



FCC Test Report

Equipment : 2T2R 802.11b/g/n/ac Module
Brand Name : AboCom
Model No. : AM7520
FCC ID : MQ4AM7520
Standard : 47 CFR FCC Part 15.407
Operating Band : 5150 MHz – 5250 MHz
5725 MHz – 5850 MHz
FCC Classification : NII
Applicant : Abocom Systems, Inc.
No.77, Yu-Yih Rd., Chu-Nan, Miao-Lih County 35059,
Taiwan R.O.C.
Manufacturer : Abocom Systems, Inc.
No.77, Yu-Yih Rd., Chu-Nan, Miao-Lih County 35059,
Taiwan R.O.C.
Function : ☐ Outdoor; ☐ Indoor; ☐ Fixed P2P
☒ Portable Client
Operate Mode : Client without radar detection

The product sample received on Mar. 02, 2016 and completely tested on Mar. 09, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

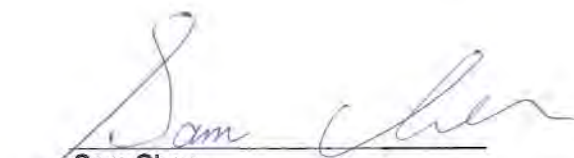

Sam Chen
SPORTON INTERNATIONAL INC.





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Summary of Test Result

Conformance Test Specifications			
Report Clause	Ref. Std. Clause	Description	Result
1.1.2	15.203	Antenna Requirement	Complied
3.1	15.207	AC Power-line Conducted Emissions	Complied
3.2	15.407(a)	Emission Bandwidth	Complied
3.3	15.407(a)	Maximum Conducted Output Power	Complied
3.4	15.407(a)	Peak Power Spectral Density	Complied
3.5	15.407(b)	Unwanted Emissions	Complied
3.6	15.407(g)	Frequency Stability	Complied

1 General Description

1.1 Information

1.1.1 RF General Information

Band	Mode	BWch (MHz)	Nss-Min	Nant
5.2G	11a	20	1	1
5.8G	11a	20	1	1
5.2G	HT20	20	2,(M8-15)	2
5.8G	HT20	20	2,(M8-15)	2
5.2G	HT40	40	2,(M8-15)	2
5.8G	HT40	40	2,(M8-15)	2
5.2G	VHT20	20	2,(M0-8)	2
5.8G	VHT20	20	2,(M0-8)	2
5.2G	VHT40	40	2,(M0-9)	2
5.8G	VHT40	40	2,(M0-9)	2
5.2G	VHT80	80	2,(M0-9)	2
5.8G	VHT80	80	2,(M0-9)	2

Note:

- ♦ 5.2G is the 5.2GHz Band (5.15-5.25GHz).
- ♦ 5.8G is the 5.8GHz Band (5.725-5.850GHz).
- ♦ 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ♦ VHT20, VHT40 and VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- ♦ BWch is the nominal channel bandwidth.
- ♦ Nss-Min is the minimum number of spatial streams.
- ♦ Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	WHA YU	SRF20152371	Printed Antenna	N/A	-1.5	2.2
2	WHA YU	SRF20152371	Printed Antenna	N/A	-0.9	1.3

Note:

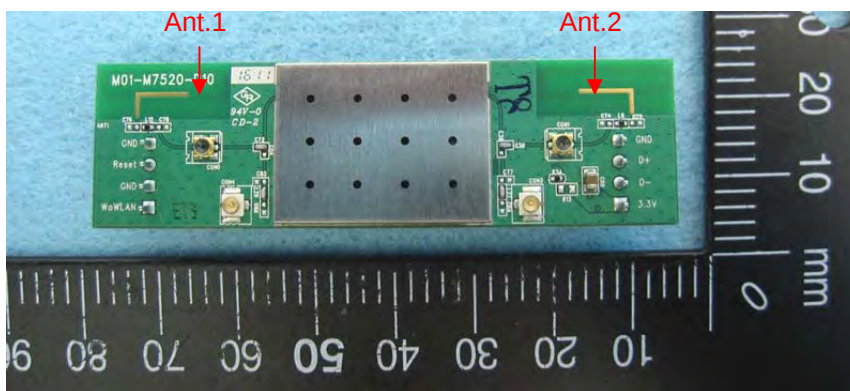
The EUT has two antennas.

For IEEE 802.11a/b/g mode (1TX/1RX):

Only Ant. 1 can be used as transmitting/receiving antenna.

For IEEE 802.11n/ac mode (2TX/2RX):

Both Ant. 1 and Ant. 2 could transmit/receive simultaneously.



1.1.3 Mode Test Duty Cycle

Mode	DC	T(s)	VBW(Hz) $\geq 1/T$
11a	1	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
VHT20	1	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
VHT40	1	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
VHT80	1	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)

1.1.4 EUT Operational Condition

EUT Power Type	From Host System		
Beamforming Function	☐ With beamforming	☒ Without beamforming	

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2013
- ◆ FCC KDB 789033 D02 v01r01
- ◆ FCC KDB 644545 D03 v01
- ◆ FCC KDB 662911 D01 v02r01

1.3 Testing Location Information

Testing Location		
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-CB	Eddie Weng	25°C / 69%	09/03/2016
Radiated	03CH01-CB	Charlie Cheng	25.7°C / 69%	08/03/2016
AC Conduction	CO01-CB	Da Deng	24°C / 55%	09/03/2016

Test site Designation No. TW0006 with FCC

Test site registered number IC 4086D with Industry Canada.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ($k=2$))

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Band	Mode	BWch (MHz)	Nss-Min	Nant	Ch. (MHz)	Range	Power Setting
5.2G	11a	20	1	1	5180	L	52
5.2G	11a	20	1	1	5200	M	63
5.2G	11a	20	1	1	5240	H	48
5.8G	11a	20	1	1	5745	L	45
5.8G	11a	20	1	1	5785	M	63
5.8G	11a	20	1	1	5825	H	49
5.2G	VHT20	20	2,(M0-8)	2	5180	L	58/60
5.2G	VHT20	20	2,(M0-8)	2	5200	M	60/63
5.2G	VHT20	20	2,(M0-8)	2	5240	H	57/60
5.8G	VHT20	20	2,(M0-8)	2	5745	L	53/51
5.8G	VHT20	20	2,(M0-8)	2	5785	M	63/61
5.8G	VHT20	20	2,(M0-8)	2	5825	H	57/54
5.2G	VHT40	40	2,(M0-9)	2	5190	L	47/49
5.2G	VHT40	40	2,(M0-9)	2	5230	H	60/63
5.8G	VHT40	40	2,(M0-9)	2	5755	L	41/44
5.8G	VHT40	40	2,(M0-9)	2	5795	H	44/41
5.2G	VHT80	80	2,(M0-9)	2	5210	S	59/55
5.8G	VHT80	80	2,(M0-9)	2	5775	S	44/41

Abbreviation Explanation

Band	Mode	BWch (MHz)	Nss-Min	Nant	Ch. (MHz)	Range	Test Cond.	Abbreviation
5.2G	VHT40	40	1,(M0-9)	2	5190	L	TN,VN	5.2G;VHT40;40;1,(M0-9);2;5190;L;TN,VN
5.2G	VHT80	80	1,(M0-9)	2	5210	S	TN,VN	5.2G;VHT80;80;1,(M0-9);2;5210;S;TN,VN

Note:

- ♦ Test range channel consist of L (Low Ch.), M (Middle Ch.), H (High Ch.), S (Single Ch. or Intra- band Ch.) and C (Inter-band Ch.).

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	Normal Link
1	Normal Link-2.4GHz
2	Normal Link-5GHz
For operating mode 2 is the worst case and it was record in this test report.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emission Bandwidth, Maximum Conducted Output Power, Peak Power Spectral Density, Frequency Stability
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests	
Tests Item	Unwanted Emissions
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	Normal Link
1	Normal Link-2.4GHz
2	Normal Link-5GHz
For operating mode 2 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
1	The EUT was performed at X axis, Y axis and Z axis position, and the worst case was found at X axis. So the measurement will follow this same test configuration.

