FCC Test Report

Report No.:	RF150708E07-1
FCC ID:	PY315200307
Test Model:	R7300
Received Date:	July 08, 2015
Test Date:	July 15 to 23, 2015
Issued Date:	Aug. 11, 2015
Applicant:	NETGEAR, Inc.
Address:	350 East Plumeria Drive San Jose, CA 95134
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (1):	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (3):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF150708E07-1	Original release.	Aug. 11, 2015

1 Certificate of Conformity

Product:	Nighthawk AC1900 DST Router
Brand:	NETGEAR
Test Model:	R7300
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, Inc.
Test Date:	July 15 to 23, 2015
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:** Aug. 11, 2015

Midoli Peng / Specialist

Approved by : _____ , **Date:** Aug. 11, 2015

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407 Under New Rule)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -7.15dB at 0.33750MHz.
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5350.00MHz.
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(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is Re-SMA 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	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.37 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.65 dB
	6GHz ~ 18GHz	3.88 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Nighthawk AC1900 DST Router
Brand	NETGEAR
Test Model	R7300
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	AC 100-240V, 1.3A, 50/60Hz
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	**For 15.407** 5.18 ~ 5.24GHz
	For 15.247 **2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.745 ~ 5.825GHz
Number of Channel	**For 15.407** 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20), VHT20 7 for 802.11n (HT40), VHT40 **For 15.247 (5GHz)** 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	**For 15.407** **CDD Mode:** 802.11a: 436.228mW 802.11ac (VHT20): 436.723mW 802.11ac (VHT40): 888.181mW 802.11ac (VHT80): 293.206mW **Beamforming Mode:** 802.11ac (VHT20): 393.736mW 802.11ac (VHT40): 674.757mW 802.11ac (VHT80): 219.7mW
	For 15.247(5GHz) **CDD Mode:** 802.11a: 932.093mW **Beamforming Mode:** 802.11ac (VHT20): 931.687mW 802.11ac (VHT40): 916.556mW 802.11ac (VHT80): 539.77mW
	For 15.247(2.4GHz) **CDD Mode:** 802.11b: 983.43mW 802.11g: 922.959mW 802.11n(HT20): 917.129mW 802.11n(HT40): 252.703mW **Beamforming Mode:** VHT20: 917.129mW VHT40: 225.567mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. The EUT must be supplied with internal power supply as following spec:
   - ◆ AC 100-240V, 1.3A, 50/60Hz
2. The antennas provided to the EUT, please refer to the following table:

Antenna No.	Ant. Gain(dBi)	Frequency range (GHz to GHz)	Antenna Type	Connecter Type
1	0.5	2.4~2.4835	Dipole	Re-SMA
	0.9	5.15~5.25	Dipole	Re-SMA
	0.4	5.725~5.85	Dipole	Re-SMA
2	0.5	2.4~2.4835	Dipole	Re-SMA
	0.9	5.15~5.25	Dipole	Re-SMA
	0.4	5.725~5.85	Dipole	Re-SMA
3	0.5	2.4~2.4835	Dipole	Re-SMA
	0.9	5.15~5.25	Dipole	Re-SMA
	0.4	5.725~5.85	Dipole	Re-SMA

3. The EUT incorporates a MIMO function with beamforming.(Except for 802.11a/b/g)

For 2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	3TX	3RX
802.11g	1 ~ 11Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
VHT20	MCS0~8 Nss=1	3TX	3RX
	MCS0~8 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX
VHT40	MCS0~9 Nss=1	3TX	3RX
	MCS0~9 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX
For 5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11ac (VHT20)	MCS 0~8, Nss=1	3TX	3RX
	MCS 0~8, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
802.11ac (VHT40)	MCS 0~9, Nss=1	3TX	3RX
	MCS 0~9, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
802.11ac (VHT80)	MCS 0~9, Nss=1	3TX	3RX
	MCS 0~9, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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

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.

CDD Mode						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT40)	5180-5240	38 to 46	46	OFDM	BPSK	13.5

Power Line Conducted Emission Test:

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

CDD Mode						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT40)	5180-5240	38 to 46	46	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

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

CDD Mode						
For Transmit Power / Peak Power Spectral Density Measurement						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
Beamforming Mode						
For Transmit Power Measurment						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3

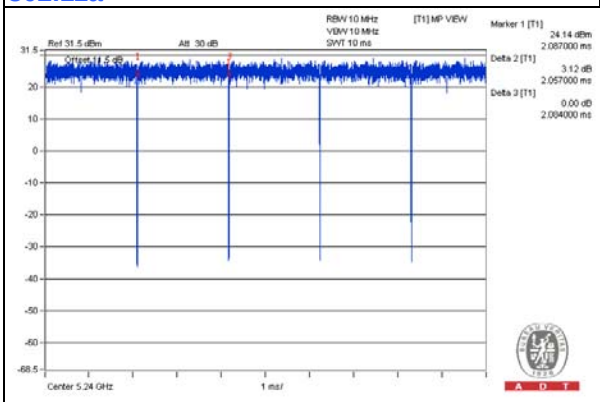
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	21deg. C, 68%RH	120Vac, 60Hz	Andy Ho
RE<1G	20deg. C,66%RH	120Vac, 60Hz	Weiwei Lo
PLC	27deg. C, 57%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Gary Cheng

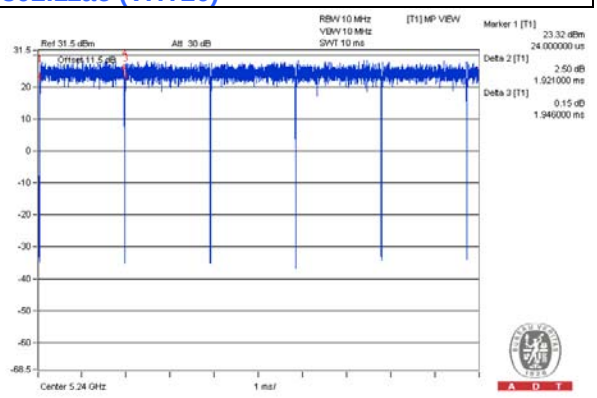
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.057 ms/2.084 ms = 0.987
802.11ac (VHT20): Duty cycle = 1.921 ms/1.946 ms = 0.987
802.11ac (VHT40): Duty cycle = 0.955 ms/0.974 ms = 0.98
802.11ac (VHT80): Duty cycle = 0.459 ms/0.492 ms = 0.933, Duty factor = 10 * log(1/0.933) = 0.30

