Intertek Testing Services
ETL SEMKO

TEST REPORT

Report Number: 30267461
Project Number: 3026746
Report Date: June 24, 2002

Testing performed on the
Internet Location Modem
Model: iLM2720
FCC ID: PDCILM272XSW

to
FCC Parts 22 and 24

for
At Road

Test Performed by:
Intertek Testing Services
1365 Adams Court
Menlo Park, CA 94025

Test Authorized by:
At Road
47200 Bayside Parkway
Fremont, CA 94538

Prepared by: David Chernomordik **Date:** 6/25/02
David Chernomordik
EMC Technical Manager

Reviewed by: [signature] **Date:** 6/28/02
Ollie Moyrong
EMC Manager

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* See file “RF exposure info”

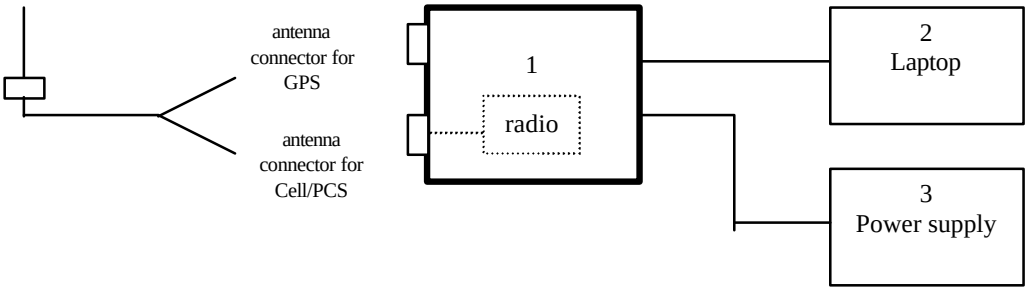
1.2 Product Description

The At Road, Inc. Model ILM2720 is Internet Location Modem.

For more information, please refer to the attached product description.

Use of Product	Internet Location Modem
Whether quantity (>1) production is planned	[X] Yes, [ ] No
Cellular Phone standards	CDMA
Type(s) of Emission	1M25F9W
RF Output Power	824-849 MHz: 23 dBm (Average) 1850-1910 MHz: 23 dBm (Average)
Frequency Range	824 - 849 MHz, 1850 - 1910 MHz
Antenna(e) & Gain	8 dBi maximum in Cellular Band 5 dBi maximum in PCS Band
Detachable antenna ? **Receiver L.O. frequency** **External input**	[X]Yes [ ] No [] Audio [X] Digital Data

1.3 Test Configuration



Item #	Description	Make	Model No.	Serial No.
1	EUT	At Road	ILM2720	Not labeled
2	Laptop	Compaq	Armada 1750	6333/T/6400/D/M/1
3	Power supply	EXTECH	EP-3003	D30030012

1.4 Related Submittal(s) Grants

None

2.0 RF Power Output
FCC 2.1046

2.1 Test Procedure

The transmitter output was connected to the Average Power Meter. The output power was adjusted to 23 dBm. The transmitter output was connected a calibrated coaxial attenuator, the other end of which was connected to a spectrum analyzer. The resolution and video bandwidths of the spectrum analyzer were set up to 10 MHz and 7 MHz accordingly. The peak power at the transmitter output was determined by adding the value of the attenuator and cable loss to the spectrum analyzer reading.
Tests were performed at three frequencies (low, middle, and high channels) in Cellular in PCS bands.

2.2 Test Equipment

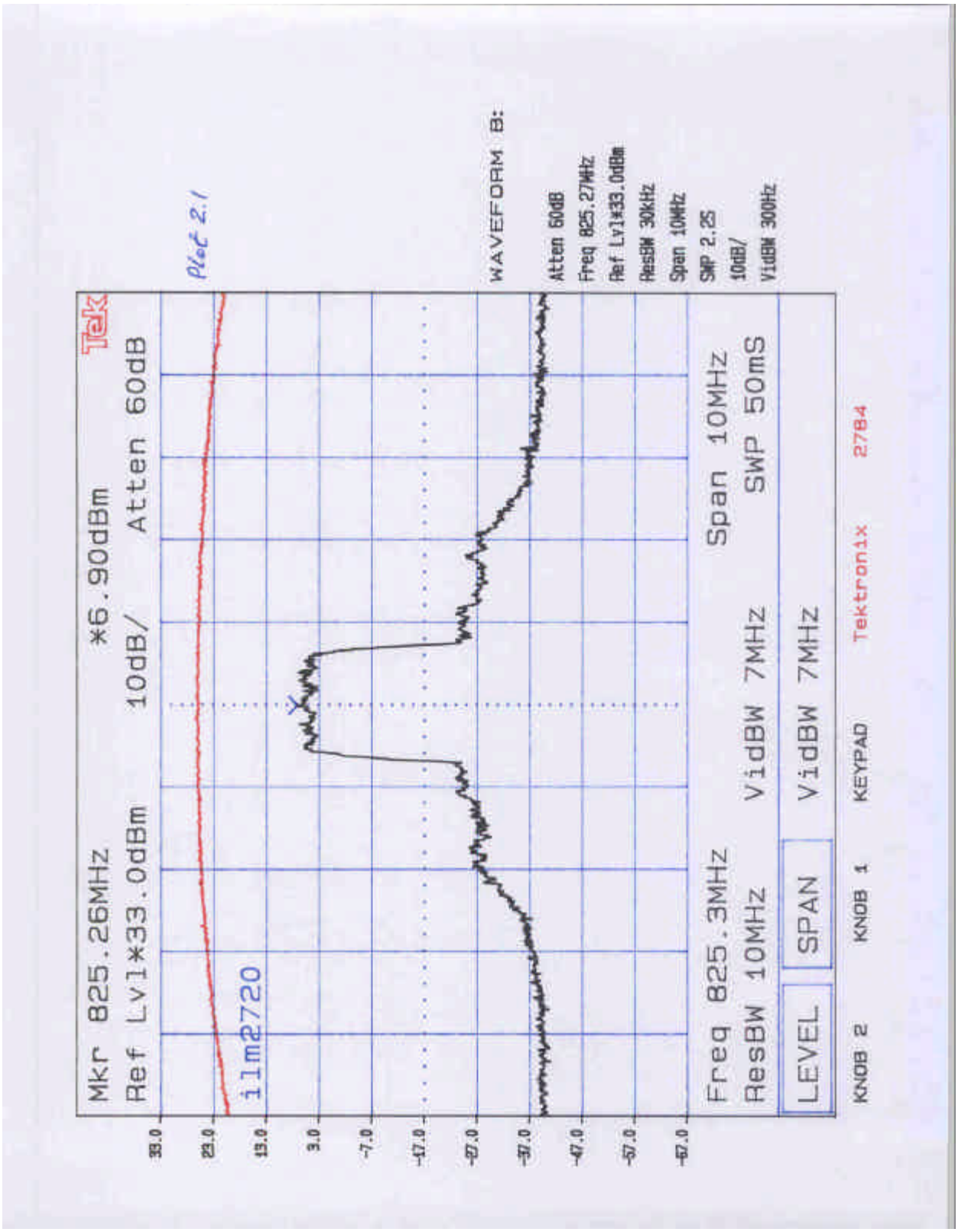
Gigatronics 8542 Power Meter
Tektronix 2784 Spectrum Analyzer, 100 Hz – 40 GHz
10 dB Attenuator

