

MEASUREMENT REPORT


(FCC : Part 15 Subpart C (15.247) / ANSI C63.4-2003)




Testing Laboratory
1288

Product.....: Wireless AP
Trade Name.....: Cetis
Model No.....: EXA100
Applicant.....: Cetis, Inc.
Applicant Address.....: 5025 Galley Rd. Colorado Springs CO,
80915 USA

Report Number	MLT1210P15003
Applicant	Cetis, Inc.
Product	Wireless AP
Sample Received Date	2012/10/1
Sample Tested Date	2012/10/1 ~ 2012/11/15

Report Prepared By	Jesse Tien
Signature	
Date Prepared	2012/11/16

Report Authorized By	Roger Chen
Signature	
Date Authorized	2012/11/16

Test By

Max Light Technology Co., Ltd.
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 laboratory.

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CERTIFICATION

We here by verify that :


The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4-2003. All test were conducted by


MLT(Max Light Technology Co.,Ltd) Room 5, 8F, No.125, Section 3 Roosevelt Road, Taipei, Taiwan, R.O.C Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is in compliance with Class B radiated and conducted emission limit of FCC Rules Part 15 Subpart C (15.247).

Applicant Name	Cetis, Inc.
Applicant Address	5025 Galley Rd. Colorado Springs CO, 80915 USA
Manufacturer Name	Serial MultiVision Pte Ltd
Manufacturer Address	5025 Galley Rd. Colorado Springs CO, 80915 USA

Equipment	Wireless AP
Model No	EXA100
FCC ID	R9AEXA100

Report Prepared By	Jesse Tien
Signature	

Report Authorized By	Roger Chen
Signature	

1. General

1.1 Introduction

The following measurement report is submitted on behalf of Cetis, Inc. In support of a Class B Digital Device certification in accordance with Part2 Subpart J and Part 15 Subpart C of the Commission's and Regulations.

1.2 Customer Details

Applicant Name	Cetis, Inc.
Applicant Address	5025 Galley Rd. Colorado Springs CO, 80915 USA
Manufacturer Name	Serial MultiVision Pte Ltd
Manufacturer Address	5025 Galley Rd. Colorado Springs CO, 80915 USA

1.3 Technical data of EUT

Equipment	Wireless AP
Model No	EXA100
FCC ID	R9AEXA100
Power Type	Model : SYS1460-1212(EXP321) Input : AC100~240V , 50/60Hz , 1.0A Output : DC12V , 1A
Type of Modulation	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transfer rate	802.11b: 11/ 5.5/ 2/ 1Mbps 802.11g: 54/ 48/ 36/ 24/ 18/ 12/ 9/ 6Mbps 802.11n HT20: 130, 117, 104, 78, 52, 39, 26, 13Mbps 802.11n HT40: 270, 243, 216, 162, 108, 81, 54, 27Mbps
Type of Antenna	Chip Antenna
Frequency of Channel	See Next page

During testing the EUT was operated at Tx or Rx mode for each emission measured. This was done in order to ensure that maximum emission levels were attained.

802.11b & 802.11g & 802.11n HT20 Frequency of Each Channel (Working Frequency)

Channel No.	Frequency (MHz)
01	2412
02	2417
03	2422
04	2427
05	2432
06	2437
07	2442
08	2447
09	2452
10	2457
11	2462

802.11n HT40 Frequency of Each Channel (Working Frequency)

Channel No.	Frequency (MHz)
03	2422
04	2427
05	2432
06	2437
07	2442
08	2447
09	2452

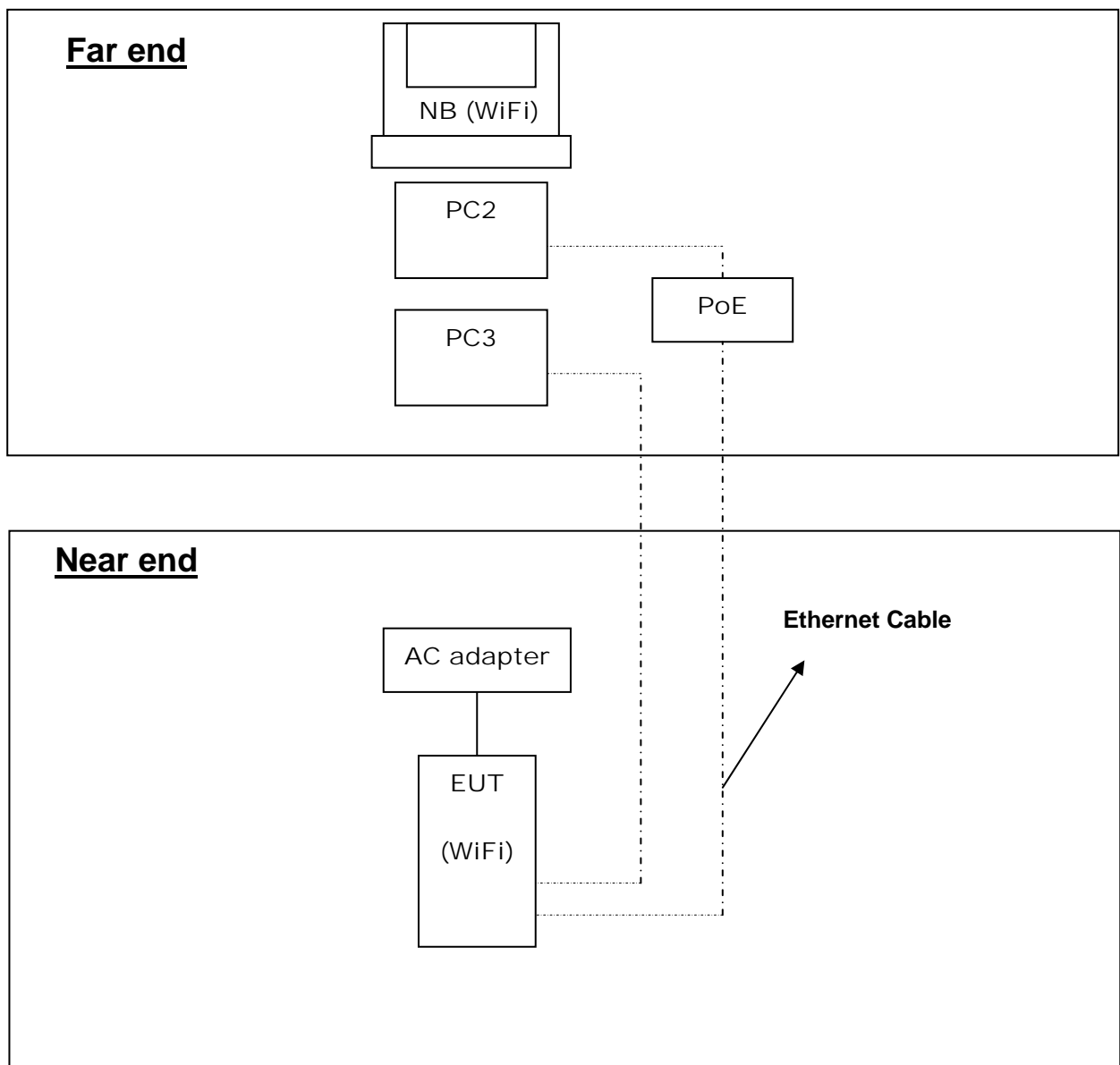
1.4 Summary Of Tests

47 CFR Part 15 Subpart C			
Reference	Test	Results	Note
15.207	AC Power Conducted Emission	PASS	
15.209	Radiated Emission	PASS	
15.247©	Transmitter Radiated Emissions	PASS	
15.247(b)	Max. Output Power	PASS	
15.247(a)(2)	6dB RF Bandwidth	PASS	
15.247(d)	Max. Power Density	PASS	
15.247©	Out of Band Conducted Spurious Emission	PASS	
15.247©	Band Edge Measurement	PASS	
15.203	Antenna Requirement	PASS	

1.5 Description of Support Equipment

This Wireless AP itself forms a system. No support equipment is required for its normal operation.

1.6 Configuration of System Under Test



1.7 Test Procedure

All measurements contained in this report were performed according to the techniques described in Measurement procedure ANSI C63.4-2003 followed KDB 558074 v02 and KDB 662911 for this testing.

1.8 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions which the EUT was considered likely to encounter in normal use were investigated. The system's radiated and conducted emissions were investigated while the computer alternately transferred data to the EUT as well as to the monitor and printer. Using a test program which sent a continuous data and transferred data to and from the EUT was proven to worst case emissions. The system's physical layout and cabling was randomly arranged to ensure that maximum emission levels were attained.

This assessment of the maximum conducted output power tests is base on the minimum transfer rate will produce a maximum output power.

802.11b data rate: 1M

802.11g data rate: 18M

802.11gn HT20 data rate: 13M

802.11gn HT40 data rate: 27M

2. Conducted Emissions Requirements

2.1 General & Setup :

The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3825/2 Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 2.5.

2.2 Test Equipment List :

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cal. Date
1.	HP	Spectrum Analyzer	73412A00110	8591EM	2012/3/22	2013/3/22
2.	EMCO	LISN	2658	3825/2	2012/3/3	2013/3/3
3.	TESEQ	ISN	24801	ISN T8	2012/4/26	2013/4/26

2.3 Test Condition :

EUT tested in accordance with the specifications given by the manufacturer, and exercised in the most unfavorable manner.

2.4 Conducted Emissions Limits :

FCC Part 15

Frequency range (MHz)	Limits (dBuV)			
	Class A		Class B	
	QP	Avg.	QP	Avg.
0.15 to 0.50	79	66	66 to 56	56 to 46
0.50 to 5.0	73	60	56	46
5.0 to 30	73	60	60	50

2.5 Measurement Data Of Conducted Emissions :

2.5.1 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11b (CH01)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.175	47.83	--	1.05	64.72	54.72	48.88	--
	0.844	50.57	34.90	1.23	56	46	51.80	36.13
	0.989	48.35	34.90	1.30	56	46	49.65	36.20
	1.338	51.70	36.10	1.32	56	46	53.02	37.42
	1.464	51.97	36.40	1.39	56	46	53.36	37.79
	2.077	45.10	34.10	1.73	56	46	46.83	35.83
	26.699	41.04	--	2.27	60	50	43.31	--
L2	0.216	45.40	--	1.07	62.96	52.96	46.47	--
	0.251	43.07	--	1.09	61.73	51.73	44.16	--
	0.876	45.24	34.60	1.21	56	46	46.45	35.81
	1.396	49.11	35.90	1.32	56	46	50.43	37.22
	1.464	49.05	35.70	1.35	56	46	50.40	37.05
	2.461	46.93	34.00	1.75	56	46	48.68	35.75
	27.416	40.72	--	2.29	60	50	43.01	--

- Notes :**
1. L1: One end & Ground L2: The other end & Ground
 2. Height of table on which the EUT was placed : 0.8 m.
 3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.
 4. The above test results are obtained under the normal condition.
 5. Amplitude = Read + Factor

2.5.2 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11b (CH06)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.885	48.04	34.72	1.25	56	46	49.29	35.97
	0.994	47.42	34.15	1.30	56	46	48.72	35.45
	1.249	49.89	34.50	1.36	56	46	51.25	35.86
	1.396	50.99	35.60	1.38	56	46	52.37	36.98
	1.472	51.34	36.60	1.39	56	46	52.73	37.99
	2.066	46.97	34.91	1.73	56	46	48.70	36.64
	2.384	46.69	34.70	1.83	56	46	48.52	36.53
L2	0.182	47.78	--	1.07	64.37	54.37	48.85	--
	0.360	42.89	--	1.09	58.74	48.74	43.98	--
	0.880	49.83	35.60	1.23	56	46	51.06	36.83
	1.178	48.44	34.90	1.28	56	46	49.72	36.18
	1.396	51.16	36.10	1.32	56	46	52.48	37.42
	1.480	50.18	35.87	1.37	56	46	51.55	37.24
	2.055	45.90	35.11	1.71	56	46	47.61	36.82

Notes : 1. L1: One end & Ground L2: The other end & Ground

2. Height of table on which the EUT was placed : 0.8 m.

3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4. The above test results are obtained under the normal condition.

5. Amplitude = Read + Factor

2.5.3 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11b (CH11)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.163	49.73	--	1.05	65.3	55.3	50.78	--
	0.885	45.22	34.00	1.25	56	46	46.47	35.25
	1.464	50.73	36.10	1.39	56	46	52.12	37.49
	1.544	50.78	35.50	1.44	56	46	52.22	36.94
	2.273	47.56	34.82	1.79	56	46	49.35	36.61
	2.500	47.72	34.75	1.84	56	46	49.56	36.59
	3.328	40.06	--	1.97	56	46	42.03	--
L2	0.150	50.55	--	0.93	66	56	51.48	--
	0.771	45.54	33.90	1.18	56	46	46.72	35.08
	0.857	45.86	34.17	1.21	56	46	47.07	35.38
	1.388	49.07	35.70	1.32	56	46	50.39	37.02
	1.464	48.69	35.40	1.35	56	46	50.04	36.75
	2.346	46.51	34.96	1.73	56	46	48.24	36.69
	3.417	39.97	--	1.89	56	46	41.86	--

Notes : 1. L1: One end & Ground L2: The other end & Ground

2. Height of table on which the EUT was placed : 0.8 m.

3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4. The above test results are obtained under the normal condition.

5. Amplitude = Read + Factor

2.5.4 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11g (CH01)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.162	48.35	--	1.05	65.38	55.38	49.40	--
	0.222	45.05	--	1.12	62.74	52.74	46.17	--
	0.876	45.36	34.70	1.23	56	46	46.59	35.93
	1.544	50.99	36.50	1.44	56	46	52.43	37.94
	2.155	45.42	35.10	1.74	56	46	47.16	36.84
	2.608	46.49	35.25	1.86	56	46	48.35	37.11
	3.364	40.62	--	1.97	56	46	42.59	--
L2	0.197	47.21	--	1.07	63.76	53.76	48.28	--
	0.373	41.07	--	1.09	58.43	48.43	42.16	--
	0.880	49.06	35.10	1.23	56	46	50.29	36.33
	0.984	47.29	34.70	1.21	56	46	48.50	35.91
	1.106	47.85	34.55	1.25	56	46	49.10	35.80
	1.396	52.19	36.40	1.32	56	46	53.51	37.72
	1.991	45.68	34.30	1.49	56	46	47.17	35.79

Notes : 1. L1: One end & Ground L2: The other end & Ground

2. Height of table on which the EUT was placed : 0.8 m.
3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.
4. The above test results are obtained under the normal condition.
5. Amplitude = Read + Factor

2.5.5 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11g (CH06)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.167	48.98	--	1.05	65.12	55.12	50.03	--
	0.853	50.95	35.50	1.23	56	46	52.18	36.73
	1.324	51.08	35.45	1.34	56	46	52.42	36.79
	1.456	52.57	36.20	1.39	56	46	53.96	37.59
	1.552	49.57	35.28	1.44	56	46	51.01	36.72
	2.358	50.07	35.65	1.82	56	46	51.89	37.47
	2.540	48.72	35.40	1.85	56	46	50.57	37.25
L2	0.186	48.37	--	1.07	64.2	54.2	49.44	--
	0.848	50.81	35.30	1.21	56	46	52.02	36.51
	0.953	49.24	35.44	1.21	56	46	50.45	36.65
	1.324	50.78	36.00	1.30	56	46	52.08	37.30
	1.472	51.15	36.30	1.35	56	46	52.50	37.65
	2.237	47.66	35.90	1.72	56	46	49.38	37.62
	3.417	41.05	--	1.89	56	46	42.94	--

- Notes :**
1. L1: One end & Ground L2: The other end & Ground
 2. Height of table on which the EUT was placed : 0.8 m.
 3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.
 4. The above test results are obtained under the normal condition.
 5. Amplitude = Read + Factor

2.5.6 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11g (CH11)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.161	47.78	--	1.05	65.43	55.43	48.83	--
	0.232	46.76	--	1.14	62.39	52.39	47.90	--
	0.294	44.68	--	1.15	60.41	50.41	45.83	--
	0.804	44.03	--	1.23	56	46	45.26	--
	0.876	45.26	36.65	1.23	56	46	46.49	38.04
	1.464	52.02	34.10	1.39	56	46	53.41	35.83
	2.055	43.53	--	1.73	56	46	45.26	--
L2	0.334	43.27	--	1.09	59.35	49.35	44.36	--
	0.848	49.02	35.60	1.21	56	46	50.23	36.81
	1.249	49.44	35.10	1.30	56	46	50.74	36.40
	1.480	50.80	36.40	1.37	56	46	52.17	37.77
	2.055	46.68	35.20	1.71	56	46	48.39	36.91
	2.384	45.54	34.60	1.74	56	46	47.28	36.34
	27.271	43.13	--	2.29	60	50	45.42	--

Notes : 1. L1: One end & Ground L2: The other end & Ground

2. Height of table on which the EUT was placed : 0.8 m.

3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4. The above test results are obtained under the normal condition.

5. Amplitude = Read + Factor

2.5.7 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11n HT20 (CH01)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.163	50.26	--	1.05	65.3	55.3	51.31	--
	0.197	47.05	--	1.12	63.76	53.76	48.17	--
	0.844	44.09	--	1.23	56	46	45.32	--
	0.984	42.04	--	1.30	56	46	43.34	--
	1.324	44.09	--	1.34	56	46	45.43	--
	1.441	44.51	--	1.39	56	46	45.90	--
	2.358	42.08	--	1.82	56	46	43.90	--
L2	0.880	44.87	34.60	1.23	56	46	46.10	35.83
	1.464	48.23	35.80	1.35	56	46	49.58	37.15
	1.544	47.92	35.60	1.39	56	46	49.31	36.99
	2.358	49.71	35.80	1.73	56	46	51.44	37.53
	2.540	51.03	36.80	1.78	56	46	52.81	38.58
	3.759	39.31	--	1.91	56	46	41.22	--
	26.699	41.87	--	2.30	60	50	44.17	--

Notes : 1. L1: One end & Ground L2: The other end & Ground

2. Height of table on which the EUT was placed : 0.8 m.

3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4. The above test results are obtained under the normal condition.

5. Amplitude = Read + Factor

2.5.8 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11n HT20 (CH06)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.206	48.36	--	1.12	63.36	53.36	49.48	--
	0.303	42.76	--	1.15	60.15	50.15	43.91	--
	0.373	41.10	--	1.15	58.43	48.43	42.25	--
	0.953	45.97	35.30	1.28	56	46	47.25	36.58
	1.324	44.66	--	1.34	56	46	46.00	--
	2.346	50.46	34.20	1.82	56	46	52.28	35.54
	3.820	39.46	--	2.01	56	46	41.47	--
L2	0.156	50.42	--	0.93	65.69	55.69	51.35	--
	0.177	48.78	--	1.07	64.64	54.64	49.85	--
	0.348	40.91	--	1.09	59	49	42.00	--
	0.880	44.54	--	1.23	56	46	45.77	--
	1.388	48.57	35.40	1.32	56	46	49.89	36.72
	1.535	48.26	35.70	1.39	56	46	49.65	37.09
	2.297	44.61	34.10	1.73	56	46	46.34	35.83

Notes : 1. L1: One end & Ground L2: The other end & Ground

2. Height of table on which the EUT was placed : 0.8 m.

3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4. The above test results are obtained under the normal condition.

5. Amplitude = Read + Factor

2.5.9 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11n HT20 (CH11)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.202	47.51	--	1.12	63.54	53.54	48.63	--
	0.844	40.08	--	1.23	56	46	41.31	--
	1.249	40.59	--	1.36	56	46	41.95	--
	1.338	42.56	--	1.32	56	46	43.88	--
	1.472	41.64	--	1.39	56	46	43.03	--
	2.500	40.47	--	1.84	56	46	42.31	--
	26.699	40.08	--	2.27	60	50	42.35	--
L2	0.222	46.87	--	1.07	62.74	52.74	47.94	--
	0.251	46.04	--	1.09	61.73	51.73	47.13	--
	0.885	46.58	35.35	1.23	56	46	47.81	36.58
	1.184	47.20	36.10	1.28	56	46	48.48	37.38
	1.441	47.57	35.90	1.35	56	46	48.92	37.25
	2.461	45.11	35.60	1.75	56	46	46.86	37.35
	26.699	42.31	--	2.30	60	50	44.61	--

Notes : 1. L1: One end & Ground L2: The other end & Ground

2. Height of table on which the EUT was placed : 0.8 m.

3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4. The above test results are obtained under the normal condition.

5. Amplitude = Read + Factor

2.5.10 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11n HT40 (CH03)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.177	47.64	--	1.12	64.64	54.64	48.76	--
	0.212	46.14	--	1.12	63.14	53.14	47.26	--
	0.876	45.59	34.60	1.23	56	46	46.82	35.83
	1.472	50.21	35.86	1.39	56	46	51.60	37.25
	1.552	50.22	36.00	1.44	56	46	51.66	37.44
	1.610	50.08	36.10	1.42	56	46	51.50	37.52
	2.461	49.87	35.95	1.83	56	46	51.70	37.78
L2	0.880	44.37	--	1.23	56	46	45.60	--
	0.953	46.48	34.96	1.21	56	46	47.69	36.19
	1.472	47.71	35.33	1.35	56	46	49.06	36.54
	2.346	47.90	35.25	1.73	56	46	49.63	36.60
	2.540	48.47	35.40	1.78	56	46	50.25	37.13
	3.681	41.11	--	1.93	56	46	43.04	--
	26.699	42.17	--	2.30	60	50	44.47	--

Notes : 1. L1: One end & Ground L2: The other end & Ground

2. Height of table on which the EUT was placed : 0.8 m.

3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4. The above test results are obtained under the normal condition.

5. Amplitude = Read + Factor

2.5.11 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11n HT40 (CH06)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.167	48.20	--	1.05	65.12	55.12	49.25	--
	0.848	40.86	--	1.23	56	46	42.09	--
	1.249	41.14	--	1.36	56	46	42.50	--
	2.033	48.19	35.92	1.73	56	46	49.92	37.65
	2.358	51.95	36.77	1.82	56	46	53.77	38.59
	2.540	50.25	36.21	1.85	56	46	52.10	38.06
	3.584	40.97	--	2.00	56	46	42.97	--
L2	0.844	47.75	35.10	1.21	56	46	48.96	36.31
	1.005	47.37	35.24	1.21	56	46	48.58	36.45
	1.184	48.16	36.05	1.28	56	46	49.44	37.33
	1.449	50.95	36.52	1.35	56	46	52.30	37.87
	2.099	47.06	35.74	1.73	56	46	48.79	37.47
	2.461	49.59	36.00	1.75	56	46	51.34	37.75
	26.699	42.49	--	2.30	60	50	44.79	--

Notes : 1. L1: One end & Ground L2: The other end & Ground

2. Height of table on which the EUT was placed : 0.8 m.

3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4. The above test results are obtained under the normal condition.

5. Amplitude = Read + Factor

2.5.12 Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : 802.11n HT40 (CH09)

Conducted Emissions								
Conductor	Frequency (MHz)	Read(dBuV)		Factor	Limits (dBuV)		Amplitude (dBuV)	
		QP	AV		QP	AV	QP	AV
L1	0.177	50.73	--	1.12	64.64	54.64	51.85	--
	0.343	44.44	--	1.15	59.13	49.13	45.59	--
	0.804	44.62	--	1.23	56	46	45.85	--
	0.880	45.10	35.11	1.25	56	46	46.35	36.36
	1.464	49.46	35.33	1.39	56	46	50.85	36.72
	1.544	50.94	36.44	1.44	56	46	52.38	37.88
	2.155	41.30	--	1.74	56	46	43.04	--
L2	0.323	44.15	--	1.07	59.62	49.62	45.22	--
	0.984	45.38	35.12	1.21	56	46	46.59	36.33
	1.359	46.58	35.35	1.32	56	46	47.90	36.67
	1.464	49.08	35.99	1.35	56	46	50.43	37.34
	2.023	44.55	34.90	1.49	56	46	46.04	36.39
	2.358	47.91	35.72	1.73	56	46	49.64	37.45
	3.901	41.42	--	1.86	56	46	43.28	--

- Notes :**
1. L1: One end & Ground L2: The other end & Ground
 2. Height of table on which the EUT was placed : 0.8 m.
 3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.
 4. The above test results are obtained under the normal condition.
 5. Amplitude = Read + Factor

3. Radiated Emissions Requirement

3.1 General Configuration:

Prior to open-field testing, the EUT was placed in a shielded enclosure and scanned at a close distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration which produced the highest emissions was noted so it could be reproduced later during the open-field tests. This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

Final radiation measurements were made on a three-meter, open-field test site. The EUT system was placed on a nonconductive turntable which was 0.8 meters height, top surface 1.0 x 1.5 meter. During the test, EUT was set to transmit continuously & measurements spectrum range from 30 MHz to 26.5 GHz is investigated.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in microvolts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in microvolts per meter (dBuV/m).

The actual field intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

$$\text{Amplitude (dBuV/m)} = \text{FI(dBuV)} + \text{AF(dBm)} + \text{CL(dBuV)} - \text{Gain(dB)}$$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(1) For fundamental frequency : Transmitter Output < +30dBm

(2) For spurious frequency : Spurious emission limits = fundamental emission limit /10

3.2 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cal. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2012/1/31	2013/1/31
2.	MLT	Pre Amplifier	20110301	PREAMP6G-02	2012/3/3	2013/3/3
3.	Agilent	Spectrum Analyzer	US40240137	E7403A	2012/1/31	2013/1/31
4.	MLT	Pre Amplifier	0.10~19.1GHz 60dBm	RF01	2012/8/24	2013/8/24
5.	MLT	Pre Amplifier	TA010-190-30	RF03	2012/7/20	2013/7/20
6.	MLT	Pre Amplifier	20110209	PREAMP6G-01	2012/3/3	2013/3/3
7.	Herotek	Pre Amplifier	30690	A402-417	2012/11/2	2013/11/2
8.	EMCO	Biconilog Antenna	59739	3142C	2012/9/6	2013/9/6
9.	EMCO	Biconilog Antenna	44568	3142C	2012/9/6	2013/9/6
10.	SCHWARZBECK	Horn Antenna	181	BBHA 9170	2012/10/18	2013/10/18
11.	SCHWARZBECK	Horn Antenna	304	BBHA 9120D	2012/10/15	2013/10/15

3.3 Test condition:

EUT tested in accordance with the specifications given by the manufacturer, and exercised in the most unfavorable manner.

3.4 Radiated Emissions Limits:

Frequency range (MHz)	Peak(dBuV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960	54

3.5 Measurement Data Of Radiated Emissions:

3.5.1 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11b (CH01)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2456.0	46.01	46.22	Peak	0.21	74	-27.78
17940.0	69.14	66.62	Peak	-2.52	74	-7.38

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2546.0	44.37	44.67	Peak	0.30	74	-29.33
17940.0	68.19	65.67	Peak	-2.52	74	-8.33

- Notes :**
1. Margin= Amplitude – Limits
 2. Distance of Measurement : 3 Meter
 3. Height of table for EUT placed: 0.8 Meter.
 4. ANT= Antenna height.
 5. Duty= Duty cycle correction factor.
 6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor (Auto calculate in spectrum analyzer)
 7. The other emission levels were very low against the limit.

3.5.2 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11b (CH06)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2252.0	43.07	43.25	Peak	0.18	74	-30.75
14640.0	70.82	58.75	Peak	-12.07	74	-15.25

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2246.0	44.31	44.52	Peak	0.21	74	-29.48
16965.0	65.58	60.49	Peak	-5.09	74	-13.51

- Notes :**
1. Margin= Amplitude – Limits
 2. Distance of Measurement : 3 Meter
 3. Height of table for EUT placed: 0.8 Meter.
 4. ANT= Antenna height.
 5. Duty= Duty cycle correction factor.
 6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)
 7. The other emission levels were very low against the limit.

3.5.3 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11b (CH11)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2320.0	43.27	43.54	Peak	0.27	74	-30.46
14625.0	69.97	57.96	Peak	-12.01	74	-16.04

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2216.0	43.57	43.74	Peak	0.17	74	-30.26
14550.0	70.05	58.21	Peak	-11.84	74	-15.79

Notes : 1. Margin= Amplitude – Limits

2. Distance of Measurement : 3 Meter

3. Height of table for EUT placed: 0.8 Meter.

4. ANT= Antenna height.

5. Duty= Duty cycle correction factor.

6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)

7. The other emission levels were very low against the limit.

3.5.4 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11g (CH01)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2242.0	43.05	43.23	Peak	0.18	74	-30.77
14625.0	70.09	58.08	Peak	-12.01	74	-15.92

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2200.0	45.02	45.18	Peak	0.16	74	-28.82
14595.0	70.24	58.31	Peak	-11.93	74	-15.69

Notes : 1. Margin= Amplitude – Limits

2. Distance of Measurement : 3 Meter

3. Height of table for EUT placed: 0.8 Meter.

4. ANT= Antenna height.

5. Duty= Duty cycle correction factor.

6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)

7. The other emission levels were very low against the limit.

3.5.5 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11g (CH06)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2230.0	43.47	43.67	Peak	0.2	74	-30.33
13770.0	69.07	57.84	Peak	-11.2	74	-16.16

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2240.0	44.64	44.82	Peak	0.18	74	-29.18
16950.0	65.88	60.72	Peak	-5.16	74	-13.28

- Notes :**
1. Margin= Amplitude – Limits
 2. Distance of Measurement : 3 Meter
 3. Height of table for EUT placed: 0.8 Meter.
 4. ANT= Antenna height.
 5. Duty= Duty cycle correction factor.
 6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)
 7. The other emission levels were very low against the limit.

