



ADDENDUM TO IP MOBILENET TEST REPORT FC03-077B

FOR THE

DATA MOBILE RADIO, M32450-25

FCC PART 90

COMPLIANCE

DATE OF ISSUE: AUGUST 23, 2004

PREPARED FOR:

IP MobileNet
16842 Von Karman Avenue
Irvine, CA 92606

P.O. No.: 003500-00
W.O. No.: 81654

PREPARED BY:

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5473A Clouds Rest
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Date of test: June 24 – July 19, 2004

Report No.: FC03-077C

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ADMINISTRATIVE INFORMATION

DATE OF TEST: June 24 – July 19, 2004

DATE OF RECEIPT: June 24, 2004

PURPOSE OF TEST: To demonstrate the compliance of the Data Mobile Radio, M32450-25 with the requirements for FCC Part 90 devices.
Addendum A is to revise the emissions designator.
Addendum B is to demonstrate the compliance of the Data Mobile Radio, M32450-25 with the requirements for FCC Part 90 devices after the frequency range was extended.
Addendum C is to revise the emissions designator.

TEST METHOD: FCC Part 90

FREQUENCY RANGE TESTED: 5 MHz-5.2 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 Data Mobile Radio, M32450-25 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:

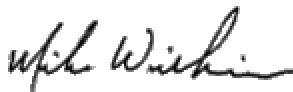
A handwritten signature in black ink, appearing to read "Joyce Walker".

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

A handwritten signature in black ink, appearing to read "Stuart Yamamoto".

Stuart Yamamoto, EMC Engineer

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

Mike Wilkinson, Lab Manager

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT tested by CKC Laboratories was a production unit.

EQUIPMENT UNDER TEST

Data Mobile Radio

Manuf: IP MobileNet
Model: M32450-25
Serial: 03483373, 03493579 & 03503580
FCC ID: MI7-M32450-25

PERIPHERAL DEVICES

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

Laptop

Manuf: Compaq
Model: Presario 1688
Serial: 1V96CLS8W8PV
FCC ID: DoC

Power Supply

Manuf: Samlex America
Model: SEC 1212
Serial: 03051-0F03-0330
FCC ID: NA

High Power Termination

Manuf: Inmet Corporation
Model: 1N100W-40M
Serial: NA
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

16K4F1D

FCC 2.1033 (c)(5) FREQUENCY RANGE

511 MHz

FCC 2.1033 (c)(6) OPERATING POWER

35.5 Watts

FCC 2.1033 (c)(7) MAXIMUM POWER RATING

Max power rating is listed per antenna height and is subject to secondary licensing requirements.
For max power rating see 90.205(d) Table 2.

FCC 2.1033 (c)(8) DC VOLTAGES

The necessary information is contained in a separate document.

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

The necessary information is contained in a separate document.

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

Frequency (MHz)	RF Power Output (Watts)
511.63750	35.5

Test Conditions: EUT is a data radio for mobile use in the VHF frequency range. Equipment is DC powered by support power supply. Support laptop is used for configuration and testing purposes only. Output of antenna port is fed through suitable external attenuation to a power meter. Temperature: 22°C, Humidity: 42%.

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
RF Power meter	02082	HP	435B	2445A11881	061704	061706
Power Sensor	02036	HP	8482A	1551A01004	061806	061806

