

FCC Test Report

Report No.: RF151229C23-1

FCC ID: NDD9576791501

Test Model: EW-7679OAP

Series Model: GAP-679OAP, OAP1750

Received Date: Jan. 11, 2016

Test Date: Jan. 24 ~ Mar. 18, 2016

Issued Date: Mar. 24, 2016

Applicant: EDIMAX TECHNOLOGY CO., LTD.

Address: No. 3, Wu-Chuan 3rd Road, Wu-Gu, New Taipei City 24891, Taiwan

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

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

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Table of Contents

Release Control Record	4
1 Certificate of Conformity.....	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information.....	7
3.1 General Description of EUT	7
3.2 Description of Test Modes	8
3.2.1 Test Mode Applicability and Tested Channel Detail	9
3.3 Duty Cycle of Test Signal	11
3.4 Description of Support Units	12
3.4.1 Configuration of System under Test	12
3.5 General Description of Applied Standards	13
4 Test Types and Results	14
4.1 Radiated Emission and Bandedge Measurement.....	14
4.1.1 Limits of Radiated Emission and Bandedge Measurement	14
4.1.2 Test Instruments	15
4.1.3 Test Procedures.....	16
4.1.4 Deviation from Test Standard	16
4.1.5 Test Set Up	17
4.1.6 EUT Operating Conditions.....	17
4.1.7 Test Results	18
4.2 Conducted Emission Measurement	47
4.2.1 Limits of Conducted Emission Measurement	47
4.2.2 Test Instruments	47
4.2.3 Test Procedures.....	48
4.2.4 Deviation from Test Standard	48
4.2.5 Test Setup.....	48
4.2.6 EUT Operating Conditions.....	48
4.2.7 Test Results	49
4.3 Transmit Power Measurement	51
4.3.1 Limits of Transmit Power Measurement	51
4.3.2 Test Setup.....	51
4.3.3 Test Instruments	51
4.3.4 Test Procedure	52
4.3.5 Deviation from Test Standard	52
4.3.6 EUT Operating Conditions.....	52
4.3.7 Test Result.....	53
4.4 Peak Power Spectral Density Measurement	62
4.4.1 Limits of Peak Power Spectral Density Measurement	62
4.4.2 Test Setup.....	62
4.4.3 Test Instruments	62
4.4.4 Test Procedures.....	63
4.4.5 Deviation from Test Standard	63
4.4.6 EUT Operating Conditions.....	63
4.4.7 Test Results	64
4.5 Frequency Stability.....	70
4.5.1 Limits of Frequency Stability Measurement	70
4.5.2 Test Setup.....	70
4.5.3 Test Instruments	70
4.5.4 Test Procedure	70
4.5.5 Deviation from Test Standard	70
4.5.6 EUT Operating Condition	70

4.5.7 Test Results	71
4.6 6dB Bandwidth Measurement.....	72
4.6.1 Limits of 6dB Bandwidth Measurement.....	72
4.6.2 Test Setup.....	72
4.6.3 Test Instruments	72
4.6.4 Test Procedure	72
4.6.5 Deviation from Test Standard	72
4.6.6 EUT Operating Condition	72
4.6.7 Test Results	73
5 Pictures of Test Arrangements.....	75
Appendix – Information on the Testing Laboratories	76



A D T

Release Control Record

Issue No.	Description	Date Issued
RF151229C23-1	Original release	Mar. 24, 2016

1 Certificate of Conformity

Product: 11ac Dual Band Concurrent Outdoor AP

Brand: EDIMAX

Test Model: EW-7679OAP

Series Model: GAP-679OAP, OAP1750

Sample Status: Engineering sample

Applicant: EDIMAX TECHNOLOGY CO., LTD.

Test Date: Jan. 24 ~ Mar. 18, 2016

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 EMC characteristics under the conditions specified in this report.

Prepared by :



Date:

Mar. 24, 2016

Pettie Chen / Senior Specialist

Approved by :



Date:

Mar. 24, 2016

Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -13.55dB at 0.43000MHz.
15.407(b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.5dB at 80.45MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	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 N plug. (The device is professionally installed)

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~ 1000MHz	3.87 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	11ac Dual Band Concurrent Outdoor AP
Brand	EDIMAX
Test Model	EW-7679OAP
Series Model	GAP-679OAP, OAP1750
Model Difference	Refer to Note
Status of EUT	Engineering sample
Power Supply Rating	48-55Vdc (PoE)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 450.0Mbps 802.11ac: up to 1300Mbps
Operating Frequency	5180 ~ 5240MHz & 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5745 ~ 5825MHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
Output Power	5180 ~ 5240MHz: 31.559mW 5745 ~ 5825MHz: 631.147mW
Antenna Type	Dipole antenna with 5.6dBi gain
Antenna Connector	N Plug
Accessory Device	Bracket, Lightning protector
Data Cable Supplied	0.4m non-shielded RJ45 cable without core 0.95m non-shielded ground cable without core

Note:

1. All models are listed as below.

Brand	Model	Remark
EDIMAX	EW-7679OAP	Main test model
EDIMAX	GAP-679OAP	Series models, for marketing purpose.
EDIMAX	OAP1750	

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

Modulation Mode	TX Function
802.11a	1TX (Fixed chain 0)
802.11n (HT20)	3TX
802.11n (HT40)	3TX
802.11ac (VHT20)	3TX
802.11ac (VHT40)	3TX
802.11ac (VHT80)	3TX

3. The EUT uses following PoE. (Support unit only)

PoE	
Brand	Power Desine
Model	PD-9001GR/AC
Input Power	100-240Vac~50-60Hz, 0.67A
Output Power	55Vdc,0.6A

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz:

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

Channel	Frequency	Channel	Frequency
149	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	
-	√	√	√	√	-

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 could just position on the Z-plane according to manufacturer's requirement.

Radiated Emission Test (Above 1GHz):

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	19.5
-	802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	40.5
-	802.11ac (VHT80)		42	42	OFDM	BPSK	87.8
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	19.5
-	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	40.5
-	802.11ac (VHT80)		155	155	OFDM	BPSK	87.8

Radiated Emission Test (Below 1GHz):

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (HT20)	5180-5240	36 to 48	157	OFDM	BPSK	7.2
	802.11n (HT20)	5745-5825	149 to 165		OFDM	BPSK	7.2

Power Line Conducted Emission Test:

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (HT20)	5180-5240	36 to 48	157	OFDM	BPSK	7.2
-	802.11n (HT20)	5745-5825	149 to 165		OFDM	BPSK	7.2

Antenna Port Conducted Measurement:

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	19.5
-	802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	40.5
-	802.11ac (VHT80)		42	42	OFDM	BPSK	87.8
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	19.5
-	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	40.5
-	802.11ac (VHT80)		155	155	OFDM	BPSK	87.8

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE $\geq$ 1G	16deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
RE<1G	16deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
PLC	20deg. C, 70%RH	120Vac, 60Hz	Jones Chang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Antony Lee

3.3 Duty Cycle of Test Signal

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

802.11a: Duty cycle = $2.675/2.812 = 0.951$, Duty factor = $10 * \log(1/0.951) = 0.22$

802.11n (HT20): Duty cycle = $2.475/2.60 = 0.952$, Duty factor = $10 * \log(1/0.952) = 0.21$

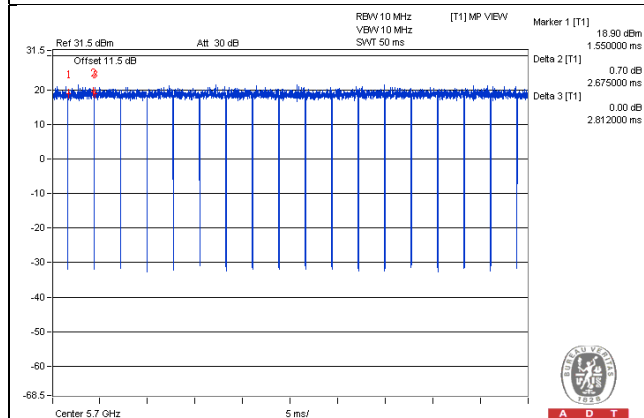
802.11n (HT40): Duty cycle = $1.162/1.287 = 0.903$, Duty factor = $10 * \log(1/0.903) = 0.44$

802.11ac (VHT20): Duty cycle = $2.51/2.59 = 0.969$, Duty factor = $10 * \log(1/0.969) = 0.14$

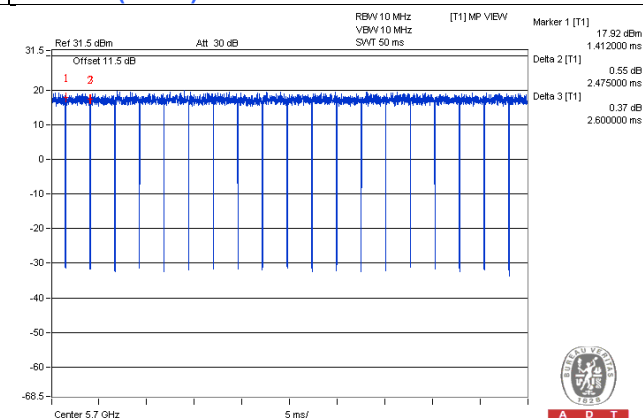
802.11ac (VHT40): Duty cycle = $1.217/1.302 = 0.935$, Duty factor = $10 * \log(1/0.935) = 0.29$

802.11ac (VHT80): Duty cycle = $0.563/0.663 = 0.849$, Duty factor = $10 * \log(1/0.849) = 0.71$

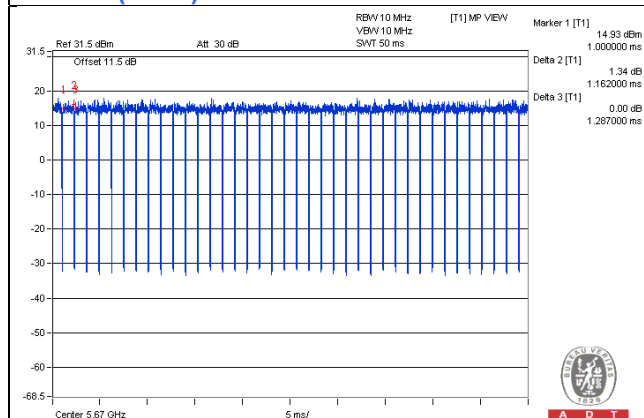
802.11a



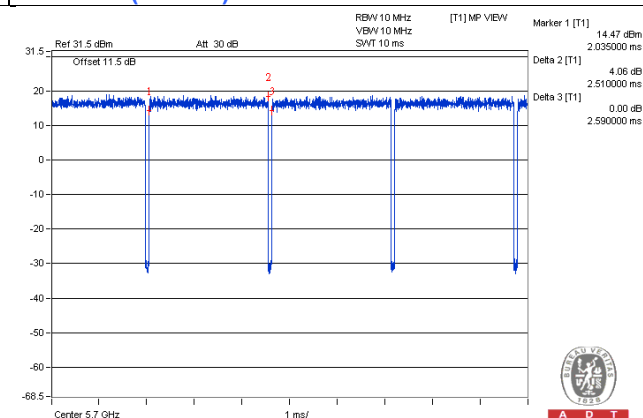
802.11n (HT20)



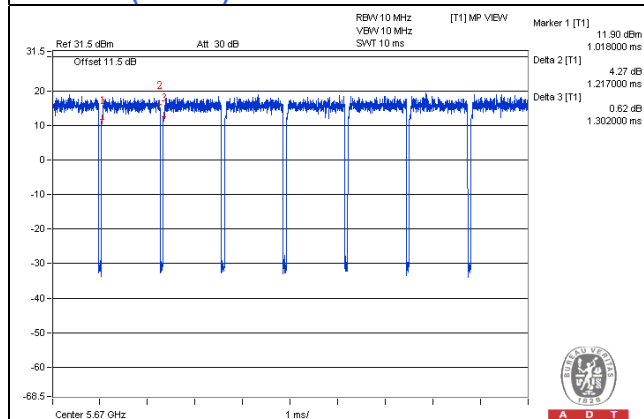
802.11n (HT40)



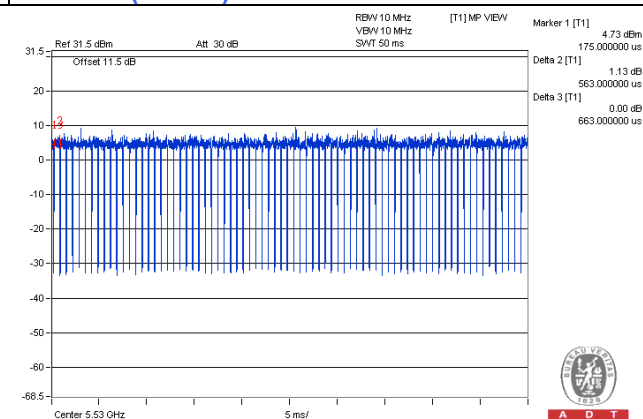
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	Dell	E5410	1HC2XM1	FCC DoC Approved	-
B.	PoE	Power Desine	PD-9001GR/AC	N/A	N/A	-

