

FCC Test Report

Report No.: RF180130D06-1

FCC ID: PANRCO330

Test Model: WL-8211-V1

Received Date: Jan. 30, 2018

Test Date: Feb. 7 ~ 27, 2018

Issued Date: Mar. 13, 2018

Applicant: CC&C Technologies, Inc.

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(R.O.C.)

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Release Control Record

Issue No.	Description	Date Issued
RF180130D06-1	Original release.	Mar. 13, 2018

1 Certificate of Conformity

Product: WLAN 11ac/11n 1x1 USB Adapter

Brand: CC&C

Test Model: WL-8211-V1

Sample Status: Engineering sample

Applicant: CC&C Technologies, Inc.

Test Date: Feb. 7 ~ 27, 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 RF characteristics under the conditions specified in this report.

Prepared by :

Annie Chang

Date: Mar. 13, 2018

Annie Chang / Senior Specialist

Approved by :

Rex Lai

Date: Mar. 13, 2018

Rex Lai / Associate Technical 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 -11.23dB at 0.50938MHz.
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 -6.96dB at 5150.00MHz.
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	N/A	Not Applicable. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.77 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.38 dB
	30MHz ~ 1000MHz	5.54 dB
Radiated Emissions above 1 GHz	Above 1GHz	5.48 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	WLAN 11ac/11n 1x1 USB Adapter
Brand	CC&C
Test Model	WL-8211-V1
Status of EUT	Engineering sample
Power Supply Rating	5Vdc from host equipment
Modulation Type	64QAM, 16QAM, QPSK, BPSK 256QAM for OFDM in 11ac mode only.
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 150Mbps 802.11ac: up to 433.35Mbps
Operating Frequency	5180MHz ~ 5320MHz
Number of Channel	802.11a, 802.11n (20MHz): 8 802.11n (40MHz): 4 802.11ac (80MHz): 2
Output Power	25.351mW
Antenna Type	PIFA antenna with 4.7dBi gain
Antenna Connector	N/A
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. The EUT incorporates a SISO function. Physically, the EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX FUNCTION
802.11a	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX
802.11ac (20MHz)	1TX
802.11ac (40MHz)	1TX
802.11ac (80MHz)	1TX

* 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)

2. 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 (20MHz), 802.11ac (20MHz):

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency
42	5210MHz

FOR 5260 ~ 5320MHz

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

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

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency
58	5290MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

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

EUT Configure 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
-	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	13.5
-	802.11ac (80MHz)		42	42	OFDM	BPSK	29.3
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
-	802.11n (20MHz)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
-	802.11n (40MHz)		54 to 62	54, 62	OFDM	BPSK	13.5
-	802.11ac (80MHz)		58	58	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (20MHz)	5180-5320	36 to 64	40	OFDM	BPSK	6.5

Power Line Conducted Emission Test:

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

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (20MHz)	5180-5320	36 to 64	40	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
-	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	13.5
-	802.11ac (80MHz)		42	42	OFDM	BPSK	29.3
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
-	802.11n (20MHz)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
-	802.11n (40MHz)		54 to 62	54, 62	OFDM	BPSK	13.5
-	802.11ac (80MHz)		58	58	OFDM	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE $\geq$ 1G	15deg. C, 79%RH	120Vac, 60Hz (System)	James Wei
RE<1G	15deg. C, 79%RH	120Vac, 60Hz (System)	James Wei
PLC	17deg. C, 76%RH	120Vac, 60Hz (System)	Ian Chang
APCM	25deg. C, 76%RH	120Vac, 60Hz (System)	Saxon Lee

3.3 Duty Cycle of Test Signal

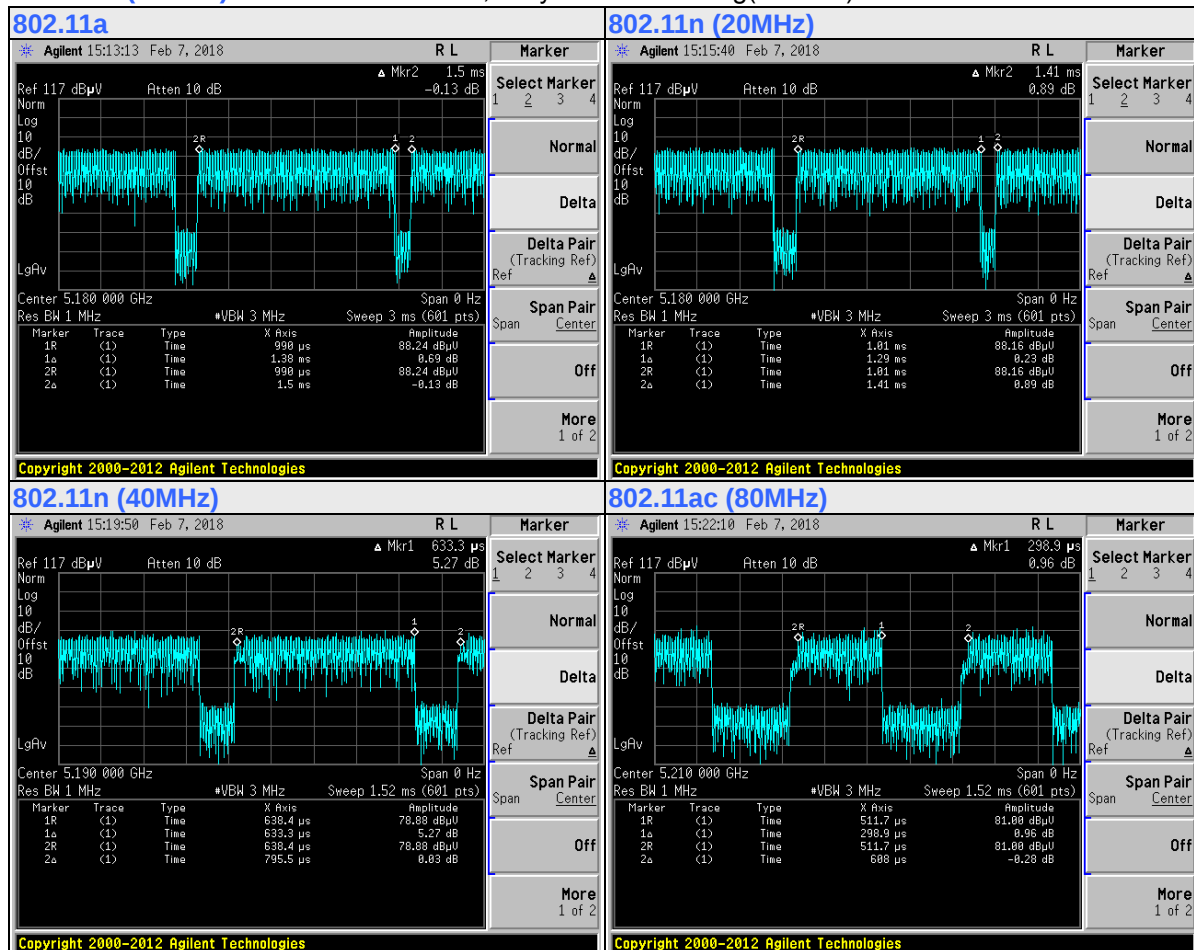
Duty cycle of test signal is < 98 %, duty factor is required

802.11a: Duty cycle = $1.35/1.50 = 0.90$, Duty factor = $10 * \log(1/0.90) = 0.46$

802.11n (20MHz): Duty cycle = $1.29/1.41 = 0.915$, Duty factor = $10 * \log(1/0.915) = 0.39$

802.11n (40MHz): Duty cycle = $0.633/0.759 = 0.834$, Duty factor = $10 * \log(1/0.834) = 0.79$

802.11ac (80MHz): $0.298/0.608 = 0.490$, Duty factor = $10 * \log(1/0.490) = 3.10$



