FCC Test Report (WLAN)

Report No.:	RF180625E05C-1
FCC ID:	2ABTEG1500
Test Model:	Fios-G1500
Received Date:	Sep. 18, 2018
Test Date:	Sep. 28 to Oct. 17, 2018
Issued Date:	Nov. 06, 2018
Applicant:	Verizon Online LLC
Address:	1300 I Street NW, Room 400W, Washington, District of Columbia, 20005 United State
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:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF180625E05C-1	Original release.	Nov. 06, 2018

1 Certificate of Conformity

Product:	Fios-G1500
Brand:	Verizon
Test Model:	Fios-G1500
Sample Status:	ENGINEERING SAMPLE
Applicant:	Verizon Online LLC
Test Date:	Sep. 28 to Oct. 17, 2018
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 : Phoenix Huang , **Date:** Nov. 06, 2018

Phoenix Huang / Specialist

Approved by : , **Date:** Nov. 06, 2018

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) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.2dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.

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) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.53 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.08 dB
	6GHz ~ 18GHz	4.98 dB
	18GHz ~ 40GHz	5.19 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Fios-G1500
Brand	Verizon
Test Model	Fios-G1500
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18GHz ~ 5.24GHz, 5.745GHz ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** 914.824mW **5GHz:** **CDD Mode:** **5.18 ~ 5.24GHz:** 513.781mW **5.745 ~ 5.825GHz:** 432.495mW **Beamforming Mode:** **5.18 ~ 5.24GHz:** 507.079mW **5.745 ~ 5.825GHz:** 432.495mW **SDM Mode:** **5.18 ~ 5.24GHz:** 513.781mW **5.745 ~ 5.825GHz:** 432.495mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II change. The difference compared with the Report No.: RF180625E05-1 as the following:
   - ◆ Add second source components including resistors, inductors, capacitors, connectors, transistors, diodes and DDR3, these changed components are a part of RF transmitter circuit.
2. According to above condition, only Radiated Emissions and Conducted power test items need to be performed. And all data weres verified to meet the requirements.
3. There are WLAN and Z-Wave technology used for the EUT. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3
WLAN (2.4GHz)	WLAN (5GHz)	Z-Wave

4. Simultaneously transmission condition.

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

5. The USB port of the EUT, it can't connect a WiFi/WWAN dongle and transmit simultaneously.
6. The EUT must be supplied with a power adapter as following table:

No.	Brand	Model No.	Spec.
1	Ktec	KSA20C1200300HU	Input: 100-240Vac, 1A, 50-60Hz Output: 12V, 3A DC output cable: Unshielded, 1.5m
2	LEI	MU36-D120300-A1	Input: 100-240Vac, 1.5A, 50-60Hz Output: 12V, 3A DC output cable: Unshielded, 1.5m
Note: In original report: From the above adapters, the radiated emissions worse case was found in **Adapter No. 2**. Therefore only the test data of the mode was recorded in this report.			

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

WLAN Directional gain table			
Frequency range (GHz)	Directional Antenna Gain (dBi)	Antenna Type	Antenna Connector
2.4 ~ 2.4835	2.94	Dipole	i-pex(MHF)
5.15 ~ 5.25	3.56		
5.25 ~ 5.35	3.56		
5.47 ~ 5.725	3.56		
5.725 ~ 5.85	3.56		
Z-Wave antenna spec.			
Antenna Net Gain (dBi)	Frequency range (MHz)	Antenna Type	Antenna Connector
1.73	902~928	Dipole	None
Note: More detailed information, please refer to operating description.			

8. The EUT incorporates a MIMO function:

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

Note:
1. All of modulation mode support beamforming function except 2.4GHz & 802.11a modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. 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)

9. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To			Description
	RE≥1G	RE<1G	APCM	
1	√	√	√	-

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

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240, 5745-5825	36 to 48, 149 to 165	48	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

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

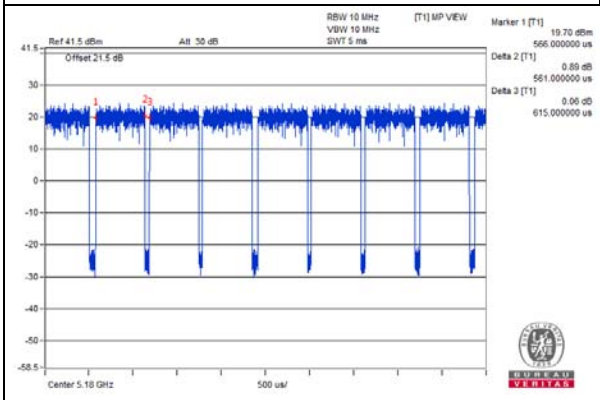
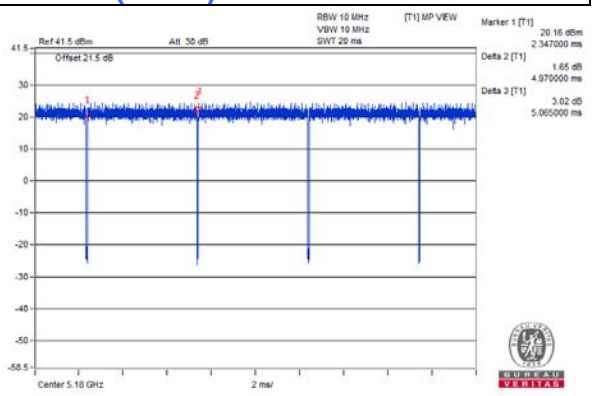
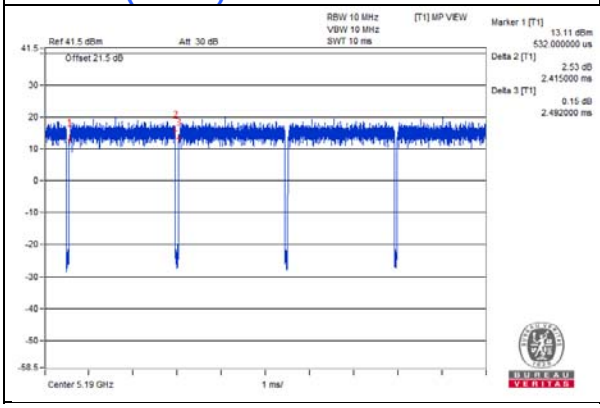
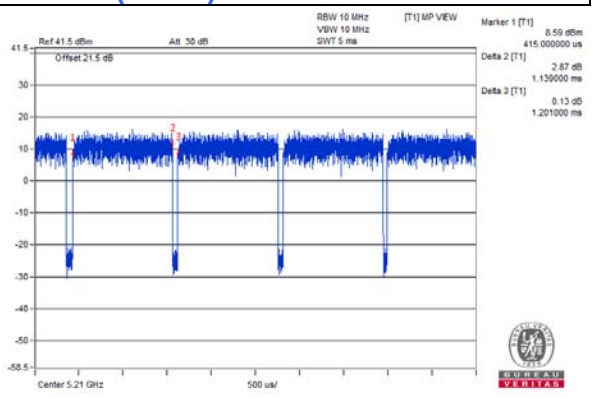
CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3
Beamforming Mode / SDM Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 67%RH	120Vac, 60Hz	Rey Chen
	21deg. C, 66%RH	120Vac, 60Hz	Rey Chen
RE<1G	21deg. C, 67%RH	120Vac, 60Hz	Frank Chuang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 0.561 ms/0.615 ms = 0.912, Duty factor = 10 * log (1/Duty cycle) = 0.4
802.11ac (VHT20): Duty cycle = 4.97 ms/5.065 ms = 0.981
802.11ac (VHT40): Duty cycle = 2.415 ms/2.492 ms = 0.969, Duty factor = 10 * log (1/Duty cycle) = 0.14
802.11ac (VHT80): Duty cycle = 1.139 ms/1.201 ms = 0.948, Duty factor = 10 * log (1/Duty cycle) = 0.23

