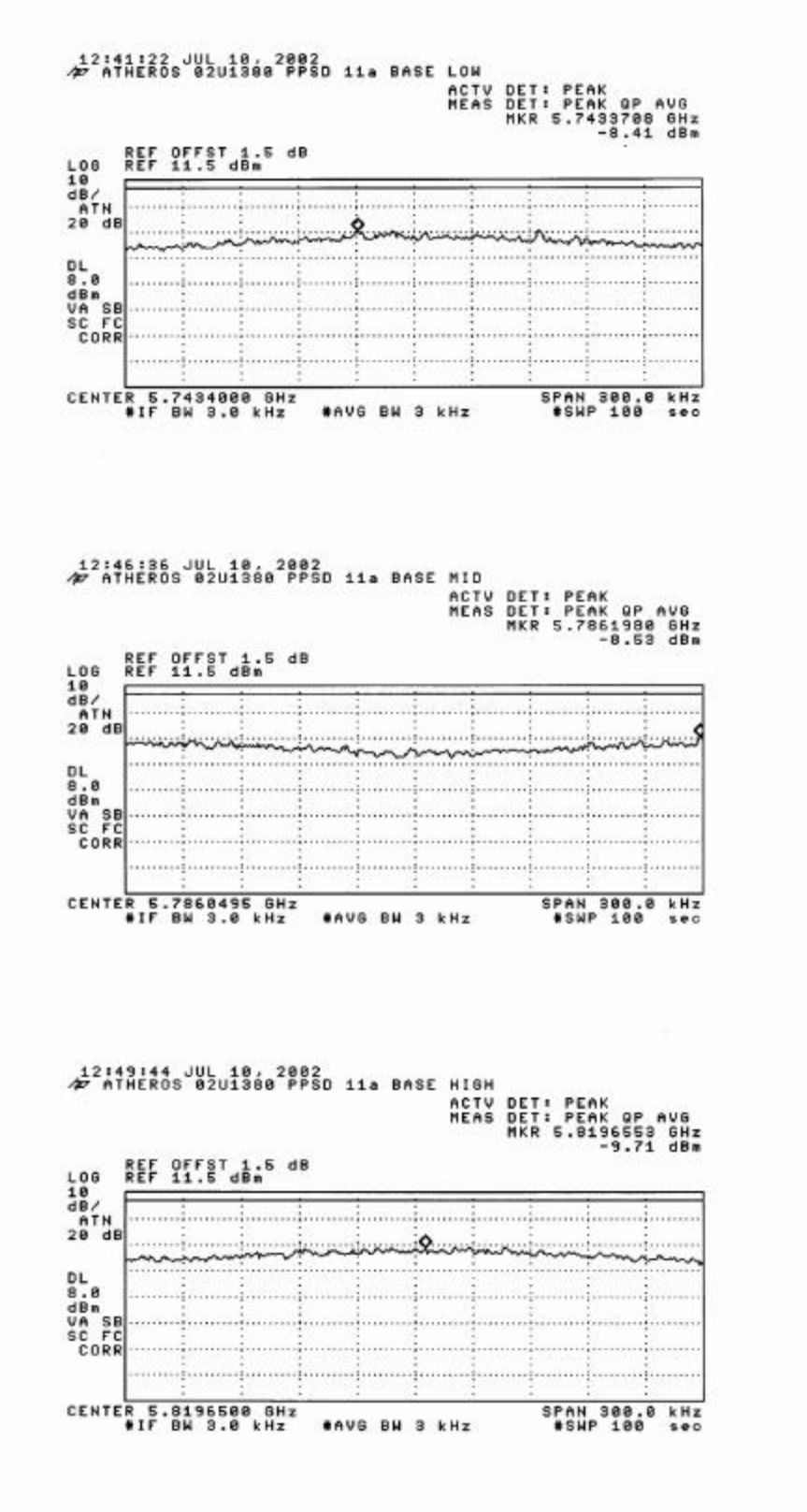
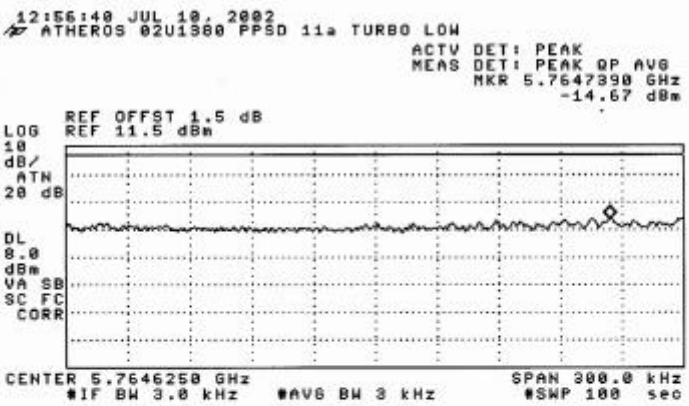
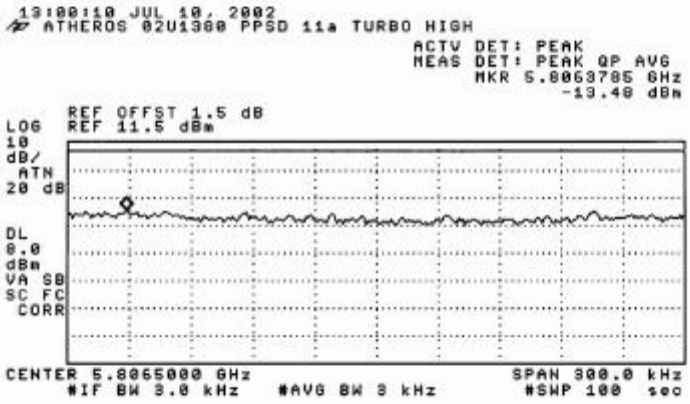






8.6. MAXIMUM PERMISSIBLE EXPOSURE

CALCULATIONS

Given

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

and

$S = E \wedge 2 / 3770$

where

E = Field Strength in Volts / meter
P = Power in Watts
G = Numeric antenna gain
d = distance in meters
S = Power Density in milliwatts / square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) =100 * d (m)

yields

$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$

$d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in mW / cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and

G (numeric) = 10 ^ (G (dBi) / 10)

yields

$$d = 0.282 * 10 ^ ((P + G) / 20) / \sqrt{S}$$ Equation (1)

where
d = MPE safe distance in cm
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in mW / cm^2

RESULTS

No non-compliance noted:

EUT output power = 21.99 dBm
Antenna Gain = 1.0 dBi
S = 1.0 mW / cm^2 from 1.1310 Table 1

Substituting these parameters into Equation (1) above:

MPE Safe Distance = 3.98 cm

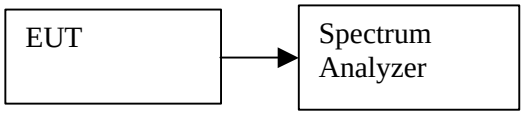
NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

8.7. SPURIOUS EMISSIONS – CONDUCTED MEASUREMENTS

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit.

Also, conducted RF measurements of the transmitter output 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 100 kHz. The video bandwidth is set to 100 kHz.

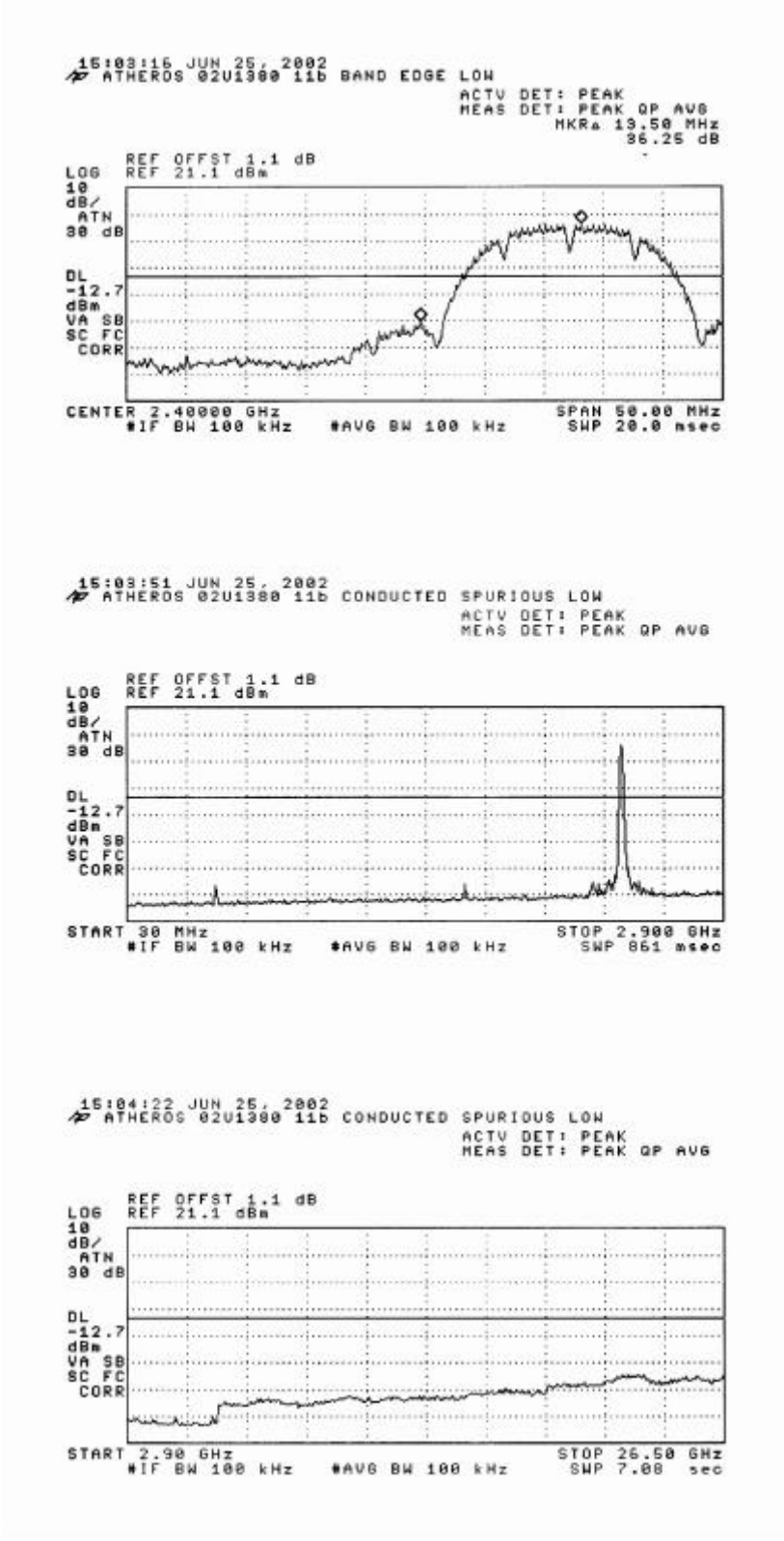
Measurements are made at the lower band edge and the restricted band adjacent to the lower edge of the authorized band, with the transmitter set to the lowest channel.

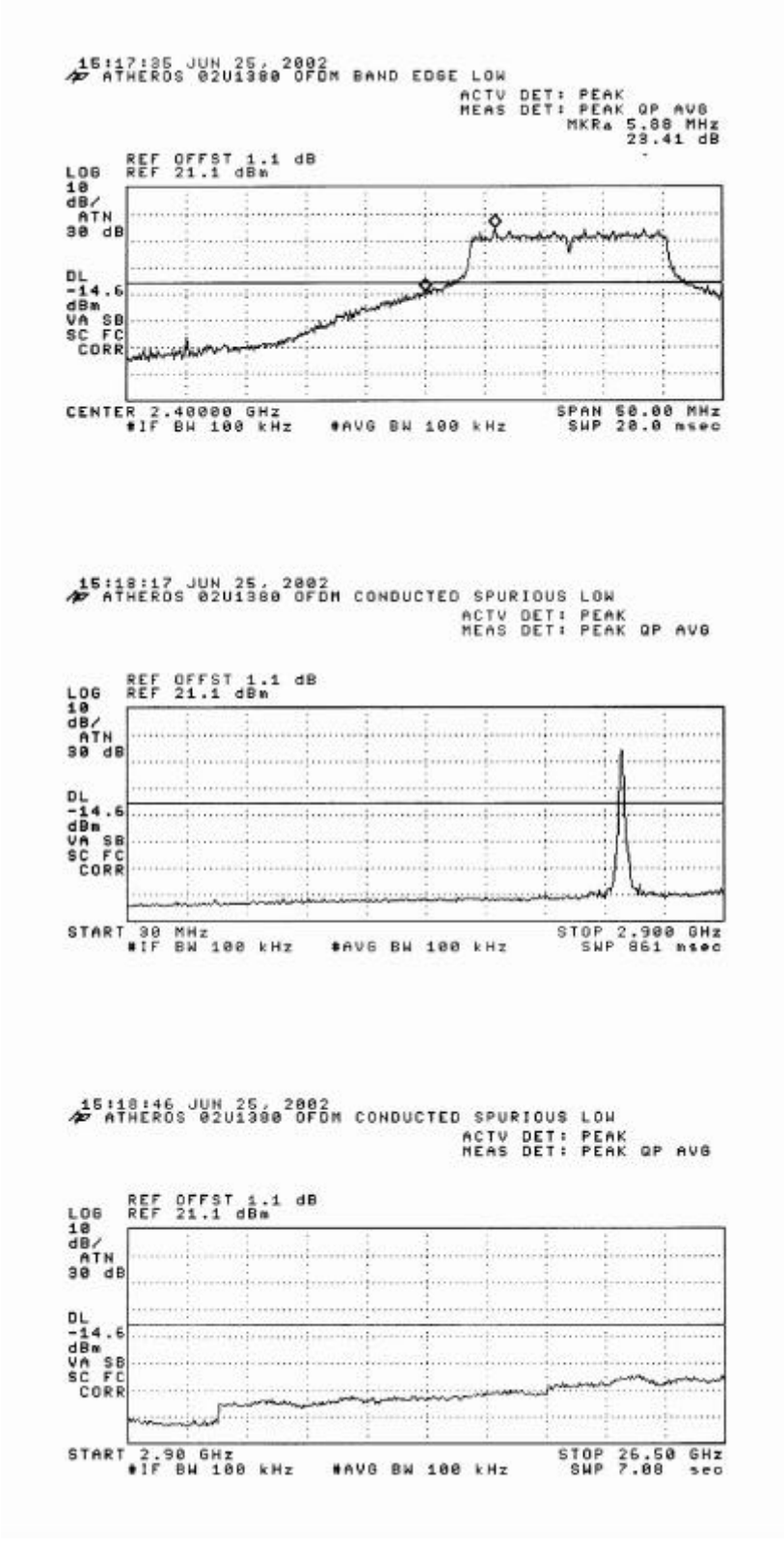
Measurements are made at the upper band edge and the restricted band adjacent to the upper edge of the authorized band, with the transmitter set to the highest channel.

