FCC Test Report

Report No.:	RF160217E01A-1
FCC ID:	PY315400328
Test Model:	D6220
Received Date:	Mar. 07, 2016
Test Date:	Mar. 10 to 22, 2016
Issued Date:	Apr. 07, 2016
Applicant:	HON HAI PRECISION IND. CO., LTD.
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:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, 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.

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Release Control Record

Issue No.	Description	Date Issued
RF160217E01A-1	Original release.	Apr. 07, 2016

1 Certificate of Conformity

Product:	AC1200 WiFi VDSL/ADSL Modem Router
Brand:	NETGEAR
Test Model:	D6220
Sample Status:	ENGINEERING SAMPLE
Applicant:	HON HAI PRECISION IND. CO., LTD.
Test Date:	Mar. 10 to 22, 2016
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10: 2013

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

Prepared by : _____ , **Date:** Apr. 07, 2016

Claire Kuan / Specialist

Approved by : _____ , **Date:** Apr. 07, 2016

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)(6)	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -3.16dB at 0.32188MHz.
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 5150.00MHz & 5725.00MHz.
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(MHF) 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	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.40 dB
	6GHz ~ 18GHz	3.73 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	AC1200 WiFi VDSL/ADSL Modem Router
Brand	NETGEAR
Test Model	D6220
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
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 866.7Mbps
Operating Frequency	**2.4GHz:** 2.412GHz ~ 2.462GHz **5GHz:** 5.18GHz ~ 5.24GHz, 5.745GHz ~ 5.825GHz
Number of Channel	**2.4GHz:** 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) **5GHz:** 9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
Output Power	2.4GHz: 546.529mW 5GHz 5.18 ~ 5.24GHz: 382.476mW 5.745 ~ 5.825GHz: 330.424mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. 2.4GHz and 5GHz technology can transmit at same time.
2. The EUT could be supplied with a power adapter as following table:

No.	Brand	Model No.	P/N	Spec.
1	NETGEAR	2ABL030F	332-10756-01	Input: 100-240V, 1.0A, 50/60Hz Output: 12V, 2.5A DC output cable (1.8m, unshielded)
2	NETGEAR	ADS-40FPA-12 12030GPCU/GPC	332-10757-01	Input: 100-240V, 1.0A, 50/60Hz Output: 12V, 2.5A DC output cable (1.8m, unshielded)
From the above adapters, the spurious emission worse case was found in **adapter 2**. Therefore only the test data of the mode was recorded in this report.				

3. The antennas provided to the EUT, please refer to the following table:

Ant. No.	Brand	Model	Antenna Gain (dBi)	Cable Length (mm)	Frequency range (GHz to GHz)	Antenna Type	Connecter Type
1	Master Wave	98619	2.62	140	2.4-2.4835	Dipole	i-pex(MHF)
			5.8	140	5.15-5.85		
2	Master Wave	98619	2.42	220	2.4-2.4835	Dipole	i-pex(MHF)
			5.59	220	5.15-5.85		

4. The EUT incorporates a MIMO function.

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

Note: 1. All of modulation mode support beamforming function (Except 2.4GHz Band and 802.11a mode in 5GHz Band) modulation mode.
2. 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)

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

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	
1	√	√	√	√	With adapter 1
2	-	-	√	-	With adapter 2

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 EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-plane**.

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
802.11a	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)	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
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.

CDD MODE						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	40	OFDM	BPSK	6
	5745-5825	149 to 165				

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)
802.11a	5180-5240	36 to 48	40	OFDM	BPSK	6
	5745-5825	149 to 165				

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	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
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)	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
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

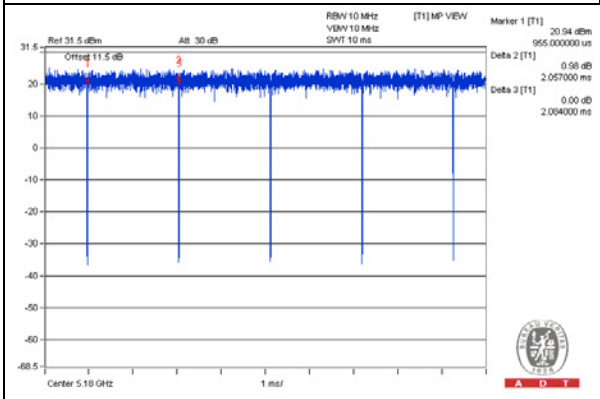
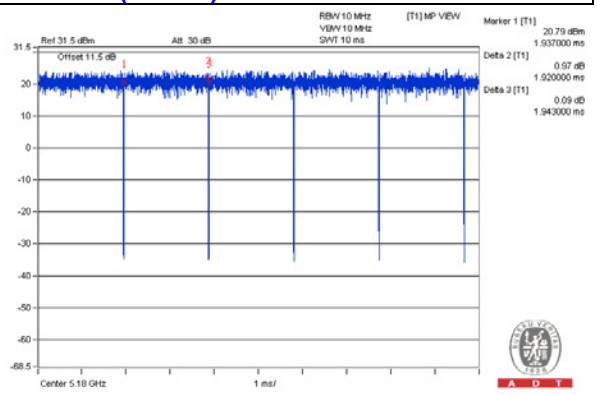
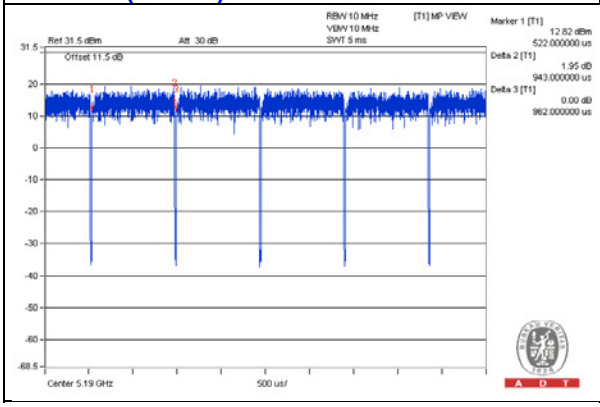
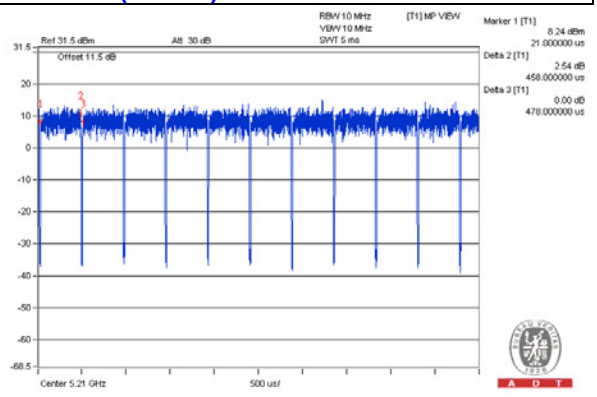
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	24deg. C, 67%RH	120Vac, 60Hz	Andy Ho
RE<1G	25deg. C, 70%RH	120Vac, 60Hz	Robert Cheng
PLC	20deg. C, 63%RH	120Vac, 60Hz	Timmy Hu
APCM	16deg. C, 65%RH	120Vac, 60Hz	Anderson Chen

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 = 1.920 ms/1.943 ms = 0.988
802.11ac (VHT40): Duty cycle = 0.943 ms/0.962 ms = 0.98
802.11ac (VHT80): Duty cycle = 0.458 ms/0.478 ms = 0.958, Duty factor = 10 * log(1/0.958) = 0.19

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.

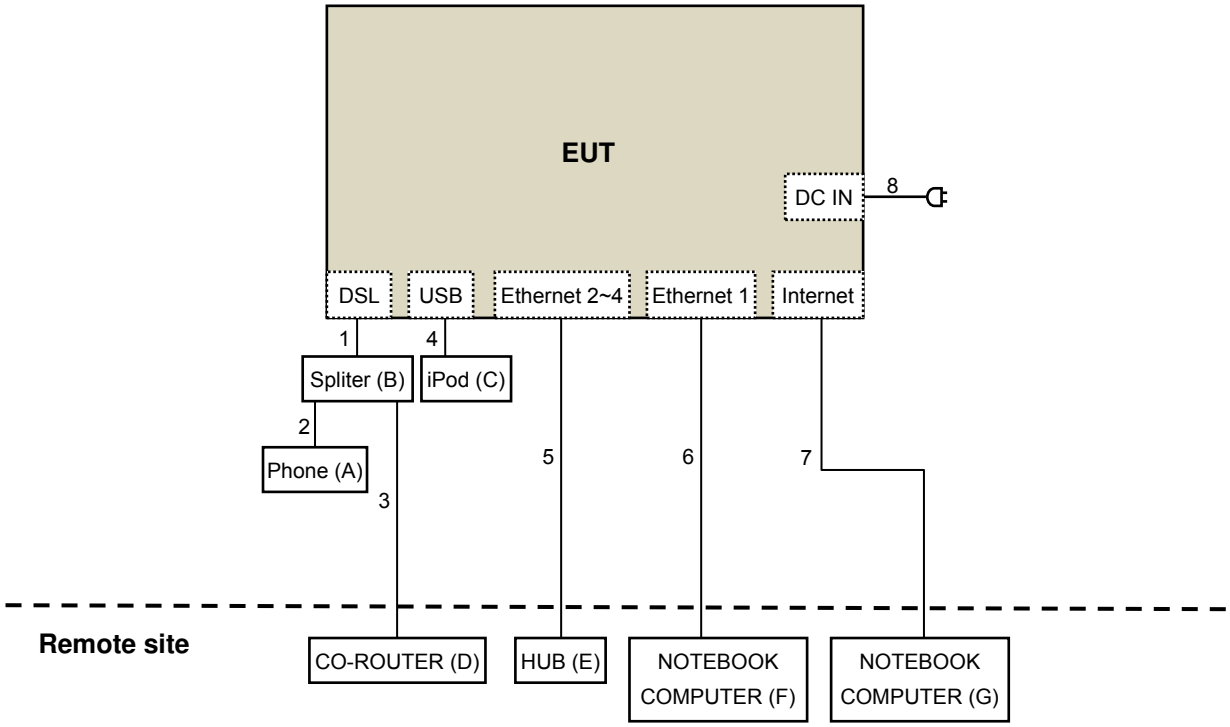
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	PHONE	DAISHO	DS-03	NA	NA	Provided by Lab
B.	SPLITER	NA	DSL499	NA	NA	Supplied by Client
C.	IPOD	Apple	MD778TA/A	CC4JG680F4T1	NA	Provided by Lab
D.	CO-ROUTER	ZyXEL	IES-1000	S4Z3112558	NA	Provided by Lab
E.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
F.	NOTEBOOK COMPUTER	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
G.	NOTEBOOK COMPUTER	DELL	E5430	GM1SKV1	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.	RJ45 to RJ232	1	1.5	No	0	Provided by Lab
2.	USB	1	0.1	Yes	0	Provided by Lab
3.	UTP RJ45	1	10	No	0	Provided by Lab
4.	UTP RJ45	1	10	No	0	Provided by Lab
5.	UTP RJ45	1	1.8	No	0	Provided by Lab
6.	AC	1	1.8	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)
KDB 789033 D02 General UNII Test Procedure New Rules v01r01
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	**LIMIT**	
789033 D02 General UNII Test Procedure New Rules v01r01	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

