

FCC Test Report (WLAN)

Report No.: RF140407E07C-1

FCC ID: TLZ-CM389NF

Test Model: AW-CM389NF

Received Date: Aug. 20, 2015

Test Date: Sep. 02 to 11, 2015

Issued Date: Sep. 18, 2015

Applicant: AzureWave Technologies, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Test Location (3): E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.



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Release Control Record

Issue No.	Description	Date Issued
RF140407E07C-1	Original release.	Sep. 18, 2015

1 Certificate of Conformity

Product: IEEE 802.11 2X2 MIMO a/b/g/n/ac Wireless LAN + Bluetooth + NFC NGFF Module

Brand: AzureWave

Test Model: AW-CM389NF

Sample Status: ENGINEERING SAMPLE

Applicant: AzureWave Technologies, Inc.

Test Date: Sep. 02 to 11, 2015

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

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

Prepared by :  , **Date:** Sep. 18, 2015
Claire Kuan / Specialist

Approved by :  , **Date:** Sep. 18, 2015
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.2dB at 5150.00MHz
15.407(a)(1/2 /3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.407(a)(1/2 /3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

NOTE: 1. This report is prepared for FCC Class II change. (Upgrade the standard to section 15.407 under new rule for U-NII-1, U-NII-3 band)

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.37 dB
Radiated Emissions above 1 GHz for Chamber G	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	IEEE 802.11 2X2 MIMO a/b/g/n/ac Wireless LAN + Bluetooth + NFC NGFF Module
Brand	AzureWave
Test Model	AW-CM389NF
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	3.3Vdc (from host equipment)
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 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	2.4GHz: 2.412GHz ~ 2.462GHz 5GHz: 5.18GHz ~ 5.24GHz, 5.26GHz ~ 5.32GHz, 5.5GHz ~ 5.7GHz, 5.745GHz ~ 5.825GHz
Number of Channel	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) 5GHz: 21 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 9 for 802.11n (HT40), 802.11ac (VHT40) 4 for 802.11ac (VHT80)
Output Power	5GHz: (U-NII-1 & U-NII-3) 802.11a: 70.939 mW 802.11ac (VHT20): 69.761mW 802.11ac (VHT40): 58.901mW 802.11ac (VHT80): 26.289mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

- This report is prepared for FCC Class II change. The difference compared with the Report No.: RF140407E07-1 design is as the following:
 - ◆ Upgrade the standard to section 15.407 under new rule for U-NII-1, U-NII-3 band.
- According to above conditions, all test items of U-NII-1, U-NII-3 band test item need to be performed, except for AC power conducted emission test item. And all data was verified to meet the requirements.

3. There are Bluetooth, WLAN and NFC technology used for the EUT.

4. WLAN/BT/NFC coexistence mode:

Condition	Technology		
1	WLAN(2.4GHz) 1Tx only	BT	NFC
2	WLAN(5GHz) 1Tx only	BT	NFC

From above coexistence mode, radiated emission of the simultaneous operation has been evaluated and no non-compliance was found.

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

For WLAN / BT used (Set 1 antenna)								
Antenna No.	Transmitter Circuit	Brand	Model	Antenna Gain(dBi) < including cable loss>	Frequency range (MHz to MHz)	Antenna Type	Connector Type	Cable Length (cm)
1	Chain (0)	MAG.LAYERS	MSA-4008-25GC1-A1	2.98	2400~2500	PIFA	i-pex(MHF)	15
				5.16	4900~5900			
2	Chain (1)	MAG.LAYERS	MSA-4008-25GC1-A1	2.98	2400~2500	PIFA	i-pex(MHF)	15
				5.16	4900~5900			
For WLAN / BT used (Set 2 antenna)								
Antenna No.	Transmitter Circuit	Brand	Model	Antenna Gain(dBi) < including cable loss>	Frequency range (MHz to MHz)	Antenna Type	Connector Type	Cable Length (cm)
3	Main Antenna Chain 0	Wistron Neweb Corporation	DC33001KT00 (81EAAL15.G92)	1.54	2400~2500	PIFA	i-pex(MHF)	36.3
				1.26	5150~5850			
4	Aux Antenna Chain 1	Wistron Neweb Corporation	DC33001KT10 (81EAAL15.G75)	0.63	2400~2500	PIFA	i-pex(MHF)	59.3
				1.84	5150~5850			
For NFC used								
Antenna No.	Brand		Model	Antenna Gain(dBi)	Frequency range (MHz)	Antenna Type	Connector Type	Cable Length (cm)
5	Marvell		30X40X4T_PCB	0.5	13.56	PCB	i-pex(MHF)	N/A

From the above antenna sets, the **set 1** was selected as representative antenna for the test and its data was recorded in this report.

6. The EUT incorporates a MIMO function.

MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	1Tx diversity/2TX(CDD)	1Rx diversity/2RX
802.11b	1 ~ 11Mbps	1Tx diversity/2TX(CDD)	1Rx diversity/2RX
802.11g	6 ~ 54Mbps	1Tx diversity/2TX(CDD)	1Rx diversity/2RX
802.11n (HT20)	MCS 0~7	1Tx	1Rx diversity
	MCS 8~15	2Tx	2Rx
802.11n (HT40)	MCS 0~7	1Tx	1Rx diversity
	MCS 8~15	2Tx	2Rx
802.11ac (VHT20) (5GHz)	MCS0~8 (256QAM) Nss=1	1Tx	1Rx diversity
	MCS0~8 (256QAM) Nss=2	2Tx	2Rx
802.11ac (VHT40) (5GHz)	MCS0~9 (256QAM) Nss=1	1Tx	1Rx diversity
	MCS0~9 (256QAM) Nss=2	2Tx	2Rx
802.11ac (VHT80) (5GHz)	MCS0~9 (256QAM) Nss=1	1Tx	1Rx diversity
	MCS0~9 (256QAM) 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)

7. 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	5210 MHz

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	13
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	27
802.11ac (VHT80)		42	42	OFDM	BPSK	58.5
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	13
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	27
802.11ac (VHT80)		155	155	OFDM	BPSK	58.5

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	5180-5240, 5745-5825	36 to 48, 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	13
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	27
802.11ac (VHT80)		42	42	OFDM	BPSK	58.5
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	13
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	27
802.11ac (VHT80)		155	155	OFDM	BPSK	58.5

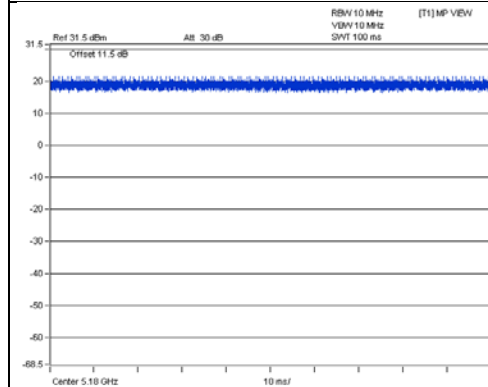
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 71%RH	120Vac, 60Hz	Gary Cheng
RE $<$ 1G	23deg. C, 67%RH	120Vac, 60Hz	Robert Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

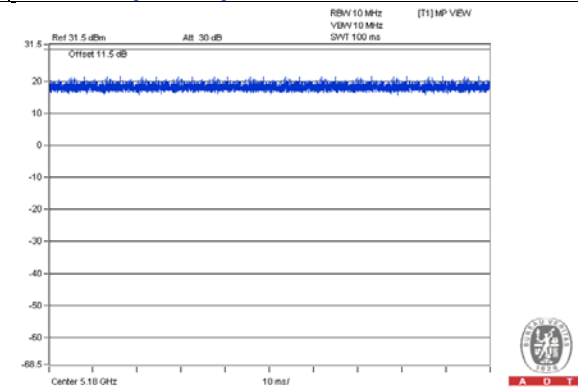
3.3 Duty Cycle of Test Signal

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

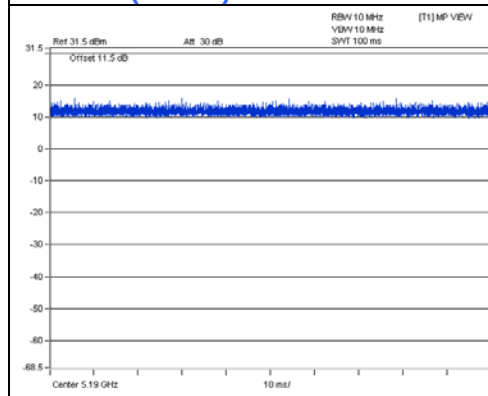
802.11a



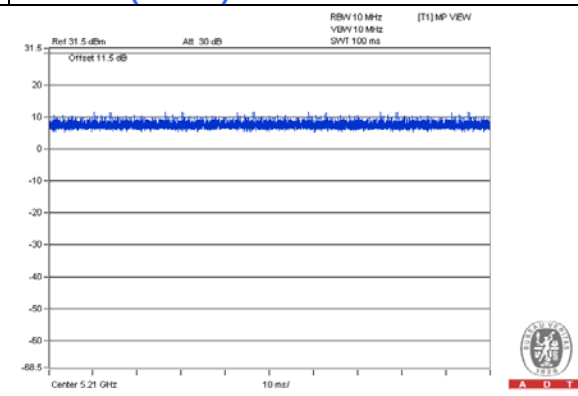
802.11ac (VHT20)



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.

