

FCC Test Report

Report No.: RF190220D10-1

FCC ID: RK9-CGA0112

Test Model: CGA0112

Received Date: Feb. 20, 2019

Test Date: Mar. 11 to 26, 2019

Issued Date: Apr. 1, 2019

Applicant: CastleNet Technology Inc.

Address: No. 64, Chung-Shan Rd. Tu-Cheng District, New Taipei City, Taiwan

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

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
(R.O.C.)

**FCC Registration /
Designation Number:** 198487 / TW2021



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Release Control Record

Issue No.	Description	Date Issued
RF190220D10-1	Original release.	Apr. 1, 2019

1 Certificate of Conformity

Product: DOCSIS3.0 Wireless Cable modem Router
Brand: Technicolor
Test Model: CGA0112
Sample Status: Engineering sample
Applicant: CastleNet Technology Inc.
Test Date: Mar. 11 to 26, 2019
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:** Apr. 1, 2019
Annie Chang / Senior Specialist

Approved by : Rex Lai, **Date:** Apr. 1, 2019
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 -12.63dB at 0.15000MHz.
15.407(b)(1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -1.03dB 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	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

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

Note:

Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 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	DOCSIS3.0 Wireless Cable modem Router
Brand	Technicolor
Test Model	CGA0112
Status of EUT	Engineering sample
Power Supply Rating	DC 12V from Adapter
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 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 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	5180 ~ 5240MHz, 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz 4 for 802.11a, 802.11n (20MHz), 802.11ac (20MHz) 2 for 802.11n (40MHz), 802.11ac (40MHz) 1 for 802.11ac (80MHz) 5745 ~ 5825MHz 5 for 802.11a, 802.11n (20MHz) 802.11ac (20MHz) 2 for 802.11n (40MHz) 802.11ac (40MHz) 1 for 802.11ac (80MHz)
Output Power	5180 ~ 5240MHz: 124.750mW 5745 ~ 5825MHz: 133.681mW
Antenna Type	5180 ~ 5240MHz: Ant.1: Metal antenna with 2.50dBi gain Ant.2: Metal antenna with 4.33dBi gain 5745 ~ 5825MHz: Ant.1: Metal antenna with 2.65dBi gain Ant.2: Metal antenna with 2.92dBi gain
Antenna Connector	N/A
Accessory Device	Adapter
Data Cable Supplied	N/A

Note:

1. The EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	TX FUNCTION
802.11a	2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX
802.11ac (20MHz)	2TX
802.11ac (40MHz)	2TX
802.11ac (80MHz)	2TX

* 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 EUT consumes power from a switching power adapter, which has several models could be chosen, as the following:

Adapter	Brand	Model No.	Specification
1	HONOTO	ADS-24FQ-12 12021EPCU	AC I/P: 100-240V, 50/60Hz, 0.7A DC O/P: 12V, 1.75A AC 2 Pin, Non-shielded DC cable (1.4m)
2	HONOTO	ADS-24FQ-12 12021EPCU-L	AC I/P: 100-120V, 50/60Hz, 0.7A DC O/P: 12V, 1.75A AC 2 Pin, Non-shielded DC cable (1.4m)

After pre-tested, the **adapter 2** was the worst for final test.

3. 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 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

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

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

NOTE: 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
-	802.11ac (20MHz)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11ac (40MHz)		38 to 46	38, 46	OFDM	BPSK	13.5
-	802.11ac (80MHz)		42	42	OFDM	BPSK	29.3
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
-	802.11ac (20MHz)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11ac (40MHz)		151 to 159	151, 159	OFDM	BPSK	13.5
-	802.11ac (80MHz)		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.

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11ac (20MHz)	5180-5240	36 to 48	48	OFDM	BPSK	6.5
-	802.11ac (20MHz)	5745-5825	149 to 165		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)
-	802.11ac (20MHz)	5180-5240	36 to 48	48	OFDM	BPSK	6.5
-	802.11ac (20MHz)	5745-5825	149 to 165		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
-	802.11ac (20MHz)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11ac (40MHz)		38 to 46	38, 46	OFDM	BPSK	13.5
-	802.11ac (80MHz)		42	42	OFDM	BPSK	29.3
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
-	802.11ac (20MHz)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11ac (40MHz)		151 to 159	151, 159	OFDM	BPSK	13.5
-	802.11ac (80MHz)		155	155	OFDM	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE $\geq$ 1G	25deg. C, 76%RH	120Vac, 60Hz	Dalen Dai
RE<1G	23deg. C, 69%RH	120Vac, 60Hz	Dalen Dai
PLC	25deg. C, 75%RH	120Vac, 60Hz	Dalen Dai
APCM	25deg. C, 76%RH	120Vac, 60Hz	Saxon Lee

3.3 Duty Cycle of Test Signal

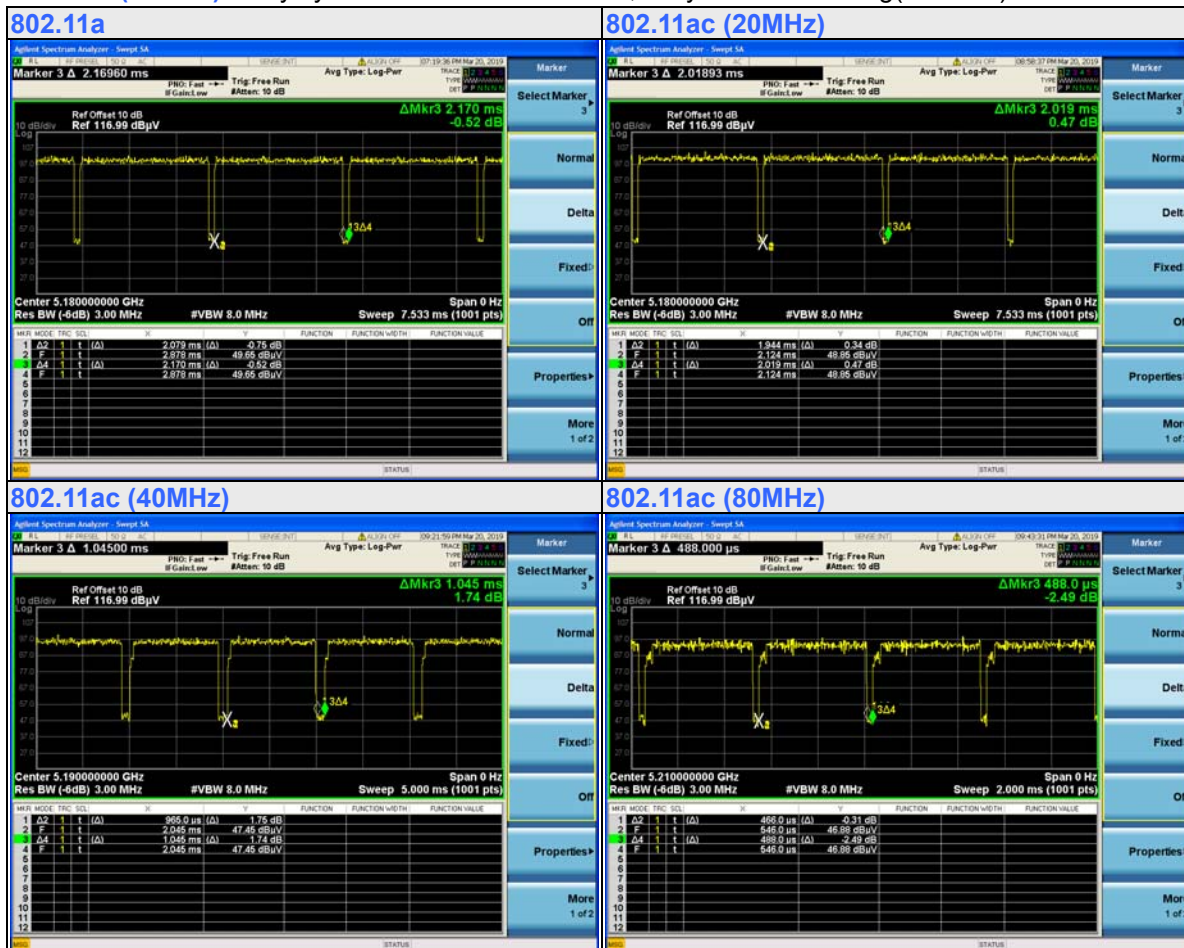
Duty cycle of test signal is < 98 %, duty factor is required

802.11a: Duty cycle = $2.079/2.170 = 0.958$, Duty factor = $10 * \log(1/0.958) = 0.19$

802.11ac (20MHz): Duty cycle = $1.944/2.019 = 0.963$, Duty factor = $10 * \log(1/0.963) = 0.16$

802.11ac (40MHz): Duty cycle = $0.965/1.045 = 0.923$, Duty factor = $10 * \log(1/0.923) = 0.35$

802.11ac (80MHz): Duty cycle = $0.466/0.488 = 0.955$, Duty factor = $10 * \log(1/0.955) = 0.20$



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	DELL	E5410	BW33YM1	FCC DoC Approved	Provided by Lab

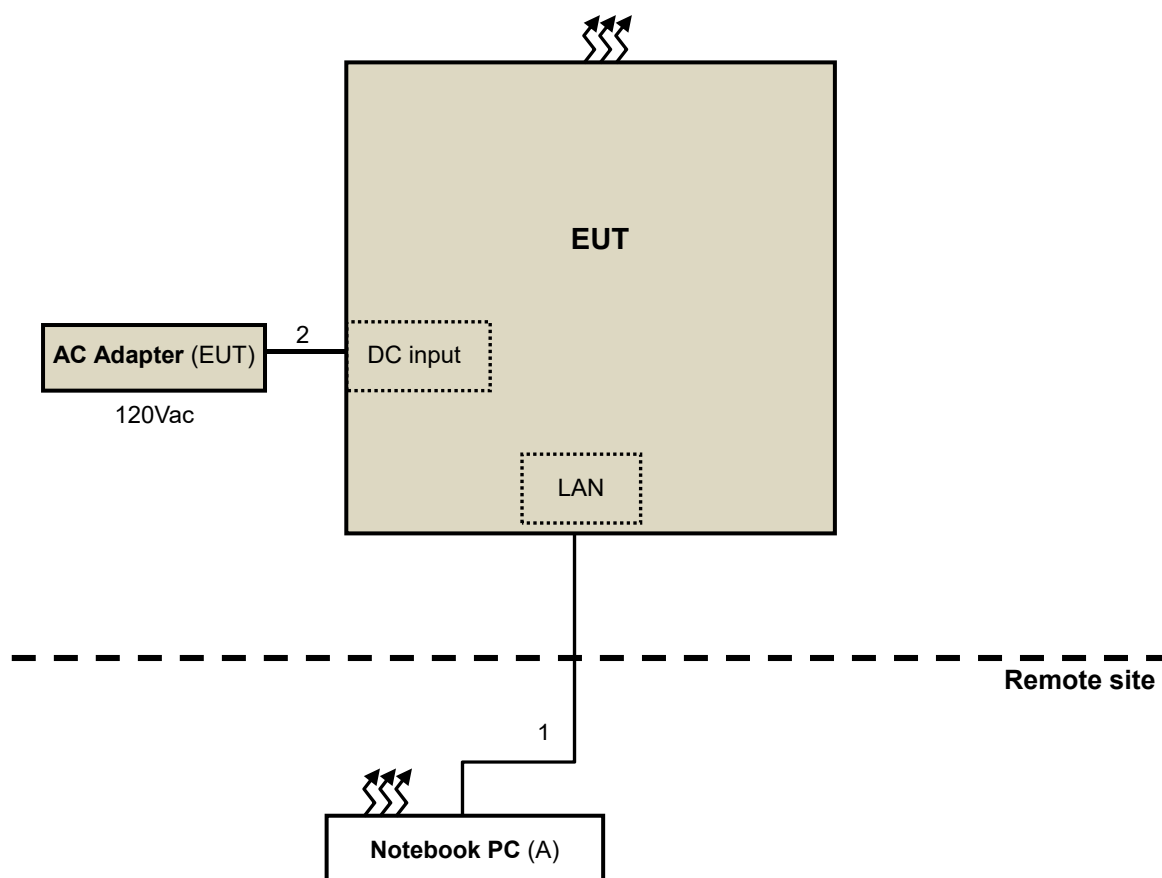
Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	3	N	0	Provided by Lab
2.	DC cable	1	3	N	0	Supplied by client

