



## Test Report

Product Name : Wireless Extender  
Model No. : WAP-5836  
FCC ID. : L9V-COMTREND5836

Applicant : Comtrend Corporation  
Address : 3F-1, 10 Lane 609, Chongxin Rd., Section 5,  
Sanchong Dist, New Taipei City 24159, Taiwan

Date of Receipt : 2012/02/07  
Issued Date : 2012/07/09  
Report No. : 122154R-RFUSP46V01  
Report Version : V1.0

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 : 2012/07/09

Report No. : 122154R-RFUSP46V01



Product Name : Wireless Extender  
 Applicant : Comtrend Corporation  
 Address : 3F-1, 10 Lane 609, Chongxin Rd., Section 5, Sanchong Dist,  
 New Taipei City 24159, Taiwan  
 Manufacturer : Ayecom Technology Co., Ltd.  
 Model No. : WAP-5836  
 FCC ID. : L9V-COMTREND5836  
 EUT Voltage : AC 100-120V 50-60Hz  
 Trade Name : Comtrend  
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart E 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 : Sandy Chuang  
 ( Sandy Chuang / Adm. Specialist )  
 Reviewed By : JuBo Shen  
 ( JuBo Shen / Engineer )  
 Approved By : Roy Wang  
 ( Roy Wang / Manager )

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## 1. General Information

### 1.1. EUT Description

Product Name	Wireless Extender
Product Type	WLAN(3TX,3RX)
Trade Name	Comtrend
Model No.	WAP-5836
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)) _5.2G	4
Channel Number- IEEE 802.11n (40MHz) _5.2G	2
Type of Modulation (IEEE 802.11a/n) _5.2G	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	2dBi
Channel Control	Auto
Antenna Type	PCB Antenna

Component	
LAN Cable	Non-Shielded, 1.5m, 2PCS
Power Adapter	DVE, DSA-12G-12 AUS 120120, 2PCS I/P: 100-120V 50-60Hz 0.3A O/P: 12.0V $\equiv$ 1A Cable Out: Non-Shielded, 1.5m

**ANT-TX / Rx & Bandwidth**

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

**ANT (TX / RX)**



IEEE 802.11n

MCS Index	Modulation	R	N <sub>BPSCS</sub>	N <sub>CBPS</sub>		N <sub>DBPS</sub>		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 <sub>BPSCS</sub>	N <sub>CBPS</sub>		N <sub>DBPS</sub>		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 <sub>BPSCS</sub>	N <sub>CBPS</sub>		N <sub>DBPS</sub>		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 <sub>BPSC</sub>	Number of coded bits per single carrier
N <sub>CBPS</sub>	Number of coded bits per symbol
N <sub>DBPS</sub>	Number of data bits per symbol
GI	guard interval



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

Working Frequency of Each Channel(5150~5250MHz)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz

IEEE 802.11n (40MHz) - 5GHz

Working Frequency of Each Channel(5150~5250MHz)			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

Note:

1. This device is a Wireless Extender including 5GHz a/n (3x4) 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 E 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 5.8GHz transmitting is measured and makes a test report of the report number: 122154R-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 122154R-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
----	------------------

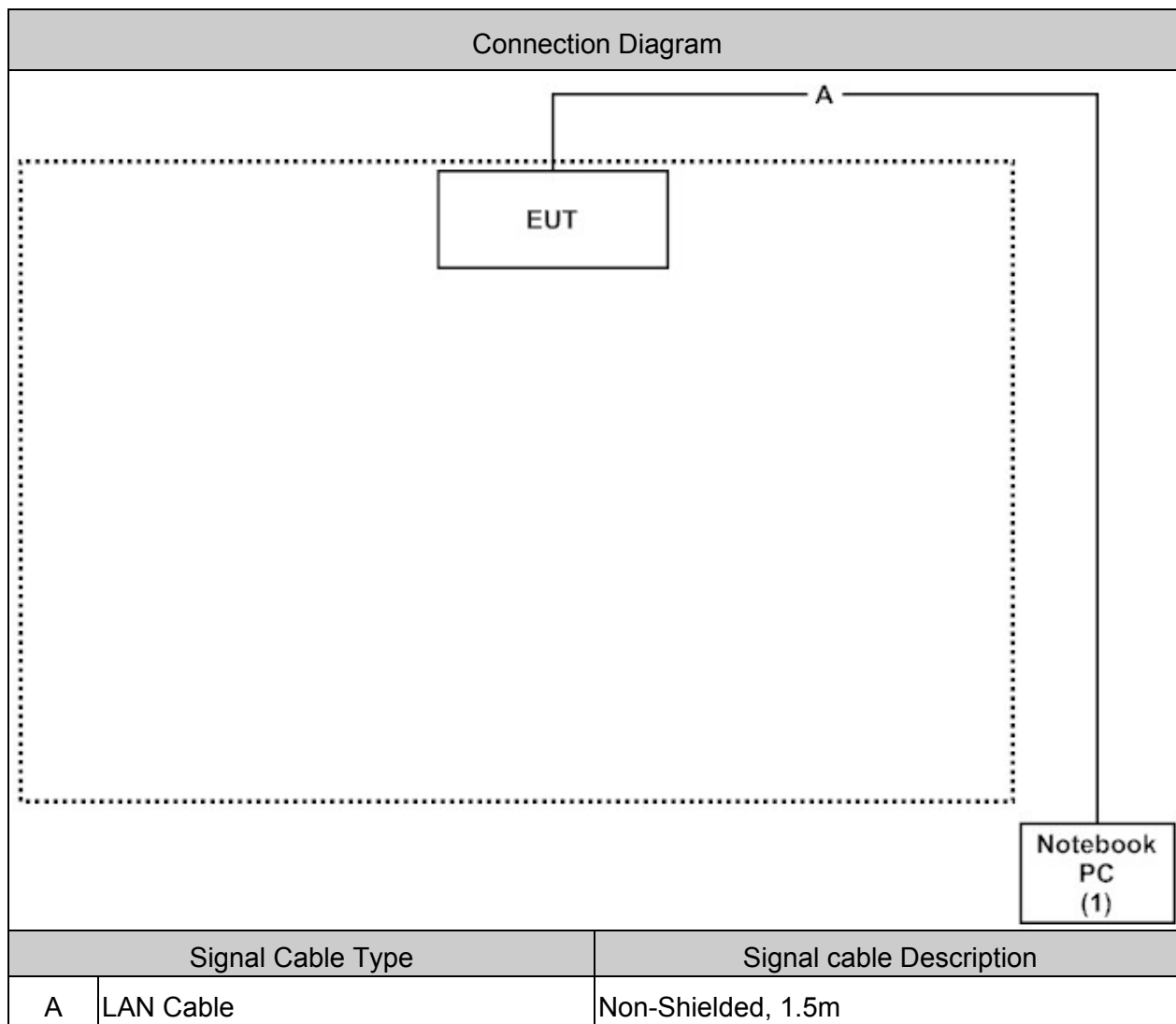
Test Items	Mode	Channel	Antenna	Result
Conducted Emission	11n(40MHz)	38	0+1+2	Complies
99 % & 26dB Bandwidth	a	36/44/48	0	Complies
	11n(20MHz)	36/44/48	0/1/2	Complies
	11n(40MHz)	38/46	0/1/2	Complies
Peak Transmit Output	a	36/44/48	0	Complies
	11n(20MHz)	36/44/48	0+1+2	Complies
	11n(40MHz)	38/46	0+1+2	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 (under1G)	a	44	0	Complies
	11n(20MHz)	44	0+1+2	Complies
	11n(40MHz)	44	0+1+2	Complies
Radiated Emission (above1G)	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	36/44/48	0	Complies
	11n(20MHz)	36/44/48	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

### 1.5. Configuration of tested System



## 1.6. EUT Exercise Software

1	Setup the EUT as shown in Section 1.5.
2	Execute the "CL1800_lab_Tool.exe" program 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	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



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



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

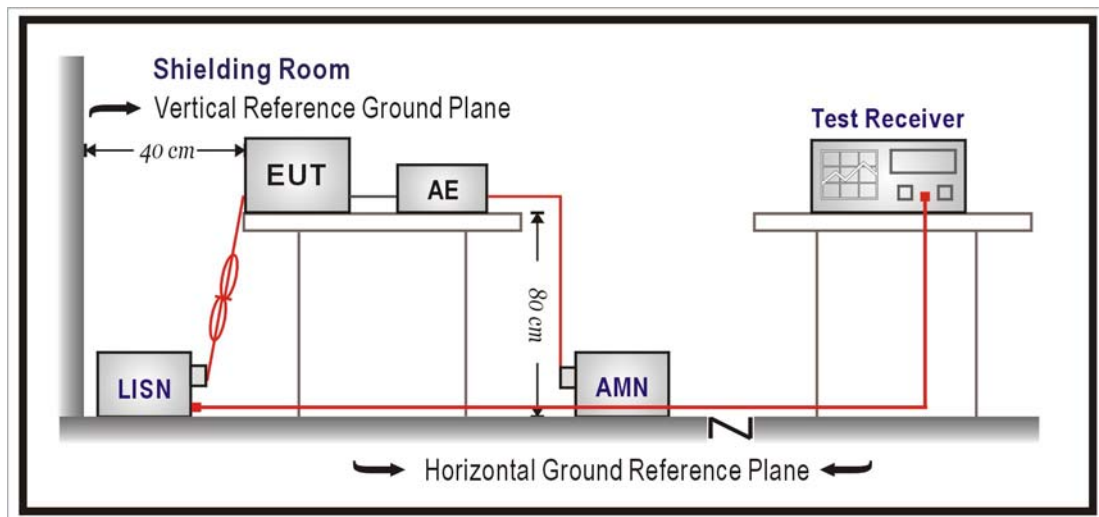
The following test equipments are used during the test:

Conducted Emission / SR3

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
LISN	R&S	ENV216	100096	2012/09/06
LISN	R&S	ESH3-Z5	836679/022	2013/02/06
Test Receiver	R&S	ESCS 30	825442/017	2013/01/01

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

2.2. Test Setup



**2.3. Limits**

<b>FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)</b>		
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. 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

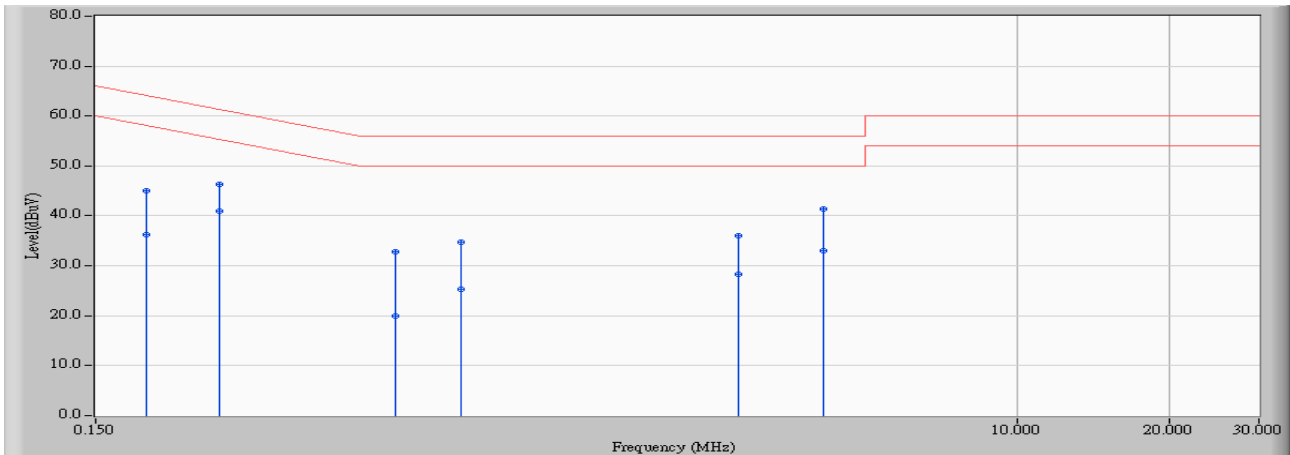
**2.6. Uncertainty**

The measurement uncertainty is defined as  $\pm 2.26$  dB.



2.7. Test Result

Site : SR3	Time : 2012/04/05 - 14:43
Limit : CISPR_B_00M_QP	Margin : 6
Probe : SR3_LISN(16A)-1_0907 - Line1	Power : AC120V/60Hz
EUT : Wireless Extender	Note : TX_802.11n(40MHz)_5190MHz

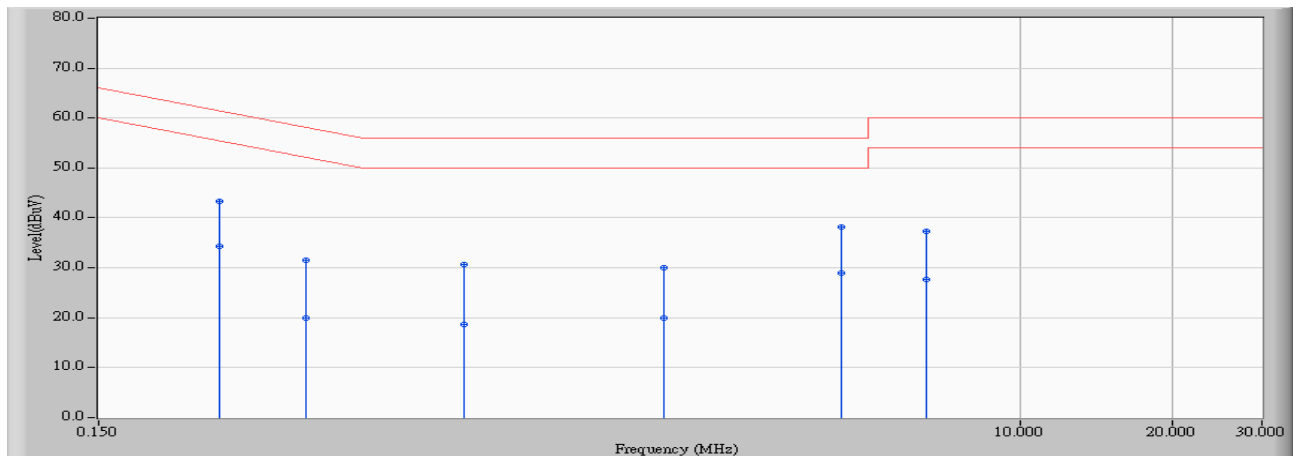


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	0.189	9.656	35.330	44.987	-19.091	64.078	QUASPEAK
2	0.189	9.656	26.570	36.227	-17.851	54.078	AVERAGE
3	0.263	9.666	36.760	46.426	-14.901	61.327	QUASPEAK
4	* 0.263	9.666	31.380	41.046	-10.281	51.327	AVERAGE
5	0.588	9.715	23.160	32.875	-23.125	56.000	QUASPEAK
6	0.588	9.715	10.260	19.975	-26.025	46.000	AVERAGE
7	0.795	9.748	25.030	34.778	-21.222	56.000	QUASPEAK
8	0.795	9.748	15.550	25.298	-20.702	46.000	AVERAGE
9	2.810	9.964	26.120	36.084	-19.916	56.000	QUASPEAK
10	2.810	9.964	18.410	28.374	-17.626	46.000	AVERAGE
11	4.115	10.019	31.390	41.409	-14.591	56.000	QUASPEAK
12	4.115	10.019	22.980	32.999	-13.001	46.000	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 : 2012/04/05 - 14:46
Limit : CISPR_B_00M_QP	Margin : 6
Probe : SR3_LISN(16A)-1_0907 - Line2	Power : AC120V/60Hz
EUT : Wireless Extender	Note : TX_802.11n(40MHz)_5190MHz



