FCC Test Report

Report No.:	RF190726C11-1
FCC ID:	KA2BA2520PA1
Test Model:	DBA-2520P
Received Date:	Jun. 28, 2019
Test Date:	Jul. 12 ~ Jul. 31, 2019
Issued Date:	Aug. 06, 2019
Applicant:	D-Link Corporation
Address:	17595 Mt. Herrmann, Fountain Valley, California, United States, 92708
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN
FCC Registration / Designation Number:	788550 / TW0003

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Release Control Record

Issue No.	Description	Date Issued
RF190726C11-1	Original release.	Aug. 06, 2019

1 Certificate of Conformity

Product:	Nuclias Cloud-Managed AC1900 Wave 2 Access Point
Brand:	D-Link Corporation
Test Model:	DBA-2520P
Sample Status:	Engineering sample
Applicant:	D-Link Corporation
Test Date:	Jul. 12 ~ Jul. 31, 2019
Standards:	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 : Polly Chien , **Date:** Aug. 06, 2019

Polly Chien / Specialist

Approved by : Bruce Chen , **Date:** Aug. 06, 2019

Bruce Chen / Senior Project Engineer

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 -3.24dB at 24.33335MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.6dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE 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) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.94 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Nuclias Cloud-Managed AC1900 Wave 2 Access Point
Brand	D-Link Corporation
Test Model	DBA-2520P
Status of EUT	Engineering sample
Power Supply Rating	12Vdc (From adapter) 54Vdc (From PoE)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	5180~5240MHz, 5745~5825MHz
Number of Channel	5180~5240MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5745~5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
Output Power	CDD Mode: 5180~5240MHz: 585.826mW 5745~5825MHz: 995.125mW Beamforming Mode: 5180~5240MHz: 195.329mW 5745~5825MHz: 331.802mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Cable Supplied	NA

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 3 completed transmitters and 3 receivers.

Modulation Mode	Beamforming Mode	TX Function
802.11a	Not Support	3TX
802.11n (HT20)	Support	3TX
802.11n (HT40)	Support	3TX
802.11ac (VHT20)	Support	3TX
802.11ac (VHT40)	Support	3TX
802.11ac (VHT80)	Support	3TX

* The modulation and bandwidth are similar for 802.11n mode for HT20/HT40 and 802.11ac mode for VHT20/VHT40. After pre-testing, 802.11ac (VHT20/VHT40) power is lower than 802.11n (HT20/HT40), therefore 802.11n (HT20/HT40) is the worst case to representative mode in test report. (Final test mode refer section 3.2.1)
* For 802.11n, CDD mode is the worst case for final radiated emission and power line conducted emission tests after pretesting CDD mode and beamforming mode.

2. The EUT uses following antennas.

Type	Connector	Ant. Gain (dBi)						
		2400 MHz	2450 MHz	2500 MHz	5150 MHz	5350 MHz	5725 MHz	5825 MHz
PIFA	I-pex(MHF)	3	3	3	4	4	4	4

3. The EUT consumes power from the following Adapters and PoE.

Adapter 1	
Brand	Channel Well Technology
Model	2ABL030F US
Input Power	100-240Vac, 50-60Hz, 1.0A
Output Power	12Vdc / 2.5A
Power Cord	1.2m non-shielded power cord without core

Adapter 2	
Brand	Asian Power Devices Inc.
Model	WA-30J12R
Input Power	100-240Vac~, 50-60Hz, 0.9A
Output Power	12Vdc / 2.5A
Power Cord	1.2m non-shielded power cord without core

PoE (Support unit)	
Brand	LEADER ELECTRONICS INC.
Model	NU90-J540167-I1
Input Power	100-240Vac~, 50-60Hz, 1.2A
Output Power	54Vdc / 1.67A

3.2 Description of Test Modes

5180 ~ 5240MHz:

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

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	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from adapter 2
C	-	√	√	-	Power from PoE

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
2. "-": Means no effect.
3. Radiated emission (below 1GHz) and power line conducted emission test items chosen the worst maximum power.

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
A	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	6.5
A	802.11n (HT40)		38 to 46	38, 46	OFDM	13.5
A	802.11ac (VHT80)		42	42	OFDM	29.3
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
A	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	6.5
A	802.11n (HT40)		151 to 159	151, 159	OFDM	13.5
A	802.11ac (VHT80)		155	155	OFDM	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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A, B, C	802.11n (HT40)	5745-5825	151 to 159	159	OFDM	13.5

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A, B, C	802.11n (HT40)	5745-5825	151 to 159	159	OFDM	13.5

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
A	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	6.5
A	802.11n (HT40)		38 to 46	38, 46	OFDM	13.5
A	802.11ac (VHT80)		42	42	OFDM	29.3
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
A	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	6.5
A	802.11n (HT40)		151 to 159	151, 159	OFDM	13.5
A	802.11ac (VHT80)		155	155	OFDM	29.3

Test Condition:

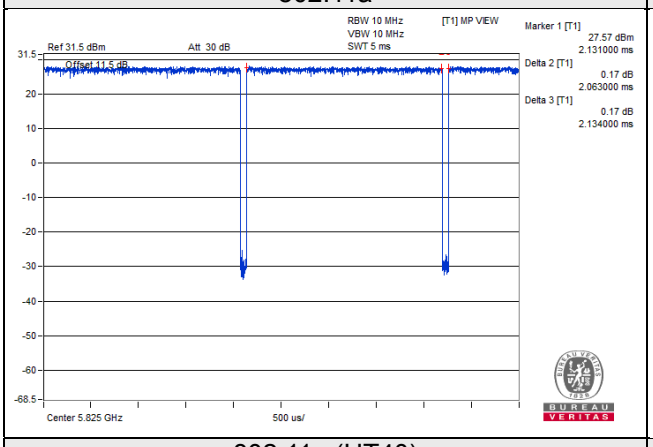
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	24deg. C, 68%RH	120Vac, 60Hz	Greg Lin
RE<1G	24deg. C, 68%RH	120Vac, 60Hz 54Vdc	Greg Lin
PLC	25deg. C, 75%RH	120Vac, 60Hz 54Vdc	Greg Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Ivan Tseng

3.3 Duty Cycle of Test Signal

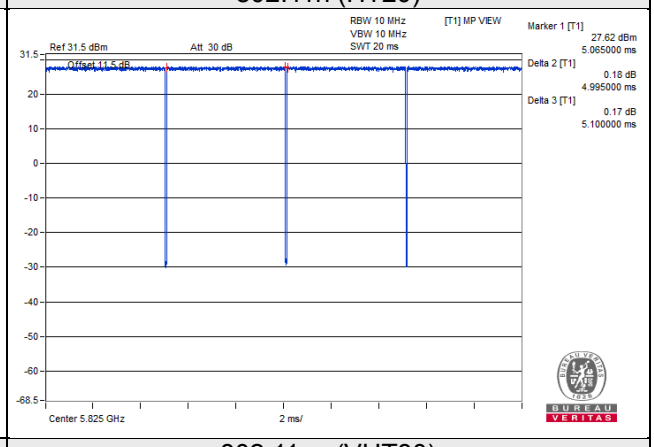
Duty cycle of test signal is < 98 %, duty factor is required

802.11a: Duty cycle = 2.063/2.134 = 0.967, Duty factor = 10 * log(1/0.967) = 0.15
802.11n (HT20): Duty cycle = 4.995/5.100 = 0.979, Duty factor = 10 * log(1/0.979) = 0.09
802.11n (HT40): Duty cycle = 2.427/2.504 = 0.969, Duty factor = 10 * log(1/0.969) = 0.14
802.11ac (VHT80): Duty cycle = 1.146/1.210 = 0.947, Duty factor = 10 * log(1/0.947) = 0.24

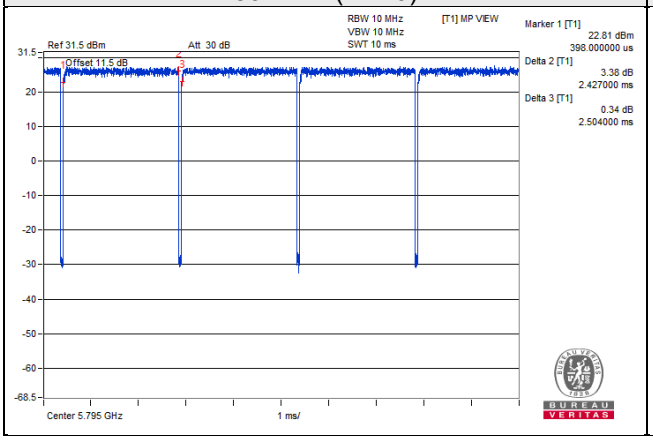
802.11a



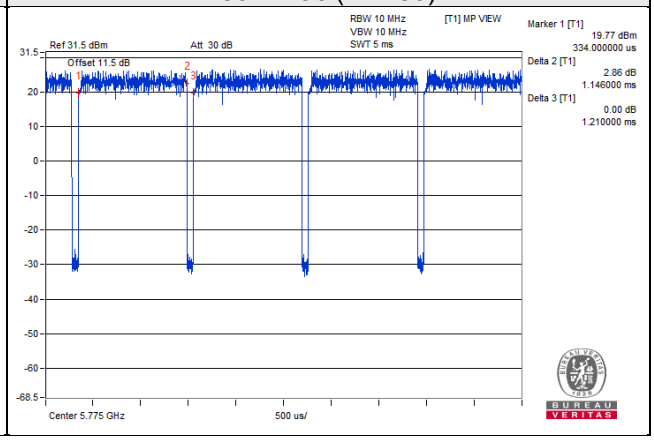
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



3.4 Description of Support Units

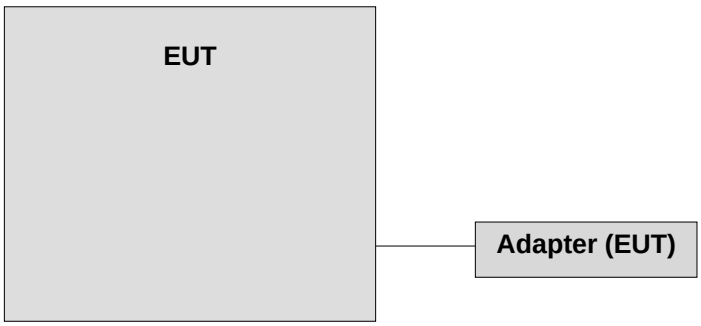
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	PoE	LEADER ELECTRONICS INC.	NU90-J540167-I1	NA	NA	Provided by client

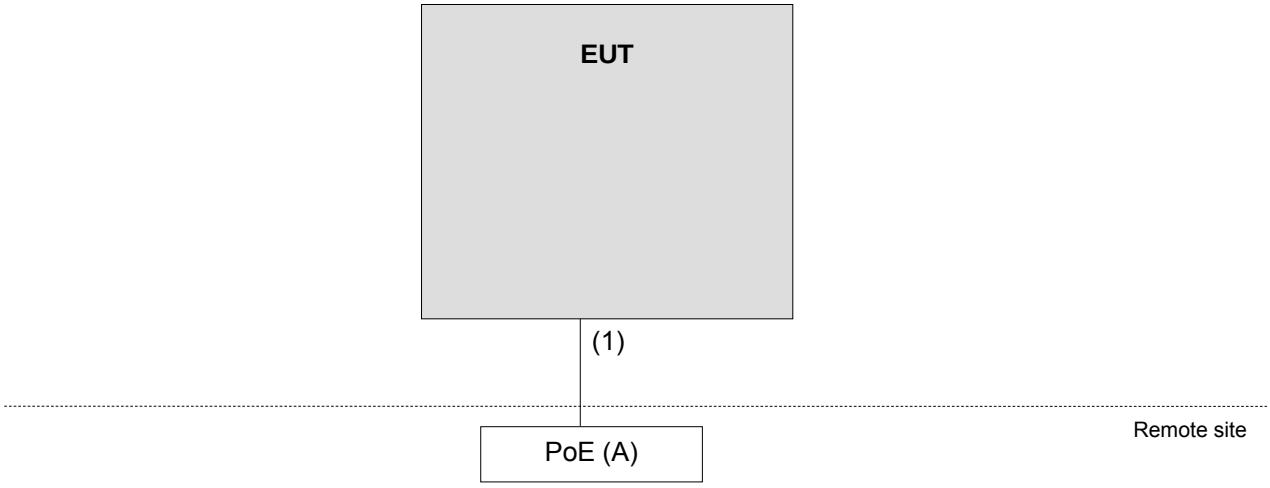
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45 cable	1	10	N	0	Cat5e

3.4.1 Configuration of System under Test

Mode A, B



Mode C



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10:2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

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

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

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 15, 2019	Apr. 14, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 04, 2019	Jun. 03, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 21, 2018	Nov. 20, 2019
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
Loop Antenna TESEQ	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Aug. 08, 2018	Aug. 07, 2019
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 19, 2019	Feb. 18, 2020
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 19, 2019	Jan. 18, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Aug. 08, 2018	Aug. 07, 2019
RF signal cable Woken	8D-FB	Cable-CH9-01	Jul. 31, 2018	Jul. 30, 2019
			Jul. 30, 2019	Jul. 29, 2020
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Nov. 14, 2018	Nov. 13, 2019
Peak Power Analyzer KEYSIGHT (Support 8TX 160M bandwidth)	8990B	MY51000485	Jan. 14, 2019	Jan. 13, 2020
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190004/MY55190007/MY55210005	Jul. 17, 2018	Jul. 16, 2019
			Jul. 18, 2019	Jul. 17, 2020

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 HwaYa Chamber 9.

