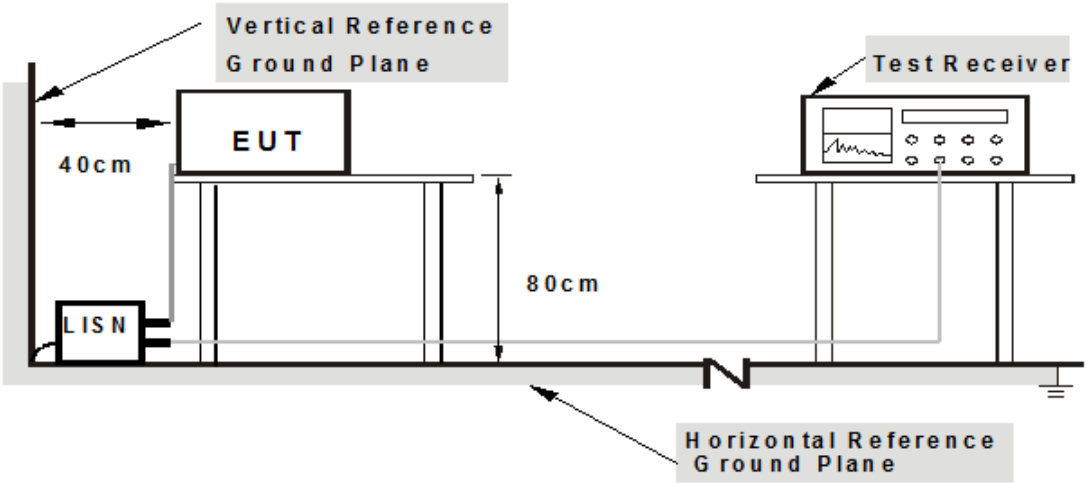
NOTE:

1. The resolution bandwidth of test receiver is 9kHz for Quasi-peak detection (QP) & Average detection (AV).

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

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

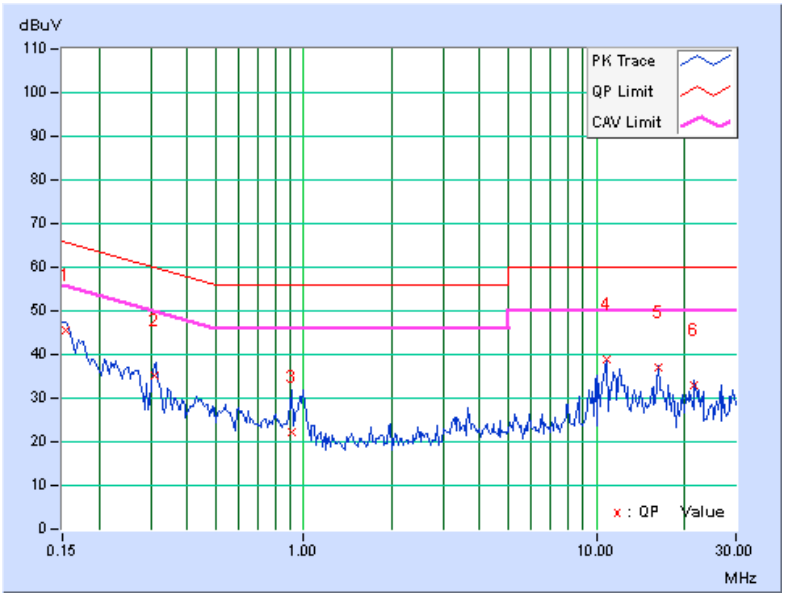
4.1.7 TEST RESULTS

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	0.15391	10.32	35.21	25.39	45.53	35.71	65.79	55.79	-20.26	-20.08
2	0.31031	10.37	24.86	21.10	35.23	31.47	59.96	49.96	-24.73	-18.49
3	0.90781	10.38	11.98	3.99	22.36	14.37	56.00	46.00	-33.64	-31.63
4	10.79422	11.00	27.92	27.08	38.92	38.08	60.00	50.00	-21.08	-11.92
5	16.23047	11.33	25.75	23.01	37.08	34.34	60.00	50.00	-22.92	-15.66
6	21.66406	11.53	21.50	21.23	33.03	32.76	60.00	50.00	-26.97	-17.24

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

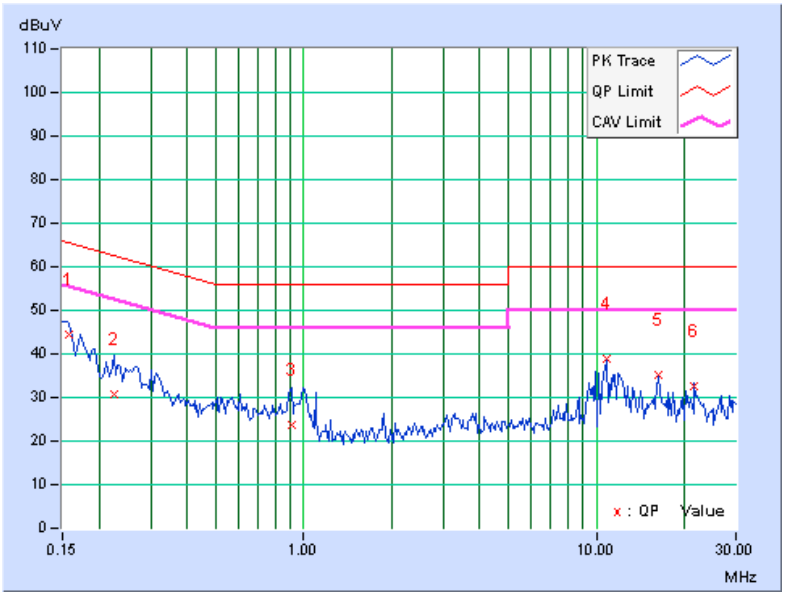


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.33	34.08	23.35	44.41	33.68	65.58	55.58	-21.17	-21.90
2	0.22422	10.38	20.51	9.49	30.89	19.87	62.66	52.66	-31.77	-32.79
3	0.90781	10.47	13.15	6.53	23.62	17.00	56.00	46.00	-32.38	-29.00
4	**10.79297**	**11.02**	**28.04**	**27.15**	**39.06**	**38.17**	**60.00**	**50.00**	**-20.94**	**-11.83**
5	16.23047	11.30	23.93	21.63	35.23	32.93	60.00	50.00	-24.77	-17.07
6	21.66406	11.44	21.29	20.35	32.73	31.79	60.00	50.00	-27.27	-18.21

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 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 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).
   For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedures 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).

4.2.3 TEST INSTRUMENTS

For Below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 12, 2014	Dec. 11, 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. 09, 2015	Feb. 08, 2016
RF Cable	8D-FB	CHHCAB-001-1 CHHCAB-001-2	Oct. 04, 2015	Oct. 03, 2016
	RF-141	CHHCAB-004	Oct. 04, 2015	Oct. 03, 2016
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. H.
3. The FCC Site Registration No. is 797305.
4. The CANADA Site Registration No. is IC 7450H-3.
5. Tested Date: Oct. 30, 2015

For Above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210105	July 24, 2015	July 23, 2016
Horn_Antenna AISI	AIH.8018	000032009111 0	Feb. 09, 2015	Feb. 08, 2016
Pre-Amplifier Agilent	8449B	3008A02578	June 23, 2015	June 22, 2016
RF Cable	NA	131205 131216 131217 SNMY23684/ 4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	June 26, 2015	June 25, 2016
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
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 test was performed in 966 Chamber No. G.
3. The FCC Site Registration No. is 966073.
4. The VCCI Site Registration No. is G-137.
5. The CANADA Site Registration No. is IC 7450H-2.
6. Tested Date: Oct. 30 to Nov. 04, 2015

4.2.4 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

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

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

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

Note:

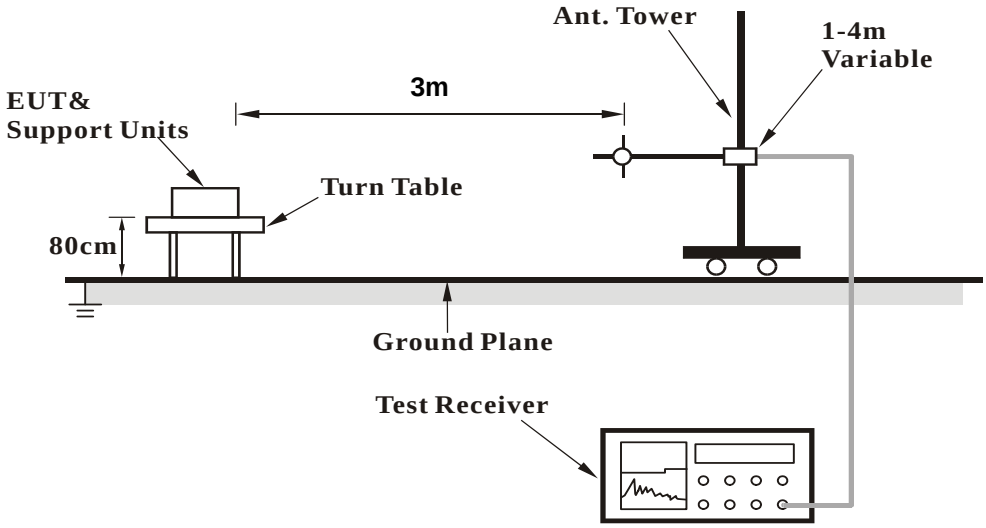
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.2.5 DEVIATION FROM TEST STANDARD

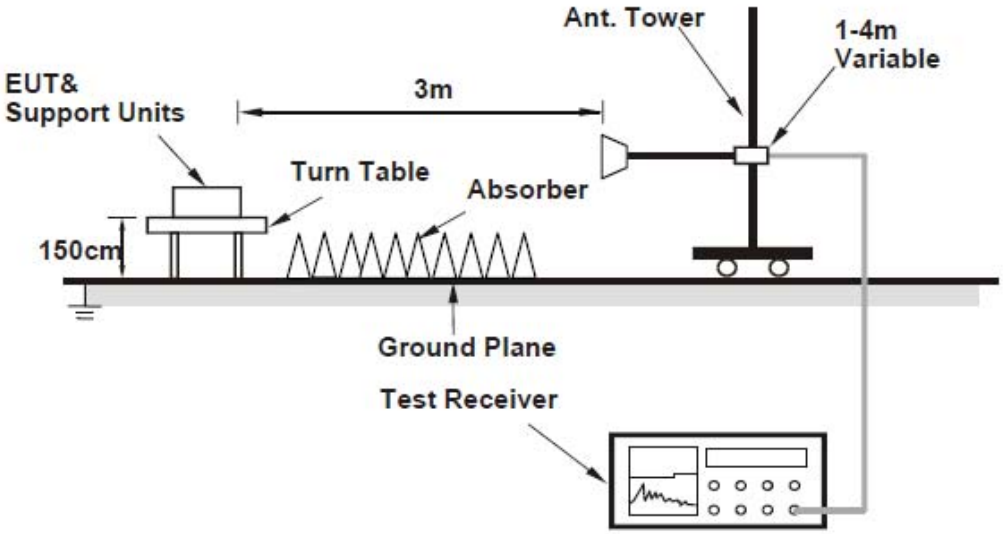
No deviation

4.2.6 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.7 EUT OPERATING CONDITION

Same as 4.1.6

4.2.8 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11a

CHANNEL	TX Channel 48	**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	106.73	25.0 QP	43.5	-18.5	1.00 H	335	36.31	-11.29
2	122.42	28.5 QP	43.5	-15.0	1.00 H	136	38.13	-9.64
3	132.34	28.5 QP	43.5	-15.0	1.00 H	265	37.44	-8.96
4	143.20	30.7 QP	43.5	-12.8	1.00 H	293	38.68	-7.94
5	250.00	25.9 QP	46.0	-20.1	1.00 H	223	34.59	-8.66
6	802.53	35.4 QP	46.0	-10.6	1.00 H	347	31.08	4.28
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	42.90	27.6 QP	40.0	-12.4	1.00 V	167	36.13	-8.50
2	55.24	29.4 QP	40.0	-10.6	1.00 V	197	37.80	-8.43
3	106.68	31.8 QP	43.5	-11.7	1.00 V	45	43.11	-11.30
4	125.57	34.2 QP	43.5	-9.3	1.00 V	2	43.73	-9.52
5	134.83	31.9 QP	43.5	-11.6	1.00 V	360	40.59	-8.66
6	198.00	26.6 QP	43.5	-16.9	1.00 V	220	37.43	-10.84

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

ABOVE 1GHz DATA

802.11a

CHANNEL	TX Channel 36	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	5061.00	61.7 PK	74.0	-12.3	1.23 H	10	57.68	4.02
2	5061.00	51.7 AV	54.0	-2.3	1.23 H	10	47.68	4.02
3	5150.00	69.3 PK	74.0	-4.7	1.23 H	10	65.02	4.28
4	5150.00	53.7 AV	54.0	-0.3	1.23 H	10	49.42	4.28
5	*5180.00	114.7 PK			1.25 H	44	110.31	4.39
6	*5180.00	105.7 AV			1.25 H	44	101.31	4.39
7	#10360.00	53.8 PK	74.0	-20.2	1.04 H	307	43.74	10.06
8	#10360.00	42.4 AV	54.0	-11.6	1.04 H	307	32.34	10.06
9	15540.00	62.6 PK	74.0	-11.4	1.23 H	31	47.76	14.84
10	15540.00	49.2 AV	54.0	-4.8	1.23 H	31	34.36	14.84
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	5061.00	60.3 PK	74.0	-13.7	1.23 V	82	56.28	4.02
2	5061.00	50.2 AV	54.0	-3.8	1.23 V	82	46.18	4.02
3	5150.00	68.4 PK	74.0	-5.6	1.23 V	82	64.12	4.28
4	5150.00	52.4 AV	54.0	-1.6	1.23 V	82	48.12	4.28
5	*5180.00	113.3 PK			1.23 V	82	108.91	4.39
6	*5180.00	104.3 AV			1.23 V	82	99.91	4.39
7	#10360.00	58.0 PK	74.0	-16.0	1.39 V	12	47.94	10.06
8	#10360.00	45.4 AV	54.0	-8.6	1.39 V	12	35.34	10.06
9	15540.00	61.4 PK	74.0	-12.6	1.39 V	83	46.56	14.84
10	15540.00	48.9 AV	54.0	-5.1	1.39 V	83	34.06	14.84

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)
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	5119.00	63.6 PK	74.0	-10.4	1.35 H	66	53.82	9.78
2	5119.00	50.1 AV	54.0	-3.9	1.35 H	66	40.32	9.78
3	*5200.00	114.8 PK			1.33 H	73	104.54	10.26
4	*5200.00	106.0 AV			1.33 H	73	95.74	10.26
5	#10400.00	54.5 PK	74.0	-19.5	1.05 H	305	37.44	17.06
6	#10400.00	42.7 AV	54.0	-11.3	1.05 H	305	25.64	17.06
7	15600.00	62.8 PK	74.0	-11.2	1.25 H	49	40.52	22.28
8	15600.00	50.2 AV	54.0	-3.8	1.25 H	49	27.92	22.28

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	5119.00	59.5 PK	74.0	-14.5	1.17 V	78	49.72	9.78
2	5119.00	47.3 AV	54.0	-6.7	1.17 V	78	37.52	9.78
3	*5200.00	115.3 PK			1.18 V	72	105.04	10.26
4	*5200.00	105.7 AV			1.18 V	72	95.44	10.26
5	#10400.00	59.2 PK	74.0	-14.8	1.40 V	21	42.14	17.06
6	#10400.00	46.3 AV	54.0	-7.7	1.40 V	21	29.24	17.06
7	15600.00	62.3 PK	74.0	-11.7	1.42 V	88	40.02	22.28
8	15600.00	49.6 AV	54.0	-4.4	1.42 V	88	27.32	22.28

