FCC Test Report
(15.407, WLAN)

Report No.: RF150820E01-2

FCC ID: 2AD8UFZPFWFE01

Test Model: FWFE

Series Model: FWFI

Received Date: Aug. 20, 2015

Test Date: Sep. 24 to Oct. 12, 2015

Issued Date: Jan. 15, 2016

Applicant: Nokia Solutions and Networks

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

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Release Control Record

Issue No.	Description	Date Issued
RF150820E01-2	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. 12, 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 -5.49dB at 6.84409MHz.
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 -0.1dB at 5725.00MHz, 15540.00MHz, 15720.00MHz & 5150.00MHz.
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.
15.407(e)	Section C.2	6dB bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
-	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: 1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.25GHz, and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 5.15~5.25GHz and 5.725~5.850GHz. For the 2400 ~ 2483.5MHz RF parameters was recorded in another test report.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (WLAN, 15.407)

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	5.18GHz ~ 5.24GHz, 5.745GHz ~ 5.825GHz
Number of Channel	9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
Output Power	802.11a: 310.575mW 802.11n (HT20): 323.214mW 802.11n (HT40): 331.042mW 802.11ac (VHT80): 108.053mW
Antenna Type	Refer to note as below
Antenna Connector	Refer to note as below
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. There are WLAN, BT, WWAN and GPS technology used for the EUT.
2. The EUT's spec. as below table:

Model name	Hardware Version	WWAN			Wi-Fi	BT	GPS	Different
		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.

3. The emission of the simultaneous operation (WLAN, BT & WWAN) has been evaluated and no non-compliance was found.
4. 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)

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

6. 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

7. 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)			

8. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (VHT20):

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	With 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	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	13.5
	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	13.5
	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	802.11n (HT40)	5745-5825	151 to 159	159	OFDM	BPSK	13.5
2	802.11n (HT40)	5745-5825	151 to 159	159	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	802.11n (HT40)	5745-5825	151 to 159	159	OFDM	BPSK	13.5
2	802.11n (HT40)	5745-5825	151 to 159	159	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	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	13.5
	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	13.5
	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

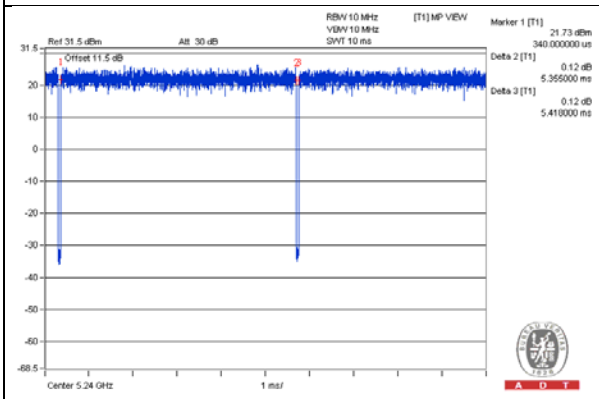
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 72%RH 24deg. C, 67%RH	120Vac, 60Hz	Andy Ho
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Weiwei Lo
PLC	25deg. C, 60%RH 26deg. C, 66%RH	120Vac, 60Hz	Timmy Hu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen Gary Cheng

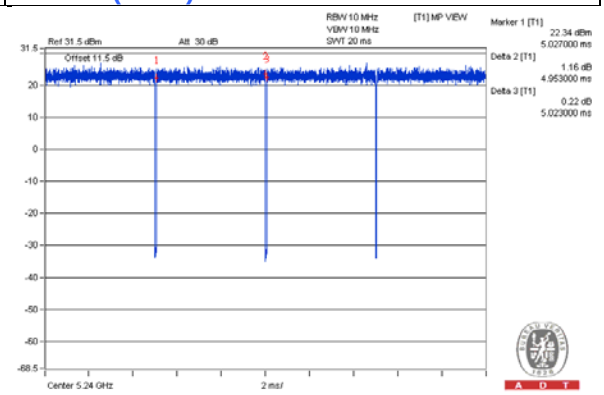
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 5.355 ms/5.418 ms = 0.988
802.11n (HT20): Duty cycle = 4.953 ms/5.023 ms = 0.986
802.11n (HT40): Duty cycle = 2.407 ms/2.468 ms = 0.975, Duty factor = 10 * log(1/0.975) = 0.11
802.11ac (VHT80): Duty cycle = 1.135 ms/1.198 ms = 0.947, Duty factor = 10 * log(1/0.947) = 0.23

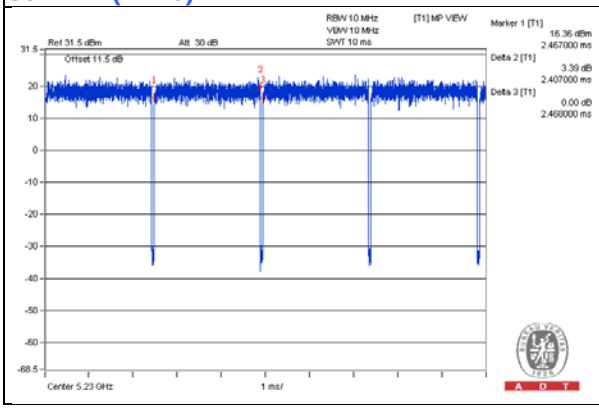
802.11a



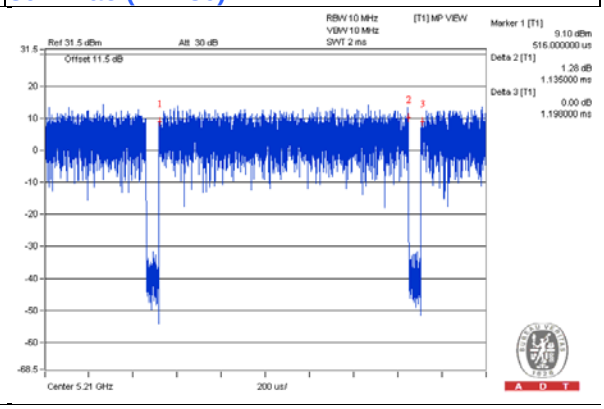
802.11n (HT20)



802.11n (HT40)



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).

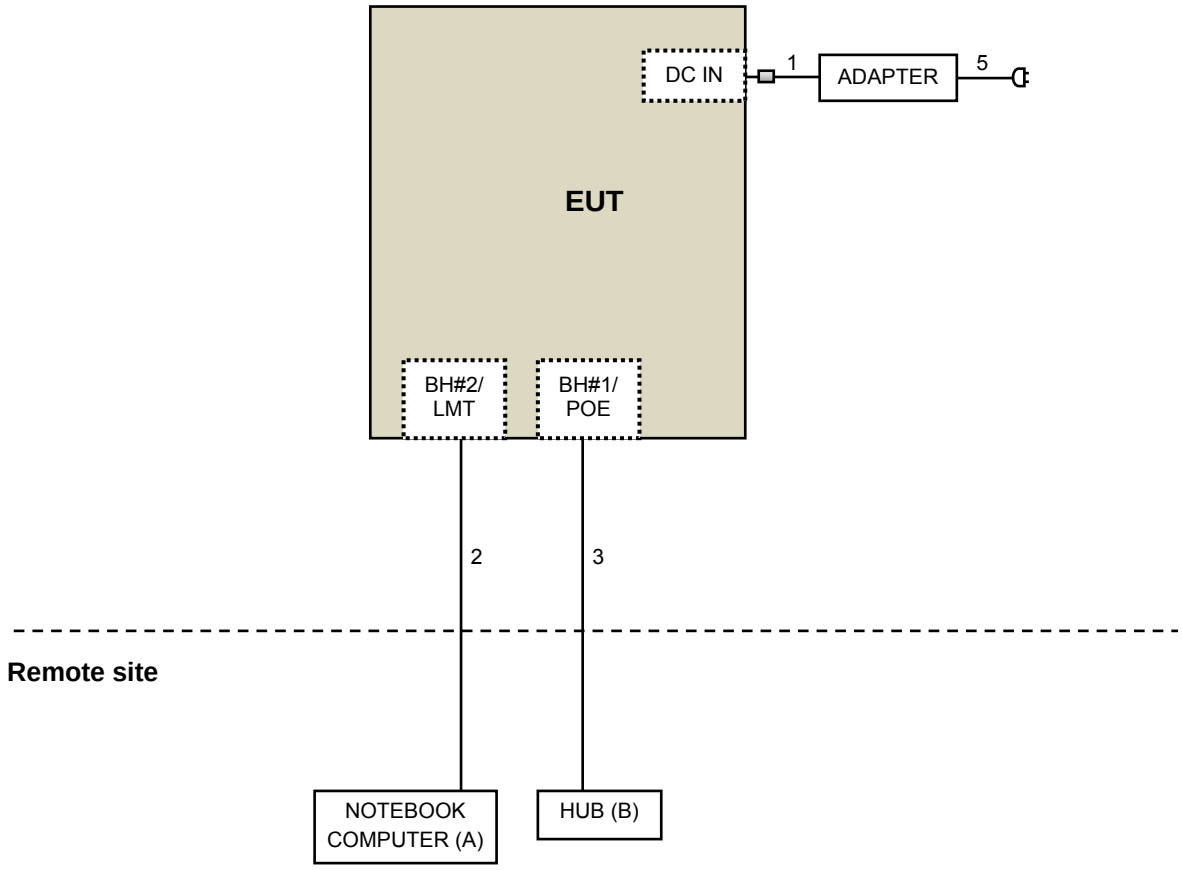
No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC	1	1.2	No	1	Supplied by Client
2	RJ-45	1	10	No	0	Provided by Lab
3	RJ-45	1	10	No	0	Provided by Lab
4	RJ-45	1	3	No	0	Provided by Lab
5	AC	1	1.8	No	0	Supplied by Client

NOTE:

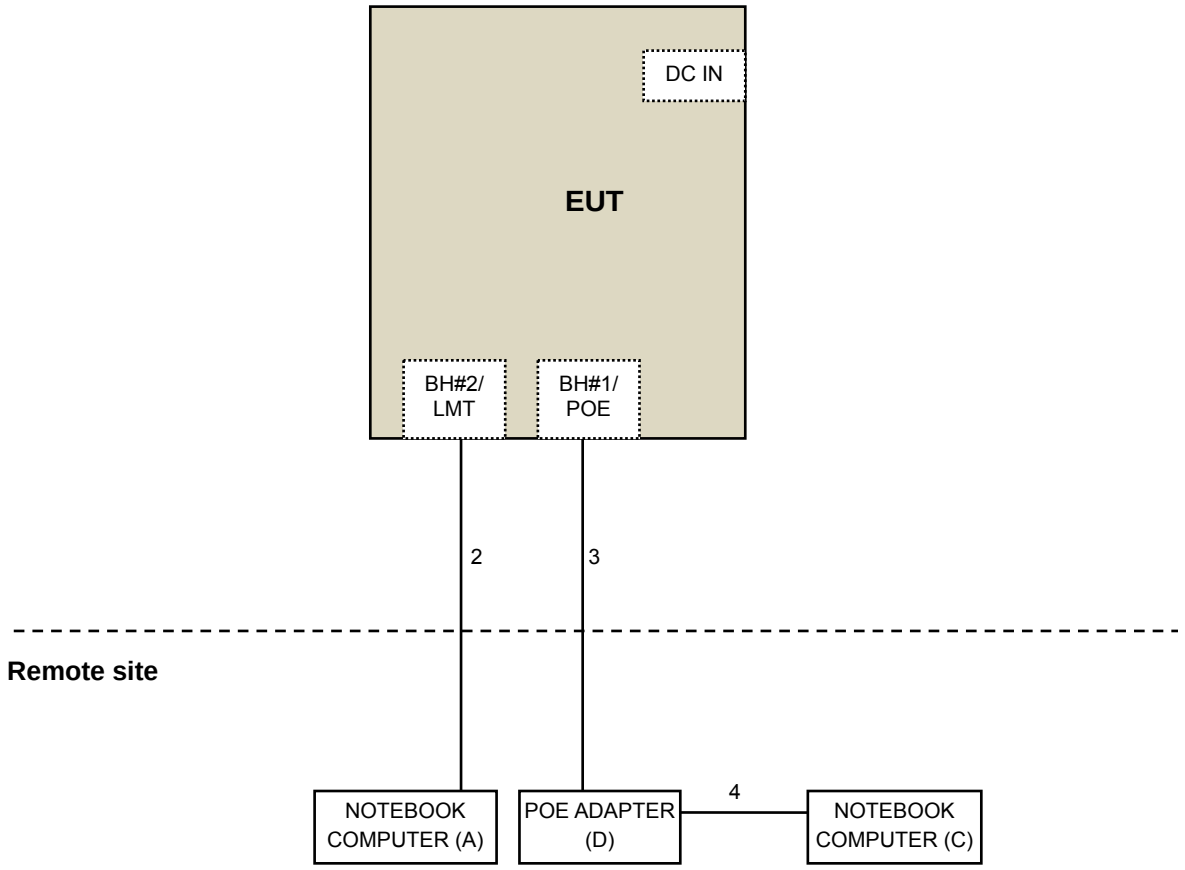
1. The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

For Adapter mode:



For POE mode:


DC IN
EUT
BH#2/
LMT
BH#1/
POE
2
3
Remote site
NOTEBOOK
COMPUTER (A)
POE ADAPTER
(D)
4
NOTEBOOK
COMPUTER (C)

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 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	**EIRP LIMIT**	**EQUIVALENT FIELD STRENGTH AT 3m**
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) *1 PK:-17 (dBm/MHz) *2	PK: 68.2(dBμV/m) *1 PK:78.2 (dBμV/m) *2

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

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 13, 2014	Jan. 12, 2016
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2015	Jan. 17, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-06	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Feb. 03, 2015	Feb. 02, 2016
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 03, 2015	Apr. 02, 2016
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Feb. 06, 2015	Feb. 05, 2016
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 31, 2015	Mar. 30, 2016
Spectrum Analyzer R&S	FSV40	100964	June 26, 2015	June 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 16, 2015	Jan. 15, 2016
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Feb. 05, 2015	Feb. 04, 2016
RF Cable	SUCOFLEX 104	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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 4.
5. The FCC Site Registration No. is 292998
6 The CANADA Site Registration No. is 20331-2
7 Tested Date: Sep. 24 to Oct. 12, 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:

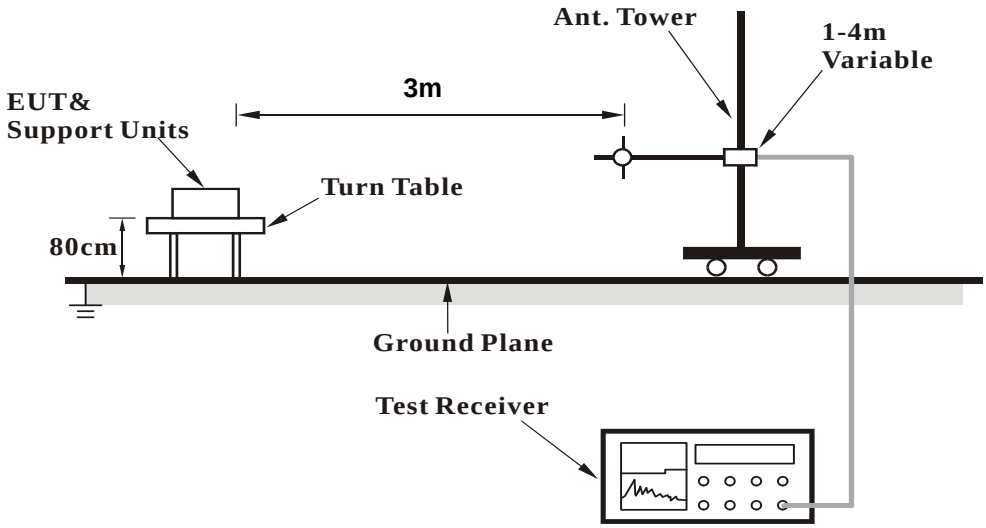
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

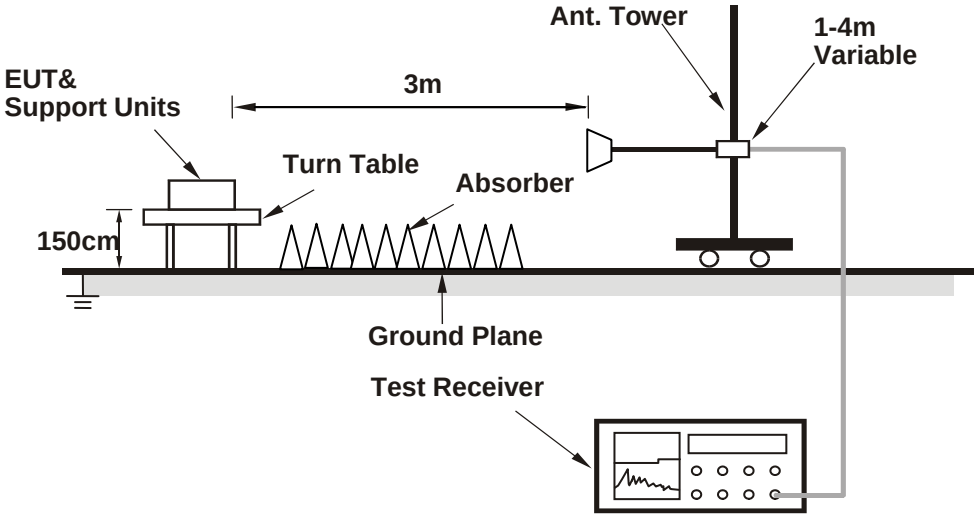
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Condition

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	64.5 PK	74.0	-9.5	1.64 H	341	56.86	7.64
2	5150.00	47.5 AV	54.0	-6.5	1.64 H	341	39.86	7.64
3	*5180.00	113.6 PK			1.64 H	341	105.84	7.76
4	*5180.00	102.6 AV			1.64 H	341	94.84	7.76
5	#10360.00	56.3 PK	74.0	-17.7	1.54 H	54	42.40	13.90
6	#10360.00	42.4 AV	54.0	-11.6	1.54 H	54	28.50	13.90
7	15540.00	68.5 PK	74.0	-5.5	1.60 H	26	50.29	18.21
8	15540.00	52.5 AV	54.0	-1.5	1.60 H	26	34.29	18.21
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	59.9 PK	74.0	-14.1	1.49 V	360	52.26	7.64
2	5150.00	44.6 AV	54.0	-9.4	1.49 V	360	36.96	7.64
3	*5180.00	107.8 PK			1.49 V	360	100.04	7.76
4	*5180.00	97.1 AV			1.49 V	360	89.34	7.76
5	#10360.00	55.3 PK	74.0	-18.7	2.47 V	324	41.40	13.90
6	#10360.00	42.4 AV	54.0	-11.6	2.47 V	324	28.50	13.90
7	15540.00	68.0 PK	74.0	-6.0	1.68 V	360	49.79	18.21
8	15540.00	51.7 AV	54.0	-2.3	1.68 V	360	33.49	18.21

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	113.0 PK			1.60 H	339	105.18	7.82
2	*5200.00	102.7 AV			1.60 H	339	94.88	7.82
3	#10400.00	56.2 PK	74.0	-17.8	1.67 H	360	42.12	14.08
4	#10400.00	43.2 AV	54.0	-10.8	1.67 H	360	29.12	14.08
5	15600.00	68.2 PK	74.0	-5.8	1.69 H	30	49.80	18.40
6	15600.00	52.3 AV	54.0	-1.7	1.69 H	30	33.90	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	108.3 PK			1.53 V	360	100.48	7.82
2	*5200.00	96.8 AV			1.53 V	360	88.98	7.82
3	#10400.00	56.1 PK	74.0	-17.9	2.48 V	323	42.02	14.08
4	#10400.00	43.0 AV	54.0	-11.0	2.48 V	323	28.92	14.08
5	15600.00	67.6 PK	74.0	-6.4	1.64 V	360	49.20	18.40
6	15600.00	50.1 AV	54.0	-3.9	1.64 V	360	31.70	18.40

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	114.1 PK			1.65 H	338	106.17	7.93
2	*5240.00	103.4 AV			1.65 H	338	95.47	7.93
3	5350.00	64.5 PK	74.0	-9.5	2.05 H	347	56.31	8.19
4	5350.00	51.3 AV	54.0	-2.7	2.05 H	347	43.11	8.19
5	#10480.00	55.8 PK	74.0	-18.2	1.54 H	46	42.03	13.77
6	#10480.00	42.8 AV	54.0	-11.2	1.54 H	46	29.03	13.77
7	15720.00	69.1 PK	74.0	-4.9	1.66 H	46	51.00	18.10
8	15720.00	53.1 AV	54.0	-0.9	1.66 H	46	35.00	18.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	109.4 PK			1.42 V	359	101.47	7.93
2	*5240.00	97.8 AV			1.42 V	359	89.87	7.93
3	5350.00	62.5 PK	74.0	-11.5	1.56 V	342	54.31	8.19
4	5350.00	50.0 AV	54.0	-4.0	1.56 V	342	41.81	8.19
5	#10480.00	55.7 PK	74.0	-18.3	2.50 V	332	41.93	13.77
6	#10480.00	41.7 AV	54.0	-12.3	2.50 V	332	27.93	13.77
7	15720.00	66.8 PK	74.0	-7.2	1.58 V	13	48.70	18.10
8	15720.00	49.9 AV	54.0	-4.1	1.58 V	13	31.80	18.10

