

FCC Test Report

Report No.: RF180918C24-1

FCC ID: RYK-WPET236ACNBT

Test Model: WPET-236ACN(BT)

Received Date: Sep. 18, 2018

Test Date: Oct. 24 ~ Nov. 06, 2018

Issued Date: Nov. 29, 2018

Applicant: SparkLAN Communications, Inc.

Address: 8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493, Taiwan (R.O.C.)

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

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

**FCC Registration /
Designation Number:** 788550 / TW0003



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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	7
3.2 Description of Test Modes	9
3.2.1 Test Mode Applicability and Tested Channel Detail	11
3.3 Duty Cycle of Test Signal	13
3.4 Description of Support Units	14
3.4.1 Configuration of System under Test	14
3.5 General Description of Applied Standards	14
4 Test Types and Results	15
4.1 Radiated Emission and Bandedge Measurement.....	15
4.1.1 Limits of Radiated Emission and Bandedge Measurement	15
4.1.2 Test Instruments	16
4.1.3 Test Procedures.....	17
4.1.4 Deviation from Test Standard	18
4.1.5 Test Setup.....	18
4.1.6 EUT Operating Conditions.....	19
4.1.7 Test Results	20
4.2 Conducted Emission Measurement	60
4.2.1 Limits of Conducted Emission Measurement	60
4.2.2 Test Instruments	60
4.2.3 Test Procedures.....	61
4.2.4 Deviation from Test Standard	61
4.2.5 Test Setup.....	61
4.2.6 EUT Operating Conditions.....	61
4.2.7 Test Results	62
4.3 Transmit Power Measurement	64
4.3.1 Limits of Transmit Power Measurement	64
4.3.2 Test Setup.....	64
4.3.3 Test Instruments	65
4.3.4 Test Procedure	65
4.3.5 Deviation from Test Standard	65
4.3.6 EUT Operating Conditions.....	65
4.3.7 Test Result.....	66
4.4 Occupied Bandwidth Measurement	73
4.4.1 Test Setup.....	73
4.4.2 Test Instruments	73
4.4.3 Test Procedure	73
4.4.4 Test Result.....	74
4.5 Peak Power Spectral Density Measurement	77
4.5.1 Limits of Peak Power Spectral Density Measurement	77
4.5.2 Test Setup.....	77
4.5.3 Test Instruments	77
4.5.4 Test Procedures.....	78
4.5.5 Deviation from Test Standard	78
4.5.6 EUT Operating Conditions.....	78
4.5.7 Test Results	79
4.6 Frequency Stability.....	84
4.6.1 Limits of Frequency Stability Measurement	84

4.6.2	Test Setup	84
4.6.3	Test Instruments	84
4.6.4	Test Procedure	84
4.6.5	Deviation from Test Standard	85
4.6.6	EUT Operating Condition	85
4.6.7	Test Results	85
4.7	6dB Bandwidth Measurement	86
4.7.1	Limits of 6dB Bandwidth Measurement	86
4.7.2	Test Setup	86
4.7.3	Test Instruments	86
4.7.4	Test Procedure	86
4.7.5	Deviation from Test Standard	86
4.7.6	EUT Operating Condition	86
4.7.7	Test Results	87
5	Pictures of Test Arrangements	89
	Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)	90
	Appendix – Information on the Testing Laboratories	93

Release Control Record

Issue No.	Description	Date Issued
RF180918C24-1	Original release.	Nov. 29, 2018

1 Certificate of Conformity

Product: 802.11ac/a/b/g/n 2T2R Wi-Fi + Bluetooth 4.2 Half Mini PCIe Module

Brand: SparkLAN

Test Model: WPET-236ACN(BT)

Sample Status: R&D sample

Applicant: SparkLAN Communications, Inc.

Test Date: Oct. 24 ~ Nov. 06, 2018

Standards: 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 RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen, **Date:** Nov. 29, 2018
Pettie Chen / Senior Specialist

Approved by : Bruce Chen, **Date:** Nov. 29, 2018
Bruce Chen / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -17.17dB at 0.64702MHz.
15.407(b)(1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.5dB at 5350.00, 5470.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit.
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connectors are IPEX MHF I at modular side & RP-SMA (M) at antenna side not standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.

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	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~ 1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	802.11ac/a/b/g/n 2T2R Wi-Fi + Bluetooth 4.2 Half Mini PCIe Module
Brand	SparkLAN
Test Model	WPET-236ACN(BT)
Sample Status	R&D sample
Power Supply Rating	3.3Vdc (host)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300.0Mbps 802.11ac: up to 867Mbps
Operating Frequency	5180~5240MHz, 5260~5320MHz, 5500~5700MHz, 5745~5825MHz
Number of Channel	5180~5240MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5260~5320MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5500~5700MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 11 802.11n (HT40), 802.11ac (VHT40): 5 802.11ac (VHT80): 2 5745~5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
Output Power	5180~5240MHz: 43.976mW 5260~5320MHz: 43.310mW 5500~5700MHz: 43.514mW 5745~5825MHz: 44.163mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Antenna
Cable Supplied	NA

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers. Chain 0 is the fixed chain at 802.11a.

Modulation Mode	TX Function
802.11a	1TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX
802.11ac (VHT20)	2TX
802.11ac (VHT40)	2TX
802.11ac (VHT80)	2TX

* The modulation and bandwidth are similar for HT20/HT40 on 802.11n mode and VHT20/VHT40 on 802.11ac mode, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

2. The EUT uses following antenna.

No.	Transmitter Circuit	Brand	Model	Antenna Type	2.4G gain with cable loss (dBi)	5G gain with cable loss (dBi)	Connector Type
1	Chain(0) Chain(1)	Sparklan	AD-301N	Dipole	4.4	B1&2: 5.2 B3&4: 5.8	IPEX MHF I at modular side & RP-SMA (M) at antenna side
2	Chain(0) Chain(1)	Sparklan	AD-103AG	Dipole	2.02	B1&2: 1.93 B3&4: 2.03	
3	Chain(0) Chain(1)	Sparklan	AD-305N	Dipole	5.0	5.0	
4	Chain(0) Chain(1)	Sparklan	AD-303N	Dipole	3.0	3.0	
5	Chain(0) Chain(1)	Sparklan	AD-302N	Dipole	3.0	2.0	

* The 5dBi with 2.4GHz max. gain is chosen for final tests.
The 5.8dBi with 5GHz max. gain is chosen for final tests.

3. 2.4GHz & 5GHz technologies cannot transmit at same time.
WLAN & BT technologies cannot transmit at same time

3.2 Description of Test Modes

5180~5240MHz:

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210 MHz

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 (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290 MHz

5500~5700MHz:

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz

5745~5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where RE $\geq$ 1G: Radiated Emission above 1GHz & Bandedge Measurement

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)	Remark
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0	-
	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	7.2	-
	802.11n (HT40)		38 to 46	38, 46	OFDM	15.0	-
	802.11ac (VHT80)		42	42	OFDM	65.0	-
	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0	-
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	7.2	-
	802.11n (HT40)		54 to 62	54, 62	OFDM	15.0	-
	802.11ac (VHT80)		58	58	OFDM	65.0	-
	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0	-
	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	7.2	-
	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	15.0	-
	802.11ac (VHT80)		106 to 122	106, 122	OFDM	65.0	-
	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0	-
	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	7.2	-
	802.11n (HT40)		151 to 159	151, 159	OFDM	15.0	-
	802.11ac (VHT80)		155	155	OFDM	65.0	-

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)	Remark
-	802.11n (HT40)	5180-5240	36 to 48	38	OFDM	7.2	-
		5260-5320	52 to 64		OFDM	7.2	-
		5500-5700	100 to 140		OFDM	7.2	-
		5745-5825	149 to 165		OFDM	7.2	-

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)	Remark
-	802.11n (HT40)	5180-5240	36 to 48	38	OFDM	7.2	-
		5260-5320	52 to 64		OFDM	7.2	-
		5500-5700	100 to 140		OFDM	7.2	-
		5745-5825	149 to 165		OFDM	7.2	-

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)	Remark
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0	-
	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	7.2	-
	802.11n (HT40)		38 to 46	38, 46	OFDM	15.0	-
	802.11ac (VHT80)		42	42	OFDM	65.0	-
	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0	-
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	7.2	-
	802.11n (HT40)		54 to 62	54, 62	OFDM	15.0	-
	802.11ac (VHT80)		58	58	OFDM	65.0	-
	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0	-
	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	7.2	-
	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	15.0	-
	802.11ac (VHT80)		106 to 122	106, 122	OFDM	65.0	-
	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0	-
	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	7.2	-
	802.11n (HT40)		151 to 159	151, 159	OFDM	15.0	-
	802.11ac (VHT80)		155	155	OFDM	65.0	-

Test Condition:

Applicable to	Environmental Conditions	Input Power (system)	Tested by
RE $\geq$ 1G	22deg. C, 64%RH	120Vac, 60Hz	Adair Peng
RE<1G	22deg. C, 64%RH	120Vac, 60Hz	Adair Peng
PLC	22deg. C, 66%RH	120Vac, 60Hz	Adair Peng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Alan Wu

3.3 Duty Cycle of Test Signal

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

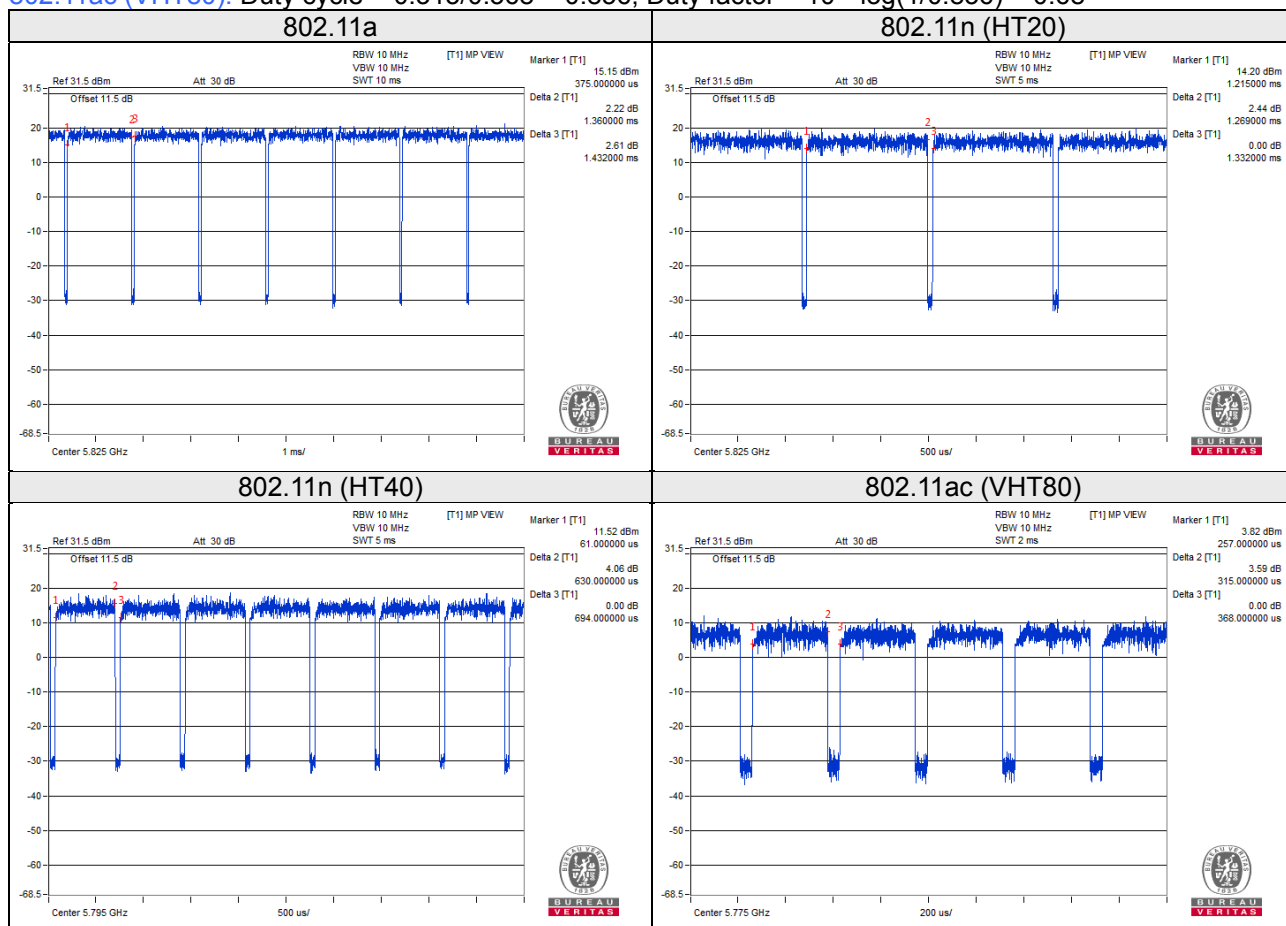
Duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = $1.36/1.432 = 0.95$, Duty factor = $10 * \log(1/0.95) = 0.22$

802.11n (HT20): Duty cycle = $1.269/1.332 = 0.953$, Duty factor = $10 * \log(1/0.953) = 0.21$

802.11n (HT40): Duty cycle = $0.630/0.694 = 0.908$, Duty factor = $10 * \log(1/0.908) = 0.42$

802.11ac (VHT80): Duty cycle = $0.315/0.368 = 0.856$, Duty factor = $10 * \log(1/0.856) = 0.68$



3.4 Description of Support Units

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

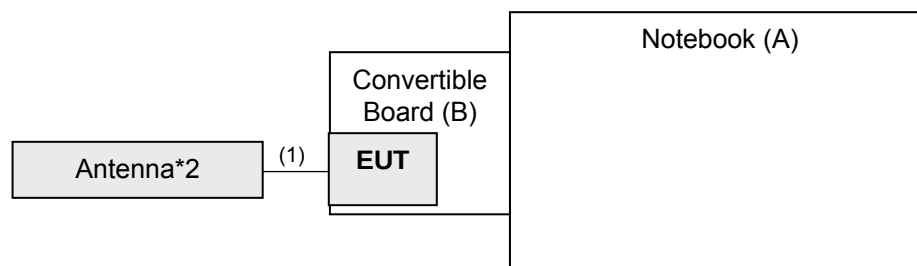
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5420	BPQ7MQ1	FCC DoC Approved	-
B.	Convertible Board	NA	NA	NA	NA	-

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Antenna cable	2	0.15	N	0	Provided by manufacturer

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart E (15.407)

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

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 v02r01			Field Strength at 3m	
			PK: 74 (dBµV/m)	AV: 54 (dBµV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)		PK: -27 (dBm/MHz)	PK: 68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☒	15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2(dBµV/m) ^{*1} PK: 105.2 (dBµV/m) ^{*2} PK: 110.8(dBµV/m) ^{*3} PK: 122.2 (dBµV/m) ^{*4}
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.			^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.			^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