Note: The core(s) is(are) originally attached to the cable(s).

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:

- 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 (dBuV/m)	AV:54 (dBuV/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(dBuV/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(dBuV/m) ^{*1} PK:105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK:122.2 (dBuV/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. 20, 2019	Feb. 19, 2020
HP Preamplifier	8449B	3008A01201	Feb. 21, 2019	Feb. 20, 2020
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 20, 2019	Feb. 19, 2020
Agilent TEST RECEIVER	N9038A	MY51210129	Mar. 05, 2019	Mar. 04, 2020
Schwarzbeck Antenna	VULB 9168	139	Nov. 26, 2018	Nov. 25, 2019
Schwarzbeck Antenna	VHBA 9123	480	May 19, 2017	May 18, 2019
Schwarzbeck Horn Antenna	BBHA-9170	212	Nov. 25, 2018	Nov. 24, 2019
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Nov. 25, 2018	Nov. 24, 2019
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	SF102	Cable-CH6-01	Aug. 13, 2018	Aug. 12, 2019
SUHNER RF cable With 3/4dB PAD	SF102	Cable-CH8-3.6m	Aug. 13, 2018	Aug. 12, 2019
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	Jun. 4, 2018	Jun. 3, 2019
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Aug. 3, 2018	Aug. 2, 2019
Loop Antenna EMCI	LPA600	270	Aug. 11, 2017	Aug. 10, 2019
EMCO Horn Antenna	3115	00028257	Nov. 25, 2018	Nov. 24, 2019
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 27, 2018	Sep. 26, 2019
Anritsu Power Sensor	MA2411B	0738404	Apr. 26, 2018	Apr. 25, 2019
Anritsu Power Meter	ML2495A	0842014	Apr. 26, 2018	Apr. 25, 2019

- 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. 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:

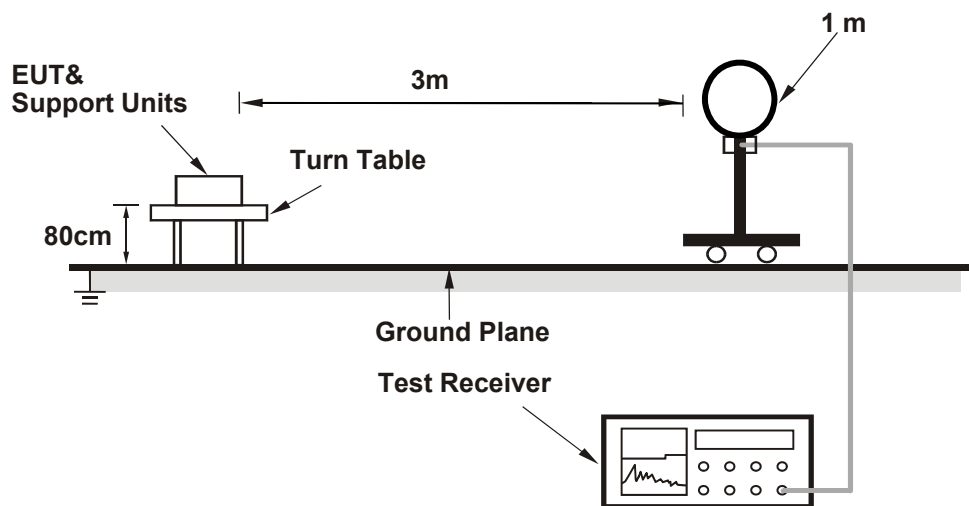
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

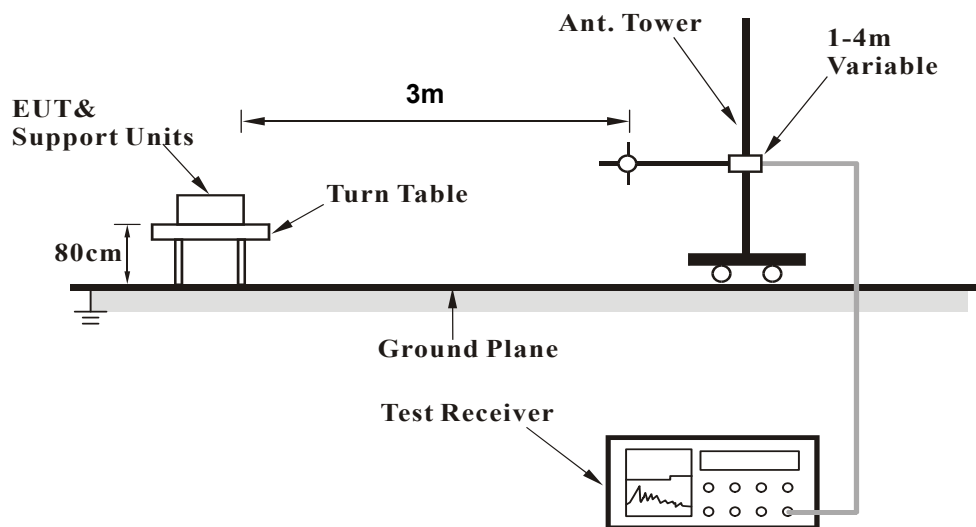
No deviation.

4.1.5 Test Setup

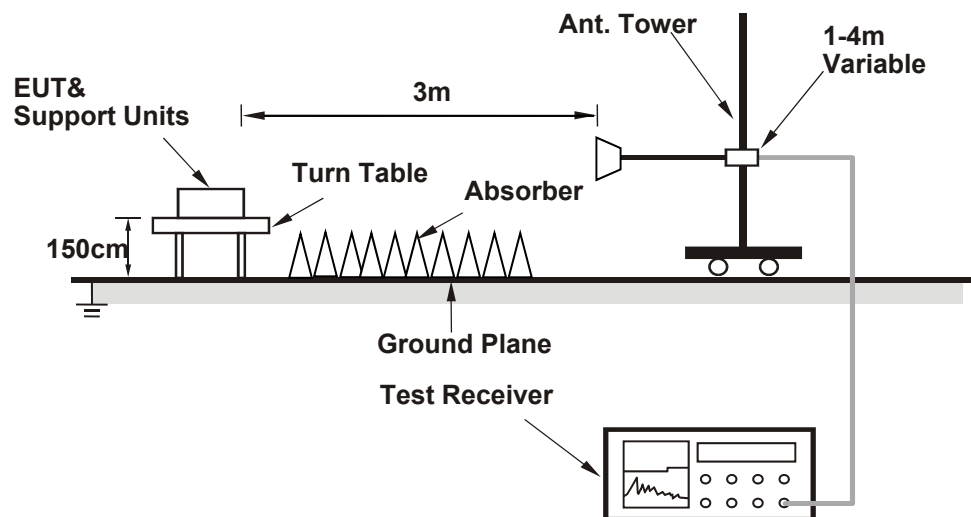
For Radiated emission below 30MHz



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

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	5100.00	64.86 PK	74.00	-9.14	1.66 H	188	57.91	6.95
2	5100.00	52.57 AV	54.00	-1.43	1.66 H	188	45.62	6.95
3	5150.00	60.09 PK	74.00	-13.91	1.66 H	188	52.88	7.21
4	5150.00	45.41 AV	54.00	-8.59	1.66 H	188	38.20	7.21
5	*5180.00	106.83 PK			1.66 H	188	99.58	7.25
6	*5180.00	96.22 AV			1.66 H	188	88.97	7.25
7	#10360.00	58.05 PK	68.20	-10.15	1.59 H	264	40.91	17.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	62.86 PK	74.00	-11.14	1.58 V	134	55.91	6.95
2	5100.00	50.42 AV	54.00	-3.58	1.58 V	134	43.47	6.95
3	5150.00	59.24 PK	74.00	-14.76	1.58 V	134	52.03	7.21
4	5150.00	44.90 AV	54.00	-9.10	1.58 V	134	37.69	7.21
5	*5180.00	105.04 PK			1.58 V	134	97.79	7.25
6	*5180.00	93.58 AV			1.58 V	134	86.33	7.25
7	#10360.00	56.77 PK	68.20	-11.43	1.77 V	142	39.63	17.14

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 other emission levels were very low against the limit.
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	5120.00	65.33 PK	74.00	-8.67	1.60 H	187	58.28	7.05
2	5120.00	52.71 AV	54.00	-1.29	1.60 H	187	45.66	7.05
3	*5200.00	107.65 PK			1.60 H	187	100.39	7.26
4	*5200.00	96.34 AV			1.60 H	187	89.08	7.26
5	#10400.00	57.86 PK	68.20	-10.34	1.66 H	258	40.52	17.34
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	5120.00	61.41 PK	74.00	-12.59	1.60 V	187	54.36	7.05
2	5120.00	48.14 AV	54.00	-5.86	1.60 V	187	41.09	7.05
3	*5200.00	105.55 PK			1.60 V	128	98.29	7.26
4	*5200.00	95.14 AV			1.60 V	128	87.88	7.26
5	#10400.00	56.67 PK	68.20	-11.53	1.82 V	152	39.33	17.34

