



## **ADDENDUM TO FC03-064**

## FOR THE

## **MOBILE STATION, M-800-25**

FCC PART 90

COMPLIANCE

## DATE OF ISSUE: OCTOBER 27, 2003

## **PREPARED FOR:**

## **PREPARED BY:**

IP MobileNet 16842 Von Karman Avenue Irvine, CA 92606

P.O. No.: 003041-00 W.O. No.: 81225 Mary Ellen Clayton CKC Laboratories, Inc. 5473A Clouds Rest Mariposa, CA 95338

Date of test: September 29 - October 3, 2003

Report No.: FC03-064A

This report contains a total of 38 pages and may be reproduced in full only. Partial reproduction may only be done with the written consent of CKC Laboratories, Inc. The results in this report apply only to the items tested, as identified herein.



# TABLE OF CONTENTS

Administrative Information	3
Summary of Results	4
Conditions for Compliance	4
Approvals	4
Measurement Uncertainty	4
Equipment Under Test (EUT) Description	5
Equipment Under Test	5
Peripheral Devices	5
Temperature and Humidity During Testing	6
FCC 2.1033(c)(3) User's Manual	6
FCC 2.1033(c)(4) Type of Emissions	6
FCC 2.1033(c)(5) Frequency Range	6
FCC 2.1033(c)(6) Operating Power	6
FCC 2.1033(c)(7) Maximum Power Rating	6
FCC 2.1033(c)(8) DC Voltages	6
FCC 2.1033(c)(9) Tune-Up Procedure	6
FCC 2.1033(c)(10) Schematics and Circuitry Description	6
FCC 2.1033(c)(11) Label and Placement	6
FCC 2.1033(c)(12) Submittal Photos	6
FCC 2.1033(c)(13) Modulation Information	6
FCC 2.1033(c)(14)/2.1046/90.205 - RF Power Output	7
FCC 2.1033(c)(14)/2.1047(b) - Audio Frequency Response	8
FCC 2.1033(c)(14)/2.1047(b) - Modulation Limiting Response	8
FCC 90.209 -Bandwidth Limitation/Necessary Bandwidth Calculation	8
FCC 2.1033(c)(14)/2.1049(i)/90.210(g) - Emissions Mask	9
FCC 2.1033(c)(14)/2.1051/90.210(g) - Spurious Emissions at Antenna Terminal	15
FCC 2.1033(c)(14)/2.1053/90.210(g) - Field Strength of Spurious Radiation	34
FCC 2.1033(c)(14)/2.1055/90.213 - Frequency Stability	36
FCC 2.1091 - MPE Calculations	38



# 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
<b>REPRESENTATIVE:</b>	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:**

**TEST PERSONNEL:** 

Joyce Walker, Quality Assurance Administrative Manager

while Wies

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.

Randy Clark, EMC Engineer



## 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		Laptop Pov	Laptop Power Supply		
Manuf:	Samlex America	Manuf:	Go Forward Enterprise Corp.		
Model:	SEC 1223	Model:	NT24-1S1220		
Serial:	03061-2G04-00695	Serial:	NA		
FCC ID:	NA	FCC ID:	NA		
Mouse		Laptop Co	mputer		
Manuf:	Microsoft	Manuf:	Compaq		
Model:	93633	Model:	1456VQLIN		
Serial:	02608451	Serial:	1V96CLS8W8PV		
FCC ID:	DoC	FCC ID:	DoC		



# TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within  $+15^{\circ}$ C and  $+35^{\circ}$ 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	<b>RF Power Output</b>
(MHz)	(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 Bn=2D+2M Where Bn = Necessary Bandwidth D (peak deviation) = 2.2kHz M (Max modulation frequency) = 7.8kHz 2D+2M = 20kHz



## 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*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:				
	fd			
Point	(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.





## 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



Page 14 of 38 Report No.: FC03-064A



# 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 Mobiler	net			
Specification:	90.210(g) - Mobile Station Low Channel				
Work Order #:	81225		D	ate: 09/29/2003	
Test Type:	Antenna T	erminals	Ti	me: 10:41:01 AM	
Equipment:	Mobile Sta	tion Data Radio	Sequence	ce#: 22	
Manufacturer:	IP Mobilen	et	Tested	By: Randal Clark	
Model:	M32800N2	5			
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 Dis	splay	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA		2811A01267	02/26/2003	02/26/2004	478
Directional Coupl	er C5571	11363	11/06/2002	11/06/2003	2579
Equipment Unde	er Test (* = $\mathbf{I}$	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

<i>Measurement Data:</i> Reading listed by margin				margin.		Te	st Distance	e: None			
#	Freq	Rdng	T1				Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	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



Customer: Specification:	IP Mobilenet 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

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:

Measur	<i>Measurement Data:</i> Reading listed by margin.			nargin.	Test Distance: None						
#	Freq	Rdng	T1				Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	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



Customer: Specification: Work Order #:	IP Mobilenet 90.210(g) - Mobile Station High Channel 81225	Date:	09/29/2003
Test Type:	Antenna Terminals	Time:	10:46:14 AM
Equipment:	Mobile Station Data Radio	Sequence#:	24
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: High. Temperature: 22°C, Humidity: 42%. No EUT emissions detected within 20dB of the limit within this frequency range.

