

FCC Test Report

Report No.: RF150820E01A-2

FCC ID: 2AD8UFZPFWFE01

Test Model: FWFE

Series Model: FWF1

Received Date: Aug. 20, 2015

Test Date: Sep. 24 to Oct. 20, 2015

Issued Date: Jan. 15, 2016

Applicant: Nokia Solutions and Networks

Address: 1455 West Shure Drive, Arlington Heights, IL 60004, USA

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

Lab Address: No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin
Chu Hsien 307, Taiwan R.O.C.

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

Test Location (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin
Chu Hsien 307, Taiwan R.O.C.

Test Location (3): E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan R.O.C.



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Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT (WLAN, 15.407 <DFS band>).....	7
3.2 Description of Test Modes	9
3.2.1 Test Mode Applicability and Tested Channel Detail.....	10
3.3 Duty Cycle of Test Signal	12
3.4 Description of Support Units	13
3.4.1 Configuration of System under Test	14
3.5 General Description of Applied Standard.....	16
4 Test Types and Results	17
4.1 Radiated Emission and Bandedge Measurement.....	17
4.1.1 Limits of Radiated Emission and Bandedge Measurement	17
4.1.2 Test Instruments	18
4.1.3 Test Procedure	20
4.1.4 Deviation from Test Standard	20
4.1.5 Test Setup.....	21
4.1.6 EUT Operating Condition	22
4.1.7 Test Results (Mode 1).....	23
4.1.8 Test Results (Mode 2).....	45
4.2 Conducted Emission Measurement	46
4.2.1 Limits of Conducted Emission Measurement	46
4.2.2 Test Instruments	46
4.2.3 Test Procedure	47
4.2.4 Deviation from Test Standard	47
4.2.5 Test Setup.....	47
4.2.6 EUT Operating Condition	47
4.2.7 Test Results (Mode 1).....	48
4.2.8 Test Results (Mode 2).....	50
4.3 Transmit Power Measurement	52
4.3.1 Limits of Transmit Power Measurement	52
4.3.2 Test Setup.....	53
4.3.3 Test Instruments	53
4.3.4 Test Procedure	53
4.3.5 Deviation from Test Standard	53
4.3.6 EUT Operating Condition	53
4.3.7 Test Result.....	54
4.4 Peak Power Spectral Density Measurement	59
4.4.1 Limits of Peak Power Spectral Density Measurement	59
4.4.2 Test Setup.....	59
4.4.3 Test Instruments	59
4.4.4 Test Procedure	59
4.4.5 Deviation from Test Standard	59
4.4.6 EUT Operating Condition	59
4.4.7 Test Results	60
4.5 Frequency Stability Measurement	63
4.5.1 Limits of Frequency Stability Measurement	63
4.5.2 Test Setup.....	63
4.5.3 Test Instruments	63
4.5.4 Test Procedure	63



4.5.5	Deviation from Test Standard	63
4.5.6	EUT Operating Condition	63
4.5.7	Test Results	64
4.6	Occupied Bandwidth Measurement	65
4.6.1	Test Setup	65
4.6.2	Test Instruments	65
4.6.3	Test Procedure	65
4.6.4	Deviation from Test Standard	65
4.6.5	EUT Operating Conditions.....	65
4.6.6	Test Results	66
4.7	26dB Bandwidth Measurement.....	68
4.7.1	Test Setup.....	68
4.7.2	Test Instruments	68
4.7.3	Test Procedure	68
4.7.4	Deviation from Test Standard	68
4.7.5	EUT Operating Condition	68
4.7.6	Test Results	69
5	Pictures of Test Arrangements.....	71
	Appendix – Information on the Testing Laboratories	72



A D T

Release Control Record

Issue No.	Description	Date Issued
RF150820E01A-2	Original release.	Jan. 15, 2016




1 Certificate of Conformity

Product: Flexi Zone Indoor Pico BTS
Brand: Nokia
Test Model: FWFE
Series Model: FWFI
Sample Status: MASS-PRODUCTION
Applicant: Nokia Solutions and Networks
Test Date: Sep. 24 to Oct. 20, 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:** Jan. 15, 2016
Lori Chung / Specialist

Approved by :  , **Date:** Jan. 15, 2016
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)				
FCC Clause	FCC KDB 789033	Test Item	Result	Remarks
15.407(b)(6)	-	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -5.31dB at 5.50781MHz.
15.407(b)(1/2/3/4/6)	Section G	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 5350.00MHz.
15.407(b)(1/2/3/4/6)	Section G	Conducted Emissions	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Section E.3	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Section F	Peak Power Spectral Density	PASS	Meet the requirement of limit.
-	Section D	Occupied Bandwidth Measurement	PASS	Meet the requirement.
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: This report is prepared for FCC Class II permissive change. (Add DFS band <5250~5350MHz & 5470~5725MHz>).

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) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.31 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 (WLAN, 15.407 <DFS band>)

Product	Flexi Zone Indoor Pico BTS
Brand	Nokia
Test Model	FWFE
Series Model	FWFI
Test Sample S/N	EA152410016
Hardware Version	473236A .101; 473771A.101
Status of EUT	MASS-PRODUCTION
Power Supply Rating	12Vdc from power adapter or 55Vdc from POE
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	5.26 ~ 5.32GHz, 5.5 ~ 5.58GHz & 5.66GHz ~ 5.70GHz
Number of Channel	12 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 5 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
Output Power	802.11a: 249.768mW 802.11ac (VHT20): 244.778mW 802.11ac (VHT40): 250.344mW 802.11ac (VHT80): 110.5mW
Antenna Type	Refer to note as below
Antenna Connector	Refer to note as below
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

- This report is prepared for FCC Class II permissive change. This report is used in conjunction with report No: RF150820E01-2 and adds the following additional information:
 - ◆ Add DFS band <5250~5350MHz & 5470~5725MHz>
- According to above condition, all test items need to be performed. And all data were verified to meet the requirements.
- There are WLAN, BT, WWAN and GPS technology used for the EUT.
- The EUT's spec. as below table:

Model name	Hardware Version	WWAN			Wi-Fi	BT	GPS	Different
		UL	Freq.(MHz)	Band				
FWFE	473236A .101	UL	1932.4~1987.6	2	✓	✓	✓	For marketing requirement
		DL	1852.4-1907.6					
FWFI	473771A.101	UL	1932.4~1987.6	2	✓	✓	✓	For marketing requirement
		DL	1852.4-1907.6					

From the above models, model: FWFE was selected as representative model for the test and its data was recorded in this report.

- The emission of the simultaneous operation (WLAN, BT & WWAN) has been evaluated and no non-compliance was found.

6. The EUT must be supplied with a POE(option) or power adapter as following table:

Power adapter		
Brand	Model No.	Spec.
DVE	DSA-60PFB-12 1 120500	Input: 100-240V, 2.0A, 50/60Hz AC input cable(1.8m, unshielded) Output: 12V, 5A DC output cable(1.2m, unshielded, with one core)

7. The EUT was pre-tested under following test modes :

Test Mode	Description
Mode A	With POE
Mode B	With adapter

For the above modes, the worst radiated emission (above 1GHz) test was found in **Mode A**. Therefore only the test data of the modes were recorded in this report.

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

WLAN Antenna Spec.							
Antenna No	Brand	Model	Antenna Type	Antenna Connector	Gain(dBi) <Including cable loss>	Cable Length (mm)	Frequency (MHz)
Internal WIFI (Main)	TongDa	T-543-8141037-3	PIFA	i-pex(MHF)	3.3	90	2412~2472
					2.4		5150~5825
Internal WIFI (Aux)	TongDa	T-543-8141037-4	PIFA	i-pex(MHF)	3	70	2412~2472
					2.9		5150~5825

9. The EUT incorporates a MIMO function.

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)

10. 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 5260 ~ 5320MHz

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

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n (40MHz), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

FOR 5500 ~ 5700MHz

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	116	5580 MHz
104	5520 MHz	132	5660 MHz
108	5540 MHz	136	5680 MHz
112	5560 MHz	140	5700 MHz

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	134	5670 MHz
110	5550 MHz		

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
106	5530MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	With POE
2	-	√	√	-	With adapter

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.

2. This device can be installed in different orientations (wall mounted or tabletop), so had been investigated two different orientations. The worst case was found when positioned on X-plane (for below 1GHz) and Y-plane (for above 1GHz)

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.

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
	802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
	802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
	802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
	802.11a	5500-5580, 5600-5700	100 to 116, 132 to 140	100, 116, 132, 140	OFDM	BPSK	6
	802.11ac (VHT20)		100 to 116, 132 to 140	100, 116, 132, 140	OFDM	BPSK	6.5
	802.11ac (VHT40)		102 to 110, 134	102, 110, 134	OFDM	BPSK	13.5
	802.11ac (VHT80)		106	106	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.

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11ac (VHT40)	5260-5320	54 to 62	54	OFDM	BPSK	13.5
2	802.11ac (VHT40)	5260-5320	54 to 62	54	OFDM	BPSK	13.5

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.

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11ac (VHT40)	5260-5320	54 to 62	54	OFDM	BPSK	13.5
2	802.11ac (VHT40)	5260-5320	54 to 62	54	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
	802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
	802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
	802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
	802.11a	5500-5580, 5600-5700	100 to 116, 132 to 140	100, 116, 132, 140	OFDM	BPSK	6
	802.11ac (VHT20)		100 to 116, 132 to 140	100, 116, 132, 140	OFDM	BPSK	6.5
	802.11ac (VHT40)		102 to 110, 134	102, 110, 134	OFDM	BPSK	13.5
	802.11ac (VHT80)		106	106	OFDM	BPSK	29.3

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE \geq 1G	23deg. C, 70%RH	120Vac, 60Hz	Andy Ho
RE $<$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Weiwei Lo
PLC	26deg. C, 66%RH 25deg. C, 60%RH	120Vac, 60Hz	Timmy Hu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

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

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

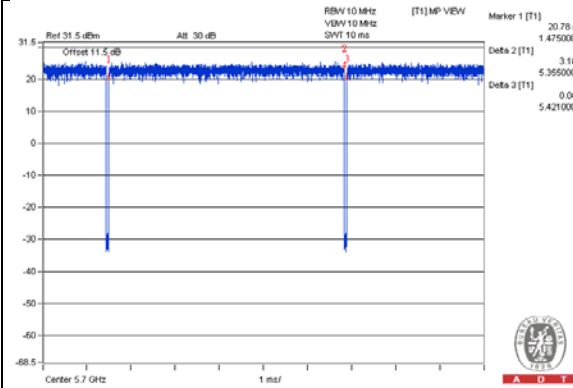
802.11a: Duty cycle = $5.355 \text{ ms} / 5.421 \text{ ms} = 0.988$

802.11ac (VHT20): Duty cycle = $4.959 \text{ ms} / 5.022 \text{ ms} = 0.987$

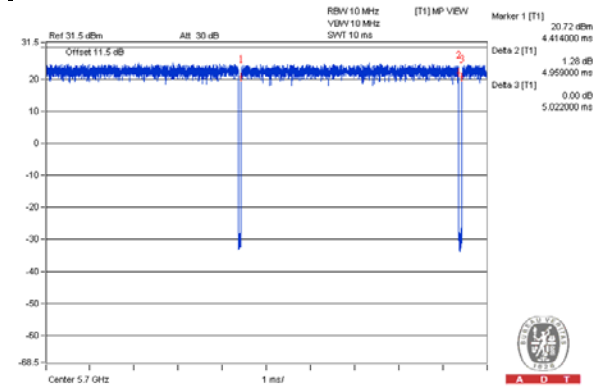
802.11ac (VHT40): Duty cycle = $2.426 \text{ ms} / 2.467 \text{ ms} = 0.983$

