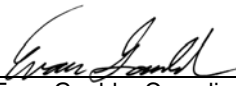
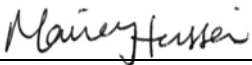




Test Report



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS

Report No	EJ0260-1 Issue 2
Client	Enterasys Networks John Ballew
Address	50 Minuteman Road Andover, MA 01810
Phone	(978) 684 - 1009
Items tested	AP3620
Standards FCC ID	FCC Part 15 Section 15.247 and 15.407 AY3-AP36V1B
FRN	0019588359
Test Dates	February 4-6, March 19, 2010
Results	As detailed within this report
Prepared by	 Evan Gould – Compliance Engineer
Authorized by	 Mairaj Hussain – EMC Supervisor
Issue Date	<u>March 19, 2010</u>
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 30 of this report.

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.



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Summary

On February 4-6 and March 18, 2010 we tested the AP3620 Wireless Access Point for compliance with the following radiated emissions requirements. This report presents data to support for a Class II permissive change to FCC ID: AY3-AP36V1B.

The change applies to both the AP3620 and the AP3640, which are electrically identical.

The Class II permissive change is for the addition of the following antennas to the above mentioned access points.

ANTENNAS BEING ADDED

Manufacturer	Model #	Antenna Type	Frequency Band(s)	Gain(s)
LairdTech	S24493TS36RSM	WS-AI-DT04360	2.4GHz, 5GHz	4dBi
Joymax	FWX-614RSXXX-514	WS-ANT02	2.4GHz; 5GHz	4dBi
LairdTech	S24493BPX12RNF	WS-AO-DS05360	2.4GHz; 5GHz	5dBi
Mars	MA-WE2458-3H	WS-AI-DT05120	2.4GHz; 5GHz	5dBi
MTI	MT-484026/NVH/B	WS-AO-5D16060	5GHz	16dBi
MTI	MT-485025/NVH/B	WS-AO-5D23009	5GHz	23dBi

UPDATES FOR ISSUE 2 REPORT

1. Removed conducted output power measurements for 5600-5650MHz band.
2. Updated ART Settings tables to reflect the removal of channels.
3. Added 20dB bandwidth analyzer plots to show that adjacent channels do not overlap with the 5600-5650MHz band.

Test Methodology

Radiated emission testing was performed according to the procedures specified in ANSI C63.4 (2003). Emissions were maximized by rotating the system around its vertical axis as well as varying the test antenna's height and polarity.

Frequency range investigated: 1000MHz – 6000MHz.

Measurement distance: 3 meters.

Release Control Record

Issue No.	Reason for change	Date Issued
1	Original Release	3/12/10
2	Update	3/19/10



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Product Tested - Configuration Documentation

EUT Configuration										
Work Order: J0260 Company: Enterasys Networks Company Address: 50 Minuteman Road Andover, MA 01810 Contact: John Ballew Person Present: John Ballew										
EUT:		MN	Antenna Gain				SN			
Phihong Switching AC Adaptor		AP3620 PSA18U-480C	N/A N/A				0500009323050255 D81900048A2			
EUT Description: Wireless Access Point EUT Max Frequency: 5.875 GHz										
Support Equipment:		MN					SN			
Enterasys D-Series Router		D2G124-12P					0813022749041			
Dell Laptop		Latitude D430					20363728797			
EUT Ports:										
Port Label	Port Type	No. of ports	No. Populated	Cable Type	Shielded	Ferrites	Length	Max Length	In/Out NEBS Type	Unpopulated Reason
Antenna	SMA	3	3	Coaxial	Yes	No	50 cm	Not Specified	NA	
LAN	RJ45	2	1	cat.5 RJ45	No	No	2.0 m	100 m	NA	
Software / Operating Mode Description:										
EUT is transmitting IEEE802.11b, IEEE802.11g, IEEE802.11gn ht20, IEEE802.11gn ht40, IEEE802.11a, IEEE802.11an ht20 and IEEE802.11an ht40 data rate.										

ART SETTINGS TABLES

The following are the ART power settings which will be associated with each of the new antennas according to the modulation employed:

802.11b

Antenna Type / MANUFACTURERS P/N	Max ART Setting per channel											
	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	
WS-AI-DT04360 S24493TS36RSM	15	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	18
WS-ANT02 FWX-614RSXXX-514	16	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	15.5
WS-AI-DT05120 MA-WE2458-3H	14	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	11
WS-AO-DS05360 S24493BPX12RNF	16	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	16

802.11g

Antenna Type / MANUFACTURERS P/N	Max ART Setting per channel											
	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	
WS-AI-DT04360 S24493TS36RSM	15	22.5	22.5	22	22	22	22	22	22	22	22	18
WS-ANT02 FWX-614RSXXX-514	16	22.5	22.5	22	22	22	22	22	22	22	22	15.5
WS-AI-DT05120 MA-WE2458-3H	14	22.5	22.5	22	22	22	22	22	22	22	22	11
WS-AO-DS05360 S24493BPX12RNF	16	22.5	22.5	22	22	22	22	22	22	22	22	16

802.11gn HT20

Antenna Type / MANUFACTURERS P/N	Max ART Setting per channel											
	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	
WS-AI-DT04360 S24493TS36RSM	15	22	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	18
WS-ANT02 FWX-614RSXXX-514	16	22	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	16
WS-AI-DT05120 MA-WE2458-3H	14	22	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	11
WS-AO-DS05360 S24493BPX12RNF	16	22	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	16

802.11gn HT40

Antenna Type / MANUFACTURERS P/N	Max ART Setting per channel									
	2432	2437	2442	2447	2452	2457	2462	2467	2472	
	2412	2417	2422	2427	2432	2437	2442	2447	2452	
WS-AI-DT04360 S24493TS36RSM	6	20	20	20	20	20	20	16	X	X
WS-ANT02 FWX-614RSXXX-514	14	20	20	20	20	20	14	X	X	
WS-AI-DT05120 MA-WE2458-3H	11	20	20	20	20	20	9	X	X	
WS-AO-DS05360 S24493BPX12RNF	13	20	20	20	20	20	14	X	X	



802.11a

Antenna Type / MANUFACTURERS P/N	Max ART Setting per channel																							
	5180	5200	5220	5240	5260	5280	5300	5320	5500	5520	5540	5560	5580	5600	5620	5640	5660	5680	5700	5745	5765	5785	5805	5825
WS-ANT02 FWX-614RSXXX-514	36	40	44	48	52	56	60	64	100	104	108	112	116	X	X	X	132	136	140	149	153	157	161	165
WS-AI-DT04360 S24493TS36RSM	12	12	12	12	6	19	19.5	17	18.5	19.5	19.5	19.5	19.5	X	X	X	15	19.5	19.5	20	20	20	20	20
WS-AI-DT05120 MA-WE2458-3H	12	12	12	12	5	19	19.5	17	18	19.5	19.5	19.5	19.5	X	X	X	9	19.5	19.5	20	20	20	20	20
WS-AO-SD16060 MT-484026NVH/B	2.5	2	2	2	X	3	3.5	4	X	X	X	X	X	X	X	X	X	X	X	15.5	16	16.5	16.5	16.5
WS-AO-SD23009 MT-485025NVH/B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	11	11	11	8
WS-AO-DS05360 S24493BPX12RNF	12	12	12	12	5	19	19.5	17	X	X	X	X	X	X	X	X	X	X	X	20	20	20	20	20

802.11an HT20

ANTENNA TYPE / MANUFACTURER P/N	Max ART Setting per channel																							
	5180	5200	5220	5240	5260	5280	5300	5320	5500	5520	5540	5560	5580	5600	5620	5640	5660	5680	5700	5745	5765	5785	5805	5825
WS-ANT02 FWX-614RSXXX-514	36	40	44	48	52	56	60	64	100	104	108	112	116	X	X	X	132	136	140	149	153	157	161	165
WS-AI-DT04360 S24493TS36RSM	14	13.5	12.5	12	5.5	19	19.5	17	18.5	19.5	19.5	19.5	19.5	X	X	X	X	20.5	20.5	20	20	20	20	20
WS-AI-DT05120 MA-WE2458-3H	12	13.5	12.5	12	4.5	19	19.5	17	18	19.5	19.5	19.5	19.5	X	X	X	X	20.5	20.5	20	20	20	20	20
WS-AO-SD16060 MT-484026NVH/B	4.5	4	3	3	X	2	2.5	3	X	X	X	X	X	X	X	X	X	X	X	15.5	16	16.5	16.5	16.5
WS-AO-SD23009 MT-485025NVH/B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	11	11	11	8
WS-AO-DS05360 S24493BPX12RNF	14	13.5	12.5	12	4.5	19	19.5	17	X	X	X	X	X	X	X	X	X	X	X	20	20	20	20	20

802.11an HT40

Antenna Type / MANUFACTURERS P/N	Max ART Setting per channel																							
	5180	5200	5220	5240	5260	5280	5300	5320	5500	5520	5540	5560	5580	5600	5620	5640	5660	5680	5700	5745	5765	5785	5805	5825
WS-ANT02 FWX-614RSXXX-514	36	40	44	48	52	56	60	64	100	104	108	112	116	120	124	128	132	136	149	153	157	161	165	
WS-AI-DT04360 S24493TS36RSM	12	12	12	12	8	19	19.5	15.5	15.5	16	16	20	20	X	X	X	X	9.5	9.5	22	22	22	22	22
WS-AI-DT05120 MA-WE2458-3H	12	12	12	12	8	19	19.5	15.5	15.5	16	16	20	20	X	X	X	X	9.5	9.5	22	22	22	22	22
WS-AI-DT05120 MA-WE2458-3H	12	12	12	12	7	19	19.5	13	13	16	16	20	20	X	X	X	X	X	X	22	22	22	22	22
WS-AO-DS05360 S24493BPX12RNF	11	11	12	12	7	19	19.5	13	13	X	X	X	X	X	X	X	X	X	X	22	22	22	22	22
WS-AO-SD16060 MT-484026NVH/B	1.5	1.5	1.5	1.5	X	X	2.5	X	X	X	X	X	X	X	X	X	X	X	X	X	16.5	16.5	16.5	16.5
WS-AO-SD23009 MT-485025NVH/B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	11	11	11	8

Note: The ART Settings in the above tables have been determined in the following manner: The worst case ART Setting values among the Conducted Output Power measurements and the Spurious Emissions measurements were entered into the table above. For example, if the conducted output power measurements would allow an ART setting of 20, yet a spurious band edge emission restricted the ART setting to 16, then 16 would appear in the tables above. On the other hand, if the conducted output measurements allow an ART setting of 12, yet the spurious band edge emission restricted the ART setting to only 16, then 12 would appear in the tables above.



Statement of Conformity

The AP3620 has been found to conform to the following parts of 47 CFR as detailed below:

Part 15	Comments
15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209.
15.247(b)(c)(d)	Conducted output power meets the requirement of the section. Spurious emissions that fall within the restricted bands in the antenna pass bands meet the limits of 15.209.
15.407(a)& (b)(7)	Conducted output power meets the requirement of the section. Spurious emissions that fall within the restricted bands in the antenna pass bands meet the limits of 15.209.
KDB 443999	<ol style="list-style-type: none"> 1. Devices are intended for indoor operations only in the band 5470-5725MHz. 2. Channels in the bands 5600-5650MHz are disabled, and plots were taken to show that there is no overlap with 5600-5650MHz band from adjacent channels.