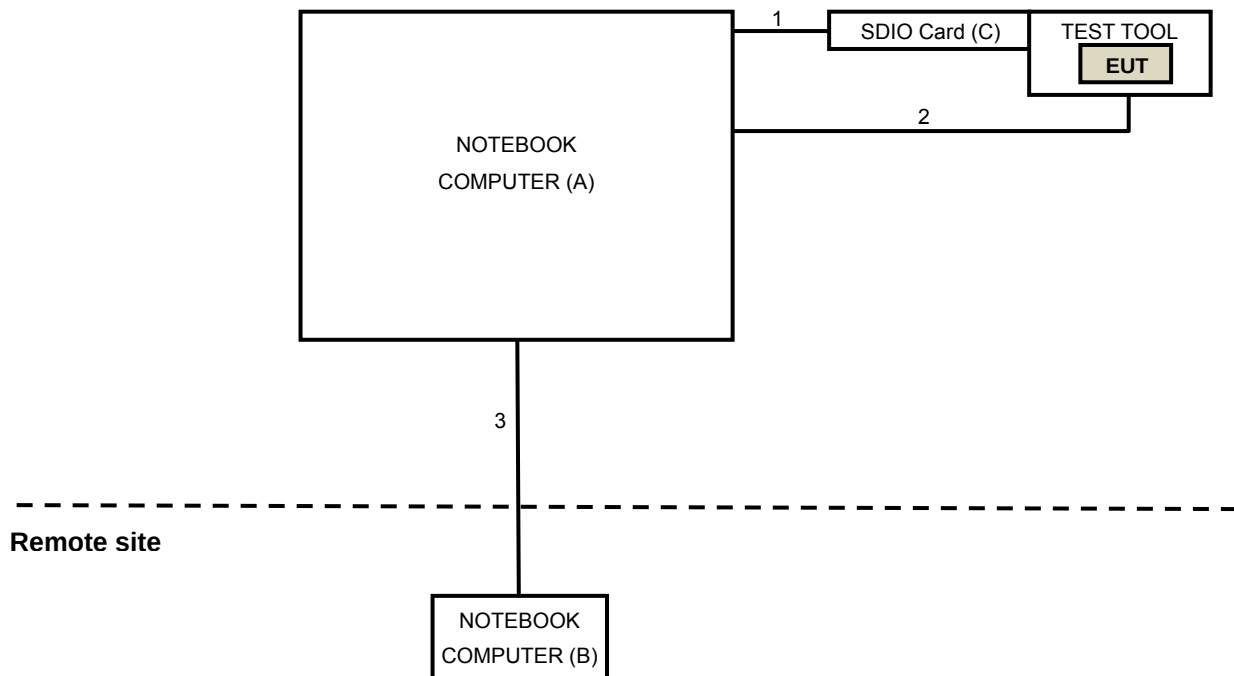
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	NOTEBOOK COMPUTER	ASUS	USF	NA	NA	Supplied by Client
B.	NOTEBOOK COMPUTER	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	SDIO Card	AzureWave	NA	NA	NA	Supplied by Client

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.	USB to Micro USB	1	1	Yes	0	Provided by Lab
2.	USB to Micro USB	1	1	Yes	0	Provided by Lab
3.	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 C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedure New Rules 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 Above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna AISI	AIH.8018	0000220091110	Feb. 06, 2015	Feb. 05, 2016
Pre-Amplifier Agilent	8449B	3008A01923	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	Jun. 26, 2015	Jun 25, 2016
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Spectrum Analyzer R&S	FSP 40	100060	May 08, 2015	May 07, 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. H.
3. The FCC Site Registration No. is 797305.
4. The CANADA Site Registration No. is IC 7450H-3.
5. Tested Date: Sep. 02 to 11, 2015

For Above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210105	July 24, 2015	July 23, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 06, 2015	Feb. 05, 2016
RF Cable	8D-FB	CHGCAB-001 -1 CHGCAB-001 -2	Oct. 04, 2014	Oct. 03, 2015
	RF-141	CHGCAB-004	Oct. 04, 2014	Oct. 03, 2015
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 test was performed in 966 Chamber No. G.
3. The FCC Site Registration No. is 966073.
4. The CANADA Site Registration No. is IC 7450H-2.
5. Tested Date: Sep. 03, 2015

4.1.3 Test Procedures

- 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:

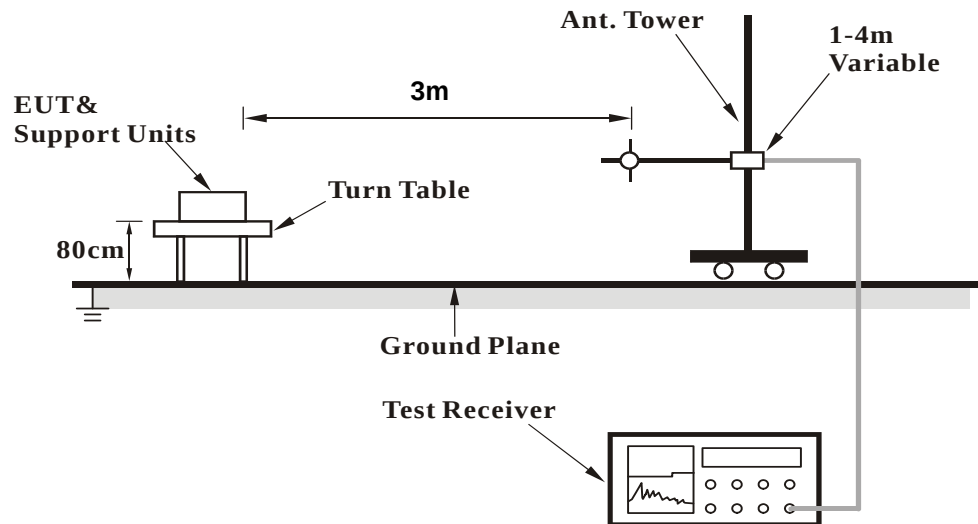
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

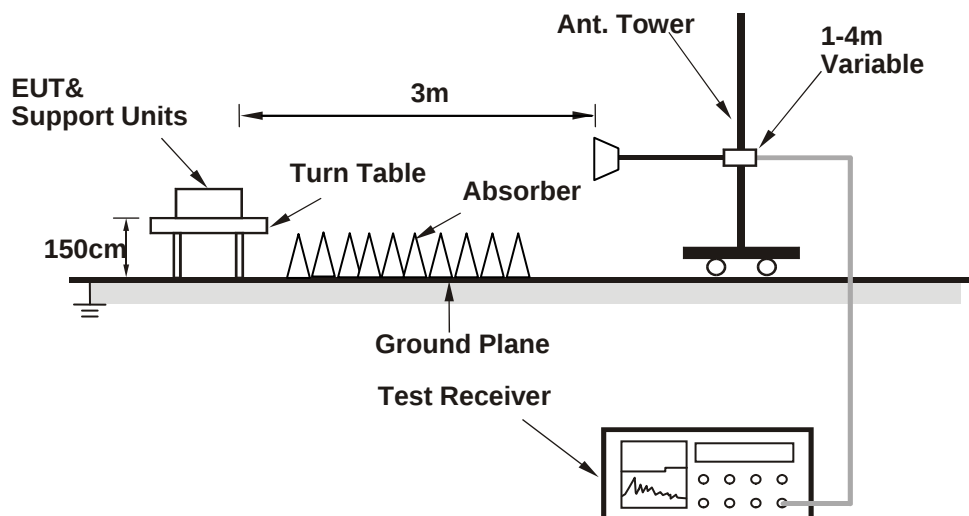
No deviation.