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	0.259	9.675	33.640	43.315	-18.136	61.451	QUASPEAK
2	0.259	9.675	24.540	34.215	-17.236	51.451	AVERAGE
3	0.384	9.693	21.940	31.633	-26.551	58.184	QUASPEAK
4	0.384	9.693	10.290	19.983	-28.201	48.184	AVERAGE
5	0.795	9.751	20.940	30.691	-25.309	56.000	QUASPEAK
6	0.795	9.751	9.000	18.751	-27.249	46.000	AVERAGE
7	1.970	9.926	20.050	29.975	-26.025	56.000	QUASPEAK
8	1.970	9.926	9.990	19.915	-26.085	46.000	AVERAGE
9	4.427	10.055	28.090	38.145	-17.855	56.000	QUASPEAK
10	* 4.427	10.055	18.940	28.995	-17.005	46.000	AVERAGE
11	6.502	10.117	27.260	37.377	-22.623	60.000	QUASPEAK
12	6.502	10.117	17.490	27.607	-22.393	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**

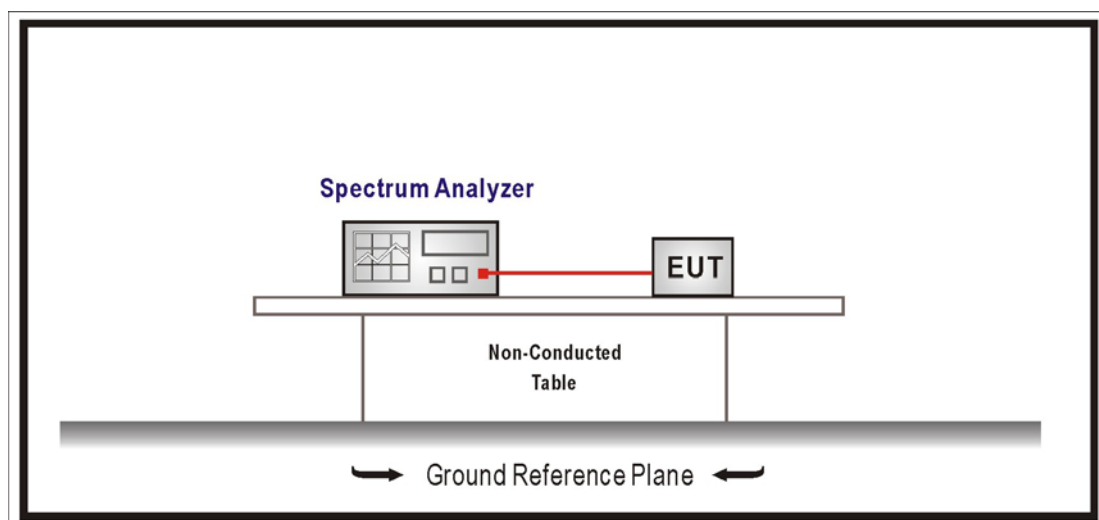
The following test equipments are used during the radiated emission tests:

**99% & 26dB Bandwidth / SR7**

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2013/02/19

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 U-NII test procedure of March 2012 KDB 789033. Set RBW 1% of the emission bandwidth, VBW equal to 3 times the RBW.

**3.5. Uncertainty**

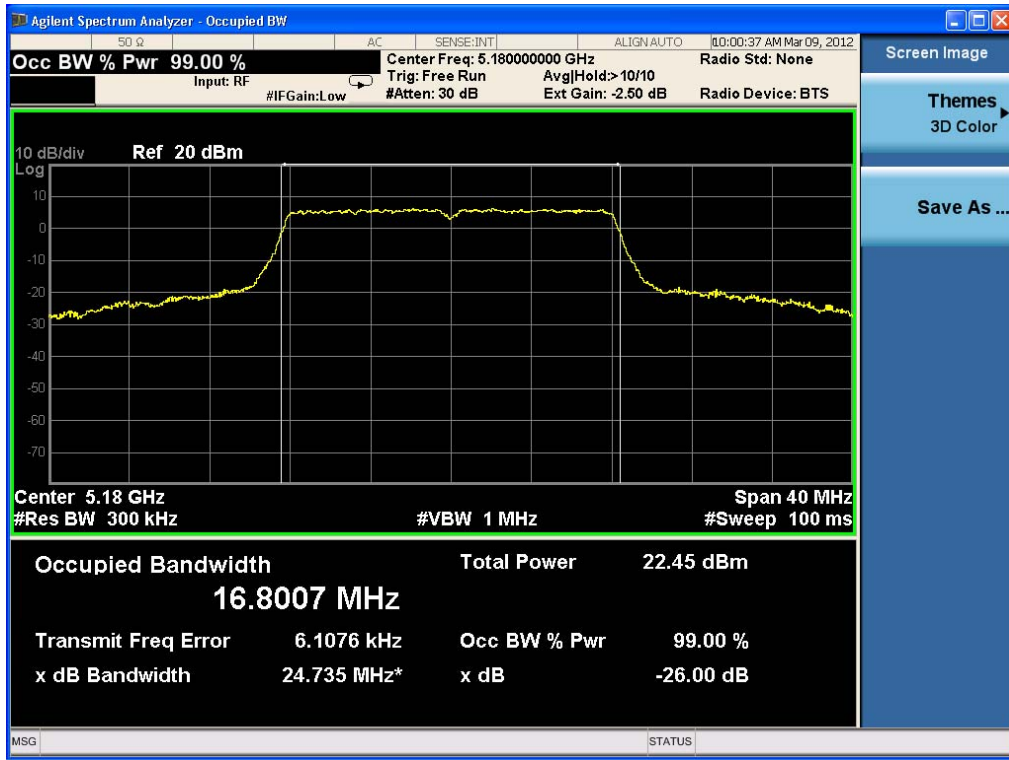
The measurement uncertainty is defined as  $\pm 150\text{Hz}$

**3.6. Test Result**

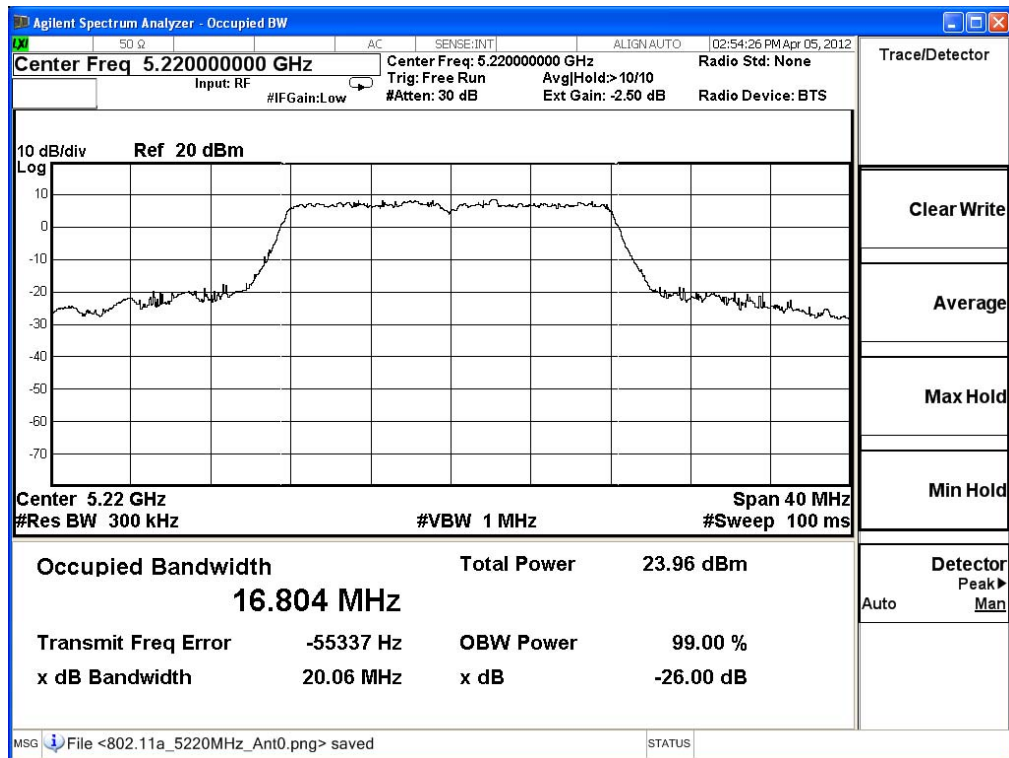
Product	Wireless Extender		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

802.11a					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
36	5180	24.735	16.800	--	NA
44	5220	20.060	16.804	--	NA
48	5240	20.110	16.784	--	NA

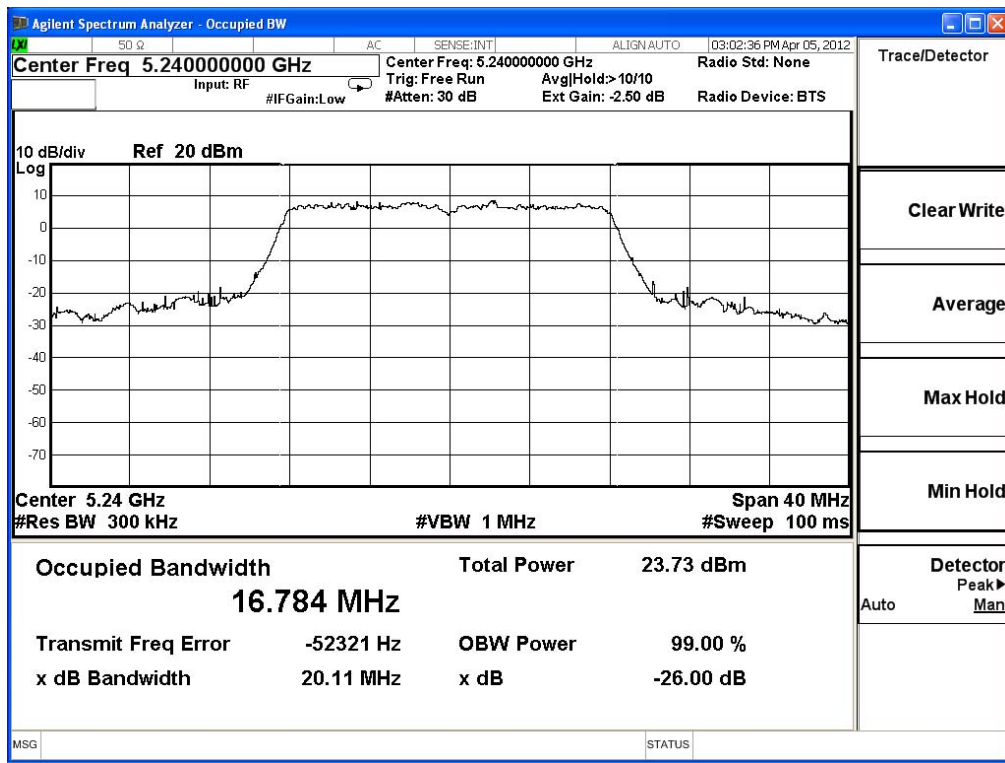
**99% & 26dB Bandwidth – Channel 36**



**99% & 26dB Bandwidth – Channel 44**



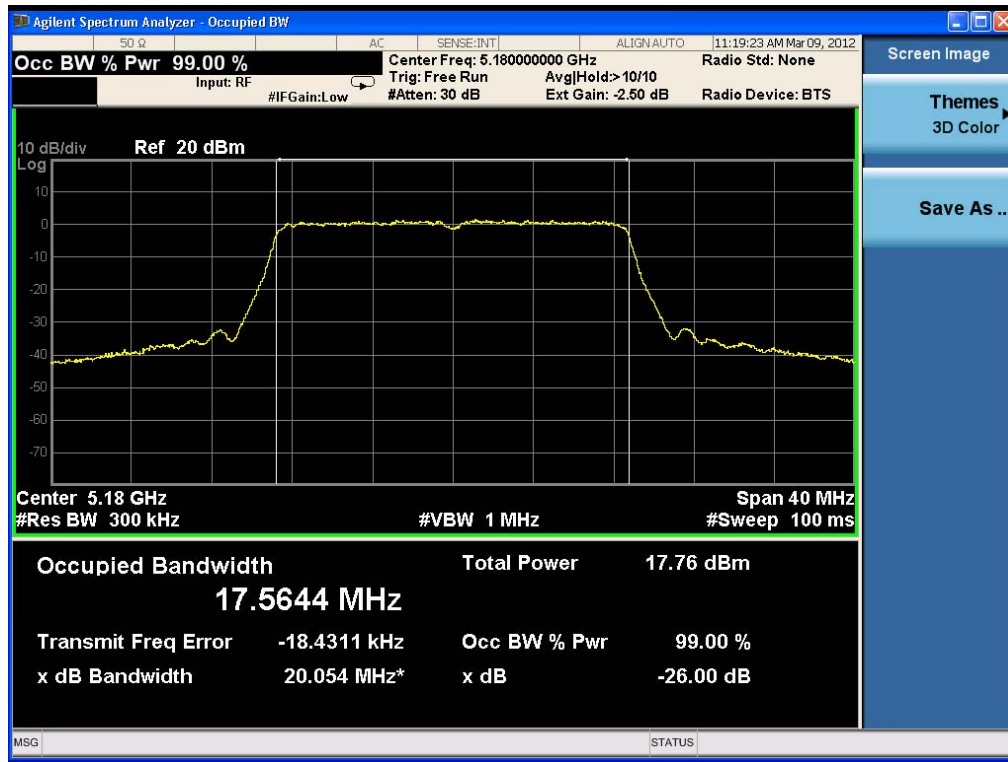
**99% & 26dB Bandwidth - Channel 48**



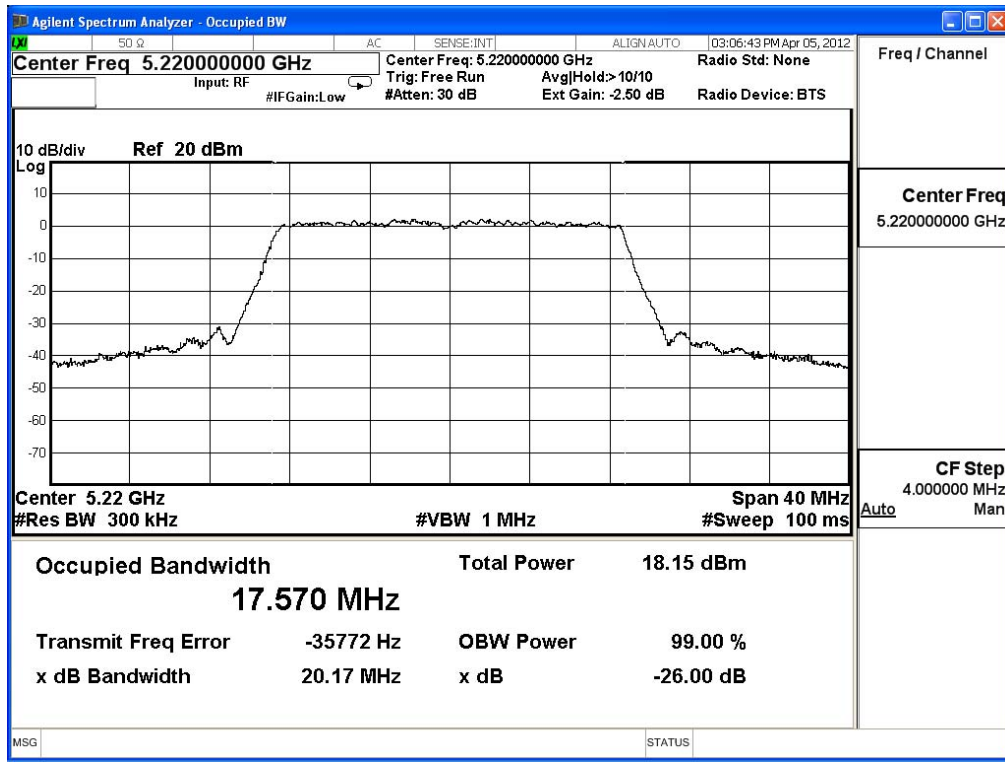
Product	Wireless Extender		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

