



Engineering and Testing for EMC and Safety Compliance

TYPE CERTIFICATION REPORT

M/A-COM, Inc.
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Lynchburg, VA 24501
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MODEL: MASTRIII/Sitepro Base Station

FCC ID: OWDTR-0017-E

February 5, 2003

STANDARDS REFERENCED FOR THIS REPORT	
PART 2: 1999	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS
PART 22: 2001	PUBLIC MOBILE SERVICES
PART 74: 2001	EXPERIMENTAL RADIO AUXILIARY, SPECIAL BROADCAST AND OTHER PROGRAM DISTRIBUTIONAL SERVICES
PART 80: 2001	STATIONS IN THE MARITIME SERVICES
PART 90: 1998	PRIVATE LAND MOBILE RADIO SERVICES
ANSI C63.4-1992	STANDARD FORMAT MEASUREMENT/TECHNICAL REPORT PERSONAL COMPUTER AND PERIPHERALS
ANSI/TIA/EIA603- 1992	LAND MOBILE FM OR PM COMMUNICATIONS EQUIPMENT MEASUREMENT AND PERFORMANCE STANDARDS
ANSI/TIA/EIA 603-1-1998	ADDENDUM TO ANSI/TIA/EIA 603-1992
ANSI/TIA/EIA -102.CAAA; 1999	DIGITAL C4FM/CQPSK TRANSCEIVER MEASUREMENT METHODS
RSS-119; Issue 6; 2000	LAND MOBILE AND FIXED RADIO TRANSMITTERS AND RECEIVERS 27.41 TO 960.0 MHz

Frequency Range	Output Power (W) Conducted	Frequency Tolerance (ppm)	Emission Designator
136-174 MHz	10-110	1.1	16K0F3E
136-174 MHz	10-110	1.1	11K0F3E
136-174 MHz	10-110	1.1	15K6F1D
136-174 MHz	10-110	1.1	15K6F1E
136-174 MHz	10-110	1.1	9K25F1D
136-174 MHz	10-110	1.1	9K25F1E
136-174 MHz	10-110	1.1	8K50F1D
136-174 MHz	10-110	1.1	8K50F1E

REPORT PREPARED BY:

TEST ENGINEER: DANIEL BALTZELL

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1 GENERAL INFORMATION

The following Report of a Type Certification is prepared on behalf of **M/A COM, Inc.** in accordance with the Federal Communications Commission and Industry Canada Rules and Regulations. The Equipment Under Test (EUT) was the **MASTRIII VHF Basestation with Sitepro; FCC ID: OWDTR-0017-E**. The test results reported in this document relate only to the item that was tested.

All measurements contained in this application were conducted in accordance with FCC Rules and Regulations CFR 47, Industry Canada RSS-119, and ANSI C63.4 Methods of Measurement of Radio Noise Emissions, 1992. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

1.1 TEST FACILITY

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report dated March 3, 1994, submitted to and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 1992).

1.2 RELATED SUBMITTAL(S)/GRANT(S)

This is an original application report.

1.3 CONFORMANCE STATEMENT

STANDARDS REFERENCED FOR THIS REPORT	
PART 2: 1999	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS
PART 22: 2001	PUBLIC MOBILE SERVICES
PART 74: 2001	EXPERIMENTAL RADIO AUXILIARY, SPECIAL BROADCAST AND OTHER PROGRAM DISTRIBUTIONAL SERVICES
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136-174 MHz	10-110	1.1	11K0F3E
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136-174 MHz	10-110	1.1	15K6F1E
136-174 MHz	10-110	1.1	9K25F1D
136-174 MHz	10-110	1.1	9K25F1E
136-174 MHz	10-110	1.1	8K50F1D
136-174 MHz	10-110	1.1	8K50F1E

We, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this attached test record. No modifications were made to the equipment during testing in order to achieve compliance with these standards.

Furthermore, there was no deviation from, additions to or exclusions from the above standards for Certification methodology.

Signature: 

Date: February 5, 2003

Typed/Printed Name: Desmond A. Fraser

Position: President

Signature: 

Date: February 5, 2003

Typed/Printed Name: Daniel W. Baltzell

Position: Test Engineer



Accredited by the National Voluntary Accreditation Program for the specific scope of accreditation under Lab Code 200061-0.

