



Flom Test Labs
EMI, EMC, RF Testing Experts Since 1963

toll-free: (866) 311-3268
fax: (480) 926-3598
<http://www.flomlabs.com>
info@flomlabs.com

Date: February 13, 2007
Applicant: Motorola Mobile Devices
600 North US Hwy 45
Libertyville, IL 60048
Attention of: Richard Altenhofen
Equipment: ic902
FCC ID: IHDT56GP1
P.O. Number:
FCC Rules: 90

Gentlemen:

Enclosed please find your copy of the Engineering Test Report.

Should you need any clarification, please feel free to contact us. Thank you again for this order - it has been a pleasure to be of service.

Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director

enclosure(s)
HSB/mdw



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Transmitter Certification Test Report

of

Model: ic902

to

Federal Communications Commission

Rule Part(s) 90

Date of report: February 13, 2007

On the Behalf of the Applicant:

Motorola

At the Request of:

Motorola Mobile Devices
600 North US Hwy 45
Libertyville, IL 60048

Attention of:

Richard Altenhofen

Supervised by:

Hoosamuddin S. Bandukwala, Lab Director

The Applicant has been cautioned as to the following:

15.21 Information to the 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 Guide17025-2005, paragraph 13.2:

a) **Test Report**

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

c) Report Number: d0710016

d) Client: Motorola Mobile Devices
600 North US Hwy 45
Libertyville, IL 60048

e) Identification: Model number: ic902

EUT Description: IDEN mobile phone

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

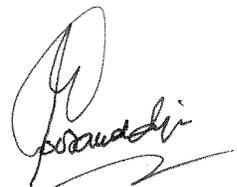
g) Report Date: February 13, 2007
EUT Received:

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:



Hoosamuddin S. Bandukwala, Lab Director

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.

Sub-part

2.1033(c)(14):

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 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057 and the following individual Parts:

- 15 - Radio Frequency Devices (unlicensed)
- 21 - Domestic Public Fixed Radio Services
- 22 - Public Mobile Services
- 22 Subpart H - Cellular Radiotelephone Service
- 22.901(d) - Alternative technologies and auxiliary services
- 23 - International Fixed Public Radiocommunication services
- 24 - Personal Communications Services
- 74 Subpart H - Low Power Auxiliary Stations
- 80 - Stations in the Maritime Services
- 80 Subpart E - General Technical Standards
- 80 Subpart F - Equipment Authorization for Compulsory Ships
- 80 Subpart K - Private Coast Stations and Marine Utility Stations
- 80 Subpart S - Compulsory Radiotelephone Installations for Small Passenger Boats
- 80 Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes
- 80 Subpart U - Radiotelephone Installations Required by the Bridge-to-Bridge Act
- 80 Subpart V - Emergency Position Indicating Radio Beacons (EPIRB'S)
- 80 Subpart W - Global Maritime Distress and Safety System (GMDSS)
- 80 Subpart X - Voluntary Radio Installations
- 87 - Aviation Services
- X 90 - Private Land Mobile Radio Services
- 94 - Private Operational-Fixed Microwave Service
- 95 Subpart A - General Mobile Radio Service (GMRS)
- 95 Subpart C - Radio Control (R/C) Radio Service
- 95 Subpart D - Citizens Band (CB) Radio Service
- 95 Subpart E - Family Radio Service
- 95 Subpart F - Interactive Video and Data Service (IVDS)
- 97 - Amateur Radio Service
- 101 - Fixed Microwave Services

Standard Test Conditions and Engineering Practices

A2LA

“A2LA has accredited Flom Test Labs, 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 17025:2005 ‘General Requirements for the Competence of Testing and Calibration Laboratories’ and any additional program requirements in the identified field of testing.”

Please refer to www.a2la.org for current scope of accreditation.

Certificate Number: **2152.01**

List of General Information Required for Certification

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

Part 90

Sub-part 2.1033

(c)(1): **Name and Address of Applicant:**

Motorola Mobile Devices
600 North US Hwy 45
Libertyville, IL 60048

Manufacturer:

Motorola Mobile Devices
600 North US Hwy 45
Libertyville, IL 60048

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

IHDT56GP1

Model Number:

ic902

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

Please see attached exhibits

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

18K3D7W

(c)(5): **Frequency Range, MHz:**

806.00 to 825.00

(c)(6): **Power Rating, Watts:**

_____ Switchable

_____ Variable

0.600

_____ N/A

FCC Grant Note:

(c)(7): **Maximum Power Rating, Watts:**

100 watt

DUT Results:

Passes _____ x _____

Fails _____

Name of Test: RF Output Power (Conducted) TxR1001

Specification: 47 CFR 2.1046(a)

