



**M. Flom Associates, Inc. - Global Compliance Center**

3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176

www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

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Date: August 24, 2004

Federal Communications Commission

Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: EG & G Technical Services, Inc.

Equipment: PIC-2

FCC ID: QUZ126988A

FCC Rules: 2, 15.245, Confidentiality

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

Filing fees are attached.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Michael Schafer', with a long horizontal flourish extending to the right.

Michael Schafer,  
Business Director

enclosure(s)  
cc: Applicant  
MS/del

**List Of Exhibits**  
(FCC **Certification** (Transmitters) - Revised 9/28/98)

Applicant: EG & G Technical Services, Inc.

FCC ID: QUZ126988A

**By Applicant:**

1. Letter Of Authorization
2. Identification Drawings
  - Label
  - Location of Label
  - Compliance Statement
  - Location of Compliance Statement
3. Documentation: 2.1033(B)
  - (3) User Manual
  - (4) Operational Description
  - (5) Block Diagram
  - (5) Schematic Diagram
  - (7) Photographs
  - Parts List
  - Active Devices
4. Draft Specification Information

**By M.F.A. Inc.**

- A. Testimonial & Statement of Certification



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Sub-part  
2.1033(c):

**Equipment Identification**

FCC ID: QUZ126988A

**Nameplate Drawing**

Attached, Exhibit 1.

**Location**

As Per Label Drawing(s)

**Date Of Report**

August 24, 2004

Supervised By:

A handwritten signature in black ink, appearing to read 'David E. Lee'.

David E. Lee,  
Compliance Test

**The applicant has been cautioned as to the following:**

15.21 Information to User.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

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*Required information per ISO/IEC Guide 25-1990, paragraph 13.2:*

a) **Test Report**

b) Laboratory: M. Flom Associates, Inc.  
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107  
(Canada: IC 2044) Chandler, AZ 85225

c) Report Number: d0480057

d) Client: EG & G Technical Services, Inc.  
2420 Comanche Rd., NE., STE D-2  
Albuquerque, NM 87107

e) Identification: PIC-2  
FCC ID: QUZ126988A  
Description: Hand Held

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: August 24, 2004  
EUT Received: August 4, 2004

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with MFA internal quality manual.

m) Supervised by:



David E. Lee,  
Compliance Test Manager

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

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**List of General Information Required for Certification**

In Accordance With FCC Rules and Regulations,  
Volume II, Part 2 and to 15.245

**Sub-part 2.1033****(c)(1): Name and Address of Applicant:**

EG & G Technical Services, Inc.  
P.O. Box 9100  
Albuquerque, NM 87119-9100

**Manufacturer:**

EG & G Technical Services, Inc.  
P.O. Box 9100  
Albuquerque, NM 87119-9100

**(c)(2): FCC ID:**

QUZ126988A

**Model Number:**

PIC-2

**(c)(3): Instruction Manual(s):**

Please See Attached Exhibits

**(c)(4): Type Of Emission:**

FSK, 38.4kb data

**(c)(5): FREQUENCY RANGE, MHz:**

915.000

**(c)(6): Field Strength:**

0.746 mV/m @ 3m

☐ Switchable☐ Variable☒ N/A**(c)(7): Maximum Permissible Field Strength:**

500 mV/m @ 3m

15.203:

**Antenna Requirement:**

- ☒ The antenna is permanently attached to the EUT  
☐ The antenna uses a unique coupling  
☐ The EUT must be professionally installed  
☐ The antenna requirement does not apply

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**Subpart 2.1033** (continued)

(c)(8): Voltages & currents in all elements in final RF Stage, including final transistor or solid state device:

Collector Current, A	=	per manual
Collector Voltage, Vdc	=	per manual
Supply Voltage, Vdc	=	12

(c)(9): **Tune-Up Procedure:**

Please See Attached Exhibits

(c)(10): **Circuit Diagram/Circuit Description:**

Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Please See Attached Exhibits