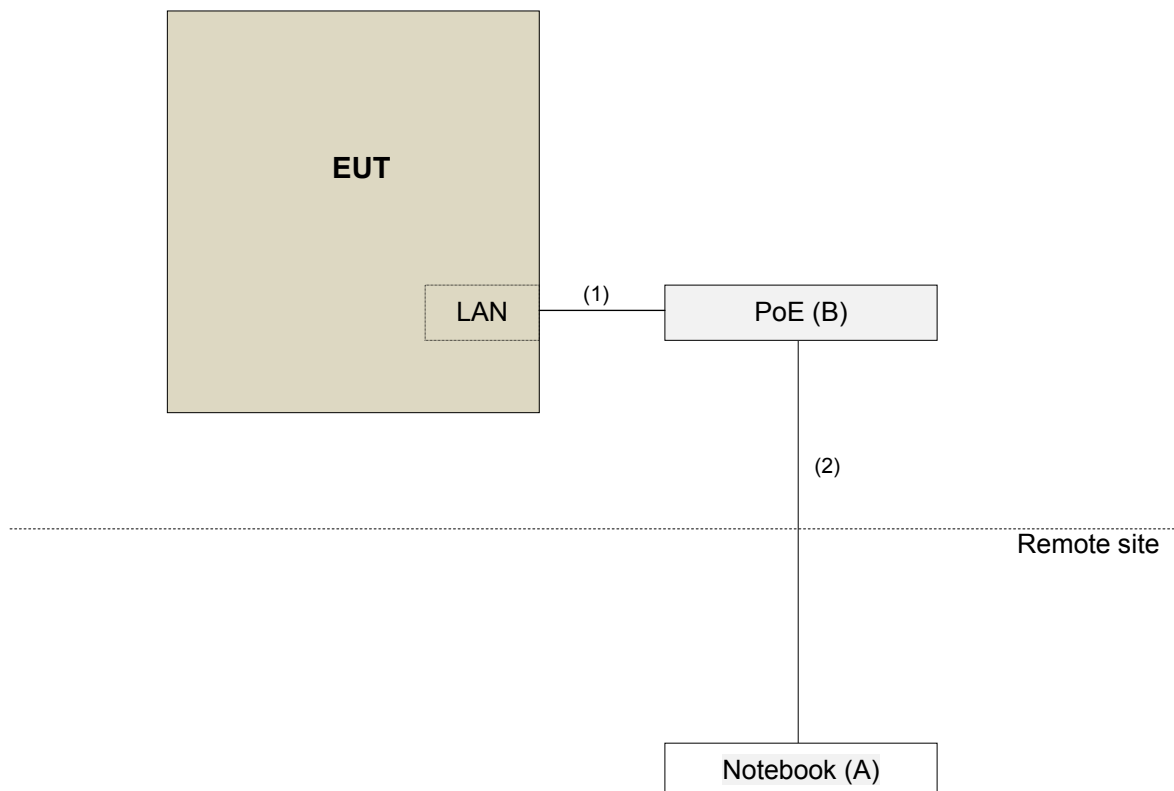
Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45 cable	1	1.8	N	0	-
2.	RJ45 cable	1	10	N	0	-

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied 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 Procedures New Rules v01r02

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC).
The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedures New Rules v01r02	FIELD STRENGTH AT 3m	
	PK:74 (dBuV/m)	AV:54 (dBuV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBuV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2}	PK: 68.2(dBuV/m) ^{*1} PK:78.2 (dBuV/m) ^{*2}

NOTE: ^{*1} beyond 10MHz of the band edge ^{*2} within 10 MHz of band edge

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

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Apr. 10, 2015	Apr. 09, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Sep. 02, 2015	Sep. 01, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-151	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna SCHWARZBECK	9120D	209	Jan. 20, 2016	Jan. 19, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Jan. 18, 2016	Jan. 17, 2017
Preamplifier Agilent	8447D	2944A10738	Oct. 18, 2015	Oct. 17, 2016
Preamplifier Agilent	8449B	3008A01964	Aug. 22, 2015	Aug. 21, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (214378)	Aug. 22, 2015	Aug. 21, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 106	Cable-CH3-03 (309224+12738)	Aug. 22, 2015	Aug. 21, 2016
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2015	Oct. 17, 2016
High Speed Peak Power Meter	ML2495A	0824011	Jul. 09, 2015	Jul. 08, 2016
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016

- 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 3.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 988962.
5. The IC Site Registration No. is IC 7450F-3.

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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:

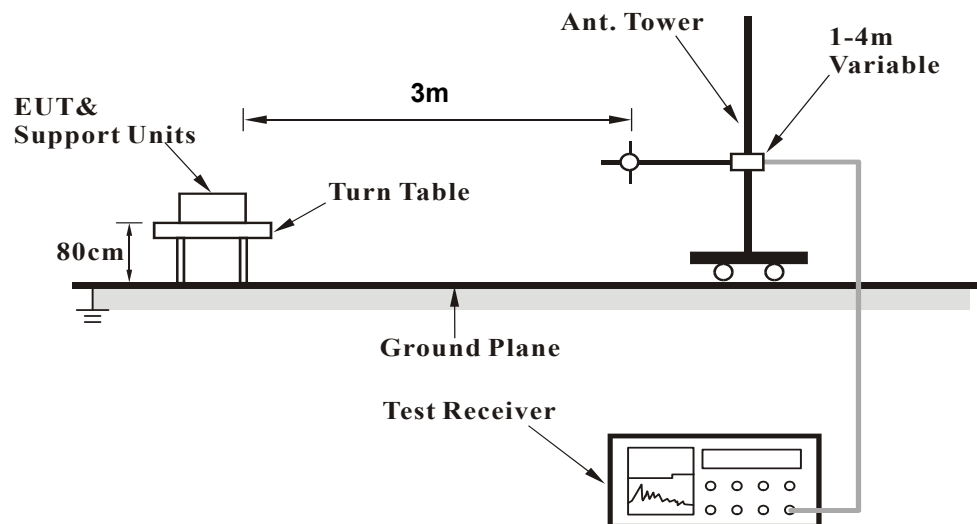
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

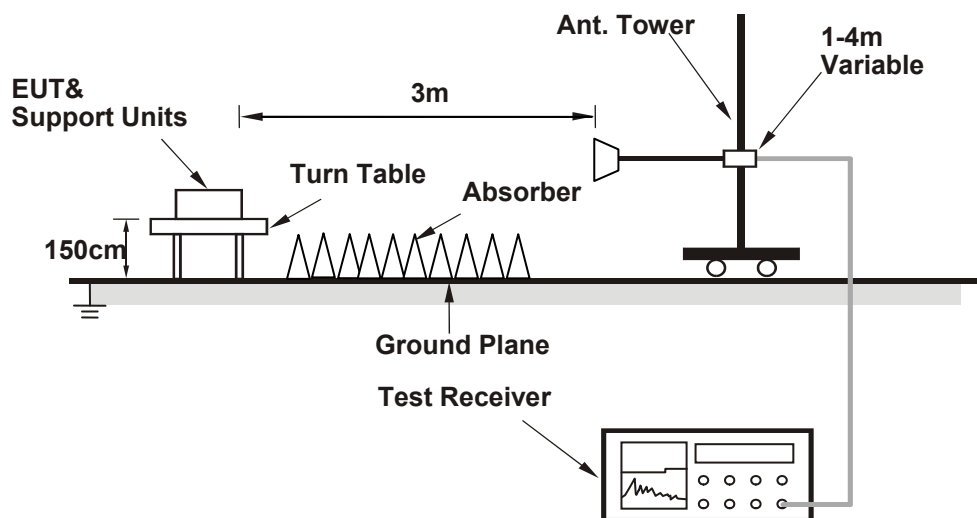
No deviation.

4.1.5 Test Set Up

<Frequency Range 30MHz ~ 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Prepared notebook to act as communication partner and placed it outside of testing area.
- The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The communication partner sent data to EUT by command "PING".
- 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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.0 PK	74.0	-18.0	1.12 H	321	50.00	6.00
2	5150.00	43.8 AV	54.0	-10.2	1.12 H	321	37.80	6.00
3	*5180.00	96.1 PK			1.00 H	316	56.70	39.40
4	*5180.00	85.9 AV			1.00 H	316	46.50	39.40
5	#10360.00	58.9 PK	74.0	-15.1	1.17 H	271	41.10	17.80
6	#10360.00	46.0 AV	54.0	-8.0	1.17 H	271	28.20	17.80
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	1.60 V	94	54.70	6.00
2	5150.00	45.5 AV	54.0	-8.5	1.60 V	94	39.50	6.00
3	*5180.00	110.5 PK			1.72 V	93	71.10	39.40
4	*5180.00	100.1 AV			1.72 V	93	60.70	39.40
5	#10360.00	58.8 PK	74.0	-15.2	1.39 V	64	41.00	17.80
6	#10360.00	46.0 AV	54.0	-8.0	1.39 V	64	28.20	17.80

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	95.8 PK			1.04 H	315	56.30	39.50
2	*5200.00	85.9 AV			1.04 H	315	46.40	39.50
3	#10400.00	58.5 PK	74.0	-15.5	1.12 H	218	40.80	17.70
4	#10400.00	46.1 AV	54.0	-7.9	1.12 H	218	28.40	17.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	110.2 PK			1.50 V	104	70.70	39.50
2	*5200.00	100.0 AV			1.50 V	104	60.50	39.50
3	#10400.00	58.7 PK	74.0	-15.3	1.22 V	76	41.00	17.70
4	#10400.00	46.0 AV	54.0	-8.0	1.22 V	76	28.30	17.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	96.4 PK			1.03 H	314	56.80	39.60
2	*5240.00	86.8 AV			1.03 H	314	47.20	39.60
3	5350.00	57.0 PK	74.0	-17.0	1.12 H	261	50.50	6.50
4	5350.00	44.2 AV	54.0	-9.8	1.12 H	261	37.70	6.50
5	#10480.00	58.8 PK	74.0	-15.2	1.33 H	64	40.10	18.70
6	#10480.00	46.2 AV	54.0	-7.8	1.33 H	64	27.50	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	110.6 PK			1.40 V	102	71.00	39.60
2	*5240.00	100.4 AV			1.40 V	102	60.80	39.60
3	5350.00	57.3 PK	74.0	-16.7	1.27 V	85	50.80	6.50
4	5350.00	45.3 AV	54.0	-8.7	1.27 V	85	38.80	6.50
5	#10480.00	59.0 PK	74.0	-15.0	1.06 V	5	40.30	18.70
6	#10480.00	46.7 AV	54.0	-7.3	1.06 V	5	28.00	18.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	56.6 PK	74.0	-17.4	1.09 H	213	49.20	7.40
2	#5714.90	44.1 AV	54.0	-9.9	1.09 H	213	36.70	7.40
3	#5722.90	57.5 PK	78.2	-20.7	1.19 H	221	50.10	7.40
4	#5725.00	45.6 PK	78.2	-32.6	1.29 H	240	38.20	7.40
5	*5745.00	96.6 PK			1.01 H	204	56.10	40.50
6	*5745.00	86.3 AV			1.01 H	204	45.80	40.50
7	11490.00	59.2 PK	74.0	-14.8	1.03 H	194	40.50	18.70
8	11490.00	46.4 AV	54.0	-7.6	1.03 H	194	27.70	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	69.0 PK	74.0	-5.0	1.04 V	264	61.60	7.40
2	#5714.90	52.5 AV	54.0	-1.5	1.04 V	264	45.10	7.40
3	#5722.90	72.3 PK	78.2	-5.9	1.02 V	267	64.90	7.40
4	#5725.00	59.2 PK	78.2	-19.0	1.02 V	264	51.80	7.40
5	*5745.00	113.7 PK			1.00 V	263	73.20	40.50
6	*5745.00	103.6 AV			1.00 V	263	63.10	40.50
7	11490.00	58.9 PK	74.0	-15.1	1.12 V	107	40.20	18.70
8	11490.00	46.1 AV	54.0	-7.9	1.12 V	107	27.40	18.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	101.1 PK			1.16 H	305	60.50	40.60
2	*5785.00	90.8 AV			1.16 H	305	50.20	40.60
3	11570.00	59.5 PK	74.0	-14.5	1.29 H	253	40.80	18.70
4	11570.00	46.5 AV	54.0	-7.5	1.29 H	253	27.80	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	118.0 PK			1.00 V	265	77.40	40.60
2	*5785.00	108.3 AV			1.00 V	265	67.70	40.60
3	11570.00	60.2 PK	74.0	-13.8	1.02 V	297	41.50	18.70
4	11570.00	47.3 AV	54.0	-6.7	1.02 V	297	28.60	18.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	99.3 PK			1.00 H	308	58.70	40.60
2	*5825.00	89.7 AV			1.00 H	308	49.10	40.60
3	#5850.00	46.2 PK	78.2	-32.0	1.09 H	304	38.60	7.60
4	#5852.10	59.0 PK	78.2	-19.2	1.11 H	308	51.30	7.70
5	#5860.10	57.3 PK	74.0	-16.7	1.17 H	307	49.60	7.70
6	#5860.10	44.8 AV	54.0	-9.2	1.17 H	307	37.10	7.70
7	11650.00	59.2 PK	74.0	-14.8	1.17 H	251	40.00	19.20
8	11650.00	46.7 AV	54.0	-7.3	1.17 H	251	27.50	19.20
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	*5825.00	114.8 PK			1.00 V	124	74.20	40.60
2	*5825.00	105.3 AV			1.00 V	124	64.70	40.60
3	#5850.00	58.2 PK	78.2	-20.0	1.02 V	295	50.60	7.60
4	#5852.10	72.7 PK	78.2	-5.5	1.00 V	296	65.00	7.70
5	#5860.10	68.8 PK	74.0	-5.2	1.00 V	290	61.10	7.70
6	#5860.10	52.5 AV	54.0	-1.5	1.00 V	290	44.80	7.70
7	11650.00	59.5 PK	74.0	-14.5	1.15 V	46	40.30	19.20
8	11650.00	46.7 AV	54.0	-7.3	1.15 V	46	27.50	19.20