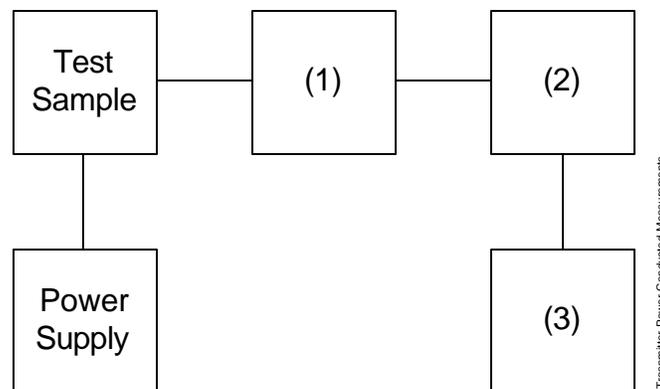
Guide: ANSI/TIA/603C-2004, Paragraph 2.2.1

Measurement Procedure

A) The EUT was connected to a resistive coaxial attenuator of normal load impedance, and the unmodulated output power was measured by means of an RF Power Meter.

B) Measurement accuracy is $\pm 3\%$.

Transmitter Test Set-Up: RF Power Output



	Asset	Description	s/n	Cycle	Last Cal
(1)	Coaxial Attenuator				
X	i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	N/A	NCR
(2)	Power Meters				
X		Gigatronics Universal Power Meter	1832284	12 mo.	Apr-06
X		Gigatronics Power Head	1832555	12 mo.	Apr-06

Measurement Results
(Worst case)

IDEN	Model No.: H93ZAH9JR7AN	Serial No.: 364AGW025R
	Frequency of Carrier, MHz	= 806.00, 813.40, 820.86, 824.98
	Ambient Temperature	= 23°C ± 3°C

Power Setting	Frequency	Average RF Power, Watts
High	806.00	27.55 dBm, 0.570 watts
High	813.40	27.70 dBm, 0.590 watts
High	820.86	27.78 dBm, 0.600 watts
High	824.98	27.85 dBm, 0.610 watts

The duty cycle for the power meter was set to 16.667% and it was configured for burst average power readings. Measurements were made on a Gigatronics Burst Power meter.

Name of Test: RF Power Output (Radiated)

NOTE: This test will be submitted as a separate exhibit by the manufacturer.

Name of Test: Spurious Emissions (Transmitter Conducted)

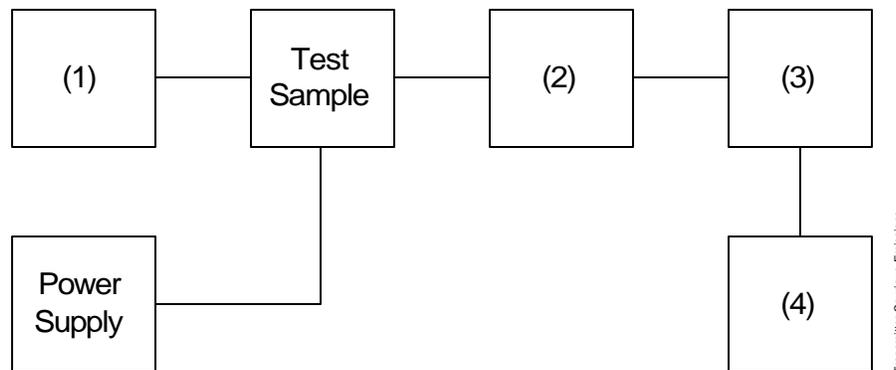
Specification: 47 CFR 2.1051

Guide: ANSI/TIA/603C-2004, Paragraph 2.2.13

Measurement Procedure

- A) The emissions were measured for the worst case as follows:
 - 1). within a band of frequencies defined by the carrier frequency plus and minus one channel.
 - 2). from the lowest frequency generated in the EUT and to at least the 10th harmonic of the carrier frequency, or 40 GHz, whichever is lower.
- B) The magnitude of spurious emissions that are attenuated more than 20 dB below the permissible value need not be specified.

Transmitter Test Set-Up: Spurious Emission



Asset	Description	s/n		
(1) Coaxial Attenuator				
X	i00231/2 PASTERNAK PE7021-30 (30 dB)	231 or 232	N/A	NCR
(2) Spectrum Analyzer				
X	i00048 HP 8566B Spectrum Analyzer	2511A01467	12 mo.	Aug-06

Name of Test: Spurious Emissions (Transmitter Conducted)

Measurement Results
(Worst Case)

Summary:

Frequency of carrier, MHz	=	806.98, 813.56, 820.98, 824.98
Spectrum Searched, GHz	=	0 to 10 x F_c
All Other Emissions	=	= 20 dB Below Limit
Limit(s), dBc		-20

Tabulated Results follow:

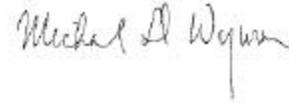
Measurement Results

State: 2:High Power

Ambient Temperature: 23°C ± 3°C

Frequency Emission, MHz	Level, dBm	Level, dBc	Margin, dB
1612.1250	-40.20	-67.75	-47.75
1627.1250	-40.60	-68.30	-48.30
1641.9750	-39.90	-67.68	-47.68
1649.9750	-39.60	-67.45	-47.45
2418.1875	-40.00	-67.55	-47.55
2440.6875	-39.60	-67.30	-47.30
2462.9625	-40.70	-68.48	-48.48
2474.9625	-40.80	-68.65	-48.65
3224.2500	-40.70	-68.25	-48.25
3254.2500	-40.80	-68.50	-48.50
3283.9500	-41.00	-68.78	-48.78
3299.9500	-40.20	-68.05	-48.05
4030.3125	-41.30	-68.85	-48.85
4067.8125	-40.00	-67.70	-47.70
4104.9375	-39.60	-67.38	-47.38
4124.9375	-40.90	-68.75	-48.75
4836.3750	-41.40	-68.95	-48.95
4881.3750	-41.00	-68.70	-48.70
4925.9250	-40.60	-68.38	-48.38
4949.9250	-40.10	-67.95	-47.95
5642.4375	-39.90	-67.45	-47.45
5694.9375	-40.00	-67.70	-47.70
5746.9125	-39.30	-67.08	-47.08
5774.9125	-37.50	-65.35	-45.35
6448.5000	-36.10	-63.65	-43.65
6508.5000	-36.40	-64.10	-44.10
6567.9000	-36.50	-64.28	-44.28
6599.9000	-35.00	-62.85	-42.85
7254.5625	-37.20	-64.75	-44.75
7322.0625	-38.10	-65.80	-45.80
7388.8875	-38.60	-66.38	-46.38
7424.8875	-35.00	-62.85	-42.85
8060.6250	-38.20	-65.75	-45.75
8135.6250	-36.20	-63.90	-43.90
8209.8750	-34.80	-62.58	-42.58
8249.8750	-35.00	-62.85	-42.85

Sample calculation. For 806.9875 the fundamental power is 27.55 dBm. The resultant level of the spurious can be calculated by subtracting the spurious from the fundamental. The margin is calculated by subtracting 20 dB from the spurious. Spurious was observed down to the 10th harmonic.



Performed by:

Michael Wyman

Name of Test: Field Strength of Spurious Radiation

Specification: 47 CFR 2.1053(a), 90.671

Guide: ANSI/TIA/603C-2004, Paragraph 1.2.12 and Table 16, 47 CFR 22.917

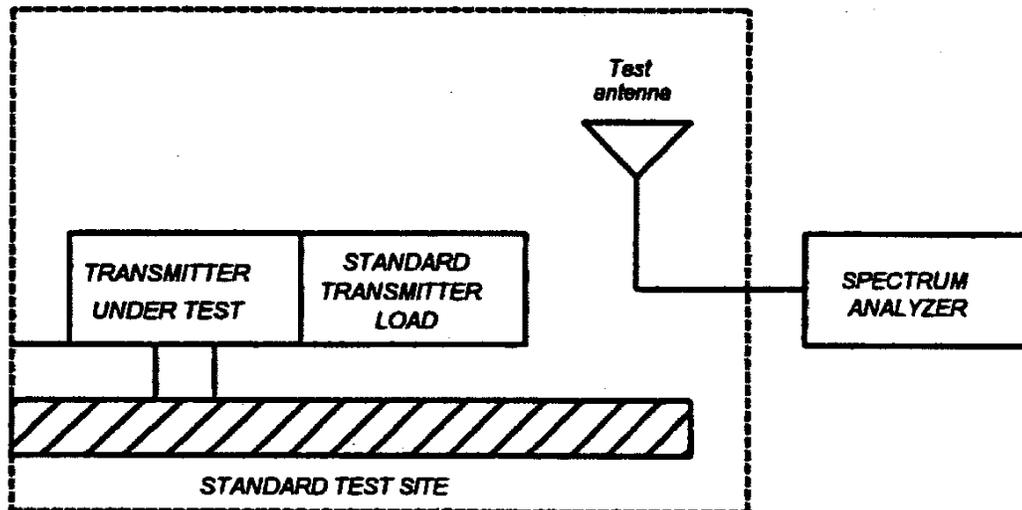
Measurement Procedure

Definition:

Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

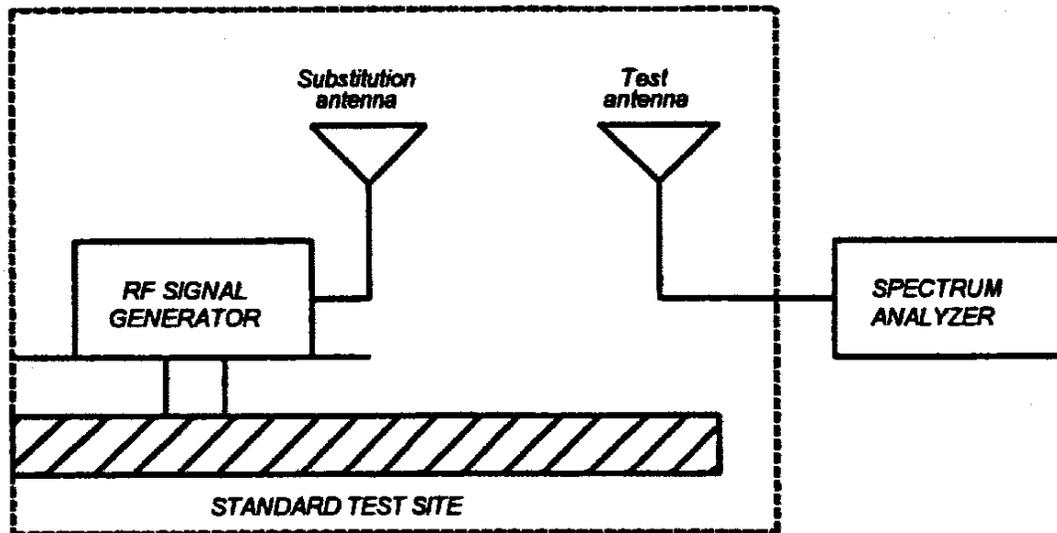
Method of Measurement:

- A) Connect the equipment as illustrated
- B) Adjust the spectrum analyzer for the following settings:
 - 1) Resolution Bandwidth 100 kHz (<1 GHz), 1 MHz (> 1GHz).
 - 2) Video Bandwidth = 3 times Resolution Bandwidth, or 30 kHz (22.917)
 - 3) Sweep Speed ≤ 2000 Hz/second
 - 4) Detector Mode = Mean or Average Power
- C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non-radiating load that is placed on the turntable. The RF cable to this load should be of minimum length.



Name of Test: Field Strength of Spurious Radiation (Cont.)

- D) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to \pm the test bandwidth (see section 1.3.4.4).
- E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.
- F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.



- G) Reconnect the equipment as illustrated.
- H) Keep the spectrum analyzer adjusted as in step B).
- I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

Name of Test: Field Strength of Spurious Radiation (Cont.)

- J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
- K) Repeat step J) with both antennas vertically polarized for each spurious frequency.
- L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.
- M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB =

$$10\log_{10}(\text{TX power in watts}/0.001) - \text{the levels in step I)}$$

NOTE: It is permissible that other antennas provided can be referenced to a dipole.

Test Equipment

Asset	Description	s/n	Cycle	Last Cal
Transducer				
X i00089	Apriel 2001 200MHz-1GHz	001500	12 mo.	Oct-06
X i00103	EMCO 3115 1GHz-18GHz	9208-3925	12 mo.	Sep-06
Amplifier				
X i00028	HP 8449A	2749A00121	12 mo.	Jun-06
Spectrum Analyzer				
X i00029	HP 8563E	3213A00104	12 mo.	Jan-06
X i00033	HP 8546A	3625A00357	12 mo.	Nov 06
Substitution Generator				
X i00067	HP 8920A Communication TS	3345U01242	12 mo.	Jun-06

Name of Test: Field Strength of Spurious Radiation

Measurement Results

g0710025: 2007-Jan-08 Mon 14:04:00
 STATE: 2:High Power

Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Level dBuV /m	@m	C.F. dB	Calc. dBuV/m	@m	ERP, dBm	Limit dBm
806.063	1612.125000	16.7	3	31.8	48.5	3	-48.9	-13.0
806.063	2418.187500	7.2	3	35.8	42.7	3	-54.6	-13.0
806.063	3224.250000	6.2	3	39.1	45.3	3	-52.1	-13.0
806.063	4030.312500	6.0	3	42.1	48.1	3	-49.3	-13.0
806.063	8060.625000	5.8	3	52.1	57.9	3	-39.4	-13.0

Observations were made to the 10th harmonic.

Name of Test: Field Strength of Spurious Radiation

Measurement Results

g0710026: 2007-Jan-09 Tue 07:58:00

STATE: 2:High Power

Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Level dBuV /m	@m	C.F. dB	Calc. dBuV/m	@m	ERP, dBm	Limit dBm
813.000	1627.125000	21.5	3	31.9	53.4	3	-44.0	-13.0
813.000	3254.250000	6.5	3	39.2	45.7	3	-51.6	-13.0
813.000	4067.812500	6.2	3	42.2	48.3	3	-49.1	-13.0
813.000	8135.625000	5.7	3	52.2	57.9	3	-39.5	-13.0

Observations were made to the 10th harmonic.