Note: This report may not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

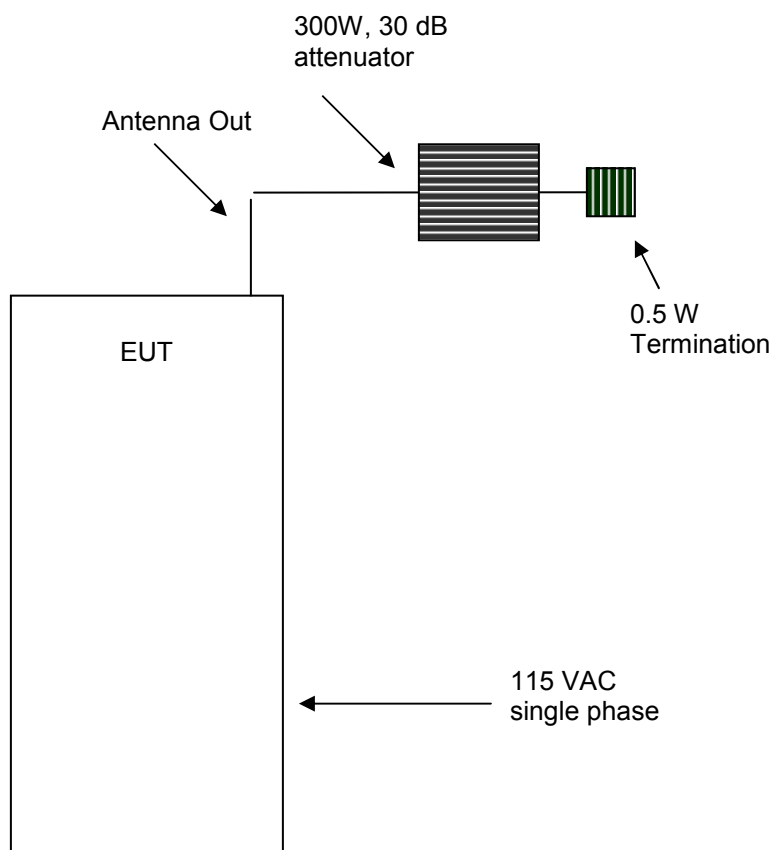
1.4 TESTED SYSTEM DETAILS

Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

TABLE 1-1: EQUIPMENT UNDER TEST (EUT)

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
MASRTIII/SITEPRO VHF BASESTATION	M/A-COM, INC.	N/A	N/A	OWDTR-0017-E	N/A	14605
MASRTIII/SITEPRO VHF BASESTATION	M/A-COM, INC.	N/A	N/A	OWDTR-0017-E	N/A	14999

FIGURE 1-1: CONFIGURATION OF TESTED SYSTEM



2 RADIATED EMISSIONS

2.1 RADIATED MEASUREMENT

Final radiated emissions measurements were made on the three-meter, open-field test site. The EUT was placed on a nonconductive turntable at ground plane level.

At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters in order to determine the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations.

Note: Rhein Tech Laboratories, Inc. has implemented procedures to minimize errors that occur from test instruments, calibration, procedures, and test setups. Test instrument and calibration errors are documented from the manufacturer or calibration lab. Other errors have been defined and calculated within the Rhein Tech quality manual, section 6.1. Rhein Tech implements the following procedures to minimize errors that may occur: yearly as well as daily calibration methods, technician training, and emphasis to employees on avoiding error.

3 FCC RULES AND REGULATIONS PART 2 §2.1046 (A); IC RSS-119 §6.2: RF POWER OUTPUT: CONDUCTED

3.1 TEST PROCEDURE

ANSI/TIA/EIA-603-1992, section 2.2.1

The EUT was connected to a coaxial attenuator having a 50Ω load impedance.

3.2 TEST DATA

The following channels (in MHz) were tested: 136.025, 150.025, and 172.975.

TABLE 3-1: RF POWER OUTPUT: CARRIER OUTPUT POWER

Channel	Frequency (MHz)	RF Power measured (Watt)*
1	136.025	110
2	152.025	110
3	172.975	110

* MEASUREMENT ACCURACY: +/- 3%

TABLE 3-2: RF POWER OUTPUT (RATED POWER)

Rated Power (W)
110.0

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER


SIGNATURE

FEBRUARY 3, 2003
DATE OF TEST

TABLE 3-3: TEST EQUIPMENT USED FOR TESTING (RF POWER OUTPUT - CONDUCTED)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901184	Agilent Technologies	E4416A	EPM-P Power Meter, single channel	GB41050573	7/19/03
901118	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2406A00178	06/14/03
901186	Agilent Technologies	E9323A (50MHz-6GHz)	Peak & Avg. Power Sensor	US40410380	7/19/03
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585	07/31/03
901228	Pasternack	PE7031-30	300W 30 dB Attenuator	DC 1 GHz	Not Required
901140	Weinschel Corp.	47-10-34 DC-18GHz	Attenuator, 50W 10dB	BK6203	Not Required

4 FCC RULES AND REGULATIONS PART 2 §2.1051; IC RSS-119 §6.3: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

4.1 TEST PROCEDURE

ANSI/TIA/EIA-603-1992, Section 2.2.13

The transmitter is terminated with a 50 Ω load and interfaced with a spectrum analyzer.