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

N/A

2.5 Support Equipment

For Test Site No: CO01-CB

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	AP	Planex	GW-AP54SGX	KA220030603014-1
2	NB	DELL	E6430	DoC
3	Mouse	Logitech	M-U0026	DoC
4	Earphone	SHYARO CHI	MIC-04	N/A
5	Fixture	Abocom	AM7221T-X10	N/A

For Test Site No: 03CH01-CB (below 1GHz)

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	AP	Netgear	R6300V2	PY313200227
2	NB	DELL	E4300	DoC
3	Mouse	HP	FM100	DoC
4	Earphone	e-Power	S90W	N/A
5	Fixture	Abocom	AM7221T-X10	N/A

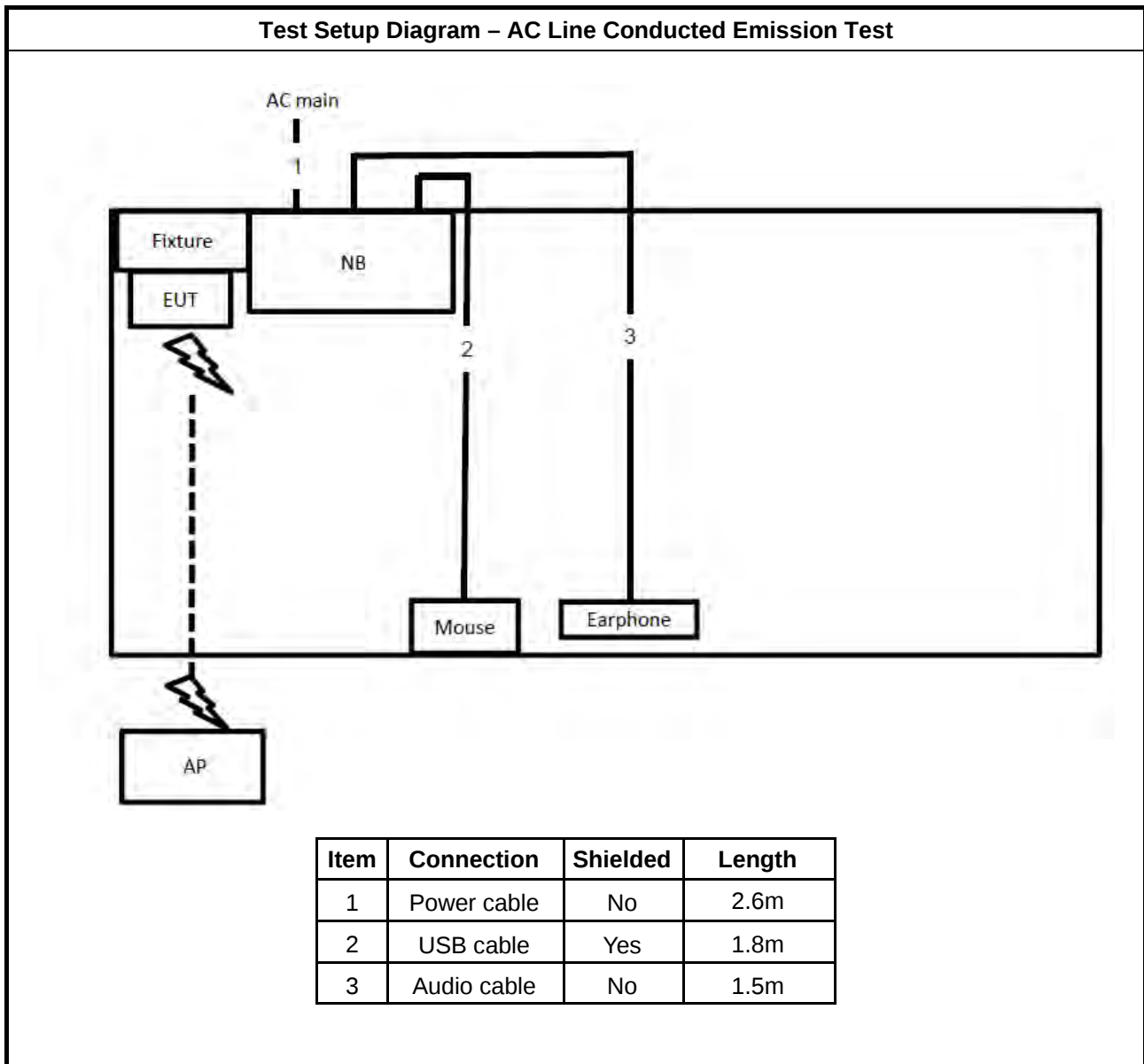
For Test Site No: 03CH01-CB (above 1GHz)

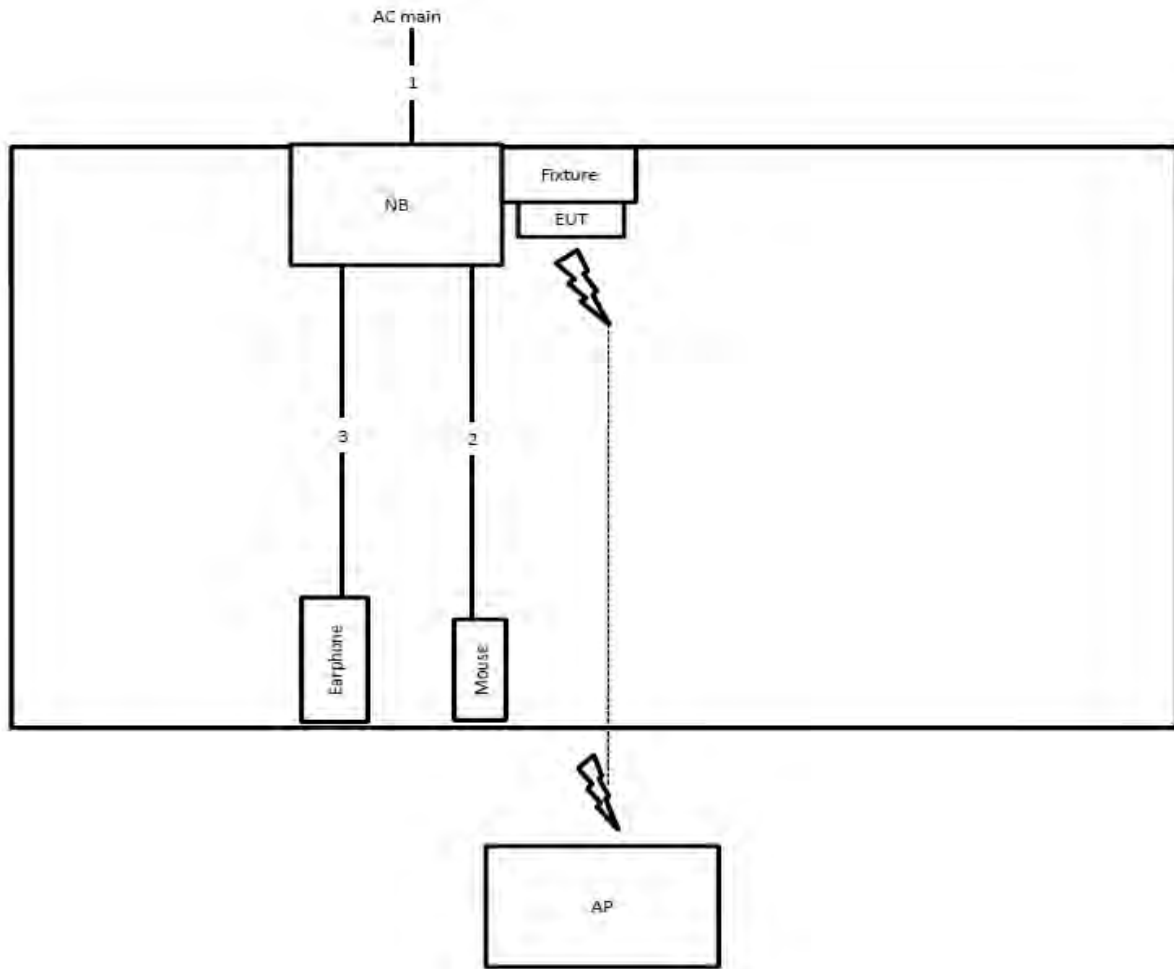
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	NB	DELL	E4300	DoC
2	Fixture	Abocom	AM7221T-X10	N/A