802.11ac (VHT80): Duty cycle = $1.134 \text{ ms} / 1.214 \text{ ms} = 0.934$, Duty factor = $10 * \log(1/0.934) = 0.30$

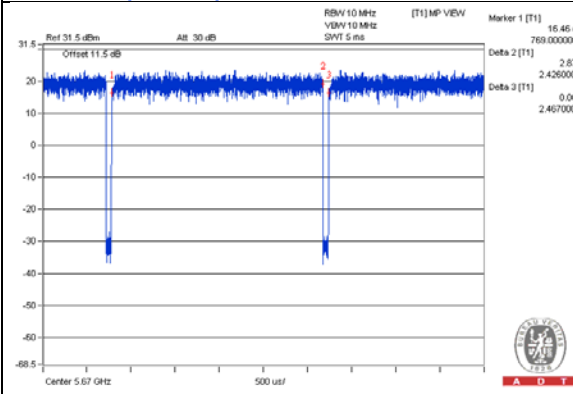
802.11a



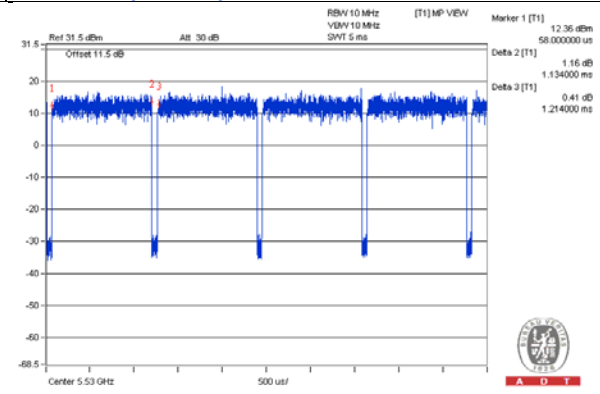
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
C	NOTEBOOK COMPUTER	DELL	PP27L	7YLB32S	FCC DoC	Provided by Lab
D	POE ADAPTER	NA	TR60A-POE-L	NA	NA	Provided by Lab

NOTE:

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

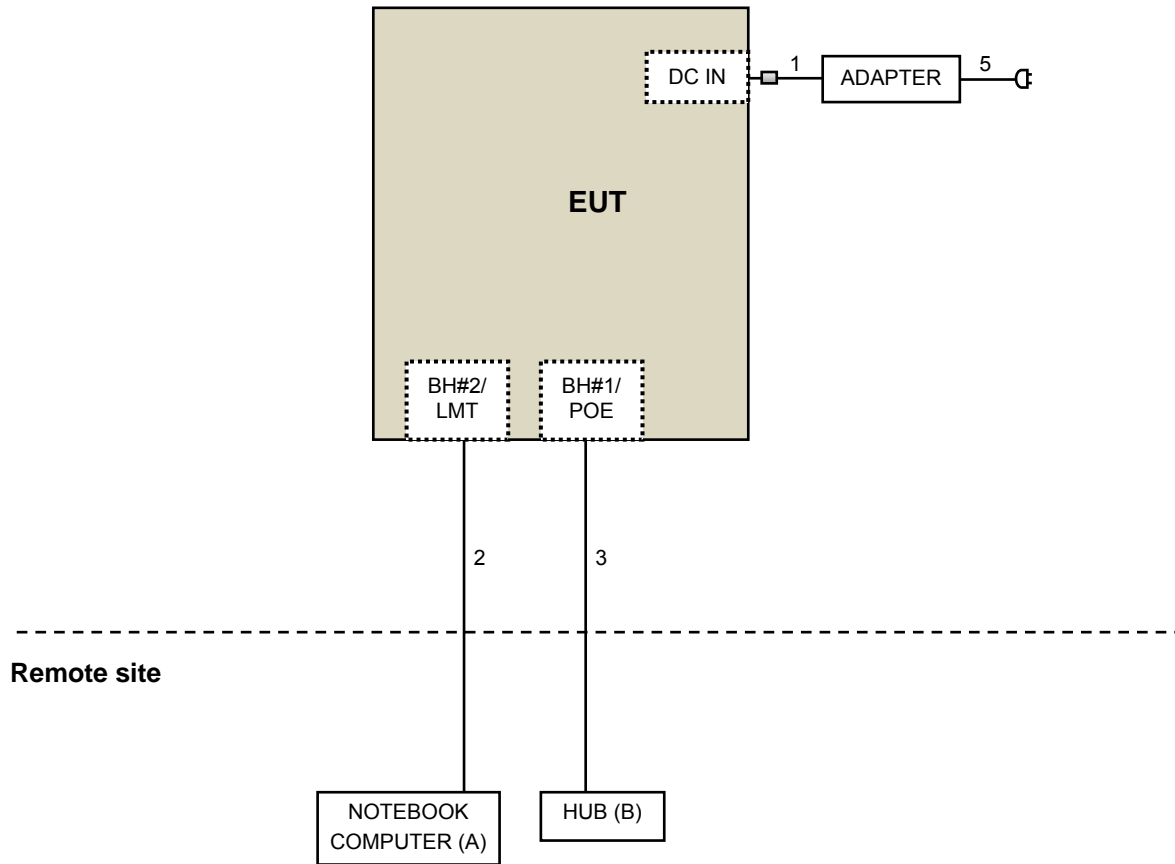
No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC	1	1.2	No	1	Supplied by Client
2	RJ-45	1	10	No	0	Provided by Lab
3	RJ-45	1	10	No	0	Provided by Lab
4	RJ-45	1	3	No	0	Provided by Lab
5	AC	1	1.8	No	0	Supplied by Client

NOTE:

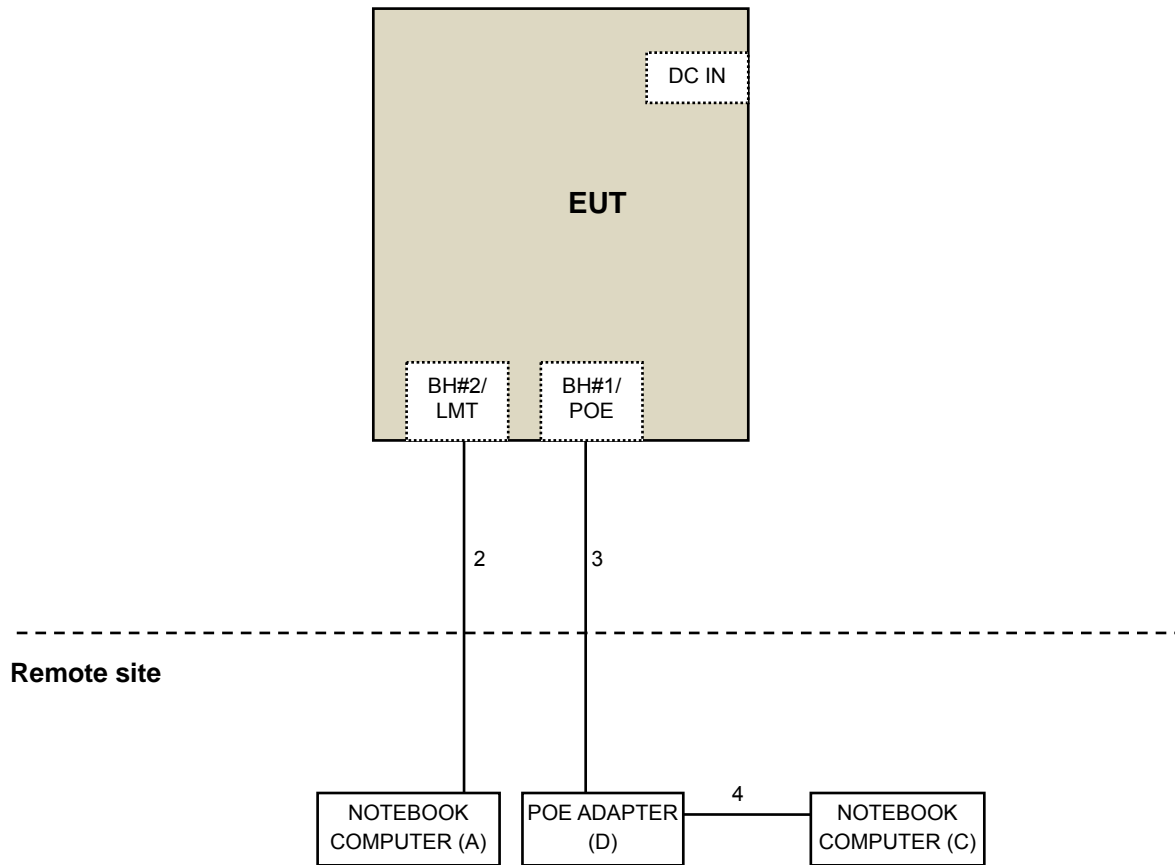
1. The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

For Adapter mode:



For POE mode:



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)

KDB 789033 D02 General UNII Test Procedures New Rules v01r01

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedure New Rules v01	FIELD STRENGTH AT 3m	
	PK:74 (dBuV/m)	AV:54 (dBuV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBuV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2}	PK: 68.2(dBuV/m) ^{*1} PK:78.2 (dBuV/m) ^{*2}

NOTE: ^{*1} beyond 10MHz of the band edge ^{*2} within 10 MHz of band edge

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$



4.1.2 Test Instruments

For Below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 13, 2014	Jan. 12, 2016
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-00 1 LOOPCAB-00 2	Jan. 18, 2015	Jan. 17, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-07	May 08, 2015	May 07, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	138	Feb. 03, 2015	Feb. 02, 2016
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 03, 2015	Apr. 02, 2016
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 3.
5. The FCC Site Registration No. is 147459
- 6 The CANADA Site Registration No. is 20331-1
- 7 Tested Date: Sep. 24, 2015

For Other test items:

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	June 26, 2015	June 25, 2016
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Power Meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power Sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016
Spectrum Analyzer R&S	FSP40	100060	May 08, 2015	May 07, 2016
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-S P-AR	MAA0812-008	Jan. 12, 2015	Jan. 11, 2016

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. H.
3. The FCC Site Registration No. is 797305.
4. The CANADA Site Registration No. is IC 7450H-3.
5. Tested Date: Oct. 20, 2015

4.1.3 Test Procedure

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

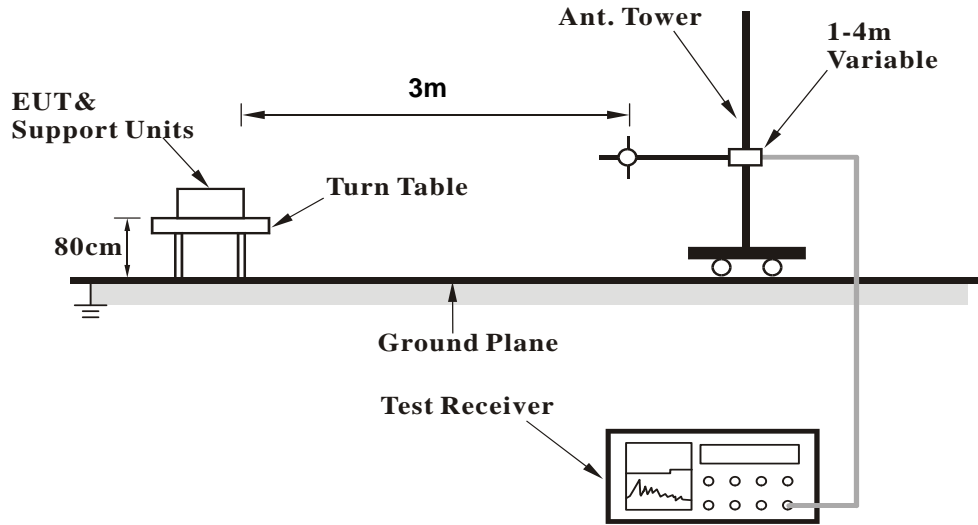
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