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)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.8 PK	74.0	-17.2	1.35 H	51	50.80	6.00
2	5150.00	43.0 AV	54.0	-11.0	1.35 H	51	37.00	6.00
3	*5180.00	95.8 PK			1.26 H	101	56.40	39.40
4	*5180.00	85.7 AV			1.26 H	101	46.30	39.40
5	#10360.00	58.0 PK	74.0	-16.0	1.03 H	86	40.20	17.80
6	#10360.00	45.5 AV	54.0	-8.5	1.03 H	86	27.70	17.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.3 PK	74.0	-17.7	1.64 V	127	50.30	6.00
2	5150.00	43.4 AV	54.0	-10.6	1.64 V	127	37.40	6.00
3	*5180.00	111.8 PK			1.76 V	129	72.40	39.40
4	*5180.00	100.9 AV			1.76 V	129	61.50	39.40
5	#10360.00	58.6 PK	74.0	-15.4	1.49 V	65	40.80	17.80
6	#10360.00	45.6 AV	54.0	-8.4	1.49 V	65	27.80	17.80

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	94.4 PK			1.00 H	212	54.90	39.50
2	*5200.00	84.3 AV			1.00 H	212	44.80	39.50
3	#10400.00	58.5 PK	74.0	-15.5	1.15 H	136	40.80	17.70
4	#10400.00	45.4 AV	54.0	-8.6	1.15 H	136	27.70	17.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	111.3 PK			2.09 V	128	71.80	39.50
2	*5200.00	100.9 AV			2.09 V	128	61.40	39.50
3	#10400.00	58.1 PK	74.0	-15.9	1.82 V	89	40.40	17.70
4	#10400.00	45.4 AV	54.0	-8.6	1.82 V	89	27.70	17.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	95.0 PK			1.00 H	213	55.40	39.60
2	*5240.00	85.3 AV			1.00 H	213	45.70	39.60
3	5350.00	56.7 PK	74.0	-17.3	1.10 H	194	50.20	6.50
4	5350.00	43.7 AV	54.0	-10.3	1.10 H	194	37.20	6.50
5	#10480.00	58.0 PK	74.0	-16.0	1.27 H	133	39.30	18.70
6	#10480.00	45.7 AV	54.0	-8.3	1.27 H	133	27.00	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	110.9 PK			1.65 V	140	71.30	39.60
2	*5240.00	100.9 AV			1.65 V	140	61.30	39.60
3	5350.00	57.2 PK	74.0	-16.8	1.70 V	135	50.70	6.50
4	5350.00	44.6 AV	54.0	-9.4	1.70 V	135	38.10	6.50
5	#10480.00	58.4 PK	74.0	-15.6	1.42 V	55	39.70	18.70
6	#10480.00	45.7 AV	54.0	-8.3	1.42 V	55	27.00	18.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	58.1 PK	74.0	-15.9	3.25 H	327	50.70	7.40
2	#5714.90	45.1 AV	54.0	-8.9	3.25 H	327	37.70	7.40
3	#5722.90	62.7 PK	78.2	-15.5	3.41 H	310	55.30	7.40
4	#5725.00	49.5 PK	78.2	-28.7	3.40 H	310	42.10	7.40
5	*5745.00	103.2 PK			3.31 H	313	62.70	40.50
6	*5745.00	93.8 AV			3.31 H	313	53.30	40.50
7	11490.00	59.4 PK	74.0	-14.6	2.12 H	246	40.70	18.70
8	11490.00	46.6 AV	54.0	-7.4	2.12 H	246	27.90	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	68.6 PK	74.0	-5.4	2.49 V	266	61.20	7.40
2	#5714.90	52.7 AV	54.0	-1.3	2.49 V	266	45.30	7.40
3	#5722.90	72.9 PK	78.2	-5.3	2.92 V	297	65.50	7.40
4	#5725.00	60.1 PK	78.2	-18.1	2.83 V	299	52.70	7.40
5	*5745.00	115.6 PK			2.74 V	275	75.10	40.50
6	*5745.00	105.7 AV			2.74 V	275	65.20	40.50
7	11490.00	59.0 PK	74.0	-15.0	1.82 V	241	40.30	18.70
8	11490.00	46.4 AV	54.0	-7.6	1.82 V	241	27.70	18.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.5 PK			3.17 H	311	69.90	40.60
2	*5785.00	100.4 AV			3.17 H	311	59.80	40.60
3	11570.00	59.9 PK	74.0	-14.1	2.94 H	100	41.20	18.70
4	11570.00	47.2 AV	54.0	-6.8	2.94 H	100	28.50	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	123.0 PK			2.82 V	261	82.40	40.60
2	*5785.00	112.6 AV			2.82 V	261	72.00	40.60
3	11570.00	64.1 PK	74.0	-9.9	2.90 V	208	45.40	18.70
4	11570.00	51.5 AV	54.0	-2.5	2.90 V	208	32.80	18.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	103.9 PK			3.33 H	310	63.30	40.60
2	*5825.00	93.6 AV			3.33 H	310	53.00	40.60
3	#5850.00	48.1 PK	78.2	-30.1	3.31 H	305	40.50	7.60
4	#5852.10	62.2 PK	78.2	-16.0	2.97 H	318	54.50	7.70
5	#5860.10	59.7 PK	74.0	-14.3	2.82 H	328	52.00	7.70
6	#5860.10	45.5 AV	54.0	-8.5	2.82 H	328	37.80	7.70
7	11650.00	59.2 PK	74.0	-14.8	2.16 H	182	40.00	19.20
8	11650.00	47.1 AV	54.0	-6.9	2.16 H	182	27.90	19.20
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	*5825.00	117.4 PK			2.73 V	289	76.80	40.60
2	*5825.00	106.9 AV			2.73 V	289	66.30	40.60
3	#5850.00	61.5 PK	78.2	-16.7	2.82 V	260	53.90	7.60
4	#5852.10	74.0 PK	78.2	-4.2	2.75 V	250	66.30	7.70
5	#5860.10	68.3 PK	74.0	-5.7	2.77 V	296	60.60	7.70
6	#5860.10	52.4 AV	54.0	-1.6	2.77 V	296	44.70	7.70
7	11650.00	60.8 PK	74.0	-13.2	2.98 V	250	41.60	19.20
8	11650.00	48.6 AV	54.0	-5.4	2.98 V	250	29.40	19.20

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)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.0 PK	74.0	-17.0	2.51 H	136	51.00	6.00
2	5150.00	43.8 AV	54.0	-10.2	2.51 H	136	37.80	6.00
3	*5190.00	91.8 PK			3.70 H	211	52.40	39.40
4	*5190.00	81.5 AV			3.70 H	211	42.10	39.40
5	#10380.00	58.1 PK	74.0	-15.9	1.41 H	72	40.40	17.70
6	#10380.00	45.7 AV	54.0	-8.3	1.41 H	72	28.00	17.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.5 PK	74.0	-11.5	1.74 V	68	56.50	6.00
2	5150.00	48.5 AV	54.0	-5.5	1.74 V	68	42.50	6.00
3	*5190.00	109.2 PK			1.89 V	261	69.80	39.40
4	*5190.00	98.6 AV			1.89 V	261	59.20	39.40
5	#10380.00	58.7 PK	74.0	-15.3	1.70 V	193	41.00	17.70
6	#10380.00	45.7 AV	54.0	-8.3	1.70 V	193	28.00	17.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	90.7 PK			3.57 H	211	51.10	39.60
2	*5230.00	80.7 AV			3.57 H	211	41.10	39.60
3	5350.00	57.6 PK	74.0	-16.4	3.21 H	221	51.10	6.50
4	5350.00	45.0 AV	54.0	-9.0	3.21 H	221	38.50	6.50
5	#10460.00	58.9 PK	74.0	-15.1	2.16 H	152	40.40	18.50
6	#10460.00	46.3 AV	54.0	-7.7	2.16 H	152	27.80	18.50
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	109.9 PK			1.95 V	257	70.30	39.60
2	*5230.00	99.4 AV			1.95 V	257	59.80	39.60
3	5350.00	58.5 PK	74.0	-15.5	1.84 V	252	52.00	6.50
4	5350.00	45.4 AV	54.0	-8.6	1.84 V	252	38.90	6.50
5	#10460.00	58.3 PK	74.0	-15.7	1.42 V	185	39.80	18.50
6	#10460.00	46.5 AV	54.0	-7.5	1.42 V	185	28.00	18.50

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)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	58.3 PK	74.0	-15.7	3.10 H	288	50.90	7.40
2	#5714.90	44.9 AV	54.0	-9.1	3.10 H	288	37.50	7.40
3	#5722.90	59.9 PK	78.2	-18.3	3.04 H	313	52.50	7.40
4	#5725.00	47.2 PK	78.2	-31.0	3.01 H	319	39.80	7.40
5	*5755.00	96.5 PK			2.95 H	311	55.90	40.60
6	*5755.00	86.8 AV			2.95 H	311	46.20	40.60
7	11510.00	59.7 PK	74.0	-14.3	2.65 H	245	41.00	18.70
8	11510.00	46.5 AV	54.0	-7.5	2.65 H	245	27.80	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	67.7 PK	74.0	-6.3	2.89 V	287	60.30	7.40
2	#5714.90	52.9 AV	54.0	-1.1	2.89 V	287	45.50	7.40
3	#5722.90	73.5 PK	78.2	-4.7	2.91 V	9	66.10	7.40
4	#5725.00	60.1 PK	78.2	-18.1	2.81 V	241	52.70	7.40
5	*5755.00	110.8 PK			2.89 V	121	70.20	40.60
6	*5755.00	100.6 AV			2.89 V	121	60.00	40.60
7	11510.00	59.3 PK	74.0	-14.7	2.25 V	69	40.60	18.70
8	11510.00	46.8 AV	54.0	-7.2	2.25 V	69	28.10	18.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	99.9 PK			1.06 H	310	59.30	40.60
2	*5795.00	90.4 AV			1.06 H	310	49.80	40.60
3	#5850.00	45.7 PK	78.2	-32.5	1.06 H	325	38.10	7.60
4	#5852.10	59.1 PK	78.2	-19.1	1.21 H	301	51.40	7.70
5	#5860.10	58.4 PK	74.0	-15.6	1.37 H	279	50.70	7.70
6	#5860.10	45.5 AV	54.0	-8.5	1.37 H	279	37.80	7.70
7	11590.00	60.5 PK	74.0	-13.5	1.13 H	241	41.70	18.80
8	11590.00	46.9 AV	54.0	-7.1	1.13 H	241	28.10	18.80
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	*5795.00	116.2 PK			2.64 V	251	75.60	40.60
2	*5795.00	105.5 AV			2.64 V	251	64.90	40.60
3	#5850.00	56.0 PK	78.2	-22.2	3.09 V	185	48.40	7.60
4	#5852.10	69.7 PK	78.2	-8.5	3.02 V	179	62.00	7.70
5	#5860.10	66.9 PK	74.0	-7.1	2.72 V	264	59.20	7.70
6	#5860.10	52.5 AV	54.0	-1.5	2.72 V	264	44.80	7.70
7	11590.00	59.9 PK	74.0	-14.1	2.18 V	191	41.10	18.80
8	11590.00	47.5 AV	54.0	-6.5	2.18 V	191	28.70	18.80