IEEE 802.11n (20MHz), (ANT 0)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
36	5180	20.054	17.564	--	NA
44	5220	20.170	17.570	--	NA
48	5240	20.190	17.579	--	NA

**99% & 26dB Bandwidth – Channel 36**

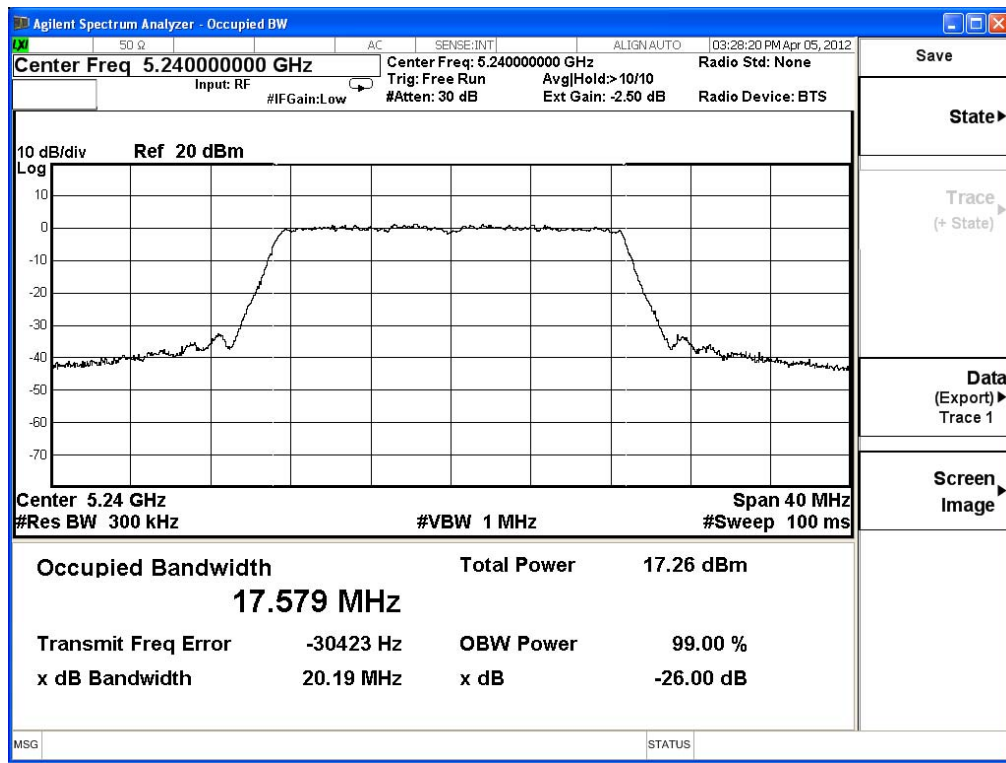


**99% & 26dB Bandwidth – Channel 44**





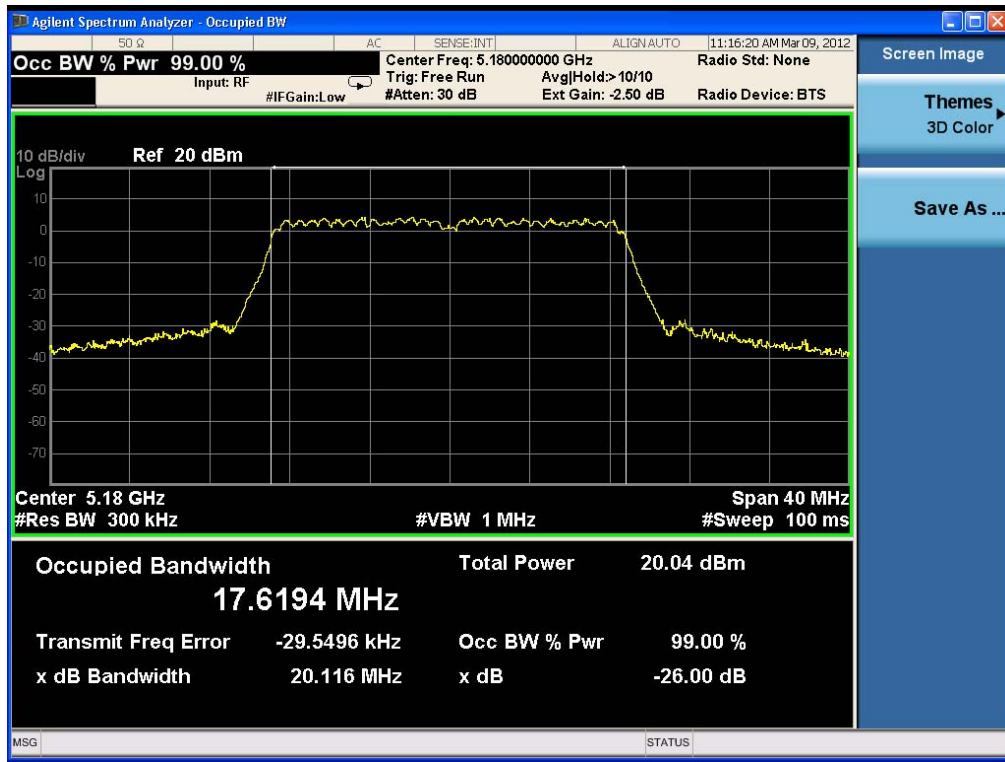
**99% & 26dB Bandwidth - Channel 48**



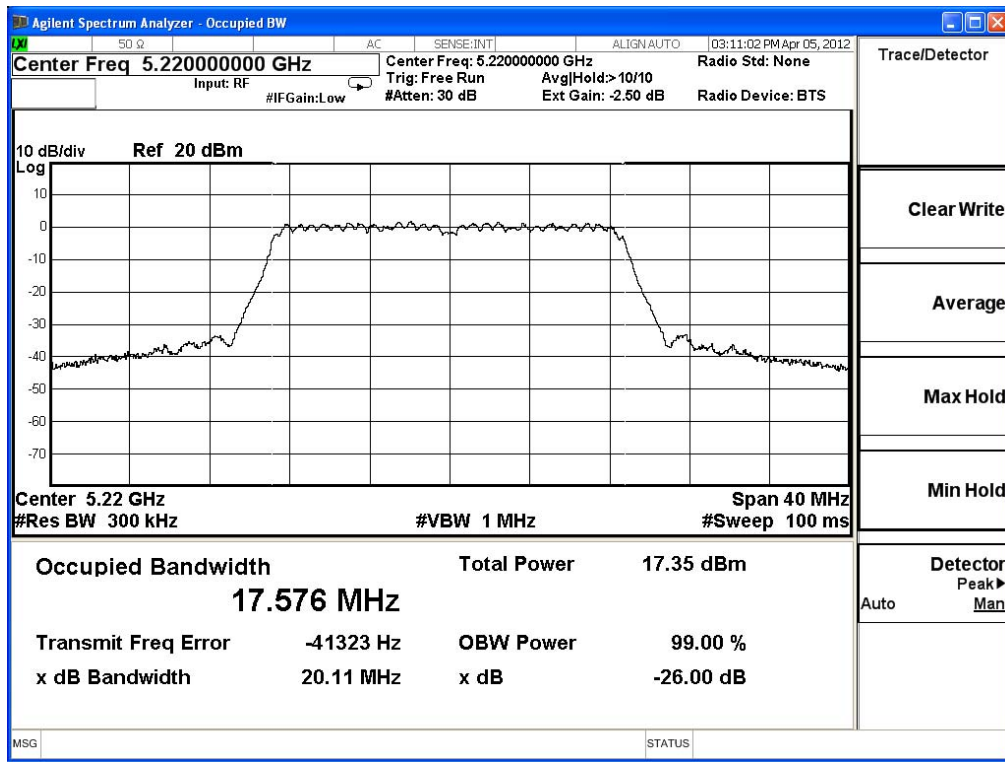
Product	Wireless Extender		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

IEEE 802.11n (20MHz), (ANT 1)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
36	5180	20.116	17.619	--	NA
44	5220	20.110	17.576	--	NA
48	5240	20.110	17.569	--	NA

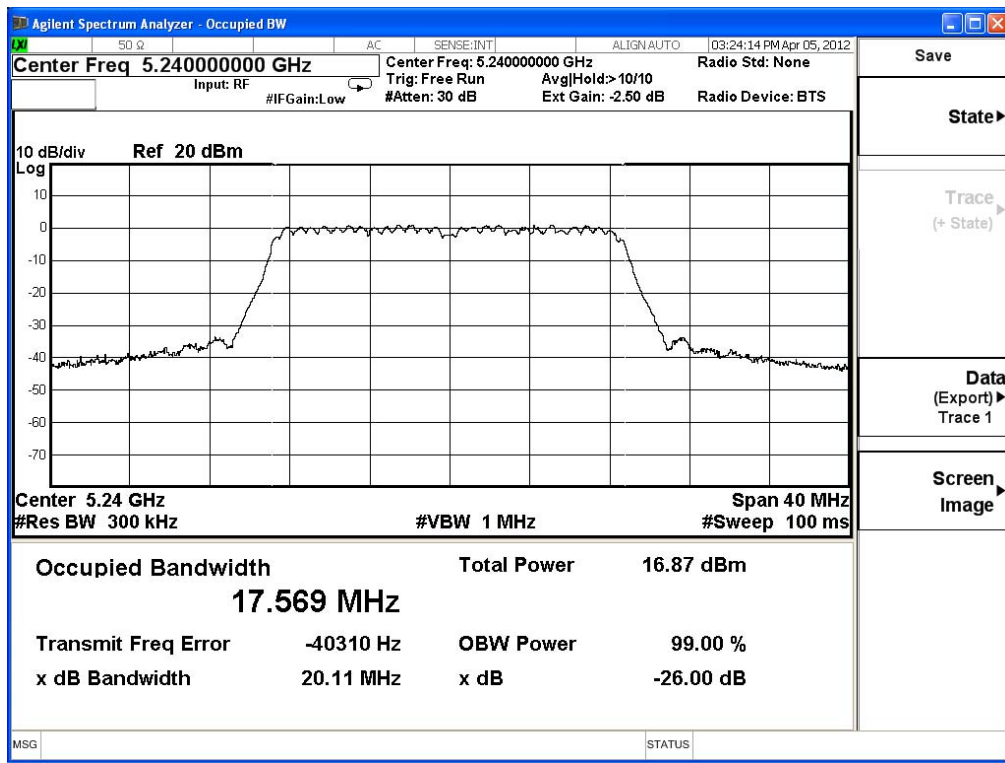
**99% & 26dB Bandwidth – Channel 36**



**99% & 26dB Bandwidth – Channel 44**



**99% & 26dB Bandwidth - Channel 48**



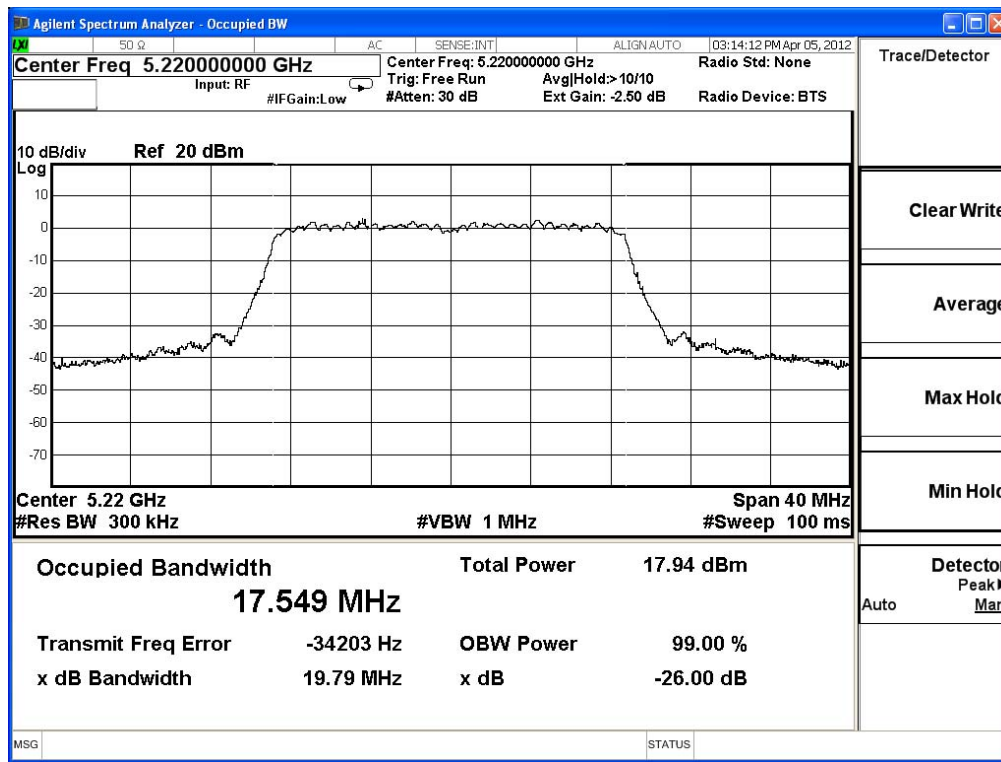
Product	Wireless Extender		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