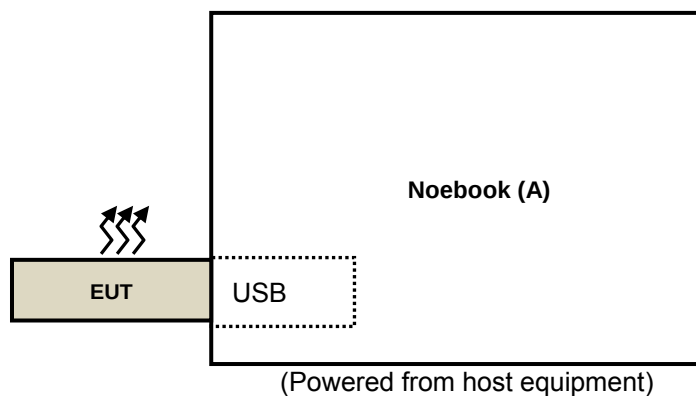
3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook PC	ASUS	PU401L	E9NXBC002007372	N/A	Provided by Lab

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

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
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:

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

Limits of unwanted emission out of the restricted bands

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules v02r01			Field Strength at 3m	
			PK:74 (dBµV/m)	AV:54 (dBµV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)		PK:-27 (dBm/MHz)	PK:68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☐	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBµV/m) ^{*1} PK:105.2 (dBµV/m) ^{*2} PK: 110.8(dBµV/m) ^{*3} PK:122.2 (dBµV/m) ^{*4}
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.			^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.			^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note:

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 21, 2017	Feb. 20, 2018
			Feb. 21, 2018	Feb. 20, 2019
HP Preamplifier	8449B	3008A01201	Feb. 22, 2017	Feb. 21, 2018
			Feb. 22, 2018	Feb. 21, 2019
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 21, 2017	Feb. 20, 2018
			Feb. 21, 2018	Feb. 20, 2019
Agilent TEST RECEIVER	N9038A	MY51210129	Feb. 6, 2018	Feb. 5, 2019
Schwarzbeck Antenna	VULB 9168	139	Nov. 29, 2017	Nov. 28, 2018
Schwarzbeck Antenna	VHBA 9123	480	May 19, 2017	May 18, 2019
Schwarzbeck Horn Antenna	BBHA-9170	212	Dec. 1, 2017	Nov. 30, 2018
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Dec. 1, 2017	Nov. 30, 2018
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF104	CABLE-CH6	Aug. 14, 2017	Aug. 13, 2018
SUHNER RF cable With 3dB PAD	SF102	Cable-CH8-3.6m	Aug. 14, 2017	Aug. 13, 2018
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	May 31, 2017	May 30, 2018
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 26, 2017	Jul. 25, 2018
Loop Antenna EMCI	LPA600	270	Aug. 11, 2017	Aug. 10, 2019
EMCO Horn Antenna	3115	00028257	Nov. 30, 2017	Nov. 29, 2018
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 29, 2017	Sep. 28, 2018
Anritsu Power Sensor	MA2411B	0738404	Apr. 24, 2017	Apr. 23, 2018
Anritsu Power Meter	ML2495A	0842014	Apr. 24, 2017	Apr. 23, 2018

- NOTE:** 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.

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 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:

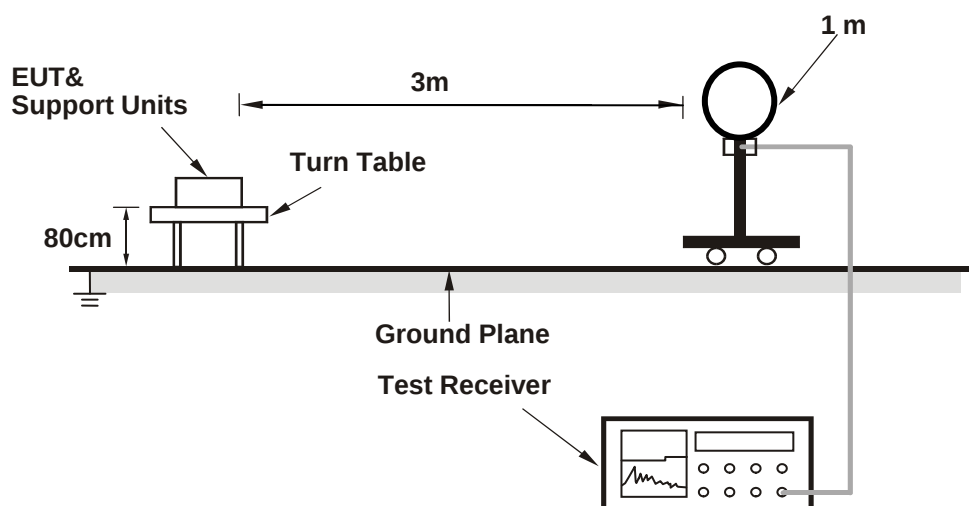
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) 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

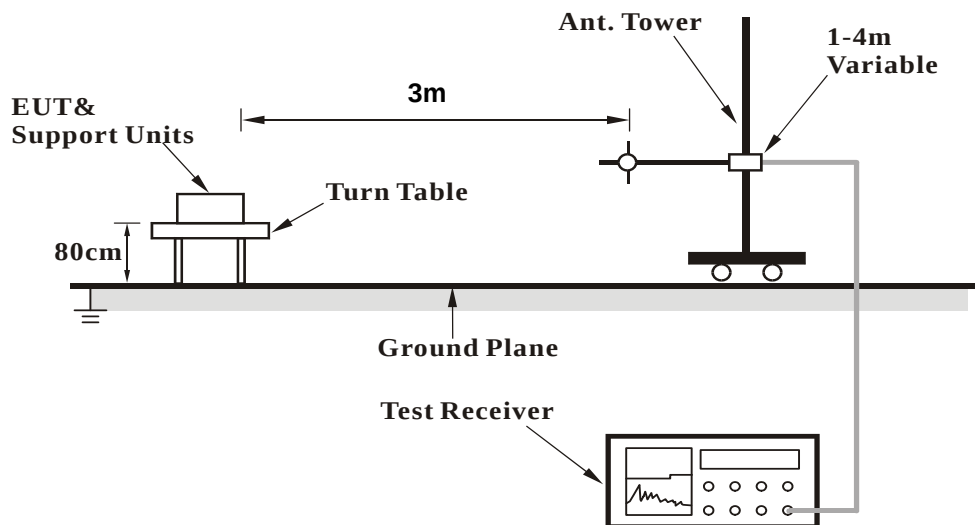
No deviation.

