

FCC Test Report

Report No.: RF140710C17D-1

FCC ID: PY314200260

Test Model: C6300BD

Received Date: July 14, 2015

Test Date: Aug. 17 to 19, 2015

Issued Date: Sep. 10, 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
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Test Location (3): E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
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A D T

Release Control Record

Issue No.	Description	Date Issued
RF140710C17D-1	Original release.	Sep. 10, 2015



A D T

1 Certificate of Conformity

Product: Wireless Cable Data Gateway

Brand: NETGEAR

Test Model: C6300BD

Sample Status: ENGINEERING SAMPLE

Applicant: NETGEAR, INC.

Test Date: Aug. 17 to 19, 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: Sep. 10, 2015

Midoli Peng / Specialist

Approved by :

Date: Sep. 10, 2015

May Chen / 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) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5863.00MHz, 5904.00MHz, 5725.00MHz, 5711.00MHz & 5904.00MHz.
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.

Note: This report is prepared for FCC Class II change. (U-NII-3 band: upgrade the standard to section 15.407)

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) (±)
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	Wireless Cable Data Gateway
Brand	NETGEAR
Test Model	C6300BD
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	For 15.407 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.5~5.7GHz 5.745 ~ 5.825GHz
	For 15.247 2.412 ~ 2.462GHz
Number of Channel	For 15.407 24 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 11 for 802.11n (HT40), 802.11ac (VHT40) 5 for 802.11ac (VHT80)
	For 15.247 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	For 15.407 (U-NII-3 band) CDD Mode: 802.11a: 243.142mW Beamforming Mode: 802.11ac (VHT20): 218.617mW 802.11ac (VHT40): 172.345mW 802.11ac (VHT80): 98.203mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II change. The differences between them are as below information:
 - ◆ Upgrade the standard to section 15.407 under new rule for U-NII-3 band.
2. According to above conditions, all test items of U-NII-3 band test item need to be performed, except for AC power conducted emission test item. And all data was verified to meet the requirements.
3. The antennas provided to the EUT, please refer to the following table:

For 2.4GHz used						
Ant. No.	Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi)	Connector type
1	Chain (0)	Master Wave	98P92UIPF030	PCB	2	I-PEX
2	Chain (1)		98P92UIPF031		2	
3	Chain (2)		98P92UIPF033		2	
For 5GHz used						
Ant. No.	Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi)	Connector type
4	Chain (0)	Master Wave	98P92UIPF033	PCB	2	I-PEX
5	Chain (1)		98P92UIPF034		2	
6	Chain (2)		98P92UIPF034		2	

4. The EUT could be supplied with a power adapter and following two different models could be chosen as following table:

No.	Brand	Model No.	P/N No.	Spec.
1	Netgear	2AAF042F	332-10618-01	AC I/P: 100-240V, 1.5A, 50/60Hz DC O/P: 12V, 3.5A DC output cable (Unshielded, 1.8m)
2	Netgear	AD898F20	332-10613-01	AC I/P: 100-240V, 1A, 50/60Hz DC O/P: 12V, 3.5A DC output cable (Unshielded, 1.8m)

5. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX FUNCTION	
802.11b	1 ~ 11Mbps	3TX	3RX
802.11g	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
5GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX FUNCTION	
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)	MCS0~8 Nss= 1	3TX	3RX
	MCS0~8 Nss= 2	3TX	3RX
	MCS0~9 Nss= 3	3TX	3RX
802.11ac (VHT40)	MCS0~9 Nss= 1	3TX	3RX
	MCS0~9 Nss= 2	3TX	3RX
	MCS0~9 Nss= 3	3TX	3RX
802.11ac (VHT80)	MCS0~9 Nss= 1	3TX	3RX
	MCS0~9 Nss= 2	3TX	3RX
	MCS0~9 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)

6. The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
7. The above EUT information was declared by the 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 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	-	√	With adapter 1 / EUT (Y-plane)

Where **RE≥1G**: Radiated Emission above 1GHz

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE:

1. The test mode was reference to the worst case in the original test report.

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.

CDD Mode						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
Beamforming Mode						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

- ☒ Following channel(s) was (were) selected for the final test as listed below.

Beamforming Mode						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT20)	5745-5825	149 to 165	149	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

CDD Mode						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
Beamforming Mode						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	22deg. C, 67%RH	120Vac, 60Hz	Weiwei Lo
RE<1G	22deg. C, 68%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

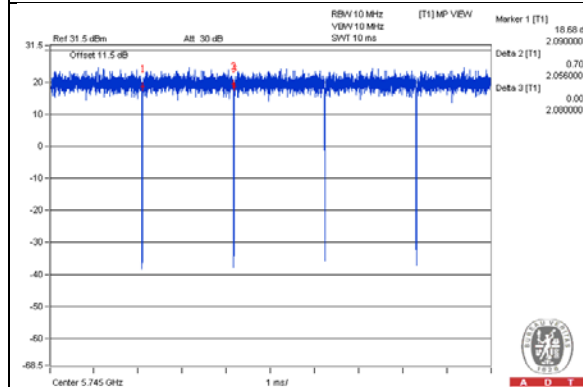
802.11a: Duty cycle = $2.056 \text{ ms} / 2.08 \text{ ms} = 0.988$

802.11ac (VHT20): Duty cycle = $1.914 \text{ ms} / 1.937 \text{ ms} = 0.988$

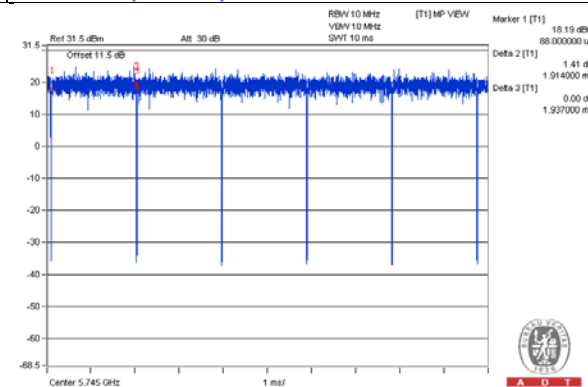
802.11ac (VHT40): Duty cycle = $0.936 \text{ ms} / 0.973 \text{ ms} = 0.962$, Duty factor = $10 * \log(1/0.962) = 0.17$

802.11ac (VHT80): Duty cycle = $0.454 \text{ ms} / 0.496 \text{ ms} = 0.915$, Duty factor = $10 * \log(1/0.915) = 0.38$

