

FCC Test Report

Report No.: RF180823C25-1

FCC ID: RYK-WPEB263ACNIBT

Test Model: WPEB-263ACNI(BT)

Received Date: Aug. 23, 2018

Test Date: Sep. 17 ~ Oct. 03, 2018

Issued Date: Oct. 18, 2018

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FCC Registration / 788550 / TW0003
Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
RF180823C25-1	Original release.	Oct. 18, 2018

1 Certificate of Conformity

Product: 802.11ac/a/b/g/n 2T2R Industrial Grade Wi-Fi / Bluetooth 4.1 Combo Half Mini PCIe Module

Brand: SparkLAN

Test Model: WPEB-263ACNI(BT)

Sample Status: R&D sample

Applicant: SparkLAN Communications, Inc.

Test Date: Sep. 17 ~ Oct. 03, 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 :



Suntee Liu / Specialist

Date:

Oct. 18, 2018

Approved by :



Bruce Chen / Project Engineer

Date:

Oct. 18, 2018

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 -13.99dB at 0.86550MHz.
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 5460.00, 10640.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit.
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connectors are IPEX MHF 4 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 Grade Wi-Fi / Bluetooth 4.1 Combo Half Mini PCIe Module
Brand	SparkLAN
Test Model	WPEB-263ACNI(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: 44.691mW 5260~5320MHz: 44.656mW 5500~5700MHz: 44.528mW 5745~5825MHz: 44.611mW
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 4 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	46	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	46	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	24deg. C, 66%RH 23deg. C, 65%RH	120Vac, 60Hz	Willy Cheng
RE<1G	22deg. C, 67%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.

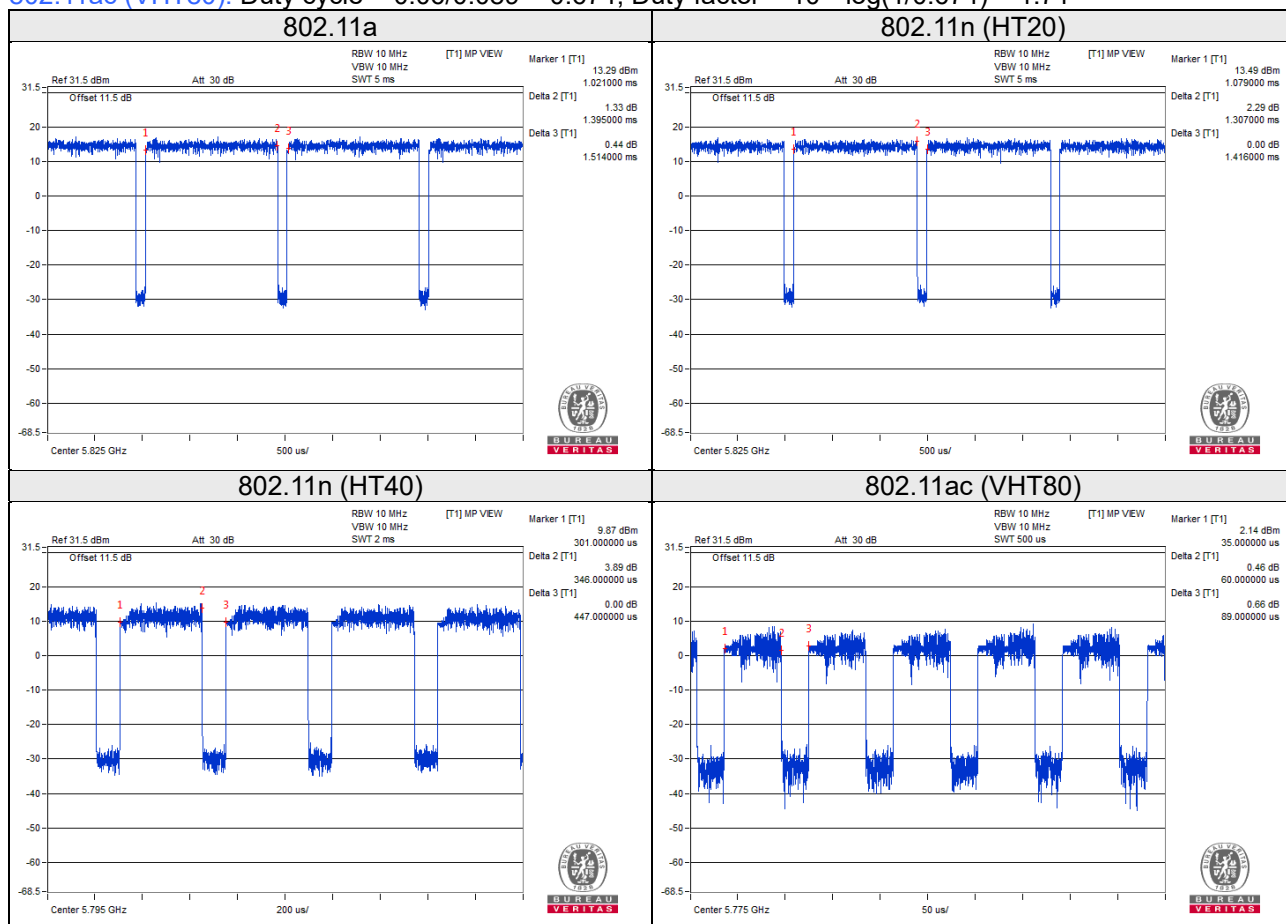
Duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = $1.395/1.514 = 0.921$, Duty factor = $10 * \log(1/0.921) = 0.36$

802.11n (HT20): Duty cycle = $1.307/1.416 = 0.923$, Duty factor = $10 * \log(1/0.923) = 0.35$

802.11n (HT40): Duty cycle = $0.346/0.447 = 0.774$, Duty factor = $10 * \log(1/0.774) = 1.11$

802.11ac (VHT80): Duty cycle = $0.06/0.089 = 0.674$, Duty factor = $10 * \log(1/0.674) = 1.71$



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.

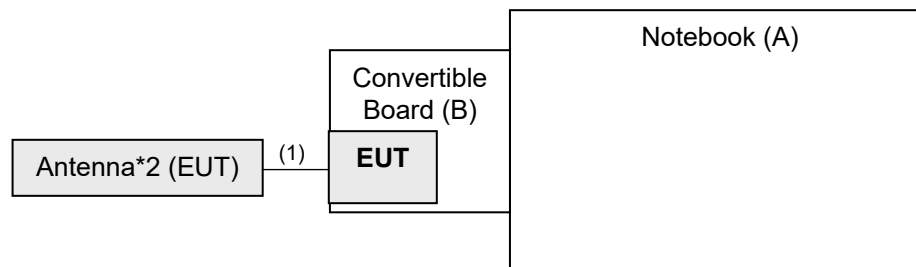
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5420	BPQ7MQ1	FCC DoC Approved	-
B.	Convertible Board	NA	NA	NA	NA	-

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	0.5	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:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 29, 2018	May 28, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 11, 2017	Dec. 10, 2018
HORN Antenna SCHWARZBECK	9120D	209	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 2018
Loop Antenna EMCI	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 21, 2018	Aug. 20, 2019
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Apr. 03, 2018	Apr. 02, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 21, 2018	Aug. 20, 2019
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-S M-8000	Cable-CH3-03 (309224+170907)	Aug. 21, 2018	Aug. 20, 2019
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Nov. 14, 2017	Nov. 13, 2018
USB Wideband 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:

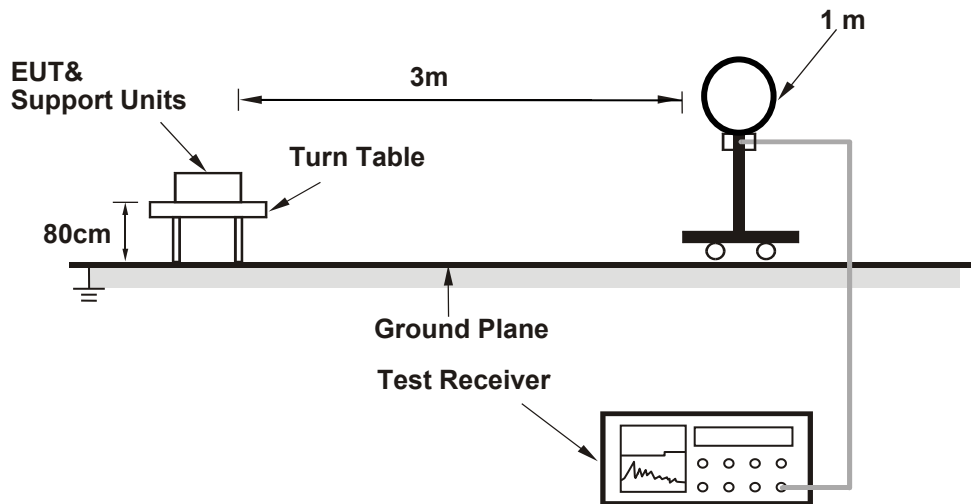
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

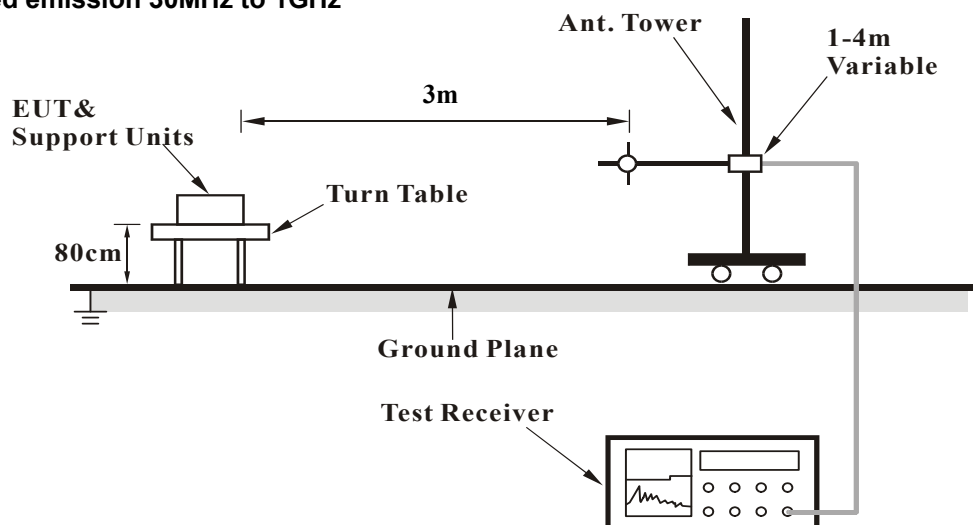
No deviation.

4.1.5 Test Setup

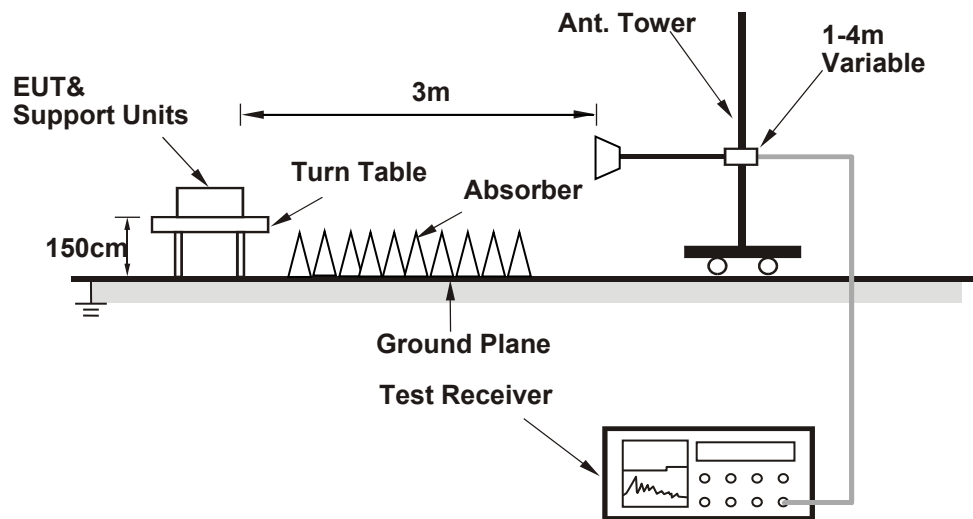
For Radiated emission below 30MHz



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	56.9 PK	74.0	-17.1	1.63 H	175	53.4	3.5
2	5150.00	43.3 AV	54.0	-10.7	1.63 H	175	39.8	3.5
3	*5180.00	93.8 PK			1.49 H	132	54.6	39.2
4	*5180.00	83.9 AV			1.49 H	132	44.7	39.2
5	#10360.00	58.0 PK	68.2	-10.2	2.99 H	261	42.6	15.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	59.2 PK	74.0	-14.8	1.97 V	76	55.7	3.5
2	5150.00	44.7 AV	54.0	-9.3	1.97 V	76	41.2	3.5
3	*5180.00	106.3 PK			1.70 V	79	67.1	39.2
4	*5180.00	96.3 AV			1.70 V	79	57.1	39.2
5	#10360.00	57.1 PK	68.2	-11.1	1.36 V	269	41.7	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	91.4 PK			1.32 H	67	52.1	39.3
2	*5200.00	81.2 AV			1.32 H	67	41.9	39.3
3	#10400.00	57.2 PK	68.2	-11.0	2.89 H	301	41.6	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	106.9 PK			1.84 V	84	67.6	39.3
2	*5200.00	96.7 AV			1.84 V	84	57.4	39.3
3	#10400.00	56.6 PK	68.2	-11.6	1.32 V	228	41.0	15.6

