MEASUREMENT REPORT

FCC PART 15.407 WLAN 802.11a/n/ac

FCC ID:	TE7T4E
APPLICANT:	TP-Link Technologies Co., Ltd.
Application Type:	Certification
Product:	AC1200 Wireless Dual Band PCI Express Adapter
Model No.:	Archer T4E
Brand Name:	tp-link
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part15 Subpart E (Section 15.407)
Test Procedure(s):	ANSI C63.10-2013, KDB 789033 D02v02r01, KDB 662911 D01v02r01
Test Date:	November 06 ~ December 08, 2018

Reviewed By: (Kevin Guo)

Approved By: (Robin Wu)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033 D02v02r01. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
1811RSU003-U2	Rev. 01	Initial Report	12-17-2018	Valid

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Description Page

§2.1033General Information

Applicant:	TP-Link Technologies Co., Ltd.
Applicant Address:	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park,Shennan Rd, Nanshan, Shenzhen,China
Manufacturer:	TP-Link Technologies Co., Ltd.
Manufacturer Address:	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park,Shennan Rd, Nanshan, Shenzhen,China
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
FCC Registration No.:	893164
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- **MRT facility is a FCC registered (MRT Reg. No. 893164) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications, Radio and SAR testing.**

1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices includingintentional and/or unintentional radiators for compliance with the technical rules and regulations of the FederalCommunications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	AC1200 Wireless Dual Band PCI Express Adapter
Model No.:	Archer T4E
Brand Name:	tp-link
Wi-Fi Specification:	802.11a/b/g/n/ac

2.2. Product Specification Subjective to this Report

Frequency Range:	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5260~5320MHz, 5500~5580MHz, 5660~5700MHz 5745~5825MHz For 802.11n-HT40/ac-VHT40: 5190~5230MHz, 5270~5310MHz, 5510MHz, 5550MHz, 5670MHz 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530MHz, 5775MHz
Type of Modulation:	802.11a/n/ac: OFDM
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps

Note: For other features of this EUT, test report will be issued separately.

2.3. Working Frequencies for this report

802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	52	5260 MHz	56	5280 MHz
60	5300 MHz	64	5320 MHz	100	5500 MHz
104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	132	5660 MHz	136	5680 MHz
140	5700 MHz	149	5745 MHz	153	5765 MHz
157	5785 MHz	161	5805 MHz	165	5825 MHz

802.11n-HT40/ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz
62	5310 MHz	102	5510 MHz	110	5550 MHz
134	5670 MHz	142	5710 MHz	151	5755 MHz
159	5795 MHz	--	--	--	--

802.11ac-VHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	106	5530 MHz
155	5775 MHz	--	--	--	--

2.4. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	TX Paths	Max Antenna Gain (dBi)	CDD Directional Gain (dBi)	
				For Power	For PSD
Dipole Antenna	2400 ~ 2500	2	2.0	2.0	5.01
	5150 ~ 5850	2	2.0	2.0	5.01

Note:

1. 802.11a, 802.11b, 802.11g support single transmission at Ant A port only.
2. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows, N_{ANT} = 2, N_{SS} = 1.

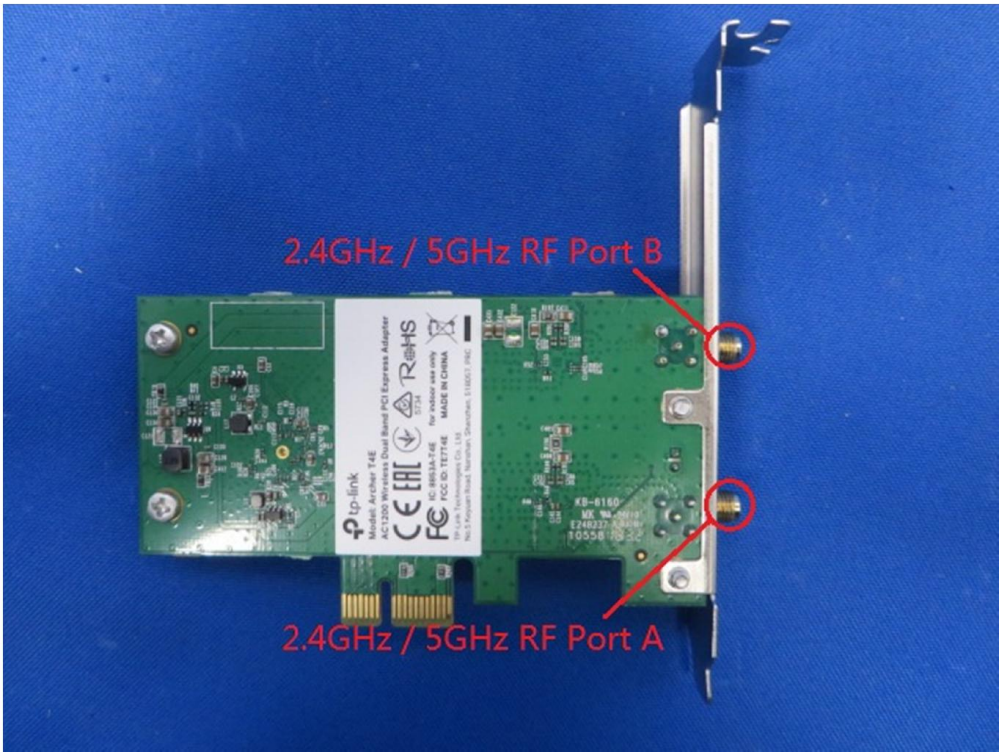
If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

a. For power spectral density (PSD) measurements on all devices,
   Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;

b. For power measurements on IEEE 802.11 devices,
   Array Gain = 0 dB for N_{ANT} ≤ 4

2.5. Description of Antenna RF Port

Software Control Port	2.4GHz & 5GHz RF Port	
	Ant A	Ant B



2.6. Test Mode

Test Mode	Mode 1: Transmit by 802.11a (6Mbps)
	Mode 2: Transmit by 802.11n-HT20 (MCS0)
	Mode 3: Transmit by 802.11n-HT40 (MCS0)
	Mode 4: Transmit by 802.11ac-VHT20 (MCS0)
	Mode 5: Transmit by 802.11ac-VHT40 (MCS0)
	Mode 6: Transmit by 802.11ac-VHT80 (MCS0)

2.7. Description of Test Software

The test utility software used during testing was “Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program”, and the version was “0.0057.28.20180718”.