For above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Jan. 20, 2016	Jan. 19, 2017
Pre-Amplifier Agilent	8449B	3008A02465	Apr. 06, 2015	Apr. 05, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150317 150321 150322	Mar. 31, 2015	Mar. 30, 2016
Spectrum Analyzer Keysight	N9030A	MY54490520	July 26, 2015	July 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Boresight Antenna Fixture	NA	NA	NA	NA
Power Meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power Sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016
Temperature & Humidity Chamber TERCHY	MHU-225AU	911033	Dec. 03, 2015	Dec. 02, 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. 3.
3. The FCC Site Registration No. is 147459
4. The CANADA Site Registration No. is 20331-1
5. Tested Date: Mar. 22, 2016

For below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-01	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 03, 2015	Apr. 02, 2016
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Boresight Antenna Fixture	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The FCC Site Registration No. is 292998
5. The CANADA Site Registration No. is 20331-2
6. Tested Date: Mar. 17, 2016

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:

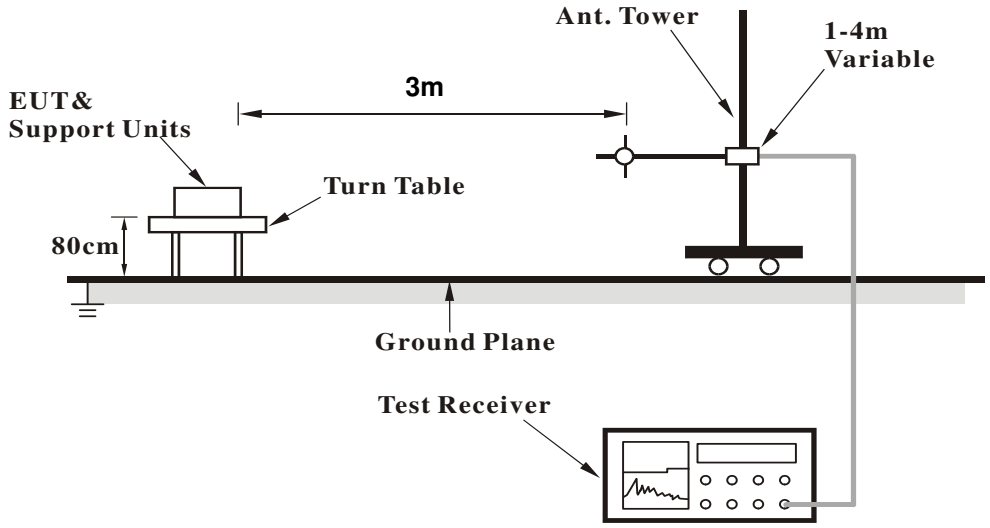
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

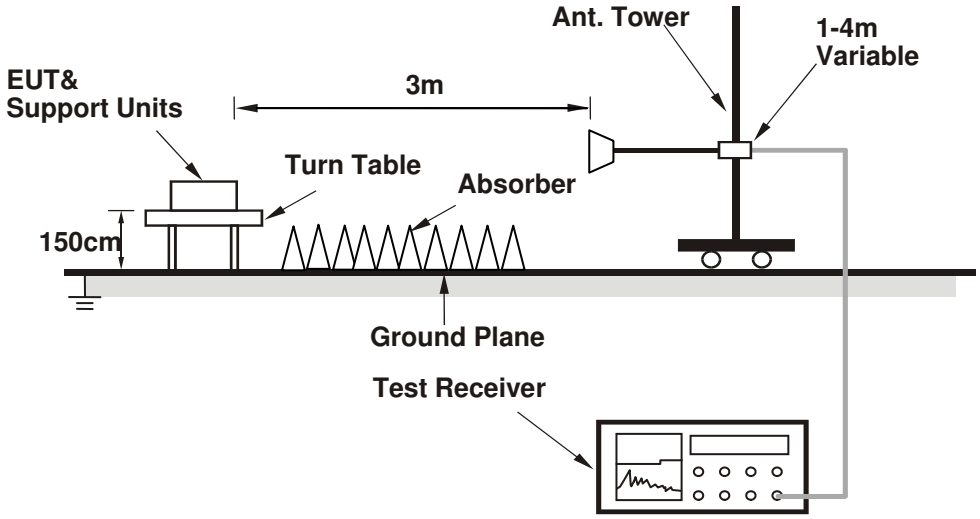
No deviation.

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

a. Placed the EUT on the testing table.
b. Prepared notebooks to act as communication partner and placed it outside of testing area.
c. Contorlling software (Mtool.exe [v2.0.1.0]) 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	5102.00	54.4 PK	74.0	-19.6	1.60 H	144	51.99	2.41
2	5102.00	40.5 AV	54.0	-13.5	1.60 H	144	38.09	2.41
3	5150.00	61.9 PK	74.0	-12.1	1.07 H	125	59.34	2.56
4	5150.00	42.4 AV	54.0	-11.6	1.07 H	125	39.84	2.56
5	*5180.00	104.3 PK			1.07 H	125	101.65	2.65
6	*5180.00	94.2 AV			1.07 H	125	91.55	2.65
7	5419.00	49.7 PK	74.0	-24.3	1.10 H	132	46.43	3.27
8	5419.00	39.4 AV	54.0	-14.6	1.10 H	132	36.13	3.27
9	#6906.67	48.7 PK	68.2	-19.5	1.22 H	177	41.57	7.13
10	#10360.00	43.4 PK	74.0	-30.6	1.57 H	163	30.18	13.22
11	#10360.00	31.3 AV	54.0	-22.7	1.57 H	163	18.08	13.22
12	15540.00	40.5 PK	74.0	-33.5	1.46 H	256	25.02	15.48
13	15540.00	26.6 AV	54.0	-27.4	1.46 H	256	11.12	15.48
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	5102.00	59.6 PK	74.0	-14.4	2.59 V	44	57.19	2.41
2	5102.00	46.5 AV	54.0	-7.5	2.59 V	44	44.09	2.41
3	5150.00	73.4 PK	74.0	-0.6	1.51 V	210	70.84	2.56
4	5150.00	53.8 AV	54.0	-0.2	1.51 V	210	51.24	2.56
5	*5180.00	116.3 PK			1.51 V	210	113.65	2.65
6	*5180.00	106.1 AV			1.51 V	210	103.45	2.65
7	5419.00	61.2 PK	74.0	-12.8	1.55 V	199	57.93	3.27
8	5419.00	50.8 AV	54.0	-3.2	1.55 V	199	47.53	3.27
9	#6906.67	60.2 PK	68.2	-8.0	1.88 V	293	53.07	7.13
10	#10360.00	47.1 PK	74.0	-26.9	1.58 V	82	33.88	13.22
11	#10360.00	32.4 AV	54.0	-21.6	1.58 V	82	19.18	13.22
12	15540.00	47.0 PK	74.0	-27.0	1.50 V	224	31.52	15.48
13	15540.00	34.1 AV	54.0	-19.9	1.50 V	224	18.62	15.48

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	105.4 PK			1.02 H	105	102.69	2.71
2	*5200.00	94.7 AV			1.02 H	105	91.99	2.71
3	5350.00	52.7 PK	74.0	-21.3	1.02 H	105	49.61	3.09
4	5350.00	41.7 AV	54.0	-12.3	1.02 H	105	38.61	3.09
5	#10400.00	43.1 PK	74.0	-30.9	1.59 H	178	29.63	13.47
6	#10400.00	31.1 AV	54.0	-22.9	1.59 H	178	17.63	13.47
7	15600.00	39.7 PK	74.0	-34.3	1.39 H	272	24.27	15.43
8	15600.00	26.1 AV	54.0	-27.9	1.39 H	272	10.67	15.43
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	115.3 PK			1.50 V	197	112.59	2.71
2	*5200.00	106.2 AV			1.50 V	197	103.49	2.71
3	5350.00	64.2 PK	74.0	-9.8	1.50 V	197	61.11	3.09
4	5350.00	53.2 AV	54.0	-0.8	1.50 V	197	50.11	3.09
5	#10400.00	47.0 PK	74.0	-27.0	1.58 V	87	33.53	13.47
6	#10400.00	32.3 AV	54.0	-21.7	1.58 V	87	18.83	13.47
7	15600.00	47.4 PK	74.0	-26.6	1.50 V	218	31.97	15.43
8	15600.00	34.2 AV	54.0	-19.8	1.50 V	218	18.77	15.43

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	105.9 PK			1.07 H	113	103.09	2.81
2	*5240.00	95.0 AV			1.07 H	113	92.19	2.81
3	5400.00	57.4 PK	74.0	-16.6	1.07 H	113	54.17	3.23
4	5400.00	47.1 AV	54.0	-6.9	1.07 H	113	43.87	3.23
5	#10480.00	43.5 PK	74.0	-30.5	1.59 H	171	30.10	13.40
6	#10480.00	31.1 AV	54.0	-22.9	1.59 H	171	17.70	13.40
7	15720.00	40.0 PK	74.0	-34.0	1.45 H	261	24.99	15.01
8	15720.00	26.1 AV	54.0	-27.9	1.45 H	261	11.09	15.01
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	116.5 PK			1.50 V	192	113.69	2.81
2	*5240.00	106.5 AV			1.50 V	192	103.69	2.81
3	5400.00	63.8 PK	74.0	-10.2	1.67 V	198	60.57	3.23
4	5400.00	53.1 AV	54.0	-0.9	1.67 V	198	49.87	3.23
5	#10480.00	46.7 PK	74.0	-27.3	1.53 V	81	33.30	13.40
6	#10480.00	32.0 AV	54.0	-22.0	1.53 V	81	18.60	13.40
7	15720.00	47.2 PK	74.0	-26.8	1.50 V	211	32.19	15.01
8	15720.00	34.1 AV	54.0	-19.9	1.50 V	211	19.09	15.01

