

FCC Test Report

Report No.: RF131021C14E

FCC ID: I88NWA1123AC

Test Model: NWA1123-AC

Received Date: Feb. 26, 2016

Test Date: Feb. 26 ~ May 06, 2016

Issued Date: May 09, 2016

Applicant: ZyXEL Communications Corporation

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Release Control Record

Issue No.	Description	Date Issued
RF131021C14E	Original release.	May 09, 2016

1 Certificate of Conformity

Product: 802.11 a/b/g/n/ac Dual-Radio Ceiling Mount PoE Access Point

Brand: ZyXEL

Test Model: NWA1123-AC

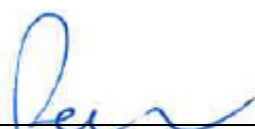
Sample Status: Engineering sample

Applicant: ZyXEL Communications Corporation

Test Date: Feb. 26 ~ May 06, 2016

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** May 09, 2016
Pettie Chen / Senior Specialist

Approved by :  , **Date:** May 09, 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 -5.27dB at 0.31000MHz.
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 5714.00MHz.
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 I-PEX not a standard connector.

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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	802.11 a/b/g/n/ac Dual-Radio Ceiling Mount PoE Access Point
Brand	ZyXEL
Test Model	NWA1123-AC
Status of EUT	Engineering sample
Power Supply Rating	12Vdc from adapter 55Vdc from POE
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
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 300Mbps 802.11ac: up to 867Mbps
Operating Frequency	5180 ~ 5240MHz & 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (HT20), 802.11n (VHT20) 2 for 802.11n (HT40), 802.11n (VHT40) 1 for 802.11ac (VHT80) 5745 ~ 5825MHz: 5 for 802.11a, 802.11n (HT20), 802.11n (VHT20) 2 for 802.11n (HT40), 802.11n (VHT40) 1 for 802.11ac (VHT80)
Output Power	5180 ~ 5240MHz: 34.551mW 5745 ~ 5825MHz: 216.042mW
Antenna Type	Printed antenna with 4.9dBi gain
Antenna Connector	I-PEX
Accessory Device	Adapter
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report of the original report no.: RF131021C14. Difference compared with the original report are updating standard to new rule version for U-NII-1 & U-NII-3 band. All tests had been re-tested.
2. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

Modulation Mode	TX FUNCTION
802.11a	2TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX
802.11ac (VHT20)	2TX
802.11ac (VHT40)	2TX
802.11ac (VHT80)	2TX

* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

3. The EUT uses following adapter and PoE.

Adapter	
Brand	DVE
Model	DSA-12CA-12 120100
Input Power	100-240Vac, 50/60Hz, 0.3A
Output Power	+12Vdc, 1A
Power Line	DC 1.5m non-shielded cable without core attached on adapter

PoE (Support unit)	
Brand	PowerDsine™
Model	9001G-40/SP
Input Power	100-240Vac, 50-60Hz, 1.5A
Output Power	55Vdc, 0.73A

4. The power setting as below.

	802.11a	802.11n (HT20)		802.11n (HT40)		802.11ac (VHT80)
CH 36	11	11.5	CH 38	11.5	CH 42	11
CH 40	11.5	11.5	CH 46	12	CH 155	13
CH 48	12	12	CH 151	14.5		
CH 149	18.5	16.5	CH 159	19		
CH 157	18.5	19				
CH 159	18.5	18.5				

5. 2.4GHz and 5GHz technology can transmit at same time.

6. Spurious emission of the simultaneous operation (2.4GHz and 5GHz) has been evaluated and no non-compliance was found.

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

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

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 $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Powered by adapter
B	-	√	√	-	Powered by POE

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
2. "-" means no effect.

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)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
A	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
A	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
A	802.11ac (VHT80)		42	42	OFDM	BPSK	65.0
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (VHT80)		155	155	OFDM	BPSK	65.0

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)
A, B	802.11n (HT20)	5180-5320	36 to 64	36	OFDM	BPSK	7.2
A, B	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)
A, B	802.11n (HT20)	5180-5320	36 to 64	36	OFDM	BPSK	7.2
A, B	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)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
A	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
A	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
A	802.11ac (VHT80)		42	42	OFDM	BPSK	65.0
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (VHT80)		155	155	OFDM	BPSK	65.0

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	23deg. C, 65%RH	120Vac, 60Hz	Chris Lin
RE<1G	23deg. C, 65%RH	120Vac, 60Hz 55Vdc	Chris Lin
PLC	26deg. C, 62%RH	120Vac, 60Hz 55Vdc	Alan Wu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Frank Liu

3.3 Duty Cycle of Test Signal

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

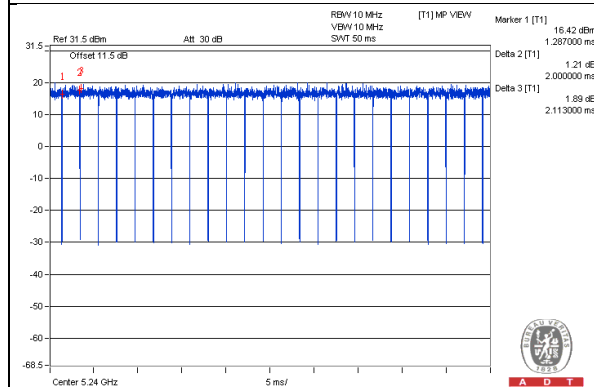
802.11a: Duty cycle = $2/2.113 = 0.947$, Duty factor = $10 * \log(1/0.947) = 0.24$

802.11n (HT20): Duty cycle = $1.85/1.937 = 0.955$, Duty factor = $10 * \log(1/0.955) = 0.20$

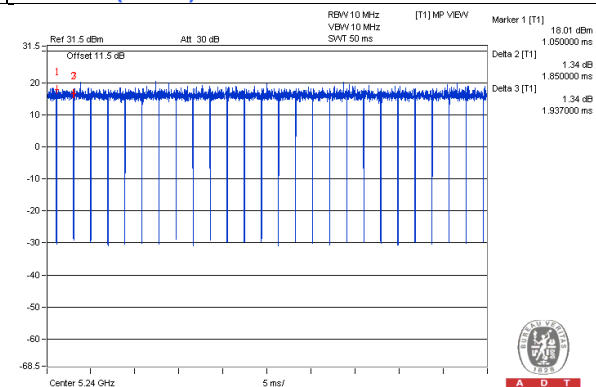
802.11n (HT40): Duty cycle = $0.9/0.988 = 0.911$, Duty factor = $10 * \log(1/0.911) = 0.41$

802.11ac (VHT80): Duty cycle = $0.438/0.576 = 0.76$, Duty factor = $10 * \log(1/0.76) = 1.19$

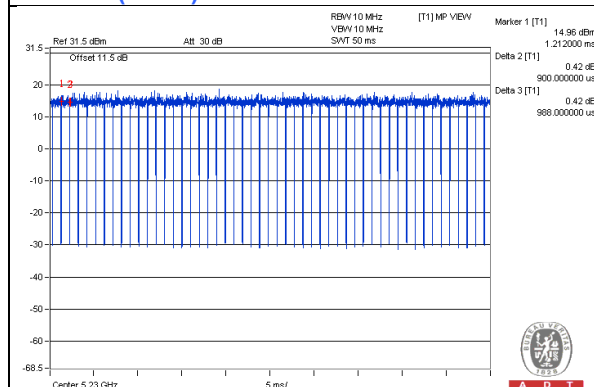
802.11a



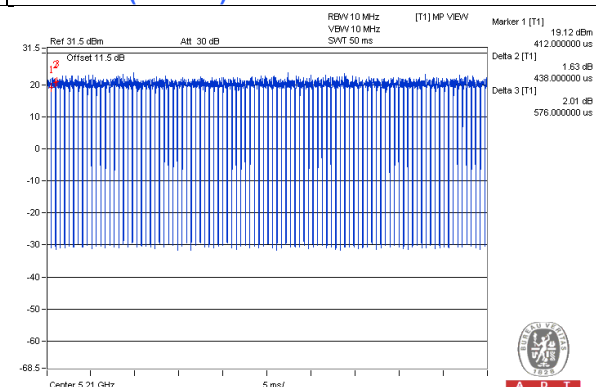
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	6RP2YM1	FCC DoC Approved	-
B.	PoE	PowerDsine™	9001G-40/SP	NA	NA	Provided by client.

Note:

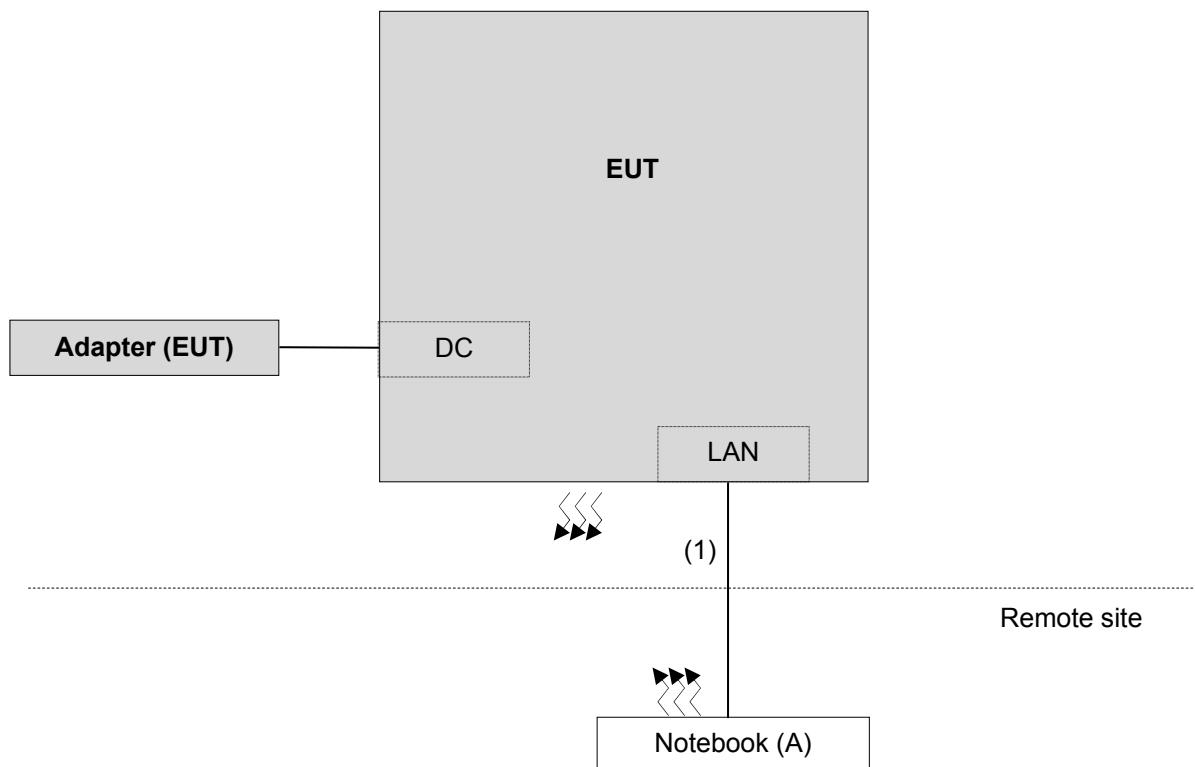
1. All power cords of the above support units are non-shielded (1.8m).
2. Items A, B acted as communication partners to transfer data.

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

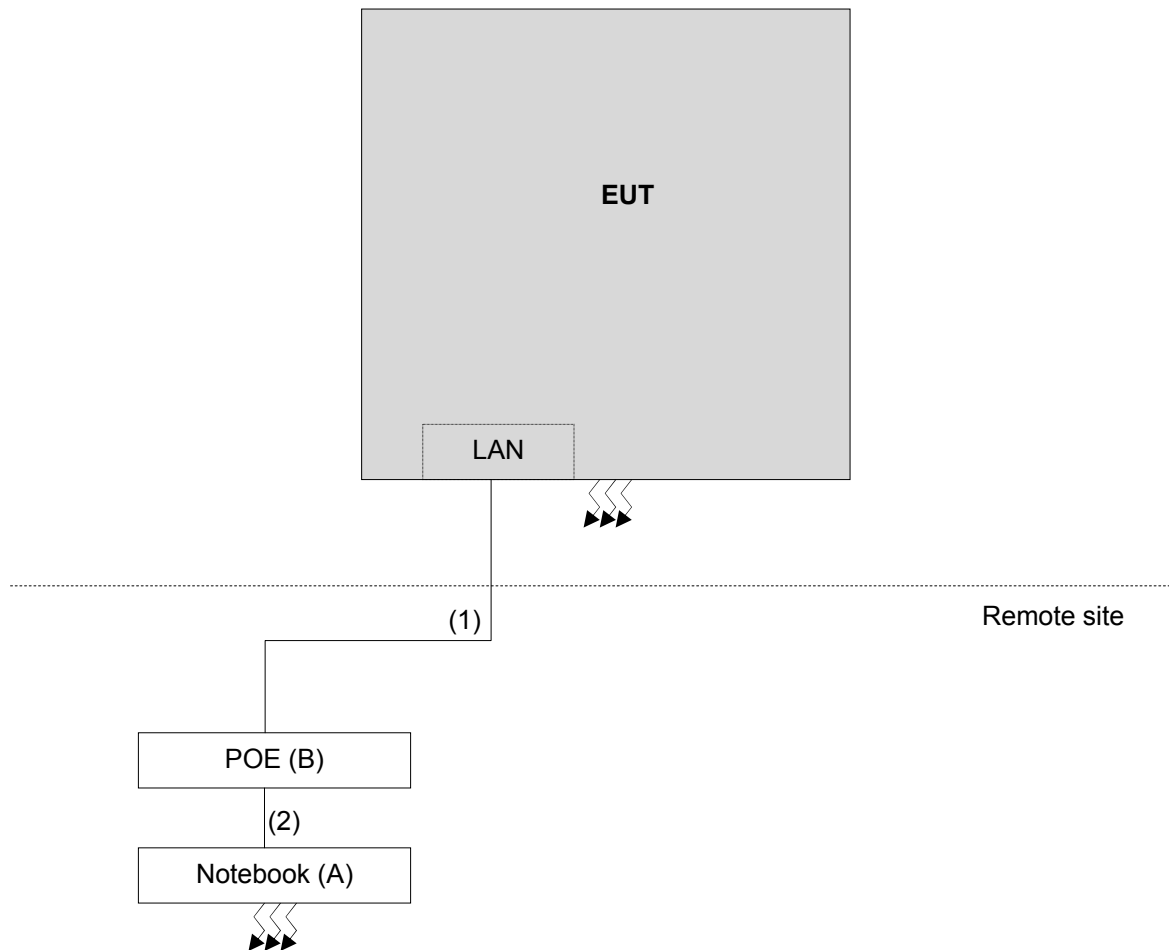
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

Test Mode A



Test Mode B



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)

KDB 789033 D02 General UNII Test Procedure New Rules 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 Procedure 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:

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 12, 2015	Oct. 11, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jul. 08, 2015	Jul. 07, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Jan. 08, 2016	Jan. 07, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Jan. 18, 2016	Jan. 17, 2017
Preamplifier Agilent	8449B	3008A01960	Aug. 09, 2015	Aug. 08, 2016
Preamplifier Agilent	8447D	2944A10631	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-02(295012+309220)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03(250724)	Aug. 09, 2015	Aug. 08, 2016
Software BV ADT	ADT_Radiated_V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021703	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 4.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 460141.
5. The IC Site Registration No. is IC7450F-4.

4.1.3 Test Procedure

- 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:

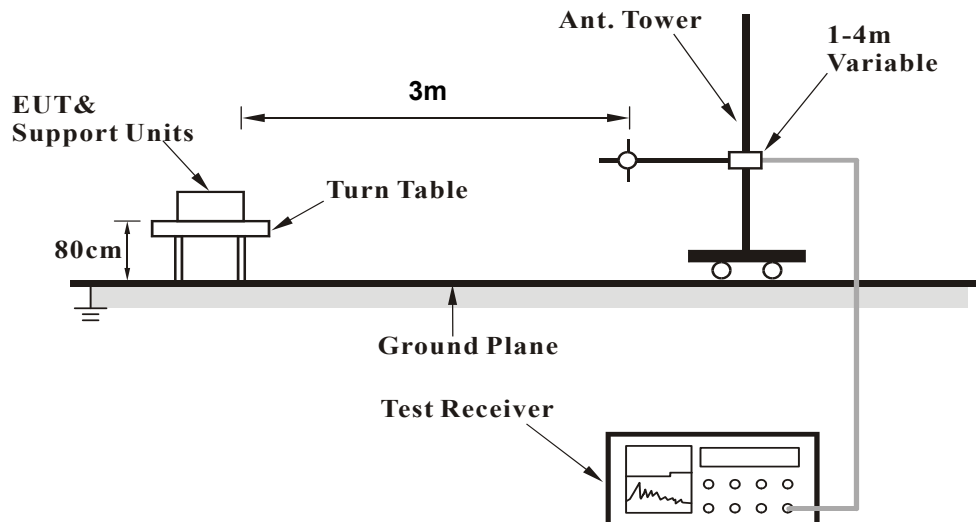
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

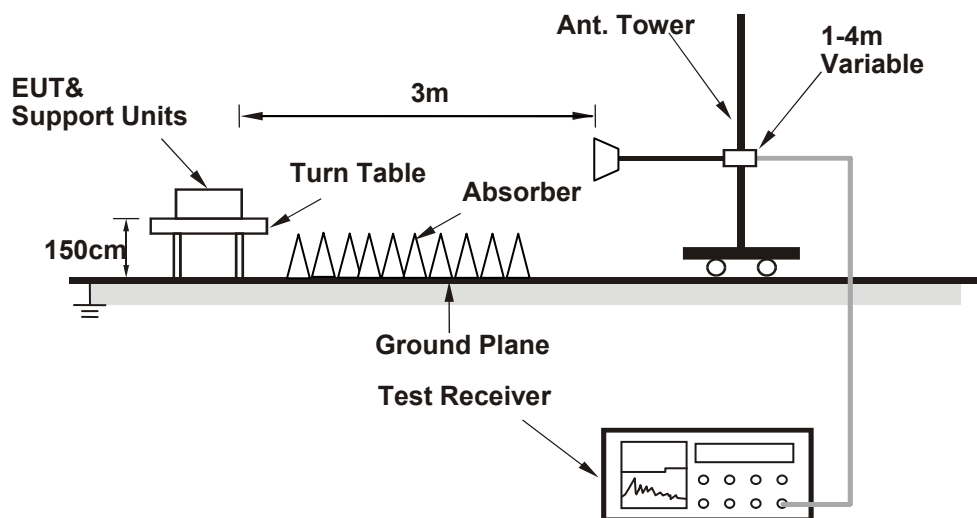
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Condition

- Placed the EUT on the testing table.
- Prepared notebook to act as a 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	54.2 PK	74.0	-19.8	1.51 H	106	48.70	5.50
2	5150.00	44.2 AV	54.0	-9.8	1.51 H	106	38.70	5.50
3	*5180.00	104.5 PK			1.41 H	0	65.00	39.50
4	*5180.00	93.7 AV			1.41 H	0	54.20	39.50
5	#10360.00	58.1 PK	74.0	-15.9	1.48 H	65	40.30	17.80
6	#10360.00	45.2 AV	54.0	-8.8	1.48 H	65	27.40	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	57.0 PK	74.0	-17.0	1.41 V	347	51.50	5.50
2	5150.00	46.0 AV	54.0	-8.0	1.41 V	347	40.50	5.50
3	*5180.00	107.7 PK			1.35 V	350	68.20	39.50
4	*5180.00	96.9 AV			1.35 V	350	57.40	39.50
5	#10360.00	58.7 PK	74.0	-15.3	1.07 V	41	41.20	17.50
6	#10360.00	46.2 AV	54.0	-7.8	1.07 V	41	28.70	17.50

