

## FCC Test Report (15.407)

**Report No.:** RF150428E01-1

**FCC ID:** KA2IR822A1

**Test Model:** DIR-822

**Received Date:** Apr. 28, 2015

**Test Date:** May 01 to 05, 2015

**Issued Date:** May 21, 2015

**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

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### Release Control Record

Issue No.	Description	Date Issued
RF150428E01-1	Original release.	May 21, 2015



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## 1 Certificate of Conformity

**Product:** AC1200 Wi-Fi Router

**Brand:** D-Link

**Test Model:** DIR-822

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** D-Link Corporation

**Test Date:** May 01 to 05, 2015

**Standard:** 47 CFR FCC Part 15, Subpart E (Section 15.407)  
ANSI C63.10:2009

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

**Prepared by :**  , **Date:** May 21, 2015  
Lori Chung / Specialist

**Approved by :**  , **Date:** May 21, 2015  
May Chen / Manager

## 2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407 Under New Rule)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -9.77dB at 0.46641MHz.
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 5715.00MHz.
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	No antenna connector is used.

**NOTE:** The EUT was operating in 2400 ~ 2483.5MHz, 5150~5250MHz and 5725~5850MHz frequencies band. This report was recorded the RF parameters including 5150~5250MHz and 5725~5.850MHz. For the 2400 ~ 2483.5MHz RF parameters was recorded in another test report.

### 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	Expanded Uncertainty (k=2) ( $\pm$ )
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.72 dB
	6GHz ~ 18GHz	4.00 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 Wi-Fi Router
Brand	D-Link
Test Model	DIR-822
Status of EUT	ENGINEERING 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
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	<b>For 15.407</b> 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
	<b>For 15.247</b> 2.412 ~ 2.462GHz
Number of Channel	<b>For 15.407</b> 9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
	<b>For 15.247</b> 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	<b>For 15.407</b> 802.11a: 264.383mW 802.11ac (VHT20): 220.326mW 802.11ac (VHT40): 126.936mW 802.11ac (VHT80): 31.324mW
	<b>For 15.247</b> 802.11b: 209.188mW 802.11g: 717.682mW 802.11n (HT20): 726.158mW 802.11n (HT40): 336.317mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

- The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
- The antennas provided to the EUT, please refer to the following table:

2.4GHz Band							
Antenna No.	Transmitter Circuit	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connector Type
1	Chain (0)	HL Technology	290-20208	2.5	2.4~2.4835	Dipole	NA
2	Chain (1)	Group Limited	290-20210	2.5	2.4~2.4835		
5GHz Band							
Antenna No.	Transmitter Circuit	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connector Type
3	Chain (0)	HL Technology	290-20207	2.5	5.15~5.85	Dipole	NA
4	Chain (1)	Group Limited	290-20209	2.5	5.15~5.85		

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

No	Brand Name	Model No.	Spec.
1	D-LINK	2AAR006F US	Input: 100-240V, 0.2A, 50/60Hz Output: 12V, 0.5A DC output cable: 1.2m, unshielded
2	D-LINK	MU06-T120050-A1	Input: 100-240V, 0.2A, 50/60Hz Output: 12V, 0.5A DC output cable: 1.2m, unshielded

For Radiated Emission test, the EUT was pre-tested with adapter 1 & 2, the worst case was found in adapter 2. Therefore only the test data of the adapter 2 was recorded in this report.

- 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: 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)

- 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 (20MHz), 802.11ac (20MHz):

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

2 channels are provided for 802.11n (40MHz), 802.11ac (40MHz):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency
42	5210MHz

#### For 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (20MHz):

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

2 channels are provided for 802.11n (40MHz), 802.11ac (40MHz):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (80MHz):

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 2
2	-	√	√	-	With adapter 1

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

**PLC**: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

**NOTE**: The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **Laying-flat type**.

**NOTE**: "-" 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	5745-5825	149 to 165	157	OFDM	BPSK	6

#### **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.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5745-5825	149 to 165	157	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.

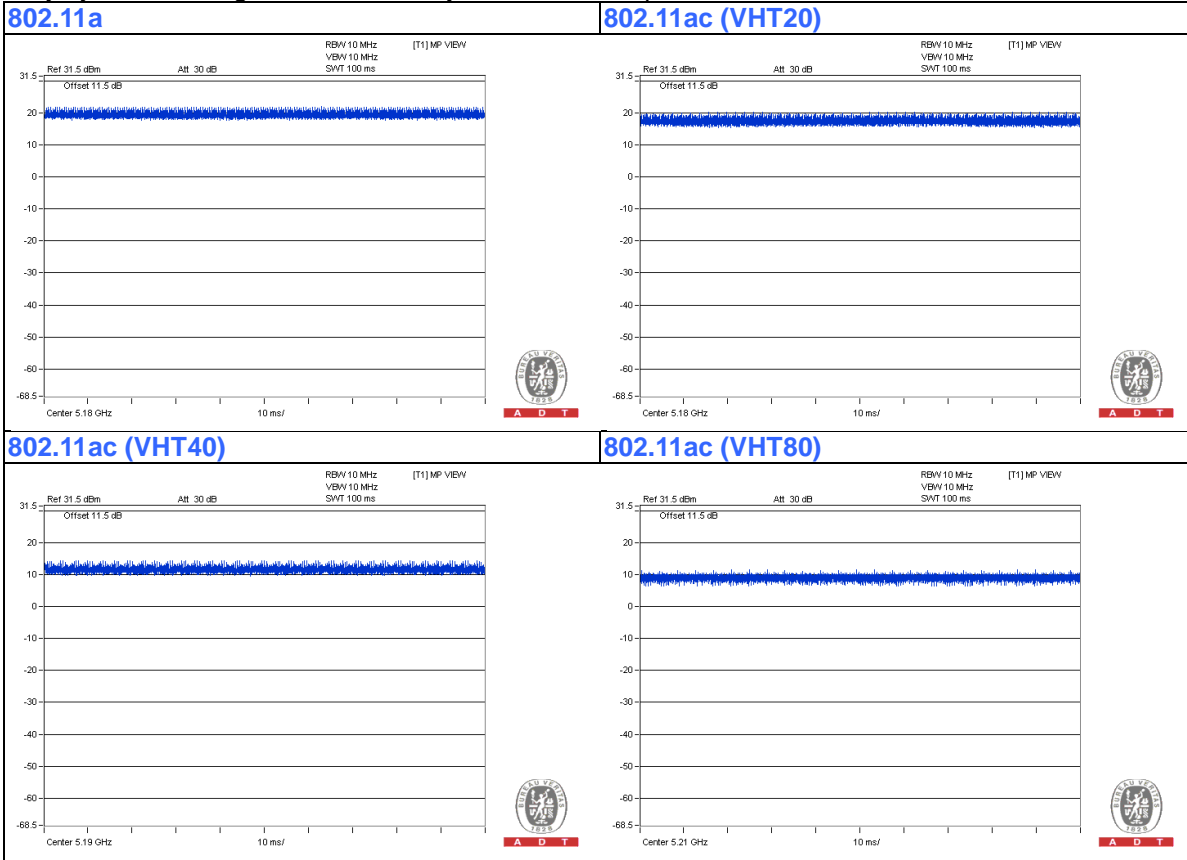
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	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	24deg. C, 69%RH	120Vac, 60Hz	Weiwei Lo
RE $<$ 1G	23deg. C, 67%RH	120Vac, 60Hz	Gary Cheng
PLC	25deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

### 3.3 Duty Cycle of Test Signal

Duty cycle of test signal is 100 %, duty factor is not required.



### 3.4 Description of Support Units

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

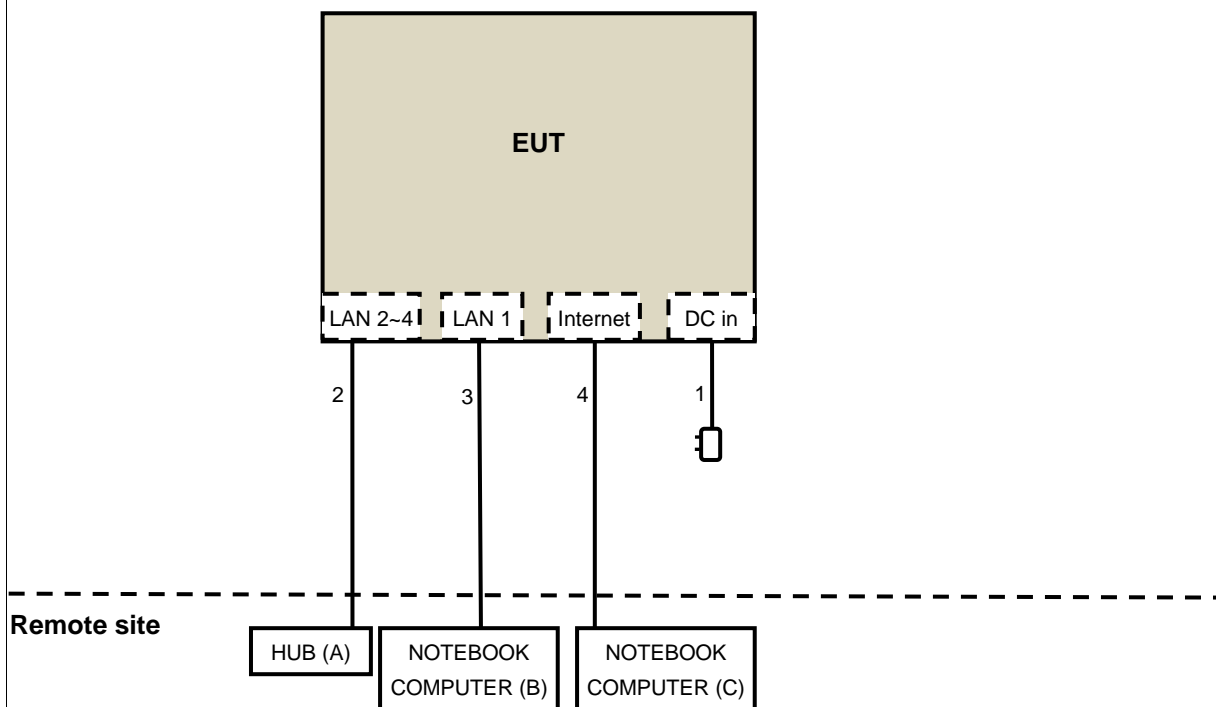
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
B	NOTEBOOK COMPUTER	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
C	NOTEBOOK COMPUTER	DELL	E6420	H62T3R1	FCC DoC	Provided by Lab