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.	iPod	Apple	MC749TA/A	CC4DMFKUDFDM	NA	Provided by Lab
B.	iPod	Apple	MD778TA/A	CC4JMH7LF4T1	NA	Provided by Lab
C.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
D.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

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.	USB Cable	1	0.1	Yes	0	Provided by Lab
2.	USB Cable	1	0.1	Yes	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	RJ-45 Cable	1	10	No	0	Provided by Lab
5.	Coaxial Cable	1	10	Yes	0	Provided by Lab
6.	DC Cable	1	1.5	No	0	Supplied by client

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 v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="2">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="2" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</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	July 12, 2018	July 11, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 05, 2018	May 04, 2019
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-3-1	Mar. 20, 2018	Mar. 19, 2019
RF Cable	8D	966-3-2	Mar. 20, 2018	Mar. 19, 2019
RF Cable	8D	966-3-3	Mar. 20, 2018	Mar. 19, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200	160922	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150317	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150322	Jan. 29, 2018	Jan. 28, 2019
Spectrum Analyzer Keysight	N9030A	MY54490679	July 23, 2018	July 22, 2019
Pre-Amplifier EMCI	EMC184045SE	980386	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160924	Jan. 29, 2018	Jan. 28, 2019
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 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019

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 CANADA Site Registration No. is 20331-1
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Sep. 28 to Oct. 17, 2018

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. Parallel, perpendicular, and ground-parallel orientations 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 detects 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:

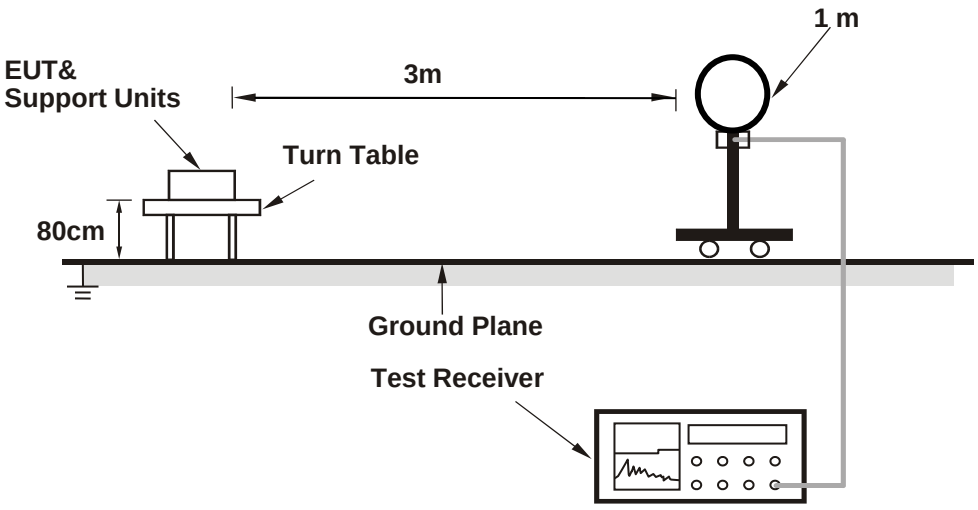
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

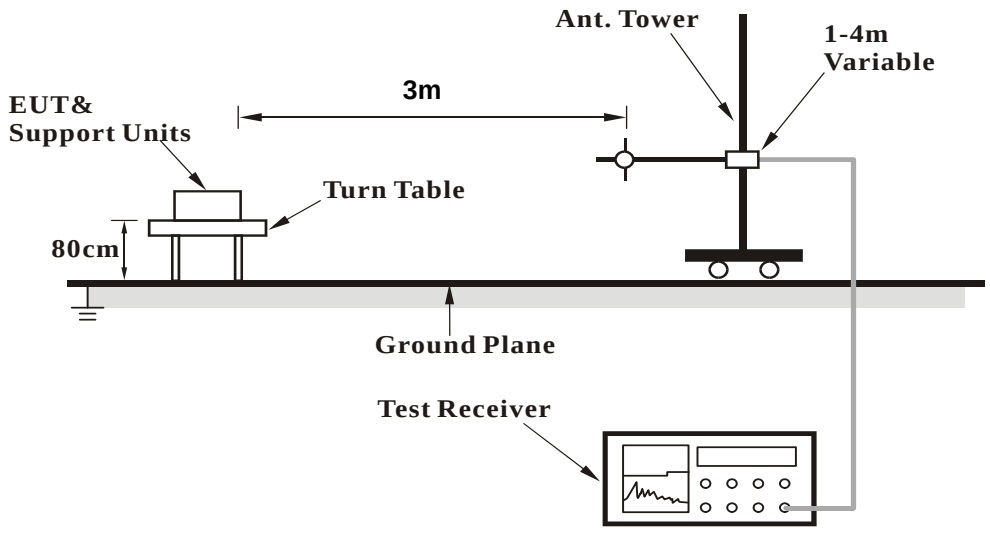
No deviation.

4.1.5 Test Setup

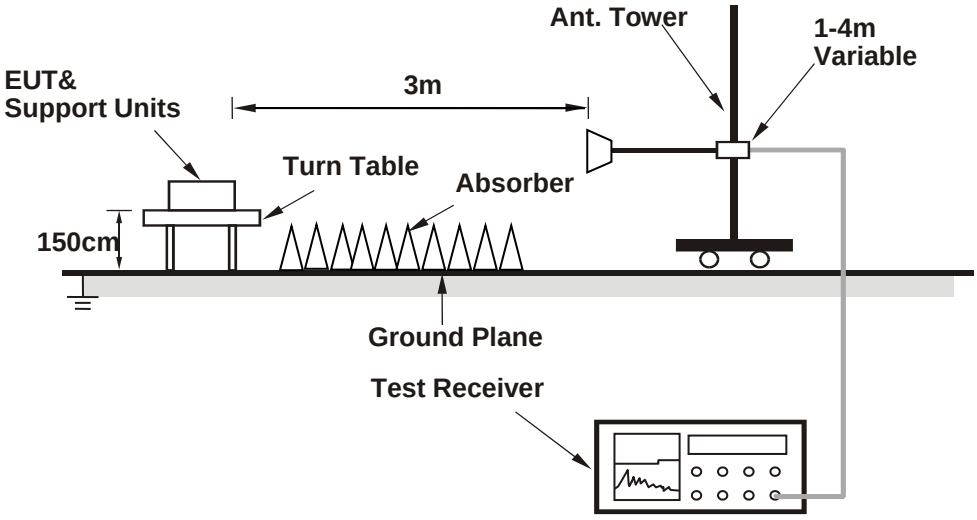
For Radiated emission below 30MHz



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. Controlling software (Telnet paste command) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.7 PK	74.0	-10.3	1.31 H	313	61.1	2.6
2	5150.00	49.3 AV	54.0	-4.7	1.31 H	313	46.7	2.6
3	*5180.00	113.3 PK			1.31 H	313	110.8	2.5
4	*5180.00	103.8 AV			1.31 H	313	101.3	2.5
5	#10360.00	55.7 PK	68.2	-12.5	1.28 H	150	43.8	11.9
6	15540.00	61.1 PK	74.0	-12.9	1.41 H	262	48.7	12.4
7	15540.00	46.7 AV	54.0	-7.3	1.41 H	262	34.3	12.4
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	66.6 PK	74.0	-7.4	1.73 V	209	64.0	2.6
2	5150.00	53.2 AV	54.0	-0.8	1.73 V	209	50.6	2.6
3	*5180.00	113.9 PK			1.73 V	209	111.4	2.5
4	*5180.00	105.0 AV			1.73 V	209	102.5	2.5
5	#10360.00	56.3 PK	68.2	-11.9	3.73 V	68	44.4	11.9
6	15540.00	64.4 PK	74.0	-9.6	1.48 V	90	52.0	12.4
7	15540.00	49.8 AV	54.0	-4.2	1.48 V	90	37.4	12.4

