Test Report

Product Name ： Dual-band Wireless-N Ethernet Adapter

Model No. ： EA-N66

FCC ID. ： MSQ-EAN66

Applicant ： ASUSTeK COMPUTER INC.

Address ： No. 15, Li-Te Rd., Peitou, Taipei 112, Taiwan R.O.C.

Date of Receipt ： 2011/11/23

Issued Date ： 2011/12/07

Report No. ： 11B489R-RFUSP32V01

Report Version ： V1.0

Test Report Certification

Issued Date : 2011/12/07
Report No. : 11B489R-RFUSP32V01

QuieTek

Product Name	:	Dual-band Wireless-N Ethernet Adapter
Applicant	:	ASUSTeK COMPUTER INC.
Address	:	No. 15, Li-Te Rd., Peitou, Taipei 112, Taiwan R.O.C.
Manufacturer	:	ASUSTeK COMPUTER INC.
Model No.	:	EA-N66
FCC ID.	:	MSQ-EAN66
EUT Voltage	:	AC 100-240V, 50-60Hz
Trade Name	:	ASUS
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C Section 15.407:2010 ANSI C63.4: 2009
Test Result	:	Complied

The test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Documented By : Carol Tsai
(Carol Tsai / Adm. Specialist)

Reviewed By : Chris Liu
(Chris Liu / Engineer)

Approved By : Roy Wang
(Roy Wang / Manager)

TABLE OF CONTENTS

1. General Information

1.1. EUT Description

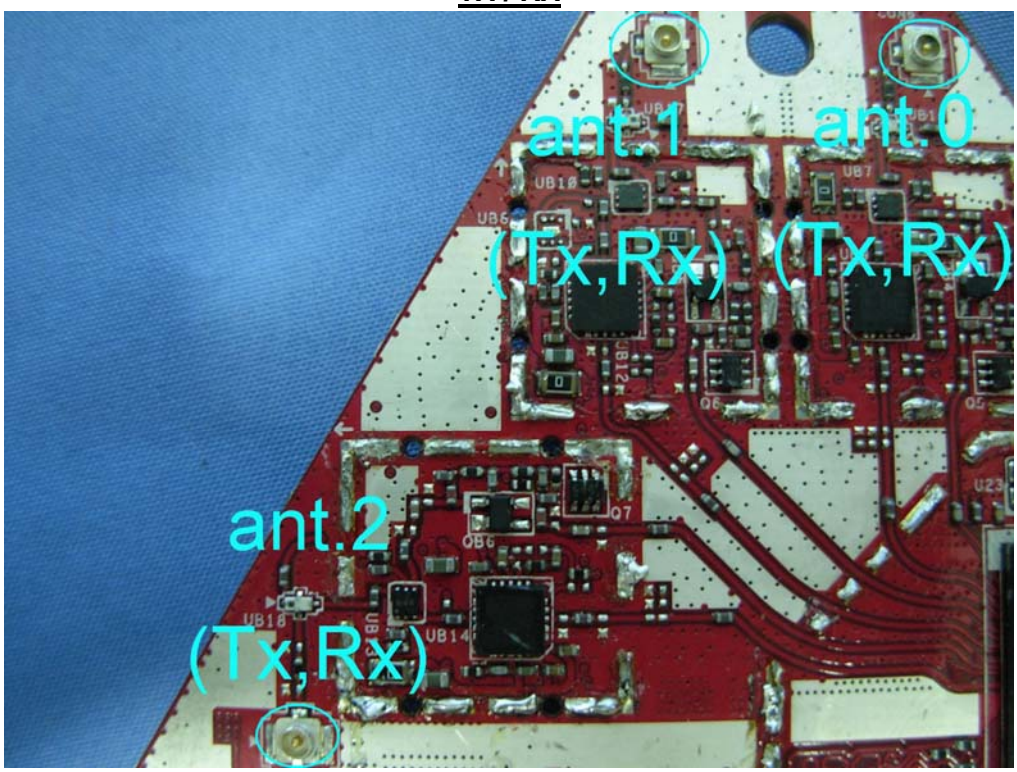
Product Name	Dual-band Wireless-N Ethernet Adapter
Product Type	WLAN (3TX, 3RX)
Trade Name	ASUS
Model No.	MSQ-EAN66
Frequency Range -IEEE 802.11a & IEEE 802.11n (20MHz)	5180~5240MHz
Frequency Range- IEEE 802.11n (40MHz)	5190~5230MHz
Channel Number - IEEE 802.11a & IEEE 802.11n (20MHz))	4
Channel Number- IEEE 802.11n (40MHz)	2
Type of Modulation (IEEE 802.11a/n)	Orthogonal Frequency Division Multiplexing (OFDM)
Data Speed (IEEE 802.11a)	6Mbps,9Mbps,12Mbps,18Mbps,24Mbps,36Mbps,48Mbps,54Mbps
Data Speed (IEEE 802.11n)	Support a subset of the combination of GI, MCS 0~MCS 23 and bandwidth defined in 802.11n
Antenna Gain	4dBi
Channel Control	Manual
Antenna Type	Dipole

Component	
LAN Cable	Non-Shielded, 1m
Power Adatper	DVE, DSA-12GX-12 FUS 120120 I/P : 100-240V~50/60Hz 0.3A O/P : +12V⎓ 1A Cable Out: Non-Shielded, 1.5m
Power Adatper	PHIHONG, PSA12A-120 I/P : 100-240V~0.5A 50-60Hz O/P : 12V⎓ 1.0A 27-37VA Cable Out: Non-Shielded, 1.5m, one ferrite core bonded.

ANT-TX / Rx & Bandwidth

ANT-TX / RX	SINGLE-TX		THREE-TX		RX	
Mode/ Channel Bandwidth	20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
IEEE802.11a	✓				✓	
IEEE802.11n			✓	✓	✓	✓

TX / RX



IEEE 802.11n

MCS Index	Modulation	R	N_{BPSCS}	N_{CBPS}		N_{DBPS}		Data Rate(Mb/s)			
				20MHz	40MHz	20MHz	40MHz	800ns GI		400ns GI (Note1)	
								20MHz	40MHz	20MHz	40MHz
0	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.2	15.0
1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.4	30.0
2	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.7	45.0
3	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.9	60.0
4	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.3	90.0
5	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.8	120.0
6	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.0	135.0
7	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.2	150.0
Note 1: Support of 400ns GI is optional on transmit and receive.											

Table 1 – MCS parameters for TX Antenna number = 1

MCS Index	Modulation	R	N_{BPSCS}	N_{CBPS}		N_{DBPS}		Data Rate(Mb/s)			
				20MHz	40MHz	20MHz	40MHz	800ns GI		400ns GI (Note1)	
								20MHz	40MHz	20MHz	40MHz
8	BPSK	1/2	1	104	216	52	108	13.0	27.0	14.4	30.0
9	QPSK	1/2	2	208	432	104	216	26.0	54.0	28.9	60.0
10	QPSK	3/4	2	208	432	156	324	39.0	81.0	43.3	90.0
11	16-QAM	1/2	4	416	864	208	432	52.0	108.0	57.8	120.0
12	16-QAM	3/4	4	416	864	312	648	78.0	162.0	86.7	180.0
13	64-QAM	2/3	6	624	1296	416	864	104.0	216.0	115.6	240.0
14	64-QAM	3/4	6	624	1296	468	972	117.0	243.0	130.0	270.0
15	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0	144.4	300.0
Note 1: Support of 400ns GI is optional on transmit and receive.											

Table 2 – MCS parameters for TX Antenna number = 2

MCS Index	Modulation	R	N_{BPSCS}	N_{CBPS}		N_{DBPS}		Data Rate(Mb/s)			
				20MHz	40MHz	20MHz	40MHz	800ns GI		400ns GI (Note1)	
								20MHz	40MHz	20MHz	40MHz
16	BPSK	1/2	1	156	324	78	162	19.5	40.5	21.7	45.0
17	QPSK	1/2	2	312	648	156	324	39.0	81.0	43.3	90.0
18	QPSK	3/4	2	312	648	234	486	58.5	121.5	65.0	135.0
19	16-QAM	1/2	4	624	1296	312	648	78.0	162.0	86.7	180.0
20	16-QAM	3/4	4	624	1296	468	972	117.0	243.0	130.0	270.0
21	64-QAM	2/3	6	936	1944	624	1296	156.0	324.0	173.3	360.0
22	64-QAM	3/4	6	936	1944	702	1458	175.5	364.5	195.0	405.0
23	64-QAM	5/6	6	936	1944	780	1620	195.0	405.0	216.7	450.0
Note 1: Support of 400ns GI is optional on transmit and receive.											

Table 3 – MCS parameters for TX Antenna number = 3

Symbol	Explanation
R	Code rate
N_{BPSC}	Number of coded bits per single carrier
N_{CBPS}	Number of coded bits per symbol
N_{DBPS}	Number of data bits per symbol
GI	guard interval

IEEE 802.11a & IEEE 802.11n (20MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz

IEEE 802.11n (40MHz)

Working Frequency of Each Channel			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

Note:

1. This device is a Dual-band Wireless-N Ethernet Adapter including 2.4GHz b/g/n and 5GHz a/n (3x3) transmitting and receiving function.
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C Paragraph 15.407.
3. Regards to the frequency band operation; the lowest、middle and highest frequency of channel were selected to perform the test, and then shown on this report.
4. The function of the 2.4GHz & 5.8GHz transmitting is measured and makes a test report of the report number: 11B489R-RFUSP42V01.
5. This device is a composite device in accordance with Part 15 regulations. The receiving function receiving was tested and its test report number is 11B489R-RFUSP37V02 under Declaration of Conformity.

1.3. Test Mode

QuieTek has verified the construction and function in typical operation. The preliminary tests were performed in different data rate, and to find the worst condition, which was shown in this test report. The following table is the final test mode.

TX	Mode 1: Transmit (Adapter: DVE) Mode 2: Transmit (Adapter: PHIHONG)

Test Items	Mode	Channel	Antenna	Result
Conducted Emission	11n(40MHz)	38	0+1+2	Complies
99 % & 26dB Bandwidth	a	36/44/48	0	Complies
	11n(20MHz)	36/44/48	0/1/2	Complies
	11n(40MHz)	38/46	0/1/2	Complies
Peak Transmit Output	a	36/44/48	0	Complies
	11n(20MHz)	36/44/48	0+1+2	Complies
	11n(40MHz)	38/46	0+1+2	Complies
Peak Power Spectrum Density	a	36/44/48	0	Complies
	11n(20MHz)	36/44/48	0+1+2	Complies
	11n(40MHz)	38/46	0+1+2	Complies
Power Excursion	a	36/44/48	0	Complies
	11n(20MHz)	36/44/48	0/1/2	Complies
	11n(40MHz)	38/46	0/1/2	Complies
Radiated Emission	a	36/44/48	0	Complies
	11n(20MHz)	36/44/48	0+1+2	Complies
	11n(40MHz)	38/46	0+1+2	Complies
Band Edge	a	36	0	Complies
	11n(20MHz)	36	0+1+2	Complies
	11n(40MHz)	38	0+1+2	Complies
Frequency Stability	a	36/48	0	Complies
	11n(20MHz)	36/48	0/1/2	Complies
	11n(40MHz)	38/46	0/1/2	Complies

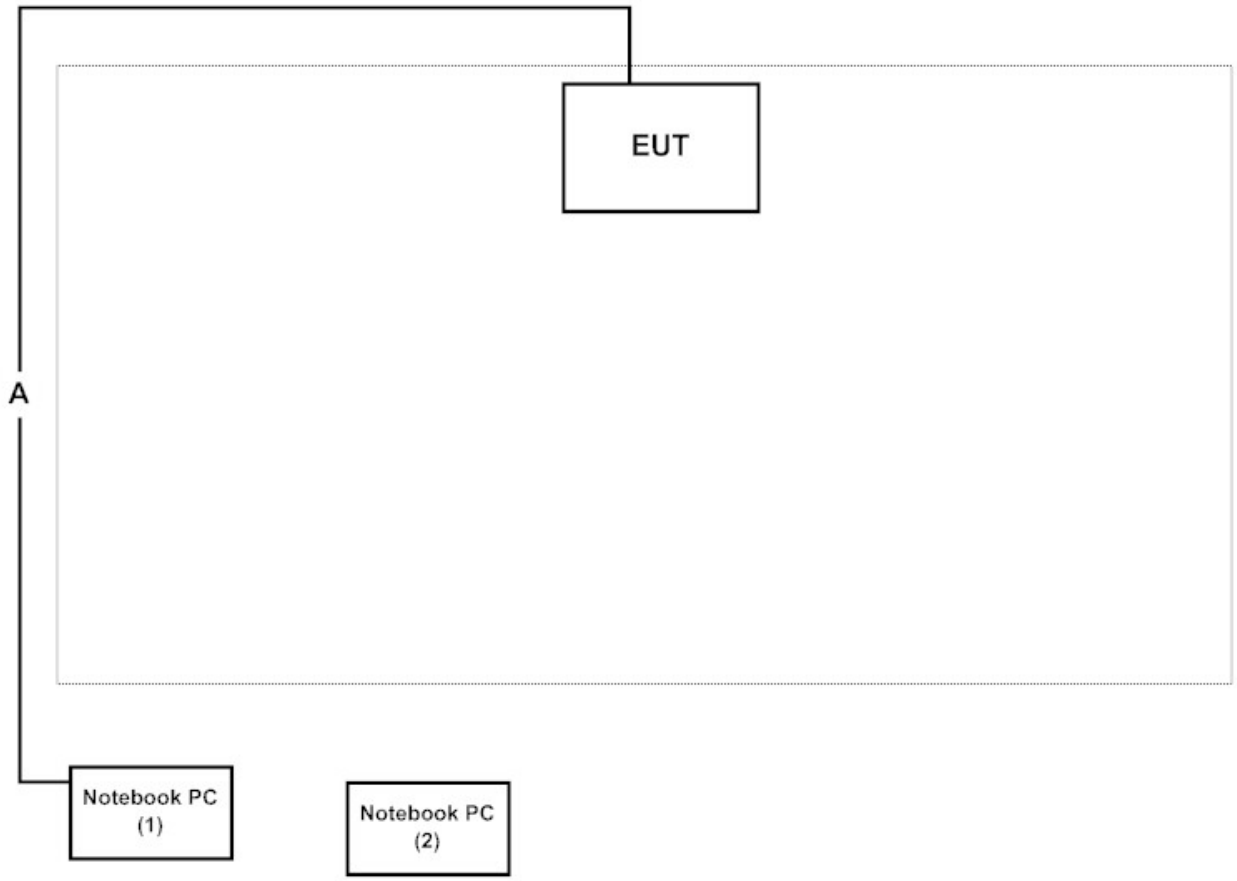
1.4. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Notebook PC	DELL	PP37L	CD8BNG1	DoC	Non-Shielded, 1.8m
2	Notebook PC	ACER	MS2296	LUSCV0213911503 32C2000	DoC	Non-Shielded, 2.5m one ferrite core bonded

1.5. Configuration of tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	LAN Cable	Non-Shielded, 1m

1.6. EUT Exercise Software

1	Setup the EUT as shown in Section 1.5.
2	Execute the “RT3883-AP-v1.0.4.0” on the EUT.
3	Configure the test mode, the test channel, and the data rate.
4	Press “Start TX” to start the continuous transmitting.
5	Verify that the EUT works properly.

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 C 15.407 Conducted Emission	15 - 35	20
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 99 % & 26dB Bandwidth	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Peal Transmit Power	15 - 35	25
Humidity (%RH)		25 - 75	65
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Peak Power Spectrum Density	15 - 35	24
Humidity (%RH)		25 - 75	49
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Power Excursion	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Radiated Emission	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Band Edge	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Frequency Stability	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000

Site Description: September 27, 2010 File on
Federal Communications Commission
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 365520

Accredited by TAF
Accreditation Number: 1313
Effective through: December 27, 2013

Testing Laboratory
1313

Accredited by NVLAP
NVLAP Lab Code: 200347-0
Effective through: September 30, 2012

NVLAP Lab Code : 200347-0

Site Name: Quietek Corporation
Site Address: No. 75-2, 3rd Lin, Wangye Keng, Yonghxing
Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan
TEL : 886-3-5928858 / FAX : 886-3-5928859
E-Mail : service@quietek.com

2. Conducted Emission

2.1. Test Equipment

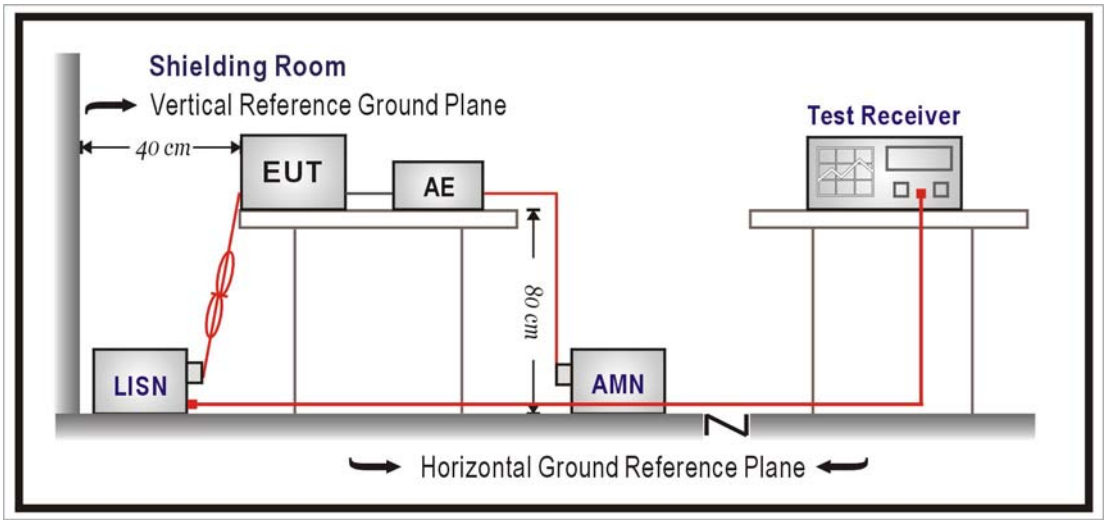
The following test equipments are used during the test:

Conducted Emission / SR2

Instrument	Manufacturer	Model No.	Serial No	Cal. Date	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	2011/03/01	2012/02/29
LISN	R&S	ENV216	100092	2011/08/31	2012/08/30
Test Receiver	R&S	ESCS 30	825442/014	2011/08/17	2012/08/16

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
0.15 - 0.50	66-56	56-46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009 and tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs.)
Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

2.5. Test Specification

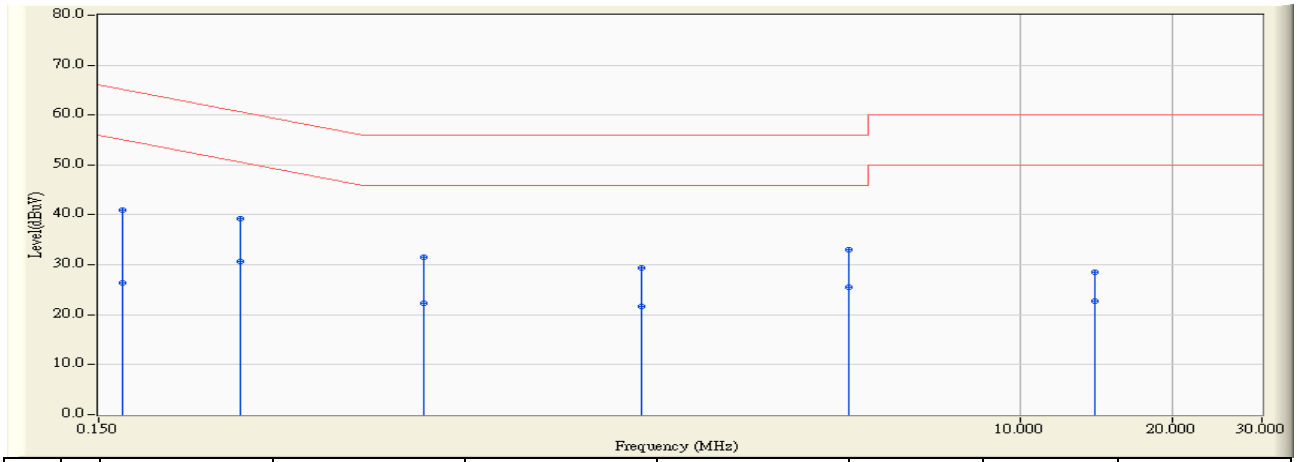
According to FCC Part 15 Subpart C Paragraph 15.207:2010

2.6. Uncertainty

The measurement uncertainty is defined as ± 2.26 dB.