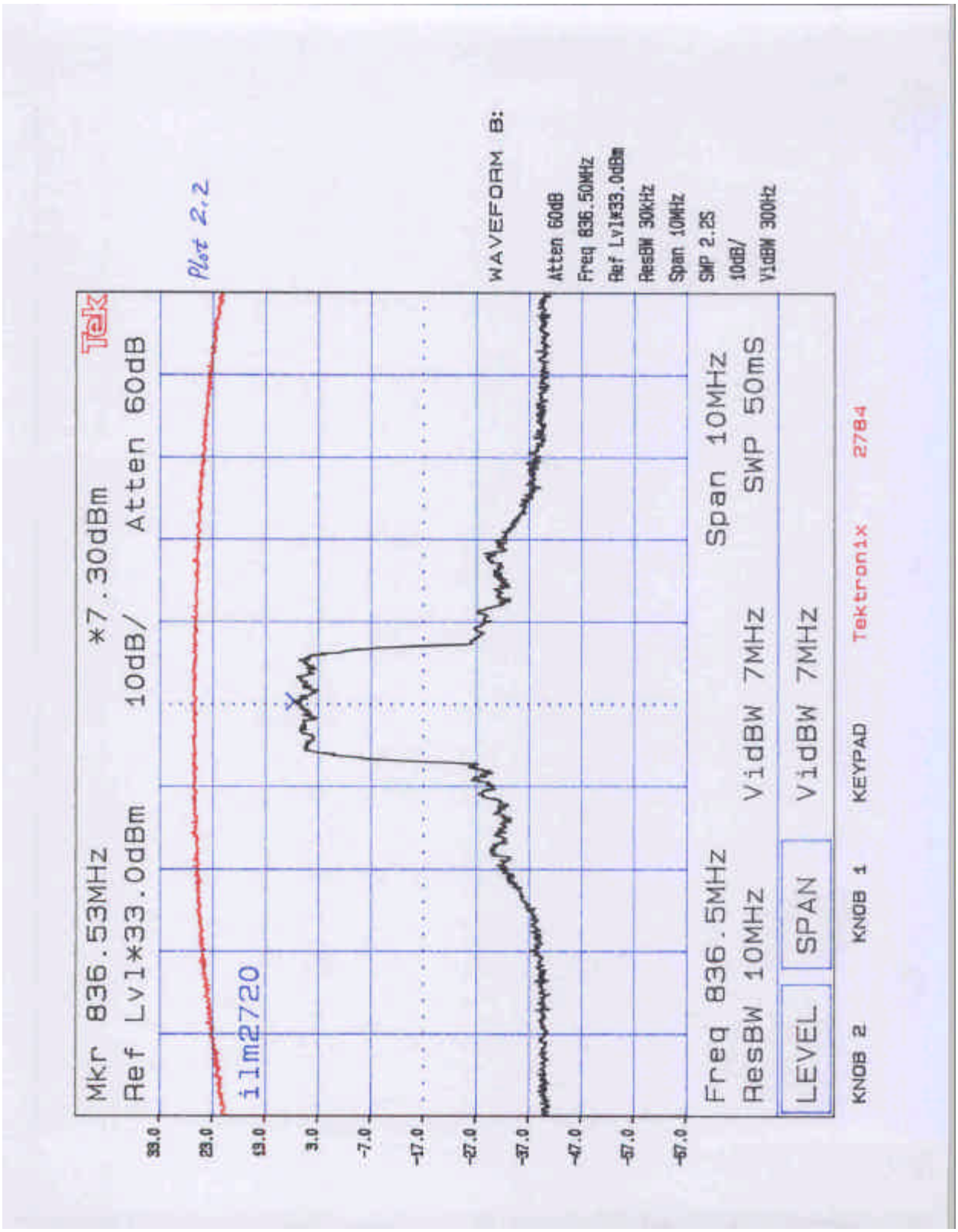
2.3 Test Results

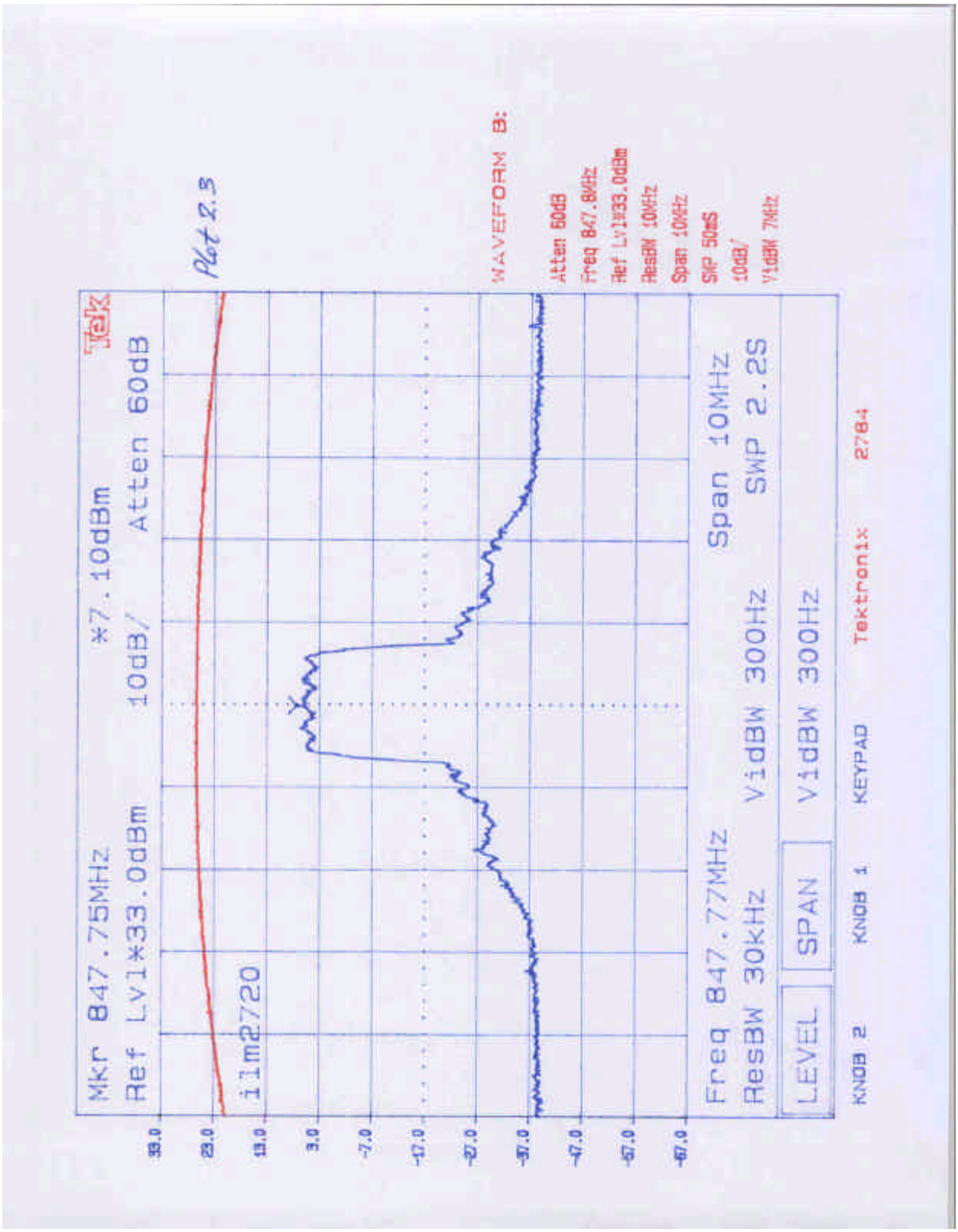
Frequency (MHz)	Average Power (dBm)	Measured Peak Power (dBm)
825.25	23.0	26.8
836.5	23.0	26.9
847.75	23.0	27.1
1851.25	23.0	26.9
1880.0	23.0	27.0
1908.75	23.0	26.8