The transmitter is modulated with a 2,500 Hz sine wave at an input level 16 dB greater than that required to produce 50% of the rated system deviation at 1000 Hz.

Digital Modulation: Modulated to its maximum extent using a pseudo random data sequence - 9600bps

4.2 TEST DATA

Frequency range of measurement per Part 2.1057: 9kHz to 10 x Fc

Limits: Mask D (dBm): $P(\text{dBm}) - (50 + 10 \times \log P(\text{W}))$

The following channels (in MHz) were investigated: 136.025, 150.675, and 172.975MHz. The worse case (unwanted emissions) channels are shown. The magnitude of emissions attenuated more than 20 dB below the FCC limit need not be recorded.

TABLE 4-1: CONDUCTED SPURIOUS EMISSIONS CHANNEL 1 – 136.025 MHZ

(136.025MHz); 12.5kHz channel spacing; Mask D; Conducted power = 110 W

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Notch Filter Insertion Loss (dB)	Level (dBc)	Limit (dBc)	Margin(dB)
272.050	-63.6	1.2	112.8	70.4	-42.4
408.075	-49.5	1.2	98.7	70.4	-28.3
544.100	-70.5	1.4	119.5	70.4	-49.1
680.125	-70.4	1.6	119.2	70.4	-48.8
816.150	-70.5	2.1	118.8	70.4	-48.4
952.175	-70.8	2.9	118.3	70.4	-47.9
1088.200	-71.2	3.1	118.5	70.4	-48.1
1224.225	-48.5	4.9	94.0	70.4	-23.6
1360.250	-67.5	20.4	97.5	70.4	-27.1

TABLE 4-2: CONDUCTED SPURIOUS EMISSIONS CHANNEL 2 – 152.025 MHZ

(152.025MHz); 12.5kHz channel spacing; Mask D; Conducted power = 110 W

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Notch Filter Insertion Loss (dB)	Level (dBc)	Limit (dBc)	Margin(dB)
304.050	-60.1	0.9	109.6	70.4	-39.2
456.075	-50.1	1.3	99.2	70.4	-28.8
608.100	-70.6	1.7	119.3	70.4	-48.9
760.125	-68.2	2.1	116.5	70.4	-46.1
912.150	-69.7	21.8	98.3	70.4	-27.9
1064.175	-69.9	3.9	116.4	70.4	-46.0
1216.200	-66.2	4.7	111.9	70.4	-41.5
1368.225	-69.4	21.0	98.8	70.4	-28.4
1520.250	-69.9	8.3	112.0	70.4	-41.6

TABLE 4-3: CONDUCTED SPURIOUS EMISSIONS CHANNEL 2 – 152.025 MHZ

(152.025MHz); 12.5kHz channel spacing; Mask D; Conducted power = 55 W (mid-power)

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Notch Filter Insertion Loss (dB)	Level (dBc)	Limit (dBc)	Margin(dB)
304.050	-51.2	0.9	97.7	67.4	-30.3
456.075	-41.7	1.3	87.8	67.4	-20.4
608.100	-81.7	1.7	127.4	67.4	-60.0
760.125	-68.4	2.1	113.7	67.4	-46.3
912.150	-89.8	21.8	115.4	67.4	-48.0
1064.175	-81.6	3.9	125.1	67.4	-57.7
1216.200	-71.1	4.7	113.8	67.4	-46.4
1368.225	-89.3	21.0	115.7	67.4	-48.3
1520.250	-89.2	8.3	128.3	67.4	-60.9

TABLE 4-4: CONDUCTED SPURIOUS EMISSIONS CHANNEL 2 – 152.025 MHZ

(152.025MHz); 12.5kHz channel spacing; Mask D; Conducted power = 10 W (low power)

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Notch Filter Insertion Loss (dB)	Level (dBc)	Limit (dBc)	Margin(dB)
304.050	-50.0	0.9	89.1	60.0	-29.1
456.075	-51.7	1.3	90.4	60.0	-30.4
608.100	-80.4	1.7	118.7	60.0	-58.7
760.125	-73.6	2.1	111.5	60.0	-51.5
912.150	-79.6	21.8	97.8	60.0	-37.8
1064.175	-81.4	3.9	117.5	60.0	-57.5
1216.200	-86.3	4.7	121.6	60.0	-61.6
1368.225	-90.2	21.0	109.2	60.0	-49.2
1520.250	-88.7	8.3	120.4	60.0	-60.4