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
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	54.2 PK	74.0	-19.8	1.09 H	118	50.44	3.76
2	#5666.00	40.3 AV	54.0	-13.7	1.09 H	118	36.54	3.76
3	#5715.00	64.3 PK	74.0	-9.7	1.09 H	118	60.51	3.79
4	#5715.00	39.4 AV	54.0	-14.6	1.09 H	118	35.61	3.79
5	#5725.00	72.4 PK	78.2	-5.8	1.09 H	118	68.60	3.80
6	*5745.00	104.4 PK			1.09 H	118	100.60	3.80
7	*5745.00	94.6 AV			1.09 H	118	90.80	3.80
8	#5903.00	55.5 PK	74.0	-18.5	1.09 H	118	51.64	3.86
9	#5903.00	44.8 AV	54.0	-9.2	1.09 H	118	40.94	3.86
10	11490.00	44.0 PK	74.0	-30.0	1.54 H	152	28.97	15.03
11	11490.00	31.4 AV	54.0	-22.6	1.54 H	152	16.37	15.03
12	#17235.00	40.2 PK	74.0	-33.8	1.46 H	266	20.60	19.60
13	#17235.00	26.3 AV	54.0	-27.7	1.46 H	266	6.70	19.60
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	#5666.00	60.7 PK	74.0	-13.3	1.50 V	203	56.94	3.76
2	#5666.00	46.7 AV	54.0	-7.3	1.50 V	203	42.94	3.76
3	#5715.00	70.1 PK	74.0	-3.9	1.50 V	202	66.31	3.79
4	#5715.00	45.6 AV	54.0	-8.4	1.50 V	202	41.81	3.79
5	**#5725.00**	**78.1 PK**	**78.2**	**-0.1**	**1.50 V**	**202**	**74.30**	**3.80**
6	*5745.00	115.4 PK			1.50 V	202	111.60	3.80
7	*5745.00	105.1 AV			1.50 V	202	101.30	3.80
8	#5903.00	61.7 PK	74.0	-12.3	1.51 V	167	57.84	3.86
9	#5903.00	51.0 AV	54.0	-3.0	1.51 V	167	47.14	3.86
10	11490.00	47.3 PK	74.0	-26.7	1.57 V	92	32.27	15.03
11	11490.00	32.3 AV	54.0	-21.7	1.57 V	92	17.27	15.03
12	#17235.00	47.3 PK	74.0	-26.7	1.46 V	218	27.70	19.60
13	#17235.00	33.9 AV	54.0	-20.1	1.46 V	218	14.30	19.60

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5301.00	57.8 PK	74.0	-16.2	1.08 H	124	54.85	2.95
2	#5301.00	45.9 AV	54.0	-8.1	1.08 H	124	42.95	2.95
3	#5725.00	63.2 PK	78.2	-15.0	1.08 H	124	59.40	3.80
4	*5785.00	108.4 PK			1.08 H	124	104.57	3.83
5	*5785.00	96.4 AV			1.08 H	124	92.57	3.83
6	#5850.00	58.9 PK	78.2	-19.3	1.08 H	124	55.07	3.83
7	#5946.00	57.7 PK	74.0	-16.3	1.08 H	124	53.72	3.98
8	#5946.00	45.5 AV	54.0	-8.5	1.08 H	124	41.52	3.98
9	11570.00	43.7 PK	74.0	-30.3	1.61 H	156	28.86	14.84
10	11570.00	31.4 AV	54.0	-22.6	1.61 H	156	16.56	14.84
11	#17355.00	40.3 PK	74.0	-33.7	1.49 H	264	20.06	20.24
12	#17355.00	26.6 AV	54.0	-27.4	1.49 H	264	6.36	20.24
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	#5301.00	63.0 PK	74.0	-11.0	2.18 V	360	60.05	2.95
2	#5301.00	52.3 AV	54.0	-1.7	2.18 V	360	49.35	2.95
3	#5725.00	69.8 PK	78.2	-8.4	1.75 V	148	66.00	3.80
4	*5785.00	119.3 PK			1.75 V	148	115.47	3.83
5	*5785.00	107.9 AV			1.75 V	148	104.07	3.83
6	#5850.00	65.1 PK	78.2	-13.1	1.75 V	148	61.27	3.83
7	#5946.00	63.2 PK	74.0	-10.8	1.94 V	87	59.22	3.98
8	#5946.00	51.6 AV	54.0	-2.4	1.94 V	87	47.62	3.98
9	11570.00	53.9 PK	74.0	-20.1	2.23 V	174	39.06	14.84
10	11570.00	41.8 AV	54.0	-12.2	2.23 V	174	26.96	14.84
11	#17355.00	46.8 PK	74.0	-27.2	1.61 V	225	26.56	20.24
12	#17355.00	33.8 AV	54.0	-20.2	1.61 V	225	13.56	20.24

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5338.40	53.3 PK	74.0	-20.7	1.13 H	118	50.24	3.06
2	#5338.40	43.2 AV	54.0	-10.8	1.13 H	118	40.14	3.06
3	*5825.00	104.2 PK			1.13 H	118	100.37	3.83
4	*5825.00	94.6 AV			1.13 H	118	90.77	3.83
5	#5850.00	72.4 PK	78.2	-5.8	1.13 H	118	68.57	3.83
6	#5860.00	63.3 PK	74.0	-10.7	1.13 H	118	59.46	3.84
7	#5860.00	40.3 AV	54.0	-13.7	1.13 H	118	36.46	3.84
8	#5986.00	55.3 PK	74.0	-18.7	1.13 H	118	51.21	4.09
9	#5986.00	41.2 AV	54.0	-12.8	1.13 H	118	37.11	4.09
10	11650.00	43.1 PK	74.0	-30.9	1.49 H	157	28.43	14.67
11	11650.00	31.1 AV	54.0	-22.9	1.49 H	157	16.43	14.67
12	#17475.00	40.2 PK	74.0	-33.8	1.45 H	270	19.37	20.83
13	#17475.00	26.7 AV	54.0	-27.3	1.45 H	270	5.87	20.83
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	#5338.40	59.5 PK	74.0	-14.5	1.98 V	360	56.44	3.06
2	#5338.40	49.4 AV	54.0	-4.6	1.98 V	360	46.34	3.06
3	*5825.00	115.6 PK			1.72 V	325	111.77	3.83
4	*5825.00	105.1 AV			1.72 V	325	101.27	3.83
5	#5850.00	78.0 PK	78.2	-0.2	1.72 V	325	74.17	3.83
6	#5860.00	69.6 PK	74.0	-4.4	1.72 V	325	65.76	3.84
7	#5860.00	46.2 AV	54.0	-7.8	1.72 V	325	42.36	3.84
8	#5986.00	60.6 PK	74.0	-13.4	1.72 V	325	56.51	4.09
9	#5986.00	49.9 AV	54.0	-4.1	1.72 V	325	45.81	4.09
10	11650.00	47.1 PK	74.0	-26.9	1.51 V	67	32.43	14.67
11	11650.00	32.1 AV	54.0	-21.9	1.51 V	67	17.43	14.67
12	#17475.00	47.9 PK	74.0	-26.1	1.50 V	212	27.07	20.83
13	#17475.00	34.6 AV	54.0	-19.4	1.50 V	212	13.77	20.83

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
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Beamforming MODE

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	5150.00	61.7 PK	74.0	-12.3	1.11 H	124	59.14	2.56
2	5150.00	42.2 AV	54.0	-11.8	1.11 H	124	39.64	2.56
3	*5180.00	104.3 PK			1.11 H	124	101.65	2.65
4	*5180.00	94.2 AV			1.11 H	124	91.55	2.65
5	5417.70	49.6 PK	74.0	-24.4	1.11 H	124	46.33	3.27
6	5417.70	39.4 AV	54.0	-14.6	1.11 H	124	36.13	3.27
7	#10360.00	43.5 PK	74.0	-30.5	1.55 H	158	30.28	13.22
8	#10360.00	31.0 AV	54.0	-23.0	1.55 H	158	17.78	13.22
9	15540.00	39.7 PK	74.0	-34.3	1.42 H	245	24.22	15.48
10	15540.00	26.1 AV	54.0	-27.9	1.42 H	245	10.62	15.48
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	73.3 PK	74.0	-0.7	1.50 V	211	70.74	2.56
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.50 V**	**211**	**51.34**	**2.56**
3	*5180.00	117.5 PK			1.50 V	211	114.85	2.65
4	*5180.00	106.2 AV			1.50 V	211	103.55	2.65
5	5417.70	61.2 PK	74.0	-12.8	1.50 V	200	57.93	3.27
6	5417.70	49.8 AV	54.0	-4.2	1.50 V	200	46.53	3.27
7	#10360.00	54.7 PK	74.0	-19.3	2.27 V	182	41.48	13.22
8	#10360.00	42.3 AV	54.0	-11.7	2.27 V	182	29.08	13.22
9	15540.00	46.5 PK	74.0	-27.5	1.59 V	210	31.02	15.48
10	15540.00	33.5 AV	54.0	-20.5	1.59 V	210	18.02	15.48

