FCC Test Report

Report No.:	RF180207C11-3
FCC ID:	MSQZ01RD
Test Model:	ASUS_Z01RD / ASUS_Z01RS
Received Date:	Feb. 07, 2018
Test Date:	Feb. 27, 2018 ~ Mar. 29, 2018
Issued Date:	May 02, 2018
Applicant:	ASUSTek COMPUTER INC.
Address:	4F, No. 150, LI-TE Rd., PEITOU, TAIPEI 112, TAIWAN
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location (1):	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.
Test Location (2):	No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C
FCC Registration / Designation Number:	427177 / TW0011

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF180207C11-3	Original Release	May 02, 2018

1 Certificate of Conformity

Product:	ASUS Phone
Brand:	ASUS
Test Model:	ASUS_Z01RD / ASUS_Z01RS
Sample Status:	Production Unit
Applicant:	ASUSTek COMPUTER INC.
Test Date:	Feb. 27, 2018 ~ Mar. 29, 2018
Standards:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** May 02, 2018

Ivonne Wu / Supervisor

Approved by : _____ , **Date:** May 02, 2018

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 -19.52 dB at 0.15000 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 -1.23 dB at 5459.92 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	No antenna connector is used.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	ASUS Phone
Brand	ASUS
Test Model	ASUS_Z01RD / ASUS_Z01RS
Status of EUT	Production Unit
Power Supply Rating	5.0 Vdc or 9.0 Vdc (adapter) 5.0 Vdc (host equipment) 3.85 Vdc (battery)
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: 300 Mbps 802.11ac: 866.7 Mbps
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5720 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 ~ 5720 MHz: 12 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	60.584 mW for 5180 ~ 5240 MHz 62.853 mW for 5260 ~ 5320 MHz 62.487 mW for 5500 ~ 5720 MHz 62.120 mW for 5745 ~ 5825 MHz
Antenna Type	PIFA antenna with -4 dBi gain (Main) / 0 dBi (Aux.) (5180 ~ 5240 MHz) PIFA antenna with -2.7 dBi gain (Main) / -1.5 dBi (Aux.) (5260 ~ 5320 MHz) PIFA antenna with -0.4 dBi gain (Main) / -2.3 dBi (Aux.) (5500 ~ 5720 MHz) PIFA antenna with -0.4 dBi gain (Main) / -1.8 dBi (Aux.) (5745 ~ 5825 MHz)
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

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. All models are listed as below.

Brand	SKU	Model	Difference
ASUS	WW-5CA	ASUS_Z01RD	Dual SIM
	WW Operator-5CA	ASUS_Z01RS	Single SIM
* The models have the same layout, circuit, and components, but different SIM card slot, therefore, only ASUS_Z01RD was chosen for the final test.			

3. There're 2 configurations for the EUT listed as below.

   Main Sample: EUT + CPU 1 + Rear Camera 1 + Front Camera 1 + UFS 3 + DDR 3

   2nd Sample: EUT + CPU 2 + Rear Camera 2 + Front Camera 2 + UFS 3 + DDR 3

   ✧ Only the worst test data was presented in the report.

4. The EUT's accessories list refers to Ext. Pho.

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

3.2 Description of Test Modes

For 5180 ~ 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 ~ 5700 MHz

12 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	144	5720

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≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Main Sample
B	-	√	-	-	2nd Sample

Where **RE≥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 **Y-plane** for 5180-5240MHz & 5260-5320MHz and **Z-plane** for 5500-5700MHz & 5745-5825MHz.
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)
A	5180-5240	802.11a	36 to 48	36, 44, 48	OFDM	BPSK	6.0
		802.11ac (VHT20)	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
		802.11ac (VHT40)	38 to 46	38, 46	OFDM	BPSK	MCS0
		802.11ac (VHT80)	42	42	OFDM	BPSK	MCS0
	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
		802.11ac (VHT20)	52 to 64	52, 60, 64	OFDM	BPSK	MCS0
		802.11ac (VHT40)	54 to 62	54, 62	OFDM	BPSK	MCS0
		802.11ac (VHT80)	58	58	OFDM	BPSK	MCS0
	5500-5720	802.11a	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.0
		802.11ac (VHT20)	100 to 144	100, 116, 140, 144	OFDM	BPSK	MCS0
		802.11ac (VHT40)	102 to 142	102, 110, 134, 142	OFDM	BPSK	MCS0
		802.11ac (VHT80)	106 to 138	106, 122, 138	OFDM	BPSK	MCS0
	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
		802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
		802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	MCS0
		802.11ac (VHT80)	155	155	OFDM	BPSK	MCS0

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)
A, B	5500-5720	802.11ac (VHT80)	106 to 138	106	OFDM	BPSK	MCS0

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)
A	5500-5720	802.11ac (VHT80)	106 to 138	106	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)
A	5180-5240	802.11a	36 to 48	36, 44, 48	OFDM	BPSK	6.0
		802.11ac (VHT20)	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
		802.11ac (VHT40)	38 to 46	38, 46	OFDM	BPSK	MCS0
		802.11ac (VHT80)	42	42	OFDM	BPSK	MCS0
	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
		802.11ac (VHT20)	52 to 64	52, 60, 64	OFDM	BPSK	MCS0
		802.11ac (VHT40)	54 to 62	54, 62	OFDM	BPSK	MCS0
		802.11ac (VHT80)	58	58	OFDM	BPSK	MCS0
	5500-5720	802.11a	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.0
		802.11ac (VHT20)	100 to 144	100, 116, 140, 144	OFDM	BPSK	MCS0
		802.11ac (VHT40)	102 to 142	102, 110, 134, 142	OFDM	BPSK	MCS0
		802.11ac (VHT80)	106 to 138	106, 122, 138	OFDM	BPSK	MCS0
	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
		802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
		802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	MCS0
		802.11ac (VHT80)	155	155	OFDM	BPSK	MCS0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
APCM	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu

3.3 Duty Cycle of Test Signal

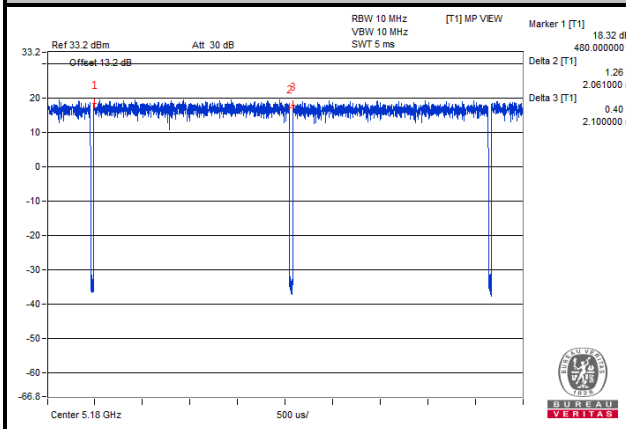
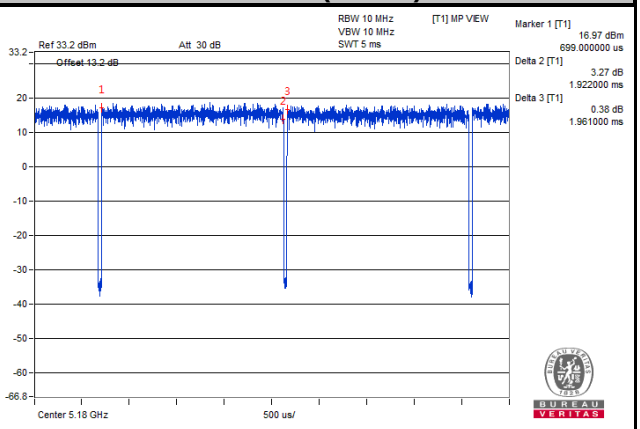
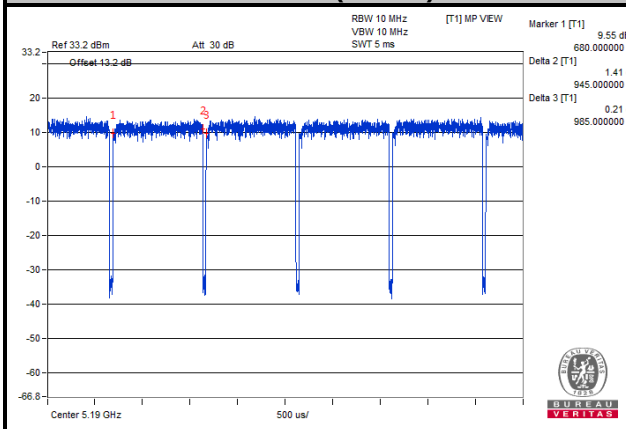
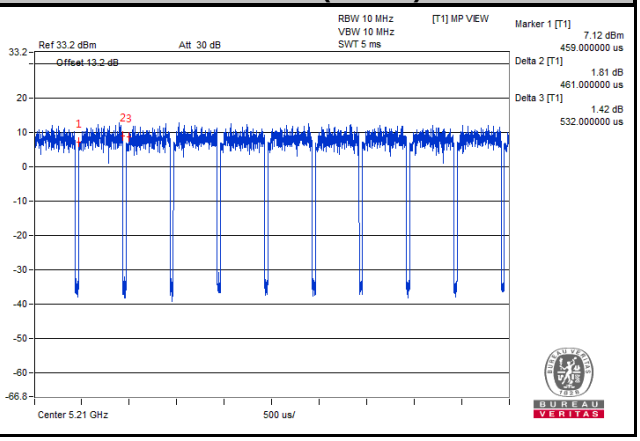
MODULATION TYPE: BPSK

802.11a: Duty cycle of test signal is > 98 %, duty factor is not required.

802.11ac (VHT20): Duty cycle of test signal is > 98 %, duty factor is not required.

802.11ac (VHT40): Duty cycle = 945/985 = 0.959, Duty factor = 10 * log(1/0.959) = 0.18

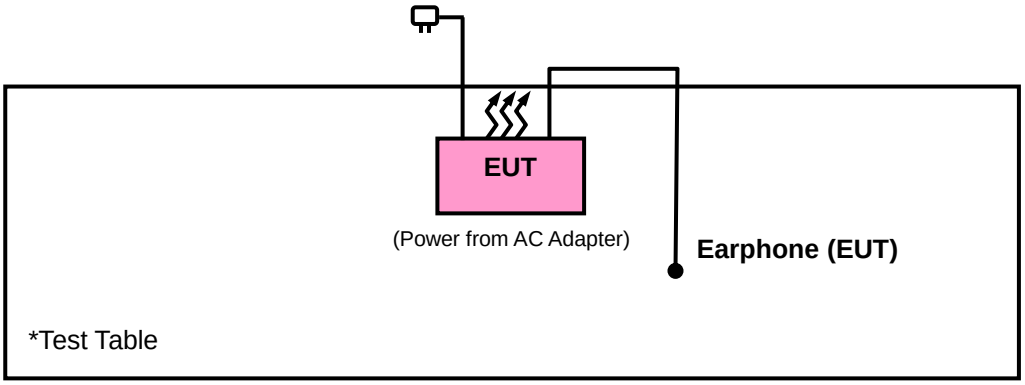
802.11ac (VHT80): Duty cycle = 461/532 = 0.867, Duty factor = 10 * log(1/0.867) = 0.62

802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	**802.11ac (VHT80)**
	

3.4 Description of Support Units

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

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)
789033 D02 General UNII Test Procedures New Rules v02r01
644545 D01 Guidance for IEEE 802 11ac v01r02
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. Other emissions shall be at least 20 dB below the highest level of the desired power:

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	15.407(b)(4)(i)	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2 (dBμV/m) *1 PK:105.2 (dBμV/m) *2 PK: 110.8 (dBμV/m) *3 PK:122.2 (dBμV/m) *4
	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	

*1 beyond 75 MHz or more above of the band edge.

*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note:

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

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

4.1.3 Test Instruments

Description & Manaufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Jul. 05, 2017	Jul. 04, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 07, 2017	Jul. 06, 2018
Bluetooth Tester	CBT	100980	Jun. 28, 2017	Jun. 27, 2019
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 26, 2017	Jun. 25, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 26, 2017	Jun. 25, 2018
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 08, 2017	Sep. 07, 2018
DC Power Supply Topward	33010D	807748	Oct. 25, 2016	Oct. 24, 2018
Digital Multimeter Fluke	87-III	70360742	Jun. 30, 2017	Jun. 29, 2018

Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450I-1.

4.1.4 Test Procedures

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. Both 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:

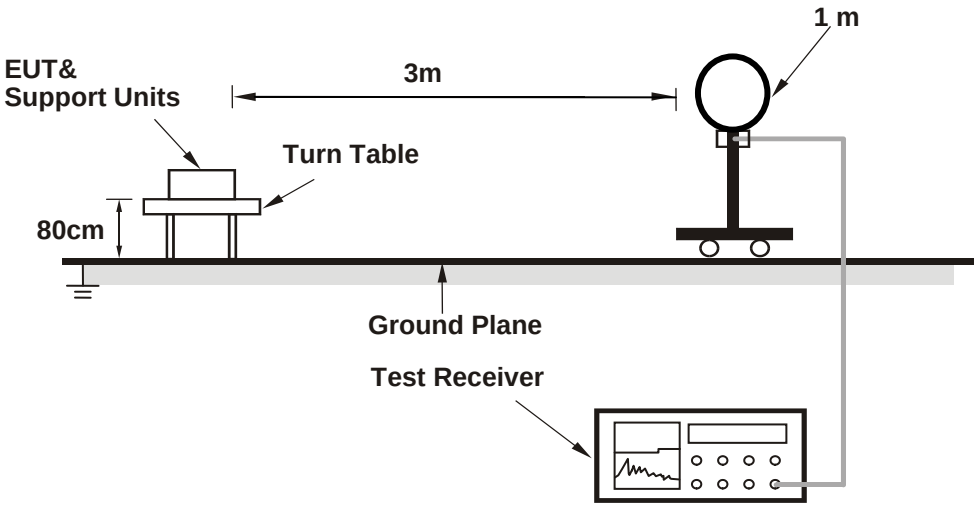
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.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

4.1.5 Deviation from Test Standard

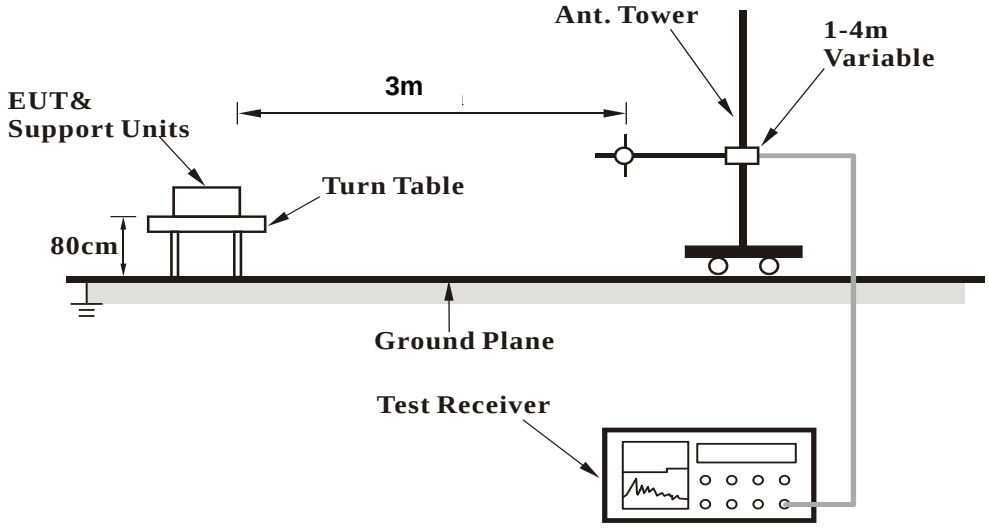
No deviation.