Test Results

Radiated Spurious Emissions

LIMITS

“...radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a)” [15.247(d)]

“The provisions of §15.205 apply to intentional radiators operating under this section.” [15.407(b)(7)]

MEASUREMENTS

Radiated Spurious Emissions Table														
Date: 05-Feb-10			Company: Enterasys			Work Order: J0260								
Engineer: Evan Gould			EUT Desc: AP3620			EUT Operating Voltage/Frequency: 48VDC								
Temp: 17.5°C			Humidity: 24%			Pressure: 1013.7mBar								
Frequency Range: 1 - 6GHz						Measurement Distance: 3 m								
Notes: 4dBI Joymax FWX-614RSXXX-514									RBW: 1MHz (pk)		1MHz (av)			
									VBW: 3MHz (pk)		10Hz (av)			
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	47 CFR 15.209(a) - Peak			47 CFR 15.209(a) - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
802.11b; 2412MHz; power = 16 V	2390.0	62.6	42.7	22.7	28.2	3.2	71.3	51.4	74.0	-2.7	Pass	54.0	-2.6	Pass
802.11g; 2412MHz; power = 16 V	2390.0	62.2	41.1	22.7	28.2	3.2	70.9	49.8	74.0	-3.1	Pass	54.0	-4.2	Pass
gn-ht20; 2412MHz; power = 16 V	2390.0	62.2	42.5	22.7	28.2	3.2	70.9	51.2	74.0	-3.1	Pass	54.0	-2.8	Pass
gn-ht40; 2422MHz; power = 14 V	2390.0	61.3	44.3	22.7	28.2	3.2	70.0	53.0	74.0	-4.0	Pass	54.0	-1.0	Pass
gn-ht40; 2452MHz; power = 14 V	2483.5	64.5	44.3	22.7	28.3	3.3	73.4	53.2	74.0	-0.6	Pass	54.0	-0.8	Pass
gn-ht20; 2462MHz; power = 16 V	2483.5	63.3	44.0	22.7	28.3	3.3	72.2	52.9	74.0	-1.8	Pass	54.0	-1.1	Pass
802.11g; 2462MHz; power = 15.5 V	2483.5	64.5	41.9	22.7	28.3	3.3	73.4	50.8	74.0	-0.6	Pass	54.0	-3.2	Pass
802.11b; 2462MHz; power = 15.5 V	2483.5	62.6	43.5	22.7	28.3	3.3	71.5	52.4	74.0	-2.5	Pass	54.0	-1.6	Pass
an-ht40; 5190MHz; power = 12 V	5150.0	47.7	32.0	20.8	33.6	4.8	65.3	49.6	74.0	-8.7	Pass	54.0	-4.4	Pass
an-ht20; 5180MHz; power = 16 V	5150.0	48.5	32.2	20.8	33.6	4.8	66.1	49.8	74.0	-7.9	Pass	54.0	-4.2	Pass
802.11a; 5180MHz; power = 16 V	5150.0	53.7	31.3	20.8	33.6	4.8	71.3	48.9	74.0	-2.7	Pass	54.0	-5.1	Pass
802.11a; 5320MHz; power = 17 V	5350.0	55.0	34.5	20.8	34.0	5.0	73.2	52.7	74.0	-0.8	Pass	54.0	-1.3	Pass
an-ht20; 5320MHz; power = 17 V	5350.0	50.3	33.6	20.8	34.0	5.0	68.5	51.8	74.0	-5.5	Pass	54.0	-2.2	Pass
an-ht40; 5310MHz; power = 15.5 V	5350.0	54.8	35.4	20.8	34.0	5.0	73.0	53.6	74.0	-1.0	Pass	54.0	-0.4	Pass
an-ht40; 5510MHz; power = 15.5 V	5460.0	50.8	34.3	20.7	34.3	5.0	69.4	52.9	74.0	-4.6	Pass	54.0	-1.1	Pass
an-ht20; 5500MHz; power = 18.5 V	5460.0	49.9	32.2	20.7	34.3	5.0	68.5	50.8	74.0	-5.5	Pass	54.0	-3.2	Pass
802.11a; 5500MHz; power = 18.5 V	5460.0	53.8	32.0	20.7	34.3	5.0	72.4	50.6	74.0	-1.6	Pass	54.0	-3.4	Pass

Table Result: Pass by -0.4 dB **Worst Freq:** 5350.0 MHz

Test Site: 1DCC-OATS-3M1 Cable 1: EMIR-HIGH-22 Cable 2: --- Cable 3: ---
 Analyzer: Rental SA#1 Preamp: Asset #1517 Antenna: Yellow Horn Preselctor: ---



Radiated Spurious Emissions Table														
Date: 05-Feb-10			Company: Enterasys			Work Order: J0260								
Engineer: Evan Gould			EUT Desc: AP3620			EUT Operating Voltage/Frequency: 48VDC								
Temp: 17.5°C			Humidity: 24%			Pressure: 1013.7mBar								
Frequency Range: 1 - 6GHz						Measurement Distance: 3 m								
Notes: 4dBi LairdTech S24493TS36RSM						RBW: 1MHz (pk)			1MHz (av)					
						VBW: 3MHz (pk)			10Hz (av)					
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	47 CFR 15.209(a) - Peak			47 CFR 15.209(a) - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
802.11b; 2412MHz; power = 15 H	2390.0	63.6	41.6	22.7	28.2	3.2	72.3	50.3	74.0	-1.7	Pass	54.0	-3.7	Pass
802.11g; 2412MHz; power = 15 H	2390.0	62.2	44.8	22.7	28.2	3.2	70.9	53.5	74.0	-3.1	Pass	54.0	-0.5	Pass
gn-h20; 2412MHz; power = 15 H	2390.0	59.8	42.4	22.7	28.2	3.2	68.5	51.1	74.0	-5.5	Pass	54.0	-2.9	Pass
gn-h40; 2422MHz; power = 6 H	2390.0	59.7	43.3	22.7	28.2	3.2	68.4	52.0	74.0	-5.6	Pass	54.0	-2.0	Pass
802.11b; 2462MHz; power = 18 V	2483.5	59.5	41.0	22.7	28.3	3.3	68.4	49.9	74.0	-5.6	Pass	54.0	-4.1	Pass
802.11g; 2462MHz; power = 18 V	2483.5	62.3	38.0	22.7	28.3	3.3	71.2	46.9	74.0	-2.8	Pass	54.0	-7.1	Pass
gn-h20; 2462MHz; power = 18 V	2483.5	61.8	41.0	22.7	28.3	3.3	70.7	49.9	74.0	-3.3	Pass	54.0	-4.1	Pass
gn-h40; 2455MHz; power = 16 V	2483.5	62.5	42.2	22.7	28.3	3.3	71.4	51.1	74.0	-2.6	Pass	54.0	-2.9	Pass
802.11a; 5180MHz; power = 13.5 V	5150.0	40.4	23.6	20.8	33.6	4.8	58.0	41.2	74.0	-16.0	Pass	54.0	-12.8	Pass
an-h20; 5180MHz; power = 14 V	5150.0	35.5	24.0	20.8	33.6	4.8	53.1	41.6	74.0	-20.9	Pass	54.0	-12.4	Pass
an-h40; 5190MHz; power = 12 V	5150.0	48.8	32.6	20.8	33.6	4.8	66.4	50.2	74.0	-7.6	Pass	54.0	-3.8	Pass
an-h40; 5310MHz; power = 16 V	5350.0	52.4	33.1	20.8	34.0	5.0	70.6	51.3	74.0	-3.4	Pass	54.0	-2.7	Pass
an-h20; 5320MHz; power = 19.5 V	5350.0	45.4	27.6	20.8	34.0	5.0	63.6	45.8	74.0	-10.4	Pass	54.0	-8.2	Pass
802.11a; 5320MHz; power = 19.5 V	5350.0	46.4	26.5	20.8	34.0	5.0	64.6	44.7	74.0	-9.4	Pass	54.0	-9.3	Pass
802.11a; 5500MHz; power = 19.5 V	5460.0	47.1	28.5	20.7	34.3	5.0	65.7	47.1	74.0	-8.3	Pass	54.0	-6.9	Pass
an-h20; 5500MHz; power = 19.5 V	5460.0	45.3	29.6	20.7	34.3	5.0	63.9	48.2	74.0	-10.1	Pass	54.0	-5.8	Pass
an-h40; 5510MHz; power = 20 V	5460.0	49.4	34.3	20.7	34.3	5.0	68.0	52.9	74.0	-6.0	Pass	54.0	-1.1	Pass

Table Result: Pass by -0.5 dB **Worst Freq:** 2390.0 MHz
 Test Site: 1DCC-OATS-3M-I **Cable 1:** EMIR-HIGH-22 **Cable 2:** --- **Cable 3:** ---
 Analyzer: Rental SA#1 **Preamp:** Asset #1517 **Antenna:** Yellow Horn **Preselctor:** ---

Radiated Spurious Emissions Table														
Date: 04-Feb-10			Company: Enterasys			Work Order: J0260								
Engineer: Evan Gould			EUT Desc: AP3620			EUT Operating Voltage/Frequency: 48VDC								
Temp: 17.5°C			Humidity: 24%			Pressure: 1008mBar								
Frequency Range: 1 - 6GHz						Measurement Distance: 3 m								
Notes: 5dBi LairdTech S24493BPX12RNF						RBW: 1MHz (pk)			1MHz (av)					
						VBW: 3MHz (pk)			10Hz (av)					
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	47 CFR 15.209(a) - Peak			47 CFR 15.209(a) - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
802.11b; 2412MHz; power = 16 V	2390.0	61.5	42.0	22.7	28.2	3.2	70.2	50.7	74.0	-3.8	Pass	54.0	-3.3	Pass
802.11g; 2412MHz; power = 16 V	2390.0	62.4	41.8	22.7	28.2	3.2	71.1	50.5	74.0	-2.9	Pass	54.0	-3.5	Pass
gn-h20; 2412MHz; power = 16 V	2390.0	63.3	42.8	22.7	28.2	3.2	72.0	51.5	74.0	-2.0	Pass	54.0	-2.5	Pass
gn-h40; 2422MHz; power = 13 V	2390.0	57.8	43.2	22.7	28.2	3.2	66.5	51.9	74.0	-7.5	Pass	54.0	-2.1	Pass
802.11b; 2462MHz; power = 16 V	2483.5	61.1	41.5	22.7	28.3	3.3	70.0	50.4	74.0	-4.0	Pass	54.0	-3.6	Pass
802.11g; 2462MHz; power = 16 V	2483.5	62.2	41.3	22.7	28.3	3.3	71.1	50.2	74.0	-2.9	Pass	54.0	-3.8	Pass
gn-h20; 2462MHz; power = 16 V	2483.5	61.9	42.0	22.7	28.3	3.3	70.8	50.9	74.0	-3.2	Pass	54.0	-3.1	Pass
gn-h40; 2452MHz; power = 14 V	2483.5	59.3	44.0	22.7	28.3	3.3	68.2	52.9	74.0	-5.8	Pass	54.0	-1.1	Pass
802.11a; 5180MHz; power = 12 V	5150.0	38.2	23.8	20.8	33.6	4.8	55.8	41.4	74.0	-18.2	Pass	54.0	-12.6	Pass
an-h20; 5180MHz; power = 14 V	5150.0	40.3	25.0	20.8	33.6	4.8	57.9	42.6	74.0	-16.1	Pass	54.0	-11.4	Pass
an-h40; 5190MHz; power = 11 V	5150.0	42.8	28.7	20.8	33.6	4.8	60.4	46.3	74.0	-13.6	Pass	54.0	-7.7	Pass
802.11a; 5320MHz; power = 17 V	5350.0	52.5	31.0	20.8	34.0	5.0	70.7	49.2	74.0	-3.3	Pass	54.0	-4.8	Pass
an-h20; 5320MHz; power = 17 V	5350.0	50.6	32.1	20.8	34.0	5.0	68.8	50.3	74.0	-5.2	Pass	54.0	-3.7	Pass
an-h40; 5310MHz; power = 13 V	5350.0	48.6	32.0	20.8	34.0	5.0	66.8	50.2	74.0	-7.2	Pass	54.0	-3.8	Pass

Table Result: Pass by -1.1 dB **Worst Freq:** 2483.5 MHz
 Test Site: 1DCC-OATS-3M-I **Cable 1:** EMIR-HIGH-22 **Cable 2:** --- **Cable 3:** ---
 Analyzer: Rental SA#1 **Preamp:** Asset #1517 **Antenna:** Yellow Horn **Preselctor:** ---