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 Conditions

1. Placed the EUT on testing table.
2. Connect the EUT with the support unit B (Notebook Computer) which is placed in a remote area.
3. The communication partner run test program "DutApiMimoBtFmBridgeEth.exe[ver.2.0.0.43]" to enable EUT under transmission/receiving condition continuously at specific channel frequency.

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	67.5 PK	74.0	-6.5	1.38 H	341	61.03	6.47
2	5150.00	51.1 AV	54.0	-2.9	1.38 H	341	44.63	6.47
3	*5180.00	110.1 PK			1.38 H	341	103.45	6.65
4	*5180.00	101.2 AV			1.38 H	341	94.55	6.65
5	#10360.00	53.8 PK	74.0	-20.2	1.40 H	141	39.59	14.21
6	#10360.00	42.0 AV	54.0	-12.0	1.40 H	141	27.79	14.21
7	15540.00	59.0 PK	74.0	-15.0	1.48 H	160	40.24	18.76
8	15540.00	47.4 AV	54.0	-6.6	1.48 H	160	28.64	18.76

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	5150.00	58.4 PK	74.0	-15.6	1.27 V	360	51.93	6.47
2	5150.00	44.0 AV	54.0	-10.0	1.27 V	360	37.53	6.47
3	*5180.00	105.5 PK			1.27 V	360	98.85	6.65
4	*5180.00	96.5 AV			1.27 V	360	89.85	6.65
5	#10360.00	54.8 PK	74.0	-19.2	1.68 V	206	40.59	14.21
6	#10360.00	42.4 AV	54.0	-11.6	1.68 V	206	28.19	14.21
7	15540.00	59.2 PK	74.0	-14.8	1.88 V	135	40.44	18.76
8	15540.00	47.3 AV	54.0	-6.7	1.88 V	135	28.54	18.76

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	110.7 PK			1.51 H	340	103.93	6.77
2	*5200.00	101.1 AV			1.51 H	340	94.33	6.77
3	#10400.00	53.5 PK	74.0	-20.5	1.41 H	120	39.28	14.22
4	#10400.00	41.5 AV	54.0	-12.5	1.41 H	120	27.28	14.22
5	15600.00	59.3 PK	74.0	-14.7	1.41 H	180	40.96	18.34
6	15600.00	47.6 AV	54.0	-6.4	1.41 H	180	29.26	18.34
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	105.5 PK			1.27 V	360	98.73	6.77
2	*5200.00	96.7 AV			1.27 V	360	89.93	6.77
3	#10400.00	54.8 PK	74.0	-19.2	1.69 V	207	40.58	14.22
4	#10400.00	42.4 AV	54.0	-11.6	1.69 V	207	28.18	14.22
5	15600.00	59.9 PK	74.0	-14.1	1.89 V	138	41.56	18.34
6	15600.00	47.9 AV	54.0	-6.1	1.89 V	138	29.56	18.34

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	111.8 PK			1.50 H	342	104.98	6.82
2	*5240.00	101.3 AV			1.50 H	342	94.48	6.82
3	5350.00	52.1 PK	74.0	-21.9	1.50 H	342	45.06	7.04
4	5350.00	39.3 AV	54.0	-14.7	1.50 H	342	32.26	7.04
5	#10480.00	53.6 PK	74.0	-20.4	1.43 H	129	39.61	13.99
6	#10480.00	41.8 AV	54.0	-12.2	1.43 H	129	27.81	13.99
7	15720.00	58.9 PK	74.0	-15.1	1.44 H	169	39.87	19.03
8	15720.00	47.4 AV	54.0	-6.6	1.44 H	169	28.37	19.03
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	105.1 PK			1.32 V	360	98.28	6.82
2	*5240.00	96.2 AV			1.32 V	360	89.38	6.82
3	#10480.00	54.5 PK	74.0	-19.5	1.66 V	192	40.51	13.99
4	#10480.00	42.0 AV	54.0	-12.0	1.66 V	192	28.01	13.99
5	15720.00	59.6 PK	74.0	-14.4	1.86 V	144	40.57	19.03
6	15720.00	47.6 AV	54.0	-6.4	1.86 V	144	28.57	19.03

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	1.13 H	333	56.92	7.38
2	#5715.00	49.0 AV	54.0	-5.0	1.13 H	333	41.62	7.38
3	#5725.00	73.2 PK	78.2	-5.0	1.13 H	333	65.82	7.38
4	*5745.00	110.4 PK			1.13 H	333	103.02	7.38
5	*5745.00	100.5 AV			1.13 H	333	93.12	7.38
6	11490.00	53.7 PK	74.0	-20.3	1.37 H	139	39.18	14.52
7	11490.00	42.0 AV	54.0	-12.0	1.37 H	139	27.48	14.52
8	#17235.00	59.4 PK	74.0	-14.6	1.46 H	161	35.64	23.76
9	#17235.00	47.8 AV	54.0	-6.2	1.46 H	161	24.04	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	#5715.00	62.5 PK	74.0	-11.5	1.05 V	16	55.12	7.38
2	#5715.00	45.1 AV	54.0	-8.9	1.05 V	16	37.72	7.38
3	#5725.00	70.6 PK	78.2	-7.6	1.05 V	16	63.22	7.38
4	*5745.00	106.7 PK			1.05 V	16	99.32	7.38
5	*5745.00	97.6 AV			1.05 V	16	90.22	7.38
6	11490.00	54.2 PK	74.0	-19.8	1.62 V	190	39.68	14.52
7	11490.00	41.6 AV	54.0	-12.4	1.62 V	190	27.08	14.52
8	#17235.00	59.5 PK	74.0	-14.5	1.92 V	151	35.74	23.76
9	#17235.00	47.3 AV	54.0	-6.7	1.92 V	151	23.54	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.

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	110.1 PK			1.12 H	333	102.72	7.38
2	*5785.00	100.5 AV			1.12 H	333	93.12	7.38
3	11570.00	53.8 PK	74.0	-20.2	1.46 H	120	39.23	14.57
4	11570.00	42.0 AV	54.0	-12.0	1.46 H	120	27.43	14.57
5	#17355.00	58.7 PK	74.0	-15.3	1.41 H	160	34.64	24.06
6	#17355.00	47.1 AV	54.0	-6.9	1.41 H	160	23.04	24.06
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	105.3 PK			1.26 V	360	97.92	7.38
2	*5785.00	96.4 AV			1.26 V	360	89.02	7.38
3	11570.00	54.7 PK	74.0	-19.3	1.74 V	212	40.13	14.57
4	11570.00	42.4 AV	54.0	-11.6	1.74 V	212	27.83	14.57
5	#17355.00	60.1 PK	74.0	-13.9	1.89 V	137	36.04	24.06
6	#17355.00	48.4 AV	54.0	-5.6	1.89 V	137	24.34	24.06

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	109.3 PK			1.18 H	333	101.99	7.31
2	*5825.00	100.1 AV			1.18 H	333	92.79	7.31
3	#5850.00	67.4 PK	78.2	-10.8	1.18 H	333	60.15	7.25
4	#5860.00	61.6 PK	74.0	-12.4	1.18 H	333	54.38	7.22
5	#5860.00	45.2 AV	54.0	-8.8	1.18 H	333	37.98	7.22
6	11650.00	53.4 PK	74.0	-20.6	1.43 H	117	38.73	14.67
7	11650.00	41.4 AV	54.0	-12.6	1.43 H	117	26.73	14.67
8	#17475.00	58.8 PK	74.0	-15.2	1.50 H	177	34.78	24.02
9	#17475.00	47.2 AV	54.0	-6.8	1.50 H	177	23.18	24.02

