

FCC Test Report

Report No.: RF180828C27-1

FCC ID: RYK-WPEQ261ACNIBT

Test Model: WPEQ-261ACNI(BT)

Received Date: Aug. 28, 2018

Test Date: Oct. 08 ~ Oct. 24, 2018

Issued Date: Nov. 23, 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	14
3.4 Description of Support Units	15
3.4.1 Configuration of System under Test	15
3.5 General Description of Applied Standards	15
4 Test Types and Results	16
4.1 Radiated Emission and Bandedge Measurement.....	16
4.1.1 Limits of Radiated Emission and Bandedge Measurement	16
4.1.2 Test Instruments	17
4.1.3 Test Procedures.....	18
4.1.4 Deviation from Test Standard	19
4.1.5 Test Setup.....	19
4.1.6 EUT Operating Conditions.....	20
4.1.7 Test Results	21
4.2 Conducted Emission Measurement	61
4.2.1 Limits of Conducted Emission Measurement	61
4.2.2 Test Instruments	61
4.2.3 Test Procedures.....	62
4.2.4 Deviation from Test Standard	62
4.2.5 Test Setup.....	62
4.2.6 EUT Operating Conditions.....	62
4.2.7 Test Results	63
4.3 Transmit Power Measurement	65
4.3.1 Limits of Transmit Power Measurement	65
4.3.2 Test Setup.....	65
4.3.3 Test Instruments	66
4.3.4 Test Procedure	66
4.3.5 Deviation from Test Standard	66
4.3.6 EUT Operating Conditions.....	66
4.3.7 Test Result.....	67
4.4 Occupied Bandwidth Measurement	74
4.4.1 Test Setup.....	74
4.4.2 Test Instruments	74
4.4.3 Test Procedure	74
4.4.4 Test Result.....	75
4.5 Peak Power Spectral Density Measurement	78
4.5.1 Limits of Peak Power Spectral Density Measurement	78
4.5.2 Test Setup.....	78
4.5.3 Test Instruments	78
4.5.4 Test Procedures.....	79
4.5.5 Deviation from Test Standard	79
4.5.6 EUT Operating Conditions.....	79
4.5.7 Test Results	80
4.6 Frequency Stability.....	85
4.6.1 Limits of Frequency Stability Measurement	85

4.6.2	Test Setup	85
4.6.3	Test Instruments	85
4.6.4	Test Procedure	85
4.6.5	Deviation from Test Standard	86
4.6.6	EUT Operating Condition	86
4.6.7	Test Results	86
4.7	6dB Bandwidth Measurement	87
4.7.1	Limits of 6dB Bandwidth Measurement	87
4.7.2	Test Setup	87
4.7.3	Test Instruments	87
4.7.4	Test Procedure	87
4.7.5	Deviation from Test Standard	87
4.7.6	EUT Operating Condition	87
4.7.7	Test Results	88
5	Pictures of Test Arrangements	90
	Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)	91
	Appendix – Information on the Testing Laboratories	94

Release Control Record

Issue No.	Description	Date Issued
RF180828C27-1	Original release.	Nov. 23, 2018

1 Certificate of Conformity

Product: 802.11ac/a/b/g/n 2T2R Industrial-graded Wi-Fi / Bluetooth 4.2 Combo Half mini PCIe Module

Brand: SparkLAN

Test Model: WPEQ-261ACNI(BT)

Sample Status: R&D sample

Applicant: SparkLAN Communications, Inc.

Test Date: Oct. 08 ~ Oct. 24, 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. 23, 2018
Pettie Chen / Senior Specialist

Approved by : Bruce Chen, **Date:** Nov. 23, 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 -17.61dB at 0.64266MHz.
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 -1.1dB at 165.96MHz.
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 Industrial-graded Wi-Fi / Bluetooth 4.2 Combo Half mini PCIe Module
Brand	SparkLAN
Test Model	WPEQ-261ACNI(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 300Mbps 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: 50.029mW 5260~5320MHz: 48.173mW 5500~5700MHz: 49.779mW 5745~5825MHz: 48.036mW
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

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	23deg. C, 69%RH	120Vac, 60Hz	Willy Cheng
RE<1G	23deg. C, 69%RH	120Vac, 60Hz	Willy Cheng
PLC	22deg. C, 66%RH	120Vac, 60Hz	Willy Cheng
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 = $2.052/2.177 = 0.943$, Duty factor = $10 * \log(1/0.943) = 0.26$

802.11n (HT20): Duty cycle = $1.929/2.047 = 0.942$, Duty factor = $10 * \log(1/0.942) = 0.26$

802.11n (HT40): Duty cycle = $0.949/1.068 = 0.889$, Duty factor = $10 * \log(1/0.889) = 0.51$

802.11ac (VHT80): Duty cycle = $0.463/0.600 = 0.772$, Duty factor = $10 * \log(1/0.772) = 1.13$



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.

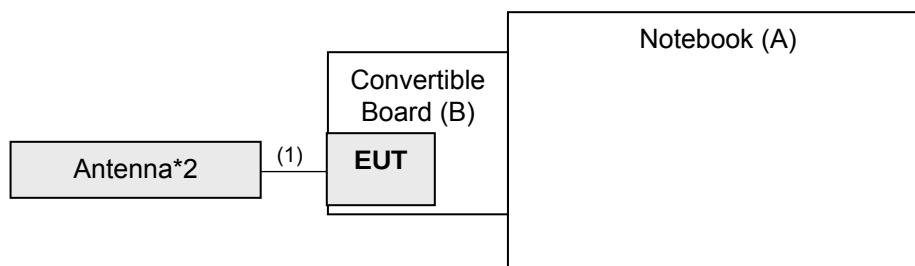
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5420	BPQ7MQ1	FCC DoC Approved	-
B.	Convertible Board	NA	NA	NA	NA	-

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:

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

Limits of unwanted emission out of the restricted bands

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules 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:

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

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:

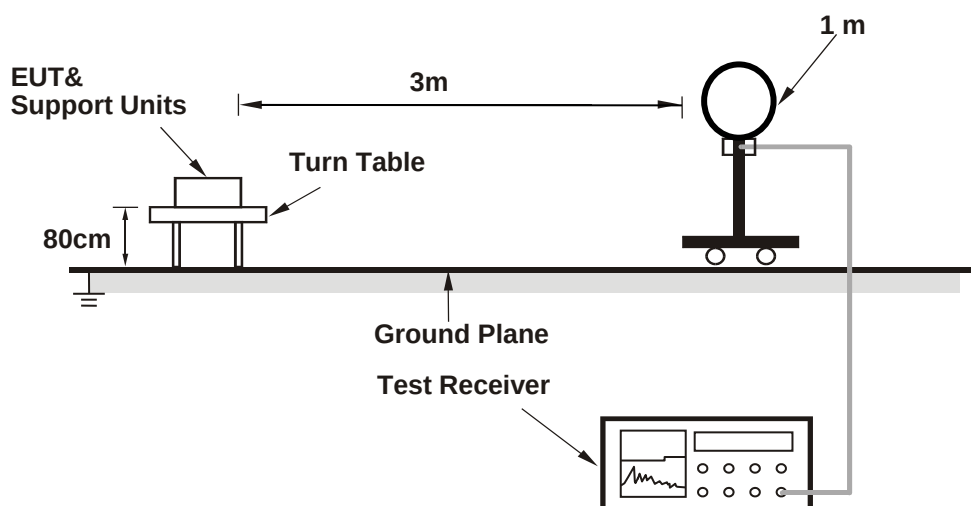
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

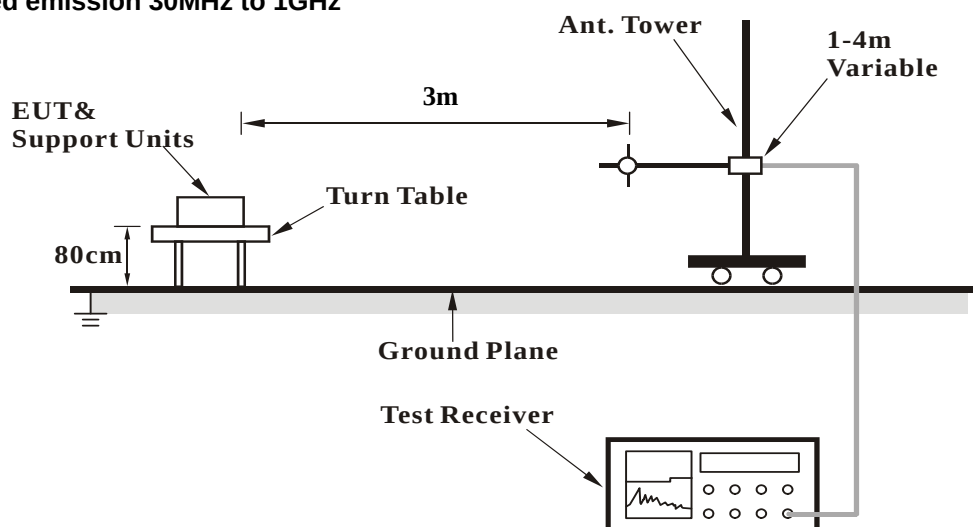
No deviation.

4.1.5 Test Setup

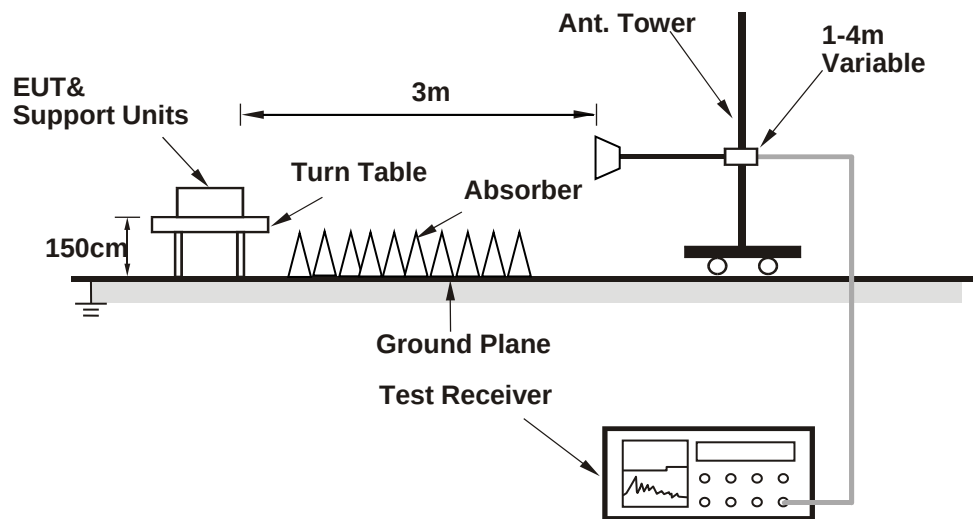
For Radiated emission below 30MHz



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	45.8 PK	74.0	-28.2	1.23 H	184	42.3	3.5
2	5150.00	42.7 AV	54.0	-11.3	1.23 H	184	39.2	3.5
3	*5180.00	92.7 PK			1.17 H	146	53.5	39.2
4	*5180.00	81.9 AV			1.17 H	146	42.7	39.2
5	#10360.00	57.6 PK	68.2	-10.6	2.56 H	283	42.2	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	46.0 PK	74.0	-28.0	1.63 V	226	42.5	3.5
2	5150.00	43.3 AV	54.0	-10.7	1.63 V	226	39.8	3.5
3	*5180.00	106.6 PK			1.64 V	252	67.4	39.2
4	*5180.00	95.6 AV			1.64 V	252	56.4	39.2
5	#10360.00	58.1 PK	68.2	-10.1	2.10 V	122	42.7	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	93.4 PK			1.26 H	263	54.1	39.3
2	*5200.00	82.5 AV			1.26 H	263	43.2	39.3
3	#10400.00	57.8 PK	68.2	-10.4	2.64 H	251	42.2	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	107.0 PK			1.63 V	309	67.7	39.3
2	*5200.00	96.3 AV			1.63 V	309	57.0	39.3
3	#10400.00	57.2 PK	68.2	-11.0	2.37 V	183	41.6	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	94.1 PK			1.26 H	263	55.0	39.1
2	*5240.00	83.2 AV			1.26 H	263	44.1	39.1
3	5350.00	55.6 PK	74.0	-18.4	1.39 H	251	51.9	3.7
4	5350.00	42.7 AV	54.0	-11.3	1.39 H	251	39.0	3.7
5	#10480.00	58.1 PK	68.2	-10.1	3.31 H	225	41.9	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	105.9 PK			1.78 V	243	66.8	39.1
2	*5240.00	95.3 AV			1.78 V	243	56.2	39.1
3	5350.00	57.0 PK	74.0	-17.0	1.85 V	281	53.3	3.7
4	5350.00	43.3 AV	54.0	-10.7	1.85 V	281	39.6	3.7
5	#10480.00	58.7 PK	68.2	-9.5	2.84 V	136	42.5	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	55.4 PK	74.0	-18.6	1.51 H	232	51.9	3.5
2	5150.00	42.7 AV	54.0	-11.3	1.51 H	232	39.2	3.5
3	*5260.00	94.1 PK			1.35 H	263	55.1	39.0
4	*5260.00	83.3 AV			1.35 H	263	44.3	39.0
5	#10520.00	58.6 PK	68.2	-9.6	3.02 H	226	42.3	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	55.9 PK	74.0	-18.1	1.89 V	258	52.4	3.5
2	5150.00	43.0 AV	54.0	-11.0	1.89 V	258	39.5	3.5
3	*5260.00	106.5 PK			1.80 V	244	67.5	39.0
4	*5260.00	95.5 AV			1.80 V	244	56.5	39.0
5	#10520.00	58.3 PK	68.2	-9.9	2.85 V	117	42.0	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	92.3 PK			1.47 H	57	53.3	39.0
2	*5300.00	81.7 AV			1.47 H	57	42.7	39.0
3	10600.00	58.0 PK	74.0	-16.0	2.55 H	241	41.4	16.6
4	10600.00	44.9 AV	54.0	-9.1	2.55 H	241	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	*5300.00	106.3 PK			1.62 V	223	67.3	39.0
2	*5300.00	95.2 AV			1.62 V	223	56.2	39.0
3	10600.00	58.8 PK	74.0	-15.2	2.96 V	154	42.2	16.6
4	10600.00	44.5 AV	54.0	-9.5	2.96 V	154	27.9	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.