For Test Site No: TH01-CB

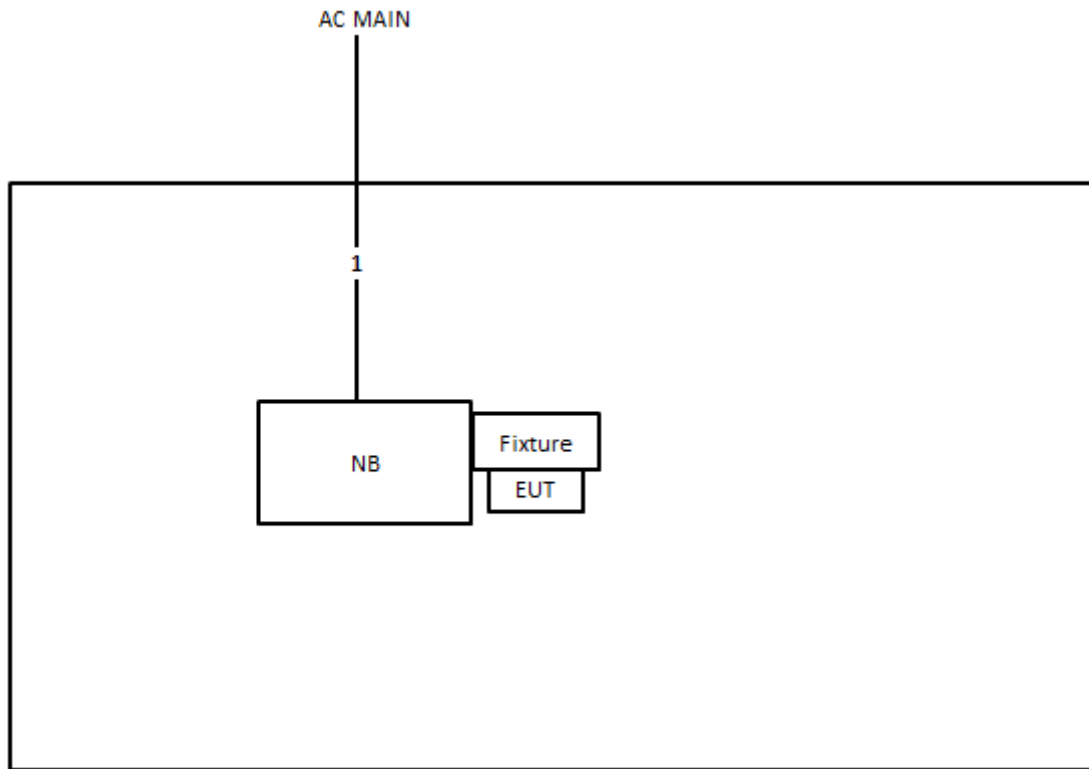
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	NB	DELL	E4300	DoC
2	Fixture	Abocom	AM7221T-X10	N/A

2.6 Test Setup Diagram



Test Setup Diagram - Radiated Test < 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	USB cable	Yes	1.8m
3	Audio cable	No	1.5m

Test Setup Diagram - Radiated Test > 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	2.6m

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

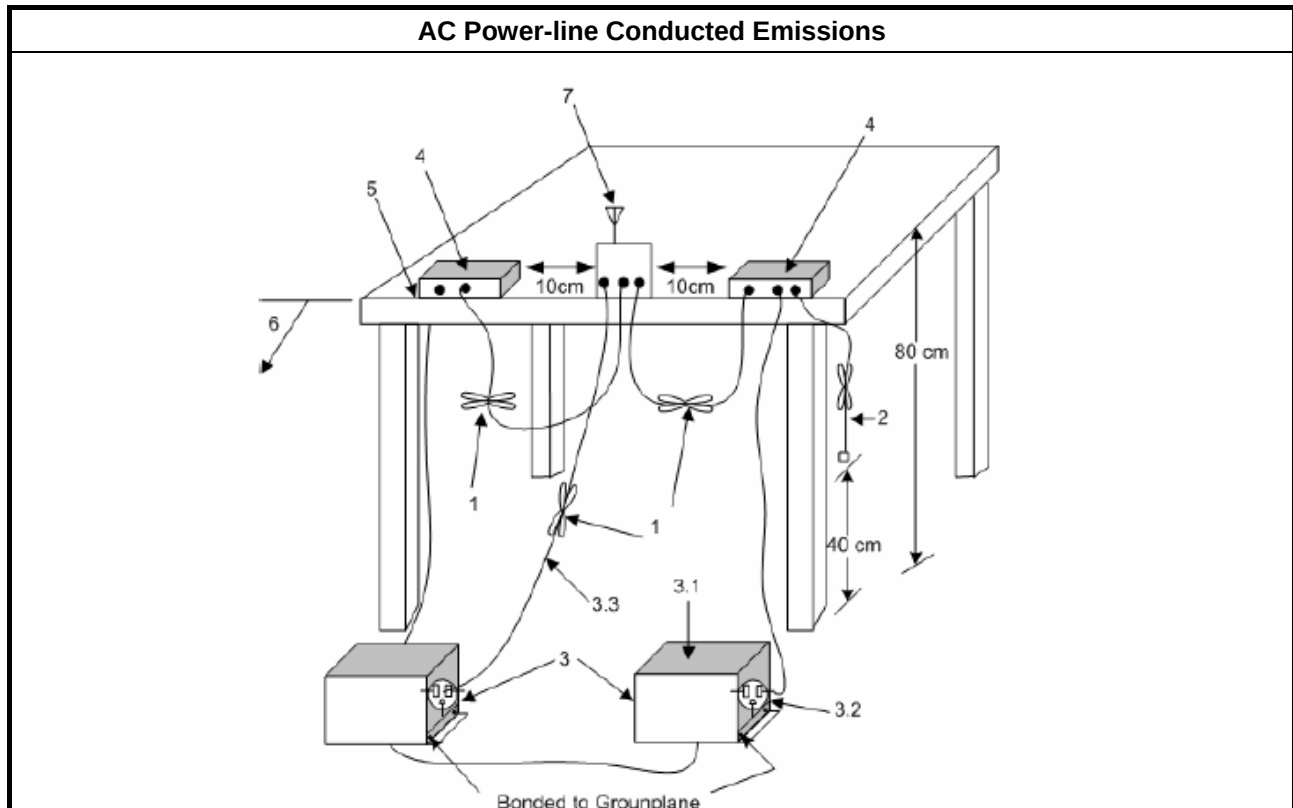
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup





3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix B

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

Emission Bandwidth Limit	
UNII Devices	
☒	For the 5.15-5.25 GHz band, N/A
☐	For the 5.25-5.35 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
☐	For the 5.47-5.725 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
☒	For the 5.725-5.85 GHz band, 6 dB emission bandwidth $\geq$ 500kHz.

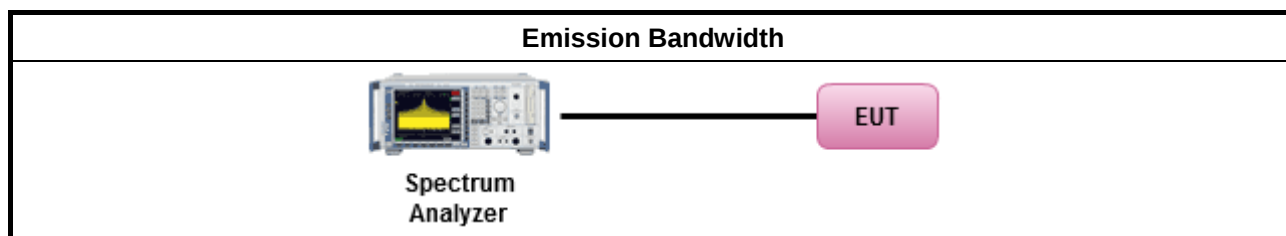
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
For the emission bandwidth shall be measured using one of the options below:	
☒	Refer as FCC KDB 789033 D02 v01r01, clause C for EBW and clause D for OBW measurement.
☐	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
☒	Refer as IC RSS-Gen, clause 4.6 for bandwidth testing.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix C

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
	Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. e.i.r.p. at any elevation angle above 30 degrees ≤ 125mW [21dBm]
	Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$
	Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$.
	Mobile or Portable Client: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☐ For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.	
☐ For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.	
☒ For the 5.725-5.85 GHz band:	
	Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$.
	Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

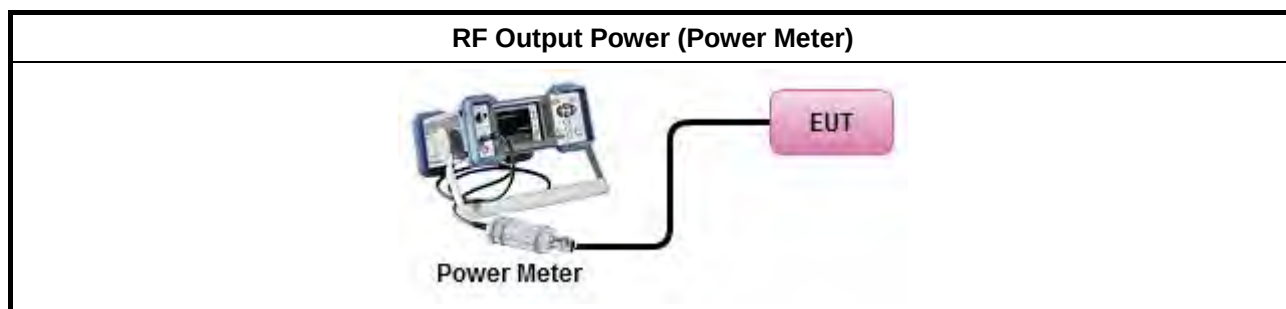
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
Maximum Conducted Output Power	
	[duty cycle $\geq$ 98% or external video / power trigger]
☐	Refer as FCC KDB 789033 D02 v01r01, clause E Method SA-1 (spectral trace averaging).
☐	Refer as FCC KDB 789033 D02 v01r01, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)
	duty cycle < 98% and average over on/off periods with duty factor
☐	Refer as FCC KDB 789033 D02 v01r01, clause E Method SA-2 (spectral trace averaging).
☐	Refer as FCC KDB 789033 D02 v01r01, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
	Wideband RF power meter and average over on/off periods with duty factor
☒	Refer as FCC KDB 789033 D02 v01r01, clause E Method PM-G (using an RF average power meter).
For conducted measurement.	
	If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup





3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix D

3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

Peak Power Spectral Density Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
	Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$.
	Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$.
	Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 23$ dBi, then $P_{Out} = 17 - (G_{TX} - 23)$.
	Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.
☐ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
☐ For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
☒ For the 5.725-5.85 GHz band:	
	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$.
	Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
PPSD = peak power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz G_{TX} = the maximum transmitting antenna directional gain in dBi.	