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

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 29, 2018	May 28, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 11, 2017	Dec. 10, 2018
HORN Antenna SCHWARZBECK	9120D	209	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 2018
Loop Antenna EMCI	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 21, 2018	Aug. 20, 2019
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Apr. 03, 2018	Apr. 02, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 21, 2018	Aug. 20, 2019
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-S M-8000	Cable-CH3-03 (309224+170907)	Aug. 21, 2018	Aug. 20, 2019
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
USB Wideband Power Meter (Including Power Sensor) KEYSIGHT	U2021XA	MY55050005/MY5519 0004/MY55190007/MY 55210005	Jul. 17, 2018	Jul. 16, 2019

- 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 HwaYa Chamber 3.
 3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
 5. The IC Site Registration No. is IC 7450F-3.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case 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.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 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:

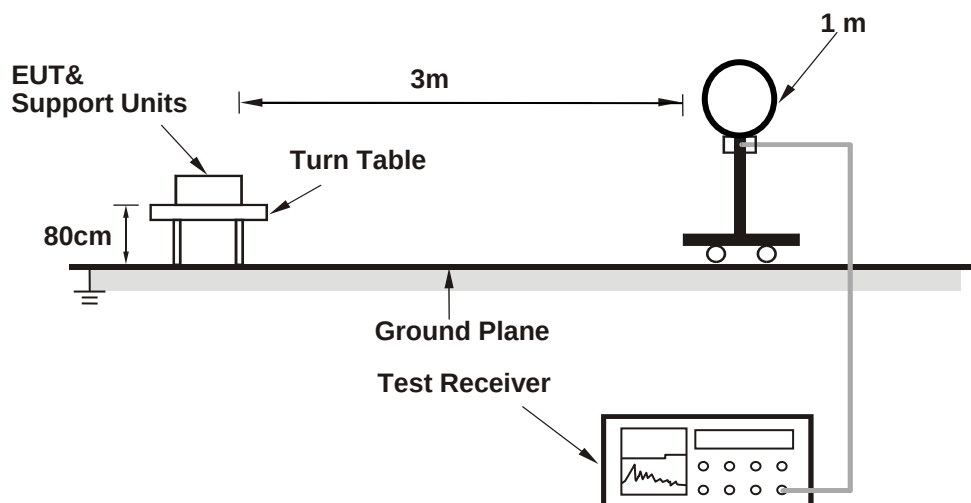
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

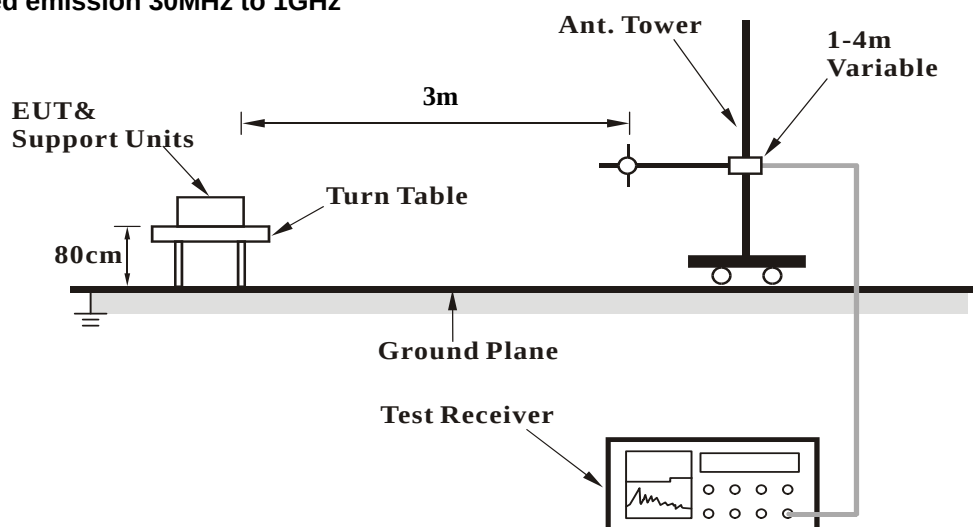
No deviation.

4.1.5 Test Setup

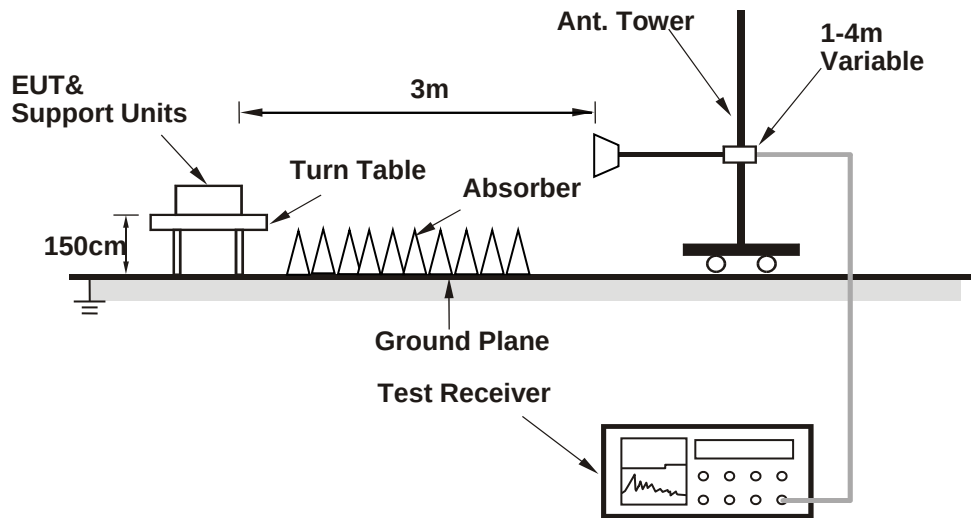
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

- a. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.0 PK	74.0	-19.0	3.03 H	122	51.5	3.5
2	5150.00	41.4 AV	54.0	-12.6	3.03 H	122	37.9	3.5
3	*5180.00	92.4 PK			2.93 H	118	53.2	39.2
4	*5180.00	82.9 AV			2.93 H	118	43.7	39.2
5	#10360.00	55.9 PK	68.2	-12.3	2.28 H	335	40.5	15.4
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	59.0 PK	74.0	-15.0	1.54 V	255	55.5	3.5
2	5150.00	44.0 AV	54.0	-10.0	1.54 V	255	40.5	3.5
3	*5180.00	105.0 PK			1.79 V	258	65.8	39.2
4	*5180.00	95.9 AV			1.79 V	258	56.7	39.2
5	#10360.00	57.2 PK	68.2	-11.0	2.57 V	155	41.8	15.4

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	91.5 PK			2.32 H	65	52.2	39.3
2	*5200.00	82.5 AV			2.32 H	65	43.2	39.3
3	#10400.00	56.1 PK	68.2	-12.1	2.31 H	323	40.5	15.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	105.4 PK			1.78 V	221	66.1	39.3
2	*5200.00	95.8 AV			1.78 V	221	56.5	39.3
3	#10400.00	57.6 PK	68.2	-10.6	2.46 V	163	42.0	15.6

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	92.1 PK			3.88 H	155	53.0	39.1
2	*5240.00	82.5 AV			3.88 H	155	43.4	39.1
3	5350.00	51.8 PK	74.0	-22.2	3.46 H	122	48.1	3.7
4	5350.00	40.3 AV	54.0	-13.7	3.46 H	122	36.6	3.7
5	#10480.00	56.2 PK	68.2	-12.0	2.33 H	343	40.0	16.2
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	104.6 PK			1.71 V	283	65.5	39.1
2	*5240.00	95.5 AV			1.71 V	283	56.4	39.1
3	5350.00	56.3 PK	74.0	-17.7	1.63 V	297	52.6	3.7
4	5350.00	43.2 AV	54.0	-10.8	1.63 V	297	39.5	3.7
5	#10480.00	58.1 PK	68.2	-10.1	2.46 V	159	41.9	16.2

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 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	54.5 PK	74.0	-19.5	3.76 H	188	51.0	3.5
2	5150.00	41.4 AV	54.0	-12.6	3.76 H	188	37.9	3.5
3	*5260.00	92.5 PK			3.83 H	179	53.5	39.0
4	*5260.00	82.8 AV			3.83 H	179	43.8	39.0
5	#10520.00	57.4 PK	68.2	-10.8	2.63 H	255	41.1	16.3
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	54.7 PK	74.0	-19.3	1.63 V	269	51.2	3.5
2	5150.00	41.6 AV	54.0	-12.4	1.63 V	269	38.1	3.5
3	*5260.00	105.7 PK			1.73 V	258	66.7	39.0
4	*5260.00	96.3 AV			1.73 V	258	57.3	39.0
5	#10520.00	58.4 PK	68.2	-9.8	2.31 V	166	42.1	16.3

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	93.8 PK			3.81 H	161	54.8	39.0
2	*5300.00	84.5 AV			3.81 H	161	45.5	39.0
3	10600.00	57.8 PK	74.0	-16.2	2.61 H	233	41.2	16.6
4	10600.00	44.3 AV	54.0	-9.7	2.61 H	233	27.7	16.6
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	107.1 PK			1.75 V	254	68.1	39.0
2	*5300.00	98.0 AV			1.75 V	254	59.0	39.0
3	10600.00	58.4 PK	74.0	-15.6	2.49 V	153	41.8	16.6
4	10600.00	44.9 AV	54.0	-9.1	2.49 V	153	28.3	16.6

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 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	94.0 PK			3.84 H	8	54.9	39.1
2	*5320.00	84.3 AV			3.84 H	8	45.2	39.1
3	5350.00	55.7 PK	74.0	-18.3	3.73 H	333	52.0	3.7
4	5350.00	41.6 AV	54.0	-12.4	3.73 H	333	37.9	3.7
5	10640.00	57.7 PK	74.0	-16.3	2.53 H	263	41.2	16.5
6	10640.00	44.8 AV	54.0	-9.2	2.53 H	263	28.3	16.5
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	107.3 PK			1.66 V	251	68.2	39.1
2	*5320.00	97.6 AV			1.66 V	251	58.5	39.1
3	5350.00	61.0 PK	74.0	-13.0	1.71 V	259	57.3	3.7
4	5350.00	45.5 AV	54.0	-8.5	1.71 V	259	41.8	3.7
5	10640.00	58.4 PK	74.0	-15.6	2.44 V	188	41.9	16.5
6	10640.00	45.3 AV	54.0	-8.7	2.44 V	188	28.8	16.5

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 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	5460.00	56.2 PK	74.0	-17.8	1.89 H	213	52.2	4.0
2	5460.00	43.1 AV	54.0	-10.9	1.89 H	213	39.1	4.0
3	#5470.00	56.5 PK	68.2	-11.7	1.97 H	221	52.5	4.0
4	*5500.00	93.3 PK			1.88 H	207	53.7	39.6
5	*5500.00	84.0 AV			1.88 H	207	44.4	39.6
6	11000.00	59.0 PK	74.0	-15.0	1.93 H	250	41.1	17.9
7	11000.00	45.8 AV	54.0	-8.2	1.93 H	250	27.9	17.9
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	5460.00	57.1 PK	74.0	-16.9	1.79 V	259	53.1	4.0
2	5460.00	43.8 AV	54.0	-10.2	1.79 V	259	39.8	4.0
3	#5470.00	60.7 PK	68.2	-7.5	1.81 V	266	56.7	4.0
4	*5500.00	107.1 PK			1.74 V	255	67.5	39.6
5	*5500.00	98.3 AV			1.74 V	255	58.7	39.6
6	11000.00	59.4 PK	74.0	-14.6	2.45 V	188	41.5	17.9
7	11000.00	46.1 AV	54.0	-7.9	2.45 V	188	28.2	17.9

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	92.4 PK			1.97 H	210	52.8	39.6
2	*5580.00	82.9 AV			1.97 H	210	43.3	39.6
3	11160.00	57.9 PK	74.0	-16.1	2.02 H	249	41.2	16.7
4	11160.00	44.8 AV	54.0	-9.2	2.02 H	249	28.1	16.7
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	106.3 PK			1.65 V	118	66.7	39.6
2	*5580.00	96.8 AV			1.65 V	118	57.2	39.6
3	11160.00	58.4 PK	74.0	-15.6	2.53 V	179	41.7	16.7
4	11160.00	45.2 AV	54.0	-8.8	2.53 V	179	28.5	16.7

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	92.0 PK			1.97 H	199	52.4	39.6
2	*5700.00	83.1 AV			1.97 H	199	43.5	39.6
3	#5725.00	57.1 PK	68.2	-11.1	1.90 H	181	53.0	4.1
4	11400.00	57.4 PK	74.0	-16.6	1.79 H	222	40.8	16.6
5	11400.00	44.7 AV	54.0	-9.3	1.79 H	222	28.1	16.6
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	106.1 PK			1.65 V	255	66.5	39.6
2	*5700.00	96.8 AV			1.65 V	255	57.2	39.6
3	#5725.00	63.2 PK	68.2	-5.0	1.77 V	263	59.1	4.1
4	11400.00	56.7 PK	74.0	-17.3	2.51 V	190	40.1	16.6
5	11400.00	43.7 AV	54.0	-10.3	2.51 V	190	27.1	16.6

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5630.13	55.6 PK	68.2	-12.6	2.76 H	119	51.4	4.2
2	*5745.00	96.4 PK			2.76 H	119	56.6	39.8
3	*5745.00	87.2 AV			2.76 H	119	47.4	39.8
4	#5981.41	58.3 PK	68.2	-9.9	2.76 H	119	53.3	5.0
5	11490.00	56.4 PK	74.0	-17.6	1.80 H	311	39.6	16.8
6	11490.00	43.3 AV	54.0	-10.7	1.80 H	311	26.5	16.8
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	#5631.41	55.8 PK	68.2	-12.4	1.90 V	249	51.6	4.2
2	*5745.00	107.1 PK			1.90 V	249	67.3	39.8
3	*5745.00	97.4 AV			1.90 V	249	57.6	39.8
4	#5980.13	57.4 PK	68.2	-10.8	1.90 V	249	52.4	5.0
5	11490.00	57.1 PK	74.0	-16.9	2.73 V	263	40.3	16.8
6	11490.00	43.5 AV	54.0	-10.5	2.73 V	263	26.7	16.8

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5618.59	55.4 PK	68.2	-12.8	2.75 H	116	51.2	4.2
2	*5785.00	96.1 PK			2.75 H	116	56.0	40.1
3	*5785.00	86.6 AV			2.75 H	116	46.5	40.1
4	#5980.77	57.2 PK	68.2	-11.0	2.75 H	116	52.2	5.0
5	11570.00	57.1 PK	74.0	-16.9	1.93 H	320	40.1	17.0
6	11570.00	43.5 AV	54.0	-10.5	1.93 H	320	26.5	17.0
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	#5606.41	56.5 PK	68.2	-11.7	1.84 V	249	52.3	4.2
2	*5785.00	106.7 PK			1.84 V	249	66.6	40.1
3	*5785.00	96.9 AV			1.84 V	249	56.8	40.1
4	#5932.69	59.0 PK	68.2	-9.2	1.84 V	249	54.1	4.9
5	11570.00	57.7 PK	74.0	-16.3	2.83 V	270	40.7	17.0
6	11570.00	44.0 AV	54.0	-10.0	2.83 V	270	27.0	17.0