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	92.8 PK			1.46 H	51	53.7	39.1
2	*5320.00	81.8 AV			1.46 H	51	42.7	39.1
3	5350.00	55.9 PK	74.0	-18.1	1.52 H	123	52.2	3.7
4	5350.00	42.6 AV	54.0	-11.4	1.52 H	123	38.9	3.7
5	10640.00	58.2 PK	74.0	-15.8	2.69 H	231	41.7	16.5
6	10640.00	44.7 AV	54.0	-9.3	2.69 H	231	28.2	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	106.8 PK			1.61 V	277	67.7	39.1
2	*5320.00	96.0 AV			1.61 V	277	56.9	39.1
3	5350.00	56.6 PK	74.0	-17.4	1.73 V	254	52.9	3.7
4	5350.00	43.4 AV	54.0	-10.6	1.73 V	254	39.7	3.7
5	10640.00	58.8 PK	74.0	-15.2	2.99 V	131	42.3	16.5
6	10640.00	45.0 AV	54.0	-9.0	2.99 V	131	28.5	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	1.75 H	263	52.2	4.0
2	5460.00	44.2 AV	54.0	-9.8	1.75 H	263	40.2	4.0
3	#5470.00	56.1 PK	68.2	-12.1	1.64 H	270	52.1	4.0
4	*5500.00	95.4 PK			1.88 H	291	55.8	39.6
5	*5500.00	84.9 AV			1.88 H	291	45.3	39.6
6	11000.00	59.6 PK	74.0	-14.4	1.99 H	231	41.7	17.9
7	11000.00	45.9 AV	54.0	-8.1	1.99 H	231	28.0	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	56.9 PK	74.0	-17.1	1.88 V	59	52.9	4.0
2	5460.00	44.4 AV	54.0	-9.6	1.88 V	59	40.4	4.0
3	#5470.00	57.8 PK	68.2	-10.4	1.99 V	84	53.8	4.0
4	*5500.00	108.3 PK			2.05 V	65	68.7	39.6
5	*5500.00	97.7 AV			2.05 V	65	58.1	39.6
6	11000.00	60.0 PK	74.0	-14.0	2.64 V	114	42.1	17.9
7	11000.00	46.1 AV	54.0	-7.9	2.64 V	114	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	94.3 PK			1.86 H	290	54.7	39.6
2	*5580.00	83.4 AV			1.86 H	290	43.8	39.6
3	11160.00	58.2 PK	74.0	-15.8	2.64 H	183	41.5	16.7
4	11160.00	45.4 AV	54.0	-8.6	2.64 H	183	28.7	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	107.6 PK			1.83 V	258	68.0	39.6
2	*5580.00	96.7 AV			1.83 V	258	57.1	39.6
3	11160.00	59.4 PK	74.0	-14.6	1.86 V	218	42.7	16.7
4	11160.00	45.9 AV	54.0	-8.1	1.86 V	218	29.2	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	92.8 PK			1.80 H	97	53.2	39.6
2	*5700.00	81.9 AV			1.80 H	97	42.3	39.6
3	#5725.00	55.7 PK	68.2	-12.5	2.12 H	100	51.6	4.1
4	11400.00	58.1 PK	74.0	-15.9	1.93 H	254	41.5	16.6
5	11400.00	44.3 AV	54.0	-9.7	1.93 H	254	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	*5700.00	107.5 PK			1.76 V	254	67.9	39.6
2	*5700.00	96.6 AV			1.76 V	254	57.0	39.6
3	#5725.00	55.5 PK	68.2	-12.7	1.79 V	241	51.4	4.1
4	11400.00	57.8 PK	74.0	-16.2	2.21 V	189	41.2	16.6
5	11400.00	43.9 AV	54.0	-10.1	2.21 V	189	27.3	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 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	#5642.31	54.0 PK	68.2	-14.2	1.34 H	272	49.7	4.3
2	*5745.00	91.3 PK			1.34 H	272	51.5	39.8
3	*5745.00	80.3 AV			1.34 H	272	40.5	39.8
4	#5957.69	57.0 PK	68.2	-11.2	1.34 H	272	52.2	4.8
5	11490.00	57.2 PK	74.0	-16.8	2.96 H	241	40.4	16.8
6	11490.00	43.9 AV	54.0	-10.1	2.96 H	241	27.1	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	#5648.72	53.8 PK	68.2	-14.4	1.72 V	276	49.5	4.3
2	*5745.00	106.7 PK			1.72 V	276	66.9	39.8
3	*5745.00	95.8 AV			1.72 V	276	56.0	39.8
4	#5959.62	56.8 PK	68.2	-11.4	1.72 V	276	52.0	4.8
5	11490.00	58.1 PK	74.0	-15.9	2.56 V	233	41.3	16.8
6	11490.00	44.3 AV	54.0	-9.7	2.56 V	233	27.5	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	#5619.23	54.7 PK	68.2	-13.5	1.35 H	295	50.5	4.2
2	*5785.00	93.3 PK			1.35 H	295	53.2	40.1
3	*5785.00	82.4 AV			1.35 H	295	42.3	40.1
4	#5957.69	56.6 PK	68.2	-11.6	1.35 H	295	51.8	4.8
5	11570.00	57.3 PK	74.0	-16.7	2.69 H	215	40.3	17.0
6	11570.00	44.9 AV	54.0	-9.1	2.69 H	215	27.9	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	#5603.85	53.9 PK	68.2	-14.3	1.77 V	251	49.7	4.2
2	*5785.00	106.1 PK			1.77 V	251	66.0	40.1
3	*5785.00	95.1 AV			1.77 V	251	55.0	40.1
4	#5996.15	56.7 PK	68.2	-11.5	1.77 V	251	51.7	5.0
5	11570.00	59.5 PK	74.0	-14.5	2.84 V	217	42.5	17.0
6	11570.00	45.6 AV	54.0	-8.4	2.84 V	217	28.6	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	#5608.97	54.5 PK	68.2	-13.7	1.32 H	294	50.3	4.2
2	*5825.00	94.6 PK			1.32 H	294	54.3	40.3
3	*5825.00	83.9 AV			1.32 H	294	43.6	40.3
4	#5975.64	57.1 PK	68.2	-11.1	1.32 H	294	52.1	5.0
5	11650.00	57.9 PK	74.0	-16.1	2.47 H	205	41.3	16.6
6	11650.00	44.2 AV	54.0	-9.8	2.47 H	205	27.6	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	#5619.23	53.7 PK	68.2	-14.5	1.81 V	252	49.5	4.2
2	*5825.00	106.8 PK			1.81 V	252	66.5	40.3
3	*5825.00	96.0 AV			1.81 V	252	55.7	40.3
4	#5930.77	57.0 PK	68.2	-11.2	1.81 V	252	52.1	4.9
5	11650.00	59.8 PK	74.0	-14.2	3.10 V	214	43.2	16.6
6	11650.00	45.5 AV	54.0	-8.5	3.10 V	214	28.9	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	55.1 PK	74.0	-18.9	1.38 H	254	51.6	3.5
2	5150.00	43.0 AV	54.0	-11.0	1.38 H	254	39.5	3.5
3	*5180.00	96.9 PK			1.47 H	262	57.7	39.2
4	*5180.00	86.5 AV			1.47 H	262	47.3	39.2
5	#10360.00	57.2 PK	68.2	-11.0	3.09 H	231	41.8	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	56.9 PK	74.0	-17.1	1.64 V	277	53.4	3.5
2	5150.00	44.2 AV	54.0	-9.8	1.64 V	277	40.7	3.5
3	*5180.00	110.5 PK			1.50 V	215	71.3	39.2
4	*5180.00	99.9 AV			1.50 V	215	60.7	39.2
5	#10360.00	56.8 PK	68.2	-11.4	2.87 V	155	41.4	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	97.7 PK			1.28 H	261	58.4	39.3
2	*5200.00	87.3 AV			1.28 H	261	48.0	39.3
3	#10400.00	57.7 PK	68.2	-10.5	3.23 H	192	42.1	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	111.5 PK			1.76 V	278	72.2	39.3
2	*5200.00	100.8 AV			1.76 V	278	61.5	39.3
3	#10400.00	57.4 PK	68.2	-10.8	2.89 V	167	41.8	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	98.2 PK			1.39 H	261	59.1	39.1
2	*5240.00	87.6 AV			1.39 H	261	48.5	39.1
3	5350.00	44.9 PK	74.0	-29.1	1.45 H	241	41.2	3.7
4	5350.00	43.0 AV	54.0	-11.0	1.45 H	241	39.3	3.7
5	#10480.00	57.6 PK	68.2	-10.6	2.93 H	267	41.4	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	111.8 PK			1.78 V	273	72.7	39.1
2	*5240.00	101.0 AV			1.78 V	273	61.9	39.1
3	5350.00	47.0 PK	74.0	-27.0	1.85 V	263	43.3	3.7
4	5350.00	43.1 AV	54.0	-10.9	1.85 V	263	39.4	3.7
5	#10480.00	58.9 PK	68.2	-9.3	2.78 V	163	42.7	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	54.8 PK	74.0	-19.2	1.46 H	218	51.3	3.5
2	5150.00	43.2 AV	54.0	-10.8	1.46 H	218	39.7	3.5
3	*5260.00	98.7 PK			1.33 H	261	59.7	39.0
4	*5260.00	88.1 AV			1.33 H	261	49.1	39.0
5	#10520.00	57.8 PK	68.2	-10.4	3.15 H	231	41.5	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	56.1 PK	74.0	-17.9	1.85 V	266	52.6	3.5
2	5150.00	43.0 AV	54.0	-11.0	1.85 V	266	39.5	3.5
3	*5260.00	111.4 PK			1.75 V	252	72.4	39.0
4	*5260.00	100.6 AV			1.75 V	252	61.6	39.0
5	#10520.00	58.5 PK	68.2	-9.7	2.81 V	142	42.2	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	98.7 PK			1.38 H	261	59.7	39.0
2	*5300.00	87.5 AV			1.38 H	261	48.5	39.0
3	10600.00	57.8 PK	74.0	-16.2	3.54 H	226	41.2	16.6
4	10600.00	45.2 AV	54.0	-8.8	3.54 H	226	28.6	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	*5300.00	111.3 PK			1.80 V	276	72.3	39.0
2	*5300.00	100.9 AV			1.80 V	276	61.9	39.0
3	10600.00	58.5 PK	74.0	-15.5	3.05 V	183	41.9	16.6
4	10600.00	44.9 AV	54.0	-9.1	3.05 V	183	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	96.7 PK			1.25 H	261	57.6	39.1
2	*5320.00	86.2 AV			1.25 H	261	47.1	39.1
3	5350.00	55.4 PK	74.0	-18.6	1.38 H	226	51.7	3.7
4	5350.00	43.5 AV	54.0	-10.5	1.38 H	226	39.8	3.7
5	10640.00	58.0 PK	74.0	-16.0	2.64 H	152	41.5	16.5
6	10640.00	45.1 AV	54.0	-8.9	2.64 H	152	28.6	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	111.7 PK			1.71 V	276	72.6	39.1
2	*5320.00	101.6 AV			1.71 V	276	62.5	39.1
3	5350.00	57.3 PK	74.0	-16.7	1.62 V	276	53.6	3.7
4	5350.00	44.7 AV	54.0	-9.3	1.62 V	276	41.0	3.7
5	10640.00	58.8 PK	74.0	-15.2	2.88 V	223	42.3	16.5
6	10640.00	44.8 AV	54.0	-9.2	2.88 V	223	28.3	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	55.2 PK	74.0	-18.8	1.79 H	221	51.2	4.0
2	5460.00	43.8 AV	54.0	-10.2	1.79 H	221	39.8	4.0
3	#5470.00	56.4 PK	68.2	-11.8	1.73 H	249	52.4	4.0
4	*5500.00	99.9 PK			1.60 H	216	60.3	39.6
5	*5500.00	88.9 AV			1.60 H	216	49.3	39.6
6	11000.00	59.0 PK	74.0	-15.0	2.13 H	236	41.1	17.9
7	11000.00	45.7 AV	54.0	-8.3	2.13 H	236	27.8	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	57.3 PK	74.0	-16.7	1.55 V	273	53.3	4.0
2	5460.00	44.2 AV	54.0	-9.8	1.55 V	273	40.2	4.0
3	#5470.00	57.7 PK	68.2	-10.5	1.72 V	248	53.7	4.0
4	*5500.00	112.1 PK			1.69 V	273	72.5	39.6
5	*5500.00	101.6 AV			1.69 V	273	62.0	39.6
6	11000.00	60.4 PK	74.0	-13.6	1.78 V	264	42.5	17.9
7	11000.00	46.2 AV	54.0	-7.8	1.78 V	264	28.3	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	96.2 PK			1.81 H	215	56.6	39.6
2	*5580.00	86.2 AV			1.81 H	215	46.6	39.6
3	11160.00	57.9 PK	74.0	-16.1	2.38 H	179	41.2	16.7
4	11160.00	44.8 AV	54.0	-9.2	2.38 H	179	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	111.6 PK			1.65 V	272	72.0	39.6
2	*5580.00	101.3 AV			1.65 V	272	61.7	39.6
3	11160.00	59.0 PK	74.0	-15.0	1.83 V	218	42.3	16.7
4	11160.00	47.2 AV	54.0	-6.8	1.83 V	218	30.5	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	93.6 PK			1.82 H	221	54.0	39.6
2	*5700.00	83.0 AV			1.82 H	221	43.4	39.6
3	#5725.00	56.4 PK	68.2	-11.8	1.89 H	234	52.3	4.1
4	11400.00	58.1 PK	74.0	-15.9	2.63 H	231	41.5	16.6
5	11400.00	44.9 AV	54.0	-9.1	2.63 H	231	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	*5700.00	110.6 PK			1.75 V	254	71.0	39.6
2	*5700.00	100.4 AV			1.75 V	254	60.8	39.6
3	#5725.00	56.1 PK	68.2	-12.1	1.93 V	259	52.0	4.1
4	11400.00	57.9 PK	74.0	-16.1	1.92 V	216	41.3	16.6
5	11400.00	44.5 AV	54.0	-9.5	1.92 V	216	27.9	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.