**NOTE:**

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

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC	1	1.2	No	0	Supplied by Client
2	RJ45	3	10	No	0	Provided by Lab
3	RJ45	1	10	No	0	Provided by Lab
4	RJ45	1	10	No	0	Provided by Lab

#### 3.4.1 Configuration of System under Test





### 3.5 General Description of Applied Standard

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

**FCC Part 15, Subpart E (15.407)**  
**789033 D02 General UNII Test Procedure New Rules v01**  
**662911 D01 Multiple Transmitter Output v02r01**  
ANSI C63.10-2009

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

**NOTE:** The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

## 4 Test Types and Results

### 4.1 Radiated Emission and Bandedge Measurement

#### 4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

#### NOTE:

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

#### LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedure New Rules 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) <sup>*1</sup> PK:-17 (dBm/MHz) <sup>*2</sup>	PK: 68.2(dBuV/m) <sup>*1</sup> PK:78.2 (dBuV/m) <sup>*2</sup>

**NOTE:** <sup>\*1</sup> beyond 10MHz of the band edge <sup>\*2</sup> 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 U-NII-1 Band test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	July 21, 2014	July 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 09, 2015	Feb. 08, 2016
RF Cable	NA	CHGCAB_001	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISI	AIH.8018	0000320091110	Feb. 09, 2015	Feb. 08, 2016
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	131205 131216 131217 SNMY23684/4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 3 The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
- 5 The VCCI Site Registration No. is G-137.
- 6 The CANADA Site Registration No. is IC 7450H-2.
- 7 Tested Date: May 08, 2015



**For other radiated emission test:**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 06, 2015	Feb. 05, 2016
RF Cable	NA	CHHCAB_001	Oct. 05, 2014	Oct. 04, 2015
Horn_Antenna AISI	AIH.8018	0000220091110	Feb. 06, 2015	Feb. 05, 2016
Pre-Amplifier Agilent	8449B	300801923	Oct. 28, 2014	Oct. 27, 2015
RF Cable	NA	131206 131213 131215 SNMY23685/4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015
Power Meter Anritsu	ML2495A	0824006	May 22, 2014	May 21, 2015
Power Sensor Anritsu	MA2411B	0738172	May 22, 2014	May 21, 2015
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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
- 5 The CANADA Site Registration No. is IC 7450H-3.
- 6 Tested Date: May 01 to 04, 2015

#### 4.1.3 Test Procedure

- a. The EUT was placed on the top of a rotating table 0.8 meters 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:

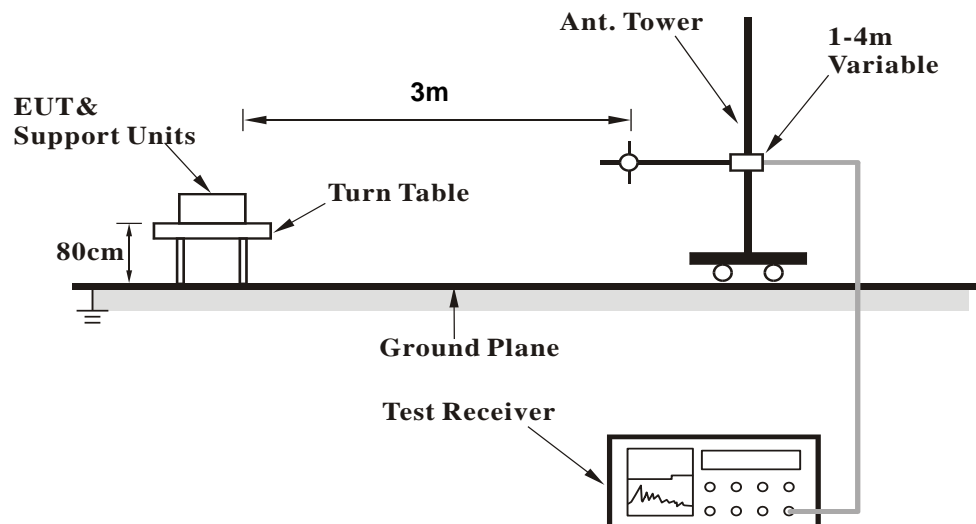
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
4. 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 ( $10 \log(1/\text{duty cycle})$ ).
5. 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.
6. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

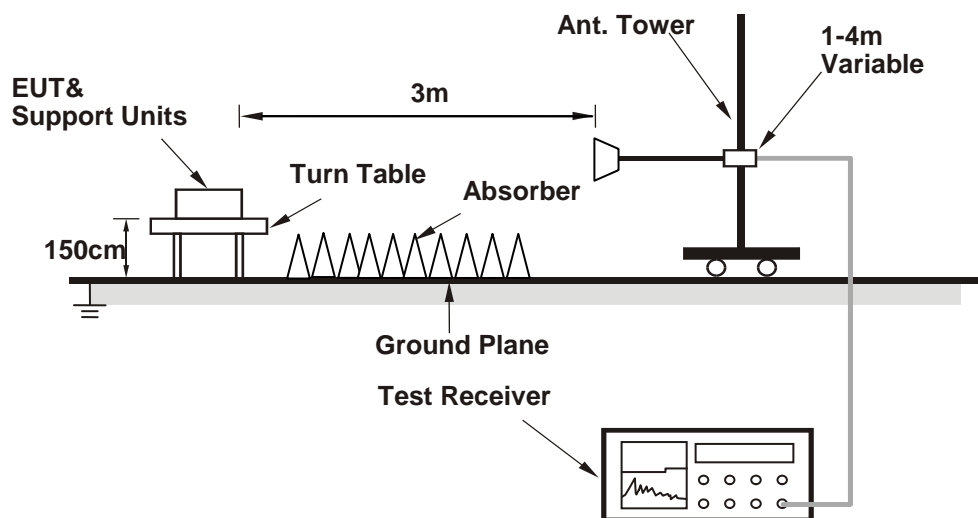
No deviation.

#### 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 (MP\_TEST.exe) has been activated to set the EUT on specific status.

#### 4.1.7 Test Results

#### Above 1GHz Data:

#### 802.11a

<b>CHANNEL</b>	TX Channel 36	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	56.5 PK	74.0	-17.5	1.30 H	23	46.53	9.97
2	5150.00	44.9 AV	54.0	-9.1	1.30 H	23	34.93	9.97
3	*5180.00	104.9 PK			1.33 H	23	94.74	10.16
4	*5180.00	95.6 AV			1.33 H	23	85.44	10.16
5	#10360.00	60.5 PK	68.2	-7.7	1.29 H	157	43.52	16.98
6	15540.00	64.4 PK	74.0	-9.6	1.22 H	177	42.47	21.93
7	15540.00	49.8 AV	54.0	-4.2	1.22 H	177	27.87	21.93

#### 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	68.7 PK	74.0	-5.3	1.33 V	13	58.73	9.97
2	5150.00	53.2 AV	54.0	-0.8	1.33 V	13	43.23	9.97
3	*5180.00	115.1 PK			1.06 V	18	104.94	10.16
4	*5180.00	106.4 AV			1.06 V	18	96.24	10.16
5	#10360.00	67.7 PK	68.2	-0.5	1.20 V	154	50.72	16.98
6	15540.00	62.8 PK	74.0	-11.2	1.29 V	150	40.87	21.93
7	15540.00	51.7 AV	54.0	-2.3	1.29 V	150	29.77	21.93

#### 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.

<b>CHANNEL</b>	TX Channel 40	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	56.3 PK	74.0	-17.7	1.35 H	29	46.33	9.97
2	5150.00	43.3 AV	54.0	-10.7	1.35 H	29	33.33	9.97
3	*5200.00	108.5 PK			1.35 H	29	98.24	10.26
4	*5200.00	100.6 AV			1.35 H	29	90.34	10.26
5	5360.00	56.7 PK	74.0	-17.3	1.35 H	29	46.11	10.59
6	5360.00	44.2 AV	54.0	-9.8	1.35 H	29	33.61	10.59
7	#10400.00	60.0 PK	68.2	-8.2	1.25 H	142	42.94	17.06
8	15600.00	64.6 PK	74.0	-9.4	1.21 H	176	42.32	22.28
9	15600.00	50.0 AV	54.0	-4.0	1.21 H	176	27.72	22.28

**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	66.2 PK	74.0	-7.8	1.15 V	20	56.23	9.97
2	5150.00	53.5 AV	54.0	-0.5	1.15 V	20	43.53	9.97
3	*5200.00	118.2 PK			1.00 V	18	107.94	10.26
4	*5200.00	110.5 AV			1.00 V	18	100.24	10.26
5	5360.00	56.1 PK	74.0	-17.9	1.16 V	21	45.51	10.59
6	5360.00	43.8 AV	54.0	-10.2	1.16 V	21	33.21	10.59
7	#10400.00	67.2 PK	68.2	-1.0	1.16 V	161	50.14	17.06
8	15600.00	63.4 PK	74.0	-10.6	1.25 V	142	41.12	22.28
9	15600.00	52.1 AV	54.0	-1.9	1.25 V	142	29.82	22.28

**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.



<b>CHANNEL</b>	TX Channel 48	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	108.7 PK			1.35 H	42	98.37	10.33
2	*5240.00	101.1 AV			1.35 H	42	90.77	10.33
3	5350.00	56.1 PK	74.0	-17.9	1.35 H	42	45.55	10.55
4	5350.00	43.8 AV	54.0	-10.2	1.35 H	42	33.25	10.55
5	#10480.00	60.2 PK	68.2	-8.0	1.26 H	130	43.47	16.73
6	15720.00	64.0 PK	74.0	-10.0	1.24 H	182	41.37	22.63
7	15720.00	49.4 AV	54.0	-4.6	1.24 H	182	26.77	22.63