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

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.6 PK	74.0	-17.4	1.32 H	64	50.60	6.00
2	5150.00	42.7 AV	54.0	-11.3	1.32 H	64	36.70	6.00
3	*5180.00	95.6 PK			1.27 H	86	56.20	39.40
4	*5180.00	85.4 AV			1.27 H	86	46.00	39.40
5	#10360.00	57.8 PK	74.0	-16.2	1.01 H	69	40.00	17.80
6	#10360.00	45.4 AV	54.0	-8.6	1.01 H	69	27.60	17.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.1 PK	74.0	-17.9	1.57 V	132	50.10	6.00
2	5150.00	43.1 AV	54.0	-10.9	1.57 V	132	37.10	6.00
3	*5180.00	111.5 PK			1.73 V	128	72.10	39.40
4	*5180.00	100.6 AV			1.73 V	128	61.20	39.40
5	#10360.00	58.4 PK	74.0	-15.6	1.43 V	81	40.60	17.80
6	#10360.00	45.5 AV	54.0	-8.5	1.43 V	81	27.70	17.80

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	94.2 PK			1.03 H	208	54.70	39.50
2	*5200.00	84.0 AV			1.03 H	208	44.50	39.50
3	#10400.00	58.3 PK	74.0	-15.7	1.09 H	137	40.60	17.70
4	#10400.00	45.2 AV	54.0	-8.8	1.09 H	137	27.50	17.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	111.0 PK			2.08 V	126	71.50	39.50
2	*5200.00	100.7 AV			2.08 V	126	61.20	39.50
3	#10400.00	57.9 PK	74.0	-16.1	1.83 V	92	40.20	17.70
4	#10400.00	45.1 AV	54.0	-8.9	1.83 V	92	27.40	17.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	94.8 PK			1.02 H	211	55.20	39.60
2	*5240.00	85.0 AV			1.02 H	211	45.40	39.60
3	5350.00	56.6 PK	74.0	-17.4	1.06 H	182	50.10	6.50
4	5350.00	43.5 AV	54.0	-10.5	1.06 H	182	37.00	6.50
5	#10480.00	57.8 PK	74.0	-16.2	1.25 H	141	39.10	18.70
6	#10480.00	45.6 AV	54.0	-8.4	1.25 H	141	26.90	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	110.7 PK			1.69 V	143	71.10	39.60
2	*5240.00	100.6 AV			1.69 V	143	61.00	39.60
3	5350.00	56.9 PK	74.0	-17.1	1.73 V	138	50.40	6.50
4	5350.00	44.4 AV	54.0	-9.6	1.73 V	138	37.90	6.50
5	#10480.00	58.2 PK	74.0	-15.8	1.34 V	69	39.50	18.70
6	#10480.00	45.5 AV	54.0	-8.5	1.34 V	69	26.80	18.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	57.7 PK	74.0	-16.3	3.22 H	308	50.30	7.40
2	#5714.90	44.6 AV	54.0	-9.4	3.22 H	308	37.20	7.40
3	#5722.90	62.3 PK	78.2	-15.9	3.37 H	321	54.90	7.40
4	#5725.00	49.0 PK	78.2	-29.2	3.36 H	294	41.60	7.40
5	*5745.00	102.6 PK			3.18 H	269	62.10	40.50
6	*5745.00	93.0 AV			3.18 H	269	52.50	40.50
7	11490.00	59.1 PK	74.0	-14.9	1.92 H	232	40.40	18.70
8	11490.00	46.1 AV	54.0	-7.9	1.92 H	232	27.40	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	68.4 PK	74.0	-5.6	2.43 V	269	61.00	7.40
2	#5714.90	52.4 AV	54.0	-1.6	2.43 V	269	45.00	7.40
3	#5722.90	72.5 PK	78.2	-5.7	2.85 V	269	65.10	7.40
4	#5725.00	59.6 PK	78.2	-18.6	2.64 V	285	52.20	7.40
5	*5745.00	115.2 PK			2.65 V	281	74.70	40.50
6	*5745.00	106.2 AV			2.65 V	281	65.70	40.50
7	11490.00	58.7 PK	74.0	-15.3	1.68 V	233	40.00	18.70
8	11490.00	46.1 AV	54.0	-7.9	1.68 V	233	27.40	18.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.0 PK			3.03 H	322	69.40	40.60
2	*5785.00	99.8 AV			3.03 H	322	59.20	40.60
3	11570.00	59.7 PK	74.0	-14.3	2.83 H	117	41.00	18.70
4	11570.00	46.9 AV	54.0	-7.1	2.83 H	117	28.20	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	122.3 PK			2.71 V	259	81.70	40.60
2	*5785.00	111.8 AV			2.71 V	259	71.20	40.60
3	11570.00	63.8 PK	74.0	-10.2	2.83 V	191	45.10	18.70
4	11570.00	51.0 AV	54.0	-3.0	2.83 V	191	32.30	18.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	103.3 PK			3.21 H	259	62.70	40.60
2	*5825.00	92.7 AV			3.21 H	259	52.10	40.60
3	#5850.00	47.7 PK	78.2	-30.5	3.16 H	285	40.10	7.60
4	#5852.10	61.7 PK	78.2	-16.5	2.62 H	308	54.00	7.70
5	#5860.10	59.3 PK	74.0	-14.7	2.63 H	307	51.60	7.70
6	#5860.10	44.9 AV	54.0	-9.1	2.63 H	307	37.20	7.70
7	11650.00	58.9 PK	74.0	-15.1	2.08 H	180	39.70	19.20
8	11650.00	46.7 AV	54.0	-7.3	2.08 H	180	27.50	19.20
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	*5825.00	116.6 PK			2.54 V	267	76.00	40.60
2	*5825.00	105.7 AV			2.54 V	267	65.10	40.60
3	#5850.00	61.0 PK	78.2	-17.2	2.80 V	255	53.40	7.60
4	#5852.10	73.4 PK	78.2	-4.8	2.62 V	273	65.70	7.70
5	#5860.10	68.2 PK	74.0	-5.8	2.54 V	268	60.50	7.70
6	#5860.10	52.2 AV	54.0	-1.8	2.54 V	268	44.50	7.70
7	11650.00	60.5 PK	74.0	-13.5	2.67 V	233	41.30	19.20
8	11650.00	48.2 AV	54.0	-5.8	2.67 V	233	29.00	19.20

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.8 PK	74.0	-17.2	2.34 H	130	50.80	6.00
2	5150.00	43.5 AV	54.0	-10.5	2.34 H	130	37.50	6.00
3	*5190.00	91.5 PK			2.42 H	131	52.10	39.40
4	*5190.00	81.1 AV			2.42 H	131	41.70	39.40
5	#10380.00	57.8 PK	74.0	-16.2	1.27 H	66	40.10	17.70
6	#10380.00	45.2 AV	54.0	-8.8	1.27 H	66	27.50	17.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.3 PK	74.0	-11.7	1.72 V	82	56.30	6.00
2	5150.00	48.2 AV	54.0	-5.8	1.72 V	82	42.20	6.00
3	*5190.00	109.0 PK			1.92 V	251	69.60	39.40
4	*5190.00	98.2 AV			1.92 V	251	58.80	39.40
5	#10380.00	58.5 PK	74.0	-15.5	1.62 V	182	40.80	17.70
6	#10380.00	45.4 AV	54.0	-8.6	1.62 V	182	27.70	17.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	90.4 PK			3.52 H	169	50.80	39.60
2	*5230.00	80.2 AV			3.52 H	169	40.60	39.60
3	5350.00	57.4 PK	74.0	-16.6	3.03 H	261	50.90	6.50
4	5350.00	44.6 AV	54.0	-9.4	3.03 H	261	38.10	6.50
5	#10460.00	58.6 PK	74.0	-15.4	2.11 H	164	40.10	18.50
6	#10460.00	45.8 AV	54.0	-8.2	2.11 H	164	27.30	18.50
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	109.7 PK			1.75 V	233	70.10	39.60
2	*5230.00	99.0 AV			1.75 V	233	59.40	39.60
3	5350.00	58.2 PK	74.0	-15.8	1.68 V	234	51.70	6.50
4	5350.00	44.8 AV	54.0	-9.2	1.68 V	234	38.30	6.50
5	#10460.00	58.1 PK	74.0	-15.9	1.38 V	164	39.60	18.50
6	#10460.00	46.1 AV	54.0	-7.9	1.38 V	164	27.60	18.50

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)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	57.9 PK	74.0	-16.1	2.84 H	269	50.50	7.40
2	#5714.90	44.5 AV	54.0	-9.5	2.84 H	269	37.10	7.40
3	#5722.90	59.2 PK	78.2	-19.0	3.01 H	286	51.80	7.40
4	#5725.00	46.7 PK	78.2	-31.5	2.85 H	311	39.30	7.40
5	*5755.00	95.6 PK			2.65 H	297	55.00	40.60
6	*5755.00	85.8 AV			2.65 H	297	45.20	40.60
7	11510.00	59.4 PK	74.0	-14.6	2.38 H	252	40.70	18.70
8	11510.00	46.0 AV	54.0	-8.0	2.38 H	252	27.30	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	67.4 PK	74.0	-6.6	2.83 V	267	60.00	7.40
2	#5714.90	52.6 AV	54.0	-1.4	2.83 V	267	45.20	7.40
3	#5722.90	73.1 PK	78.2	-5.1	2.67 V	13	65.70	7.40
4	#5725.00	59.7 PK	78.2	-18.5	2.73 V	238	52.30	7.40
5	*5755.00	110.2 PK			2.67 V	138	69.60	40.60
6	*5755.00	99.9 AV			2.67 V	138	59.30	40.60
7	11510.00	59.0 PK	74.0	-15.0	2.04 V	65	40.30	18.70
8	11510.00	46.4 AV	54.0	-7.6	2.04 V	65	27.70	18.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	99.2 PK			1.11 H	285	58.60	40.60
2	*5795.00	89.7 AV			1.11 H	285	49.10	40.60
3	#5850.00	45.4 PK	78.2	-32.8	1.04 H	322	37.80	7.60
4	#5852.10	58.7 PK	78.2	-19.5	1.26 H	286	51.00	7.70
5	#5860.10	58.2 PK	74.0	-15.8	1.36 H	258	50.50	7.70
6	#5860.10	45.2 AV	54.0	-8.8	1.36 H	258	37.50	7.70
7	11590.00	60.3 PK	74.0	-13.7	1.19 H	226	41.50	18.80
8	11590.00	46.5 AV	54.0	-7.5	1.19 H	226	27.70	18.80
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	*5795.00	115.4 PK			2.53 V	239	74.80	40.60
2	*5795.00	104.6 AV			2.53 V	239	64.00	40.60
3	#5850.00	55.6 PK	78.2	-22.6	3.02 V	194	48.00	7.60
4	#5852.10	69.1 PK	78.2	-9.1	2.76 V	166	61.40	7.70
5	#5860.10	66.7 PK	74.0	-7.3	2.64 V	258	59.00	7.70
6	#5860.10	52.2 AV	54.0	-1.8	2.64 V	258	44.50	7.70
7	11590.00	59.5 PK	74.0	-14.5	2.11 V	204	40.70	18.80
8	11590.00	47.0 AV	54.0	-7.0	2.11 V	204	28.20	18.80

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)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.9 PK	74.0	-18.1	2.89 H	132	49.90	6.00
2	5150.00	44.2 AV	54.0	-9.8	2.89 H	132	38.20	6.00
3	*5210.00	86.6 PK			3.08 H	116	47.10	39.50
4	*5210.00	77.2 AV			3.08 H	116	37.70	39.50
5	#10420.00	58.6 PK	74.0	-15.4	2.64 H	93	40.70	17.90
6	#10420.00	46.1 AV	54.0	-7.9	2.64 H	93	28.20	17.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.4 PK	74.0	-5.6	1.80 V	315	62.40	6.00
2	5150.00	52.2 AV	54.0	-1.8	1.80 V	315	46.20	6.00
3	*5210.00	104.9 PK			2.04 V	131	65.40	39.50
4	*5210.00	95.4 AV			2.04 V	131	55.90	39.50
5	#10420.00	59.3 PK	74.0	-14.7	1.53 V	66	41.40	17.90
6	#10420.00	46.2 AV	54.0	-7.8	1.53 V	66	28.30	17.90