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 other emission levels were very low against the limit.
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	#5160.00	65.39 PK	68.20	-2.81	1.63 H	191	58.17	7.22
2	#5160.00	52.73 AV	54.00	-1.27	1.63 H	191	45.51	7.22
3	*5240.00	107.87 PK			1.63 H	191	100.91	6.96
4	*5240.00	96.63 AV			1.63 H	191	89.67	6.96
5	5350.00	58.25 PK	74.00	-15.75	1.63 H	191	50.88	7.37
6	5350.00	45.95 AV	54.00	-8.05	1.63 H	191	38.58	7.37
7	#10480.00	58.58 PK	68.20	-9.62	1.54 H	258	40.88	17.70
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	#5160.00	62.24 PK	68.20	-5.96	1.59 V	139	55.02	7.22
2	#5160.00	49.83 AV	54.00	-4.17	1.59 V	139	42.61	7.22
3	*5240.00	105.17 PK			1.59 V	139	98.21	6.96
4	*5240.00	94.75 AV			1.59 V	139	87.79	6.96
5	5350.00	57.40 PK	74.00	-16.60	1.59 V	139	50.03	7.37
6	5350.00	45.36 AV	54.00	-8.64	1.59 V	139	37.99	7.37
7	#10480.00	57.03 PK	68.20	-11.17	1.73 V	163	39.33	17.70

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5620.11	60.97 PK	68.20	-7.23	1.48 H	185	53.39	7.58
2	*5745.00	107.65 PK			1.48 H	185	100.06	7.59
3	*5745.00	96.88 AV			1.48 H	185	89.29	7.59
4	#5952.61	60.49 PK	68.20	-7.71	1.48 H	185	52.39	8.10
5	11490.00	59.33 PK	74.00	-14.67	1.64 H	139	41.26	18.07
6	11490.00	45.56 AV	54.00	-8.44	1.64 H	139	27.49	18.07
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	#5617.55	59.69 PK	68.20	-8.51	1.54 V	129	52.10	7.59
2	*5745.00	105.77 PK			1.54 V	129	98.18	7.59
3	*5745.00	95.51 AV			1.54 V	129	87.92	7.59
4	#5937.36	60.23 PK	68.20	-7.97	1.54 V	129	52.08	8.15
5	11490.00	58.11 PK	74.00	-15.89	1.58 V	199	40.04	18.07
6	11490.00	44.36 AV	54.00	-9.64	1.58 V	199	26.29	18.07

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5628.37	59.02 PK	68.20	-9.18	1.59 H	193	51.49	7.53
2	*5785.00	109.00 PK			1.59 H	193	101.26	7.74
3	*5785.00	98.37 AV			1.59 H	193	90.63	7.74
4	#5942.35	58.72 PK	68.20	-9.48	1.59 H	193	50.60	8.12
5	11570.00	59.53 PK	74.00	-14.47	1.89 H	91	41.55	17.98
6	11570.00	45.40 AV	54.00	-8.60	1.89 H	91	27.42	17.98
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	#5626.21	58.41 PK	68.20	-9.79	1.49 V	133	50.86	7.55
2	*5785.00	107.31 PK			1.49 V	133	99.57	7.74
3	*5785.00	96.70 AV			1.49 V	133	88.96	7.74
4	#5938.21	57.41 PK	68.20	-10.79	1.49 V	133	49.27	8.14
5	11570.00	58.26 PK	74.00	-15.74	1.47 V	188	40.28	17.98
6	11570.00	44.31 AV	54.00	-9.69	1.47 V	188	26.33	17.98

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5614.71	59.25 PK	68.20	-8.95	1.47 H	189	51.65	7.60
2	*5825.00	108.80 PK			1.47 H	189	100.88	7.92
3	*5825.00	97.67 AV			1.47 H	189	89.75	7.92
4	#5948.30	60.07 PK	68.20	-8.13	1.47 H	189	51.96	8.11
5	11650.00	58.93 PK	74.00	-15.07	1.82 H	263	41.21	17.72
6	11650.00	45.01 AV	54.00	-8.99	1.82 H	263	27.29	17.72
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	#5614.49	58.70 PK	68.20	-9.50	1.54 V	124	51.09	7.61
2	*5825.00	106.67 PK			1.54 V	124	98.75	7.92
3	*5825.00	95.35 AV			1.54 V	124	87.43	7.92
4	#5983.25	60.28 PK	68.20	-7.92	1.54 V	124	52.18	8.10
5	11650.00	58.13 PK	74.00	-15.87	2.10 V	123	40.41	17.72
6	11650.00	44.06 AV	54.00	-9.94	2.10 V	123	26.34	17.72

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (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	5100.00	66.11 PK	74.00	-7.89	1.54 H	186	59.16	6.95
2	5100.00	52.55 AV	54.00	-1.45	1.54 H	186	45.60	6.95
3	5150.00	60.10 PK	74.00	-13.90	1.54 H	186	52.89	7.21
4	5150.00	45.39 AV	54.00	-8.61	1.54 H	186	38.18	7.21
5	*5180.00	108.41 PK			1.54 H	186	101.16	7.25
6	*5180.00	96.85 AV			1.54 H	186	89.60	7.25
7	#10360.00	57.72 PK	68.20	-10.48	1.74 H	183	40.58	17.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	63.69 PK	74.00	-10.31	1.44 V	157	56.74	6.95
2	5100.00	49.26 AV	54.00	-4.74	1.44 V	157	42.31	6.95
3	5150.00	58.97 PK	74.00	-15.03	1.44 V	157	51.76	7.21
4	5150.00	44.80 AV	54.00	-9.20	1.44 V	157	37.59	7.21
5	*5180.00	106.48 PK			1.44 V	157	99.23	7.25
6	*5180.00	94.99 AV			1.44 V	157	87.74	7.25
7	#10360.00	56.71 PK	68.20	-11.49	1.26 V	162	39.57	17.14

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 other emission levels were very low against the limit.
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	5120.00	65.39 PK	74.00	-8.61	1.64 H	185	58.34	7.05
2	5120.00	52.66 AV	54.00	-1.34	1.64 H	185	45.61	7.05
3	*5200.00	107.76 PK			1.64 H	185	100.50	7.26
4	*5200.00	95.60 AV			1.64 H	185	88.34	7.26
5	#10400.00	58.05 PK	68.20	-10.15	1.66 H	193	40.71	17.34
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	5120.00	62.46 PK	74.00	-11.54	1.42 V	128	55.41	7.05
2	5120.00	49.12 AV	54.00	-4.88	1.42 V	128	42.07	7.05
3	*5200.00	106.01 PK			1.42 V	128	98.75	7.26
4	*5200.00	93.61 AV			1.42 V	128	86.35	7.26
5	#10400.00	56.93 PK	68.20	-11.27	1.82 V	152	39.59	17.34

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 other emission levels were very low against the limit.
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	#5160.00	66.50 PK	68.20	-1.70	1.64 H	191	59.28	7.22
2	#5160.00	52.86 AV	54.00	-1.14	1.64 H	191	45.64	7.22
3	*5240.00	109.45 PK			1.64 H	191	102.49	6.96
4	*5240.00	97.35 AV			1.64 H	191	90.39	6.96
5	5350.00	59.14 PK	74.00	-14.86	1.64 H	191	51.77	7.37
6	5350.00	45.88 AV	54.00	-8.12	1.64 H	191	38.51	7.37
7	#10480.00	58.32 PK	68.20	-9.88	1.77 H	185	40.62	17.70
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	#5160.00	63.51 PK	68.20	-4.69	1.46 V	160	56.29	7.22
2	#5160.00	50.11 AV	54.00	-3.89	1.46 V	160	42.89	7.22
3	*5240.00	107.41 PK			1.46 V	160	100.45	6.96
4	*5240.00	95.75 AV			1.46 V	160	88.79	6.96
5	5350.00	58.25 PK	74.00	-15.75	1.46 V	160	50.88	7.37
6	5350.00	45.40 AV	54.00	-8.60	1.46 V	160	38.03	7.37
7	#10480.00	57.35 PK	68.20	-10.85	1.39 V	170	39.65	17.70

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5626.80	60.36 PK	68.20	-7.84	1.62 H	177	52.81	7.55
2	*5745.00	108.36 PK			1.62 H	177	100.77	7.59
3	*5745.00	96.24 AV			1.62 H	177	88.65	7.59
4	#5936.96	60.52 PK	68.20	-7.68	1.62 H	177	52.37	8.15
5	11490.00	58.35 PK	74.00	-15.65	1.17 H	127	40.28	18.07
6	11490.00	44.40 AV	54.00	-9.60	1.17 H	127	26.33	18.07
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	#5630.83	60.42 PK	68.20	-7.78	1.55 V	129	52.90	7.52
2	*5745.00	106.11 PK			1.55 V	129	98.52	7.59
3	*5745.00	94.47 AV			1.55 V	129	86.88	7.59
4	#5932.27	59.22 PK	68.20	-8.98	1.55 V	129	51.06	8.16
5	11490.00	57.70 PK	74.00	-16.30	1.45 V	162	39.63	18.07
6	11490.00	43.62 AV	54.00	-10.38	1.45 V	162	25.55	18.07

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5620.48	60.26 PK	68.20	-7.94	1.68 H	185	52.68	7.58
2	*5785.00	108.51 PK			1.68 H	185	100.77	7.74
3	*5785.00	96.26 AV			1.68 H	185	88.52	7.74
4	#5941.33	60.61 PK	68.20	-7.59	1.68 H	185	52.49	8.12
5	11570.00	58.60 PK	74.00	-15.40	1.96 H	36	40.62	17.98
6	11570.00	44.79 AV	54.00	-9.21	1.96 H	36	26.81	17.98
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	#5630.90	58.90 PK	68.20	-9.30	1.52 V	131	51.38	7.52
2	*5785.00	106.49 PK			1.52 V	131	98.75	7.74
3	*5785.00	93.97 AV			1.52 V	131	86.23	7.74
4	#5939.08	59.10 PK	68.20	-9.10	1.52 V	131	50.97	8.13
5	11570.00	57.70 PK	74.00	-16.30	1.82 V	215	39.72	17.98
6	11570.00	43.20 AV	54.00	-10.80	1.82 V	215	25.22	17.98

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5645.93	58.94 PK	68.20	-9.26	1.62 H	180	51.48	7.46
2	*5825.00	108.24 PK			1.62 H	180	100.32	7.92
3	*5825.00	96.01 AV			1.62 H	180	88.09	7.92
4	#5983.64	60.88 PK	68.20	-7.32	1.62 H	180	52.79	8.09
5	11650.00	57.84 PK	74.00	-16.16	2.10 H	221	40.12	17.72
6	11650.00	44.06 AV	54.00	-9.94	2.10 H	221	26.34	17.72
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	#5623.55	58.03 PK	68.20	-10.17	1.53 V	140	50.47	7.56
2	*5825.00	106.35 PK			1.53 V	140	98.43	7.92
3	*5825.00	94.15 AV			1.53 V	140	86.23	7.92
4	#5936.29	59.27 PK	68.20	-8.93	1.53 V	140	51.12	8.15
5	11650.00	56.94 PK	74.00	-17.06	1.17 V	142	39.22	17.72
6	11650.00	42.91 AV	54.00	-11.09	1.17 V	142	25.19	17.72