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	115.8 PK			1.41 H	310	113.4	2.4
2	*5200.00	107.5 AV			1.41 H	310	105.1	2.4
3	#10400.00	55.7 PK	68.2	-12.5	1.28 H	132	43.5	12.2
4	15600.00	64.5 PK	74.0	-9.5	1.38 H	294	51.6	12.9
5	15600.00	51.3 AV	54.0	-2.7	1.38 H	294	38.4	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	*5200.00	117.2 PK			2.11 V	238	114.8	2.4
2	*5200.00	108.8 AV			2.11 V	238	106.4	2.4
3	#10400.00	57.4 PK	68.2	-10.8	3.84 V	71	45.2	12.2
4	15600.00	65.6 PK	74.0	-8.4	1.34 V	78	52.7	12.9
5	15600.00	53.0 AV	54.0	-1.0	1.34 V	78	40.1	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.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	115.3 PK			1.38 H	295	113.1	2.2
2	*5240.00	106.7 AV			1.38 H	295	104.5	2.2
3	5350.00	52.5 PK	74.0	-21.5	1.38 H	295	50.2	2.3
4	5350.00	42.3 AV	54.0	-11.7	1.38 H	295	40.0	2.3
5	#10480.00	52.9 PK	68.2	-15.3	1.26 H	120	40.5	12.4
6	15720.00	61.5 PK	74.0	-12.5	1.27 H	286	49.5	12.0
7	15720.00	47.2 AV	54.0	-6.8	1.27 H	286	35.2	12.0
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	*5240.00	116.8 PK			1.50 V	211	114.6	2.2
2	*5240.00	108.0 AV			1.50 V	211	105.8	2.2
3	5350.00	56.2 PK	74.0	-17.8	1.50 V	211	53.9	2.3
4	5350.00	45.9 AV	54.0	-8.1	1.50 V	211	43.6	2.3
5	#10480.00	56.2 PK	68.2	-12.0	3.65 V	84	43.8	12.4
6	15720.00	64.0 PK	74.0	-10.0	1.35 V	99	52.0	12.0
7	15720.00	49.5 AV	54.0	-4.5	1.35 V	99	37.5	12.0

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5640.78	57.3 PK	68.2	-10.9	1.58 H	294	58.1	-0.8
2	*5745.00	115.0 PK			1.58 H	294	112.1	2.9
3	*5745.00	106.7 AV			1.58 H	294	103.8	2.9
4	#5994.10	57.8 PK	68.2	-10.4	1.58 H	294	58.0	-0.2
5	11490.00	53.8 PK	74.0	-20.2	1.46 H	265	41.5	12.3
6	11490.00	43.1 AV	54.0	-10.9	1.46 H	265	30.8	12.3
7	#17235.00	61.4 PK	68.2	-6.8	1.48 H	321	46.1	15.3
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	#5630.69	58.2 PK	68.2	-10.0	1.78 V	287	59.0	-0.8
2	*5745.00	115.2 PK			1.78 V	287	112.3	2.9
3	*5745.00	107.0 AV			1.78 V	287	104.1	2.9
4	#5943.23	58.8 PK	68.2	-9.4	1.78 V	287	59.0	-0.2
5	11490.00	56.2 PK	74.0	-17.8	1.49 V	242	43.9	12.3
6	11490.00	45.1 AV	54.0	-8.9	1.49 V	242	32.8	12.3
7	#17235.00	63.3 PK	68.2	-4.9	1.66 V	129	48.0	15.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5613.27	56.9 PK	68.2	-11.3	1.63 H	292	57.7	-0.8
2	*5785.00	114.7 PK			1.63 H	292	111.6	3.1
3	*5785.00	106.7 AV			1.63 H	292	103.6	3.1
4	#5931.70	58.0 PK	68.2	-10.2	1.63 H	292	58.2	-0.2
5	11570.00	53.8 PK	74.0	-20.2	1.52 H	251	41.4	12.4
6	11570.00	43.4 AV	54.0	-10.6	1.52 H	251	31.0	12.4
7	#17355.00	61.8 PK	68.2	-6.4	1.53 H	329	45.8	16.0
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	#5564.87	57.1 PK	68.2	-11.1	1.72 V	291	58.1	-1.0
2	*5785.00	116.1 PK			1.72 V	291	113.0	3.1
3	*5785.00	107.8 AV			1.72 V	291	104.7	3.1
4	#5938.22	57.7 PK	68.2	-10.5	1.72 V	291	57.9	-0.2
5	11570.00	57.1 PK	74.0	-16.9	1.43 V	225	44.7	12.4
6	11570.00	45.7 AV	54.0	-8.3	1.43 V	225	33.3	12.4
7	#17355.00	64.7 PK	68.2	-3.5	1.67 V	140	48.7	16.0

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5570.64	56.1 PK	68.2	-12.1	1.61 H	174	53.3	2.8
2	*5825.00	114.0 PK			1.61 H	174	110.8	3.2
3	*5825.00	106.1 AV			1.61 H	174	102.9	3.2
4	#5995.23	57.4 PK	68.2	-10.8	1.61 H	174	54.2	3.2
5	11650.00	54.1 PK	74.0	-19.9	1.50 H	282	41.7	12.4
6	11650.00	43.6 AV	54.0	-10.4	1.50 H	282	31.2	12.4
7	#17475.00	61.7 PK	68.2	-6.5	1.53 H	332	44.3	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	#5606.95	56.6 PK	68.2	-11.6	1.71 V	306	57.5	-0.9
2	*5825.00	115.5 PK			1.71 V	306	112.3	3.2
3	*5825.00	107.3 AV			1.71 V	306	104.1	3.2
4	#5939.38	57.8 PK	68.2	-10.4	1.71 V	306	58.0	-0.2
5	11650.00	56.6 PK	74.0	-17.4	1.49 V	241	44.2	12.4
6	11650.00	45.3 AV	54.0	-8.7	1.49 V	241	32.9	12.4
7	#17475.00	64.7 PK	68.2	-3.5	1.70 V	121	47.3	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 (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.4 PK	74.0	-9.6	1.31 H	309	61.8	2.6
2	5150.00	50.4 AV	54.0	-3.6	1.31 H	309	47.8	2.6
3	*5180.00	112.7 PK			1.31 H	309	110.2	2.5
4	*5180.00	103.2 AV			1.31 H	309	100.7	2.5
5	#10360.00	50.0 PK	68.2	-18.2	1.35 H	117	38.1	11.9
6	15540.00	62.9 PK	74.0	-11.1	1.27 H	297	50.5	12.4
7	15540.00	48.0 AV	54.0	-6.0	1.27 H	297	35.6	12.4
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	65.1 PK	74.0	-8.9	1.29 V	196	62.5	2.6
2	5150.00	53.0 AV	54.0	-1.0	1.29 V	196	50.4	2.6
3	*5180.00	113.8 PK			1.29 V	196	111.3	2.5
4	*5180.00	103.9 AV			1.29 V	196	101.4	2.5
5	#10360.00	58.8 PK	68.2	-9.4	2.68 V	65	46.9	11.9
6	15540.00	65.0 PK	74.0	-9.0	1.56 V	85	52.6	12.4
7	15540.00	50.4 AV	54.0	-3.6	1.56 V	85	38.0	12.4