4.1.6 Test Set Up

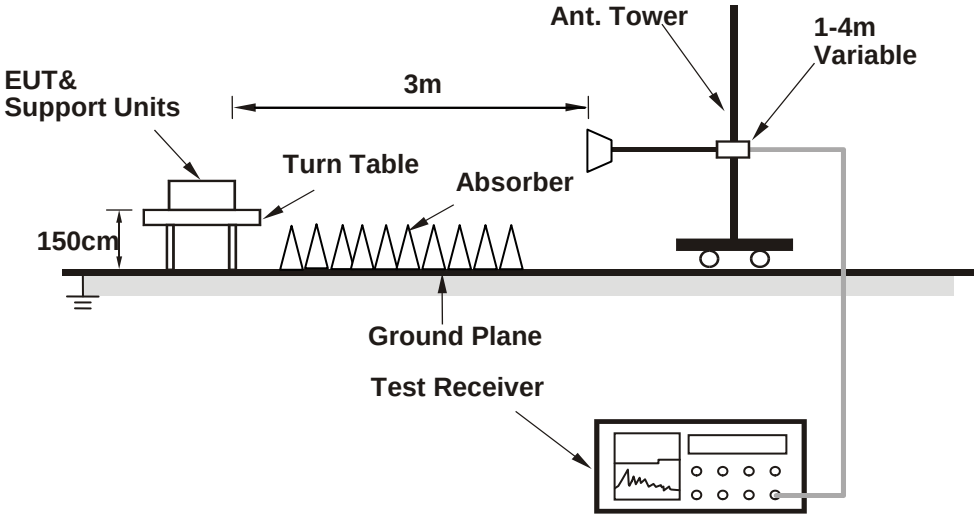
<Radiated Emission below 30 MHz>



<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

a. Placed the EUT on a testing table.
b. 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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5148.95	46.22	37.97	54	-7.78	34.12	8.13	34	199	246	Average
5148.95	56.93	48.68	74	-17.07	34.12	8.13	34	199	246	Peak
5180	96.31	88			34.15	8.16	34	195	244	Average
5180	103.39	95.08			34.15	8.16	34	195	244	Peak
*10360	55.45	41.15	68.2	-12.75	37.12	12.3	35.12	149	245	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5150	44.33	36.08	54	-9.67	34.12	8.13	34	116	161	Average
5150	56.27	48.02	74	-17.73	34.12	8.13	34	116	161	Peak
5180	93.75	85.44			34.15	8.16	34	116	161	Average
5180	101.4	93.09			34.15	8.16	34	116	161	Peak
*10360	55.32	41.02	68.2	-12.88	37.12	12.3	35.12	112	37	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5180 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 44	**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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5128.25	43.01	34.79	54	-10.99	34.11	8.1	33.99	195	244	Average
5128.25	52.96	44.74	74	-21.04	34.11	8.1	33.99	195	244	Peak
5220	96.15	87.76			34.17	8.22	34	195	244	Average
5220	103.62	95.23			34.17	8.22	34	195	244	Peak
5430.3	42.83	34.04	54	-11.17	34.35	8.48	34.04	195	244	Average
5430.3	53.54	44.75	74	-20.46	34.35	8.48	34.04	195	244	Peak
*10440	54.43	39.97	68.2	-13.77	37.16	12.47	35.17	173	215	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5130.2	42.66	34.44	54	-11.34	34.11	8.1	33.99	116	161	Average
5130.2	52.97	44.75	74	-21.03	34.11	8.1	33.99	116	161	Peak
5220	94.17	85.78			34.17	8.22	34	116	161	Average
5220	101.82	93.43			34.17	8.22	34	116	161	Peak
5452.96	42.91	34.09	54	-11.09	34.36	8.51	34.05	116	161	Average
5452.96	53.37	44.55	74	-20.63	34.36	8.51	34.05	116	161	Peak
*10440	55.27	40.81	68.2	-12.93	37.16	12.47	35.17	125	166	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5220 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5240	95.65	87.21			34.19	8.26	34.01	195	244	Average
5240	103.1	94.66			34.19	8.26	34.01	195	244	Peak
5442.29	42.8	34.01	54	-11.2	34.35	8.48	34.04	195	244	Average
5442.29	53.74	44.95	74	-20.26	34.35	8.48	34.04	195	244	Peak
*10480	55.07	40.56	68.2	-13.13	37.19	12.53	35.21	152	108	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5240	93.47	85.03			34.19	8.26	34.01	116	161	Average
5240	101.04	92.6			34.19	8.26	34.01	116	161	Peak
5446.8	43.03	34.2	54	-10.97	34.36	8.51	34.04	116	161	Average
5446.8	53.42	44.59	74	-20.58	34.36	8.51	34.04	116	161	Peak
*10480	55.22	40.71	68.2	-12.98	37.19	12.53	35.21	127	164	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5108.3	42.41	34.21	54	-11.59	34.09	8.1	33.99	102	248	Average
5108.3	53.31	45.11	74	-20.69	34.09	8.1	33.99	102	248	Peak
5260	95.56	87.1			34.21	8.26	34.01	102	248	Average
5260	102.36	93.9			34.21	8.26	34.01	102	248	Peak
*10520	55.67	41.08	68.2	-12.53	37.21	12.61	35.23	165	245	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5123.45	42.35	34.13	54	-11.65	34.11	8.1	33.99	129	172	Average
5123.45	53	44.78	74	-21	34.11	8.1	33.99	129	172	Peak
5260	91.98	83.52			34.21	8.26	34.01	129	172	Average
5260	99.47	91.01			34.21	8.26	34.01	129	172	Peak
*10520	55.86	41.27	68.2	-12.34	37.21	12.61	35.23	135	116	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5111.15	42.45	34.25	54	-11.55	34.09	8.1	33.99	102	248	Average
5111.15	52.97	44.77	74	-21.03	34.09	8.1	33.99	102	248	Peak
5300	94.5	85.96			34.24	8.32	34.02	102	248	Average
5300	101.42	92.88			34.24	8.32	34.02	102	248	Peak
5351.21	42.56	33.93	54	-11.44	34.28	8.38	34.03	102	248	Average
5351.21	53.08	44.45	74	-20.92	34.28	8.38	34.03	102	248	Peak
10600	46.31	31.63	54	-7.69	37.28	12.67	35.27	125	191	Average
10600	55.16	40.48	74	-18.84	37.28	12.67	35.27	125	191	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5123.75	42.35	34.13	54	-11.65	34.11	8.1	33.99	129	172	Average
5123.75	53.56	45.34	74	-20.44	34.11	8.1	33.99	129	172	Peak
5300	90.99	82.45			34.24	8.32	34.02	129	172	Average
5300	98.42	89.88			34.24	8.32	34.02	129	172	Peak
5458.35	42.51	33.69	54	-11.49	34.36	8.51	34.05	129	172	Average
5458.35	53.69	44.87	74	-20.31	34.36	8.51	34.05	129	172	Peak
10600	46.25	31.57	54	-7.75	37.28	12.67	35.27	147	164	Average
10600	55.26	40.58	74	-18.74	37.28	12.67	35.27	147	164	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5300 MHz: Fundamental Frequency

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5320	94.58	86			34.25	8.35	34.02	102	248	Average
5320	101.29	92.71			34.25	8.35	34.02	102	248	Peak
5350.22	43	34.37	54	-11	34.28	8.38	34.03	102	248	Average
5350.22	53.03	44.4	74	-20.97	34.28	8.38	34.03	102	248	Peak
10640	46.37	31.64	54	-7.63	37.31	12.71	35.29	192	315	Average
10640	56.37	41.64	74	-17.63	37.31	12.71	35.29	192	315	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5320	91.61	83.03			34.25	8.35	34.02	129	172	Average
5320	98.45	89.87			34.25	8.35	34.02	129	172	Peak
5452.19	42.65	33.83	54	-11.35	34.36	8.51	34.05	129	172	Average
5452.19	53.3	44.48	74	-20.7	34.36	8.51	34.05	129	172	Peak
10640	46.52	31.79	54	-7.48	37.31	12.71	35.29	154	218	Average
10640	56.48	41.75	74	-17.52	37.31	12.71	35.29	154	218	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5460.08	44.75	35.93	54	-9.25	34.36	8.51	34.05	149	165	Average
5460.08	55.46	46.64	74	-18.54	34.36	8.51	34.05	149	165	Peak
*5470.48	63.42	54.59	68.2	-4.78	34.37	8.51	34.05	149	165	Peak
5500	94.65	85.73			34.4	8.57	34.05	160	188	Average
5500	101.96	93.04			34.4	8.57	34.05	160	188	Peak
11000	46.78	31.7	54	-7.22	37.6	12.96	35.48	132	180	Average
11000	57.11	42.03	74	-16.89	37.6	12.96	35.48	132	180	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5459.44	44.6	35.78	54	-9.4	34.36	8.51	34.05	118	172	Average
5459.44	56.87	48.05	74	-17.13	34.36	8.51	34.05	118	172	Peak
*5469.84	61.6	52.77	68.2	-6.6	34.37	8.51	34.05	118	172	Peak
5500	93.05	84.13			34.4	8.57	34.05	135	172	Average
5500	100.22	91.3			34.4	8.57	34.05	135	172	Peak
11000	46.62	31.54	54	-7.38	37.6	12.96	35.48	149	124	Average
11000	55.68	40.6	74	-18.32	37.6	12.96	35.48	149	124	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5455.6	42.48	33.66	54	-11.52	34.36	8.51	34.05	230	182	Average
5455.6	53.71	44.89	74	-20.29	34.36	8.51	34.05	230	182	Peak
*5469.04	51.97	43.14	68.2	-16.23	34.37	8.51	34.05	230	182	Peak
5580	94.44	85.45			34.47	8.6	34.08	230	182	Average
5580	101.73	92.74			34.47	8.6	34.08	230	182	Peak
*5724.44	53.06	43.9	68.2	-15.14	34.62	8.65	34.11	230	182	Peak
11160	46.68	31.6	54	-7.32	37.7	12.83	35.45	108	195	Average
11160	55.71	40.63	74	-18.29	37.7	12.83	35.45	108	195	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5453.04	43.07	34.25	54	-10.93	34.36	8.51	34.05	236	178	Average
5453.04	53.69	44.87	74	-20.31	34.36	8.51	34.05	236	178	Peak
*5469.84	52.16	43.33	68.2	-16.04	34.37	8.51	34.05	236	178	Peak
5580	92.68	83.69			34.47	8.6	34.08	236	178	Average
5580	100.08	91.09			34.47	8.6	34.08	236	178	Peak
*5724.04	51.71	42.55	68.2	-16.49	34.62	8.65	34.11	236	178	Peak
11160	46.58	31.5	54	-7.42	37.7	12.83	35.45	147	154	Average
11160	55.47	40.39	74	-18.53	37.7	12.83	35.45	147	154	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5580 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5700	94.2	85.07			34.59	8.64	34.1	176	129	Average
5700	101.77	92.64			34.59	8.64	34.1	176	129	Peak
*5725.32	57.6	48.44	68.2	-10.6	34.62	8.65	34.11	127	240	Peak
11400	46.82	31.72	54	-7.18	37.84	12.67	35.41	196	235	Average
11400	55.87	40.77	74	-18.13	37.84	12.67	35.41	196	235	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5700	93.24	84.11			34.59	8.64	34.1	124	178	Average
5700	100.52	91.39			34.59	8.64	34.1	124	178	Peak
*5724.44	56.15	46.99	68.2	-12.05	34.62	8.65	34.11	118	166	Peak
11400	46.27	31.17	54	-7.73	37.84	12.67	35.41	125	186	Average
11400	56.19	41.09	74	-17.81	37.84	12.67	35.41	125	186	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5700 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 144	**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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5448	42.59	33.76	54	-11.41	34.36	8.51	34.04	176	126	Average
5448	53.51	44.68	74	-20.49	34.36	8.51	34.04	176	126	Peak
*5469.08	51.92	43.09	68.2	-16.28	34.37	8.51	34.05	176	126	Peak
5720	94.11	84.95	54			8.65	34.11	176	126	Average
5720	101.51	92.35	74			8.65	34.11	176	126	Peak
*5853.5	56.55	47.23	78.2	-21.65	34.76	8.7	34.14	176	126	Peak
*5866	56.96	47.63	68.2	-11.24	34.76	8.71	34.14	176	126	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5455.3	42.43	33.61	54	-11.57	34.36	8.51	34.05	124	176	Average
5455.3	53.33	44.51	74	-20.67	34.36	8.51	34.05	124	176	Peak
*5465	53.01	44.18	68.2	-15.19	34.37	8.51	34.05	124	176	Peak
5720	93.11	83.95	54			8.65	34.11	124	176	Average
5720	100.35	91.19	74			8.65	34.11	124	176	Peak
*5857.6	55.96	46.64	78.2	-22.24	34.76	8.7	34.14	124	176	Peak
*5857.6	57.12	47.79	68.2	-11.08	34.76	8.71	34.14	124	176	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5720 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5745	94.07	84.88			34.64	8.66	34.11	176	133	Average
5745	101.37	92.18			34.64	8.66	34.11	176	133	Peak
11490	46.62	31.5	54	-7.38	37.89	12.62	35.39	136	284	Average
11490	57.25	42.13	74	-16.75	37.89	12.62	35.39	136	284	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5745	92.23	83.04			34.64	8.66	34.11	128	178	Average
5745	99.38	90.19			34.64	8.66	34.11	128	178	Peak
11490	46.53	31.41	54	-7.47	37.89	12.62	35.39	124	128	Average
11490	55.48	40.36	74	-18.52	37.89	12.62	35.39	124	128	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5577.175	52.27	43.27	68.2	-15.93	34.47	8.6	34.07	176	133	Peak
5651.725	49.17	40.08	69.48	-20.31	34.56	8.62	34.09	176	133	Peak
5923.675	51.57	42.17	69.18	-17.61	34.83	8.73	34.16	176	133	Peak
*5948.35	53.41	43.98	68.2	-14.79	34.85	8.74	34.16	176	133	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5618.125	52.88	43.83	68.2	-15.32	34.52	8.61	34.08	128	178	Peak
5652.25	49.95	40.86	69.86	-19.91	34.56	8.62	34.09	128	178	Peak
5922.625	50.15	40.75	69.96	-19.81	34.83	8.73	34.16	128	178	Peak
*5989.825	52.92	43.44	68.2	-15.28	34.9	8.75	34.17	128	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5785	94.34	85.11			34.68	8.68	34.13	176	133	Average
5785	101.91	92.68			34.68	8.68	34.13	176	133	Peak
11570	46.58	31.27	54	-7.42	38	12.68	35.37	149	223	Average
11570	56.19	40.88	74	-17.81	38	12.68	35.37	149	223	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5785	92.23	83			34.68	8.68	34.13	128	178	Average
5785	99.42	90.19			34.68	8.68	34.13	128	178	Peak
11570	46.25	30.94	54	-7.75	38	12.68	35.37	142	96	Average
11570	56.13	40.82	74	-17.87	38	12.68	35.37	142	96	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5575.6	53.23	44.23	68.2	-14.97	34.47	8.6	34.07	176	133	Peak
5651.725	50.43	41.34	69.48	-19.05	34.56	8.62	34.09	176	133	Peak
5923.675	50.09	40.69	69.18	-19.09	34.83	8.73	34.16	176	133	Peak
*6002.95	54	44.51	68.2	-14.2	34.9	8.76	34.17	176	133	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5629.675	53.04	43.99	68.2	-15.16	34.52	8.62	34.09	128	178	Peak
5651.725	51	41.91	69.48	-18.48	34.56	8.62	34.09	128	178	Peak
5923.15	51.03	41.63	69.57	-18.54	34.83	8.73	34.16	128	178	Peak
*6022.375	52.61	43.1	68.2	-15.59	34.92	8.77	34.18	128	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5825	94.81	85.52			34.73	8.69	34.13	176	133	Average
5825	101.58	92.29			34.73	8.69	34.13	176	133	Peak
11650	46.62	31.09	54	-7.38	38.09	12.8	35.36	195	174	Average
11650	55.53	40	74	-18.47	38.09	12.8	35.36	195	174	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5825	93.26	83.97			34.73	8.69	34.13	128	178	Average
5825	99.22	89.93			34.73	8.69	34.13	128	178	Peak
11650	46.34	30.81	54	-7.66	38.09	12.8	35.36	105	59	Average
11650	55.45	39.92	74	-18.55	38.09	12.8	35.36	105	59	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5566.15	54.15	45.16	68.2	-14.05	34.47	8.59	34.07	176	133	Peak
5651.725	51.12	42.03	69.48	-18.36	34.56	8.62	34.09	176	133	Peak
5923.15	49.7	40.3	69.57	-19.87	34.83	8.73	34.16	176	133	Peak
*5928.4	53.44	44.04	68.2	-14.76	34.83	8.73	34.16	176	133	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5621.8	52.77	43.72	68.2	-15.43	34.52	8.61	34.08	128	178	Peak
5651.725	50.15	41.06	69.48	-19.33	34.56	8.62	34.09	128	178	Peak
5923.675	50.49	41.09	69.18	-18.69	34.83	8.73	34.16	128	178	Peak
*5957.275	52.8	43.35	68.2	-15.4	34.87	8.74	34.16	128	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band

802.11ac (VHT20)