Power Parameter Value:

Test Mode	Test Frequency (MHz)	Power Parameter Value		Test Mode	Test Frequency (MHz)	Power Parameter Value	
		Ant A	Ant B			Ant A	Ant B
802.11a	5180	52.0	--	802.11ac-VHT20	5180	50.0	46.0
	5220	50.0	--		5220	48.0	45.0
	5240	48.0	--		5240	47.0	44.0
	5260	47.0	--		5260	46.0	43.0
	5300	45.0	--		5300	44.0	42.0
	5320	45.0	--		5320	44.0	42.0
	5500	51.0	--		5500	50.0	45.0
	5580	51.0	--		5580	48.0	45.0
	5700	48.0	--		5700	47.0	40.0
	5745	49.0	--		5745	49.0	45.0
	5785	48.0	--		5785	49.0	45.0
	5825	47.0	--		5825	49.0	45.0
802.11n-HT20	5180	50.0	48.0	802.11ac-VHT40	5190	50.0	47.0
	5220	48.0	46.0		5230	52.0	50.0
	5240	46.0	44.0		5270	49.0	46.0
	5260	45.0	44.0		5310	47.0	45.0
	5300	45.0	42.0		5510	48.0	44.0
	5320	45.0	42.0		5550	54.0	48.0
	5500	52.0	47.0		5670	53.0	45.0
	5580	49.0	45.0		5755	50.0	47.0
	5700	47.0	40.0		5795	49.0	45.0
	5745	49.0	45.0		--	--	--
	5785	49.0	45.0		--	--	--
	5825	47.0	45.0		--	--	--

Test Mode	Test Frequency (MHz)	Power Parameter Value		Test Mode	Test Frequency (MHz)	Power Parameter Value	
		Ant A	Ant B			Ant A	Ant B
802.11n-HT40	5190	47.0	45.0	802.11ac-VHT80	5210	48.0	46.0
	5230	52.0	48.0		5290	48.0	46.0
	5270	49.0	45.0		5530	47.0	43.0
	5310	48.0	45.0		5775	49.0	45.0
	5510	49.0	45.0		--	--	--
	5550	54.0	48.0		--	--	--
	5670	53.0	44.0		--	--	--
	5755	51.0	47.0		--	--	--
	5795	49.0	47.0		--	--	--

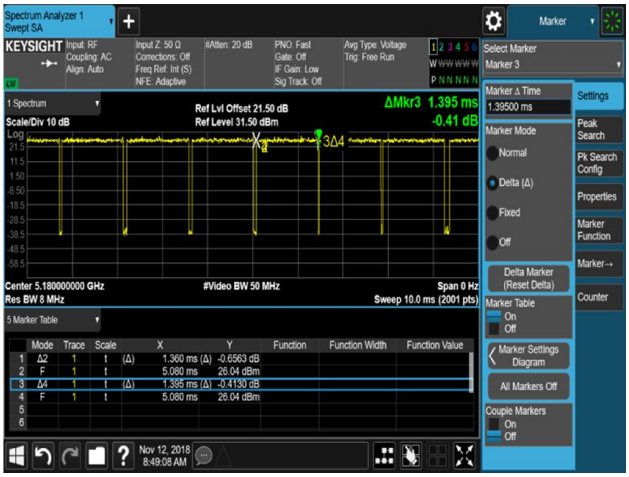
2.8. Device Capabilities

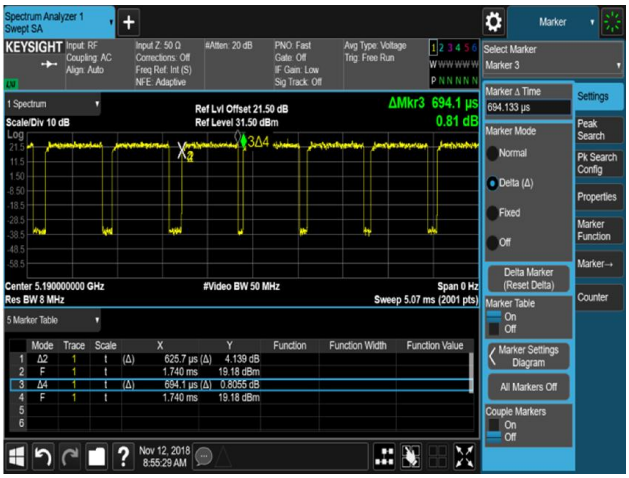
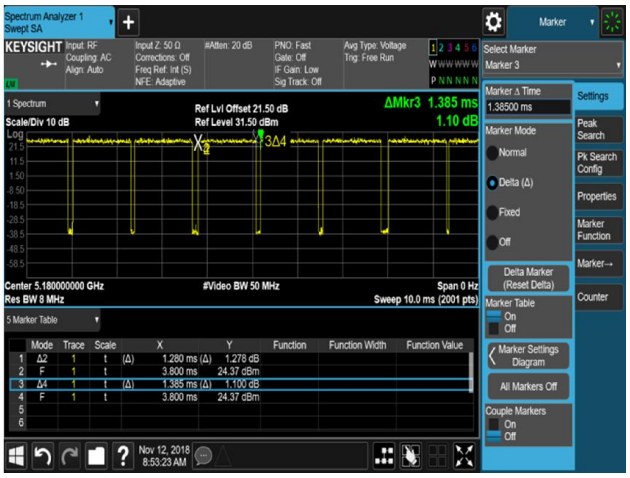
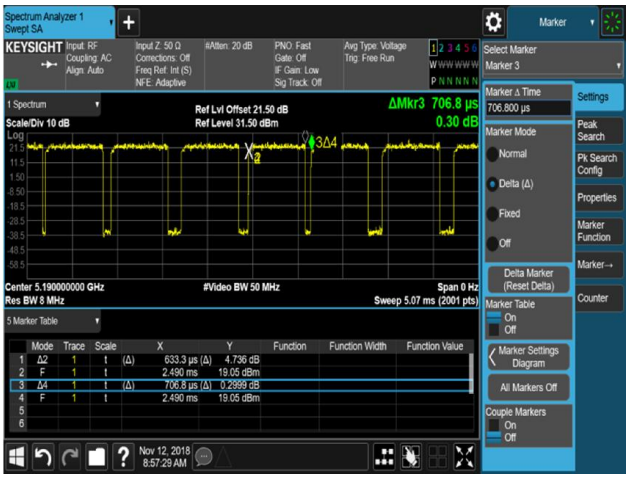
This device contains the following capabilities:

2.4GHz WLAN (DTS), 5GHz WLAN (UNII).

Note: 5GHz (NII) operation is possible in 20MHz, 40MHz, and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Model No.	Test Mode	Duty Cycle
Archer T4E	802.11a	97.49%
	802.11n-HT20	93.36%
	802.11n-HT40	90.15%
	802.11ac-VHT20	92.42%
	802.11ac-VHT40	89.60%
	802.11ac-VHT80	79.23%

Duty Cycle (T = Transmission Duration)	
802.11a (T = 1.360ms)	802.11n-HT20 (T = 1.265ms)
	

802.11n-HT40 (T = 625.7us)	802.11ac-VHT20 (T = 1.280ms)
	
802.11ac-VHT40 (T = 633.3us)	**802.11ac-VHT80 (T = 315.9us)**
	

2.9. Test Configuration

The **AC1200 Wireless Dual Band PCI Express Adapter**was tested per the guidance of KDB 789033 D02v02r01.ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testingand AC line conducted testing.

2.10. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.11. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphletsupplied to the user and be readily visible to the purchaser at the time of purchase. However, when the deviceis so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label andlabel location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed WirelessDevices (ANSI C63.10-2013), and the guidance provided in KDB 789033 D02v02r01 were used in themeasurement of the **AC1200 Wireless Dual Band PCI Express Adapter.**

Deviation from measurement procedure…….....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

3.3. Radiated Emissions

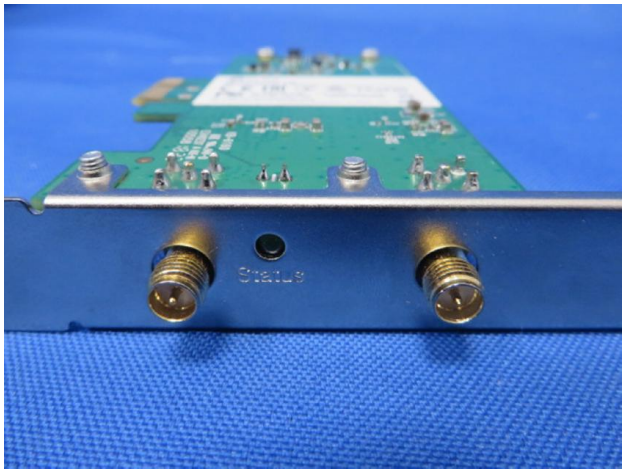
The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remotecontrolled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An80cm high PVC support structure is placed on top of the turntable.
For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated tomaximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.
Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by theresponsible party can be used with the device. The use of a permanently attached antenna or of an antennathat uses a unique coupling to the intentional radiator shall be considered sufficient to comply with theprovisions of this section."