4.1.5 Test Setup

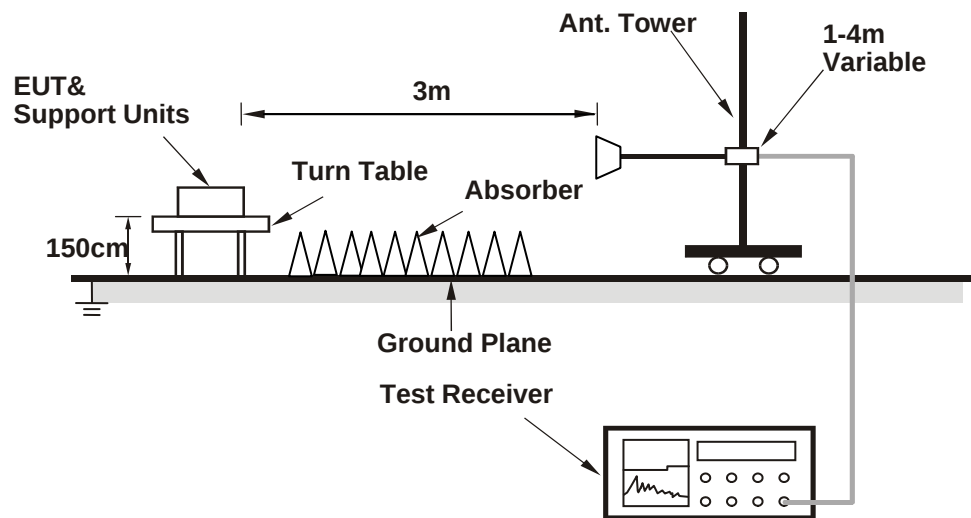
For Radiated emission below 30MHz



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 Notebook.
- b. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	59.51 PK	74.00	-14.49	1.33 H	74	54.22	5.29
2	5150.00	46.87 AV	54.00	-7.13	1.33 H	74	41.58	5.29
3	*5180.00	103.50 PK			1.33 H	74	98.31	5.19
4	*5180.00	92.85 AV			1.33 H	74	87.66	5.19
5	#10360.00	58.90 PK	74.00	-15.10	1.00 H	227	43.81	15.09
6	#10360.00	45.92 AV	54.00	-8.08	1.00 H	227	30.83	15.09
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.02 PK	74.00	-15.98	1.00 V	221	52.73	5.29
2	5150.00	46.06 AV	54.00	-7.94	1.00 V	221	40.77	5.29
3	*5180.00	100.54 PK			1.00 V	221	95.35	5.19
4	*5180.00	89.42 AV			1.00 V	221	84.23	5.19
5	#10360.00	56.63 PK	74.00	-17.37	1.00 V	84	41.54	15.09
6	#10360.00	44.32 AV	54.00	-9.68	1.00 V	84	29.23	15.09

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	103.85 PK			1.33 H	72	98.73	5.12
2	*5200.00	92.89 AV			1.33 H	72	87.77	5.12
3	#10400.00	59.04 PK	74.00	-14.96	1.00 H	238	43.88	15.16
4	#10400.00	46.05 AV	54.00	-7.95	1.00 H	238	30.89	15.16
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	100.59 PK			1.00 V	228	95.47	5.12
2	*5200.00	89.44 AV			1.00 V	228	84.32	5.12
3	#10400.00	56.84 PK	74.00	-17.16	1.00 V	87	41.68	15.16
4	#10400.00	44.47 AV	54.00	-9.53	1.00 V	87	29.31	15.16

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	103.06 PK			1.31 H	73	98.11	4.95
2	*5240.00	92.46 AV			1.31 H	73	87.51	4.95
3	5350.00	58.66 PK	74.00	-15.34	1.31 H	73	53.62	5.04
4	5350.00	45.58 AV	54.00	-8.42	1.31 H	73	40.54	5.04
5	#10480.00	59.39 PK	74.00	-14.61	1.00 H	225	43.69	15.70
6	#10480.00	46.42 AV	54.00	-7.58	1.00 H	225	30.72	15.70
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	100.13 PK			1.00 V	213	95.18	4.95
2	*5240.00	88.98 AV			1.00 V	213	84.03	4.95
3	5350.00	56.33 PK	74.00	-17.67	1.00 V	213	51.29	5.04
4	5350.00	44.75 AV	54.00	-9.25	1.00 V	213	39.71	5.04
5	#10480.00	57.14 PK	74.00	-16.86	1.00 V	95	41.44	15.70
6	#10480.00	44.78 AV	54.00	-9.22	1.00 V	95	29.08	15.70

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	60.09 PK	74.00	-13.91	1.15 H	76	54.80	5.29
2	5150.00	46.67 AV	54.00	-7.33	1.15 H	76	41.38	5.29
3	*5260.00	104.46 PK			1.15 H	76	99.58	4.88
4	*5260.00	93.97 AV			1.15 H	76	89.09	4.88
5	#10520.00	59.75 PK	74.00	-14.25	1.00 H	208	43.98	15.77
6	#10520.00	46.66 AV	54.00	-7.34	1.00 H	208	30.89	15.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.26 PK	74.00	-15.74	1.03 V	211	52.97	5.29
2	5150.00	46.18 AV	54.00	-7.82	1.03 V	211	40.89	5.29
3	*5260.00	100.41 PK			1.03 V	211	95.53	4.88
4	*5260.00	89.26 AV			1.03 V	211	84.38	4.88
5	#10520.00	57.43 PK	74.00	-16.57	1.00 V	88	41.66	15.77
6	#10520.00	45.08 AV	54.00	-8.92	1.00 V	88	29.31	15.77

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)
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	*5300.00	104.47 PK			1.19 H	76	99.71	4.76
2	*5300.00	93.94 AV			1.19 H	76	89.18	4.76
3	10600.00	59.49 PK	74.00	-14.51	1.00 H	195	44.03	15.46
4	10600.00	46.41 AV	54.00	-7.59	1.00 H	195	30.95	15.46
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	100.35 PK			1.00 V	204	95.59	4.76
2	*5300.00	89.18 AV			1.00 V	204	84.42	4.76
3	10600.00	57.16 PK	74.00	-16.84	1.00 V	79	41.70	15.46
4	10600.00	44.89 AV	54.00	-9.11	1.00 V	79	29.43	15.46

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)
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	*5320.00	104.24 PK			1.28 H	81	99.37	4.87
2	*5320.00	93.79 AV			1.28 H	81	88.92	4.87
3	5350.00	59.99 PK	74.00	-14.01	1.28 H	91	54.95	5.04
4	5350.00	45.63 AV	54.00	-8.37	1.28 H	91	40.59	5.04
5	10640.00	59.48 PK	74.00	-14.52	1.00 H	223	43.87	15.61
6	10640.00	46.36 AV	54.00	-7.64	1.00 H	223	30.75	15.61
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	100.24 PK			1.00 V	209	95.37	4.87
2	*5320.00	89.06 AV			1.00 V	209	84.19	4.87
3	5350.00	58.12 PK	74.00	-15.88	1.00 V	209	53.08	5.04
4	5350.00	44.92 AV	54.00	-9.08	1.00 V	209	39.88	5.04
5	10640.00	57.14 PK	74.00	-16.86	1.00 V	92	41.53	15.61
6	10640.00	44.83 AV	54.00	-9.17	1.00 V	92	29.22	15.61

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.

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	60.08 PK	74.00	-13.92	1.16 H	82	54.79	5.29
2	5150.00	47.04 AV	54.00	-6.96	1.16 H	82	41.75	5.29
3	*5180.00	104.71 PK			1.16 H	82	99.52	5.19
4	*5180.00	94.03 AV			1.16 H	82	88.84	5.19
5	#10360.00	56.92 PK	74.00	-17.08	1.00 H	207	41.83	15.09
6	#10360.00	45.75 AV	54.00	-8.25	1.00 H	207	30.66	15.09
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	59.78 PK	74.00	-14.22	1.02 V	220	54.49	5.29
2	5150.00	46.61 AV	54.00	-7.39	1.02 V	220	41.32	5.29
3	*5180.00	99.83 PK			1.02 V	220	94.64	5.19
4	*5180.00	90.38 AV			1.02 V	220	85.19	5.19
5	#10360.00	55.32 PK	74.00	-18.68	1.00 V	78	40.23	15.09
6	#10360.00	43.92 AV	54.00	-10.08	1.00 V	78	28.83	15.09

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	104.84 PK			1.17 H	85	99.72	5.12
2	*5200.00	94.03 AV			1.17 H	85	88.91	5.12
3	#10400.00	57.05 PK	74.00	-16.95	1.00 H	213	41.89	15.16
4	#10400.00	45.87 AV	54.00	-8.13	1.00 H	213	30.71	15.16
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	99.81 PK			1.01 V	218	94.69	5.12
2	*5200.00	90.34 AV			1.01 V	218	85.22	5.12
3	#10400.00	55.48 PK	74.00	-18.52	1.00 V	79	40.32	15.16
4	#10400.00	44.07 AV	54.00	-9.93	1.00 V	79	28.91	15.16

