

Table of Contents

<u>Rule</u>	<u>Description</u>	<u>Page</u>
2.1033(c)(14)	Rule Summary	2
	Standard Test Conditions and Engineering Practices	3
2.1033(c)	General Information Required	4
2.1046(a)	Carrier Output Power (Conducted)	6
2.1051	Unwanted Emissions (Transmitter Conducted)	8
2.1053(a)	Field Strength of Spurious Radiation	10
2.1049(c)(1)	Emission Masks (Occupied Bandwidth)	14
2.1047(b)	Modulation Limiting	24
2.1055(a)(1)	Frequency Stability (Temperature Variation)	26
2.1055(b)(1)	Frequency Stability (Voltage Variation)	28
2.202(g)	Necessary Bandwidth and Emission Bandwidth	30

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: d0680037

d) Client: Wulfsberg Electronics Division
6400 Wilkinson Drive
Prescott, AZ 86301-6164

e) Identification: CVC-151
FCC ID: FRWCVC-151

EUT Description: Aviation Control Unit (SN: E0001)

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

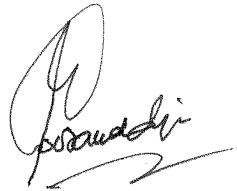
g) Report Date: August 11, 2006

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.

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:

- ☐ 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
- ☐ 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

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

In accordance with ANSI C63.4-2003 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.



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**

List of General Information Required for Certification

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

87

Sub-part 2.1033

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

Wulfsberg Electronics Division
6400 Wilkinson Drive
Prescott, AZ 86301-6164

Manufacturer:

Wulfsberg Electronics Division
6400 Wilkinson Drive
Prescott, AZ 86301-6164

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

FRWCVC-151

Model Number:

CVC-151

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

Please see attached exhibits

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

16K0F3E

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

118.0 to 151.975

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

_____ Switchable

_____ Variable

20 to 25.12

_____ x N/A

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

N/A

DUT Results:

Passes _____ x _____

Fails _____

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	=	28

(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

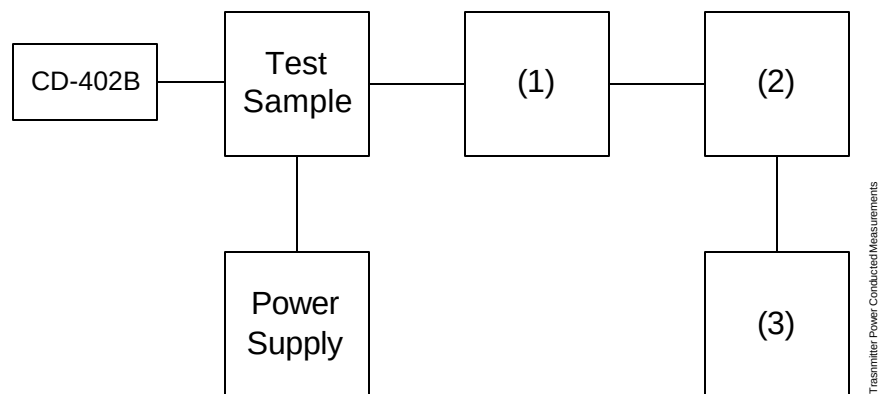
Name of Test: Carrier Output Power (Conducted)
Specification: 47 CFR 2.1046(a)
Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.1

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	WEINSCHTEL CORP 68-30-34 (30 dB)	LW934	NCR	
	NARDA 4772-10 (10 dB)		NCR	
(2)	Spectrum Analyzer			
X	i00048 HP 8566B Spectrum Analyzer	2511A01467	12 mo.	Jun-06
(3)	Frequency Counter			
X	i00067 HP 5334B	I00019	12 mo.	Jul-06

Name of Test: Carrier Output Power (Conducted)

Measurement Results
(Worst case)

Frequency of Carrier, MHz = 118.0, 135.0, 151.975
Ambient Temperature = 23°C ± 3°C

Power Setting	RF Power, Watts
High	22.4

Performed by:



David McPherson, Compliance Test
Engineer

Name of Test: Unwanted Emissions (Transmitter Conducted)

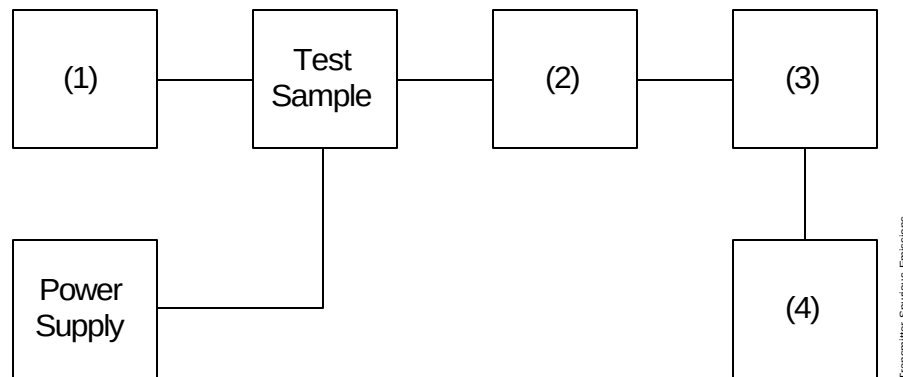
Specification: 47 CFR 2.1051

Guide: ANSI/TIA/EIA-603-1992, 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) Audio Oscillator/Generator				
i00017	HP 8903A Audio Analyzer	2216A01753	12 mo.	
i00002	HP 3336B Synthesizer / Level Gen.	1931A01465	12 mo.	
(2) Coaxial Attenuator				
X	WEINSCHEL CORP 68-30-34 (30 dB)	LW934	NCR	
	NARDA 4772-10 (10 dB)		NCR	
(3) Filters; Notch				
X	I00126 TNF-1 EAGLE		NCR	
(4) Spectrum Analyzer				
X	i00048 HP 8566B	2152A02970	12 mo.	Jun-06