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	105.8 PK			1.33 V	360	98.49	7.31
2	*5825.00	96.9 AV			1.33 V	360	89.59	7.31
3	#5850.00	65.2 PK	78.2	-13.0	1.33 V	360	57.95	7.25
4	#5860.00	59.4 PK	74.0	-14.6	1.33 V	360	52.18	7.22
5	#5860.00	41.3 AV	54.0	-12.7	1.33 V	360	34.08	7.22
6	11650.00	54.0 PK	74.0	-20.0	1.73 V	198	39.33	14.67
7	11650.00	41.9 AV	54.0	-12.1	1.73 V	198	27.23	14.67
8	#17475.00	60.0 PK	74.0	-14.0	1.88 V	125	35.98	24.02
9	#17475.00	47.8 AV	54.0	-6.2	1.88 V	125	23.78	24.02

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	5150.00	67.3 PK	74.0	-6.7	1.40 H	349	60.83	6.47
2	5150.00	50.6 AV	54.0	-3.4	1.40 H	349	44.13	6.47
3	*5180.00	110.0 PK			1.40 H	349	103.35	6.65
4	*5180.00	100.8 AV			1.40 H	349	94.15	6.65
5	#10360.00	53.9 PK	74.0	-20.1	1.45 H	135	39.69	14.21
6	#10360.00	42.4 AV	54.0	-11.6	1.45 H	135	28.19	14.21
7	15540.00	58.4 PK	74.0	-15.6	1.52 H	163	39.64	18.76
8	15540.00	47.0 AV	54.0	-7.0	1.52 H	163	28.24	18.76
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	5150.00	58.6 PK	74.0	-15.4	1.23 V	360	52.13	6.47
2	5150.00	44.2 AV	54.0	-9.8	1.23 V	360	37.73	6.47
3	*5180.00	105.5 PK			1.23 V	360	98.85	6.65
4	*5180.00	96.4 AV			1.23 V	360	89.75	6.65
5	#10360.00	55.1 PK	74.0	-18.9	1.64 V	193	40.89	14.21
6	#10360.00	42.6 AV	54.0	-11.4	1.64 V	193	28.39	14.21
7	15540.00	59.3 PK	74.0	-14.7	1.86 V	135	40.54	18.76
8	15540.00	47.4 AV	54.0	-6.6	1.86 V	135	28.64	18.76

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.

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	110.3 PK			1.35 H	360	103.53	6.77
2	*5200.00	100.8 AV			1.35 H	360	94.03	6.77
3	#10400.00	53.5 PK	74.0	-20.5	1.41 H	139	39.28	14.22
4	#10400.00	42.0 AV	54.0	-12.0	1.41 H	139	27.78	14.22
5	15600.00	58.7 PK	74.0	-15.3	1.50 H	162	40.36	18.34
6	15600.00	47.4 AV	54.0	-6.6	1.50 H	162	29.06	18.34
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	105.3 PK			1.19 V	360	98.53	6.77
2	*5200.00	96.0 AV			1.19 V	360	89.23	6.77
3	#10400.00	55.4 PK	74.0	-18.6	1.69 V	178	41.18	14.22
4	#10400.00	42.7 AV	54.0	-11.3	1.69 V	178	28.48	14.22
5	15600.00	59.3 PK	74.0	-14.7	1.91 V	138	40.96	18.34
6	15600.00	47.6 AV	54.0	-6.4	1.91 V	138	29.26	18.34

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	110.0 PK			1.44 H	357	103.18	6.82
2	*5240.00	100.8 AV			1.44 H	357	93.98	6.82
3	5350.00	51.9 PK	74.0	-22.1	1.44 H	357	44.86	7.04
4	5350.00	39.0 AV	54.0	-15.0	1.44 H	357	31.96	7.04
5	#10480.00	54.7 PK	74.0	-19.3	1.49 H	122	40.71	13.99
6	#10480.00	42.9 AV	54.0	-11.1	1.49 H	122	28.91	13.99
7	15720.00	58.0 PK	74.0	-16.0	1.57 H	148	38.97	19.03
8	15720.00	46.7 AV	54.0	-7.3	1.57 H	148	27.67	19.03
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	105.6 PK			1.24 V	360	98.78	6.82
2	*5240.00	96.5 AV			1.24 V	360	89.68	6.82
3	5350.00	59.5 PK	74.0	-14.5	1.24 V	360	52.46	7.04
4	5350.00	47.4 AV	54.0	-6.6	1.24 V	360	40.36	7.04
5	#10480.00	54.6 PK	74.0	-19.4	1.65 V	179	40.61	13.99
6	#10480.00	42.3 AV	54.0	-11.7	1.65 V	179	28.31	13.99
7	15720.00	59.3 PK	74.0	-14.7	1.90 V	138	40.27	19.03
8	15720.00	47.4 AV	54.0	-6.6	1.90 V	138	28.37	19.03

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	1.17 H	319	56.92	7.38
2	#5715.00	48.7 AV	54.0	-5.3	1.17 H	319	41.32	7.38
3	#5725.00	73.4 PK	78.2	-4.8	1.17 H	319	66.02	7.38
4	*5745.00	110.8 PK			1.17 H	319	103.42	7.38
5	*5745.00	100.9 AV			1.17 H	319	93.52	7.38
6	11490.00	53.4 PK	74.0	-20.6	1.41 H	153	38.88	14.52
7	11490.00	41.6 AV	54.0	-12.4	1.41 H	153	27.08	14.52
8	#17235.00	59.3 PK	74.0	-14.7	1.49 H	149	35.54	23.76
9	#17235.00	47.5 AV	54.0	-6.5	1.49 H	149	23.74	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	#5715.00	62.2 PK	74.0	-11.8	1.05 V	12	54.82	7.38
2	#5715.00	44.7 AV	54.0	-9.3	1.05 V	12	37.32	7.38
3	#5725.00	70.1 PK	78.2	-8.1	1.11 V	11	62.72	7.38
4	*5745.00	106.8 PK			1.03 V	9	99.42	7.38
5	*5745.00	97.4 AV			1.03 V	9	90.02	7.38
6	11490.00	53.9 PK	74.0	-20.1	1.68 V	202	39.38	14.52
7	11490.00	41.3 AV	54.0	-12.7	1.68 V	202	26.78	14.52
8	#17235.00	59.1 PK	74.0	-14.9	1.86 V	155	35.34	23.76
9	#17235.00	46.9 AV	54.0	-7.1	1.86 V	155	23.14	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.

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	111.1 PK			1.16 H	306	103.72	7.38
2	*5785.00	101.2 AV			1.16 H	306	93.82	7.38
3	11570.00	53.4 PK	74.0	-20.6	1.35 H	153	38.83	14.57
4	11570.00	41.5 AV	54.0	-12.5	1.35 H	153	26.93	14.57
5	#17355.00	59.1 PK	74.0	-14.9	1.53 H	162	35.04	24.06
6	#17355.00	47.3 AV	54.0	-6.7	1.53 H	162	23.24	24.06
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	107.0 PK			1.00 V	11	99.62	7.38
2	*5785.00	97.8 AV			1.00 V	11	90.42	7.38
3	11570.00	54.0 PK	74.0	-20.0	1.66 V	211	39.43	14.57
4	11570.00	41.4 AV	54.0	-12.6	1.66 V	211	26.83	14.57
5	#17355.00	59.0 PK	74.0	-15.0	1.91 V	160	34.94	24.06
6	#17355.00	46.8 AV	54.0	-7.2	1.91 V	160	22.74	24.06

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	110.7 PK			1.21 H	323	103.39	7.31
2	*5825.00	100.8 AV			1.21 H	323	93.49	7.31
3	#5850.00	67.8 PK	78.2	-10.4	1.21 H	323	60.55	7.25
4	#5860.00	61.0 PK	74.0	-13.0	1.21 H	323	53.78	7.22
5	#5860.00	44.7 AV	54.0	-9.3	1.21 H	323	37.48	7.22
6	11650.00	53.1 PK	74.0	-20.9	1.43 H	157	38.43	14.67
7	11650.00	41.3 AV	54.0	-12.7	1.43 H	157	26.63	14.67
8	#17475.00	59.1 PK	74.0	-14.9	1.48 H	165	35.08	24.02
9	#17475.00	47.6 AV	54.0	-6.4	1.48 H	165	23.58	24.02
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	107.3 PK			1.05 V	21	99.99	7.31
2	*5825.00	97.7 AV			1.05 V	21	90.39	7.31
3	#5850.00	64.7 PK	78.2	-13.5	1.05 V	21	57.45	7.25
4	#5860.00	59.3 PK	74.0	-14.7	1.05 V	21	52.08	7.22
5	#5860.00	41.3 AV	54.0	-12.7	1.05 V	21	34.08	7.22
6	11650.00	53.6 PK	74.0	-20.4	1.64 V	198	38.93	14.67
7	11650.00	40.9 AV	54.0	-13.1	1.64 V	198	26.23	14.67
8	#17475.00	58.9 PK	74.0	-15.1	1.91 V	169	34.88	24.02
9	#17475.00	46.6 AV	54.0	-7.4	1.91 V	169	22.58	24.02