(c)(11): **Label Information:**

Please See Attached Exhibits

(c)(12): **Photographs:**

Please See Attached Exhibits

(c)(13): **Digital Modulation Description:**

☐ Attached Exhibits  
☒ N/A

(c)(14): **Test And Measurement Data:**

Follows

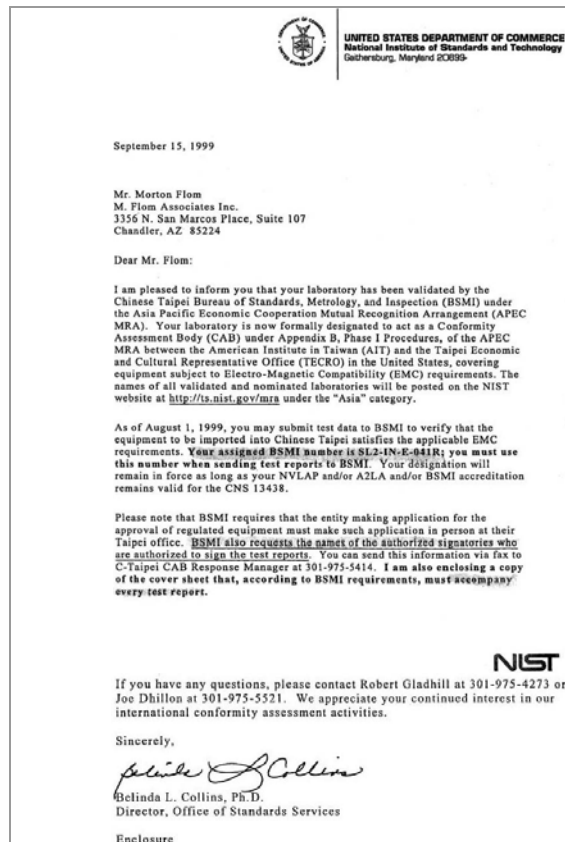




## A2LA

"A2LA has accredited M. Flom Associates, Inc. Chandler, AZ for technical competence in the field of Electrical Testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 - 1999 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Certificate Number: **2152-01**



## NIST

I am pleased to inform you that your laboratory has been validated by the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Your laboratory is now formally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA between the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office (TECRO) in the United States, covering equipment subject to Electro-Magnetic Compatibility (EMC) requirements. The names of all validated and nominated laboratories will be posted on the NIST website at <http://ts.nist.gov/mra> under the 'Asia' category."

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Sub-part  
2.1033(b):**Test And Measurement Data**

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.1031, 2.1033, 2.1035, 2.1041, 2.1043, 2.1045, and the following individual Parts:

_____	15.209	Radiated emission limits; general requirements
_____	15.211	Tunnel radio systems
_____	15.213	Cable locating equipment
_____	15.214	Cordless telephones
_____	15.217	Operation in the band 160-190 kHz
_____	15.219	Operation in the band 510-1705 kHz
_____	15.221	Operation in the band 525-1705 kHz (leaky coax)
_____	15.223	Operation in the band 1.705-10 MHz
_____	15.225	Operation in the band 13.553-13.567 MHz
_____	15.227	Operation in the band 26-27.28 MHz (remote control)
_____	15.229	Operation in the band 40.66-40.70 MHz
_____	15.231	Periodic operation in the band 40.66-40.70 MHz and above 70 MHz
_____	15.233	Operation within the bands 43.71-44.49, 46.60-46.98 MHz 48.75-49.51 MHz and 49.66-50.0 MHz
_____	15.235	Operation within the band 49.82-49.90 MHz
_____	15.237	Operation within the bands 72.0-73.0 MHz, 74.6-74.8 MHz and 75.2-76.0 MHz (auditory assistance)
_____	15.239	Operation in band 88-108 MHz
_____	15.241	Operation in the band 174-216 MHz (biomedical)
_____	15.243	Operation in the band 890-940 MHz (materials)
X _____	15.245	Operation within the bands 902-928 MHz, 2435-2465 MHz, 5785-5815 MHz, 10500-10550 MHz, and 24075-24175 MHz (field disturbance sensors)
_____	15.247	Operation within bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz (spread spectrum)
_____	15.249	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz
_____	15.251	Operation within the bands 2.9-3.26 GHz, 3.267-3.332 GHz, 3.339-3.3458 GHz, and 3.358-3.6 GHz (vehicle identification systems)
_____	15.321	Specific requirements for asynchronous devices operating in the 1910-1920 MHz and 2390-2400 MHz bands (Unlicensed PCS)
_____	15.323	Specific requirements for isochronous devices operating in the 1920-1930 MHz sub-band (Unlicensed PCS)