4.1.3 Test Procedures

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 detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

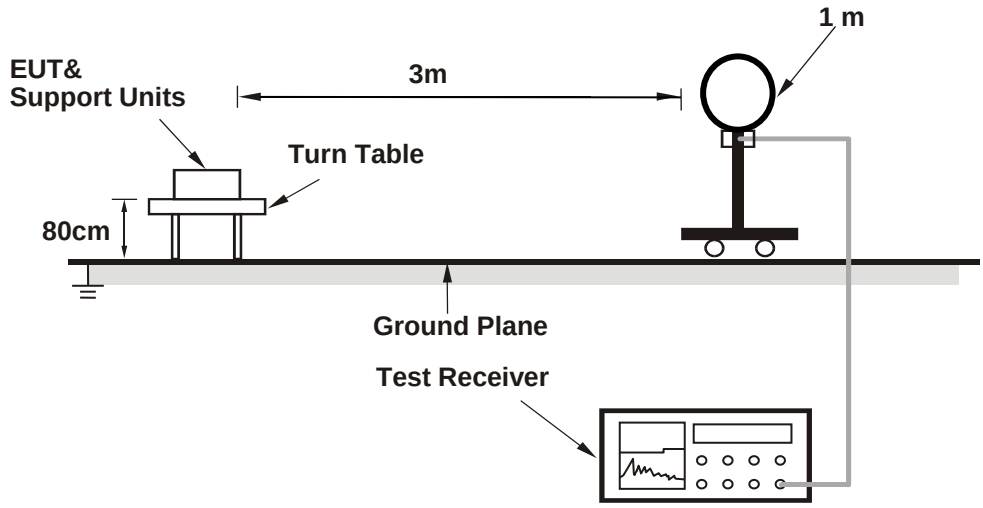
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz. (11a: RBW = 1 MHz, VBW =1 kHz ; 11n (HT20): RBW = 1 MHz, VBW = 300 Hz ; 11n (HT40): RBW = 1 MHz, VBW = 1 kHz ; 11ac (VHT80): RBW = 1 MHz, VBW = 1 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

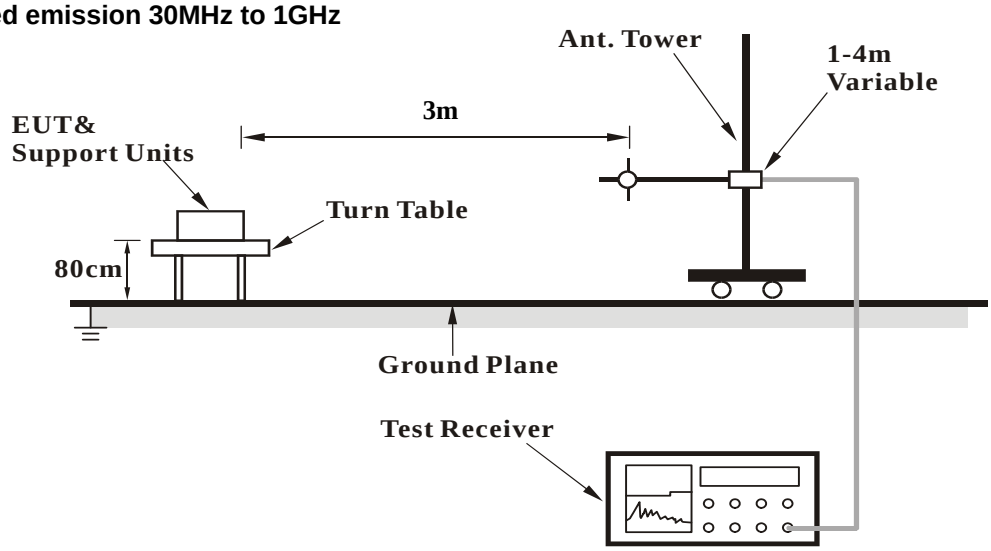
No deviation.

4.1.5 Test Set Up

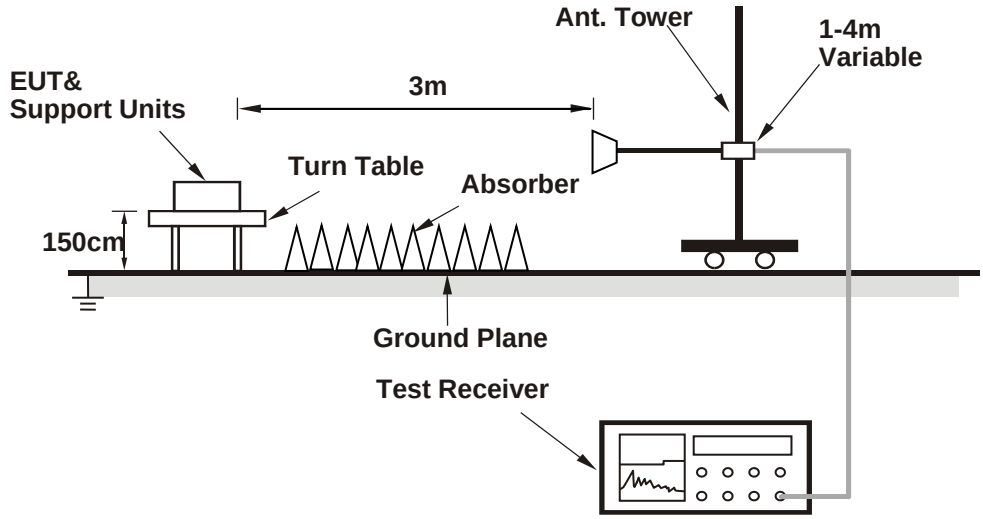
For Radiated emission below 30MHz



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 Conditions

a. Placed the EUT on the testing table.
b. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (QRCT 3.0.239.0) to enable EUT under transmission condition continuously at specific channel frequency.
d. The necessary accessories enable the system in full functions.

4.1.7 Test Results

Above 1GHz data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.1 PK	74.0	-7.9	2.09 H	304	62.6	3.5
2	**5150.00**	**53.4 AV**	**54.0**	**-0.6**	**2.09 H**	**304**	**49.9**	**3.5**
3	*5180.00	119.6 PK			1.81 H	301	81.6	38.0
4	*5180.00	109.3 AV			1.81 H	301	71.3	38.0
5	#10360.00	57.0 PK	68.2	-11.2	1.59 H	267	41.4	15.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	60.7 PK	74.0	-13.3	1.31 V	304	57.2	3.5
2	5150.00	47.9 AV	54.0	-6.1	1.31 V	304	44.4	3.5
3	*5180.00	114.1 PK			1.24 V	317	76.1	38.0
4	*5180.00	103.8 AV			1.24 V	317	65.8	38.0
5	#10360.00	56.4 PK	68.2	-11.8	1.37 V	214	40.8	15.6

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	122.5 PK			1.85 H	302	84.6	37.9
2	*5200.00	112.4 AV			1.85 H	302	74.5	37.9
3	#10400.00	57.4 PK	68.2	-10.8	1.52 H	280	41.8	15.6
4	15600.00	67.2 PK	74.0	-6.8	2.43 H	199	51.2	16.0
5	15600.00	52.8 AV	54.0	-1.2	2.43 H	199	36.8	16.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	117.2 PK			1.29 V	311	79.3	37.9
2	*5200.00	107.0 AV			1.29 V	311	69.1	37.9
3	#10400.00	56.9 PK	68.2	-11.3	1.31 V	208	41.3	15.6
4	15600.00	63.9 PK	74.0	-10.1	1.13 V	209	47.9	16.0
5	15600.00	50.0 AV	54.0	-4.0	1.13 V	209	34.0	16.0

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	122.5 PK			2.34 H	307	84.8	37.7
2	*5240.00	112.1 AV			2.34 H	307	74.4	37.7
3	5350.00	56.9 PK	74.0	-17.1	2.26 H	301	53.5	3.4
4	5350.00	43.6 AV	54.0	-10.4	2.26 H	301	40.2	3.4
5	#10480.00	57.6 PK	68.2	-10.6	1.47 H	254	42.2	15.4
6	15720.00	66.5 PK	74.0	-7.5	2.41 H	196	51.1	15.4
7	15720.00	52.8 AV	54.0	-1.2	2.41 H	196	37.4	15.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	117.0 PK			1.32 V	315	79.3	37.7
2	*5240.00	106.6 AV			1.32 V	315	68.9	37.7
3	5350.00	55.2 PK	74.0	-18.8	1.24 V	303	51.8	3.4
4	5350.00	43.0 AV	54.0	-11.0	1.24 V	303	39.6	3.4
5	#10480.00	56.1 PK	68.2	-12.1	1.45 V	221	40.7	15.4
6	15720.00	65.8 PK	74.0	-8.2	1.27 V	207	50.4	15.4
7	15720.00	52.2 AV	54.0	-1.8	1.27 V	207	36.8	15.4

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5648.80	54.0 PK	68.2	-14.2	1.28 H	311	52.4	1.6
2	*5745.00	124.9 PK			1.28 H	311	86.4	38.5
3	*5745.00	114.2 AV			1.28 H	311	75.7	38.5
4	#5986.40	53.9 PK	68.2	-14.3	1.28 H	311	51.4	2.5
5	11490.00	56.2 PK	74.0	-17.8	1.46 H	267	42.3	13.9
6	11490.00	42.3 AV	54.0	-11.7	1.46 H	267	28.4	13.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5618.40	53.8 PK	68.2	-14.4	1.21 V	332	52.4	1.4
2	*5745.00	119.9 PK			1.21 V	332	81.4	38.5
3	*5745.00	109.0 AV			1.21 V	332	70.5	38.5
4	#5943.20	53.7 PK	68.2	-14.5	1.21 V	332	51.3	2.4
5	11490.00	55.2 PK	74.0	-18.8	2.64 V	113	41.3	13.9
6	11490.00	41.5 AV	54.0	-12.5	2.64 V	113	27.6	13.9

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5641.60	52.9 PK	68.2	-15.3	1.09 H	308	51.3	1.6
2	*5785.00	123.8 PK			1.09 H	308	85.1	38.7
3	*5785.00	113.3 AV			1.09 H	308	74.6	38.7
4	#5945.60	53.5 PK	68.2	-14.7	1.09 H	308	51.1	2.4
5	11570.00	56.2 PK	74.0	-17.8	1.32 H	253	42.4	13.8
6	11570.00	42.4 AV	54.0	-11.6	1.32 H	253	28.6	13.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5620.80	53.1 PK	68.2	-15.1	1.28 V	327	51.7	1.4
2	*5785.00	119.3 PK			1.28 V	327	80.6	38.7
3	*5785.00	107.9 AV			1.28 V	327	69.2	38.7
4	#5940.80	54.1 PK	68.2	-14.1	1.28 V	327	51.7	2.4
5	11570.00	55.1 PK	74.0	-18.9	2.53 V	104	41.3	13.8
6	11570.00	41.0 AV	54.0	-13.0	2.53 V	104	27.2	13.8

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5632.80	53.2 PK	68.2	-15.0	1.16 H	310	51.7	1.5
2	*5825.00	123.7 PK			1.16 H	310	84.9	38.8
3	*5825.00	113.1 AV			1.16 H	310	74.3	38.8
4	#5941.60	54.0 PK	68.2	-14.2	1.16 H	310	51.6	2.4
5	11650.00	55.6 PK	74.0	-18.4	1.33 H	254	41.8	13.8
6	11650.00	42.0 AV	54.0	-12.0	1.33 H	254	28.2	13.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5624.80	52.7 PK	68.2	-15.5	1.51 V	342	51.3	1.4
2	*5825.00	119.0 PK			1.51 V	342	80.2	38.8
3	*5825.00	108.6 AV			1.51 V	342	69.8	38.8
4	#5971.20	54.2 PK	68.2	-14.0	1.51 V	342	51.7	2.5
5	11650.00	55.0 PK	74.0	-19.0	2.73 V	124	41.2	13.8
6	11650.00	40.9 AV	54.0	-13.1	2.73 V	124	27.1	13.8

Remarks:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.8 PK	74.0	-7.2	2.02 H	306	63.3	3.5
2	5150.00	52.9 AV	54.0	-1.1	2.02 H	306	49.4	3.5
3	*5180.00	120.5 PK			2.02 H	300	82.5	38.0
4	*5180.00	109.7 AV			2.02 H	300	71.7	38.0
5	#10360.00	57.2 PK	68.2	-11.0	1.63 H	274	41.6	15.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.1 PK	74.0	-11.9	1.07 V	316	58.6	3.5
2	5150.00	48.0 AV	54.0	-6.0	1.07 V	316	44.5	3.5
3	*5180.00	114.9 PK			1.16 V	308	76.9	38.0
4	*5180.00	104.2 AV			1.16 V	308	66.2	38.0
5	#10360.00	56.5 PK	68.2	-11.7	1.42 V	223	40.9	15.6