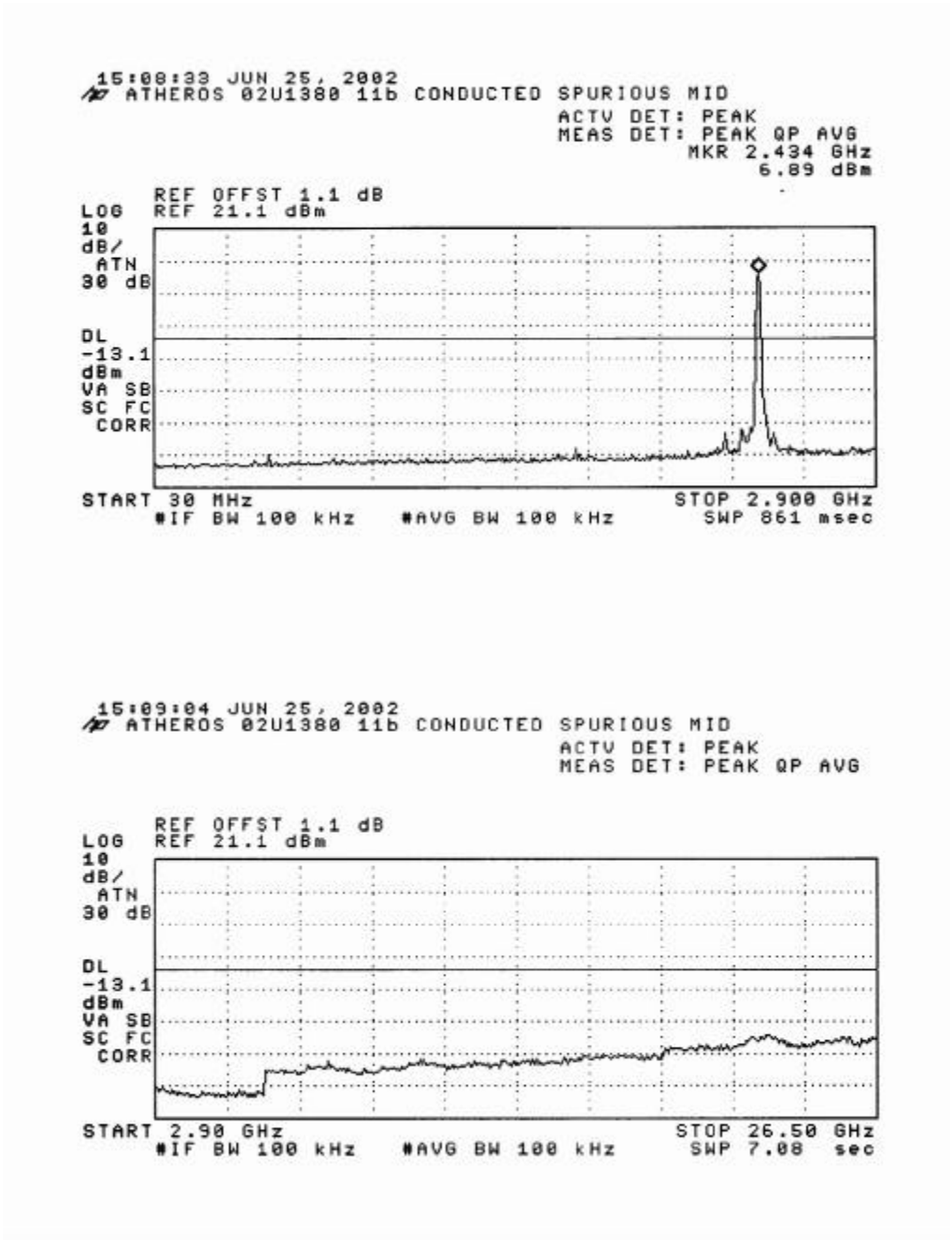
Measurements are made over the 30 MHz to 26.5 GHz range with the transmitter set to the lowest, middle, and highest channels.

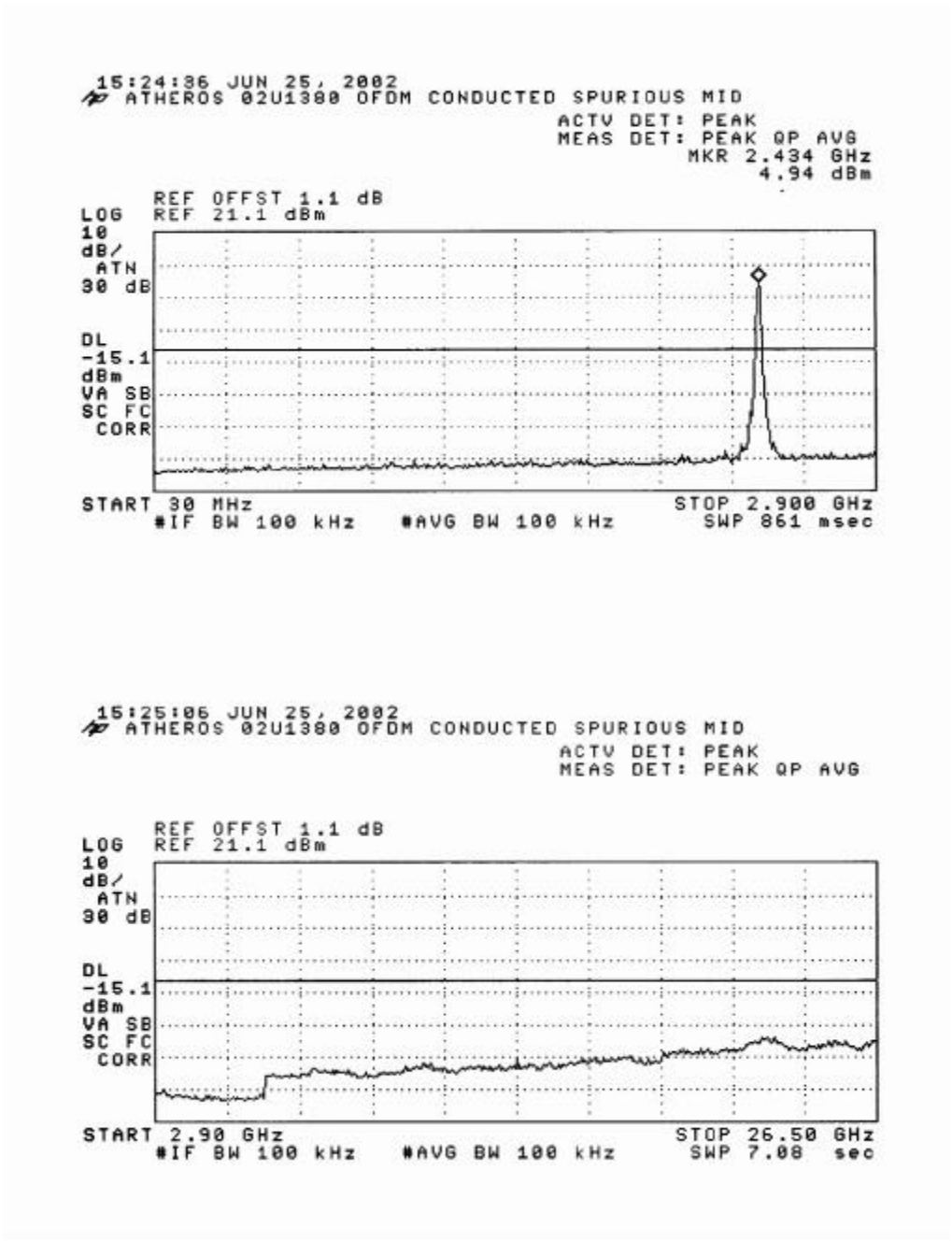
RESULTS

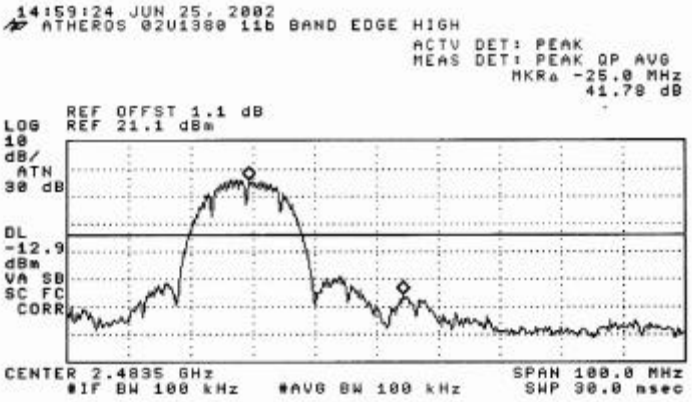
No non-compliance noted:

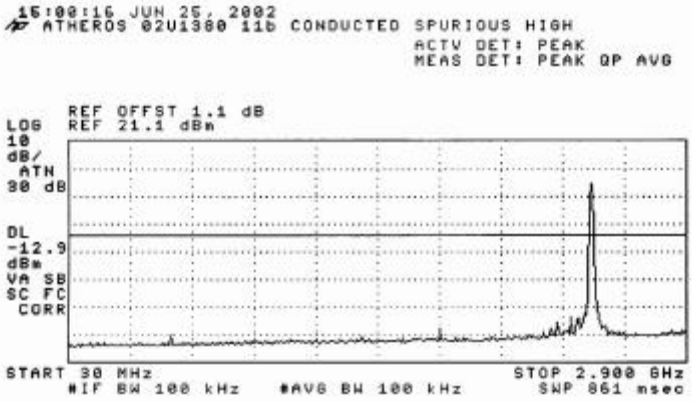


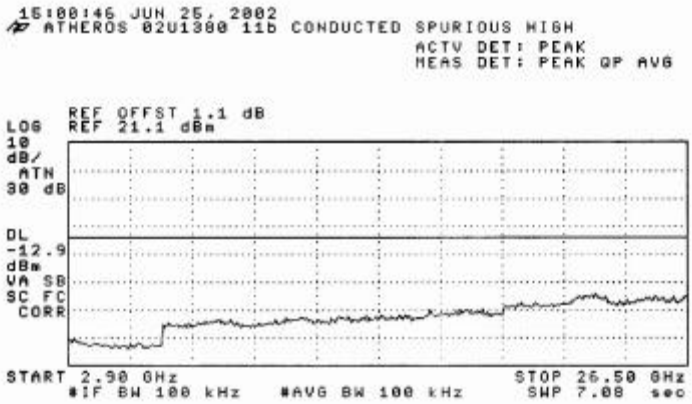


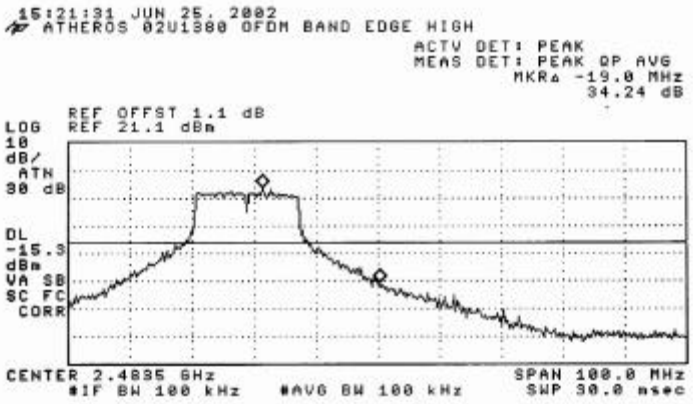


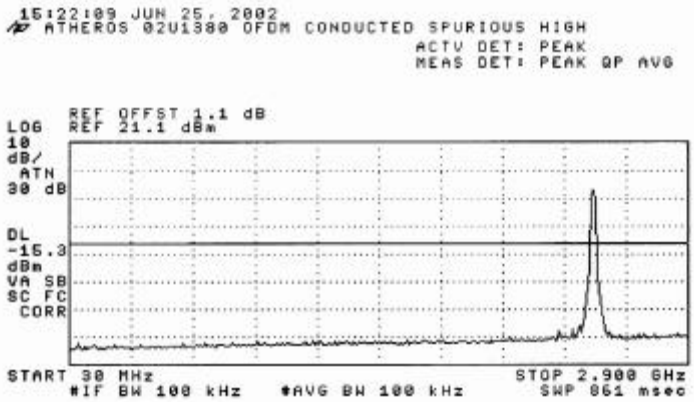


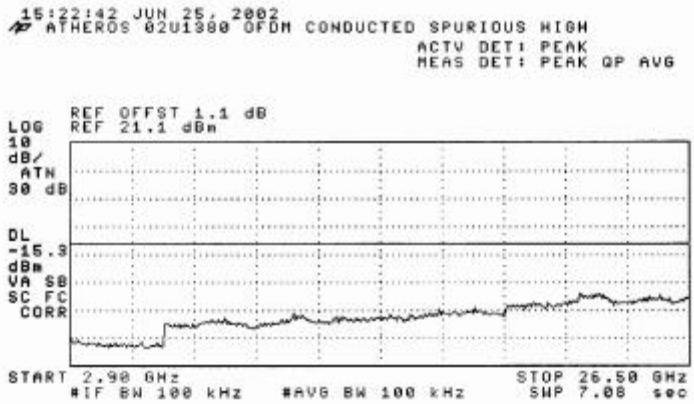


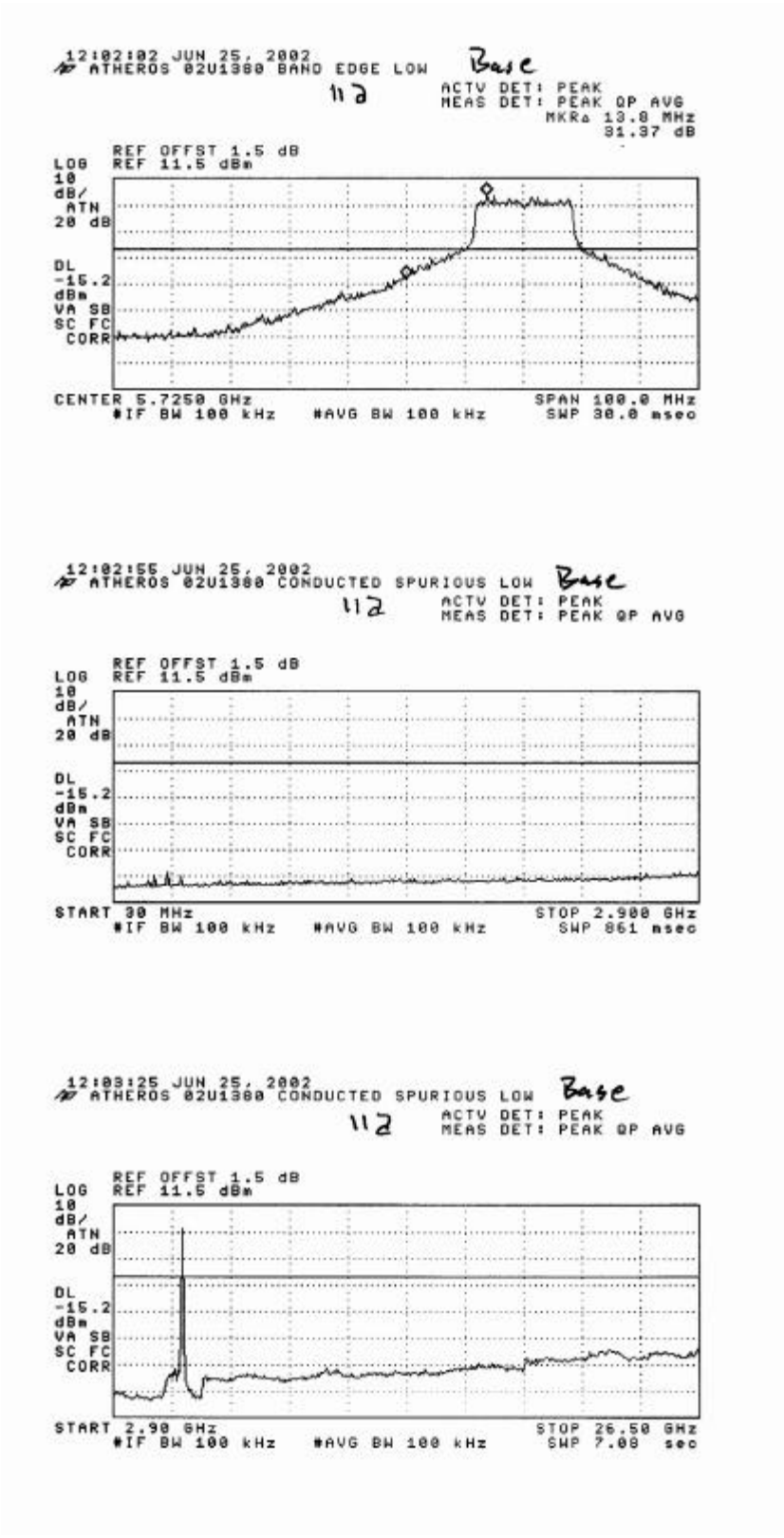


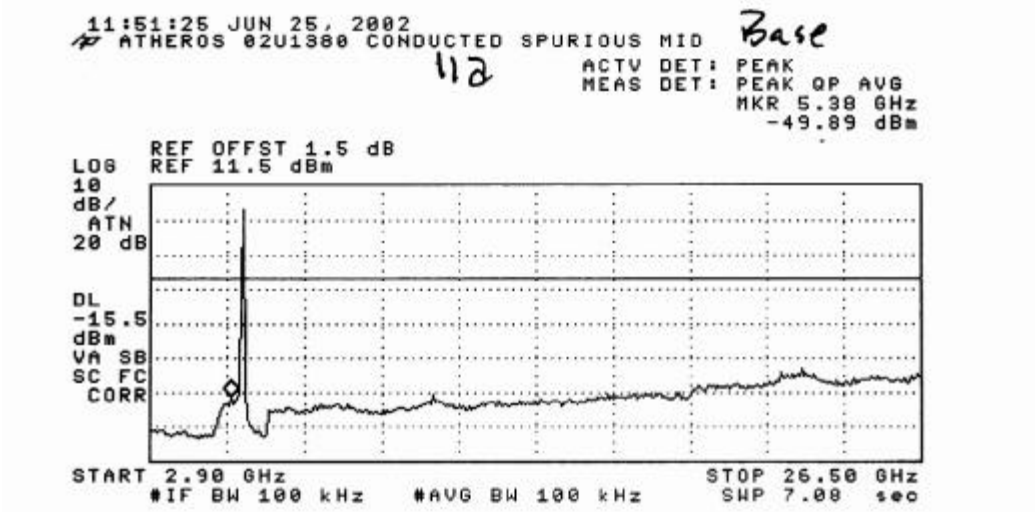


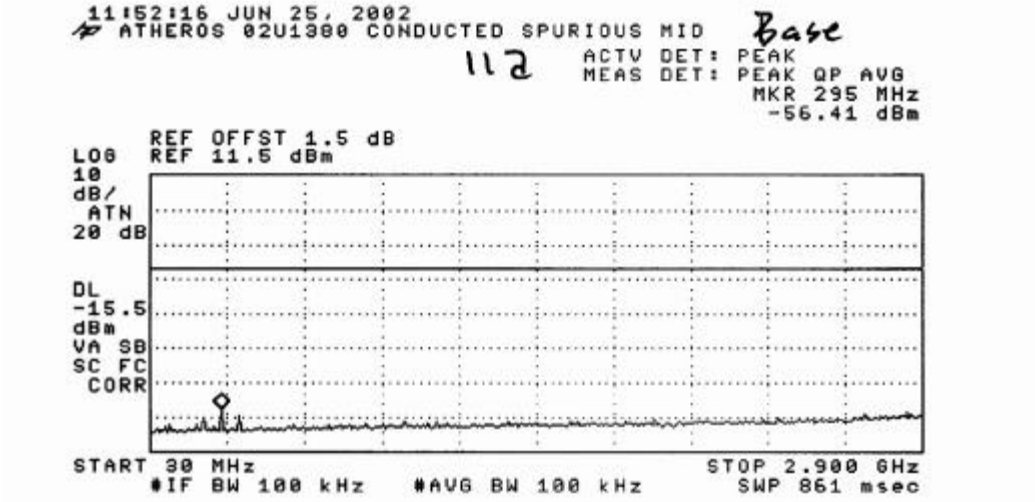


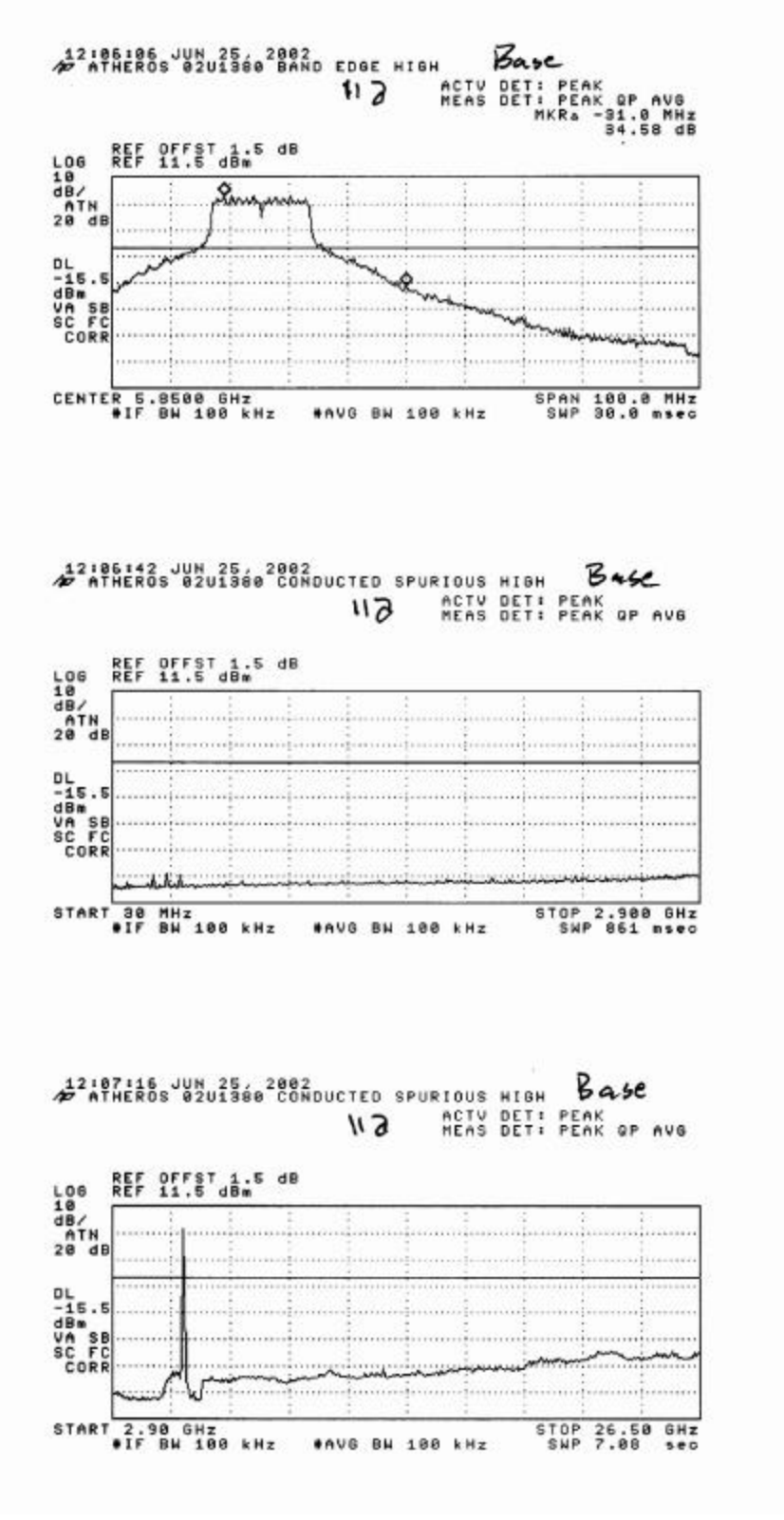


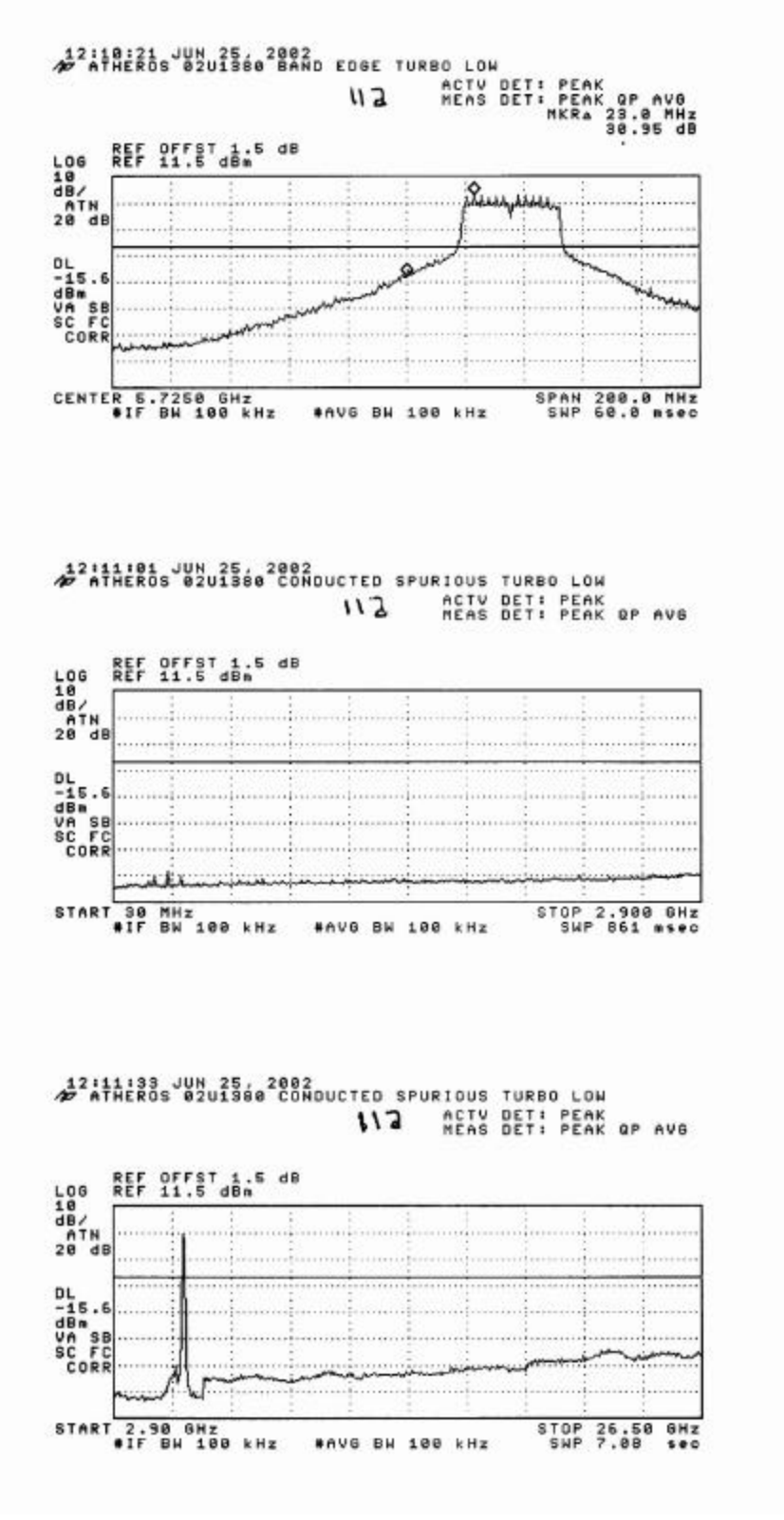


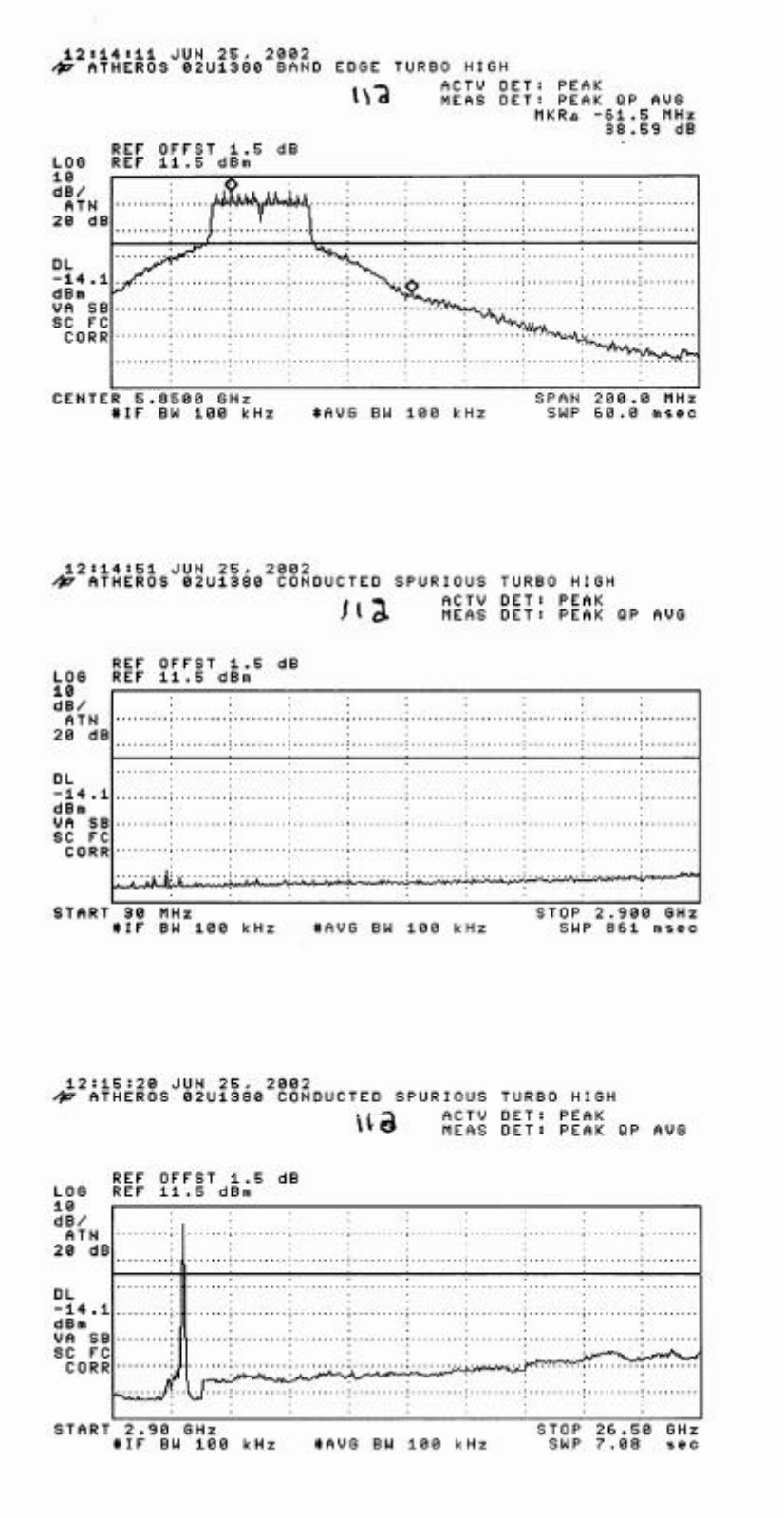












8.8. UNDESIRABLE EMISSIONS – RADIATED MEASUREMENTS

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 outside restricted bands, the resolution bandwidth is set to 100 kHz. Peak detection is used.

For measurements above 1 GHz within restricted bands, 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.

For operation in the 2.4 GHz band, the spectrum from 30 MHz to 26 GHz is investigated. For operation in the 5.8 GHz band, 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.

SYSTEM NOISE FLOOR FOR HARMONIC AND SPURIOUS MEASUREMENTS

Compliance Certification Services

Worst Case Radiated Emissions System Noise Floor

Each band below corresponds to each horn antenna band