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)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	57.2 PK	74.0	-16.8	1.64 H	324	49.80	7.40
2	#5714.90	45.9 AV	54.0	-8.1	1.64 H	324	38.50	7.40
3	#5722.90	57.5 PK	78.2	-20.7	1.78 H	348	50.10	7.40
4	#5725.00	45.6 PK	78.2	-32.6	1.53 H	316	38.20	7.40
5	*5775.00	85.1 PK			1.19 H	308	44.50	40.60
6	*5775.00	76.3 AV			1.19 H	308	35.70	40.60
7	#5850.00	45.7 PK	78.2	-32.5	1.70 H	303	38.10	7.60
8	#5852.10	58.5 PK	78.2	-19.7	1.46 H	289	50.80	7.70
9	#5860.10	58.7 PK	74.0	-15.3	1.30 H	262	51.00	7.70
10	#5860.10	46.3 AV	54.0	-7.7	1.30 H	262	38.60	7.70
11	11550.00	59.4 PK	74.0	-14.6	1.34 H	252	40.80	18.60
12	11550.00	46.8 AV	54.0	-7.2	1.34 H	252	28.20	18.60

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	#5714.90	67.7 PK	74.0	-6.3	2.81 V	264	60.30	7.40
2	#5714.90	52.7 AV	54.0	-1.3	2.81 V	264	45.30	7.40
3	#5722.90	70.7 PK	78.2	-7.5	2.82 V	293	63.30	7.40
4	#5725.00	55.8 PK	78.2	-22.4	2.77 V	297	48.40	7.40
5	*5775.00	102.6 PK			3.15 V	134	62.00	40.60
6	*5775.00	91.9 AV			3.15 V	134	51.30	40.60
7	#5850.00	47.5 PK	78.2	-30.7	3.19 V	135	39.90	7.60
8	#5852.10	61.3 PK	78.2	-16.9	3.13 V	130	53.60	7.70
9	#5860.10	58.6 PK	74.0	-15.4	3.23 V	150	50.90	7.70
10	#5860.10	46.3 AV	54.0	-7.7	3.23 V	150	38.60	7.70
11	11550.00	59.7 PK	74.0	-14.3	2.84 V	116	41.10	18.60
12	11550.00	47.4 AV	54.0	-6.6	2.84 V	116	28.80	18.60

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz worst-case data:

802.11n (HT20)

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.12	31.8 QP	40.0	-8.2	2.00 H	117	46.30	-14.50
2	90.17	41.3 QP	43.5	-2.2	2.00 H	244	60.90	-19.60
3	162.11	37.0 QP	43.5	-6.5	1.50 H	253	50.60	-13.60
4	251.55	33.9 QP	46.0	-12.1	1.50 H	97	48.00	-14.10
5	624.85	34.7 QP	46.0	-11.3	1.00 H	211	39.80	-5.10
6	751.23	40.8 QP	46.0	-5.2	1.00 H	135	43.60	-2.80
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	61.01	36.9 QP	40.0	-3.1	1.50 V	57	51.70	-14.80
2	80.45	39.5 QP	40.0	-0.5	1.99 V	148	58.10	-18.60
3	162.11	35.9 QP	43.5	-7.6	1.00 V	119	49.50	-13.60
4	251.55	37.3 QP	46.0	-8.7	1.99 V	99	51.40	-14.10
5	624.85	31.4 QP	46.0	-14.6	1.99 V	188	36.50	-5.10
6	751.23	43.0 QP	46.0	-3.0	1.50 V	222	45.80	-2.80

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 16, 2015	Nov. 15, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 26, 2015	Dec. 25, 2016
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2016	Feb. 25, 2017
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 24, 2015	Jul. 23, 2016
Software ADT	BV ADT_Cond_ V7.3.7.3	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-2040.

4.2.3 Test Procedures

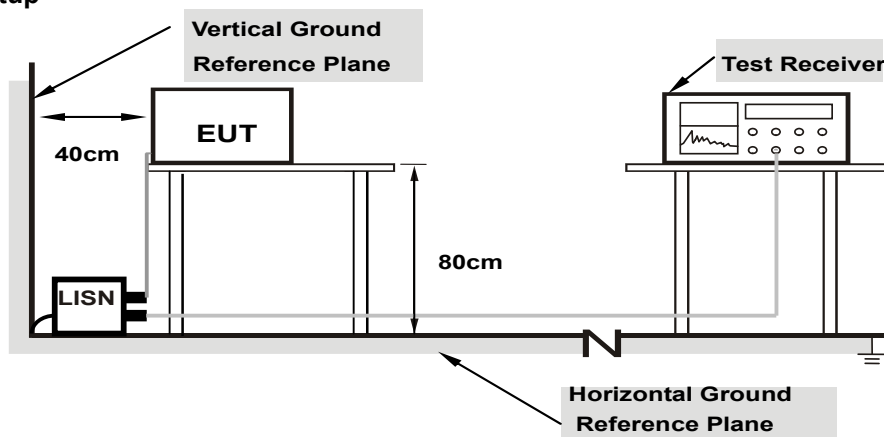
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: 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.

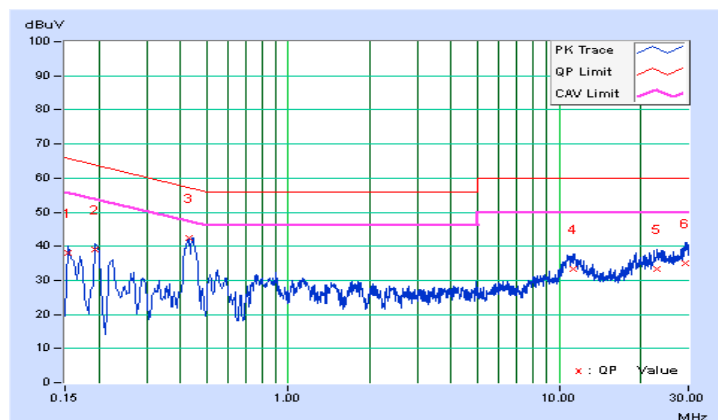
4.2.7 Test Results

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.08	28.05	14.55	38.13	24.63	65.78	55.78	-27.66	-31.16
2	0.19400	10.08	28.83	18.92	38.91	29.00	63.86	53.86	-24.95	-24.86
3	0.43000	10.18	32.27	23.53	42.45	33.71	57.25	47.25	-14.81	-13.55
4	11.26600	10.84	22.47	17.22	33.31	28.06	60.00	50.00	-26.69	-21.94
5	23.08200	11.61	21.58	16.19	33.19	27.80	60.00	50.00	-26.81	-22.20
6	29.19000	12.02	23.12	17.80	35.14	29.82	60.00	50.00	-24.86	-20.18

REMARKS:

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

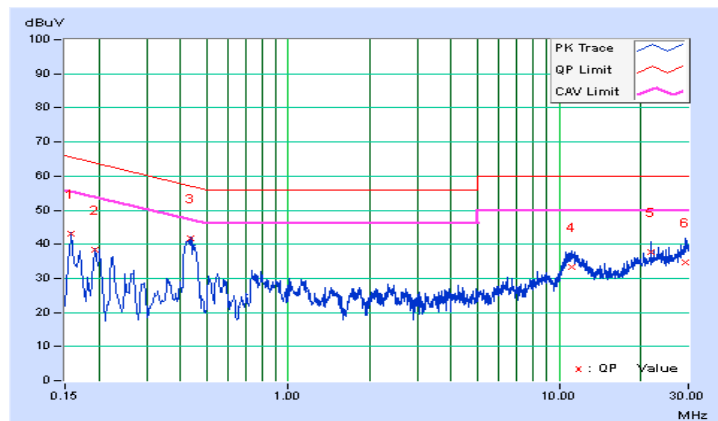


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15800	10.08	33.01	21.52	43.09	31.60	65.57	55.57	-22.47	-23.96
2	0.19400	10.08	28.39	17.73	38.47	27.81	63.86	53.86	-25.39	-26.05
3	0.43400	10.24	31.59	21.97	41.83	32.21	57.18	47.18	-15.34	-14.96
4	11.17000	10.93	22.46	17.17	33.39	28.10	60.00	50.00	-26.61	-21.90
5	21.90600	11.71	26.12	23.35	37.83	35.06	60.00	50.00	-22.17	-14.94
6	29.11000	12.22	22.55	17.25	34.77	29.47	60.00	50.00	-25.23	-20.53

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 $N_{ANT} \leq 4$;

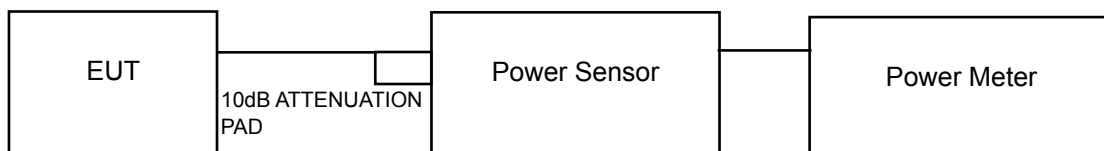
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

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

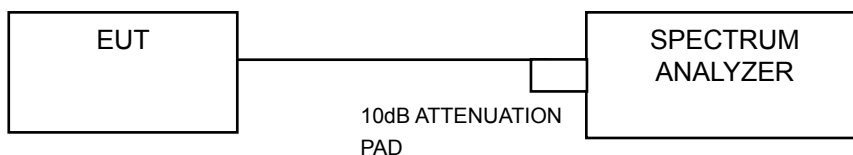
For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup

For Power Output Measurement



For 26dB and Occupied Bandwidth



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR AVERAGE POWER MEASUREMENT

For 802.11a, 802.11n (HT20), 802.11n (HT40)

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

For 802.11ac (VHT80)

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

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:

For U-NII-1 Band

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
36	5180	31.046	14.92	30	5.6	20.52	21.00	Pass
40	5200	31.550	14.99	30	5.6	20.59	21.00	Pass
48	5240	31.117	14.93	30	5.6	20.53	21.00	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2							
36	5180	10.18	10.16	9.94	30.661	14.87	25.63	5.6	20.47	21.00	Pass
40	5200	10.21	10.25	9.90	30.860	14.89	25.63	5.6	20.49	21.00	Pass
48	5240	9.60	9.78	10.10	28.859	14.60	25.63	5.6	20.20	21.00	Pass

Note:

Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power limit shall be reduced to 30-(10.37-6) = 25.63dBm.

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2							
38	5190	10.09	10.46	10.10	31.559	14.99	25.63	5.6	20.59	21.00	Pass
46	5230	9.89	9.99	10.14	30.055	14.78	25.63	5.6	20.38	21.00	Pass

Note:

Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power limit shall be reduced to 30-(10.37-6) = 25.63dBm.

802.11ac (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2							
36	5180	10.21	10.18	9.98	30.872	14.90	25.63	5.6	20.50	21.00	Pass
40	5200	10.26	10.35	10.01	31.479	14.98	25.63	5.6	20.58	21.00	Pass
48	5240	9.73	9.82	10.13	29.295	14.67	25.63	5.6	20.27	21.00	Pass

Note:

Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power limit shall be reduced to 30-(10.37-6) = 25.63dBm.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2							
38	5190	9.98	10.47	10.12	31.377	14.97	25.63	5.6	20.57	21.00	Pass
46	5230	9.93	10.06	10.10	30.212	14.80	25.63	5.6	20.40	21.00	Pass

Note:

Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power limit shall be reduced to 30-(10.37-6) = 25.63dBm.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2							
42	5210	9.44	9.56	9.64	27.030	14.32	25.63	5.6	19.92	21.00	Pass

Note:

Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power limit shall be reduced to 30-(10.37-6) = 25.63dBm.

For U-NII-3 Band

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
149	5745	62.661	17.97	30	Pass
157	5785	221.309	23.45	30	Pass
165	5825	110.154	20.42	30	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				
149	5745	15.98	16.20	15.22	114.581	20.59	25.63	Pass
157	5785	23.32	23.47	22.78	626.785	27.97	25.63	Pass
165	5825	18.28	18.13	18.17	197.926	22.97	25.63	Pass

Note:

Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.

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				
151	5755	13.63	13.81	13.20	68.004	18.33	25.63	Pass
159	5795	17.41	17.72	17.92	176.181	22.46	25.63	Pass

Note:

Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.

802.11ac (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
149	5745	16.03	16.34	15.25	116.637	20.67	25.63	Pass
157	5785	23.34	23.51	22.81	631.147	28.00	25.63	Pass
165	5825	18.38	18.15	18.20	200.247	23.02	25.63	Pass

Note:

Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
151	5755	13.74	13.88	13.23	69.131	18.40	25.63	Pass
159	5795	17.55	17.79	17.98	179.808	22.55	25.63	Pass

Note:

Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.

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				
155	5775	7.69	8.21	7.50	18.120	12.58	25.63	Pass

Note:

Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.