2.7. Test Result

Site : SR2	**Time : 2011/12/01 - 17:05**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR2_LISN(16A)-1_0831 - Line1	**Power : AC 120V/60Hz**
EUT : Dual-band Wireless-N Ethernet Adapter	**Note : Mode 1: Transmit (Adapter: DVE)** **5.2GHz**

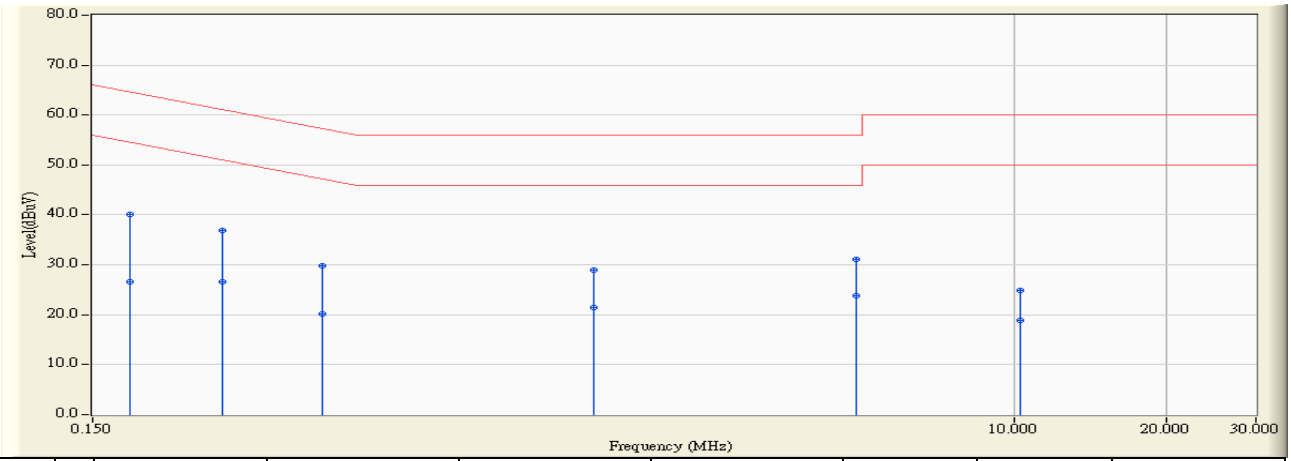


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.167	9.600	31.390	40.990	-24.118	65.108	QUASIPEAK
2		0.167	9.600	16.850	26.450	-28.658	55.108	AVERAGE
3		0.287	9.600	29.550	39.150	-21.469	60.619	QUASIPEAK
4	*	0.287	9.600	21.020	30.620	-19.999	50.619	AVERAGE
5		0.658	9.609	22.000	31.610	-24.390	56.000	QUASIPEAK
6		0.658	9.609	12.590	22.200	-23.800	46.000	AVERAGE
7		1.775	9.784	19.650	29.433	-26.567	56.000	QUASIPEAK
8		1.775	9.784	11.780	21.563	-24.437	46.000	AVERAGE
9		4.568	9.866	23.100	32.966	-23.034	56.000	QUASIPEAK
10		4.568	9.866	15.620	25.486	-20.514	46.000	AVERAGE
11		14.033	10.155	18.310	28.465	-31.535	60.000	QUASIPEAK
12		14.033	10.155	12.680	22.835	-27.165	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2	**Time : 2011/12/01 - 17:08**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR2_LISN(16A)-1_0831 - Line2	**Power : AC 120V/60Hz**
EUT : Dual-band Wireless-N Ethernet Adapter	**Note : Mode 1: Transmit (Adapter: DVE)** **5.2GHz**

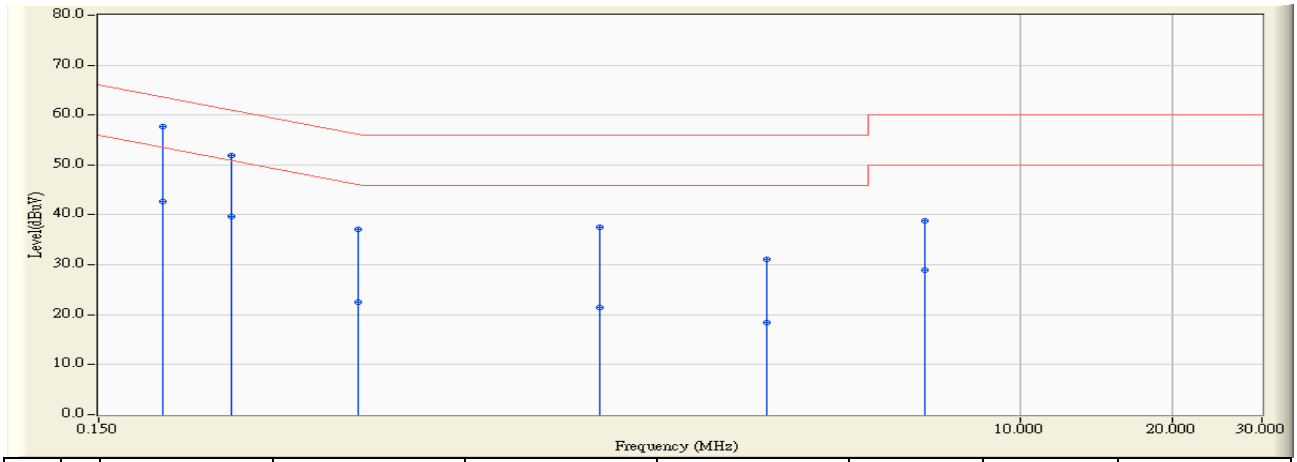


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.177	9.610	30.530	40.140	-24.469	64.609	QUASIPEAK
2		0.177	9.610	16.990	26.600	-28.009	54.609	AVERAGE
3		0.271	9.610	27.270	36.880	-24.204	61.084	QUASIPEAK
4		0.271	9.610	17.000	26.610	-24.474	51.084	AVERAGE
5		0.427	9.610	20.300	29.910	-27.394	57.304	QUASIPEAK
6		0.427	9.610	10.550	20.160	-27.144	47.304	AVERAGE
7		1.470	9.767	19.170	28.937	-27.063	56.000	QUASIPEAK
8		1.470	9.767	11.660	21.427	-24.573	46.000	AVERAGE
9		4.869	9.880	21.210	31.090	-24.910	56.000	QUASIPEAK
10	*	4.869	9.880	13.910	23.790	-22.210	46.000	AVERAGE
11		10.248	10.096	14.760	24.857	-35.143	60.000	QUASIPEAK
12		10.248	10.096	8.720	18.817	-31.183	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2	**Time : 2011/12/01 - 17:24**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR2_LISN(16A)-1_0831 - Line1	**Power : AC 120V/60Hz**
EUT : Dual-band Wireless-N Ethernet Adapter	**Note : Mode 2: Transmit (Adapter: PHIHONG) 5.2GHz**

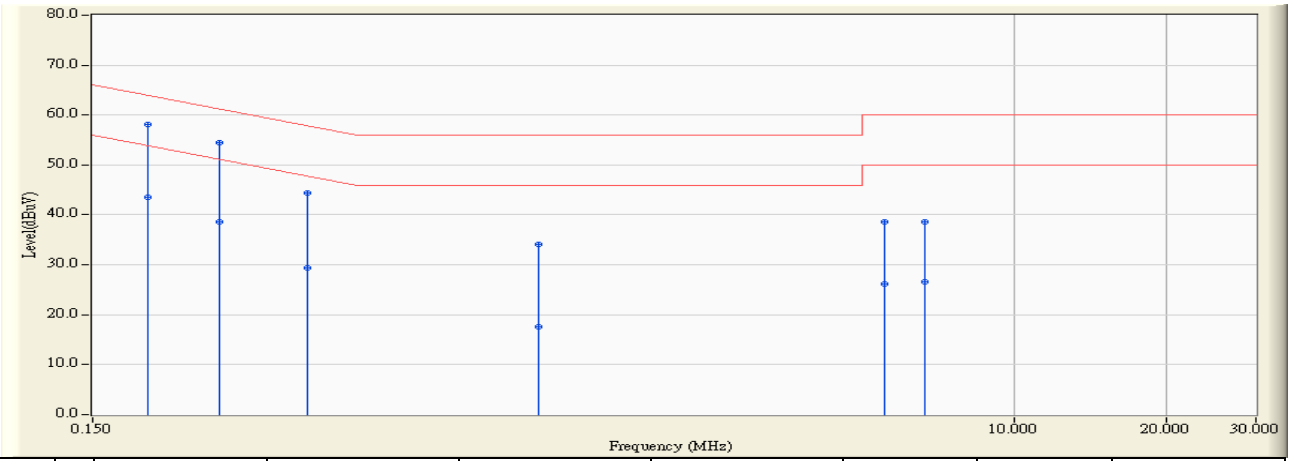


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.201	9.600	48.150	57.750	-5.828	63.578	QUASIPEAK
2		0.201	9.600	33.120	42.720	-10.858	53.578	AVERAGE
3		0.275	9.600	42.320	51.920	-9.046	60.966	QUASIPEAK
4		0.275	9.600	30.100	39.700	-11.266	50.966	AVERAGE
5		0.490	9.601	27.430	37.031	-19.139	56.170	QUASIPEAK
6		0.490	9.601	12.890	22.491	-23.679	46.170	AVERAGE
7		1.474	9.763	27.790	37.553	-18.447	56.000	QUASIPEAK
8		1.474	9.763	11.660	21.423	-24.577	46.000	AVERAGE
9		3.146	9.824	21.180	31.004	-24.996	56.000	QUASIPEAK
10		3.146	9.824	8.720	18.544	-27.456	46.000	AVERAGE
11		6.482	9.926	28.800	38.726	-21.274	60.000	QUASIPEAK
12		6.482	9.926	19.090	29.016	-20.984	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2	**Time : 2011/12/01 - 17:21**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR2_LISN(16A)-1_0831 - Line2	**Power : AC 120V/60Hz**
EUT : Dual-band Wireless-N Ethernet Adapter	**Note : Mode 2: Transmit (Adapter: PHIHONG) 5.2GHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.193	9.610	48.530	58.140	-5.768	63.908	QUASIPEAK
2		0.193	9.610	33.990	43.600	-10.308	53.908	AVERAGE
3		0.267	9.610	44.790	54.400	-6.805	61.205	QUASIPEAK
4		0.267	9.610	28.950	38.560	-12.645	51.205	AVERAGE
5		0.400	9.610	34.880	44.490	-13.363	57.853	QUASIPEAK
6		0.400	9.610	19.830	29.440	-18.413	47.853	AVERAGE
7		1.142	9.701	24.450	34.151	-21.849	56.000	QUASIPEAK
8		1.142	9.701	7.970	17.671	-28.329	46.000	AVERAGE
9		5.525	9.904	28.780	38.684	-21.316	60.000	QUASIPEAK
10		5.525	9.904	16.240	26.144	-23.856	50.000	AVERAGE
11		6.630	9.948	28.590	38.539	-21.461	60.000	QUASIPEAK
12		6.630	9.948	16.600	26.549	-23.451	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

3. 99% & 26dB Bandwidth

3.1. Test Equipment

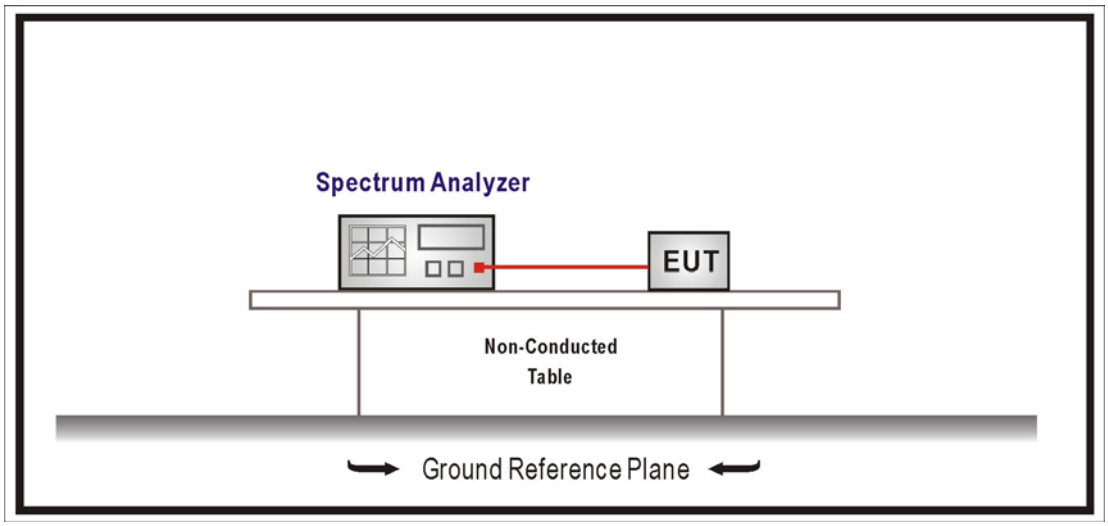
The following test equipments are used during the radiated emission tests:

99% & 26dB Bandwidth / SR7

Instrument	Manufacturer	Model No.	Serial No	Cal. Date	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2011/01/17	2012/01/16

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

3.2. Test Setup



3.3. Limits

No Required

3.4. Test Procedure

The EUT was tested according to FCC Public Notice DA 02-2138, AUGUST 2002.
Set RBW 1% of the emission bandwidth, VBW equal to 3 times the RBW.

3.5. Uncertainty

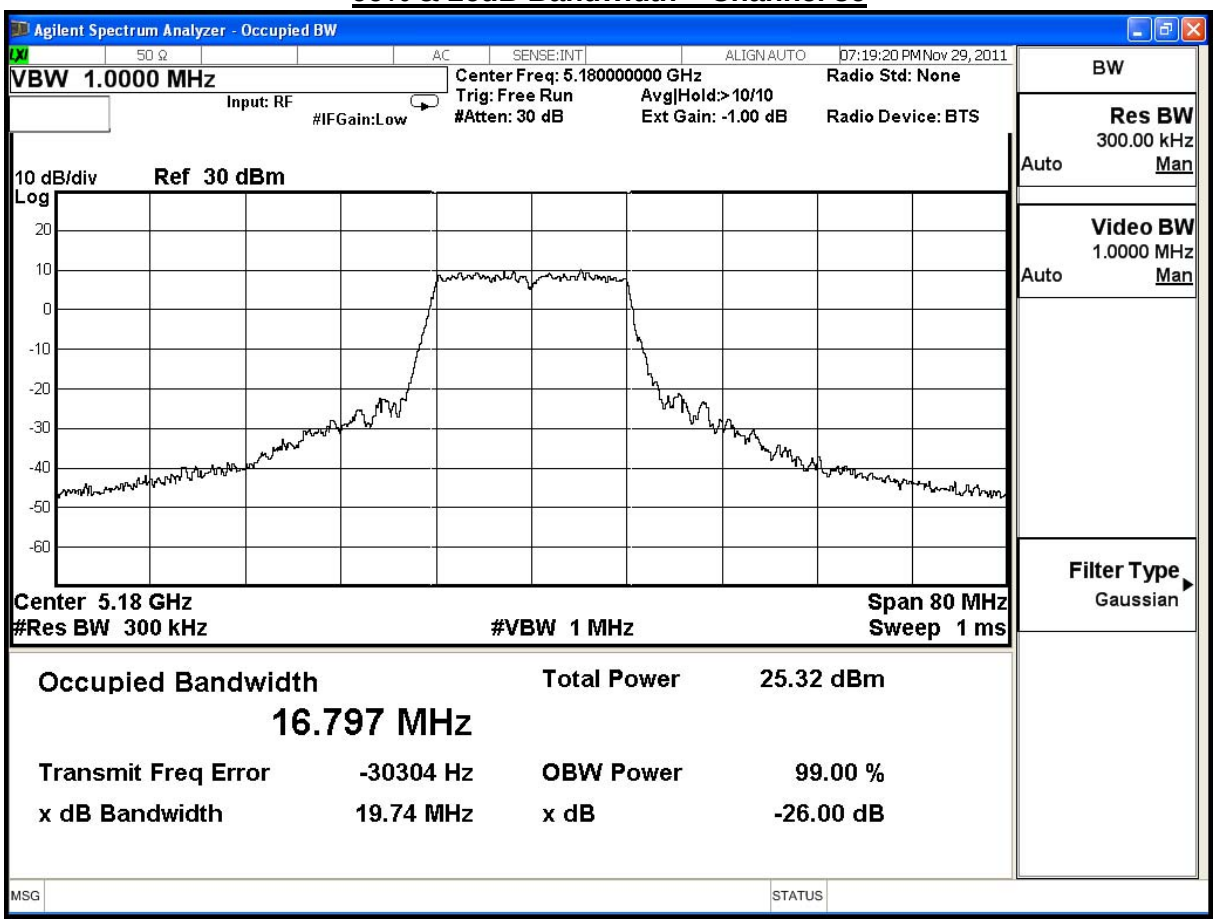
The measurement uncertainty is defined as ±150Hz

3.6. Test Result

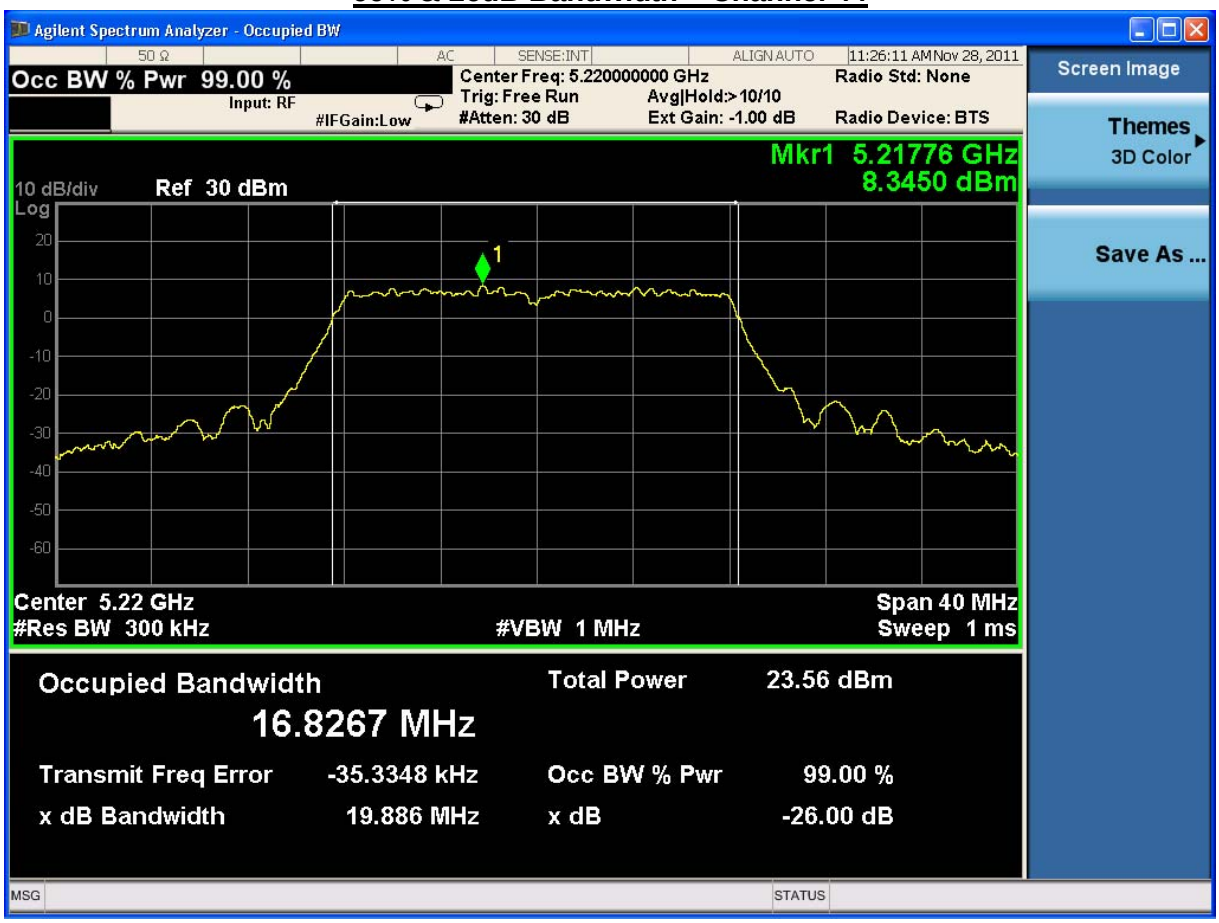
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/28	Test Site	SR7

802.11a					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
36	5180	19.74	16.79	--	NA
44	5220	19.88	16.82	--	NA
48	5240	19.96	16.82	--	NA

