



ADDENDUM TO FC02-067

FOR THE

HPV/GPS MOBILE RADIO, IP4HPV

FCC PART 90 AND PART 15 SUBPART B SECTIONS 15.107, 15.109
AND 15.111 CLASS B

COMPLIANCE

DATE OF ISSUE: AUGUST 30, 2002

PREPARED FOR:

IP MobileNet, Inc.
16842 Von Karman Avenue, Suite 200
Irvine, CA 92606

P.O. No.: 002179-00
W.O. No.: 79240

PREPARED BY:

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CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: July 30 - August 16, 2002

Report No.: FC02-067A

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CKC Laboratories, Inc. has received Certificates of Accreditation from the following agencies:

A2LA (USA); DATech (Germany); BSMI (Taiwan); Nemko (Norway); and GOST (Russia).

CKC Laboratories, Inc. has received test site Registration Acceptance from the following agencies:

FCC (USA); VCCI (Japan); and Industry Canada.

CKC Laboratories, Inc. has received Letters of Acceptance through an MRA for the following agencies:

ACA/NATA (Australia); SABS (South Africa); SWEDAC (Sweden); Radio Communications Agency (RA); HOKLAS (Hong Kong); Bakom (Swiss); BIPT (Belgium); Denmark Telestyrelsen; RvA (Netherlands); SEE (Luxembourg) SITTEL (Bolivia); and UKAS (UK).

ADMINISTRATIVE INFORMATION

DATE OF TEST: July 30 - August 16, 2002

DATE OF RECEIPT: July 30, 2002

PURPOSE OF TEST: To demonstrate the compliance of the HPV/GPS Mobile Radio, IP4HPV with the requirements for FCC Part 90 and Part 15 Subpart B Sections 15.107, 15.109 and 15.111 devices. The purpose of Addendum A is to revise the voltage variation data and put it with the frequency stability data.

TEST METHOD: ANSI C63.4 (1992) and FCC Part 90

FREQUENCY RANGE TESTED: 450 kHz – 5.6 GHz

MANUFACTURER: IP MobileNet, Inc.
16842 Von Karman Avenue, Suite 200
Irvine, CA 92606

REPRESENTATIVE: Bobby Amin, Technical Ops Manager

TEST LOCATION: CKC Laboratories, Inc.
110 Olinda Place, Brea, CA 92621
5473A Clouds Rest, Mariposa, CA 95338

SUMMARY OF RESULTS

As received, the IP MobileNet, Inc. HPV/GPS Mobile Radio, IP4HPV was found to be fully compliant with the following standards and specifications:

United States

- FCC Part 90 and Part 15 Subpart B Sections 15.107, 15.109 and 15.111 Class B using:
- ANSI C63.4 (1992) and FCC Part 90 method

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

QUALITY ASSURANCE:



Steve Behm, Director of Engineering Services



Joyce Walker, Quality Assurance Administrative Manager



Septimiu Apahidean, EMC/Lab Manager



Chuck Kendall, EMC/Lab Manager

TEST PERSONNEL:



Eddie Wong, EMC Engineer



Monika Brandle, EMC Engineer/
Evaluation Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The Land mobile transceiver tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

DC Line Filter

Manuf: Radio Shack
Model: 270-055
Serial: NA
FCC ID: NA

Land Mobile Transceiver

Manuf: IP MobileNet
Model: IP4HPV
Serial: NA
FCC ID: MI7-IPMNIP4 (pending)

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Laptop

Manuf: Dell
Model: Inspiron 2500
Serial: 08C6461296121A5503
FCC ID: DoC

Power Supply

Manuf: Radio Shack
Model: 22510
Serial: NA
FCC ID: NA

2.1033(c)(3) USER'S MANUAL

The necessary information is contained in a separate document.

2.1033 (c)(4) TYPE OF EMISSIONS

20K0F1D.

2.1033(c)(5) FREQUENCY RANGES

509-512 MHz Transmitter range.

506-509 MHz Receiving range.

2.1033(c)(6) OPERATING POWER

34 Watts.

2.1033(c)(7) MAXIMUM POWER RATING

150 Watts.

2.1033(c)(8) DC VOLTAGES

DC voltage applied is 13.6 VDC +/- 20%, DC Current is 11 amps.

2.1033(c)(9) TUNE-UP PROCEDURE

There is no tune-up procedure required over the power range or at specific operating power levels because the unit is software controlled.

2.1033(c)(10) SCHEMATICS AND CIRCUITRY DESCRIPTION

The necessary information is contained in a separate document.

2.1033(c)(11) LABEL AND PLACEMENT

The necessary information is contained in a separate document.

2.1033(c)(12) SUBMITTAL PHOTOS

The necessary information is contained in a separate document.

2.1033(c)(13) MODULATION INFORMATION

See page 7 of the owner's manual.

2.1033(c)(14)/2.1046/90.205(h)- RF POWER OUTPUT

470-512 MHz. Power and height limitations are specified in 90.307 and 90.309.

90.307: Protection Criteria.....

90.309: Table and figure.

Note: The final product is not to be sold with an antenna and this test is not to qualify the EUT for licensing. Therefore, the antenna height and service area during actual installation is not specified.

For this test, the power limitation is selected to be **150 watts** as specified in Table C. (90.309) by assuming the mobile and control station distance between base station and protected co-channel TV station is 151 Miles.

Test setup: Conducted RF Power measurement is performed with a Power meter connected to the Tx antenna port of the EUT via a 40 dB attenuator. The RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. The laptop is running test program to exercise the EUT. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

The EUT satisfied the RF power requirement by demonstrating the conducted power is under the 150 watts limit.

Freq	Measured RF Power
509.0 MHz	34 Watts
510.5 MHz	33 Watts
511.9 MHz	33 Watts

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
RF Power Meter	02082	HP	435B	2445A11881	082101	082102

PHOTOGRAPH SHOWING RF POWER FC 90.210(h)



2.1033(c)(14)/2.1047(a) - MODULATION CHARACTERISTICS - AUDIO FREQUENCY RESPONSE

Not applicable to this unit.

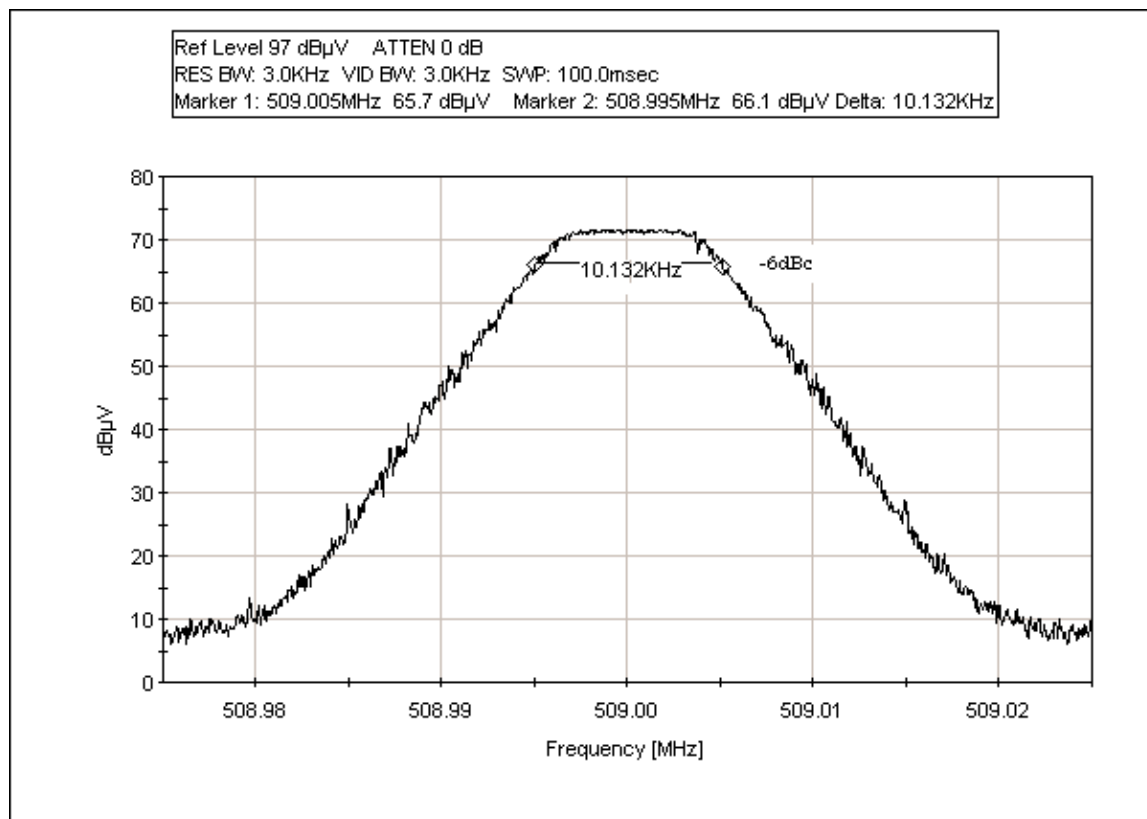
2.1033(c)(14)/2.1047(b) MODULATION CHARACTERISTICS – Modulation Limiting Response

Not applicable to this unit.

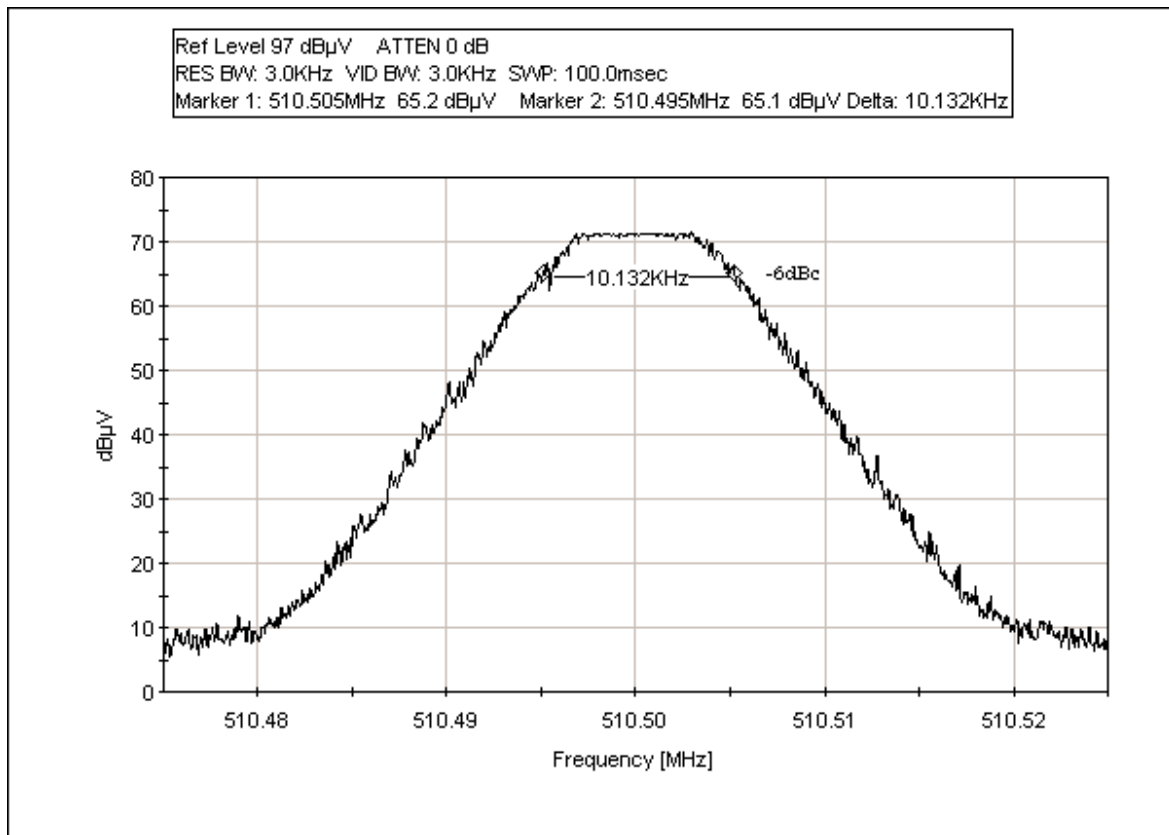
2.1033(c)(14)/2.1049(i)/90.209/90.210- OCCUPIED BANDWIDTH

Test Conditions: Bandwidth measurement is performed with a power meter connected to the antenna port of the EUT via a 40 dB attenuator and a 40 dB step attenuator. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. The laptop is running test program to exercise the EUT. 13.8Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