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	105.8 PK			1.00 H	120	103.09	2.71
2	*5200.00	95.1 AV			1.00 H	120	92.39	2.71
3	5362.00	52.1 PK	74.0	-21.9	1.00 H	120	48.98	3.12
4	5362.00	41.3 AV	54.0	-12.7	1.00 H	120	38.18	3.12
5	#10400.00	43.3 PK	74.0	-30.7	1.61 H	164	29.83	13.47
6	#10400.00	31.3 AV	54.0	-22.7	1.61 H	164	17.83	13.47
7	15600.00	39.8 PK	74.0	-34.2	1.42 H	283	24.37	15.43
8	15600.00	26.2 AV	54.0	-27.8	1.42 H	283	10.77	15.43
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	118.3 PK			1.50 V	176	115.59	2.71
2	*5200.00	107.1 AV			1.50 V	176	104.39	2.71
3	5362.00	63.8 PK	74.0	-10.2	1.50 V	198	60.68	3.12
4	5362.00	52.0 AV	54.0	-2.0	1.50 V	198	48.88	3.12
5	#10400.00	53.8 PK	74.0	-20.2	2.18 V	187	40.33	13.47
6	#10400.00	41.5 AV	54.0	-12.5	2.18 V	187	28.03	13.47
7	15600.00	47.1 PK	74.0	-26.9	1.61 V	224	31.67	15.43
8	15600.00	34.1 AV	54.0	-19.9	1.61 V	224	18.67	15.43

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	106.3 PK			1.05 H	102	103.49	2.81
2	*5240.00	95.2 AV			1.05 H	102	92.39	2.81
3	5397.00	57.9 PK	74.0	-16.1	1.05 H	102	54.67	3.23
4	5397.00	47.5 AV	54.0	-6.5	1.05 H	102	44.27	3.23
5	#10480.00	43.5 PK	74.0	-30.5	1.57 H	181	30.10	13.40
6	#10480.00	31.2 AV	54.0	-22.8	1.57 H	181	17.80	13.40
7	15720.00	40.2 PK	74.0	-33.8	1.46 H	274	25.19	15.01
8	15720.00	26.3 AV	54.0	-27.7	1.46 H	274	11.29	15.01
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	117.5 PK			1.50 V	210	114.69	2.81
2	*5240.00	106.6 AV			1.50 V	210	103.79	2.81
3	5397.00	62.9 PK	74.0	-11.1	1.50 V	198	59.67	3.23
4	5397.00	52.2 AV	54.0	-1.8	1.50 V	198	48.97	3.23
5	#10480.00	53.5 PK	74.0	-20.5	2.21 V	187	40.10	13.40
6	#10480.00	41.6 AV	54.0	-12.4	2.21 V	187	28.20	13.40
7	15720.00	46.7 PK	74.0	-27.3	1.63 V	216	31.69	15.01
8	15720.00	33.5 AV	54.0	-20.5	1.63 V	216	18.49	15.01

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5662.00	53.9 PK	74.0	-20.1	1.06 H	122	50.16	3.74
2	#5662.00	40.0 AV	54.0	-14.0	1.06 H	122	36.26	3.74
3	#5715.00	64.0 PK	74.0	-10.0	1.06 H	122	60.21	3.79
4	#5715.00	39.3 AV	54.0	-14.7	1.06 H	122	35.51	3.79
5	#5725.00	72.6 PK	78.2	-5.6	1.06 H	122	68.80	3.80
6	*5745.00	104.5 PK			1.06 H	122	100.70	3.80
7	*5745.00	94.6 AV			1.06 H	122	90.80	3.80
8	#5984.00	55.2 PK	74.0	-18.8	1.06 H	122	51.11	4.09
9	#5984.00	44.5 AV	54.0	-9.5	1.06 H	122	40.41	4.09
10	11490.00	43.7 PK	74.0	-30.3	1.58 H	136	28.67	15.03
11	11490.00	31.2 AV	54.0	-22.8	1.58 H	136	16.17	15.03
12	#17235.00	40.3 PK	74.0	-33.7	1.43 H	266	20.70	19.60
13	#17235.00	26.4 AV	54.0	-27.6	1.43 H	266	6.80	19.60
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	#5662.00	65.2 PK	74.0	-8.8	1.90 V	162	61.46	3.74
2	#5662.00	43.3 AV	54.0	-10.7	1.90 V	162	39.56	3.74
3	#5715.00	70.1 PK	74.0	-3.9	1.92 V	148	66.31	3.79
4	#5715.00	45.5 AV	54.0	-8.5	1.92 V	148	41.71	3.79
5	#5725.00	78.0 PK	78.2	-0.2	1.92 V	148	74.20	3.80
6	*5745.00	114.8 PK			1.92 V	148	111.00	3.80
7	*5745.00	102.3 AV			1.92 V	148	98.50	3.80
8	#5984.00	58.7 PK	74.0	-15.3	1.92 V	141	54.61	4.09
9	#5984.00	48.3 AV	54.0	-5.7	1.92 V	141	44.21	4.09
10	11490.00	53.4 PK	74.0	-20.6	2.29 V	182	38.37	15.03
11	11490.00	41.5 AV	54.0	-12.5	2.29 V	182	26.47	15.03
12	#17235.00	46.4 PK	74.0	-27.6	1.59 V	235	26.80	19.60
13	#17235.00	33.4 AV	54.0	-20.6	1.59 V	235	13.80	19.60

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5304.00	55.8 PK	74.0	-18.2	1.04 H	111	52.85	2.95
2	#5304.00	45.7 AV	54.0	-8.3	1.04 H	111	42.75	2.95
3	#5725.00	64.2 PK	78.2	-14.0	1.04 H	111	60.40	3.80
4	*5785.00	108.7 PK			1.04 H	111	104.87	3.83
5	*5785.00	96.9 AV			1.04 H	111	93.07	3.83
6	#5850.00	62.4 PK	78.2	-15.8	1.04 H	111	58.57	3.83
7	#5943.00	57.9 PK	74.0	-16.1	1.04 H	111	53.93	3.97
8	#5943.00	43.2 AV	54.0	-10.8	1.04 H	111	39.23	3.97
9	11570.00	44.1 PK	74.0	-29.9	1.66 H	162	29.26	14.84
10	11570.00	31.5 AV	54.0	-22.5	1.66 H	162	16.66	14.84
11	#17355.00	40.5 PK	74.0	-33.5	1.51 H	276	20.26	20.24
12	#17355.00	26.6 AV	54.0	-27.4	1.51 H	276	6.36	20.24
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	#5304.00	62.2 PK	74.0	-11.8	2.11 V	360	59.25	2.95
2	#5304.00	51.6 AV	54.0	-2.4	2.11 V	360	48.65	2.95
3	#5725.00	70.4 PK	78.2	-7.8	1.74 V	191	66.60	3.80
4	*5785.00	118.1 PK			1.74 V	191	114.27	3.83
5	*5785.00	106.1 AV			1.74 V	191	102.27	3.83
6	#5850.00	68.5 PK	78.2	-9.7	1.74 V	191	64.67	3.83
7	#5943.00	64.1 PK	74.0	-9.9	1.86 V	339	60.13	3.97
8	#5943.00	49.0 AV	54.0	-5.0	1.86 V	339	45.03	3.97
9	11570.00	53.9 PK	74.0	-20.1	2.26 V	163	39.06	14.84
10	11570.00	41.8 AV	54.0	-12.2	2.26 V	163	26.96	14.84
11	#17355.00	47.5 PK	74.0	-26.5	1.57 V	226	27.26	20.24
12	#17355.00	34.2 AV	54.0	-19.8	1.57 V	226	13.96	20.24

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	104.0 PK			1.14 H	117	100.17	3.83
2	*5825.00	94.5 AV			1.14 H	117	90.67	3.83
3	#5850.00	72.4 PK	78.2	-5.8	1.09 H	109	68.57	3.83
4	#5860.00	62.9 PK	74.0	-11.1	1.10 H	123	59.06	3.84
5	#5860.00	40.2 AV	54.0	-13.8	1.10 H	123	36.36	3.84
6	#5984.00	55.0 PK	74.0	-19.0	1.19 H	103	50.91	4.09
7	#5984.00	41.1 AV	54.0	-12.9	1.19 H	103	37.01	4.09
8	11650.00	44.2 PK	74.0	-29.8	1.52 H	164	29.53	14.67
9	11650.00	31.6 AV	54.0	-22.4	1.52 H	164	16.93	14.67
10	#17475.00	40.8 PK	74.0	-33.2	1.47 H	285	19.97	20.83
11	#17475.00	26.9 AV	54.0	-27.1	1.47 H	285	6.07	20.83
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	116.3 PK			1.98 V	146	112.47	3.83
2	*5825.00	104.7 AV			1.98 V	146	100.87	3.83
3	#5850.00	77.8 PK	78.2	-0.4	1.98 V	146	73.97	3.83
4	#5860.00	71.7 PK	74.0	-2.3	1.98 V	146	67.86	3.84
5	#5860.00	49.7 AV	54.0	-4.3	1.98 V	146	45.86	3.84
6	#5984.00	62.1 PK	74.0	-11.9	2.02 V	137	58.01	4.09
7	#5984.00	50.9 AV	54.0	-3.1	2.02 V	137	46.81	4.09
8	11650.00	54.5 PK	74.0	-19.5	2.25 V	183	39.83	14.67
9	11650.00	42.3 AV	54.0	-11.7	2.25 V	183	27.63	14.67
10	#17475.00	47.0 PK	74.0	-27.0	1.58 V	209	26.17	20.83
11	#17475.00	34.1 AV	54.0	-19.9	1.58 V	209	13.27	20.83

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
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	65.9 PK	74.0	-8.1	1.04 H	145	63.34	2.56
2	5150.00	47.4 AV	54.0	-6.6	1.04 H	145	44.84	2.56
3	*5190.00	101.1 PK			1.04 H	145	98.42	2.68
4	*5190.00	88.9 AV			1.04 H	145	86.22	2.68
5	5350.00	53.4 PK	74.0	-20.6	1.04 H	145	50.31	3.09
6	5350.00	41.3 AV	54.0	-12.7	1.04 H	145	38.21	3.09
7	#6920.00	52.4 PK	74.0	-21.6	1.04 H	145	45.19	7.21
8	#6920.00	46.5 AV	54.0	-7.5	1.04 H	145	39.29	7.21
9	#10380.00	43.9 PK	74.0	-30.1	1.45 H	169	30.56	13.34
10	#10380.00	31.6 AV	54.0	-22.4	1.45 H	169	18.26	13.34
11	15570.00	39.8 PK	74.0	-34.2	1.43 H	269	24.35	15.45
12	15570.00	26.1 AV	54.0	-27.9	1.43 H	269	10.65	15.45
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	5150.00	72.1 PK	74.0	-1.9	2.01 V	18	69.54	2.56
2	5150.00	53.8 AV	54.0	-0.2	2.01 V	18	51.24	2.56
3	*5190.00	112.1 PK			2.01 V	18	109.42	2.68
4	*5190.00	100.3 AV			2.01 V	18	97.62	2.68
5	5350.00	58.8 PK	74.0	-15.2	2.01 V	18	55.71	3.09
6	5350.00	47.8 AV	54.0	-6.2	2.01 V	18	44.71	3.09
7	#6920.00	58.8 PK	74.0	-15.2	2.01 V	360	51.59	7.21
8	#6920.00	52.7 AV	54.0	-1.3	2.01 V	360	45.49	7.21
9	#10380.00	53.1 PK	74.0	-20.9	2.30 V	187	39.76	13.34
10	#10380.00	40.2 AV	54.0	-13.8	2.30 V	187	26.86	13.34
11	15570.00	45.3 PK	74.0	-28.7	1.58 V	196	29.85	15.45
12	15570.00	32.4 AV	54.0	-21.6	1.58 V	196	16.95	15.45

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.