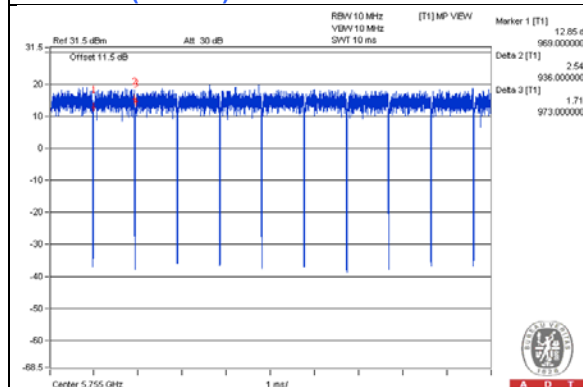
802.11a



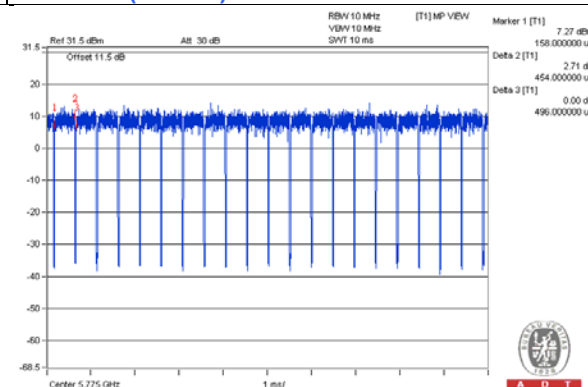
802.11ac (VHT20)



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.

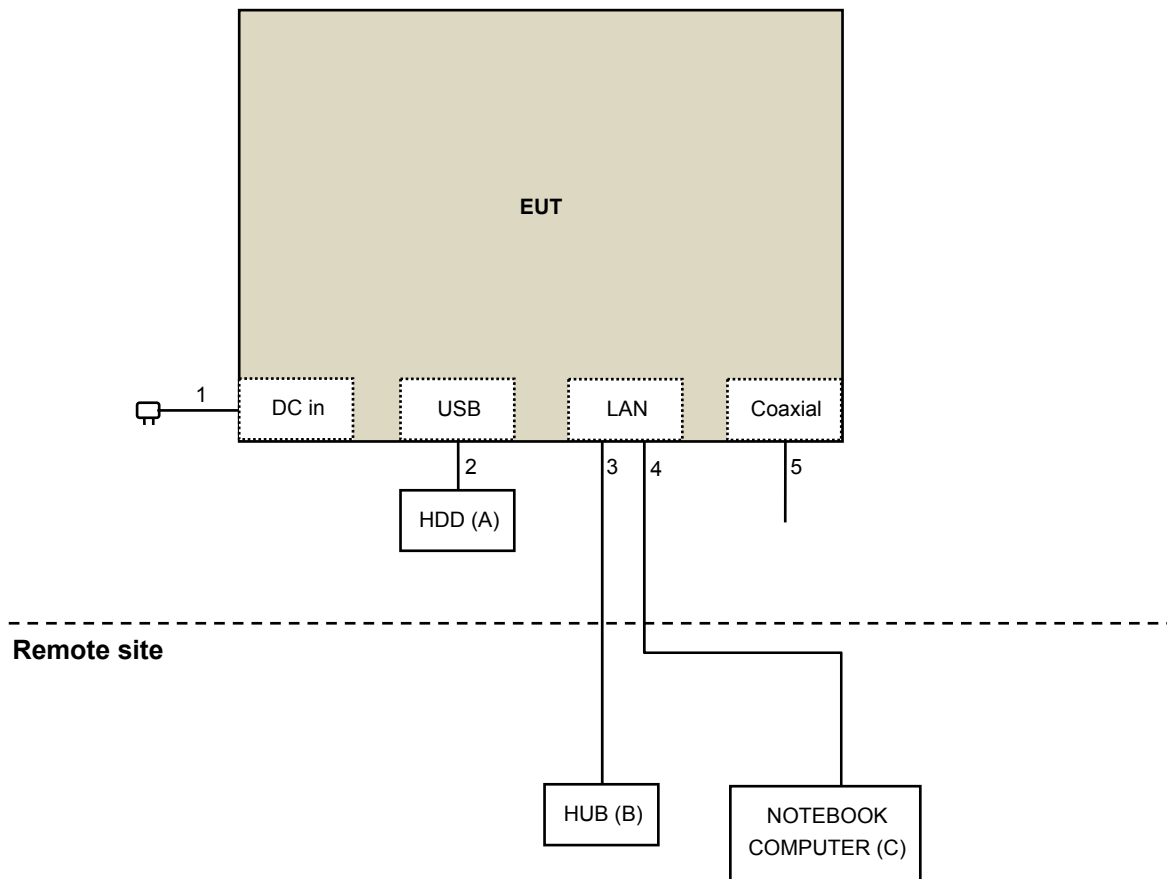
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	HDD	WD	WDBACW0010HBK-SESN	WCAZAL625787	FCC DoC	Provided by Lab
B	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
C	NOTEBOOK COMPUTER	DELL	PP32LA	GSLB32S	FCC DoC	Provided by Lab

NOTE:

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

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC	1	1.8	No	0	Supplied by client
2	USB 3.0	1	1	Yes	0	Provided by Lab
3	RJ45	3	10	No	0	Provided by Lab
4	RJ45	1	10	No	0	Provided by Lab
5	Coaxial	1	10	No	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.

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 v01	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.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210105	July 24, 2015	July 23, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	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-S P-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.
7. Tested Date: Aug. 17 to 19, 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:

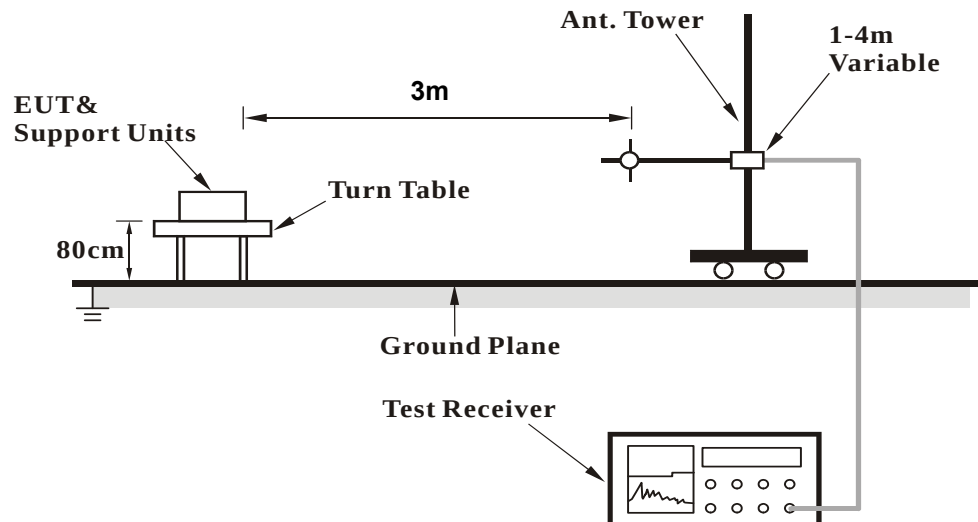
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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 ($10 \log(1/\text{duty cycle})$).
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

