



ADDENDUM TO FC03-064
FOR THE
MOBILE STATION, M-800-25
FCC PART 90
COMPLIANCE

DATE OF ISSUE: OCTOBER 27, 2003

PREPARED FOR:

IP MobileNet
16842 Von Karman Avenue
Irvine, CA 92606

P.O. No.: 003041-00
W.O. No.: 81225

PREPARED BY:

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

Date of test: September 29 - October 3, 2003

Report No.: FC03-064A

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ADMINISTRATIVE INFORMATION

DATE OF TEST: September 29 - October 3, 2003

DATE OF RECEIPT: September 29, 2003

PURPOSE OF TEST: To demonstrate the compliance of the Mobile Station, M-800-25 with the requirements for FCC Part 90 devices.
Addendum A is to revise the output power on page 6, add the bandwidth limitations calculation on page 8 and revise the emissions mask calculations on page 12.

TEST METHOD: FCC Part 90

FREQUENCY RANGE TESTED: 1 MHz – 9 GHz

MANUFACTURER: IP MobileNet
16842 Von Karman Avenue
Irvine, CA 92606

REPRESENTATIVE: Jim Lukes

TEST LOCATION: CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92621

SUMMARY OF RESULTS

As received, the IP MobileNet Mobile Station, M-800-25 was found to be fully compliant with the following standards and specifications:

United States

➤ FCC Part 90

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

A handwritten signature in black ink, appearing to read "Joyce Walker".

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

A handwritten signature in black ink, appearing to read "Randy Clark".

Randy Clark, EMC Engineer

A handwritten signature in black ink, appearing to read "Mike Wilkinson".

Mike Wilkinson, Lab Manager

MEASUREMENT UNCERTAINTY

TEST	HIGHEST UNCERTAINTY
Radiated Emissions	+/- 2.94 dB
Conducted Emissions	+/- 1.56 dB

Note: Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Statements of compliance are based on the nominal values only.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT tested by CKC Laboratories was representative of a production unit.
The following model was tested by CKC Laboratories: **M32800N25**

Since the time of testing the manufacturer has chosen to use the following model name in its place. Any differences between the names does not affect their EMC characteristics and therefore complies to the level of testing equivalent to the tested model name shown on the data sheets: **M-800-25**

In regards to the new model number system not matching the documentation, IPMobileNet will be identifying products using a MODEL number system. This system allows accurately defining the configuration of the product as it is delivered to the customer. The documentation will retain our previous PART NUMBER system. The part number system will define a family of products that operate in the same frequency band, same PC boards, parts and package. Example: the IPM8 is a mobile radio in the 800 MHz range, with tuning and or software settings parameters can be changed, such as data rate, frequency.

EQUIPMENT UNDER TEST

Mobile Station

Manuf: IP Mobilenet
Model: M-800-25
Serial: 03392466
FCC ID: MI7-IPM800(pending)

PERIPHERAL DEVICES

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

Power Supply

Manuf: Samlex America
Model: SEC 1223
Serial: 03061-2G04-00695
FCC ID: NA

Laptop Power Supply

Manuf: Go Forward Enterprise Corp.
Model: NT24-1S1220
Serial: NA
FCC ID: NA

Mouse

Manuf: Microsoft
Model: 93633
Serial: 02608451
FCC ID: DoC

Laptop Computer

Manuf: Compaq
Model: 1456VQLIN
Serial: 1V96CLS8W8PV
FCC ID: DoC

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

FCC 2.1033(c)(3) USER'S MANUAL

The necessary information is contained in a separate document.

FCC 2.1033 (c)(4) TYPE OF EMISSIONS

20K0F1D

FCC 2.1033(c)(5) FREQUENCY RANGE

806-821 MHz.

FCC 2.1033(c)(6) OPERATING POWER

20 Watts fixed.

FCC 2.1033(c)(7) MAXIMUM POWER RATING

100 Watts.

FCC 2.1033(c)(8) DC VOLTAGES

13.8 VDC

FCC 2.1033(c)(9) TUNE-UP PROCEDURE

The necessary information is contained in a separate document.

FCC 2.1033(c)(10) SCHEMATICS AND CIRCUITRY DESCRIPTION

The necessary information is contained in a separate document.

FCC 2.1033(c)(11) LABEL AND PLACEMENT

The necessary information is contained in a separate document.

FCC 2.1033(c)(12) SUBMITTAL PHOTOS

The necessary information is contained in a separate document.

FCC 2.1033(c)(13) MODULATION INFORMATION

FSK

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

Test Conditions: EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive load through a directional coupler, the output of the directional coupler is fed to a spectrum analyzer. Frequency Range Investigated: 1-30 MHz. Channel Selected: Low. Temperature: 22°C, Humidity: 42%. No EUT emissions detected within 20dB of the limit within this frequency range.

Bandwidth settings used: 100 kHz.

Frequency (MHz)	RF Power Output (Watts)
806	20.0
815	20.0
821	19.0

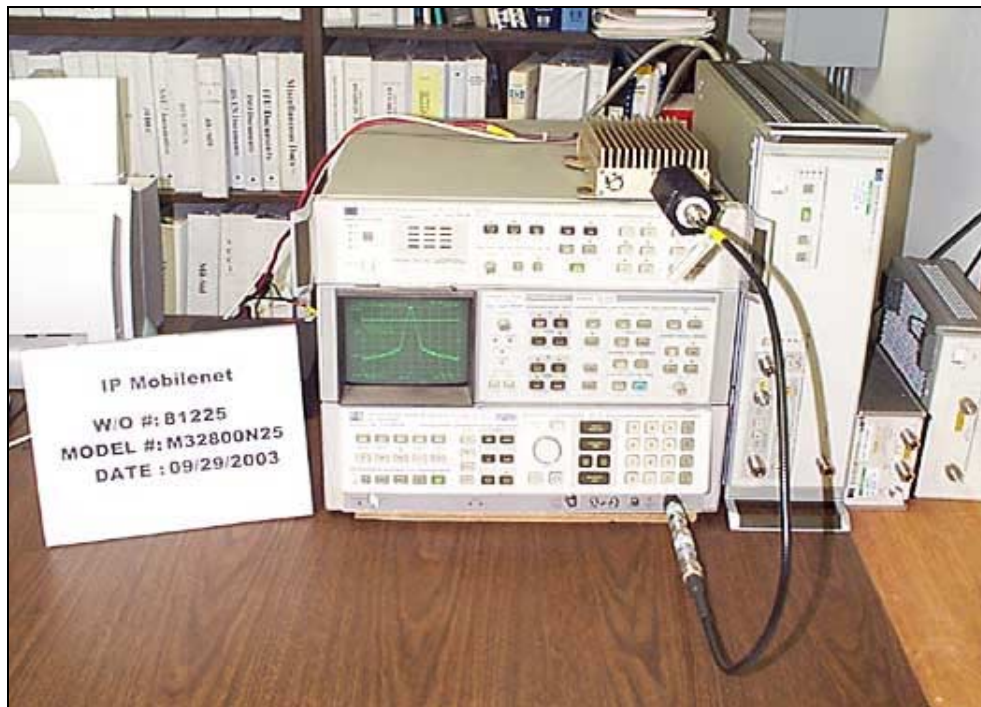
Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Directional Coupler C5571	11363	11/06/2002	11/06/2003	2579

PHOTOGRAPH SHOWING DIRECT CONNECT EMISSIONS 1 MHz - 1 GHz



PHOTOGRAPH SHOWING DIRECT CONNECT EMISSIONS >1 GHz



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

Not applicable to this unit.

