

FCC Test Report

Product Name : Dual Band 3x3 802.11ac PCI-E Adapter
Model No. : PCE-AC68
FCC ID. : MSQ- PCEAC68

Applicant : ASUSTeK COMPUTER INC.

Address : 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt : 2013/07/02

Issued Date : 2013/08/29

Report No. : 137132R-RFUSP42V01

Report Version : V7.0



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.

Test Report Certification

Issued Date : 2013/08/29

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Product Name : Dual Band 3x3 802.11ac PCI-E Adapter
 Applicant : ASUSTeK COMPUTER INC.
 Address : 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan
 Manufacturer : Arcadyan Technology Corporation
 Model No. : PCE-AC68
 FCC ID. : MSQ- PCEAC68
 EUT Voltage : DC 3.3V (Power by PC)
 Trade Name : ASUS
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.247:2012
 ANSI C63.4: 2009
 Test Result : Complied

The test results relate only to the samples tested.

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Documented By :

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Tested By :

(Sabrina Tsai / Assistant Engineer)

Approved By :

(Roy Wang / Manager)

Laboratory Information

We, **QuieTek Corporation**, are an independent RF consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025 specified testing scopes:

Taiwan R.O.C.	:	TAF, Accreditation Number: 1313
USA	:	FCC, Registration Number: 365520
Canada	:	IC, Submission No: 150981

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site:<http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

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1. General Information

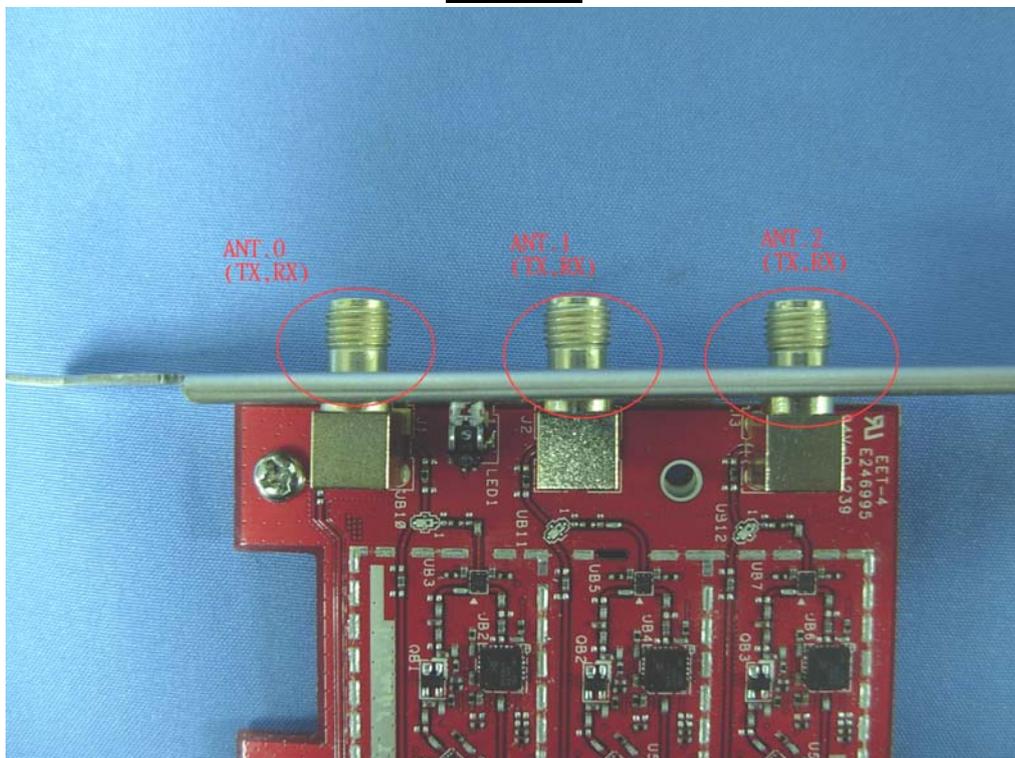
1.1. EUT Description

Product Name	Dual Band 3x3 802.11ac PCI-E Adapter	
Product Type	WLAN(3TX,3RX)	
Trade Name	ASUS	
Model No.	PCE-AC68	
Frequency Range/ Channel Number	IEEE 802.11b/g/ IEEE 802.11n (20MHz)_2.4GHz	2412~2462MHz / 11 Channels
	IEEE 802.11n (40MHz)_2.4GHz	2422~2452MHz / 7 Channels
	IEEE 802.11a/ IEEE 802.11n (20MHz)_5.8GHz / IEEE 802.11ac (20MHz)	5745~5825MHz / 5 Channels
	IEEE 802.11n (40MHz)_5.8GHz / IEEE 802.11ac (40MHz)	5755~5795MHz / 2 Channels
	IEEE 802.11ac (80MHz)	5775~5775MHz / 1 Channel
	Type of Modulation	IEEE 802.11b
IEEE 802.11a/g/n/ac		Orthogonal Frequency Division Multiplexing
Data Speed	IEEE 802.11b	1, 2, 5.5, 11Mbps
	IEEE 802.11a/g	6, 9, 18, 24, 36, 48,54Mbps
	IEEE 802.11n	Support a subset of the combination of GI, MCS 0~MCS 23 and bandwidth defined in 802.11n
	IEEE 802.11ac	Support a subset of the combination of GI, MCS 0~MCS 9 and bandwidth defined in 802.11ac
Antenna Gain	Ant0:3dBi, Ant1:3dBi, Ant2:3dBi	
Beamforming Gain	2.4G:NA	
	5G:4.77dB	
Antenna Type	Dipole Antenna	

ANT-TX / RX & Bandwidth

ANT-TX / RX	TX			RX		
	20MHz	40MHz	80MHz	20MHz	40MHz	80MHz
IEEE802.11a	✓			✓		
IEEE802.11b	✓			✓		
IEEE802.11g	✓			✓		
IEEE802.11n	✓	✓		✓	✓	
IEEE802.11ac	✓	✓	✓	✓	✓	✓

3TX / 3RX



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

Draft IEEE 802.11ac Data Rate

Spatial Streams (Note1)	MCS Index	Modulation type	Coding rate	Data Rate(Mb/s)							
				20 MHz		40 MHz		80 MHz		160 MHz	
				Guard Interval		Guard Interval		Guard Interval		Guard Interval	
				800ns	400ns	800ns	400ns	800ns	400ns	800ns	400ns
1	0	BPSK	1/2	6.5	7.2	13.5	15	29.3	32.5	58.5	65
	1	QPSK	1/2	13	14.4	27	30	58.5	65	117	130
	2	QPSK	3/4	19.5	21.7	40.5	45	87.8	97.5	175.5	195
	3	16-QAM	1/2	26	28.9	54	60	117	130	234	260
	4	16-QAM	3/4	39	43.3	81	90	175.5	195	351	390
	5	64-QAM	2/3	52	57.8	108	120	234	260	468	520
	6	64-QAM	3/4	58.5	65	121.5	135	263.3	292.5	526.5	585
	7	64-QAM	5/6	65	72.2	135	150	292.5	325	585	650
	8	256-QAM	3/4	78	86.7	162	180	351	390	702	780
	9	256-QAM	5/6	N/A	N/A	180	200	390	433.3	780	866.7
2	0	BPSK	1/2	13	14.4	27	30	58.6	65	117	130
	1	QPSK	1/2	26	28.8	54	60	117	130	234	260
	2	QPSK	3/4	39	43.4	81	90	175.6	195	351	390
	3	16-QAM	1/2	52	57.8	108	120	234	260	468	520
	4	16-QAM	3/4	78	86.6	162	180	351	390	702	780
	5	64-QAM	2/3	104	115.6	216	240	468	520	936	1040
	6	64-QAM	3/4	117	130	243	270	526.6	585	1053	1170
	7	64-QAM	5/6	130	144.4	270	300	585	650	1170	1300
	8	256-QAM	3/4	156	173.4	324	360	702	780	1404	1560
	9	256-QAM	5/6	N/A	N/A	360	400	780	866.6	1560	1733.4
3	0	BPSK	1/2	19.5	21.6	40.5	45	87.9	97.5	175.5	195
	1	QPSK	1/2	39	43.2	81	90	175.5	195	351	390
	2	QPSK	3/4	58.5	65.1	121.5	135	263.4	292.5	526.5	585
	3	16-QAM	1/2	78	86.7	162	180	351	390	702	780
	4	16-QAM	3/4	117	129.9	243	270	526.5	585	1053	1170
	5	64-QAM	2/3	156	173.4	324	360	702	780	1404	1560
	6	64-QAM	3/4	175.5	195	364.5	405	789.9	877.5	1579.5	1755
	7	64-QAM	5/6	195	216.6	405	450	877.5	975	1755	1950
	8	256-QAM	3/4	234	260.1	486	540	1053	1170	2106	2340
	9	256-QAM	5/6	N/A	N/A	540	600	1170	1299.9	2340	2600.1

IEEE 802.11b/g & IEEE 802.11n (20MHz) - 2.4GHz

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
001	2412 MHz	002	2417 MHz	003	2422 MHz	004	2427 MHz
005	2432 MHz	006	2437 MHz	007	2442 MHz	008	2447 MHz
009	2452 MHz	010	2457 MHz	011	2462 MHz		

IEEE 802.11n (40MHz) - 2.4GHz

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
003	2422 MHz	004	2427 MHz	005	2432 MHz	006	2437 MHz
007	2442 MHz	008	2447 MHz	009	2452 MHz		

IEEE 802.11a & IEEE 802.11n (20MHz) & IEEE 802.11ac (20MHz) - 5GHz

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745 MHz	153	5765 MHz	157	5785 MHz	161	5805 MHz
165	5825 MHz						

IEEE 802.11n (40MHz) & IEEE 802.11ac (40MHz) - 5GHz

Working Frequency of Each Channel			
Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

IEEE 802.11ac (80MHz) - 5GHz

Working Frequency of Each Channel	
Channel	Frequency
155	5775 MHz

Note:

1. This device is a Dual Band 3x3 802.11ac PCI-E 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 15.247.
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 5.2GHz transmitting is measured and makes a test report of the report number: 137132R-RFUSP46V01.
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 137132R-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 (CDD mode) Mode 2: Transmit (Beamforming mode)
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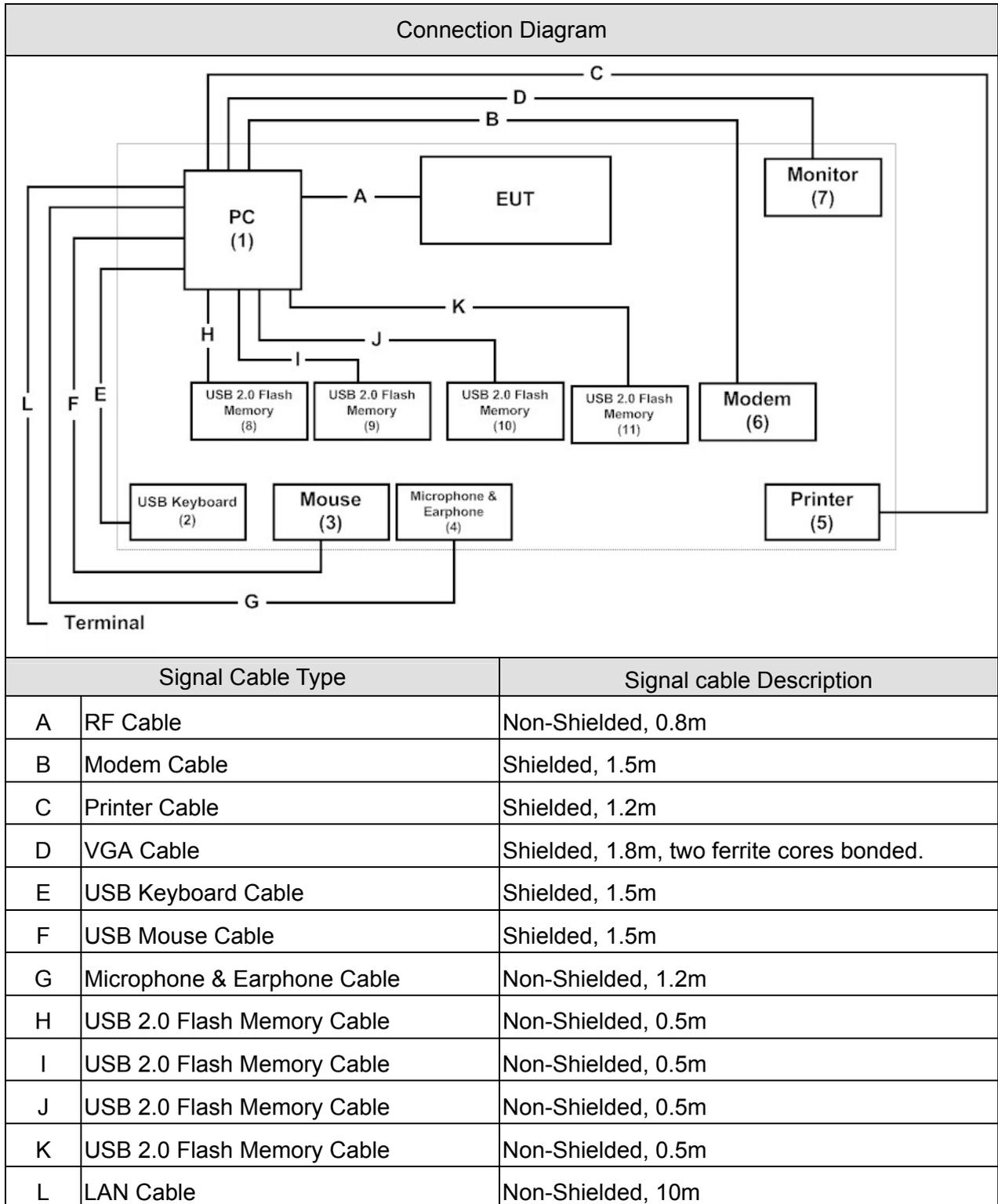
Test Items	Modulation	Channel	Antenna	Result
Conducted Emission	11n(40MHz)	6	0+1+2	Complies
	11ac(80MHz)	155	0+1+2	Complies
Peak Power Output	a	149/ 157/ 165	0+1+2	Complies
	b/g	1/ 6/ 11	0+1+2	Complies
	11n(20MHz)	1/ 6/ 11/ 149/ 157/ 165	0+1+2	Complies
	11n(40MHz)	3/ 6/ 9/ 151/ 159	0+1+2	Complies
	11ac(80MHz)	155	0+1+2	Complies
Radiated Emission	a	149/ 157/ 165	0+1+2	Complies
	b/g	1/ 6/ 11	0+1+2	Complies
	11n(20MHz)	1/ 6/ 11/ 149/ 157/ 165	0+1+2	Complies
	11n(40MHz)	3/ 6/ 9/ 151/ 159	0+1+2	Complies
	11ac(80MHz)	155	0+1+2	Complies
RF antenna conducted test	a	149/ 165	0/1/2	Complies
	b/g	1/ 11	0/1/2	Complies
	11n(20MHz)	1/ 11/ 149/ 165	0/1/2	Complies
	11n(40MHz)	3/ 9/ 151/ 159	0/1/2	Complies
	11ac(80MHz)	155	0/1/2	Complies
Radiated Emission Band Edge	b/g	1/ 11	0+1+2	Complies
	11n(20MHz)	1/ 11	0+1+2	Complies
	11n(40MHz)	3/ 9	0+1+2	Complies
Occupied Bandwidth	a	149/ 157/ 165	0/1/2	Complies
	b/g	1/ 6/ 11	0/1/2	Complies
	11n(20MHz)	1/ 6/ 11/ 149/ 157/ 165	0/1/2	Complies
	11n(40MHz)	3/ 6/ 9/ 151/ 159	0/1/2	Complies
	11ac(80MHz)	155	0/1/2	Complies
Power Density	a	149/ 157/ 165	0+1+2	Complies
	b/g	1/ 6/ 11	0+1+2	Complies
	11n(20MHz)	1/ 6/ 11/ 149/ 157/ 165	0+1+2	Complies
	11n(40MHz)	3/ 6/ 9/ 151/ 159	0+1+2	Complies
	11ac(80MHz)	155	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 PC	DELL	DCSM	00144-531-356-513	DoC	Non-Shielded, 1.8m
2 USB Keyboard	DELL	SK-8115	1437	DoC	--
3 Mouse	Logitech	M-SBF83	HCA52200315	DoC	--
4 Microphone & Earphone	Fujiei	SBZ-38	N/A	DoC	--
5 Printer	HP	C2642A	MY75N1D2Y1	DoC	Non-Shielded, 0.7m
6 Modem	ACEEX	DM-1414	980033034	DoC	Non-Shielded, 1.6m
7 Monitor	DELL	U2410f	082WXD-72872-16 R-0W2L	DoC	Non-Shielded, 1.8m
8 USB 2.0 Flash Memory	Apacer	AH223	N/A	DoC	--
9 USB 2.0 Flash Memory	Apacer	AH223	N/A	DoC	--
10 USB 2.0 Flash Memory	Apacer	AH223	N/A	DoC	--
11 USB 2.0 Flash Memory	Apacer	AH223	N/A	DoC	--

1.5. Configuration of tested System



1.6. EUT Exercise Software

1	Setup the EUT as shown in Section 1.5.
2	Execute the control program "Mtool Ver 1.0.0.9" 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 15.207 Conducted Emission	15 - 35	20
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output (DSSS)	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Radiated Emission (DSSS)	15 - 35	25
Humidity (%RH)		25 - 75	65
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 RF antenna conducted test (DSSS)	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Band Edge (DSSS)	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth (DSSS)	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Power Density (DSSS)	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000

2. Conducted Emission

2.1. Test Equipment

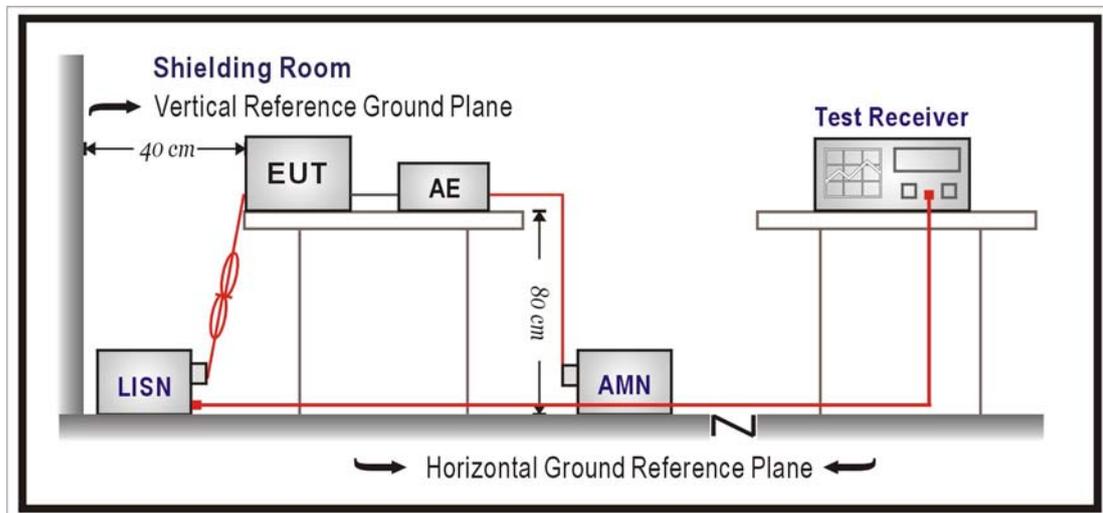
The following test equipments are used during the test:

Conducted Emission / SR3

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	2013/02/13
LISN	R&S	ENV216	100092	2013/08/21
Test Receiver	R&S	ESCS 30	825442/014	2013/08/07

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. 2012 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

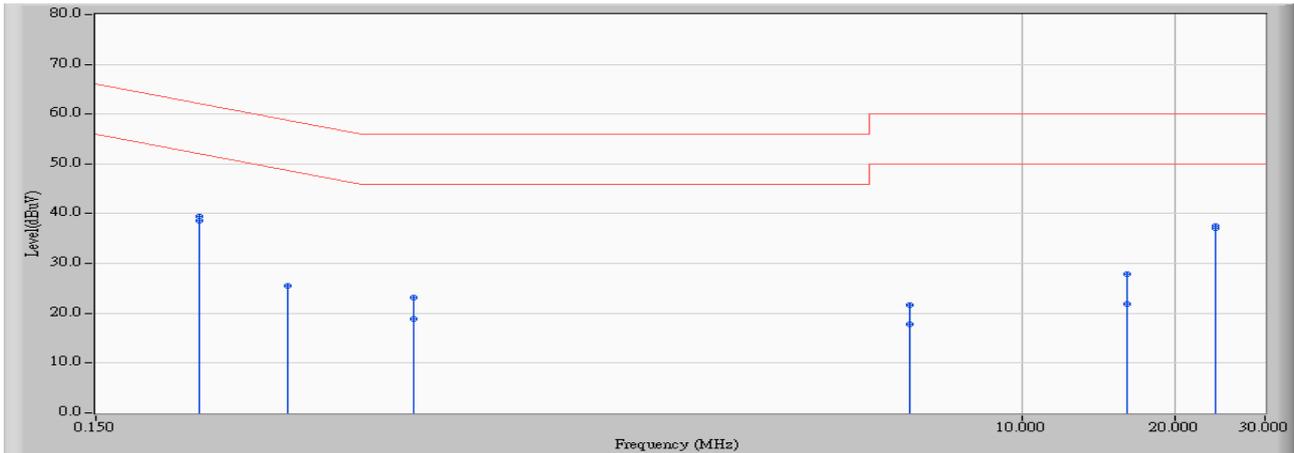
According to FCC Part 15 Subpart C Paragraph 15.207: 2012

2.6. Uncertainty

The measurement uncertainty is defined as ± 2.26 dB.

2.7. Test Result

Site : SR3	Time : 2012/10/17 - 13:22
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR3_LISN(16A)-1_0907 - Line1	Power : DC 3.3V (Power by PC)
EUT : Dual Band 3x3 802.11ac PCI-E Adapter	Note : Mode 1: Transmit (CDD mode) 2437MHz,802.11n(40M)

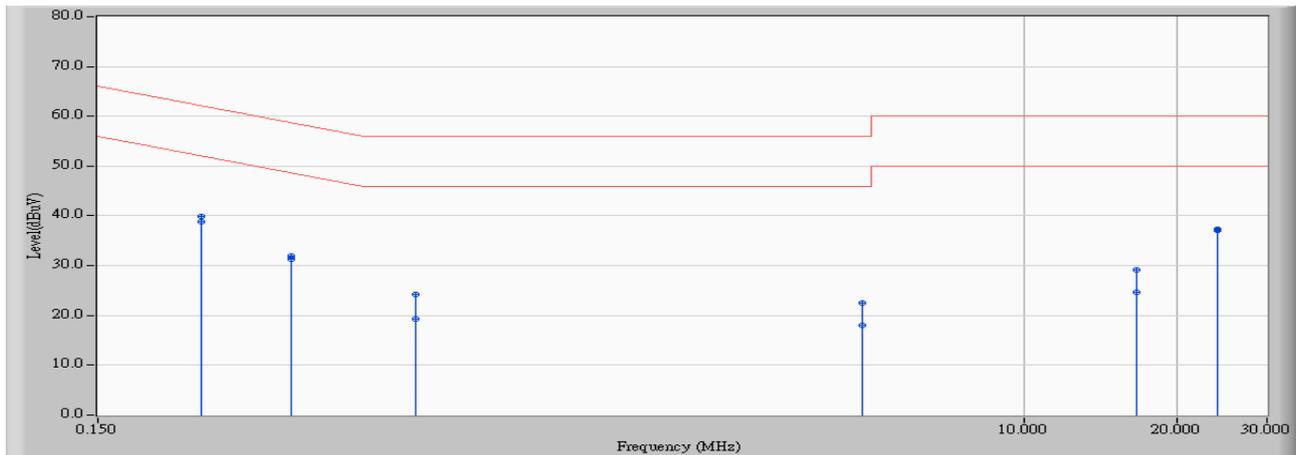


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.240	9.663	29.880	39.543	-22.559	62.102	QUASPEAK
2		0.240	9.663	28.940	38.603	-13.499	52.102	AVERAGE
3		0.357	9.679	15.910	25.589	-33.208	58.797	QUASPEAK
4		0.357	9.679	15.900	25.579	-23.218	48.797	AVERAGE
5		0.634	9.723	13.470	23.193	-32.807	56.000	QUASPEAK
6		0.634	9.723	9.180	18.903	-27.097	46.000	AVERAGE
7		5.982	10.073	11.630	21.702	-38.298	60.000	QUASPEAK
8		5.982	10.073	7.760	17.832	-32.168	50.000	AVERAGE
9		16.045	10.268	17.510	27.778	-32.222	60.000	QUASPEAK
10		16.045	10.268	11.700	21.968	-28.032	50.000	AVERAGE
11		24.013	10.340	27.140	37.480	-22.520	60.000	QUASPEAK
12	*	24.013	10.340	26.820	37.160	-12.840	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 : SR3	Time : 2012/10/17 - 13:24
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR3_LISN(16A)-1_0907 - Line2	Power : DC 3.3V (Power by PC)
EUT : Dual Band 3x3 802.11ac PCI-E Adapter	Note : Mode 1: Transmit (CDD mode) 2437MHz,802.11n(40M)

