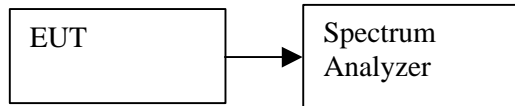


## 8.9. UNDESIRABLE EMISSION – CONDUCTED MEASUREMENTS

Conducted RF measurements of the transmitter output were made at the band edges.

Also, conducted RF measurements of the transmitter over the 30 MHz to 26.5 GHz band were made in order to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

### TEST SETUP



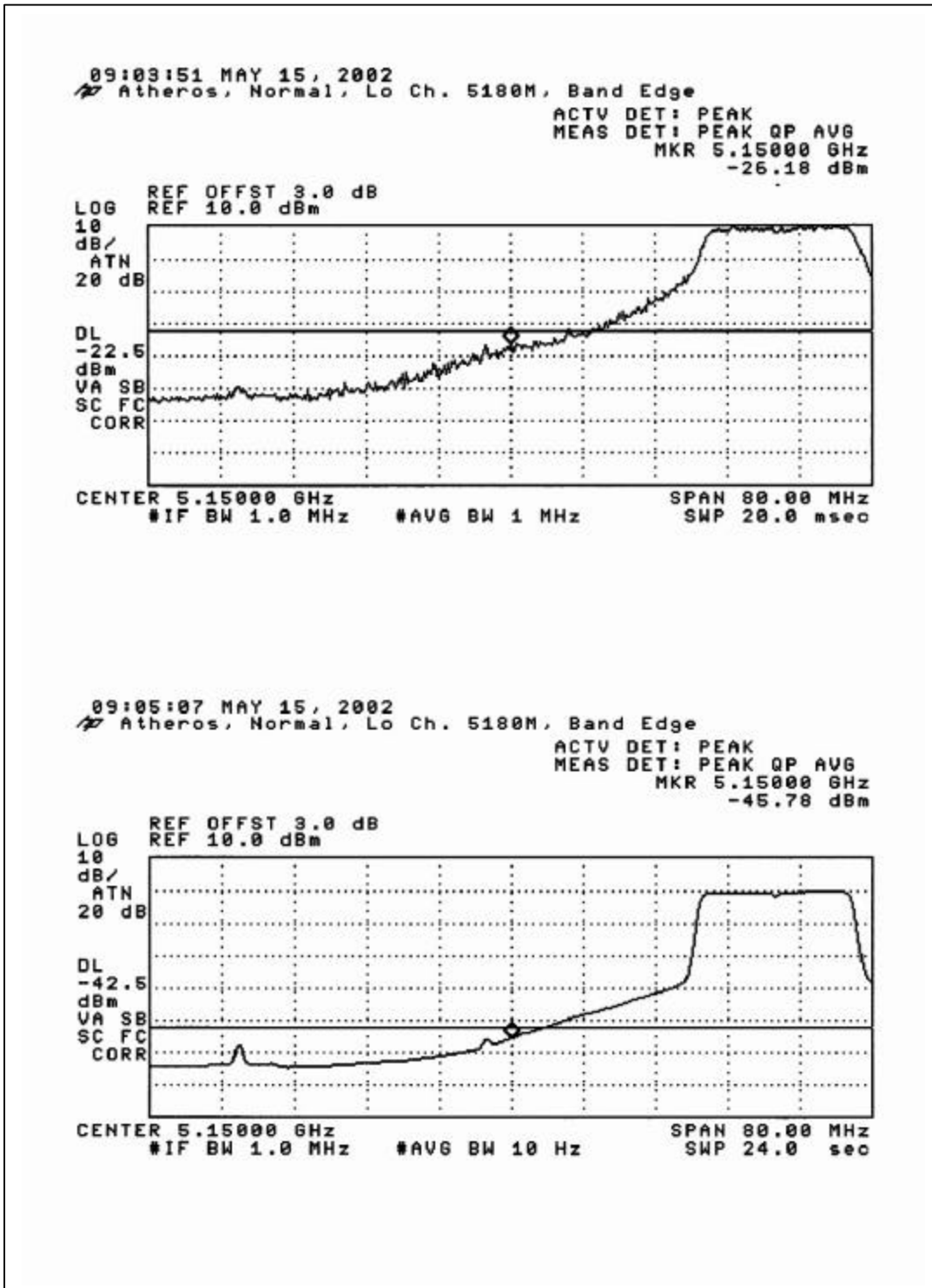
### TEST PROCEDURE

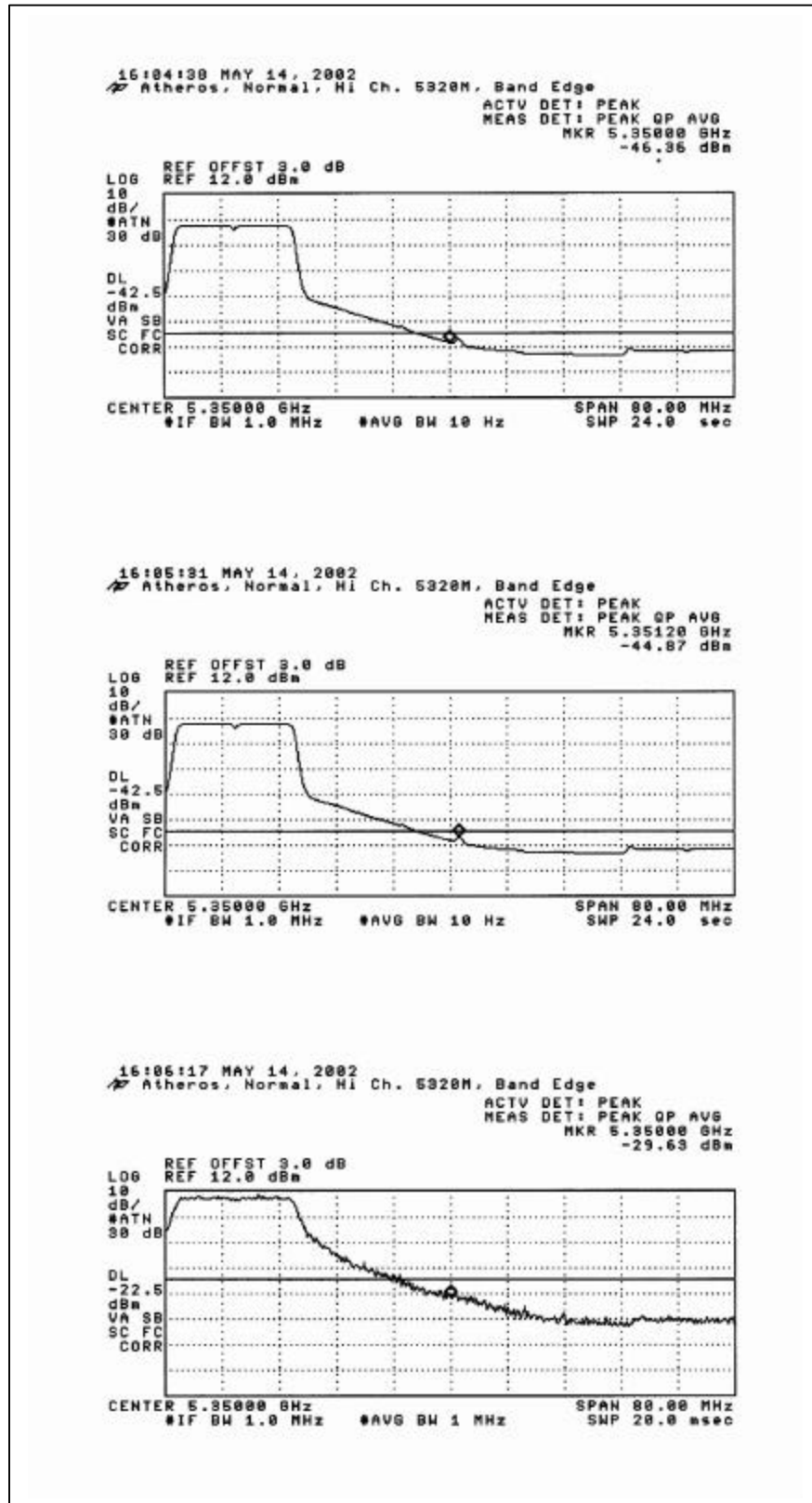
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