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.6 PK	74.0	-10.4	1.44 H	291	61.0	2.6
2	5150.00	46.9 AV	54.0	-7.1	1.44 H	291	44.3	2.6
3	*5200.00	113.1 PK			1.44 H	291	110.7	2.4
4	*5200.00	104.3 AV			1.44 H	291	101.9	2.4
5	#10400.00	54.8 PK	68.2	-13.4	1.35 H	120	42.6	12.2
6	15600.00	63.4 PK	74.0	-10.6	1.39 H	282	50.5	12.9
7	15600.00	50.4 AV	54.0	-3.6	1.39 H	282	37.5	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	5150.00	65.7 PK	74.0	-8.3	1.34 V	204	63.1	2.6
2	5150.00	49.1 AV	54.0	-4.9	1.34 V	204	46.5	2.6
3	*5200.00	114.3 PK			1.34 V	204	111.9	2.4
4	*5200.00	105.4 AV			1.34 V	204	103.0	2.4
5	#10400.00	63.3 PK	68.2	-4.9	3.74 V	67	51.1	12.2
6	15600.00	66.9 PK	74.0	-7.1	1.67 V	79	54.0	12.9
7	15600.00	52.2 AV	54.0	-1.8	1.67 V	79	39.3	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.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	113.0 PK			1.51 H	333	110.8	2.2
2	*5240.00	103.7 AV			1.51 H	333	101.5	2.2
3	5350.00	56.1 PK	74.0	-17.9	1.51 H	333	53.8	2.3
4	5350.00	43.6 AV	54.0	-10.4	1.51 H	333	41.3	2.3
5	#10480.00	54.3 PK	68.2	-13.9	1.31 H	117	41.9	12.4
6	15720.00	62.5 PK	74.0	-11.5	1.36 H	300	50.5	12.0
7	15720.00	47.3 AV	54.0	-6.7	1.36 H	300	35.3	12.0
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	*5240.00	114.2 PK			2.09 V	225	112.0	2.2
2	*5240.00	105.4 AV			2.09 V	225	103.2	2.2
3	5350.00	57.2 PK	74.0	-16.8	2.09 V	225	54.9	2.3
4	5350.00	45.3 AV	54.0	-8.7	2.09 V	225	43.0	2.3
5	#10480.00	57.2 PK	68.2	-11.0	3.71 V	44	44.8	12.4
6	15720.00	62.2 PK	74.0	-11.8	1.70 V	94	50.2	12.0
7	15720.00	49.6 AV	54.0	-4.4	1.70 V	94	37.6	12.0

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5633.80	57.0 PK	68.2	-11.2	1.66 H	289	57.8	-0.8
2	*5745.00	115.0 PK			1.66 H	289	112.1	2.9
3	*5745.00	105.3 AV			1.66 H	289	102.4	2.9
4	#5957.24	58.4 PK	68.2	-9.8	1.66 H	289	58.6	-0.2
5	11490.00	55.5 PK	74.0	-18.5	1.62 H	171	43.2	12.3
6	11490.00	44.6 AV	54.0	-9.4	1.62 H	171	32.3	12.3
7	#17235.00	61.9 PK	68.2	-6.3	1.46 H	152	46.6	15.3
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	#5645.84	58.2 PK	68.2	-10.0	1.79 V	265	55.5	2.7
2	*5745.00	116.0 PK			1.79 V	265	113.1	2.9
3	*5745.00	107.4 AV			1.79 V	265	104.5	2.9
4	#5938.66	58.8 PK	68.2	-9.4	1.79 V	265	55.4	3.4
5	11490.00	56.9 PK	74.0	-17.1	1.48 V	221	44.6	12.3
6	11490.00	45.6 AV	54.0	-8.4	1.48 V	221	33.3	12.3
7	#17235.00	64.2 PK	68.2	-4.0	1.74 V	129	48.9	15.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5611.52	57.1 PK	68.2	-11.1	1.65 H	272	54.3	2.8
2	*5785.00	115.0 PK			1.65 H	272	111.9	3.1
3	*5785.00	105.0 AV			1.65 H	272	101.9	3.1
4	#5947.61	57.9 PK	68.2	-10.3	1.65 H	272	54.7	3.2
5	11570.00	56.0 PK	74.0	-18.0	1.63 H	160	43.6	12.4
6	11570.00	44.8 AV	54.0	-9.2	1.63 H	160	32.4	12.4
7	#17355.00	62.2 PK	68.2	-6.0	1.53 H	161	46.2	16.0
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	#5640.37	57.1 PK	68.2	-11.1	1.71 V	261	57.9	-0.8
2	*5785.00	116.5 PK			1.71 V	261	113.4	3.1
3	*5785.00	107.8 AV			1.71 V	261	104.7	3.1
4	#5933.70	58.6 PK	68.2	-9.6	1.71 V	261	58.7	-0.1
5	11570.00	57.6 PK	74.0	-16.4	1.55 V	200	45.2	12.4
6	11570.00	45.8 AV	54.0	-8.2	1.55 V	200	33.4	12.4
7	#17355.00	64.7 PK	68.2	-3.5	1.63 V	168	48.7	16.0

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5631.65	57.3 PK	68.2	-10.9	1.60 H	302	58.1	-0.8
2	*5825.00	115.9 PK			1.60 H	302	112.7	3.2
3	*5825.00	105.8 AV			1.60 H	302	102.6	3.2
4	#5940.85	58.3 PK	68.2	-9.9	1.60 H	302	58.5	-0.2
5	11650.00	55.2 PK	74.0	-18.8	1.62 H	166	42.8	12.4
6	11650.00	44.6 AV	54.0	-9.4	1.62 H	166	32.2	12.4
7	#17475.00	62.5 PK	68.2	-5.7	1.49 H	164	45.1	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	#5641.77	56.9 PK	68.2	-11.3	1.71 V	280	57.7	-0.8
2	*5825.00	116.5 PK			1.71 V	280	113.3	3.2
3	*5825.00	107.7 AV			1.71 V	280	104.5	3.2
4	#5975.27	57.1 PK	68.2	-11.1	1.71 V	280	57.3	-0.2
5	11650.00	57.1 PK	74.0	-16.9	1.46 V	238	44.7	12.4
6	11650.00	45.5 AV	54.0	-8.5	1.46 V	238	33.1	12.4
7	#17475.00	64.6 PK	68.2	-3.6	1.69 V	127	47.2	17.4

REMARKS:

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	150.00	63.1 PK	74.0	-10.9	1.55 H	261	63.1	0.0
2	150.00	48.5 AV	54.0	-5.5	1.55 H	261	48.5	0.0
3	*5190.00	106.9 PK			1.55 H	261	104.4	2.5
4	*5190.00	96.7 AV			1.55 H	261	94.2	2.5
5	5350.00	49.1 PK	74.0	-24.9	1.55 H	261	46.8	2.3
6	5350.00	37.9 AV	54.0	-16.1	1.55 H	261	35.6	2.3
7	#10380.00	53.5 PK	68.2	-14.7	1.43 H	135	41.5	12.0
8	15570.00	59.3 PK	74.0	-14.7	1.42 H	136	46.7	12.6
9	15570.00	45.1 AV	54.0	-8.9	1.42 H	136	32.5	12.6
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	66.6 PK	74.0	-7.4	1.62 V	220	64.0	2.6
2	5150.00	52.8 AV	54.0	-1.2	1.62 V	220	50.2	2.6
3	*5190.00	109.2 PK			1.62 V	220	106.7	2.5
4	*5190.00	99.5 AV			1.62 V	220	97.0	2.5
5	5350.00	53.1 PK	74.0	-20.9	1.62 V	220	50.8	2.3
6	5350.00	40.9 AV	54.0	-13.1	1.62 V	220	38.6	2.3
7	#10380.00	56.1 PK	68.2	-12.1	3.67 V	83	44.1	12.0
8	15570.00	60.5 PK	74.0	-13.5	1.69 V	93	47.9	12.6
9	15570.00	47.1 AV	54.0	-6.9	1.69 V	93	34.5	12.6

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.7 PK	74.0	-8.3	1.58 H	259	63.1	2.6
2	5150.00	48.2 AV	54.0	-5.8	1.58 H	259	45.6	2.6
3	*5230.00	111.5 PK			1.58 H	259	109.3	2.2
4	*5230.00	101.5 AV			1.58 H	259	99.3	2.2
5	5350.00	55.3 PK	74.0	-18.7	1.58 H	259	53.0	2.3
6	5350.00	42.7 AV	54.0	-11.3	1.58 H	259	40.4	2.3
7	#10460.00	54.9 PK	68.2	-13.3	1.44 H	134	42.5	12.4
8	15690.00	59.6 PK	74.0	-14.4	1.49 H	128	47.4	12.2
9	15690.00	47.0 AV	54.0	-7.0	1.49 H	128	34.8	12.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.4 PK	74.0	-5.6	2.17 V	226	65.8	2.6
2	5150.00	52.7 AV	54.0	-1.3	2.17 V	226	50.1	2.6
3	*5230.00	113.5 PK			2.17 V	226	111.3	2.2
4	*5230.00	103.8 AV			2.17 V	226	101.6	2.2
5	5350.00	57.6 PK	74.0	-16.4	2.17 V	226	55.3	2.3
6	5350.00	45.9 AV	54.0	-8.1	2.17 V	226	43.6	2.3
7	#10460.00	56.6 PK	68.2	-11.6	3.75 V	61	44.2	12.4
8	15690.00	62.5 PK	74.0	-11.5	1.68 V	84	50.3	12.2
9	15690.00	49.3 AV	54.0	-4.7	1.68 V	84	37.1	12.2

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5644.82	58.7 PK	68.2	-9.5	1.67 H	298	59.5	-0.8
2	*5755.00	111.0 PK			1.67 H	298	108.0	3.0
3	*5755.00	100.9 AV			1.67 H	298	97.9	3.0
4	#5956.46	58.0 PK	68.2	-10.2	1.67 H	298	58.2	-0.2
5	11510.00	55.5 PK	74.0	-18.5	1.59 H	180	43.2	12.3
6	11510.00	41.0 AV	54.0	-13.0	1.59 H	180	28.7	12.3
7	#17265.00	61.2 PK	68.2	-7.0	1.54 H	152	45.8	15.4
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	#5645.84	61.3 PK	68.2	-6.9	1.73 V	288	62.1	-0.8
2	*5755.00	113.0 PK			1.73 V	288	110.0	3.0
3	*5755.00	103.3 AV			1.73 V	288	100.3	3.0
4	#5946.91	58.9 PK	68.2	-9.3	1.73 V	288	59.1	-0.2
5	11510.00	57.9 PK	74.0	-16.1	1.48 V	222	45.6	12.3
6	11510.00	43.0 AV	54.0	-11.0	1.48 V	222	30.7	12.3
7	#17265.00	63.8 PK	68.2	-4.4	1.69 V	128	48.4	15.4

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5618.22	57.7 PK	68.2	-10.5	1.64 H	286	58.5	-0.8
2	*5795.00	110.7 PK			1.64 H	286	107.7	3.0
3	*5795.00	100.2 AV			1.64 H	286	97.2	3.0
4	#5936.46	56.9 PK	68.2	-11.3	1.64 H	286	57.0	-0.1
5	11590.00	55.7 PK	74.0	-18.3	1.64 H	183	43.3	12.4
6	11590.00	41.5 AV	54.0	-12.5	1.64 H	183	29.1	12.4
7	#17385.00	61.2 PK	68.2	-7.0	1.59 H	152	45.0	16.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5645.64	58.6 PK	68.2	-9.6	1.68 V	283	59.4	-0.8
2	*5795.00	113.2 PK			1.68 V	293	110.2	3.0
3	*5795.00	103.2 AV			1.68 V	293	100.2	3.0
4	#5970.35	60.5 PK	68.2	-7.7	1.68 V	293	60.7	-0.2
5	11590.00	57.2 PK	74.0	-16.8	1.50 V	210	44.8	12.4
6	11590.00	42.6 AV	54.0	-11.4	1.50 V	210	30.2	12.4
7	#17385.00	62.7 PK	68.2	-5.5	1.76 V	137	46.5	16.2

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.8 PK	74.0	-9.2	1.49 H	236	62.2	2.6
2	5150.00	47.9 AV	54.0	-6.1	1.49 H	236	45.3	2.6
3	*5210.00	103.4 PK			1.49 H	236	101.0	2.4
4	*5210.00	94.0 AV			1.49 H	236	91.6	2.4
5	5350.00	48.9 PK	74.0	-25.1	1.49 H	236	46.6	2.3
6	5350.00	37.9 AV	54.0	-16.1	1.49 H	236	35.6	2.3
7	#10420.00	52.7 PK	68.2	-15.5	1.50 H	148	40.5	12.2
8	15630.00	56.8 PK	74.0	-17.2	1.38 H	105	44.1	12.7
9	15630.00	44.0 AV	54.0	-10.0	1.38 H	105	31.3	12.7
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	5150.00	69.9 PK	74.0	-4.1	2.01 V	218	67.3	2.6
2	**5150.00**	**53.8 AV**	**54.0**	**-0.2**	**2.01 V**	**218**	**51.2**	**2.6**
3	*5210.00	104.9 PK			2.01 V	218	102.5	2.4
4	*5210.00	96.2 AV			2.01 V	218	93.8	2.4
5	5350.00	53.3 PK	74.0	-20.7	2.01 V	218	51.0	2.3
6	5350.00	42.1 AV	54.0	-11.9	2.01 V	218	39.8	2.3
7	#10420.00	54.8 PK	68.2	-13.4	3.61 V	56	42.6	12.2
8	15630.00	60.7 PK	74.0	-13.3	1.78 V	81	48.0	12.7
9	15630.00	46.9 AV	54.0	-7.1	1.78 V	81	34.2	12.7

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 155	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	#5632.18	65.6 PK	68.2	-2.6	1.68 H	277	66.4	-0.8
2	*5775.00	109.0 PK			1.68 H	277	106.0	3.0
3	*5775.00	99.2 AV			1.68 H	277	96.2	3.0
4	#5931.23	62.2 PK	68.2	-6.0	1.68 H	277	62.4	-0.2
5	11550.00	54.4 PK	74.0	-19.6	1.55 H	183	42.0	12.4
6	11550.00	42.2 AV	54.0	-11.8	1.55 H	183	29.8	12.4
7	#17325.00	60.9 PK	68.2	-7.3	1.47 H	125	45.2	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	#5632.25	66.8 PK	68.2	-1.4	1.74 V	295	67.6	-0.8
2	*5775.00	109.6 PK			1.74 V	295	106.6	3.0
3	*5775.00	100.0 AV			1.74 V	295	97.0	3.0
4	#5928.37	65.1 PK	68.2	-3.1	1.74 V	295	65.3	-0.2
5	11550.00	55.8 PK	74.0	-18.2	1.61 V	194	43.4	12.4
6	11550.00	43.2 AV	54.0	-10.8	1.61 V	194	30.8	12.4
7	#17325.00	62.1 PK	68.2	-6.1	1.78 V	151	46.4	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.

