

FCC Test Report

Report No.: RF190314C39-4

FCC ID: 2AAED-R9861511

Test Model: C 3010S

Received Date: Mar. 14, 2019

Test Date: Oct. 12, 2019 ~ Oct. 20, 2019

Issued Date: Oct. 25, 2019

Applicant: Barco NV

Address: President Kennedypark 35 8500 Kortrijk Belgium

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

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

Test Location: No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, Taiwan

FCC Registration /
Designation Number: 788550 / TW0003



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

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results.....	6
2.1 Measurement Uncertainty.....	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT	7
3.2 Description of Test Modes.....	9
3.2.1 Test Mode Applicability and Tested Channel Detail.....	11
3.3 Duty Cycle of Test Signal	13
3.4 Description of Support Units	14
3.4.1 Configuration of System under Test	14
3.5 General Description of Applied Standards.....	14
4 Test Types and Results	15
4.1 Radiated Emission and Bandedge Measurement	15
4.1.1 Limits of Radiated Emission and Bandedge Measurement	15
4.1.2 Limits of Unwanted Emission Out of the Restricted Bands	16
4.1.3 Test Instruments	17
4.1.4 Test Procedures.....	19
4.1.5 Deviation from Test Standard	19
4.1.6 Test Setup.....	20
4.1.7 EUT Operating Conditions.....	21
4.1.8 Test Results	22
4.2 Conducted Emission Measurement.....	64
4.2.1 Limits of Conducted Emission Measurement	64
4.2.2 Test Instruments	64
4.2.3 Test Procedures.....	65
4.2.4 Deviation from Test Standard	65
4.2.5 Test Setup.....	65
4.2.6 EUT Operating Conditions.....	65
4.2.7 Test Results	66
4.3 Transmit Power Measurement.....	68
4.3.1 Limits of Transmit Power Measurement	68
4.3.2 Test Setup.....	68
4.3.3 Test Instruments	69
4.3.4 Test Procedure	69
4.3.5 Deviation from Test Standard	69
4.3.6 EUT Operating Conditions.....	69
4.3.7 Test Results	70
4.4 Occupied Bandwidth Measurement.....	77
4.4.1 Test Setup.....	77
4.4.2 Test Instruments	77
4.4.3 Test Procedure	77
4.4.4 Test Results	78
4.5 Peak Power Spectral Density Measurement	81
4.5.1 Limits of Peak Power Spectral Density Measurement	81
4.5.2 Test Setup.....	81
4.5.3 Test Instruments	81
4.5.4 Test Procedures.....	81
4.5.5 Deviation from Test Standard	82
4.5.6 EUT Operating Conditions.....	82
4.5.7 Test Results	83
4.6 Frequency Stability	91

4.6.1	Limit of Frequency Stability Measurement	91
4.6.2	Test Setup	91
4.6.3	Test Instruments	91
4.6.4	Test Procedure	91
4.6.5	Deviation from Test Standard	91
4.6.6	EUT Operating Condition	91
4.6.7	Test Results	92
4.7	6 dB Bandwidth Measurement.....	93
4.7.1	Limits of 6 dB Bandwidth Measurement.....	93
4.7.2	Test Setup.....	93
4.7.3	Test Instruments	93
4.7.4	Test Procedure	93
4.7.5	Deviation from Test Standard	93
4.7.6	EUT Operating Condition	93
4.7.7	Test Results	94
5	Pictures of Test Arrangements.....	96
	Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)	97
	Appendix – Information of the Testing Laboratories	100

Release Control Record

Issue No.	Description	Date Issued
RF190314C39-4	Original Release	Oct. 25, 2019

1 Certificate of Conformity

Product: ClickShare

Brand: BARCO

Test Model: C 3010S

Sample Status: Engineering Sample

Applicant: Barco NV

Test Date: Oct. 12, 2019 ~ Oct. 20, 2019

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 : Rona Chen, **Date:** Oct. 25, 2019
Rona Chen / Specialist

Approved by : Dylan Chiou, **Date:** Oct. 25, 2019
Dylan Chiou / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -8.78 dB at 0.29992 MHz.
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 -1.53 dB at 5350 MHz & 11400 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6 dB Bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is I-PEX not a standard connector.

Note:

- For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.
- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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	150 kHz ~ 30 MHz	2.79 dB
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	ClickShare
Brand	BARCO
Test Model	C 3010S
Status of EUT	Engineering Sample
Power Supply Rating	12.0 Vdc (Adapter)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0 Mbps 802.11n: up to 300.0 Mbps 802.11ac: up to 866.7 Mbps
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5710 MHz, 5745 ~ 5825 MHz
Number of Channel	5180 ~ 5240 MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5260 ~ 5320 MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5500 ~ 5710 MHz: 11 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 6 for 802.11n (HT40), 802.11ac (VHT40) 3 for 802.11ac (VHT80) 5745 ~ 5825 MHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
Output Power	54.553 mW for 5180 ~ 5240 MHz 54.251 mW for 5260 ~ 5320 MHz 64.301 mW for 5500 ~ 5710 MHz 50.177 mW for 5745 ~ 5825 MHz
Antenna Type	Refer to Note as below
Antenna Connector	Refer to Note as below
FW Version	01.99.02.RD_qdart_andch-0005
Accessory Device	Refer to Note as below
Data Cable Supplied	N/A

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

Modulation Mode	Tx Function
802.11a	2TX
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 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

2. The antenna information is listed as below.

Antenna Type	Brand	Antenna Connector	Model	Peak Gain (dBi)					
				BT	WLAN 2.4 GHz	WLAN 5.18~5.24 GHz	WLAN 5.26~5.32 GHz	WLAN 5.5~5.7 GHz	WLAN 5.745~5.825 GHz
PIFA	VSO ELECTRONICS CO., LTD.	I-PEX	Main: MS-5777-MAIN	-	2.76	1.34	2.06	3.61	3.06
			Aux.: MS-5777-AUX	2.67	2.67	1.71	3.53	3.78	3.43

3. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	Asian Power Devices Inc.	WB-24J12R	I/P: 100-240 Vac, 50-60 Hz, 0.7 A O/P: 12 Vdc, 2 A 1.46 m with one core
USB Type-C Button	BARCO	R9861600D01C	--

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

3.2 Description of Test Modes

For 5180 ~ 5240 MHz

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

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

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
42	5210

For 5260 ~ 5320 MHz

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

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

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	62	5310

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
58	5290

For 5500 ~ 5710 MHz

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

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

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	126	5630
110	5550	134	5670
118	5590	142	5710

3 channels are provided for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530	138	5690
122	5610		

For 5745 ~ 5825 MHz:

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

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

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
155	5775

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 1 GHz

RE<1G: Radiated Emission below 1 GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Z-plane.
2. "-" means no effect.

Radiated Emission Test (Above 1 GHz):

- ☒ 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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 40, 48	OFDM	BPSK	6.5
-		802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	13.5
-		802.11ac (VHT80)	42	42	OFDM	BPSK	29.3
-	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-		802.11n (HT20)	52 to 64	52, 60, 64	OFDM	BPSK	6.5
-		802.11n (HT40)	54 to 62	54, 62	OFDM	BPSK	13.5
-		802.11ac (VHT80)	58	58	OFDM	BPSK	29.3
-	5500-5710	802.11a	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-		802.11n (HT20)	100 to 140	100, 116, 140	OFDM	BPSK	6.5
-		802.11n (HT40)	102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
-		802.11ac (VHT80)	106 to 138	106, 122, 138	OFDM	BPSK	29.3
-	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
-		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	13.5
-		802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1 GHz):

- ☒ 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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5500-5710	802.11a	100 to 140	140	OFDM	BPSK	6.0

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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5500-5710	802.11a	100 to 140	140	OFDM	BPSK	6.0

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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 40, 48	OFDM	BPSK	6.5
-		802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	13.5
-		802.11ac (VHT80)	42	42	OFDM	BPSK	29.3
-	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-		802.11n (HT20)	52 to 64	52, 60, 64	OFDM	BPSK	6.5
-		802.11n (HT40)	54 to 62	54, 62	OFDM	BPSK	13.5
-		802.11ac (VHT80)	58	58	OFDM	BPSK	29.3
-	5500-5710	802.11a	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-		802.11n (HT20)	100 to 140	100, 116, 140	OFDM	BPSK	6.5
-		802.11n (HT40)	102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
-		802.11ac (VHT80)	106 to 138	106, 122, 138	OFDM	BPSK	29.3
-	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
-		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	13.5
-		802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang
APCM	25 deg. C, 65 % RH	12 Vdc	Gavin Wu

3.3 Duty Cycle of Test Signal

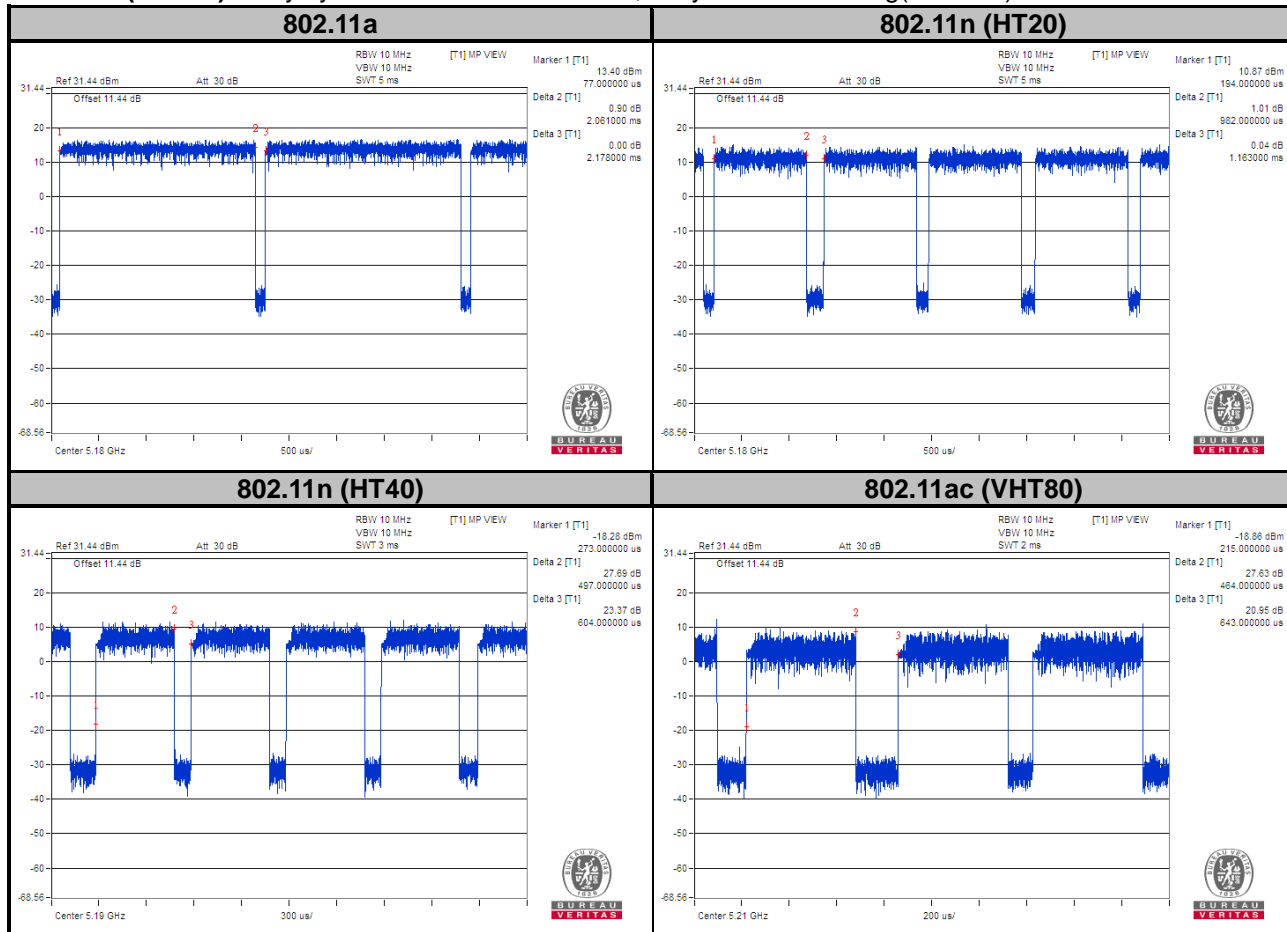
MODULATION TYPE: BPSK

802.11a: Duty cycle = $2.061/2.178 = 0.946$, Duty factor = $10 * \log(1/0.946) = 0.24$

802.11n (HT20): Duty cycle = $0.982/1.163 = 0.844$, Duty factor = $10 * \log(1/0.844) = 0.73$

802.11n (HT40): Duty cycle = $0.497/0.604 = 0.823$, Duty factor = $10 * \log(1/0.823) = 0.85$

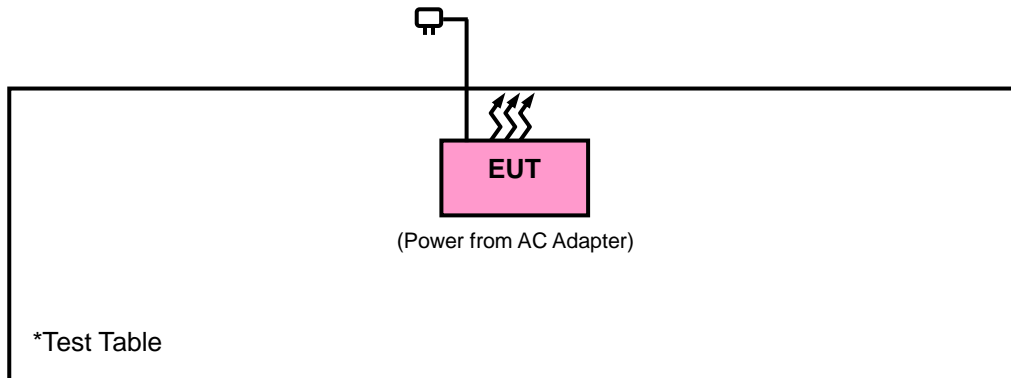
802.11ac (VHT80): Duty cycle = $0.464/0.643 = 0.722$, Duty factor = $10 * \log(1/0.722) = 1.42$



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

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 Procedures New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, 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 20 dB under any condition of modulation.

4.1.2 Limits of Unwanted Emission Out of the Restricted Bands

Applicable To			Limit	
789033 D02 General UNII Test Procedures New Rules v02r01			Field Strength at 3 m	
			PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3 m
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	<input checked="" type="checkbox"/>	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}
	<input type="checkbox"/>	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:

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

4.1.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Mar. 18, 2019	Mar. 17, 2020
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 13, 2018	Dec. 12, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020
Broadband Horn Antenna SCHWARZBECK	BBHA 9170	148	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 25, 2018	Nov. 24, 2019
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Nov. 23, 2018	Nov. 22, 2019
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020
Loop Antenna	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
Preamplifier EMCI	EMC001340	980269	Jun. 17, 2019	Jun. 16, 2020
Preamplifier EMCI	EMC 012645	980115	Oct. 08, 2019	Oct. 07, 2020
Preamplifier EMCI	EMC 184045	980116	Oct. 08, 2019	Oct. 07, 2020
Preamplifier EMCI	EMC 330H	980112	Oct. 08, 2019	Oct. 07, 2020
Power Meter Anritsu	ML2495A	1012010	Sep. 04, 2019	Sep. 03, 2020
Power Sensor Anritsu	MA2411B	1315050	Sep. 04, 2019	Sep. 03, 2020
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM-8 000&3000	140811+170717	Oct. 08, 2019	Oct. 07, 2020
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1 000(140807)	Oct. 08, 2019	Oct. 07, 2020
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 08, 2019	Oct. 07, 2020
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Temperature & Humidity Chamber	GTH-120-40-CP-A R	MAA1306-019	Sep. 06, 2019	Sep. 05, 2020
DC Power Supply Topward	33010D	807748	NA	NA
Digital Multimeter Fluke	87-III	70360742	Jun. 27, 2019	Jun. 26, 2020

- 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 10.