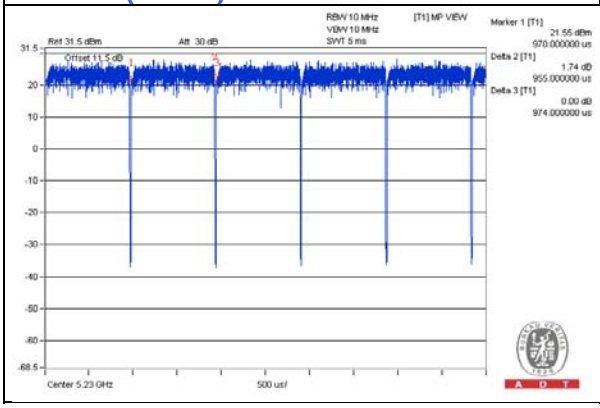
802.11a



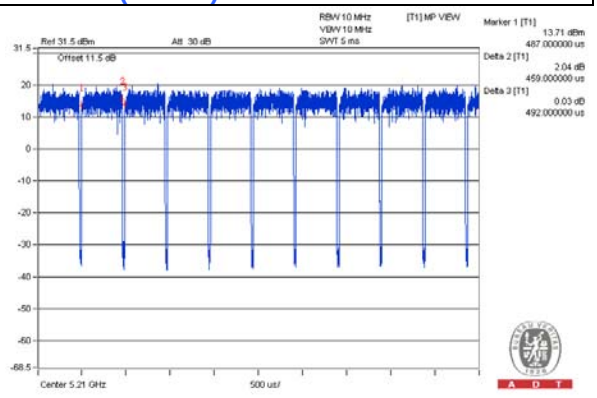
802.11ac (VHT20)



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.

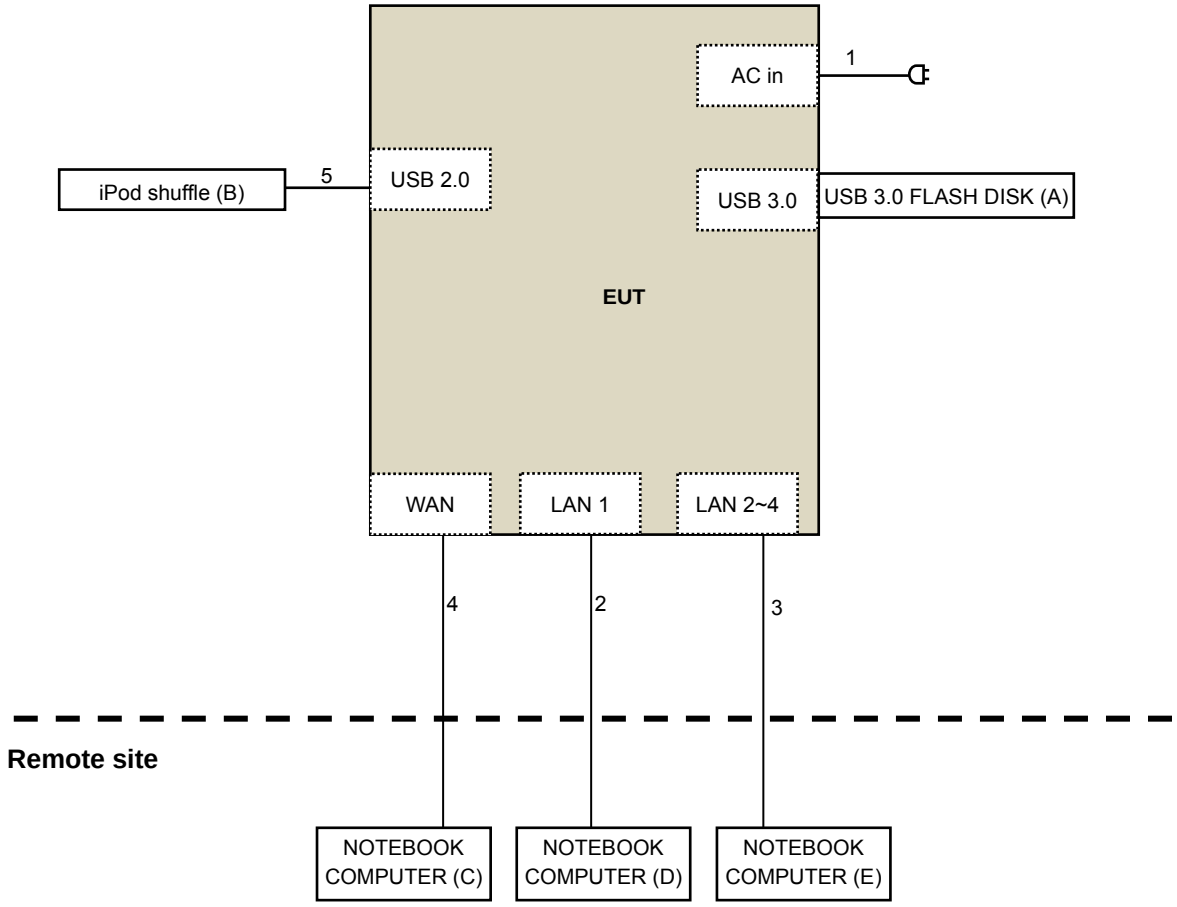
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	USB 3.0 FLASH DISK	Transcend	NA	NA	NA	Provided by Lab
B.	iPod shuffle	Apple	MC749TA/A	CC4DMFJUDFDM	NA	Provided by Lab
C.	NOTEBOOK COMPUTER	DELL	PP27L	6YLB32S	FCC DoC	Provided by Lab
D.	NOTEBOOK COMPUTER	DELL	PP27L	7YLB32S	FCC DoC	Provided by Lab
E.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	AC	1	1.8	No	0	Supplied by Client
2.	RJ-45	1	1	No	0	Provided by Lab
3.	RJ-45	3	10	No	0	Provided by Lab
4.	RJ-45	1	10	No	0	Provided by Lab
5.	USB	1	0.1	Yes	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)
789033 D02 General UNII Test Procedure New Rules v01
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:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	**LIMIT**	
789033 D02 General UNII Test Procedure New Rules v01	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	**EIRP LIMIT**	**EQUIVALENT FIELD STRENGTH AT 3m**
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/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(dBμV/m) [*1] PK:78.2 (dBμV/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:

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 12, 2014	Dec. 11, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-03	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 06, 2015	Feb. 05, 2016
RF Cable	8D-FB	CHGCAB-001-1 CHGCAB-001-2	Oct. 04, 2014	Oct. 03, 2015
	RF-141	CHGCAB-004	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISI	AIH.8018	0000320091110	Feb. 09, 2015	Feb. 08, 2016
Pre-Amplifier Agilent	8449B	3008A02578	June 23, 2015	June 22, 2016
RF Cable	NA	131205 131216 131217 SNMY23684/4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	June 26, 2015	June 25, 2016
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
SPECTRUM ANALYZER R&S	FSV 40	100964	June 26, 2015	June 25, 2016
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-SP-AR	MAA0812-008	Jan. 12, 2015	Jan. 11, 2016
Power Meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power Sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 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 966 Chamber No. G.
3. The FCC Site Registration No. is 966073.
4. The VCCI Site Registration No. is G-137.
5. The CANADA Site Registration No. is IC 7450H-2.
6. Tested Date: July 21 to 23, 2015

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:

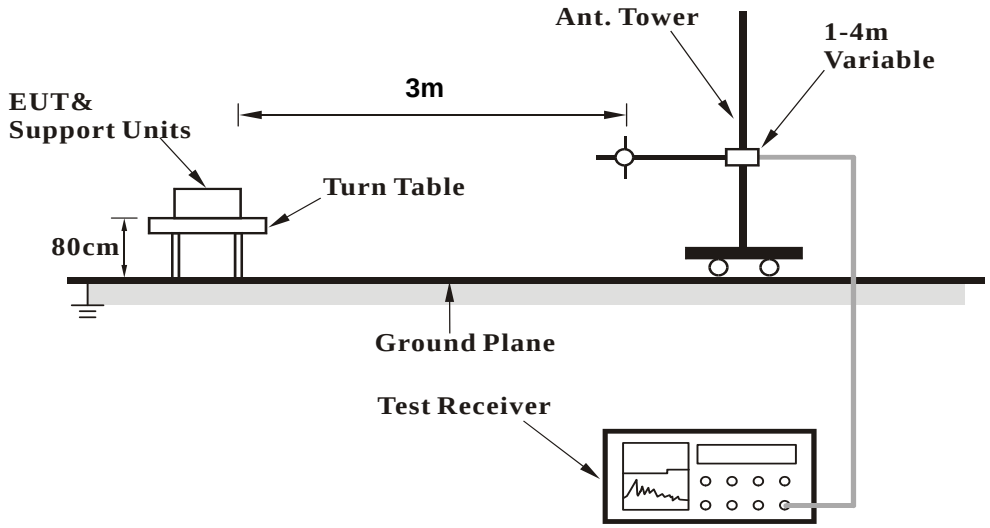
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 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

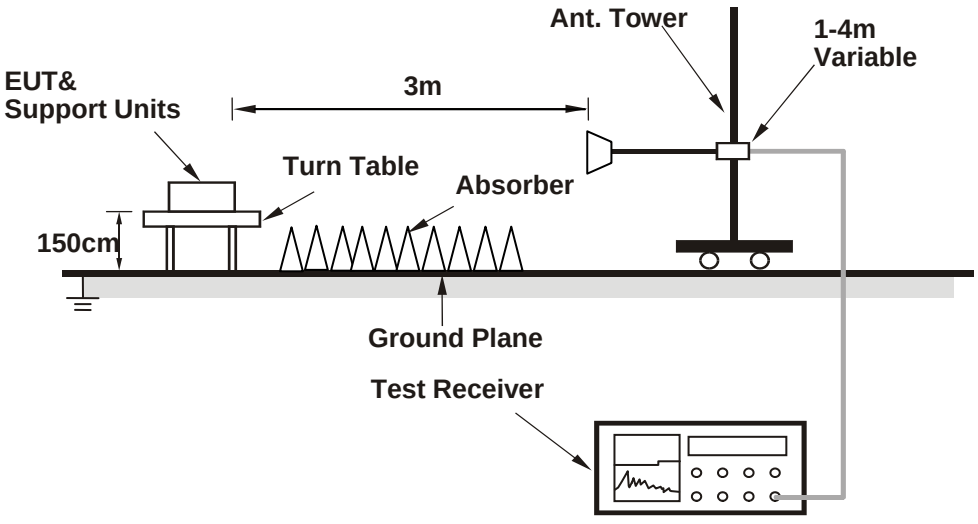
No deviation.

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

1. Connect the EUT with the support units C-E (NOTEBOOK COMPUTER) which is placed on remote site.
2. Controlling software (Mtool 2.0.1.8.msi) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data

CDD Mode

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5022.00	60.5 PK	74.0	-13.5	1.99 H	148	58.78	1.72
2	5022.00	49.5 AV	54.0	-4.5	1.99 H	148	47.78	1.72
3	*5180.00	113.8 PK			2.35 H	124	111.70	2.10
4	*5180.00	103.3 AV			2.35 H	124	101.20	2.10
5	#10360.00	48.4 PK	74.0	-25.6	1.55 H	229	35.41	12.99
6	#10360.00	36.4 AV	54.0	-17.6	1.55 H	229	23.41	12.99
7	15540.00	48.7 PK	74.0	-25.3	1.21 H	186	33.93	14.77
8	15540.00	36.8 AV	54.0	-17.2	1.21 H	186	22.03	14.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5022.00	73.8 PK	74.0	-0.2	1.90 V	166	72.08	1.72
2	5022.00	50.9 AV	54.0	-3.1	1.90 V	166	49.18	1.72
3	*5180.00	117.5 PK			1.90 V	166	115.40	2.10
4	*5180.00	107.0 AV			1.90 V	166	104.90	2.10
5	#10360.00	46.7 PK	74.0	-27.3	1.51 V	180	33.71	12.99
6	#10360.00	34.4 AV	54.0	-19.6	1.51 V	180	21.41	12.99
7	15540.00	49.1 PK	74.0	-24.9	1.48 V	304	34.33	14.77
8	15540.00	36.0 AV	54.0	-18.0	1.48 V	304	21.23	14.77