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	106.0 PK			1.25 H	0	66.40	39.60
2	*5200.00	95.8 AV			1.25 H	0	56.20	39.60
3	#10400.00	58.0 PK	74.0	-16.0	1.15 H	23	40.00	18.00
4	#10400.00	45.9 AV	54.0	-8.1	1.15 H	23	27.90	18.00
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	108.4 PK			1.41 V	347	68.80	39.60
2	*5200.00	97.5 AV			1.41 V	347	57.90	39.60
3	#10400.00	59.6 PK	74.0	-14.4	1.47 V	84	41.60	18.00
4	#10400.00	46.7 AV	54.0	-7.3	1.47 V	84	28.70	18.00

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	106.4 PK			1.46 H	8	66.80	39.60
2	*5240.00	96.5 AV			1.46 H	8	56.90	39.60
3	5350.00	54.7 PK	74.0	-19.3	1.59 H	15	49.00	5.70
4	5350.00	44.4 AV	54.0	-9.6	1.59 H	15	38.70	5.70
5	#10480.00	58.0 PK	74.0	-16.0	1.07 H	44	40.00	18.00
6	#10480.00	45.5 AV	54.0	-8.5	1.07 H	44	27.50	18.00
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	108.3 PK			1.18 V	350	68.70	39.60
2	*5240.00	98.0 AV			1.18 V	350	58.40	39.60
3	5350.00	56.3 PK	74.0	-17.7	1.25 V	341	50.60	5.70
4	5350.00	46.5 AV	54.0	-7.5	1.25 V	341	40.80	5.70
5	#10480.00	58.6 PK	74.0	-15.4	1.45 V	63	40.60	18.00
6	#10480.00	45.4 AV	54.0	-8.6	1.45 V	63	27.40	18.00

REMARKS:

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

802.11n (HT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
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	54.2 PK	74.0	-19.8	1.52 H	16	48.70	5.50
2	5150.00	44.0 AV	54.0	-10.0	1.52 H	16	38.50	5.50
3	*5180.00	104.5 PK			1.40 H	0	65.00	39.50
4	*5180.00	94.5 AV			1.40 H	0	55.00	39.50
5	#10360.00	57.5 PK	74.0	-16.5	1.25 H	64	40.00	17.50
6	#10360.00	44.6 AV	54.0	-9.4	1.25 H	64	27.10	17.50
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	5150.00	56.1 PK	74.0	-17.9	1.10 V	340	50.60	5.50
2	5150.00	45.7 AV	54.0	-8.3	1.10 V	340	40.20	5.50
3	*5180.00	107.0 PK			1.05 V	351	67.50	39.50
4	*5180.00	97.1 AV			1.05 V	351	57.60	39.50
5	#10360.00	59.0 PK	74.0	-15.0	1.47 V	87	41.50	17.50
6	#10360.00	45.9 AV	54.0	-8.1	1.47 V	87	28.40	17.50

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	104.8 PK			1.17 H	2	65.20	39.60
2	*5200.00	95.1 AV			1.17 H	2	55.50	39.60
3	#10400.00	58.0 PK	74.0	-16.0	1.56 H	31	40.00	18.00
4	#10400.00	45.4 AV	54.0	-8.6	1.56 H	31	27.40	18.00
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	107.9 PK			1.34 V	350	68.30	39.60
2	*5200.00	97.5 AV			1.34 V	350	57.90	39.60
3	#10400.00	58.0 PK	74.0	-16.0	1.45 V	78	40.00	18.00
4	#10400.00	45.2 AV	54.0	-8.8	1.45 V	78	27.20	18.00

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	104.8 PK			1.63 H	0	65.20	39.60
2	*5240.00	94.9 AV			1.63 H	0	55.30	39.60
3	5350.00	53.9 PK	74.0	-20.1	1.52 H	12	48.20	5.70
4	5350.00	43.8 AV	54.0	-10.2	1.52 H	12	38.10	5.70
5	#10480.00	58.1 PK	74.0	-15.9	1.22 H	47	40.10	18.00
6	#10480.00	45.1 AV	54.0	-8.9	1.22 H	47	27.10	18.00
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	107.7 PK			1.26 V	351	68.10	39.60
2	*5240.00	97.0 AV			1.26 V	351	57.40	39.60
3	5350.00	57.3 PK	74.0	-16.7	1.33 V	317	51.60	5.70
4	5350.00	45.9 AV	54.0	-8.1	1.33 V	317	40.20	5.70
5	#10480.00	59.0 PK	74.0	-15.0	1.48 V	56	41.00	18.00
6	#10480.00	46.6 AV	54.0	-7.4	1.48 V	56	28.60	18.00

REMARKS:

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

802.11n (HT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK)
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	54.5 PK	74.0	-19.5	1.47 H	123	49.00	5.50
2	5150.00	44.0 AV	54.0	-10.0	1.47 H	123	38.50	5.50
3	*5190.00	102.2 PK			1.32 H	0	62.70	39.50
4	*5190.00	92.1 AV			1.32 H	0	52.60	39.50
5	#10380.00	58.1 PK	74.0	-15.9	1.55 H	224	40.30	17.80
6	#10380.00	45.0 AV	54.0	-9.0	1.55 H	224	27.20	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	55.8 PK	74.0	-18.2	1.45 V	87	50.30	5.50
2	5150.00	45.5 AV	54.0	-8.5	1.45 V	87	40.00	5.50
3	*5190.00	104.3 PK			1.46 V	350	64.80	39.50
4	*5190.00	94.5 AV			1.46 V	350	55.00	39.50
5	#10380.00	59.4 PK	74.0	-14.6	1.52 V	63	41.60	17.80
6	#10380.00	46.2 AV	54.0	-7.8	1.52 V	63	28.40	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)– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	101.4 PK			1.47 H	13	61.80	39.60
2	*5230.00	91.2 AV			1.47 H	13	51.60	39.60
3	5350.00	54.3 PK	74.0	-19.7	1.57 H	89	48.60	5.70
4	5350.00	44.1 AV	54.0	-9.9	1.57 H	89	38.40	5.70
5	#10460.00	58.0 PK	74.0	-16.0	1.36 H	41	40.00	18.00
6	#10460.00	45.2 AV	54.0	-8.8	1.36 H	41	27.20	18.00
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	104.2 PK			1.03 V	340	64.60	39.60
2	*5230.00	93.6 AV			1.03 V	340	54.00	39.60
3	5350.00	56.4 PK	74.0	-17.6	1.32 V	69	50.70	5.70
4	5350.00	45.8 AV	54.0	-8.2	1.32 V	69	40.10	5.70
5	#10460.00	59.6 PK	74.0	-14.4	1.47 V	18	41.60	18.00
6	#10460.00	46.7 AV	54.0	-7.3	1.47 V	18	28.70	18.00

REMARKS:

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

802.11ac (VHT80)

CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK)
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	54.1 PK	74.0	-19.9	1.47 H	85	48.60	5.50
2	5150.00	44.2 AV	54.0	-9.8	1.47 H	85	38.70	5.50
3	*5210.00	97.5 PK			1.51 H	10	57.90	39.60
4	*5210.00	87.0 AV			1.51 H	10	47.40	39.60
5	5350.00	53.7 PK	74.0	-20.3	1.48 H	70	48.00	5.70
6	5350.00	43.9 AV	54.0	-10.1	1.48 H	70	38.20	5.70
7	#10420.00	58.6 PK	74.0	-15.4	1.26 H	89	40.60	18.00
8	#10420.00	45.2 AV	54.0	-8.8	1.26 H	89	27.20	18.00
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	55.6 PK	74.0	-18.4	1.26 V	320	50.10	5.50
2	5150.00	45.6 AV	54.0	-8.4	1.26 V	320	40.10	5.50
3	*5210.00	100.5 PK			1.10 V	340	60.90	39.60
4	*5210.00	88.9 AV			1.10 V	340	49.30	39.60
5	5350.00	55.1 PK	74.0	-18.9	1.18 V	324	49.40	5.70
6	5350.00	45.1 AV	54.0	-8.9	1.18 V	324	39.40	5.70
7	#10420.00	59.2 PK	74.0	-14.8	1.26 V	38	41.20	18.00
8	#10420.00	46.5 AV	54.0	-7.5	1.26 V	38	28.50	18.00

REMARKS:

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

802.11a

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	#5714.00	68.5 PK	74.0	-5.5	1.39 H	341	62.30	6.20
2	#5714.00	50.2 AV	54.0	-3.8	1.39 H	341	44.00	6.20
3	#5722.00	73.2 PK	78.2	-5.0	1.17 H	314	66.90	6.30
4	#5725.00	71.8 PK	78.2	-6.4	1.15 H	302	65.50	6.30
5	*5745.00	110.4 PK			1.28 H	359	70.00	40.40
6	*5745.00	100.7 AV			1.28 H	359	60.30	40.40
7	11490.00	59.3 PK	74.0	-14.7	1.47 H	84	40.00	19.30
8	11490.00	47.2 AV	54.0	-6.8	1.47 H	84	27.90	19.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	71.7 PK	74.0	-2.3	1.04 V	359	65.50	6.20
2	#5714.00	52.7 AV	54.0	-1.3	1.04 V	359	46.50	6.20
3	#5722.00	76.1 PK	78.2	-2.1	1.00 V	348	69.80	6.30
4	#5725.00	73.4 PK	78.2	-4.8	1.08 V	325	67.10	6.30
5	*5745.00	111.7 PK			1.01 V	0	71.30	40.40
6	*5745.00	102.9 AV			1.01 V	0	62.50	40.40
7	11490.00	60.8 PK	74.0	-13.2	1.47 V	85	41.50	19.30
8	11490.00	47.4 AV	54.0	-6.6	1.47 V	85	28.10	19.30