Uses the lowest gain preamplifier; actual preamp used may have higher gain
Uses the longest typical cable configuration; actual cables used may have less loss
Noise floor field strength results are compared to the FCC 15.205 Restricted Band limit

Specification Distance: 3 meters

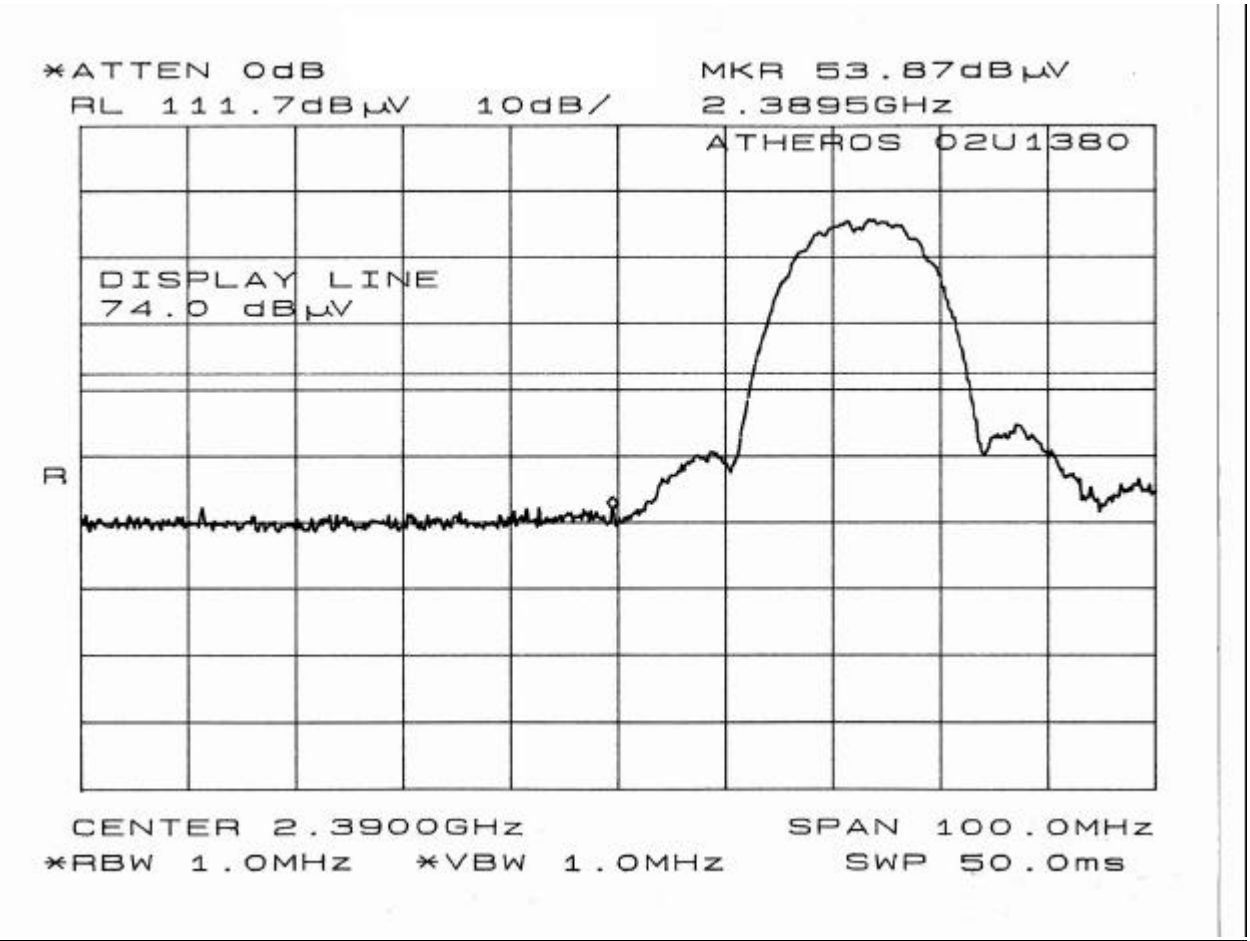
Freq GHz	SA dBuV	AF dB/m	Distance m	Distance dB	Preamp dB	Cable dB	Field dBuV/m	Limit dBuV/m	Margin dB
1 to 18 GHz band									
RBW = 1 MHz, peak detection									
18	41.9	47.8	1	-9.5	32.6	13.5	61.06	74	-12.94
RBW = 1 MHz, average detection									
18	28.7	47.8	1	-9.5	32.6	13.5	47.86	54	-6.14
18 to 26 GHz band									
RBW = 1 MHz, peak detection									
26	44.6	33.4	1	-9.5	35.0	19.5	52.96	74	-21.04
RBW = 1 MHz, average detection									
26	32.4	33.4	1	-9.5	35.0	19.5	40.76	54	-13.24
26 to 40 GHz band									
External mixer is used for this band									
Preamplifier is internal to Spectrum Analyzer, with gain factor built into firmware									
Antenna is mounted directly on external mixer, therefore cable = 0 dB									
RBW = 1 MHz, peak detection									
40	39.2	44.5	0.3	-20.0	0.0	0	63.70	74	-10.30
RBW = 1 MHz, average detection									
40	27.2	44.5	0.3	-20.0	0.0	0	51.70	54	-2.30