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5042.00	59.4 PK	74.0	-14.6	2.30 H	140	57.62	1.78
2	5042.00	46.1 AV	54.0	-7.9	2.30 H	140	44.32	1.78
3	*5200.00	106.1 PK			2.30 H	139	103.95	2.15
4	*5200.00	103.8 AV			2.30 H	139	101.65	2.15
5	5350.00	58.4 PK	74.0	-15.6	2.00 H	143	55.87	2.53
6	5350.00	49.1 AV	54.0	-4.9	2.00 H	143	46.57	2.53
7	#10400.00	48.1 PK	74.0	-25.9	1.55 H	228	34.85	13.25
8	#10400.00	36.2 AV	54.0	-17.8	1.55 H	228	22.95	13.25
9	15600.00	49.2 PK	74.0	-24.8	1.23 H	196	34.42	14.78
10	15600.00	37.2 AV	54.0	-16.8	1.23 H	196	22.42	14.78
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	5042.00	62.1 PK	74.0	-11.9	2.30 V	173	60.32	1.78
2	5042.00	51.5 AV	54.0	-2.5	2.30 V	173	49.72	1.78
3	*5200.00	109.8 PK			2.11 V	199	107.65	2.15
4	*5200.00	107.5 AV			2.11 V	199	105.35	2.15
5	5350.00	64.7 PK	74.0	-9.3	2.31 V	4	62.17	2.53
6	**5350.00**	**53.9 AV**	**54.0**	**-0.1**	**2.31 V**	**4**	**51.37**	**2.53**
7	#10400.00	46.4 PK	74.0	-27.6	1.56 V	178	33.15	13.25
8	#10400.00	33.9 AV	54.0	-20.1	1.56 V	178	20.65	13.25
9	15600.00	49.5 PK	74.0	-24.5	1.48 V	289	34.72	14.78
10	15600.00	36.1 AV	54.0	-17.9	1.48 V	289	21.32	14.78

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5081.00	57.7 PK	74.0	-16.3	1.95 H	128	55.83	1.87
2	5081.00	46.4 AV	54.0	-7.6	1.95 H	128	44.53	1.87
3	*5240.00	113.7 PK			2.30 H	138	111.44	2.26
4	*5240.00	104.3 AV			2.30 H	138	102.04	2.26
5	5401.00	59.5 PK	74.0	-14.5	2.03 H	146	56.89	2.61
6	5401.00	48.2 AV	54.0	-5.8	2.03 H	146	45.59	2.61
7	#10480.00	47.9 PK	74.0	-26.1	1.59 H	219	34.63	13.27
8	#10480.00	36.2 AV	54.0	-17.8	1.59 H	219	22.93	13.27
9	15720.00	48.7 PK	74.0	-25.3	1.20 H	187	34.15	14.55
10	15720.00	36.8 AV	54.0	-17.2	1.20 H	187	22.25	14.55
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	5081.00	63.1 PK	74.0	-10.9	2.24 V	175	61.23	1.87
2	5081.00	51.8 AV	54.0	-2.2	2.24 V	175	49.93	1.87
3	*5240.00	118.4 PK			2.10 V	203	116.14	2.26
4	*5240.00	108.0 AV			2.10 V	203	105.74	2.26
5	5401.00	64.9 PK	74.0	-9.1	2.30 V	23	62.29	2.61
6	5401.00	53.6 AV	54.0	-0.4	2.30 V	23	50.99	2.61
7	#10480.00	46.5 PK	74.0	-27.5	1.54 V	184	33.23	13.27
8	#10480.00	34.3 AV	54.0	-19.7	1.54 V	184	21.03	13.27
9	15720.00	49.5 PK	74.0	-24.5	1.54 V	279	34.95	14.55
10	15720.00	36.3 AV	54.0	-17.7	1.54 V	279	21.75	14.55

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 (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5023.00	58.3 PK	74.0	-15.7	2.06 H	135	56.57	1.73
2	5023.00	46.7 AV	54.0	-7.3	2.06 H	135	44.97	1.73
3	5150.00	68.0 PK	74.0	-6.0	2.32 H	128	65.97	2.03
4	5150.00	48.2 AV	54.0	-5.8	2.32 H	128	46.17	2.03
5	*5180.00	115.7 PK			2.32 H	128	113.60	2.10
6	*5180.00	104.3 AV			2.32 H	128	102.20	2.10
7	#10360.00	48.5 PK	74.0	-25.5	1.57 H	223	35.51	12.99
8	#10360.00	36.4 AV	54.0	-17.6	1.57 H	223	23.41	12.99
9	15540.00	48.8 PK	74.0	-25.2	1.21 H	204	34.03	14.77
10	15540.00	36.7 AV	54.0	-17.3	1.21 H	204	21.93	14.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5023.00	63.7 PK	74.0	-10.3	2.49 V	203	61.97	1.73
2	5023.00	52.1 AV	54.0	-1.9	2.49 V	203	50.37	1.73
3	5150.00	73.4 PK	74.0	-0.6	2.12 V	170	71.37	2.03
4	5150.00	53.6 AV	54.0	-0.4	2.12 V	170	51.57	2.03
5	*5180.00	119.4 PK			2.12 V	170	117.30	2.10
6	*5180.00	108.0 AV			2.12 V	170	105.90	2.10
7	#10360.00	46.5 PK	74.0	-27.5	1.60 V	198	33.51	12.99
8	#10360.00	34.2 AV	54.0	-19.8	1.60 V	198	21.21	12.99
9	15540.00	49.7 PK	74.0	-24.3	1.54 V	292	34.93	14.77
10	15540.00	36.5 AV	54.0	-17.5	1.54 V	292	21.73	14.77

