FCC Test Report (DFS Band)

Report No.:	RF170407E01A-1
FCC ID:	S9GH320
Model No.:	H320
Received Date:	Apr. 07, 2017
Test Date:	Apr. 12 to May 03, 2017
Issued Date:	May 26, 2017
Applicant:	Ruckus Wireless, Inc.
Address:	350 West Java Drive, Sunnyvale, CA 94089
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.

Testing Laboratory
2022

Table of Contents

Release Control Record 4

1 Certificate of Conformity 5

2 Summary of Test Results 6

2.1 Measurement Uncertainty 6
2.2 Modification Record 6

3 General Information 7

3.1 General Description of EUT (DFS band) 7
3.2 Description of Test Modes 9
3.2.1 Test Mode Applicability and Tested Channel Detail 10
3.3 Duty Cycle of Test Signal 12
3.4 Description of Support Units 13
3.4.1 Configuration of System under Test 14
3.5 General Description of Applied Standard 15

4 Test Types and Results 16

4.1 Radiated Emission and Bandedge Measurement 16
4.1.1 Limits of Radiated Emission and Bandedge Measurement 16
4.1.2 Test Instruments 17
4.1.3 Test Procedure 19
4.1.4 Deviation from Test Standard 19
4.1.5 Test Setup 20
4.1.6 EUT Operating Condition 21
4.1.7 Test Results 22
4.2 Conducted Emission Measurement 47
4.2.1 Limits of Conducted Emission Measurement 47
4.2.2 Test Instruments 47
4.2.3 Test Procedure 48
4.2.4 Deviation from Test Standard 48
4.2.5 Test Setup 48
4.2.6 EUT Operating Condition 48
4.2.7 Test Results 49
4.3 Transmit Power Measurment 51
4.3.1 Limits of Transmit Power Measurement 51
4.3.2 Test Setup 51
4.3.3 Test Instruments 52
4.3.4 Test Procedure 52
4.3.5 Deviation from Test Standard 52
4.3.6 EUT Operating Condition 52
4.3.7 Test Result 53
4.4 Occupied Bandwidth Measurement 61
4.4.1 Test Setup 61
4.4.2 Test Instruments 61
4.4.3 Test Procedure 61
4.4.4 Test Results 62
4.5 Peak Power Spectral Density Measurement 65
4.5.1 Limits of Peak Power Spectral Density Measurement 65
4.5.2 Test Setup 65
4.5.3 Test Instruments 65
4.5.4 Test Procedure 65
4.5.5 Deviation from Test Standard 65
4.5.6 EUT Operating Condition 66
4.5.7 Test Results 67
4.6 Frequency Stability Measurement 73
4.6.1 Limits of Frequency Stability Measurement 73

4.6.2 Test Setup 73
4.6.3 Test Instruments 73
4.6.4 Test Procedure 73
4.6.5 Deviation from Test Standard 73
4.6.6 EUT Operating Condition 73
4.6.7 Test Results 74
4.7 6dB Bandwidth Measurment 75
4.7.1 Limits of 6dB Bandwidth Measurement 75
4.7.2 Test Setup 75
4.7.3 Test Instruments 75
4.7.4 Test Procedure 75
4.7.5 Deviation from Test Standard 75
4.7.6 EUT Operating Condition 75
4.7.7 Test Results 76

5 Pictures of Test Arrangements 78

Appendix – Information on the Testing Laboratories 79

Release Control Record

Issue No.	Description	Date Issued
RF170407E01A-1	Original release.	May 26, 2017

1 Certificate of Conformity

Product:	H320 Access Point
Brand:	Ruckus
Model No.:	H320
Sample Status:	ENGINEERING SAMPLE
Applicant:	Ruckus Wireless, Inc.
Test Date:	Apr. 12 to May 03, 2017
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 : _____ , **Date:** May 26, 2017

Wendy Wu / Specialist

Approved by : _____ , **Date:** May 26, 2017

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 -2.37dB at 0.4625MHz.
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 -1.1dB at 5725.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
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 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	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.32 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.82 dB
	6GHz ~ 18GHz	4.58 dB
	18GHz ~ 40GHz	5.03 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (DFS band)

Product	H320 Access Point
Brand	Ruckus
Model No.	H320
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 48V from POE
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	5.26 ~ 5.32GHz, 5.5 ~ 5.72GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20): 16 802.11n (HT40), 802.11ac (VHT40): 8 802.11ac (VHT80): 4
Output Power	**5.26 ~ 5.32GHz:** 118.344mW **5.50 ~ 5.72GHz:** 116.047mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF170407E01-1 as the following:
   - ◆ Add DFS band <5.26 ~ 5.32GHz, 5.5 ~ 5.72GHz>
2. According to above condition, all test items need to be performed. And all data weres verified to meet the requirements.
3. Simultaneously transmission condition.

Condition	Technology	
1	WLAN 2.4GHz	WLAN 5GHz
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

4. The EUT must be supplied with a POE (only for test not for sale) as following table:

Brand	Model No.	Spec.
Ruckus Wireless, Inc	740-64214-001	Input: 100-240Vac, 50/60Hz, 0.75A Output: 48Vdc, 0.5A

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

No.	PCB Chain No	Brand	Model	Antenna Gain(dBi)	Frequency range	Antenna Type	Connector type
1	Chain 0	Ruckus	H320 Hpol	1	2.4~2.4835GHz	Printed	I-pex
				3	5.15~5.85GHz		
2	Chain 1	Ruckus	H320 Vpol	1	5.15~5.85GHz	Printed	I-pex

6. The EUT incorporates a MIMO function:

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

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

7. 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	5290 MHz

FOR 5500 ~ 5720MHz

12 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	144	5720 MHz

6 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	142	5710 MHz

3 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	138	5690 MHz
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	
-	√	√	√	√	-

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.

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	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	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.

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5320	52 to 64 100 to 144	64	OFDM	BPSK	6.5

Power Line Conducted Emission Test:

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

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5320	52 to 64 100 to 144	64	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

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	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	29.3

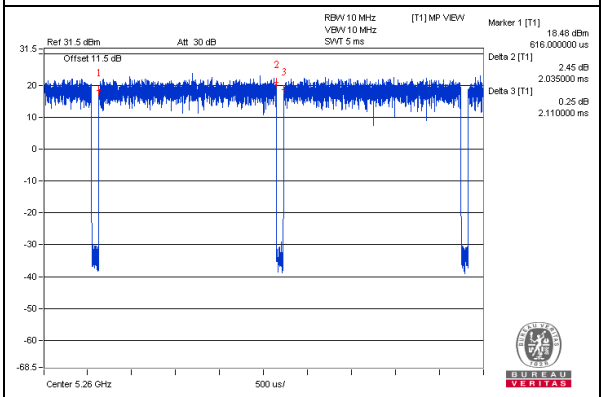
Test Condition:

Applicable To	Environmental Conditions	Input Power (System)	Tested By
RE≥1G	23deg. C, 66%RH	120Vac, 60Hz	Terry Huang
RE<1G	22deg. C, 66%RH	120Vac, 60Hz	Terry Huang
PLC	23deg. C, 61%RH	120Vac, 60Hz	Weiwei Lo
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

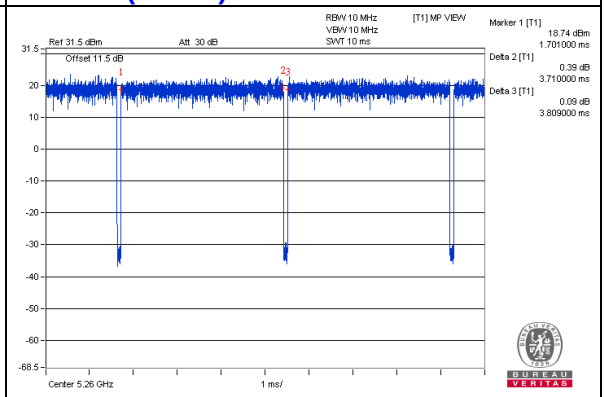
3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor shall be considered.
802.11a: Duty cycle = 2.035 ms/2.11 ms = 0.964, Duty factor = 10 * log(1/0.964) = 0.16
802.11ac (VHT20): Duty cycle = 3.71ms/3.809 ms = 0.974, Duty factor = 10 * log(1/0.974) = 0.11
802.11ac (VHT40): Duty cycle = 1.81 ms/1.908 ms = 0.949, Duty factor = 10 * log(1/0.949) = 0.23
802.11ac (VHT80): Duty cycle = 0.857 ms/0.962 ms = 0.891, Duty factor = 10 * log(1/0.891) = 0.50

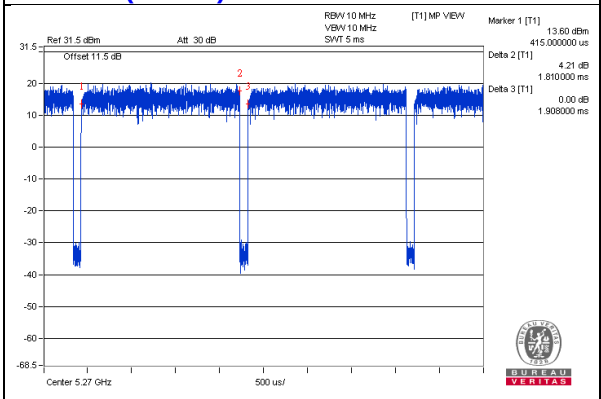
802.11a



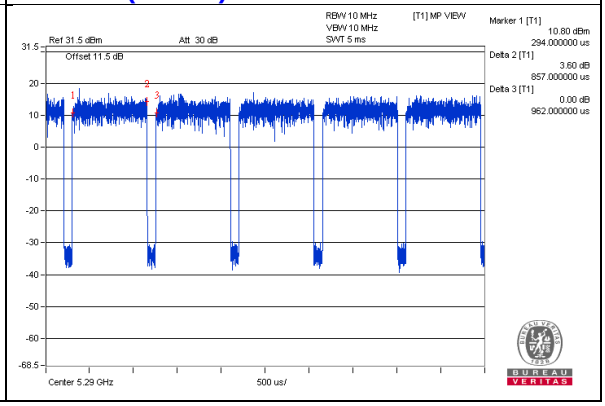
802.11ac (VHT20)



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.

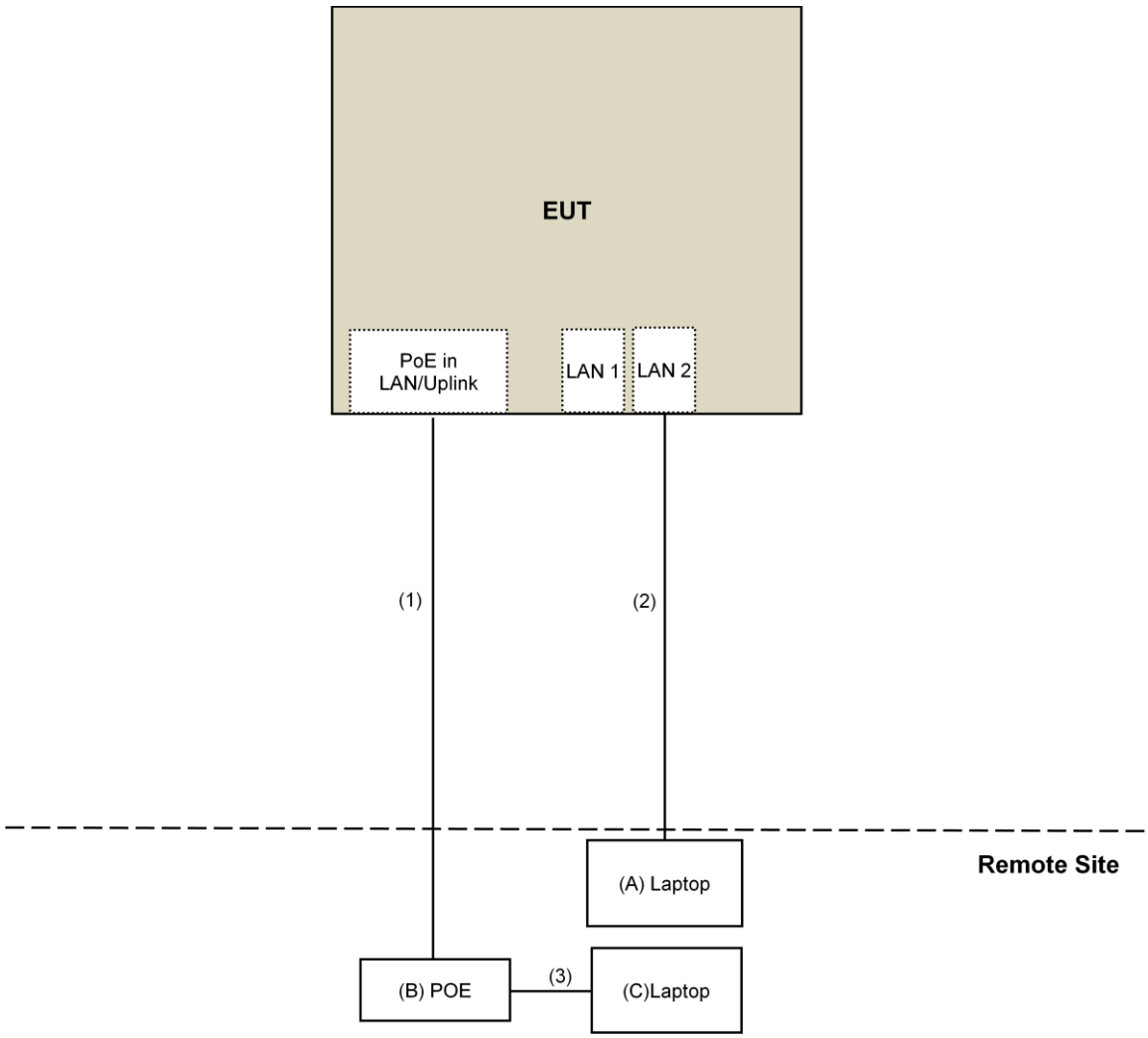
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6440	F9LYQ32	F9LYQ32	Provided by Lab
B.	POE	Ruckus Wireless, Inc	740-64214-001	NA	NA	Supplied by client
C.	Laptop	DELL	XPS 13	NA	NA	Supplied by client