**FCC 2.1033(c)(14)/2.1047(b) MODULATION CHARACTERISTICS- MODULATION
LIMITING RESPONSE**

Not applicable to this unit.

**FCC 90.209 BANDWIDTH LIMITIATION/NECESSARY BANDWIDTH
CALCULATION**

Necessary bandwidth calculation is $B_n = 2D + 2M$ Where

B_n = Necessary Bandwidth

D (peak deviation) = 2.2kHz

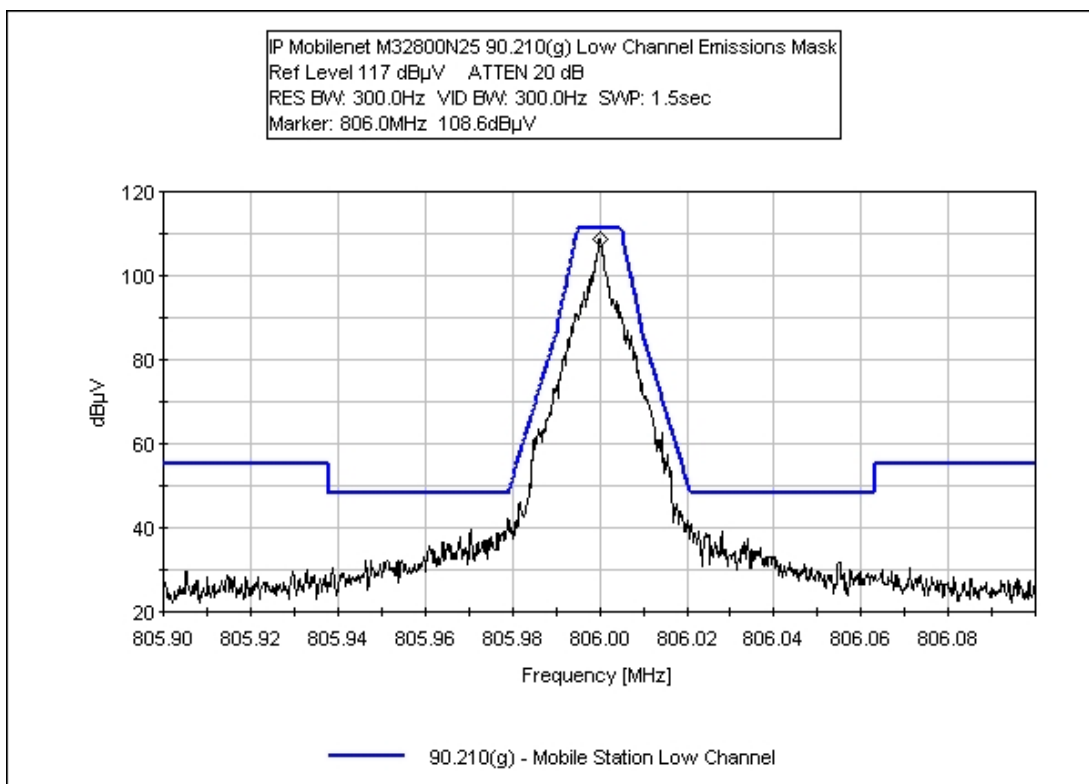
M (Max modulation frequency) = 7.8kHz

$2D + 2M = 20\text{kHz}$

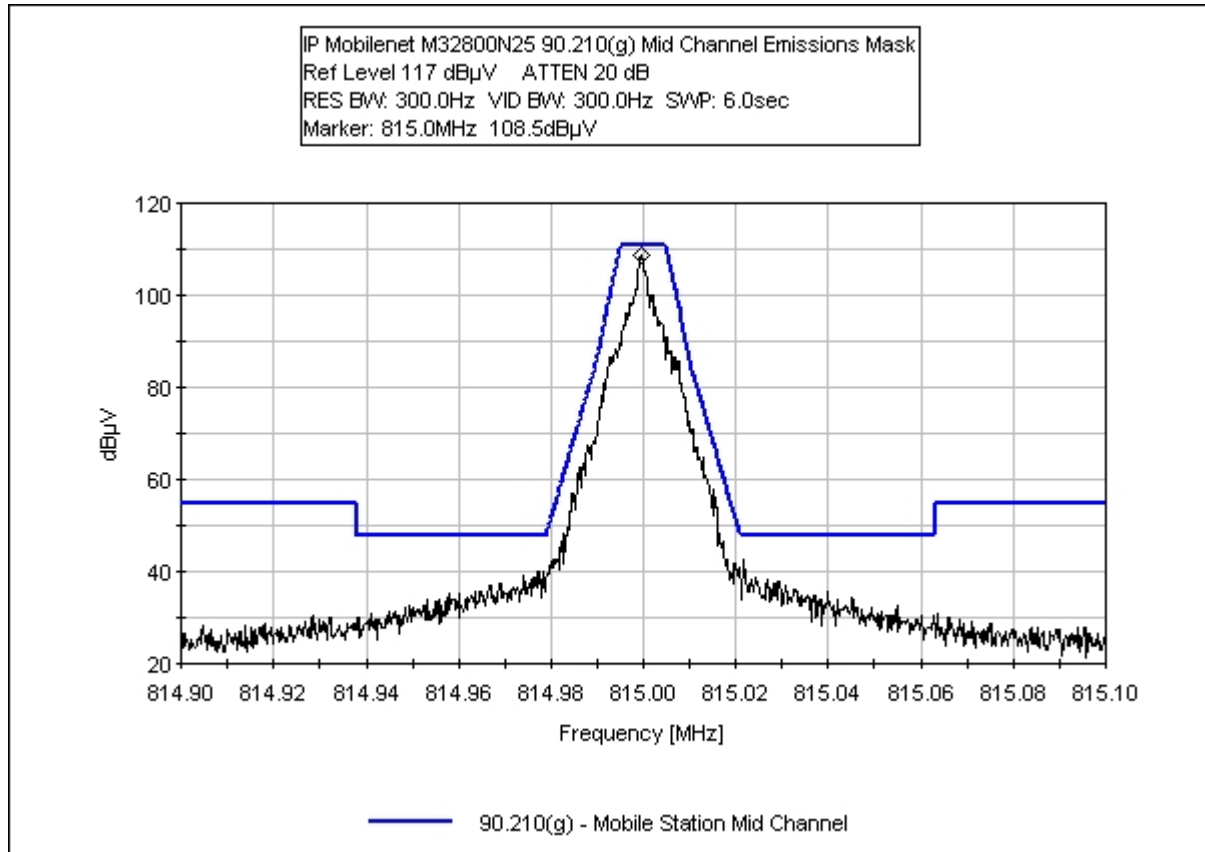
FCC 2.1033(c)(14)/2.1049(i)/90.210(g) - EMISSIONS MASK

Test Conditions: EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive load through a directional coupler, the output of the directional coupler is fed to a spectrum analyzer. Frequency Range Investigated: 1-30 MHz. Channel Selected: Low. Temperature: 22°C, Humidity: 42%. No EUT emissions detected within 20dB of the limit within this frequency range.