TEST RESULTS

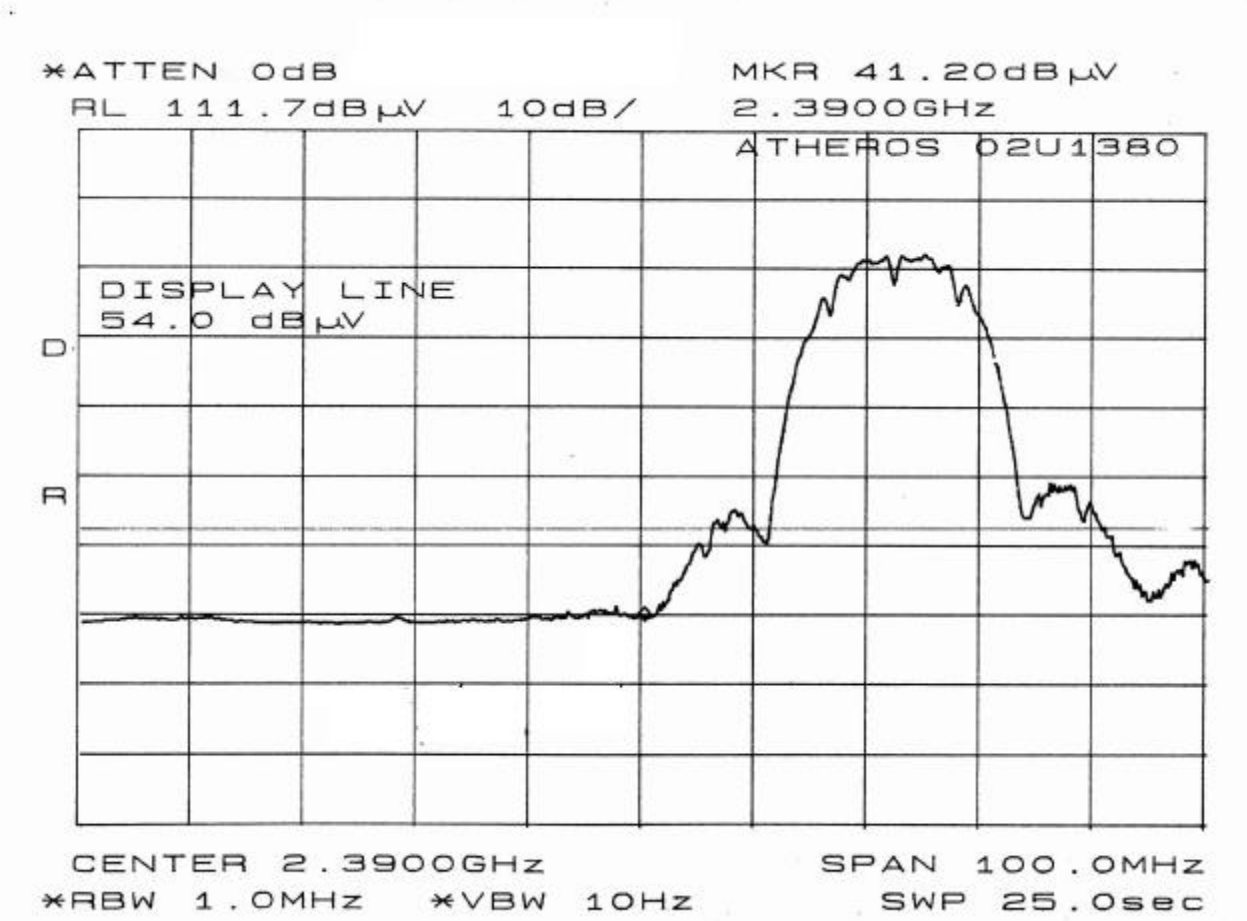
No non-compliance noted:

BAND EDGE RADIATED EMISSIONS

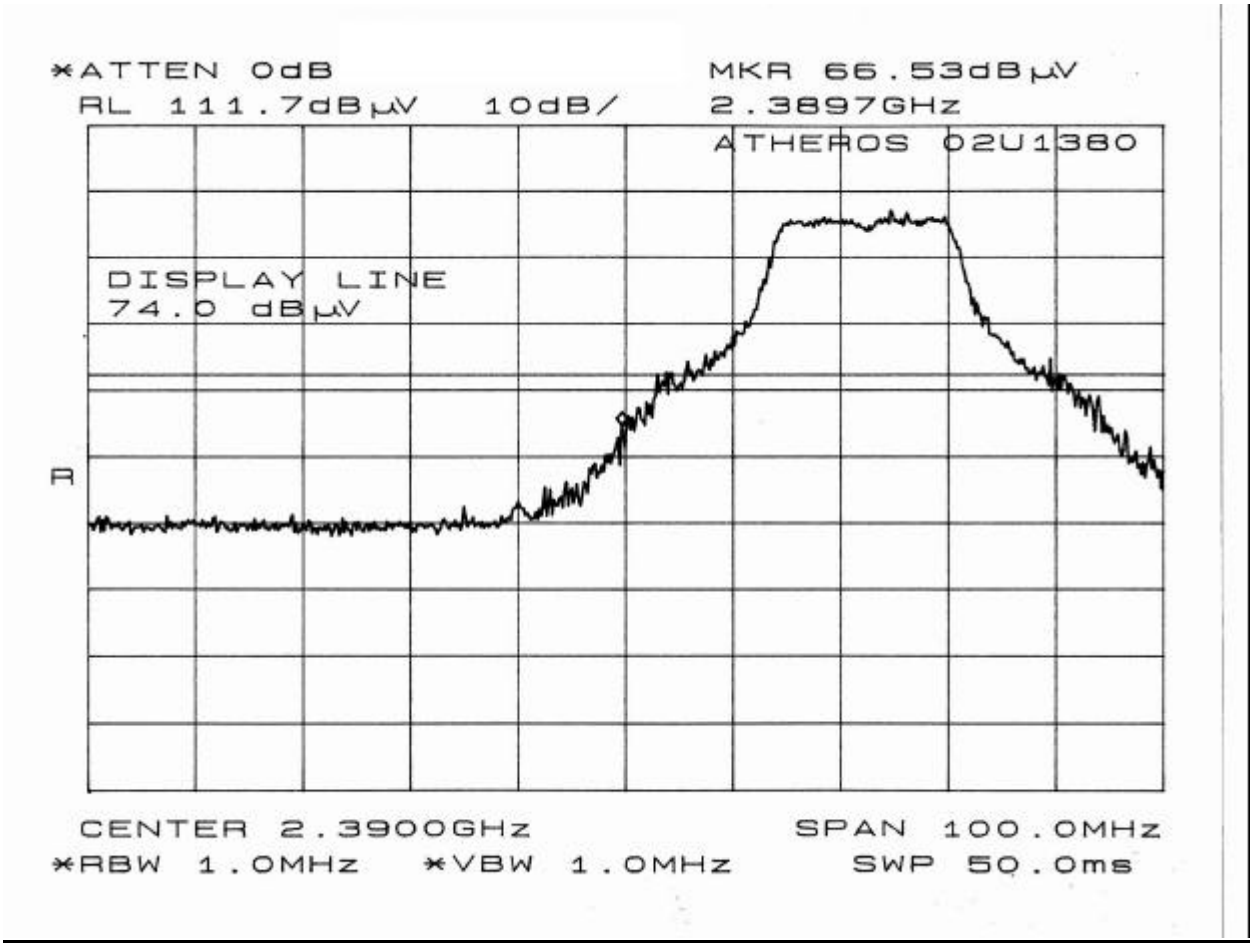
2.4 GHZ 11B BASE MODE LOW CHANNEL VERTICAL POLARIZATION PEAK



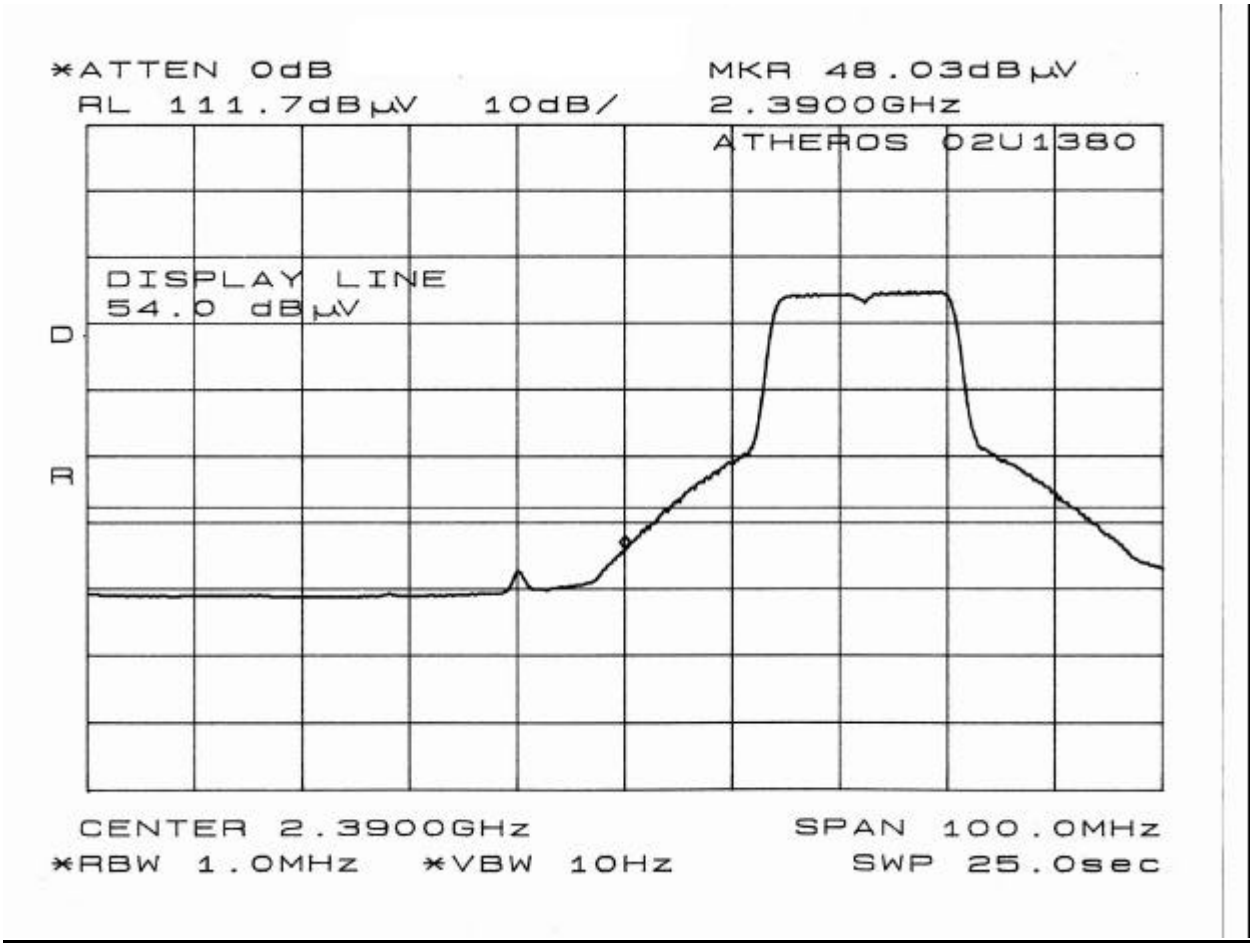
2.4 GHZ 11B BASE MODE LOW CHANNEL VERTICAL POLARIZATION AVERAGE



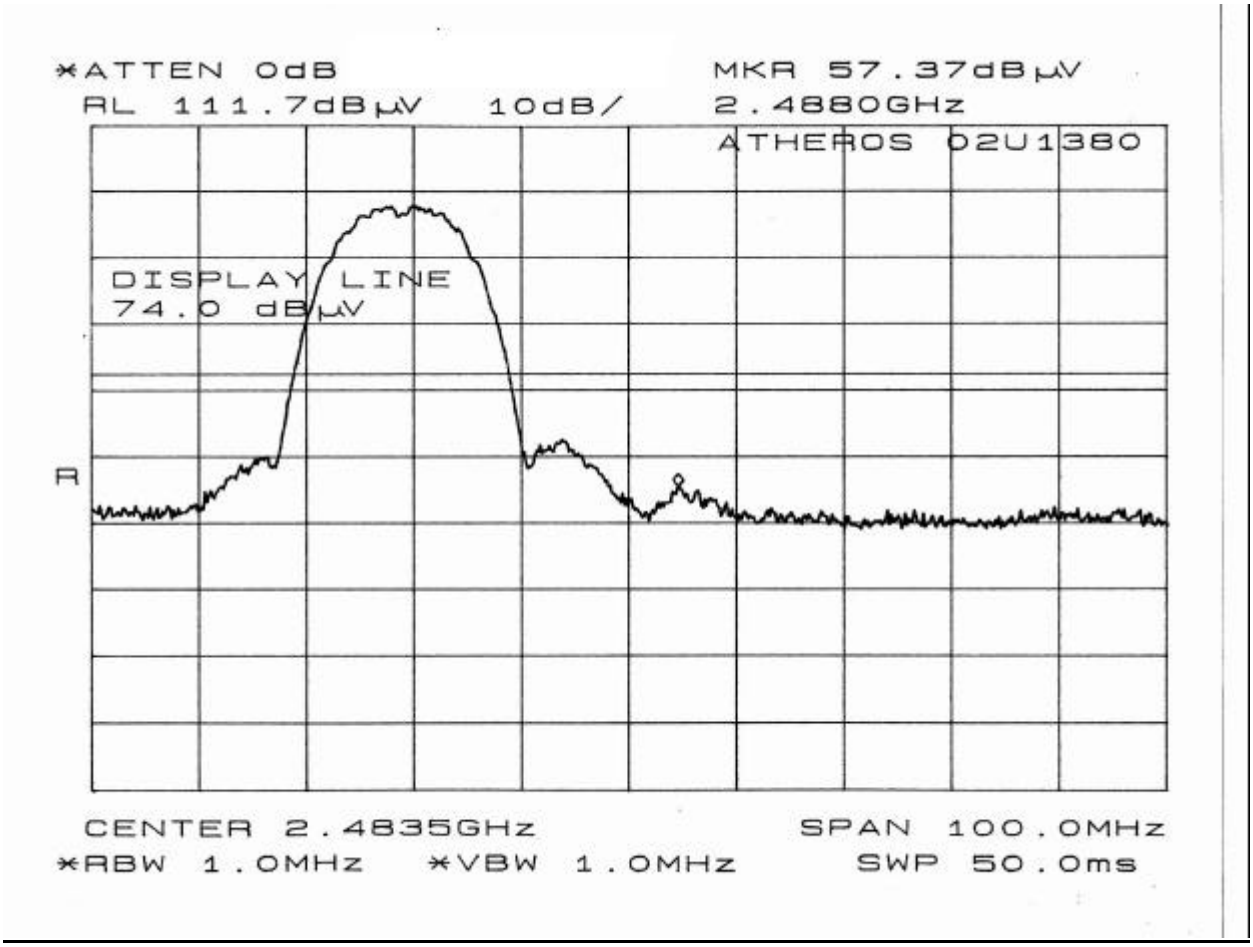
2.4 GHZ OFDM MODE LOW CHANNEL VERTICAL POLARIZATION PEAK



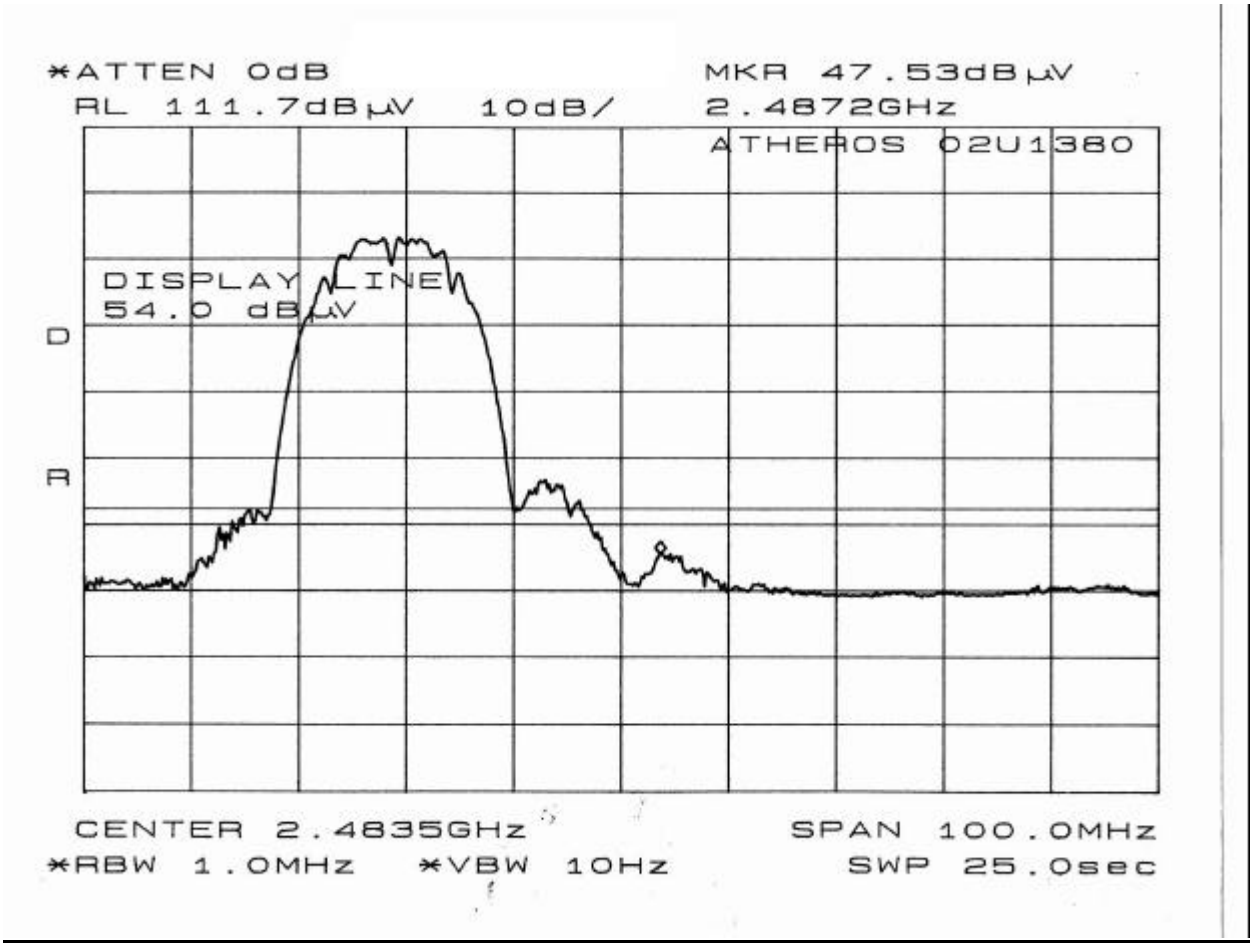
2.4 GHZ OFDM MODE LOW CHANNEL VERTICAL POLARIZATION AVERAGE



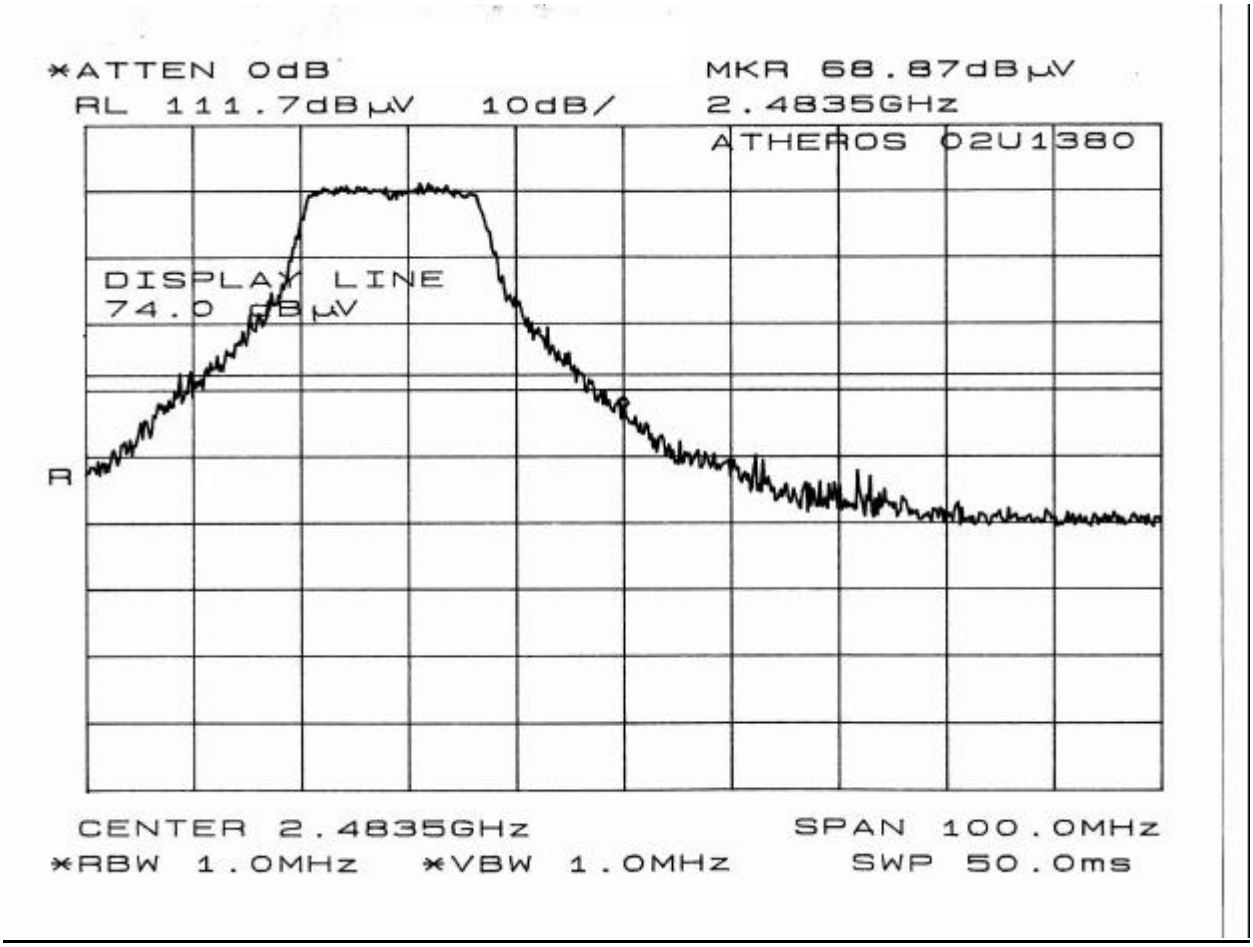
2.4 GHZ 11B BASE MODE HIGH CHANNEL VERTICAL POLARIZATION PEAK



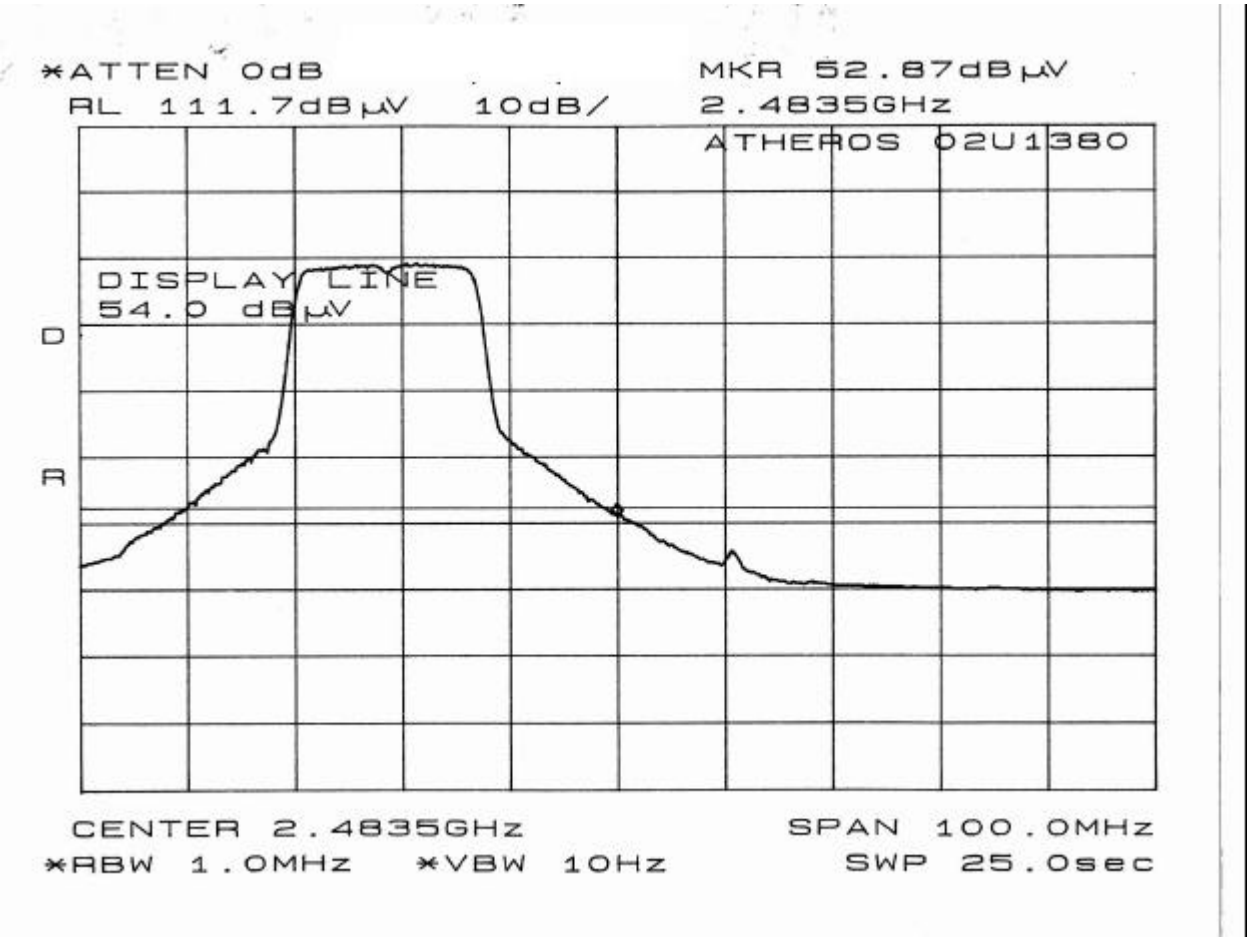
2.4 GHZ 11B BASE MODE HIGH CHANNEL VERTICAL POLARIZATION AVERAGE



2.4 GHZ OFDM MODE HIGH CHANNEL VERTICAL POLARIZATION PEAK



2.4 GHZ OFDM MODE HIGH CHANNEL VERTICAL POLARIZATION AVERAGE



FUNDAMENTAL, HARMONIC AND SPURIOUS RADIATED EMISSIONS

Compliance Certification Services A-Site 6/27/02 Mike H
Radiated Emissions Atheros 02U1380
FCC 15.247 Transmitting 11b Base Mode 2.4 Band Low Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
2.412	V	Peak	69.9	28.9	1	-9.5	0.0	2.3	91.56		
2.412	H	Peak	72.2	28.9	1	-9.5	0.0	2.3	93.86		
Band Edge:											
2.389	V	Peak	32.2	28.9	1	-9.5	0.0	2.3	53.86	74	-20.14
2.388	V	Avg	21.2	28.9	1	-9.5	0.0	2.3	42.86	54	-11.14
2.386	H	Peak	30.9	28.9	1	-9.5	0.0	2.3	52.56	74	-21.44
2.387	H	Avg	19.9	28.9	1	-9.5	0.0	2.3	41.56	54	-12.44
Harmonics and Spurious:											
4.464	V	Peak	41.2	32.9	1	-9.5	36.0	4.2	32.76	73.86	-41.10
4.464	H	Peak	39	32.9	1	-9.5	36.0	4.2	30.56	73.86	-43.30
4.824	V	Peak	46.5	34	1	-9.5	36.1	4.3	39.16	74	-34.84
4.824	V	Avg	38.8	34	1	-9.5	36.1	4.3	31.46	54	-22.54
4.824	H	Below System Noise Floor									
5.58	V	Peak	37.7	35.2	1	-9.5	36.3	4.4	31.46	73.86	-42.40
5.58	H	Below System Noise Floor									
6.333	V	Peak	48.5	35.4	1	-9.5	36.5	4.8	42.66	73.86	-31.20
6.333	H	Peak	46.3	35.4	1	-9.5	36.5	4.8	40.46	73.86	-33.40
7.236	V	Peak	51.8	37.2	1	-9.5	36.3	6	49.16	73.86	-24.70
7.236	H	Peak	49.5	37.2	1	-9.5	36.3	6	46.86	73.86	-27.00
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