Below 1GHz Data:

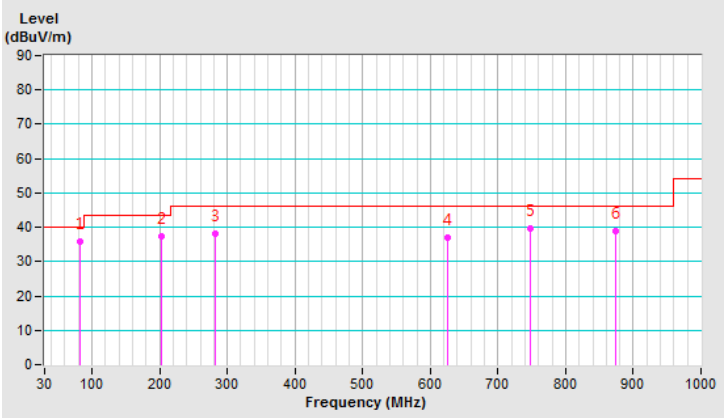
802.11ac (VHT20)

CHANNEL	TX Channel 48	**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	82.64	35.7 QP	40.0	-4.3	1.50 H	360	48.9	-13.2
2	201.86	37.3 QP	43.5	-6.2	1.50 H	225	48.2	-10.9
3	282.19	38.2 QP	46.0	-7.8	1.50 H	179	45.8	-7.6
4	625.51	37.1 QP	46.0	-8.9	2.00 H	121	36.2	0.9
5	747.68	39.7 QP	46.0	-6.3	1.50 H	104	36.5	3.2
6	873.48	38.9 QP	46.0	-7.1	1.50 H	115	34.4	4.5

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. Margin value = Emission Level – Limit value
4. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

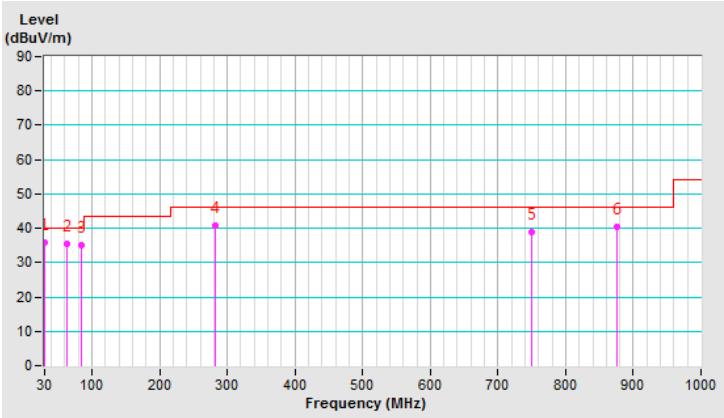


CHANNEL	TX Channel 48	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	30.85	35.9 QP	40.0	-4.1	1.50 V	356	44.9	-9.0
2	62.88	35.5 QP	40.0	-4.5	1.00 V	97	44.4	-8.9
3	83.99	34.9 QP	40.0	-5.1	1.00 V	257	48.3	-13.4
4	282.57	40.9 QP	46.0	-5.1	1.50 V	303	48.5	-7.6
5	749.94	39.0 QP	46.0	-7.0	2.00 V	31	35.7	3.3
6	874.96	40.4 QP	46.0	-5.6	1.50 V	167	35.9	4.5

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. Margin value = Emission Level – Limit value
4. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Transmit Power Measurement

4.2.1 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)
		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.

4.2.2 Test Setup

4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedure

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

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

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

4.2.7 Test Results

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	19.01	18.98	18.95	18.85	313.944	24.97	30	Pass
40	5200	20.37	20.39	20.48	20.78	449.649	26.53	30	Pass
48	5240	20.28	20.09	20.49	20.51	433.158	26.37	30	Pass
149	5745	20.01	20.01	20.27	20.05	408.034	26.11	30	Pass
157	5785	20.08	20.09	20.11	20.13	409.557	26.12	30	Pass
165	5825	20.02	20.12	20.23	20.27	415.117	26.18	30	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	17.78	17.87	18.03	18.29	252.2	24.02	30	Pass
40	5200	20.08	20.09	20.19	20.84	429.764	26.33	30	Pass
48	5240	20.87	20.92	21.17	21.37	513.781	27.11	30	Pass
149	5745	19.98	20.03	20.08	20.29	408.998	26.12	30	Pass
157	5785	20.13	20.09	20.15	20.09	410.741	26.14	30	Pass
165	5825	20.02	20.08	20.07	20.38	413.09	26.16	30	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	16.09	15.91	16.27	16.45	166.159	22.21	30	Pass
46	5230	20.84	20.34	20.43	21.01	466.073	26.68	30	Pass
151	5755	19.97	20.47	20.37	20.39	429.03	26.32	30	Pass
159	5795	19.91	20.46	20.49	20.47	432.495	26.36	30	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	14.86	14.51	15.27	15.29	126.326	21.01	30	Pass
155	5775	19.51	19.77	19.67	18.89	354.302	25.49	30	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	17.78	17.87	18.03	18.29	252.2	24.02	30	Pass
40	5200	20.08	20.09	20.19	20.84	429.764	26.33	30	Pass
48	5240	20.77	20.78	21.17	21.37	507.079	27.05	30	Pass
149	5745	19.98	20.03	20.08	20.29	408.998	26.12	30	Pass
157	5785	20.13	20.09	20.15	20.09	410.741	26.14	30	Pass
165	5825	20.02	20.08	20.07	20.38	413.09	26.16	30	Pass

Note: 1. The directional gain is 3.56dBi < 6dBi, so the power limit shall not be reduced.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	16.09	15.91	16.27	16.45	166.159	22.21	30	Pass
46	5230	20.84	20.34	20.43	21.01	466.073	26.68	30	Pass
151	5755	19.97	20.47	20.37	20.39	429.03	26.32	30	Pass
159	5795	19.91	20.46	20.49	20.47	432.495	26.36	30	Pass

Note: 1. The directional gain is 3.56dBi < 6dBi, so the power limit shall not be reduced.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	14.86	14.51	15.27	15.29	126.326	21.01	30	Pass
155	5775	19.51	19.77	19.67	19.89	374.355	25.73	30	Pass

Note: 1. The directional gain is 3.56dBi < 6dBi, so the power limit shall not be reduced.