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
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	110.4 PK			1.35 H	10	69.90	40.50
2	*5785.00	100.4 AV			1.35 H	10	59.90	40.50
3	11570.00	59.1 PK	74.0	-14.9	1.57 H	41	40.10	19.00
4	11570.00	46.5 AV	54.0	-7.5	1.57 H	41	27.50	19.00
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	112.8 PK			1.14 V	355	72.30	40.50
2	*5785.00	102.7 AV			1.14 V	355	62.20	40.50
3	11570.00	60.6 PK	74.0	-13.4	1.25 V	96	41.60	19.00
4	11570.00	48.0 AV	54.0	-6.0	1.25 V	96	29.00	19.00

REMARKS:

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

CHANNEL	TX Channel 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	110.7 PK			1.08 H	12	70.10	40.60
2	*5825.00	100.0 AV			1.08 H	12	59.40	40.60
3	#5850.00	60.9 PK	78.2	-17.3	1.29 H	25	54.30	6.60
4	#5853.00	73.1 PK	78.2	-5.1	1.17 H	24	66.50	6.60
5	#5861.00	67.4 PK	74.0	-6.6	1.18 H	26	60.80	6.60
6	#5861.00	47.1 AV	54.0	-6.9	1.18 H	26	40.50	6.60
7	11650.00	58.5 PK	74.0	-15.5	1.25 H	74	40.00	18.50
8	11650.00	45.6 AV	54.0	-8.4	1.25 H	74	27.10	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	*5825.00	112.8 PK			1.27 V	351	72.20	40.60
2	*5825.00	102.7 AV			1.27 V	351	62.10	40.60
3	#5850.00	59.6 PK	78.2	-18.6	1.75 V	314	53.00	6.60
4	#5853.00	73.6 PK	78.2	-4.6	1.71 V	341	67.00	6.60
5	#5861.00	67.0 PK	74.0	-7.0	1.67 V	354	60.40	6.60
6	#5861.00	47.4 AV	54.0	-6.6	1.67 V	354	40.80	6.60
7	11650.00	60.1 PK	74.0	-13.9	1.47 V	87	41.60	18.50
8	11650.00	46.9 AV	54.0	-7.1	1.47 V	87	28.40	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)– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (HT20)

CHANNEL	TX Channel 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	#5714.00	63.2 PK	74.0	-10.8	1.46 H	351	57.00	6.20
2	#5714.00	46.7 AV	54.0	-7.3	1.46 H	351	40.50	6.20
3	#5722.00	73.2 PK	78.2	-5.0	1.27 H	314	66.90	6.30
4	#5725.00	66.5 PK	78.2	-11.7	1.55 H	317	60.20	6.30
5	*5745.00	109.1 PK			1.43 H	17	68.70	40.40
6	*5745.00	98.2 AV			1.43 H	17	57.80	40.40
7	11490.00	59.3 PK	74.0	-14.7	1.47 H	41	40.00	19.30
8	11490.00	46.5 AV	54.0	-7.5	1.47 H	41	27.20	19.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	67.6 PK	74.0	-6.4	1.60 V	38	61.40	6.20
2	#5714.00	47.3 AV	54.0	-6.7	1.60 V	38	41.10	6.20
3	#5722.00	77.5 PK	78.2	-0.7	1.00 V	358	71.20	6.30
4	#5725.00	67.2 PK	78.2	-11.0	1.18 V	64	60.90	6.30
5	*5745.00	111.2 PK			1.09 V	0	70.80	40.40
6	*5745.00	101.8 AV			1.09 V	0	61.40	40.40
7	11490.00	60.9 PK	74.0	-13.1	1.47 V	84	41.60	19.30
8	11490.00	47.7 AV	54.0	-6.3	1.47 V	84	28.40	19.30

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
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	110.4 PK			1.17 H	20	69.90	40.50
2	*5785.00	101.0 AV			1.17 H	20	60.50	40.50
3	11570.00	59.0 PK	74.0	-15.0	1.47 H	87	40.00	19.00
4	11570.00	46.1 AV	54.0	-7.9	1.47 H	87	27.10	19.00
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	113.3 PK			1.46 V	354	72.80	40.50
2	*5785.00	103.7 AV			1.46 V	354	63.20	40.50
3	11570.00	60.6 PK	74.0	-13.4	1.47 V	54	41.60	19.00
4	11570.00	47.7 AV	54.0	-6.3	1.47 V	54	28.70	19.00

REMARKS:

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

CHANNEL	TX Channel 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	111.7 PK			1.07 H	7	71.10	40.60
2	*5825.00	102.2 AV			1.07 H	7	61.60	40.60
3	#5850.00	62.6 PK	78.2	-15.6	1.17 H	352	56.00	6.60
4	#5853.00	73.0 PK	78.2	-5.2	1.17 H	352	66.40	6.60
5	#5861.00	68.9 PK	74.0	-5.1	1.17 H	325	62.30	6.60
6	#5861.00	47.1 AV	54.0	-6.9	1.17 H	325	40.50	6.60
7	11650.00	58.5 PK	74.0	-15.5	1.47 H	87	40.00	18.50
8	11650.00	45.6 AV	54.0	-8.4	1.47 H	87	27.10	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	*5825.00	113.1 PK			1.45 V	351	72.50	40.60
2	*5825.00	102.9 AV			1.45 V	351	62.30	40.60
3	#5850.00	57.0 PK	78.2	-21.2	1.31 V	268	50.40	6.60
4	#5853.00	70.1 PK	78.2	-8.1	1.47 V	264	63.50	6.60
5	#5861.00	67.9 PK	74.0	-6.1	1.28 V	277	61.30	6.60
6	#5861.00	47.5 AV	54.0	-6.5	1.28 V	277	40.90	6.60
7	11650.00	60.1 PK	74.0	-13.9	1.47 V	41	41.60	18.50
8	11650.00	47.1 AV	54.0	-6.9	1.47 V	41	28.60	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)– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (HT40)

CHANNEL	TX Channel 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	#5714.00	68.2 PK	74.0	-5.8	1.36 H	23	62.00	6.20
2	#5714.00	47.1 AV	54.0	-6.9	1.36 H	23	40.90	6.20
3	#5722.00	75.0 PK	78.2	-3.2	1.36 H	23	68.70	6.30
4	#5725.00	63.2 PK	78.2	-15.0	1.36 H	27	56.90	6.30
5	*5755.00	103.8 PK			1.27 H	10	63.30	40.50
6	*5755.00	94.9 AV			1.27 H	10	54.40	40.50
7	11510.00	59.1 PK	74.0	-14.9	1.47 H	41	40.00	19.10
8	11510.00	46.2 AV	54.0	-7.8	1.47 H	41	27.10	19.10
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	#5714.00	71.6 PK	74.0	-2.4	1.32 V	340	65.40	6.20
2	#5714.00	51.1 AV	54.0	-2.9	1.32 V	340	44.90	6.20
3	#5722.00	77.0 PK	78.2	-1.2	1.24 V	350	70.70	6.30
4	#5725.00	65.3 PK	78.2	-12.9	1.28 V	56	59.00	6.30
5	*5755.00	106.8 PK			1.05 V	351	66.30	40.50
6	*5755.00	97.4 AV			1.05 V	351	56.90	40.50
7	11510.00	60.7 PK	74.0	-13.3	1.47 V	87	41.60	19.10
8	11510.00	47.5 AV	54.0	-6.5	1.47 V	87	28.40	19.10

REMARKS:

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

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK)
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	108.1 PK			1.22 H	10	67.60	40.50
2	*5795.00	99.0 AV			1.22 H	10	58.50	40.50
3	#5850.00	56.7 PK	78.2	-21.5	1.36 H	25	50.10	6.60
4	#5853.00	67.1 PK	78.2	-11.1	1.47 H	236	60.50	6.60
5	#5861.00	62.6 PK	74.0	-11.4	1.55 H	23	56.00	6.60
6	#5861.00	47.1 AV	54.0	-6.9	1.55 H	23	40.50	6.60
7	11590.00	58.7 PK	74.0	-15.3	1.47 H	125	40.00	18.70
8	11590.00	45.8 AV	54.0	-8.2	1.47 H	125	27.10	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	*5795.00	109.3 PK			1.45 V	353	68.80	40.50
2	*5795.00	100.2 AV			1.45 V	353	59.70	40.50
3	#5850.00	56.7 PK	78.2	-21.5	1.55 V	248	50.10	6.60
4	#5853.00	68.1 PK	78.2	-10.1	1.49 V	341	61.50	6.60
5	#5861.00	63.5 PK	74.0	-10.5	1.52 V	0	56.90	6.60
6	#5861.00	47.8 AV	54.0	-6.2	1.52 V	0	41.20	6.60
7	11590.00	60.3 PK	74.0	-13.7	1.54 V	74	41.60	18.70
8	11590.00	46.8 AV	54.0	-7.2	1.54 V	74	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)– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT80)