Name of Test: Unwanted Emissions (Transmitter Conducted)

Measurement Results
(Worst Case)

Summary:

Frequency of carrier, MHz	=	118.0, 135.0, 151.975
Spectrum Searched, GHz	=	0 to 10 x F _C
Maximum Response, Hz	=	N/A
All Other Emissions	=	= 20 dB Below Limit
Limit(s), dBc		56.5 (Po = 43.5 dBm)

Tabulated Results follow:

Measurement Results

State: Ambient Temperature: 23°C ± 3°C

CHANNEL TUNED (MHz)	SPURIOUS FREQ (MHz)	MEASURED LEVEL (dBm)	LEVEL BELOW CARRIER (dB)	MARGIN (dB)
118.00	236.000	-29.3	72.8	16.3
118.00	354.000	-40.6	84.1	27.6
118.00	472.000	-47.2	90.7	34.2
118.00	590.000	-55.4	98.9	42.4
118.00	708.000	-51.2	94.7	38.2
118.00	826.000	-56.3	99.8	43.3
118.00	944.000	-56.8	100.3	43.8
118.00	1062.000	-56.2	99.7	43.2
118.00	1180.000	-56.4	99.9	43.4

Performed by:



David McPherson, Compliance Test Engineer

Name of Test: Field Strength of Spurious Radiation

Specification: 47 CFR 2.1053(a)

Guide: ANSI/TIA/EIA-603-1992/2001, Paragraph 1.2.12 and Table 16, 47 CFR 22.917

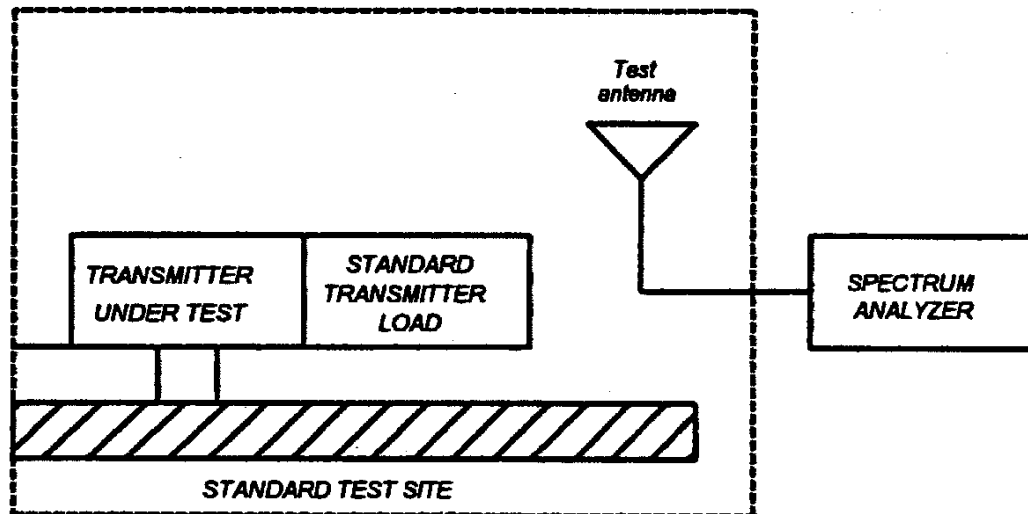
Measurement Procedure

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.

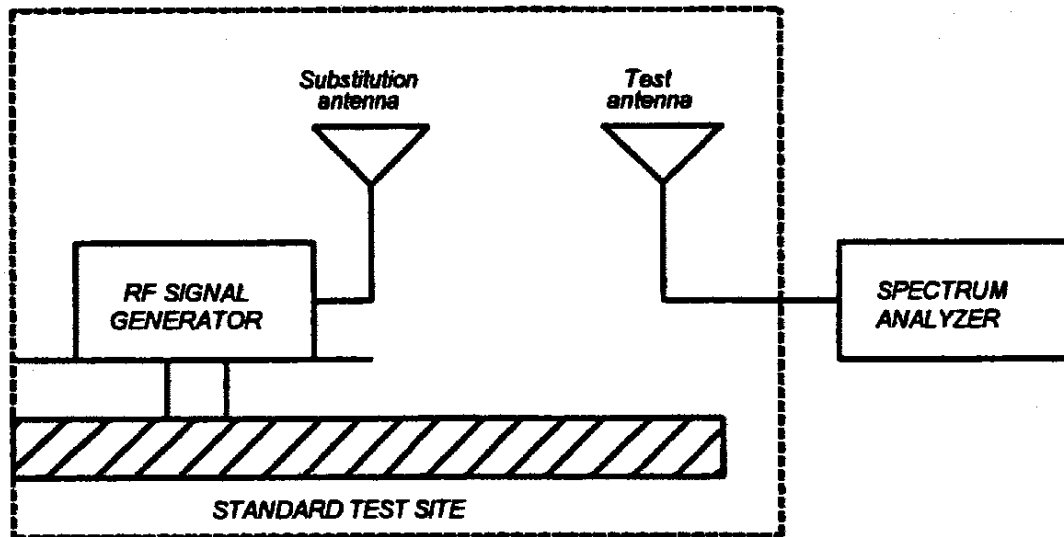
Method of Measurement:

- 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 i00088	EMCO 3109-B 25MHz-300MHz	2336	12 mo.	Oct-05
X i00089	Apriel 2001 200MHz-1GHz	001500	12 mo.	Oct-05
X i00103	EMCO 3115 1GHz-18GHz	9208-3925	12 mo.	Aug-05
Spectrum Analyzer				
X i00029	HP 8563E	3213A00104	12 mo.	Jan-06
X i00033	HP 85462A	3625A00357	12 mo.	

Name of Test: Field Strength of Spurious Radiation

Measurement Results

g0670002: 2006-Jul-13 Thu 09:27:00

STATE: 2:High Power

Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	ERP, dBm	MARG, dBc
135.000000	270.070000	-61.7	-48.7
135.000000	405.070000	-53	-40.0
135.000000	540.070000	-61.8	-48.8
135.000000	675.070000	-59.9	-47.0
135.000000	810.070000	-57.6	-44.6
135.000000	945.070000	-54.2	-41.2
135.000000	1080.070000	-53.9	-40.9
135.000000	1215.070000	-52.9	-40.0
135.000000	1350.070000	-54.1	-41.1



Performed by:

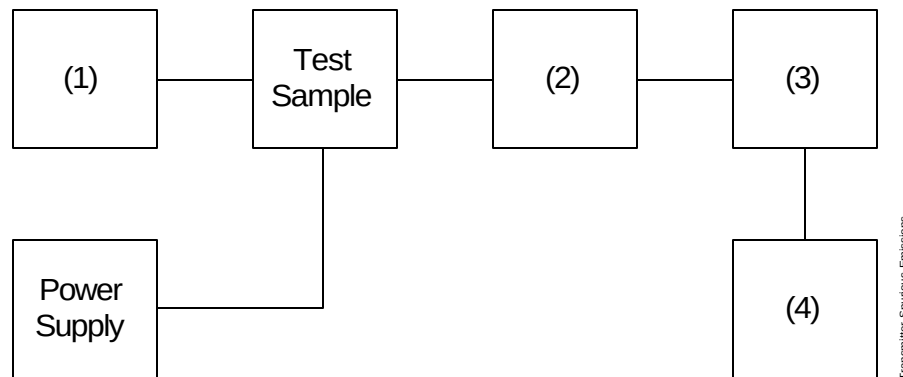
Fred Chastain

Name of Test: Emission Masks (Occupied Bandwidth)
Specification: 47 CFR 2.1049(c)(1)
Guide: ANSI/TIA/EIA-603-1992, 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



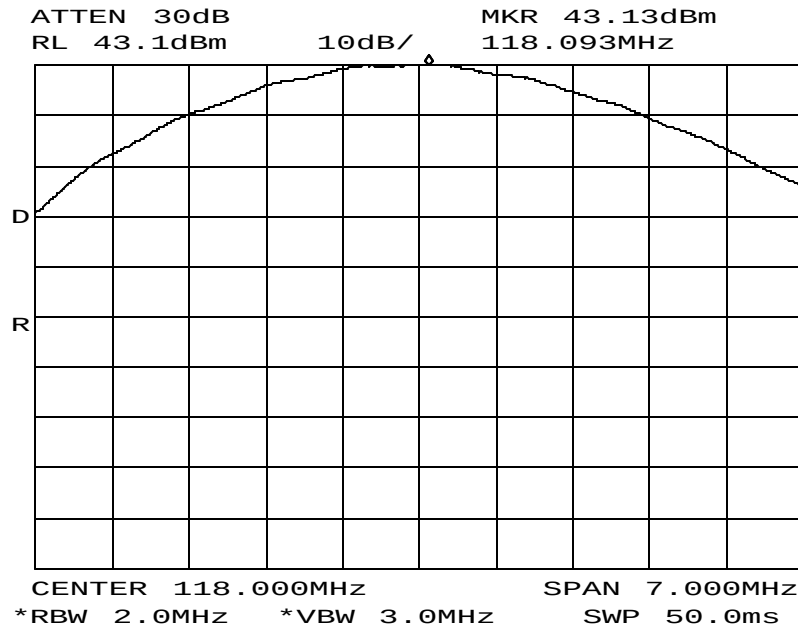
Asset	Description	s/n	Cycle	Last Cal
(1) Audio Oscillator/Generator				
X i00017	HP 8903A Modulation Meter	2216A01753	12 mo.	Apr-04
(2) Coaxial Attenuator				
X i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
i00123	NARDA 766 (10 dB)	7802A	NCR	
(3) Interface				
X i00021	HP 8954A Transceiver Interface	2146A00159	NCR	
(4) Spectrum Analyzer				
X i00048	HP 8566B	2511A01467	12 mo.	Jun-06
X i00029	HP 8563E	3213A00104	12 mo.	Jan-06

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0670013: 2006-Jul-31 Mon 13:46:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
NONE
REFERENCE LEVEL – LOW CHANNEL