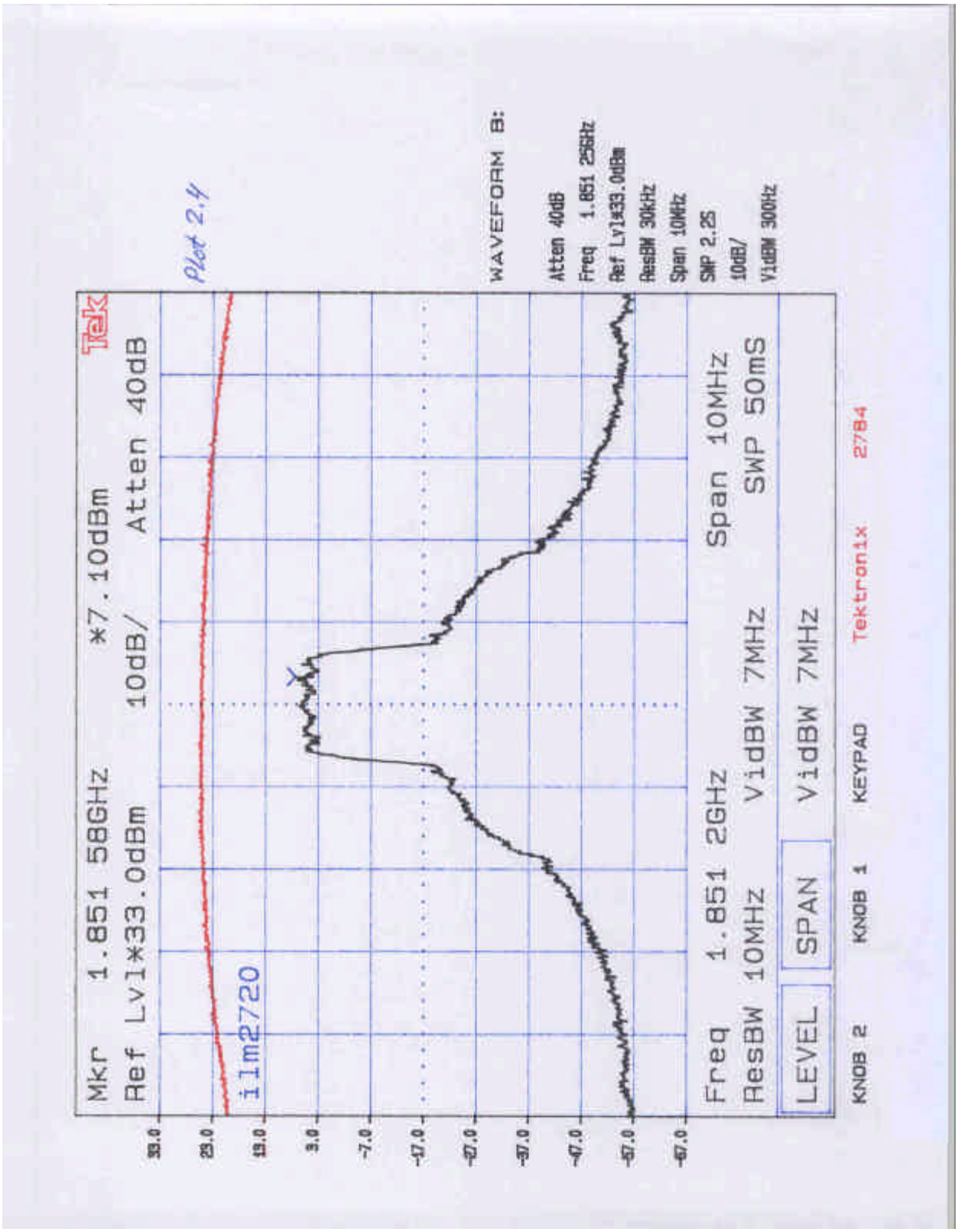
For more details refer to the attached plots:

Cellular Band (CDMA Mode)	
Plot Number	**Description**
2.1	Low Channel
2.2	Middle Channel
2.3	High Channel
PCS Band (CDMA Mode)	
Plot Number	**Description**
2.4	Low Channel
2.5	Middle Channel
2.6	High Channel