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5038.00	54.4 PK	74.0	-19.6	2.02 H	120	52.64	1.76
2	5038.00	44.9 AV	54.0	-9.1	2.02 H	120	43.14	1.76
3	*5200.00	113.1 PK			2.34 H	136	110.95	2.15
4	*5200.00	103.4 AV			2.34 H	136	101.25	2.15
5	5361.00	59.2 PK	74.0	-14.8	2.33 H	139	56.66	2.54
6	5361.00	48.4 AV	54.0	-5.6	2.33 H	139	45.86	2.54
7	#10400.00	48.3 PK	74.0	-25.7	1.60 H	212	35.05	13.25
8	#10400.00	36.1 AV	54.0	-17.9	1.60 H	212	22.85	13.25
9	15600.00	48.2 PK	74.0	-25.8	1.19 H	212	33.42	14.78
10	15600.00	36.3 AV	54.0	-17.7	1.19 H	212	21.52	14.78
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	5038.00	59.8 PK	74.0	-14.2	1.87 V	170	58.04	1.76
2	5038.00	50.3 AV	54.0	-3.7	1.87 V	170	48.54	1.76
3	*5200.00	116.8 PK			2.17 V	193	114.65	2.15
4	*5200.00	107.1 AV			2.17 V	193	104.95	2.15
5	5361.00	64.6 PK	74.0	-9.4	1.87 V	240	62.06	2.54
6	5361.00	53.8 AV	54.0	-0.2	1.87 V	240	51.26	2.54
7	#10400.00	46.8 PK	74.0	-27.2	1.62 V	191	33.55	13.25
8	#10400.00	34.5 AV	54.0	-19.5	1.62 V	191	21.25	13.25
9	15600.00	49.3 PK	74.0	-24.7	1.53 V	292	34.52	14.78
10	15600.00	36.3 AV	54.0	-17.7	1.53 V	292	21.52	14.78

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5077.00	56.0 PK	74.0	-18.0	1.96 H	118	54.14	1.86
2	5077.00	46.4 AV	54.0	-7.6	1.96 H	118	44.54	1.86
3	*5240.00	113.0 PK			2.32 H	145	110.74	2.26
4	*5240.00	102.8 AV			2.32 H	145	100.54	2.26
5	5401.00	56.1 PK	74.0	-17.9	2.28 H	151	53.49	2.61
6	5401.00	47.9 AV	54.0	-6.1	2.28 H	151	45.29	2.61
7	#10480.00	47.9 PK	74.0	-26.1	1.60 H	207	34.63	13.27
8	#10480.00	35.7 AV	54.0	-18.3	1.60 H	207	22.43	13.27
9	15720.00	47.7 PK	74.0	-26.3	1.22 H	206	33.15	14.55
10	15720.00	35.8 AV	54.0	-18.2	1.22 H	206	21.25	14.55
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	5077.00	61.2 PK	74.0	-12.8	1.46 V	37	59.34	1.86
2	5077.00	51.5 AV	54.0	-2.5	1.46 V	37	49.64	1.86
3	*5240.00	116.7 PK			1.71 V	146	114.44	2.26
4	*5240.00	106.5 AV			1.71 V	146	104.24	2.26
5	5401.00	61.5 PK	74.0	-12.5	1.79 V	222	58.89	2.61
6	5401.00	53.3 AV	54.0	-0.7	1.79 V	222	50.69	2.61
7	#10480.00	46.5 PK	74.0	-27.5	1.66 V	189	33.23	13.27
8	#10480.00	34.0 AV	54.0	-20.0	1.66 V	189	20.73	13.27
9	15720.00	48.6 PK	74.0	-25.4	1.51 V	285	34.05	14.55
10	15720.00	35.8 AV	54.0	-18.2	1.51 V	285	21.25	14.55

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 (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.4 PK	74.0	-6.6	2.28 H	156	65.37	2.03
2	5150.00	47.9 AV	54.0	-6.1	2.28 H	156	45.87	2.03
3	*5190.00	110.6 PK			2.36 H	161	108.48	2.12
4	*5190.00	99.2 AV			2.36 H	161	97.08	2.12
5	#10380.00	47.5 PK	74.0	-26.5	1.59 H	194	34.38	13.12
6	#10380.00	35.2 AV	54.0	-18.8	1.59 H	194	22.08	13.12
7	15570.00	47.9 PK	74.0	-26.1	1.20 H	214	33.12	14.78
8	15570.00	35.9 AV	54.0	-18.1	1.20 H	214	21.12	14.78
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	72.6 PK	74.0	-1.4	1.96 V	206	70.57	2.03
2	5150.00	53.1 AV	54.0	-0.9	1.96 V	206	51.07	2.03
3	*5190.00	114.4 PK			1.96 V	206	112.28	2.12
4	*5190.00	102.7 AV			1.96 V	206	100.58	2.12
5	#10380.00	46.5 PK	74.0	-27.5	1.66 V	204	33.38	13.12
6	#10380.00	34.0 AV	54.0	-20.0	1.66 V	204	20.88	13.12
7	15570.00	48.5 PK	74.0	-25.5	1.56 V	284	33.72	14.78
8	15570.00	35.4 AV	54.0	-18.6	1.56 V	284	20.62	14.78

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.8 PK	74.0	-9.2	1.94 H	126	62.77	2.03
2	5150.00	48.4 AV	54.0	-5.6	1.94 H	126	46.37	2.03
3	*5230.00	116.8 PK			2.30 H	152	114.56	2.24
4	*5230.00	104.5 AV			2.30 H	152	102.26	2.24
5	5350.00	58.6 PK	74.0	-15.4	2.33 H	150	56.07	2.53
6	5350.00	46.9 AV	54.0	-7.1	2.33 H	150	44.37	2.53
7	#10460.00	47.7 PK	74.0	-26.3	1.58 H	208	34.44	13.26
8	#10460.00	35.4 AV	54.0	-18.6	1.58 H	208	22.14	13.26
9	15690.00	48.3 PK	74.0	-25.7	1.16 H	208	33.70	14.60
10	15690.00	36.2 AV	54.0	-17.8	1.16 H	208	21.60	14.60
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	5150.00	69.6 PK	74.0	-4.4	1.91 V	206	67.57	2.03
2	5150.00	53.2 AV	54.0	-0.8	1.91 V	206	51.17	2.03
3	*5230.00	120.4 PK			1.91 V	206	118.16	2.24
4	*5230.00	108.5 AV			1.91 V	206	106.26	2.24
5	5350.00	63.8 PK	74.0	-10.2	1.91 V	174	61.27	2.53
6	5350.00	52.1 AV	54.0	-1.9	1.91 V	174	49.57	2.53
7	#10460.00	46.5 PK	74.0	-27.5	1.71 V	195	33.24	13.26
8	#10460.00	34.1 AV	54.0	-19.9	1.71 V	195	20.84	13.26
9	15690.00	48.8 PK	74.0	-25.2	1.52 V	293	34.20	14.60
10	15690.00	35.9 AV	54.0	-18.1	1.52 V	293	21.30	14.60