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)
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	5119.00	60.7 PK	74.0	-13.3	1.09 H	60	56.52	4.18
2	5119.00	50.8 AV	54.0	-3.2	1.09 H	60	46.62	4.18
3	*5240.00	115.5 PK			1.09 H	60	111.09	4.41
4	*5240.00	106.0 AV			1.09 H	60	101.59	4.41
5	#10480.00	55.5 PK	74.0	-18.5	1.01 H	325	45.24	10.26
6	#10480.00	43.3 AV	54.0	-10.7	1.01 H	325	33.04	10.26
7	15720.00	62.4 PK	74.0	-11.6	1.25 H	35	47.73	14.67
8	15720.00	50.1 AV	54.0	-3.9	1.25 H	35	35.43	14.67
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	5119.00	57.2 PK	74.0	-16.8	1.18 V	83	53.02	4.18
2	5119.00	47.6 AV	54.0	-6.4	1.18 V	83	43.42	4.18
3	*5240.00	114.4 PK			1.18 V	83	109.99	4.41
4	*5240.00	104.9 AV			1.18 V	83	100.49	4.41
5	#10480.00	60.3 PK	74.0	-13.7	1.32 V	313	50.04	10.26
6	#10480.00	47.1 AV	54.0	-6.9	1.32 V	313	36.84	10.26
7	15720.00	64.5 PK	74.0	-9.5	1.00 V	359	49.83	14.67
8	15720.00	50.6 AV	54.0	-3.4	1.00 V	359	35.93	14.67

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)
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	59.5 PK	74.0	-14.5	1.09 H	12	54.60	4.90
2	#5715.00	44.4 AV	54.0	-9.6	1.09 H	12	39.50	4.90
3	#5725.00	77.9 PK	78.2	-0.3	1.09 H	12	72.97	4.93
4	*5745.00	109.7 PK			1.09 H	12	104.78	4.92
5	*5745.00	99.3 AV			1.09 H	12	94.38	4.92
6	11490.00	53.7 PK	74.0	-20.3	1.00 H	320	43.05	10.65
7	11490.00	42.4 AV	54.0	-11.6	1.00 H	320	31.75	10.65
8	#17235.00	59.2 PK	74.0	-14.8	1.24 H	25	39.75	19.45
9	#17235.00	45.3 AV	54.0	-8.7	1.24 H	25	25.85	19.45

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	55.6 PK	74.0	-18.4	1.24 V	94	50.70	4.90
2	#5715.00	41.5 AV	54.0	-12.5	1.24 V	94	36.60	4.90
3	#5725.00	74.6 PK	78.2	-3.6	1.24 V	94	69.67	4.93
4	*5745.00	107.6 PK			1.24 V	94	102.68	4.92
5	*5745.00	97.5 AV			1.24 V	94	92.58	4.92
6	11490.00	54.2 PK	74.0	-19.8	1.38 V	12	43.55	10.65
7	11490.00	41.0 AV	54.0	-13.0	1.38 V	12	30.35	10.65
8	#17235.00	66.2 PK	74.0	-7.8	1.44 V	84	46.75	19.45
9	#17235.00	43.2 AV	54.0	-10.8	1.44 V	84	23.75	19.45

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	66.6 PK	74.0	-7.4	1.15 H	22	61.70	4.90
2	#5715.00	42.9 AV	54.0	-11.1	1.15 H	22	38.00	4.90
3	#5725.00	64.6 PK	78.2	-13.6	1.05 H	18	59.67	4.93
4	*5785.00	117.2 PK			1.29 H	49	112.25	4.95
5	*5785.00	107.6 AV			1.29 H	49	102.65	4.95
6	11570.00	58.7 PK	74.0	-15.3	1.09 H	60	48.02	10.68
7	11570.00	44.7 AV	54.0	-9.3	1.09 H	60	34.02	10.68
8	#17355.00	65.2 PK	74.0	-8.8	1.03 H	103	45.44	19.76
9	#17355.00	50.4 AV	54.0	-3.6	1.03 H	103	30.64	19.76

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	63.7 PK	74.0	-10.3	1.15 V	69	58.80	4.90
2	#5715.00	40.2 AV	54.0	-13.8	1.15 V	69	35.30	4.90
3	#5725.00	60.2 PK	78.2	-18.0	1.15 V	69	55.27	4.93
4	*5785.00	115.4 PK			1.15 V	69	110.45	4.95
5	*5785.00	106.2 AV			1.15 V	69	101.25	4.95
6	11570.00	55.6 PK	74.0	-18.4	1.10 V	195	44.92	10.68
7	11570.00	43.7 AV	54.0	-10.3	1.10 V	195	33.02	10.68
8	#17355.00	64.6 PK	74.0	-9.4	1.17 V	327	44.84	19.76
9	#17355.00	51.7 AV	54.0	-2.3	1.17 V	327	31.94	19.76

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)
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	*5825.00	113.7 PK			1.10 H	3	108.72	4.98
2	*5825.00	104.4 AV			1.10 H	3	99.42	4.98
3	#5850.00	77.9 PK	78.2	-0.3	1.08 H	3	72.88	5.02
4	#5860.00	61.5 PK	74.0	-12.5	1.08 H	3	56.46	5.04
5	#5860.00	47.6 AV	54.0	-6.4	1.08 H	3	42.56	5.04
6	11650.00	57.4 PK	74.0	-16.6	1.13 H	66	46.81	10.59
7	11650.00	43.4 AV	54.0	-10.6	1.13 H	66	32.81	10.59
8	#17475.00	65.7 PK	74.0	-8.3	1.00 H	119	45.75	19.95
9	#17475.00	50.7 AV	54.0	-3.3	1.00 H	119	30.75	19.95
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	112.4 PK			1.10 V	54	107.42	4.98
2	*5825.00	103.1 AV			1.10 V	54	98.12	4.98
3	#5850.00	74.2 PK	78.2	-4.0	1.10 V	54	69.18	5.02
4	#5860.00	58.0 PK	74.0	-16.0	1.10 V	54	52.96	5.04
5	#5860.00	43.4 AV	54.0	-10.6	1.10 V	54	38.36	5.04
6	11650.00	55.3 PK	74.0	-18.7	1.11 V	202	44.71	10.59
7	11650.00	42.1 AV	54.0	-11.9	1.11 V	202	31.51	10.59
8	#17475.00	63.1 PK	74.0	-10.9	1.14 V	343	43.15	19.95
9	#17475.00	50.2 AV	54.0	-3.8	1.14 V	343	30.25	19.95

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)
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	5150.00	70.7 PK	74.0	-3.3	1.57 H	52	66.42	4.28
2	5150.00	53.5 AV	54.0	-0.5	1.57 H	52	49.22	4.28
3	*5180.00	113.9 PK			1.57 H	52	109.51	4.39
4	*5180.00	105.1 AV			1.57 H	52	100.71	4.39
5	#10360.00	53.5 PK	74.0	-20.5	1.04 H	274	43.44	10.06
6	#10360.00	42.0 AV	54.0	-12.0	1.04 H	274	31.94	10.06
7	15540.00	62.7 PK	74.0	-11.3	1.20 H	27	47.86	14.84
8	15540.00	49.5 AV	54.0	-4.5	1.20 H	27	34.66	14.84
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	67.9 PK	74.0	-6.1	1.27 V	62	63.62	4.28
2	5150.00	52.2 AV	54.0	-1.8	1.27 V	62	47.92	4.28
3	*5180.00	113.0 PK			1.27 V	62	108.61	4.39
4	*5180.00	104.0 AV			1.27 V	62	99.61	4.39
5	#10360.00	57.5 PK	74.0	-16.5	1.41 V	11	47.44	10.06
6	#10360.00	45.6 AV	54.0	-8.4	1.41 V	11	35.54	10.06
7	15540.00	60.6 PK	74.0	-13.4	1.34 V	80	45.76	14.84
8	15540.00	48.0 AV	54.0	-6.0	1.34 V	80	33.16	14.84