4.1.4 Test Procedures

For Radiated Emission below 30 MHz

- 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 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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:

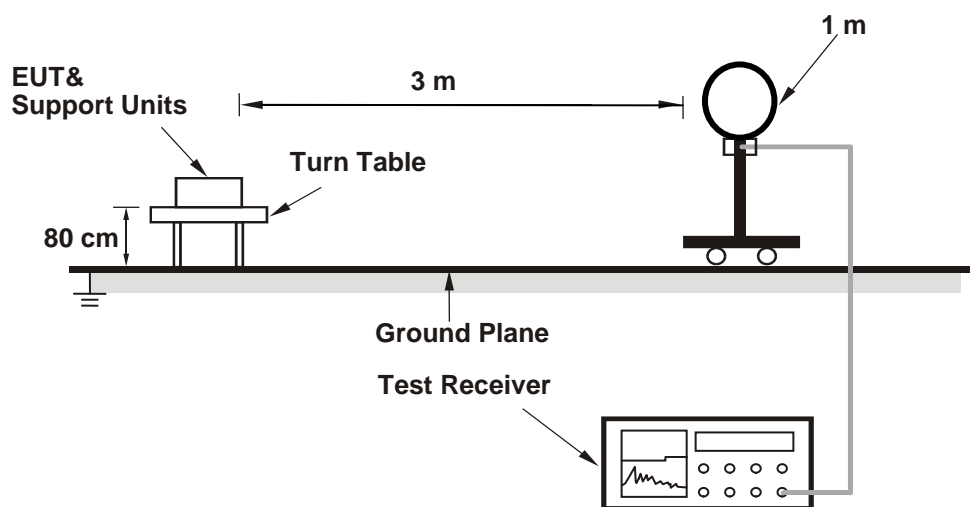
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
(11a: RBW = 1 MHz, VBW = 1 kHz ; 11n (HT20): RBW = 1 MHz, VBW = 3 kHz ;
11n (HT40): RBW = 1 MHz, VBW = 3 kHz ; 11ac (VHT80): RBW = 1 MHz, VBW = 3 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.5 Deviation from Test Standard

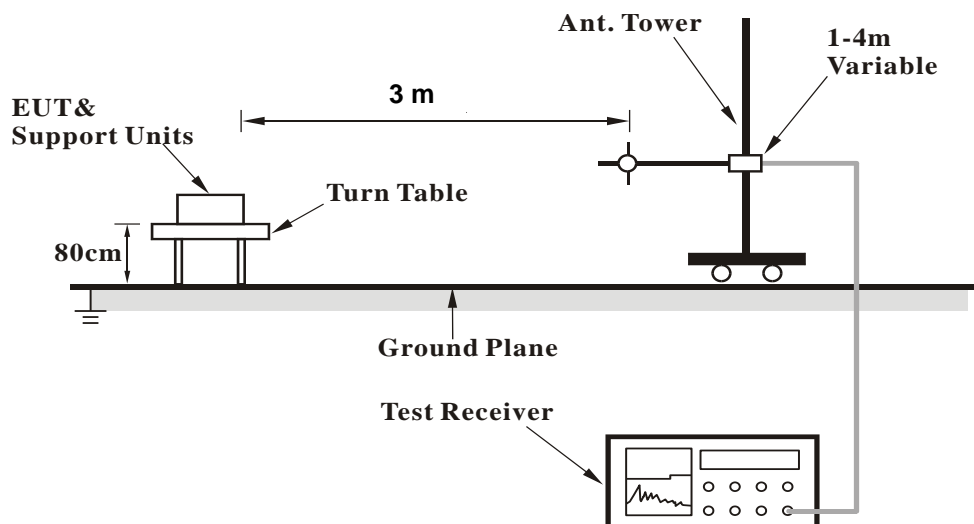
No deviation.

4.1.6 Test Setup

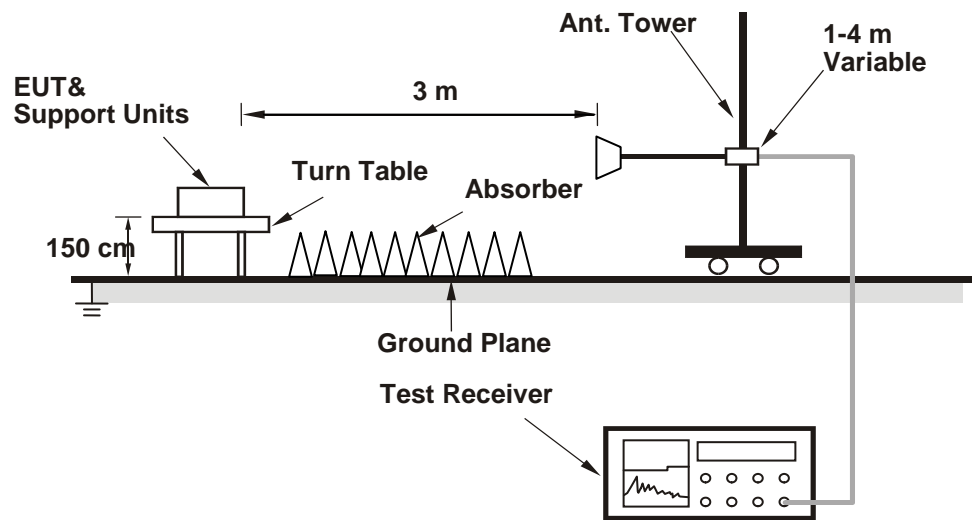
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



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

4.1.7 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.8 Test Results

Above 1 GHz Data :