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	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	3	No	0	Provided by Lab

3.4.1 Configuration of System under Test



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 v01r04
KDB 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.

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

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v01r03</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBμV/m)</td><td>AV:54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK:105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK:122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*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.</td></tr>
</table>

Note:

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. 18, 2016	Aug. 17, 2017
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 07, 2016	May 06, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Dec. 29, 2016	Dec. 28, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 28, 2016	Dec. 27, 2017
Pre-Amplifier EMCI	EMC12630SE	980384	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Spectrum Analyzer Keysight	N9030A	MY54490520	July 29, 2016	July 28, 2017
Pre-Amplifier EMCI	EMC184045SE	980386	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	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	FSv40	100964	June 28, 2016	June 27, 2017
Power meter Anritsu	ML2495A	1014008	May 5, 2016	May 4, 2017
Power sensor Anritsu	MA2411B	0917122	May 5, 2016	May 4, 2017
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 11, 2017	Jan. 10, 2018
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2016	Nov. 09, 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. The CANADA Site Registration No. is 20331-1
6 Loop antenna was used for all emissions below 30 MHz.
7. Tested Date: Apr. 12 to May 03, 2017

4.1.3 Test Procedure

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Both X and Y axes of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case 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.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 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:

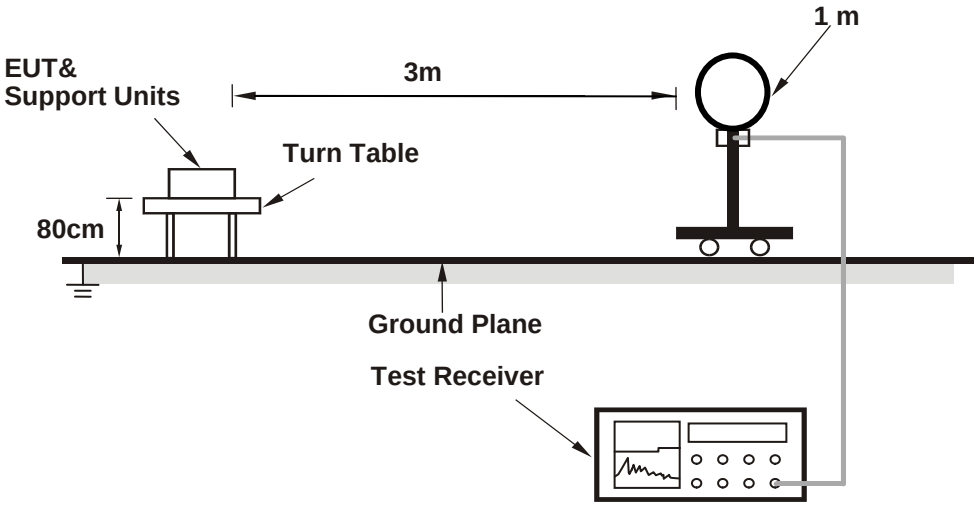
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

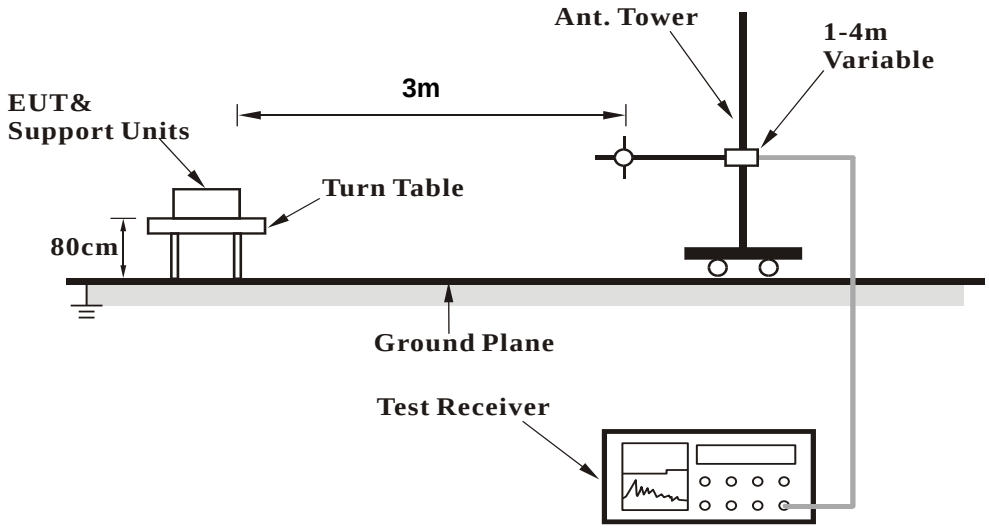
No deviation.

4.1.5 Test Setup

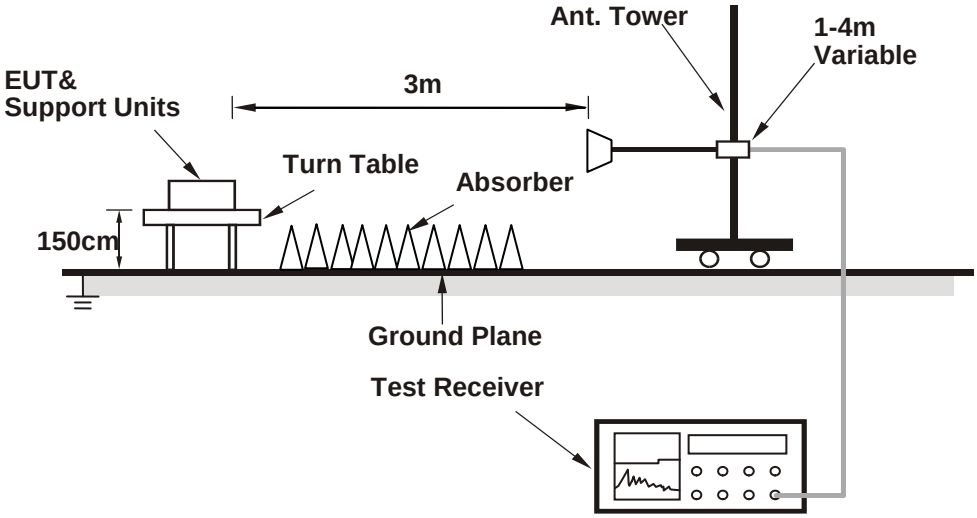
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the Laptop which is placed on remote site.

b. Contorlling software (QRCT.exe[Ver3.0.187.0]) 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	5150.00	49.8 PK	74.0	-24.2	2.53 H	149	46.1	3.7
2	5150.00	38.0 AV	54.0	-16.0	2.53 H	149	34.3	3.7
3	*5260.00	111.7 PK			2.53 H	149	107.7	4.0
4	*5260.00	100.4 AV			2.53 H	149	96.4	4.0
5	5350.00	50.7 PK	74.0	-23.3	2.53 H	149	46.6	4.1
6	5350.00	38.6 AV	54.0	-15.4	2.53 H	149	34.5	4.1
7	#10520.00	58.1 PK	74.0	-15.9	1.12 H	203	44.9	13.2
8	#10520.00	45.4 AV	54.0	-8.6	1.12 H	203	32.2	13.2
9	15780.00	49.6 PK	74.0	-24.4	1.85 H	158	36.0	13.6
10	15780.00	36.3 AV	54.0	-17.7	1.85 H	158	22.7	13.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	41.2 PK	74.0	-32.8	1.49 V	144	37.5	3.7
2	5150.00	32.1 AV	54.0	-21.9	1.49 V	144	28.4	3.7
3	*5260.00	104.8 PK			1.49 V	144	100.8	4.0
4	*5260.00	93.3 AV			1.49 V	144	89.3	4.0
5	5350.00	42.7 PK	74.0	-31.3	1.49 V	144	38.6	4.1
6	5350.00	32.7 AV	54.0	-21.3	1.49 V	144	28.6	4.1
7	#10520.00	55.3 PK	74.0	-18.7	3.95 V	360	42.1	13.2
8	#10520.00	42.1 AV	54.0	-11.9	3.95 V	360	28.9	13.2
9	15780.00	53.3 PK	74.0	-20.7	2.53 V	169	39.7	13.6
10	15780.00	38.2 AV	54.0	-15.8	2.53 V	169	24.6	13.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	112.4 PK			2.51 H	151	108.3	4.1
2	*5300.00	101.2 AV			2.51 H	151	97.1	4.1
3	5350.00	52.5 PK	74.0	-21.5	2.51 H	151	48.4	4.1
4	5350.00	40.2 AV	54.0	-13.8	2.51 H	151	36.1	4.1
5	10600.00	58.0 PK	74.0	-16.0	1.05 H	173	44.5	13.5
6	10600.00	45.4 AV	54.0	-8.6	1.05 H	173	31.9	13.5
7	15900.00	49.2 PK	74.0	-24.8	1.76 H	144	36.3	12.9
8	15900.00	35.9 AV	54.0	-18.1	1.76 H	144	23.0	12.9
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	*5300.00	105.5 PK			1.52 V	159	101.4	4.1
2	*5300.00	94.1 AV			1.52 V	159	90.0	4.1
3	5350.00	43.9 PK	74.0	-30.1	1.52 V	159	39.8	4.1
4	5350.00	34.3 AV	54.0	-19.7	1.52 V	159	30.2	4.1
5	10600.00	55.5 PK	74.0	-18.5	3.93 V	360	42.0	13.5
6	10600.00	42.5 AV	54.0	-11.5	3.93 V	360	29.0	13.5
7	15900.00	53.7 PK	74.0	-20.3	2.58 V	171	40.8	12.9
8	15900.00	38.5 AV	54.0	-15.5	2.58 V	171	25.6	12.9

REMARKS:

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

CHANNEL	TX Channel 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	112.8 PK			2.48 H	146	108.7	4.1
2	*5320.00	101.5 AV			2.48 H	146	97.4	4.1
3	5350.00	58.2 PK	74.0	-15.8	2.48 H	146	54.1	4.1
4	5350.00	45.0 AV	54.0	-9.0	2.48 H	146	40.9	4.1
5	10640.00	57.9 PK	74.0	-16.1	1.08 H	193	44.4	13.5
6	10640.00	45.2 AV	54.0	-8.8	1.08 H	193	31.7	13.5
7	15960.00	49.7 PK	74.0	-24.3	1.82 H	148	36.8	12.9
8	15960.00	36.1 AV	54.0	-17.9	1.82 H	148	23.2	12.9
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	*5320.00	105.9 PK			1.46 V	159	101.8	4.1
2	*5320.00	94.4 AV			1.46 V	159	90.3	4.1
3	5350.00	49.6 PK	74.0	-24.4	1.46 V	159	45.5	4.1
4	5350.00	39.1 AV	54.0	-14.9	1.46 V	159	35.0	4.1
5	10640.00	55.6 PK	74.0	-18.4	3.93 V	360	42.1	13.5
6	10640.00	42.2 AV	54.0	-11.8	3.93 V	360	28.7	13.5
7	15960.00	53.0 PK	74.0	-21.0	2.59 V	178	40.1	12.9
8	15960.00	37.9 AV	54.0	-16.1	2.59 V	178	25.0	12.9