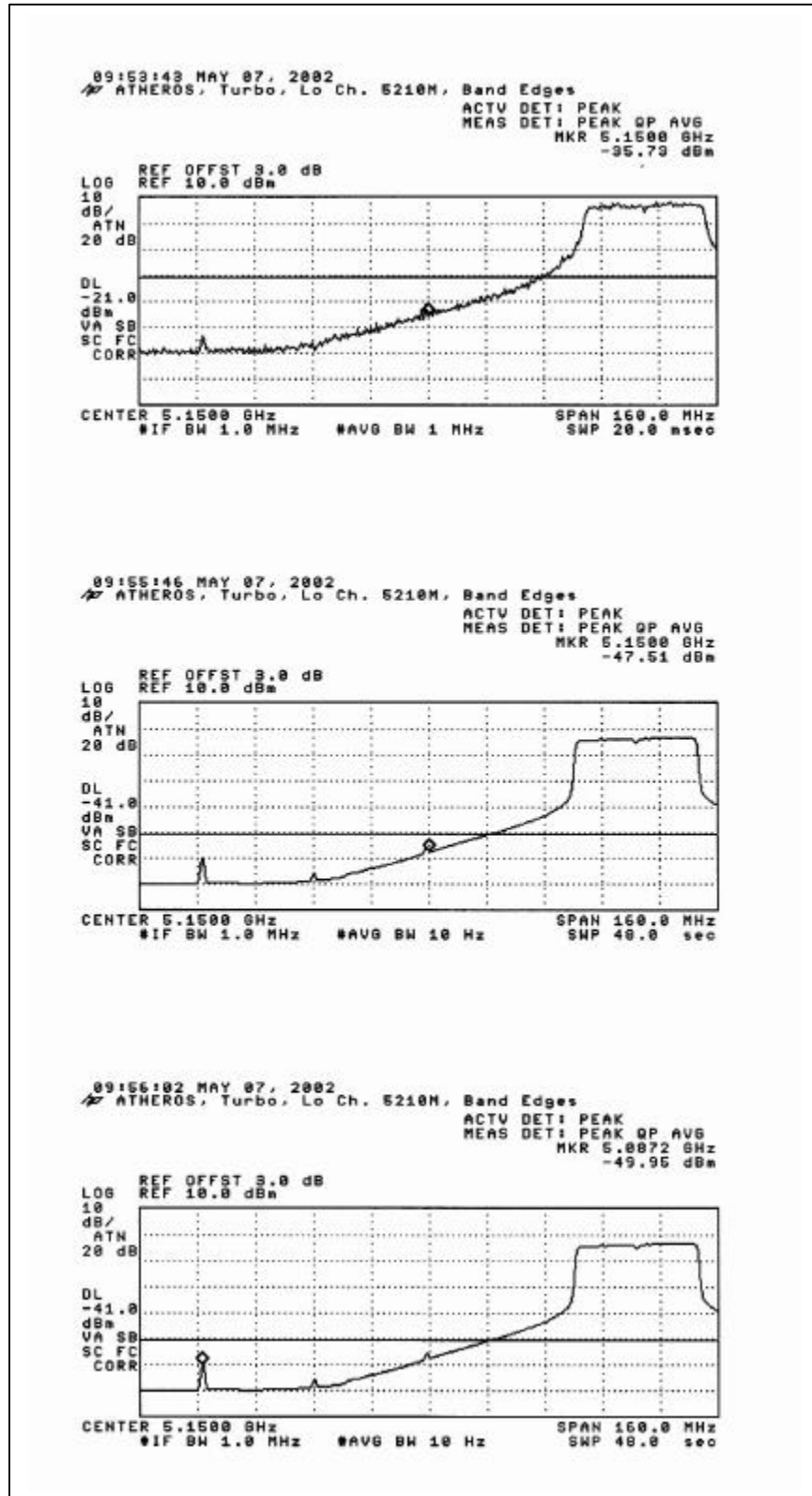
### BAND EDGE RESULTS

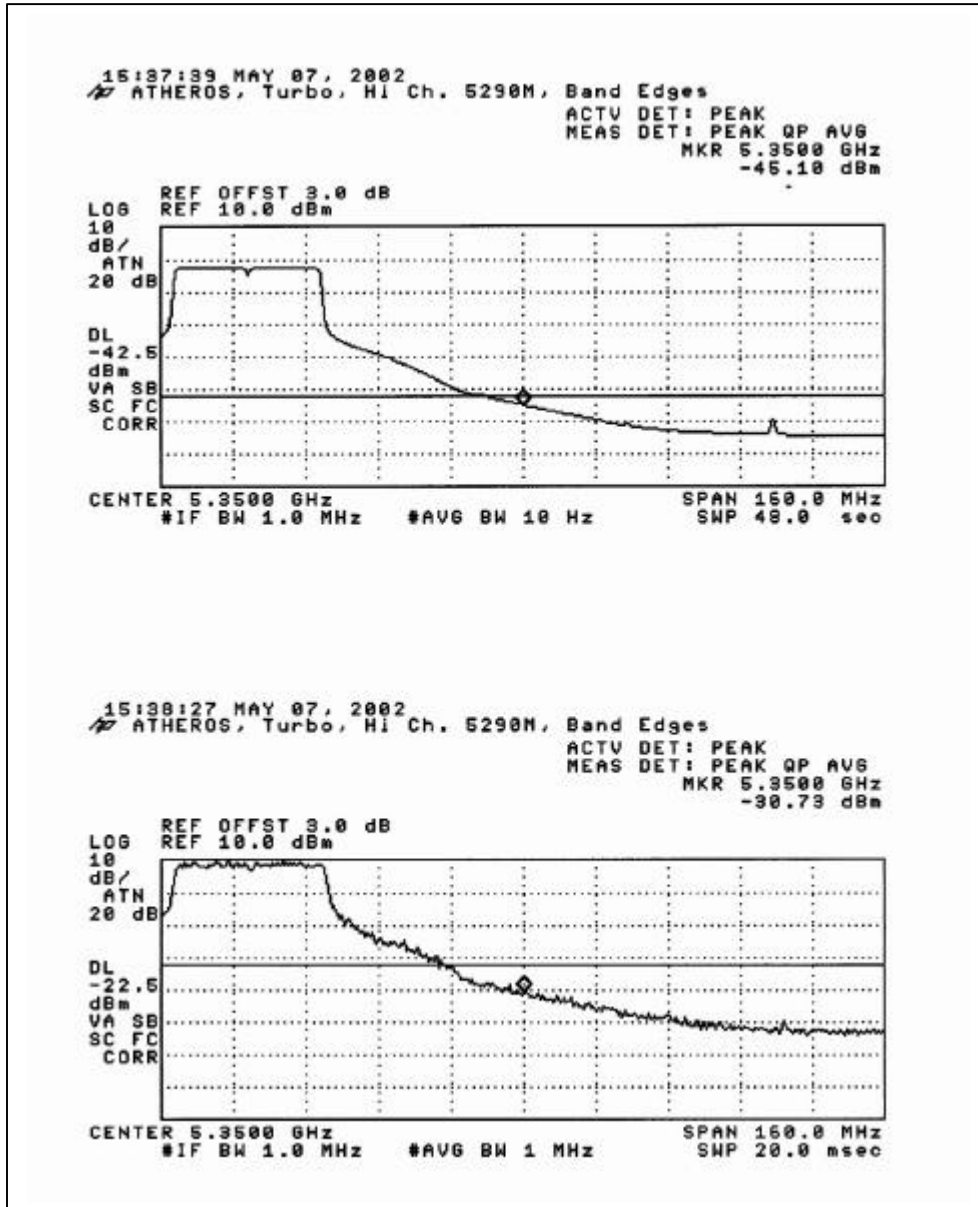
No non-compliance noted:

<b>Normal Mode</b>										
Band Edge	Frequency (MHz)	Reading (dBm)		Ant Gain (dBi)	Results EIRP (dBm)		15.209 Limit (dBm)		Margin (dB)	
		Peak	Avg		Peak	Avg	Peak	Avg	Peak	Avg
Low	5150	-26.18	-45.78	1.5	-24.68	-44.28	-21	-41	-3.68	-3.28
High	5350	-29.63	-46.36	1.5	-28.13	-44.86	-21	-41	-7.13	-3.86
High	5351	N/A	-44.87	1.5	N/A	-43.37	N/A	-41	N/A	-2.37
<b>Turbo Mode</b>										
Band Edge	Frequency (MHz)	Reading (dBm)		Ant Gain (dBi)	Results EIRP (dBm)		15.209 Limit (dBm)		Margin (dB)	
		Peak	Avg		Peak	Avg	Peak	Avg	Peak	Avg
Low	5150	-35.73	-47.51	1.5	-34.22	-46.01	-21	-41	-13.2	-5.01
Low	5087	N/A	-49.95	1.5	N/A	-48.45	N/A	-41	N/A	-7.45
High	5350	-30.73	-45.10	1.5	-29.23	-43.60	-21	-41	-8.23	-2.60

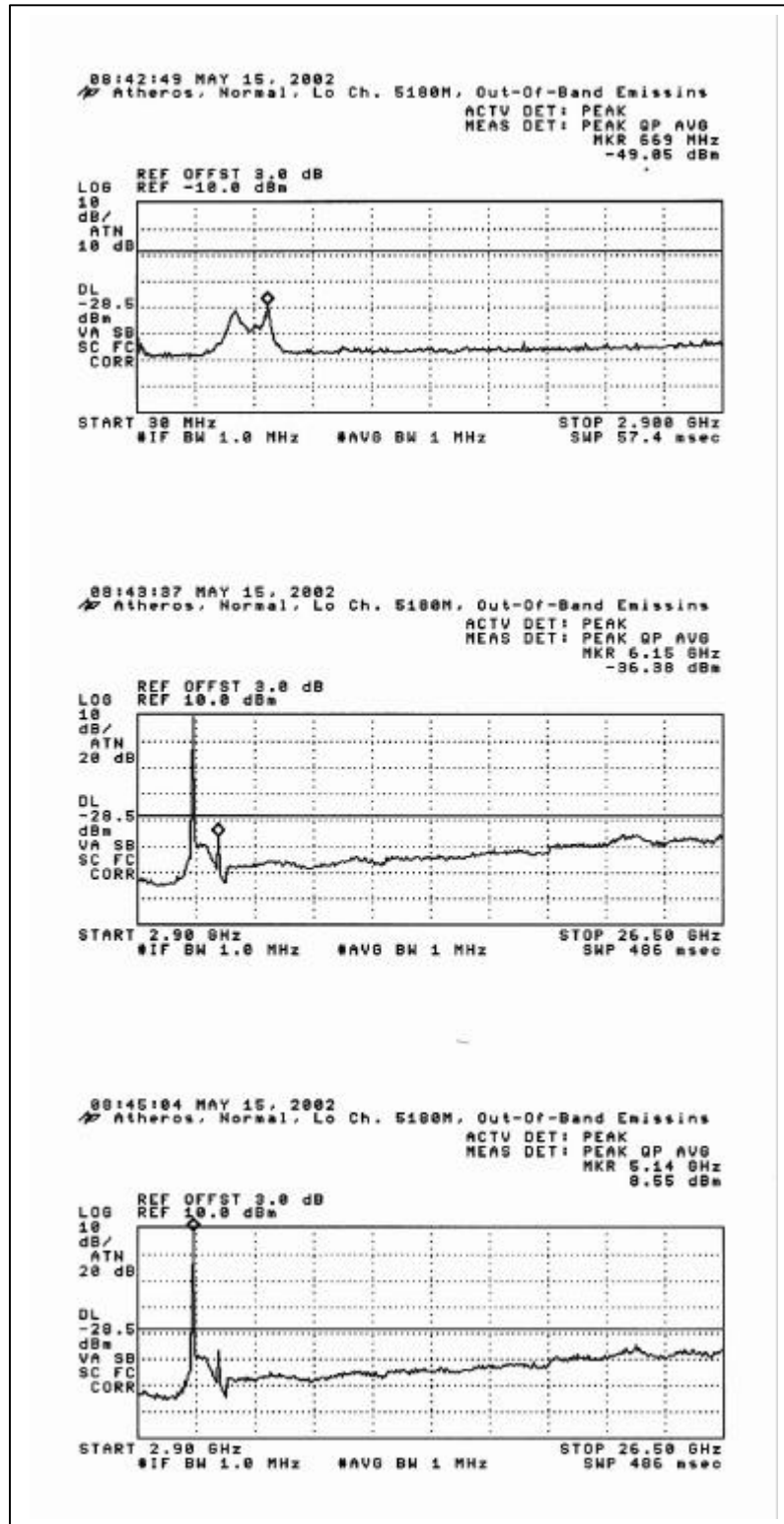


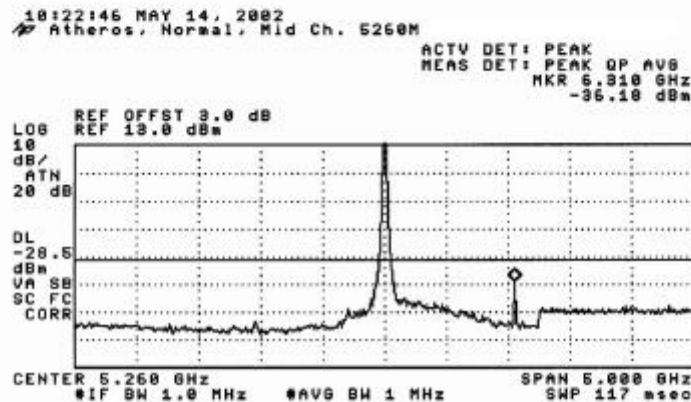
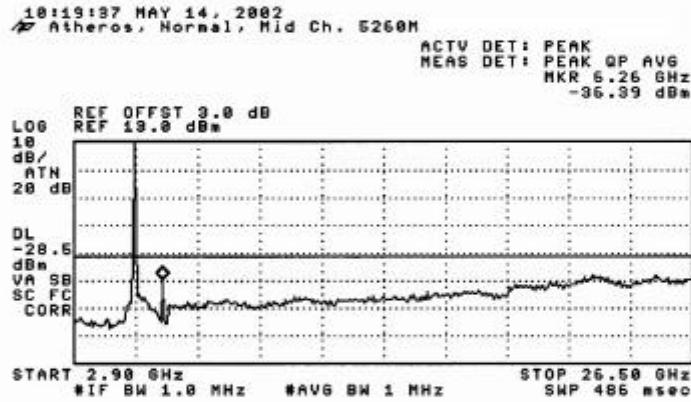
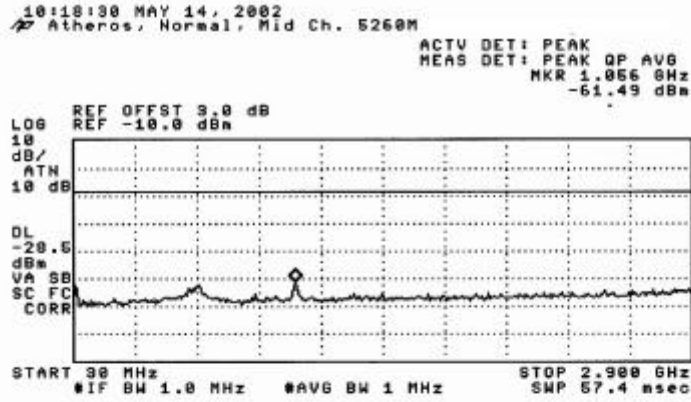