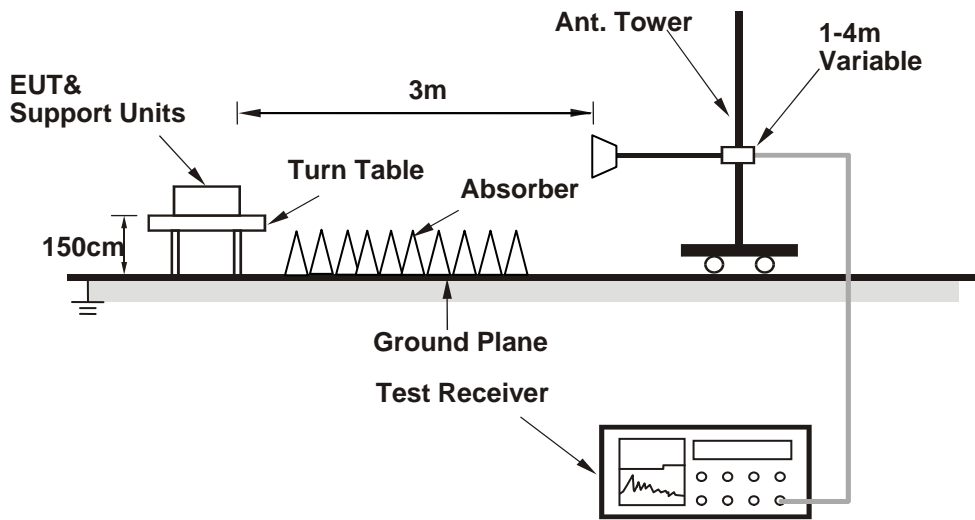
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Condition

For adapter mode:

1. Connect the EUT with the support unit A (Notebook Computer) which is placed in remote site.
2. The communication partner run test program “Cart type command [Cart command_(FZI).txt]” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

For POE mode:

1. Connect the EUT with the support units A & C (Notebook Computer) which is placed in remote site.
2. The communication partner run test program “Cart type command [Cart command_(FZI).txt]” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 Test Results (Mode 1)
Above 1GHz Data:
802.11a

CHANNEL	TX Channel 52	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	50.9 PK	74.0	-23.1	1.45 H	360	40.93	9.97
2	5150.00	40.4 AV	54.0	-13.6	1.45 H	360	30.43	9.97
3	*5260.00	112.6 PK			1.45 H	360	102.24	10.36
4	*5260.00	101.2 AV			1.45 H	360	90.84	10.36
5	#10520.00	57.9 PK	74.0	-16.1	1.53 H	335	41.18	16.72
6	#10520.00	44.1 AV	54.0	-9.9	1.53 H	335	27.38	16.72
7	15780.00	67.4 PK	74.0	-6.6	1.71 H	53	44.53	22.87
8	15780.00	51.8 AV	54.0	-2.2	1.71 H	53	28.93	22.87

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	5150.00	44.3 PK	74.0	-29.7	1.59 V	22	34.33	9.97
2	5150.00	36.4 AV	54.0	-17.6	1.59 V	22	26.43	9.97
3	*5260.00	106.9 PK			1.59 V	27	96.54	10.36
4	*5260.00	96.4 AV			1.59 V	27	86.04	10.36
5	#10520.00	55.0 PK	74.0	-19.0	2.50 V	320	38.28	16.72
6	#10520.00	41.2 AV	54.0	-12.8	2.50 V	320	24.48	16.72
7	15780.00	59.6 PK	74.0	-14.4	1.69 V	360	36.73	22.87
8	15780.00	47.2 AV	54.0	-6.8	1.69 V	360	24.33	22.87

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 60	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	*5300.00	112.2 PK			1.54 H	5	101.77	10.43
2	*5300.00	101.4 AV			1.54 H	5	90.97	10.43
3	10600.00	58.0 PK	74.0	-16.0	1.37 H	341	41.02	16.98
4	10600.00	46.1 AV	54.0	-7.9	1.37 H	341	29.12	16.98
5	15900.00	67.4 PK	74.0	-6.6	1.71 H	325	44.59	22.81
6	15900.00	52.1 AV	54.0	-1.9	1.71 H	325	29.29	22.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	106.6 PK			1.56 V	13	96.17	10.43
2	*5300.00	96.3 AV			1.56 V	13	85.87	10.43
3	10600.00	54.6 PK	74.0	-19.4	2.46 V	318	37.62	16.98
4	10600.00	40.8 AV	54.0	-13.2	2.46 V	318	23.82	16.98
5	15900.00	60.5 PK	74.0	-13.5	1.66 V	360	37.69	22.81
6	15900.00	48.4 AV	54.0	-5.6	1.66 V	360	25.59	22.81

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.

CHANNEL	TX Channel 64	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	*5320.00	111.7 PK			1.50 H	3	101.22	10.48
2	*5320.00	101.3 AV			1.50 H	3	90.82	10.48
3	5350.00	62.1 PK	74.0	-11.9	1.50 H	3	51.55	10.55
4	5350.00	48.3 AV	54.0	-5.7	1.50 H	3	37.75	10.55
5	10640.00	58.6 PK	74.0	-15.4	1.40 H	341	41.54	17.06
6	10640.00	46.8 AV	54.0	-7.2	1.40 H	341	29.74	17.06
7	15960.00	67.8 PK	74.0	-6.2	1.73 H	327	45.07	22.73
8	15960.00	52.0 AV	54.0	-2.0	1.73 H	327	29.27	22.73

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	*5320.00	104.0 PK			1.52 V	12	93.52	10.48
2	*5320.00	93.8 AV			1.52 V	12	83.32	10.48
3	5350.00	60.4 PK	74.0	-13.6	1.52 V	12	49.85	10.55
4	5350.00	46.8 AV	54.0	-7.2	1.52 V	12	36.25	10.55
5	10640.00	54.9 PK	74.0	-19.1	2.52 V	312	37.84	17.06
6	10640.00	41.2 AV	54.0	-12.8	2.52 V	312	24.14	17.06
7	15960.00	58.7 PK	74.0	-15.3	1.66 V	360	35.97	22.73
8	15960.00	46.6 AV	54.0	-7.4	1.66 V	360	23.87	22.73

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.

CHANNEL	TX Channel 100	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	#5470.00	56.8 PK	74.0	-17.2	2.11 H	91	45.88	10.92
2	#5470.00	45.4 AV	54.0	-8.6	2.11 H	91	34.48	10.92
3	*5500.00	111.3 PK			2.11 H	91	100.28	11.02
4	*5500.00	100.3 AV			2.11 H	91	89.28	11.02
5	11000.00	59.4 PK	74.0	-14.6	2.31 H	67	41.69	17.71
6	11000.00	46.9 AV	54.0	-7.1	2.31 H	67	29.19	17.71
7	#16500.00	67.6 PK	74.0	-6.4	1.53 H	304	43.25	24.35
8	#16500.00	52.4 AV	54.0	-1.6	1.53 H	304	28.05	24.35

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	#5470.00	54.6 PK	74.0	-19.4	1.54 V	14	43.68	10.92
2	#5470.00	43.5 AV	54.0	-10.5	1.54 V	14	32.58	10.92
3	*5500.00	104.4 PK			1.54 V	14	93.38	11.02
4	*5500.00	94.3 AV			1.54 V	14	83.28	11.02
5	11000.00	55.3 PK	74.0	-18.7	1.50 V	346	37.59	17.71
6	11000.00	41.4 AV	54.0	-12.6	1.50 V	346	23.69	17.71
7	#16500.00	58.5 PK	74.0	-15.5	1.62 V	360	34.15	24.35
8	#16500.00	46.7 AV	54.0	-7.3	1.62 V	360	22.35	24.35

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 116	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	*5580.00	114.3 PK			2.07 H	88	103.24	11.06
2	*5580.00	101.4 AV			2.07 H	88	90.34	11.06
3	11160.00	59.3 PK	74.0	-14.7	2.42 H	65	41.47	17.83
4	11160.00	46.5 AV	54.0	-7.5	2.42 H	65	28.67	17.83
5	#16740.00	66.9 PK	74.0	-7.1	1.53 H	297	41.61	25.29
6	#16740.00	52.0 AV	54.0	-2.0	1.53 H	297	26.71	25.29

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	*5580.00	105.4 PK			1.55 V	17	94.34	11.06
2	*5580.00	95.6 AV			1.55 V	17	84.54	11.06
3	11160.00	56.4 PK	74.0	-17.6	1.46 V	342	38.57	17.83
4	11160.00	42.6 AV	54.0	-11.4	1.46 V	342	24.77	17.83
5	#16740.00	58.6 PK	74.0	-15.4	1.61 V	360	33.31	25.29
6	#16740.00	47.0 AV	54.0	-7.0	1.61 V	360	21.71	25.29

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 132	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	*5660.00	113.1 PK			2.15 H	80	101.78	11.32
2	*5660.00	101.7 AV			2.15 H	80	90.38	11.32
3	11320.00	54.1 PK	74.0	-19.9	1.56 H	37	36.27	17.83
4	11320.00	42.7 AV	54.0	-11.3	1.56 H	37	24.87	17.83
5	#16980.00	67.8 PK	74.0	-6.2	1.58 H	299	41.18	26.62
6	#16980.00	52.6 AV	54.0	-1.4	1.58 H	299	25.98	26.62

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	*5660.00	105.5 PK			1.54 V	7	94.18	11.32
2	*5660.00	95.7 AV			1.54 V	7	84.38	11.32
3	11320.00	56.1 PK	74.0	-17.9	1.40 V	344	38.27	17.83
4	11320.00	42.1 AV	54.0	-11.9	1.40 V	344	24.27	17.83
5	#16980.00	58.8 PK	74.0	-15.2	1.65 V	359	32.18	26.62
6	#16980.00	47.1 AV	54.0	-6.9	1.65 V	359	20.48	26.62

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.

CHANNEL	TX Channel 140	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	*5700.00	113.4 PK			1.53 H	360	101.92	11.48
2	*5700.00	101.8 AV			1.53 H	360	90.32	11.48
3	#5725.00	62.7 PK	74.0	-11.3	1.53 H	360	51.15	11.55
4	#5725.00	48.7 AV	54.0	-5.3	1.53 H	360	37.15	11.55
5	11400.00	58.6 PK	74.0	-15.4	1.35 H	51	40.58	18.02
6	11400.00	43.3 AV	54.0	-10.7	1.35 H	51	25.28	18.02
7	#17100.00	66.4 PK	74.0	-7.6	1.45 H	53	38.78	27.62
8	#17100.00	51.9 AV	54.0	-2.1	1.45 H	53	24.28	27.62

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	*5700.00	105.8 PK			1.56 V	21	94.32	11.48
2	*5700.00	96.0 AV			1.56 V	21	84.52	11.48
3	#5725.00	60.5 PK	74.0	-13.5	1.56 V	21	48.95	11.55
4	#5725.00	46.5 AV	54.0	-7.5	1.56 V	21	34.95	11.55
5	11400.00	56.5 PK	74.0	-17.5	1.51 V	343	38.48	18.02
6	11400.00	42.7 AV	54.0	-11.3	1.51 V	343	24.68	18.02
7	#17100.00	59.4 PK	74.0	-14.6	1.60 V	360	31.78	27.62
8	#17100.00	47.5 AV	54.0	-6.5	1.60 V	360	19.88	27.62

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.