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5605.77	55.3 PK	68.2	-12.9	2.75 H	115	51.1	4.2
2	*5825.00	96.3 PK			2.75 H	115	56.0	40.3
3	*5825.00	86.5 AV			2.75 H	115	46.2	40.3
4	#5955.77	57.2 PK	68.2	-11.0	2.75 H	115	52.4	4.8
5	11650.00	56.8 PK	74.0	-17.2	1.91 H	303	40.2	16.6
6	11650.00	42.9 AV	54.0	-11.1	1.91 H	303	26.3	16.6
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	#5612.18	55.3 PK	68.2	-12.9	1.84 V	244	51.1	4.2
2	*5825.00	106.2 PK			1.84 V	244	65.9	40.3
3	*5825.00	96.6 AV			1.84 V	244	56.3	40.3
4	#5978.85	57.7 PK	68.2	-10.5	1.84 V	244	52.7	5.0
5	11650.00	57.3 PK	74.0	-16.7	2.69 V	255	40.7	16.6
6	11650.00	43.5 AV	54.0	-10.5	2.69 V	255	26.9	16.6

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)
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	54.6 PK	74.0	-19.4	3.77 H	1	51.1	3.5
2	5150.00	41.3 AV	54.0	-12.7	3.77 H	1	37.8	3.5
3	*5180.00	61.5 PK			3.81 H	8	58.0	3.5
4	*5180.00	52.0 AV			3.81 H	8	48.5	3.5
5	#10360.00	57.1 PK	68.2	-11.1	2.22 H	258	41.7	15.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.6 PK	74.0	-8.4	1.53 V	41	62.1	3.5
2	5150.00	47.7 AV	54.0	-6.3	1.53 V	41	44.2	3.5
3	*5180.00	110.7 PK			1.65 V	43	71.5	39.2
4	*5180.00	101.2 AV			1.65 V	43	62.0	39.2
5	#10360.00	57.6 PK	68.2	-10.6	1.83 V	358	42.2	15.4

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	96.8 PK			3.89 H	5	57.5	39.3
2	*5200.00	87.0 AV			3.89 H	5	47.7	39.3
3	#10400.00	57.6 PK	68.2	-10.6	2.03 H	277	42.0	15.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	110.4 PK			1.73 V	259	71.1	39.3
2	*5200.00	100.9 AV			1.73 V	259	61.6	39.3
3	#10400.00	58.1 PK	68.2	-10.1	1.93 V	347	42.5	15.6

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	96.4 PK			3.77 H	13	57.3	39.1
2	*5240.00	86.6 AV			3.77 H	13	47.5	39.1
3	5350.00	56.1 PK	74.0	-17.9	3.63 H	359	52.4	3.7
4	5350.00	42.9 AV	54.0	-11.1	3.63 H	359	39.2	3.7
5	#10480.00	58.0 PK	68.2	-10.2	2.03 H	269	41.8	16.2
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	109.9 PK			1.79 V	274	70.8	39.1
2	*5240.00	100.3 AV			1.79 V	274	61.2	39.1
3	5350.00	57.7 PK	74.0	-16.3	1.95 V	297	54.0	3.7
4	5350.00	43.2 AV	54.0	-10.8	1.95 V	297	39.5	3.7
5	#10480.00	58.5 PK	68.2	-9.7	1.92 V	337	42.3	16.2

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 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	54.1 PK	74.0	-19.9	3.79 H	163	50.6	3.5
2	5150.00	41.2 AV	54.0	-12.8	3.79 H	163	37.7	3.5
3	*5260.00	97.6 PK			3.82 H	180	58.6	39.0
4	*5260.00	88.0 AV			3.82 H	180	49.0	39.0
5	#10520.00	58.1 PK	68.2	-10.1	2.63 H	283	41.8	16.3
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	55.1 PK	74.0	-18.9	1.63 V	269	51.6	3.5
2	5150.00	41.6 AV	54.0	-12.4	1.63 V	269	38.1	3.5
3	*5260.00	111.3 PK			1.70 V	258	72.3	39.0
4	*5260.00	101.8 AV			1.70 V	258	62.8	39.0
5	#10520.00	58.4 PK	68.2	-9.8	1.99 V	333	42.1	16.3

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	61.9 PK			3.88 H	165	58.5	3.4
2	*5300.00	51.9 AV			3.88 H	165	48.5	3.4
3	10600.00	57.8 PK	74.0	-16.2	2.77 H	243	41.2	16.6
4	10600.00	44.4 AV	54.0	-9.6	2.77 H	243	27.8	16.6
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	110.8 PK			1.71 V	272	71.8	39.0
2	*5300.00	101.1 AV			1.71 V	272	62.1	39.0
3	10600.00	58.5 PK	74.0	-15.5	2.01 V	329	41.9	16.6
4	10600.00	44.8 AV	54.0	-9.2	2.01 V	329	28.2	16.6

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 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	62.0 PK			3.89 H	7	58.5	3.5
2	*5320.00	52.2 AV			3.89 H	7	48.7	3.5
3	5350.00	55.9 PK	74.0	-18.1	3.66 H	13	52.2	3.7
4	5350.00	41.6 AV	54.0	-12.4	3.66 H	13	37.9	3.7
5	10640.00	58.8 PK	74.0	-15.2	2.59 H	255	42.3	16.5
6	10640.00	45.3 AV	54.0	-8.7	2.59 H	255	28.8	16.5
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	110.7 PK			1.76 V	273	71.6	39.1
2	*5320.00	101.3 AV			1.76 V	273	62.2	39.1
3	5350.00	64.6 PK	74.0	-9.4	1.51 V	299	60.9	3.7
4	5350.00	46.1 AV	54.0	-7.9	1.51 V	299	42.4	3.7
5	10640.00	59.4 PK	74.0	-14.6	1.83 V	335	42.9	16.5
6	10640.00	46.3 AV	54.0	-7.7	1.83 V	335	29.8	16.5

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 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	5460.00	56.3 PK	74.0	-17.7	2.01 H	323	52.3	4.0
2	5460.00	42.7 AV	54.0	-11.3	2.01 H	323	38.7	4.0
3	#5470.00	59.5 PK	68.2	-8.7	1.99 H	303	55.5	4.0
4	*5500.00	96.8 PK			1.92 H	318	57.2	39.6
5	*5500.00	87.7 AV			1.92 H	318	48.1	39.6
6	11000.00	59.1 PK	74.0	-14.9	2.11 H	229	41.2	17.9
7	11000.00	46.2 AV	54.0	-7.8	2.11 H	229	28.3	17.9
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	5460.00	57.5 PK	74.0	-16.5	1.69 V	270	53.5	4.0
2	5460.00	43.9 AV	54.0	-10.1	1.69 V	270	39.9	4.0
3	#5470.00	61.5 PK	68.2	-6.7	1.73 V	266	57.5	4.0
4	*5500.00	112.0 PK			1.68 V	254	72.4	39.6
5	*5500.00	102.6 AV			1.68 V	254	63.0	39.6
6	11000.00	59.7 PK	74.0	-14.3	2.19 V	222	41.8	17.9
7	11000.00	46.4 AV	54.0	-7.6	2.19 V	222	28.5	17.9

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	96.1 PK			1.97 H	323	56.5	39.6
2	*5580.00	86.6 AV			1.97 H	323	47.0	39.6
3	11160.00	58.6 PK	74.0	-15.4	2.19 H	243	41.9	16.7
4	11160.00	45.0 AV	54.0	-9.0	2.19 H	243	28.3	16.7
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	110.9 PK			1.75 V	272	71.3	39.6
2	*5580.00	101.8 AV			1.75 V	272	62.2	39.6
3	11160.00	59.2 PK	74.0	-14.8	2.29 V	231	42.5	16.7
4	11160.00	45.6 AV	54.0	-8.4	2.29 V	231	28.9	16.7

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	94.9 PK			2.05 H	311	55.3	39.6
2	*5700.00	85.6 AV			2.05 H	311	46.0	39.6
3	#5725.00	60.2 PK	68.2	-8.0	1.99 H	333	56.1	4.1
4	11400.00	57.3 PK	74.0	-16.7	2.43 H	233	40.7	16.6
5	11400.00	44.5 AV	54.0	-9.5	2.43 H	233	27.9	16.6
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	110.1 PK			1.70 V	270	70.5	39.6
2	*5700.00	100.8 AV			1.70 V	270	61.2	39.6
3	#5725.00	62.6 PK	68.2	-5.6	1.82 V	277	58.5	4.1
4	11400.00	57.8 PK	74.0	-16.2	2.22 V	243	41.2	16.6
5	11400.00	44.3 AV	54.0	-9.7	2.22 V	243	27.7	16.6

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5633.33	54.8 PK	68.2	-13.4	2.76 H	113	50.6	4.2
2	*5745.00	96.0 PK			2.76 H	113	56.2	39.8
3	*5745.00	86.5 AV			2.76 H	113	46.7	39.8
4	#5978.85	57.7 PK	68.2	-10.5	2.76 H	113	52.7	5.0
5	11490.00	57.3 PK	74.0	-16.7	1.84 H	307	40.5	16.8
6	11490.00	42.9 AV	54.0	-11.1	1.84 H	307	26.1	16.8
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	#5603.21	56.7 PK	68.2	-11.5	1.65 V	265	52.5	4.2
2	*5745.00	110.0 PK			1.65 V	265	70.2	39.8
3	*5745.00	100.3 AV			1.65 V	265	60.5	39.8
4	#5938.46	57.4 PK	68.2	-10.8	1.65 V	265	52.6	4.8
5	11490.00	57.8 PK	74.0	-16.2	2.67 V	277	41.0	16.8
6	11490.00	43.4 AV	54.0	-10.6	2.67 V	277	26.6	16.8

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5618.59	55.1 PK	68.2	-13.1	2.73 H	117	50.9	4.2
2	*5785.00	97.5 PK			2.73 H	117	57.4	40.1
3	*5785.00	87.7 AV			2.73 H	117	47.6	40.1
4	#5966.67	57.3 PK	68.2	-10.9	2.73 H	117	52.4	4.9
5	11570.00	58.0 PK	74.0	-16.0	1.79 H	314	41.0	17.0
6	11570.00	43.5 AV	54.0	-10.5	1.79 H	314	26.5	17.0
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	#5614.74	55.3 PK	68.2	-12.9	1.69 V	264	51.1	4.2
2	*5785.00	110.3 PK			1.69 V	264	70.2	40.1
3	*5785.00	100.8 AV			1.69 V	264	60.7	40.1
4	#5974.36	57.1 PK	68.2	-11.1	1.69 V	264	52.1	5.0
5	11570.00	58.3 PK	74.0	-15.7	2.73 V	269	41.3	17.0
6	11570.00	44.0 AV	54.0	-10.0	2.73 V	269	27.0	17.0

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5637.82	55.4 PK	68.2	-12.8	2.70 H	114	51.2	4.2
2	*5825.00	97.1 PK			2.70 H	114	56.8	40.3
3	*5825.00	87.3 AV			2.70 H	114	47.0	40.3
4	#5969.87	57.0 PK	68.2	-11.2	2.70 H	114	52.1	4.9
5	11650.00	57.3 PK	74.0	-16.7	1.93 H	299	40.7	16.6
6	11650.00	43.2 AV	54.0	-10.8	1.93 H	299	26.6	16.6
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	#5648.72	55.1 PK	68.2	-13.1	1.78 V	265	50.8	4.3
2	*5825.00	109.5 PK			1.78 V	265	69.2	40.3
3	*5825.00	99.6 AV			1.78 V	265	59.3	40.3
4	#5927.56	57.1 PK	68.2	-11.1	1.78 V	265	52.2	4.9
5	11650.00	57.4 PK	74.0	-16.6	2.61 V	269	40.8	16.6
6	11650.00	43.5 AV	54.0	-10.5	2.61 V	269	26.9	16.6

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)
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	58.0 PK	74.0	-16.0	3.59 H	33	54.5	3.5
2	5150.00	45.8 AV	54.0	-8.2	3.59 H	33	42.3	3.5
3	*5190.00	94.3 PK			3.88 H	7	55.0	39.3
4	*5190.00	84.2 AV			3.88 H	7	44.9	39.3
5	#10380.00	57.2 PK	68.2	-11.0	2.03 H	331	41.7	15.5
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	69.0 PK	74.0	-5.0	2.06 V	76	65.5	3.5
2	5150.00	51.5 AV	54.0	-2.5	2.06 V	76	48.0	3.5
3	*5190.00	107.3 PK			2.05 V	79	68.0	39.3
4	*5190.00	97.8 AV			2.05 V	79	58.5	39.3
5	#10380.00	57.6 PK	68.2	-10.6	2.01 V	266	42.1	15.5

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	92.4 PK			3.81 H	11	53.3	39.1
2	*5230.00	82.9 AV			3.81 H	11	43.8	39.1
3	5350.00	53.8 PK	74.0	-20.2	3.69 H	344	50.1	3.7
4	5350.00	41.5 AV	54.0	-12.5	3.69 H	344	37.8	3.7
5	#10460.00	57.1 PK	68.2	-11.1	2.13 H	293	41.1	16.0
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	105.7 PK			2.09 V	97	66.6	39.1
2	*5230.00	96.3 AV			2.09 V	97	57.2	39.1
3	5350.00	56.6 PK	74.0	-17.4	2.28 V	63	52.9	3.7
4	5350.00	43.3 AV	54.0	-10.7	2.28 V	63	39.6	3.7
5	#10460.00	57.7 PK	68.2	-10.5	2.09 V	273	41.7	16.0

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 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	54.6 PK	74.0	-19.4	3.79 H	177	51.1	3.5
2	5150.00	40.7 AV	54.0	-13.3	3.79 H	177	37.2	3.5
3	*5270.00	94.0 PK			3.81 H	163	55.0	39.0
4	*5270.00	84.5 AV			3.81 H	163	45.5	39.0
5	#10540.00	57.6 PK	68.2	-10.6	2.77 H	246	41.2	16.4
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	55.0 PK	74.0	-19.0	1.66 V	269	51.5	3.5
2	5150.00	41.6 AV	54.0	-12.4	1.66 V	269	38.1	3.5
3	*5270.00	107.3 PK			1.77 V	241	68.3	39.0
4	*5270.00	97.8 AV			1.77 V	241	58.8	39.0
5	#10540.00	58.1 PK	68.2	-10.1	1.88 V	343	41.7	16.4