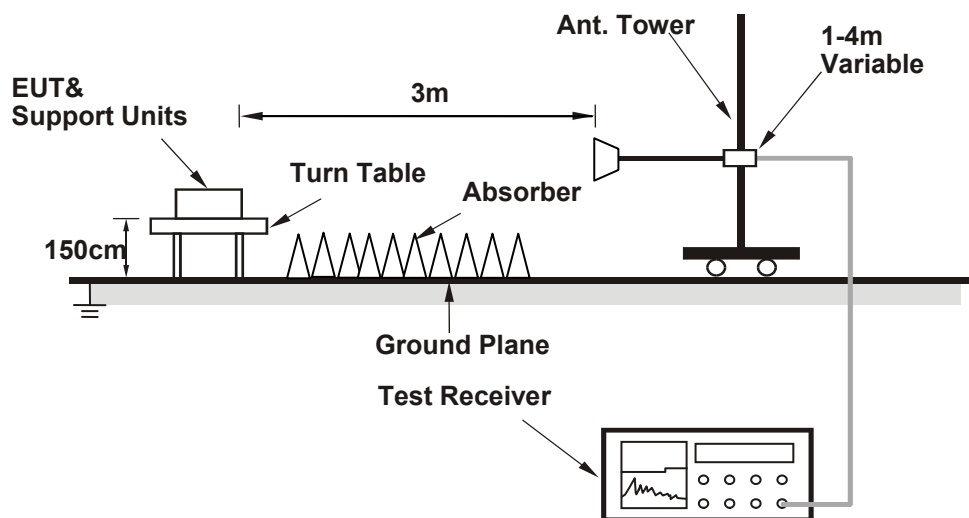
No deviation.

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

1. Placed the EUT on testing table.
2. Prepared computer system (support unit C) to act as communication partner.
3. The communication partner ran test program "Mtool.exe[v2.0.1.1]" to enable EUT under transmission/receiving condition continuously.

4.1.7 Test Results

Above 1GHz Data

CDD Mode

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	#5663.00	65.1 PK	68.2	-3.1	1.54 H	278	53.78	11.32
2	#5715.00	68.1 PK	74.0	-5.9	1.51 H	250	56.57	11.53
3	#5715.00	45.5 AV	54.0	-8.5	1.51 H	250	33.97	11.53
4	#5725.00	75.5 PK	78.2	-2.7	1.51 H	250	63.95	11.55
5	*5745.00	114.1 PK			1.51 H	250	102.47	11.63
6	*5745.00	103.1 AV			1.51 H	250	91.47	11.63
7	#5903.00	62.6 PK	68.2	-5.6	1.48 H	301	50.86	11.74
8	11490.00	53.5 PK	74.0	-20.5	1.42 H	221	36.20	17.30
9	11490.00	40.0 AV	54.0	-14.0	1.42 H	221	22.70	17.30
10	#17235.00	58.9 PK	74.0	-15.1	1.58 H	105	32.09	26.81
11	#17235.00	45.6 AV	54.0	-8.4	1.58 H	105	18.79	26.81
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	#5663.00	67.4 PK	68.2	-0.8	1.98 V	111	56.08	11.32
2	#5715.00	72.6 PK	74.0	-1.4	1.70 V	122	61.07	11.53
3	#5715.00	50.5 AV	54.0	-3.5	1.70 V	122	38.97	11.53
4	#5725.00	77.6 PK	78.2	-0.6	1.70 V	122	66.05	11.55
5	*5745.00	117.8 PK			1.70 V	122	106.17	11.63
6	*5745.00	107.3 AV			1.70 V	122	95.67	11.63
7	#5903.00	65.8 PK	68.2	-2.4	1.83 V	116	54.06	11.74
8	11490.00	53.8 PK	74.0	-20.2	1.15 V	247	36.50	17.30
9	11490.00	40.5 AV	54.0	-13.5	1.15 V	247	23.20	17.30
10	#17235.00	58.9 PK	74.0	-15.1	1.38 V	235	32.09	26.81
11	#17235.00	46.2 AV	54.0	-7.8	1.38 V	235	19.39	26.81

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": 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	#5703.00	63.4 PK	68.2	-4.8	1.53 H	267	51.92	11.48
2	*5785.00	114.2 PK			1.48 H	254	102.46	11.74
3	*5785.00	103.2 AV			1.48 H	254	91.46	11.74
4	#5850.00	58.7 PK	78.2	-19.5	1.48 H	254	46.95	11.75
5	#5863.00	63.9 PK	68.2	-4.3	1.44 H	303	52.15	11.75
6	11570.00	53.6 PK	74.0	-20.4	1.42 H	225	35.69	17.91
7	11570.00	40.3 AV	54.0	-13.7	1.42 H	225	22.39	17.91
8	#17355.00	59.0 PK	74.0	-15.0	1.58 H	99	31.86	27.14
9	#17355.00	45.6 AV	54.0	-8.4	1.58 H	99	18.46	27.14

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5703.00	67.2 PK	68.2	-1.0	1.92 V	116	55.72	11.48
2	*5785.00	118.0 PK			1.74 V	124	106.26	11.74
3	*5785.00	107.3 AV			1.74 V	124	95.56	11.74
4	#5850.00	62.2 PK	78.2	-16.0	1.74 V	124	50.45	11.75
5	#5863.00	68.1 PK	68.2	-0.1	1.76 V	117	56.35	11.75
6	11570.00	54.2 PK	74.0	-19.8	1.16 V	251	36.29	17.91
7	11570.00	40.8 AV	54.0	-13.2	1.16 V	251	22.89	17.91
8	#17355.00	58.5 PK	74.0	-15.5	1.37 V	233	31.36	27.14
9	#17355.00	46.0 AV	54.0	-8.0	1.37 V	233	18.86	27.14