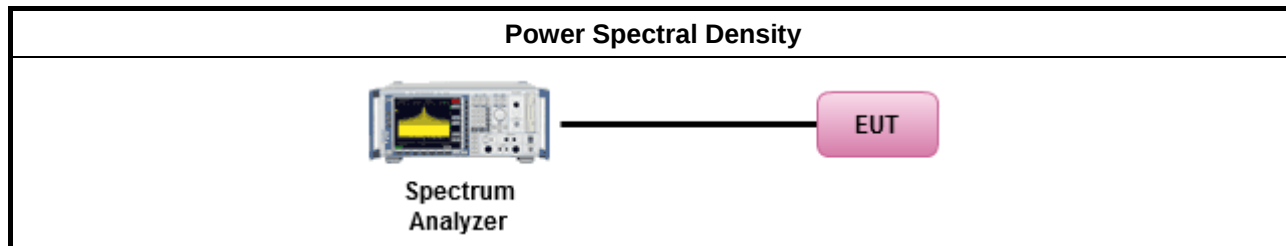
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method	
Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options:	
☐ Refer as FCC KDB 789033 D02 v01r01, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth	
[duty cycle ≥ 98% or external video / power trigger]	
☒ Refer as FCC KDB 789033 D02 v01r01, clause E Method SA-1 (spectral trace averaging).	
☐ Refer as FCC KDB 789033 D02 v01r01, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)	
duty cycle < 98% and average over on/off periods with duty factor	
☒ Refer as FCC KDB 789033 D02 v01r01, clause E Method SA-2 (spectral trace averaging).	
☐ Refer as FCC KDB 789033 D02 v01r01, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)	
For conducted measurement.	
If the EUT supports multiple transmit chains using options given below:	
☒ Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.	
☐ Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,	
☐ Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.	
If multiple transmit chains, EIRP PPSD calculation could be following as methods: $PPSD_{total} = PPSD_1 + PPSD_2 + \dots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$	

3.4.4 Test Setup



3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix E

3.5 Unwanted Emissions

3.5.1 Transmitter Radiated Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted band emissions above 1GHz Limit	
Operating Band	Limit
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.85 GHz	5.715 5.725 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] 5.85 5.86 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] Other un-restricted band: e.i.r.p. -27 dBm [68.2 dBuV/m@3m]

Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

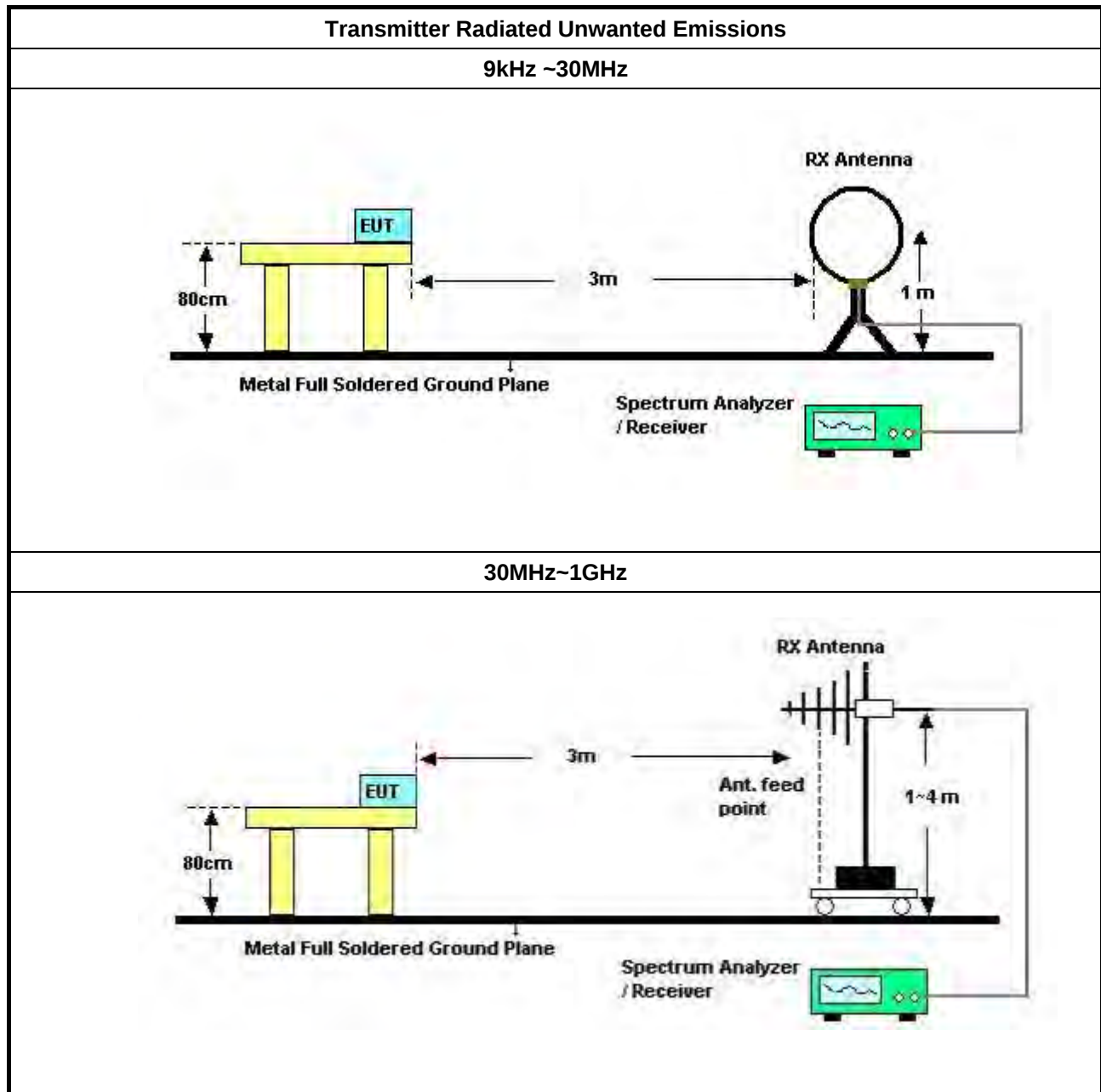
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

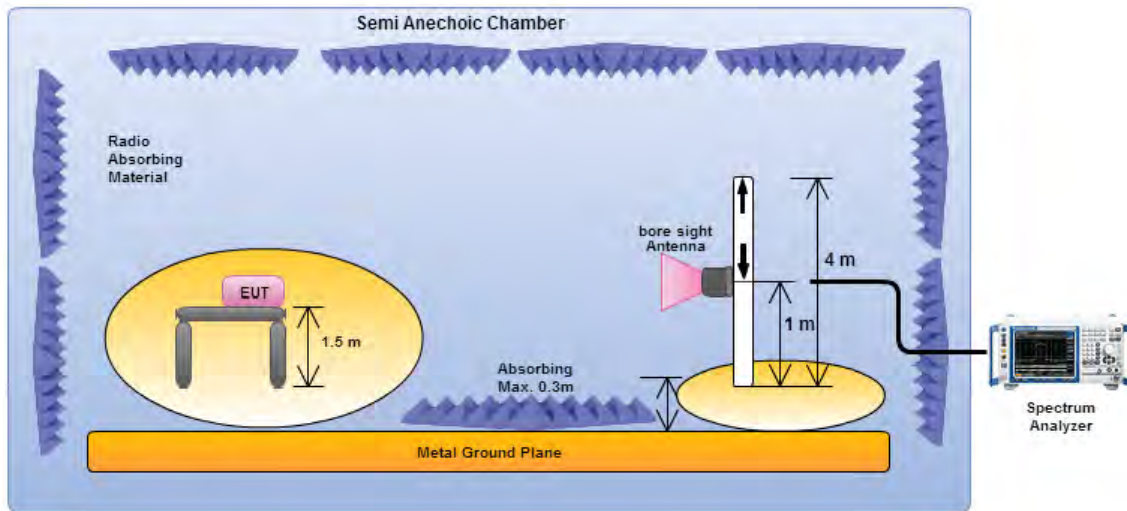
3.5.3 Test Procedures

Test Method	
Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
For the transmitter unwanted emissions shall be measured using following options below:	
	Refer as FCC KDB 789033 D02 v01r01, clause H)2) for unwanted emissions into non-restricted bands.
	Refer as FCC KDB 789033 D02 v01r01, clause H)1) for unwanted emissions into restricted bands.
	☐ Refer as FCC KDB 789033 D02 v01r01, H)6) Method AD (Trace Averaging).
	☒ Refer as FCC KDB 789033 D02 v01r01, H)6) Method VB (Reduced VBW).
	☐ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW $\geq$ 1/T, where T is pulse time.
	☐ Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
	☒ Refer as FCC KDB 789033 D02 v01r01, clause H)5) measurement procedure peak limit.
	☐ Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
	For radiated measurement.
	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
The any unwanted emissions level shall not exceed the fundamental emission level.	
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.	