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	64.9 PK	74.0	-9.1	1.64 H	360	55.80	9.10
2	#5715.00	50.1 AV	54.0	-3.9	1.64 H	360	41.00	9.10
3	**#5725.00**	**78.1 PK**	**78.2**	**-0.1**	**1.64 H**	**360**	**68.99**	**9.11**
4	*5745.00	114.3 PK			1.64 H	360	105.14	9.16
5	*5745.00	103.2 AV			1.64 H	360	94.04	9.16
6	11490.00	56.9 PK	74.0	-17.1	1.54 H	63	42.14	14.76
7	11490.00	43.2 AV	54.0	-10.8	1.54 H	63	28.44	14.76
8	#17235.00	61.3 PK	74.0	-12.7	1.40 H	47	39.05	22.25
9	#17235.00	46.4 AV	54.0	-7.6	1.40 H	47	24.15	22.25
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	62.2 PK	74.0	-11.8	1.45 V	360	53.10	9.10
2	#5715.00	48.2 AV	54.0	-5.8	1.45 V	360	39.10	9.10
3	#5725.00	76.4 PK	78.2	-1.8	1.45 V	360	67.29	9.11
4	*5745.00	110.1 PK			1.45 V	360	100.94	9.16
5	*5745.00	96.9 AV			1.45 V	360	87.74	9.16
6	11490.00	57.6 PK	74.0	-16.4	1.82 V	360	42.84	14.76
7	11490.00	42.9 AV	54.0	-11.1	1.82 V	360	28.14	14.76
8	#17235.00	61.4 PK	74.0	-12.6	1.60 V	316	39.15	22.25
9	#17235.00	46.3 AV	54.0	-7.7	1.60 V	316	24.05	22.25

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	113.0 PK			1.61 H	360	103.78	9.22
2	*5785.00	102.7 AV			1.61 H	360	93.48	9.22
3	11570.00	57.0 PK	74.0	-17.0	1.56 H	71	42.17	14.83
4	11570.00	43.3 AV	54.0	-10.7	1.56 H	71	28.47	14.83
5	#17355.00	61.5 PK	74.0	-12.5	1.45 H	58	38.82	22.68
6	#17355.00	46.4 AV	54.0	-7.6	1.45 H	58	23.72	22.68
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	108.7 PK			1.32 V	347	99.48	9.22
2	*5785.00	95.5 AV			1.32 V	347	86.28	9.22
3	11570.00	57.2 PK	74.0	-16.8	1.78 V	360	42.37	14.83
4	11570.00	42.5 AV	54.0	-11.5	1.78 V	360	27.67	14.83
5	#17355.00	61.0 PK	74.0	-13.0	1.54 V	307	38.32	22.68
6	#17355.00	45.9 AV	54.0	-8.1	1.54 V	307	23.22	22.68

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	114.3 PK			1.60 H	63	105.01	9.29
2	*5825.00	103.4 AV			1.60 H	63	94.11	9.29
3	#5850.00	68.4 PK	78.2	-9.8	1.60 H	63	59.09	9.31
4	#5860.00	60.3 PK	74.0	-13.7	1.60 H	63	50.98	9.32
5	#5860.00	45.2 AV	54.0	-8.8	1.60 H	63	35.88	9.32
6	11650.00	57.2 PK	74.0	-16.8	1.51 H	59	42.21	14.99
7	11650.00	43.5 AV	54.0	-10.5	1.51 H	59	28.51	14.99
8	#17475.00	61.5 PK	74.0	-12.5	1.41 H	63	38.15	23.35
9	#17475.00	46.7 AV	54.0	-7.3	1.41 H	63	23.35	23.35
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	*5825.00	109.6 PK			1.47 V	256	100.31	9.29
2	*5825.00	96.3 AV			1.47 V	256	87.01	9.29
3	#5850.00	65.9 PK	78.2	-12.3	1.47 V	256	56.59	9.31
4	#5860.00	57.6 PK	74.0	-16.4	1.47 V	256	48.28	9.32
5	#5860.00	43.5 AV	54.0	-10.5	1.47 V	256	34.18	9.32
6	11650.00	57.1 PK	74.0	-16.9	1.84 V	360	42.11	14.99
7	11650.00	42.5 AV	54.0	-11.5	1.84 V	360	27.51	14.99
8	#17475.00	61.2 PK	74.0	-12.8	1.53 V	305	37.85	23.35
9	#17475.00	46.0 AV	54.0	-8.0	1.53 V	305	22.65	23.35

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.

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.1 PK	74.0	-8.9	1.99 H	338	57.46	7.64
2	5150.00	51.8 AV	54.0	-2.2	1.99 H	338	44.16	7.64
3	*5180.00	113.4 PK			1.99 H	338	105.64	7.76
4	*5180.00	103.2 AV			1.99 H	338	95.44	7.76
5	#10360.00	65.8 PK	74.0	-8.2	1.50 H	340	51.90	13.90
6	#10360.00	43.0 AV	54.0	-11.0	1.50 H	340	29.10	13.90
7	15540.00	71.1 PK	74.0	-2.9	1.68 H	32	52.89	18.21
8	**15540.00**	**53.9 AV**	**54.0**	**-0.1**	**1.68 H**	**32**	**35.69**	**18.21**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.1 PK	74.0	-11.9	1.51 V	356	54.46	7.64
2	5150.00	49.7 AV	54.0	-4.3	1.51 V	356	42.06	7.64
3	*5180.00	108.4 PK			1.51 V	356	100.64	7.76
4	*5180.00	95.6 AV			1.51 V	356	87.84	7.76
5	#10360.00	56.6 PK	74.0	-17.4	1.55 V	360	42.70	13.90
6	#10360.00	42.1 AV	54.0	-11.9	1.55 V	360	28.20	13.90
7	15540.00	66.6 PK	74.0	-7.4	1.50 V	360	48.39	18.21
8	15540.00	50.6 AV	54.0	-3.4	1.50 V	360	32.39	18.21

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	113.4 PK			2.12 H	341	105.58	7.82
2	*5200.00	103.4 AV			2.12 H	341	95.58	7.82
3	#10400.00	63.8 PK	74.0	-10.2	1.62 H	36	49.72	14.08
4	#10400.00	43.4 AV	54.0	-10.6	1.62 H	36	29.32	14.08
5	15600.00	71.2 PK	74.0	-2.8	1.67 H	31	52.80	18.40
6	15600.00	53.2 AV	54.0	-0.8	1.67 H	31	34.80	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	108.9 PK			1.48 V	321	101.08	7.82
2	*5200.00	96.0 AV			1.48 V	321	88.18	7.82
3	#10400.00	57.4 PK	74.0	-16.6	1.70 V	47	43.32	14.08
4	#10400.00	42.3 AV	54.0	-11.7	1.70 V	47	28.22	14.08
5	15600.00	58.6 PK	74.0	-15.4	1.64 V	23	40.20	18.40
6	15600.00	47.9 AV	54.0	-6.1	1.64 V	23	29.50	18.40

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	112.9 PK			2.07 H	340	104.97	7.93
2	*5240.00	103.3 AV			2.07 H	340	95.37	7.93
3	5350.00	67.5 PK	74.0	-6.5	2.07 H	360	59.31	8.19
4	5350.00	52.6 AV	54.0	-1.4	2.07 H	360	44.41	8.19
5	#10480.00	57.6 PK	74.0	-16.4	1.66 H	51	43.83	13.77
6	#10480.00	43.4 AV	54.0	-10.6	1.66 H	51	29.63	13.77
7	15720.00	70.7 PK	74.0	-3.3	1.71 H	46	52.60	18.10
8	**15720.00**	**53.9 AV**	**54.0**	**-0.1**	**1.71 H**	**46**	**35.80**	**18.10**

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	108.5 PK			1.39 V	298	100.57	7.93
2	*5240.00	95.9 AV			1.39 V	298	87.97	7.93
3	5350.00	64.2 PK	74.0	-9.8	1.39 V	298	56.01	8.19
4	5350.00	49.3 AV	54.0	-4.7	1.39 V	298	41.11	8.19
5	#10480.00	56.2 PK	74.0	-17.8	1.67 V	44	42.43	13.77
6	#10480.00	42.2 AV	54.0	-11.8	1.67 V	44	28.43	13.77
7	15720.00	58.7 PK	74.0	-15.3	1.71 V	47	40.60	18.10
8	15720.00	48.0 AV	54.0	-6.0	1.71 V	47	29.90	18.10

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	64.3 PK	74.0	-9.7	1.71 H	360	55.20	9.10
2	#5715.00	50.3 AV	54.0	-3.7	1.71 H	360	41.20	9.10
3	#5725.00	77.8 PK	78.2	-0.4	1.71 H	360	68.69	9.11
4	*5745.00	113.0 PK			1.71 H	360	103.84	9.16
5	*5745.00	103.5 AV			1.71 H	360	94.34	9.16
6	11490.00	56.6 PK	74.0	-17.4	1.51 H	54	41.84	14.76
7	11490.00	43.0 AV	54.0	-11.0	1.51 H	54	28.24	14.76
8	#17235.00	61.5 PK	74.0	-12.5	1.41 H	52	39.25	22.25
9	#17235.00	46.6 AV	54.0	-7.4	1.41 H	52	24.35	22.25
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	61.5 PK	74.0	-12.5	1.23 V	321	52.40	9.10
2	#5715.00	46.8 AV	54.0	-7.2	1.23 V	321	37.70	9.10
3	#5725.00	73.6 PK	78.2	-4.6	1.23 V	321	64.49	9.11
4	*5745.00	109.4 PK			1.23 V	321	100.24	9.16
5	*5745.00	96.2 AV			1.23 V	321	87.04	9.16
6	11490.00	57.5 PK	74.0	-16.5	1.81 V	360	42.74	14.76
7	11490.00	42.7 AV	54.0	-11.3	1.81 V	360	27.94	14.76
8	#17235.00	61.2 PK	74.0	-12.8	1.53 V	297	38.95	22.25
9	#17235.00	46.0 AV	54.0	-8.0	1.53 V	297	23.75	22.25