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	104.43 PK			1.00 H	80	99.48	4.95
2	*5240.00	94.10 AV			1.00 H	80	89.15	4.95
3	5350.00	58.30 PK	74.00	-15.70	1.00 H	80	53.26	5.04
4	5350.00	45.76 AV	54.00	-8.24	1.00 H	80	40.72	5.04
5	#10480.00	57.32 PK	74.00	-16.68	1.00 H	215	41.62	15.70
6	#10480.00	46.22 AV	54.00	-7.78	1.00 H	215	30.52	15.70
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	99.46 PK			1.00 V	218	94.51	4.95
2	*5240.00	90.01 AV			1.00 V	218	85.06	4.95
3	5350.00	58.08 PK	74.00	-15.92	1.00 V	218	53.04	5.04
4	5350.00	45.48 AV	54.00	-8.52	1.00 V	218	40.44	5.04
5	#10480.00	55.84 PK	74.00	-18.16	1.00 V	77	40.14	15.70
6	#10480.00	44.46 AV	54.00	-9.54	1.00 V	77	28.76	15.70

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	59.84 PK	74.00	-14.16	1.38 H	83	54.55	5.29
2	5150.00	46.80 AV	54.00	-7.20	1.38 H	83	41.51	5.29
3	*5260.00	104.28 PK			1.38 H	83	99.40	4.88
4	*5260.00	94.65 AV			1.38 H	83	89.77	4.88
5	#10520.00	56.59 PK	74.00	-17.41	1.00 H	235	40.82	15.77
6	#10520.00	46.46 AV	54.00	-7.54	1.00 H	235	30.69	15.77
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	59.57 PK	74.00	-14.43	1.00 V	217	54.28	5.29
2	5150.00	46.41 AV	54.00	-7.59	1.00 V	217	41.12	5.29
3	*5260.00	99.37 PK			1.00 V	217	94.49	4.88
4	*5260.00	89.91 AV			1.00 V	217	85.03	4.88
5	#10520.00	55.87 PK	74.00	-18.13	1.00 V	82	40.10	15.77
6	#10520.00	44.48 AV	54.00	-9.52	1.00 V	82	28.71	15.77

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)
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	*5300.00	104.49 PK			1.35 H	89	99.73	4.76
2	*5300.00	94.59 AV			1.35 H	89	89.83	4.76
3	10600.00	56.36 PK	74.00	-17.64	1.00 H	237	40.90	15.46
4	10600.00	46.22 AV	54.00	-7.78	1.00 H	237	30.76	15.46
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	99.45 PK			1.00 V	201	94.69	4.76
2	*5300.00	89.98 AV			1.00 V	201	85.22	4.76
3	10600.00	55.69 PK	74.00	-18.31	1.00 V	86	40.23	15.46
4	10600.00	44.33 AV	54.00	-9.67	1.00 V	86	28.87	15.46

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)
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	*5320.00	104.55 PK			1.39 H	81	99.68	4.87
2	*5320.00	94.66 AV			1.39 H	81	89.79	4.87
3	5350.00	58.99 PK	74.00	-15.01	1.39 H	81	53.95	5.04
4	5350.00	45.75 AV	54.00	-8.25	1.39 H	81	40.71	5.04
5	10640.00	56.48 PK	74.00	-17.52	1.00 H	233	40.87	15.61
6	10640.00	46.35 AV	54.00	-7.65	1.00 H	233	30.74	15.61
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	99.47 PK			1.00 V	209	94.60	4.87
2	*5320.00	90.04 AV			1.00 V	209	85.17	4.87
3	5350.00	58.53 PK	74.00	-15.47	1.00 V	209	53.49	5.04
4	5350.00	45.47 AV	54.00	-8.53	1.00 V	209	40.43	5.04
5	10640.00	55.77 PK	74.00	-18.23	1.00 V	77	40.16	15.61
6	10640.00	44.44 AV	54.00	-9.56	1.00 V	77	28.83	15.61

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.

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.85 PK	74.00	-17.15	2.93 H	262	51.56	5.29
2	5150.00	44.56 AV	54.00	-9.44	2.93 H	262	39.27	5.29
3	*5190.00	92.45 PK			2.93 H	262	87.29	5.16
4	*5190.00	82.89 AV			2.93 H	262	77.73	5.16
5	#10380.00	56.41 PK	74.00	-17.59	1.17 H	201	41.29	15.12
6	#10380.00	42.67 AV	54.00	-11.33	1.17 H	201	27.55	15.12
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.59 PK	74.00	-17.41	2.94 V	152	51.30	5.29
2	5150.00	44.42 AV	54.00	-9.58	2.94 V	152	39.13	5.29
3	*5190.00	88.93 PK			2.94 V	152	83.77	5.16
4	*5190.00	79.28 AV			2.94 V	152	74.12	5.16
5	#10380.00	54.84 PK	74.00	-19.16	2.09 V	114	39.72	15.12
6	#10380.00	41.30 AV	54.00	-12.70	2.09 V	114	26.18	15.12

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	91.93 PK			2.88 H	258	86.95	4.98
2	*5230.00	82.31 AV			2.88 H	258	77.33	4.98
3	5350.00	55.70 PK	74.00	-18.30	2.88 H	258	50.66	5.04
4	5350.00	43.02 AV	54.00	-10.98	2.88 H	258	37.98	5.04
5	#10460.00	56.56 PK	74.00	-17.44	1.18 H	192	40.99	15.57
6	#10460.00	42.96 AV	54.00	-11.04	1.18 H	192	27.39	15.57
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	88.50 PK			2.95 V	155	83.52	4.98
2	*5230.00	78.87 AV			2.95 V	155	73.89	4.98
3	5350.00	55.26 PK	74.00	-18.74	2.95 V	155	50.22	5.04
4	5350.00	42.53 AV	54.00	-11.47	2.95 V	155	37.49	5.04
5	#10460.00	55.15 PK	74.00	-18.85	2.21 V	108	39.58	15.57
6	#10460.00	41.40 AV	54.00	-12.60	2.21 V	108	25.83	15.57

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.36 PK	74.00	-17.64	2.98 H	261	51.07	5.29
2	5150.00	44.71 AV	54.00	-9.29	2.98 H	261	39.42	5.29
3	*5270.00	90.93 PK			2.98 H	261	86.07	4.86
4	*5270.00	81.95 AV			2.98 H	261	77.09	4.86
5	#10540.00	55.96 PK	74.00	-18.04	1.19 H	231	40.27	15.69
6	#10540.00	42.51 AV	54.00	-11.49	1.19 H	231	26.82	15.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.10 PK	74.00	-17.90	2.95 V	158	50.81	5.29
2	5150.00	44.51 AV	54.00	-9.49	2.95 V	158	39.22	5.29
3	*5270.00	87.47 PK			2.95 V	158	82.61	4.86
4	*5270.00	78.58 AV			2.95 V	158	73.72	4.86
5	#10540.00	54.80 PK	74.00	-19.20	1.84 V	89	39.11	15.69
6	#10540.00	41.23 AV	54.00	-12.77	1.84 V	89	25.54	15.69

REMARKS:

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

CHANNEL	TX Channel 62	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	*5310.00	90.56 PK			2.99 H	266	85.74	4.82
2	*5310.00	81.43 AV			2.99 H	266	76.61	4.82
3	5350.00	55.33 PK	74.00	-18.67	2.99 H	266	50.29	5.04
4	5350.00	42.72 AV	54.00	-11.28	2.99 H	266	37.68	5.04
5	10620.00	55.62 PK	74.00	-18.38	1.19 H	189	40.08	15.54
6	10620.00	42.29 AV	54.00	-11.71	1.19 H	189	26.75	15.54
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	87.43 PK			2.99 V	266	82.61	4.82
2	*5310.00	78.37 AV			2.99 V	266	73.55	4.82
3	5350.00	54.85 PK	74.00	-19.15	2.99 V	266	49.81	5.04
4	5350.00	42.07 AV	54.00	-11.93	2.99 V	266	37.03	5.04
5	10620.00	54.73 PK	74.00	-19.27	1.19 V	189	39.19	15.54
6	10620.00	40.98 AV	54.00	-13.02	1.19 V	189	25.44	15.54

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.