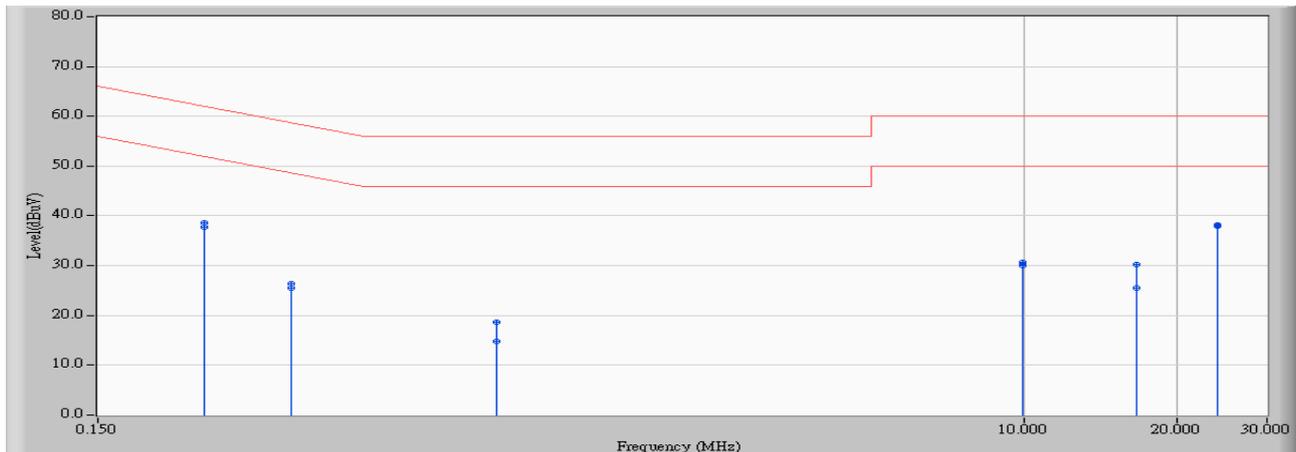


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	0.240	9.673	30.320	39.993	-22.109	62.102	QUASPEAK
2	0.240	9.673	29.160	38.833	-13.269	52.102	AVERAGE
3	0.361	9.690	22.340	32.030	-26.677	58.707	QUASPEAK
4	0.361	9.690	21.570	31.260	-17.447	48.707	AVERAGE
5	0.634	9.729	14.420	24.149	-31.851	56.000	QUASPEAK
6	0.634	9.729	9.570	19.299	-26.701	46.000	AVERAGE
7	4.787	10.074	12.470	22.544	-33.456	56.000	QUASPEAK
8	4.787	10.074	7.970	18.044	-27.956	46.000	AVERAGE
9	16.603	10.415	18.750	29.165	-30.835	60.000	QUASPEAK
10	16.603	10.415	14.210	24.625	-25.375	50.000	AVERAGE
11	24.013	10.574	26.760	37.334	-22.666	60.000	QUASPEAK
12	* 24.013	10.574	26.540	37.114	-12.886	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 : SR3	Time : 2012/10/17 - 13:38
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR3_LISN(16A)-1_0907 - Line1	Power : DC 3.3V (Power by PC)
EUT : Dual Band 3x3 802.11ac PCI-E Adapter	Note : Mode 1: Transmit (CDD mode) 5775MHz,802.11ac(80M)

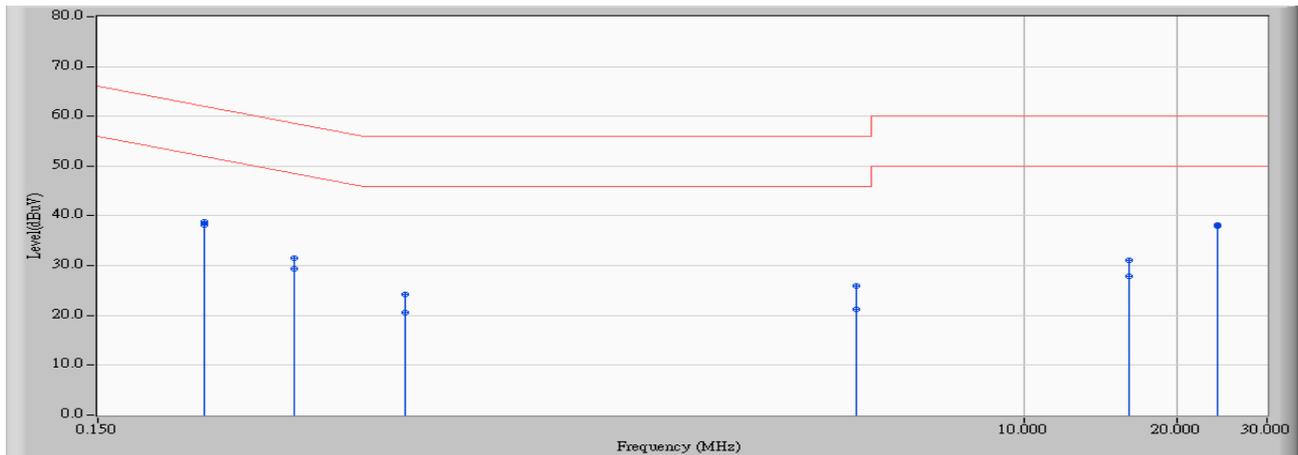


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	0.244	9.663	28.880	38.543	-23.424	61.967	QUASPEAK
2	0.244	9.663	28.090	37.753	-14.214	51.967	AVERAGE
3	0.361	9.680	16.780	26.460	-32.247	58.707	QUASPEAK
4	0.361	9.680	15.780	25.460	-23.247	48.707	AVERAGE
5	0.916	9.767	8.890	18.657	-37.343	56.000	QUASPEAK
6	0.916	9.767	4.960	14.727	-31.273	46.000	AVERAGE
7	9.927	10.129	20.490	30.619	-29.381	60.000	QUASPEAK
8	9.927	10.129	19.860	29.989	-20.011	50.000	AVERAGE
9	16.584	10.273	19.940	30.213	-29.787	60.000	QUASPEAK
10	16.584	10.273	15.210	25.483	-24.517	50.000	AVERAGE
11	24.009	10.340	27.810	38.150	-21.850	60.000	QUASPEAK
12	* 24.009	10.340	27.520	37.860	-12.140	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 : SR3	Time : 2012/10/17 - 13:40
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR3_LISN(16A)-1_0907 - Line2	Power : DC 3.3V (Power by PC)
EUT : Dual Band 3x3 802.11ac PCI-E Adapter	Note : Mode 1: Transmit (CDD mode) 5775MHz,802.11ac(80M)



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	0.244	9.673	29.240	38.913	-23.054	61.967	QUASPEAK
2	0.244	9.673	28.410	38.083	-13.884	51.967	AVERAGE
3	0.365	9.691	21.810	31.501	-27.117	58.617	QUASPEAK
4	0.365	9.691	19.660	29.351	-19.267	48.617	AVERAGE
5	0.603	9.724	14.500	24.224	-31.776	56.000	QUASPEAK
6	0.603	9.724	10.880	20.604	-25.396	46.000	AVERAGE
7	4.677	10.068	15.820	25.888	-30.112	56.000	QUASPEAK
8	4.677	10.068	11.260	21.328	-24.672	46.000	AVERAGE
9	16.103	10.401	20.630	31.031	-28.969	60.000	QUASPEAK
10	16.103	10.401	17.380	27.781	-22.219	50.000	AVERAGE
11	24.009	10.574	27.650	38.224	-21.776	60.000	QUASPEAK
12	* 24.009	10.574	27.300	37.874	-12.126	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. Peak Power Output

3.1. Test Equipment

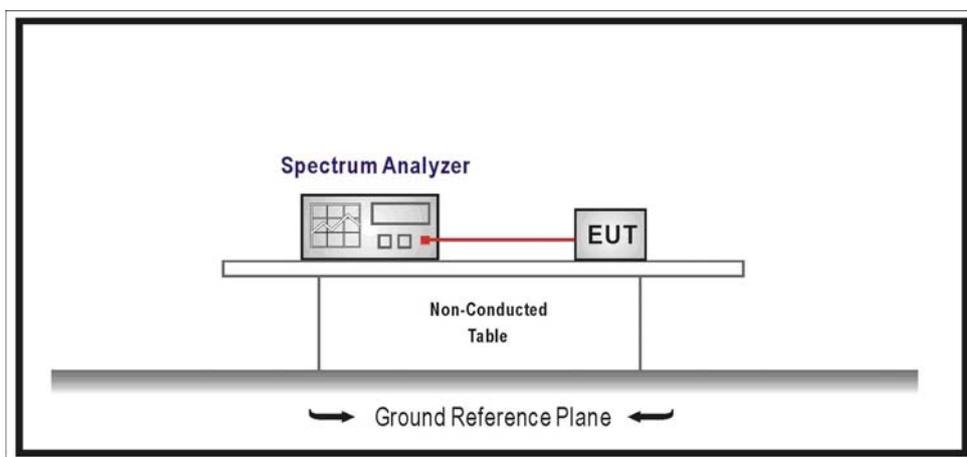
The following test equipments are used during the test:

Peak Power / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2014/07/31

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

3.2. Test Setup



3.3. Test procedures

The EUT was tested according to DTS test procedure of Oct. 2012 KDB558074, Section 8.2.1 Measurement Procedure option1 for compliance to FCC 47CFR 15.247 requirements.

3.4. Limits

The maximum peak power shall be less 1 Watt.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

3.6. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB.

3.7. Test Result

Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

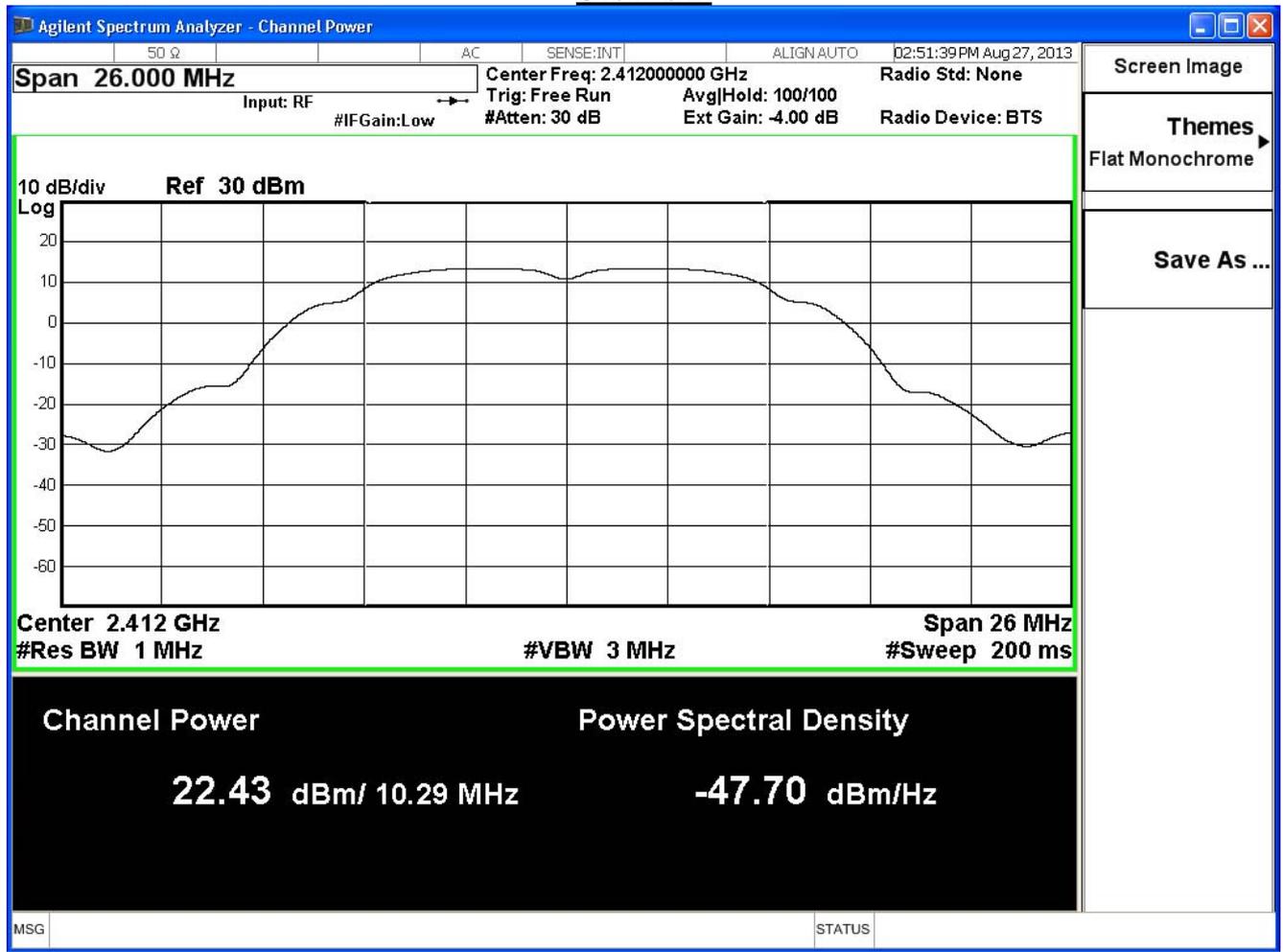
IEEE 802.11b (ANT 0)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	22.43	≤ 30	Pass
6	2437	23.55	≤ 30	Pass
11	2462	18.97	≤ 30	Pass

The worst emission of data rate is 1Mbps.

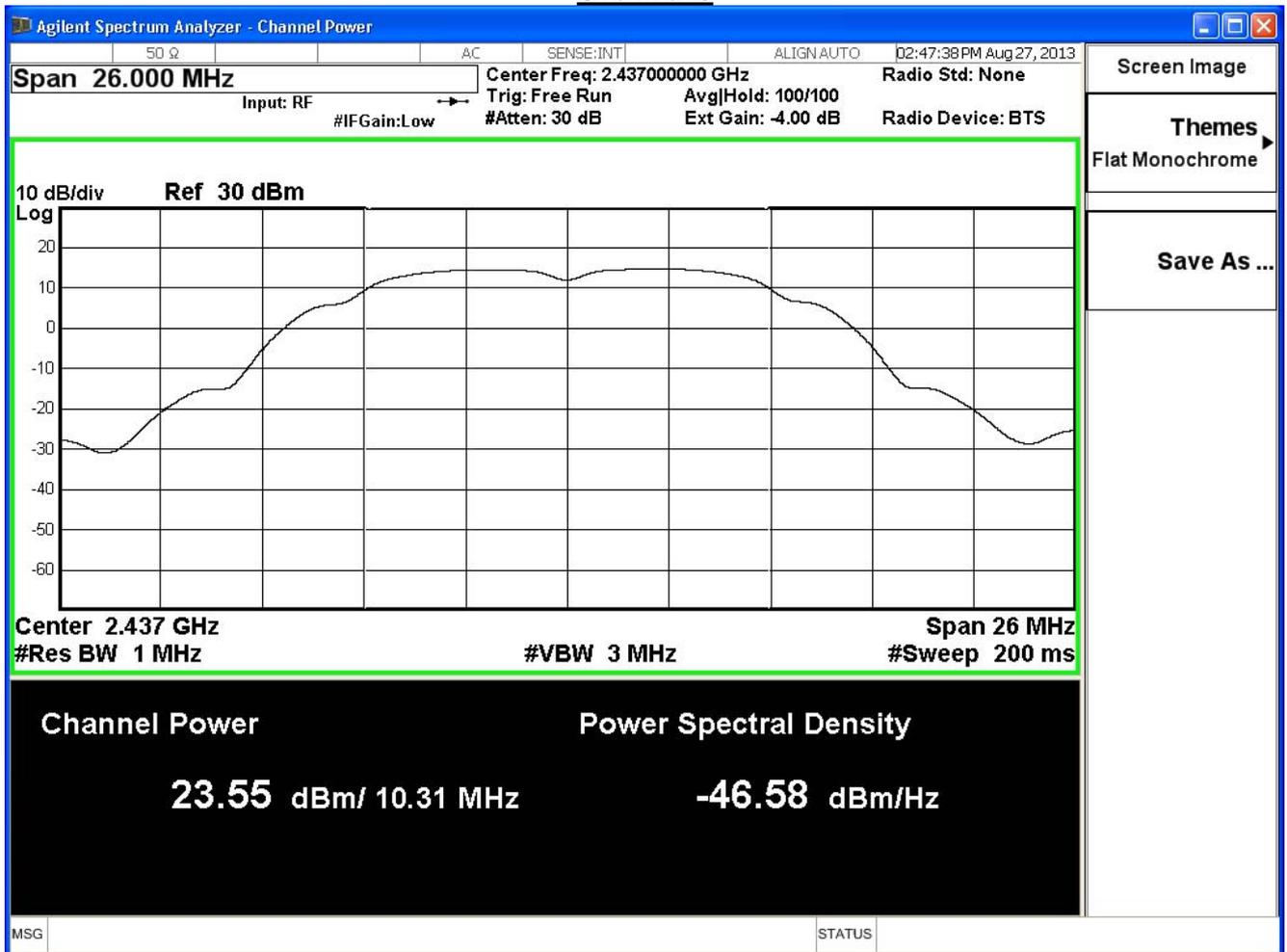
Peak Power Output Value (dBm)						
Channel No.	Frequency (MHz)	Data Rate				Required Limit
		1	2	5.5	11	
1	2412	22.43	--	--	--	30dBm
6	2437	23.55	23.54	23.52	23.51	30dBm
11	2462	18.97	--	--	--	30dBm

Note: Measure Level =Reading value + cable loss

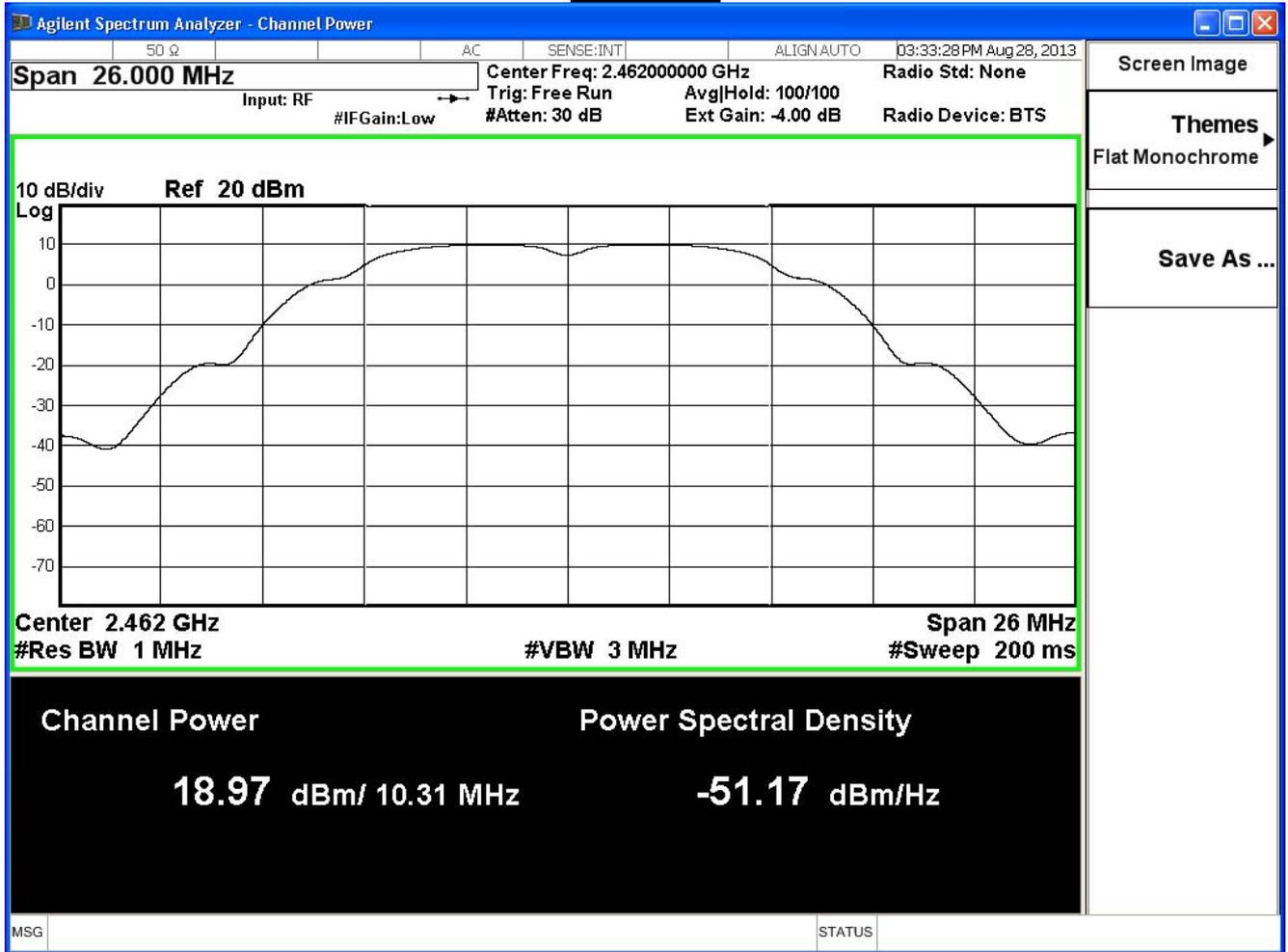
Channel 1



Channel 6



Channel 11



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

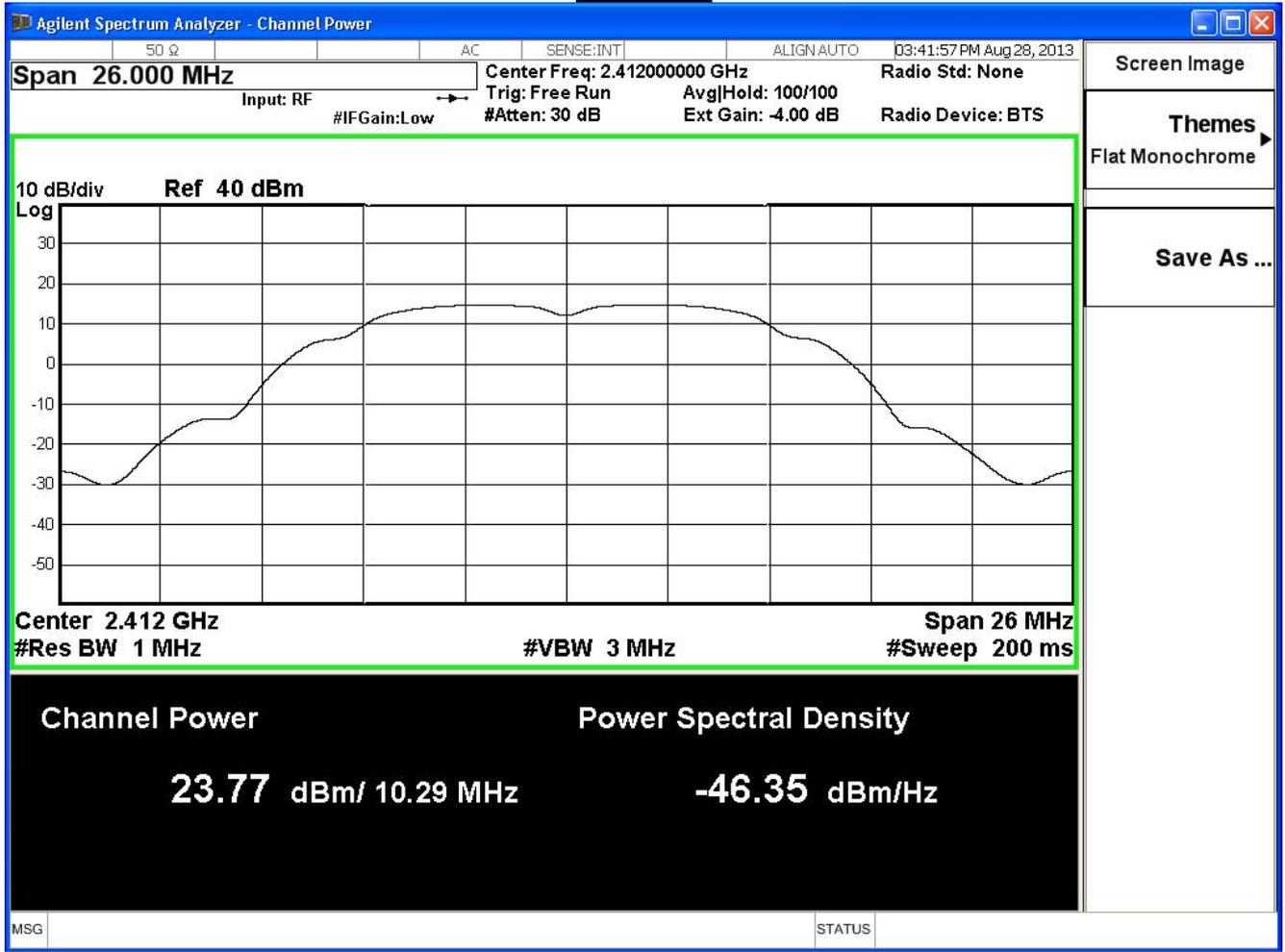
IEEE 802.11b (ANT 1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	23.77	≤ 30	Pass
6	2437	22.40	≤ 30	Pass
11	2462	19.93	≤ 30	Pass

The worst emission of data rate is 1Mbps.