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	#5614.10	53.9 PK	68.2	-14.3	1.51 H	273	49.7	4.2
2	*5745.00	94.4 PK			1.51 H	273	54.6	39.8
3	*5745.00	84.1 AV			1.51 H	273	44.3	39.8
4	#5966.67	56.5 PK	68.2	-11.7	1.51 H	273	51.6	4.9
5	11490.00	57.7 PK	74.0	-16.3	3.01 H	243	40.9	16.8
6	11490.00	44.8 AV	54.0	-9.2	3.01 H	243	28.0	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	#5604.49	54.5 PK	68.2	-13.7	1.60 V	271	50.3	4.2
2	*5745.00	110.6 PK			1.60 V	271	70.8	39.8
3	*5745.00	99.8 AV			1.60 V	271	60.0	39.8
4	#5971.15	56.9 PK	68.2	-11.3	1.60 V	271	52.0	4.9
5	11490.00	58.6 PK	74.0	-15.4	3.69 V	116	41.8	16.8
6	11490.00	46.1 AV	54.0	-7.9	3.69 V	116	29.3	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	#5604.49	53.8 PK	68.2	-14.4	1.48 H	261	49.6	4.2
2	*5785.00	95.6 PK			1.48 H	261	55.5	40.1
3	*5785.00	85.5 AV			1.48 H	261	45.4	40.1
4	#5978.21	56.4 PK	68.2	-11.8	1.48 H	261	51.4	5.0
5	11570.00	58.2 PK	74.0	-15.8	2.89 H	237	41.2	17.0
6	11570.00	45.1 AV	54.0	-8.9	2.89 H	237	28.1	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	#5613.46	55.2 PK	68.2	-13.0	1.86 V	271	51.0	4.2
2	*5785.00	111.0 PK			1.86 V	271	70.9	40.1
3	*5785.00	100.4 AV			1.86 V	271	60.3	40.1
4	#5971.15	56.6 PK	68.2	-11.6	1.86 V	271	51.7	4.9
5	11570.00	60.0 PK	74.0	-14.0	3.13 V	79	43.0	17.0
6	11570.00	46.2 AV	54.0	-7.8	3.13 V	79	29.2	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	#5636.54	54.6 PK	68.2	-13.6	1.14 H	225	50.4	4.2
2	*5825.00	96.3 PK			1.14 H	225	56.0	40.3
3	*5825.00	86.1 AV			1.14 H	225	45.8	40.3
4	#5942.95	56.5 PK	68.2	-11.7	1.14 H	225	51.7	4.8
5	11650.00	57.7 PK	74.0	-16.3	2.48 H	196	41.1	16.6
6	11650.00	44.7 AV	54.0	-9.3	2.48 H	196	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	#5637.82	54.4 PK	68.2	-13.8	1.85 V	271	50.2	4.2
2	*5825.00	111.4 PK			1.85 V	271	71.1	40.3
3	*5825.00	100.7 AV			1.85 V	271	60.4	40.3
4	#5946.79	56.5 PK	68.2	-11.7	1.85 V	271	51.7	4.8
5	11650.00	59.0 PK	74.0	-15.0	3.69 V	117	42.4	16.6
6	11650.00	45.9 AV	54.0	-8.1	3.69 V	117	29.3	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.