802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 36	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.94	50.17	48.64	1.53	54	-3.83	186	79	Average
5149.94	62.61	61.08	1.53	74	-11.39	186	79	Peak
5180	99.38	97.85	1.53			186	79	Average
5180	106.12	104.59	1.53			186	79	Peak
*10360	55.56	58.4	-2.84	68.2	-12.64	198	225	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.58	51.92	50.39	1.53	54	-2.08	201	339	Average
5149.58	63.67	62.14	1.53	74	-10.33	201	339	Peak
5180	102.98	101.45	1.53			201	339	Average
5180	108.87	107.34	1.53			201	339	Peak
*10360	58.85	61.69	-2.84	68.2	-9.35	100	12	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5180 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 40	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.86	42.47	40.94	1.53	54	-11.53	200	89	Average
5148.86	50.37	48.84	1.53	74	-23.63	200	89	Peak
5200	99.44	97.91	1.53			200	89	Average
5200	105.83	104.3	1.53			200	89	Peak
5405.66	40.66	38.99	1.67	54	-13.34	186	79	Average
5405.66	50.99	49.32	1.67	74	-23.01	186	79	Peak
*10400	57.38	60.27	-2.89	68.2	-10.82	195	238	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.76	44.03	42.5	1.53	54	-9.97	199	339	Average
5149.76	51.47	49.94	1.53	74	-22.53	199	339	Peak
5200	102.9	101.37	1.53			199	339	Average
5200	110	108.47	1.53			199	339	Peak
5351.21	40.79	39.33	1.46	54	-13.21	199	339	Average
5351.21	49.36	47.9	1.46	74	-24.64	199	339	Peak
*10400	60.87	63.76	-2.89	68.2	-7.33	101	12	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5200 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5128.7	40.6	39.11	1.49	54	-13.4	187	90	Average
5128.7	49.24	47.75	1.49	74	-24.76	187	90	Peak
5240	100.4	99.02	1.38			187	90	Average
5240	105.82	104.44	1.38			187	90	Peak
5371.01	40.85	39.32	1.53	54	-13.15	187	90	Average
5371.01	50.56	49.03	1.53	74	-23.44	187	90	Peak
*10480	57.34	60.07	-2.73	68.2	-10.86	197	238	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5143.82	40.86	39.33	1.53	54	-13.14	199	335	Average
5143.82	50.26	48.73	1.53	74	-23.74	199	335	Peak
5240	104.07	102.69	1.38			199	335	Average
5240	110.11	108.73	1.38			199	335	Peak
5399.83	40.87	39.2	1.67	54	-13.13	199	335	Average
5399.83	50.94	49.27	1.67	74	-23.06	199	335	Peak
*10480	60.82	63.55	-2.73	68.2	-7.38	112	12	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5240 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 52	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.94	40.45	38.92	1.53	54	-13.55	187	90	Average
5149.94	49.9	48.37	1.53	74	-24.1	187	90	Peak
5260	100.09	98.78	1.31			187	90	Average
5260	107.07	105.76	1.31			187	90	Peak
5358.47	41.04	39.58	1.46	54	-12.96	187	90	Average
5358.47	50.17	48.71	1.46	74	-23.83	187	90	Peak
*10520	55.94	58.66	-2.72	68.2	-12.26	195	244	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5147.06	40.7	39.17	1.53	54	-13.3	200	335	Average
5147.06	49.77	48.24	1.53	74	-24.23	200	335	Peak
5260	103.84	102.53	1.31			200	335	Average
5260	109.58	108.27	1.31			200	335	Peak
5355.72	41.12	39.66	1.46	54	-12.88	200	335	Average
5355.72	50.94	49.48	1.46	74	-23.06	200	335	Peak
*10520	59.73	62.45	-2.72	68.2	-8.47	101	13	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5260 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 60	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5139.86	40.59	39.04	1.55	54	-13.41	181	89	Average
5139.86	50.75	49.2	1.55	74	-23.25	181	89	Peak
5300	101.11	99.8	1.31			181	89	Average
5300	107.21	105.9	1.31			181	89	Peak
5350.66	43.93	42.47	1.46	54	-10.07	181	89	Average
5350.66	52.11	50.65	1.46	74	-21.89	181	89	Peak
10600	47.43	50.34	-2.91	54	-6.57	187	244	Average
10600	56.56	59.47	-2.91	74	-17.44	187	244	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.5	40.69	39.16	1.53	54	-13.31	197	339	Average
5148.5	50.33	48.8	1.53	74	-23.67	197	339	Peak
5300	103.34	102.03	1.31			197	339	Average
5300	109.52	108.21	1.31			197	339	Peak
5350	46.69	45.23	1.46	54	-7.31	197	339	Average
5350	64.71	63.25	1.46	74	-9.29	197	339	Peak
10600	49.75	52.66	-2.91	54	-4.25	101	15	Average
10600	60.07	62.98	-2.91	74	-13.93	101	15	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5300 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 64	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	101.13	99.77	1.36			168	89	Average
5320	107.84	106.48	1.36			168	89	Peak
5350.22	49.62	48.16	1.46	54	-4.38	168	89	Average
5350.22	59.76	58.3	1.46	74	-14.24	168	89	Peak
10640	47.49	50.38	-2.89	54	-6.51	154	256	Average
10640	56.4	59.29	-2.89	74	-17.6	154	256	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	103.3	101.94	1.36			198	336	Average
5320	109.97	108.61	1.36			198	336	Peak
5350.11	51.84	50.38	1.46	54	-2.16	198	336	Average
5350.11	66.4	64.94	1.46	74	-7.6	198	336	Peak
10640	52.33	55.22	-2.89	54	-1.67	100	11	Average
10640	60.75	63.64	-2.89	74	-13.25	100	11	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 100	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5459.6	43.32	41.45	1.87	54	-10.68	197	84	Average
5459.6	59.86	57.99	1.87	74	-14.14	197	84	Peak
*5470	62.17	60.31	1.86	68.2	-6.03	197	84	Peak
5500	96.02	94.15	1.87			197	84	Average
5500	102.16	100.29	1.87			197	84	Peak
*5725	49.28	47.52	1.76	68.2	-18.92	197	84	Peak
11000	46.25	48.56	-2.31	54	-7.75	100	12	Average
11000	55.32	57.63	-2.31	74	-18.68	100	12	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5459.28	45.35	43.48	1.87	54	-8.65	190	336	Average
5459.28	60.8	58.93	1.87	74	-13.2	190	336	Peak
*5470	66.43	64.57	1.86	68.2	-1.77	190	336	Peak
5500	100	98.13	1.87			190	336	Average
5500	106.21	104.34	1.87			190	336	Peak
*5725	49.37	47.61	1.76	68.2	-18.83	190	336	Peak
11000	47.92	50.23	-2.31	54	-6.08	176	0	Average
11000	55.96	58.27	-2.31	74	-18.04	176	0	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5367.28	41.05	39.52	1.53	54	-12.95	194	98	Average
5367.28	50.4	48.87	1.53	74	-23.6	194	98	Peak
*5470	49.68	47.82	1.86	68.2	-18.52	194	98	Peak
5580	101.97	100.15	1.82			194	98	Average
5580	108.79	106.97	1.82			194	98	Peak
*5725	49.31	47.55	1.76	68.2	-18.89	194	98	Peak
11160	46.61	49.16	-2.55	54	-7.39	189	235	Average
11160	56.83	59.38	-2.55	74	-17.17	189	235	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5431.76	41.06	39.28	1.78	54	-12.94	186	341	Average
5431.76	50.14	48.36	1.78	74	-23.86	186	341	Peak
*5470	49.32	47.46	1.86	68.2	-18.88	186	341	Peak
5580	103.88	102.06	1.82			186	341	Average
5580	111	109.18	1.82			186	341	Peak
*5725	49.3	47.54	1.76	68.2	-18.9	186	341	Peak
11160	49.44	51.99	-2.55	54	-4.56	194	19	Average
11160	58.79	61.34	-2.55	74	-15.21	194	19	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5580 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5434.64	40.6	38.82	1.78	54	-13.4	187	79	Average
5434.64	50.11	48.33	1.78	74	-23.89	187	79	Peak
*5470	48.47	46.61	1.86	68.2	-19.73	187	79	Peak
5700	92.8	91.21	1.59			187	79	Average
5700	99.1	97.51	1.59			187	79	Peak
*5725	59.31	57.55	1.76	68.2	-8.89	187	79	Peak
11400	48.12	50.35	-2.23	54	-5.88	157	27	Average
11400	55.17	57.4	-2.23	74	-18.83	157	27	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5439.76	40.84	39.06	1.78	54	-13.16	186	330	Average
5439.76	49.59	47.81	1.78	74	-24.41	186	330	Peak
*5470	48.79	46.93	1.86	68.2	-19.41	186	330	Peak
5700	95.58	93.99	1.59			186	330	Average
5700	101.66	100.07	1.59			186	330	Peak
*5725	62.55	60.79	1.76	68.2	-5.65	186	330	Peak
11400	52.47	54.7	-2.23	54	-1.53	200	360	Average
11400	58.29	60.52	-2.23	74	-15.71	200	360	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5700 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 149	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	95.44	93.62	1.82			176	123	Average
5745	101.68	99.86	1.82			176	123	Peak
11490	47.91	50.11	-2.2	54	-6.09	160	23	Average
11490	54.47	56.67	-2.2	74	-19.53	160	23	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	96.3	94.48	1.82			172	340	Average
5745	102.07	100.25	1.82			172	340	Peak
11490	52.4	54.6	-2.2	54	-1.6	200	360	Average
11490	60.58	62.78	-2.2	74	-13.42	200	360	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5616.975	50.78	48.88	1.9	68.2	-17.42	176	123	Peak
5658.775	50.13	48.28	1.85	74.72	-24.59	176	123	Peak
5919.55	50.53	48.22	2.31	72.22	-21.69	176	123	Peak
5999.825	51.54	49.18	2.36	68.2	-16.66	176	123	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5602.25	51.64	49.71	1.93	68.2	-16.56	172	340	Peak
5654.975	49.71	47.86	1.85	71.9	-22.19	172	340	Peak
5920.025	50.95	48.64	2.31	71.87	-20.92	172	340	Peak
5973.7	50.89	48.56	2.33	68.2	-17.31	172	340	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5745 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 157	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	98.95	97.03	1.92			175	120	Average
5785	105.49	103.57	1.92			175	120	Peak
11570	47.93	50.13	-2.2	54	-6.07	133	26	Average
11570	56.82	59.02	-2.2	74	-17.18	133	26	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	102.55	100.63	1.92			170	336	Average
5785	108.7	106.78	1.92			170	336	Peak
11570	52.46	54.66	-2.2	54	-1.54	200	360	Average
11570	59.33	61.53	-2.2	74	-14.67	200	360	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5615.075	51.11	49.24	1.87	68.2	-17.09	175	120	Peak
5660.2	50.6	48.75	1.85	75.77	-25.17	175	120	Peak
5917.65	50.61	48.3	2.31	73.62	-23.01	175	120	Peak
5932.375	52.02	49.72	2.3	68.2	-16.18	175	120	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5605.1	50.79	48.92	1.87	68.2	-17.41	170	336	Peak
5659.25	49.65	47.8	1.85	75.07	-25.42	170	336	Peak
5918.125	49.84	47.53	2.31	73.27	-23.43	170	336	Peak
5944.25	51.25	48.96	2.29	68.2	-16.95	170	336	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5785 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 165	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	99.78	97.7	2.08			174	120	Average
5825	106.35	104.27	2.08			174	120	Peak
11650	47.81	50.2	-2.39	54	-6.19	195	241	Average
11650	54.85	57.24	-2.39	74	-19.15	195	241	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	102.96	100.88	2.08			150	351	Average
5825	108.74	106.66	2.08			150	351	Peak
11650	51.51	53.9	-2.39	54	-2.49	200	11	Average
11650	57.99	60.38	-2.39	74	-16.01	200	11	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5634.075	50.4	48.52	1.88	68.2	-17.8	174	120	Peak
5653.075	51.63	49.72	1.91	70.49	-18.86	174	120	Peak
5920.5	51.57	49.26	2.31	71.52	-19.95	174	120	Peak
5988.425	51.47	49.14	2.33	68.2	-16.73	174	120	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5599.875	51.53	49.6	1.93	68.2	-16.67	150	351	Peak
5653.55	50.55	48.64	1.91	70.84	-20.29	150	351	Peak
5919.075	50.31	48	2.31	72.57	-22.26	150	351	Peak
5970.375	50.41	48.11	2.3	68.2	-17.79	150	351	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 36	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.68	46.69	45.16	1.53	54	-7.31	151	97	Average
5148.68	56.52	54.99	1.53	74	-17.48	151	97	Peak
5180	98.17	96.64	1.53			151	97	Average
5180	104.8	103.27	1.53			151	97	Peak
*10360	52.87	55.71	-2.84	68.2	-15.33	100	33	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.32	48.34	46.81	1.53	54	-5.66	197	344	Average
5148.32	61.65	60.12	1.53	74	-12.35	197	344	Peak
5180	100.06	98.53	1.53			197	344	Average
5180	106.81	105.28	1.53			197	344	Peak
*10360	57.16	60	-2.84	68.2	-11.04	110	0	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5180 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 40	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.58	42.35	40.82	1.53	54	-11.65	145	99	Average
5149.58	55.2	53.67	1.53	74	-18.8	145	99	Peak
5200	101.51	99.98	1.53			145	99	Average
5200	107.67	106.14	1.53			145	99	Peak
5382.23	40.6	39	1.6	54	-13.4	145	99	Average
5382.23	49.55	47.95	1.6	74	-24.45	145	99	Peak
*10400	57.03	59.92	-2.89	68.2	-11.17	100	28	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.86	44.07	42.54	1.53	54	-9.93	188	346	Average
5148.86	54.49	52.96	1.53	74	-19.51	188	346	Peak
5200	102.63	101.1	1.53			188	346	Average
5200	109.24	107.71	1.53			188	346	Peak
5352.97	40.66	39.2	1.46	54	-13.34	188	346	Average
5352.97	50.29	48.83	1.46	74	-23.71	188	346	Peak
*10400	61.69	64.58	-2.89	68.2	-6.51	110	360	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5200 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5143.82	40.59	39.06	1.53	54	-13.41	144	84	Average
5143.82	49.41	47.88	1.53	74	-24.59	144	84	Peak
5240	100.44	99.06	1.38			144	84	Average
5240	106.07	104.69	1.38			144	84	Peak
5369.91	40.57	39.04	1.53	54	-13.43	144	84	Average
5369.91	50.47	48.94	1.53	74	-23.53	144	84	Peak
*10480	55.72	58.45	-2.73	68.2	-12.48	100	30	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.58	42.85	41.32	1.53	54	-11.15	177	342	Average
5149.58	56.08	54.55	1.53	74	-17.92	177	342	Peak
5240	101.93	100.55	1.38			177	342	Average
5240	107.76	106.38	1.38			177	342	Peak
5351.1	42.2	40.74	1.46	54	-11.8	177	342	Average
5351.1	55.77	54.31	1.46	74	-18.23	177	342	Peak
*10480	58.31	61.04	-2.73	68.2	-9.89	100	0	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 52	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5146.7	40.41	38.88	1.53	54	-13.59	148	94	Average
5146.7	50.09	48.56	1.53	74	-23.91	148	94	Peak
5260	99.5	98.19	1.31			148	94	Average
5260	106.88	105.57	1.31			148	94	Peak
5355.72	40.75	39.29	1.46	54	-13.25	148	94	Average
5355.72	49.79	48.33	1.46	74	-24.21	148	94	Peak
*10520	53.34	56.06	-2.72	68.2	-14.86	100	35	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.86	40.48	38.95	1.53	54	-13.52	192	343	Average
5148.86	49.38	47.85	1.53	74	-24.62	192	343	Peak
5260	102.1	100.79	1.31			192	343	Average
5260	108.01	106.7	1.31			192	343	Peak
5355.94	41.28	39.82	1.46	54	-12.72	192	343	Average
5355.94	50.22	48.76	1.46	74	-23.78	192	343	Peak
*10520	56.64	59.36	-2.72	68.2	-11.56	110	360	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5260 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 60	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5147.42	40.42	38.89	1.53	54	-13.58	137	87	Average
5147.42	49.53	48	1.53	74	-24.47	137	87	Peak
5300	101.16	99.85	1.31			137	87	Average
5300	106.64	105.33	1.31			137	87	Peak
5350	43.04	41.58	1.46	54	-10.96	137	87	Average
5350	50.99	49.53	1.46	74	-23.01	137	87	Peak
10600	45.41	48.32	-2.91	54	-8.59	101	33	Average
10600	54.09	57	-2.91	74	-19.91	101	33	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.58	40.5	38.97	1.53	54	-13.5	194	345	Average
5149.58	50.13	48.6	1.53	74	-23.87	194	345	Peak
5300	102.92	101.61	1.31			194	345	Average
5300	108.89	107.58	1.31			194	345	Peak
5350	43.92	42.46	1.46	54	-10.08	194	345	Average
5350	58.08	56.62	1.46	74	-15.92	194	345	Peak
10600	46.64	49.55	-2.91	54	-7.36	108	359	Average
10600	55.6	58.51	-2.91	74	-18.4	108	359	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5300 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 64	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	100.55	99.19	1.36			137	70	Average
5320	106.68	105.32	1.36			137	70	Peak
5351.65	47.05	45.59	1.46	54	-6.95	137	70	Average
5351.65	55.95	54.49	1.46	74	-18.05	137	70	Peak
10640	45.86	48.75	-2.89	54	-8.14	122	22	Average
10640	56.39	59.28	-2.89	74	-17.61	122	22	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	102.56	101.2	1.36			170	343	Average
5320	108.22	106.86	1.36			170	343	Peak
5350.22	48.34	46.88	1.46	54	-5.66	170	343	Average
5350.22	61.92	60.46	1.46	74	-12.08	170	343	Peak
10640	47.13	50.02	-2.89	54	-6.87	200	0	Average
10640	57.76	60.65	-2.89	74	-16.24	200	0	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 100	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5459.92	44.38	42.51	1.87	54	-9.62	180	84	Average
5459.92	58.31	56.44	1.87	74	-15.69	180	84	Peak
*5470	64.38	62.52	1.86	68.2	-3.82	180	84	Peak
5500	96.85	94.98	1.87			180	84	Average
5500	103.77	101.9	1.87			180	84	Peak
*5725	49.2	47.44	1.76	68.2	-19	180	84	Peak
11000	46.94	49.25	-2.31	54	-7.06	132	29	Average
11000	54.15	56.46	-2.31	74	-19.85	132	29	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.32	45.98	44.11	1.87	54	-8.02	188	339	Average
5458.32	61.56	59.69	1.87	74	-12.44	188	339	Peak
*5470	66.64	64.78	1.86	68.2	-1.56	188	339	Peak
5500	100.06	98.19	1.87			188	339	Average
5500	106.72	104.85	1.87			188	339	Peak
*5725	49.05	47.29	1.76	68.2	-19.15	188	339	Peak
11000	49.05	51.36	-2.31	54	-4.95	200	0	Average
11000	53.78	56.09	-2.31	74	-20.22	200	0	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5442.32	40.71	38.93	1.78	54	-13.29	160	67	Average
5442.32	50.45	48.67	1.78	74	-23.55	160	67	Peak
*5470	49.97	48.11	1.86	68.2	-18.23	160	67	Peak
5580	99.3	97.48	1.82			160	67	Average
5580	105.55	103.73	1.82			160	67	Peak
*5725	50.64	48.88	1.76	68.2	-17.56	160	67	Peak
11160	46.3	48.85	-2.55	54	-7.7	121	11	Average
11160	53.41	55.96	-2.55	74	-20.59	121	11	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5436.4	40.91	39.13	1.78	54	-13.09	188	340	Average
5436.4	49.85	48.07	1.78	74	-24.15	188	340	Peak
*5470	49.69	47.83	1.86	68.2	-18.51	188	340	Peak
5580	101.51	99.69	1.82			188	340	Average
5580	107.85	106.03	1.82			188	340	Peak
*5725	49.15	47.39	1.76	68.2	-19.05	188	340	Peak
11160	47.68	50.23	-2.55	54	-6.32	200	1	Average
11160	54.68	57.23	-2.55	74	-19.32	200	1	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5580 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5452.72	40.64	38.77	1.87	54	-13.36	192	78	Average
5452.72	50.1	48.23	1.87	74	-23.9	192	78	Peak
*5470	47.95	46.09	1.86	68.2	-20.25	192	78	Peak
5700	92.61	91.02	1.59			192	78	Average
5700	98.29	96.7	1.59			192	78	Peak
*5725	51.65	49.89	1.76	68.2	-16.55	192	78	Peak
11400	47.36	49.59	-2.23	54	-6.64	155	30	Average
11400	54.57	56.8	-2.23	74	-19.43	155	30	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5419.12	40.64	38.93	1.71	54	-13.36	188	340	Average
5419.12	50.61	48.9	1.71	74	-23.39	188	340	Peak
*5470	49.22	47.36	1.86	68.2	-18.98	188	340	Peak
5700	95.35	93.76	1.59			188	340	Average
5700	101.61	100.02	1.59			188	340	Peak
*5725	58.98	57.22	1.76	68.2	-9.22	188	340	Peak
11400	52.22	54.45	-2.23	54	-1.78	200	360	Average