3.5.6 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11g (CH11)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2216.0	42.75	42.92	Peak	0.17	74	-31.08
13770.0	69.19	57.96	Peak	-11.23	74	-16.04

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
1350.0	40.93	47.59	Peak	-33.07	74	-6.66
13965.0	68.04	57.41	Peak	-10.63	74	-16.59

- Notes :**
1. Margin= Amplitude – Limits
 2. Distance of Measurement : 3 Meter
 3. Height of table for EUT placed: 0.8 Meter.
 4. ANT= Antenna height.
 5. Duty= Duty cycle correction factor.
 6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)
 7. The other emission levels were very low against the limit.

3.5.7 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11n HT20 (CH01)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2250.0	43.48	43.69	Peak	0.21	74	-30.31
17895.0	68.90	66.20	Peak	-2.70	74	-7.80

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2186.0	45.12	45.13	Peak	0.01	74	-28.87
17895.0	68.85	66.15	Peak	-2.70	74	-7.85

- Notes :**
1. Margin= Amplitude – Limits
 2. Distance of Measurement : 3 Meter
 3. Height of table for EUT placed: 0.8 Meter.
 4. ANT= Antenna height.
 5. Duty= Duty cycle correction factor.
 6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)
 7. The other emission levels were very low against the limit.

3.5.8 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11n HT20 (CH06)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2230.0	43.15	43.35	Peak	0.20	74	-30.65
16995.0	65.58	60.67	Peak	-4.91	74	-13.33

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2272.0	44.70	44.93	Peak	0.23	74	-29.07
17715.0	67.85	63.61	Peak	-4.24	74	-10.39

- Notes :**
1. Margin= Amplitude – Limits
 2. Distance of Measurement : 3 Meter
 3. Height of table for EUT placed: 0.8 Meter.
 4. ANT= Antenna height.
 5. Duty= Duty cycle correction factor.
 6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)
 7. The other emission levels were very low against the limit.

3.5.9 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11n HT20 (CH11)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2230.0	43.50	43.70	Peak	0.20	74	-30.30
17145.0	66.33	61.38	Peak	-4.95	74	-12.62

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2242.0	45.69	45.87	Peak	0.18	74	-28.13
17100.0	66.12	61.12	Peak	-5.00	74	-12.88

- Notes :**
1. Margin= Amplitude – Limits
 2. Distance of Measurement : 3 Meter
 3. Height of table for EUT placed: 0.8 Meter.
 4. ANT= Antenna height.
 5. Duty= Duty cycle correction factor.
 6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)
 7. The other emission levels were very low against the limit.

3.5.10 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11n HT40 (CH03)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2356.0	43.56	43.77	Peak	0.21	74	-30.23
17925.0	68.21	65.60	Peak	-2.61	74	-8.40

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2270.0	45.50	45.73	Peak	0.23	74	-28.27
16965.0	66.50	61.41	Peak	-5.09	74	-12.59

- Notes :**
1. Margin= Amplitude – Limits
 2. Distance of Measurement : 3 Meter
 3. Height of table for EUT placed: 0.8 Meter.
 4. ANT= Antenna height.
 5. Duty= Duty cycle correction factor.
 6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)
 7. The other emission levels were very low against the limit.

3.5.11 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11n HT40 (CH06)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2220.0	43.74	43.94	Peak	0.20	74	-30.06
17955.0	68.17	65.75	Peak	-2.42	74	-8.25

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2206.0	45.73	45.89	Peak	0.16	74	-28.11
17895.0	68.01	65.31	Peak	-2.70	74	-8.69

- Notes :**
1. Margin= Amplitude – Limits
 2. Distance of Measurement : 3 Meter
 3. Height of table for EUT placed: 0.8 Meter.
 4. ANT= Antenna height.
 5. Duty= Duty cycle correction factor.
 6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)
 7. The other emission levels were very low against the limit.

3.5.12 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Test Mode : 802.11n HT40 (CH09)

Radiated Emissions (HORIZONTAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2182.0	43.07	43.08	Peak	0.01	74	-30.92
17925.0	69.04	66.43	Peak	-2.61	74	-7.57

Radiated Emissions (VERTICAL)						
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Remark	Factor (dB)	Limit (dBuV/m)	Margin (dB)
2256.0	44.55	44.73	Peak	0.18	74	-29.27
17865.0	68.70	65.63	Peak	-3.07	74	-8.37

- Notes :**
1. Margin= Amplitude – Limits
 2. Distance of Measurement : 3 Meter
 3. Height of table for EUT placed: 0.8 Meter.
 4. ANT= Antenna height.
 5. Duty= Duty cycle correction factor.
 6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)
 7. The other emission levels were very low against the limit.

4. Maximum Conducted Output Power Requirements

4.1 Test Condition & Setup :

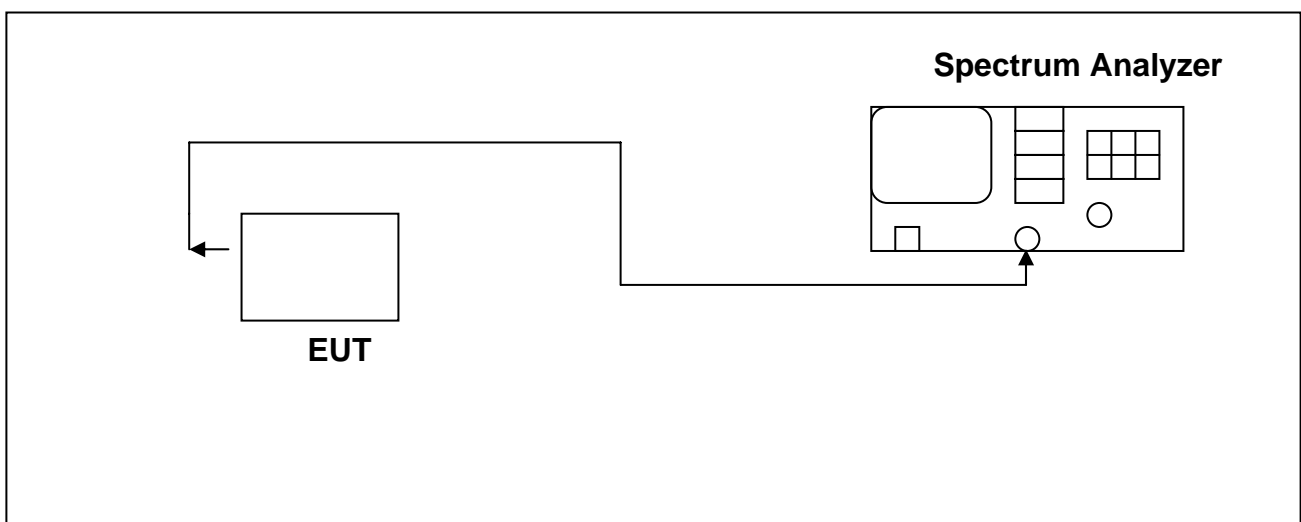
The tests below are run with the EUT's transmitter set at high power in TDD mode. A RJ-45 port from a computer to the EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to spectrum analyzer. The maximum peak output power shall not exceed 1 watt.

The antenna port of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to $(\text{GAIN} - 6)/3$ dBm.

Measurement procedure is followed KDB 558074 v02 (8.1.2 option 2: channel integration method)

4.2 Test Instruments Configuration:



4.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cal. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2012/1/31	2013/1/31

4.4 Test Result:

802.11b

Frequency (MHz)	Data Rate(Mbps)	Output(dBm)	Required Limit
2412	11	12.12	<30dBm
2412	5.5	12.42	<30dBm
2412	2	12.43	<30dBm
2412	1	12.73	<30dBm

Frequency (MHz)	Data Rate(Mbps)	Output(dBm)	Required Limit
2412	1	12.73	<30dBm
2437	5.5	12.26	<30dBm
2462	1	12.74	<30dBm

Note: Test result is the worst case of the different data rate.

802.11g

Frequency (MHz)	Data Rate(Mbps)	Output(dBm)	Required Limit
2412	54	9.81	<30dBm
2412	48	9.93	<30dBm
2412	36	10.22	<30dBm
2412	24	10.18	<30dBm
2412	18	10.36	<30dBm
2412	12	10.35	<30dBm
2412	9	10.08	<30dBm
2412	6	10.05	<30dBm

Frequency (MHz)	Data Rate(Mbps)	Output(dBm)	Required Limit
2412	18	10.36	<30dBm
2437	18	8.96	<30dBm
2462	9	9.01	<30dBm

Note: Test result is the worst case of the different data rate.

802.11n HT20

Frequency (MHz)	Data Rate(Mbps)		Output Power(dBm)		Required Limit
	Ant 1	Ant 2	Ant 1	Ant 2	
2412	130	130	9.17	7.63	<30dBm
2412	117	117	9.12	8.03	<30dBm
2412	104	104	9.12	7.78	<30dBm
2412	78	78	9.12	8.15	<30dBm
2412	52	52	9.46	8.16	<30dBm
2412	39	39	9.38	9.10	<30dBm
2412	26	26	10.19	8.09	<30dBm
2412	13	13	9.44	10.37	<30dBm

Frequency (MHz)	Data Rate(Mbps)		Output Power(dBm)		Total Output Power(dBm)	Required Limit
	Ant 1	Ant 2	Ant 1	Ant 2		
2412	13	13	9.44	10.37	12.94	<30dBm
2437	26	13	9.33	9.33	12.34	<30dBm
2462	26	13	8.15	8.58	11.38	<30dBm

Note: Test result is the worst case of the different data rate.

802.11n HT40

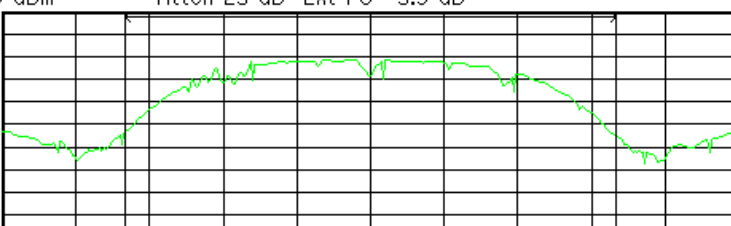
Frequency (MHz)	Data Rate(Mbps)		Output Power(dBm)		Required Limit
	Ant 1	Ant 2	Ant 1	Ant 2	
2422	270	270	8.31	7.37	<30dBm
2422	243	243	8.18	7.76	<30dBm
2422	216	216	7.99	7.52	<30dBm
2422	162	162	8.07	7.69	<30dBm
2422	108	108	8.50	8.06	<30dBm
2422	81	81	8.80	7.97	<30dBm
2422	54	54	8.65	9.15	<30dBm
2422	27	27	9.31	9.99	<30dBm

Frequency (MHz)	Data Rate(Mbps)		Output Power(dBm)		Total Output Power(dBm)	Required Limit
	Ant 1	Ant 2	Ant 1	Ant 2		
2422	27	27	9.31	9.99	12.67	<30dBm
2437	27	27	9.08	9.55	12.33	<30dBm
2452	27	27	8.60	9.58	12.13	<30dBm

Note: Test result is the worst case of the different data rate.

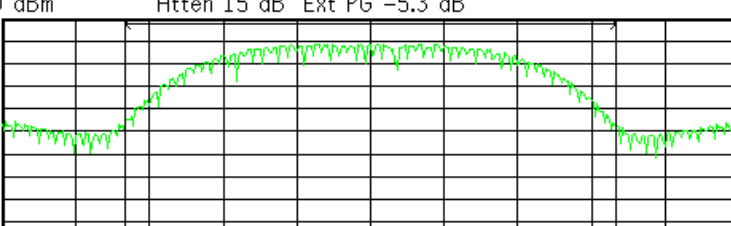
802.11b (2412MHz)

Agilent 06:53:23 Jun 26, 2012

Ch Freq 2.412 GHz		Trig Free	BW/Avg
Channel Power			Res BW 300.000000 kHz Auto Man
Ref 20 dBm Atten 25 dB Ext PG -5.3 dB #Avg Log 10 dB/			Video BW 3.00000000 MHz Auto Man
			VBW/RBW 10.00000 Auto Man
Center 2.412 GHz Span 30 MHz #Res BW 300 kHz #VBW 3 MHz #Sweep 100.3 ms (401 pts)			Average 10 On Off
Channel Power Power Spectral Density 12.73 dBm /20.0000 MHz -60.28 dBm/Hz			Avg Type Pwr (RMS) Auto Man
			EMI Res BW None
A:\SCREN630.GIF file saved			

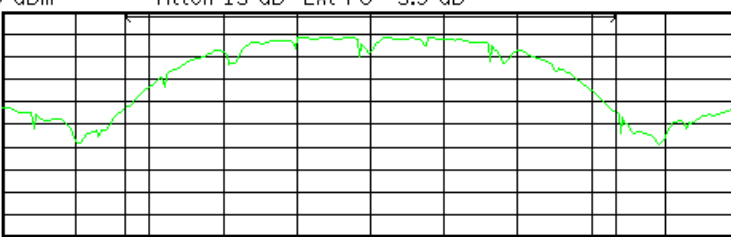
802.11b (2437MHz)

Agilent 08:11:14 Jun 26, 2012

Ch Freq 2.437 GHz		Trig Free	File
Channel Power			Catalog
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB #Avg Log 10 dB/			Save
			Load
Center 2.437 GHz Span 30 MHz #Res BW 300 kHz #VBW 3 MHz #Sweep 100.3 ms (401 pts)			Delete
Channel Power Power Spectral Density 12.26 dBm /20.0000 MHz -60.75 dBm/Hz			Copy
			Rename
			More 1 of 2
A:\SCREN675.GIF file saved			

802.11b (2462MHz)

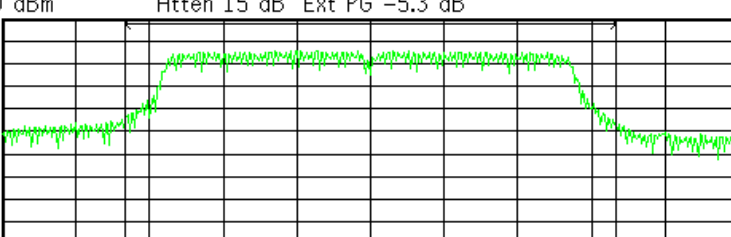
Agilent 07:32:32 Jun 26, 2012

Ch Freq 2.462 GHz		Trig Free
Channel Power [REDACTED]		
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB		
		
Center 2.462 GHz		Span 30 MHz
#Res BW 300 kHz		#Sweep 100.3 ms (401 pts)
Channel Power	Power Spectral Density	
12.74 dBm /20.0000 MHz	-60.27 dBm/Hz	
A:\SCREN646.GIF file saved		

Sweep
Sweep Time 100.3 ms Auto Man
Sweep Single Cont
Auto Sweep Coupling SR SA
Gate [Off]
Points 401
Segmented

802.11g (2412MHz)


Agilent 07:43:37 Jun 26, 2012

Ch Freq 2.412 GHz		Trig Free
Channel Power [REDACTED]		
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB		
		
Center 2.412 GHz		Span 30 MHz
#Res BW 300 kHz		#Sweep 100.3 ms (401 pts)
Channel Power	Power Spectral Density	
10.36 dBm /20.0000 MHz	-62.65 dBm/Hz	
A:\SCREN654.GIF file saved		

File
Catalog
Save
Load
Delete
Copy
Rename
More 1 of 2

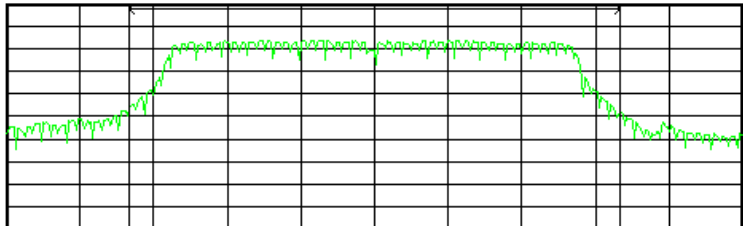
802.11g (2437MHz)

Agilent 07:47:10 Jun 26, 2012

Ch Freq 2.437 GHz		Trig Free	File
Channel Power			Catalog
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB			Save
			Load
Center 2.437 GHz Span 30 MHz			Delete
#Res BW 300 kHz #VBW 3 MHz #Sweep 100.3 ms (401 pts)			Copy
Channel Power	Power Spectral Density		Rename
8.96 dBm /20.0000 MHz	-64.05 dBm/Hz		More
			1 of 2
A:\SCREN662.GIF file saved			


802.11g (2462MHz)

Agilent 07:51:33 Jun 26, 2012

Ch Freq 2.462 GHz		Trig Free	File
Channel Power			Catalog
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB			Save
			Load
Center 2.462 GHz Span 30 MHz			Delete
#Res BW 300 kHz #VBW 3 MHz #Sweep 100.3 ms (401 pts)			Copy
Channel Power	Power Spectral Density		Rename
9.01 dBm /20.0000 MHz	-64.01 dBm/Hz		More
			1 of 2
A:\SCREN672.GIF file saved			

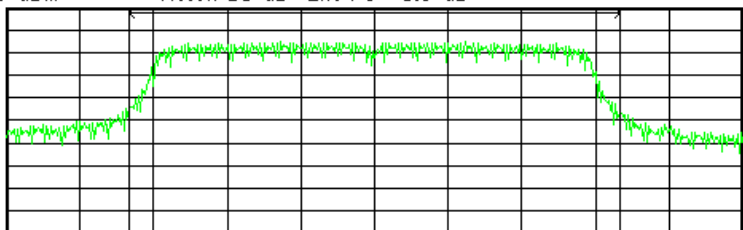
802.11HT20 ANT1 (2412MHz)

Agilent 08:15:02 Jun 26, 2012

Ch Freq 2.412 GHz		Trig Free	File
Channel Power			Catalog
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB			Save
			Load
Center 2.412 GHz Span 30 MHz			Delete
#Res BW 300 kHz #VBW 3 MHz #Sweep 100.3 ms (401 pts)			Copy
Channel Power	Power Spectral Density		Rename
10.19 dBm /20.0000 MHz	-62.82 dBm/Hz		More
			1 of 2
A:\SCREN678.GIF file saved			

802.11HT20 ANT1 (2437MHz)

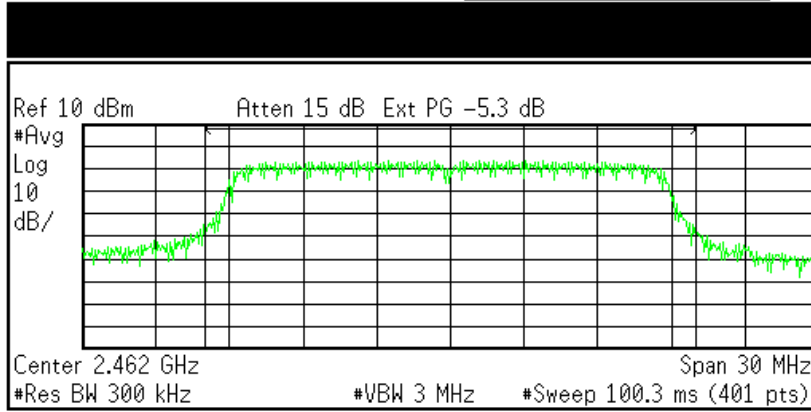
Agilent 08:21:53 Jun 26, 2012

Ch Freq 2.437 GHz		Trig Free	File
Channel Power			Catalog
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB			Save
			Load
Center 2.437 GHz Span 30 MHz			Delete
#Res BW 300 kHz #VBW 3 MHz #Sweep 100.3 ms (401 pts)			Copy
Channel Power	Power Spectral Density		Rename
9.33 dBm /20.0000 MHz	-63.68 dBm/Hz		More
			1 of 2
A:\SCREN694.GIF file saved			

802.11HT20 ANT1 (2462MHz)

Agilent 08:29:10 Jun 26, 2012

Ch Freq 2.462 GHz Trig Free
Channel Power



Channel Power 8.15 dBm /20.0000 MHz
Power Spectral Density -64.86 dBm/Hz

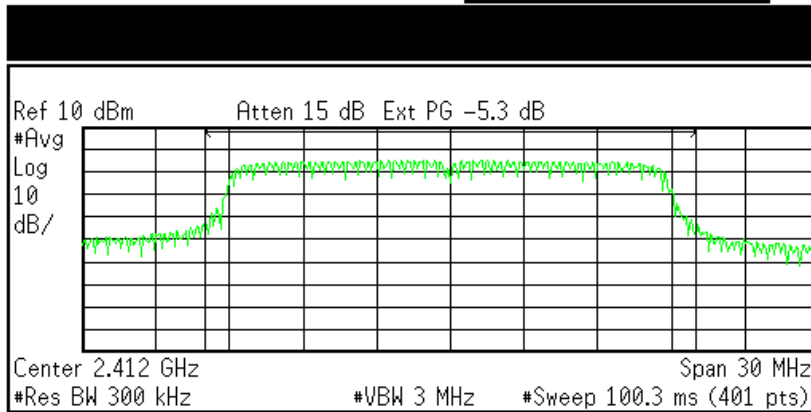
A:\SCREN710.GIF file saved

- File
- Catalog
- Save
- Load
- Delete
- Copy
- Rename
- More 1 of 2

802.11HT20 ANT2 (2412MHz)

Agilent 08:13:33 Jun 26, 2012

Ch Freq 2.412 GHz Trig Free
Channel Power



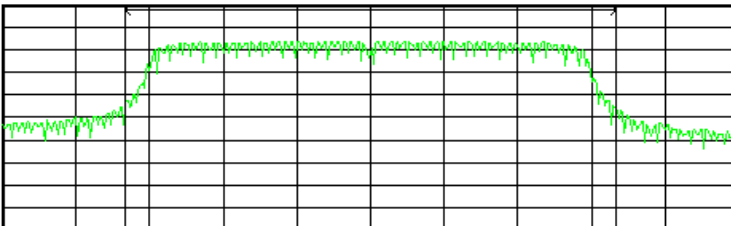
Channel Power 10.37 dBm /20.0000 MHz
Power Spectral Density -62.64 dBm/Hz

A:\SCREN676.GIF file saved

- Freq/Channel
- Center Freq 2.41200000 GHz
- Start Freq 2.39700000 GHz
- Stop Freq 2.42700000 GHz
- CF Step 3.00000000 MHz
Auto Man
- Freq Offset 0.00000000 Hz
- Signal Track On Off
- Scale Type Log Lin

802.11HT20 ANT2 (2437MHz)

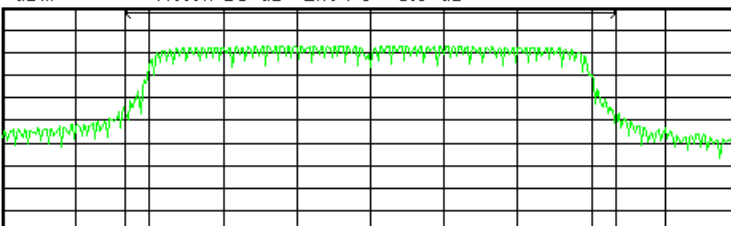
Agilent 08:21:00 Jun 26, 2012

Ch Freq 2.437 GHz		Trig Free
Channel Power		
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB #Avg Log 10 dB/		
		
Center 2.437 GHz		Span 30 MHz
#Res BW 300 kHz		#VBW 3 MHz #Sweep 100.3 ms (401 pts)
Channel Power	Power Spectral Density	
9.33 dBm /20.0000 MHz	-63.68 dBm/Hz	
A:\SCREN692.GIF file saved		

Freq/Channel
Center Freq 2.43700000 GHz
Start Freq 2.42200000 GHz
Stop Freq 2.45200000 GHz
CF Step 3.00000000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off
Scale Type Log Lin

802.11HT20 ANT2 (2462MHz)

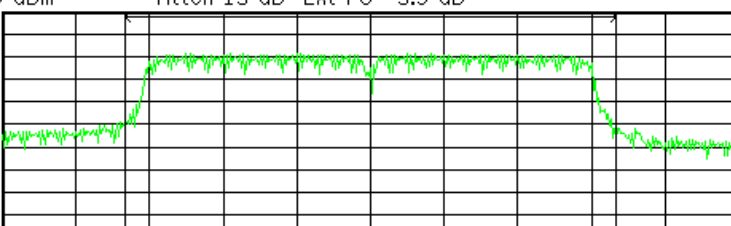
Agilent 08:28:23 Jun 26, 2012

Ch Freq 2.462 GHz		Trig Free
Channel Power		
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB #Avg Log 10 dB/		
		
Center 2.462 GHz		Span 30 MHz
#Res BW 300 kHz		#VBW 3 MHz #Sweep 100.3 ms (401 pts)
Channel Power	Power Spectral Density	
8.58 dBm /20.0000 MHz	-64.43 dBm/Hz	
A:\SCREN708.GIF file saved		

Freq/Channel
Center Freq 2.46200000 GHz
Start Freq 2.44700000 GHz
Stop Freq 2.47700000 GHz
CF Step 3.00000000 MHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off
Scale Type Log Lin

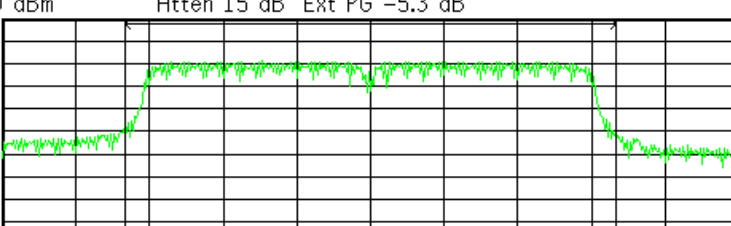
802.11HT40 ANT1 (2422MHz)

Agilent 02:01:28 Jun 27, 2012

Ch Freq 2.422 GHz		Trig Free
Channel Power [REDACTED]		
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB #Avg Log 10 dB/		
		
Center 2.422 GHz		Span 60 MHz
#Res BW 300 kHz	#VBW 3 MHz	#Sweep 100.3 ms (401 pts)
Channel Power	Power Spectral Density	
9.31 dBm /40.0000 MHz	-66.71 dBm/Hz	
Freq/Channel		
Center Freq 2.42200000 GHz		
Start Freq 2.39200000 GHz		
Stop Freq 2.45200000 GHz		
CF Step 6.00000000 MHz Auto Man		
Freq Offset 0.00000000 Hz		
Signal Track On Off		
Scale Type Log Lin		

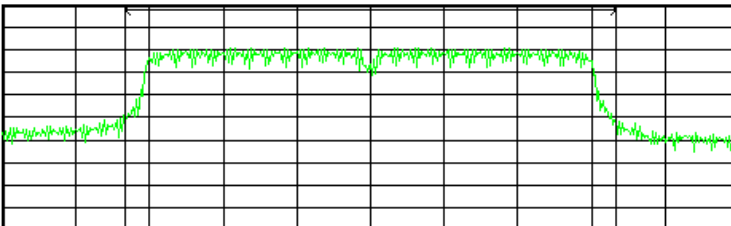
802.11HT20 ANT1 (2437MHz)

Agilent 02:18:53 Jun 27, 2012

Ch Freq 2.437 GHz		Trig Free
Channel Power [REDACTED]		
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB #Avg Log 10 dB/		
		
Center 2.437 GHz		Span 60 MHz
#Res BW 300 kHz	#VBW 3 MHz	#Sweep 100.3 ms (401 pts)
Channel Power	Power Spectral Density	
9.08 dBm /40.0000 MHz	-66.94 dBm/Hz	
Freq/Channel		
Center Freq 2.43700000 GHz		
Start Freq 2.40700000 GHz		
Stop Freq 2.46700000 GHz		
CF Step 6.00000000 MHz Auto Man		
Freq Offset 0.00000000 Hz		
Signal Track On Off		
Scale Type Log Lin		

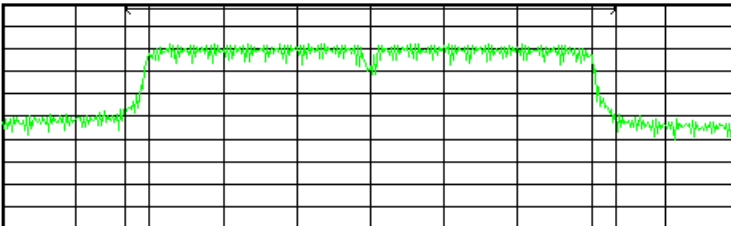
802.11HT40 ANT1 (2452MHz)

Agilent 02:26:07 Jun 27, 2012

Ch Freq 2.452 GHz		Trig Free
Channel Power [REDACTED]		
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB #Avg [REDACTED] Log [REDACTED] 10 [REDACTED] dB/ [REDACTED]		
		
Center 2.452 GHz		Span 60 MHz
#Res BW 300 kHz	#VBW 3 MHz	#Sweep 100.3 ms (401 pts)
Channel Power	Power Spectral Density	
8.60 dBm /40.0000 MHz	-67.42 dBm/Hz	
Freq/Channel		
Center Freq 2.45200000 GHz		
Start Freq 2.42200000 GHz		
Stop Freq 2.48200000 GHz		
CF Step 6.00000000 MHz Auto Man		
Freq Offset 0.00000000 Hz		
Signal Track On Off		
Scale Type Log Lin		

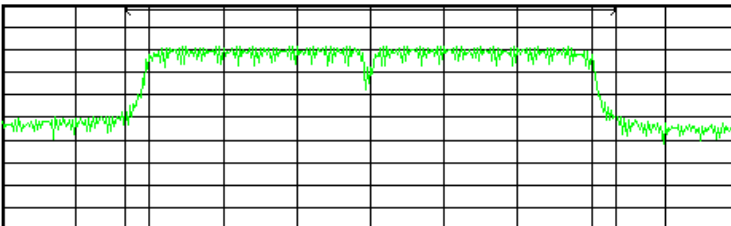
802.11HT40 ANT2 (2422MHz)

Agilent 02:01:01 Jun 27, 2012

Ch Freq 2.422 GHz		Trig Free
Channel Power [REDACTED]		
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB #Avg [REDACTED] Log [REDACTED] 10 [REDACTED] dB/ [REDACTED]		
		