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	90.9 PK			1.49 H	176	51.8	39.1
2	*5240.00	81.0 AV			1.49 H	176	41.9	39.1
3	5350.00	56.7 PK	74.0	-17.3	1.86 H	144	53.0	3.7
4	5350.00	43.6 AV	54.0	-10.4	1.86 H	144	39.9	3.7
5	#10480.00	58.3 PK	68.2	-9.9	1.00 H	326	42.1	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	106.4 PK			1.85 V	81	67.3	39.1
2	*5240.00	96.3 AV			1.85 V	81	57.2	39.1
3	5350.00	57.0 PK	74.0	-17.0	2.02 V	136	53.3	3.7
4	5350.00	43.4 AV	54.0	-10.6	2.02 V	136	39.7	3.7
5	#10480.00	57.7 PK	68.2	-10.5	1.17 V	238	41.5	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	55.8 PK	74.0	-18.2	1.62 H	239	52.3	3.5
2	5150.00	43.4 AV	54.0	-10.6	1.62 H	239	39.9	3.5
3	*5260.00	91.1 PK			1.49 H	175	52.1	39.0
4	*5260.00	81.6 AV			1.49 H	175	42.6	39.0
5	#10520.00	57.4 PK	68.2	-10.8	2.89 H	356	41.1	16.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.2 PK	74.0	-16.8	1.86 V	138	53.7	3.5
2	5150.00	43.3 AV	54.0	-10.7	1.86 V	138	39.8	3.5
3	*5260.00	107.3 PK			1.73 V	77	68.3	39.0
4	*5260.00	96.6 AV			1.73 V	77	57.6	39.0
5	#10520.00	58.9 PK	68.2	-9.3	1.26 V	273	42.6	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	91.5 PK			1.36 H	61	52.5	39.0
2	*5300.00	81.1 AV			1.36 H	61	42.1	39.0
3	10600.00	57.7 PK	74.0	-16.3	2.76 H	329	41.1	16.6
4	10600.00	44.6 AV	54.0	-9.4	2.76 H	329	28.0	16.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	107.2 PK			1.69 V	79	68.2	39.0
2	*5300.00	96.6 AV			1.69 V	79	57.6	39.0
3	10600.00	58.6 PK	74.0	-15.4	1.00 V	116	42.0	16.6
4	10600.00	45.5 AV	54.0	-8.5	1.00 V	116	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.

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	92.7 PK			1.26 H	174	53.6	39.1
2	*5320.00	82.5 AV			1.26 H	174	43.4	39.1
3	5350.00	56.3 PK	74.0	-17.7	1.48 H	262	52.6	3.7
4	5350.00	42.9 AV	54.0	-11.1	1.48 H	262	39.2	3.7
5	10640.00	58.5 PK	74.0	-15.5	2.98 H	156	42.0	16.5
6	10640.00	44.8 AV	54.0	-9.2	2.98 H	156	28.3	16.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	106.4 PK			1.87 V	85	67.3	39.1
2	*5320.00	95.9 AV			1.87 V	85	56.8	39.1
3	5350.00	57.1 PK	74.0	-16.9	1.64 V	281	53.4	3.7
4	5350.00	44.3 AV	54.0	-9.7	1.64 V	281	40.6	3.7
5	10640.00	59.0 PK	74.0	-15.0	1.09 V	132	42.5	16.5
6	10640.00	45.5 AV	54.0	-8.5	1.09 V	132	29.0	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	55.4 PK	74.0	-18.6	1.92 H	255	51.4	4.0
2	5460.00	43.8 AV	54.0	-10.2	1.92 H	255	39.8	4.0
3	#5470.00	57.1 PK	68.2	-11.1	2.13 H	188	53.1	4.0
4	*5500.00	88.7 PK			1.76 H	231	49.1	39.6
5	*5500.00	79.4 AV			1.76 H	231	39.8	39.6
6	11000.00	62.7 PK	74.0	-11.3	3.78 H	329	44.8	17.9
7	11000.00	47.9 AV	54.0	-6.1	3.78 H	329	30.0	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	58.3 PK	74.0	-15.7	1.92 V	84	54.3	4.0
2	5460.00	45.5 AV	54.0	-8.5	1.92 V	84	41.5	4.0
3	#5470.00	60.9 PK	68.2	-7.3	1.78 V	76	56.9	4.0
4	*5500.00	109.0 PK			1.82 V	76	69.4	39.6
5	*5500.00	99.8 AV			1.82 V	76	60.2	39.6
6	11000.00	65.1 PK	74.0	-8.9	3.85 V	258	47.2	17.9
7	11000.00	50.2 AV	54.0	-3.8	3.85 V	258	32.3	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	85.7 PK			1.62 H	265	46.1	39.6
2	*5580.00	76.2 AV			1.62 H	265	36.6	39.6
3	11160.00	62.5 PK	74.0	-11.5	3.82 H	356	45.8	16.7
4	11160.00	46.9 AV	54.0	-7.1	3.82 H	356	30.2	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	108.3 PK			1.84 V	73	68.7	39.6
2	*5580.00	97.9 AV			1.84 V	73	58.3	39.6
3	11160.00	64.7 PK	74.0	-9.3	3.81 V	257	48.0	16.7
4	11160.00	50.4 AV	54.0	-3.6	3.81 V	257	33.7	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	88.0 PK			1.47 H	224	48.4	39.6
2	*5700.00	77.9 AV			1.47 H	224	38.3	39.6
3	#5725.00	55.9 PK	68.2	-12.3	2.21 H	186	51.8	4.1
4	11400.00	58.7 PK	74.0	-15.3	2.89 H	322	42.1	16.6
5	11400.00	45.9 AV	54.0	-8.1	2.89 H	322	29.3	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	107.1 PK			1.80 V	54	67.5	39.6
2	*5700.00	96.2 AV			1.80 V	54	56.6	39.6
3	#5725.00	56.4 PK	68.2	-11.8	1.85 V	53	52.3	4.1
4	11400.00	62.0 PK	74.0	-12.0	3.37 V	251	45.4	16.6
5	11400.00	47.6 AV	54.0	-6.4	3.37 V	251	31.0	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	#5625.64	53.9 PK	68.2	-14.3	1.49 H	345	49.7	4.2
2	*5745.00	89.5 PK			1.49 H	345	49.7	39.8
3	*5745.00	78.9 AV			1.49 H	345	39.1	39.8
4	#5973.08	57.0 PK	68.2	-11.2	1.49 H	345	52.0	5.0
5	11490.00	59.4 PK	74.0	-14.6	3.99 H	356	42.6	16.8
6	11490.00	46.6 AV	54.0	-7.4	3.99 H	356	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	#5605.77	55.1 PK	68.2	-13.1	1.90 V	61	50.9	4.2
2	*5745.00	107.0 PK			1.90 V	61	67.2	39.8
3	*5745.00	96.1 AV			1.90 V	61	56.3	39.8
4	#5982.69	57.4 PK	68.2	-10.8	1.90 V	61	52.4	5.0
5	11490.00	62.6 PK	74.0	-11.4	3.60 V	249	45.8	16.8
6	11490.00	48.3 AV	54.0	-5.7	3.60 V	249	31.5	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	#5600.00	54.2 PK	68.2	-14.0	1.30 H	345	50.0	4.2
2	*5785.00	89.9 PK			1.30 H	345	49.8	40.1
3	*5785.00	79.9 AV			1.30 H	345	39.8	40.1
4	#5946.15	56.9 PK	68.2	-11.3	1.30 H	345	52.1	4.8
5	11570.00	59.8 PK	74.0	-14.2	3.74 H	349	42.8	17.0
6	11570.00	47.4 AV	54.0	-6.6	3.74 H	349	30.4	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	#5611.54	54.7 PK	68.2	-13.5	1.96 V	61	50.5	4.2
2	*5785.00	105.7 PK			1.96 V	61	65.6	40.1
3	*5785.00	95.4 AV			1.96 V	61	55.3	40.1
4	#5933.33	57.2 PK	68.2	-11.0	1.96 V	61	52.3	4.9
5	11570.00	63.6 PK	74.0	-10.4	3.64 V	252	46.6	17.0
6	11570.00	49.5 AV	54.0	-4.5	3.64 V	252	32.5	17.0

Remarks:

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

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	#5647.44	54.2 PK	68.2	-14.0	1.50 H	345	49.9	4.3
2	*5825.00	90.6 PK			1.50 H	345	50.3	40.3
3	*5825.00	80.5 AV			1.50 H	345	40.2	40.3
4	#5967.31	58.0 PK	68.2	-10.2	1.50 H	345	53.1	4.9
5	11650.00	61.6 PK	74.0	-12.4	3.76 H	323	45.0	16.6
6	11650.00	47.3 AV	54.0	-6.7	3.76 H	323	30.7	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	#5600.00	54.6 PK	68.2	-13.6	1.95 V	82	50.4	4.2
2	*5825.00	105.5 PK			1.95 V	82	65.2	40.3
3	*5825.00	95.3 AV			1.95 V	82	55.0	40.3
4	#5974.36	57.4 PK	68.2	-10.8	1.95 V	82	52.4	5.0
5	11650.00	64.0 PK	74.0	-10.0	3.38 V	262	47.4	16.6
6	11650.00	49.9 AV	54.0	-4.1	3.38 V	262	33.3	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 (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	56.1 PK	74.0	-17.9	1.96 H	84	52.6	3.5
2	5150.00	44.1 AV	54.0	-9.9	1.96 H	84	40.6	3.5
3	*5180.00	94.5 PK			1.84 H	182	55.3	39.2
4	*5180.00	83.2 AV			1.84 H	182	44.0	39.2
5	#10360.00	58.6 PK	68.2	-9.6	3.84 H	356	43.2	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	57.0 PK	74.0	-17.0	1.95 V	78	53.5	3.5
2	5150.00	44.8 AV	54.0	-9.2	1.95 V	78	41.3	3.5
3	*5180.00	108.8 PK			1.90 V	81	69.6	39.2
4	*5180.00	97.8 AV			1.90 V	81	58.6	39.2
5	#10360.00	60.4 PK	68.2	-7.8	3.12 V	296	45.0	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	94.5 PK			1.74 H	23	55.2	39.3
2	*5200.00	83.2 AV			1.74 H	23	43.9	39.3
3	#10400.00	59.5 PK	68.2	-8.7	3.79 H	346	43.9	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	107.9 PK			1.60 V	317	68.6	39.3
2	*5200.00	96.3 AV			1.60 V	317	57.0	39.3
3	#10400.00	61.2 PK	68.2	-7.0	2.99 V	286	45.6	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	95.7 PK			1.58 H	183	56.6	39.1
2	*5240.00	83.8 AV			1.58 H	183	44.7	39.1
3	5350.00	56.7 PK	74.0	-17.3	1.62 H	208	53.0	3.7
4	5350.00	43.9 AV	54.0	-10.1	1.62 H	208	40.2	3.7
5	#10480.00	60.3 PK	68.2	-7.9	3.98 H	344	44.1	16.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	109.8 PK			1.77 V	84	70.7	39.1
2	*5240.00	98.5 AV			1.77 V	84	59.4	39.1
3	5350.00	57.5 PK	74.0	-16.5	1.95 V	289	53.8	3.7
4	5350.00	44.5 AV	54.0	-9.5	1.95 V	289	40.8	3.7
5	#10480.00	62.0 PK	68.2	-6.2	3.01 V	276	45.8	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	56.0 PK	74.0	-18.0	1.86 H	201	52.5	3.5
2	5150.00	43.9 AV	54.0	-10.1	1.86 H	201	40.4	3.5
3	*5260.00	95.2 PK			1.58 H	229	56.2	39.0
4	*5260.00	83.1 AV			1.58 H	229	44.1	39.0
5	#10520.00	59.5 PK	68.2	-8.7	3.81 H	355	43.2	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	56.4 PK	74.0	-17.6	1.68 V	96	52.9	3.5
2	5150.00	43.7 AV	54.0	-10.3	1.68 V	96	40.2	3.5
3	*5260.00	110.0 PK			1.90 V	80	71.0	39.0
4	*5260.00	98.6 AV			1.90 V	80	59.6	39.0
5	#10520.00	61.9 PK	68.2	-6.3	3.02 V	254	45.6	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	96.4 PK			1.74 H	183	57.4	39.0
2	*5300.00	84.9 AV			1.74 H	183	45.9	39.0
3	10600.00	62.5 PK	74.0	-11.5	3.72 H	350	45.9	16.6
4	10600.00	49.4 AV	54.0	-4.6	3.72 H	350	32.8	16.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	109.0 PK			1.52 V	316	70.0	39.0
2	*5300.00	97.7 AV			1.52 V	316	58.7	39.0
3	10600.00	64.7 PK	74.0	-9.3	3.07 V	275	48.1	16.6
4	10600.00	51.6 AV	54.0	-2.4	3.07 V	275	35.0	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	98.8 PK			1.45 H	184	59.7	39.1
2	*5320.00	87.3 AV			1.45 H	184	48.2	39.1
3	5350.00	57.4 PK	74.0	-16.6	1.76 H	293	53.7	3.7
4	5350.00	44.7 AV	54.0	-9.3	1.76 H	293	41.0	3.7
5	10640.00	63.8 PK	74.0	-10.2	3.84 H	349	47.3	16.5
6	10640.00	50.7 AV	54.0	-3.3	3.84 H	349	34.2	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	110.8 PK			1.81 V	87	71.7	39.1
2	*5320.00	99.4 AV			1.81 V	87	60.3	39.1
3	5350.00	57.6 PK	74.0	-16.4	1.52 V	310	53.9	3.7
4	5350.00	45.5 AV	54.0	-8.5	1.52 V	310	41.8	3.7
5	10640.00	66.2 PK	74.0	-7.8	3.05 V	275	49.7	16.5
6	10640.00	52.9 AV	54.0	-1.1	3.05 V	275	36.4	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	56.9 PK	74.0	-17.1	2.38 H	241	52.9	4.0
2	5460.00	44.1 AV	54.0	-9.9	2.38 H	241	40.1	4.0
3	#5470.00	56.3 PK	68.2	-11.9	2.83 H	212	52.3	4.0
4	*5500.00	89.1 PK			2.57 H	268	49.5	39.6
5	*5500.00	77.2 AV			2.57 H	268	37.6	39.6
6	11000.00	63.0 PK	74.0	-11.0	3.92 H	329	45.1	17.9
7	11000.00	49.5 AV	54.0	-4.5	3.92 H	329	31.6	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	58.0 PK	74.0	-16.0	1.74 V	69	54.0	4.0
2	5460.00	46.0 AV	54.0	-8.0	1.74 V	69	42.0	4.0
3	#5470.00	60.1 PK	68.2	-8.1	2.02 V	97	56.1	4.0
4	*5500.00	109.4 PK			1.83 V	79	69.8	39.6
5	*5500.00	97.6 AV			1.83 V	79	58.0	39.6
6	11000.00	66.2 PK	74.0	-7.8	4.00 V	267	48.3	17.9
7	11000.00	52.8 AV	54.0	-1.2	4.00 V	267	34.9	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	88.5 PK			2.57 H	288	48.9	39.6
2	*5580.00	77.1 AV			2.57 H	288	37.5	39.6
3	11160.00	61.6 PK	74.0	-12.4	3.99 H	342	44.9	16.7
4	11160.00	48.7 AV	54.0	-5.3	3.99 H	342	32.0	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	109.9 PK			1.94 V	60	70.3	39.6
2	*5580.00	97.9 AV			1.94 V	60	58.3	39.6
3	11160.00	65.7 PK	74.0	-8.3	3.61 V	264	49.0	16.7
4	11160.00	52.5 AV	54.0	-1.5	3.61 V	264	35.8	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	90.0 PK			2.56 H	284	50.4	39.6
2	*5700.00	78.4 AV			2.56 H	284	38.8	39.6
3	#5725.00	55.6 PK	68.2	-12.6	2.14 H	256	51.5	4.1
4	11400.00	60.9 PK	74.0	-13.1	3.97 H	345	44.3	16.6
5	11400.00	48.3 AV	54.0	-5.7	3.97 H	345	31.7	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	110.1 PK			1.70 V	56	70.5	39.6
2	*5700.00	98.3 AV			1.70 V	56	58.7	39.6
3	#5725.00	57.6 PK	68.2	-10.6	1.70 V	104	53.5	4.1
4	11400.00	64.1 PK	74.0	-9.9	3.51 V	255	47.5	16.6
5	11400.00	50.9 AV	54.0	-3.1	3.51 V	255	34.3	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	#5603.85	53.9 PK	68.2	-14.3	1.48 H	345	49.7	4.2
2	*5745.00	90.0 PK			1.48 H	345	50.2	39.8
3	*5745.00	79.1 AV			1.48 H	345	39.3	39.8
4	#5965.38	56.8 PK	68.2	-11.4	1.48 H	345	52.0	4.8
5	11490.00	59.3 PK	74.0	-14.7	3.91 H	343	42.5	16.8
6	11490.00	47.7 AV	54.0	-6.3	3.91 H	343	30.9	16.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5625.64	54.6 PK	68.2	-13.6	1.89 V	58	50.4	4.2
2	*5745.00	110.2 PK			1.89 V	58	70.4	39.8
3	*5745.00	98.4 AV			1.89 V	58	58.6	39.8
4	#5961.54	58.3 PK	68.2	-9.9	1.89 V	58	53.5	4.8
5	11490.00	62.5 PK	74.0	-11.5	3.61 V	250	45.7	16.8
6	11490.00	50.0 AV	54.0	-4.0	3.61 V	250	33.2	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 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	#5612.82	53.7 PK	68.2	-14.5	1.55 H	345	49.5	4.2
2	*5785.00	91.3 PK			1.55 H	345	51.2	40.1
3	*5785.00	80.8 AV			1.55 H	345	40.7	40.1
4	#5967.31	56.5 PK	68.2	-11.7	1.55 H	345	51.6	4.9
5	11570.00	61.6 PK	74.0	-12.4	3.87 H	354	44.6	17.0
6	11570.00	48.3 AV	54.0	-5.7	3.87 H	354	31.3	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	#5633.97	54.8 PK	68.2	-13.4	1.83 V	58	50.6	4.2
2	*5785.00	109.4 PK			1.83 V	58	69.3	40.1
3	*5785.00	97.8 AV			1.83 V	58	57.7	40.1
4	#5979.49	57.5 PK	68.2	-10.7	1.83 V	58	52.5	5.0
5	11570.00	63.9 PK	74.0	-10.1	3.68 V	258	46.9	17.0
6	11570.00	51.1 AV	54.0	-2.9	3.68 V	258	34.1	17.0

Remarks:

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

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	#5606.41	53.6 PK	68.2	-14.6	1.51 H	345	49.4	4.2
2	*5825.00	92.3 PK			1.51 H	345	52.0	40.3
3	*5825.00	81.5 AV			1.51 H	345	41.2	40.3
4	#5971.15	56.3 PK	68.2	-11.9	1.51 H	345	51.4	4.9
5	11650.00	63.8 PK	74.0	-10.2	3.92 H	357	47.2	16.6
6	11650.00	49.7 AV	54.0	-4.3	3.92 H	357	33.1	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	#5616.67	54.6 PK	68.2	-13.6	1.79 V	97	50.4	4.2
2	*5825.00	109.3 PK			1.79 V	97	69.0	40.3
3	*5825.00	97.0 AV			1.79 V	97	56.7	40.3
4	#5951.92	58.5 PK	68.2	-9.7	1.79 V	97	53.7	4.8
5	11650.00	65.6 PK	74.0	-8.4	3.55 V	249	49.0	16.6
6	11650.00	52.2 AV	54.0	-1.8	3.55 V	249	35.6	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.

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	59.1 PK	74.0	-14.9	1.89 H	71	55.6	3.5
2	5150.00	46.0 AV	54.0	-8.0	1.89 H	71	42.5	3.5
3	*5190.00	93.2 PK			1.46 H	23	53.9	39.3
4	*5190.00	81.1 AV			1.46 H	23	41.8	39.3
5	#10380.00	59.9 PK	68.2	-8.3	3.67 H	271	44.4	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	61.8 PK	74.0	-12.2	1.73 V	83	58.3	3.5
2	5150.00	48.1 AV	54.0	-5.9	1.73 V	83	44.6	3.5
3	*5190.00	105.6 PK			1.84 V	84	66.3	39.3
4	*5190.00	94.3 AV			1.84 V	84	55.0	39.3
5	#10380.00	57.1 PK	68.2	-11.1	1.76 V	193	41.6	15.5

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	92.5 PK			1.79 H	181	53.4	39.1
2	*5230.00	81.0 AV			1.79 H	181	41.9	39.1
3	5350.00	59.0 PK	74.0	-15.0	1.62 H	292	55.3	3.7
4	5350.00	46.0 AV	54.0	-8.0	1.62 H	292	42.3	3.7
5	#10460.00	58.9 PK	68.2	-9.3	3.14 H	288	42.9	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	106.1 PK			1.78 V	88	67.0	39.1
2	*5230.00	94.0 AV			1.78 V	88	54.9	39.1
3	5350.00	57.0 PK	74.0	-17.0	1.96 V	288	53.3	3.7
4	5350.00	44.5 AV	54.0	-9.5	1.96 V	288	40.8	3.7
5	#10460.00	59.6 PK	68.2	-8.6	3.40 V	268	43.6	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	57.8 PK	74.0	-16.2	1.52 H	231	54.3	3.5
2	5150.00	45.4 AV	54.0	-8.6	1.52 H	231	41.9	3.5
3	*5270.00	94.9 PK			1.50 H	184	55.9	39.0
4	*5270.00	82.0 AV			1.50 H	184	43.0	39.0
5	#10540.00	60.3 PK	68.2	-7.9	2.78 H	296	43.9	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	57.0 PK	74.0	-17.0	1.89 V	261	53.5	3.5
2	5150.00	44.2 AV	54.0	-9.8	1.89 V	261	40.7	3.5
3	*5270.00	105.8 PK			1.78 V	62	66.8	39.0
4	*5270.00	94.3 AV			1.78 V	62	55.3	39.0
5	#10540.00	61.9 PK	68.2	-6.3	3.02 V	274	45.5	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	95.5 PK			1.44 H	183	56.5	39.0
2	*5310.00	83.0 AV			1.44 H	183	44.0	39.0
3	5350.00	59.5 PK	74.0	-14.5	1.55 H	203	55.8	3.7
4	5350.00	46.4 AV	54.0	-7.6	1.55 H	203	42.7	3.7
5	10620.00	59.1 PK	74.0	-14.9	2.96 H	301	42.5	16.6
6	10620.00	46.8 AV	54.0	-7.2	2.96 H	301	30.2	16.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	106.9 PK			1.88 V	79	67.9	39.0
2	*5310.00	94.6 AV			1.88 V	79	55.6	39.0
3	5350.00	62.1 PK	74.0	-11.9	1.96 V	83	58.4	3.7
4	5350.00	47.9 AV	54.0	-6.1	1.96 V	83	44.2	3.7
5	10620.00	62.2 PK	74.0	-11.8	3.91 V	248	45.6	16.6
6	10620.00	48.8 AV	54.0	-5.2	3.91 V	248	32.2	16.6

Remarks:

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

CHANNEL	TX Channel 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	56.8 PK	74.0	-17.2	1.95 H	232	52.8	4.0
2	5460.00	43.6 AV	54.0	-10.4	1.95 H	232	39.6	4.0
3	#5470.00	57.2 PK	68.2	-11.0	2.28 H	251	53.2	4.0
4	*5510.00	89.6 PK			2.01 H	225	49.9	39.7
5	*5510.00	78.0 AV			2.01 H	225	38.3	39.7
6	11020.00	62.9 PK	74.0	-11.1	3.90 H	340	45.3	17.6
7	11020.00	49.1 AV	54.0	-4.9	3.90 H	340	31.5	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	62.2 PK	74.0	-11.8	1.96 V	102	58.2	4.0
2	5460.00	49.3 AV	54.0	-4.7	1.96 V	102	45.3	4.0
3	#5470.00	66.7 PK	68.2	-1.5	1.86 V	84	62.7	4.0
4	*5510.00	107.5 PK			1.84 V	81	67.8	39.7
5	*5510.00	95.6 AV			1.84 V	81	55.9	39.7
6	11020.00	66.2 PK	74.0	-7.8	3.77 V	253	48.6	17.6
7	11020.00	51.8 AV	54.0	-2.2	3.77 V	253	34.2	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	89.2 PK			1.73 H	225	49.6	39.6
2	*5550.00	77.9 AV			1.73 H	225	38.3	39.6
3	11100.00	59.3 PK	74.0	-14.7	2.39 H	264	42.5	16.8
4	11100.00	47.1 AV	54.0	-6.9	2.39 H	264	30.3	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	108.0 PK			1.88 V	86	68.4	39.6
2	*5550.00	96.5 AV			1.88 V	86	56.9	39.6
3	11100.00	66.3 PK	74.0	-7.7	3.60 V	246	49.5	16.8
4	11100.00	52.4 AV	54.0	-1.6	3.60 V	246	35.6	16.8

Remarks:

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

CHANNEL	TX Channel 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	90.1 PK			2.10 H	226	50.3	39.8
2	*5670.00	78.5 AV			2.10 H	226	38.7	39.8
3	#5725.00	55.3 PK	68.2	-12.9	1.89 H	264	51.2	4.1
4	11340.00	59.3 PK	74.0	-14.7	2.81 H	166	42.5	16.8
5	11340.00	47.1 AV	54.0	-6.9	2.81 H	166	30.3	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	107.4 PK			1.75 V	73	67.6	39.8
2	*5670.00	96.0 AV			1.75 V	73	56.2	39.8
3	#5725.00	59.7 PK	68.2	-8.5	1.93 V	89	55.6	4.1
4	11340.00	64.6 PK	74.0	-9.4	3.55 V	245	47.8	16.8
5	11340.00	50.3 AV	54.0	-3.7	3.55 V	245	33.5	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 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	#5602.56	54.0 PK	68.2	-14.2	1.92 H	360	49.8	4.2
2	*5755.00	88.7 PK			1.92 H	360	48.9	39.8
3	*5755.00	77.6 AV			1.92 H	360	37.8	39.8
4	#5984.62	57.8 PK	68.2	-10.4	1.92 H	360	52.8	5.0
5	11510.00	61.8 PK	74.0	-12.2	3.89 H	355	44.9	16.9
6	11510.00	48.3 AV	54.0	-5.7	3.89 H	355	31.4	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	#5604.49	54.7 PK	68.2	-13.5	1.90 V	60	50.5	4.2
2	*5755.00	108.3 PK			1.90 V	60	68.5	39.8
3	*5755.00	96.3 AV			1.90 V	60	56.5	39.8
4	#5993.59	58.2 PK	68.2	-10.0	1.90 V	60	53.2	5.0
5	11510.00	63.9 PK	74.0	-10.1	3.33 V	260	47.0	16.9
6	11510.00	49.9 AV	54.0	-4.1	3.33 V	260	33.0	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	#5630.13	53.9 PK	68.2	-14.3	1.32 H	344	49.7	4.2
2	*5795.00	89.9 PK			1.32 H	344	49.8	40.1
3	*5795.00	79.0 AV			1.32 H	344	38.9	40.1
4	#5932.05	57.8 PK	68.2	-10.4	1.32 H	344	52.9	4.9
5	11590.00	62.5 PK	74.0	-11.5	3.49 H	339	45.5	17.0
6	11590.00	48.9 AV	54.0	-5.1	3.49 H	339	31.9	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	#5632.05	54.6 PK	68.2	-13.6	1.67 V	56	50.4	4.2
2	*5795.00	107.4 PK			1.67 V	56	67.3	40.1
3	*5795.00	94.8 AV			1.67 V	56	54.7	40.1
4	#5957.69	57.2 PK	68.2	-11.0	1.67 V	56	52.4	4.8
5	11590.00	64.2 PK	74.0	-9.8	3.54 V	248	47.2	17.0
6	11590.00	50.3 AV	54.0	-3.7	3.54 V	248	33.3	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	58.2 PK	74.0	-15.8	1.51 H	77	54.7	3.5
2	5150.00	47.6 AV	54.0	-6.4	1.51 H	77	44.1	3.5
3	*5210.00	89.0 PK			1.48 H	24	49.8	39.2
4	*5210.00	80.7 AV			1.48 H	24	41.5	39.2
5	5350.00	58.2 PK	74.0	-15.8	1.89 H	197	54.5	3.7
6	5350.00	47.6 AV	54.0	-6.4	1.89 H	197	43.9	3.7
7	#10420.00	59.6 PK	68.2	-8.6	3.74 H	315	43.9	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	70.8 PK	74.0	-3.2	1.88 V	77	67.3	3.5
2	5150.00	50.9 AV	54.0	-3.1	1.88 V	77	47.4	3.5
3	*5210.00	103.7 PK			1.82 V	87	64.5	39.2
4	*5210.00	95.0 AV			1.82 V	87	55.8	39.2
5	5350.00	59.3 PK	74.0	-14.7	2.02 V	287	55.6	3.7
6	5350.00	48.7 AV	54.0	-5.3	2.02 V	287	45.0	3.7
7	#10420.00	59.0 PK	68.2	-9.2	3.28 V	277	43.3	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	58.8 PK	74.0	-15.2	1.62 H	235	55.3	3.5
2	5150.00	48.4 AV	54.0	-5.6	1.62 H	235	44.9	3.5
3	*5290.00	90.9 PK			1.50 H	184	51.9	39.0
4	*5290.00	81.6 AV			1.50 H	184	42.6	39.0
5	5350.00	59.3 PK	74.0	-14.7	1.48 H	221	55.6	3.7
6	5350.00	48.3 AV	54.0	-5.7	1.48 H	221	44.6	3.7
7	#10580.00	60.6 PK	68.2	-7.6	3.96 H	309	43.9	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	59.3 PK	74.0	-14.7	1.96 V	91	55.8	3.5
2	5150.00	48.6 AV	54.0	-5.4	1.96 V	91	45.1	3.5
3	*5290.00	104.6 PK			1.94 V	82	65.6	39.0
4	*5290.00	96.1 AV			1.94 V	82	57.1	39.0
5	5350.00	66.4 PK	74.0	-7.6	1.90 V	79	62.7	3.7
6	5350.00	52.8 AV	54.0	-1.2	1.90 V	79	49.1	3.7
7	#10580.00	61.9 PK	68.2	-6.3	3.74 V	259	45.2	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 106	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	56.7 PK	74.0	-17.3	1.79 H	231	52.7	4.0
2	5460.00	46.9 AV	54.0	-7.1	1.79 H	231	42.9	4.0
3	#5470.00	56.9 PK	68.2	-11.3	2.13 H	189	52.9	4.0
4	*5530.00	83.8 PK			1.73 H	225	44.1	39.7
5	*5530.00	74.5 AV			1.73 H	225	34.8	39.7
6	#5725.00	55.2 PK	68.2	-13.0	1.92 H	256	51.1	4.1
7	11060.00	59.5 PK	74.0	-14.5	2.96 H	173	42.3	17.2
8	11060.00	50.5 AV	54.0	-3.5	2.96 H	173	33.3	17.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	62.3 PK	74.0	-11.7	1.92 V	83	58.3	4.0
2	5460.00	52.9 AV	54.0	-1.1	1.92 V	83	48.9	4.0
3	#5470.00	62.6 PK	68.2	-5.6	1.87 V	82	58.6	4.0
4	*5530.00	101.0 PK			1.82 V	105	61.3	39.7
5	*5530.00	92.1 AV			1.82 V	105	52.4	39.7
6	#5725.00	56.2 PK	68.2	-12.0	1.82 V	115	52.1	4.1
7	11060.00	61.1 PK	74.0	-12.9	3.61 V	243	43.9	17.2
8	11060.00	52.6 AV	54.0	-1.4	3.61 V	243	35.4	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	56.2 PK	74.0	-17.8	1.57 H	115	52.2	4.0
2	5460.00	47.2 AV	54.0	-6.8	1.57 H	115	43.2	4.0
3	#5470.00	57.1 PK	68.2	-11.1	1.82 H	108	53.1	4.0
4	*5610.00	82.6 PK			1.64 H	47	42.8	39.8
5	*5610.00	75.3 AV			1.64 H	47	35.5	39.8
6	#5725.00	55.2 PK	68.2	-13.0	1.53 H	56	51.1	4.1
7	11220.00	60.0 PK	74.0	-14.0	4.00 H	350	43.2	16.8
8	11220.00	52.2 AV	54.0	-1.8	4.00 H	350	35.4	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	57.8 PK	74.0	-16.2	1.77 V	68	53.8	4.0
2	5460.00	47.6 AV	54.0	-6.4	1.77 V	68	43.6	4.0
3	#5470.00	58.1 PK	68.2	-10.1	1.87 V	83	54.1	4.0
4	*5610.00	101.4 PK			1.74 V	59	61.6	39.8
5	*5610.00	93.9 AV			1.74 V	59	54.1	39.8
6	#5725.00	56.1 PK	68.2	-12.1	1.96 V	43	52.0	4.1
7	11220.00	61.7 PK	74.0	-12.3	3.74 V	266	44.9	16.8
8	11220.00	52.8 AV	54.0	-1.2	3.74 V	266	36.0	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 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	#5605.13	54.0 PK	68.2	-14.2	1.61 H	344	49.8	4.2
2	#5650.00	55.6 PK	68.2	-12.6	1.89 H	306	51.3	4.3
3	*5775.00	82.5 PK			1.61 H	344	42.5	40.0
4	*5775.00	75.6 AV			1.61 H	344	35.6	40.0
5	#5925.00	58.3 PK	68.2	-9.9	1.73 H	335	53.4	4.9
6	#5976.92	57.1 PK	68.2	-11.1	1.61 H	344	52.1	5.0
7	11550.00	59.2 PK	74.0	-14.8	3.82 H	351	42.2	17.0
8	11550.00	50.0 AV	54.0	-4.0	3.82 H	351	33.0	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	#5625.00	56.5 PK	68.2	-11.7	1.74 V	64	52.3	4.2
2	#5650.00	57.2 PK	68.2	-11.0	1.86 V	79	52.9	4.3
3	*5775.00	101.0 PK			1.72 V	57	61.0	40.0
4	*5775.00	92.4 AV			1.72 V	57	52.4	40.0
5	#5925.00	58.0 PK	68.2	-10.2	1.64 V	103	53.1	4.9
6	#5975.00	57.5 PK	68.2	-10.7	1.74 V	64	52.5	5.0
7	11550.00	60.4 PK	74.0	-13.6	3.67 V	252	43.4	17.0
8	11550.00	51.7 AV	54.0	-2.3	3.67 V	252	34.7	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:

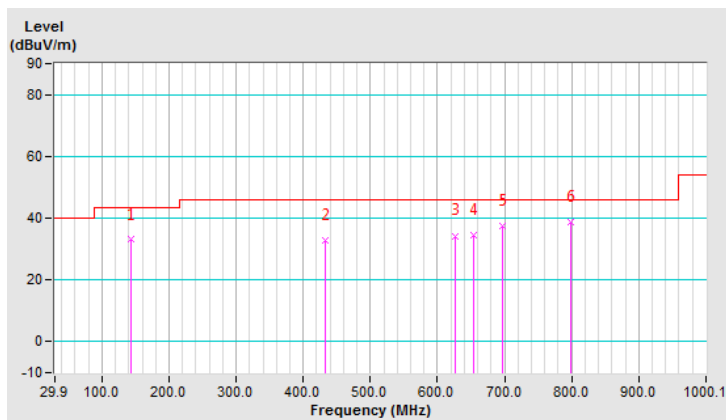
802.11n (HT40)

CHANNEL	TX Channel 46	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	142.67	33.0 QP	43.5	-10.5	2.00 H	173	42.3	-9.3
2	432.37	32.9 QP	46.0	-13.1	2.00 H	58	37.4	-4.5
3	626.80	34.3 QP	46.0	-11.7	1.00 H	32	34.8	-0.5
4	654.02	34.6 QP	46.0	-11.4	1.00 H	358	35.0	-0.4
5	696.79	37.6 QP	46.0	-8.4	1.50 H	18	37.3	0.3
6	797.89	38.6 QP	46.0	-7.4	1.00 H	46	36.3	2.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.

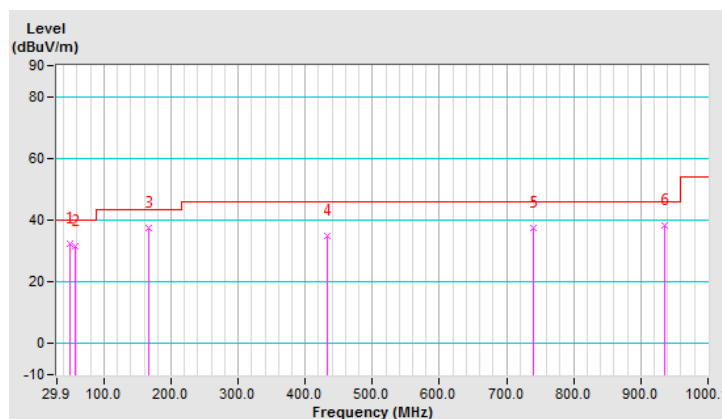


CHANNEL	TX Channel 46	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	49.34	32.4 QP	40.0	-7.6	1.00 V	9	41.7	-9.3
2	57.12	31.6 QP	40.0	-8.4	1.49 V	4	41.2	-9.6
3	166.00	37.3 QP	43.5	-6.2	1.00 V	191	46.3	-9.0
4	432.37	35.0 QP	46.0	-11.0	1.00 V	78	39.5	-4.5
5	739.57	37.4 QP	46.0	-8.6	1.00 V	157	35.7	1.7
6	935.94	38.5 QP	46.0	-7.5	1.00 V	9	33.6	4.9

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	ESR3	102412	Feb. 08, 2018	Feb. 07, 2019
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 05, 2018	Sep. 04, 2019
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Feb. 05, 2018	Feb. 04, 2019
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 13, 2018	Aug. 12, 2019
Software ADT	BV ADT_Conc_ V7.3.7.4	NA	NA	NA

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

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

3. The VCCI Site Registration No. is C-2047.

4.2.3 Test Procedures

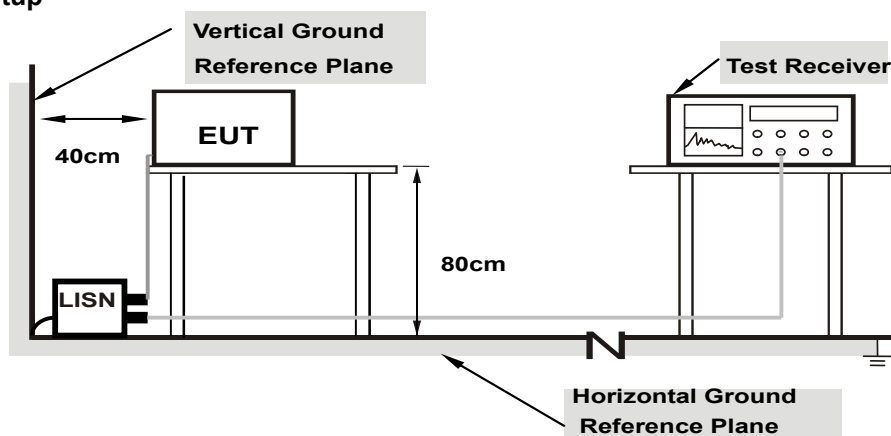
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