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	122.6 PK			2.01 H	302	84.7	37.9
2	*5200.00	112.6 AV			2.01 H	302	74.7	37.9
3	#10360.00	57.4 PK	68.2	-10.8	1.67 H	253	41.8	15.6
4	15600.00	68.8 PK	74.0	-5.2	2.15 H	153	52.8	16.0
5	15600.00	52.6 AV	54.0	-1.4	2.15 H	153	36.6	16.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	117.2 PK			1.24 V	315	79.3	37.9
2	*5200.00	107.2 AV			1.24 V	315	69.3	37.9
3	#10400.00	56.8 PK	68.2	-11.4	1.44 V	223	41.2	15.6
4	15600.00	66.4 PK	74.0	-7.6	1.27 V	196	50.4	16.0
5	15600.00	50.3 AV	54.0	-3.7	1.27 V	196	34.3	16.0

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	124.2 PK			2.01 H	301	86.5	37.7
2	*5240.00	113.5 AV			2.01 H	301	75.8	37.7
3	5350.00	57.0 PK	74.0	-17.0	2.08 H	297	53.6	3.4
4	5350.00	43.7 AV	54.0	-10.3	2.08 H	297	40.3	3.4
5	#10480.00	57.7 PK	68.2	-10.5	1.51 H	248	42.3	15.4
6	15720.00	67.5 PK	74.0	-6.5	2.10 H	152	52.1	15.4
7	15720.00	52.7 AV	54.0	-1.3	2.10 H	152	37.3	15.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	118.6 PK			1.36 V	304	80.9	37.7
2	*5240.00	107.9 AV			1.36 V	304	70.2	37.7
3	5350.00	55.0 PK	74.0	-19.0	1.31 V	297	51.6	3.4
4	5350.00	43.1 AV	54.0	-10.9	1.31 V	297	39.7	3.4
5	#10480.00	56.2 PK	68.2	-12.0	1.50 V	216	40.8	15.4
6	15720.00	66.2 PK	74.0	-7.8	1.22 V	213	50.8	15.4
7	15720.00	51.8 AV	54.0	-2.2	1.22 V	213	36.4	15.4

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5645.60	56.8 PK	68.2	-11.4	2.20 H	323	52.7	4.1
2	*5745.00	123.7 PK			2.20 H	323	85.2	38.5
3	*5745.00	112.9 AV			2.20 H	323	74.4	38.5
4	#5972.80	56.3 PK	68.2	-11.9	2.20 H	323	51.6	4.7
5	11490.00	57.6 PK	74.0	-16.4	1.37 H	262	41.9	15.7
6	11490.00	43.9 AV	54.0	-10.1	1.37 H	262	28.2	15.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5649.60	55.4 PK	68.2	-12.8	1.24 V	321	51.3	4.1
2	*5745.00	118.3 PK			1.24 V	321	79.8	38.5
3	*5745.00	107.7 AV			1.24 V	321	69.2	38.5
4	#5985.60	55.9 PK	68.2	-12.3	1.24 V	321	51.2	4.7
5	11490.00	56.9 PK	74.0	-17.1	2.64 V	113	41.2	15.7
6	11490.00	43.3 AV	54.0	-10.7	2.64 V	113	27.6	15.7

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5612.00	55.5 PK	68.2	-12.7	1.87 H	321	51.7	3.8
2	*5785.00	123.6 PK			1.87 H	321	84.9	38.7
3	*5785.00	113.1 AV			1.87 H	321	74.4	38.7
4	#5993.60	56.1 PK	68.2	-12.1	1.87 H	321	51.4	4.7
5	11570.00	57.9 PK	74.0	-16.1	1.53 H	260	42.4	15.5
6	11570.00	44.2 AV	54.0	-9.8	1.53 H	260	28.7	15.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5644.80	54.5 PK	68.2	-13.7	1.26 V	316	50.4	4.1
2	*5785.00	118.3 PK			1.26 V	316	79.6	38.7
3	*5785.00	107.8 AV			1.26 V	316	69.1	38.7
4	#5942.40	55.8 PK	68.2	-12.4	1.26 V	316	51.1	4.7
5	11570.00	57.0 PK	74.0	-17.0	2.49 V	360	41.5	15.5
6	11570.00	43.3 AV	54.0	-10.7	2.49 V	360	27.8	15.5

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5639.20	57.1 PK	68.2	-11.1	2.18 H	307	53.1	4.0
2	*5825.00	123.0 PK			2.18 H	307	84.2	38.8
3	*5825.00	112.9 AV			2.18 H	307	74.1	38.8
4	#5925.60	57.0 PK	68.2	-11.2	2.18 H	307	52.3	4.7
5	11650.00	57.7 PK	74.0	-16.3	1.44 H	257	42.3	15.4
6	11650.00	44.0 AV	54.0	-10.0	1.44 H	257	28.6	15.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5606.40	55.0 PK	68.2	-13.2	1.33 V	318	51.2	3.8
2	*5825.00	117.6 PK			1.33 V	318	78.8	38.8
3	*5825.00	107.5 AV			1.33 V	318	68.7	38.8
4	#5956.00	56.2 PK	68.2	-12.0	1.33 V	318	51.5	4.7
5	11650.00	56.6 PK	74.0	-17.4	2.55 V	116	41.2	15.4
6	11650.00	42.9 AV	54.0	-11.1	2.55 V	116	27.5	15.4

Remarks:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.5 PK	74.0	-6.5	2.15 H	307	64.0	3.5
2	**5150.00**	**53.4 AV**	**54.0**	**-0.6**	**2.15 H**	**307**	**49.9**	**3.5**
3	*5190.00	115.5 PK			2.08 H	301	77.6	37.9
4	*5190.00	105.7 AV			2.08 H	301	67.8	37.9
5	#10380.00	57.3 PK	68.2	-10.9	1.54 H	261	41.6	15.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.7 PK	74.0	-11.3	1.26 V	301	59.2	3.5
2	5150.00	48.2 AV	54.0	-5.8	1.26 V	301	44.7	3.5
3	*5190.00	110.1 PK			1.32 V	308	72.2	37.9
4	*5190.00	100.3 AV			1.32 V	308	62.4	37.9
5	#10380.00	56.5 PK	68.2	-11.7	1.42 V	219	40.8	15.7

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	121.2 PK			1.88 H	301	83.5	37.7
2	*5230.00	111.1 AV			1.88 H	301	73.4	37.7
3	5350.00	60.5 PK	74.0	-13.5	2.17 H	311	57.1	3.4
4	5350.00	47.3 AV	54.0	-6.7	2.17 H	311	43.9	3.4
5	#10460.00	57.8 PK	68.2	-10.4	1.47 H	255	42.4	15.4
6	15690.00	66.3 PK	74.0	-7.7	2.12 H	152	50.8	15.5
7	15690.00	52.8 AV	54.0	-1.2	2.12 H	152	37.3	15.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	115.6 PK			1.28 V	315	77.9	37.7
2	*5230.00	105.6 AV			1.28 V	315	67.9	37.7
3	5350.00	55.8 PK	74.0	-18.2	1.34 V	302	52.4	3.4
4	5350.00	44.0 AV	54.0	-10.0	1.34 V	302	40.6	3.4
5	#10460.00	56.7 PK	68.2	-11.5	1.56 V	213	41.3	15.4
6	15690.00	64.2 PK	74.0	-9.8	1.21 V	224	48.7	15.5
7	15690.00	51.4 AV	54.0	-2.6	1.21 V	224	35.9	15.5

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5644.80	65.0 PK	68.2	-3.2	1.26 H	309	63.4	1.6
2	*5755.00	121.7 PK			1.26 H	309	83.1	38.6
3	*5755.00	111.1 AV			1.26 H	309	72.5	38.6
4	#5967.20	53.9 PK	68.2	-14.3	1.26 H	309	51.4	2.5
5	11510.00	55.6 PK	74.0	-18.4	1.36 H	255	41.7	13.9
6	11510.00	42.0 AV	54.0	-12.0	1.36 H	255	28.1	13.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5639.20	60.3 PK	68.2	-7.9	1.63 V	341	58.8	1.5
2	*5755.00	116.4 PK			1.63 V	341	77.8	38.6
3	*5755.00	105.8 AV			1.63 V	341	67.2	38.6
4	#5933.60	53.9 PK	68.2	-14.3	1.63 V	341	51.5	2.4
5	11510.00	54.7 PK	74.0	-19.3	2.52 V	108	40.8	13.9
6	11510.00	40.8 AV	54.0	-13.2	2.52 V	108	26.9	13.9

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5645.60	55.1 PK	68.2	-13.1	1.22 H	311	53.5	1.6
2	*5795.00	120.4 PK			1.22 H	311	81.7	38.7
3	*5795.00	110.0 AV			1.22 H	311	71.3	38.7
4	#5926.40	57.2 PK	68.2	-11.0	1.22 H	311	54.8	2.4
5	11590.00	55.5 PK	74.0	-18.5	1.45 H	273	41.7	13.8
6	11590.00	41.9 AV	54.0	-12.1	1.45 H	273	28.1	13.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5612.00	53.1 PK	68.2	-15.1	1.57 V	346	51.7	1.4
2	*5795.00	114.9 PK			1.57 V	346	76.2	38.7
3	*5795.00	104.5 AV			1.57 V	346	65.8	38.7
4	#5927.20	54.8 PK	68.2	-13.4	1.57 V	346	52.4	2.4
5	11590.00	54.4 PK	74.0	-19.6	2.55 V	117	40.6	13.8
6	11590.00	40.5 AV	54.0	-13.5	2.55 V	117	26.7	13.8

Remarks:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.0 PK	74.0	-7.0	1.80 H	301	63.5	3.5
2	5150.00	53.3 AV	54.0	-0.7	1.80 H	301	49.8	3.5
3	*5210.00	111.3 PK			1.76 H	300	73.5	37.8
4	*5210.00	101.4 AV			1.76 H	300	63.6	37.8
5	5350.00	59.5 PK	74.0	-14.5	1.79 H	30	56.1	3.4
6	5350.00	47.4 AV	54.0	-6.6	1.79 H	30	44.0	3.4
7	#10420.00	56.9 PK	68.2	-11.3	1.52 H	267	41.3	15.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.3 PK	74.0	-11.7	1.12 V	296	58.8	3.5
2	5150.00	48.7 AV	54.0	-5.3	1.12 V	296	45.2	3.5
3	*5210.00	106.0 PK			1.19 V	302	68.2	37.8
4	*5210.00	96.1 AV			1.19 V	302	58.3	37.8
5	5350.00	60.0 PK	74.0	-14.0	1.21 V	288	56.6	3.4
6	5350.00	46.0 AV	54.0	-8.0	1.21 V	288	42.6	3.4
7	#10420.00	56.0 PK	68.2	-12.2	1.62 V	219	40.4	15.6

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5643.20	65.7 PK	68.2	-2.5	1.17 H	312	64.1	1.6
2	#5650.00	67.3 PK	68.2	-0.9	1.31 H	309	65.8	1.5
3	*5775.00	113.3 PK			1.17 H	312	74.7	38.6
4	*5775.00	103.3 AV			1.17 H	312	64.7	38.6
5	#5925.00	63.5 PK	68.2	-4.7	1.28 H	306	61.1	2.4
6	#5928.00	61.8 PK	68.2	-6.4	1.17 H	312	59.4	2.4
7	11550.00	55.4 PK	74.0	-18.6	1.49 H	253	41.6	13.8
8	11550.00	41.5 AV	54.0	-12.5	1.49 H	253	27.7	13.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5643.20	62.0 PK	68.2	-6.2	1.67 V	346	60.4	1.6
2	#5650.00	63.4 PK	68.2	-4.8	1.53 V	332	61.9	1.5
3	*5775.00	107.8 PK			1.67 V	346	69.2	38.6
4	*5775.00	97.8 AV			1.67 V	346	59.2	38.6
5	#5925.00	59.0 PK	68.2	-9.2	1.73 V	351	56.6	2.4
6	#5933.60	56.7 PK	68.2	-11.5	1.67 V	346	54.3	2.4
7	11550.00	54.5 PK	74.0	-19.5	2.59 V	114	40.7	13.8
8	11550.00	40.6 AV	54.0	-13.4	2.59 V	114	26.8	13.8

Remarks:

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

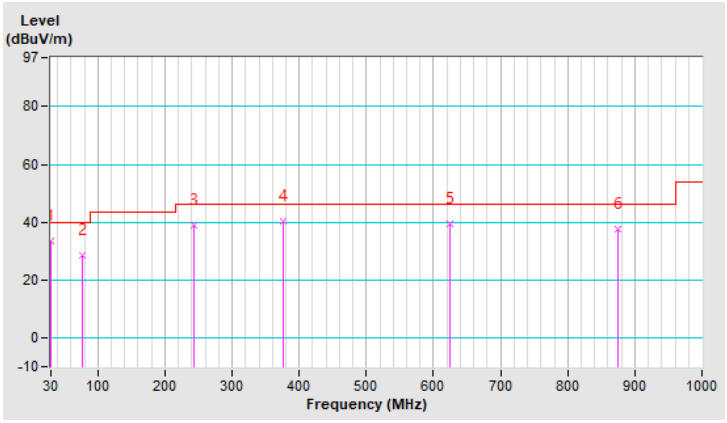
Below 1GHz Worst-Case Data: 802.11n (HT40)

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.97	33.4 QP	40.0	-6.6	1.50 H	232	44.8	-11.4
2	77.53	28.6 QP	40.0	-11.4	1.25 H	93	42.1	-13.5
3	242.43	39.0 QP	46.0	-7.0	1.00 H	254	48.9	-9.9
4	375.32	40.4 QP	46.0	-5.6	1.25 H	260	47.1	-6.7
5	624.61	39.2 QP	46.0	-6.8	1.50 H	159	40.9	-1.7
6	874.87	37.5 QP	46.0	-8.5	1.00 H	6	34.9	2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.