Performed by:

David McPherson, Compliance Test Engineer

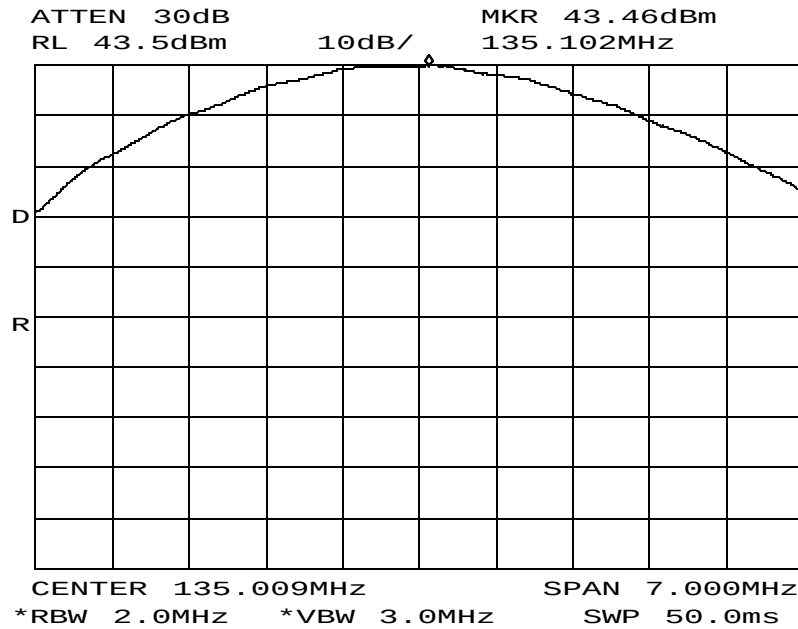
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0670015: 2006-Jul-31 Mon 14:05:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
NONE
REFERENCE LEVEL – MID CHANNEL

Performed by:

David McPherson, Compliance Test Engineer

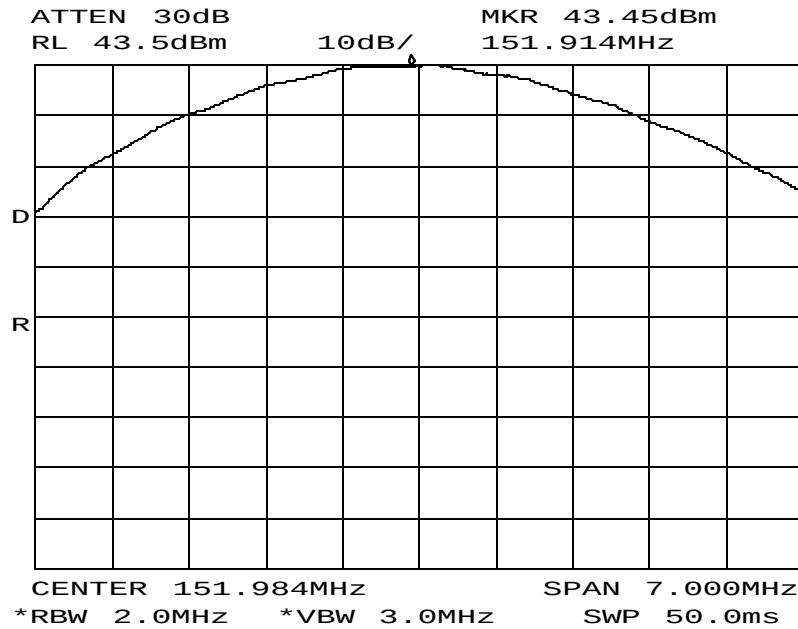
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0670018: 2006-Jul-31 Mon 14:18:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
NONE
REFERENCE LEVEL - HIGH CHANNEL

Performed by:

David McPherson, Compliance Test Engineer

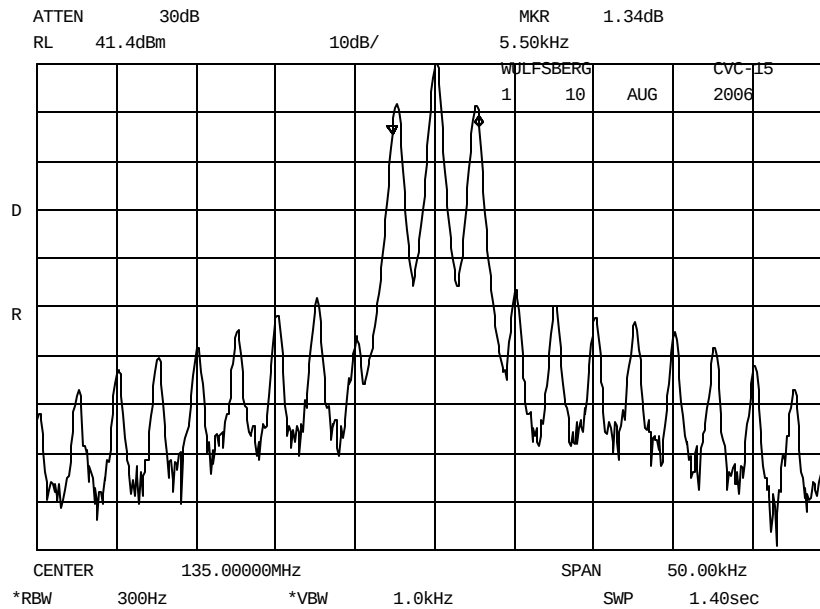
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0680112: 2006-Aug-10 Thu 18:03:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
VOICE: 2500 Hz SINE WAVE
99% POWER BANDWIDTH, LOW
CHANNEL