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	65.1 PK	74.0	-8.9	1.16 H	336	58.63	6.47
2	5150.00	53.4 AV	54.0	-0.6	1.16 H	336	46.93	6.47
3	*5190.00	102.6 PK			1.16 H	336	95.90	6.70
4	*5190.00	92.7 AV			1.16 H	336	86.00	6.70
5	5350.00	52.3 PK	74.0	-21.7	1.16 H	336	45.26	7.04
6	5350.00	40.1 AV	54.0	-13.9	1.16 H	336	33.06	7.04
7	#10380.00	51.4 PK	74.0	-22.6	1.47 H	141	37.19	14.21
8	#10380.00	40.0 AV	54.0	-14.0	1.47 H	141	25.79	14.21
9	15570.00	57.5 PK	74.0	-16.5	1.47 H	177	38.95	18.55
10	15570.00	46.1 AV	54.0	-7.9	1.47 H	177	27.55	18.55
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.4 PK	74.0	-11.6	1.05 V	22	55.93	6.47
2	5150.00	51.4 AV	54.0	-2.6	1.05 V	22	44.93	6.47
3	*5190.00	99.2 PK			1.05 V	22	92.50	6.70
4	*5190.00	89.4 AV			1.05 V	22	82.70	6.70
5	5350.00	51.2 PK	74.0	-22.8	1.05 V	22	44.16	7.04
6	5350.00	39.4 AV	54.0	-14.6	1.05 V	22	32.36	7.04
7	#10380.00	51.3 PK	74.0	-22.7	1.64 V	213	37.09	14.21
8	#10380.00	40.4 AV	54.0	-13.6	1.64 V	213	26.19	14.21
9	15570.00	56.4 PK	74.0	-17.6	1.91 V	159	37.85	18.55
10	15570.00	45.2 AV	54.0	-8.8	1.91 V	159	26.65	18.55

REMARKS:

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

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	105.8 PK			1.33 H	336	98.99	6.81
2	*5230.00	96.0 AV			1.33 H	336	89.19	6.81
3	5350.00	53.2 PK	74.0	-20.8	1.33 H	336	46.16	7.04
4	5350.00	40.3 AV	54.0	-13.7	1.33 H	336	33.26	7.04
5	#10460.00	51.6 PK	74.0	-22.4	1.52 H	133	37.55	14.05
6	#10460.00	40.4 AV	54.0	-13.6	1.52 H	133	26.35	14.05
7	15690.00	57.8 PK	74.0	-16.2	1.50 H	185	38.93	18.87
8	15690.00	46.4 AV	54.0	-7.6	1.50 H	185	27.53	18.87
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	102.4 PK			1.04 V	11	95.59	6.81
2	*5230.00	93.4 AV			1.04 V	11	86.59	6.81
3	5350.00	51.2 PK	74.0	-22.8	1.04 V	11	44.16	7.04
4	5350.00	38.4 AV	54.0	-15.6	1.04 V	11	31.36	7.04
5	#10460.00	51.5 PK	74.0	-22.5	1.61 V	228	37.45	14.05
6	#10460.00	40.3 AV	54.0	-13.7	1.61 V	228	26.25	14.05
7	15690.00	56.4 PK	74.0	-17.6	1.89 V	146	37.53	18.87
8	15690.00	45.5 AV	54.0	-8.5	1.89 V	146	26.63	18.87

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	66.6 PK	74.0	-7.4	1.46 H	323	59.22	7.38
2	#5715.00	53.1 AV	54.0	-0.9	1.46 H	323	45.72	7.38
3	#5725.00	70.1 PK	78.2	-8.1	1.46 H	323	62.72	7.38
4	*5755.00	102.6 PK			1.46 H	323	95.22	7.38
5	*5755.00	93.3 AV			1.46 H	323	85.92	7.38
6	11510.00	51.4 PK	74.0	-22.6	1.46 H	135	36.90	14.50
7	11510.00	39.8 AV	54.0	-14.2	1.46 H	135	25.30	14.50
8	#17265.00	57.7 PK	74.0	-16.3	1.41 H	168	34.18	23.52
9	#17265.00	46.2 AV	54.0	-7.8	1.41 H	168	22.68	23.52

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	#5715.00	63.2 PK	74.0	-10.8	1.00 V	56	55.82	7.38
2	#5715.00	50.4 AV	54.0	-3.6	1.00 V	56	43.02	7.38
3	#5725.00	67.0 PK	78.2	-11.2	1.00 V	56	59.62	7.38
4	*5755.00	99.3 PK			1.00 V	56	91.92	7.38
5	*5755.00	90.4 AV			1.00 V	56	83.02	7.38
6	11510.00	51.9 PK	74.0	-22.1	1.68 V	227	37.40	14.50
7	11510.00	40.8 AV	54.0	-13.2	1.68 V	227	26.30	14.50
8	#17265.00	56.7 PK	74.0	-17.3	1.88 V	166	33.18	23.52
9	#17265.00	45.3 AV	54.0	-8.7	1.88 V	166	21.78	23.52

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.

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	105.8 PK			1.64 H	323	98.42	7.38
2	*5795.00	94.8 AV			1.64 H	323	87.42	7.38
3	#5850.00	66.5 PK	78.2	-11.7	1.64 H	323	59.25	7.25
4	#5860.00	61.7 PK	74.0	-12.3	1.64 H	323	54.48	7.22
5	#5860.00	48.1 AV	54.0	-5.9	1.64 H	323	40.88	7.22
6	11590.00	51.1 PK	74.0	-22.9	1.52 H	145	36.49	14.61
7	11590.00	39.9 AV	54.0	-14.1	1.52 H	145	25.29	14.61
8	#17385.00	57.6 PK	74.0	-16.4	1.43 H	177	33.11	24.49
9	#17385.00	46.0 AV	54.0	-8.0	1.43 H	177	21.51	24.49
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	102.4 PK			1.05 V	62	95.02	7.38
2	*5795.00	91.4 AV			1.05 V	62	84.02	7.38
3	#5850.00	63.2 PK	78.2	-15.0	1.05 V	62	55.95	7.25
4	#5860.00	58.3 PK	74.0	-15.7	1.05 V	62	51.08	7.22
5	#5860.00	46.2 AV	54.0	-7.8	1.05 V	62	38.98	7.22
6	11590.00	50.7 PK	74.0	-23.3	1.60 V	221	36.09	14.61
7	11590.00	40.1 AV	54.0	-13.9	1.60 V	221	25.49	14.61
8	#17385.00	55.8 PK	74.0	-18.2	1.86 V	173	31.31	24.49
9	#17385.00	44.7 AV	54.0	-9.3	1.86 V	173	20.21	24.49

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	69.4 PK	74.0	-4.6	1.53 H	342	62.93	6.47
2	5150.00	53.8 AV	54.0	-0.2	1.53 H	342	47.33	6.47
3	*5210.00	99.4 PK			1.53 H	342	92.62	6.78
4	*5210.00	88.5 AV			1.53 H	342	81.72	6.78
5	5350.00	54.2 PK	74.0	-19.8	1.53 H	342	47.16	7.04
6	5350.00	39.3 AV	54.0	-14.7	1.53 H	342	32.26	7.04
7	#10420.00	51.8 PK	74.0	-22.2	1.50 H	155	37.65	14.15
8	#10420.00	40.2 AV	54.0	-13.8	1.50 H	155	26.05	14.15
9	15630.00	57.3 PK	74.0	-16.7	1.44 H	179	38.78	18.52
10	15630.00	46.1 AV	54.0	-7.9	1.44 H	179	27.58	18.52
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	66.9 PK	74.0	-7.1	1.01 V	68	60.43	6.47
2	5150.00	50.6 AV	54.0	-3.4	1.01 V	68	44.13	6.47
3	*5210.00	96.4 PK			1.01 V	68	89.62	6.78
4	*5210.00	85.6 AV			1.01 V	68	78.82	6.78
5	5350.00	51.6 PK	74.0	-22.4	1.01 V	68	44.56	7.04
6	5350.00	38.4 AV	54.0	-15.6	1.01 V	68	31.36	7.04
7	#10420.00	50.9 PK	74.0	-23.1	1.67 V	226	36.75	14.15
8	#10420.00	40.3 AV	54.0	-13.7	1.67 V	226	26.15	14.15
9	15630.00	56.8 PK	74.0	-17.2	1.86 V	174	38.28	18.52
10	15630.00	45.7 AV	54.0	-8.3	1.86 V	174	27.18	18.52

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.