**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	118.5 PK			1.00 V	18	108.17	10.33
2	*5240.00	111.0 AV			1.00 V	18	100.67	10.33
3	5350.00	61.4 PK	74.0	-12.6	1.21 V	46	50.85	10.55
4	5350.00	46.8 AV	54.0	-7.2	1.21 V	46	36.25	10.55
5	#10480.00	67.8 PK	68.2	-0.4	1.01 V	223	51.07	16.73
6	15720.00	64.8 PK	74.0	-9.2	1.38 V	174	42.17	22.63
7	15720.00	50.2 AV	54.0	-3.8	1.38 V	174	27.57	22.63

**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.

<b>CHANNEL</b>	TX Channel 149	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	55.1 PK	74.0	-18.9	1.30 H	17	50.62	4.48
2	#5715.00	42.5 AV	54.0	-11.5	1.30 H	17	38.02	4.48
3	#5725.00	67.5 PK	78.2	-10.7	1.33 H	18	63.00	4.50
4	*5745.00	102.6 PK			1.33 H	18	98.11	4.49
5	*5745.00	93.2 AV			1.33 H	18	88.71	4.49
6	11490.00	60.0 PK	74.0	-14.0	1.29 H	140	49.96	10.04
7	11490.00	49.1 AV	54.0	-4.9	1.29 H	140	39.06	10.04
8	#17235.00	65.8 PK	74.0	-8.2	1.17 H	188	47.24	18.56
9	#17235.00	51.0 AV	54.0	-3.0	1.17 H	188	32.44	18.56

**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	#5715.00	59.0 PK	74.0	-15.0	1.02 V	77	54.52	4.48
2	#5715.00	49.0 AV	54.0	-5.0	1.02 V	77	44.52	4.48
3	#5725.00	77.8 PK	78.2	-0.4	1.00 V	81	73.30	4.50
4	*5745.00	112.8 PK			1.10 V	78	108.31	4.49
5	*5745.00	103.6 AV			1.10 V	78	99.11	4.49
6	11490.00	65.1 PK	74.0	-8.9	1.10 V	232	55.06	10.04
7	11490.00	53.3 AV	54.0	-0.7	1.10 V	232	43.26	10.04
8	#17235.00	70.1 PK	74.0	-3.9	1.17 V	221	51.54	18.56
9	#17235.00	50.2 AV	54.0	-3.8	1.17 V	221	31.64	18.56

**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.

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.6 PK			1.36 H	23	106.10	4.50
2	*5785.00	103.5 AV			1.36 H	23	99.00	4.50
3	11570.00	60.1 PK	74.0	-13.9	1.23 H	130	50.02	10.08
4	11570.00	48.9 AV	54.0	-5.1	1.23 H	130	38.82	10.08
5	#17355.00	65.2 PK	74.0	-8.8	1.17 H	183	46.30	18.90
6	#17355.00	50.6 AV	54.0	-3.4	1.17 H	183	31.70	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	*5785.00	120.7 PK			1.54 V	35	116.20	4.50
2	*5785.00	113.4 AV			1.54 V	35	108.90	4.50
3	11570.00	64.8 PK	74.0	-9.2	1.10 V	241	54.72	10.08
4	11570.00	53.0 AV	54.0	-1.0	1.10 V	241	42.92	10.08
5	#17355.00	70.0 PK	74.0	-4.0	1.20 V	211	51.10	18.90
6	#17355.00	50.2 AV	54.0	-3.8	1.20 V	211	31.30	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.



<b>CHANNEL</b>	TX Channel 165	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	105.3 PK			1.35 H	33	100.77	4.53
2	*5825.00	96.7 AV			1.35 H	33	92.17	4.53
3	#5850.00	67.6 PK	78.2	-10.6	1.35 H	33	63.03	4.57
4	#5860.00	55.8 PK	74.0	-18.2	1.35 H	33	51.21	4.59
5	#5860.00	43.0 AV	54.0	-11.0	1.35 H	33	38.41	4.59
6	11650.00	59.8 PK	74.0	-14.2	1.29 H	129	49.83	9.97
7	11650.00	48.7 AV	54.0	-5.3	1.29 H	129	38.73	9.97
8	#17475.00	64.9 PK	74.0	-9.1	1.12 H	181	45.79	19.11
9	#17475.00	50.5 AV	54.0	-3.5	1.12 H	181	31.39	19.11

**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	115.6 PK			1.28 V	77	111.07	4.53
2	*5825.00	106.8 AV			1.28 V	77	102.27	4.53
3	#5850.00	77.3 PK	78.2	-0.9	1.20 V	122	72.73	4.57
4	#5860.00	65.5 PK	74.0	-8.5	1.17 V	123	60.91	4.59
5	#5860.00	52.6 AV	54.0	-1.4	1.17 V	123	48.01	4.59
6	11650.00	64.2 PK	74.0	-9.8	1.10 V	242	54.23	9.97
7	11650.00	52.6 AV	54.0	-1.4	1.10 V	242	42.63	9.97
8	#17475.00	70.4 PK	74.0	-3.6	1.19 V	214	51.29	19.11
9	#17475.00	50.4 AV	54.0	-3.6	1.19 V	214	31.29	19.11

**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)**

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

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
<b>NO.</b>	<b>FREQ. (MHz)</b>	<b>EMISSION LEVEL (dBuV/m)</b>	<b>LIMIT (dBuV/m)</b>	<b>MARGIN (dB)</b>	<b>ANTENNA HEIGHT (m)</b>	<b>TABLE ANGLE (Degree)</b>	<b>RAW VALUE (dBuV)</b>	<b>CORRECTION FACTOR (dB/m)</b>
1	5150.00	56.5 PK	74.0	-17.5	1.40 H	31	46.53	9.97
2	5150.00	44.3 AV	54.0	-9.7	1.40 H	31	34.33	9.97
3	*5180.00	103.6 PK			1.40 H	31	93.44	10.16
4	*5180.00	95.6 AV			1.40 H	31	85.44	10.16
5	#10360.00	59.7 PK	68.2	-8.5	1.21 H	145	42.72	16.98
6	15540.00	64.2 PK	74.0	-9.8	1.22 H	191	42.27	21.93
7	15540.00	49.7 AV	54.0	-4.3	1.22 H	191	27.77	21.93

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
<b>NO.</b>	<b>FREQ. (MHz)</b>	<b>EMISSION LEVEL (dBuV/m)</b>	<b>LIMIT (dBuV/m)</b>	<b>MARGIN (dB)</b>	<b>ANTENNA HEIGHT (m)</b>	<b>TABLE ANGLE (Degree)</b>	<b>RAW VALUE (dBuV)</b>	<b>CORRECTION FACTOR (dB/m)</b>
1	5150.00	65.9 PK	74.0	-8.1	1.20 V	49	55.93	9.97
2	5150.00	53.8 AV	54.0	-0.2	1.20 V	49	43.83	9.97
3	*5180.00	113.6 PK			1.26 V	73	103.44	10.16
4	*5180.00	105.7 AV			1.26 V	73	95.54	10.16
5	#10360.00	67.3 PK	68.2	-0.9	1.16 V	158	50.32	16.98
6	15540.00	63.4 PK	74.0	-10.6	1.22 V	134	41.47	21.93
7	15540.00	52.0 AV	54.0	-2.0	1.22 V	134	30.07	21.93

**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.



<b>CHANNEL</b>	TX Channel 40	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	55.3 PK	74.0	-18.7	1.39 H	27	45.33	9.97
2	5150.00	43.3 AV	54.0	-10.7	1.39 H	27	33.33	9.97
3	*5200.00	107.1 PK			1.39 H	27	96.84	10.26
4	*5200.00	97.9 AV			1.39 H	27	87.64	10.26
5	5360.00	56.3 PK	74.0	-17.7	1.39 H	27	45.71	10.59
6	5360.00	44.1 AV	54.0	-9.9	1.39 H	27	33.51	10.59
7	#10400.00	60.2 PK	68.2	-8.0	1.19 H	126	43.14	17.06
8	15600.00	64.9 PK	74.0	-9.1	1.18 H	179	42.62	22.28
9	15600.00	50.2 AV	54.0	-3.8	1.18 H	179	27.92	22.28

**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	64.1 PK	74.0	-9.9	1.20 V	325	54.13	9.97
2	5150.00	48.9 AV	54.0	-5.1	1.20 V	325	38.93	9.97
3	*5200.00	117.4 PK			1.16 V	22	107.14	10.26
4	*5200.00	108.4 AV			1.16 V	22	98.14	10.26
5	5360.00	58.0 PK	74.0	-16.0	1.13 V	339	47.41	10.59
6	5360.00	48.9 AV	54.0	-5.1	1.13 V	339	38.31	10.59
7	#10400.00	67.2 PK	68.2	-1.0	1.00 V	224	50.14	17.06
8	15600.00	64.6 PK	74.0	-9.4	1.02 V	211	42.32	22.28
9	15600.00	50.8 AV	54.0	-3.2	1.02 V	211	28.52	22.28

**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.

<b>CHANNEL</b>	TX Channel 48	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	108.1 PK			1.32 H	43	97.77	10.33
2	*5240.00	98.8 AV			1.32 H	43	88.47	10.33
3	5350.00	56.4 PK	74.0	-17.6	1.32 H	43	45.85	10.55
4	5350.00	44.0 AV	54.0	-10.0	1.32 H	43	33.45	10.55
5	5400.00	56.3 PK	74.0	-17.7	1.32 H	43	45.60	10.70
6	5400.00	43.9 AV	54.0	-10.1	1.32 H	43	33.20	10.70
7	#10480.00	59.2 PK	68.2	-9.0	1.29 H	140	42.47	16.73
8	15720.00	64.8 PK	74.0	-9.2	1.20 H	188	42.17	22.63
9	15720.00	50.3 AV	54.0	-3.7	1.20 H	188	27.67	22.63