Radiated Spurious Emissions Table

Date: 04-Feb-10 Company: Enterasys Work Order: J0260
 Engineer: Evan Gould EUT Desc: AP3620 EUT Operating Voltage/Frequency: 48VDC
 Temp: 17.5°C Humidity: 24% Pressure: 1008mBar

Frequency Range: 1 - 6GHz Measurement Distance: 3 m

Notes: 5dBi Mars MA-WE2458-3H RBW: 1MHz (pk) 1MHz (av)
 VBW: 3MHz (pk) 10Hz (av)

Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	47 CFR 15.209(a) - Peak			47 CFR 15.209(a) - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
802.11b; 2412MHz; power = 14 H	2390.0	60.1	42.6	22.7	28.2	3.2	68.8	51.3	74.0	-5.2	Pass	54.0	-2.7	Pass
802.11g; 2412MHz; power = 14 H	2390.0	61.9	42.6	22.7	28.2	3.2	70.6	51.3	74.0	-3.4	Pass	54.0	-2.7	Pass
gn-h120; 2412MHz; power = 14 H	2390.0	60.1	43.1	22.7	28.2	3.2	68.8	51.8	74.0	-5.2	Pass	54.0	-2.2	Pass
gn-h140; 2422MHz; power = 11 H	2390.0	61.2	44.2	22.7	28.2	3.2	69.9	52.9	74.0	-4.1	Pass	54.0	-1.1	Pass
gn-h140; 2452MHz; power = 9 H	2483.5	59.9	43.5	22.7	28.3	3.3	68.8	52.4	74.0	-5.2	Pass	54.0	-1.6	Pass
gn-h120; 2462MHz; power = 11 H	2483.5	57.0	41.8	22.7	28.3	3.3	65.9	50.7	74.0	-8.1	Pass	54.0	-3.3	Pass
802.11g; 2462MHz; power = 11 H	2483.5	55.2	41.3	22.7	28.3	3.3	64.1	50.2	74.0	-9.9	Pass	54.0	-3.8	Pass
802.11b; 2462MHz; power = 11 H	2483.5	56.9	41.7	22.7	28.3	3.3	65.8	50.6	74.0	-8.2	Pass	54.0	-3.4	Pass
802.11a; 5180MHz; power = 12 H	5150.0	37.6	24.7	20.8	33.6	4.8	55.2	42.3	74.0	-18.8	Pass	54.0	-11.7	Pass
an-h120; 5180MHz; power = 12 H	5150.0	37.5	24.8	20.8	33.6	4.8	55.1	42.4	74.0	-18.9	Pass	54.0	-11.6	Pass
an-h140; 5190MHz; power = 12 H	5150.0	47.5	32.4	20.8	33.6	4.8	65.1	50.0	74.0	-8.9	Pass	54.0	-4.0	Pass
an-h140; 5310MHz; power = 13 H	5350.0	49.2	32.0	20.8	34.0	5.0	67.4	50.2	74.0	-6.6	Pass	54.0	-3.8	Pass
an-h120; 5320MHz; power = 17 H	5350.0	50.1	32.7	20.8	34.0	5.0	68.3	50.9	74.0	-5.7	Pass	54.0	-3.1	Pass
802.11a; 5320MHz; power = 17 H	5350.0	53.1	32.7	20.8	34.0	5.0	71.3	50.9	74.0	-2.7	Pass	54.0	-3.1	Pass
802.11a; 5500MHz; power = 18 H	5460.0	51.0	29.3	20.7	34.3	5.0	69.6	47.9	74.0	-4.4	Pass	54.0	-6.1	Pass
an-h120; 5500MHz; power = 18 H	5460.0	52.6	34.2	20.7	34.3	5.0	71.2	52.8	74.0	-2.8	Pass	54.0	-1.2	Pass
an-h140; 5510MHz; power = 16 H	5460.0	50.8	35.2	20.7	34.3	5.0	69.4	53.8	74.0	-4.6	Pass	54.0	-0.2	Pass

Table Result: Pass by -1.1 dB **Worst Freq:** 2390.0 MHz

Test Site: 1DCC-OATS-3M1 Cable 1: EMIR-HIGH-22 Cable 2: --- Cable 3: ---
 Analyzer: Rental SA#1 Preamp: Asset #1517 Antenna: Yellow Horn Preselctor: ---

Radiated Spurious Emissions Table

Date: 05-Feb-10 Company: Enterasys Work Order: J0260
 Engineer: Evan Gould EUT Desc: AP3620 EUT Operating Voltage/Frequency: 48VDC
 Temp: 17.5°C Humidity: 24% Pressure: 1013.7mBar

Frequency Range: 1 - 6GHz Measurement Distance: 1 m

Notes: 16dBi MTI Antenna MT-484026/NV/HB RBW: 1MHz (pk) 1MHz (av)
 VBW: 3MHz (pk) 10Hz (av)

Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	47 CFR 15.209(a) - Peak			47 CFR 15.209(a) - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
802.11a; 5180MHz; power = 2.5 V	5150.0	37.1	26.6	20.8	34.4	4.8	55.5	45.0	83.5	-28.0	Pass	63.5	-18.5	Pass
an-h120; 5180MHz; power = 4.5 V	5150.0	37.3	26.7	20.8	34.4	4.8	55.7	45.1	83.5	-27.8	Pass	63.5	-18.4	Pass
an-h140; 5190MHz; pow = 1.5 V	5150.0	42.0	29.3	20.8	34.4	4.8	60.4	47.7	83.5	-23.1	Pass	63.5	-15.8	Pass
802.11a; 5320MHz; power = 4 V	5350.0	38.5	29.1	20.8	34.8	5.0	57.5	48.1	83.5	-26.0	Pass	63.5	-15.4	Pass
an-h120; 5320MHz; power = 3 V	5350.0	36.9	28.5	20.8	34.8	5.0	55.9	47.5	83.5	-27.6	Pass	63.5	-16.0	Pass
an-h140; 5310MHz; pow = 2.5 V	5350.0	39.0	27.8	20.8	34.8	5.0	58.0	46.8	83.5	-25.5	Pass	63.5	-16.7	Pass
802.11a; 5745MHz; power = 15.5 V	5433.4	52.1	39.0	20.7	35.0	5.0	71.4	58.3	83.5	-12.1	Pass	63.5	-5.2	Pass
802.11a; 5825MHz; power = 16.5 V	5423.2	55.1	41.9	20.7	35.0	5.0	74.4	61.2	83.5	-9.1	Pass	63.5	-2.3	Pass
an-h120; 5825MHz; power = 16.5 V	5447.1	54.5	39.7	20.7	35.0	5.0	73.8	59.0	83.5	-9.7	Pass	63.5	-4.5	Pass
an-h120; 5745MHz; power = 15.5 V	5437.2	50.9	38.4	20.7	35.0	5.0	70.2	57.7	83.5	-13.3	Pass	63.5	-5.8	Pass
an-h140; 5755MHz; power = 16.5 V	5438.0	55.5	43.1	20.7	35.0	5.0	74.8	62.4	83.5	-8.7	Pass	63.5	-1.1	Pass
an-h140; 5795MHz; power = 16.5 V	5433.0	55.8	42.7	20.7	35.0	5.0	75.1	62.0	83.5	-8.4	Pass	63.5	-1.5	Pass

Table Result: Pass by -1.1 dB **Worst Freq:** 5438.0 MHz

Test Site: 1DCC-OATS-3M1 Cable 1: EMIR-HIGH-22 Cable 2: --- Cable 3: ---
 Analyzer: Rental SA#1 Preamp: Asset #1517 Antenna: Yellow Horn Preselctor: ---

Radiated Spurious Emissions Table

Date: 05-Feb-10 Company: Enterasys Work Order: J0260
 Engineer: Evan Gould EUT Desc: AP3620 EUT Operating Voltage/Frequency: 48VDC
 Temp: 17.5°C Humidity: 24% Pressure: 1013.7mBar

Frequency Range: 1 - 6GHz Measurement Distance: 1 m

Notes: 23dBi MTI Antenna MT-485025/NV/HB RBW: 1MHz (pk) 1MHz (av)
 VBW: 3MHz (pk) 10Hz (av)

Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	47 CFR 15.209(a) - Peak			47 CFR 15.209(a) - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
802.11a; 5825MHz; power = 8 V	5428.9	55.4	43.6	20.7	35.0	5.0	74.7	62.9	83.5	-8.8	Pass	63.5	-0.6	Pass
802.11a; 5745MHz; power = 11 V	5446.8	55.7	43.3	20.7	35.0	5.0	75.0	62.6	83.5	-8.5	Pass	63.5	-0.9	Pass
802.11a; 5765MHz; power = 11 V	5389.6	55.2	42.7	20.7	34.9	5.0	74.4	61.9	83.5	-9.1	Pass	63.5	-1.6	Pass
802.11a; 5785MHz; power = 11 V	5444.9	54.9	43.3	20.7	35.0	5.0	74.2	62.6	83.5	-9.3	Pass	63.5	-0.9	Pass
802.11a; 5805MHz; power = 11 V	5444.6	55.5	43.2	20.7	35.0	5.0	74.8	62.5	83.5	-8.7	Pass	63.5	-1.0	Pass
an-h120; 5805MHz; power = 11 V	5389.3	55.0	41.9	20.8	34.8	5.0	74.0	60.9	83.5	-9.5	Pass	63.5	-2.6	Pass
an-h120; 5825MHz; power = 8 V	5428.9	55.4	43.6	20.7	35.0	5.0	74.7	62.9	83.5	-8.8	Pass	63.5	-0.6	Pass
an-h140; 5755MHz; power = 11 V	5420.4	56.0	43.1	20.7	35.0	5.0	75.3	62.4	83.5	-8.2	Pass	63.5	-1.1	Pass
an-h140; 5795MHz; power = 11 V	5411.3	57.4	43.2	20.7	34.9	5.0	76.6	62.4	83.5	-6.9	Pass	63.5	-1.1	Pass

Table Result: Pass by -0.6 dB **Worst Freq:** 5428.9 MHz

Test Site: 1DCC-OATS-3M1 Cable 1: EMIR-HIGH-22 Cable 2: --- Cable 3: ---
 Analyzer: Rental SA#1 Preamp: Asset #1517 Antenna: Yellow Horn Preselctor: ---



Rev: 28-Jan-2010

Spectrum Analyzers / Receivers /Preselectors

	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental SA #1 (Brown)	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	10-Feb-2010

Radiated Emissions Sites

	FCC Code	IC Code	VCCI Code	Cat	Calibration Due
1DCC-OATS-3M-I	719150	2762A-8	R-3109	II	7-Jul-2011

Preamps /Couplers Attenuators / Filters

	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
1517 HF Preamp	1-18GHz	CS	CS	N/A	1517	II	29-May-2010

Antennas

	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Yellow Horn	1-18GHz	3115	EMCO	9608-4898	37	I	27-May-2011

Meteorological Meters

	MN	Mfr	SN	Asset	Cat	Calibration Due
Weather Clock (Pressure Only)	BA928	Oregon Scientific	C3166-1	831	I	17-Mar-2011
1DCC-OATS-3M-I Thermohyrometer	35519-044	Control Company	72457635	1334	II	18-Aug-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



Conducted Output Power

“The maximum peak conducted output power of the intentional radiator shall not exceed... 1 Watt.” [15.247(b)(3)]

“...if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below (1 Watt) by the amount in dB that the directional gain of the antenna exceeds 6 dBi.” [15.247(b)(4)]

“Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.” [15.247(b)(4)(i)]

“Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.” [15.247(b)(4)(ii)]

“For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed...50mW. If transmitting antennas of directional gain greater than 6 dBi are used...the maximum conducted output power...shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.” [15.407(a)(1)]

“For the band 5.25-5.35 GHz and 5.47-5.725GHz, the maximum conducted output power over the frequency band of operation shall not exceed...250mW. If transmitting antennas of directional gain greater than 6 dBi are used...the maximum conducted output power...shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.” [15.407(a)(2)]

