

FCC Test Report

Report No.: RF130207E02H-1

FCC ID: KA2AP1650A1

Test Model: DAP-1650

Received Date: Dec. 31, 2015

Test Date: Jan. 05 to 06, 2016

Issued Date: Jan. 13, 2016

Applicant: D-Link Corporation

Address: No.289, Sinhu 3rd Rd., Neihu District, Taipei City 114, Taiwan, R.O.C.

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.

Test Location (3): No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin
Chu Hsien 307, Taiwan R.O.C.



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A D T

Release Control Record

Issue No.	Description	Date Issued
RF130207E02H-1	Original release.	Jan. 13, 2016

1 Certificate of Conformity

Product: Wireless AC1200 Dual Band Gigabit Range Extender

Brand: D-Link

Test Model: DAP-1650

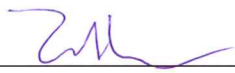
Sample Status: R&D SAMPLE

Applicant: D-Link Corporation

Test Date: Jan. 05 to 06, 2016

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

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

Prepared by :  , **Date:** Jan. 13, 2016
Elsie Hsu / Specialist

Approved by :  , **Date:** Jan. 13, 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) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.3dB at 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 IPEX not a standard connector.

NOTE: 1. Upgraded the standard to section 15.407 under new rule.

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	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 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 AC1200 Dual Band Gigabit Range Extender
Brand	D-Link
Test Model	DAP-1650
Status of EUT	R&D SAMPLE
Power Supply Rating	12Vdc 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 866.7Mbps
Operating Frequency	For 15.407 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
	For 15.247 2.412 ~ 2.462GHz
Number of Channel	For 15.407 9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 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 5.18~5.24 GHz 802.11a: 187.086mW 802.11ac (VHT20): 189.981mW 802.11ac (VHT40): 183.15mW 802.11ac (VHT80): 96.164mW 5.745~5.825 GHz 802.11a: 192.515mW 802.11ac (VHT20): 186.003mW 802.11ac (VHT40): 122.657mW 802.11ac (VHT80): 72.881mW
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 permissive change. The difference compared with the Report No.: RF130710E11E-1 design is as the following:
 - ◆ Upgraded the standard to section 15.407 under new rule.
2. According to above conditions, all test items of U-NII-1, U-NII-3 band need to be performed, except for AC power conducted emission test item. And all data was verified to meet the requirements.
3. The EUT is a 2.4GHz & 5GHz WLAN device.
4. The EUT must be supplied with a power adapter as following table:

Brand	Model No.	Spec.
D-LINK	AMS115-1202000FU	Input: 100-240V, 0.8A, 50/60Hz Output: 12V, 2A DC power cable: 1.5m, unshielded

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

For 2.4GHz								
Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain (dBi) (Include cable loss)	Frequency range (MHz to MHz)	Connector Type	Cable Loss (dB)	Cable Length (cm)
Chain (1)	MAG.LA YERS	PCA-5010-2G4C1-A1	PCB Dipole	2.67	2400~2500	NA	NA	6.5
Chain (0)	Alpha	NA	Printed	2.94	2400~2500	NA	NA	5
For 5GHz								
Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain (dBi) (Include cable loss)	Frequency range (MHz to MHz)	Connector Type	Cable Loss (dB)	Cable Length (cm)
Chain (1)	MAG.LA YERS	PCA-2010-5G0C1-A4	PCB Dipole	2.25	4900~5825	IPEX	NA	11
Chain (0)	MAG.LA YERS	PCA-2010-5G0C1-A4	PCB Dipole	2.25	4900~5825	IPEX	NA	11

6. 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

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)

7. The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
8. 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	
-	√	√	-	√	-

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. "-" 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.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		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.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5320 5745-5825	36 to 64 149 to 165	36	OFDM	BPSK	6

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.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		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	27deg. C, 72%RH	120Vac, 60Hz	Robert Cheng
RE<1G	23deg. C, 69%RH	120Vac, 60Hz	Robert Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

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.

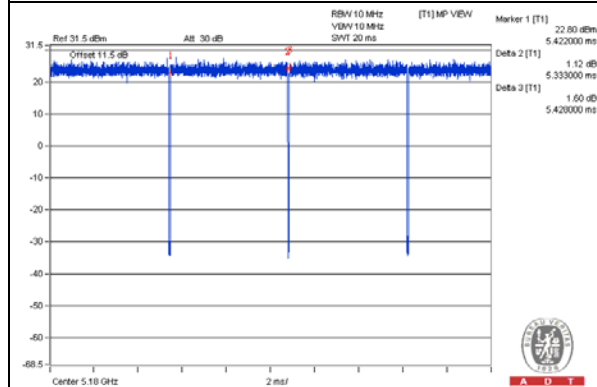
802.11a: Duty cycle = $5.333 \text{ ms} / 5.428 \text{ ms} = 0.982$

802.11ac (VHT20): Duty cycle = $4.95 \text{ ms} / 5.021 \text{ ms} = 0.986$

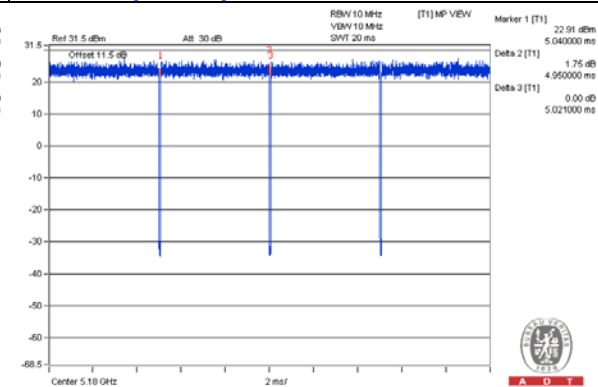
802.11ac (VHT40): Duty cycle = $2.396 \text{ ms} / 2.46 \text{ ms} = 0.974$, Duty factor = $10 * \log(1/0.974) = 0.11$

802.11ac (VHT80): Duty cycle = $1.135 \text{ ms} / 1.218 \text{ ms} = 0.932$, Duty factor = $10 * \log(1/0.932) = 0.31$

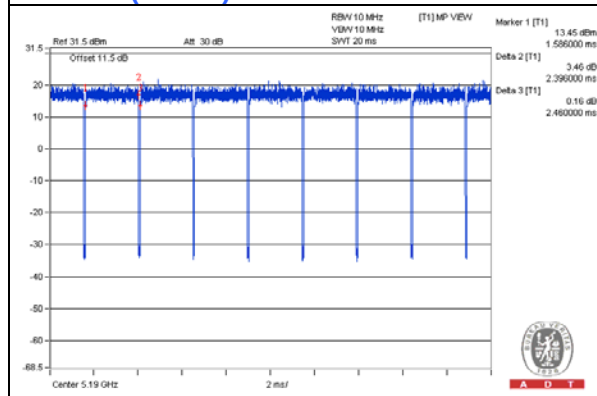
802.11a



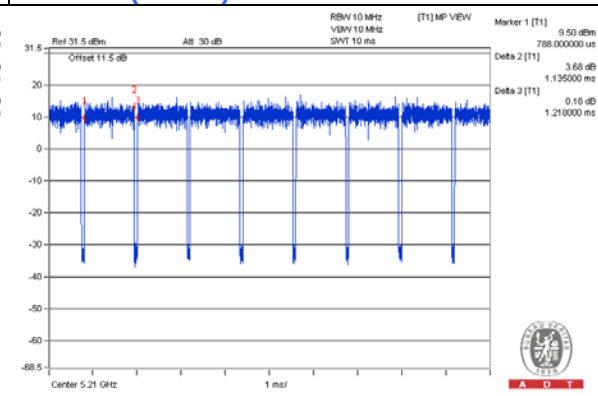
802.11ac (VHT20)



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.