**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	117.8 PK			1.39 V	59	107.47	10.33
2	*5240.00	108.8 AV			1.39 V	59	98.47	10.33
3	5350.00	53.2 PK	74.0	-20.8	1.17 V	50	42.65	10.55
4	5350.00	43.4 AV	54.0	-10.6	1.17 V	50	32.85	10.55
5	5400.00	57.4 PK	74.0	-16.6	1.16 V	47	46.70	10.70
6	5400.00	46.1 AV	54.0	-7.9	1.16 V	47	35.40	10.70
7	#10480.00	67.1 PK	68.2	-1.1	1.00 V	223	50.37	16.73
8	15720.00	64.3 PK	74.0	-9.7	1.02 V	321	41.67	22.63
9	15720.00	51.4 AV	54.0	-2.6	1.02 V	321	28.77	22.63

**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.

<b>CHANNEL</b>	TX Channel 149	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	55.5 PK	74.0	-18.5	1.30 H	48	51.02	4.48
2	#5715.00	42.7 AV	54.0	-11.3	1.30 H	48	38.22	4.48
3	#5725.00	67.7 PK	78.2	-10.5	1.36 H	6	63.20	4.50
4	*5745.00	104.0 PK			1.36 H	6	99.51	4.49
5	*5745.00	95.9 AV			1.36 H	6	91.41	4.49
6	11490.00	60.0 PK	74.0	-14.0	1.22 H	130	49.96	10.04
7	11490.00	48.9 AV	54.0	-5.1	1.22 H	130	38.86	10.04
8	#17235.00	64.8 PK	74.0	-9.2	1.14 H	173	46.24	18.56
9	#17235.00	50.4 AV	54.0	-3.6	1.14 H	173	31.84	18.56

**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	#5715.00	62.5 PK	74.0	-11.5	1.40 V	34	58.02	4.48
2	#5715.00	48.3 AV	54.0	-5.7	1.40 V	34	43.82	4.48
3	#5725.00	77.8 PK	78.2	-0.4	1.37 V	44	73.30	4.50
4	*5745.00	114.2 PK			1.55 V	33	109.71	4.49
5	*5745.00	105.8 AV			1.55 V	33	101.31	4.49
6	11490.00	64.4 PK	74.0	-9.6	1.15 V	230	54.36	10.04
7	11490.00	52.6 AV	54.0	-1.4	1.15 V	230	42.56	10.04
8	#17235.00	70.5 PK	74.0	-3.5	1.25 V	202	51.94	18.56
9	#17235.00	50.5 AV	54.0	-3.5	1.25 V	202	31.94	18.56

**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.

<b>CHANNEL</b>	TX Channel 157	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	111.0 PK			1.35 H	23	106.50	4.50
2	*5785.00	103.1 AV			1.35 H	23	98.60	4.50
3	11570.00	60.7 PK	74.0	-13.3	1.28 H	129	50.62	10.08
4	11570.00	49.3 AV	54.0	-4.7	1.28 H	129	39.22	10.08
5	#17355.00	65.4 PK	74.0	-8.6	1.14 H	192	46.50	18.90
6	#17355.00	50.8 AV	54.0	-3.2	1.14 H	192	31.90	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	*5785.00	120.8 PK			1.54 V	33	116.30	4.50
2	*5785.00	112.8 AV			1.54 V	33	108.30	4.50
3	11570.00	71.0 PK	74.0	-3.0	1.14 V	215	60.92	10.08
4	11570.00	53.5 AV	54.0	-0.5	1.14 V	215	43.42	10.08
5	#17355.00	69.3 PK	74.0	-4.7	1.22 V	204	50.40	18.90
6	#17355.00	49.7 AV	54.0	-4.3	1.22 V	204	30.80	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.

<b>CHANNEL</b>	TX Channel 165	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	105.7 PK			1.39 H	7	101.17	4.53
2	*5825.00	98.0 AV			1.39 H	7	93.47	4.53
3	#5850.00	67.7 PK	78.2	-10.5	1.39 H	7	63.13	4.57
4	#5860.00	56.5 PK	74.0	-17.5	1.39 H	7	51.91	4.59
5	#5860.00	42.5 AV	54.0	-11.5	1.39 H	7	37.91	4.59
6	11650.00	60.1 PK	74.0	-13.9	1.28 H	126	50.13	9.97
7	11650.00	49.0 AV	54.0	-5.0	1.28 H	126	39.03	9.97
8	#17475.00	64.7 PK	74.0	-9.3	1.21 H	181	45.59	19.11
9	#17475.00	50.3 AV	54.0	-3.7	1.21 H	181	31.19	19.11

**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	115.7 PK			1.36 V	25	111.17	4.53
2	*5825.00	108.1 AV			1.36 V	25	103.57	4.53
3	#5850.00	77.5 PK	78.2	-0.7	1.62 V	36	72.93	4.57
4	#5860.00	66.7 PK	74.0	-7.3	1.34 V	41	62.11	4.59
5	#5860.00	52.4 AV	54.0	-1.6	1.34 V	41	47.81	4.59
6	11650.00	65.1 PK	74.0	-8.9	1.15 V	251	55.13	9.97
7	11650.00	53.1 AV	54.0	-0.9	1.15 V	251	43.13	9.97
8	#17475.00	70.3 PK	74.0	-3.7	1.18 V	220	51.19	19.11
9	#17475.00	50.7 AV	54.0	-3.3	1.18 V	220	31.59	19.11

**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)**

<b>CHANNEL</b>	TX Channel 38	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	55.1 PK	74.0	-18.9	1.35 H	26	45.13	9.97
2	5150.00	44.2 AV	54.0	-9.8	1.35 H	26	34.23	9.97
3	*5190.00	97.8 PK			1.35 H	26	87.60	10.20
4	*5190.00	87.7 AV			1.35 H	26	77.50	10.20
5	#10380.00	60.2 PK	68.2	-8.0	1.28 H	146	43.18	17.02
6	15570.00	63.5 PK	74.0	-10.5	1.26 H	178	41.40	22.10
7	15570.00	49.0 AV	54.0	-5.0	1.26 H	178	26.90	22.10

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.8 PK	74.0	-9.2	1.26 V	159	54.83	9.97
2	5150.00	53.7 AV	54.0	-0.3	1.26 V	159	43.73	9.97
3	*5190.00	107.9 PK			1.25 V	60	97.70	10.20
4	*5190.00	97.8 AV			1.25 V	60	87.60	10.20
5	#10380.00	67.7 PK	68.2	-0.5	1.15 V	159	50.68	17.02
6	15570.00	63.2 PK	74.0	-10.8	1.20 V	149	41.10	22.10
7	15570.00	51.7 AV	54.0	-2.3	1.20 V	149	29.60	22.10

**REMARKS:**

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



<b>CHANNEL</b>	TX Channel 46	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	55.8 PK	74.0	-18.2	1.39 H	28	45.83	9.97
2	5150.00	43.6 AV	54.0	-10.4	1.39 H	28	33.63	9.97
3	*5230.00	104.5 PK			1.39 H	28	94.18	10.32
4	*5230.00	95.5 AV			1.39 H	28	85.18	10.32
5	5350.00	55.8 PK	74.0	-18.2	1.39 H	28	45.25	10.55
6	5350.00	43.7 AV	54.0	-10.3	1.39 H	28	33.15	10.55
7	5390.00	55.8 PK	74.0	-18.2	1.39 H	28	45.13	10.67
8	5390.00	43.7 AV	54.0	-10.3	1.39 H	28	33.03	10.67
9	#10460.00	60.8 PK	68.2	-7.4	1.20 H	154	43.98	16.82
10	15690.00	64.6 PK	74.0	-9.4	1.20 H	171	42.08	22.52
11	15690.00	49.8 AV	54.0	-4.2	1.20 H	171	27.28	22.52

**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	66.5 PK	74.0	-7.5	1.31 V	73	56.53	9.97
2	5150.00	53.5 AV	54.0	-0.5	1.31 V	73	43.53	9.97
3	*5230.00	114.5 PK			1.38 V	74	104.18	10.32
4	*5230.00	105.2 AV			1.38 V	74	94.88	10.32
5	5350.00	52.0 PK	74.0	-22.0	1.26 V	52	41.45	10.55
6	5350.00	43.2 AV	54.0	-10.8	1.26 V	52	32.65	10.55
7	5390.00	56.7 PK	74.0	-17.3	1.25 V	60	46.03	10.67
8	5390.00	45.7 AV	54.0	-8.3	1.25 V	60	35.03	10.67
9	#10460.00	67.4 PK	68.2	-0.8	1.12 V	147	50.58	16.82
10	15690.00	63.7 PK	74.0	-10.3	1.21 V	143	41.18	22.52
11	15690.00	52.5 AV	54.0	-1.5	1.21 V	143	29.98	22.52

**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.



<b>CHANNEL</b>	TX Channel 151	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	58.1 PK	68.2	-10.1	1.30 H	22	53.62	4.48
2	#5725.00	60.3 PK	78.2	-17.9	1.30 H	22	55.80	4.50
3	*5755.00	97.9 PK			1.30 H	22	93.41	4.49
4	*5755.00	89.4 AV			1.30 H	22	84.91	4.49
5	11510.00	59.8 PK	74.0	-14.2	1.20 H	138	49.75	10.05
6	11510.00	48.6 AV	54.0	-5.4	1.20 H	138	38.55	10.05
7	#17265.00	65.6 PK	74.0	-8.4	1.17 H	167	46.96	18.64
8	#17265.00	50.8 AV	54.0	-3.2	1.17 H	167	32.16	18.64