MEASUREMENTS

802.11b

Antennas (dBi)	Frequency (MHz)	ART Setting	Port A SA Reading (dBm)	Port B SA Reading (dBm)	Port C SA Reading (dBm)	Linear Sum of Ports (dBm)	Attenuation (dB)	Adjusted Output Power (dBm)	FCC Limit (dBm)	Result (Pass/Fail)
4, 5	2412	21	3.03	1.79	2.62	7.28	19.9	27.18	30	Pass
4, 5	2417	22.5	5.24	4.37	4.88	9.62	19.9	29.52	30	Pass
4, 5	2422	22.5	5.17	4.38	4.95	9.62	19.9	29.52	30	Pass
4, 5	2427	22.5	5.25	4.57	5.06	9.74	19.9	29.64	30	Pass
4, 5	2432	22.5	5.15	4.63	5.22	9.78	19.9	29.68	30	Pass
4, 5	2437	22.5	5.12	4.89	5.21	9.85	19.9	29.75	30	Pass
4, 5	2442	22.5	4.14	4.67	5.1	9.43	19.9	29.33	30	Pass
4, 5	2447	22.5	4.95	4.84	5.1	9.74	19.9	29.64	30	Pass
4, 5	2452	22.5	4.94	4.85	4.98	9.69	19.9	29.59	30	Pass
4, 5	2457	22.5	4.89	4.91	4.98	9.70	19.9	29.60	30	Pass
4, 5	2462	22.5	5.04	5.31	5.29	9.99	19.9	29.89	30	Pass



802.11g

Antennas (dBi)	Frequency (MHz)	ART Setting	Port A SA Reading (dBm)	Port B SA Reading (dBm)	Port C SA Reading (dBm)	Linear Sum of Ports (dBm)	Attenuation (dB)	Adjusted Output Power (dBm)	FCC Limit (dBm)	Result (Pass/Fail)
4, 5	2412	21.5	3.31	2.1	2.98	7.60	19.9	27.50	30	Pass
4, 5	2417	22.5	5.51	4.72	5.17	9.92	19.9	29.82	30	Pass
4, 5	2422	22.5	5.46	4.92	5.3	10.00	19.9	29.90	30	Pass
4, 5	2427	22	5.46	4.99	5.39	10.06	19.9	29.96	30	Pass
4, 5	2432	22	5.45	5.08	3.37	9.49	19.9	29.39	30	Pass
4, 5	2437	22	5.25	5.11	3.4	9.44	19.9	29.34	30	Pass
4, 5	2442	22	3.85	5.2	3.46	9.01	19.9	28.91	30	Pass
4, 5	2447	22	4.62	5.34	2.9	9.17	19.9	29.07	30	Pass
4, 5	2452	22	4.59	4.99	3.1	9.07	19.9	28.97	30	Pass
4, 5	2457	22	4.42	4.9	2.82	8.91	19.9	28.81	30	Pass
4, 5	2462	22	4.35	5.29	3.56	9.23	19.9	29.13	30	Pass

gn-ht20

Antennas (dBi)	Frequency (MHz)	ART Setting	Port A SA Reading (dBm)	Port B SA Reading (dBm)	Port C SA Reading (dBm)	Linear Sum of Ports (dBm)	Attenuation (dB)	Adjusted Output Power (dBm)	FCC Limit (dBm)	Result (Pass/Fail)
4, 5	2412	20	1.96	0.82	1.79	6.32	19.9	26.22	30	Pass
4, 5	2417	22	3.62	2.44	3.32	7.93	19.9	27.83	30	Pass
4, 5	2422	22.5	3.62	2.58	3.42	8.00	19.9	27.90	30	Pass
4, 5	2427	22.5	5.05	2.71	4.99	9.15	19.9	29.05	30	Pass
4, 5	2432	22.5	5.04	2.52	5	9.11	19.9	29.01	30	Pass
4, 5	2437	22.5	5.03	4.84	5.02	9.74	19.9	29.64	30	Pass
4, 5	2442	22.5	5.01	4.91	5.03	9.75	19.9	29.65	30	Pass
4, 5	2447	22.5	4.98	4.98	5.04	9.77	19.9	29.67	30	Pass
4, 5	2452	22.5	4.95	5.04	5.05	9.78	19.9	29.68	30	Pass
4, 5	2457	22.5	4.9	5.11	5	9.78	19.9	29.68	30	Pass
4, 5	2462	22.5	4.82	5.18	5.02	9.78	19.9	29.68	30	Pass

gn-ht40

Antennas (dBi)	Frequency (MHz)	ART Setting	Port A SA Reading (dBm)	Port B SA Reading (dBm)	Port C SA Reading (dBm)	Linear Sum of Ports (dBm)	Attenuation (dB)	Adjusted Output Power (dBm)	FCC Limit (dBm)	Result (Pass/Fail)
4, 5	2422	18.5	0.77	1.22	1.58	5.97	19.9	25.87	30	Pass
4, 5	2427	20	2.3	1.26	1.63	6.52	19.9	26.42	30	Pass
4, 5	2432	20	2.37	1.22	1.36	6.45	19.9	26.35	30	Pass
4, 5	2437	20	2.38	1.3	1.4	6.49	19.9	26.39	30	Pass
4, 5	2442	20	2.24	1.62	1.46	6.56	19.9	26.46	30	Pass
4, 5	2447	20	2.243	1.27	1.05	6.32	19.9	26.22	30	Pass
4, 5	2452	20	2.41	1.17	1.06	6.36	19.9	26.26	30	Pass

802.11a (15.247)

Antennas (dBi)	Frequency (MHz)	ART Setting	Port A SA Reading (dBm)	Port B SA Reading (dBm)	Port C SA Reading (dBm)	Linear Sum of Ports (dBm)	Attenuation (dB)	Adjusted Output Power (dBm)	FCC Limit (dBm)	Result (Pass/Fail)
4, 5	5745	20	-1.6	-1.23	-1.39	3.37	19.9	23.27	30	Pass
4, 5	5765	20	-2.29	-1.39	-0.98	3.25	19.9	23.15	30	Pass
4, 5	5785	20	-2.34	0.53	-1.2	3.93	19.9	23.83	30	Pass
4, 5	5805	20	-2.41	0.43	-2.23	3.57	19.9	23.47	30	Pass
4, 5	5825	20	-0.12	0.53	-1.27	4.55	19.9	24.45	30	Pass
16	5745	15.5	-5.91	-5.41	-4.9	-0.62	19.9	19.28	20	Pass
16	5765	16	-5.71	-5.41	-5.09	-0.62	19.9	19.28	20	Pass
16	5785	16.5	-5.23	-5.43	-4.75	-0.36	19.9	19.54	20	Pass
16	5805	16.5	-5.31	-5.57	-4.96	-0.50	19.9	19.40	20	Pass
16	5825	16.5	-5.23	-5.05	-5.05	-0.34	19.9	19.56	20	Pass
point-to-point: 23	5745	20	-1.6	-1.23	-1.39	3.37	19.9	23.27	30	Pass
point-to-point: 23	5765	20	-2.29	-1.39	-0.98	3.25	19.9	23.15	30	Pass
point-to-point: 23	5785	20	-2.34	0.53	-1.2	3.93	19.9	23.83	30	Pass
point-to-point: 23	5805	20	-2.41	0.43	-2.23	3.57	19.9	23.47	30	Pass
point-to-point: 23	5825	20	-0.12	0.53	-1.27	4.55	19.9	24.45	30	Pass



802.11a (U-NII)

Antennas (dBi)	Frequency (MHz)	ART Setting	Port A SA Reading (dBm)	Port B SA Reading (dBm)	Port C SA Reading (dBm)	Linear Sum of Ports (dBm)	Attenuation (dB)	Adjusted Output Power (dBm)	FCC Limit (dBm)	Result (Pass/Fail)
4, 5	5180	12	-8.28	-7.94	-7.82	-3.24	19.9	16.66	16.99	Pass
4, 5	5200	12	-8.41	-8.26	-7.94	-3.43	19.9	16.47	16.99	Pass
4, 5	5220	12	-8.1	-7.98	-7.79	-3.18	19.9	16.72	16.99	Pass
4, 5	5240	12	-8.42	-7.87	-7.43	-3.12	19.9	16.78	16.99	Pass
4, 5	5260	18.5	-1.62	-1.68	-1.04	3.33	19.9	23.23	23.98	Pass
4, 5	5280	19	-1.21	-1.39	-0.95	3.59	19.9	23.49	23.98	Pass
4, 5	5300	19.5	-0.75	-1.01	-0.83	3.91	19.9	23.81	23.98	Pass
4, 5	5320	19.5	-1.06	-1.12	-1.17	3.65	19.9	23.55	23.98	Pass
4, 5	5500	19.5	-1.4	-1.74	-1.65	3.18	19.9	23.08	23.98	Pass
4, 5	5520	19.5	-1.71	-1.96	-2.64	2.69	19.9	22.59	23.98	Pass
4, 5	5540	19.5	-1.75	-1.97	-2.6	2.68	19.9	22.58	23.98	Pass
4, 5	5560	19.5	-1.75	-1.85	-2.37	2.79	19.9	22.69	23.98	Pass
4, 5	5580	19.5	-1.94	-2.25	-2.35	2.59	19.9	22.49	23.98	Pass
4, 5	5680	19.5	-2.53	-1.89	-1.65	2.76	19.9	22.66	23.98	Pass
4, 5	5700	19.5	-2.54	-1.88	-1.83	2.70	19.9	22.60	23.98	Pass
16	5180	2.5	-18.21	-17.55	-18.3	-13.24	19.9	6.66	6.99	Pass
16	5200	2	-18.28	-17.82	-17.92	-13.23	19.9	6.67	6.99	Pass
16	5220	2	-18.8	-17.73	-17.77	-13.30	19.9	6.60	6.99	Pass
16	5240	2	-18.5	-17.71	-17.73	-13.19	19.9	6.71	6.99	Pass
16	5260	2.5	-19.25	-18.2	-17.53	-13.50	19.9	6.40	13.98	Pass
16	5280	3	-18.55	-18	-17.64	-13.28	19.9	6.62	13.98	Pass
16	5300	3.5	-17.38	-18.24	-17.9	-13.05	19.9	6.85	13.98	Pass
16	5320	4	-17.16	-18.17	-17.97	-12.97	19.9	6.93	13.98	Pass

an-ht20 (15.247)

Antennas (dBi)	Frequency (MHz)	ART Setting	Port A SA Reading (dBm)	Port B SA Reading (dBm)	Port C SA Reading (dBm)	Linear Sum of Ports (dBm)	Attenuation (dB)	Adjusted Output Power (dBm)	FCC Limit (dBm)	Result (Pass/Fail)
4, 5	5745	20	-1.97	-2.47	-1.5	2.81	19.9	22.71	30	Pass
4, 5	5765	20	-2.51	-2.64	-1.24	2.69	19.9	22.59	30	Pass
4, 5	5785	20	-2.48	-2.9	-1.5	2.52	19.9	22.42	30	Pass
4, 5	5805	20	-2.69	-3.65	-2.34	1.91	19.9	21.81	30	Pass
4, 5	5825	20	-0.15	-0.45	-1.1	4.22	19.9	24.12	30	Pass
16	5745	15.5	-6.17	-5.52	-5.27	-0.87	19.9	19.03	20	Pass
16	5765	16	-6.02	-5.13	-5.45	-0.75	19.9	19.15	20	Pass
16	5785	16.5	-5.58	-5.05	-5.1	-0.47	19.9	19.43	20	Pass
16	5805	16.5	-5.57	-4.83	-5.28	-0.44	19.9	19.46	20	Pass
16	5825	16.5	-5.57	-4.82	-5.23	-0.42	19.9	19.48	20	Pass
point-to-point: 23	5745	20	-1.97	-2.47	-1.5	2.81	19.9	22.71	30	Pass
point-to-point: 23	5765	20	-2.51	-2.64	-1.24	2.69	19.9	22.59	30	Pass
point-to-point: 23	5785	20	-2.48	-2.9	-1.5	2.52	19.9	22.42	30	Pass
point-to-point: 23	5805	20	-2.69	-3.65	-2.34	1.91	19.9	21.81	30	Pass
point-to-point: 23	5825	20	-0.15	-0.45	-1.1	4.22	19.9	24.12	30	Pass



an-ht20 (U-NII)