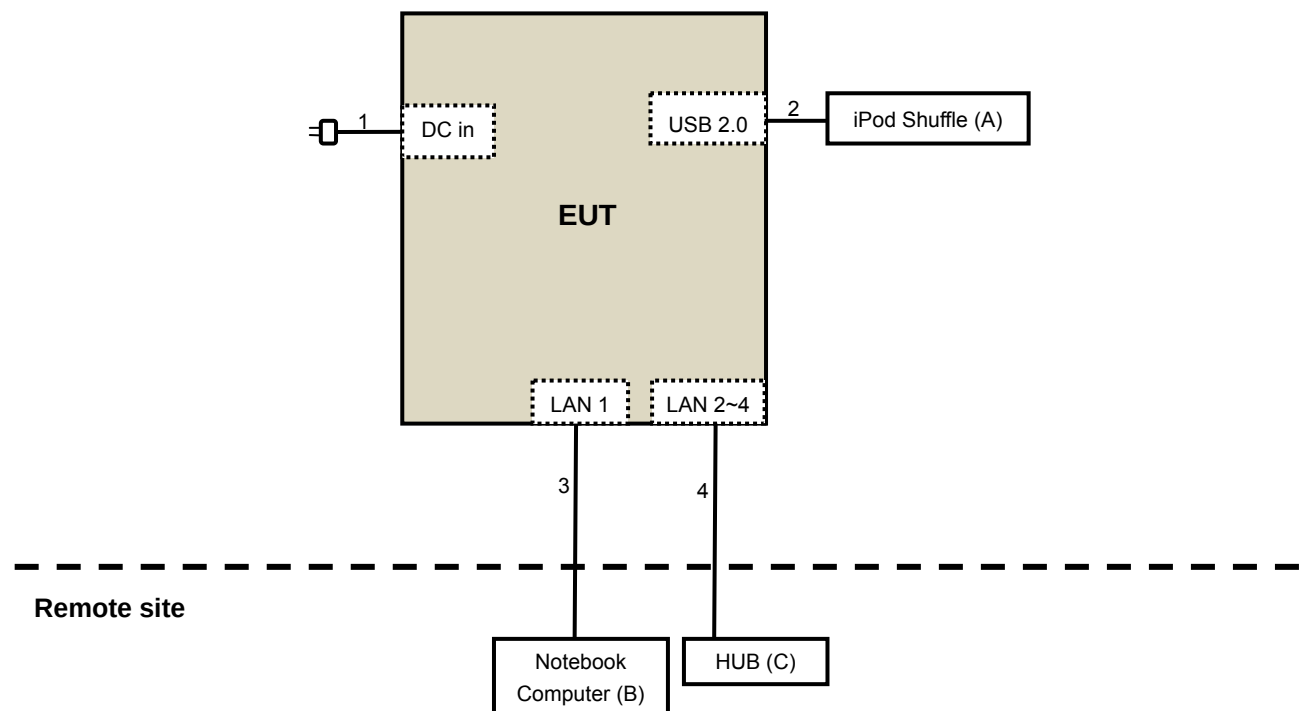
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	iPod shuffle	Apple	MD778TA/A	CC4JMFL0F4T1	NA	Provided by Lab
B.	Notebook Computer	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC	1	1.2	No	0	Supplied by Client
2.	USB	1	0.1	Yes	0	Provided by Lab
3.	RJ45	1	10	No	0	Provided by Lab
4.	RJ45	3	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)

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:

- 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

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. 13, 2014	Jan. 12, 2016
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2015	Jan. 17, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-06	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Feb. 03, 2015	Feb. 02, 2016
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

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. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 4.
5. The FCC Site Registration No. is 292998
6. The CANADA Site Registration No. is 20331-2
- 7 Tested Date: Jan. 06, 2016

For other test items:

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	Feb. 05, 2015	Feb. 04, 2016
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. 16, 2015	Jan. 15, 2016
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Feb. 05, 2015	Feb. 04, 2016
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 17, 2015	Jan. 16, 2016
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	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
Spectrum Analyzer R&S	FSP40	100060	May 08, 2015	May 07, 2016
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-S P-AR	MAA0812-008	Jan. 12, 2015	Jan. 11, 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: Jan. 05 to 06, 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:

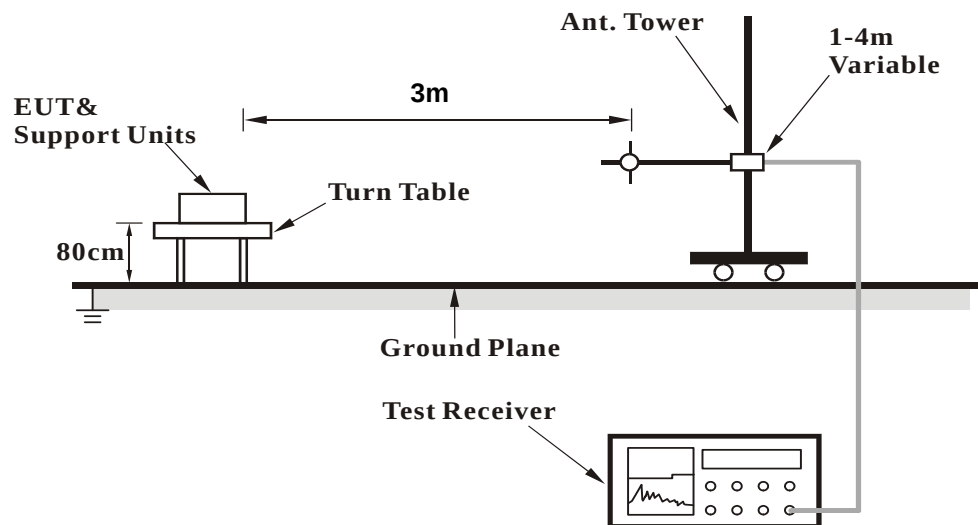
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

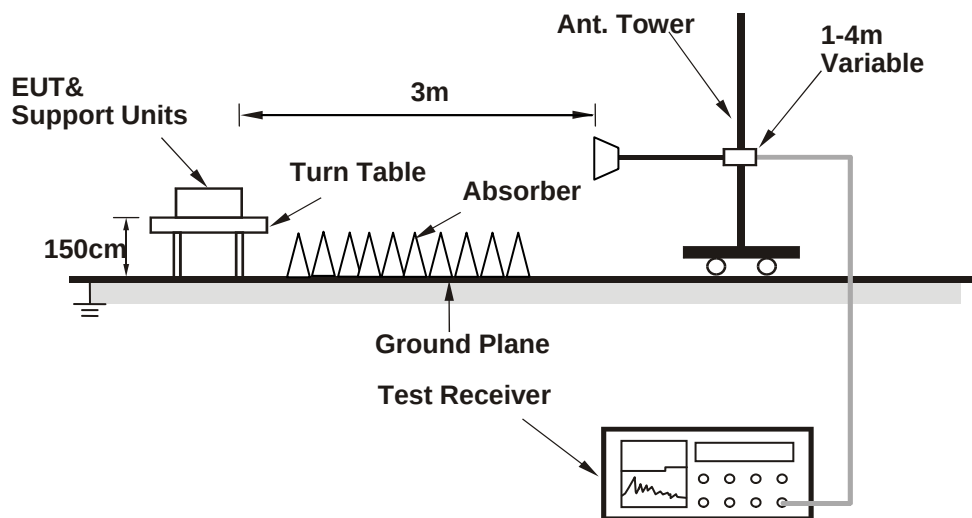
No deviation.