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (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	68.45 PK	74.00	-5.55	1.58 H	187	61.24	7.21
2	5150.00	52.97 AV	54.00	-1.03	1.58 H	187	45.76	7.21
3	*5190.00	105.67 PK			1.58 H	187	98.42	7.25
4	*5190.00	94.29 AV			1.58 H	187	87.04	7.25
5	#10380.00	58.12 PK	68.20	-10.08	1.72 H	158	40.88	17.24

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	65.10 PK	74.00	-8.90	1.47 V	134	57.89	7.21
2	5150.00	49.87 AV	54.00	-4.13	1.47 V	134	42.66	7.21
3	*5190.00	104.01 PK			1.47 V	134	96.76	7.25
4	*5190.00	92.61 AV			1.47 V	134	85.36	7.25
5	#10380.00	56.78 PK	68.20	-11.42	1.77 V	193	39.54	17.24

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.35 PK	74.00	-8.65	1.54 H	188	58.14	7.21
2	5150.00	52.83 AV	54.00	-1.17	1.54 H	188	45.62	7.21
3	*5230.00	107.09 PK			1.54 H	188	100.05	7.04
4	*5230.00	95.70 AV			1.54 H	188	88.66	7.04
5	5350.00	57.91 PK	74.00	-16.09	1.54 H	188	50.54	7.37
6	5350.00	44.49 AV	54.00	-9.51	1.54 H	188	37.12	7.37
7	#10460.00	58.38 PK	68.20	-9.82	1.52 H	198	40.77	17.61
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	5150.00	63.24 PK	74.00	-10.76	1.44 V	131	56.03	7.21
2	5150.00	50.39 AV	54.00	-3.61	1.44 V	131	43.18	7.21
3	*5230.00	105.79 PK			1.44 V	131	98.75	7.04
4	*5230.00	93.70 AV			1.44 V	131	86.66	7.04
5	5350.00	47.44 PK	74.00	-26.56	1.44 V	131	40.07	7.37
6	5350.00	44.25 AV	54.00	-9.75	1.44 V	131	36.88	7.37
7	#10460.00	57.15 PK	68.20	-11.05	1.91 V	123	39.54	17.61

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5633.85	59.84 PK	68.20	-8.36	1.58 H	179	52.33	7.51
2	*5755.00	106.49 PK			1.58 H	179	98.88	7.61
3	*5755.00	95.13 AV			1.58 H	179	87.52	7.61
4	#5931.15	60.67 PK	68.20	-7.53	1.58 H	179	52.52	8.15
5	11510.00	58.34 PK	74.00	-15.66	1.62 H	123	40.25	18.09
6	11510.00	44.92 AV	54.00	-9.08	1.62 H	123	26.83	18.09
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	#5631.55	58.99 PK	68.20	-9.21	1.13 V	125	51.47	7.52
2	*5755.00	103.97 PK			1.13 V	125	96.36	7.61
3	*5755.00	92.86 AV			1.13 V	125	85.25	7.61
4	#5961.26	59.73 PK	68.20	-8.47	1.13 V	125	51.63	8.10
5	11510.00	57.78 PK	74.00	-16.22	1.78 V	158	39.69	18.09
6	11510.00	43.94 AV	54.00	-10.06	1.78 V	158	25.85	18.09

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5630.69	59.89 PK	68.20	-8.31	1.69 H	187	52.37	7.52
2	*5795.00	106.59 PK			1.69 H	187	98.80	7.79
3	*5795.00	95.43 AV			1.69 H	187	87.64	7.79
4	#5968.89	60.60 PK	68.20	-7.60	1.69 H	187	52.50	8.10
5	11590.00	58.79 PK	74.00	-15.21	2.14 H	284	40.85	17.94
6	11590.00	44.78 AV	54.00	-9.22	2.14 H	284	26.84	17.94
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5628.97	58.29 PK	68.20	-9.91	1.20 V	129	50.76	7.53
2	*5795.00	104.22 PK			1.20 V	129	96.43	7.79
3	*5795.00	93.08 AV			1.20 V	129	85.29	7.79
4	#5957.43	59.87 PK	68.20	-8.33	1.20 V	129	51.76	8.11
5	11590.00	57.46 PK	74.00	-16.54	2.56 V	201	39.52	17.94
6	11590.00	43.38 AV	54.00	-10.62	2.56 V	201	25.44	17.94

REMARKS:

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

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	66.66 PK	74.00	-7.34	1.57 H	188	59.45	7.21
2	5150.00	52.64 AV	54.00	-1.36	1.57 H	188	45.43	7.21
3	*5210.00	99.41 PK			1.57 H	188	92.23	7.18
4	*5210.00	88.81 AV			1.57 H	188	81.63	7.18
5	5350.00	58.57 PK	74.00	-15.43	1.57 H	188	51.20	7.37
6	5350.00	44.90 AV	54.00	-9.10	1.57 H	188	37.53	7.37
7	#10420.00	58.00 PK	68.20	-10.20	1.58 H	199	40.57	17.43
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	63.36 PK	74.00	-10.64	1.45 V	138	56.15	7.21
2	5150.00	49.28 AV	54.00	-4.72	1.45 V	138	42.07	7.21
3	*5210.00	97.34 PK			1.45 V	138	90.16	7.18
4	*5210.00	87.27 AV			1.45 V	138	80.09	7.18
5	5350.00	57.63 PK	74.00	-16.37	1.45 V	138	50.26	7.37
6	5350.00	44.42 AV	54.00	-9.58	1.45 V	138	37.05	7.37
7	#10420.00	56.85 PK	68.20	-11.35	1.88 V	231	39.42	17.43

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5618.22	61.89 PK	68.20	-6.31	1.68 H	189	54.31	7.58
2	*5775.00	104.59 PK			1.68 H	189	96.89	7.70
3	*5775.00	92.99 AV			1.68 H	189	85.29	7.70
4	#5979.57	60.38 PK	68.20	-7.82	1.68 H	189	52.29	8.09
5	11550.00	58.79 PK	74.00	-15.21	1.88 H	175	40.77	18.02
6	11550.00	44.41 AV	54.00	-9.59	1.88 H	175	26.39	18.02
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	#5634.97	58.95 PK	68.20	-9.25	1.02 V	118	51.45	7.50
2	*5775.00	102.15 PK			1.02 V	118	94.45	7.70
3	*5775.00	91.25 AV			1.02 V	118	83.55	7.70
4	#5974.35	59.61 PK	68.20	-8.59	1.02 V	118	51.52	8.09
5	11550.00	57.57 PK	74.00	-16.43	1.89 V	154	39.55	18.02
6	11550.00	43.43 AV	54.00	-10.57	1.89 V	154	25.41	18.02

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Data:

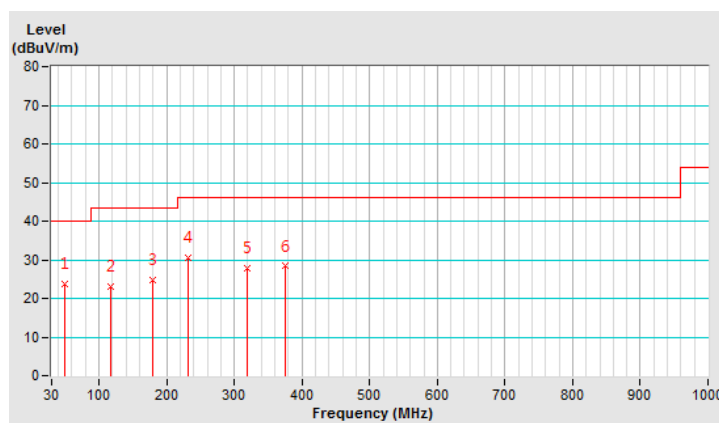
802.11ac (20MHz)

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	48.82	23.85 QP	40.00	-16.15	1.64 H	0	30.99	-7.14
2	116.57	22.97 QP	43.50	-20.53	1.00 H	92	32.43	-9.46
3	179.87	24.86 QP	43.50	-18.64	1.18 H	259	33.00	-8.14
4	231.57	30.45 QP	46.00	-15.55	1.52 H	263	38.66	-8.21
5	318.19	27.89 QP	46.00	-18.11	1.74 H	291	32.42	-4.53
6	375.03	28.31 QP	46.00	-17.69	1.62 H	151	32.01	-3.70

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. 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.

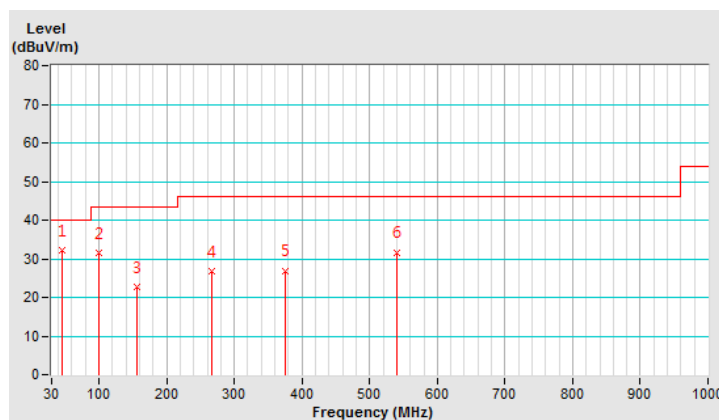


CHANNEL	TX Channel 48	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	45.57	32.07 QP	40.00	-7.93	1.24 V	110	39.30	-7.23
2	100.62	31.42 QP	43.50	-12.08	2.34 V	304	42.62	-11.20
3	156.83	22.56 QP	43.50	-20.94	1.78 V	360	29.33	-6.77
4	267.46	26.68 QP	46.00	-19.32	1.15 V	194	32.82	-6.14
5	375.03	26.80 QP	46.00	-19.20	1.29 V	160	30.50	-3.70
6	540.03	31.66 QP	46.00	-14.34	1.06 V	360	32.34	-0.68

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. 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 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	ESR3	102414	Jan. 17, 2019	Jan. 16, 2020
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ENV216	101197	May 23, 2018	May 22, 2019
LISN With Adapter (for EUT)	AD10	C10Ada-002	May 23, 2018	May 22, 2019
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100218	Nov. 30, 2018	Nov. 29, 2019
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 3, 2018	May 2, 2019
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C10.01	Feb. 13, 2019	Feb. 12, 2020
SUHNTER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-011484	May 8, 2018	May 7, 2019
ROHDE & SCHWARZ Artificial Mains Network (For TV EUT)	ESH3-Z5	100220	Nov. 21, 2018	Nov. 20, 2019
LISN With Adapter (for TV EUT)	100220	NA	Nov. 21, 2018	Nov. 20, 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 test was performed in Shielded Room No. 10.