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	57.4 PK	74.0	-16.6	1.48 H	284	53.9	3.5
2	5150.00	43.3 AV	54.0	-10.7	1.48 H	284	39.8	3.5
3	*5190.00	94.1 PK			1.32 H	260	54.8	39.3
4	*5190.00	84.1 AV			1.32 H	260	44.8	39.3
5	#10380.00	56.2 PK	68.2	-12.0	2.94 H	158	40.7	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	68.0 PK	74.0	-6.0	1.72 V	50	64.5	3.5
2	5150.00	48.0 AV	54.0	-6.0	1.72 V	50	44.5	3.5
3	*5190.00	109.7 PK			1.78 V	51	70.4	39.3
4	*5190.00	99.5 AV			1.78 V	51	60.2	39.3
5	#10380.00	58.2 PK	68.2	-10.0	2.53 V	208	42.7	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	95.6 PK			1.44 H	262	56.5	39.1
2	*5230.00	85.1 AV			1.44 H	262	46.0	39.1
3	5350.00	56.3 PK	74.0	-17.7	1.39 H	223	52.6	3.7
4	5350.00	43.4 AV	54.0	-10.6	1.39 H	223	39.7	3.7
5	#10460.00	57.6 PK	68.2	-10.6	2.61 H	158	41.6	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	107.5 PK			1.80 V	272	68.4	39.1
2	*5230.00	97.3 AV			1.80 V	272	58.2	39.1
3	5350.00	59.4 PK	74.0	-14.6	1.68 V	231	55.7	3.7
4	5350.00	43.0 AV	54.0	-11.0	1.68 V	231	39.3	3.7
5	#10460.00	57.9 PK	68.2	-10.3	2.93 V	208	41.9	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	55.7 PK	74.0	-18.3	1.25 H	275	52.2	3.5
2	5150.00	42.7 AV	54.0	-11.3	1.25 H	275	39.2	3.5
3	*5270.00	95.2 PK			1.14 H	261	56.2	39.0
4	*5270.00	84.7 AV			1.14 H	261	45.7	39.0
5	#10540.00	56.9 PK	68.2	-11.3	2.87 H	269	40.5	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	56.3 PK	74.0	-17.7	1.86 V	253	52.8	3.5
2	5150.00	43.3 AV	54.0	-10.7	1.86 V	253	39.8	3.5
3	*5270.00	108.4 PK			1.74 V	272	69.4	39.0
4	*5270.00	97.9 AV			1.74 V	272	58.9	39.0
5	#10540.00	58.7 PK	68.2	-9.5	2.67 V	223	42.3	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	94.9 PK			1.38 H	260	55.9	39.0
2	*5310.00	84.3 AV			1.38 H	260	45.3	39.0
3	5350.00	55.7 PK	74.0	-18.3	1.45 H	216	52.0	3.7
4	5350.00	43.3 AV	54.0	-10.7	1.45 H	216	39.6	3.7
5	10620.00	57.8 PK	74.0	-16.2	2.68 H	254	41.2	16.6
6	10620.00	44.7 AV	54.0	-9.3	2.68 H	254	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	*5310.00	108.3 PK			1.68 V	275	69.3	39.0
2	*5310.00	97.9 AV			1.68 V	275	58.9	39.0
3	5350.00	64.9 PK	74.0	-9.1	1.70 V	273	61.2	3.7
4	5350.00	46.9 AV	54.0	-7.1	1.70 V	273	43.2	3.7
5	10620.00	58.4 PK	74.0	-15.6	2.64 V	203	41.8	16.6
6	10620.00	45.2 AV	54.0	-8.8	2.64 V	203	28.6	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	55.9 PK	74.0	-18.1	1.49 H	251	51.9	4.0
2	5460.00	43.8 AV	54.0	-10.2	1.49 H	251	39.8	4.0
3	#5470.00	57.7 PK	68.2	-10.5	1.82 H	223	53.7	4.0
4	*5510.00	96.4 PK			1.70 H	216	56.7	39.7
5	*5510.00	86.0 AV			1.70 H	216	46.3	39.7
6	11020.00	58.1 PK	74.0	-15.9	2.53 H	237	40.5	17.6
7	11020.00	45.2 AV	54.0	-8.8	2.53 H	237	27.6	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	59.3 PK	74.0	-14.7	1.62 V	295	55.3	4.0
2	5460.00	45.4 AV	54.0	-8.6	1.62 V	295	41.4	4.0
3	#5470.00	62.4 PK	68.2	-5.8	1.64 V	304	58.4	4.0
4	*5510.00	108.7 PK			1.67 V	271	69.0	39.7
5	*5510.00	98.3 AV			1.67 V	271	58.6	39.7
6	11020.00	59.2 PK	74.0	-14.8	2.25 V	194	41.6	17.6
7	11020.00	46.1 AV	54.0	-7.9	2.25 V	194	28.5	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	93.6 PK			1.72 H	230	54.0	39.6
2	*5550.00	83.9 AV			1.72 H	230	44.3	39.6
3	11100.00	57.1 PK	74.0	-16.9	2.36 H	191	40.3	16.8
4	11100.00	45.6 AV	54.0	-8.4	2.36 H	191	28.8	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	*5550.00	108.3 PK			1.74 V	272	68.7	39.6
2	*5550.00	98.2 AV			1.74 V	272	58.6	39.6
3	11100.00	58.9 PK	74.0	-15.1	2.08 V	212	42.1	16.8
4	11100.00	45.8 AV	54.0	-8.2	2.08 V	212	29.0	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	89.4 PK			1.50 H	227	49.6	39.8
2	*5670.00	79.7 AV			1.50 H	227	39.9	39.8
3	#5725.00	58.8 PK	68.2	-9.4	1.61 H	243	54.7	4.1
4	11340.00	57.7 PK	74.0	-16.3	1.87 H	236	40.9	16.8
5	11340.00	44.6 AV	54.0	-9.4	1.87 H	236	27.8	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	108.0 PK			1.68 V	265	68.2	39.8
2	*5670.00	97.8 AV			1.68 V	265	58.0	39.8
3	#5725.00	64.5 PK	68.2	-3.7	1.76 V	285	60.4	4.1
4	11340.00	58.1 PK	74.0	-15.9	1.77 V	256	41.3	16.8
5	11340.00	44.8 AV	54.0	-9.2	1.77 V	256	28.0	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	#5649.36	53.5 PK	68.2	-14.7	1.62 H	264	49.2	4.3
2	*5755.00	91.7 PK			1.62 H	264	51.9	39.8
3	*5755.00	82.0 AV			1.62 H	264	42.2	39.8
4	#5937.18	56.3 PK	68.2	-11.9	1.62 H	264	51.5	4.8
5	11510.00	58.2 PK	74.0	-15.8	2.83 H	187	41.3	16.9
6	11510.00	45.1 AV	54.0	-8.9	2.83 H	187	28.2	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	55.4 PK	68.2	-12.8	1.91 V	272	51.1	4.3
2	*5755.00	107.3 PK			1.91 V	272	67.5	39.8
3	*5755.00	96.9 AV			1.91 V	272	57.1	39.8
4	#5947.44	57.2 PK	68.2	-11.0	1.91 V	272	52.4	4.8
5	11510.00	58.5 PK	74.0	-15.5	3.91 V	87	41.6	16.9
6	11510.00	45.5 AV	54.0	-8.5	3.91 V	87	28.6	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	#5605.13	54.3 PK	68.2	-13.9	1.47 H	262	50.1	4.2
2	*5795.00	93.5 PK			1.47 H	262	53.4	40.1
3	*5795.00	83.1 AV			1.47 H	262	43.0	40.1
4	#5976.28	56.7 PK	68.2	-11.5	1.47 H	262	51.7	5.0
5	11590.00	58.7 PK	74.0	-15.3	2.81 H	202	41.7	17.0
6	11590.00	45.0 AV	54.0	-9.0	2.81 H	202	28.0	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	#5647.44	55.6 PK	68.2	-12.6	1.86 V	270	51.3	4.3
2	*5795.00	107.5 PK			1.86 V	270	67.4	40.1
3	*5795.00	97.1 AV			1.86 V	270	57.0	40.1
4	#5931.41	56.8 PK	68.2	-11.4	1.86 V	270	51.9	4.9
5	11590.00	59.1 PK	74.0	-14.9	3.96 V	75	42.1	17.0
6	11590.00	45.3 AV	54.0	-8.7	3.96 V	75	28.3	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	56.0 PK	74.0	-18.0	1.26 H	253	52.5	3.5
2	5150.00	43.5 AV	54.0	-10.5	1.26 H	253	40.0	3.5
3	*5210.00	89.5 PK			1.44 H	261	50.3	39.2
4	*5210.00	79.9 AV			1.44 H	261	40.7	39.2
5	5350.00	56.1 PK	74.0	-17.9	1.19 H	288	52.4	3.7
6	5350.00	43.9 AV	54.0	-10.1	1.19 H	288	40.2	3.7
7	#10420.00	57.4 PK	68.2	-10.8	3.16 H	251	41.7	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	57.1 PK	74.0	-16.9	1.52 V	246	53.6	3.5
2	5150.00	44.8 AV	54.0	-9.2	1.52 V	246	41.3	3.5
3	*5210.00	101.3 PK			1.87 V	249	62.1	39.2
4	*5210.00	91.5 AV			1.87 V	249	52.3	39.2
5	5350.00	57.1 PK	74.0	-16.9	1.69 V	274	53.4	3.7
6	5350.00	45.0 AV	54.0	-9.0	1.69 V	274	41.3	3.7
7	#10420.00	58.2 PK	68.2	-10.0	2.86 V	226	42.5	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	1.26 H	218	51.2	3.5
2	5150.00	43.1 AV	54.0	-10.9	1.26 H	218	39.6	3.5
3	*5290.00	89.9 PK			1.16 H	261	50.9	39.0
4	*5290.00	79.9 AV			1.16 H	261	40.9	39.0
5	5350.00	55.9 PK	74.0	-18.1	1.23 H	212	52.2	3.7
6	5350.00	43.8 AV	54.0	-10.2	1.23 H	212	40.1	3.7
7	#10580.00	58.2 PK	68.2	-10.0	2.57 H	189	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	55.4 PK	74.0	-18.6	1.89 V	264	51.9	3.5
2	5150.00	44.0 AV	54.0	-10.0	1.89 V	264	40.5	3.5
3	*5290.00	103.0 PK			1.72 V	274	64.0	39.0
4	*5290.00	93.4 AV			1.72 V	274	54.4	39.0
5	5350.00	61.5 PK	74.0	-12.5	1.71 V	273	57.8	3.7
6	5350.00	48.2 AV	54.0	-5.8	1.71 V	273	44.5	3.7
7	#10580.00	58.6 PK	68.2	-9.6	2.53 V	212	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	57.4 PK	74.0	-16.6	1.89 H	225	53.4	4.0
2	5460.00	45.2 AV	54.0	-8.8	1.89 H	225	41.2	4.0
3	#5470.00	58.6 PK	68.2	-9.6	1.77 H	254	54.6	4.0
4	*5530.00	89.8 PK			1.72 H	216	50.1	39.7
5	*5530.00	80.0 AV			1.72 H	216	40.3	39.7
6	#5725.00	55.4 PK	68.2	-12.8	1.64 H	263	51.3	4.1
7	11060.00	57.8 PK	74.0	-16.2	2.33 H	185	40.6	17.2
8	11060.00	45.6 AV	54.0	-8.4	2.33 H	185	28.4	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	61.2 PK	74.0	-12.8	1.71 V	275	57.2	4.0
2	5460.00	48.9 AV	54.0	-5.1	1.71 V	275	44.9	4.0
3	#5470.00	62.1 PK	68.2	-6.1	1.65 V	269	58.1	4.0
4	*5530.00	103.2 PK			1.76 V	274	63.5	39.7
5	*5530.00	93.5 AV			1.76 V	274	53.8	39.7
6	#5725.00	55.1 PK	68.2	-13.1	1.65 V	249	51.0	4.1
7	11060.00	59.5 PK	74.0	-14.5	1.89 V	223	42.3	17.2
8	11060.00	47.1 AV	54.0	-6.9	1.89 V	223	29.9	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	56.1 PK	74.0	-17.9	1.83 H	235	52.1	4.0
2	5460.00	44.8 AV	54.0	-9.2	1.83 H	235	40.8	4.0
3	#5470.00	57.4 PK	68.2	-10.8	1.83 H	233	53.4	4.0
4	*5610.00	87.3 PK			1.73 H	229	47.5	39.8
5	*5610.00	76.7 AV			1.73 H	229	36.9	39.8
6	#5725.00	57.2 PK	68.2	-11.0	1.95 H	254	53.1	4.1
7	11220.00	59.2 PK	74.0	-14.8	2.31 H	176	42.4	16.8
8	11220.00	46.6 AV	54.0	-7.4	2.31 H	176	29.8	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	57.6 PK	74.0	-16.4	1.93 V	285	53.6	4.0
2	5460.00	46.2 AV	54.0	-7.8	1.93 V	285	42.2	4.0
3	#5470.00	57.6 PK	68.2	-10.6	1.88 V	265	53.6	4.0
4	*5610.00	102.2 PK			1.78 V	271	62.4	39.8
5	*5610.00	92.6 AV			1.78 V	271	52.8	39.8
6	#5725.00	57.5 PK	68.2	-10.7	1.62 V	255	53.4	4.1
7	11220.00	59.4 PK	74.0	-14.6	1.89 V	235	42.6	16.8
8	11220.00	47.0 AV	54.0	-7.0	1.89 V	235	30.2	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	#5625.00	54.6 PK	68.2	-13.6	1.26 H	262	50.4	4.2
2	#5650.00	55.3 PK	68.2	-12.9	1.43 H	255	51.0	4.3
3	*5775.00	86.7 PK			1.26 H	262	46.7	40.0
4	*5775.00	77.2 AV			1.26 H	262	37.2	40.0
5	#5925.00	57.5 PK	68.2	-10.7	1.08 H	284	52.6	4.9
6	#5956.41	56.2 PK	68.2	-12.0	1.26 H	262	51.4	4.8
7	11550.00	58.5 PK	74.0	-15.5	2.64 H	231	41.5	17.0
8	11550.00	46.7 AV	54.0	-7.3	2.64 H	231	29.7	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	#5645.51	55.9 PK	68.2	-12.3	1.71 V	267	51.6	4.3
2	#5650.00	57.5 PK	68.2	-10.7	1.89 V	296	53.2	4.3
3	*5775.00	101.8 PK			1.71 V	267	61.8	40.0
4	*5775.00	91.9 AV			1.71 V	267	51.9	40.0
5	#5925.00	58.3 PK	68.2	-9.9	1.64 V	213	53.4	4.9
6	#5973.72	56.8 PK	68.2	-11.4	1.71 V	267	51.8	5.0
7	11550.00	58.8 PK	74.0	-15.2	3.43 V	112	41.8	17.0
8	11550.00	47.0 AV	54.0	-7.0	3.43 V	112	30.0	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.

Below 1GHz worst-case data:

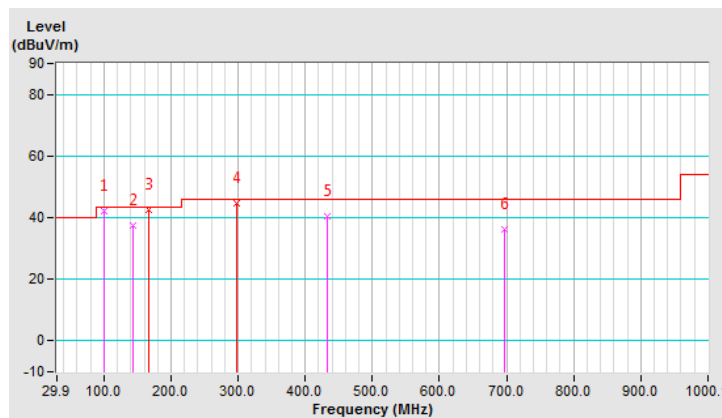
802.11n (HT40)

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	99.89	42.1 QP	43.5	-1.4	2.00 H	12	55.8	-13.7
2	142.67	37.3 QP	43.5	-6.2	2.00 H	12	46.6	-9.3
3	165.96	42.4 QP	43.5	-1.1	1.50 H	61	51.4	-9.0
4	298.73	44.7 QP	46.0	-1.3	1.00 H	157	52.2	-7.5
5	432.37	40.6 QP	46.0	-5.4	2.00 H	150	45.1	-4.5
6	696.79	36.1 QP	46.0	-9.9	1.01 H	204	35.8	0.3

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.

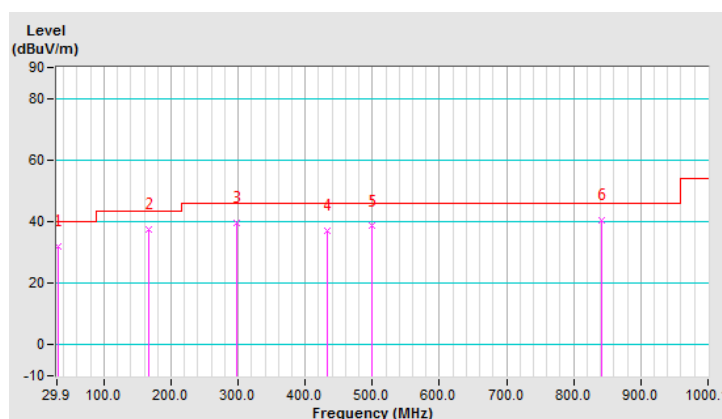


CHANNEL	TX Channel 38	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	31.84	32.0 QP	40.0	-8.0	1.00 V	145	43.0	-11.0
2	166.00	37.6 QP	43.5	-5.9	1.00 V	213	46.6	-9.0
3	298.21	39.6 QP	46.0	-6.4	1.50 V	88	47.1	-7.5
4	432.37	37.1 QP	46.0	-8.9	1.50 V	88	41.6	-4.5
5	498.47	38.5 QP	46.0	-7.5	1.00 V	49	42.0	-3.5
6	842.61	40.4 QP	46.0	-5.6	1.00 V	46	37.5	2.9

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 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_Cond_ 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

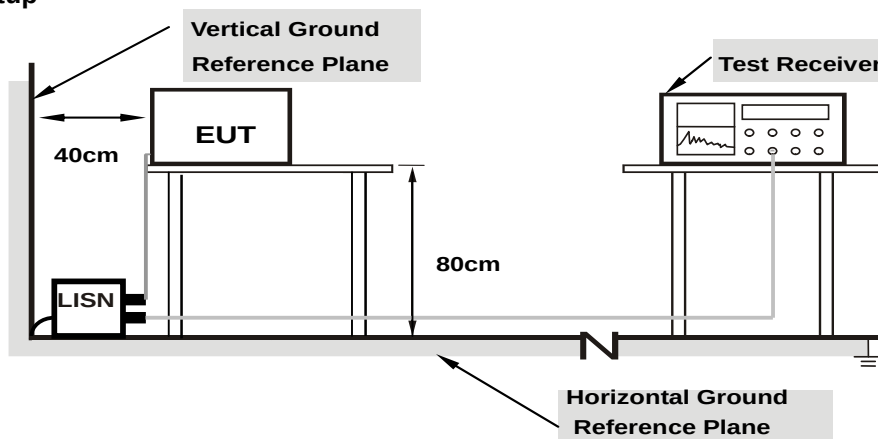
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

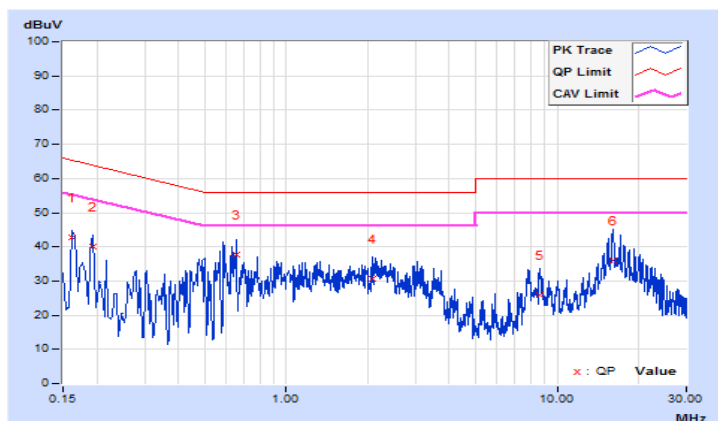
802.11n (HT40)

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [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	9.67	33.19	18.73	42.86	28.40	65.37	55.37	-22.51	-26.97
2	0.19301	9.67	30.31	16.70	39.98	26.37	63.91	53.91	-23.93	-27.54
3	0.65439	9.66	27.98	11.18	37.64	20.84	56.00	46.00	-18.36	-25.16
4	2.06981	9.68	20.91	10.01	30.59	19.69	56.00	46.00	-25.41	-26.31
5	8.60733	9.82	16.01	7.63	25.83	17.45	60.00	50.00	-34.17	-32.55
6	16.13799	9.89	25.99	18.74	35.88	28.63	60.00	50.00	-24.12	-21.37

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.