- The antenna of the **AC1200 Wireless Dual Band PCI Express Adapter** is uses a unique connector (Reversed SMA connector).



Conclusion:

The unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions – SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2019/04/20
Two-Line V-Network	R&S	ENV 216	MRTSUE06002	1 year	2019/06/15
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2019/06/15
Thermohygrometer	Testo	608-H1	MRTSUE06404	1 year	2019/08/15
Shielding Anechoic Chamber	Mikebang	Chamber-SR2	MRTSUE06214	N/A	N/A

Radiated Emissions - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
MXE EMI Receiver	Agilent	N9038A	MRTSUE06125	1 year	2019/08/14
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06452	1 year	2019/07/20
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2019/11/20
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2019/10/21
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2019/11/18
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2018/12/14
Broadband Coaxial Preamplifier	Agilent	BBV 9718	MRTSUE06176	1 year	2019/11/17
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2019/06/13
Digitial Thermometer & Hygrometer	MingGao	ETH529	MRTSUE06170	1 year	2018/12/12
Anechoic Chamber	RIKEN	Chamber-AC1	MRTSUE06213	1 year	2019/05/02

Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	KEYSIGHT	N9010B	MRTSUE06452	1 year	2019/07/20
USB wideband power sensor	KEYSIGHT	U2021XA	MRTSUE06446	1 year	2019/07/20
Attenuator	MVE	MVE2211-10	MRTSUE06800	1 year	2019/07/10
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2019/12/06
Thermohygrometer	testo	608-H1	MRTSUE06401	1 year	2019/08/15

Software	**Version**	**Function**
e3	V 8.3.5	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB
Output Power - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.13dB
Power Spectrum Density - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.15dB
Occupied Bandwidth - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.28%

7. TEST RESULT

7.1. Summary

Product Name: **AC1200 Wireless Dual Band PCI Express Adapter**

FCC ID: **TE7T4E**

FCC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407(a)	26dB Bandwidth	N/A	Conducted	Pass	Section 7.2
15.407(e)	6dB Bandwidth	≥ 500kHz		Pass	Section 7.3
15.407(a)(1)(iv), (2), (3)	Maximum Conducted Output Power	Refer to section 7.4		Pass	Section 7.4
15.407(h)(1)	Transmit Power Control	≤ 24 dBm		Pass	Section 7.5
15.407(a)(1)(iv), (2), (3), (5)	Peak Power Spectral Density	Refer to section 7.6		Pass	Section 7.6
15.407(g)	Frequency Stability	± 20 ppm		Pass	Section 7.7
15.407(b)(1), (4)(i)	Undesirable Emissions	Refer to Section 7.8	Radiated	Pass	Section 7.8 & 7.9
15.205, 15.209 15.407(b)(5), (6), (7)	General Field Strength Limits(Restricted Bands andRadiated Emission Limits)	Emissions in restrictedbands must meet theradiated limits detailed in15.209		Pass	
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.10

Notes:

1) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer.The correction table was used to account for the losses of the cables and attenuators used as part ofthe system to connect the EUT to the analyzer at all frequencies of interest.
2) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
3) Test Items “26dB Bandwidth” & “6dB Bandwidth” have been assessed MIMO transmission, and showed the worst test data in this report.

7.2. 26dB Bandwidth Measurement

7.2.1.Test Limit

N/A

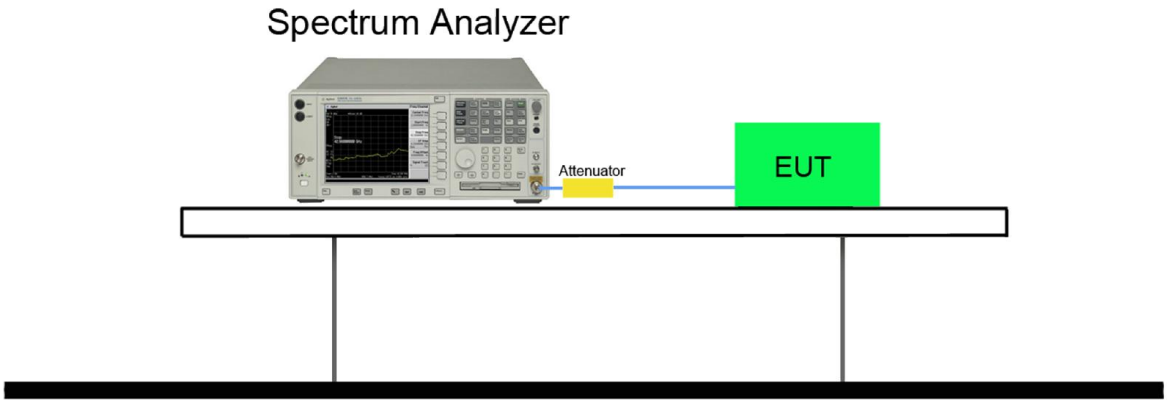
7.2.2.Test Procedure used

KDB 789033 D02v02r01 - Section C.1

7.2.3.Test Setting

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediated power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth.
3. VBW ≥ 3×RBW.
4. Detector = Peak.
5. Trace mode = max hold.