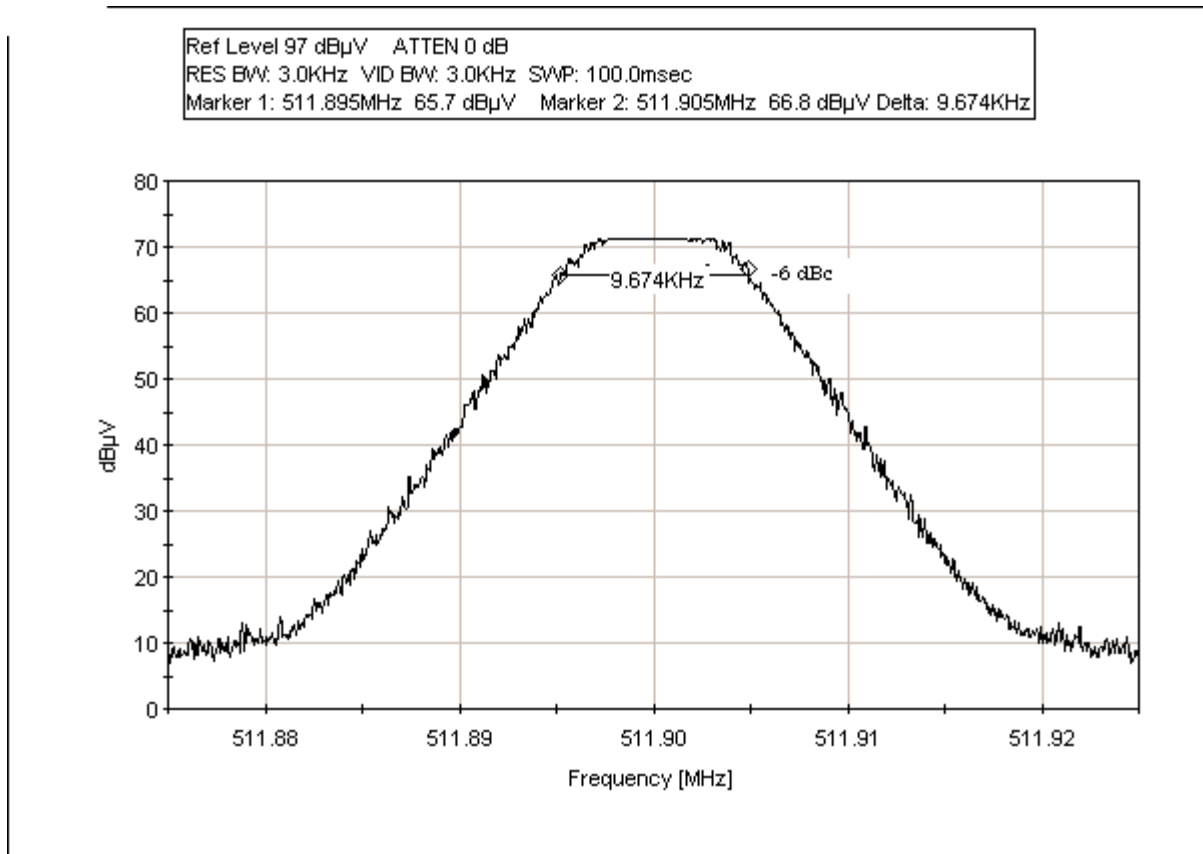
FCC 90.209 BandWidth - 509 MHz



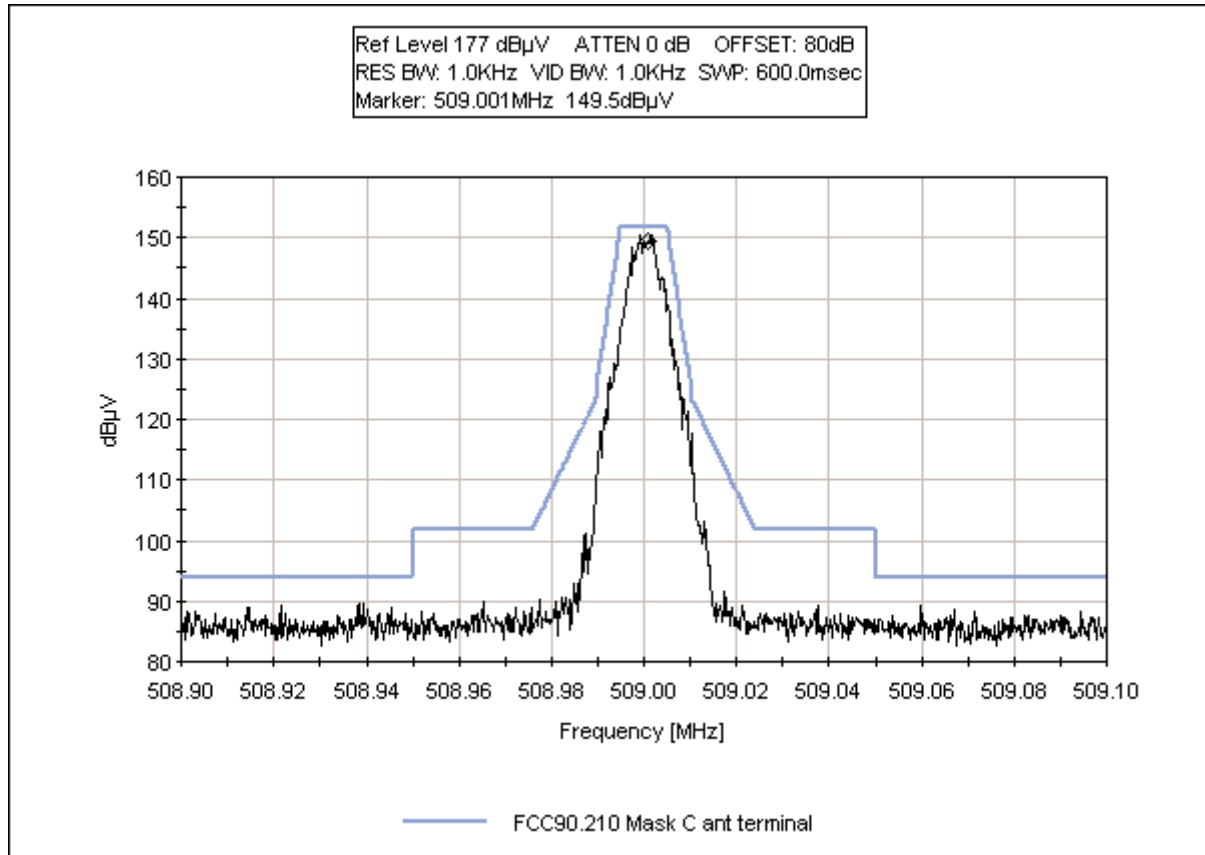
FCC 90.209 BandWidth - 510 MHz



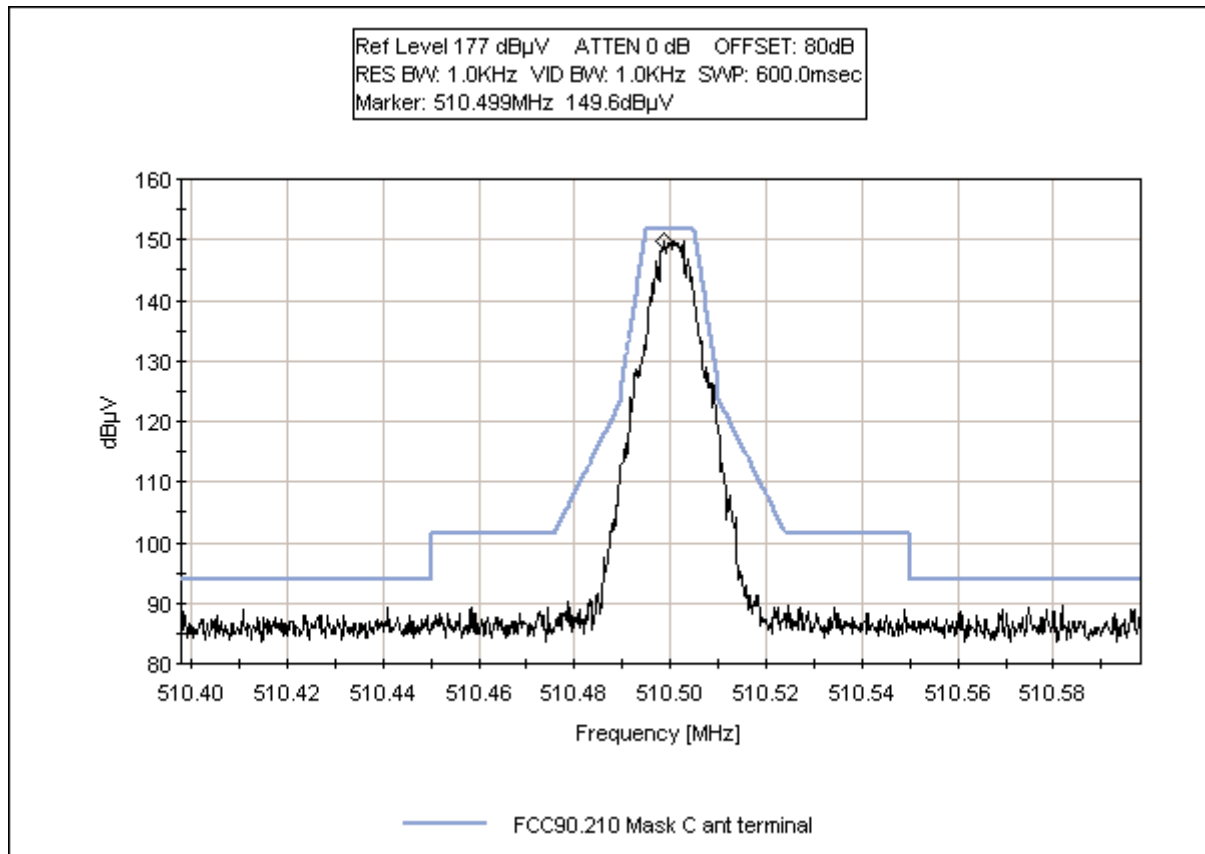
FCC 90.209 BandWidth - 512 MHz



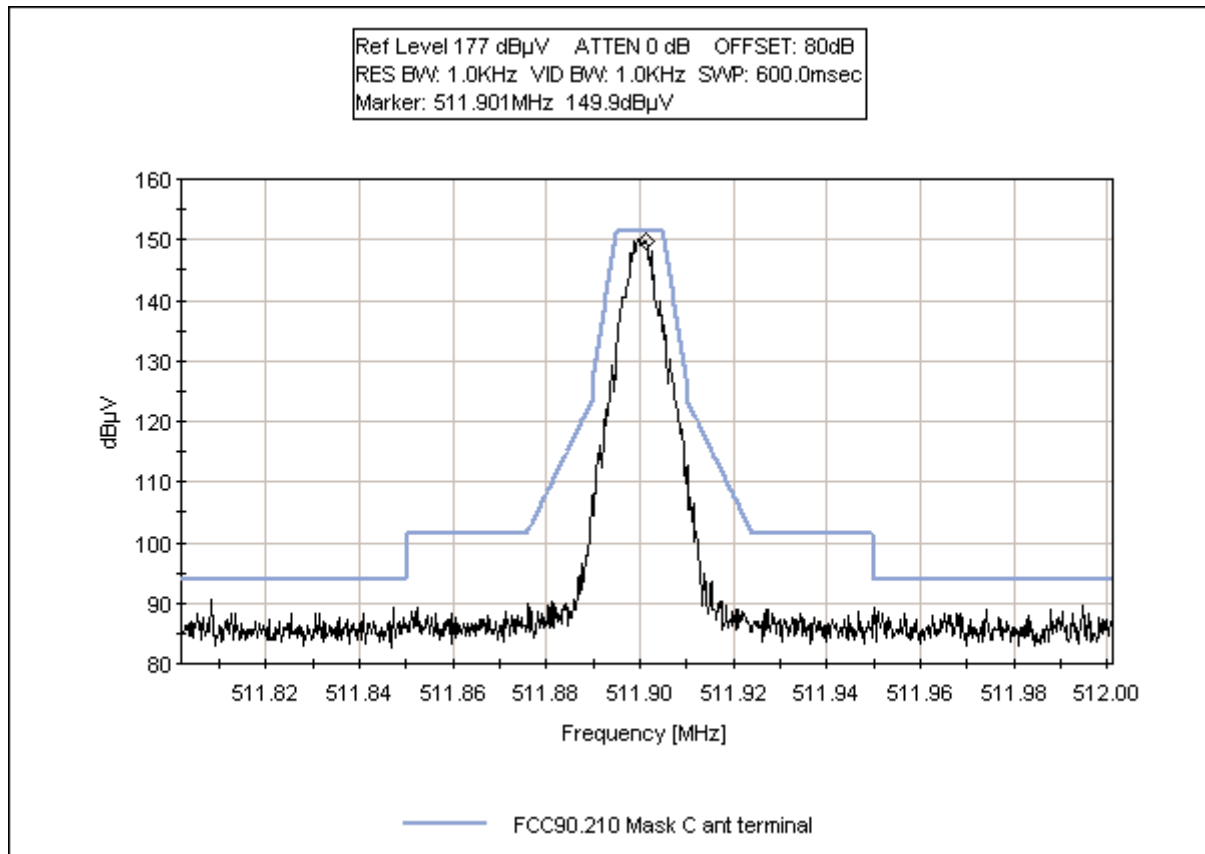
FCC 90.210 Occupied Bandwidth Mask C - 509 MHz



FCC 90.210 Occupied Bandwidth Mask C - 510 MHz



FCC 90.210 Occupied Bandwidth Mask C - 512 MHz



PHOTOGRAPH SHOWING DIRECT CONNECT TESTING



Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
High Pass Filter (above 1.5 GHz)	02116	HP	84300- 80037	3643A00027	062502	062503
¼" Helix Coaxial Cable	NA	Andrew	FSJ-50A-4	Cable#7 (6 ft)	071502	071503

2.1033(c)(14)/2.1051/ - SPURIOUS EMISSIONS AT ANTENNA TERMINAL

Limit line for Spurious Conducted Emission

$$\text{Required Attenuation} = 43 + 10 \log P \text{ dB}$$

$$\text{Limit line (dB}\mu\text{V)} = V_{\text{dB}\mu\text{V}} - \text{Attenuation}$$

$$\begin{aligned} V_{\text{dB}\mu\text{V}} &= 20 \log \frac{V}{1 \times 10^{-6}} \\ &= 20 (\log V - \log 1 \times 10^{-6}) \\ &= 20 \log V - 20 \log 1 \times 10^{-6} \\ &= 20 \log V - 20 (-6) \\ &= 20 \log V + 120 \end{aligned}$$

$$\begin{aligned} \text{Attenuation} &= 43 + 10 \log P \\ &= 43 + 10 \log \frac{V^2}{R} \\ &= 43 + 10 (\log V^2 - \log R) \\ &= 43 + 10 (2 \log V - \log R) \\ &= 43 + 20 \log V - 10 \log R \end{aligned}$$

$$\begin{aligned} \text{Limit line} &= V_{\text{dB}\mu\text{V}} - \text{Attenuation} \\ &= 20 \log V + 120 - (43 + 20 \log V - 10 \log R) \\ &= 20 \log V + 120 - 43 - 20 \log V + 10 \log R \\ &= 20 \log V + 120 - 43 - 20 \log V + 10 \log R \\ &= 120 - 43 + 10 \log 50 \quad \text{Note : } R = 50 \, \Omega \\ &= 120 - 43 + 16.897 \\ &= 94 \text{ dB}\mu\text{V at any power level} \end{aligned}$$

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **IP MobileNet**
 Specification: **FCC90.210 Mask C ant terminal**
 Work Order #: **79240** Date: 07/31/2002
 Test Type: **Conducted Emissions** Time: 16:39:25
 Equipment: **Land Mobile Transceiver** Sequence#: 1
 Manufacturer: IP MobileNet Tested By: Eddie Wong
 Model: IP4HPV-GPS 13.8Vdc
 S/N: NA

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Power Supply	Radio Shack	22510	NA

Test Conditions / Notes:

Measurement is performed with a spectrum analyzer connected to the antenna port of the EUT via a 40 dB attenuator and a 20 dB step attenuator. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. The laptop is running test program to exercise the EUT. Channel Tx 509.0 MHz Rx 506.0 MHz, Inj 0 551.0 MHz. Frequency range of measurement: 4 MHz - 5.6 GHz, 4 - 30 MHz RBW= VBW=9 kHz. 30 MHz - 1GHz RBW=VBW=120 kHz. 1 - 5.6 GHz RBW=VBW=1 MHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

T1=1.5 GHz HPF AN 2116	T2=Brea Cable: 6' 1/4" Heliax - Brea # 7.
------------------------	---

Measurement Data:		Reading listed by margin.				Test Lead: Antenna Terminal				
#	Freq MHz	Rdng dBμ V	T1 dB	T2 dB		Dist Table	Corr dBμ V	Spec dBμ V	Margin dB	Polar Ant
1	507.200M	151.4				+0.0	151.4	94.0	+57.4	Anten
								Fundamental		
2	1528.000M	91.5	+0.0	+0.5		+0.0	92.0	94.0	-2.0	Anten
3	3022.000M	89.3	+0.5	+1.0		+0.0	90.8	94.0	-3.2	Anten
4	1018.000M	90.3	+0.0	+0.4		+0.0	90.7	94.0	-3.3	Anten
	Ave									
^	1018.000M	93.7	+0.0	+0.4		+0.0	94.1	94.0	+0.1	Anten
6	646.000M	87.7				+0.0	87.7	94.0	-6.3	Anten
7	550.980M	83.0				+0.0	83.0	94.0	-11.0	Anten

8	11.640M	82.7			+0.0	82.7	94.0	-11.3	Anten
9	2033.000M	71.5	+0.8	+0.6	+0.0	72.9	94.0	-21.1	Anten
10	3554.000M	69.0	+0.5	+0.9	+0.0	70.4	94.0	-23.6	Anten
11	2540.000M	67.6	+0.6	+0.9	+0.0	69.1	94.0	-24.9	Anten
12	4562.000M	65.9	+0.3	+0.9	+0.0	67.1	94.0	-26.9	Anten

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112
 Customer: **IP MobileNet**
 Specification: **FCC90.210 Mask C ant terminal**
 Work Order #: **79240** Date: 07/31/2002
 Test Type: **Conducted Emissions** Time: 16:44:39
 Equipment: **Land Mobile Transceiver** Sequence#: 2
 Manufacturer: IP MobileNet Tested By: Eddie Wong
 Model: IP4HPV-GPS 13.8Vdc
 S/N: NA

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Power Supply	Radio Shack	22510	NA

Test Conditions / Notes:

Measurement is performed with a spectrum analyzer connected to the antenna port of the EUT via a 40 dB attenuator and a 20 dB step attenuator. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. The laptop is running test program to exercise the EUT. Channel Tx 510.5 MHz, Rx 507.5 MHz, Inj 1 552.5 MHz. Frequency range of measurement: 4 MHz - 5.6 GHz, 4 - 30 MHz RBW= VBW=9 kHz. 30 MHz - 1GHz RBW=VBW=120 kHz. 1 - 5.6 GHz RBW=VBW=1 MHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

T1=1.5 GHz HPF AN 2116	T2=Brea Cable: 6' 1/4" Helix - Brea # 7.
------------------------	--

Measurement Data:		Reading listed by margin.					Test Lead: Antenna Terminal				
#	Freq MHz	Rdng dBμV	T1 dB	T2 dB			Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	510.577M	151.8	+0.0				+0.0	151.8	94.0	+57.8	Anten
									Fundamental		
2	1021.000M	89.9	+0.0	+0.4			+0.0	90.3	94.0	-3.7	Anten
	Ave										
^	1021.000M	94.7	+0.0	+0.4			+0.0	95.1	94.0	+1.1	Anten
4	1531.590M	89.0	+0.0	+0.5			+0.0	89.5	94.0	-4.5	Anten
5	1534.000M	84.2	+0.0	+0.5			+0.0	84.7	94.0	-9.3	Anten
6	14.430M	84.3	+0.0				+0.0	84.3	94.0	-9.7	Anten
7	3058.000M	74.4	+0.5	+1.0			+0.0	75.9	94.0	-18.1	Anten
8	3058.000M	74.3	+0.5	+1.0			+0.0	75.8	94.0	-18.2	Anten
9	2043.000M	71.9	+0.8	+0.6			+0.0	73.3	94.0	-20.7	Anten
10	2547.000M	71.0	+0.6	+1.0			+0.0	72.6	94.0	-21.4	Anten

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **IP MobileNet**
 Specification: **FCC90.210 Mask C ant terminal**
 Work Order #: **79240**
 Test Type: **Conducted Emissions**
 Equipment: **Land Mobile Transceiver**
 Manufacturer: IP MobileNet
 Model: IP4HPV-GPS
 S/N: NA

Date: 07/31/2002
 Time: 16:48:45
 Sequence#: 3
 Tested By: Eddie Wong
 13.8Vdc

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Power Supply	Radio Shack	22510	NA

Test Conditions / Notes:

Measurement is performed with a spectrum analyzer connected to the antenna port of the EUT via a 40 dB attenuator and a 20 dB step attenuator. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. The laptop is running test program to exercise the EUT. Channel Tx 511.9 MHz, Rx 508.9 MHz, Inj 2 553.9 MHz. Frequency range of measurement: 4 MHz - 5.6 GHz, 4 - 30 MHz RBW= VBW=9 kHz. 30 MHz - 1GHz RBW=VBW=120 kHz. 1 - 5.6 GHz RBW=VBW=1 MHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

T1=1.5 GHz HPF AN 2116	T2=Brea Cable: 6' 1/4" Heliax - Brea # 7.
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Measurement Data: Reading listed by margin.