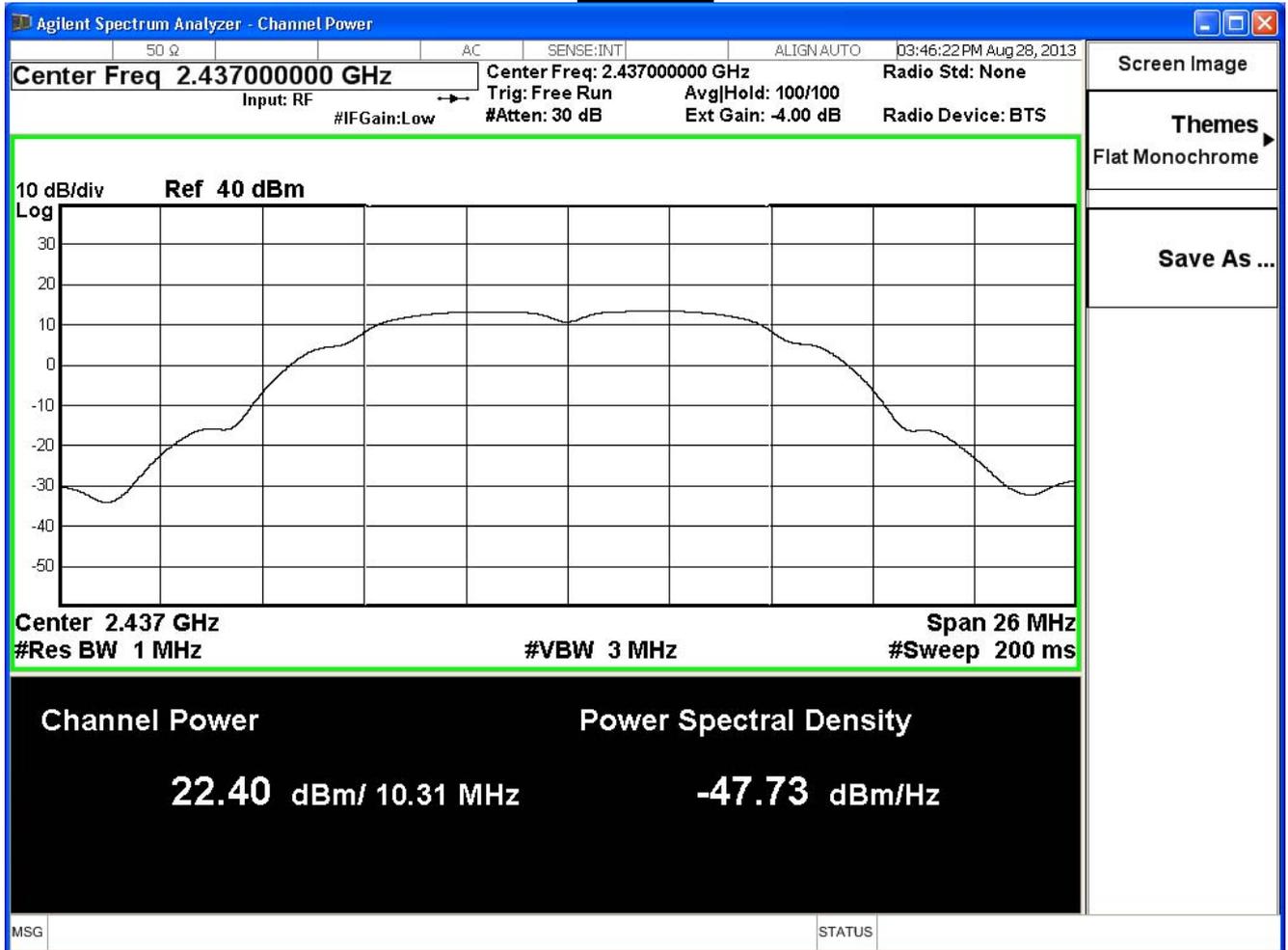
Peak Power Output Value (dBm)						
Channel No.	Frequency (MHz)	Data Rate				Required Limit
		1	2	5.5	11	
1	2412	23.77	--	--	--	30dBm
6	2437	22.40	22.39	22.38	22.37	30dBm
11	2462	19.93	--	--	--	30dBm

Note: Measure Level =Reading value + cable loss

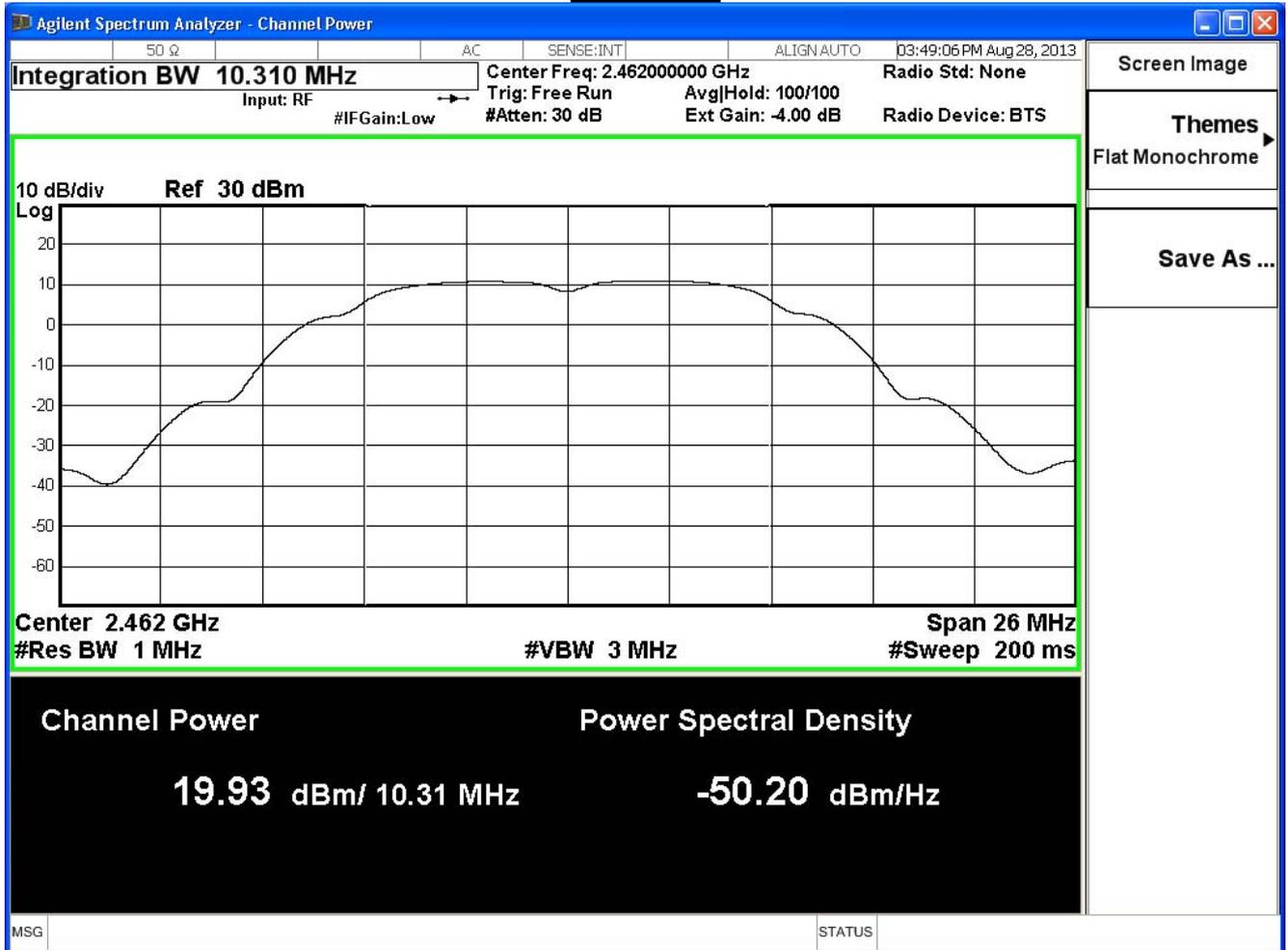
Channel 1



Channel 6



Channel 11



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

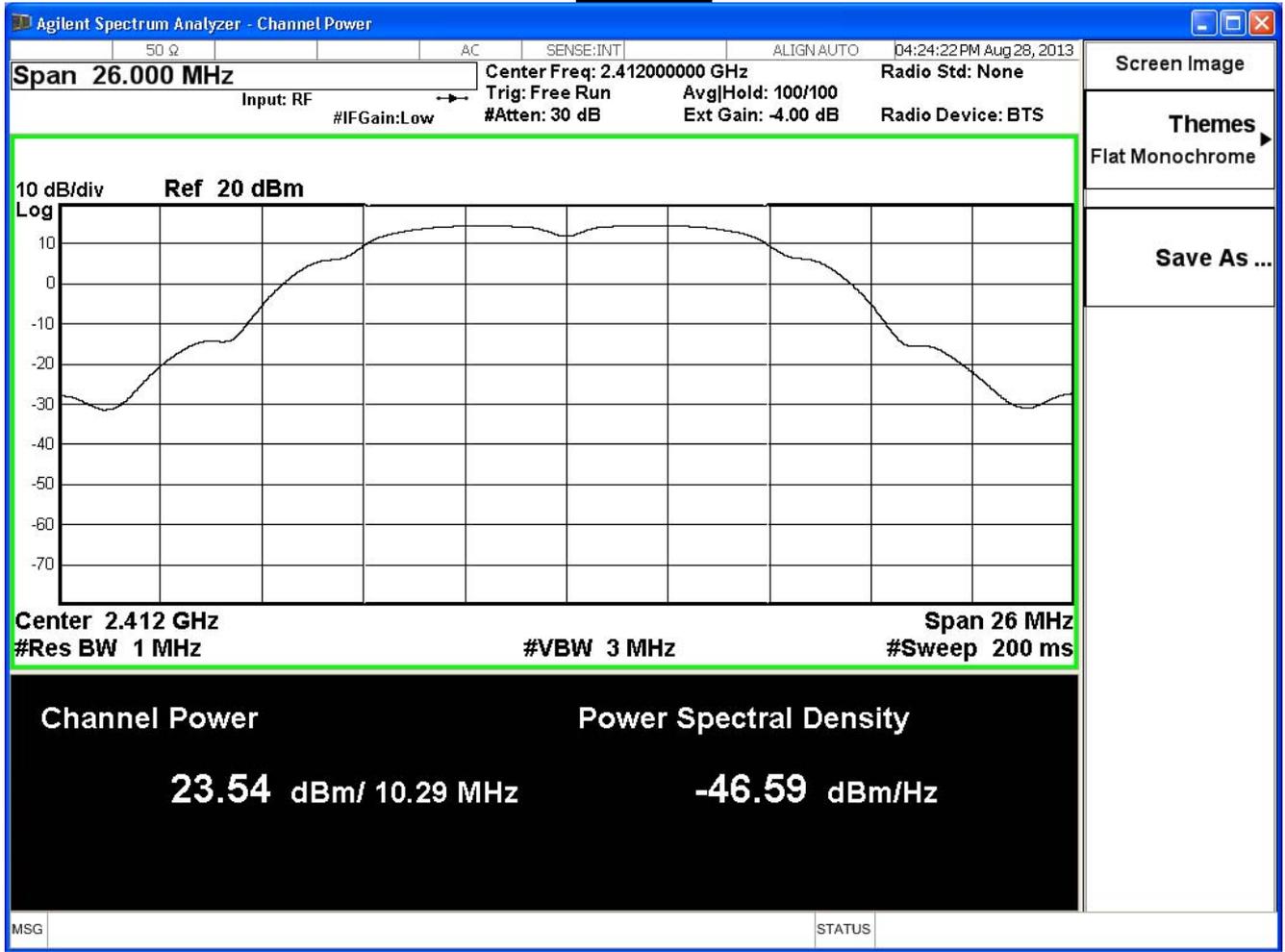
IEEE 802.11b (ANT 2)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	23.54	≤ 30	Pass
6	2437	23.49	≤ 30	Pass
11	2462	19.22	≤ 30	Pass

The worst emission of data rate is 1Mbps.

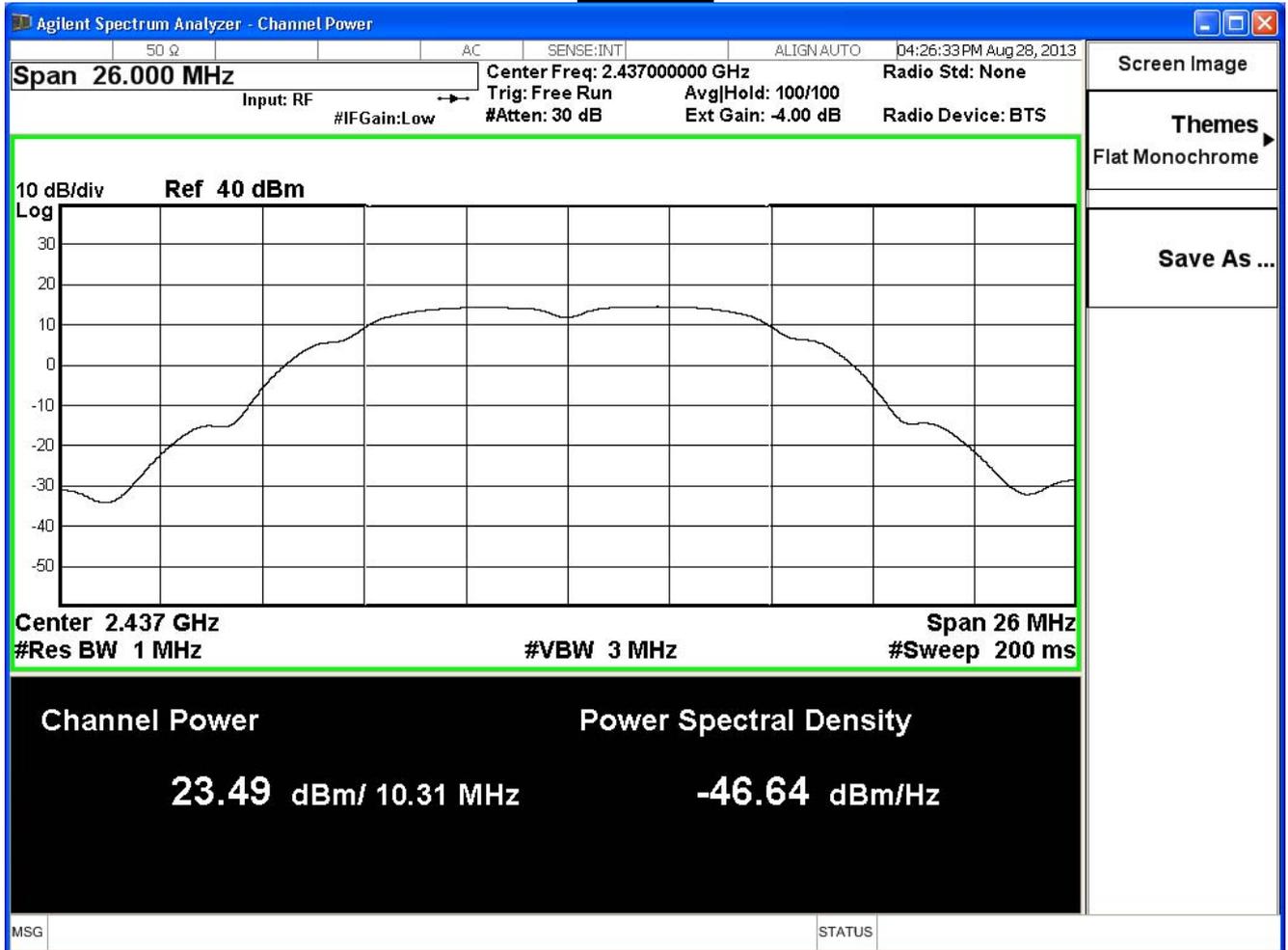
Peak Power Output Value (dBm)						
Channel No.	Frequency (MHz)	Data Rate				Required Limit
		1	2	5.5	11	
1	2412	23.54	--	--	--	30dBm
6	2437	23.49	23.48	23.47	23.46	30dBm
11	2462	19.22	--	--	--	30dBm

Note: Measure Level =Reading value + cable loss

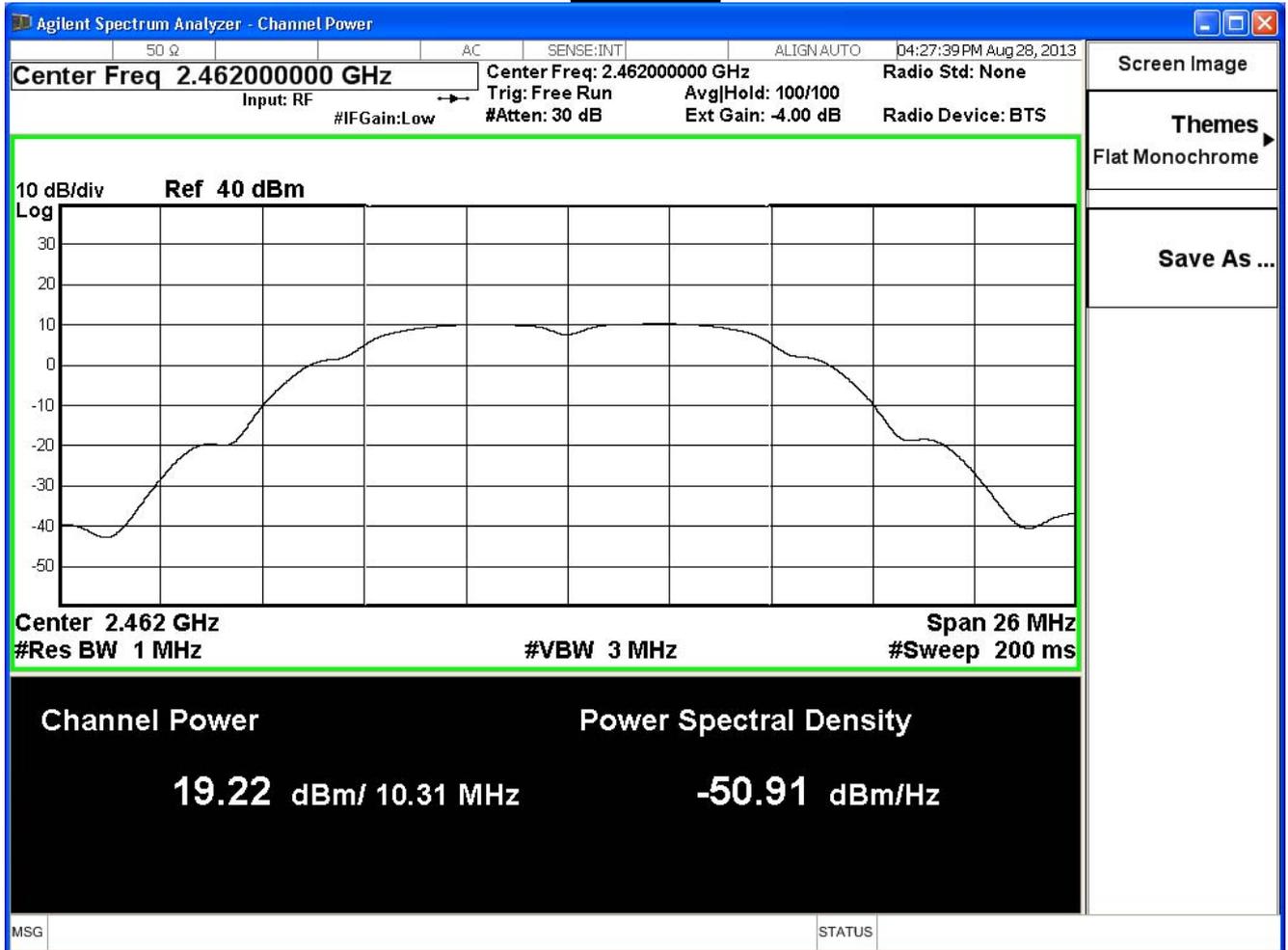
Channel 1



Channel 6



Channel 11



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

IEEE 802.11b (ANT 0+1+2)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	28.06	≤ 30	Pass
6	2437	27.95	≤ 30	Pass
11	2462	24.16	≤ 30	Pass

Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

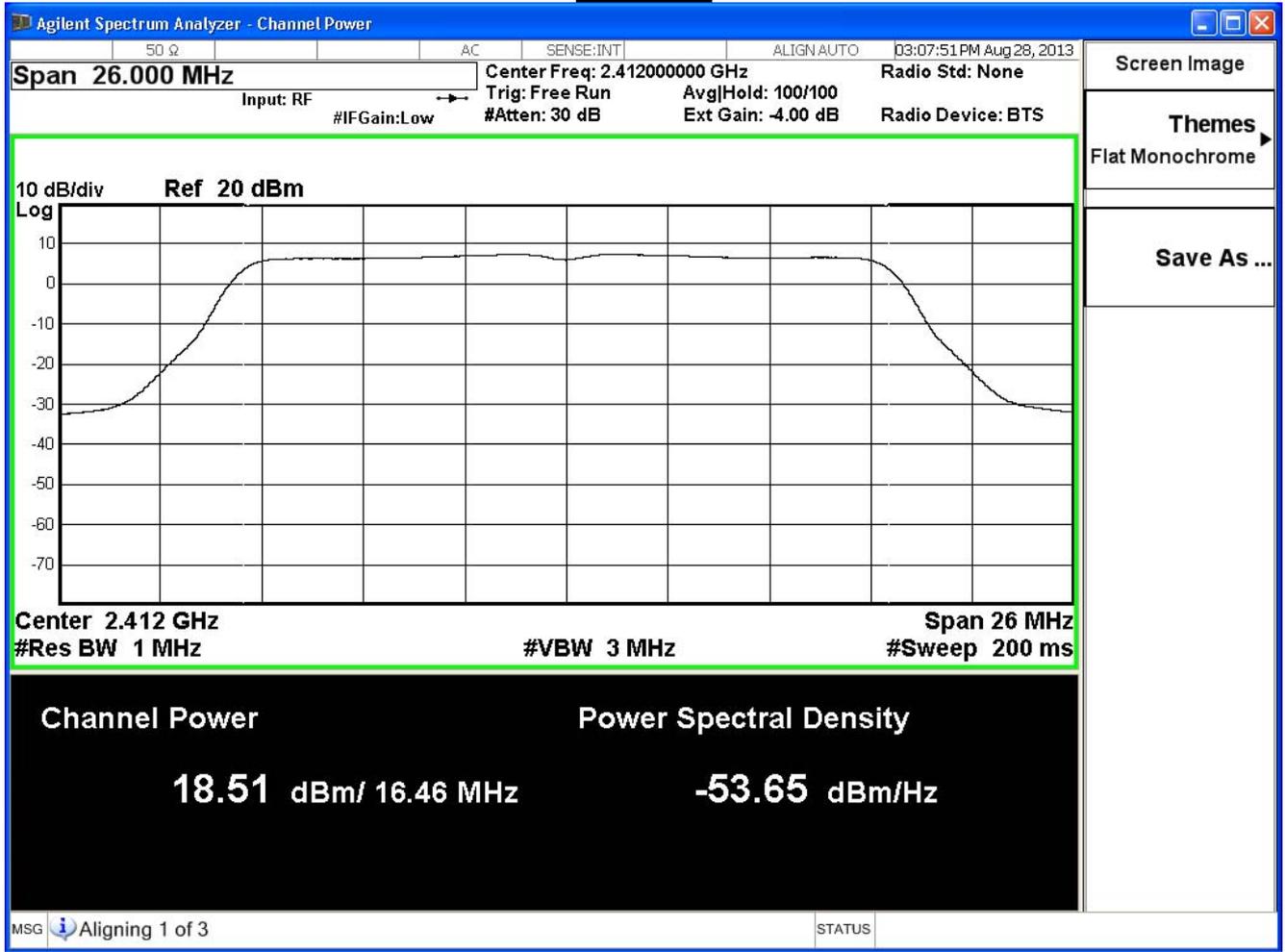
IEEE 802.11g (ANT 0)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	18.51	≤ 30	Pass
6	2437	22.71	≤ 30	Pass
11	2462	16.68	≤ 30	Pass

The worst emission of data rate is 6Mbps.

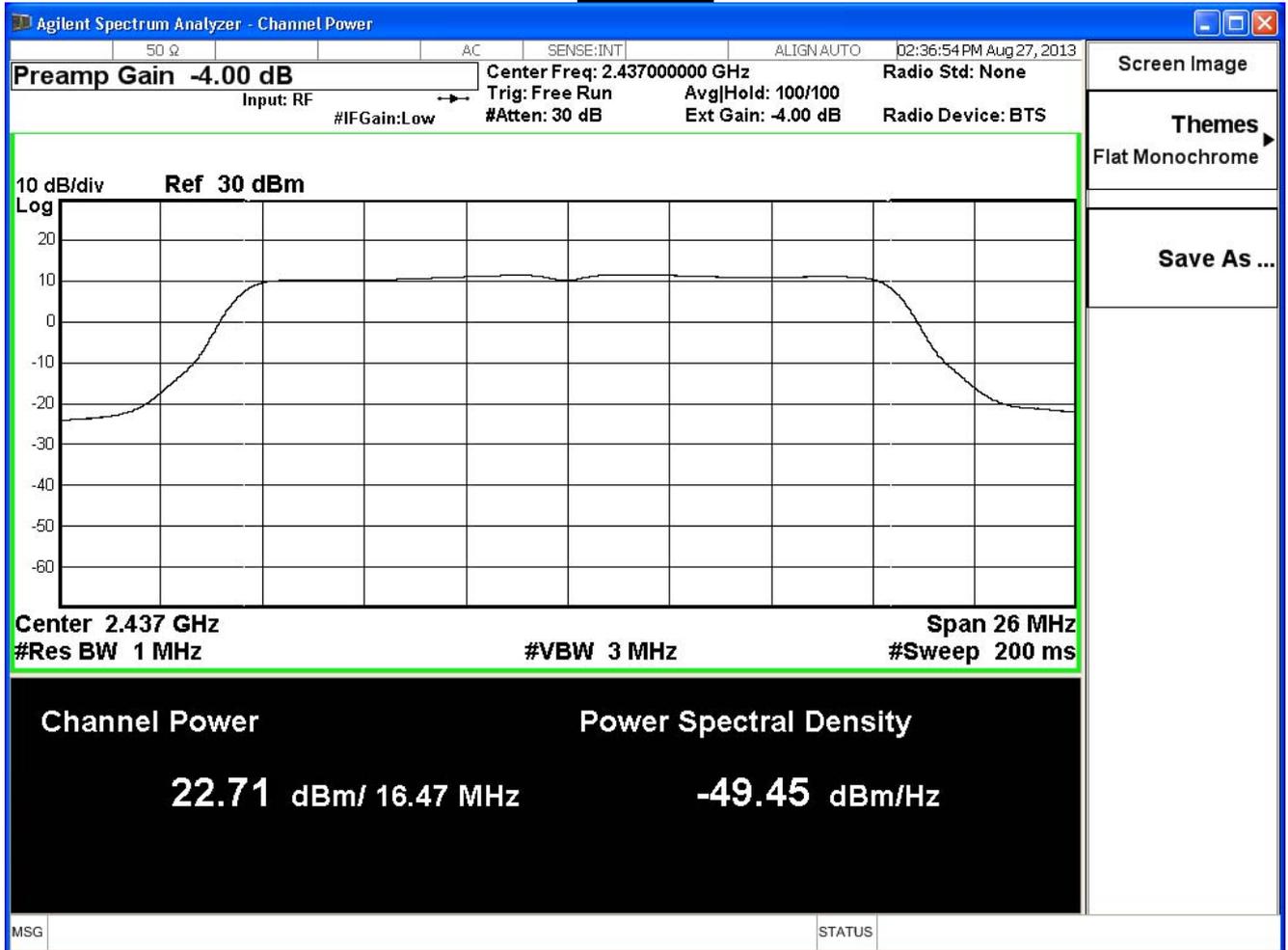
Peak Power Output Value(dBm)									
Channel No.	Frequency (MHz)	Data Rate (Mbps)							Required Limit
		6	12	18	24	36	48	54	
1	2412	18.51	--	--	--	--	--	--	30dBm
6	2437	22.71	22.70	22.68	22.67	22.65	22.63	22.61	30dBm
11	2462	16.68	--	--	--	--	--	--	30dBm