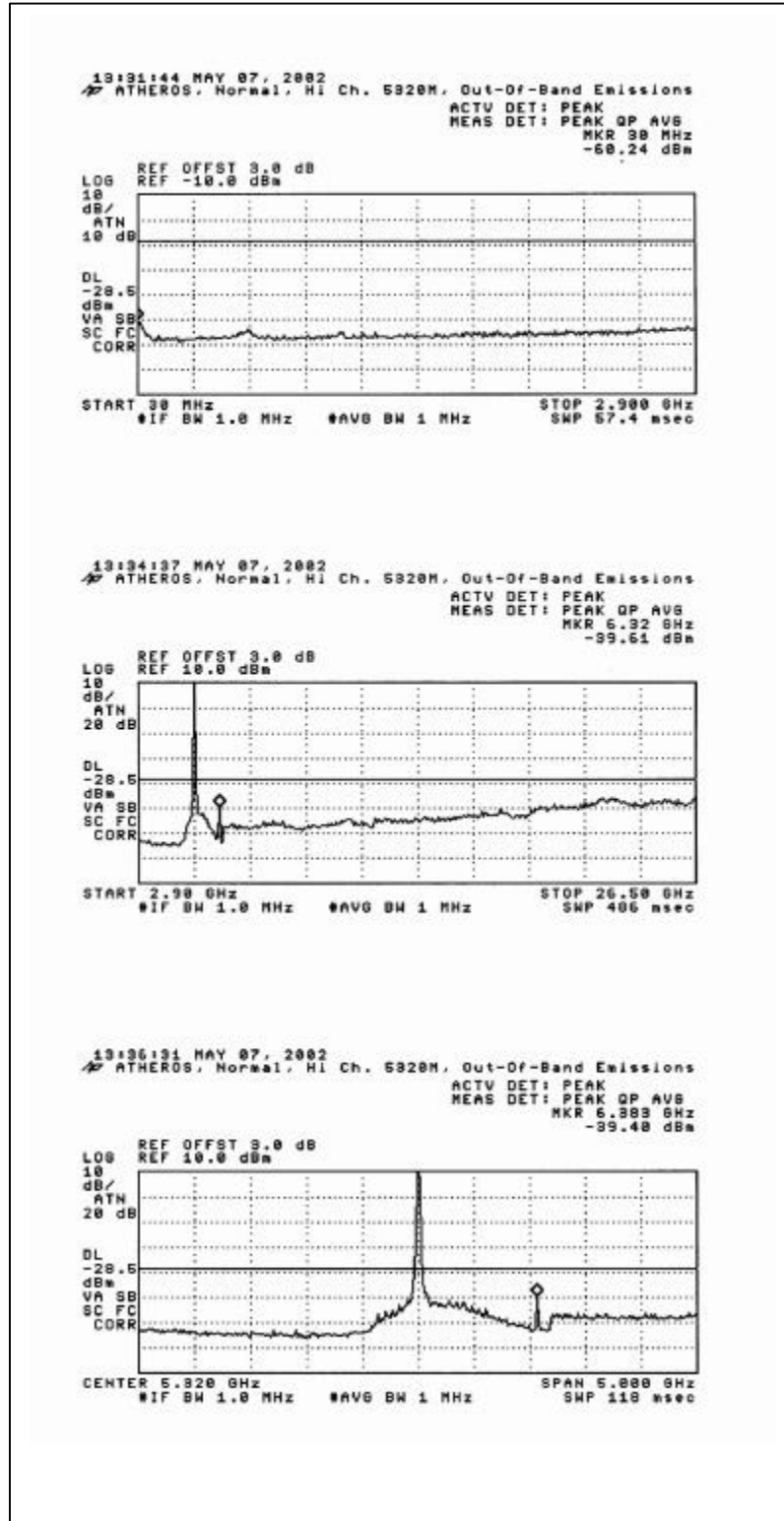




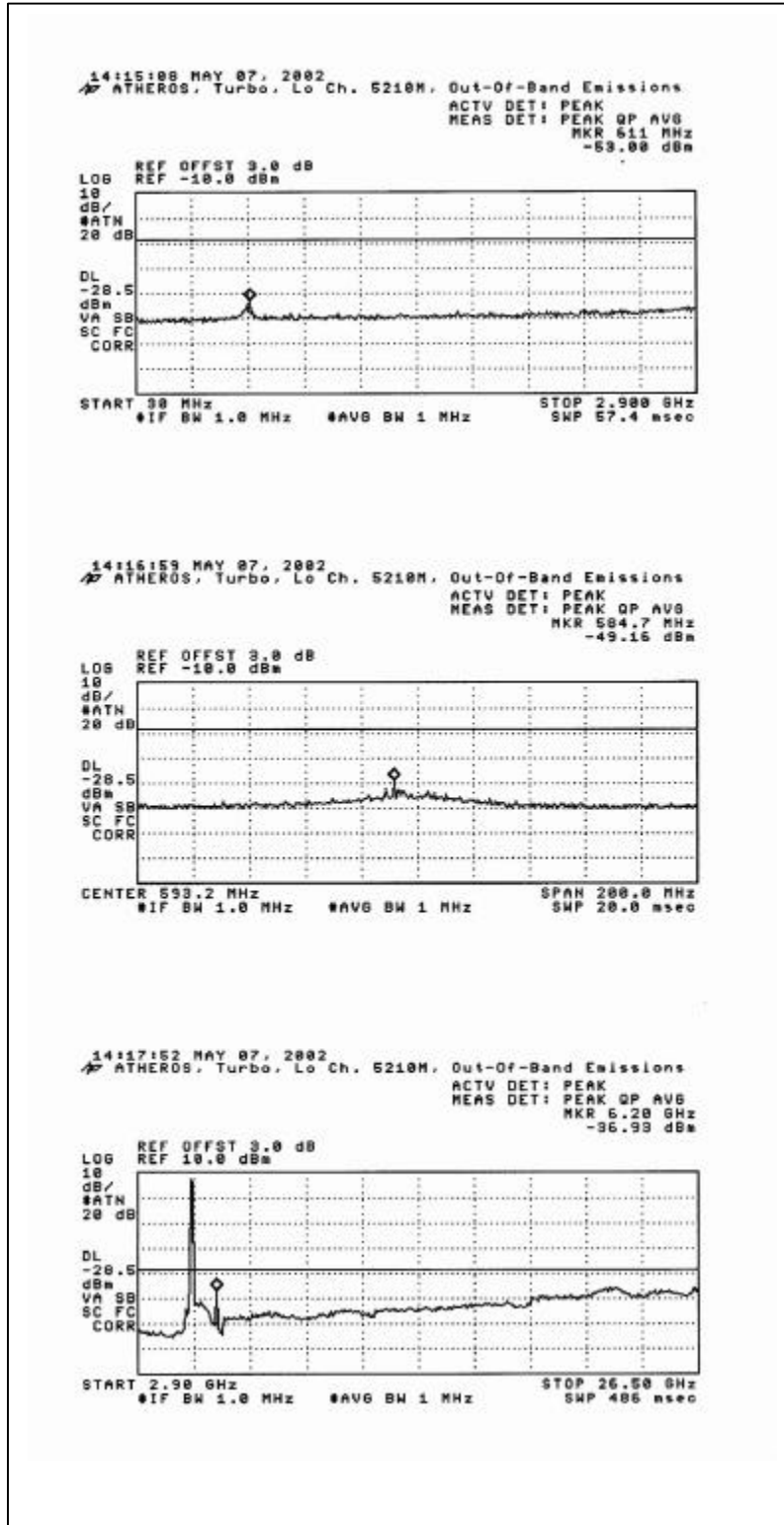
**SPURIOUS EMISSION RESULTS FROM 30 MHz TO 26 GHz**

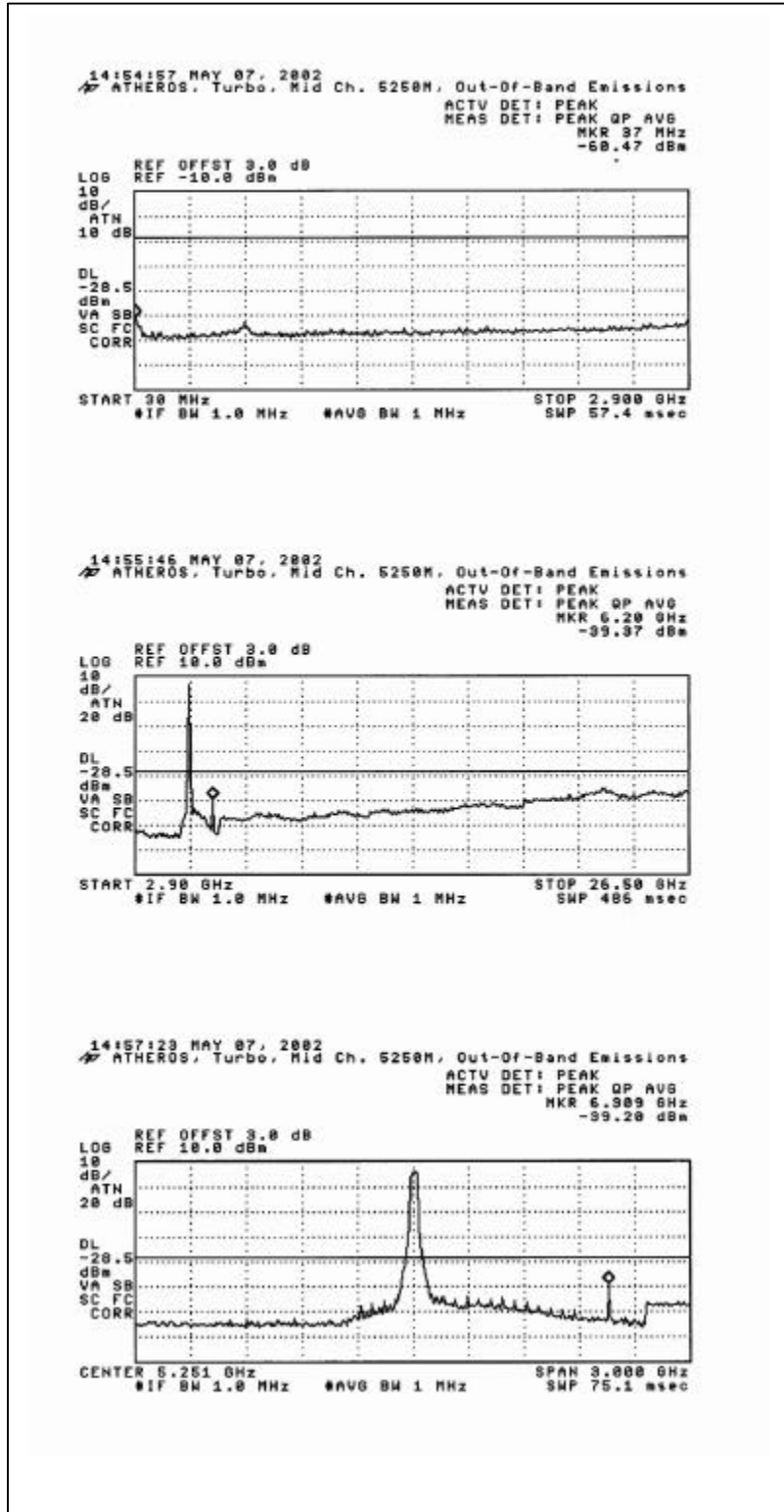












## 8.10. UNDESIRABLE EMISSION – RADIATED MEASUREMENTS

### TEST SETUP

For measurements of the EUT as a digital device, the EUT and all other support equipment were placed on a wooden table 80 cm above the ground plane. For measurements of the EUT as a transmitter, the EUT and the laptop were placed on the wooden table. The antenna to EUT distance is 3 meters for measurements below 1 GHz and 1 meter for measurements above 1 GHz. The EUT is configured in accordance with Section 8 of ANSI C63.4/1992.

The EUT is set to transmit in a continuous mode.

### TEST PROCEDURE

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

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.

The spectrum from 30 MHz to 40 GHz is investigated.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The frequency span is set small enough to easily differentiate between broadcast stations, intermittent ambient signals and EUT emissions. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the suspected signal. Measurements were made with the antenna polarized in both the vertical and the horizontal positions.