## Transducer Legend:

Measur	ement Data:	R	eading lis	ted by r	nargin.	Test Distance: None					
#	Freq	Rdng	T1				Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	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



Customer: Specification:	IP Mobilenet 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:

support 2 critecor			
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:

Measu	rement Data:	R	Reading listed by margin.			Test Distance: None					
#	Freq	Rdng	T1				Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	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	-8.8	None
									Fundamen	ıtal	
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



Customer:	IP Mobilenet		
Specification:	90.210(g) - Mobile Station Mid Channel		
Work Order #:	81225	Date:	09/29/2003
Test Type:	Antenna Terminals	Time:	10:54:43 AM
Equipment:	Mobile Station Data Radio	Sequence#:	26
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:

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:

Measu	rement Data:	R	eading lis	ted by r	nargin.		Te	st Distanc	e: None		
#	Freq	Rdng	T1				Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	815.000M	102.3	+39.0				+0.0	141.3	150.0	-8.7	None
									Fundamen	ıtal	
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



Customer: Specification:	IP Mobilenet 90.210(g) - Mobile Station High Channel		
Work Order #:	81225	Date:	09/29/2003
Test Type:	Antenna Terminals	Time:	10:51:05 AM
Equipment:	Mobile Station Data Radio	Sequence#:	25
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:

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:

Measu	rement Data:	Re	eading lis	ted by n	nargin.		Te	st Distand	e: None		
#	Freq	Rdng	T1				Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	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
									Fundamen	ıtal	
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



Customer: Specification: Work Order #:	IP Mobilenet 90.210(g) - Mobile Station Low Channel 81225	Date:	09/29/2003
Test Type:	Antenna Terminals	Time:	15:17:50
Equipment:	Mobile Station Data Radio	Sequence#:	29
Manufacturer:	IP Mobilenet	Tested By:	Randal Clark
Model: S/N:	M32800N25 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
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):FunctionManufacturerModel #S/NMobile Station Data Radio\*IP MobilenetM32800N2503392466

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:

8		
T1=Cable HF P01527	T2=Pad 30dB	
T3=Pad 6dB	T4=Pad 3dB	

Measu	irement Data:	Re	eading lis	ted by ma	argin.		Те	st Distanc	e: None		
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	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: Specification: Work Order #:	IP Mobilenet 90.210(g) - Mobile Station Mid Channel 81225	Data	00/20/2003
Test Type:	Antenna Terminals	Time:	15:27:15
Equipment:	Mobile Station Data Radio	Sequence#:	30
Manufacturer: Model: S/N:	IP Mobilenet M32800N25 03392466	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:

8	
T1=Cable HF P01527	T2=Pad 30dB
T3=Pad 6dB	T4=Pad 3dB

М	easu	rement Data:	Re	eading lis	ted by ma	argin.		Te	st Distanc	e: None		
	#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
		MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	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



Customer: Specification:	IP Mobilenet 90.210(g) - Mobile Station High Channel		
Work Order #:	81225	Date:	09/29/2003
Test Type:	Antenna Terminals	Time:	15:39:42
Equipment:	Mobile Station Data Radio	Sequence#:	31
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
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:

8	
T1=Cable HF P01527	T2=Pad 30dB
T3=Pad 6dB	T4=Pad 3dB

Measu	rement Data:	Re	eading lis	ted by ma	argin.		Te	st Distanc	e: None		
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	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



Page 33 of 38 Report No.: FC03-064A



## 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-	NA	06/03/2003	06/03/2005	0
005-20				
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 <b>VDC</b>
Frequency Limit:	2.5 <b>PPM</b>

#### **Temperature Variations**

	Channel 1 (MHz)	Dev. (MHz)	Channel 2 (MHz)	Dev. (MHz)	Channel 3 (MHz)	Dev. (MHz
Channel Frequency:	806		815		821	
Temp (C) Voltage						
-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 (±15%)

20 11.7 20 13.8 20 15.9	805.99992 805.99997 805.99988	0.00008 0.00004 0.00012	815.00003 814.99990 814.99994	0.00003 0.00010 0.00006	821.0 820.9 820.9	00012 0.00012 99996 0.00004 99993 0.00007
Max Deviation (MHz)	000.00000	0.00145		0.00150		0.00155
Max Deviation (PPM)		1.80521 PASS		1.84049 PASS	. <b>L</b>	1.88794 PASS
Max Deviation (MHz)		0.00145		0.00150		0.00155
Max Deviation (%)		0.00000		0.00000		0.00000
		PASS		PASS	-	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



Page 37 of 38 Report No.: FC03-064A



# FCC 2.1091 – MPE CALCULATIONS

Calculations prepared for:

Date of Report: 10/1/03

Calculations prepared by:

IP MobilenetRandal Clark<br/>CKC Laboratories, Inc.<br/>5473A Clouds Rest Road<br/>Mariposa, CA 95338Model Number:<br/>M32800N25M32800N25FCC Identification:StateFundamental Operating Frequency:806-821 MHzMaximum Rated Output Power:<br/>Measured Output Power:20 Watts<br/>20 Watts

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

MPE Limit =  $0.54 \text{ (mW/cm}^2)$ (Calculated using the lowest operating frequency, 806MHz)

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

 $PowerDensity(mW/cm^{2}) = \frac{EIRP}{4\pi d^{2}}$ 

Given: **EIRP** in *mW* and **d** 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.