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)
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	5122.00	70.5 PK	74.0	-3.5	1.56 H	53	66.29	4.21
2	5122.00	50.3 AV	54.0	-3.7	1.56 H	53	46.09	4.21
3	*5200.00	116.0 PK			1.56 H	61	111.56	4.44
4	*5200.00	106.3 AV			1.56 H	61	101.86	4.44
5	#10400.00	54.7 PK	74.0	-19.3	1.03 H	298	44.63	10.07
6	#10400.00	42.7 AV	54.0	-11.3	1.03 H	298	32.63	10.07
7	15600.00	62.6 PK	74.0	-11.4	1.21 H	1	47.54	15.06
8	15600.00	49.8 AV	54.0	-4.2	1.21 H	1	34.74	15.06
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	5122.00	59.4 PK	74.0	-14.6	1.18 V	83	55.19	4.21
2	5122.00	47.8 AV	54.0	-6.2	1.18 V	83	43.59	4.21
3	*5200.00	115.5 PK			1.18 V	83	111.06	4.44
4	*5200.00	106.0 AV			1.18 V	83	101.56	4.44
5	#10400.00	60.6 PK	74.0	-13.4	1.24 V	346	50.53	10.07
6	#10400.00	47.6 AV	54.0	-6.4	1.24 V	346	37.53	10.07
7	15600.00	63.5 PK	74.0	-10.5	1.00 V	360	48.44	15.06
8	15600.00	50.5 AV	54.0	-3.5	1.00 V	360	35.44	15.06

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)
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	5121.00	61.1 PK	74.0	-12.9	1.09 H	15	56.90	4.20
2	5121.00	51.1 AV	54.0	-2.9	1.09 H	15	46.90	4.20
3	*5240.00	117.3 PK			1.06 H	15	112.89	4.41
4	*5240.00	107.2 AV			1.06 H	15	102.79	4.41
5	5361.40	57.2 PK	74.0	-16.8	1.28 H	314	52.66	4.54
6	5361.40	47.3 AV	54.0	-6.7	1.28 H	314	42.76	4.54
7	#10480.00	55.1 PK	74.0	-18.9	1.02 H	311	44.84	10.26
8	#10480.00	42.9 AV	54.0	-11.1	1.02 H	311	32.64	10.26
9	15720.00	62.8 PK	74.0	-11.2	1.18 H	36	48.13	14.67
10	15720.00	50.5 AV	54.0	-3.5	1.18 H	36	35.83	14.67

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	5121.00	60.4 PK	74.0	-13.6	1.12 V	80	56.20	4.20
2	5121.00	48.2 AV	54.0	-5.8	1.12 V	80	44.00	4.20
3	*5240.00	114.6 PK			1.12 V	80	110.19	4.41
4	*5240.00	105.8 AV			1.12 V	80	101.39	4.41
5	5361.40	56.6 PK	74.0	-17.4	1.12 V	80	52.06	4.54
6	5361.40	46.4 AV	54.0	-7.6	1.12 V	80	41.86	4.54
7	#10480.00	60.3 PK	74.0	-13.7	1.34 V	335	50.04	10.26
8	#10480.00	47.0 AV	54.0	-7.0	1.34 V	335	36.74	10.26
9	15720.00	63.6 PK	74.0	-10.4	1.02 V	360	48.93	14.67
10	15720.00	50.4 AV	54.0	-3.6	1.02 V	360	35.73	14.67

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)
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	60.1 PK	74.0	-13.9	1.09 H	12	55.20	4.90
2	#5715.00	44.3 AV	54.0	-9.7	1.09 H	12	39.40	4.90
3	#5725.00	77.4 PK	78.2	-0.8	1.09 H	12	72.47	4.93
4	*5745.00	108.1 PK			1.10 H	11	103.18	4.92
5	*5745.00	98.8 AV			1.10 H	11	93.88	4.92
6	11490.00	54.2 PK	74.0	-19.8	1.02 H	324	43.55	10.65
7	11490.00	42.6 AV	54.0	-11.4	1.02 H	324	31.95	10.65
8	#17235.00	59.8 PK	74.0	-14.2	1.20 H	28	40.35	19.45
9	#17235.00	45.7 AV	54.0	-8.3	1.20 H	28	26.25	19.45
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	55.6 PK	74.0	-18.4	1.29 V	100	50.70	4.90
2	#5715.00	41.5 AV	54.0	-12.5	1.29 V	100	36.60	4.90
3	#5725.00	74.6 PK	78.2	-3.6	1.29 V	100	69.67	4.93
4	*5745.00	106.8 PK			1.29 V	100	101.88	4.92
5	*5745.00	97.2 AV			1.29 V	100	92.28	4.92
6	11490.00	54.3 PK	74.0	-19.7	1.33 V	11	43.65	10.65
7	11490.00	41.1 AV	54.0	-12.9	1.33 V	11	30.45	10.65
8	#17235.00	65.7 PK	74.0	-8.3	1.40 V	93	46.25	19.45
9	#17235.00	42.8 AV	54.0	-11.2	1.40 V	93	23.35	19.45

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	67.1 PK	74.0	-6.9	1.10 H	12	62.20	4.90
2	#5715.00	43.2 AV	54.0	-10.8	1.10 H	12	38.30	4.90
3	#5725.00	64.2 PK	78.2	-14.0	1.10 H	12	59.27	4.93
4	*5785.00	116.8 PK			1.08 H	12	111.85	4.95
5	*5785.00	106.4 AV			1.08 H	12	101.45	4.95
6	11570.00	58.0 PK	74.0	-16.0	1.11 H	70	47.32	10.68
7	11570.00	44.3 AV	54.0	-9.7	1.11 H	70	33.62	10.68
8	#17355.00	64.5 PK	74.0	-9.5	1.00 H	103	44.74	19.76
9	#17355.00	50.0 AV	54.0	-4.0	1.00 H	103	30.24	19.76

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	63.5 PK	74.0	-10.5	1.12 V	79	58.60	4.90
2	#5715.00	40.2 AV	54.0	-13.8	1.12 V	79	35.30	4.90
3	#5725.00	60.5 PK	78.2	-17.7	1.12 V	79	55.57	4.93
4	*5785.00	114.2 PK			1.12 V	79	109.25	4.95
5	*5785.00	105.7 AV			1.12 V	79	100.75	4.95
6	11570.00	55.6 PK	74.0	-18.4	1.06 V	160	44.92	10.68
7	11570.00	43.6 AV	54.0	-10.4	1.06 V	160	32.92	10.68
8	#17355.00	64.4 PK	74.0	-9.6	1.19 V	323	44.64	19.76
9	#17355.00	51.4 AV	54.0	-2.6	1.19 V	323	31.64	19.76

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)
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	*5825.00	112.5 PK			1.07 H	2	107.52	4.98
2	*5825.00	103.3 AV			1.07 H	2	98.32	4.98
3	#5850.00	77.4 PK	78.2	-0.8	1.08 H	2	72.38	5.02
4	#5860.00	64.5 PK	74.0	-9.5	1.08 H	2	59.46	5.04
5	#5860.00	48.2 AV	54.0	-5.8	1.08 H	2	43.16	5.04
6	11650.00	57.2 PK	74.0	-16.8	1.18 H	78	46.61	10.59
7	11650.00	43.2 AV	54.0	-10.8	1.18 H	78	32.61	10.59
8	#17475.00	65.5 PK	74.0	-8.5	1.00 H	118	45.55	19.95
9	#17475.00	50.6 AV	54.0	-3.4	1.00 H	118	30.65	19.95