Name of Test: Field Strength of Spurious Radiation

Measurement Results

g0710027: 2007-Jan-09 Tue 08:19:00

STATE: 2:High Power

Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Level dBuV /m	@m	C.F. dB	Calc. dBuV/m	@m	ERP, dBm	Limit , dBm
821.000	1641.975000	13.2	3	32.1	45.3	3	-52.1	-13.0
821.000	2462.962500	7.2	3	35.7	42.8	3	-54.6	-13.0
821.000	3283.950000	6.5	3	39.2	45.7	3	-51.7	-13.0
821.000	8209.875000	8.5	3	52.3	60.8	3	-36.6	-13.0

Observations were made to the 10th harmonic.

Name of Test: Field Strength of Spurious Radiation

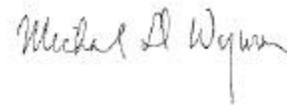
Measurement Results

g0710028: 2007-Jan-09 Tue 08:36:00
 STATE: 2:High Power

Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Level dBuV/m	@ m	C.F. dB	Calc. dBuV/m	@m	ERP, dBm	Limit , dBm
824.000	1649.975000	21.5	3	32.2	53.7	3	-43.7	-13.0
824.000	2474.962500	7.7	3	35.7	43.4	3	-54.0	-13.0
824.000	3299.950000	6.8	3	39.2	46.0	3	-51.3	-13.0
824.000	4124.937500	5.2	3	42.3	47.4	3	-49.9	-13.0
824.000	8249.875000	4.7	3	52.4	57.1	3	-40.3	-13.0

Observations were made to the 10th harmonic.



Performed by:

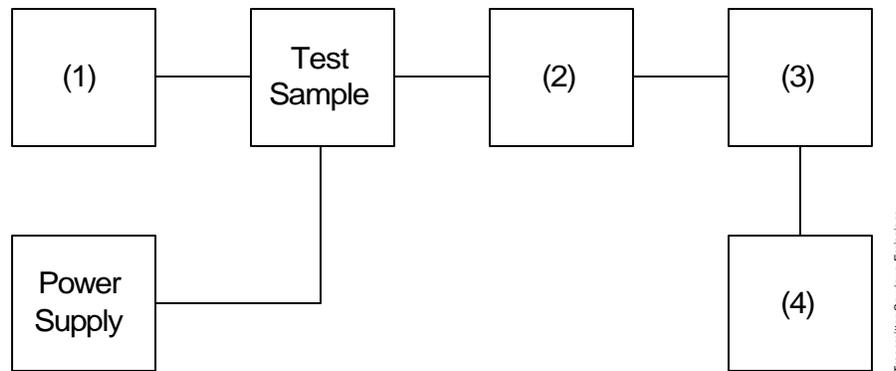
Michael Wyman

Name of Test: Emission Masks (Occupied Bandwidth)
Specification: 47 CFR 2.1049(c)(1), 90.210
Guide: ANSI/TIA/603C-2004, Paragraph 2.2.11

Measurement Procedure

- A) The EUT and test equipment were set up as shown below
- B) For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for $\pm 2.5/\pm 1.25$ kHz deviation (or 50% modulation). With level constant, the signal level was increased 16 dB.
- C) For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.
- D) The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

Transmitter Test Set-Up: Occupied Bandwidth



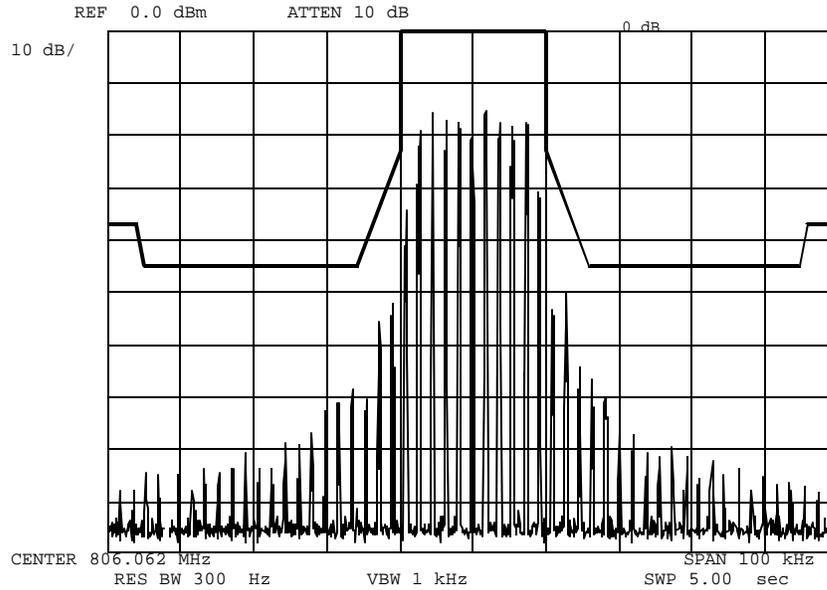
Asset	Description	s/n	Cycle	Last Cal
(1) Audio Oscillator/Generator				
X i00324	HP 8903B Modulation Meter	3011A09079	12 mo.	Oct-06
(2) Coaxial Attenuator				
X i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	N/A	NCR
(3) Interface				
X i00021	HP 8954A Transceiver Interface	2146A00159	N/A	NCR
(4) Spectrum Analyzer				
X i00048	HP 8566B Spectrum Analyzer	2511A01467	12 mo.	Aug-06