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	57.0 PK	74.0	-17.0	1.10 H	131	54.44	2.56
2	5150.00	46.1 AV	54.0	-7.9	1.10 H	131	43.54	2.56
3	*5230.00	105.4 PK			1.10 H	131	102.63	2.77
4	*5230.00	95.5 AV			1.10 H	131	92.73	2.77
5	5387.00	55.9 PK	74.0	-18.1	1.10 H	131	52.71	3.19
6	5387.00	44.1 AV	54.0	-9.9	1.10 H	131	40.91	3.19
7	#10460.00	43.4 PK	74.0	-30.6	1.46 H	178	29.98	13.42
8	#10460.00	31.3 AV	54.0	-22.7	1.46 H	178	17.88	13.42
9	15690.00	40.4 PK	74.0	-33.6	1.48 H	284	25.26	15.14
10	15690.00	26.6 AV	54.0	-27.4	1.48 H	284	11.46	15.14
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	5150.00	63.0 PK	74.0	-11.0	2.01 V	18	60.44	2.56
2	5150.00	52.2 AV	54.0	-1.8	2.01 V	18	49.64	2.56
3	*5230.00	117.1 PK			2.01 V	18	114.33	2.77
4	*5230.00	105.8 AV			2.01 V	18	103.03	2.77
5	5387.00	62.3 PK	74.0	-11.7	2.06 V	85	59.11	3.19
6	5387.00	50.4 AV	54.0	-3.6	2.06 V	85	47.21	3.19
7	#10460.00	53.2 PK	74.0	-20.8	2.31 V	196	39.78	13.42
8	#10460.00	40.3 AV	54.0	-13.7	2.31 V	196	26.88	13.42
9	15690.00	44.9 PK	74.0	-29.1	1.52 V	190	29.76	15.14
10	15690.00	32.0 AV	54.0	-22.0	1.52 V	190	16.86	15.14

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	66.1 PK	74.0	-7.9	1.02 H	130	62.31	3.79
2	#5715.00	46.6 AV	54.0	-7.4	1.02 H	130	42.81	3.79
3	#5725.00	71.7 PK	78.2	-6.5	1.02 H	130	67.90	3.80
4	*5755.00	99.4 PK			1.02 H	130	95.59	3.81
5	*5755.00	86.5 AV			1.02 H	130	82.69	3.81
6	#5911.00	51.3 PK	74.0	-22.7	1.02 H	130	47.42	3.88
7	#5911.00	40.3 AV	54.0	-13.7	1.02 H	130	36.42	3.88
8	11510.00	43.7 PK	74.0	-30.3	1.44 H	156	28.71	14.99
9	11510.00	31.3 AV	54.0	-22.7	1.44 H	156	16.31	14.99
10	#17265.00	39.7 PK	74.0	-34.3	1.41 H	272	19.93	19.77
11	#17265.00	26.2 AV	54.0	-27.8	1.41 H	272	6.43	19.77
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	#5715.00	72.2 PK	74.0	-1.8	2.01 V	86	68.41	3.79
2	#5715.00	52.8 AV	54.0	-1.2	2.01 V	86	49.01	3.79
3	**#5725.00**	**78.1 PK**	**78.2**	**-0.1**	**2.01 V**	**86**	**74.30**	**3.80**
4	*5755.00	110.5 PK			2.01 V	86	106.69	3.81
5	*5755.00	98.5 AV			2.01 V	86	94.69	3.81
6	#5911.00	57.6 PK	74.0	-16.4	2.01 V	86	53.72	3.88
7	#5911.00	46.2 AV	54.0	-7.8	2.01 V	86	42.32	3.88
8	11510.00	53.4 PK	74.0	-20.6	2.25 V	178	38.41	14.99
9	11510.00	40.6 AV	54.0	-13.4	2.25 V	178	25.61	14.99
10	#17265.00	45.4 PK	74.0	-28.6	1.53 V	195	25.63	19.77
11	#17265.00	32.3 AV	54.0	-21.7	1.53 V	195	12.53	19.77

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	103.3 PK			1.08 H	149	99.46	3.84
2	*5795.00	91.4 AV			1.08 H	149	87.56	3.84
3	#5850.00	69.3 PK	78.2	-8.9	1.08 H	149	65.47	3.83
4	#5861.00	64.8 PK	74.0	-9.2	1.08 H	149	60.96	3.84
5	#5861.00	47.7 AV	54.0	-6.3	1.08 H	149	43.86	3.84
6	11590.00	43.2 PK	74.0	-30.8	1.48 H	174	28.41	14.79
7	11590.00	31.1 AV	54.0	-22.9	1.48 H	174	16.31	14.79
8	#17385.00	39.3 PK	74.0	-34.7	1.41 H	266	18.90	20.40
9	#17385.00	25.7 AV	54.0	-28.3	1.41 H	266	5.30	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	114.4 PK			1.99 V	86	110.56	3.84
2	*5795.00	102.1 AV			1.99 V	86	98.26	3.84
3	#5850.00	75.7 PK	78.2	-2.5	1.99 V	86	71.87	3.83
4	#5861.00	71.3 PK	74.0	-2.7	1.99 V	86	67.46	3.84
5	#5861.00	53.8 AV	54.0	-0.2	1.99 V	86	49.96	3.84
6	11590.00	52.8 PK	74.0	-21.2	2.33 V	198	38.01	14.79
7	11590.00	40.0 AV	54.0	-14.0	2.33 V	198	25.21	14.79
8	#17385.00	45.6 PK	74.0	-28.4	1.59 V	188	25.20	20.40
9	#17385.00	32.9 AV	54.0	-21.1	1.59 V	188	12.50	20.40

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	61.4 PK	74.0	-12.6	1.07 H	144	58.84	2.56
2	5150.00	47.4 AV	54.0	-6.6	1.07 H	144	44.84	2.56
3	*5210.00	95.4 PK			1.07 H	144	92.67	2.73
4	*5210.00	83.0 AV			1.07 H	144	80.27	2.73
5	5350.00	47.9 PK	74.0	-26.1	1.07 H	144	44.81	3.09
6	5350.00	39.6 AV	54.0	-14.4	1.07 H	144	36.51	3.09
7	#10420.00	42.5 PK	74.0	-31.5	1.44 H	190	29.04	13.46
8	#10420.00	30.7 AV	54.0	-23.3	1.44 H	190	17.24	13.46
9	15630.00	39.8 PK	74.0	-34.2	1.39 H	256	24.47	15.33
10	15630.00	26.0 AV	54.0	-28.0	1.39 H	256	10.67	15.33
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	67.8 PK	74.0	-6.2	1.92 V	202	65.24	2.56
2	5150.00	53.5 AV	54.0	-0.5	1.92 V	202	50.94	2.56
3	*5210.00	106.4 PK			1.92 V	202	103.67	2.73
4	*5210.00	94.5 AV			1.92 V	202	91.77	2.73
5	5350.00	54.1 PK	74.0	-19.9	1.92 V	202	51.01	3.09
6	5350.00	44.0 AV	54.0	-10.0	1.92 V	202	40.91	3.09
7	#10420.00	53.5 PK	74.0	-20.5	2.37 V	183	40.04	13.46
8	#10420.00	40.4 AV	54.0	-13.6	2.37 V	183	26.94	13.46
9	15630.00	45.2 PK	74.0	-28.8	1.60 V	198	29.87	15.33
10	15630.00	32.6 AV	54.0	-21.4	1.60 V	198	17.27	15.33

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	63.4 PK	74.0	-10.6	1.05 H	145	59.61	3.79
2	#5715.00	47.5 AV	54.0	-6.5	1.05 H	145	43.71	3.79
3	#5725.00	65.9 PK	78.2	-12.3	1.05 H	145	62.10	3.80
4	*5775.00	95.7 PK			1.05 H	145	91.89	3.81
5	*5775.00	83.0 AV			1.05 H	145	79.19	3.81
6	#5850.00	58.0 PK	78.2	-20.2	1.05 H	145	54.17	3.83
7	#5860.00	53.4 PK	74.0	-20.6	1.05 H	145	49.56	3.84
8	#5860.00	37.8 AV	54.0	-16.2	1.05 H	145	33.96	3.84
9	11550.00	42.2 PK	74.0	-31.8	1.41 H	176	27.31	14.89
10	11550.00	30.4 AV	54.0	-23.6	1.41 H	176	15.51	14.89
11	#17325.00	39.7 PK	74.0	-34.3	1.44 H	242	19.62	20.08
12	#17325.00	26.1 AV	54.0	-27.9	1.44 H	242	6.02	20.08
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	69.5 PK	74.0	-4.5	1.84 V	263	65.71	3.79
2	#5715.00	53.6 AV	54.0	-0.4	1.84 V	263	49.81	3.79
3	#5725.00	72.3 PK	78.2	-5.9	1.84 V	263	68.50	3.80
4	*5775.00	106.2 PK			1.84 V	263	102.39	3.81
5	*5775.00	94.1 AV			1.84 V	263	90.29	3.81
6	#5850.00	64.6 PK	78.2	-13.6	1.84 V	263	60.77	3.83
7	#5860.00	59.6 PK	74.0	-14.4	1.84 V	263	55.76	3.84
8	#5860.00	43.9 AV	54.0	-10.1	1.84 V	263	40.06	3.84
9	11550.00	52.1 PK	74.0	-21.9	2.37 V	206	37.21	14.89
10	11550.00	39.5 AV	54.0	-14.5	2.37 V	206	24.61	14.89
11	#17325.00	46.0 PK	74.0	-28.0	1.62 V	193	25.92	20.08
12	#17325.00	33.3 AV	54.0	-20.7	1.62 V	193	13.22	20.08