11400	59.32	61.55	-2.23	74	-14.68	200	360	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5700 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 149	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	95.95	94.13	1.82			180	84	Average
5745	101.84	100.02	1.82			180	84	Peak
11570	47.35	49.55	-2.2	54	-6.65	125	21	Average
11570	54.59	56.79	-2.2	74	-19.41	125	21	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	96.13	94.31	1.82			188	333	Average
5745	102.53	100.71	1.82			188	333	Peak
11490	52.43	54.63	-2.2	54	-1.57	200	0	Average
11490	59.82	62.02	-2.2	74	-14.18	200	0	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5631.225	50.72	48.88	1.84	68.2	-17.48	180	84	Peak
5656.4	49.58	47.73	1.85	72.95	-23.37	180	84	Peak
5921.45	50.04	47.73	2.31	70.82	-20.78	180	84	Peak
6024.525	50.47	48.06	2.41	68.2	-17.73	180	84	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5644.525	51.46	49.58	1.88	68.2	-16.74	188	333	Peak
5653.55	50.85	48.94	1.91	70.84	-19.99	188	333	Peak
5923.825	50.19	47.89	2.3	69.07	-18.88	188	333	Peak
5934.75	50.67	48.37	2.3	68.2	-17.53	188	333	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5745 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 157	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	98.1	96.18	1.92			176	87	Average
5785	103.97	102.05	1.92			176	87	Peak
11570	46.35	48.55	-2.2	54	-7.65	121	19	Average
11570	54.59	56.79	-2.2	74	-19.41	121	19	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	98.51	96.59	1.92			182	334	Average
5785	104.41	102.49	1.92			182	334	Peak
11570	48.02	50.22	-2.2	54	-5.98	200	0	Average
11570	55.11	57.31	-2.2	74	-18.89	200	0	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5602.725	50.14	48.21	1.93	68.2	-18.06	176	87	Peak
5658.3	49.47	47.62	1.85	74.36	-24.89	176	87	Peak
5923.825	50.4	48.1	2.3	69.07	-18.67	176	87	Peak
6009.325	50.84	48.45	2.39	68.2	-17.36	176	87	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5647.375	50.44	48.56	1.88	68.2	-17.76	182	334	Peak
5660.2	50.83	48.98	1.85	75.77	-24.94	182	334	Peak
5915.275	49.59	47.28	2.31	75.37	-25.78	182	334	Peak
5932.375	50.56	48.26	2.3	68.2	-17.64	182	334	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5785 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 165	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	97.6	95.52	2.08			181	101	Average
5825	104.26	102.18	2.08			181	101	Peak
11650	47.46	49.85	-2.39	54	-6.54	122	20	Average
11650	54.97	57.36	-2.39	74	-19.03	122	20	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	97.47	95.39	2.08			190	325	Average
5825	104.41	102.33	2.08			190	325	Peak
11650	47.82	50.21	-2.39	54	-6.18	200	360	Average
11650	53.33	55.72	-2.39	74	-20.67	200	360	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5635.975	50.35	48.47	1.88	68.2	-17.85	181	101	Peak
5653.075	51.29	49.38	1.91	70.49	-19.2	181	101	Peak
5915.75	50.07	47.76	2.31	75.02	-24.95	181	101	Peak
5991.275	50.81	48.45	2.36	68.2	-17.39	181	101	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5595.125	50.91	49.04	1.87	68.2	-17.29	190	325	Peak
5659.25	49.66	47.81	1.85	75.07	-25.41	190	325	Peak
5920.975	50.21	47.9	2.31	71.17	-20.96	190	325	Peak
5928.1	51.6	49.3	2.3	68.2	-16.6	190	325	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5825 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 38	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.94	47.39	45.86	1.53	54	-6.61	200	102	Average
5149.94	54.61	53.08	1.53	74	-19.39	200	102	Peak
5190	90.51	88.98	1.53			200	102	Average
5190	96.65	95.12	1.53			200	102	Peak
5380.25	40.98	39.38	1.6	54	-13.02	200	102	Average
5380.25	50.81	49.21	1.6	74	-23.19	200	102	Peak
*10380	52.56	55.43	-2.87	68.2	-15.64	122	21	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.94	49.76	48.23	1.53	54	-4.24	200	344	Average
5149.94	61.34	59.81	1.53	74	-12.66	200	344	Peak
5190	93.44	91.91	1.53			200	344	Average
5190	99.54	98.01	1.53			200	344	Peak
5388.61	40.98	39.38	1.6	54	-13.02	200	344	Average
5388.61	51.62	50.02	1.6	74	-22.38	200	344	Peak
*10380	54.38	57.25	-2.87	68.2	-13.82	200	0	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5190 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 46	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5145.62	42.27	40.74	1.53	54	-11.73	200	105	Average
5145.62	55.41	53.88	1.53	74	-18.59	200	105	Peak
5230	94.53	93.15	1.38			200	105	Average
5230	101.3	99.92	1.38			200	105	Peak
5439.54	41.04	39.26	1.78	54	-12.96	200	105	Average
5439.54	51	49.22	1.78	74	-23	200	105	Peak
*10460	53.49	56.28	-2.79	68.2	-14.71	122	25	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.68	44.01	42.48	1.53	54	-9.99	203	346	Average
5148.68	52.23	50.7	1.53	74	-21.77	203	346	Peak
5230	97.51	96.13	1.38			203	346	Average
5230	103.64	102.26	1.38			203	346	Peak
5360.23	42.22	40.76	1.46	54	-11.78	203	346	Average
5360.23	53.84	52.38	1.46	74	-20.16	203	346	Peak
*10460	53.53	56.32	-2.79	68.2	-14.67	200	0	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5230 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 54	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5141.84	41.22	39.67	1.55	54	-12.78	181	103	Average
5141.84	50.92	49.37	1.55	74	-23.08	181	103	Peak
5270	95.45	94.14	1.31			181	103	Average
5270	101.42	100.11	1.31			181	103	Peak
5363.97	42.73	41.2	1.53	54	-11.27	181	103	Average
5363.97	55.91	54.38	1.53	74	-18.09	181	103	Peak
*10540	55.07	57.84	-2.77	68.2	-13.13	123	37	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5142.38	41.16	39.61	1.55	54	-12.84	188	348	Average
5142.38	51.94	50.39	1.55	74	-22.06	188	348	Peak
5270	97.82	96.51	1.31			188	348	Average
5270	104.4	103.09	1.31			188	348	Peak
5351.87	44.21	42.75	1.46	54	-9.79	188	348	Average
5351.87	58.75	57.29	1.46	74	-15.25	188	348	Peak
*10540	55.66	58.43	-2.77	68.2	-12.54	201	1	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5270 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 62	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5144.54	40.78	39.25	1.53	54	-13.22	175	101	Average
5144.54	51.07	49.54	1.53	74	-22.93	175	101	Peak
5310	93.95	92.59	1.36			175	101	Average
5310	100.35	98.99	1.36			175	101	Peak
5350.11	49.72	48.26	1.46	54	-4.28	175	101	Average
5350.11	63.1	61.64	1.46	74	-10.9	175	101	Peak
10620	45.46	48.35	-2.89	54	-8.54	111	36	Average
10620	54.15	57.04	-2.89	74	-19.85	111	36	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5131.22	51.53	50.04	1.49	74	-22.47	181	346	Peak
5131.22	40.94	39.45	1.49	54	-13.06	181	346	Average
5310	96.58	95.22	1.36			181	346	Average
5310	102.73	101.37	1.36			181	346	Peak
5355.5	51.63	50.17	1.46	54	-2.37	181	346	Average
5355.5	64.42	62.96	1.46	74	-9.58	181	346	Peak
10620	46.46	49.35	-2.89	54	-7.54	200	0	Average
10620	55.19	58.08	-2.89	74	-18.81	200	0	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5310 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 102	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.96	44.4	42.53	1.87	54	-9.6	177	98	Average
5458.96	59.18	57.31	1.87	74	-14.82	177	98	Peak
*5470	61.23	59.37	1.86	68.2	-6.97	177	98	Peak
5510	92.6	90.76	1.84			177	98	Average
5510	99.72	97.88	1.84			177	98	Peak
*5725	50.05	48.29	1.76	68.2	-18.15	177	98	Peak
11020	47.21	49.55	-2.34	54	-6.79	123	23	Average
11020	53.38	55.72	-2.34	74	-20.62	123	23	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.8	45.97	44.1	1.87	54	-8.03	182	344	Average
5458.8	61.1	59.23	1.87	74	-12.9	182	344	Peak
*5470	66.01	64.15	1.86	68.2	-2.19	182	344	Peak
5510	95.33	93.49	1.84			182	344	Average
5510	101.66	99.82	1.84			182	344	Peak
*5725	50.36	48.6	1.76	68.2	-17.84	182	344	Peak
11020	49.02	51.36	-2.34	54	-4.98	199	360	Average
11020	55.43	57.77	-2.34	74	-18.57	199	360	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 5510 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 110	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5453.68	42.47	40.6	1.87	54	-11.53	187	105	Average
5453.68	56.18	54.31	1.87	74	-17.82	187	105	Peak
*5470	55.81	53.95	1.86	68.2	-12.39	187	105	Peak
5550	96.32	94.49	1.83			187	105	Average
5550	102.14	100.31	1.83			187	105	Peak
*5725	48.78	47.02	1.76	68.2	-19.42	187	105	Peak
11100	47.18	49.64	-2.46	54	-6.82	125	28	Average
11100	54.87	57.33	-2.46	74	-19.13	125	28	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.48	43.81	41.94	1.87	54	-10.19	190	345	Average
5458.48	59.6	57.73	1.87	74	-14.4	190	345	Peak
*5470	59.54	57.68	1.86	68.2	-8.66	190	345	Peak
5550	98.5	96.67	1.83			190	345	Average
5550	105.01	103.18	1.83			190	345	Peak
*5725	51.26	49.5	1.76	68.2	-16.94	190	345	Peak
11100	48.49	50.95	-2.46	54	-5.51	200	0	Average
11100	53.87	56.33	-2.46	74	-20.13	200	0	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5550 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 134	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5372.88	41.03	39.5	1.53	54	-12.97	173	98	Average
5372.88	53.08	51.55	1.53	74	-20.92	173	98	Peak
*5470	51.71	49.85	1.86	68.2	-16.49	173	98	Peak
5670	95.37	93.61	1.76			173	98	Average
5670	100.89	99.13	1.76			173	98	Peak
*5725	54.73	52.97	1.76	68.2	-13.47	173	98	Peak
11340	48.47	50.83	-2.36	54	-5.53	120	34	Average
11340	58.07	60.43	-2.36	74	-15.93	120	34	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5451.28	41.67	39.8	1.87	54	-12.33	184	327	Average
5451.28	53.53	51.66	1.87	74	-20.47	184	327	Peak
*5470	55.41	53.55	1.86	68.2	-12.79	184	327	Peak
5670	97.34	95.58	1.76			184	327	Average
5670	103.8	102.04	1.76			184	327	Peak
*5725	61.15	59.39	1.76	68.2	-7.05	184	327	Peak
11340	52.46	54.82	-2.36	54	-1.54	200	0	Average
11340	58.4	60.76	-2.36	74	-15.6	200	0	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5670 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 142	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	47.57	45.7	1.87	54	-6.43	119	41	Average
5460	57.92	56.05	1.87	74	-16.08	119	41	Peak
*5470	58.29	56.43	1.86	68.2	-9.91	119	41	Peak
5710	93.84	92.18	1.66			119	41	Average
5710	99.59	97.93	1.66			119	41	Peak
11420	48.43	50.67	-2.24	54	-5.57	147	195	Average
11420	58.39	60.63	-2.24	74	-15.61	147	195	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	45.87	44	1.87	54	-8.13	128	301	Average
5460	56.4	54.53	1.87	74	-17.6	128	301	Peak
*5470	56.99	55.13	1.86	68.2	-11.21	128	301	Peak
5710	96.27	94.61	1.66			128	300	Average
5710	102.59	100.93	1.66			128	300	Peak
11420	46.66	48.9	-2.24	54	-7.34	164	257	Average
11420	56.51	58.75	-2.24	74	-17.49	164	257	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5710 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 151	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5755	92.59	90.69	1.9			140	108	Average
5755	98.82	96.92	1.9			140	108	Peak
11510	47.2	49.41	-2.21	54	-6.8	160	25	Average
11510	54.23	56.44	-2.21	74	-19.77	160	25	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5755	95.06	93.16	1.9			108	299	Average
5755	101.31	99.41	1.9			108	299	Peak
11510	52.05	54.26	-2.21	54	-1.95	200	0	Average
11510	58.41	60.62	-2.21	74	-15.59	200	0	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5575.65	51.73	49.87	1.86	68.2	-16.47	140	108	Peak
5660.2	52.13	50.28	1.85	75.77	-23.64	140	108	Peak
5922.875	49.99	47.69	2.3	69.77	-19.78	140	108	Peak
6008.375	50.49	48.1	2.39	68.2	-17.71	140	108	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5645.95	53.01	51.13	1.88	68.2	-15.19	108	299	Peak
5654.025	50.28	48.43	1.85	71.19	-20.91	108	299	Peak
5918.6	49.78	47.47	2.31	72.92	-23.14	108	299	Peak
5940.45	52.01	49.72	2.29	68.2	-16.19	108	299	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5755 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 159	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5795	94.29	92.29	2			129	108	Average
5795	100.49	98.49	2			129	108	Peak
11590	47.01	49.2	-2.19	54	-6.99	156	24	Average
11590	53.44	55.63	-2.19	74	-20.56	156	24	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5795	96.59	94.59	2			131	300	Average
5795	103.15	101.15	2			131	300	Peak
11590	50.67	52.86	-2.19	54	-3.33	200	0	Average
11590	57.65	59.84	-2.19	74	-16.35	200	0	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5613.175	50.26	48.39	1.87	68.2	-17.94	129	108	Peak
5653.075	48.85	46.94	1.91	70.49	-21.64	129	108	Peak
5918.6	50.15	47.84	2.31	72.92	-22.77	129	108	Peak
5948.525	50.83	48.54	2.29	68.2	-17.37	129	108	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5597.025	54.11	52.24	1.87	68.2	-14.09	131	300	Peak
5650.7	57.75	55.84	1.91	68.72	-10.97	131	300	Peak
5918.125	55.77	53.46	2.31	73.27	-17.5	131	300	Peak
5982.725	51.56	49.23	2.33	68.2	-16.64	131	300	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5795 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	49.81	48.28	1.53	54	-4.19	100	94	Average
5150	59.26	57.73	1.53	74	-14.74	100	94	Peak
5210	86.98	85.54	1.44			100	94	Average
5210	92.98	91.54	1.44			100	94	Peak
5350	42.67	41.21	1.46	54	-11.33	100	94	Average
5350	51.67	50.21	1.46	74	-22.33	100	94	Peak
*10420	54.61	57.46	-2.85	68.2	-13.59	100	72	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	52.46	50.93	1.53	54	-1.54	237	347	Average
5150	60.14	58.61	1.53	74	-13.86	237	347	Peak
5210	89.54	88.1	1.44			237	347	Average
5210	96.58	95.14	1.44			237	347	Peak
5350	43.97	42.51	1.46	54	-10.03	237	347	Average
5350	51.89	50.43	1.46	74	-22.11	237	347	Peak
*10420	54.3	57.15	-2.85	68.2	-13.9	168	122	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5210 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 58	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	43.7	42.17	1.53	54	-10.3	100	78	Average
5150	50.93	49.4	1.53	74	-23.07	100	78	Peak
5290	91.31	90	1.31			100	78	Average
5290	98.16	96.85	1.31			100	78	Peak
5350	51.48	50.02	1.46	54	-2.52	100	78	Average
5350	61.42	59.96	1.46	74	-12.58	100	78	Peak
*10580	56.02	58.9	-2.88	68.2	-12.18	136	127	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	44.91	43.38	1.53	54	-9.09	244	348	Average
5150	53.2	51.67	1.53	74	-20.8	244	348	Peak
5290	93.01	91.7	1.31			244	348	Average
5290	99.84	98.53	1.31			244	348	Peak
5350	52.47	51.01	1.46	54	-1.53	244	348	Average
5350	63.97	62.51	1.46	74	-10.03	244	348	Peak
*10580	56.3	59.18	-2.88	68.2	-11.9	103	334	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5290 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 106	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	52.15	50.28	1.87	54	-1.85	250	358	Average
5460	59.27	57.4	1.87	74	-14.73	250	358	Peak
*5470	60.66	58.8	1.86	68.2	-7.54	250	358	Peak
5530	90.6	88.79	1.81			250	358	Average
5530	97.72	95.91	1.81			250	358	Peak
*5725	49.41	47.65	1.76	68.2	-18.79	250	358	Peak
11060	49.32	51.74	-2.42	54	-4.68	132	72	Average
11060	55.74	58.16	-2.42	74	-18.26	132	72	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	49.97	48.1	1.87	54	-4.03	100	68	Average
5460	57.48	55.61	1.87	74	-16.52	100	68	Peak
*5470	60.97	59.11	1.86	68.2	-7.23	100	68	Peak
5530	89.33	87.52	1.81			100	68	Average
5530	96.07	94.26	1.81			100	68	Peak
*5725	49.78	48.02	1.76	68.2	-18.42	100	68	Peak
11060	49.94	52.36	-2.42	54	-4.06	142	306	Average
11060	56.89	59.31	-2.42	74	-17.11	142	306	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5530 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 122	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	43.8	41.93	1.87	54	-10.2	100	65	Average
5460	52.93	51.06	1.87	74	-21.07	100	65	Peak
*5470	52.14	50.28	1.86	68.2	-16.06	100	65	Peak
5610	91.58	89.71	1.87			100	65	Average
5610	98.94	97.07	1.87			100	65	Peak
*5725	53.39	51.63	1.76	68.2	-14.81	100	65	Peak
11220	49.55	52.07	-2.52	54	-4.45	127	259	Average
11220	55.6	58.12	-2.52	74	-18.4	127	259	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	45.08	43.21	1.87	54	-8.92	126	359	Average
5460	54.07	52.2	1.87	74	-19.93	126	359	Peak
*5470	53.98	52.12	1.86	68.2	-14.22	126	359	Peak
5610	92.77	90.9	1.87			126	359	Average
5610	99.33	97.46	1.87			126	359	Peak
*5725	55.87	54.11	1.76	68.2	-12.33	126	359	Peak
11220	50.1	52.62	-2.52	54	-3.9	109	177	Average
11220	56.7	59.22	-2.52	74	-17.3	109	177	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5610 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 138	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	41.06	39.19	1.87	54	-12.94	100	64	Average
5460	52.76	50.89	1.87	74	-21.24	100	64	Peak
*5470	48.93	47.07	1.86	68.2	-19.27	100	64	Peak
5690	89.86	88.27	1.59			100	64	Average
5690	96.38	94.79	1.59			100	64	Peak
11380	49.07	51.33	-2.26	54	-4.93	172	209	Average
11380	57.98	60.24	-2.26	74	-16.02	172	209	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	41.11	39.24	1.87	54	-12.89	122	357	Average
5460	52.09	50.22	1.87	74	-21.91	122	357	Peak
*5470	51.73	49.87	1.86	68.2	-16.47	122	357	Peak
5690	91.08	89.49	1.59			122	357	Average
5690	98.01	96.42	1.59			122	357	Peak
11380	47.77	50.03	-2.26	54	-6.23	100	98	Average
11380	57.57	59.83	-2.26	74	-16.43	100	98	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5690 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 155	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5775	89.9	87.94	1.96			100	85	Average
5775	96.66	94.7	1.96			100	85	Peak
11550	48.17	50.37	-2.2	54	-5.83	162	333	Average
11550	56.04	58.24	-2.2	74	-17.96	162	333	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5775	90.62	88.66	1.96			103	358	Average
5775	97.75	95.79	1.96			103	358	Peak
11550	49.14	51.34	-2.2	54	-4.86	103	101	Average
11550	57.32	59.52	-2.2	74	-16.68	103	101	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5642.625	52.93	51.05	1.88	68.2	-15.27	100	85	Peak
5650.7	55.54	53.63	1.91	68.72	-13.18	100	85	Peak
5917.175	50.5	48.19	2.31	73.97	-23.47	100	85	Peak
6001.25	51.08	48.72	2.36	68.2	-17.12	100	85	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5617.925	55.95	54.05	1.9	68.2	-12.25	103	358	Peak
5659.725	56.64	54.79	1.85	75.42	-18.78	103	358	Peak
5915.275	51.02	48.71	2.31	75.37	-24.35	103	358	Peak
5930.95	52.09	49.79	2.3	68.2	-16.11	103	358	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 5775 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