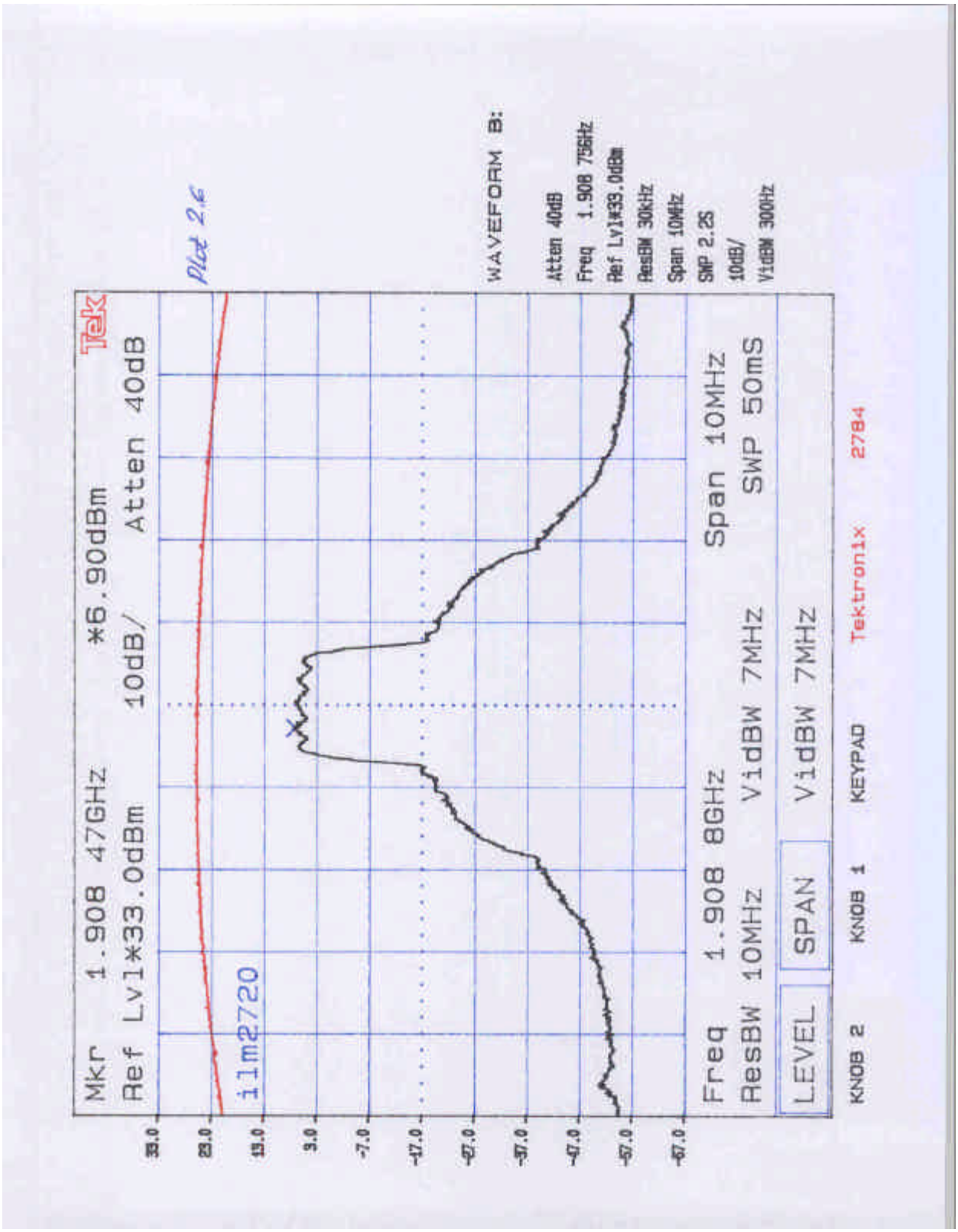

Mkr 825.26MHz
*6.90dBm
Ref Lvl*33.0dBm
10dB/
Atten 60dB
Ref 2.1
11m2720
WAVEFORM B:
Atten 60dB
Freq 825.27MHz
Ref Lvl*33.0dBm
ResBW 30kHz
Span 10MHz
SWP 2.2S
10dB/
VidBW 300Hz
Freq 825.3MHz
ResBW 10MHz
Span 10MHz
VidBW 7MHz
SWP 50mS
VidBW 7MHz
LEVEL
SPAN
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
33.0
23.0
13.0
3.0
-7.0
-17.0
-27.0
-37.0
-47.0
-57.0
-67.0


Plot 2,2
WAVEFORM B:
Atten 60dB
Freq 836.50MHz
Ref Lvl*33.0dBm
ResBW 30kHz
Span 10MHz
SWP 2.2S
10dB/
VidBW 300Hz
Tek
Mkr 836.53MHz
Ref Lvl*33.0dBm
*7.30dBm
10dB/
Atten 60dB
i1m2720
Freq 836.5MHz
ResBW 10MHz
VidBW 7MHz
Span 10MHz
SWP 50mS
VidBW 7MHz
LEVEL
SPAN
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
33.0
23.0
13.0
3.0
-7.0
-17.0
-27.0
-37.0
-47.0
-57.0
-67.0


Plot 2.3
WAVEFORM B:
Atten 60dB
Freq 847.8MHz
Ref Lvl=33.0dBm
ResBW 10KHz
Span 10MHz
SWP 50mS
10dB/
VidBW 7MHz
Mkr 847.75MHz
Ref Lvl*33.0dBm
*7.10dBm
10dB/
Atten 60dB
i1m2720
Freq 847.77MHz
ResBW 30KHz
VidBW 300Hz
Span 10MHz
SWP 2.2S
VidBW 300Hz
LEVEL
SPAN
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
33.0
23.0
13.0
3.0
-7.0
-17.0
-27.0
-37.0
-47.0
-57.0
-67.0


Plot 2.4
Tek
Mkr 1.851 58GHz *7.10dBm
Ref Lvl*33.0dBm 10dB/ Atten 40dB
i1m2720
WAVEFORM B:
Atten 40dB
Freq 1.851 25GHz
Ref Lvl*33.0dBm
ResBW 30kHz
Span 10MHz
SWP 2.2S
10dB/
VidBW 300Hz
Freq 1.851 2GHz
ResBW 10MHz
Span 10MHz
VidBW 7MHz
SWP 50mS
VidBW 7MHz
LEVEL
SPAN
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


Plot 2.5
WAVEFORM B:
Atten 40dB
Freq 1.880 00GHz
Ref Lvl*33.0dBm
ResBW 30kHz
Span 10MHz
SWP 2.2S
10dB/
VidBW 300Hz
Mkr 1.879 69GHz *7.20dBm
Ref Lvl*33.0dBm 10dB/ Atten 40dB
i1m2720
Freq 1.880 0GHz Span 10MHz
ResBW 10MHz VidBW 7MHz SWP 50mS
LEVEL SPAN VidBW 7MHz
KNOB 2 KNOB 1 KEYPAD Tektronix 2784
33.0
23.0
13.0
3.0
-7.0
-17.0
-27.0
-37.0
-47.0
-57.0
-67.0


Plot 2-6
Tek
Mkr 1.908 47GHz *6.90dBm
Ref Lvl*33.0dBm 10dB/ Atten 40dB
11m2720
WAVEFORM B:
Atten 40dB
Freq 1.908 75GHz
Ref Lvl*33.0dBm
ResBW 30kHz
Span 10MHz
SWP 2.2S
10dB/
VidBW 300Hz
Freq 1.908 8GHz Span 10MHz
ResBW 10MHz VidBW 7MHz SWP 50mS
LEVEL SPAN VidBW 7MHz
KNOB 2 KNOB 1 KEYPAD Tektronix 2784

3.0 Radiated Power

FCC 22.913

The Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

FCC 24.232
The Equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

3.1 Test Procedure

The ERP/EIRP was calculated by adding the antenna gain (in dBd or dBi) to the output power in dBm.