4.2.3 Test Procedure

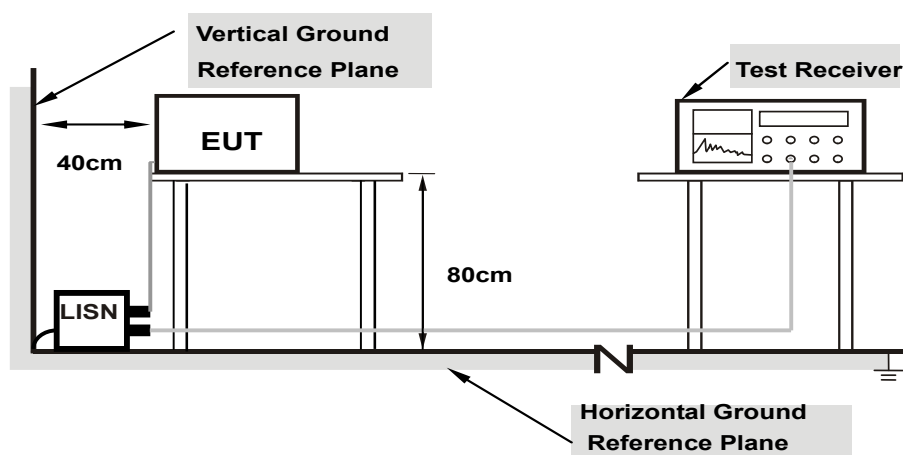
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

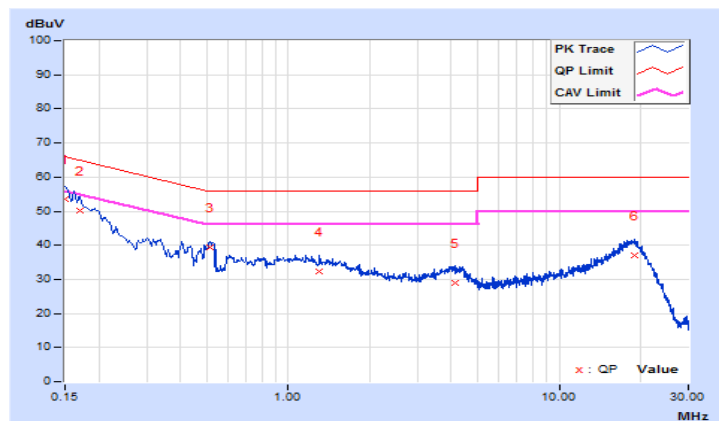
4.2.7 Test Results

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

No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.70	43.67	26.87	53.37	36.57	66.00	56.00	-12.63	-19.43
2	0.16955	9.71	40.36	23.54	50.07	33.25	64.98	54.98	-14.91	-21.73
3	0.51176	9.82	29.51	20.06	39.33	29.88	56.00	46.00	-16.67	-16.12
4	1.30155	9.95	22.44	13.64	32.39	23.59	56.00	46.00	-23.61	-22.41
5	4.14803	10.12	18.75	8.21	28.87	18.33	56.00	46.00	-27.13	-27.67
6	19.02517	10.41	26.53	20.26	36.94	30.67	60.00	50.00	-23.06	-19.33

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.

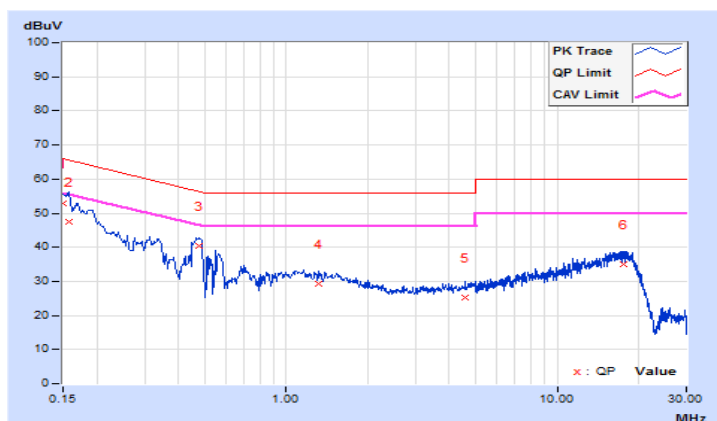


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.71	43.28	25.84	52.99	35.55	66.00	56.00	-13.01	-20.45
2	0.15760	9.72	37.73	21.15	47.45	30.87	65.59	55.59	-18.14	-24.72
3	0.47453	9.85	30.63	23.89	40.48	33.74	56.43	46.43	-15.95	-12.69
4	1.32110	10.00	19.46	11.70	29.46	21.70	56.00	46.00	-26.54	-24.30
5	4.58204	10.16	15.22	6.07	25.38	16.23	56.00	46.00	-30.62	-29.77
6	17.57847	10.43	24.49	17.58	34.92	28.01	60.00	50.00	-25.08	-21.99

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

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

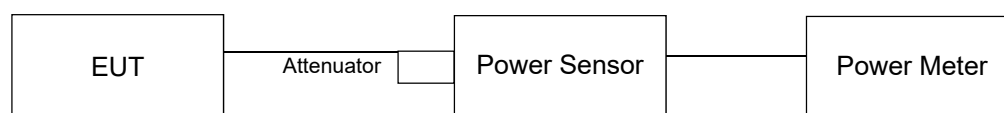
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup



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

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.

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

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	15.02	15.14	64.428	18.09	30	Pass
40	5200	15.54	15.67	72.708	18.62	30	Pass
48	5240	17.02	17.17	102.469	20.11	30	Pass
149	5745	18.19	18.31	133.681	21.26	30	Pass
157	5785	18.12	18.26	131.851	21.20	30	Pass
165	5825	18.02	18.11	128.101	21.08	30	Pass

802.11ac (20MHz)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	15.24	15.42	68.254	18.34	30	Pass
40	5200	16.61	16.74	93.020	19.69	30	Pass
48	5240	17.92	17.98	124.750	20.96	30	Pass
149	5745	18.11	18.27	131.857	21.20	30	Pass
157	5785	17.94	18.08	126.499	21.02	30	Pass
165	5825	17.82	17.89	122.052	20.87	30	Pass

802.11ac (40MHz)

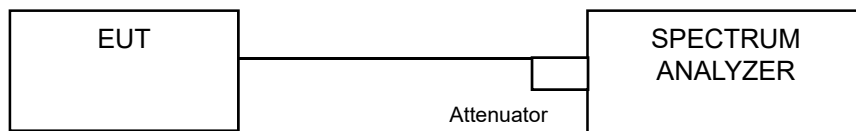
CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
38	5190	14.52	14.78	58.375	17.66	30	Pass
46	5230	17.86	17.95	123.467	20.92	30	Pass
151	5755	17.28	17.42	108.664	20.36	30	Pass
159	5795	17.11	17.23	104.249	20.18	30	Pass

802.11ac (80MHz)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
42	5210	13.18	13.31	42.226	16.26	30	Pass
155	5775	17.72	17.81	119.551	20.78	30	Pass

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
36	5180	16.92	16.92
40	5200	16.92	16.92
48	5240	16.92	16.92
149	5745	16.96	17.00
157	5785	16.95	17.00
165	5825	17.00	16.90

802.11ac (20MHz)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
36	5180	18.00	17.88
40	5200	17.88	17.88
48	5240	18.00	18.00
149	5745	18.00	18.00
157	5785	18.00	18.00
165	5825	18.00	18.00

802.11ac (40MHz)

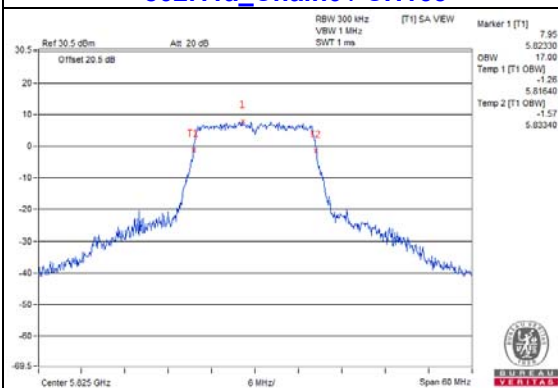
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
38	5190	36.60	36.60
46	5230	36.60	36.40
151	5755	36.67	36.50
159	5795	36.50	36.50

802.11ac (80MHz)

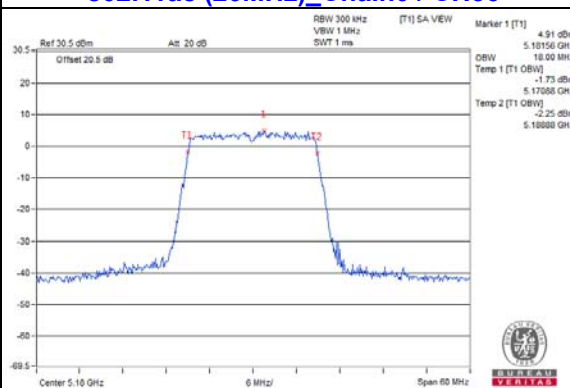
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
42	5210	75.84	75.60
155	5775	75.68	75.88

Spectrum Plot of Worst Value

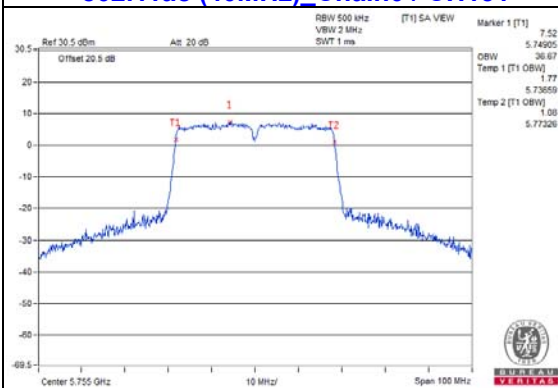
802.11a_Chain0 / CH165



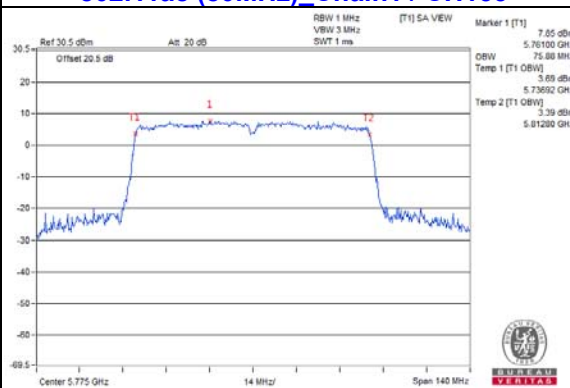
802.11ac (20MHz)_Chain0 / CH36



802.11ac (40MHz)_Chain0 / CH151



802.11ac (80MHz)_Chain1 / CH155

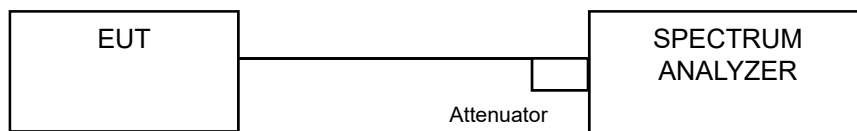


4.5 Peak Power Spectral Density Measurement

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 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)

For U-NII-3:

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
- 3) Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
- 4) Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$
- 5) Sweep time = auto, trigger set to "free run".
- 6) Trace average at least 100 traces in power averaging mode.
- 7) Record the max value and add 10 log (1/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	0.99	0.92	0.19	4.15	16.53	Pass
40	5200	1.65	1.55	0.19	4.80	16.53	Pass
48	5240	2.59	2.56	0.19	5.77	16.53	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.47\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(6.47-6) = 16.53\text{dBm}$.
3. Refer to section 3.4 for duty cycle spectrum plot.