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	67.7 PK	74.0	-6.3	1.26 H	323	60.32	7.38
2	#5715.00	53.5 AV	54.0	-0.5	1.26 H	323	46.12	7.38
3	#5725.00	64.5 PK	78.2	-13.7	1.26 H	323	57.12	7.38
4	*5775.00	98.6 PK			1.26 H	323	91.22	7.38
5	*5775.00	87.9 AV			1.26 H	323	80.52	7.38
6	#5850.00	68.5 PK	78.2	-9.7	1.26 H	323	61.25	7.25
7	#5860.00	62.6 PK	74.0	-11.4	1.26 H	323	55.38	7.22
8	#5860.00	50.6 AV	54.0	-3.4	1.26 H	323	43.38	7.22
9	11550.00	51.6 PK	74.0	-22.4	1.41 H	133	37.05	14.55
10	11550.00	40.1 AV	54.0	-13.9	1.41 H	133	25.55	14.55
11	#17325.00	57.0 PK	74.0	-17.0	1.51 H	189	33.38	23.62
12	#17325.00	45.7 AV	54.0	-8.3	1.51 H	189	22.08	23.62

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	64.5 PK	74.0	-9.5	1.09 V	52	57.12	7.38
2	#5715.00	50.4 AV	54.0	-3.6	1.09 V	52	43.02	7.38
3	#5725.00	61.5 PK	78.2	-16.7	1.09 V	52	54.12	7.38
4	*5775.00	95.4 PK			1.09 V	52	88.02	7.38
5	*5775.00	84.6 AV			1.09 V	52	77.22	7.38
6	#5850.00	65.4 PK	78.2	-12.8	1.09 V	52	58.15	7.25
7	#5860.00	59.4 PK	74.0	-14.6	1.09 V	52	52.18	7.22
8	#5860.00	47.7 AV	54.0	-6.3	1.09 V	52	40.48	7.22
9	11550.00	50.7 PK	74.0	-23.3	1.70 V	220	36.15	14.55
10	11550.00	39.9 AV	54.0	-14.1	1.70 V	220	25.35	14.55
11	#17325.00	56.1 PK	74.0	-17.9	1.86 V	158	32.48	23.62
12	#17325.00	45.1 AV	54.0	-8.9	1.86 V	158	21.48	23.62

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

802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	166.11	39.1 QP	43.5	-4.4	1.34 H	201	52.61	-13.50
2	431.11	42.0 QP	46.0	-4.0	1.64 H	78	50.66	-8.65
3	576.11	42.5 QP	46.0	-3.5	1.47 H	67	48.26	-5.75
4	768.11	41.4 QP	46.0	-4.6	1.64 H	175	43.07	-1.65
5	815.71	42.1 QP	46.0	-3.9	1.64 H	174	43.29	-1.17
6	864.11	42.5 QP	46.0	-3.5	1.67 H	301	43.13	-0.62
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	60.41	34.2 QP	40.0	-5.8	1.24 V	201	48.39	-14.18
2	312.01	37.2 QP	46.0	-8.8	1.24 V	301	49.19	-11.98
3	432.21	41.4 QP	46.0	-4.6	1.24 V	77	50.01	-8.60
4	527.71	39.0 QP	46.0	-7.0	1.11 V	241	45.81	-6.80
5	647.71	36.0 QP	46.0	-10.0	1.88 V	301	40.10	-4.09
6	935.71	42.2 QP	46.0	-3.8	1.45 V	211	41.35	0.86

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Transmit Power Measurement

4.2.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 D01 Multiple Transmitter Output v02r01 Method of conducted output power measurement on IEEE 802.11 devices,

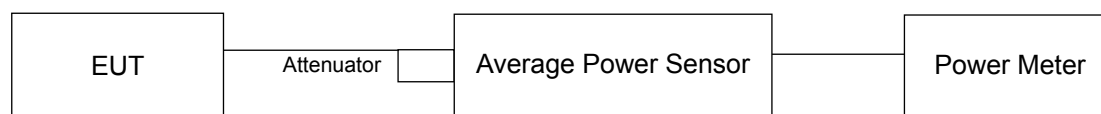
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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 Procedures

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 Conditions

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 Results

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	15.32	15.67	70.939	18.51	24	Pass
40	5200	15.40	15.52	70.319	18.47	24	Pass
48	5240	15.17	15.02	64.654	18.11	24	Pass
149	5745	14.38	14.56	55.992	17.48	30	Pass
157	5785	14.13	14.39	53.361	17.27	30	Pass
165	5825	14.07	13.87	49.905	16.98	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	15.34	15.51	69.761	18.44	24	Pass
40	5200	15.22	15.42	68.1	18.33	24	Pass
48	5240	15.25	14.98	64.974	18.13	24	Pass
149	5745	14.35	14.83	57.636	17.61	30	Pass
157	5785	14.14	14.64	55.049	17.41	30	Pass
165	5825	14.02	13.97	50.181	17.01	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	12.41	12.22	34.09	15.33	24	Pass
46	5230	14.78	14.60	58.901	17.70	24	Pass
151	5755	12.19	12.27	33.424	15.24	30	Pass
159	5795	13.36	13.78	45.555	16.59	30	Pass

802.11ac (VHT80)

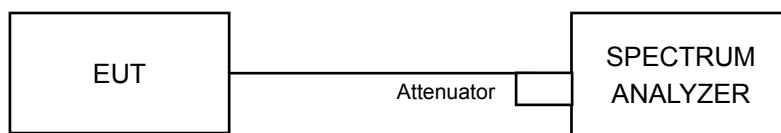
Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	11.33	11.04	26.289	14.20	24	Pass
155	5775	10.63	10.22	22.081	13.44	30	Pass

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 Procedures

For U-NII-1

Using method SA-1

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value

For U-NII-3:

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
- Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
- 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 $BWCF = 10\log(500\text{ kHz}/300\text{ kHz})$
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

Same as Item 4.2.6.

4.3.7 Test Results

For U-NII-1:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
36	5180	0.34	-1.08	2.70	8.83	Pass
40	5200	-0.49	0.04	2.79	8.83	Pass
48	5240	0.10	0.76	3.45	8.83	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.17-6) = 8.83\text{dBm}$.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
36	5180	1.07	0.95	4.02	8.83	Pass
40	5200	-0.82	-1.56	1.84	8.83	Pass
48	5240	-0.08	0.56	3.26	8.83	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.17-6) = 8.83\text{dBm}$.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
38	5190	-10.83	-5.05	-4.03	8.83	Pass
46	5230	-3.00	-4.86	-0.82	8.83	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.17-6) = 8.83\text{dBm}$.