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. Connect the EUT with the support units B & C (Notebook Computer) which is placed on remote site.
2. Controlling software (Mtool.exe [Ver 2.0.2.8]) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.8 PK	74.0	-10.2	1.65 H	179	55.47	8.33
2	5150.00	48.2 AV	54.0	-5.8	1.65 H	179	39.87	8.33
3	*5180.00	105.4 PK			1.65 H	179	96.93	8.47
4	*5180.00	98.2 AV			1.65 H	179	89.73	8.47
5	#10360.00	56.3 PK	74.0	-17.7	1.16 H	324	41.80	14.50
6	#10360.00	46.5 AV	54.0	-7.5	1.16 H	324	32.00	14.50
7	15540.00	61.2 PK	74.0	-12.8	1.04 H	299	42.52	18.68
8	15540.00	50.1 AV	54.0	-3.9	1.04 H	299	31.42	18.68

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	67.3 PK	74.0	-6.7	2.37 V	86	58.97	8.33
2	5150.00	52.1 AV	54.0	-1.9	2.37 V	86	43.77	8.33
3	*5180.00	109.7 PK			2.37 V	86	101.23	8.47
4	*5180.00	102.5 AV			2.37 V	86	94.03	8.47
5	#10360.00	57.4 PK	74.0	-16.6	2.53 V	240	42.90	14.50
6	#10360.00	47.2 AV	54.0	-6.8	2.53 V	240	32.70	14.50
7	15540.00	63.4 PK	74.0	-10.6	3.03 V	266	44.72	18.68
8	15540.00	50.6 AV	54.0	-3.4	3.03 V	266	31.92	18.68

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	105.3 PK			1.61 H	175	96.76	8.54
2	*5200.00	97.9 AV			1.61 H	175	89.36	8.54
3	#10400.00	55.8 PK	74.0	-18.2	1.18 H	332	41.20	14.60
4	#10400.00	46.2 AV	54.0	-7.8	1.18 H	332	31.60	14.60
5	15600.00	61.7 PK	74.0	-12.3	1.07 H	310	42.80	18.90
6	15600.00	50.4 AV	54.0	-3.6	1.07 H	310	31.50	18.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	109.5 PK			2.50 V	178	100.96	8.54
2	*5200.00	102.5 AV			2.50 V	178	93.96	8.54
3	#10400.00	57.9 PK	74.0	-16.1	2.50 V	247	43.30	14.60
4	#10400.00	47.7 AV	54.0	-6.3	2.50 V	247	33.10	14.60
5	15600.00	63.8 PK	74.0	-10.2	3.05 V	261	44.90	18.90
6	15600.00	50.7 AV	54.0	-3.3	3.05 V	261	31.80	18.90

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	105.0 PK			1.60 H	170	96.40	8.60
2	*5240.00	97.9 AV			1.60 H	170	89.30	8.60
3	5350.00	50.3 PK	74.0	-23.7	1.60 H	170	41.50	8.80
4	5350.00	41.4 AV	54.0	-12.6	1.60 H	170	32.60	8.80
5	#10480.00	56.2 PK	74.0	-17.8	1.20 H	335	41.73	14.47
6	#10480.00	46.7 AV	54.0	-7.3	1.20 H	335	32.23	14.47
7	15720.00	61.6 PK	74.0	-12.4	1.06 H	320	42.56	19.04
8	15720.00	50.5 AV	54.0	-3.5	1.06 H	320	31.46	19.04
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	110.9 PK			2.39 V	77	102.30	8.60
2	*5240.00	103.8 AV			2.39 V	77	95.20	8.60
3	5350.00	51.6 PK	74.0	-22.4	2.39 V	77	42.80	8.80
4	5350.00	42.8 AV	54.0	-11.2	2.39 V	77	34.00	8.80
5	#10480.00	58.2 PK	74.0	-15.8	2.46 V	254	43.73	14.47
6	#10480.00	47.7 AV	54.0	-6.3	2.46 V	254	33.23	14.47
7	15720.00	64.4 PK	74.0	-9.6	3.01 V	257	45.36	19.04
8	15720.00	51.1 AV	54.0	-2.9	3.01 V	257	32.06	19.04

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	#5715.00	64.3 PK	74.0	-9.7	1.65 H	166	54.62	9.68
2	#5715.00	47.5 AV	54.0	-6.5	1.65 H	166	37.82	9.68
3	#5725.00	73.6 PK	78.2	-4.6	1.65 H	166	63.90	9.70
4	*5745.00	101.8 PK			1.65 H	166	92.04	9.76
5	*5745.00	93.6 AV			1.65 H	166	83.84	9.76
6	11490.00	54.6 PK	74.0	-19.4	1.18 H	340	39.74	14.86
7	11490.00	44.3 AV	54.0	-9.7	1.18 H	340	29.44	14.86
8	#17235.00	62.2 PK	74.0	-11.8	1.11 H	323	38.97	23.23
9	#17235.00	50.9 AV	54.0	-3.1	1.11 H	323	27.67	23.23
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	65.2 PK	74.0	-8.8	2.38 V	171	55.52	9.68
2	#5715.00	48.6 AV	54.0	-5.4	2.38 V	171	38.92	9.68
3	#5725.00	77.9 PK	78.2	-0.3	2.47 V	177	68.20	9.70
4	*5745.00	106.2 PK			2.41 V	168	96.44	9.76
5	*5745.00	98.8 AV			2.41 V	168	89.04	9.76
6	11490.00	55.4 PK	74.0	-18.6	2.46 V	256	40.54	14.86
7	11490.00	45.3 AV	54.0	-8.7	2.46 V	256	30.44	14.86
8	#17235.00	61.3 PK	74.0	-12.7	3.03 V	251	38.07	23.23
9	#17235.00	48.4 AV	54.0	-5.6	3.03 V	251	25.17	23.23

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	104.6 PK			1.64 H	168	94.75	9.85
2	*5785.00	97.6 AV			1.64 H	168	87.75	9.85
3	11570.00	56.0 PK	74.0	-18.0	1.24 H	340	40.80	15.20
4	11570.00	46.7 AV	54.0	-7.3	1.24 H	340	31.50	15.20
5	#17355.00	62.0 PK	74.0	-12.0	1.01 H	331	38.44	23.56
6	#17355.00	50.7 AV	54.0	-3.3	1.01 H	331	27.14	23.56
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.0 PK			2.39 V	167	100.15	9.85
2	*5785.00	102.9 AV			2.39 V	167	93.05	9.85
3	11570.00	58.2 PK	74.0	-15.8	2.17 V	152	43.00	15.20
4	11570.00	48.2 AV	54.0	-5.8	2.17 V	152	33.00	15.20
5	#17355.00	59.2 PK	74.0	-14.8	2.31 V	277	35.64	23.56
6	#17355.00	50.1 AV	54.0	-3.9	2.31 V	277	26.54	23.56

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	104.8 PK			1.61 H	161	94.89	9.91
2	*5825.00	97.8 AV			1.61 H	161	87.89	9.91
3	#5850.00	73.4 PK	78.2	-4.8	1.61 H	161	63.48	9.92
4	#5860.00	65.9 PK	74.0	-8.1	1.61 H	161	55.97	9.93
5	#5860.00	49.3 AV	54.0	-4.7	1.61 H	161	39.37	9.93
6	11650.00	55.2 PK	74.0	-18.8	1.23 H	338	39.80	15.40
7	11650.00	45.3 AV	54.0	-8.7	1.23 H	338	29.90	15.40
8	#17475.00	62.4 PK	74.0	-11.6	1.07 H	323	38.31	24.09
9	#17475.00	49.6 AV	54.0	-4.4	1.07 H	323	25.51	24.09

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	109.8 PK			2.49 V	170	99.89	9.91
2	*5825.00	102.1 AV			2.49 V	170	92.19	9.91
3	#5850.00	76.4 PK	78.2	-1.8	2.49 V	170	66.48	9.92
4	#5860.00	70.2 PK	74.0	-3.8	2.49 V	170	60.27	9.93
5	#5860.00	53.6 AV	54.0	-0.4	2.49 V	170	43.67	9.93
6	11650.00	56.3 PK	74.0	-17.7	2.49 V	257	40.90	15.40
7	11650.00	46.2 AV	54.0	-7.8	2.49 V	257	30.80	15.40
8	#17475.00	63.6 PK	74.0	-10.4	3.10 V	266	39.51	24.09
9	#17475.00	50.4 AV	54.0	-3.6	3.10 V	266	26.31	24.09

REMARKS:

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

802.11ac (VHT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
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	5119.94	64.1 PK	74.0	-9.9	1.67 H	192	55.91	8.19
2	5119.94	48.2 AV	54.0	-5.8	1.67 H	192	40.01	8.19
3	*5180.00	105.1 PK			1.67 H	192	96.63	8.47
4	*5180.00	97.8 AV			1.67 H	192	89.33	8.47
5	#10360.00	56.2 PK	74.0	-17.8	1.21 H	313	41.70	14.50
6	#10360.00	46.1 AV	54.0	-7.9	1.21 H	313	31.60	14.50
7	15540.00	61.3 PK	74.0	-12.7	1.08 H	309	42.62	18.68
8	15540.00	50.1 AV	54.0	-3.9	1.08 H	309	31.42	18.68
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	67.3 PK	74.0	-6.7	2.08 V	72	58.97	8.33
2	5150.00	52.2 AV	54.0	-1.8	2.08 V	72	43.87	8.33
3	*5180.00	109.6 PK			2.08 V	72	101.13	8.47
4	*5180.00	102.0 AV			2.08 V	72	93.53	8.47
5	#10360.00	58.5 PK	74.0	-15.5	2.41 V	269	44.00	14.50
6	#10360.00	48.0 AV	54.0	-6.0	2.41 V	269	33.50	14.50
7	15540.00	64.3 PK	74.0	-9.7	3.02 V	261	45.62	18.68
8	15540.00	51.0 AV	54.0	-3.0	3.02 V	261	32.32	18.68

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	104.7 PK			1.73 H	208	96.16	8.54
2	*5200.00	97.5 AV			1.73 H	208	88.96	8.54
3	#10400.00	55.8 PK	74.0	-18.2	1.26 H	317	41.20	14.60
4	#10400.00	45.9 AV	54.0	-8.1	1.26 H	317	31.30	14.60
5	15600.00	61.4 PK	74.0	-12.6	1.07 H	304	42.50	18.90
6	15600.00	50.1 AV	54.0	-3.9	1.07 H	304	31.20	18.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	110.1 PK			2.45 V	171	101.56	8.54
2	*5200.00	102.8 AV			2.45 V	171	94.26	8.54
3	#10400.00	57.6 PK	74.0	-16.4	2.44 V	251	43.00	14.60
4	#10400.00	47.3 AV	54.0	-6.7	2.44 V	251	32.70	14.60
5	15600.00	64.1 PK	74.0	-9.9	3.02 V	250	45.20	18.90
6	15600.00	50.8 AV	54.0	-3.2	3.02 V	250	31.90	18.90

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	104.8 PK			1.69 H	188	96.20	8.60
2	*5240.00	97.3 AV			1.69 H	188	88.70	8.60
3	5399.99	51.3 PK	74.0	-22.7	1.69 H	188	42.37	8.93
4	5399.99	42.4 AV	54.0	-11.6	1.69 H	188	33.47	8.93
5	#10480.00	56.3 PK	74.0	-17.7	1.18 H	327	41.83	14.47
6	#10480.00	46.0 AV	54.0	-8.0	1.18 H	327	31.53	14.47
7	15720.00	61.3 PK	74.0	-12.7	1.07 H	318	42.26	19.04
8	15720.00	50.1 AV	54.0	-3.9	1.07 H	318	31.06	19.04
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	110.8 PK			1.97 V	80	102.20	8.60
2	*5240.00	103.9 AV			1.97 V	80	95.30	8.60
3	5399.99	52.0 PK	74.0	-22.0	1.97 V	80	43.07	8.93
4	5399.99	43.1 AV	54.0	-10.9	1.97 V	80	34.17	8.93
5	#10480.00	58.4 PK	74.0	-15.6	2.49 V	253	43.93	14.47
6	#10480.00	47.6 AV	54.0	-6.4	2.49 V	253	33.13	14.47
7	15720.00	64.6 PK	74.0	-9.4	3.06 V	241	45.56	19.04
8	15720.00	51.4 AV	54.0	-2.6	3.06 V	241	32.36	19.04

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	#5715.00	64.0 PK	74.0	-10.0	1.68 H	152	54.32	9.68
2	#5715.00	47.4 AV	54.0	-6.6	1.68 H	152	37.72	9.68
3	#5725.00	73.7 PK	78.2	-4.5	1.68 H	152	64.00	9.70
4	*5745.00	102.6 PK			1.68 H	152	92.84	9.76
5	*5745.00	95.4 AV			1.68 H	152	85.64	9.76
6	11490.00	55.0 PK	74.0	-19.0	1.13 H	337	40.14	14.86
7	11490.00	44.4 AV	54.0	-9.6	1.13 H	337	29.54	14.86
8	#17235.00	62.3 PK	74.0	-11.7	1.16 H	336	39.07	23.23
9	#17235.00	51.3 AV	54.0	-2.7	1.16 H	336	28.07	23.23
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	65.8 PK	74.0	-8.2	2.42 V	177	56.12	9.68
2	#5715.00	48.9 AV	54.0	-5.1	2.42 V	177	39.22	9.68
3	#5725.00	77.8 PK	78.2	-0.4	2.42 V	177	68.10	9.70
4	*5745.00	106.2 PK			2.42 V	177	96.44	9.76
5	*5745.00	99.0 AV			2.42 V	177	89.24	9.76
6	11490.00	55.3 PK	74.0	-18.7	2.44 V	242	40.44	14.86
7	11490.00	45.3 AV	54.0	-8.7	2.44 V	242	30.44	14.86
8	#17235.00	61.0 PK	74.0	-13.0	3.05 V	239	37.77	23.23
9	#17235.00	47.9 AV	54.0	-6.1	3.05 V	239	24.67	23.23

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	104.5 PK			1.73 H	203	94.65	9.85
2	*5785.00	97.0 AV			1.73 H	203	87.15	9.85
3	11570.00	55.8 PK	74.0	-18.2	1.20 H	326	40.60	15.20
4	11570.00	45.5 AV	54.0	-8.5	1.20 H	326	30.30	15.20
5	#17355.00	61.3 PK	74.0	-12.7	1.09 H	305	37.74	23.56
6	#17355.00	50.3 AV	54.0	-3.7	1.09 H	305	26.74	23.56
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	109.9 PK			2.40 V	168	100.05	9.85
2	*5785.00	102.7 AV			2.40 V	168	92.85	9.85
3	11570.00	57.8 PK	74.0	-16.2	2.47 V	238	42.60	15.20
4	11570.00	47.7 AV	54.0	-6.3	2.47 V	238	32.50	15.20
5	#17355.00	63.5 PK	74.0	-10.5	3.04 V	262	39.94	23.56
6	#17355.00	50.6 AV	54.0	-3.4	3.04 V	262	27.04	23.56

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	105.5 PK			1.60 H	174	95.59	9.91
2	*5825.00	98.3 AV			1.60 H	174	88.39	9.91
3	#5850.00	73.9 PK	78.2	-4.3	1.60 H	174	63.98	9.92
4	#5860.00	66.4 PK	74.0	-7.6	1.60 H	174	56.47	9.93
5	#5860.00	49.8 AV	54.0	-4.2	1.60 H	174	39.87	9.93
6	11650.00	55.3 PK	74.0	-18.7	1.23 H	334	39.90	15.40
7	11650.00	45.6 AV	54.0	-8.4	1.23 H	334	30.20	15.40
8	#17475.00	62.7 PK	74.0	-11.3	1.01 H	325	38.61	24.09
9	#17475.00	50.0 AV	54.0	-4.0	1.01 H	325	25.91	24.09

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	109.8 PK			2.54 V	173	99.89	9.91
2	*5825.00	102.6 AV			2.54 V	173	92.69	9.91
3	#5850.00	76.5 PK	78.2	-1.7	2.54 V	173	66.58	9.92
4	#5860.00	70.2 PK	74.0	-3.8	2.54 V	173	60.27	9.93
5	#5860.00	53.3 AV	54.0	-0.7	2.54 V	173	43.37	9.93
6	11650.00	56.3 PK	74.0	-17.7	2.47 V	258	40.90	15.40
7	11650.00	46.1 AV	54.0	-7.9	2.47 V	258	30.70	15.40
8	#17475.00	63.2 PK	74.0	-10.8	3.14 V	252	39.11	24.09
9	#17475.00	50.0 AV	54.0	-4.0	3.14 V	252	25.91	24.09