Test Lead: Antenna Terminal

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB		Dist dB	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	511.968M	151.4	+0.0			+0.0	151.4	94.0	+57.4	Anten
								Fundamental		
2	1023.800M	89.3	+0.0	+0.4		+0.0	89.7	94.0	-4.3	Anten
	Ave									
^	1023.800M	93.9	+0.0	+0.4		+0.0	94.3	94.0	+0.3	Anten
4	1535.000M	85.9	+0.0	+0.5		+0.0	86.4	94.0	-7.6	Anten
5	5.600M	82.7	+0.0			+0.0	82.7	94.0	-11.3	Anten
6	2043.000M	76.0	+0.8	+0.6		+0.0	77.4	94.0	-16.6	Anten
7	3066.000M	74.1	+0.5	+1.1		+0.0	75.7	94.0	-18.3	Anten
8	3577.000M	72.3	+0.5	+1.0		+0.0	73.8	94.0	-20.2	Anten

PHOTOGRAPH SHOWING DIRECT CONNECT TESTING



Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
High Pass Filter (above 1.5 GHz)	02116	HP	84300- 80037	3643A00027	062502	062503
¼" Helix Coaxial Cable	NA	Andrew	FSJ-50A-4	Cable#7 (6 ft)	071502	071503

2.1033(c)(14)/2.1053/90.210 - FIELD STRENGTH OF SPURIOUS RADIATION

EUT placed on the wooden table. Transmit antenna port is connected to a RF load via a power meter for visual verification. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. Receiver antenna port is connected to an antenna.

The laptop is running test program to exercise the EUT.

Spec limit = 82.23 dBuV@3meter

Channel	Tx	Rx	Inj
0	509.0 MHz	506.0 MHz	551.0 MHz
1	510.5 MHz	507.5 MHz	552.5 MHz
2	511.9 MHz	508.9 MHz	553.9 MHz

Frequency range of measurement:

4 MHz - 5.6 GHz

4 - 30 MHz RBW= VBW=9 kHz

30 MHz - 1GHz RBW=VBW=120 kHz

1 - 5.6 GHz RBW=VBW=1 MHz

13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Limit line for Spurious Radiated Emission

$$\text{Required Attenuation} = 43 + 10 \log P \text{ (dB)}$$

For radiated spurious emission measured at 3 meter test distance,

$$\begin{aligned} \text{Required attenuation} &= 43 + 10 \log P_{t \text{ at 3 meter}} \text{ dB} \\ \text{Limit line (dBuV)} &= E_{\text{dBuV}} - \text{Attenuation} \end{aligned}$$

$$E_{\text{dBuV}} = \text{Measured field strength at 3 meter in dBuV/m}$$

Power Density (Isotropic)

$$P_D = \frac{P_t}{4\pi r^2}$$

P_D = Power Density in Watts /m²

P_t = Average Transmit Power

r = Test distance

Field Intensity E (V/m)

$$E = \sqrt{P_D \times 377}$$

$$E = \frac{\sqrt{P_t \times 377}}{4\pi r^2}$$

$$E = \sqrt{\frac{P_t \times 30}{r^2}}$$

$$P_t = \left(\frac{E^2 \times r^2}{30} \right)$$

$$10 \log P_t = 10 \log E^2 \text{ (V/m)} + 10 \log r^2 - 10 \log 30$$

$$10 \log P_t = 20 \log E \text{ (V/m)} + 20 \log r - 10 \log 30$$

At 3 meter, $r = 3 \text{ m}$

$$10 \log P_t = 20 \log E \text{ (V/m)} + 20 \log 3 - 10 \log 30$$

$$10 \log P_t = 20 \log E \text{ (V/m)} + 9.54 - 14.77$$

Operating Frequency: 509 MHz
Channel: Low
Highest Measured Output Power: 45.31 ERP(dBm)= 34 ERP(Watts)
Distance: 3 meters
Limit: $43+10\log(P)$ 58.31 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
1,018.00	-40.6	Horiz	85.91
1,527.07	-40.70	Vert	86.01
1,527.00	-40.80	Horiz	86.11
3,054.04	-45.00	Vert	90.31
3,563.06	-46.00	Vert	91.31
1,018.07	-46.60	Vert	91.91
31.84	-48.70	Vert	94.01
1,527.00	-49.10	Horiz	94.41
2,544.80	-49.10	Vert	94.41
3,054.00	-49.60	Horiz	94.91
3,563.40	-50.80	Horiz	96.11
522.84	-51.30	Horiz	96.61
4,071.90	-51.50	Vert	96.81
523.00	-53.00	Horiz	98.31
2,544.60	-53.30	Horiz	98.61
1,889.00	-56.20	Vert	101.51
1,897.70	-56.60	Vert	101.91
2,036.10	-57.20	Vert	102.51
29.22	-59.00		104.31
111.60	-59.50	Vert	104.81
446.55	-59.70	Horiz	105.01
319.05	-60.40	Horiz	105.71
830.80	-60.50	Horiz	105.81
190.75	-61.20	Horiz	106.51
307.00	-61.90	Horiz	107.21
214.50	-62.40	Vert	107.71
53.50	-62.90	Horiz	108.21
826.35	-64.30	Horiz	109.61
55.75	-64.30	Horiz	109.61

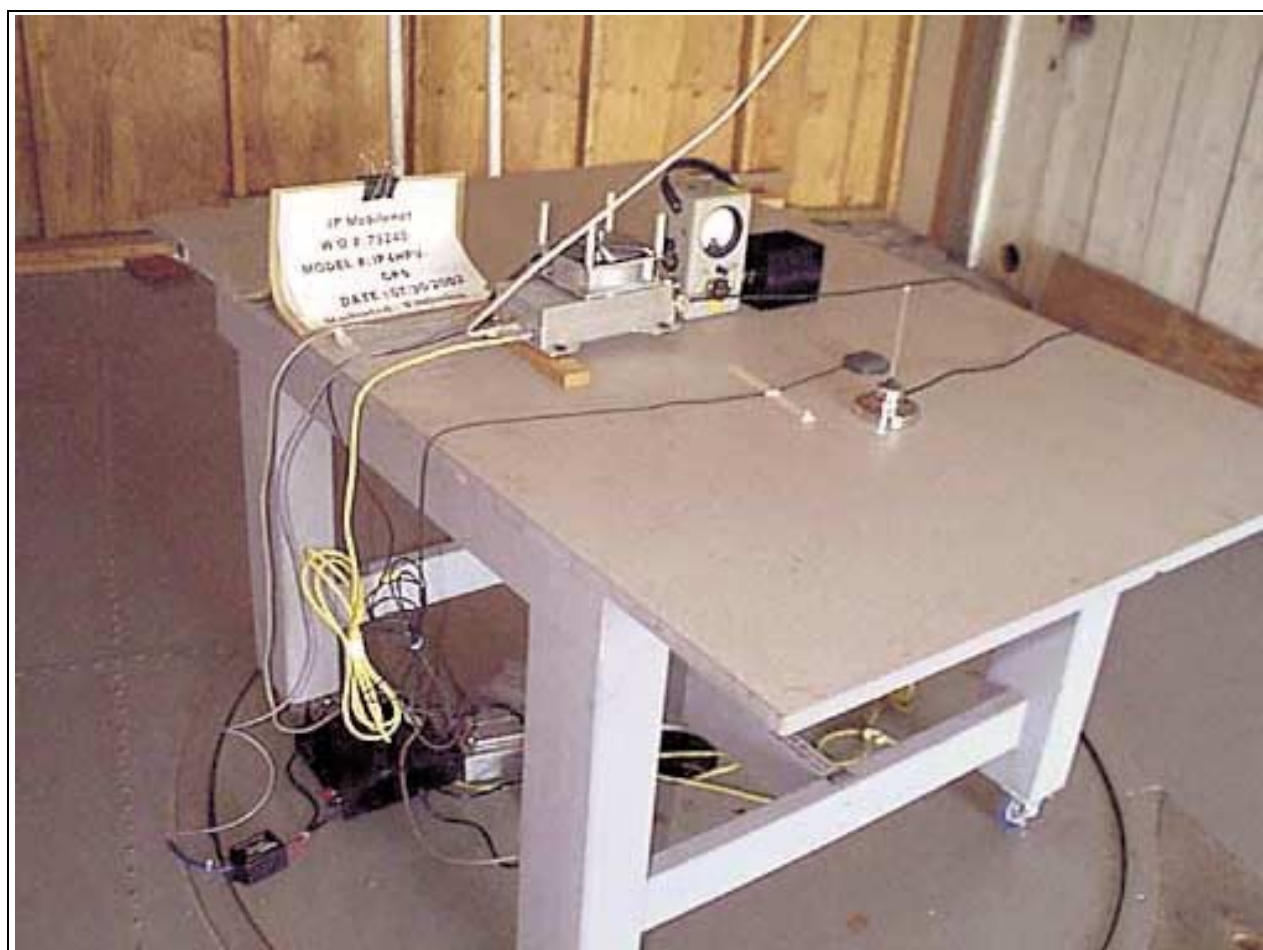
Operating Frequency: 510.5 MHz
Channel: Middle
Highest Measured Output Power: 45.19 ERP(dBm)= 33 ERP(Watts)
Distance: 3 meters
Limit: $43+10\log(P)$ 58.19 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
29.28	-58.9		104.09
29.40	-70.50	Horiz	115.69
30.03	-50.80	Vert	95.99
54.70	-63.10	Horiz	108.29
59.35	-53.60	Vert	98.79
59.60	-63.10	Horiz	108.29
110.40	-65.90	Horiz	111.09
111.55	-59.90	Vert	105.09
1,021.10	-47.70	Vert	92.89
1,023.76	-54.50	Horiz	99.69
1,531.48	-43.60	Vert	88.79
1,535.40	-48.20	Horiz	93.39
2,559.80	-55.80	Horiz	100.99
3,063.03	-41.40	Vert	86.59
3,071.40	-48.50	Horiz	93.69
3,573.50	-50.10	Vert	95.29
3,583.80	-51.40	Horiz	96.59
5,119.40	-53.00	Horiz	98.19

Operating Frequency: 511.9 MHz
Channel: High
Highest Measured Output Power: 45.19 ERP(dBm)= 33 ERP(Watts)
Distance: 3 meters
Limit: $43+10\log(P)$ 58.19 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
29.17	-61.5		106.69
33.45	-46.90	Vert	92.09
52.80	-61.80	Horiz	106.99
53.55	-55.40	Vert	100.59
56.90	-65.50	Horiz	110.69
59.15	-52.90	Vert	98.09
86.15	-60.70	Vert	105.89
111.05	-62.10	Horiz	107.29
111.15	-59.20	Vert	104.39
193.15	-61.90	Horiz	107.09
1,023.70	-50.30	Horiz	95.49
1,023.76	-46.90	Vert	92.09
1,535.66	-40.50	Horiz	85.69
1,535.74	-41.60	Vert	86.79
2,559.42	-52.40	Vert	97.59
2,559.50	-53.20	Horiz	98.39
3,071.10	-49.20	Horiz	94.39
3,071.50	-40.00	Vert	85.19
3,583.40	-49.30	Vert	94.49

PHOTOGRAPH SHOWING RADIATED EMISSIONS FCC 90.210



PHOTOGRAPH SHOWING RADIATED EMISSIONS FCC 90.210



Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
4 MHz – 30 MHz						
Loop Antenna	00314	EMCO	6502	2014	072302	072303
Antenna cable	NA	NA	RG214	Cable#15	122001	122002
30 MHz – 1000 MHz						
Bicon Antenna	306	AH	SAS200/540	220	092401	092402
Log Periodic Antenna	331	AH	SAS 00/516	330	092401	092402
Pre-amp	00309	HP	8447D	1937A02548	090501	090502
Antenna cable	NA	NA	RG214	Cable#15	122001	122002
Pre-amp to SA cable	NA	Harbour	RG223/U	Cable#10	070802	070803
1000-5600 MHz						
Horn Antenna	0849	EMCO	3115	6246	091201	091202
Microwave Pre-amp	00786	HP	83017A	3123A00281	091201	091202
¼" Helix Coaxial Cable	NA	Andrew	LDF1-50	Cable#18 (70 ft)	091101	091102

2.1033(c)(14)/2.1055/90.205(h)/90.213 FREQUENCY STABILITY AND VOLTAGE VARIATIONS

Test Conditions: EUT is located inside of the temperature chamber with support equipment located outside. Spectrum analyzer is connected directly to the antenna port of the EUT. Temperature monitoring equipment is affixed to the outside of the EUT enclosure. EUT is powered through an external DC power source.