**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	68.1 PK	68.2	-0.1	1.40 V	33	63.62	4.48
2	#5725.00	70.2 PK	78.2	-8.0	1.44 V	35	65.70	4.50
3	*5755.00	107.9 PK			1.56 V	33	103.41	4.49
4	*5755.00	99.3 AV			1.56 V	33	94.81	4.49
5	11510.00	64.8 PK	74.0	-9.2	1.06 V	248	54.75	10.05
6	11510.00	52.7 AV	54.0	-1.3	1.06 V	248	42.65	10.05
7	#17265.00	70.3 PK	74.0	-3.7	1.19 V	199	51.66	18.64
8	#17265.00	50.5 AV	54.0	-3.5	1.19 V	199	31.86	18.64

**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.

<b>CHANNEL</b>	TX Channel 159	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	102.9 PK			1.35 H	13	98.39	4.51
2	*5795.00	93.1 AV			1.35 H	13	88.59	4.51
3	#5850.00	61.8 PK	78.2	-16.4	1.35 H	13	57.23	4.57
4	#5860.00	60.6 PK	74.0	-13.4	1.35 H	13	56.01	4.59
5	#5860.00	44.2 AV	54.0	-9.8	1.35 H	13	39.61	4.59
6	11590.00	60.1 PK	74.0	-13.9	1.23 H	139	50.01	10.09
7	11590.00	48.7 AV	54.0	-5.3	1.23 H	139	38.61	10.09
8	#17385.00	64.7 PK	74.0	-9.3	1.14 H	195	45.70	19.00
9	#17385.00	50.3 AV	54.0	-3.7	1.14 H	195	31.30	19.00

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	113.0 PK			1.68 V	68	108.49	4.51
2	*5795.00	103.4 AV			1.68 V	68	98.89	4.51
3	#5850.00	71.7 PK	78.2	-6.5	1.87 V	30	67.13	4.57
4	#5860.00	70.2 PK	74.0	-3.8	1.70 V	32	65.61	4.59
5	#5860.00	53.8 AV	54.0	-0.2	1.70 V	32	49.21	4.59
6	11590.00	64.5 PK	74.0	-9.5	1.13 V	245	54.41	10.09
7	11590.00	52.7 AV	54.0	-1.3	1.13 V	245	42.61	10.09
8	#17385.00	70.3 PK	74.0	-3.7	1.25 V	199	51.30	19.00
9	#17385.00	50.2 AV	54.0	-3.8	1.25 V	199	31.20	19.00

**REMARKS:**

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

802.11ac (VHT80)

<b>CHANNEL</b>	TX Channel 42	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	55.3 PK	74.0	-18.7	1.37 H	16	45.33	9.97
2	5150.00	43.5 AV	54.0	-10.5	1.37 H	16	33.53	9.97
3	*5210.00	97.4 PK			1.37 H	16	87.13	10.27
4	*5210.00	87.5 AV			1.37 H	16	77.23	10.27
5	5350.00	56.0 PK	74.0	-18.0	1.37 H	16	45.45	10.55
6	5350.00	43.7 AV	54.0	-10.3	1.37 H	16	33.15	10.55
7	#10420.00	60.0 PK	68.2	-8.2	1.31 H	158	43.02	16.98
8	15630.00	64.6 PK	74.0	-9.4	1.19 H	182	42.23	22.37
9	15630.00	49.9 AV	54.0	-4.1	1.19 H	182	27.53	22.37

**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	65.3 PK	74.0	-8.7	1.41 V	72	55.33	9.97
2	5150.00	53.3 AV	54.0	-0.7	1.41 V	72	43.33	9.97
3	*5210.00	106.8 PK			1.35 V	72	96.53	10.27
4	*5210.00	97.1 AV			1.35 V	72	86.83	10.27
5	5350.00	56.1 PK	74.0	-17.9	1.24 V	69	45.55	10.55
6	5350.00	45.7 AV	54.0	-8.3	1.24 V	69	35.15	10.55
7	#10420.00	67.5 PK	68.2	-0.7	1.20 V	176	50.52	16.98
8	15630.00	63.1 PK	74.0	-10.9	1.22 V	130	40.73	22.37
9	15630.00	51.7 AV	54.0	-2.3	1.22 V	130	29.33	22.37

**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.

<b>CHANNEL</b>	TX Channel 155	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	59.8 PK	74.0	-14.2	1.33 H	21	55.32	4.48
2	#5715.00	43.4 AV	54.0	-10.6	1.33 H	21	38.92	4.48
3	#5725.00	65.8 PK	78.2	-12.4	1.33 H	21	61.30	4.50
4	*5775.00	96.3 PK			1.33 H	21	91.81	4.49
5	*5775.00	84.6 AV			1.33 H	21	80.11	4.49
6	#5850.00	59.1 PK	78.2	-19.1	1.33 H	21	54.53	4.57
7	#5860.00	58.7 PK	74.0	-15.3	1.33 H	21	54.11	4.59
8	#5860.00	43.3 AV	54.0	-10.7	1.33 H	21	38.71	4.59
9	11550.00	60.4 PK	74.0	-13.6	1.29 H	127	50.33	10.07
10	11550.00	48.9 AV	54.0	-5.1	1.29 H	127	38.83	10.07
11	#17325.00	65.4 PK	74.0	-8.6	1.18 H	198	46.58	18.82
12	#17325.00	50.9 AV	54.0	-3.1	1.18 H	198	32.08	18.82

**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	70.0 PK	74.0	-4.0	1.65 V	84	65.52	4.48
2	#5715.00	53.8 AV	54.0	-0.2	1.65 V	84	49.32	4.48
3	#5725.00	75.4 PK	78.2	-2.8	1.56 V	72	70.90	4.50
4	*5775.00	106.3 PK			1.68 V	23	101.81	4.49
5	*5775.00	94.6 AV			1.68 V	23	90.11	4.49
6	#5850.00	69.0 PK	78.2	-9.2	1.57 V	69	64.43	4.57
7	#5860.00	59.0 PK	74.0	-15.0	1.63 V	76	54.41	4.59
8	#5860.00	47.8 AV	54.0	-6.2	1.63 V	76	43.21	4.59
9	11550.00	65.2 PK	74.0	-8.8	1.15 V	242	55.13	10.07
10	11550.00	53.5 AV	54.0	-0.5	1.15 V	242	43.43	10.07
11	#17325.00	70.0 PK	74.0	-4.0	1.15 V	211	51.18	18.82
12	#17325.00	50.1 AV	54.0	-3.9	1.15 V	211	31.28	18.82

**REMARKS:**

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

**Below 1GHz Data:**

<b>CHANNEL</b>	TX Channel 157	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	Below 1GHz		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
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	106.72	36.2 QP	43.5	-7.3	1.70 H	30	52.54	-16.38
2	141.22	35.5 QP	43.5	-8.0	2.00 H	272	48.79	-13.27
3	151.45	33.3 QP	43.5	-10.2	1.60 H	100	46.10	-12.80
4	362.52	41.4 QP	46.0	-4.6	1.10 H	100	51.70	-10.30
5	393.28	34.7 QP	46.0	-11.3	1.10 H	300	44.48	-9.78
6	500.00	37.6 QP	46.0	-8.4	1.10 H	192	44.76	-7.16

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
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	50.42	36.7 QP	40.0	-3.3	1.10 V	182	50.00	-13.30
2	118.02	36.4 QP	43.5	-7.1	1.10 V	80	51.62	-15.24
3	139.28	39.8 QP	43.5	-3.7	1.00 V	116	53.22	-13.42
4	362.52	40.7 QP	46.0	-5.3	1.00 V	204	50.98	-10.30
5	494.12	40.7 QP	46.0	-5.3	1.50 V	300	48.07	-7.37
6	543.71	40.4 QP	46.0	-5.6	1.51 V	15	47.01	-6.59

**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 ROHDE & SCHWARZ	ESCS 30	847124/029	Oct. 22, 2014	Oct. 21, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable (JYEBAO)	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

**Note:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: May 04 to 05, 2015

#### 4.2.3 Test Procedure

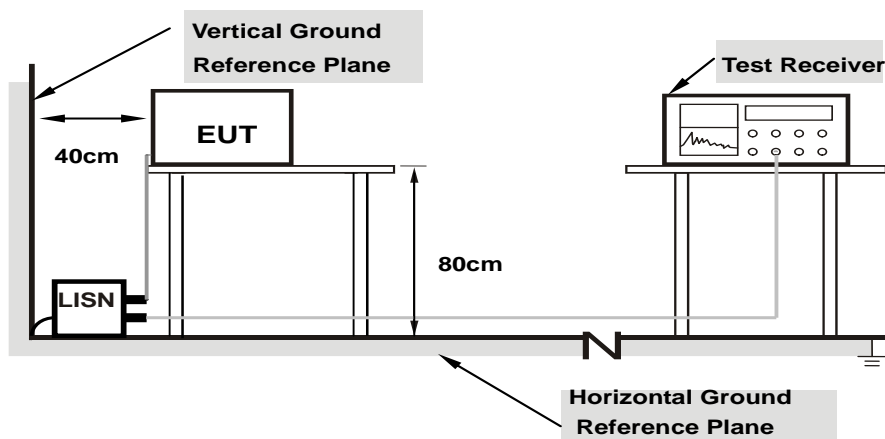
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

#### 4.2.4 Deviation from Test Standard

No deviation.

#### 4.2.5 Test Setup



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

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.