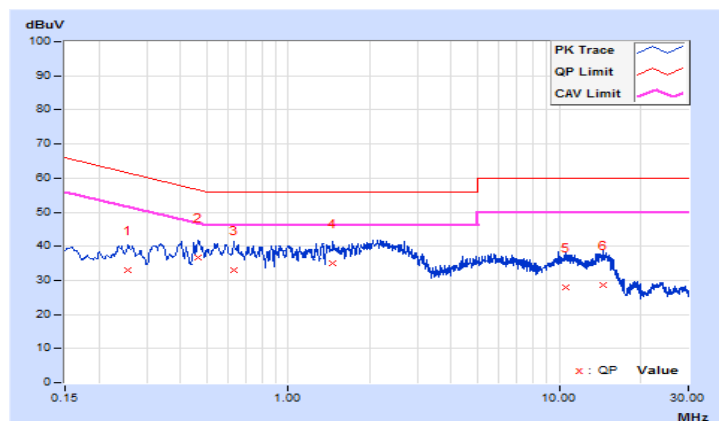
802.11n (HT40)

Channel	TX Channel 46	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	0.25613	10.06	23.06	17.94	33.12	28.00	61.56	51.56	-28.44	-23.56
2	0.46516	10.06	26.75	21.58	36.81	31.64	56.60	46.60	-19.79	-14.96
3	0.62925	10.06	22.86	14.11	32.92	24.17	56.00	46.00	-23.08	-21.83
4	1.45536	10.07	24.89	18.69	34.96	28.76	56.00	46.00	-21.04	-17.24
5	10.64850	10.31	17.58	8.99	27.89	19.30	60.00	50.00	-32.11	-30.70
6	14.47800	10.40	18.08	9.66	28.48	20.06	60.00	50.00	-31.52	-29.94

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.

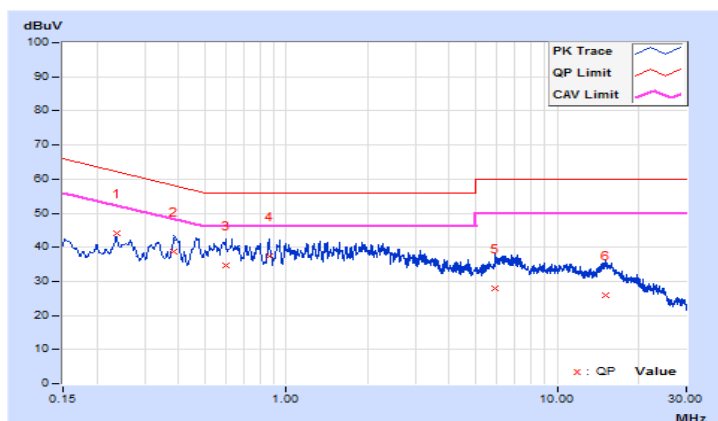


Channel	TX Channel 46	Detector Function	Quasi-Peak (QP) / Average (AV)
Phase	Neutral (N)		

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	0.23600	10.07	33.89	16.99	43.96	27.06	62.24	52.24	-18.28	-25.18
2	0.38625	10.07	28.50	15.11	38.57	25.18	58.14	48.14	-19.57	-22.96
3	0.59778	10.07	24.66	18.10	34.73	28.17	56.00	46.00	-21.27	-17.83
4	0.86550	10.08	27.35	21.93	37.43	32.01	56.00	46.00	-18.57	-13.99
5	5.93475	10.23	17.61	11.43	27.84	21.66	60.00	50.00	-32.16	-28.34
6	15.08775	10.53	15.29	7.67	25.82	18.20	60.00	50.00	-34.18	-31.80

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} ;

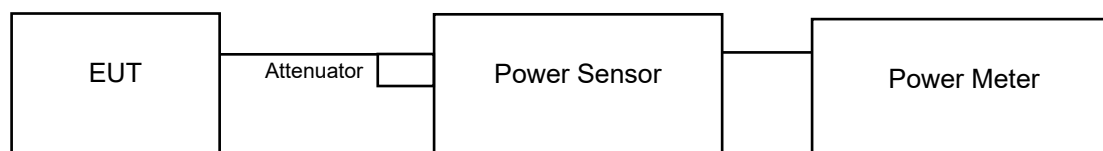
Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

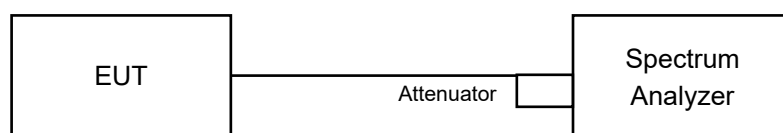
4.3.2 Test Setup

For Power Output

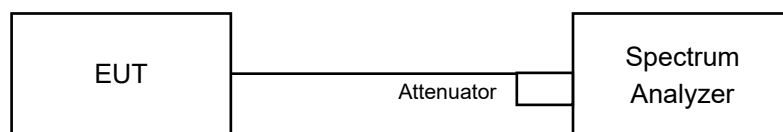
802.11a, 802.11n (HT20), 802.11n (HT40)



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	Pass
40	5200	28.119	14.49	24	Pass
48	5240	27.669	14.42	24	Pass
52	5260	27.861	14.45	24	Pass
60	5300	28.054	14.48	24	Pass
64	5320	27.416	14.38	24	Pass
100	5500	27.990	14.47	24	Pass
116	5580	28.054	14.48	24	Pass
140	5700	27.606	14.41	24	Pass
149	5745	27.606	14.41	30	Pass
157	5785	27.479	14.39	30	Pass
165	5825	27.797	14.44	30	Pass

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

For 5260~5320MHz, 5500~5700MHz

1. $11\text{dBm} + 10\log (21.94) = 24.41 \text{ dBm} > 24\text{dBm}$
2. $11\text{dBm} + 10\log (21.97) = 24.42 \text{ dBm} > 24\text{dBm}$
3. $11\text{dBm} + 10\log (21.95) = 24.41 \text{ dBm} > 24\text{dBm}$
4. $11\text{dBm} + 10\log (21.94) = 24.41 \text{ dBm} > 24\text{dBm}$
5. $11\text{dBm} + 10\log (21.92) = 24.41 \text{ dBm} > 24\text{dBm}$
6. $11\text{dBm} + 10\log (21.86) = 24.40 \text{ dBm} > 24\text{dBm}$

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	13.61	13.35	44.588	16.49	24	Pass
40	5200	13.35	13.61	44.588	16.49	24	Pass
48	5240	13.22	13.64	44.110	16.45	24	Pass
52	5260	12.91	13.92	44.203	16.45	24	Pass
60	5300	12.79	14.09	44.656	16.50	24	Pass
64	5320	12.89	13.99	44.515	16.49	24	Pass
100	5500	9.20	9.78	17.824	12.51	24	Pass
116	5580	9.71	10.24	19.922	12.99	24	Pass
140	5700	12.88	14.00	44.528	16.49	24	Pass
149	5745	12.81	13.92	43.759	16.41	30	Pass
157	5785	12.96	13.89	44.261	16.46	30	Pass
165	5825	13.12	13.82	44.611	16.49	30	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 (22.10) = 24.44 dBm > 24dBm
2. 11dBm + 10log (22.25) = 24.47 dBm > 24dBm
3. 11dBm + 10log (22.15) = 24.45 dBm > 24dBm
4. 11dBm + 10log (22.16) = 24.46 dBm > 24dBm
5. 11dBm + 10log (22.07) = 24.44 dBm > 24dBm
6. 11dBm + 10log (22.14) = 24.45 dBm > 24dBm

Chain 1

1. 11dBm + 10log (22.14) = 24.45 dBm > 24dBm
2. 11dBm + 10log (21.97) = 24.42 dBm > 24dBm
3. 11dBm + 10log (21.89) = 24.40 dBm > 24dBm
4. 11dBm + 10log (21.99) = 24.42 dBm > 24dBm
5. 11dBm + 10log (22.13) = 24.45 dBm > 24dBm
6. 11dBm + 10log (22.02) = 24.43 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	13.17	13.73	44.354	16.47	24	Pass
46	5230	13.24	13.73	44.691	16.50	24	Pass
54	5270	13.14	13.79	44.539	16.49	24	Pass
62	5310	13.28	13.64	44.402	16.47	24	Pass
102	5510	11.09	11.76	27.850	14.45	24	Pass
110	5550	11.76	12.25	31.785	15.02	24	Pass
134	5670	13.04	13.79	44.070	16.44	24	Pass
151	5755	13.18	13.64	43.918	16.43	30	Pass
159	5795	13.02	13.72	43.595	16.39	30	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 (41.45) = 27.18 dBm > 24dBm
2. 11dBm + 10log (41.49) = 27.18 dBm > 24dBm
3. 11dBm + 10log (41.34) = 27.16 dBm > 24dBm
4. 11dBm + 10log (41.22) = 27.15 dBm > 24dBm
5. 11dBm + 10log (41.23) = 27.15 dBm > 24dBm

Chain 1

1. 11dBm + 10log (41.15) = 27.14 dBm > 24dBm
2. 11dBm + 10log (41.05) = 27.13 dBm > 24dBm
3. 11dBm + 10log (41.07) = 27.14 dBm > 24dBm
4. 11dBm + 10log (40.98) = 27.13 dBm > 24dBm
5. 11dBm + 10log (41.10) = 27.14 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	11.65	11.29	28.081	14.48	24	Pass
58	5290	11.22	11.57	27.598	14.41	24	Pass
106	5530	8.52	8.81	14.715	11.68	24	Pass
122	5610	11.04	11.81	27.877	14.45	24	Pass
155	5775	11.17	11.77	28.123	14.49	30	Pass

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

For 5260~5320MHz, 5500~5700MHz

Chain 0

1. $11\text{dBm} + 10\log (82.01) = 30.14 \text{ dBm} > 24\text{dBm}$
2. $11\text{dBm} + 10\log (82.28) = 30.15 \text{ dBm} > 24\text{dBm}$
3. $11\text{dBm} + 10\log (82.09) = 30.14 \text{ dBm} > 24\text{dBm}$

Chain 1

1. $11\text{dBm} + 10\log (81.86) = 30.13 \text{ dBm} > 24\text{dBm}$
2. $11\text{dBm} + 10\log (81.88) = 30.13 \text{ dBm} > 24\text{dBm}$
3. $11\text{dBm} + 10\log (81.75) = 30.12 \text{ dBm} > 24\text{dBm}$

26dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)
36	5180	40.37
40	5200	21.97
48	5240	21.94
52	5260	21.94
60	5300	21.97
64	5320	21.95
100	5500	21.94
116	5580	21.92
140	5700	21.86

802.11n (HT20)

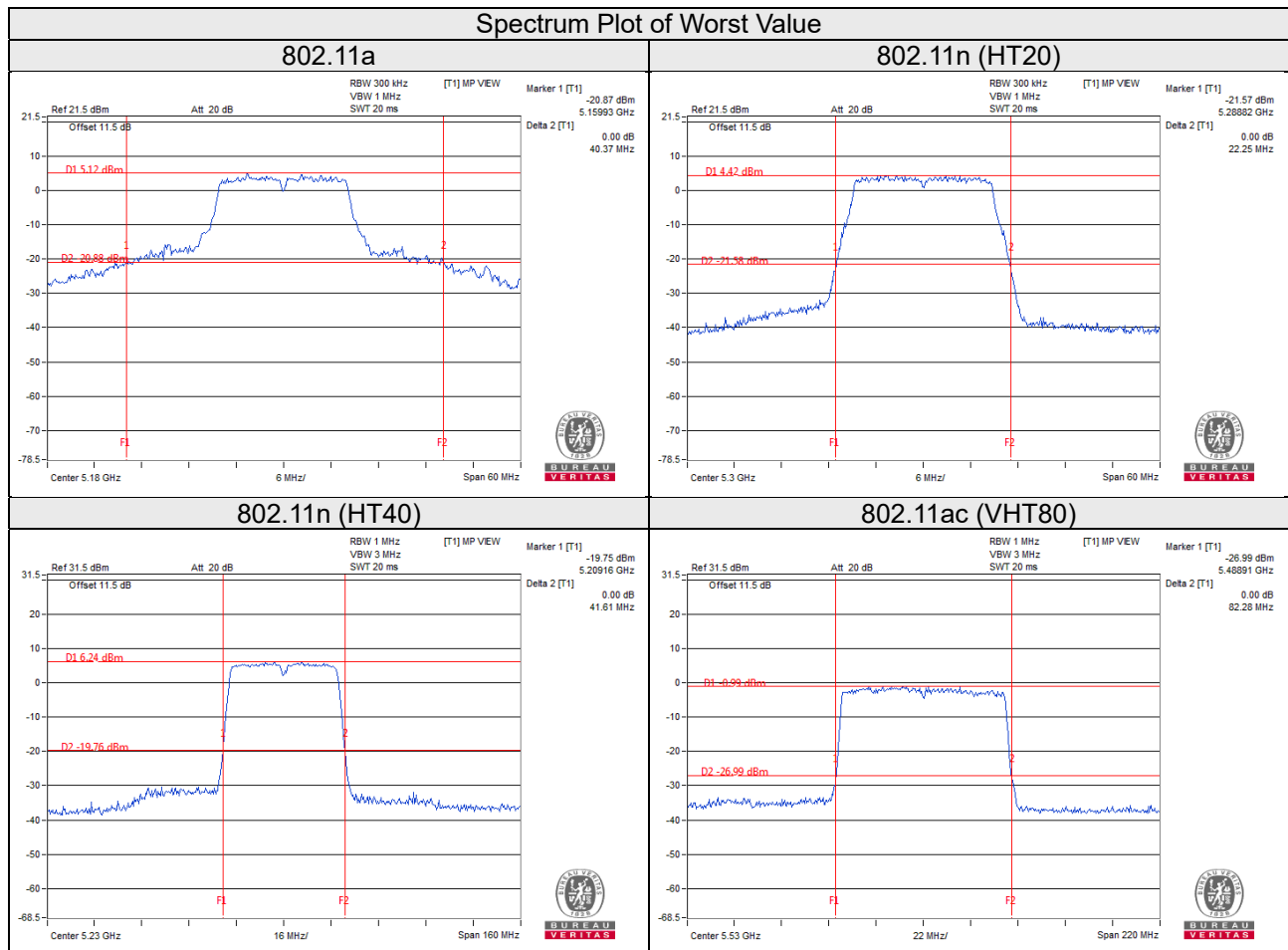
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	22.12	21.96
40	5200	21.99	21.95
48	5240	22.15	21.98
52	5260	22.10	22.14
60	5300	22.25	21.97
64	5320	22.15	21.89
100	5500	22.16	21.99
116	5580	22.07	22.13
140	5700	22.14	22.02