IEEE 802.11n (20MHz), (ANT 2)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
36	5180	19.787	17.576	--	NA
44	5220	19.790	17.549	--	NA
48	5240	19.920	17.553	--	NA

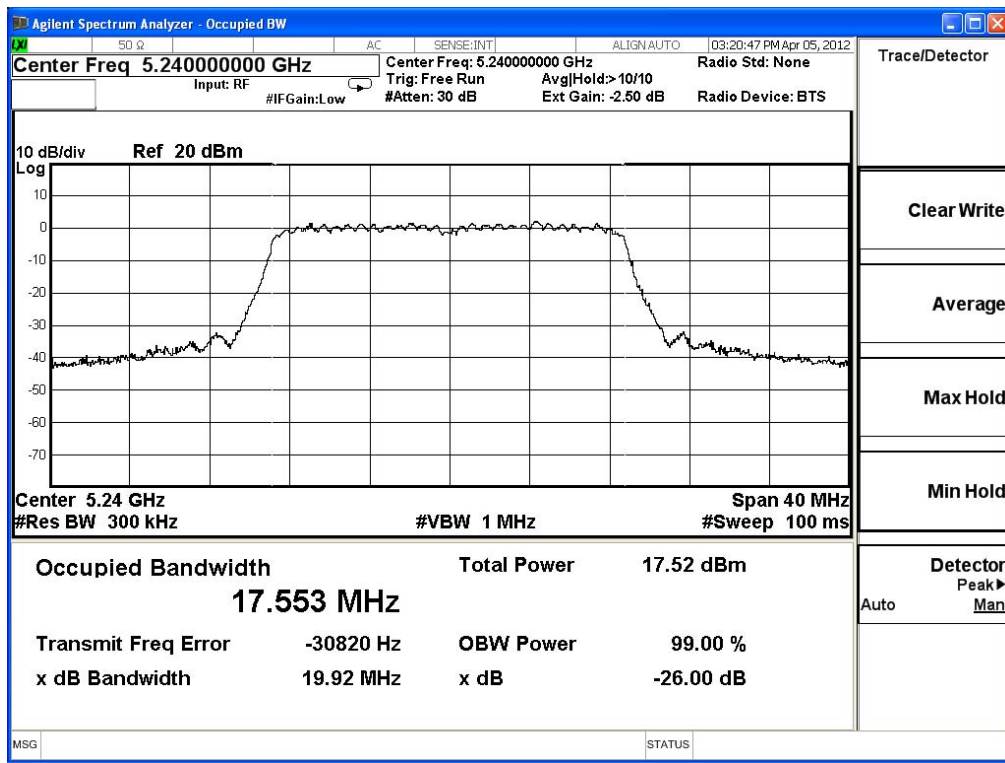
**99% & 26dB Bandwidth – Channel 36**



**99% & 26dB Bandwidth – Channel 44**



**99% & 26dB Bandwidth - Channel 48**

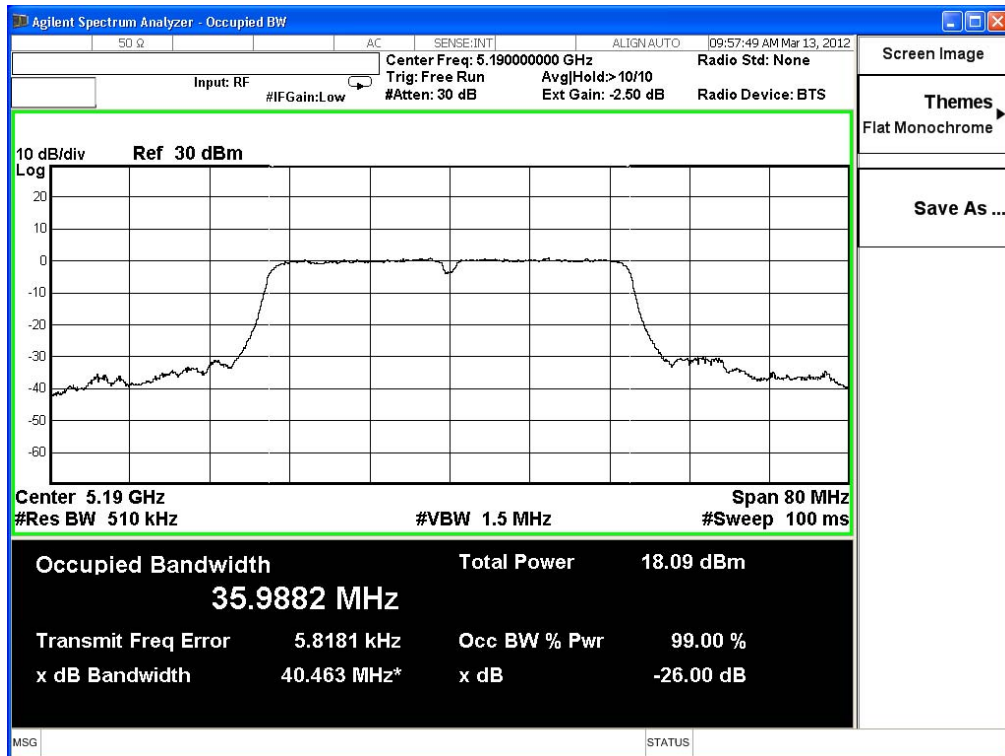


Product	Wireless Extender		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

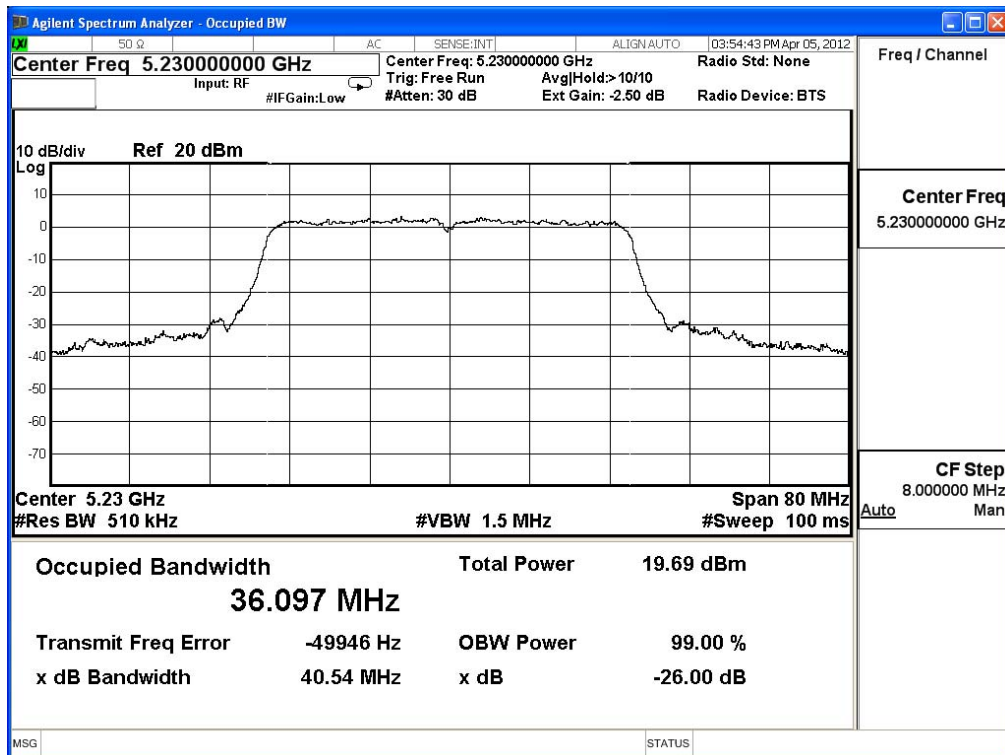
IEEE 802.11n (40MHz), (ANT 0)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
38	5190	40.463	35.988	--	NA
46	5230	40.540	36.097	--	NA



**99% & 26dB Bandwidth – Channel 38**



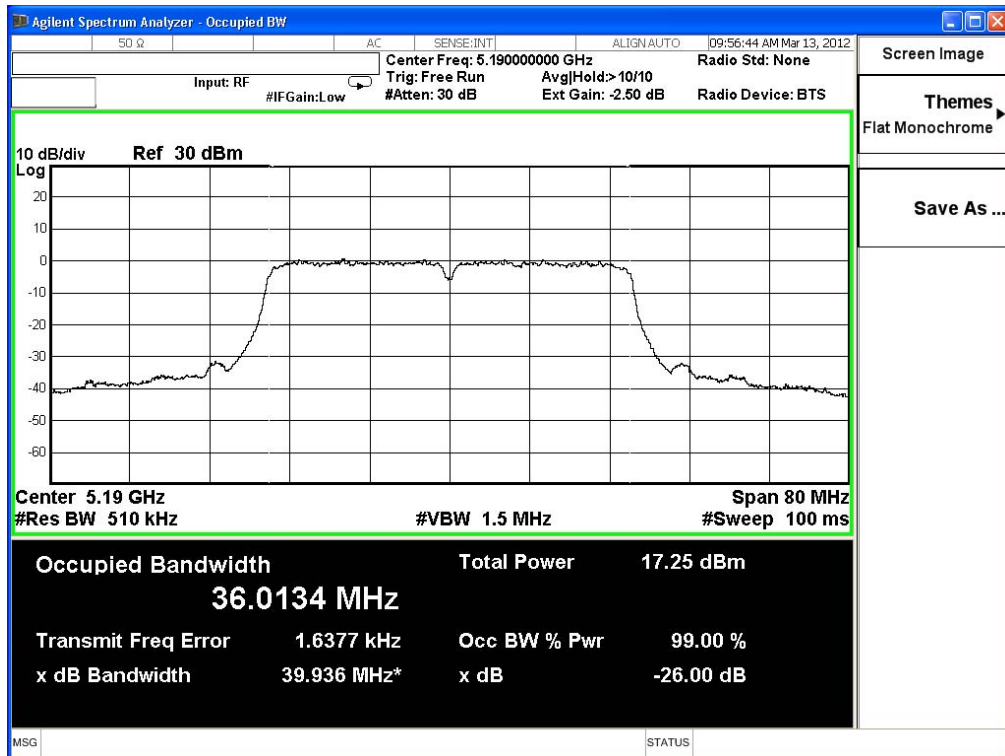
**99% & 26dB Bandwidth – Channel 46**



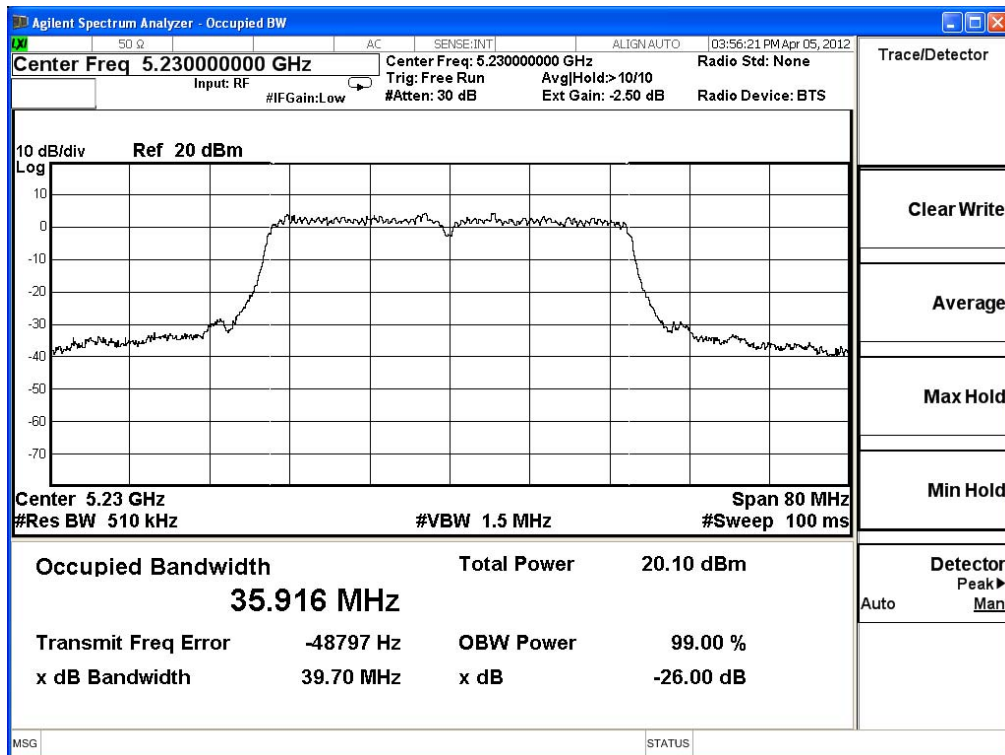
Product	Wireless Extender		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

IEEE 802.11n (40MHz), (ANT 1)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
38	5190	39.936	36.013	--	NA
46	5230	39.700	35.916	--	NA