Specification Limits and Sample Calculations:

$$E = \sqrt{30 * P * G} / d$$

Where d = distance = 3m

P=Power in EIRP in watts; -27dBm =  $1.99526 \times 10^{-6}$ W

G=Numeric gain

E=Volts / meter

Assume Power = -27dBm =  $1.99526 \times 10^{-6}$ W

Gain in numeric = 1

$$\begin{aligned} \text{Then, } E(\text{V/m}) &= \sqrt{30 * (1.99526 \times 10^{-6} \text{W}) * (1)} / 3 \\ &= 2.579 \times 10^{-3} \text{V/m} \end{aligned}$$

$$E(\text{uV/m}) = 2579 \text{uV/m}$$

$$E(\text{dBuV/m}) = 20 * \log(2579 \text{uV/m}) = 68.23 \text{dBuV/m}$$

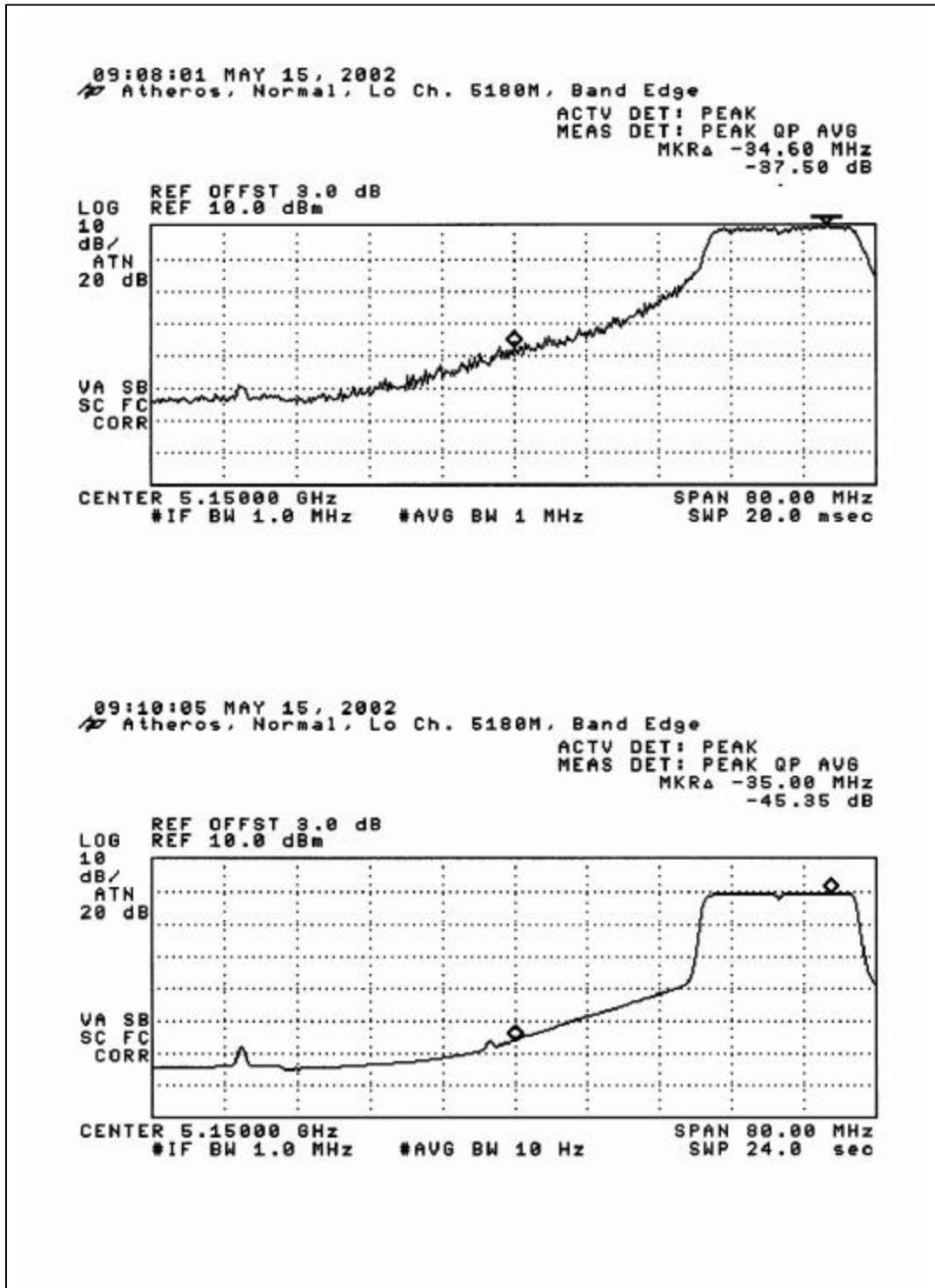
So, -27dBm(EIRP) is equivalent to 68.23dBuV/m @ 3m

**RESULTS**

No non-compliance noted:

**FUNDAMENTAL, HARMONIC AND SPURIOUS RADIATED EMISSIONS RESULTS**

05/14/02 <b>FCC Measurement</b>																						
Compliance Certification Services, Morgan Hill Open Field Site																						
<b>Test Engr:</b>		Thu Chan																				
<b>Project #:</b>		02U1295																				
<b>Company:</b>		AtherosCommunications, Inc.																				
<b>EUT Descrip.:</b>		802.11a Wireless LAN Cardbus Card																				
<b>EUT M/N:</b>		Tecra 8200 Laptop Computer																				
<b>Test Target:</b>		FCC 15.407 UNII																				
<b>Mode Oper:</b>		Normal, Low Channel, 5180MHz (Frequency Range 5.15 - 5.35GHz)																				
<b>Equipment for 1-26 GHz:</b>								<b>Equipment for 26 - 40 GHz:</b>														
HP8593EM Analyzer								HP8566B Analyzer														
Miteq NSP2600-44 Preamp								HP 11975A Amplifier (LO)														
EMCO 3115 Horn Antenna								HP 11970A External mixer/antenna														
ARA MWH 1826/B								Dico 1149 Horn Antenna														
Cable: 15.0 feet								Cable: IF Only (321 MHz)														
<b>Peak Measurements:</b>								<b>Average Measurements:</b>								<b>Peak Delta</b>		<b>Ave Delta</b>				
1 MHz Resolution Bandwidth								1MHz Resolution Bandwidth								37.50		45.35				
1MHz Video Bandwidth								10Hz Video Bandwidth														
f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes							
5.180	5.0	75.4	65.1	34.7	4.8	0.0	-5.9	0.0	109.0	98.7					V (Fundamental)							
5.180	5.0	63.2	52.5	34.7	4.8	0.0	-5.9	0.0	96.8	86.1					H (Fundamental)							
<b>Band Edge:</b>																						
5.150	Using Peak Delta = 37.50 and Average Delta = 45.35															71.5	53.3	74.0	54.0	-2.5	-0.7	* V (Band Edge)
5.150	Using Peak Delta = 37.50 and Average Delta = 45.35															59.3	40.7	74.0	54.0	-14.7	-13.3	* H (Band Edge)
<b>Harmonic:</b>																						
10.360	5.0	49.0	33.5	38.9	8.8	-35.6	-5.9	1.0	56.2	40.7	68.2				** V							
15.540	5.0	49.7	38.0	38.3	11.4	-38.6	-5.9	1.0	55.9	44.2	74.0	54.0	-18.1	-9.8	* V							
20.720	2.5	51.0	41.5	32.3	14.2	-38.7	-11.9	0.0	47.0	37.5	74.0	54.0	-27.0	-16.5	* V (Noise Floor)							
25.960	2.5	54.0	43.5	33.0	18.0	-40.0	-11.9	0.0	53.0	42.5	68.2				** V (Noise Floor)							
31.080	1.0	37.1	26.2	44.1	0.0	0.0	-19.9	0.0	61.3	50.4	68.2				** V (Noise Floor)							
36.260	1.0	37.2	26.2	44.1	0.0	0.0	-19.9	0.0	61.4	50.4	68.2				** V (Noise Floor)							
10.360	5.0	44.7	33.2	38.9	8.8	-35.6	-5.9	1.0	51.9	40.4	68.2				** H							
15.540	5.0	48.8	37.3	38.3	11.4	-38.6	-5.9	1.0	55.0	43.5	74.0	54.0	-19.0	-10.5	* H							
20.720	2.5	51.0	41.5	32.3	14.2	-38.7	-11.9	0.0	47.0	37.5	74.0	54.0	-27.0	-16.5	* H (Noise Floor)							
25.960	2.5	54.0	43.5	33.0	18.0	-40.0	-11.9	0.0	53.0	42.5	68.2				** H (Noise Floor)							
31.080	1.0	37.1	26.1	44.1	0.0	0.0	-19.9	0.0	61.3	50.3	68.2				** H (Noise Floor)							
36.260	1.0	37.2	26.2	44.1	0.0	0.0	-19.9	0.0	61.4	50.4	68.2				** H (Noise Floor)							
<b>Spurious:</b>																						
6.216	5.0	62.0	60.3	35.4	6.7	-36.3	-5.9	0.0	62.0	60.2	68.2				** V (w/ 10dB attn)							
4.121	5.0	55.4	47.0	33.2	5.2	-36.1	-5.9	0.0	51.8	43.4	74.0	54.0	-22.2	-10.6	* V (w/ 10dB attn)							
4.202	5.0	57.1	49.0	33.1	5.3	-36.1	-5.9	0.0	53.5	45.4	74.0	54.0	-20.5	-8.6	* V (w/ 10dB attn)							
4.304	5.0	59.0	48.0	33.1	5.3	-36.1	-5.9	0.0	55.4	44.4	74.0	54.0	-18.6	-9.6	* V (w/ 10dB attn)							
4.392	5.0	58.0	49.0	33.0	5.4	-36.1	-5.9	0.0	54.4	45.4	74.0	54.0	-19.6	-8.6	* V (w/ 10dB attn)							
4.596	5.0	65.2	45.5	33.2	5.5	-36.1	-5.9	0.0	62.0	42.3	74.0	54.0	-12.0	-11.7	* V (w/ 10dB attn)							
5.247	5.0	59.0	48.0	34.8	6.0	-36.1	-5.9	0.0	57.9	46.9	68.2				** V (w/ 10dB attn)							
6.056	4.0	67.7	50.0	35.4	6.6	-36.3	-7.8	0.0	65.7	48.0	68.2				** V (w/ 20dB attn)							
6.215	5.0	65.0	59.8	35.4	6.7	-36.3	-5.9	0.0	65.0	59.8	68.2				** V (w/ 10dB attn)							
6.056	4.0	62.0	50.0	35.4	6.6	-36.3	-7.8	0.0	60.0	48.0	68.2				** H (w/ 20dB attn)							
6.215	5.0	54.0	47.5	35.4	6.7	-36.3	-5.9	0.0	54.0	47.5	68.2				** H (w/ 10dB attn)							
4.569	5.0	62.4	42.5	33.1	5.5	-36.1	-5.9	0.0	59.0	39.2	74.0	54.0	-15.0	-14.8	* H (w/ 10dB attn)							
<b>Note:</b>																						
* Restricted Band Limit																						
** Non Restricted Band Liimit = -27dBm = 68.2dBuV																						
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit									
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit									
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit									
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit									
CL	Cable Loss					HPF	High Pass Filter															



05/10/02 **FCC Measurement**  
**Compliance Certification Services, Morgan Hill Open Field Site**

**Test Engr:** Thu Chan  
**Project #:** 02U1295  
**Company:** AtherosCommunications, Inc.  
**EUT Descrip.:** 802.11a Wireless LAN Cardbus Card  
**EUT M/N:** Tecra 8200 Laptop Computer  
**Test Target:** FCC 15.407 UNII  
**Mode Oper:** Normal, Mid Channel, 5260MHz  
 (Frequency Range 5.15 - 5.35GHz)

**Equipment for 1-26 GHz:**  
 HP8593EM Analyzer  
 Miteq NSP2600-44 Preamp  
 EMCO 3115 Horn Antenna  
 ARA MWH 1826/B  
 Cable: 15.0 feet

**Equipment for 26 - 40 GHz:**  
 HP8566B Analyzer  
 HP 11975A Amplifier (LO)  
 HP 11970A External mixer/antenna  
 Dico 1149 Horn Antenna  
 Cable: IF Only (321 MHz)