802.11ac (VHT20)

CHANNEL	TX Channel 52	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	53.1 PK	74.0	-20.9	1.46 H	360	43.13	9.97
2	5150.00	41.8 AV	54.0	-12.2	1.46 H	360	31.83	9.97
3	*5260.00	112.4 PK			1.46 H	360	102.04	10.36
4	*5260.00	101.4 AV			1.46 H	360	91.04	10.36
5	#10520.00	55.3 PK	74.0	-18.7	1.08 H	342	38.58	16.72
6	#10520.00	42.2 AV	54.0	-11.8	1.08 H	342	25.48	16.72
7	15780.00	66.5 PK	74.0	-7.5	1.63 H	50	43.63	22.87
8	15780.00	51.4 AV	54.0	-2.6	1.63 H	50	28.53	22.87

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	5150.00	44.3 PK	74.0	-29.7	1.65 V	12	34.33	9.97
2	5150.00	36.3 AV	54.0	-17.7	1.65 V	12	26.33	9.97
3	*5260.00	107.3 PK			1.65 V	12	96.94	10.36
4	*5260.00	96.8 AV			1.65 V	12	86.44	10.36
5	#10520.00	55.3 PK	74.0	-18.7	2.49 V	326	38.58	16.72
6	#10520.00	41.7 AV	54.0	-12.3	2.49 V	326	24.98	16.72
7	15780.00	59.0 PK	74.0	-15.0	1.75 V	360	36.13	22.87
8	15780.00	46.9 AV	54.0	-7.1	1.75 V	360	24.03	22.87

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 60	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	*5300.00	111.1 PK			1.53 H	360	100.67	10.43
2	*5300.00	100.7 AV			1.53 H	360	90.27	10.43
3	10600.00	58.3 PK	74.0	-15.7	1.68 H	89	41.32	16.98
4	10600.00	45.5 AV	54.0	-8.5	1.68 H	89	28.52	16.98
5	15900.00	67.4 PK	74.0	-6.6	1.71 H	54	44.59	22.81
6	15900.00	51.9 AV	54.0	-2.1	1.71 H	54	29.09	22.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	106.8 PK			1.60 V	27	96.37	10.43
2	*5300.00	96.7 AV			1.60 V	27	86.27	10.43
3	10600.00	54.2 PK	74.0	-19.8	2.42 V	322	37.22	16.98
4	10600.00	40.3 AV	54.0	-13.7	2.42 V	322	23.32	16.98
5	15900.00	60.7 PK	74.0	-13.3	1.69 V	360	37.89	22.81
6	15900.00	48.5 AV	54.0	-5.5	1.69 V	360	25.69	22.81

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.

CHANNEL	TX Channel 64	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	*5320.00	111.2 PK			1.47 H	2	100.72	10.48
2	*5320.00	100.6 AV			1.47 H	2	90.12	10.48
3	5350.00	64.0 PK	74.0	-10.0	1.47 H	2	53.45	10.55
4	5350.00	48.9 AV	54.0	-5.1	1.47 H	2	38.35	10.55
5	10640.00	58.4 PK	74.0	-15.6	1.47 H	342	41.34	17.06
6	10640.00	45.2 AV	54.0	-8.8	1.47 H	342	28.14	17.06
7	15960.00	68.6 PK	74.0	-5.4	1.79 H	52	45.87	22.73
8	15960.00	51.7 AV	54.0	-2.3	1.79 H	52	28.97	22.73

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	*5320.00	106.5 PK			1.57 V	24	96.02	10.48
2	*5320.00	96.1 AV			1.57 V	24	85.62	10.48
3	5350.00	62.6 PK	74.0	-11.4	1.57 V	24	52.05	10.55
4	5350.00	46.5 AV	54.0	-7.5	1.57 V	24	35.95	10.55
5	10640.00	53.9 PK	74.0	-20.1	2.50 V	329	36.84	17.06
6	10640.00	40.3 AV	54.0	-13.7	2.50 V	329	23.24	17.06
7	15960.00	60.2 PK	74.0	-13.8	1.69 V	360	37.47	22.73
8	15960.00	48.2 AV	54.0	-5.8	1.69 V	360	25.47	22.73

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.

CHANNEL	TX Channel 100	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	#5470.00	58.1 PK	74.0	-15.9	1.86 H	79	47.18	10.92
2	#5470.00	44.4 AV	54.0	-9.6	1.86 H	79	33.48	10.92
3	*5500.00	112.7 PK			1.87 H	79	101.68	11.02
4	*5500.00	101.1 AV			1.87 H	79	90.08	11.02
5	11000.00	66.5 PK	74.0	-7.5	2.30 H	79	48.79	17.71
6	11000.00	51.4 AV	54.0	-2.6	2.30 H	79	33.69	17.71
7	#16500.00	67.3 PK	74.0	-6.7	1.42 H	71	42.95	24.35
8	#16500.00	51.4 AV	54.0	-2.6	1.42 H	71	27.05	24.35

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	#5470.00	56.4 PK	74.0	-17.6	1.53 V	15	45.48	10.92
2	#5470.00	42.2 AV	54.0	-11.8	1.53 V	15	31.28	10.92
3	*5500.00	107.4 PK			1.53 V	15	96.38	11.02
4	*5500.00	97.2 AV			1.53 V	15	86.18	11.02
5	11000.00	54.2 PK	74.0	-19.8	2.51 V	314	36.49	17.71
6	11000.00	41.2 AV	54.0	-12.8	2.51 V	314	23.49	17.71
7	#16500.00	60.2 PK	74.0	-13.8	1.65 V	360	35.85	24.35
8	#16500.00	47.9 AV	54.0	-6.1	1.65 V	360	23.55	24.35

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 116	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	*5580.00	112.3 PK			2.03 H	80	101.24	11.06
2	*5580.00	102.4 AV			2.03 H	80	91.34	11.06
3	11160.00	61.0 PK	74.0	-13.0	2.43 H	61	43.17	17.83
4	11160.00	47.8 AV	54.0	-6.2	2.43 H	61	29.97	17.83
5	#16740.00	55.0 PK	74.0	-19.0	1.48 H	76	29.71	25.29
6	#16740.00	42.6 AV	54.0	-11.4	1.48 H	76	17.31	25.29

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	*5580.00	108.4 PK			1.50 V	18	97.34	11.06
2	*5580.00	97.6 AV			1.50 V	18	86.54	11.06
3	11160.00	53.7 PK	74.0	-20.3	2.50 V	315	35.87	17.83
4	11160.00	41.0 AV	54.0	-13.0	2.50 V	315	23.17	17.83
5	#16740.00	59.8 PK	74.0	-14.2	1.68 V	360	34.51	25.29
6	#16740.00	47.5 AV	54.0	-6.5	1.68 V	360	22.21	25.29

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 132	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	*5660.00	112.6 PK			2.11 H	79	101.28	11.32
2	*5660.00	102.3 AV			2.11 H	79	90.98	11.32
3	11320.00	54.8 PK	74.0	-19.2	1.53 H	310	36.97	17.83
4	11320.00	42.5 AV	54.0	-11.5	1.53 H	310	24.67	17.83
5	#16980.00	59.7 PK	74.0	-14.3	1.99 H	54	33.08	26.62
6	#16980.00	47.4 AV	54.0	-6.6	1.99 H	54	20.78	26.62

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	*5660.00	107.7 PK			1.53 V	21	96.38	11.32
2	*5660.00	97.4 AV			1.53 V	21	86.08	11.32
3	11320.00	53.6 PK	74.0	-20.4	2.56 V	318	35.77	17.83
4	11320.00	40.8 AV	54.0	-13.2	2.56 V	318	22.97	17.83
5	#16980.00	60.4 PK	74.0	-13.6	1.67 V	360	33.78	26.62
6	#16980.00	48.2 AV	54.0	-5.8	1.67 V	360	21.58	26.62

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.

CHANNEL	TX Channel 140	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	*5700.00	112.6 PK			1.63 H	20	101.12	11.48
2	*5700.00	102.2 AV			1.63 H	20	90.72	11.48
3	#5725.00	70.1 PK	74.0	-3.9	1.63 H	20	58.55	11.55
4	#5725.00	51.5 AV	54.0	-2.5	1.63 H	20	39.95	11.55
5	11400.00	60.4 PK	74.0	-13.6	2.03 H	73	42.38	18.02
6	11400.00	46.5 AV	54.0	-7.5	2.03 H	73	28.48	18.02
7	#17100.00	67.4 PK	74.0	-6.6	1.44 H	58	39.78	27.62
8	#17100.00	51.9 AV	54.0	-2.1	1.44 H	58	24.28	27.62

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	*5700.00	107.9 PK			1.55 V	2	96.42	11.48
2	*5700.00	97.5 AV			1.55 V	2	86.02	11.48
3	#5725.00	68.4 PK	74.0	-5.6	1.55 V	2	56.85	11.55
4	#5725.00	48.6 AV	54.0	-5.4	1.55 V	2	37.05	11.55
5	11400.00	53.7 PK	74.0	-20.3	2.56 V	328	35.68	18.02
6	11400.00	40.8 AV	54.0	-13.2	2.56 V	328	22.78	18.02
7	#17100.00	60.2 PK	74.0	-13.8	1.59 V	360	32.58	27.62
8	#17100.00	48.1 AV	54.0	-5.9	1.59 V	360	20.48	27.62

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.

802.11ac (VHT40)

CHANNEL	TX Channel 54	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	54.1 PK	74.0	-19.9	1.59 H	360	44.13	9.97
2	5150.00	42.9 AV	54.0	-11.1	1.59 H	360	32.93	9.97
3	*5270.00	110.1 PK			1.59 H	360	99.73	10.37
4	*5270.00	98.6 AV			1.59 H	360	88.23	10.37
5	#10540.00	56.7 PK	74.0	-17.3	1.04 H	336	39.93	16.77
6	#10540.00	43.6 AV	54.0	-10.4	1.04 H	336	26.83	16.77
7	15810.00	67.1 PK	74.0	-6.9	1.66 H	51	44.15	22.95
8	15810.00	51.7 AV	54.0	-2.3	1.66 H	51	28.75	22.95

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	52.1 PK	74.0	-21.9	1.54 V	4	42.13	9.97
2	5150.00	40.4 AV	54.0	-13.6	1.54 V	4	30.43	9.97
3	*5270.00	103.1 PK			1.54 V	4	92.73	10.37
4	*5270.00	94.4 AV			1.54 V	4	84.03	10.37
5	#10540.00	54.2 PK	74.0	-19.8	2.57 V	322	37.43	16.77
6	#10540.00	41.2 AV	54.0	-12.8	2.57 V	322	24.43	16.77
7	15810.00	60.5 PK	74.0	-13.5	1.60 V	360	37.55	22.95
8	15810.00	48.2 AV	54.0	-5.8	1.60 V	360	25.25	22.95

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 62	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	*5310.00	109.6 PK			1.57 H	360	99.14	10.46
2	*5310.00	97.8 AV			1.57 H	360	87.34	10.46
3	5350.00	66.5 PK	74.0	-7.5	1.57 H	360	55.95	10.55
4	5350.00	52.6 AV	54.0	-1.4	1.57 H	360	42.05	10.55
5	10620.00	56.1 PK	74.0	-17.9	1.63 H	85	39.07	17.03
6	10620.00	43.3 AV	54.0	-10.7	1.63 H	85	26.27	17.03
7	15930.00	64.1 PK	74.0	-9.9	1.65 H	51	41.33	22.77
8	15930.00	48.4 AV	54.0	-5.6	1.65 H	51	25.63	22.77