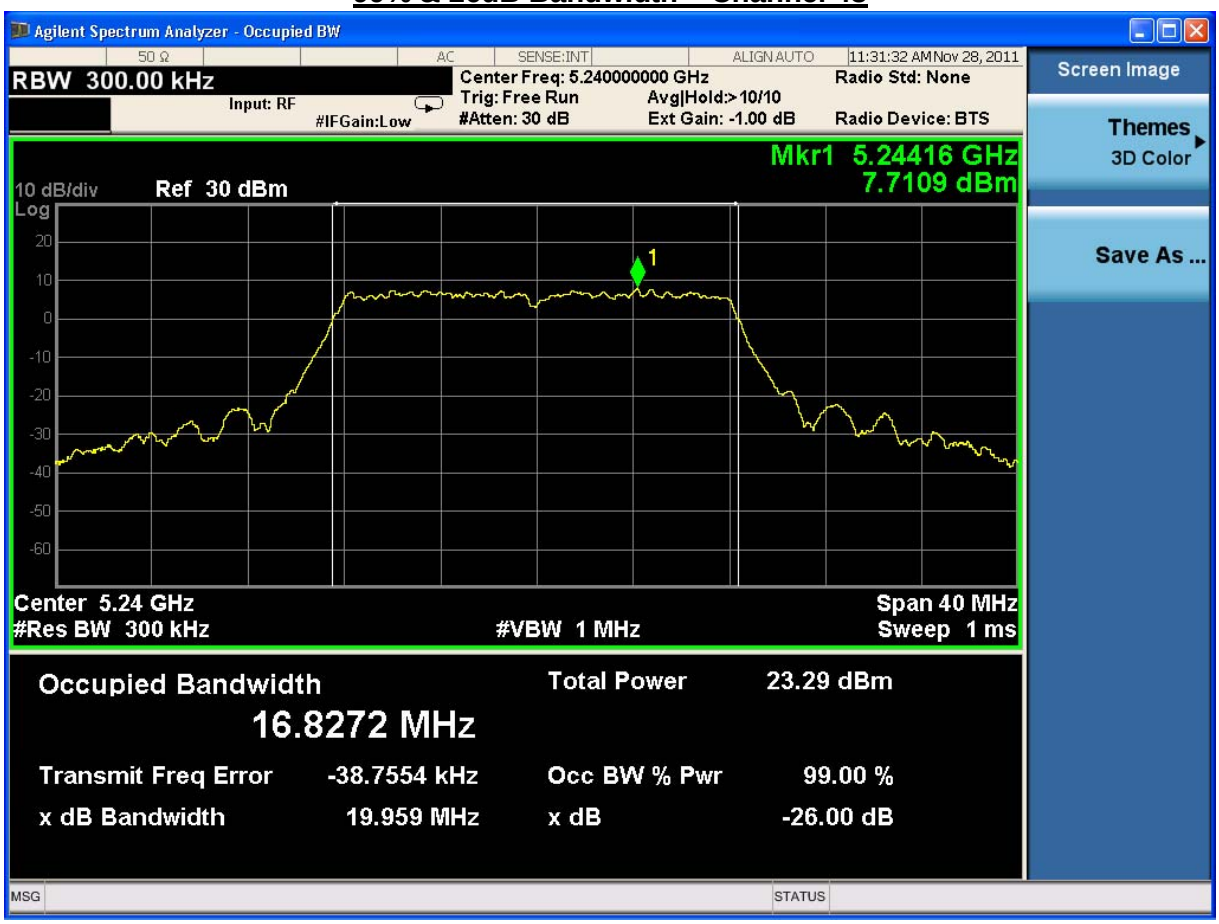
99% & 26dB Bandwidth – Channel 36



99% & 26dB Bandwidth – Channel 44



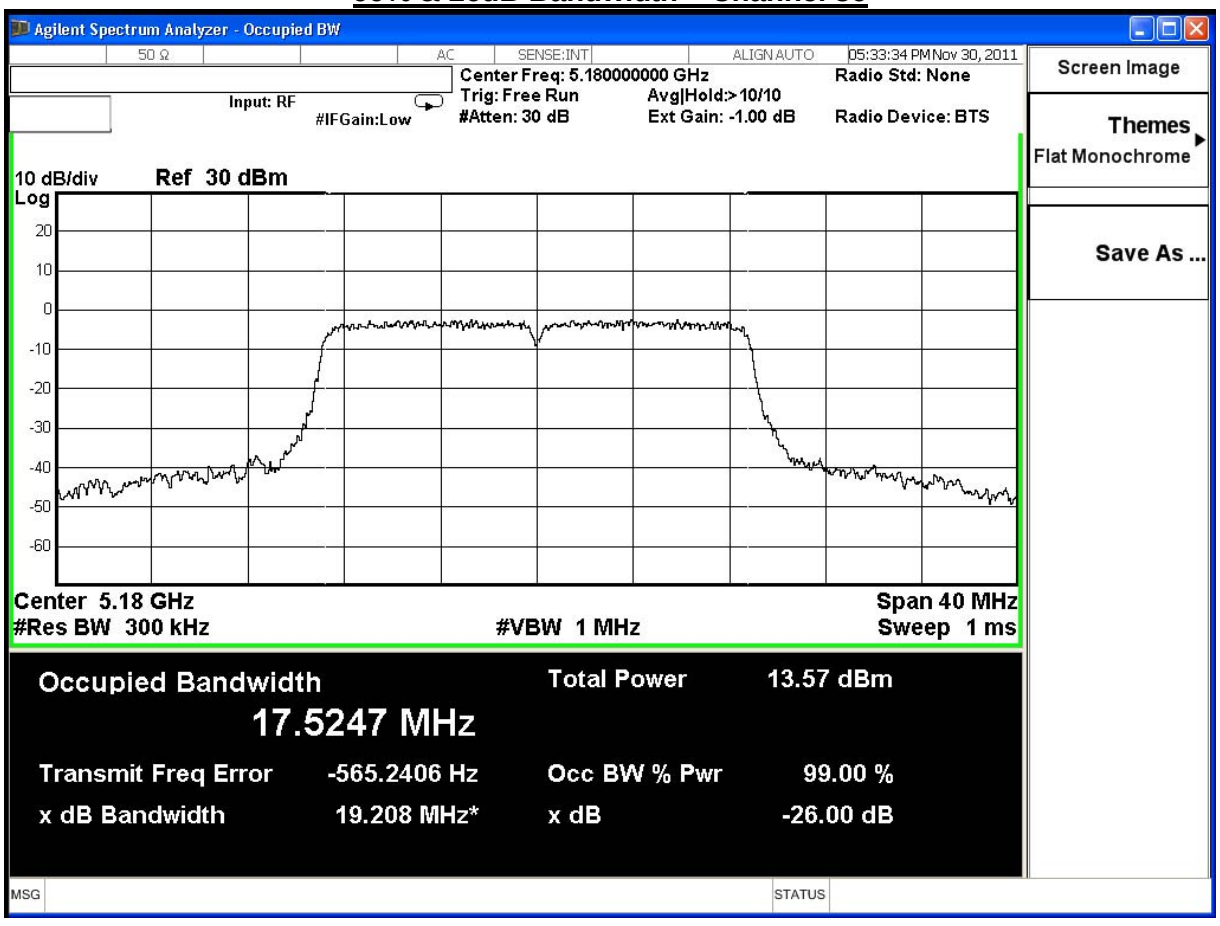
99% & 26dB Bandwidth – Channel 48



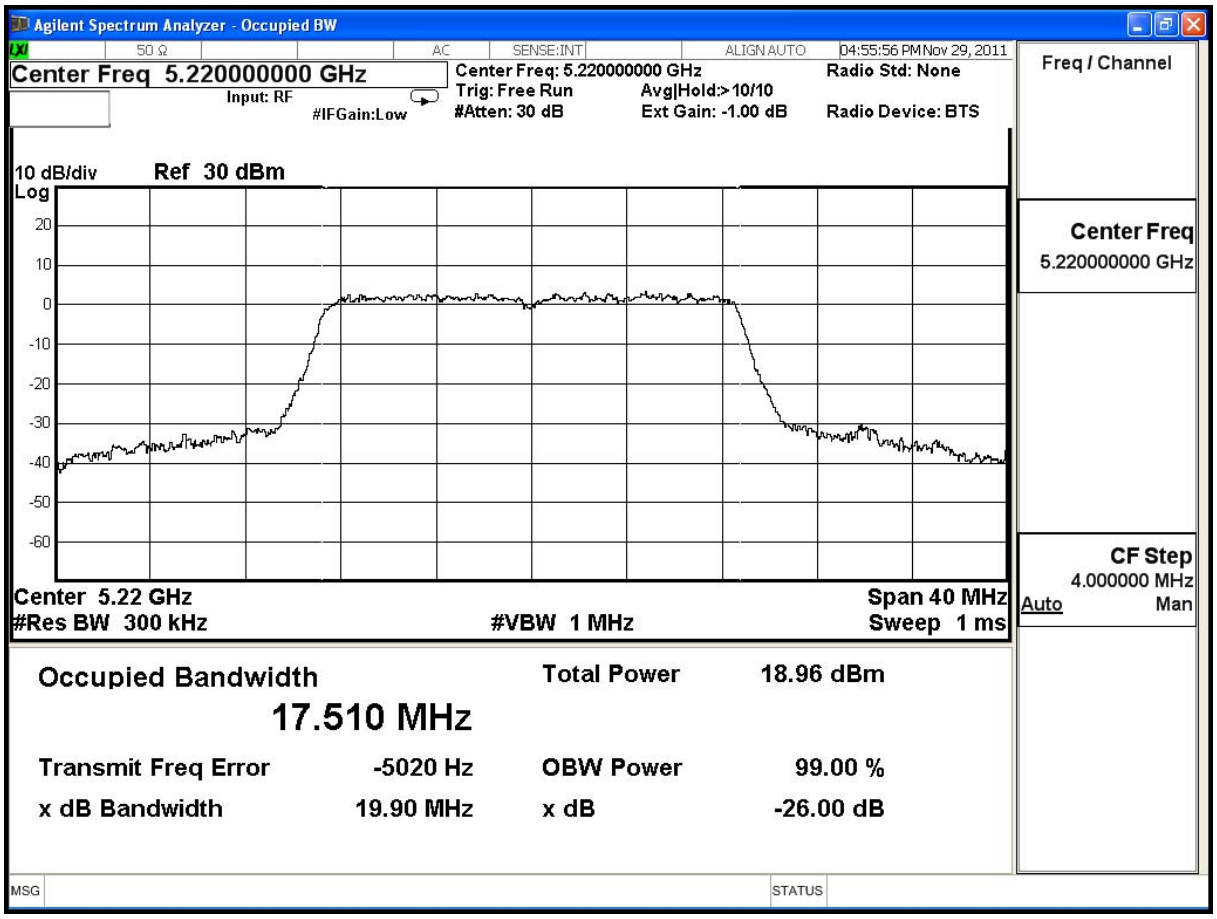
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

802.11n_20M(ANT 0)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
36	5180	19.20	17.52	--	NA
44	5220	19.90	17.51	--	NA
48	5240	19.85	17.51	--	NA

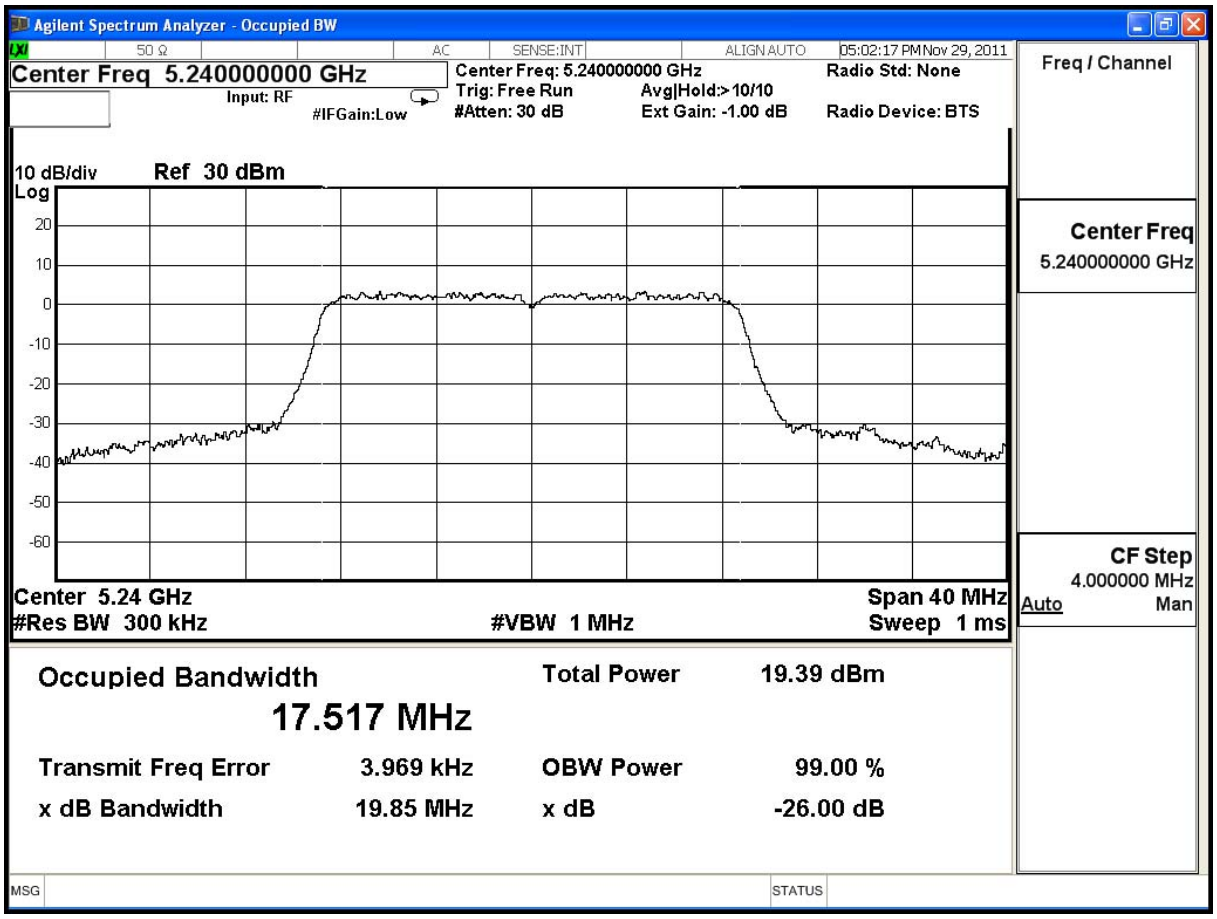
99% & 26dB Bandwidth – Channel 36



99% & 26dB Bandwidth – Channel 44



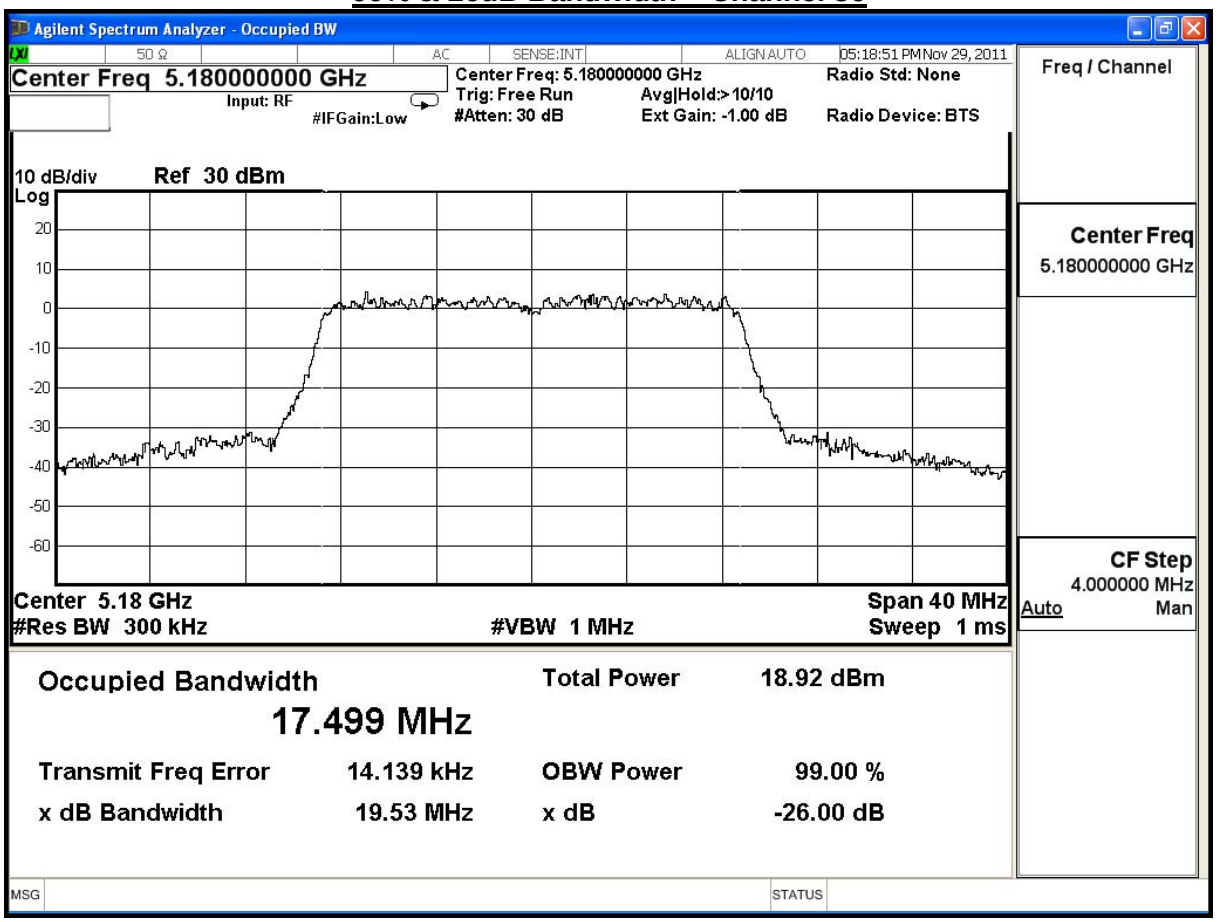
99% & 26dB Bandwidth – Channel 48



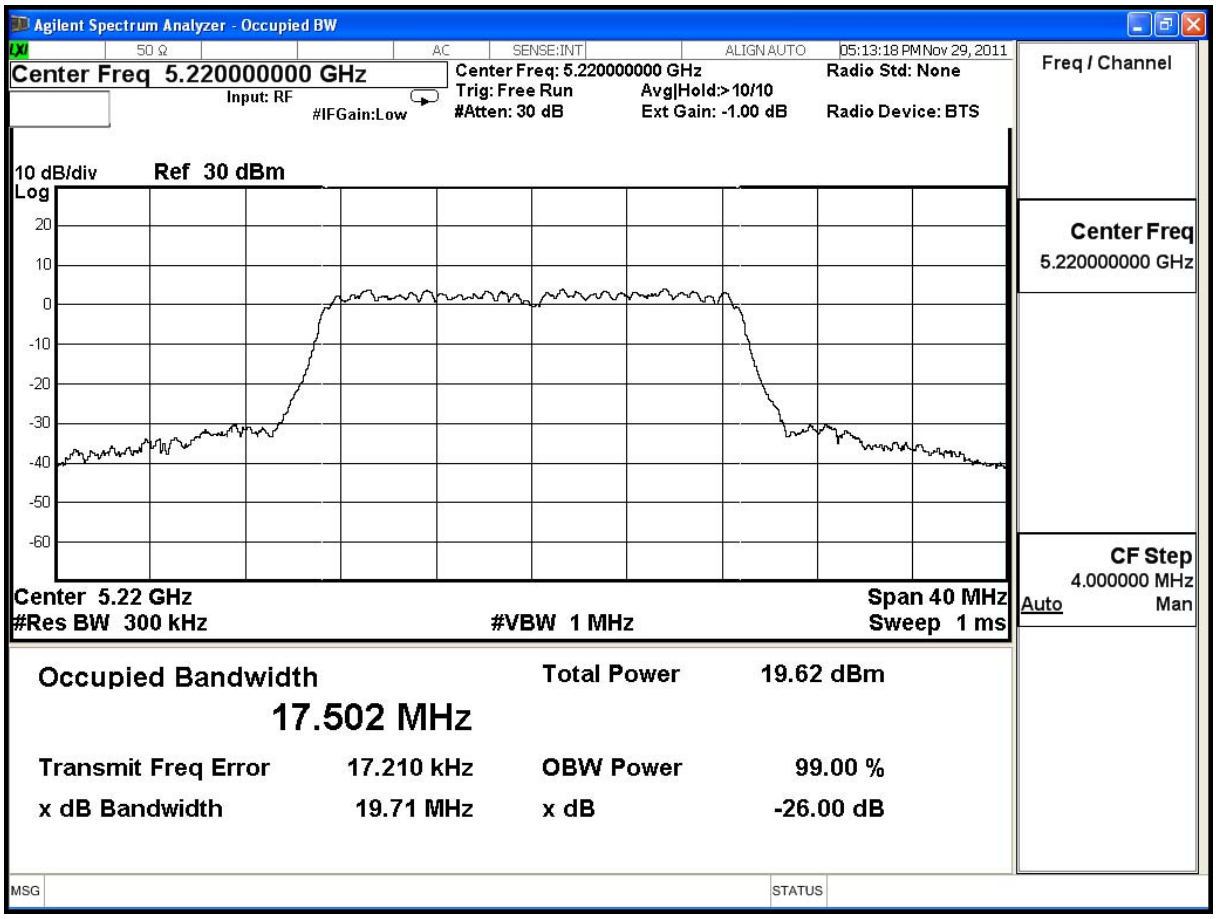
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

802.11n_20M(ANT 1)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
36	5180	19.53	17.49	--	NA
44	5220	19.71	17.50	--	NA
48	5240	19.57	17.51	--	NA