REMARKS:

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

CHANNEL	TX Channel 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	#5470.00	63.9 PK	74.0	-10.1	2.55 H	172	59.7	4.2
2	#5470.00	47.6 AV	54.0	-6.4	2.55 H	172	43.4	4.2
3	*5500.00	115.2 PK			2.55 H	172	111.0	4.2
4	*5500.00	102.8 AV			2.55 H	172	98.6	4.2
5	11000.00	58.5 PK	74.0	-15.5	1.04 H	181	44.4	14.1
6	11000.00	45.8 AV	54.0	-8.2	1.04 H	181	31.7	14.1
7	#16500.00	48.8 PK	74.0	-25.2	1.80 H	170	34.3	14.5
8	#16500.00	35.5 AV	54.0	-18.5	1.80 H	170	21.0	14.5
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	55.3 PK	74.0	-18.7	1.53 V	140	51.1	4.2
2	#5470.00	41.7 AV	54.0	-12.3	1.53 V	140	37.5	4.2
3	*5500.00	108.3 PK			1.53 V	140	104.1	4.2
4	*5500.00	96.9 AV			1.53 V	140	92.7	4.2
5	11000.00	54.9 PK	74.0	-19.1	3.97 V	360	40.8	14.1
6	11000.00	41.8 AV	54.0	-12.2	3.97 V	360	27.7	14.1
7	#16500.00	53.6 PK	74.0	-20.4	2.59 V	164	39.1	14.5
8	#16500.00	38.3 AV	54.0	-15.7	2.59 V	164	23.8	14.5

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 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	115.0 PK			2.54 H	175	110.8	4.2
2	*5580.00	102.5 AV			2.54 H	175	98.3	4.2
3	11160.00	58.6 PK	74.0	-15.4	1.12 H	179	44.9	13.7
4	11160.00	45.6 AV	54.0	-8.4	1.12 H	179	31.9	13.7
5	#16740.00	49.4 PK	74.0	-24.6	1.82 H	156	33.7	15.7
6	#16740.00	36.0 AV	54.0	-18.0	1.82 H	156	20.3	15.7
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	*5580.00	108.1 PK			1.44 V	140	103.9	4.2
2	*5580.00	95.4 AV			1.44 V	140	91.2	4.2
3	11160.00	55.7 PK	74.0	-18.3	3.96 V	360	42.0	13.7
4	11160.00	42.5 AV	54.0	-11.5	3.96 V	360	28.8	13.7
5	#16740.00	53.4 PK	74.0	-20.6	2.55 V	183	37.7	15.7
6	#16740.00	38.1 AV	54.0	-15.9	2.55 V	183	22.4	15.7

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 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	114.2 PK			2.56 H	171	109.7	4.5
2	*5700.00	102.1 AV			2.56 H	171	97.6	4.5
3	#5725.00	67.2 PK	74.0	-6.8	2.56 H	171	62.8	4.4
4	#5725.00	50.8 AV	54.0	-3.2	2.56 H	171	46.4	4.4
5	11400.00	58.5 PK	74.0	-15.5	1.07 H	174	44.9	13.6
6	11400.00	45.5 AV	54.0	-8.5	1.07 H	174	31.9	13.6
7	#17100.00	48.9 PK	74.0	-25.1	1.79 H	147	31.5	17.4
8	#17100.00	35.8 AV	54.0	-18.2	1.79 H	147	18.4	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	*5700.00	107.3 PK			1.44 V	153	102.8	4.5
2	*5700.00	95.0 AV			1.44 V	153	90.5	4.5
3	#5725.00	67.2 PK	74.0	-6.8	1.44 V	153	62.8	4.4
4	#5725.00	44.9 AV	54.0	-9.1	1.44 V	153	40.5	4.4
5	11400.00	55.9 PK	74.0	-18.1	3.98 V	360	42.3	13.6
6	11400.00	42.5 AV	54.0	-11.5	3.98 V	360	28.9	13.6
7	#17100.00	53.0 PK	74.0	-21.0	2.56 V	179	35.6	17.4
8	#17100.00	38.1 AV	54.0	-15.9	2.56 V	179	20.7	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 144	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	#5470.00	50.4 PK	74.0	-23.6	2.50 H	170	46.2	4.2
2	#5470.00	37.7 AV	54.0	-16.3	2.50 H	170	33.5	4.2
3	*5720.00	114.7 PK			2.50 H	170	110.3	4.4
4	*5720.00	102.5 AV			2.50 H	170	98.1	4.4
5	#5850.00	51.7 PK	74.0	-22.3	2.50 H	170	47.2	4.5
6	#5850.00	38.1 AV	54.0	-15.9	2.50 H	170	33.6	4.5
7	11440.00	58.8 PK	74.0	-15.2	1.05 H	184	45.3	13.5
8	11440.00	46.0 AV	54.0	-8.0	1.05 H	184	32.5	13.5
9	#17160.00	49.0 PK	74.0	-25.0	1.84 H	157	31.7	17.3
10	#17160.00	35.7 AV	54.0	-18.3	1.84 H	157	18.4	17.3
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	#5470.00	41.8 PK	74.0	-32.2	1.43 V	141	37.6	4.2
2	#5470.00	31.8 AV	54.0	-22.2	1.43 V	141	27.6	4.2
3	*5720.00	107.8 PK			1.43 V	141	103.4	4.4
4	*5720.00	95.4 AV			1.43 V	141	91.0	4.4
5	#5850.00	43.1 PK	74.0	-30.9	1.43 V	141	38.6	4.5
6	#5850.00	32.2 AV	54.0	-21.8	1.43 V	141	27.7	4.5
7	11440.00	55.9 PK	74.0	-18.1	3.94 V	360	42.4	13.5
8	11440.00	42.4 AV	54.0	-11.6	3.94 V	360	28.9	13.5
9	#17160.00	52.9 PK	74.0	-21.1	2.49 V	181	35.6	17.3
10	#17160.00	37.9 AV	54.0	-16.1	2.49 V	181	20.6	17.3

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.

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	5150.00	50.1 PK	74.0	-23.9	2.62 H	139	46.4	3.7
2	5150.00	39.2 AV	54.0	-14.8	2.62 H	139	35.5	3.7
3	*5260.00	112.4 PK			2.62 H	139	108.4	4.0
4	*5260.00	101.5 AV			2.62 H	139	97.5	4.0
5	5350.00	50.8 PK	74.0	-23.2	2.62 H	139	46.7	4.1
6	5350.00	39.3 AV	54.0	-14.7	2.62 H	139	35.2	4.1
7	#10520.00	58.4 PK	74.0	-15.6	1.08 H	181	45.2	13.2
8	#10520.00	45.4 AV	54.0	-8.6	1.08 H	181	32.2	13.2
9	15780.00	49.2 PK	74.0	-24.8	1.87 H	156	35.6	13.6
10	15780.00	35.7 AV	54.0	-18.3	1.87 H	156	22.1	13.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	48.6 PK	74.0	-25.4	1.09 V	154	44.9	3.7
2	5150.00	38.6 AV	54.0	-15.4	1.09 V	154	34.9	3.7
3	*5260.00	103.9 PK			1.09 V	154	99.9	4.0
4	*5260.00	93.7 AV			1.09 V	154	89.7	4.0
5	5350.00	49.3 PK	74.0	-24.7	1.09 V	154	45.2	4.1
6	5350.00	38.7 AV	54.0	-15.3	1.09 V	154	34.6	4.1
7	#10520.00	55.7 PK	74.0	-18.3	3.87 V	360	42.5	13.2
8	#10520.00	42.1 AV	54.0	-11.9	3.87 V	360	28.9	13.2
9	15780.00	53.0 PK	74.0	-21.0	2.64 V	187	39.4	13.6
10	15780.00	37.7 AV	54.0	-16.3	2.64 V	187	24.1	13.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	112.2 PK			2.60 H	164	108.1	4.1
2	*5300.00	101.1 AV			2.60 H	164	97.0	4.1
3	10600.00	57.7 PK	74.0	-16.3	1.13 H	182	44.2	13.5
4	10600.00	45.3 AV	54.0	-8.7	1.13 H	182	31.8	13.5
5	15900.00	49.0 PK	74.0	-25.0	1.80 H	158	36.1	12.9
6	15900.00	35.6 AV	54.0	-18.4	1.80 H	158	22.7	12.9
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	*5300.00	103.7 PK			1.04 V	139	99.6	4.1
2	*5300.00	93.3 AV			1.04 V	139	89.2	4.1
3	10600.00	56.2 PK	74.0	-17.8	3.94 V	360	42.7	13.5
4	10600.00	42.6 AV	54.0	-11.4	3.94 V	360	29.1	13.5
5	15900.00	53.2 PK	74.0	-20.8	2.64 V	165	40.3	12.9
6	15900.00	38.1 AV	54.0	-15.9	2.64 V	165	25.2	12.9

REMARKS:

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

CHANNEL	TX Channel 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	112.5 PK			2.59 H	160	108.4	4.1
2	*5320.00	101.6 AV			2.59 H	160	97.5	4.1
3	5350.00	60.1 PK	74.0	-13.9	2.59 H	160	56.0	4.1
4	5350.00	44.7 AV	54.0	-9.3	2.59 H	160	40.6	4.1
5	10640.00	58.3 PK	74.0	-15.7	1.14 H	185	44.8	13.5
6	10640.00	45.4 AV	54.0	-8.6	1.14 H	185	31.9	13.5
7	15960.00	49.9 PK	74.0	-24.1	1.83 H	140	37.0	12.9
8	15960.00	36.1 AV	54.0	-17.9	1.83 H	140	23.2	12.9
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	*5320.00	104.0 PK			1.10 V	133	99.9	4.1
2	*5320.00	93.8 AV			1.10 V	133	89.7	4.1
3	5350.00	58.6 PK	74.0	-15.4	1.10 V	133	54.5	4.1
4	5350.00	44.1 AV	54.0	-9.9	1.10 V	133	40.0	4.1
5	10640.00	56.2 PK	74.0	-17.8	3.95 V	360	42.7	13.5
6	10640.00	42.5 AV	54.0	-11.5	3.95 V	360	29.0	13.5
7	15960.00	52.5 PK	74.0	-21.5	2.55 V	176	39.6	12.9
8	15960.00	37.6 AV	54.0	-16.4	2.55 V	176	24.7	12.9

REMARKS:

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

CHANNEL	TX Channel 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	#5470.00	61.3 PK	74.0	-12.7	2.51 H	159	57.1	4.2
2	#5470.00	48.1 AV	54.0	-5.9	2.51 H	159	43.9	4.2
3	*5500.00	114.4 PK			2.51 H	159	110.2	4.2
4	*5500.00	103.1 AV			2.51 H	159	98.9	4.2
5	11000.00	57.8 PK	74.0	-16.2	1.07 H	191	43.7	14.1
6	11000.00	44.8 AV	54.0	-9.2	1.07 H	191	30.7	14.1
7	#16500.00	49.9 PK	74.0	-24.1	1.78 H	137	35.4	14.5
8	#16500.00	36.3 AV	54.0	-17.7	1.78 H	137	21.8	14.5
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	59.8 PK	74.0	-14.2	1.11 V	162	55.6	4.2
2	#5470.00	47.5 AV	54.0	-6.5	1.11 V	162	43.3	4.2
3	*5500.00	105.9 PK			1.11 V	162	101.7	4.2
4	*5500.00	95.3 AV			1.11 V	162	91.1	4.2
5	11000.00	55.6 PK	74.0	-18.4	3.93 V	360	41.5	14.1
6	11000.00	42.4 AV	54.0	-11.6	3.93 V	360	28.3	14.1
7	#16500.00	53.0 PK	74.0	-21.0	2.56 V	179	38.5	14.5
8	#16500.00	38.2 AV	54.0	-15.8	2.56 V	179	23.7	14.5