PHOTOGRAPH SHOWING RF POWER OUTPUT



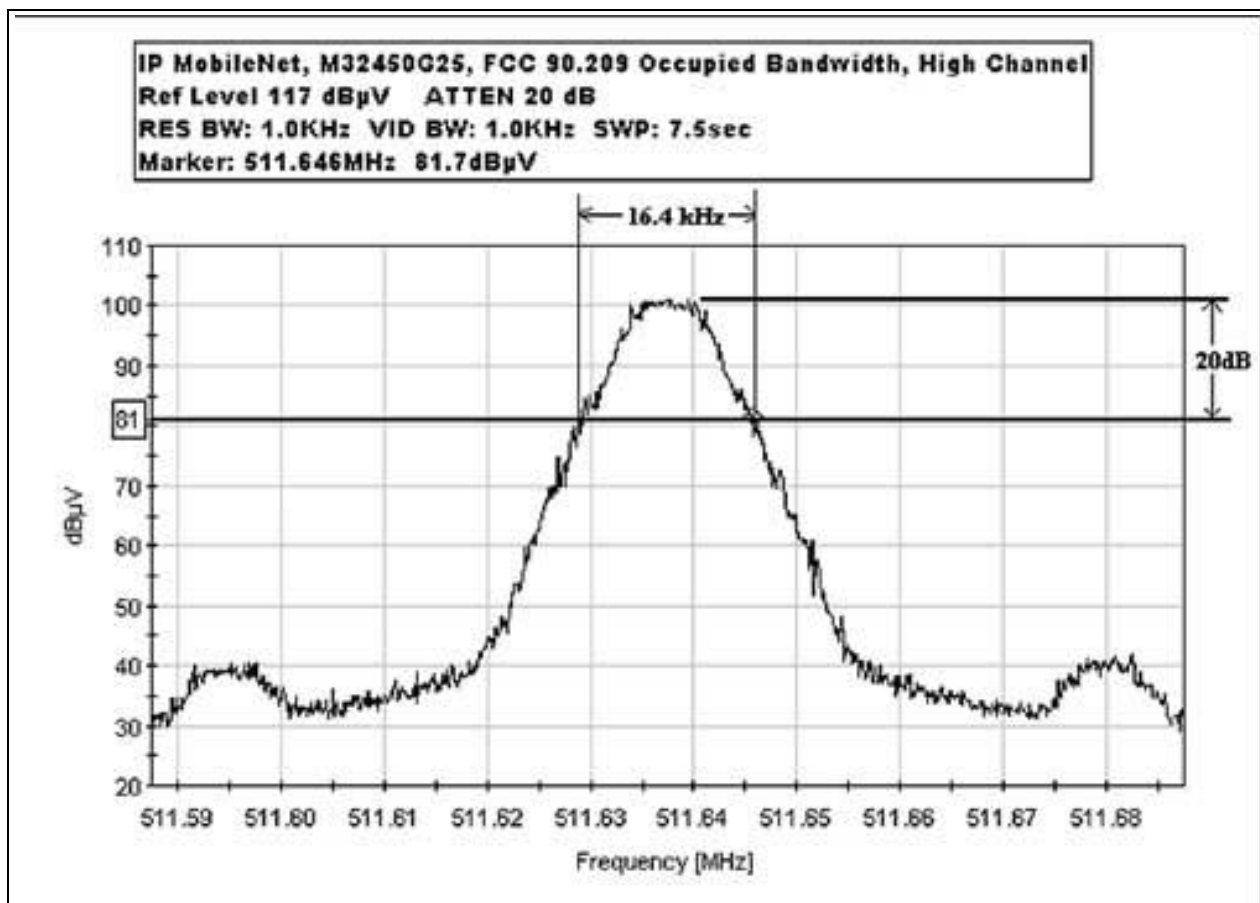
**FCC 2.1033(c)(14)/2.1047(a) - MODULATION CHARACTERISTICS - AUDIO
FREQUENCY RESPONSE**