Compliance Certification Services A-Site 6/27/02 Mike H

Radiated Emissions Atheros 02U1380

FCC 15.247 Transmitting 11b Base Mode 2.4 Band Mid Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
2.437	V	Peak	72.7	28.9	1	-9.5	0.0	2.3	94.36		
2.437	H	Peak	71.7	28.9	1	-9.5	0.0	2.3	93.36		
Harmonics and Spurious:											
4.484	V	Peak	42.8	32.9	1	-9.5	36.0	4.2	34.36	74.36	-40.00
4.484	H	Peak	40.2	32.9	1	-9.5	36.0	4.2	31.76	74.36	-42.60
4.874	V	Peak	48.5	34	1	-9.5	36.1	4.3	41.16	74	-32.84
4.874	V	Avg	41.3	34	1	-9.5	36.1	4.3	33.96	54	-20.04
4.874	H	Below System Noise Floor									
6.336	V	Peak	48.3	35.4	1	-9.5	36.5	4.8	42.46	74.36	-31.90
6.336	H	Peak	47.3	35.4	1	-9.5	36.5	4.8	41.46	74.36	-32.90
7.311	V	Peak	53.3	37.2	1	-9.5	36.3	6	50.66	74	-23.34
7.311	V	Avg	46.8	37.2	1	-9.5	36.3	6	44.16	54	-9.84
7.311	H	Peak	50.3	37.2	1	-9.5	36.3	6	47.66	74	-26.34
7.311	H	Avg	42	37.2	1	-9.5	36.3	6	39.36	54	-14.64
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

Compliance Certification Services A-Site 6/27/02 Mike H

Radiated Emissions Atheros 02U1380

FCC 15.247 Transmitting 11b Base Mode 2.4 Band High Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
2.462	V	Peak	73.7	28.9	1	-9.5	0.0	2.3	95.36		
2.462	H	Peak	71.7	28.9	1	-9.5	0.0	2.3	93.36		
Band Edge:											
2.488	V	Peak	35.7	28.9	1	-9.5	0.0	2.3	57.36	74	-16.64
2.487	V	Avg	25.9	28.9	1	-9.5	0.0	2.3	47.56	54	-6.44
2.489	H	Peak	33.7	28.9	1	-9.5	0.0	2.3	55.36	74	-18.64
2.488	H	Avg	25.4	28.9	1	-9.5	0.0	2.3	47.06	54	-6.94
Harmonics and Spurious:											
4.503	V	Peak	46.7	32.9	1	-9.5	36.0	4.2	38.26	74	-35.74
4.503	V	Avg	36.3	32.9	1	-9.5	36.0	4.2	27.86	54	-26.14
4.503	H	Below System Noise Floor									
4.924	V	Peak	48.5	34	1	-9.5	36.1	4.3	41.16	74	-32.84
4.924	V	Avg	42.3	34	1	-9.5	36.1	4.3	34.96	54	-19.04
4.924	H	Peak	45.7	34	1	-9.5	36.1	4.3	38.36	74	-35.64
4.924	H	Avg	35.2	34	1	-9.5	36.1	4.3	27.86	54	-26.14
5.62	V	Peak	39.3	35.2	1	-9.5	36.3	4.4	33.06	75.36	-42.30
5.62	H	Below System Noise Floor									
6.333	V	Peak	48.4	35.4	1	-9.5	36.5	4.8	42.56	75.36	-32.80
6.333	H	Peak	47	35.4	1	-9.5	36.5	4.8	41.16	75.36	-34.20
7.386	V	Peak	53.7	37.2	1	-9.5	36.3	6	51.06	74	-22.94
7.386	V	Avg	47	37.2	1	-9.5	36.3	6	44.36	54	-9.64
7.386	H	Peak	50.7	37.2	1	-9.5	36.3	6	48.06	74	-25.94
7.386	H	Avg	42.3	37.2	1	-9.5	36.3	6	39.66	54	-14.34
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

Compliance Certification Services A-Site 6/27/02 Mike H

Radiated Emissions Atheros 02U1380

FCC 15.247 Transmitting 11g OFDM Mode 2.4 Band Low Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
2.412	V	Peak	67.7	28.9	1	-9.5	0.0	2.3	89.36		
2.412	H	Peak	71.4	28.9	1	-9.5	0.0	2.3	93.06		
Band Edge:											
2.39	V	Peak	44.9	28.9	1	-9.5	0.0	2.3	66.56	74	-7.44
2.39	V	Avg	26.4	28.9	1	-9.5	0.0	2.3	48.06	54	-5.94
2.39	H	Peak	40.5	28.9	1	-9.5	0.0	2.3	62.16	74	-11.84
2.39	H	Avg	24.2	28.9	1	-9.5	0.0	2.3	45.86	54	-8.14
Harmonics and Spurious:											
4.464	V	Peak	43.2	32.9	1	-9.5	36.0	4.2	34.76	73.06	-38.30
4.464	H	Peak	40.3	32.9	1	-9.5	36.0	4.2	31.86	73.06	-41.20
4.824	V	Peak	49.7	34	1	-9.5	36.1	4.3	42.36	74	-31.64
4.824	V	Avg	36	34	1	-9.5	36.1	4.3	28.66	54	-25.34
4.824	H	Below System Noise Floor									
5.58	V	Peak	38.2	35.2	1	-9.5	36.3	4.4	31.96	73.06	-41.10
5.58	H	Peak	36.3	35.2	1	-9.5	36.3	4.4	30.06	73.06	-43.00
6.333	V	Peak	45.8	35.4	1	-9.5	36.5	4.8	39.96	73.06	-33.10
6.333	H	Peak	44.2	35.4	1	-9.5	36.5	4.8	38.36	73.06	-34.70
7.236	V	Peak	55.5	37.2	1	-9.5	36.3	6	52.86	73.06	-20.20
7.236	H	Peak	52.2	37.2	1	-9.5	36.3	6	49.56	73.06	-23.50
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

Compliance Certification Services A-Site 6/27/02 Mike H

Radiated Emissions Atheros 02U1380

FCC 15.247 Transmitting 11g OFDM Mode 2.4 Band Mid Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
2.437	V	Peak	70.2	28.9	1	-9.5	0.0	2.3	91.86		
2.437	H	Peak	70.7	28.9	1	-9.5	0.0	2.3	92.36		
Harmonics and Spurious:											
4.484	V	Peak	44.7	32.9	1	-9.5	36.0	4.2	36.26	72.36	-36.10
4.484	H	Peak	41	32.9	1	-9.5	36.0	4.2	32.56	72.36	-39.80
4.874	V	Peak	48.8	34	1	-9.5	36.1	4.3	41.46	74	-32.54
4.874	V	Avg	34	34	1	-9.5	36.1	4.3	26.66	54	-27.34
4.874	H	Below System Noise Floor									
6.336	V	Peak	45.6	35.4	1	-9.5	36.5	4.8	39.76	72.36	-32.60
6.336	H	Peak	44.8	35.4	1	-9.5	36.5	4.8	38.96	72.36	-33.40
7.311	V	Peak	56.3	37.2	1	-9.5	36.3	6	53.66	74	-20.34
7.311	V	Avg	42.6	37.2	1	-9.5	36.3	6	39.96	54	-14.04
7.311	H	Peak	52.7	37.2	1	-9.5	36.3	6	50.06	74	-23.94
7.311	H	Avg	38.3	37.2	1	-9.5	36.3	6	35.66	54	-18.34
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

Compliance Certification Services A-Site 6/27/02 Mike H

Radiated Emissions Atheros 02U1380

FCC 15.247 Transmitting 11g OFDM Mode 2.4 Band High Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
2.462	V	Peak	72.2	28.9	1	-9.5	0.0	2.3	93.86		
2.462	H	Peak	69.7	28.9	1	-9.5	0.0	2.3	91.36		
Band Edge:											
2.4835	V	Peak	47.2	28.9	1	-9.5	0.0	2.3	68.86	74	-5.14
2.4835	V	Avg	31.2	28.9	1	-9.5	0.0	2.3	52.86	54	-1.14
2.4835	H	Peak	42.9	28.9	1	-9.5	0.0	2.3	64.56	74	-9.44
2.4835	H	Avg	18.4	28.9	1	-9.5	0.0	2.3	40.06	54	-13.94
Harmonics and Spurious:											
4.503	V	Peak	46.5	32.9	1	-9.5	36.0	4.2	38.06	74	-35.94
4.503	V	Avg	36.8	32.9	1	-9.5	36.0	4.2	28.36	54	-25.64
4.503	H	Below System Noise Floor									
4.924	V	Peak	48.7	34	1	-9.5	36.1	4.3	41.36	74	-32.64
4.924	V	Avg	34.2	34	1	-9.5	36.1	4.3	26.86	54	-27.14
4.924	H	Below System Noise Floor									
5.62	V	Peak	37.1	35.2	1	-9.5	36.3	4.4	30.86	73.86	-43.00
5.62	H	Peak	35.2	35.2	1	-9.5	36.3	4.4	28.96	73.86	-44.90
6.333	V	Peak	45.3	35.4	1	-9.5	36.5	4.8	39.46	73.86	-34.40
6.333	H	Peak	44.5	35.4	1	-9.5	36.5	4.8	38.66	73.86	-35.20
7.386	V	Peak	56	37.2	1	-9.5	36.3	6	53.36	74	-20.64
7.386	V	Avg	42.5	37.2	1	-9.5	36.3	6	39.86	54	-14.14
7.386	H	Peak	52.7	37.2	1	-9.5	36.3	6	50.06	74	-23.94
7.386	H	Avg	39	37.2	1	-9.5	36.3	6	36.36	54	-17.64
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

Compliance Certification Services A-Site 6/28/02 Mike H

Radiated Emissions Atheros 02U1380

FCC 15.247 Transmitting 11a Base Mode 5.8 Band Low Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
5.745	V	Peak	67.8	35.3	1	-9.5	0.0	4	97.56		
5.745	H	Peak	58.9	35.3	1	-9.5	0.0	4	88.66		
Harmonics and Spurious:											
11.49	V	Peak	49.2	39.7	1	-9.5	36.1	8.4	51.66	74	-22.34
11.49	V	Avg	34.2	39.7	1	-9.5	36.1	8.4	36.66	54	-17.34
11.49	H	Peak	46.7	39.7	1	-9.5	36.1	8.4	49.16	74	-24.84
11.49	H	Avg	31.9	39.7	1	-9.5	36.1	8.4	34.36	54	-19.64
22.98	V	Peak	55.1	32.6	1	-9.5	39.4	7.9	46.66	74	-27.34
22.98	V	Avg	39.9	32.6	1	-9.5	39.4	7.9	31.46	54	-22.54
22.98	H	Below System Noise Floor									
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

Compliance Certification Services A-Site 6/28/02 Mike H

Radiated Emissions Atheros 02U1380

FCC 15.247 Transmitting 11a Base Mode 5.8 Band Mid Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
5.785	V	Peak	67.8	35.3	1	-9.5	0.0	4	97.56		
5.785	H	Peak	58.9	35.3	1	-9.5	0.0	4	88.66		
Harmonics and Spurious:											
11.57	V	Peak	56.5	39.7	1	-9.5	36.1	8.4	58.96	74	-15.04
11.57	V	Avg	41.2	39.7	1	-9.5	36.1	8.4	43.66	54	-10.34
11.57	H	Peak	50.3	39.7	1	-9.5	36.1	8.4	52.76	74	-21.24
11.57	H	Avg	36.7	39.7	1	-9.5	36.1	8.4	39.16	54	-14.84
23.14	V	Peak	47.2	32.7	1	-9.5	39.5	7.9	38.76	77.56	-38.80
23.14	H	Below System Noise Floor									
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

Compliance Certification Services A-Site 6/28/02 Mike H

Radiated Emissions Atheros 02U1380

FCC 15.247 Transmitting 11a Base Mode 5.8 Band High Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
5.825	V	Peak	67.8	35.3	1	-9.5	0.0	4	97.56		
5.825	H	Peak	58.9	35.3	1	-9.5	0.0	4	88.66		
Harmonics and Spurious:											
11.65	V	Peak	54.5	39.7	1	-9.5	36.1	8.5	57.06	74	-16.94
11.65	V	Avg	39.7	39.7	1	-9.5	36.1	8.5	42.26	54	-11.74
11.65	H	Peak	50.2	39.7	1	-9.5	36.1	8.5	52.76	74	-21.24
11.65	H	Avg	35.2	39.7	1	-9.5	36.1	8.5	37.76	54	-16.24
23.3	V	Peak	44.2	32.8	1	-9.5	39.5	8	35.96	77.56	-41.60
23.3	H	Below System Noise Floor									
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