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5149.7	43.54	35.29	54	-10.46	34.12	8.13	34	195	244	Average
5149.7	54.08	45.83	74	-19.92	34.12	8.13	34	195	244	Peak
5180	94.35	86.04			34.15	8.16	34	195	244	Average
5180	102.58	94.27			34.15	8.16	34	195	244	Peak
*10360	55.08	40.78	68.2	-13.12	37.12	12.3	35.12	145	92	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5149.4	43.48	35.23	54	-10.52	34.12	8.13	34	116	161	Average
5149.4	53.33	45.08	74	-20.67	34.12	8.13	34	116	161	Peak
5180	91.71	83.4			34.15	8.16	34	116	161	Average
5180	100.16	91.85			34.15	8.16	34	116	161	Peak
*10360	55.91	41.61	68.2	-12.29	37.12	12.3	35.12	159	312	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5180 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 44	**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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5146.55	42.78	34.53	54	-11.22	34.12	8.13	34	195	244	Average
5146.55	53.35	45.1	74	-20.65	34.12	8.13	34	195	244	Peak
5220	94.9	86.51			34.17	8.22	34	195	244	Average
5220	102.7	94.31			34.17	8.22	34	195	244	Peak
5446.36	42.83	34	54	-11.17	34.36	8.51	34.04	195	244	Average
5446.36	53.92	45.09	74	-20.08	34.36	8.51	34.04	195	244	Peak
*10440	55.71	41.25	68.2	-12.49	37.16	12.47	35.17	125	212	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5132.45	42.76	34.54	54	-11.24	34.11	8.1	33.99	116	161	Average
5132.45	53.16	44.94	74	-20.84	34.11	8.1	33.99	116	161	Peak
5220	92.27	83.88			34.17	8.22	34	116	161	Average
5220	100.18	91.79			34.17	8.22	34	116	161	Peak
5354.84	42.69	34.06	54	-11.31	34.28	8.38	34.03	116	161	Average
5354.84	53.19	44.56	74	-20.81	34.28	8.38	34.03	116	161	Peak
*10440	55.73	41.27	68.2	-12.47	37.16	12.47	35.17	154	177	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5220 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5240	94.78	86.34			34.19	8.26	34.01	195	244	Average
5240	102.73	94.29			34.19	8.26	34.01	195	244	Peak
5448.34	42.95	34.12	54	-11.05	34.36	8.51	34.04	195	244	Average
5448.34	53.98	45.15	74	-20.02	34.36	8.51	34.04	195	244	Peak
*10480	55.54	41.03	68.2	-12.66	37.19	12.53	35.21	185	49	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5240	92.26	83.82			34.19	8.26	34.01	116	161	Average
5240	100.76	92.32			34.19	8.26	34.01	116	161	Peak
5439.43	42.93	34.14	54	-11.07	34.35	8.48	34.04	116	161	Average
5439.43	53.3	44.51	74	-20.7	34.35	8.48	34.04	116	161	Peak
*10480	55.15	40.64	68.2	-13.05	37.19	12.53	35.21	164	199	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5126.75	42.36	34.14	54	-11.64	34.11	8.1	33.99	102	248	Average
5126.75	52.97	44.75	74	-21.03	34.11	8.1	33.99	102	248	Peak
5260	93.63	85.17			34.21	8.26	34.01	102	248	Average
5260	101.31	92.85			34.21	8.26	34.01	102	248	Peak
*10520	55.48	40.89	68.2	-12.72	37.21	12.61	35.23	112	95	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5138.6	42.21	33.96	54	-11.79	34.11	8.13	33.99	129	172	Average
5138.6	53.93	45.68	74	-20.07	34.11	8.13	33.99	129	172	Peak
5260	90.6	82.14			34.21	8.26	34.01	129	172	Average
5260	98.59	90.13			34.21	8.26	34.01	129	172	Peak
*10520	55.79	41.2	68.2	-12.41	37.21	12.61	35.23	192	257	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5149.4	42.41	34.16	54	-11.59	34.12	8.13	34	102	248	Average
5149.4	53.07	44.82	74	-20.93	34.12	8.13	34	102	248	Peak
5300	92.79	84.25			34.24	8.32	34.02	102	248	Average
5300	100.63	92.09			34.24	8.32	34.02	102	248	Peak
5438.88	42.49	33.7	54	-11.51	34.35	8.48	34.04	102	248	Average
5438.88	53.83	45.04	74	-20.17	34.35	8.48	34.04	102	248	Peak
10600	46.23	31.55	54	-7.77	37.28	12.67	35.27	176	231	Average
10600	55.31	40.63	74	-18.69	37.28	12.67	35.27	176	231	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5109.95	42.31	34.11	54	-11.69	34.09	8.1	33.99	129	172	Average
5109.95	52.75	44.55	74	-21.25	34.09	8.1	33.99	129	172	Peak
5300	90.38	81.84			34.24	8.32	34.02	129	172	Average
5300	97.54	89			34.24	8.32	34.02	129	172	Peak
5354.29	42.56	33.93	54	-11.44	34.28	8.38	34.03	129	172	Average
5354.29	53.4	44.77	74	-20.6	34.28	8.38	34.03	129	172	Peak
10600	46.43	31.75	54	-7.57	37.28	12.67	35.27	128	175	Average
10600	55.39	40.71	74	-18.61	37.28	12.67	35.27	128	175	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5300 MHz: Fundamental Frequency

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5320	92.43	83.85			34.25	8.35	34.02	102	248	Average
5320	100.7	92.12			34.25	8.35	34.02	102	248	Peak
5350.88	42.94	34.31	54	-11.06	34.28	8.38	34.03	102	248	Average
5350.88	52.66	44.03	74	-21.34	34.28	8.38	34.03	102	248	Peak
10640	46.64	31.91	54	-7.36	37.31	12.71	35.29	168	283	Average
10640	56.18	41.45	74	-17.82	37.31	12.71	35.29	168	283	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5320	90.23	81.65			34.25	8.35	34.02	129	172	Average
5320	97.22	88.64			34.25	8.35	34.02	129	172	Peak
5447.46	42.58	33.75	54	-11.42	34.36	8.51	34.04	129	172	Average
5447.46	53.15	44.32	74	-20.85	34.36	8.51	34.04	129	172	Peak
10640	46.33	31.6	54	-7.67	37.31	12.71	35.29	132	158	Average
10640	56.42	41.69	74	-17.58	37.31	12.71	35.29	132	158	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5459.92	43.05	34.23	54	-10.95	34.36	8.51	34.05	137	109	Average
5459.92	53.84	45.02	74	-20.16	34.36	8.51	34.05	137	109	Peak
*5470.64	61.86	53.03	68.2	-6.34	34.37	8.51	34.05	137	109	Peak
5500	92.67	83.75			34.4	8.57	34.05	160	188	Average
5500	100.6	91.68			34.4	8.57	34.05	160	188	Peak
11000	46.71	31.63	54	-7.29	37.6	12.96	35.48	165	302	Average
11000	56.43	41.35	74	-17.57	37.6	12.96	35.48	165	302	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5458.96	42.95	34.13	54	-11.05	34.36	8.51	34.05	152	166	Average
5458.96	53.47	44.65	74	-20.53	34.36	8.51	34.05	152	166	Peak
*5470.64	60.24	51.41	68.2	-7.96	34.37	8.51	34.05	152	166	Peak
5500	90.77	81.85			34.4	8.57	34.05	135	172	Average
5500	98.66	89.74			34.4	8.57	34.05	135	172	Peak
11000	46.21	31.13	54	-7.79	37.6	12.96	35.48	184	116	Average
11000	55.33	40.25	74	-18.67	37.6	12.96	35.48	184	116	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5457.68	42.41	33.59	54	-11.59	34.36	8.51	34.05	230	182	Average
5457.68	53.83	45.01	74	-20.17	34.36	8.51	34.05	230	182	Peak
*5468.4	51.35	42.52	68.2	-16.85	34.37	8.51	34.05	230	182	Peak
5580	92.7	83.71			34.47	8.6	34.08	230	182	Average
5580	100.45	91.46			34.47	8.6	34.08	230	182	Peak
*5724.04	52.48	43.32	68.2	-15.72	34.62	8.65	34.11	230	182	Peak
11600	46.59	31.16	54	-7.41	38.04	12.76	35.37	195	264	Average
11600	55.76	40.33	74	-18.24	38.04	12.76	35.37	195	264	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5458.32	42.43	33.61	54	-11.57	34.36	8.51	34.05	236	178	Average
5458.32	52.94	44.12	74	-21.06	34.36	8.51	34.05	236	178	Peak
*5468.88	50.96	42.13	68.2	-17.24	34.37	8.51	34.05	236	178	Peak
5580	91.49	82.5			34.47	8.6	34.08	236	178	Average
5580	99.12	90.13			34.47	8.6	34.08	236	178	Peak
*5725.4	53.04	43.88	68.2	-15.16	34.62	8.65	34.11	236	178	Peak
11600	46.62	31.19	54	-7.38	38.04	12.76	35.37	195	165	Average
11600	55.82	40.39	74	-18.18	38.04	12.76	35.37	195	165	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5580 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5700	92.42	83.29			34.59	8.64	34.1	176	129	Average
5700	100.2	91.07			34.59	8.64	34.1	176	129	Peak
*5724.36	55.55	46.39	68.2	-12.65	34.62	8.65	34.11	171	129	Peak
11400	46.68	31.58	54	-7.32	37.84	12.67	35.41	156	250	Average
11400	55.87	40.77	74	-18.13	37.84	12.67	35.41	156	250	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5700	92.05	82.92			34.59	8.64	34.1	124	178	Average
5700	99.28	90.15			34.59	8.64	34.1	124	178	Peak
*5724.68	54.47	45.31	68.2	-13.73	34.62	8.65	34.11	116	174	Peak
11400	46.31	31.21	54	-7.69	37.84	12.67	35.41	163	219	Average
11400	56.18	41.08	74	-17.82	37.84	12.67	35.41	163	219	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5700 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 144	**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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5443.88	42.35	33.56	54	-11.65	34.35	8.48	34.04	176	128	Average
5443.88	52.66	43.87	74	-21.34	34.35	8.48	34.04	176	128	Peak
*5469.78	51.58	42.75	68.2	-16.62	34.37	8.51	34.05	176	128	Peak
5720	92.23	83.07			34.62	8.65	34.11	176	128	Average
5720	100.12	90.96			34.62	8.65	34.11	176	128	Peak
*5857.6	56.52	47.2	78.2	-21.68	34.76	8.7	34.14	176	128	Peak
*5867.6	56.59	47.26	68.2	-11.61	34.76	8.71	34.14	176	128	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5455.6	42.36	33.54	54	-11.64	34.36	8.51	34.05	124	178	Average
5455.6	53.36	44.54	74	-20.64	34.36	8.51	34.05	124	178	Peak
*5468.9	52.24	43.41	68.2	-15.96	34.37	8.51	34.05	124	178	Peak
5720	91.26	82.1			34.62	8.65	34.11	124	178	Average
5720	98.88	89.72			34.62	8.65	34.11	124	178	Peak
*5857.2	56.98	47.66	78.2	-21.22	34.76	8.7	34.14	124	178	Peak
*5865	56.83	47.5	68.2	-11.37	34.76	8.71	34.14	124	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5720 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5745	92.27	83.08			34.64	8.66	34.11	176	133	Average
5745	100.61	91.42			34.64	8.66	34.11	176	133	Peak
11490	46.63	31.51	54	-7.37	37.89	12.62	35.39	146	231	Average
11490	56.78	41.66	74	-17.22	37.89	12.62	35.39	146	231	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5745	90.57	81.38			34.64	8.66	34.11	128	178	Average
5745	98.43	89.24			34.64	8.66	34.11	128	178	Peak
11490	46.23	31.11	54	-7.77	37.89	12.62	35.39	152	108	Average
11490	55.41	40.29	74	-18.59	37.89	12.62	35.39	152	108	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5567.2	53.55	44.56	68.2	-14.65	34.47	8.59	34.07	176	133	Peak
5652.25	51.56	42.47	69.86	-18.3	34.56	8.62	34.09	176	133	Peak
5922.625	48.79	39.39	69.96	-21.17	34.83	8.73	34.16	176	133	Peak
*6003.475	53.41	43.92	68.2	-14.79	34.9	8.76	34.17	176	133	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5623.9	54.04	44.99	68.2	-14.16	34.52	8.61	34.08	128	178	Peak
5652.25	49.66	40.57	69.86	-20.2	34.56	8.62	34.09	128	178	Peak
5923.15	49.97	40.57	69.57	-19.6	34.83	8.73	34.16	128	178	Peak
*5948.875	52.84	43.41	68.2	-15.36	34.85	8.74	34.16	128	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5785	93.71	84.48			34.68	8.68	34.13	176	133	Average
5785	100.82	91.59			34.68	8.68	34.13	176	133	Peak
11570	46.52	31.21	54	-7.48	38	12.68	35.37	152	228	Average
11570	56.39	41.08	74	-17.61	38	12.68	35.37	152	228	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5785	90.87	81.64			34.68	8.68	34.13	128	178	Average
5785	98.33	89.1			34.68	8.68	34.13	128	178	Peak
11570	46.29	30.98	54	-7.71	38	12.68	35.37	125	85	Average
11570	55.86	40.55	74	-18.14	38	12.68	35.37	125	85	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5528.35	53.47	44.54	68.2	-14.73	34.42	8.58	34.07	176	133	Peak
5652.25	50.03	40.94	69.86	-19.83	34.56	8.62	34.09	176	133	Peak
5922.625	51.16	41.76	69.96	-18.8	34.83	8.73	34.16	176	133	Peak
*5962.525	52.87	43.43	68.2	-15.33	34.87	8.74	34.17	176	133	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5596.075	53.67	44.66	68.2	-14.53	34.49	8.6	34.08	128	178	Peak
5651.2	49.7	40.61	69.09	-19.39	34.56	8.62	34.09	128	178	Peak
5923.675	50.49	41.09	69.18	-18.69	34.83	8.73	34.16	128	178	Peak
*5945.2	52.34	42.91	68.2	-15.86	34.85	8.74	34.16	128	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5825	92.93	83.64			34.73	8.69	34.13	176	133	Average
5825	100.58	91.29			34.73	8.69	34.13	176	133	Peak
11650	46.72	31.19	54	-7.28	38.09	12.8	35.36	195	214	Average
11650	56.38	40.85	74	-17.62	38.09	12.8	35.36	195	214	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5825	91.11	81.82			34.73	8.69	34.13	128	178	Average
5825	98.21	88.92			34.73	8.69	34.13	128	178	Peak
11650	46.28	30.75	54	-7.72	38.09	12.8	35.36	187	154	Average
11650	56.05	40.52	74	-17.95	38.09	12.8	35.36	187	154	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5554.075	52.78	43.81	68.2	-15.42	34.45	8.59	34.07	176	133	Peak
5651.725	51.06	41.97	69.48	-18.42	34.56	8.62	34.09	176	133	Peak
5923.15	52.73	43.33	69.57	-16.84	34.83	8.73	34.16	176	133	Peak
*5992.975	52.35	42.86	68.2	-15.85	34.9	8.76	34.17	176	133	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5575.6	53.35	44.35	68.2	-14.85	34.47	8.6	34.07	128	178	Peak
5652.25	50.5	41.41	69.86	-19.36	34.56	8.62	34.09	128	178	Peak
5923.675	50.48	41.08	69.18	-18.7	34.83	8.73	34.16	128	178	Peak
*5968.825	52.74	43.29	68.2	-15.46	34.87	8.75	34.17	128	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band

802.11ac (VHT40)

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5149.85	49.96	41.71	54	-4.04	34.12	8.13	34	200	244	Peak
5149.85	60.04	51.79	74	-13.96	34.12	8.13	34	200	244	Peak
5190	91.72	83.38			34.15	8.19	34	195	244	Average
5190	99.16	90.82			34.15	8.19	34	195	244	Peak
5386.19	43.4	34.72	54	-10.6	34.31	8.41	34.04	200	244	Average
5386.19	54.13	45.45	74	-19.87	34.31	8.41	34.04	200	244	Peak
*10380	55.09	40.74	68.2	-13.11	37.13	12.36	35.14	195	226	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5149.85	49.29	41.04	54	-4.71	34.12	8.13	34	108	149	Peak
5149.85	58.53	50.28	74	-15.47	34.12	8.13	34	108	149	Peak
5190	89.56	81.22			34.15	8.19	34	116	161	Average
5190	97.34	89			34.15	8.19	34	116	161	Peak
5432.06	43.37	34.58	54	-10.63	34.35	8.48	34.04	116	161	Average
5432.06	53.65	44.86	74	-20.35	34.35	8.48	34.04	116	161	Peak
*10380	55.51	41.16	68.2	-12.69	37.13	12.36	35.14	124	85	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5190 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5138.6	43.3	35.05	54	-10.7	34.11	8.13	33.99	195	244	Average
5138.6	53.39	45.14	74	-20.61	34.11	8.13	33.99	195	244	Peak
5230	92.08	83.68			34.19	8.22	34.01	195	244	Average
5230	99.46	91.06			34.19	8.22	34.01	195	244	Peak
5374.53	43.35	34.69	54	-10.65	34.29	8.41	34.04	195	244	Average
5374.53	53.51	44.85	74	-20.49	34.29	8.41	34.04	195	244	Peak
*10460	55.01	40.5	68.2	-13.19	37.17	12.53	35.19	154	122	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5133.35	43.17	34.92	54	-10.83	34.11	8.13	33.99	116	161	Average
5133.35	53.43	45.18	74	-20.57	34.11	8.13	33.99	116	161	Peak
5230	90.32	81.92			34.19	8.22	34.01	116	161	Average
5230	97.73	89.33			34.19	8.22	34.01	116	161	Peak
5454.39	43.22	34.4	54	-10.78	34.36	8.51	34.05	116	161	Average
5454.39	53.52	44.7	74	-20.48	34.36	8.51	34.05	116	161	Peak
*10460	54.78	40.27	68.2	-13.42	37.17	12.53	35.19	124	195	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5230 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5084.75	42.78	34.62	54	-11.22	34.07	8.07	33.98	102	248	Average
5084.75	52.9	44.74	74	-21.1	34.07	8.07	33.98	102	248	Peak
5270	90.46	81.97			34.21	8.29	34.01	102	248	Average
5270	97.01	88.52			34.21	8.29	34.01	102	248	Peak
5449.77	43.02	34.2	54	-10.98	34.36	8.51	34.05	102	248	Average
5449.77	52.99	44.17	74	-21.01	34.36	8.51	34.05	102	248	Peak
*10540	56.39	41.77	68.2	-11.81	37.23	12.63	35.24	195	226	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5137.1	42.72	34.47	54	-11.28	34.11	8.13	33.99	129	172	Average
5137.1	52.71	44.46	74	-21.29	34.11	8.13	33.99	129	172	Peak
5270	87.05	78.56			34.21	8.29	34.01	129	172	Average
5270	94.59	86.1			34.21	8.29	34.01	129	172	Peak
5358.91	42.89	34.26	54	-11.11	34.28	8.38	34.03	129	172	Average
5358.91	53.34	44.71	74	-20.66	34.28	8.38	34.03	129	172	Peak
*10540	55.55	40.93	68.2	-12.65	37.23	12.63	35.24	123	148	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5270 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5119.25	42.38	34.18	54	-11.62	34.09	8.1	33.99	102	248	Average
5119.25	53.52	45.32	74	-20.48	34.09	8.1	33.99	102	248	Peak
5310	90.05	81.5			34.25	8.32	34.02	102	248	Average
5310	97.73	89.18			34.25	8.32	34.02	102	248	Peak
5352.42	45.62	36.99	54	-8.38	34.28	8.38	34.03	121	249	Average
5352.42	56.11	47.48	74	-17.89	34.28	8.38	34.03	121	249	Peak
10620	46.63	31.92	54	-7.37	37.3	12.69	35.28	195	246	Average
10620	55.73	41.02	74	-18.27	37.3	12.69	35.28	195	246	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5086.1	42.37	34.21	54	-11.63	34.07	8.07	33.98	129	172	Average
5086.1	52.89	44.73	74	-21.11	34.07	8.07	33.98	129	172	Peak
5310	87.06	78.51			34.25	8.32	34.02	129	172	Average
5310	94.65	86.1			34.25	8.32	34.02	129	172	Peak
5445.59	42.42	33.59	54	-11.58	34.36	8.51	34.04	129	172	Average
5445.59	52.84	44.01	74	-21.16	34.36	8.51	34.04	129	172	Peak
10620	46.75	32.04	54	-7.25	37.3	12.69	35.28	125	164	Average
10620	56.61	41.9	74	-17.39	37.3	12.69	35.28	125	164	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5310 MHz: Fundamental Frequency