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	111.4 PK			1.08 V	53	106.42	4.98
2	*5825.00	102.1 AV			1.08 V	53	97.12	4.98
3	#5850.00	73.8 PK	78.2	-4.4	1.08 V	53	68.78	5.02
4	#5860.00	58.0 PK	74.0	-16.0	1.08 V	53	52.96	5.04
5	#5860.00	43.1 AV	54.0	-10.9	1.08 V	53	38.06	5.04
6	11650.00	55.3 PK	74.0	-18.7	1.13 V	195	44.71	10.59
7	11650.00	41.9 AV	54.0	-12.1	1.13 V	195	31.31	10.59
8	#17475.00	62.9 PK	74.0	-11.1	1.15 V	350	42.95	19.95
9	#17475.00	50.0 AV	54.0	-4.0	1.15 V	350	30.05	19.95

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)
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	5150.00	70.6 PK	74.0	-3.4	1.08 H	14	66.32	4.28
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.08 H**	**14**	**49.62**	**4.28**
3	*5190.00	106.8 PK			1.06 H	14	102.39	4.41
4	*5190.00	97.0 AV			1.06 H	14	92.59	4.41
5	#10380.00	50.3 PK	74.0	-23.7	1.08 H	255	40.23	10.07
6	#10380.00	39.4 AV	54.0	-14.6	1.08 H	255	29.33	10.07
7	15570.00	60.1 PK	74.0	-13.9	1.18 H	8	45.15	14.95
8	15570.00	47.6 AV	54.0	-6.4	1.18 H	8	32.65	14.95
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	60.5 PK	74.0	-13.5	1.44 V	102	56.22	4.28
2	5150.00	47.3 AV	54.0	-6.7	1.44 V	102	43.02	4.28
3	*5190.00	104.2 PK			1.44 V	102	99.79	4.41
4	*5190.00	94.3 AV			1.44 V	102	89.89	4.41
5	#10380.00	56.1 PK	74.0	-17.9	1.46 V	12	46.03	10.07
6	#10380.00	43.2 AV	54.0	-10.8	1.46 V	12	33.13	10.07
7	15570.00	58.2 PK	74.0	-15.8	1.27 V	50	43.25	14.95
8	15570.00	46.6 AV	54.0	-7.4	1.27 V	50	31.65	14.95

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)
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	5150.00	71.5 PK	74.0	-2.5	1.00 H	11	67.22	4.28
2	5150.00	52.9 AV	54.0	-1.1	1.00 H	11	48.62	4.28
3	*5230.00	112.3 PK			1.21 H	14	107.88	4.42
4	*5230.00	102.8 AV			1.21 H	14	98.38	4.42
5	#10460.00	54.7 PK	74.0	-19.3	1.08 H	312	44.49	10.21
6	#10460.00	42.9 AV	54.0	-11.1	1.08 H	312	32.69	10.21
7	15690.00	62.2 PK	74.0	-11.8	1.16 H	50	47.52	14.68
8	15690.00	50.4 AV	54.0	-3.6	1.16 H	50	35.72	14.68

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	60.2 PK	74.0	-13.8	1.06 V	82	55.92	4.28
2	5150.00	48.1 AV	54.0	-5.9	1.06 V	82	43.82	4.28
3	*5230.00	108.3 PK			1.06 V	82	103.88	4.42
4	*5230.00	98.8 AV			1.06 V	82	94.38	4.42
5	#10460.00	59.4 PK	74.0	-14.6	1.35 V	347	49.19	10.21
6	#10460.00	46.5 AV	54.0	-7.5	1.35 V	347	36.29	10.21
7	15690.00	62.2 PK	74.0	-11.8	1.06 V	360	47.52	14.68
8	15690.00	49.3 AV	54.0	-4.7	1.06 V	360	34.62	14.68

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)
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	72.1 PK	74.0	-1.9	1.10 H	13	67.20	4.90
2	#5715.00	53.7 AV	54.0	-0.3	1.10 H	13	48.80	4.90
3	#5725.00	76.3 PK	78.2	-1.9	1.10 H	13	71.37	4.93
4	*5755.00	103.6 PK			1.10 H	13	98.67	4.93
5	*5755.00	94.3 AV			1.10 H	13	89.37	4.93
6	11510.00	53.8 PK	74.0	-20.2	1.34 H	27	43.14	10.66
7	11510.00	40.8 AV	54.0	-13.2	1.34 H	27	30.14	10.66
8	#17265.00	66.2 PK	74.0	-7.8	1.48 H	75	46.68	19.52
9	#17265.00	43.4 AV	54.0	-10.6	1.48 H	75	23.88	19.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	69.4 PK	74.0	-4.6	1.08 V	56	64.50	4.90
2	#5715.00	50.6 AV	54.0	-3.4	1.08 V	56	45.70	4.90
3	#5725.00	72.4 PK	78.2	-5.8	1.08 V	56	67.47	4.93
4	*5755.00	102.1 PK			1.08 V	56	97.17	4.93
5	*5755.00	93.2 AV			1.08 V	56	88.27	4.93
6	11510.00	51.6 PK	74.0	-22.4	1.12 V	194	40.94	10.66
7	11510.00	38.4 AV	54.0	-15.6	1.12 V	194	27.74	10.66
8	#17265.00	64.3 PK	74.0	-9.7	1.12 V	343	44.78	19.52
9	#17265.00	41.0 AV	54.0	-13.0	1.12 V	343	21.48	19.52

REMARKS:

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

CHANNEL	TX Channel 159	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	*5795.00	110.6 PK			1.09 H	10	105.64	4.96
2	*5795.00	100.7 AV			1.09 H	10	95.74	4.96
3	#5850.00	77.8 PK	78.2	-0.4	1.07 H	0	72.78	5.02
4	#5860.00	70.7 PK	74.0	-3.3	1.07 H	0	65.66	5.04
5	#5860.00	53.0 AV	54.0	-1.0	1.07 H	0	47.96	5.04
6	11590.00	53.6 PK	74.0	-20.4	1.33 H	23	42.91	10.69
7	11590.00	40.6 AV	54.0	-13.4	1.33 H	23	29.91	10.69
8	#17385.00	66.2 PK	74.0	-7.8	1.49 H	67	46.34	19.86
9	#17385.00	43.3 AV	54.0	-10.7	1.49 H	67	23.44	19.86
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	*5795.00	109.3 PK			1.08 V	29	104.34	4.96
2	*5795.00	99.4 AV			1.08 V	29	94.44	4.96
3	#5850.00	75.3 PK	78.2	-2.9	1.08 V	29	70.28	5.02
4	#5860.00	68.9 PK	74.0	-5.1	1.08 V	29	63.86	5.04
5	#5860.00	51.0 AV	54.0	-3.0	1.08 V	29	45.96	5.04
6	11590.00	51.9 PK	74.0	-22.1	1.13 V	203	41.21	10.69
7	11590.00	38.9 AV	54.0	-15.1	1.13 V	203	28.21	10.69
8	#17385.00	64.8 PK	74.0	-9.2	1.08 V	339	44.94	19.86
9	#17385.00	41.2 AV	54.0	-12.8	1.08 V	339	21.34	19.86

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

802.11ac (VHT80)

CHANNEL	TX Channel 42	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	5150.00	69.9 PK	74.0	-4.1	1.00 H	11	65.62	4.28
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.00 H**	**11**	**49.62**	**4.28**
3	*5210.00	103.4 PK			1.00 H	20	98.97	4.43
4	*5210.00	92.3 AV			1.00 H	20	87.87	4.43
5	#10420.00	49.7 PK	74.0	-24.3	1.14 H	255	39.59	10.11
6	#10420.00	38.8 AV	54.0	-15.2	1.14 H	255	28.69	10.11
7	15630.00	59.2 PK	74.0	-14.8	1.06 H	3	44.26	14.94
8	15630.00	46.7 AV	54.0	-7.3	1.06 H	3	31.76	14.94
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	65.2 PK	74.0	-8.8	1.42 V	100	60.92	4.28
2	5150.00	49.6 AV	54.0	-4.4	1.42 V	100	45.32	4.28
3	*5210.00	100.2 PK			1.42 V	100	95.77	4.43
4	*5210.00	89.1 AV			1.42 V	100	84.67	4.43
5	#10420.00	55.5 PK	74.0	-18.5	1.43 V	10	45.39	10.11
6	#10420.00	42.8 AV	54.0	-11.2	1.43 V	10	32.69	10.11
7	15630.00	58.2 PK	74.0	-15.8	1.26 V	49	43.26	14.94
8	15630.00	46.4 AV	54.0	-7.6	1.26 V	49	31.46	14.94