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
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	113.3 PK			1.43 H	248	101.52	11.78
2	*5825.00	103.0 AV			1.43 H	248	91.22	11.78
3	#5850.00	63.9 PK	78.2	-14.3	1.43 H	248	52.15	11.75
4	#5904.00	64.0 PK	68.2	-4.2	1.46 H	315	52.25	11.75
5	11650.00	53.4 PK	74.0	-20.6	1.44 H	234	35.24	18.16
6	11650.00	40.3 AV	54.0	-13.7	1.44 H	234	22.14	18.16
7	#17475.00	58.7 PK	74.0	-15.3	1.62 H	92	30.78	27.92
8	#17475.00	45.5 AV	54.0	-8.5	1.62 H	92	17.58	27.92
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	117.5 PK			1.97 V	115	105.72	11.78
2	*5825.00	107.1 AV			1.97 V	115	95.32	11.78
3	#5850.00	67.7 PK	78.2	-10.5	1.97 V	115	55.95	11.75
4	#5904.00	68.1 PK	68.2	-0.1	1.63 V	117	56.35	11.75
5	11650.00	54.3 PK	74.0	-19.7	1.11 V	243	36.14	18.16
6	11650.00	41.0 AV	54.0	-13.0	1.11 V	243	22.84	18.16
7	#17475.00	58.7 PK	74.0	-15.3	1.39 V	245	30.78	27.92
8	#17475.00	46.3 AV	54.0	-7.7	1.39 V	245	18.38	27.92

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.

Beamforming Mode

802.11ac (VHT20)

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	#5666.00	63.9 PK	68.2	-4.3	1.42 H	300	52.55	11.35
2	#5715.00	66.7 PK	74.0	-7.3	1.39 H	233	55.17	11.53
3	#5715.00	47.2 AV	54.0	-6.8	1.39 H	233	35.67	11.53
4	#5725.00	73.6 PK	78.2	-4.6	1.41 H	260	62.05	11.55
5	*5745.00	114.2 PK			1.39 H	233	102.57	11.63
6	*5745.00	102.6 AV			1.39 H	233	90.97	11.63
7	11490.00	53.8 PK	74.0	-20.2	1.39 H	220	36.50	17.30
8	11490.00	40.5 AV	54.0	-13.5	1.39 H	220	23.20	17.30
9	#17235.00	58.5 PK	74.0	-15.5	1.57 H	91	31.69	26.81
10	#17235.00	45.1 AV	54.0	-8.9	1.57 H	91	18.29	26.81
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	#5666.00	68.0 PK	68.2	-0.2	1.74 V	114	56.65	11.35
2	#5715.00	71.0 PK	74.0	-3.0	1.94 V	114	59.47	11.53
3	#5715.00	50.7 AV	54.0	-3.3	1.94 V	114	39.17	11.53
4	#5725.00	78.1 PK	78.2	-0.1	1.88 V	112	66.55	11.55
5	*5745.00	118.5 PK			1.94 V	114	106.87	11.63
6	*5745.00	106.7 AV			1.94 V	114	95.07	11.63
7	11490.00	54.4 PK	74.0	-19.6	1.07 V	250	37.10	17.30
8	11490.00	41.2 AV	54.0	-12.8	1.07 V	250	23.90	17.30
9	#17235.00	58.7 PK	74.0	-15.3	1.37 V	246	31.89	26.81
10	#17235.00	46.2 AV	54.0	-7.8	1.37 V	246	19.39	26.81

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": 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	#5711.00	63.9 PK	68.2	-4.3	1.36 H	232	52.39	11.51
2	*5785.00	113.9 PK			1.36 H	232	102.16	11.74
3	*5785.00	102.1 AV			1.36 H	232	90.36	11.74
4	#5850.00	63.1 PK	78.2	-15.1	1.36 H	232	51.35	11.75
5	#5863.00	63.3 PK	68.2	-4.9	1.48 H	299	51.55	11.75
6	11570.00	53.6 PK	74.0	-20.4	1.37 H	222	35.69	17.91
7	11570.00	40.4 AV	54.0	-13.6	1.37 H	222	22.49	17.91
8	#17355.00	58.6 PK	74.0	-15.4	1.63 H	82	31.46	27.14
9	#17355.00	45.5 AV	54.0	-8.5	1.63 H	82	18.36	27.14

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5711.00	68.1 PK	68.2	-0.1	1.76 V	113	56.59	11.51
2	*5785.00	118.1 PK			1.75 V	126	106.36	11.74
3	*5785.00	106.2 AV			1.75 V	126	94.46	11.74
4	#5850.00	67.4 PK	78.2	-10.8	1.75 V	113	55.65	11.75
5	#5863.00	67.4 PK	68.2	-0.8	1.90 V	126	55.65	11.75
6	11570.00	53.7 PK	74.0	-20.3	1.07 V	234	35.79	17.91
7	11570.00	40.8 AV	54.0	-13.2	1.07 V	234	22.89	17.91
8	#17355.00	58.7 PK	74.0	-15.3	1.33 V	249	31.56	27.14
9	#17355.00	46.5 AV	54.0	-7.5	1.33 V	249	19.36	27.14

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
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	112.8 PK			1.33 H	236	101.02	11.78
2	*5825.00	100.8 AV			1.33 H	236	89.02	11.78
3	#5850.00	65.3 PK	78.2	-12.9	1.33 H	236	53.55	11.75
4	#5904.00	63.8 PK	68.2	-4.4	1.33 H	236	52.05	11.75
5	11650.00	53.1 PK	74.0	-20.9	1.33 H	229	34.94	18.16
6	11650.00	40.2 AV	54.0	-13.8	1.33 H	229	22.04	18.16
7	#17475.00	58.8 PK	74.0	-15.2	1.69 H	93	30.88	27.92
8	#17475.00	45.6 AV	54.0	-8.4	1.69 H	93	17.68	27.92
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	117.0 PK			1.65 V	106	105.22	11.78
2	*5825.00	104.9 AV			1.65 V	106	93.12	11.78
3	#5850.00	69.5 PK	78.2	-8.7	1.80 V	125	57.75	11.75
4	#5904.00	68.1 PK	68.2	-0.1	1.80 V	125	56.35	11.75
5	11650.00	54.4 PK	74.0	-19.6	1.03 V	236	36.24	18.16
6	11650.00	41.2 AV	54.0	-12.8	1.03 V	236	23.04	18.16
7	#17475.00	58.1 PK	74.0	-15.9	1.35 V	242	30.18	27.92
8	#17475.00	46.0 AV	54.0	-8.0	1.35 V	242	18.08	27.92