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 20dB OCCUPIED BANDWIDTH



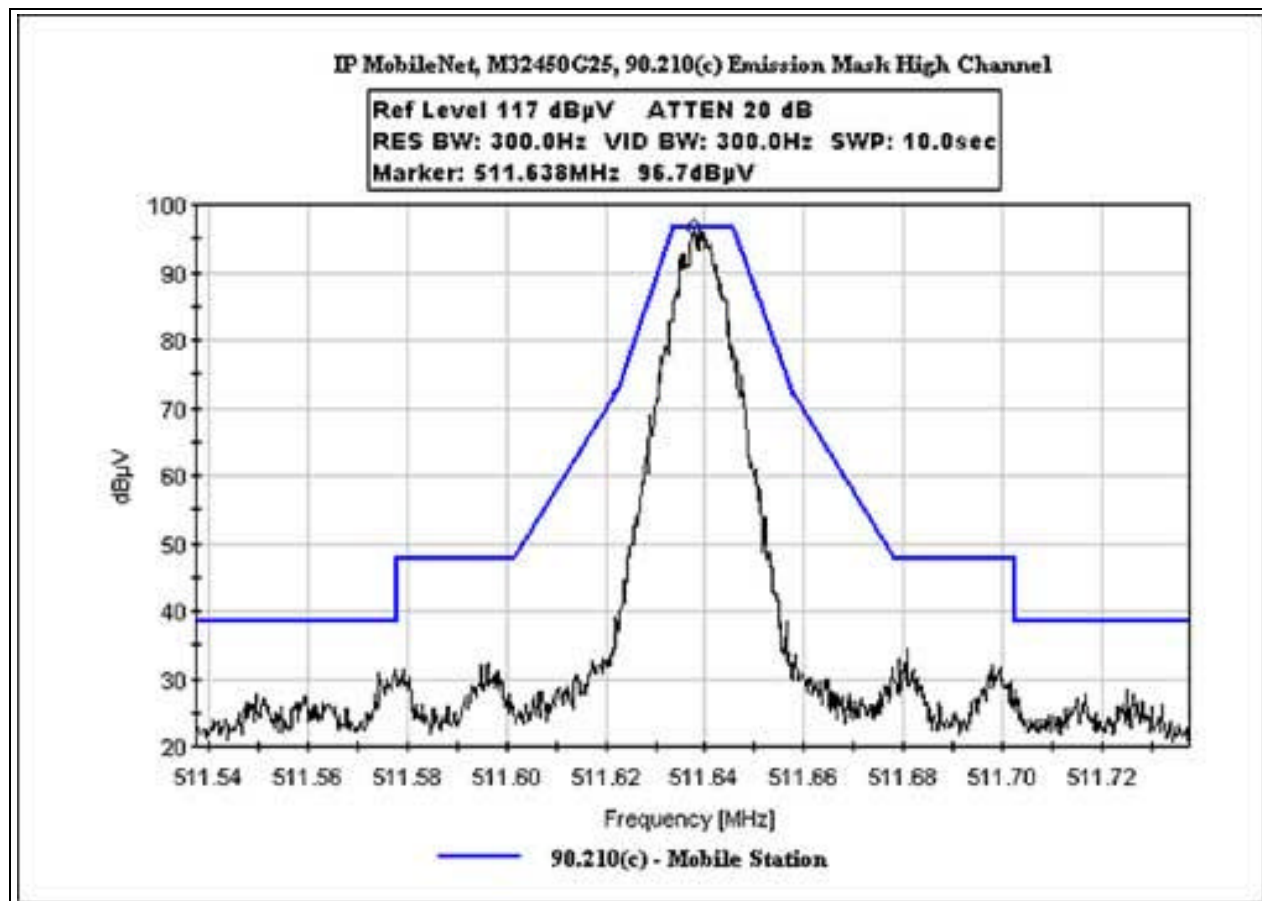
Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	033103	033105
24" SMA Cable	2604	Argosy	UFA147A	0-0360-200200	012304	012305

PHOTOGRAPH SHOWING OCCUPIED BANDWIDTH



FCC 90.210(c) EMISSIONS MASK HIGH CHANNEL



Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	033103	033105
24" SMA Cable	2604	Argosy	UFA147A	0-0360-200200	012304	012305

PHOTOGRAPH SHOWING EMISSIONS MASK



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

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

Customer: **IP Mobilenet**

Specification: **FCC 90.210**

Work Order #: **81654**

Date: 06/25/2004

Test Type: **Maximized Emissions**

Time: 09:25:24

Equipment: **Data Mobile Radio**

Sequence#: 2

Manufacturer: IP Mobilenet

Tested By: Stuart Yamamoto

Model: M32450G25

S/N: 04191931

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Data Mobile Radio*	IP Mobilenet	M32450G25	04191931

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Panasonic	CF-27	CF-27EB6GCEM
Power Supply	Samlex America	SEC 1212	03051-0F03-0330
High Power Termination	Inmet Corporation	1N100W-40M	

Test Conditions / Notes:

The EUT is a data radio for mobile use in the VHF frequency range. The EUT is DC powered by support power supply. The support laptop is used for configuration and testing purposes only and is place remote from the test site. The EUT output antenna port is terminated with high power 50 Ohm termination. Transmit Frequency 170.000 MHz, High Channel. Temperature: 25°C, Humidity: 59%, Pressure: 100kPa. Frequency Range Investigated: 5 MHz to 5200 MHz. Measurement Bandwidth Settings: 5 MHz to 1000 MHz - RBW=VBW=10kHz, 1000 MHz to 5200 MHz - RBW=VBW=1MHz. **No EUT emissions detected within 20dB of the limit.**

Transducer Legend:

T1=Cable Helix #17 84ft(10 meter)	T2=SMA Cable 1-40GHz AN2604_012305
T3=10dB Attenuator	

Measurement Data:

Reading listed by margin.

Test Distance: None

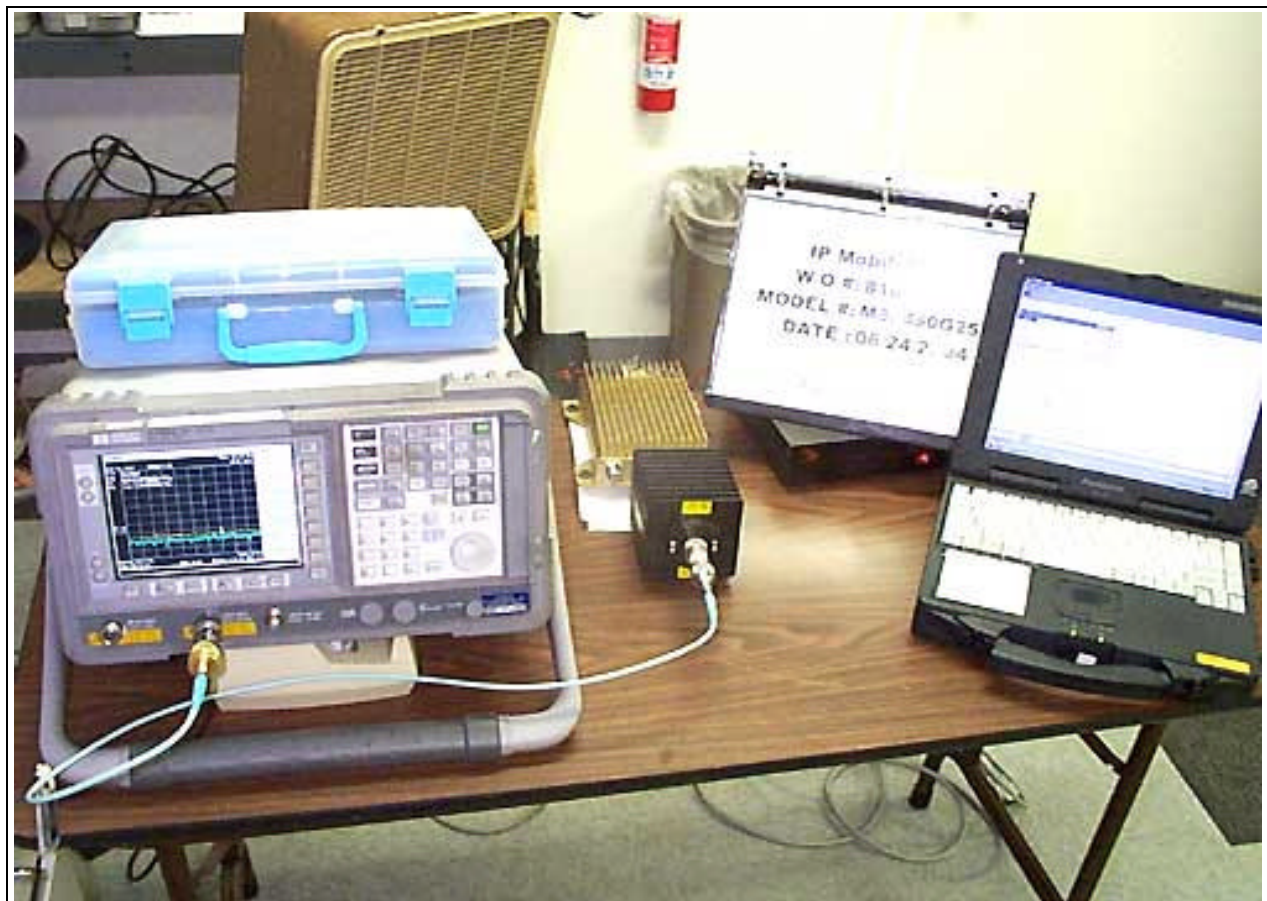
#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB		Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	511.638M	102.9	+2.4	+0.0	+10.0		+0.0	115.3	94.8	+20.5	None
									Fundamental		
2	255.818M	61.6	+1.8	+0.0	+10.0		+0.0	73.4	94.8	-21.4	None
3	4604.737M	41.5	+8.9	+0.7	+10.0		+0.0	61.1	94.8	-33.7	None
4	1023.275M	46.5	+3.6	+0.3	+10.0		+0.0	60.4	94.8	-34.4	None
5	3581.463M	41.4	+7.2	+0.6	+10.0		+0.0	59.2	94.8	-35.6	None
6	5116.375M	39.1	+9.1	+0.8	+10.0		+0.0	59.0	94.8	-35.8	None