**Peak Measurements:**  
 1 MHz Resolution Bandwidth  
 1MHz Video Bandwidth

**Average Measurements:**  
 1MHz Resolution Bandwidth  
 10Hz Video Bandwidth

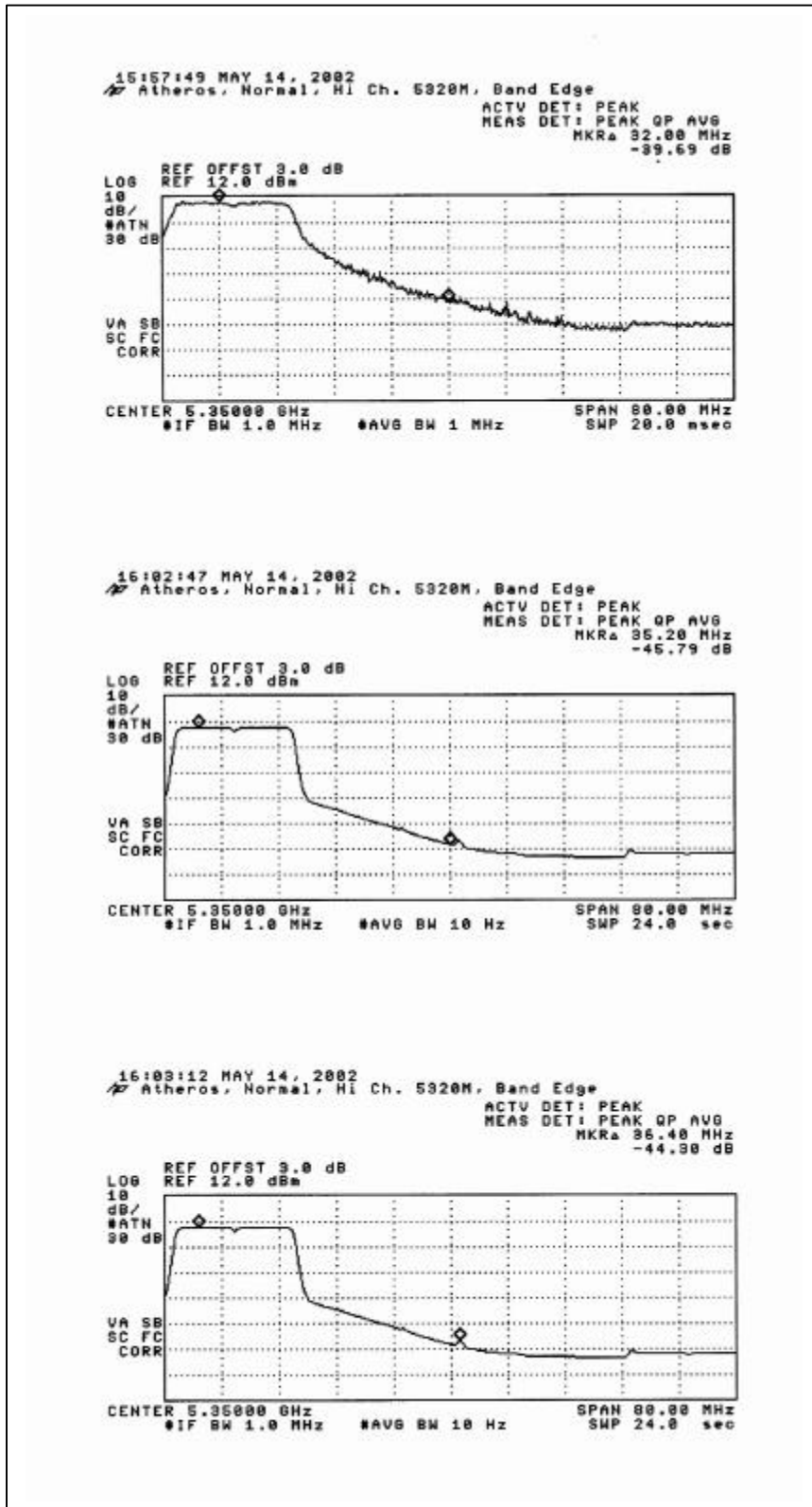
f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
<b>Harmonic:</b>															
10.520	5.0	56.0	42.2	38.9	8.9	-35.6	-5.9	1.0	63.3	49.5	68.2		-4.9		** V
15.780	5.0	51.7	39.0	38.1	11.6	-38.6	-5.9	1.0	57.9	45.2	74.0	54.0	-16.1	-8.8	* V
21.040	2.5	53.2	42.0	32.4	14.4	-38.6	-11.9	0.0	49.4	38.3	74.0	54.0	-24.6	-15.7	* V (Noise Floor)
26.300	1.0	37.3	26.3	44.1	0.0	0.0	-19.9	0.0	61.5	50.5	68.2		-6.7		** V (Noise Floor)
31.560	1.0	37.5	26.4	44.1	0.0	0.0	-19.9	0.0	61.7	50.6	74.0	54.0	-12.3	-3.4	* V (Noise Floor)
36.820	1.0	37.6	26.5	44.1	0.0	0.0	-19.9	0.0	61.8	50.7	68.2		-6.4		** V (Noise Floor)
10.520	5.0	50.0	37.0	38.9	8.9	-35.6	-5.9	1.0	57.3	44.3	68.2		-10.9		** H
15.780	5.0	51.3	39.2	38.1	11.6	-38.6	-5.9	1.0	57.5	45.4	74.0	54.0	-16.5	-8.6	* H
21.040	2.5	53.2	42.0	32.4	14.4	-38.6	-11.9	0.0	49.5	38.3	74.0	54.0	-24.5	-15.7	* H (Noise Floor)
26.300	1.0	37.2	26.1	44.1	0.0	0.0	-19.9	0.0	61.4	50.3	68.2		-6.8		** H (Noise Floor)
31.560	1.0	37.4	26.2	44.1	0.0	0.0	-19.9	0.0	61.6	50.4	74.0	54.0	-12.4	-3.6	* H (Noise Floor)
36.820	1.0	37.5	26.3	44.1	0.0	0.0	-19.9	0.0	61.7	50.5	68.2		-6.5		** H (Noise Floor)
<b>Spurious:</b>															
6.125	2.5	67.8	53.0	35.4	6.7	-36.3	-11.9	0.0	61.7	46.9	68.2		-6.5		** V (w/ 16dB Pad)
6.992	2.5	65.0	52.5	36.5	7.1	-36.4	-11.9	0.0	60.3	47.8	68.2		-8.0		** V (w/ 16dB Pad)
6.992	2.5	64.4	52.5	36.5	7.1	-36.4	-11.9	0.0	59.7	47.8	68.2		-8.6		** H (w/ 16dB Pad)
4.390	5.0	69.8	53.0	33.0	5.4	-36.1	-5.9	0.0	66.2	49.4	74.0	54.0	-7.8	-4.6	* V (w/ 10dB Pad)
3.535	5.0	71.2	51.5	32.3	4.7	-36.2	-5.9	0.0	66.1	46.4	68.2		-2.1		** V (w/ 10dB Pad)
2.457	5.0	65.0	46.2	29.0	3.9	-36.3	-5.9	0.0	55.7	36.9	68.2		-12.5		** V (w/ 10dB Pad)
4.390	5.0	60.1	47.2	33.0	5.4	-36.1	-5.9	0.0	56.5	43.6	74.0	54.0	-17.5	-10.4	* H (w/ 10dB Pad)
3.535	5.0	60.0	47.0	32.3	4.7	-36.2	-5.9	0.0	54.9	41.9	68.2		-13.3		** H (w/ 10dB Pad)
6.125	5.0	61.3	48.8	35.4	6.7	-36.3	-5.9	0.0	61.2	48.7	68.2		-7.0		** H (w/ 10dB Pad)

**Note:** \* Restricted Band Limit  
 \*\* Non Restricted Band Limit = -27dBm = 68.2dBuV

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

05/08/02 <b>FCC Measurement</b>																	
<b>Compliance Certification Services, Morgan Hill Open Field Site</b>																	
<b>Test Engr:</b>		Thu Chan															
<b>Project #:</b>		02U1295															
<b>Company:</b>		AtherosCommunications, Inc.															
<b>EUT Descrip.:</b>		802.11a Wireless LAN Cardbus Card															
<b>EUT M/N:</b>		Tecra 8200 Laptop Computer															
<b>Test Target:</b>		FCC 15.407 UNII															
<b>Mode Oper:</b>		Normal, Hi Channel, 5320MHz (Frequency Range 5.15 - 5.35GHz)															
<b>Equipment for 1-26 GHz:</b>								<b>Equipment for 26 - 40 GHz:</b>									
HP8593EM Analyzer								HP8566B Analyzer									
Miteq NSP2600-44 Preamp								HP 11975A Amplifier (LO)									
EMCO 3115 Horn Antenna								HP 11970A External mixer/antenna									
ARA MWH 1826/B								Dico 1149 Horn Antenna									
Cable: 15.0 feet								Cable: IF Only (321 MHz)									
<b>Peak Measurements:</b>																	
1 MHz Resolution Bandwidth								<b>Average Measurements:</b>				Peak Delta		Ave Delta			
1MHz Video Bandwidth								1MHz Resolution Bandwidth				39.69		44.30			
1MHz Video Bandwidth								10Hz Video Bandwidth									
f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes		
5.320	5.0	74.0	63.6	35.0	4.9	0.0	-5.9	0.0	108.0	97.6					V (Fundamental)		
5.320	5.0	65.5	55.0	35.0	4.9	0.0	-5.9	0.0	99.5	89.0					H (Fundamental)		
<b>Band Edge:</b>																	
5.350	Using Peak Delta = 39.69 and Average Delta = 44.30										68.3	53.3	74.0	54.0	-5.7	-0.7	* V (Band Edge)
5.350	Using Peak Delta = 39.69 and Average Delta = 44.30										59.8	44.7	74.0	54.0	-14.2	-9.3	* H (Band Edge)
<b>Harmonic:</b>																	
10.640	5.0	46.3	33.6	38.9	8.9	-35.7	-5.9	1.0	53.6	40.9	74.0	54.0	-20.4	-13.1	* V		
15.960	5.0	51.5	37.7	38.0	11.7	-38.7	-5.9	1.0	57.7	43.9	74.0	54.0	-16.3	-10.1	* V		
21.280	2.5	53.2	41.2	32.3	14.5	-38.6	-11.9	0.0	49.4	37.5	74.0	54.0	-24.6	-16.5	* V (Noise Floor)		
26.600	1.0	37.5	26.5	44.1	0.0	0.0	-19.9	0.0	61.7	50.7	68.2		-6.5		** V (Noise Floor)		
31.920	1.0	37.6	26.6	44.1	0.0	0.0	-19.9	0.0	61.8	50.8	68.2		-6.4		** V (Noise Floor)		
37.240	1.0	37.8	26.7	44.1	0.0	0.0	-19.9	0.0	62.0	50.9	68.2		-6.2		** V (Noise Floor)		
10.640	5.0	44.5	33.0	38.9	8.9	-35.7	-5.9	1.0	51.8	40.3	74.0	54.0	-22.2	-13.7	* H		
15.960	5.0	51.3	37.4	38.0	11.7	-38.7	-5.9	1.0	57.5	43.6	74.0	54.0	-16.5	-10.4	* H		
21.280	2.5	53.2	41.3	32.3	14.5	-38.6	-11.9	0.0	49.5	37.6	74.0	54.0	-24.5	-16.4	* H (Noise Floor)		
26.600	1.0	37.3	26.3	44.1	0.0	0.0	-19.9	0.0	61.5	50.5	68.2		-6.7		** H (Noise Floor)		
31.920	1.0	37.5	26.5	44.1	0.0	0.0	-19.9	0.0	61.7	50.7	68.2		-6.5		** H (Noise Floor)		
37.240	1.0	37.7	26.7	44.1	0.0	0.0	-19.9	0.0	61.9	50.9	68.2		-6.3		** H (Noise Floor)		
<b>Spurious:</b>																	
6.192	5.0	61.6	47.0	35.4	6.7	-36.3	-5.9	0.0	61.6	47.0	68.2		-6.7		** V (w/ 10dB Pad)		
6.383	5.0	59.1	53.0	35.5	6.8	-36.3	-5.9	0.0	59.1	53.1	68.2		-9.1		** V (w/ 10dB Pad)		
4.256	5.0	51.8	40.0	33.1	5.3	-36.1	-5.9	0.0	48.2	36.4	74.0	54.0	-25.8	-17.6	* V (w/ 10dB Pad)		
5.386	5.0	58.0	46.1	35.1	6.1	-36.1	-5.9	0.0	57.2	45.3	74.0	54.0	-16.8	-8.7	* V (w/ 10dB Pad)		
5.408	5.0	57.3	47.6	35.1	6.2	-36.1	-5.9	0.0	56.5	46.9	74.0	54.0	-17.5	-7.1	* V (w/ 10dB Pad)		
5.216	5.0	57.0	49.5	34.8	6.0	-36.1	-5.9	0.0	55.8	48.3	68.2		-12.4		** V (w/ 10dB Pad)		
4.959	5.0	54.2	45.4	34.3	5.8	-36.1	-5.9	0.0	52.4	43.6	74.0	54.0	-21.6	-10.4	* V (w/ 10dB Pad)		
5.023	5.0	54.3	45.4	34.4	5.9	-36.1	-5.9	0.0	52.6	43.8	74.0	54.0	-21.4	-10.2	* V (w/ 10dB Pad)		
5.024	5.0	53.3	42.0	34.4	5.9	-36.1	-5.9	0.0	51.6	40.4	74.0	54.0	-22.4	-13.6	* H (w/ 10dB Pad)		
5.024	5.0	53.3	42.0	34.4	5.9	-36.1	-5.9	0.0	51.6	40.4	74.0	54.0	-22.4	-13.6	* H (w/ 10dB Pad)		
5.216	5.0	54.7	43.5	34.8	6.0	-36.1	-5.9	0.0	53.5	42.3	68.2		-14.7		** H (w/ 10dB Pad)		
5.024	5.0	53.3	42.0	34.4	5.9	-36.1	-5.9	0.0	51.6	40.4	74.0	54.0	-22.4	-13.6	* H (w/ 10dB Pad)		
5.400	5.0	54.5	44.0	35.1	6.2	-36.1	-5.9	0.0	53.7	43.2	74.0	54.0	-20.3	-10.8	* H (w/ 10dB Pad)		
6.183	5.0	55.7	42.7	35.4	6.7	-36.3	-5.9	0.0	55.7	42.7	68.2		-12.6		** H (w/ 10dB Pad)		
6.384	5.0	53.6	45.1	35.5	6.8	-36.3	-5.9	0.0	53.7	45.2	68.2		-14.6		** H (w/ 10dB Pad)		
<b>Note:</b>																	
* Restricted Band Limit																	
** Non Restricted Band Limit = -27dBm = 68.2dBuV																	
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit				
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit				
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit				
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit				
CL	Cable Loss					HPF	High Pass Filter										