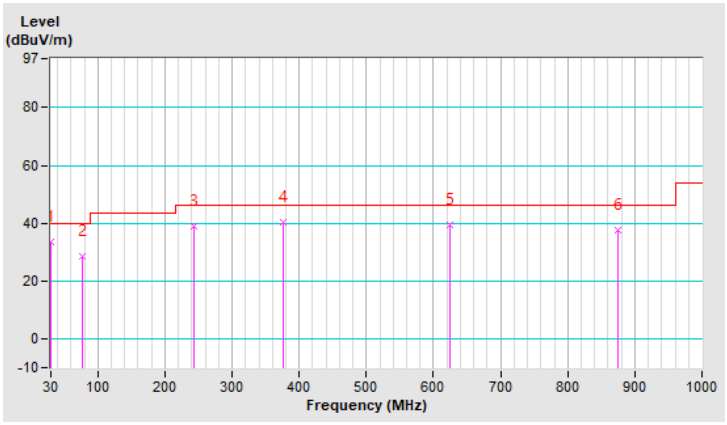


CHANNEL	TX Channel 159	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	A

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	51.34	29.4 QP	40.0	-10.6	1.25 V	135	39.3	-9.9
2	246.31	29.6 QP	46.0	-16.4	1.00 V	177	39.4	-9.8
3	375.32	40.9 QP	46.0	-5.1	1.50 V	161	47.6	-6.7
4	482.02	41.9 QP	46.0	-4.1	1.50 V	46	46.8	-4.9
5	624.61	38.5 QP	46.0	-7.5	1.00 V	17	40.2	-1.7
6	874.87	38.3 QP	46.0	-7.7	1.25 V	193	35.7	2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.

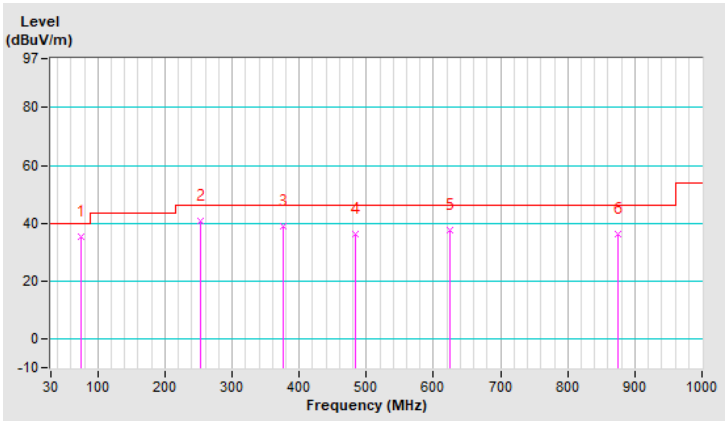


CHANNEL	TX Channel 159	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

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	74.62	35.4 QP	40.0	-4.6	1.25 H	114	48.1	-12.7
2	253.10	40.9 QP	46.0	-5.1	1.00 H	6	50.5	-9.6
3	375.32	38.8 QP	46.0	-7.2	1.25 H	313	45.5	-6.7
4	483.96	36.2 QP	46.0	-9.8	1.50 H	6	41.0	-4.8
5	624.61	37.4 QP	46.0	-8.6	1.25 H	142	39.1	-1.7
6	874.87	36.2 QP	46.0	-9.8	1.50 H	184	33.6	2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.

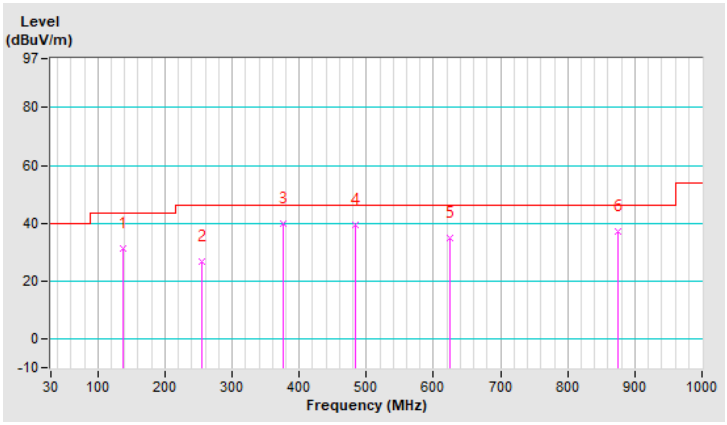


CHANNEL	TX Channel 159	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

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	136.70	31.1 QP	43.5	-12.4	1.50 V	151	41.3	-10.2
2	255.04	26.8 QP	46.0	-19.2	1.25 V	48	36.3	-9.5
3	375.32	39.7 QP	46.0	-6.3	1.25 V	162	46.4	-6.7
4	482.99	39.3 QP	46.0	-6.7	1.00 V	13	44.1	-4.8
5	624.61	35.1 QP	46.0	-10.9	1.00 V	117	36.8	-1.7
6	874.87	37.1 QP	46.0	-8.9	1.50 V	213	34.5	2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.

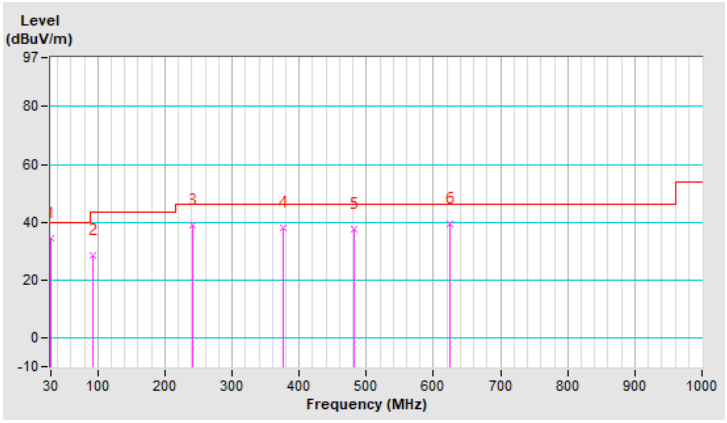


CHANNEL	TX Channel 159	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	C

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.97	34.3 QP	40.0	-5.7	1.25 H	79	45.8	-11.5
2	92.08	28.4 QP	43.5	-15.1	1.00 H	125	43.0	-14.6
3	240.49	39.1 QP	46.0	-6.9	1.00 H	309	49.1	-10.0
4	375.32	37.9 QP	46.0	-8.1	1.50 H	310	44.5	-6.7
5	481.05	37.6 QP	46.0	-8.4	1.50 H	337	42.5	-4.9
6	624.61	39.5 QP	46.0	-6.5	1.00 H	166	41.2	-1.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.

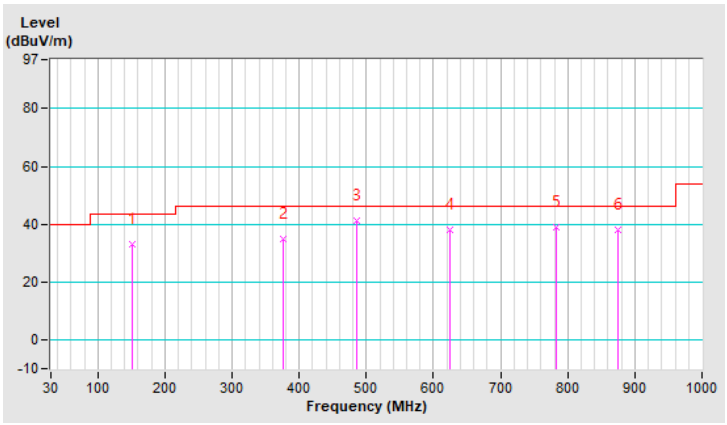


CHANNEL	TX Channel 159	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	C

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	151.25	33.2 QP	43.5	-10.3	1.50 V	264	42.6	-9.4
2	375.32	34.9 QP	46.0	-11.1	1.25 V	173	41.6	-6.7
3	484.93	41.4 QP	46.0	-4.6	1.25 V	24	46.2	-4.8
4	624.61	38.0 QP	46.0	-8.0	1.00 V	67	39.7	-1.7
5	783.69	39.1 QP	46.0	-6.9	1.00 V	314	37.5	1.6
6	875.00	38.1 QP	46.0	-7.9	1.25 V	152	35.5	2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB 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.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 10, 2018	Dec. 09, 2019
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2018	Sep. 04, 2019
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 21, 2019	Feb. 20, 2020
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 19, 2018	Aug. 18, 2019
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-12040.

4.2.3 Test Procedures

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

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

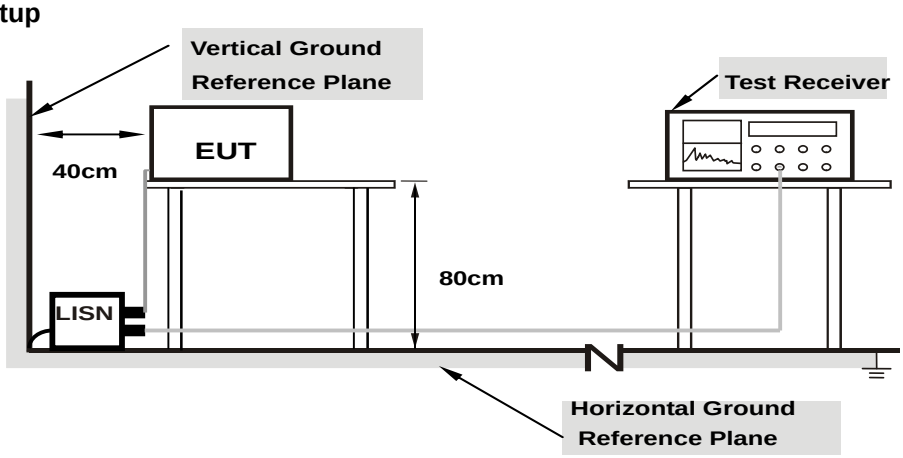
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

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 Conditions

Same as 4.1.6.

4.2.7 Test Results

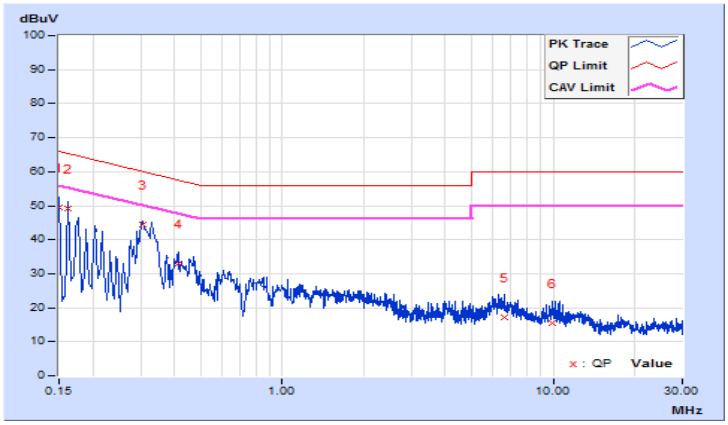
Worst-Case Data: 802.11n (HT40) CH159

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.69	39.85	21.02	49.54	30.71	66.00	56.00	-16.46	-25.29
2	0.16173	9.69	39.52	24.10	49.21	33.79	65.37	55.37	-16.16	-21.58
3	0.30534	9.68	34.87	29.18	44.55	38.86	60.10	50.10	-15.55	-11.24
4	0.41197	9.68	23.43	14.92	33.11	24.60	57.61	47.61	-24.50	-23.01
5	6.62887	9.80	7.24	1.71	17.04	11.51	60.00	50.00	-42.96	-38.49
6	9.97192	9.87	5.65	1.04	15.52	10.91	60.00	50.00	-44.48	-39.09

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.