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	112.5 PK			1.69 H	360	103.28	9.22
2	*5785.00	102.8 AV			1.69 H	360	93.58	9.22
3	11570.00	56.6 PK	74.0	-17.4	1.54 H	51	41.77	14.83
4	11570.00	42.9 AV	54.0	-11.1	1.54 H	51	28.07	14.83
5	#17355.00	61.2 PK	74.0	-12.8	1.38 H	42	38.52	22.68
6	#17355.00	46.4 AV	54.0	-7.6	1.38 H	42	23.72	22.68
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	108.2 PK			1.47 V	287	98.98	9.22
2	*5785.00	95.4 AV			1.47 V	287	86.18	9.22
3	11570.00	57.5 PK	74.0	-16.5	1.82 V	360	42.67	14.83
4	11570.00	42.8 AV	54.0	-11.2	1.82 V	360	27.97	14.83
5	#17355.00	60.5 PK	74.0	-13.5	1.58 V	307	37.82	22.68
6	#17355.00	45.6 AV	54.0	-8.4	1.58 V	307	22.92	22.68

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	114.0 PK			1.90 H	70	104.71	9.29
2	*5825.00	102.9 AV			1.90 H	70	93.61	9.29
3	#5850.00	62.8 PK	78.2	-15.4	1.90 H	70	53.49	9.31
4	#5860.00	59.2 PK	74.0	-14.8	1.90 H	70	49.88	9.32
5	#5860.00	48.2 AV	54.0	-5.8	1.90 H	70	38.88	9.32
6	11650.00	56.9 PK	74.0	-17.1	1.51 H	59	41.91	14.99
7	11650.00	42.9 AV	54.0	-11.1	1.51 H	59	27.91	14.99
8	#17475.00	61.3 PK	74.0	-12.7	1.40 H	55	37.95	23.35
9	#17475.00	46.2 AV	54.0	-7.8	1.40 H	55	22.85	23.35
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	*5825.00	108.7 PK			1.58 V	276	99.41	9.29
2	*5825.00	95.7 AV			1.58 V	276	86.41	9.29
3	#5850.00	59.7 PK	78.2	-18.5	1.58 V	276	50.39	9.31
4	#5860.00	57.3 PK	74.0	-16.7	1.58 V	276	47.98	9.32
5	#5860.00	46.1 AV	54.0	-7.9	1.58 V	276	36.78	9.32
6	11650.00	57.2 PK	74.0	-16.8	1.84 V	360	42.21	14.99
7	11650.00	42.3 AV	54.0	-11.7	1.84 V	360	27.31	14.99
8	#17475.00	61.4 PK	74.0	-12.6	1.57 V	308	38.05	23.35
9	#17475.00	46.1 AV	54.0	-7.9	1.57 V	308	22.75	23.35

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.

802.11n (HT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.4 PK	74.0	-8.6	1.70 H	341	57.76	7.64
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.70 H**	**341**	**46.26**	**7.64**
3	*5190.00	107.6 PK			1.70 H	341	99.82	7.78
4	*5190.00	96.5 AV			1.70 H	341	88.72	7.78
5	5350.00	62.7 PK	74.0	-11.3	1.70 H	341	54.51	8.19
6	5350.00	51.6 AV	54.0	-2.4	1.70 H	341	43.41	8.19
7	#10380.00	55.6 PK	74.0	-18.4	1.84 H	360	41.61	13.99
8	#10380.00	42.7 AV	54.0	-11.3	1.84 H	360	28.71	13.99
9	15570.00	60.3 PK	74.0	-13.7	1.51 H	308	42.00	18.30
10	15570.00	46.0 AV	54.0	-8.0	1.51 H	308	27.70	18.30

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.2 PK	74.0	-10.8	1.65 V	287	55.56	7.64
2	5150.00	50.9 AV	54.0	-3.1	1.65 V	287	43.26	7.64
3	*5190.00	100.3 PK			1.65 V	287	92.52	7.78
4	*5190.00	90.2 AV			1.65 V	287	82.42	7.78
5	5350.00	59.8 PK	74.0	-14.2	1.65 V	287	51.61	8.19
6	5350.00	48.5 AV	54.0	-5.5	1.65 V	287	40.31	8.19
7	#10380.00	57.0 PK	74.0	-17.0	1.83 V	360	43.01	13.99
8	#10380.00	41.2 AV	54.0	-12.8	1.83 V	360	27.21	13.99
9	15570.00	61.2 PK	74.0	-12.8	1.61 V	299	42.90	18.30
10	15570.00	45.7 AV	54.0	-8.3	1.61 V	299	27.40	18.30

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	111.2 PK			1.68 H	339	103.29	7.91
2	*5230.00	99.7 AV			1.68 H	339	91.79	7.91
3	5350.00	63.2 PK	74.0	-10.8	1.68 H	339	55.01	8.19
4	5350.00	51.1 AV	54.0	-2.9	1.68 H	339	42.91	8.19
5	#10460.00	57.1 PK	74.0	-16.9	1.60 H	306	43.25	13.85
6	#10460.00	43.4 AV	54.0	-10.6	1.60 H	306	29.55	13.85
7	15690.00	66.9 PK	74.0	-7.1	1.67 H	44	48.83	18.07
8	15690.00	53.3 AV	54.0	-0.7	1.67 H	44	35.23	18.07
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	105.6 PK			1.57 V	269	97.69	7.91
2	*5230.00	94.6 AV			1.57 V	269	86.69	7.91
3	5350.00	60.0 PK	74.0	-14.0	1.57 V	269	51.81	8.19
4	5350.00	48.7 AV	54.0	-5.3	1.57 V	269	40.51	8.19
5	#10460.00	56.8 PK	74.0	-17.2	1.58 V	299	42.95	13.85
6	#10460.00	42.6 AV	54.0	-11.4	1.58 V	299	28.75	13.85
7	15690.00	62.2 PK	74.0	-11.8	1.60 V	287	44.13	18.07
8	15690.00	46.4 AV	54.0	-7.6	1.60 V	287	28.33	18.07

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	68.0 PK	74.0	-6.0	1.69 H	67	58.90	9.10
2	#5715.00	52.8 AV	54.0	-1.2	1.69 H	67	43.70	9.10
3	#5725.00	75.0 PK	78.2	-3.2	1.69 H	67	65.89	9.11
4	*5755.00	108.7 PK			1.69 H	67	99.54	9.16
5	*5755.00	96.7 AV			1.69 H	67	87.54	9.16
6	11510.00	56.4 PK	74.0	-17.6	1.54 H	47	41.66	14.74
7	11510.00	43.5 AV	54.0	-10.5	1.54 H	47	28.76	14.74
8	#17265.00	61.6 PK	74.0	-12.4	1.62 H	303	39.35	22.25
9	#17265.00	46.5 AV	54.0	-7.5	1.62 H	303	24.25	22.25
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	64.6 PK	74.0	-9.4	1.66 V	291	55.50	9.10
2	#5715.00	49.7 AV	54.0	-4.3	1.66 V	291	40.60	9.10
3	#5725.00	72.3 PK	78.2	-5.9	1.66 V	291	63.19	9.11
4	*5755.00	103.5 PK			1.66 V	291	94.34	9.16
5	*5755.00	92.3 AV			1.66 V	291	83.14	9.16
6	11510.00	55.5 PK	74.0	-18.5	2.43 V	323	40.76	14.74
7	11510.00	42.7 AV	54.0	-11.3	2.43 V	323	27.96	14.74
8	#17265.00	61.1 PK	74.0	-12.9	1.64 V	295	38.85	22.25
9	#17265.00	46.0 AV	54.0	-8.0	1.64 V	295	23.75	22.25

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	110.6 PK			1.80 H	65	101.35	9.25
2	*5795.00	98.2 AV			1.80 H	65	88.95	9.25
3	#5850.00	59.9 PK	78.2	-18.3	1.80 H	65	50.59	9.31
4	#5860.00	56.7 PK	74.0	-17.3	1.80 H	65	47.38	9.32
5	#5860.00	47.0 AV	54.0	-7.0	1.80 H	65	37.68	9.32
6	11590.00	57.1 PK	74.0	-16.9	1.54 H	47	42.25	14.85
7	11590.00	43.6 AV	54.0	-10.4	1.54 H	47	28.75	14.85
8	#17385.00	61.5 PK	74.0	-12.5	1.38 H	33	38.59	22.91
9	#17385.00	46.5 AV	54.0	-7.5	1.38 H	33	23.59	22.91
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	*5795.00	106.5 PK			2.01 V	271	97.25	9.25
2	*5795.00	93.6 AV			2.01 V	271	84.35	9.25
3	#5850.00	56.2 PK	78.2	-22.0	2.01 V	271	46.89	9.31
4	#5860.00	53.6 PK	74.0	-20.4	2.01 V	271	44.28	9.32
5	#5860.00	44.2 AV	54.0	-9.8	2.01 V	271	34.88	9.32
6	11590.00	57.5 PK	74.0	-16.5	1.74 V	360	42.65	14.85
7	11590.00	42.7 AV	54.0	-11.3	1.74 V	360	27.85	14.85
8	#17385.00	61.6 PK	74.0	-12.4	1.58 V	301	38.69	22.91
9	#17385.00	46.4 AV	54.0	-7.6	1.58 V	301	23.49	22.91

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.5 PK	74.0	-7.5	1.53 H	1	65.86	0.64
2	5150.00	53.1 AV	54.0	-0.9	1.53 H	1	52.46	0.64
3	*5210.00	103.5 PK			1.53 H	1	102.67	0.83
4	*5210.00	91.5 AV			1.53 H	1	90.67	0.83
5	#10420.00	57.2 PK	74.0	-16.8	1.57 H	39	46.14	11.06
6	#10420.00	43.7 AV	54.0	-10.3	1.57 H	39	32.64	11.06
7	15630.00	60.8 PK	74.0	-13.2	1.41 H	28	47.77	13.03
8	15630.00	46.0 AV	54.0	-8.0	1.41 H	28	32.97	13.03
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.8 PK	74.0	-15.2	2.05 V	277	58.16	0.64
2	5150.00	49.7 AV	54.0	-4.3	2.05 V	277	49.06	0.64
3	*5210.00	99.2 PK			2.05 V	277	98.37	0.83
4	*5210.00	86.9 AV			2.05 V	277	86.07	0.83
5	#10420.00	57.8 PK	74.0	-16.2	1.69 V	360	46.74	11.06
6	#10420.00	43.1 AV	54.0	-10.9	1.69 V	360	32.04	11.06
7	15630.00	61.3 PK	74.0	-12.7	1.60 V	311	48.27	13.03
8	15630.00	46.1 AV	54.0	-7.9	1.60 V	311	33.07	13.03