3.2 Test Result

The antenna supplied with the device has a gain of 3 dBi. However, according to Installation Guide, the maximum allowed antenna gain is: 8 dBi for the Cellular band and 5 dBi for the PCS bang. Therefore,

In the band 824-849 MHz
the maximum ERP = 28.9 dBm (average)
the maximum ERP = 33.0 dBm (peak)
In the band 1850-1910 MHz
the maximum EIRP = 28.0 dBm (average)
the maximum EIRP = 32.0 dBm (peak)

Complies	

4.0 Occupied Bandwidth

FCC 2.1049

4.1 Test Procedure

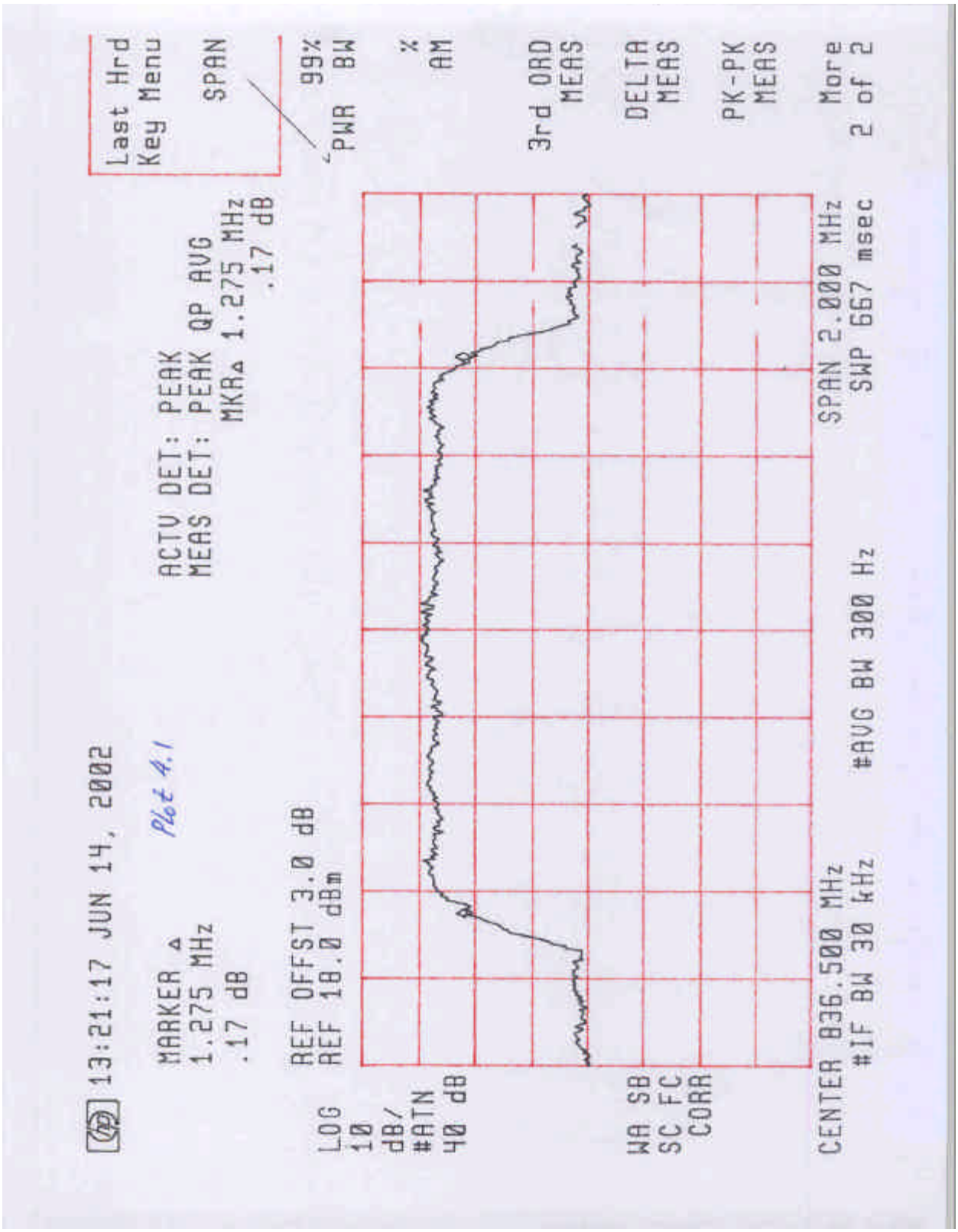
The transmitter output was connected to a calibrated coaxial attenuator, the other end of which was connected to a spectrum analyzer. The Occupied Bandwidth (defined as the 99% Power Bandwidth) was measured with HP8546A Spectrum Analyzer.