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.3 PK	74.0	-12.7	1.61 H	174	52.97	8.33
2	5150.00	48.8 AV	54.0	-5.2	1.61 H	174	40.47	8.33
3	*5190.00	101.6 PK			1.61 H	174	93.10	8.50
4	*5190.00	93.5 AV			1.61 H	174	85.00	8.50
5	5350.00	52.6 PK	74.0	-21.4	1.61 H	174	43.80	8.80
6	5350.00	42.4 AV	54.0	-11.6	1.61 H	174	33.60	8.80
7	#10380.00	54.5 PK	74.0	-19.5	1.22 H	345	39.95	14.55
8	#10380.00	44.6 AV	54.0	-9.4	1.22 H	345	30.05	14.55
9	15570.00	60.6 PK	74.0	-13.4	1.00 H	337	41.81	18.79
10	15570.00	47.3 AV	54.0	-6.7	1.00 H	337	28.51	18.79
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	65.5 PK	74.0	-8.5	2.82 V	171	57.17	8.33
2	5150.00	53.4 AV	54.0	-0.6	2.82 V	171	45.07	8.33
3	*5190.00	105.7 PK			2.82 V	171	97.20	8.50
4	*5190.00	97.8 AV			2.82 V	171	89.30	8.50
5	5350.00	53.6 PK	74.0	-20.4	2.82 V	171	44.80	8.80
6	5350.00	43.7 AV	54.0	-10.3	2.82 V	171	34.90	8.80
7	#10380.00	55.1 PK	74.0	-18.9	2.48 V	256	40.55	14.55
8	#10380.00	45.0 AV	54.0	-9.0	2.48 V	256	30.45	14.55
9	15570.00	61.0 PK	74.0	-13.0	3.11 V	231	42.21	18.79
10	15570.00	48.1 AV	54.0	-5.9	3.11 V	231	29.31	18.79

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	101.5 PK			1.66 H	177	92.91	8.59
2	*5230.00	94.3 AV			1.66 H	177	85.71	8.59
3	5350.00	51.4 PK	74.0	-22.6	1.66 H	177	42.60	8.80
4	5350.00	41.5 AV	54.0	-12.5	1.66 H	177	32.70	8.80
5	#10460.00	54.4 PK	74.0	-19.6	1.27 H	342	39.89	14.51
6	#10460.00	44.4 AV	54.0	-9.6	1.27 H	342	29.89	14.51
7	15690.00	60.8 PK	74.0	-13.2	1.01 H	350	41.83	18.97
8	15690.00	47.7 AV	54.0	-6.3	1.01 H	350	28.73	18.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	105.6 PK			2.80 V	191	97.01	8.59
2	*5230.00	98.4 AV			2.80 V	191	89.81	8.59
3	5350.00	52.7 PK	74.0	-21.3	2.80 V	191	43.90	8.80
4	5350.00	42.2 AV	54.0	-11.8	2.80 V	191	33.40	8.80
5	#10460.00	55.0 PK	74.0	-19.0	2.42 V	233	40.49	14.51
6	#10460.00	45.2 AV	54.0	-8.8	2.42 V	233	30.69	14.51
7	15690.00	61.6 PK	74.0	-12.4	3.03 V	255	42.63	18.97
8	15690.00	48.4 AV	54.0	-5.6	3.03 V	255	29.43	18.97

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)
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	64.2 PK	74.0	-9.8	1.62 H	192	54.52	9.68
2	#5715.00	48.8 AV	54.0	-5.2	1.62 H	192	39.12	9.68
3	#5725.00	73.0 PK	78.2	-5.2	1.62 H	192	63.30	9.70
4	*5755.00	97.6 PK			1.62 H	192	87.83	9.77
5	*5755.00	90.2 AV			1.62 H	192	80.43	9.77
6	11510.00	53.6 PK	74.0	-20.4	1.30 H	338	38.75	14.85
7	11510.00	42.2 AV	54.0	-11.8	1.30 H	338	27.35	14.85
8	#17265.00	60.3 PK	74.0	-13.7	1.03 H	344	37.07	23.23
9	#17265.00	47.0 AV	54.0	-7.0	1.03 H	344	23.77	23.23
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	68.5 PK	74.0	-5.5	2.85 V	170	58.82	9.68
2	#5715.00	53.2 AV	54.0	-0.8	2.85 V	170	43.52	9.68
3	#5725.00	73.6 PK	78.2	-4.6	2.85 V	170	63.90	9.70
4	*5755.00	101.8 PK			2.85 V	170	92.03	9.77
5	*5755.00	94.6 AV			2.85 V	170	84.83	9.77
6	11510.00	54.6 PK	74.0	-19.4	2.44 V	229	39.75	14.85
7	11510.00	44.9 AV	54.0	-9.1	2.44 V	229	30.05	14.85
8	#17265.00	60.5 PK	74.0	-13.5	3.06 V	224	37.27	23.23
9	#17265.00	47.3 AV	54.0	-6.7	3.06 V	224	24.07	23.23

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	97.7 PK			1.67 H	196	87.82	9.88
2	*5795.00	90.5 AV			1.67 H	196	80.62	9.88
3	#5850.00	70.4 PK	78.2	-7.8	1.67 H	196	60.48	9.92
4	#5860.00	62.4 PK	74.0	-11.6	1.67 H	196	52.47	9.93
5	#5860.00	50.4 AV	54.0	-3.6	1.67 H	196	40.47	9.93
6	11590.00	54.6 PK	74.0	-19.4	1.33 H	340	39.29	15.31
7	11590.00	44.4 AV	54.0	-9.6	1.33 H	340	29.09	15.31
8	#17385.00	61.6 PK	74.0	-12.4	1.05 H	348	37.84	23.76
9	#17385.00	48.3 AV	54.0	-5.7	1.05 H	348	24.54	23.76

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	104.7 PK			2.69 V	178	94.82	9.88
2	*5795.00	97.2 AV			2.69 V	178	87.32	9.88
3	#5850.00	71.8 PK	78.2	-6.4	2.69 V	178	61.88	9.92
4	#5860.00	66.1 PK	74.0	-7.9	2.69 V	178	56.17	9.93
5	#5860.00	53.6 AV	54.0	-0.4	2.69 V	178	43.67	9.93
6	11590.00	55.7 PK	74.0	-18.3	2.42 V	257	40.39	15.31
7	11590.00	45.5 AV	54.0	-8.5	2.42 V	257	30.19	15.31
8	#17385.00	61.4 PK	74.0	-12.6	3.03 V	243	37.64	23.76
9	#17385.00	48.4 AV	54.0	-5.6	3.03 V	243	24.64	23.76

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.2 PK	74.0	-9.8	1.65 H	199	55.87	8.33
2	5150.00	47.6 AV	54.0	-6.4	1.65 H	199	39.27	8.33
3	*5210.00	94.3 PK			1.65 H	199	85.75	8.55
4	*5210.00	87.4 AV			1.65 H	199	78.85	8.55
5	5350.00	53.4 PK	74.0	-20.6	1.65 H	199	44.60	8.80
6	5350.00	41.5 AV	54.0	-12.5	1.65 H	199	32.70	8.80
7	#10420.00	55.2 PK	74.0	-18.8	1.38 H	346	40.63	14.57
8	#10420.00	44.8 AV	54.0	-9.2	1.38 H	346	30.23	14.57
9	15630.00	61.5 PK	74.0	-12.5	1.04 H	340	42.57	18.93
10	15630.00	48.1 AV	54.0	-5.9	1.04 H	340	29.17	18.93
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	65.2 PK	74.0	-8.8	2.66 V	170	56.87	8.33
2	5150.00	48.0 AV	54.0	-6.0	2.66 V	170	39.67	8.33
3	*5210.00	98.8 PK			2.66 V	170	90.25	8.55
4	*5210.00	91.2 AV			2.66 V	170	82.65	8.55
5	5350.00	54.1 PK	74.0	-19.9	2.66 V	170	45.30	8.80
6	5350.00	42.6 AV	54.0	-11.4	2.66 V	170	33.80	8.80
7	#10420.00	53.6 PK	74.0	-20.4	2.41 V	229	39.03	14.57
8	#10420.00	43.2 AV	54.0	-10.8	2.41 V	229	28.63	14.57
9	15630.00	59.6 PK	74.0	-14.4	3.03 V	238	40.67	18.93
10	15630.00	46.5 AV	54.0	-7.5	3.03 V	238	27.57	18.93