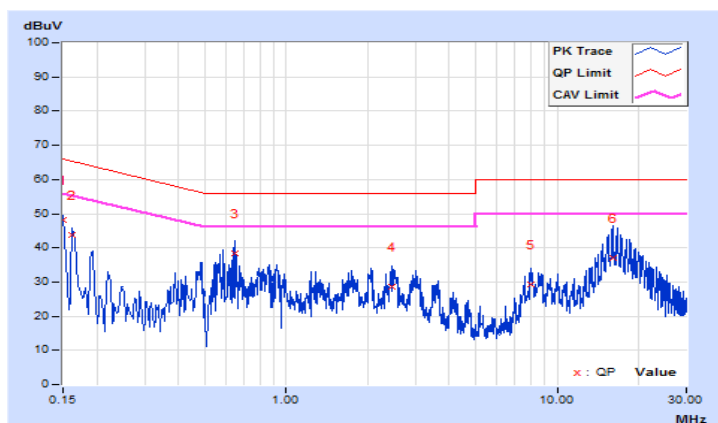


Channel	TX Channel 38	Detector Function	Quasi-Peak (QP) / Average (AV)
Phase	Neutral (N)		

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	0.15000	9.68	38.44	21.13	48.12	30.81	66.00	56.00	-17.88	-25.19
2	0.16181	9.68	34.04	18.17	43.72	27.85	65.37	55.37	-21.65	-27.52
3	0.64266	9.66	28.73	12.79	38.39	22.45	56.00	46.00	-17.61	-23.55
4	2.45299	9.69	18.94	9.67	28.63	19.36	56.00	46.00	-27.37	-26.64
5	8.01301	9.82	19.46	10.25	29.28	20.07	60.00	50.00	-30.72	-29.93
6	16.02069	9.95	27.24	20.20	37.19	30.15	60.00	50.00	-22.81	-19.85

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} ;

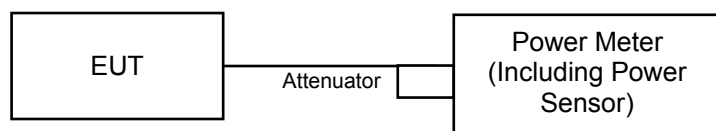
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

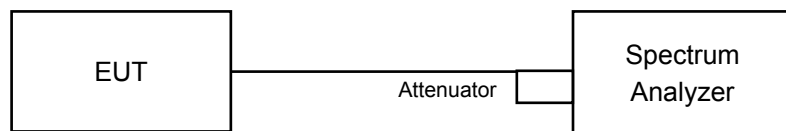
4.3.2 Test Setup

For Power Output

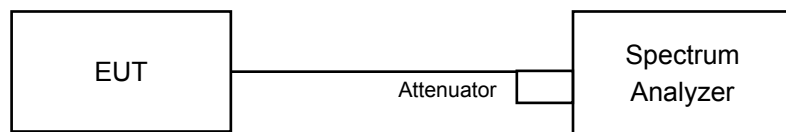
802.11a, 802.11n (HT20), 802.11n (HT40)



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	28.054	14.48	24.00	Pass
40	5200	28.054	14.48	24.00	Pass
48	5240	26.669	14.26	24.00	Pass
52	5260	27.733	14.43	23.83	Pass
60	5300	26.485	14.23	23.83	Pass
64	5320	27.416	14.38	23.89	Pass
100	5500	27.290	14.36	23.85	Pass
116	5580	28.249	14.51	23.90	Pass
140	5700	27.669	14.42	23.82	Pass
149	5745	27.797	14.44	30.00	Pass
157	5785	26.730	14.27	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. $11\text{dBm} + 10\log(19.22) = 23.83\text{ dBm} < 24\text{dBm}$
2. $11\text{dBm} + 10\log(19.23) = 23.83\text{ dBm} < 24\text{dBm}$
3. $11\text{dBm} + 10\log(19.46) = 23.89\text{ dBm} < 24\text{dBm}$
4. $11\text{dBm} + 10\log(19.28) = 23.85\text{ dBm} < 24\text{dBm}$
5. $11\text{dBm} + 10\log(19.52) = 23.90\text{ dBm} < 24\text{dBm}$
6. $11\text{dBm} + 10\log(19.18) = 23.82\text{ dBm} < 24\text{dBm}$

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	13.72	14.11	49.313	16.93	24.00	Pass
40	5200	13.78	14.13	49.760	16.97	24.00	Pass
48	5240	13.81	13.86	48.366	16.85	24.00	Pass
52	5260	13.83	13.72	47.705	16.79	24.00	Pass
60	5300	13.98	13.53	47.545	16.77	24.00	Pass
64	5320	14.07	13.55	48.173	16.83	24.00	Pass
100	5500	13.79	13.66	47.160	16.74	24.00	Pass
116	5580	14.00	13.92	49.779	16.97	24.00	Pass
140	5700	13.92	13.59	47.516	16.77	24.00	Pass
149	5745	13.84	13.66	47.437	16.76	30.00	Pass
157	5785	13.86	13.75	48.036	16.82	30.00	Pass
165	5825	13.64	13.45	45.252	16.56	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(20.61) = 24.14 dBm > 24dBm
2. 11dBm + 10log(20.37) = 24.09 dBm > 24dBm
3. 11dBm + 10log(20.50) = 24.12 dBm > 24dBm
4. 11dBm + 10log(20.44) = 24.10 dBm > 24dBm
5. 11dBm + 10log(20.46) = 24.11 dBm > 24dBm
6. 11dBm + 10log(20.63) = 24.14 dBm > 24dBm

Chain 1

1. 11dBm + 10log(20.31) = 24.08 dBm > 24dBm
2. 11dBm + 10log(20.36) = 24.09 dBm > 24dBm
3. 11dBm + 10log(20.41) = 24.10 dBm > 24dBm
4. 11dBm + 10log(20.31) = 24.08 dBm > 24dBm
5. 11dBm + 10log(20.38) = 24.09 dBm > 24dBm
6. 11dBm + 10log(20.36) = 24.09 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	13.73	14.22	50.029	16.99	24.00	Pass
46	5230	13.65	13.44	45.254	16.56	24.00	Pass
54	5270	13.85	13.63	47.333	16.75	24.00	Pass
62	5310	14.00	13.47	47.352	16.75	24.00	Pass
102	5510	13.86	13.62	47.336	16.75	24.00	Pass
110	5550	13.89	13.71	47.987	16.81	24.00	Pass
134	5670	13.87	13.73	47.983	16.81	24.00	Pass
151	5755	13.77	13.71	47.319	16.75	30.00	Pass
159	5795	13.82	13.37	45.826	16.61	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(41.88) = 27.22 dBm > 24dBm
2. 11dBm + 10log(41.83) = 27.21 dBm > 24dBm
3. 11dBm + 10log(42.04) = 27.24 dBm > 24dBm
4. 11dBm + 10log(41.94) = 27.23 dBm > 24dBm
5. 11dBm + 10log(41.91) = 27.22 dBm > 24dBm

Chain 1

1. 11dBm + 10log(42.12) = 27.24 dBm > 24dBm
2. 11dBm + 10log(42.88) = 27.32 dBm > 24dBm
3. 11dBm + 10log(43.39) = 27.37 dBm > 24dBm
4. 11dBm + 10log(42.91) = 27.33 dBm > 24dBm
5. 11dBm + 10log(43.98) = 27.43 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	11.11	11.04	25.618	14.09	24.00	Pass
58	5290	11.29	11.18	26.581	14.25	24.00	Pass
106	5530	11.52	11.32	27.743	14.43	24.00	Pass
122	5610	11.29	11.18	26.581	14.25	24.00	Pass
155	5775	11.26	10.95	25.811	14.12	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(83.98) = 30.24 dBm > 24dBm
2. 11dBm + 10log(83.88) = 30.24 dBm > 24dBm
3. 11dBm + 10log(84.05) = 30.25 dBm > 24dBm

Chain 1

1. 11dBm + 10log(83.66) = 30.23 dBm > 24dBm
2. 11dBm + 10log(83.83) = 30.23 dBm > 24dBm
3. 11dBm + 10log(83.78) = 30.23 dBm > 24dBm

26dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)
36	5180	19.64
40	5200	19.15
48	5240	19.23
52	5260	19.22
60	5300	19.23
64	5320	19.46
100	5500	19.28
116	5580	19.52
140	5700	19.18

802.11n (HT20)

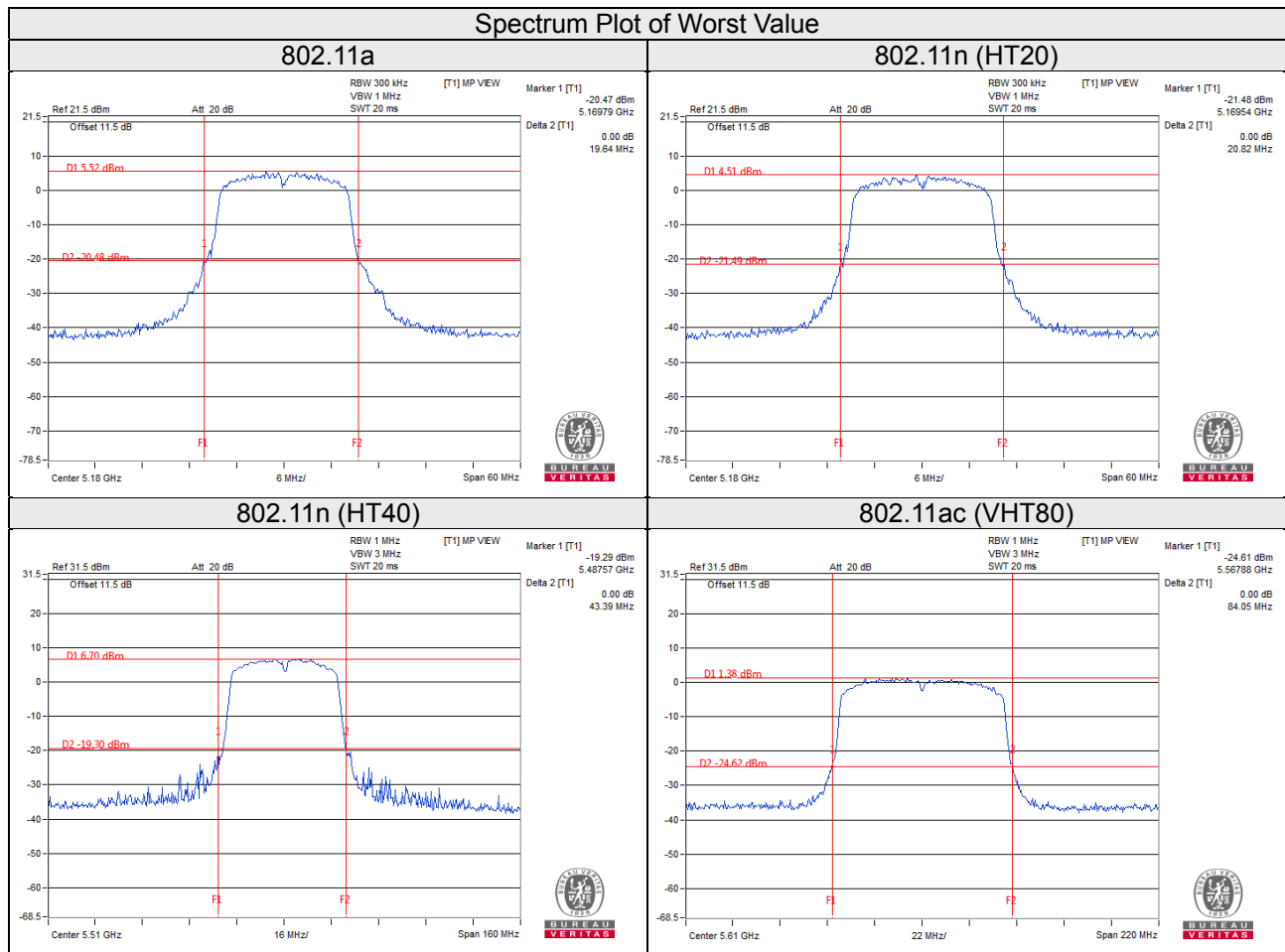
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	20.82	20.26
40	5200	20.64	20.28
48	5240	20.64	20.35
52	5260	20.61	20.31
60	5300	20.37	20.36
64	5320	20.50	20.41
100	5500	20.44	20.31
116	5580	20.46	20.38
140	5700	20.63	20.36

802.11n (HT40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	42.06	42.13
46	5230	43.09	42.12
54	5270	41.88	42.12
62	5310	41.83	42.88
102	5510	42.04	43.39
110	5550	41.94	42.91
134	5670	41.91	43.98

802.11ac (VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	83.65	83.50
58	5290	83.98	83.66
106	5530	83.88	83.83
122	5610	84.05	83.78



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	28.249	14.51

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	48.173	16.83
5470~5725	49.779	16.97

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	47.352	16.75
5470~5725	47.987	16.81

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.