802.11n (HT40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	41.45	41.08
46	5230	41.61	41.24
54	5270	41.45	41.15
62	5310	41.49	41.05
102	5510	41.34	41.07
110	5550	41.22	40.98
134	5670	41.23	41.10

802.11ac (VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	81.98	81.97
58	5290	82.01	81.86
106	5530	82.28	81.88
122	5610	82.09	81.75



EUT Maximum Conducted Power

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	28.054	14.48
5470~5725	28.054	14.48

Note: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	44.656	16.50
5470~5725	44.528	16.49

Note: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	44.539	16.49
5470~5725	44.070	16.44

Note: Manufacturer provides Transmit Power Control description to meet this requirement.

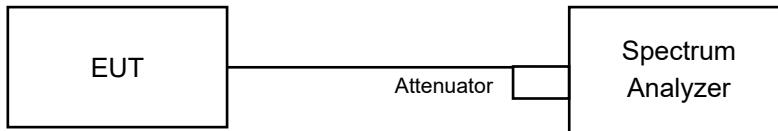
802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	27.598	14.41
5470~5725	27.877	14.45

Note: Manufacturer provides Transmit Power Control description to meet this requirement.

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	20.40
40	5200	17.28
48	5240	17.16
52	5260	17.04
60	5300	17.16
64	5320	17.16
100	5500	17.16
116	5580	17.16
140	5700	17.16
149	5745	16.56
157	5785	17.16
165	5825	17.16

802.11n (HT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.12	18.00
40	5200	18.24	18.00
48	5240	18.24	18.00
52	5260	18.24	18.00
60	5300	18.24	18.12
64	5320	18.24	18.00
100	5500	18.24	18.12
116	5580	18.24	18.00
140	5700	18.24	18.12
149	5745	17.40	17.40
157	5785	18.24	18.12
165	5825	18.24	18.00

802.11n (HT40)

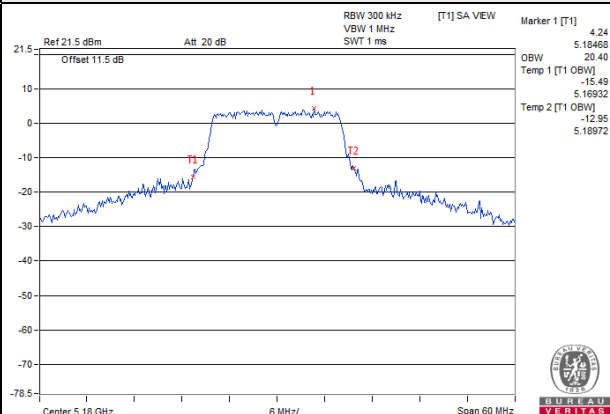
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.84	36.60
46	5230	36.72	36.60
54	5270	36.84	36.72
62	5310	36.72	36.72
102	5510	36.72	36.60
110	5550	36.72	36.72
134	5670	36.84	36.72
151	5755	36.60	36.72
159	5795	36.84	36.72

802.11ac (VHT80)

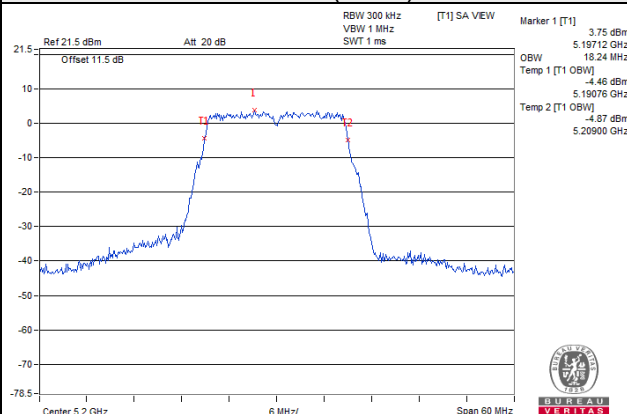
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	76.08
58	5290	76.08	76.08
106	5530	75.84	76.08
122	5610	75.84	76.08
155	5775	76.08	75.84

Spectrum Plot of Worst Value

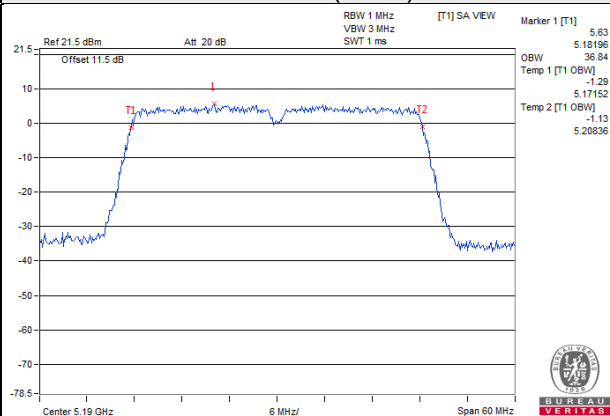
802.11a



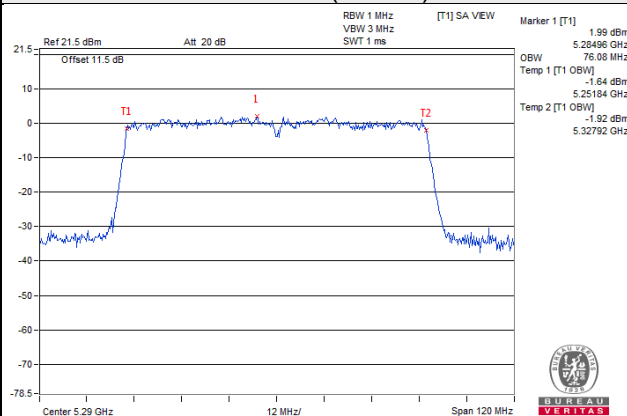
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

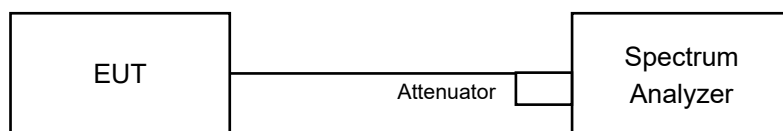


4.5 Peak Power Spectral Density Measurement

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	0.01	0.36	0.37	11	Pass
40	5200	0.07	0.36	0.43	11	Pass
48	5240	-0.07	0.36	0.29	11	Pass
52	5260	-0.12	0.36	0.24	11	Pass
60	5300	0.03	0.36	0.39	11	Pass
64	5320	-0.19	0.36	0.17	11	Pass
100	5500	-0.83	0.36	-0.47	11	Pass
116	5580	-0.25	0.36	0.11	11	Pass
140	5700	-0.47	0.36	-0.11	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	-1.51	-0.82	0.35	2.21	8.19	Pass
40	5200	-0.70	-1.01	0.35	2.51	8.19	Pass
48	5240	-0.75	-0.93	0.35	2.52	8.19	Pass
52	5260	-0.69	-0.88	0.35	2.57	8.19	Pass
60	5300	-0.58	-0.79	0.35	2.67	8.19	Pass
64	5320	-0.39	-0.66	0.35	2.84	8.19	Pass
100	5500	-4.57	-4.24	0.35	-1.04	8.19	Pass
116	5580	-4.36	-4.00	0.35	-0.82	8.19	Pass
140	5700	-2.00	-2.32	0.35	1.20	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	-5.38	-5.19	1.11	-1.16	8.19	Pass
46	5230	-5.37	-5.01	1.11	-1.06	8.19	Pass
54	5270	-5.28	-4.92	1.11	-0.97	8.19	Pass
62	5310	-5.09	-4.33	1.11	-0.57	8.19	Pass
102	5510	-6.60	-5.54	1.11	-1.91	8.19	Pass
110	5550	-6.22	-5.18	1.11	-1.55	8.19	Pass
134	5670	-5.36	-4.60	1.11	-0.84	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)

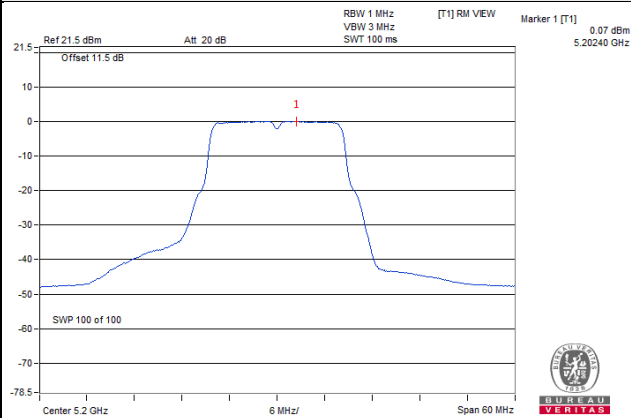
Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-8.96	-8.49	1.71	-3.99	8.19	Pass
58	5290	-8.86	-8.46	1.71	-3.93	8.19	Pass
106	5530	-12.24	-10.85	1.71	-6.77	8.19	Pass
122	5610	-10.53	-9.46	1.71	-5.24	8.19	Pass

Note:

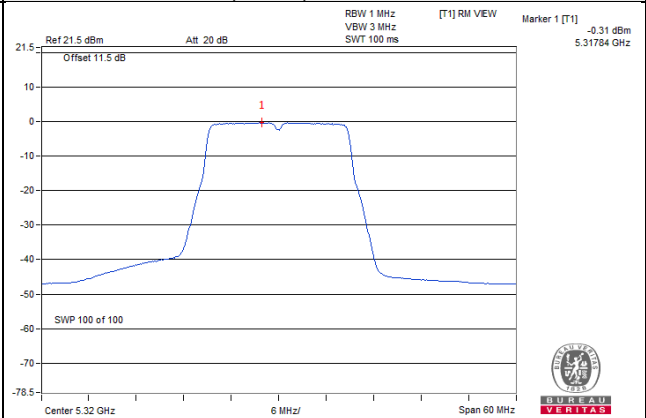
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Directional Gain = $5.8\text{dBi} + 10\log(2) = 8.81\text{dBi} > 6\text{dBi}$,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

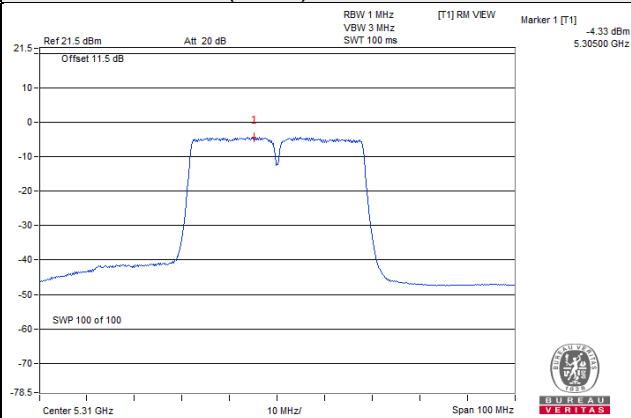
802.11a / CH 40



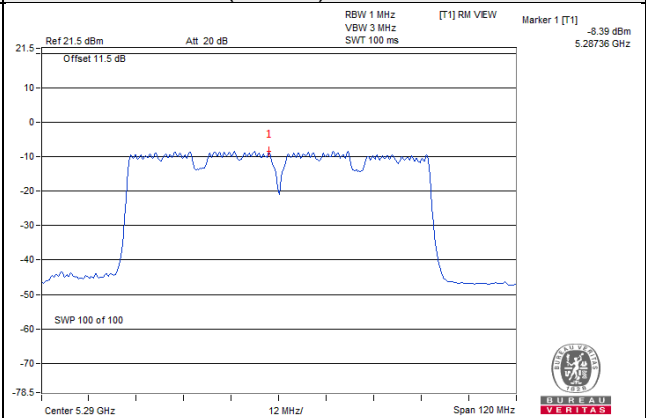
802.11n (HT20) / Chain 0 / CH 64



802.11n (HT40) / Chain 1 / CH 62



802.11ac (VHT80) / Chain 1 / CH 58



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	-9.78	-7.56	0.36	-7.20	30	Pass
157	5785	-10.14	-7.92	0.36	-7.56	30	Pass
165	5825	-9.62	-7.40	0.36	-7.04	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	-10.20	-7.98	3.01	0.35	-4.62	27.19	Pass
	157	5785	-10.39	-8.17	3.01	0.35	-4.81	27.19	Pass
	165	5825	-9.79	-7.57	3.01	0.35	-4.21	27.19	Pass
1	149	5745	-10.19	-7.97	3.01	0.35	-4.61	27.19	Pass
	157	5785	-9.86	-7.64	3.01	0.35	-4.28	27.19	Pass
	165	5825	-9.44	-7.22	3.01	0.35	-3.86	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	-12.71	-10.49	3.01	1.11	-6.37	27.19	Pass
	159	5795	-13.03	-10.81	3.01	1.11	-6.69	27.19	Pass
1	151	5755	-12.10	-9.88	3.01	1.11	-5.76	27.19	Pass
	159	5795	-12.37	-10.15	3.01	1.11	-6.03	27.19	Pass