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 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	114.2 PK			2.59 H	158	110.0	4.2
2	*5580.00	102.8 AV			2.59 H	158	98.6	4.2
3	11160.00	58.0 PK	74.0	-16.0	1.07 H	193	44.3	13.7
4	11160.00	45.5 AV	54.0	-8.5	1.07 H	193	31.8	13.7
5	#16740.00	49.4 PK	74.0	-24.6	1.85 H	164	33.7	15.7
6	#16740.00	36.0 AV	54.0	-18.0	1.85 H	164	20.3	15.7
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	*5580.00	105.2 PK			1.12 V	133	101.0	4.2
2	*5580.00	95.0 AV			1.12 V	133	90.8	4.2
3	11160.00	55.8 PK	74.0	-18.2	3.94 V	360	42.1	13.7
4	11160.00	42.3 AV	54.0	-11.7	3.94 V	360	28.6	13.7
5	#16740.00	52.9 PK	74.0	-21.1	2.64 V	193	37.2	15.7
6	#16740.00	37.5 AV	54.0	-16.5	2.64 V	193	21.8	15.7

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 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	113.5 PK			2.65 H	166	109.0	4.5
2	*5700.00	103.4 AV			2.65 H	166	98.9	4.5
3	#5725.00	68.5 PK	74.0	-5.5	2.65 H	166	64.1	4.4
4	**#5725.00**	**52.9 AV**	**54.0**	**-1.1**	**2.65 H**	**166**	**48.5**	**4.4**
5	11400.00	58.0 PK	74.0	-16.0	1.10 H	193	44.4	13.6
6	11400.00	45.1 AV	54.0	-8.9	1.10 H	193	31.5	13.6
7	#17100.00	49.8 PK	74.0	-24.2	1.77 H	164	32.4	17.4
8	#17100.00	36.3 AV	54.0	-17.7	1.77 H	164	18.9	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	*5700.00	105.8 PK			1.04 V	155	101.3	4.5
2	*5700.00	95.6 AV			1.04 V	155	91.1	4.5
3	#5725.00	67.0 PK	74.0	-7.0	1.04 V	155	62.6	4.4
4	#5725.00	52.3 AV	54.0	-1.7	1.04 V	155	47.9	4.4
5	11400.00	55.7 PK	74.0	-18.3	3.92 V	360	42.1	13.6
6	11400.00	42.4 AV	54.0	-11.6	3.92 V	360	28.8	13.6
7	#17100.00	53.1 PK	74.0	-20.9	2.62 V	184	35.7	17.4
8	#17100.00	38.0 AV	54.0	-16.0	2.62 V	184	20.6	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 144	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	#5470.00	50.1 PK	74.0	-23.9	2.63 H	164	45.9	4.2
2	#5470.00	37.5 AV	54.0	-16.5	2.63 H	164	33.3	4.2
3	*5720.00	113.7 PK			2.63 H	164	109.3	4.4
4	*5720.00	103.0 AV			2.63 H	164	98.6	4.4
5	#5850.00	50.7 PK	74.0	-23.3	2.63 H	164	46.2	4.5
6	#5850.00	38.5 AV	54.0	-15.5	2.63 H	164	34.0	4.5
7	11440.00	58.1 PK	74.0	-15.9	1.07 H	179	44.6	13.5
8	11440.00	45.3 AV	54.0	-8.7	1.07 H	179	31.8	13.5
9	#17160.00	50.1 PK	74.0	-23.9	1.78 H	163	32.8	17.3
10	#17160.00	36.2 AV	54.0	-17.8	1.78 H	163	18.9	17.3
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	#5470.00	48.6 PK	74.0	-25.4	1.13 V	152	44.4	4.2
2	#5470.00	36.9 AV	54.0	-17.1	1.13 V	152	32.7	4.2
3	*5720.00	105.4 PK			1.13 V	152	101.0	4.4
4	*5720.00	95.2 AV			1.13 V	152	90.8	4.4
5	#5850.00	49.2 PK	74.0	-24.8	1.13 V	152	44.7	4.5
6	#5850.00	37.9 AV	54.0	-16.1	1.13 V	152	33.4	4.5
7	11440.00	55.2 PK	74.0	-18.8	3.89 V	360	41.7	13.5
8	11440.00	41.9 AV	54.0	-12.1	3.89 V	360	28.4	13.5
9	#17160.00	52.6 PK	74.0	-21.4	2.63 V	192	35.3	17.3
10	#17160.00	37.4 AV	54.0	-16.6	2.63 V	192	20.1	17.3

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.

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	5150.00	49.3 PK	74.0	-24.7	2.39 H	126	45.6	3.7
2	5150.00	39.5 AV	54.0	-14.5	2.39 H	126	35.8	3.7
3	*5270.00	109.1 PK			2.39 H	126	105.1	4.0
4	*5270.00	100.4 AV			2.39 H	126	96.4	4.0
5	#10540.00	54.4 PK	74.0	-19.6	1.00 H	200	41.1	13.3
6	#10540.00	42.4 AV	54.0	-11.6	1.00 H	200	29.1	13.3
7	15810.00	46.8 PK	74.0	-27.2	1.87 H	170	33.4	13.4
8	15810.00	33.8 AV	54.0	-20.2	1.87 H	170	20.4	13.4
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	5150.00	50.2 PK	74.0	-23.8	1.15 V	84	46.5	3.7
2	5150.00	38.8 AV	54.0	-15.2	1.15 V	84	35.1	3.7
3	*5270.00	100.9 PK			1.15 V	84	96.9	4.0
4	*5270.00	92.7 AV			1.15 V	84	88.7	4.0
5	#10540.00	52.2 PK	74.0	-21.8	3.94 V	360	38.9	13.3
6	#10540.00	38.4 AV	54.0	-15.6	3.94 V	360	25.1	13.3
7	15810.00	46.5 PK	74.0	-27.5	2.50 V	142	33.1	13.4
8	15810.00	33.9 AV	54.0	-20.1	2.50 V	142	20.5	13.4

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 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	108.1 PK			2.70 H	174	104.0	4.1
2	*5310.00	98.4 AV			2.70 H	174	94.3	4.1
3	5350.00	65.2 PK	74.0	-8.8	2.70 H	174	61.1	4.1
4	5350.00	52.5 AV	54.0	-1.5	2.70 H	174	48.4	4.1
5	10620.00	54.3 PK	74.0	-19.7	1.07 H	188	40.8	13.5
6	10620.00	42.1 AV	54.0	-11.9	1.07 H	188	28.6	13.5
7	15930.00	45.7 PK	74.0	-28.3	1.87 H	165	32.9	12.8
8	15930.00	33.2 AV	54.0	-20.8	1.87 H	165	20.4	12.8
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	99.4 PK			1.12 V	92	95.3	4.1
2	*5310.00	90.2 AV			1.12 V	92	86.1	4.1
3	5350.00	63.8 PK	74.0	-10.2	1.12 V	92	59.7	4.1
4	5350.00	51.6 AV	54.0	-2.4	1.12 V	92	47.5	4.1
5	10620.00	51.6 PK	74.0	-22.4	3.95 V	360	38.1	13.5
6	10620.00	38.0 AV	54.0	-16.0	3.95 V	360	24.5	13.5
7	15930.00	46.3 PK	74.0	-27.7	2.61 V	168	33.5	12.8
8	15930.00	33.6 AV	54.0	-20.4	2.61 V	168	20.8	12.8

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	67.4 PK	74.0	-6.6	2.55 H	172	63.2	4.2
2	#5470.00	52.5 AV	54.0	-1.5	2.55 H	172	48.3	4.2
3	*5510.00	108.3 PK			2.55 H	172	104.1	4.2
4	*5510.00	99.3 AV			2.55 H	172	95.1	4.2
5	11020.00	54.6 PK	74.0	-19.4	1.04 H	190	40.6	14.0
6	11020.00	42.7 AV	54.0	-11.3	1.04 H	190	28.7	14.0
7	#16530.00	46.9 PK	74.0	-27.1	1.83 H	154	32.0	14.9
8	#16530.00	33.9 AV	54.0	-20.1	1.83 H	154	19.0	14.9
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	#5470.00	65.7 PK	74.0	-8.3	1.11 V	75	61.5	4.2
2	#5470.00	51.3 AV	54.0	-2.7	1.11 V	75	47.1	4.2
3	*5510.00	99.8 PK			1.11 V	75	95.6	4.2
4	*5510.00	91.3 AV			1.11 V	75	87.1	4.2
5	11020.00	52.5 PK	74.0	-21.5	3.98 V	360	38.5	14.0
6	11020.00	38.6 AV	54.0	-15.4	3.98 V	360	24.6	14.0
7	#16530.00	46.1 PK	74.0	-27.9	2.59 V	140	31.2	14.9
8	#16530.00	33.4 AV	54.0	-20.6	2.59 V	140	18.5	14.9

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.

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	#5470.00	55.5 PK	74.0	-18.5	2.29 H	167	51.3	4.2
2	#5470.00	42.1 AV	54.0	-11.9	2.29 H	167	37.9	4.2
3	*5550.00	110.9 PK			2.29 H	167	106.7	4.2
4	*5550.00	101.2 AV			2.29 H	167	97.0	4.2
5	#5725.00	51.3 PK	74.0	-22.7	2.29 H	167	46.9	4.4
6	#5725.00	38.5 AV	54.0	-15.5	2.29 H	167	34.1	4.4
7	11100.00	53.9 PK	74.0	-20.1	1.05 H	182	40.1	13.8
8	11100.00	42.2 AV	54.0	-11.8	1.05 H	182	28.4	13.8
9	#16650.00	46.5 PK	74.0	-27.5	1.80 H	165	30.9	15.6
10	#16650.00	33.4 AV	54.0	-20.6	1.80 H	165	17.8	15.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	53.8 PK	74.0	-20.2	1.13 V	90	49.6	4.2
2	#5470.00	40.8 AV	54.0	-13.2	1.13 V	90	36.6	4.2
3	*5550.00	102.4 PK			1.13 V	90	98.2	4.2
4	*5550.00	93.5 AV			1.13 V	90	89.3	4.2
5	#5725.00	50.5 PK	74.0	-23.5	1.13 V	90	46.1	4.4
6	#5725.00	38.2 AV	54.0	-15.8	1.13 V	90	33.8	4.4
7	11100.00	52.5 PK	74.0	-21.5	3.88 V	360	38.7	13.8
8	11100.00	38.5 AV	54.0	-15.5	3.88 V	360	24.7	13.8
9	#16650.00	46.0 PK	74.0	-28.0	2.48 V	149	30.4	15.6
10	#16650.00	33.2 AV	54.0	-20.8	2.48 V	149	17.6	15.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	111.5 PK			2.66 H	173	107.2	4.3
2	*5670.00	102.0 AV			2.66 H	173	97.7	4.3
3	#5725.00	58.9 PK	74.0	-15.1	2.66 H	173	54.5	4.4
4	#5725.00	47.4 AV	54.0	-6.6	2.66 H	173	43.0	4.4
5	11340.00	54.0 PK	74.0	-20.0	1.00 H	179	40.4	13.6
6	11340.00	41.8 AV	54.0	-12.2	1.00 H	179	28.2	13.6
7	#17010.00	46.1 PK	74.0	-27.9	1.85 H	158	29.0	17.1
8	#17010.00	33.5 AV	54.0	-20.5	1.85 H	158	16.4	17.1
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	*5670.00	103.4 PK			1.11 V	79	99.1	4.3
2	*5670.00	94.3 AV			1.11 V	79	90.0	4.3
3	#5725.00	57.2 PK	74.0	-16.8	1.11 V	79	52.8	4.4
4	#5725.00	46.5 AV	54.0	-7.5	1.11 V	79	42.1	4.4
5	11340.00	52.6 PK	74.0	-21.4	3.90 V	360	39.0	13.6
6	11340.00	38.8 AV	54.0	-15.2	3.90 V	360	25.2	13.6
7	#17010.00	46.4 PK	74.0	-27.6	2.44 V	154	29.3	17.1
8	#17010.00	33.5 AV	54.0	-20.5	2.44 V	154	16.4	17.1

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.