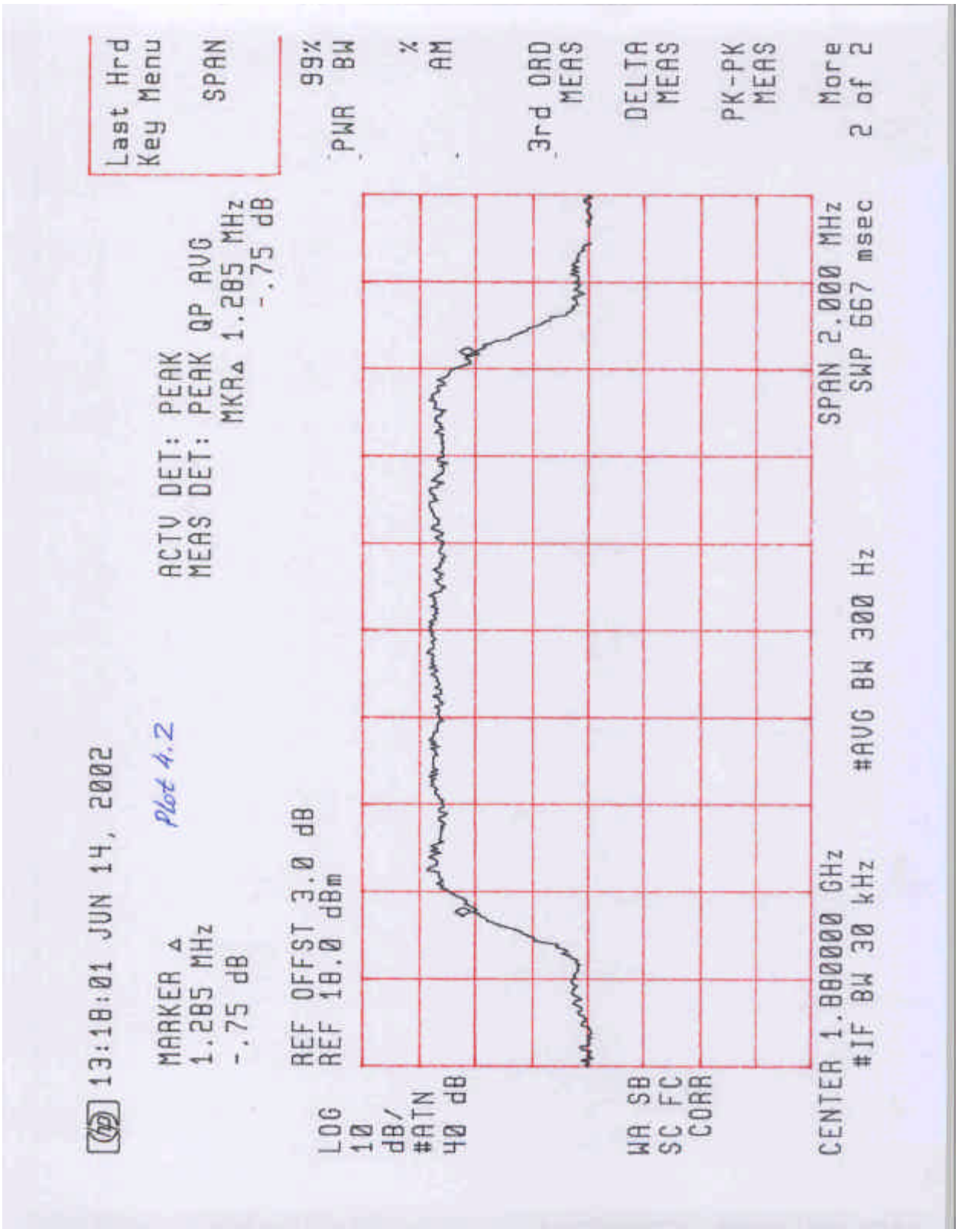
4.2 Test Equipment

Hewlett Packard HP8546A Spectrum Analyzer

4.3 Test Results

See attached plots 4.1 and 4.2. The test result shows that the bandwidth is 1.288 MHz, which is 3% higher than the theoretical bandwidth for CDMA - 1.25 MHz. The Emission Designator was determined as 1M25F9W


Last Hrd Key Menu
SPAN
99% PWR BW
% AM
3rd ORD MEAS
DELTA MEAS
PK-PK MEAS
More 2 of 2
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKRΔ 1.275 MHz .17 dB
MARKER Δ 1.275 MHz .17 dB
13:21:17 JUN 14, 2002
Plot 4.1
REF OFFST 3.0 dB
REF 10.0 dBm
LOG 10 dB/ #ATN 40 dB
WA SB SC FC CORR
CENTER 836.500 MHz
#IF BW 30 kHz
#AVG BW 300 Hz
SPAN 2.000 MHz
SWP 667 msec


Last Hrd Key Menu
SPAN
99% PWR BW
% AM
3rd ORD MEAS
DELTA MEAS
PK-PK MEAS
More 2 of 2
13:18:01 JUN 14, 2002
Plot 4.2
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR△ 1.285 MHz
-.75 dB
MARKER △
1.285 MHz
-.75 dB
REF OFFST 3.0 dB
REF 10.0 dBm
LOG
10
dB/
#ATN
40 dB
WA SB
SC FC
CORR
SPAN 2.000 MHz
SWP 667 msec
CENTER 1.000000 GHz
#IF BW 30 kHz
#AVG BW 300 Hz

5.0 Out of Band Emissions at Antenna Terminals

FCC 22.901(d), 22.901(d), 22.917(f), 24.238(a)

Out of Band Emissions:

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least (43 + 10 log P) dB.

Mobile Emissions in Base Frequency Range:

The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed -80 dBm at the transmit antenna connector.

5.1 Test Procedure

The RF output of the transmitter was connected to a spectrum analyzer through appropriate attenuation. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic.

5.2 Test Equipment

Tektronix 2784 Spectrum Analyzer

5.3 Test Results

Complies	Refer to the plots in Appendix A.

6.0 Field Strength of Spurious Radiation

FCC 2.1053, 22.901(d), 24.238(a)

6.1 Test Procedure

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT.

The frequency range up to tenth harmonic of each of the three fundamental frequency (low, middle, and high channels) for each band (cellular and PCS) was investigated. The tests were performed with the Radio Card installed in Laptop and PDA for both polarization of the transmitter's antenna (antenna in vertical and horizontal position). The worst case of emissions was reported.

For spurious emissions attenuation, the substitution method was used. On each frequency where the Field Strength was found above 63.4 dBuV/m (which corresponds to ERP = -33 dBm), the EUT was substituted by a reference antenna (half-wave dipole - below 1 GHz, or Horn antenna - above 1GHz), connected to a signal generator. The signal generator output was adjusted to obtain the same reading as from EUT. The ERP/EIRP at the spurious emissions frequency was calculated as in section 3. The spurious emissions attenuation was calculated as the difference between ERP/EIRP at the fundamental frequency (see section 3) and at the spurious emissions frequency.

6.2 Test Equipment

EMCO 3115 Horn Antennas
HP 8566B Spectrum Analyzer
Tektronix 2784 Spectrum Analyzer
Low Pass Filter
Preamplifiers

6.3 Test Results

All spurious emissions are attenuated more than 20 dB than the required attenuation limit. Therefore measurements by the substitution method were not performed.
Refer to the field strength data sheets in Appendix B

Test Result:	Complies

7.0 Line Conducted Emissions

FCC 15.107

7.1 Test Procedure

Test procedure described in the ANSI C63.4 Standard was employed. The Laptop was connected to the AC line through the LISNs. Both HOT and NEUTRAL leads were tested.

7.2 Test Equipment

HP8568A Spectrum Analyzer with 85650 Quasi-peak adapter
Solar Electronics 8028-50-TS-24-BNC LISNs

7.3 Test Results

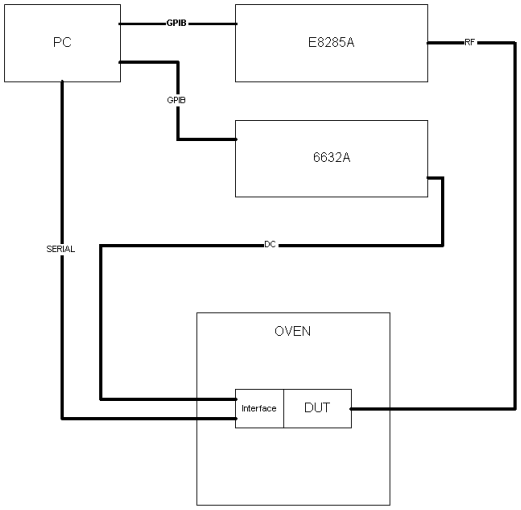
Test is not applicable. The EUT is used in an automobiles and battery powered only

8.0 Frequency Stability vs Temperature

FCC 2.1055

8.1 Test Procedure

The test was performed by Sierra Wireless personnel.