CHANNEL	TX Channel 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	#5714.00	67.7 PK	74.0	-6.3	1.29 H	67	61.50	6.20
2	#5714.00	51.8 AV	54.0	-2.2	1.29 H	67	45.60	6.20
3	#5722.00	69.3 PK	78.2	-8.9	1.47 H	77	63.00	6.30
4	#5725.00	58.5 PK	78.2	-19.7	1.39 H	64	52.20	6.30
5	*5775.00	100.0 PK			1.27 H	10	59.50	40.50
6	*5775.00	88.0 AV			1.27 H	10	47.50	40.50
7	#5850.00	58.3 PK	78.2	-19.9	1.32 H	40	51.70	6.60
8	#5852.10	59.4 PK	78.2	-18.8	1.41 H	74	52.80	6.60
9	#5860.10	58.6 PK	74.0	-15.4	1.21 H	73	52.00	6.60
10	#5860.10	45.4 AV	54.0	-8.6	1.21 H	73	38.80	6.60
11	11550.00	59.0 PK	74.0	-15.0	1.32 H	69	40.00	19.00
12	11550.00	46.2 AV	54.0	-7.8	1.32 H	69	27.20	19.00
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	#5714.00	70.2 PK	74.0	-3.8	1.00 V	353	64.00	6.20
2	#5714.00	53.5 AV	54.0	-0.5	1.00 V	353	47.30	6.20
3	#5722.00	71.7 PK	78.2	-6.5	1.08 V	345	65.40	6.30
4	#5725.00	62.3 PK	78.2	-15.9	1.19 V	342	56.00	6.30
5	*5775.00	101.8 PK			1.08 V	348	61.30	40.50
6	*5775.00	91.4 AV			1.08 V	348	50.90	40.50
7	#5850.00	61.6 PK	78.2	-16.6	1.10 V	346	55.00	6.60
8	#5852.10	59.5 PK	78.2	-18.7	1.00 V	359	52.90	6.60
9	#5860.10	58.8 PK	74.0	-15.2	1.00 V	338	52.20	6.60
10	#5860.10	45.5 AV	54.0	-8.5	1.00 V	338	38.90	6.60
11	11550.00	60.5 PK	74.0	-13.5	1.59 V	63	41.50	19.00
12	11550.00	47.2 AV	54.0	-6.8	1.59 V	63	28.20	19.00

REMARKS:

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

BELOW 1GHz WORST-CASE DATA
802.11n (HT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	124.98	36.5 QP	43.5	-7.0	1.51 H	237	52.30	-15.80
2	249.17	44.7 QP	46.0	-1.3	1.01 H	250	59.30	-14.60
3	363.65	41.7 QP	46.0	-4.3	1.01 H	175	53.40	-11.70
4	600.38	42.3 QP	46.0	-3.7	1.01 H	12	49.40	-7.10
5	749.79	42.0 QP	46.0	-4.0	1.01 H	239	45.90	-3.90
6	875.91	36.8 QP	46.0	-9.2	1.01 H	158	39.00	-2.20
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	124.98	39.9 QP	43.5	-3.6	1.00 V	158	55.70	-15.80
2	249.17	38.4 QP	46.0	-7.6	1.49 V	210	53.00	-14.60
3	499.48	40.4 QP	46.0	-5.6	1.00 V	201	49.80	-9.40
4	625.60	41.6 QP	46.0	-4.4	1.49 V	214	48.20	-6.60
5	749.79	39.7 QP	46.0	-6.3	1.00 V	299	43.60	-3.90
6	875.91	41.1 QP	46.0	-4.9	1.00 V	310	43.30	-2.20

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)– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	124.98	37.3 QP	43.5	-6.2	2.00 H	272	53.10	-15.80
2	249.17	40.5 QP	46.0	-5.5	1.49 H	126	55.10	-14.60
3	499.48	44.9 QP	46.0	-1.1	1.49 H	164	54.30	-9.40
4	625.60	42.1 QP	46.0	-3.9	1.00 H	223	48.70	-6.60
5	749.79	41.2 QP	46.0	-4.8	1.00 H	236	45.10	-3.90
6	936.07	40.2 QP	46.0	-5.8	2.00 H	7	41.20	-1.00
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	37.66	38.7 QP	40.0	-1.3	1.01 V	135	53.40	-14.70
2	249.17	40.5 QP	46.0	-5.5	1.01 V	293	55.10	-14.60
3	363.65	39.5 QP	46.0	-6.5	1.51 V	112	51.20	-11.70
4	499.48	40.9 QP	46.0	-5.1	1.01 V	169	50.30	-9.40
5	625.60	40.3 QP	46.0	-5.7	1.51 V	183	46.90	-6.60
6	934.13	40.6 QP	46.0	-5.4	2.00 V	247	41.50	-0.90

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)– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

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

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 12, 2015	Oct. 11, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Dec. 26, 2015	Dec. 25, 2016
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 11, 2016	Jan. 10, 2017
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 21, 2015	Jul. 20, 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 2.

3. The VCCI Site Registration No. is C-2047.

4.2.3 Test Procedure

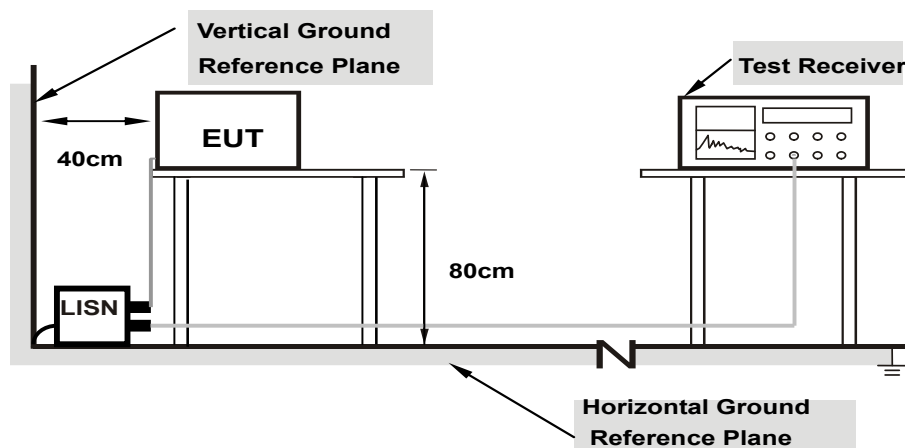
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

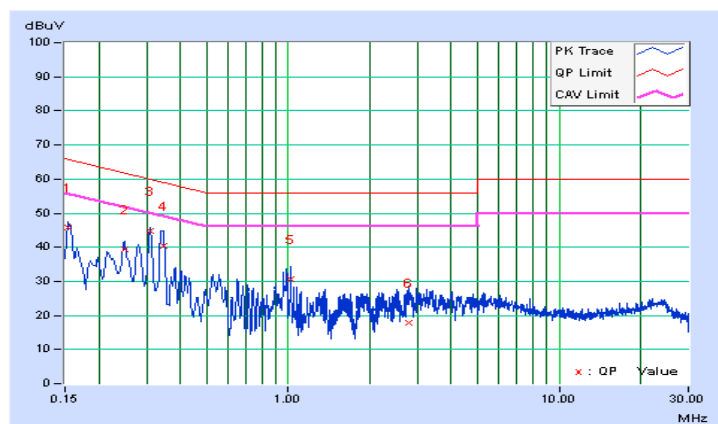
4.2.7 Test Results

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.18	35.69	27.80	45.87	37.98	65.78	55.78	-19.91	-17.80
2	0.24941	10.22	29.13	27.88	39.35	38.10	61.78	51.78	-22.43	-13.68
3	0.31000	10.23	34.56	34.47	44.79	44.70	59.97	49.97	-15.18	-5.27
4	0.34486	10.23	30.06	27.01	40.29	37.24	59.09	49.09	-18.79	-11.84
5	1.01800	10.31	20.18	14.14	30.49	24.45	56.00	46.00	-25.51	-21.55
6	2.78599	10.39	7.36	-2.07	17.75	8.32	56.00	46.00	-38.25	-37.68

REMARKS:

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

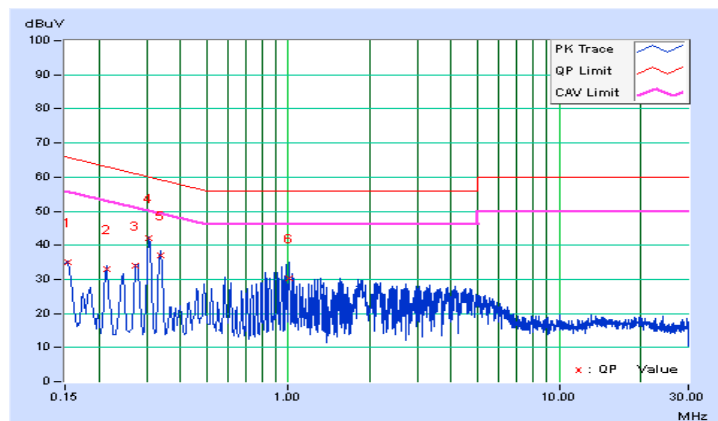


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq. [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	10.19	24.71	24.34	34.90	34.53	65.78	55.78	-30.88	-21.25
2	0.21400	10.21	22.77	18.14	32.98	28.35	63.05	53.05	-30.07	-24.70
3	0.27422	10.24	23.85	23.68	34.09	33.92	60.99	50.99	-26.90	-17.07
4	0.30600	10.25	31.81	31.74	42.06	41.99	60.08	50.08	-18.02	-8.09
5	0.33800	10.27	26.71	26.57	36.98	36.84	59.25	49.25	-22.27	-12.41
6	1.00600	10.29	19.89	14.46	30.18	24.75	56.00	46.00	-25.82	-21.25

REMARKS:

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

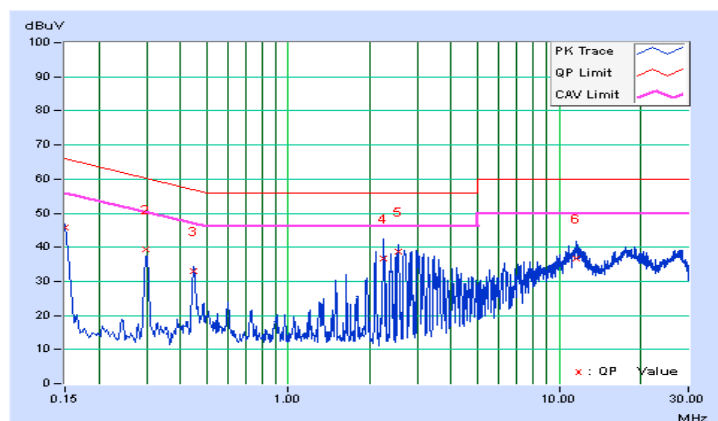


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [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	0.15000	10.18	35.57	24.83	45.75	35.01	66.00	56.00	-20.25	-20.99
2	0.29913	10.22	29.24	24.90	39.46	35.12	60.27	50.27	-20.80	-15.14
3	0.44999	10.25	22.80	22.26	33.05	32.51	56.88	46.88	-23.83	-14.37
4	2.25400	10.38	26.38	15.31	36.76	25.69	56.00	46.00	-19.24	-20.31
5	2.54200	10.39	28.32	21.51	38.71	31.90	56.00	46.00	-17.29	-14.10
6	11.50200	10.55	26.09	18.44	36.64	28.99	60.00	50.00	-23.36	-21.01

REMARKS:

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

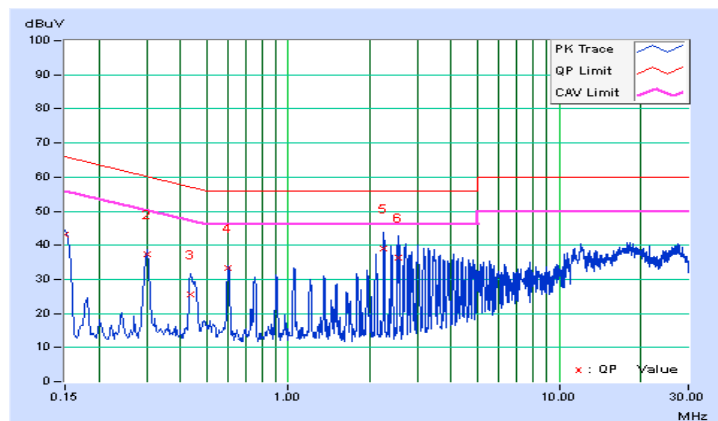


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.19	32.96	24.50	43.15	34.69	66.00	56.00	-22.85	-21.31
2	0.30150	10.25	27.20	26.20	37.45	36.45	60.20	50.20	-22.75	-13.75
3	0.43484	10.30	15.21	5.19	25.51	15.49	57.16	47.16	-31.65	-31.67
4	0.59810	10.30	22.97	22.07	33.27	32.37	56.00	46.00	-22.73	-13.63
5	2.25400	10.43	28.69	17.58	39.12	28.01	56.00	46.00	-16.88	-17.99
6	2.55800	10.45	26.04	15.10	36.49	25.55	56.00	46.00	-19.51	-20.45

REMARKS:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

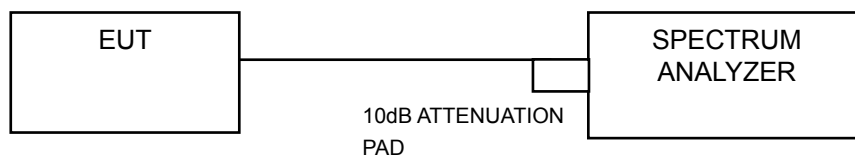
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

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

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

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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) Detector = RMS.
- 8) Trace mode = max hold.
- 9) 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 Condition

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

4.3.7 Test Result

POWER OUTPUT:

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	11.28	12.70	32.049	15.06	30	Pass
40	5200	11.83	12.53	33.147	15.20	30	Pass
48	5240	12.56	11.35	31.676	15.01	30	Pass
149	5745	19.32	20.37	194.400	22.89	30	Pass
157	5785	19.56	19.62	181.987	22.60	30	Pass
165	5825	19.66	19.94	191.098	22.81	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	11.52	12.86	33.511	15.25	30	Pass
40	5200	11.98	12.35	32.955	15.18	30	Pass
48	5240	12.71	11.33	32.247	15.08	30	Pass
149	5745	17.02	17.98	113.156	20.54	30	Pass
157	5785	20.12	20.54	216.042	23.35	30	Pass
165	5825	19.94	20.04	199.553	23.00	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	11.84	12.85	34.551	15.38	30	Pass
46	5230	12.01	11.67	30.574	14.85	30	Pass
151	5755	15.06	15.99	71.782	18.56	30	Pass
159	5795	20.15	20.28	210.174	23.23	30	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	11.55	11.67	28.978	14.62	30	Pass
155	5775	14.34	15.02	58.933	17.70	30	Pass

26dB BANDWIDTH:

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	22.20	21.58	Pass
40	5200	22.69	21.67	Pass
48	5240	22.71	21.58	Pass

802.11n (HT20)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	23.23	24.37	Pass
40	5200	22.88	23.13	Pass
48	5240	23.37	23.03	Pass

802.11n (HT40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	73.00	44.71	Pass
46	5230	45.97	46.71	Pass

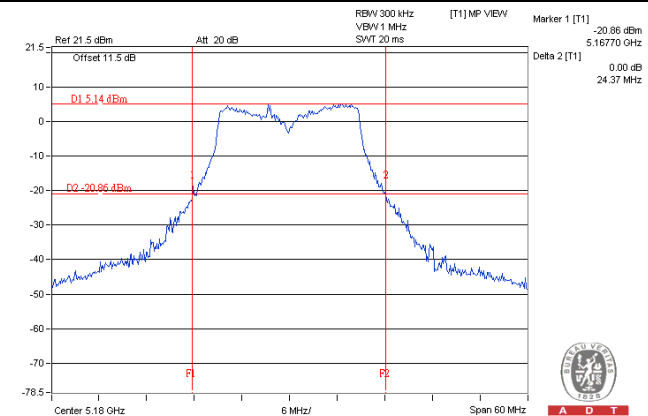
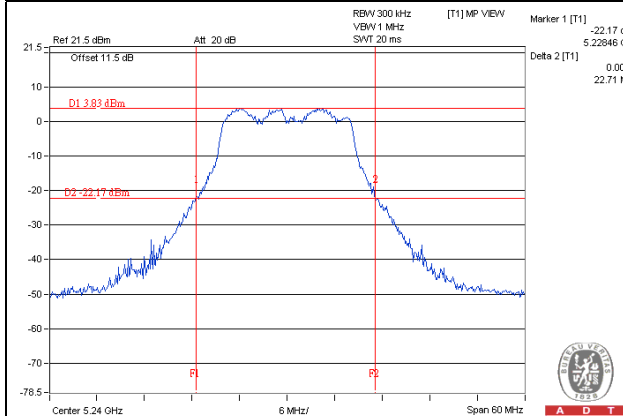
802.11ac (VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	134.91	87.26	Pass

SPECTRUM PLOT OF WORST VALUE

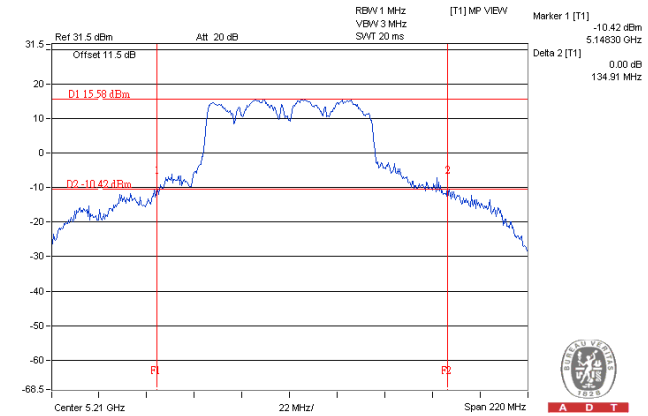
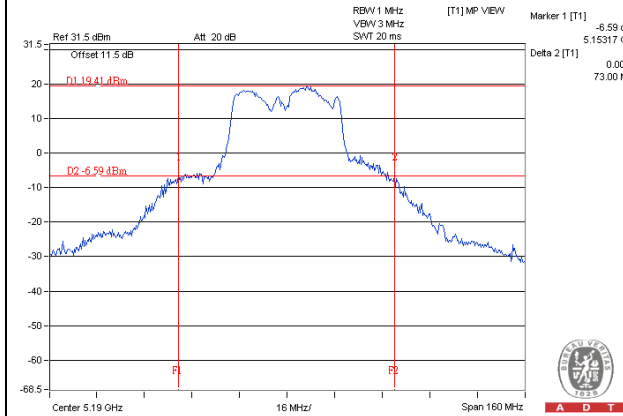
802.11a

802.11n (HT20)



802.11n (HT40)

802.11ac (VHT80)

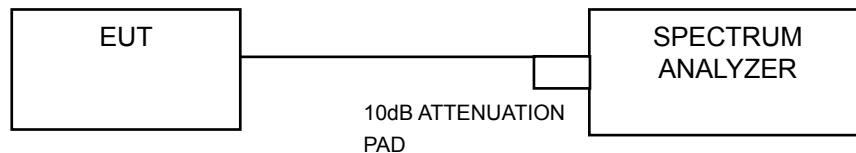


4.4 Peak Power Spectral Density Measurement

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	
		Mobile and Portable client device	11dBm/ MHz
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 Procedure

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 30 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to "free run".
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-1 Band 802.11a

Channel	Frequency (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					
36	5180	0.11	0.81	3.48	0.24	3.72	15.09	Pass
40	5200	-1.47	0.79	2.81	0.24	3.05	15.09	Pass
48	5240	0.08	0.33	3.21	0.24	3.45	15.09	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. For U-NII-1 Band:

Directional gain = 4.9dBi + 10log(2) = 7.91dBi > 6dBi, so the power density limit shall be reduced to 17-(7.91-6) = 15.09dBm.