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	57.7 PK			3.85 H	173	54.3	3.4
2	*5310.00	48.4 AV			3.85 H	173	45.0	3.4
3	5350.00	56.8 PK	74.0	-17.2	3.73 H	166	53.1	3.7
4	5350.00	42.6 AV	54.0	-11.4	3.73 H	166	38.9	3.7
5	10620.00	57.5 PK	74.0	-16.5	2.53 H	263	40.9	16.6
6	10620.00	44.9 AV	54.0	-9.1	2.53 H	263	28.3	16.6
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	106.6 PK			1.66 V	258	67.6	39.0
2	*5310.00	97.3 AV			1.66 V	258	58.3	39.0
3	5350.00	66.0 PK	74.0	-8.0	1.69 V	257	62.3	3.7
4	5350.00	52.5 AV	54.0	-1.5	1.69 V	257	48.8	3.7
5	10620.00	57.8 PK	74.0	-16.2	1.99 V	354	41.2	16.6
6	10620.00	45.4 AV	54.0	-8.6	1.99 V	354	28.8	16.6

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 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	5460.00	57.2 PK	74.0	-16.8	1.99 H	313	53.2	4.0
2	5460.00	41.7 AV	54.0	-12.3	1.99 H	313	37.7	4.0
3	#5470.00	60.3 PK	68.2	-7.9	1.97 H	331	56.3	4.0
4	*5510.00	94.8 PK			1.88 H	320	55.1	39.7
5	*5510.00	84.6 AV			1.88 H	320	44.9	39.7
6	11020.00	59.1 PK	74.0	-14.9	1.99 H	222	41.5	17.6
7	11020.00	45.9 AV	54.0	-8.1	1.99 H	222	28.3	17.6
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	5460.00	64.9 PK	74.0	-9.1	1.83 V	101	60.9	4.0
2	5460.00	47.1 AV	54.0	-6.9	1.83 V	101	43.1	4.0
3	#5470.00	66.7 PK	68.2	-1.5	2.01 V	67	62.7	4.0
4	*5510.00	108.7 PK			1.98 V	70	69.0	39.7
5	*5510.00	99.3 AV			1.98 V	70	59.6	39.7
6	11020.00	59.5 PK	74.0	-14.5	2.66 V	239	41.9	17.6
7	11020.00	46.4 AV	54.0	-7.6	2.66 V	239	28.8	17.6

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	93.9 PK			1.97 H	323	54.3	39.6
2	*5550.00	84.8 AV			1.97 H	323	45.2	39.6
3	11000.00	59.7 PK	74.0	-14.3	2.03 H	229	41.8	17.9
4	11000.00	46.4 AV	54.0	-7.6	2.03 H	229	28.5	17.9
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	108.8 PK			1.97 V	66	69.2	39.6
2	*5550.00	99.6 AV			1.97 V	66	60.0	39.6
3	11100.00	58.9 PK	74.0	-15.1	2.63 V	213	42.1	16.8
4	11100.00	45.7 AV	54.0	-8.3	2.63 V	213	28.9	16.8

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	93.7 PK			1.88 H	323	53.9	39.8
2	*5670.00	83.6 AV			1.88 H	323	43.8	39.8
3	#5725.00	57.2 PK	68.2	-11.0	1.89 H	343	53.1	4.1
4	11340.00	57.9 PK	74.0	-16.1	1.99 H	243	41.1	16.8
5	11340.00	44.7 AV	54.0	-9.3	1.99 H	243	27.9	16.8
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	108.5 PK			1.97 V	84	68.7	39.8
2	*5670.00	98.8 AV			1.97 V	84	59.0	39.8
3	#5725.00	58.6 PK	68.2	-9.6	2.08 V	80	54.5	4.1
4	11340.00	58.1 PK	74.0	-15.9	2.51 V	229	41.3	16.8
5	11340.00	44.9 AV	54.0	-9.1	2.51 V	229	28.1	16.8

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5633.97	55.1 PK	68.2	-13.1	2.62 H	111	50.9	4.2
2	*5755.00	94.1 PK			2.62 H	111	54.3	39.8
3	*5755.00	85.0 AV			2.62 H	111	45.2	39.8
4	#5969.87	57.7 PK	68.2	-10.5	2.62 H	111	52.8	4.9
5	11510.00	57.9 PK	74.0	-16.1	1.72 H	309	41.0	16.9
6	11510.00	44.0 AV	54.0	-10.0	1.72 H	309	27.1	16.9
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	#5646.79	56.2 PK	68.2	-12.0	1.72 V	264	51.9	4.3
2	*5755.00	107.5 PK			1.72 V	264	67.7	39.8
3	*5755.00	98.1 AV			1.72 V	264	58.3	39.8
4	#5980.13	57.5 PK	68.2	-10.7	1.72 V	264	52.5	5.0
5	11510.00	58.0 PK	74.0	-16.0	2.49 V	255	41.1	16.9
6	11510.00	44.2 AV	54.0	-9.8	2.49 V	255	27.3	16.9

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5614.74	55.1 PK	68.2	-13.1	2.61 H	108	50.9	4.2
2	*5795.00	95.1 PK			2.61 H	108	55.0	40.1
3	*5795.00	86.0 AV			2.61 H	108	45.9	40.1
4	#5929.49	57.1 PK	68.2	-11.1	2.61 H	108	52.2	4.9
5	11590.00	57.2 PK	74.0	-16.8	1.93 H	319	40.2	17.0
6	11590.00	43.7 AV	54.0	-10.3	1.93 H	319	26.7	17.0
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	#5630.77	55.7 PK	68.2	-12.5	1.63 V	253	51.5	4.2
2	*5795.00	105.6 PK			1.63 V	253	65.5	40.1
3	*5795.00	96.3 AV			1.63 V	253	56.2	40.1
4	#5982.05	58.2 PK	68.2	-10.0	1.63 V	253	53.2	5.0
5	11590.00	57.9 PK	74.0	-16.1	2.77 V	269	40.9	17.0
6	11590.00	44.1 AV	54.0	-9.9	2.77 V	269	27.1	17.0

Remarks:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	54.4 PK	74.0	-19.6	3.69 H	153	50.9	3.5
2	5150.00	44.6 AV	54.0	-9.4	3.69 H	153	41.1	3.5
3	*5210.00	89.7 PK			3.57 H	162	50.5	39.2
4	*5210.00	79.5 AV			3.57 H	162	40.3	39.2
5	5350.00	53.0 PK	74.0	-21.0	3.39 H	111	49.3	3.7
6	5350.00	41.0 AV	54.0	-13.0	3.39 H	111	37.3	3.7
7	#10420.00	56.9 PK	68.2	-11.3	2.22 H	269	41.2	15.7
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	64.0 PK	74.0	-10.0	1.63 V	48	60.5	3.5
2	5150.00	50.6 AV	54.0	-3.4	1.63 V	48	47.1	3.5
3	*5210.00	102.8 PK			1.64 V	259	63.6	39.2
4	*5210.00	93.0 AV			1.64 V	259	53.8	39.2
5	5350.00	56.4 PK	74.0	-17.6	1.86 V	77	52.7	3.7
6	5350.00	43.6 AV	54.0	-10.4	1.86 V	77	39.9	3.7
7	#10420.00	57.5 PK	68.2	-10.7	1.99 V	263	41.8	15.7

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 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	54.7 PK	74.0	-19.3	3.76 H	179	51.2	3.5
2	5150.00	40.8 AV	54.0	-13.2	3.76 H	179	37.3	3.5
3	*5290.00	88.9 PK			3.86 H	166	49.9	39.0
4	*5290.00	79.2 AV			3.86 H	166	40.2	39.0
5	5350.00	59.0 PK	74.0	-15.0	3.69 H	170	55.3	3.7
6	5350.00	43.4 AV	54.0	-10.6	3.69 H	170	39.7	3.7
7	#10580.00	58.2 PK	68.2	-10.0	2.43 H	263	41.5	16.7
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	55.3 PK	74.0	-18.7	1.70 V	269	51.8	3.5
2	5150.00	41.6 AV	54.0	-12.4	1.70 V	269	38.1	3.5
3	*5290.00	102.2 PK			1.86 V	272	63.2	39.0
4	*5290.00	92.4 AV			1.86 V	272	53.4	39.0
5	5350.00	67.2 PK	74.0	-6.8	1.61 V	275	63.5	3.7
6	5350.00	52.3 AV	54.0	-1.7	1.61 V	275	48.6	3.7
7	#10580.00	58.6 PK	68.2	-9.6	1.94 V	329	41.9	16.7

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	5460.00	56.0 PK	74.0	-18.0	2.01 H	120	52.0	4.0
2	5460.00	43.1 AV	54.0	-10.9	2.01 H	120	39.1	4.0
3	#5470.00	57.3 PK	68.2	-10.9	1.93 H	123	53.3	4.0
4	*5530.00	52.2 PK			2.12 H	119	48.1	4.1
5	*5530.00	41.8 AV			2.12 H	119	37.7	4.1
6	#5725.00	56.0 PK	68.2	-12.2	1.99 H	131	51.9	4.1
7	11060.00	58.3 PK	74.0	-15.7	1.89 H	230	41.1	17.2
8	11060.00	45.5 AV	54.0	-8.5	1.89 H	230	28.3	17.2
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	5460.00	62.0 PK	74.0	-12.0	2.01 V	77	58.0	4.0
2	5460.00	46.9 AV	54.0	-7.1	2.01 V	77	42.9	4.0
3	#5470.00	62.5 PK	68.2	-5.7	2.10 V	69	58.5	4.0
4	*5530.00	104.2 PK			1.95 V	68	64.5	39.7
5	*5530.00	94.4 AV			1.95 V	68	54.7	39.7
6	#5725.00	61.0 PK	68.2	-7.2	2.05 V	63	56.9	4.1
7	11060.00	59.3 PK	74.0	-14.7	2.59 V	253	42.1	17.2
8	11060.00	46.0 AV	54.0	-8.0	2.59 V	253	28.8	17.2

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 122	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	5460.00	57.3 PK	74.0	-16.7	2.12 H	179	53.3	4.0
2	5460.00	42.9 AV	54.0	-11.1	2.12 H	179	38.9	4.0
3	#5470.00	59.0 PK	68.2	-9.2	2.21 H	180	55.0	4.0
4	*5610.00	86.9 PK			2.06 H	174	47.1	39.8
5	*5610.00	77.1 AV			2.06 H	174	37.3	39.8
6	#5725.00	55.2 PK	68.2	-13.0	2.13 H	188	51.1	4.1
7	11220.00	58.1 PK	74.0	-15.9	1.91 H	222	41.3	16.8
8	11220.00	45.3 AV	54.0	-8.7	1.91 H	222	28.5	16.8
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	5460.00	56.5 PK	74.0	-17.5	1.99 V	70	52.5	4.0
2	5460.00	42.9 AV	54.0	-11.1	1.99 V	70	38.9	4.0
3	#5470.00	56.9 PK	68.2	-11.3	2.12 V	63	52.9	4.0
4	*5610.00	103.2 PK			1.98 V	68	63.4	39.8
5	*5610.00	94.1 AV			1.98 V	68	54.3	39.8
6	#5725.00	54.9 PK	68.2	-13.3	2.14 V	78	50.8	4.1
7	11220.00	58.9 PK	74.0	-15.1	2.61 V	255	42.1	16.8
8	11220.00	45.5 AV	54.0	-8.5	2.61 V	255	28.7	16.8

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5629.49	55.3 PK	68.2	-12.9	2.53 H	73	51.1	4.2
2	#5650.00	56.5 PK	68.2	-11.7	2.60 H	80	52.2	4.3
3	*5775.00	95.5 PK			2.53 H	73	55.5	40.0
4	*5775.00	86.0 AV			2.53 H	73	46.0	40.0
5	#5925.00	59.0 PK	68.2	-9.2	2.51 H	70	54.1	4.9
6	#5928.85	57.7 PK	68.2	-10.5	2.53 H	73	52.8	4.9
7	11550.00	56.3 PK	74.0	-17.7	1.93 H	317	39.3	17.0
8	11550.00	43.1 AV	54.0	-10.9	1.93 H	317	26.1	17.0
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	#5639.10	56.3 PK	68.2	-11.9	1.62 V	265	52.1	4.2
2	#5650.00	57.4 PK	68.2	-10.8	1.69 V	244	53.1	4.3
3	*5775.00	103.0 PK			1.62 V	265	63.0	40.0
4	*5775.00	93.4 AV			1.62 V	265	53.4	40.0
5	#5925.00	59.1 PK	68.2	-9.1	1.66 V	269	54.2	4.9
6	#5963.46	58.0 PK	68.2	-10.2	1.62 V	265	53.2	4.8
7	11550.00	56.7 PK	74.0	-17.3	2.51 V	263	39.7	17.0
8	11550.00	43.5 AV	54.0	-10.5	2.51 V	263	26.5	17.0

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 worst-case data:

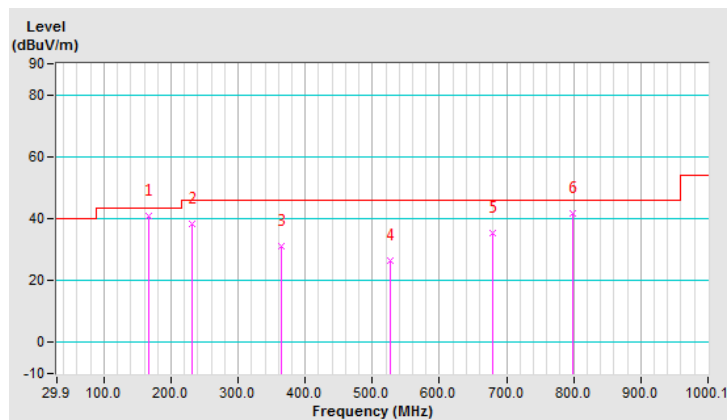
802.11n (HT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	166.00	40.7 QP	43.5	-2.8	1.00 H	73	49.7	-9.0
2	232.11	38.4 QP	46.0	-7.6	2.00 H	85	49.3	-10.9
3	364.32	31.0 QP	46.0	-15.0	1.00 H	5	37.2	-6.2
4	527.64	26.3 QP	46.0	-19.7	1.50 H	96	29.4	-3.1
5	679.29	35.2 QP	46.0	-10.8	2.00 H	43	35.1	0.1
6	797.89	41.5 QP	46.0	-4.5	1.00 H	41	39.2	2.3

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 of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.