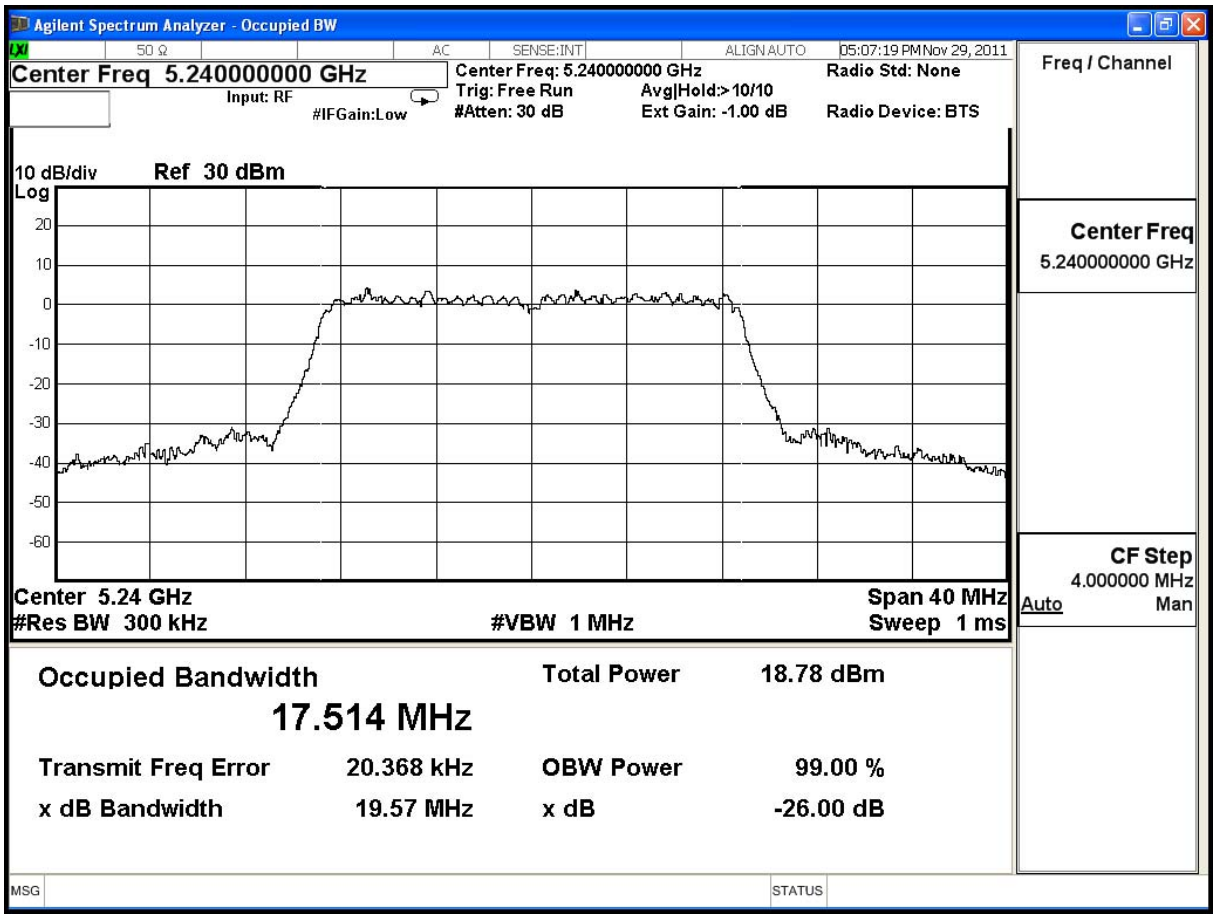
99% & 26dB Bandwidth – Channel 36



99% & 26dB Bandwidth – Channel 44



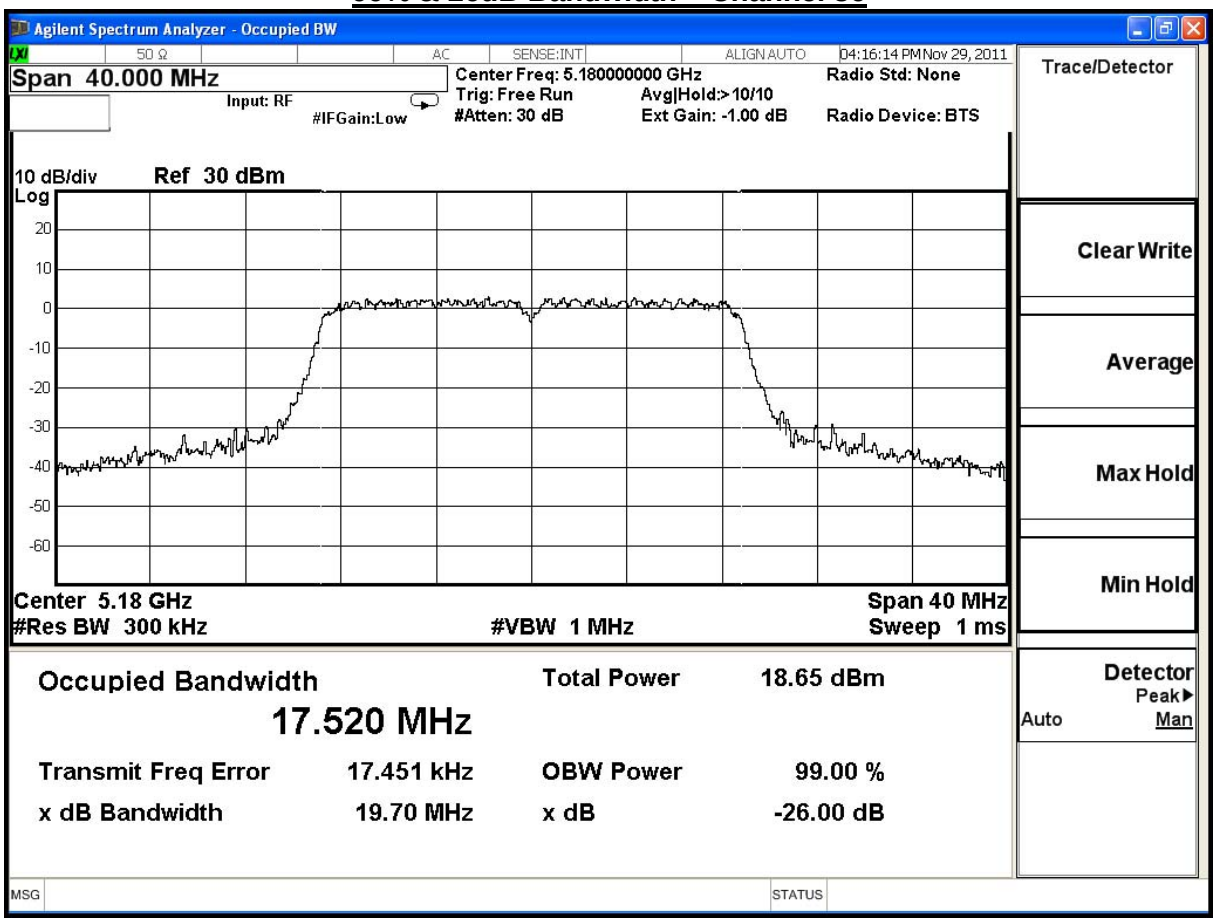
99% & 26dB Bandwidth – Channel 48



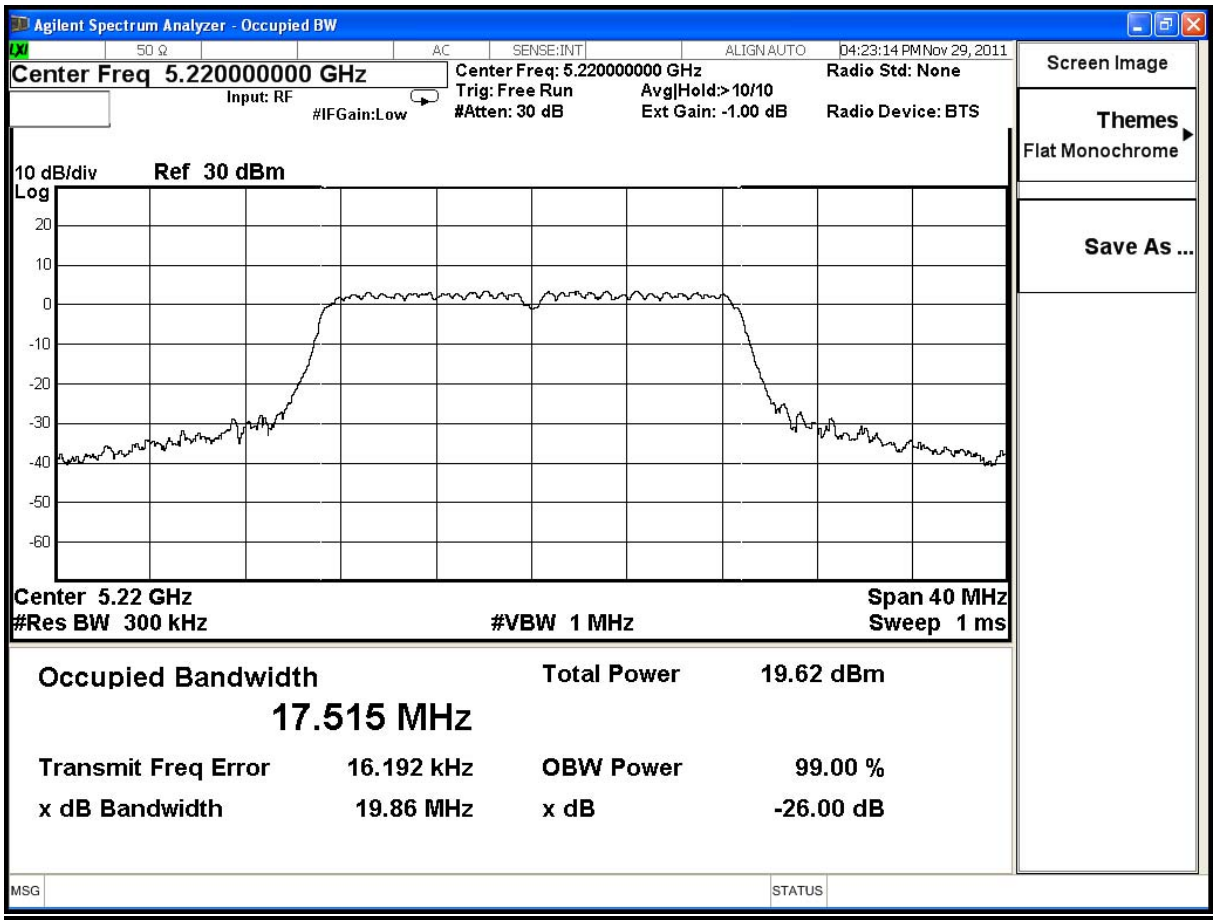
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

802.11n_20M(ANT 2)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
36	5180	19.70	17.52	--	NA
44	5220	19.86	17.51	--	NA
48	5240	20.07	17.55	--	NA

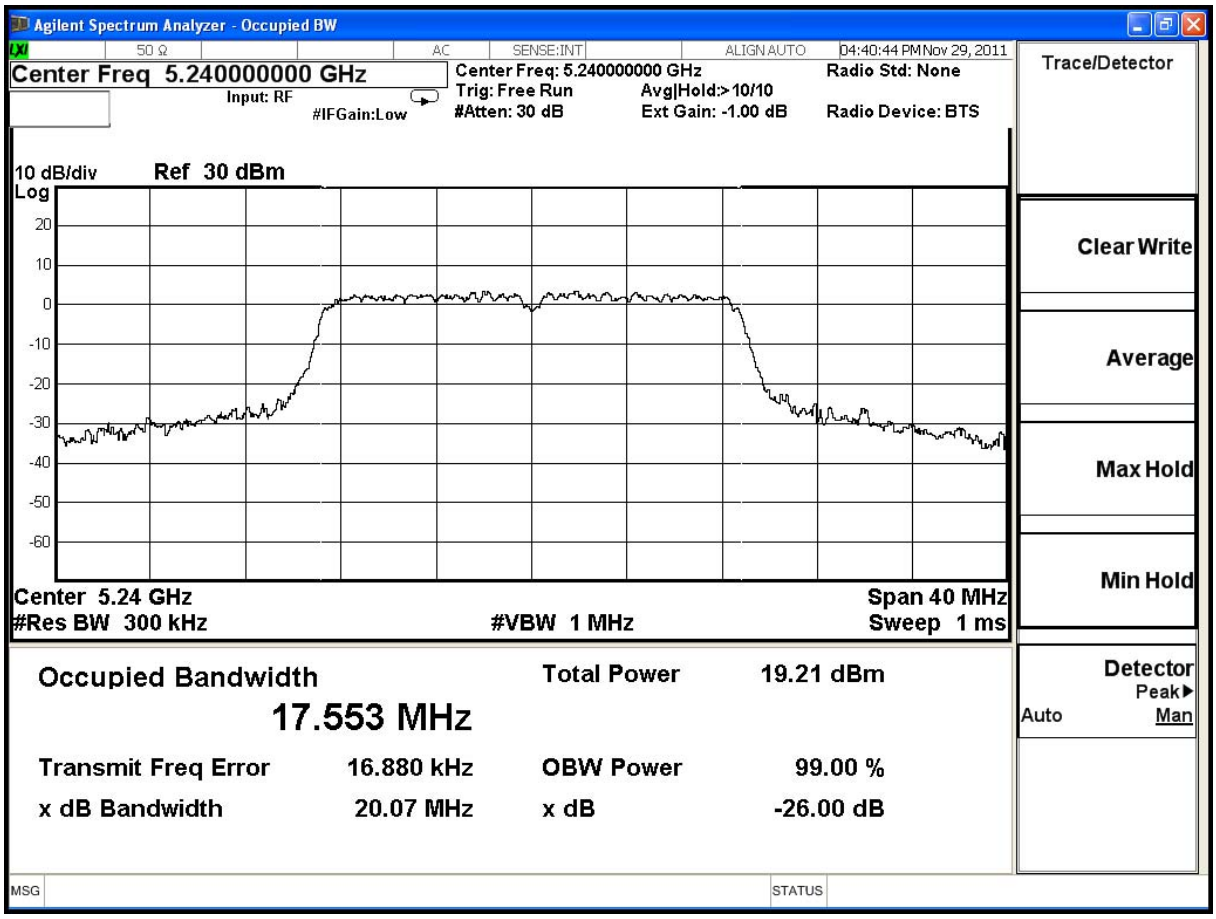
99% & 26dB Bandwidth – Channel 36



99% & 26dB Bandwidth – Channel 44



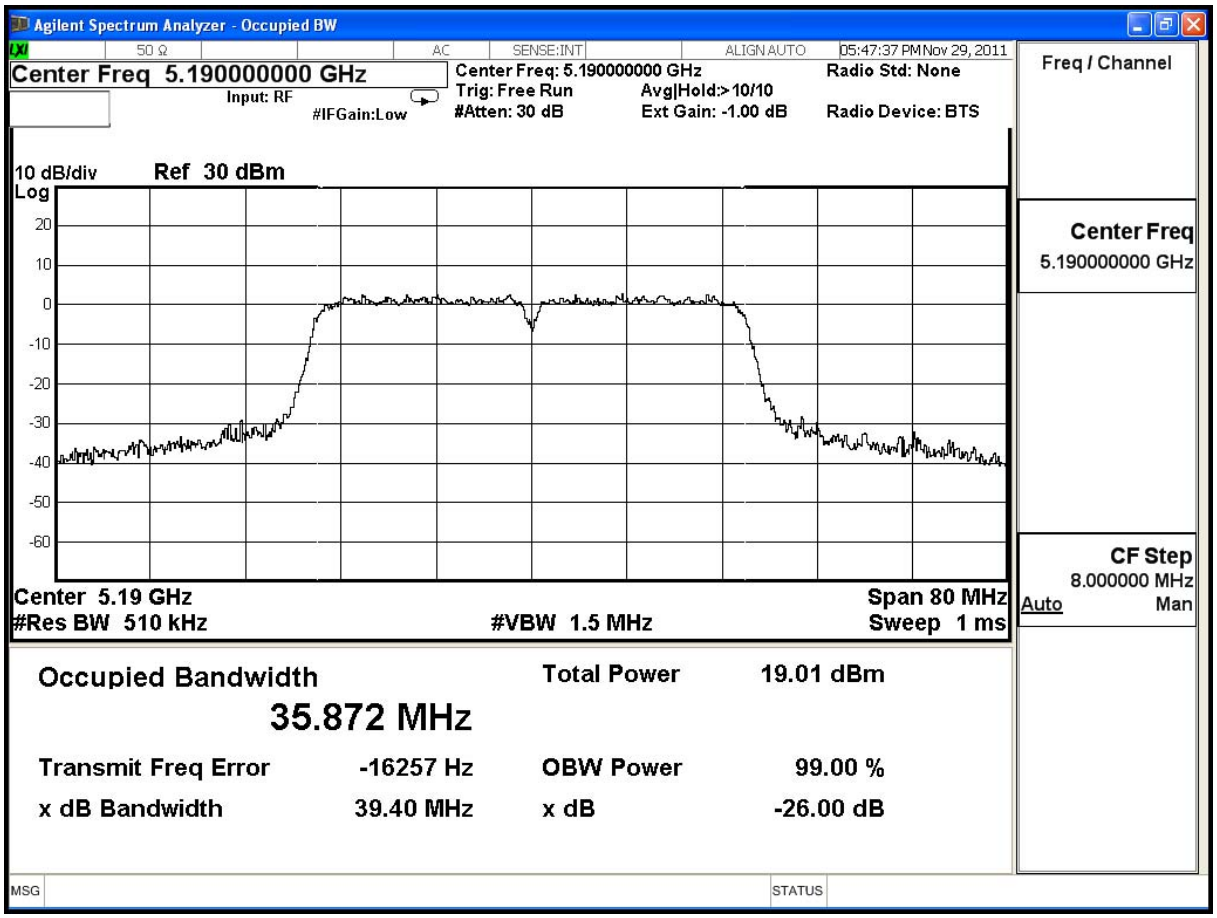
99% & 26dB Bandwidth – Channel 48



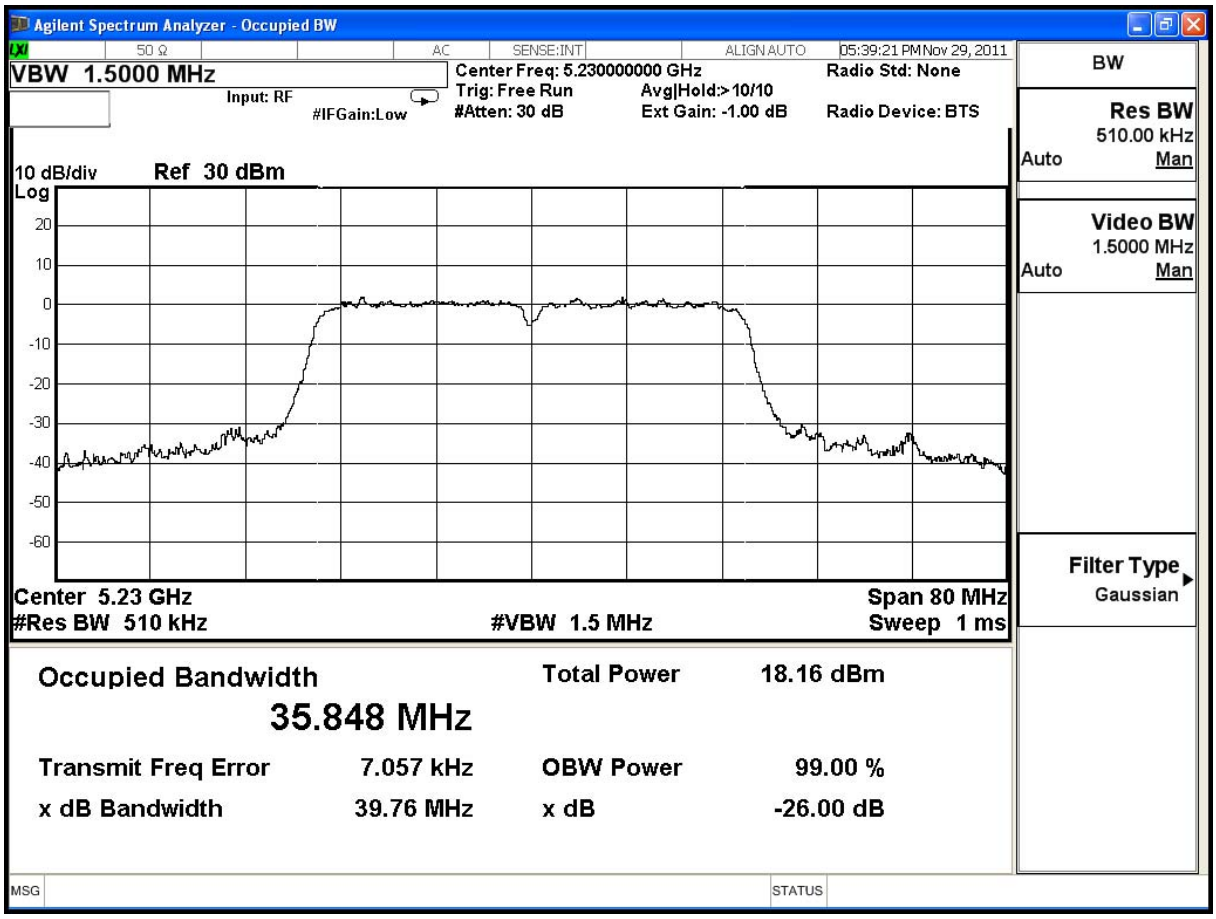
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