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	72.2 PK	74.0	-1.8	1.11 H	14	67.30	4.90
2	#5715.00	53.6 AV	54.0	-0.4	1.11 H	14	48.70	4.90
3	#5725.00	72.8 PK	78.2	-5.4	1.11 H	14	67.87	4.93
4	*5775.00	101.1 PK			1.10 H	9	96.17	4.93
5	*5775.00	89.8 AV			1.10 H	9	84.87	4.93
6	#5850.00	57.2 PK	78.2	-21.0	1.11 H	14	52.18	5.02
7	#5860.00	56.2 PK	74.0	-17.8	1.11 H	14	51.16	5.04
8	#5860.00	41.5 AV	54.0	-12.5	1.11 H	14	36.46	5.04
9	11550.00	52.4 PK	74.0	-21.6	1.31 H	42	41.73	10.67
10	11550.00	38.9 AV	54.0	-15.1	1.31 H	42	28.23	10.67
11	#17325.00	64.3 PK	74.0	-9.7	1.45 H	78	44.61	19.69
12	#17325.00	41.0 AV	54.0	-13.0	1.45 H	78	21.31	19.69

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	68.9 PK	74.0	-5.1	1.21 V	66	64.00	4.90
2	#5715.00	53.5 AV	54.0	-0.5	1.21 V	66	48.60	4.90
3	#5725.00	70.7 PK	78.2	-7.5	1.21 V	66	65.77	4.93
4	*5775.00	99.9 PK			1.19 V	65	94.97	4.93
5	*5775.00	89.6 AV			1.19 V	65	84.67	4.93
6	#5850.00	57.8 PK	78.2	-20.4	1.21 V	66	52.78	5.02
7	#5860.00	58.5 PK	74.0	-15.5	1.21 V	66	53.46	5.04
8	#5860.00	40.4 AV	54.0	-13.6	1.21 V	66	35.36	5.04
9	11550.00	51.3 PK	74.0	-22.7	1.10 V	209	40.63	10.67
10	11550.00	37.2 AV	54.0	-16.8	1.10 V	209	26.53	10.67
11	#17325.00	63.2 PK	74.0	-10.8	1.06 V	351	43.51	19.69
12	#17325.00	40.5 AV	54.0	-13.5	1.06 V	351	20.81	19.69

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.

4.3 TRANSMIT POWER MEASUREMENT

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)

Note: Where B is the 26dB emission bandwidth in MHz.

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

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

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

Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

4.3.2 TEST INSTRUMENTS

FOR POWER OUTPUT MEASUREMENT

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 calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Dec. 17, 2014

4.3.3 TEST PROCEDURE

FOR POWER OUTPUT MEASUREMENT

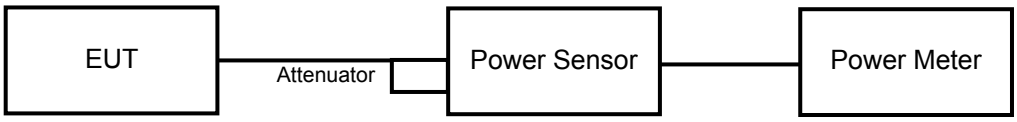
Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP

FOR POWER OUTPUT MEASUREMENT



4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.3.7 TEST RESULTS

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
802.11a							
36	5180	19.05	19.22	163.913	22.15	30	PASS
40	5200	21.97	21.73	306.334	24.86	30	PASS
48	5240	22.01	21.69	306.426	24.86	30	PASS
149	5745	16.69	16.61	92.48	19.66	30	PASS
157	5785	21.78	21.52	292.567	24.66	30	PASS
165	5825	18.74	18.21	141.039	21.49	30	PASS
802.11ac (VHT20)							
36	5180	19.07	19.25	164.864	22.17	30	PASS
40	5200	21.71	21.05	275.602	24.40	30	PASS
48	5240	21.82	21.11	281.177	24.49	30	PASS
149	5745	16.39	16.42	87.404	19.42	30	PASS
157	5785	21.62	21.34	281.355	24.49	30	PASS
165	5825	18.11	18.19	130.631	21.16	30	PASS
802.11ac (VHT40)							
38	5190	13.07	13.38	42.054	16.24	30	PASS
46	5230	18.01	18.56	135.02	21.30	30	PASS
151	5755	15.01	15.24	65.116	18.14	30	PASS
159	5795	18.85	18.81	152.769	21.84	30	PASS
802.11ac (VHT80)							
42	5210	12.51	12.31	34.846	15.42	30	PASS
155	5775	13.58	13.61	45.764	16.61	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 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 calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Dec. 17, 2014

4.4.3 TEST PROCEDURES

For U-NII-1:

For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)

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

For 802.11ac (VHT80)

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)

For U-NII-3:

For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)

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

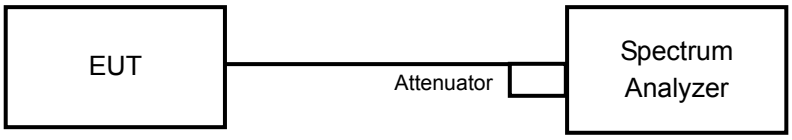
For 802.11ac (VHT80)

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 add 10 log (1/duty cycle)

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as 4.3.6

4.4.7 TEST RESULTS

For U-NII-1:

CHANNEL	CHANNEL FREQUENCY (MHz)	PSD (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
802.11a						
36	5180	5.66	4.80	8.26	16.48	PASS
40	5200	8.64	7.82	11.26	16.48	PASS
48	5240	7.95	7.81	10.89	16.48	PASS
802.11ac (VHT20)						
36	5180	4.88	4.52	7.71	16.48	PASS
40	5200	7.55	7.61	10.59	16.48	PASS
48	5240	7.38	7.35	10.38	16.48	PASS
802.11ac (VHT40)						
38	5190	-4.08	-2.85	-0.41	16.48	PASS
46	5230	0.65	1.86	4.31	16.48	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.