Antennas (dBi)	Frequency (MHz)	ART Setting	Port A SA Reading (dBm)	Port B SA Reading (dBm)	Port C SA Reading (dBm)	Linear Sum of Ports (dBm)	Attenuation (dB)	Adjusted Output Power (dBm)	FCC Limit (dBm)	Result (Pass/Fail)
4, 5	5180	14	-7.84	-8.06	-8.09	-3.22	19.9	16.68	16.99	Pass
4, 5	5200	13.5	-8.51	-7.71	-7.99	-3.29	19.9	16.61	16.99	Pass
4, 5	5220	12.5	-8.9	-8.57	-8.57	-3.69	19.9	16.21	16.99	Pass
4, 5	5240	12	-8.79	-8.5	-8.05	-3.66	19.9	16.24	16.99	Pass
4, 5	5260	18.5	-2.01	-1.83	-1.18	3.11	19.9	23.01	23.98	Pass
4, 5	5280	19	-1.56	-1.54	-1.07	3.39	19.9	23.29	23.98	Pass
4, 5	5300	19.5	-1.02	-1.28	-1.05	3.66	19.9	23.56	23.98	Pass
4, 5	5320	19.5	-1.47	-1.5	-1.8	3.18	19.9	23.08	23.98	Pass
4, 5	5500	19.5	-5.2	-5.75	-2.44	0.56	19.9	20.46	23.98	Pass
4, 5	5520	19.5	-7.7	-7.7	-3.33	-0.95	19.9	18.95	23.98	Pass
4, 5	5540	19.5	-9.4	-8.95	-3.73	-1.77	19.9	18.13	23.98	Pass
4, 5	5560	19.5	-9.08	-9.19	-3.72	-1.75	19.9	18.15	23.98	Pass
4, 5	5580	19.5	-7.68	-8.61	-3.55	-1.25	19.9	18.65	23.98	Pass
4, 5	5680	20.5	-2.63	-2.6	-1.8	2.45	19.9	22.35	23.98	Pass
4, 5	5700	20.5	-2.76	-2.39	-1.73	2.50	19.9	22.40	23.98	Pass
16	5180	4.5	-17.75	-17.86	-18.34	-13.20	19.9	6.70	6.99	Pass
16	5200	4	-18.45	-18.07	-17.79	-13.32	19.9	6.58	6.99	Pass
16	5220	3	-19.85	-17.92	-17.78	-13.65	19.9	6.25	6.99	Pass
16	5240	3	-19	-17.69	-17.57	-13.27	19.9	6.63	6.99	Pass
16	5260	2	-19.49	-17.95	-18.14	-13.70	19.9	6.20	13.98	Pass
16	5280	2	-19.29	-18.03	-18.34	-13.75	19.9	6.15	13.98	Pass
16	5300	2.5	-18.35	-18.49	-18.88	-13.80	19.9	6.10	13.98	Pass
16	5320	3	-18.09	-18.59	-18.27	-13.54	19.9	6.36	13.98	Pass

an-ht40 (15.247)

Antennas (dBi)	Frequency (MHz)	ART Setting	Port A SA Reading (dBm)	Port B SA Reading (dBm)	Port C SA Reading (dBm)	Linear Sum of Ports (dBm)	Attenuation (dB)	Adjusted Output Power (dBm)	FCC Limit (dBm)	Result (Pass/Fail)
4, 5	5755	22	0.3	0.6	0.12	5.12	19.9	25.02	30	Pass
4, 5	5795	22	-0.07	0.47	0.56	5.10	19.9	25.00	30	Pass
16	5755	16.5	-5.23	-4.52	-5.27	-0.22	19.9	19.68	20	Pass
16	5795	16.5	-5.21	-4.67	-5.23	-0.26	19.9	19.64	20	Pass
point-to-point: 23	5755	22	0.3	0.6	0.12	5.12	19.9	25.02	30	Pass
point-to-point: 23	5795	22	-0.07	0.47	0.56	5.10	19.9	25.00	30	Pass

an-ht40 (U-NII)

Antennas (dBi)	Frequency (MHz)	ART Setting	Port A SA Reading (dBm)	Port B SA Reading (dBm)	Port C SA Reading (dBm)	Linear Sum of Ports (dBm)	Attenuation (dB)	Adjusted Output Power (dBm)	FCC Limit (dBm)	Result (Pass/Fail)
4, 5	5190	12	-8.81	-8.35	-8.2	-3.67	19.9	16.23	16.99	Pass
4, 5	5230	12	-8.56	-8.25	-7.61	-3.35	19.9	16.55	16.99	Pass
4, 5	5270	19	-1.58	-1.1	-1.26	3.46	19.9	23.36	23.98	Pass
4, 5	5310	19.5	-2.22	-1.64	-2.08	2.80	19.9	22.70	23.98	Pass
4, 5	5510	20	-6.24	-6.49	-7.45	-1.92	19.9	17.98	23.98	Pass
4, 5	5550	22	-5.17	-6.59	-6.09	-1.14	19.9	18.76	23.98	Pass
4, 5	5670	20	-1.48	-4.4	-1.33	2.58	19.9	22.48	23.98	Pass
16	5190	1.5	-19.11	-18.23	-17.99	-13.65	19.9	6.25	6.99	Pass
16	5230	1.5	-19.3	-17.96	-17.82	-13.54	19.9	6.36	6.99	Pass
16	5270	2.5	-19.03	-18.3	-17.81	-13.58	19.9	6.32	13.98	Pass
16	5310	3.5	-17.66	-18.72	-18.4	-13.47	19.9	6.43	13.98	Pass

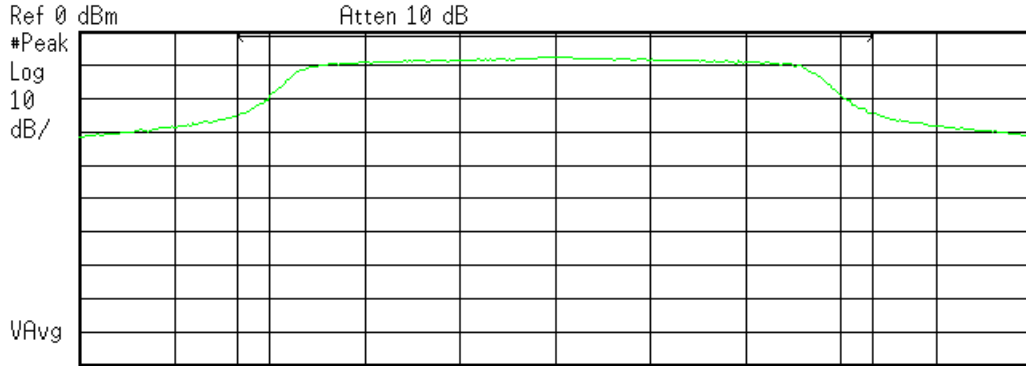


SAMPLE ANALYZER PLOTS

802.11b; 2412MHz; ART Setting: 21; Port A

Agilent 16:51:12 Jan 14, 2010

R L



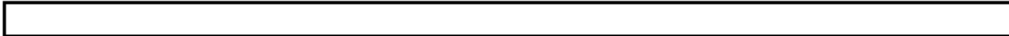
Center 2.412 GHz Span 30 MHz
 #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)

Channel Power

3.03 dBm /20.0000 MHz

Power Spectral Density

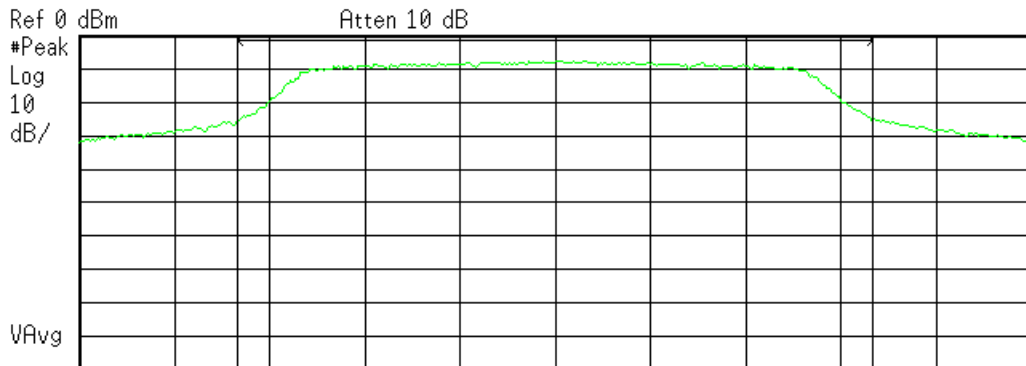
-69.98 dBm/Hz



802.11g; 2412MHz; ART Setting: 21.5; Port A

Agilent 11:00:47 Jan 15, 2010

R L



Center 2.412 GHz Span 30 MHz
 #Res BW 1 MHz #VBW 3 MHz #Sweep 4 ms (401 pts)