Performed by:

David McPherson, Compliance Test Engineer

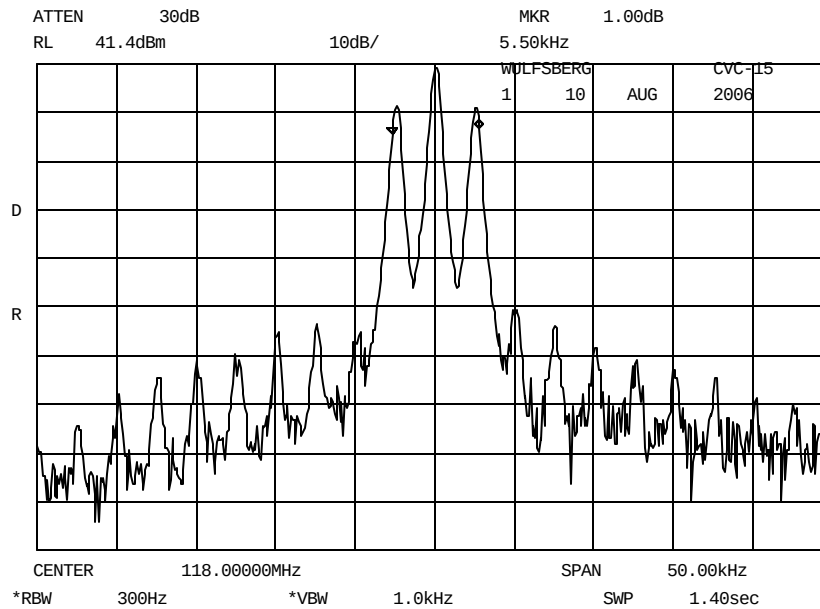
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0680113: 2006-Aug-10 Thu 18:06:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
VOICE: 2500 Hz SINE WAVE
99% POWER BANDWIDTH, MID
CHANNEL

Performed by:

David McPherson, Compliance Test Engineer

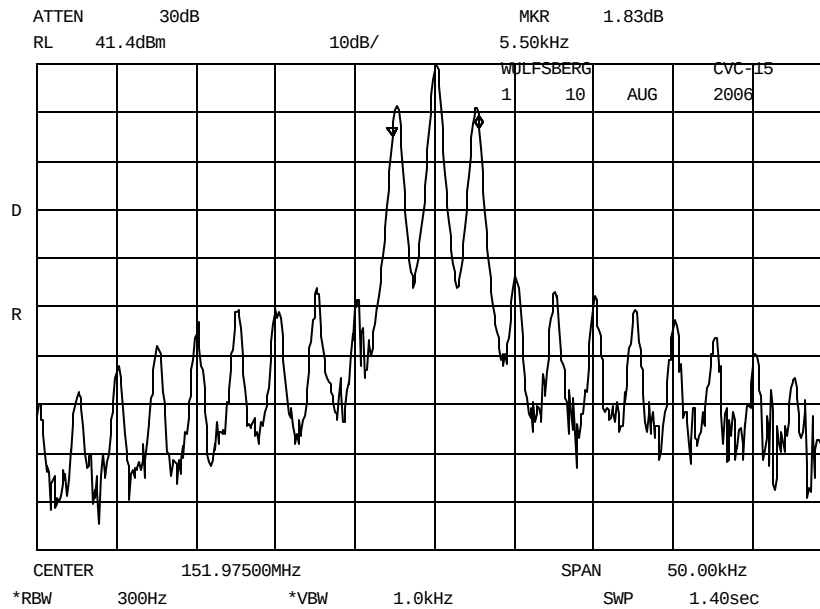
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0680114: 2006-Aug-10 Thu 18:07:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
VOICE: 2500 Hz SINE WAVE
99% POWER BANDWIDTH, HIGH
CHANNEL

Performed by:

David McPherson, Compliance Test Engineer

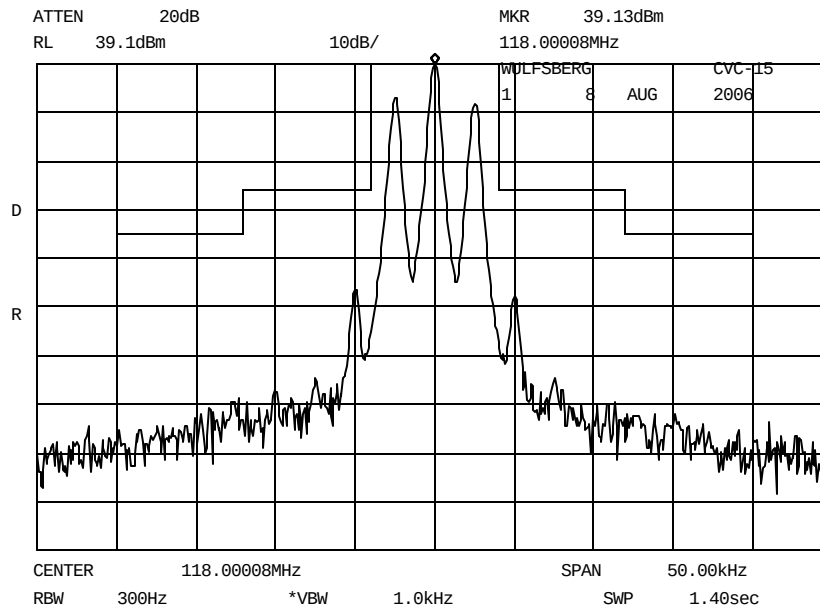
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0680108: 2006-Aug-08 Tue 10:56:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
VOICE: 2500 Hz SINE WAVE
AM MODULATION AT 8.33KHZ – LOW
CHANNEL