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.3 PK	74.0	-6.7	2.35 H	163	65.27	2.03
2	5150.00	48.7 AV	54.0	-5.3	2.35 H	163	46.67	2.03
3	*5210.00	102.8 PK			2.36 H	160	100.62	2.18
4	*5210.00	91.3 AV			2.36 H	160	89.12	2.18
5	5350.00	52.5 PK	74.0	-21.5	1.97 H	136	49.97	2.53
6	5350.00	39.4 AV	54.0	-14.6	1.97 H	136	36.87	2.53
7	#10420.00	48.1 PK	74.0	-25.9	1.53 H	200	34.85	13.25
8	#10420.00	35.5 AV	54.0	-18.5	1.53 H	200	22.25	13.25
9	15630.00	48.5 PK	74.0	-25.5	1.22 H	220	33.78	14.72
10	15630.00	36.6 AV	54.0	-17.4	1.22 H	220	21.88	14.72
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	72.6 PK	74.0	-1.4	1.54 V	299	70.57	2.03
2	5150.00	53.8 AV	54.0	-0.2	1.54 V	299	51.77	2.03
3	*5210.00	106.5 PK			1.54 V	299	104.32	2.18
4	*5210.00	95.0 AV			1.54 V	299	92.82	2.18
5	5350.00	57.6 PK	74.0	-16.4	1.54 V	299	55.07	2.53
6	5350.00	44.5 AV	54.0	-9.5	1.54 V	299	41.97	2.53
7	#10420.00	46.4 PK	74.0	-27.6	1.70 V	206	33.15	13.25
8	#10420.00	34.2 AV	54.0	-19.8	1.70 V	206	20.95	13.25
9	15630.00	49.1 PK	74.0	-24.9	1.56 V	305	34.38	14.72
10	15630.00	36.4 AV	54.0	-17.6	1.56 V	305	21.68	14.72

REMARKS:

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

Below 1GHz Data

CDD Mode

802.11ac (VHT40)

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 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	132.04	33.6 QP	43.5	-9.9	2.00 H	287	47.58	-14.00
2	167.69	34.9 QP	43.5	-8.6	2.00 H	105	48.27	-13.38
3	210.86	33.5 QP	43.5	-10.0	1.00 H	250	49.56	-16.02
4	374.98	29.6 QP	46.0	-16.4	1.00 H	192	39.60	-9.98
5	479.98	30.3 QP	46.0	-15.7	2.00 H	93	37.59	-7.28
6	750.03	35.6 QP	46.0	-10.4	1.00 H	12	36.80	-1.21
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	179.23	31.3 QP	43.5	-12.2	1.50 V	322	45.68	-14.36
2	211.29	30.8 QP	43.5	-12.7	1.00 V	254	46.81	-16.01
3	276.48	25.1 QP	46.0	-20.9	2.00 V	266	37.85	-12.78
4	374.98	25.3 QP	46.0	-20.7	1.50 V	353	35.25	-9.98
5	480.03	26.0 QP	46.0	-20.0	1.50 V	166	33.26	-7.28
6	749.98	33.2 QP	46.0	-12.8	1.00 V	0	34.40	-1.21

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.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 06, 2015	May 05, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: July 15, 2015

4.2.3 Test Procedure

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

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

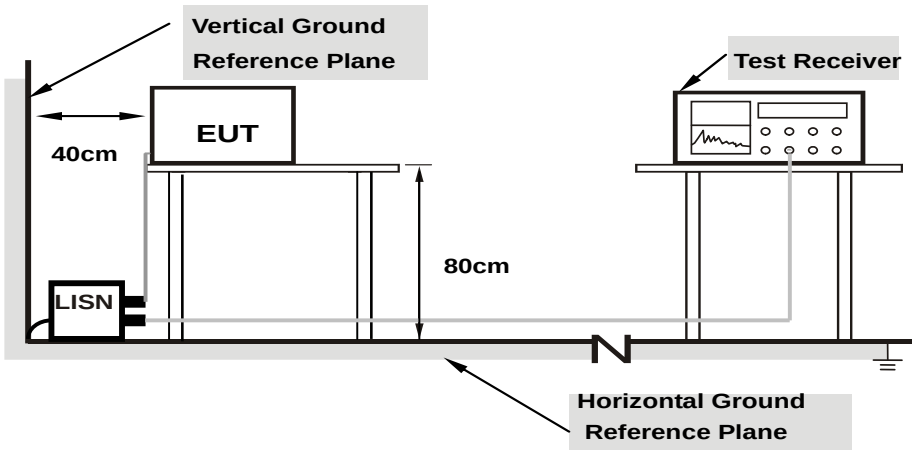
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: 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.

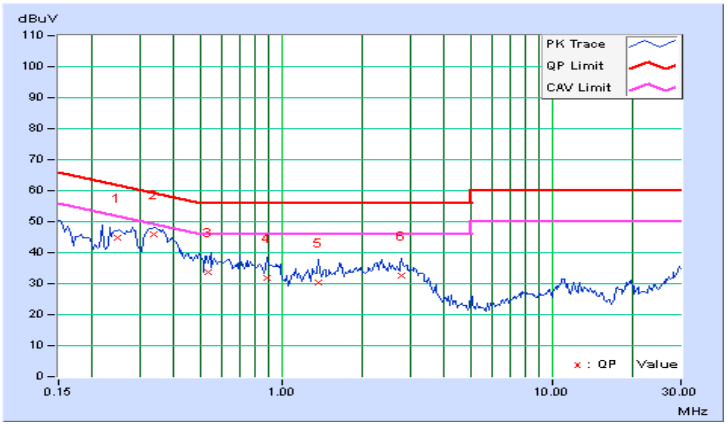
4.2.7 Test Results

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.24844	0.09	44.58	37.50	44.67	37.59	61.81	51.81	-17.14	-14.22
2	0.33757	0.10	45.87	36.88	45.97	36.98	59.26	49.26	-13.30	-12.29
3	0.53561	0.11	33.63	24.87	33.74	24.98	56.00	46.00	-22.26	-21.02
4	0.88833	0.12	31.66	23.02	31.78	23.14	56.00	46.00	-24.22	-22.86
5	1.36332	0.14	30.41	23.52	30.55	23.66	56.00	46.00	-25.45	-22.34
6	2.77356	0.19	32.38	26.77	32.57	26.96	56.00	46.00	-23.43	-19.04