802.11ac (20MHz)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	0.92	0.89	0.16	4.08	16.53	Pass
40	5200	1.87	1.93	0.16	5.07	16.53	Pass
48	5240	3.43	3.29	0.16	6.54	16.53	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.47\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(6.47-6) = 16.53\text{dBm}$.
3. Refer to section 3.4 for duty cycle spectrum plot.

802.11ac (40MHz)

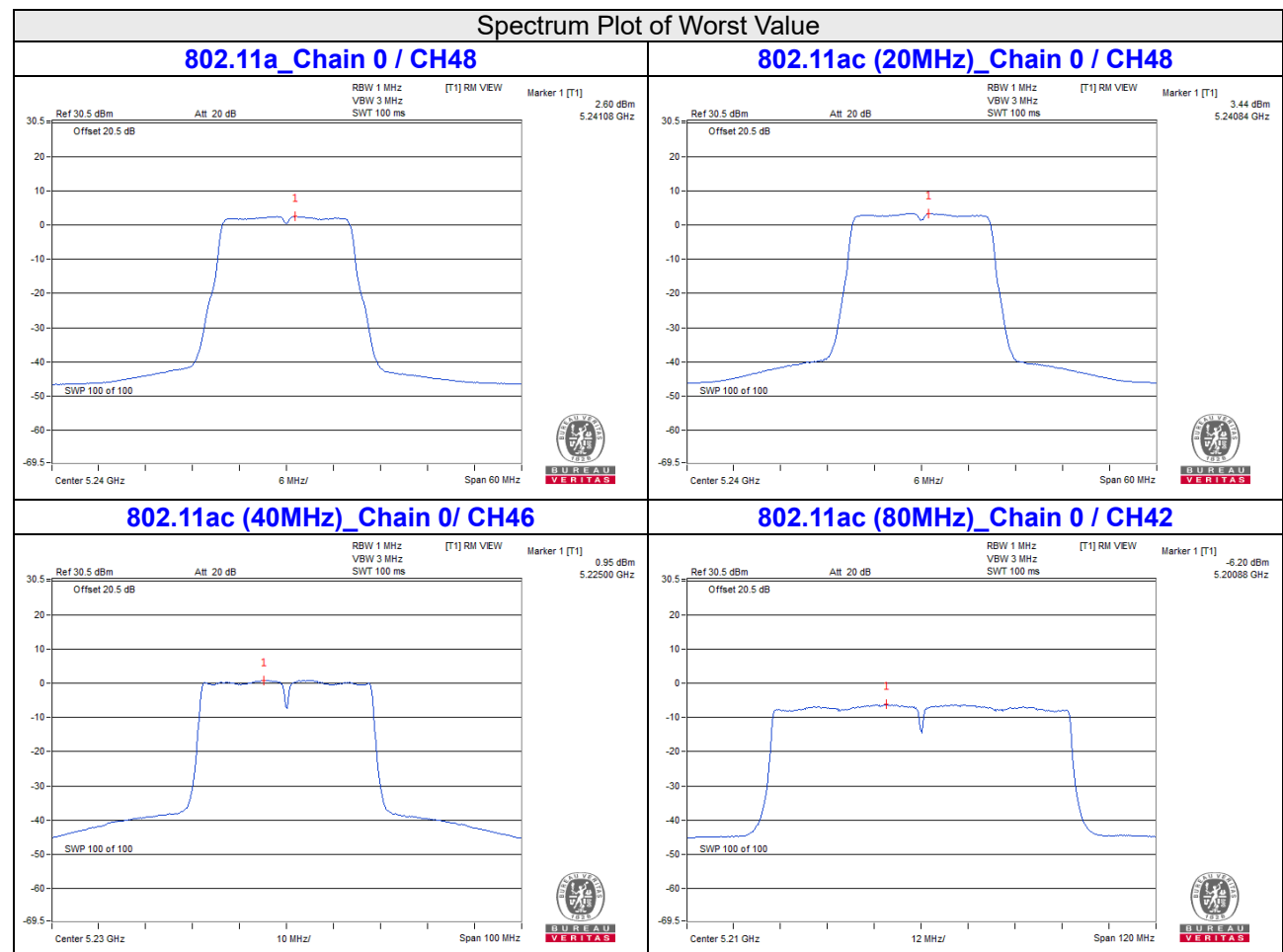
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-1.74	-1.71	0.35	1.63	16.53	Pass
46	5230	0.94	0.91	0.35	4.28	16.53	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.47\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(6.47-6) = 16.53\text{dBm}$.
3. Refer to section 3.4 for duty cycle spectrum plot.

802.11ac (80MHz)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-6.21	-6.34	0.20	-3.06	16.53	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.47\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (6.47 - 6) = 16.53\text{dBm}$.
3. Refer to section 3.4 for duty cycle spectrum plot.



For U-NII-3:

802.11a

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/500kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-3.88	3.01	0.19	-0.68	30.00	Pass
	157	5785	-4.22	3.01	0.19	-1.02	30.00	Pass
	165	5825	-4.42	3.01	0.19	-1.22	30.00	Pass
1	149	5745	-3.93	3.01	0.19	-0.73	30.00	Pass
	157	5785	-4.14	3.01	0.19	-0.94	30.00	Pass
	165	5825	-4.40	3.01	0.19	-1.20	30.00	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.8\text{dBi} < 6\text{dBi}$, so the power density limit is not reduced.

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

802.11ac (20MHz)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/500kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-4.29	3.01	0.16	-1.12	30.00	Pass
	157	5785	-4.48	3.01	0.16	-1.31	30.00	Pass
	165	5825	-4.72	3.01	0.16	-1.55	30.00	Pass
1	149	5745	-4.15	3.01	0.16	-0.98	30.00	Pass
	157	5785	-4.52	3.01	0.16	-1.35	30.00	Pass
	165	5825	-4.74	3.01	0.16	-1.57	30.00	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.8\text{dBi} < 6\text{dBi}$, so the power density limit is not reduced.

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

802.11ac (40MHz)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/500kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	151	5755	-8.88	3.01	0.35	-5.52	30.00	Pass
	159	5795	-8.87	3.01	0.35	-5.51	30.00	Pass
1	151	5755	-8.81	3.01	0.35	-5.45	30.00	Pass
	159	5795	-8.92	3.01	0.35	-5.56	30.00	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.8\text{dBi} < 6\text{dBi}$, so the power density limit is not reduced.

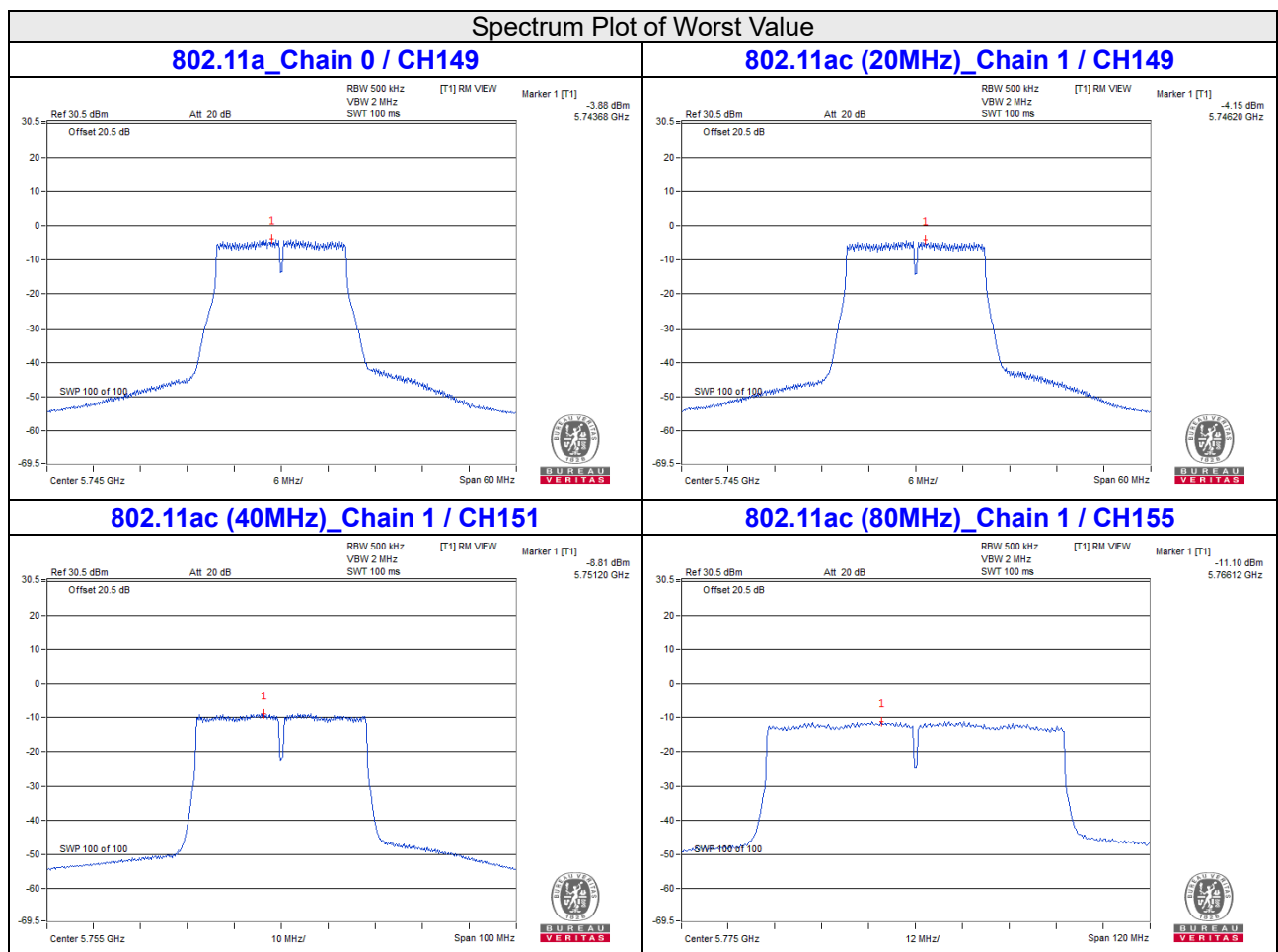
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (80MHz)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/500kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	155	5775	-11.16	3.01	0.20	-7.95	30.00	Pass
1	155	5775	-11.10	3.01	0.20	-7.89	30.00	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.8\text{dBi} < 6\text{dBi}$, so the power density limit is not reduced.