**99% & 26dB Bandwidth – Channel 38**



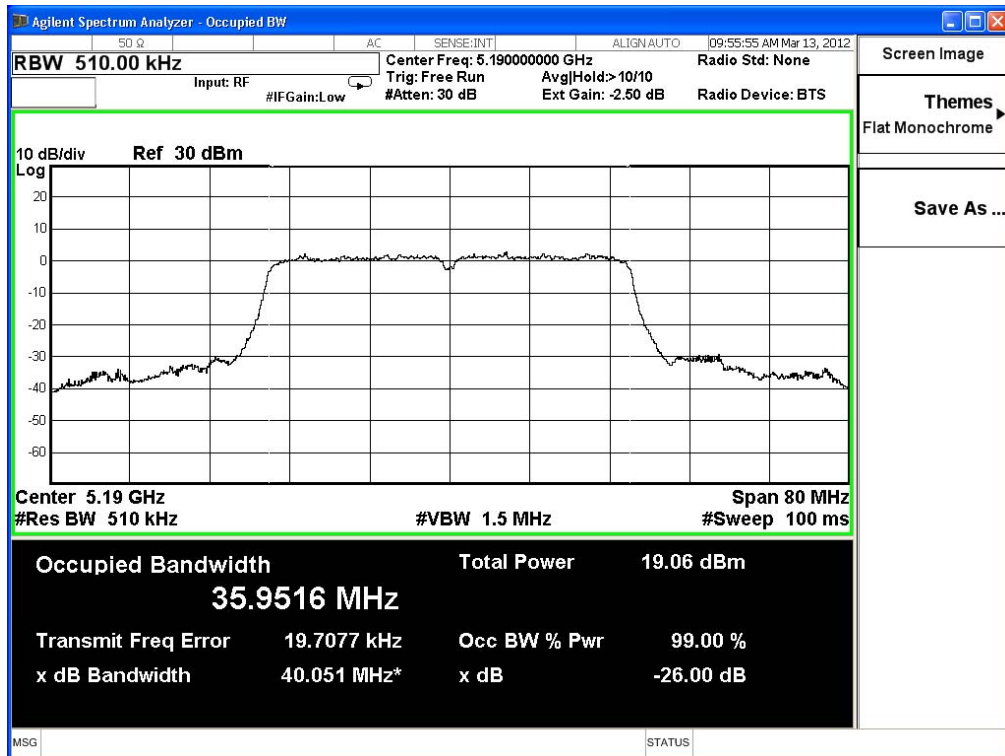
**99% & 26dB Bandwidth – Channel 46**



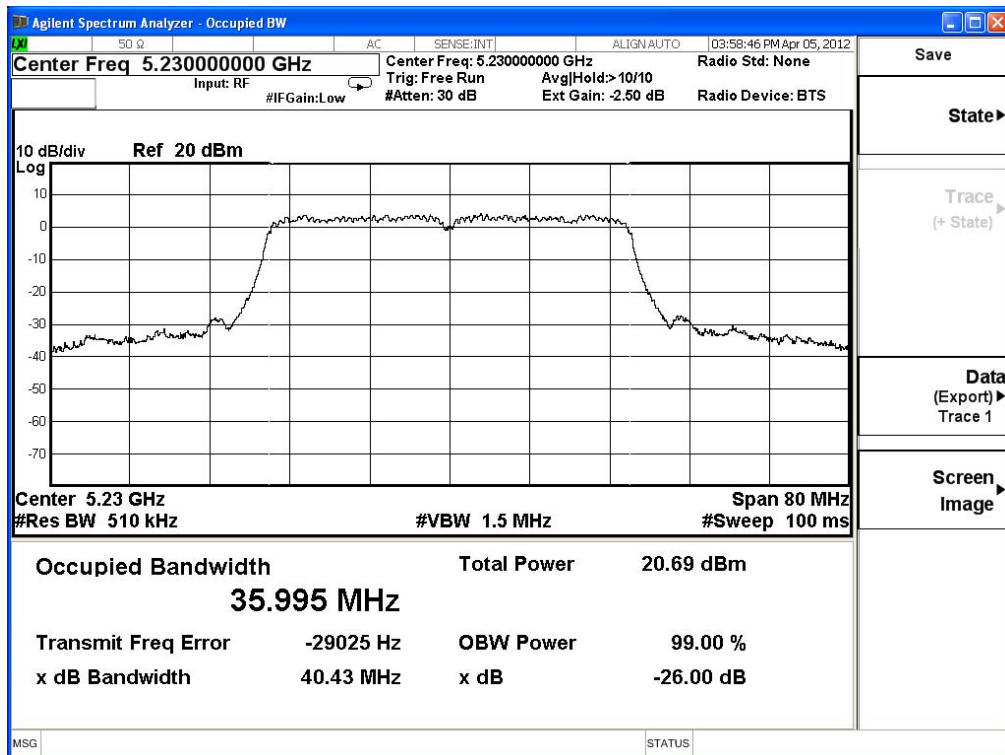
Product	Wireless Extender		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

IEEE 802.11n (40MHz), (ANT 2)					
Channel No.	Frequency (MHz)	26dB BW (MHz)	99 % OBW (MHz)	Required Limit (MHz)	Result
38	5190	40.051	35.952	--	NA
46	5230	40.430	35.995	--	NA

**99% & 26dB Bandwidth – Channel 38**



**99% & 26dB Bandwidth – Channel 46**



**4. Peak Transmit Output**

**4.1. Test Equipment**

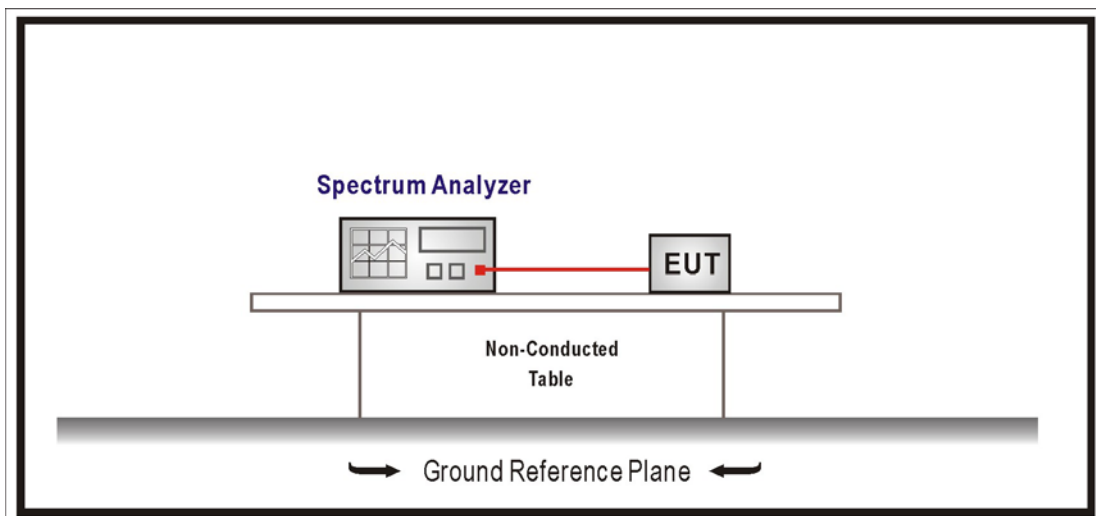
The following test equipments are used during the radiated emission tests:

**Peak Transmit Output / SR7**

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2013/02/19

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  $4 \text{ dBm} + 10\log B$ , 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  $11 \text{ dBm} + 10\log B$ , 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  $17 \text{ dBm} + 10\log B$ , 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 U-NII test procedure of March 2012 KDB 789033 for compliance to FCC 47CFR Subpart E requirements. The Method SA-1 of the Maximum conducted output power was used.

Set RBW=1MHz, VBW=3MHz with RMS 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  $\pm 1.27 \text{ dB}$

4.6. Test Result

Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

802.11a ANT 0 (MAIN)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	24.735	16.83	≤17	≤ 17.93	Pass
44	5220	20.060	16.91	≤ 17	≤ 17.02	Pass
48	5240	20.110	16.80	≤ 17	≤ 17.03	Pass

The worst emission of data rate is 6 Mbps.

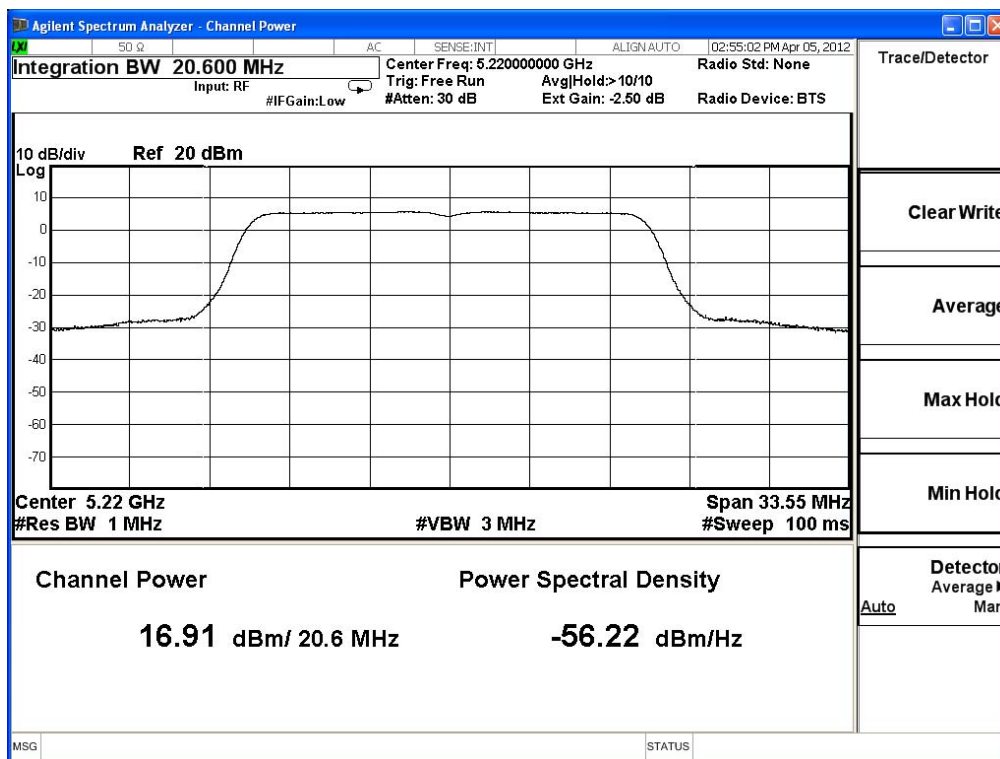
Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
36	5180	16.83	--	--	--	--	--	--	≤17dBm
44	5220	16.91	16.82	16.80	16.71	16.88	16.86	16.87	≤17dBm
48	5240	16.80	--	--	--	--	--	--	≤17dBm



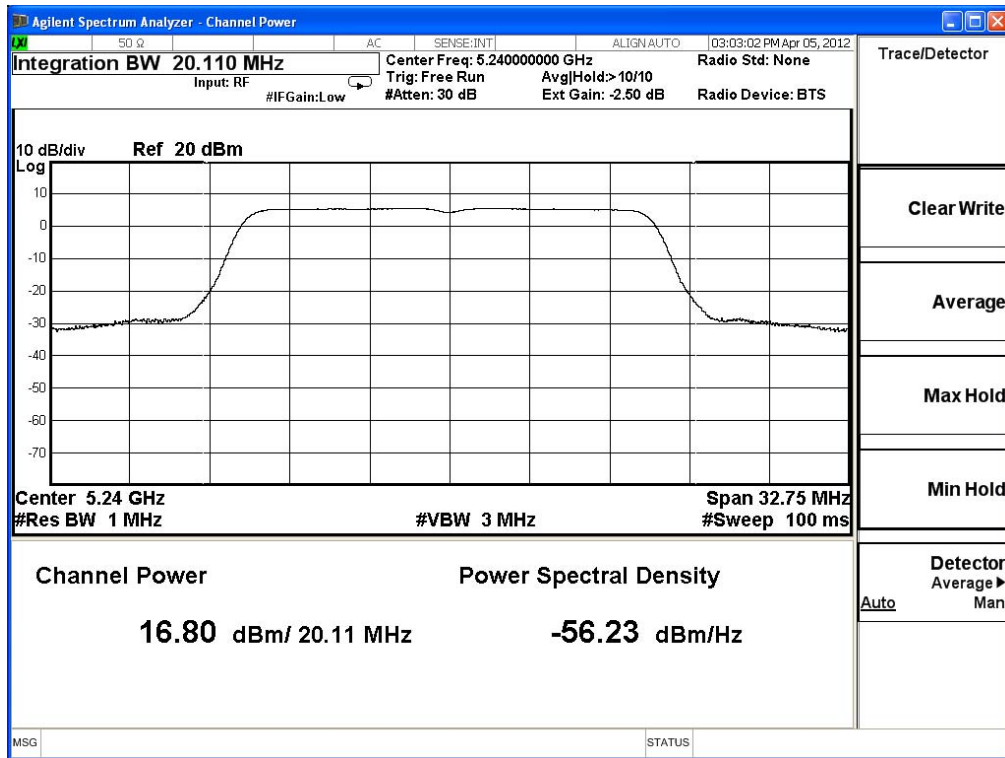
**Peak transmit Power - Channel 36**



**Peak transmit Power - Channel 44**



**Peak transmit Power - Channel 48**



Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/07/09	Test Site	SR7

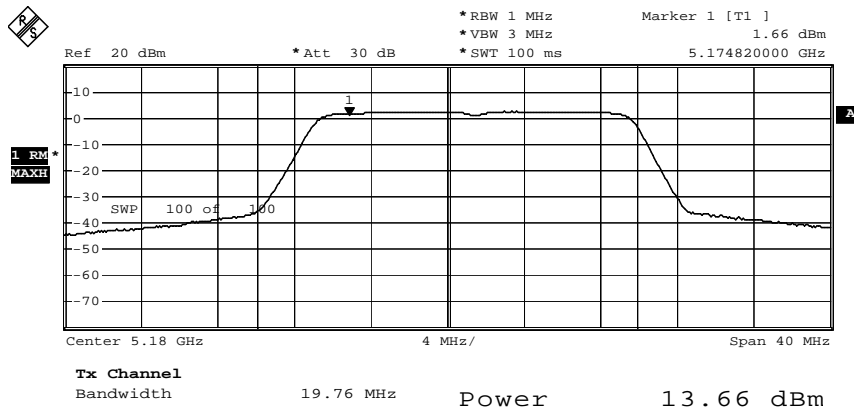
## 802.11a ANT 0 (AUX)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	19.760	13.66	≤ 17	≤ 16.96	Pass
44	5220	19.520	14.08	≤ 17	≤ 16.90	Pass
48	5240	19.680	14.03	≤ 17	≤ 16.94	Pass

The worst emission of data rate is 6 Mbps.