7	4093.100M	39.6	+7.5	+0.7	+10.0	+0.0	57.8	94.8	-37.0	None
8	1534.912M	42.2	+4.5	+0.4	+10.0	+0.0	57.1	94.8	-37.7	None
9	1023.270M	42.9	+3.6	+0.3	+10.0	+0.0	56.8	94.8	-38.0	None
10	2046.550M	40.5	+5.0	+0.5	+10.0	+0.0	56.0	94.8	-38.8	None
11	2558.188M	38.6	+6.3	+0.5	+10.0	+0.0	55.4	94.8	-39.4	None
12	456.848M	41.9	+2.3	+0.0	+10.0	+0.0	54.2	94.8	-40.6	None
13	566.423M	39.4	+2.6	+0.0	+10.0	+0.0	52.0	94.8	-42.8	None
14	347.308M	37.0	+2.1	+0.0	+10.0	+0.0	49.1	94.8	-45.7	None
15	311.080M	32.8	+1.9	+0.0	+10.0	+0.0	44.7	94.8	-50.1	None
16	54.790M	33.6	+0.8	+0.0	+10.0	+0.0	44.4	94.8	-50.4	None
17	292.490M	32.2	+1.8	+0.0	+10.0	+0.0	44.0	94.8	-50.8	None
18	164.398M	31.3	+1.4	+0.0	+10.0	+0.0	42.7	94.8	-52.1	None

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	033103	033105
24" SMA Cable	2604	Argosy	UFA147A	0-0360-200200	012304	012305

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP



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

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

Customer: **IP Mobilenet**

Specification: **FCC 90.210C OATS**

Work Order #: **81654**

Date: 06/24/2004

Test Type: **Maximized Emissions**

Time: 15:22:53

Equipment: **Data Mobile Radio**

Sequence#: 1

Manufacturer: IP Mobilenet

Tested By: Stuart Yamamoto

Model: M32450G25

S/N: 04191931

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Data Mobile Radio*	IP Mobilenet	M32450G25	04191931

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Computer	Panasonic	CF-27	CF-27EB6GCEM
Power Supply	Samlex America	SEC 1212	03051-0F03-0330
High Power Termination	Inmet Corporation	1N100W-40M	

Test Conditions / Notes:

The EUT is a data radio for mobile use in the VHF frequency range. The EUT is DC powered by support power supply. The support laptop is used for configuration and testing purposes only and is placed remote from the test site. The EUT output antenna port is terminated with high power 50 Ohm termination. Transmit Frequency 170.000 MHz, High Channel. Temperature: 25°C, Humidity: 59%, Pressure: 100kPa. Frequency Range Investigated: 5 MHz to 5200 MHz. Measurement Bandwidth Settings: 5 MHz to 1000 MHz - RBW=VBW=10kHz, 1000 MHz to 5200 MHz - RBW=VBW=1MHz. **No EUT emissions detected within 20dB of the limit.**