05/08/02 **FCC Measurement**  
**Compliance Certification Services, Morgan Hill Open Field Site**

**Test Engr:** Thu Chan  
**Project #:** 02U1295  
**Company:** AtherosCommunications, Inc.  
**EUT Descrip.:** 802.11a Wireless LAN Cardbus Card  
**EUT M/N:** Tecra 8200 Laptop Computer  
**Test Target:** FCC 15.407 UNII  
**Mode Oper:** Turbo, Low Channel, 5210MHz  
 (Frequency Range 5.15 - 5.35GHz)

**Equipment for 1-26 GHz:**  
 HP8593EM Analyzer  
 Miteq NSP2600-44 Preamp  
 EMCO 3115 Horn Antenna  
 ARA MWH 1826/B  
 Cable: 15.0 feet

**Equipment for 26 - 40 GHz:**  
 HP8566B Analyzer  
 HP 11975A Amplifier (LO)  
 HP 11970A External mixer/antenna  
 Dico 1149 Horn Antenna  
 Cable: IF Only (321 MHz)

**Peak Measurements:**  
 1 MHz Resolution Bandwidth  
 1MHz Video Bandwidth

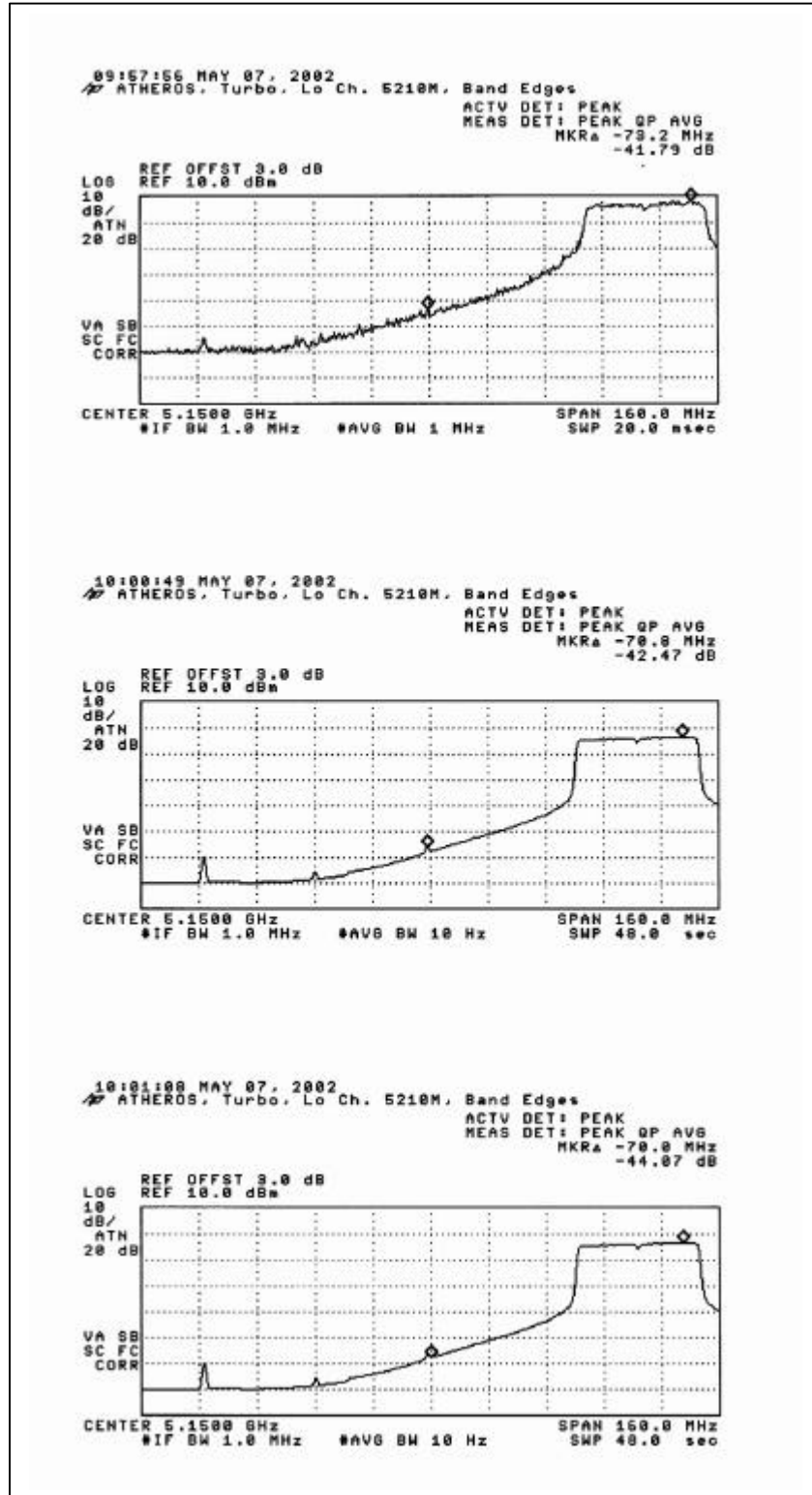
**Average Measurements:**  
 1MHz Resolution Bandwidth  
 10Hz Video Bandwidth

Peak Delta 41.79  
 Ave Delta 42.47

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.210	5.0	70.9	60.2	34.8	4.8	0.0	-5.9	0.0	104.6	93.9					V (Fundamental)
5.210	5.0	64.1	53.6	34.8	4.8	0.0	-5.9	0.0	97.8	87.3					H (Fundamental)
<b>Band Edge:</b>															
5.150		Using Peak Delta = 41.79 and Average Delta = 42.47							62.8	51.4	74.0	54.0	-11.6	-2.6	* V (Band Edge)
5.150		Using Peak Delta = 41.79 and Average Delta = 42.47							56.0	44.8	74.0	54.0	-18.0	-9.2	* H (Band Edge)
<b>Harmonic:</b>															
10.420	5.0	43.5	33.6	38.9	8.9	-35.6	-5.9	1.0	50.8	40.9	68.2				** V
15.630	5.0	49.0	38.1	38.2	11.5	-38.6	-5.9	1.0	55.2	44.3	74.0	54.0	-18.8	-9.7	* V
20.840	2.5	53.1	41.0	32.4	14.3	-38.6	-11.9	0.0	49.2	37.1	74.0	54.0	-24.8	-16.9	* V (Noise Floor)
26.050	1.0	37.0	26.0	44.1	0.0	0.0	-19.9	0.0	61.2	50.2	68.2				** V (Noise Floor)
31.260	1.0	37.1	26.1	44.1	0.0	0.0	-19.9	0.0	61.3	50.3	74.0	54.0	-12.7	-3.7	* V (Noise Floor)
36.470	1.0	37.2	26.2	44.1	0.0	0.0	-19.9	0.0	61.4	50.4	74.0	54.0	-12.6	-3.6	* V (Noise Floor)
10.420	5.0	44.5	33.5	38.9	8.9	-35.6	-5.9	1.0	51.8	40.8	68.2				** H
15.630	5.0	50.5	37.5	38.2	11.5	-38.6	-5.9	1.0	56.7	43.7	74.0	54.0	-17.3	-10.3	* H
20.840	2.5	53.1	41.0	32.4	14.3	-38.6	-11.9	0.0	49.2	37.1	74.0	54.0	-24.8	-16.9	* H (Noise Floor)
26.050	1.0	37.0	26.0	44.1	0.0	0.0	-19.9	0.0	61.2	50.2	68.2				** H (Noise Floor)
31.260	1.0	37.1	26.1	44.1	0.0	0.0	-19.9	0.0	61.3	50.3	74.0	54.0	-12.7	-3.7	* H (Noise Floor)
36.470	1.0	37.2	26.2	44.1	0.0	0.0	-19.9	0.0	61.4	50.4	74.0	54.0	-12.6	-3.6	* H (Noise Floor)
<b>Spurious:</b>															
4.157	5.0	55.0	42.0	33.2	5.2	-36.1	-5.9	0.0	51.4	38.4	74.0	54.0	-22.6	-15.6	* V (w/ 10dB attn)
4.332	5.0	63.5	51.0	33.0	5.3	-36.1	-5.9	0.0	59.9	47.4	74.0	54.0	-14.1	-6.6	* V (w/ 10dB attn)
2.507	5.0	56.5	44.5	29.1	3.9	-36.3	-5.9	0.0	47.4	35.4	68.2				** V (w/ 10dB attn)
4.616	5.0	60.8	42.0	33.2	5.6	-36.1	-5.9	0.0	57.6	38.8	74.0	54.0	-16.4	-15.2	* V (w/ 10dB attn)
6.252	5.0	63.7	59.5	35.5	6.7	-36.3	-5.9	0.0	63.6	59.5	68.2				** V (w/ 10dB attn)
6.252	5.0	58.2	52.7	35.5	6.7	-36.3	-5.9	0.0	58.2	52.7	68.2				** H (w/ 10dB Pad)
4.616	5.0	52.0	42.0	33.2	5.6	-36.1	-5.9	0.0	48.8	38.8	74.0	54.0	-25.2	-15.2	* H (w/ 10dB Pad)
4.337	5.0	56.1	43.3	33.0	5.4	-36.1	-5.9	0.0	52.5	39.7	74.0	54.0	-21.5	-14.3	* H (w/ 10dB Pad)

**Note:** \* Restricted Band Limit  
 \*\* Non Restricted Band Limit = -27dBm = 68.2dBuV

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		



05/10/02 **FCC Measurement**  
**Compliance Certification Services, Morgan Hill Open Field Site**

**Test Engr:** Thu Chan  
**Project #:** 02U1295  
**Company:** AtherosCommunications, Inc.  
**EUT Descrip.:** 802.11a Wireless LAN Cardbus Card  
**EUT M/N:** Tecra 8200 Laptop Computer  
**Test Target:** FCC 15.407 UNII  
**Mode Oper:** Turbo, Mid Channel, 5250MHz  
 (Frequency Range 5.15 - 5.35GHz)

**Equipment for 1-26 GHz:**

HP8593EM Analyzer  
 Miteq NSP2600-44 Preamp  
 EMCO 3115 Horn Antenna  
 ARA MWH 1826/B  
 Cable: 15.0 feet

**Equipment for 26 - 40 GHz:**

HP8566B Analyzer  
 HP 11975A Amplifier (LO)  
 HP 11970A External mixer/antenna  
 Dico 1149 Horn Antenna  
 Cable: IF Only (321 MHz)