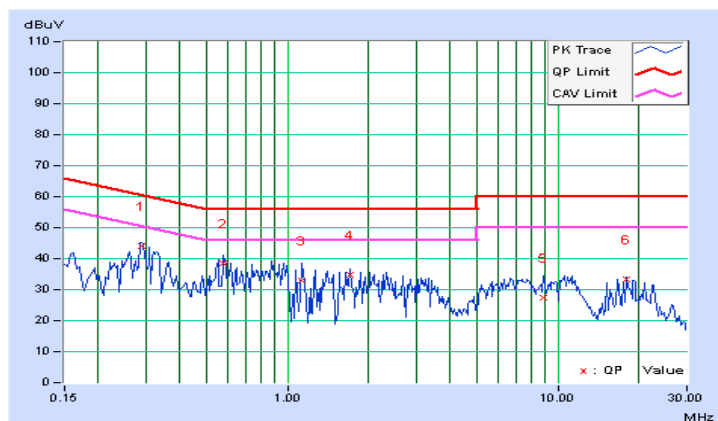
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.29063	0.09	43.97	38.65	44.06	38.74	60.51	50.51	-16.44	-11.76
2	0.57969	0.11	38.40	27.70	38.51	27.81	56.00	46.00	-17.49	-18.19
3	1.13672	0.14	32.69	23.01	32.83	23.15	56.00	46.00	-23.17	-22.85
4	1.70703	0.16	34.74	22.25	34.90	22.41	56.00	46.00	-21.10	-23.59
5	8.87109	0.41	26.93	16.60	27.34	17.01	60.00	50.00	-32.66	-32.99
6	17.91016	0.65	32.56	27.28	33.21	27.93	60.00	50.00	-26.79	-22.07

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

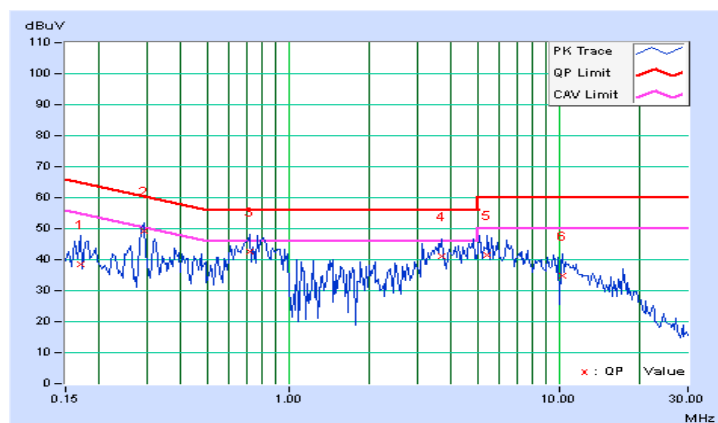


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16953	0.08	38.61	24.46	38.69	24.54	64.98	54.98	-26.29	-30.44
2	0.29453	0.09	49.14	38.72	49.23	38.81	60.40	50.40	-11.17	-11.59
3	0.71641	0.12	42.37	27.64	42.49	27.76	56.00	46.00	-13.51	-18.24
4	3.70313	0.22	40.84	29.35	41.06	29.57	56.00	46.00	-14.94	-16.43
5	5.44922	0.29	41.25	30.37	41.54	30.66	60.00	50.00	-18.46	-19.34
6	10.28516	0.47	34.24	25.08	34.71	25.55	60.00	50.00	-25.29	-24.45

**Remarks:**

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



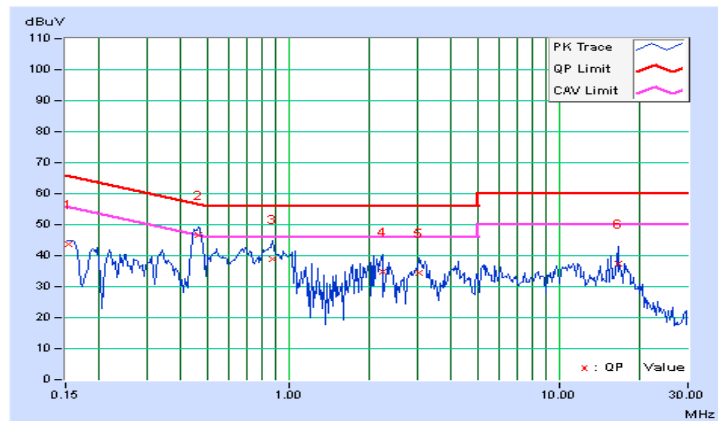
4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.08	43.70	35.80	43.78	35.88	65.79	55.79	-22.01	-19.91
<b>2</b>	<b>0.46641</b>	<b>0.10</b>	<b>46.70</b>	<b>35.99</b>	<b>46.80</b>	<b>36.09</b>	<b>56.58</b>	<b>46.58</b>	<b>-9.77</b>	<b>-10.48</b>
3	0.86875	0.12	38.71	28.09	38.83	28.21	56.00	46.00	-17.17	-17.79
4	2.23047	0.18	34.75	25.27	34.93	25.45	56.00	46.00	-21.07	-20.55
5	3.05469	0.20	34.31	26.06	34.51	26.26	56.00	46.00	-21.49	-19.74
6	16.51953	0.61	36.92	28.25	37.53	28.86	60.00	50.00	-22.47	-21.14

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

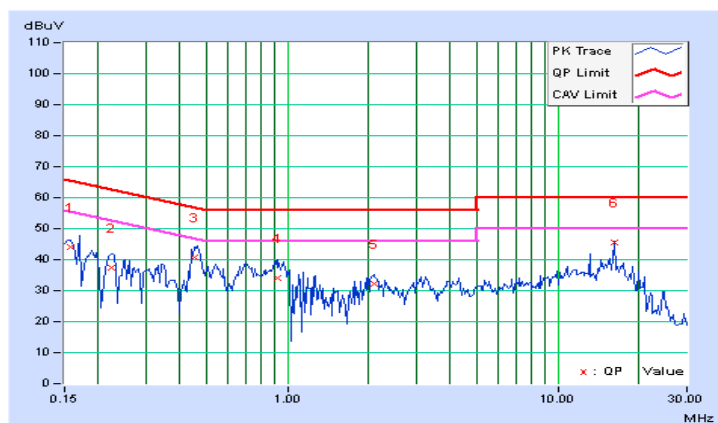


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.08	44.17	34.37	44.25	34.45	65.58	55.58	-21.33	-21.13
2	0.22422	0.08	37.31	32.14	37.39	32.22	62.66	52.66	-25.27	-20.44
3	0.45469	0.10	40.52	29.57	40.62	29.67	56.79	46.79	-16.17	-17.12
4	0.92344	0.13	34.02	22.58	34.15	22.71	56.00	46.00	-21.85	-23.29
5	2.08984	0.17	31.96	22.59	32.13	22.76	56.00	46.00	-23.87	-23.24
6	16.19141	0.63	44.84	37.12	45.47	37.75	60.00	50.00	-14.53	-12.25

**Remarks:**

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



### 4.3 Transmit Power Measurement

#### 4.3.1 Limits of Transmit Power Measurement

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

\*B is the 26 dB emission bandwidth in megahertz

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

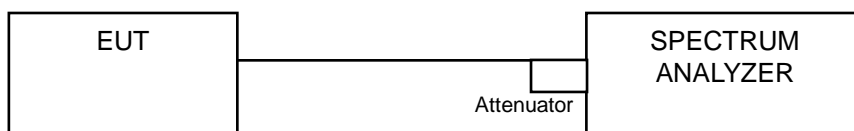
Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$ ;

Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  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:**
**802.11a**

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	17.50	17.30	109.937	20.41	30	Pass
40	5200	20.13	19.80	198.538	22.98	30	Pass
48	5240	20.30	20.06	208.543	23.19	30	Pass
149	5745	14.97	14.55	59.915	17.78	30	Pass
157	5785	21.91	20.38	264.383	24.22	30	Pass
165	5825	18.80	17.54	132.612	21.23	30	Pass

**802.11ac (VHT20)**

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	14.75	13.81	53.898	17.32	30	Pass
40	5200	19.11	19.20	164.646	22.17	30	Pass
48	5240	19.34	19.16	168.315	22.26	30	Pass
149	5745	14.45	15.20	60.974	17.85	30	Pass
157	5785	20.94	19.83	220.326	23.43	30	Pass
165	5825	15.94	15.83	77.546	18.90	30	Pass

**802.11ac (VHT40)**

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	11.35	12.29	30.589	14.86	30	Pass
46	5230	17.72	16.75	106.471	20.27	30	Pass
151	5755	12.38	12.47	34.958	15.44	30	Pass
159	5795	17.35	18.61	126.936	21.04	30	Pass

**802.11ac (VHT80)**

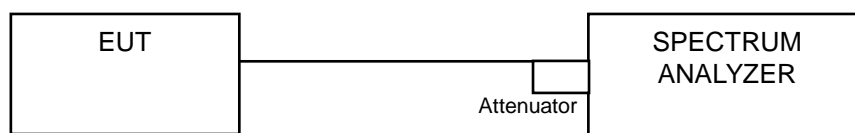
Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	12.12	11.77	31.324	14.96	30	Pass
155	5775	10.33	11.51	24.947	13.97	30	Pass

#### 4.4 Peak Power Spectral Density Measurement

##### 4.4.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
	√	Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A			11dBm/ MHz
U-NII-2C			11dBm/ MHz
U-NII-3		√	30dBm/ 500kHz

##### 4.4.2 Test Setup



##### 4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

##### 4.4.4 Test Procedure

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

Using method SA-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 band:

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

##### 4.4.5 Deviation from Test Standard

No deviation.

##### 4.4.6 EUT Operating Condition

Same as Item 4.3.6.

#### 4.4.7 Test Results

### For U-NII-1 Band 802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
36	5180	3.06	3.64	6.37	17	Pass
40	5200	5.06	5.21	8.15	17	Pass
48	5240	6.13	5.39	8.79	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 =  $2.5\text{dBi} + 10\log(2) = 5.51\text{dBi} < 6\text{dBi}$  , so the power density limit shall not be reduced.

### 802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
36	5180	0.79	1.05	3.93	17	Pass
40	5200	5.35	4.08	7.77	17	Pass
48	5240	4.41	-1.03	5.50	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 =  $2.5\text{dBi} + 10\log(2) = 5.51\text{dBi} < 6\text{dBi}$  , so the power density limit shall not be reduced.

### 802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
38	5190	-6.21	-6.22	-3.20	17	Pass
46	5230	1.70	2.39	5.07	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 =  $2.5\text{dBi} + 10\log(2) = 5.51\text{dBi} < 6\text{dBi}$  , so the power density limit shall not be reduced.