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

802.11n (HT20)

Channel	Frequency (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					
36	5180	0.79	0.05	3.45	0.20	3.65	15.09	Pass
40	5200	0.46	-1.00	2.80	0.20	3.00	15.09	Pass
48	5240	-0.07	0.11	3.03	0.20	3.23	15.09	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. For U-NII-1 Band:

Directional gain = 4.9dBi + 10log(2) = 7.91dBi > 6dBi, so the power density limit shall be reduced to 17-(7.91-6) = 15.09dBm.

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

802.11n (HT40)

Channel	Frequency (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					
38	5190	-3.45	-3.07	-0.25	0.41	0.16	15.09	Pass
46	5230	-2.50	-2.96	0.28	0.41	0.69	15.09	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. **For U-NII-1 Band:**
Directional gain = 4.9dBi + 10log(2) = 7.91dBi > 6dBi, so the power density limit shall be reduced to 17-(7.91-6) = 15.09dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

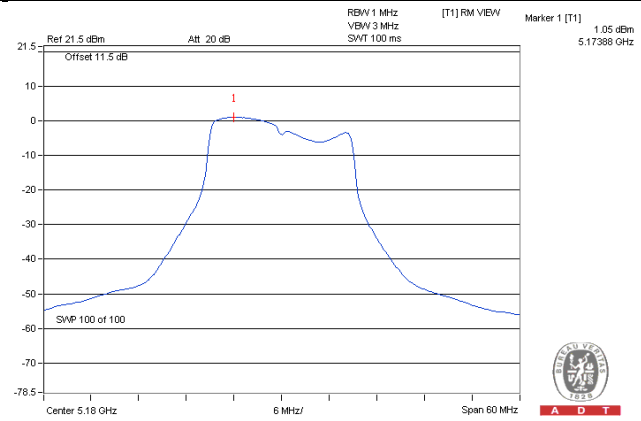
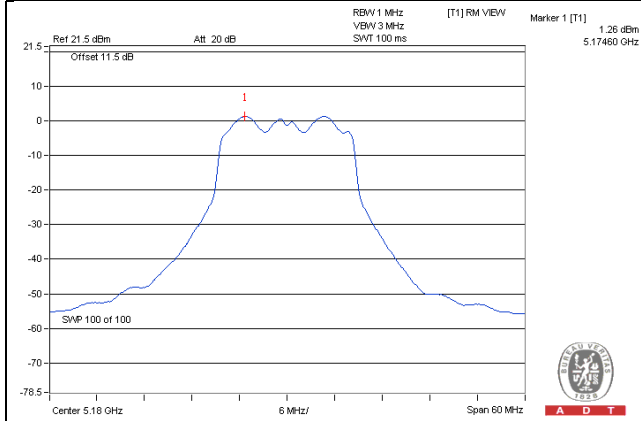
Channel	Frequency (MHz)	PSD (dBm)		Total PSD w/o Duty Factor (dBm)	Duty Factor	Total PSD with Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1					
42	5210	-6.72	-6.16	-3.42	1.19	-2.23	15.09	Pass

- 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. **For U-NII-1 Band:**
Directional gain = 4.9dBi + 10log(2) = 7.91dBi > 6dBi, so the power density limit shall be reduced to 17-(7.91-6) = 15.09dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

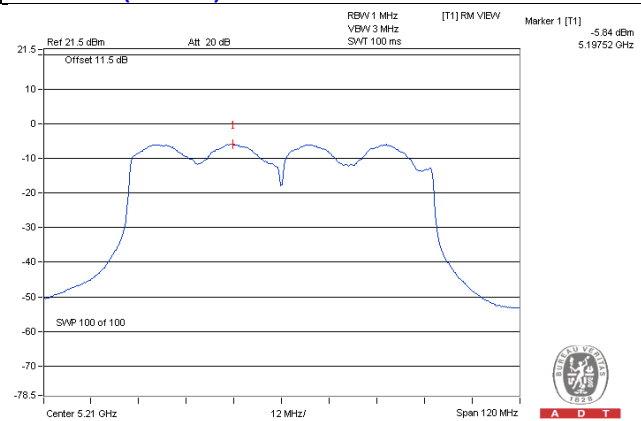
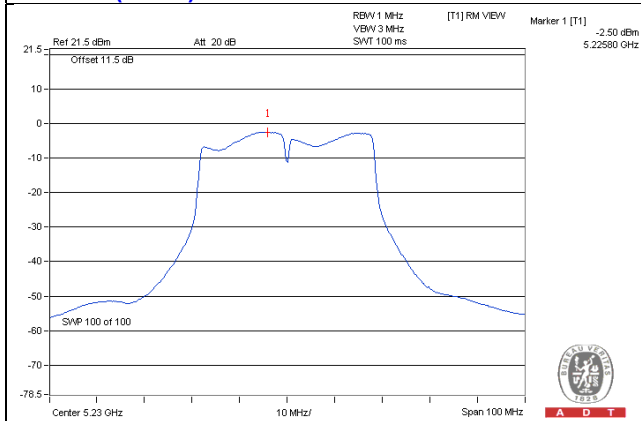
802.11a / Ch 36 / Chain 1

802.11n (HT20) / Ch 36 / Chain 0



802.11n (HT40) / Ch 46 / Chain 0

802.11ac (VHT80) / Ch 42 / Chain 1



For U-NII-3 Band

802.11a

TX chain	Chan.	Freq. (MHz)	PSD (dBm /300kHz)	PSD (dBm /500kHz)	10 log (N=2) dB	Duty Factor	Total PSD (dBm /500kHz)	Limit (dBm /500kHz)	Pass /Fail
0	149	5745	0.04	2.26	3.01	0.24	5.51	28.09	Pass
	157	5785	-1.20	1.02	3.01	0.24	4.27	28.09	Pass
	165	5825	-1.27	0.95	3.01	0.24	4.20	28.09	Pass
1	149	5745	-1.82	0.40	3.01	0.24	3.65	28.09	Pass
	157	5785	-1.64	0.58	3.01	0.24	3.83	28.09	Pass
	165	5825	-1.26	0.96	3.01	0.24	4.21	28.09	Pass

NOTE:

- Directional gain = $4.9\text{dBi} + 10\log(2) = 7.91\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(7.91-6) = 28.09\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm /300kHz)	PSD (dBm /500kHz)	10 log (N=2) dB	Duty Factor	Total PSD (dBm /500kHz)	Limit (dBm /500kHz)	Pass /Fail
0	149	5745	-3.58	-1.36	3.01	0.20	1.85	28.09	Pass
	157	5785	-0.04	2.18	3.01	0.20	5.39	28.09	Pass
	165	5825	-0.88	1.34	3.01	0.20	4.55	28.09	Pass
1	149	5745	-4.21	-1.99	3.01	0.20	1.22	28.09	Pass
	157	5785	-1.16	1.06	3.01	0.20	4.27	28.09	Pass
	165	5825	-0.77	1.45	3.01	0.20	4.66	28.09	Pass

NOTE:

- Directional gain = $4.9\text{dBi} + 10\log(2) = 7.91\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(7.91-6) = 28.09\text{dBm}$.
- 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=2) dB	Duty Factor	Total PSD (dBm /500kHz)	Limit (dBm /500kHz)	Pass /Fail
0	151	5755	-7.92	-5.70	3.01	0.41	-2.28	28.09	Pass
	159	5795	-3.90	-1.68	3.01	0.41	1.74	28.09	Pass
1	151	5755	-8.73	-6.51	3.01	0.41	-3.09	28.09	Pass
	159	5795	-4.05	-1.83	3.01	0.41	1.59	28.09	Pass

NOTE:

- Directional gain = $4.9\text{dBi} + 10\log(2) = 7.91\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(7.91-6) = 28.09\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

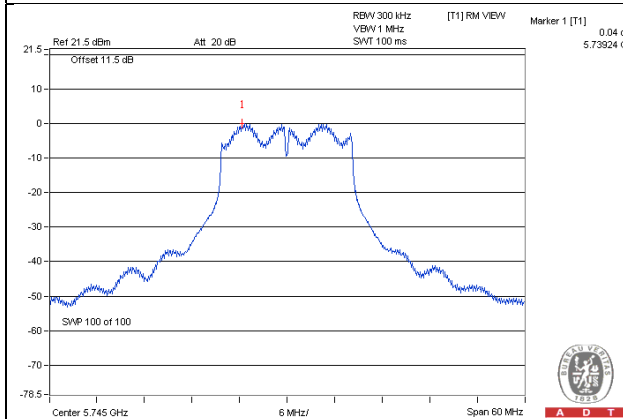
TX chain	Chan.	Freq. (MHz)	PSD (dBm /300kHz)	PSD (dBm /500kHz)	10 log (N=2) dB	Duty Factor	Total PSD (dBm /500kHz)	Limit (dBm /500kHz)	Pass /Fail
0	155	5775	-11.97	-9.75	3.01	1.19	-5.55	28.09	Pass
1	155	5775	-12.80	-10.58	3.01	1.19	-6.38	28.09	Pass

NOTE:

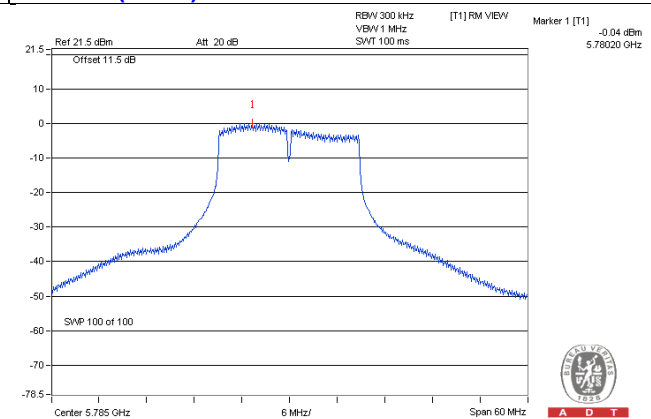
- Directional gain = $4.9\text{dBi} + 10\log(2) = 7.91\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (7.91 - 6) = 28.09\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