7.2.4.Test Setup



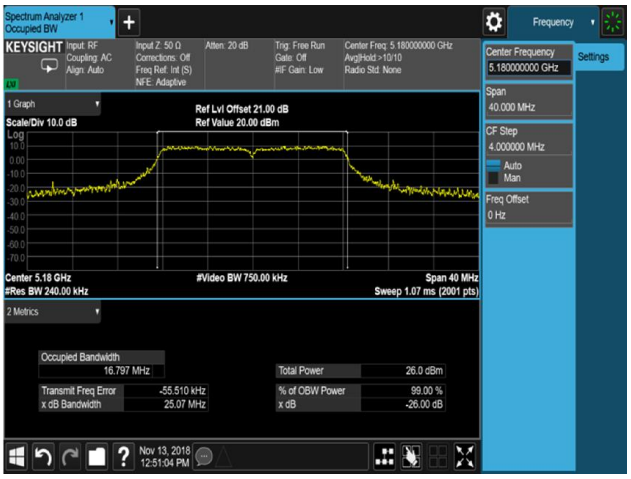
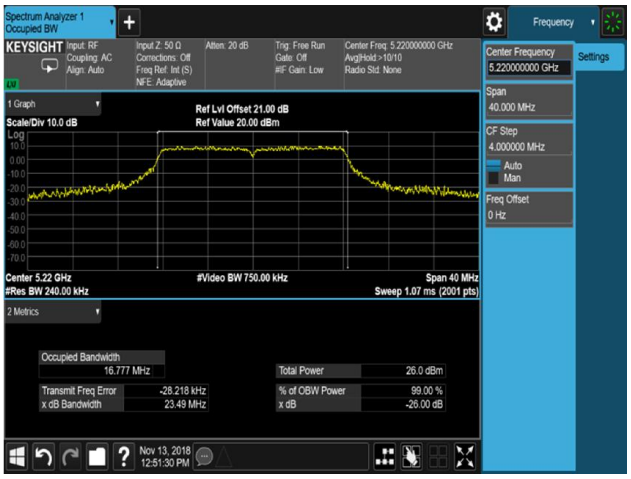
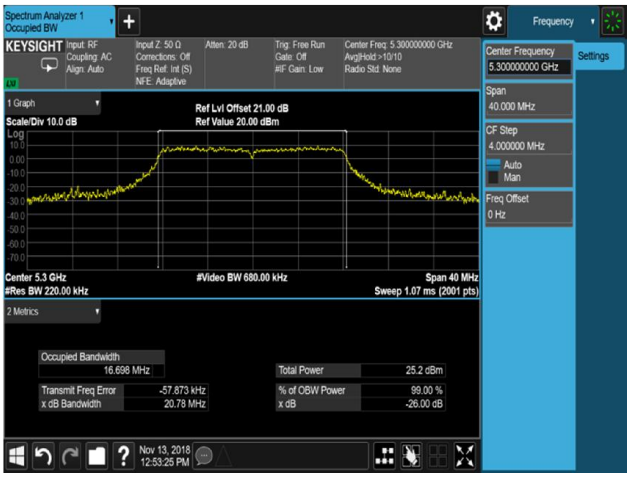
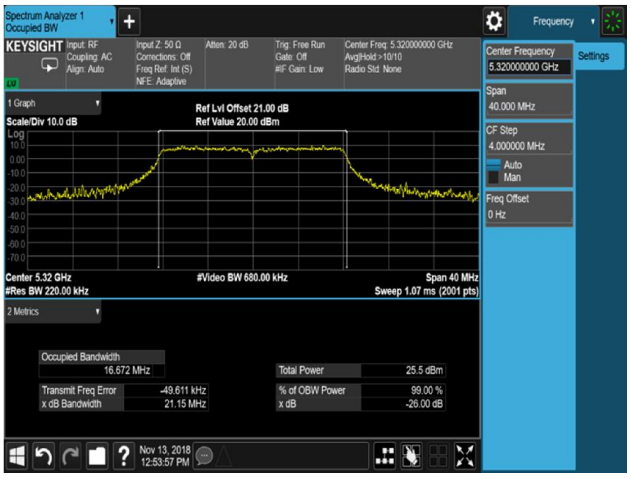
7.2.5.Test Result

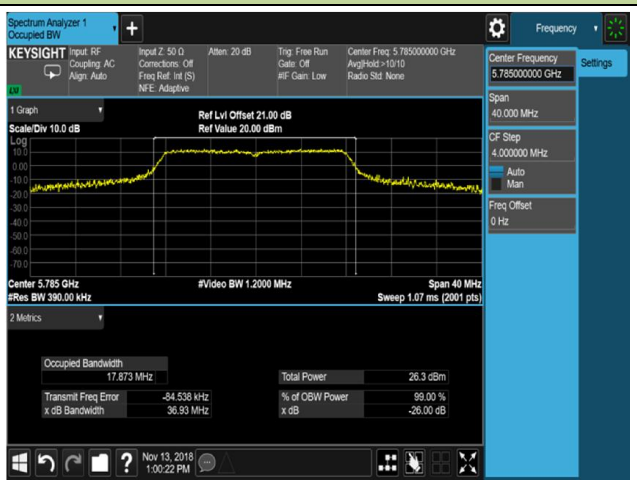
Product	AC1200 Wireless Dual Band PCI Express Adapter	Temperature	24°C
Test Engineer	Snake Ni	Relative Humidity	59%
Test Site	TR3	Test Date	2018/11/13

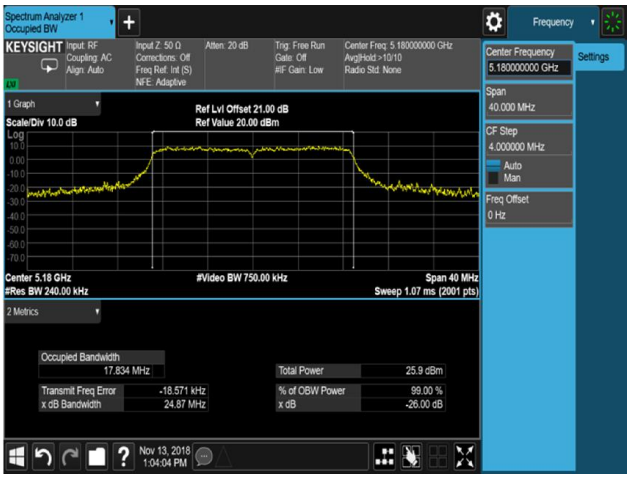
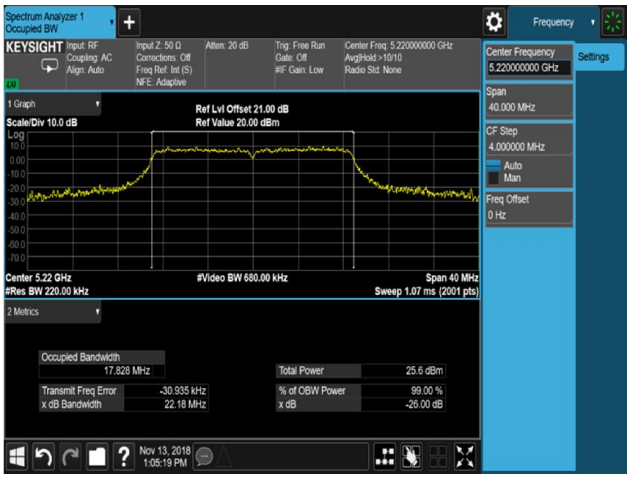
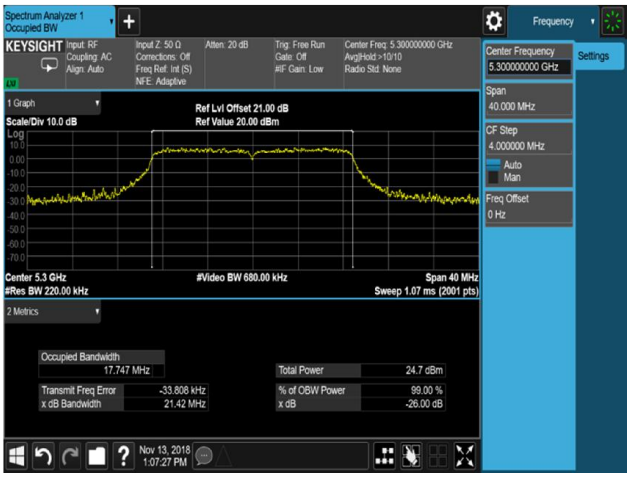
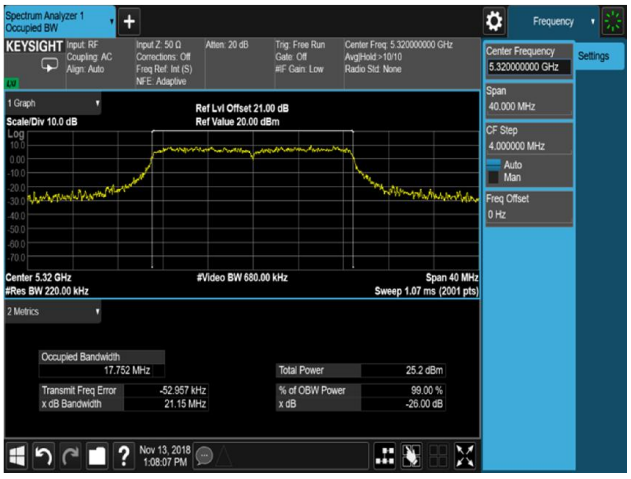
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Ant A					
802.11a	6Mbps	36	5180	25.07	16.80
802.11a	6Mbps	44	5220	23.49	16.78
802.11a	6Mbps	48	5240	25.25	16.75
802.11a	6Mbps	52	5260	22.24	16.76
802.11a	6Mbps	60	5300	20.78	16.70
802.11a	6Mbps	64	5320	21.15	16.67
802.11a	6Mbps	100	5500	22.50	16.78
802.11a	6Mbps	116	5580	29.06	17.22
802.11a	6Mbps	140	5700	37.11	17.42
802.11a	6Mbps	149	5745	39.50	18.96
802.11a	6Mbps	157	5785	36.93	17.87
802.11a	6Mbps	165	5825	37.17	17.61
Ant A / Ant A + B					
802.11n-HT20	MCS0	36	5180	24.87	17.83
802.11n-HT20	MCS0	44	5220	22.18	17.83
802.11n-HT20	MCS0	48	5240	21.21	17.75
802.11n-HT20	MCS0	52	5260	21.27	17.70
802.11n-HT20	MCS0	60	5300	21.42	17.75
802.11n-HT20	MCS0	64	5320	21.15	17.75
802.11n-HT20	MCS0	100	5500	21.29	17.75
802.11n-HT20	MCS0	116	5580	22.07	17.78
802.11n-HT20	MCS0	140	5700	30.13	18.06
802.11n-HT20	MCS0	149	5745	37.11	18.33
802.11n-HT20	MCS0	157	5785	36.74	18.46
802.11n-HT20	MCS0	165	5825	38.59	18.59