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

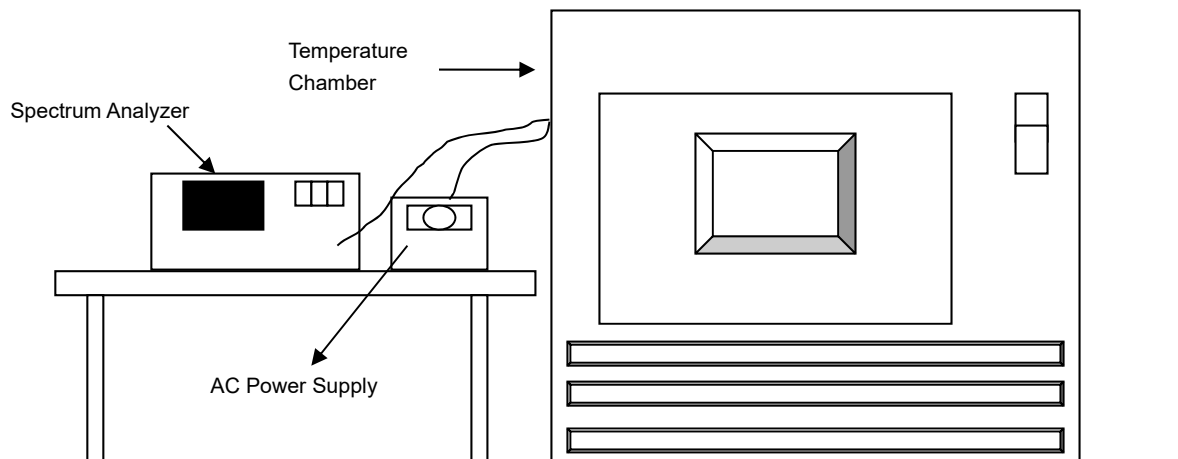


4.6 Frequency Stability Measurement

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 (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.
- 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	5180.0178	Pass	5180.0178	Pass	5180.0188	Pass	5180.0175	Pass
40	120	5179.9913	Pass	5179.9934	Pass	5179.993	Pass	5179.9934	Pass
30	120	5179.9922	Pass	5179.9939	Pass	5179.9902	Pass	5179.9893	Pass
20	120	5179.9904	Pass	5179.9915	Pass	5179.9934	Pass	5179.9911	Pass
10	120	5180.0108	Pass	5180.0139	Pass	5180.0132	Pass	5180.0149	Pass
0	120	5179.9889	Pass	5179.988	Pass	5179.9872	Pass	5179.9905	Pass
-10	120	5180.018	Pass	5180.0162	Pass	5180.014	Pass	5180.015	Pass
-20	120	5180.0021	Pass	5180.0032	Pass	5180.0014	Pass	5180.0057	Pass
-30	120	5180.0209	Pass	5180.0217	Pass	5180.0225	Pass	5180.0207	Pass

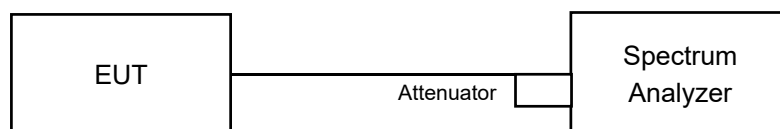
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5179.9899	Pass	5179.9921	Pass	5179.9931	Pass	5179.9907	Pass
	120	5179.9904	Pass	5179.9915	Pass	5179.9934	Pass	5179.9911	Pass
	102	5179.9904	Pass	5179.9921	Pass	5179.993	Pass	5179.9917	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.41	16.42	0.5	PASS
157	5785	16.41	16.42	0.5	PASS
165	5825	16.42	16.43	0.5	PASS

802.11ac (20MHz)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.64	17.67	0.5	PASS
157	5785	17.66	17.66	0.5	PASS
165	5825	17.66	17.66	0.5	PASS

802.11ac (40MHz)

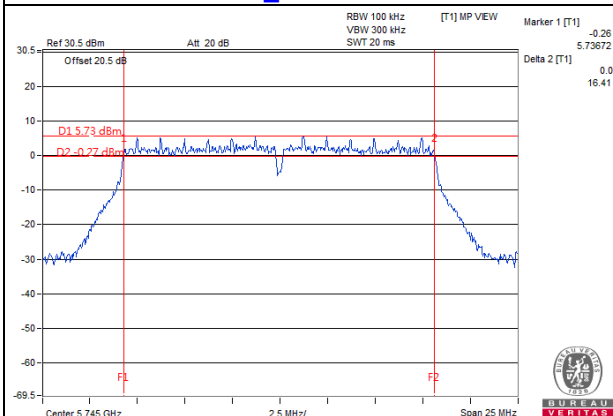
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.43	36.46	0.5	PASS
159	5795	36.42	36.43	0.5	PASS

802.11ac (80MHz)

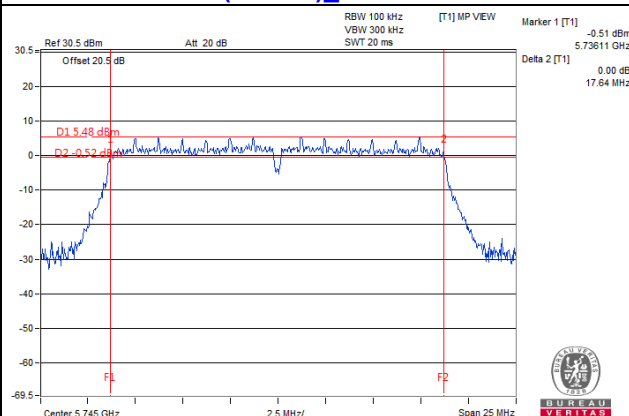
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.88	76.18	0.5	PASS