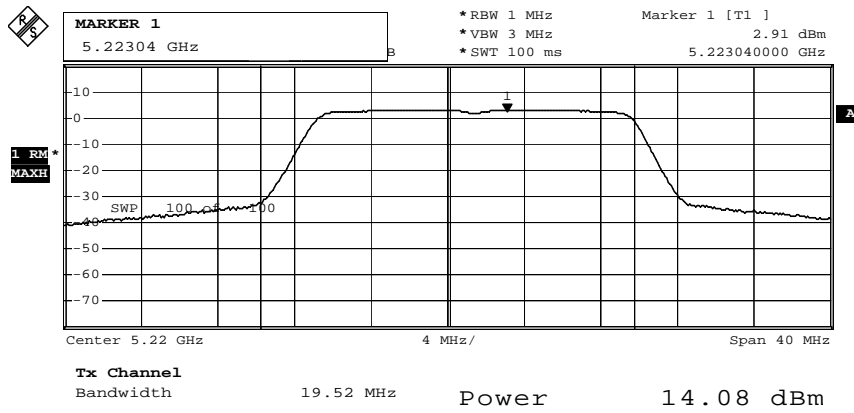
Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
36	5180	13.66	--	--	--	--	--	--	≤17dBm
44	5220	14.08	14.02	14.00	14.01	14.05	14.03	14.00	≤17dBm
48	5240	14.03	--	--	--	--	--	--	≤17dBm

**Peak transmit Power - Channel 36**



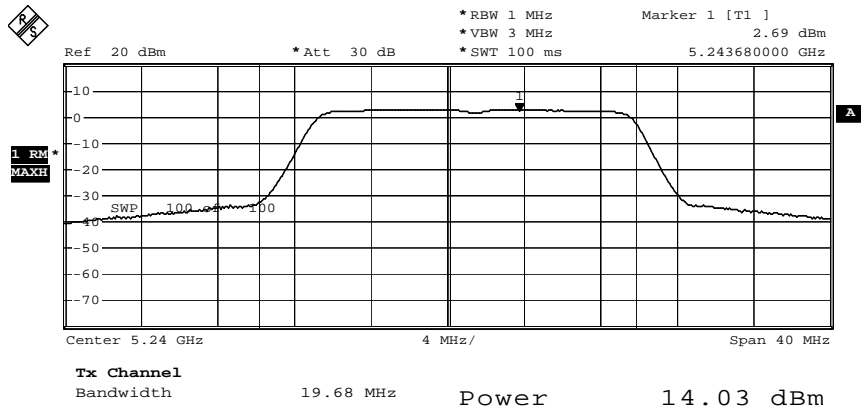
Date: 9.JUL.2012 10:36:55

**Peak transmit Power - Channel 44**



Date: 9.JUL.2012 10:25:55

**Peak transmit Power - Channel 48**



Date: 9.JUL.2012 10:31:07

Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

IEEE 802.11n (20MHz), ANT 0 (MAIN)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	20.054	12.02	≤17	≤ 17.12	Pass
44	5220	20.170	10.36	≤ 17	≤ 17.04	Pass
48	5240	20.110	9.66	≤ 17	≤ 17.03	Pass

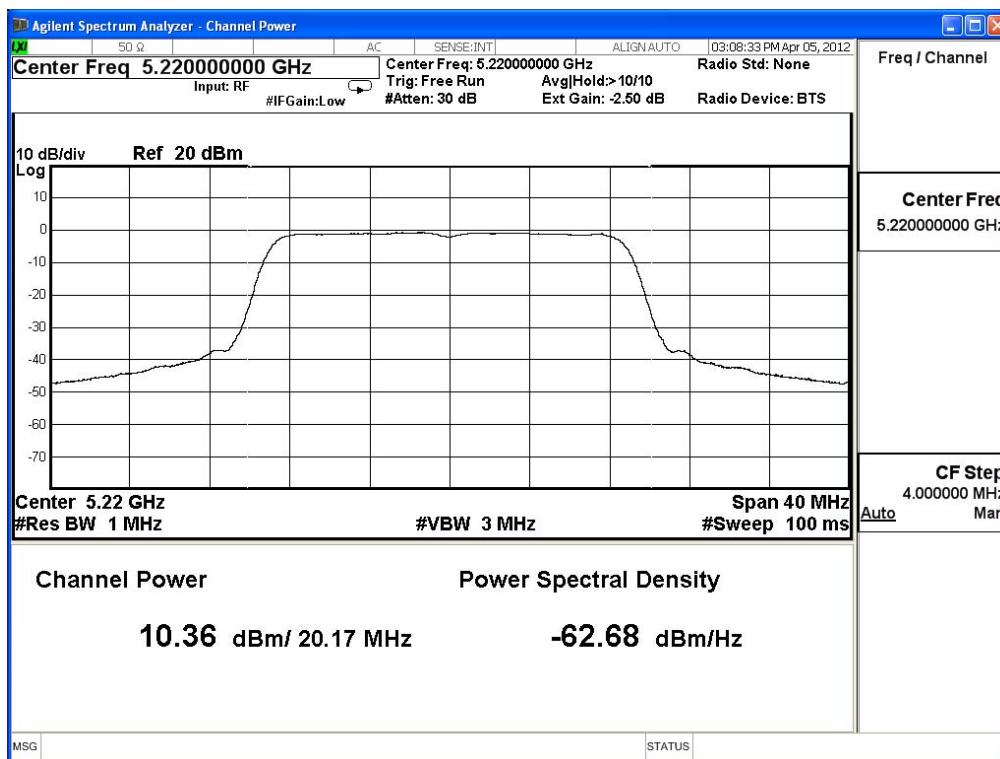
The worst emission of data rate is 19.5Mbps.

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		19.5	39	58.5	78	117	156	175.5	195	
36	5180	12.02	12.01	12.00	11.98	11.99	11.96	11.97	11.95	≤17dBm
44	5220	10.36	--	--	--	--	--	--	--	≤17dBm
48	5240	9.66	--	--	--	--	--	--	--	≤17dBm

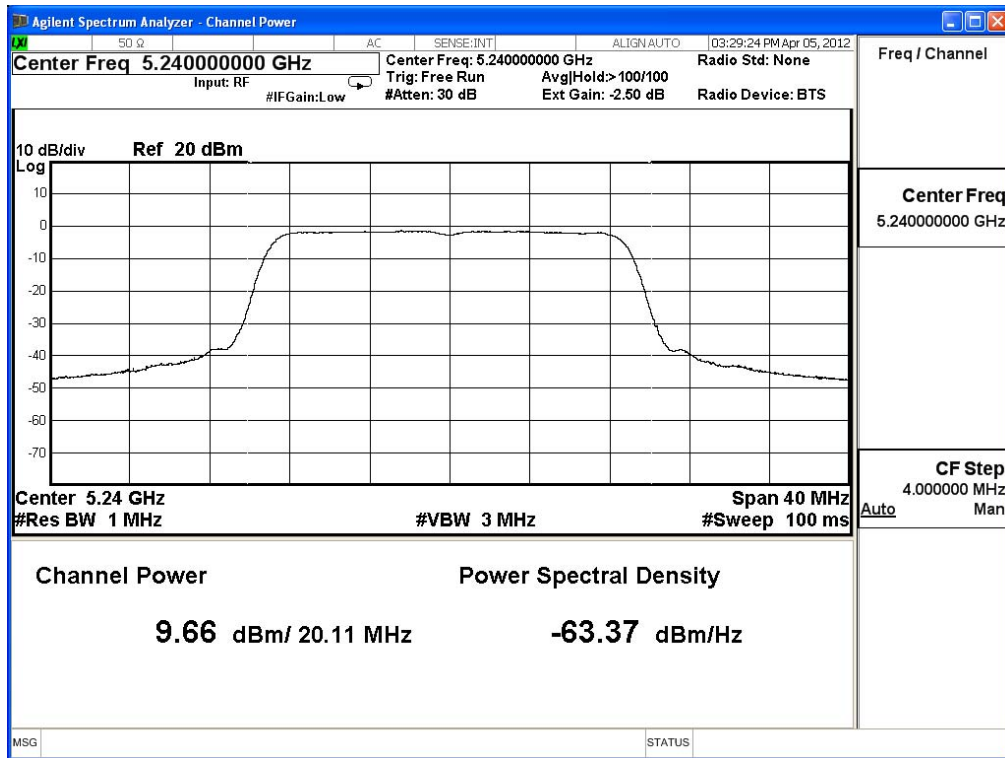
**Peak transmit Power - Channel 36**



**Peak transmit Power - Channel 44**



**Peak transmit Power - Channel 48**





Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/07/09	Test Site	SR7

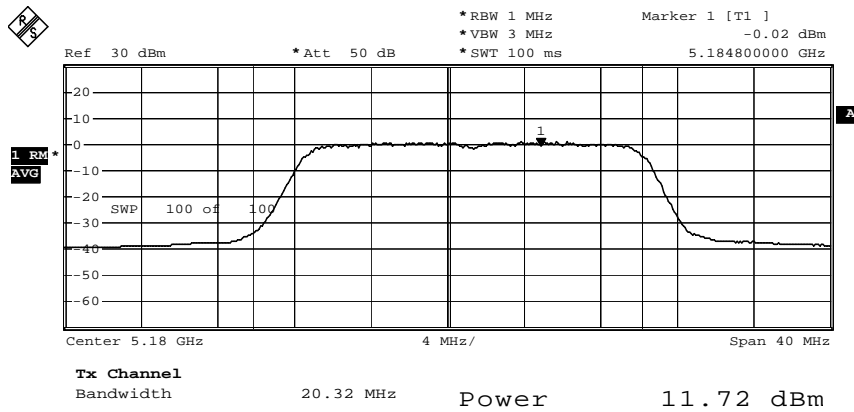
IEEE 802.11n (20MHz), ANT 0 (AUX)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	20.320	11.72	≤ 17	≤17.07	Pass
44	5220	20.400	10.34	≤ 17	≤17.09	Pass
48	5240	20.480	9.59	≤ 17	≤ 17.11	Pass

The worst emission of data rate is 19.5Mbps.

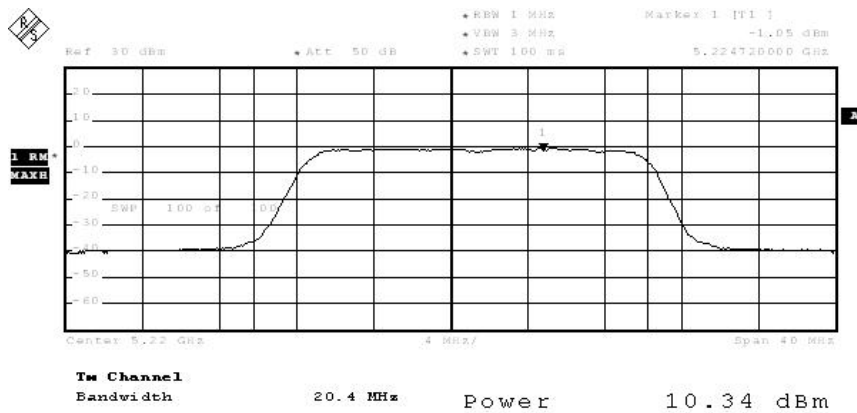
Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		19.5	39	58.5	78	117	156	175.5	195	
36	5180	11.72	11.71	11.70	10.98	10.97	10.95	10.90	10.91	≤17dBm
44	5220	10.34	--	--	--	--	--	--	--	≤17dBm
48	5240	9.59	--	--	--	--	--	--	--	≤17dBm

**Peak transmit Power - Channel 36**



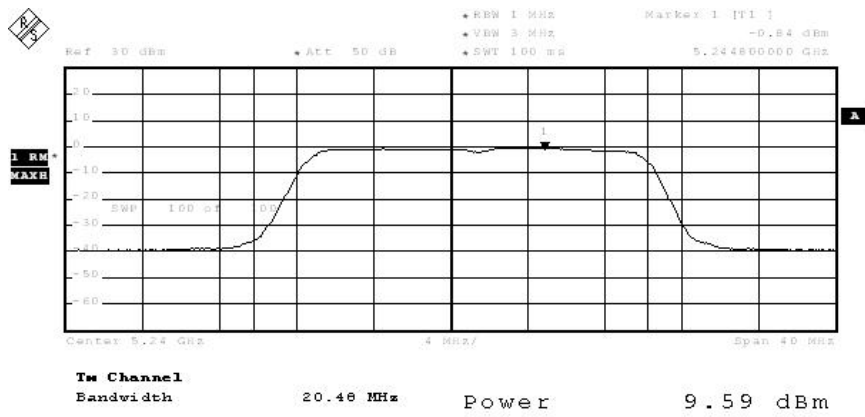
Date: 9.JUL.2012 09:21:48

**Peak transmit Power - Channel 44**



Date: 9.JUL.2012 09:34:04

**Peak transmit Power - Channel 48**



Date: 9.JUL.2012 09:45:17

Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

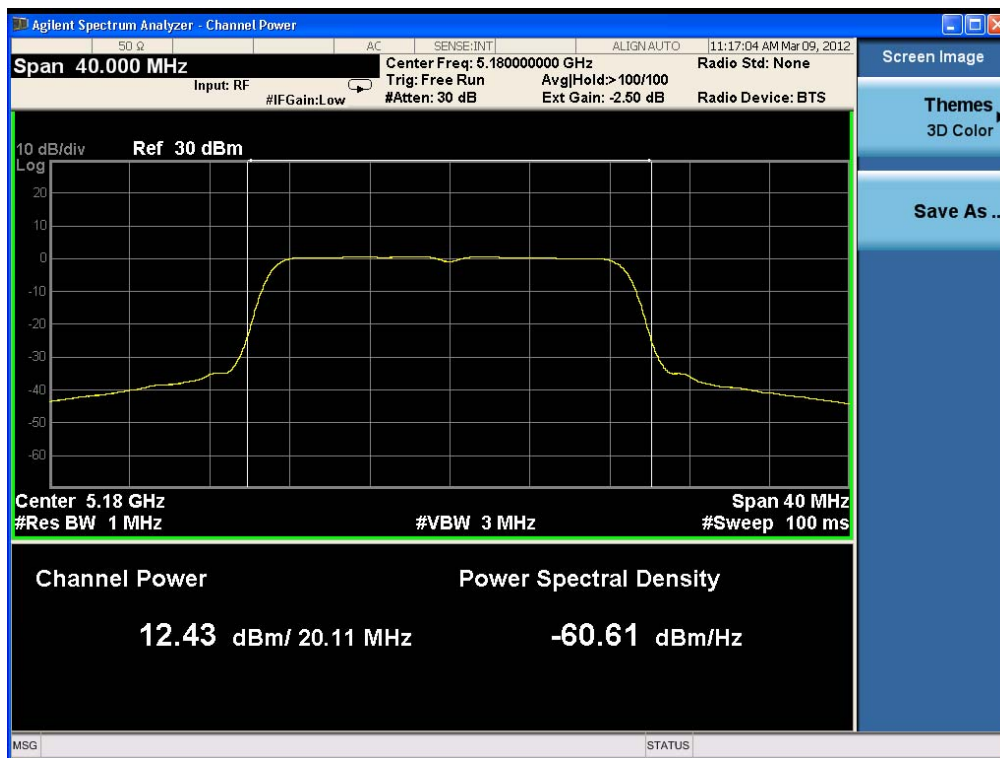
IEEE 802.11n (20MHz), (ANT 1)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	20.116	12.43	≤17	≤ 17.03	Pass
44	5220	20.110	9.52	≤ 17	≤ 17.03	Pass
48	5240	20.110	8.99	≤ 17	≤ 17.03	Pass

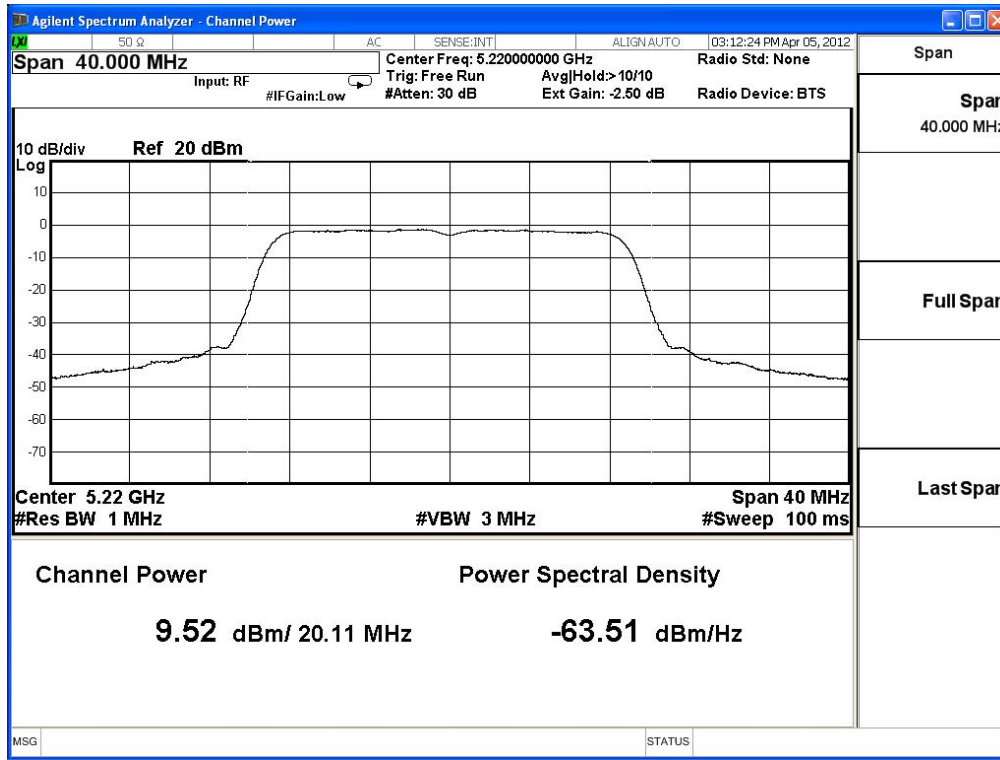
The worst emission of data rate is 19.5Mbps.