Center 2.422 GHz		Span 60 MHz
#Res BW 300 kHz	#VBW 3 MHz	#Sweep 100.3 ms (401 pts)
Channel Power	Power Spectral Density	
9.99 dBm /40.0000 MHz	-66.03 dBm/Hz	
Freq/Channel		
Center Freq 2.42200000 GHz		
Start Freq 2.39200000 GHz		
Stop Freq 2.45200000 GHz		
CF Step 6.00000000 MHz Auto Man		
Freq Offset 0.00000000 Hz		
Signal Track On Off		
Scale Type Log Lin		

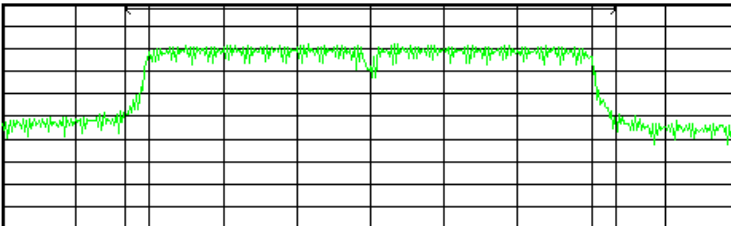
802.11HT40 ANT2 (2437MHz)

Agilent 02:18:24 Jun 27, 2012

Ch Freq 2.437 GHz		Trig Free
Channel Power		
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB #Avg Log 10 dB/		
		
Center 2.437 GHz		Span 60 MHz
#Res BW 300 kHz	#VBW 3 MHz	#Sweep 100.3 ms (401 pts)
Channel Power	Power Spectral Density	
9.55 dBm /40.0000 MHz	-66.47 dBm/Hz	
Freq/Channel		
Center Freq 2.43700000 GHz		
Start Freq 2.40700000 GHz		
Stop Freq 2.46700000 GHz		
CF Step 6.00000000 MHz Auto Man		
Freq Offset 0.00000000 Hz		
Signal Track On Off		
Scale Type Log Lin		

802.11HT40 ANT2 (2452MHz)

Agilent 02:25:39 Jun 27, 2012

Ch Freq 2.452 GHz		Trig Free
Channel Power		
Ref 10 dBm Atten 15 dB Ext PG -5.3 dB #Avg Log 10 dB/		
		
Center 2.452 GHz		Span 60 MHz
#Res BW 300 kHz	#VBW 3 MHz	#Sweep 100.3 ms (401 pts)
Channel Power	Power Spectral Density	
9.58 dBm /40.0000 MHz	-66.44 dBm/Hz	
Freq/Channel		
Center Freq 2.45200000 GHz		
Start Freq 2.42200000 GHz		
Stop Freq 2.48200000 GHz		
CF Step 6.00000000 MHz Auto Man		
Freq Offset 0.00000000 Hz		
Signal Track On Off		
Scale Type Log Lin		

5. Minimum 6dB RF Bandwidth Requirements

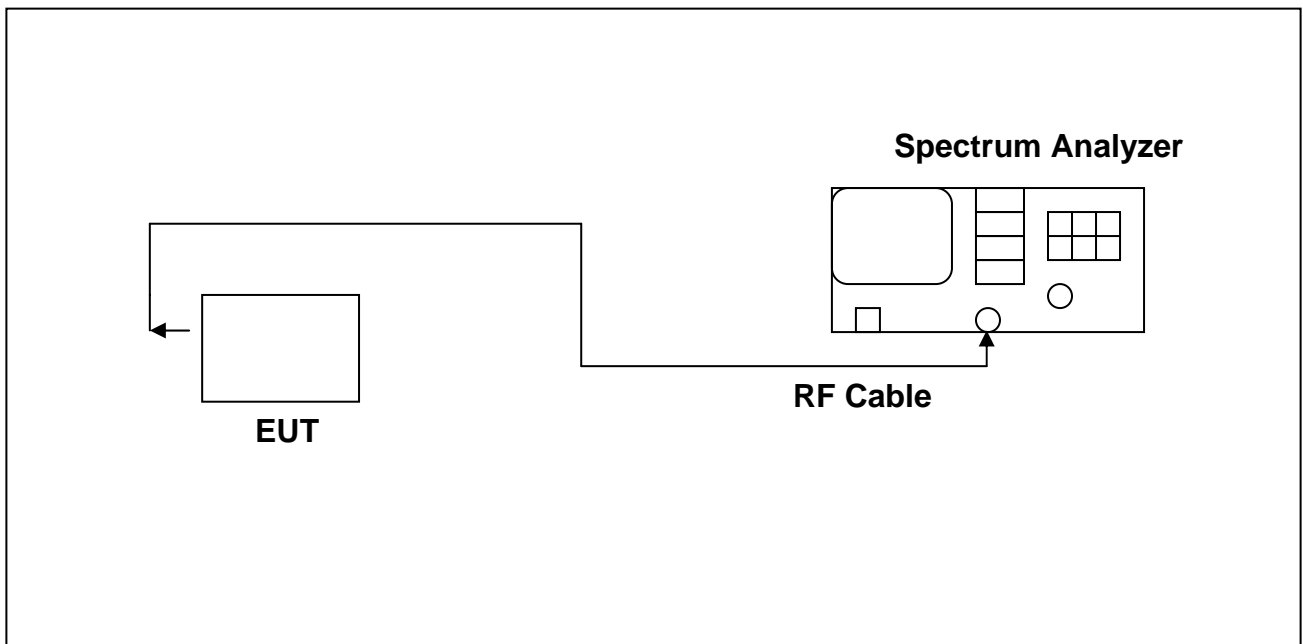
5.1 Test Condition & Setup :

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

The test was performed at 3 channels (Channel 1, 6, 11)

Measurement procedure is followed KDB 558074 v02 (7.2 option 2: Channel bandwidth)

5.2 Test Instruments Configuration:



5.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cal. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2012/1/31	2013/1/31

5.4 Test Result:

802.11b

Frequency (MHz)	Min. 6dB Bandwidth (MHz)	Required Limit
2412	11.250	>500KHz
2437	12.375	>500KHz
2462	11.250	>500KHz

802.11g

Frequency (MHz)	Min. 6dB Bandwidth (MHz)	Required Limit
2412	16.000	>500KHz
2437	16.250	>500KHz
2462	16.125	>500KHz

802.11n HT20(Ant 1)

Frequency (MHz)	Min. 6dB Bandwidth (MHz)	Required Limit
2412	17.375	>500KHz
2437	17.375	>500KHz
2462	16.875	>500KHz

802.11n HT20(Ant 2)

Frequency (MHz)	Min. 6dB Bandwidth (MHz)	Required Limit
2422	17.250	>500KHz
2437	17.125	>500KHz
2452	16.500	>500KHz

802.11n HT40(Ant 1)

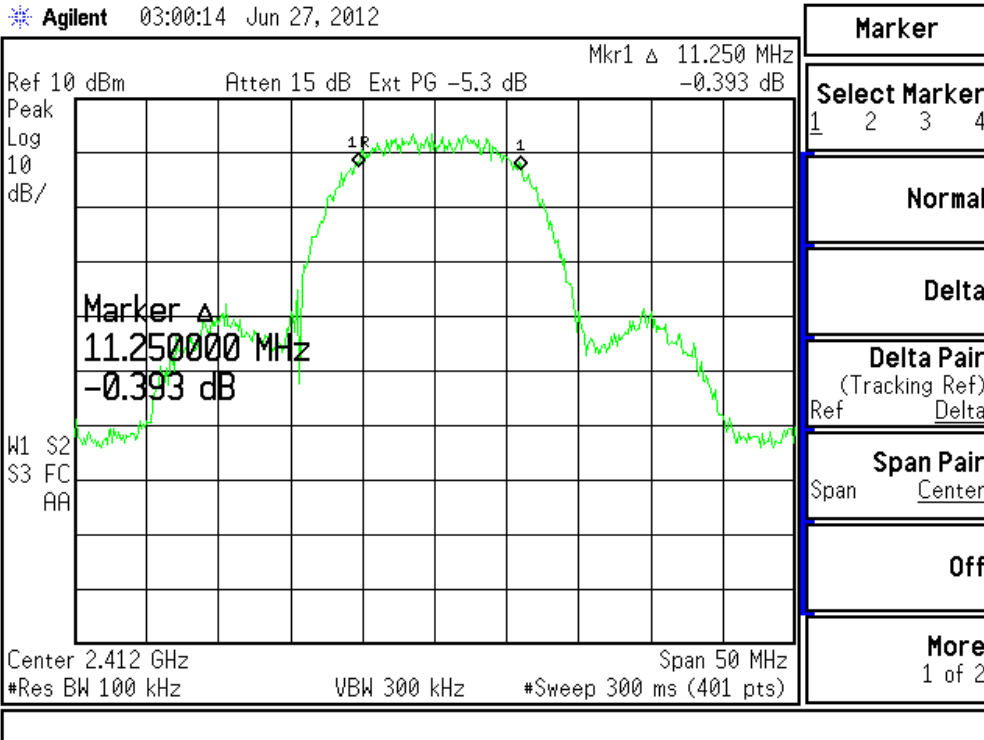
Frequency (MHz)	Min. 6dB Bandwidth (MHz)	Required Limit
2412	36.250	>500KHz
2437	36.250	>500KHz
2462	36.000	>500KHz

802.11n HT40(Ant 2)

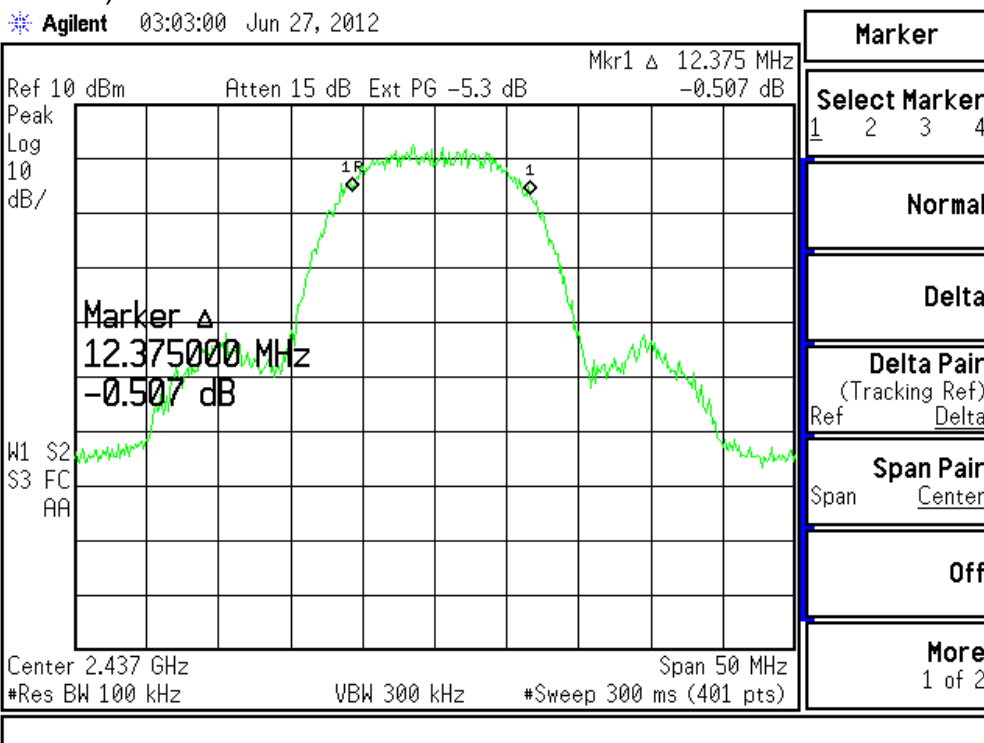
Frequency (MHz)	Min. 6dB Bandwidth (MHz)	Required Limit
2422	36.250	>500KHz
2437	36.250	>500KHz
2452	36.250	>500KHz

Note: Test Graphs See next page.

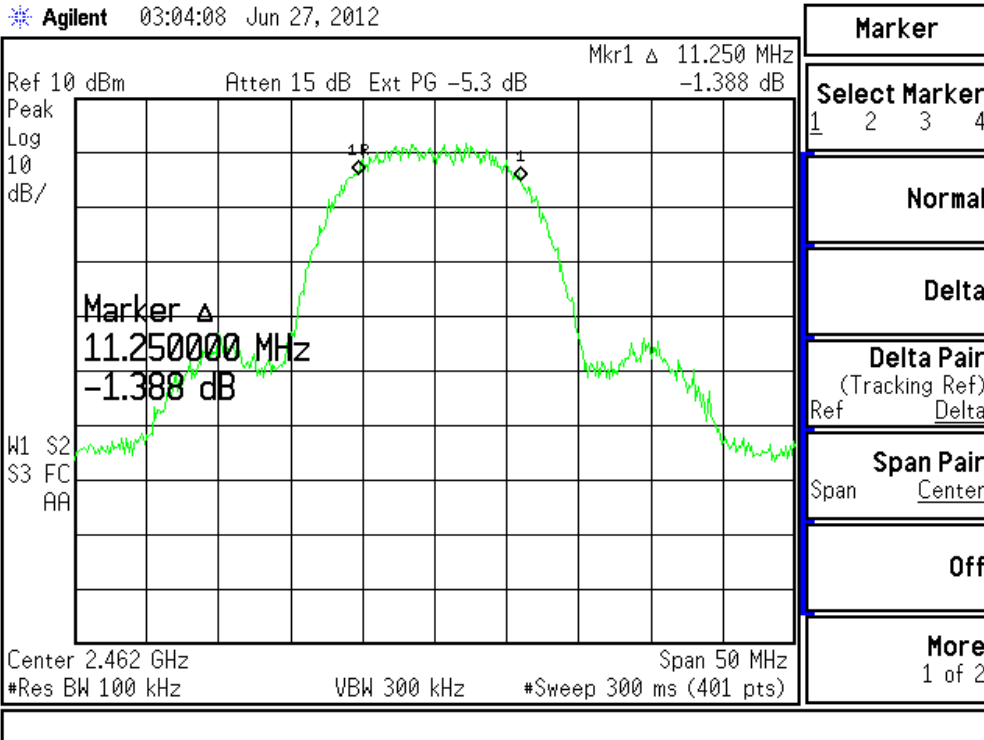
802.11b (2412MHz)



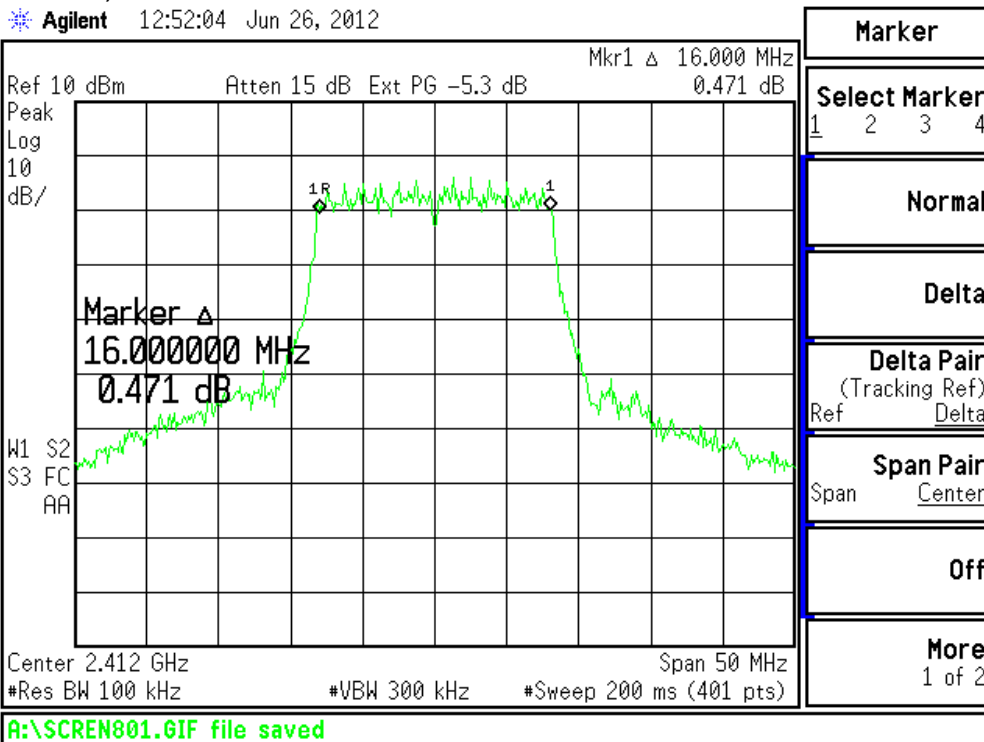
802.11b (2437MHz)



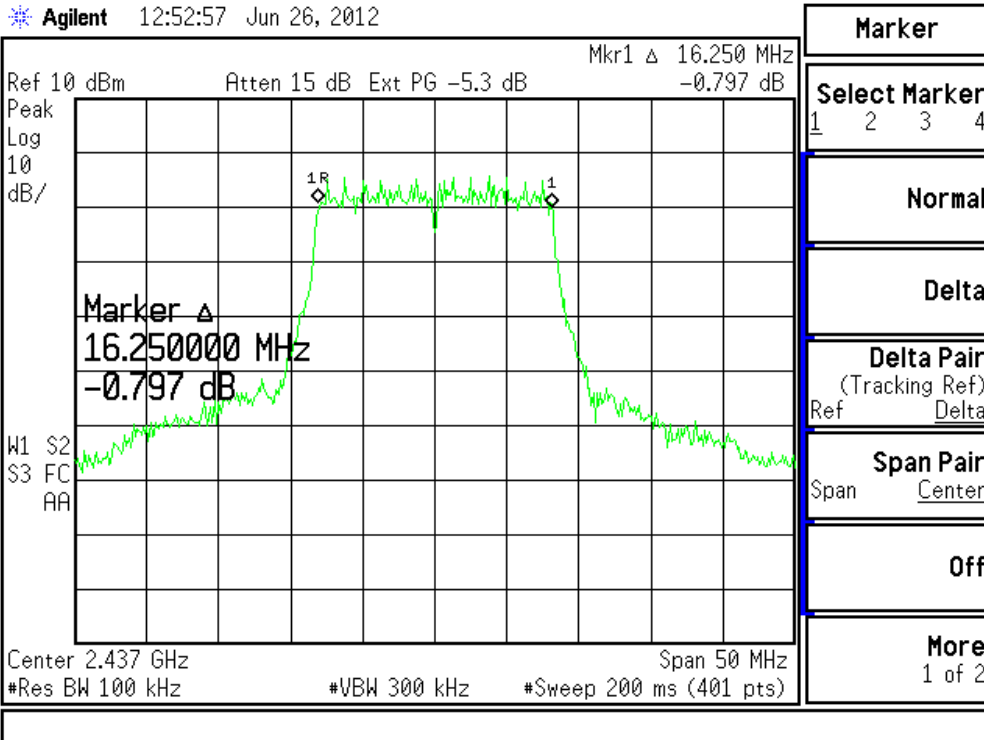
802.11b (2462MHz)



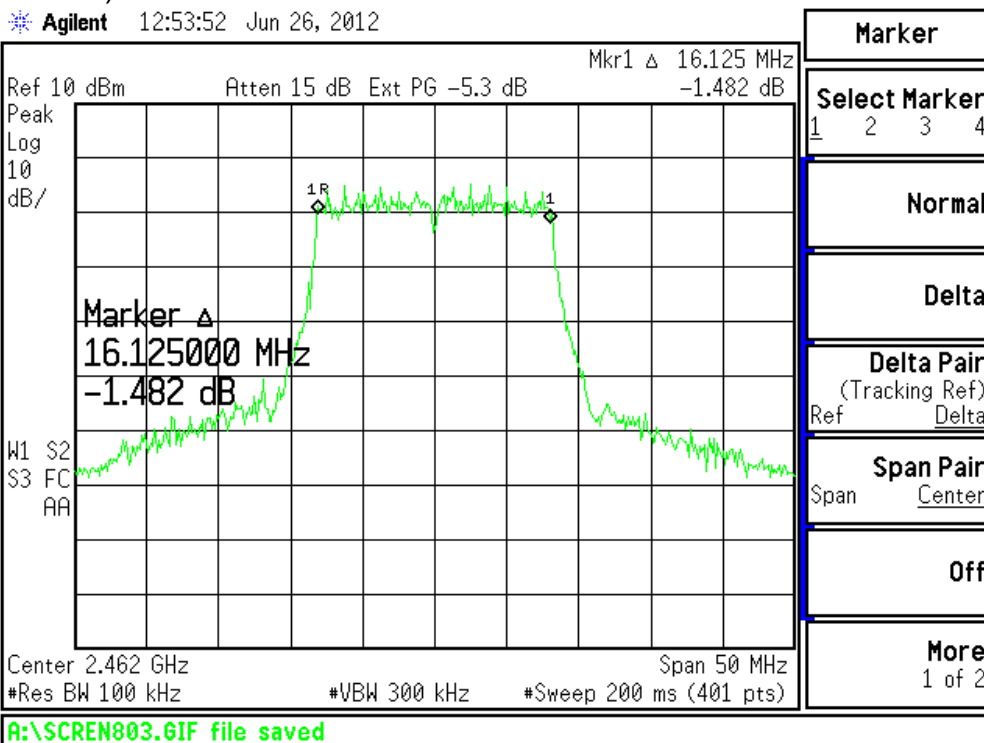
802.11g (2412MHz)



802.11g (2437MHz)

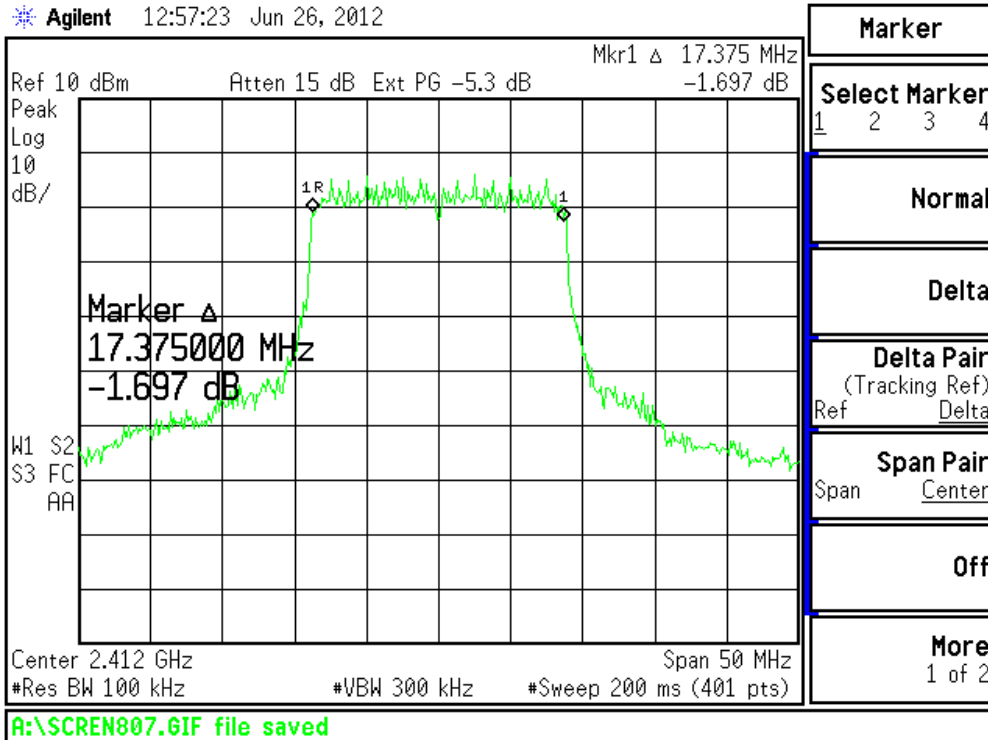


802.11g (2462MHz)



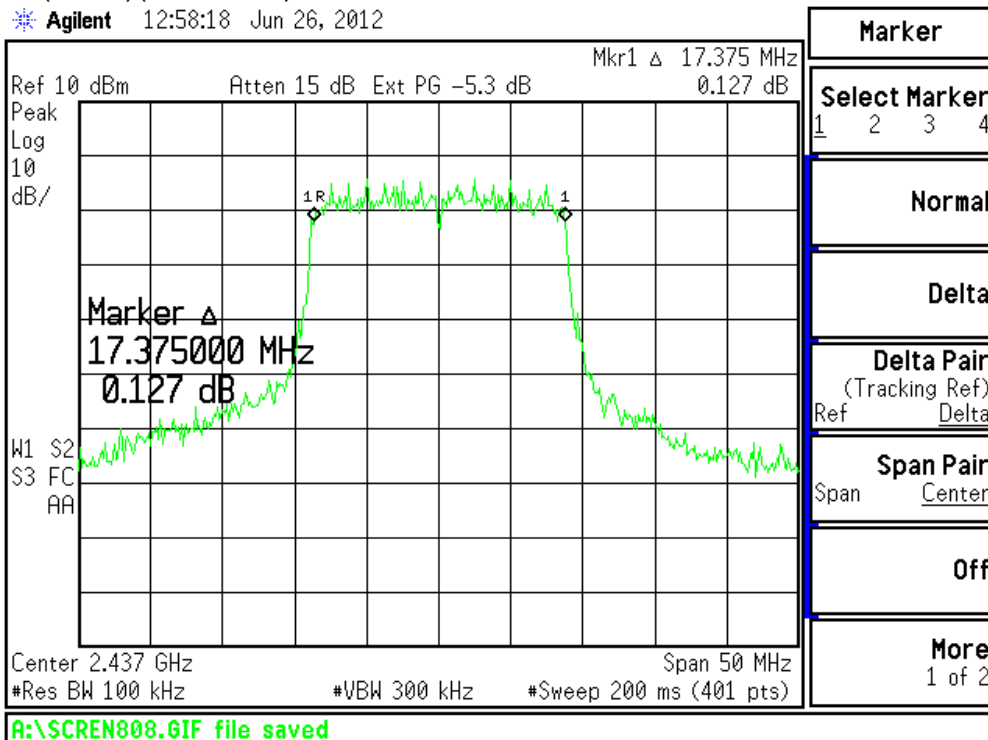
802.11n HT20(Ant 1)(2412MHz)

Agilent 12:57:23 Jun 26, 2012



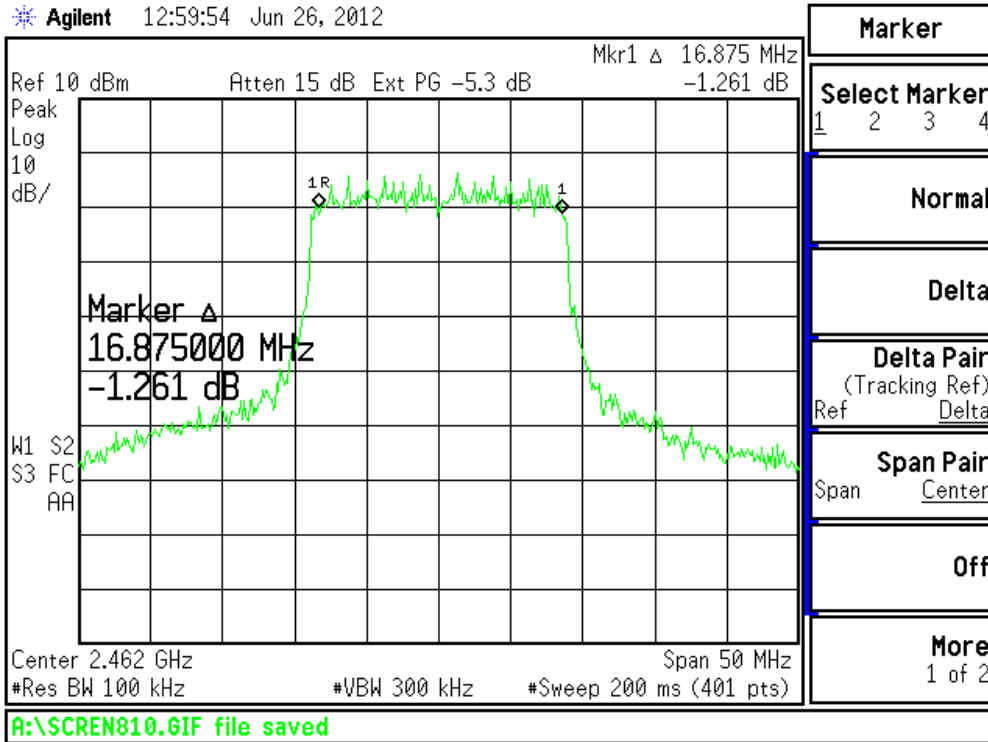
802.11n HT20(Ant 1)(2437MHz)