CHANNEL	TX Channel 142	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	50.7 PK	74.0	-23.3	2.63 H	176	46.5	4.2
2	#5470.00	37.5 AV	54.0	-16.5	2.63 H	176	33.3	4.2
3	*5710.00	111.9 PK			2.63 H	176	107.4	4.5
4	*5710.00	102.2 AV			2.63 H	176	97.7	4.5
5	#5850.00	50.8 PK	74.0	-23.2	2.63 H	176	46.3	4.5
6	#5850.00	38.3 AV	54.0	-15.7	2.63 H	176	33.8	4.5
7	11420.00	54.2 PK	74.0	-19.8	1.05 H	196	40.6	13.6
8	11420.00	42.0 AV	54.0	-12.0	1.05 H	196	28.4	13.6
9	#17130.00	46.1 PK	74.0	-27.9	1.87 H	164	28.7	17.4
10	#17130.00	33.2 AV	54.0	-20.8	1.87 H	164	15.8	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	#5470.00	50.6 PK	74.0	-23.4	1.11 V	89	46.4	4.2
2	#5470.00	37.3 AV	54.0	-16.7	1.11 V	89	33.1	4.2
3	*5710.00	103.6 PK			1.11 V	89	99.1	4.5
4	*5710.00	94.5 AV			1.11 V	89	90.0	4.5
5	#5850.00	50.7 PK	74.0	-23.3	1.11 V	89	46.2	4.5
6	#5850.00	38.1 AV	54.0	-15.9	1.11 V	89	33.6	4.5
7	11420.00	52.3 PK	74.0	-21.7	3.96 V	360	38.7	13.6
8	11420.00	38.2 AV	54.0	-15.8	3.96 V	360	24.6	13.6
9	#17130.00	46.5 PK	74.0	-27.5	2.53 V	143	29.1	17.4
10	#17130.00	33.9 AV	54.0	-20.1	2.53 V	143	16.5	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.

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	49.1 PK	74.0	-24.9	2.02 H	173	45.4	3.7
2	5150.00	38.9 AV	54.0	-15.1	2.02 H	173	35.2	3.7
3	*5290.00	103.6 PK			2.02 H	173	99.5	4.1
4	*5290.00	93.9 AV			2.02 H	173	89.8	4.1
5	5350.00	64.3 PK	74.0	-9.7	2.02 H	173	60.2	4.1
6	5350.00	52.5 AV	54.0	-1.5	2.02 H	173	48.4	4.1
7	#10580.00	51.8 PK	74.0	-22.2	1.00 H	186	38.4	13.4
8	#10580.00	35.9 AV	54.0	-18.1	1.00 H	186	22.5	13.4
9	15870.00	49.5 PK	74.0	-24.5	1.89 H	150	36.5	13.0
10	15870.00	34.8 AV	54.0	-19.2	1.89 H	150	21.8	13.0
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	49.3 PK	74.0	-24.7	1.08 V	88	45.6	3.7
2	5150.00	38.1 AV	54.0	-15.9	1.08 V	88	34.4	3.7
3	*5290.00	94.5 PK			1.08 V	88	90.4	4.1
4	*5290.00	86.3 AV			1.08 V	88	82.2	4.1
5	5350.00	63.3 PK	74.0	-10.7	1.08 V	88	59.2	4.1
6	5350.00	51.8 AV	54.0	-2.2	1.08 V	88	47.7	4.1
7	#10580.00	50.7 PK	74.0	-23.3	3.92 V	360	37.3	13.4
8	#10580.00	35.0 AV	54.0	-19.0	3.92 V	360	21.6	13.4
9	15870.00	49.5 PK	74.0	-24.5	2.49 V	161	36.5	13.0
10	15870.00	34.1 AV	54.0	-19.9	2.49 V	161	21.1	13.0

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	65.7 PK	74.0	-8.3	2.51 H	183	61.5	4.2
2	#5470.00	52.5 AV	54.0	-1.5	2.51 H	183	48.3	4.2
3	*5530.00	103.5 PK			2.51 H	183	99.3	4.2
4	*5530.00	94.4 AV			2.51 H	183	90.2	4.2
5	#5725.00	49.9 PK	74.0	-24.1	2.51 H	183	45.5	4.4
6	#5725.00	37.8 AV	54.0	-16.2	2.51 H	183	33.4	4.4
7	11060.00	50.8 PK	74.0	-23.2	1.08 H	171	36.9	13.9
8	11060.00	35.7 AV	54.0	-18.3	1.08 H	171	21.8	13.9
9	#16590.00	49.7 PK	74.0	-24.3	1.79 H	168	34.1	15.6
10	#16590.00	34.7 AV	54.0	-19.3	1.79 H	168	19.1	15.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	63.8 PK	74.0	-10.2	1.13 V	92	59.6	4.2
2	#5470.00	51.8 AV	54.0	-2.2	1.13 V	92	47.6	4.2
3	*5530.00	94.7 PK			1.13 V	92	90.5	4.2
4	*5530.00	86.4 AV			1.13 V	92	82.2	4.2
5	#5725.00	49.7 PK	74.0	-24.3	1.13 V	92	45.3	4.4
6	#5725.00	37.2 AV	54.0	-16.8	1.13 V	92	32.8	4.4
7	11060.00	51.3 PK	74.0	-22.7	3.86 V	360	37.4	13.9
8	11060.00	35.4 AV	54.0	-18.6	3.86 V	360	21.5	13.9
9	#16590.00	49.8 PK	74.0	-24.2	2.53 V	170	34.2	15.6
10	#16590.00	34.2 AV	54.0	-19.8	2.53 V	170	18.6	15.6

REMARKS:

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

CHANNEL	TX Channel 122	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	*5610.00	107.3 PK			2.57 H	169	102.9	4.4
2	*5610.00	98.1 AV			2.57 H	169	93.7	4.4
3	#5725.00	58.8 PK	74.0	-15.2	2.57 H	169	54.4	4.4
4	#5725.00	46.9 AV	54.0	-7.1	2.57 H	169	42.5	4.4
5	11220.00	51.2 PK	74.0	-22.8	1.10 H	163	37.5	13.7
6	11220.00	36.0 AV	54.0	-18.0	1.10 H	163	22.3	13.7
7	#16830.00	50.5 PK	74.0	-23.5	1.83 H	169	34.6	15.9
8	#16830.00	35.4 AV	54.0	-18.6	1.83 H	169	19.5	15.9
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	*5610.00	98.7 PK			1.11 V	91	94.3	4.4
2	*5610.00	90.2 AV			1.11 V	91	85.8	4.4
3	#5725.00	57.3 PK	74.0	-16.7	1.11 V	91	52.9	4.4
4	#5725.00	45.4 AV	54.0	-8.6	1.11 V	91	41.0	4.4
5	11220.00	51.0 PK	74.0	-23.0	3.96 V	360	37.3	13.7
6	11220.00	35.3 AV	54.0	-18.7	3.96 V	360	21.6	13.7
7	#16830.00	49.8 PK	74.0	-24.2	2.51 V	170	33.9	15.9
8	#16830.00	34.5 AV	54.0	-19.5	2.51 V	170	18.6	15.9

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.

CHANNEL	TX Channel 138	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	53.8 PK	74.0	-20.2	2.41 H	169	49.6	4.2
2	#5470.00	39.4 AV	54.0	-14.6	2.41 H	169	35.2	4.2
3	*5690.00	108.8 PK			2.41 H	169	104.3	4.5
4	*5690.00	98.9 AV			2.41 H	169	94.4	4.5
5	#5850.00	55.3 PK	74.0	-18.7	2.41 H	169	50.8	4.5
6	#5850.00	43.0 AV	54.0	-11.0	2.41 H	169	38.5	4.5
7	11380.00	52.3 PK	74.0	-21.7	1.06 H	188	38.7	13.6
8	11380.00	36.7 AV	54.0	-17.3	1.06 H	188	23.1	13.6
9	#17070.00	50.3 PK	74.0	-23.7	1.84 H	143	33.0	17.3
10	#17070.00	34.9 AV	54.0	-19.1	1.84 H	143	17.6	17.3
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	#5470.00	52.7 PK	74.0	-21.3	1.09 V	95	48.5	4.2
2	#5470.00	38.7 AV	54.0	-15.3	1.09 V	95	34.5	4.2
3	*5690.00	99.4 PK			1.09 V	95	94.9	4.5
4	*5690.00	90.7 AV			1.09 V	95	86.2	4.5
5	#5850.00	54.0 PK	74.0	-20.0	1.09 V	95	49.5	4.5
6	#5850.00	42.1 AV	54.0	-11.9	1.09 V	95	37.6	4.5
7	11380.00	51.1 PK	74.0	-22.9	3.91 V	360	37.5	13.6
8	11380.00	35.6 AV	54.0	-18.4	3.91 V	360	22.0	13.6
9	#17070.00	50.2 PK	74.0	-23.8	2.52 V	146	32.9	17.3
10	#17070.00	34.5 AV	54.0	-19.5	2.52 V	146	17.2	17.3

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.

Below 1GHz Data:

802.11ac (VHT20)

CHANNEL	TX Channel 60	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 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	30.99	25.3 QP	40.0	-14.7	1.50 H	331	34.9	-9.6
2	71.42	26.6 QP	40.0	-13.4	1.00 H	275	37.5	-10.9
3	164.71	35.3 QP	43.5	-8.2	1.00 H	265	43.7	-8.4
4	250.00	28.1 QP	46.0	-17.9	1.50 H	277	37.6	-9.5
5	786.53	29.7 QP	46.0	-16.3	1.00 H	144	26.8	2.9
6	952.42	31.0 QP	46.0	-15.0	2.00 H	139	26.5	4.5
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	53.91	34.9 QP	40.0	-5.1	1.00 V	150	43.2	-8.3
2	72.32	32.1 QP	40.0	-7.9	2.00 V	332	43.3	-11.2
3	163.79	34.3 QP	43.5	-9.2	1.00 V	147	42.6	-8.3
4	499.99	30.4 QP	46.0	-15.6	1.00 V	174	33.1	-2.7
5	644.33	29.4 QP	46.0	-16.6	1.00 V	319	29.0	0.4
6	897.71	30.8 QP	46.0	-15.2	1.50 V	74	26.8	4.0

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2016	Oct. 23, 2017
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 13, 2016	June 12, 2017
50 ohms Terminator	N/A	EMC-02	Sep. 29, 2016	Sep. 28, 2017
RF Cable	5D-FB	COCCAB-001	Sep. 30, 2016	Sep. 29, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 20, 2016	June 19, 2017
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 1.
3 Tested Date: May 02, 2017

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.

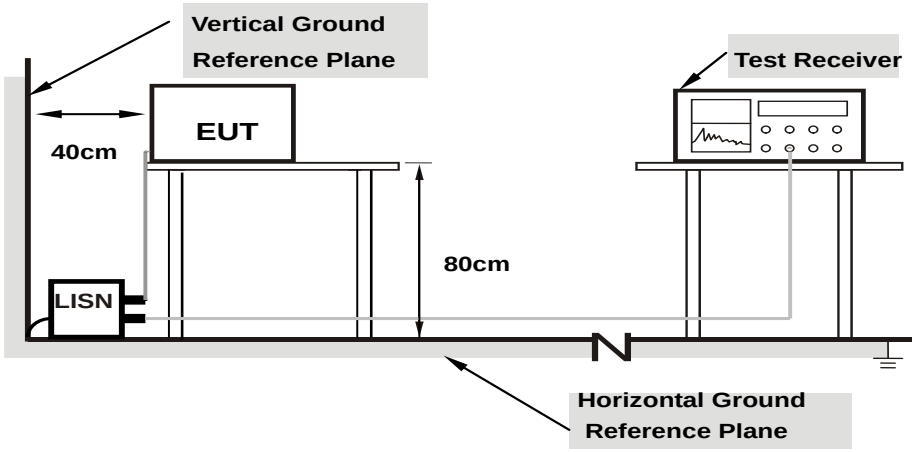
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

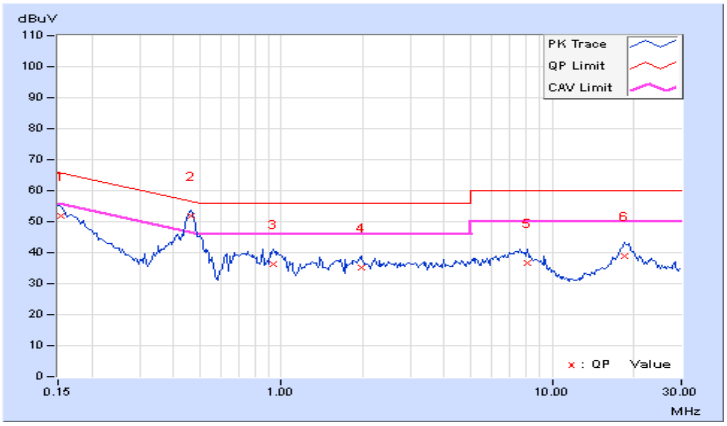
4.2.7 Test Results

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	10.19	41.57	26.90	51.76	37.09	65.79	55.79	-14.03	-18.70
2	**0.46250**	**10.22**	**41.52**	**34.06**	**51.74**	**44.28**	**56.65**	**46.65**	**-4.91**	**-2.37**
3	0.93906	10.26	26.20	18.65	36.46	28.91	56.00	46.00	-19.54	-17.09
4	1.97656	10.24	24.87	16.16	35.11	26.40	56.00	46.00	-20.89	-19.60
5	8.08203	10.45	26.11	20.37	36.56	30.82	60.00	50.00	-23.44	-19.18
6	18.51563	11.28	27.73	23.22	39.01	34.50	60.00	50.00	-20.99	-15.50

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.