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer RF Section	00312	HP	8568A	2049A01287	073102	073104
Spectrum Analyzer Display Section	00034	HP	85662A	2349A06091	081902	081904
Quasi Peak Adapter	02325	HP	85650A	2521A00932	073102	073104
Bilog Antenna	00851	Schaffner- Chase EMC	CBL6111C	2629	031604	031606
Antenna cable (10 meter site D)	NA	Andrew	LDF1-50	Cable#17	100203	100204
Antenna cable from bulkhead to antenna	N/A	Pasternack	RG-214/U	Cable #33	032904	032905
Preamp to SA Cable (3 feet)	NA	Pasternack	E100316-I	Cable #22	100603	100604
Pre-amp	00010	HP	8447D	2727A05392	071602	071604
Antenna cable (Helix)	NA	Andrew	LDF1-50	Cable#19	101303	101304
Horn Antenna	01646	EMCO	3115	9603-4683	042503	042505
24" SMA Cable	2604	Argosy	UFA147A	0-0360-200200	012304	012305
Microwave Pre-amp	00787	HP	83017A	3123A00282	042303	042305
Magnetic Loop Antenna	00314	Emco	6502	2014	072302	072304
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	033103	033105

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions

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

Customer: IP Mobilenet
WO#: 81654
Test Engineer: Mike Wilkinson Stuart Yamamoto

Device Model #: M32450-25 M32450G25
Operating Voltage: 13.8 VDC/VAC
Frequency Limit: 5 PPM/%

Temperature Variations

Channel Frequency:		Channel 1 (MHz)	Dev. (MHz)	Channel 2 (MHz)	Dev. (MHz)	Channel 3 (MHz)	Dev. (MHz)
		465		450		511.6375	
Temp (C)	Voltage						
-30	13.8	465.00019	0.00018	450.00067	0.00067	511.63766	0.00016
-20	13.8	465.00019	0.00018	450.00066	0.00066	511.63764	0.00014
-10	13.8	465.00022	0.00022	450.00051	0.00051	511.63766	0.00016
0	13.8	465.00003	0.00003	450.00030	0.00030	511.63764	0.00014
10	13.8	465.00005	0.00005	450.00020	0.00020	511.63772	0.00022
20	13.8	465.00005	0.00005	450.00017	0.00017	511.63752	0.00002
30	13.8	465.00004	0.00004	450.00015	0.00015	511.63766	0.00016
40	13.8	465.00008	0.00008	450.00018	0.00018	511.63772	0.00022
50	13.8	465.00016	0.00016	450.00023	0.00023	511.63772	0.00022

Voltage Variations (±15%)

20	11.7	464.99997	0.00004	450.00017	0.00017	511.63752	0.00002
20	13.8	464.99997	0.00004	450.00017	0.00017	511.63752	0.00002
20	15.9	464.99997	0.00004	450.00018	0.00018	511.63752	0.00002
Max Deviation (MHz)		0.00002		0.00067		0.00022	
Max Deviation (PPM)		0.04731		1.48889		0.42999	
		PASS		PASS		PASS	

Note: EUT settings were changed as follows:

Txsynctime=2000, was 7

Txtailtime=50, was 12

Txquiettime=50, 5

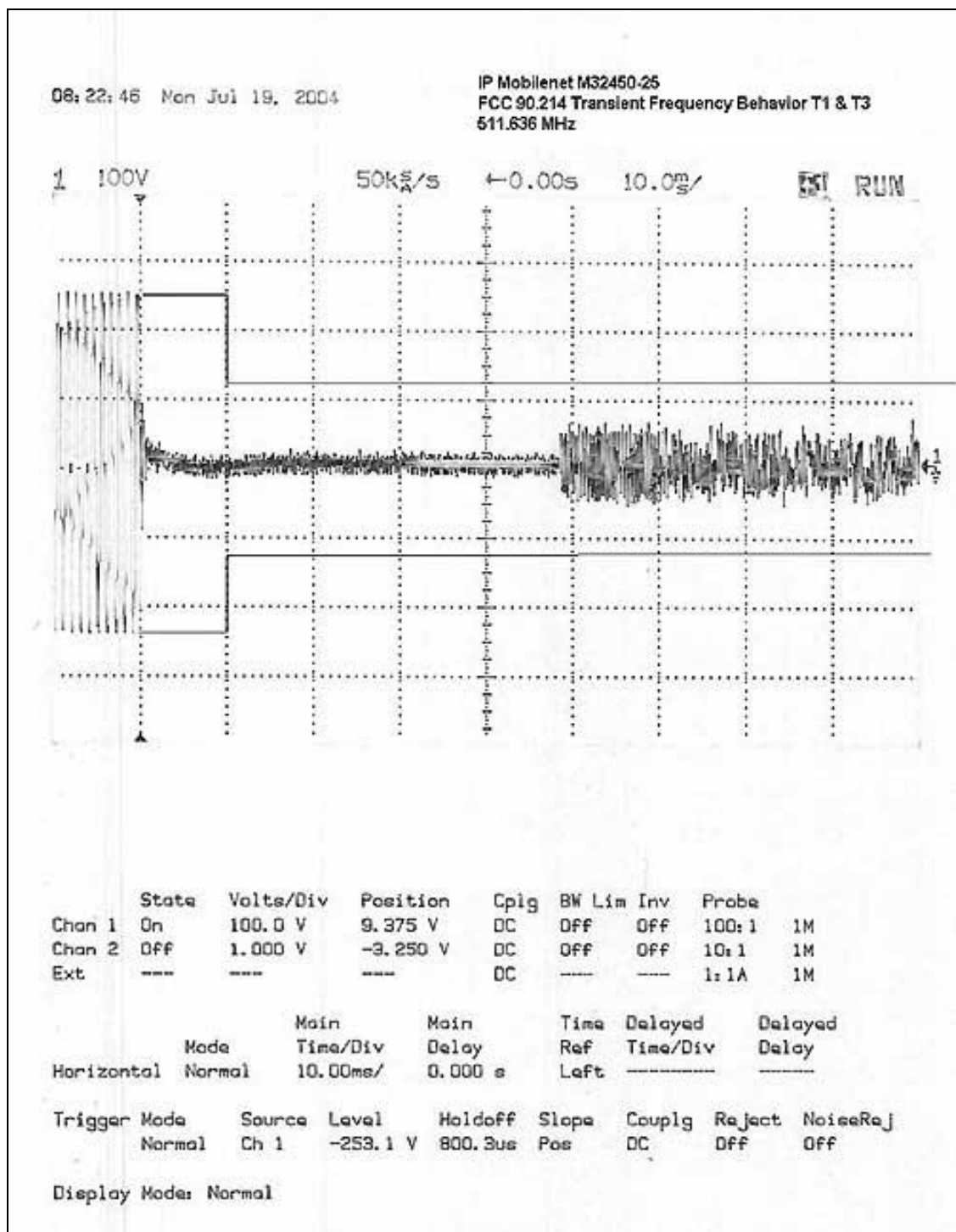
Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer RF Section	00312	HP	8568A	2049A01287	073102	073104
Spectrum Analyzer Display Section	00034	HP	85662A	2349A06091	081902	081904
Quasi Peak Adapter	02325	HP	85650A	2521A00932	073102	073104
Digital Multimeter	01830	Fluke	45	6949042	121204	121204
Temperature Chamber	01878	Thermotron	S1.2 Mini	7470	080703	080704