Channel Power

3.32 dBm /20.0000 MHz

Power Spectral Density

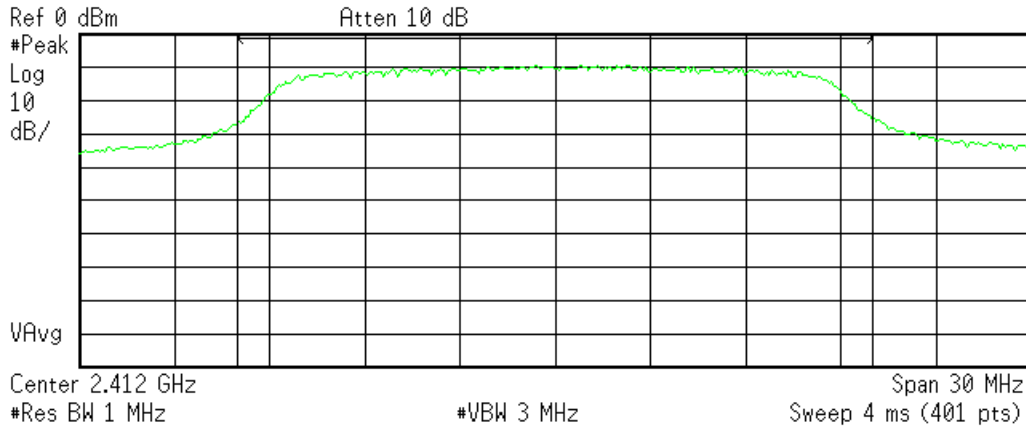
-69.69 dBm/Hz



gn-ht20; 2412MHz; ART Setting: 20; Port C

Agilent 15:07:46 Jan 15, 2010

R L

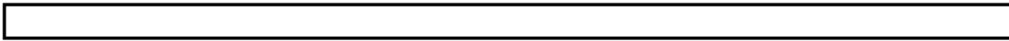


Channel Power

1.79 dBm /20.0000 MHz

Power Spectral Density

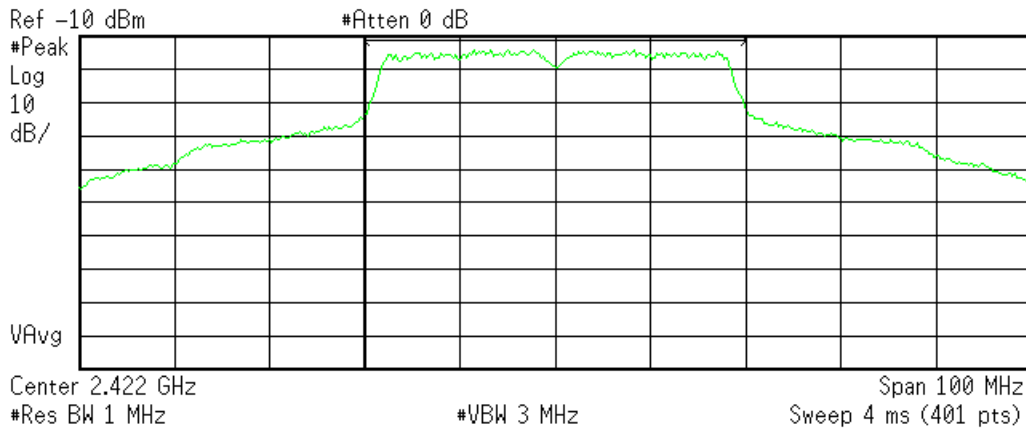
-71.22 dBm/Hz



gn-ht40; 2422MHz; ART Setting: 18.5; Port A

Agilent 17:11:18 Jan 15, 2010

R L

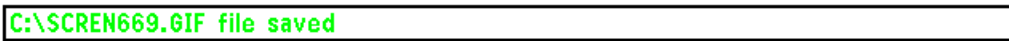


Channel Power

0.77 dBm /40.0000 MHz

Power Spectral Density

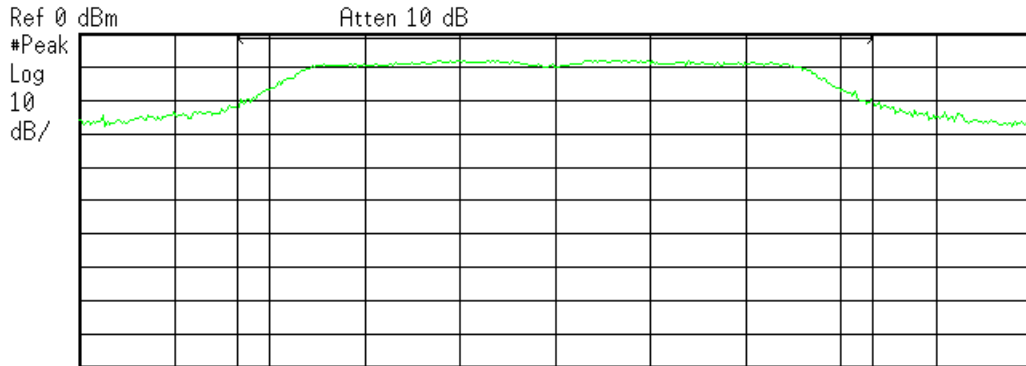
-75.25 dBm/Hz



802.11a (15.247); 5745MHz; ART Setting: 20; Port C

Agilent 10:47:16 Jan 22, 2010

R L



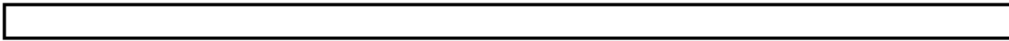
Center 5.745 GHz Span 30 MHz
 #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)

Channel Power

-1.39 dBm /20.0000 MHz

Power Spectral Density

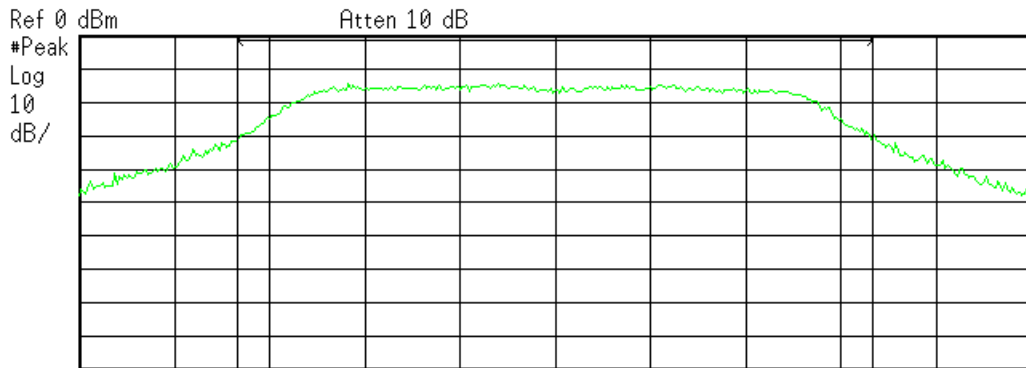
-74.40 dBm/Hz



802.11a (U-NII); 5180MHz; ART Setting: 12; Port A

Agilent 15:04:47 Jan 21, 2010

R L



Center 5.18 GHz Span 30 MHz
 #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)

Channel Power

-8.28 dBm /20.0000 MHz

Power Spectral Density

-81.29 dBm/Hz

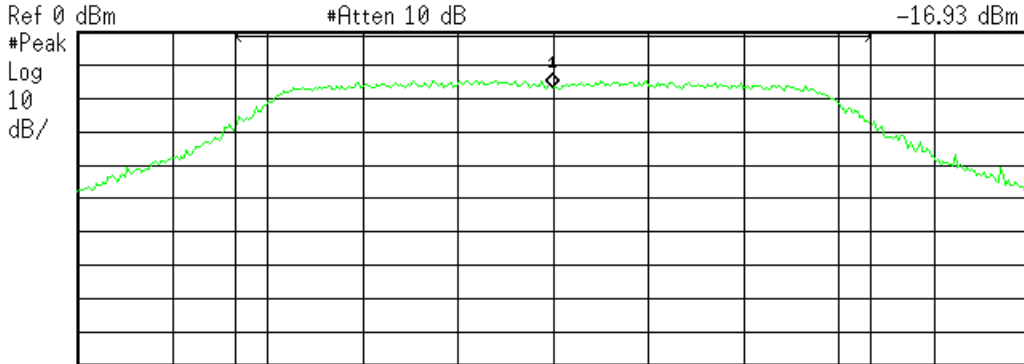


an-ht20 (U-NII); 5180MHz; ART Setting: 14; Port C

Agilent 16:13:19 Jan 22, 2010

R L

Mkr1 5.180000 GHz
-16.93 dBm



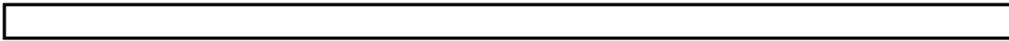
Center 5.18 GHz #Res BW 1 MHz #VBW 3 MHz Span 30 MHz Sweep 4 ms (401 pts)

Channel Power

-8.09 dBm /20.0000 MHz

Power Spectral Density

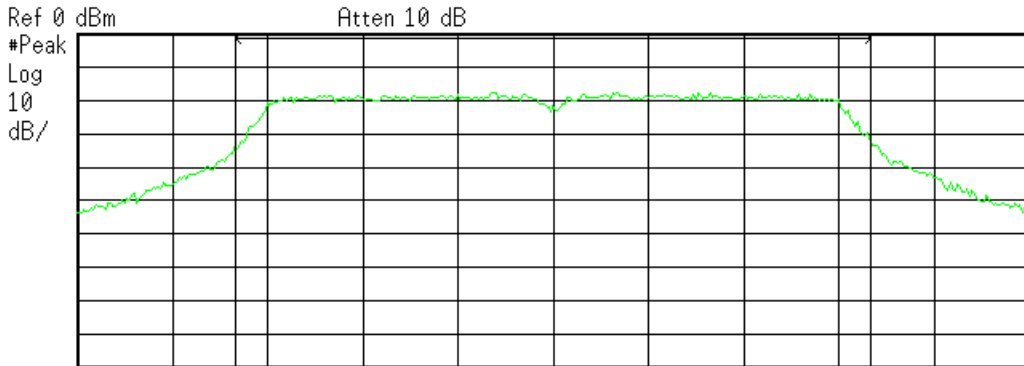
-81.10 dBm/Hz



an-ht40 (U-NII); 5190MHz; ART Setting: 12; Port C

Agilent 14:30:51 Jan 25, 2010

R L



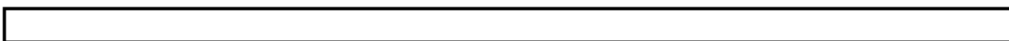
Center 5.19 GHz #Res BW 1 MHz #VBW 3 MHz Span 60 MHz Sweep 4 ms (401 pts)

Channel Power

-8.20 dBm /40.0000 MHz

Power Spectral Density

-84.22 dBm/Hz



Rev: 25-Jan-2010

Spectrum Analyzers / Receivers /Preselectors
Rental SA #1 (Brown)

Range	MN	Mfr	SN	Asset	Cat	Calibration Due
9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	10-Feb-2010

Preamps /Couplers Attenuators / Filters

Range	MN	Mfr	SN	Asset	Cat	Calibration Due
HF 20dB 50W Attenuator	PE 7019-20	Pasternack	1	791	II	8-May-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

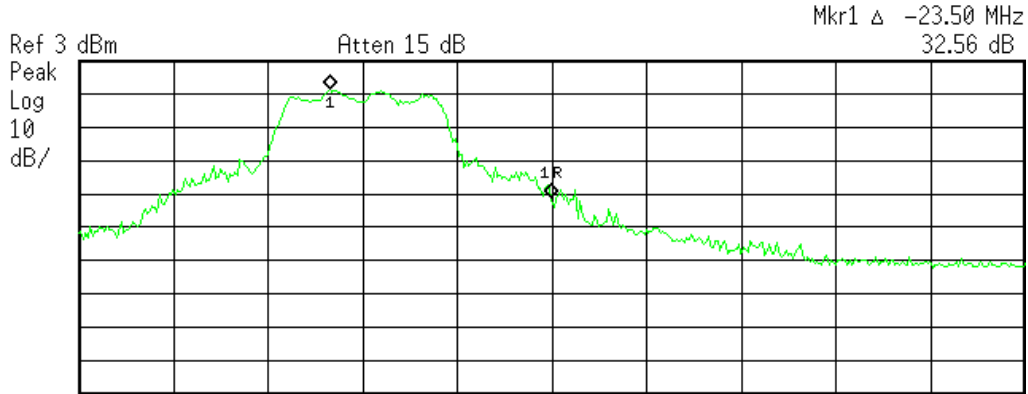


20dB Bandwidth Plots 5600-5650MHz

WS-ANT02; 5580MHz; 802.11a; ART Setting: 19.5

Agilent 13:35:21 Mar 18, 2010

R T



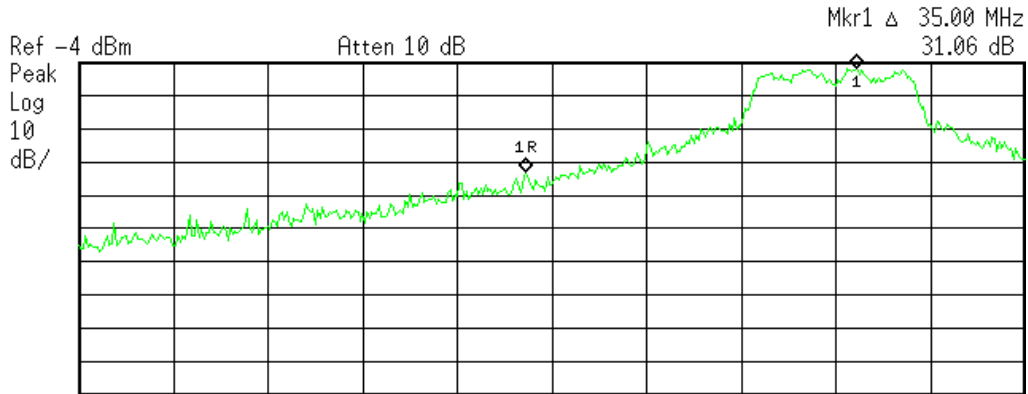
Center 5.6 GHz Span 100 MHz
 #Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.60000 GHz	-38.39 dBm
1Δ	(1)	Freq	-23.50 MHz	32.56 dB