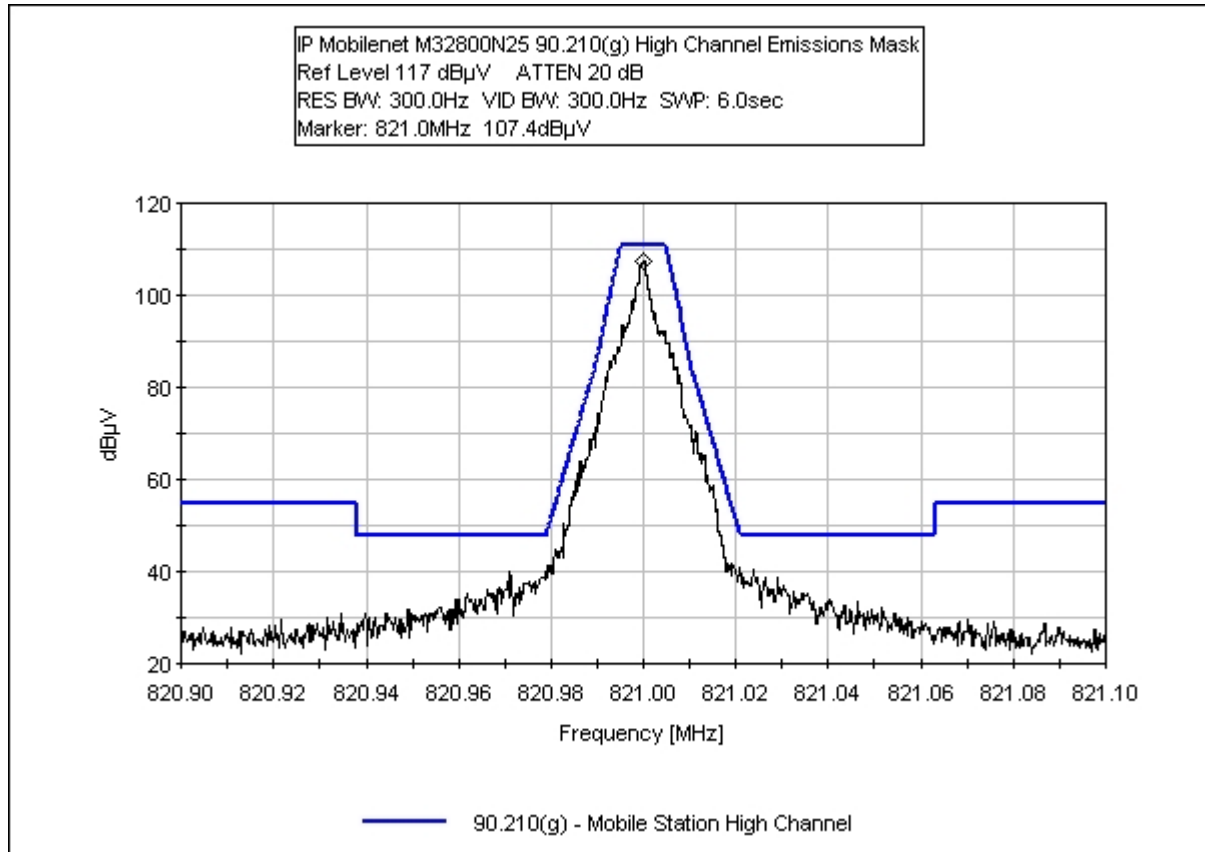
FCC 90.210(g) LOW CHANNEL



FCC 90.210(g) EMISSIONS MASK MID CHANNEL



FCC 90.210(g) EMISSIONS MASK HIGH CHANNEL



47 CFR 90.210(g)
Example Calculation of Emissions Mask

Carrier Frequency:	806.000	MHz
Channel Spacing:	25.0	kHz
Peak Unmodulated Power Output:	43.0110	dBm
Peak Unmodulated Power Output:	20.0032	Watts

Calculation of Attenuation Requirements:

P is the peak unmodulated carrier output power in Watts, and fd is the displacement frequency from the center of the authorized bandwidth in kHz.

NOTE: Only the endpoints are calculated. The limit line is linearly interpolated between the two points on a LOG - Linear scale.

90.210(g)(1)

On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5 kHz, but not more than 10 kHz: At least 83 log (fd/5) dB;

$$F(fd) = 83 \cdot \text{LOG}(fd/5)$$

F(5) =	0.0	dBc
F(10) =	25.0	dBc

90.210(g)(2)

On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least 116 log (fd/6.1) dB or 50+10 log(P) dB or 70 dB, whichever is the lesser attenuation.

Attenuation:

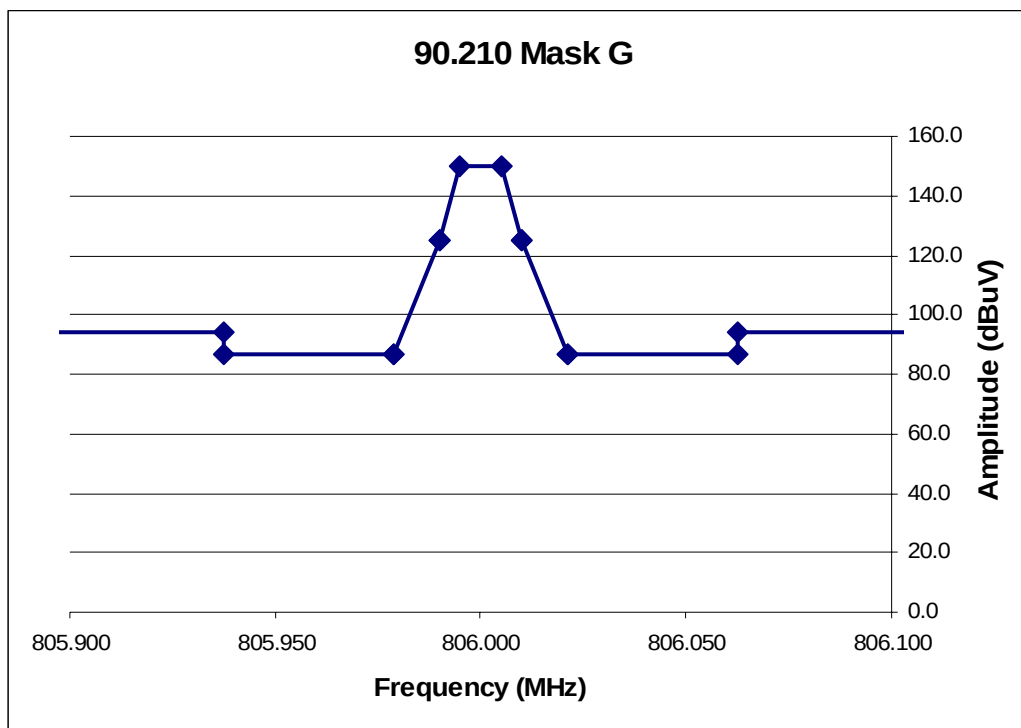
Point	fd (kHz)	116LOG(fd/6.1)	50+10LOG(P)	70
1	10	24.9	63.0	70
2	21.3	63.0	63.0	70

Point 2 is when 116LOG(fd/6.1) is equal to the lesser of 50+10LOG(P) or 70dB

90.210(g)(3)