Agilent 12:58:18 Jun 26, 2012



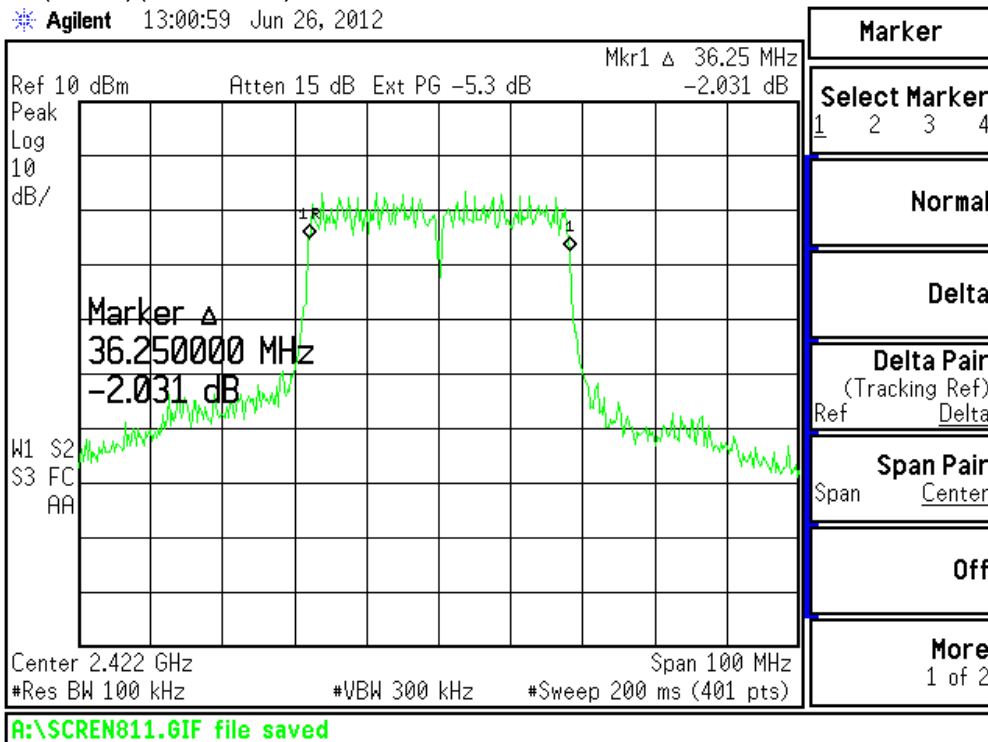
802.11n HT20(Ant 1)(2462MHz)

Agilent 12:59:54 Jun 26, 2012



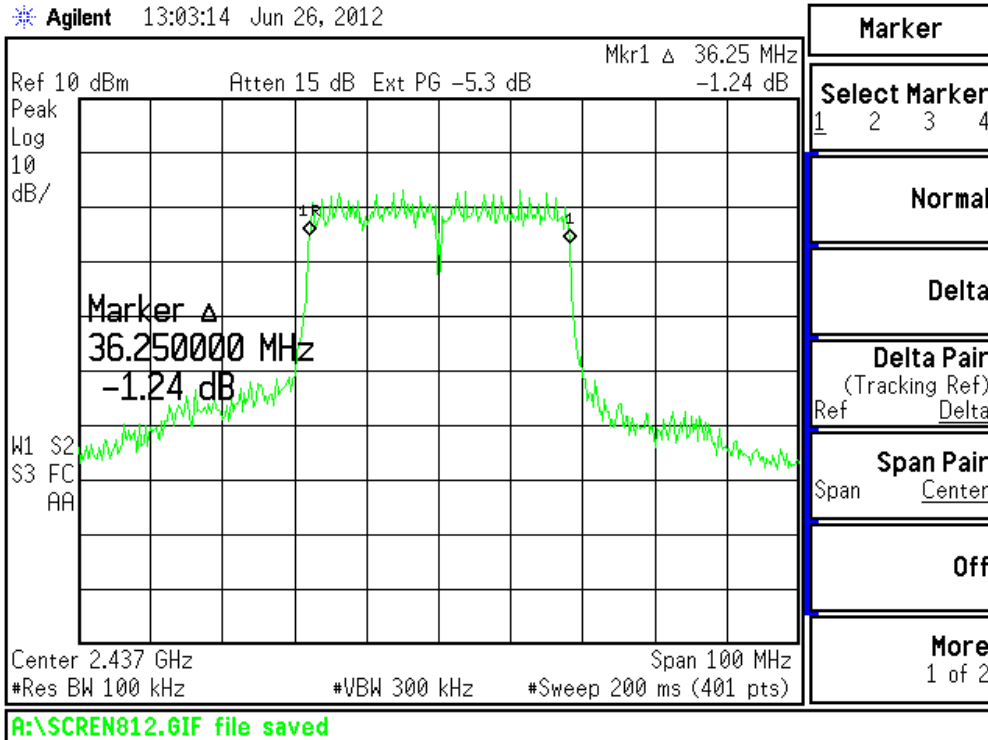
802.11n HT40(Ant 1)(2422MHz)

Agilent 13:00:59 Jun 26, 2012



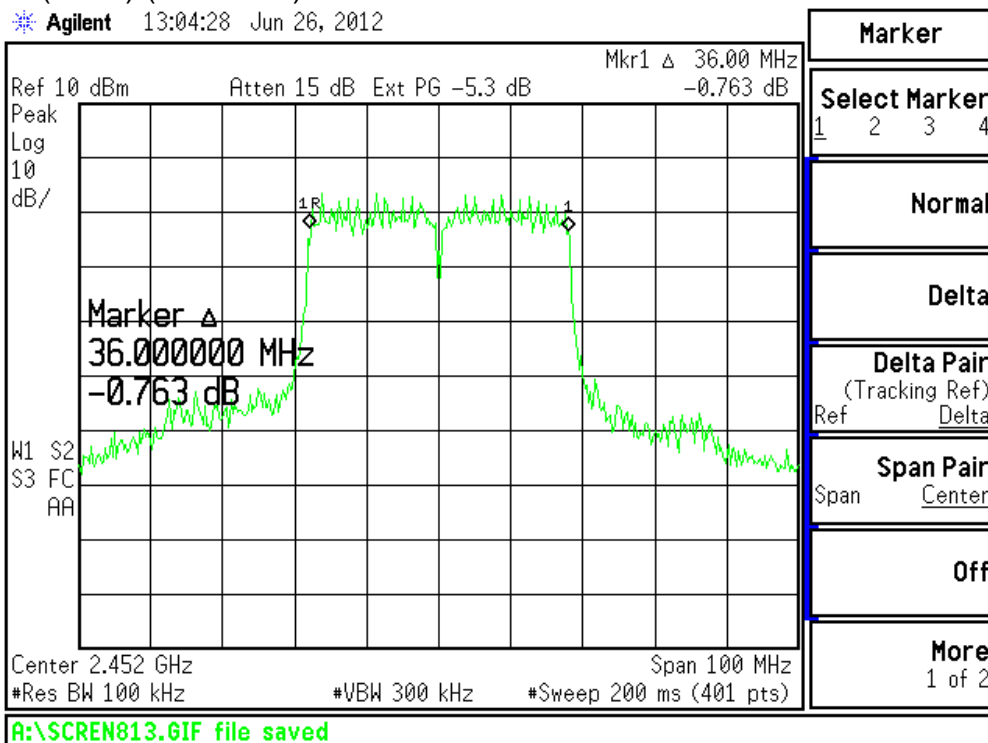
802.11n HT40(Ant 1) (2437MHz)

Agilent 13:03:14 Jun 26, 2012



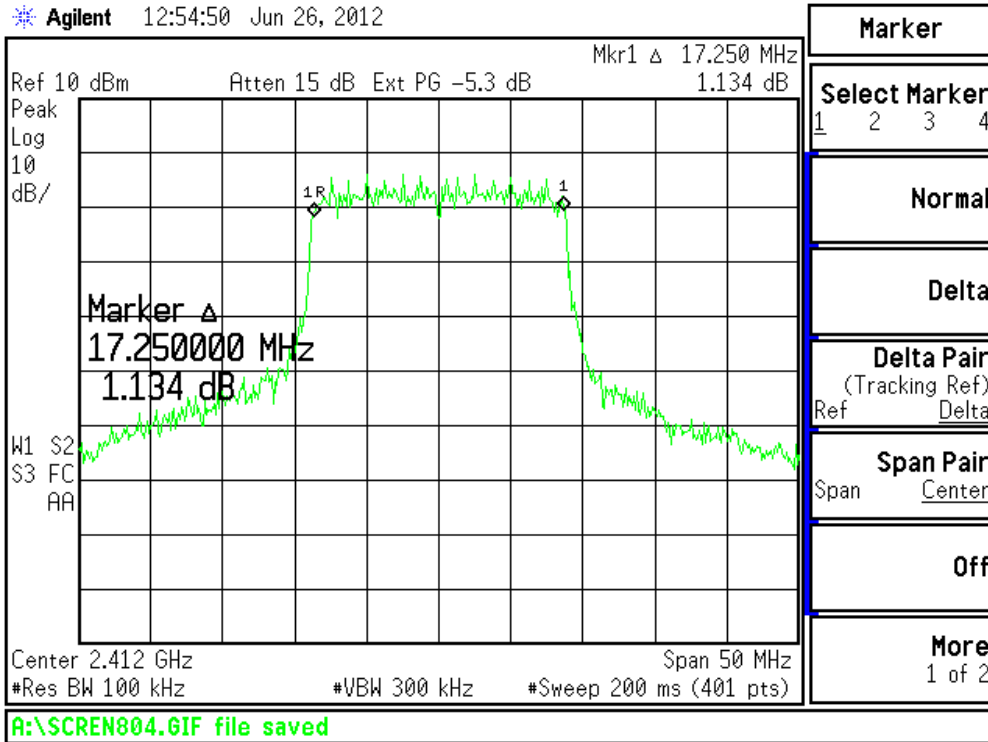
802.11n HT40(Ant 1) (2452MHz)

Agilent 13:04:28 Jun 26, 2012



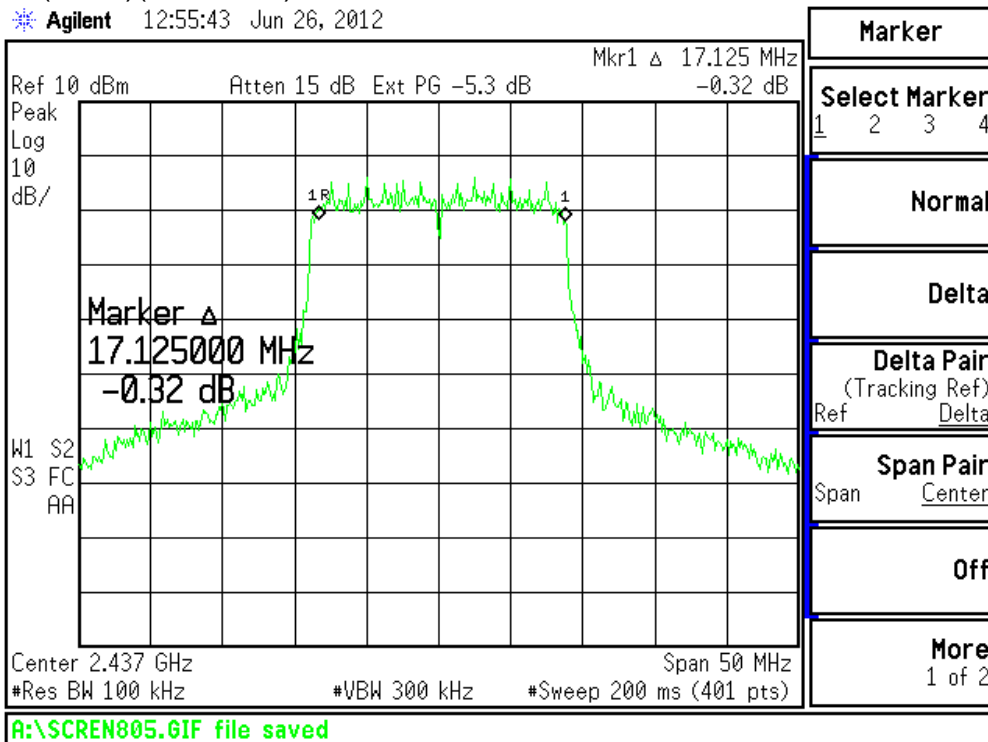
802.11n HT20(Ant 2)(2412MHz)

Agilent 12:54:50 Jun 26, 2012

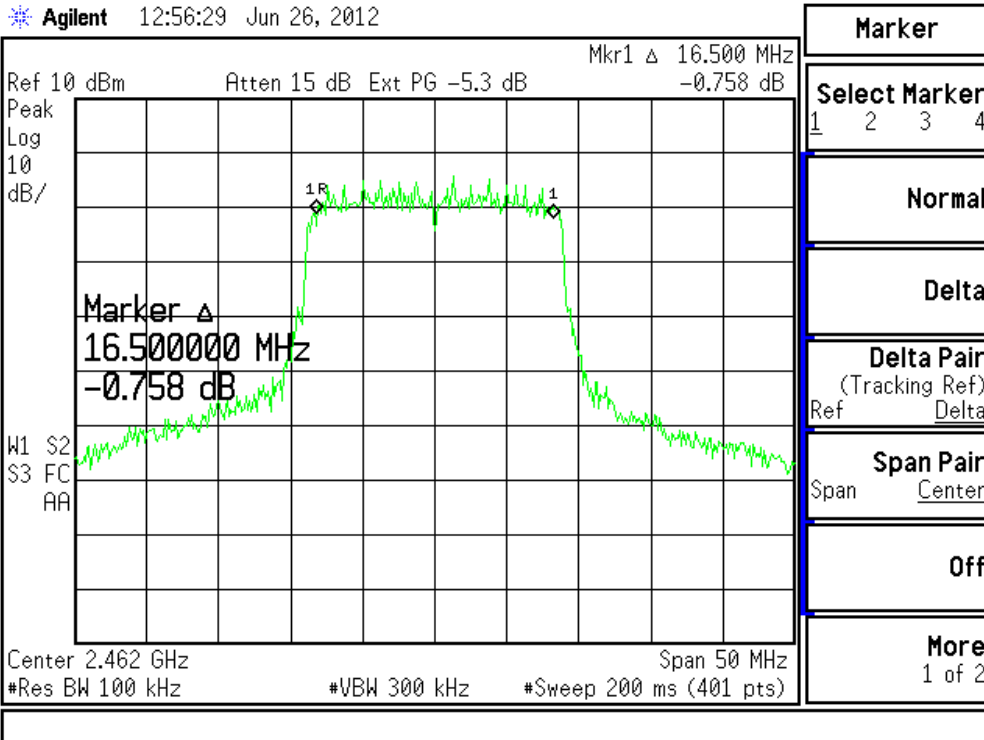


802.11n HT20(Ant 2)(2437MHz)

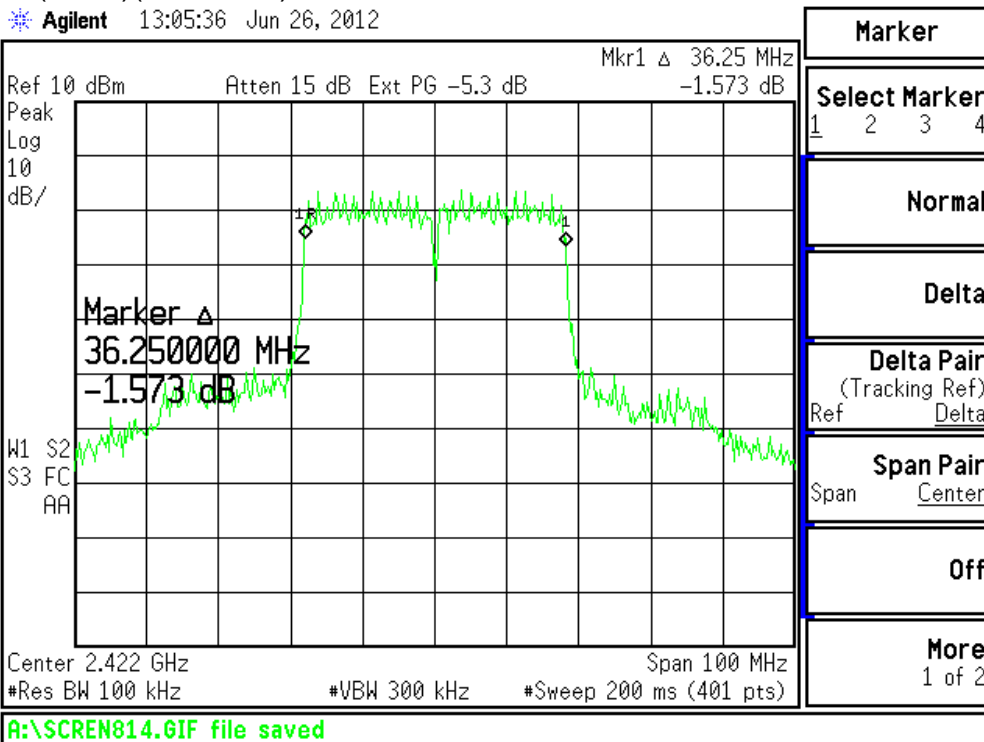
Agilent 12:55:43 Jun 26, 2012



802.11n HT20(Ant 2)(2462MHz)

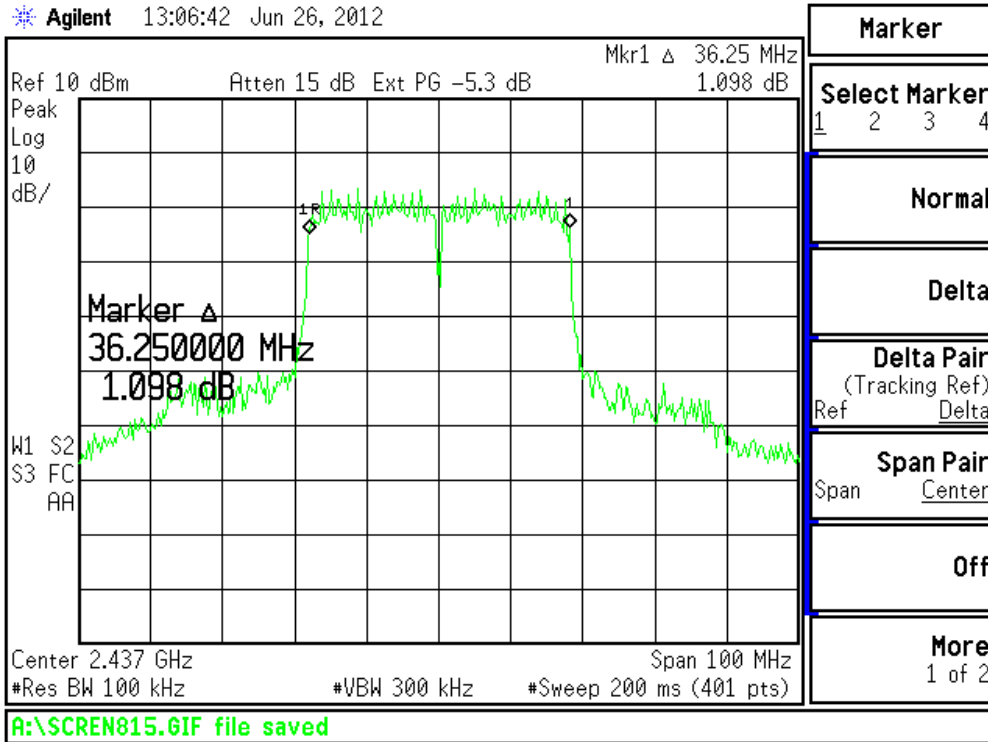


802.11n HT40(Ant 2)(2422MHz)



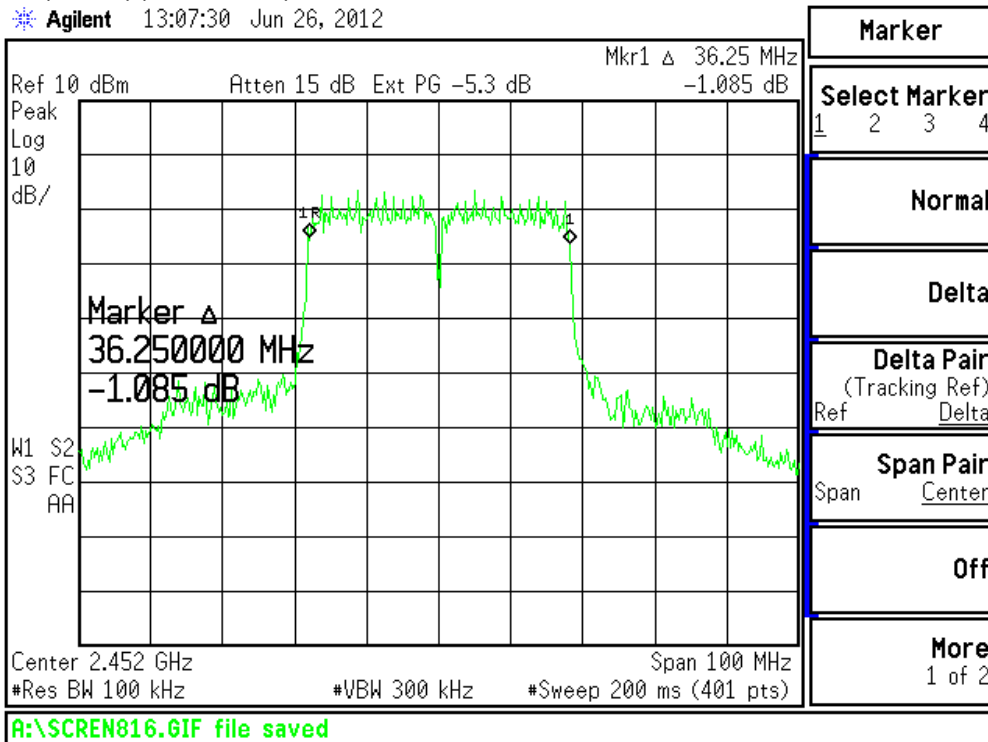
802.11n HT40(Ant 2)(2437MHz)

Agilent 13:06:42 Jun 26, 2012



802.11n HT40(Ant 2)(2452MHz)

Agilent 13:07:30 Jun 26, 2012



6. Maximum Power Density Requirements

6.1 Test Condition & Setup :

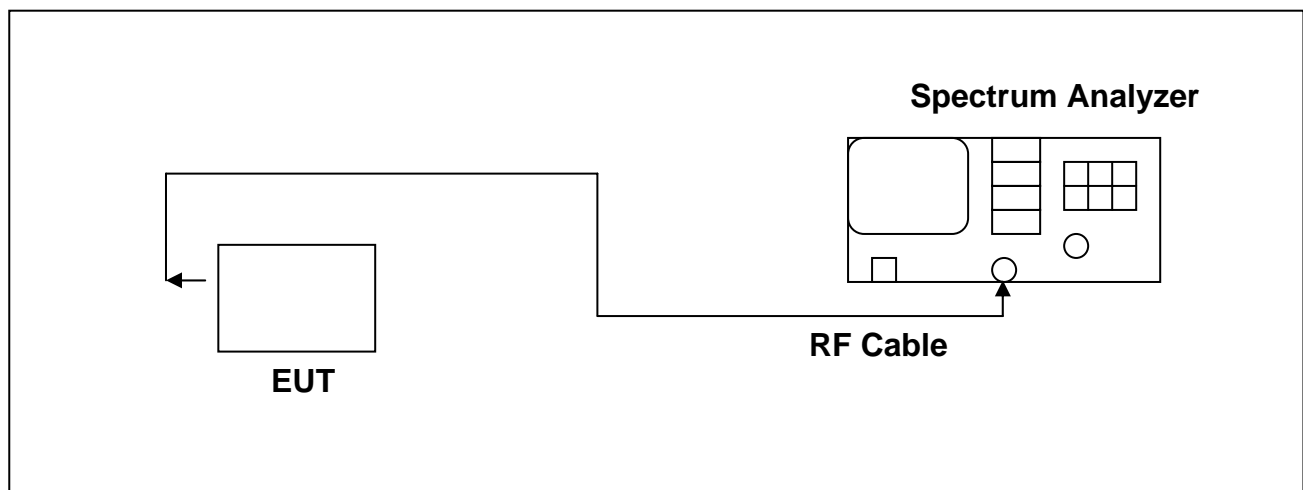
The spectrum analyzer RES BW was set to 3 kHz. The START and STOP frequencies were set to the band edges of the maximum output passband. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs. The specification calls for a 1 second interval at each 3 kHz bandwidth; total SWEEP TIME is calculated as follows:

$$\text{SWEEP TIME (SEC)} = (\text{Fstop, kHz} - \text{Fstart, kHz}) / 3 \text{ kHz}$$

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Measurement procedure is followed KDB 558074 v02 (9.3 option 3)

6.2 Test Instruments Configuration:



6.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cal. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2012/1/31	2013/1/31

6.4 Test Result:

802.11b

Frequency (MHz)	Power Density (dBm)	Required Limit
2412	-16.190	<8dBm
2437	-3.906	<8dBm
2462	-17.600	<8dBm

802.11g

Frequency (MHz)	Power Density (dBm)	Required Limit
2412	-16.020	<8dBm
2437	-21.310	<8dBm
2462	-20.320	<8dBm

802.11n HT20(Ant 1)

Frequency (MHz)	Power Density (dBm)	Required Limit
2412	-19.570	<8dBm
2437	-19.780	<8dBm
2462	-19.360	<8dBm

802.11n HT40(Ant 1)

Frequency (MHz)	Power Density (dBm)	Required Limit
2422	-20.930	<8dBm
2437	-21.050	<8dBm
2452	-21.190	<8dBm

802.11n HT20(Ant 2)

Frequency (MHz)	Power Density (dBm)	Required Limit
2412	-14.970	<8dBm
2437	-19.670	<8dBm
2462	-19.730	<8dBm

802.11n HT40(Ant 2)

Frequency (MHz)	Power Density (dBm)	Required Limit
2422	-17.830	<8dBm
2437	-20.590	<8dBm
2452	-21.300	<8dBm

802.11n HT20(Ant1 + Ant2)

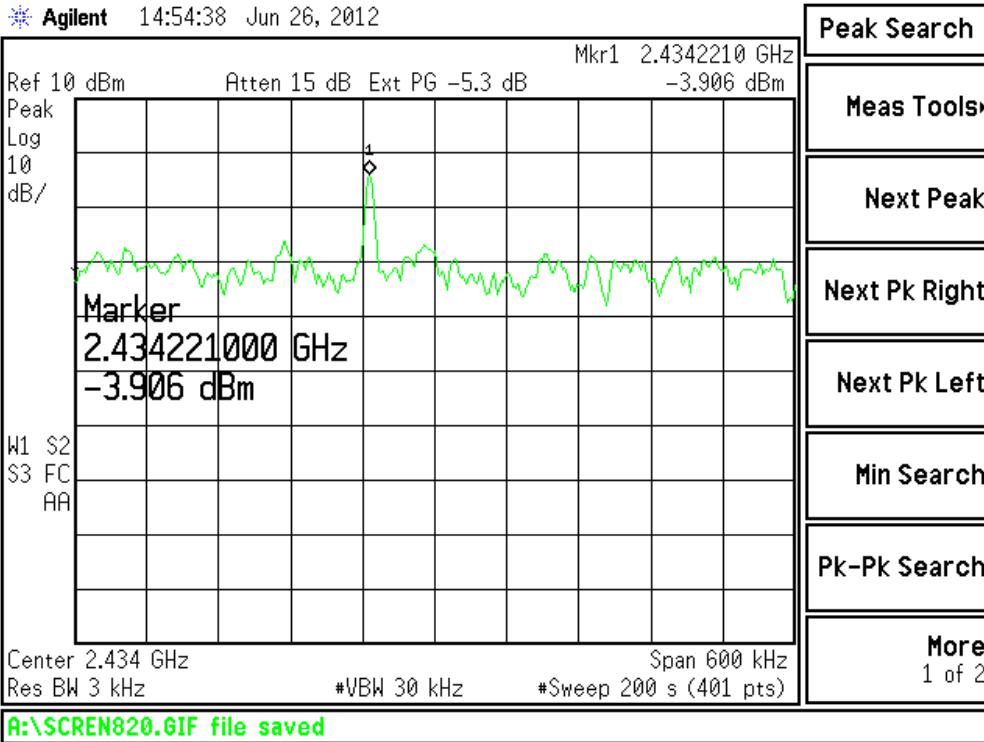
Frequency (MHz)	Power Density (dBm)	Required Limit
2412	-22.460	<8dBm
2437	-21.760	<8dBm
2462	-20.210	<8dBm

802.11n HT40(Ant1 + Ant2)

Frequency (MHz)	Power Density (dBm)	Required Limit
2422	-18.410	<8dBm
2437	-21.240	<8dBm
2452	-23.100	<8dBm

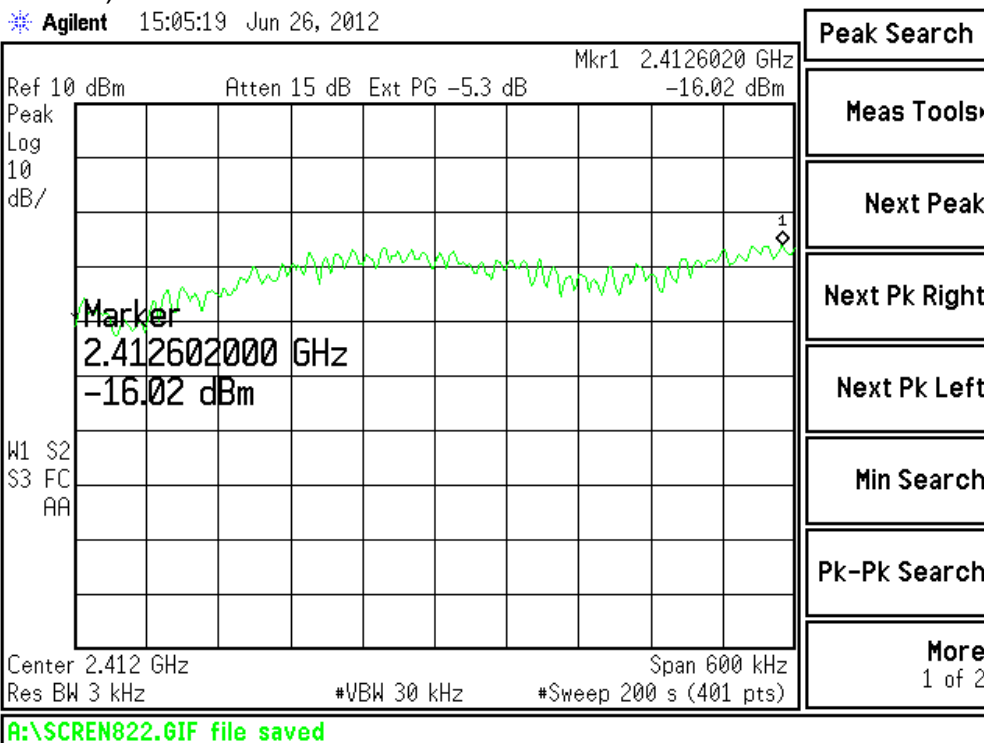
- Note :**
1. Frequency Span = 600KHz
 2. Sweep Time = 200secs
 3. Test Graphs See next page.