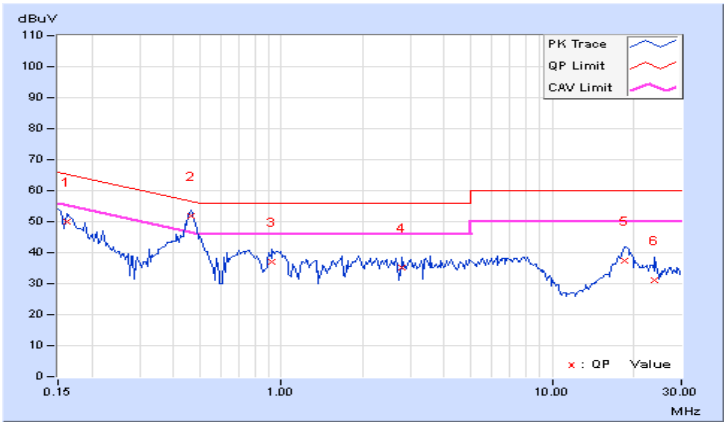


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.16172	10.18	39.86	24.81	50.04	34.99	65.38	55.38	-15.34	-20.39
2	0.46250	10.21	41.60	34.02	51.81	44.23	56.65	46.65	-4.84	-2.42
3	0.92734	10.23	26.86	17.64	37.09	27.87	56.00	46.00	-18.91	-18.13
4	2.80469	10.23	24.99	18.22	35.22	28.45	56.00	46.00	-20.78	-17.55
5	18.48828	11.03	26.52	21.71	37.55	32.74	60.00	50.00	-22.45	-17.26
6	24.00000	11.08	19.86	13.72	30.94	24.80	60.00	50.00	-29.06	-25.20

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,

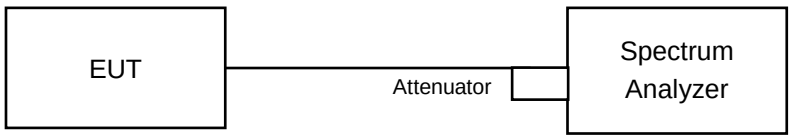
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

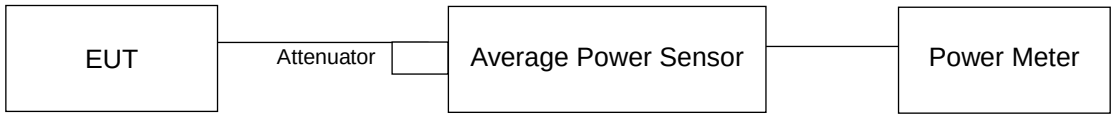
4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

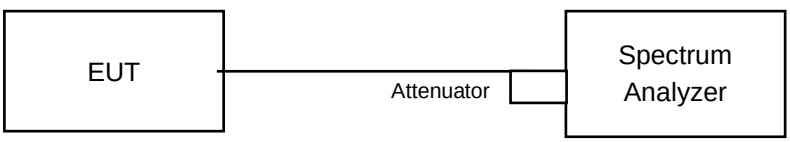
For channel straddling 5725MHz:



For other channels:



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 Average Power Measurement

For channel straddling 5725MHz:

Method SA-2

1. Set span to encompass the emission bandwidth (EBW) of the signal.
2. Set RBW =1MHz.
3. Set the VBW ≥ 3 x RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Detector = RMS.
7. Trace average at least 100 traces in power averaging mode
8. Compute power by integrating the spectrum across the 26 dB EBW of the signal.
9. Duty factor need added to measured value (duty cycle < 98 percent).

For other channels:

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.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		CHAIN 0	CHAIN 1				
52	5260	17.53	17.31	110.451	20.43	23.92	Pass
60	5300	17.38	17.47	110.549	20.44	23.92	Pass
64	5320	17.25	17.99	116.039	20.65	23.95	Pass
100	5500	17.56	17.46	112.735	20.52	23.99	Pass
116	5580	17.48	17.65	114.186	20.58	24.00	Pass
140	5700	17.18	17.78	112.219	20.50	24.00	Pass
*144 (UNII-2C Band)	5720	12.30	12.59	36.432	15.61	22.86	Pass
*144 (UNII-3 Band)	5720	6.26	6.69	9.222	9.65	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
144	5720	45.654	16.59
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	19.85	19.60
60	5300	19.61	19.64
64	5320	19.75	20.65
100	5500	21.22	19.95
116	5580	20.78	20.74
140	5700	20.53	21.16
144 (UNII-2C Band)	5720	15.35	15.62

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	19.60	23.92 > 24
60	5300	19.61	23.92 > 24
64	5320	19.75	23.95 > 24
100	5500	19.95	23.99 > 24
116	5580	20.74	24.16 > 24
140	5700	20.53	24.12 > 24
144 (UNII-2C Band)	5720	15.35	22.86 < 24

802.11ac (VHT20)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		CHAIN 0	CHAIN 1				
52	5260	17.45	17.25	108.678	20.36	24.00	Pass
60	5300	17.39	17.45	110.418	20.43	24.00	Pass
64	5320	17.33	18.08	118.344	20.73	24.00	Pass
100	5500	17.57	17.55	114.033	20.57	24.00	Pass
116	5580	17.54	17.73	116.047	20.65	24.00	Pass
140	5700	17.15	17.87	113.115	20.54	24.00	Pass
*144 (UNII-2C Band)	5720	12.29	13.28	39.244	15.94	23.02	Pass
*144 (UNII-3 Band)	5720	6.65	7.68	10.765	10.32	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
144	5720	50.009	16.99
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	21.38	21.01
60	5300	21.04	20.60
64	5320	20.73	20.87
100	5500	20.91	20.66
116	5580	21.10	21.31
140	5700	20.68	26.36
144 (UNII-2C Band)	5720	15.95	16.79

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.01	24.22 > 24
60	5300	20.60	24.13 > 24
64	5320	20.73	24.16 > 24
100	5500	20.66	24.15 > 24
116	5580	21.10	24.24 > 24
140	5700	20.68	24.15 > 24
144 (UNII-2C Band)	5720	15.95	23.02 < 24

802.11ac (VHT40)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		CHAIN 0	CHAIN 1				
54	5270	17.79	17.43	115.452	20.62	24.00	Pass
62	5310	16.68	16.61	92.373	19.66	24.00	Pass
102	5510	15.94	15.88	77.99	18.92	24.00	Pass
110	5550	17.29	17.29	107.16	20.30	24.00	Pass
134	5670	17.26	17.70	112.095	20.50	24.00	Pass
*142 (UNII-2C Band)	5710	12.43	13.09	39.918	16.01	24.00	Pass
*142 (UNII-3 Band)	5710	-1.77	2.35	2.5122	4.00	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
142	5710	42.4302	16.28
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	41.28	41.14
62	5310	40.89	41.11
102	5510	40.80	41.03
110	5550	41.53	40.96
134	5670	41.22	47.54
142 (UNII-2C Band)	5710	35.52	36.85

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.14	27.14 > 24
62	5310	40.89	27.11 > 24
102	5510	40.80	27.1 > 24
110	5550	40.96	27.12 > 24
134	5670	41.22	27.15 > 24
142 (UNII-2C Band)	5710	35.52	26.5 > 24

802.11ac (VHT80)

CHAN.	CHAN. FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		CHAIN 0	CHAIN 1				
58	5290	15.98	15.78	77.472	18.89	24.00	Pass
106	5530	14.25	14.28	53.399	17.28	24.00	Pass
122	5610	17.20	17.35	106.806	20.29	24.00	Pass
*138 (UNII-2C Band)	5690	11.58	12.36	35.48	15.50	24.00	Pass
*138 (UNII-3 Band)	5690	-2.01	-1.90	1.4314	1.56	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

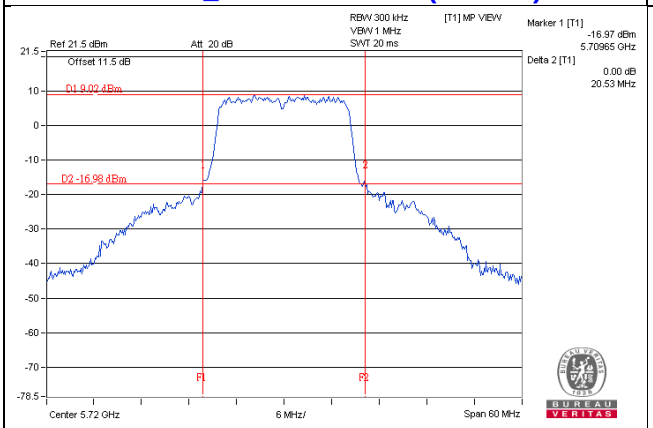
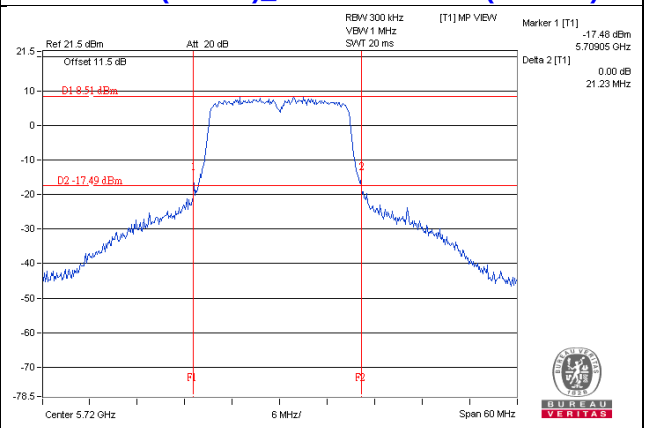
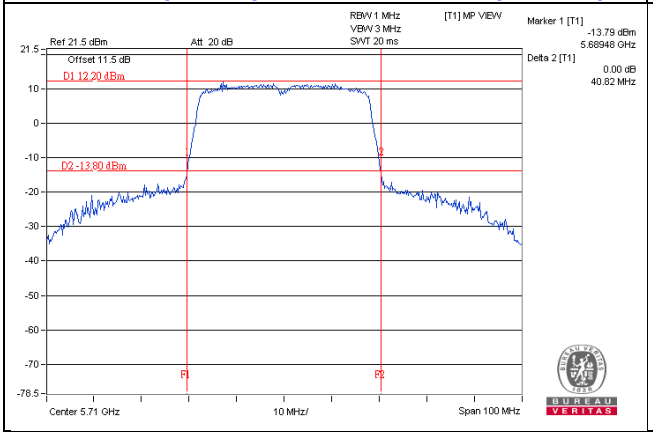
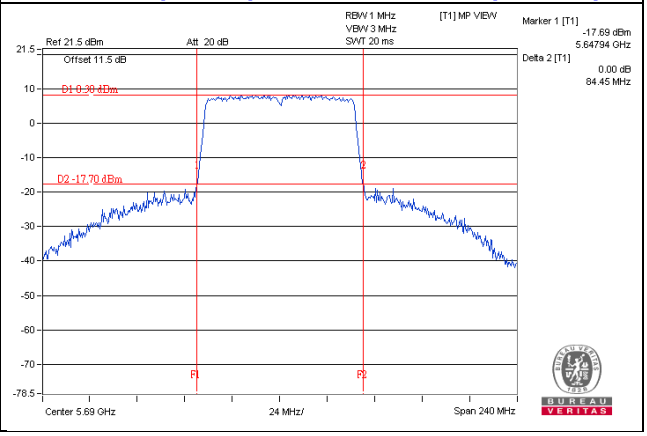
Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
138	5690	36.9114	15.67
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	84.54	83.14
106	5530	83.47	83.85
122	5610	84.04	84.27
138 (UNII-2C Band)	5690	77.06	99.50

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	83.14	30.19 > 24
106	5530	83.47	30.21 > 24
122	5610	84.04	30.24 > 24
138 (UNII-2C Band)	5690	77.06	29.86 > 24