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5458	46	37.18	54	-8	34.36	8.51	34.05	132	190	Average
5458	57.41	48.59	74	-16.59	34.36	8.51	34.05	132	190	Peak
*5470.96	65.23	56.37	68.2	-2.97	34.37	8.54	34.05	132	190	Peak
5510	89.51	80.6			34.4	8.57	34.06	160	188	Average
5510	96.84	87.93			34.4	8.57	34.06	160	188	Peak
*5724.28	53.06	43.9	68.2	-15.14	34.62	8.65	34.11	132	190	Peak
11020	46.29	31.22	54	-7.71	37.61	12.94	35.48	154	29	Average
11020	56.07	41	74	-17.93	37.61	12.94	35.48	154	29	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5457.52	45.94	37.12	54	-8.06	34.36	8.51	34.05	139	202	Average
5457.52	56.14	47.32	74	-17.86	34.36	8.51	34.05	139	202	Peak
*5470.96	63.53	54.67	68.2	-4.67	34.37	8.54	34.05	139	202	Peak
5510	87.34	78.43			34.4	8.57	34.06	135	172	Average
5510	94.67	85.76			34.4	8.57	34.06	135	172	Peak
*5725.24	52.31	43.15	68.2	-15.89	34.62	8.65	34.11	135	172	Peak
11020	46.36	31.29	54	-7.64	37.61	12.94	35.48	135	206	Average
11020	56.15	41.08	74	-17.85	37.61	12.94	35.48	135	206	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5510 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5369.04	42.94	34.27	54	-11.06	34.29	8.41	34.03	230	182	Average
5369.04	52.68	44.01	74	-21.32	34.29	8.41	34.03	230	182	Peak
*5470.64	51.89	43.06	68.2	-16.31	34.37	8.51	34.05	230	182	Peak
5550	89.4	80.43			34.45	8.59	34.07	230	182	Average
5550	96.64	87.67			34.45	8.59	34.07	230	182	Peak
*5725.56	52.15	42.99	68.2	-16.05	34.62	8.65	34.11	230	182	Peak
11000	46.72	31.64	54	-7.28	37.6	12.96	35.48	187	211	Average
11000	55.93	40.85	74	-18.07	37.6	12.96	35.48	187	211	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5447.28	42.45	33.62	54	-11.55	34.36	8.51	34.04	236	178	Average
5447.28	52.98	44.15	74	-21.02	34.36	8.51	34.04	236	178	Peak
*5469.36	51.56	42.73	68.2	-16.64	34.37	8.51	34.05	236	178	Peak
5550	87.16	78.19			34.45	8.59	34.07	236	178	Average
5550	94.34	85.37			34.45	8.59	34.07	236	178	Peak
*5724.44	52.52	43.36	68.2	-15.68	34.62	8.65	34.11	236	178	Peak
11000	46.54	31.46	54	-7.46	37.6	12.96	35.48	124	165	Average
11000	55.23	40.15	74	-18.77	37.6	12.96	35.48	124	165	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5550 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5441.52	42.96	34.17	54	-11.04	34.35	8.48	34.04	176	129	Average
5441.52	53.97	45.18	74	-20.03	34.35	8.48	34.04	176	129	Peak
*5470.64	52.19	43.36	68.2	-16.01	34.37	8.51	34.05	176	129	Peak
5670	89.64	80.54			34.57	8.63	34.1	176	129	Average
5670	96.48	87.38			34.57	8.63	34.1	176	129	Peak
*5725.4	52.8	43.64	68.2	-15.4	34.62	8.65	34.11	176	129	Peak
11340	46.37	31.28	54	-7.63	37.8	12.71	35.42	156	230	Average
11340	56.28	41.19	74	-17.72	37.8	12.71	35.42	156	230	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5432.08	42.86	34.07	54	-11.14	34.35	8.48	34.04	124	178	Average
5432.08	53.28	44.49	74	-20.72	34.35	8.48	34.04	124	178	Peak
*5470.8	51.87	43.01	68.2	-16.33	34.37	8.54	34.05	124	178	Peak
5670	87.35	78.25			34.57	8.63	34.1	124	178	Average
5670	94.71	85.61			34.57	8.63	34.1	124	178	Peak
*5724.44	53.48	44.32	68.2	-14.72	34.62	8.65	34.11	124	178	Peak
11340	46.63	31.54	54	-7.37	37.8	12.71	35.42	125	168	Average
11340	56.91	41.82	74	-17.09	37.8	12.71	35.42	125	168	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5670 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5458.2	42.75	33.93	54	-11.25	34.36	8.51	34.05	176	128	Average
5458.2	52.76	43.94	74	-21.24	34.36	8.51	34.05	176	128	Peak
*5469.15	52.21	43.38	68.2	-15.99	34.37	8.51	34.05	176	128	Peak
5710	89.48	80.33			34.61	8.65	34.11	176	128	Average
5710	96.13	86.98			34.61	8.65	34.11	176	128	Peak
*5851	57.77	48.45	78.2	-20.43	34.76	8.7	34.14	176	128	Peak
*5862	57.12	47.79	68.2	-11.08	34.76	8.71	34.14	176	128	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5455	42.89	34.12	54	-11.11	34.33	8.48	34.04	124	178	Average
5455	53.69	44.92	74	-20.31	34.33	8.48	34.04	124	178	Peak
*5468.6	52.33	43.5	68.2	-15.87	34.37	8.51	34.05	124	178	Peak
5710	87.03	77.88			34.61	8.65	34.11	124	178	Average
5710	94.56	85.41			34.61	8.65	34.11	124	178	Peak
*5857	57.13	47.81	78.2	-21.07	34.76	8.7	34.14	124	178	Peak
*5862	55.69	46.36	68.2	-12.51	34.76	8.71	34.14	124	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5710 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5755	89.06	79.85			34.66	8.66	34.11	176	133	Average
5755	96.32	87.11			34.66	8.66	34.11	176	133	Peak
11510	46.55	31.44	54	-7.45	37.9	12.6	35.39	169	327	Average
11510	56.29	41.18	74	-17.71	37.9	12.6	35.39	169	327	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5755	86.84	77.63			34.66	8.66	34.11	128	178	Average
5755	94.11	84.9			34.66	8.66	34.11	128	178	Peak
11510	46.6	31.49	54	-7.4	37.9	12.6	35.39	149	267	Average
11510	56.55	41.44	74	-17.45	37.9	12.6	35.39	149	267	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5516.275	53.21	44.28	68.2	-14.99	34.42	8.57	34.06	176	133	Peak
5651.725	50.91	41.82	69.48	-18.57	34.56	8.62	34.09	176	133	Peak
5923.675	48.72	39.32	69.18	-20.46	34.83	8.73	34.16	176	133	Peak
*5979.85	53.06	43.6	68.2	-15.14	34.88	8.75	34.17	176	133	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5574.025	52.76	43.77	68.2	-15.44	34.47	8.59	34.07	128	178	Peak
5652.25	50.39	41.3	69.86	-19.47	34.56	8.62	34.09	128	178	Peak
5923.15	50.3	40.9	69.57	-19.27	34.83	8.73	34.16	128	178	Peak
*5965.675	53.73	44.28	68.2	-14.47	34.87	8.75	34.17	128	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5755 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5795	89.32	80.08			34.69	8.68	34.13	176	133	Average
5795	96.56	87.32			34.69	8.68	34.13	176	133	Peak
11590	46.32	30.95	54	-7.68	38.02	12.72	35.37	158	216	Average
11590	56.21	40.84	74	-17.79	38.02	12.72	35.37	158	216	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5795	87.39	78.15			34.69	8.68	34.13	128	178	Average
5795	94.26	85.02			34.69	8.68	34.13	128	178	Peak
11590	46.31	30.94	54	-7.69	38.02	12.72	35.37	196	131	Average
11590	56.05	40.68	74	-17.95	38.02	12.72	35.37	196	131	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5578.225	53.17	44.18	68.2	-15.03	34.47	8.6	34.08	176	133	Peak
5651.725	50.06	40.97	69.48	-19.42	34.56	8.62	34.09	176	133	Peak
5923.675	48.71	39.31	69.18	-20.47	34.83	8.73	34.16	176	133	Peak
*5942.05	52.68	43.25	68.2	-15.52	34.85	8.74	34.16	176	133	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5621.275	53.75	44.7	68.2	-14.45	34.52	8.61	34.08	128	178	Peak
5651.725	51.01	41.92	69.48	-18.47	34.56	8.62	34.09	128	178	Peak
5923.15	49.91	40.51	69.57	-19.66	34.83	8.73	34.16	128	178	Peak
*6013.45	53.45	43.95	68.2	-14.75	34.92	8.76	34.18	128	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5795 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5142.8	52.58	44.32	54	-1.42	34.12	8.13	33.99	200	244	Average
5142.8	63	54.74	74	-11	34.12	8.13	33.99	200	244	Peak
5210	89.82	81.46			34.17	8.19	34	103	244	Average
5210	96.39	88.03			34.17	8.19	34	103	244	Peak
5449.33	43.66	34.83	54	-10.34	34.36	8.51	34.04	200	244	Average
5449.33	53.36	44.53	74	-20.64	34.36	8.51	34.04	200	244	Peak
*10420	54.27	39.86	68.2	-13.93	37.15	12.42	35.16	195	172	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5145.65	51.5	43.25	54	-2.5	34.12	8.13	34	130	161	Average
5145.65	60.83	52.58	74	-13.17	34.12	8.13	34	116	161	Peak
5210	87.73	79.37			34.17	8.19	34	116	161	Average
5210	94.11	85.75			34.17	8.19	34	116	161	Peak
5460	43.52	34.7	54	-10.48	34.36	8.51	34.05	116	161	Average
5460	53.71	44.89	74	-20.29	34.36	8.51	34.05	130	161	Peak
*10420	54.5	40.09	68.2	-13.7	37.15	12.42	35.16	134	185	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5210 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5130.35	42.87	34.65	54	-11.13	34.11	8.1	33.99	102	248	Average
5130.35	52.8	44.58	74	-21.2	34.11	8.1	33.99	102	248	Peak
5290	86.42	77.89			34.23	8.32	34.02	102	248	Average
5290	94.08	85.55			34.23	8.32	34.02	102	248	Peak
5355.5	49.09	40.46	54	-4.91	34.28	8.38	34.03	125	260	Average
5355.5	58.11	49.48	74	-15.89	34.28	8.38	34.03	125	260	Peak
*10580	55.73	41.08	68.2	-12.47	37.27	12.65	35.27	154	46	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5115.35	42.87	34.67	54	-11.13	34.09	8.1	33.99	102	248	Average
5115.35	52.77	44.57	74	-21.23	34.09	8.1	33.99	102	248	Peak
5290	83.77	75.24			34.23	8.32	34.02	102	248	Average
5290	91.21	82.68			34.23	8.32	34.02	102	248	Peak
5350.77	47.54	38.91	54	-6.46	34.28	8.38	34.03	158	199	Average
5350.77	57.82	49.19	74	-16.18	34.28	8.38	34.03	158	199	Peak
*10580	56.66	42.01	68.2	-11.54	37.27	12.65	35.27	131	85	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5290 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5459.92	52.77	43.95	54	-1.23	34.36	8.51	34.05	160	193	Average
5459.92	61.62	52.8	74	-12.38	34.36	8.51	34.05	160	193	Peak
*5468.08	64.44	55.61	68.2	-3.76	34.37	8.51	34.05	140	119	Peak
5530	82.69	73.76			34.42	8.58	34.07	140	188	Average
5530	89.87	80.94			34.42	8.58	34.07	140	188	Peak
*5725.56	51.86	42.7	68.2	-16.34	34.62	8.65	34.11	160	193	Peak
11060	46.69	31.61	54	-7.31	37.64	12.91	35.47	156	211	Average
11060	55.9	40.82	74	-18.1	37.64	12.91	35.47	156	211	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5452.08	50.81	41.99	54	-3.19	34.36	8.51	34.05	107	195	Average
5452.08	61.32	52.5	74	-12.68	34.36	8.51	34.05	107	195	Peak
*5468.56	62.08	53.25	68.2	-6.12	34.37	8.51	34.05	113	154	Peak
5530	82.82	73.89			34.42	8.58	34.07	113	178	Average
5530	90.08	81.15			34.42	8.58	34.07	113	178	Peak
*5723.96	52.17	43.01	68.2	-16.03	34.62	8.65	34.11	107	195	Peak
11060	46.52	31.44	54	-7.48	37.64	12.91	35.47	121	190	Average
11060	55.46	40.38	74	-18.54	37.64	12.91	35.47	121	190	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5530 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5459.6	43.41	34.59	54	-10.59	34.36	8.51	34.05	208	182	Average
5459.6	53.29	44.47	74	-20.71	34.36	8.51	34.05	208	182	Peak
*5469.52	52.64	43.81	68.2	-15.56	34.37	8.51	34.05	208	182	Peak
5610	85.88	76.85			34.5	8.61	34.08	208	182	Average
5610	93.22	84.19			34.5	8.61	34.08	208	182	Peak
*5724.68	52.45	43.29	68.2	-15.75	34.62	8.65	34.11	208	182	Peak
11220	46.71	31.62	54	-7.29	37.73	12.8	35.44	139	234	Average
11220	56.84	41.75	74	-17.16	37.73	12.8	35.44	139	234	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5457.04	43.53	34.71	54	-10.47	34.36	8.51	34.05	236	178	Average
5457.04	53.12	44.3	74	-20.88	34.36	8.51	34.05	236	178	Peak
*5470.48	52.12	43.29	68.2	-16.08	34.37	8.51	34.05	236	178	Peak
5610	84.52	75.49			34.5	8.61	34.08	236	178	Average
5610	92.01	82.98			34.5	8.61	34.08	236	178	Peak
*5725.08	53.51	44.35	68.2	-14.69	34.62	8.65	34.11	236	178	Peak
11220	46.38	31.29	54	-7.62	37.73	12.8	35.44	152	86	Average
11220	56.16	41.07	74	-17.84	37.73	12.8	35.44	152	86	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5610 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5458.7	43.02	34.2	54	-10.98	34.36	8.51	34.05	206	185	Average
5458.7	53.03	44.21	74	-20.97	34.36	8.51	34.05	206	185	Peak
*5468.8	51.33	42.5	68.2	-16.87	34.37	8.51	34.05	206	185	Peak
5690	85.12	75.99			34.59	8.64	34.1	206	185	Average
5690	92.46	83.33			34.59	8.64	34.1	206	185	Peak
*5851	57.26	47.94	78.2	-20.94	34.76	8.7	34.14	206	185	Peak
*5863	56.63	47.3	68.2	-11.57	34.76	8.71	34.14	206	185	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5458.7	43.21	34.38	54	-10.79	34.36	8.51	34.04	236	178	Average
5458.7	53.18	44.35	74	-20.82	34.36	8.51	34.04	236	178	Peak
*5469.8	51.53	42.7	68.2	-16.67	34.37	8.51	34.05	236	178	Peak
5690	83.88	74.75			34.59	8.64	34.1	236	178	Average
5690	91.31	82.18			34.59	8.64	34.1	236	178	Peak
*5859.4	56.86	47.54	78.2	-21.34	34.76	8.7	34.14	236	178	Peak
*5863.3	57.11	47.78	68.2	-11.09	34.76	8.71	34.14	236	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5690 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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**	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5775	86.34	77.11			34.68	8.67	34.12	176	133	Average
5775	93.92	84.69			34.68	8.67	34.12	176	133	Peak
11550	46.69	31.42	54	-7.31	37.97	12.68	35.38	147	321	Average
11550	55.89	40.62	74	-18.11	37.97	12.68	35.38	147	321	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5775	84.19	74.96			34.68	8.67	34.12	128	178	Average
5775	91.96	82.73			34.68	8.67	34.12	128	178	Peak
11550	46.37	31.1	54	-7.63	37.97	12.68	35.38	146	224	Average
11550	56.5	41.23	74	-17.5	37.97	12.68	35.38	146	224	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5524.675	52.79	43.85	68.2	-15.41	34.42	8.58	34.06	176	133	Peak
5651.725	49.91	40.82	69.48	-19.57	34.56	8.62	34.09	176	133	Peak
5923.675	50.38	40.98	69.18	-18.8	34.83	8.73	34.16	176	133	Peak
*5984.05	52.65	43.19	68.2	-15.55	34.88	8.75	34.17	176	133	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
*5619.175	52.51	43.46	68.2	-15.69	34.52	8.61	34.08	128	178	Peak
5651.725	51.57	42.48	69.48	-17.91	34.56	8.62	34.09	128	178	Peak
5923.15	50.44	41.04	69.57	-19.13	34.83	8.73	34.16	128	178	Peak
*6009.25	52.74	43.23	68.2	-15.46	34.92	8.76	34.17	128	178	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5775 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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:

<Mode A>

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 106	**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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
99.66	23.14	41.84	43.5	-20.36	12.28	1.28	32.26	154	44	Peak
138	23.41	45.75	43.5	-20.09	8.54	1.38	32.26	155	124	Peak
293.52	29.73	46.89	46	-16.27	12.94	2.03	32.13	127	297	Peak
323.8	25.96	42.33	46	-20.04	13.62	2.11	32.1	135	102	Peak
647.9	26.06	36.81	46	-19.94	18.41	2.99	32.15	198	305	Peak
810.3	24.83	33.03	46	-21.17	20.49	3.32	32.01	177	7	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
45.93	25.56	42.47	40	-14.44	14.41	0.9	32.22	197	126	Peak
138	20.03	42.37	43.5	-23.47	8.54	1.38	32.26	180	44	Peak
294.87	27.62	44.76	46	-18.38	12.96	2.03	32.13	147	7	Peak
300	26.97	44.02	46	-19.03	13.06	2.03	32.14	109	147	Peak
499.5	27.86	40.98	46	-18.14	16.35	2.63	32.1	147	7	Peak
749.4	28.87	37.99	46	-17.13	19.81	3.22	32.15	197	58	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value

<Mode B>

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 106	**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**	Karl Lee

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
98.58	21.38	42.73	43.5	-22.12	9.58	1.28	32.21	137	190	Peak
160.41	20.84	40.79	43.5	-22.66	10.8	1.52	32.27	162	214	Peak
268.95	15.52	32.15	46	-30.48	13.54	1.94	32.11	151	345	Peak
345.5	18.54	32.28	46	-27.46	16.14	2.19	32.07	189	247	Peak
715.8	19.93	25.66	46	-26.07	23.27	3.11	32.11	162	138	Peak
921.6	20.51	22.1	46	-25.49	26.2	3.53	31.32	118	156	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
31.62	20.14	35.09	40	-19.86	16.57	0.74	32.26	108	179	Peak
97.77	15.72	37.09	43.5	-27.78	9.5	1.28	32.15	194	306	Peak
188.76	14.54	34.78	43.5	-28.96	10.4	1.61	32.25	182	268	Peak
521.2	19.35	28.28	46	-26.65	20.51	2.7	32.14	158	263	Peak
708.1	18.79	24.59	46	-27.21	23.19	3.11	32.1	198	115	Peak
957.3	15.94	17.21	46	-30.06	26.04	3.67	30.98	130	47	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 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	Nov. 23, 2017	Nov. 22, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2017	Sep. 04, 2018
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 06, 2018	Mar. 05, 2019
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

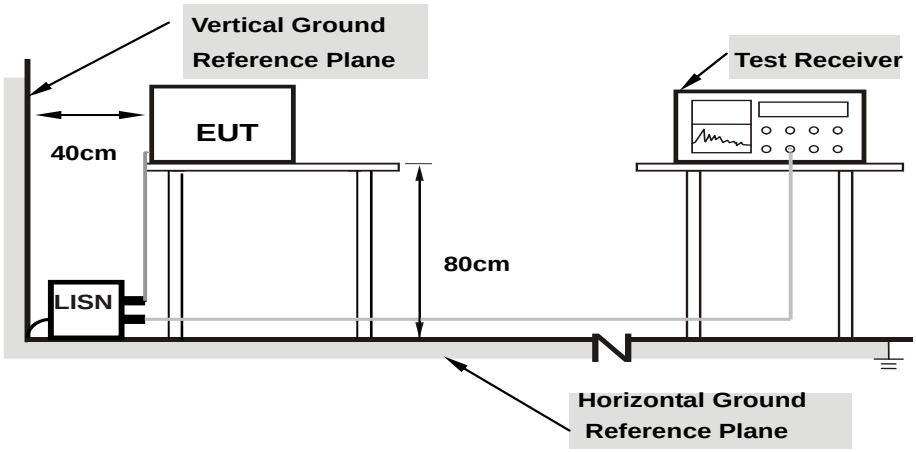
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 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: 1.Support units were connected to second LISN.
2.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

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

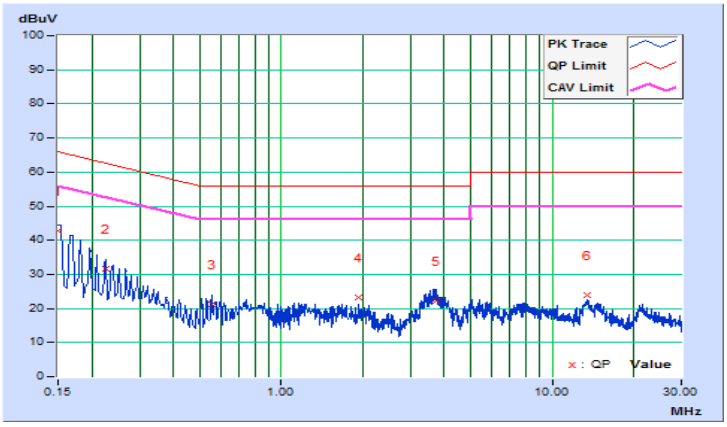
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Getaz Yang	Test Date	2018/2/27

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	10.10	32.67	20.66	42.77	30.76	66.00	56.00	-23.23	-25.24
2	0.22434	10.11	21.64	10.99	31.75	21.10	62.66	52.66	-30.91	-31.56
3	0.55273	10.12	10.98	7.19	21.10	17.31	56.00	46.00	-34.90	-28.69
4	1.92514	10.18	12.98	8.29	23.16	18.47	56.00	46.00	-32.84	-27.53
5	3.71592	10.27	12.12	6.87	22.39	17.14	56.00	46.00	-33.61	-28.86
6	13.52220	10.83	13.05	10.53	23.88	21.36	60.00	50.00	-36.12	-28.64

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

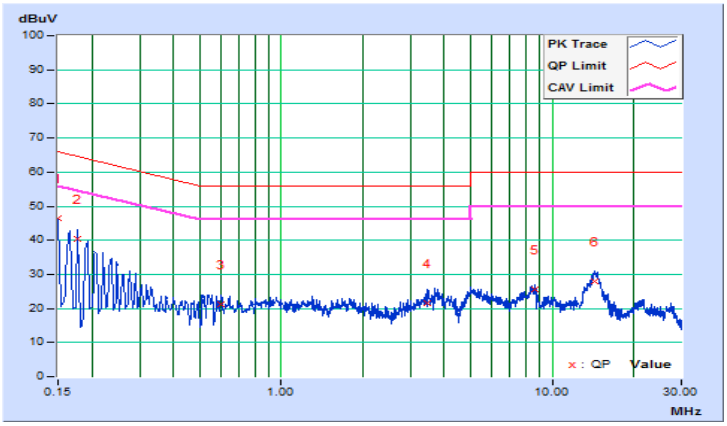


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Getaz Yang	Test Date	2018/2/27

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	0.15000	10.10	36.38	21.91	46.48	32.01	66.00	56.00	-19.52	-23.99
2	0.17737	10.10	30.33	16.71	40.43	26.81	64.61	54.61	-24.18	-27.80
3	0.59965	10.12	11.00	8.25	21.12	18.37	56.00	46.00	-34.88	-27.63
4	3.45395	10.24	11.34	6.71	21.58	16.95	56.00	46.00	-34.42	-29.05
5	8.67771	10.46	15.02	10.83	25.48	21.29	60.00	50.00	-34.52	-28.71
6	14.41759	10.71	17.23	12.83	27.94	23.54	60.00	50.00	-32.06	-26.46

Remarks:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 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 $N_{ANT} \leq 4$;

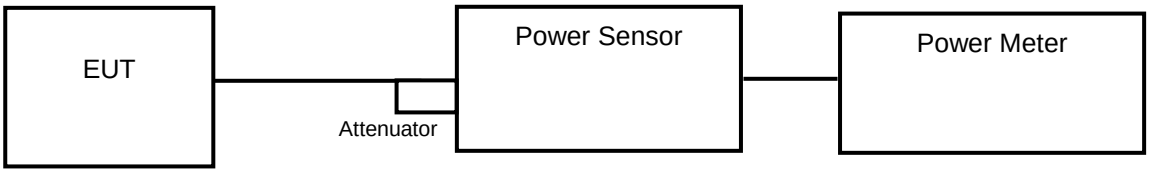
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

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

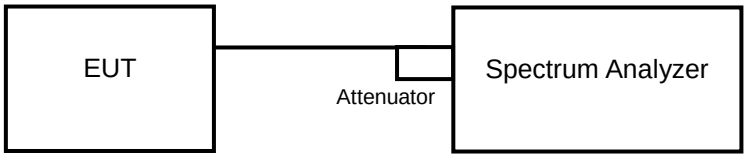
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

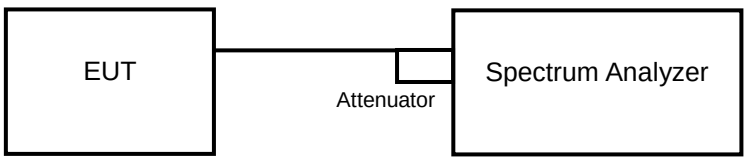
<Power Output Measurement>



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, 802.11ac (VHT20), 802.11ac (VHT40)>

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)>

a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
b. Set sweep trigger to “free run”.
c. Set RBW = 1 MHz.
d. Set VBW ≥ 3 MHz
e. Number of points in sweep ≥ 2 Span / RBW.
f. Sweep time ≤ (number of points in sweep) * T
g. Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
h. Detector = RMS.
i. Trace mode = max hold.
j. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

26 dB Bandwidth

a. Set RBW = approximately 1 % of the emission bandwidth.
b. Set the VBW > RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

Power Output:

802.11a

Channel	Frequency (MHz)	Maximum Cunducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	15.14	14.46	60.584	17.82	24	Pass
44	5220	15.33	13.87	58.497	17.67	24	Pass
48	5240	14.92	14.09	56.691	17.54	24	Pass
52	5260	15.30	14.53	62.263	17.94	24	Pass
60	5300	15.42	14.39	62.313	17.95	24	Pass
64	5320	15.51	14.36	62.853	17.98	24	Pass
100	5500	15.41	14.43	62.487	17.96	24	Pass
116	5580	15.17	14.19	59.127	17.72	24	Pass
140	5700	14.97	14.92	62.451	17.96	24	Pass
2c-144	5720	13.41	13.23	42.966	16.33	23.16	Pass
3-144	5720	9.49	9.69	18.203	12.60	30	Pass
149	5745	15.31	14.29	60.816	17.84	30	Pass
157	5785	15.29	14.52	62.120	17.93	30	Pass
165	5825	15.46	13.98	60.159	17.79	30	Pass

Note:

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

Chain 0

1. 11 dBm + 10log (25.14) = 25.00 dBm > 24 dBm.
2. 11 dBm + 10log (25.06) = 24.98 dBm > 24 dBm.
3. 11 dBm + 10log (24.86) = 24.95 dBm > 24 dBm.
4. 11 dBm + 10log (24.88) = 24.95 dBm > 24 dBm.
5. 11 dBm + 10log (23.68) = 24.74 dBm > 24 dBm.
6. 11 dBm + 10log (24.95) = 24.97 dBm > 24 dBm.
7. 11 dBm + 10log (16.45) = 23.16 dBm < 24 dBm.

Chain 1

1. 11 dBm + 10log (24.13) = 24.82 dBm > 24 dBm.
2. 11 dBm + 10log (25.50) = 25.06 dBm > 24 dBm.
3. 11 dBm + 10log (24.40) = 24.87 dBm > 24 dBm.
4. 11 dBm + 10log (25.86) = 25.12 dBm > 24 dBm.
5. 11 dBm + 10log (24.50) = 24.89 dBm > 24 dBm.
6. 11 dBm + 10log (24.98) = 24.97 dBm > 24 dBm.
7. 11 dBm + 10log (16.78) = 23.25 dBm < 24 dBm.

802.11ac (VHT20)

Channel	Frequency (MHz)	Maximum Cunducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	14.12	13.17	46.572	16.68	24	Pass
44	5220	14.37	13.21	48.294	16.84	24	Pass
48	5240	14.54	13.16	49.146	16.91	24	Pass
52	5260	14.19	13.09	46.612	16.68	24	Pass
60	5300	13.87	13.43	46.407	16.67	24	Pass
64	5320	14.06	13.32	46.946	16.72	24	Pass
100	5500	14.46	13.27	49.157	16.92	24	Pass
116	5580	14.09	13.06	45.875	16.62	24	Pass
140	5700	13.90	13.26	45.731	16.60	24	Pass
2c-144	5720	12.39	11.64	31.926	15.04	23.20	Pass
3-144	5720	8.35	8.09	13.281	11.23	30	Pass
149	5745	13.76	13.23	44.806	16.51	30	Pass
157	5785	14.16	13.44	48.142	16.83	30	Pass
165	5825	14.25	12.85	45.882	16.62	30	Pass

Note:

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

Chain 0

1. 11 dBm + 10log (25.52) = 25.06 dBm > 24 dBm.
2. 11 dBm + 10log (25.04) = 24.98 dBm > 24 dBm.
3. 11 dBm + 10log (24.97) = 24.97 dBm > 24 dBm.
4. 11 dBm + 10log (25.00) = 24.97 dBm > 24 dBm.
5. 11 dBm + 10log (24.06) = 24.81 dBm > 24 dBm.
6. 11 dBm + 10log (24.62) = 24.91 dBm > 24 dBm.
7. 11 dBm + 10log (16.65) = 23.21 dBm < 24 dBm.

Chain 1

1. 11 dBm + 10log (24.98) = 24.97 dBm > 24 dBm.
2. 11 dBm + 10log (25.05) = 24.98 dBm > 24 dBm.
3. 11 dBm + 10log (24.81) = 24.94 dBm > 24 dBm.
4. 11 dBm + 10log (26.27) = 25.19 dBm > 24 dBm.
5. 11 dBm + 10log (26.23) = 25.18 dBm > 24 dBm.
6. 11 dBm + 10log (25.15) = 25.00 dBm > 24 dBm.
7. 11 dBm + 10log (16.61) = 23.20 dBm < 24 dBm.

802.11ac (VHT40)

Channel	Frequency (MHz)	Maximum Cunducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	12.34	12.11	33.395	15.24	24	Pass
46	5230	12.41	12.14	33.786	15.29	24	Pass
54	5270	12.44	12.47	35.199	15.47	24	Pass
62	5310	12.46	12.09	33.801	15.29	24	Pass
102	5510	12.72	12.16	35.151	15.46	24	Pass
110	5550	12.39	12.35	34.517	15.38	24	Pass
134	5670	12.42	12.11	33.713	15.28	24	Pass
2c-142	5710	11.44	11.12	28.023	14.48	24	Pass
3-142	5710	5.07	4.85	6.537	8.15	30	Pass
151	5755	12.51	12.43	35.322	15.48	30	Pass
159	5795	12.41	12.39	34.756	15.41	30	Pass

Note:

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

Chain 0

1. 11 dBm + 10log (42.10) = 27.24 dBm > 24 dBm.
2. 11 dBm + 10log (41.91) = 27.22 dBm > 24 dBm.
3. 11 dBm + 10log (41.94) = 27.22 dBm > 24 dBm.
4. 11 dBm + 10log (41.93) = 27.22 dBm > 24 dBm.
5. 11 dBm + 10log (42.07) = 27.23 dBm > 24 dBm.
6. 11 dBm + 10log (38.03) = 26.80 dBm > 24 dBm.