802.11b (2437MHz)



- Peak Search
- Meas Tools
- Next Peak
- Next Pk Right
- Next Pk Left
- Min Search
- Pk-Pk Search
- More 1 of 2

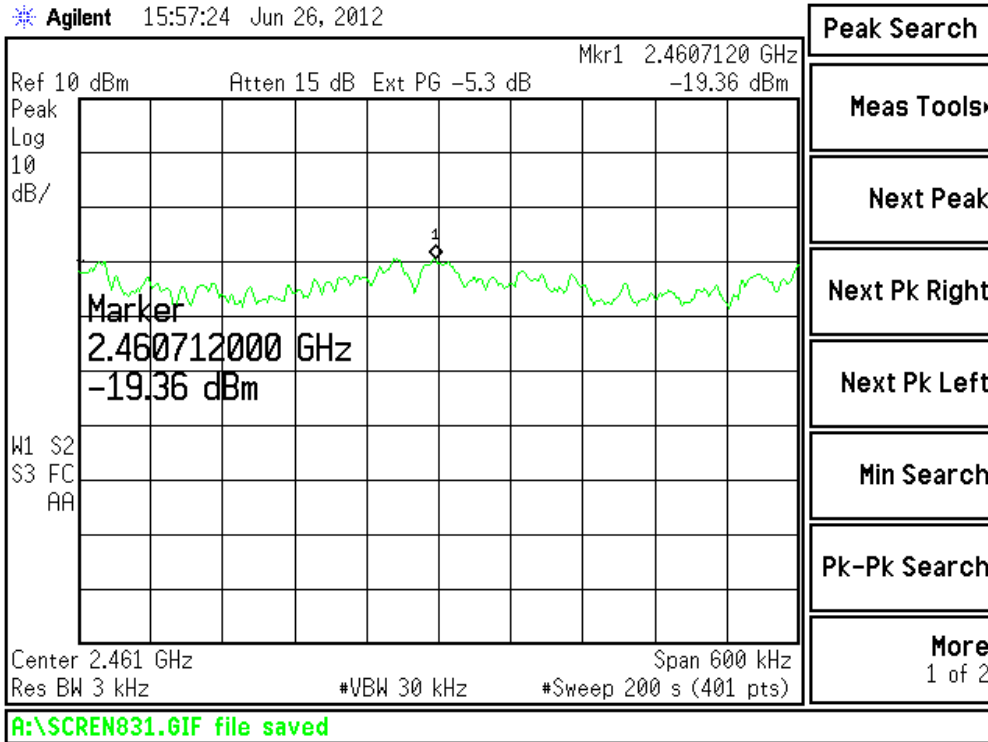
802.11g (2412MHz)



- Peak Search
- Meas Tools
- Next Peak
- Next Pk Right
- Next Pk Left
- Min Search
- Pk-Pk Search
- More 1 of 2

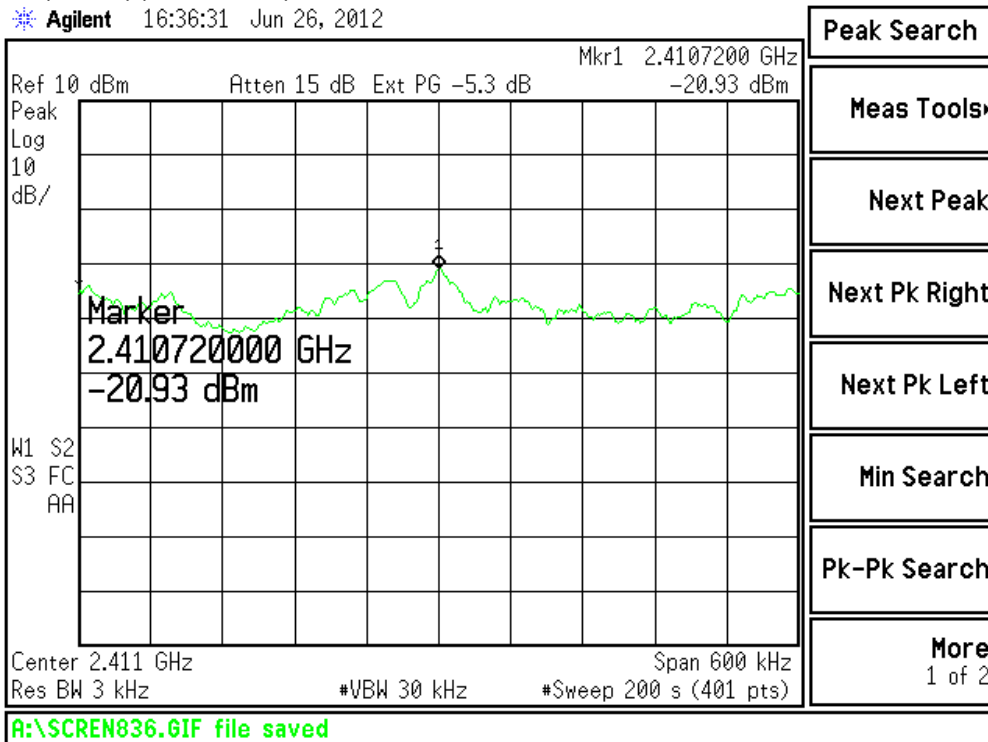
802.11n HT20(Ant 1)(2462MHz)

Agilent 15:57:24 Jun 26, 2012



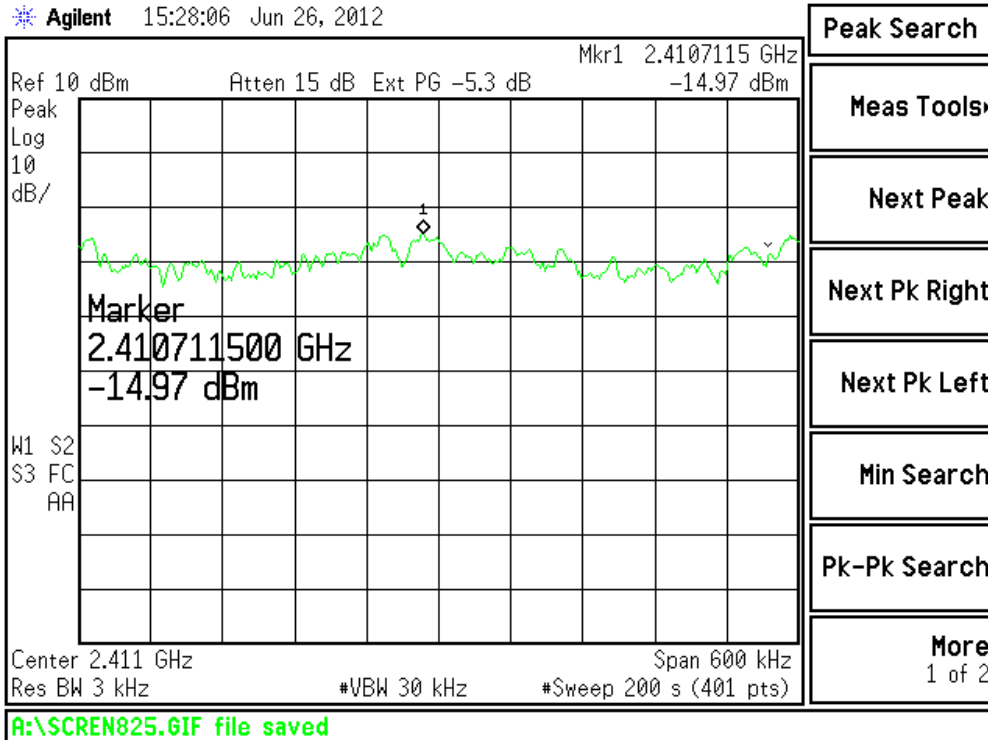
802.11n HT40(Ant 1)(2422MHz)

Agilent 16:36:31 Jun 26, 2012



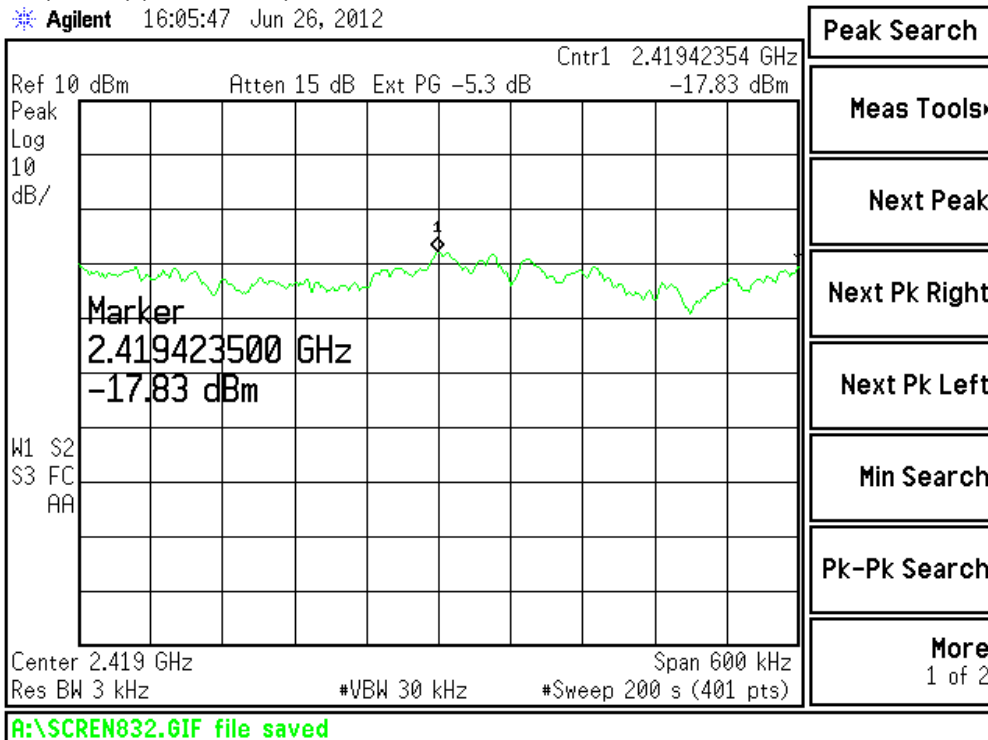
802.11n HT20(Ant 2)(2412MHz)

Agilent 15:28:06 Jun 26, 2012



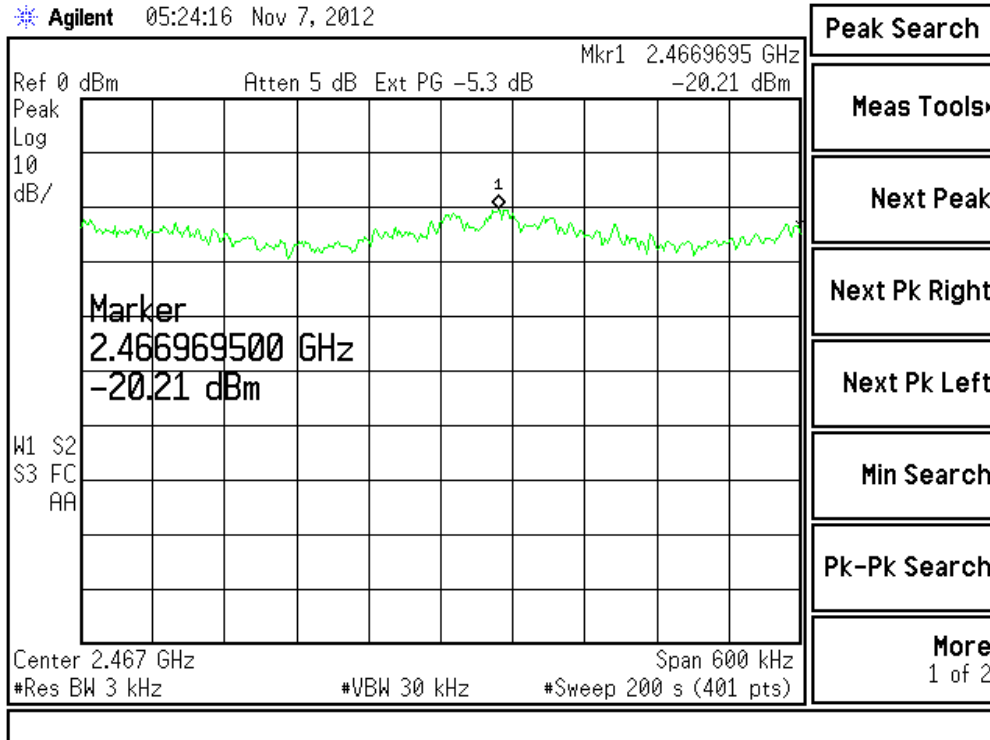
802.11n HT40(Ant 2)(2422MHz)

Agilent 16:05:47 Jun 26, 2012



802.11n HT20(Ant1 + Ant 2)(2462MHz)

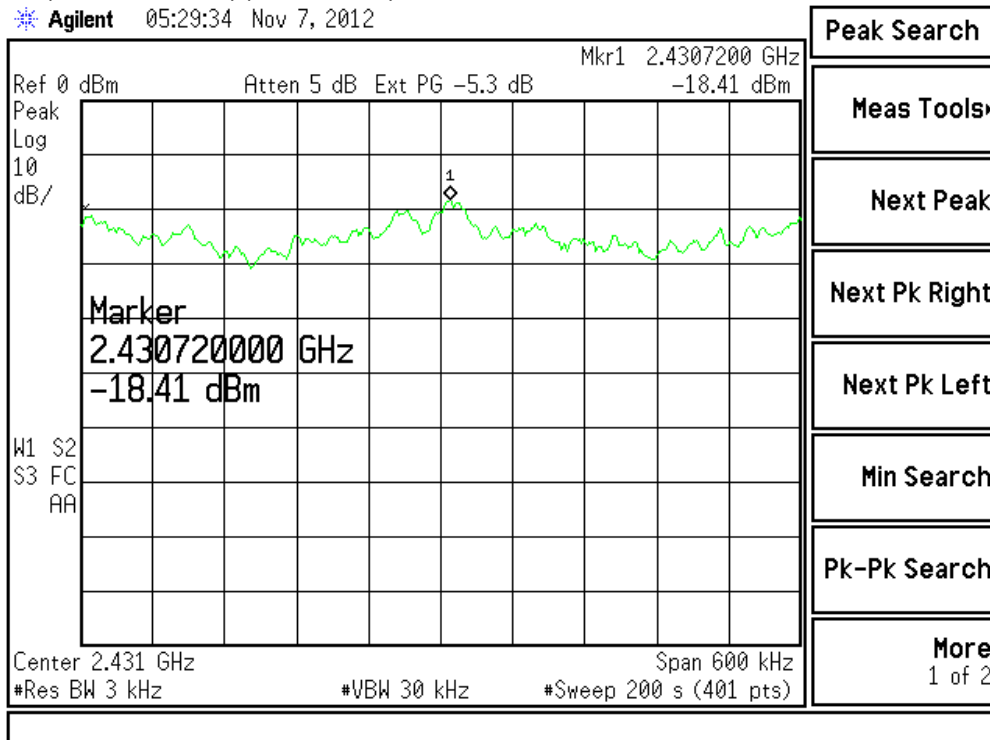
Agilent 05:24:16 Nov 7, 2012



- Peak Search
- Meas Tools
- Next Peak
- Next Pk Right
- Next Pk Left
- Min Search
- Pk-Pk Search
- More
1 of 2

802.11n HT40(Ant1 + Ant 2)(2422MHz)

Agilent 05:29:34 Nov 7, 2012



- Peak Search
- Meas Tools
- Next Peak
- Next Pk Right
- Next Pk Left
- Min Search
- Pk-Pk Search
- More
1 of 2

7. Out of Band Conducted Spurious Emissions Requirements

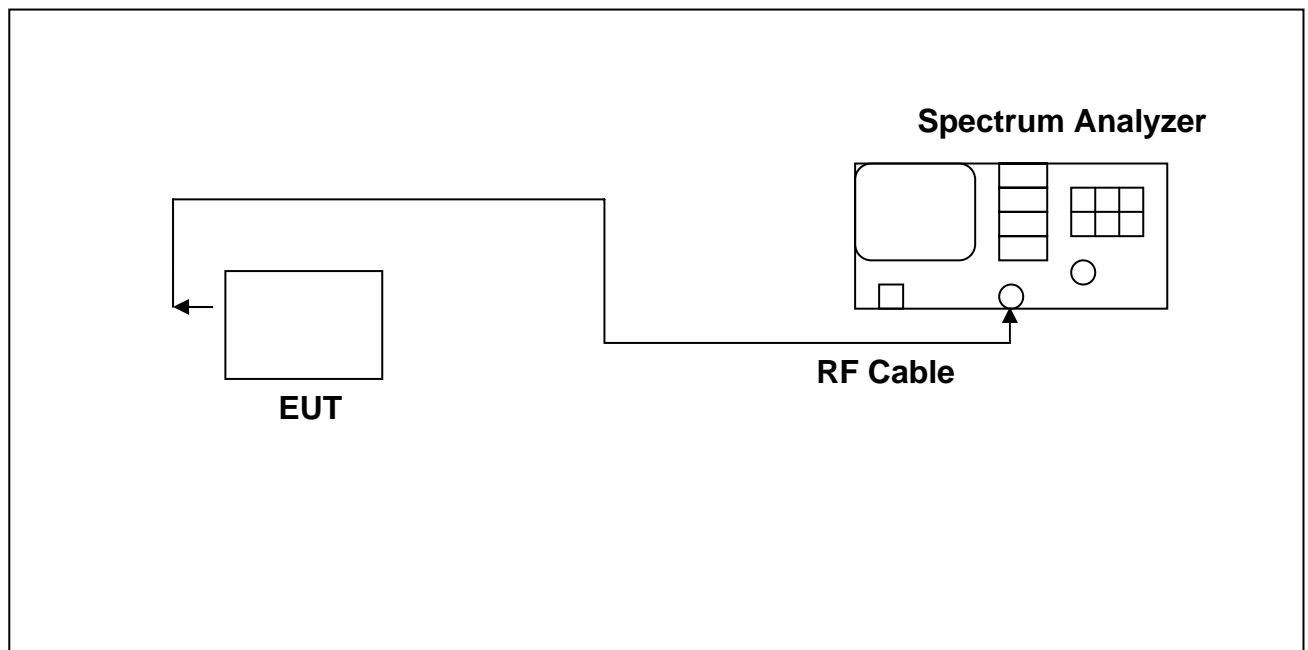
7.1 Test Condition & Setup :

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels.

Measurement procedure is followed KDB 558074 v02 (10.1.2 Unwanted emission level measurement)

7.2 Test Instruments Configuration:



7.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cal. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2012/1/31	2013/1/31

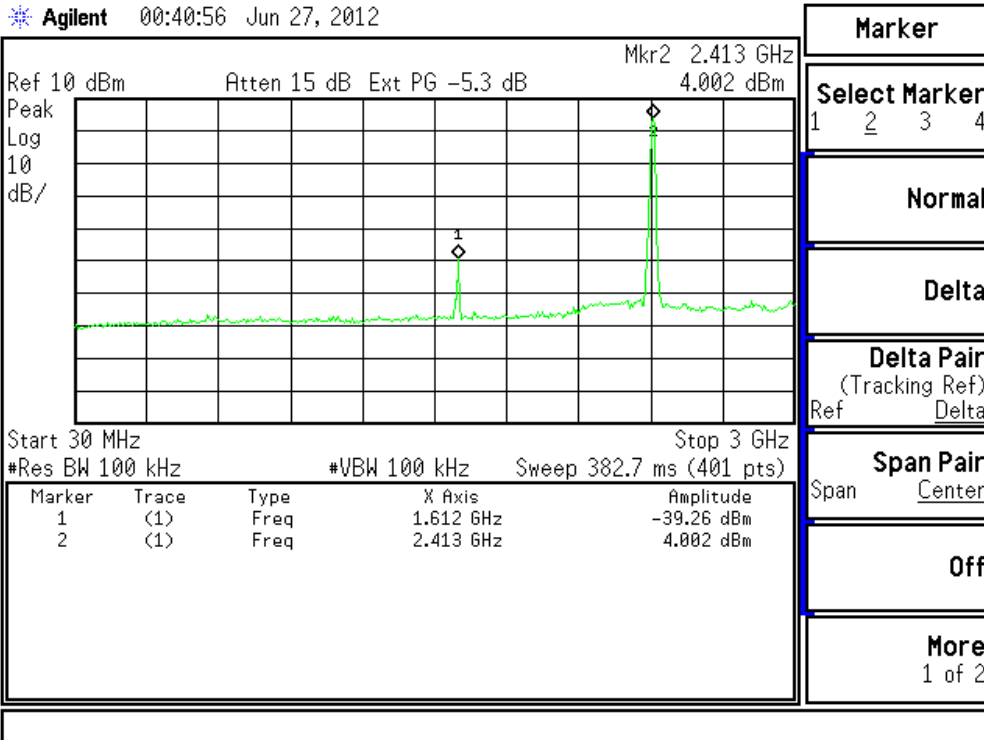
7.4 Test Result:

Refer to attached data sheets. Data shows out of band emissions are suppressed well below the -20 dBc minimum required by the Rules.

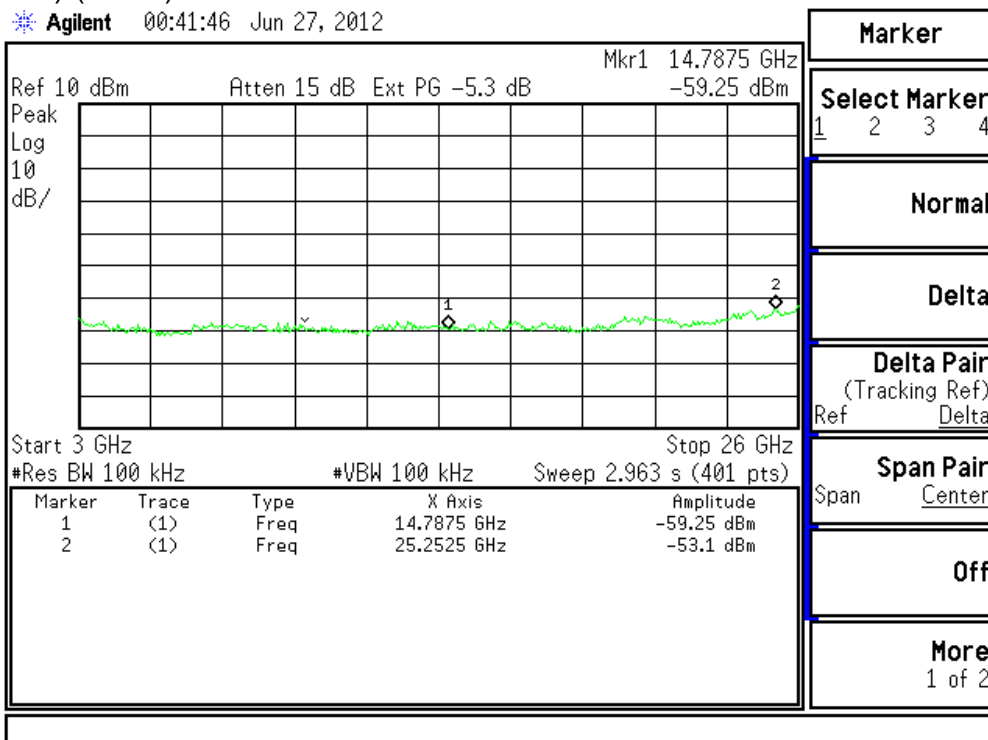
For the MIMO result, if the spurious emission of two antennas have the same frequency, we choose the worst one and add 3dB to be the final result, otherwise, use the graph to represent it.

Note : Test Graphs See next page.

802.11b (CH01) (1 of 2)

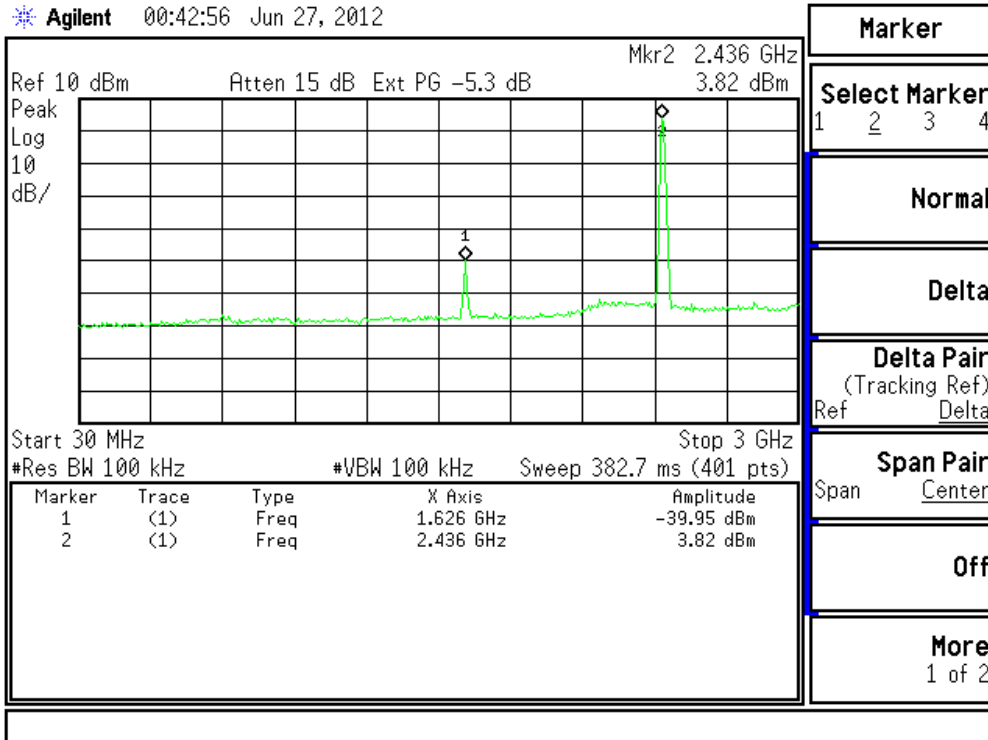


802.11b (CH01) (2 of 2)



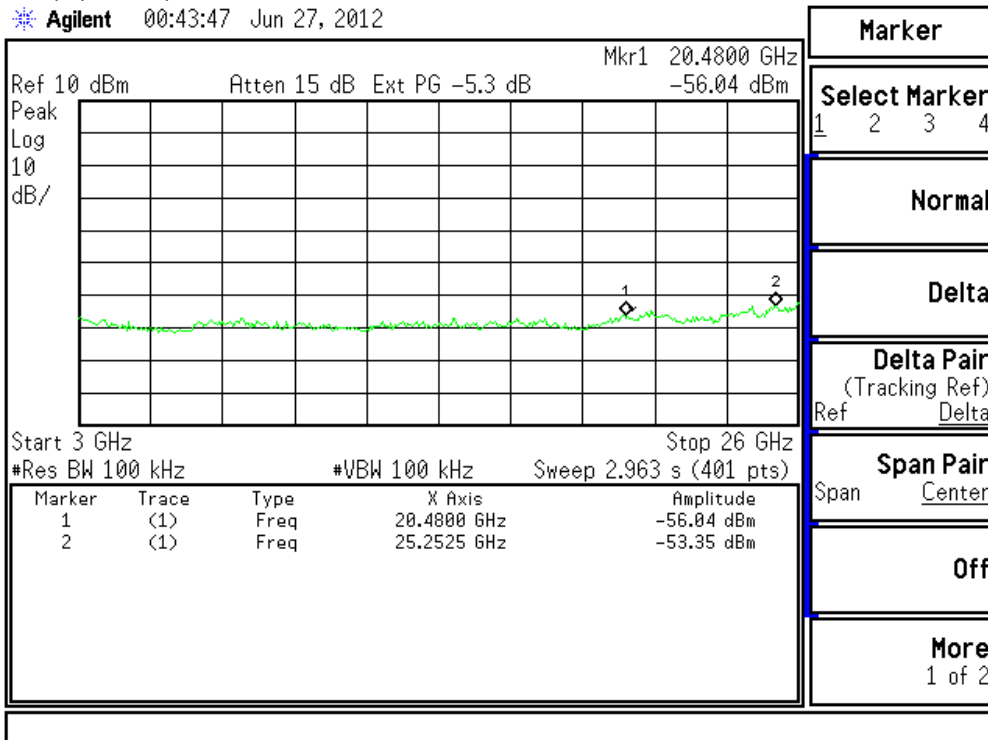
802.11b (CH06) (1 of 2)