26dB BANDWIDTH:

802.11a

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	Pass / Fail
36	5180	23.01	Pass
40	5200	22.46	Pass
48	5240	22.16	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
36	5180	23.36	22.69	23.44	Pass
40	5200	22.96	22.76	23.69	Pass
48	5240	23.14	22.98	23.51	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
38	5190	45.91	45.27	45.13	Pass
46	5230	46.32	45.36	45.90	Pass

802.11ac (VHT20)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
36	5180	23.30	23.55	23.22	Pass
40	5200	23.46	24.31	23.17	Pass
48	5240	23.83	23.72	23.16	Pass

802.11ac (VHT40)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
38	5190	46.68	47.09	44.93	Pass
46	5230	46.56	45.54	46.05	Pass

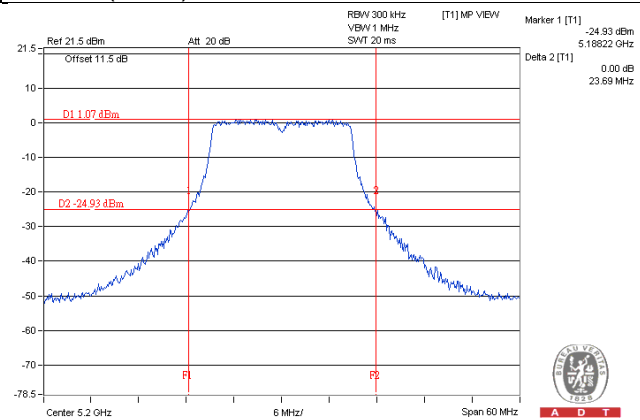
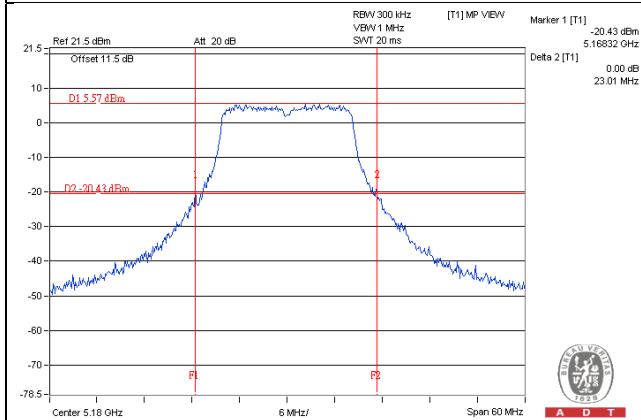
802.11ac (VHT80)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
42	5210	89.63	87.83	87.07	Pass

Spectrum Plot of Worst Value

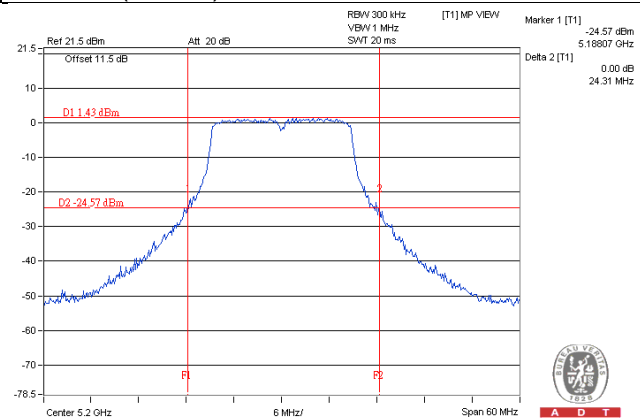
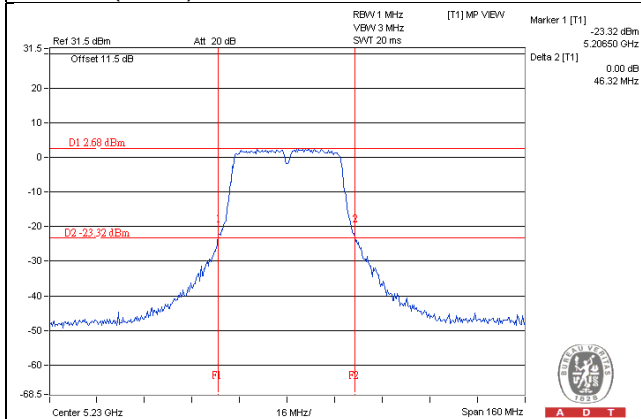
802.11a

802.11n (HT20)



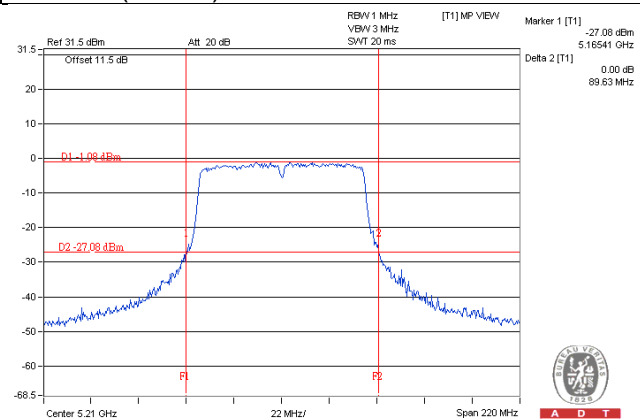
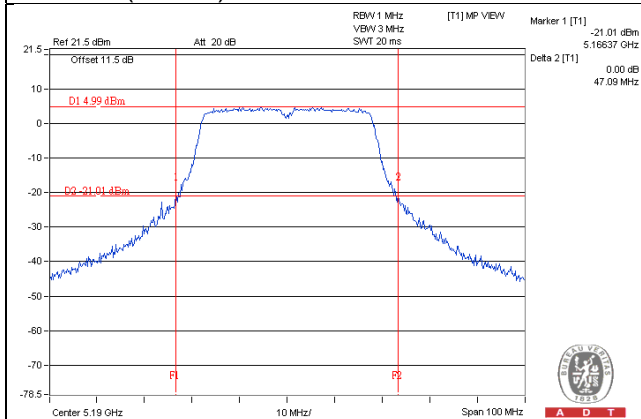
802.11n (HT40)

802.11ac (VHT20)



802.11ac (VHT40)

802.11ac (VHT80)



OCCUPIED BANDWIDTH:

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)
36	5180	16.80
40	5200	16.68
48	5240	16.92
149	5745	16.80
157	5785	18.00
165	5825	16.68

802.11n (HT20)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
36	5180	18.00	17.88	17.88
40	5200	17.88	18.00	17.88
48	5240	18.00	17.88	17.88
149	5745	17.88	17.88	17.88
157	5785	18.60	20.40	18.36
165	5825	18.00	18.00	17.76

802.11n (HT40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
38	5190	36.72	36.84	36.60
46	5230	36.72	36.72	36.84
151	5755	36.60	36.72	36.84
159	5795	36.60	36.60	36.72

802.11ac (VHT20)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
36	5180	17.88	17.88	17.88
40	5200	17.88	17.88	17.88
48	5240	17.88	17.88	17.88
149	5745	17.91	17.91	17.91
157	5785	18.84	21.48	19.56
165	5825	17.88	18.00	17.88

802.11ac (VHT40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
38	5190	36.84	36.96	36.84
46	5230	36.96	36.96	36.96
151	5755	36.96	36.84	36.87
159	5795	36.96	37.08	36.84

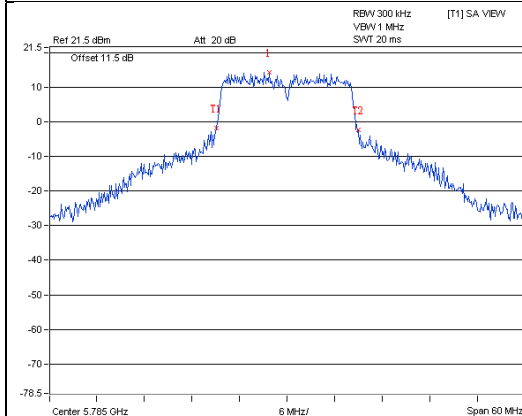
802.11ac (VHT80)

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

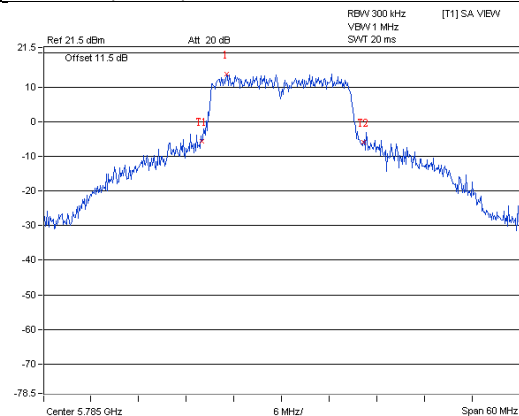
Spectrum Plot of Worst Value

802.11a

802.11n (HT20)



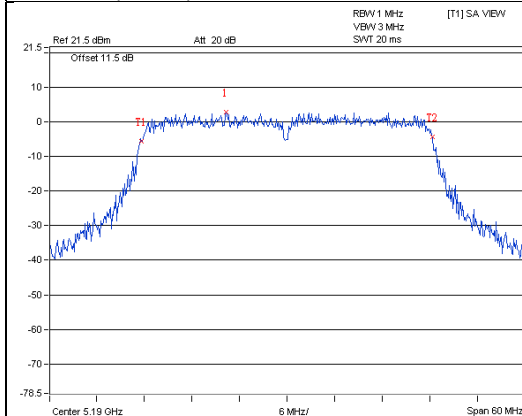
A D T



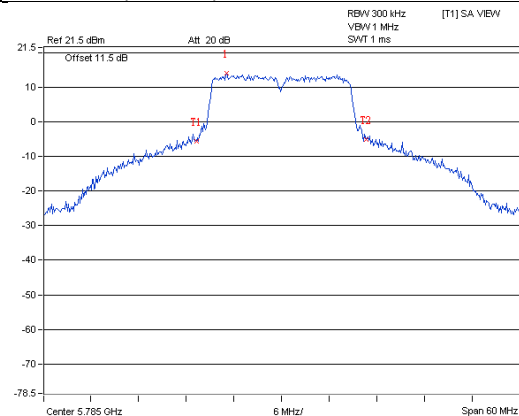
A D T

802.11n (HT40)

802.11ac (VHT20)



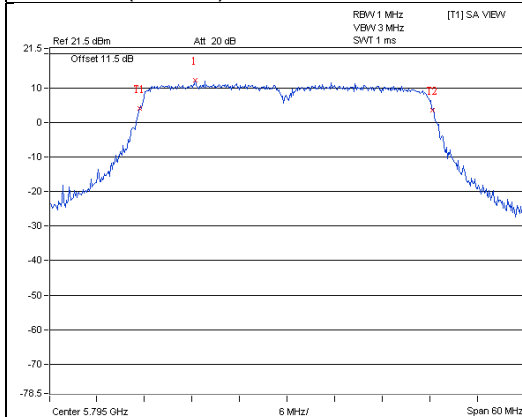
A D T



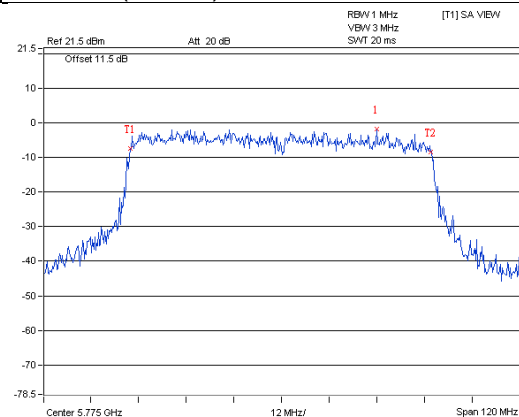
A D T

802.11ac (VHT40)

802.11ac (VHT80)



A D T



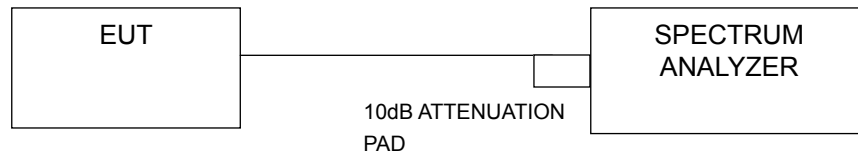
A D T

4.4 Peak Power Spectral Density Measurement

4.4.1 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	11dBm/ MHz
		Mobile and Portable client device	
U-NII-2A	-		11dBm/ MHz
U-NII-2C	-		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

For U-NII-1 band:

Using method SA-2

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 1 MHz, Set VBW $\geq$ 3 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to "free run".
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Record the max value and add $10 \log (1/\text{duty cycle})$

For U-NII-3 band:

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-1 Band

802.11a

Chan.	Freq. (MHz)	PSD w/o duty factor (dBm)	Duty factor	PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
36	5180	0.20	0.22	0.42	17.00	Pass
40	5200	0.30	0.22	0.52	17.00	Pass
48	5240	0.19	0.22	0.41	17.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
36	5180	-5.44	-4.39	-4.24	0.12	0.21	0.33	12.63	Pass
40	5200	-5.52	-4.34	-4.26	0.10	0.21	0.31	12.63	Pass
48	5240	-5.58	-4.39	-4.43	0.01	0.21	0.22	12.63	Pass