Customer: IP Mobile Net
WO#: 79240
Date: 30-Aug-02
Test Engineer: Monika Brandle

Device Model #: IP4HPV-GPS
Operating Voltage: 13 VDC
Frequency Limit: 1.5 PPM / %

Temperature Variations

Channel		Channel 1	Dev.	Channel 2	Dev.	Channel 3	Dev.
Frequency:		(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)
		509.00004		510.50012		511.90012	
Temp							
(C)	Voltage						
-30	13	509.00003	0.00001	510.50007	0.00005	511.90009	0.00003
-20	13	509.00011	0.00007	510.50007	0.00005	511.90002	0.00010
-10	13	508.99995	0.00009	510.49993	0.00019	511.89997	0.00015
0	13	508.99994	0.00010	510.49991	0.00019	511.89992	0.00020
10	13	508.99995	0.00009	510.49993	0.00019	511.89991	0.00021
20	13	509.00002	0.00002	510.49998	0.00019	511.89999	0.00013
30	13	509.00000	0.00004	510.50003	0.00009	511.90004	0.00008
40	13	509.00002	0.00002	510.50006	0.00009	511.90007	0.00005
50	13	509.00004	0.00000	510.50007	0.00005	511.90009	0.00003

Voltage Variations (±15%)

20	11.1	509.00001	0.00003	510.50000	0.00012	511.89999	0.00013
20	13	509.00004	0.00000	510.50012	0.00000	511.90012	0.00000
20	15.0	508.99993	0.00011	510.49997	0.00015	511.89993	0.00019

Max Deviation (MHz)	0.00011	0.00019	0.00021
Max Deviation (PPM)	0.21611	0.37218	0.41024
	PASS	PASS	PASS

**PHOTOGRAPH SHOWING FREQUENCY STABILITY
AND VOLTAGE VARIATIONS**

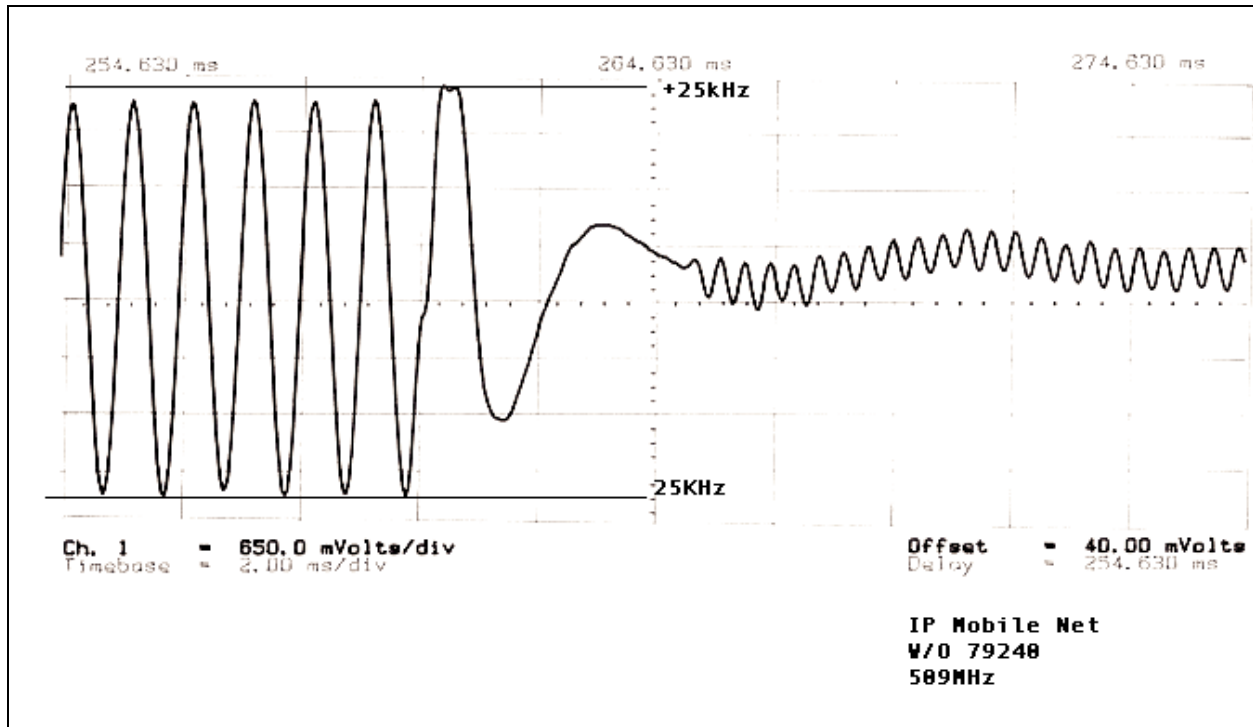


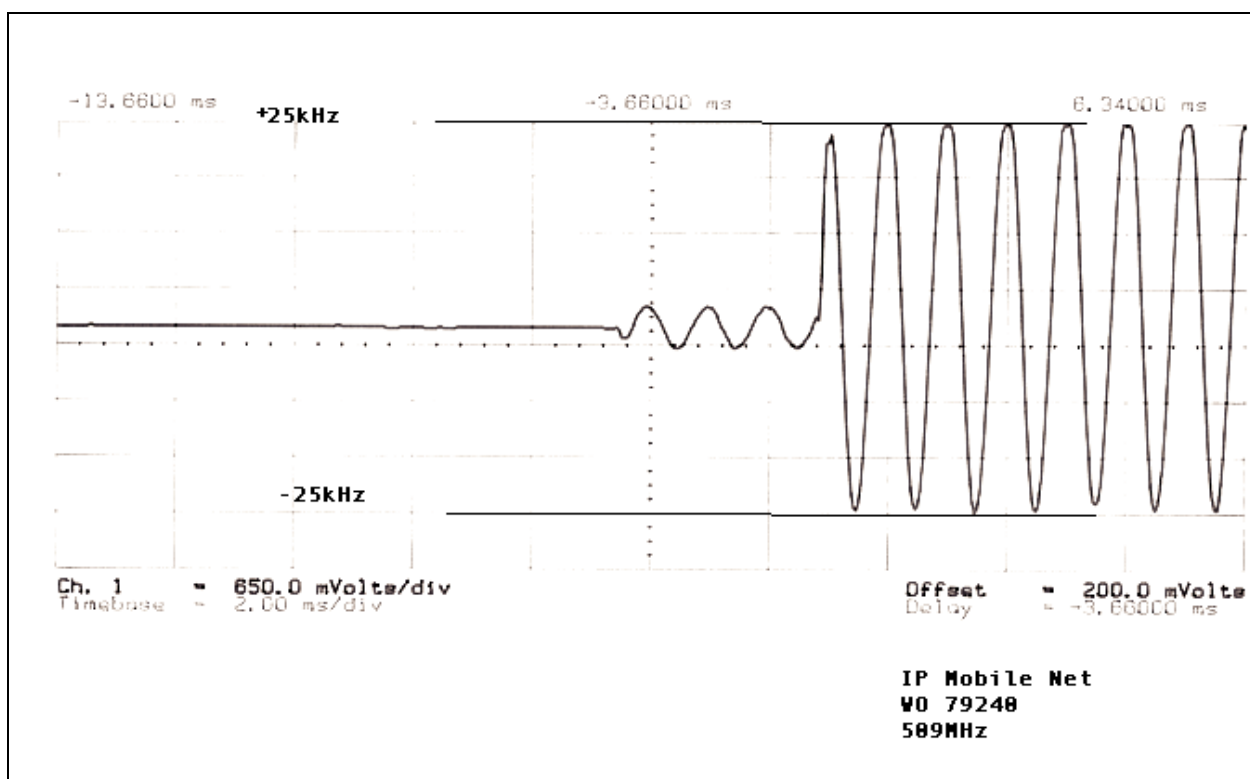
Test Equipment

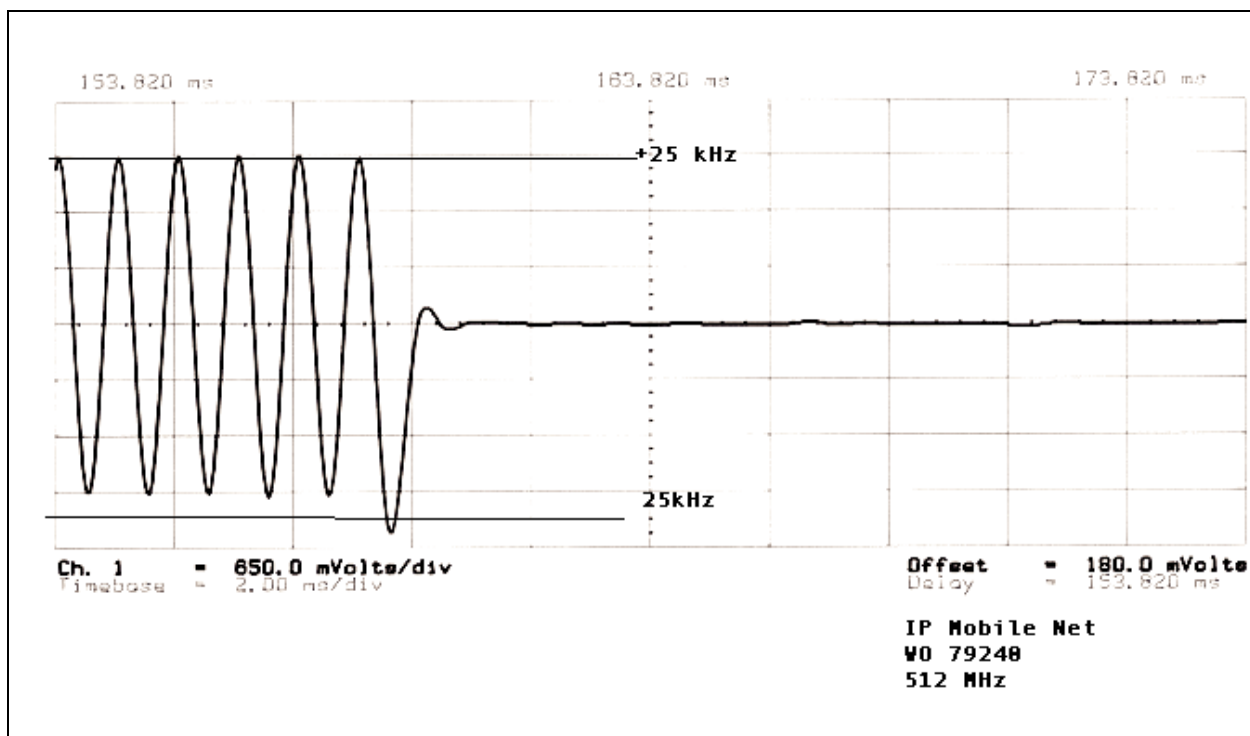
<i>Equipment</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Asset #</i>	<i>Cal Date</i>	<i>Cal Due</i>
Temp Chamber	Thermotron	S-1.2 MiniMax	11899	01879	2/7/02	020703
Frequency Counter	HP	5340A	1532A03198	01253	4/30/02	043003
DC, Power Supply	Leader	LPS-2801	6030090	P01889	6/5/02	060503

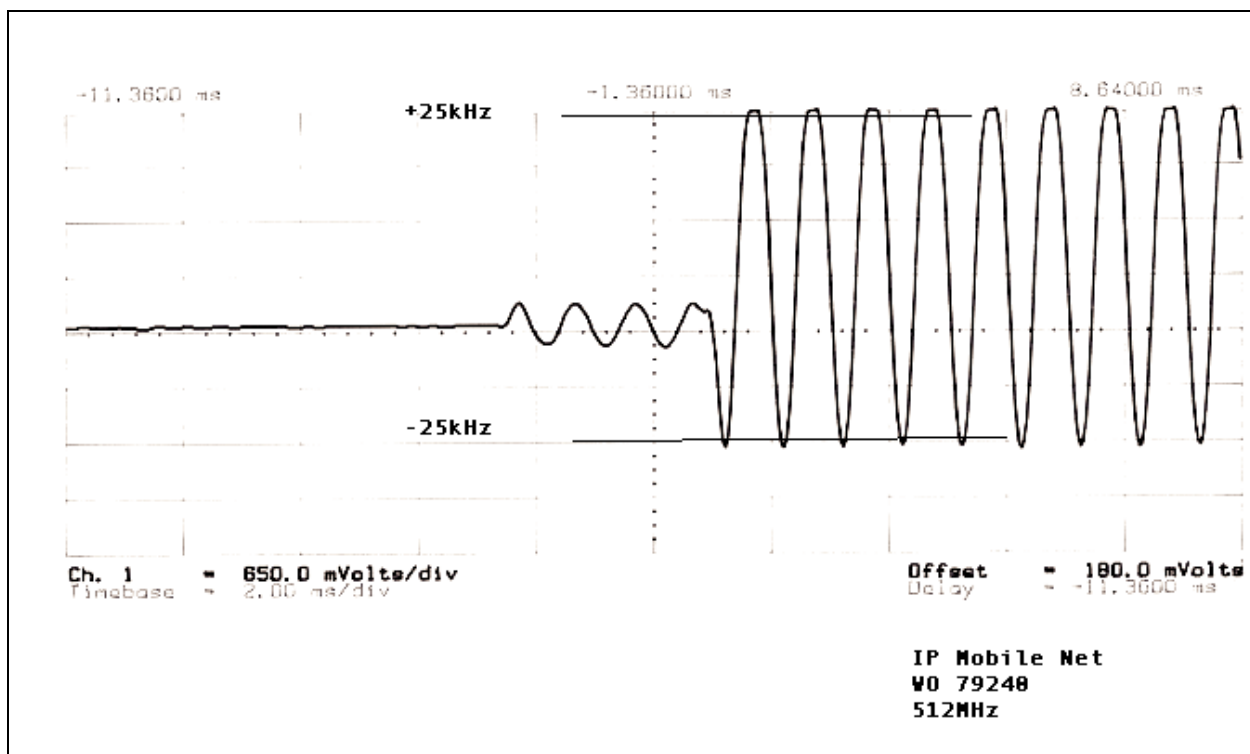
90.214 TRANSIENT FREQUENCY BEHAVIOR

Test Conditions: Test performed in accordance with TIA/EIA 603.









PHOTOGRAPH SHOWING TRANSIENT FREQUENCY BEHAVIOR



Test Equipment

<i>Equipment</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Asset #</i>	<i>Cal Date</i>	<i>Cal Due</i>
Generator, Signal	Marconi	2022D	119259/016	01870	9/5/01	090502
Analyzer/Modulation	HP	8901A	2751A05181	02072	11/20/01	112002
Oscilloscope, Digital	HP	54111D	3051A03191	02008	9/28/01	092802
Power Supply, DC	Sorensen	DCR-60-30B	176	00765	7/17/02	071703
Attenuator	Bird	100-SA-MFN-30	9949	P01572	3/21/02	032103
Power Meter	HP	435B	2342A08531	00174	5/29/02	052903
Power Sensor	HP	7560	1551A01004	02036	5/29/02	052903
Splitter	Motorola		549TR18HE	P01314	4/05/02	040503
Attenuator	JFW	50FHC-014-20		P01631	3/21/02	032103
Attenuator, High power 3dB	Weinschel	50-3 21016		P01289	3/21/02	032103
Attenuator, High power 6dB	Weinschel	50-6 58099		P01239	3/21/02	032103

15.107 – AC CONDUCTED EMISSIONS

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **IP MobileNet**
Specification: **FCC 15.107 Class B**
Work Order #: **79240**
Test Type: **Conducted Emissions**
Equipment: **Land Mobile Transceiver**
Manufacturer: IP MobileNet
Model: IP4HPV-GPS
S/N: NA

Date: 08/01/2002
Time: 2:06:41 PM
Sequence#: 6
Tested By: Eddie Wong
120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Power Supply	Radio Shack	22510	NA

Test Conditions / Notes:

EUT placed on the wooden table. Transmit antenna port is connected to a RF load via a power meter for visual verification. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. Receiver antenna port is terminated to a 50 ohm load. The laptop is running test program to exercise the EUT. Channel Tx 510.5 MHz, Rx 507.5 MHz, Inj 1 552.5 MHz. Frequency range of measurement: 450kHz - 30MHz RBW=VBW=9 kHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

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Measurement Data:

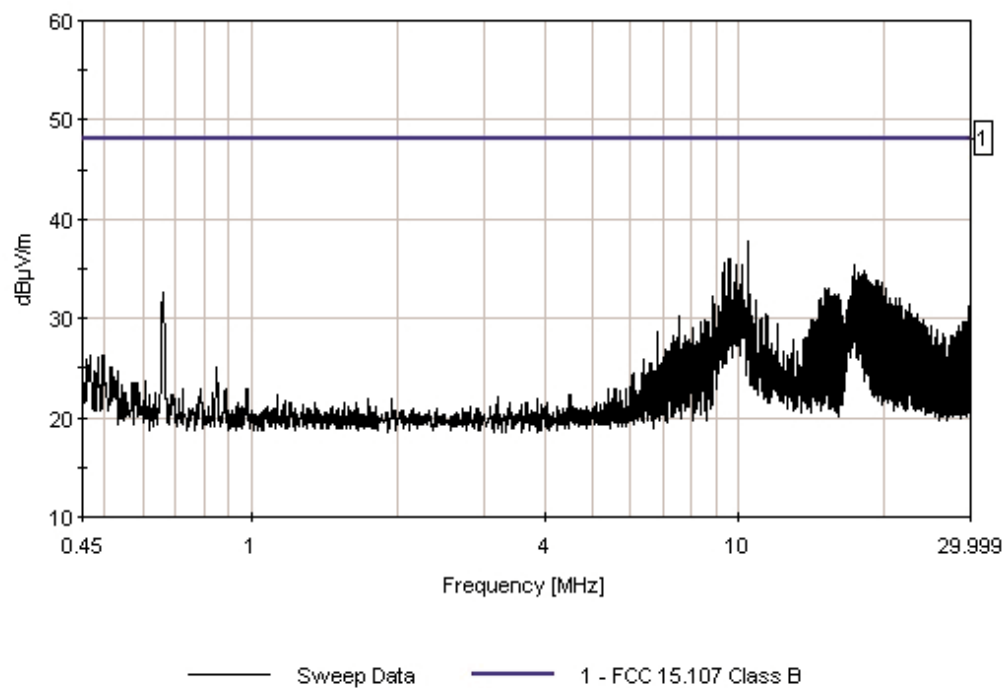
Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dB μ V	dB	dB	dB	dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	10.515M	37.7					+0.0	37.7	48.0	-10.3	Black
2	9.587M	35.9					+0.0	35.9	48.0	-12.1	Black
3	9.326M	35.6					+0.0	35.6	48.0	-12.4	Black
4	9.893M	35.3					+0.0	35.3	48.0	-12.7	Black
5	10.155M	35.3					+0.0	35.3	48.0	-12.7	Black
6	17.290M	35.3					+0.0	35.3	48.0	-12.7	Black
7	18.155M	34.8					+0.0	34.8	48.0	-13.2	Black
8	17.380M	34.6					+0.0	34.6	48.0	-13.4	Black