Performed by:

David McPherson, Compliance Test
Engineer

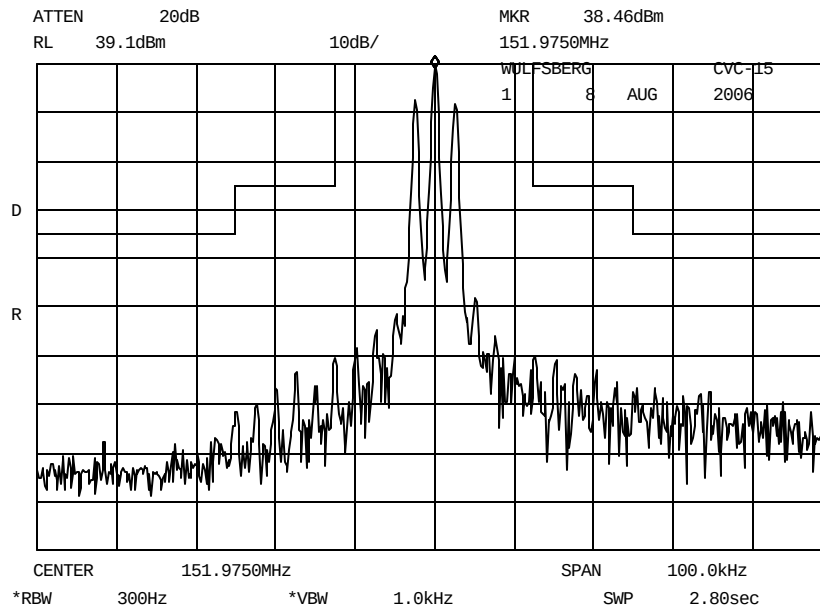
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0680109: 2006-Aug-08 Tue 11:03:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
VOICE: 2500 Hz SINE WAVE
AM MODULATION AT 25KHZ - HIGH
CHANNEL

Performed by:

David McPherson, Compliance Test Engineer

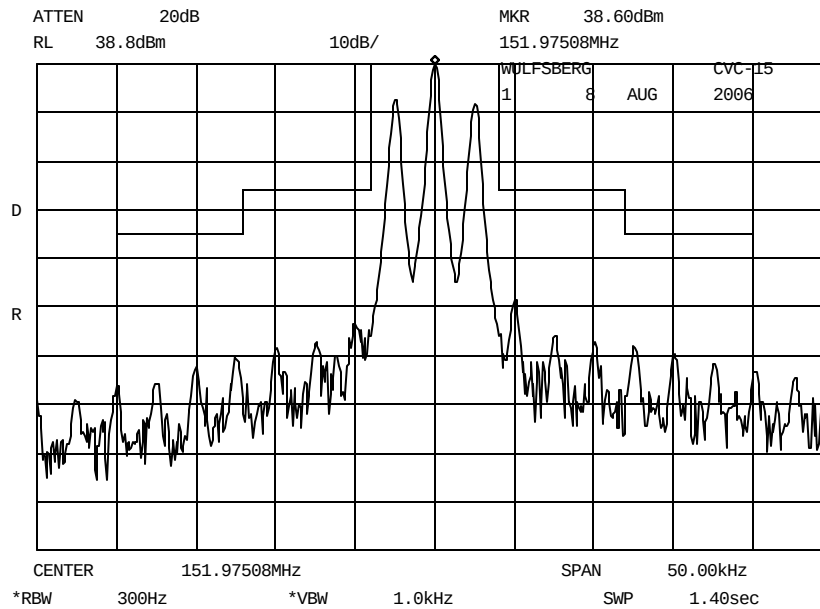
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0680110: 2006-Aug-08 Tue 11:08:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
VOICE: 2500 Hz SINE WAVE
AM MODULATION AT 25KHZ - HIGH
CHANNEL

Performed by:

David McPherson, Compliance Test Engineer

Name of Test: Modulation Limiting

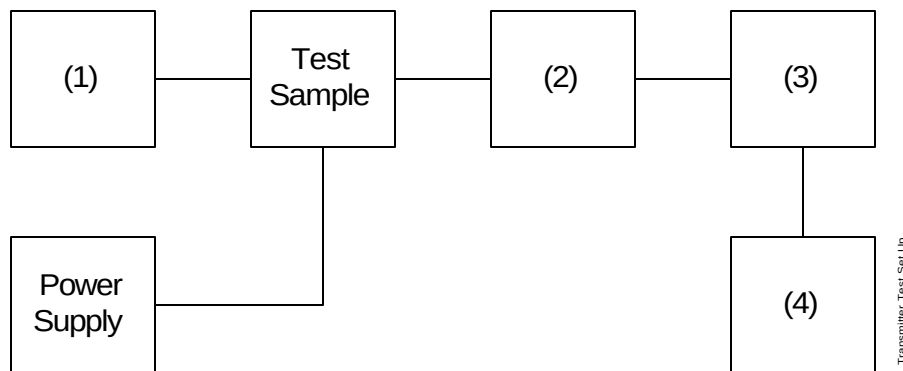
Specification: 47 CFR 2.1047(b)

Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.3

Measurement Procedure

- A) The signal generator was connected to the input of the EUT as shown below.
- B) The modulation response was measured for each of three frequencies (one of which was the frequency of maximum response), and the input voltage was varied and was observed on an HP 8901A Modulation Analyzer.
- C) The input level was varied from 30% modulation (± 1.5 kHz deviation) to at least 20 dB higher than the saturation point.
- D) Measurements were performed for both negative and positive modulation and the respective results were recorded.

Transmitter Test Set-Up: Modulation Limiting



Asset	Description	s/n		
(1) Audio Oscillator				
X i00017	HP 8903A Audio Analyzer	2216A01753	12 mo.	Aug-05
(2) Coaxial Attenuator				
i0012/23	NARDA 766-(10 dB)	7802 or 7802A	NCR	
X i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
(3) Modulation Analyzer				
X i00020	HP 8901A Modulation Meter	2105A01087	NCR	
(4) Audio Analyzer				
X i00017	HP 8903A Audio Analyzer	2216A01753	12 mo.	Aug-05

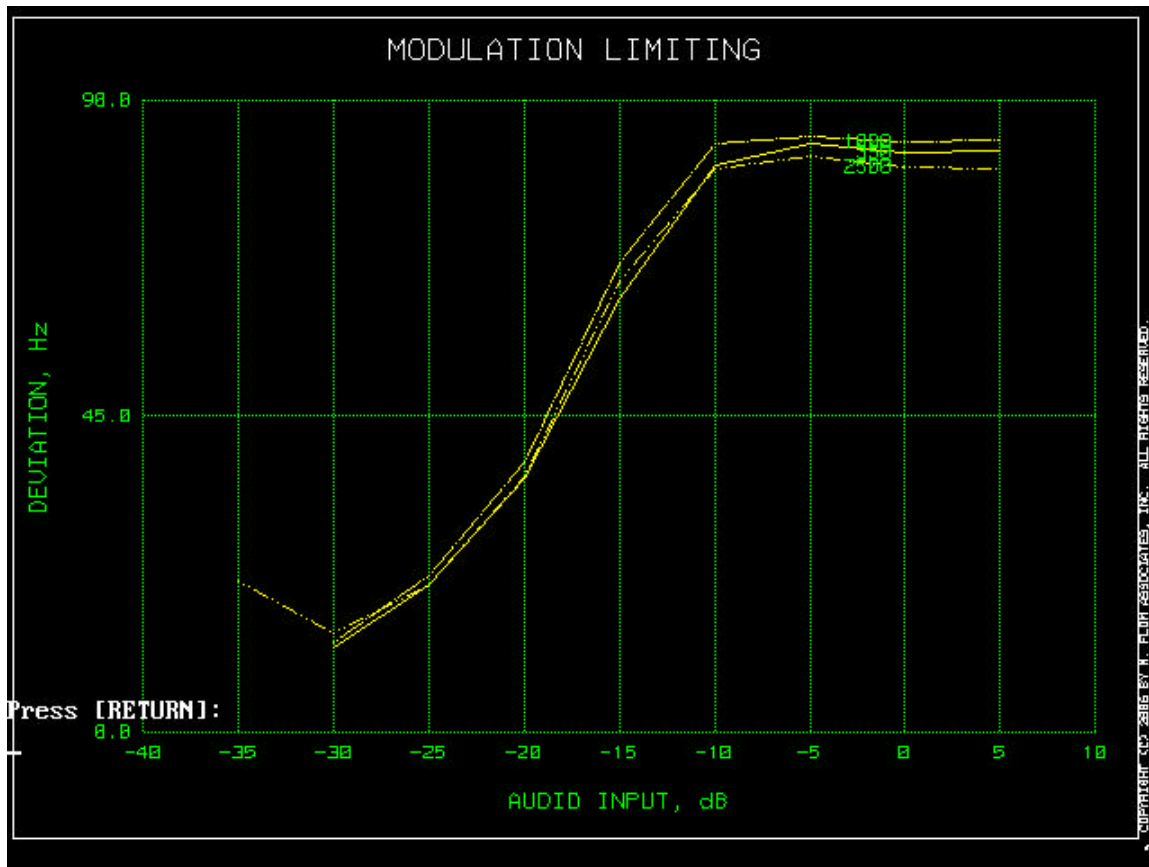
Name of Test: Modulation Limiting

Measurement Results

g0680091: 2006-Aug-08 Tue 11:13:00

State: 0:General

Ambient Temperature: 23°C ± 3°C



Performed by:

David McPherson, Compliance Test Engineer

Name of Test: Frequency Stability (Temperature Variation)