3.5.4 Test Setup



Above 1GHz





3.5.5 Transmitter Unwanted Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

3.5.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix F

3.6 Frequency Stability

3.6.1 Frequency Stability Limit

Frequency Stability Limit	
UNII Devices	
In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.	
LE-LAN Devices	
N/A	
IEEE Std. 802.11	
The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band and ± 25 ppm maximum for the 2.4 GHz band.	

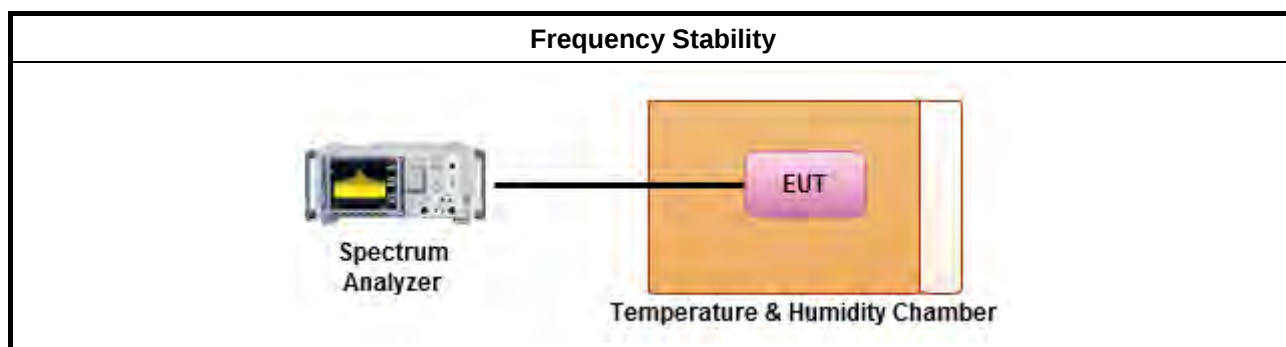
3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Test Method	
Refer as ANSI C63.10, clause 6.8 for frequency stability tests	
	Frequency stability with respect to ambient temperature
	Frequency stability when varying supply voltage
	Extreme temperature is -30°C~50°C.

3.6.4 Test Setup





3.6.5 Test Result of Frequency Stability

Refer as Appendix G



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100355	9kHz ~ 2.75GHz	Apr. 22, 2015	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 25, 2015	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Mar. 15, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov.13, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 27, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 12, 2015*	Radiation (10CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz ~ 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz ~ 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz ~ 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz ~ 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)



FCC Test Report

Report No. : FR630217AB

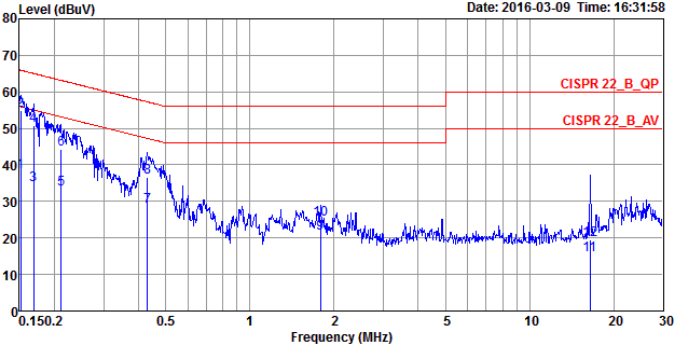
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)

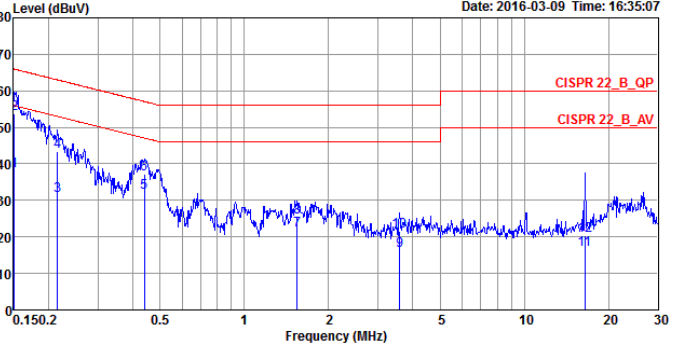
Note: Calibration Interval of instruments listed above is one year.

“*” Calibration Interval of instruments listed above is two years.

NCR means Non-Calibration required.



AC Power-line Conducted Emissions Result																																																																																																																																																					
Operating Mode	2		Power Phase	Neutral																																																																																																																																																	
Operating Function	Normal Link																																																																																																																																																				
Level (dBuV) Date: 2016-03-09 Time: 16:31:58  Frequency (MHz) <table><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Pol/Phase</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV</th><th>dB</th><th>dBuV</th><th>dBuV</th><th>dB</th><th>dB</th><th></th><th></th></tr><tr><td>1</td><td>0.1516</td><td>38.03</td><td>-17.88</td><td>55.91</td><td>27.99</td><td>10.02</td><td>0.02</td><td>NEUTRAL</td><td>Average</td></tr><tr><td>2</td><td>0.1516</td><td>54.88</td><td>-11.03</td><td>65.91</td><td>44.84</td><td>10.02</td><td>0.02</td><td>NEUTRAL</td><td>QP</td></tr><tr><td>3</td><td>0.1685</td><td>34.58</td><td>-20.45</td><td>55.03</td><td>24.54</td><td>10.02</td><td>0.02</td><td>NEUTRAL</td><td>Average</td></tr><tr><td>4</td><td>0.1685</td><td>50.69</td><td>-14.34</td><td>65.03</td><td>40.65</td><td>10.02</td><td>0.02</td><td>NEUTRAL</td><td>QP</td></tr><tr><td>5</td><td>0.2117</td><td>33.32</td><td>-19.82</td><td>53.14</td><td>23.38</td><td>9.92</td><td>0.02</td><td>NEUTRAL</td><td>Average</td></tr><tr><td>6</td><td>0.2117</td><td>44.17</td><td>-18.97</td><td>63.14</td><td>34.23</td><td>9.92</td><td>0.02</td><td>NEUTRAL</td><td>QP</td></tr><tr><td>7</td><td>0.4305</td><td>28.61</td><td>-18.63</td><td>47.24</td><td>18.65</td><td>9.92</td><td>0.04</td><td>NEUTRAL</td><td>Average</td></tr><tr><td>8</td><td>0.4305</td><td>36.59</td><td>-20.65</td><td>57.24</td><td>26.63</td><td>9.92</td><td>0.04</td><td>NEUTRAL</td><td>QP</td></tr><tr><td>9</td><td>1.7905</td><td>21.35</td><td>-24.65</td><td>46.00</td><td>11.33</td><td>9.96</td><td>0.06</td><td>NEUTRAL</td><td>Average</td></tr><tr><td>10</td><td>1.7905</td><td>25.03</td><td>-30.97</td><td>56.00</td><td>15.01</td><td>9.96</td><td>0.06</td><td>NEUTRAL</td><td>QP</td></tr><tr><td>11</td><td>16.4856</td><td>15.49</td><td>-34.51</td><td>50.00</td><td>4.98</td><td>10.25</td><td>0.26</td><td>NEUTRAL</td><td>Average</td></tr><tr><td>12</td><td>16.4856</td><td>19.49</td><td>-40.51</td><td>60.00</td><td>8.98</td><td>10.25</td><td>0.26</td><td>NEUTRAL</td><td>QP</td></tr></table>											Freq	Level	Limit	Line	Level	Factor	Loss	Pol/Phase	Remark		MHz	dBuV	dB	dBuV	dBuV	dB	dB			1	0.1516	38.03	-17.88	55.91	27.99	10.02	0.02	NEUTRAL	Average	2	0.1516	54.88	-11.03	65.91	44.84	10.02	0.02	NEUTRAL	QP	3	0.1685	34.58	-20.45	55.03	24.54	10.02	0.02	NEUTRAL	Average	4	0.1685	50.69	-14.34	65.03	40.65	10.02	0.02	NEUTRAL	QP	5	0.2117	33.32	-19.82	53.14	23.38	9.92	0.02	NEUTRAL	Average	6	0.2117	44.17	-18.97	63.14	34.23	9.92	0.02	NEUTRAL	QP	7	0.4305	28.61	-18.63	47.24	18.65	9.92	0.04	NEUTRAL	Average	8	0.4305	36.59	-20.65	57.24	26.63	9.92	0.04	NEUTRAL	QP	9	1.7905	21.35	-24.65	46.00	11.33	9.96	0.06	NEUTRAL	Average	10	1.7905	25.03	-30.97	56.00	15.01	9.96	0.06	NEUTRAL	QP	11	16.4856	15.49	-34.51	50.00	4.98	10.25	0.26	NEUTRAL	Average	12	16.4856	19.49	-40.51	60.00	8.98	10.25	0.26	NEUTRAL	QP
	Freq	Level	Limit	Line	Level	Factor	Loss	Pol/Phase	Remark																																																																																																																																												
	MHz	dBuV	dB	dBuV	dBuV	dB	dB																																																																																																																																														
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Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit. Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)																																																																																																																																																					