9	17.578M	34.6	+0.0	34.6	48.0	-13.4	Black
10	17.668M	34.6	+0.0	34.6	48.0	-13.4	Black
11	18.056M	34.5	+0.0	34.5	48.0	-13.5	Black
12	18.245M	34.5	+0.0	34.5	48.0	-13.5	Black
13	17.191M	34.3	+0.0	34.3	48.0	-13.7	Black
14	17.767M	34.2	+0.0	34.2	48.0	-13.8	Black
15	18.443M	33.9	+0.0	33.9	48.0	-14.1	Black

CKC Laboratories, Inc. Date: 08/01/2002 Time: 2:06:41 PM IP MobileNet WO#: 79240
FCC 15.107 Class B Test Lead: Black 120V 60Hz Sequence#: 6



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **IP MobileNet**
 Specification: **FCC 15.107 Class B**
 Work Order #: **79240**
 Test Type: **Conducted Emissions**
 Equipment: **Land Mobile Transceiver**
 Manufacturer: IP MobileNet
 Model: IP4HPV-GPS
 S/N: NA

Date: 08/01/2002
 Time: 2:02:32 PM
 Sequence#: 5
 Tested By: Eddie Wong
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Power Supply	Radio Shack	22510	NA

Test Conditions / Notes:

EUT placed on the wooden table. Transmit antenna port is connected to a RF load via a power meter for visual verification. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. Receiver antenna port is terminated to a 50 ohm load. The laptop is running test program to exercise the EUT. Channel Tx 510.5 MHz, Rx 507.5 MHz, Inj 1 552.5 MHz. Frequency range of measurement: 450kHz - 30MHz RBW=VBW=9 kHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

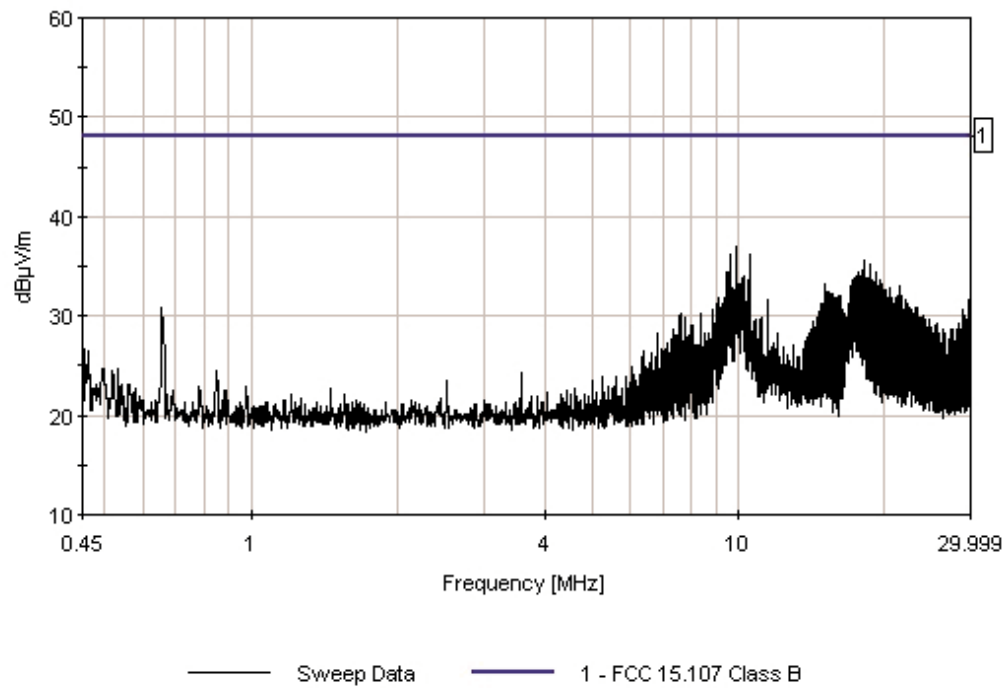
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Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBμV	dB	dB	dB	dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	9.912M	36.9					+0.0	36.9	48.0	-11.1	White
2	9.596M	36.1					+0.0	36.1	48.0	-11.9	White
3	10.533M	36.1					+0.0	36.1	48.0	-11.9	White
4	18.137M	35.6					+0.0	35.6	48.0	-12.4	White
5	18.722M	35.1					+0.0	35.1	48.0	-12.9	White
6	18.047M	34.6					+0.0	34.6	48.0	-13.4	White
7	9.497M	34.5					+0.0	34.5	48.0	-13.5	White
8	19.110M	34.5					+0.0	34.5	48.0	-13.5	White
9	17.659M	34.4					+0.0	34.4	48.0	-13.6	White

10	18.632M	34.3	+0.0	34.3	48.0	-13.7	White
11	10.263M	34.0	+0.0	34.0	48.0	-14.0	White
12	17.479M	34.0	+0.0	34.0	48.0	-14.0	White
13	17.758M	34.0	+0.0	34.0	48.0	-14.0	White
14	17.857M	34.0	+0.0	34.0	48.0	-14.0	White
15	452.000k	25.5	+0.0	25.5	48.0	-22.5	White

CKC Laboratories, Inc. Date: 08/01/2002 Time: 2:02:32 PM IP MobileNet WO#: 79240
FCC 15.107 Class B Test Lead: White 120V 60Hz Sequence#: 5



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **IP MobileNet**
 Specification: **FCC 15.107 Class B**
 Work Order #: **79240**
 Test Type: **Conducted Emissions**
 Equipment: **Land Mobile Transceiver**
 Manufacturer: IP MobileNet
 Model: IP4HPV-GPS
 S/N: NA

Date: 08/01/2002
 Time: 1:38:06 PM
 Sequence#: 6
 Tested By: Eddie Wong
 110Vac 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Laptop	Dell	Inspiron 2500	NCN-08C646-12961-21A-5472

Test Conditions / Notes:

EUT placed on the wooden table. Transmit antenna port is connected to a RF load via a power meter for visual verification. RS232 Port is connected to a section of serial cable, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a remote lap top via UTP. Receiver antenna port is terminated to a 50 ohm load. The laptop is running test program to exercise the EUT and pinging the ethernet connection of the EUT. Channel Tx 510.5 MHz, Rx 507.5 MHz, Inj 1 552.5 MHz. Frequency range of measurement: 450kHz - 30MHz RBW=VBW=9 kHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

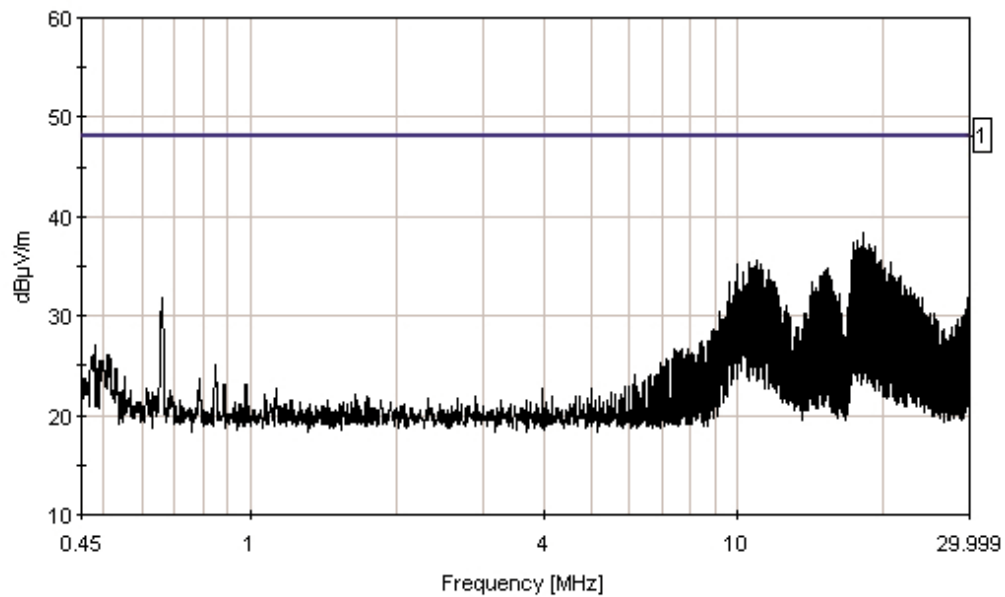
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Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBμV					Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	18.065M	38.4					+0.0	38.4	48.0	-9.6	Black
2	17.587M	37.6					+0.0	37.6	48.0	-10.4	Black
3	17.389M	37.3					+0.0	37.3	48.0	-10.7	Black
4	18.641M	37.2					+0.0	37.2	48.0	-10.8	Black
5	19.128M	37.0					+0.0	37.0	48.0	-11.0	Black
6	18.164M	36.9					+0.0	36.9	48.0	-11.1	Black
7	17.290M	36.8					+0.0	36.8	48.0	-11.2	Black
8	18.830M	36.8					+0.0	36.8	48.0	-11.2	Black

9	17.776M	36.7	+0.0	36.7	48.0	-11.3	Black
10	18.353M	36.7	+0.0	36.7	48.0	-11.3	Black
11	17.488M	36.6	+0.0	36.6	48.0	-11.4	Black
12	17.677M	36.6	+0.0	36.6	48.0	-11.4	Black
13	18.254M	36.6	+0.0	36.6	48.0	-11.4	Black
14	18.452M	36.6	+0.0	36.6	48.0	-11.4	Black
15	18.740M	36.5	+0.0	36.5	48.0	-11.5	Black

CKC Laboratories, Inc. Date: 08/01/2002 Time: 1:38:06 PM IP MobileNet WVO#: 79240
FCC 15.107 Class B Test Lead: Black 110Vac 60Hz Sequence#: 6



— Sweep Data — 1 - FCC 15.107 Class B

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **IP MobileNet**
 Specification: **FCC 15.107 Class B**
 Work Order #: **79240** Date: 08/01/2002
 Test Type: **Conducted Emissions** Time: 13:48:13
 Equipment: **Land Mobile Transceiver** Sequence#: 7
 Manufacturer: IP MobileNet Tested By: Eddie Wong
 Model: IP4HPV-GPS 110Vac 60Hz
 S/N: NA

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Laptop	Dell	Inspiron 2500	NCN-08C646-12961-21A-5472

Test Conditions / Notes:

EUT placed on the wooden table. Transmit antenna port is connected to a RF load via a power meter for visual verification. RS232 Port is connected to a section of serial cable, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a remote lap top via UTP. Receiver antenna port is terminated to a 50 ohm load. The laptop is running test program to exercise the EUT and pinging the ethernet connection of the EUT. Channel Tx 510.5 MHz, Rx 507.5 MHz, Inj 1 552.5 MHz. Frequency range of measurement: 450 kHz – 30 MHz RBW=VBW=9 kHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

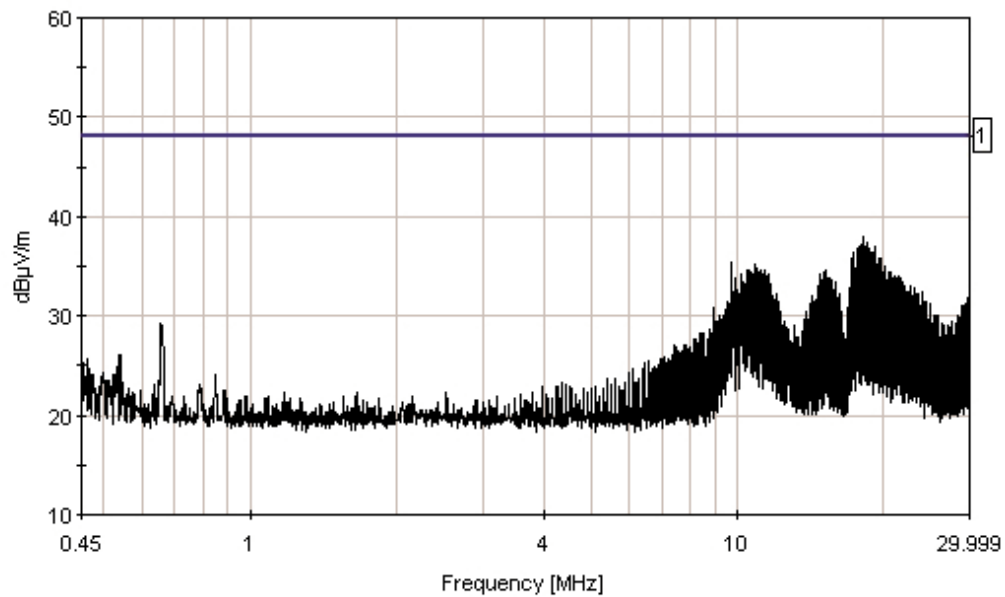
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Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBμV					Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	18.065M	38.0					+0.0	38.0	48.0	-10.0	White
2	18.551M	37.3					+0.0	37.3	48.0	-10.7	White
3	18.155M	37.1					+0.0	37.1	48.0	-10.9	White
4	17.776M	37.0					+0.0	37.0	48.0	-11.0	White
5	19.128M	37.0					+0.0	37.0	48.0	-11.0	White
6	18.254M	36.9					+0.0	36.9	48.0	-11.1	White
7	17.686M	36.8					+0.0	36.8	48.0	-11.2	White
8	18.650M	36.8					+0.0	36.8	48.0	-11.2	White

9	17.975M	36.7	+0.0	36.7	48.0	-11.3	White
10	19.227M	36.5	+0.0	36.5	48.0	-11.5	White
11	18.740M	36.4	+0.0	36.4	48.0	-11.6	White
12	18.830M	36.4	+0.0	36.4	48.0	-11.6	White
13	17.587M	36.3	+0.0	36.3	48.0	-11.7	White
14	18.452M	36.3	+0.0	36.3	48.0	-11.7	White
15	452.000k	28.1	+0.0	28.1	48.0	-19.9	White

CKC Laboratories, Inc. Date: 08/01/2002 Time: 13:48:13 IP MobileNet W/O#: 79240
FCC 15.107 Class B Test Lead: White 110Vac 60Hz Sequence#: 7

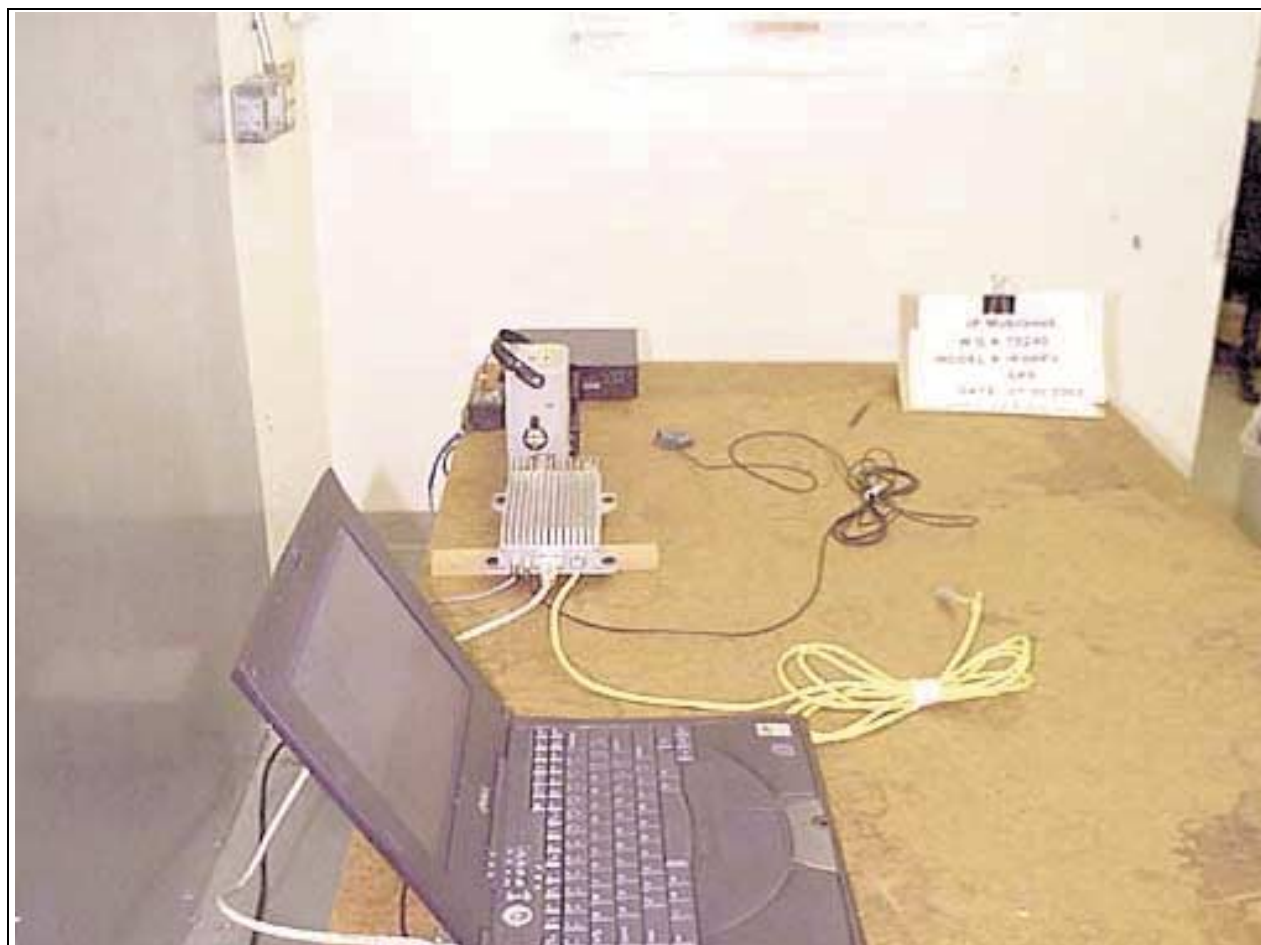


PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Front View - RS232

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Back View - RS232

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Front View - UTP

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Back View – UTP

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
LISN	02128	EMCO	3816/2NM	9809-1090	032002	032003
LISN	00847	EMCO	3816/2NM	1104	101501	101502