Note: Measure Level =Reading value + cable loss

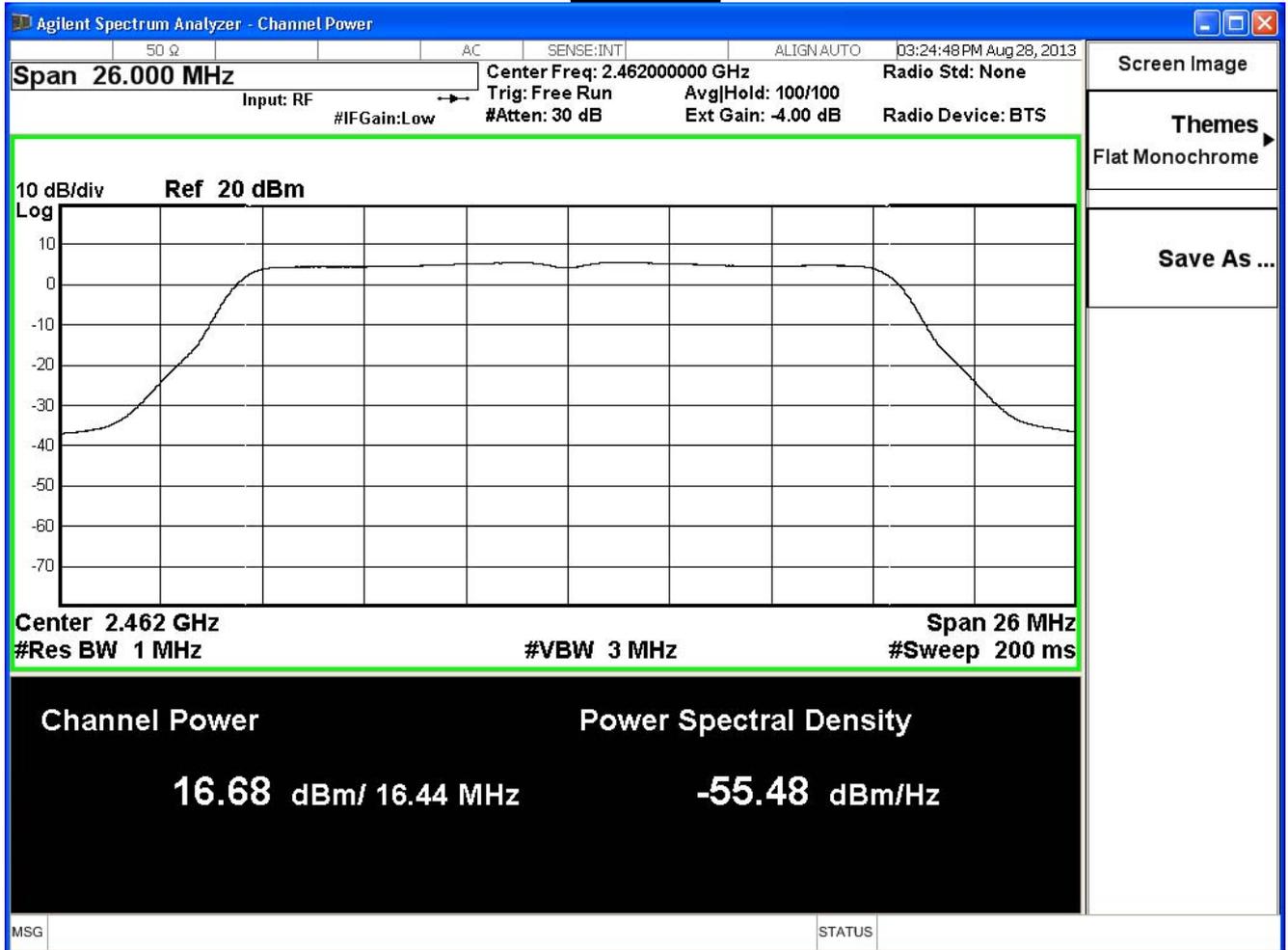
Channel 1



Channel 6



Channel 11



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

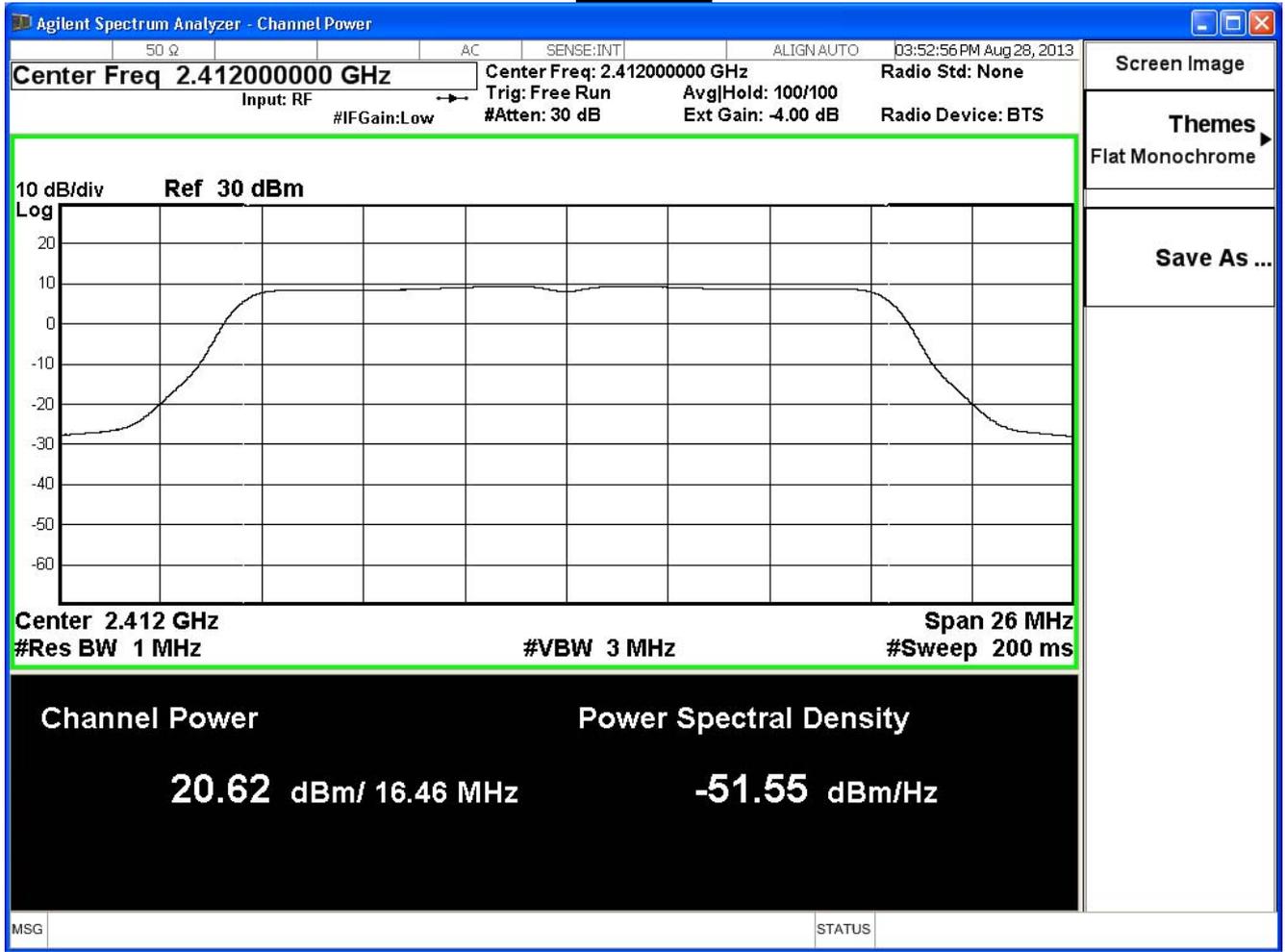
IEEE 802.11g (ANT 1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	20.62	≤ 30	Pass
6	2437	22.81	≤ 30	Pass
11	2462	17.70	≤ 30	Pass

The worst emission of data rate is 6Mbps.

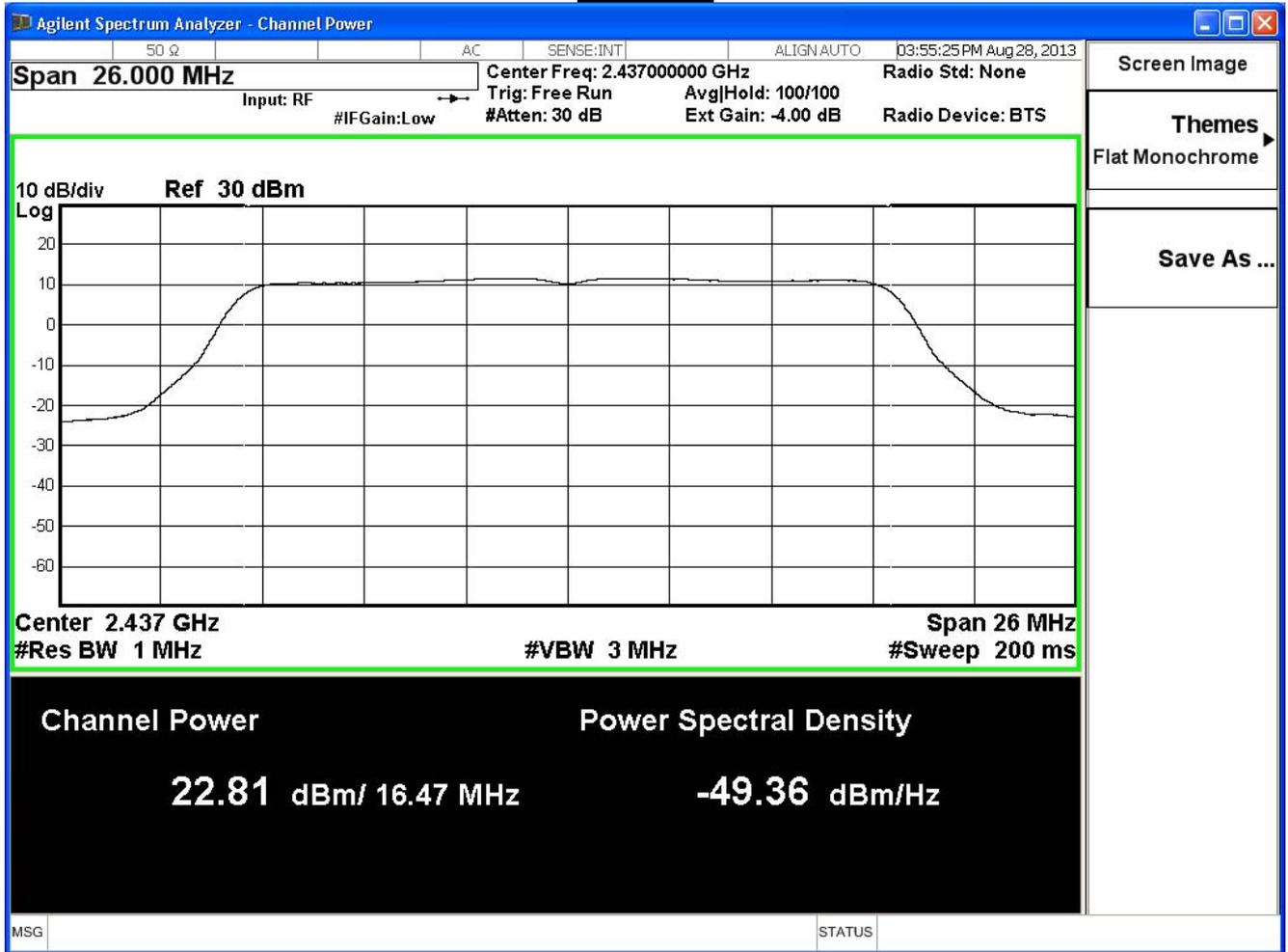
Peak Power Output Value(dBm)									
Channel No.	Frequency (MHz)	Data Rate (Mbps)							Required Limit
		6	12	18	24	36	48	54	
1	2412	20.62	--	--	--	--	--	--	30dBm
6	2437	22.81	22.80	22.79	22.76	22.74	22.73	22.72	30dBm
11	2462	17.70	--	--	--	--	--	--	30dBm

Note: Measure Level =Reading value + cable loss

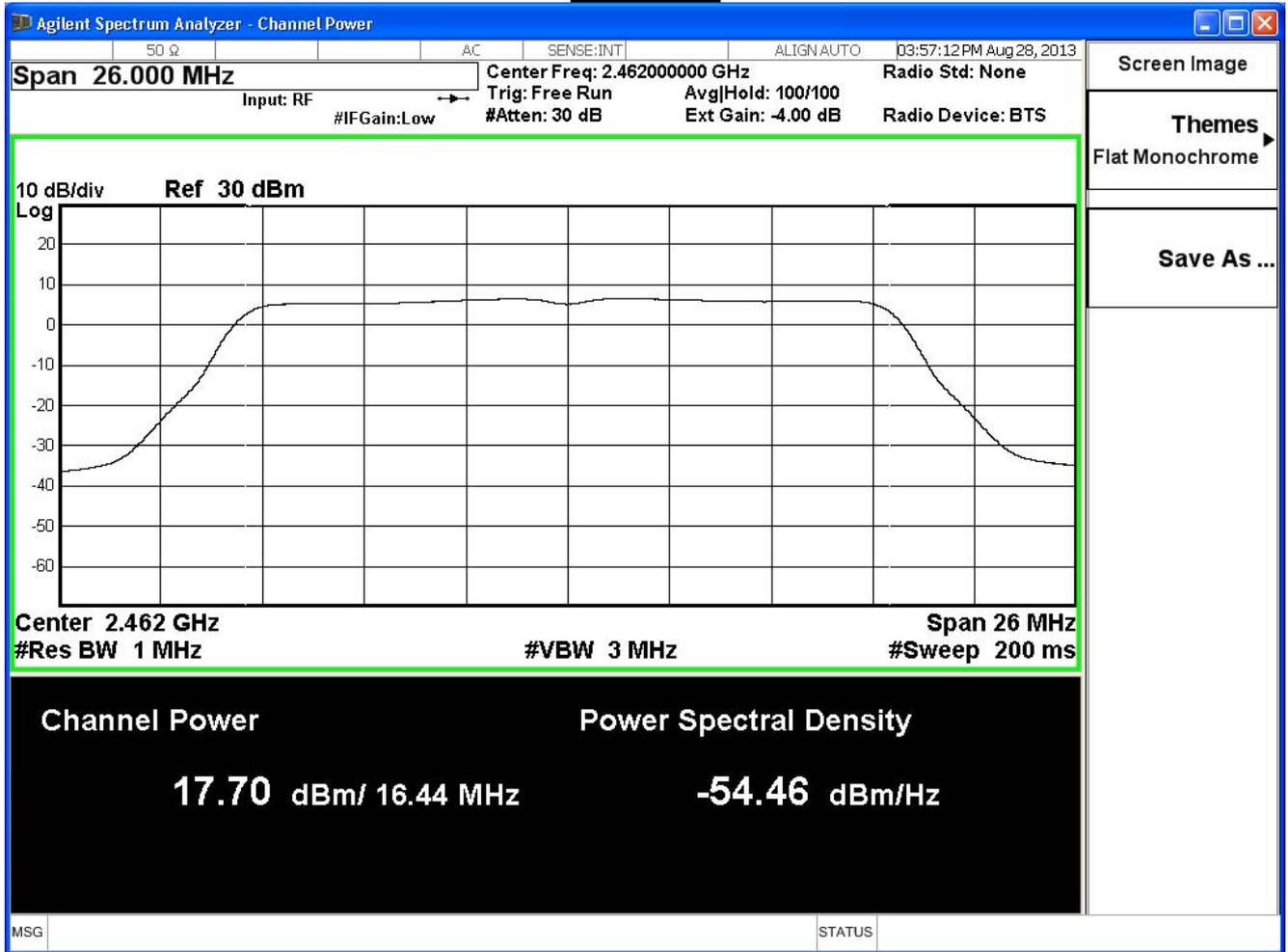
Channel 1



Channel 6



Channel 11



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

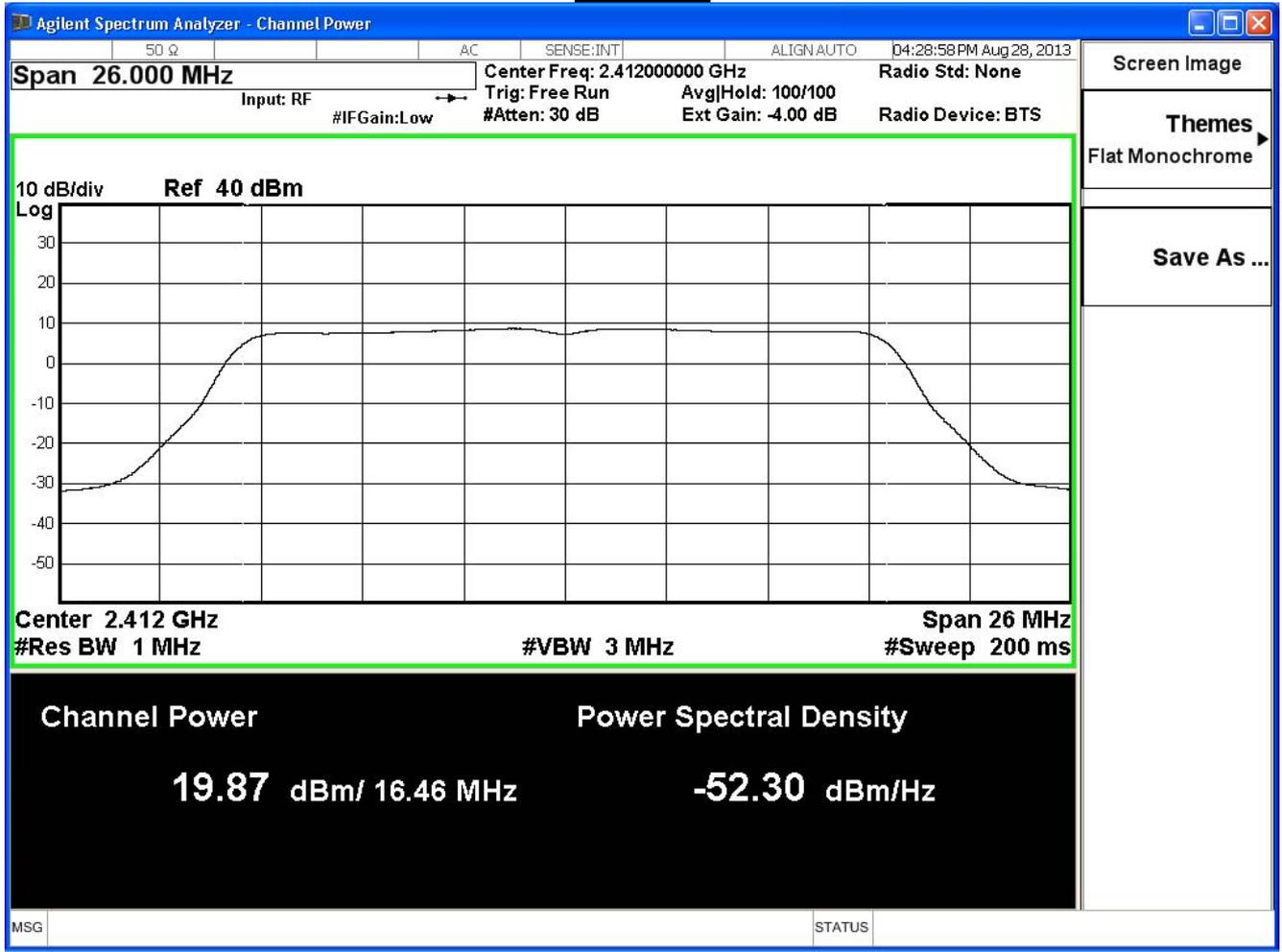
IEEE 802.11g (ANT 2)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	19.87	≤ 30	Pass
6	2437	22.75	≤ 30	Pass
11	2462	16.92	≤ 30	Pass

The worst emission of data rate is 6Mbps.

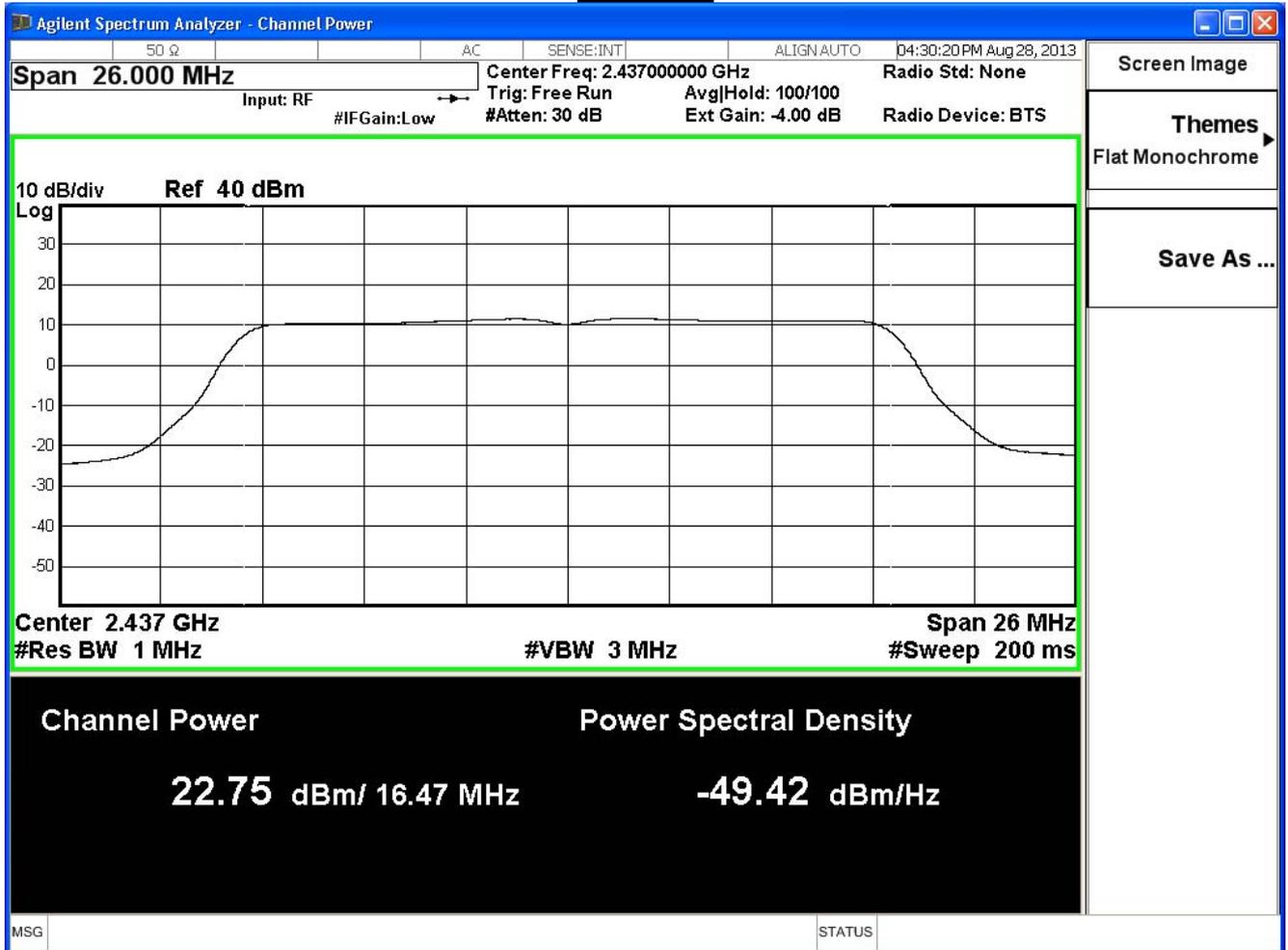
Peak Power Output Value(dBm)									
Channel No.	Frequency (MHz)	Data Rate (Mbps)							Required Limit
		6	12	18	24	36	48	54	
1	2412	19.87	--	--	--	--	--	--	30dBm
6	2437	22.75	22.74	22.73	22.71	22.69	22.68	22.66	30dBm
11	2462	16.92	--	--	--	--	--	--	30dBm

Note: Measure Level =Reading value + cable loss

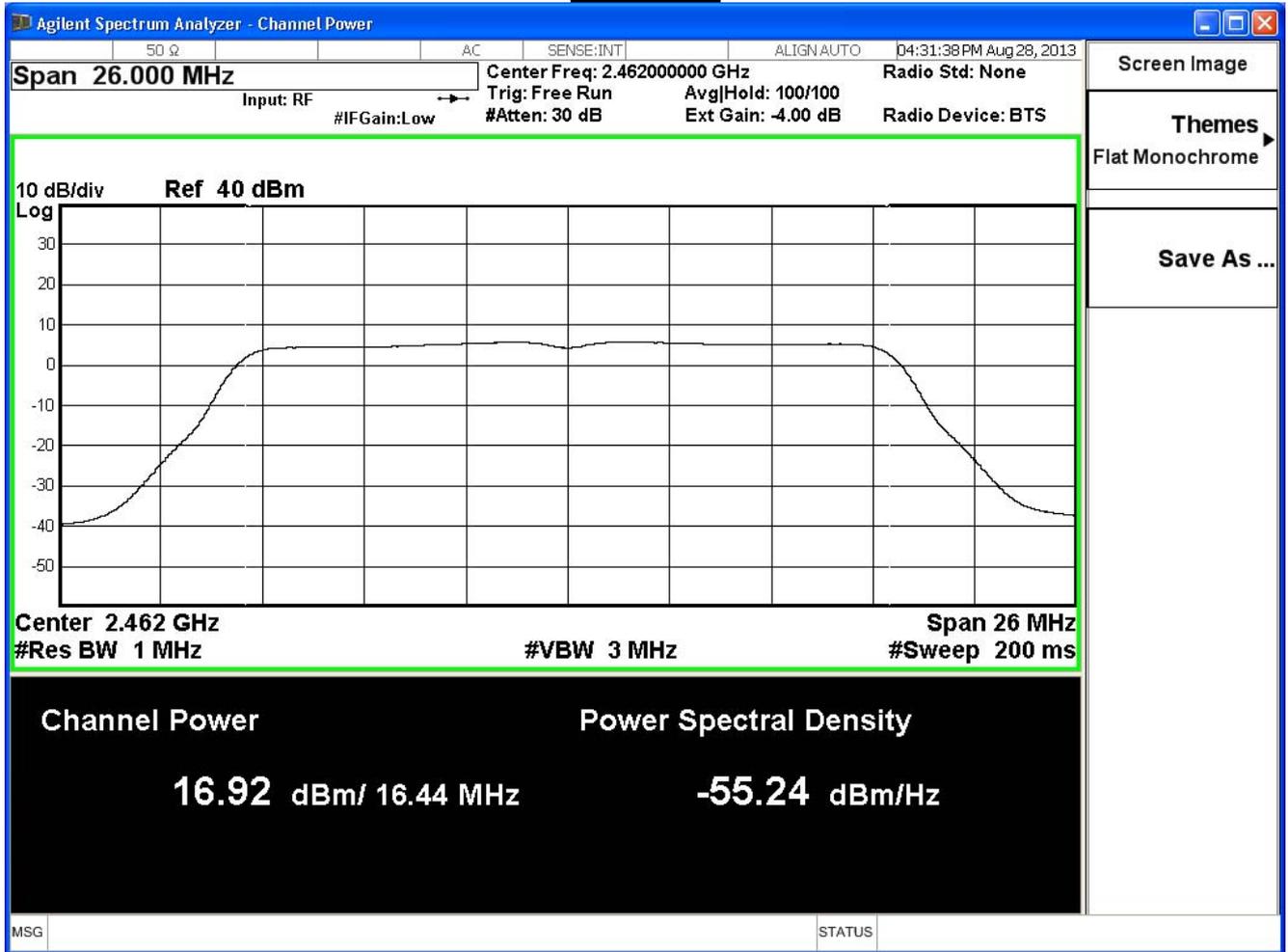
Channel 1



Channel 6



Channel 11



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

IEEE 802.11g (ANT 0+1+2)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	24.52	≤ 30	Pass
6	2437	27.53	≤ 30	Pass
11	2462	21.89	≤ 30	Pass

Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

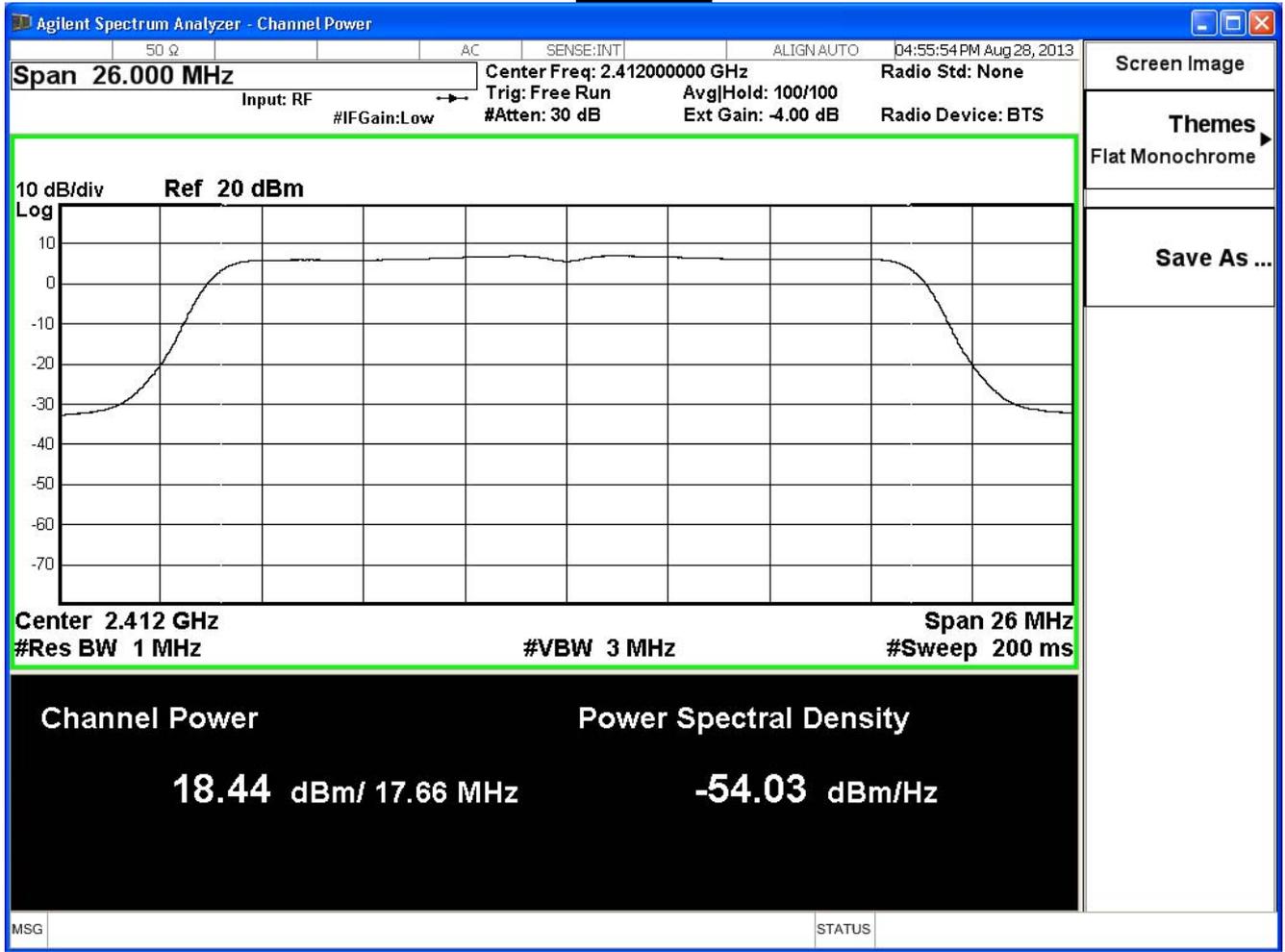
IEEE 802.11n 20MHz (ANT 0)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	18.44	≤ 30	Pass
6	2437	23.24	≤ 30	Pass
11	2462	16.62	≤ 30	Pass

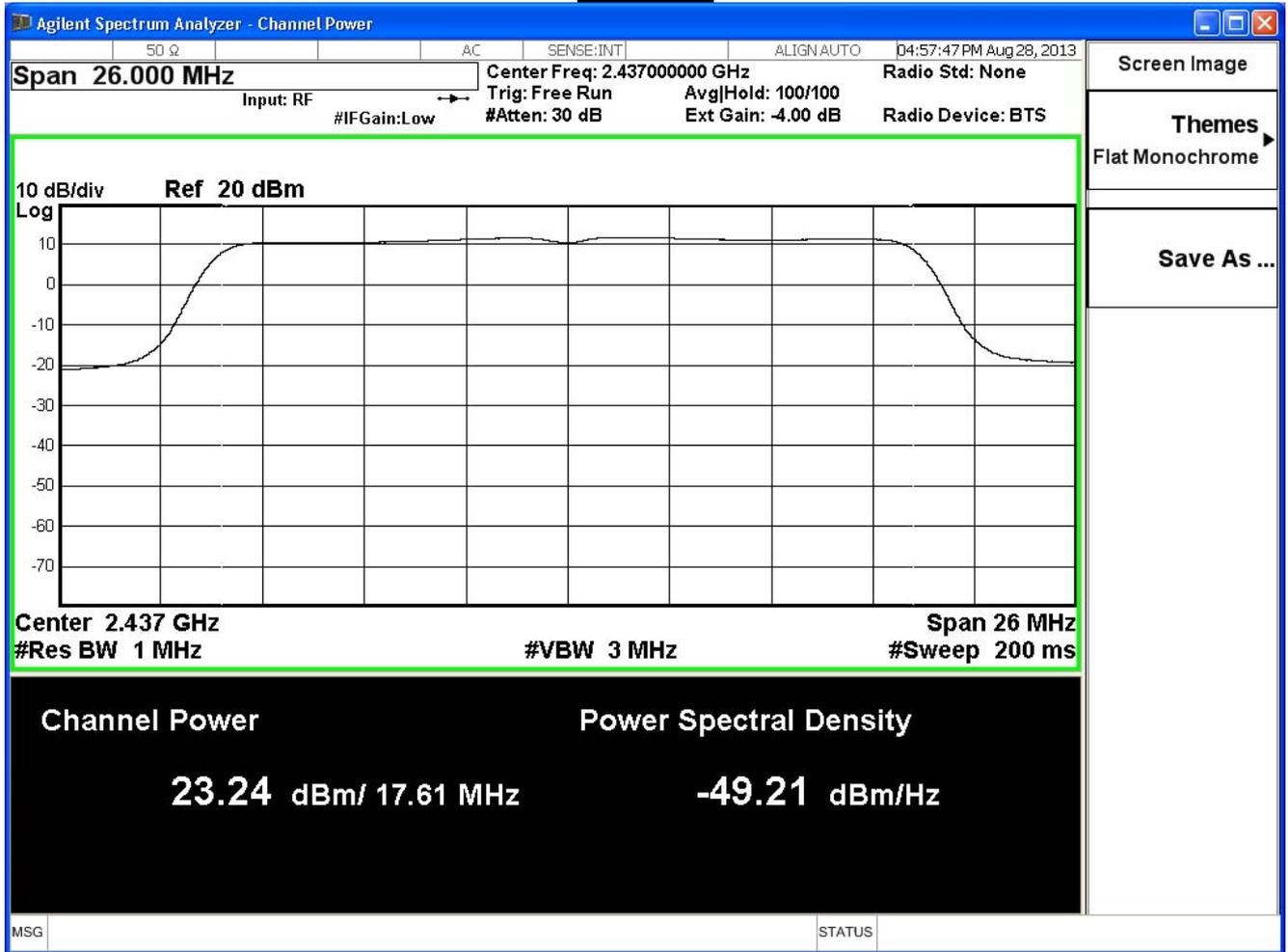
The worst emission of data rate is 19.5 Mbps.

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	
1	2412	18.44	--	--	--	--	--	--	--	30dBm
6	2437	23.24	23.22	23.21	23.20	23.19	23.18	23.16	23.15	30dBm
11	2462	16.62	--	--	--	--	--	--	--	30dBm

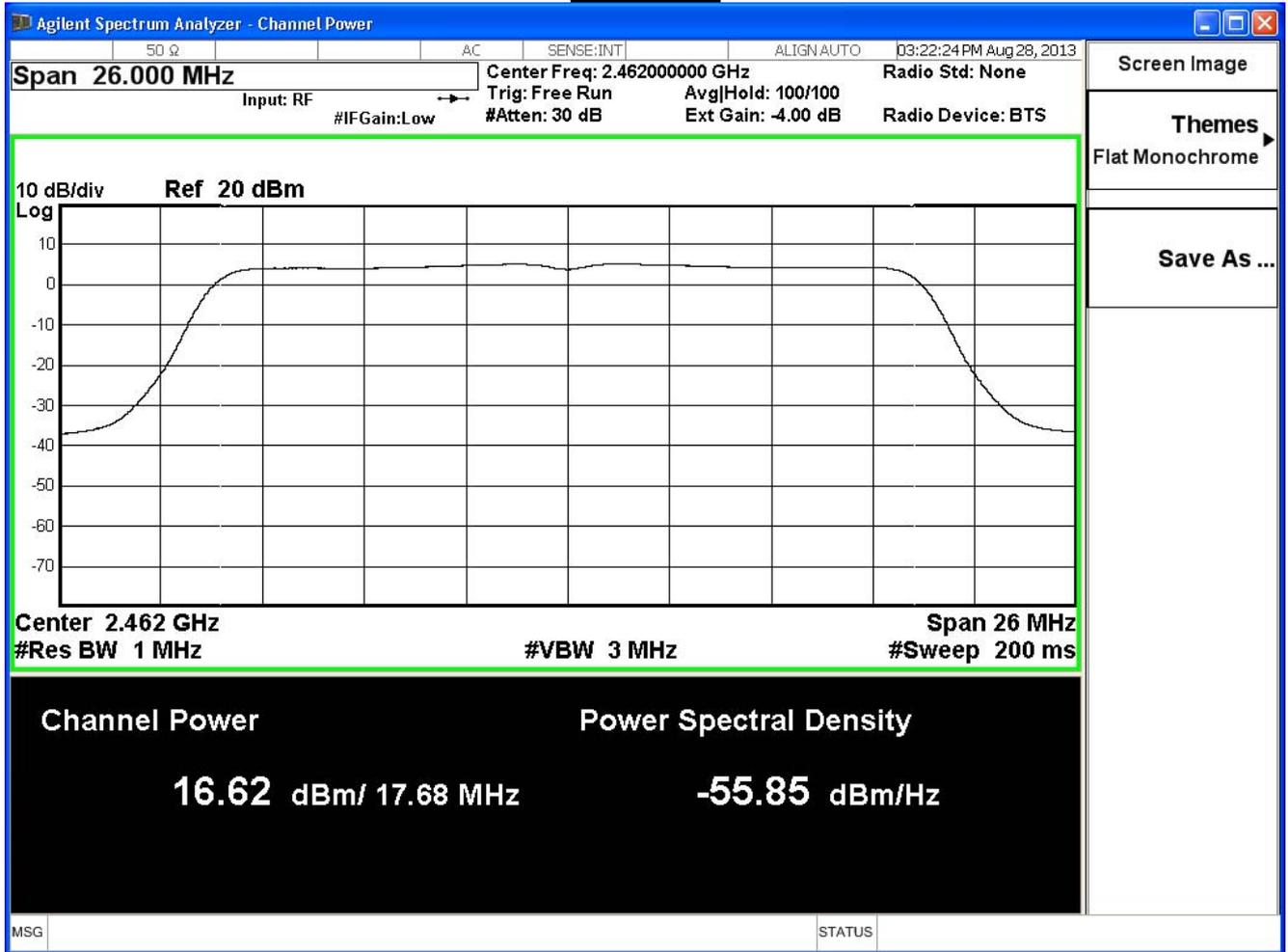
Channel 1



Channel 6



Channel 11



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

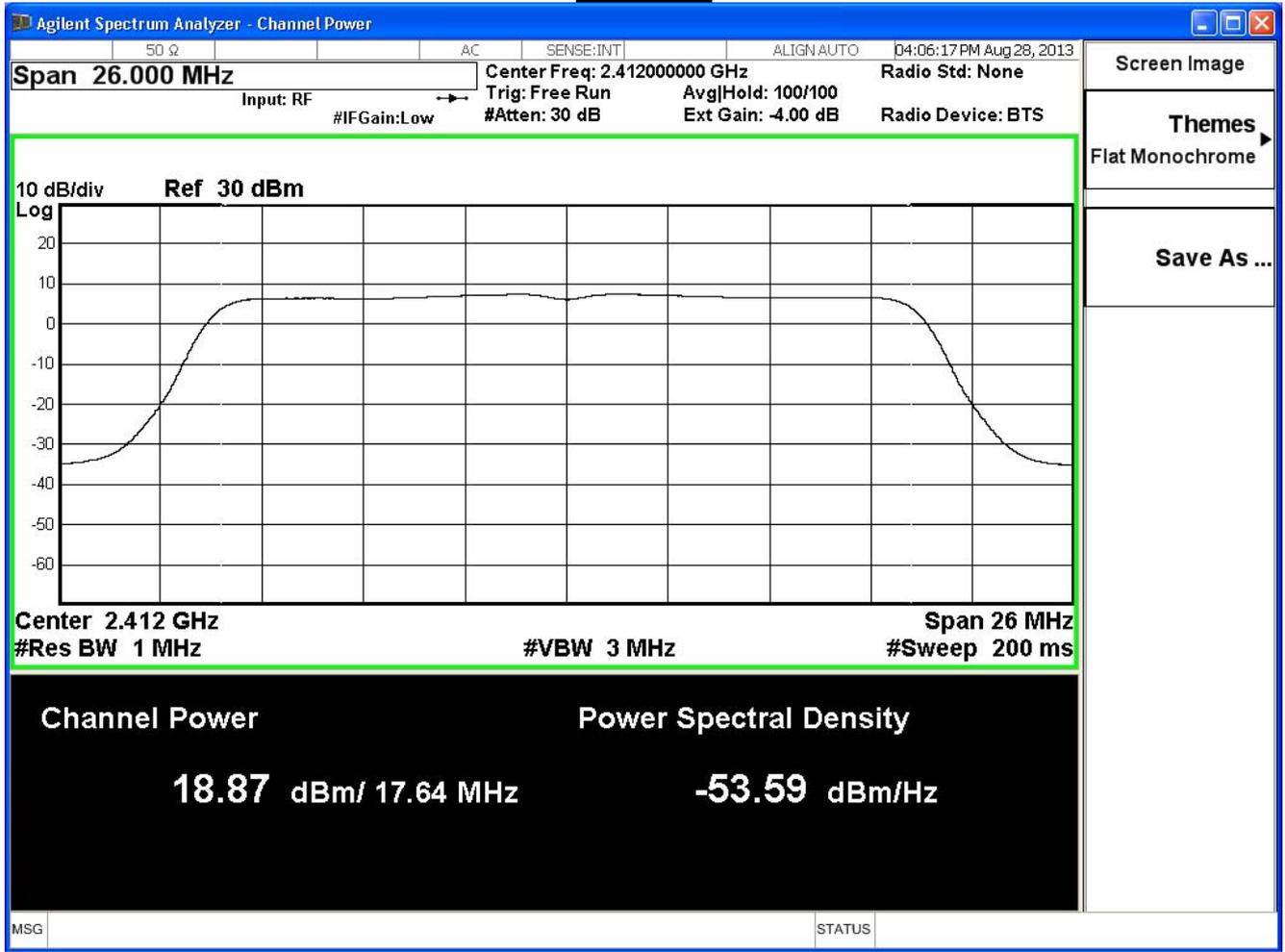
IEEE 802.11n 20MHz (ANT 1)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	18.87	≤ 30	Pass
6	2437	22.42	≤ 30	Pass
11	2462	16.68	≤ 30	Pass

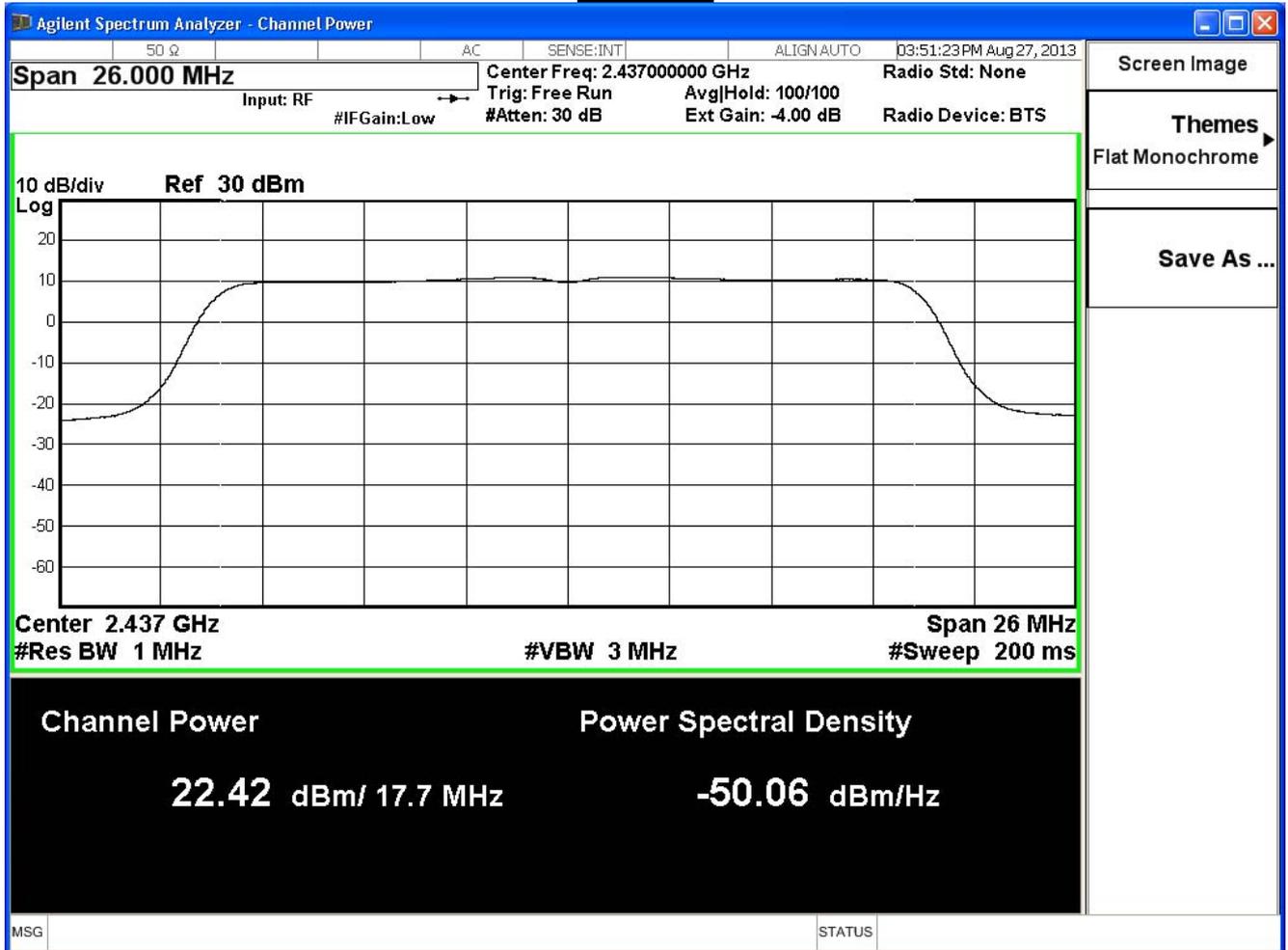
The worst emission of data rate is 19.5 Mbps.

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	
1	2412	18.87	--	--	--	--	--	--	--	30dBm
6	2437	22.42	22.41	22.39	22.38	22.27	22.26	22.24	22.22	30dBm
11	2462	16.68	--	--	--	--	--	--	--	30dBm

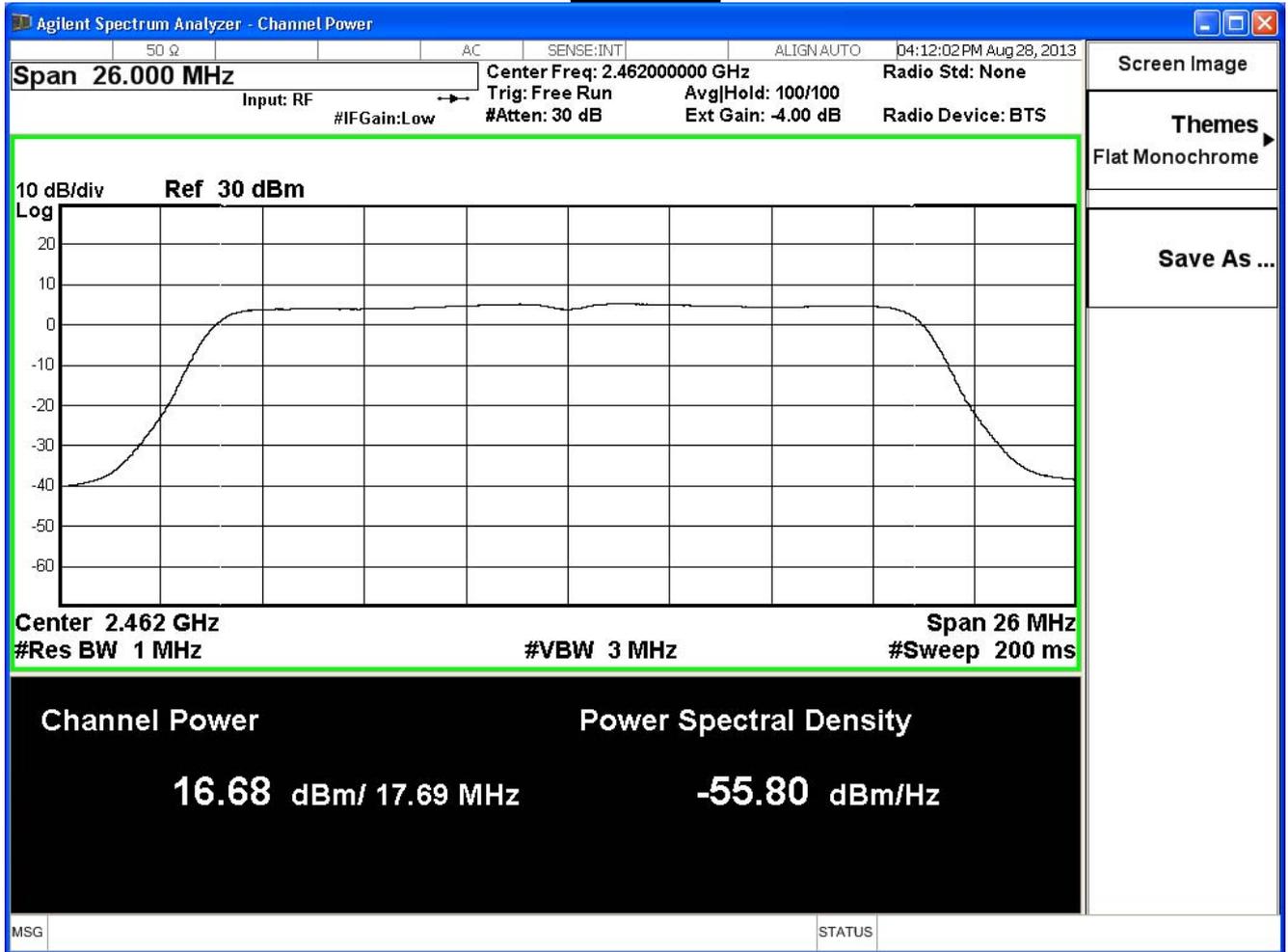
Channel 1



Channel 6



Channel 11



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

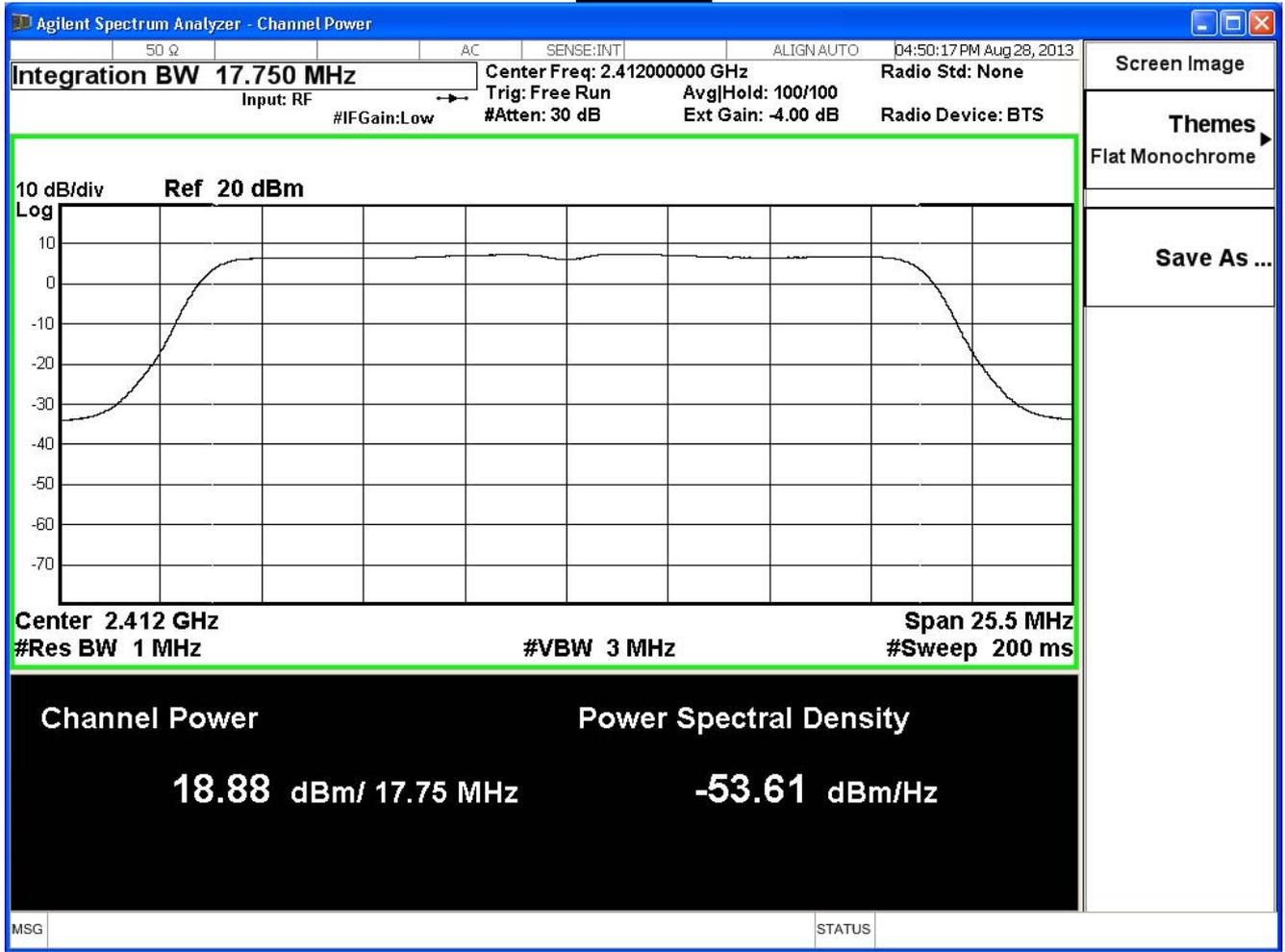
IEEE 802.11n 20MHz (ANT 2)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	18.88	≤ 30	Pass
6	2437	22.44	≤ 30	Pass
11	2462	16.86	≤ 30	Pass