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	102.8 PK			1.55 V	12	92.34	10.46
2	*5310.00	94.0 AV			1.55 V	12	83.54	10.46
3	5350.00	52.8 PK	74.0	-21.2	1.52 V	12	42.25	10.55
4	5350.00	40.9 AV	54.0	-13.1	1.52 V	12	30.35	10.55
5	10620.00	53.9 PK	74.0	-20.1	2.61 V	313	36.87	17.03
6	10620.00	41.0 AV	54.0	-13.0	2.61 V	313	23.97	17.03
7	15930.00	60.3 PK	74.0	-13.7	1.60 V	360	37.53	22.77
8	15930.00	48.1 AV	54.0	-5.9	1.60 V	360	25.33	22.77

REMARKS:

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

CHANNEL	TX Channel 102	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	#5470.00	68.1 PK	74.0	-5.9	2.20 H	81	57.18	10.92
2	#5470.00	52.2 AV	54.0	-1.8	2.20 H	81	41.28	10.92
3	*5510.00	108.2 PK			2.20 H	81	97.18	11.02
4	*5510.00	96.9 AV			2.20 H	81	85.88	11.02
5	11020.00	63.0 PK	74.0	-11.0	2.29 H	74	45.27	17.73
6	11020.00	48.8 AV	54.0	-5.2	2.29 H	74	31.07	17.73
7	#16530.00	56.2 PK	74.0	-17.8	1.53 H	76	31.65	24.55
8	#16530.00	41.4 AV	54.0	-12.6	1.53 H	76	16.85	24.55

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	#5470.00	66.4 PK	74.0	-7.6	1.73 V	31	55.48	10.92
2	#5470.00	50.4 AV	54.0	-3.6	1.73 V	31	39.48	10.92
3	*5510.00	102.4 PK			1.73 V	31	91.38	11.02
4	*5510.00	94.3 AV			1.73 V	31	83.28	11.02
5	11020.00	53.5 PK	74.0	-20.5	2.57 V	314	35.77	17.73
6	11020.00	40.5 AV	54.0	-13.5	2.57 V	314	22.77	17.73
7	#16530.00	60.7 PK	74.0	-13.3	1.62 V	360	36.15	24.55
8	#16530.00	48.4 AV	54.0	-5.6	1.62 V	360	23.85	24.55

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 110	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	*5550.00	108.9 PK			1.97 H	74	97.85	11.05
2	*5550.00	96.0 AV			1.97 H	74	84.95	11.05
3	11100.00	60.7 PK	74.0	-13.3	1.97 H	74	42.93	17.77
4	11100.00	47.2 AV	54.0	-6.8	1.97 H	74	29.43	17.77
5	#16650.00	56.4 PK	74.0	-17.6	1.50 H	66	31.29	25.11
6	#16650.00	42.7 AV	54.0	-11.3	1.50 H	66	17.59	25.11

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	*5550.00	102.9 PK			1.69 V	34	91.85	11.05
2	*5550.00	94.6 AV			1.69 V	34	83.55	11.05
3	11100.00	53.1 PK	74.0	-20.9	2.57 V	311	35.33	17.77
4	11100.00	40.3 AV	54.0	-13.7	2.57 V	311	22.53	17.77
5	#16650.00	60.3 PK	74.0	-13.7	1.56 V	360	35.19	25.11
6	#16650.00	48.3 AV	54.0	-5.7	1.56 V	360	23.19	25.11

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.

CHANNEL	TX Channel 134	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	*5670.00	108.0 PK			1.65 H	21	96.65	11.35
2	*5670.00	95.5 AV			1.65 H	21	84.15	11.35
3	#5725.00	58.6 PK	74.0	-15.4	1.65 H	21	47.05	11.55
4	#5725.00	43.4 AV	54.0	-10.6	1.65 H	21	31.85	11.55
5	11340.00	60.8 PK	74.0	-13.2	1.95 H	80	42.92	17.88
6	11340.00	47.2 AV	54.0	-6.8	1.95 H	80	29.32	17.88
7	#17010.00	55.9 PK	74.0	-18.1	1.50 H	53	29.04	26.86
8	#17010.00	42.2 AV	54.0	-11.8	1.50 H	53	15.34	26.86

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	*5670.00	104.3 PK			1.47 V	360	92.95	11.35
2	*5670.00	93.9 AV			1.47 V	360	82.55	11.35
3	#5725.00	55.1 PK	74.0	-18.9	1.47 V	360	43.55	11.55
4	#5725.00	41.9 AV	54.0	-12.1	1.47 V	360	30.35	11.55
5	11340.00	53.6 PK	74.0	-20.4	2.54 V	305	35.72	17.88
6	11340.00	40.5 AV	54.0	-13.5	2.54 V	305	22.62	17.88
7	#17010.00	60.5 PK	74.0	-13.5	1.57 V	360	33.64	26.86
8	#17010.00	48.5 AV	54.0	-5.5	1.57 V	360	21.64	26.86

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

802.11ac (VHT80)

CHANNEL	TX Channel 58	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	66.3 PK	74.0	-7.7	1.59 H	360	56.33	9.97
2	5150.00	52.4 AV	54.0	-1.6	1.59 H	360	42.43	9.97
3	*5290.00	105.3 PK			1.59 H	360	94.88	10.42
4	*5290.00	93.3 AV			1.59 H	360	82.88	10.42
5	5350.00	67.5 PK	74.0	-6.5	1.59 H	360	56.95	10.55
6	5350.00	53.8 AV	54.0	-0.2	1.59 H	360	43.25	10.55
7	#10580.00	63.2 PK	74.0	-10.8	2.29 H	90	46.29	16.91
8	#10580.00	48.9 AV	54.0	-5.1	2.29 H	90	31.99	16.91
9	15870.00	56.2 PK	74.0	-17.8	1.52 H	50	33.35	22.85
10	15870.00	41.0 AV	54.0	-13.0	1.52 H	50	18.15	22.85

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.3 PK	74.0	-9.7	1.46 V	360	54.33	9.97
2	5150.00	50.4 AV	54.0	-3.6	1.46 V	360	40.43	9.97
3	*5290.00	102.4 PK			1.46 V	360	91.98	10.42
4	*5290.00	91.4 AV			1.46 V	360	80.98	10.42
5	5350.00	65.4 PK	74.0	-8.6	1.46 V	360	54.85	10.55
6	5350.00	51.3 AV	54.0	-2.7	1.46 V	360	40.75	10.55
7	#10580.00	53.1 PK	74.0	-20.9	2.54 V	303	36.19	16.91
8	#10580.00	40.3 AV	54.0	-13.7	2.54 V	303	23.39	16.91
9	15870.00	60.8 PK	74.0	-13.2	1.62 V	360	37.95	22.85
10	15870.00	48.7 AV	54.0	-5.3	1.62 V	360	25.85	22.85

REMARKS:

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

CHANNEL	TX Channel 106	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	#5470.00	68.5 PK	74.0	-5.5	1.82 H	81	57.58	10.92
2	#5470.00	53.6 AV	54.0	-0.4	1.82 H	81	42.68	10.92
3	*5530.00	106.9 PK			1.82 H	81	95.87	11.03
4	*5530.00	94.3 AV			1.82 H	81	83.27	11.03
5	#5725.00	67.3 PK	74.0	-6.7	1.82 H	81	55.75	11.55
6	#5725.00	52.6 AV	54.0	-1.4	1.82 H	81	41.05	11.55
7	11060.00	63.5 PK	74.0	-10.5	2.32 H	80	45.75	17.75
8	11060.00	49.1 AV	54.0	-4.9	2.32 H	80	31.35	17.75
9	#16590.00	56.6 PK	74.0	-17.4	1.48 H	64	31.69	24.91
10	#16590.00	41.5 AV	54.0	-12.5	1.48 H	64	16.59	24.91

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	#5470.00	66.5 PK	74.0	-7.5	1.42 V	360	55.58	10.92
2	#5470.00	51.6 AV	54.0	-2.4	1.42 V	360	40.68	10.92
3	*5530.00	103.3 PK			1.42 V	360	92.27	11.03
4	*5530.00	92.4 AV			1.42 V	360	81.37	11.03
5	#5725.00	65.3 PK	74.0	-8.7	1.42 V	360	53.75	11.55
6	#5725.00	50.4 AV	54.0	-3.6	1.42 V	360	38.85	11.55
7	11060.00	53.6 PK	74.0	-20.4	2.56 V	316	35.85	17.75
8	11060.00	40.7 AV	54.0	-13.3	2.56 V	316	22.95	17.75
9	#16590.00	61.3 PK	74.0	-12.7	1.63 V	360	36.39	24.91
10	#16590.00	48.9 AV	54.0	-5.1	1.63 V	360	23.99	24.91

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

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 54	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	145.99	33.9 QP	43.5	-9.7	1.50 H	105	47.56	-13.71
2	299.32	37.6 QP	46.0	-8.4	1.00 H	38	50.21	-12.60
3	342.34	35.3 QP	46.0	-10.7	1.00 H	140	46.83	-11.55
4	540.01	36.7 QP	46.0	-9.3	1.50 H	272	43.61	-6.94
5	687.89	35.9 QP	46.0	-10.2	1.00 H	144	39.73	-3.88
6	921.62	41.6 QP	46.0	-4.5	2.00 H	340	41.75	-0.20

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	132.78	31.6 QP	43.5	-11.9	1.30 V	360	46.01	-14.44
2	375.99	35.3 QP	46.0	-10.7	2.00 V	263	45.77	-10.48
3	479.32	33.8 QP	46.0	-12.2	1.50 V	300	41.87	-8.11
4	550.01	32.1 QP	46.0	-13.9	1.00 V	3	38.90	-6.77
5	757.02	35.7 QP	46.0	-10.3	1.50 V	116	38.29	-2.55
6	921.62	41.8 QP	46.0	-4.2	2.00 V	309	41.99	-0.20

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

4.1.8 Test Results (Mode 2)

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 54	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	156.59	33.8 QP	43.5	-9.7	1.50 H	285	46.67	-12.86
2	233.17	33.2 QP	46.0	-12.9	1.50 H	282	48.45	-15.30
3	350.00	32.3 QP	46.0	-13.7	1.00 H	50	43.62	-11.36
4	650.02	35.8 QP	46.0	-10.2	1.50 H	182	40.08	-4.30
5	700.03	33.4 QP	46.0	-12.6	1.50 H	360	37.16	-3.73
6	921.62	40.8 QP	46.0	-5.2	1.50 H	291	40.98	-0.20

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	97.90	30.8 QP	43.5	-12.8	1.00 V	360	49.28	-18.53
2	309.85	30.4 QP	46.0	-15.6	1.50 V	120	42.61	-12.18
3	500.01	32.3 QP	46.0	-13.7	1.00 V	12	40.11	-7.77
4	550.02	31.9 QP	46.0	-14.1	1.00 V	322	38.70	-6.77
5	650.02	31.8 QP	46.0	-14.3	1.00 V	238	36.05	-4.30
6	921.62	39.6 QP	46.0	-6.4	1.00 V	30	39.78	-0.20

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 06, 2015	May 05, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 01, 2015	Aug. 31, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	E1-011311	09	Nov. 27, 2014	Nov. 26, 2015
50 ohms Terminator	E1-011315	13	Dec. 12, 2014	Dec. 11, 2015
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: Sep. 30 to Oct. 02, 2015

4.2.3 Test Procedure

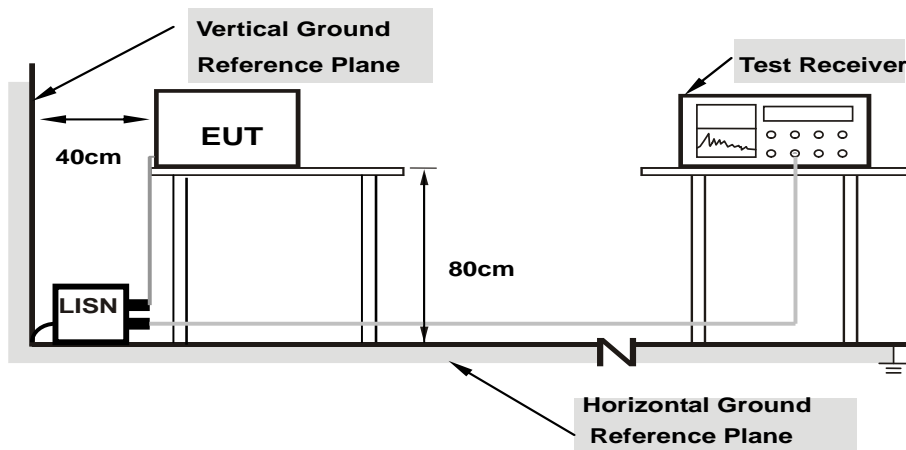
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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.