Note:

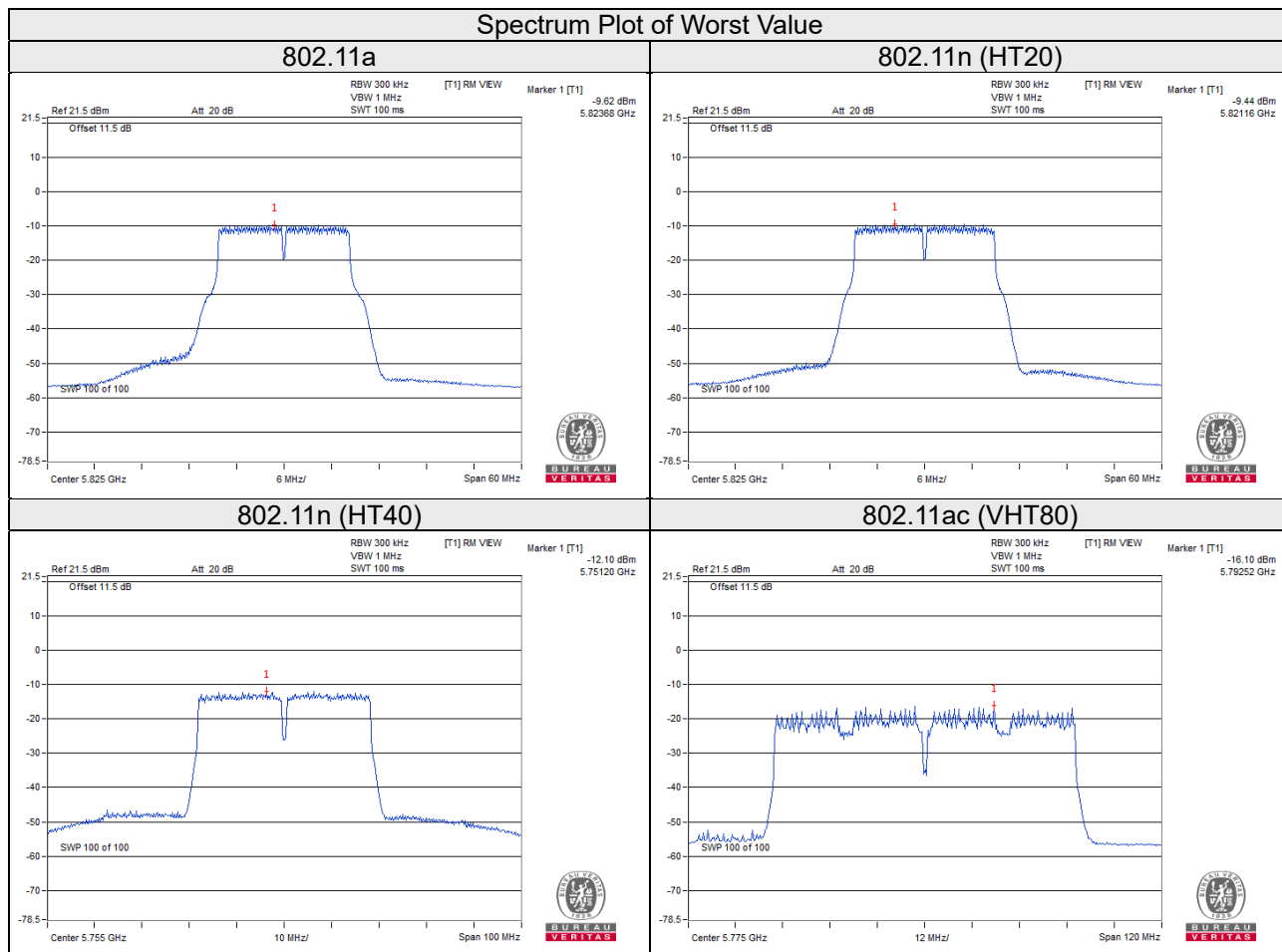
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Max. Directional Gain = 5.8dBi + 10log(2) = 8.81dBi > 6dBi, so the limit shall 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	-17.40	-15.18	3.01	1.71	-10.46	27.19	Pass
1	155	5775	-16.10	-13.88	3.01	1.71	-9.16	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 = $5.8\text{dBi} + 10\log(2) = 8.81\text{dBi} > 6\text{dBi}$, so the limit shall be reduced to $30-(8.81-6) = 27.19\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

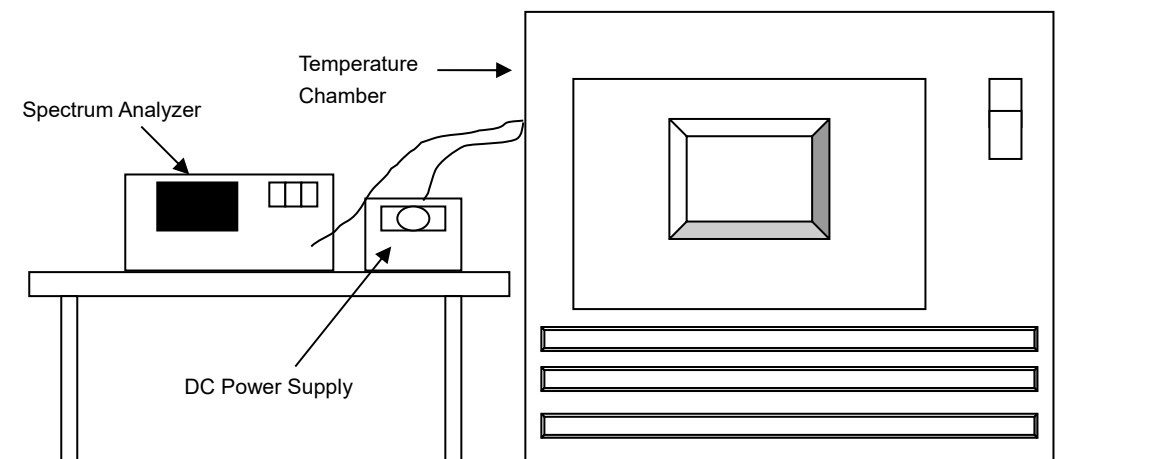


4.6 Frequency Stability

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	5179.972	PASS	5179.9755	PASS	5179.9751	PASS	5179.9761	PASS
80	3.3	5179.9931	PASS	5179.9934	PASS	5179.9929	PASS	5179.9924	PASS
70	3.3	5179.9921	PASS	5179.9895	PASS	5179.9915	PASS	5179.9889	PASS
60	3.3	5179.9813	PASS	5179.9854	PASS	5179.9822	PASS	5179.9824	PASS
50	3.3	5179.9935	PASS	5179.9959	PASS	5179.9963	PASS	5179.9966	PASS
40	3.3	5180.0145	PASS	5180.0162	PASS	5180.0138	PASS	5180.0128	PASS
30	3.3	5180.004	PASS	5180.0051	PASS	5180.0032	PASS	5180.0007	PASS
20	3.3	5180.0049	PASS	5180.0046	PASS	5180.0078	PASS	5180.0093	PASS
10	3.3	5179.9877	PASS	5179.9885	PASS	5179.9881	PASS	5179.9862	PASS
0	3.3	5179.9745	PASS	5179.9741	PASS	5179.9774	PASS	5179.9767	PASS
-10	3.3	5180.0218	PASS	5180.0226	PASS	5180.0251	PASS	5180.0241	PASS
-20	3.3	5180.0167	PASS	5180.0202	PASS	5180.0201	PASS	5180.018	PASS
-30	3.3	5180.0172	PASS	5180.0127	PASS	5180.0137	PASS	5180.0158	PASS
-40	3.3	5179.9976	PASS	5180.0014	PASS	5179.9976	PASS	5180.001	PASS

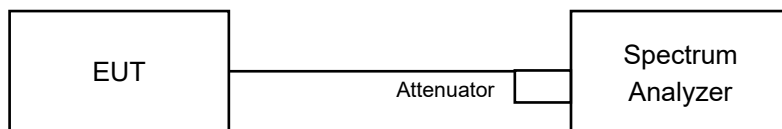
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	3.795	5180.0051	PASS	5180.0054	PASS	5180.0081	PASS	5180.0103	PASS
	3.3	5180.0049	PASS	5180.0046	PASS	5180.0078	PASS	5180.0093	PASS
	2.805	5180.0053	PASS	5180.0036	PASS	5180.0071	PASS	5180.0087	PASS

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

Measurement Procedure REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

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

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.11	17.10	0.5	Pass
157	5785	17.66	17.65	0.5	Pass
165	5825	17.67	17.66	0.5	Pass

802.11n (HT40)

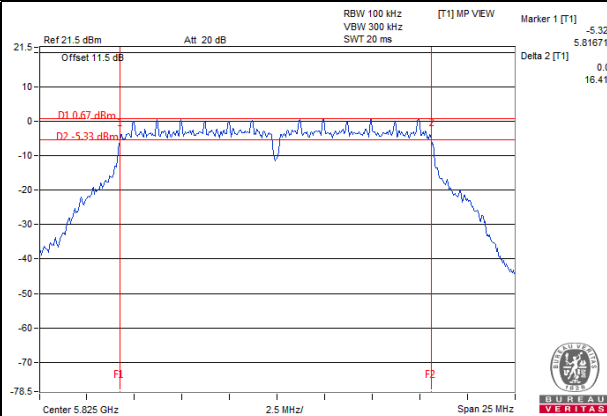
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.38	36.44	0.5	Pass
159	5795	36.45	36.44	0.5	Pass

802.11ac (VHT80)

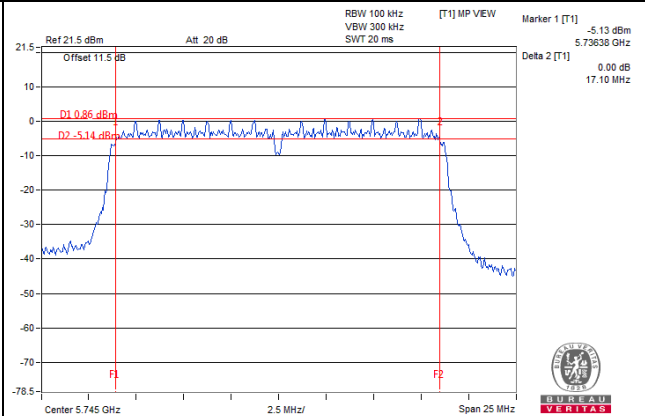
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.32	76.50	0.5	Pass

Spectrum Plot of Worst Value

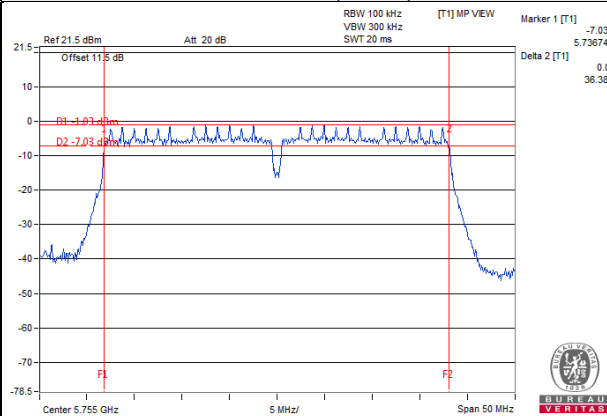
802.11a



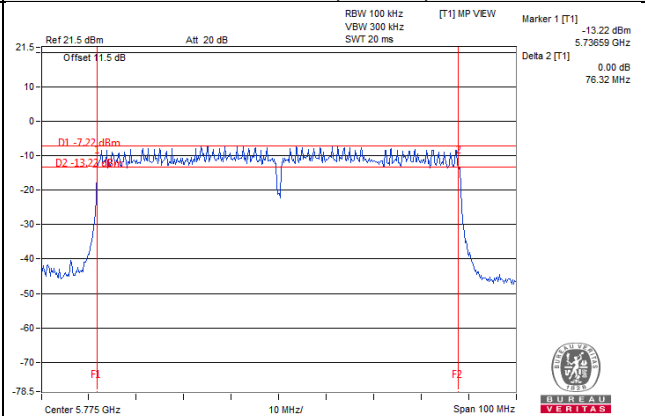
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