Agilent 00:42:56 Jun 27, 2012

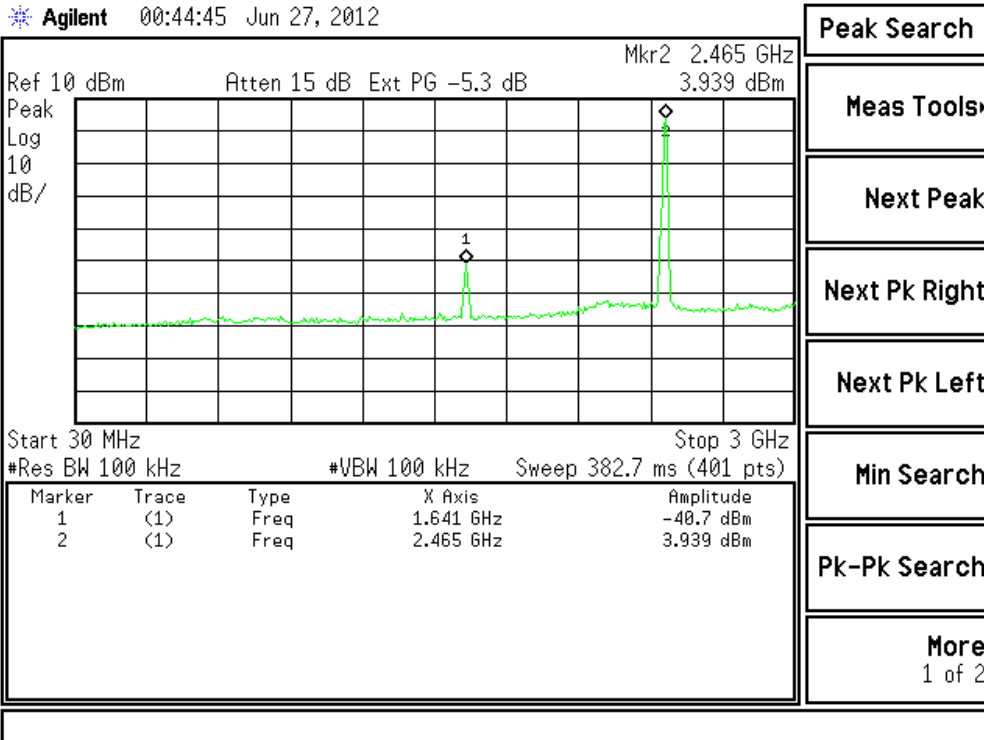


802.11b (CH06) (2 of 2)

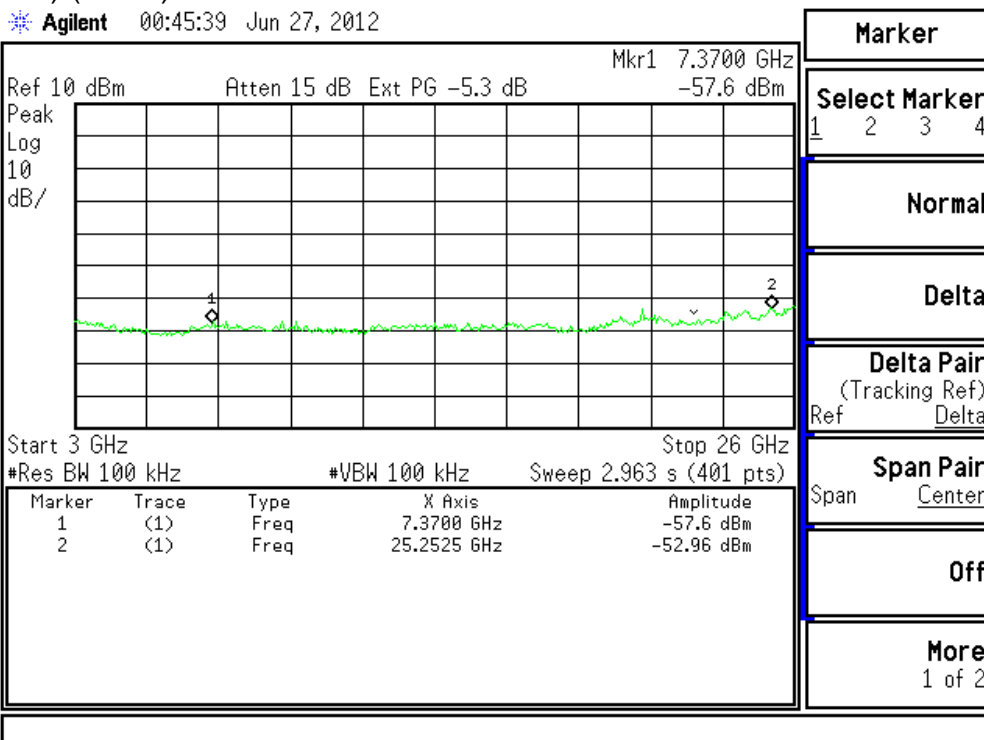
Agilent 00:43:47 Jun 27, 2012



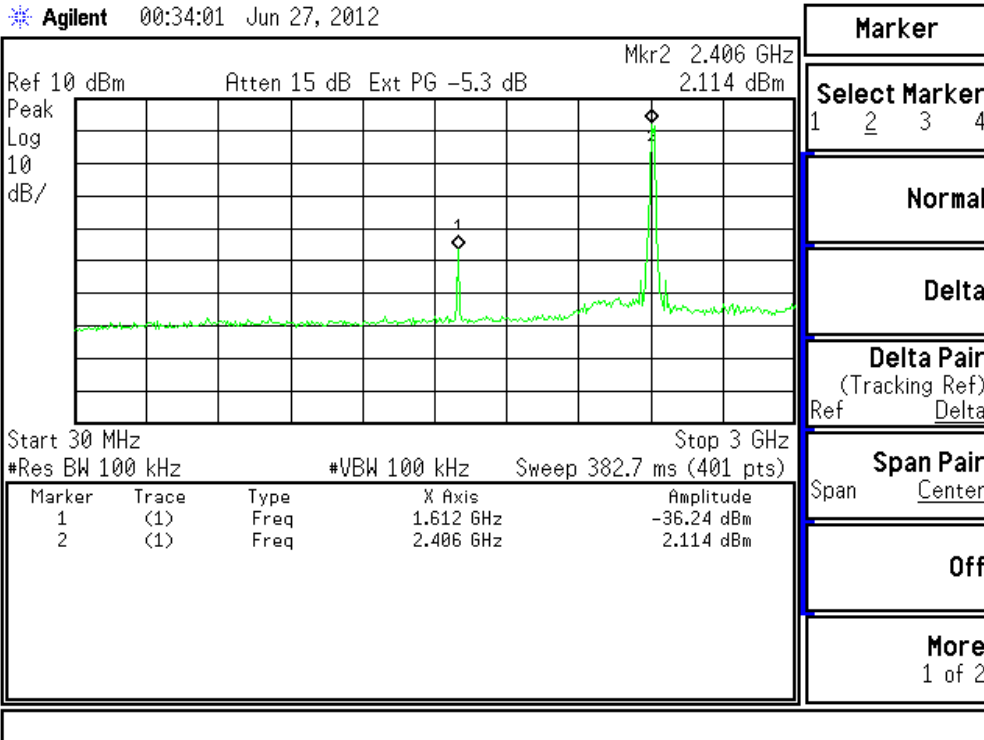
802.11b (CH11) (1 of 2)



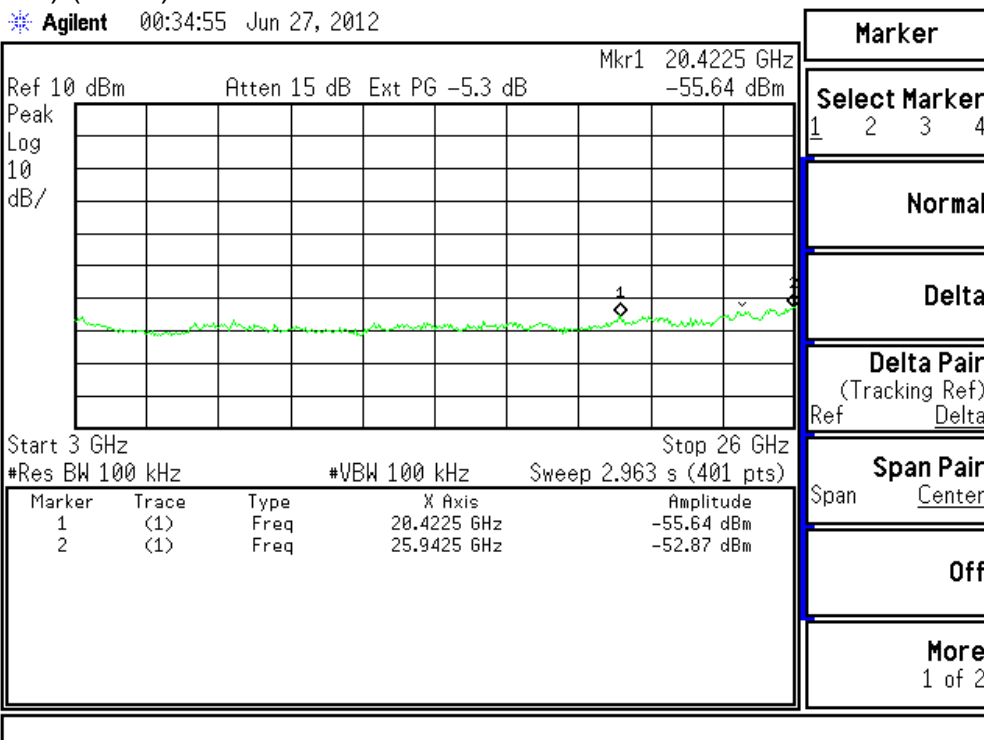
802.11b (CH11) (2 of 2)



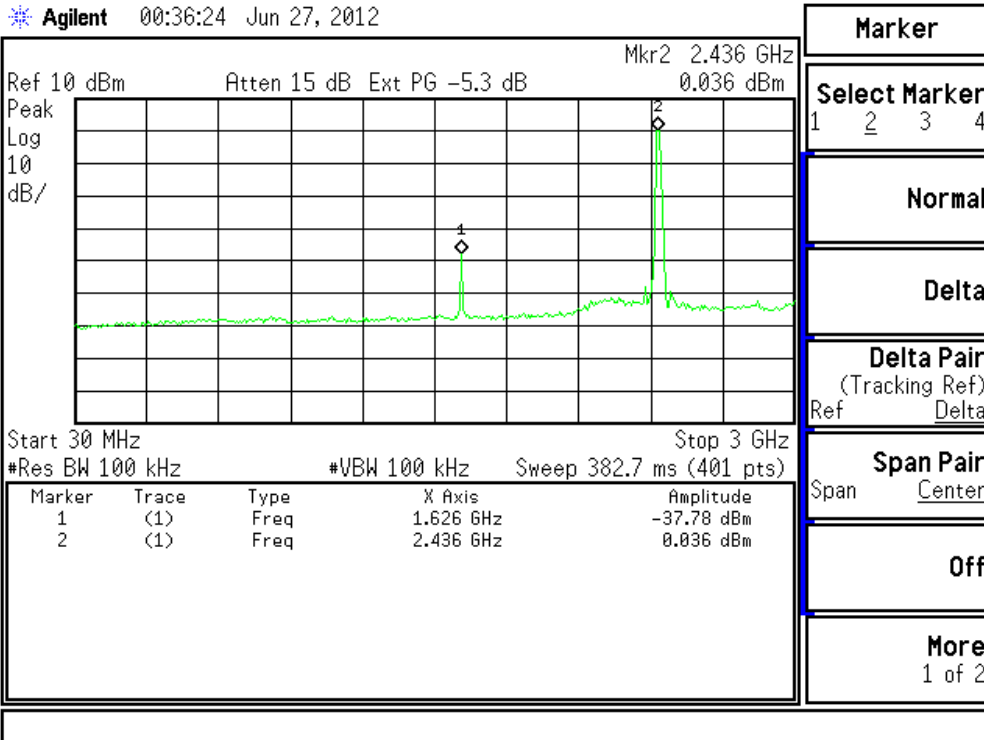
802.11g (CH01) (1 of 2)



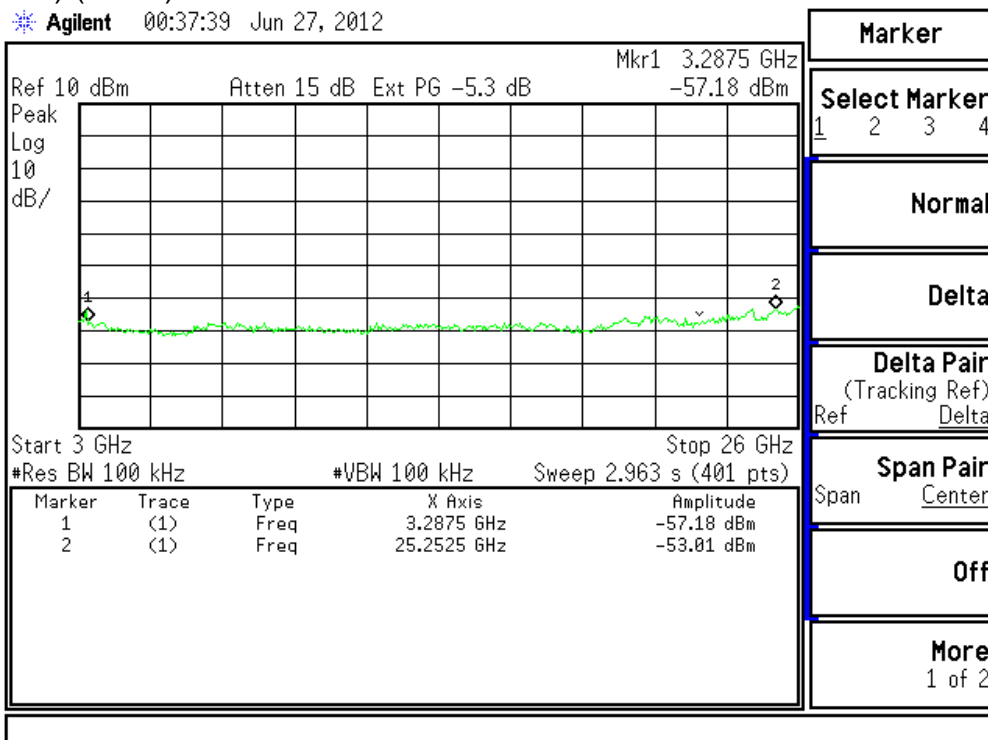
802.11g (CH01) (2 of 2)



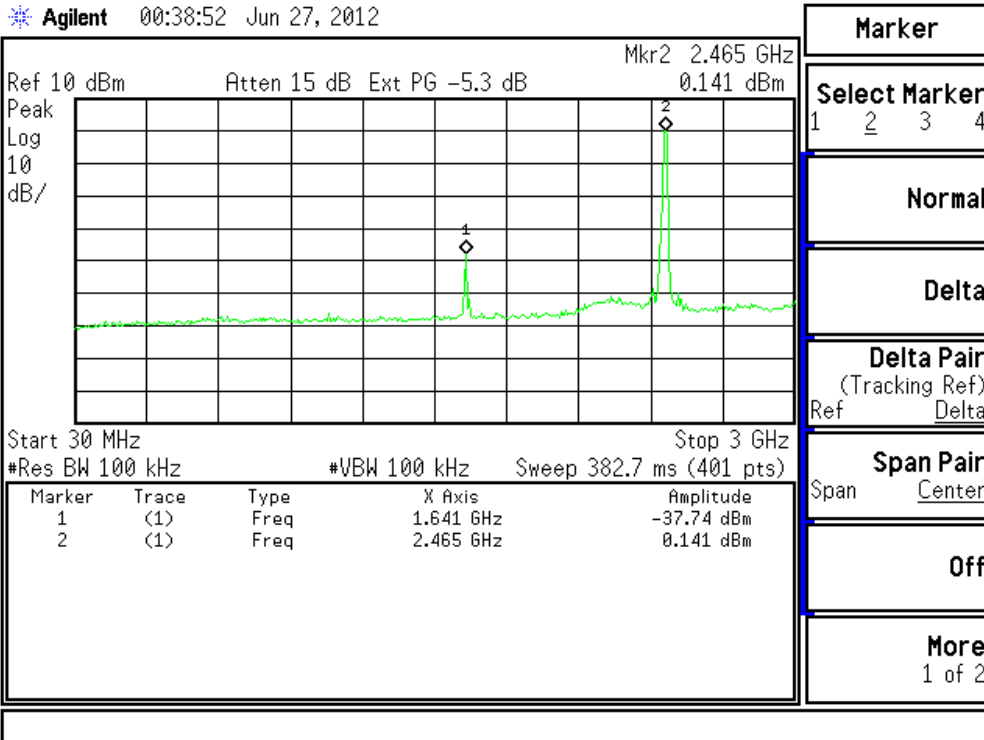
802.11g (CH06) (1 of 2)



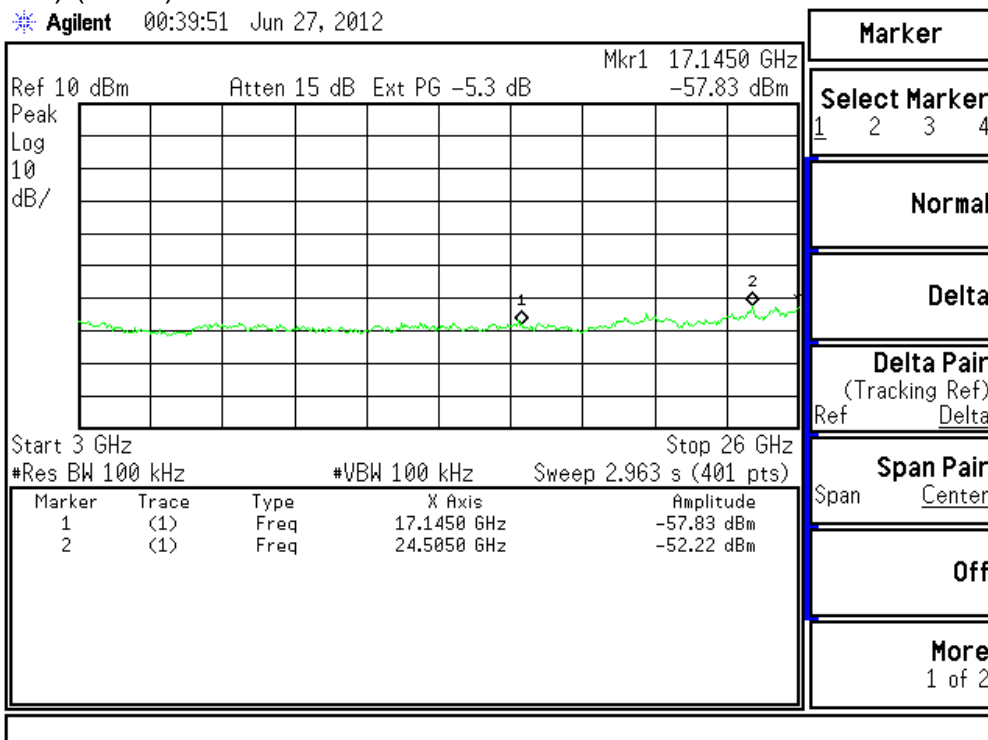
802.11g (CH06) (2 of 2)



802.11g (CH11) (1 of 2)

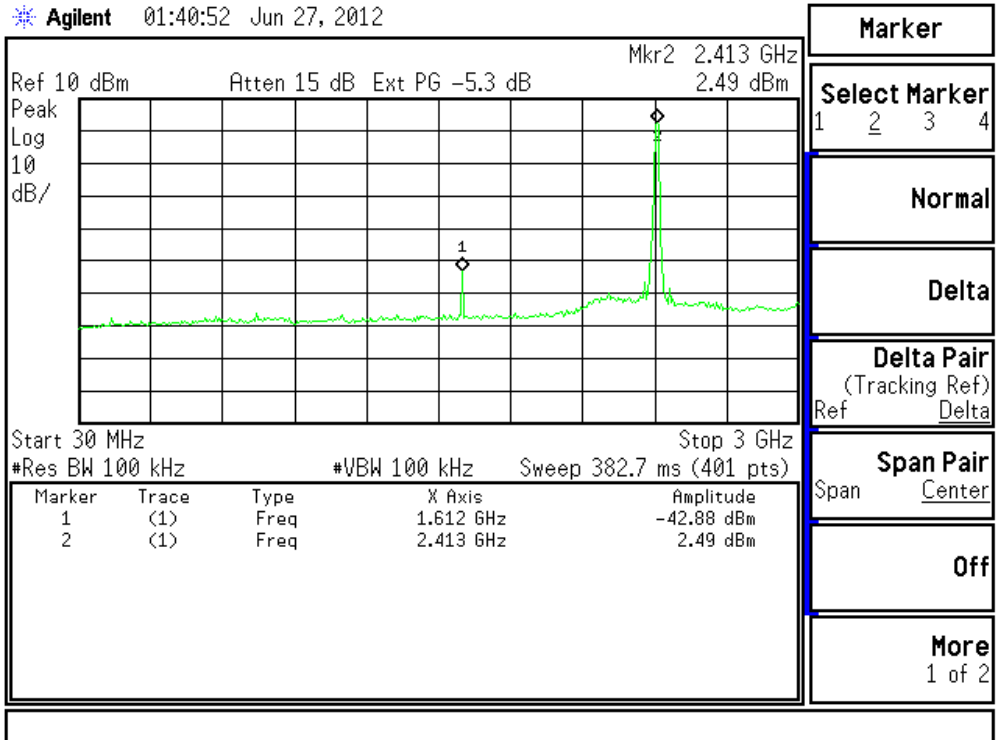


802.11g (CH11) (2 of 2)



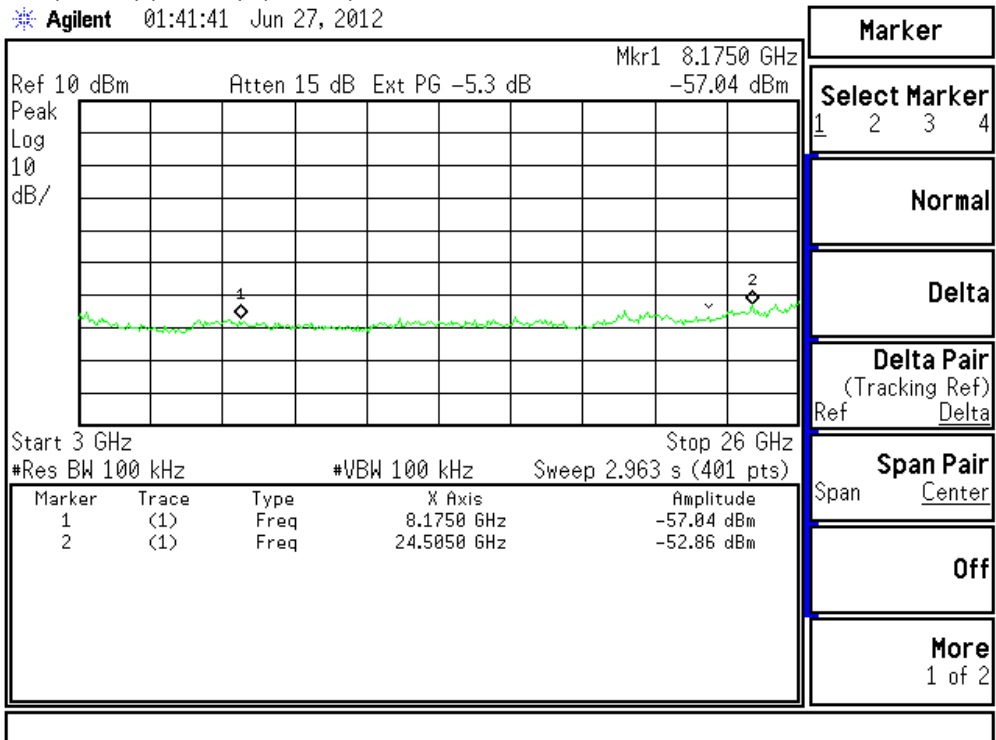
802.11n HT20 (Ant 1)(CH01) (1 of 2)

Agilent 01:40:52 Jun 27, 2012



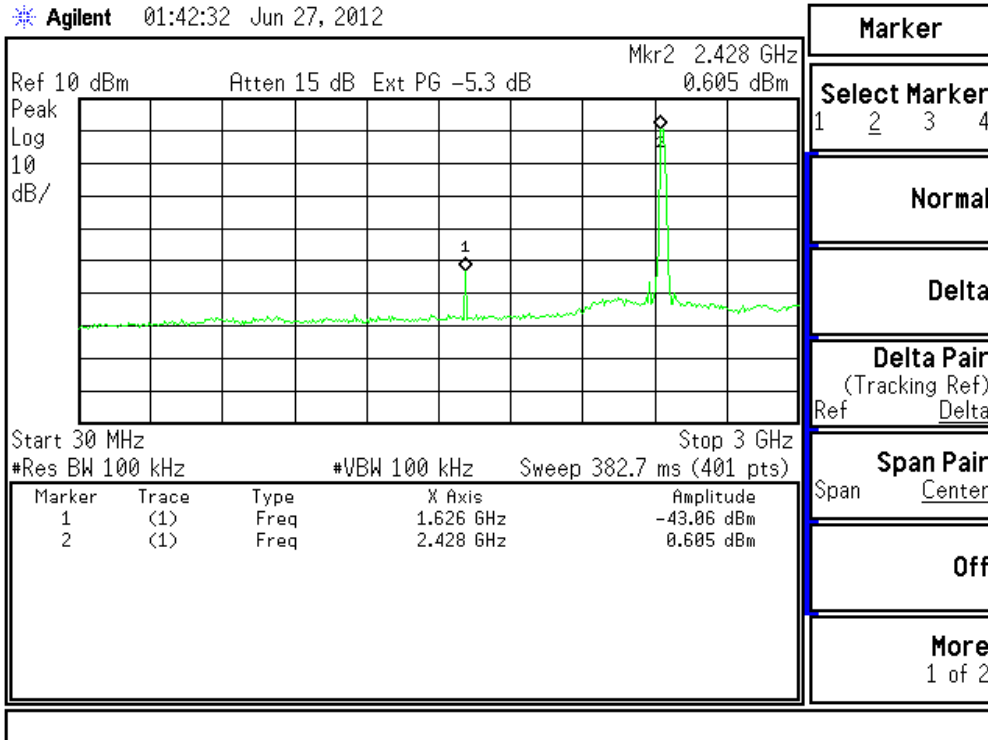
802.11n HT20 (Ant 1)(CH01) (2 of 2)

Agilent 01:41:41 Jun 27, 2012



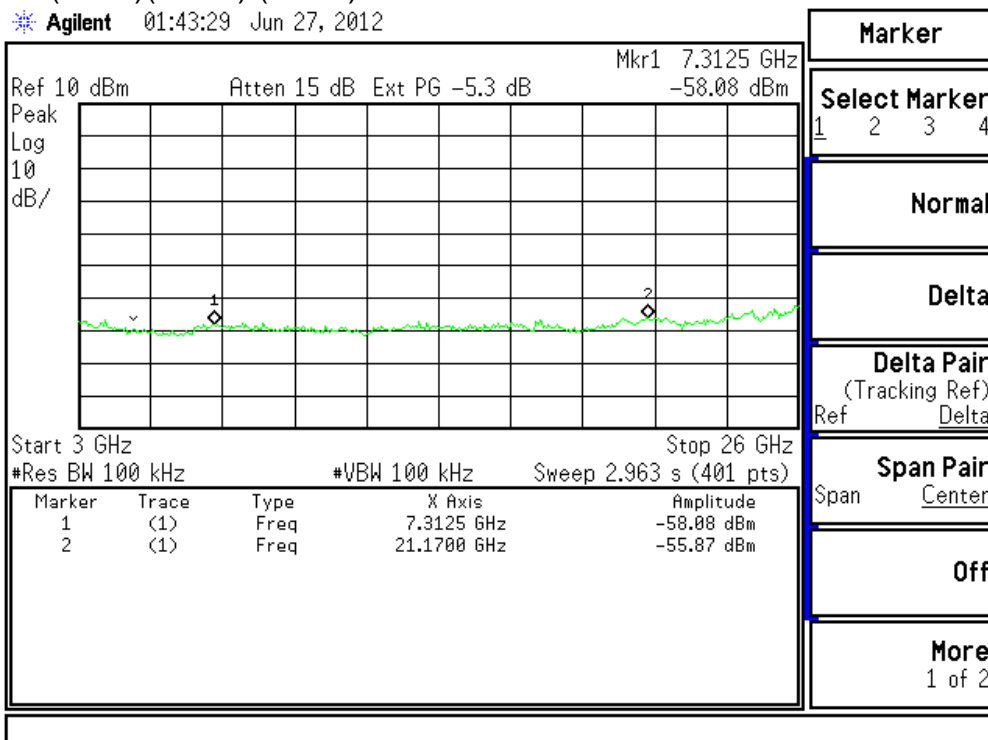
802.11n HT20 (Ant 1)(CH06) (1 of 2)

Agilent 01:42:32 Jun 27, 2012



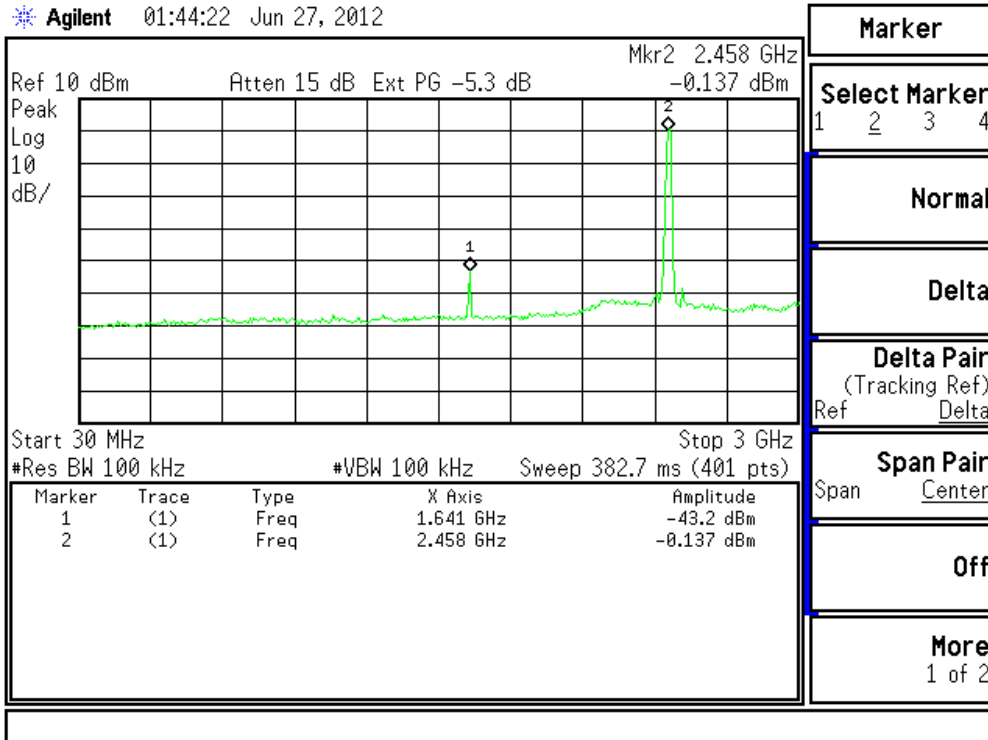
802.11n HT20 (Ant 1)(CH06) (2 of 2)