9 kHz ~ 30 MHz Data:

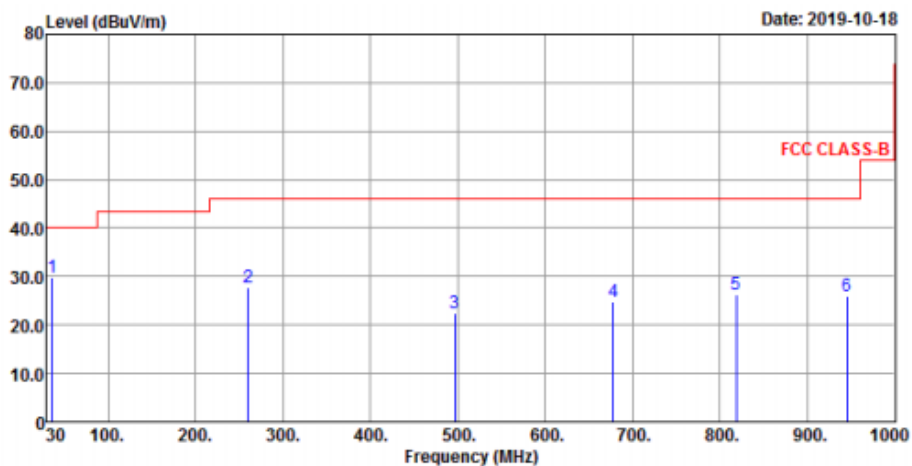
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

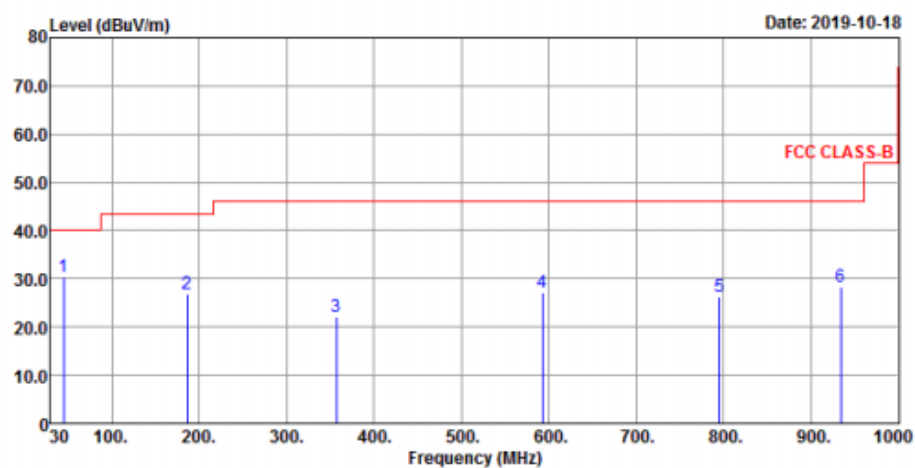
802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
35.82	29.83	47	-17.17	40	-10.17	162	141	Peak
259.89	27.66	45.02	-17.36	46	-18.34	159	73	Peak
496.57	22.48	33.25	-10.77	46	-23.52	126	124	Peak
677.96	24.66	31.71	-7.05	46	-21.34	102	222	Peak
818.61	26.22	31.2	-4.98	46	-19.78	117	69	Peak
945.68	26.07	28.82	-2.75	46	-19.93	107	229	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
44.55	30.3	47.31	-17.01	40	-9.7	189	37	Peak
186.17	26.78	45.88	-19.1	43.5	-16.72	210	102	Peak
356.89	22.04	36.79	-14.75	46	-23.96	166	312	Peak
592.6	27.3	35.77	-8.47	46	-18.7	122	114	Peak
795.33	26.35	31.4	-5.05	46	-19.65	136	298	Peak
934.04	28.33	31.13	-2.8	46	-17.67	102	125	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- The emission levels of other frequencies were very low against the limit

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 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 10, 2018	Dec. 09, 2019
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 21, 2019	Feb. 20, 2020
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 22, 2019	Aug. 21, 2020
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1.
 3. The VCCI Site Registration No. is C-12040.

4.2.3 Test Procedures

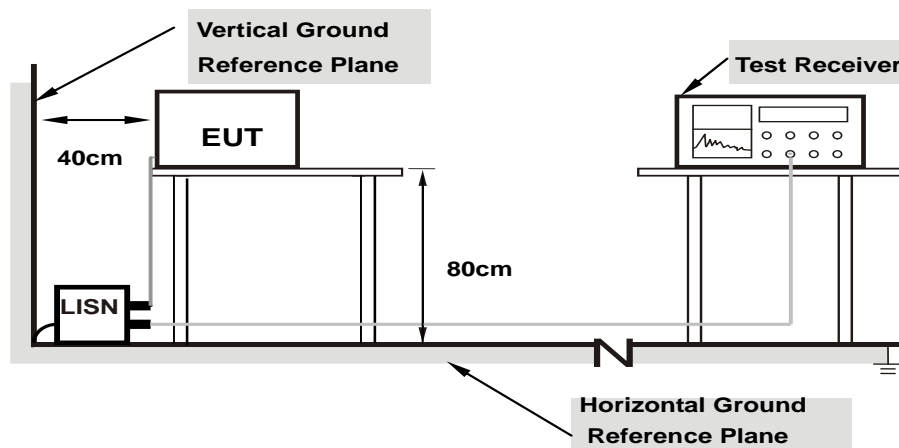
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

Note: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



- Note:**
- Support units were connected to second LISN.
 - Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

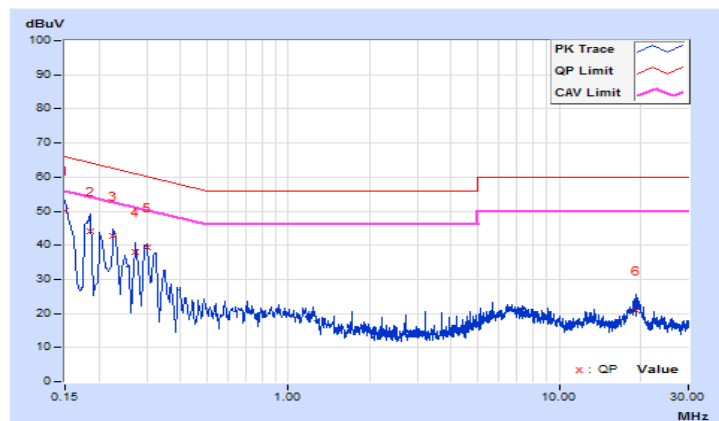
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2019/10/20

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.67	40.44	36.34	50.11	46.01	66.00	56.00	-15.89	-9.99
2	0.18600	9.66	34.40	26.88	44.06	36.54	64.21	54.21	-20.15	-17.67
3	0.22624	9.66	33.06	26.25	42.72	35.91	62.59	52.59	-19.87	-16.68
4	0.27400	9.67	28.40	22.48	38.07	32.15	61.00	51.00	-22.93	-18.85
5	0.30071	9.68	29.86	26.10	39.54	35.78	60.22	50.22	-20.68	-14.44
6	19.15000	9.98	11.00	3.00	20.98	12.98	60.00	50.00	-39.02	-37.02

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

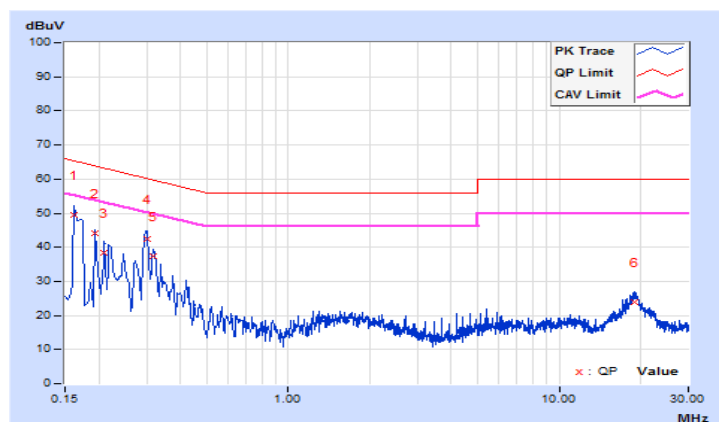


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2019/10/20

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16200	9.64	39.98	31.24	49.62	40.88	65.36	55.36	-15.74	-14.48
2	0.19400	9.64	34.50	27.41	44.14	37.05	63.86	53.86	-19.72	-16.81
3	0.21000	9.64	28.58	20.32	38.22	29.96	63.21	53.21	-24.99	-23.25
4	0.29992	9.65	32.94	31.82	42.59	41.47	60.25	50.25	-17.66	-8.78
5	0.31781	9.65	27.88	24.09	37.53	33.74	59.76	49.76	-22.23	-16.02
6	19.01000	10.04	13.87	6.42	23.91	16.46	60.00	50.00	-36.09	-33.54

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 125 mW (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	250 mW (24 dBm)
U-NII-2A		✓	250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-2C		✓	250 mW (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 $N_{ANT} \leq 4$;

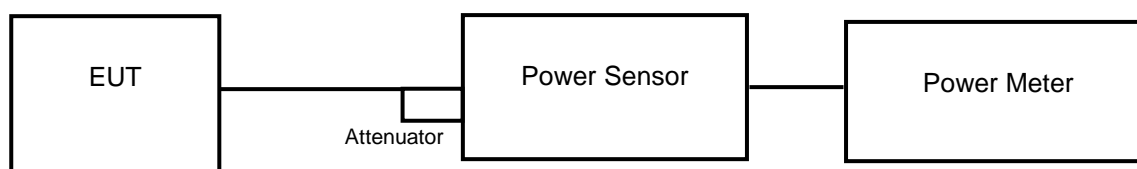
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

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

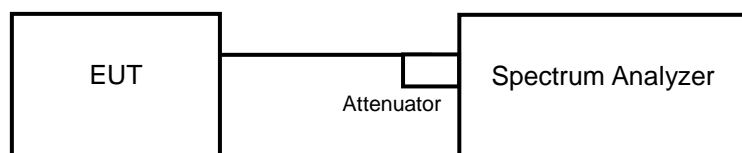
For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup

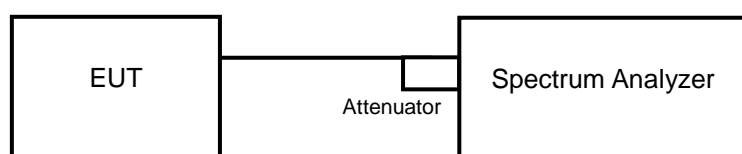
<Power Output Measurement>



or



<26 dB Bandwidth>



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

Average Power Measurement

<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.

<802.11ac (VHT80)>

- Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99 % occupied bandwidth) of the signal.
- Set sweep trigger to "free run".
- Set RBW = 1 MHz.
- Set VBW \geq 3 MHz
- Number of points in sweep \geq 2 Span / RBW.
- Sweep time \leq (number of points in sweep) * T
- Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
- Detector = RMS.
- Trace mode = max hold.
- Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

26 dB Bandwidth

- Set RBW = approximately 1 % of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- 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 Results

Power Output:

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	12.13	14.64	45.438	16.57	24	Pass
40	5200	11.89	14.99	47.003	16.72	24	Pass
48	5240	11.32	15.11	45.986	16.63	24	Pass
52	5260	12.08	15.81	54.251	17.34	23.92	Pass
60	5300	11.33	15.08	45.794	16.61	23.86	Pass
64	5320	11.31	14.95	44.782	16.51	23.86	Pass
100	5500	9.43	11.27	22.167	13.46	23.78	Pass
116	5580	13.45	16.25	64.301	18.08	23.84	Pass
140	5700	7.26	8.79	12.889	11.10	23.79	Pass
149	5745	7.73	9.83	15.545	11.92	30	Pass
157	5785	12.65	15.02	50.177	17.01	30	Pass
165	5825	12.59	14.98	49.632	16.96	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. $11 \text{ dBm} + 10\log (19.59) = 23.92 \text{ dBm} < 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log (19.34) = 23.86 \text{ dBm} < 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log (19.35) = 23.86 \text{ dBm} < 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log (19.10) = 23.81 \text{ dBm} < 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log (19.24) = 23.84 \text{ dBm} < 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log (19.14) = 23.81 \text{ dBm} < 24 \text{ dBm}$.

Chain 1

1. $11 \text{ dBm} + 10\log (35.52) = 26.50 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log (22.92) = 24.60 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log (21.12) = 24.24 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log (19.01) = 23.78 \text{ dBm} < 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log (34.53) = 26.38 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log (19.02) = 23.79 \text{ dBm} < 24 \text{ dBm}$.

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	9.31	12.21	25.165	14.01	24	Pass
40	5200	12.69	15.56	54.553	17.37	24	Pass
48	5240	10.32	14.14	36.707	15.65	24	Pass
52	5260	11.06	14.85	43.313	16.37	24	Pass
60	5300	10.30	13.89	35.206	15.47	24	Pass
64	5320	10.12	13.80	34.268	15.35	24	Pass
100	5500	9.25	11.67	23.103	13.64	24	Pass
116	5580	12.57	15.24	51.492	17.12	24	Pass
140	5700	6.94	9.51	13.876	11.42	24	Pass
149	5745	8.24	10.32	17.433	12.41	30	Pass
157	5785	11.77	13.94	39.805	16.00	30	Pass
165	5825	11.58	13.95	39.219	15.93	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. $11 \text{ dBm} + 10\log(20.44) = 24.10 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(20.26) = 24.06 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(20.65) = 24.14 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(20.36) = 24.08 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(20.75) = 24.17 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(20.58) = 24.13 \text{ dBm} > 24 \text{ dBm}$.

Chain 1

1. $11 \text{ dBm} + 10\log(21.98) = 24.42 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(20.13) = 24.03 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(20.37) = 24.08 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(20.16) = 24.04 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(20.94) = 24.20 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(19.96) = 24.00 \text{ dBm} > 24 \text{ dBm}$.