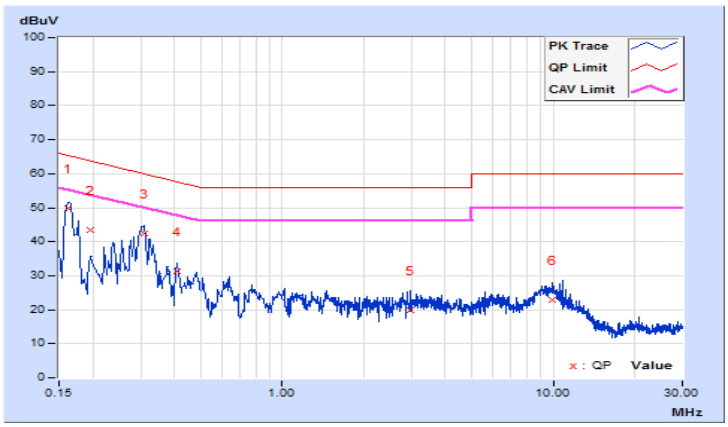


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16139	9.66	40.05	24.75	49.71	34.41	65.39	55.39	-15.68	-20.98
2	0.19665	9.66	33.83	17.26	43.49	26.92	63.75	53.75	-20.26	-26.83
3	0.31031	9.65	32.93	25.15	42.58	34.80	59.96	49.96	-17.38	-15.16
4	0.40800	9.65	21.74	14.32	31.39	23.97	57.69	47.69	-26.30	-23.72
5	2.96520	9.69	10.13	4.76	19.82	14.45	56.00	46.00	-36.18	-31.55
6	9.97974	9.85	13.00	8.02	22.85	17.87	60.00	50.00	-37.15	-32.13

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.

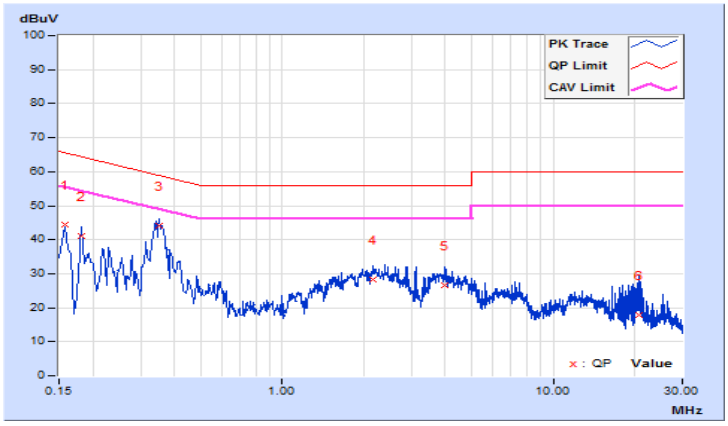


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	9.69	34.60	20.34	44.29	30.03	65.58	55.58	-21.29	-25.55
2	0.18122	9.68	31.49	17.95	41.17	27.63	64.43	54.43	-23.26	-26.80
3	0.34941	9.68	34.39	23.91	44.07	33.59	58.98	48.98	-14.91	-15.39
4	2.15974	9.70	18.54	14.16	28.24	23.86	56.00	46.00	-27.76	-22.14
5	3.99744	9.75	16.81	11.49	26.56	21.24	56.00	46.00	-29.44	-24.76
6	20.64622	9.93	7.82	2.74	17.75	12.67	60.00	50.00	-42.25	-37.33

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.

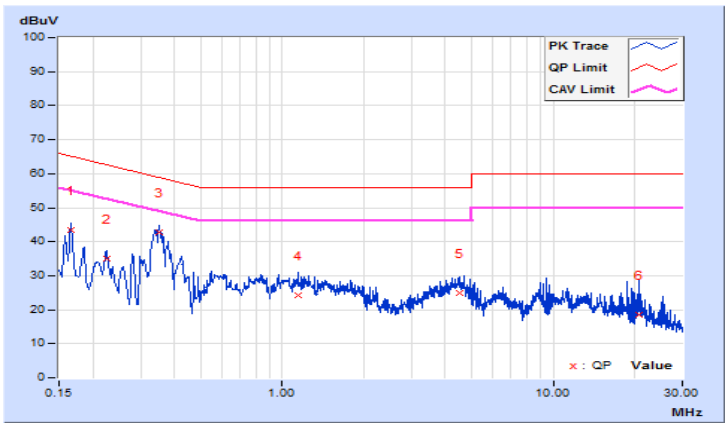


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16569	9.66	33.87	20.58	43.53	30.24	65.17	55.17	-21.64	-24.93
2	0.22434	9.66	25.50	16.29	35.16	25.95	62.66	52.66	-27.50	-26.71
3	0.34926	9.65	33.22	22.80	42.87	32.45	58.98	48.98	-16.11	-16.53
4	1.13923	9.64	14.76	10.02	24.40	19.66	56.00	46.00	-31.60	-26.34
5	4.52529	9.73	15.04	8.60	24.77	18.33	56.00	46.00	-31.23	-27.67
6	20.66186	10.00	8.47	2.07	18.47	12.07	60.00	50.00	-41.53	-37.93

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.

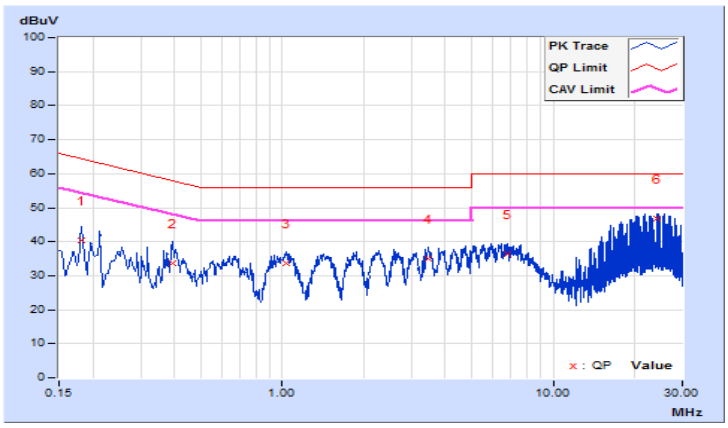


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18128	9.66	30.61	19.32	40.27	28.98	64.43	54.43	-24.16	-25.45
2	0.39242	9.65	24.04	17.32	33.69	26.97	58.01	48.01	-24.32	-21.04
3	1.03366	9.64	23.98	18.74	33.62	28.38	56.00	46.00	-22.38	-17.62
4	3.46959	9.70	25.36	20.30	35.06	30.00	56.00	46.00	-20.94	-16.00
5	6.76876	9.77	26.53	20.20	36.30	29.97	60.00	50.00	-23.70	-20.03
6	24.32162	9.88	36.98	35.01	46.86	44.89	60.00	50.00	-13.14	-5.11

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.

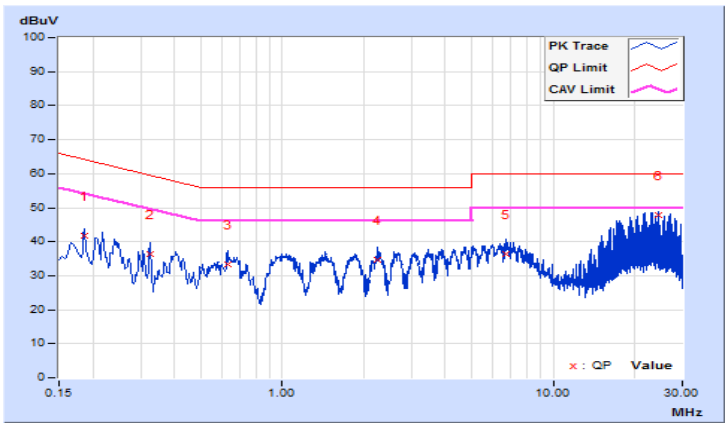


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18519	9.66	32.21	20.98	41.87	30.64	64.25	54.25	-22.38	-23.61
2	0.32595	9.65	26.81	12.85	36.46	22.50	59.55	49.55	-23.09	-27.05
3	0.62689	9.64	23.73	17.73	33.37	27.37	56.00	46.00	-22.63	-18.63
4	2.25749	9.67	24.87	20.03	34.54	29.70	56.00	46.00	-21.46	-16.30
5	6.70316	9.77	26.65	20.50	36.42	30.27	60.00	50.00	-23.58	-19.73
6	**24.33335**	**9.97**	**37.85**	**36.79**	**47.82**	**46.76**	**60.00**	**50.00**	**-12.18**	**-3.24**

REMARKS:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	-		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	-		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

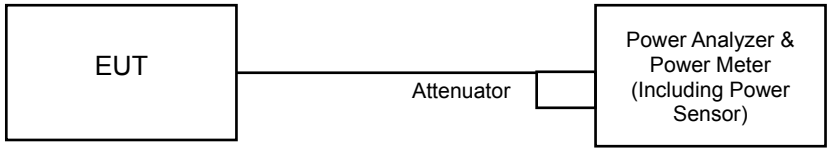
*B is the 26 dB emission bandwidth in megahertz

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

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 Conditions

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:

CDD Mode

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	19.31	19.64	19.57	267.928	24.28	30.00	Pass
40	5200	21.62	21.92	21.80	452.164	26.55	30.00	Pass
48	5240	21.77	21.97	21.88	461.882	26.65	30.00	Pass
149	5745	25.08	24.94	24.82	937.385	29.72	30.00	Pass
157	5785	25.12	24.82	24.84	933.265	29.70	30.00	Pass
165	5825	25.23	24.86	25.09	962.471	29.83	30.00	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	19.53	20.03	19.70	283.761	24.53	30.00	Pass
40	5200	21.83	22.17	21.89	471.746	26.74	30.00	Pass
48	5240	21.40	21.74	21.44	426.633	26.30	30.00	Pass
149	5745	24.88	24.91	24.72	913.835	29.61	30.00	Pass
157	5785	25.04	24.89	24.90	936.503	29.72	30.00	Pass
165	5825	25.06	24.88	25.04	947.391	29.77	30.00	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	18.17	18.62	18.18	204.159	23.10	30.00	Pass
46	5230	22.72	23.12	22.87	**585.826**	27.68	30.00	Pass
151	5755	25.05	25.14	25.22	979.138	29.91	30.00	Pass
159	5795	25.33	25.16	25.13	**995.125**	29.98	30.00	Pass

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	16.83	17.03	16.52	143.536	21.57	30.00	Pass
155	5775	21.09	21.04	20.74	374.163	25.73	30.00	Pass

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	14.76	15.26	14.93	94.614	19.76	27.23	Pass
40	5200	17.06	17.40	17.12	157.293	21.97	27.23	Pass
48	5240	16.63	16.97	16.67	142.252	21.53	27.23	Pass
149	5745	20.11	20.14	19.95	304.696	24.84	27.23	Pass
157	5785	20.27	20.12	20.13	312.255	24.95	27.23	Pass
165	5825	20.29	20.11	20.27	315.884	25.00	27.23	Pass

Note:
1. 5180-5240MHz: Directional gain = 4dBi + 10log(3) = 8.77dBi > 6dBi so the power limit shall be reduced to 30 - (8.77 - 6) = 27.23dBi.
2. 5745-5825MHz: Directional gain = 4dBi + 10log(3) = 8.77dBi > 6dBi so the power limit shall be reduced to 30 - (8.77 - 6) = 27.23dBi.

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	13.40	13.85	13.41	68.072	18.33	27.23	Pass
46	5230	17.95	18.35	18.10	**195.329**	22.91	27.23	Pass
151	5755	20.28	20.37	20.45	326.470	25.14	27.23	Pass
159	5795	20.56	20.39	20.36	**331.802**	25.21	27.23	Pass

Note:
1. 5180-5240MHz: Directional gain = 4dBi + 10log(3) = 8.77dBi > 6dBi so the power limit shall be reduced to 30 - (8.77 - 6) = 27.23dBi.
2. 5745-5825MHz: Directional gain = 4dBi + 10log(3) = 8.77dBi > 6dBi so the power limit shall be reduced to 30 - (8.77 - 6) = 27.23dBi.

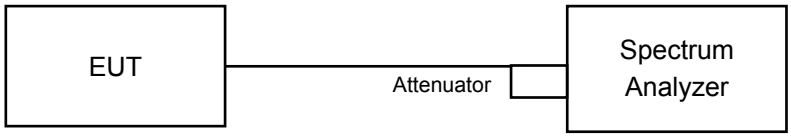
802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	12.06	12.26	11.75	47.858	16.80	27.23	Pass
155	5775	16.32	16.27	15.97	124.756	20.96	27.23	Pass

Note:
1. 5180-5240MHz: Directional gain = 4dBi + 10log(3) = 8.77dBi > 6dBi so the power limit shall be reduced to 30 - (8.77 - 6) = 27.23dBi.
2. 5745-5825MHz: Directional gain = 4dBi + 10log(3) = 8.77dBi > 6dBi so the power limit shall be reduced to 30 - (8.77 - 6) = 27.23dBi.