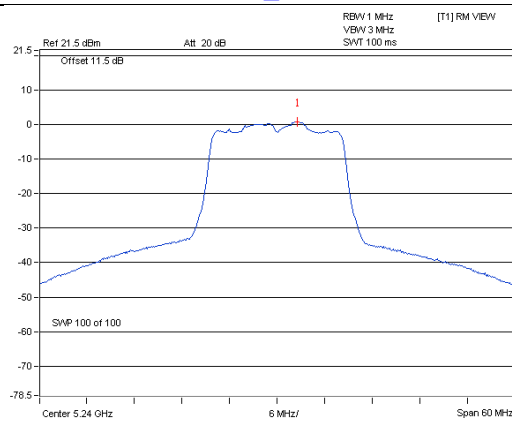
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
42	5210	-11.17	-10.99	-8.07	8.83	Pass

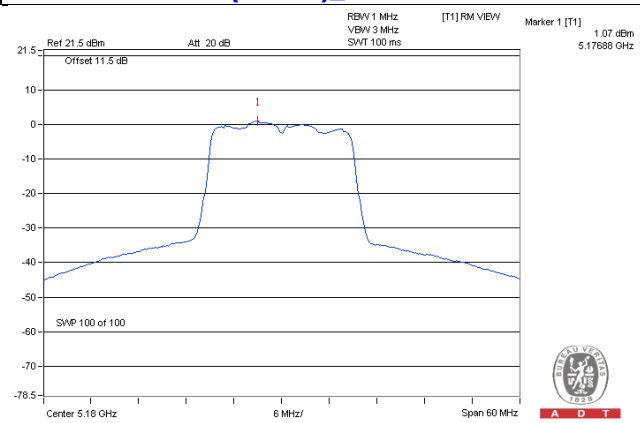
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.17-6) = 8.83\text{dBm}$.

Spectrum Plot of Worst Value

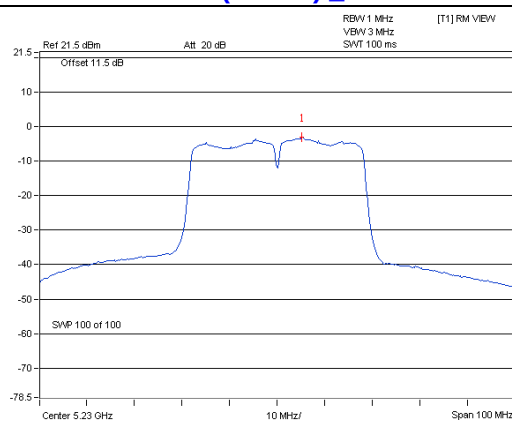
802.11a_Chain 1 / CH48



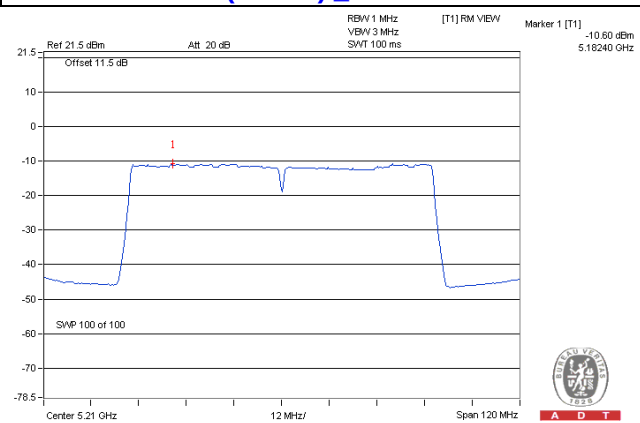
802.11ac (VHT20)_Chain 0 / CH36



802.11ac (VHT40)_Chain 0 / CH46



802.11ac (VHT80)_Chain 1 / CH42



For U-NII-3:

802.11a

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-8.68	-6.46	3.01	-3.45	27.83	Pass
	157	5785	-9.97	-7.75	3.01	-4.74	27.83	Pass
	165	5825	-8.99	-6.77	3.01	-3.76	27.83	Pass
1	149	5745	-9.26	-7.04	3.01	-4.03	27.83	Pass
	157	5785	-9.97	-7.75	3.01	-4.74	27.83	Pass
	165	5825	-9.59	-7.37	3.01	-4.36	27.83	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(8.17-6) = 27.83\text{dBm}$.

802.11ac (VHT20)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-9.54	-7.32	3.01	-4.31	27.83	Pass
	157	5785	-9.68	-7.46	3.01	-4.45	27.83	Pass
	165	5825	-9.13	-6.91	3.01	-3.90	27.83	Pass
1	149	5745	-8.75	-6.53	3.01	-3.52	27.83	Pass
	157	5785	-9.66	-7.44	3.01	-4.43	27.83	Pass
	165	5825	-9.25	-7.03	3.01	-4.02	27.83	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(8.17-6) = 27.83\text{dBm}$.

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	151	5755	-15.28	-13.06	3.01	-10.05	27.83	Pass
	159	5795	-13.88	-11.66	3.01	-8.65	27.83	Pass
1	151	5755	-15.07	-12.85	3.01	-9.84	27.83	Pass
	159	5795	-13.57	-11.35	3.01	-8.34	27.83	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(8.17-6) = 27.83\text{dBm}$.

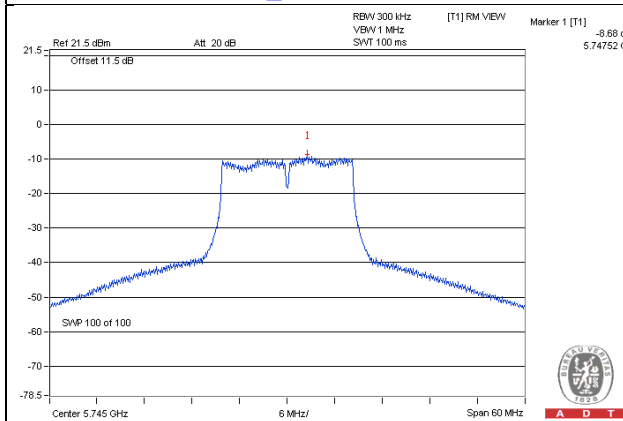
802.11ac (VHT80)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	155	5775	-19.18	-16.96	3.01	-13.95	27.83	Pass
1	155	5775	-19.10	-16.88	3.01	-13.87	27.83	Pass

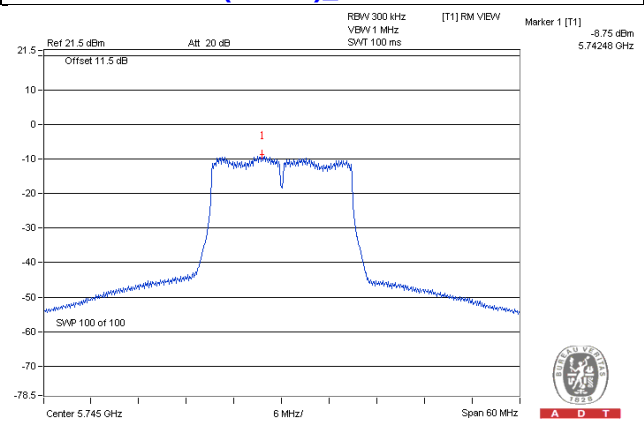
Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(8.17-6) = 27.83\text{dBm}$.