On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

$$43+10\text{LOG}(P) = 56.0$$



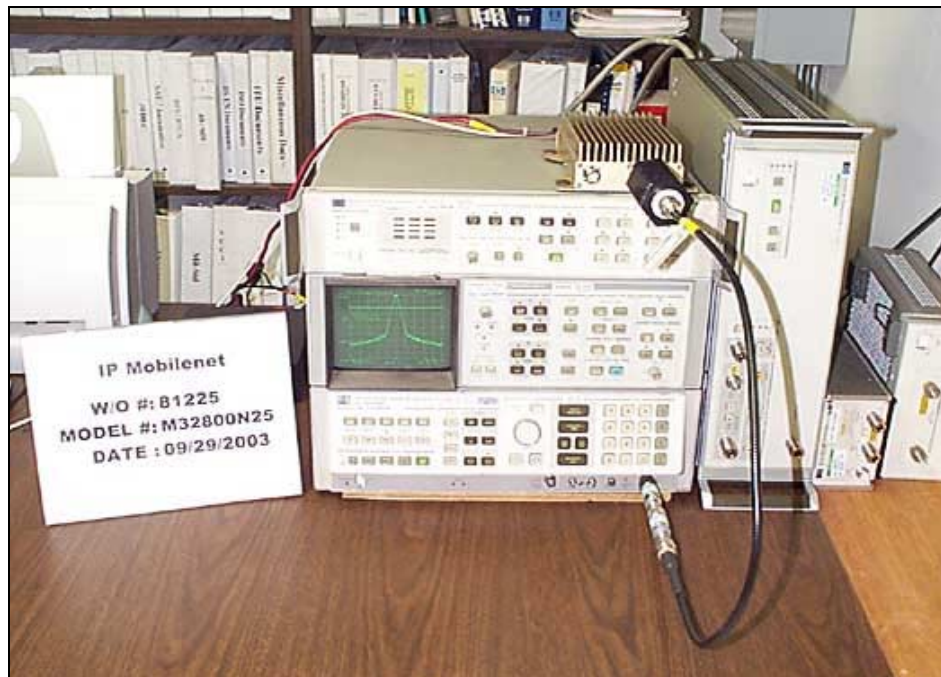
Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Directional Coupler C5571	11363	11/06/2002	11/06/2003	2579

PHOTOGRAPH SHOWING DIRECT CONNECT EMISSIONS 1 MHz - 1 GHz



PHOTOGRAPH SHOWING DIRECT CONNECT EMISSIONS >1 GHz



FCC 2.1033(c)(14)/2.1051/90.210(g) - SPURIOUS EMISSIONS AT ANTENNA TERMINAL

Bandwidth settings used: 100 kHz.

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **IP Mobilenet**
 Specification: **90.210(g) - Mobile Station Low Channel**
 Work Order #: **81225** Date: 09/29/2003
 Test Type: **Antenna Terminals** Time: 10:41:01 AM
 Equipment: **Mobile Station Data Radio** Sequence#: 22
 Manufacturer: IP Mobilenet Tested By: Randal Clark
 Model: M32800N25
 S/N: 03392466

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Directional Coupler C5571	11363	11/06/2002	11/06/2003	2579

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Mobile Station Data Radio*	IP Mobilenet	M32800N25	03392466

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Samlex America	SEC 1223	03061-2G04-00695
Laptop Power Supply	Go Forward Enterprise Corp.	NT24-1S1220	NA
Mouse	Microsoft	93633	02608451
Laptop Computer	Compaq	1456VQLIN	1V96CLS8W8PV

Test Conditions / Notes:

EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive load through a directional coupler, the output of the directional coupler is fed to a spectrum analyzer. Frequency Range Investigated: 1-30 MHz. Channel Selected: Low. Temperature: 22°C, Humidity: 42%. **No EUT emissions detected within 20dB of the limit within this frequency range.**

Transducer Legend:

T1=DC	AN 02576
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Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	3.297M	25.9	+39.6				+0.0	65.5	94.0	-28.5	None
2	2.867M	25.7	+39.7				+0.0	65.4	94.0	-28.6	None
3	14.681M	25.5	+39.7				+0.0	65.2	94.0	-28.8	None

4	26.582M	24.9	+39.7	+0.0	64.6	94.0	-29.4	None
5	27.768M	24.9	+39.7	+0.0	64.6	94.0	-29.4	None
6	12.681M	24.8	+39.6	+0.0	64.4	94.0	-29.6	None

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **IP Mobilenet**
 Specification: **90.210(g) - Mobile Station Mid Channel**
 Work Order #: **81225** Date: 09/29/2003
 Test Type: **Antenna Terminals** Time: 10:44:53 AM
 Equipment: **Mobile Station Data Radio** Sequence#: 23
 Manufacturer: IP Mobilenet Tested By: Randal Clark
 Model: M32800N25
 S/N: 03392466

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Directional Coupler C5571	11363	11/06/2002	11/06/2003	2579

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Mobile Station Data Radio*	IP Mobilenet	M32800N25	03392466

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Samlex America	SEC 1223	03061-2G04-00695
Laptop Power Supply	Go Forward Enterprise Corp.	NT24-1S1220	NA
Mouse	Microsoft	93633	02608451
Laptop Computer	Compaq	1456VQLIN	1V96CLS8W8PV

Test Conditions / Notes:

EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive load through a directional coupler, the output of the directional coupler is fed to a spectrum analyzer. Frequency Range Investigated: 1-30 MHz. Channel Selected: Mid. Temperature: 22°C, Humidity: 42%. **No EUT emissions detected within 20dB of the limit within this frequency range.**

Transducer Legend:

T1=DC AN 02576

Measurement Data: Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	3.559M	26.3	+39.6				+0.0	65.9	94.0	-28.1	None
2	2.252M	25.3	+39.7				+0.0	65.0	94.0	-29.0	None
3	24.942M	25.2	+39.7				+0.0	64.9	94.0	-29.1	None
4	16.005M	25.1	+39.7				+0.0	64.8	94.0	-29.2	None
5	28.624M	24.9	+39.7				+0.0	64.6	94.0	-29.4	None
6	1.278M	24.8	+39.7				+0.0	64.5	94.0	-29.5	None

7	1.491M	24.8	+39.7	+0.0	64.5	94.0	-29.5	None
8	1.641M	24.7	+39.7	+0.0	64.4	94.0	-29.6	None
9	2.205M	24.7	+39.7	+0.0	64.4	94.0	-29.6	None
10	1.354M	24.6	+39.7	+0.0	64.3	94.0	-29.7	None
11	1.809M	24.6	+39.7	+0.0	64.3	94.0	-29.7	None
12	1.611M	24.5	+39.7	+0.0	64.2	94.0	-29.8	None

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **IP Mobilenet**
 Specification: **90.210(g) - Mobile Station High Channel**
 Work Order #: **81225**
 Test Type: **Antenna Terminals**
 Equipment: **Mobile Station Data Radio**
 Manufacturer: **IP Mobilenet**
 Model: **M32800N25**
 S/N: **03392466**

Date: 09/29/2003
 Time: 10:46:14 AM
 Sequence#: 24
 Tested By: Randal Clark

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Directional Coupler C5571	11363	11/06/2002	11/06/2003	2579

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Mobile Station Data Radio*	IP Mobilenet	M32800N25	03392466

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Samlex America	SEC 1223	03061-2G04-00695
Laptop Power Supply	Go Forward Enterprise Corp.	NT24-1S1220	NA
Mouse	Microsoft	93633	02608451
Laptop Computer	Compaq	1456VQLIN	1V96CLS8W8PV

Test Conditions / Notes:

EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive load through a directional coupler, the output of the directional coupler is fed to a spectrum analyzer. Frequency Range Investigated: 1-30 MHz. Channel Selected: High. Temperature: 22°C, Humidity: 42%. **No EUT emissions detected within 20dB of the limit within this frequency range.**

Transducer Legend:

T1=DC	AN 02576
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Measurement Data: Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	28.566M	25.9	+39.7				+0.0	65.6	94.0	-28.4	None
2	7.081M	25.9	+39.6				+0.0	65.5	94.0	-28.5	None
3	22.303M	25.8	+39.7				+0.0	65.5	94.0	-28.5	None
4	13.159M	25.5	+39.6				+0.0	65.1	94.0	-28.9	None
5	11.321M	25.2	+39.6				+0.0	64.8	94.0	-29.2	None