802.11ac (80MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.34 PK	74.00	-17.66	2.90 H	258	51.05	5.29
2	5150.00	45.38 AV	54.00	-8.62	2.90 H	258	40.09	5.29
3	*5210.00	90.69 PK			2.90 H	258	85.62	5.07
4	*5210.00	81.52 AV			2.90 H	258	76.45	5.07
5	5350.00	56.23 PK	74.00	-17.77	2.90 H	258	51.19	5.04
6	5350.00	43.68 AV	54.00	-10.32	2.90 H	258	38.64	5.04
7	#10420.00	55.43 PK	74.00	-18.57	2.27 H	211	40.13	15.30
8	#10420.00	42.56 AV	54.00	-11.44	2.27 H	211	27.26	15.30

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.55 PK	74.00	-17.45	3.21 V	164	51.26	5.29
2	5150.00	45.01 AV	54.00	-8.99	3.21 V	164	39.72	5.29
3	*5210.00	86.52 PK			3.21 V	164	81.45	5.07
4	*5210.00	77.20 AV			3.21 V	164	72.13	5.07
5	5350.00	56.11 PK	74.00	-17.89	3.21 V	164	51.07	5.04
6	5350.00	43.56 AV	54.00	-10.44	3.21 V	164	38.52	5.04
7	#10420.00	53.74 PK	74.00	-20.26	1.75 V	209	38.44	15.30
8	#10420.00	40.89 AV	54.00	-13.11	1.75 V	209	25.59	15.30

REMARKS:

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

CHANNEL	TX Channel 58	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.49 PK	74.00	-17.51	2.97 H	257	51.20	5.29
2	5150.00	45.37 AV	54.00	-8.63	2.97 H	257	40.08	5.29
3	*5290.00	89.77 PK			2.97 H	257	84.99	4.78
4	*5290.00	80.22 AV			2.97 H	257	75.44	4.78
5	5350.00	56.56 PK	74.00	-17.44	2.97 H	257	51.52	5.04
6	5350.00	43.84 AV	54.00	-10.16	2.97 H	257	38.80	5.04
7	#10580.00	55.49 PK	74.00	-18.51	2.04 H	231	39.96	15.53
8	#10580.00	42.56 AV	54.00	-11.44	2.04 H	231	27.03	15.53
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.88 PK	74.00	-17.12	3.26 V	169	51.59	5.29
2	5150.00	45.24 AV	54.00	-8.76	3.26 V	169	39.95	5.29
3	*5290.00	85.40 PK			3.26 V	169	80.62	4.78
4	*5290.00	76.26 AV			3.26 V	169	71.48	4.78
5	5350.00	56.63 PK	74.00	-17.37	3.26 V	169	51.59	5.04
6	5350.00	43.50 AV	54.00	-10.50	3.26 V	169	38.46	5.04
7	#10580.00	53.81 PK	74.00	-20.19	1.77 V	201	38.28	15.53
8	#10580.00	40.94 AV	54.00	-13.06	1.77 V	201	25.41	15.53

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:

802.11n (20MHz)

CHANNEL	TX Channel 40	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	39.95	21.60 QP	40.00	-18.40	1.05 H	105	30.95	-9.35
2	120.00	21.01 QP	43.50	-22.49	2.28 H	105	32.36	-11.35
3	236.06	34.87 QP	46.00	-11.13	1.75 H	269	45.22	-10.35
4	528.09	23.20 QP	46.00	-22.80	1.65 H	276	25.41	-2.21
5	655.51	24.97 QP	46.00	-21.03	1.42 H	46	24.52	0.45
6	798.56	27.97 QP	46.00	-18.03	1.03 H	136	24.72	3.25
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	39.95	28.76 QP	40.00	-11.24	1.25 V	359	38.11	-9.35
2	120.00	26.72 QP	43.50	-16.78	1.12 V	3	38.07	-11.35
3	472.07	29.80 QP	46.00	-16.20	1.58 V	28	33.02	-3.22
4	607.90	25.62 QP	46.00	-20.38	1.56 V	324	25.89	-0.27
5	714.60	32.05 QP	46.00	-13.95	1.77 V	31	30.44	1.61
6	848.54	27.97 QP	46.00	-18.03	2.09 V	331	23.96	4.01

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.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESCS 30	100276	Apr. 10, 2017	Apr. 9, 2018
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ENV216	101197	May 22, 2017	May 21, 2018
LISN With Adapter (for EUT)	AD10	C10Ada-002	May 22, 2017	May 21, 2018
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100218	Nov. 23, 2017	Nov. 22, 2018
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 9, 2017	May 8, 2018
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C10.01	Feb. 14, 2017	Feb. 13, 2018
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-011484	May 18, 2017	May 17, 2018
ROHDE & SCHWARZ Artificial Mains Network (For TV EUT)	ESH3-Z5	100220	Nov. 14, 2017	Nov. 13, 2018
LISN With Adapter (for TV EUT)	100220	N/A	Nov. 14, 2017	Nov. 13, 2018

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in Shielded Room No. 10.

4.2.3 Test Procedure

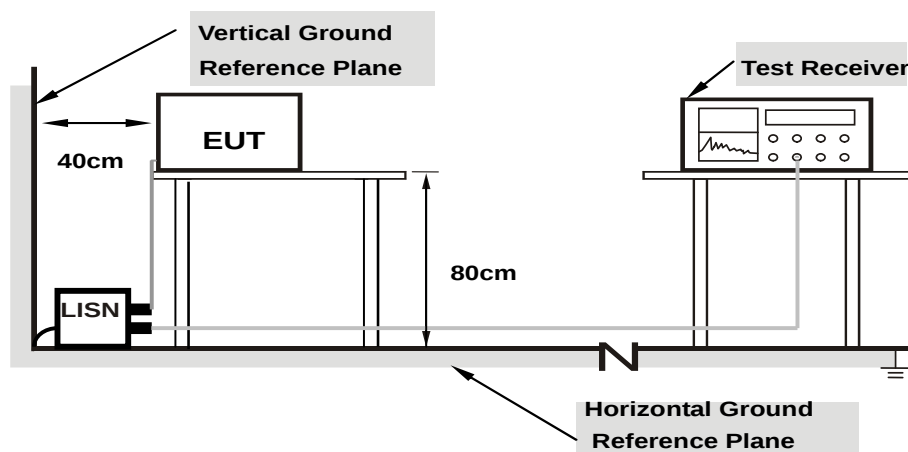
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 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.

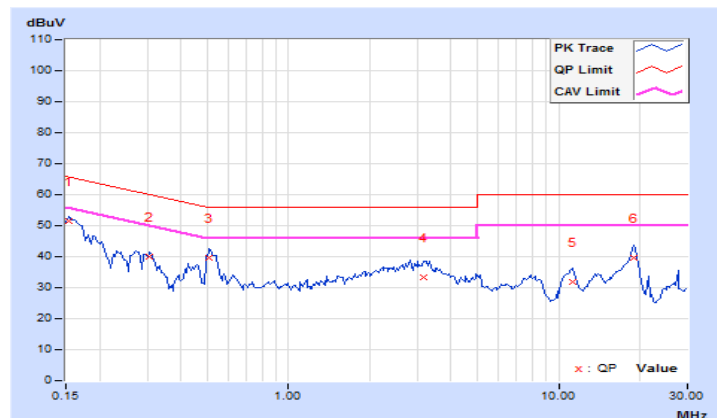
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.65	41.84	34.03	51.49	43.68	65.79	55.79	-14.30	-12.11
2	0.30625	9.66	30.26	24.74	39.92	34.40	60.07	50.07	-20.15	-15.67
3	0.50938	9.67	29.97	25.10	39.64	34.77	56.00	46.00	-16.36	-11.23
4	3.17578	9.80	23.58	18.18	33.38	27.98	56.00	46.00	-22.62	-18.02
5	11.31250	9.94	21.84	16.78	31.78	26.72	60.00	50.00	-28.22	-23.28
6	18.96484	9.98	29.81	24.99	39.79	34.97	60.00	50.00	-20.21	-15.03

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.