Spectrum Plot of Worst Value

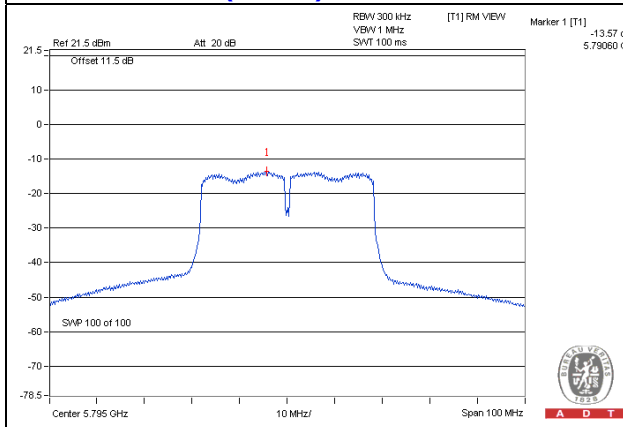
802.11a_Chain 0 / CH149



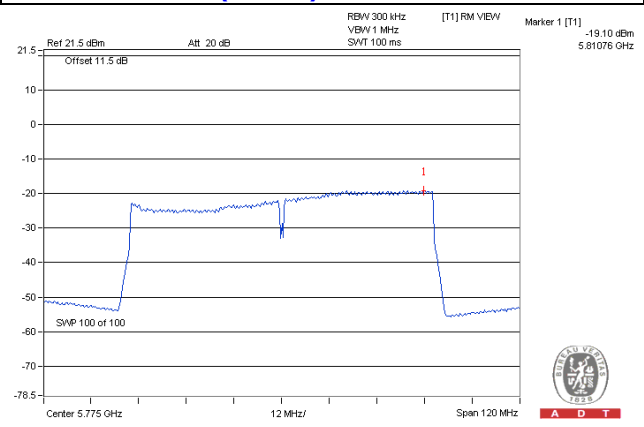
802.11ac (VHT20)_Chain 1 / CH149



802.11ac (VHT40)_Chain 1 / CH159



802.11ac (VHT40)_Chain 1 / CH155

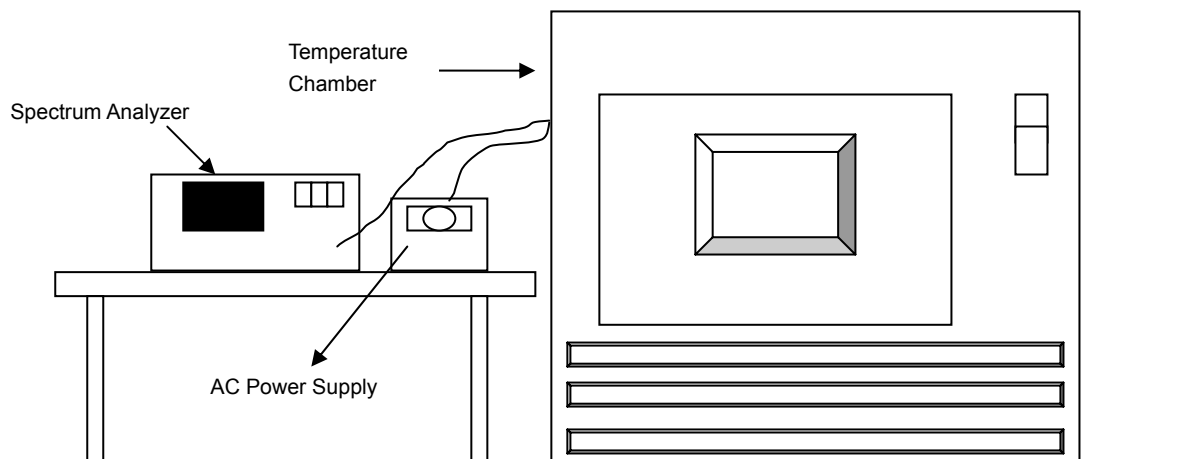


4.4 Frequency Stability Measurement

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 Procedures

- 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 Conditions

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	5180.0129	0.00025	5180.0177	0.00034	5180.013	0.00025	5180.0174	0.00034
40	120	5180.0166	0.00032	5180.0158	0.00031	5180.0147	0.00028	5180.0182	0.00035
30	120	5180.0239	0.00046	5180.0256	0.00049	5180.0271	0.00052	5180.0245	0.00047
20	120	5179.9914	-0.00017	5179.9933	-0.00013	5179.9898	-0.00020	5179.9904	-0.00019
10	120	5179.9967	-0.00006	5179.994	-0.00012	5179.9937	-0.00012	5179.992	-0.00015
0	120	5179.9989	-0.00002	5179.9957	-0.00008	5179.9986	-0.00003	5179.9944	-0.00011
-10	120	5179.9817	-0.00035	5179.9822	-0.00034	5179.9791	-0.00040	5179.9787	-0.00041
-20	120	5179.9978	-0.00004	5179.9945	-0.00011	5179.9946	-0.00010	5179.9946	-0.00010
-30	120	5180.0125	0.00024	5180.0096	0.00019	5180.0097	0.00019	5180.0074	0.00014

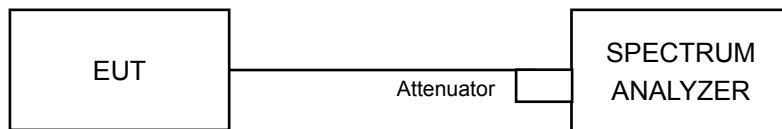
Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9915	-0.00016	5179.9925	-0.00014	5179.99	-0.00019	5179.991	-0.00017
	120	5179.9914	-0.00017	5179.9933	-0.00013	5179.9898	-0.00020	5179.9904	-0.00019
	102	5179.9916	-0.00016	5179.9923	-0.00015	5179.9896	-0.00020	5179.991	-0.00017

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 Procedures

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 Conditions

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	16.58	16.63	0.5	Pass
157	5785	16.59	16.58	0.5	Pass
165	5825	16.61	16.59	0.5	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.76	17.72	0.5	Pass
157	5785	17.79	17.75	0.5	Pass
165	5825	17.74	17.72	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.52	36.53	0.5	Pass
159	5795	36.53	36.53	0.5	Pass

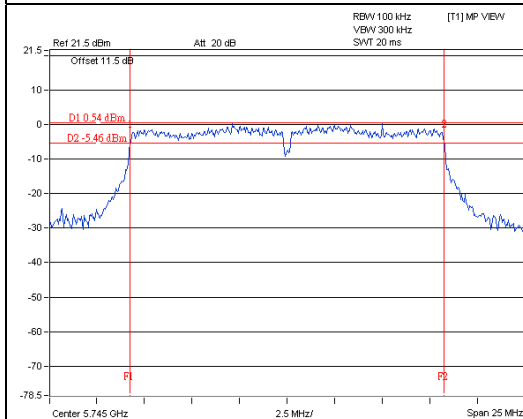
802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.65	76.59	0.5	Pass

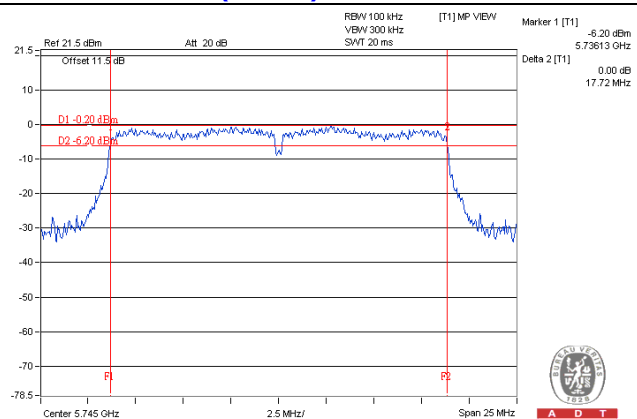
Spectrum Plot of Worst Value

802.11a_Chain 0 / CH149

802.11ac (VHT20)_Chain 1 / CH149



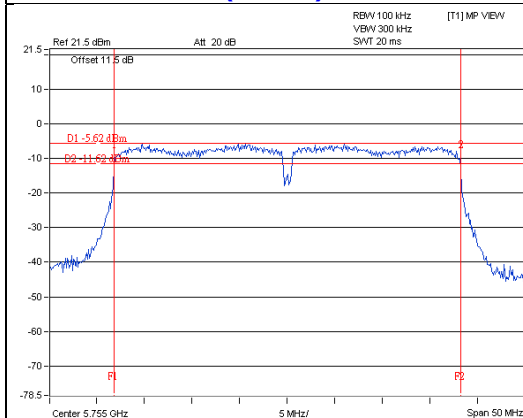
A D T



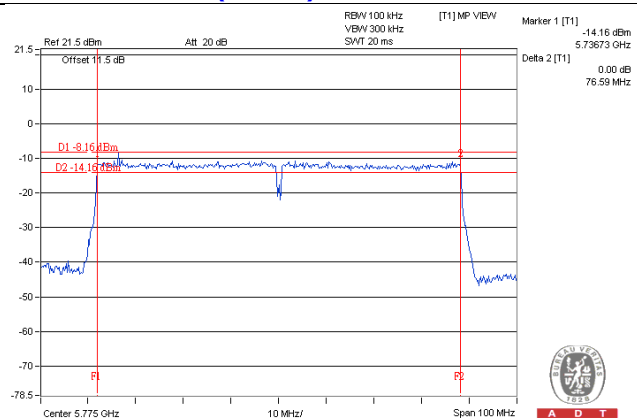
A D T

802.11ac (VHT40)_Chain 0 / CH151

802.11ac (VHT80)_Chain 1 / CH155



A D T



A D T

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: www.bureauveritas-adt.com

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

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