6	2.991M	24.9	+39.7	+0.0	64.6	94.0	-29.4	None
7	16.690M	24.1	+39.7	+0.0	63.8	94.0	-30.2	None
8	16.960M	24.1	+39.7	+0.0	63.8	94.0	-30.2	None

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **IP Mobilenet**
 Specification: **90.210(g) - Mobile Station Low Channel**
 Work Order #: **81225** Date: 09/29/2003
 Test Type: **Antenna Terminals** Time: 10:58:42 AM
 Equipment: **Mobile Station Data Radio** Sequence#: 27
 Manufacturer: IP Mobilenet Tested By: Randal Clark
 Model: M32800N25
 S/N: 03392466

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Directional Coupler C5571	11363	11/06/2002	11/06/2003	2579

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Mobile Station Data Radio*	IP Mobilenet	M32800N25	03392466

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Samlex America	SEC 1223	03061-2G04-00695
Laptop Power Supply	Go Forward Enterprise Corp.	NT24-1S1220	NA
Mouse	Microsoft	93633	02608451
Laptop Computer	Compaq	1456VQLIN	1V96CLS8W8PV

Test Conditions / Notes:

EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive load through a directional coupler, the output of the directional coupler is fed to a spectrum analyzer. Frequency Range Investigated: 30-1000 MHz. Channel Selected: Mid. Temperature: 22°C, Humidity: 42%.

Transducer Legend:

T1=DC AN 02576

Measurement Data: Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	850.828M	48.4	+39.1				+0.0	87.5	94.0	-6.5	None
2	761.474M	48.3	+38.9				+0.0	87.2	94.0	-6.8	None
3	806.000M	102.3	+38.9				+0.0	141.2	150.0 Fundamental	-8.8	None
4	895.265M	43.7	+39.3				+0.0	83.0	94.0	-11.0	None
5	755.829M	41.4	+38.9				+0.0	80.3	94.0	-13.7	None
6	717.157M	39.9	+38.9				+0.0	78.8	94.0	-15.2	None

7	856.593M	39.2	+39.1	+0.0	78.3	94.0	-15.7	None
8	957.293M	37.7	+39.0	+0.0	76.7	94.0	-17.3	None
9	795.102M	36.8	+38.9	+0.0	75.7	94.0	-18.3	None
10	553.941M	35.7	+39.7	+0.0	75.4	94.0	-18.6	None
11	422.042M	35.2	+39.7	+0.0	74.9	94.0	-19.1	None
12	104.066M	34.9	+39.5	+0.0	74.4	94.0	-19.6	None
13	301.991M	34.9	+39.5	+0.0	74.4	94.0	-19.6	None
14	579.642M	34.7	+39.7	+0.0	74.4	94.0	-19.6	None
15	57.015M	33.9	+39.7	+0.0	73.6	94.0	-20.4	None

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **IP Mobilenet**
 Specification: **90.210(g) - Mobile Station Mid Channel**
 Work Order #: **81225**
 Test Type: **Antenna Terminals**
 Equipment: **Mobile Station Data Radio**
 Manufacturer: **IP Mobilenet**
 Model: **M32800N25**
 S/N: **03392466**

Date: 09/29/2003
 Time: 10:54:43 AM
 Sequence#: 26
 Tested By: Randal Clark

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Directional Coupler C5571	11363	11/06/2002	11/06/2003	2579

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Mobile Station Data Radio*	IP Mobilenet	M32800N25	03392466

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Samlex America	SEC 1223	03061-2G04-00695
Laptop Power Supply	Go Forward Enterprise Corp.	NT24-1S1220	NA
Mouse	Microsoft	93633	02608451
Laptop Computer	Compaq	1456VQLIN	1V96CLS8W8PV

Test Conditions / Notes:

EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive load through a directional coupler, the output of the directional coupler is fed to a spectrum analyzer. Frequency Range Investigated: 30-1000 MHz. Channel Selected: Mid. Temperature: 22°C, Humidity: 42%.

Transducer Legend:

T1=DC AN 02576

Measurement Data: Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	815.000M	102.3	+39.0				+0.0	141.3	150.0	-8.7	None
									Fundamental		
2	866.081M	43.5	+39.2				+0.0	82.7	94.0	-11.3	None
3	865.600M	42.9	+39.2				+0.0	82.1	94.0	-11.9	None
4	904.152M	41.5	+39.3				+0.0	80.8	94.0	-13.2	None
5	859.355M	41.5	+39.1				+0.0	80.6	94.0	-13.4	None
6	859.715M	41.5	+39.1				+0.0	80.6	94.0	-13.4	None

7	726.164M	40.2	+38.9	+0.0	79.1	94.0	-14.9	None
8	967.939M	39.4	+39.0	+0.0	78.4	94.0	-15.6	None
9	764.356M	39.4	+38.9	+0.0	78.3	94.0	-15.7	None
10	770.601M	39.3	+38.9	+0.0	78.2	94.0	-15.8	None
11	804.229M	37.9	+38.9	+0.0	76.8	94.0	-17.2	None
12	948.777M	37.8	+39.0	+0.0	76.8	94.0	-17.2	None
13	560.066M	36.3	+39.7	+0.0	76.0	94.0	-18.0	None
14	763.996M	36.9	+38.9	+0.0	75.8	94.0	-18.2	None
15	94.677M	35.0	+39.6	+0.0	74.6	94.0	-19.4	None
16	254.912M	35.0	+39.5	+0.0	74.5	94.0	-19.5	None
17	865.240M	35.2	+39.2	+0.0	74.4	94.0	-19.6	None
18	772.283M	35.3	+38.9	+0.0	74.2	94.0	-19.8	None
19	661.791M	34.8	+39.2	+0.0	74.0	94.0	-20.0	None
20	175.646M	34.1	+39.8	+0.0	73.9	94.0	-20.1	None

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **IP Mobilenet**
 Specification: **90.210(g) - Mobile Station High Channel**
 Work Order #: **81225**
 Test Type: **Antenna Terminals**
 Equipment: **Mobile Station Data Radio**
 Manufacturer: **IP Mobilenet**
 Model: **M32800N25**
 S/N: **03392466**

Date: 09/29/2003
 Time: 10:51:05 AM
 Sequence#: 25
 Tested By: Randal Clark

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Directional Coupler C5571	11363	11/06/2002	11/06/2003	2579

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Mobile Station Data Radio*	IP Mobilenet	M32800N25	03392466

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Samlex America	SEC 1223	03061-2G04-00695
Laptop Power Supply	Go Forward Enterprise Corp.	NT24-1S1220	NA
Mouse	Microsoft	93633	02608451
Laptop Computer	Compaq	1456VQLIN	1V96CLS8W8PV

Test Conditions / Notes:

EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive load through a directional coupler, the output of the directional coupler is fed to a spectrum analyzer. Frequency Range Investigated: 30-1000 MHz. Channel Selected: High. Temperature: 22°C, Humidity: 42%.