Standard Test Conditions  
and  
Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2000 DRAFT, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

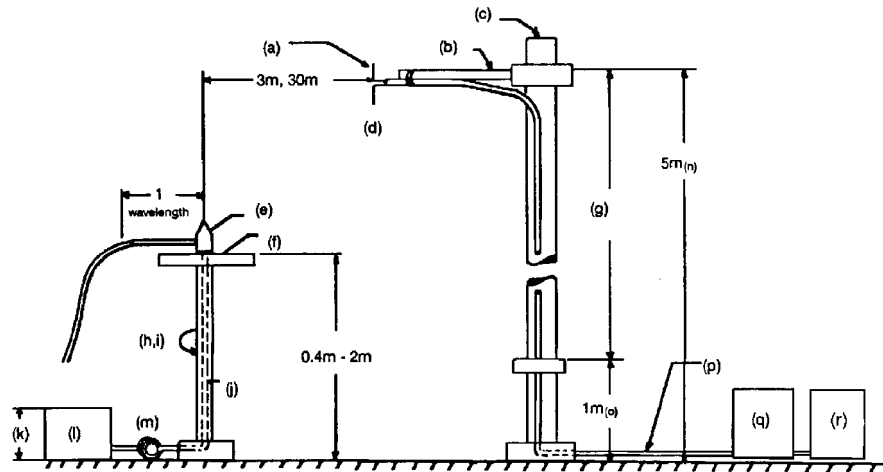
Measurement results, unless otherwise noted, are worst-case measurements.

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**Name of Test:**

Field Strength of Spurious Radiation

**Radiated Test Setup****Notes:**

- (a) Search Antenna - Rotatable on boom
- (b) Non-metallic boom
- (c) Non-metallic mast
- (d) Adjustable horizontally
- (e) Equipment Under Test
- (f) Turntable
- (g) Boom adjustable in height.
- (h) External control cables routed horizontally at least one wavelength.
- (i) Rotatable
- (j) Cables routed through hollow turntable center
- (k) 30 cm or less
- (l) External power source
- (m) 10 cm diameter coil of excess cable
- (n) 25 cm (V), 1 m-7 m (V, H)
- (o) 25 cm from bottom end of 'V', 1m normally
- (p) Calibrated Cable at least 10m in length
- (q) Amplifier (optional)
- (r) Spectrum Analyzer

Asset	Description	s/n	Cycle	Last Cal
(as applicable)				
<b>Transducer</b>				
X i00088	EMCO 3109-B 25MHz-300MHz	2336	12 mo.	Sep-03
X i00089	April 2001 200MHz-1GHz	001500	12 mo.	Sep-03
i00103	EMCO 3115 1GHz-18GHz	9208-3925	12 mo.	Sep-03
i00065	EMCO 3301-B Active Monopole	2635	12 mo.	Sep-03
<b>Amplifier</b>				
i00028	HP 8449A	2749A00121	12 mo.	May-04
<b>Spectrum Analyzer</b>				
i00029	HP 8563E	3213A00104	12 mo.	Jan-04
X i00033	HP 85462A	3625A00357	12 mo.	Aug-04
i00048	HP 8566B	2511AD1467	12 mo.	Jul-04

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Photograph(s) of Test Setup for Highest Emissions

**Test Setup:**

Radiated Emissions



Page Number 9 of 17.