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)
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	64.4 PK	74.0	-9.6	1.64 H	185	54.72	9.68
2	#5715.00	49.6 AV	54.0	-4.4	1.64 H	185	39.92	9.68
3	#5725.00	71.5 PK	78.2	-6.7	1.64 H	185	61.80	9.70
4	*5775.00	98.3 PK			1.64 H	185	88.47	9.83
5	*5775.00	89.5 AV			1.64 H	185	79.67	9.83
6	#5850.00	72.5 PK	78.2	-5.7	1.64 H	185	62.58	9.92
7	#5860.00	71.5 PK	74.0	-2.5	1.64 H	185	61.57	9.93
8	#5860.00	48.8 AV	54.0	-5.2	1.64 H	185	38.87	9.93
9	11550.00	53.6 PK	74.0	-20.4	1.38 H	351	38.51	15.09
10	11550.00	43.2 AV	54.0	-10.8	1.38 H	351	28.11	15.09
11	#17325.00	58.4 PK	74.0	-15.6	1.00 H	333	35.02	23.38
12	#17325.00	45.5 AV	54.0	-8.5	1.00 H	333	22.12	23.38

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	69.6 PK	74.0	-4.4	2.32 V	173	59.92	9.68
2	#5715.00	53.3 AV	54.0	-0.7	2.32 V	173	43.62	9.68
3	#5725.00	72.9 PK	78.2	-5.3	2.32 V	173	63.20	9.70
4	*5775.00	102.7 PK			2.32 V	173	92.87	9.83
5	*5775.00	93.2 AV			2.32 V	173	83.37	9.83
6	#5850.00	73.6 PK	78.2	-4.6	2.32 V	173	63.68	9.92
7	#5860.00	72.8 PK	74.0	-1.2	2.32 V	173	62.87	9.93
8	#5860.00	49.3 AV	54.0	-4.7	2.32 V	173	39.37	9.93
9	11550.00	53.7 PK	74.0	-20.3	2.38 V	239	38.61	15.09
10	11550.00	43.1 AV	54.0	-10.9	2.38 V	239	28.01	15.09
11	#17325.00	59.1 PK	74.0	-14.9	3.01 V	239	35.72	23.38
12	#17325.00	46.2 AV	54.0	-7.8	3.01 V	239	22.82	23.38

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.

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,

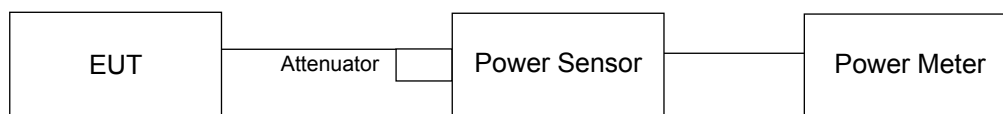
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

POWER OUTPUT:

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	19.69	19.71	186.652	22.71	30	Pass
40	5200	19.68	19.74	187.086	22.72	30	Pass
48	5240	19.61	19.63	183.244	22.63	30	Pass
149	5745	17.22	17.75	112.289	20.50	30	Pass
157	5785	19.54	20.11	192.515	22.84	30	Pass
165	5825	19.07	19.30	165.838	22.20	30	Pass

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	19.82	19.36	182.238	22.61	30	Pass
40	5200	19.51	19.86	186.159	22.70	30	Pass
48	5240	19.90	19.65	189.981	22.79	30	Pass
149	5745	17.27	17.63	111.276	20.46	30	Pass
157	5785	19.31	20.03	186.003	22.70	30	Pass
165	5825	19.22	19.20	166.736	22.22	30	Pass

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	18.21	17.78	126.201	21.01	30	Pass
46	5230	19.46	19.77	183.15	22.63	30	Pass
151	5755	15.28	16.13	74.749	18.74	30	Pass
159	5795	17.48	18.24	122.657	20.89	30	Pass

802.11ac (VHT80)

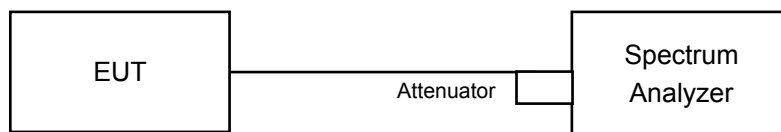
Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.61	17.02	96.164	19.83	30	Pass
155	5775	15.53	15.70	72.881	18.63	30	Pass

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

802.11a & 802.11ac (VH20)

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 $\geq$ 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 band:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500\text{kHz}/300\text{kHz})$
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

802.11ac (VHT40) & 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 $\geq$ 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 $10 \log (1/\text{duty cycle})$

For U-NII-3 band:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500\text{kHz}/300\text{kHz})$
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 4.1.6.

4.3.7 Test Results

For U-NII-1 Band

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	6.41	6.47	9.45	17	Pass
40	5200	6.63	6.32	9.49	17	Pass
48	5240	6.72	6.82	9.78	17	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $2.25\text{dBi} + 10\log(2) = 5.26\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

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	5.97	5.88	8.94	17	Pass
40	5200	6.40	6.04	9.23	17	Pass
48	5240	6.27	6.54	9.42	17	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $2.25\text{dBi} + 10\log(2) = 5.26\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

802.11ac (VHT40)

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				
38	5190	0.97	0.99	0.11	4.10	17	Pass
46	5230	3.05	2.78	0.11	6.04	17	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $2.25\text{dBi} + 10\log(2) = 5.26\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

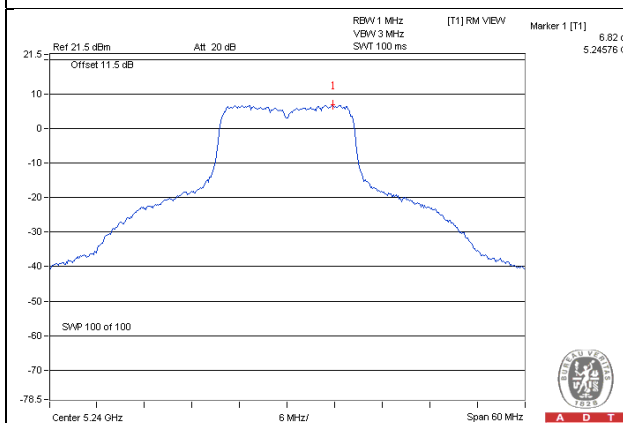
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. EIRP Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-2.05	-2.16	0.31	1.21	17	Pass

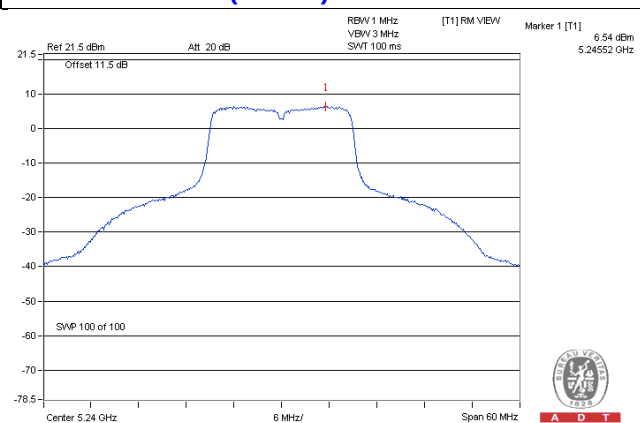
- Note:**
- Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
 - Directional gain = $2.25\text{dBi} + 10\log(2) = 5.26\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.
 - Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