Transducer Legend:

T1=DC AN 02576

Measurement Data: Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	865.841M	47.6	+39.2				+0.0	86.8	94.0	-7.2	None
2	821.000M	102.3	+39.0				+0.0	141.3	150.0	-8.7	None
									Fundamental		
3	776.366M	44.7	+38.9				+0.0	83.6	94.0	-10.4	None
4	776.606M	44.5	+38.9				+0.0	83.4	94.0	-10.6	None
5	910.157M	40.5	+39.2				+0.0	79.7	94.0	-14.3	None
6	769.761M	40.1	+38.9				+0.0	79.0	94.0	-15.0	None

7	954.788M	39.2	+39.0	+0.0	78.2	94.0	-15.8	None
8	954.475M	38.9	+39.0	+0.0	77.9	94.0	-16.1	None
9	731.929M	38.9	+38.9	+0.0	77.8	94.0	-16.2	None
10	732.169M	38.7	+38.9	+0.0	77.6	94.0	-16.4	None
11	975.140M	38.5	+38.9	+0.0	77.4	94.0	-16.6	None
12	974.827M	38.2	+38.9	+0.0	77.1	94.0	-16.9	None
13	872.446M	37.6	+39.2	+0.0	76.8	94.0	-17.2	None
14	810.354M	37.0	+38.9	+0.0	75.9	94.0	-18.1	None
15	270.525M	35.8	+39.5	+0.0	75.3	94.0	-18.7	None
16	666.955M	36.0	+39.2	+0.0	75.2	94.0	-18.8	None
17	687.252M	36.1	+39.0	+0.0	75.1	94.0	-18.9	None
18	153.788M	34.7	+39.6	+0.0	74.3	94.0	-19.7	None
19	382.015M	34.6	+39.7	+0.0	74.3	94.0	-19.7	None
20	564.390M	34.6	+39.7	+0.0	74.3	94.0	-19.7	None

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **IP Mobilenet**
 Specification: **90.210(g) - Mobile Station Low Channel**
 Work Order #: **81225**
 Test Type: **Antenna Terminals**
 Equipment: **Mobile Station Data Radio**
 Manufacturer: IP Mobilenet
 Model: M32800N25
 S/N: 03392466

Date: 09/29/2003
 Time: 15:17:50
 Sequence#: 29
 Tested By: Randal Clark

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Bird Attenuator, 25A-MFN-30	9724	05/08/2003	05/08/2005	0
Cable, Andrews Hardline	NA	06/04/2003	06/04/2005	0
Attenuator, WE 50-3	21016	05/06/2003	05/06/2005	0
Attenuator, WE 50-6	58099	05/06/2003	05/06/2005	0

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Mobile Station Data Radio*	IP Mobilenet	M32800N25	03392466

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Samlex America	SEC 1223	03061-2G04-00695
Laptop Power Supply	Go Forward Enterprise Corp.	NT24-1S1220	NA
Mouse	Microsoft	93633	02608451
Laptop Computer	Compaq	1456VQLIN	1V96CLS8W8PV

Test Conditions / Notes:

EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive attenuator which is routed to a spectrum analyzer. Frequency Range Investigated: 1-9 GHz. Channel Selected: Low. Temperature: 22°C, Humidity: 42%.

Transducer Legend:

T1=Cable HF P01527	T2=Pad 30dB
T3=Pad 6dB	T4=Pad 3dB

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	1612.087M	53.2	+0.4	+30.2	+6.2	+3.1	+0.0	93.1	94.0	-0.9	None
2	2417.416M	52.5	+0.5	+30.1	+6.2	+3.1	+0.0	92.4	94.0	-1.6	None
3	4030.027M	51.0	+0.6	+29.5	+6.1	+3.3	+0.0	90.5	94.0	-3.5	None
4	3223.221M	49.2	+0.5	+29.6	+6.1	+3.0	+0.0	88.4	94.0	-5.6	None

5	6960.955M	49.7	+1.0	+27.1	+5.7	+2.8	+0.0	86.3	94.0	-7.7	None
6	4833.830M	47.3	+0.9	+28.4	+6.0	+3.4	+0.0	86.0	94.0	-8.0	None
7	7007.001M	49.1	+1.0	+27.1	+5.7	+2.8	+0.0	85.7	94.0	-8.3	None
8	6123.118M	48.7	+0.8	+27.6	+5.4	+2.9	+0.0	85.4	94.0	-8.6	None
9	5836.832M	48.2	+0.7	+27.8	+5.6	+3.0	+0.0	85.3	94.0	-8.7	None
10	8958.328M	47.8	+1.6	+25.1	+6.3	+4.0	+0.0	84.8	94.0	-9.2	None
11	5993.989M	47.7	+0.7	+27.8	+5.5	+3.0	+0.0	84.7	94.0	-9.3	None
12	8831.352M	47.4	+1.7	+24.6	+6.3	+3.9	+0.0	83.9	94.0	-10.1	None
13	8623.032M	47.9	+1.9	+23.9	+6.4	+3.7	+0.0	83.8	94.0	-10.2	None
14	8183.576M	48.2	+1.5	+24.0	+6.2	+3.3	+0.0	83.2	94.0	-10.8	None
15	8135.960M	47.4	+1.4	+24.1	+6.2	+3.3	+0.0	82.4	94.0	-11.6	None

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **IP Mobilenet**
 Specification: **90.210(g) - Mobile Station Mid Channel**
 Work Order #: **81225**
 Test Type: **Antenna Terminals**
 Equipment: **Mobile Station Data Radio**
 Manufacturer: **IP Mobilenet**
 Model: **M32800N25**
 S/N: **03392466**

Date: 09/29/2003
 Time: 15:27:15
 Sequence#: 30
 Tested By: Randal Clark

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Bird Attenuator, 25A-MFN-30	9724	05/08/2003	05/08/2005	0
Cable, Andrews Hardline	NA	06/04/2003	06/04/2005	0
Attenuator, WE 50-3	21016	05/06/2003	05/06/2005	0
Attenuator, WE 50-6	58099	05/06/2003	05/06/2005	0

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Mobile Station Data Radio*	IP Mobilenet	M32800N25	03392466

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Samlex America	SEC 1223	03061-2G04-00695
Laptop Power Supply	Go Forward Enterprise Corp.	NT24-1S1220	NA
Mouse	Microsoft	93633	02608451
Laptop Computer	Compaq	1456VQLIN	1V96CLS8W8PV

Test Conditions / Notes:

EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive attenuator which is routed to a spectrum analyzer. Frequency Range Investigated: 1-9 GHz. Channel Selected: Mid. Temperature: 22°C, Humidity: 42%.

Transducer Legend:

T1=Cable HF P01527	T2=Pad 30dB
T3=Pad 6dB	T4=Pad 3dB

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	1628.628M	52.7	+0.4	+30.2	+6.2	+3.1	+0.0	92.6	94.0	-1.4	None
2	4075.085M	52.7	+0.6	+29.5	+6.1	+3.3	+0.0	92.2	94.0	-1.8	None
3	2445.095M	51.7	+0.5	+30.1	+6.3	+3.1	+0.0	91.7	94.0	-2.3	None
4	4887.884M	49.3	+0.9	+28.4	+6.0	+3.5	+0.0	88.1	94.0	-5.9	None

5	3259.257M	48.1	+0.6	+29.6	+6.1	+3.0	+0.0	87.4	94.0	-6.6	None
6	5804.800M	48.8	+0.7	+27.8	+5.6	+3.0	+0.0	85.9	94.0	-8.1	None
7	6650.645M	49.4	+1.0	+27.2	+5.4	+2.6	+0.0	85.6	94.0	-8.4	None
8	7020.014M	48.8	+1.0	+27.1	+5.7	+2.8	+0.0	85.4	94.0	-8.6	None
9	8948.408M	48.0	+1.6	+25.0	+6.3	+4.0	+0.0	84.9	94.0	-9.1	None