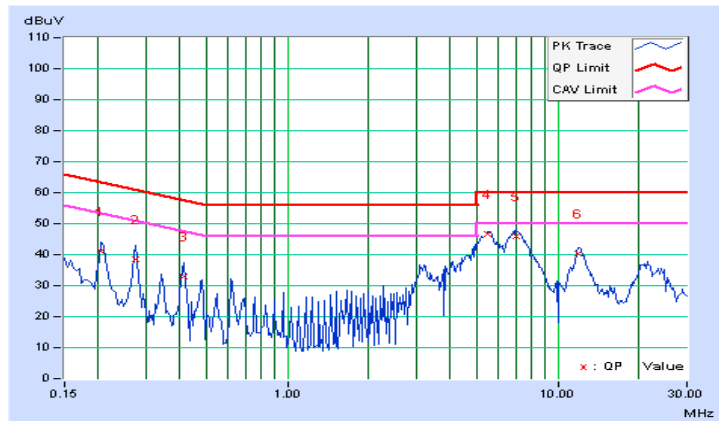
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.20469	0.12	41.16	33.96	41.28	34.08	63.42	53.42	-22.14	-19.34
2	0.27500	0.13	38.49	32.85	38.62	32.98	60.97	50.97	-22.35	-17.99
3	0.41172	0.14	32.95	27.05	33.09	27.19	57.61	47.61	-24.52	-20.42
4	5.50781	0.34	46.30	44.35	46.64	44.69	60.00	50.00	-13.36	-5.31
5	7.02344	0.40	45.62	42.54	46.02	42.94	60.00	50.00	-13.98	-7.06
6	11.91016	0.58	39.64	36.51	40.22	37.09	60.00	50.00	-19.78	-12.91

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

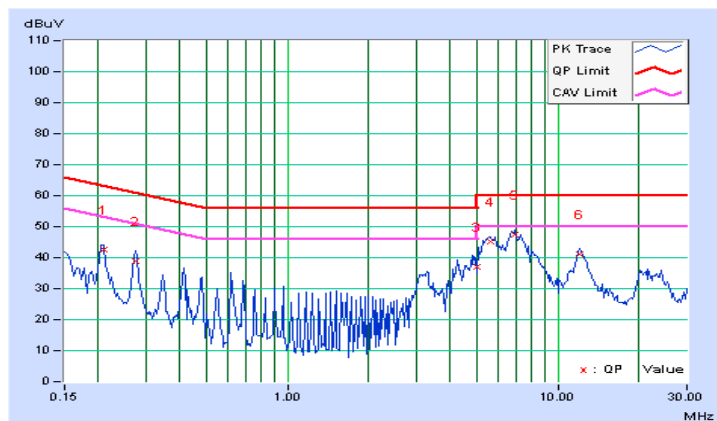


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.20859	0.10	42.46	37.13	42.56	37.23	63.26	53.26	-20.70	-16.03
2	0.27500	0.11	38.93	32.97	39.04	33.08	60.97	50.97	-21.93	-17.89
3	5.00000	0.33	36.73	22.02	37.06	22.35	56.00	46.00	-18.94	-23.65
4	5.64453	0.36	44.99	42.21	45.35	42.57	60.00	50.00	-14.65	-7.43
5	6.95703	0.41	47.06	43.91	47.47	44.32	60.00	50.00	-12.53	-5.68
6	11.98438	0.59	40.46	37.16	41.05	37.75	60.00	50.00	-18.95	-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



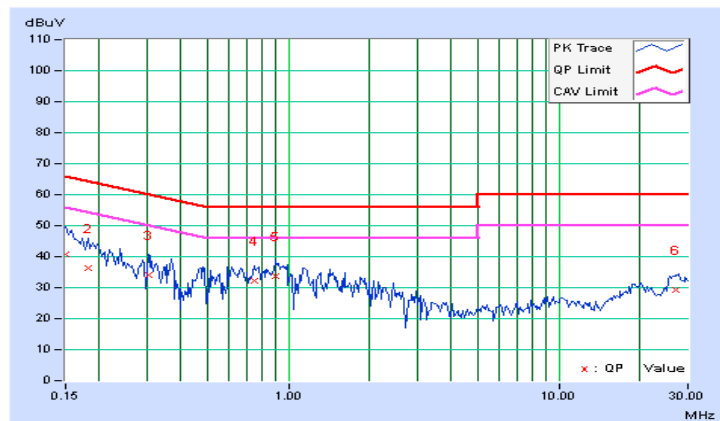
4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.15000	0.11	40.47	23.66	40.58	23.77	66.00	56.00	-25.42	-32.23
2	0.18125	0.12	36.33	16.98	36.45	17.10	64.43	54.43	-27.98	-37.33
3	0.30234	0.13	33.81	20.65	33.94	20.78	60.18	50.18	-26.24	-29.40
4	0.74375	0.16	31.98	22.31	32.14	22.47	56.00	46.00	-23.86	-23.53
5	0.89609	0.16	33.62	25.28	33.78	25.44	56.00	46.00	-22.22	-20.56
6	26.91016	1.04	28.11	23.62	29.15	24.66	60.00	50.00	-30.85	-25.34

REMARKS:

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

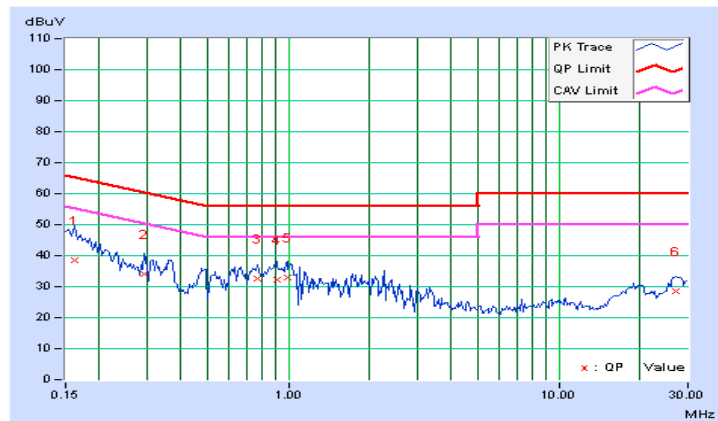


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.16172	0.09	38.61	26.33	38.70	26.42	65.38	55.38	-26.67	-28.95
2	0.29453	0.11	33.79	24.03	33.90	24.14	60.40	50.40	-26.50	-26.26
3	0.77109	0.14	32.44	24.23	32.58	24.37	56.00	46.00	-23.42	-21.63
4	0.90781	0.15	32.17	22.86	32.32	23.01	56.00	46.00	-23.68	-22.99
5	0.98984	0.16	32.66	21.41	32.82	21.57	56.00	46.00	-23.18	-24.43
6	27.10547	1.06	27.35	22.60	28.41	23.66	60.00	50.00	-31.59	-26.34

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 $N_{ANT} \leq 4$;

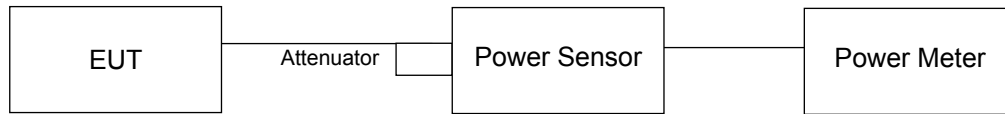
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

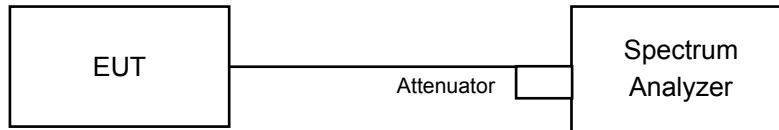
For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT



FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter with average sensor is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

FOR 26dB OCCUPIED BANDWIDTH

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

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
802.11a

POWER OUTPUT

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.79	21.04	247.007	23.93	24	Pass
60	5300	20.60	21.04	241.872	23.84	24	Pass
64	5320	20.75	21.17	249.768	23.98	24	Pass
100	5500	20.92	20.96	248.333	23.95	24	Pass
116	5580	20.44	21.19	242.184	23.84	24	Pass
132	5660	20.51	20.96	237.198	23.75	24	Pass
140	5700	20.46	21.08	239.406	23.79	24	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	23.00	22.73
60	5300	23.46	21.98
64	5320	22.58	22.13
100	5500	22.58	23.10
116	5580	22.16	22.73
132	5660	23.03	22.71
140	5700	22.52	23.08

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	22.73	24.56 > 24
60	5300	21.98	24.42 > 24
64	5320	22.13	24.44 > 24
100	5500	22.58	24.53 > 24
116	5580	22.16	24.45 > 24
132	5660	22.71	24.56 > 24
140	5700	22.52	24.52 > 24

802.11ac (VHT20)
POWER OUTPUT

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.73	21.02	244.778	23.89	24	Pass
60	5300	20.56	21.02	240.237	23.81	24	Pass
64	5320	20.45	20.98	236.231	23.73	24	Pass
100	5500	20.68	21.04	244.007	23.87	24	Pass
116	5580	20.52	21.06	240.364	23.81	24	Pass
132	5660	20.68	20.98	242.264	23.84	24	Pass
140	5700	20.43	21.05	237.758	23.76	24	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	23.64	23.94
60	5300	23.52	24.40
64	5320	23.77	23.80
100	5500	23.56	23.88
116	5580	23.12	23.83
132	5660	23.27	23.80
140	5700	23.64	24.45

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	23.64	24.73 > 24
60	5300	23.52	24.71 > 24
64	5320	23.77	24.76 > 24
100	5500	23.56	24.72 > 24
116	5580	23.12	24.63 > 24
132	5660	23.27	24.66 > 24
140	5700	23.64	24.73 > 24

802.11ac (VHT40)
POWER OUTPUT

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.76	21.18	250.344	23.99	24	Pass
62	5310	20.65	20.98	241.459	23.83	24	Pass
102	5510	20.69	21.00	243.113	23.86	24	Pass
110	5550	20.78	20.94	243.839	23.87	24	Pass
134	5670	20.67	21.01	242.864	23.85	24	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	47.58	46.48
62	5310	47.79	46.22
102	5510	46.37	46.93
110	5550	47.52	45.57
134	5670	46.93	46.25

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	46.48	27.67 > 24
62	5310	46.22	27.64 > 24
102	5510	46.37	27.66 > 24
110	5550	45.57	27.58 > 24
134	5670	46.25	27.65 > 24

802.11ac (VHT80)