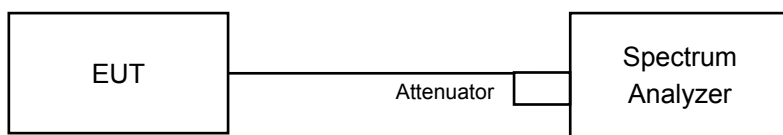
802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	26.581	14.25
5470~5725	27.743	14.43

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	16.32
40	5200	16.20
48	5240	16.20
52	5260	16.20
60	5300	16.20
64	5320	16.20
100	5500	16.20
116	5580	16.32
140	5700	16.20
149	5745	16.32
157	5785	16.32
165	5825	16.32

802.11n (HT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.40	17.40
40	5200	17.40	17.40
48	5240	17.40	17.40
52	5260	17.40	17.40
60	5300	17.40	17.40
64	5320	17.40	17.40
100	5500	17.40	17.40
116	5580	17.40	17.40
140	5700	17.40	17.40
149	5745	17.40	17.40
157	5785	17.40	17.40
165	5825	17.40	17.40

802.11n (HT40)

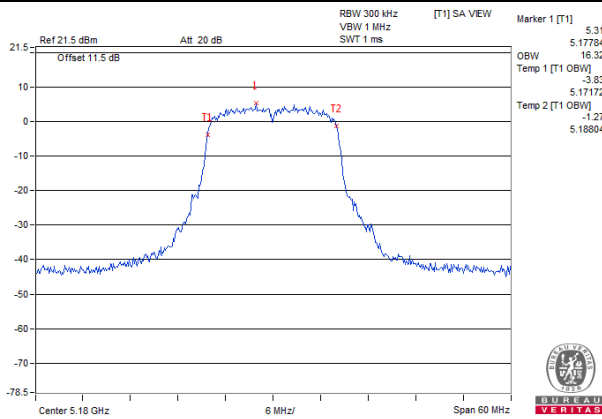
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.00	36.00
46	5230	36.00	36.00
54	5270	36.00	36.00
62	5310	36.00	36.00
102	5510	36.00	36.00
110	5550	36.12	36.00
134	5670	36.12	36.00
151	5755	36.12	36.00
159	5795	36.12	36.00

802.11ac (VHT80)

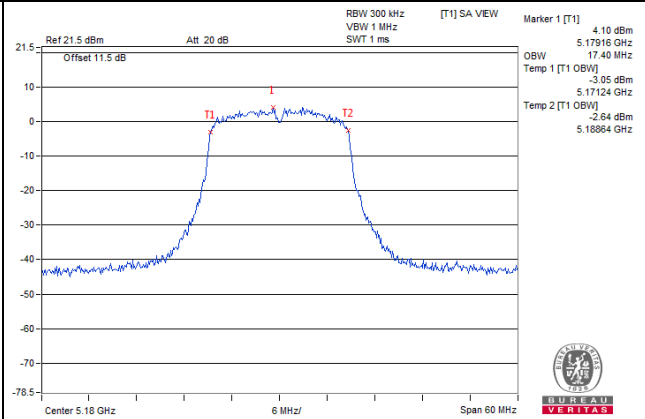
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.12	74.88
58	5290	75.12	75.12
106	5530	75.12	75.12
122	5610	75.12	75.12
155	5775	75.12	75.12

Spectrum Plot of Worst Value

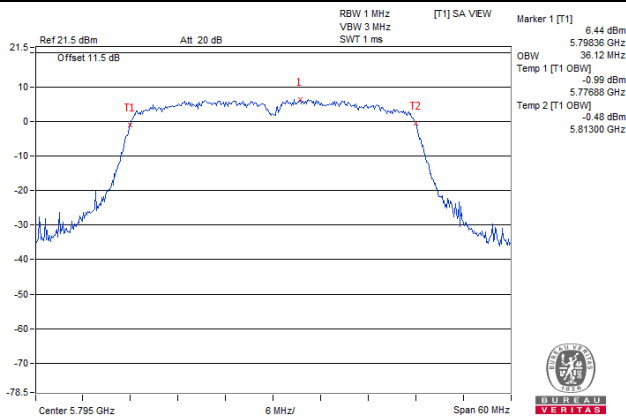
802.11a



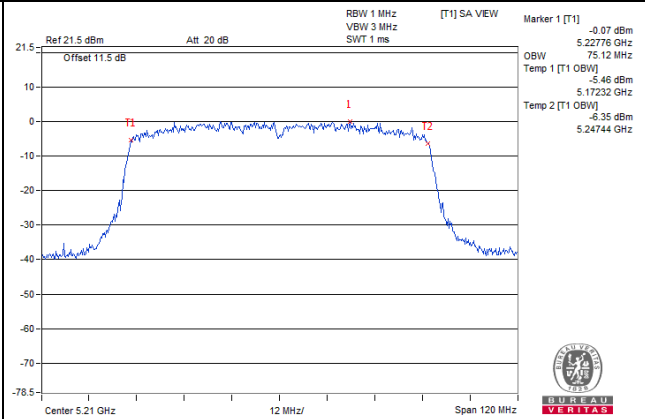
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

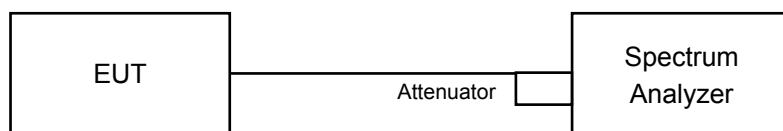


4.5 Peak Power Spectral Density Measurement

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	0.55	0.26	0.81	11	Pass
40	5200	0.64	0.26	0.90	11	Pass
48	5240	-0.13	0.26	0.13	11	Pass
52	5260	-0.04	0.26	0.22	11	Pass
60	5300	-0.28	0.26	-0.02	11	Pass
64	5320	-0.13	0.26	0.13	11	Pass
100	5500	0.60	0.26	0.86	11	Pass
116	5580	0.28	0.26	0.54	11	Pass
140	5700	0.70	0.26	0.96	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	-0.63	-0.63	0.26	2.64	8.19	Pass
40	5200	-0.28	-0.79	0.26	2.74	8.19	Pass
48	5240	-0.47	-0.56	0.26	2.76	8.19	Pass
52	5260	-0.75	-0.65	0.26	2.57	8.19	Pass
60	5300	-0.64	-0.80	0.26	2.55	8.19	Pass
64	5320	-0.51	-0.37	0.26	2.83	8.19	Pass
100	5500	-0.75	-0.41	0.26	2.69	8.19	Pass
116	5580	-0.58	0.15	0.26	3.07	8.19	Pass
140	5700	-0.18	-0.23	0.26	3.07	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	-3.76	-3.82	0.51	-0.27	8.19	Pass
46	5230	-4.41	-4.61	0.51	-0.99	8.19	Pass
54	5270	-4.40	-4.33	0.51	-0.84	8.19	Pass
62	5310	-4.26	-4.21	0.51	-0.71	8.19	Pass
102	5510	-3.64	-4.06	0.51	-0.32	8.19	Pass
110	5550	-3.46	-3.92	0.51	-0.16	8.19	Pass
134	5670	-3.49	-3.74	0.51	-0.09	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)

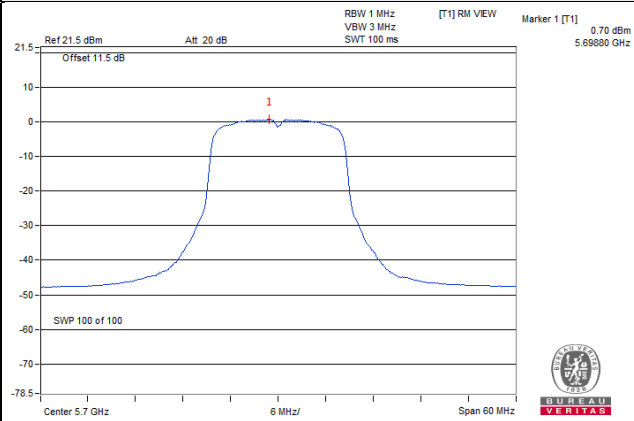
Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-10.74	-10.76	1.13	-6.61	8.19	Pass
58	5290	-9.96	-10.81	1.13	-6.22	8.19	Pass
106	5530	-9.52	-10.14	1.13	-5.68	8.19	Pass
122	5610	-10.12	-10.41	1.13	-6.12	8.19	Pass

Note:

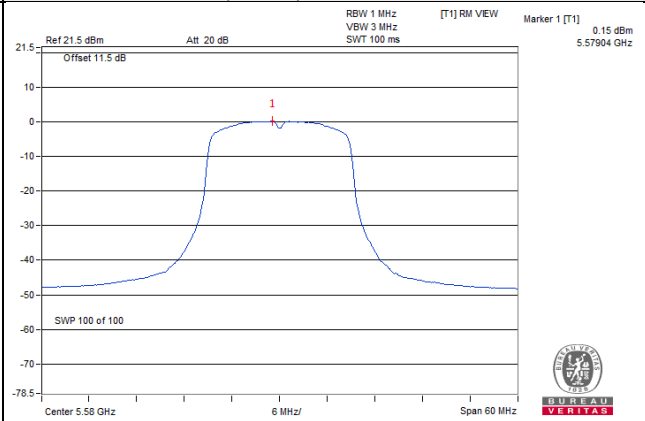
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Directional Gain = $5.8\text{dBi} + 10\log(2) = 8.81\text{dBi} > 6\text{dBi}$, 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

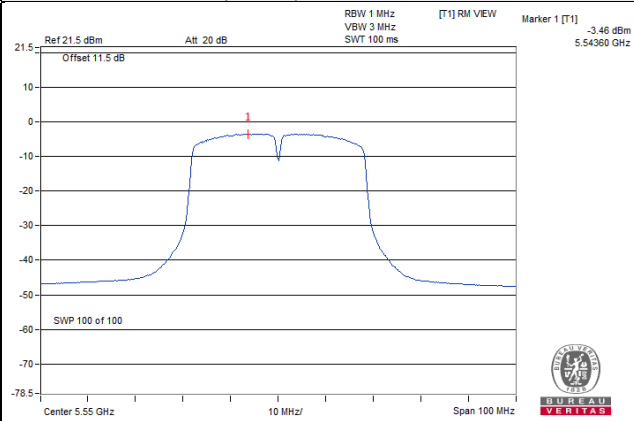
802.11a / CH 140



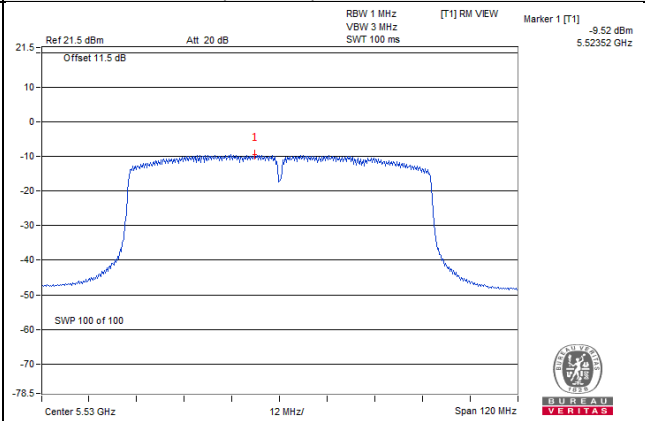
802.11n (HT20) / Chain 1 / CH 116



802.11n (HT40) / Chain 0 / CH 110



802.11ac (VHT80) / Chain 0 / CH 106



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	-7.70	-5.48	0.26	-5.22	30	Pass
157	5785	-7.99	-5.77	0.26	-5.51	30	Pass
165	5825	-7.71	-5.49	0.26	-5.23	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	-8.44	-6.22	3.01	0.26	-2.95	27.19	Pass
	157	5785	-9.03	-6.81	3.01	0.26	-3.54	27.19	Pass
	165	5825	-9.26	-7.04	3.01	0.26	-3.77	27.19	Pass
1	149	5745	-8.69	-6.47	3.01	0.26	-3.20	27.19	Pass
	157	5785	-8.66	-6.44	3.01	0.26	-3.17	27.19	Pass
	165	5825	-8.75	-6.53	3.01	0.26	-3.26	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	-12.55	-10.33	3.01	0.51	-6.81	27.19	Pass
	159	5795	-12.72	-10.50	3.01	0.51	-6.98	27.19	Pass
1	151	5755	-13.13	-10.91	3.01	0.51	-7.39	27.19	Pass
	159	5795	-12.80	-10.58	3.01	0.51	-7.06	27.19	Pass