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

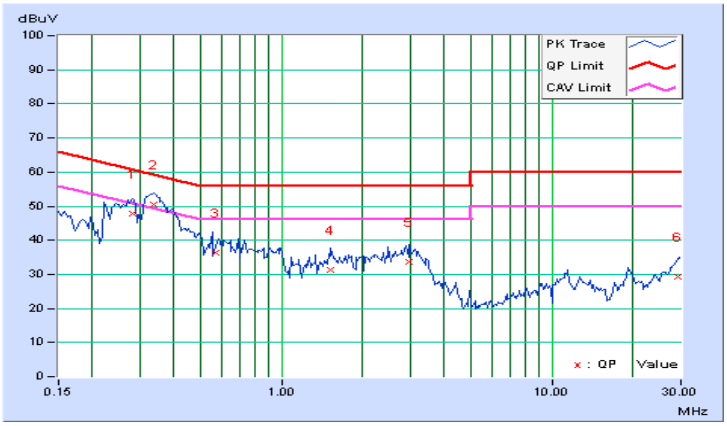


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.28281	0.09	47.78	37.82	47.87	37.91	60.73	50.73	-12.86	-12.82
2	**0.33750**	**0.09**	**50.55**	**42.02**	**50.64**	**42.11**	**59.26**	**49.26**	**-8.62**	**-7.15**
3	0.57212	0.11	36.41	29.22	36.52	29.33	56.00	46.00	-19.48	-16.67
4	1.52734	0.15	31.24	24.73	31.39	24.88	56.00	46.00	-24.61	-21.12
5	2.95703	0.20	33.38	27.69	33.58	27.89	56.00	46.00	-22.42	-18.11
6	29.13672	0.96	28.37	23.29	29.33	24.25	60.00	50.00	-30.67	-25.75

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 Measurment

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

CDD Mode

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11a								
36	5180	21.02	21.53	21.98	426.468	26.30	30	Pass
40	5200	20.77	21.67	22.15	430.351	26.34	30	Pass
48	5240	21.15	21.77	21.92	436.228	26.40	30	Pass
802.11ac (VHT20)								
36	5180	20.65	21.91	22.17	436.2	26.40	30	Pass
40	5200	21.02	21.78	22.03	436.723	26.40	30	Pass
48	5240	21.04	21.59	21.93	427.224	26.31	30	Pass
802.11ac (VHT40)								
38	5190	18.64	18.96	19.53	241.562	23.83	30	Pass
46	5230	24.40	24.71	25.01	888.181	29.49	30	Pass
802.11ac (VHT80)								
42	5210	19.92	19.81	19.97	293.206	24.67	30	Pass

Beamforming Mode

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11ac (VHT20)								
36	5180	19.90	21.15	21.32	363.56	25.61	30	Pass
40	5200	20.57	21.33	21.58	393.736	25.95	30	Pass
48	5240	20.66	21.21	21.45	388.18	25.89	30	Pass
802.11ac (VHT40)								
38	5190	17.10	17.42	18.02	169.881	22.30	30	Pass
46	5230	23.20	23.54	23.80	674.757	28.29	30	Pass
802.11ac (VHT80)								
42	5210	18.65	18.57	18.72	219.7	23.42	30	Pass

Note: Directional gain = 0.3dBi + 10log(3) = 5.67dBi < 6dBi , so the power limit shall not be reduced.

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 802.11a, 802.11ac (VHT20) & 802.11ac (VHT40)

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, 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

For 802.11ac (VHT80)

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, 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)