POWER OUTPUT

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	16.74	17.28	100.662	20.03	24	Pass
106	5530	17.25	17.59	110.5	20.43	24	Pass

26dB OCCUPIED BANDWIDTH

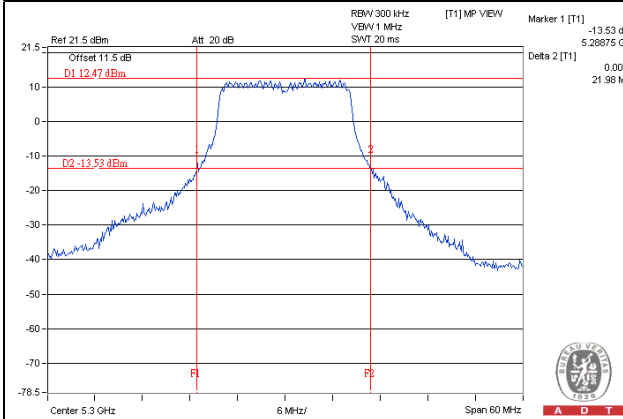
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	91.47	87.77
106	5530	90.31	89.67

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

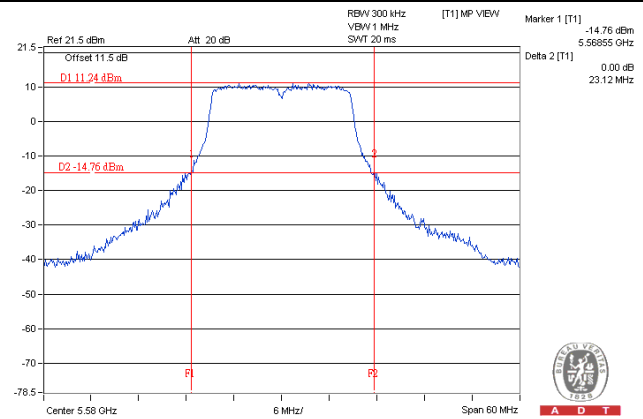
Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	87.77	30.43 > 24
106	5530	89.67	30.52 > 24

Spectrum Plot of Worst Value

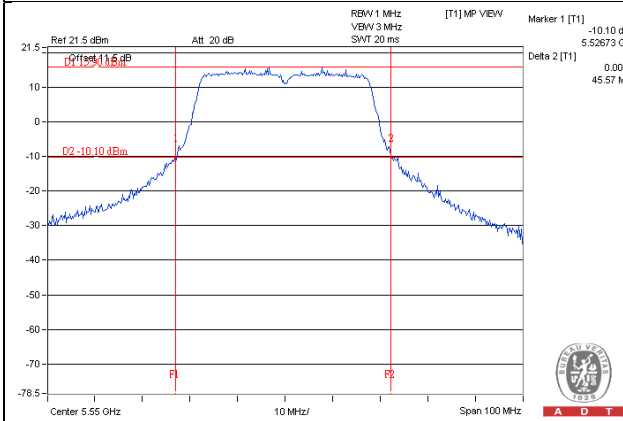
802.11a: Chain 1 / CH60



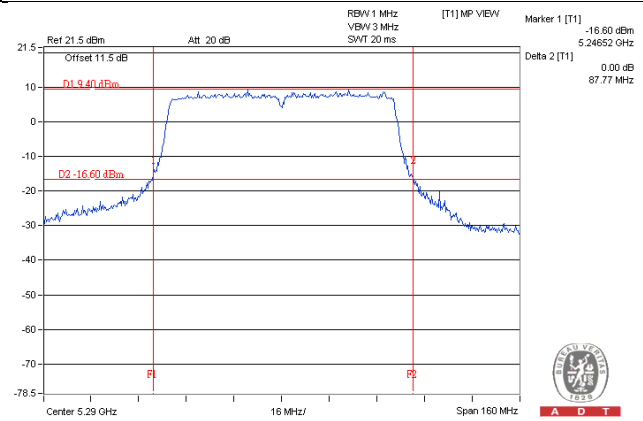
802.11ac (VHT20): Chain 0 / CH116



802.11ac (VHT40): Chain 1 / CH110



802.11ac (VHT80): Chain 1 / CH58



4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

For 802.11a, 802.11ac (VHT20) & 802.11ac (VHT40):

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 802.11ac (VHT80):

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

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

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
52	5260	7.30	7.18	10.25	11	Pass
60	5300	7.20	6.91	10.07	11	Pass
64	5320	7.44	7.25	10.36	11	Pass
100	5500	6.78	7.27	10.04	11	Pass
116	5580	6.71	7.47	10.12	11	Pass
132	5660	6.49	7.32	9.94	11	Pass
140	5700	6.88	7.41	10.16	11	Pass

NOTE: 1. Method 1 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 = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.66\text{dBi} < 6\text{dBi}$, 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			
52	5260	6.97	6.68	9.84	11	Pass
60	5300	6.90	6.61	9.77	11	Pass
64	5320	6.58	7.20	9.91	11	Pass
100	5500	6.50	7.55	10.07	11	Pass
116	5580	6.45	7.21	9.86	11	Pass
132	5660	6.56	6.83	9.71	11	Pass
140	5700	6.61	7.11	9.88	11	Pass

NOTE: 1. Method 1 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 = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.66\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

802.11ac (VHT40)

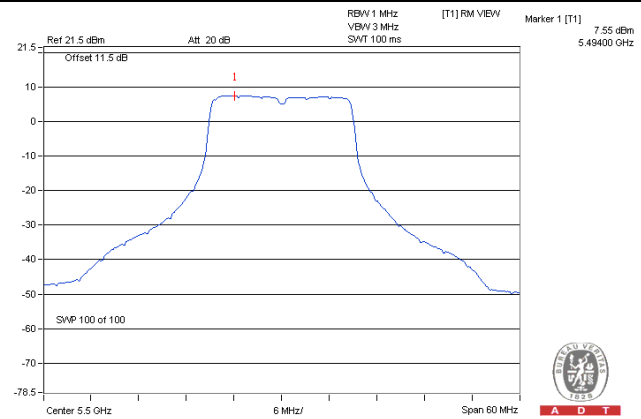
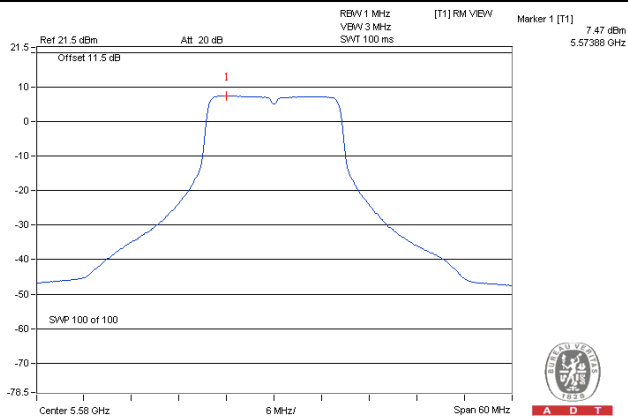
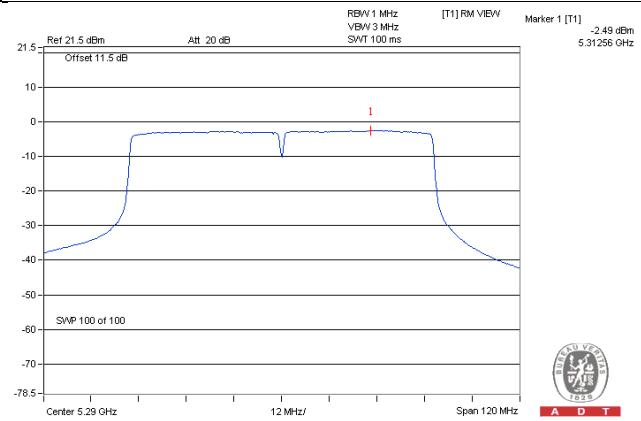
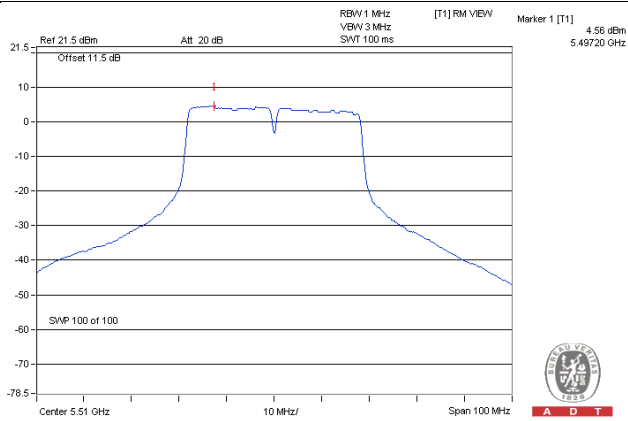
Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
54	5270	4.01	3.92	6.98	11	Pass
62	5310	3.90	3.50	6.71	11	Pass
102	5510	3.54	4.56	7.09	11	Pass
110	5550	3.55	3.98	6.78	11	Pass
134	5670	3.72	3.94	6.84	11	Pass

- NOTE:** 1. Method 1 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 = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$ = 5.66dBi < 6dBi, so the power density limit shall not be reduced.

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm)		Duty Factor	Total PSD with Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	-2.53	-2.49	0.30	0.80	11	Pass
106	5530	-2.76	-3.61	0.30	0.14	11	Pass

- NOTE:** 1. Method 1 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 = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$ = 5.66dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

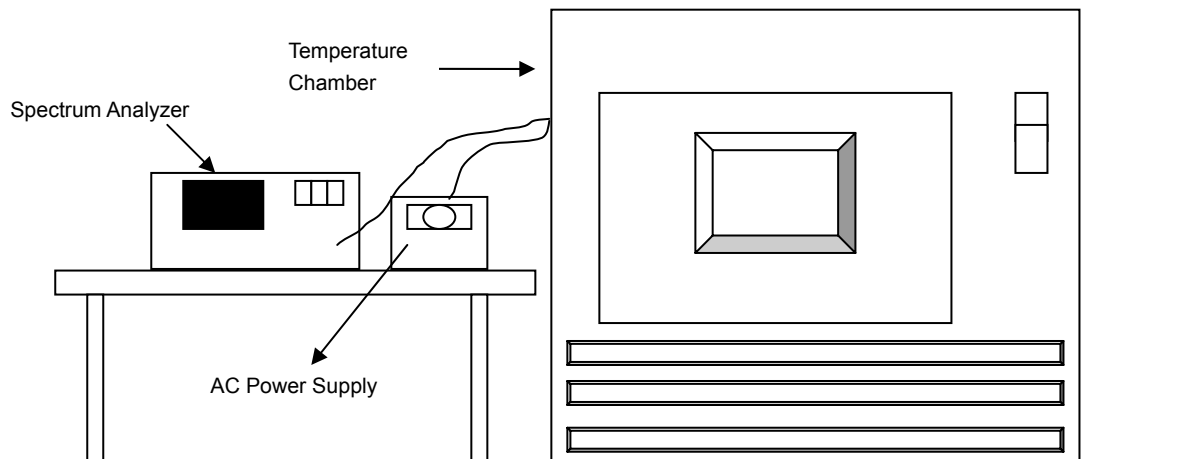
Spectrum Plot of Worst Value**802.11a: Chain 1 / CH16****802.11ac (VHT20): Chain 1 / CH100****802.11ac (VHT40): Chain 1 / CH102****802.11ac (VHT80): Chain 1 / CH58**