Note:

- Method 1 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.
- Directional gain = $5.6\text{dBi} + 10\log(3) = 10.37\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (10.37 - 6) = 12.63\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
38	5190	-8.54	-7.47	-7.11	-2.89	0.44	-2.45	12.63	Pass
46	5230	-8.61	-7.68	-7.45	-3.11	0.44	-2.67	12.63	Pass

Note:

- Method 1 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.
- Directional gain = $5.6\text{dBi} + 10\log(3) = 10.37\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (10.37 - 6) = 12.63\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
36	5180	-4.09	-2.92	-3.46	1.30	0.14	1.44	12.63	Pass
40	5200	-4.18	-2.84	-3.60	1.26	0.14	1.40	12.63	Pass
48	5240	-4.58	-2.98	-3.60	1.10	0.14	1.24	12.63	Pass

Note:

1. Method 1 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 = $5.6\text{dBi} + 10\log(3) = 10.37\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (10.37 - 6) = 12.63\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
38	5190	-6.72	-6.26	-6.55	-1.73	0.29	-1.44	12.63	Pass
46	5230	-7.59	-6.02	-6.58	-1.91	0.29	-1.62	12.63	Pass

Note:

1. Method 1 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 = $5.6\text{dBi} + 10\log(3) = 10.37\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (10.37 - 6) = 12.63\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
42	5210	-12.63	-11.84	-11.47	-7.18	0.71	-6.47	12.63	Pass

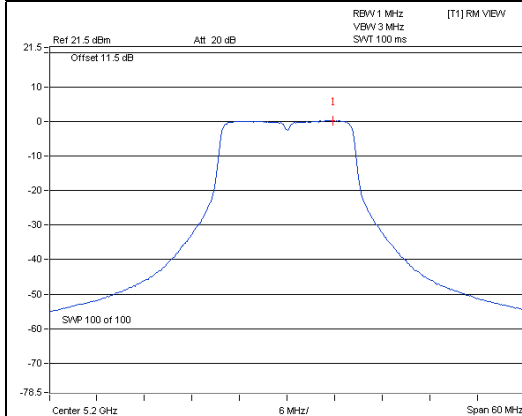
Note:

1. Method 1 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 = $5.6\text{dBi} + 10\log(3) = 10.37\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (10.37 - 6) = 12.63\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

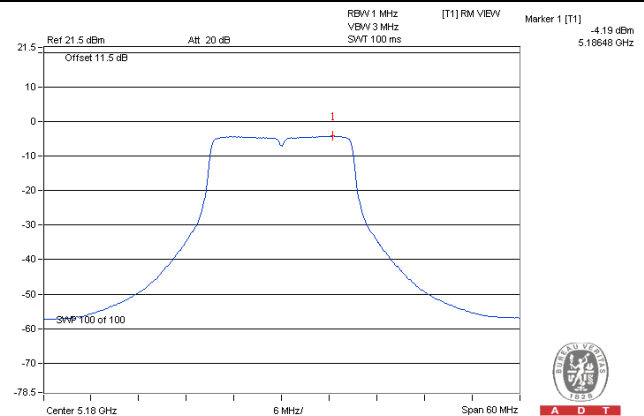
Spectrum Plot of Worst Value

802.11a / Ch 40

802.11n (HT20) / Ch 36 / Chain 2



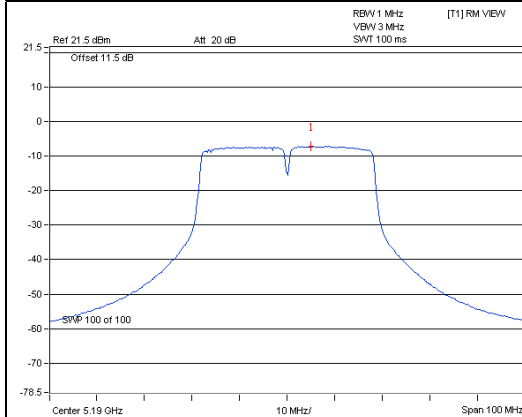
A D T



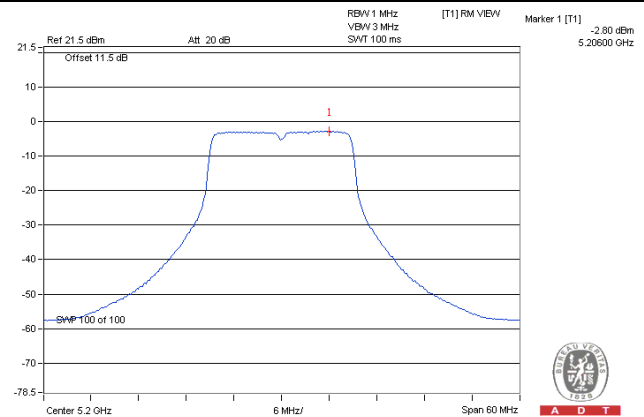
A D T

802.11n (HT40) / Ch 38 / Chain 2

802.11ac (VHT20) / Ch 40 / Chain 1



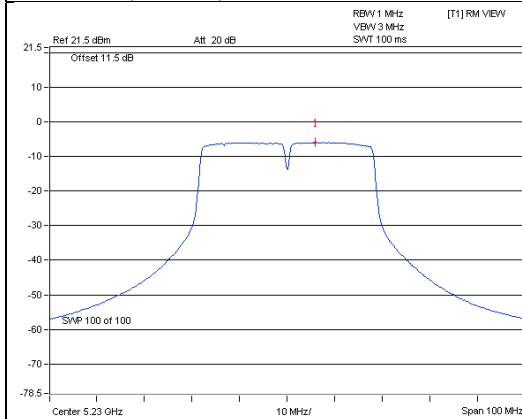
A D T



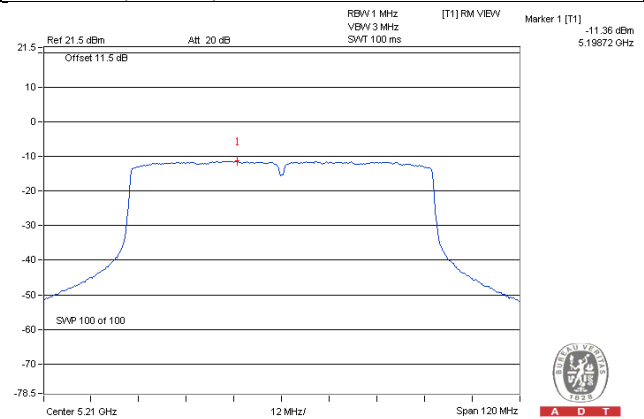
A D T

802.11ac (VHT40) / Ch 46 / Chain 1

802.11ac (VHT80) / Ch 42 / Chain 2



A D T



A D T

For U-NII-3 Band

802.11a

Chan.	Freq. (MHz)	PSD (dBm/300k Hz)	PSD (dBm/500k Hz)	Duty factor	Total PSD (dBm/500k Hz)	Limit (dBm/500k Hz)	Pass / Fail
149	5745	-2.64	-0.42	0.22	-0.20	30.00	Pass
157	5785	2.09	4.31	0.22	4.53	30.00	Pass
165	5825	-0.60	1.62	0.22	1.84	30.00	Pass

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Duty Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-5.64	-3.42	4.77	0.21	1.56	25.63	Pass
	157	5785	1.73	3.95	4.77	0.21	8.93	25.63	Pass
	165	5825	-3.50	-1.28	4.77	0.21	3.70	25.63	Pass
1	149	5745	-5.05	-2.83	4.77	0.21	2.15	25.63	Pass
	157	5785	1.57	3.79	4.77	0.21	8.77	25.63	Pass
	165	5825	-3.39	-1.17	4.77	0.21	3.81	25.63	Pass
2	149	5745	-6.10	-3.88	4.77	0.21	1.10	25.63	Pass
	157	5785	1.41	3.63	4.77	0.21	8.61	25.63	Pass
	165	5825	-3.83	-1.61	4.77	0.21	3.37	25.63	Pass

Note:

- Directional gain = $5.6\text{dBi} + 10\log(3) = 10.37\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(10.37-6) = 25.63\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Duty Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	151	5755	-11.40	-9.18	4.77	0.44	-3.97	25.63	Pass
	159	5795	-7.29	-5.07	4.77	0.44	0.14	25.63	Pass
1	151	5755	-10.82	-8.60	4.77	0.44	-3.39	25.63	Pass
	159	5795	-6.88	-4.66	4.77	0.44	0.55	25.63	Pass
2	151	5755	-11.45	-9.23	4.77	0.44	-4.02	25.63	Pass
	159	5795	-6.83	-4.61	4.77	0.44	0.60	25.63	Pass

Note:

- Directional gain = $5.6\text{dBi} + 10\log(3) = 10.37\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(10.37-6) = 25.63\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Duty Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-6.66	-4.44	4.77	0.14	0.47	25.63	Pass
	157	5785	0.74	2.96	4.77	0.14	7.87	25.63	Pass
	165	5825	-4.36	-2.14	4.77	0.14	2.77	25.63	Pass
1	149	5745	-5.74	-3.52	4.77	0.14	1.39	25.63	Pass
	157	5785	1.38	3.60	4.77	0.14	8.51	25.63	Pass
	165	5825	-4.22	-2.00	4.77	0.14	2.91	25.63	Pass
2	149	5745	-6.78	-4.56	4.77	0.14	0.35	25.63	Pass
	157	5785	1.04	3.26	4.77	0.14	8.17	25.63	Pass
	165	5825	-3.97	-1.75	4.77	0.14	3.16	25.63	Pass

Note:

1. Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Duty Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	151	5755	-12.23	-10.01	4.77	0.29	-4.95	25.63	Pass
	159	5795	-8.23	-6.01	4.77	0.29	-0.95	25.63	Pass
1	151	5755	-11.11	-8.89	4.77	0.29	-3.83	25.63	Pass
	159	5795	-7.53	-5.31	4.77	0.29	-0.25	25.63	Pass
2	151	5755	-11.88	-9.66	4.77	0.29	-4.60	25.63	Pass
	159	5795	-7.25	-5.03	4.77	0.29	0.03	25.63	Pass

Note:

1. Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Duty Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	155	5775	-20.43	-18.21	4.77	0.71	-12.73	25.63	Pass
1	155	5775	-19.83	-17.61	4.77	0.71	-12.13	25.63	Pass
2	155	5775	-20.59	-18.37	4.77	0.71	-12.89	25.63	Pass

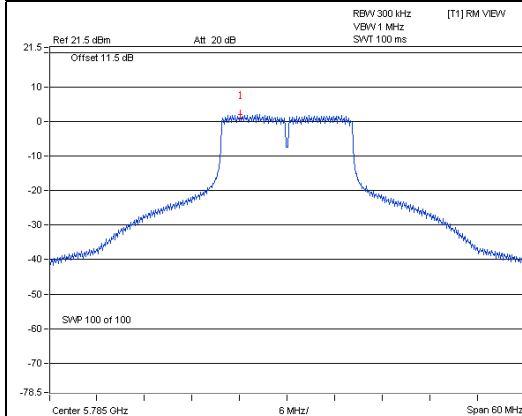
Note:

1. Directional gain = 5.6dBi + 10log(3) = 10.37dBi > 6dBi, so the power density limit shall be reduced to 30-(10.37-6) = 25.63dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

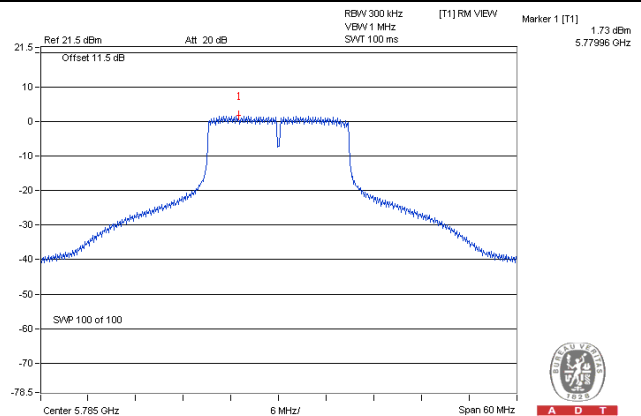
Spectrum Plot of Worst Value

802.11a

802.11n (HT20)