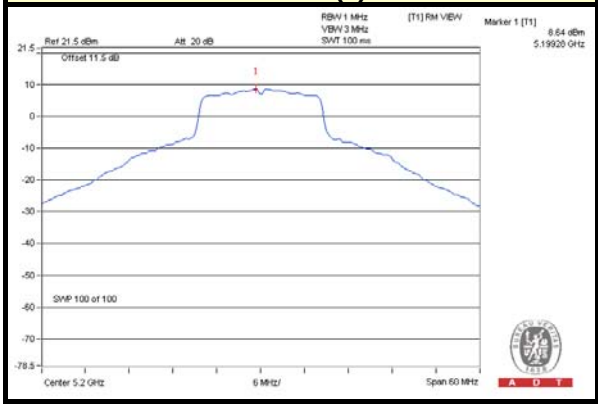
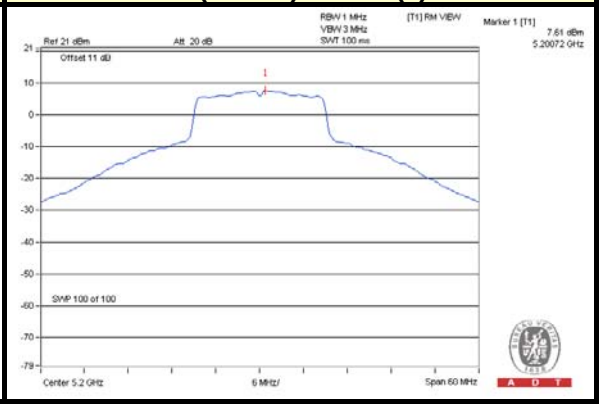
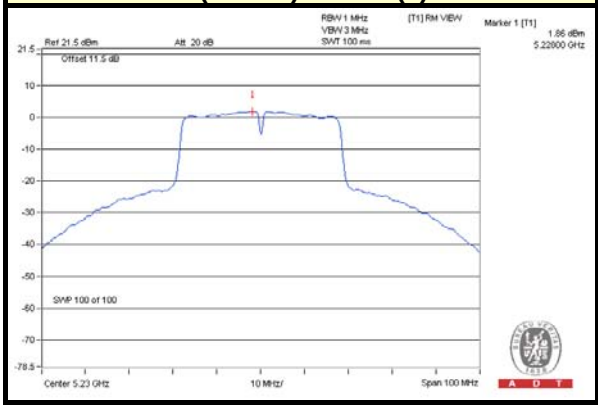
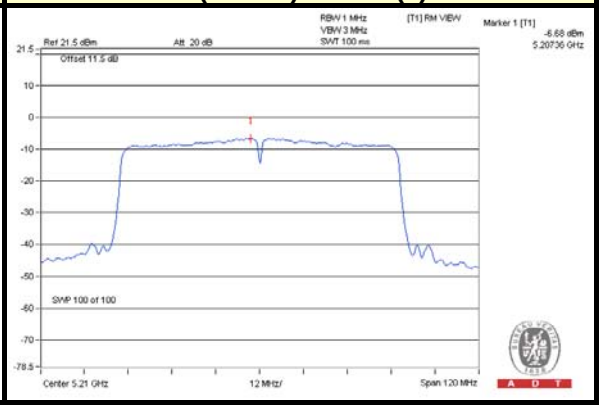
2. **For 5150MHz ~ 5250MHz:** Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.52dBi > 6dBi , so the power density limit shall be reduced to 17-(6.52-6) = 16.48dBm.

802.11ac (VHT80)							
CHANNEL	CHANNEL FREQUENCY (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				
42	5210	-7.94	-6.68	0.14	-4.11	16.48	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. **For 5150MHz ~ 5250MHz:** Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.52dBi > 6dBi , so the power density limit shall be reduced to 17-(6.52-6) = 16.48dBm.

3. Refer to section 3.4 for duty cycle spectrum plot.

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) : CH42**
	

For U-NII-3:

802.11a								
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	TOTAL PSD (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
0	149	5745	-4.14	-1.92	3.01	1.09	29.79	PASS
	157	5785	0.46	2.68	3.01	5.69	29.79	PASS
	165	5825	-1.76	0.46	3.01	3.47	29.79	PASS
1	149	5745	-4.68	-2.46	3.01	0.55	29.79	PASS
	157	5785	0.14	2.36	3.01	5.37	29.79	PASS
	165	5825	-2.55	-0.33	3.01	2.68	29.79	PASS
802.11ac (VHT20)								
0	149	5745	-4.61	-2.39	3.01	0.62	29.79	PASS
	157	5785	-0.02	2.20	3.01	5.21	29.79	PASS
	165	5825	-2.57	-0.35	3.01	2.66	29.79	PASS
1	149	5745	-5.06	-2.84	3.01	0.17	29.79	PASS
	157	5785	-0.35	1.87	3.01	4.88	29.79	PASS
	165	5825	-2.84	-0.62	3.01	2.39	29.79	PASS
802.11ac (VHT40)								
0	151	5755	-9.58	-7.36	3.01	-4.35	29.79	PASS
	159	5795	-5.98	-3.76	3.01	-0.75	29.79	PASS
1	151	5755	-10.01	-7.79	3.01	-4.78	29.79	PASS
	159	5795	-6.06	-3.84	3.01	-0.83	29.79	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[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.21dBi > 6dBi , so the power density limit shall be reduced to 30-(6.21-6) = 29.79dBm.

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	-13.76	-11.54	3.01	0.14	-8.39	29.79	PASS
1	155	5775	-13.99	-11.77	3.01	0.14	-8.62	29.79	PASS

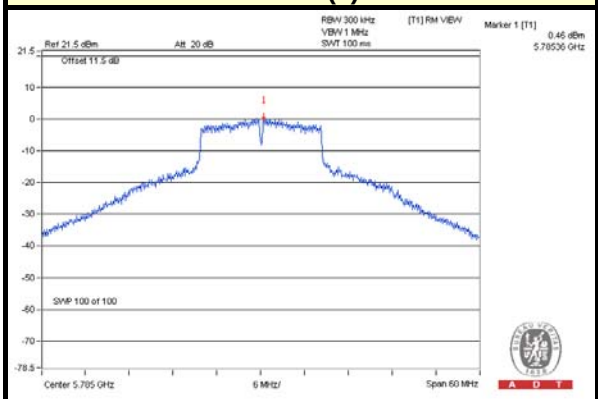
Note : 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.21dBi > 6dBi , so the power density limit shall be reduced to 30-(6.21-6) = 29.79dBm.

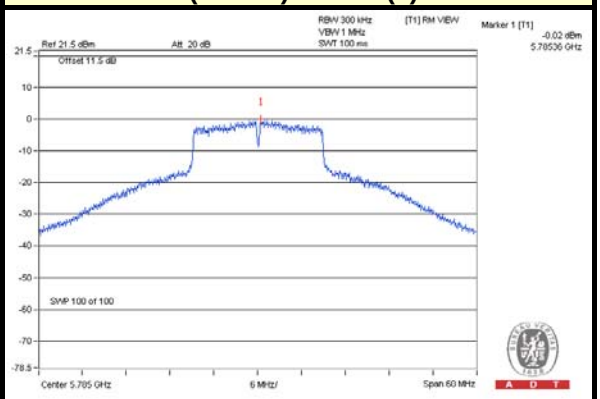
3. Refer to section 3.4 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

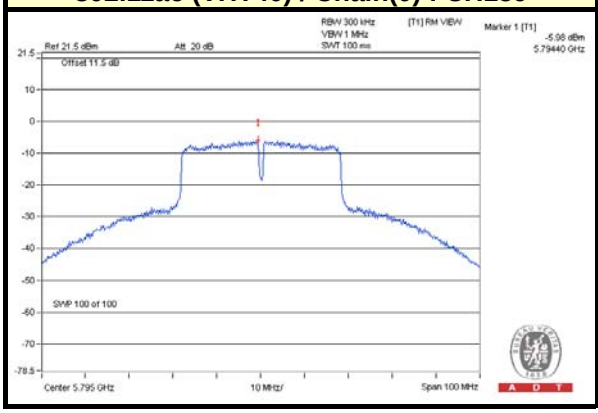
802.11a / Chain(0) : CH157



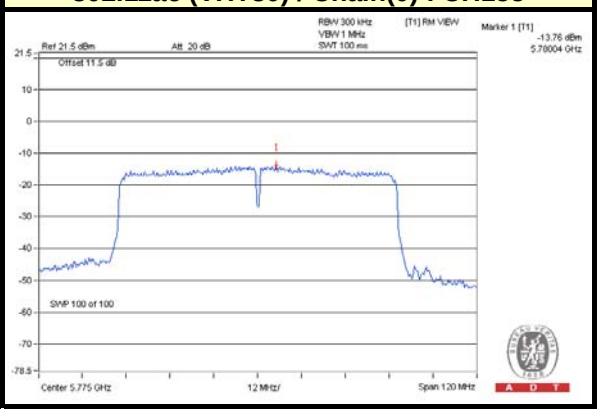
802.11ac (VHT20) / Chain(0) : CH157



802.11ac (VHT40) / Chain(0) : CH159



802.11ac (VHT80) / Chain(0) : CH155



4.5 FREQUENCY STABILITY

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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP 40	100060	May 08, 2014	May 07, 2015
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-SP -AR	MAA0812-008	Jan. 13, 2014	Jan. 12, 2015

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. Tested date : Dec. 17, 2014