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 sampling. 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 Result

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
36	5180	16.44	16.44	16.44
40	5200	16.44	16.44	16.44
48	5240	16.44	16.44	16.44
149	5745	24.48	21.48	17.04
157	5785	27.36	22.44	17.16
165	5825	25.56	20.52	18.12

802.11n (HT20)

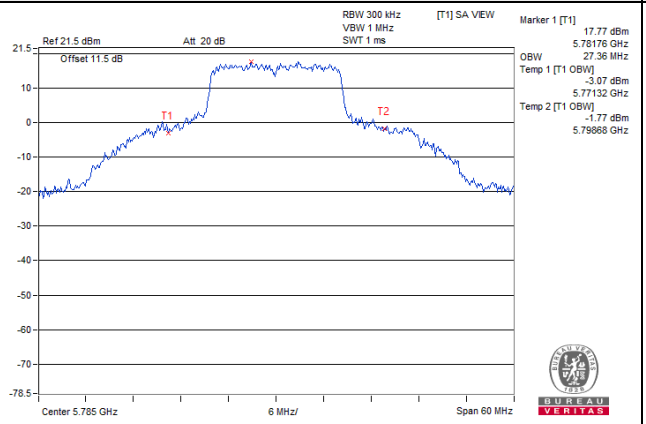
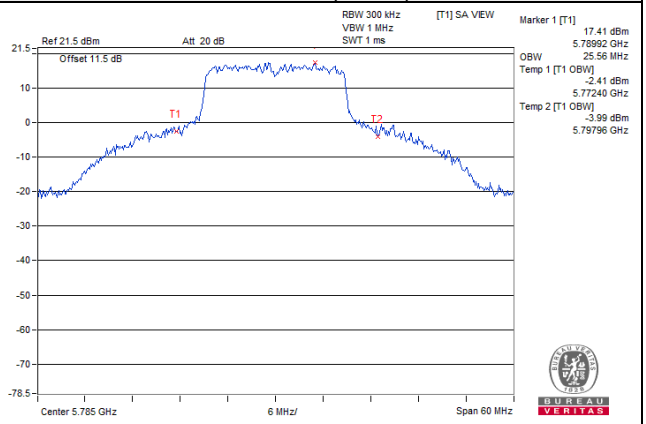
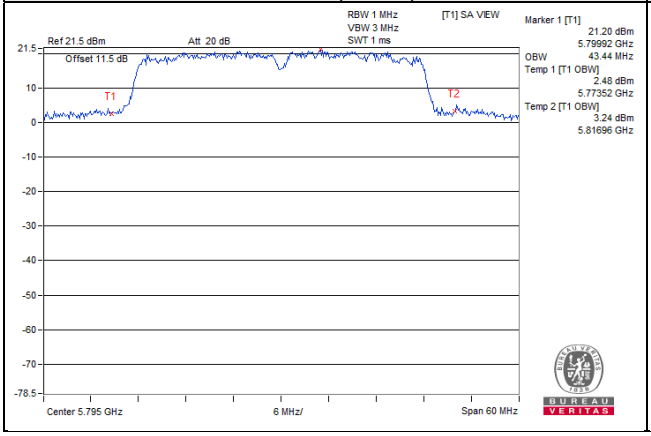
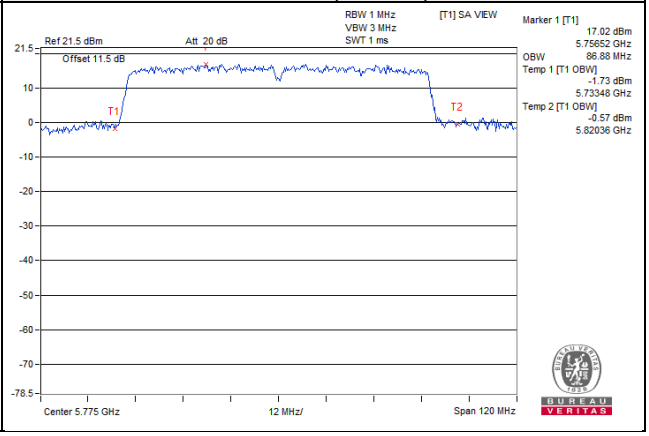
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
36	5180	17.64	17.64	17.64
40	5200	17.64	17.76	17.64
48	5240	17.64	17.64	17.64
149	5745	21.60	20.04	18.00
157	5785	25.56	20.76	18.12
165	5825	25.20	18.84	18.48

802.11n (HT40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
38	5190	36.12	36.12	36.12
46	5230	36.24	36.48	36.12
151	5755	40.68	37.56	36.72
159	5795	43.44	37.44	36.72

802.11ac (VHT80)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
42	5210	75.84	76.08	75.60
155	5775	86.88	75.84	75.84

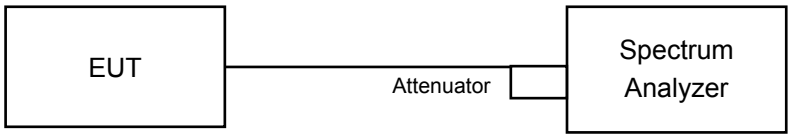
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
	√	Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A	-		11dBm/ MHz
U-NII-2C	-		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

For U-NII-1 band:

Using method SA-2

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 1MHz, Set VBW ≥ 3 MHz, Detector = RMS

c. Set Channel power measure = 1MHz

d. Sweep time = auto, trigger set to “free run”.

e. Trace average at least 100 traces in power averaging mode.

f. Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS

c. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.

d. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz / 300 kHz)

e. Sweep time = auto, trigger set to “free run”.

f. Trace average at least 100 traces in power averaging mode.

g. 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 Conditions

Same as 4.3.6.

4.5.7 Test Results

For U-NII-1 band:

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)			Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	6.90	6.70	6.85	0.15	11.74	14.23	Pass
40	5200	9.12	9.16	9.28	0.15	14.11	14.23	Pass
48	5240	8.99	8.76	9.22	0.15	13.92	14.23	Pass

Note:
1. Method E) 2) 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 = 4dBi + 10log(3) = 8.77dBi > 6dBi, so the power density limit shall be reduced to 17 - (8.77 - 6) = 14.23dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)			Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	6.58	7.35	6.37	0.09	11.65	14.23	Pass
40	5200	8.99	9.61	8.76	0.09	14.00	14.23	Pass
48	5240	9.12	9.21	8.64	0.09	13.86	14.23	Pass

Note:
1. Method E) 2) 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 = 4dBi + 10log(3) = 8.77dBi > 6dBi, so the power density limit shall be reduced to 17 - (8.77 - 6) = 14.23dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)			Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	2.62	2.38	2.47	0.14	7.40	14.23	Pass
46	5230	7.55	7.48	7.63	0.14	12.46	14.23	Pass

Note:
1. Method E) 2) 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 = 4dBi + 10log(3) = 8.77dBi > 6dBi, so the power density limit shall be reduced to 17 - (8.77 - 6) = 14.23dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

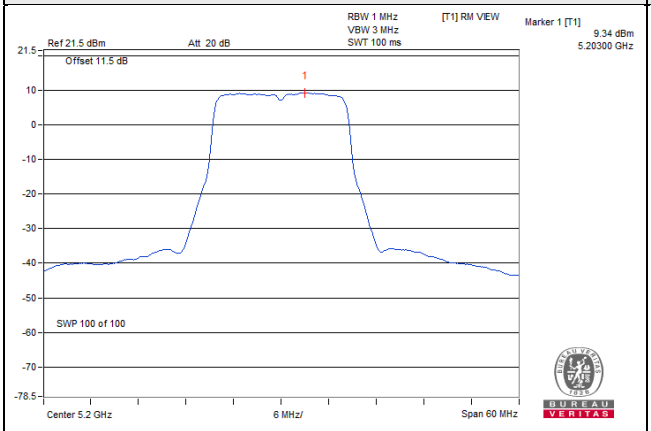
802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)			Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	-1.89	-1.73	-2.57	0.24	2.96	14.23	Pass

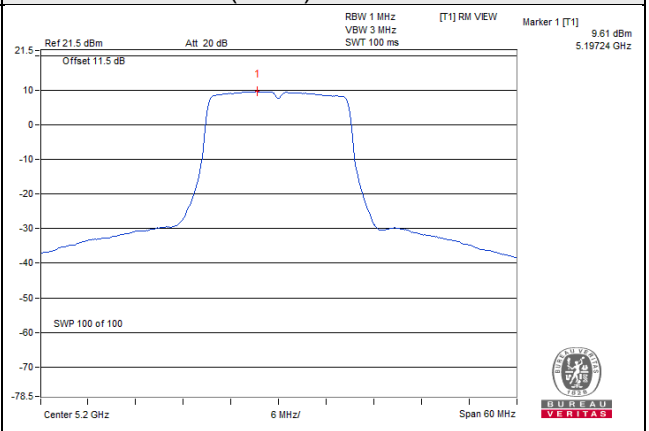
Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4dBi + 10log(3) = 8.77dBi > 6dBi, so the power density limit shall be reduced to 17 - (8.77 - 6) = 14.23dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

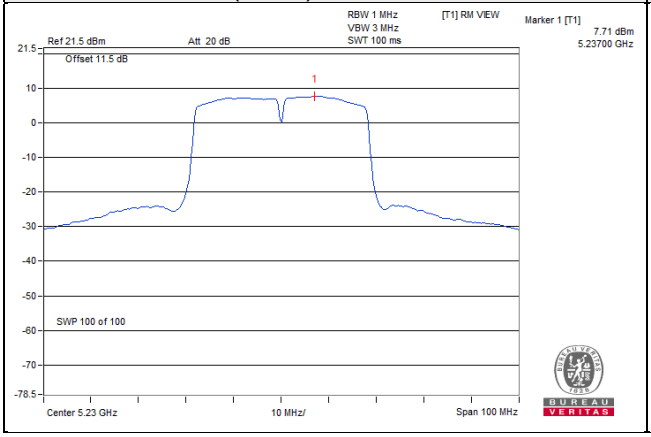
802.11a / Chain 2 / Ch 40



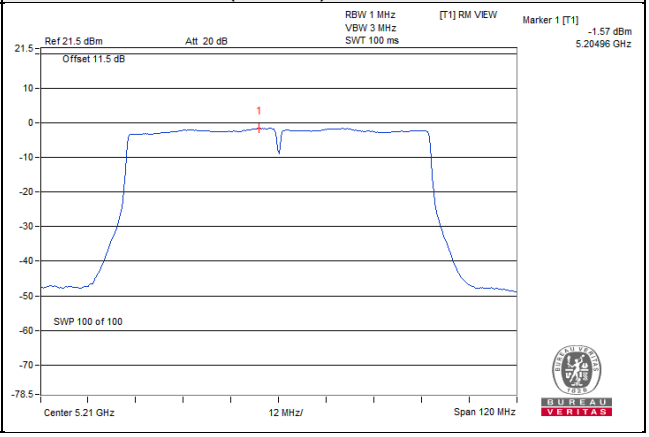
802.11n (HT20) / Chain 1 / Ch 40



802.11n (HT40) / Chain 2 / Ch 46



802.11ac (VHT80) / Chain 1 / Ch 42



For U-NII-3 band:

802.11a

TX chain	Chan.	Freq. (MHz)	PSD w/o Duty Factor		10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	4.70	6.92	4.77	0.15	11.84	27.23	Pass
	157	5785	4.75	6.97	4.77	0.15	11.89	27.23	Pass
	165	5825	4.65	6.87	4.77	0.15	11.79	27.23	Pass
1	149	5745	4.64	6.86	4.77	0.15	11.78	27.23	Pass
	157	5785	4.49	6.71	4.77	0.15	11.63	27.23	Pass
	165	5825	4.05	6.27	4.77	0.15	11.19	27.23	Pass
2	149	5745	4.11	6.33	4.77	0.15	11.25	27.23	Pass
	157	5785	4.15	6.37	4.77	0.15	11.29	27.23	Pass
	165	5825	4.21	6.43	4.77	0.15	11.35	27.23	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 4dBi + 10log(3) = 8.77dBi > 6dBi so the power density limit shall be reduced to 30 - (8.77 - 6) = 27.23dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD w/o Duty Factor		10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	4.19	6.41	4.77	0.09	11.27	27.23	Pass
	157	5785	4.29	6.51	4.77	0.09	11.37	27.23	Pass
	165	5825	4.23	6.45	4.77	0.09	11.31	27.23	Pass
1	149	5745	4.35	6.57	4.77	0.09	11.43	27.23	Pass
	157	5785	4.31	6.53	4.77	0.09	11.39	27.23	Pass
	165	5825	3.91	6.13	4.77	0.09	10.99	27.23	Pass
2	149	5745	3.87	6.09	4.77	0.09	10.95	27.23	Pass
	157	5785	3.80	6.02	4.77	0.09	10.88	27.23	Pass
	165	5825	3.77	5.99	4.77	0.09	10.85	27.23	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 4dBi + 10log(3) = 8.77dBi > 6dBi so the power density limit shall be reduced to 30 - (8.77 - 6) = 27.23dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