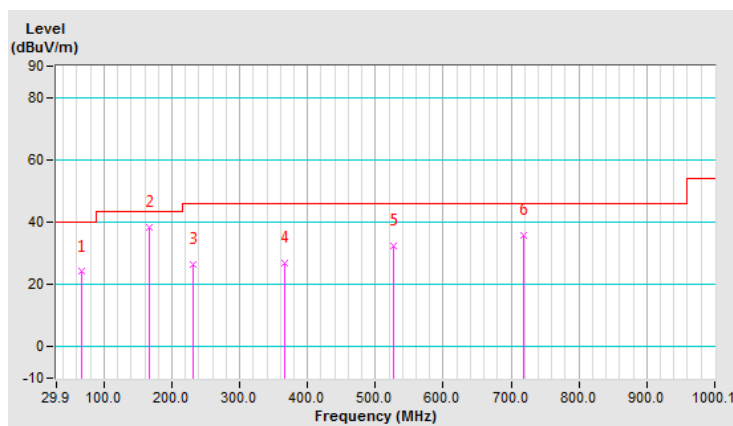


CHANNEL	TX Channel 38	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	66.84	24.1 QP	40.0	-15.9	1.00 V	73	34.6	-10.5
2	166.00	38.3 QP	43.5	-5.2	1.00 V	45	47.3	-9.0
3	232.11	26.5 QP	46.0	-19.5	1.00 V	139	37.4	-10.9
4	366.26	26.9 QP	46.0	-19.1	1.49 V	1	33.1	-6.2
5	527.64	32.2 QP	46.0	-13.8	1.00 V	247	35.3	-3.1
6	718.18	35.6 QP	46.0	-10.4	1.49 V	16	34.8	0.8

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 of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.



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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 23, 2017	Nov. 22, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2018	Sep. 04, 2019
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 26, 2018	Feb. 25, 2019
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 19, 2018	Aug. 18, 2019
Software ADT	BV ADT_Conc_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

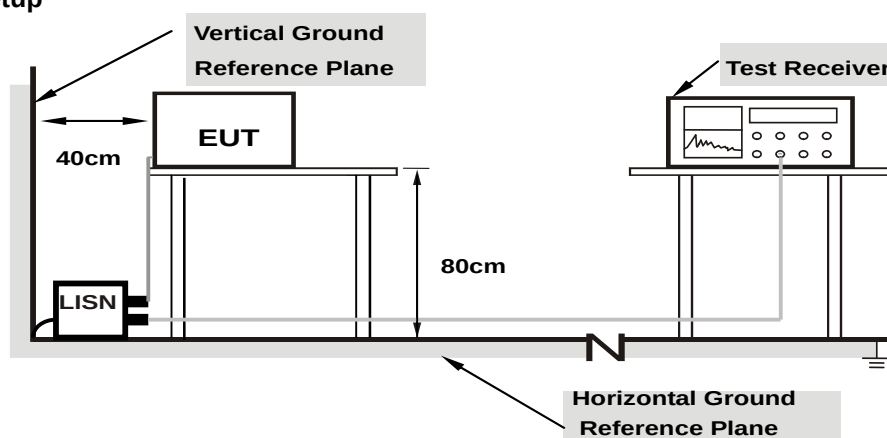
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

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 Conditions

Same as item 4.1.6.

4.2.7 Test Results

Worst-case data:

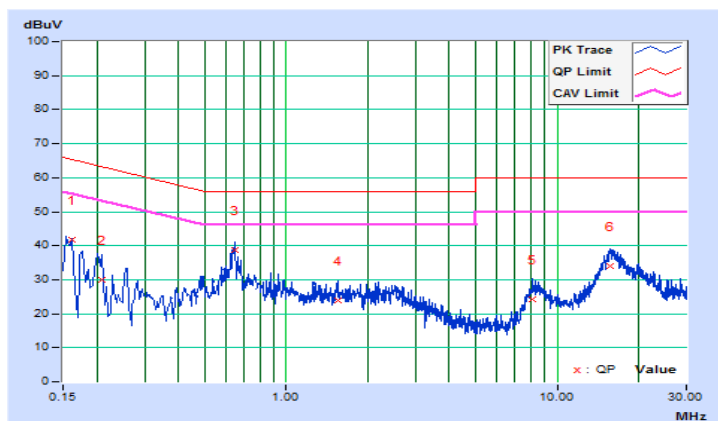
802.11n (HT40)

Channel	TX Channel 38	Detector Function	Quasi-Peak (QP) / Average (AV)
Phase	Line (L)		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16173	10.04	31.85	16.76	41.89	26.80	65.37	55.37	-23.48	-28.57
2	0.20865	10.05	19.90	5.33	29.95	15.38	63.26	53.26	-33.31	-37.88
3	0.64702	10.05	28.78	14.62	38.83	24.67	56.00	46.00	-17.17	-21.33
4	1.55760	10.09	13.73	7.51	23.82	17.60	56.00	46.00	-32.18	-28.40
5	8.05602	10.46	13.85	7.33	24.31	17.79	60.00	50.00	-35.69	-32.21
6	15.71180	10.92	23.13	17.38	34.05	28.30	60.00	50.00	-25.95	-21.70

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.

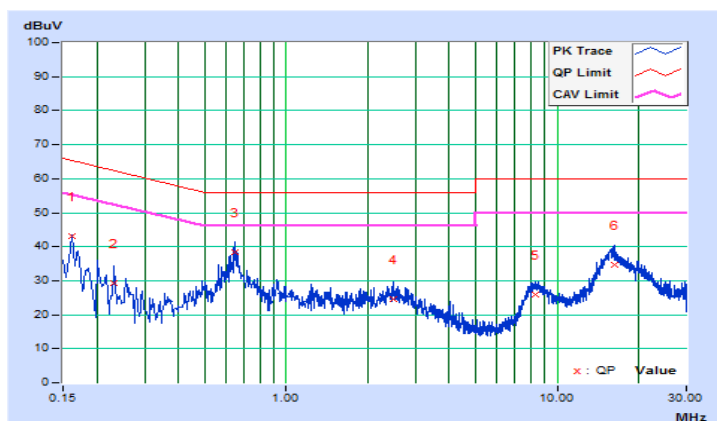


Channel	TX Channel 38	Detector Function	Quasi-Peak (QP) / Average (AV)
Phase	Neutral (N)		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16181	10.04	33.19	18.10	43.23	28.14	65.37	55.37	-22.14	-27.23
2	0.23216	10.04	19.09	6.94	29.13	16.98	62.37	52.37	-33.24	-35.39
3	0.64657	10.05	28.37	13.48	38.42	23.53	56.00	46.00	-17.58	-22.47
4	2.47254	10.14	14.31	8.39	24.45	18.53	56.00	46.00	-31.55	-27.47
5	8.31316	10.41	15.59	9.24	26.00	19.65	60.00	50.00	-34.00	-30.35
6	16.32176	10.77	23.95	18.13	34.72	28.90	60.00	50.00	-25.28	-21.10

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} ;

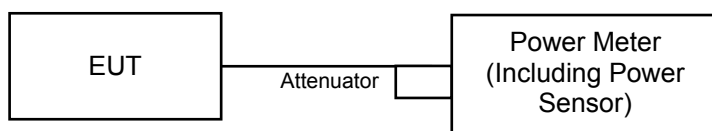
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

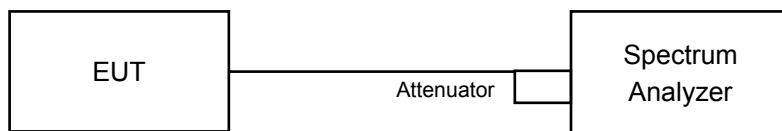
4.3.2 Test Setup

For Power Output

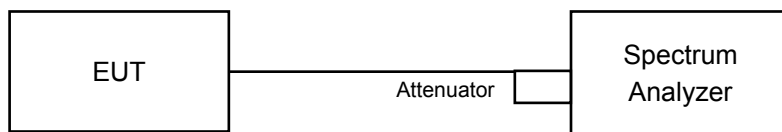
802.11a, 802.11n (HT20), 802.11n (HT40)



802.11ac (VHT80)



For Bandwidth



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

For 802.11a, 802.11n (HT20), 802.11n (HT40)

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.

For 802.11ac (VHT80)

- a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- b. Set sweep trigger to "free run".
- c. Set RBW = 1 MHz
- d. Set VBW $\geq$ 3 MHz
- e. Number of points in sweep $\geq$ 2 Span / RBW
- f. Sweep time $\leq$ (number of points in sweep) * T
- g. Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
- h. Detector = RMS
- i. Trace mode = max hold
- j. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
- k. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

For 26dB Bandwidth

- a. Set RBW = approximately 1% of the emission bandwidth.
- b. Set the VBW > RBW.
- c. Detector = Peak.
- d. Trace mode = max hold.
- e. 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 Conditions

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 (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	26.669	14.26	24.00	Pass
40	5200	26.062	14.16	24.00	Pass
48	5240	25.410	14.05	24.00	Pass
52	5260	25.586	14.08	24.00	Pass
60	5300	27.733	14.43	24.00	Pass
64	5320	27.227	14.35	24.00	Pass
100	5500	25.527	14.07	24.00	Pass
116	5580	26.363	14.21	24.00	Pass
140	5700	27.102	14.33	24.00	Pass
149	5745	28.054	14.48	30.00	Pass
157	5785	27.861	14.45	30.00	Pass
165	5825	28.054	14.48	30.00	Pass

Note: Max. Gain = 5.8dBi < 6dBi, so the limit no need to be reduced.

For 5260~5320MHz, 5500~5700MHz

1. $11\text{dBm} + 10\log(20.78) = 24.18\text{ dBm} > 24\text{dBm}$
2. $11\text{dBm} + 10\log(21.12) = 24.25\text{ dBm} > 24\text{dBm}$
3. $11\text{dBm} + 10\log(20.69) = 24.16\text{ dBm} > 24\text{dBm}$
4. $11\text{dBm} + 10\log(20.48) = 24.11\text{ dBm} > 24\text{dBm}$
5. $11\text{dBm} + 10\log(20.63) = 24.14\text{ dBm} > 24\text{dBm}$
6. $11\text{dBm} + 10\log(21.21) = 24.27\text{ dBm} > 24\text{dBm}$

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	13.57	13.09	43.121	16.35	24.00	Pass
40	5200	13.46	13.16	42.883	16.32	24.00	Pass
48	5240	13.29	13.55	43.976	16.43	24.00	Pass
52	5260	13.11	13.45	42.595	16.29	24.00	Pass
60	5300	13.03	13.25	41.226	16.15	24.00	Pass
64	5320	13.28	13.43	43.310	16.37	24.00	Pass
100	5500	13.14	13.54	43.200	16.35	24.00	Pass
116	5580	13.12	13.31	41.941	16.23	24.00	Pass
140	5700	13.26	13.37	42.911	16.33	24.00	Pass
149	5745	13.22	13.65	44.163	16.45	30.00	Pass
157	5785	13.32	13.40	43.356	16.37	30.00	Pass
165	5825	13.22	13.42	42.968	16.33	30.00	Pass

Note: Max. Gain = 5.8dBi < 6dBi, so the limit no need to be reduced.

For 5260~5320MHz, 5500~5700MHz

Chain 0

1. 11dBm + 10log(21.35) = 24.29 dBm > 24dBm
2. 11dBm + 10log(21.35) = 24.29 dBm > 24dBm
3. 11dBm + 10log(21.12) = 24.25 dBm > 24dBm
4. 11dBm + 10log(21.29) = 24.28 dBm > 24dBm
5. 11dBm + 10log(21.23) = 24.27 dBm > 24dBm
6. 11dBm + 10log(21.33) = 24.29 dBm > 24dBm

Chain 1

1. 11dBm + 10log(21.70) = 24.36 dBm > 24dBm
2. 11dBm + 10log(21.69) = 24.36 dBm > 24dBm
3. 11dBm + 10log(21.36) = 24.30 dBm > 24dBm
4. 11dBm + 10log(21.54) = 24.33 dBm > 24dBm
5. 11dBm + 10log(21.30) = 24.28 dBm > 24dBm
6. 11dBm + 10log(21.25) = 24.27 dBm > 24dBm

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	13.25	13.12	41.647	16.20	24.00	Pass
46	5230	13.26	13.35	42.811	16.32	24.00	Pass
54	5270	13.13	13.29	41.889	16.22	24.00	Pass
62	5310	11.77	12.18	31.551	14.99	24.00	Pass
102	5510	13.39	13.27	43.059	16.34	24.00	Pass
110	5550	13.47	13.28	43.514	16.39	24.00	Pass
134	5670	13.36	13.38	43.454	16.38	24.00	Pass
151	5755	13.13	13.19	41.404	16.17	30.00	Pass
159	5795	13.47	13.26	43.417	16.38	30.00	Pass

Note: Max. Gain = 5.8dBi < 6dBi, so the limit no need to be reduced.

For 5260~5320MHz, 5500~5700MHz

Chain 0

1. 11dBm + 10log(45.60) = 27.59 dBm > 24dBm
2. 11dBm + 10log(45.00) = 27.53 dBm > 24dBm
3. 11dBm + 10log(45.32) = 27.56 dBm > 24dBm
4. 11dBm + 10log(45.24) = 27.56 dBm > 24dBm
5. 11dBm + 10log(45.25) = 27.56 dBm > 24dBm

Chain 1

1. 11dBm + 10log(45.44) = 27.57 dBm > 24dBm
2. 11dBm + 10log(45.36) = 27.57 dBm > 24dBm
3. 11dBm + 10log(45.26) = 27.56 dBm > 24dBm
4. 11dBm + 10log(45.00) = 27.53 dBm > 24dBm
5. 11dBm + 10log(45.07) = 27.54 dBm > 24dBm

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	10.37	10.36	21.753	13.38	24.00	Pass
58	5290	9.89	9.88	19.477	12.90	24.00	Pass
106	5530	10.39	10.32	21.705	13.37	24.00	Pass
122	5610	10.36	10.43	21.905	13.41	24.00	Pass
155	5775	10.37	10.35	21.728	13.37	30.00	Pass

Note: Max. Gain = 5.8dBi < 6dBi, so the limit no need to be reduced.