REMARKS:

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

BELOW 1GHz WORST-CASE DATA:

CDD MODE

802.11a

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	80.11	29.1 QP	40.0	-10.9	1.47 H	100	42.66	-13.54
2	185.12	37.3 QP	43.5	-6.2	1.24 H	100	48.30	-10.96
3	261.95	40.4 QP	46.0	-5.6	1.24 H	147	49.76	-9.34
4	299.65	38.2 QP	46.0	-7.8	1.47 H	36	46.10	-7.89
5	375.11	41.3 QP	46.0	-4.7	1.24 H	45	47.32	-5.98
6	625.12	38.4 QP	46.0	-7.6	1.64 H	241	38.50	-0.08
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	78.85	36.7 QP	40.0	-3.3	2.41 V	100	50.03	-13.31
2	188.64	36.1 QP	43.5	-7.4	1.67 V	301	47.44	-11.32
3	261.24	38.4 QP	46.0	-7.6	1.67 V	100	47.81	-9.39
4	375.12	38.3 QP	46.0	-7.7	1.64 V	88	44.29	-5.98
5	500.14	37.6 QP	46.0	-8.4	1.67 V	124	40.55	-2.91
6	625.12	38.4 QP	46.0	-7.6	1.22 V	51	38.50	-0.08

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. 01, 2015	Aug. 31, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 08, 2016	Mar. 07, 2017
50 ohms Terminator	N/A	EMC-03	Sep. 23, 2015	Sep. 22, 2016
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2015	Sep. 30, 2016
50 ohms Terminator	E1-011315	13	Dec. 11 2015	Dec. 10 2016
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: Mar. 10, 2016

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.

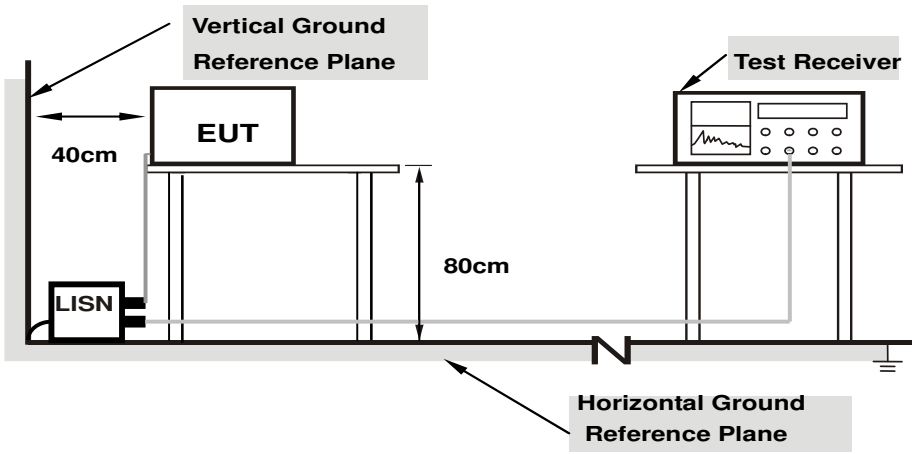
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

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 (Mode 1)

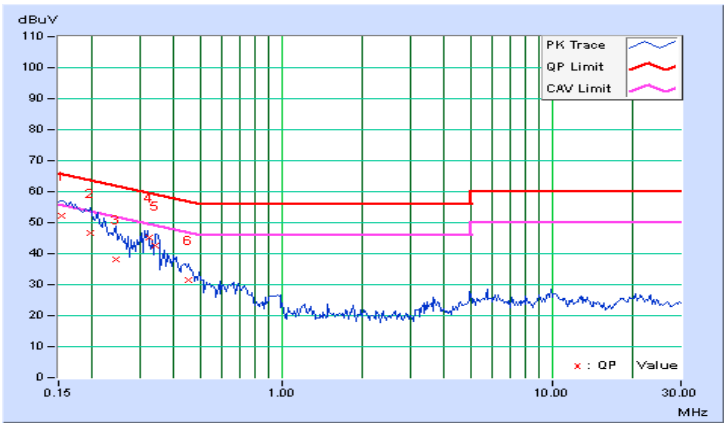
CDD MODE

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.26	41.96	33.06	52.22	43.32	65.79	55.79	-13.57	-12.47
2	0.19687	10.22	36.60	27.00	46.82	37.22	63.74	53.74	-16.92	-16.52
3	0.24375	10.22	27.75	14.38	37.97	24.60	61.97	51.97	-23.99	-27.36
4	0.32269	10.23	34.83	33.91	45.06	44.14	59.64	49.64	-14.57	-5.49
5	0.34141	10.23	32.30	27.83	42.53	38.06	59.17	49.17	-16.63	-11.10
6	0.45469	10.23	21.22	15.90	31.45	26.13	56.79	46.79	-25.34	-20.66

REMARKS:

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

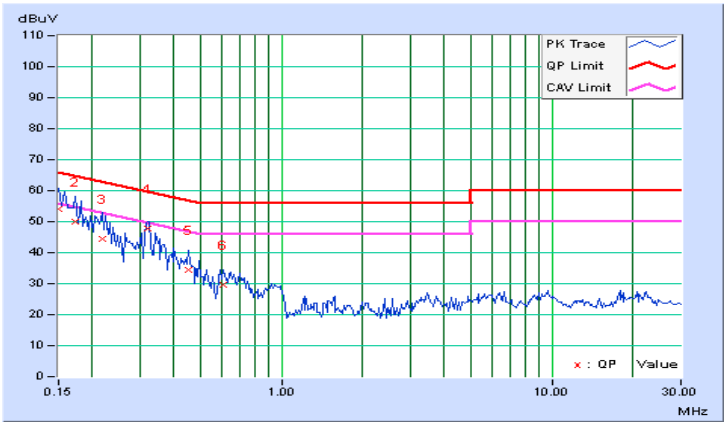


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.24	43.97	34.00	54.21	44.24	66.00	56.00	-11.79	-11.76
2	0.17344	10.22	39.62	29.94	49.84	40.16	64.79	54.79	-14.95	-14.63
3	0.21641	10.20	34.11	26.80	44.31	37.00	62.96	52.96	-18.64	-15.95
4	**0.32188**	**10.21**	**37.61**	**36.29**	**47.82**	**46.50**	**59.66**	**49.66**	**-11.84**	**-3.16**
5	0.45078	10.21	24.11	19.21	34.32	29.42	56.86	46.86	-22.54	-17.44
6	0.61094	10.20	19.38	13.50	29.58	23.70	56.00	46.00	-26.42	-22.30

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.



4.2.8 Test Results (Mode 2)

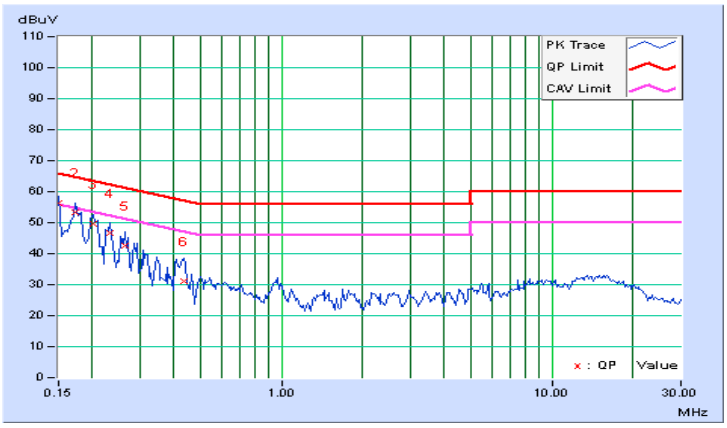
CDD MODE

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.26	46.10	31.83	56.36	42.09	66.00	56.00	-9.64	-13.91
2	0.17344	10.24	42.91	32.89	53.15	43.13	64.79	54.79	-11.64	-11.66
3	0.20078	10.22	39.36	29.78	49.58	40.00	63.58	53.58	-14.00	-13.58
4	0.23203	10.22	36.46	28.19	46.68	38.41	62.38	52.38	-15.69	-13.96
5	0.26328	10.23	32.34	25.61	42.57	35.84	61.33	51.33	-18.76	-15.49
6	0.43516	10.24	20.76	12.55	31.00	22.79	57.15	47.15	-26.16	-24.37

REMARKS:

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

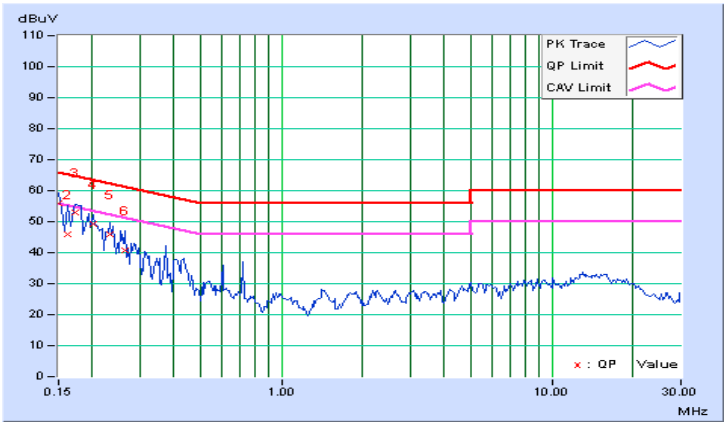


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.24	45.68	35.59	55.92	45.83	66.00	56.00	-10.08	-10.17
2	0.16172	10.23	35.64	16.03	45.87	26.26	65.38	55.38	-19.50	-29.11
3	0.17344	10.22	42.56	32.97	52.78	43.19	64.79	54.79	-12.01	-11.60
4	0.20078	10.20	38.93	28.95	49.13	39.15	63.58	53.58	-14.45	-14.43
5	0.23203	10.20	35.68	27.11	45.88	37.31	62.38	52.38	-16.49	-15.06
6	0.26328	10.21	30.45	23.93	40.66	34.14	61.33	51.33	-20.67	-17.19