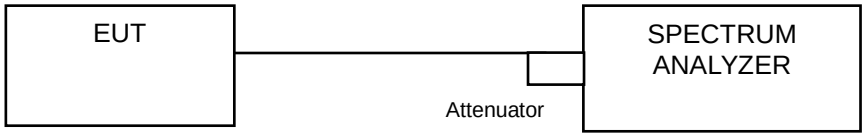
Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH144 (UNII-2C)	**802.11ac (VHT20)_Chain 0 / CH144 (UNII-2C)**
	
802.11ac (VHT40) _Chain 0 / CH142 (UNII-2C)	**802.11ac (VHT80) _Chain 0 / CH138 (UNII-2C)**
	

NOTE:

For CH144 (U_NII-2C) = 5725MHz - Marker 1
For CH142 (U_NII-2C) = 5725MHz - Marker 1
For CH138 (U_NII-2C) = 5725MHz - Marker 1

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
52	5260	16.56	16.56
60	5300	16.56	16.56
64	5320	16.56	16.56
100	5500	16.56	16.56
116	5580	16.56	16.56
140	5700	16.56	16.56
144 (UNII-2C Band)	5720	13.40	13.40
144 (UNII-3 Band)	5720	3.16	3.16

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
52	5260	17.76	17.76
60	5300	17.76	17.76
64	5320	17.76	17.76
100	5500	17.76	17.76
116	5580	17.76	17.76
140	5700	17.76	17.76
144 (UNII-2C Band)	5720	14.00	14.00
144 (UNII-3 Band)	5720	3.76	3.76

802.11ac (VHT40)

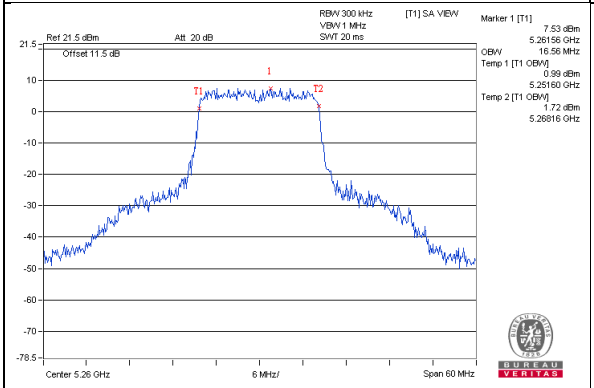
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
54	5270	36.48	36.24
62	5310	36.24	36.24
102	5510	36.24	36.24
110	5550	36.48	36.24
134	5670	36.24	36.48
142 (UNII-2C Band)	5710	33.40	33.40
142 (UNII-3 Band)	5710	3.00	3.00

802.11ac (VHT80)

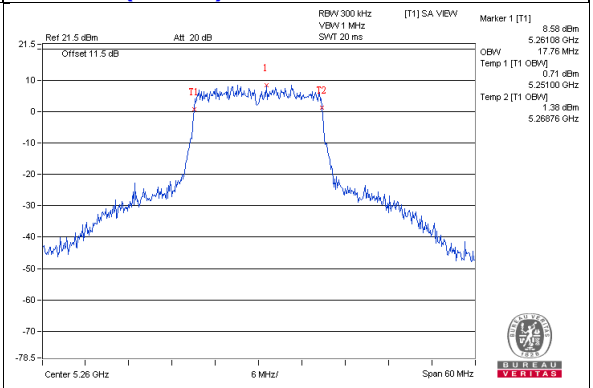
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
58	5290	75.36	75.84
106	5530	75.84	75.84
122	5610	76.32	75.84
138 (UNII-2C Band)	5690	72.92	73.40
138 (UNII-3 Band)	5690	2.92	2.92

Spectrum Plot of Worst Value

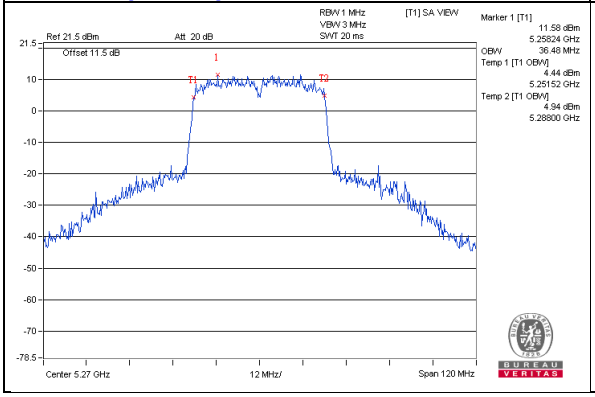
802.11a_Chain0 / CH52



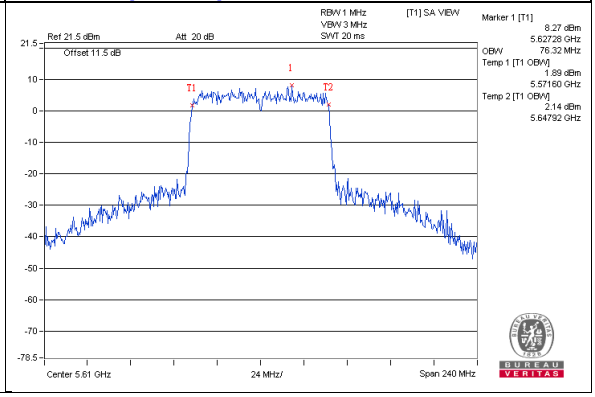
802.11ac (VHT20)_Chain0 / CH52



802.11ac (VHT40)_Chain0 / CH54



802.11ac (VHT80)_Chain0/ CH122

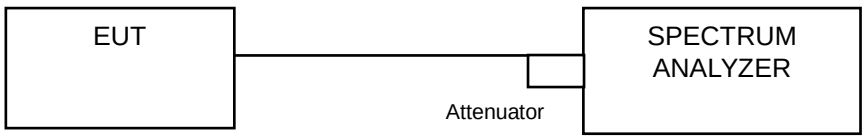


4.5 Peak Power Spectral Density Measurement

4.5.1 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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-2A, UNII-2C:

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:

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)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-2A & 2C:

802.11a

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				
52	5260	3.48	3.18	0.16	6.50	11.00	Pass
60	5300	3.28	3.61	0.16	6.62	11.00	Pass
64	5320	2.90	4.02	0.16	6.66	11.00	Pass
100	5500	4.02	3.39	0.16	6.88	11.00	Pass
116	5580	4.00	3.84	0.16	7.09	11.00	Pass
140	5700	3.22	2.83	0.16	6.20	11.00	Pass
144 (UNII-2C Band)	5720	3.41	3.42	0.16	6.58	11.00	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] = 5.07dBi < 6dBi , so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

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				
52	5260	3.88	3.50	0.11	6.82	11.00	Pass
60	5300	3.33	3.27	0.11	6.42	11.00	Pass
64	5320	3.34	4.11	0.11	6.87	11.00	Pass
100	5500	3.43	3.41	0.11	6.54	11.00	Pass
116	5580	3.86	3.83	0.11	6.97	11.00	Pass
140	5700	2.73	3.98	0.11	6.52	11.00	Pass
144 (UNII-2C Band)	5720	2.80	3.64	0.11	6.36	11.00	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] = 5.07dBi < 6dBi , so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

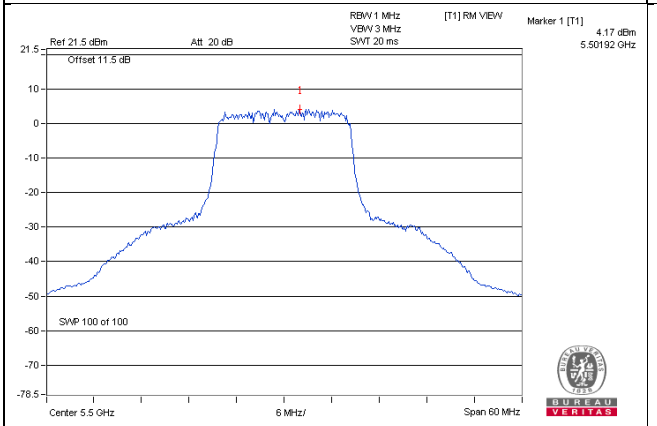
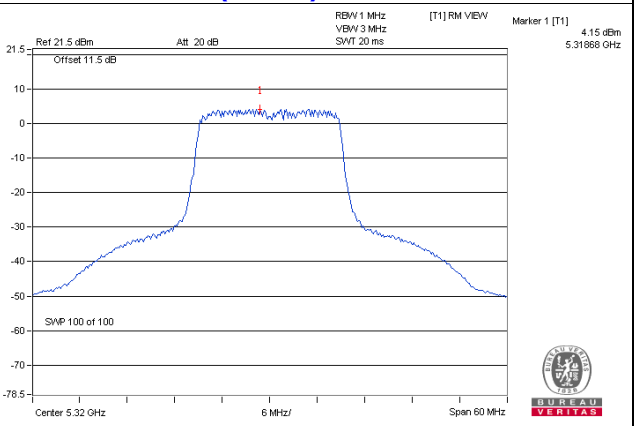
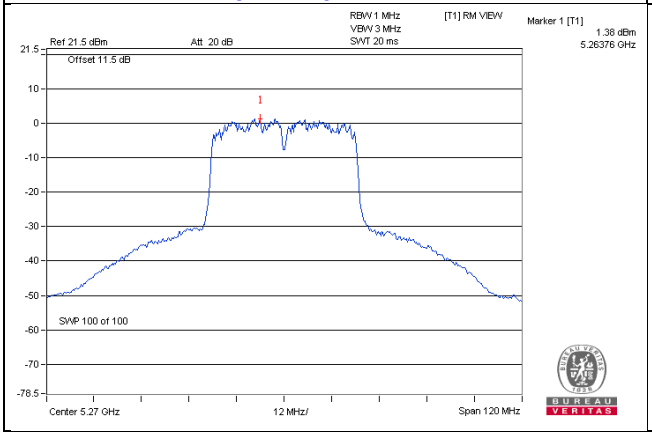
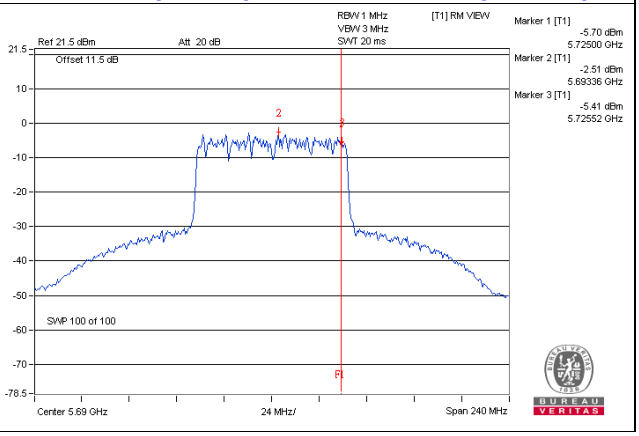
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	1.31	0.39	0.23	4.11	11.00	Pass
62	5310	0.05	0.07	0.23	3.30	11.00	Pass
102	5510	-0.97	-1.15	0.23	2.18	11.00	Pass
110	5550	1.09	0.61	0.23	4.10	11.00	Pass
134	5670	0.44	-0.01	0.23	3.46	11.00	Pass
142 (UNII-2C Band)	5710	0.00	0.62	0.23	3.56	11.00	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] = 5.07dBi < 6dBi , so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	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				
58	5290	-4.17	-4.40	0.50	-0.77	11.00	Pass
106	5530	-5.18	-7.67	0.50	-2.74	11.00	Pass
122	5610	-3.32	-2.78	0.50	0.47	11.00	Pass
138 (UNII-2C Band)	5690	-3.61	-2.51	0.50	0.49	11.00	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] = 5.07dBi < 6dBi , so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH100	**802.11ac (VHT20)_Chain 1 / CH64**
	
802.11ac (VHT40)_Chain 0 / CH54	**802.11ac (VHT80)_Chain 1 / CH138 (UNII-2C)**
	

For U-NII-3:

802.11a

TX chain	Chan.	Chan. Freq. (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	144 (U-NII-3 Band)	5720	-5.59	-3.37	3.01	0.16	-0.20	30.00	Pass
1	144 (U-NII-3 Band)	5720	-5.30	-3.08	3.01	0.16	0.09	30.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.07dBi < 6dBi , so the power density limit shall not be reduced.

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

802.11ac (VHT20)

TX chain	Chan.	Chan. Freq. (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	144 (U-NII-3 Band)	5720	-6.55	-4.33	3.01	0.11	-1.21	30.00	Pass
1	144 (U-NII-3 Band)	5720	-4.77	-2.55	3.01	0.11	0.57	30.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.07dBi < 6dBi , so the power density limit shall not be reduced.