802.11n_40M(ANT 0)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
38	5190	39.40	35.87	--	NA
46	5230	39.76	35.84	--	NA

99% & 26dB Bandwidth – Channel 38



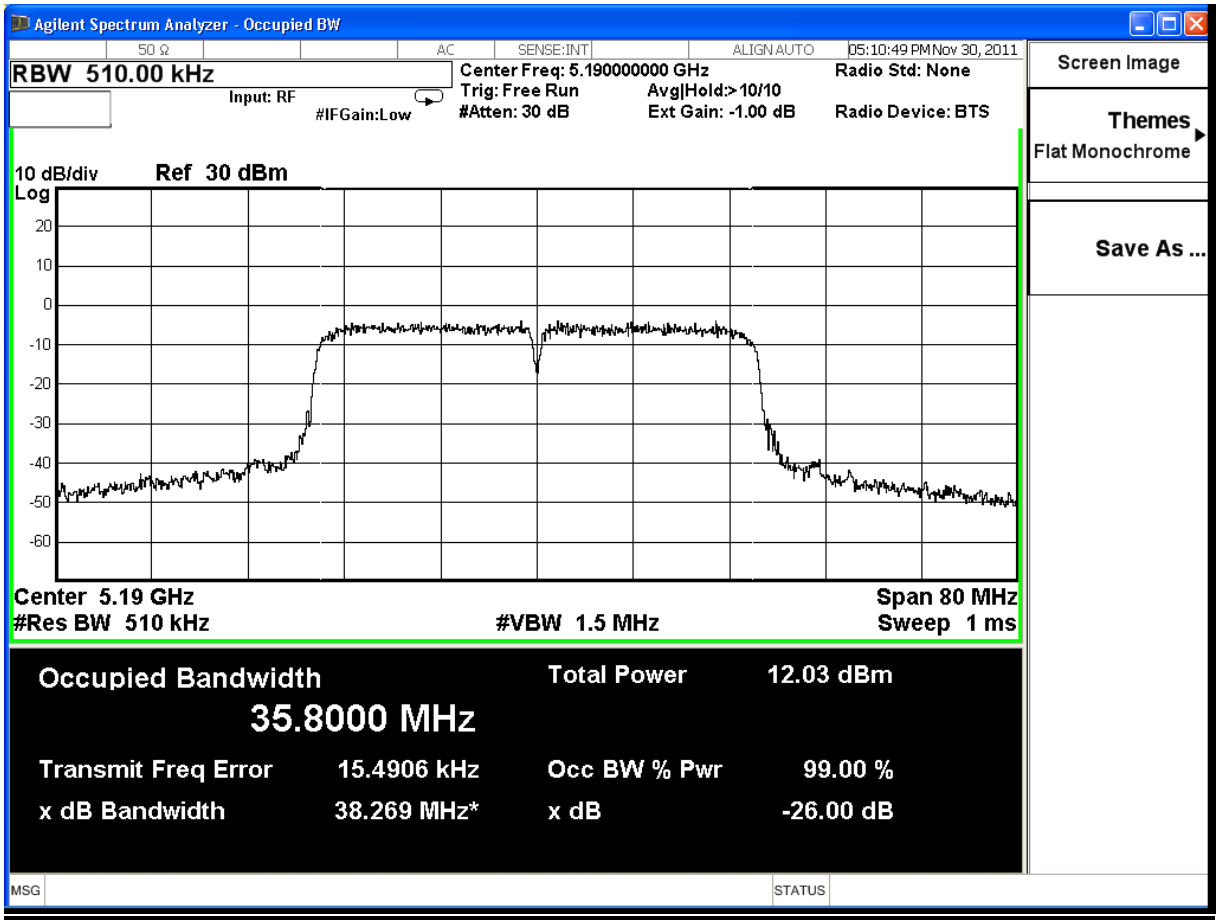
99% & 26dB Bandwidth – Channel 46



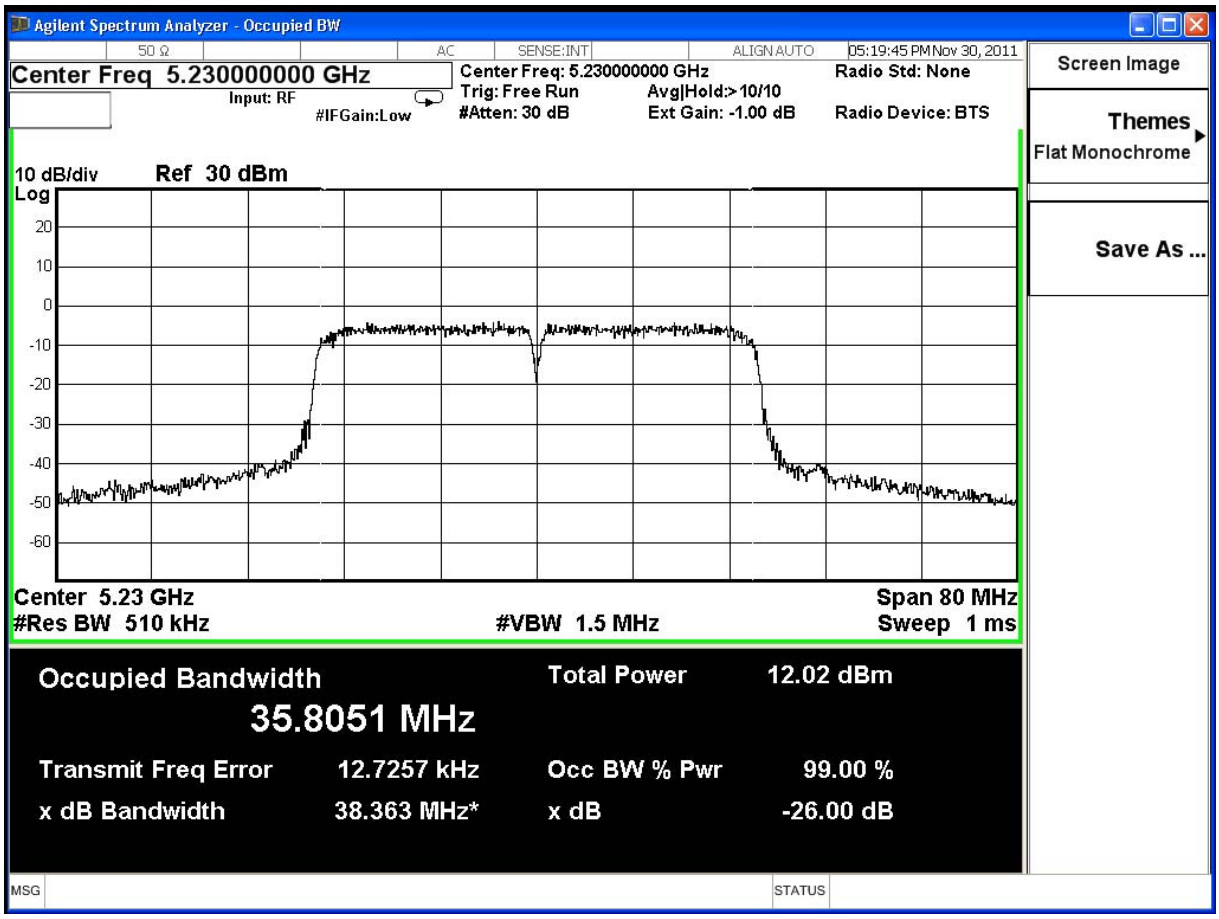
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/30	Test Site	SR7

802.11n_40M(ANT 1)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
38	5190	38.26	35.80	--	NA
46	5230	38.36	35.80	--	NA

99% & 26dB Bandwidth – Channel 38



99% & 26dB Bandwidth – Channel 46

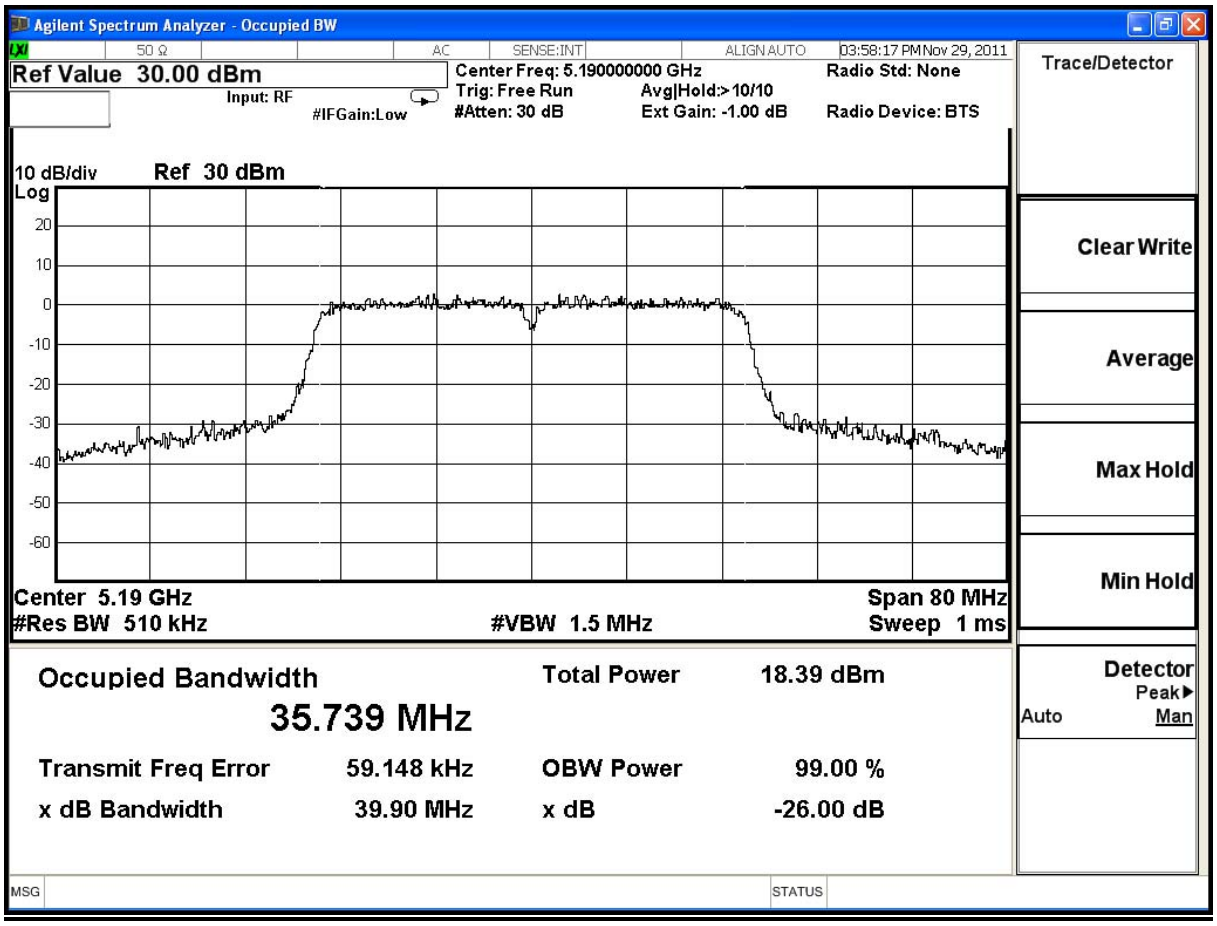


Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

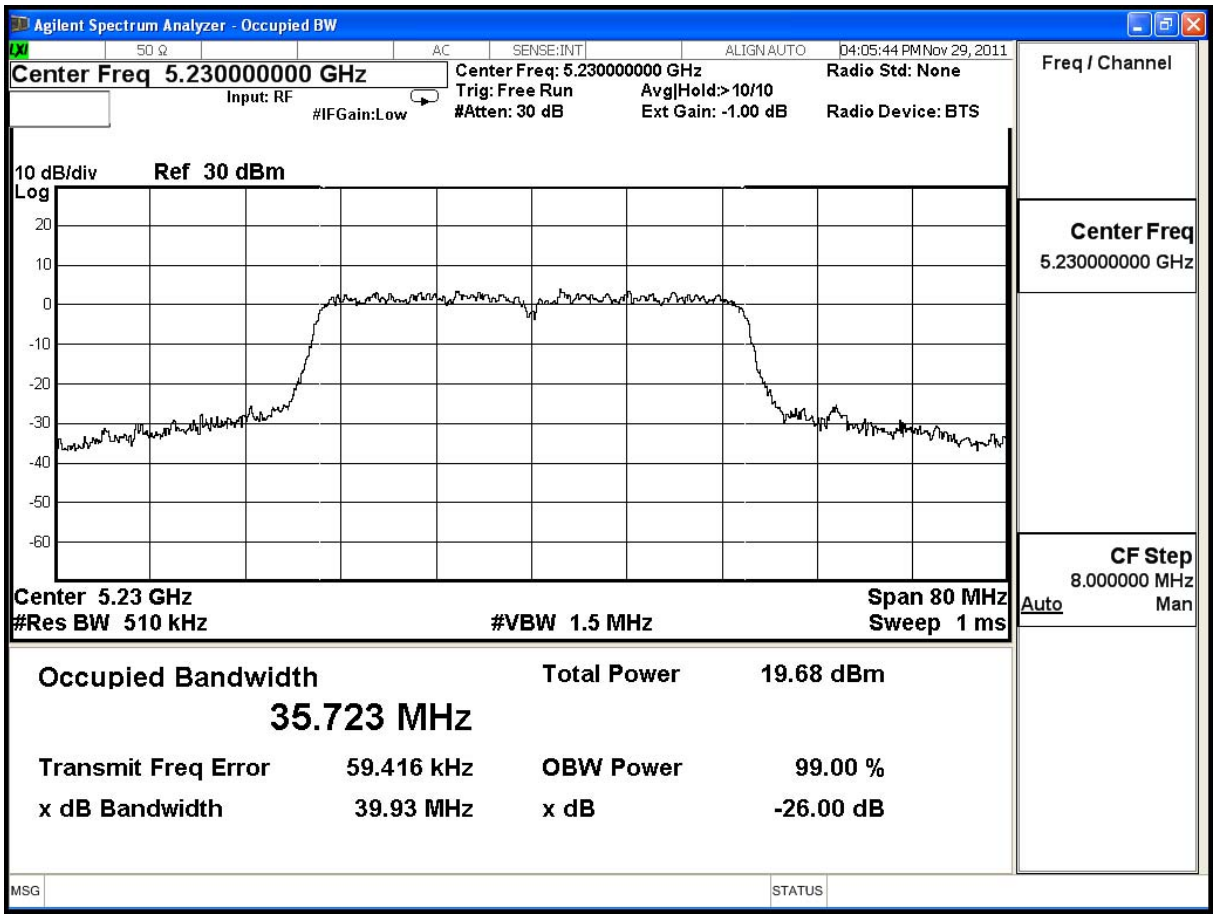
802.11n_40M(ANT 2)

Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
38	5190	39.90	35.73	--	NA
46	5230	39.93	35.72	--	NA

99% & 26dB Bandwidth – Channel 38



99% & 26dB Bandwidth – Channel 46



4. Peak Transmit Output

4.1. Test Equipment

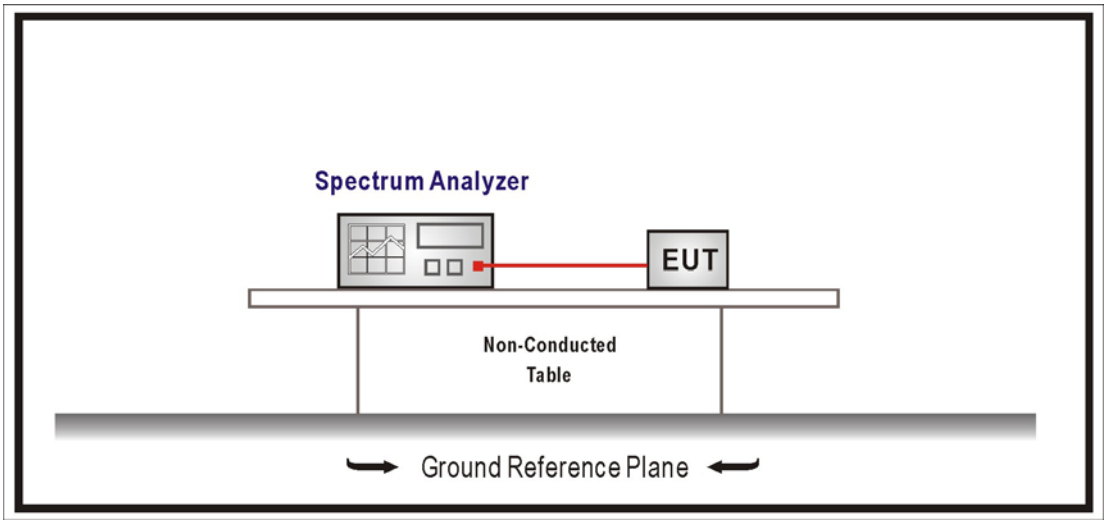
The following test equipments are used during the radiated emission tests:

Peak Transmit Output / SR7

Instrument	Manufacturer	Model No.	Serial No	Cal. Date	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2011/01/17	2012/01/16

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

4.2. Test Setup



4.3. Limits

1. For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the 26dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
2. For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.825 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 1W or 17 dBm + 10log B, where B is the 26dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

4.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements. The Method #1 of the Peak conducted transmit output power was used.

Set RBW=1MHz, VBW=3MHz with sample detector and trace average 100 traces in power averaging mode. Set span to encompass the entire emission bandwidth (EBW) of the signal. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

4.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

4.6. Test Result

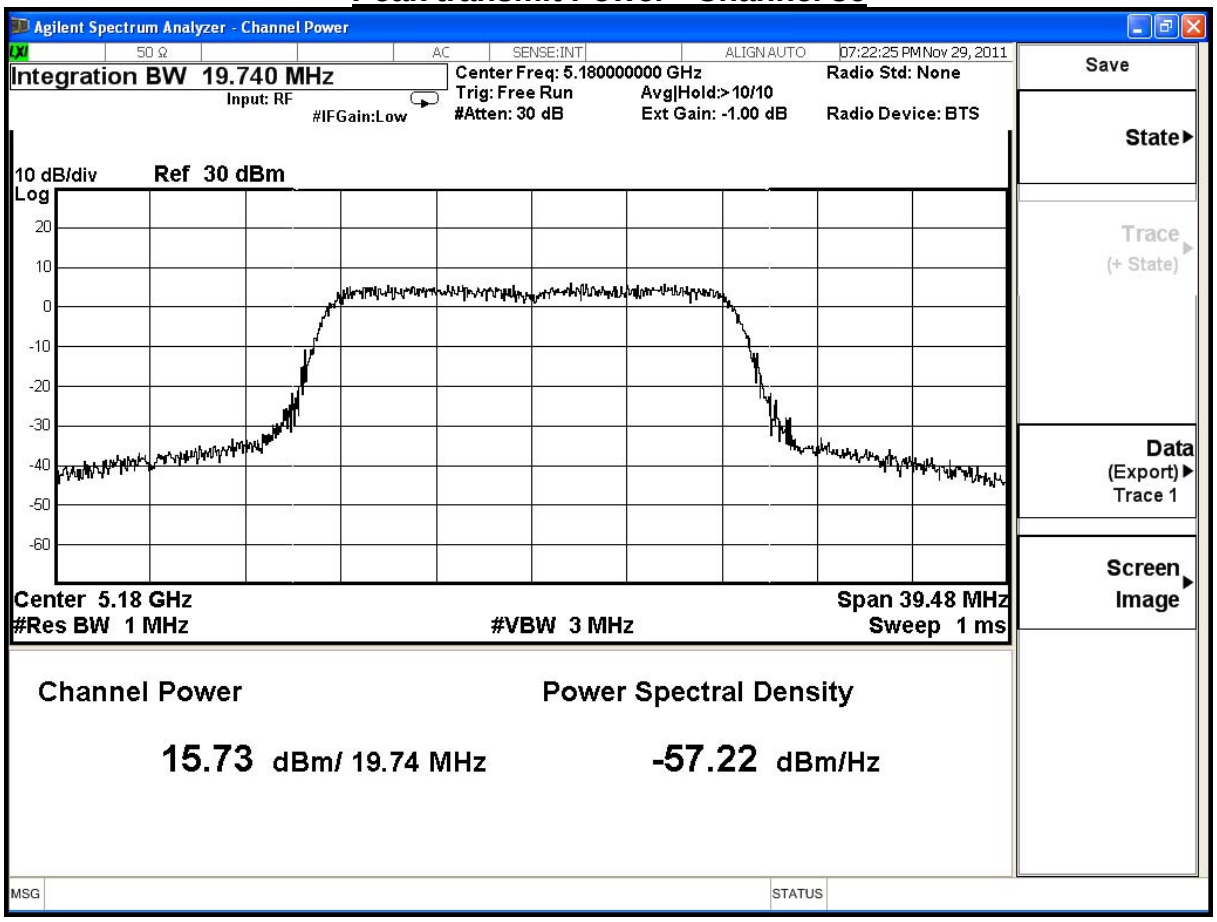
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/28	Test Site	SR7

802.11a						
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	19.74	15.73	≤17	≤16.95	Pass
44	5220	19.88	16.77	≤ 17	≤16.98	Pass
48	5240	19.96	16.48	≤ 17	≤17.00	Pass

The worst emission of data rate is 6 Mbps.