Note:

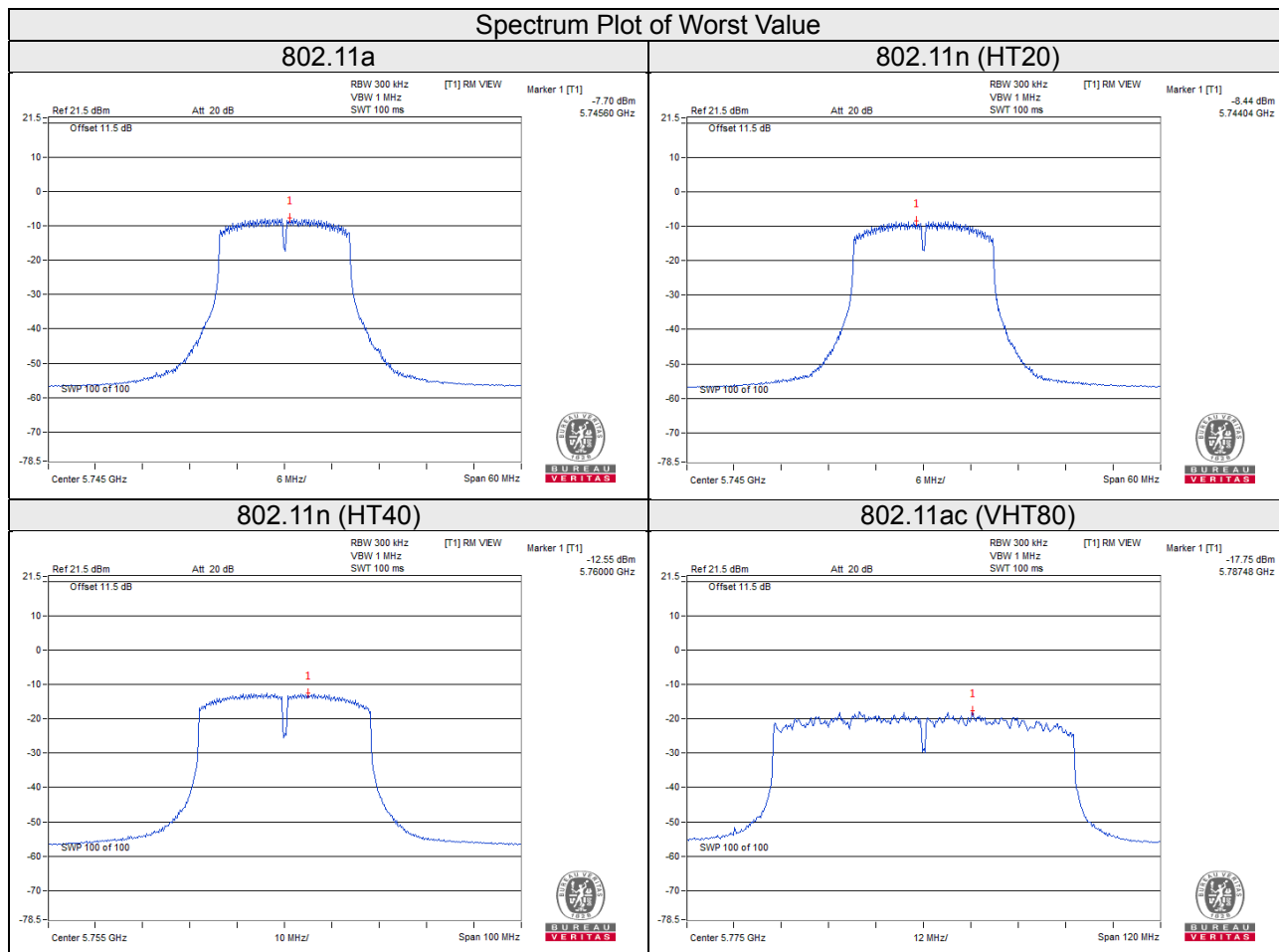
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Directional Gain = 5.8dBi + 10log(2) = 8.81dBi > 6dBi, so the limit shall 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	-18.40	-16.18	3.01	1.13	-12.04	27.19	Pass
1	155	5775	-17.75	-15.53	3.01	1.13	-11.39	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.

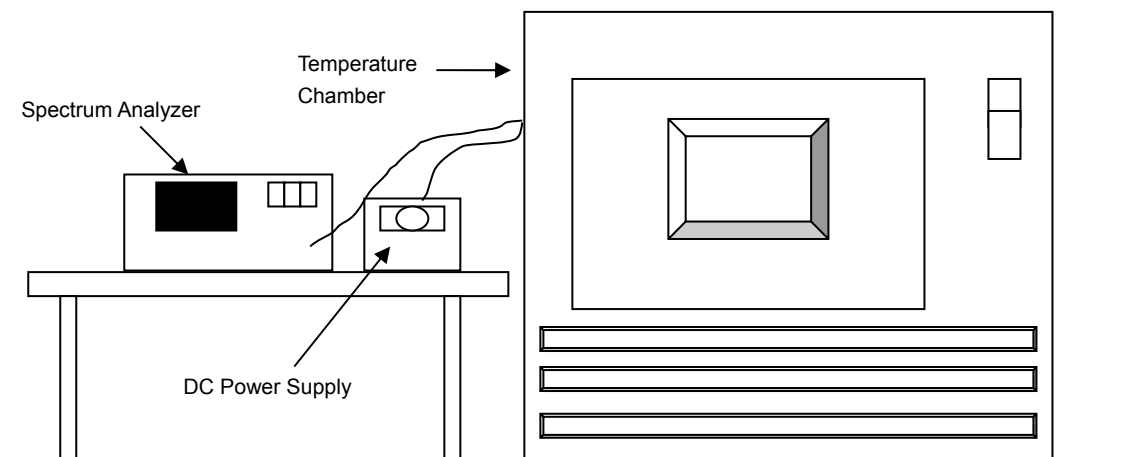


4.6 Frequency Stability

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	5179.9780	PASS	5179.9772	PASS	5179.9760	PASS	5179.9788	PASS
80	3.3	5180.0043	PASS	5180.0065	PASS	5180.0050	PASS	5180.0044	PASS
70	3.3	5180.0104	PASS	5180.0081	PASS	5180.0109	PASS	5180.0107	PASS
60	3.3	5180.0182	PASS	5180.0186	PASS	5180.0208	PASS	5180.0170	PASS
50	3.3	5179.9986	PASS	5179.9971	PASS	5180.0008	PASS	5180.0009	PASS
40	3.3	5179.9762	PASS	5179.9766	PASS	5179.9775	PASS	5179.9789	PASS
30	3.3	5180.0109	PASS	5180.0101	PASS	5180.0107	PASS	5180.0104	PASS
20	3.3	5179.9993	PASS	5179.9988	PASS	5180.0019	PASS	5180.0004	PASS
10	3.3	5180.0042	PASS	5180.0033	PASS	5180.0049	PASS	5180.0066	PASS
0	3.3	5180.0149	PASS	5180.0176	PASS	5180.0160	PASS	5180.0164	PASS
-10	3.3	5180.0174	PASS	5180.0145	PASS	5180.0147	PASS	5180.0149	PASS
-20	3.3	5180.0240	PASS	5180.0267	PASS	5180.0229	PASS	5180.0237	PASS
-30	3.3	5180.0102	PASS	5180.0104	PASS	5180.0094	PASS	5180.0115	PASS
-40	3.3	5179.9725	PASS	5179.9735	PASS	5179.9726	PASS	5179.9742	PASS

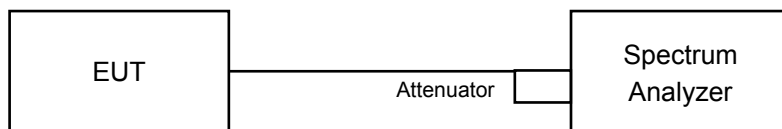
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	3.795	5179.9991	PASS	5179.9991	PASS	5180.0021	PASS	5180.0003	PASS
	3.3	5179.9993	PASS	5179.9988	PASS	5180.0019	PASS	5180.0004	PASS
	2.805	5180.0001	PASS	5179.999	PASS	5180.0015	PASS	5179.9997	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	15.38	0.5	Pass
157	5785	15.38	0.5	Pass
165	5825	15.38	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.20	15.20	0.5	Pass
157	5785	15.17	15.16	0.5	Pass
165	5825	15.18	15.17	0.5	Pass

802.11n (HT40)

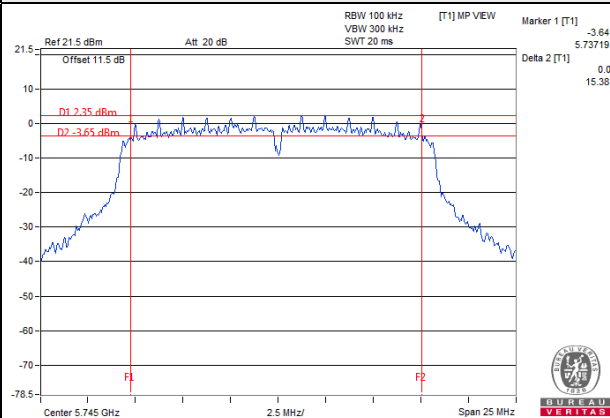
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.21	35.15	0.5	Pass
159	5795	35.25	35.17	0.5	Pass

802.11ac (VHT80)

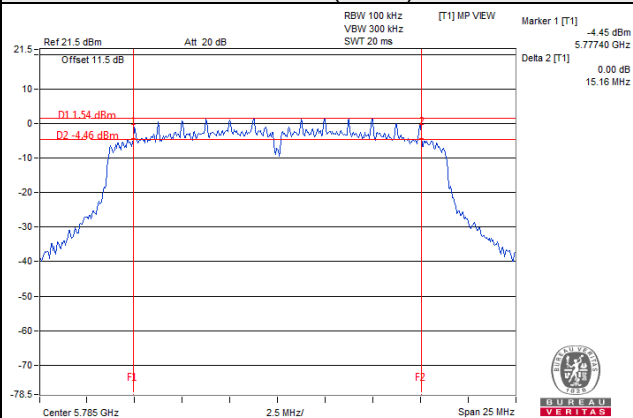
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.35	75.38	0.5	Pass

Spectrum Plot of Worst Value

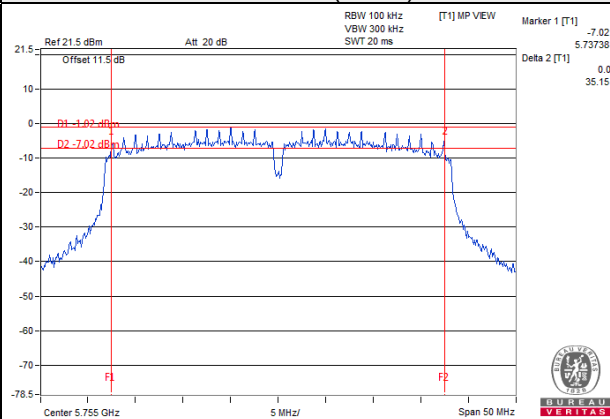
802.11a



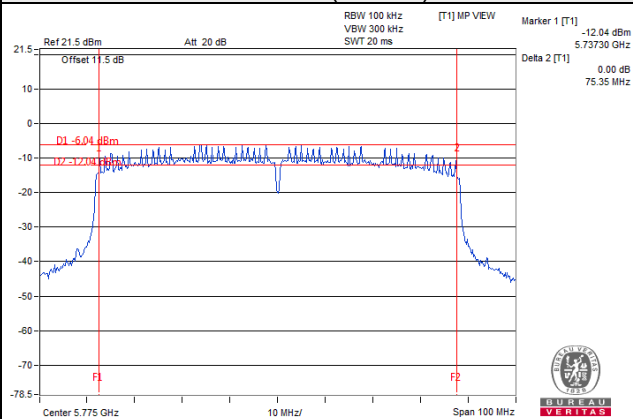
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