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	68.4 PK	74.0	-5.6	1.83 H	76	66.73	1.67
2	#5715.00	53.7 AV	54.0	-0.3	1.83 H	76	52.03	1.67
3	#5725.00	74.7 PK	78.2	-3.5	1.83 H	76	73.02	1.68
4	*5775.00	105.8 PK			1.83 H	76	104.05	1.75
5	*5775.00	94.0 AV			1.83 H	76	92.25	1.75
6	#5850.00	71.2 PK	78.2	-7.0	1.83 H	76	69.43	1.77
7	#5860.00	66.5 PK	74.0	-7.5	1.83 H	76	64.73	1.77
8	#5860.00	52.3 AV	54.0	-1.7	1.83 H	76	50.53	1.77
9	11550.00	57.4 PK	74.0	-16.6	1.60 H	37	44.99	12.41
10	11550.00	43.8 AV	54.0	-10.2	1.60 H	37	31.39	12.41
11	#17325.00	60.7 PK	74.0	-13.3	1.46 H	31	42.77	17.93
12	#17325.00	45.9 AV	54.0	-8.1	1.46 H	31	27.97	17.93

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	61.5 PK	74.0	-12.5	2.03 V	270	59.83	1.67
2	#5715.00	50.3 AV	54.0	-3.7	2.03 V	270	48.63	1.67
3	#5725.00	71.4 PK	78.2	-6.8	2.03 V	270	69.72	1.68
4	*5775.00	100.3 PK			2.03 V	270	98.55	1.75
5	*5775.00	89.2 AV			2.03 V	270	87.45	1.75
6	#5850.00	67.8 PK	78.2	-10.4	2.03 V	270	66.03	1.77
7	#5860.00	59.3 PK	74.0	-14.7	2.03 V	270	57.53	1.77
8	#5860.00	48.0 AV	54.0	-6.0	2.03 V	270	46.23	1.77
9	11550.00	58.1 PK	74.0	-15.9	1.73 V	360	45.69	12.41
10	11550.00	43.1 AV	54.0	-10.9	1.73 V	360	30.69	12.41
11	#17325.00	61.0 PK	74.0	-13.0	1.62 V	325	43.07	17.93
12	#17325.00	46.0 AV	54.0	-8.0	1.62 V	325	28.07	17.93

REMARKS:

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

Below 1GHz Data:

802.11n (HT40)

CHANNEL	TX Channel 159	**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	185.99	33.8 QP	43.5	-9.7	1.00 H	115	49.65	-15.82
2	299.32	37.6 QP	46.0	-8.4	1.00 H	38	50.21	-12.60
3	432.34	35.3 QP	46.0	-10.7	1.50 H	40	44.18	-8.92
4	550.01	36.7 QP	46.0	-9.3	1.40 H	202	43.45	-6.77
5	707.89	35.8 QP	46.0	-10.2	1.00 H	144	39.50	-3.72
6	921.63	41.4 QP	46.0	-4.6	1.00 H	180	41.62	-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	135.99	35.3 QP	43.5	-8.2	1.50 V	243	49.52	-14.24
2	299.32	33.7 QP	46.0	-12.3	1.50 V	260	46.33	-12.60
3	432.78	31.6 QP	46.0	-14.4	1.00 V	209	40.46	-8.90
4	600.01	32.1 QP	46.0	-13.9	1.00 V	138	37.25	-5.11
5	667.02	35.7 QP	46.0	-10.3	1.50 V	206	40.03	-4.33
6	921.62	41.8 QP	46.0	-4.2	1.00 V	50	41.96	-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:

802.11n (HT40)

CHANNEL	TX Channel 159	**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	155.71	33.6 QP	43.5	-9.9	1.50 H	264	46.56	-12.95
2	235.83	33.3 QP	46.0	-12.7	1.50 H	279	48.24	-14.97
3	550.02	34.4 QP	46.0	-11.6	1.50 H	58	41.14	-6.77
4	650.02	35.6 QP	46.0	-10.4	1.50 H	174	39.89	-4.30
5	700.03	33.4 QP	46.0	-12.6	1.50 H	360	37.09	-3.73
6	921.62	41.0 QP	46.0	-5.0	1.50 H	223	41.16	-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	66.13	36.6 QP	40.0	-3.4	1.00 V	353	51.22	-14.62
2	148.15	30.8 QP	43.5	-12.7	1.00 V	322	44.28	-13.51
3	303.98	30.6 QP	46.0	-15.4	1.50 V	119	43.08	-12.44
4	550.02	32.0 QP	46.0	-14.0	1.00 V	320	38.77	-6.77
5	650.02	32.2 QP	46.0	-13.8	1.00 V	251	36.52	-4.30
6	921.62	39.9 QP	46.0	-6.1	1.00 V	72	40.12	-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.

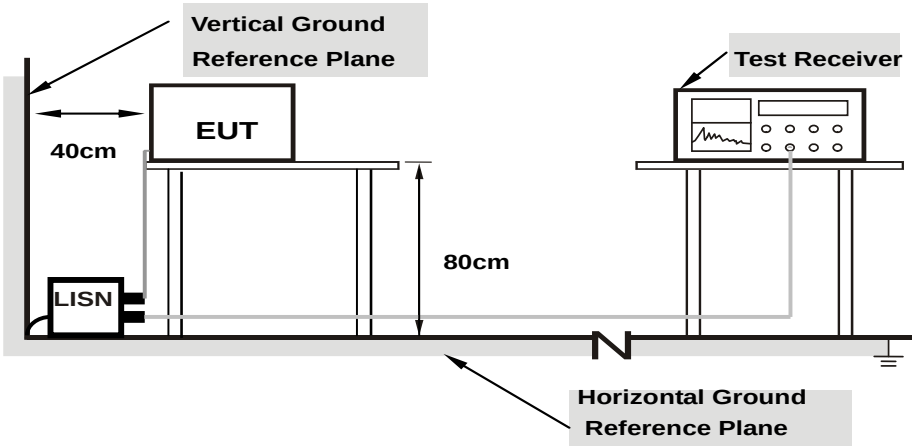
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

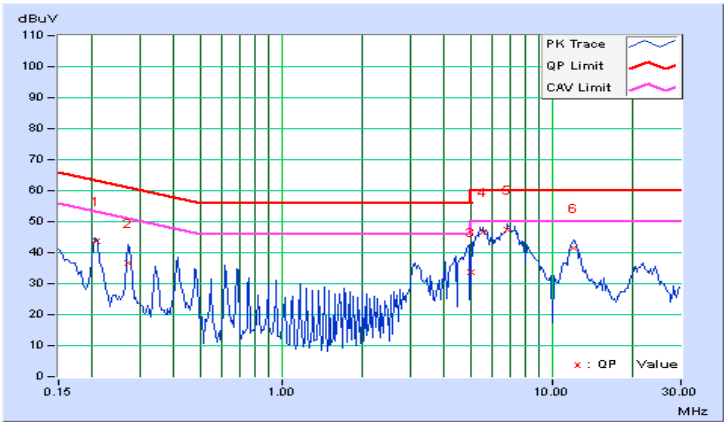
4.2.7 Test Results (Mode 1)

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.20606	0.12	43.45	36.66	43.57	36.78	63.36	53.36	-19.79	-16.58
2	0.27109	0.13	36.68	29.86	36.81	29.99	61.08	51.08	-24.28	-21.10
3	5.00000	0.32	33.29	27.98	33.61	28.30	56.00	46.00	-22.39	-17.70
4	5.55859	0.34	46.27	43.80	46.61	44.14	60.00	50.00	-13.39	-5.86
5	6.86150	0.39	46.96	43.67	47.35	44.06	60.00	50.00	-12.65	-5.94
6	12.01531	0.58	40.92	37.77	41.50	38.35	60.00	50.00	-18.50	-11.65

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

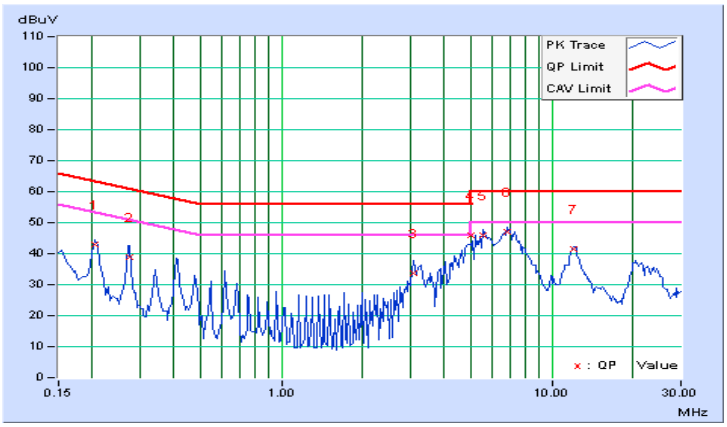


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.20469	0.10	42.85	35.63	42.95	35.73	63.42	53.42	-20.47	-17.69
2	0.27497	0.11	38.75	33.20	38.86	33.31	60.97	50.97	-22.11	-17.66
3	3.08203	0.25	33.46	26.14	33.71	26.39	56.00	46.00	-22.29	-19.61
4	5.00000	0.33	45.52	32.38	45.85	32.71	56.00	46.00	-10.15	-13.29
5	5.54297	0.35	45.72	43.87	46.07	44.22	60.00	50.00	-13.93	-5.78
6	**6.84409**	**0.40**	**46.59**	**44.11**	**46.99**	**44.51**	**60.00**	**50.00**	**-13.01**	**-5.49**
7	11.99816	0.59	40.99	37.65	41.58	38.24	60.00	50.00	-18.42	-11.76

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



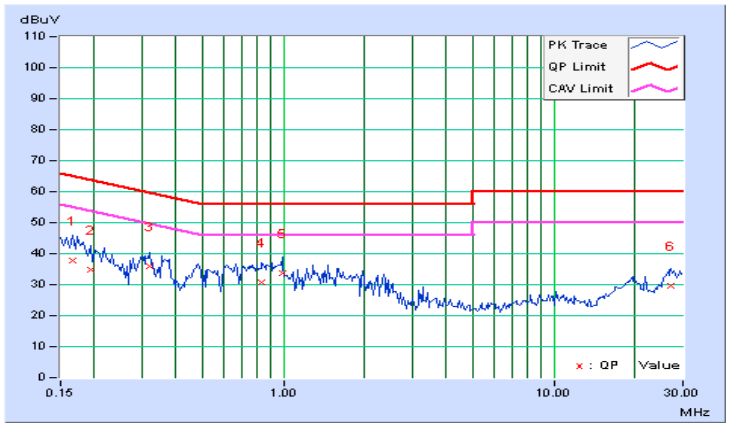
4.2.8 Test Results (Mode 2)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.11	37.77	22.66	37.88	22.77	65.18	55.18	-27.29	-32.40
2	0.19297	0.12	34.72	19.83	34.84	19.95	63.91	53.91	-29.07	-33.96
3	0.32188	0.13	35.62	29.64	35.75	29.77	59.66	49.66	-23.91	-19.89
4	0.82969	0.16	30.74	20.36	30.90	20.52	56.00	46.00	-25.10	-25.48
5	0.99375	0.17	33.43	23.37	33.60	23.54	56.00	46.00	-22.40	-22.46
6	26.98828	1.04	28.63	23.69	29.67	24.73	60.00	50.00	-30.33	-25.27