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	8.67	11.72	22.221	13.47	24	Pass
46	5230	10.79	14.37	39.348	15.95	24	Pass
54	5270	10.82	14.69	41.522	16.18	24	Pass
62	5310	10.23	13.93	35.261	15.47	24	Pass
102	5510	7.84	9.89	15.831	12.00	24	Pass
110	5550	11.69	14.12	40.58	16.08	24	Pass
134	5670	11.59	14.85	44.97	16.53	24	Pass
142	5710 (U-NII-2C)	10.53	13.41	33.226	15.21	24	Pass
142	5710 (U-NII-3)	3.18	5.88	5.953	7.75	30	Pass
151	5755	9.10	11.23	24.33	13.86	30	Pass
159	5795	11.96	14.19	8.127	9.10	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. $11 \text{ dBm} + 10\log (46.08) = 27.63 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log (45.46) = 27.57 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log (46.58) = 27.68 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log (46.03) = 27.63 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log (44.70) = 27.50 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log (5725.00 - 5683.61) = 27.16 \text{ dBm} > 24 \text{ dBm}$.

Chain 1

1. $11 \text{ dBm} + 10\log (57.67) = 28.60 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log (46.32) = 27.65 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log (52.50) = 28.20 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log (51.94) = 28.15 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log (53.87) = 28.31 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log (5725.00 - 5681.73) = 27.36 \text{ dBm} > 24 \text{ dBm}$.

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	6.31	9.34	12.866	11.09	24	Pass
58	5290	7.90	11.68	20.889	13.20	24	Pass
106	5530	8.31	9.84	16.414	12.15	24	Pass
122	5610	9.35	12.04	24.606	13.91	24	Pass
138	5690 (U-NII-2C)	9.35	12.04	24.606	13.91	24	Pass
138	5690 (U-NII-3)	7.96	10.59	17.707	12.48	30	Pass
155	5775	8.64	10.95	19.756	12.96	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. $11 \text{ dBm} + 10\log(82.48) = 30.16 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(81.61) = 30.11 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(83.49) = 30.21 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(5725.00 - 5648.83) = 29.81 \text{ dBm} > 24 \text{ dBm}$.

Chain 1

1. $11 \text{ dBm} + 10\log(82.45) = 30.16 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(82.73) = 30.17 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(81.87) = 30.13 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(5725.00 - 5649.41) = 29.78 \text{ dBm} > 24 \text{ dBm}$.

26 dB Bandwidth:
802.11a

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	19.49	34.25
40	5200	19.66	34.09
48	5240	19.25	28.42
52	5260	19.59	35.52
60	5300	19.34	22.92
64	5320	19.35	21.12
100	5500	19.10	19.01
116	5580	19.24	34.53
140	5700	19.14	19.02

802.11n (HT20)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	20.47	20.66
40	5200	20.91	36.21
48	5240	20.27	20.62
52	5260	20.44	21.98
60	5300	20.26	20.13
64	5320	20.65	20.37
100	5500	20.36	20.16
116	5580	20.75	20.94
140	5700	20.58	19.96

802.11n (HT40)

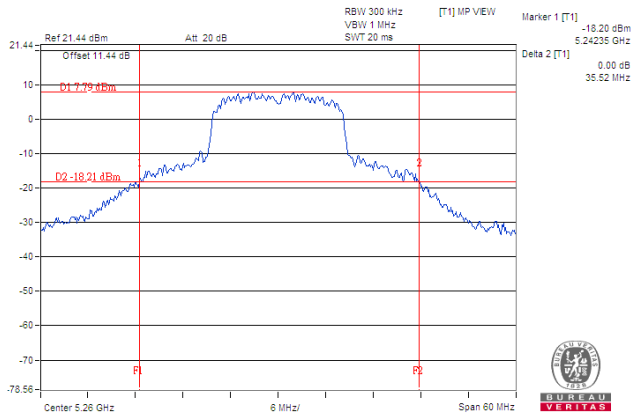
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	46.69	49.00
46	5230	46.13	49.97
54	5270	46.08	57.67
62	5310	45.46	46.32
102	5510	46.58	52.50
110	5550	46.03	51.94
134	5670	44.70	53.87
142	5710 (U-NII-2C)	41.39	43.27
142	5710 (U-NII-3)	7.62	7.64

802.11ac (VHT80)

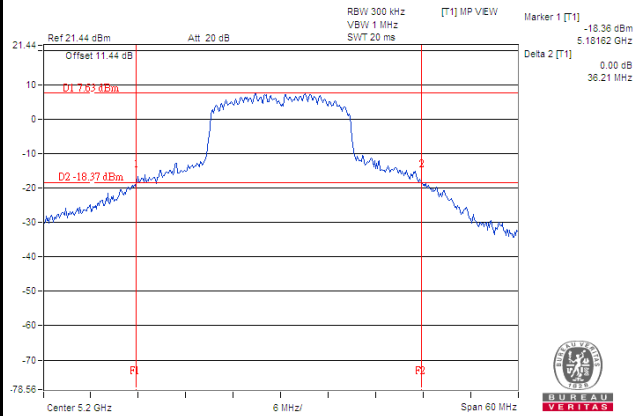
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	81.17	83.06
58	5290	82.48	82.45
106	5530	81.61	82.73
122	5610	83.49	81.87
138	5690 (U-NII-2C)	76.17	75.59
138	5690 (U-NII-3)	5.98	5.18

Spectrum Plot of Worst Value

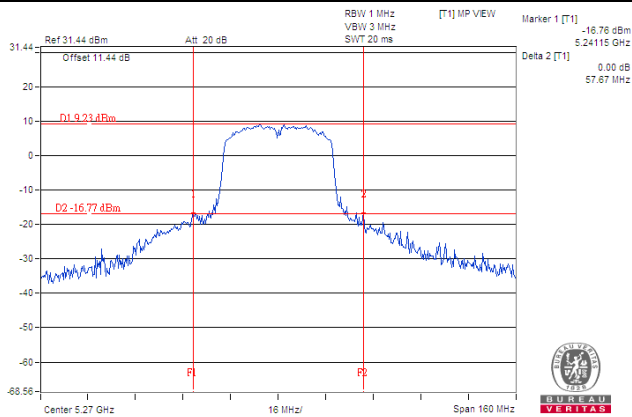
802.11a



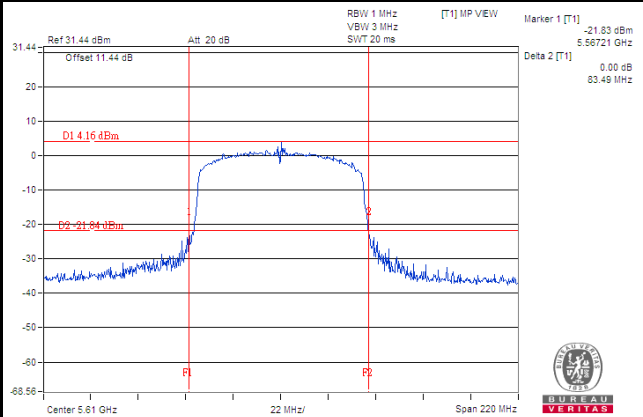
802.11n (HT20)



802.11n (HT40)

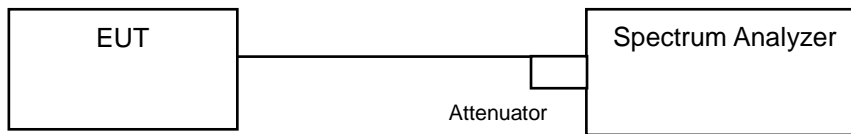


802.11ac (VHT80)



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 SAMPLE. 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 Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.32	17.76
40	5200	16.32	17.64
48	5240	16.32	16.80
52	5260	16.32	20.28
60	5300	16.32	16.44
64	5320	16.32	16.44
100	5500	16.32	16.32
116	5580	16.32	18.60
140	5700	16.32	16.32
149	5745	16.32	16.26
157	5785	16.35	16.35
165	5825	16.35	16.43

802.11n (HT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.40	17.52
40	5200	17.52	20.16
48	5240	17.40	17.52
52	5260	17.52	17.52
60	5300	17.40	17.52
64	5320	17.52	17.52
100	5500	17.40	17.40
116	5580	17.52	17.52
140	5700	17.40	17.40
149	5745	17.40	17.40
157	5785	17.39	17.48
165	5825	17.39	17.48

802.11n (HT40)

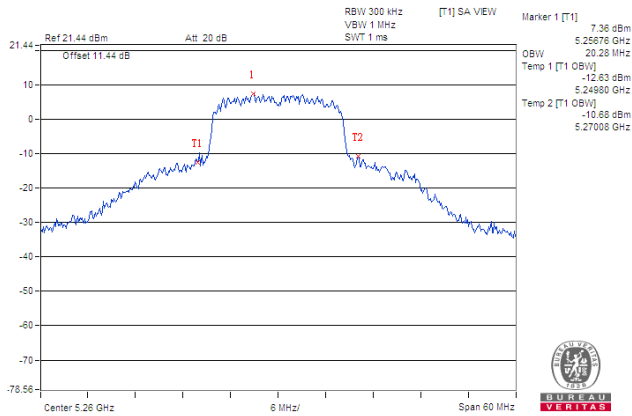
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.24	36.00
46	5230	36.00	36.24
54	5270	36.48	36.12
62	5310	36.48	36.00
102	5510	36.12	36.00
110	5550	36.48	36.00
134	5670	36.24	36.12
142	5710 (U-NII-2C)	33.24	33.24
142	5710 (U-NII-3)	2.76	2.88
151	5755	36.00	36.00
159	5795	36.00	36.00

802.11ac (VHT80)

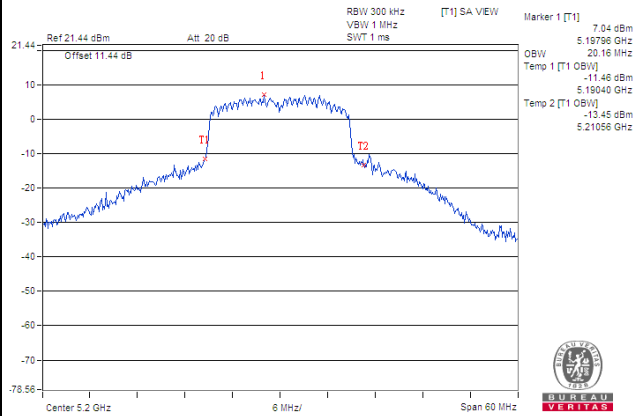
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	74.88	74.88
58	5290	75.84	74.88
106	5530	74.88	74.88
122	5610	75.36	74.88
138	5690 (U-NII-2C)	72.92	72.68
138	5690 (U-NII-3)	2.44	2.20
155	5775	74.79	74.79

Spectrum Plot of Worst Value

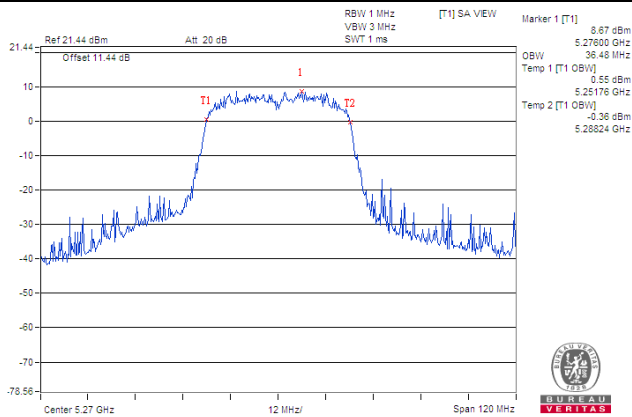
802.11a



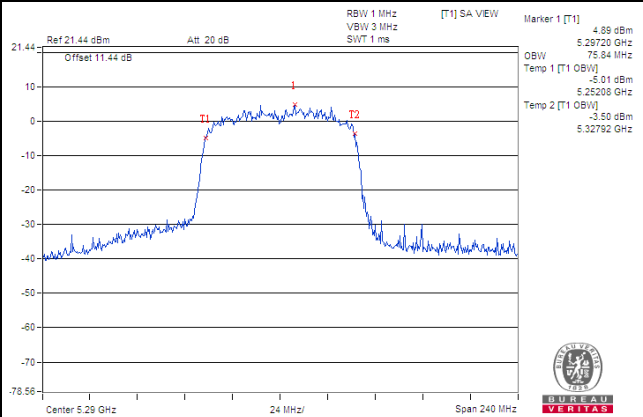
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

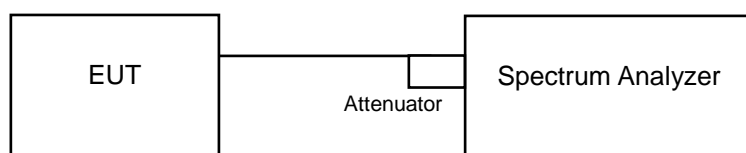


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.5.4 Test Procedures

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

Using method SA-2

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

※For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz} / 300 \text{ kHz})$.
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/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

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

4.5.7 Test Results

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

802.11a

Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	-1.10	2.01	0.24	3.98	11	Pass
40	5200	-1.08	1.97	0.24	3.96	11	Pass
48	5240	-2.36	2.33	0.24	3.84	11	Pass
52	5260	-1.37	2.50	0.24	4.23	11	Pass
60	5300	-1.61	1.95	0.24	3.78	11	Pass
64	5320	-1.63	1.91	0.24	3.74	11	Pass
100	5500	-3.54	-1.12	0.24	1.09	10.29	Pass
116	5580	0.86	3.13	0.24	5.39	10.29	Pass
140	5700	-5.38	-3.40	0.24	-1.03	10.29	Pass

Note:

- Method E) 2) 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.
- For U-NII-1 Band:
Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.54 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.
For U-NII-2A Band:
Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.84 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.
For U-NII-2C Band:
Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.71 \text{ dBi} > 6 \text{ dB}$, so the power density limit shall be reduced to $11 - (6.71 - 6) = 10.29 \text{ dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	-3.91	-0.99	0.73	1.53	11	Pass
40	5200	-0.83	1.99	0.73	4.55	11	Pass
48	5240	-3.17	0.44	0.73	2.74	11	Pass
52	5260	-2.47	1.15	0.73	3.45	11	Pass
60	5300	-3.23	0.16	0.73	2.53	11	Pass
64	5320	-3.24	0.38	0.73	2.68	11	Pass
100	5500	-3.65	-1.96	0.73	1.02	10.29	Pass
116	5580	-0.58	1.54	0.73	4.35	10.29	Pass
140	5700	-6.73	-4.39	0.73	-1.66	10.29	Pass

Note:

1. Method E) 2) 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. For U-NII-1 Band:

Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.54 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.

For U-NII-2A Band:

Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.84 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.

For U-NII-2C Band:

Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.71 \text{ dBi} > 6 \text{ dB}$, so the power density limit shall be reduced to $11 - (6.71 - 6) = 10.29 \text{ dBm}$.