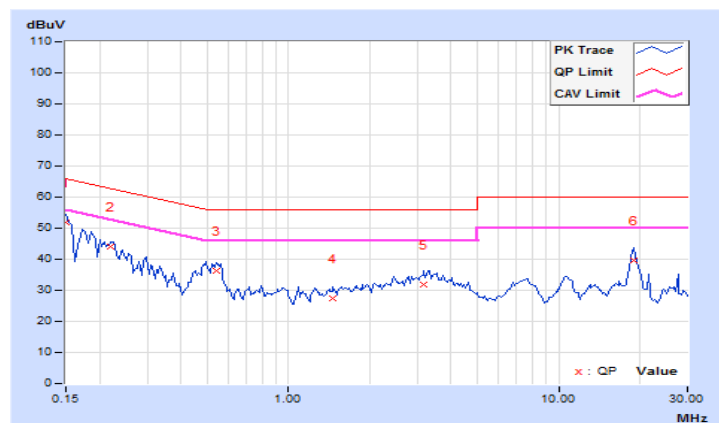


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.68	42.17	30.63	51.85	40.31	66.00	56.00	-14.15	-15.69
2	0.22031	9.67	34.29	27.70	43.96	37.37	62.81	52.81	-18.85	-15.44
3	0.54453	9.69	26.53	21.80	36.22	31.49	56.00	46.00	-19.78	-14.51
4	1.46484	9.73	17.82	12.77	27.55	22.50	56.00	46.00	-28.45	-23.50
5	3.16016	9.81	22.09	16.54	31.90	26.35	56.00	46.00	-24.10	-19.65
6	19.03125	10.05	29.69	25.03	39.74	35.08	60.00	50.00	-20.26	-14.92

REMARKS:

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



4.3 Transmit Power Measurement

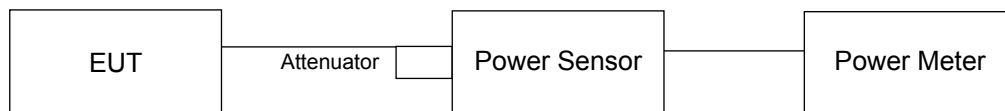
4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 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)

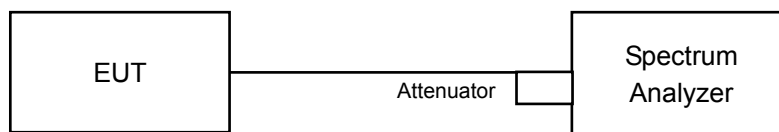
*B is the 26 dB emission bandwidth in megahertz

4.3.2 Test Setup

For Power Output Measurement



For 26dB Occupied Bandwidth



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

For 802.11a, 802.11n (20MHz), 802.11n (40MHz)

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 and set the detector to AVERAGE. Duty factor is not added to measured value.

For 802.11ac (80MHz)

- 1) Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- 2) Set sweep trigger to "free run".
- 3) Set RBW = 1 MHz.
- 4) Set VBW $\geq$ 3 MHz
- 5) Number of points in sweep $\geq$ 2 Span / RBW.
- 6) Sweep time $\leq$ (number of points in sweep) * T
- 7) Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
- 8) Detector = RMS.
- 9) Trace mode = max hold.
- 10) Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

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

Power Output:

802.11a

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
36	5180	25.235	14.02	24	Pass
40	5200	25.351	14.04	24	Pass
48	5240	25.003	13.98	24	Pass
52	5260	24.889	13.96	24	Pass
60	5300	25.235	14.02	24	Pass
64	5320	25.119	14.00	24	Pass

NOTE:

For U-NII-2A Band:

1. $11\text{dBm} + 10\log(21.96) = 24.42\text{ dBm} > 24\text{dBm}$.
2. $11\text{dBm} + 10\log(21.78) = 24.38\text{ dBm} > 24\text{dBm}$.
3. $11\text{dBm} + 10\log(22.06) = 24.44\text{ dBm} > 24\text{dBm}$.

802.11n (20MHz)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
36	5180	20.230	13.06	24	Pass
40	5200	20.137	13.04	24	Pass
48	5240	20.091	13.03	24	Pass
52	5260	19.953	13.00	24	Pass
60	5300	19.815	12.97	24	Pass
64	5320	20.137	13.04	24	Pass

NOTE:

For U-NII-2A Band:

1. $11\text{dBm} + 10\log(22.13) = 24.45\text{ dBm} > 24\text{dBm}$.
2. $11\text{dBm} + 10\log(22.58) = 24.54\text{ dBm} > 24\text{dBm}$.
3. $11\text{dBm} + 10\log(22.43) = 24.51\text{ dBm} > 24\text{dBm}$.

802.11n (40MHz)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
38	5190	20.137	13.04	24	Pass
46	5230	19.907	12.99	24	Pass
54	5270	20.045	13.02	24	Pass
62	5310	19.770	12.96	24	Pass

NOTE:

For U-NII-2A Band:

1. $11\text{dBm} + 10\log(44.45) = 27.48\text{ dBm} > 24\text{dBm}$.
2. $11\text{dBm} + 10\log(44.18) = 27.45\text{ dBm} > 24\text{dBm}$.

802.11ac (80MHz)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
42	5210	20.230	13.06	24	Pass
58	5290	20.137	13.04	24	Pass

NOTE:

For U-NII-2A Band:

1. $11\text{dBm} + 10\log(84.61) = 30.27\text{ dBm} > 24\text{dBm}$.

26dB Bandwidth:

802.11a

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)
52	5260	21.96
60	5300	21.78
64	5320	22.06

802.11n (20MHz)

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)
52	5260	22.13
60	5300	22.58
64	5320	22.43

802.11n (40MHz)

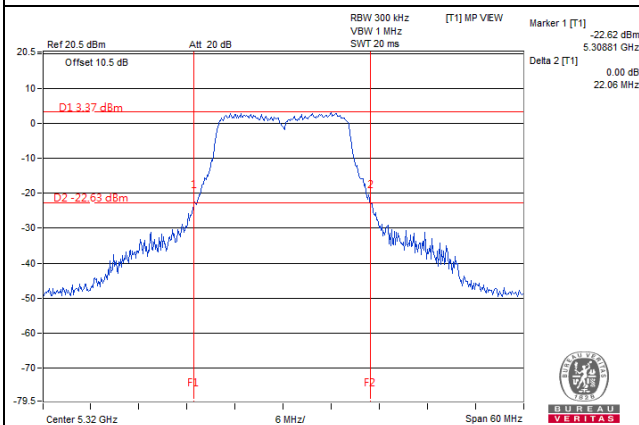
Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)
54	5270	44.45
62	5310	44.18

802.11ac (80MHz)

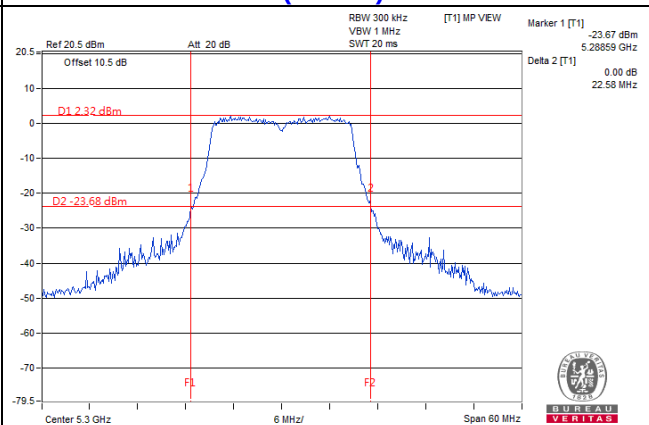
Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)
58	5290	84.61