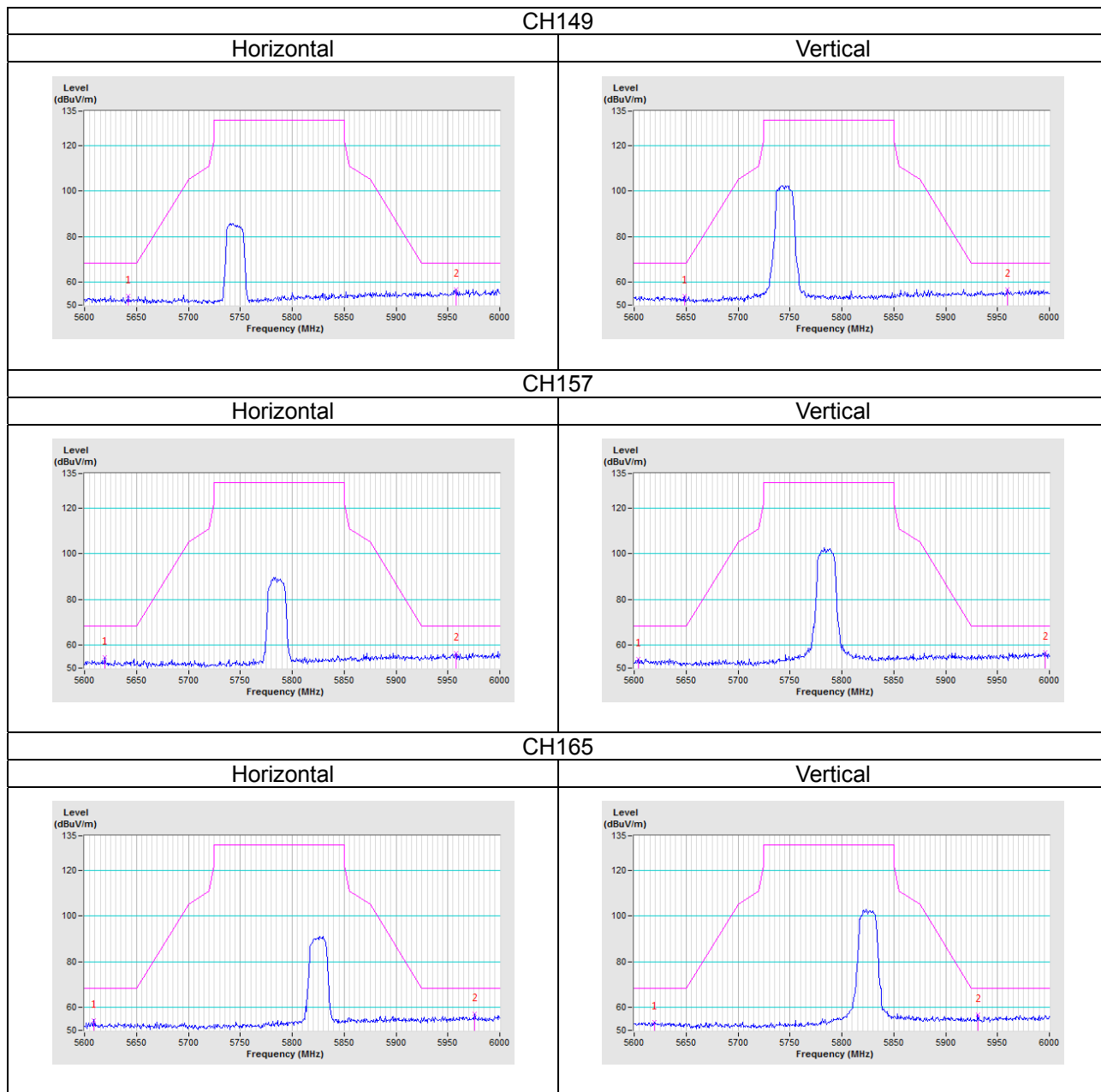


5 Pictures of Test Arrangements

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

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

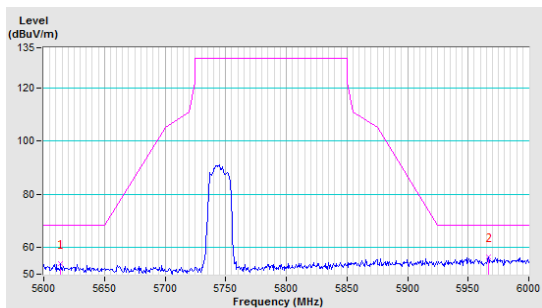
802.11a



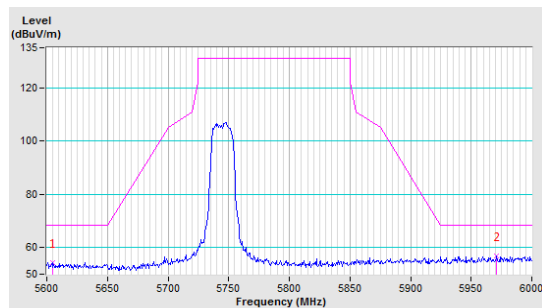
802.11n (HT20)

CH149

Horizontal

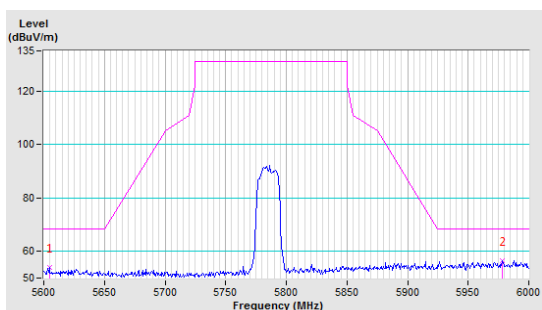


Vertical

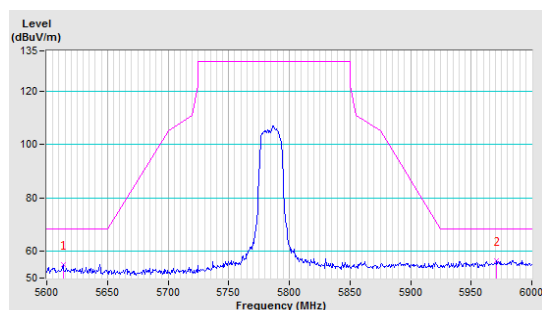


CH157

Horizontal

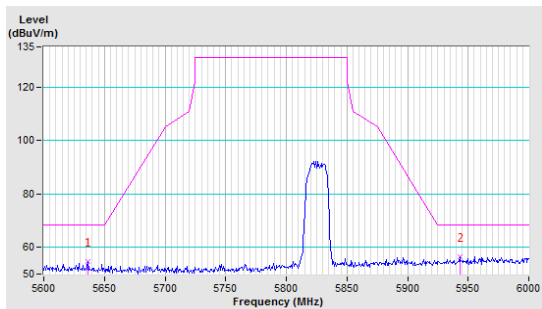


Vertical

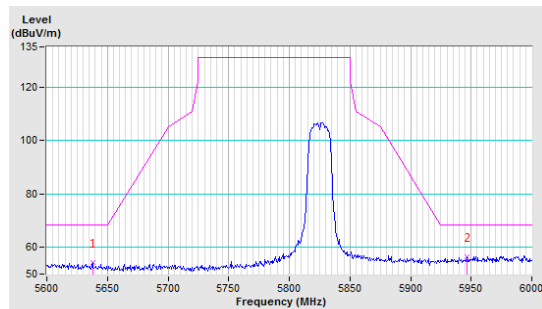


CH165

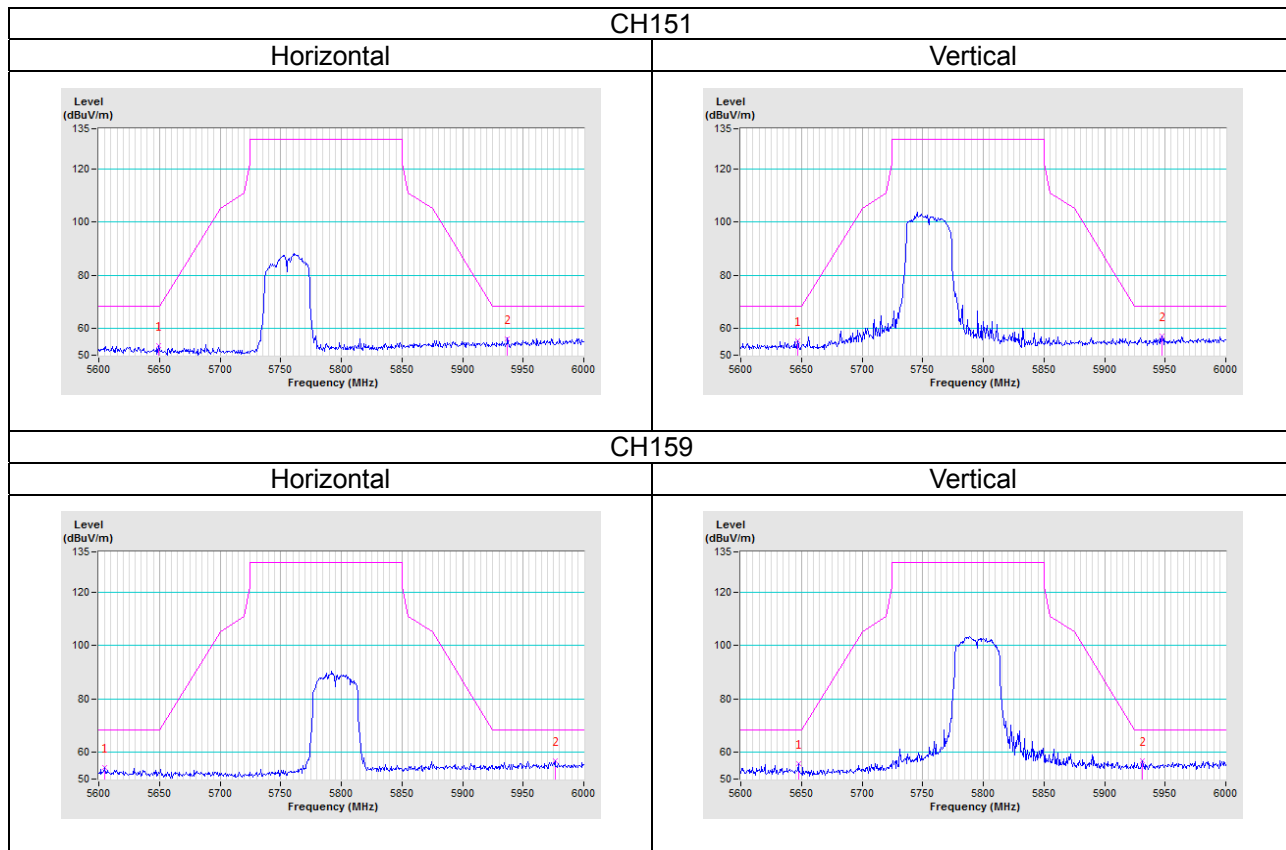
Horizontal



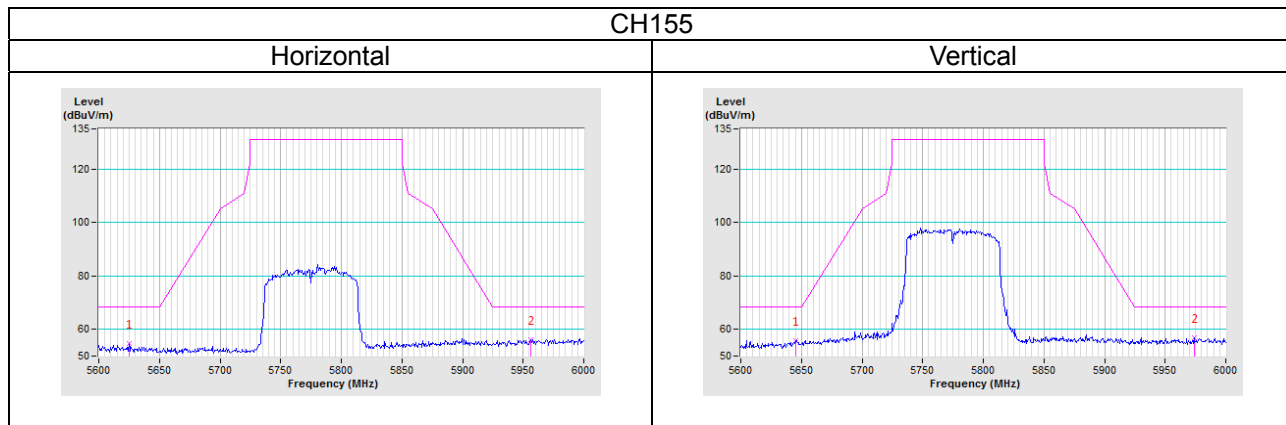
Vertical



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 ---