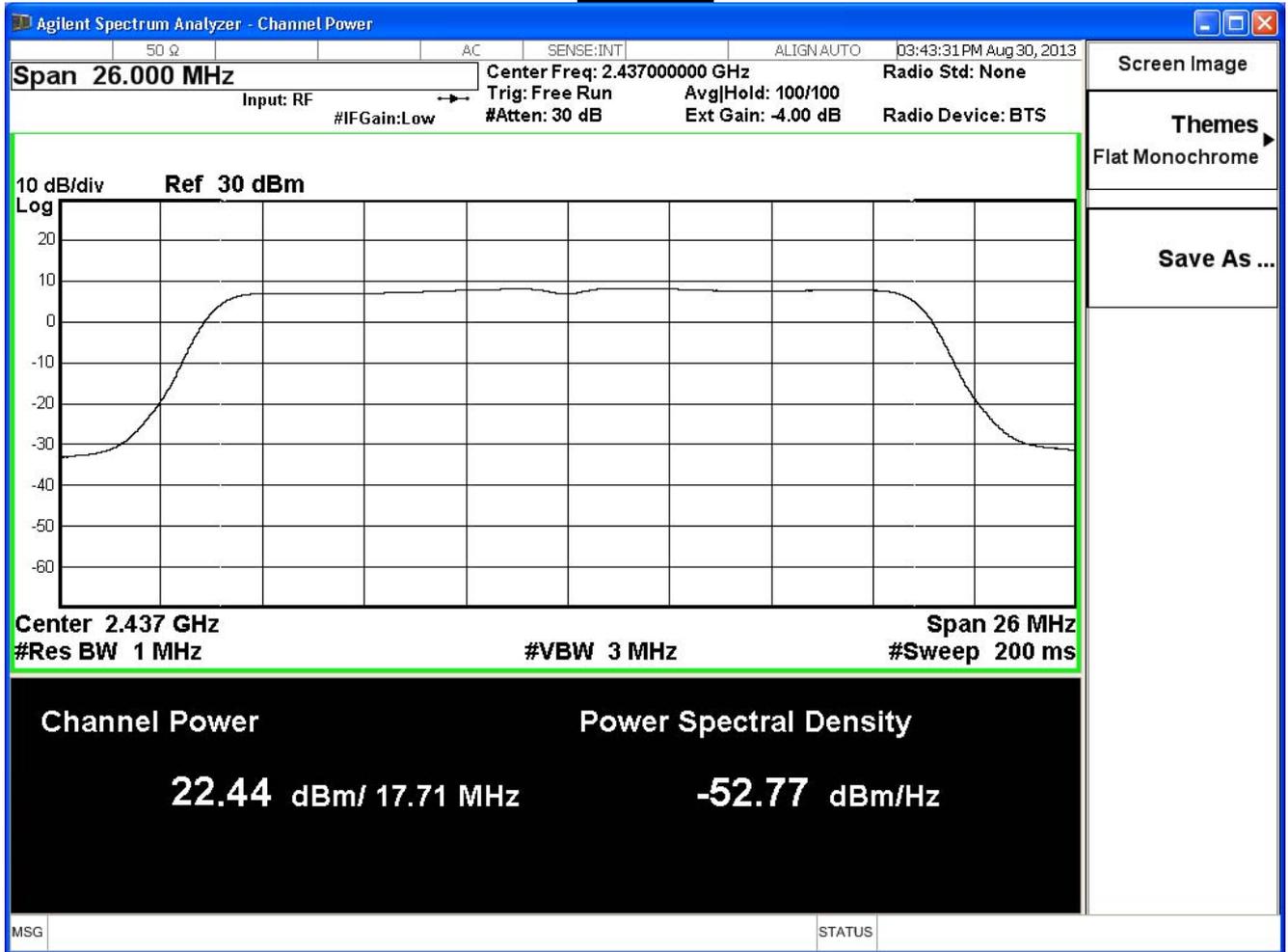
The worst emission of data rate is 19.5 Mbps.

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	
1	2412	18.88	--	--	--	--	--	--	--	30dBm
6	2437	22.44	22.43	22.42	22.41	22.40	22.39	22.38	22.37	30dBm
11	2462	16.86	--	--	--	--	--	--	--	30dBm

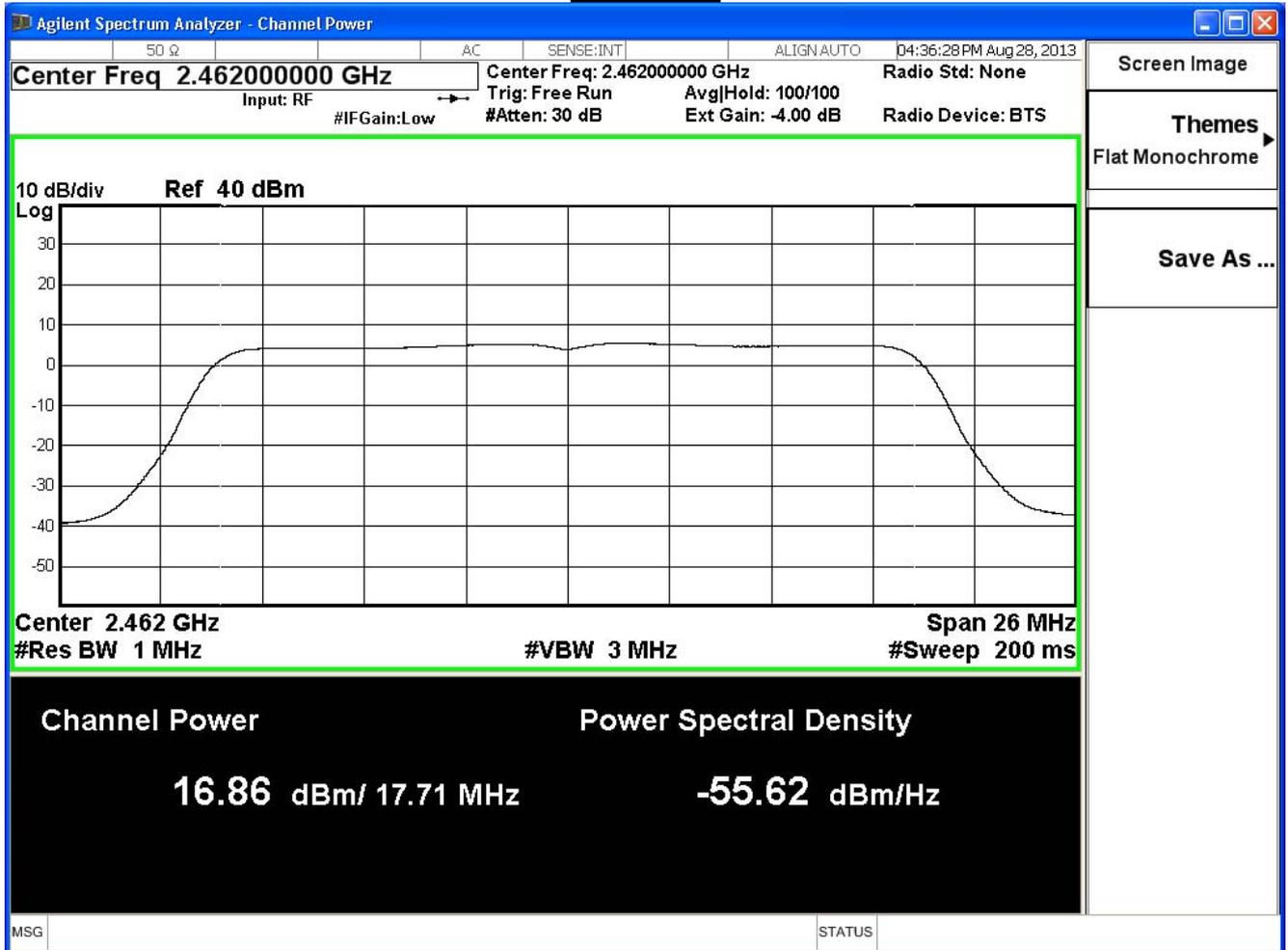
Channel 1



Channel 6



Channel 11



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

IEEE 802.11n 20MHz (ANT 0+1+2)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	23.51	≤ 30	Pass
6	2437	27.49	≤ 30	Pass
11	2462	21.49	≤ 30	Pass

Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

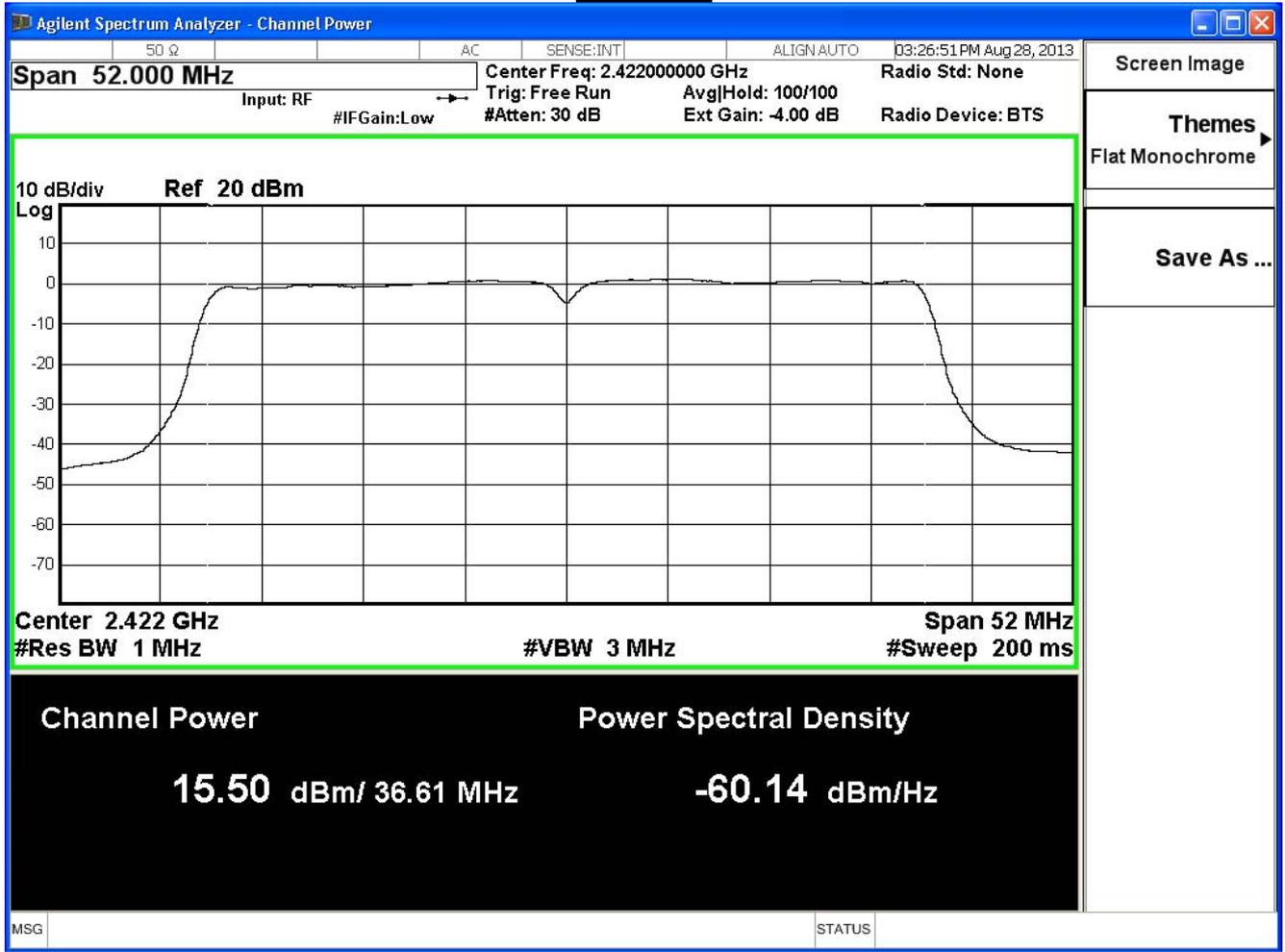
IEEE802.11n 40MHz(ANT 0)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
3	2422	15.50	≤ 30	Pass
6	2437	18.41	≤ 30	Pass
9	2452	13.67	≤ 30	Pass

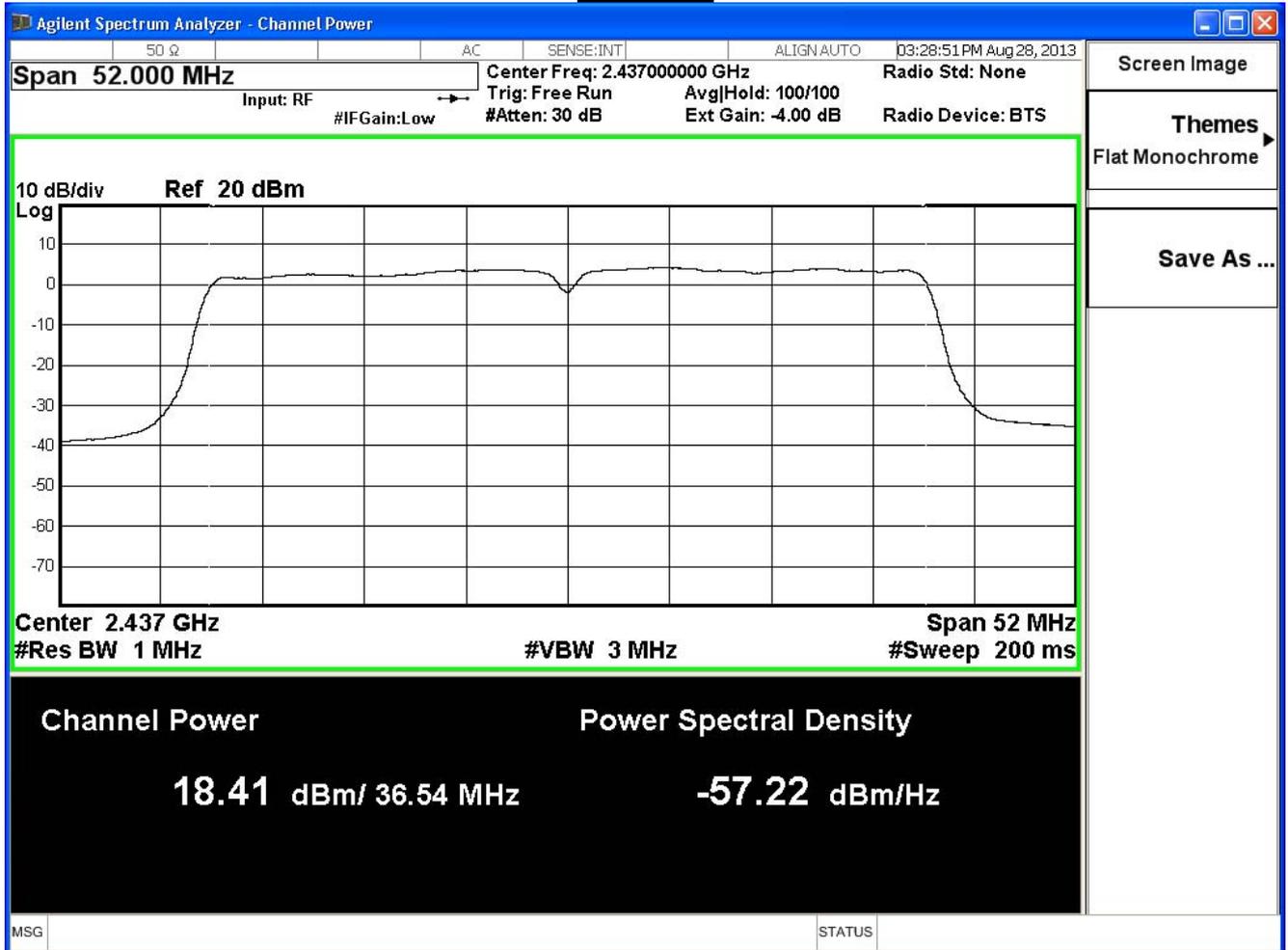
The worst emission of data rate is 40.5Mbps

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	
3	2422	15.50	--	--	--	--	--	--	--	30dBm
6	2437	18.41	18.40	18.38	18.37	18.35	18.33	18.32	18.21	30dBm
9	2452	13.67	--	--	--	--	--	--	--	30dBm

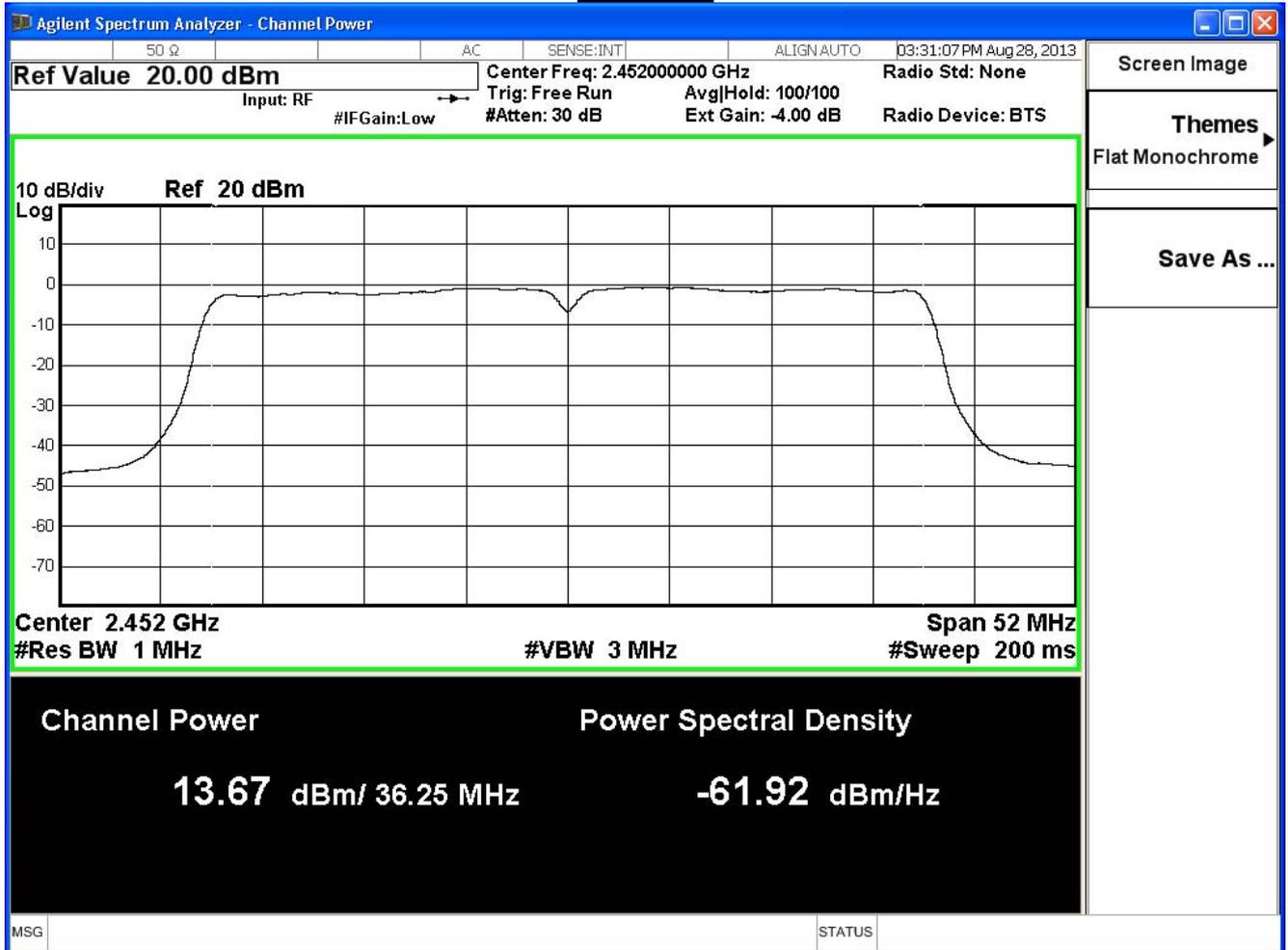
Channel 3



Channel 6



Channel 9



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

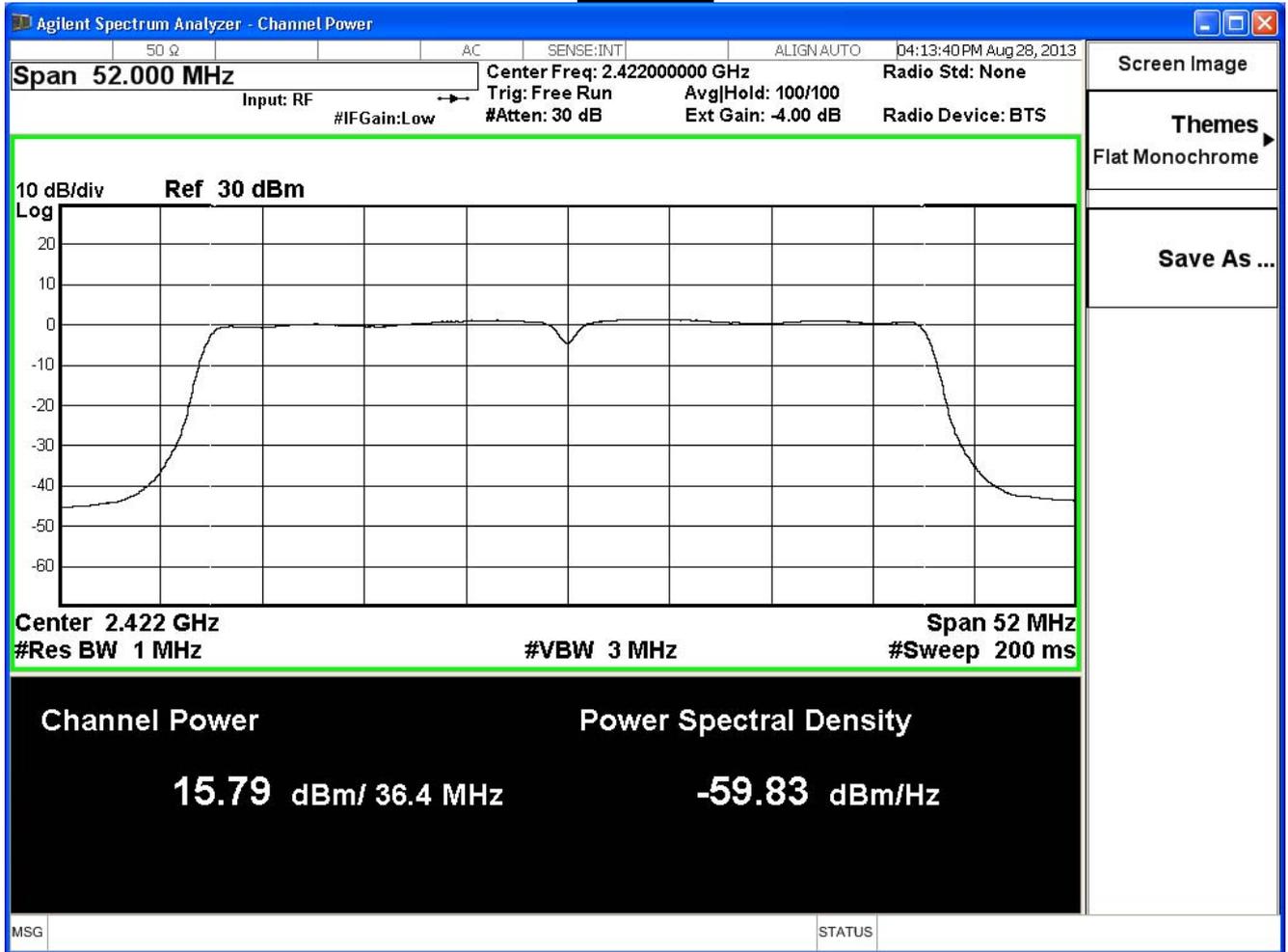
IEEE802.11n 40MHz(ANT 1)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
3	2422	15.79	≤ 30	Pass
6	2437	18.33	≤ 30	Pass
9	2452	13.63	≤ 30	Pass

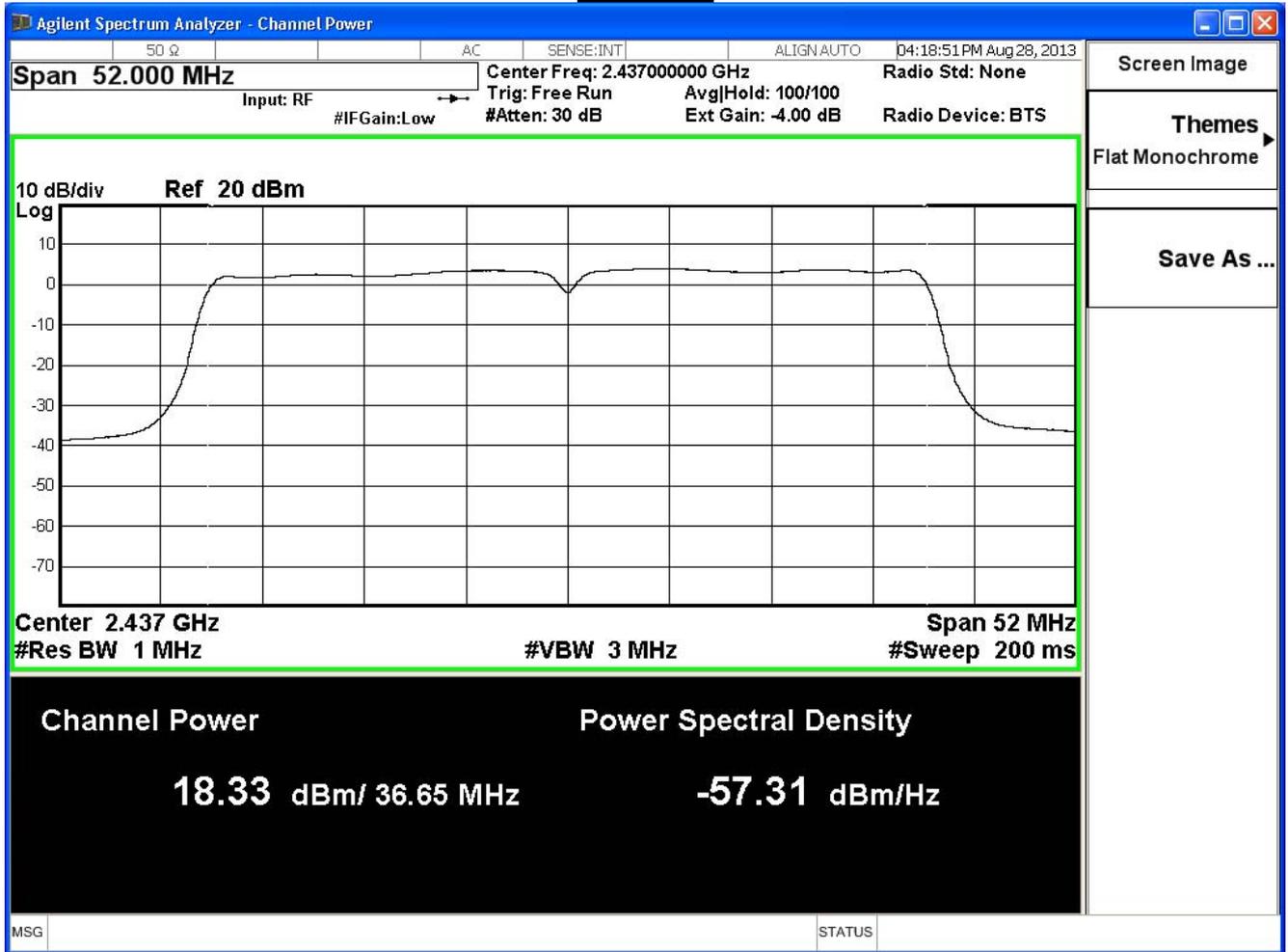
The worst emission of data rate is 40.5Mbps