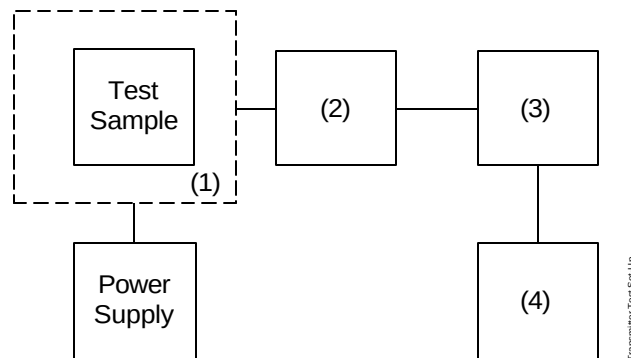
Specification: 47 CFR 2.1055(a)(1)

Guide: ANSI/TIA/EIA-603-1992, 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	Cycle	Last Cal
(1) Temperature, Humidity, Vibration				
X i00027	Tenney Temp. Chamber	9083-765-234	NCR	
(2) Coaxial Attenuator				
i0012/23	NARDA 766-(10 dB)	7802 or 7802A	NCR	
X i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
(3) Spectrum Analyzer				
X i00067	HP 8563E	3213A01467	12 mo.	Jun-06
(4) Frequency Counter				
X i00067	HP 5334B	I00019	12 mo.	Jul-06

Name of Test: Frequency Stability (Temperature Variation)

Measurement Results

g0680001: 2006-Aug-01 Tue 10:08:20

State: 0:General

Supplied Voltage

Ambient Temperature: 23°C ± 3°C

28 VDC

Temperature (° C)	Measured Frequency (MHz)	Nominal Frequency (MHz)	Deviation (%)	Limit (%)	Deviation (Hz)	Limit (Hz)	Deviation (ppm)	Limit (ppm)
+50	135.000045	135.000000	0.00003	0.003	45	4050	0.33	30
+40	135.000040	135.000000	0.00003	0.003	40	4050	0.30	30
+30	135.000010	135.000000	0.00001	0.003	10	4050	0.07	30
+25 (ref)	135.000035	135.000000	0.00003	0.003	35	4050	0.26	30
+20	135.000015	135.000000	0.00001	0.003	15	4050	0.11	30
+10	134.999995	135.000000	0.00000	0.003	-5	4050	-0.04	30
+0	134.999968	135.000000	-0.00002	0.003	-32	4050	-0.24	30
-10	134.999947	135.000000	-0.00004	0.003	-53	4050	-0.39	30
-20	134.999958	135.000000	-0.00003	0.003	-42	4050	-0.31	30
-30	134.999952	135.000000	-0.00004	0.003	-48	4050	-0.36	30

Performed by:



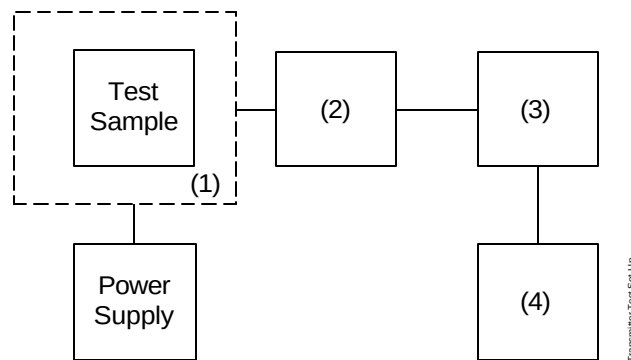
David McPherson, Compliance Test
Engineer

Name of Test: Frequency Stability (Voltage Variation)
Specification: 47 CFR 2.1055(d)(1)
Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

Measurement Procedure

- A) The EUT was placed in a temperature chamber (if required) at $25 \pm 5^\circ\text{C}$ and connected as shown below.
- B) The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
- C) The variation in frequency was measured for the worst case.

Transmitter Test Set-Up: Voltage Variation



Asset	Description	s/n	Cycle	Last Cal
(1) Temperature, Humidity, Vibration				
X i00027	Tenney Temp. Chamber	9083-765-234	NCR	
(2) Coaxial Attenuator				
i0012/23	NARDA 766-(10 dB)	7802 or 7802A	NCR	
X i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
(3) Spectrum Analyzer				
X i00067	HP 8563E	3213A01467	12 mo.	Jun-06
(4) Frequency Counter				
X i00067	HP 5334B	I00019	12 mo.	Jul-06

Results: Frequency Stability (Voltage Variation)

State: Ambient Temperature: 23°C ± 3°C

Supplied Voltage (VDC)	Measured Frequency (MHz)	Nominal Frequency (MHz)	Deviation (%)	Limit (%)	Deviation (Hz)	Limit (Hz)	Deviation (ppm)	Limit (ppm)
23.8	135.000038	135.000000	0.00003	0.003	38	4050	0.28	30
28.0	135.000035	135.000000	0.00003	0.003	35	4050	0.26	30
32.2	135.000042	135.000000	0.00003	0.003	42	4050	0.31	30



Performed by:

David McPherson, Compliance Test Engineer

Name of Test: Necessary Bandwidth and Emission Bandwidth

Specification: 47 CFR 2.202(g)

Modulation = 6K00A3E

Necessary Bandwidth Calculation:

Maximum Modulation (M), kHz	=	N/A
Maximum Deviation (D), kHz	=	N/A
Constant Factor (K)	=	1
Necessary Bandwidth (B_N), kHz	=	$(2 \times M) + (2 \times D \times K)$
	=	5.5 KHz (measured)

Performed by:
END OF TEST REPORT



David McPherson, Compliance Test Engineer