For 5260~5320MHz, 5500~5700MHz

Chain 0

1. 11dBm + 10log(83.80) = 30.23 dBm > 24dBm
2. 11dBm + 10log(83.63) = 30.22 dBm > 24dBm
3. 11dBm + 10log(83.67) = 30.23 dBm > 24dBm

Chain 1

1. 11dBm + 10log(83.74) = 30.23 dBm > 24dBm
2. 11dBm + 10log(83.63) = 30.22 dBm > 24dBm
3. 11dBm + 10log(83.84) = 30.23 dBm > 24dBm

26dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)
36	5180	23.10
40	5200	20.74
48	5240	20.49
52	5260	20.78
60	5300	21.12
64	5320	20.69
100	5500	20.48
116	5580	20.63
140	5700	21.21

802.11n (HT20)

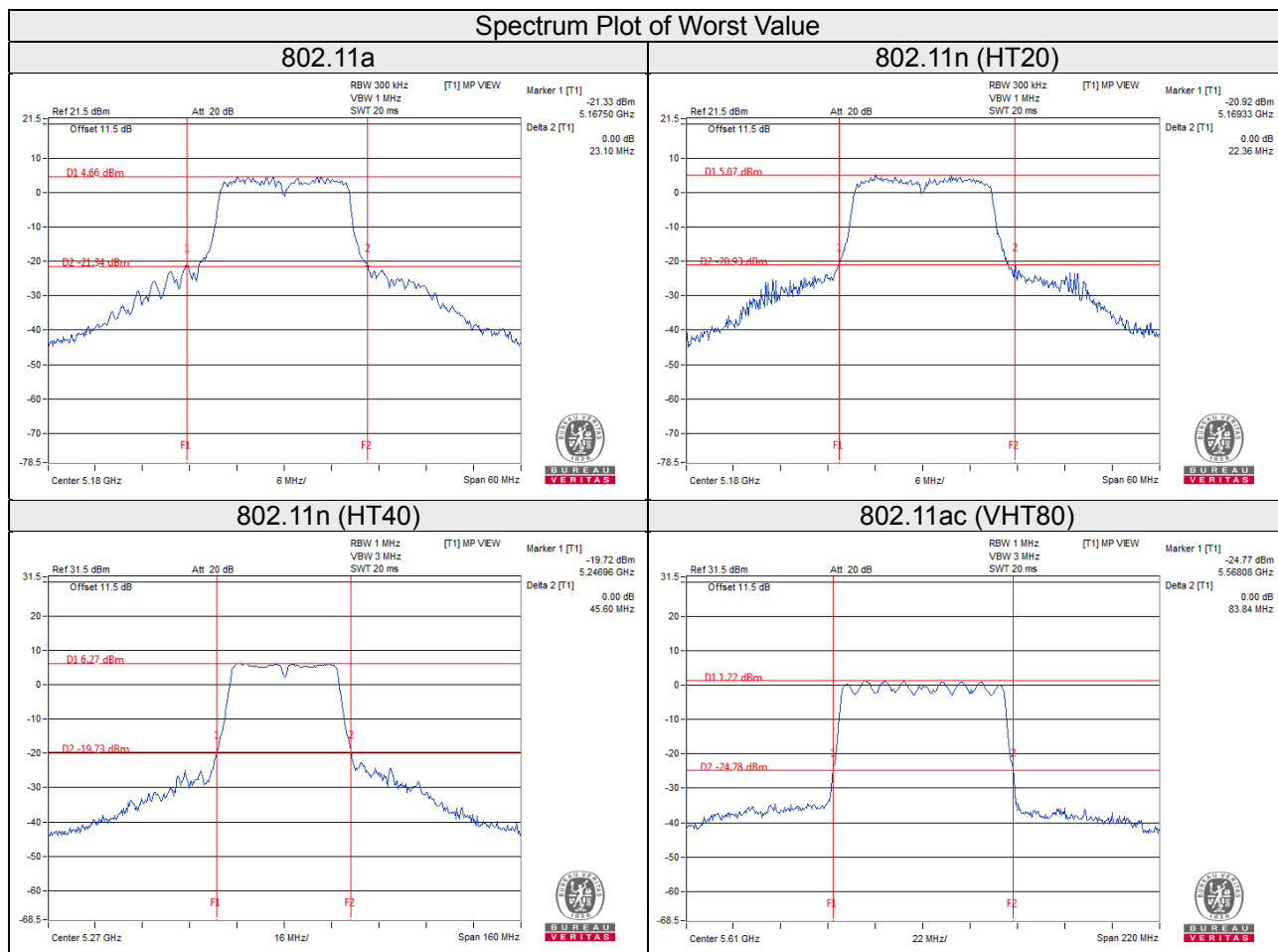
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	22.36	21.59
40	5200	21.69	21.51
48	5240	21.64	21.83
52	5260	21.35	21.70
60	5300	21.35	21.69
64	5320	21.12	21.36
100	5500	21.29	21.54
116	5580	21.23	21.30
140	5700	21.33	21.25

802.11n (HT40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	45.41	45.53
46	5230	45.49	45.30
54	5270	45.60	45.44
62	5310	45.00	45.36
102	5510	45.32	45.26
110	5550	45.24	45.00
134	5670	45.25	45.07

802.11ac (VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	83.41	83.50
58	5290	83.80	83.74
106	5530	83.63	83.63
122	5610	83.67	83.84



EUT Maximum Conducted Power

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	27.733	14.43
5470~5725	27.102	14.33

Note: The UUT can adjust a transmitter's output power based on the signal level present at the receiver. TPC is auto controlled by software.

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	43.310	16.37
5470~5725	43.200	16.35

Note: The UUT can adjust a transmitter's output power based on the signal level present at the receiver. TPC is auto controlled by software.

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	41.889	16.22
5470~5725	43.514	16.39

Note: The UUT can adjust a transmitter's output power based on the signal level present at the receiver. TPC is auto controlled by software.

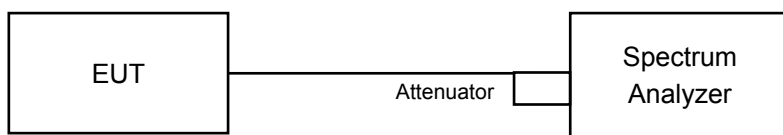
802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	19.477	12.90
5470~5725	21.905	13.41

Note: The UUT can adjust a transmitter's output power based on the signal level present at the receiver. TPC is auto controlled by software.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 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 sampling. 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.

4.4.4 Test Result

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	16.68
40	5200	16.80
48	5240	16.80
52	5260	16.80
60	5300	16.68
64	5320	16.80
100	5500	16.80
116	5580	16.68
140	5700	16.80
149	5745	16.80
157	5785	16.80
165	5825	16.80

802.11n (HT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.76	17.76
40	5200	17.88	17.76
48	5240	17.64	17.76
52	5260	17.76	17.88
60	5300	17.64	17.76
64	5320	17.64	17.76
100	5500	17.76	17.76
116	5580	17.64	17.76
140	5700	17.76	17.76
149	5745	17.76	17.76
157	5785	17.76	17.76
165	5825	17.64	17.76

802.11n (HT40)

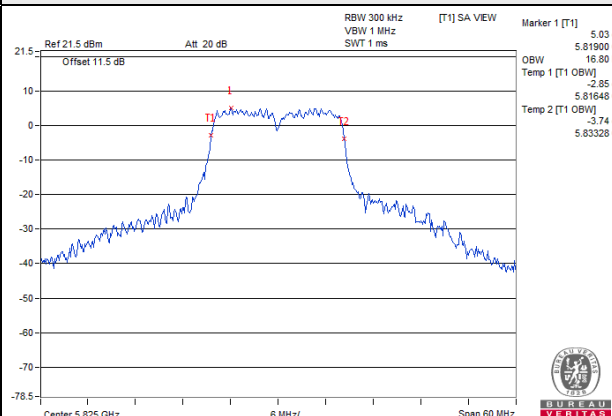
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	37.08	37.20
46	5230	37.08	37.32
54	5270	37.32	37.08
62	5310	37.20	37.20
102	5510	37.20	37.20
110	5550	37.20	37.20
134	5670	37.20	37.20
151	5755	37.20	37.08
159	5795	37.08	37.20

802.11ac (VHT80)

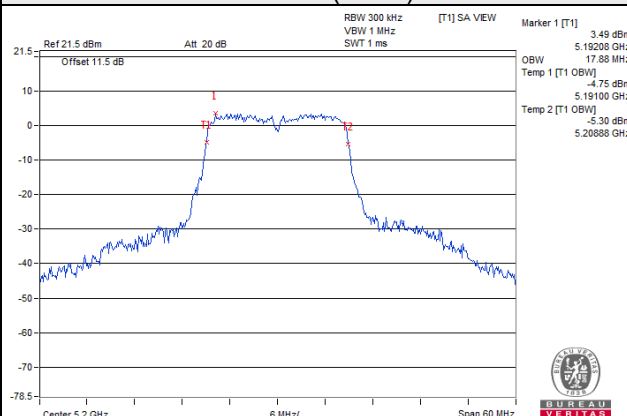
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	75.84
58	5290	75.60	75.84
106	5530	75.60	75.60
122	5610	75.60	75.60
155	5775	75.60	75.60

Spectrum Plot of Worst Value

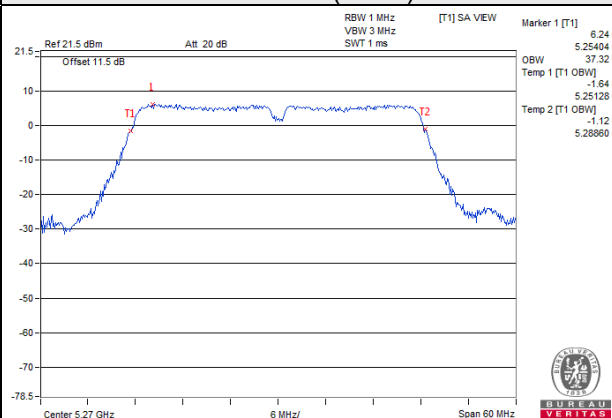
802.11a



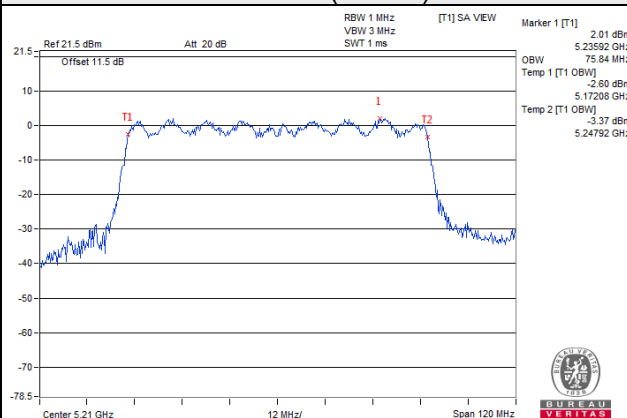
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

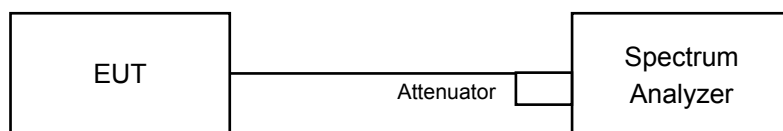


4.5 Peak Power Spectral Density Measurement

4.5.1 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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

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

Duty cycle of test signal is $\geq 98\%$

Using method SA-1

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

Duty cycle of test signal is $< 98\%$

Using method SA-2

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

For U-NII-3 band

Duty cycle $\geq 98\%$

- 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 $\text{BWCF} = 10\log(500 \text{ kHz} / 300 \text{ kHz})$.
- 5) Sweep time = auto, trigger set to "free run".
- 6) Trace average at least 100 traces in power averaging mode.
- 7) Record the max value.

Duty cycle $< 98\%$

- 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 $\text{BWCF} = 10\log(500 \text{ kHz}/300\text{kHz})$
- 5) Sweep time = auto, trigger set to "free run".
- 6) Trace average at least 100 traces in power averaging mode.
- 7) Record the max value and add $10 \log (1/\text{duty cycle})$

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as item 4.3.6.

4.5.7 Test Results

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

802.11a

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
36	5180	0.61	0.22	0.83	11	Pass
40	5200	0.57	0.22	0.79	11	Pass
48	5240	0.49	0.22	0.71	11	Pass
52	5260	0.53	0.22	0.75	11	Pass
60	5300	1.00	0.22	1.22	11	Pass
64	5320	0.81	0.22	1.03	11	Pass
100	5500	0.18	0.22	0.40	11	Pass
116	5580	0.06	0.22	0.28	11	Pass
140	5700	1.02	0.22	1.24	11	Pass

Note:

1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Gain = 5.8dBi < 6dBi, so the limit no need to be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	0.36	-0.43	0.21	3.20	8.19	Pass
40	5200	0.37	-0.41	0.21	3.22	8.19	Pass
48	5240	0.23	0.10	0.21	3.39	8.19	Pass
52	5260	0.04	0.07	0.21	3.28	8.19	Pass
60	5300	-0.15	0.00	0.21	3.15	8.19	Pass
64	5320	-0.31	-0.15	0.21	2.99	8.19	Pass
100	5500	-0.32	-0.15	0.21	2.99	8.19	Pass
116	5580	-0.15	-0.19	0.21	3.05	8.19	Pass
140	5700	-0.23	-0.01	0.21	3.10	8.19	Pass

Note:

1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Directional Gain = 5.8dBi + 10log(2) = 8.81dBi > 6dBi, so the limit shall be reduced to 11-(8.81-6) = 8.19dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-3.25	-3.55	0.42	0.03	8.19	Pass
46	5230	-3.10	-3.12	0.42	0.32	8.19	Pass
54	5270	-3.29	-3.18	0.42	0.20	8.19	Pass
62	5310	-5.63	-5.23	0.42	-2.00	8.19	Pass
102	5510	-3.65	-3.05	0.42	0.09	8.19	Pass
110	5550	-3.55	-3.38	0.42	-0.03	8.19	Pass
134	5670	-3.03	-3.15	0.42	0.34	8.19	Pass

Note:

1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Directional Gain = $5.8\text{dBi} + 10\log(2) = 8.81\text{dBi} > 6\text{dBi}$, so the limit shall be reduced to $11-(8.81-6) = 8.19\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

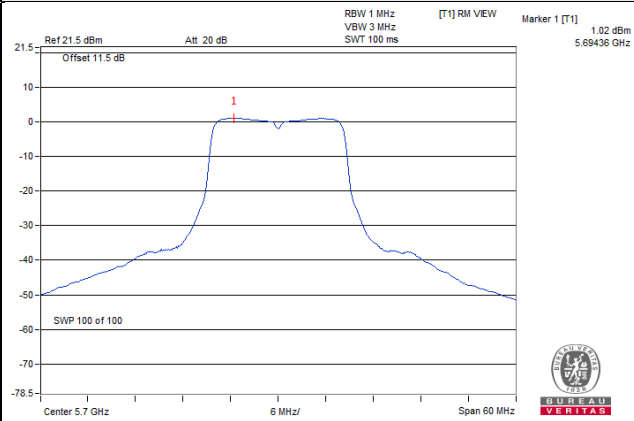
Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-7.92	-8.08	0.68	-4.31	8.19	Pass
58	5290	-8.62	-8.83	0.68	-5.03	8.19	Pass
106	5530	-8.36	-8.37	0.68	-4.68	8.19	Pass
122	5610	-8.50	-8.46	0.68	-4.79	8.19	Pass

Note:

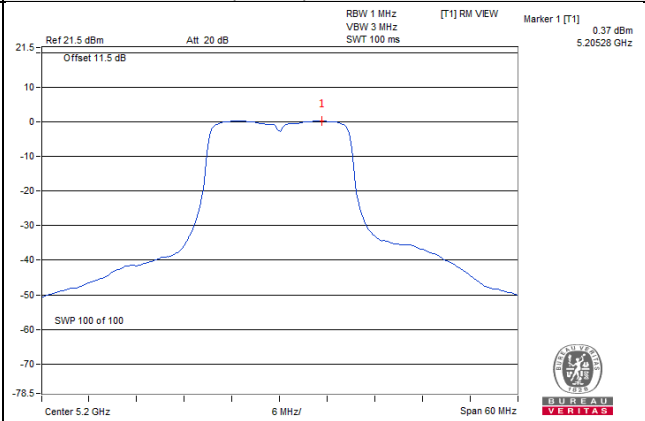
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Directional Gain = $5.8\text{dBi} + 10\log(2) = 8.81\text{dBi} > 6\text{dBi}$, so the limit shall be reduced to $11-(8.81-6) = 8.19\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

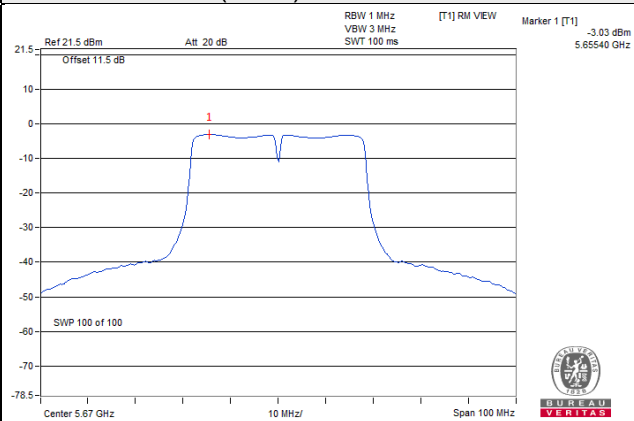
802.11a / CH 140



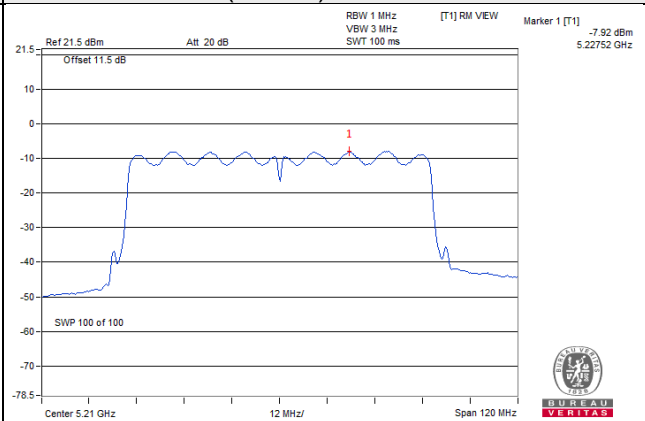
802.11n (HT20) / Chain 0 / CH 40



802.11n (HT40) / Chain 0 / CH 134



802.11ac (VHT80) / Chain 0 / CH 42



For U-NII-3 band
802.11a

Chan.	Freq. (MHz)	PSD W/O Duty Factor		Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
		(dBm/300kHz)	(dBm/500kHz)				
149	5745	-6.83	-4.61	0.22	-4.39	30	Pass
157	5785	-6.71	-4.49	0.22	-4.27	30	Pass
165	5825	-7.16	-4.94	0.22	-4.72	30	Pass

Note:

1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Gain = 5.8dBi < 6dBi, so the limit no need to be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	-8.23	-6.01	3.01	0.21	-2.79	27.19	Pass
	157	5785	-8.12	-5.90	3.01	0.21	-2.68	27.19	Pass
	165	5825	-8.31	-6.09	3.01	0.21	-2.87	27.19	Pass
1	149	5745	-7.87	-5.65	3.01	0.21	-2.43	27.19	Pass
	157	5785	-8.07	-5.85	3.01	0.21	-2.63	27.19	Pass
	165	5825	-8.11	-5.89	3.01	0.21	-2.67	27.19	Pass

Note:

1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Directional Gain = 5.8dBi + 10log(2) = 8.81dBi > 6dBi, so the limit shall be reduced to 30-(8.81-6) = 27.19dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-11.66	-9.44	3.01	0.42	-6.01	27.19	Pass
	159	5795	-11.05	-8.83	3.01	0.42	-5.40	27.19	Pass
1	151	5755	-11.56	-9.34	3.01	0.42	-5.91	27.19	Pass
	159	5795	-11.32	-9.10	3.01	0.42	-5.67	27.19	Pass

Note:

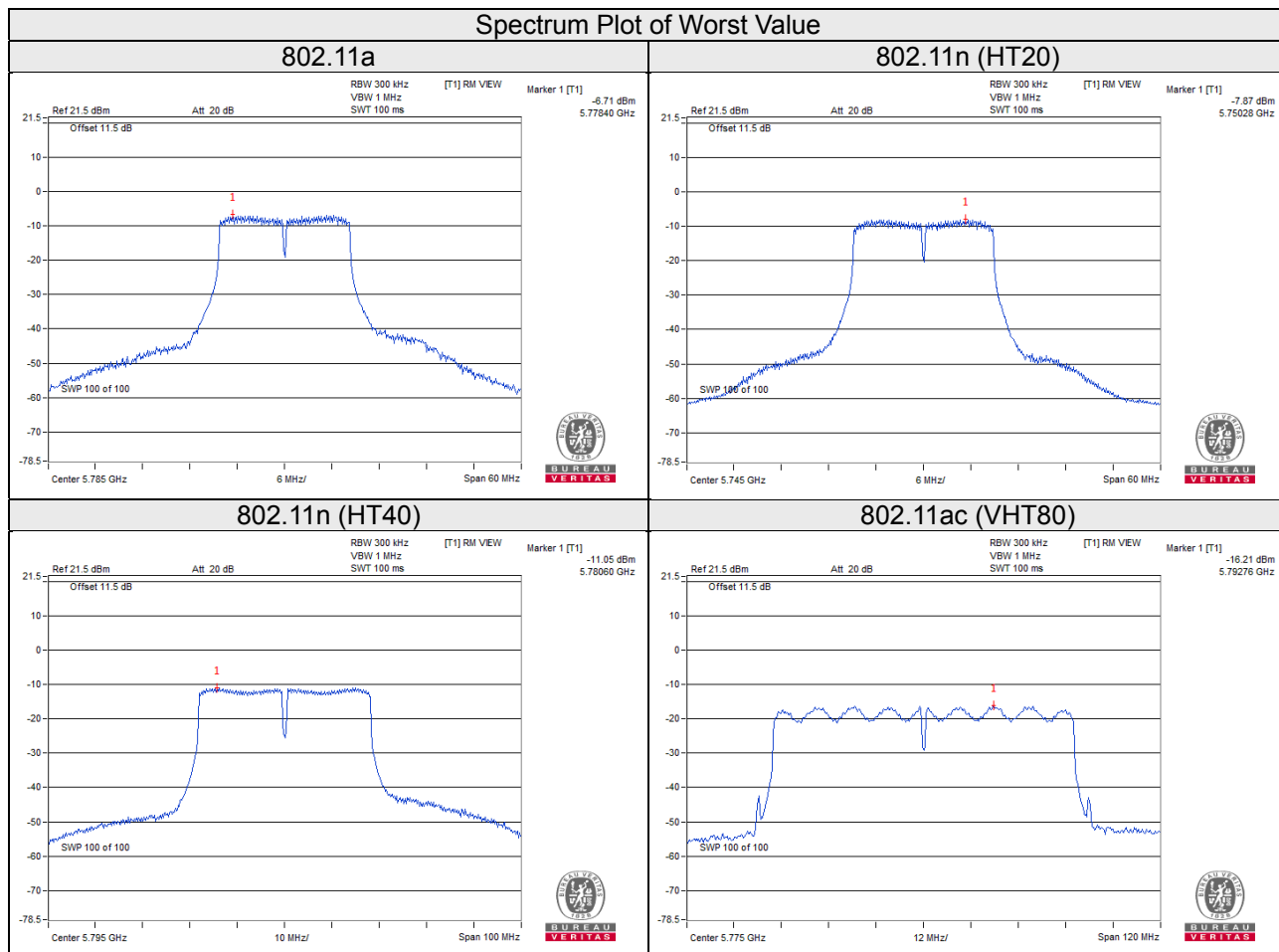
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Directional Gain = 5.8dBi + 10log(2) = 8.81dBi > 6dBi, so the limit shall be reduced to 30-(8.81-6) = 27.19dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-16.21	-13.99	3.01	0.68	-10.30	27.19	Pass
1	155	5775	-16.47	-14.25	3.01	0.68	-10.56	27.19	Pass

Note:

1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Directional Gain = 5.8dBi + 10log(2) = 8.81dBi > 6dBi, so the limit shall be reduced to 30-(8.81-6) = 27.19dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

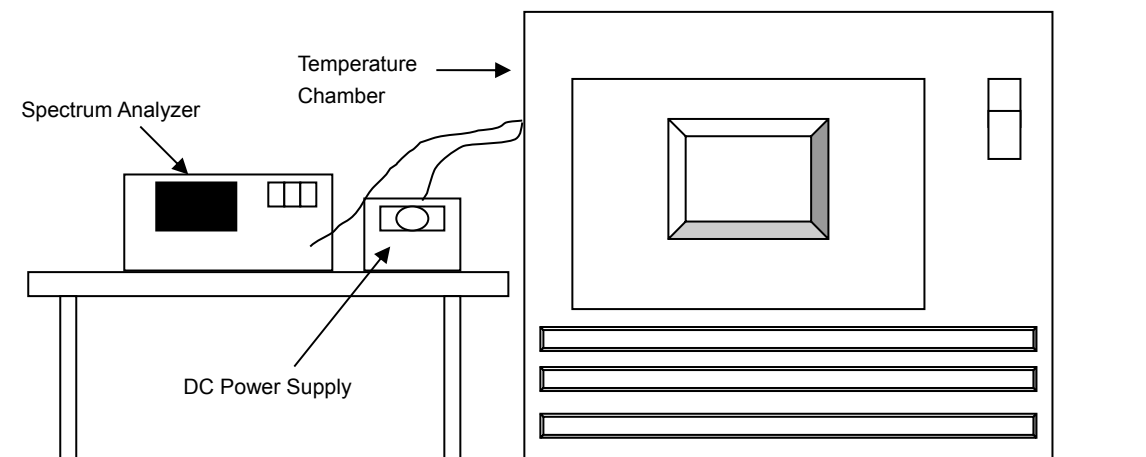


4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 11, 2018	Jun. 10, 2019
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 04, 2018	Jun. 03, 2019
Digital Multimeter Fluke	87-III	70360742	Jun. 29, 2018	Jun. 28, 2019
DC Power Supply Topward	6603D	700637	NA	NA

4.6.4 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.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
85	3.3	5179.9868	PASS	5179.9857	PASS	5179.9868	PASS	5179.9838	PASS
80	3.3	5180.0147	PASS	5180.0131	PASS	5180.0138	PASS	5180.0132	PASS
70	3.3	5179.9810	PASS	5179.9788	PASS	5179.9772	PASS	5179.9811	PASS
60	3.3	5180.0038	PASS	5179.9996	PASS	5180.0012	PASS	5180.0005	PASS
50	3.3	5180.0235	PASS	5180.0247	PASS	5180.0215	PASS	5180.0230	PASS
40	3.3	5179.9920	PASS	5179.9926	PASS	5179.9941	PASS	5179.9951	PASS
30	3.3	5179.9875	PASS	5179.9868	PASS	5179.9882	PASS	5179.9870	PASS
20	3.3	5180.0053	PASS	5180.0057	PASS	5180.0074	PASS	5180.0062	PASS
10	3.3	5180.0138	PASS	5180.0139	PASS	5180.0139	PASS	5180.0166	PASS
0	3.3	5180.0121	PASS	5180.0129	PASS	5180.0132	PASS	5180.0144	PASS
-10	3.3	5180.0211	PASS	5180.0213	PASS	5180.0186	PASS	5180.0184	PASS
-20	3.3	5179.9936	PASS	5179.9939	PASS	5179.9934	PASS	5179.9907	PASS
-30	3.3	5180.0107	PASS	5180.0157	PASS	5180.0122	PASS	5180.0127	PASS
-40	3.3	5180.0167	PASS	5180.0178	PASS	5180.0179	PASS	5180.0179	PASS

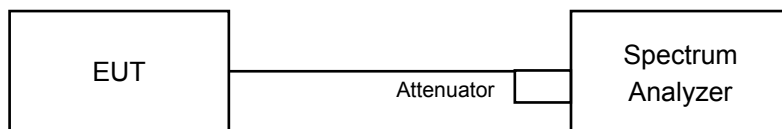
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	3.795	5180.0063	PASS	5180.0063	PASS	5180.0082	PASS	5180.0053	PASS
	3.3	5180.0053	PASS	5180.0057	PASS	5180.0074	PASS	5180.0062	PASS
	2.805	5180.0049	PASS	5180.0063	PASS	5180.0076	PASS	5180.0072	PASS

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

Measurement Procedure REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.55	0.5	Pass
157	5785	16.56	0.5	Pass
165	5825	16.56	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.70	17.69	0.5	Pass
157	5785	17.68	17.69	0.5	Pass
165	5825	17.69	17.68	0.5	Pass

802.11n (HT40)

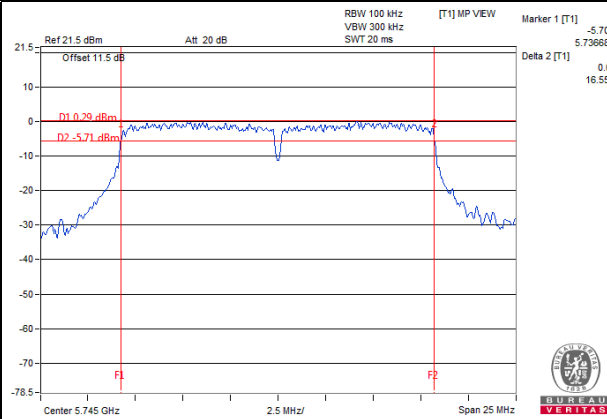
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.64	36.63	0.5	Pass
159	5795	36.64	36.65	0.5	Pass

802.11ac (VHT80)

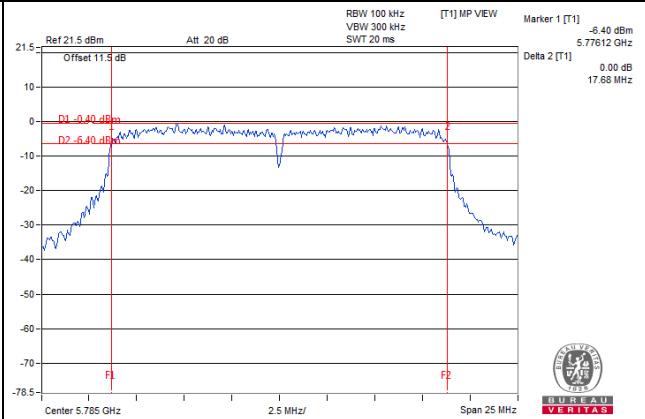
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.50	76.56	0.5	Pass