15.109 – RADIATED EMISSIONS

Test Location: KKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **IP MobileNet**

Specification: **FCC 15.109 Class B**

Work Order #: **79240**

Date: 07/31/2002

Test Type: **Maximized emission**

Time: 15:59:37

Equipment: **Land Mobile Transceiver**

Sequence#: 4

Manufacturer: IP MobileNet

Tested By: Eddie Wong

Model: IP4HPV-GPS

S/N: NA

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Power Supply	Radio Shack	22510	NA

Test Conditions / Notes:

EUT placed on the wooden table. Transmit antenna port is connected to a RF load via a power meter for visual verification. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. Receiver antenna port is terminated to a 50 ohm load. The laptop is running test program to exercise the EUT. Channel Tx 510.5 MHz, Rx 552.5 MHz, Inj 1 507.5 MHz. Frequency range of measurement: 30 MHz - 5.6 GHz, 30 - 1GHz RBW=VBW=120 kHz. 1 - 5.6 GHz RBW=VBW=1 MHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

T1=Bicon 092401	T2=Log 331 092401
T3=Cable #10 070803	T4=Cable #15 120602
T5=Preamp 8447D 090501	T6=Horn Antenna sn6246
T7=HP3017A sn3123A00281 11-Sept-01	T8=Helix #18 70' 11Sept2001

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	T5	T6	T7	T8	Table	dBμV/m	dBμV/m	dB	Ant
1	552.561M	48.0	+0.0	+18.0	+0.4	+4.6	+0.0	42.4	46.0	-3.6	Vert
	QP		-28.6	+0.0	+0.0	+0.0					
^	552.562M	48.1	+0.0	+18.0	+0.4	+4.6	+0.0	42.5	46.0	-3.5	Vert
			-28.6	+0.0	+0.0	+0.0					
3	184.004M	46.8	+17.2	+0.0	+0.2	+2.5	+0.0	38.4	43.5	-5.1	Horiz
			-28.3	+0.0	+0.0	+0.0					
4	552.560M	46.0	+0.0	+18.0	+0.4	+4.6	+0.0	40.4	46.0	-5.6	Horiz
	QP		-28.6	+0.0	+0.0	+0.0					
^	552.578M	46.0	+0.0	+18.0	+0.4	+4.6	+0.0	40.4	46.0	-5.6	Horiz
			-28.6	+0.0	+0.0	+0.0					

6	184.602M QP	46.1	+17.2 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	37.7	43.5	-5.8	Horiz
^	184.602M	48.2	+17.2 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	39.8	43.5	-3.7	Horiz
8	214.316M	45.8	+17.1 -28.3	+0.0 +0.0	+0.2 +0.0	+2.7 +0.0	+0.0	37.5	43.5	-6.0	Horiz
9	214.816M	45.6	+17.1 -28.3	+0.0 +0.0	+0.2 +0.0	+2.7 +0.0	+0.0	37.3	43.5	-6.2	Horiz
10	208.302M QP	45.8	+17.0 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	37.2	43.5	-6.3	Horiz
^	208.302M	48.0	+17.0 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	39.4	43.5	-4.1	Horiz
12	192.853M	45.7	+17.0 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	37.1	43.5	-6.4	Horiz
13	95.032M	53.2	+10.3 -28.3	+0.0 +0.0	+0.1 +0.0	+1.7 +0.0	+0.0	37.0	43.5	-6.5	Vert
14	188.352M QP	45.4	+17.1 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	36.9	43.5	-6.6	Horiz
^	188.338M	47.3	+17.1 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	38.8	43.5	-4.7	Horiz
16	31.726M	43.8	+16.2 -28.5	+0.0 +0.0	+0.1 +0.0	+1.0 +0.0	+0.0	32.6	40.0	-7.4	Vert
17	36.750M QP	43.6	+15.6 -28.4	+0.0 +0.0	+0.1 +0.0	+1.1 +0.0	+0.0	32.0	40.0	-8.0	Vert
^	36.750M	47.1	+15.6 -28.4	+0.0 +0.0	+0.1 +0.0	+1.1 +0.0	+0.0	35.5	40.0	-4.5	Vert
19	90.317M	52.4	+9.2 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	35.2	43.5	-8.3	Horiz
20	213.740M	43.4	+17.1 -28.3	+0.0 +0.0	+0.2 +0.0	+2.7 +0.0	+0.0	35.1	43.5	-8.4	Horiz
21	115.874M	46.4	+14.6 -28.4	+0.0 +0.0	+0.2 +0.0	+1.9 +0.0	+0.0	34.7	43.5	-8.8	Vert
22	37.602M QP	42.9	+15.3 -28.4	+0.0 +0.0	+0.1 +0.0	+1.1 +0.0	+0.0	31.0	40.0	-9.0	Horiz
^	37.602M	47.0	+15.3 -28.4	+0.0 +0.0	+0.1 +0.0	+1.1 +0.0	+0.0	35.1	40.0	-4.9	Horiz
24	92.124M	51.3	+9.6 -28.2	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	34.4	43.5	-9.1	Horiz
25	197.154M	42.9	+16.9 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	34.2	43.5	-9.3	Horiz
26	91.027M	51.2	+9.4 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	34.2	43.5	-9.3	Horiz
27	88.700M	51.8	+8.8 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	34.2	43.5	-9.3	Horiz
28	89.132M	51.7	+8.9 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	34.2	43.5	-9.3	Vert
29	33.000M QP	41.8	+16.1 -28.5	+0.0 +0.0	+0.1 +0.0	+1.0 +0.0	+0.0	30.5	40.0	-9.5	Vert
^	33.000M	46.8	+16.1 -28.5	+0.0 +0.0	+0.1 +0.0	+1.0 +0.0	+0.0	35.5	40.0	-4.5	Vert

31	92.896M	50.5	+9.8 -28.2	+0.0 +0.0	+0.1 +0.0	+1.7 +0.0	+0.0	33.9	43.5	-9.6	Vert
32	89.628M	51.1	+9.0 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	33.7	43.5	-9.8	Horiz
33	97.031M	49.4	+10.8 -28.3	+0.0 +0.0	+0.1 +0.0	+1.7 +0.0	+0.0	33.7	43.5	-9.8	Vert
34	93.780M	50.0	+10.0 -28.2	+0.0 +0.0	+0.1 +0.0	+1.7 +0.0	+0.0	33.6	43.5	-9.9	Horiz
35	205.336M	41.7	+16.9 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	33.0	43.5	-10.5	Horiz
36	86.348M	47.4	+8.3 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	29.3	40.0	-10.7	Vert
37	195.160M	41.4	+16.9 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	32.7	43.5	-10.8	Horiz
38	210.086M	41.2	+17.0 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	32.6	43.5	-10.9	Vert
39	87.158M	46.8	+8.5 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	28.9	40.0	-11.1	Horiz
40	62.548M	48.0	+7.8 -28.6	+0.0 +0.0	+0.1 +0.0	+1.4 +0.0	+0.0	28.7	40.0	-11.3	Vert
41	206.820M	40.6	+17.0 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	32.0	43.5	-11.5	Vert
42	184.118M	38.9	+17.2 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	30.5	43.5	-13.0	Vert
43	116.798M	42.0	+14.7 -28.4	+0.0 +0.0	+0.2 +0.0	+1.9 +0.0	+0.0	30.4	43.5	-13.1	Horiz
44	180.129M	38.6	+17.3 -28.2	+0.0 +0.0	+0.2 +0.0	+2.4 +0.0	+0.0	30.3	43.5	-13.2	Horiz
45	52.306M	43.7	+10.2 -28.4	+0.0 +0.0	+0.1 +0.0	+1.2 +0.0	+0.0	26.8	40.0	-13.2	Vert
46	75.100M	46.5	+6.8 -28.4	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	26.6	40.0	-13.4	Horiz
47	182.864M	38.2	+17.2 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	29.8	43.5	-13.7	Vert
48	119.292M	40.7	+15.2 -28.4	+0.0 +0.0	+0.2 +0.0	+2.0 +0.0	+0.0	29.7	43.5	-13.8	Vert
49	113.046M	41.8	+14.1 -28.4	+0.0 +0.0	+0.2 +0.0	+1.9 +0.0	+0.0	29.6	43.5	-13.9	Horiz
50	132.133M	39.1	+16.4 -28.4	+0.0 +0.0	+0.2 +0.0	+2.1 +0.0	+0.0	29.4	43.5	-14.1	Horiz
51	139.714M	38.3	+17.1 -28.4	+0.0 +0.0	+0.2 +0.0	+2.1 +0.0	+0.0	29.3	43.5	-14.2	Horiz
52	128.052M	39.4	+16.1 -28.4	+0.0 +0.0	+0.2 +0.0	+2.0 +0.0	+0.0	29.3	43.5	-14.2	Horiz
53	129.076M	39.3	+16.2 -28.4	+0.0 +0.0	+0.2 +0.0	+2.0 +0.0	+0.0	29.3	43.5	-14.2	Vert
54	74.174M	45.5	+6.9 -28.4	+0.0 +0.0	+0.1 +0.0	+1.5 +0.0	+0.0	25.6	40.0	-14.4	Vert
55	510.564M	37.9	+0.0 -28.5	+17.1 +0.0	+0.4 +0.0	+4.4 +0.0	+0.0	31.3	46.0	-14.7	Vert

56	120.950M	39.4	+15.4 -28.4	+0.0 +0.0	+0.2 +0.0	+2.0 +0.0	+0.0	28.6	43.5	-14.9	Horiz
57	118.654M	39.7	+15.1 -28.4	+0.0 +0.0	+0.2 +0.0	+2.0 +0.0	+0.0	28.6	43.5	-14.9	Horiz
58	122.397M	39.1	+15.5 -28.4	+0.0 +0.0	+0.2 +0.0	+2.0 +0.0	+0.0	28.4	43.5	-15.1	Horiz
59	110.406M	41.1	+13.6 -28.4	+0.0 +0.0	+0.1 +0.0	+1.9 +0.0	+0.0	28.3	43.5	-15.2	Horiz
60	321.216M	34.5	+0.0 -28.3	+20.8 +0.0	+0.3 +0.0	+3.4 +0.0	+0.0	30.7	46.0	-15.3	Vert
61	135.542M	37.4	+16.7 -28.4	+0.0 +0.0	+0.2 +0.0	+2.1 +0.0	+0.0	28.0	43.5	-15.5	Horiz
62	510.582M	37.0	+0.0 -28.5	+17.1 +0.0	+0.4 +0.0	+4.4 +0.0	+0.0	30.4	46.0	-15.6	Horiz
63	110.719M	40.7	+13.6 -28.4	+0.0 +0.0	+0.1 +0.0	+1.9 +0.0	+0.0	27.9	43.5	-15.6	Vert
64	2844.700M	42.4	+0.0 +0.0	+0.0 +29.3	+0.0 -38.0	+0.0 +4.6	+0.0	38.3	54.0	-15.7	Horiz
65	324.079M	34.0	+0.0 -28.2	+20.6 +0.0	+0.3 +0.0	+3.4 +0.0	+0.0	30.1	46.0	-15.9	Vert
66	79.467M	43.7	+6.8 -28.2	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	24.0	40.0	-16.0	Vert
67	203.492M	36.1	+16.9 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	27.4	43.5	-16.1	Horiz
68	178.274M	35.7	+17.3 -28.2	+0.0 +0.0	+0.2 +0.0	+2.4 +0.0	+0.0	27.4	43.5	-16.1	Horiz
69	292.876M	33.0	+21.6 -28.3	+0.0 +0.0	+0.3 +0.0	+3.2 +0.0	+0.0	29.8	46.0	-16.2	Horiz
70	75.029M	43.5	+6.8 -28.4	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	23.6	40.0	-16.4	Vert
71	1714.700M	47.0	+0.0 +0.0	+0.0 +25.4	+0.0 -38.6	+0.0 +3.6	+0.0	37.4	54.0	-16.6	Horiz
72	315.100M	32.6	+0.0 -28.3	+21.3 +0.0	+0.3 +0.0	+3.4 +0.0	+0.0	29.3	46.0	-16.7	Horiz
73	74.226M	42.6	+6.9 -28.4	+0.0 +0.0	+0.1 +0.0	+1.5 +0.0	+0.0	22.7	40.0	-17.3	Horiz
74	147.539M	34.8	+17.3 -28.4	+0.0 +0.0	+0.2 +0.0	+2.2 +0.0	+0.0	26.1	43.5	-17.4	Vert
75	83.513M	41.4	+7.6 -28.2	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	22.5	40.0	-17.5	Horiz
76	325.804M	32.3	+0.0 -28.2	+20.5 +0.0	+0.3 +0.0	+3.4 +0.0	+0.0	28.3	46.0	-17.7	Vert
77	318.254M	31.7	+0.0 -28.3	+21.1 +0.0	+0.3 +0.0	+3.4 +0.0	+0.0	28.2	46.0	-17.8	Vert
78	294.984M	31.1	+21.8 -28.3	+0.0 +0.0	+0.3 +0.0	+3.3 +0.0	+0.0	28.2	46.0	-17.8	Vert
79	486.708M	35.2	+0.0 -28.6	+16.7 +0.0	+0.4 +0.0	+4.3 +0.0	+0.0	28.0	46.0	-18.0	Horiz
80	98.517M	40.7	+11.2 -28.4	+0.0 +0.0	+0.1 +0.0	+1.8 +0.0	+0.0	25.4	43.5	-18.1	Horiz