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 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	#5715.00	63.8 PK	68.2	-4.4	1.28 H	230	52.27	11.53
2	#5725.00	73.2 PK	78.2	-5.0	1.28 H	230	61.65	11.55
3	*5755.00	109.3 PK			1.28 H	230	97.66	11.64
4	*5755.00	98.2 AV			1.28 H	230	86.56	11.64
5	#5850.00	59.7 PK	78.2	-18.5	1.28 H	230	47.95	11.75
6	#5919.00	58.2 PK	74.0	-15.8	1.45 H	118	46.37	11.83
7	#5919.00	47.4 AV	54.0	-6.6	1.45 H	118	35.57	11.83
8	11510.00	53.4 PK	74.0	-20.6	1.33 H	243	36.10	17.30
9	11510.00	40.6 AV	54.0	-13.4	1.33 H	243	23.30	17.30
10	#17265.00	58.6 PK	74.0	-15.4	1.74 H	80	31.89	26.71
11	#17265.00	45.6 AV	54.0	-8.4	1.74 H	80	18.89	26.71
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	#5715.00	68.0 PK	68.2	-0.2	1.87 V	114	56.47	11.53
2	#5725.00	77.8 PK	78.2	-0.4	1.87 V	114	66.25	11.55
3	*5755.00	114.2 PK			1.87 V	114	102.56	11.64
4	*5755.00	102.4 AV			1.87 V	114	90.76	11.64
5	#5850.00	63.9 PK	78.2	-14.3	1.87 V	114	52.15	11.75
6	#5919.00	62.7 PK	74.0	-11.3	1.66 V	127	50.87	11.83
7	#5919.00	51.6 AV	54.0	-2.4	1.66 V	127	39.77	11.83
8	11510.00	54.2 PK	74.0	-19.8	1.07 V	241	36.90	17.30
9	11510.00	41.2 AV	54.0	-12.8	1.07 V	241	23.90	17.30
10	#17265.00	58.7 PK	74.0	-15.3	1.33 V	249	31.99	26.71
11	#17265.00	46.3 AV	54.0	-7.7	1.33 V	249	19.59	26.71

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	#5715.00	60.2 PK	74.0	-13.8	1.32 H	239	48.67	11.53
2	#5715.00	49.1 AV	54.0	-4.9	1.32 H	239	37.57	11.53
3	*5795.00	108.5 PK			1.32 H	239	96.72	11.78
4	*5795.00	97.3 AV			1.32 H	239	85.52	11.78
5	#5850.00	62.1 PK	78.2	-16.1	1.32 H	239	50.35	11.75
6	#5860.00	63.8 PK	74.0	-10.2	1.32 H	239	52.05	11.75
7	#5860.00	49.2 AV	54.0	-4.8	1.32 H	239	37.45	11.75
8	11590.00	53.8 PK	74.0	-20.2	1.34 H	246	35.69	18.11
9	11590.00	41.1 AV	54.0	-12.9	1.34 H	246	22.99	18.11
10	#17385.00	58.5 PK	74.0	-15.5	1.68 H	85	31.05	27.45
11	#17385.00	45.5 AV	54.0	-8.5	1.68 H	85	18.05	27.45
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	#5715.00	64.3 PK	74.0	-9.7	1.88 V	111	52.77	11.53
2	#5715.00	53.3 AV	54.0	-0.7	1.88 V	111	41.77	11.53
3	*5795.00	113.6 PK			1.88 V	111	101.82	11.78
4	*5795.00	101.8 AV			1.88 V	111	90.02	11.78
5	#5850.00	66.6 PK	78.2	-11.6	1.88 V	111	54.85	11.75
6	#5860.00	68.4 PK	74.0	-5.6	1.88 V	111	56.65	11.75
7	#5860.00	53.7 AV	54.0	-0.3	1.88 V	111	41.95	11.75
8	11590.00	54.0 PK	74.0	-20.0	1.12 V	248	35.89	18.11
9	11590.00	41.2 AV	54.0	-12.8	1.12 V	248	23.09	18.11
10	#17385.00	59.1 PK	74.0	-14.9	1.37 V	261	31.65	27.45
11	#17385.00	46.5 AV	54.0	-7.5	1.37 V	261	19.05	27.45

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	#5715.00	64.8 PK	74.0	-9.2	1.30 H	253	53.27	11.53
2	#5715.00	49.3 AV	54.0	-4.7	1.30 H	253	37.77	11.53
3	#5725.00	69.0 PK	78.2	-9.2	1.30 H	253	57.45	11.55
4	*5775.00	102.8 PK			1.30 H	253	91.08	11.72
5	*5775.00	91.6 AV			1.30 H	253	79.88	11.72
6	#5850.00	61.3 PK	78.2	-16.9	1.30 H	253	49.55	11.75
7	11550.00	53.7 PK	74.0	-20.3	1.32 H	258	35.99	17.71
8	11550.00	40.9 AV	54.0	-13.1	1.32 H	258	23.19	17.71
9	#17325.00	58.7 PK	74.0	-15.3	1.66 H	95	31.85	26.85
10	#17325.00	45.5 AV	54.0	-8.5	1.66 H	95	18.65	26.85
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	#5715.00	69.3 PK	74.0	-4.7	1.87 V	116	57.77	11.53
2	#5715.00	53.7 AV	54.0	-0.3	1.87 V	116	42.17	11.53
3	#5725.00	74.1 PK	78.2	-4.1	1.87 V	116	62.55	11.55
4	*5775.00	108.4 PK			1.87 V	116	96.68	11.72
5	*5775.00	96.2 AV			1.87 V	116	84.48	11.72
6	#5850.00	65.9 PK	78.2	-12.3	1.87 V	116	54.15	11.75
7	11550.00	53.8 PK	74.0	-20.2	1.08 V	241	36.09	17.71
8	11550.00	41.0 AV	54.0	-13.0	1.08 V	241	23.29	17.71
9	#17325.00	58.7 PK	74.0	-15.3	1.34 V	249	31.85	26.85
10	#17325.00	46.4 AV	54.0	-7.6	1.34 V	249	19.55	26.85

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

Beamforming MODE

802.11ac (VHT20)