**Peak Measurements:**

1 MHz Resolution Bandwidth  
 1MHz Video Bandwidth

**Average Measurements:**

1MHz Resolution Bandwidth  
 10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
<b>Harmonic:</b>															
10.500	5.0	48.0	36.0	38.9	8.9	-35.6	-5.9	1.0	55.3	43.3	68.2		-12.9	-8.3	** V
15.750	5.0	51.0	39.5	38.2	11.6	-38.6	-5.9	1.0	57.2	45.7	74.0	54.0	-16.8	-8.3	* V
21.000	2.5	53.2	42.0	32.4	14.4	-38.6	-11.9	0.0	49.4	38.3	74.0	54.0	-24.6	-15.7	* V (Noise Floor)
26.250	1.0	37.2	26.1	44.1	0.0	0.0	-19.9	0.0	61.4	50.3	68.2		-6.8		** V (Noise Floor)
31.500	1.0	37.4	26.3	44.1	0.0	0.0	-19.9	0.0	61.6	50.5	74.0	54.0	-12.4	-3.5	* V (Noise Floor)
36.750	1.0	37.5	26.4	44.1	0.0	0.0	-19.9	0.0	61.7	50.6	68.2		-6.5		** V (Noise Floor)
10.500	5.0	47.2	36.0	38.9	8.9	-35.6	-5.9	1.0	54.5	43.3	68.2		-13.7		** V (Noise Floor)
15.750	5.0	51.0	39.0	38.2	11.6	-38.6	-5.9	1.0	57.2	45.2	74.0	54.0	-16.8	-8.8	* H
21.000	2.5	53.2	42.0	32.4	14.4	-38.6	-11.9	0.0	49.5	38.3	74.0	54.0	-24.5	-15.7	* H (Noise Floor)
26.250	1.0	37.0	26.1	44.1	0.0	0.0	-19.9	0.0	61.2	50.3	68.2		-7.0		** H (Noise Floor)
31.500	1.0	37.3	26.2	44.1	0.0	0.0	-19.9	0.0	61.5	50.4	74.0	54.0	-12.5	-3.6	* H (Noise Floor)
36.750	1.0	37.4	26.4	44.1	0.0	0.0	-19.9	0.0	61.6	50.6	68.2		-6.6		** H (Noise Floor)
<b>Spurious:</b>															
6.130	5.0	63.3	51.3	35.4	6.7	-36.3	-5.9	0.0	63.2	51.2	68.2		-5.0		** V (w/ 10dB Pad)
4.413	5.0	63.0	50.5	33.0	5.4	-36.1	-5.9	0.0	59.4	46.9	68.2		-8.8		** V (w/ 10dB Pad)
4.327	5.0	60.3	45.0	33.0	5.3	-36.1	-5.9	0.0	56.7	41.4	74.0	54.0	-17.3	-12.6	* V (w/ 10dB Pad)
3.496	5.0	68.0	52.0	32.2	4.6	-36.2	-5.9	0.0	62.8	46.8	68.2		-5.5		** V (w/ 10dB Pad)
1.988	5.0	71.0	62.0	27.8	3.6	-36.4	-5.9	0.0	60.2	51.2	68.2		-8.0		** V (w/ 10dB Pad)
1.988	5.0	63.5	53.0	27.8	3.6	-36.4	-5.9	0.0	52.7	42.2	68.2		-15.5		** H (w/ 10dB Pad)
6.130	5.0	58.5	46.5	35.4	6.7	-36.3	-5.9	0.0	58.4	46.4	68.2		-9.8		** H (w/ 10dB Pad)

**Note:** \* Restricted Band Limit  
 \*\* Non Restricted Band Limit = -27dBm = 68.2dBuV

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

05/10/02 **FCC Measurement**  
**Compliance Certification Services, Morgan Hill Open Field Site**

**Test Engr:** Thu Chan  
**Project #:** 02U1295  
**Company:** AtherosCommunications, Inc.  
**EUT Descrip.:** 802.11a Wireless LAN Cardbus Card  
**EUT M/N:** Tecra 8200 Laptop Computer  
**Test Target:** FCC 15.407 UNII  
**Mode Oper:** Turbo, Hi Channel, 5290MHz  
 (Frequency Range 5.15 - 5.35GHz)

**Equipment for 1-26 GHz:**  
 HP8593EM Analyzer  
 Miteq NSP2600-44 Preamp  
 EMCO 3115 Horn Antenna  
 ARA MWH 1826/B  
 Cable: 15.0 feet

**Equipment for 26 - 40 GHz:**  
 HP8566B Analyzer  
 HP 11975A Amplifier (LO)  
 HP 11970A External mixer/antenna  
 Dico 1149 Horn Antenna  
 Cable: IF Only (321 MHz)

**Peak Measurements:**  
 1 MHz Resolution Bandwidth  
 1MHz Video Bandwidth

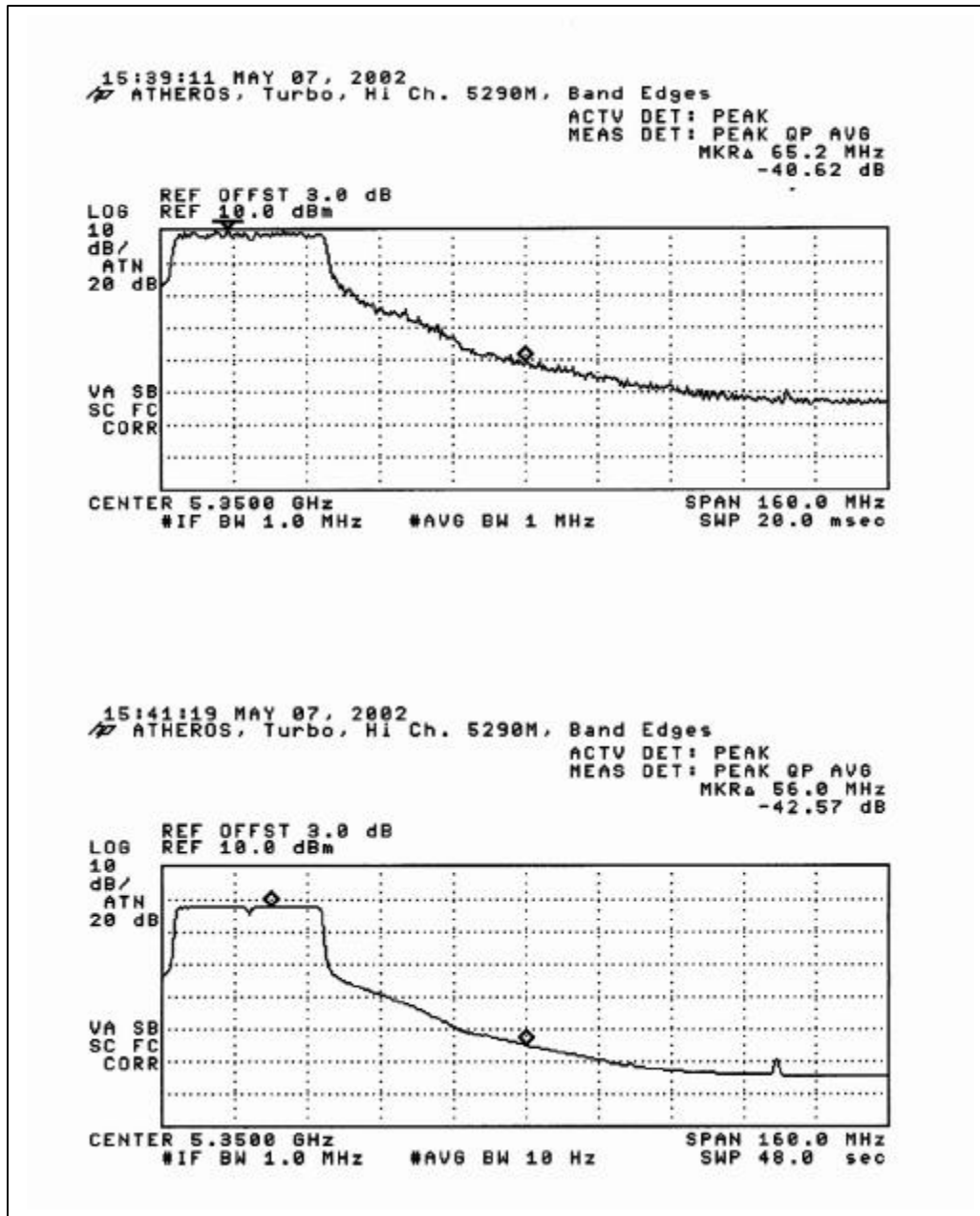
**Average Measurements:**  
 1MHz Resolution Bandwidth  
 10Hz Video Bandwidth

Peak Delta 40.62  
 Ave Delta 42.57


f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes	
5.290	5.0	73.8	62.0	34.9	4.9	0.0	-5.9	0.0	107.7	95.9					V (Fundamental)	
5.290	5.0	68.0	57.0	34.9	4.9	0.0	-5.9	0.0	101.9	90.9					H (Fundamental)	
<b>Band Edge:</b>																
5.350	Using Peak Delta = 40.62 and Average Delta = 42.57									67.1	53.3	74.0	54.0	-6.9	-0.7	* V (Band Edge)
5.350	Using Peak Delta = 40.62 and Average Delta = 42.57									61.3	48.3	74.0	54.0	-12.7	-5.7	* H (Band Edge)
<b>Harmonic:</b>																
10.580	5.0	48.0	35.4	38.9	8.9	-35.6	-5.9	1.0	55.3	42.7	68.2		-12.9		** V	
10.616	5.0	50.0	37.0	38.9	8.9	-35.6	-5.9	1.0	57.3	44.3	74.0	54.0	-16.7	-9.7	* V	
15.870	5.0	51.5	37.7	38.1	11.6	-38.6	-5.9	1.0	57.7	43.9	74.0	54.0	-16.3	-10.1	* V	
21.160	2.5	53.2	41.2	32.4	14.4	-38.6	-11.9	0.0	49.4	37.5	74.0	54.0	-24.6	-16.5	* V (Noise Floor)	
26.450	1.0	37.4	26.3	44.1	0.0	0.0	-19.9	0.0	61.6	50.5	68.2		-6.6		** V (Noise Floor)	
31.740	1.0	37.5	26.4	44.1	0.0	0.0	-19.9	0.0	61.7	50.6	74.0	54.0	-12.3	-3.4	* V (Noise Floor)	
37.030	1.0	37.6	26.6	44.1	0.0	0.0	-19.9	0.0	61.8	50.8	68.2		-6.4		** V (Noise Floor)	
10.580	5.0	47.5	35.6	38.9	8.9	-35.6	-5.9	1.0	54.8	42.9	68.2		-13.4		** H	
10.617	5.0	52.0	41.3	38.9	8.9	-35.6	-5.9	1.0	59.3	48.6	74.0	54.0	-14.7	-5.4	* H	
15.870	5.0	50.7	38.5	38.1	11.6	-38.6	-5.9	1.0	56.9	44.7	74.0	54.0	-17.1	-9.3	* H	
21.160	2.5	53.4	41.5	32.4	14.4	-38.6	-11.9	0.0	49.7	37.8	74.0	54.0	-24.3	-16.2	* H (Noise Floor)	
26.450	1.0	37.3	26.3	44.1	0.0	0.0	-19.9	0.0	61.5	50.5	68.2		-6.7		** H (Noise Floor)	
31.740	1.0	37.4	26.4	44.1	0.0	0.0	-19.9	0.0	61.6	50.6	74.0	54.0	-12.4	-3.4	* H (Noise Floor)	
37.030	1.0	37.6	26.6	44.1	0.0	0.0	-19.9	0.0	61.8	50.8	68.2		-6.4		** H (Noise Floor)	
<b>Spurious:</b>																
1.989	5.0	70.8	60.5	27.9	3.6	-36.4	-5.9	0.0	60.0	49.7	68.2		-8.2		** V (w/ 10dB Pad)	
2.339	5.0	59.0	49.2	28.7	3.8	-36.3	-5.9	0.0	49.3	39.5	74.0	54.0	-24.7	-14.5	* V (w/ 10dB Pad)	
3.540	5.0	65.0	49.5	32.3	4.7	-36.2	-5.9	0.0	59.9	44.4	68.2		-8.3		** V (w/ 10dB Pad)	
4.420	5.0	64.0	50.5	33.0	5.4	-36.1	-5.9	0.0	60.4	46.9	68.2		-7.8		** V (w/ 10dB Pad)	
6.167	5.0	63.0	50.0	35.4	6.7	-36.3	-5.9	0.0	63.0	50.0	68.2		-5.3		** V (w/ 10dB Pad)	
6.167	5.0	60.4	49.0	35.4	6.7	-36.3	-5.9	0.0	60.4	49.0	68.2		-7.9		** H (w/ 10dB Pad)	
4.420	5.0	59.3	48.0	33.0	5.4	-36.1	-5.9	0.0	55.7	44.4	68.2		-12.5		** H (w/ 10dB Pad)	
3.540	5.0	61.0	47.3	32.3	4.7	-36.2	-5.9	0.0	55.9	42.2	68.2		-12.3		** H (w/ 10dB Pad)	
1.989	5.0	66.0	57.0	27.9	3.6	-36.4	-5.9	0.0	55.2	46.2	68.2		-13.0		** H (w/ 10dB Pad)	