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

- 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

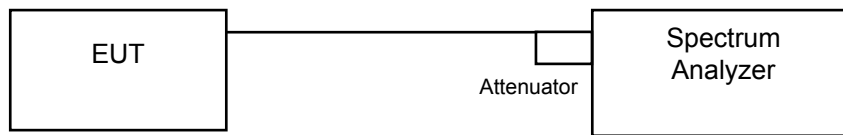
4.5.7 Test Results

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5700MHz									
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	5700.0141	0.00025	5700.0152	0.00027	5700.0113	0.00020	5700.0114	0.00020
40	120	5699.9785	-0.00038	5699.983	-0.00030	5699.9815	-0.00032	5699.9837	-0.00029
30	120	5699.9788	-0.00037	5699.9821	-0.00031	5699.9825	-0.00031	5699.9795	-0.00036
20	120	5699.9849	-0.00026	5699.9845	-0.00027	5699.9843	-0.00028	5699.9857	-0.00025
10	120	5699.9906	-0.00016	5699.9903	-0.00017	5699.9938	-0.00011	5699.9907	-0.00016
0	120	5700.0157	0.00028	5700.0182	0.00032	5700.0194	0.00034	5700.0182	0.00032
-10	120	5699.9699	-0.00053	5699.9721	-0.00049	5699.9725	-0.00048	5699.9736	-0.00046
-20	120	5699.992	-0.00014	5699.9925	-0.00013	5699.9934	-0.00012	5699.9914	-0.00015
-30	120	5700.0228	0.00040	5700.022	0.00039	5700.0268	0.00047	5700.026	0.00046

FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5700MHz									
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	5699.9859	-0.00025	5699.9856	-0.00025	5699.9854	-0.00026	5699.9846	-0.00027
	120	5699.9849	-0.00026	5699.9845	-0.00027	5699.9843	-0.00028	5699.9857	-0.00025
	102	5699.9845	-0.00027	5699.9842	-0.00028	5699.9853	-0.00026	5699.9862	-0.00024

4.6 Occupied Bandwidth Measurement

4.6.1 Test Setup



4.6.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to PEAK. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.6.4 Deviation from Test Standard

No deviation.

4.6.5 EUT Operating Conditions

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

4.6.6 Test Results
802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	16.80	16.68
60	5300	16.80	16.68
64	5320	16.92	16.68
100	5500	16.92	16.68
116	5580	16.92	16.68
132	5660	16.92	16.68
140	5700	16.80	16.80

802.11ac (VHT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	18.00	17.88
60	5300	17.88	17.88
64	5320	18.00	17.88
100	5500	17.88	18.00
116	5580	17.88	18.00
132	5660	17.88	17.88
140	5700	17.88	17.88

802.11ac (VHT40)

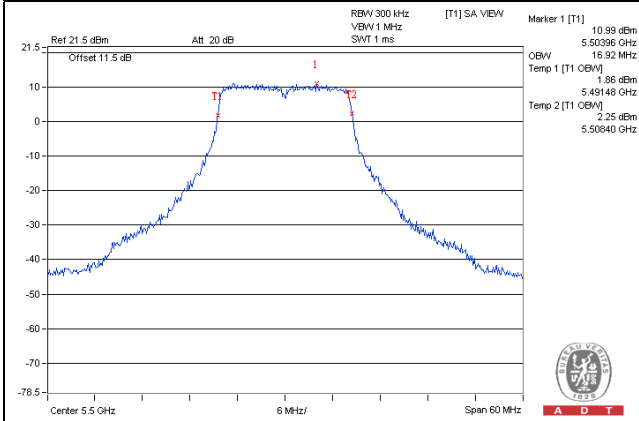
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	37.00	37.00
62	5310	37.00	37.00
102	5510	37.00	37.00
110	5550	37.00	37.00
134	5670	37.00	37.00

802.11ac (VHT80)

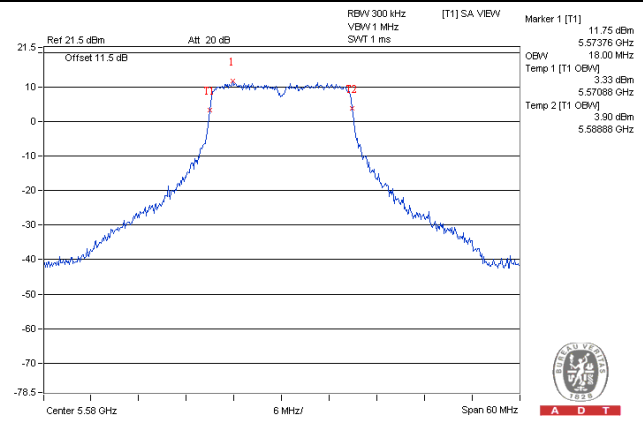
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	75.84	76.08
106	5530	76.32	76.08

Spectrum Plot of Worst Value

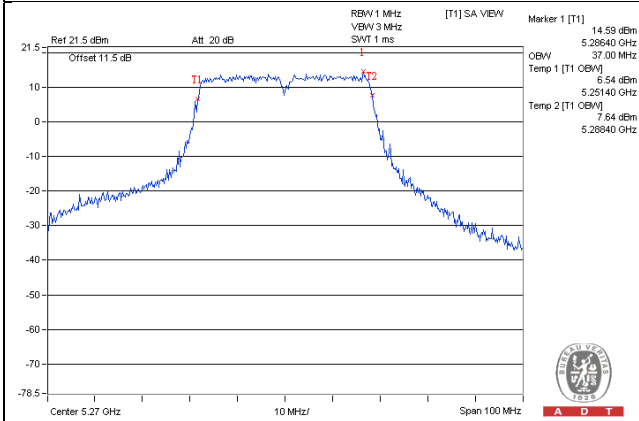
802.11a: Chain 0 / CH100



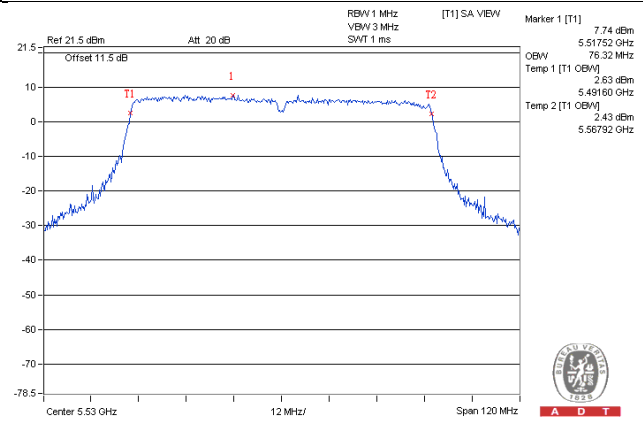
802.11ac (VHT20): Chain 1 / CH116



802.11ac (VHT40): Chain 1 / CH54



802.11ac (VHT80): Chain 0 / CH106



4.7 26dB Bandwidth Measurement

4.7.1 Test Setup



4.7.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.3 Test Procedure

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.7.4 Deviation from Test Standard

No deviation.

4.7.5 EUT Operating Condition

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

4.7.6 Test Results
802.11a

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	23.00	22.73
60	5300	23.46	21.98
64	5320	22.58	22.13
100	5500	22.58	23.10
116	5580	22.16	22.73
132	5660	23.03	22.71
140	5700	22.52	23.08

802.11ac (VHT20)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	23.64	23.94
60	5300	23.52	24.40
64	5320	23.77	23.80
100	5500	23.56	23.88
116	5580	23.12	23.83
132	5660	23.27	23.80
140	5700	23.64	24.45

802.11ac (VHT40)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	47.58	46.48
62	5310	47.79	46.22
102	5510	46.37	46.93
110	5550	47.52	45.57
134	5670	46.93	46.25

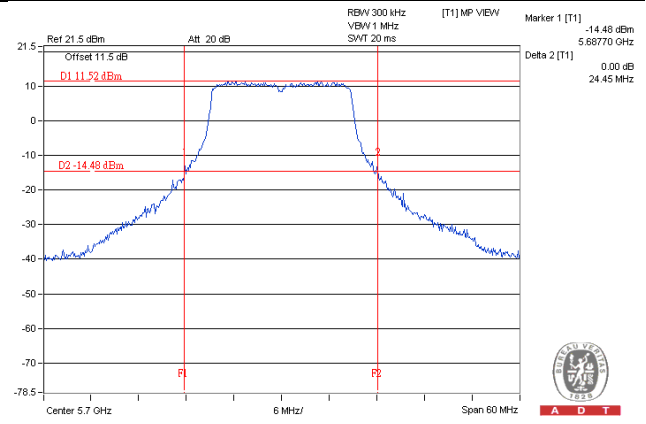
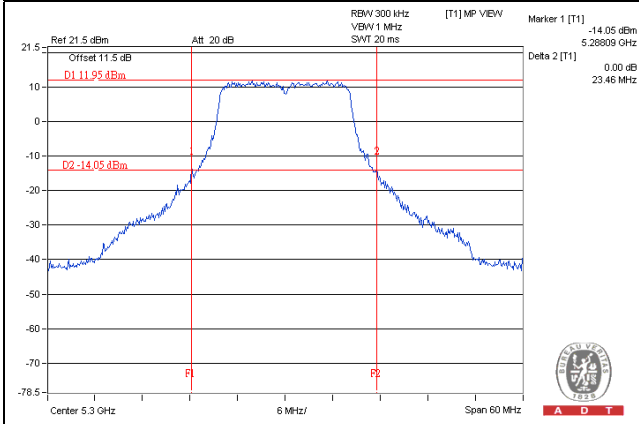
802.11ac (VHT80)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	91.47	87.77
106	5530	90.31	89.67

Spectrum Plot of Worst Value

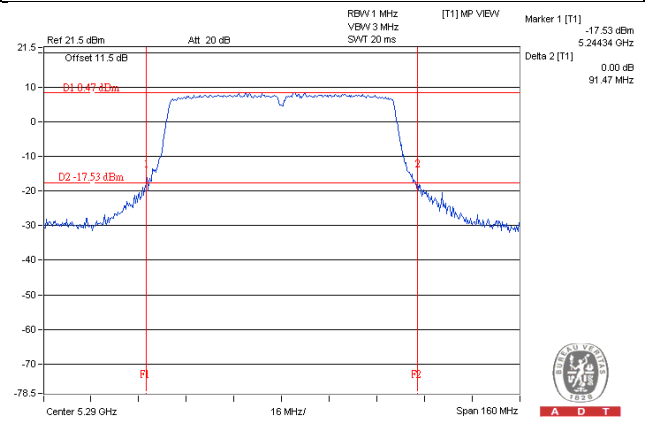
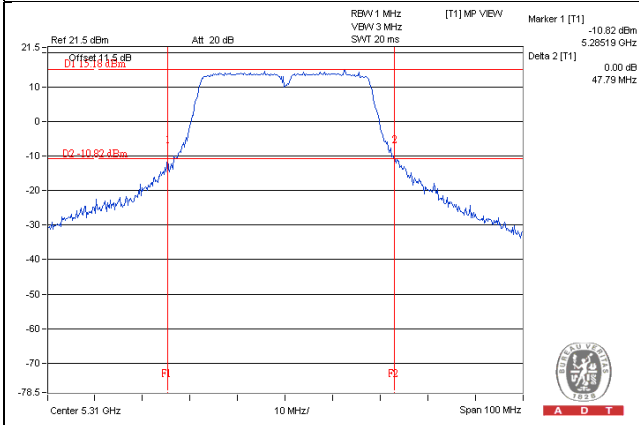
802.11a: Chain 0 / CH60

802.11a (VHT20): Chain 1 / CH140



802.11ac (VHT40): Chain 0 / CH62

802.11ac (VHT80): Chain 0 / CH58



5 Pictures of Test Arrangements

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



A D T

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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