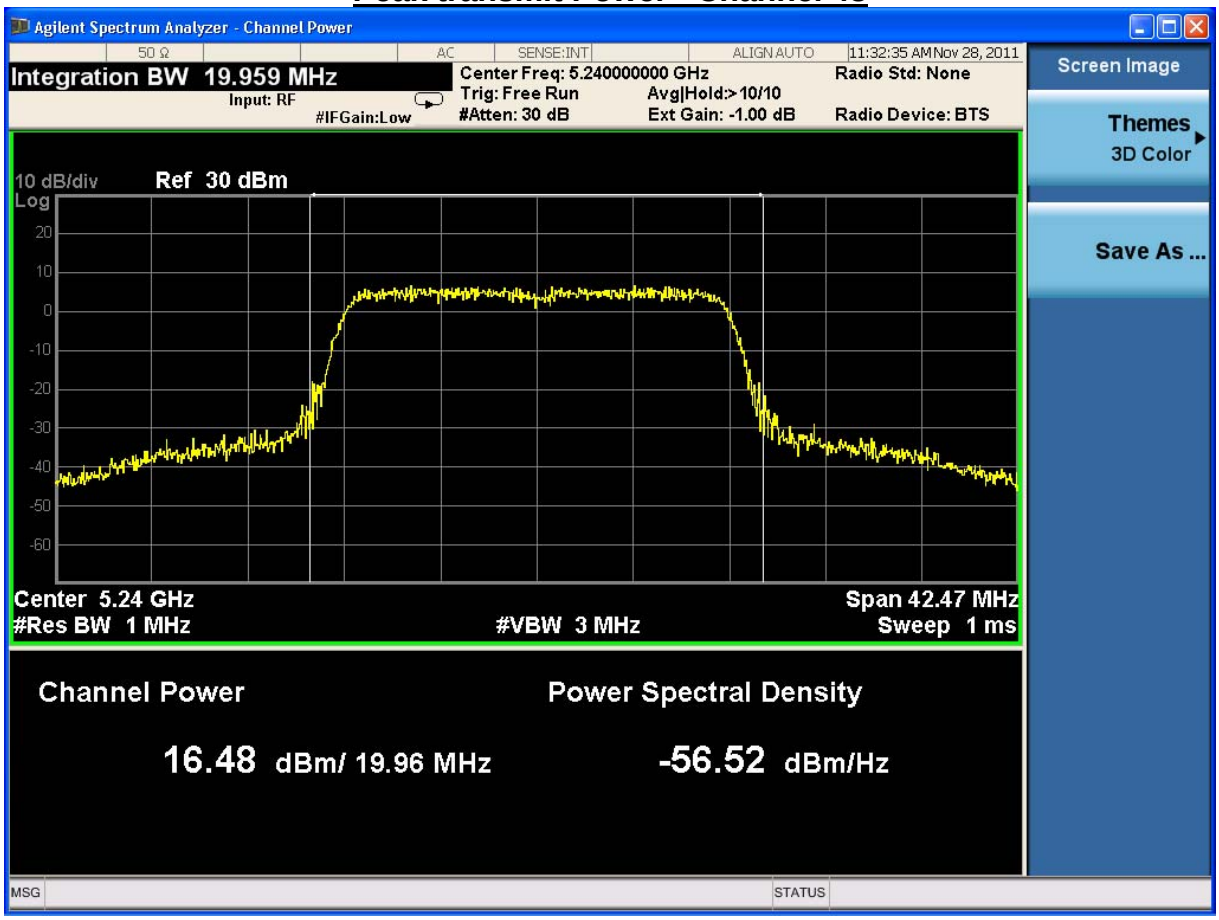
Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
36	5180	15.73	--	--	--	--	--	--	17dBm or 4dBm+10logB
44	5220	16.77	16.67	16.64	16.61	16.52	16.44	16.34	
48	5240	16.48	--	--	--	--	--	--	

Peak transmit Power - Channel 36



Peak transmit Power - Channel 44

Peak transmit Power - Channel 48



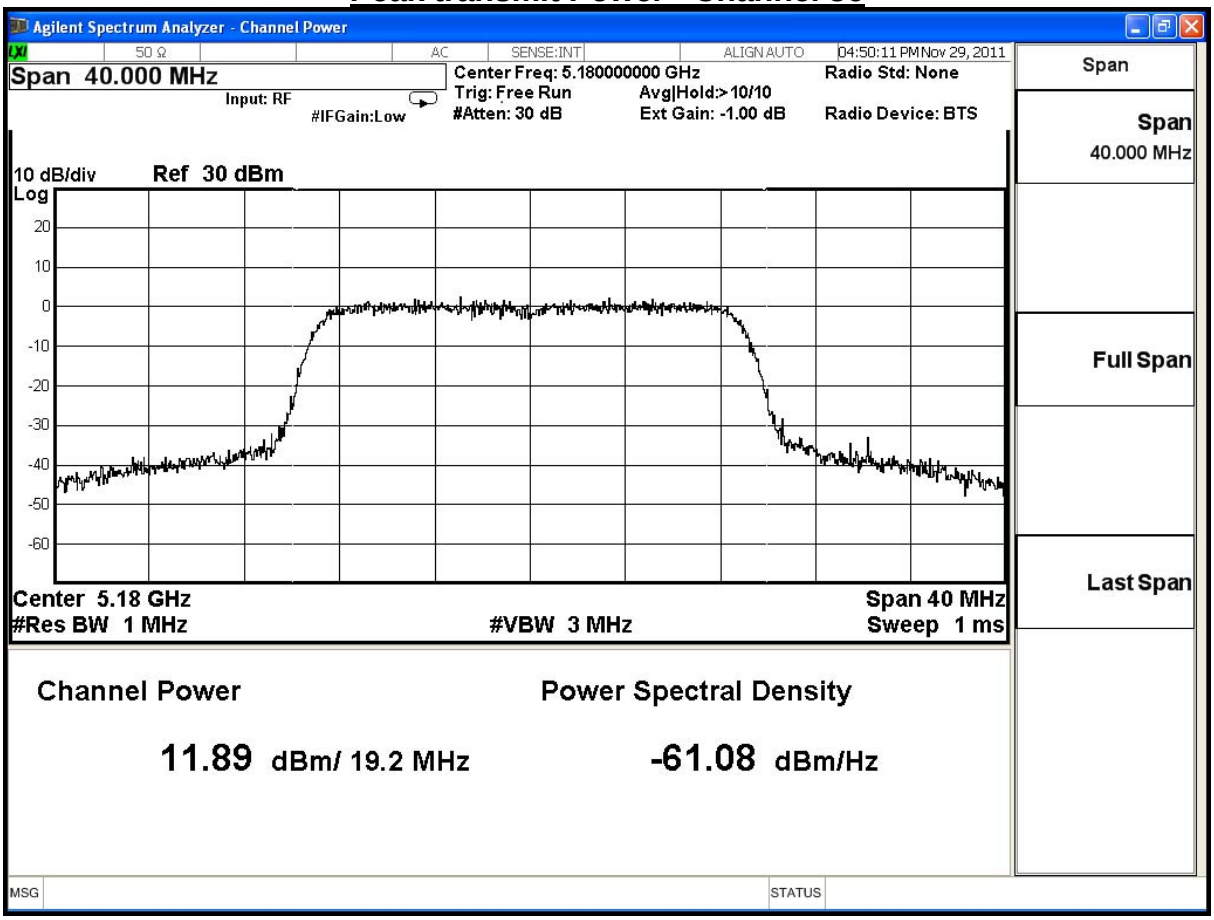
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

IEEE 802.11n(20MHz)_ANT 0						
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	19.20	11.89	≤17	≤16.83	Pass
44	5220	19.90	12.00	≤ 17	≤16.98	Pass
48	5240	19.85	12.17	≤ 17	≤16.97	Pass

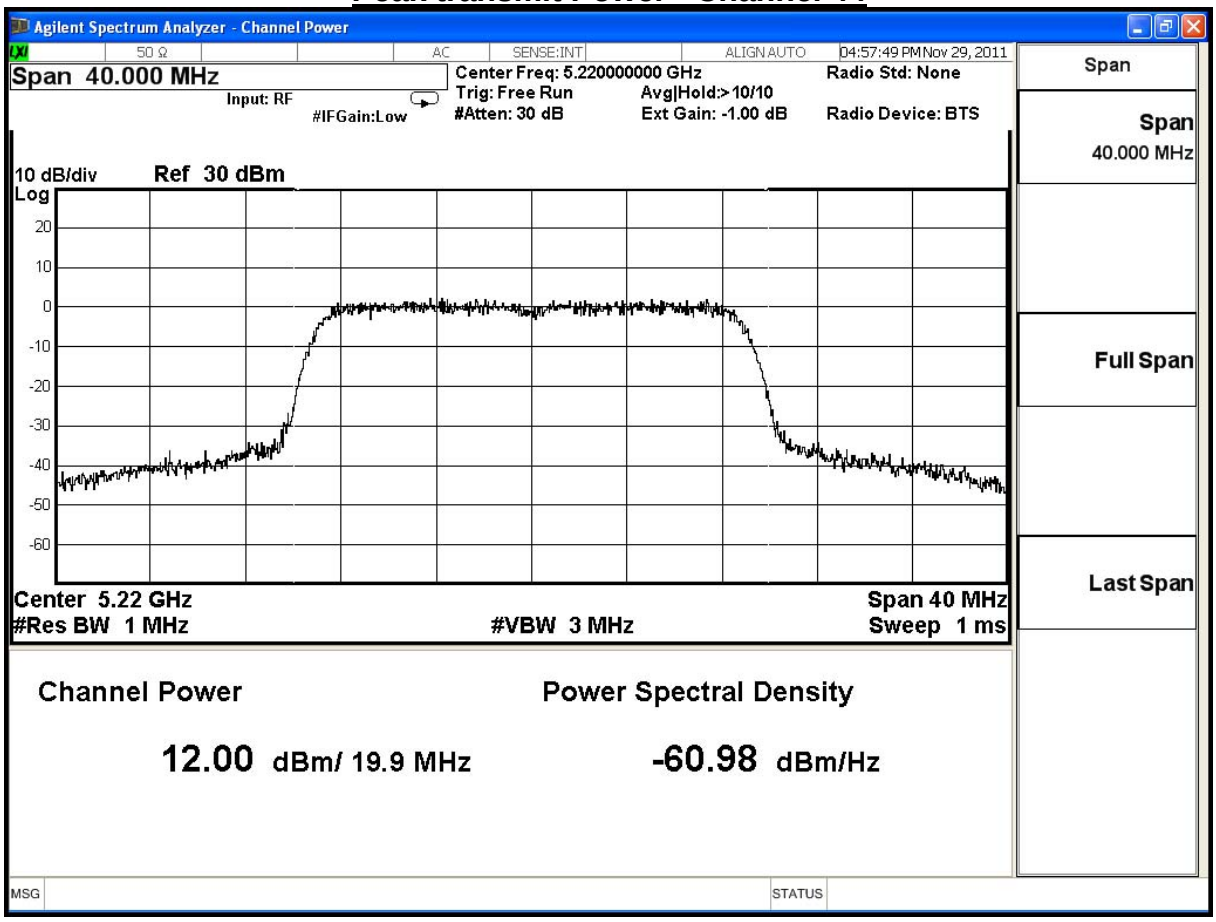
The worst emission of data rate is 19.5Mbps.

Peak Power Output (dBm)										
MCS Index		16	17	18	19	20	21	22	23	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		19.5	39	58.5	78	117	156	175.5	195	
36	5180	11.89	--	--	--	--	--	--	--	17dBm or 4dBm+10logB
44	5220	12.00	11.97	11.95	11.93	11.91	11.90	11.87	11.85	
48	5240	12.17	--	--	--	--	--	--	--	

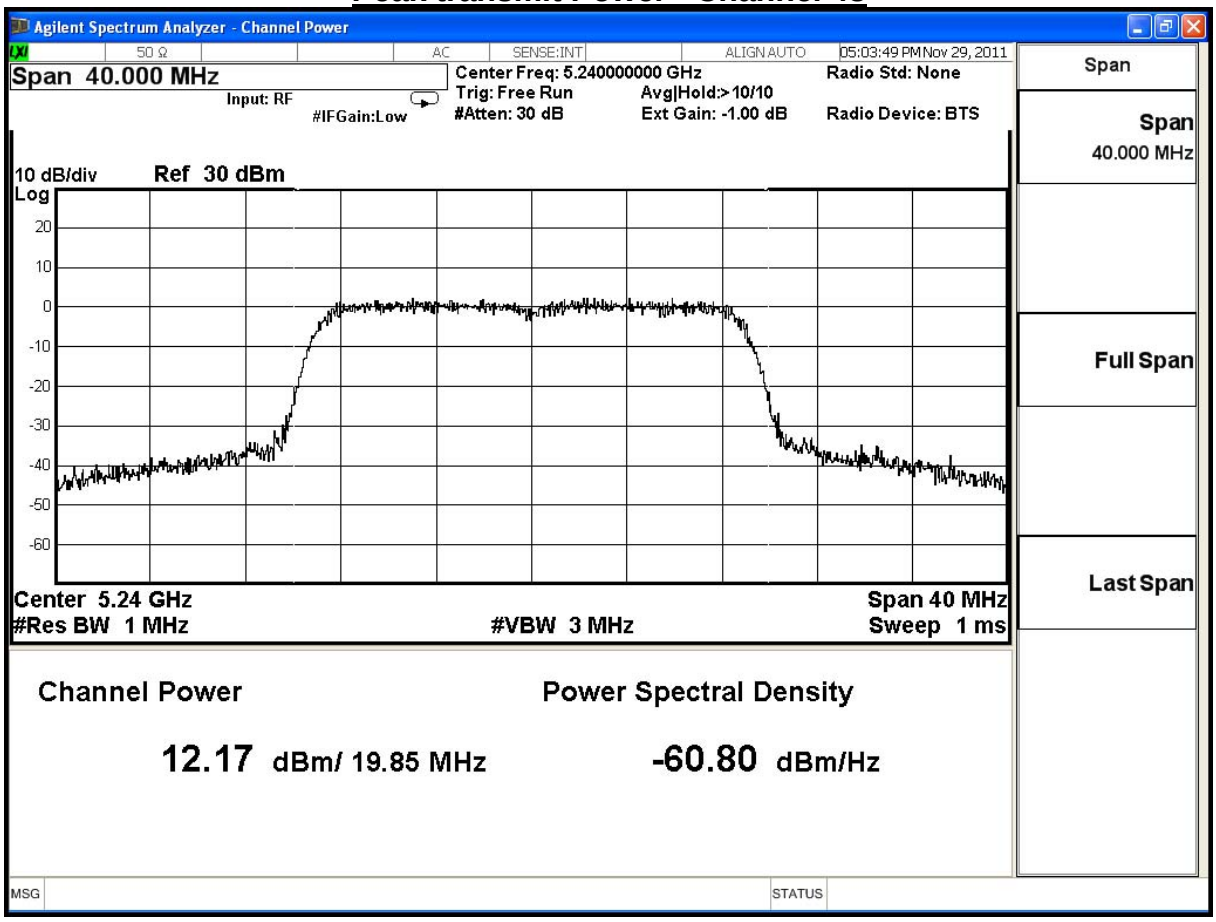
Peak transmit Power - Channel 36



Peak transmit Power - Channel 44



Peak transmit Power - Channel 48



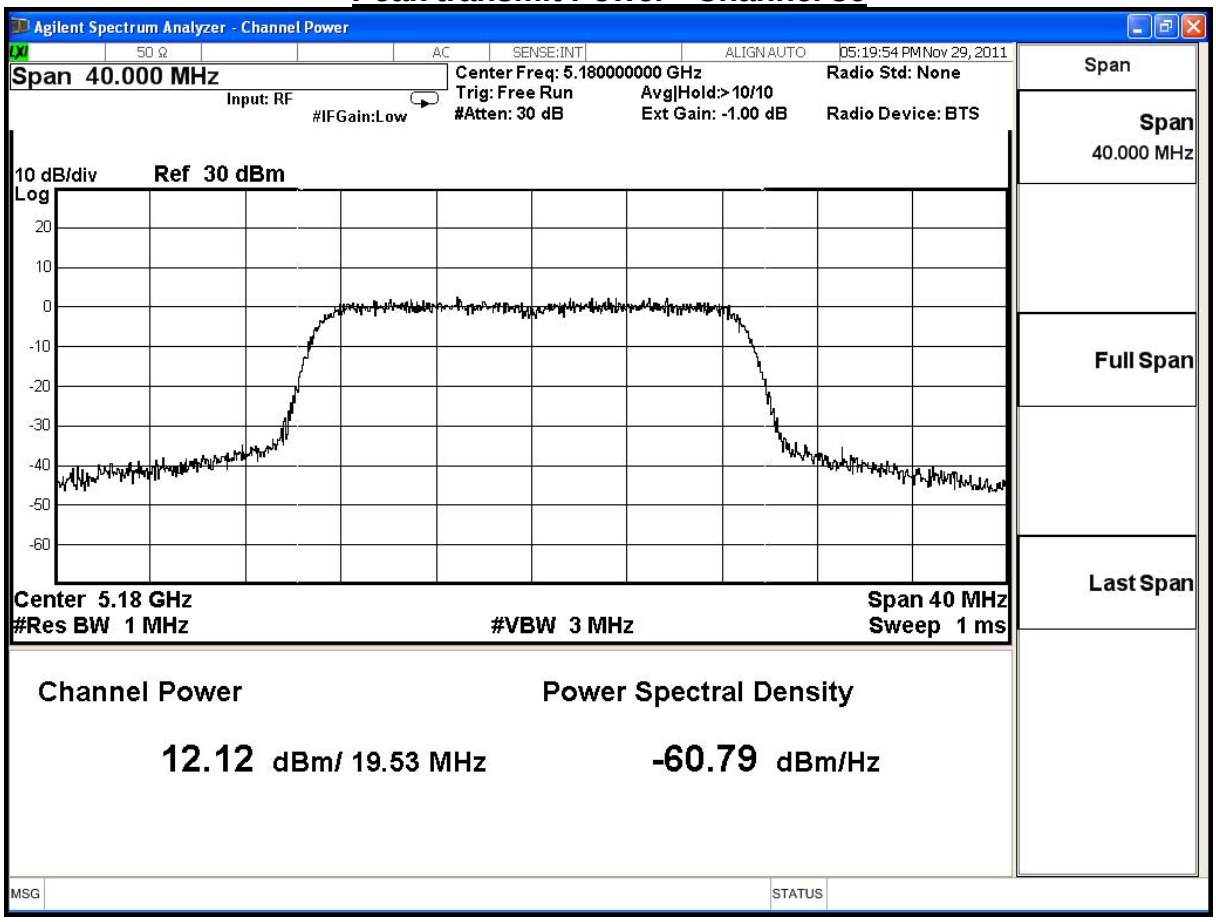
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

IEEE 802.11n(20MHz)_ANT 1						
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	19.53	12.12	≤17	≤16.90	Pass
44	5220	19.71	12.14	≤ 17	≤16.95	Pass
48	5240	19.57	11.57	≤ 17	≤16.91	Pass

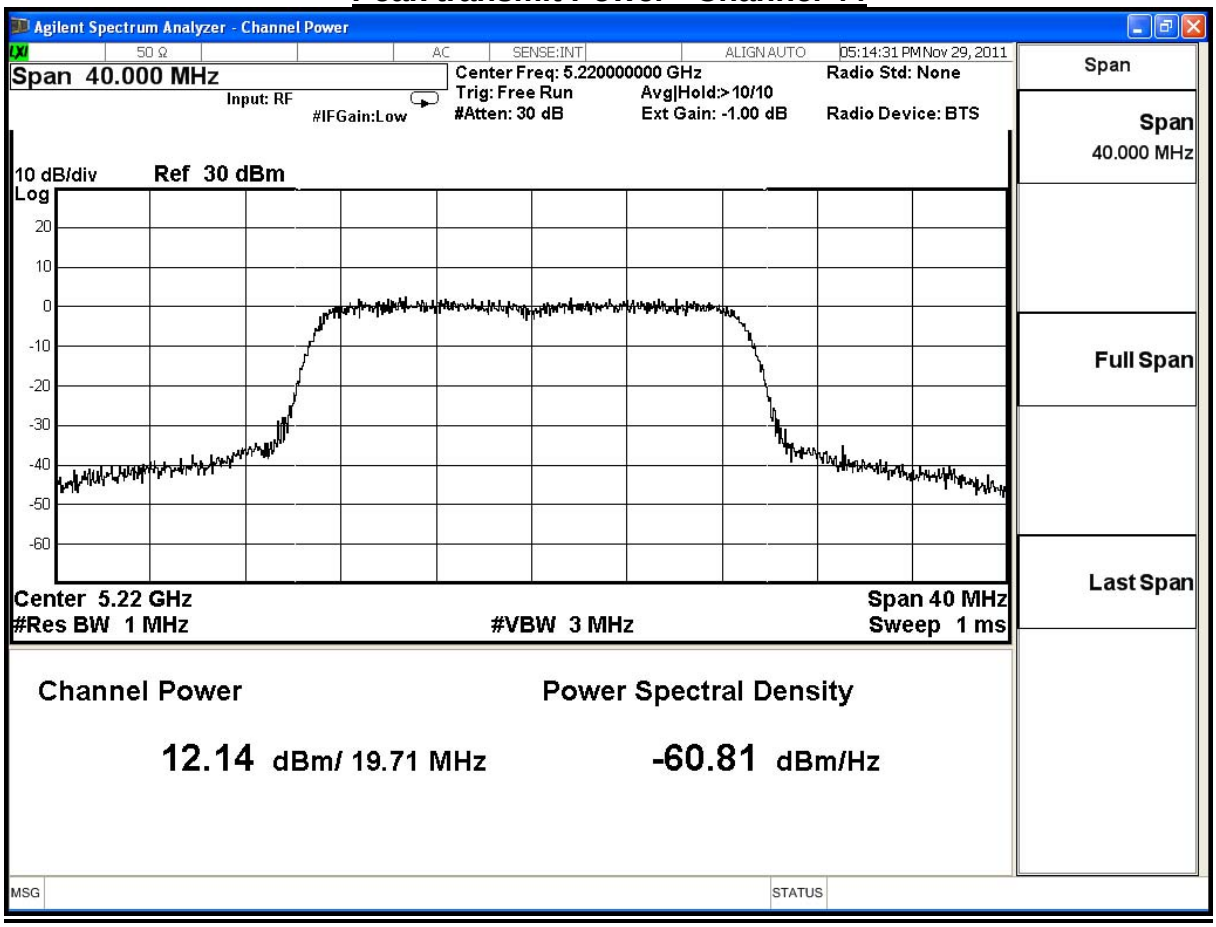
The worst emission of data rate is 19.5Mbps.