AC Power-line Conducted Emissions Result																																																							
Operating Mode	2		Power Phase	Line																																																			
Operating Function	Normal Link																																																						
Level (dBuV) Date: 2016-03-09 Time: 16:35:07  Frequency (MHz) <table><tr><th></th><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>Read</th><th>LISN</th><th>Cable</th><th>Pol/Phase</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV</th><th>Limit</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th></th><th></th></tr><tr><th></th><th></th><th></th><th>dB</th><th>dBuV</th><th>dBuV</th><th>dB</th><th>dB</th><th></th><th></th></tr><tr><td>1</td><td>0.1508</td><td>38.03</td><td>-17.93</td><td>55.96</td><td>27.99</td><td>10.02</td><td>0.02</td><td>LINE</td><td>Average</td></tr><tr><td>2</td><td>0.1508</td><td>53.83</td><td>-12.13</td><td>65.96</td><td>43.79</td><td>10.02</td><td>0.02</td><td>LINE</td><td>QP</td></tr><tr><td>3</td><td>0.2151</td><td>31.36</td><td>-21.65</td><td>53.01</td></tr></table>		Freq	Level	Over	Limit	Read	LISN	Cable	Pol/Phase	Remark		MHz	dBuV	Limit	Line	Level	Factor	Loss						dB	dBuV	dBuV	dB	dB			1	0.1508	38.03	-17.93	55.96	27.99	10.02	0.02	LINE	Average	2	0.1508	53.83	-12.13	65.96	43.79	10.02	0.02	LINE	QP	3	0.2151	31.36	-21.65	53.01
	Freq	Level	Over	Limit	Read	LISN	Cable	Pol/Phase	Remark																																														
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3	0.2151	31.36	-21.65	53.01																																																			



Summary

Mode	N dB (Hz)	OBW (Hz)	ITU-Code
5.2G;11a;20;1;1	45.95M	29.61M	29M6D1D
5.8G;11a;20;1;1	16.55M	30.935M	30M9D1D
5.2G;VHT20;20;2,(M0-8);2	47.3M	28.061M	28M1D1D
5.8G;VHT20;20;2,(M0-8);2	17.775M	25.962M	26M0D1D
5.2G;VHT40;40;2,(M0-9);2	98.45M	54.873M	54M9D1D
5.8G;VHT40;40;2,(M0-9);2	36.55M	36.332M	36M3D1D
5.2G;VHT80;80;2,(M0-9);2	164.3M	80.16M	80M2D1D
5.8G;VHT80;80;2,(M0-9);2	75.7M	75.462M	75M5D1D



Result

Mode	Result	Limit	P1-N dB (Hz)	P1-OBW (Hz)	P2-N dB (Hz)	P2-OBW (Hz)
5.2G;11a;20;1;1;5180;L;TN,VN	Pass	Inf	36.175M	17.166M		
5.2G;11a;20;1;1;5200;M;TN,VN	Pass	Inf	45.95M	29.61M		
5.2G;11a;20;1;1;5240;H;TN,VN	Pass	Inf	32.675M	16.692M		
5.8G;11a;20;1;1;5745;L;TN,VN	Pass	500k	16.55M	16.592M		
5.8G;11a;20;1;1;5785;M;TN,VN	Pass	500k	16.45M	30.935M		
5.8G;11a;20;1;1;5825;H;TN,VN	Pass	500k	16.525M	17.216M		
5.2G;VHT20;20;2;(M0-8);2;5180;L;TN,VN	Pass	Inf	43.525M	18.341M	40.925M	18.566M
5.2G;VHT20;20;2;(M0-8);2;5200;M;TN,VN	Pass	Inf	46.175M	24.238M	47.3M	28.061M
5.2G;VHT20;20;2;(M0-8);2;5240;H;TN,VN	Pass	Inf	45.775M	23.088M	42.75M	19.64M
5.8G;VHT20;20;2;(M0-8);2;5745;L;TN,VN	Pass	500k	17.775M	17.841M	17.7M	17.791M
5.8G;VHT20;20;2;(M0-8);2;5785;M;TN,VN	Pass	500k	17.675M	25.962M	17.7M	24.088M
5.8G;VHT20;20;2;(M0-8);2;5825;H;TN,VN	Pass	500k	17.775M	19.615M	17.65M	18.116M
5.2G;VHT40;40;2;(M0-9);2;5190;L;TN,VN	Pass	Inf	43.85M	36.332M	45.15M	36.332M
5.2G;VHT40;40;2;(M0-9);2;5230;H;TN,VN	Pass	Inf	96.4M	53.423M	98.45M	54.873M
5.8G;VHT40;40;2;(M0-9);2;5755;L;TN,VN	Pass	500k	36.55M	36.282M	36.35M	36.332M
5.8G;VHT40;40;2;(M0-9);2;5795;H;TN,VN	Pass	500k	36.35M	36.282M	36.45M	36.332M
5.2G;VHT80;80;2;(M0-9);2;5210;S;TN,VN	Pass	Inf	164.3M	80.16M	156.4M	76.062M
5.8G;VHT80;80;2;(M0-9);2;5775;S;TN,VN	Pass	500k	75.7M	75.362M	75.3M	75.462M



Summary

Mode	Sum (dBm)	Sum (W)	EIRP (dBm)	EIRP (W)
5.2G;11a;20;1;1	21.89	0.15453	24.09	0.25645
5.8G;11a;20;1;1	21.62	0.14521	23.82	0.24099
5.2G;VHT20;20;2,(M0-8);2	22.47	0.1766	24.24	0.26546
5.8G;VHT20;20;2,(M0-8);2	22.35	0.17179	24.13	0.25882
5.2G;VHT40;40;2,(M0-9);2	22.38	0.17298	24.15	0.26002
5.8G;VHT40;40;2,(M0-9);2	21.40	0.13804	23.17	0.20749
5.2G;VHT80;80;2,(M0-9);2	17.57	0.05715	19.34	0.0859
5.8G;VHT80;80;2,(M0-9);2	17.49	0.0561	19.27	0.08453