SDM Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	17.78	17.87	18.03	18.29	252.2	24.02	30	Pass
40	5200	20.08	20.09	20.19	20.84	429.764	26.33	30	Pass
48	5240	20.87	20.92	21.17	21.37	513.781	27.11	30	Pass
149	5745	19.98	20.03	20.08	20.29	408.998	26.12	30	Pass
157	5785	20.13	20.09	20.15	20.09	410.741	26.14	30	Pass
165	5825	20.02	20.08	20.07	20.38	413.09	26.16	30	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	16.09	15.91	16.27	16.45	166.159	22.21	30	Pass
46	5230	20.84	20.34	20.43	21.01	466.073	26.68	30	Pass
151	5755	19.97	20.47	20.37	20.39	429.03	26.32	30	Pass
159	5795	19.91	20.46	20.49	20.47	432.495	26.36	30	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	14.86	14.51	15.27	15.29	126.326	21.01	30	Pass
155	5775	19.51	19.77	19.67	18.89	354.302	25.49	30	Pass

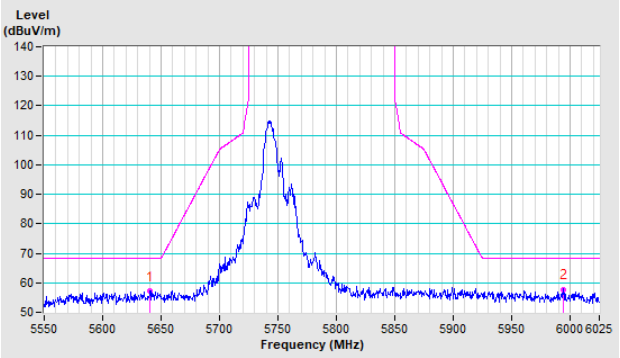
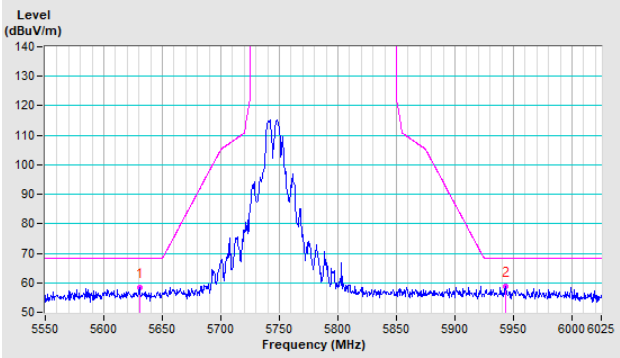
5 Pictures of Test Arrangements

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

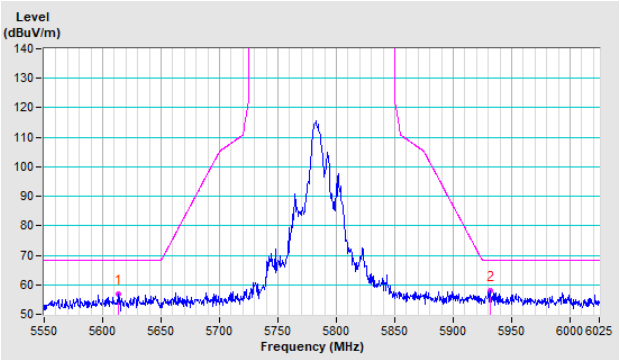
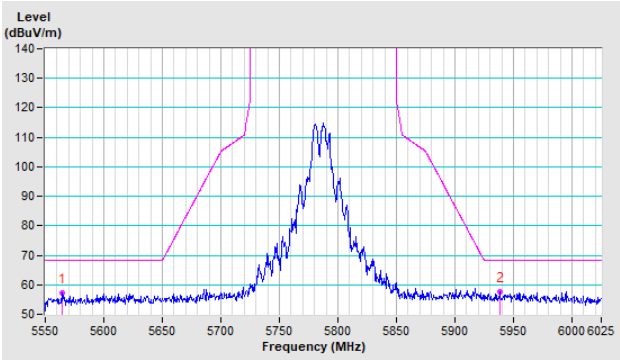
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

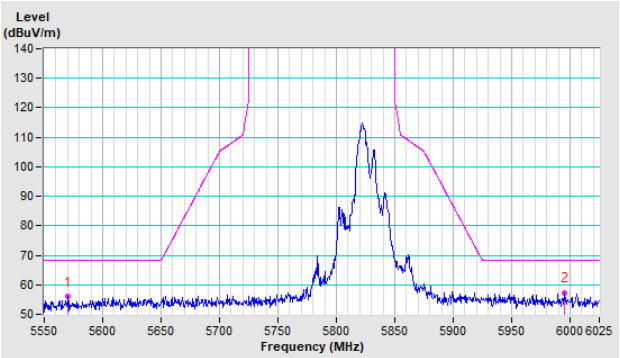
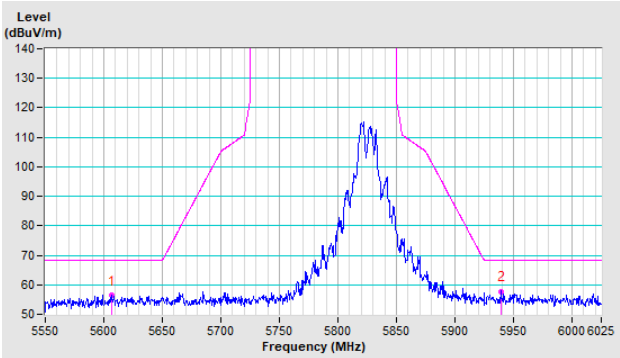
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

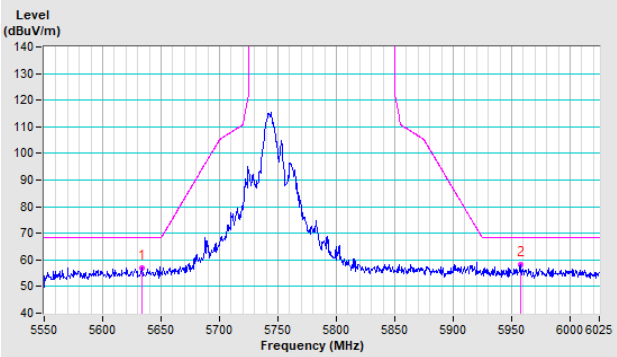
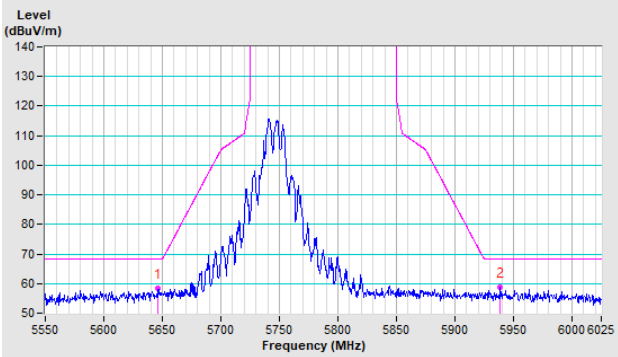
Horizontal	Vertical
	