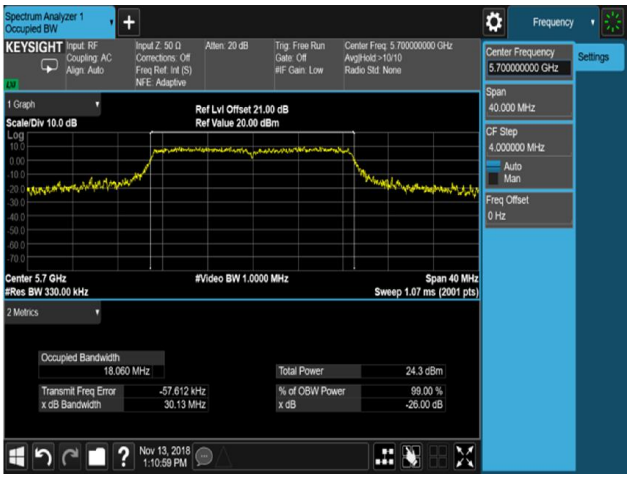
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Ant A / Ant A + B					
802.11n-HT40	MCS0	38	5190	48.90	36.69
802.11n-HT40	MCS0	46	5230	49.49	36.58
802.11n-HT40	MCS0	54	5270	48.50	36.58
802.11n-HT40	MCS0	62	5310	48.31	36.64
802.11n-HT40	MCS0	102	5510	63.98	36.86
802.11n-HT40	MCS0	110	5550	75.55	37.30
802.11n-HT40	MCS0	134	5670	77.03	38.13
802.11n-HT40	MCS0	151	5755	79.80	38.63
802.11n-HT40	MCS0	159	5795	74.47	37.51
802.11ac-VHT20	MCS0	36	5180	21.77	17.73
802.11ac-VHT20	MCS0	44	5220	21.72	17.76
802.11ac-VHT20	MCS0	48	5240	21.29	17.71
802.11ac-VHT20	MCS0	52	5260	21.02	17.75
802.11ac-VHT20	MCS0	60	5300	21.41	17.75
802.11ac-VHT20	MCS0	64	5320	21.40	17.73
802.11ac-VHT20	MCS0	100	5500	21.19	17.75
802.11ac-VHT20	MCS0	116	5580	24.95	17.76
802.11ac-VHT20	MCS0	140	5700	33.34	18.06
802.11ac-VHT20	MCS0	149	5745	32.86	18.23
802.11ac-VHT20	MCS0	157	5785	33.89	18.25
802.11ac-VHT20	MCS0	165	5825	33.05	18.07
802.11ac-VHT40	MCS0	38	5190	48.19	36.57
802.11ac-VHT40	MCS0	46	5230	44.30	36.40
802.11ac-VHT40	MCS0	54	5270	43.56	36.42
802.11ac-VHT40	MCS0	62	5310	44.46	36.46
802.11ac-VHT40	MCS0	102	5510	54.58	36.58
802.11ac-VHT40	MCS0	110	5550	74.22	36.99
802.11ac-VHT40	MCS0	134	5670	76.72	38.10
802.11ac-VHT40	MCS0	151	5755	76.80	37.46
802.11ac-VHT40	MCS0	159	5795	72.94	37.49

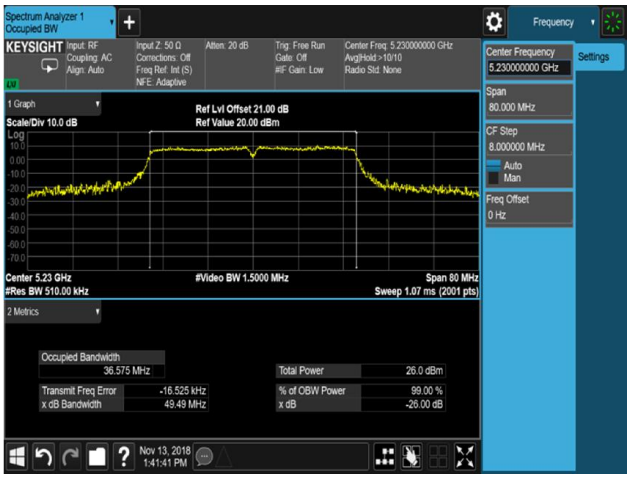
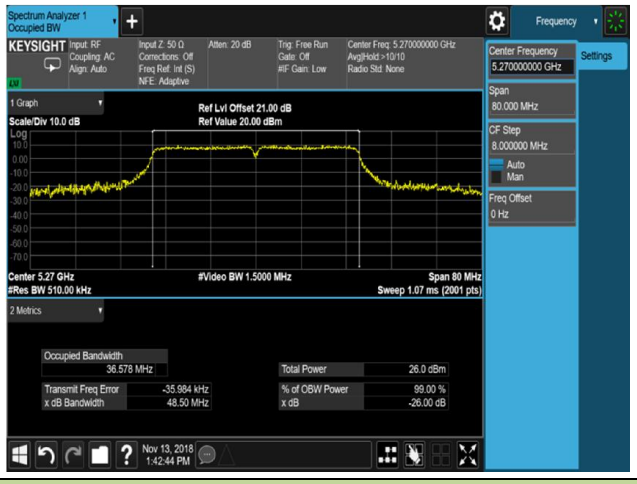
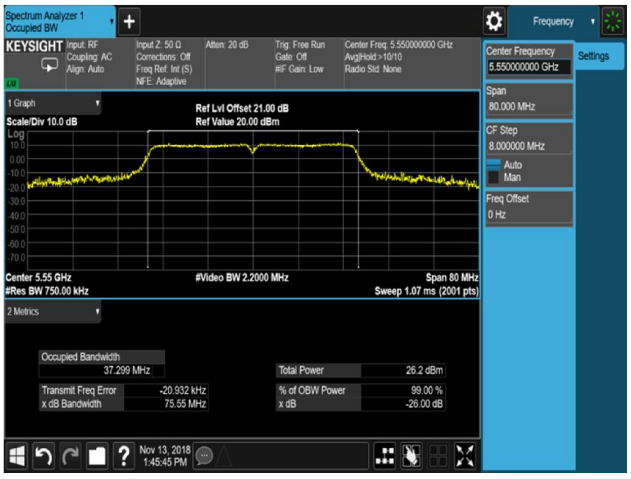
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Ant A / Ant A + B					
802.11ac-VHT80	MCS0	42	5210	81.94	75.20
802.11ac-VHT80	MCS0	58	5290	80.77	75.20
802.11ac-VHT80	MCS0	106	5530	108.10	75.43
802.11ac-VHT80	MCS0	155	5775	130.70	75.87