Measurement Results: Field Strength of Spurious Radiation

Frequency of Carrier, MHz = 915.000  
 Spectrum Searched = Fc to 10 x Fc  
 All Other Emissions =  $\geq 20$ dB Below Limit  
 Measurement Results = Attached  
 Meets general radiated emission limits (Rule 15.209)  
 outside of the frequency band.

Per 47 CFR 15.245:

(a) EUT is, or makes use of, a field disturbance sensor.

(b) EUT complies with the following limits:

<b>Fc Frequency, MHz</b>	<b>Fc FIELD, mv/m</b>	<b>Spurious Field, mv/m</b>
902-928	500	1.6
2435-2465	500	1.6
5783-5815	500	1.6
10500-10550	2500	25.0
24075-24175	2500	25.0

(b)(1) Harmonic emissions in the restricted bands below 17.7 GHz do not exceed the field strength limits of 15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz do not exceed the following field strength limits:

(b)(1)(I) For field disturbance sensors used only within a building or to open doors, 25.0 mv/m

(b)(1)(ii) For all other field disturbance sensors, 7.5 mv/m

(b)(1)(iii) Emissions in the restricted bands fully comply with the limits given in 15.209

(b)(2) Emissions were measured at a distance of 3 meters.

(b)(3) Emissions radiated outside of the specified frequency bands, other than harmonics, were attenuated by at least the lesser attenuation of 50 dB below the fundamental of 15.209.

(b)(4) The emissions were measured on instrumentation employing an average detector. The provisions in 15.35 for limiting peak emissions were met.

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**Name of Test:** Transmitter Fundamental (Radiated)

g0480029: 2004-Aug-04 Wed 07:50:00

State: 0:General

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV	@ m	C.F., dB	Calc dB $\mu$ V/m	mV/m	@ m
915.000000	915.000000	22.9	3	34.6	57.5	0.746	3

**Name of Test:** Transmitter Spurious Emissions (Radiated)

g0480029: 2004-Aug-04 Wed 07:56:00

State: 0:General

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV	@ m	C.F., dB	Calc dB $\mu$ V/m	mV/m	@ m
915.000000	1830.000000	17.0	3	15.6	32.6	0.043	3
915.000000	2745.000000	17.0	3	20.9	37.9	0.079	3

All other emissions in the required measurement range were more that 20 dB below the required limits.

**Name of Test:** Receiver Spurious Emissions (Radiated)

g0480029: 2004-Aug-04 Wed 08:56:00

State: 0:General

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV	@ m	C.F., dB	Calc dB $\mu$ V/m	mV/m	@ m
915.000000	914.855800	19.8	3	24.1	43.9	0.156	3
915.000000	1829.696300	-7.1	3	33.5	26.4	0.021	3
915.000000	2744.548000	-0.4	3	39.7	39.3	0.092	3
915.000000	3659.400000	30.5	3	-1.9	28.6	0.027	3
915.000000	4574.250000	30.3	3	0.7	31.0	0.035	3

All other emissions in the required measurement range were more that 20 dB below the required limits.



Supervised By:

David E. Lee,  
Compliance Test Manager

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**Name of Test:** Emission Masks (Occupied Bandwidth)