Chain 1

1. 11 dBm + 10log (41.96) = 27.22 dBm > 24 dBm.
2. 11 dBm + 10log (41.79) = 27.21 dBm > 24 dBm.
3. 11 dBm + 10log (41.86) = 27.21 dBm > 24 dBm.
4. 11 dBm + 10log (42.01) = 27.23 dBm > 24 dBm.
5. 11 dBm + 10log (42.17) = 27.25 dBm > 24 dBm.
6. 11 dBm + 10log (39.91) = 27.01 dBm > 24 dBm.

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Cunducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	12.95	11.50	33.849	15.30	24	Pass
58	5290	12.72	11.94	34.338	15.36	24	Pass
106	5530	11.24	10.56	24.681	13.92	24	Pass
122	5610	13.05	11.52	34.375	15.36	24	Pass
2c-138	5690	12.39	11.11	34.89	15.43	24	Pass
3-138	5690	4.18	0.27	4.247	6.28	30	Pass
155	5775	12.58	11.75	33.075	15.19	30	Pass

Note:

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

Chain 0

1. 11 dBm + 10log (83.54) = 30.21 dBm > 24 dBm.
2. 11 dBm + 10log (83.24) = 30.20 dBm > 24 dBm.
3. 11 dBm + 10log (82.96) = 30.18 dBm > 24 dBm.
4. 11 dBm + 10log (79.48) = 30.00 dBm > 24 dBm.

Chain 1

1. 11 dBm + 10log (82.83) = 30.18 dBm > 24 dBm.
2. 11 dBm + 10log (82.54) = 30.16 dBm > 24 dBm.
3. 11 dBm + 10log (82.61) = 30.17 dBm > 24 dBm.
4. 11 dBm + 10log (76.18) = 29.82 dBm > 24 dBm.

26 dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	24.95	24.45
44	5220	25.01	24.23
48	5240	24.99	23.82
52	5260	25.14	24.13
60	5300	25.06	25.50
64	5320	24.86	24.40
100	5500	24.88	25.86
116	5580	23.68	24.50
140	5700	24.95	24.98
2c-144	5720	16.45	16.78

802.11ac (VHT20)

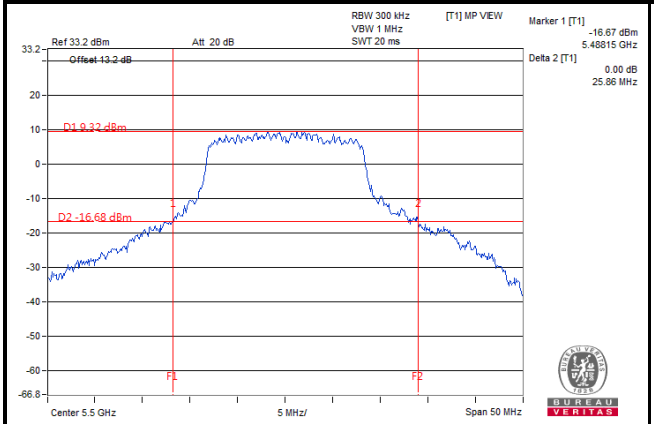
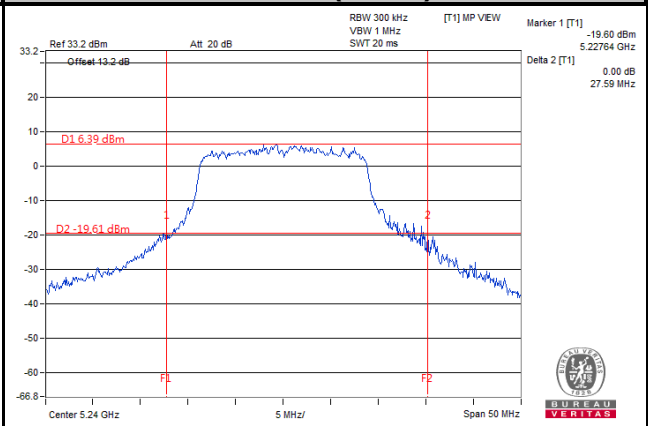
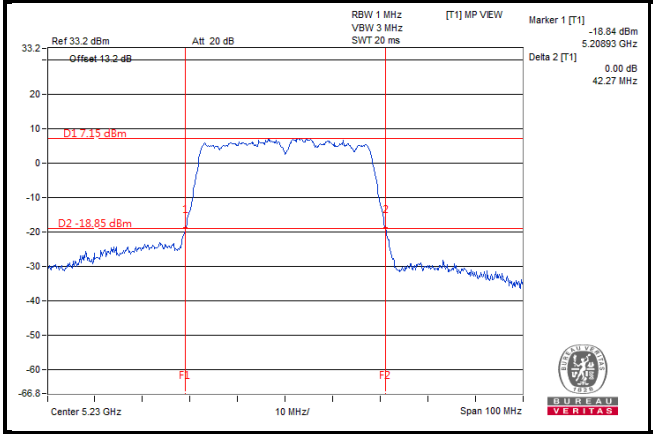
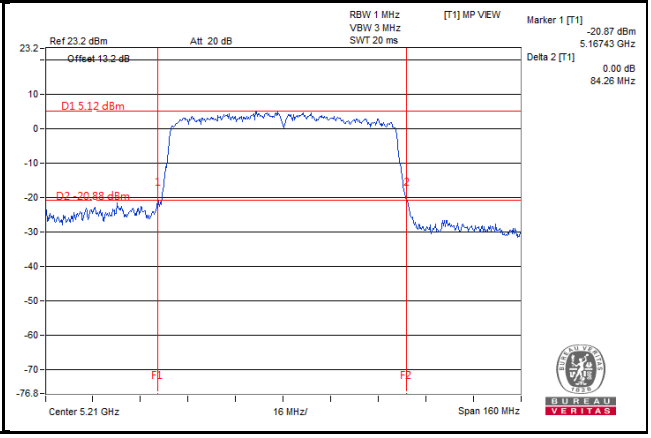
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	26.01	24.83
44	5220	25.61	24.77
48	5240	25.30	27.59
52	5260	25.52	24.98
60	5300	25.04	25.05
64	5320	24.97	24.81
100	5500	25.00	26.27
116	5580	24.06	26.23
140	5700	24.62	25.15
2c-144	5720	16.65	16.61

802.11ac (VHT40)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	41.99	42.03
46	5230	42.27	42.19
54	5270	42.10	41.96
62	5310	41.91	41.79
102	5510	41.94	41.86
110	5550	41.93	42.01
134	5670	42.07	42.17
2c-142	5710	38.03	39.91

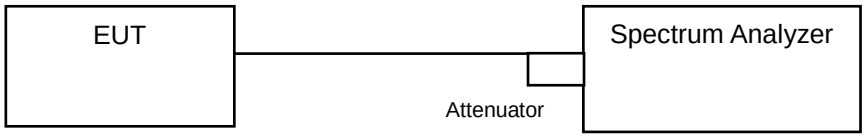
802.11ac (VHT80)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	84.26	82.68
58	5290	83.54	82.83
106	5530	83.24	82.54
122	5610	82.96	82.61
2c-138	5690	79.48	76.18

Spectrum Plot of Worst Value	
802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	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	16.92	16.73
40	5200	16.87	16.69
48	5240	16.97	16.73
52	5260	16.97	16.78
60	5300	16.92	16.83
64	5320	16.87	16.73
100	5500	16.87	16.83
116	5580	16.78	16.73
140	5700	16.92	16.78
2c-144	5720	13.28	13.28
3-144	5720	3.16	3.16
149	5745	16.69	16.78
157	5785	16.65	16.80
165	5825	16.65	16.80

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.03	17.88
40	5200	18.03	17.93
48	5240	18.03	17.98
52	5260	17.98	17.88
60	5300	17.98	17.93
64	5320	17.98	17.88
100	5500	17.98	17.93
116	5580	17.98	17.93
140	5700	17.98	17.93
2c-144	5720	13.88	13.88
3-144	5720	3.76	3.76
149	5745	17.88	17.88
157	5785	17.90	17.90
165	5825	17.90	17.85

802.11ac (VHT40)

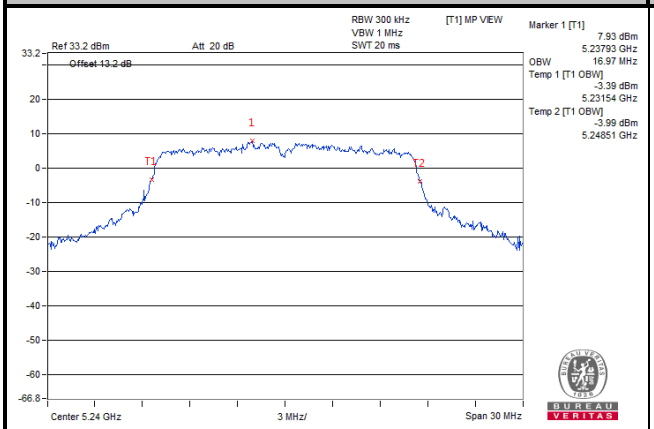
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.66	36.66
46	5230	36.79	36.54
54	5270	36.66	36.54
62	5310	36.79	36.54
102	5510	36.67	36.66
110	5550	36.67	36.54
134	5670	36.79	36.66
2c-142	5710	33.48	33.48
3-142	5710	3.36	3.36
151	5755	36.70	36.70
159	5795	36.83	36.67

802.11ac (VHT80)

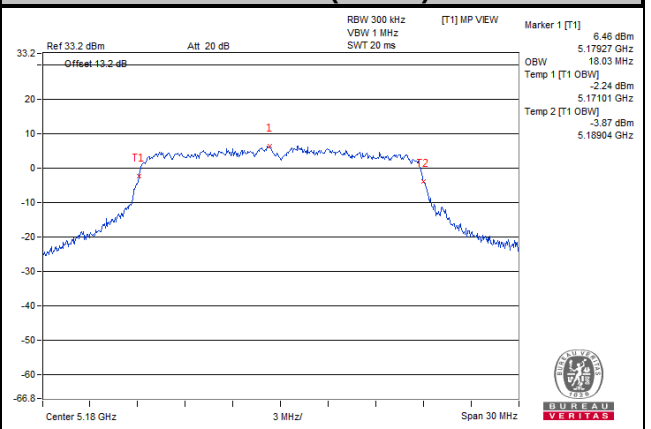
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.80	75.80
58	5290	75.80	75.80
106	5530	75.64	75.64
122	5610	75.80	75.64
2c-138	5690	73.40	72.92
3-138	5690	2.92	2.68
155	5775	75.96	75.80

Spectrum Plot of Worst Value

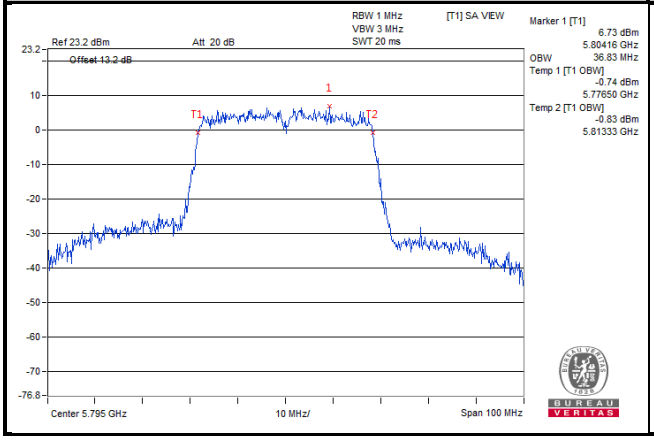
802.11a



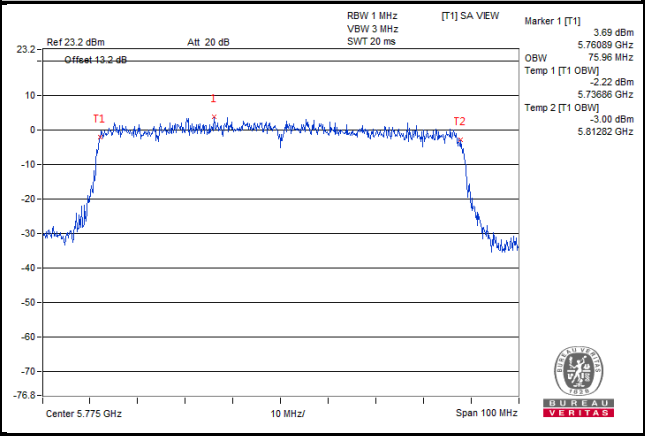
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)

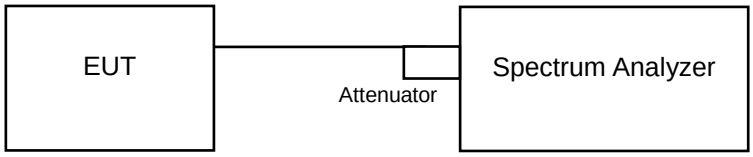


4.5 Peak Power Spectral Density Measurement

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-1

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

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 = 500 kHz, Set VBW ≥ 3 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
4. Sweep time = auto, trigger set to “free run”.
5. Trace average at least 100 traces in power averaging mode.
6. Record the max value and add 10 log (1/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)		Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	4.86	4.53	7.71	11	Pass
44	5220	4.52	4.48	7.51	11	Pass
48	5240	4.46	4.36	7.42	11	Pass
52	5260	4.65	4.50	7.59	11	Pass
60	5300	4.93	4.58	7.77	11	Pass
64	5320	4.32	4.20	7.27	11	Pass
100	5500	4.78	4.76	7.78	11	Pass
116	5580	4.65	4.46	7.57	11	Pass
140	5700	4.66	4.59	7.64	11	Pass
2c-144	5720	3.29	3.48	6.40	11	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. **For U-NII-1 Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.24$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
3. **For U-NII-2A:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 0.93$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
4. **U-NII-2C Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.71$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.

802.11ac (VHT20)

Channel	Frequency (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	3.68	3.33	6.52	11	Pass
44	5220	3.79	3.43	6.62	11	Pass
48	5240	3.78	3.35	6.58	11	Pass
52	5260	3.43	3.29	6.37	11	Pass
60	5300	3.46	3.38	6.43	11	Pass
64	5320	3.64	3.10	6.39	11	Pass
100	5500	3.57	3.49	6.54	11	Pass
116	5580	3.37	3.28	6.34	11	Pass
140	5700	3.47	3.31	6.40	11	Pass
2c-144	5720	1.05	0.65	3.86	11	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. **For U-NII-1 Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.24$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
3. **For U-NII-2A:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 0.93$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
4. **U-NII-2C Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.71$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.

802.11ac (VHT40)

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	-1.26	-1.37	0.18	1.88	11	Pass
46	5230	-1.63	-1.96	0.18	1.40	11	Pass
54	5270	-1.44	-1.57	0.18	1.69	11	Pass
62	5310	-1.50	-1.81	0.18	1.54	11	Pass
102	5510	-1.20	-1.51	0.18	1.84	11	Pass
110	5550	-1.21	-1.58	0.18	1.80	11	Pass
134	5670	-1.46	-1.51	0.18	1.71	11	Pass
2c-142	5710	-5.21	-5.24	0.18	-2.03	11	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. **For U-NII-1 Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.24$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
3. **For U-NII-2A:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 0.93$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
4. **U-NII-2C Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.71$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
5. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

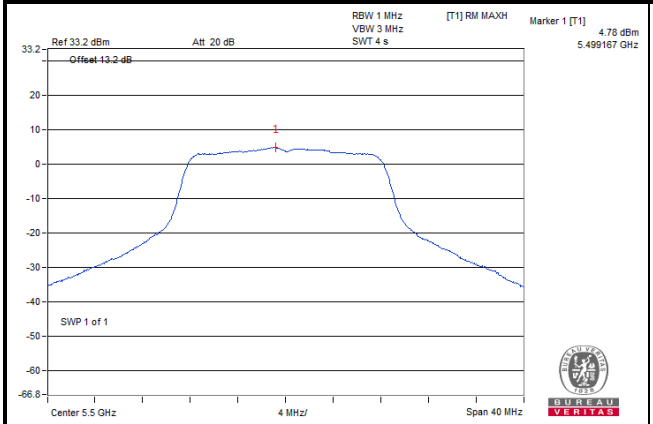
Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-5.54	-5.86	0.62	-2.07	11	Pass
58	5290	-5.34	-6.03	0.62	-2.04	11	Pass
106	5530	-6.90	-7.55	0.62	-3.58	11	Pass
122	5610	-5.15	-6.15	0.62	-1.99	11	Pass
2c-138	5690	-7.70	-5.94	0.62	-3.10	11	Pass

Note:

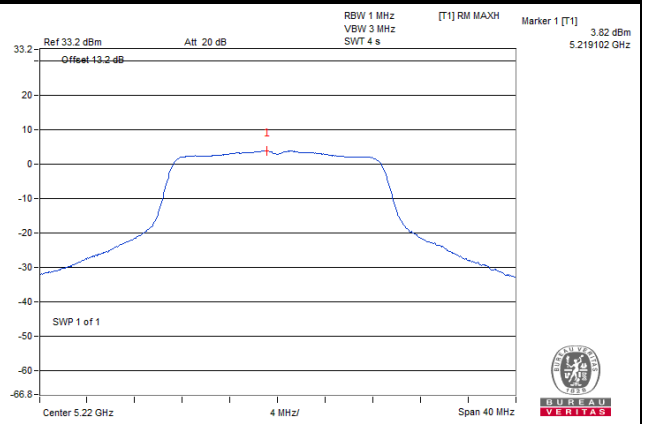
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. **For U-NII-1 Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.24$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
3. **For U-NII-2A:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 0.93$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
4. **U-NII-2C Band:**
   Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.71$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
5. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