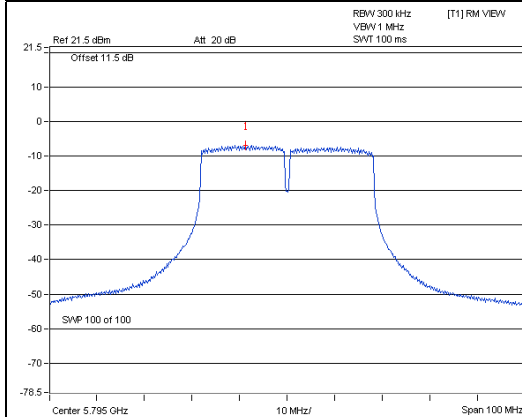
A D T



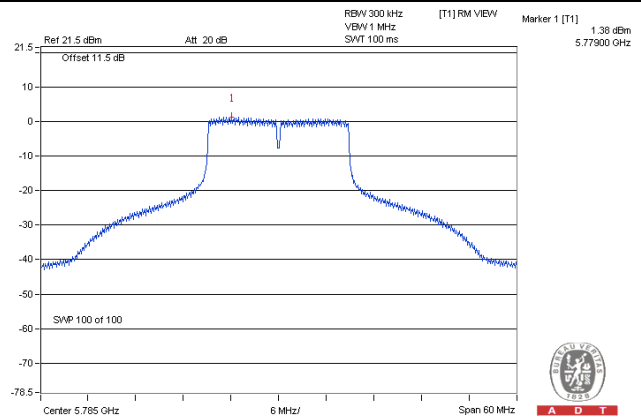
A D T

802.11n (HT40)

802.11ac (VHT20)



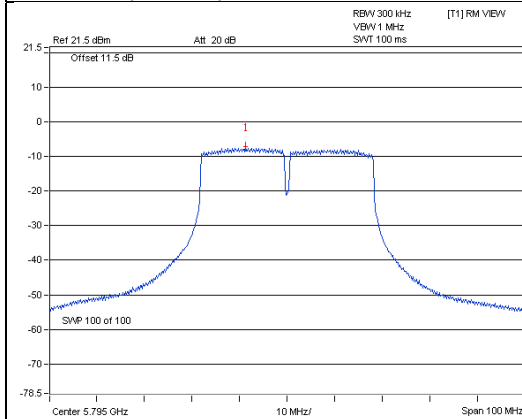
A D T



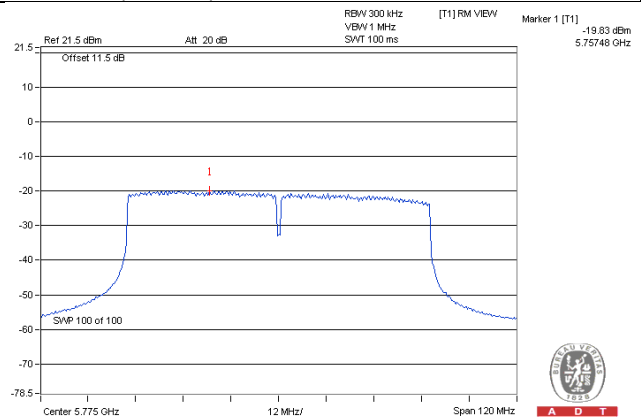
A D T

802.11ac (VHT40)

802.11ac (VHT80)



A D T



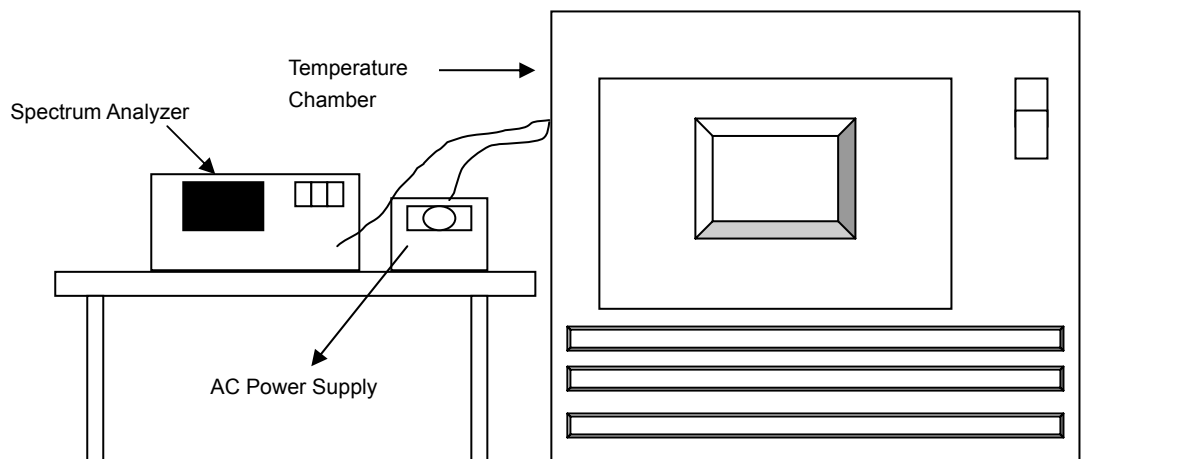
A D T

4.5 Frequency Stability

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
70	120	5180.0098	0.00019	5180.0113	0.00022	5180.0092	0.00018	5180.0132	0.00025
60	120	5179.9818	-0.00035	5179.9816	-0.00036	5179.9790	-0.00041	5179.9821	-0.00035
50	120	5179.9747	-0.00049	5179.9736	-0.00051	5179.9744	-0.00049	5179.9765	-0.00045
40	120	5180.0106	0.00020	5180.0133	0.00026	5180.0116	0.00022	5180.0112	0.00022
30	120	5180.0188	0.00036	5180.0210	0.00041	5180.0191	0.00037	5180.0206	0.00040
20	120	5179.9828	-0.00033	5179.9804	-0.00038	5179.9801	-0.00038	5179.9833	-0.00032
10	120	5180.0241	0.00047	5180.0250	0.00048	5180.0262	0.00051	5180.0236	0.00046
0	120	5180.0163	0.00031	5180.0142	0.00027	5180.0129	0.00025	5180.0171	0.00033
-10	120	5179.9879	-0.00023	5179.9871	-0.00025	5179.9836	-0.00032	5179.9856	-0.00028
-20	120	5179.9968	-0.00006	5179.9979	-0.00004	5179.9950	-0.00010	5179.9978	-0.00004
-30	120	5179.9855	-0.00028	5179.9851	-0.00029	5179.9855	-0.00028	5179.9838	-0.00031
-40	120	5179.9795	-0.00040	5179.9786	-0.00041	5179.9812	-0.00036	5179.9820	-0.00035

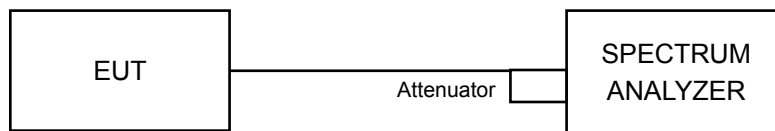
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9825	-0.00034	5179.9810	-0.00037	5179.9805	-0.00038	5179.9830	-0.00033
	120	5179.9828	-0.00033	5179.9804	-0.00038	5179.9801	-0.00038	5179.9833	-0.00032
	102	5179.9830	-0.00033	5179.9799	-0.00039	5179.9791	-0.00040	5179.9826	-0.00034

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.44	0.5	Pass
157	5785	16.40	0.5	Pass
165	5825	16.41	0.5	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	17.64	17.66	17.64	0.5	Pass
157	5785	17.61	17.63	17.63	0.5	Pass
165	5825	17.62	17.63	17.64	0.5	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
151	5755	36.15	36.40	35.81	0.5	Pass
159	5795	36.19	36.14	35.82	0.5	Pass

802.11ac (VHT20)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	17.62	17.63	17.61	0.5	Pass
157	5785	17.62	17.62	17.63	0.5	Pass
165	5825	17.63	17.65	17.63	0.5	Pass

802.11ac (VHT40)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
151	5755	36.37	35.96	36.40	0.5	Pass
159	5795	36.17	36.37	35.91	0.5	Pass

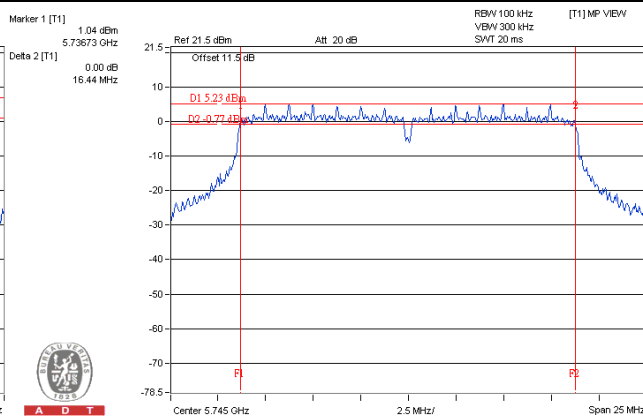
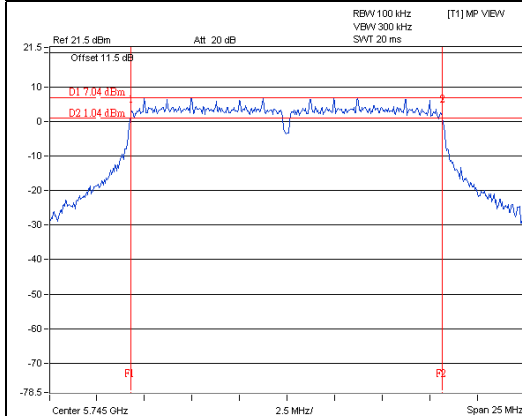
802.11ac (VHT80)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
155	5775	73.29	73.33	74.08	0.5	Pass

Spectrum Plot of Worst Value

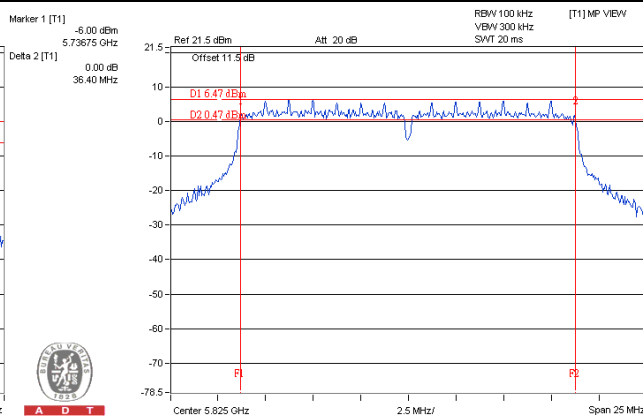
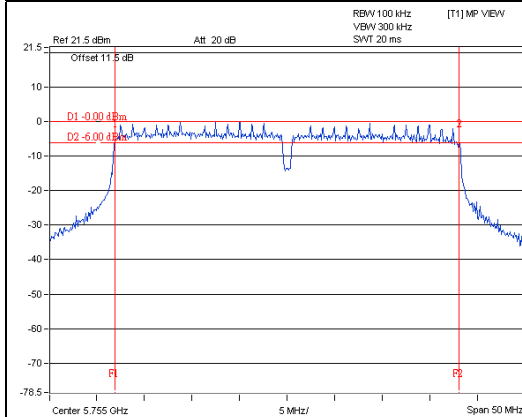
802.11a

802.11n (HT20)



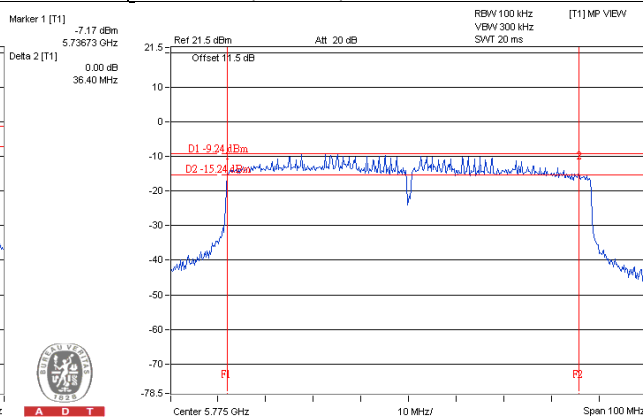
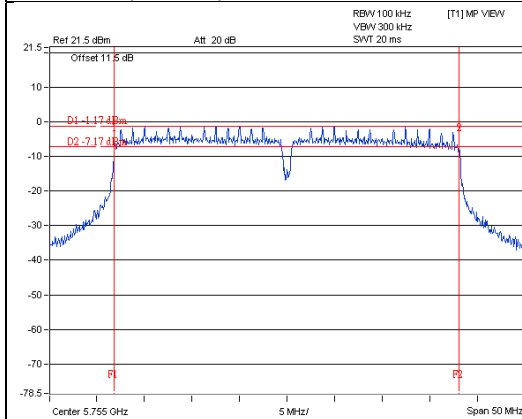
802.11n (HT40)

802.11ac (VHT20)



802.11ac (VHT40)

802.11ac (VHT80)



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---