CHANNEL	TX Channel 149	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	125.01	32.5 QP	43.5	-11.0	2.00 H	256	47.36	-14.85
2	250.00	42.9 QP	46.0	-3.2	1.00 H	118	56.86	-14.01
3	375.03	35.8 QP	46.0	-10.2	1.00 H	315	45.79	-9.97
4	500.01	34.5 QP	46.0	-11.5	1.50 H	156	41.33	-6.83
5	749.98	36.6 QP	46.0	-9.4	1.00 H	360	37.77	-1.21
6	875.02	40.3 QP	46.0	-5.7	1.50 H	230	40.09	0.24
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	47.80	34.6 QP	40.0	-5.4	1.00 V	122	47.68	-13.04
2	66.28	32.1 QP	40.0	-8.0	1.00 V	44	46.51	-14.46
3	125.01	30.7 QP	43.5	-12.8	1.00 V	227	45.58	-14.85
4	250.00	37.9 QP	46.0	-8.1	2.00 V	360	51.90	-14.01
5	375.03	35.9 QP	46.0	-10.1	1.50 V	273	45.83	-9.97
6	500.01	37.4 QP	46.0	-8.7	1.00 V	298	44.18	-6.83

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 Transmit Power Measurement

4.2.1 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,

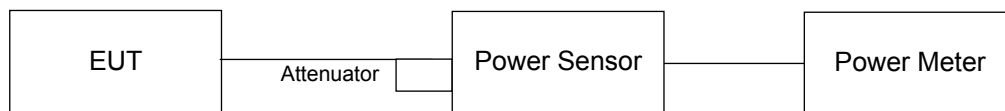
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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.

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 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.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

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

4.2.7 Test Result

CDD Mode

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11a								
149	5745	18.83	19.28	19.14	243.142	23.86	30	Pass
157	5785	17.86	18.34	18.39	198.352	22.97	30	Pass
165	5825	17.88	18.37	18.38	198.948	22.99	30	Pass

Beamforming Mode

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11ac (VHT20)								
149	5745	18.31	18.82	18.73	218.617	23.40	29.23	Pass
157	5785	18.21	18.43	18.69	209.846	23.22	29.23	Pass
165	5825	17.18	17.73	17.72	170.689	22.32	29.23	Pass
802.11ac (VHT40)								
151	5755	17.03	17.49	17.34	160.771	22.06	29.23	Pass
159	5795	17.37	17.71	17.69	172.345	22.36	29.23	Pass
802.11ac (VHT80)								
155	5775	14.74	15.23	15.45	98.203	19.92	29.23	Pass

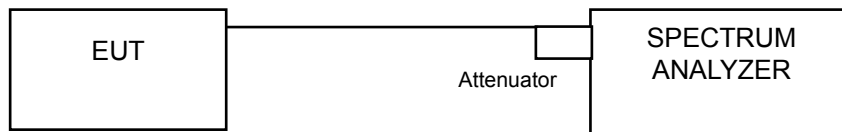
Note: 1. Directional gain = $2\text{dBi} + 10\log(3) = 6.77\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30-(6.77-6) = 29.23\text{dBm}$.

4.3 Peak Power Spectral Density Measurement

4.3.1 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

4.3.2 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 AVG. power (duty cycle ≥ 98%)

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

For AVG. power (duty cycle < 98%)

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

Same as Item 4.2.6.

4.3.7 Test Results

CDD Mode

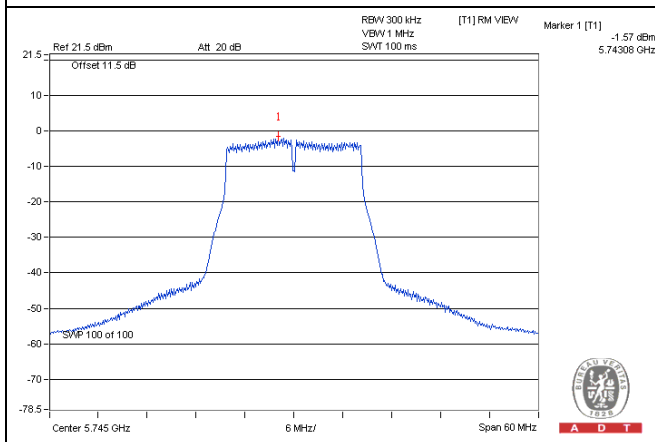
TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
802.11a								
0	149	5745	-2.95	-0.73	4.77	4.04	29.23	Pass
	157	5785	-3.68	-1.46	4.77	3.31	29.23	Pass
	165	5825	-3.56	-1.34	4.77	3.43	29.23	Pass
1	149	5745	-1.57	0.65	4.77	5.42	29.23	Pass
	157	5785	-2.47	-0.25	4.77	4.52	29.23	Pass
	165	5825	-2.23	-0.01	4.77	4.76	29.23	Pass
2	149	5745	-1.92	0.30	4.77	5.07	29.23	Pass
	157	5785	-3.17	-0.95	4.77	3.82	29.23	Pass
	165	5825	-2.86	-0.64	4.77	4.13	29.23	Pass

Note: 1. Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power density limit shall be reduced to 30-(6.77-6) = 29.23dBm.

CDD Mode

Spectrum Plot of Worst Value

802.11a – Chain 1: CH 149



Beamforming Mode

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
802.11ac (VHT20)								
0	149	5745	-3.09	-0.87	4.77	3.90	29.23	Pass
	157	5785	-3.31	-1.09	4.77	3.68	29.23	Pass
	165	5825	-4.10	-1.88	4.77	2.89	29.23	Pass
1	149	5745	-2.91	-0.69	4.77	4.08	29.23	Pass
	157	5785	-2.84	-0.62	4.77	4.15	29.23	Pass
	165	5825	-3.80	-1.58	4.77	3.19	29.23	Pass
2	149	5745	-2.93	-0.71	4.77	4.06	29.23	Pass
	157	5785	-3.20	-0.98	4.77	3.79	29.23	Pass
	165	5825	-3.67	-1.45	4.77	3.32	29.23	Pass

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=3) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
802.11ac (VHT40)									
0	151	5755	-8.19	-5.97	4.77	0.17	-1.03	29.23	Pass
	159	5795	-7.68	-5.46	4.77	0.17	-0.52	29.23	Pass
1	151	5755	-7.85	-5.63	4.77	0.17	-0.69	29.23	Pass
	159	5795	-7.61	-5.39	4.77	0.17	-0.45	29.23	Pass
2	151	5755	-7.92	-5.70	4.77	0.17	-0.76	29.23	Pass
	159	5795	-7.21	-4.99	4.77	0.17	-0.05	29.23	Pass
802.11ac (VHT80)									
0	155	5775	-13.77	-11.55	4.77	0.38	-6.40	29.23	Pass
1	155	5775	-13.22	-11.00	4.77	0.38	-5.85	29.23	Pass
2	155	5775	-12.78	-10.56	4.77	0.38	-5.41	29.23	Pass