802.11a 26dB Bandwidth & 99% Bandwidth - Ant A	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
	
Channel 48 (5240MHz)	Channel 52 (5260MHz)
	
Channel 60 (5300MHz)	Channel 64 (5320MHz)
	

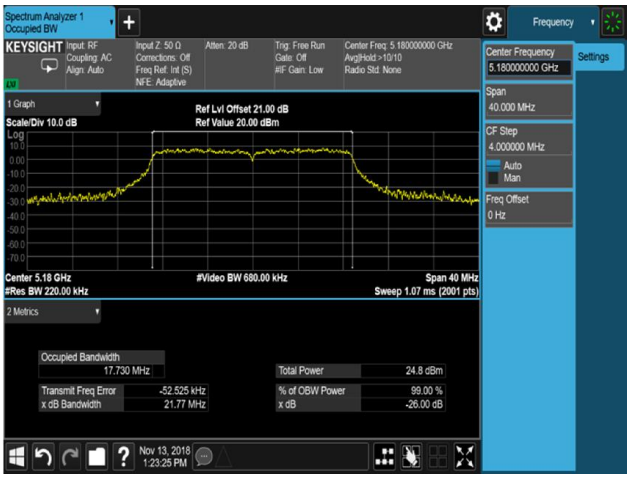
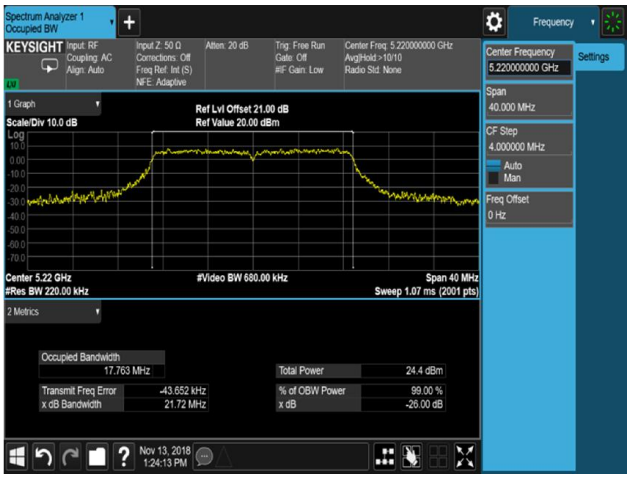
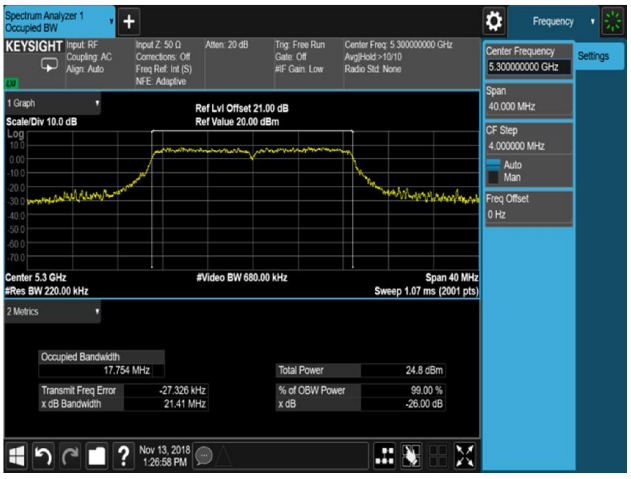
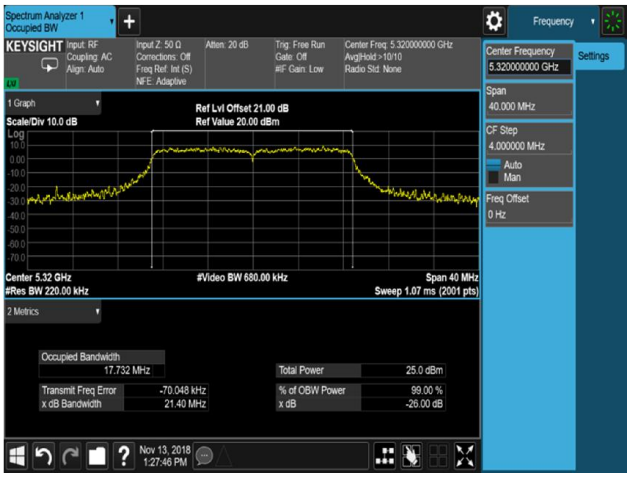
Channel 100 (5500MHz)	Channel 116 (5580MHz)
	
Channel 140 (5700MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

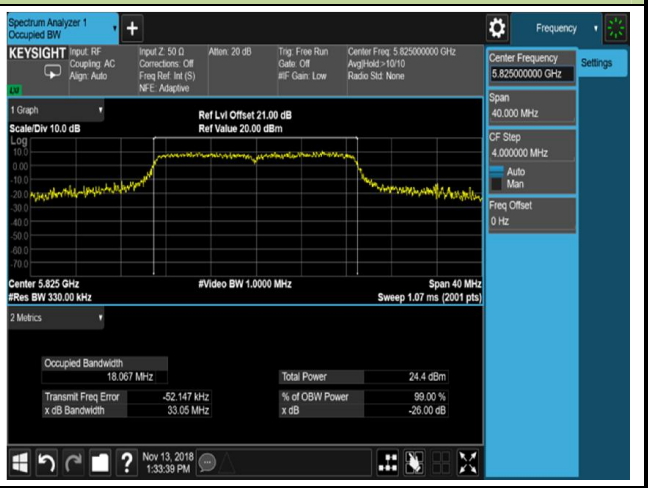
802.11n-HT20 26dB Bandwidth & 99% Bandwidth - Ant A / Ant A + B	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
	
Channel 48 (5240MHz)	Channel 52 (5260MHz)
	