Peak Power Output (dBm)										
MCS Index		16	17	18	19	20	21	22	23	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		19.5	39	58.5	78	117	156	175.5	195	
36	5180	12.12	--	--	--	--	--	--	--	17dBm or 4dBm+10logB
44	5220	12.14	12.10	12.08	12.07	12.04	12.00	11.98	11.94	
48	5240	11.57	--	--	--	--	--	--	--	

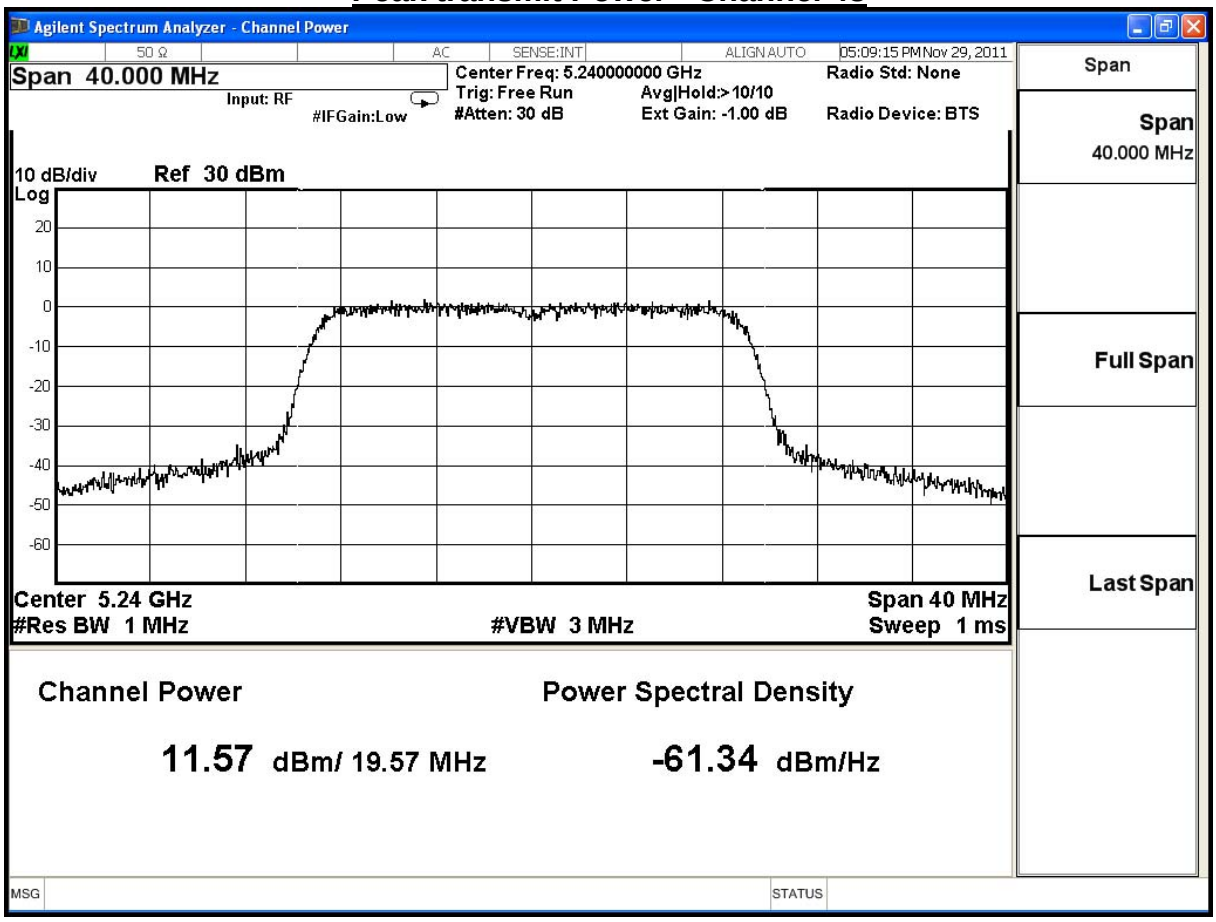
Peak transmit Power - Channel 36



Peak transmit Power - Channel 44



Peak transmit Power - Channel 48



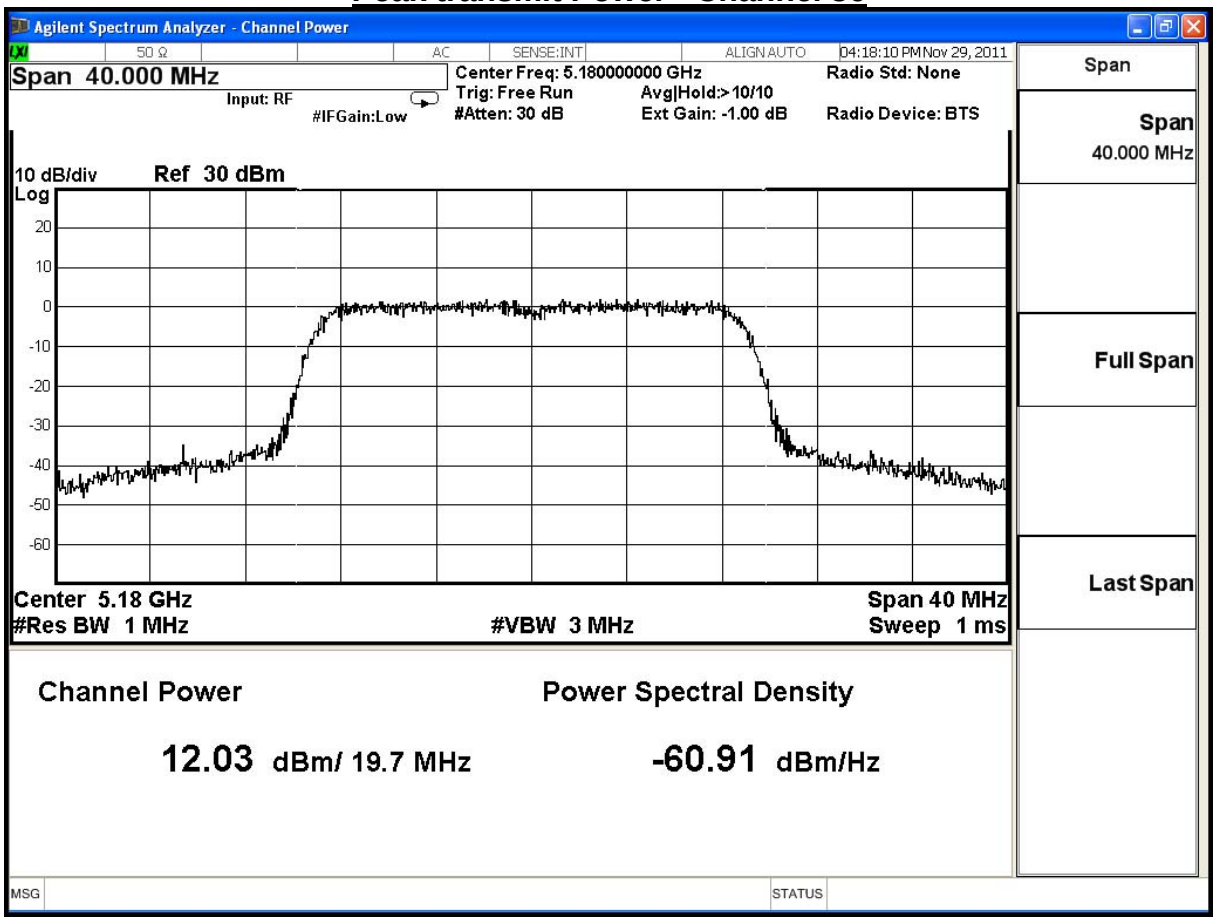
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

IEEE 802.11n(20MHz)_ANT 2						
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	19.70	12.03	≤17	≤16.94	Pass
44	5220	19.86	12.27	≤ 17	≤16.97	Pass
48	5240	20.07	12.28	≤ 17	≤17.02	Pass

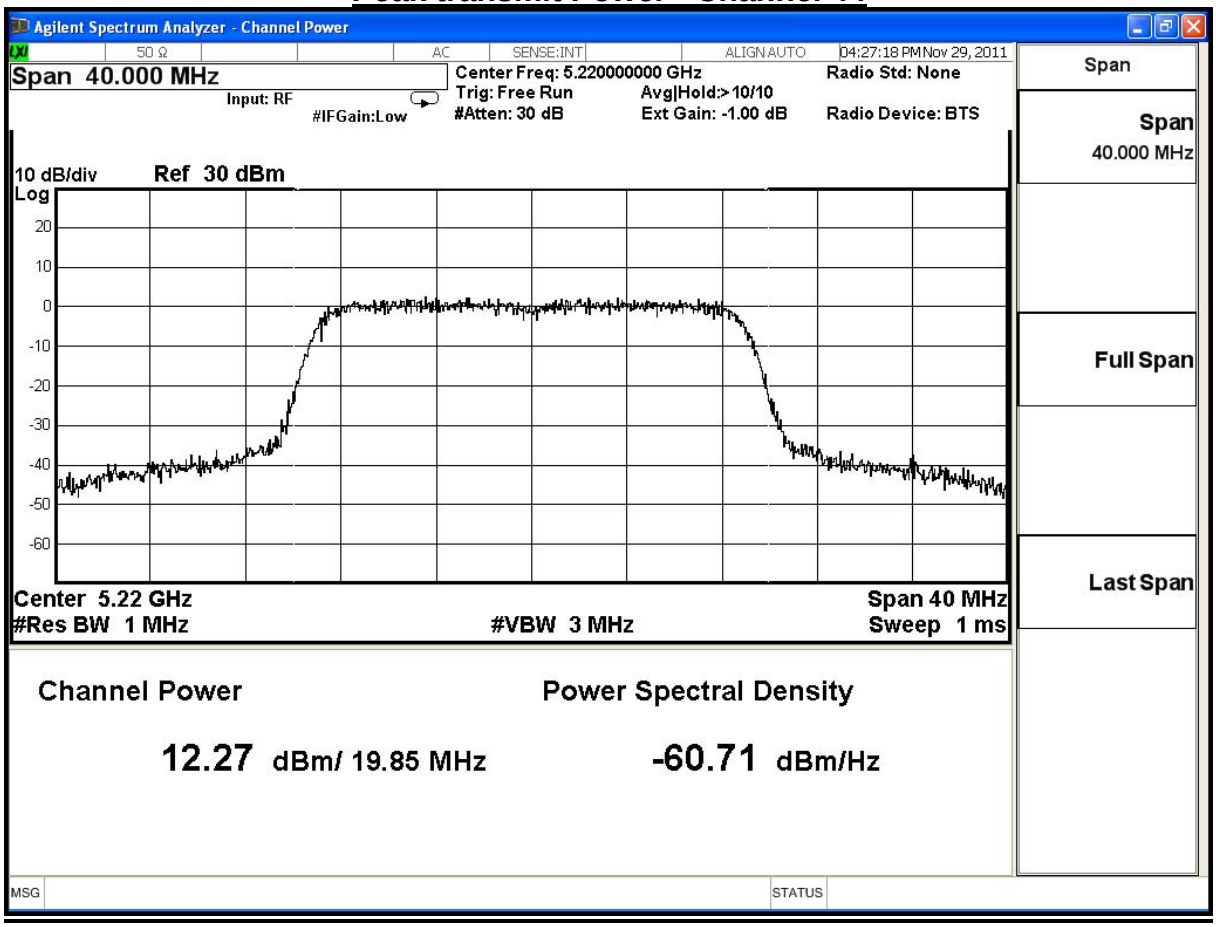
The worst emission of data rate is 19.5Mbps.

Peak Power Output (dBm)										
MCS Index		16	17	18	19	20	21	22	23	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		19.5	39	58.5	78	117	156	175.5	195	
36	5180	12.03	--	--	--	--	--	--	--	17dBm or 4dBm+10logB
44	5220	12.27	12.20	12.18	12.17	12.14	12.11	12.04	12.03	
48	5240	12.28	--	--	--	--	--	--	--	

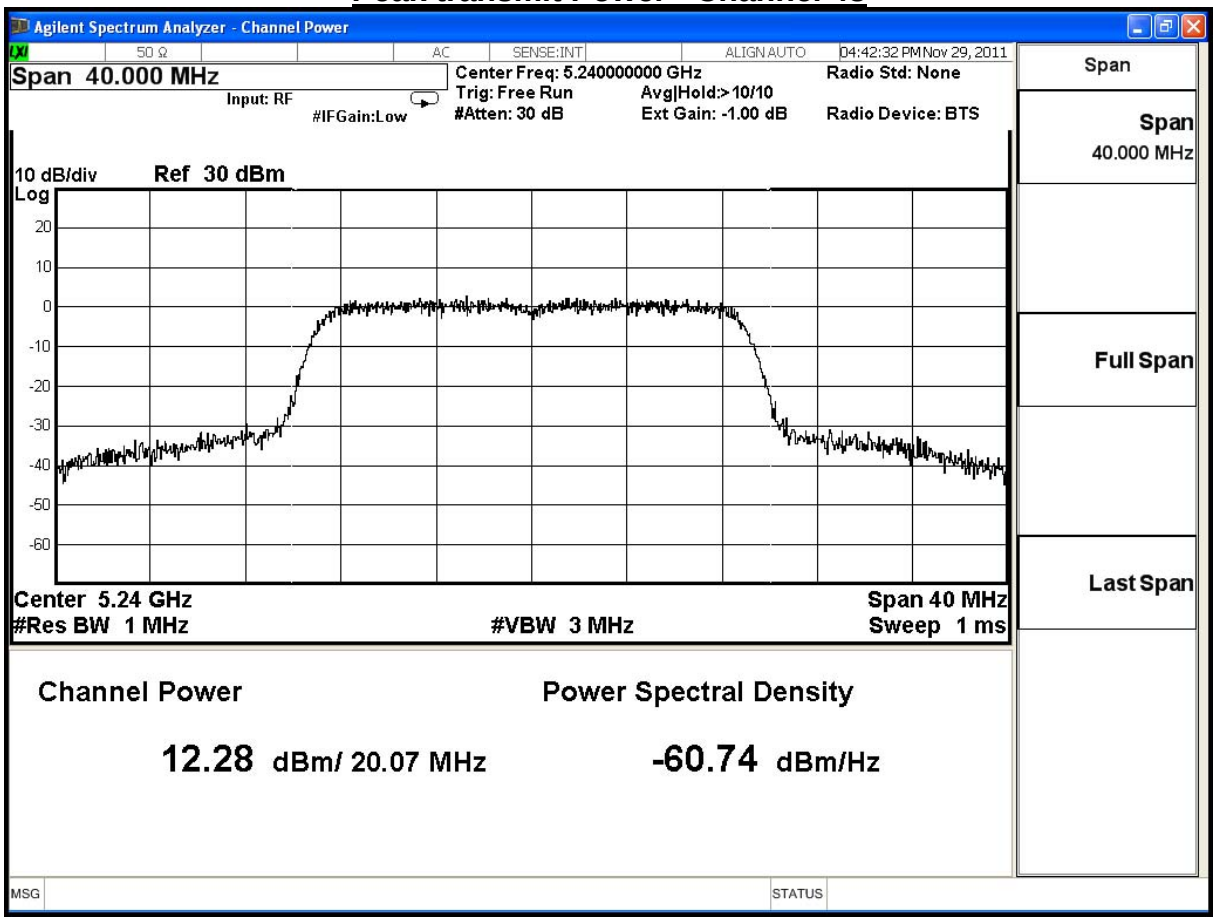
Peak transmit Power - Channel 36



Peak transmit Power - Channel 44



Peak transmit Power - Channel 48



Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

IEEE 802.11n(20MHz)_ANT 0+1+2					
Channel No.	Frequency (MHz)	Total Output Power		Required Limit (dBm)	Result
		(dBm)	(mW)		
36	5180	16.79	47.75	≤16.83	Pass
44	5220	16.91	49.09	≤ 16.95	Pass
48	5240	16.79	47.75	≤ 16.91	Pass

Peak Power Output (dBm)										
MCS Index		8	9	10	11	12	13	14	15	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		19.5	39	58.5	78	117	156	175.5	195	
36	5180	16.79	--	--	--	--	--	--	--	30dBm
44	5220	16.91	16.86	16.84	16.83	16.8	16.78	16.74	16.71	30dBm
48	5240	16.79	--	--	--	--	--	--	--	30dBm

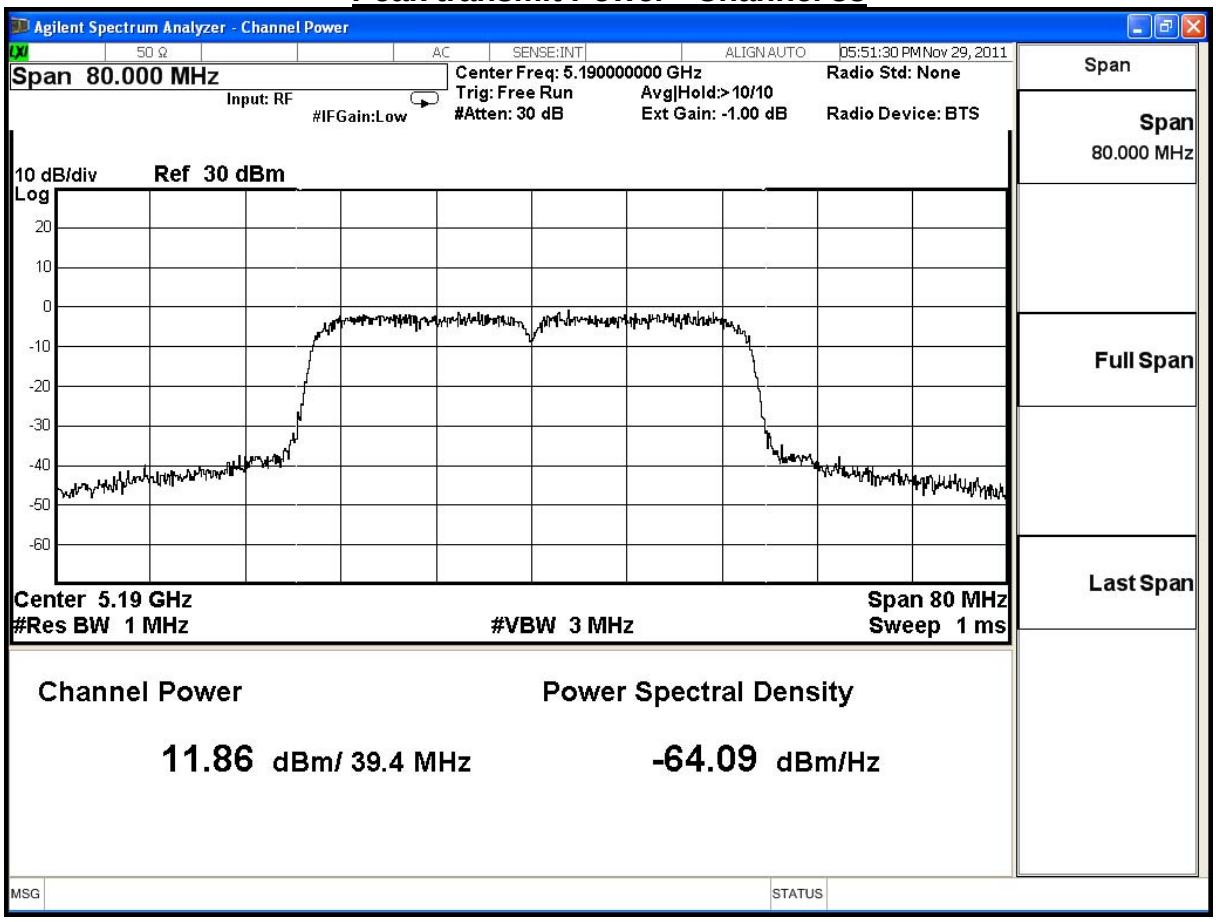
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