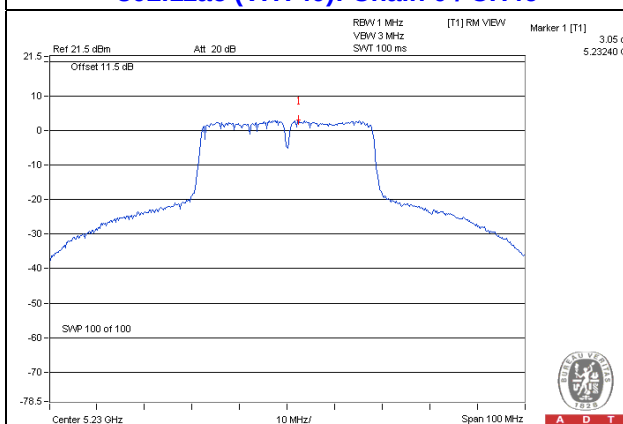
802.11a: Chain 1 / CH48



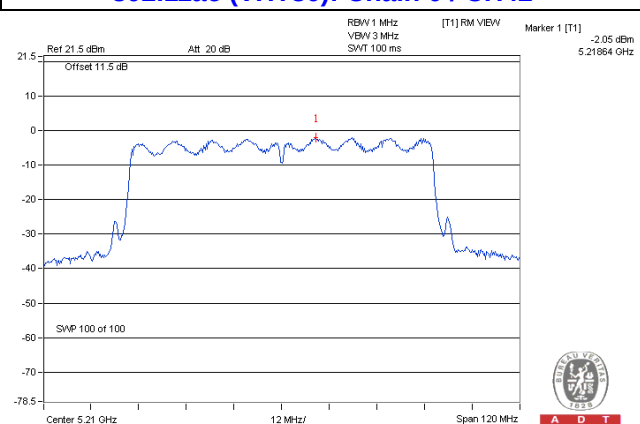
802.11ac (VHT20): Chain 1 / CH48



802.11ac (VHT40): Chain 0 / CH46



802.11ac (VHT80): Chain 0 / CH42



For U-NII-3 Band

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	-4.99	-2.77	3.01	0.24	30	Pass
	157	5785	-1.84	0.38	3.01	3.39	30	Pass
	165	5825	-2.33	-0.11	3.01	2.90	30	Pass
1	149	5745	-3.75	-1.53	3.01	1.48	30	Pass
	157	5785	-0.53	1.69	3.01	4.70	30	Pass
	165	5825	-1.38	0.84	3.01	3.85	30	Pass

Note: 1. Directional gain = $2.25\text{dBi} + 10\log(2) = 5.26\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

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	-4.93	-2.71	3.01	0.30	30	Pass
	157	5785	-2.56	-0.34	3.01	2.67	30	Pass
	165	5825	-3.02	-0.80	3.01	2.21	30	Pass
1	149	5745	-3.26	-1.04	3.01	1.97	30	Pass
	157	5785	-0.75	1.47	3.01	4.48	30	Pass
	165	5825	-1.56	0.66	3.01	3.67	30	Pass

Note: 1. Directional gain = $2.25\text{dBi} + 10\log(2) = 5.26\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-10.05	-7.83	3.01	0.11	-4.71	30	Pass
	159	5795	-7.23	-5.01	3.01	0.11	-1.89	30	Pass
1	151	5755	-8.78	-6.56	3.01	0.11	-3.44	30	Pass
	159	5795	-6.69	-4.47	3.01	0.16	-1.35	30	Pass

Note: 1. Directional gain = $2.25\text{dBi} + 10\log(2) = 5.26\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

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

802.11ac (VHT80)

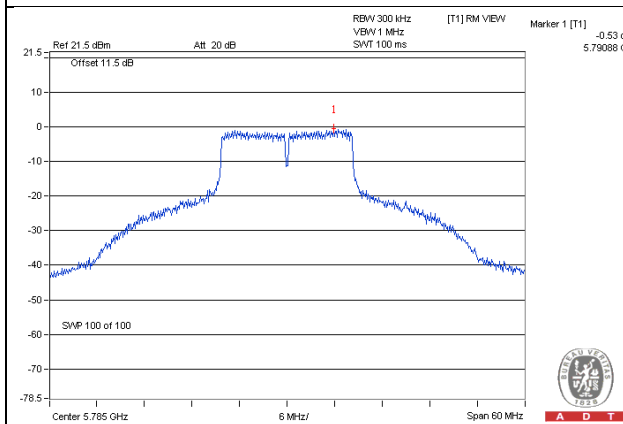
TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-13.03	-10.81	3.01	0.31	-7.49	30	Pass
1	155	5775	-11.67	-9.45	3.01	0.31	-6.13	30	Pass

Note: 1. Directional gain = 2.25dBi + 10log(2) = 5.26dBi < 6dBi , so the power density limit shall not be reduced.

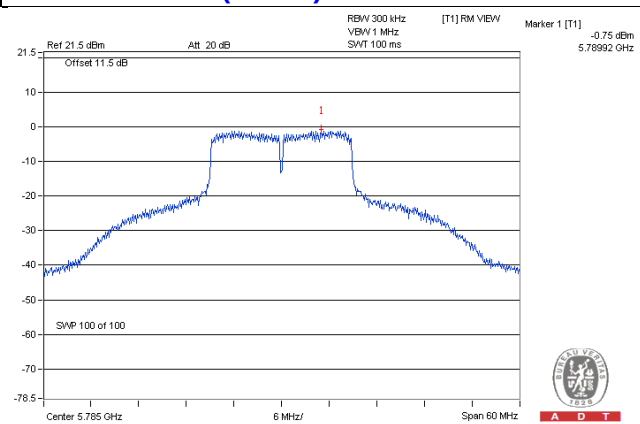
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