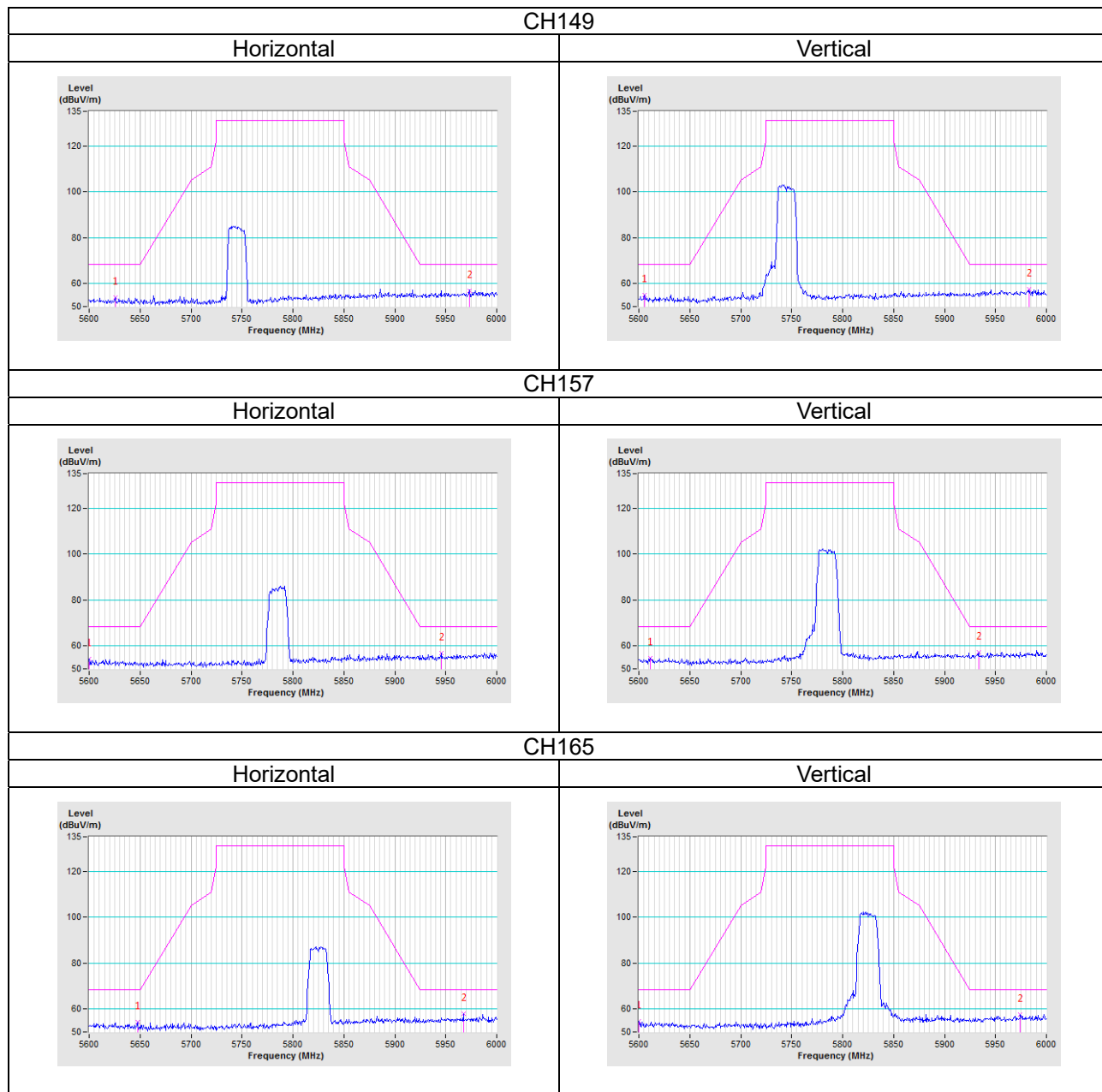


5 Pictures of Test Arrangements

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

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

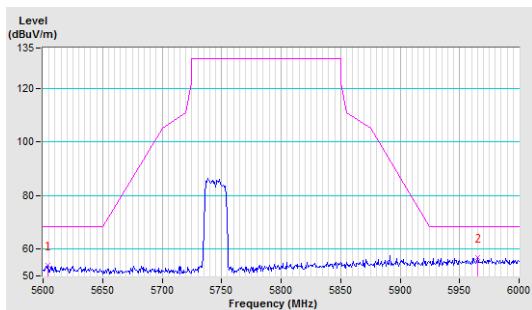
802.11a



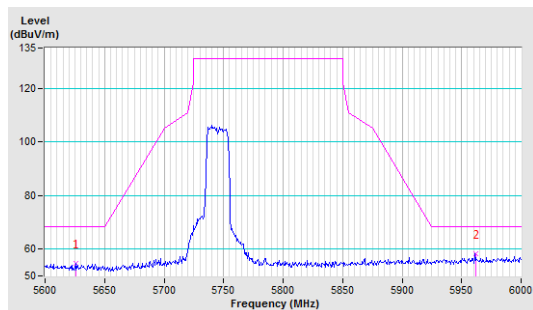
802.11n (HT20)

CH149

Horizontal

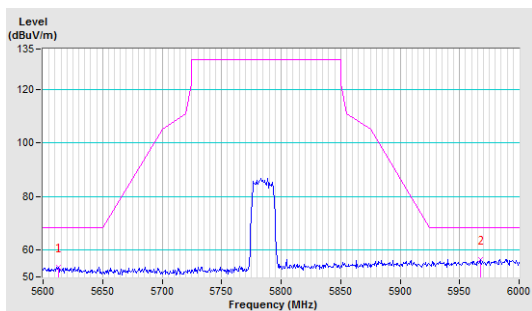


Vertical

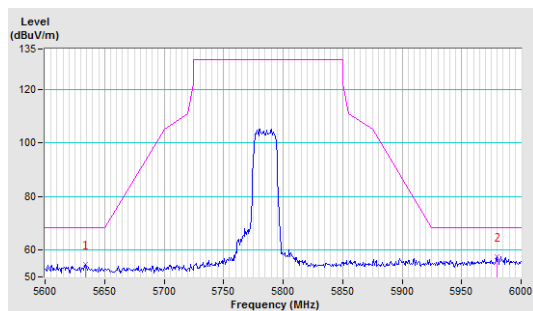


CH157

Horizontal

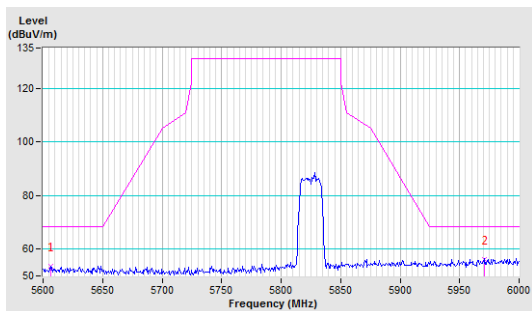


Vertical

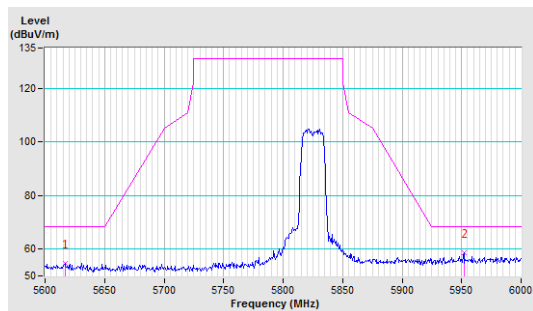


CH165

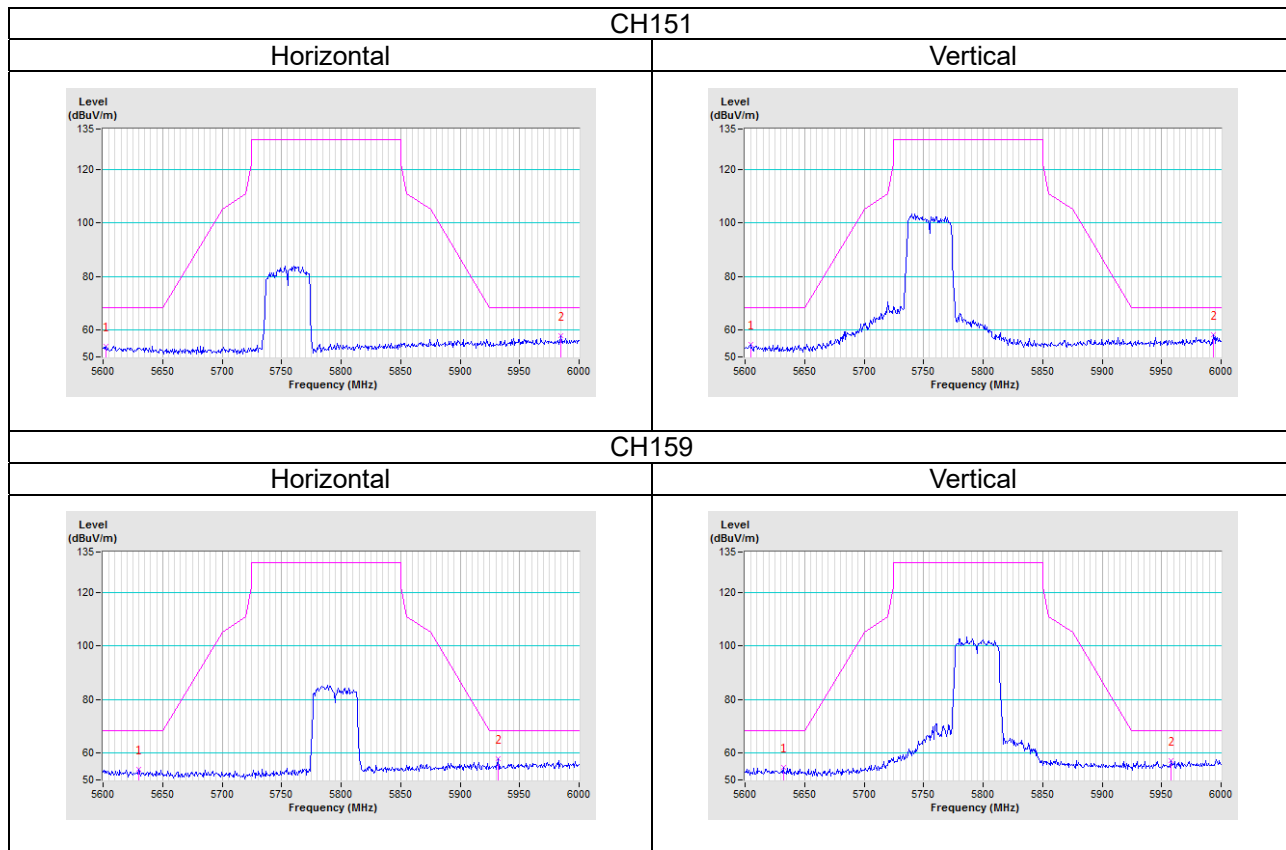
Horizontal



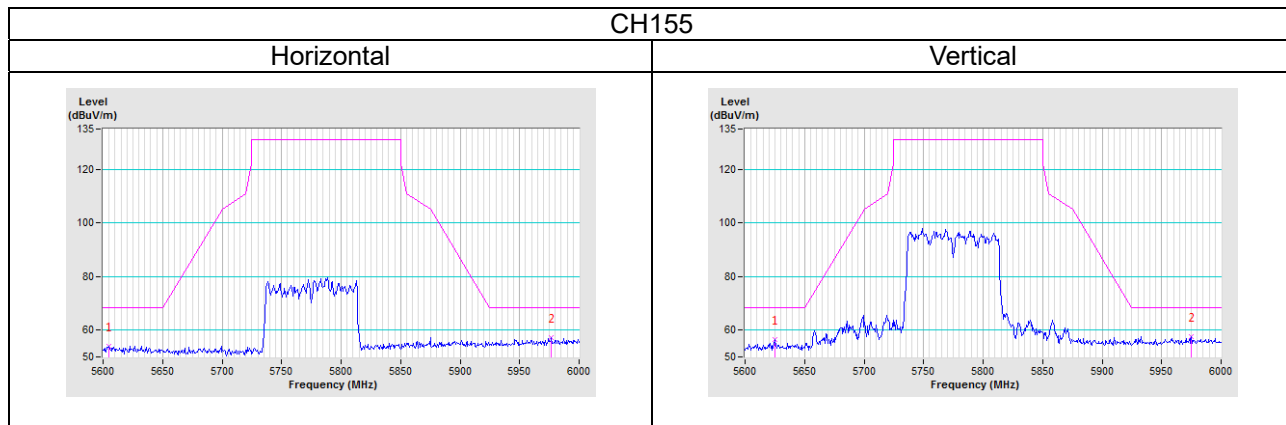
Vertical



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

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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

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Tel: 886-3-3183232

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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