IEEE 802.11n(40MHz)_ANT 0						
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
38	5190	39.40	11.86	≤17	≤19.95	Pass
46	5230	39.76	11.05	≤ 17	≤19.99	Pass

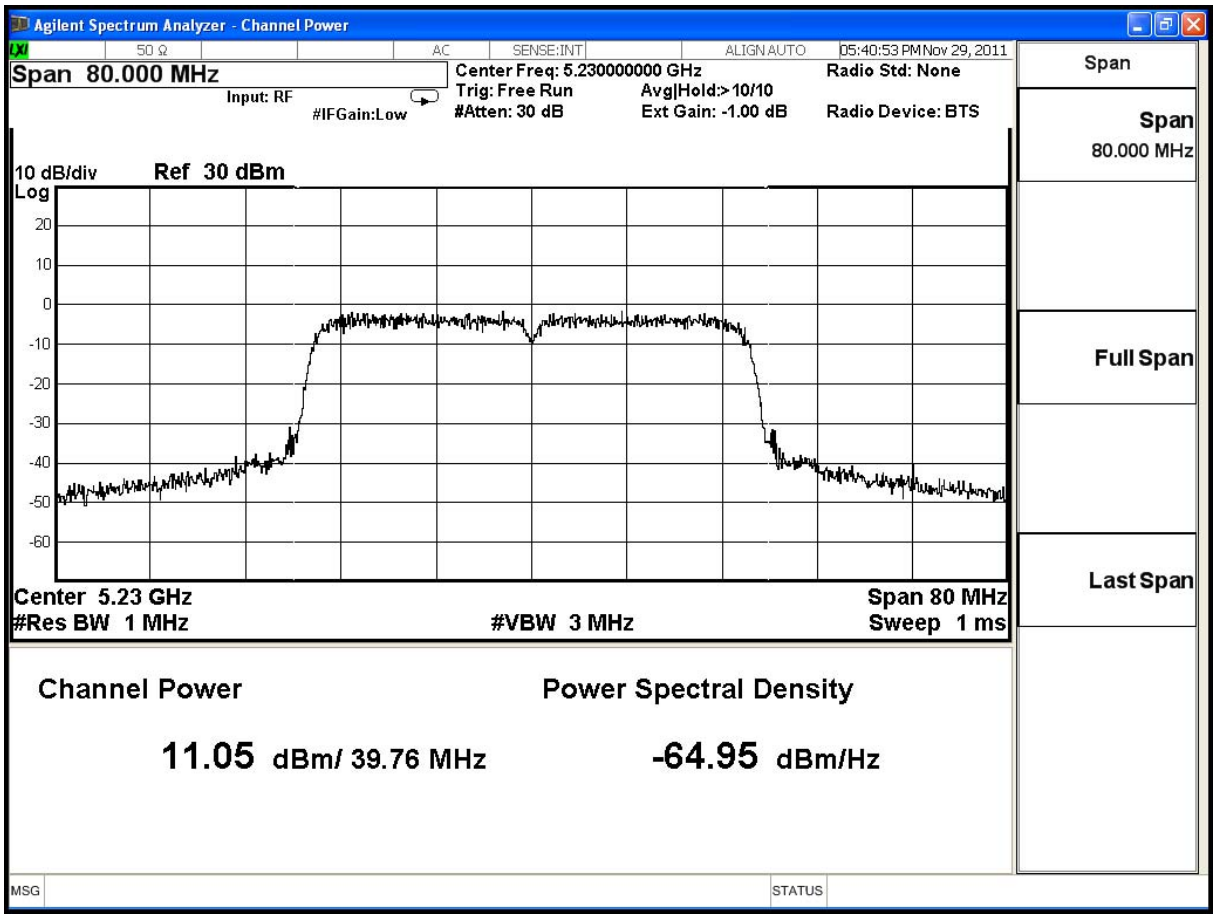
The worst emission of data rate is 40.5 Mbps

Peak Power Output (dBm)									
MCS Index		8	9	10	11	12	13	14	15	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
38	5190	11.86	11.84	11.75	11.74	11.70	11.65	11.64	11.60	17dBm or 4dBm+10logB
46	5230	11.05	--	--	--	--	--	--	--	

Peak transmit Power - Channel 38



Peak transmit Power - Channel 46



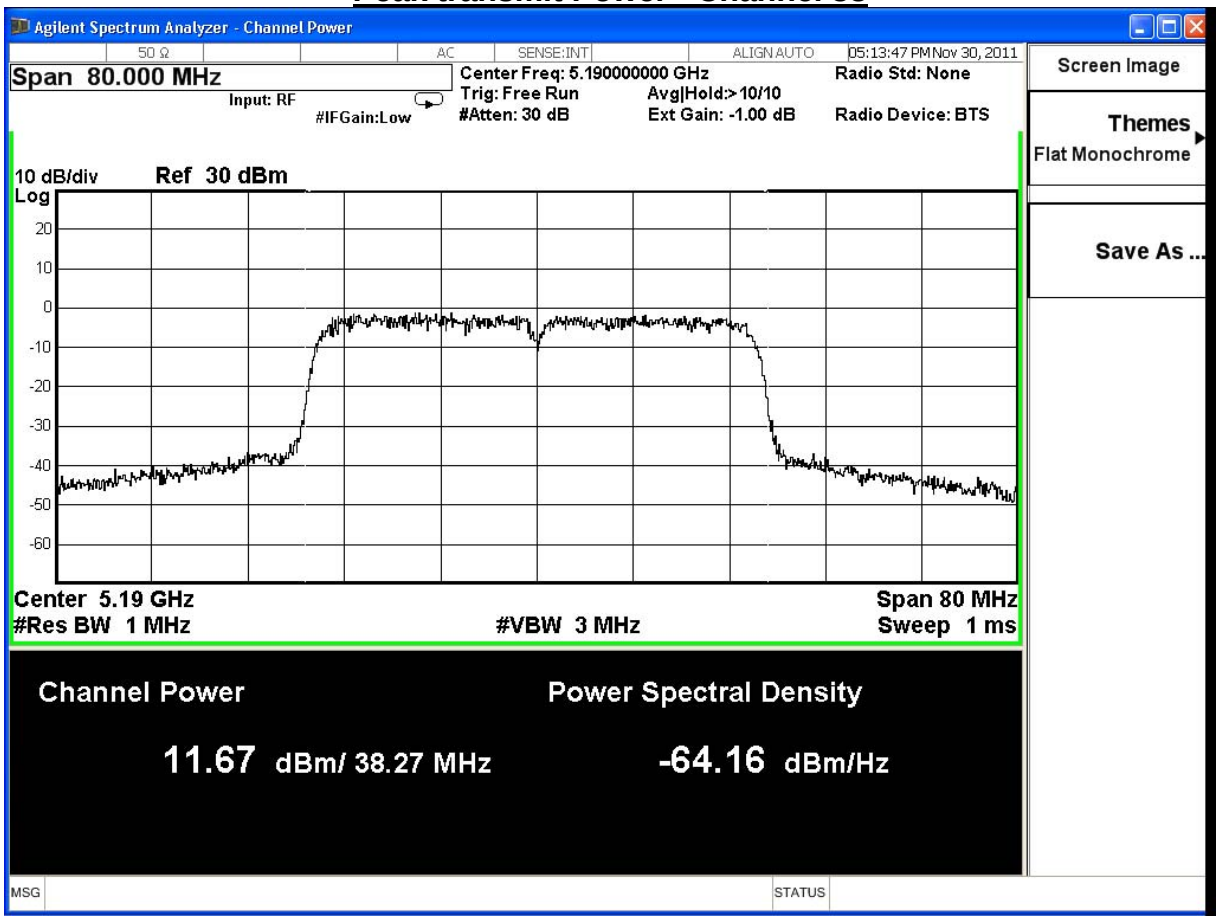
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/30	Test Site	SR7

IEEE 802.11n(40MHz)_ANT 1						
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
38	5190	38.26	11.67	≤17	≤19.82	Pass
46	5230	38.36	11.75	≤ 17	≤19.82	Pass

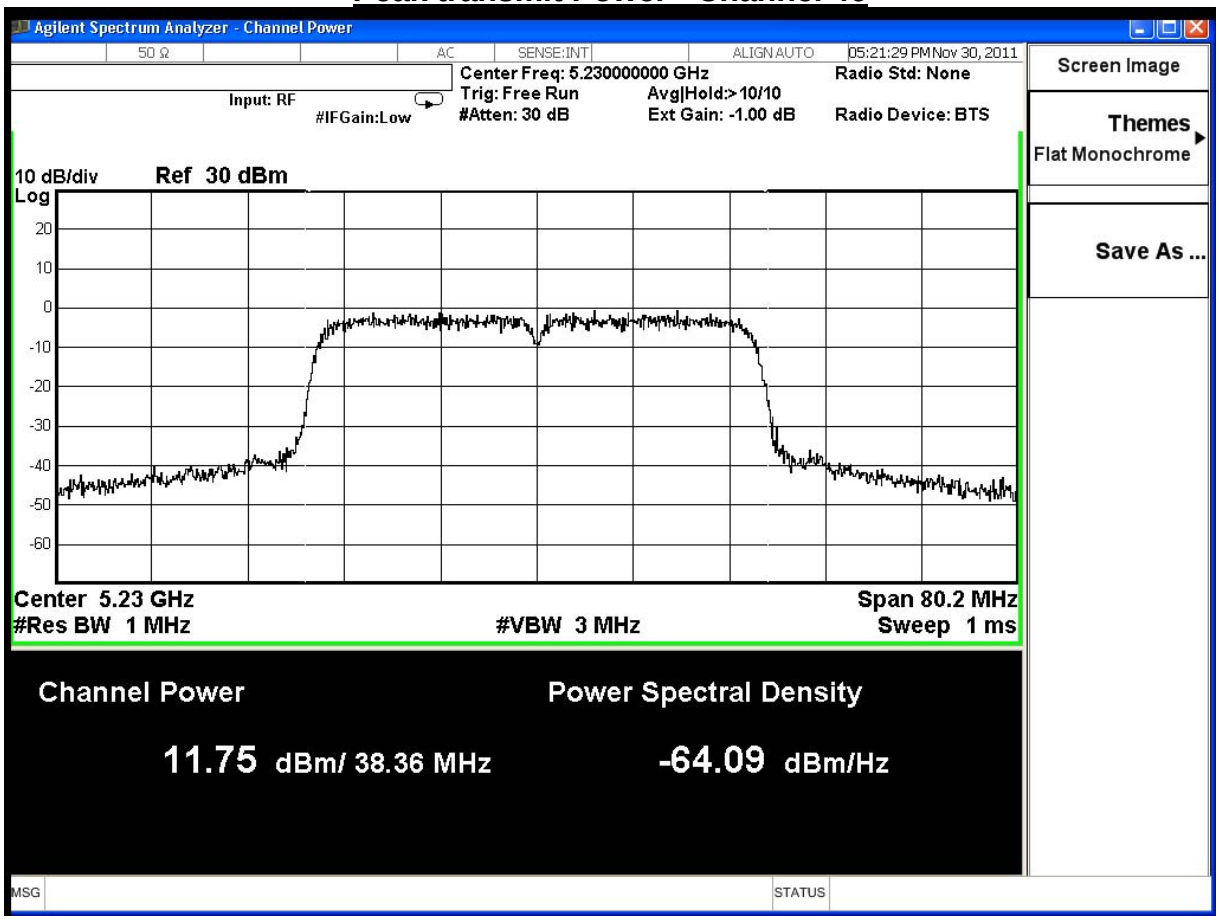
The worst emission of data rate is 40.5 Mbps

Peak Power Output (dBm)										
MCS Index		16	17	18	19	20	21	22	23	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
38	5190	11.67	11.24	11.12	11.09	11.01	10.95	10.94	10.90	17dBm or 4dBm+10logB
46	5230	11.75	--	--	--	--	--	--	--	

Peak transmit Power - Channel 38



Peak transmit Power - Channel 46



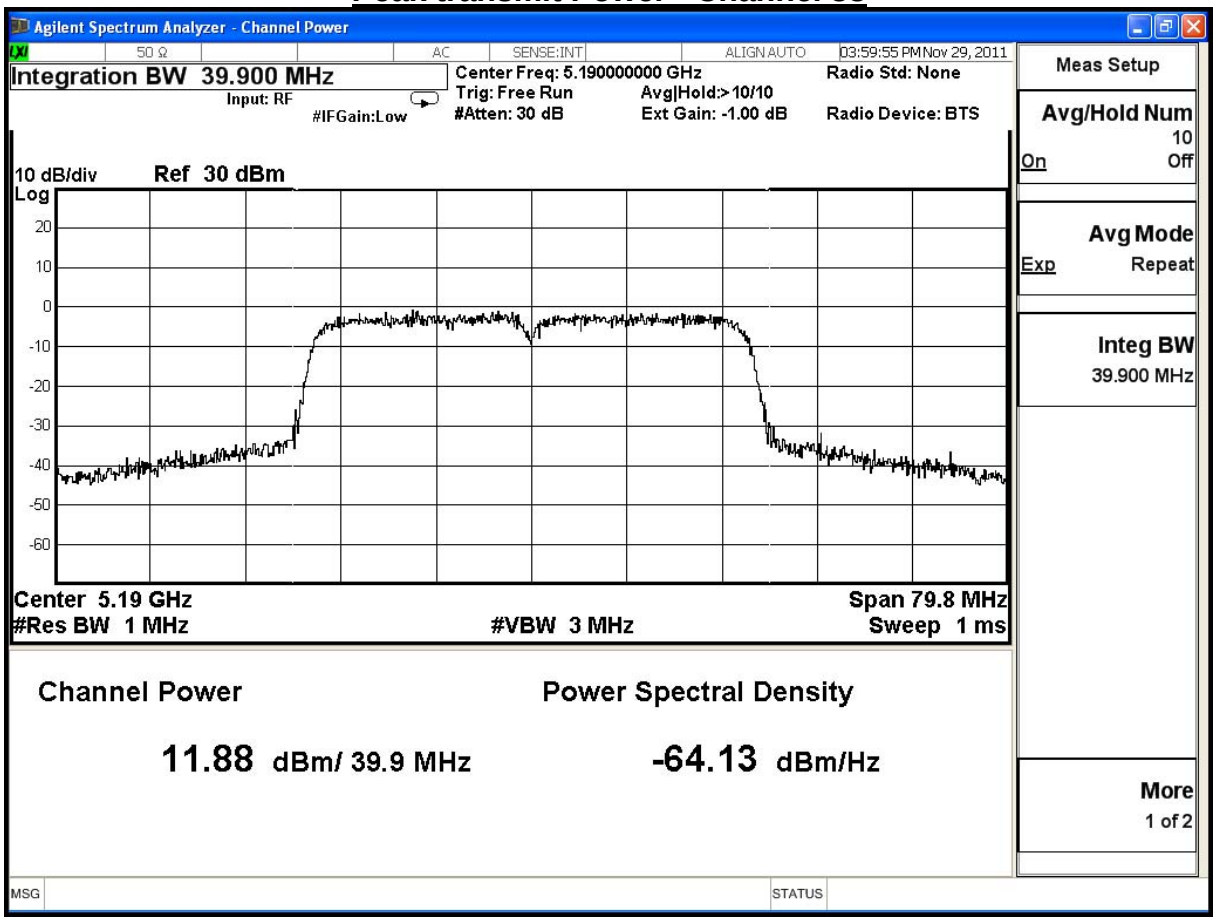
Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

IEEE 802.11n(40MHz)_ANT 2						
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
38	5190	39.90	11.88	≤17	≤20.00	Pass
46	5230	39.93	11.66	≤ 17	≤20.01	Pass

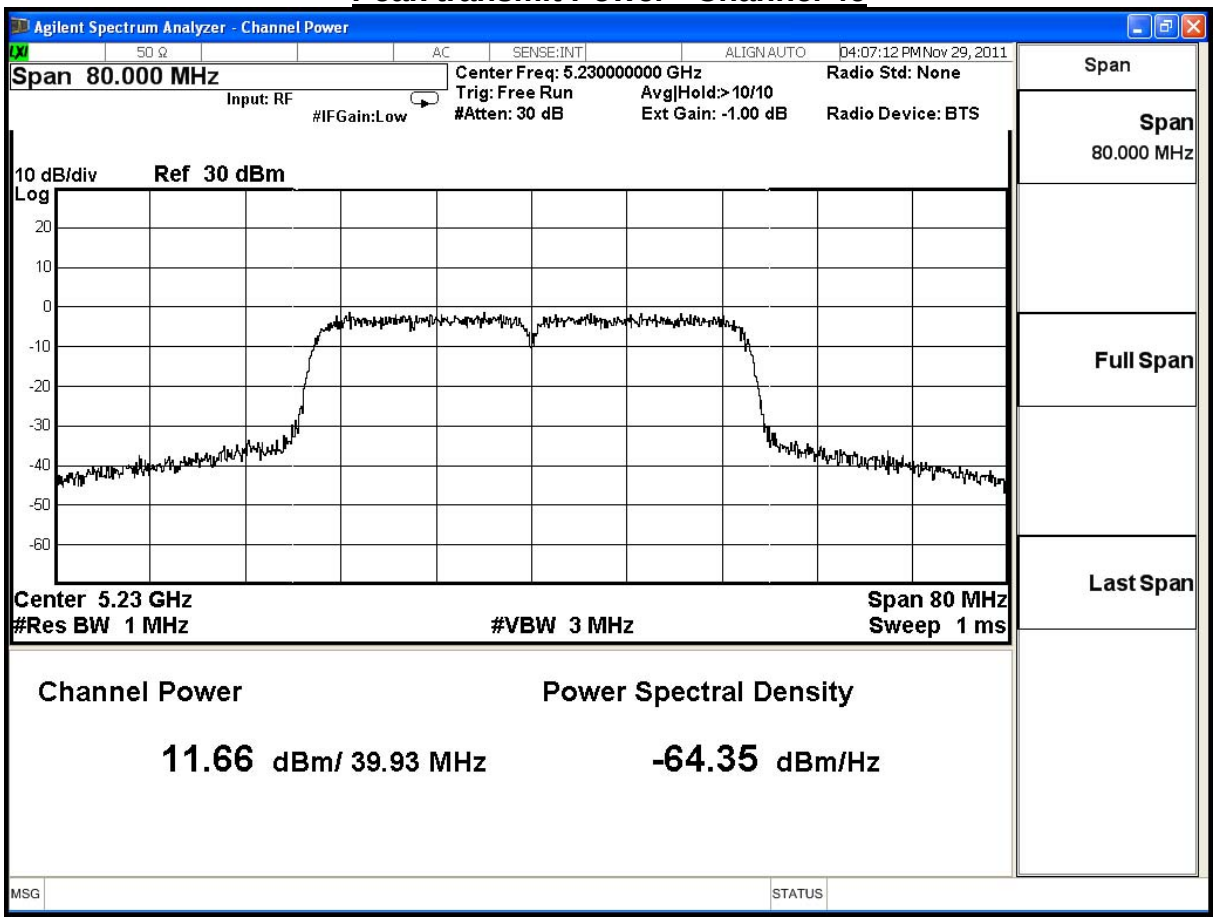
The worst emission of data rate is 40.5 Mbps

Peak Power Output (dBm)									
MCS Index		16	17	18	19	20	21	22	23	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
38	5190	11.88	11.87	11.84	11.75	11.64	11.60	11.57	11.48	17dBm or 4dBm+10logB
46	5230	11.66	--	--	--	--	--	--	--	

Peak transmit Power - Channel 38



Peak transmit Power - Channel 46



Product	Dual-band Wireless-N Ethernet Adapter		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit (Adapter: DVE)		
Date of Test	2011/11/29	Test Site	SR7

IEEE 802.11n(40MHz)_ANT 0+1+2					
Channel No.	Frequency (MHz)	Total Output Power		Required Limit (dBm)	Result
		(dBm)	(mW)		
38	5190	16.58	45.49	≤17	Pass
46	5230	16.27	42.36	≤ 17	Pass

The worst emission of data rate is 40.5 Mbps

Peak Power Output (dBm)										
MCS Index		16	17	18	19	20	21	22	23	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
38	5190	16.58	16.43	16.35	16.31	16.23	16.18	16.17	16.11	17dBm or 4dBm+10logB
46	5230	16.27	--	--	--	--	--	--	--	