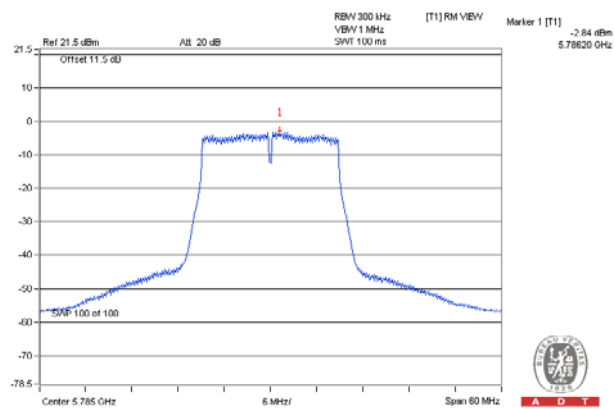
Note: 1. Directional gain = $2\text{dBi} + 10\log(3) = 6.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (6.77 - 6) = 29.23\text{dBm}$.

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

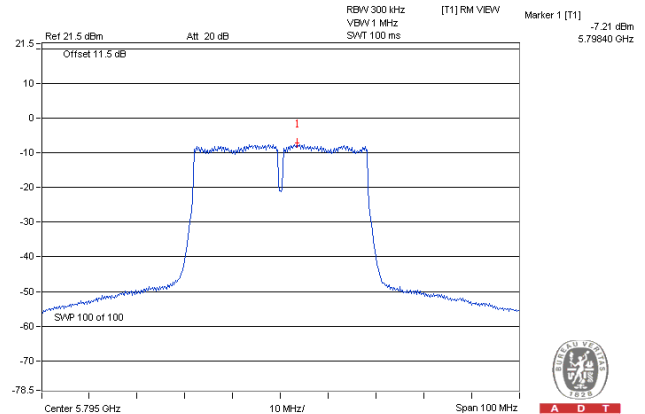
Beamforming Mode

Spectrum Plot of Worst Value

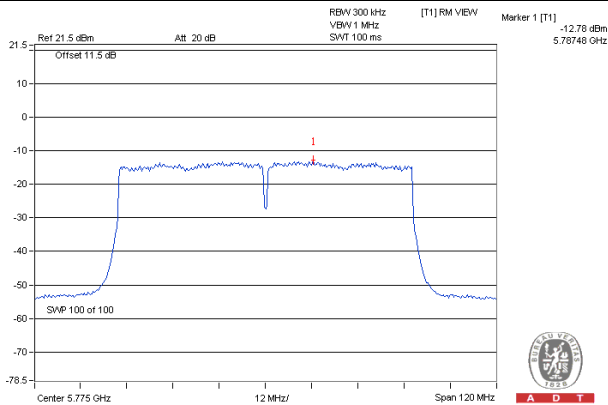
802.11ac (VHT20) – Chain 1: CH 157



802.11ac (VHT40) – Chain 2: CH 159



802.11ac (VHT80) – Chain 2: CH 155

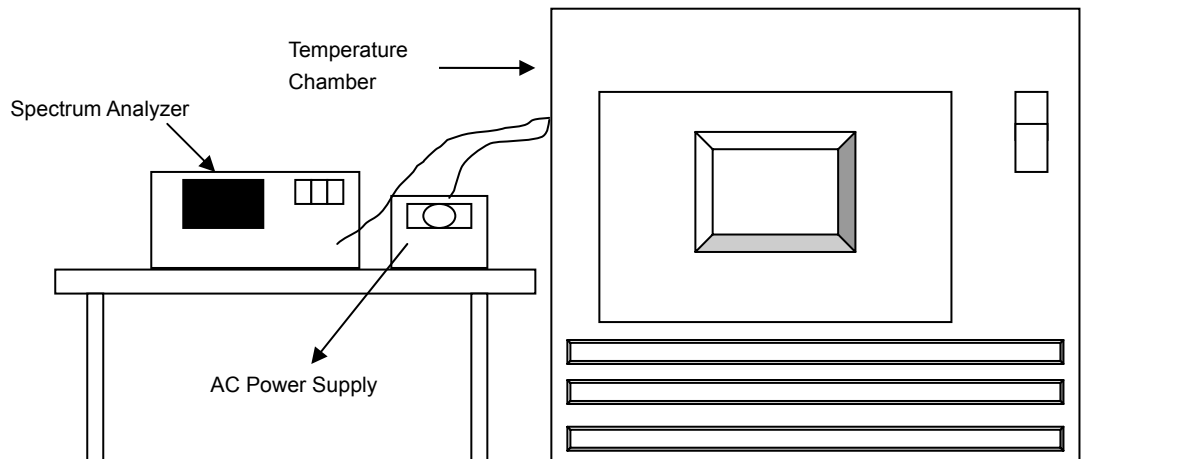


4.4 Frequency Stability Measurement

4.4.1 Limits of Frequency Stability Measurement

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

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

- 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.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

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

4.4.7 Test Results

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5745MHz									
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	5744.9999	0.00000	5744.9965	-0.00006	5744.9992	-0.00001	5744.9999	0.00000
40	120	5745.0301	0.00052	5745.0272	0.00047	5745.0281	0.00049	5745.0249	0.00043
30	120	5744.9759	-0.00042	5744.9761	-0.00042	5744.9764	-0.00041	5744.9799	-0.00035
20	120	5744.9775	-0.00039	5744.9774	-0.00039	5744.9826	-0.00030	5744.9782	-0.00038
10	120	5744.9891	-0.00019	5744.9864	-0.00024	5744.9905	-0.00017	5744.9888	-0.00019
0	120	5745.0139	0.00024	5745.0163	0.00028	5745.0151	0.00026	5745.0172	0.00030
-10	120	5745.0118	0.00021	5745.0133	0.00023	5745.0122	0.00021	5745.0127	0.00022
-20	120	5744.9971	-0.00005	5744.999	-0.00002	5744.9962	-0.00007	5744.9985	-0.00003
-30	120	5744.9771	-0.00040	5744.9756	-0.00042	5744.9758	-0.00042	5744.9748	-0.00044