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		19.5	39	58.5	78	117	156	175.5	195	
36	5180	12.43	12.41	12.42	12.40	12.38	12.39	12.37	12.36	≤17dBm
44	5220	9.52	--	--	--	--	--	--	--	≤17dBm
48	5240	8.99	--	--	--	--	--	--	--	≤17dBm

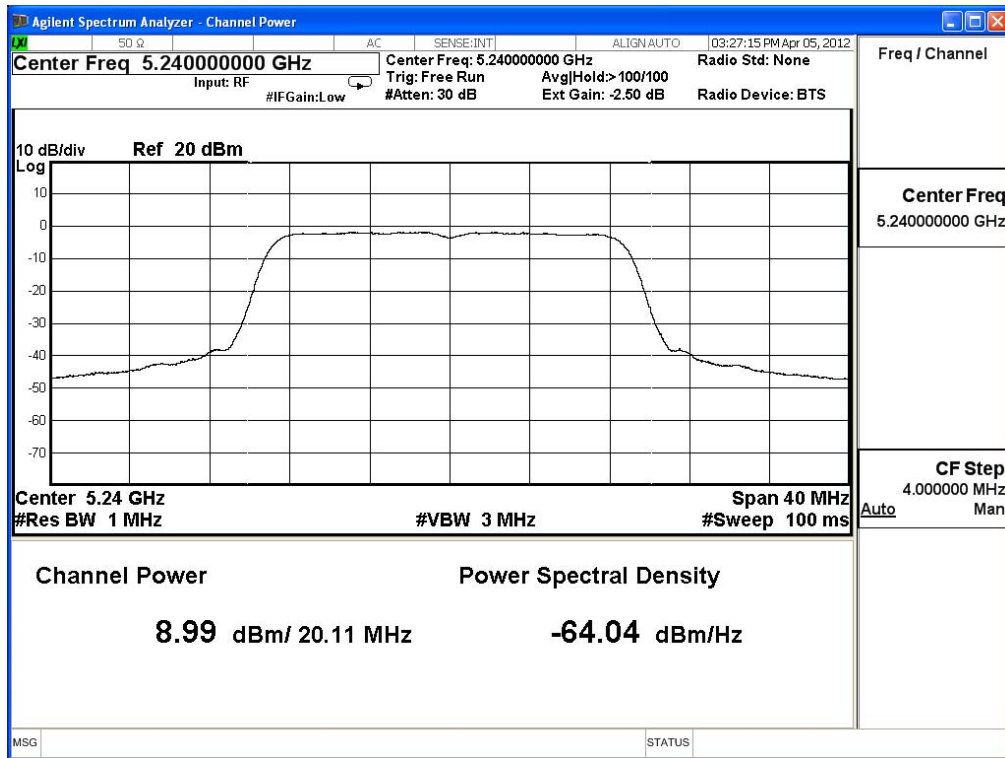
**Peak transmit Power - Channel 36**



**Peak transmit Power - Channel 44**



**Peak transmit Power - Channel 48**



Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

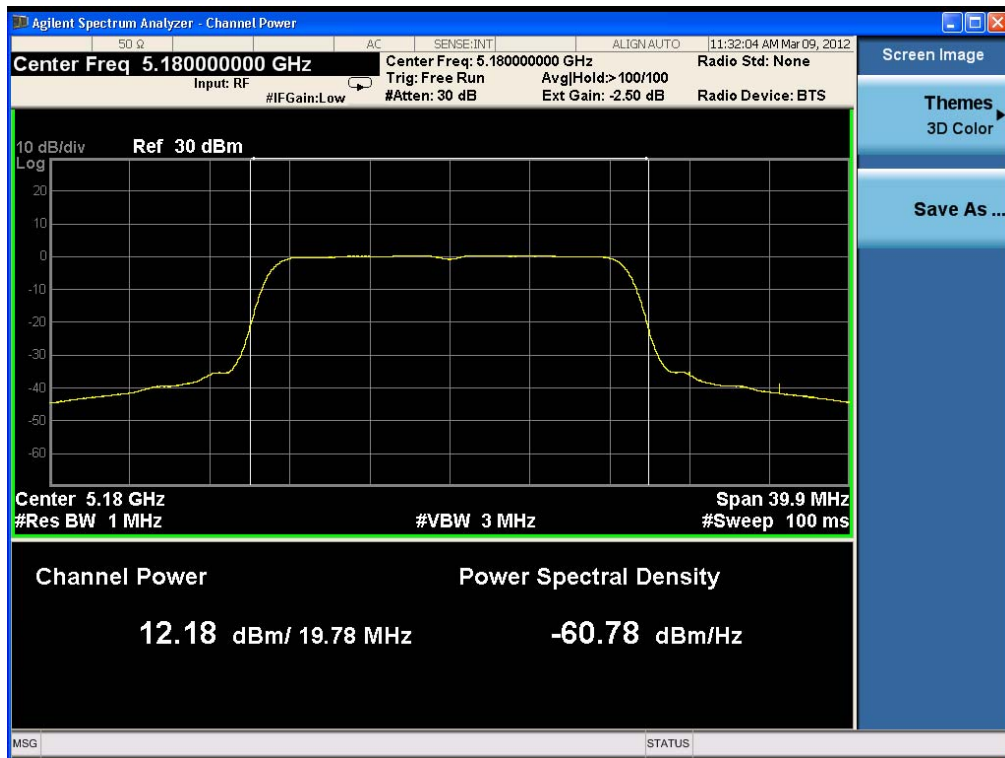
## IEEE 802.11n (20MHz), (ANT 2)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	19.787	12.18	≤17	≤ 16.96	Pass
44	5220	19.790	10.04	≤ 17	≤ 16.96	Pass
48	5240	19.920	9.79	≤ 17	≤16.99	Pass

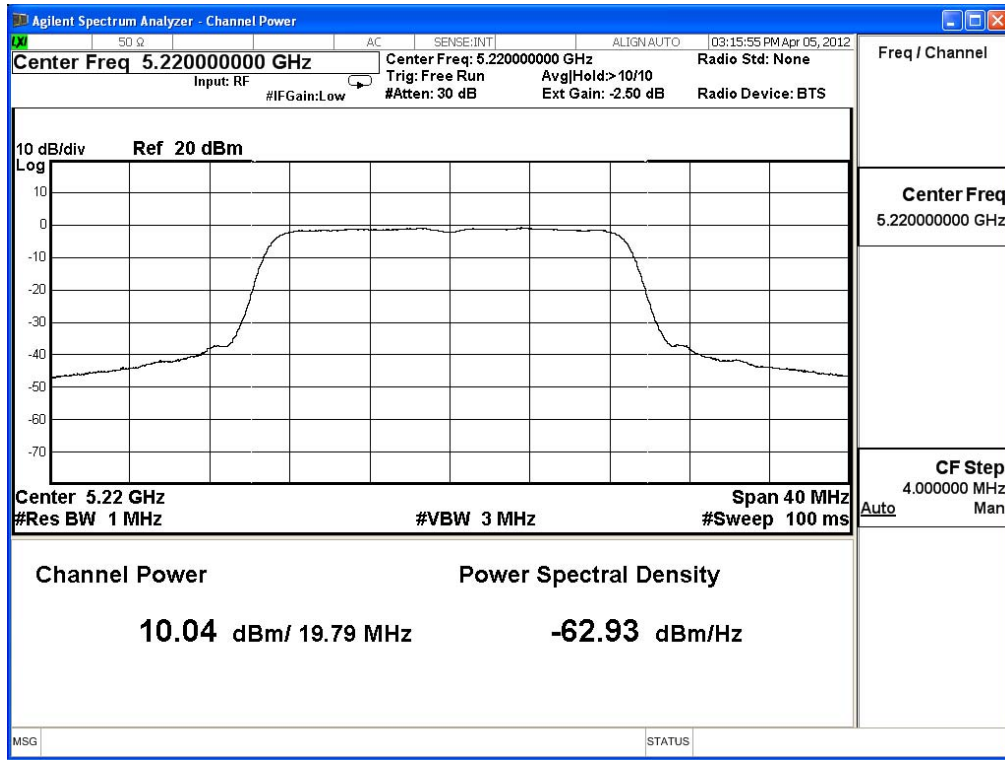
The worst emission of data rate is 19.5Mbps.

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		19.5	39	58.5	78	117	156	175.5	195	
36	5180	12.18	12.16	12.17	12.15	12.13	12.14	12.15	12.11	≤17dBm
44	5220	10.04	--	--	--	--	--	--	--	≤17dBm
48	5240	9.79	--	--	--	--	--	--	--	≤17dBm

**Peak transmit Power - Channel 36**

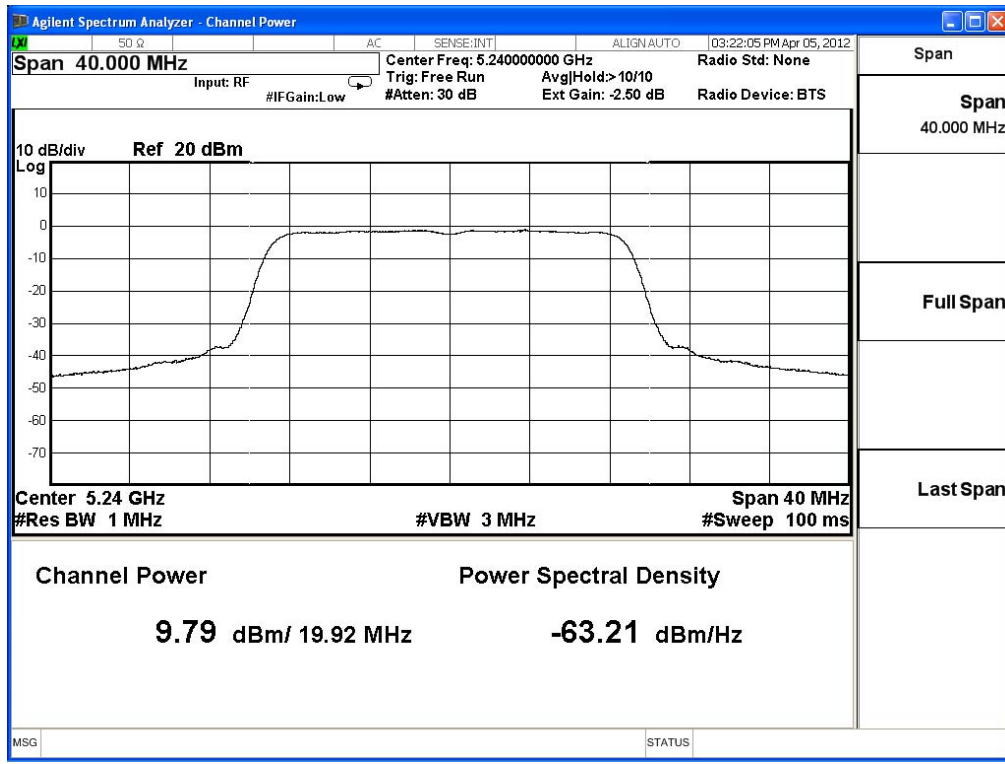


**Peak transmit Power - Channel 44**





**Peak transmit Power - Channel 48**



Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	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	16.98	49.89	≤17	Pass
44	5220	14.76	29.92	≤ 17	Pass
48	5240	14.27	26.73	≤ 17	Pass

Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

IEEE 802.11n (40MHz), ANT 0 (MAIN)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
38	5190	40.463	11.76	≤17	≤20.07	Pass
46	5230	40.540	11.77	≤ 17	≤ 20.07	Pass

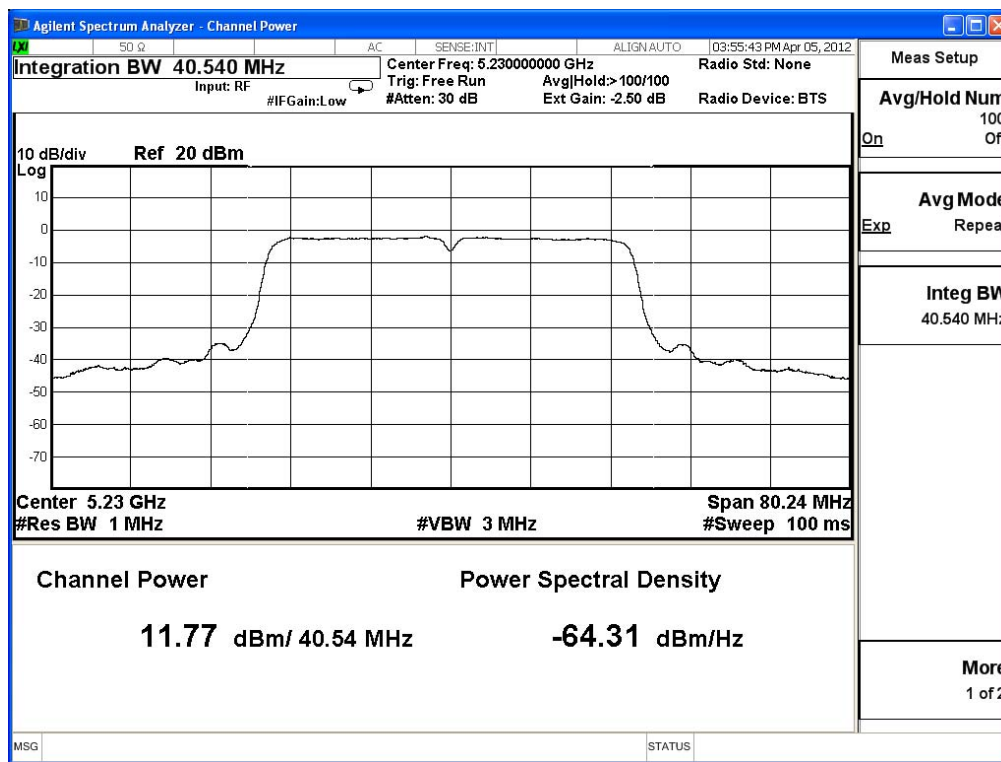
The worst emission of data rate is 40.5 Mbps