WS-ANT02; 5680MHz; 802.11a; ART Setting: 19.5

Agilent 14:15:05 Mar 18, 2010

R T



Center 5.65 GHz Span 100 MHz
 #Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.64725 GHz	-37 dBm
1Δ	(1)	Freq	35.00 MHz	31.06 dB

Ctemp.gif file saved

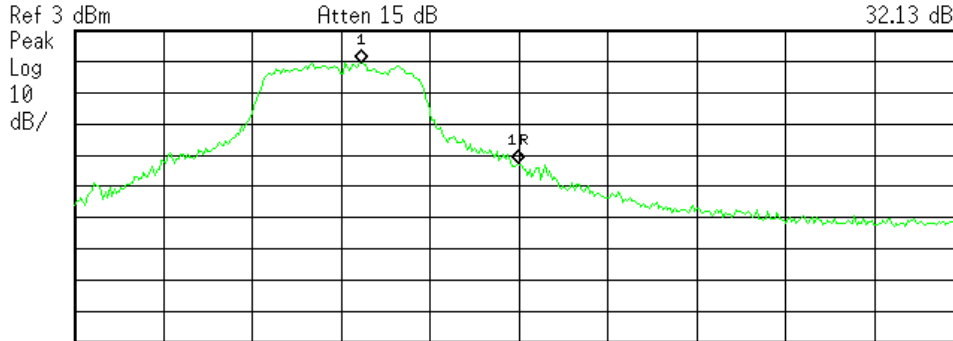


WS-ANT02; 5580MHz; an-ht20; ART Setting: 19.5

Agilent 13:38:25 Mar 18, 2010

R T

Mkr1 Δ -17.75 MHz
32.13 dB



Center 5.6 GHz Span 100 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.60000 GHz	-39.43 dBm
1Δ	(1)	Freq	-17.75 MHz	32.13 dB

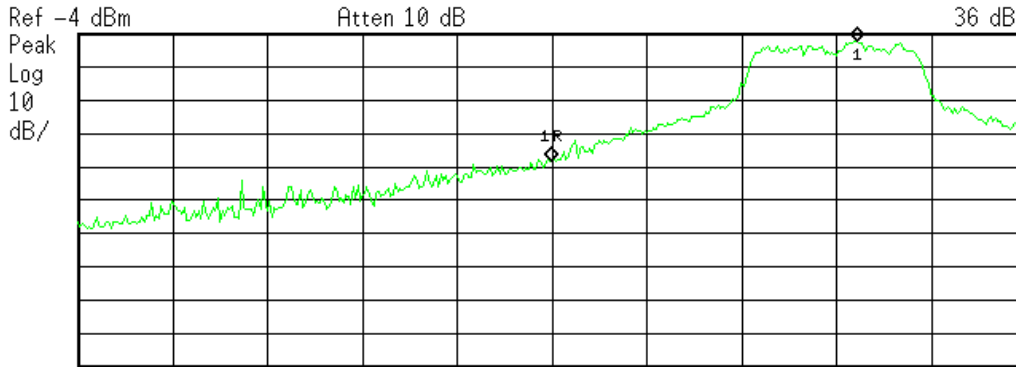
C:\temp.gif file saved

WS-ANT02; 5680MHz; an-ht20; ART Setting: 20.5

Agilent 14:12:27 Mar 18, 2010

R T

Mkr1 Δ 32.25 MHz
36 dB



Center 5.65 GHz Span 100 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.65000 GHz	-42.42 dBm
1Δ	(1)	Freq	32.25 MHz	36 dB

C:\temp.gif file saved

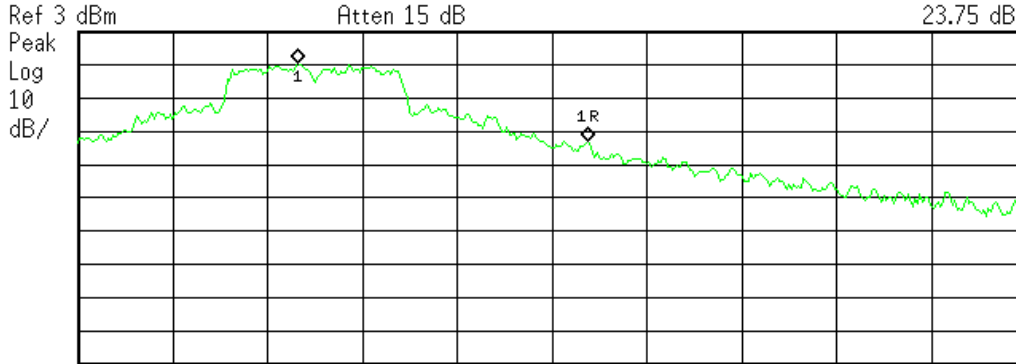


WS-ANT02; 5550MHz; an-ht40; ART Setting: 21

Agilent 13:47:04 Mar 18, 2010

R T

Mkr1 Δ -61.0 MHz
23.75 dB



Ref 3 dBm Atten 15 dB Center 5.6 GHz Span 200 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.6075 GHz	-30.18 dBm
1Δ	(1)	Freq	-61.0 MHz	23.75 dB

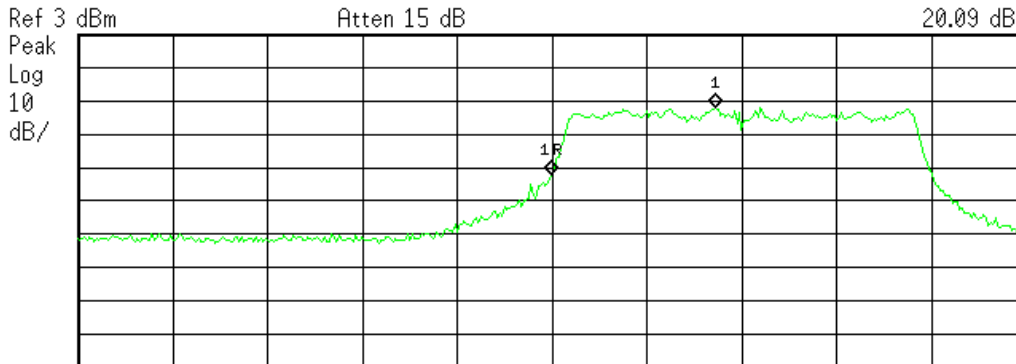
C:\temp.gif file saved

WS-ANT02; 5670MHz; an-ht40; ART Setting: 9.5

Agilent 13:54:54 Mar 18, 2010

R T

Mkr1 Δ 17.25 MHz
20.09 dB



Ref 3 dBm Atten 15 dB Center 5.65 GHz Span 100 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.65000 GHz	-38.92 dBm
1Δ	(1)	Freq	17.25 MHz	20.09 dB

C:\temp.gif file saved

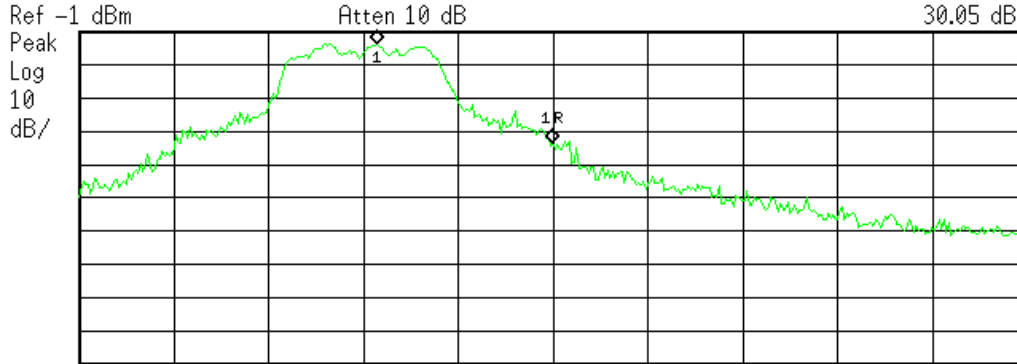


WS-AI-DT04360; 5580MHz; 802.11a; ART Setting: 19.5

Agilent 14:45:54 Mar 18, 2010

R T

Mkr1 Δ -18.50 MHz
30.05 dB



Center 5.6 GHz Span 100 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.60000 GHz	-34.69 dBm
1Δ	(1)	Freq	-18.50 MHz	30.05 dB

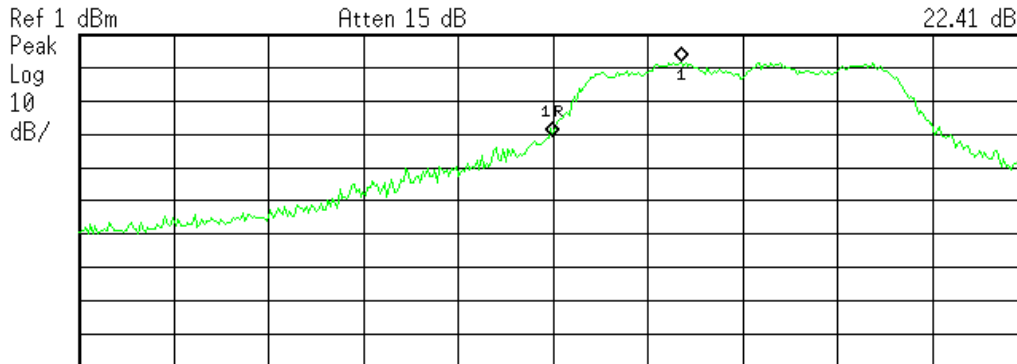
C:\temp.gif file saved

WS-AI-DT04360; 5660MHz; 802.11a; ART Setting: 15

Agilent 14:30:03 Mar 18, 2010

R T

Mkr1 Δ 6.750 MHz
22.41 dB



Center 5.65 GHz Span 50 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.650000 GHz	-29.53 dBm
1Δ	(1)	Freq	6.750 MHz	22.41 dB

C:\temp.gif file saved

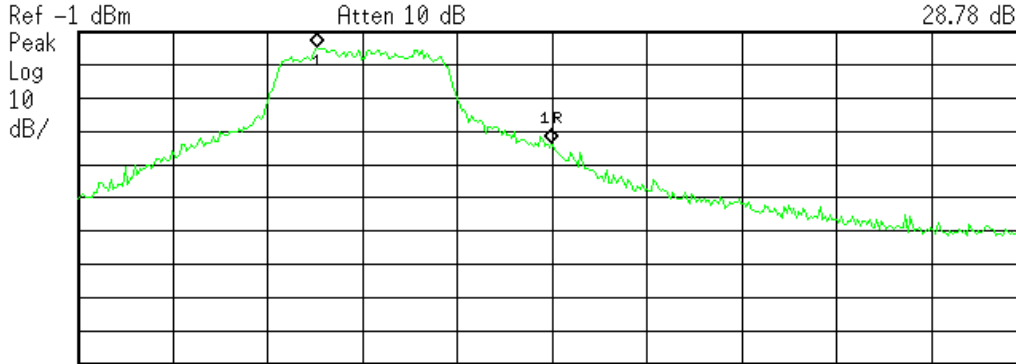


WS-AI-DT04360; 5580MHz; an-ht20; ART Setting: 19.5

Agilent 14:44:31 Mar 18, 2010

R T

Mkr1 Δ -24.75 MHz
28.78 dB



Center 5.6 GHz Span 100 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.60000 GHz	-34.64 dBm
1Δ	(1)	Freq	-24.75 MHz	28.78 dB