REMARKS:

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

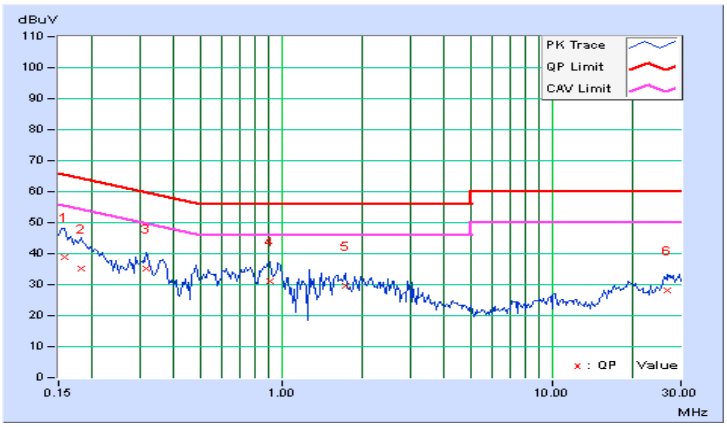


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.09	38.71	27.05	38.80	27.14	65.58	55.58	-26.78	-28.44
2	0.18125	0.10	35.08	15.41	35.18	15.51	64.43	54.43	-29.25	-38.92
3	0.31797	0.11	35.26	29.17	35.37	29.28	59.76	49.76	-24.39	-20.48
4	0.91172	0.15	31.11	22.60	31.26	22.75	56.00	46.00	-24.74	-23.25
5	1.72266	0.20	29.40	21.79	29.60	21.99	56.00	46.00	-26.40	-24.01
6	26.77734	1.05	27.08	22.35	28.13	23.40	60.00	50.00	-31.87	-26.60

REMARKS:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

POWER OUTPUT:

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.79	21.25	253.302	24.04	30	Pass
40	5200	20.75	20.94	243.015	23.86	30	Pass
48	5240	21.15	21.18	261.537	24.18	30	Pass
149	5745	22.14	21.67	310.575	24.92	30	Pass
157	5785	21.67	21.53	289.126	24.61	30	Pass
165	5825	21.44	21.58	283.196	24.52	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.82	21.30	255.677	24.08	30	Pass
40	5200	21.14	21.66	276.572	24.42	30	Pass
48	5240	21.62	21.71	293.463	24.68	30	Pass
149	5745	22.28	21.88	323.214	25.09	30	Pass
157	5785	21.66	21.48	287.16	24.58	30	Pass
165	5825	21.65	21.52	288.124	24.60	30	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	18.19	18.61	138.528	21.42	30	Pass
46	5230	21.20	21.12	261.246	24.17	30	Pass
151	5755	19.30	19.36	171.412	22.34	30	Pass
159	5795	22.01	22.36	331.042	25.20	30	Pass

802.11ac (VHT80)

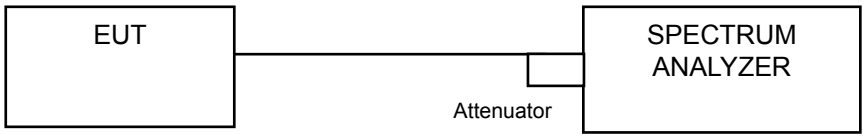
Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	14.64	15.10	61.466	17.89	30	Pass
155	5775	17.42	17.23	108.053	20.34	30	Pass

4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

For 802.11a & 802.11n (HT20):

Using method SA-1

For U-NII-1 band:

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

For U-NII-3 band:

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

For 802.11n (HT40), 11ac(VHT80):

Using method SA-2

For U-NII-1 band:

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

For U-NII-3 band:

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-1 Band

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
36	5180	6.70	6.73	9.73	17	Pass
40	5200	6.72	6.64	9.69	17	Pass
48	5240	7.09	7.59	10.36	17	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 doesn't reduced.

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm)		Total Power Density (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
36	5180	6.32	5.99	9.17	17	PASS
40	5200	6.76	6.88	9.83	17	PASS
48	5240	7.13	7.75	10.46	17	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 doesn't reduced.

802.11n (HT40)

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				
38	5190	0.76	0.81	0.11	3.91	17	Pass
46	5230	3.54	4.22	0.11	7.01	17	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 doesn't reduced.

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

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				
42	5210	-4.10	-4.92	0.23	-1.24	17	PASS

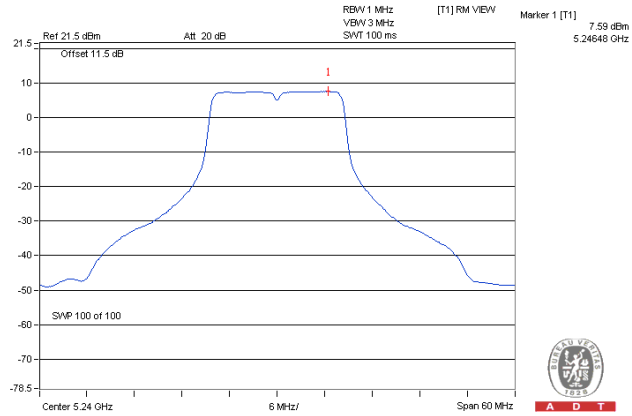
NOTE: 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit doesn't reduced.

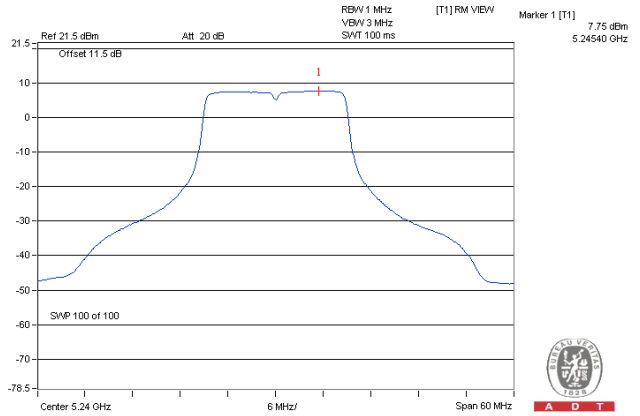
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

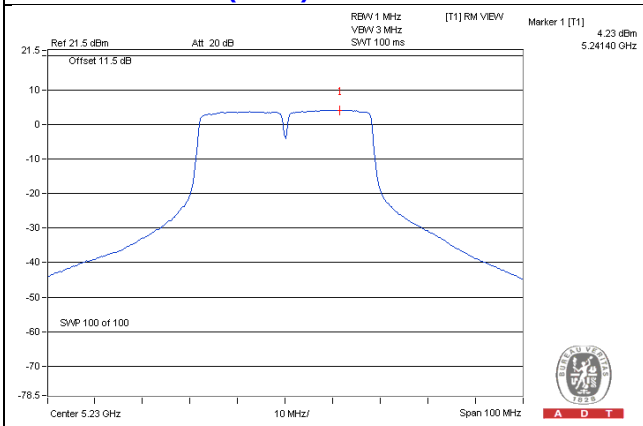
802.11a – Chain 1: CH 48



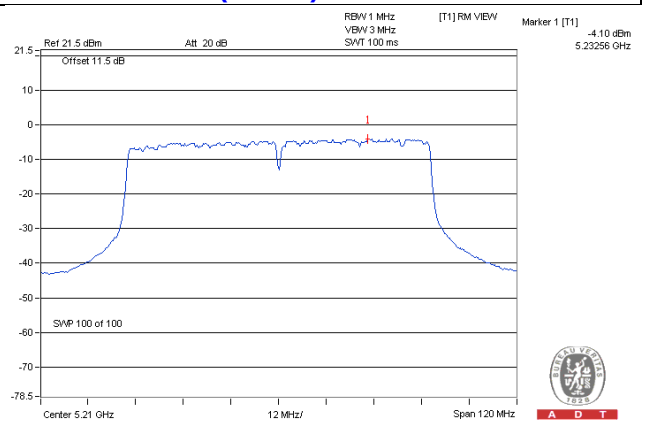
802.11n (HT20) – Chain 1: CH 48



802.11n (HT40) – Chain 1: CH 46



802.11ac (VHT80) – Chain 0: CH 42



For U-NII-3 Band

802.11a

TX chain	Channel	Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-0.31	1.91	3.01	4.92	30	Pass
	157	5785	-0.85	1.37	3.01	4.38	30	Pass
	165	5825	-1.10	1.12	3.01	4.13	30	Pass
1	149	5745	0.55	2.77	3.01	5.78	30	Pass
	157	5785	-0.12	2.10	3.01	5.11	30	Pass
	165	5825	-0.75	1.47	3.01	4.48	30	Pass

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit doesn't reduced.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-0.36	1.86	3.01	4.87	30	Pass
	157	5785	-1.41	0.81	3.01	3.82	30	Pass
	165	5825	-1.30	0.92	3.01	3.93	30	Pass
1	149	5745	0.17	2.39	3.01	5.40	30	Pass
	157	5785	-0.52	1.70	3.01	4.71	30	Pass
	165	5825	-1.13	1.09	3.01	4.10	30	Pass

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit doesn't reduced.

802.11n (HT40)

TX Chain	Channel	FrequencY (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-6.19	-3.97	3.01	0.11	-0.85	30	Pass
	159	5795	-3.76	-1.54	3.01	0.11	1.58	30	Pass
1	151	5755	-5.82	-3.60	3.01	0.11	-0.48	30	Pass
	159	5795	-3.30	-1.08	3.01	0.11	2.04	30	Pass

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit doesn't reduced.

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

802.11ac (VHT80)

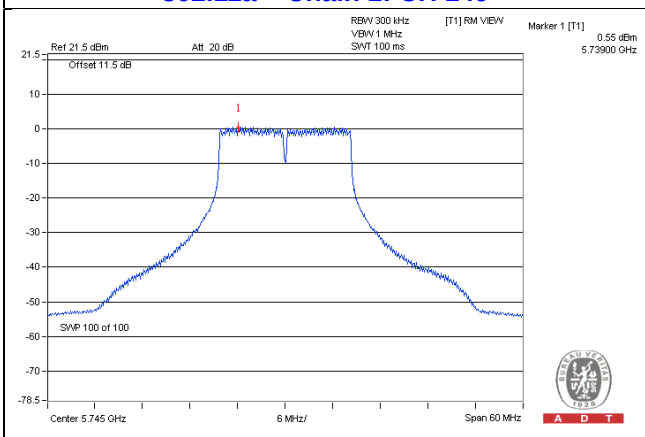
TX Chain	Channel	FrequencY (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-10.94	-8.72	3.01	0.23	-5.48	30	Pass
1	155	5775	-10.63	-8.41	3.01	0.23	-5.17	30	Pass

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.66dBi < 6dBi, so the power density limit doesn't reduced.