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
38	5190	11.76	--	--	--	--	--	--	--	≤17dBm
46	5230	11.77	11.75	11.76	11.73	11.74	11.72	11.70	11.71	≤17dBm

**Peak transmit Power - Channel 38**



**Peak transmit Power - Channel 46**



Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/07/09	Test Site	SR7

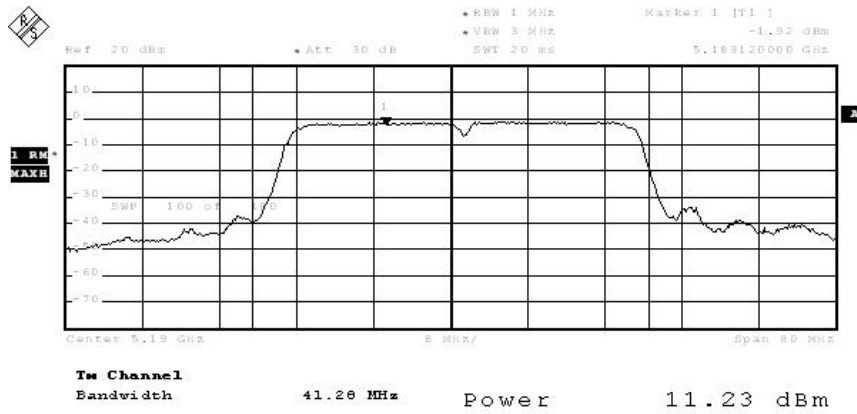
IEEE 802.11n (40MHz), (ANT 0) (AUX)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
38	5190	41.280	11.23	≤17	≤20.15	Pass
46	5230	40.960	11.08	≤ 17	≤20.12	Pass

The worst emission of data rate is 40.5 Mbps

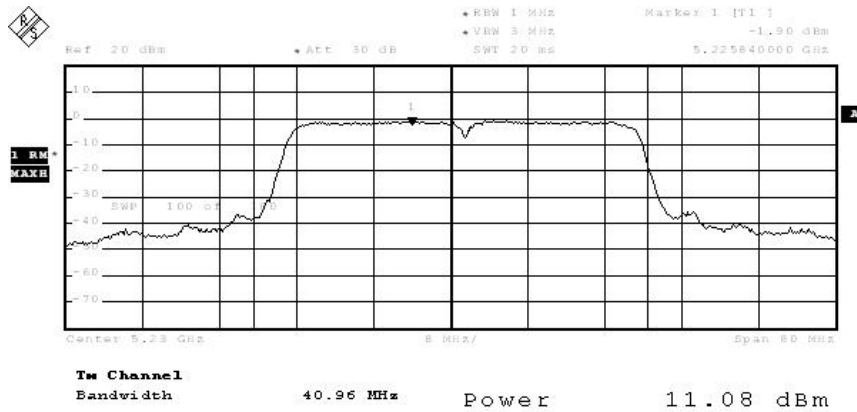
Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
38	5190	11.23	11.21	11.22	11.20	11.18	11.19	11.17	11.16	≤17dBm
46	5230	11.08	--	--	--	--	--	--	--	≤17dBm

**Peak transmit Power - Channel 38**



Date: 9 JUL 2012 10:01:35

**Peak transmit Power - Channel 46**



Date: 9 JUL 2012 10:09:34

Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

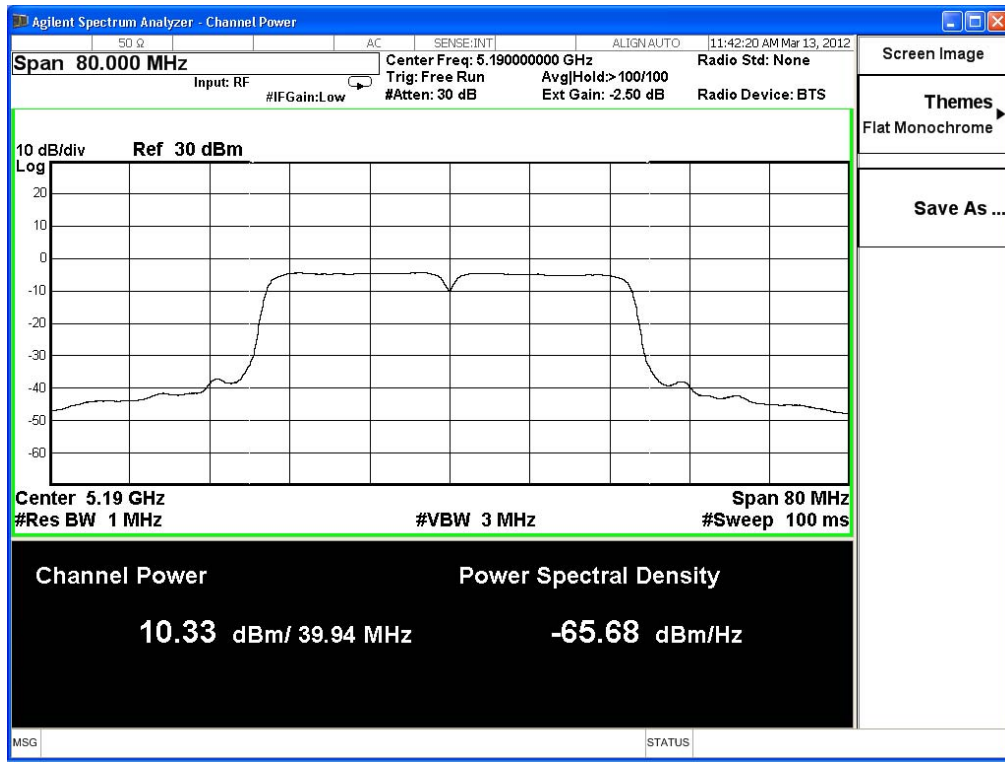
IEEE 802.11n (40MHz), (ANT 1)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
38	5190	39.936	10.33	≤17	≤20.01	Pass
46	5230	39.700	11.12	≤ 17	≤19.98	Pass

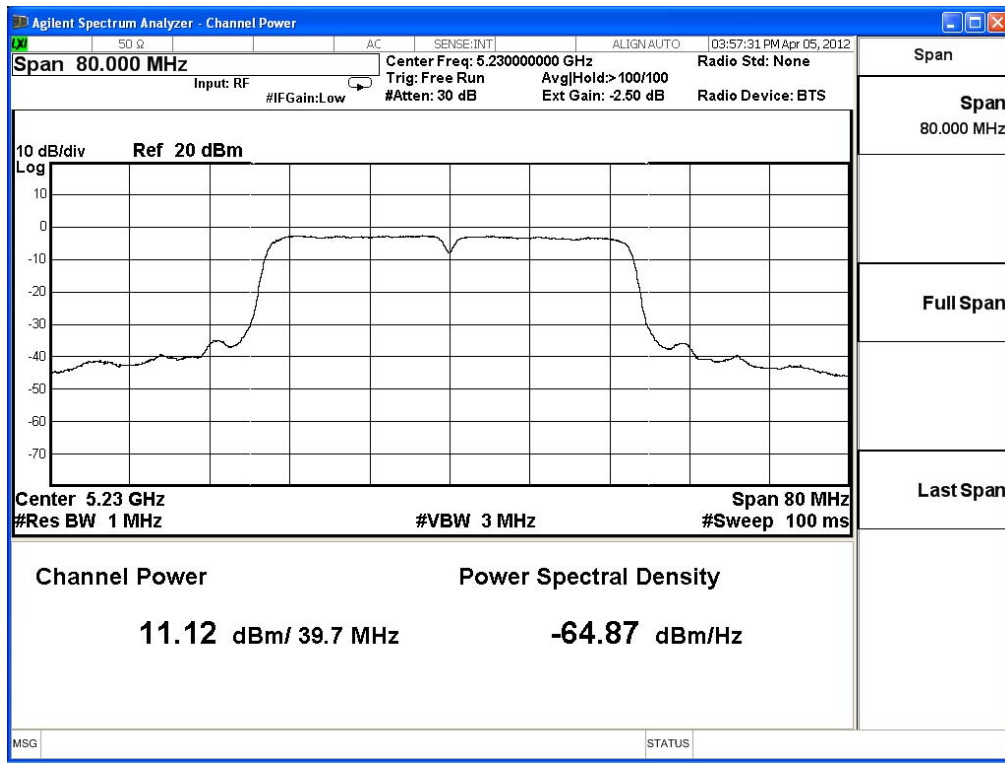
The worst emission of data rate is 40.5 Mbps

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
38	5190	10.33	--	--	--	--	--	--	--	≤17dBm
46	5230	11.12	11.10	11.11	11.08	11.09	11.07	11.06	11.05	≤17dBm

**Peak transmit Power - Channel 38**



**Peak transmit Power - Channel 46**





Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	Test Site	SR7

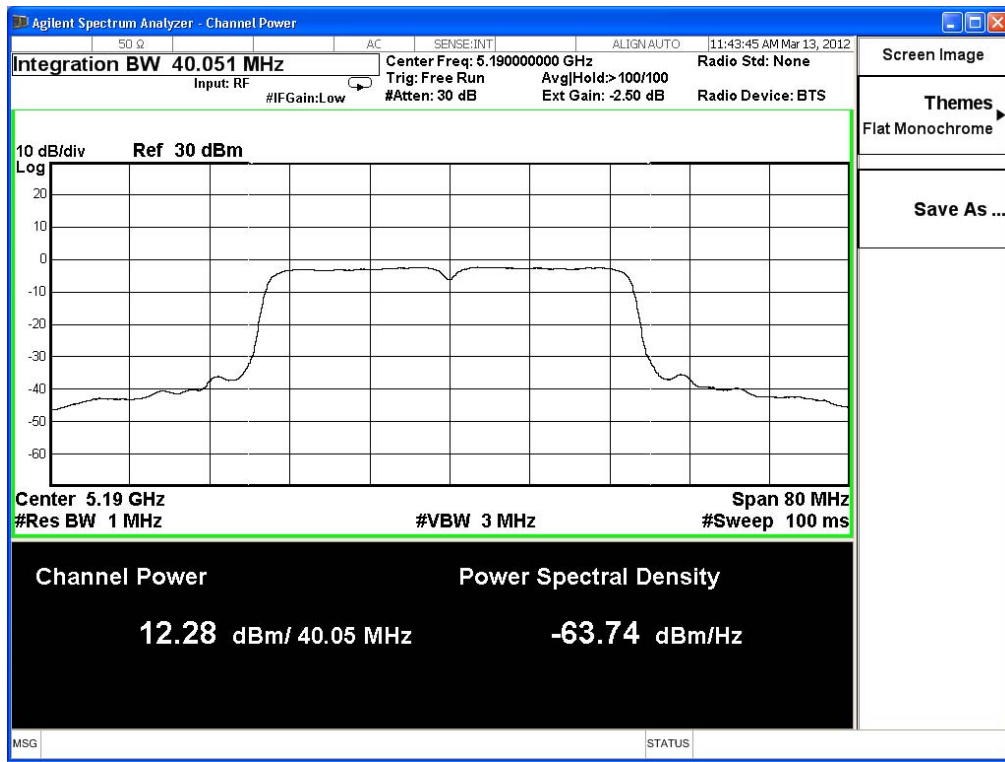
IEEE 802.11n (40MHz), (ANT 2)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
38	5190	40.051	12.28	≤17	≤20.02	Pass
46	5230	40.430	12.02	≤ 17	≤ 20.06	Pass

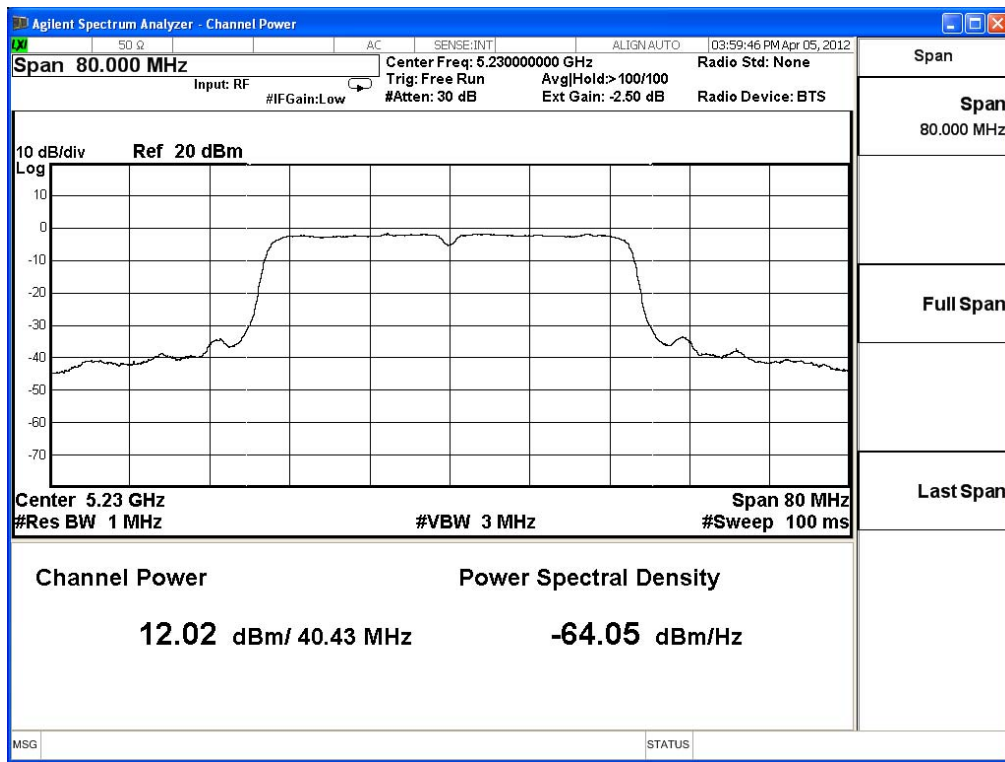
The worst emission of data rate is 40.5 Mbps

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
38	5190	12.28	12.26	12.27	12.25	12.24	12.22	12.23	12.21	≤17dBm
46	5230	12.02	--	--	--	--	--	--	--	≤17dBm

**Peak transmit Power - Channel 38**



**Peak transmit Power - Channel 46**



Product	Wireless Extender		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Transmit		
Date of Test	2012/04/05	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	16.30	42.66	≤17	Pass
46	5230	16.42	43.85	≤ 17	Pass