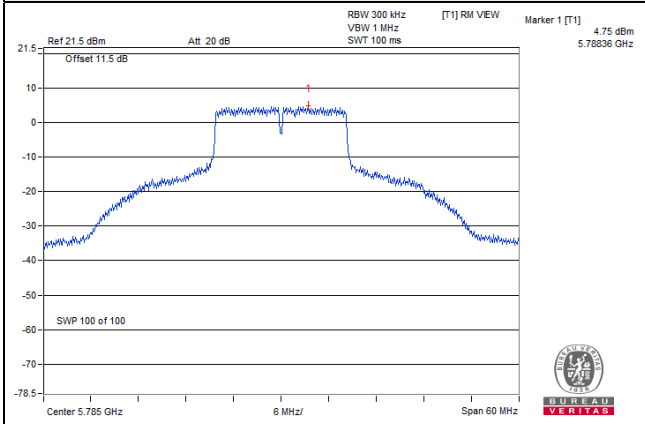
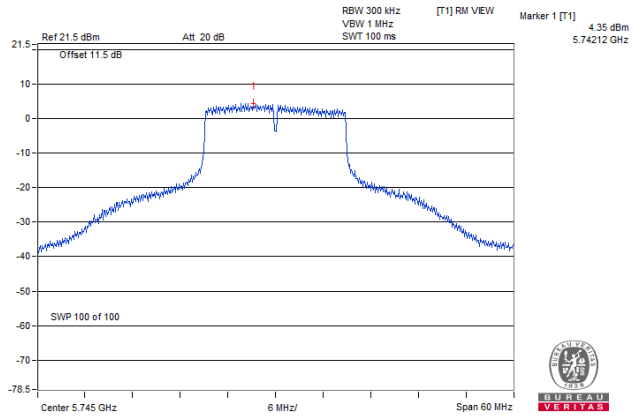
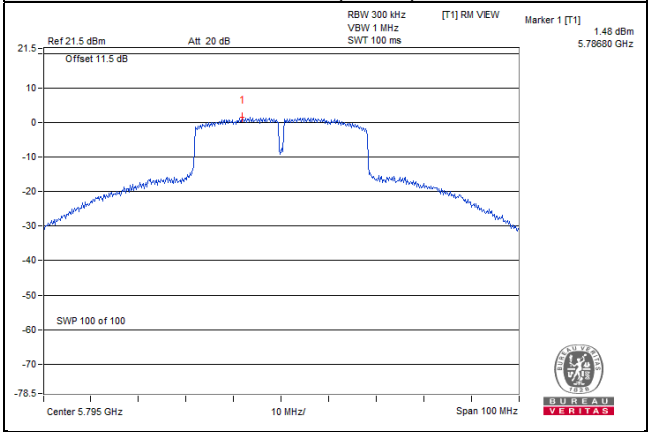
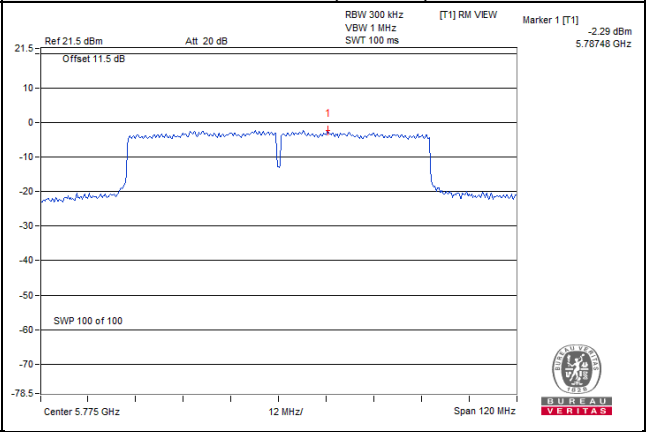
TX chain	Chan.	Freq. (MHz)	PSD w/o Duty Factor		10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	1.35	3.57	4.77	0.14	8.48	27.23	Pass
	159	5795	1.48	3.70	4.77	0.14	8.61	27.23	Pass
1	151	5755	1.36	3.58	4.77	0.14	8.49	27.23	Pass
	159	5795	1.15	3.37	4.77	0.14	8.28	27.23	Pass
2	151	5755	0.80	3.02	4.77	0.14	7.93	27.23	Pass
	159	5795	0.85	3.07	4.77	0.14	7.98	27.23	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. 5Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi so the power density limit shall be reduced to 30 - (9.77 - 6) = 26.23dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Freq. (MHz)	PSD w/o Duty Factor		10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-2.29	-0.07	4.77	0.24	4.94	27.23	Pass
1	155	5775	-6.26	-4.04	4.77	0.24	0.97	27.23	Pass
2	155	5775	-7.09	-4.87	4.77	0.24	0.14	27.23	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 4dBi + 10log(3) = 8.77dBi > 6dBi so the power density limit shall be reduced to 30 - (8.77 - 6) = 27.23dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

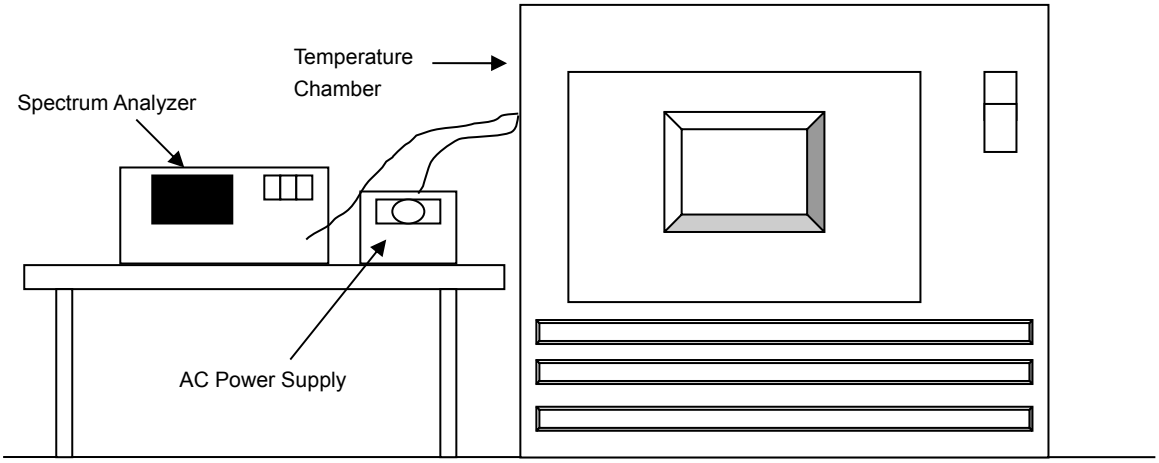
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

4.6 Frequency Stability

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

Tested date: Jul. 31, 2019

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2019	Jun. 11, 2020
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 03, 2019	Jun. 02, 2020
Digital Multimeter Fluke	87-III	70360742	Jun. 27, 2019	Jun. 26, 2020
AC Power Supply Extech	CFW-105	E000603	NA	NA

4.6.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
e. Repeat step c and d with every 10 degrees reduction until the lowest temperature achieved.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5150MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
50	120	5179.9958	Pass	5179.9958	Pass	5179.9967	Pass	5179.9951	Pass
40	120	5179.9886	Pass	5179.9852	Pass	5179.987	Pass	5179.9861	Pass
30	120	5179.9926	Pass	5179.9935	Pass	5179.9912	Pass	5179.9926	Pass
20	120	5180.01	Pass	5180.0062	Pass	5180.0074	Pass	5180.006	Pass
10	120	5179.987	Pass	5179.9881	Pass	5179.9884	Pass	5179.9904	Pass
0	120	5180.0199	Pass	5180.0154	Pass	5180.0173	Pass	5180.0201	Pass
-10	120	5180.0013	Pass	5180.0006	Pass	5180.0002	Pass	5179.9996	Pass
-20	120	5179.9863	Pass	5179.9855	Pass	5179.9862	Pass	5179.9861	Pass
-30	120	5180.0262	Pass	5180.0245	Pass	5180.0228	Pass	5180.026	Pass

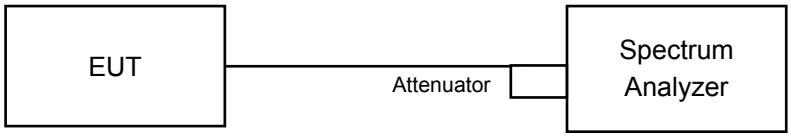
Frequency Stability Versus Voltage									
Operating Frequency: 5150MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5180.0108	Pass	5180.0067	Pass	5180.0073	Pass	5180.0058	Pass
	120	5180.01	Pass	5180.0062	Pass	5180.0074	Pass	5180.006	Pass
	102	5180.0099	Pass	5180.0061	Pass	5180.0075	Pass	5180.007	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

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	16.39	16.34	16.38	0.5	Pass
157	5785	16.38	16.37	16.38	0.5	Pass
165	5825	16.38	16.39	16.38	0.5	Pass

802.11n (HT20)

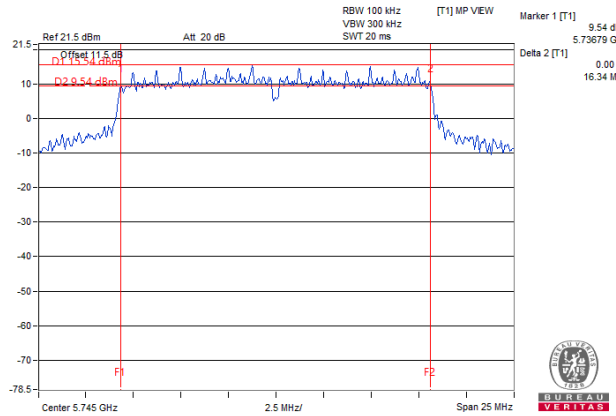
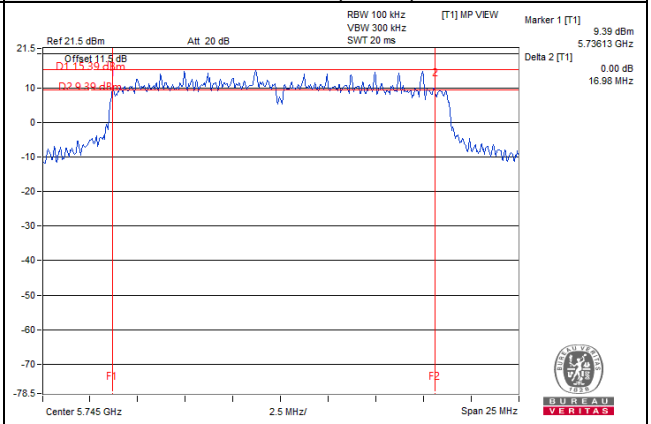
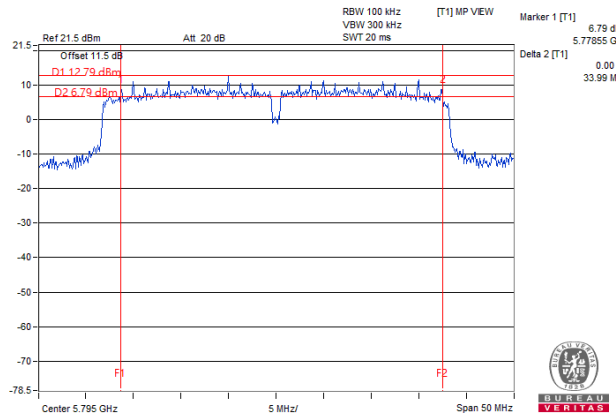
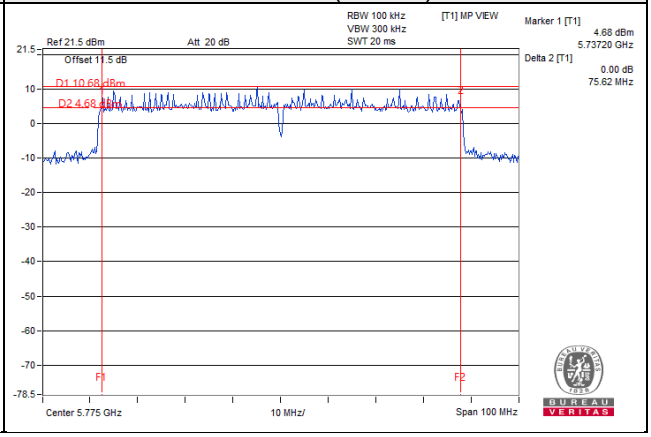
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	17.61	16.98	17.59	0.5	Pass
157	5785	17.63	17.37	17.58	0.5	Pass
165	5825	17.61	17.62	17.61	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
151	5755	35.13	35.16	35.18	0.5	Pass
159	5795	35.15	35.16	33.99	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
155	5775	75.62	76.08	76.03	0.5	Pass