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

802.11n (HT40)

Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-8.23	-5.32	0.85	-2.68	11	Pass
46	5230	-6.11	-2.97	0.85	-0.40	11	Pass
54	5270	-6.02	-2.34	0.85	0.06	11	Pass
62	5310	-6.75	-3.55	0.85	-1.00	11	Pass
102	5510	-9.21	-7.03	0.85	-4.12	10.29	Pass
110	5550	-5.50	-3.64	0.85	-0.61	10.29	Pass
134	5670	-5.06	-2.44	0.85	0.31	10.29	Pass
142	5710 (U-NII-2C)	-5.74	-2.74	0.85	-0.13	10.29	Pass

Note:

- Method E) 2) 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.
- For U-NII-1 Band:**

$$\text{Directional gain} = 10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{\text{ANT}}] = 4.54 \text{ dBi} < 6 \text{ dBi}$$
, so the limit no need to be reduced.
For U-NII-2A Band:

$$\text{Directional gain} = 10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{\text{ANT}}] = 5.84 \text{ dBi} < 6 \text{ dBi}$$
, so the limit no need to be reduced.
For U-NII-2C Band:

$$\text{Directional gain} = 10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{\text{ANT}}] = 6.71 \text{ dBi} > 6 \text{ dB}$$
, so the power density limit shall be reduced to $11 - (6.71 - 6) = 10.29 \text{ dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

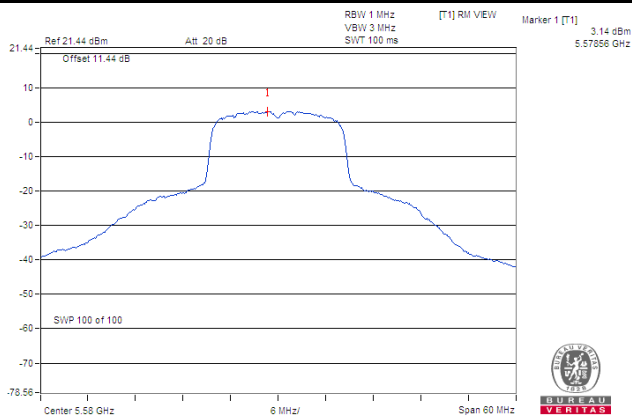
Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-13.53	-10.86	1.42	-7.56	11	Pass
58	5290	-12.13	-8.22	1.42	-5.32	11	Pass
106	5530	-12.45	-10.50	1.42	-6.94	10.29	Pass
122	5610	-10.09	-8.19	1.42	-4.61	10.29	Pass
138	5690 (U-NII-2C)	-11.98	-8.93	1.42	-5.76	10.29	Pass

Note:

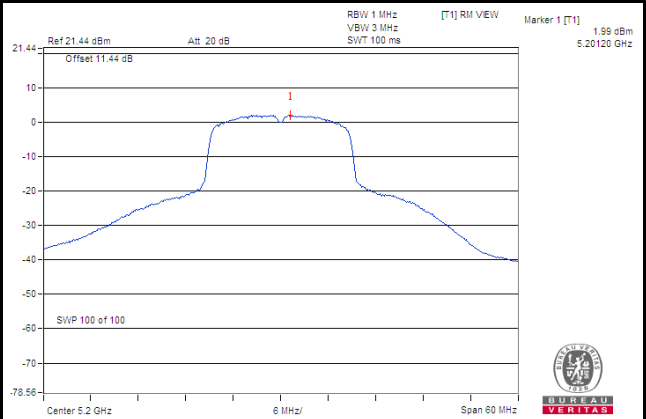
- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- For U-NII-1 Band:**
Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.54 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.
- For U-NII-2A Band:**
Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.84 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.
- For U-NII-2C Band:**
Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.71 \text{ dBi} > 6 \text{ dB}$, so the power density limit shall be reduced to $11 - (6.71 - 6) = 10.29 \text{ dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

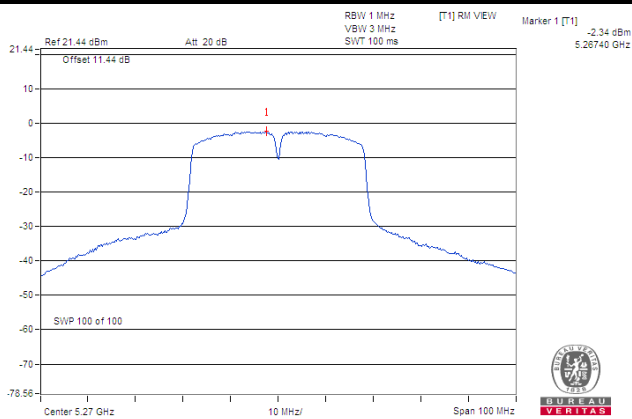
802.11a



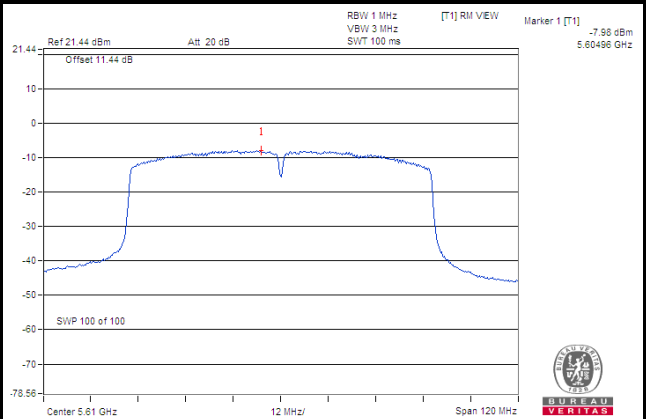
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



For U-NII-3 Band

802.11a

TX Chain	Channel	Frequency (MHz)	PSD w/o Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	149	5745	-12.24	-10.02	3.01	0.24	-6.77	29.74	Pass
	157	5785	-8.81	-6.59	3.01	0.24	-3.34	29.74	Pass
	165	5825	-8.88	-6.66	3.01	0.24	-3.41	29.74	Pass
1	149	5745	-10.26	-8.04	3.01	0.24	-4.79	29.74	Pass
	157	5785	-6.19	-3.97	3.01	0.24	-0.72	29.74	Pass
	165	5825	-6.25	-4.03	3.01	0.24	-0.78	29.74	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.26 > 6$ dBi, so the power density limit shall be reduced to $30 - (6.26 - 6) = 29.74$ dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX Chain	Channel	Frequency (MHz)	PSD		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	149	5745	-13.44	-11.22	3.01	0.73	-7.48	29.74	Pass
	157	5785	-10.11	-7.89	3.01	0.73	-4.15	29.74	Pass
	165	5825	-10.25	-8.03	3.01	0.73	-4.29	29.74	Pass
1	149	5745	-11.31	-9.09	3.01	0.73	-5.35	29.74	Pass
	157	5785	-7.85	-5.63	3.01	0.73	-1.89	29.74	Pass
	165	5825	-8.10	-5.88	3.01	0.73	-2.14	29.74	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.26 > 6$ dBi, so the power density limit shall be reduced to $30 - (6.26 - 6) = 29.74$ dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

TX Chain	Channel	Frequency (MHz)	PSD		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	142	5710 (U-NII-3)	-17.79	-15.57	3.01	0.85	-11.71	29.74	Pass
	151	5755	-16.83	-14.61	3.01	0.85	-10.75	29.74	Pass
	159	5795	-14.04	-11.82	3.01	0.85	-7.96	29.74	Pass
1	142	5710 (U-NII-3)	-13.92	-11.70	3.01	0.85	-7.84	29.74	Pass
	151	5755	-14.32	-12.10	3.01	0.85	-8.24	29.74	Pass
	159	5795	-11.43	-9.21	3.01	0.85	-5.35	29.74	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] = 6.26 > 6$ dBi, so the power density limit shall be reduced to $30 - (6.26 - 6) = 29.74$ dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

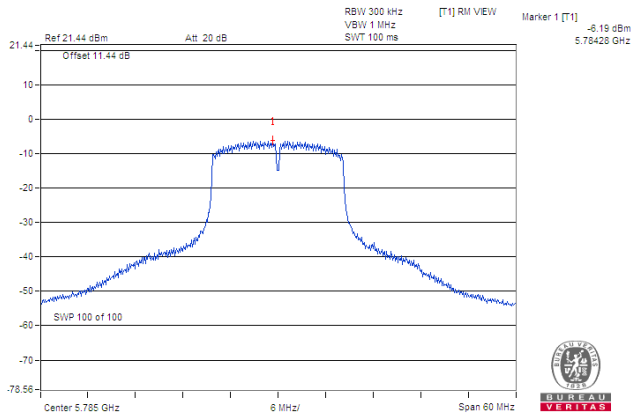
TX Chain	Channel	Frequency (MHz)	PSD		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	138	5690 (U-NII-3)	-25.58	-23.36	3.01	1.42	-18.93	29.74	Pass
	155	5775	-20.43	-18.21	3.01	1.42	-13.78	29.74	Pass
1	138	5690 (U-NII-3)	-22.12	-19.90	3.01	1.42	-15.47	29.74	Pass
	155	5775	-18.25	-16.03	3.01	1.42	-11.60	29.74	Pass

Note:

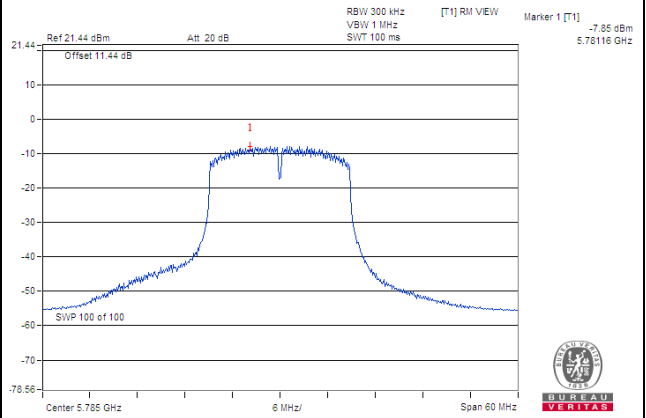
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] = 6.26 > 6$ dBi, so the power density limit shall be reduced to $30 - (6.26 - 6) = 29.74$ dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

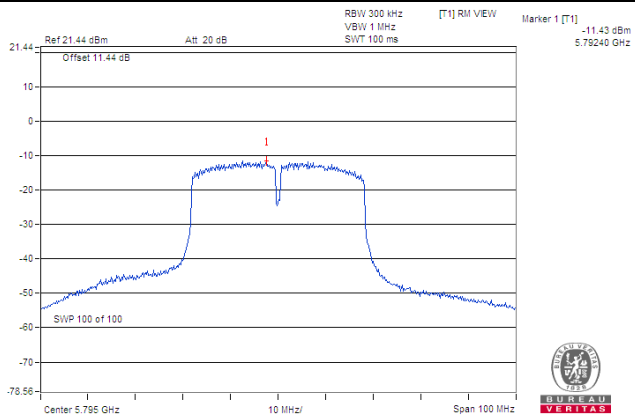
802.11a



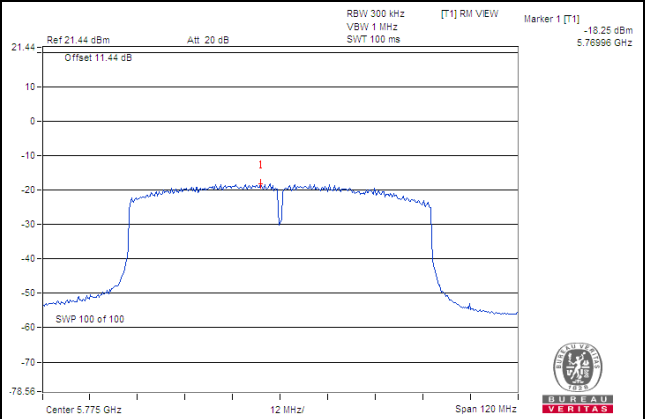
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

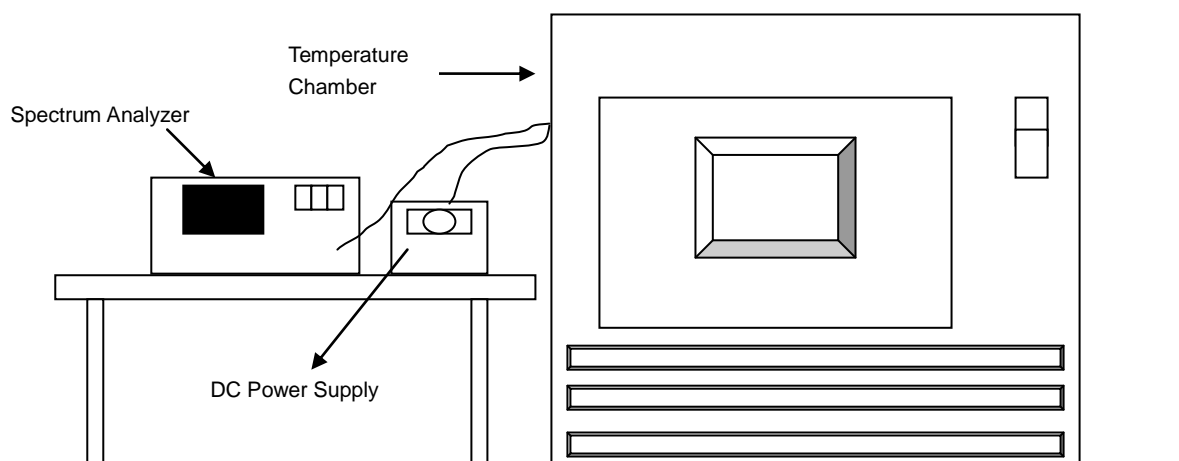


4.6 Frequency Stability

4.6.1 Limit 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

Refer to section 4.1.3 to get information of above instrument.

4.6.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal DC 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 c and d with every 10 degrees reduction until the lowest temperature achieved.
- 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: 5180 MHz									
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
40	12	5179.9871	PASS	5179.9862	PASS	5179.9863	PASS	5179.9866	PASS
30	12	5179.9942	PASS	5179.9922	PASS	5179.9942	PASS	5179.9947	PASS
20	12	5179.9806	PASS	5179.9779	PASS	5179.9781	PASS	5179.9817	PASS
10	12	5180.0226	PASS	5180.0208	PASS	5180.0202	PASS	5180.021	PASS
0	12	5179.9896	PASS	5179.9866	PASS	5179.9907	PASS	5179.9909	PASS

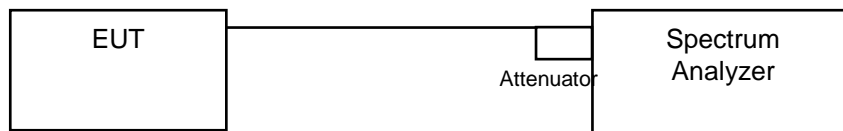
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
Temp. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	13.8	5180.0232	PASS	5180.0207	PASS	5180.0207	PASS	5180.0211	PASS
	12	5180.0226	PASS	5180.0208	PASS	5180.0202	PASS	5180.021	PASS
	10.2	5180.0219	PASS	5180.0198	PASS	5180.0204	PASS	5180.0215	PASS

4.7 6 dB Bandwidth Measurement

4.7.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100 kHz
- 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)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.15	15.14	0.5	Pass
157	5785	15.18	15.14	0.5	Pass
165	5825	15.18	15.18	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.15	15.69	0.5	Pass
157	5785	15.18	15.74	0.5	Pass
165	5825	15.18	15.75	0.5	Pass

802.11n (HT40)

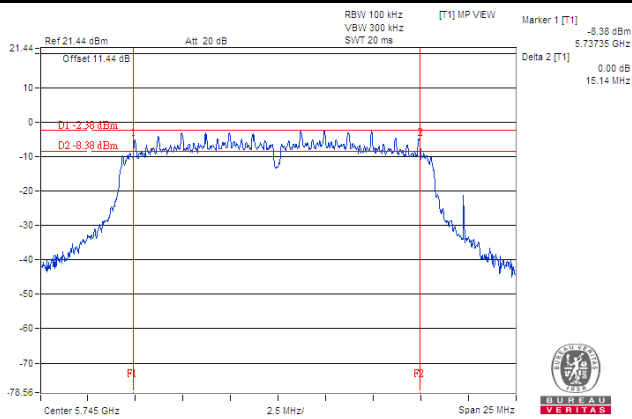
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142	5710 (U-NII-3)	2.53	2.52	0.5	Pass
151	5755	35.17	35.16	0.5	Pass
159	5795	35.17	35.18	0.5	Pass

802.11ac (VHT80)