**Specification:** 47 CFR 2.1049(c)(1)

**Guide:** ANSI/TIA/EIA-603-1992, Paragraph 2.2.11

**Test Equipment:** As per attached page

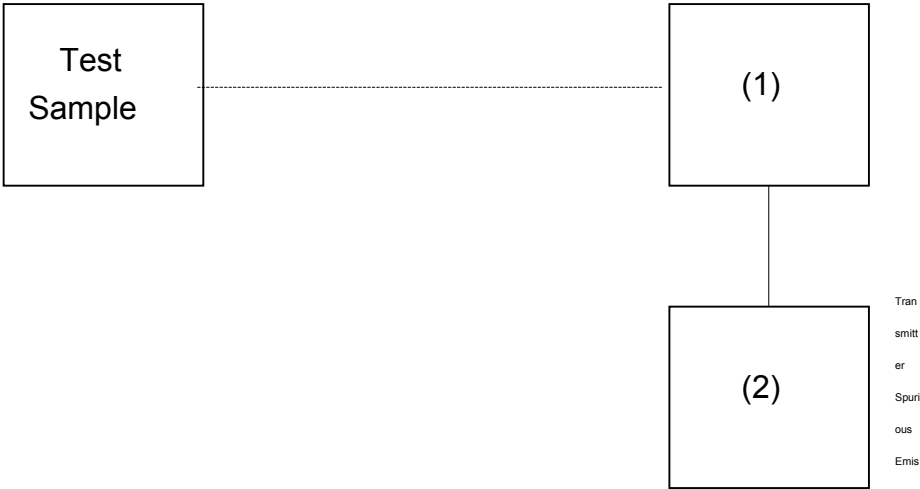
### **Measurement Procedure**

1. The EUT and test equipment were set up as shown on the following page, with the Spectrum Analyzer loosely coupled.
2. The transmit function was enabled.
3. The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.
4. Measurement Results: Attached



Transmitter Spurious Emission

Test A. Occupied Bandwidth (In-Band Spurious)  
Test B. Out-of-Band Spurious



Asset	Description	s/n		
(1)	Antenna – Loose Coupled			
(2)	Spectrum Analyzer			
x	i00048	HP 8566B	2511A01467	12 mo July-04
	i00029	HP 8563E	3213A00104	12 mo Mar-04

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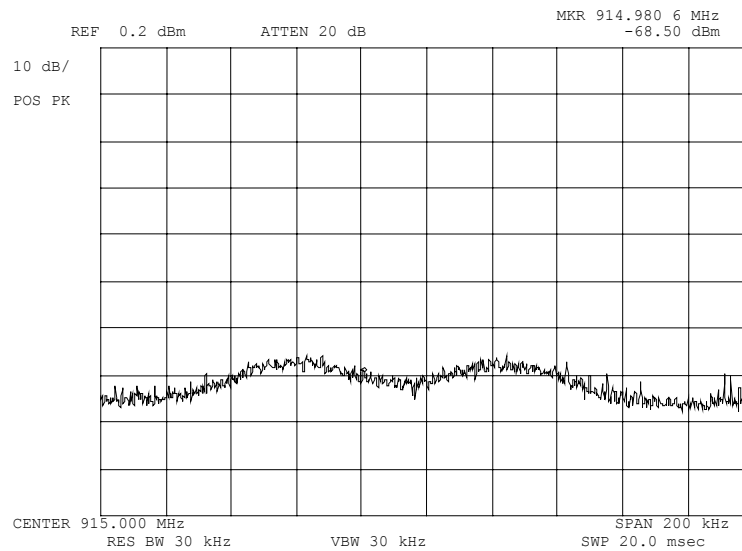
**Name of Test:** Emission Masks (Occupied Bandwidth)

**Measurement Results**

g0480031: 2004-Aug-04 Wed 08:09:00

State: 0:General

Ambient Temperature: 23°C ± 3°C



Power:  
Modulation:

LOOSE COUPLED  
38.4 DATA  
WAVEFORM

Performed by:

David E. Lee,  
Compliance Test Manager

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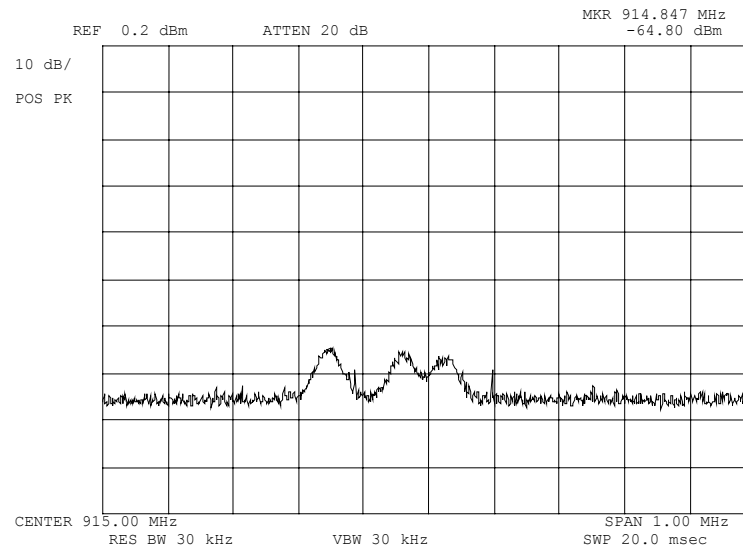
**Name of Test:** Emission Masks (Occupied Bandwidth)

**Measurement Results**

g0480032: 2004-Aug-04 Wed 08:12:00

State: 0:General


Ambient Temperature: 23°C ± 3°C



Power:  
Modulation:

LOOSE COUPLED  
38.4 DATA  
TX WAVEFORM IN CENTER,  
LOCAL OSCILLATOR TO LEFT

Performed by:

  
David E. Lee,  
Compliance Test Manager

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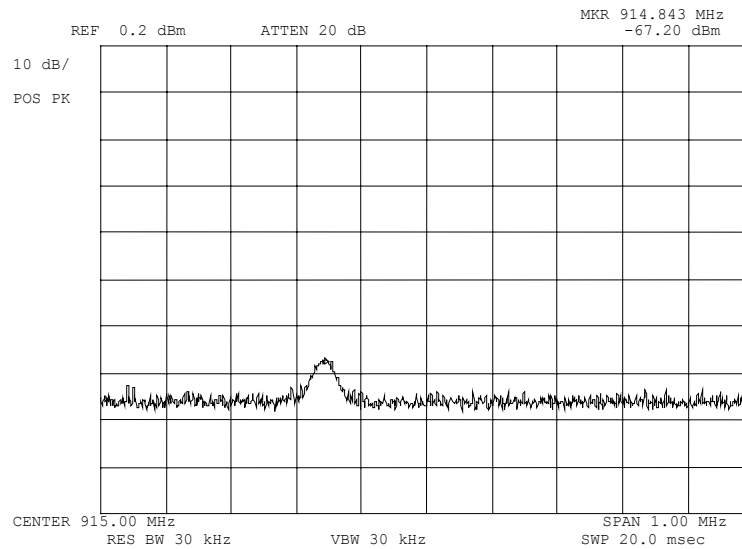
**Name of Test:** Emission Masks (Occupied Bandwidth)

**Measurement Results**

g0480035: 2004-Aug-04 Wed 08:14:00

State: 0:General

Ambient Temperature: 23°C ± 3°C



Power:  
Modulation:

LOOSE COUPLED  
38.4 DATA  
LOCAL OSC ONLY

**NOTE:**

No other Occupied Bandwidth measurements taken as emissions over 20dB below 15.209 limits.

Performed by:

David E. Lee,  
Compliance Test Manager

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**Name of Test:** Frequency Stability (Temperature Variation)

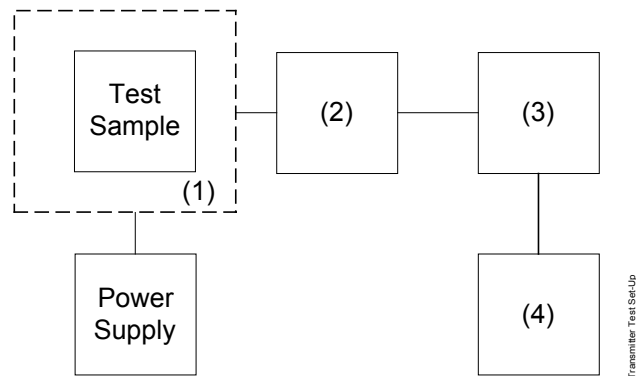
**Specification:** 47 CFR 2.1055(a)(1)