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	
3	2422	15.79	--	--	--	--	--	--	--	30dBm
6	2437	18.33	18.32	18.31	18.29	18.17	18.16	18.15	18.14	30dBm
9	2452	13.63	--	--	--	--	--	--	--	30dBm

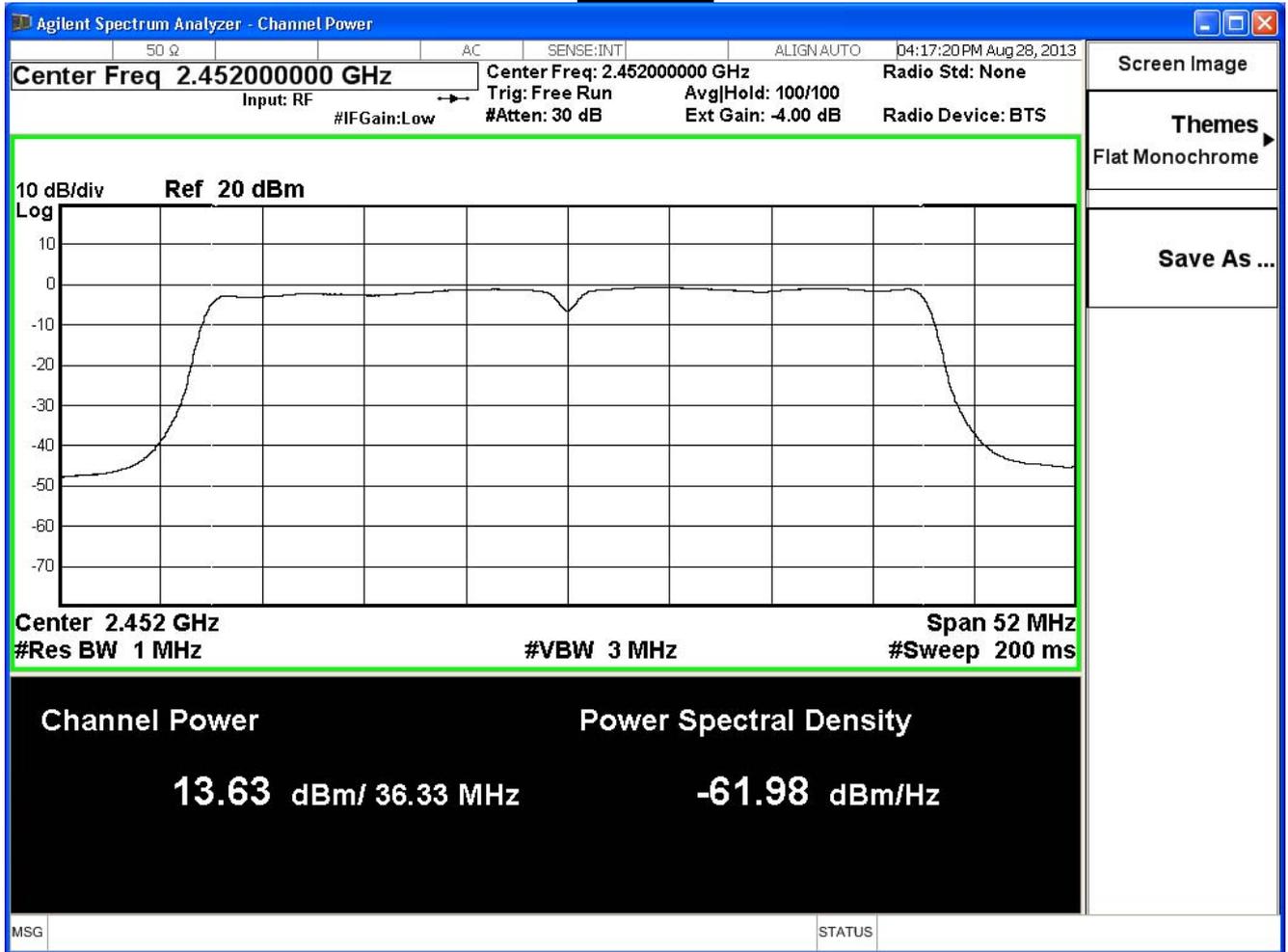
Channel 3



Channel 6



Channel 9



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

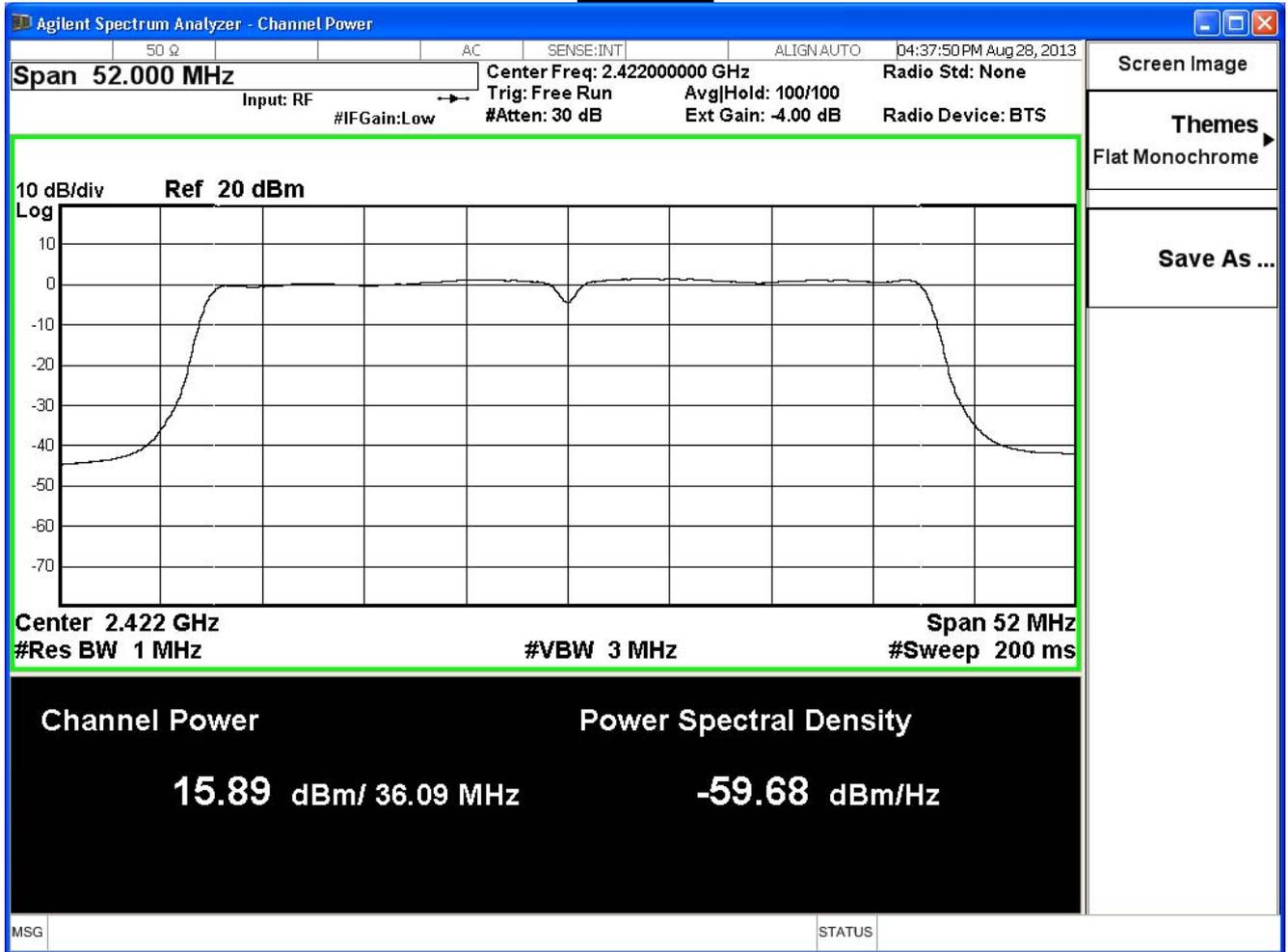
IEEE802.11n 40MHz(ANT 2)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
3	2422	15.89	≤ 30	Pass
6	2437	18.64	≤ 30	Pass
9	2452	14.09	≤ 30	Pass

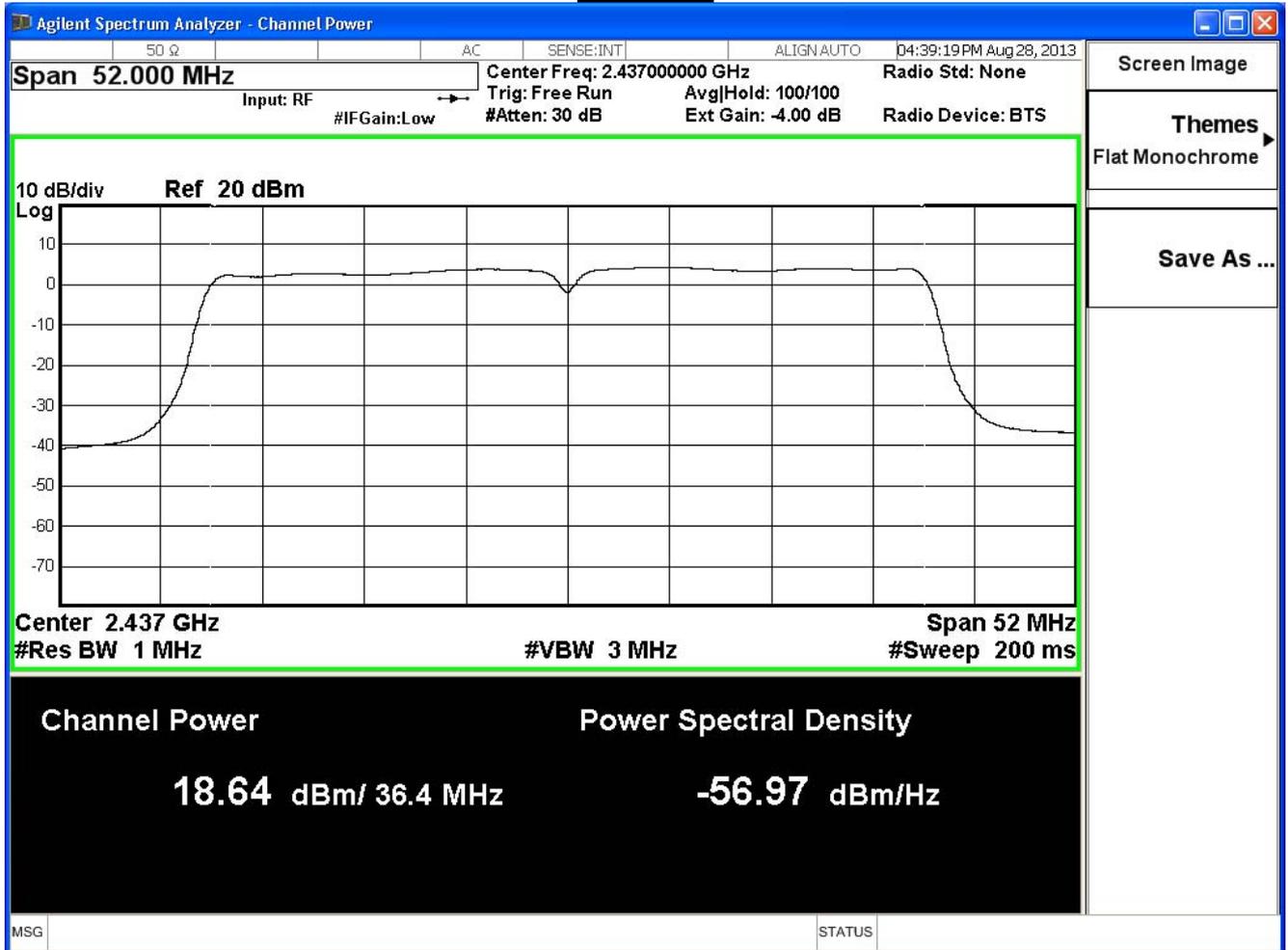
The worst emission of data rate is 40.5Mbps

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	
3	2422	15.89	--	--	--	--	--	--	--	30dBm
6	2437	18.64	18.63	18.61	18.59	18.57	18.55	18.54	18.53	30dBm
9	2452	14.09	--	--	--	--	--	--	--	30dBm

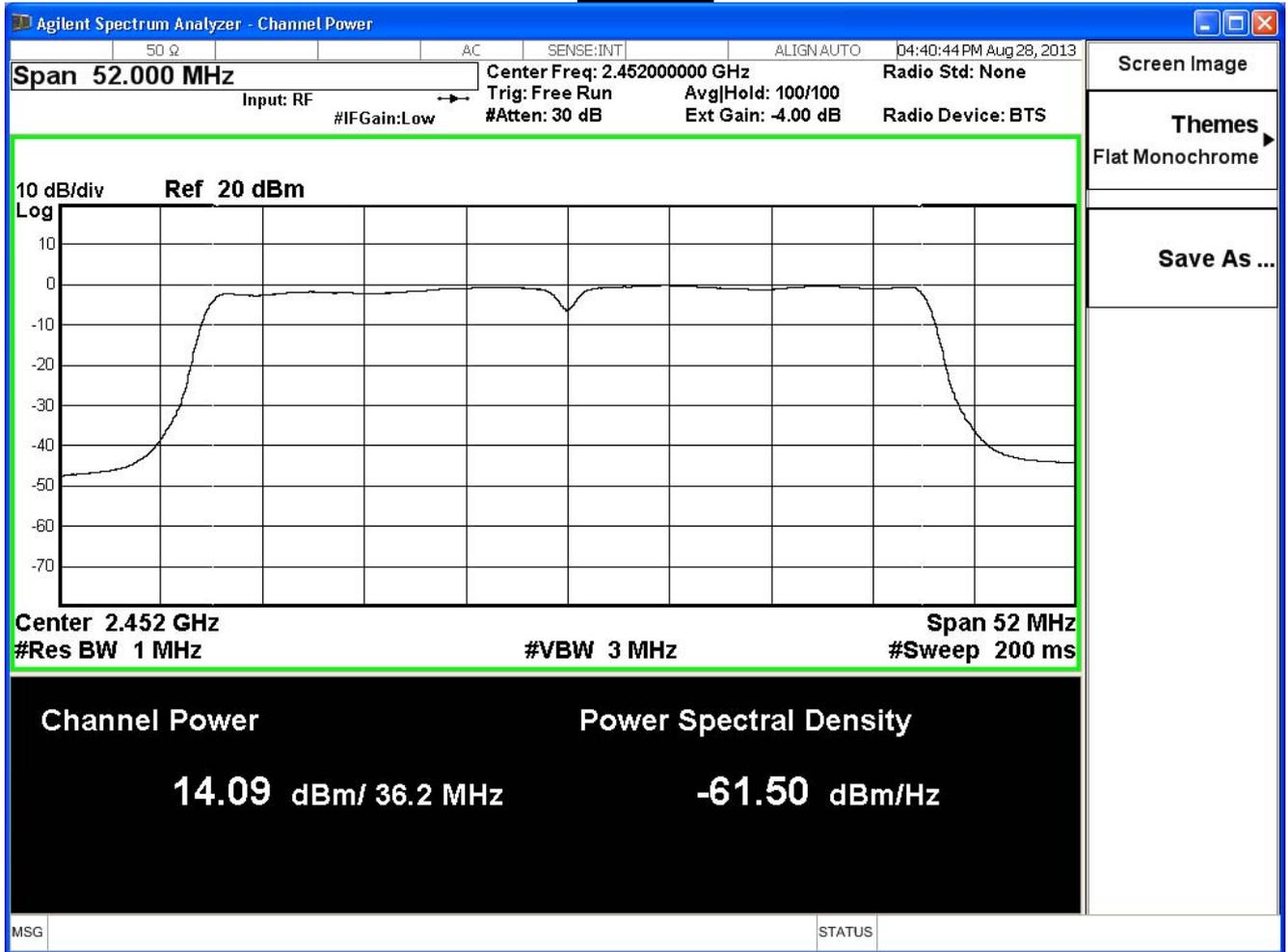
Channel 3



Channel 6



Channel 9



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/28	Test Site	SR7

IEEE802.11n 40MHz(ANT 0+1+2)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
3	2422	20.50	≤ 30	Pass
6	2437	23.23	≤ 30	Pass
9	2452	18.57	≤ 30	Pass

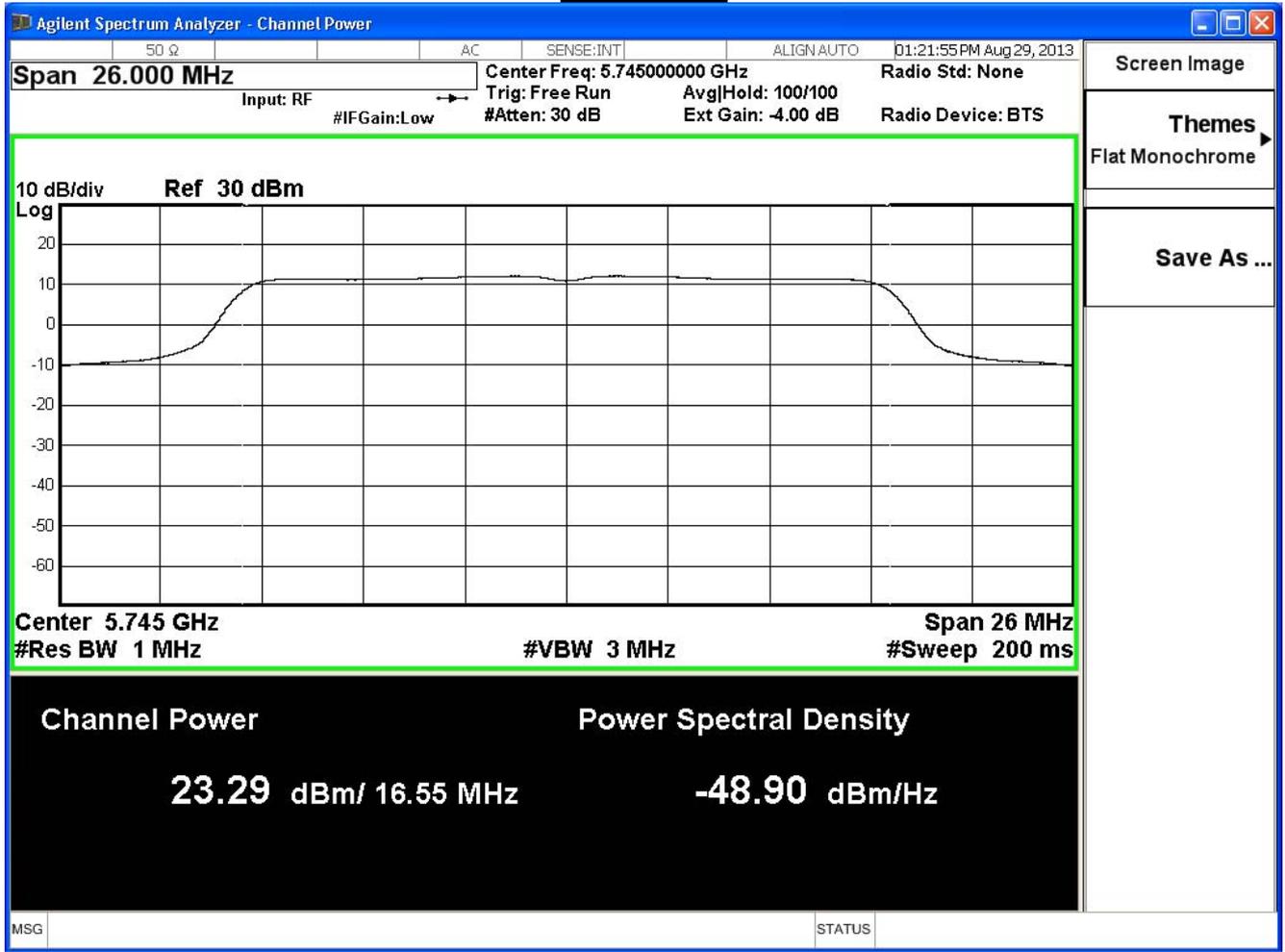
Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/27	Test Site	SR7

IEEE 802.11a (ANT 0)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	23.29	≤ 30	Pass
157	5785	23.63	≤ 30	Pass
165	5825	23.30	≤ 30	Pass

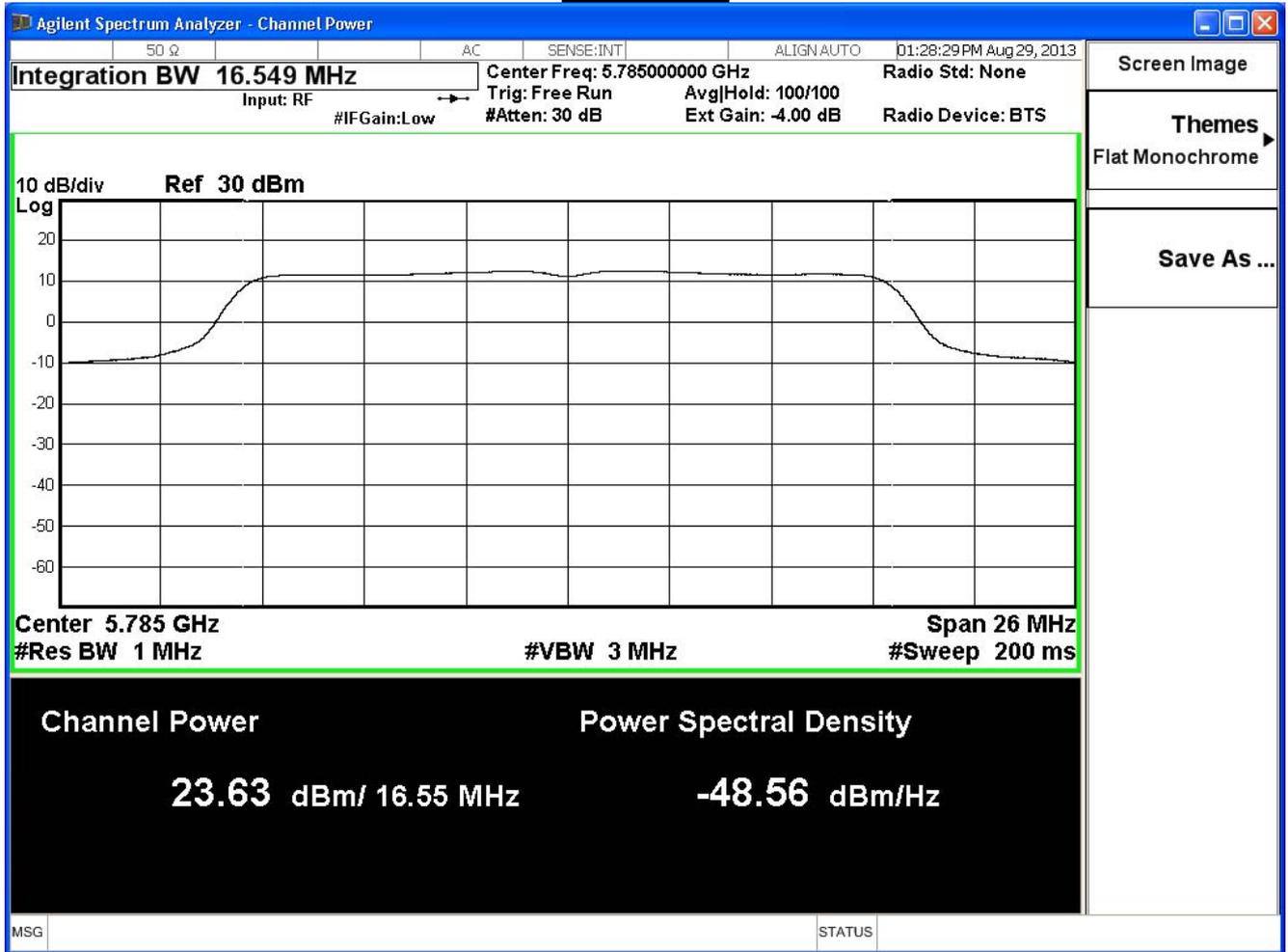
The worst emission of data rate is 6Mbps.