Name of Test: Occupied Bandwidth 18 kHz

Measurement Results

g06c0003: 2006-Dec-21 Thu 16:00:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:
Emission Mask G

HIGH IDEN
OCC BW 18KZ
806

Performed by:

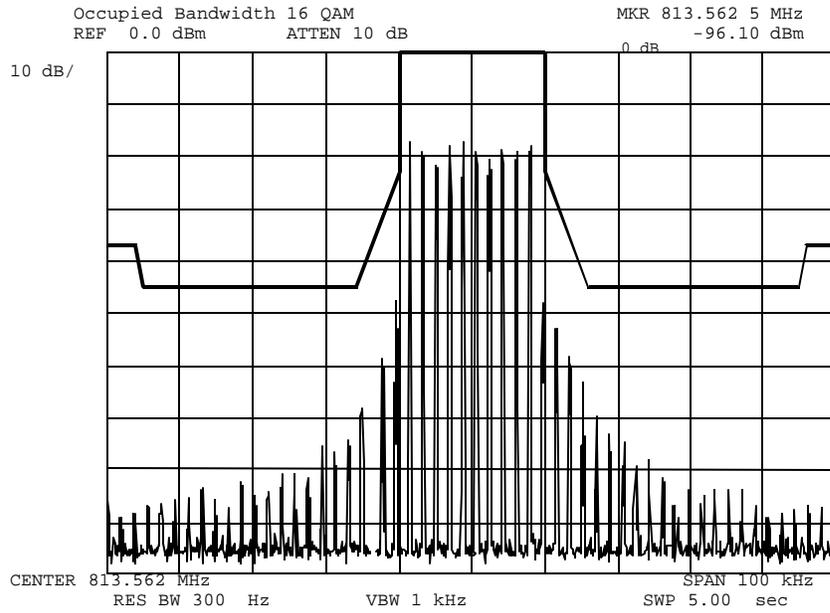
Michael Wyman

Name of Test: Occupied Bandwidth 18 kHz

Measurement Results

g06c0004: 2006-Dec-21 Thu 16:01:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Emission mask G
Power: HIGH IDEN
Modulation: OCC BW 18KZ
813

Performed by:

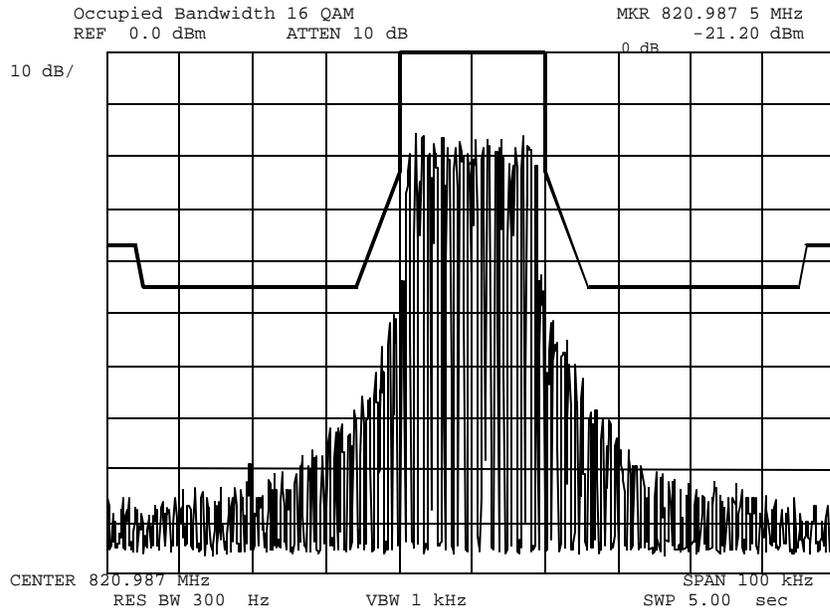
Michael Wyman

Name of Test: Occupied Bandwidth 18 kHz

Measurement Results

g06c0005: 2006-Dec-21 Thu 16:03:00
 State: 2:High Power

Ambient Temperature: 23°C ± 3°C



	Power:	HIGH IDEN
Emission Mask G	Modulation:	OCC BW 18KZ
		820

Michael D Wyman

Performed by:

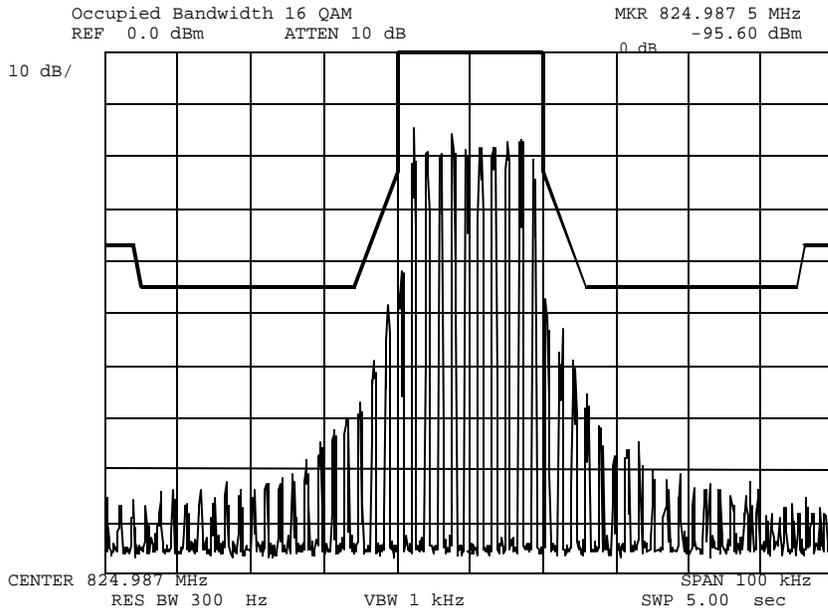
Michael Wyman

Name of Test: Occupied Bandwidth 18 kHz

Measurement Results

g06c0002: 2006-Dec-21 Thu 15:54:00
 State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Emission Mask G

Power: HIGH IDEN
 Modulation: OCC BW 18KZ
 824

Performed by:

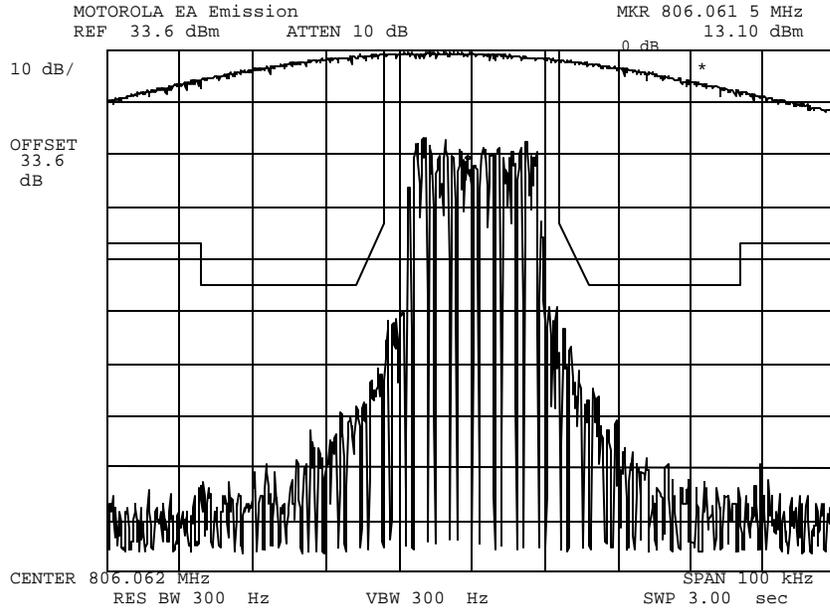
Michael Wyman

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0720053: 2007-Feb-13 Tue 12:29:00
 State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH 806
 Modulation: 16QAM
 EA MASK

Michael D Wyman

Performed by:

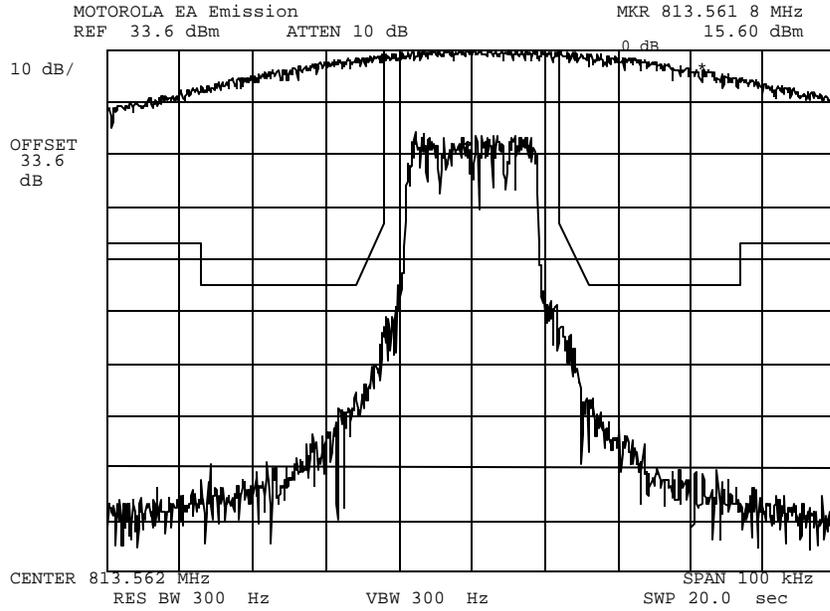
Michael Wyman

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0720054: 2007-Feb-13 Tue 12:36:00
 State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH 813
 Modulation: 16QAM
 EA MASK

Michael D Wyman

Performed by:

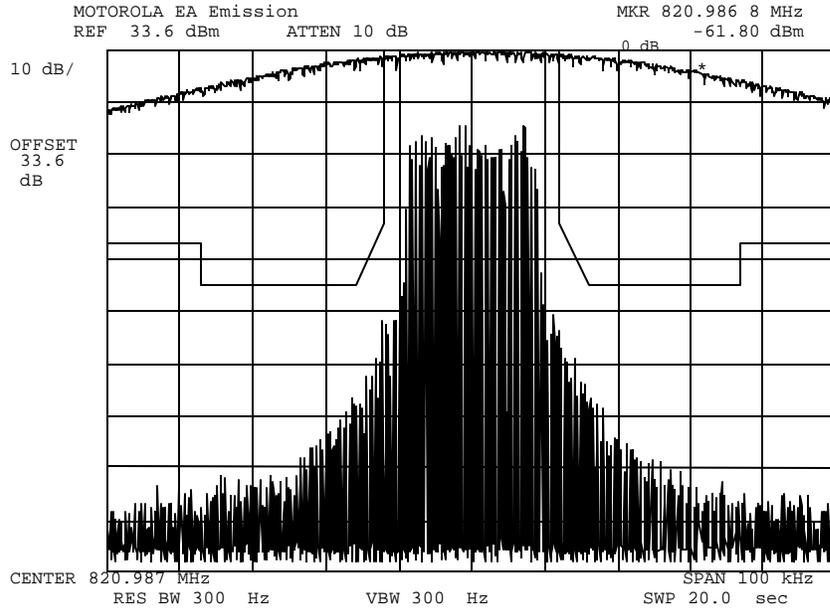
Michael Wyman

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0720055: 2007-Feb-13 Tue 12:40:00
 State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH 820
 Modulation: 16QAM
 EA MASK

Michael D Wyman

Performed by:

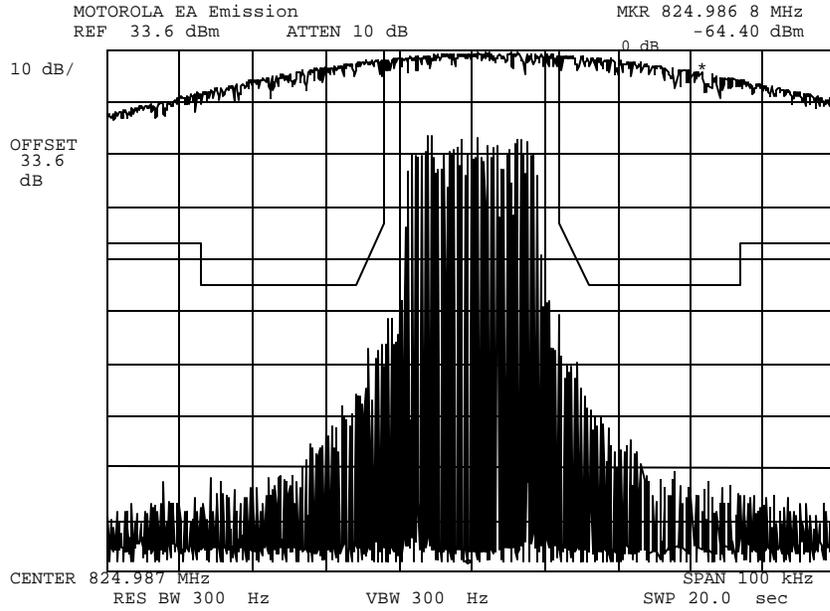
Michael Wyman

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0720056: 2007-Feb-13 Tue 12:46:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH 824
Modulation: 16QAM
EA MASK

Performed by:

Michael Wyman

Name of Test: Frequency Stability (Temperature Variation)

NOTE: This test will be submitted as a separate exhibit by the customer.

END OF TEST REPORT

**Testimonial
and
Statement of Certification**

This is to Certify:

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:



Hoosamuddin S. Bandukwala, Lab Director