Channel 60 (5300MHz)	Channel 64 (5320MHz)
	

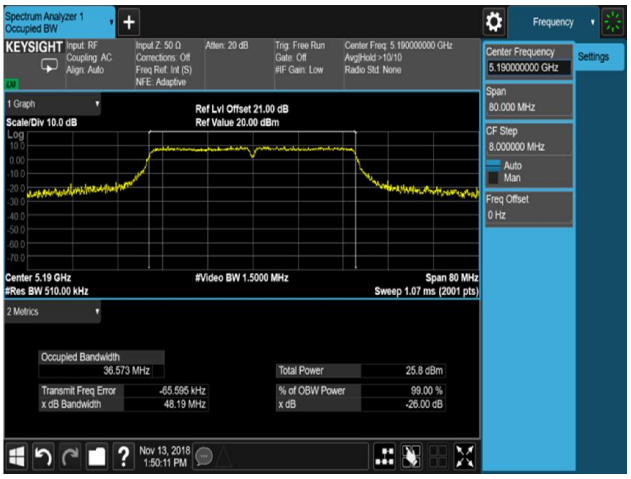
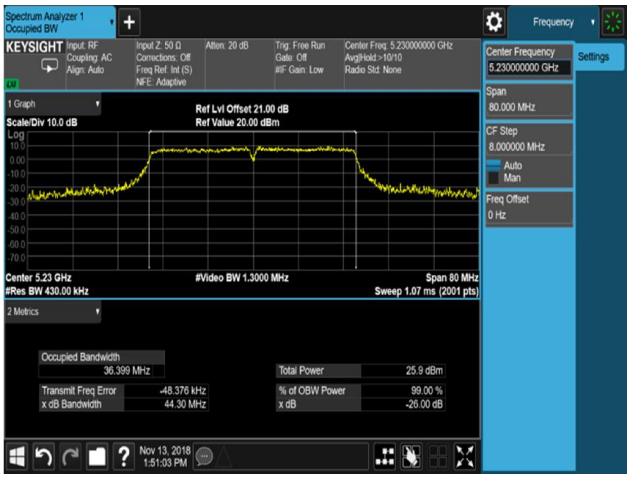
Channel 100 (5500MHz)	Channel 116 (5560MHz)
	
Channel 140 (5700MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

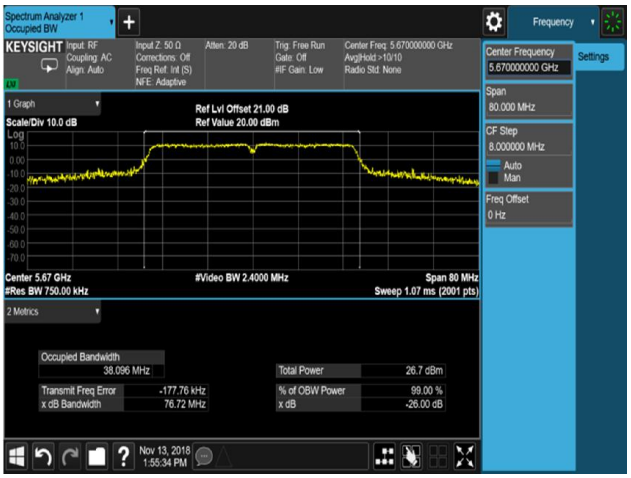
802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant A / Ant A + B	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
Channel 54 (5270MHz)	Channel 62 (5310MHz)
	
Channel 102 (5510MHz)	Channel 110 (5550MHz)
	

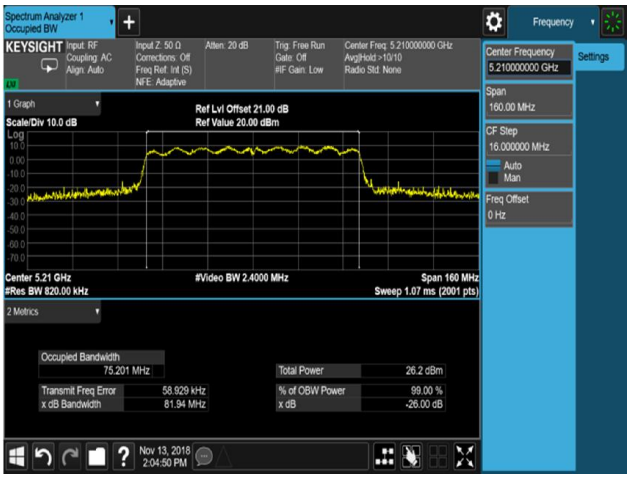
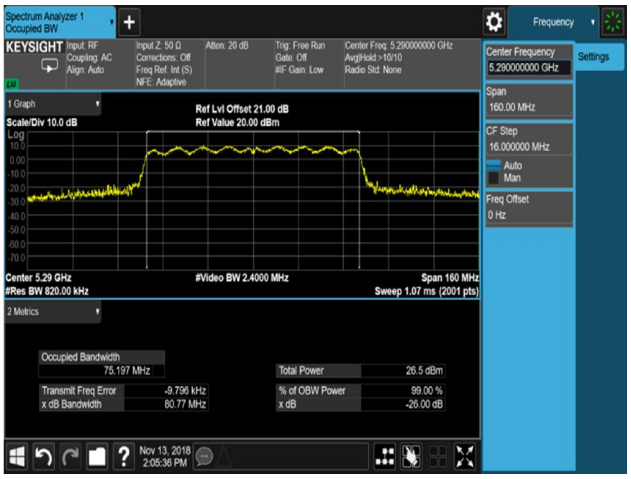
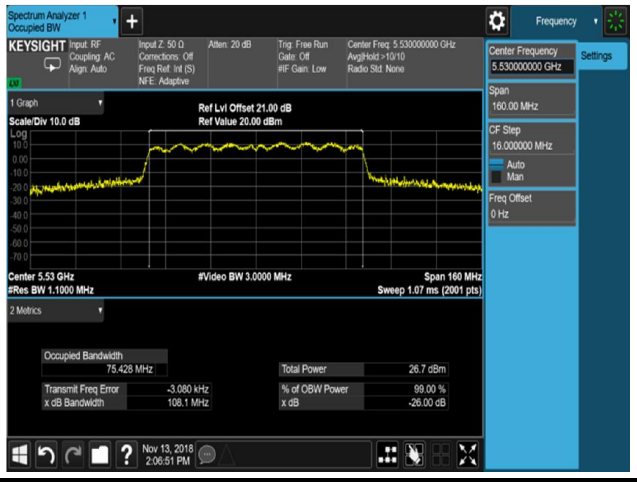
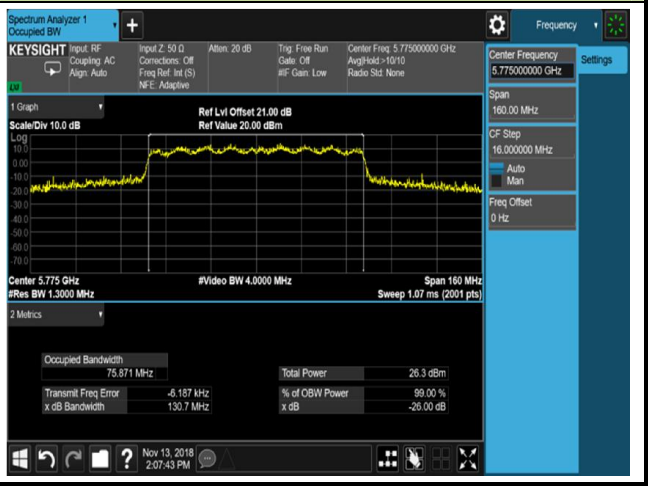
Channel 134 (5670MHz)	Channel 151 (5755MHz)
	