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

CDD Mode

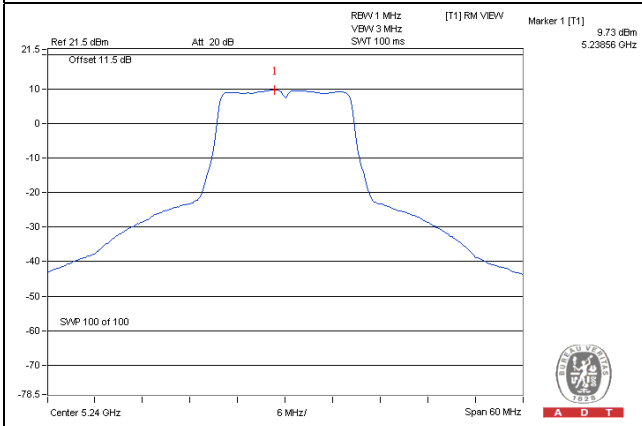
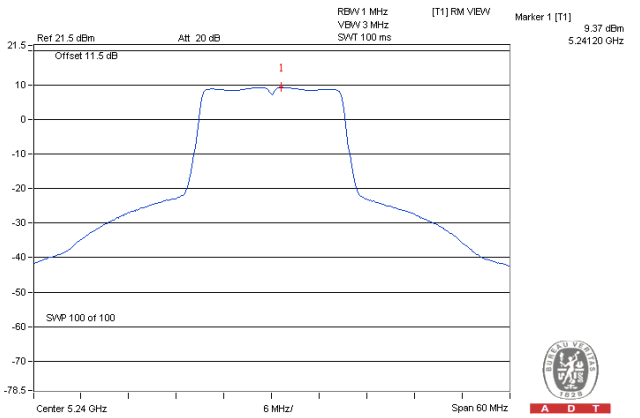
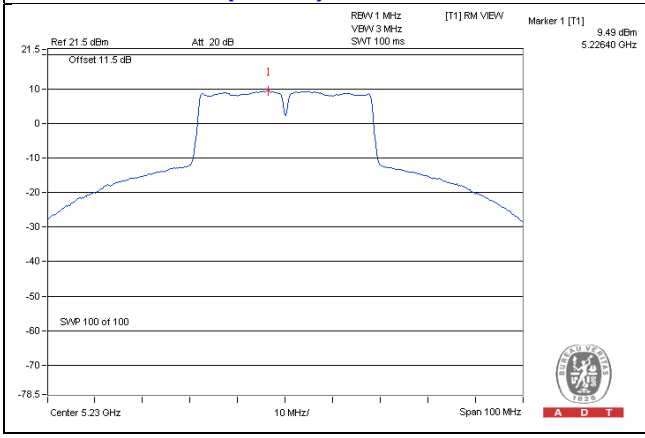
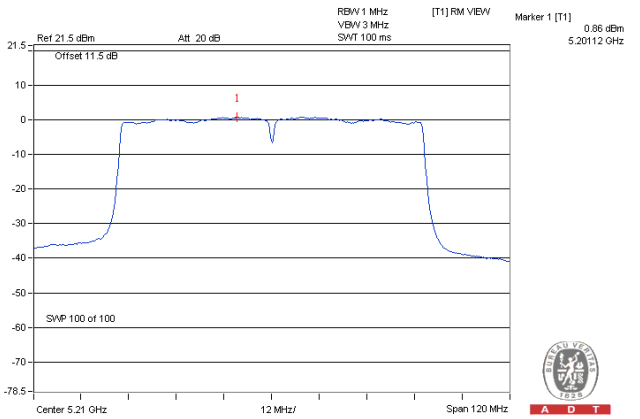
Chan.	Chan. Freq. (MHz)	PSD (dBm)			Total Power Density (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
802.11a							
36	5180	8.21	8.46	9.29	13.45	17	Pass
40	5200	8.48	8.84	9.51	13.74	17	Pass
48	5240	8.86	9.10	9.71	14.01	17	Pass
802.11ac (VHT20)							
36	5180	8.08	8.35	9.11	13.31	17	Pass
40	5200	8.09	8.42	9.01	13.29	17	Pass
48	5240	8.49	8.78	9.37	13.67	17	Pass
802.11ac (VHT40)							
38	5190	2.48	2.92	3.65	7.81	17	Pass
46	5230	8.51	9.02	9.49	13.80	17	Pass

Chan.	Chan. Freq. (MHz)	PSD w/o duty factor (dBm)			Duty Factor (dB)	Total PSD with Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11ac (VHT80)								
42	5210	-0.95	-0.23	0.86	0.30	5.03	17	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 0.9dBi + 10log(3) = 5.67dBi < 6dBi , so the power limit shall not be reduced.

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

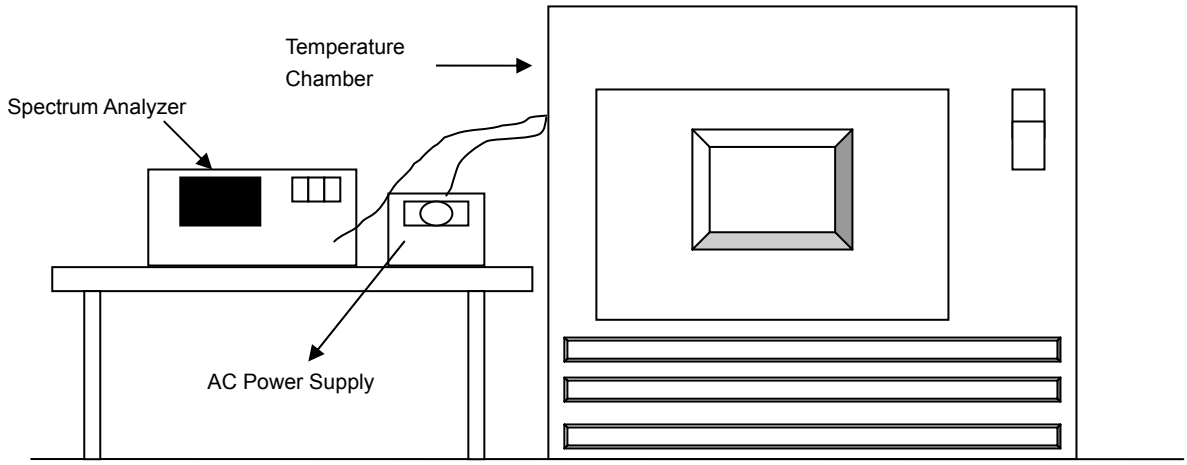
Spectrum Plot of Worst Value	
802.11a – Chain 2: CH 48	**802.11ac (VHT20) – Chain 2: CH 48**
	
802.11ac (VHT40) – Chain 2: CH 46	**802.11ac (VHT80) – Chain 2: CH 42**
	

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

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

4.5.5 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

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5240MHz									
TEMP. (℃)	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	5239.9945	-0.00010	5239.9926	-0.00014	5239.9965	-0.00007	5239.9951	-0.00009
40	120	5240.0061	0.00012	5240.0025	0.00005	5240.007	0.00013	5240.0029	0.00006
30	120	5239.9958	-0.00008	5239.9962	-0.00007	5239.9962	-0.00007	5240.0005	0.00001
20	120	5240.0143	0.00027	5240.0127	0.00024	5240.0132	0.00025	5240.0122	0.00023
10	120	5240.0088	0.00017	5240.0104	0.00020	5240.0113	0.00022	5240.012	0.00023
0	120	5240.0117	0.00022	5240.0128	0.00024	5240.0096	0.00018	5240.0091	0.00017
-10	120	5240.0027	0.00005	5240.0003	0.00001	5239.9992	-0.00002	5240.0033	0.00006
-20	120	5240.0201	0.00038	5240.0215	0.00041	5240.0198	0.00038	5240.0211	0.00040
-30	120	5240.0186	0.00035	5240.0163	0.00031	5240.0181	0.00035	5240.017	0.00032

FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5240MHz									
TEMP. (℃)	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	5240.0133	0.00025	5240.0135	0.00026	5240.0133	0.00025	5240.0123	0.00023
	120	5240.0143	0.00027	5240.0127	0.00024	5240.0132	0.00025	5240.0122	0.00023
	102	5240.015	0.00029	5240.0123	0.00023	5240.0136	0.00026	5240.0114	0.00022

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 Lab/Telecom Lab
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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