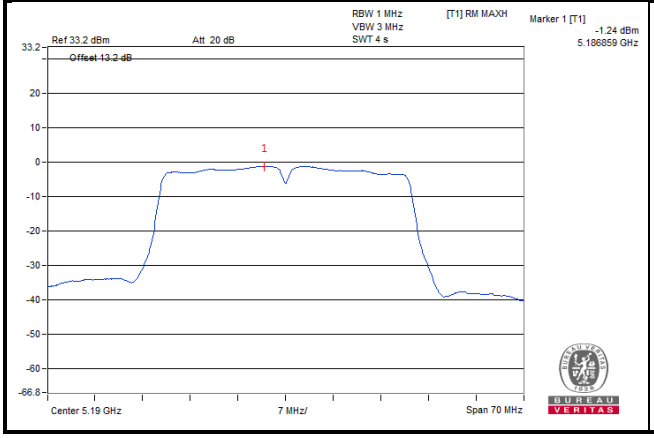
802.11a



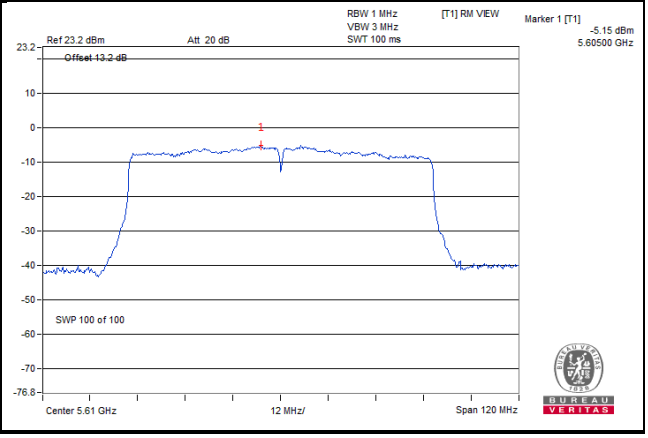
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



For U-NII-3 Band

802.11a

TX Chain	Channel	Freq. (MHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	3-144	5720	-1.24	3.01	1.77	30	Pass
	149	5745	2.08	3.01	5.09	30	Pass
	157	5785	2.07	3.01	5.08	30	Pass
	165	5825	2.00	3.01	5.01	30	Pass
1	3-144	5720	-1.10	3.01	1.91	30	Pass
	149	5745	0.70	3.01	3.71	30	Pass
	157	5785	0.79	3.01	3.80	30	Pass
	165	5825	0.66	3.01	3.67	30	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.94$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.

802.11ac (VHT20)

TX Chain	Channel	Freq. (MHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	3-144	5720	-2.14	3.01	0.87	30	Pass
	149	5745	-0.35	3.01	2.66	30	Pass
	157	5785	-0.41	3.01	2.60	30	Pass
	165	5825	-0.66	3.01	2.35	30	Pass
1	3-144	5720	-2.61	3.01	0.40	30	Pass
	149	5745	-0.94	3.01	2.07	30	Pass
	157	5785	-0.88	3.01	2.13	30	Pass
	165	5825	-0.84	3.01	2.17	30	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.94$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.

802.11ac (VHT40)

TX Chain	Channel	Frequency (MHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	3-142	5710	-8.63	3.01	0.18	-5.44	30	Pass
	151	5755	-3.31	3.01	0.18	-0.12	30	Pass
	159	5795	-3.62	3.01	0.18	-0.43	30	Pass
1	3-142	5710	-8.96	3.01	0.18	-5.77	30	Pass
	151	5755	-3.75	3.01	0.18	-0.56	30	Pass
	159	5795	-3.91	3.01	0.18	-0.72	30	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.94$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

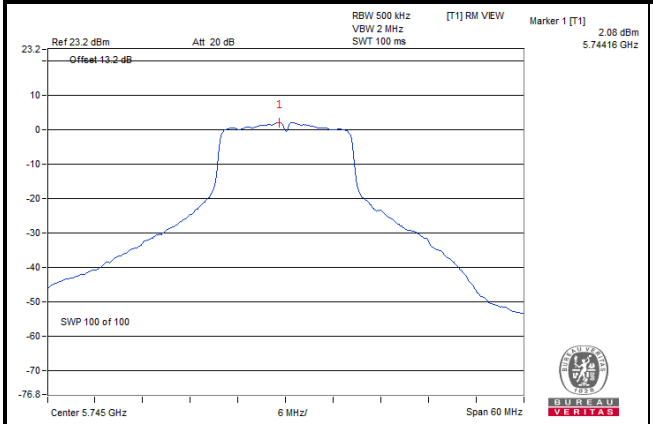
TX Chain	Channel	Frequency (MHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	3-138	5690	-10.26	3.01	0.62	-6.63	30	Pass
	155	5775	-6.29	3.01	0.62	-2.66	30	Pass
1	3-138	5690	-11.12	3.01	0.62	-7.49	30	Pass
	155	5775	-7.31	3.01	0.62	-3.68	30	Pass

Note:

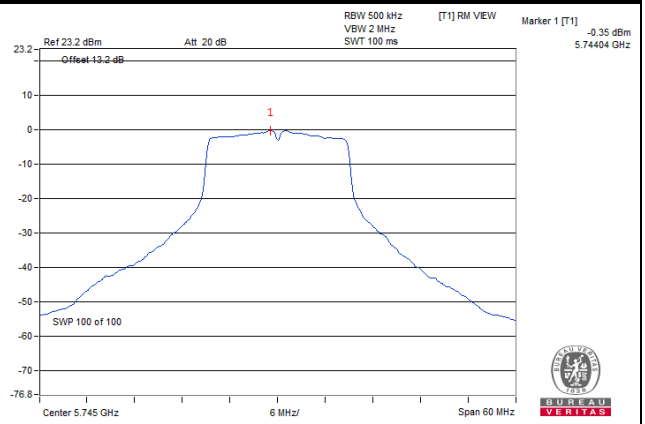
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \ldots. + 10^{GN/20})^2 / N_{ANT}] = 1.94$ dBi < 6 dBi, so the power density limit doesn't need to be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

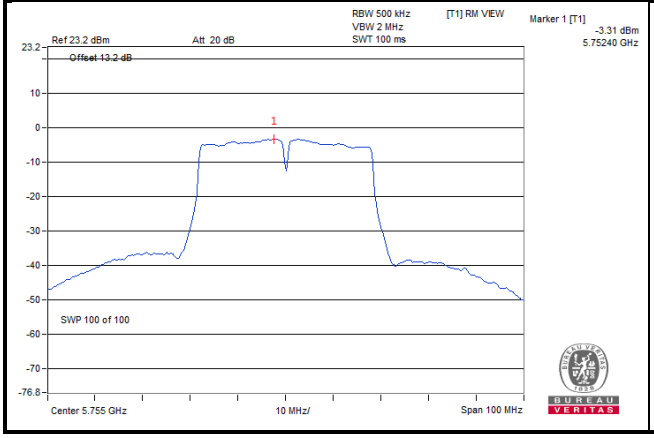
802.11a



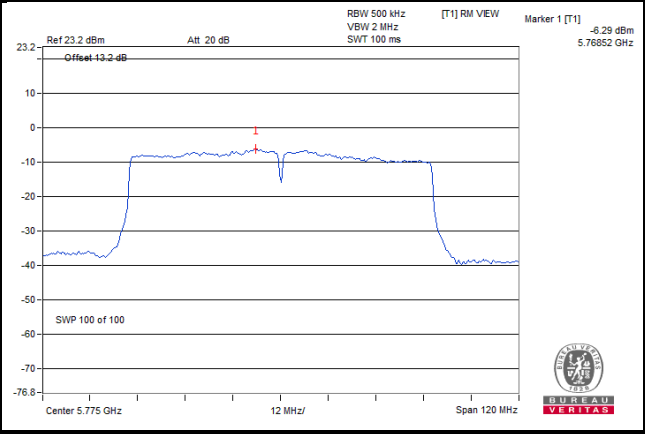
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)

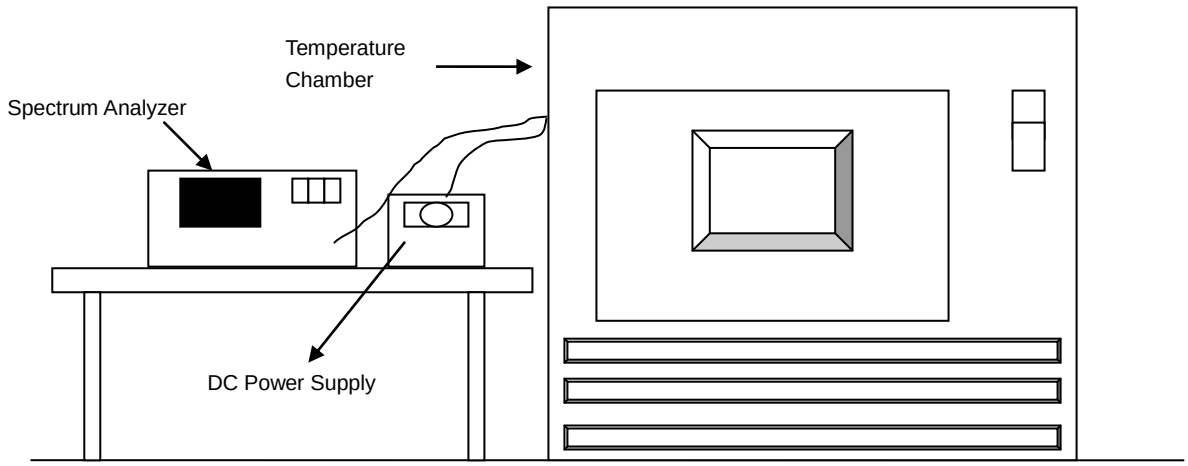


4.6 Frequency Stability

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

a. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
b. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10 dB lower than the measured peak value.
c. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

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. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
55	3.85	5179.9864	-0.00026	5179.9892	-0.00021	5179.9872	-0.00025	5179.9888	-0.00022
50	3.85	5180.0123	0.00024	5180.0152	0.00029	5180.0113	0.00022	5180.015	0.00029
40	3.85	5180.0162	0.00031	5180.017	0.00033	5180.0189	0.00036	5180.0179	0.00035
30	3.85	5180.0192	0.00037	5180.0231	0.00045	5180.0184	0.00036	5180.0207	0.00040
20	3.85	5180.0225	0.00043	5180.0249	0.00048	5180.0215	0.00042	5180.0203	0.00039
10	3.85	5180.006	0.00012	5180.0056	0.00011	5180.0076	0.00015	5180.0057	0.00011
0	3.85	5180.0145	0.00028	5180.0107	0.00021	5180.0122	0.00024	5180.014	0.00027
-10	3.85	5180.0074	0.00014	5180.0067	0.00013	5180.0068	0.00013	5180.0111	0.00021
-20	3.85	5180.0159	0.00031	5180.0178	0.00034	5180.0157	0.00030	5180.0164	0.00032
-30	3.85	5180.0151	0.00029	5180.0131	0.00025	5180.0122	0.00024	5180.0119	0.00023

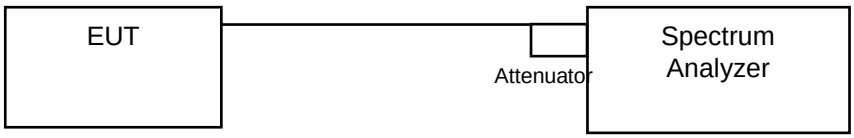
Frequency Stability Versus Voltage.									
Operating Frequency: 5180 MHz									
Temp. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	4.4275	5180.0191	0.00037	5180.0224	0.00043	5180.0174	0.00034	5180.0205	0.00040
	3.85	5180.0192	0.00037	5180.0231	0.00045	5180.0184	0.00036	5180.0207	0.00040
	3.2725	5180.0195	0.00038	5180.0227	0.00044	5180.019	0.00037	5180.0216	0.00042

4.7 6 dB Bandwidth Measurment

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

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

4.7.5 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		
3-144	5720	2.75	2.57	0.5	Pass
149	5745	15.36	15.18	0.5	Pass
157	5785	15.20	15.18	0.5	Pass
165	5825	15.16	15.20	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3-144	5720	3.86	3.84	0.5	Pass
149	5745	15.93	15.50	0.5	Pass
157	5785	15.98	15.18	0.5	Pass
165	5825	16.80	15.98	0.5	Pass

802.11n (HT40)

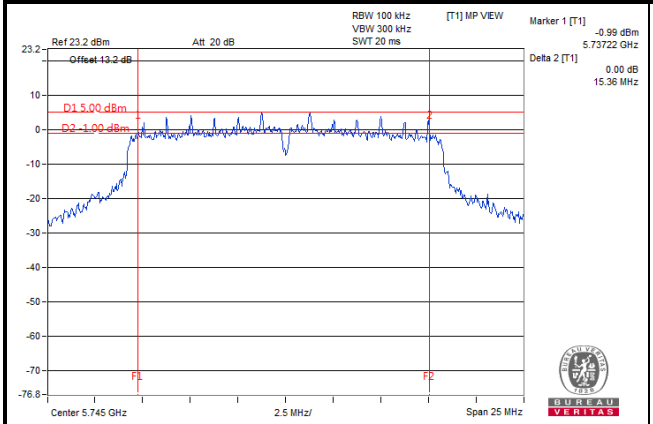
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3-142	5710	3.24	3.22	0.5	Pass
151	5755	35.54	35.21	0.5	Pass
159	5795	35.25	35.29	0.5	Pass

802.11ac (VHT80)

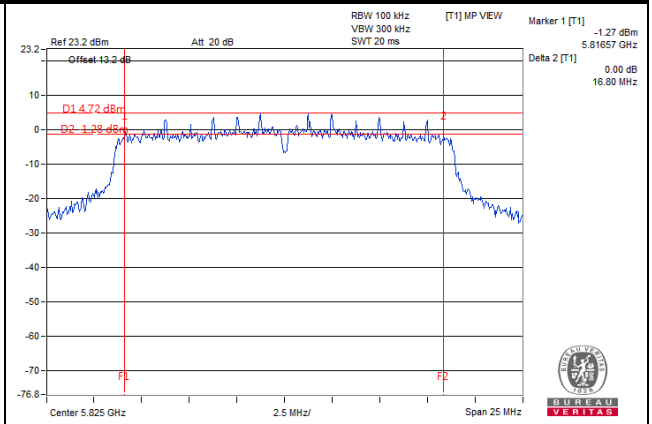
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3-138	5690	3.22	2.63	0.5	Pass
155	5775	75.53	75.33	0.5	Pass

Spectrum Plot of Worst Value

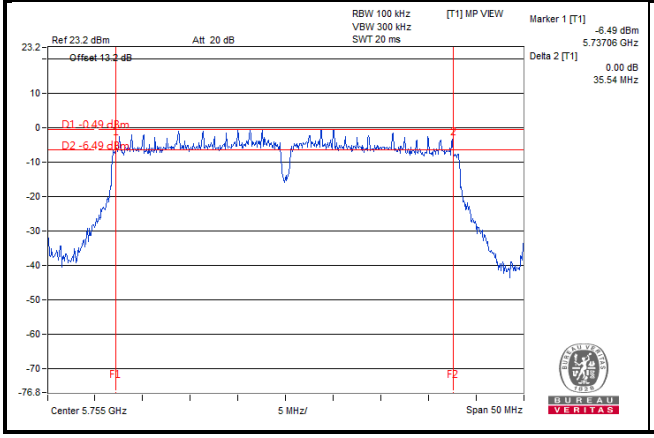
802.11a



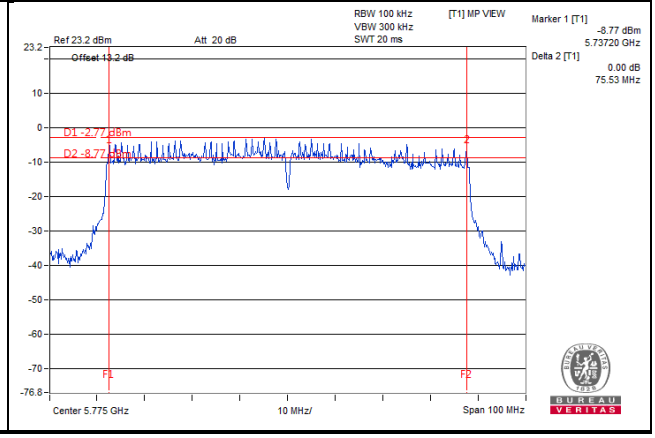
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



5 Pictures of Test Arrangements

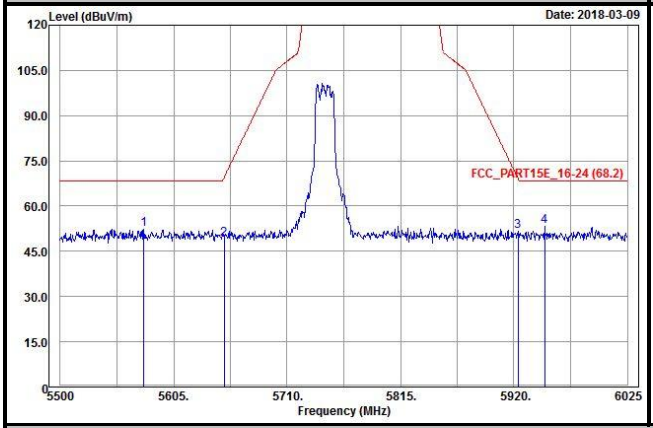
Please refer to the attached file (Test Setup Photo).