Agilent 01:43:29 Jun 27, 2012



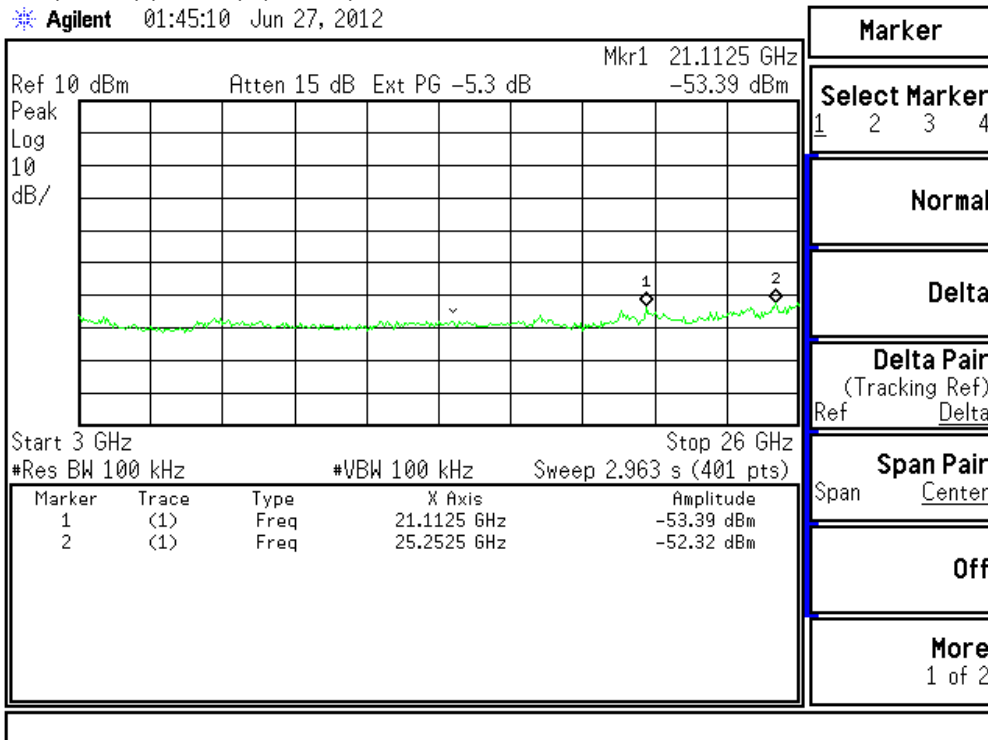
802.11n HT20 (Ant 1)(CH11) (1 of 2)

Agilent 01:44:22 Jun 27, 2012



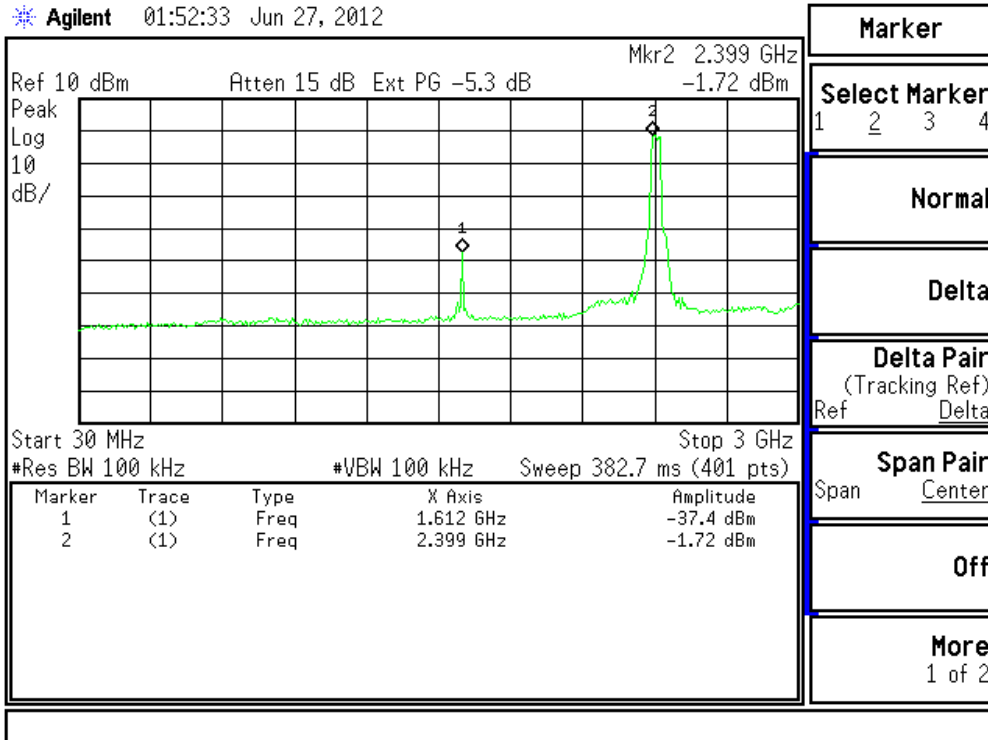
802.11n HT20 (Ant 1)(CH11) (2 of 2)

Agilent 01:45:10 Jun 27, 2012



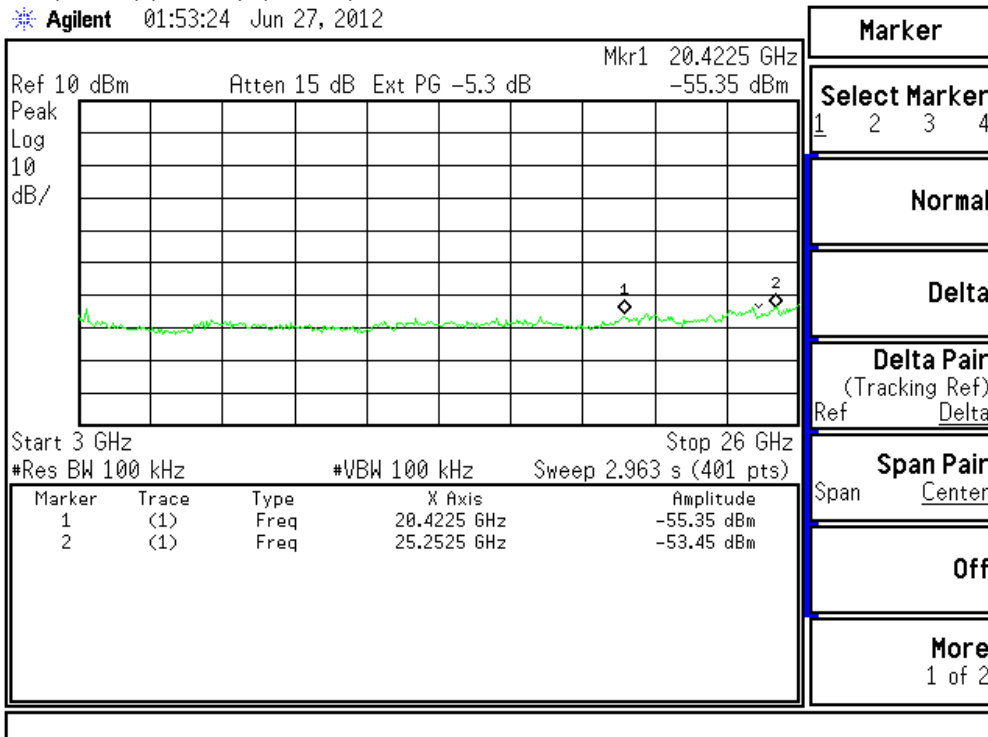
802.11n HT40 (Ant 1)(CH03) (1 of 2)

Agilent 01:52:33 Jun 27, 2012



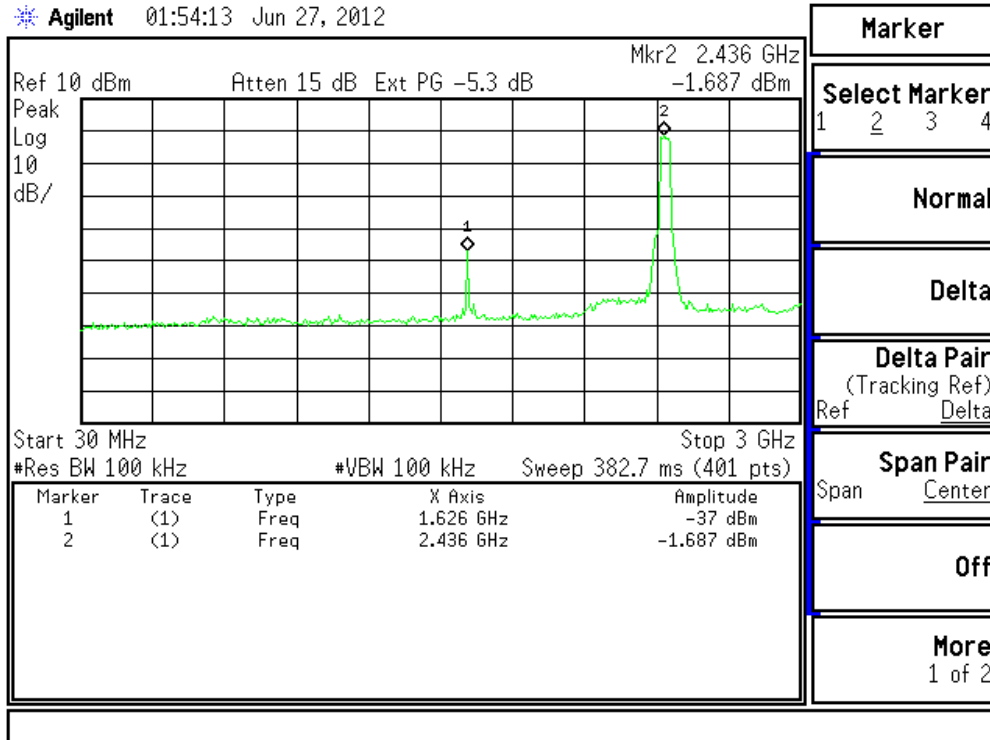
802.11n HT40 (Ant 1)(CH03) (2 of 2)

Agilent 01:53:24 Jun 27, 2012



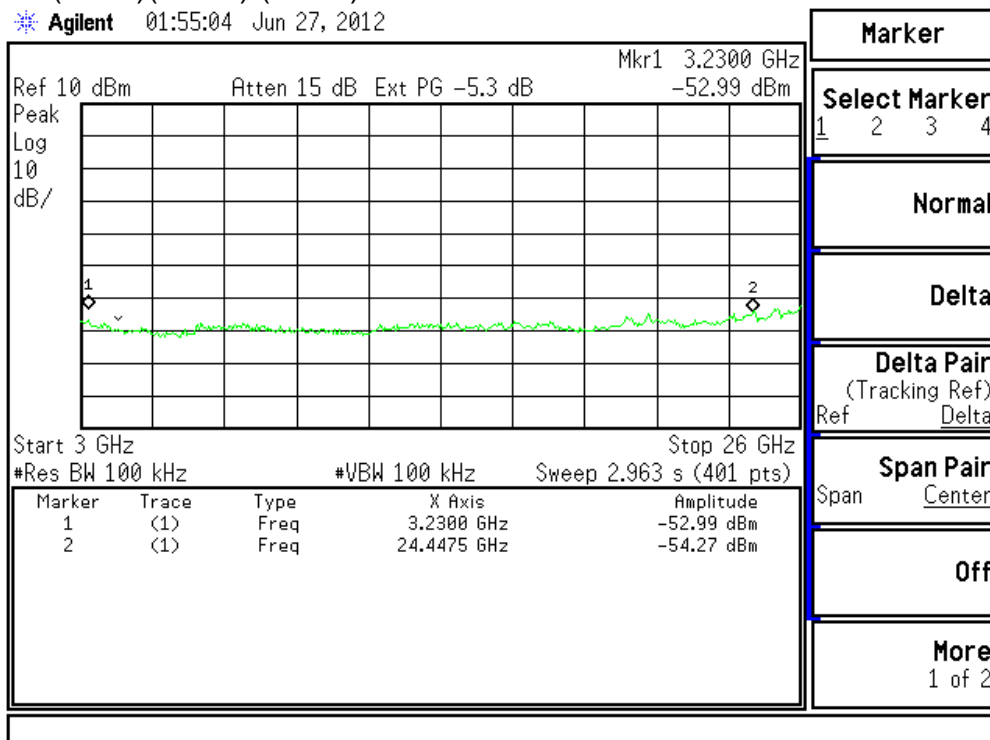
802.11n HT40 (Ant 1)(CH06) (1 of 2)

Agilent 01:54:13 Jun 27, 2012



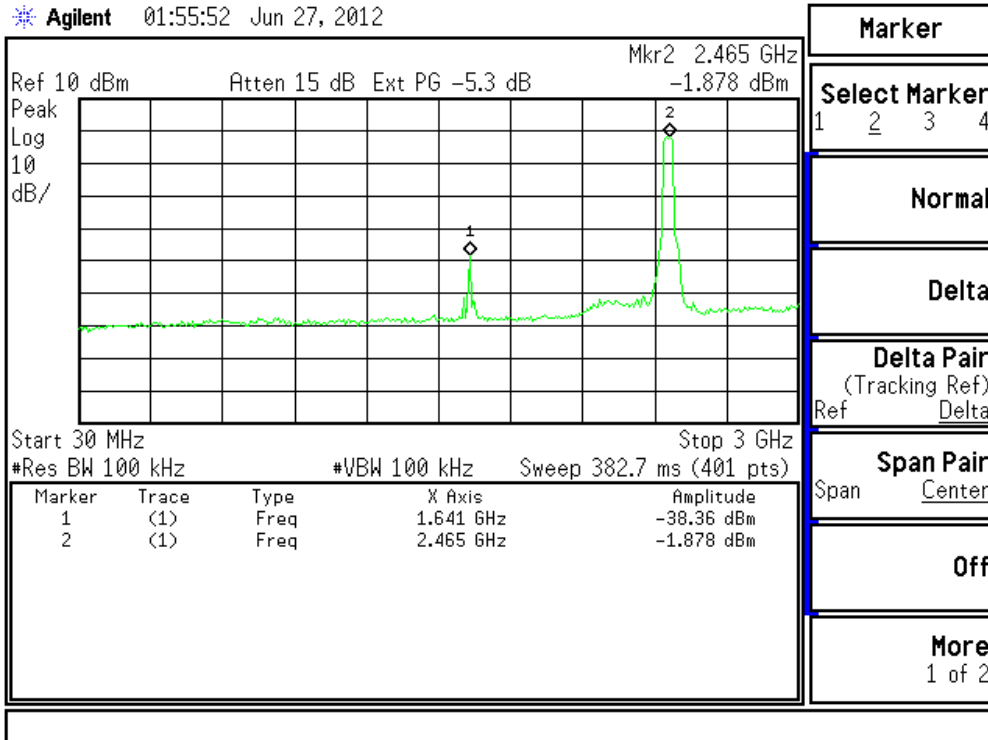
802.11n HT40 (Ant 1)(CH06) (2 of 2)

Agilent 01:55:04 Jun 27, 2012



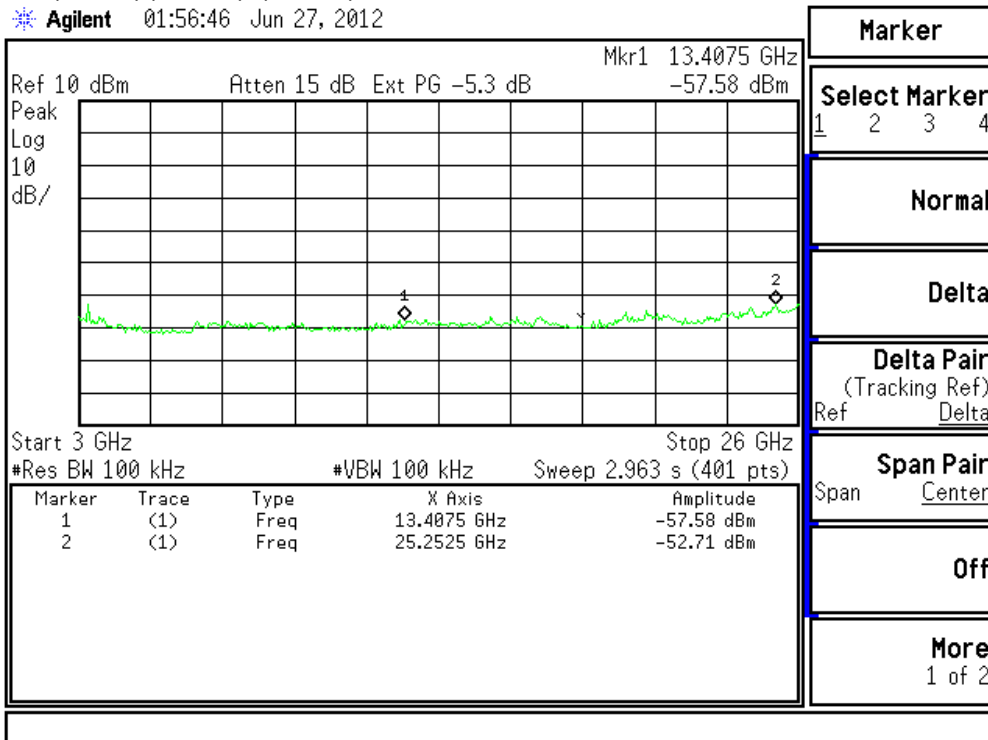
802.11n HT40 (Ant 1)(CH09) (1 of 2)

Agilent 01:55:52 Jun 27, 2012



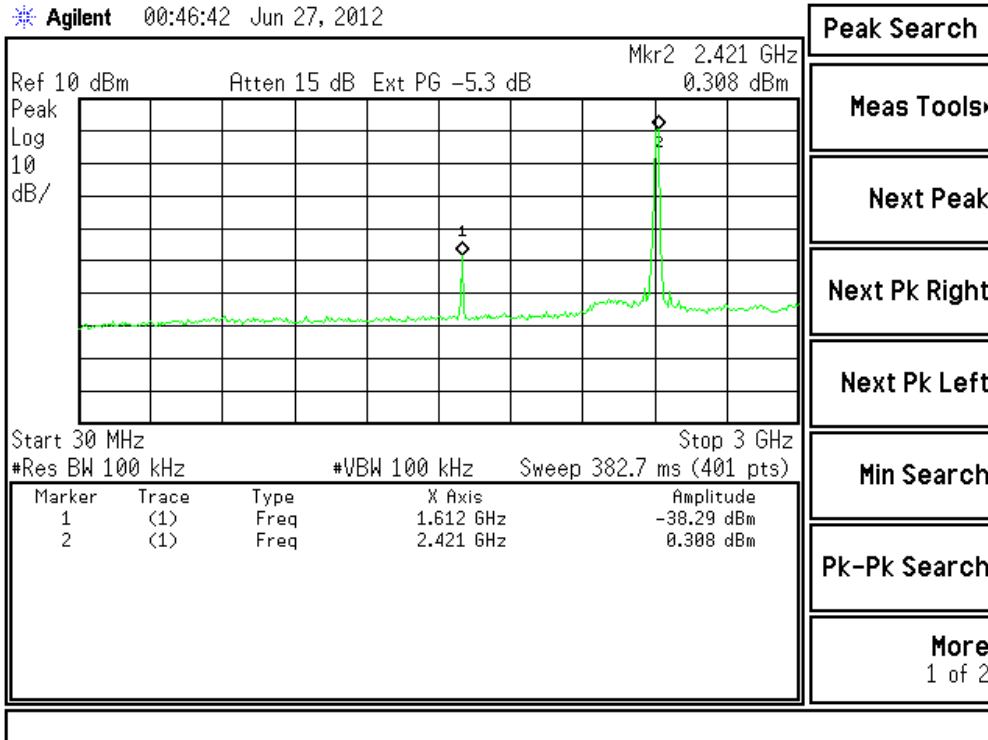
802.11n HT40 (Ant 1)(CH09) (2 of 2)

Agilent 01:56:46 Jun 27, 2012



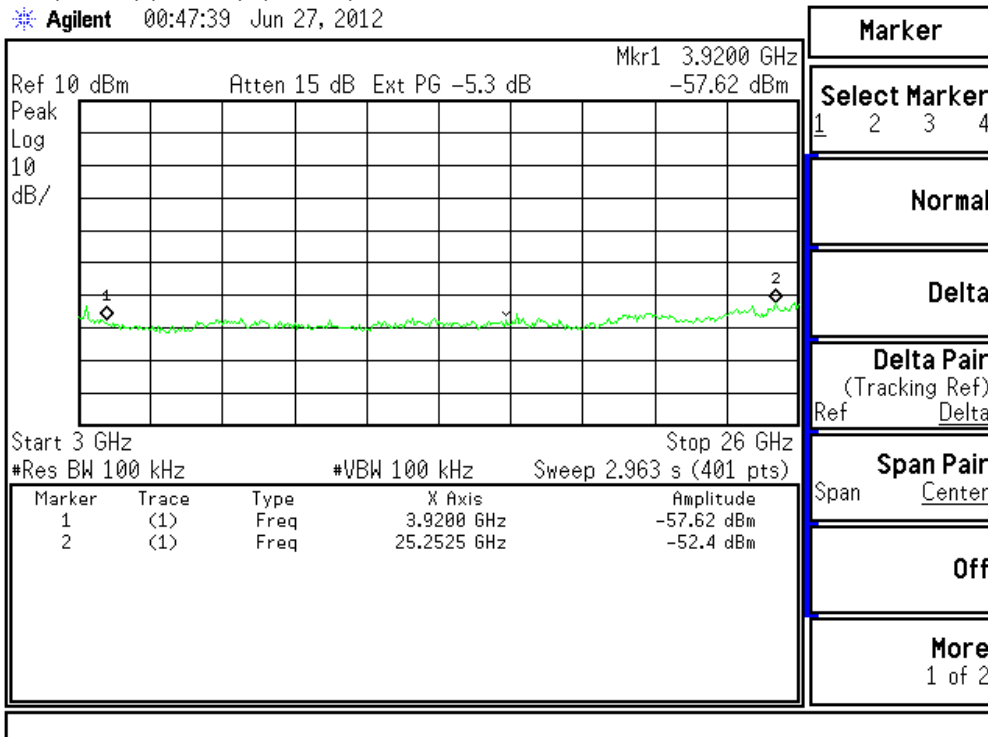
802.11n HT20 (Ant 2)(CH01) (1 of 2)

Agilent 00:46:42 Jun 27, 2012



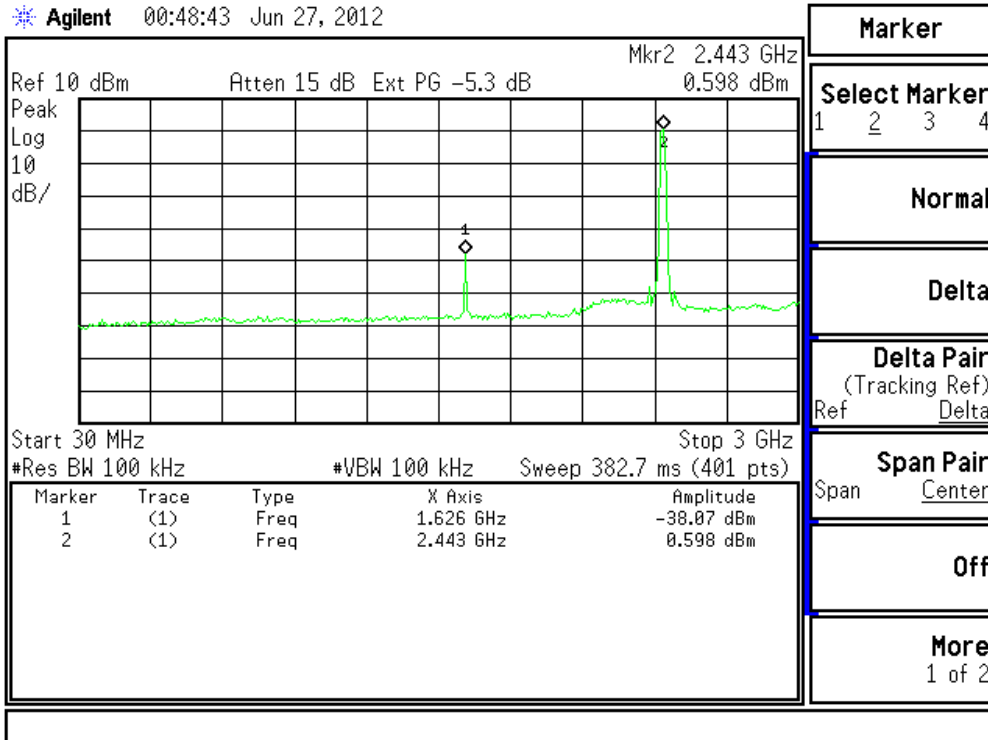
802.11n HT20 (Ant 2)(CH01) (2 of 2)

Agilent 00:47:39 Jun 27, 2012



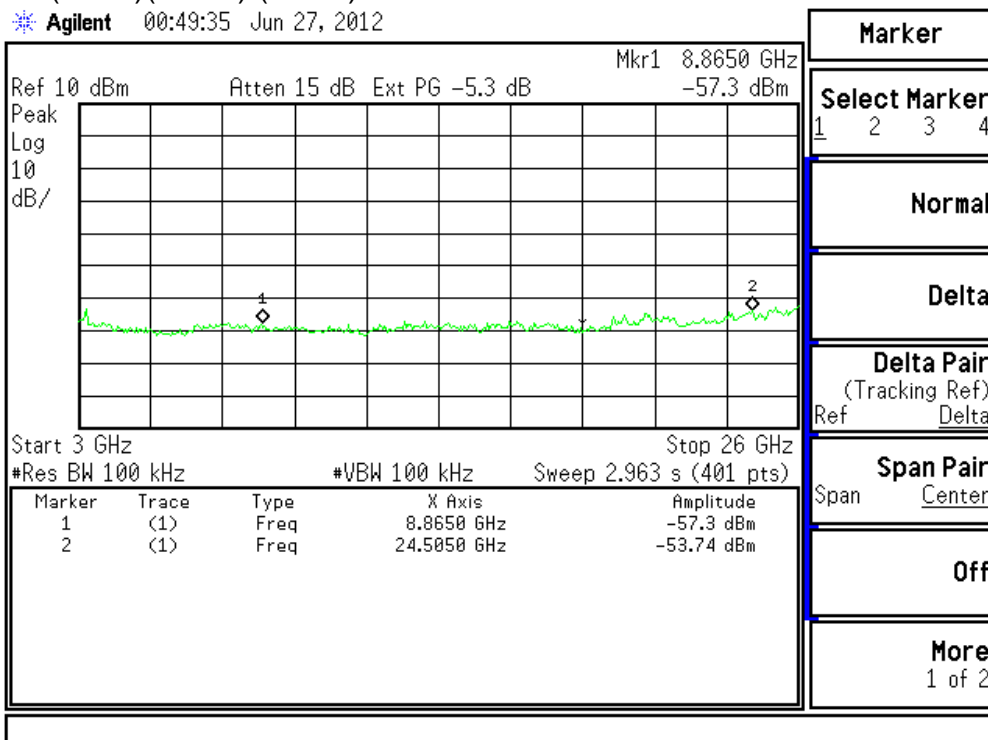
802.11n HT20 (Ant 2)(CH06) (1 of 2)

Agilent 00:48:43 Jun 27, 2012



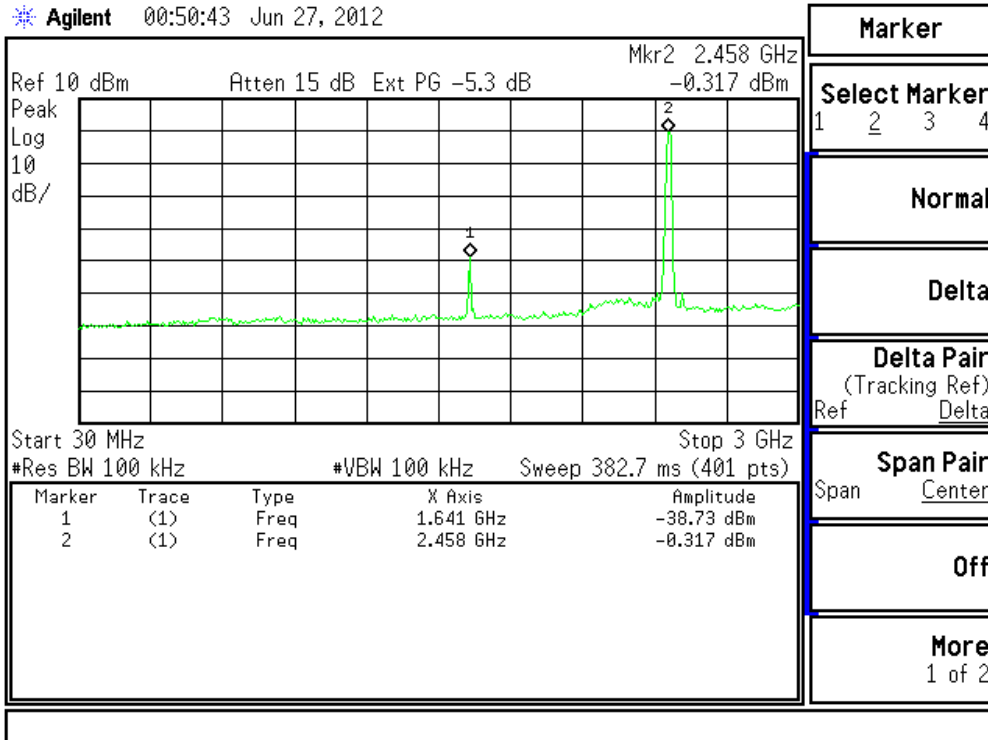
802.11n HT20 (Ant 2)(CH06) (2 of 2)