Compliance Certification Services A-Site 6/28/02 Mike H
Radiated Emissions Atheros 02U1380
FCC 15.247 Transmitting 11a Turbo Mode 5.8 Band Low Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
5.76	V	Peak	67.8	35.3	1	-9.5	0.0	4	97.56		
5.76	H	Peak	58.9	35.3	1	-9.5	0.0	4	88.66		
Harmonics and Spurious:											
11.52	V	Peak	49.5	39.7	1	-9.5	36.1	8.4	51.96	74	-22.04
11.52	V	Avg	34.9	39.7	1	-9.5	36.1	8.4	37.36	54	-16.64
11.52	H	Peak	50.2	39.7	1	-9.5	36.1	8.4	52.66	74	-21.34
11.52	H	Avg	32.2	39.7	1	-9.5	36.1	8.4	34.66	54	-19.34
23.04	V	Peak	55	32.6	1	-9.5	39.4	7.9	46.56	74	-27.44
23.04	V	Avg	40.2	32.6	1	-9.5	39.4	7.9	31.76	54	-22.24
23.04	H	Below System Noise Floor									
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

Compliance Certification Services A-Site 6/28/02 Mike H
Radiated Emissions Atheros 02U1380
FCC 15.247 Transmitting 11a Turbo Mode 5.8 Band High Channel

Specification Distance: 3 meters

Freq GHz	Pol V/H	Det	SA dBuV	AF dB/m	Dist m	Dist dB	Preamp dB	Cable / HPF dB	Field dBuV/m	Limit dBuV/m	Margin dB
Note 1: RBW = 100 kHz for fundamental and spurious emissions outside restricted bands.											
Note 2: RBW = 1 MHz for spurious emissions within restricted bands.											
Fundamental:											
5.8	V	Peak	67.8	35.3	1	-9.5	0.0	4	97.56		
5.8	H	Peak	58.9	35.3	1	-9.5	0.0	4	88.66		
Harmonics and Spurious:											
11.6	V	Peak	54.2	39.7	1	-9.5	36.1	8.5	56.76	74	-17.24
11.6	V	Avg	39	39.7	1	-9.5	36.1	8.5	41.56	54	-12.44
11.6	H	Peak	48.2	39.7	1	-9.5	36.1	8.5	50.76	74	-23.24
11.6	H	Avg	33.4	39.7	1	-9.5	36.1	8.5	35.96	54	-18.04
23.2	V	Peak	45.7	32.7	1	-9.5	39.5	8	37.36	77.56	-40.20
23.2	H	Below System Noise Floor									
Note 3: No other non-harmonic spurious emissions were found.											
Note 4: All other harmonic spurious emissions were below system noise floor.											

DIGITAL DEVICE RADIATED EMISSIONS

COMPLIANCE Certification Services
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 #:	02U1380-1
Report #:	020625A1
Date& Time:	06/25/02 6:51 PM
Test Engr:	Thanh Nguyen
Company:	ATHEROS COMMUNICATION, INC.
EUT Description:	802.11a/b/g Cardbus
Test Configuration :	EUT plugin the Laptop,Printer,modem
Type of Test:	FCC Class B
Mode of Operation:	TX Mode at Lower UNII Mid Channel 5.6GHz

<< Main Sheet

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
401.42	49.10	15.65	3.26	27.82	40.19	46.00	-5.81	3mV	270.00	1.00	P
500.31	46.80	17.97	3.68	28.40	40.05	46.00	-5.95	3mV	270.00	1.00	P
398.52	48.90	15.61	3.24	27.80	39.95	46.00	-6.05	3mV	270.00	1.00	P
400.00	47.20	15.62	3.25	27.81	38.26	46.00	-7.74	3mV	270.00	1.00	P
146.97	44.10	15.93	1.90	27.42	34.51	43.50	-8.99	3mV	180.00	1.00	P
167.22	43.00	16.42	2.02	27.36	34.08	43.50	-9.42	3mV	90.00	1.00	P
6 Worst Data											

Note: Changing the transmitter band, mode or channel does not affect these emissions.

8.9. POWER LINE CONDUCTED EMISSIONS

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

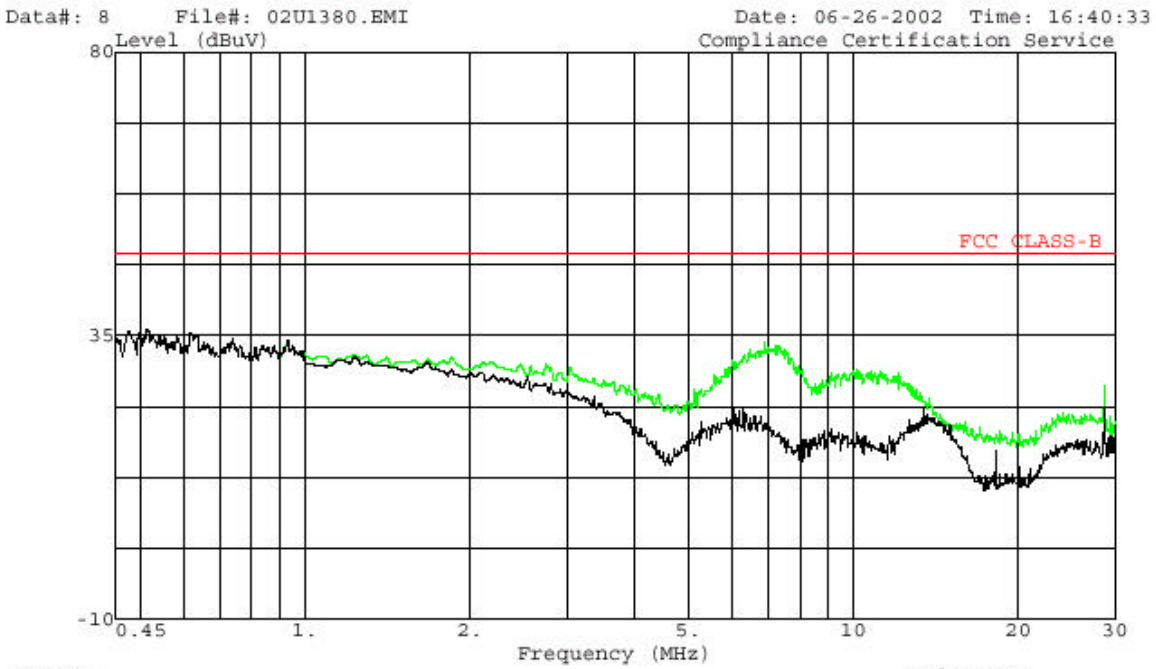
The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

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

RESULTS

No non-compliance noted:

COMPLIANCE Engineering Services, Inc.
561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888



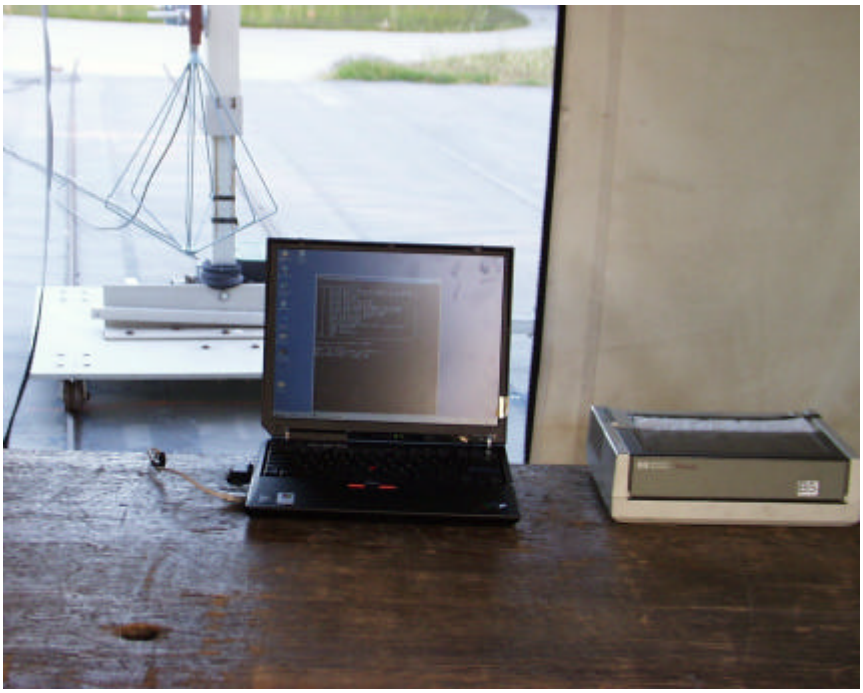
Trace: 3 Ref Trace:
Project # : 02U1380-1
Test Engineer: Thanh Nguyen
Company : ATHEROS COMMUNICATIONS, INC.
EUT : 802.11 a/b/g
: Model: CB22
Test Config : EUT/laptop/ printer/ mouse
Type of Test : FCC Class B
Mode of Op. : Tx
: L1: PK (Green), L2 (Black)
: 115VAc, 60Hz

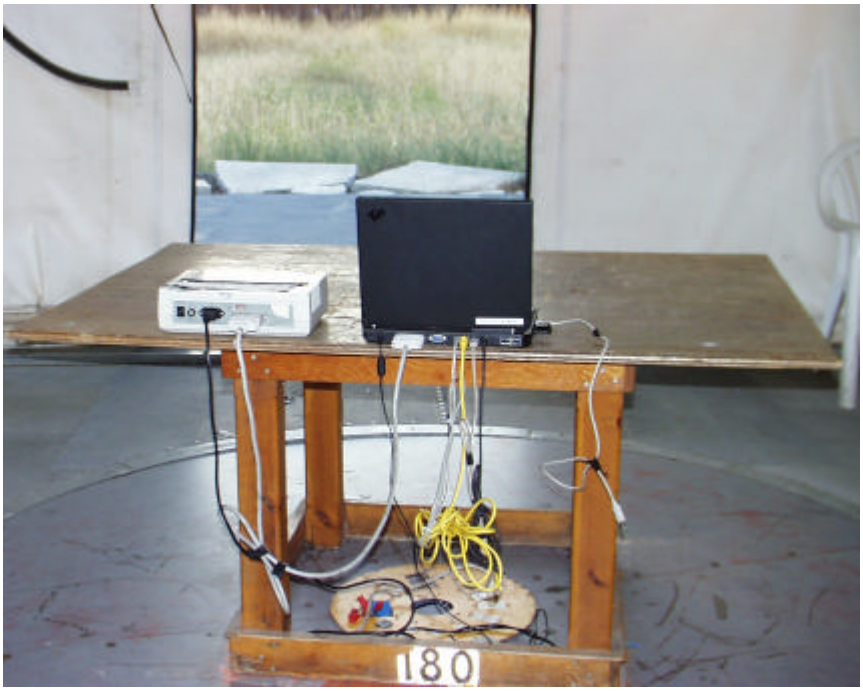
8.10. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

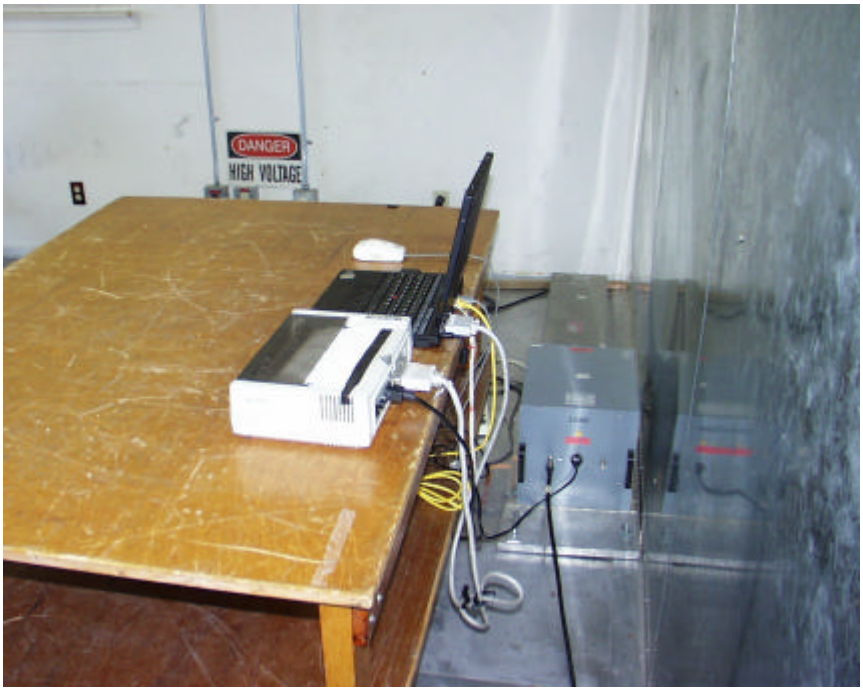
TRANSMITTER RADIATED RF MEASUREMENT SETUP

DIGITAL DEVICE RADIATED EMISSIONS MEASUREMENT SETUP





POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



END OF REPORT