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

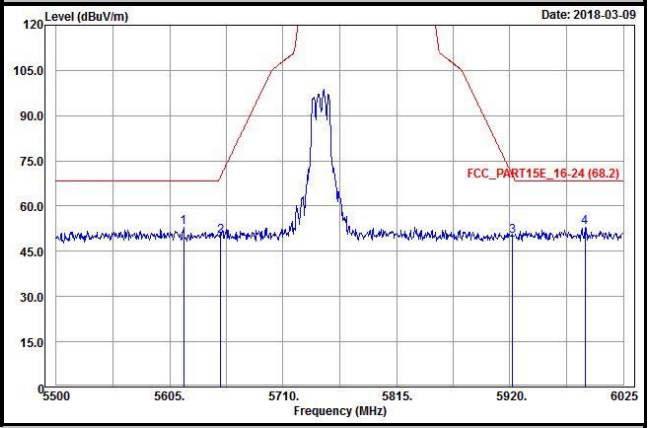
802.11a

Ch 149

Horizontal

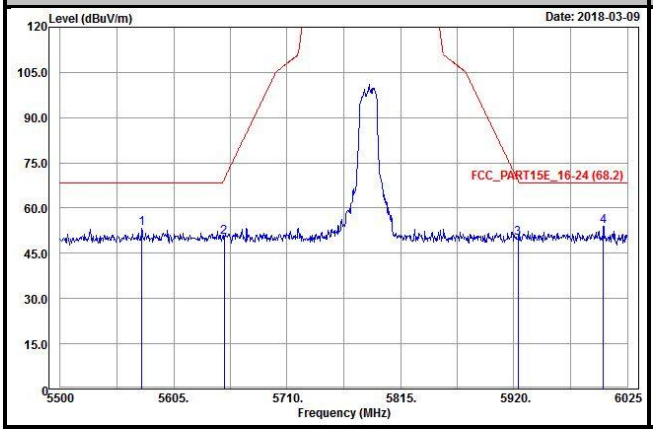


Vertical

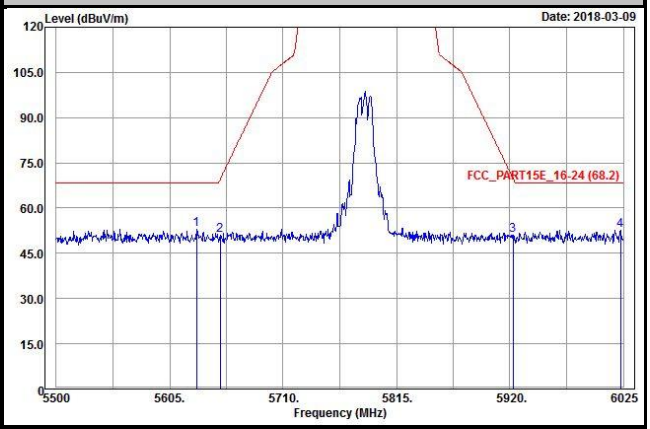


Ch 157

Horizontal

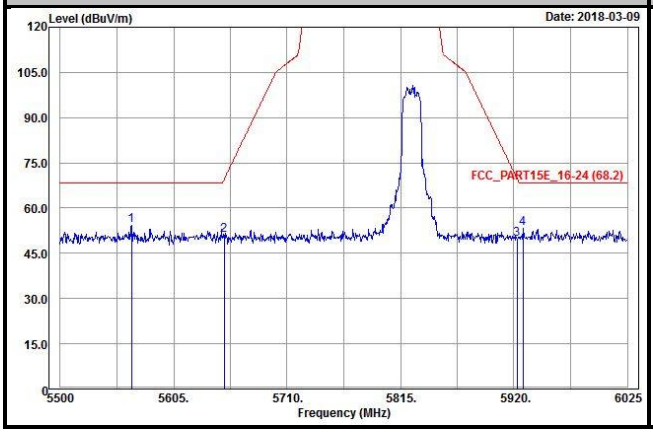


Vertical

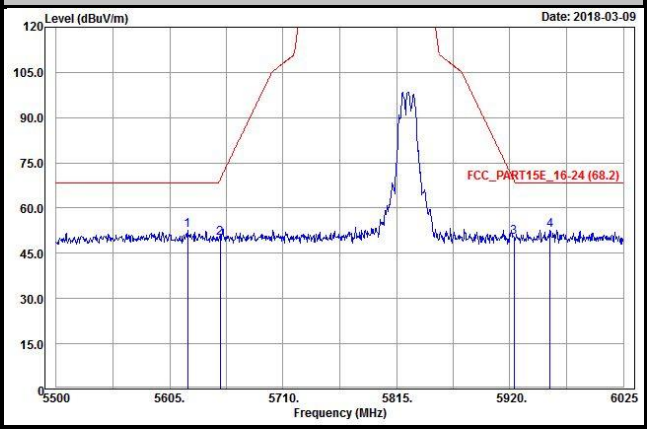


Ch 165

Horizontal



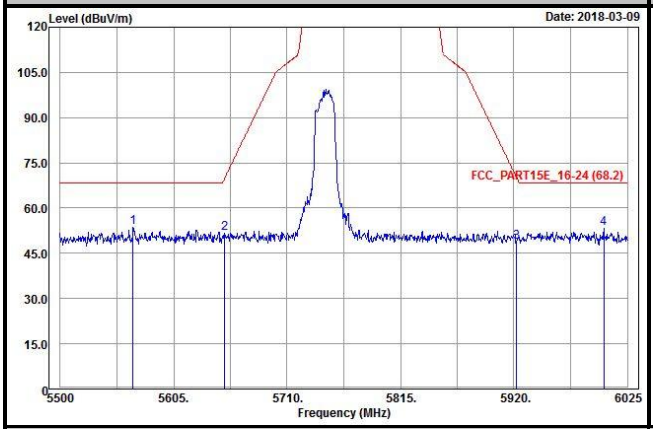
Vertical



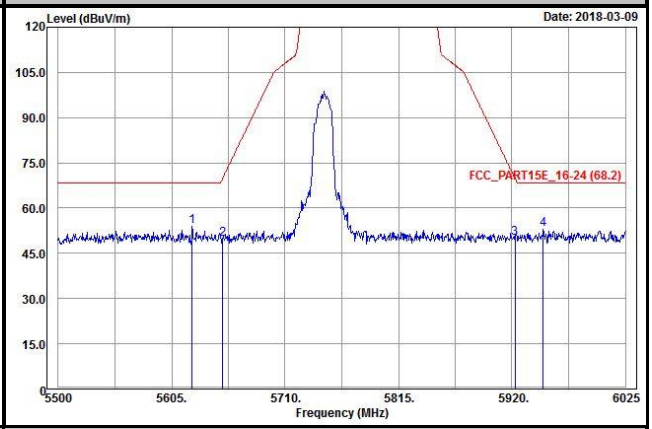
802.11ac (VHT20)

Ch 149

Horizontal

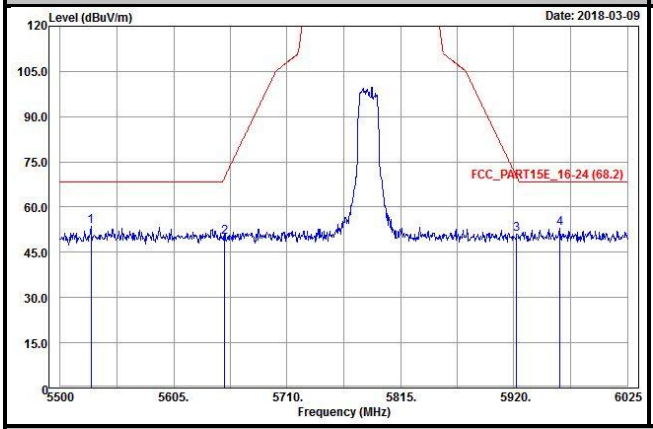


Vertical

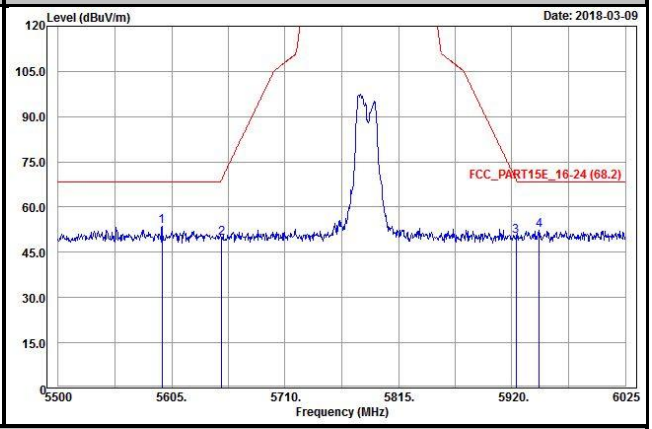


Ch 157

Horizontal

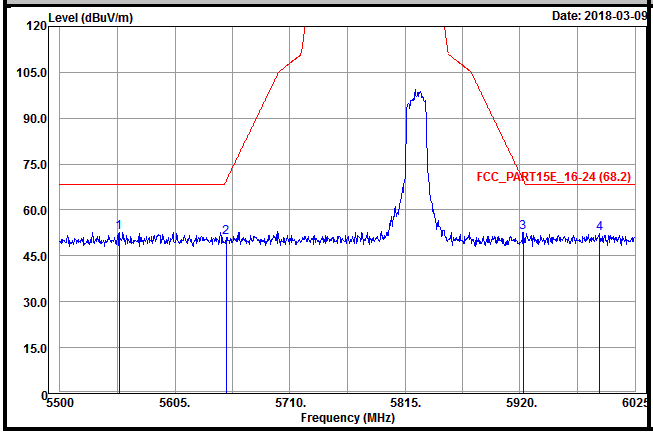


Vertical

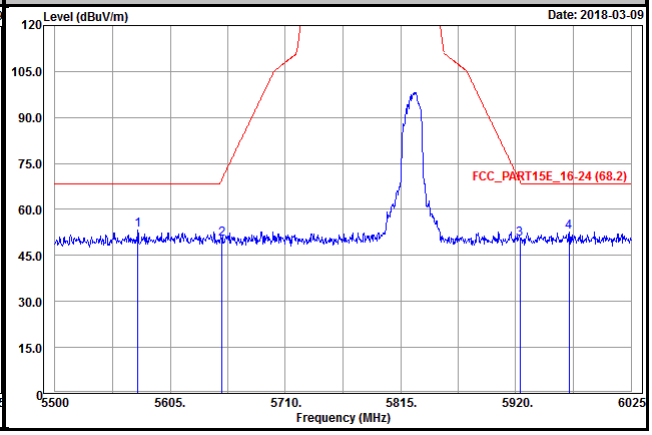


Ch 165

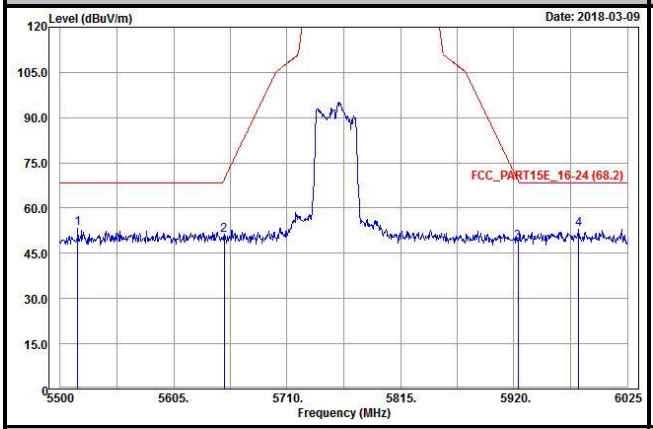
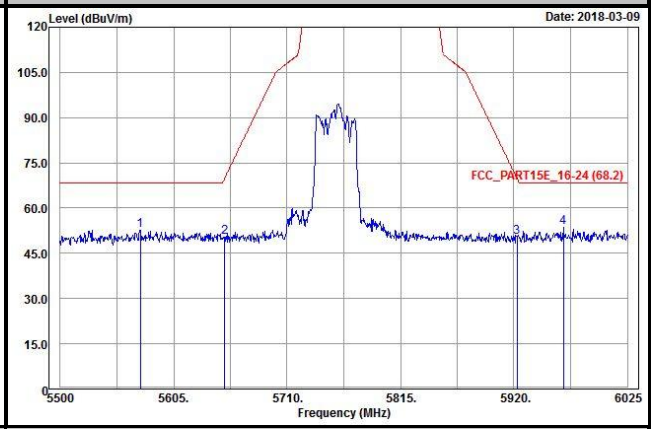
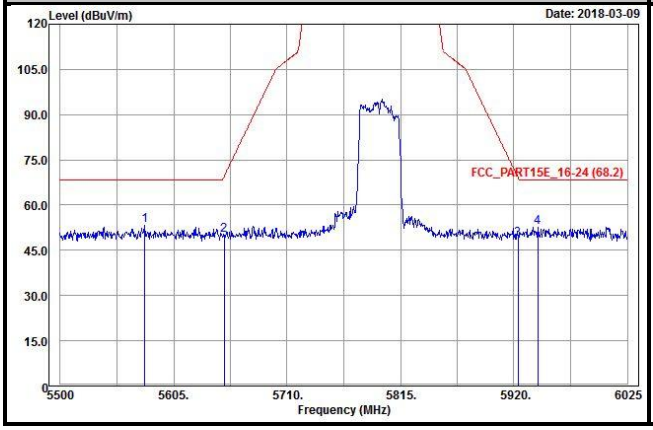
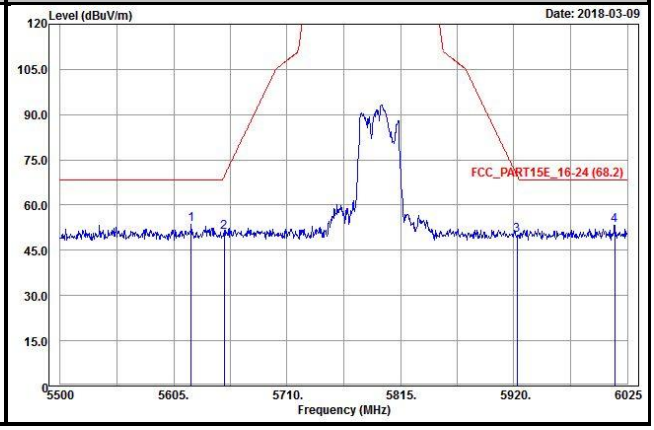
Horizontal



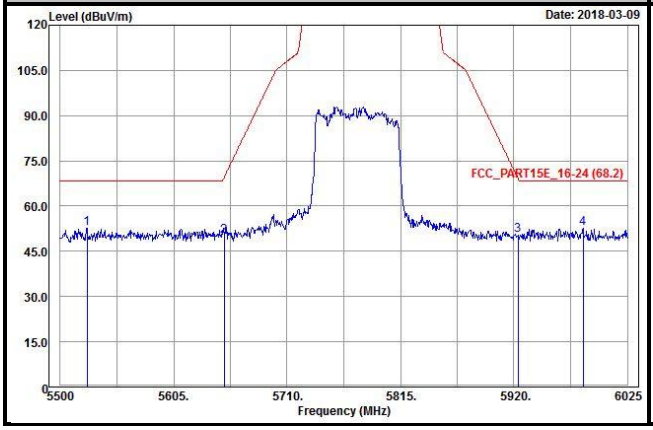
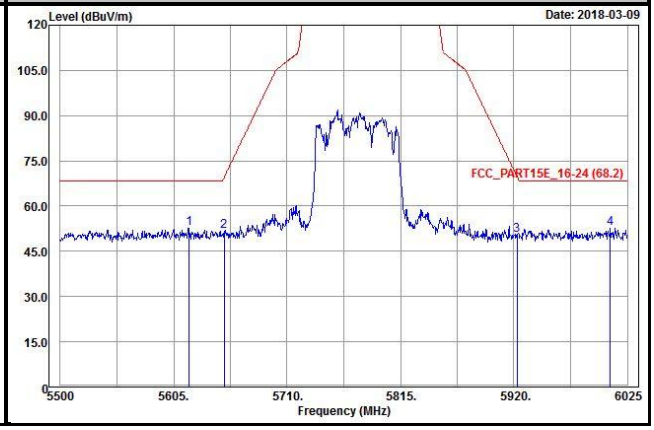
Vertical



802.11ac (VHT40)

Ch 151	
Horizontal	Vertical
	
Ch 159	
Horizontal	Vertical
	

802.11ac (VHT80)

Ch 155	
Horizontal	Vertical
	

Appendix – Information on the Testing Laboratories

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

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

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Email: service.adt@tw.bureauveritas.com
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The address and road map of all our labs can be found in our web site also.

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