Result

Mode	Result	DG (dBi)	EIRP (dBm)	EIRP Lim. (dBm)	Sum (dBm)	Sum Lim. (dBm)	P1 (dBm)	P2 (dBm)
5.2G;11a;20;1;1;5180;L;TN,VN	Pass	2.20	20.88	30.00	18.68	24.00	18.68	
5.2G;11a;20;1;1;5200;M;TN,VN	Pass	2.20	24.09	30.00	21.89	24.00	21.89	
5.2G;11a;20;1;1;5240;H;TN,VN	Pass	2.20	20.23	30.00	18.03	24.00	18.03	
5.8G;11a;20;1;1;5745;L;TN,VN	Pass	2.20	19.08	36.00	16.88	30.00	16.88	
5.8G;11a;20;1;1;5785;M;TN,VN	Pass	2.20	23.82	36.00	21.62	30.00	21.62	
5.8G;11a;20;1;1;5825;H;TN,VN	Pass	2.20	20.83	36.00	18.63	30.00	18.63	
5.2G;VHT20;20;2;(M0-8);2;5180;L;TN,VN	Pass	1.77	23.54	30.00	21.77	24.00	18.49	19.00
5.2G;VHT20;20;2;(M0-8);2;5200;M;TN,VN	Pass	1.77	23.78	30.00	22.01	24.00	18.88	19.12
5.2G;VHT20;20;2;(M0-8);2;5240;H;TN,VN	Pass	1.77	24.24	30.00	22.47	24.00	19.45	19.47
5.8G;VHT20;20;2;(M0-8);2;5745;L;TN,VN	Pass	1.77	22.36	36.00	20.59	30.00	17.51	17.65
5.8G;VHT20;20;2;(M0-8);2;5785;M;TN,VN	Pass	1.77	24.13	36.00	22.35	30.00	19.25	19.44
5.8G;VHT20;20;2;(M0-8);2;5825;H;TN,VN	Pass	1.77	23.81	36.00	22.03	30.00	18.95	19.09
5.2G;VHT40;40;2;(M0-9);2;5190;L;TN,VN	Pass	1.77	19.85	30.00	18.08	24.00	14.99	15.15
5.2G;VHT40;40;2;(M0-9);2;5230;H;TN,VN	Pass	1.77	24.15	30.00	22.38	24.00	19.21	19.52
5.8G;VHT40;40;2;(M0-9);2;5755;L;TN,VN	Pass	1.77	19.22	36.00	17.44	30.00	14.42	14.44
5.8G;VHT40;40;2;(M0-9);2;5795;H;TN,VN	Pass	1.77	23.17	36.00	21.40	30.00	18.43	18.35
5.2G;VHT80;80;2;(M0-9);2;5210;S;TN,VN	Pass	1.77	19.34	30.00	17.57	24.00	14.57	14.54
5.8G;VHT80;80;2;(M0-9);2;5775;S;TN,VN	Pass	1.77	19.27	36.00	17.49	30.00	14.47	14.50



Summary

Mode	PD (dBm/RBW)	EIRP.PD (dBm/RBW)
5.2G;11a;20;1;1	9.77	11.97
5.8G;11a;20;1;1	8.32	10.52
5.2G;VHT20;20;2,(M0-8);2	9.77	11.55
5.8G;VHT20;20;2,(M0-8);2	8.92	10.70
5.2G;VHT40;40;2,(M0-9);2	6.90	8.67
5.8G;VHT40;40;2,(M0-9);2	-1.35	0.43
5.2G;VHT80;80;2,(M0-9);2	4.29	6.06
5.8G;VHT80;80;2,(M0-9);2	-3.77	-2.00



Result

Mode	Result	Meas.RBW (Hz)	Lim.RBW (Hz)	BWCF (dB)	DG (dBi)	Sum.Max (dBm/RBW)	PD (dBm/RBW)	PD.Limit (dBm/RBW)	EIRP.PD (dBm/RBW)	EIRP.PD.Li m (dBm/RBW)	P1 (dBm/RBW)	P2 (dBm/RBW)
5.2G;11a;20;1;1;5180;L;TN,VN	Pass	1M	1M	0.00	2.20	6.52	6.52	11.00	8.72	17.00	6.52	
5.2G;11a;20;1;1;5200;M;TN,VN	Pass	1M	1M	0.00	2.20	9.77	9.77	11.00	11.97	17.00	9.77	
5.2G;11a;20;1;1;5240;H;TN,VN	Pass	1M	1M	0.00	2.20	6.77	6.77	11.00	8.97	17.00	6.77	
5.8G;11a;20;1;1;5745;L;TN,VN	Pass	500k	500k	0.00	2.20	3.46	3.46	30.00	5.66	36.00	3.46	
5.8G;11a;20;1;1;5785;M;TN,VN	Pass	500k	500k	0.00	2.20	8.32	8.32	30.00	10.52	36.00	8.32	
5.8G;11a;20;1;1;5825;H;TN,VN	Pass	500k	500k	0.00	2.20	5.20	5.20	30.00	7.40	36.00	5.20	
5.2G;VHT20;20;2;(M0-8);2;5180;L;TN,VN	Pass	1M	1M	0.00	1.77	9.33	9.33	11.00	11.11	17.00	6.06	6.63
5.2G;VHT20;20;2;(M0-8);2;5200;M;TN,VN	Pass	1M	1M	0.00	1.77	9.58	9.58	11.00	11.36	17.00	6.74	6.82
5.2G;VHT20;20;2;(M0-8);2;5240;H;TN,VN	Pass	1M	1M	0.00	1.77	9.77	9.77	11.00	11.55	17.00	6.60	7.12
5.8G;VHT20;20;2;(M0-8);2;5745;L;TN,VN	Pass	500k	500k	0.00	1.77	6.26	6.26	30.00	8.04	36.00	3.04	3.81
5.8G;VHT20;20;2;(M0-8);2;5785;M;TN,VN	Pass	500k	500k	0.00	1.77	8.92	8.92	30.00	10.70	36.00	5.80	6.77
5.8G;VHT20;20;2;(M0-8);2;5825;H;TN,VN	Pass	500k	500k	0.00	1.77	7.95	7.95	30.00	9.72	36.00	5.34	5.21
5.2G;VHT40;40;2;(M0-9);2;5190;L;TN,VN	Pass	1M	1M	0.00	1.77	2.56	2.56	11.00	4.34	17.00	-0.43	-0.09
5.2G;VHT40;40;2;(M0-9);2;5230;H;TN,VN	Pass	1M	1M	0.00	1.77	6.90	6.90	11.00	8.67	17.00	3.93	4.05
5.8G;VHT40;40;2;(M0-9);2;5755;L;TN,VN	Pass	500k	500k	0.00	1.77	-1.39	-1.39	30.00	0.38	36.00	-5.96	-3.10
5.8G;VHT40;40;2;(M0-9);2;5795;H;TN,VN	Pass	500k	500k	0.00	1.77	-1.35	-1.35	30.00	0.43	36.00	-3.98	-4.09
5.2G;VHT80;80;2;(M0-9);2;5210;S;TN,VN	Pass	1M	1M	0.00	1.77	4.29	4.29	11.00	6.06	17.00	2.39	0.54
5.8G;VHT80;80;2;(M0-9);2;5775;S;TN,VN	Pass	500k	500k	0.00	1.77	-3.77	-3.77	30.00	-2.00	36.00	-6.09	-6.44



RSE below 1GHz Result																																																																																																													
Operating Mode	2	Polarization	Horizontal																																																																																																										
Operating Function	Normal Link																																																																																																												
Level (dBuV/m) Date: 2016-03-08 Time: 15:46:10 Trace: (Discrete) Condition: FCC CLASS-B 3m 05 1G ANT-1511 HORIZONTAL : RBW:100.000KHz VBW:300.000KHz SWT:0.500sec EUT : AM7520 mode : Normal Power : AC 110V / 60Hz Memo 5-1 : EUT Z Memo 5-2 : Link 5G : C-3 <table><tr><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>CableAntenna</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>30.97</td><td>29.25</td><td>40.00</td><td>-10.75</td><td>36.02</td><td>0.50</td><td>25.13</td><td>32.40</td><td>100</td><td>3 Peak</td><td>HORIZONTAL</td></tr><tr><td>2</td><td>68.80</td><td>34.75</td><td>40.00</td><td>-5.25</td><td>53.44</td><td>0.72</td><td>12.99</td><td>32.40</td><td>400</td><td>71 Peak</td><td>HORIZONTAL</td></tr><tr><td>3</td><td>118.27</td><td>35.03</td><td>43.50</td><td>-8.47</td><td>47.42</td><td>0.94</td><td>19.05</td><td>32.38</td><td>300</td><td>266 Peak</td><td>HORIZONTAL</td></tr><tr><td>4</td><td>275.41</td><td>42.96</td><td>46.00</td><td>-3.04</td><td>54.19</td><td>1.41</td><td>19.65</td><td>32.29</td><td>150</td><td>289 Peak</td><td>HORIZONTAL</td></tr><tr><td>5</td><td>375.32</td><td>42.34</td><td>46.00</td><td>-3.66</td><td>50.91</td><td>1.67</td><td>22.08</td><td>32.32</td><td>100</td><td>298 Peak</td><td>HORIZONTAL</td></tr><tr><td>6</td><td>464.56</td><td>41.81</td><td>46.00</td><td>-4.19</td><td>48.84</td><td>1.87</td><td>23.44</td><td>32.34</td><td>100</td><td>142 Peak</td><td>HORIZONTAL</td></tr><tr><td>7</td><td>531.49</td><td>40.03</td><td>46.00</td><td>-5.97</td><td>45.89</td><td>2.00</td><td>24.51</td><td>32.37</td><td>100</td><td>57 Peak</td><td>HORIZONTAL</td></tr></table>				Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		1	30.97	29.25	40.00	-10.75	36.02	0.50	25.13	32.40	100	3 Peak	HORIZONTAL	2	68.80	34.75	40.00	-5.25	53.44	0.72	12.99	32.40	400	71 Peak	HORIZONTAL	3	118.27	35.03	43.50	-8.47	47.42	0.94	19.05	32.38	300	266 Peak	HORIZONTAL	4	275.41	42.96	46.00	-3.04	54.19	1.41	19.65	32.29	150	289 Peak	HORIZONTAL	5	375.32	42.34	46.00	-3.66	50.91	1.67	22.08	32.32	100	298 Peak	HORIZONTAL	6	464.56	41.81	46.00	-4.19	48.84	1.87	23.44	32.34	100	142 Peak	HORIZONTAL	7	531.49	40.03	46.00	-5.97	45.89	2.00	24.51	32.37	100	57 Peak	HORIZONTAL
Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase																																																																																																			
MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg																																																																																																				
1	30.97	29.25	40.00	-10.75	36.02	0.50	25.13	32.40	100	3 Peak	HORIZONTAL																																																																																																		
2	68.80	34.75	40.00	-5.25	53.44	0.72	12.99	32.40	400	71 Peak	HORIZONTAL																																																																																																		
3	118.27	35.03	43.50	-8.47	47.42	0.94	19.05	32.38	300	266 Peak	HORIZONTAL																																																																																																		
4	275.41	42.96	46.00	-3.04	54.19	1.41	19.65	32.29	150	289 Peak	HORIZONTAL																																																																																																		
5	375.32	42.34	46.00	-3.66	50.91	1.67	22.08	32.32	100	298 Peak	HORIZONTAL																																																																																																		
6	464.56	41.81	46.00	-4.19	48.84	1.87	23.44	32.34	100	142 Peak	HORIZONTAL																																																																																																		
7	531.49	40.03	46.00	-5.97	45.89	2.00	24.51	32.37	100	57 Peak	HORIZONTAL																																																																																																		
Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit. Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)																																																																																																													