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

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (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	142 (U-NII-3 Band)	5710	-9.82	-7.60	3.01	0.23	-4.36	30.00	Pass
1	142 (U-NII-3 Band)	5710	-9.34	-7.12	3.01	0.23	-3.88	30.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.07dBi < 6dBi , so the power density limit shall not be reduced.

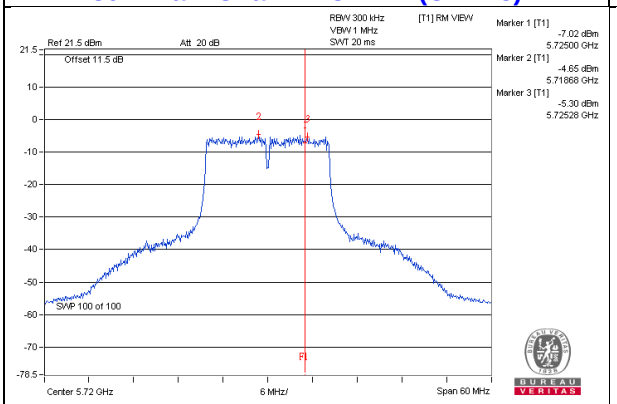
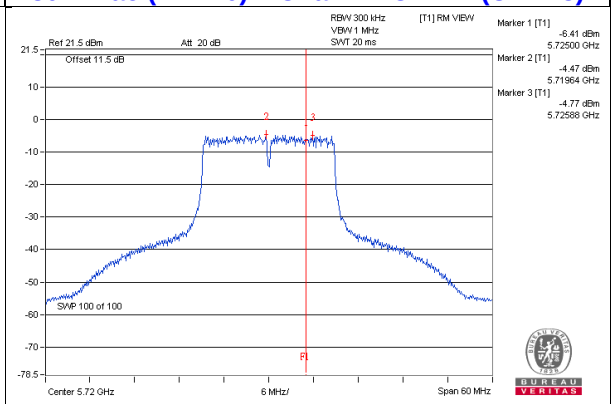
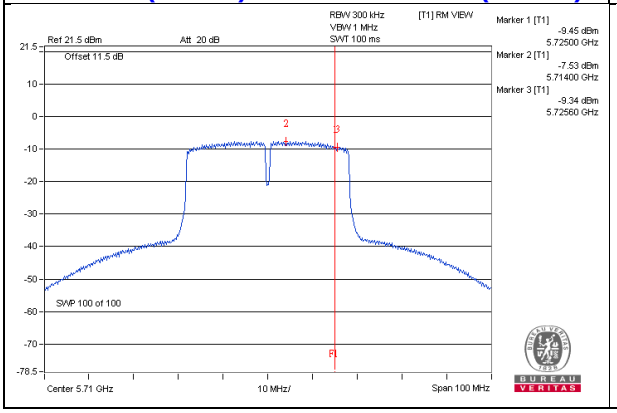
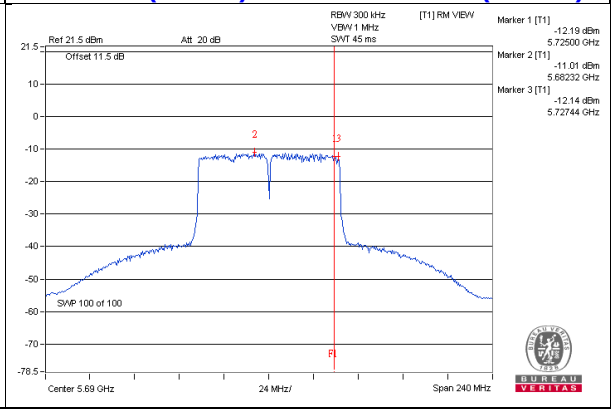
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Chan. Freq. (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	138 (U-NII-3 Band)	5690	-13.23	-11.01	3.01	0.50	-7.50	30.00	Pass
1	138 (U-NII-3 Band)	5690	-12.14	-9.92	3.01	0.50	-6.41	30.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.07dBi < 6dBi , so the power density limit shall not be reduced.

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

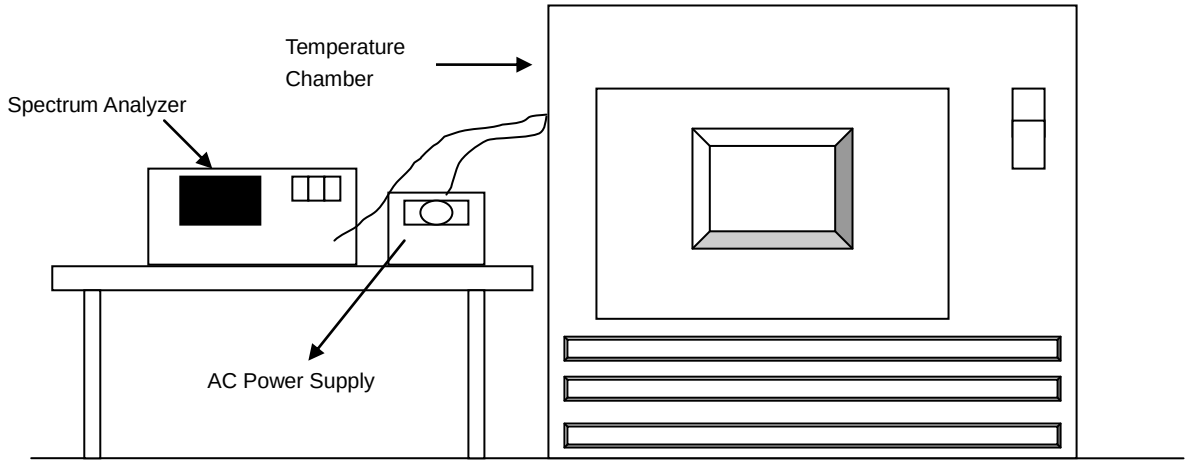
Spectrum Plot of Worst Value	
802.11a – Chain 1: CH 144(U-NII-3)	**802.11ac (VHT20) – Chain 1: CH 144(U-NII-3)**
	
802.11ac (VHT40) – Chain 1: CH 142(U-NII-3)	**802.11ac (VHT80) – Chain 1: CH 138(U-NII-3)**
	

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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.
.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 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	5260.0094	PASS	5260.0097	PASS	5260.0078	PASS	5260.0098	PASS
40	120	5259.9879	PASS	5259.9916	PASS	5259.9885	PASS	5259.9897	PASS
30	120	5260.0052	PASS	5260.0055	PASS	5260.0031	PASS	5260.0052	PASS
20	120	5260.0191	PASS	5260.0198	PASS	5260.0183	PASS	5260.0177	PASS
10	120	5259.9885	PASS	5259.987	PASS	5259.988	PASS	5259.9886	PASS
0	120	5259.9866	PASS	5259.9855	PASS	5259.9829	PASS	5259.9869	PASS
-10	120	5260.0262	PASS	5260.0279	PASS	5260.0235	PASS	5260.0251	PASS
-20	120	5259.9964	PASS	5259.9957	PASS	5259.9968	PASS	5259.9936	PASS
-30	120	5260.0108	PASS	5260.0083	PASS	5260.0123	PASS	5260.0096	PASS

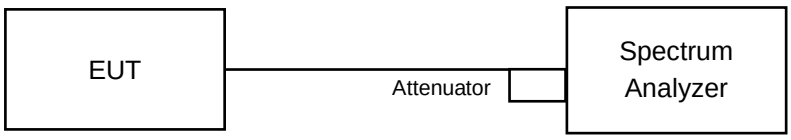
Frequency Stability Versus Voltage									
Operating Frequency: 5260 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5260.019	PASS	5260.0196	PASS	5260.0193	PASS	5260.0184	PASS
	120	5260.0191	PASS	5260.0198	PASS	5260.0183	PASS	5260.0177	PASS
	102	5260.0187	PASS	5260.0207	PASS	5260.0193	PASS	5260.0179	PASS

4.7 6dB Bandwidth Measurment

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144 (UNII-3 Band)	5720	3.10	3.10	0.5	PASS

802.11ac (VHT20)

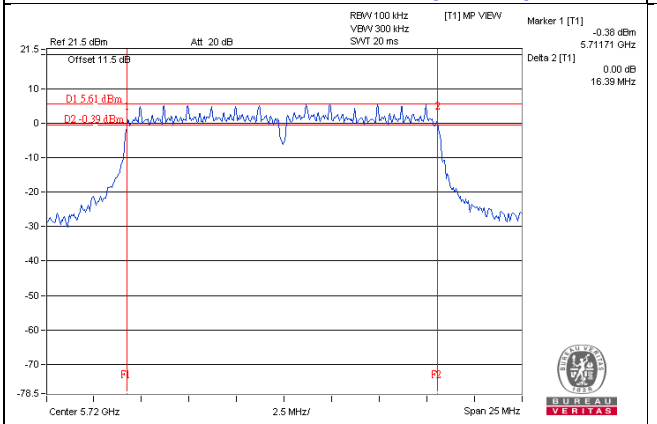
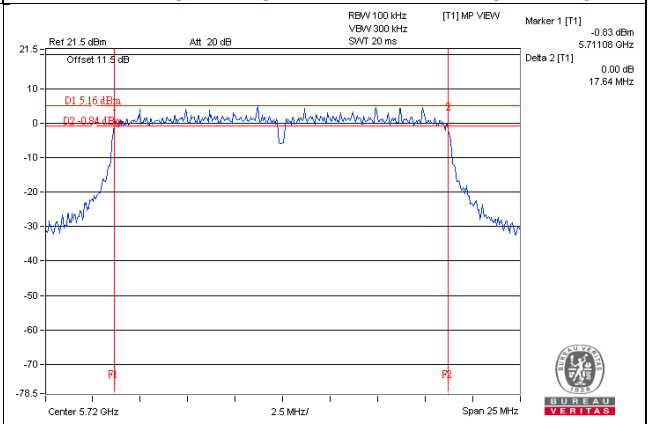
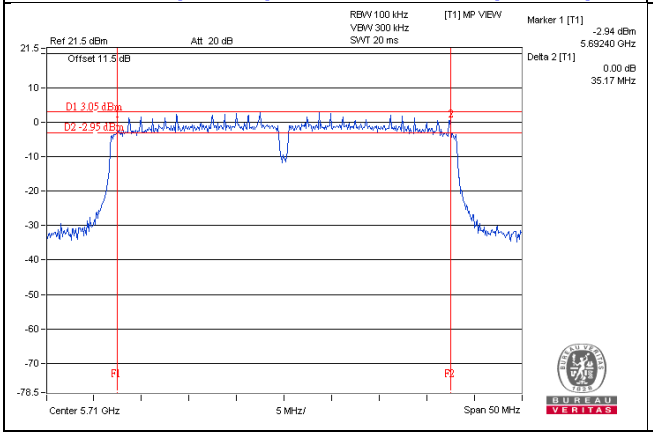
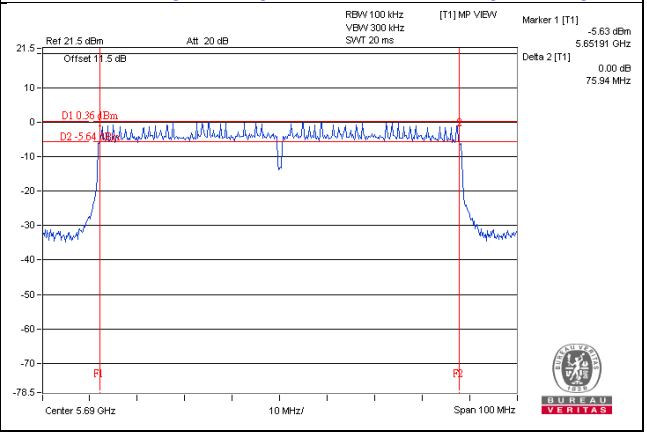
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144 (UNII-3 Band)	5720	3.72	3.72	0.5	PASS

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142 (UNII-3 Band)	5710	2.57	2.81	0.5	PASS

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138 (UNII-3 Band)	5690	2.85	3.20	0.5	PASS

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH144(U-NII-3)	**802.11ac (VHT20)_Chain 0 / CH144(U-NII-3)**
	
802.11ac (VHT40)_Chain 0 / CH142(U-NII-3)	**802.11ac (VHT80)_Chain 0 / CH138(U-NII-3)**
	

Note: The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

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

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

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

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

--- END ---