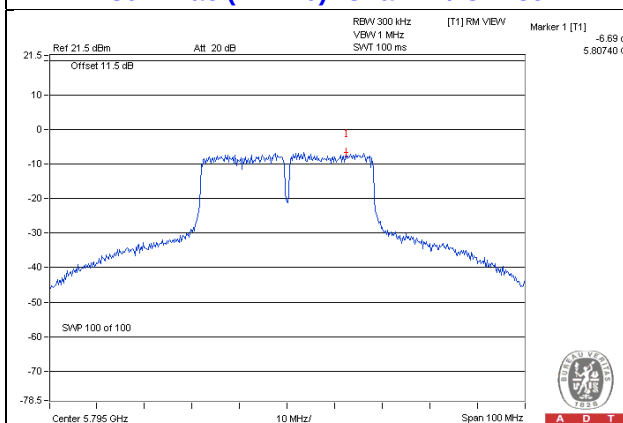
802.11a: : Chain 1 / CH157



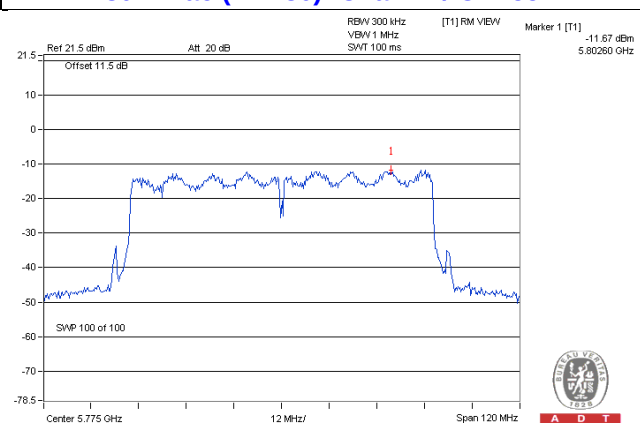
802.11ac (VHT20): Chain 1 / CH157



802.11ac (VHT40): Chain 1 / CH159



802.11ac (VHT80): Chain 1 / CH155

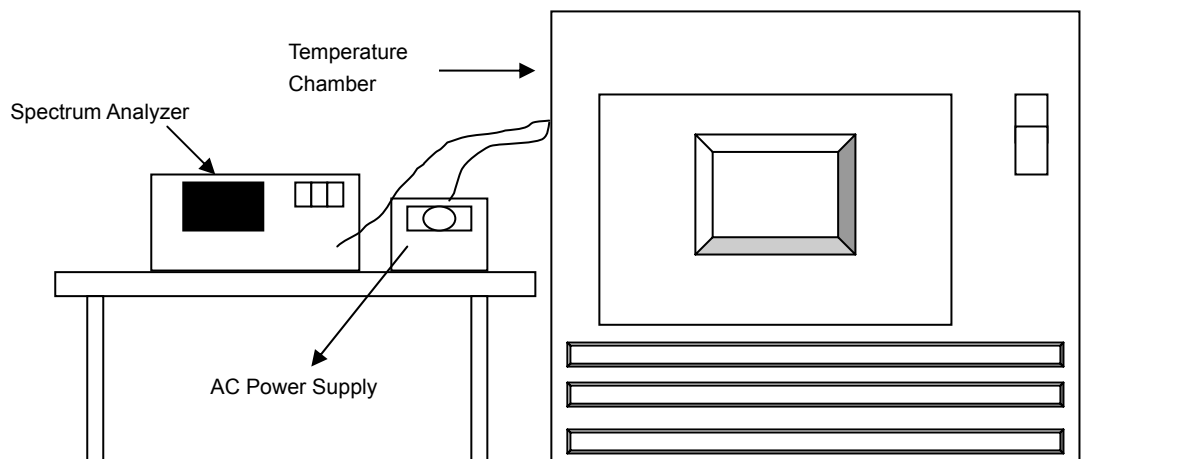


4.4 Frequency Stability Measurement

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: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5180.0226	0.00044	5180.0245	0.00047	5180.0224	0.00043	5180.0262	0.00051
40	120	5179.9754	-0.00047	5179.9739	-0.00050	5179.9768	-0.00045	5179.973	-0.00052
30	120	5180.0075	0.00014	5180.0098	0.00019	5180.0089	0.00017	5180.0102	0.00020
20	120	5179.9843	-0.00030	5179.9841	-0.00031	5179.9838	-0.00031	5179.9847	-0.00030
10	120	5179.9826	-0.00034	5179.9783	-0.00042	5179.9822	-0.00034	5179.9803	-0.00038
0	120	5180.0182	0.00035	5180.017	0.00033	5180.0158	0.00031	5180.0182	0.00035
-10	120	5179.9935	-0.00013	5179.9961	-0.00008	5179.9966	-0.00007	5179.9923	-0.00015
-20	120	5180.0013	0.00003	5179.9966	-0.00007	5179.9979	-0.00004	5179.9991	-0.00002
-30	120	5180.0091	0.00018	5180.0058	0.00011	5180.0068	0.00013	5180.0086	0.00017

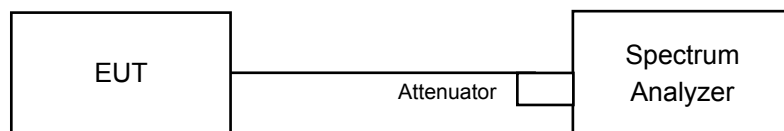
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9847	-0.00030	5179.9843	-0.00030	5179.9833	-0.00032	5179.9848	-0.00029
	120	5179.9843	-0.00030	5179.9841	-0.00031	5179.9838	-0.00031	5179.9847	-0.00030
	102	5179.9844	-0.00030	5179.9838	-0.00031	5179.9837	-0.00031	5179.9855	-0.00028

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

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.38	16.35	0.5	Pass
157	5785	16.38	16.36	0.5	Pass
165	5825	16.37	16.35	0.5	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.11	17.31	0.5	Pass
157	5785	17.09	16.93	0.5	Pass
165	5825	17.35	17.05	0.5	Pass

802.11ac (VHT40)

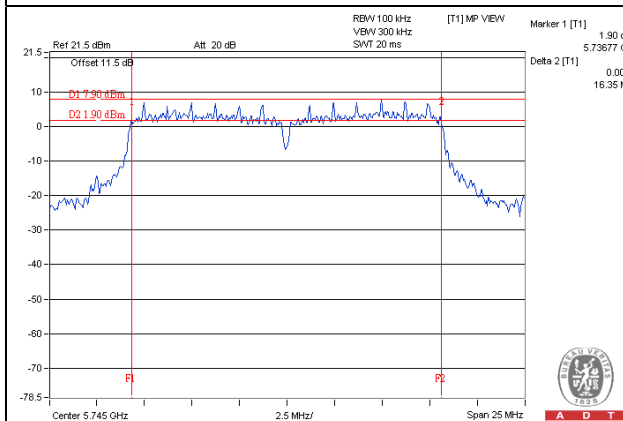
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.15	35.51	0.5	Pass
159	5795	35.93	35.83	0.5	Pass

802.11ac (VHT80)

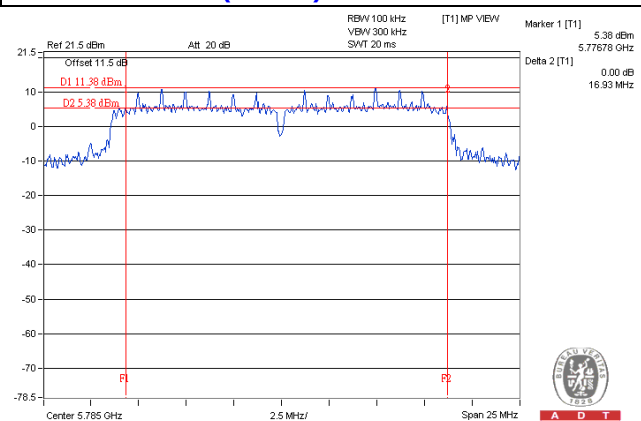
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.52	75.51	0.5	Pass

Spectrum Plot of Worst Value

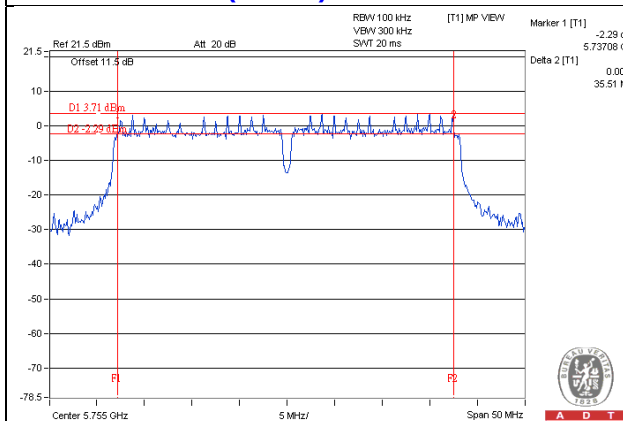
802.11a: Chain 1 / CH149



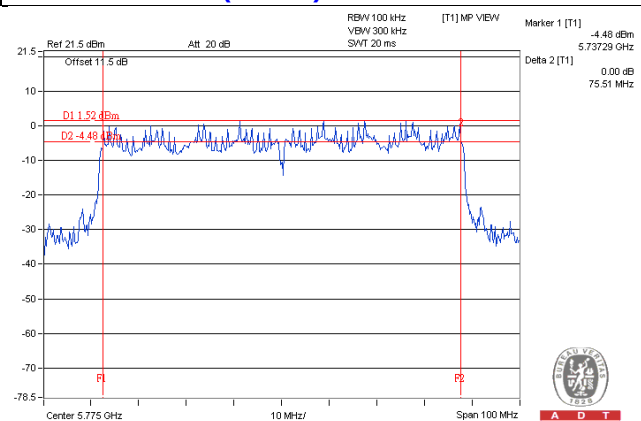
802.11ac (VHT20): Chain 1 / CH157



802.11ac (VHT40): Chain 1 / CH151



802.11ac (VHT80): Chain 1 / 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:

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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