RSE below 1GHz Result																																																																																																	
Operating Mode	2	Power Phase	Vertical																																																																																														
Operating Function	Normal Link																																																																																																
Level (dBuV/m) Date: 2016-03-08 Time: 15:43:05 Trace: (Discrete) Condition: FCC CLASS-B 3m 05 1G ANT-1511 VERTICAL : RBW:100.000KHz VBW:300.000KHz SWT:0.500sec EUT : AM7520 mode : Normal Power : AC 110V / 60Hz Memo 5-1 : EUT Z Memo 5-2 : Link 5G : C-3 <table><tr><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>CableAntenna</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>65.89</td><td>35.55</td><td>40.00</td><td>-4.45</td><td>54.02</td><td>0.70</td><td>13.23</td><td>32.40</td><td>400</td><td>339 Peak</td><td>VERTICAL</td></tr><tr><td>2</td><td>132.82</td><td>30.02</td><td>43.50</td><td>-13.48</td><td>42.77</td><td>0.99</td><td>18.63</td><td>32.37</td><td>100</td><td>89 Peak</td><td>VERTICAL</td></tr><tr><td>3</td><td>280.26</td><td>42.48</td><td>46.00</td><td>-3.52</td><td>53.64</td><td>1.43</td><td>19.70</td><td>32.29</td><td>200</td><td>191 Peak</td><td>VERTICAL</td></tr><tr><td>4</td><td>379.20</td><td>38.10</td><td>46.00</td><td>-7.90</td><td>46.59</td><td>1.68</td><td>22.15</td><td>32.32</td><td>125</td><td>173 Peak</td><td>VERTICAL</td></tr><tr><td>5</td><td>453.89</td><td>39.73</td><td>46.00</td><td>-6.27</td><td>46.94</td><td>1.85</td><td>23.28</td><td>32.34</td><td>200</td><td>191 Peak</td><td>VERTICAL</td></tr><tr><td>6</td><td>535.37</td><td>41.69</td><td>46.00</td><td>-4.31</td><td>47.49</td><td>2.00</td><td>24.57</td><td>32.37</td><td>150</td><td>160 Peak</td><td>VERTICAL</td></tr></table>				Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		1	65.89	35.55	40.00	-4.45	54.02	0.70	13.23	32.40	400	339 Peak	VERTICAL	2	132.82	30.02	43.50	-13.48	42.77	0.99	18.63	32.37	100	89 Peak	VERTICAL	3	280.26	42.48	46.00	-3.52	53.64	1.43	19.70	32.29	200	191 Peak	VERTICAL	4	379.20	38.10	46.00	-7.90	46.59	1.68	22.15	32.32	125	173 Peak	VERTICAL	5	453.89	39.73	46.00	-6.27	46.94	1.85	23.28	32.34	200	191 Peak	VERTICAL	6	535.37	41.69	46.00	-4.31	47.49	2.00	24.57	32.37	150	160 Peak	VERTICAL
Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase																																																																																							
MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg																																																																																								
1	65.89	35.55	40.00	-4.45	54.02	0.70	13.23	32.40	400	339 Peak	VERTICAL																																																																																						
2	132.82	30.02	43.50	-13.48	42.77	0.99	18.63	32.37	100	89 Peak	VERTICAL																																																																																						
3	280.26	42.48	46.00	-3.52	53.64	1.43	19.70	32.29	200	191 Peak	VERTICAL																																																																																						
4	379.20	38.10	46.00	-7.90	46.59	1.68	22.15	32.32	125	173 Peak	VERTICAL																																																																																						
5	453.89	39.73	46.00	-6.27	46.94	1.85	23.28	32.34	200	191 Peak	VERTICAL																																																																																						
6	535.37	41.69	46.00	-4.31	47.49	2.00	24.57	32.37	150	160 Peak	VERTICAL																																																																																						
Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit. Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)																																																																																																	



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
5.2G;VHT80;80;2,(M0-9);2;5210;S;TX	Pass	AV	5.147G	53.79	54.00	-0.21	5.07	3	H	45	1.00	-
5.8G;11a;20;1;1;5825;H;TX	Pass	PK	5.8604G	68.01	68.20	-0.19	5.87	3	V	346	1.00	-
5.2G;VHT80;80;2,(M0-9);2;5210;S;TX	Pass	AV	5.147G	53.79	54.00	-0.21	5.07	3	H	45	1.00	-
5.8G;11a;20;1;1;5825;H;TX	Pass	PK	5.8604G	68.01	68.20	-0.19	5.87	3	V	346	1.00	-
5.2G;VHT80;80;2,(M0-9);2;5210;S;TX	Pass	AV	5.147G	53.79	54.00	-0.21	5.07	3	H	45	1.00	-
5.8G;11a;20;1;1;5825;H;TX	Pass	PK	5.8604G	68.01	68.20	-0.19	5.87	3	V	346	1.00	-
5.2G;VHT80;80;2,(M0-9);2;5210;S;TX	Pass	AV	5.147G	53.79	54.00	-0.21	5.07	3	H	45	1.00	-
5.8G;11a;20;1;1;5825;H;TX	Pass	PK	5.8604G	68.01	68.20	-0.19	5.87	3	V	346	1.00	-



Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	6G	40.00	68.20	-28.20	6.18	3	H	40	2.21	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	11.577G	56.27	74.00	-17.73	15.19	3	H	99	1.65	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	17.3055G	64.62	68.20	-3.58	21.55	3	H	231	1.84	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	AV	5.712G	55.56	Inf	-Inf	5.95	3	V	15	1.00	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	AV	5.722G	56.24	Inf	-Inf	5.92	3	V	15	1.00	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	AV	5.757G	91.39	Inf	-Inf	5.84	3	V	15	1.00	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	AV	5.85G	52.36	Inf	-Inf	5.85	3	V	15	1.00	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	AV	5.861G	50.57	Inf	-Inf	5.87	3	V	15	1.00	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	AV	6G	33.55	Inf	-Inf	6.18	3	V	122	2.01	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	AV	11.565G	47.66	54.00	-6.34	15.20	3	V	119	1.90	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	AV	17.3535G	55.49	Inf	-Inf	21.99	3	V	60	2.13	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	5.711G	67.63	68.20	-0.57	5.95	3	V	15	1.00	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	5.722G	68.22	78.20	-9.98	5.92	3	V	15	1.00	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	5.793G	103.09	Inf	-Inf	5.75	3	V	15	1.00	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	5.856G	64.75	78.20	-13.45	5.86	3	V	15	1.00	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	5.862G	63.42	68.20	-4.78	5.88	3	V	15	1.00	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	6G	40.54	68.20	-27.66	6.18	3	V	122	2.01	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	11.5485G	55.55	74.00	-18.45	15.22	3	V	119	1.90	-
5.8G;VHT80;80;2,(M0-9);2;5775;S;TX	Pass	PK	17.286G	63.71	68.20	-4.49	21.37	3	V	60	2.13	-