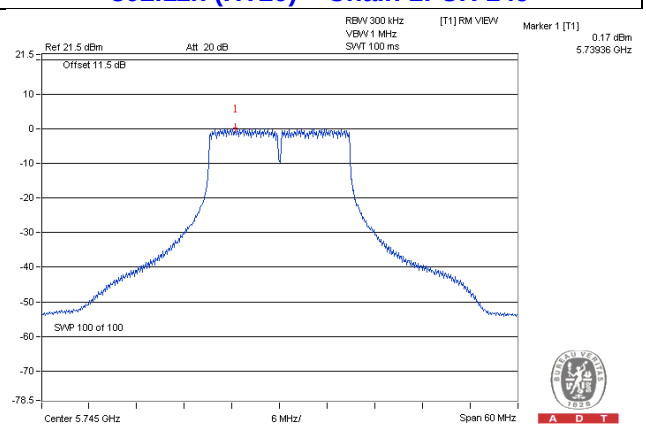
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

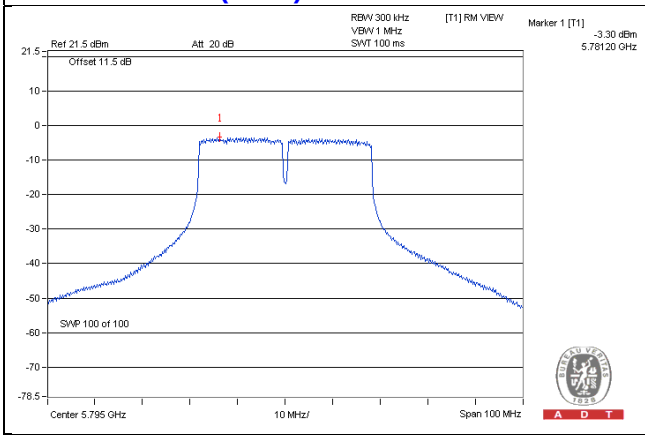
802.11a – Chain 1: CH 149



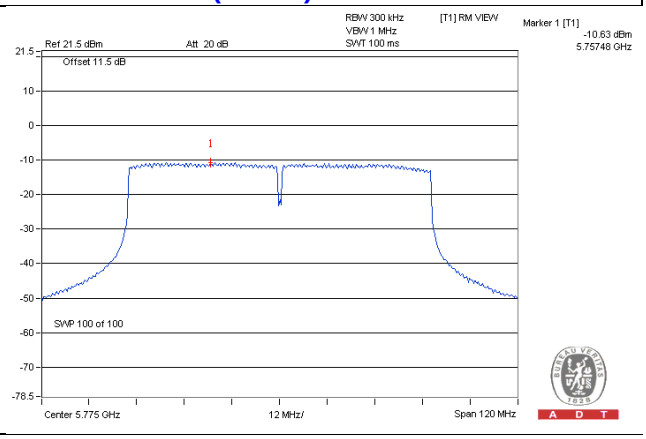
802.11n (HT20) – Chain 1: CH 149



802.11n (HT40) – Chain 1: CH 159



802.11ac (VHT80) – Chain 1: CH 155

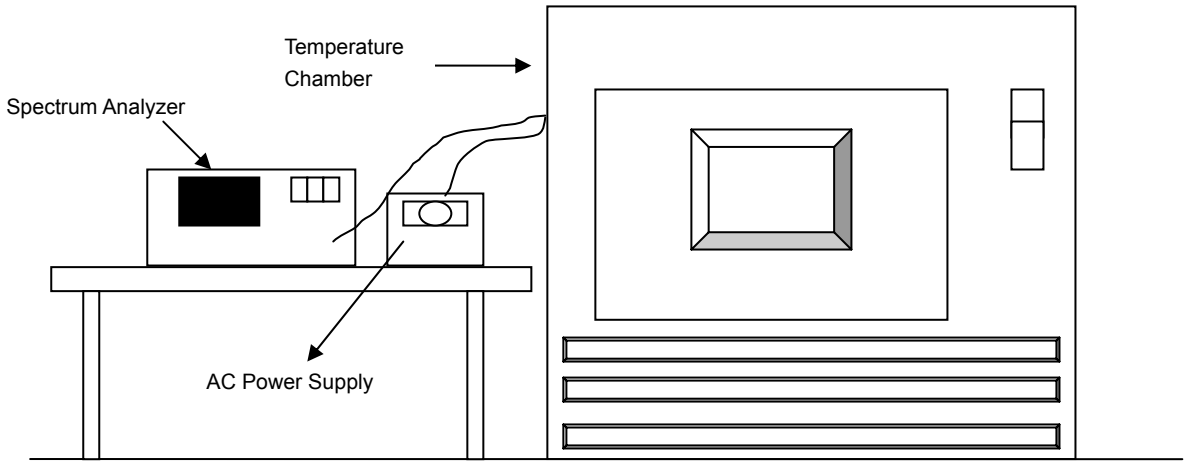


4.5 Frequency Stability Measurement

4.5.1 Limits of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5180MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5179.9961	-0.00008	5179.9958	-0.00008	5179.9931	-0.00013	5179.9953	-0.00009
40	120	5180.0237	0.00046	5180.0233	0.00045	5180.0242	0.00047	5180.0266	0.00051
30	120	5180.0136	0.00026	5180.0104	0.00020	5180.0105	0.00020	5180.0131	0.00025
20	120	5179.9848	-0.00029	5179.9859	-0.00027	5179.9857	-0.00028	5179.984	-0.00031
10	120	5180.006	0.00012	5180.0058	0.00011	5180.0105	0.00020	5180.0077	0.00015
0	120	5179.9963	-0.00007	5179.9953	-0.00009	5179.995	-0.00010	5179.9948	-0.00010
-10	120	5180.0232	0.00045	5180.027	0.00052	5180.0242	0.00047	5180.0237	0.00046
-20	120	5179.9818	-0.00035	5179.9801	-0.00038	5179.9817	-0.00035	5179.9796	-0.00039
-30	120	5180.0083	0.00016	5180.0084	0.00016	5180.0123	0.00024	5180.0125	0.00024

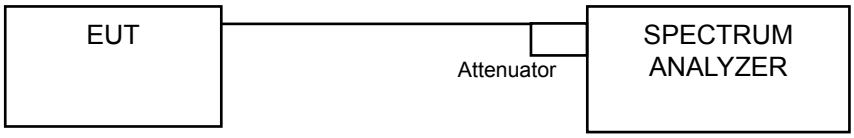
FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9838	-0.00031	5179.9868	-0.00025	5179.9848	-0.00029	5179.984	-0.00031
	120	5179.9848	-0.00029	5179.9859	-0.00027	5179.9857	-0.00028	5179.984	-0.00031
	102	5179.9852	-0.00029	5179.9858	-0.00027	5179.9866	-0.00026	5179.9843	-0.00030

4.6 6dB Bandwidth Measurment

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.41	16.38	0.5	Pass
157	5785	16.42	16.41	0.5	Pass
165	5825	16.40	16.41	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.65	17.65	0.5	PASS
157	5785	17.62	17.63	0.5	PASS
165	5825	17.64	17.61	0.5	PASS

802.11n (HT40)

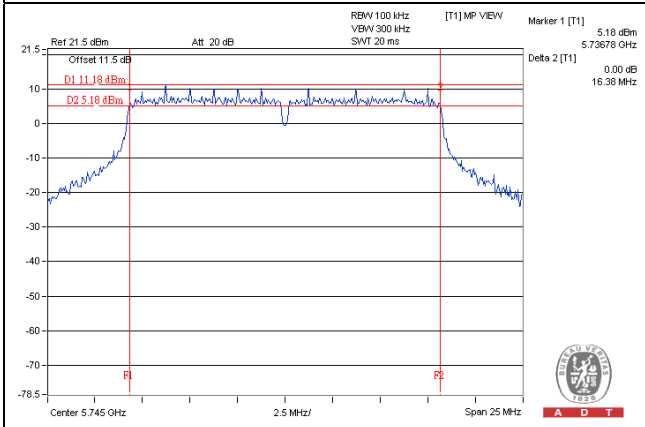
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.44	36.44	0.5	PASS
159	5795	36.43	36.19	0.5	PASS

802.11ac (VHT80)

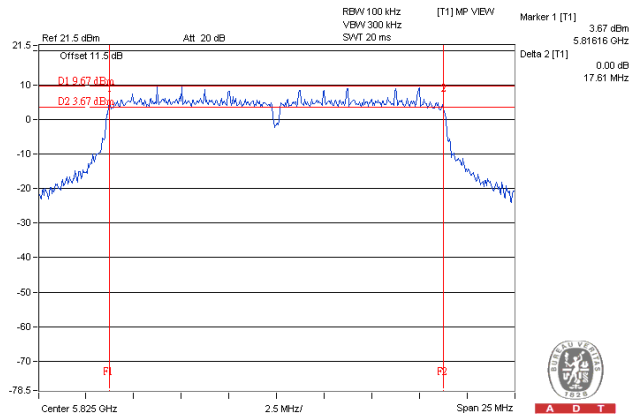
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	75.88	75.48	0.5	PASS

Spectrum Plot of Worst Value

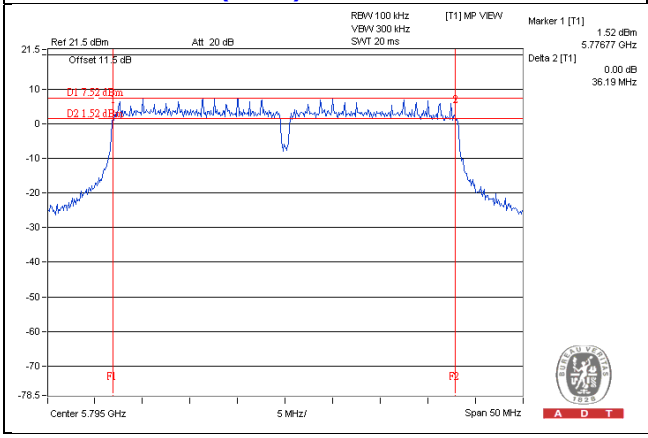
802.11a – Chain 1: CH 149



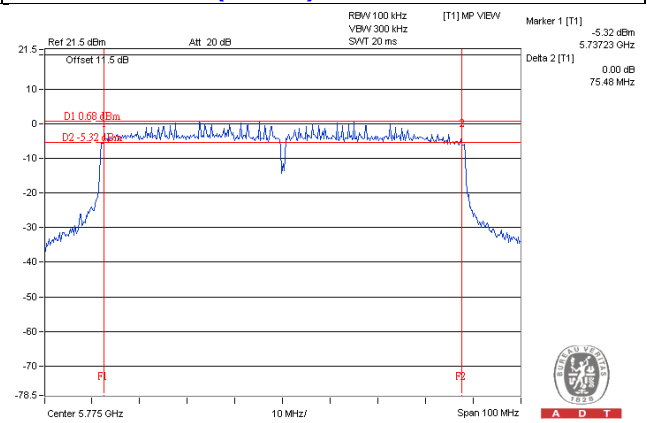
802.11n (HT20) – Chain 1: CH 165



802.11n (HT40) – Chain 1: CH 159



802.11ac (VHT80) – Chain 1: CH 155



4.7 Occupied 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

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.