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

POWER OUTPUT:

CDD MODE

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.21	19.89	180.867	22.57	30	Pass
40	5200	23.17	22.43	382.476	25.83	30	Pass
48	5240	23.02	22.24	367.941	25.66	30	Pass
149	5745	16.88	17.36	103.203	20.14	30	Pass
157	5785	22.24	22.12	330.424	25.19	30	Pass
165	5825	18.41	19.11	150.813	21.78	30	Pass

Beamforming MODE

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.68	19.67	185.58	22.69	27.29	Pass
40	5200	23.11	22.06	365.338	25.63	27.29	Pass
48	5240	23.04	22.13	364.677	25.62	27.29	Pass
149	5745	15.56	16.67	82.427	19.16	27.29	Pass
157	5785	22.04	22.11	322.511	25.09	27.29	Pass
165	5825	18.42	19.05	149.855	21.76	27.29	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] =8.71dBi > 6dBi , so the power density limit shall be reduced to 30-(8.71-6) = 27.29dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	16.12	15.96	80.372	19.05	27.29	Pass
46	5230	21.69	21.52	289.477	24.62	27.29	Pass
151	5755	15.14	16.02	72.653	18.61	27.29	Pass
159	5795	19.03	19.57	170.556	22.32	27.29	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] =8.71dBi > 6dBi , so the power density limit shall be reduced to 30-(8.71-6) = 27.29dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	14.46	14.51	56.174	17.50	27.29	Pass
155	5775	14.39	14.94	58.668	17.68	27.29	Pass

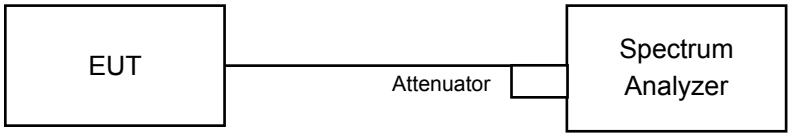
Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] =8.71dBi > 6dBi , so the power density limit shall be reduced to 30-(8.71-6) = 27.29dBm.

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):

For U-NII-1 band:

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 U-NII-3:

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 = 10log(500 kHz/300kHz)
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 802.11ac (VHT80):

For U-NII-1 band:

Using method SA-2

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

For U-NII-3:

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 = 10log(500 kHz/300kHz)
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/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

For U-NII-1:

CDD MODE

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	6.12	6.22	9.18	14.29	Pass
40	5200	8.28	9.94	12.20	14.29	Pass
48	5240	8.64	9.10	11.89	14.29	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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 8.71dBi > 6dBi , so the power density limit shall be reduced to 17-(8.71-6) = 14.29dBm.

Beamforming MODE

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	5.78	6.05	8.93	14.29	Pass
40	5200	8.20	9.60	11.97	14.29	Pass
48	5240	8.46	9.74	12.16	14.29	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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 8.71dBi > 6dBi , so the power density limit shall be reduced to 17-(8.71-6) = 14.29dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
38	5190	0.05	-1.05	2.54	14.29	Pass
46	5230	5.30	-2.36	5.99	14.29	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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 8.71dBi > 6dBi , so the power density limit shall be reduced to 17-(8.71-6) = 14.29dBm.

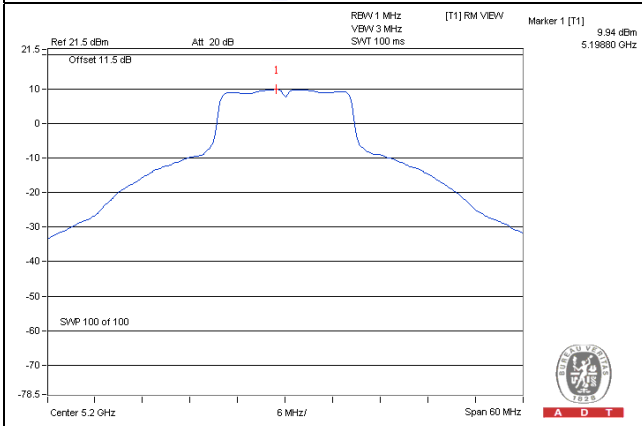
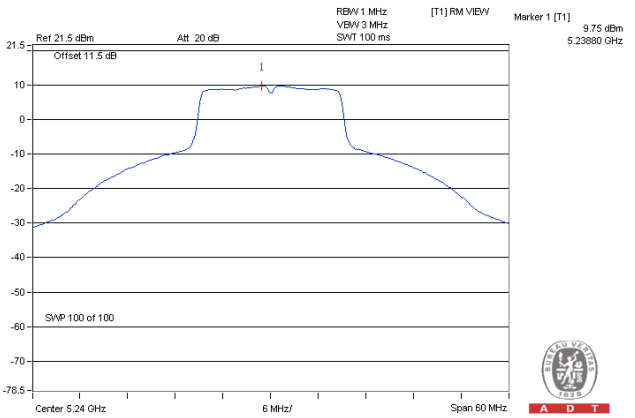
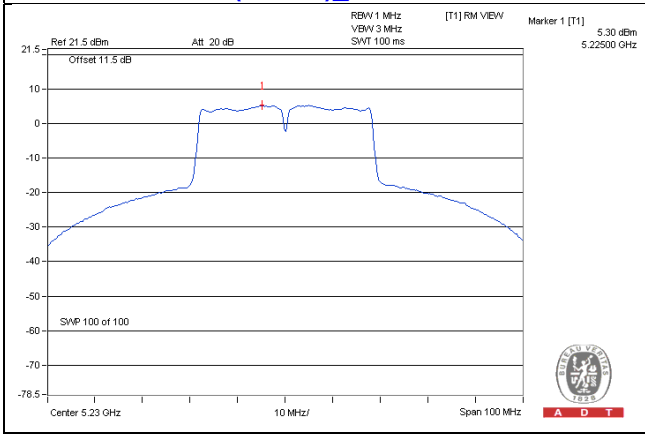
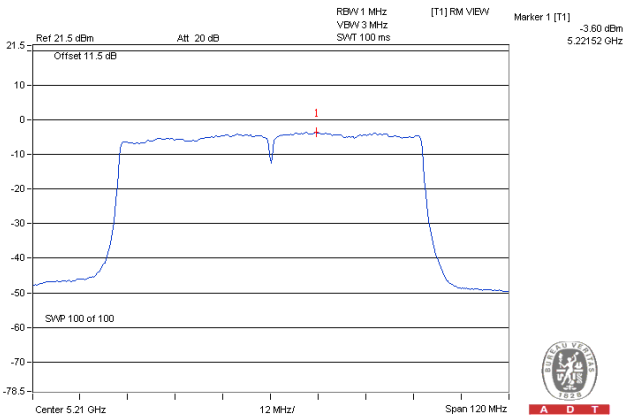
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. EIRP Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-5.11	-3.63	0.19	-1.11	14.29	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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 8.71dBi > 6dBi , so the power density limit shall be reduced to 17-(8.71-6) = 14.29dBm.

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

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH40	**802.11ac (VHT20)_Chain 1 / CH48**
	
802.11ac (VHT40)_Chain 0 / CH46	**802.11ac (VHT80)_Chain 1 / CH42**
	

For U-NII-3:

CDD MODE

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-4.28	-2.06	3.01	0.95	27.29	Pass
	157	5785	1.47	3.69	3.01	6.70	27.29	Pass
	165	5825	-2.84	-0.62	3.01	2.39	27.29	Pass
1	149	5745	-4.75	-2.53	3.01	0.48	27.29	Pass
	157	5785	1.31	3.53	3.01	6.54	27.29	Pass
	165	5825	-3.58	-1.36	3.01	1.65	27.29	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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 8.71dBi > 6dBi , so the power density limit shall be reduced to 30-(8.71-6) = 27.29dBm.

Beamforming MODE

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-5.71	-3.49	3.01	-0.48	27.29	Pass
	157	5785	1.00	3.22	3.01	6.23	27.29	Pass
	165	5825	-3.09	-0.87	3.01	2.14	27.29	Pass
1	149	5745	-6.47	-4.25	3.01	-1.24	27.29	Pass
	157	5785	0.80	3.02	3.01	6.03	27.29	Pass
	165	5825	-1.95	0.27	3.01	3.28	27.29	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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 8.71dBi > 6dBi , so the power density limit shall be reduced to 30-(8.71-6) = 27.29dBm.

802.11ac (VHT40)