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **IP Mobilenet**
 Specification: **90.210(g) - Mobile Station High Channel**
 Work Order #: **81225**
 Test Type: **Antenna Terminals**
 Equipment: **Mobile Station Data Radio**
 Manufacturer: IP Mobilenet
 Model: M32800N25
 S/N: 03392466

Date: 09/29/2003
 Time: 15:39:42
 Sequence#: 31
 Tested By: Randal Clark

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Bird Attenuator, 25A-MFN-30	9724	05/08/2003	05/08/2005	0
Cable, Andrews Hardline	NA	06/04/2003	06/04/2005	0
Attenuator, WE 50-3	21016	05/06/2003	05/06/2005	0
Attenuator, WE 50-6	58099	05/06/2003	05/06/2005	0

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Mobile Station Data Radio*	IP Mobilenet	M32800N25	03392466

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Samlex America	SEC 1223	03061-2G04-00695
Laptop Power Supply	Go Forward Enterprise Corp.	NT24-1S1220	NA
Mouse	Microsoft	93633	02608451
Laptop Computer	Compaq	1456VQLIN	1V96CLS8W8PV

Test Conditions / Notes:

EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive attenuator which is routed to a spectrum analyzer. Frequency Range Investigated: 1-9 GHz. Channel Selected: High. Temperature: 22°C, Humidity: 42%.

Transducer Legend:

T1=Cable HF P01527	T2=Pad 30dB
T3=Pad 6dB	T4=Pad 3dB

Measurement Data: Reading listed by margin. Test Distance: None

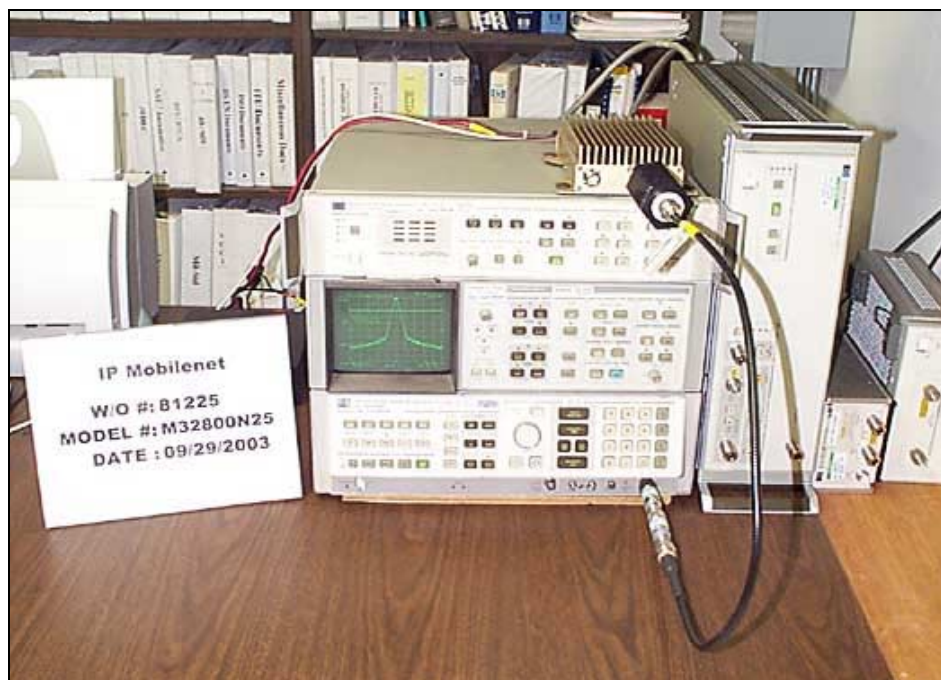
#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	2418.084M	53.1	+0.5	+30.1	+6.2	+3.1	+0.0	93.0	94.0	-1.0	None
2	1612.092M	53.0	+0.4	+30.2	+6.2	+3.1	+0.0	92.9	94.0	-1.1	None
3	4030.027M	51.1	+0.6	+29.5	+6.1	+3.3	+0.0	90.6	94.0	-3.4	None
4	3223.221M	48.4	+0.5	+29.6	+6.1	+3.0	+0.0	87.6	94.0	-6.4	None

5	5824.820M	49.3	+0.7	+27.8	+5.6	+3.0	+0.0	86.4	94.0	-7.6	None
6	6752.747M	49.8	+1.0	+27.1	+5.5	+2.7	+0.0	86.1	94.0	-7.9	None
7	4832.829M	46.9	+0.9	+28.4	+6.0	+3.4	+0.0	85.6	94.0	-8.4	None
8	8921.624M	48.3	+1.7	+24.9	+6.3	+3.9	+0.0	85.1	94.0	-8.9	None
9	8942.456M	48.1	+1.6	+25.0	+6.3	+4.0	+0.0	85.0	94.0	-9.0	None
10	7253.247M	48.6	+1.3	+26.5	+5.7	+2.8	+0.0	84.9	94.0	-9.1	None
11	7556.550M	48.2	+1.5	+25.7	+6.1	+3.1	+0.0	84.6	94.0	-9.4	None
12	8973.208M	47.2	+1.6	+25.1	+6.3	+4.0	+0.0	84.2	94.0	-9.8	None

PHOTOGRAPH SHOWING DIRECT CONNECT EMISSIONS 1 MHz - 1 GHz



PHOTOGRAPH SHOWING DIRECT CONNECT EMISSIONS >1 GHz



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

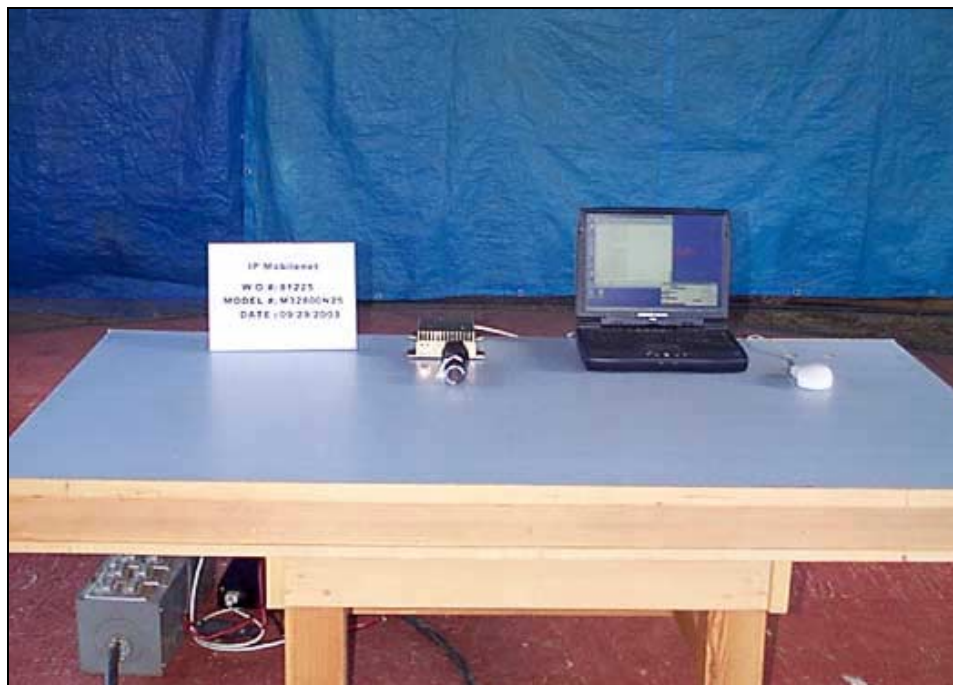
Test Conditions: EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive load. Frequency Range Investigated: 1MHz - 9GHz. Channel Selected: Low, Mid and High. Temperature: 22°C, Humidity: 42% Data represents the worst case of all channels tested. **No EUT signals detected within 20dB of the limit.**

Bandwidth settings used: 100 kHz.