CH 165 5825 MHz

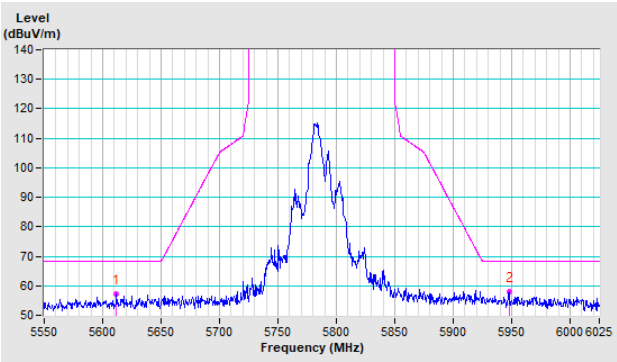
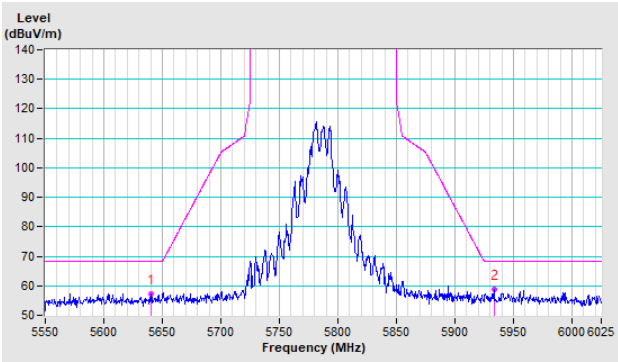
Horizontal	Vertical
	

802.11ac (VHT20)

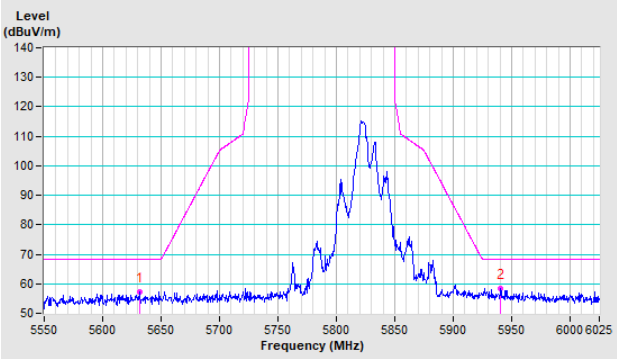
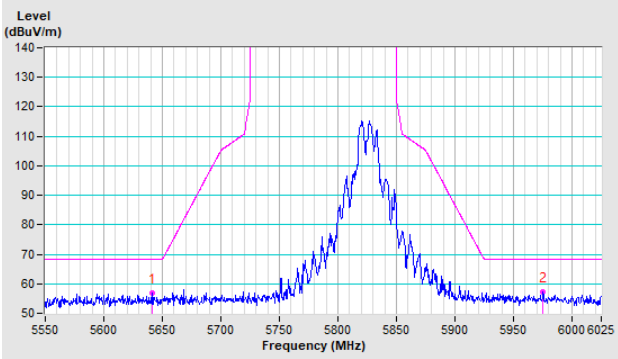
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

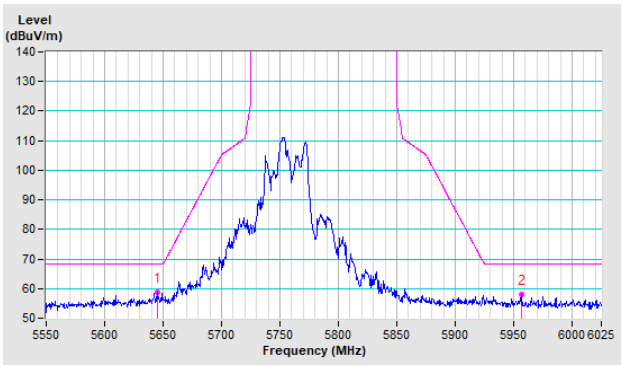
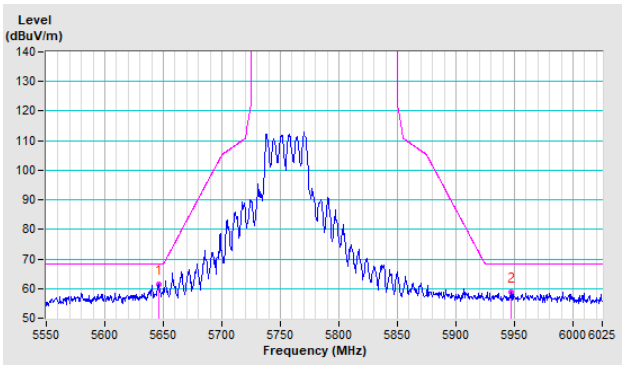
Horizontal	Vertical
	

CH 165 5825 MHz

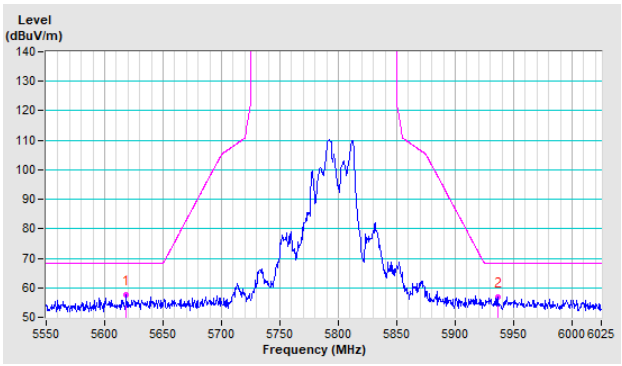
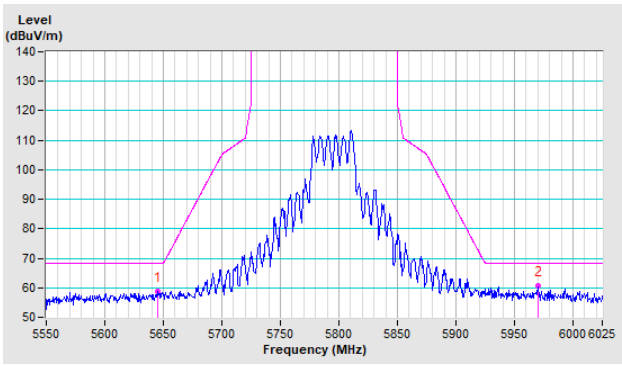
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

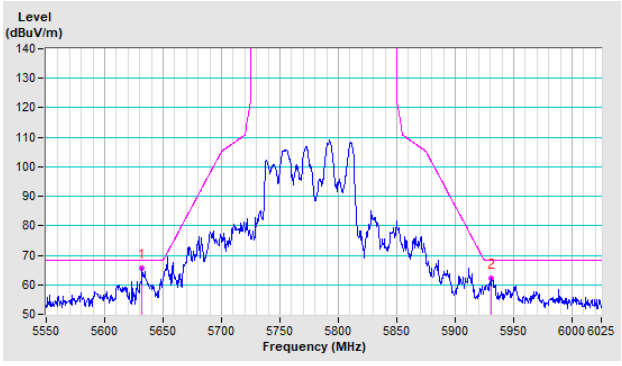
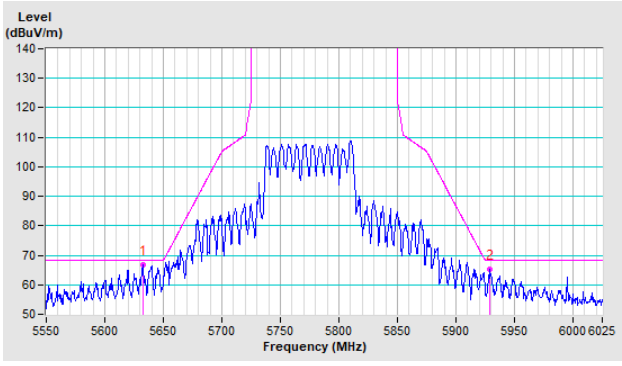
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz

Horizontal	Vertical
	

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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

Linkou 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.

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