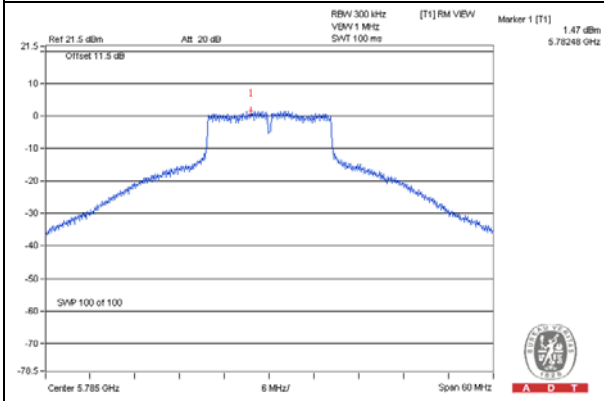
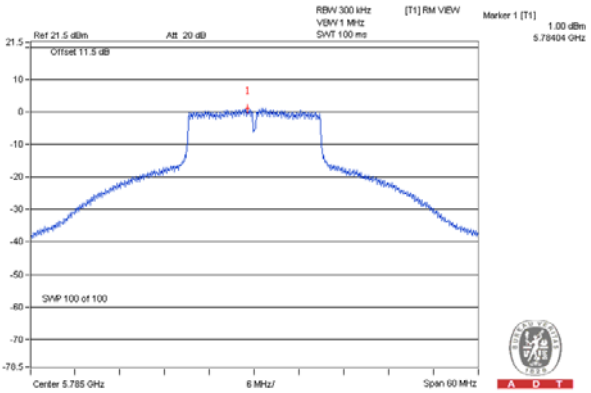
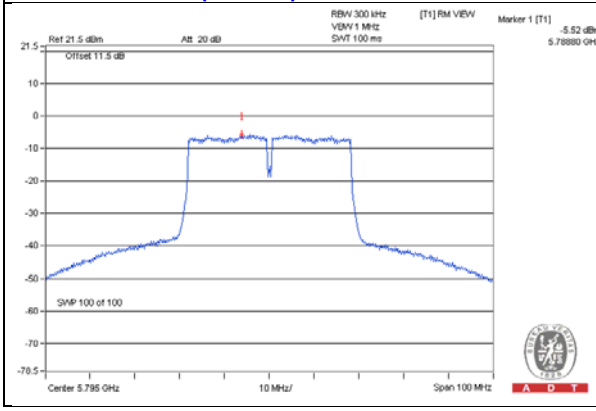
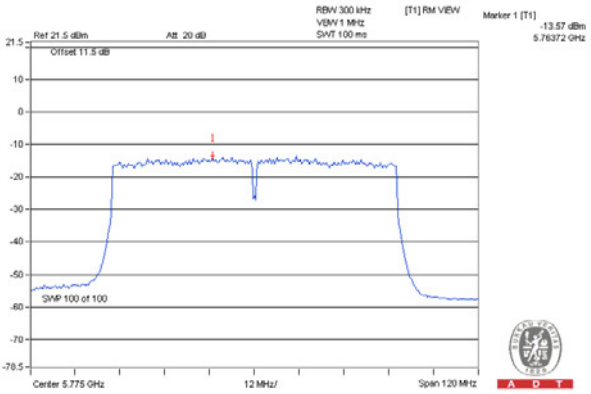
TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	151	5755	-8.84	-6.62	3.01	-3.61	27.29	Pass
	159	5795	-5.52	-3.30	3.01	-0.29	27.29	Pass
1	151	5755	-9.50	-7.28	3.01	-4.27	27.29	Pass
	159	5795	-6.21	-3.99	3.01	-0.98	27.29	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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 8.71dBi > 6dBi , so the power density limit shall be reduced to 30-(8.71-6) = 27.29dBm.

802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	155	5775	-13.57	-11.35	3.01	0.19	-8.15	27.29	Pass
1	155	5775	-14.25	-12.03	3.01	0.19	-8.83	27.29	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 = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 8.71dBi > 6dBi , so the power density limit shall be reduced to 30-(8.71-6) = 27.29dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

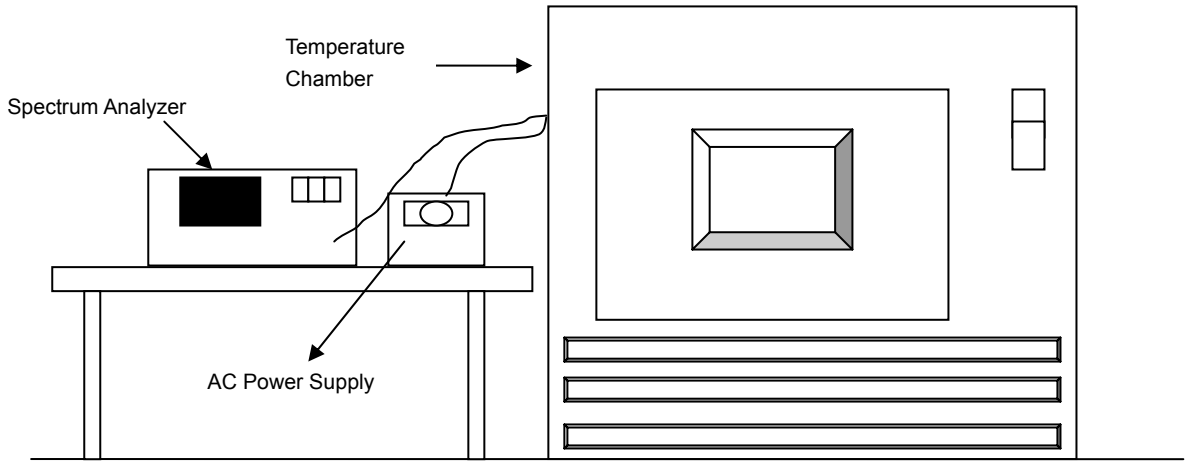
Spectrum Plot of Worst Value	
802.11a – Chain 0: CH 157	**802.11ac (VHT20) – Chain 0: CH 157**
	
802.11ac (VHT40) – Chain 0: CH 159	**802.11ac (VHT80) – Chain 0: CH 155**
	

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

CDD MODE

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5180MHz									
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	5179.9918	-0.00016	5179.9908	-0.00018	5179.9921	-0.00015	5179.9919	-0.00016
40	120	5179.9854	-0.00028	5179.9891	-0.00021	5179.9877	-0.00024	5179.9885	-0.00022
30	120	5179.9928	-0.00014	5179.9945	-0.00011	5179.9924	-0.00015	5179.9906	-0.00018
20	120	5179.9911	-0.00017	5179.9919	-0.00016	5179.9922	-0.00015	5179.996	-0.00008
10	120	5180.0149	0.00029	5180.0156	0.00030	5180.0147	0.00028	5180.0176	0.00034
0	120	5179.9771	-0.00044	5179.9761	-0.00046	5179.9751	-0.00048	5179.9737	-0.00051
-10	120	5180.0021	0.00004	5180.003	0.00006	5180.0003	0.00001	5180.0042	0.00008
-20	120	5180.0074	0.00014	5180.0067	0.00013	5180.0045	0.00009	5180.0054	0.00010
-30	120	5180.0136	0.00026	5180.0151	0.00029	5180.0166	0.00032	5180.0131	0.00025

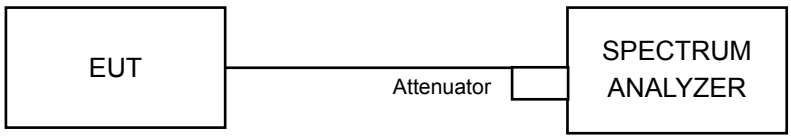
FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9913	-0.00017	5179.991	-0.00017	5179.9913	-0.00017	5179.9965	-0.00007
	120	5179.9911	-0.00017	5179.9919	-0.00016	5179.9922	-0.00015	5179.996	-0.00008
	102	5179.9914	-0.00017	5179.9926	-0.00014	5179.9913	-0.00017	5179.9958	-0.00008

4.6 6dB Bandwidth Measurment

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

CDD MODE

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.44	16.37	0.5	Pass
157	5785	15.24	15.80	0.5	Pass
165	5825	16.43	16.40	0.5	Pass

Beamforming MODE

802.11ac (VHT20)

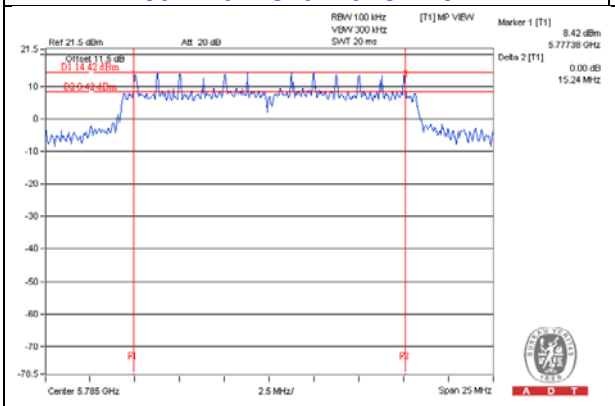
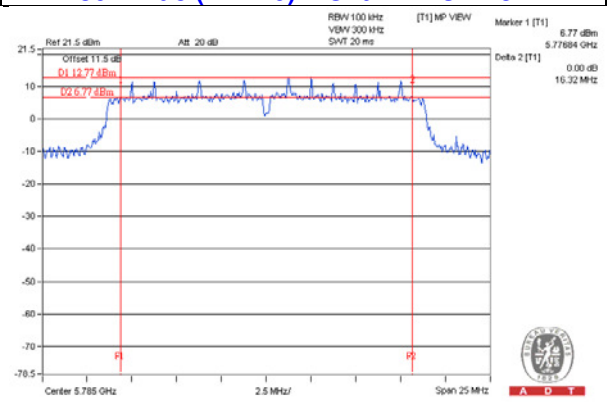
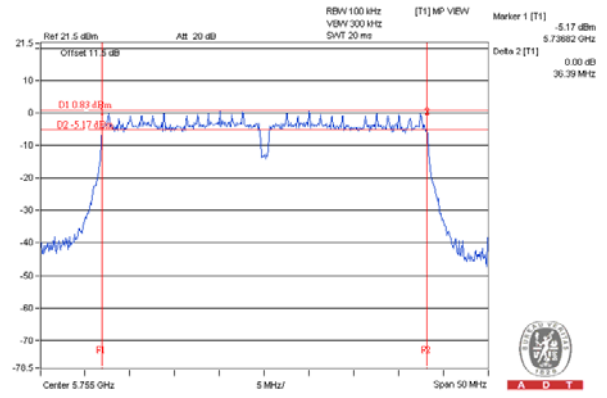
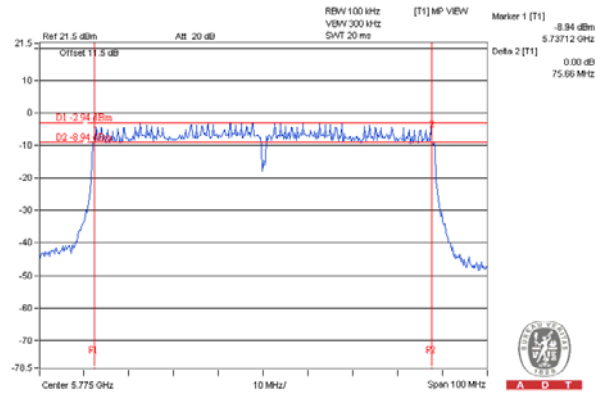
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.67	17.62	0.5	Pass
157	5785	16.98	16.32	0.5	Pass
165	5825	17.67	17.61	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.45	36.39	0.5	Pass
159	5795	36.45	36.43	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.66	76.09	0.5	Pass

Spectrum Plot of Worst Value	
802.11a – Chain 0: CH 157	**802.11ac (VHT20) – Chain 1: CH 157**
	
802.11ac (VHT40) – Chain 1: CH 151	**802.11ac (VHT80) – Chain 0: CH 155**
	

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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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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