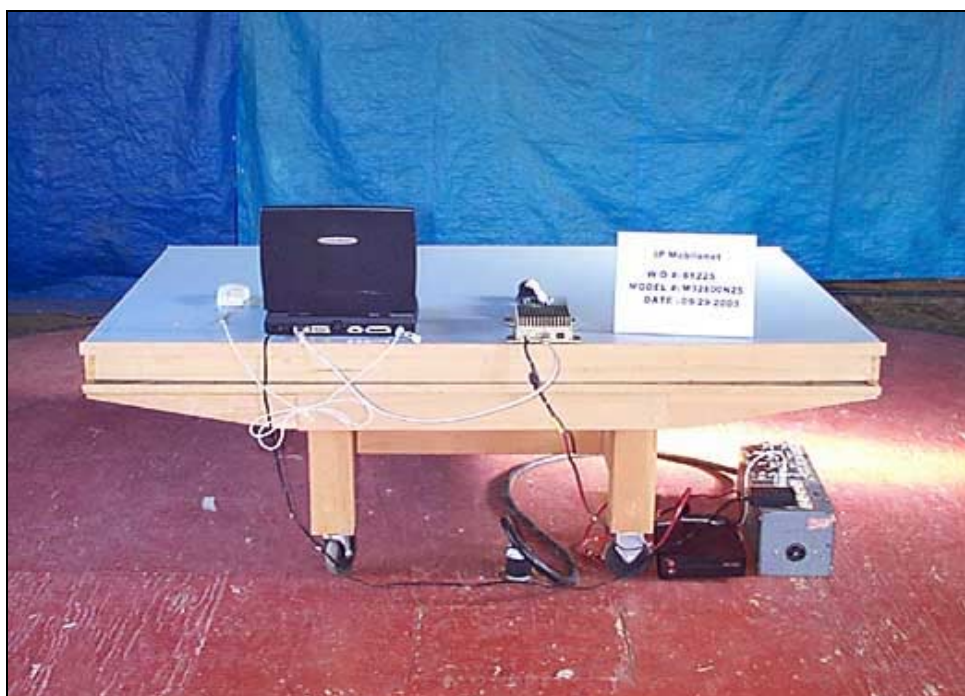
Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Cable, Site B		11/18/2002	11/18/2003	0
EMCO Loop Antenna	1074	05/21/2003	05/21/2005	226
Chase CBL6111C Bilog	2456	12/13/2002	12/13/2004	1991
HP 8447D Preamp	1937A02604	03/07/2003	03/07/2004	99
Cable H&S 35'	90148402	01/21/2003	01/21/2004	0
Cable, WL Gore 2'	149047	04/10/2003	04/10/2004	0
Cable, Andrews Hardline HF-005-20	NA	06/03/2003	06/03/2005	0
EMCO 3115 Horn Antenna	9006-3413	11/25/2002	11/25/2003	327
HP 8449B Preamp	3008A00301	10/21/2002	10/18/2003	2010

PHOTOGRAPH SHOWING OATS RADIATED EMISSIONS



Radiated Emissions - Front View



Radiated Emissions - Back View

FCC 2.1033(c)(14)/2.1055/90.213- FREQUENCY STABILITY

Test Conditions: EUT is a data radio for mobile use operating on a frequency of 806-821 MHz. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Antenna port is terminated into a 50 ohm resistive attenuator which is routed to a spectrum analyzer. At ambient room temperature, the input DC voltage is varied $\pm 15\%$ of nominal operating voltage.

Frequency Stability

Customer: IP Mobilenet
WO#: 81225
Date: 01-Oct-03
Test Engineer: Randal Clark

Device Model #: M32800N25
Operating Voltage: 13.8 VDC
Frequency Limit: 2.5 PPM

Temperature Variations

Channel Frequency:	Channel 1 (MHz)	Dev. (MHz)	Channel 2 (MHz)	Dev. (MHz)	Channel 3 (MHz)	Dev. (MHz)
Temp (C) Voltage	806		815		821	
-30 13.8	806.00146	0.00145	815.00150	0.00150	821.00155	0.00155
-20 13.8	806.00144	0.00144	815.00140	0.00140	821.00134	0.00134
-10 13.8	806.00120	0.00120	815.00107	0.00107	821.00111	0.00111
0 13.8	806.00067	0.00067	815.00082	0.00081	821.00084	0.00084
10 13.8	806.00020	0.00020	815.00029	0.00029	821.00031	0.00031
20 13.8	805.99997	0.00004	814.99990	0.00010	820.99996	0.00004
30 13.8	805.99996	0.00004	814.99994	0.00006	820.99993	0.00008
40 13.8	805.99996	0.00005	814.99984	0.00017	820.99994	0.00006
50 13.8	806.00011	0.00011	815.00017	0.00017	821.00018	0.00018

Voltage Variations ($\pm 15\%$)

20 11.7	805.99992	0.00008	815.00003	0.00003	821.00012	0.00012
20 13.8	805.99997	0.00004	814.99990	0.00010	820.99996	0.00004
20 15.9	805.99988	0.00012	814.99994	0.00006	820.99993	0.00007

Max Deviation (MHz)	0.00145
Max Deviation (PPM)	1.80521
	PASS

0.00150
1.84049
PASS

0.00155
1.88794
PASS

Max Deviation (MHz)	0.00145
Max Deviation (%)	0.00000
	PASS

0.00150
0.00000
PASS

0.00155
0.00000
PASS

Test equipment:

Description	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Temp Chamber	01879	Thermotron	S-1.2 MiniMax	11899	1/31/03	1/31/04
Thermometer	02242	Omega	HH-26K	T-202884	8/15/03	8/14/05
Power Supply, DC	00765	Sorensen	DCR-60-30B	176	7/8/03	7/7/05
Spectrum Analyzer 100Hz - 22.5GHz	00490	HP	8566B	2209A01404	2/26/03	2/26/04
Spectrum Analyzer Display	00489	HP	8566B	2403A08241	2/26/03	2/26/04
Spectrum Analyzer QP Adapter	00478	HP	85650A	2811A01267	2/26/03	2/26/04

PHOTOGRAPH SHOWING TEMPERATURE TESTING



FCC 2.1091 – MPE CALCULATIONS

Date of Report: 10/1/03

Calculations prepared for:

IP Mobilenet

Calculations prepared by:

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

Model Number: M32800N25
FCC Identification:

Fundamental Operating Frequency: 806-821 MHz

Maximum Rated Output Power: 20 Watts
Measured Output Power: 20 Watts

MPE Limit in accordance with 1.1310(b): Limits for general population/uncontrolled exposure

MPE Limit = 0.54 (mW/cm²)
(Calculated using the lowest operating frequency, 806MHz)

EIRP (mW)	Distance (cm)	Power Density (mW/cm ²)	Result
20000.00	54.29	0.540	Pass

$$PowerDensity(mW / cm^2) = \frac{EIRP}{4\pi d^2} \quad \text{Given: } \mathbf{EIRP} \text{ in } mW \text{ and } \mathbf{d} \text{ in } cm$$

Note: Antennae are not sold with this equipment; EIRP is listed assuming a 0 dBi gain antenna.

As can be seen from the MPE results, this device passes the limits specified in 1.1310 at a distance of 54.3 cm and at an output power of 20 watts assuming a 0 dBi gain antenna.