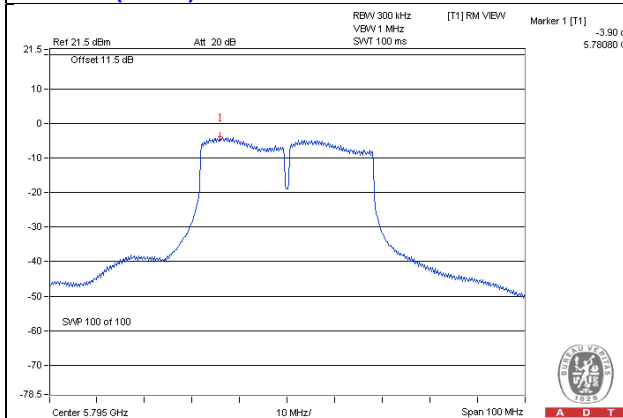
802.11a



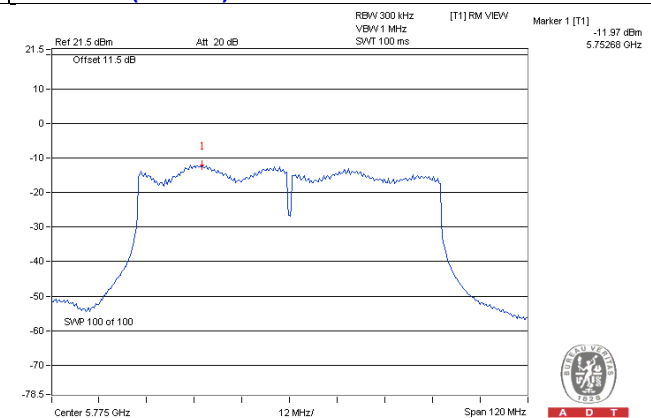
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

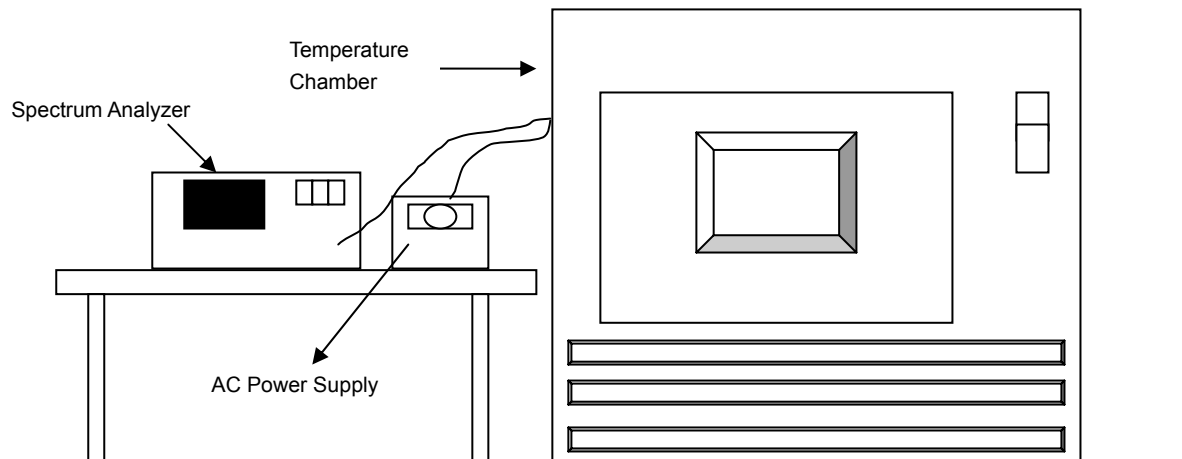


4.5 Frequency Stability Measurement

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 (%)
50	120	5180.0153	0.00030	5180.0182	0.00035	5180.0192	0.00037	5180.0167	0.00032
40	120	5179.9929	-0.00014	5179.9942	-0.00011	5179.9971	-0.00006	5179.9939	-0.00012
30	120	5179.9805	-0.00038	5179.9854	-0.00028	5179.9825	-0.00034	5179.9829	-0.00033
20	120	5180.0071	0.00014	5180.0054	0.00010	5180.0023	0.00004	5180.0070	0.00014
10	120	5180.0072	0.00014	5180.0061	0.00012	5180.0063	0.00012	5180.0083	0.00016
0	120	5180.0232	0.00045	5180.0207	0.00040	5180.0213	0.00041	5180.0240	0.00046
-10	120	5180.0233	0.00045	5180.0247	0.00048	5180.0242	0.00047	5180.0212	0.00041
-20	120	5180.0199	0.00038	5180.0187	0.00036	5180.0175	0.00034	5180.0164	0.00032
-30	120	5179.9867	-0.00026	5179.9877	-0.00024	5179.9868	-0.00025	5179.9871	-0.00025

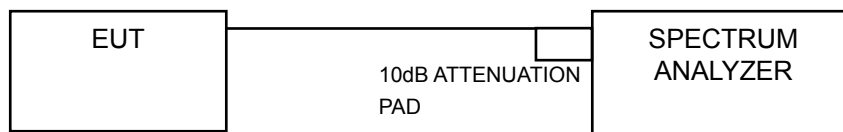
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5180.0076	0.00015	5180.0052	0.00010	5180.0027	0.00005	5180.0060	0.00012
	120	5180.0071	0.00014	5180.0054	0.00010	5180.0023	0.00004	5180.0070	0.00014
	102	5180.0065	0.00013	5180.0052	0.00010	5180.0021	0.00004	5180.0068	0.00013

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
		Chain 0	Chain 1		
149	5745	15.69	16.43	0.5	Pass
157	5785	16.49	16.52	0.5	Pass
165	5825	16.44	16.49	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.68	17.71	0.5	Pass
157	5785	16.99	17.66	0.5	Pass
165	5825	17.67	17.70	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.46	36.47	0.5	Pass
159	5795	35.92	36.44	0.5	Pass

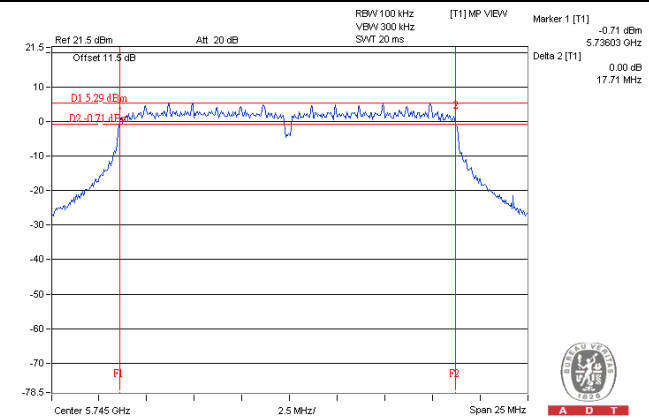
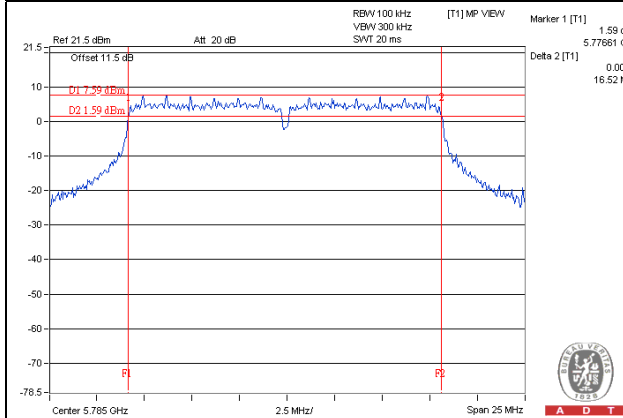
802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.99	76.63	0.5	Pass

SPECTRUM PLOT OF WORST VALUE

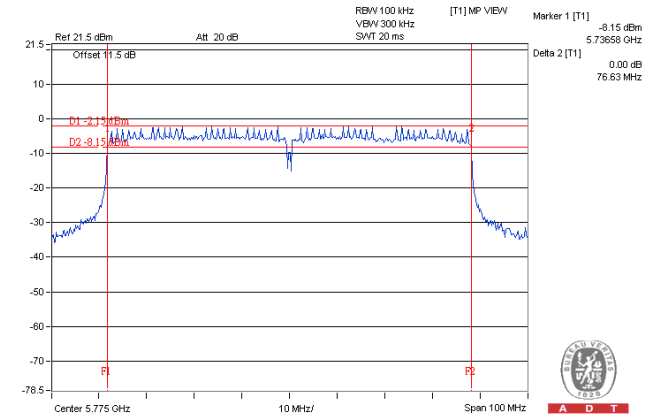
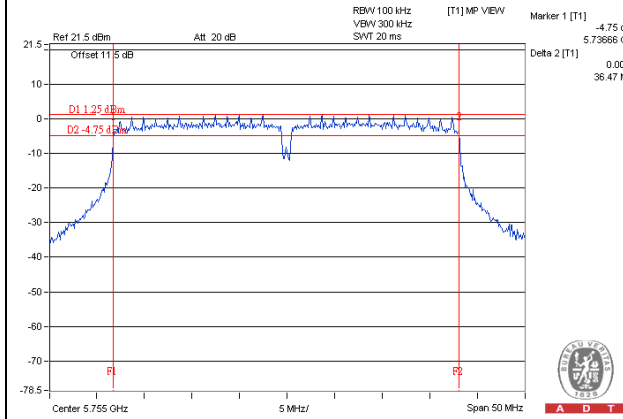
802.11a

802.11n (HT20)



802.11n (HT40)

802.11ac (VHT80)



5 Pictures of Test Arrangements

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

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:

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Fax: 886-2-26051924

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Tel: 886-3-6668565

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Hwa Ya EMC/RF/Safety

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Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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