Channel 159 (5795MHz)	
	

802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth - Ant A / Ant A + B	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
	
Channel 48 (5240MHz)	Channel 52 (5260MHz)
	
Channel 60 (5300MHz)	Channel 64 (5320MHz)
	

Channel 100 (5500MHz)	Channel 116 (5580MHz)
	
Channel 140 (5700MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

802.11ac-VHT40 26dB Bandwidth & 99% Bandwidth - Ant A / Ant A + B	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
Channel 54 (5270MHz)	Channel 62 (5310MHz)
	
Channel 102 (5510MHz)	Channel 110 (5550MHz)
	

Channel 134 (5670MHz)	Channel 151 (5755MHz)
	
Channel 159 (5795MHz)	
	

802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth - Ant A / Ant A + B	
Channel 42 (5210MHz)	Channel 58 (5290MHz)
	
Channel 106 (5530MHz)	Channel 155 (5775MHz)
	

7.3. 6dB Bandwidth Measurement

7.3.1.Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

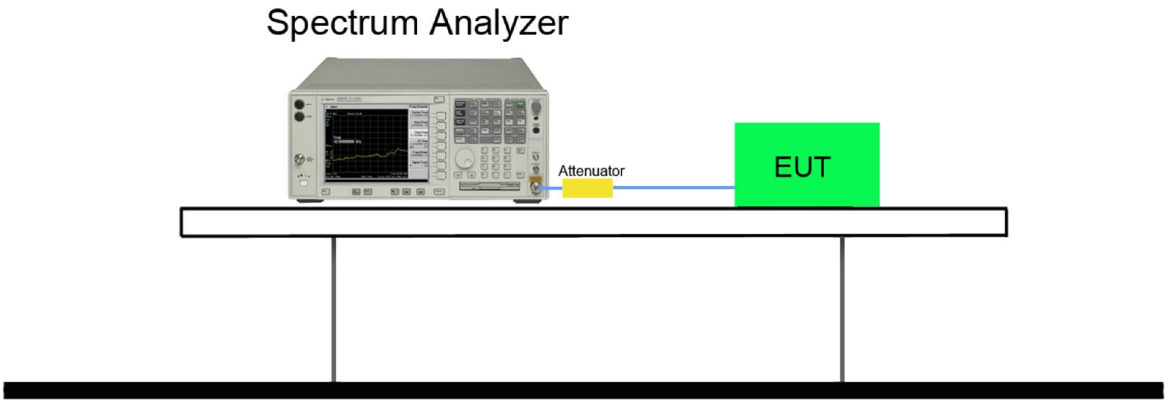
7.3.2.Test Procedure used

KDB 789033 D02v02r01 - Section C.2

7.3.3.Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW ≧ 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.3.4.Test Setup



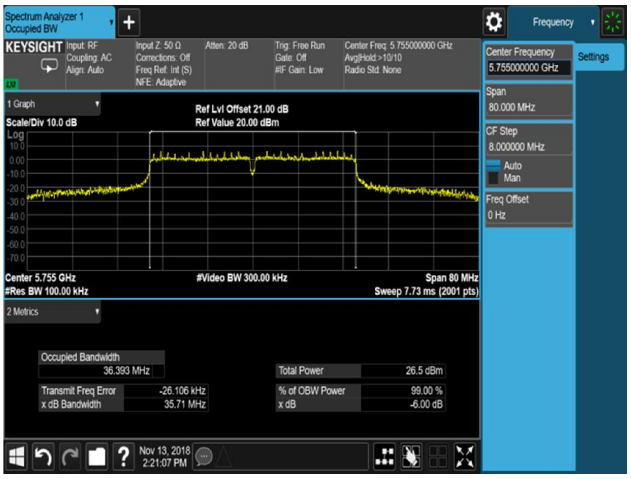
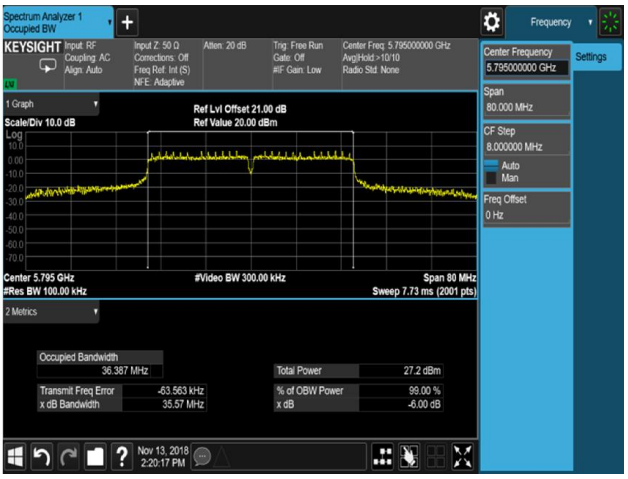
7.3.5.Test Result

Product	AC1200 Wireless Dual Band PCI Express Adapter	Temperature	24°C
Test Engineer	Dandy Li	Relative Humidity	59%
Test Site	TR3	Test Date	2018/11/13

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant A						
802.11a	6Mbps	149	5745	16.33	≥ 0.5	Pass
802.11a	6Mbps	157	5785	16.89	≥ 0.5	Pass
802.11a	6Mbps	165	5825	16.76	≥ 0.5	Pass
Ant A / Ant A + B						
802.11n-HT20	6Mbps	149	5745	17.05	≥ 0.5	Pass
802.11n-HT20	6Mbps	157	5785	16.89	≥ 0.5	Pass
802.11n-HT20	6Mbps	165	5825	17.32	≥ 0.5	Pass
802.11n-HT40	6Mbps	151	5755	35.71	≥ 0.5	Pass
802.11n-HT40	6Mbps	159	5795	35.57	≥ 0.5	Pass
802.11ac-VHT20	MCS0	149	5745	17.05	≥ 0.5	Pass
802.11ac-VHT20	MCS0	157	5785	16.58	≥ 0.5	Pass
802.11ac-VHT20	MCS0	165	5825	17.29	≥ 0.5	Pass
802.11ac-VHT40	MCS0	151	5755	36.09	≥ 0.5	Pass
802.11ac-VHT40	MCS0	159	5795	35.82	≥ 0.5	Pass
802.11ac-VHT80	MCS0	155	5775	75.17	≥ 0.5	Pass

802.11a 6dB Bandwidth - Ant A / Ant A + B	
Channel 149 (5745MHz)	Channel 157 (5785MHz)
	
Channel 165 (5825MHz)	
	

802.11n-HT20 6dB Bandwidth - Ant A / Ant A + B	
Channel 149 (5745MHz)	Channel 157 (5785MHz)
	
Channel 165 (5825MHz)	
	

802.11n-HT40 6dB Bandwidth - Ant A / Ant A + B	
Channel 149 (5755MHz)	Channel 157 (5795MHz)
	
802.11ac-VHT20 6dB Bandwidth - Ant A / Ant A + B	
Channel 149 (5745MHz)	Channel 157 (5785MHz)
	
Channel 165 (5825MHz)