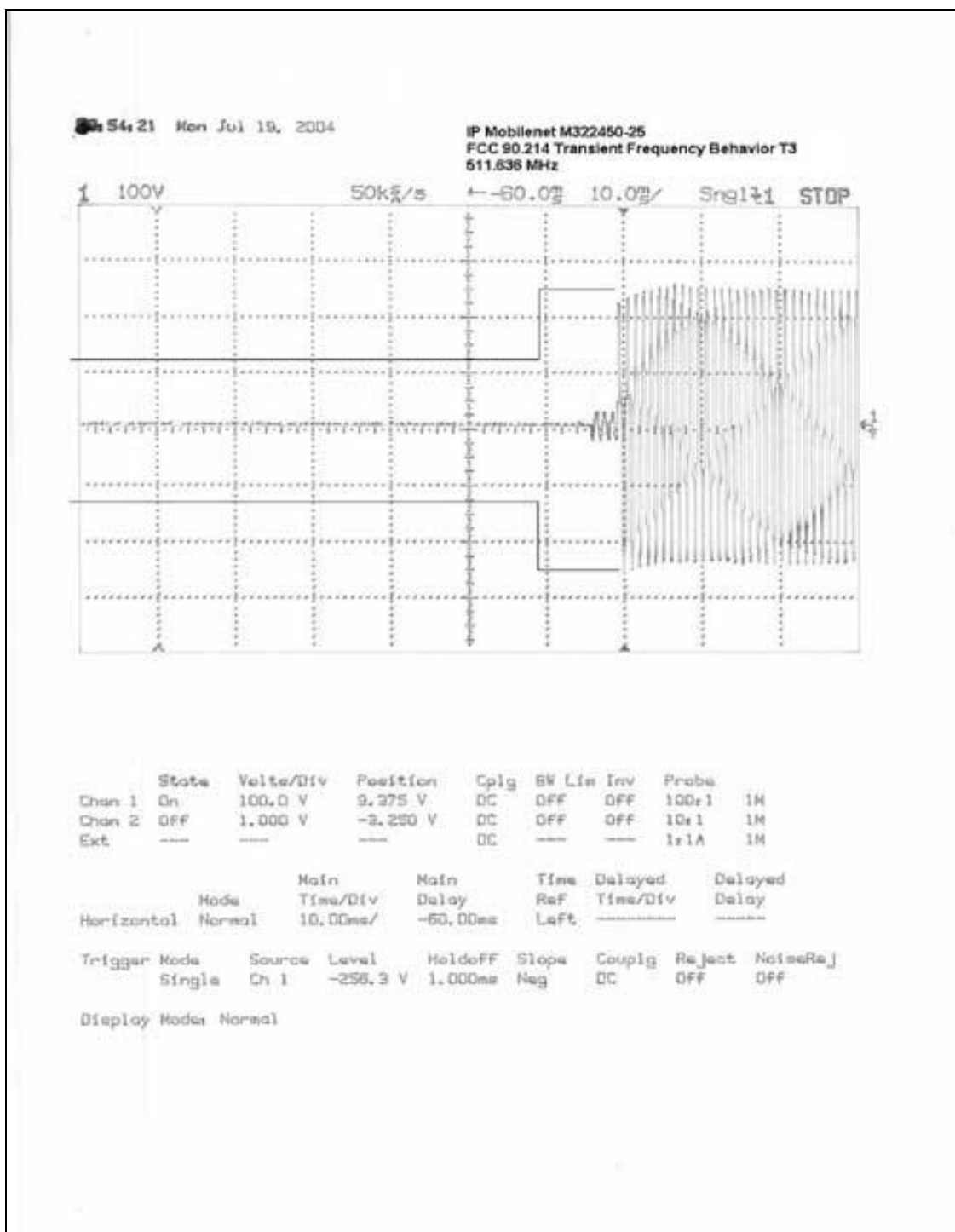
PHOTOGRAPH SHOWING TEMPERATURE TESTING



FCC 90.214 TRANSIENT FREQUENCY BEHAVIOR T1 & T3



FCC 90.214 TRANSIENT FREQUENCY BEHAVIOR T3



Test Equipment

<i>Description</i>	<i>Asset #</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Cal Date</i>	<i>Cal Due</i>
Analyzer, Modulation	02072	HP	8901A	2751A05181	11/27/02	11/26/04
Oscilloscope	01383	HP	HP54615B	US37340347	1/20/03	1/20/05
Power Meter	00613	HP	435B	2702A16632	8/12/02	8/11/04
Power Sensor	02392	HP	8482A	2652A16108	1/31/03	1/30/05
Generator, Signal	01469	HP	8673C	2822A00551	9/13/02	9/12/04

PHOTOGRAPH SHOWING TRANSIENT FREQUENCY BEHAVIOR