4.7.4 Deviation from Test Standard

No deviation.

4.7.5 EUT Operating Conditions

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

4.7.6 Test Results

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.80	16.92
40	5200	16.68	16.92
48	5240	16.68	16.80
149	5745	16.68	16.92
157	5785	16.80	16.92
165	5825	16.68	16.92

802.11n (HT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.88	17.88
40	5200	18.00	17.88
48	5240	17.88	18.00
149	5745	18.00	17.88
157	5785	17.88	17.88
165	5825	17.88	18.00

802.11n (HT40)

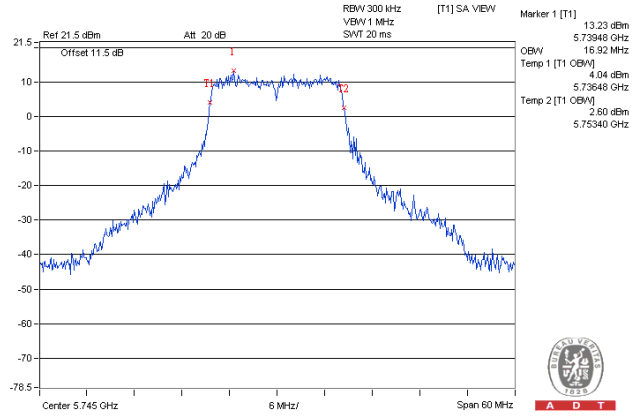
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.60	36.80
46	5230	36.80	36.60
151	5755	36.60	36.80
159	5795	36.80	36.80

802.11ac (VHT80)

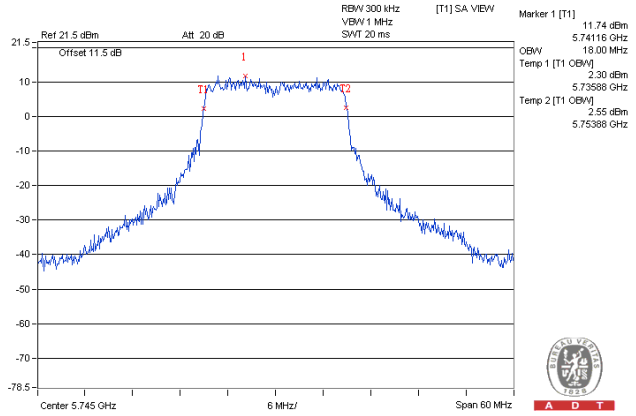
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	75.84
155	5775	76.08	76.08

Spectrum Plot of Worst Value

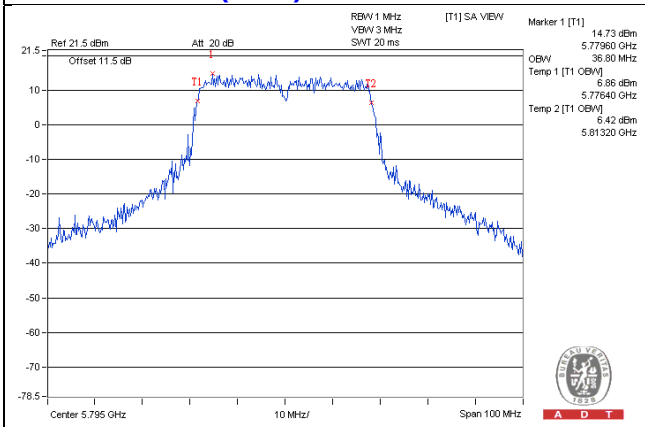
802.11a – Chain 1: CH 149



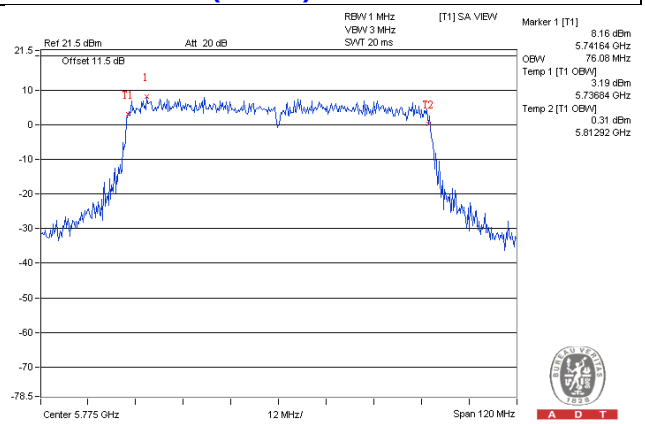
802.11n (HT20) – Chain 0: CH 149



802.11n (HT40) – Chain 1: CH 159

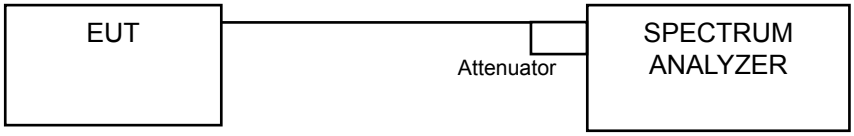


802.11ac (VHT80) – Chain 0: CH 155



4.8 26dB Bandwidth Measurment

4.8.1 Test Setup



4.8.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.8.3 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%.

4.8.4 Deviation from Test Standard

No deviation.

4.8.5 EUT Operating Condition

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

4.8.6 Test Results

802.11a

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	23.69	22.96
40	5200	23.17	22.78
48	5240	23.12	22.70
149	5745	22.61	22.95
157	5785	23.17	22.23
165	5825	22.90	22.65

802.11n (HT20)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	24.92	23.75
40	5200	25.21	23.77
48	5240	23.51	24.19
149	5745	23.51	24.09
157	5785	23.76	23.60
165	5825	24.29	23.74

802.11n (HT40)

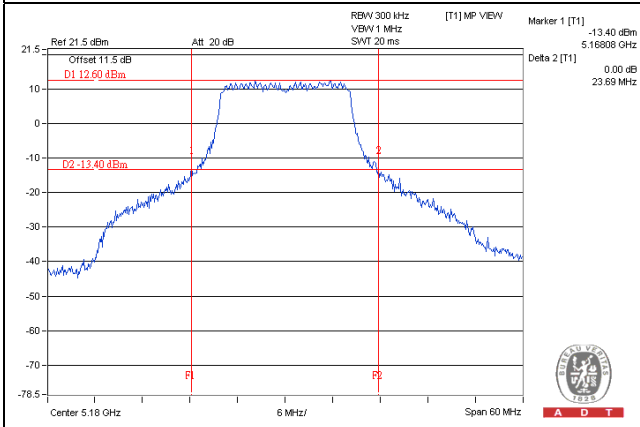
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	46.19	46.43
46	5230	46.45	48.30
151	5755	45.38	46.24
159	5795	46.34	44.79

802.11ac (VHT80)

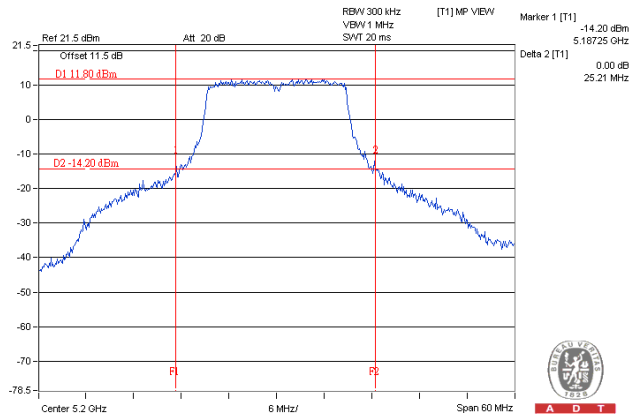
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	84.86	82.74
155	5775	88.23	89.08

Spectrum Plot of Worst Value

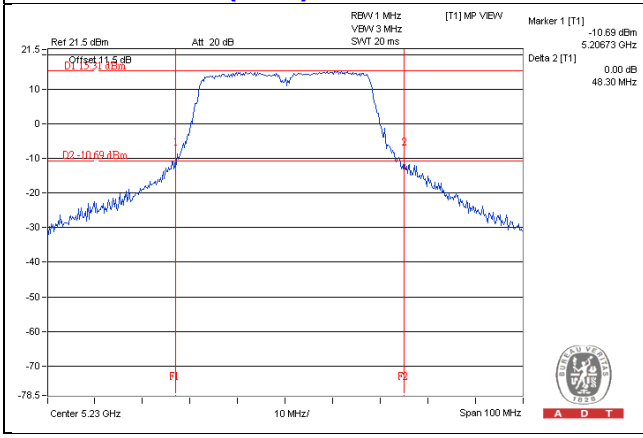
802.11a – Chain 0: CH 36



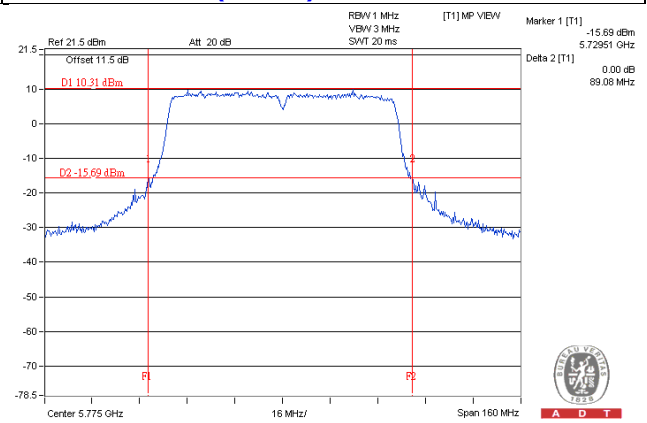
802.11n (HT20) – Chain 0: CH 40



802.11n (HT40) – Chain 1: CH 46



802.11ac (VHT80) – Chain 1: CH 155



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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Fax: 886-2-26051924

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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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