81	82.617M	41.0	+7.4 -28.2	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	21.9	40.0	-18.1	Horiz
82	131.674M	35.1	+16.4 -28.4	+0.0 +0.0	+0.2 +0.0	+2.1 +0.0	+0.0	25.4	43.5	-18.1	Vert
83	1531.566M	46.6	+0.0 +0.0	+0.0 +24.6	+0.0 -38.8	+0.0 +3.4	+0.0	35.8	54.0	-18.2	Vert
84	280.050M	31.6	+20.5 -28.3	+0.0 +0.0	+0.3 +0.0	+3.1 +0.0	+0.0	27.2	46.0	-18.8	Vert
85	615.380M	30.1	+0.0 -28.0	+19.5 +0.0	+0.4 +0.0	+5.0 +0.0	+0.0	27.0	46.0	-19.0	Vert
86	320.116M	30.6	+0.0 -28.3	+20.9 +0.0	+0.3 +0.0	+3.4 +0.0	+0.0	26.9	46.0	-19.1	Vert
87	540.072M	32.5	+0.0 -28.6	+17.7 +0.0	+0.4 +0.0	+4.6 +0.0	+0.0	26.6	46.0	-19.4	Horiz
88	109.685M	37.1	+13.4 -28.4	+0.0 +0.0	+0.1 +0.0	+1.9 +0.0	+0.0	24.1	43.5	-19.4	Horiz
89	1531.550M	45.4	+0.0 +0.0	+0.0 +24.6	+0.0 -38.8	+0.0 +3.4	+0.0	34.6	54.0	-19.4	Horiz
90	360.090M	31.8	+0.0 -28.2	+18.1 +0.0	+0.3 +0.0	+3.6 +0.0	+0.0	25.6	46.0	-20.4	Vert
91	240.086M	33.1	+17.6 -28.2	+0.0 +0.0	+0.3 +0.0	+2.8 +0.0	+0.0	25.6	46.0	-20.4	Vert
92	221.257M	33.4	+17.3 -28.3	+0.0 +0.0	+0.2 +0.0	+2.7 +0.0	+0.0	25.3	46.0	-20.7	Vert
93	72.190M	38.3	+6.9 -28.5	+0.0 +0.0	+0.1 +0.0	+1.5 +0.0	+0.0	18.3	40.0	-21.7	Horiz
94	229.602M	31.9	+17.4 -28.3	+0.0 +0.0	+0.2 +0.0	+2.7 +0.0	+0.0	23.9	46.0	-22.1	Vert

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **IP MobileNet**
 Specification: **FCC 15.109 Class B**
 Work Order #: **79240** Date: 08/01/2002
 Test Type: **Maximized emission** Time: 11:52:45
 Equipment: **Land Mobile Transceiver** Sequence#: 5
 Manufacturer: IP MobileNet Tested By: Eddie Wong
 Model: IP4HPV-GPS
 S/N: NA

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Laptop	Dell	Inspiron 2500	NCN-08C646-12961-21A-5472

Test Conditions / Notes:

EUT placed on the wooden table. Transmit antenna port is connected to a RF load via a power meter for visual verification. RS232 Port is connected to a section of serial cable, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a remote lap top via UTP. Receiver antenna port is terminated to a 50 ohm load. The laptop is running test program to exercise the EUT and pinging the ethernet connection of the EUT. Channel Tx 510.5 MHz, Rx 507.5 MHz, Inj 1 552.5 MHz. Frequency range of measurement: 30 MHz - 5.6 GHz, 30 - 1GHz RBW=VBW=120 kHz. 1 - 5.6 GHz RBW=VBW=1 MHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

T1=Bicon 092401	T2=Log 331 092401
T3=Cable #10 070803	T4=Cable #15 120602
T5=Preamp 8447D 090501	T6=Horn Antenna sn6246
T7=HP3017A sn3123A00281 11-Sept-01	T8=Helix #18 70' 11Sept2001

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	T5	T6	T7	T8	Table	dBμV/m	dBμV/m	dB	Ant
1	34.680M	45.9	+16.1	+0.0	+0.1	+1.1	+0.0	34.8	40.0	-5.2	Vert
			-28.4	+0.0	+0.0	+0.0					
2	36.930M	46.3	+15.5	+0.0	+0.1	+1.1	+0.0	34.6	40.0	-5.4	Vert
	QP		-28.4	+0.0	+0.0	+0.0					
^	36.930M	48.6	+15.5	+0.0	+0.1	+1.1	+0.0	36.9	40.0	-3.1	Vert
			-28.4	+0.0	+0.0	+0.0					
4	44.316M	48.0	+12.9	+0.0	+0.1	+1.1	+0.0	33.7	40.0	-6.3	Vert
			-28.4	+0.0	+0.0	+0.0					
5	31.621M	44.2	+16.2	+0.0	+0.1	+1.0	+0.0	33.0	40.0	-7.0	Horiz
			-28.5	+0.0	+0.0	+0.0					
6	32.190M	44.1	+16.2	+0.0	+0.1	+1.0	+0.0	32.9	40.0	-7.1	Horiz
			-28.5	+0.0	+0.0	+0.0					

7	45.159M	46.5	+12.5 -28.3	+0.0 +0.0	+0.1 +0.0	+1.2 +0.0	+0.0	32.0	40.0	-8.0	Vert
8	198.928M	43.9	+16.8 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	35.1	43.5	-8.4	Vert
9	331.902M	41.4	+0.0 -28.2	+20.0 +0.0	+0.3 +0.0	+3.4 +0.0	+0.0	36.9	46.0	-9.1	Vert
10	331.894M	41.3	+0.0 -28.2	+20.0 +0.0	+0.3 +0.0	+3.4 +0.0	+0.0	36.8	46.0	-9.2	Horiz
11	100.093M	48.7	+11.5 -28.4	+0.0 +0.0	+0.1 +0.0	+1.8 +0.0	+0.0	33.7	43.5	-9.8	Vert
12	552.580M	41.6	+0.0 -28.6	+18.0 +0.0	+0.4 +0.0	+4.6 +0.0	+0.0	36.0	46.0	-10.0	Horiz
13	188.775M	41.2	+17.1 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	32.7	43.5	-10.8	Horiz
14	552.586M	40.2	+0.0 -28.6	+18.0 +0.0	+0.4 +0.0	+4.6 +0.0	+0.0	34.6	46.0	-11.4	Vert
15	298.332M	36.8	+22.1 -28.3	+0.0 +0.0	+0.3 +0.0	+3.3 +0.0	+0.0	34.2	46.0	-11.8	Horiz
16	87.831M	45.9	+8.6 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	28.1	40.0	-11.9	Horiz
17	184.828M	39.5	+17.2 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	31.1	43.5	-12.4	Vert
18	86.534M	45.6	+8.3 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	27.5	40.0	-12.5	Horiz
19	112.137M	43.4	+13.9 -28.4	+0.0 +0.0	+0.2 +0.0	+1.9 +0.0	+0.0	31.0	43.5	-12.5	Vert
20	109.388M	43.8	+13.4 -28.4	+0.0 +0.0	+0.1 +0.0	+1.9 +0.0	+0.0	30.8	43.5	-12.7	Horiz
21	186.053M	39.2	+17.1 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	30.7	43.5	-12.8	Horiz
22	218.518M	41.2	+17.2 -28.3	+0.0 +0.0	+0.2 +0.0	+2.7 +0.0	+0.0	33.0	46.0	-13.0	Vert
23	55.967M	44.9	+9.2 -28.5	+0.0 +0.0	+0.1 +0.0	+1.3 +0.0	+0.0	27.0	40.0	-13.0	Vert
24	170.710M	38.5	+17.4 -28.2	+0.0 +0.0	+0.2 +0.0	+2.4 +0.0	+0.0	30.3	43.5	-13.2	Horiz
25	186.583M	38.7	+17.1 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	30.2	43.5	-13.3	Vert
26	113.968M	42.2	+14.2 -28.4	+0.0 +0.0	+0.2 +0.0	+1.9 +0.0	+0.0	30.1	43.5	-13.4	Horiz
27	190.711M	38.6	+17.0 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	30.0	43.5	-13.5	Vert
28	194.666M	38.6	+16.9 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	29.9	43.5	-13.6	Horiz
29	189.243M	38.4	+17.1 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	29.9	43.5	-13.6	Vert
30	115.904M	41.5	+14.6 -28.4	+0.0 +0.0	+0.2 +0.0	+1.9 +0.0	+0.0	29.8	43.5	-13.7	Vert
31	182.091M	38.1	+17.2 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	29.7	43.5	-13.8	Horiz

32	510.569M	38.6	+0.0 -28.5	+17.1 +0.0	+0.4 +0.0	+4.4 +0.0	+0.0	32.0	46.0	-14.0	Vert
33	119.972M	40.4	+15.3 -28.4	+0.0 +0.0	+0.2 +0.0	+2.0 +0.0	+0.0	29.5	43.5	-14.0	Horiz
34	93.367M	46.0	+9.9 -28.2	+0.0 +0.0	+0.1 +0.0	+1.7 +0.0	+0.0	29.5	43.5	-14.0	Vert
35	365.936M	38.4	+0.0 -28.2	+17.7 +0.0	+0.3 +0.0	+3.6 +0.0	+0.0	31.8	46.0	-14.2	Horiz
36	72.092M	45.8	+6.9 -28.5	+0.0 +0.0	+0.1 +0.0	+1.5 +0.0	+0.0	25.8	40.0	-14.2	Vert
37	193.724M	37.7	+17.0 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	29.1	43.5	-14.4	Vert
38	108.318M	42.0	+13.2 -28.4	+0.0 +0.0	+0.1 +0.0	+1.9 +0.0	+0.0	28.8	43.5	-14.7	Horiz
39	52.085M	41.7	+10.3 -28.4	+0.0 +0.0	+0.1 +0.0	+1.2 +0.0	+0.0	24.9	40.0	-15.1	Vert
40	171.858M	36.5	+17.4 -28.2	+0.0 +0.0	+0.2 +0.0	+2.4 +0.0	+0.0	28.3	43.5	-15.2	Horiz
41	92.028M	45.2	+9.6 -28.2	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	28.3	43.5	-15.2	Horiz
42	195.938M	36.9	+16.9 -28.4	+0.0 +0.0	+0.2 +0.0	+2.6 +0.0	+0.0	28.2	43.5	-15.3	Vert
43	265.568M	36.2	+19.3 -28.3	+0.0 +0.0	+0.3 +0.0	+3.0 +0.0	+0.0	30.5	46.0	-15.5	Horiz
44	147.518M	36.7	+17.3 -28.4	+0.0 +0.0	+0.2 +0.0	+2.2 +0.0	+0.0	28.0	43.5	-15.5	Horiz
45	84.742M	43.0	+7.9 -28.2	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	24.4	40.0	-15.6	Vert
46	108.272M	41.0	+13.2 -28.4	+0.0 +0.0	+0.1 +0.0	+1.9 +0.0	+0.0	27.8	43.5	-15.7	Vert
47	89.217M	45.0	+8.9 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	27.5	43.5	-16.0	Vert
48	350.101M	35.6	+0.0 -28.2	+18.7 +0.0	+0.3 +0.0	+3.5 +0.0	+0.0	29.9	46.0	-16.1	Vert
49	360.112M	36.1	+0.0 -28.2	+18.1 +0.0	+0.3 +0.0	+3.6 +0.0	+0.0	29.9	46.0	-16.1	Vert
50	270.075M	35.1	+19.7 -28.3	+0.0 +0.0	+0.3 +0.0	+3.1 +0.0	+0.0	29.9	46.0	-16.1	Horiz
51	114.957M	39.3	+14.4 -28.4	+0.0 +0.0	+0.2 +0.0	+1.9 +0.0	+0.0	27.4	43.5	-16.1	Vert
52	510.586M	36.4	+0.0 -28.5	+17.1 +0.0	+0.4 +0.0	+4.4 +0.0	+0.0	29.8	46.0	-16.2	Horiz
53	90.050M	44.6	+9.1 -28.1	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	27.3	43.5	-16.2	Horiz
54	109.003M	40.3	+13.3 -28.4	+0.0 +0.0	+0.1 +0.0	+1.9 +0.0	+0.0	27.2	43.5	-16.3	Vert
55	192.981M	35.7	+17.0 -28.3	+0.0 +0.0	+0.2 +0.0	+2.5 +0.0	+0.0	27.1	43.5	-16.4	Vert
56	84.098M	42.1	+7.8 -28.2	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	23.4	40.0	-16.6	Horiz

57	180.844M	35.2	+17.3 -28.2	+0.0 +0.0	+0.2 +0.0	+2.4 +0.0	+0.0	26.9	43.5	-16.6	Vert
58	84.079M	42.0	+7.8 -28.2	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	23.3	40.0	-16.7	Vert
59	179.166M	35.0	+17.3 -28.2	+0.0 +0.0	+0.2 +0.0	+2.4 +0.0	+0.0	26.7	43.5	-16.8	Horiz
60	43.520M	37.2	+13.2 -28.4	+0.0 +0.0	+0.1 +0.0	+1.1 +0.0	+0.0	23.2	40.0	-16.8	Horiz
61	131.116M	36.4	+16.3 -28.4	+0.0 +0.0	+0.2 +0.0	+2.1 +0.0	+0.0	26.6	43.5	-16.9	Vert
62	329.932M	32.9	+0.0 -28.2	+20.2 +0.0	+0.3 +0.0	+3.4 +0.0	+0.0	28.6	46.0	-17.4	Vert
63	3377.000M	37.2	+0.0 +0.0	+0.0 +30.8	+0.0 -37.4	+0.0 +5.9	+0.0	36.5	54.0	-17.5	Vert
64	280.093M	32.8	+20.5 -28.3	+0.0 +0.0	+0.3 +0.0	+3.1 +0.0	+0.0	28.4	46.0	-17.6	Horiz
65	45.352M	36.8	+12.5 -28.3	+0.0 +0.0	+0.1 +0.0	+1.2 +0.0	+0.0	22.3	40.0	-17.7	Horiz
66	75.046M	42.0	+6.8 -28.4	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	22.1	40.0	-17.9	Vert
67	400.056M	36.6	+0.0 -28.3	+15.5 +0.0	+0.3 +0.0	+3.8 +0.0	+0.0	27.9	46.0	-18.1	Horiz
68	311.206M	31.0	+0.0 -28.3	+21.6 +0.0	+0.3 +0.0	+3.3 +0.0	+0.0	27.9	46.0	-18.1	Horiz
69	334.310M	32.5	+0.0 -28.2	+19.9 +0.0	+0.3 +0.0	+3.4 +0.0	+0.0	27.9	46.0	-18.1	Vert
70	232.090M	35.6	+17.5 -28.3	+0.0 +0.0	+0.2 +0.0	+2.8 +0.0	+0.0	27.8	46.0	-18.2	Horiz
71	62.672M	41.1	+7.8 -28.6	+0.0 +0.0	+0.1 +0.0	+1.4 +0.0	+0.0	21.8	40.0	-18.2	Vert
72	53.780M	38.8	+9.8 -28.4	+0.0 +0.0	+0.1 +0.0	+1.2 +0.0	+0.0	21.5	40.0	-18.5	Vert
73	365.328M	33.9	+0.0 -28.2	+17.7 +0.0	+0.3 +0.0	+3.6 +0.0	+0.0	27.3	46.0	-18.7	Vert
74	80.237M	40.8	+6.9 -28.2	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	21.2	40.0	-18.8	Vert
75	65.494M	40.6	+7.4 -28.6	+0.0 +0.0	+0.1 +0.0	+1.4 +0.0	+0.0	20.9	40.0	-19.1	Horiz
76	540.116M	32.6	+0.0 -28.6	+17.7 +0.0	+0.4 +0.0	+4.6 +0.0	+0.0	26.7	46.0	-19.3	Horiz
77	255.107M	33.2	+18.3 -28.2	+0.0 +0.0	+0.3 +0.0	+2.9 +0.0	+0.0	26.5	46.0	-19.5	Horiz
78	1531.610M	44.7	+0.0 +0.0	+0.0 +24.6	+0.0 -38.8	+0.0 +3.4	+0.0	33.9	54.0	-20.1	Horiz
79	513.332M	32.1	+0.0 -28.5	+17.2 +0.0	+0.4 +0.0	+4.5 +0.0	+0.0	25.7	46.0	-20.3	Vert
80	375.056M	32.4	+0.0 -28.3	+17.1 +0.0	+0.3 +0.0	+3.7 +0.0	+0.0	25.2	46.0	-20.8	Vert
81	82.551M	38.3	+7.4 -28.2	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	19.2	40.0	-20.8	Horiz

82	400.110M	33.8	+0.0 -28.3	+15.5 +0.0	+0.3 +0.0	+3.8 +0.0	+0.0	25.1	46.0	-20.9	Vert
83	75.072M	38.3	+6.8 -28.4	+0.0 +0.0	+0.1 +0.0	+1.6 +0.0	+0.0	18.4	40.0	-21.6	Horiz
84	381.054M	31.9	+0.0 -28.3	+16.7 +0.0	+0.3 +0.0	+3.7 +0.0	+0.0	24.3	46.0	-21.7	Vert
85	406.482M	32.8	+0.0 -28.4	+15.6 +0.0	+0.3 +0.0	+3.8 +0.0	+0.0	24.1	46.0	-21.9	Vert
86	418.086M	32.5	+0.0 -28.5	+15.8 +0.0	+0.3 +0.0	+3.9 +0.0	+0.0	24.0	46.0	-22.0	Vert
87	466.762M	31.2	+0.0 -28.6	+16.5 +0.0	+0.4 +0.0	+4.1 +0.0	+0.0	23.6	46.0	-22.4	Vert
88	458.216M	30.4	+0.0 -28.7	+16.4 +0.0	+0.4 +0.0	+4.1 +0.0	+0.0	22.6	46.0	-23.4	Vert
89	73.507M	35.8	+6.9 -28.5	+0.0 +0.0	+0.1 +0.0	+1.5 +0.0	+0.0	15.8	40.0	-24.2	Horiz