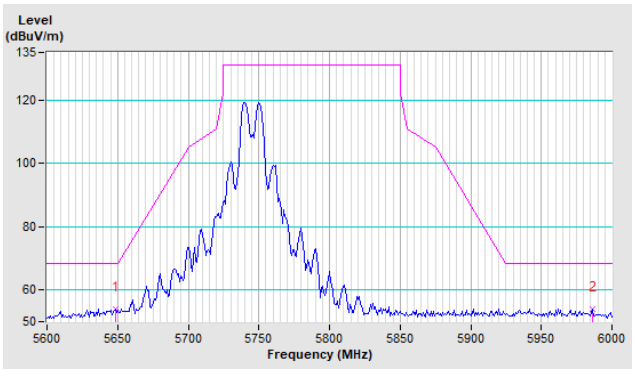
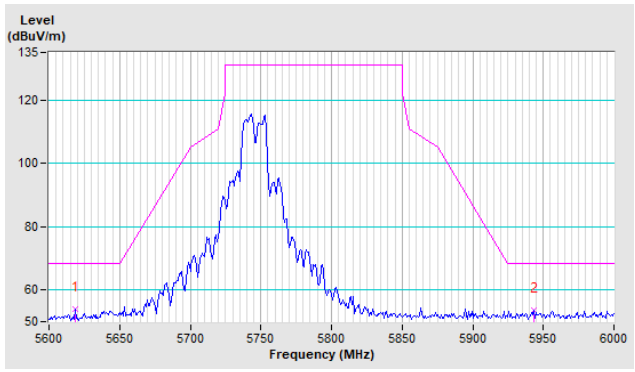
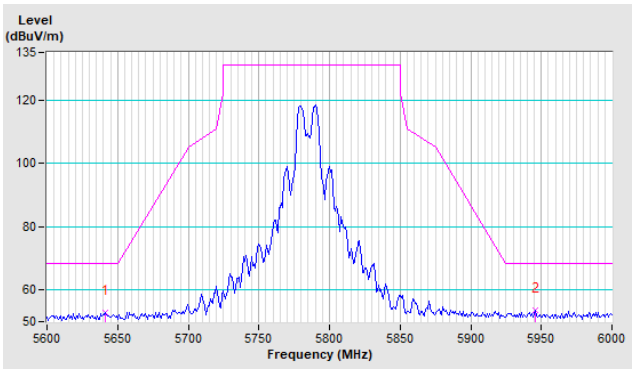
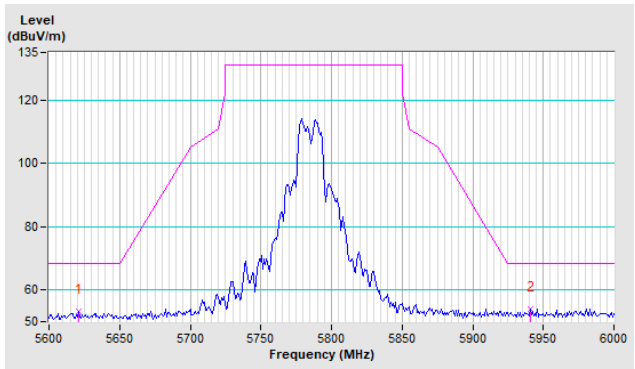
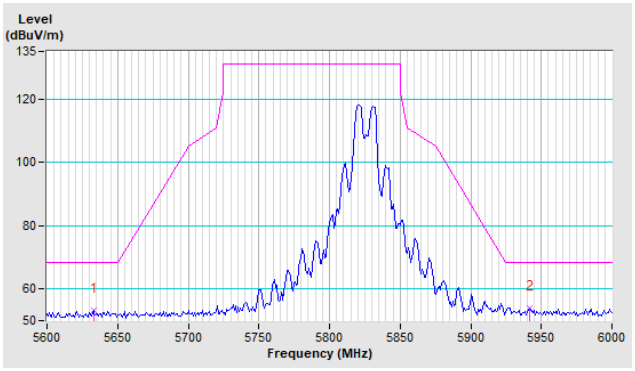
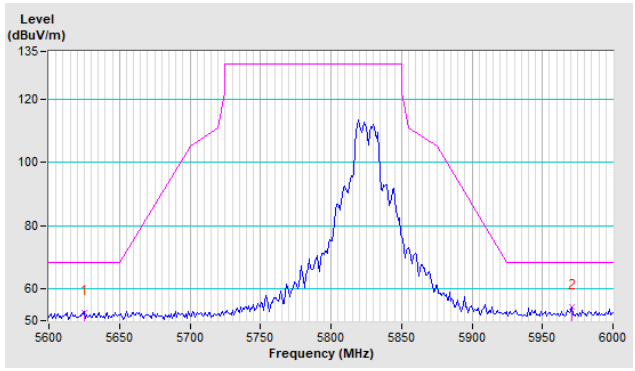
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

5 Pictures of Test Arrangements

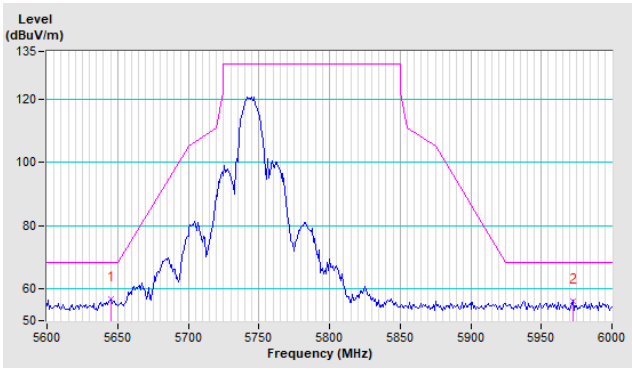
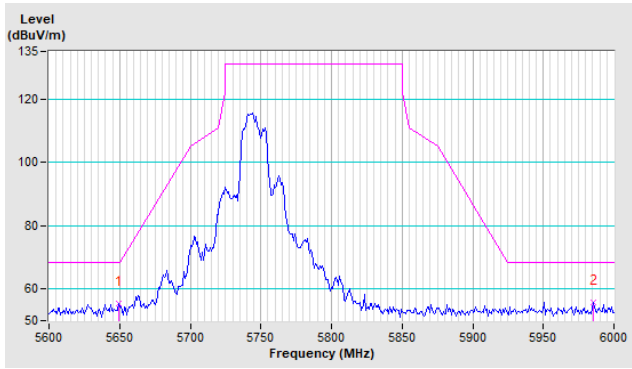
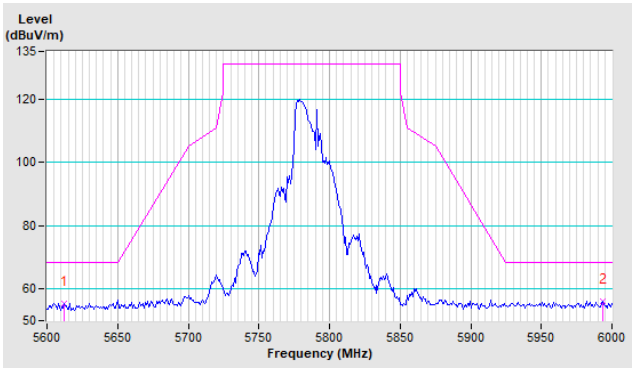
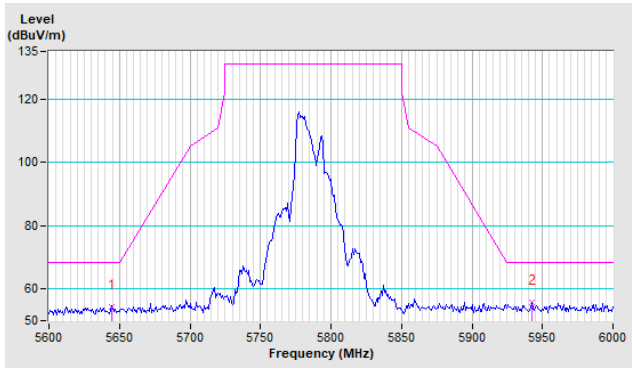
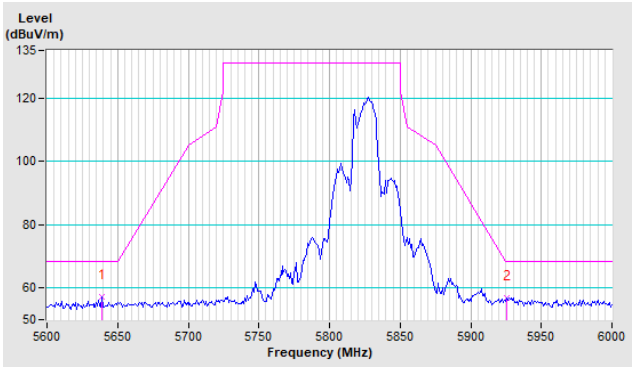
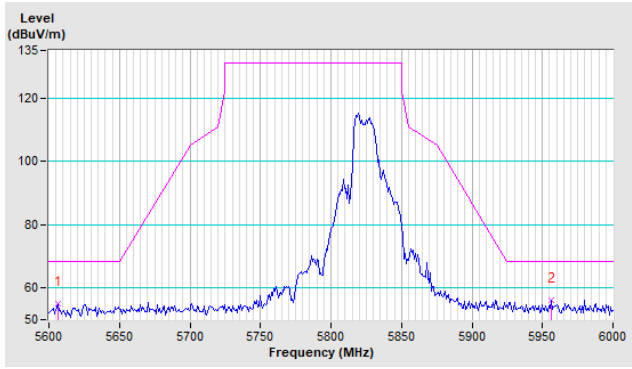
Please refer to the attached file (Test Setup Photo).

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

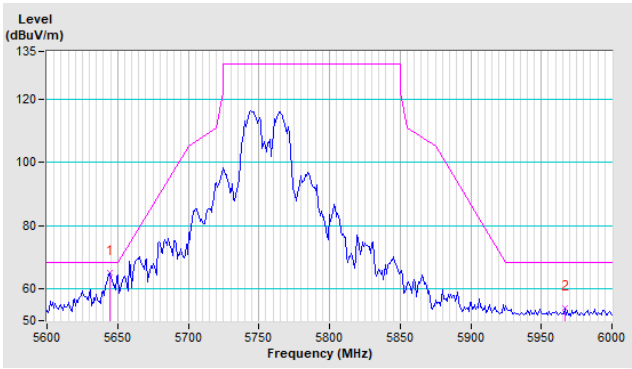
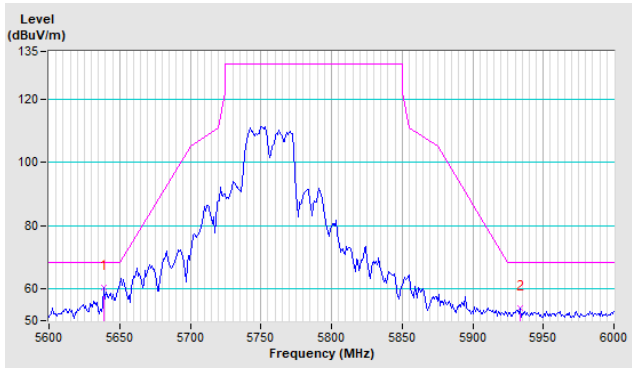
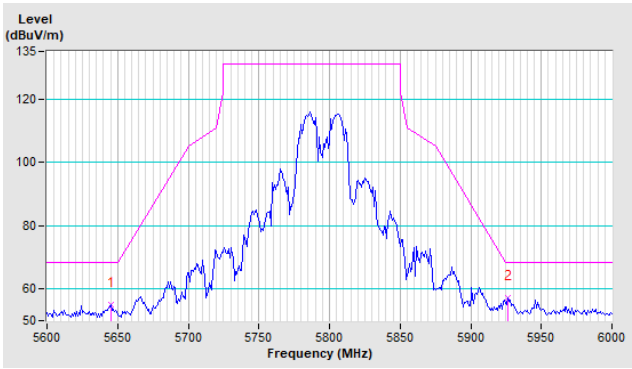
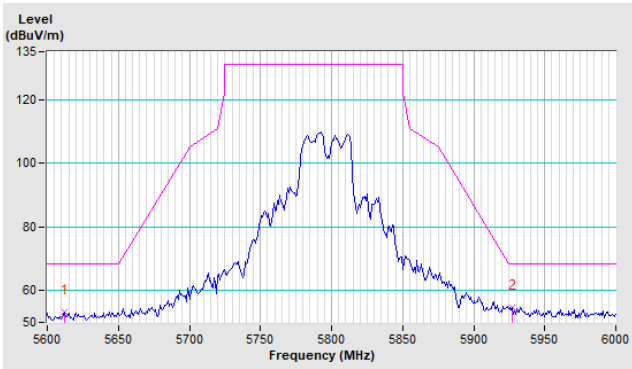
802.11a

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

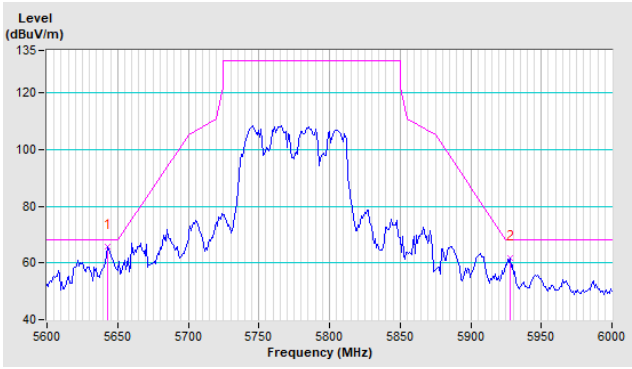
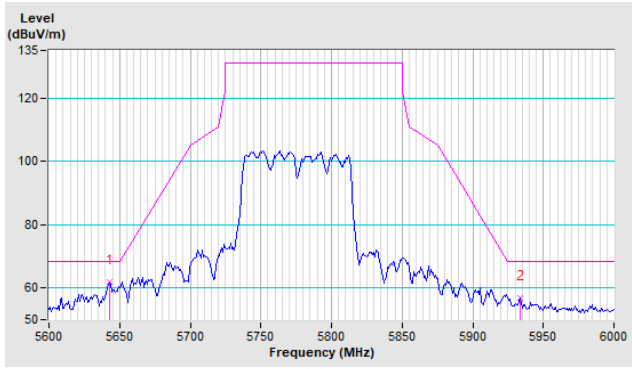
802.11n (HT20)

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

802.11n (HT40)

CH151	
Horizontal	Vertical
	
CH159	
Horizontal	Vertical
	

802.11ac (VHT80)

CH155	
Horizontal	Vertical
	

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 and approved according to ISO/IEC 17025.

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

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