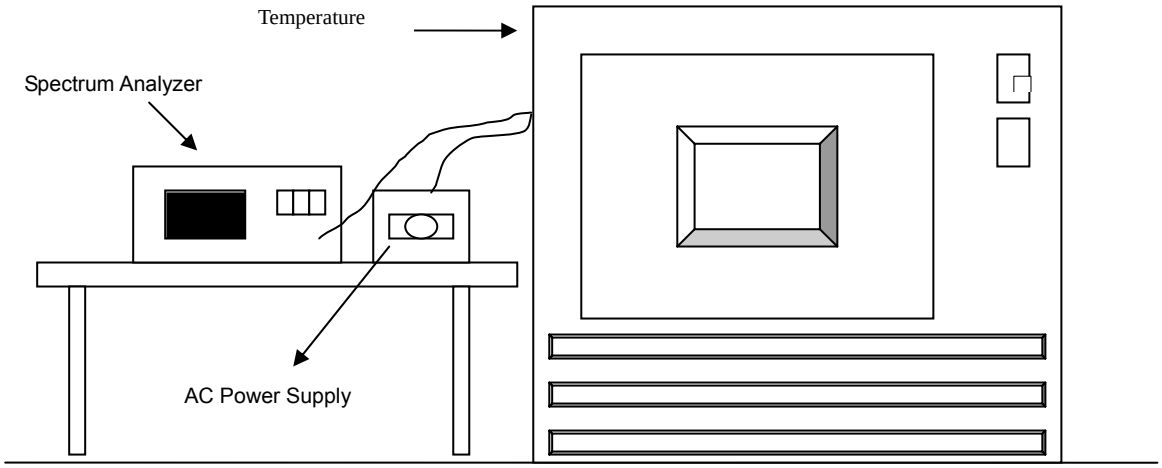
4.5.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. 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.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. 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.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



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: 5240MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
50	120	5240.0198	0.00038	5240.0217	0.00041	5240.0235	0.00045	5240.0204	0.00039
40	120	5240.0086	0.00016	5240.0134	0.00026	5240.0127	0.00024	5240.0101	0.00019
30	120	5240.0103	0.00020	5240.0094	0.00018	5240.0086	0.00016	5240.0068	0.00013
20	120	5240.0212	0.00040	5240.0223	0.00043	5240.0202	0.00039	5240.0248	0.00047
10	120	5240.0248	0.00047	5240.0268	0.00051	5240.0259	0.00049	5240.0275	0.00052
0	120	5240.0035	0.00007	5240.0041	0.00008	5240.0024	0.00005	5240.0019	0.00004
-10	120	5240.0171	0.00033	5240.0163	0.00031	5240.0174	0.00033	5240.0136	0.00026
-20	120	5239.9745	-0.00049	5239.9751	-0.00048	5239.9781	-0.00042	5239.9779	-0.00042
-30	120	5240.0154	0.00029	5240.015	0.00029	5240.0156	0.00030	5240.0133	0.00025

FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5240MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	138	5240.0203	0.00039	5240.022	0.00042	5240.0202	0.00039	5240.0257	0.00049
	120	5240.0212	0.00040	5240.0223	0.00043	5240.0202	0.00039	5240.0248	0.00047
	102	5240.0213	0.00041	5240.0231	0.00044	5240.0192	0.00037	5240.0251	0.00048

4.6 6dB BANDWIDTH MEASUREMENT

4.6.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV 40	100964	July 05, 2014	July 04, 2015

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. Tested date : July 24, 2014

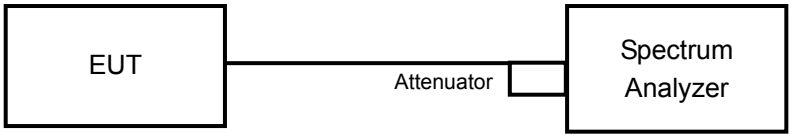
4.6.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 100kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. 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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP

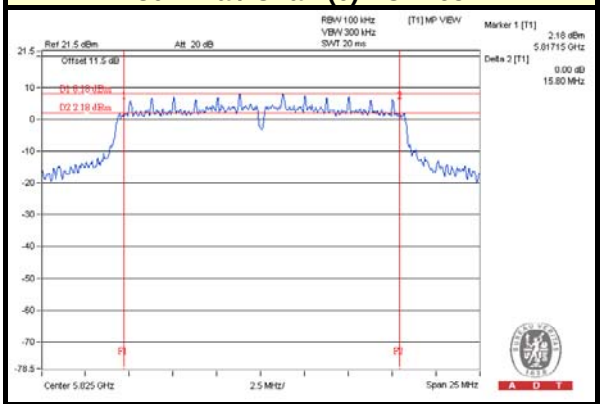
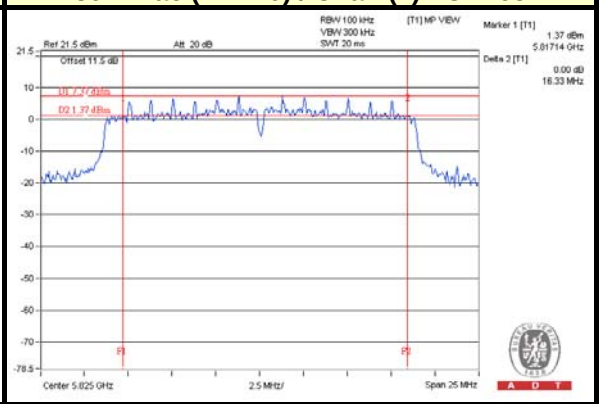
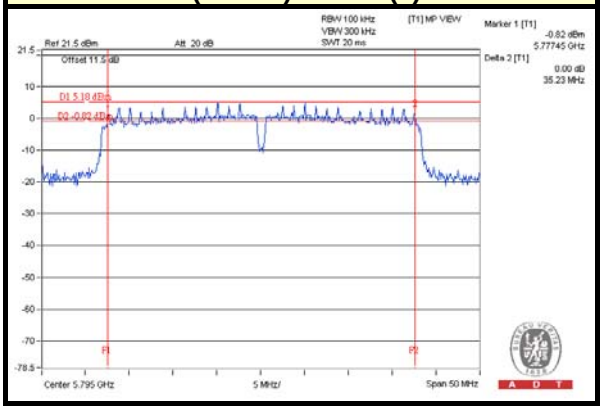
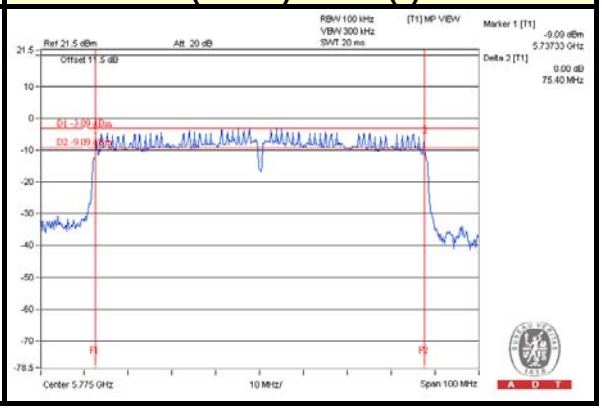


4.6.6 EUT OPERATING CONDITIONS

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

4.6.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
802.11a					
149	5745	16.04	16.08	0.5	PASS
157	5785	16.38	16.37	0.5	PASS
165	5825	15.80	16.06	0.5	PASS
802.11ac (VHT20)					
149	5745	16.45	16.36	0.5	PASS
157	5785	17.63	17.57	0.5	PASS
165	5825	16.58	16.33	0.5	PASS
802.11ac (VHT40)					
151	5755	35.32	35.25	0.5	PASS
159	5795	35.24	35.23	0.5	PASS
802.11ac (VHT80)					
155	5775	75.40	75.44	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11a / Chain(0) : CH165	**802.11ac (VHT20) / Chain(1) : CH165**
	
802.11ac (VHT40) / Chain(1) : CH159	**802.11ac (VHT80) / Chain(0) : CH155**
	

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

Hsin Chu EMC/RF/Telecom Lab:
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab:
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

7. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

--- END ---