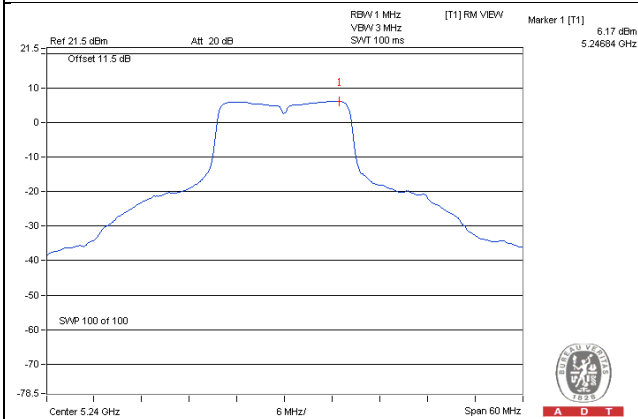
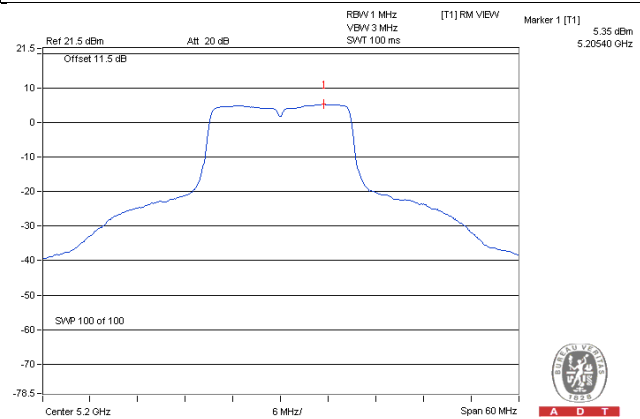
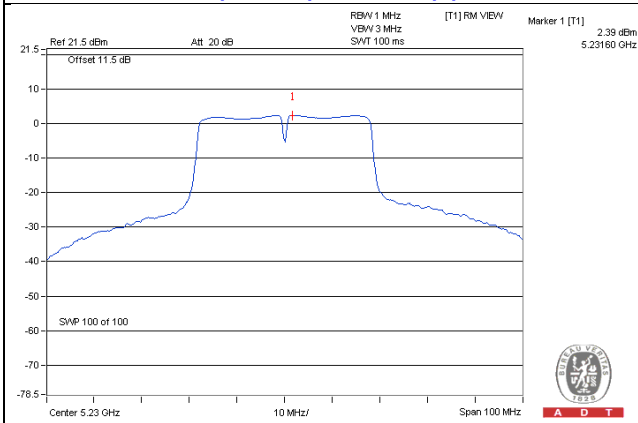
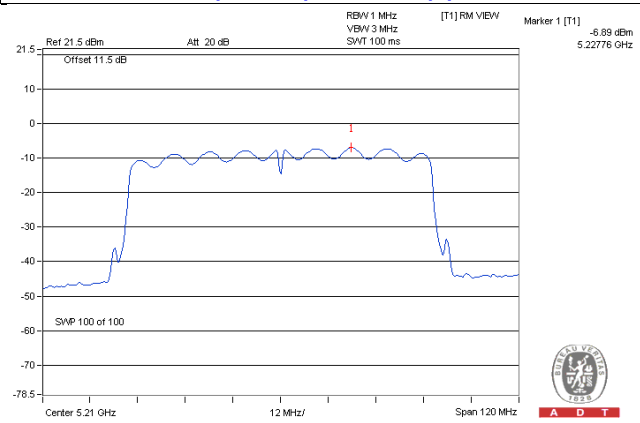


**802.11ac (VHT80):**

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
42	5210	-6.89	-7.01	-3.94	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 =  $2.5\text{dBi} + 10\log(2) = 5.51\text{dBi} < 6\text{dBi}$ , so the power density limit shall not be reduced.

**Spectrum Plot of Worst Value**
**802.11a – Chain (0): CH 48**

**802.11ac (VHT20) – Chain (0): CH 40**

**802.11ac (VHT40) – Chain (1): CH 46**

**802.11ac (VHT80) – Chain (0): CH 42**


## For U-NII-3 Band

### 802.11a

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-3.88	-1.66	3.01	1.35	30	Pass
	157	5785	1.50	3.72	3.01	6.73	30	Pass
	165	5825	-1.39	0.83	3.01	3.84	30	Pass
1	149	5745	-6.61	-4.39	3.01	-1.38	30	Pass
	157	5785	-0.09	2.13	3.01	5.14	30	Pass
	165	5825	-3.02	-0.80	3.01	2.21	30	Pass

**NOTE:** 1. Directional gain =  $2.5\text{dBi} + 10\log(2) = 5.51\text{dBi} < 6\text{dBi}$  , so the power density limit shall not be reduced.

### 802.11ac (VHT20)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-5.53	-3.31	3.01	-0.30	30	Pass
	157	5785	1.02	3.24	3.01	6.25	30	Pass
	165	5825	-2.37	-0.15	3.01	2.86	30	Pass
1	149	5745	-7.52	-5.30	3.01	-2.29	30	Pass
	157	5785	-0.10	2.12	3.01	5.13	30	Pass
	165	5825	-4.16	-1.94	3.01	1.07	30	Pass

**NOTE:** 1. Directional gain =  $2.5\text{dBi} + 10\log(2) = 5.51\text{dBi} < 6\text{dBi}$  , so the power density limit shall not be reduced.

### 802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	151	5755	-11.47	-9.25	3.01	-6.24	30	Pass
	159	5795	-6.15	-3.93	3.01	-0.92	30	Pass
1	151	5755	-13.44	-11.22	3.01	-8.21	30	Pass
	159	5795	-8.05	-5.83	3.01	-2.82	30	Pass

**NOTE:** 1. Directional gain =  $2.5\text{dBi} + 10\log(2) = 5.51\text{dBi} < 6\text{dBi}$  , so the power density limit shall not be reduced.

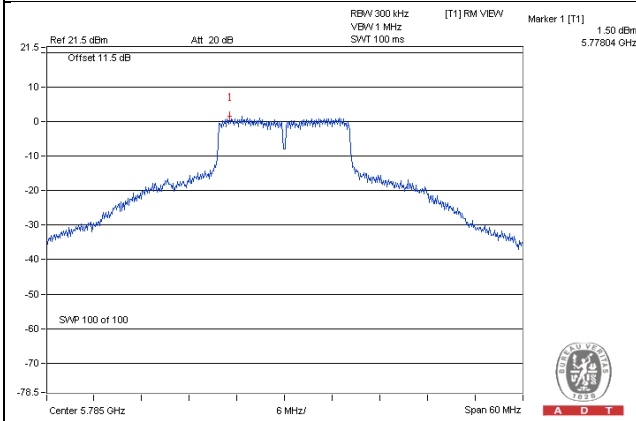
### 802.11ac (VHT80)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	155	5775	-14.92	-12.70	3.01	-9.69	30	Pass
1	155	5775	-17.11	-14.89	3.01	-11.88	30	Pass

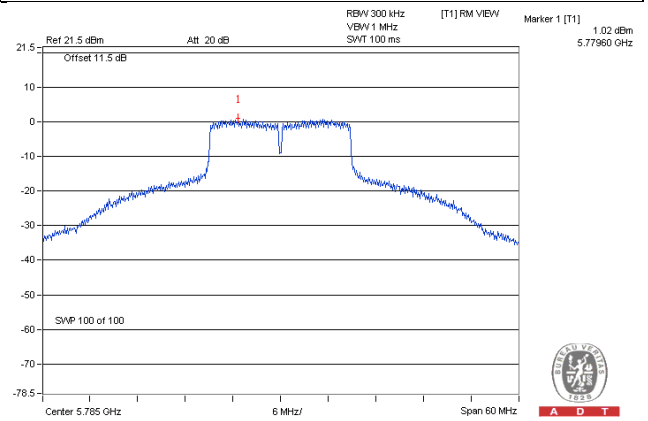
**NOTE:** 1. Directional gain =  $2.5\text{dBi} + 10\log(2) = 5.51\text{dBi} < 6\text{dBi}$  , so the power density limit shall not be reduced.