Spectrum Plot of Worst Value

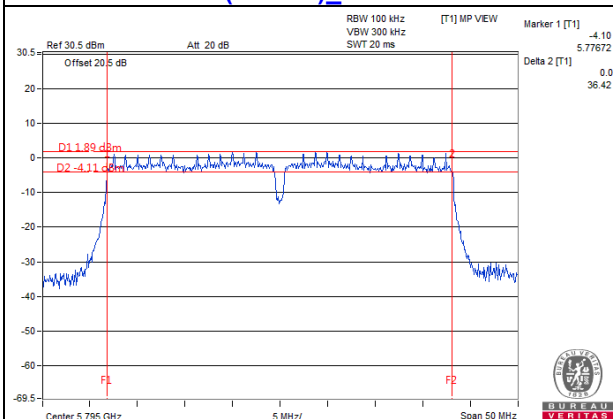
802.11a_Chain 0 / CH149



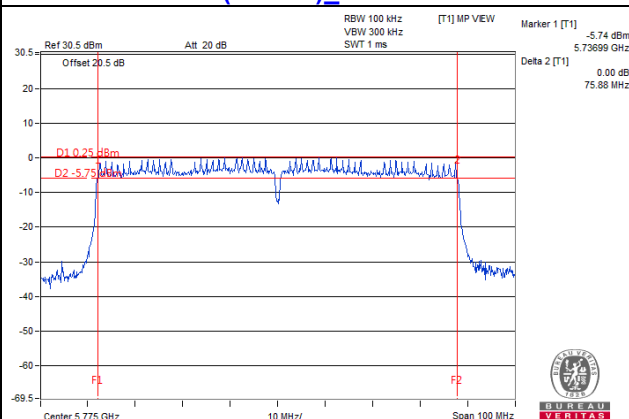
802.11ac (20MHz)_Chain 0 / CH149



802.11ac (40MHz)_Chain 0 / CH159



802.11ac (80MHz)_Chain 0 / CH155

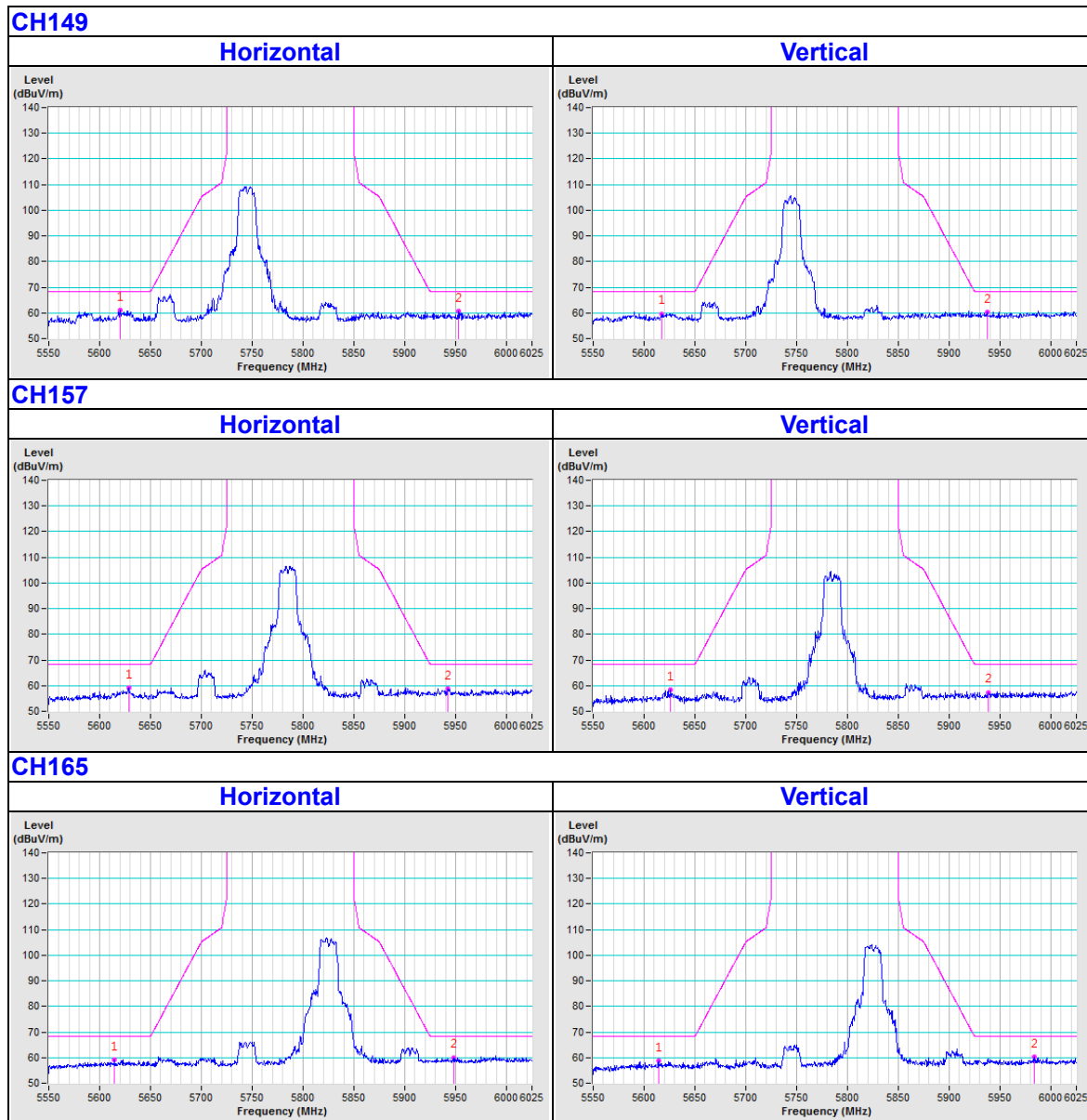


5 Pictures of Test Arrangements

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

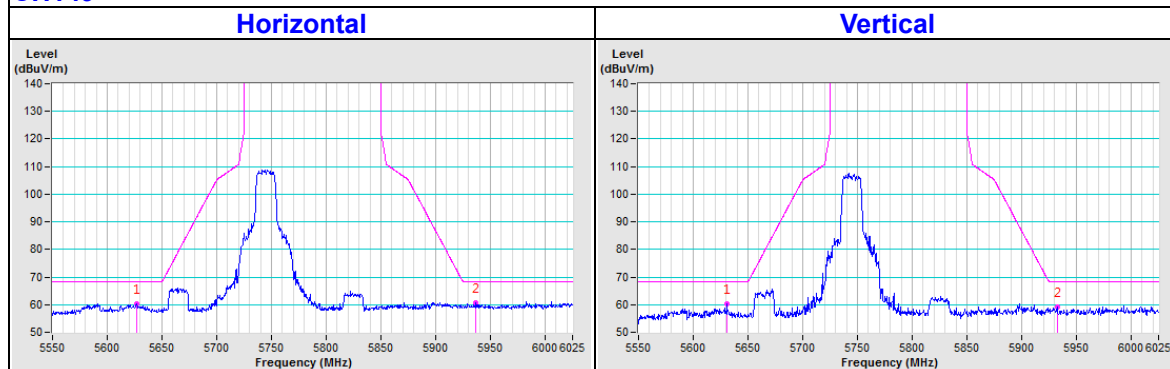
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

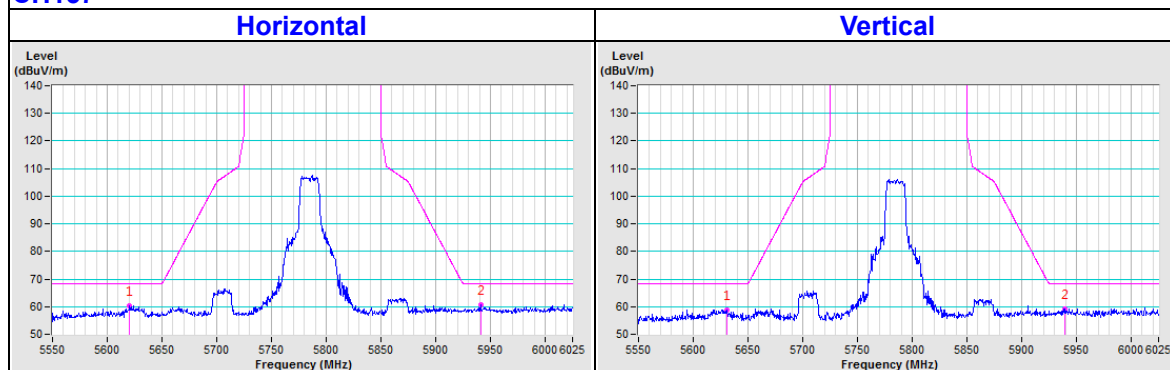


802.11ac (20MHz)

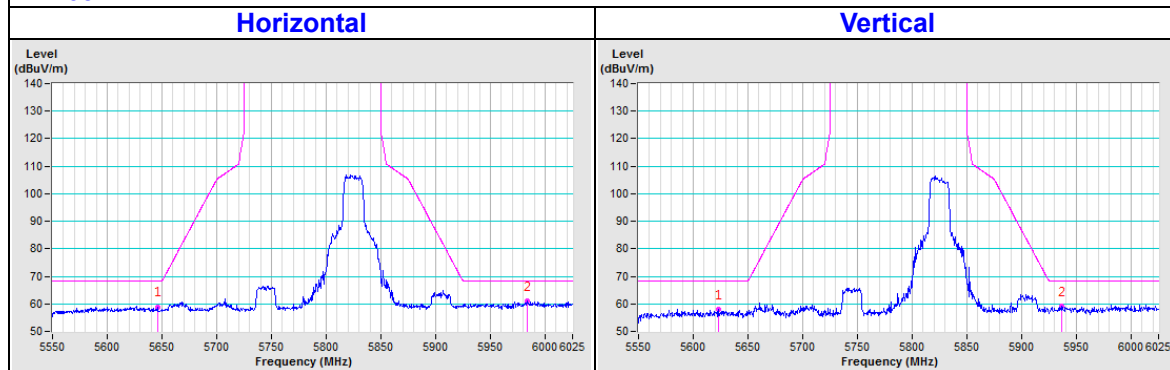
CH149



CH157

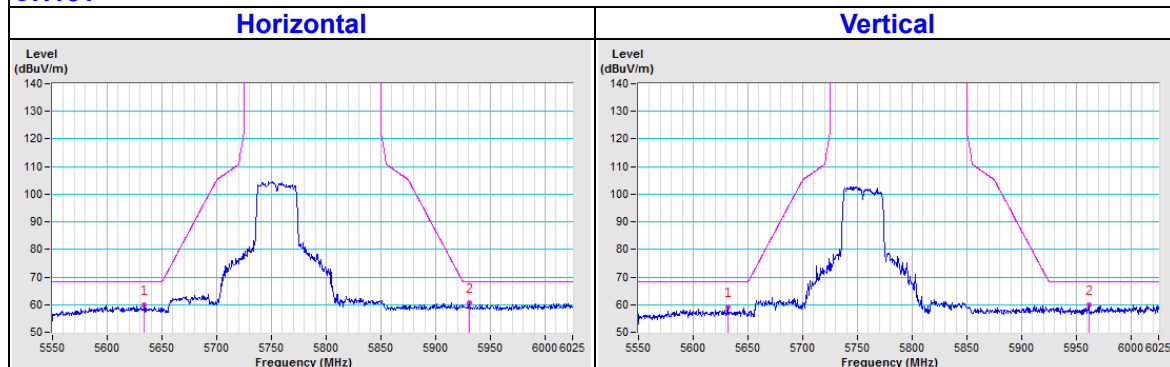


CH165

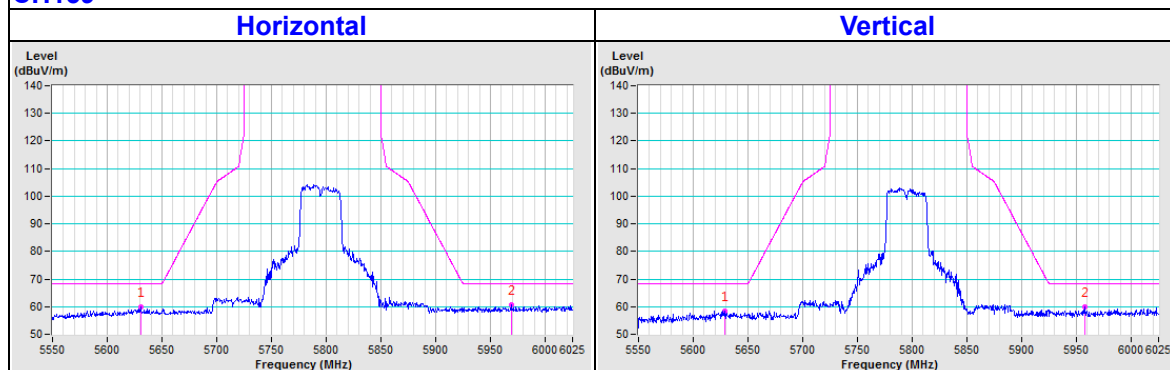


802.11ac (40MHz)

CH151

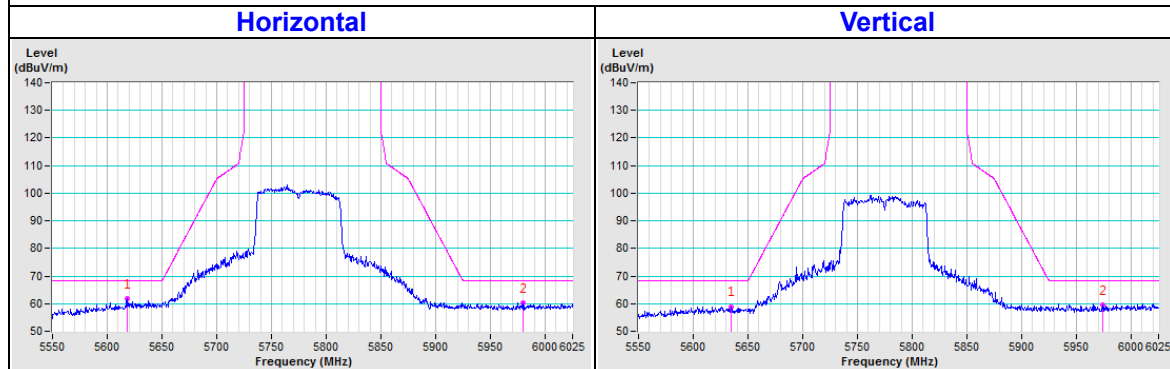


CH159



802.11ac (80MHz)

CH155



Appendix – Information of 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:

Lin Kou 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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