Test setup block diagram

The ILM2720 was placed inside the temperature chamber. After the temperature stabilized for approximately 10 minutes, the transmitting frequency was recorded.

8.2 Test Equipment

Aglient Wireless Test Set, model 8960
HP E3631A DC Power Supply

8.3 Test Results

Test Result:	Complies. Emission attenuation on the band-edges frequencies of the frequency block is not affected by the measured frequency instability.

EUT: FSN_E020425503430H

Transmitting Frequency: 1880 MHz
Frequency error limit: 2.5 ppm or 4700 Hz

Temperature (°C)	Frequency Error (Hz)
-30	2.1
-20	4.0
-10	-2.1
0	0.5
10	2.7
20	2.9
30	4.7
40	-3.2
50	4.6

Note: The measured frequency stability vs. temperature for the Cellular band is identical (% difference) to the above table since the transmitting frequency is locked to the same oscillator.

9.0 Frequency Stability vs Voltage
FCC 2.1055

9.1 Test Procedure

The test was performed by Sierra Wireless personnel.
For the test setup block diagram, refer to sec. 8.
The ILM2720 was connected to a DC Power Supply. The voltage was set to 115% of the nominal value and was then decreased to 85% of the nominal value. The output frequency was recorded for each voltage setting.

9.2 Test Equipment

Aglient Wireless Test Set, model 8960
HP E3631A DC Power Supply

9.3 Test Results.

Test Result:	Complies. Emission attenuation on the band-edges frequencies of the frequency block is not affected by the measured frequency instability.

EUT: FSN_E020425503350H2

Transmitting Frequency: 837 MHz
Frequency error limit: 2.5 ppm or 2092.5 Hz

Vcc, Volts	Difference (Hz)
2.805 *	-7.6
3.795 **	5.8

Transmitting Frequency: 1880 MHz
Frequency error limit: 2.5 ppm or 4700 Hz

Vcc, Volts	Difference (Hz)
2.805 *	-6.5
3.795 **	5.5

Note:
* 85% of the nominal voltage supplied to the modem,
** 115% of the nominal voltage supplied to the modem.

10.0 List of test Equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model/Type	Serial #	Cal Int	Cal Due
Bi-Log Antenna #2	EMCO	3143	9509-1160	12	7/12/02
Pre-Amplifier	Sonoma Inst.	310	185634	12	01/10/03
RF Filter Section	Hewlett Packard	85460A	3448A00267	12	7/20/02
EMI Receiver	Hewlett Packard	8546A	3710A00373	12	7/20/02
Spectrum Analyzer	Tektronix	2784	B3020108	12	8/8/02
Double-ridged Horn Antenna	EMCO	3115	8812-3049	12	4/03/03
Horn Antenna	EMCO	3160-09	-	#	#
Horn Antenna	EMCO	3160-10	-	#	#
Pre-Amplifier	Miteq	AMF-4D-001180-24-10P	799159	12	04/05/03
Pre-amplifier	CTT	ACO/400	47526	12	10/5/02
Wireless Test Set	Aglient	8960	GB41070182	12	06/27/03

 # No calibration required

11.0 Miscellaneous Comments

For setup photos see separate file “Set Up Photos”

11.0 Document History

Revision/ Job Number	Writer Initials	Date	Change
1.0 / 3026748	SS	June 25, 2002	Original document

12.0 Appendix A

Out of Band Emissions at Antenna Terminals

Cellular Band	
Plot Number	**Description**
5.1a - 5.1f	Low Channel, 825.25 MHz
5.2a - 5.2f	Middle Channel, 836.5 MHz
5.3a - 5.3f	High Channel, 847.75 MHz

PCS Band	
Plot Number	**Description**
5.4a - 5.4f	Low Channel, 1851.25 MHz
5.5a - 5.5f	Middle Channel, 1880 MHz
5.6a - 5.6g	High Channel, 1908.75 MHz

Emission in Base Frequency Range	
Plot Number	**Description**
5.7a	Low Channel, 825.25 MHz
5.7b	Middle Channel, 836.5 MHz
5.7c	High Channel, 847.75 MHz

13.0 Appendix B

Radiated Emissions Test Data

Company:	At Road	**Model #:**	Ilm2720
EUT:	Internet Location Modem	**FCC #:**	PDCILM272XSW
Project #:	3026746	**Test Date:**	June 6, 2002
Test Mode:	Tx @ 825.25 MHz	**Engineer:**	B. Gordon

	Antenna Used	Pre-Amp Used			Cable Used
Number:	14	5		0	1a
Model:	EMCO 3115	CTT		None	NPS366

Frequency	Reading	Detector	Ant	Amp	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	Net
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)
1650.50	16.0	Peak	14	0	V	27.4	0	7.1	50.5
2475.75	42.0	Peak	14	5	V	30.6	36.5	8.2	44.3
3301.00	41.0	Peak	14	5	V	32.3	36.4	9.7	46.6
4126.25	41.0	Peak	14	5	V	34.1	36.3	9.7	48.5
4951.50	38.0 *	Peak	14	5	V/H	35.2	35.8	13.1	49.8
5776.75	38.0 *	Peak	14	5	V/H	36.4	35.3	11.3	50.4
6602.00	38.0 *	Peak	14	5	V/H	36.5	35.3	15.6	54.7
7427.25	38.0 *	Peak	14	5	V/H	37.9	35.4	13.0	53.5
8252.50	38.0 *	Peak	14	5	V/H	37.8	35.5	13.2	53.5

a) Insert. Loss = Cable A + Cable B + Cable C
b) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
c) * Noise floor
d) All other emissions not reported at least 10 dB below the limit
e) Test was performed at 3 m

Radiated Emissions Test Data

Company	AT Road	**Model #:**	Ilm2720
EUT:	Internet Location Modem	**FCC #:**	PDCILM272XSW
Project #:	3026746	**Test Date:**	June 6, 2002
Test Mode:	Tx @ 836.5 MHz	**Engineer:**	B. Gordon

	Antenna Used	Pre-Amp Used		Cable Used	
Number:	14	5	0	1a	0
Model:	EMCO 3115	CTT	None	NPS366	None

Frequency	**Reading**	**Detector**	**Ant**	**Amp**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**Net**
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)
1673.00	17.0	Peak	14	0	H	27.7	0	7.1	51.8
2509.60	41.0	Peak	14	5	V	30.7	36.5	8.2	43.4
3364.12	41.0	Peak	14	5	V	32.4	36.4	10.1	47.1
4182.65	41.0	Peak	14	5	V	34.1	36.3	9.7	48.5
5018.18	38.0 *	Peak	14	5	V/H	35.3	35.8	13.5	51.0
5855.71	38.0 *	Peak	14	5	V/H	36.5	35.3	11.4	50.6
6692.22	38.0 *	Peak	14	5	V/H	36.6	35.3	14.6	53.9
7528.76	38.0 *	Peak	14	5	V/H	38.0	35.4	13.2	53.8
8365.20	38.0 *	Peak	14	5	V/H	37.8	35.4	13.1	53.5