#### Spectrum Plot of Worst Value

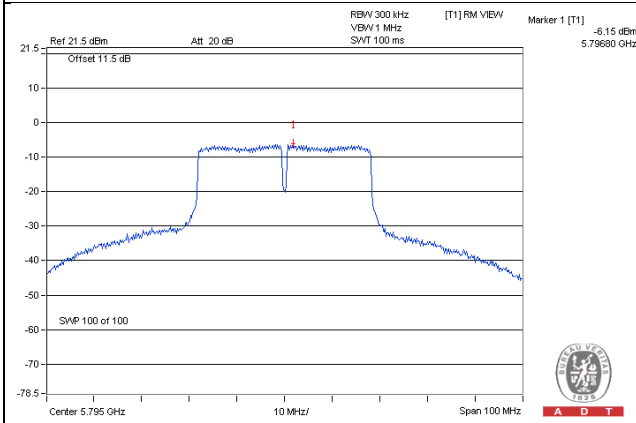
802.11a – Chain (0): CH 157



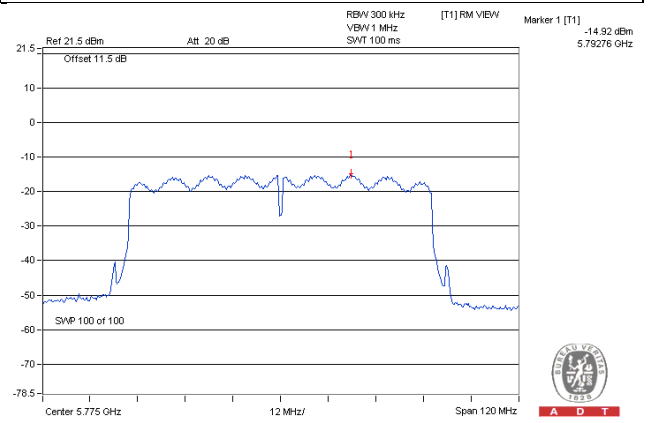
802.11ac (VHT20) – Chain (0): CH 157



802.11ac (VHT40) – Chain (0): CH 159



802.11ac (VHT80) – Chain (0): CH 155

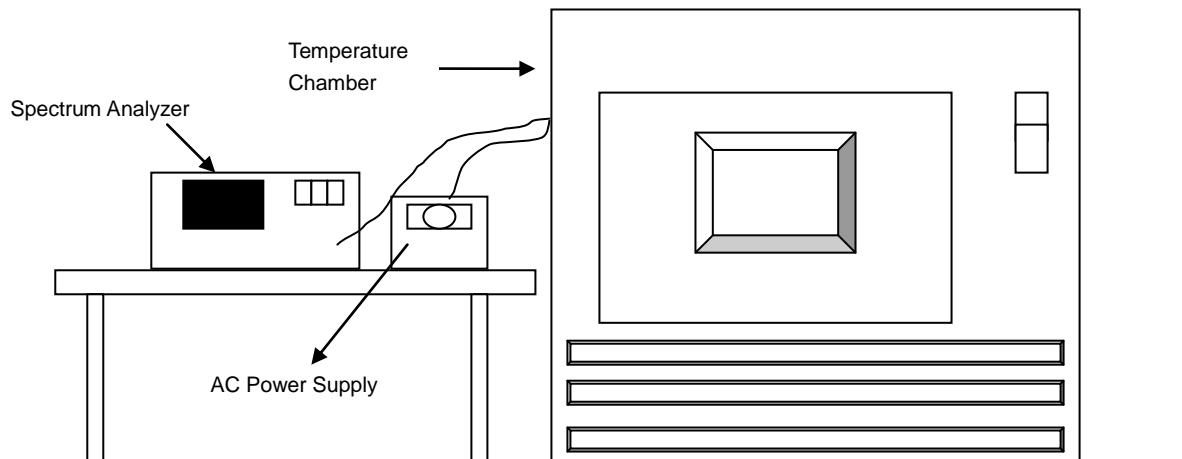


## 4.5 Frequency Stability Measurement

### 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**

<b>FREQUENCY STABILITY VERSUS TEMP.</b>									
<b>OPERATING FREQUENCY: 5180MHz</b>									
<b>TEMP. (°C)</b>	<b>POWER SUPPLY (Vac)</b>	<b>0 MINUTE</b>		<b>2 MINUTE</b>		<b>5 MINUTE</b>		<b>10 MINUTE</b>	
		<b>Measured Frequency (MHz)</b>	<b>Frequency Drift (%)</b>	<b>Measured Frequency (MHz)</b>	<b>Frequency Drift (%)</b>	<b>Measured Frequency (MHz)</b>	<b>Frequency Drift (%)</b>	<b>Measured Frequency (MHz)</b>	<b>Frequency Drift (%)</b>
50	120	5179.9757	-0.00047	5179.9787	-0.00041	5179.9754	-0.00047	5179.9769	-0.00045
40	120	5179.9871	-0.00025	5179.9863	-0.00026	5179.9863	-0.00026	5179.9877	-0.00024
30	120	5179.98	-0.00039	5179.9808	-0.00037	5179.9812	-0.00036	5179.9831	-0.00033
20	120	5179.999	-0.00002	5179.9987	-0.00003	5179.9981	-0.00004	5179.9966	-0.00007
10	120	5180.02	0.00039	5180.0202	0.00039	5180.023	0.00044	5180.0186	0.00036
0	120	5179.9885	-0.00022	5179.9886	-0.00022	5179.988	-0.00023	5179.9851	-0.00029
-10	120	5180.0044	0.00008	5180.0049	0.00009	5180.0032	0.00006	5180.0051	0.00010
-20	120	5179.9839	-0.00031	5179.985	-0.00029	5179.9836	-0.00032	5179.9844	-0.00030
-30	120	5179.9974	-0.00005	5179.9959	-0.00008	5179.9983	-0.00003	5179.9953	-0.00009

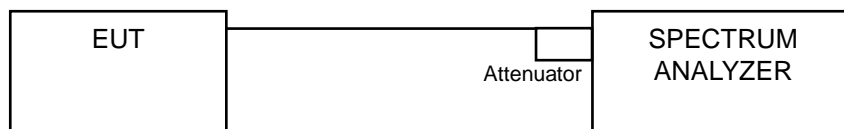
<b>FREQUENCY STABILITY VERSUS TEMP.</b>									
<b>OPERATING FREQUENCY: 5180MHz</b>									
<b>TEMP. (°C)</b>	<b>POWER SUPPLY (Vac)</b>	<b>0 MINUTE</b>		<b>2 MINUTE</b>		<b>5 MINUTE</b>		<b>10 MINUTE</b>	
		<b>Measured Frequency (MHz)</b>	<b>Frequency Drift (%)</b>	<b>Measured Frequency (MHz)</b>	<b>Frequency Drift (%)</b>	<b>Measured Frequency (MHz)</b>	<b>Frequency Drift (%)</b>	<b>Measured Frequency (MHz)</b>	<b>Frequency Drift (%)</b>
20	138	5179.9991	-0.00002	5179.9979	-0.00004	5179.9977	-0.00004	5179.9958	-0.00008
	120	5179.999	-0.00002	5179.9987	-0.00003	5179.9981	-0.00004	5179.9966	-0.00007
	102	5179.9995	-0.00001	5179.9992	-0.00002	5179.998	-0.00004	5179.9967	-0.00006

## 4.6 6dB Bandwidth Measurement

### 4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

### 4.6.2 Test Setup



### 4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.6.4 Test Procedure

#### MEASUREMENT PROCEDURE REF

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

### 4.6.5 Deviation from Test Standard

No deviation.

### 4.6.6 EUT Operating Condition

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

#### 4.6.7 Test Results

##### 802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.56	16.63	0.5	Pass
157	5785	16.90	16.57	0.5	Pass
165	5825	16.55	16.56	0.5	Pass

##### 802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.79	17.80	0.5	Pass
157	5785	17.80	17.75	0.5	Pass
165	5825	17.80	17.79	0.5	Pass

##### 802.11ac (VHT40)

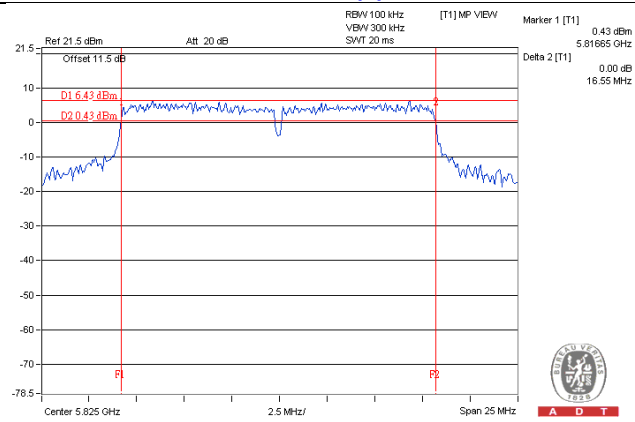
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.67	36.61	0.5	Pass
159	5795	36.64	36.59	0.5	Pass

##### 802.11ac (VHT80)

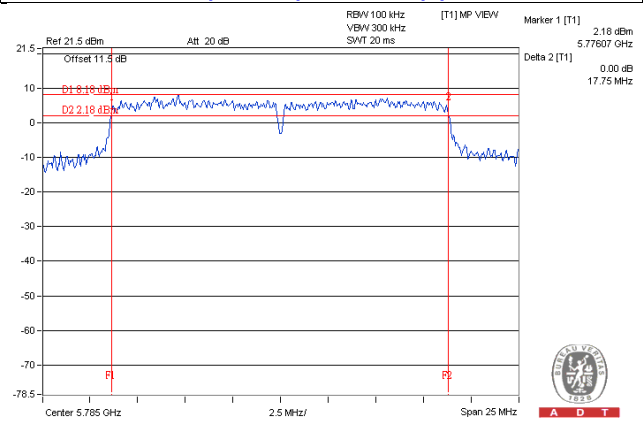
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.16	87.70	0.5	Pass

Spectrum Plot of Worst Value

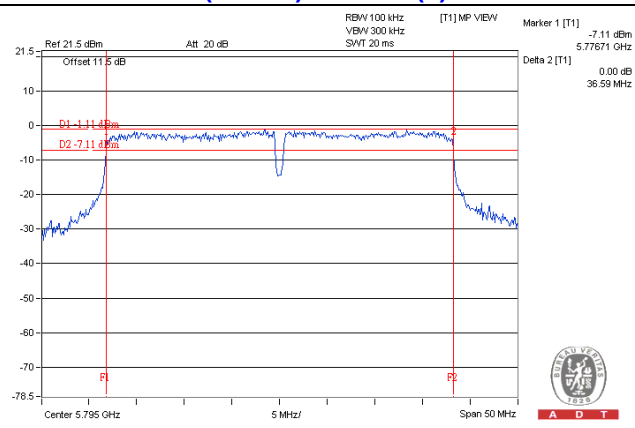
802.11a – Chain (0): CH 165



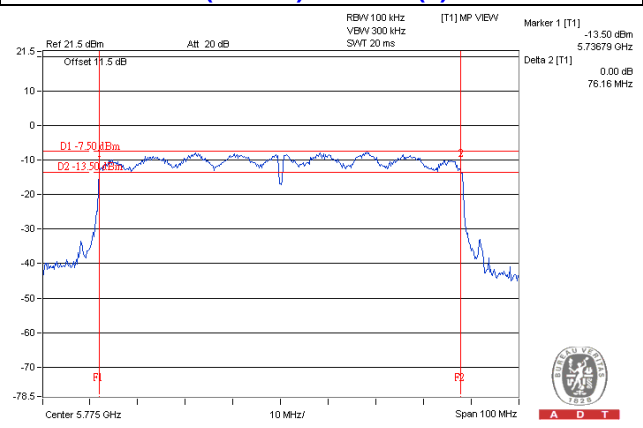
802.11ac (VHT20) – Chain (1): CH 157



802.11ac (VHT40) – Chain (1): CH 159



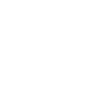
802.11ac (VHT80) – Chain (0): CH 155





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

--- END ---