**Guide:** ANSI/TIA/EIA-603-1992/2001, Paragraph 2.2.2

Measurement Procedure

- A) The EUT and test equipment were set up as shown on the following page.
- B) With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
- C) With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
- D) The temperature tests were performed for the worst case.

**Transmitter Test Set-Up: Temperature Variation**



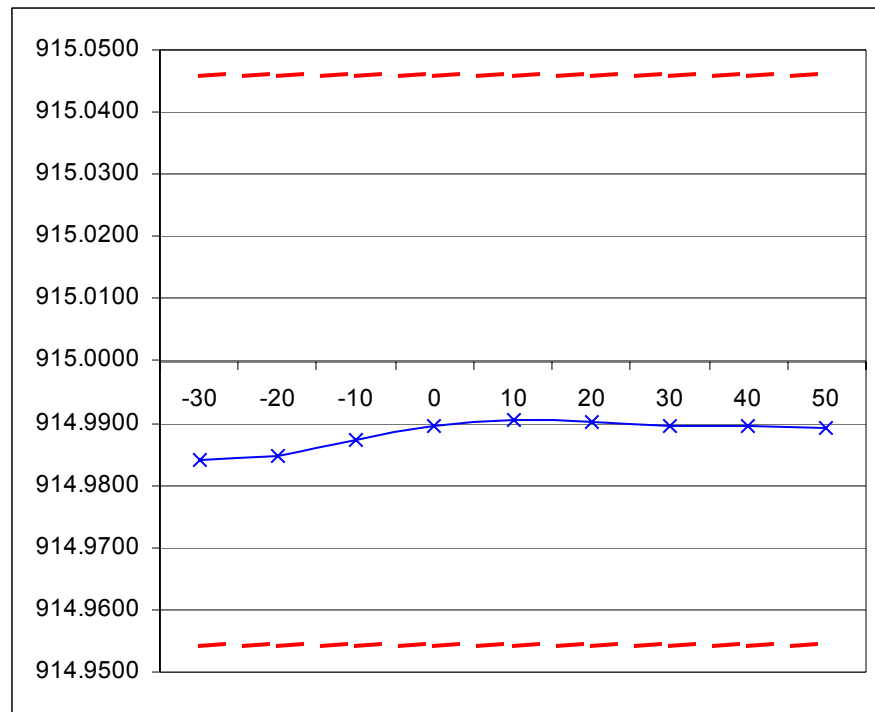
Asset	Description	s/n		
<b>(1) Temperature, Humidity, Vibration</b>				
X i00027	Tenney Temp. Chamber	9083-765-234	NCR	
<b>(2) Coaxial Attenuator</b>				
i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
i00122/3	NARDA 766 (10 dB)	7802 or 7802A	NCR	
<b>(3) RF Power</b>				
i00067	HP 8920A Communications TS	3345U01242	12 mo	Feb-04
<b>(4) Frequency Counter</b>				
X i00067	HP 8920A Communications TS	3345U01242	12 mo	Feb-04

Page Number 17 of 17.

**Name of Test:** Frequency Stability (Temperature Variation)

### Measurement Results

State: General



Performed by:

David E. Lee,  
Compliance Test Manager

**NOTICE**

## § 15.205 Restricted Bands of Operation

(a) Except as shown in paragraph (b) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69625	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-339.4	3600-4400	(2)
13.36-13.41			

Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz. Above 38.6

**Testimonial  
And  
Statement Of Certification**

**This is to certify that:**

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

Certifying Engineer:



David E. Lee,  
Compliance Test Manager