Notes:

a) Insert. Loss = Cable A + Cable B + Cable C
b) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
c) * Noise floor
d) All other emissions not reported at least 10 dB below the limit
e) Test was performed at 3 m

Radiated Emissions Test Data

Company:	AT Road	**Model #:**	Ilm2720
EUT:	Internet Location Modem	**FCC #:**	PDCILM272XSW
Project #:	3026746	**Test Date:**	June 6, 2002
Test Mode:	Tx @ 847.75 MHz	**Engineer:**	B. Gordon

	Antenna Used	Pre-Amp Used			Cable Used	
Number:	14	5		0	1a	0
Model:	EMCO 3115	CTT		None	NPS366	None

Frequency	**Reading**	**Detector**	**Ant**	**Amp**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**Net**
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)
1695.5	17.0	Peak	14	0	H	27.8	0	7.0	51.8
2543.3	41.0	Peak	14	5	V	30.8	36.5	8.2	43.5
3391.0	41.0	Peak	14	5	V	32.5	36.4	10.2	47.3
4238.8	41.0	Peak	14	5	V	34.1	36.3	9.9	48.7
5086.5	38.0 *	Peak	14	5	V/H	35.4	35.7	12.9	50.6
5934.3	38.0 *	Peak	14	5	V/H	36.5	35.2	11.4	50.7
6782.0	38.0 *	Peak	14	5	V/H	36.8	35.3	13.7	53.2
7629.8	38.0 *	Peak	14	5	V/H	38.0	35.4	13.4	54.0
8477.5	38.0 *	Peak	14	5	V/H	37.8	35.4	13.3	53.7

Notes:	a) Insert. Loss = Cable A + Cable B + Cable C
	b) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
	c) * Noise floor
	d) All other emissions not reported at least 10 dB below the limit
	e) Test was performed at 3 m

Radiated Emissions Test Data

Company:	AT Road	**Model #:**	Ilm2720
EUT:	Internet Location Modem	**FCC #:**	PDCILM272XSW
Project #:	3026746	**Test Date:**	June 8, 2002
Test Mode:	Tx @ 1851.25 MHz	**Engineer:**	B. Gordon

	Antenna Used			Pre-Amp Used			Cable Used	
Number:	14		21	0	5	12	1a	0
Model:	EMCO 3115		3160-9	None	CTT	ACO/180	NPS366	None

Frequency	**Reading**	**Detector**	**Ant**	**Amp**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**Net**
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)
3702.50	46.0	Peak	14	5	H	33.4	36.4	9.4	52.4
5553.75	40.1	Peak	14	5	V	36.2	35.5	11.3	52.1
7405.00	38.8	Peak	14	5	V	37.8	35.4	12.9	54.1
9256.25	38.3 *	Peak	14	5	V	39.5	35.3	14.4	56.9
11107.5	36.7 *	Peak	14	5	V	40.2	36.3	15.8	56.4
12958.8	38.0 *	Peak	14	5	V	40.4	36.9	16.8	58.3
14810.0	38.0 *	Peak	14	5	H/V	41.9	36.2	17.9	61.6
16661.3	38.0 *	Peak	14	5	H/V	41.3	35.6	19.0	62.7
18512.5	38.0 *	Peak	21	12	H/V	41.3	35.6	19.0	62.7

Notes:	a) Insert. Loss = Cable A + Cable B + Cable C
	b) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
	c) * Noise floor
	d) All other emissions not reported at least 10 dB below the limit
	e) Test was performed at 3 m

Radiated Emissions Test Data

Company:	AT Road	**Model #:**	Ilm2720
EUT:	Internet Location Modem	**FCC #:**	PDCILM272XSW
Project #:	3026746	**Test Date:**	June 8, 2002
Test Mode:	Tx @ 1880 MHz	**Engineer:**	B. Gordon

	Antenna Used			Pre-Amp Used			Cable Used	
Number:	14		21	12	5	0	1a	0
Model:	EMCO 3115		3160-9	ACO/180	CTT	None	NPS366	None

Frequency	**Reading**	**Detector**	**Ant**	**Amp**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**Net**
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)
3760.00	42.6	Peak	14	5	V	33.5	36.4	9.4	49.1
5640.00	40.1	Peak	14	5	V	36.2	35.4	11.3	52.2
7520.00	38.8 *	Peak	14	5	V	38.0	35.4	13.2	54.6
9400.00	38.3 *	Peak	14	5	V	39.1	35.3	13.9	56.0
11280.0	36.7 *	Peak	14	5	H/V	40.4	36.5	15.9	56.5
13160.0	38.0 *	Peak	14	5	H/V	40.2	36.9	17.0	58.3
15040.0	38.0 *	Peak	14	5	H/V	42.2	36.1	18.1	62.2
16920.0	38.0 *	Peak	14	5	H/V	41.8	35.6	19.2	63.4
18800.0	38.0 *	Peak	21	12	H/V	41.8	35.6	19.2	63.4

Notes:	a) Insert. Loss = Cable A + Cable B + Cable C
	b) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
	c) * Noise floor
	d) All other emissions not reported at least 10 dB below the limit
	e) Test was performed at 3 m

Radiated Emissions Test Data									
Company:	AT Road			**Model #:**	Ilm2720				
EUT:	Internet Location Modem			**FCC #:**	PDCILM272XSW				
Project #:	3026746			**Test Date:**	June 8, 2002				
Test Mode:	Tx @ 1908.75 MHz			**Engineer:**	B. Gordon				
	Antenna Used			Pre-Amp Used			Cable Used		
Number:	14		21	5	12	0	1a	0	
Model:	EMCO 3115		3160-9	CTT	ACO/180	None	NPS366	None	

Frequency	**Reading**	**Detector**	**Ant**	**Amp**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**Net**
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)
3817.50	44.3	Peak	14	5	V	33.7	36.4	9.4	51.0
5726.25	38.0	Peak	14	5	V	36.3	35.4	11.3	50.2
7635.00	37.3	Peak	14	5	V	38.0	35.4	13.5	53.4
9543.75	36.8 *	Peak	14	5	V	38.8	35.3	14.3	54.6
11452.5	36.7 *	Peak	14	5	H/V	40.6	36.7	16.0	56.6
13361.3	38.0 *	Peak	14	5	H/V	40.2	36.8	17.1	58.5
15270.0	38.0 *	Peak	14	5	H/V	42.1	36.0	18.2	62.3
17178.8	38.0 *	Peak	14	5	H/V	42.9	35.6	19.3	63.6
19087.5	38.0 *	Peak	21	12	H/V	42.9	35.6	19.3	63.6

Notes:	a) Insert. Loss = Cable A + Cable B + Cable C
	b) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
	c) * Noise floor
	d) All other emissions not reported at least 10 dB below the limit
	e) Test was performed at 3 m