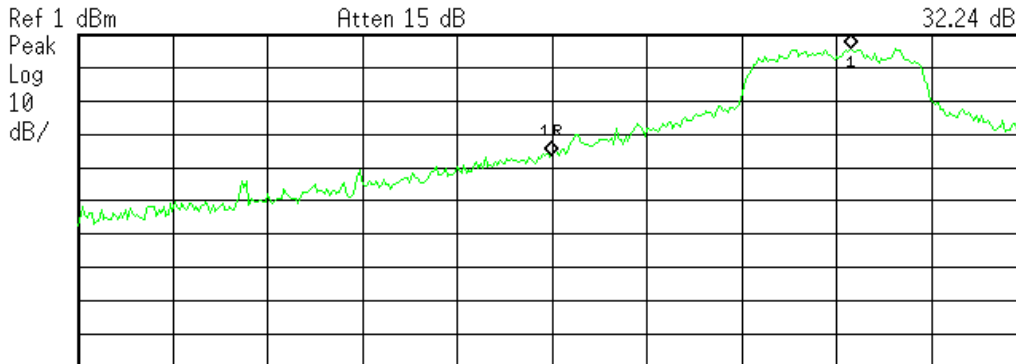
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WS-AI-DT04360; 5680MHz; an-ht20; ART Setting: 20.5

Agilent 14:34:01 Mar 18, 2010

R T

Mkr1 Δ 31.50 MHz
32.24 dB



Center 5.65 GHz Span 100 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.65000 GHz	-35.44 dBm
1Δ	(1)	Freq	31.50 MHz	32.24 dB

C:\temp.gif file saved

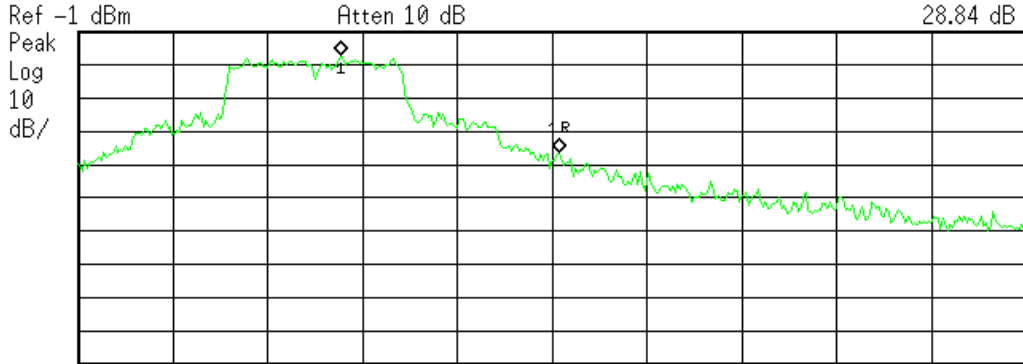


WS-AI-DT04360; 5550MHz; an-ht40; ART Setting: 20

Agilent 14:42:57 Mar 18, 2010

R T

Mkr1 Δ -46.0 MHz
28.84 dB



Center 5.6 GHz Span 200 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.6015 GHz	-37.17 dBm
1Δ	(1)	Freq	-46.0 MHz	28.84 dB

C:\temp.gif file saved

Note: Channels 132-136 have been disabled for this antenna.

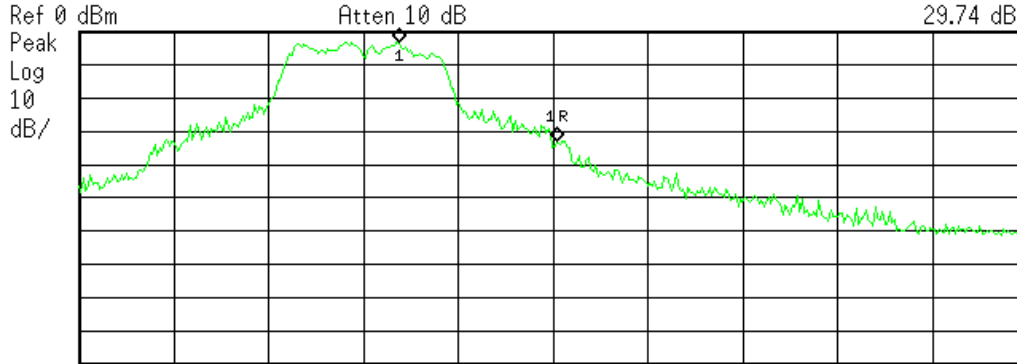


WS-AI-DT05120; 5580MHz; 802.11a; ART Setting: 19.5

Agilent 14:56:00 Mar 18, 2010

R T

Mkr1 Δ -16.75 MHz
29.74 dB



Center 5.6 GHz Span 100 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.60050 GHz	-32.9 dBm
1Δ	(1)	Freq	-16.75 MHz	29.74 dB

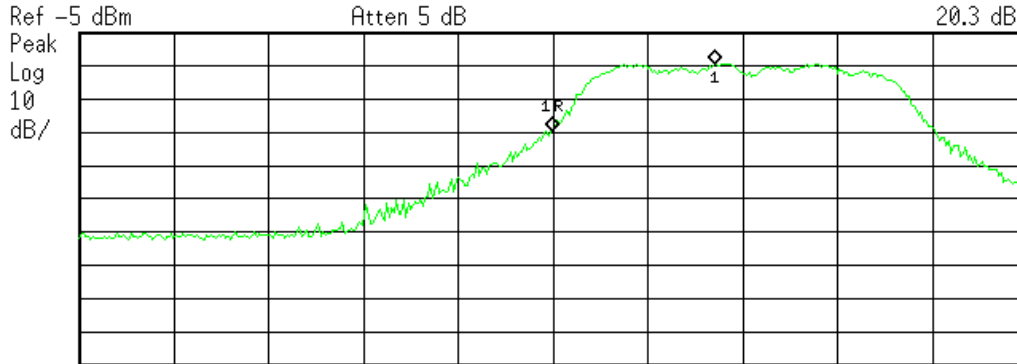
C:\temp.gif file saved

WS-AI-DT05120; 5660MHz; 802.11a; ART Setting: 9

Agilent 15:11:52 Mar 18, 2010

R T

Mkr1 Δ 8.500 MHz
20.3 dB



Center 5.65 GHz Span 50 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.650000 GHz	-34.64 dBm
1Δ	(1)	Freq	8.500 MHz	20.3 dB

C:\temp.gif file saved

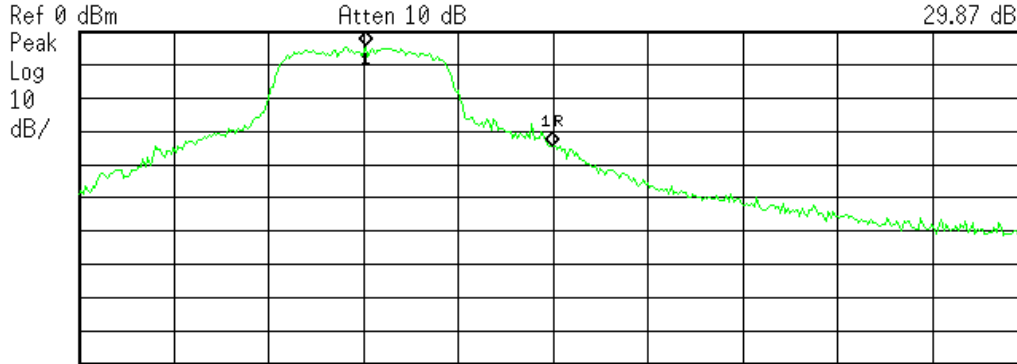


WS-AI-DT05120; 5580MHz; an-ht20; ART Setting: 19.5

Agilent 14:57:35 Mar 18, 2010

R T

Mkr1 Δ -19.75 MHz
29.87 dB



Center 5.6 GHz Span 100 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.60000 GHz	-34.27 dBm
1Δ	(1)	Freq	-19.75 MHz	29.87 dB

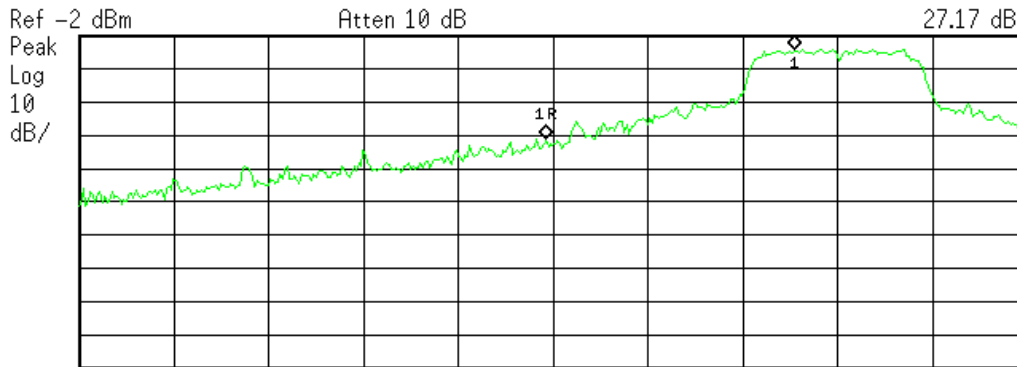
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WS-AI-DT05120; 5680MHz; an-ht20; ART Setting: 20.5

Agilent 15:07:08 Mar 18, 2010

R T

Mkr1 Δ 26.25 MHz
27.17 dB



Center 5.65 GHz Span 100 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.64925 GHz	-33.34 dBm
1Δ	(1)	Freq	26.25 MHz	27.17 dB

C:\temp.gif file saved

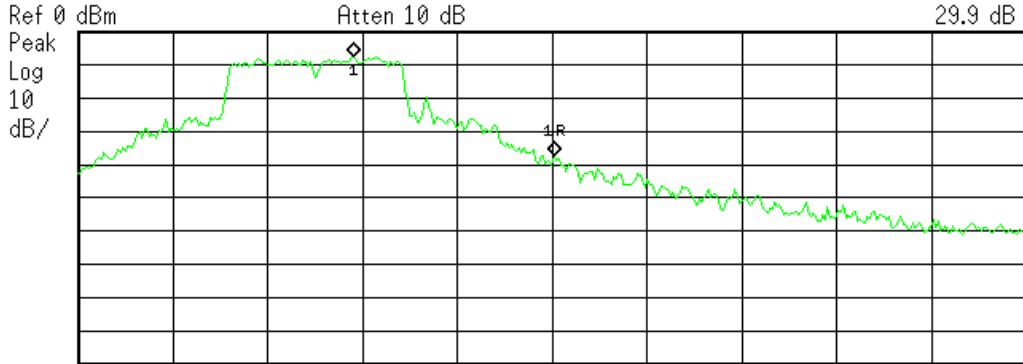


WS-AI-DT05120; 5550MHz; an-ht40; ART Setting: 20

Agilent 15:00:12 Mar 18, 2010

R T

Mkr1 Δ -42.5 MHz
29.9 dB



Center 5.6 GHz Span 200 MHz
#Res BW 1 MHz VBW 1 MHz Sweep 4 ms (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	5.6005 GHz	-37.49 dBm
1Δ	(1)	Freq	-42.5 MHz	29.9 dB

C:\temp.gif file saved

Note: Channels 132-136 have been disabled for this antenna.



Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty (ETSI)
Radiated Emissions (30-1000MHz)	5.6dB	N/A
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions	3.9dB	N/A
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency	8.2×10^{-8}	1×10^{-7}
RF power, conducted	0.7dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency	• 1.2%	• 5%
• Within 6kHz and 25kHz of audio frequency	• 0.1dB	• 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	0.7dB	3dB
Conducted emission of receivers	0.7dB	1dB
Radiated emission of transmitter, valid up to 26.5GHz	5.6dB	6dB
Radiated emission of transmitter, valid up to 80GHz	5.6dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	5.6dB	6dB
Radiated emission of receiver, valid up to 80GHz	5.6dB	6dB
RF level uncertainty for a given BER	0.7dB	1dB
Humidity	2.31%	5%
Temperature	0.6°C	1.0°C
Time	0.8%	10%
RF Power Density, Conducted	2.2dB	3dB
DC and low frequency voltages	1.29%	3%
Voltage (AC, <10kHz)	1.29%	2%
Voltage (DC)	0.23%	1%
The above reflects a 95% confidence level		



Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS," "MTL," "ACTS," "MTL-ACTS" and "CURTIS-STRAUS" (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only where such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.



13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

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