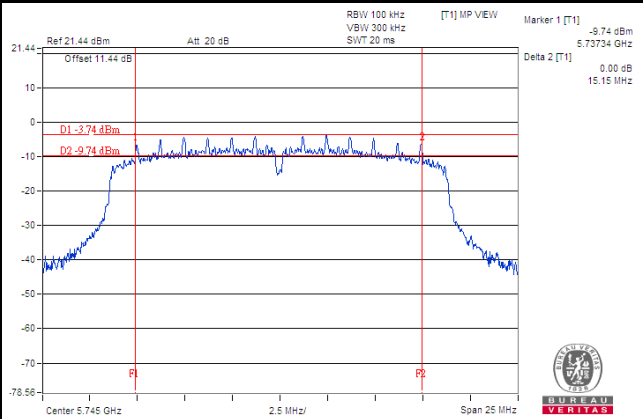
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138	5690 (U-NII-3)	2.61	2.62	0.5	Pass
155	5775	75.27	75.29	0.5	Pass

Spectrum Plot of Worst Value

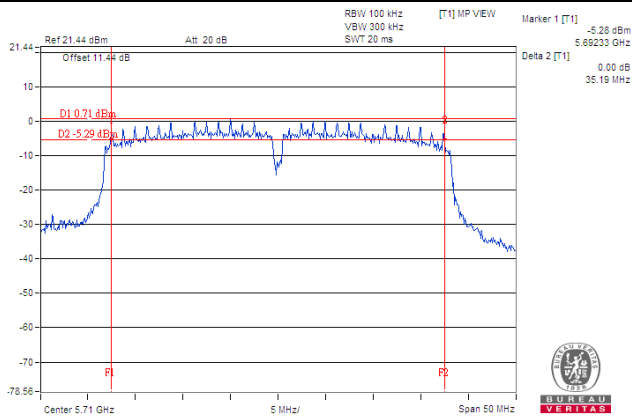
802.11a



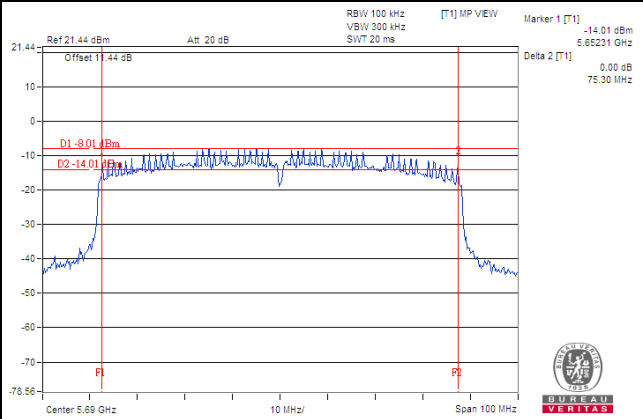
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



Note:

For CH142 (UNII-3 Band): The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

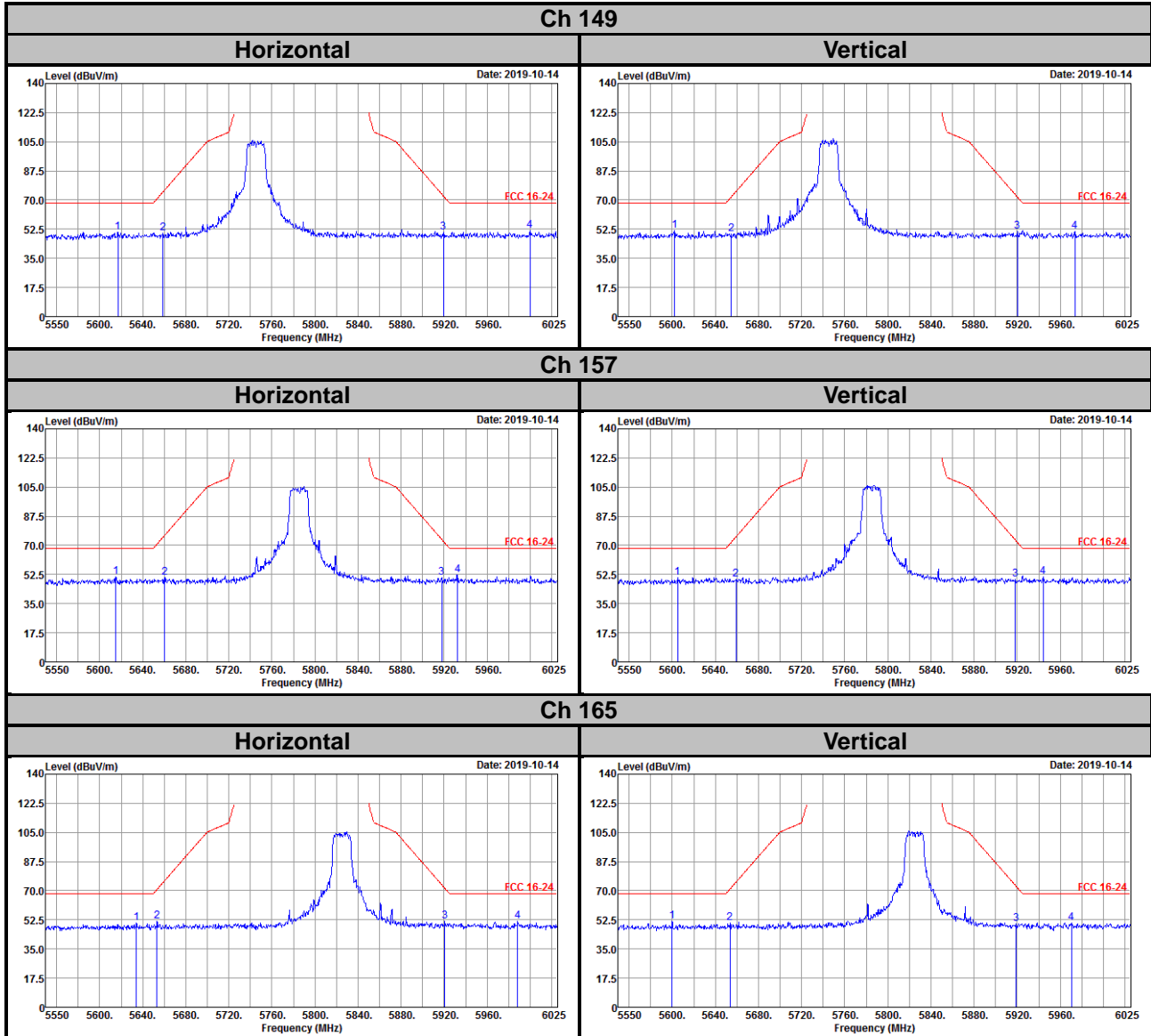
For CH138 (UNII-3 Band): The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

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)

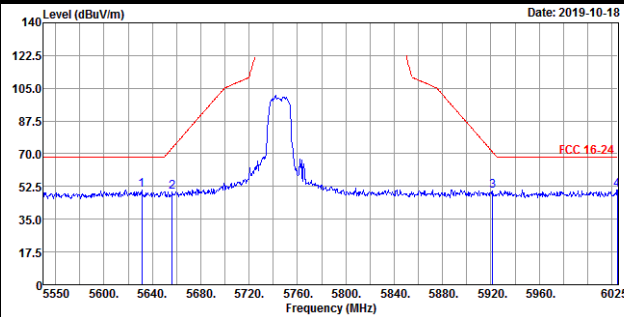
802.11a



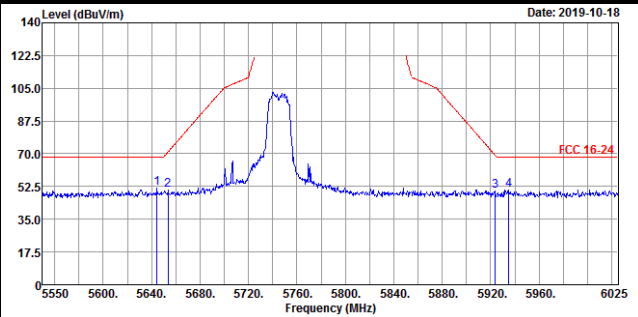
802.11n (HT20)

Ch 149

Horizontal

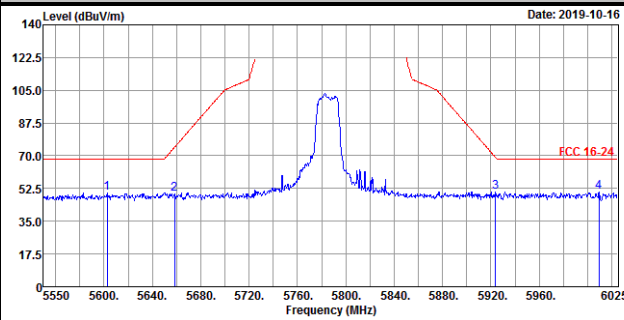


Vertical

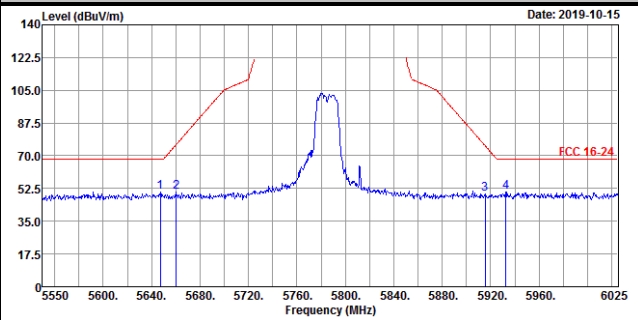


Ch 157

Horizontal

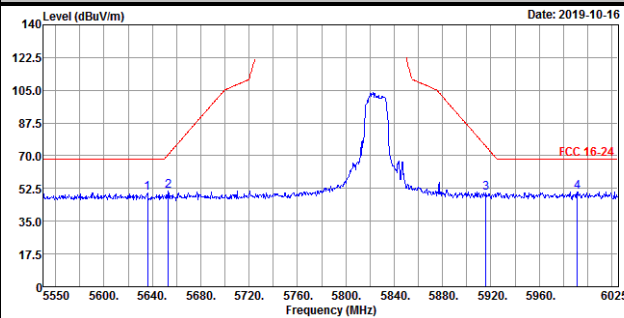


Vertical

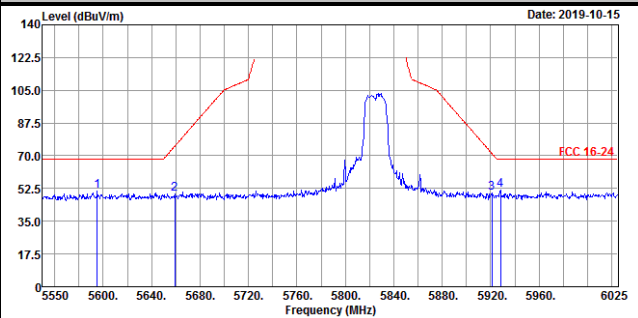


Ch 165

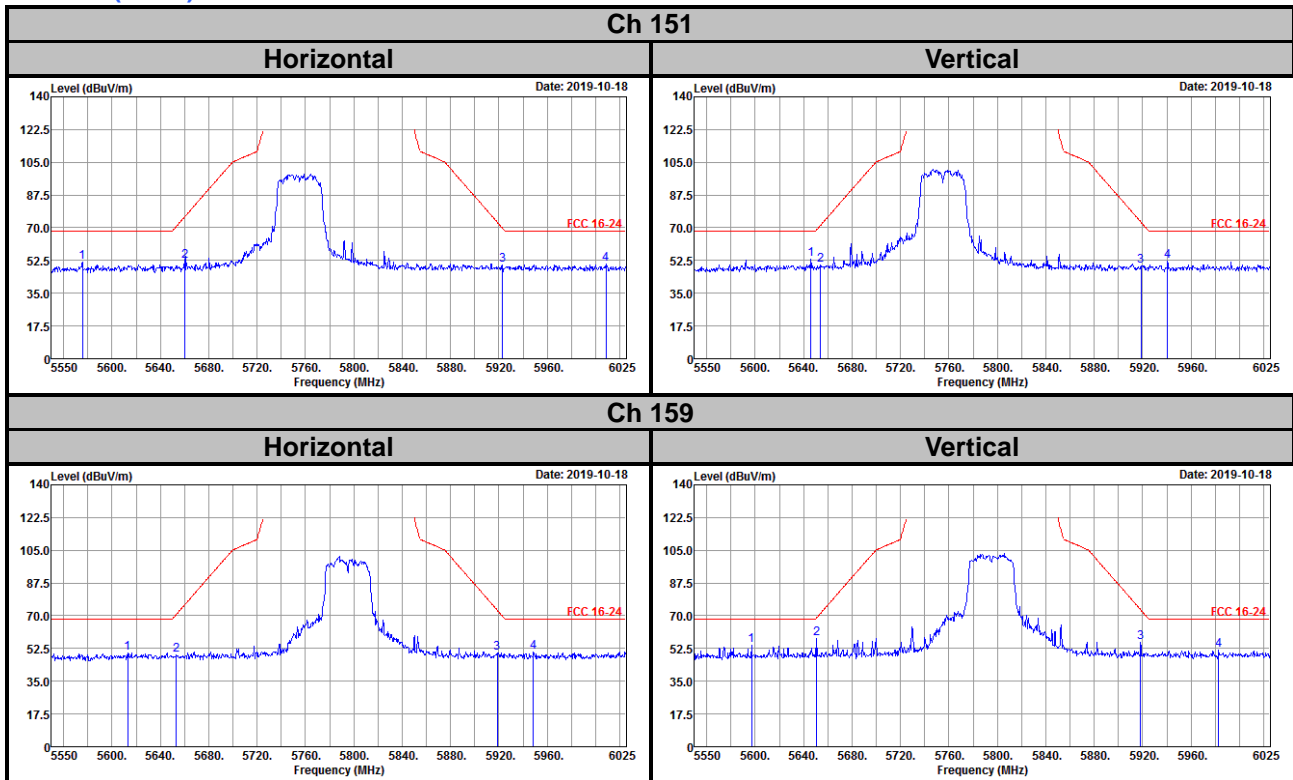
Horizontal



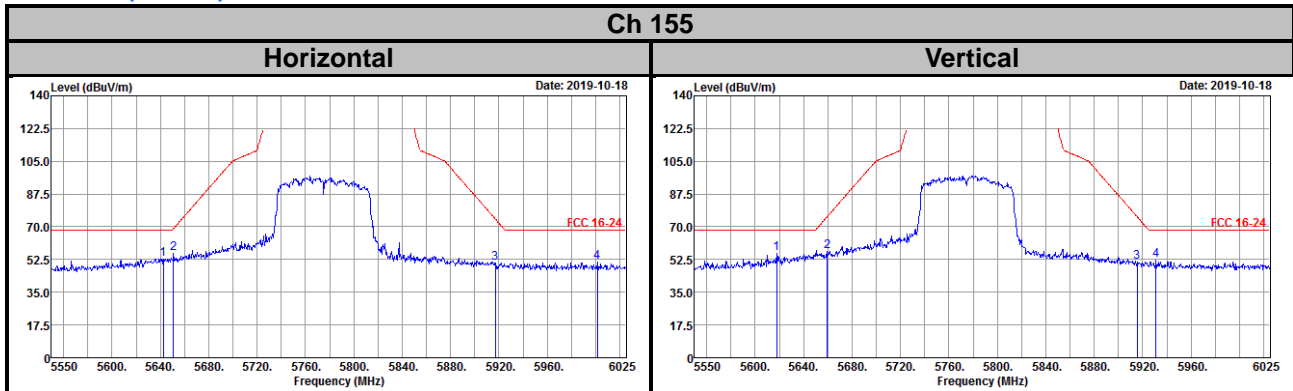
Vertical



802.11n (HT40)



802.11ac (VHT80)



Appendix – Information of 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 according to ISO/IEC 17025.

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

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---