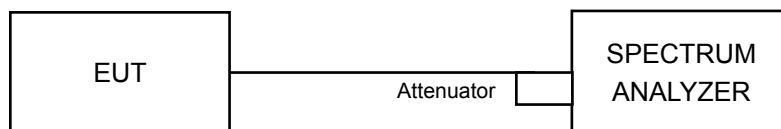
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5745MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5744.9786	-0.00037	5744.9771	-0.00040	5744.9828	-0.00030	5744.9775	-0.00039
	120	5744.9775	-0.00039	5744.9774	-0.00039	5744.9826	-0.00030	5744.9782	-0.00038
	102	5744.9765	-0.00041	5744.977	-0.00040	5744.983	-0.00030	5744.9775	-0.00039

4.5 6dB Bandwidth Measurement

4.5.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

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

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

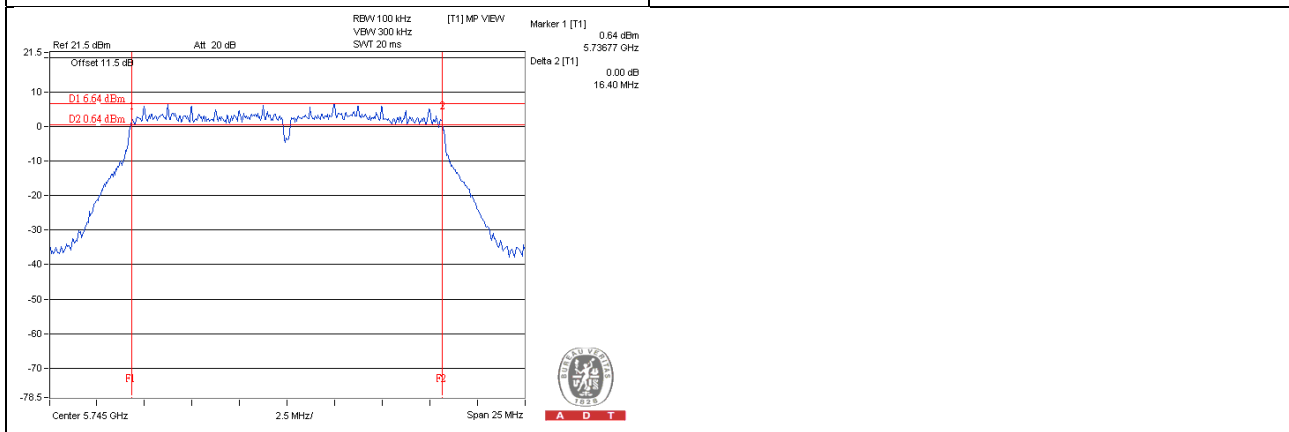
CDD Mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
802.11a						
149	5745	16.40	16.42	16.44	0.5	Pass
157	5785	16.41	16.44	16.40	0.5	Pass
165	5825	16.40	16.45	16.44	0.5	Pass

CDD Mode

SPECTRUM PLOT OF WORST VALUE

802.11a – Chain 0: CH 149



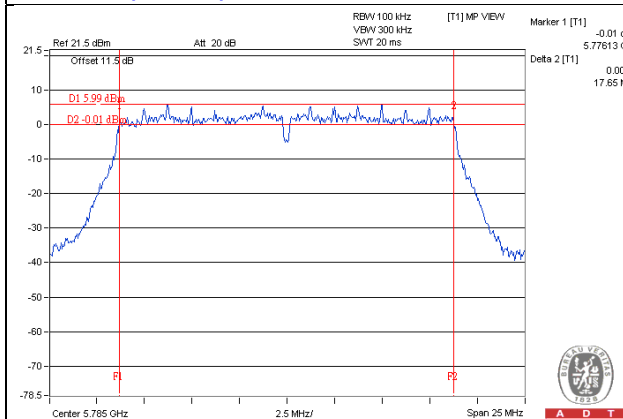
Beamforming Mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
802.11ac (VHT20)						
149	5745	17.66	17.67	17.69	0.5	Pass
157	5785	17.65	17.69	17.68	0.5	Pass
165	5825	17.66	17.66	17.66	0.5	Pass
802.11ac (VHT40)						
151	5755	36.45	36.47	36.46	0.5	Pass
159	5795	35.98	36.43	36.45	0.5	Pass
802.11ac (VHT80)						
155	5775	75.58	76.46	76.23	0.5	Pass

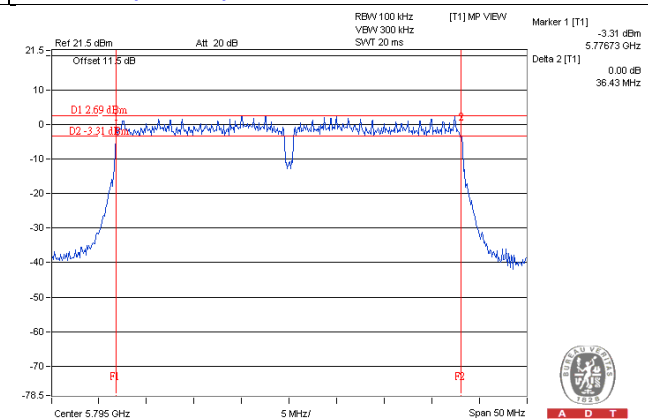
Beamforming Mode

SPECTRUM PLOT OF WORST VALUE

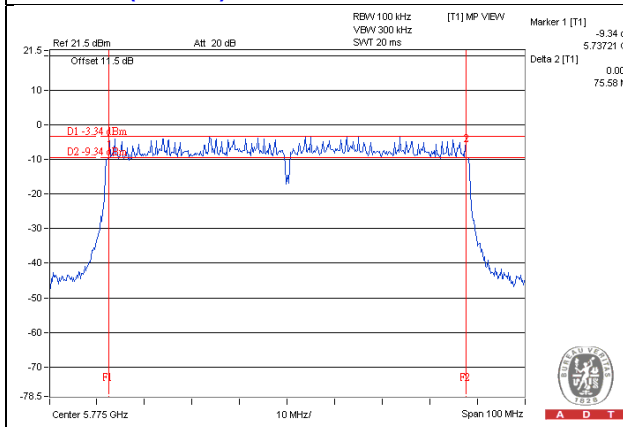
802.11ac (VHT20) – Chain 0: CH157



802.11ac (VHT40) – Chain 1: CH159



802.11ac (VHT80) – Chain 0: CH155



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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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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