Spectrum Plot of Worst Value

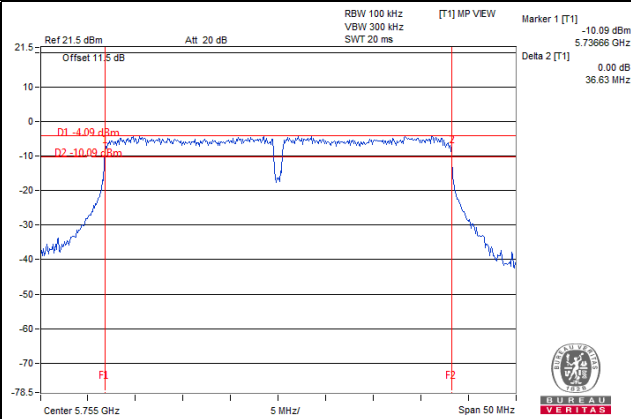
802.11a



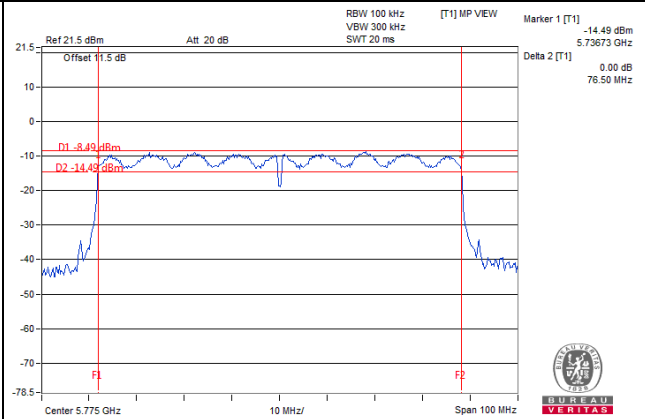
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

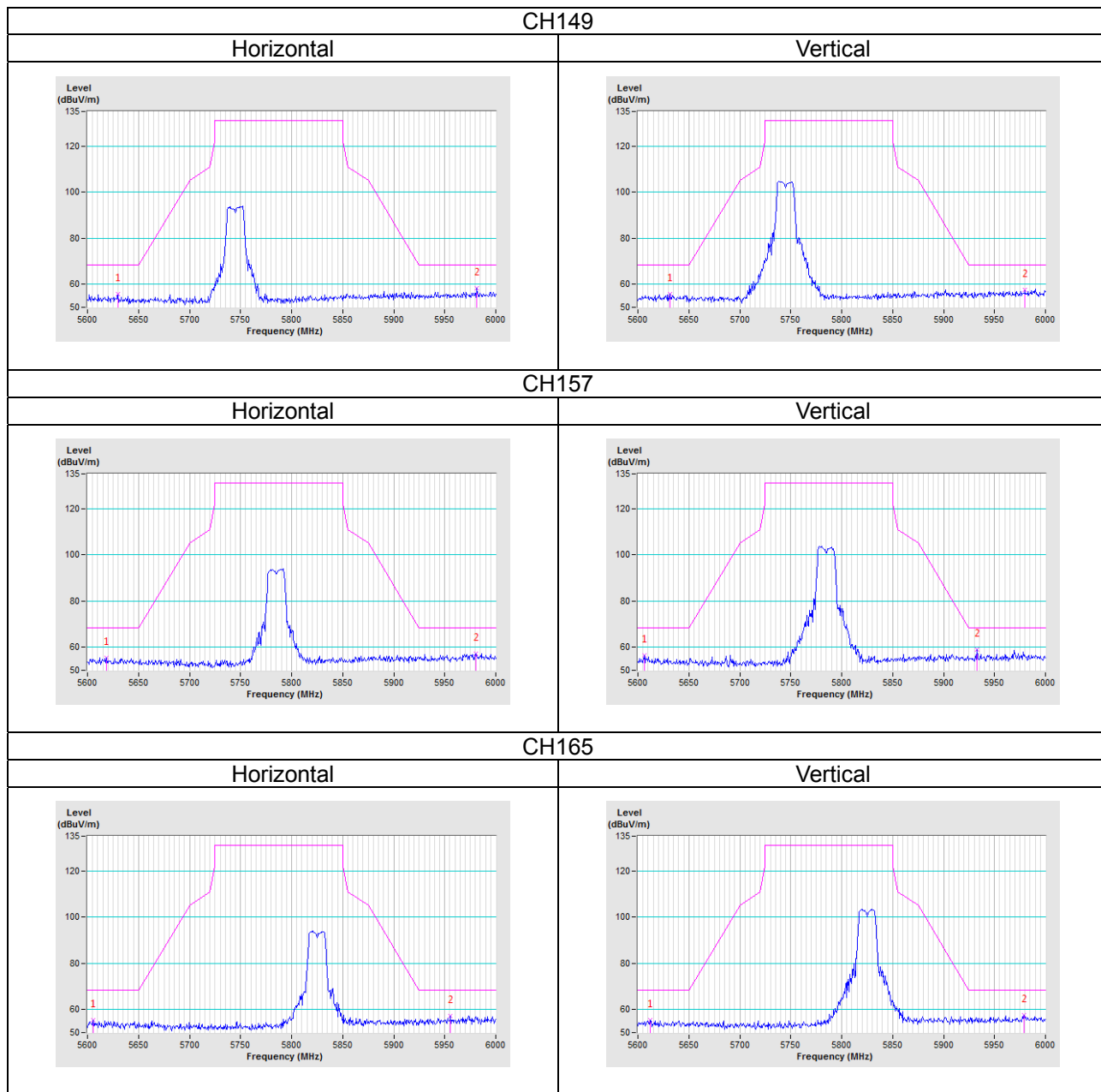


5 Pictures of Test Arrangements

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

Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

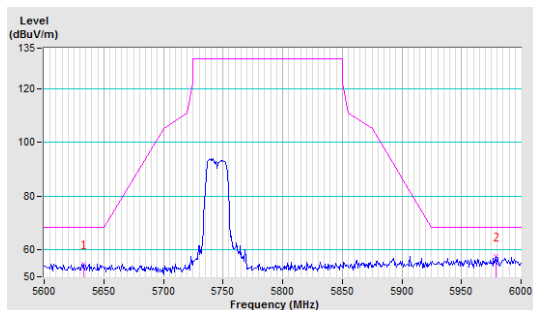
802.11a



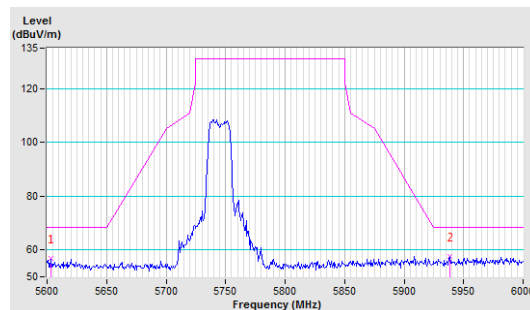
802.11n (HT20)

CH149

Horizontal

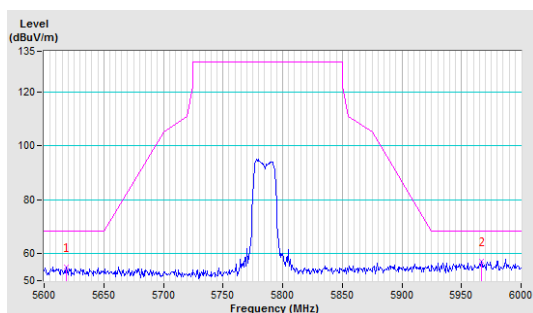


Vertical

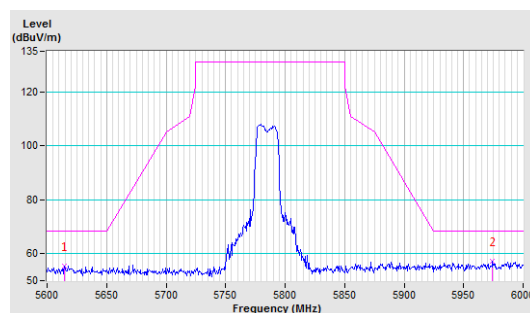


CH157

Horizontal

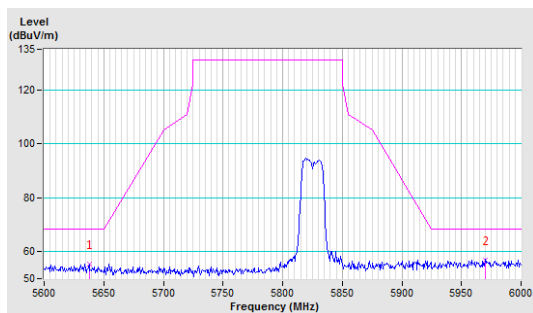


Vertical

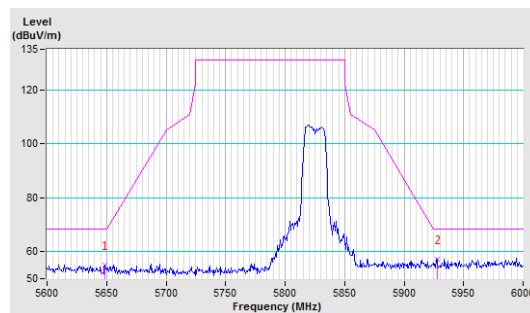


CH165

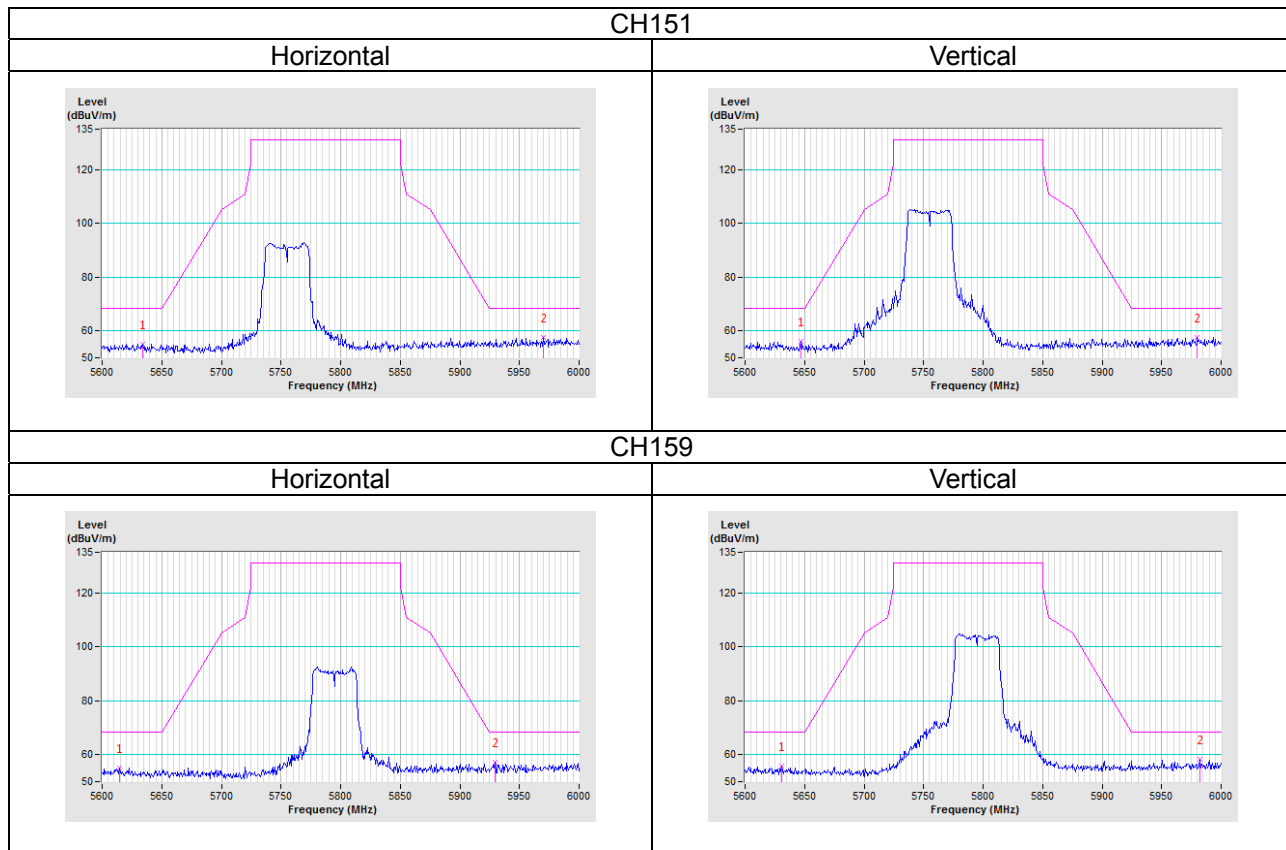
Horizontal



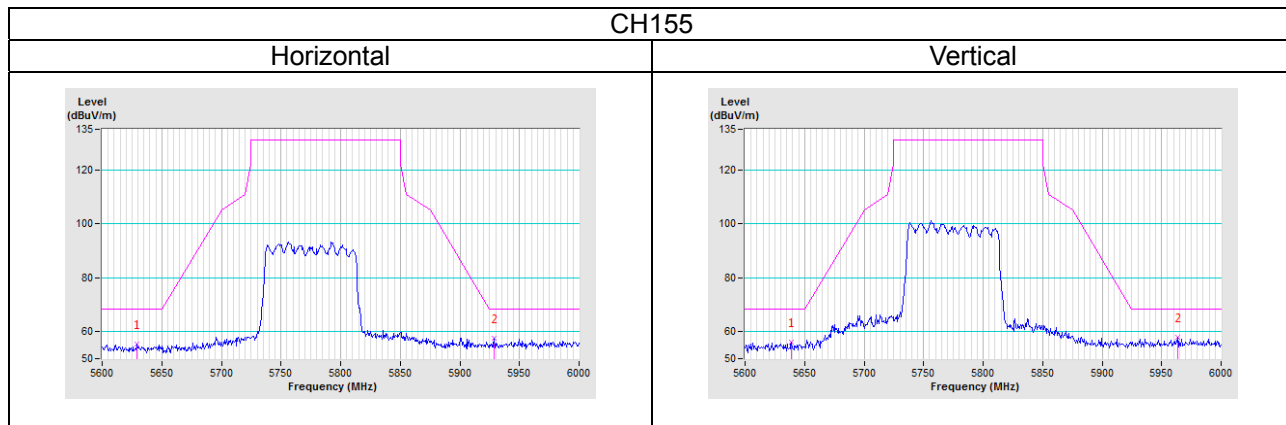
Vertical



802.11n (HT40)



802.11ac (VHT80)



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 FCC recognized accredited test firms and 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

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.

--- END ---