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
149	5745	23.29	--	--	--	--	--	--	1 Watt=30dBm
157	5785	23.63	23.62	23.61	23.60	23.59	23.58	23.57	1 Watt=30dBm
165	5825	23.30	--	--	--	--	--	--	1 Watt=30dBm

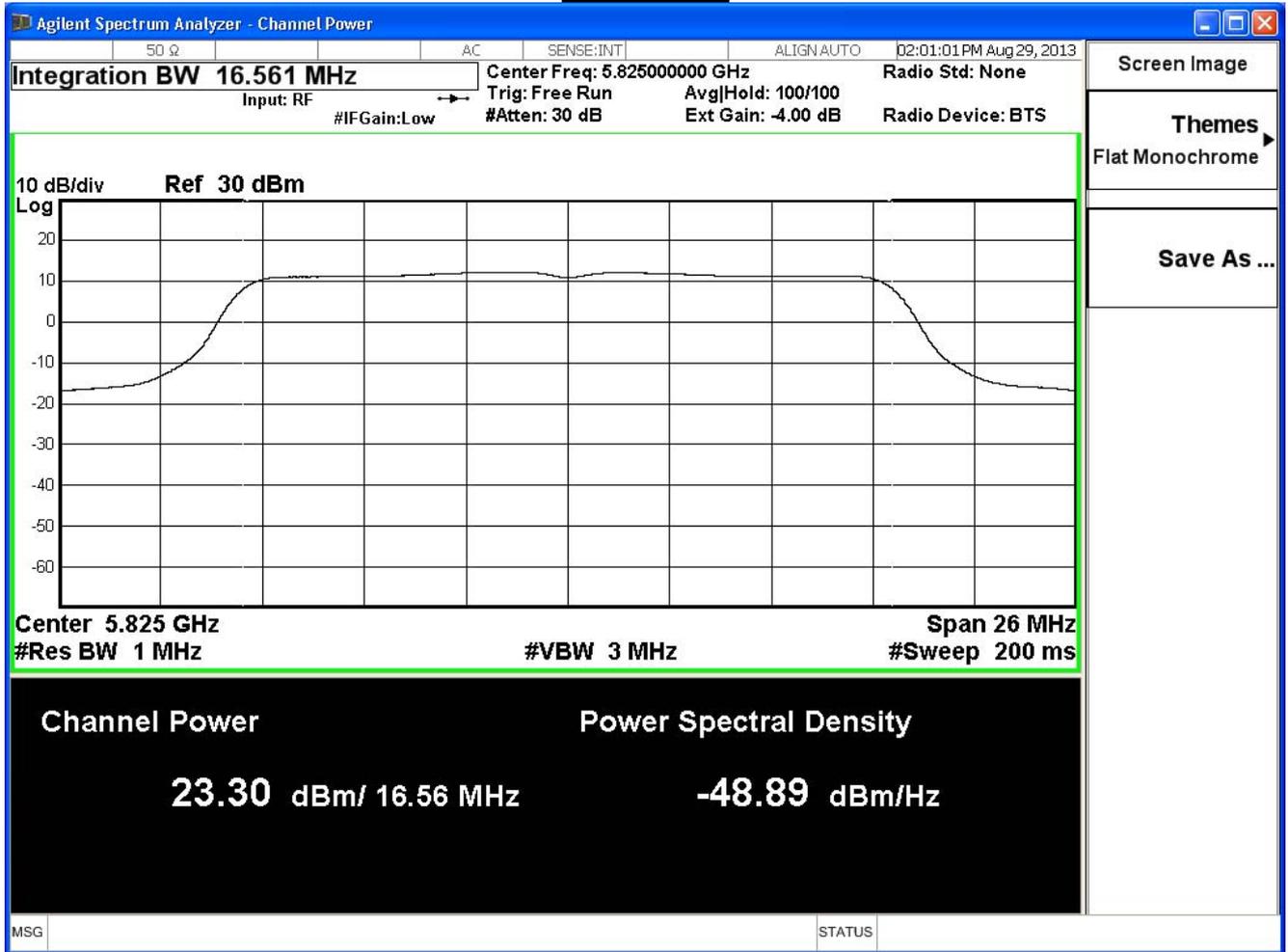
Channel 149



Channel 157



Channel 165



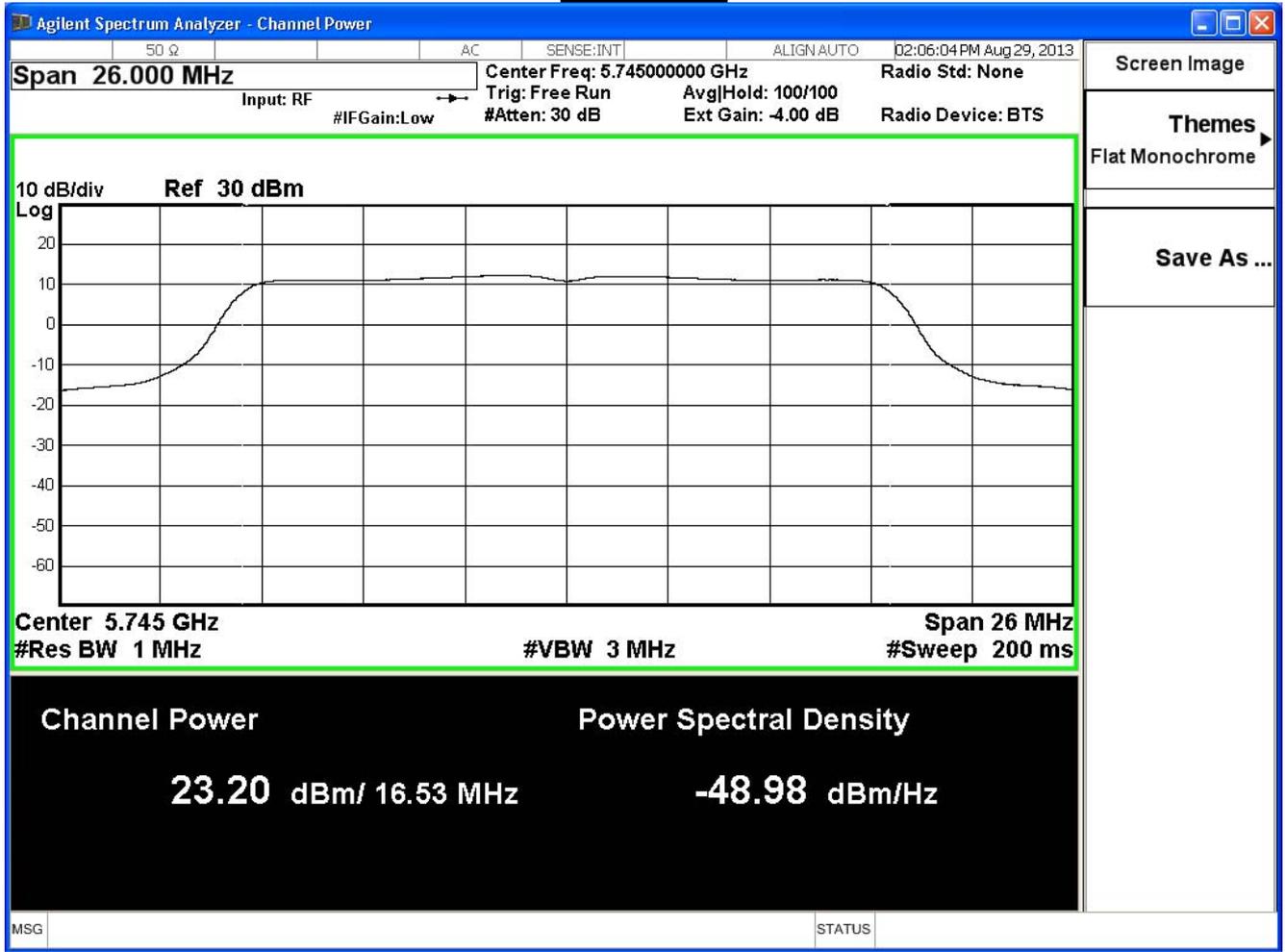
Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/27	Test Site	SR7

IEEE 802.11a (ANT 1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	23.20	≤ 30	Pass
157	5785	23.29	≤ 30	Pass
165	5825	23.28	≤ 30	Pass

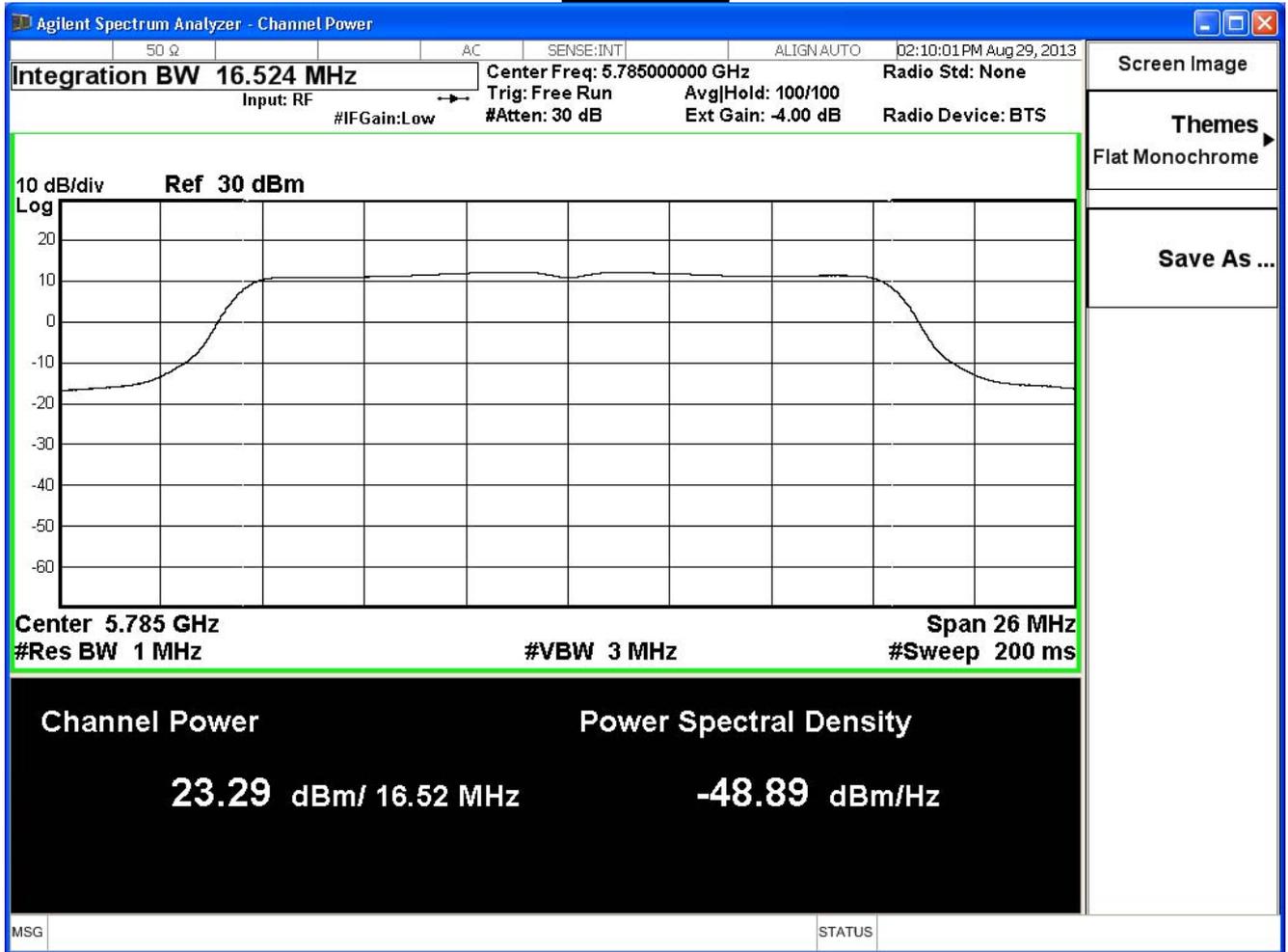
The worst emission of data rate is 6Mbps.

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
149	5745	23.20	--	--	--	--	--	--	1 Watt=30dBm
157	5785	23.29	23.28	23.27	23.26	23.25	23.24	23.23	1 Watt=30dBm
165	5825	23.28	--	--	--	--	--	--	1 Watt=30dBm

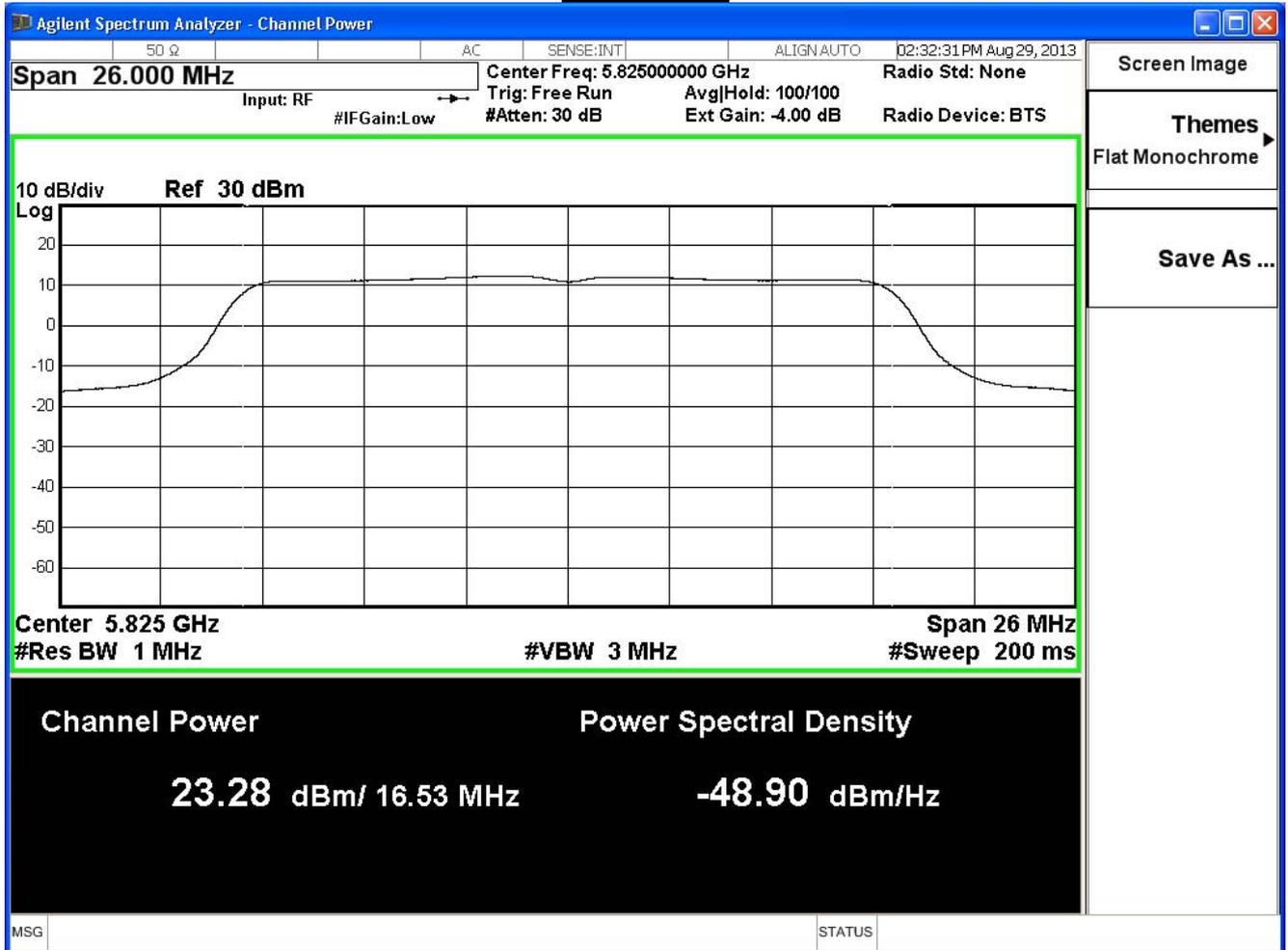
Channel 149



Channel 157



Channel 165



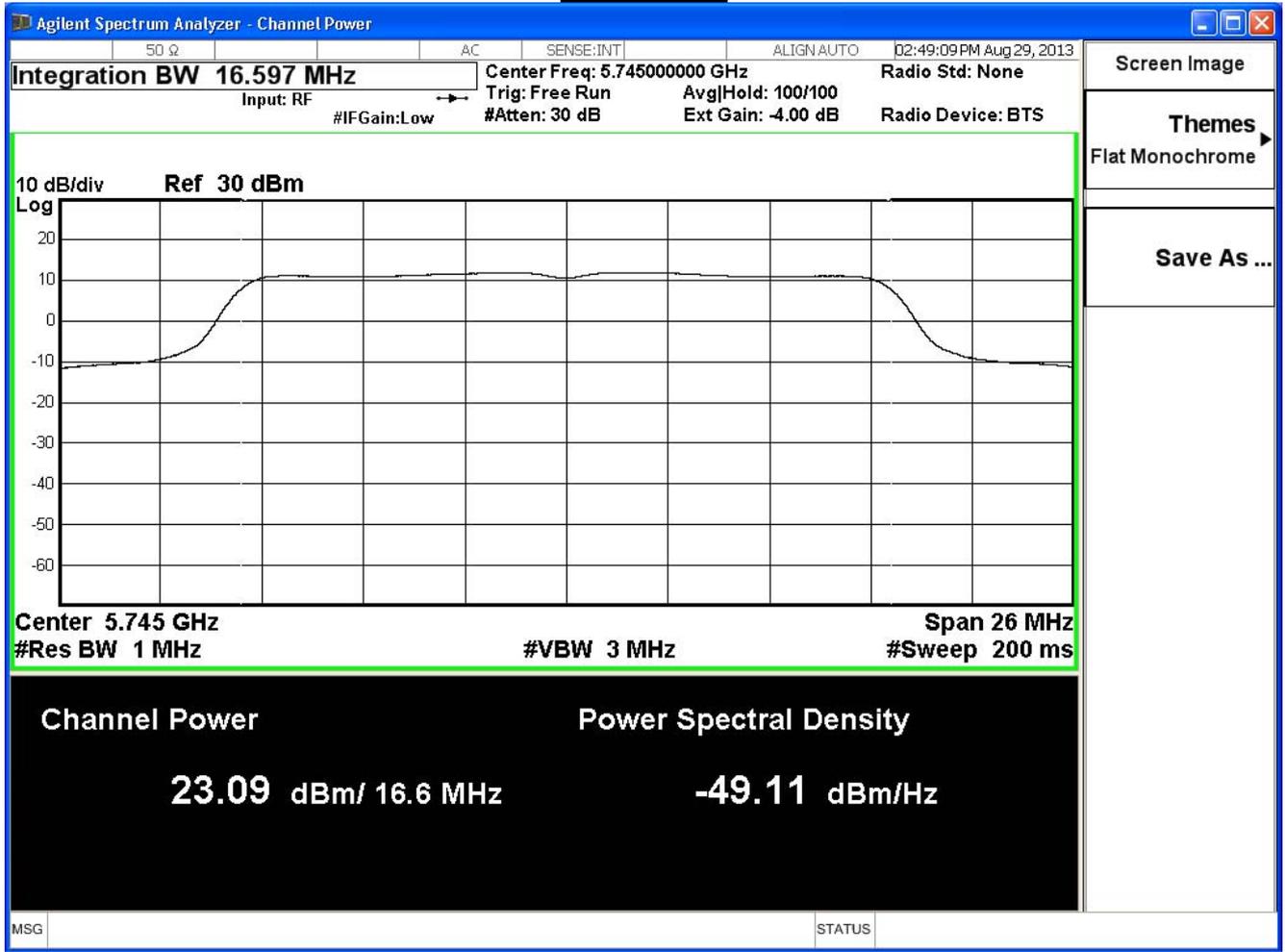
Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/27	Test Site	SR7

IEEE 802.11a (ANT 2)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	23.09	≤ 30	Pass
157	5785	23.21	≤ 30	Pass
165	5825	22.87	≤ 30	Pass

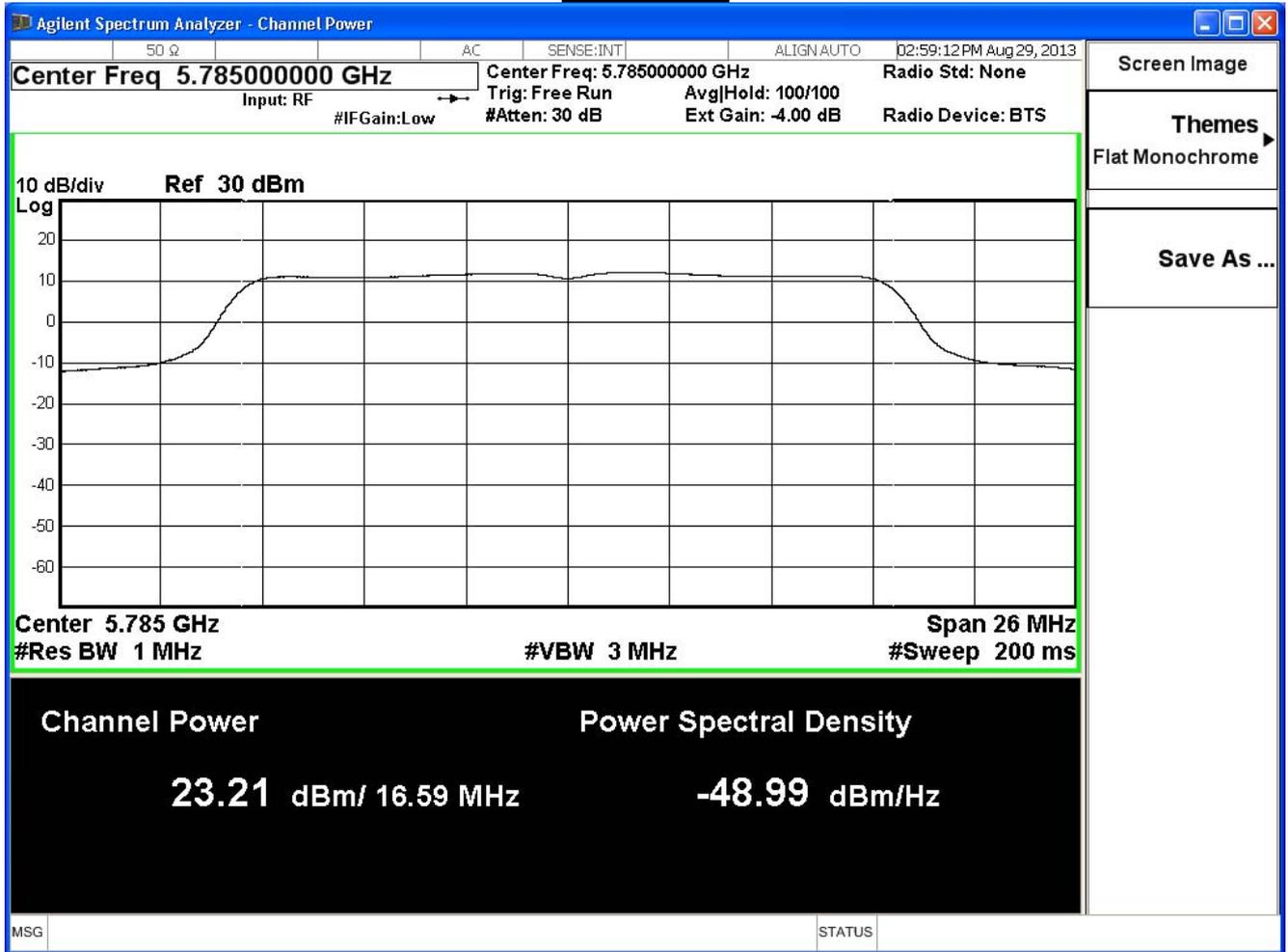
The worst emission of data rate is 6Mbps.

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
149	5745	23.09	--	--	--	--	--	--	1 Watt=30dBm
157	5785	23.21	23.20	23.19	23.18	23.17	23.16	23.15	1 Watt=30dBm
165	5825	22.87	--	--	--	--	--	--	1 Watt=30dBm

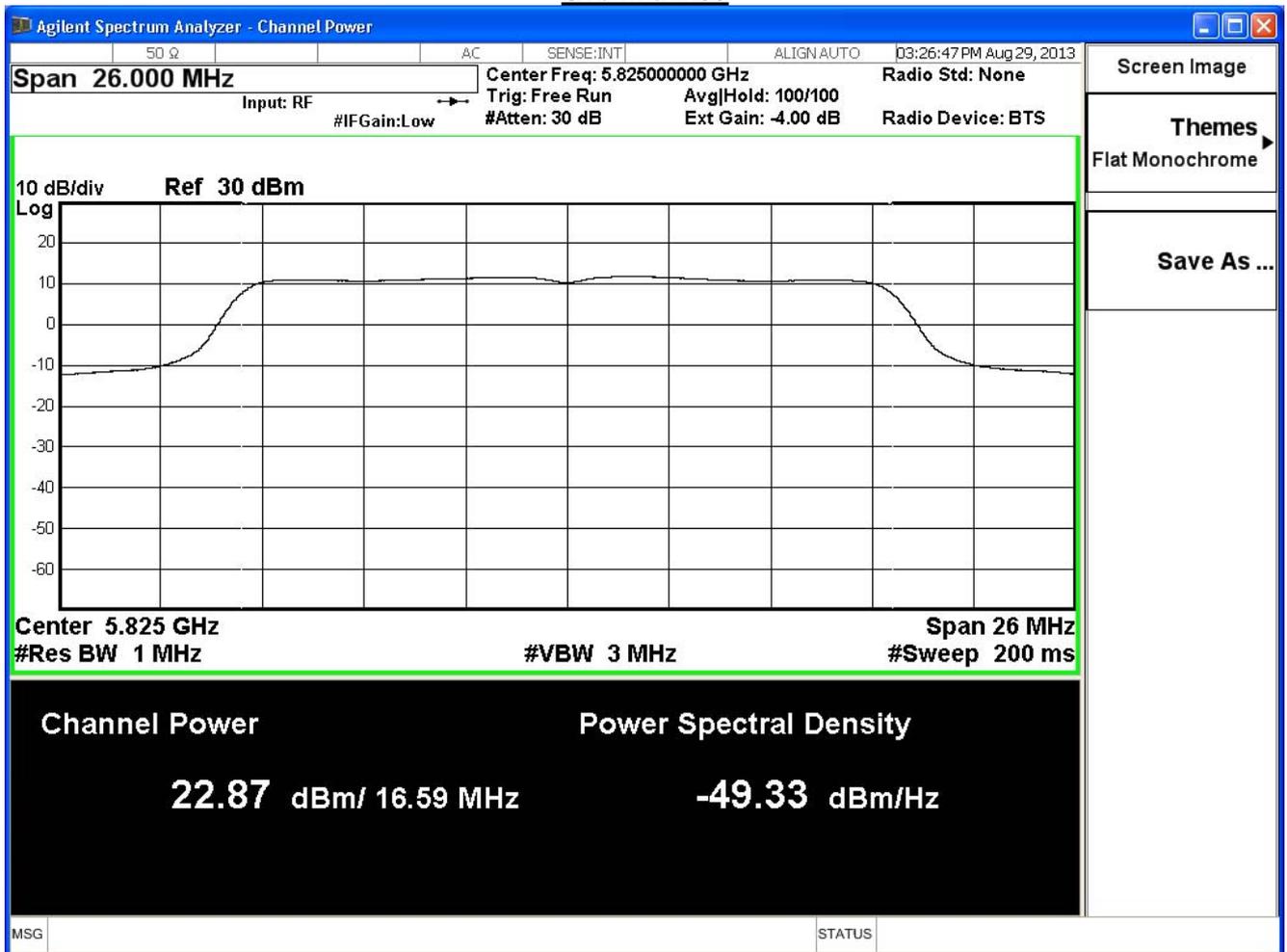
Channel 149



Channel 157



Channel 165



Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (CDD mode)		
Date of Test	2013/08/27	Test Site	SR7

IEEE 802.11a (ANT 0+1+2)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	27.97	≤ 30	Pass
157	5785	28.15	≤ 30	Pass
165	5825	27.93	≤ 30	Pass