**Note:** \* Restricted Band Limit  
 \*\* Non Restricted Band Limit = -27dBm = 68.2dBuV

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		



**DIGITAL DEVICE RADIATED EMISSION RESULTS**



FCC, VCCI, CISPR, CE, AUSTEL, NZ  
 UL, CSA, TUV, BSMI, DHHS, NVLAP

561F MONTEREY ROAD, SAN JOSE, CA 95037-9001  
 PHONE: (408) 463-0885 FAX: (408) 463-0888

*Project #:* 02U1295-2  
*Report #:* 020513B1  
*Date & Time:* 05/13/02 9:15 AM  
*Test Engr:* Chin Pang

*Company:* Atheros communications, Inc.  
*EUT Description:* 802.11a Wireless LAN Cardbus Card  
*Test Configuration :* EUT/Support Peripherals  
*Type of Test:* FCC Class B  
*Mode of Operation:* Turbo, 108Mb/s, 5.25GHz

A-Site
 B-Site
 C-Site
 F-Site
6 Worst Data
Descending

Freq. (MHz)	Reading (dBuV)	AF (dB)	Class (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
20Mhz & 32Mhz step size											
160.00	46.30	10.03	2.67	29.34	29.66	43.50	-13.84	3mV	180.00	1.00	P
416.00	46.00	16.09	4.67	29.41	37.35	46.00	-8.65	3mV	180.00	1.00	P
544.00	46.00	17.93	5.53	29.75	39.72	46.00	-6.28	3mV	180.00	1.00	P
672.00	46.60	18.80	6.34	29.57	42.17	46.00	-3.83	3mV	180.00	1.00	P
800.00	43.80	19.73	7.07	29.29	41.31	46.00	-4.69	3mV	180.00	1.00	P
840.00	39.60	19.95	7.29	29.14	37.71	46.00	-8.29	3mV	180.00	1.00	P
331.00	43.80	13.86	4.02	28.98	32.70	46.00	-13.30	3mV	180.00	1.00	P
514.00	44.90	17.51	5.33	29.76	37.99	46.00	-8.01	3mV	180.00	1.00	P
640.00	44.40	18.76	6.15	29.64	39.67	46.00	-6.33	3mV	180.00	1.00	P
416.00	41.20	16.09	4.67	29.41	32.55	46.00	-13.45	3mH	180.00	1.50	P
288.00	45.10	12.77	3.68	28.84	32.71	46.00	-13.29	3mH	180.00	1.20	P
544.00	45.00	17.93	5.53	29.75	38.72	46.00	-7.28	3mH	180.00	1.20	P
800.00	44.60	19.73	7.07	29.29	42.11	46.00	-3.89	3mH	180.00	1.20	P
960.00	43.60	20.66	7.88	28.66	43.48	46.00	-2.52	3mH	180.00	1.20	P
Total data # 14 V.2b											

### 8.11. POWER LINE CONDUCTED EMISSION

#### TEST SETUP

The EUT is placed on a wooden table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane on the floor.

The EUT is set to transmit in a continuous mode.

#### TEST PROCEDURE

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

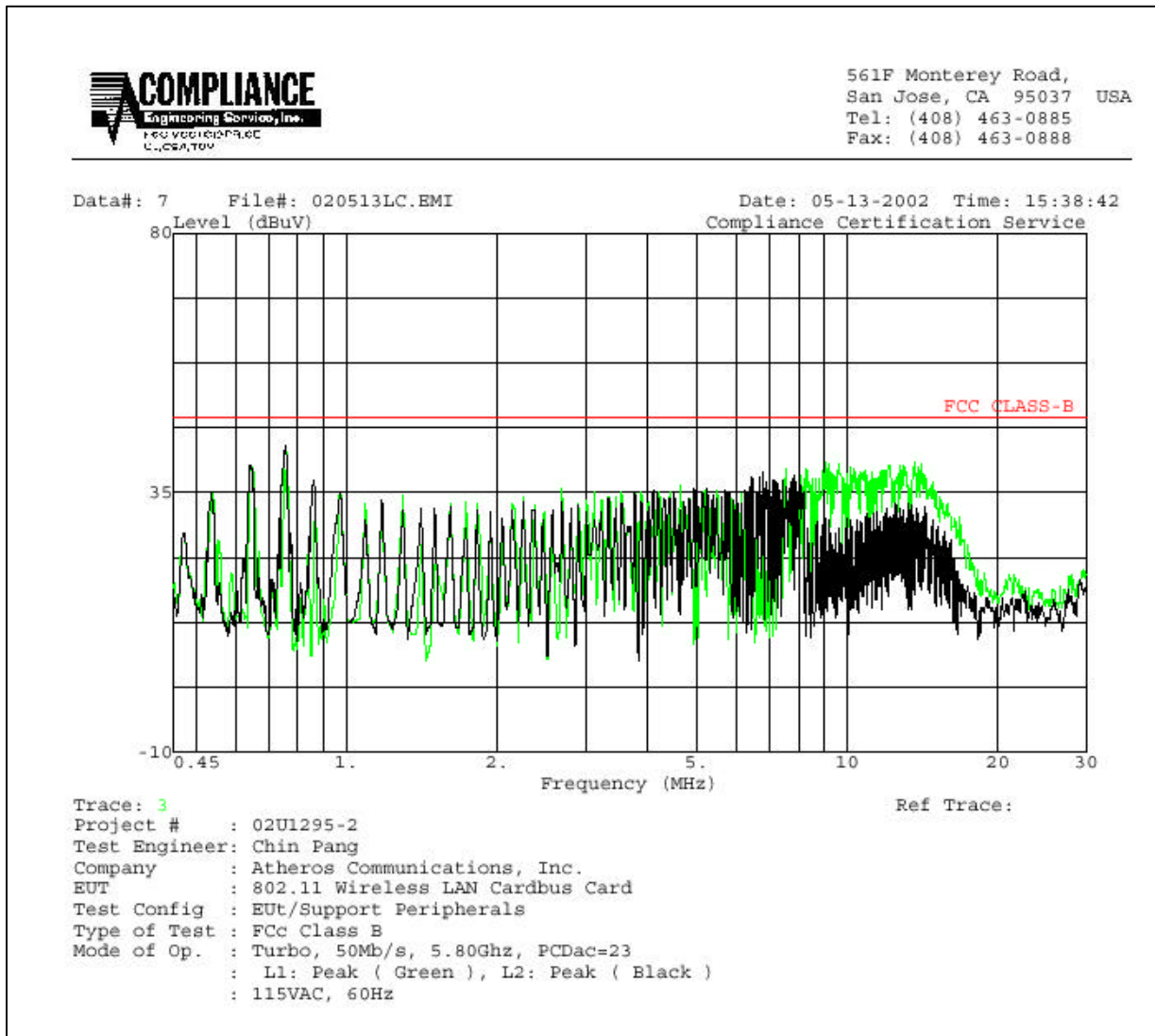
#### RESULTS

No non-compliance noted:

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	FCCB	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.65	40.17	—	—	0	48.00	—	-7.83	—	L1
0.76	42.22	—	—	0	48.00	—	-5.78	—	L1
13.97	40.18	—	—	0	48.00	—	-7.82	—	L1
0.64	39.40	—	—	0	48.00	—	-8.60	—	L2
0.75	43.34	—	—	0	48.00	—	-4.66	—	L2
7.86	38.14	—	—	0	48.00	—	-9.86	—	L2
6 Worst Data									



**PLOT OF CONDUCTED EMISSIONS**



## 8.12. SETUP PHOTOS

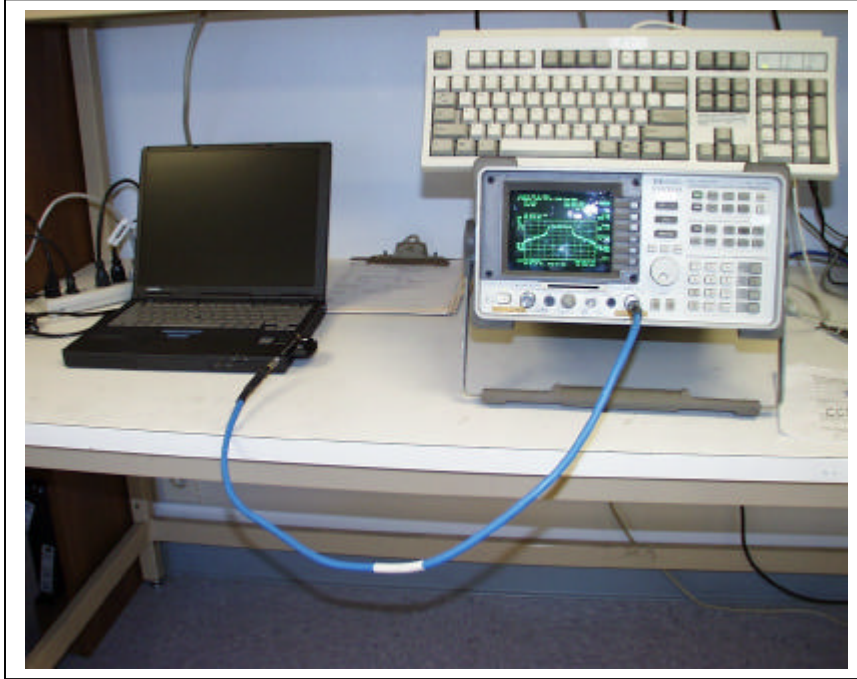
### DIGITAL DEVICE RADIATED EMISSION SETUP



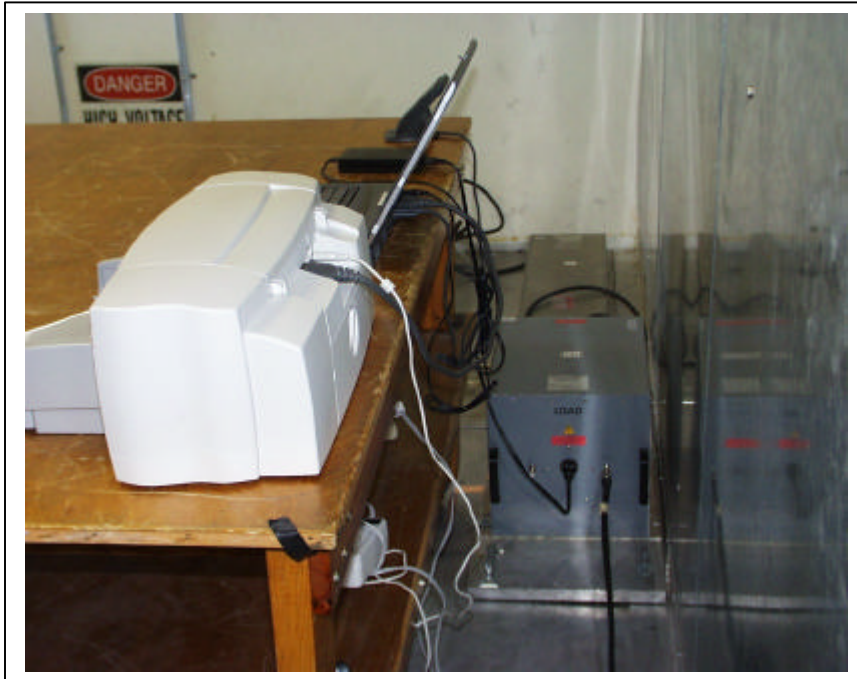
**TRANSMITTER RADIATED EMISSION SETUP**



**ANTENNA TERMINAL PORT MEASUREMENT SETUP**



**LINE CONDUCTION EMISSION SETUP**



**END OF REPORT**