Spectrum Plot of Worst Value

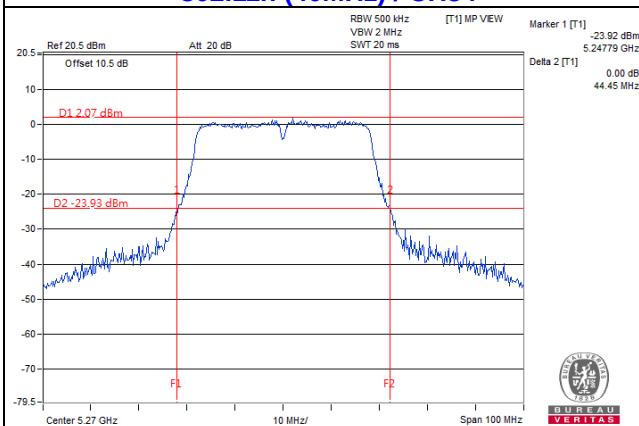
802.11a / CH64



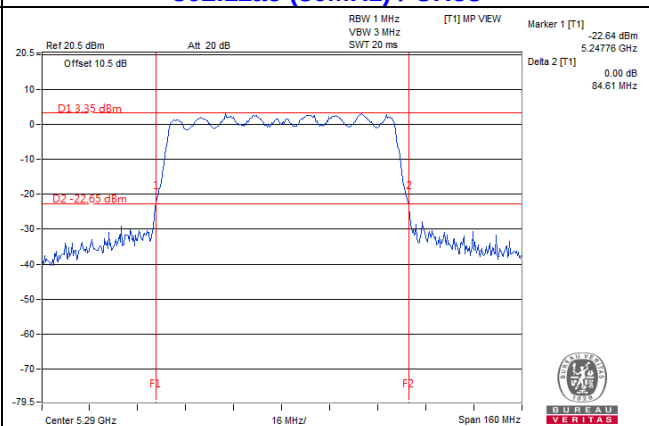
802.11n (20MHz) / CH60



802.11n (40MHz) / CH54



802.11ac (80MHz) / CH58



EUT MAXIMUM CONDUCTED POWER

802.11a

Frequency Band (MHz)	MAX. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	25.235	14.02

NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11n (20MHz)

Frequency Band (MHz)	MAX. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	20.137	13.04

NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11n (40MHz)

Frequency Band (MHz)	MAX. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	20.045	13.02

NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

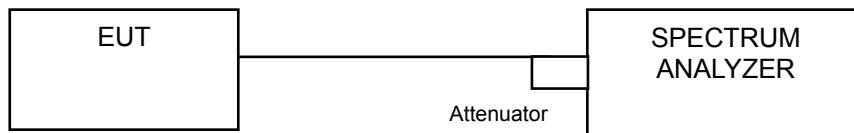
802.11ac (80MHz)

Frequency Band (MHz)	MAX. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	20.230	13.06

NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

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)
36	5180	16.92
40	5200	16.92
48	5240	16.92
52	5260	16.92
60	5300	16.92
64	5320	16.92

802.11n (20MHz)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	17.88
40	5200	17.88
48	5240	18.00
52	5260	18.00
60	5300	17.88
64	5320	17.88

802.11n (40MHz)

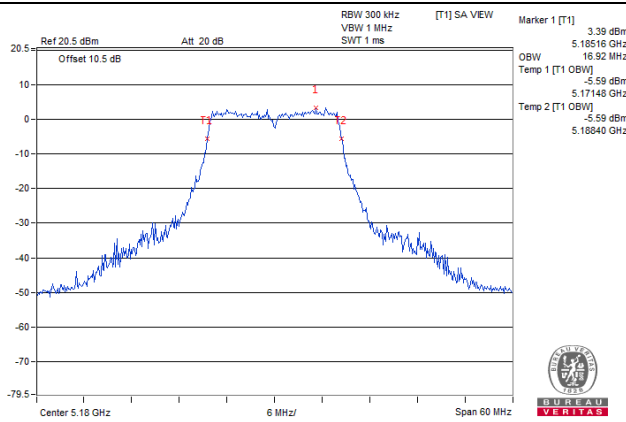
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
38	5190	36.40
46	5230	36.60
54	5270	36.40
62	5310	36.40

802.11ac (80MHz)

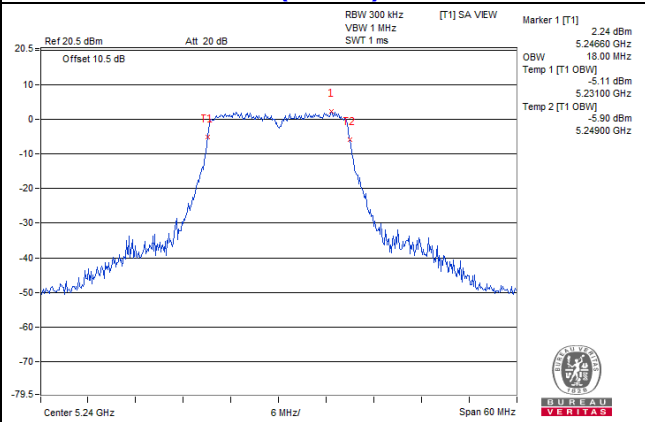
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
42	5210	75.84
58	5290	75.84

Spectrum Plot of Worst Value

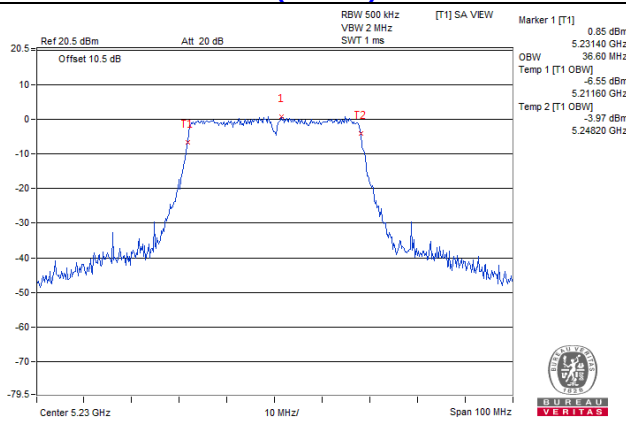
802.11a / CH36



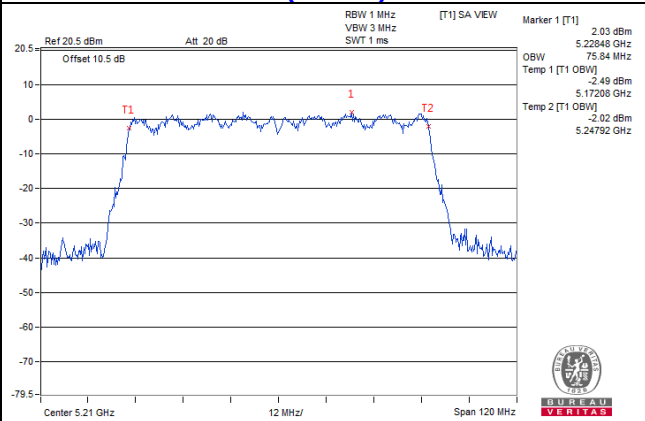
802.11n (20MHz) / CH48



802.11n (40MHz) / CH46



802.11ac (80MHz) / CH42

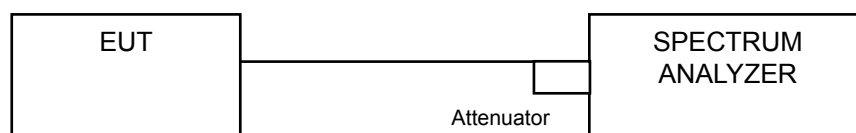


4.5 Peak Power Spectral Density Measurement

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	
	√	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-1, U-NII-2A band:

Using method SA-2

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 30 kHz, Set VBW ≥ 1 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to "free run".
- 5) Trace average at least 100 traces in power averaging mode.
- 6) 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

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
36	5180	-0.24	0.46	0.22	11	Pass
40	5200	-0.67	0.46	-0.21	11	Pass
48	5240	0.11	0.46	0.57	11	Pass
52	5260	-0.65	0.46	-0.19	11	Pass
60	5300	-0.26	0.46	0.20	11	Pass
64	5320	-0.84	0.46	-0.38	11	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot

802.11ac (20MHz)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
36	5180	-1.52	0.39	-1.13	11	Pass
40	5200	-1.94	0.39	-1.55	11	Pass
48	5240	-1.38	0.39	-0.99	11	Pass
52	5260	-2.13	0.39	-1.74	11	Pass
60	5300	-2.05	0.39	-1.66	11	Pass
64	5320	-1.82	0.39	-1.43	11	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot

802.11ac (40MHz)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
38	5190	-5.85	0.79	-5.06	11	Pass
46	5230	-5.16	0.79	-4.37	11	Pass
54	5270	-5.47	0.79	-4.68	11	Pass
62	5310	-5.30	0.79	-4.51	11	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot

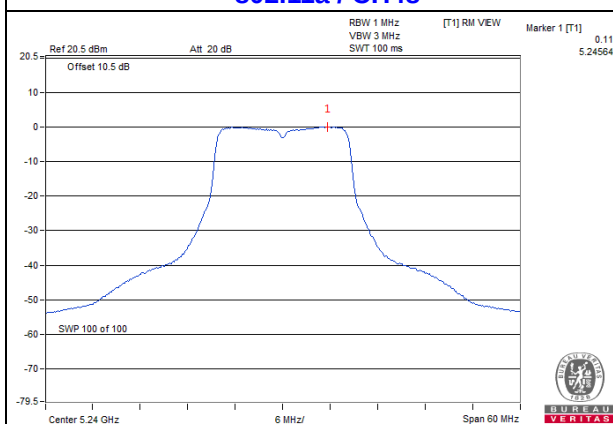
802.11ac (80MHz)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
42	5210	-8.04	3.10	-4.94	11	Pass
58	5290	-7.68	3.10	-4.58	11	Pass

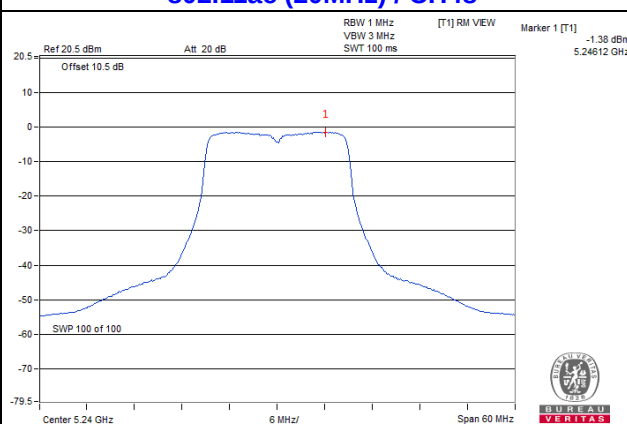
Note: Refer to section 3.3 for duty cycle spectrum plot

Spectrum Plot of Worst Value

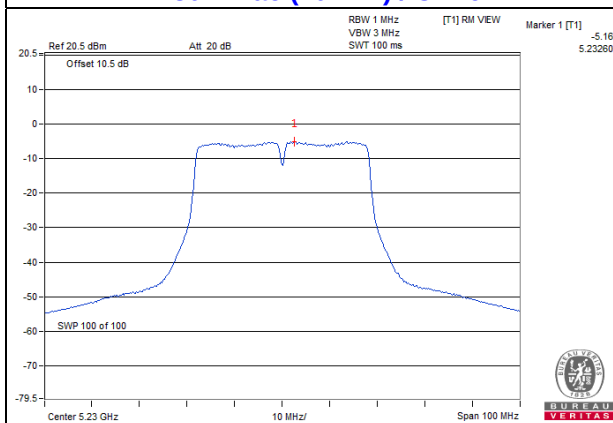
802.11a / CH48



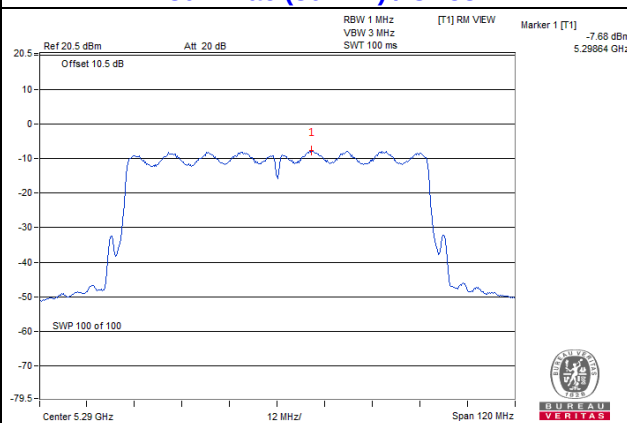
802.11ac (20MHz) / CH48



802.11ac (40MHz) / CH46



802.11ac (80MHz) / CH58

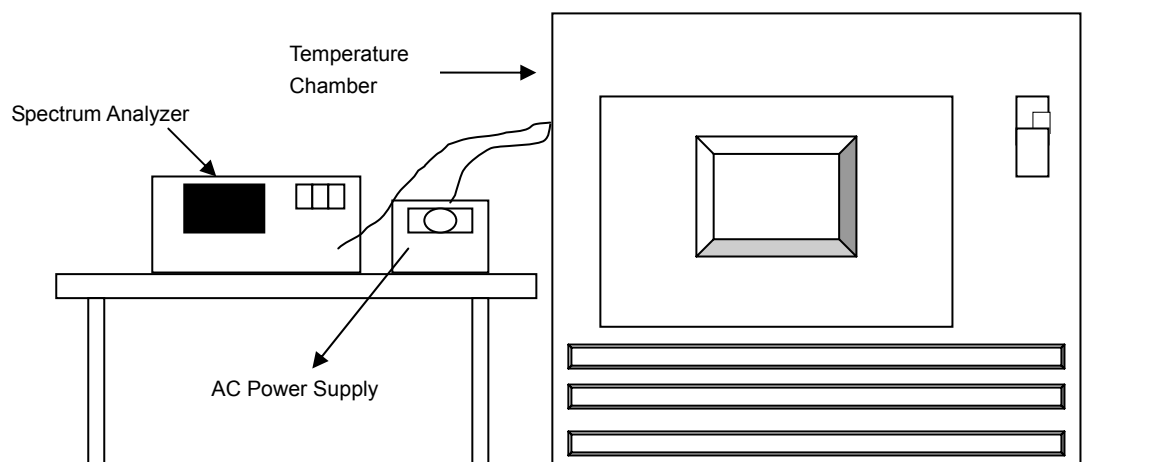


4.6 Frequency Stability Measurement

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

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- 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.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- 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: 5180 MHz									
TEMP. (°C)	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	5180.043564	Pass	5180.043532	Pass	5180.043877	Pass	5180.04395	Pass
40	120	5180.041911	Pass	5180.042386	Pass	5180.042269	Pass	5180.042007	Pass
30	120	5180.043035	Pass	5180.043088	Pass	5180.043108	Pass	5180.043277	Pass
20	120	5180.04313	Pass	5180.043437	Pass	5180.043422	Pass	5180.043294	Pass
10	120	5180.042681	Pass	5180.042755	Pass	5180.042620	Pass	5180.042642	Pass
0	120	5180.043208	Pass	5180.04277	Pass	5180.043225	Pass	5180.042832	Pass
-10	120	5180.04329	Pass	5180.043271	Pass	5180.043236	Pass	5180.043515	Pass
-20	120	5180.043087	Pass	5180.043001	Pass	5180.043238	Pass	5180.043339	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (°C)	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	5180.043538	Pass	5180.043473	Pass	5180.043426	Pass	5180.043252	Pass
	120	5180.04313	Pass	5180.043437	Pass	5180.043422	Pass	5180.043294	Pass
	102	5180.042106	Pass	5180.042089	Pass	5180.041827	Pass	5180.042102	Pass

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

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Tel: 886-3-3183232

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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