Agilent 00:49:35 Jun 27, 2012



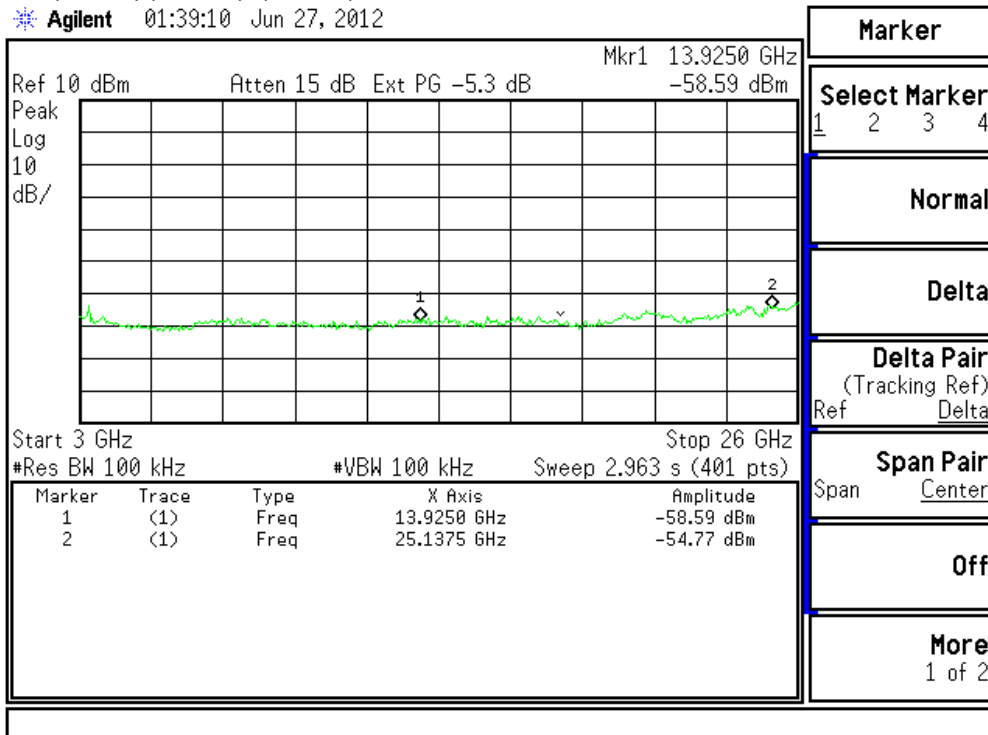
802.11n HT20 (Ant 2)(CH11) (1 of 2)

Agilent 00:50:43 Jun 27, 2012



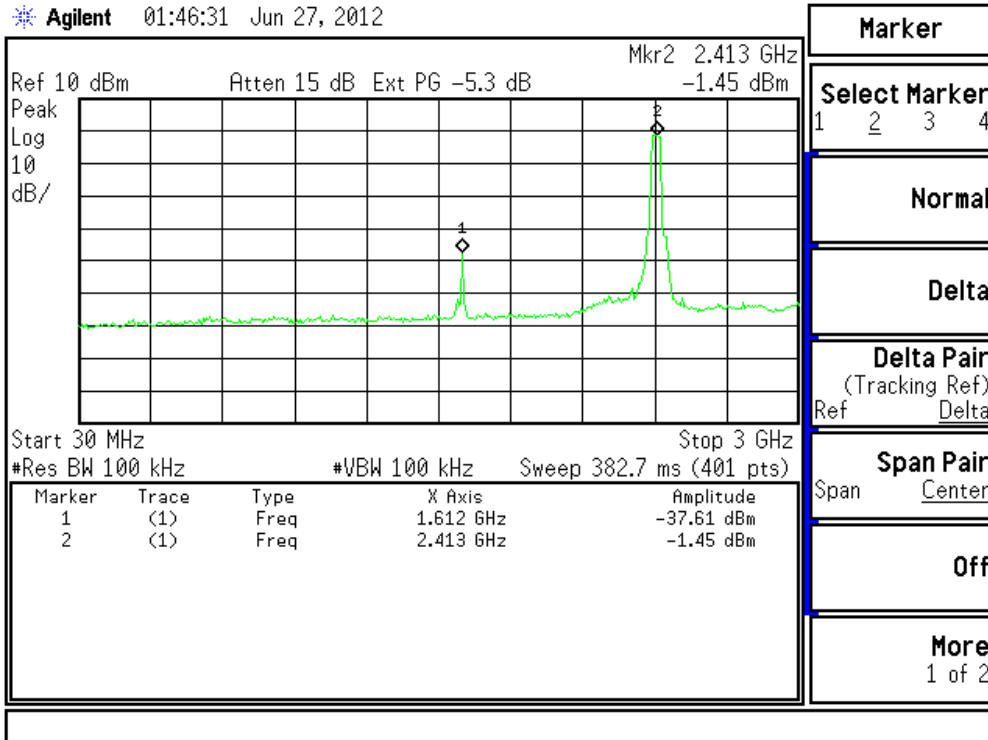
802.11n HT20 (Ant 2)(CH11) (2 of 2)

Agilent 01:39:10 Jun 27, 2012



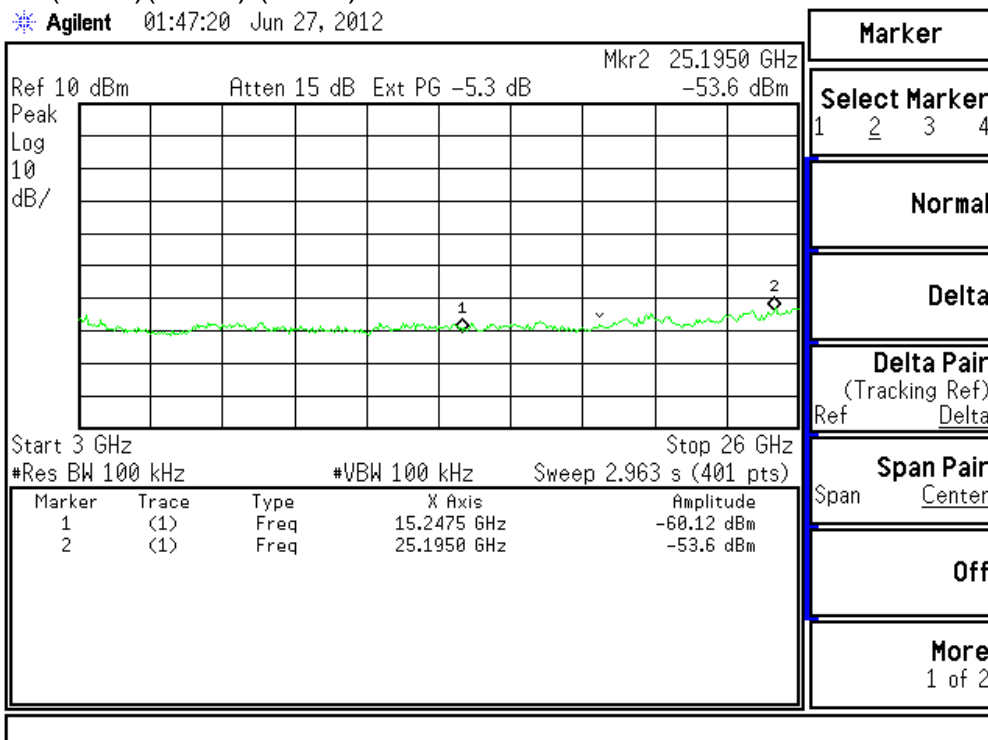
802.11n HT40 (Ant 2)(CH03) (1 of 2)

Agilent 01:46:31 Jun 27, 2012



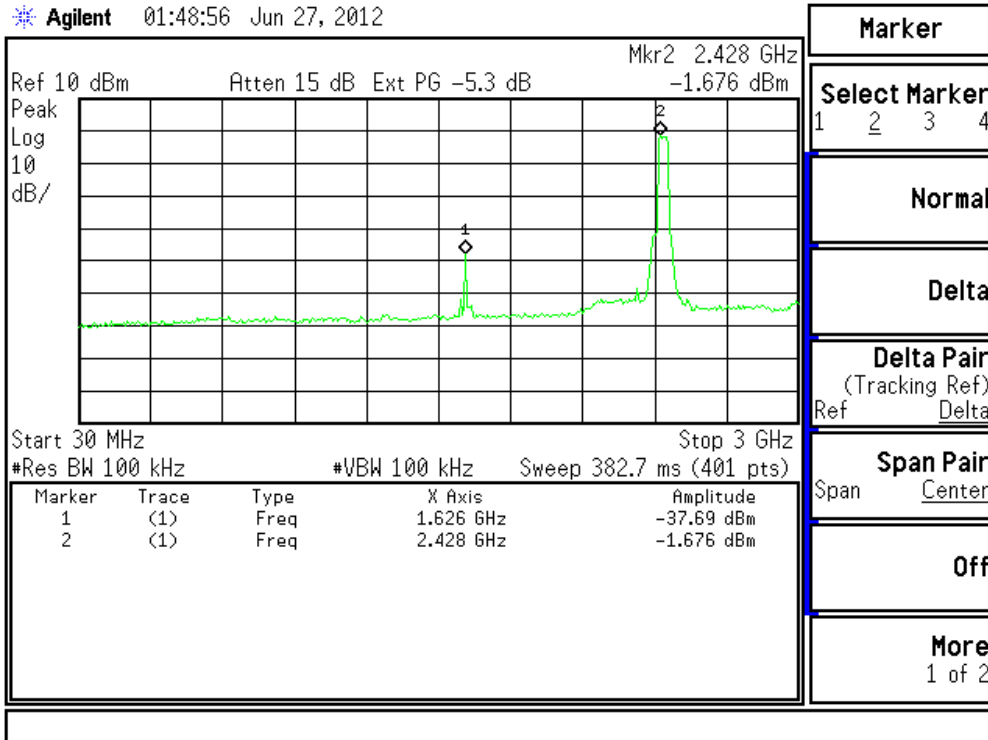
802.11n HT40 (Ant 2)(CH03) (2 of 2)

Agilent 01:47:20 Jun 27, 2012



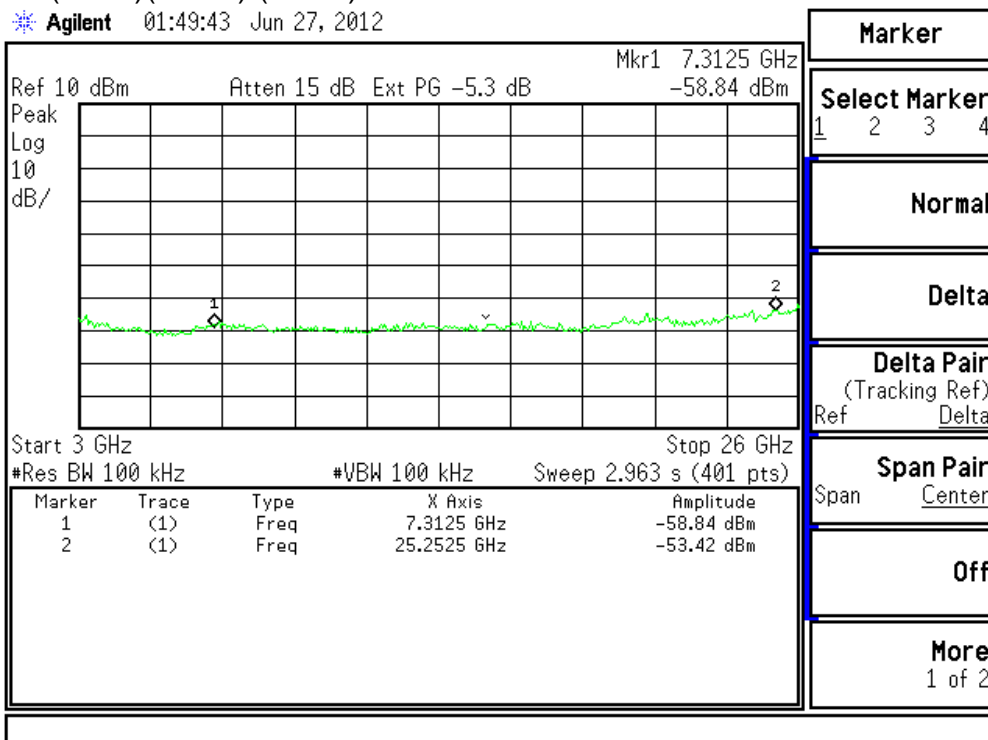
802.11n HT40 (Ant 2)(CH06) (1 of 2)

Agilent 01:48:56 Jun 27, 2012



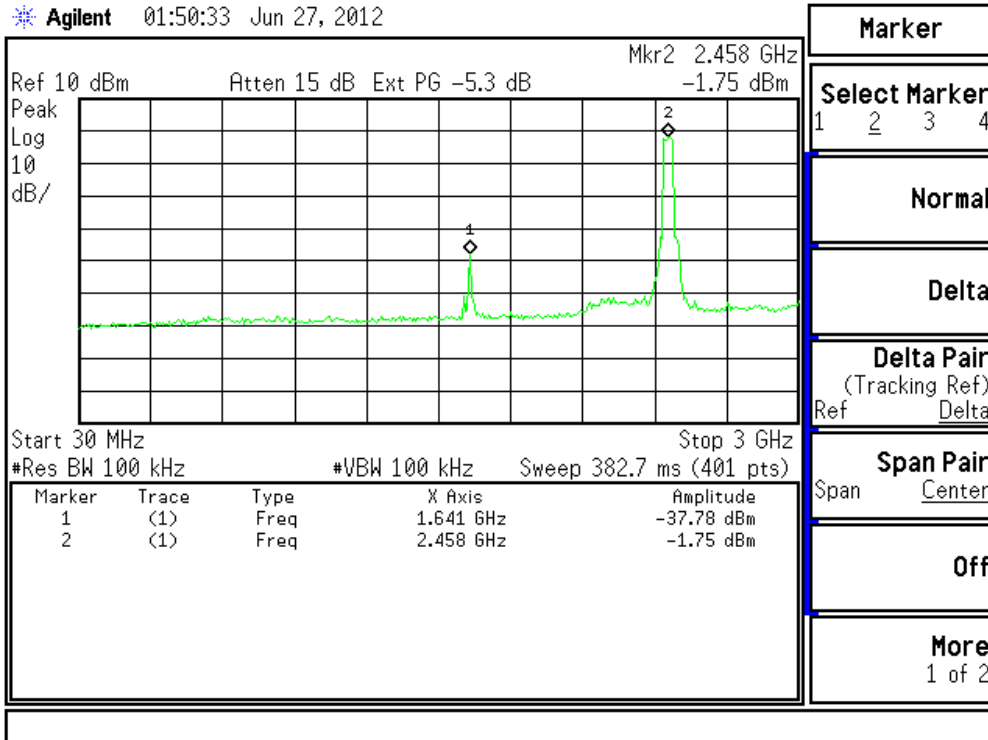
802.11n HT40 (Ant 2)(CH06) (2 of 2)

Agilent 01:49:43 Jun 27, 2012



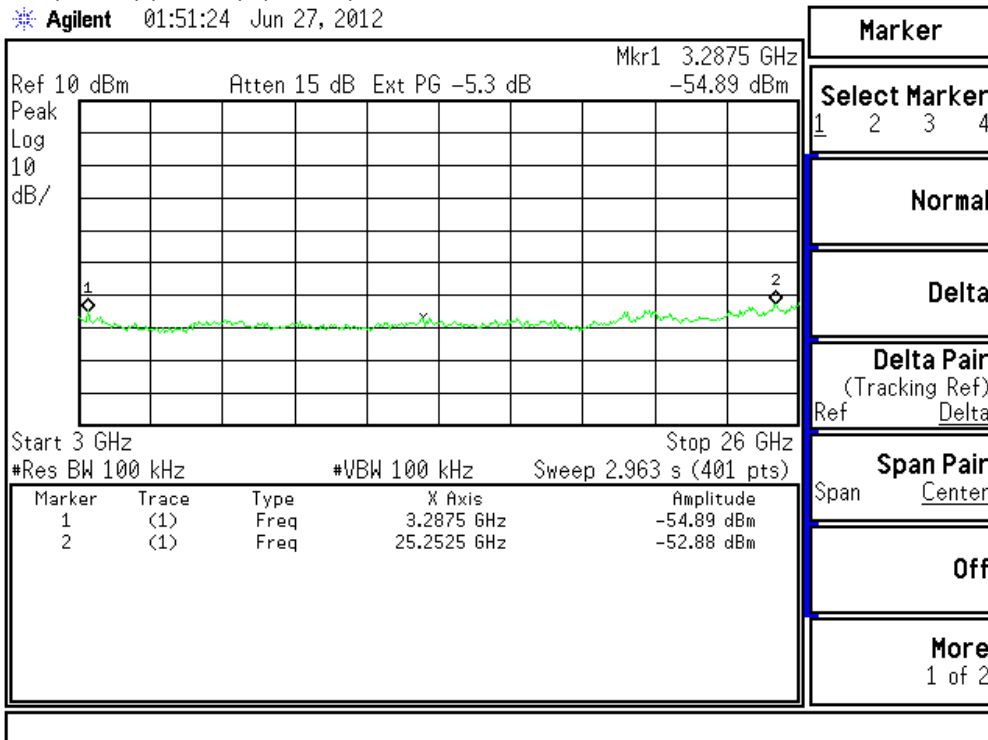
802.11n HT40 (Ant 2)(CH09) (1 of 2)

Agilent 01:50:33 Jun 27, 2012



802.11n HT40 (Ant 2)(CH09) (2 of 2)

Agilent 01:51:24 Jun 27, 2012



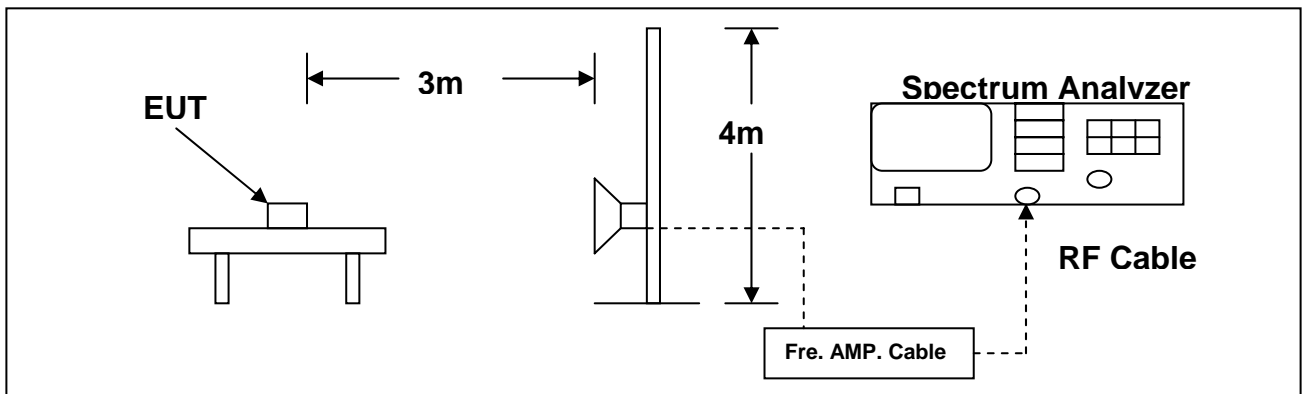
8. Band Edges Requirement

8.1 Test Condition & Setup :

According to 15.247(d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF con-ducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Measurement procedure is followed KDB 558074 v02 (10.2.5.1 Marker-Delta method).

8.2 Test Instruments Configuration:



8.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cal. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2012/1/31	2013/1/31
2.	MLT	Pre Amplifier	0.10~19.1GHz 60dBm	RF01	2012/8/24	2013/8/24
3.	MLT	Pre Amplifier	TA010-190-30	RF03	2012/7/20	2013/7/20
4.	MLT	Pre Amplifier	20110209	PREAMP6G-01	2012/3/3	2013/3/3
5.	SCHWARZBECK	Horn Antenna	181	BBHA 9170	2012/10/18	2013/10/18
6.	SCHWARZBECK	Horn Antenna	304	BBHA 9120D	2012/10/15	2013/10/15

8.4 Test Result :

(802.11b)

Radiated Emissions (HORIZONTAL) CH01						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2396.8	39.6 (PK)	1	150	0	74.0(PK)	-34.4
2396.8	34.3 (AV)	1	150	0	54.0(AV)	-19.7

Radiated Emissions (VERTICAL) CH01						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2397.5	49.1 (PK)	1	190	0	74.0(PK)	-24.9
2397.5	38.9 (AV)	1	190	0	54.0(AV)	-15.1

Radiated Emissions (HORIZONTAL) CH11						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2485.2	37.8 (PK)	1	200	0	74.0(PK)	-36.2
2485.2	28.7 (AV)	1	200	0	54.0(AV)	-25.3

Radiated Emissions (VERTICAL) CH11						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2484.0	39.0 (PK)	1	170	0	74.0(PK)	-35.0
2484.0	28.5 (AV)	1	170	0	54.0(AV)	-25.6

Notes : 1. Margin= Amplitude - Limits

2. Height of table for EUT placed: 0.8 Meter.

3. ANT= Antenna height.

4. Duty= Duty cycle correction factor.

5. Amplitude= Reading Amplitude – Amplifier gain+ Cable loss+ Antenna factor
(Auto calculate in spectrum analyzer)

(802.11g)

Radiated Emissions (HORIZONTAL) CH01						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2398.8	42.5 (PK)	1	132	0	74.0(PK)	-31.5
2398.8	33.0 (AV)	1	132	0	54.0(AV)	-21.0

Radiated Emissions (VERTICAL) CH01						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2399.1	48.7 (PK)	1	190	0	74.0(PK)	-25.3
2399.1	37.3 (AV)	1	190	0	54.0(AV)	-16.7

Radiated Emissions (HORIZONTAL) CH11						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2485.3	39.2 (PK)	1	140	0	74.0(PK)	-34.8
2485.3	27.0 (AV)	1	140	0	54.0(AV)	-27.0

Radiated Emissions (VERTICAL) CH11						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2485.6	39.0 (PK)	1	180	0	74.0(PK)	-35.1
2485.6	27.6 (AV)	1	180	0	54.0(AV)	-26.4

- Notes :**
1. Margin= Amplitude - Limits
 2. Height of table for EUT placed: 0.8 Meter.
 3. ANT= Antenna height.
 4. Duty= Duty cycle correction factor.
 5. Amplitude= Reading Amplitude – Amplifier gain+ Cable loss+ Antenna factor
(Auto calculate in spectrum analyzer)

(802.11n HT20)

Radiated Emissions (HORIZONTAL) CH01						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2399.8	44.1 (PK)	1	130	0	74.0(PK)	-29.9
2399.8	35.02 (AV)	1	130	0	54.0(AV)	-19.0

Radiated Emissions (VERTICAL) CH01						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2399.1	49.4 (PK)	1	200	0	74.0(PK)	-24.6
2399.1	36.9 (AV)	1	200	0	54.0(AV)	-17.1

Radiated Emissions (HORIZONTAL) CH11						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2485.8	38.0 (PK)	1	200	0	74.0(PK)	-36.0
2485.8	27.2 (AV)	1	200	0	54.0(AV)	-26.8

Radiated Emissions (VERTICAL) CH11						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2485.8	38.2 (PK)	1	180	0	74.0(PK)	-35.8
2485.8	27.8 (AV)	1	180	0	54.0(AV)	-26.2

- Notes :**
1. Margin= Amplitude - Limits
 2. Height of table for EUT placed: 0.8 Meter.
 3. ANT= Antenna height.
 4. Duty= Duty cycle correction factor.
 5. Amplitude= Reading Amplitude – Amplifier gain+ Cable loss+ Antenna factor
(Auto calculate in spectrum analyzer)

(802.11n HT40)

Radiated Emissions (HORIZONTAL) CH01						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2397.0	43.8 (PK)	1	120	0	74.0(PK)	-30.2
2397.0	30.1 (AV)	1	120	0	54.0(AV)	-23.9

Radiated Emissions (VERTICAL) CH01						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2397.0	50.2 (PK)	1	205	0	74.0(PK)	-23.8
2397.0	32.5 (AV)	1	205	0	54.0(AV)	-21.5

Radiated Emissions (HORIZONTAL) CH11						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2488.2	43.7 (PK)	1	160	0	74.0(PK)	-30.3
2488.2	30.9 (AV)	1	160	0	54.0(AV)	-23.1

Radiated Emissions (VERTICAL) CH11						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Limit (dBuV/m)	Margin (dB)
2483.8	52.6 (PK)	1	160	0	74.0(PK)	-21.5
2483.8	32.7 (AV)	1	160	0	54.0(AV)	-21.3

- Notes :**
1. Margin= Amplitude - Limits
 2. Height of table for EUT placed: 0.8 Meter.
 3. ANT= Antenna height.
 4. Duty= Duty cycle correction factor.
 5. Amplitude= Reading Amplitude – Amplifier gain+ Cable loss+ Antenna factor
(Auto calculate in spectrum analyzer)

9. Antenna Requirements

9.1 Standard Applicable :

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

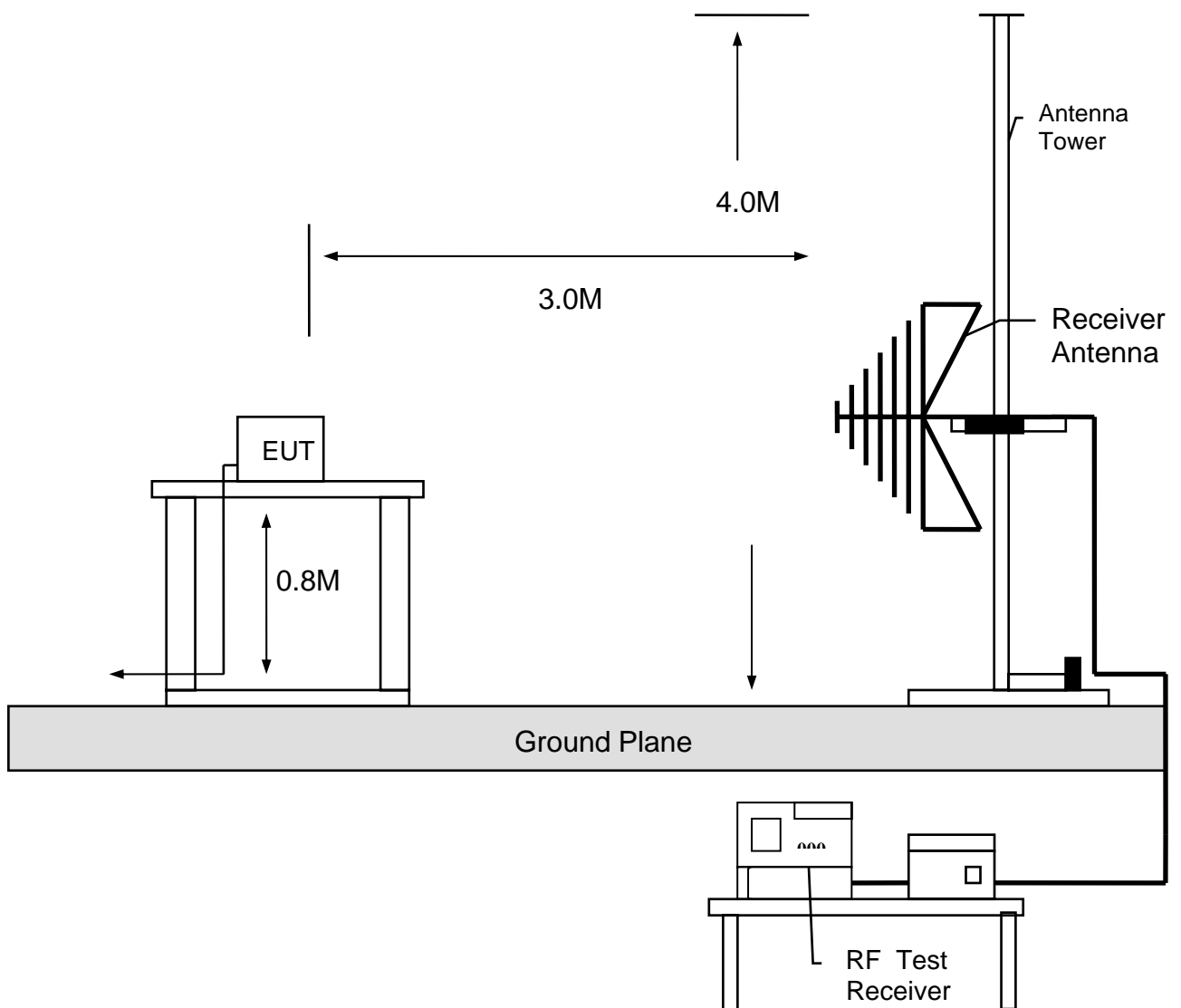
According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.2 Antenna Construction

	Model No	ANT TYPE	GAIN	type of connector
1	502219-156	Chip Antenna	1.5 dBi	N/A

Appendix I - EUT Test Setup

MEASUREMENT OF RADIATED EMISSION



Appendix II - Brand / Trade Name & Model No. Multiple Listee

Model No.	Trade Name
N/A	N/A