Test Equipment

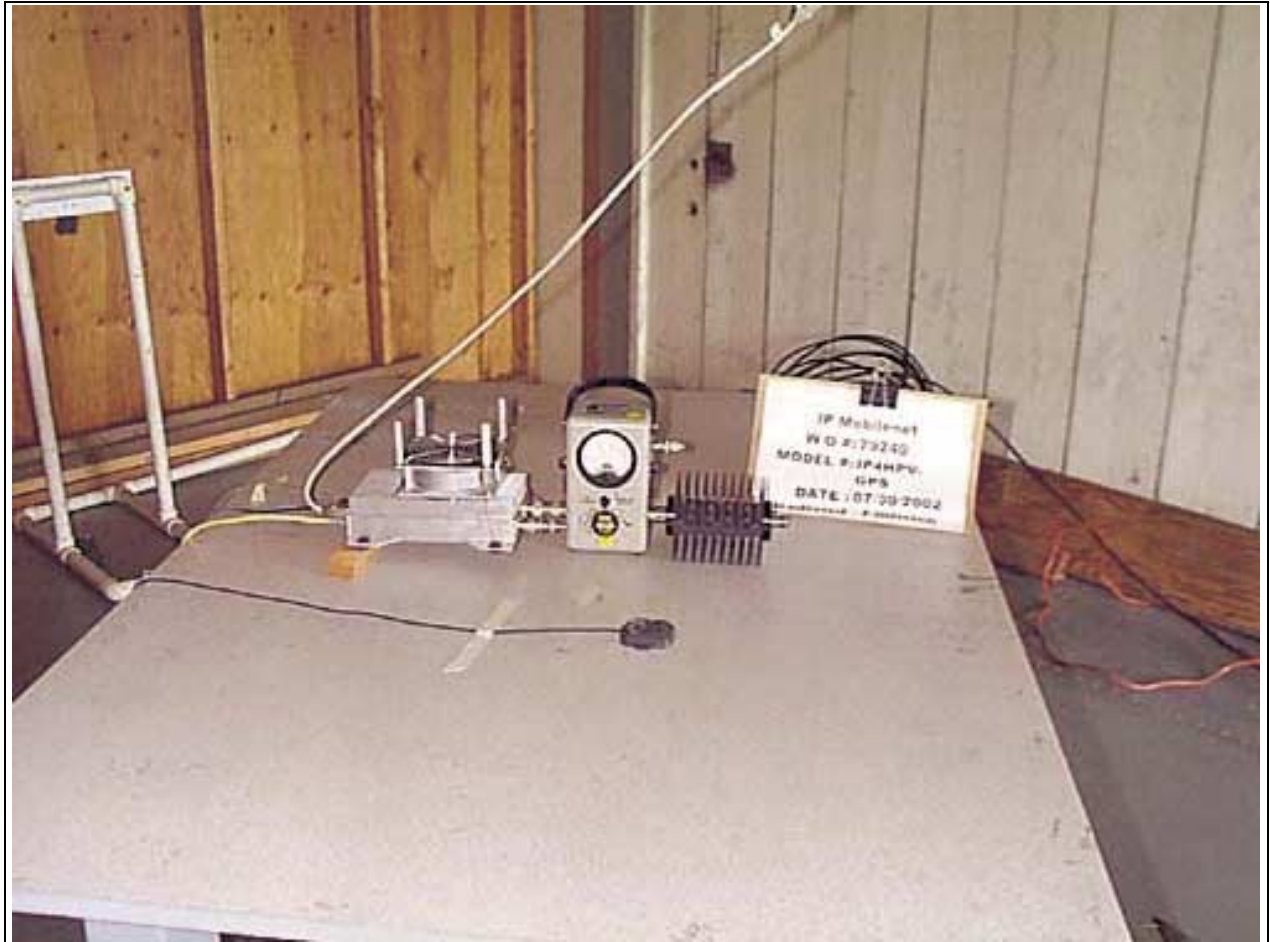
Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
4 MHz – 30 MHz						
Loop Antenna	00314	EMCO	6502	2014	072302	072303
Antenna cable	NA	NA	RG214	Cable#15	122001	122002
30 MHz – 1000 MHz						
Bicon Antenna	306	AH	SAS200/540	220	092401	092402
Log Periodic Antenna	331	AH	SAS 00/516	330	092401	092402
Pre-amp	00309	HP	8447D	1937A02548	090501	090502
Antenna cable	NA	NA	RG214	Cable#15	122001	122002
Pre-amp to SA cable	NA	Harbour	RG223/U	Cable#10	070802	070803
1000-5600 MHz						
Horn Antenna	0849	EMCO	3115	6246	091201	091202
Microwave Pre-amp	00786	HP	83017A	3123A00281	091201	091202
¼” Helix Coaxial Cable	NA	Andrew	LDF1-50	Cable#18 (70 ft)	091101	091102

PHOTOGRAPH SHOWING RADIATED EMISSIONS FCC 90.210



Radiated Emissions - Loop Antenna

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View - RS232

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View - RS232

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View - UTP

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View - UTP

15.111 – RADIATED EMISSIONS

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112
 Customer: **IP MobileNet**
 Specification: **FCC15.111 Antenna Power Conducted Limit for Receiver**
 Work Order #: **79240** Date: 07/30/2002
 Test Type: **Conducted Emissions** Time: 16:03:31
 Equipment: **Land Mobile Transceiver** Sequence#: 4
 Manufacturer: IP MobileNet Tested By: Eddie Wong
 Model: IP4HPV-GPS 13.8Vdc
 S/N: NA

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Power Supply	Radio Shack	22510	NA

Test Conditions / Notes:

Measurement is performed with a spectrum analyzer connected to the receiving antenna port of the EUT. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. The laptop is running test program to exercise the EUT. Channel Tx 509.0 MHz, Rx 551.0 MHz, Inj 0 506.0 MHz. Limit: 5 nWatt = 50 dBuV. Frequency range of measurement: 30 MHz - 5.6 GHz, 30 MHz - 1GHz RBW=VBW=120 kHz. 1 - 5.6 GHz RBW=VBW=1 MHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

T1=Brea Cable; 6' 1/4" Helix - Brea # 7.
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Measurement Data:		Reading listed by margin.					Test Lead: Antenna Terminal				
#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	4072.090M	44.1	+1.0				+0.0	45.1	50.0	-4.9	Anten
2	4581.040M	42.2	+1.0				+0.0	43.2	50.0	-6.8	Anten
3	2545.110M	38.7	+0.9				+0.0	39.6	50.0	-10.4	Anten
4	5599.040M	35.6	+1.3				+0.0	36.9	50.0	-13.1	Anten
5	2036.060M	33.2	+0.6				+0.0	33.8	50.0	-16.2	Anten
6	509.096M	33.7	+0.0				+0.0	33.7	50.0	-16.3	Anten
7	1526.960M	32.2	+0.5				+0.0	32.7	50.0	-17.3	Anten
8	5509.800M	29.8	+1.3				+0.0	31.1	50.0	-18.9	Anten
9	1527.086M	29.3	+0.5				+0.0	29.8	50.0	-20.2	Anten

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **IP MobileNet**
Specification: **FCC15.111 Antenna Power Conducted Limit for Receiver**
Work Order #: **79240** Date: 07/30/2002
Test Type: **Conducted Emissions** Time: 16:30:35
Equipment: **Land Mobile Transceiver** Sequence#: 5
Manufacturer: IP MobileNet Tested By: Eddie Wong
Model: IP4HPV-GPS 13.8Vdc
S/N: NA

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Power Supply	Radio Shack	22510	NA

Test Conditions / Notes:

Measurement is performed with a spectrum analyzer connected to the receiving antenna port of the EUT. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. The laptop is running test program to exercise the EUT. Channel Tx 510.5 MHz, Rx 507.5 MHz, Inj 1 552.5 MHz. Limit: 5 nWatt = 50 dBuV. Frequency range of measurement: 30 MHz - 5.6 GHz, 30 MHz - 1GHz RBW=VBW=120 kHz. 1 - 5.6 GHz RBW=VBW=1 MHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

T1=Brea Cable: 6' 1/4" Helix - Brea # 7.
--

Measurement Data:		Reading listed by margin.					Test Lead: Antenna Terminal				
#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	4084.160M	45.2	+1.0				+0.0	46.2	50.0	-3.8	Anten
2	4594.510M	42.1	+1.0				+0.0	43.1	50.0	-6.9	Anten
3	2552.550M	38.6	+1.0				+0.0	39.6	50.0	-10.4	Anten
4	3573.540M	38.5	+1.0				+0.0	39.5	50.0	-10.5	Anten
5	5615.410M	35.5	+1.3				+0.0	36.8	50.0	-13.2	Anten
6	5105.030M	35.4	+1.0				+0.0	36.4	50.0	-13.6	Anten
7	510.596M	34.1	+0.0				+0.0	34.1	50.0	-15.9	Anten

8	2041.930M	33.4	+0.6	+0.0	34.0	50.0	-16.0	Anten
9	1531.340M	31.8	+0.5	+0.0	32.3	50.0	-17.7	Anten
10	3063.040M	29.8	+1.1	+0.0	30.9	50.0	-19.1	Anten
11	1021.040M	27.5	+0.4	+0.0	27.9	50.0	-22.1	Anten

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **IP MobileNet**
 Specification: **FCC15.111 Antenna Power Conducted Limit for Receiver**
 Work Order #: **79240** Date: 07/30/2002
 Test Type: **Conducted Emissions** Time: 16:38:00
 Equipment: **Land Mobile Transceiver** Sequence#: 6
 Manufacturer: IP MobileNet Tested By: Eddie Wong
 Model: IP4HPV-GPS 13.8Vdc
 S/N: NA

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
DC Line Filter	Radio Shack	270-055	NA
Land Mobile Transceiver*	IP MobileNet	IP4HPV-GPS	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Inspiron 2500	08C6461296121A5503
Power Supply	Radio Shack	22510	NA

Test Conditions / Notes:

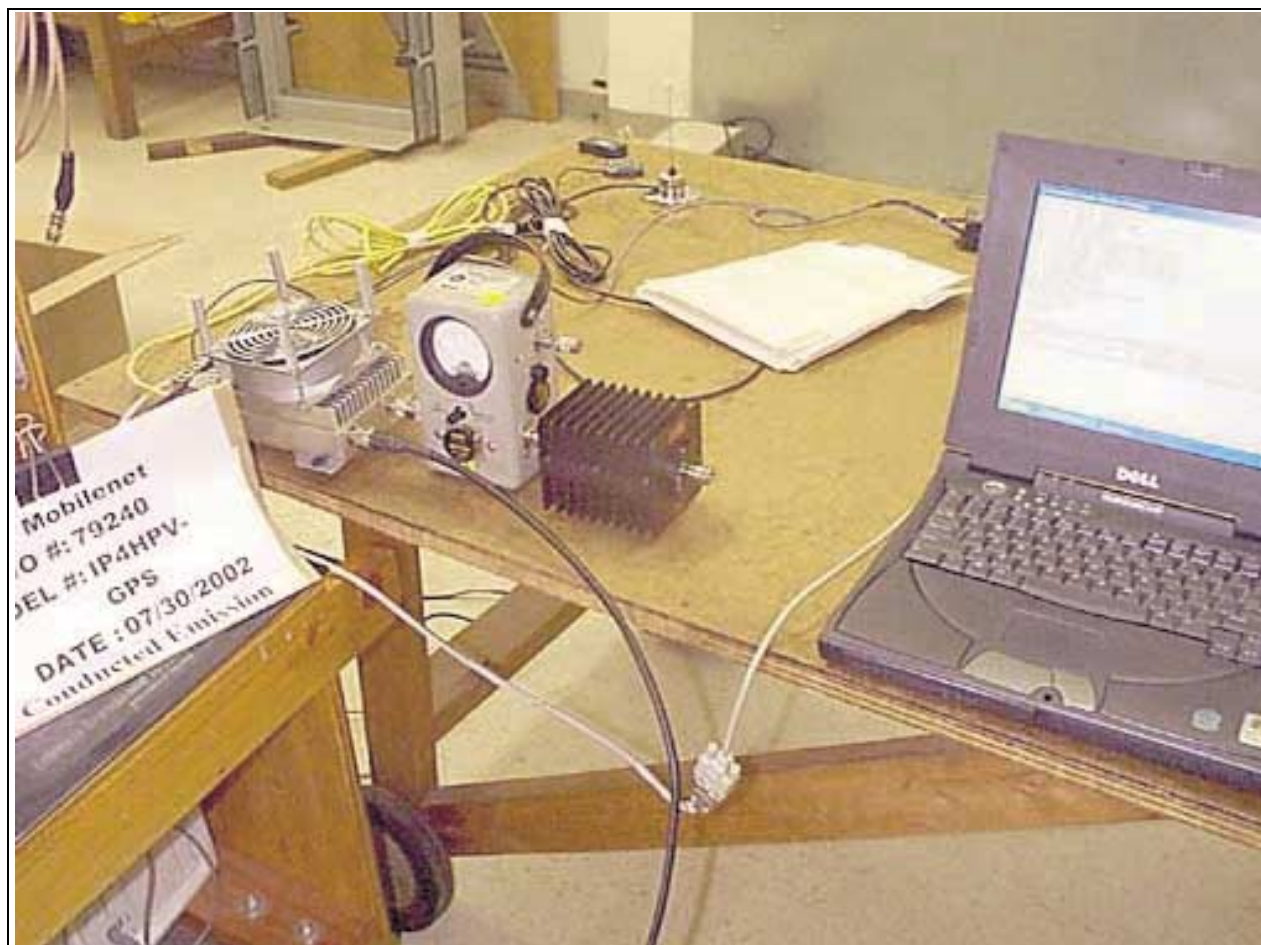
Measurement is performed with a spectrum analyzer connected to the receiving antenna port of the EUT. RS232 Port is connected to a laptop, GPS antenna port is connected to a GPS antenna, ethernet port is connected to a section of ethernet cable. The laptop is running test program to exercise the EUT. Channel Tx 511.9 MHz, Rx 508.9 MHz, Inj 2 553.9 MHz. Limit: 5 nWatt = 50 dBuV. Frequency range of measurement: 30 MHz - 5.6 GHz, 30 MHz - 1GHz RBW=VBW=120 kHz. 1 - 5.6 GHz RBW=VBW=1 MHz. 13.8 Vdc (from a 110Vac, 60 Hz DC Power Supply), 22°C, 63% relative humidity.

Transducer Legend:

T1=Brea Cable: 6' 1/4" Helix - Brea # 7.

Measurement Data:		Reading listed by margin.					Test Lead: Antenna Terminal				
#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	4606.900M	43.2	+1.0				+0.0	44.2	50.0	-5.8	Anten
2	2769.500M	38.7	+1.3				+0.0	40.0	50.0	-10.0	Anten
3	2559.900M	38.8	+1.0				+0.0	39.8	50.0	-10.2	Anten
4	4985.700M	34.8	+1.1				+0.0	35.9	50.0	-14.1	Anten
5	2047.500M	35.2	+0.6				+0.0	35.8	50.0	-14.2	Anten
6	1535.700M	33.3	+0.5				+0.0	33.8	50.0	-16.2	Anten
7	3071.900M	32.0	+1.1				+0.0	33.1	50.0	-16.9	Anten
8	512.400M	32.9	+0.0				+0.0	32.9	50.0	-17.1	Anten
9	3323.900M	31.7	+0.9				+0.0	32.6	50.0	-17.4	Anten

PHOTOGRAPH SHOWING CONDUCTED EMISSIONS FCC 15.111



PHOTOGRAPH SHOWING CONDUCTED EMISSIONS FCC 15.111



Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
High Pass Filter (above 1.5 GHz)	02116	HP	84300- 80037	3643A00027	062502	062503
¼" Heliax Coaxial Cable	NA	Andrew	FSJ-50A-4	Cable#7 (6 ft)	071502	071503