TABLE 4-5: CONDUCTED SPURIOUS EMISSIONS CHANNEL 3 – 172.975 MHZ

(172.975MHzMHz); 12.5kHz channel spacing; Mask D; Conducted power = 110 W

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Notch Filter Insertion Loss (dB)	Level (dBc)	Limit (dBc)	Margin(dB)
345.950	-92.1	38.1	104.4	70.4	-34.0
518.925	-86.6	30.6	106.4	70.4	-36.0
691.900	-99.9	30.9	119.4	70.4	-49.0
864.875	-92.2	30.6	112.0	70.4	-41.6
1037.850	-99.7	27.6	122.5	70.4	-52.1
1210.825	-96.9	29.3	118.0	70.4	-47.6
1383.800	-98.5	43.7	105.2	70.4	-34.8
1556.775	-98.6	23.1	125.9	70.4	-55.5
1729.750	-99.8	34.0	116.2	70.4	-45.8

TABLE 4-6: TEST EQUIPMENT USED FOR TESTING (CONDUCTED SPURIOUS EMISSIONS)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	5/10/03
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	5/10/03
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	5/10/03
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585	07/31/03
901129	Par Electronics	118-174 (25W)	VHF Notch Filters	N/A	Not Required
901228	Pasternack	PE7031-30	300W dBi Attenuator	DC 1 GHz	Not Required
900928	Hewlett Packard	83752A	Synthesized Sweeper (0.01 to 20 GHz)	3610A00866	06/19/03
901140	Weinschel Corp.	47-10-34 DC-18GHz	Attenuator, 50W 10dB	BK6203	Not Required

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER


SIGNATURE

FEBRUARY 3, 2003
DATE OF TEST

5 FCC RULES AND REGULATIONS PART 2 §2.1053 (A) ; IC RSS-119 §6.3: FIELD STRENGTH OF SPURIOUS RADIATION

5.1 TEST PROCEDURE

ANSI/TIA/EIA-603-1992, section 2.2.12

Analog Modulation: The transmitter is terminated with a 50 Ω load and is modulated with a 2,500 Hz sine wave at an input level 16 dB greater than that required to produce 50% of the rated system deviation at 1000 Hz.

Digital Modulation: Modulated to its maximum extent using a pseudo random data sequence - 9600bps

The spurious emissions levels were measured and the device under test was replaced by a substitution antenna connected to a signal generator. This signal generator level was then corrected by subtracting the cable loss from the substitution antenna to the signal generator and the gain of the antenna was further corrected to a half wave dipole.

5.2 TEST DATA

5.2.1 CFR 47 PART 90.210 REQUIREMENTS

The worst-case emissions test data are shown. The magnitude of emissions attenuated more than 20 dB below the FCC limit need not be recorded.

TABLE 5-1: FIELD STRENGTH OF SPURIOUS RADIATION – MID CHANNEL (152.025 MHZ)

(152.025 MHz) 12.5k channel spacing; Conducted power = 110W; Limit (50+10LogP)= -20 dBm or 70.4 dBc (Mask D)

Frequency (MHz)	S/G level (dBm)	Cable Loss* (dB)	Difference in gain (ref. To 1/2 wave dipole)	Emission level (dBc)	Margin (dB)
304.050	-71.4	0.2	-0.7	122.3	-51.9
456.075	-65.1	0.3	-0.6	116.0	-45.6
608.100	-63.6	0.3	-1.2	115.1	-44.7
760.125	-66.0	0.4	-1.2	117.6	-47.2
912.150	-64.1	0.4	-1.1	115.6	-45.2
1064.175	-57.3	0.4	0.4	107.3	-36.9
1216.200	-57.8	0.4	1.8	106.4	-36.0
1368.225	-58.1	0.5	3.3	105.3	-34.9
1520.250	-56.4	0.5	4.7	102.3	-31.9

*This insertion loss corresponds to the cable connecting the RF Signal Generator to the 1/2 wave dipole antenna.

TABLE 5-2: TEST EQUIPMENT USED FOR TESTING (FIELD STRENGTH OF SPURIOUS RADIATION)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz - 2 GHz)	2648	6/17/03
900905	Rhein Tech Labs	PR-1040	Amplifier	900905	N/A
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	5/10/03
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	5/10/03
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	5/10/03
900917	Hewlett Packard	8648C	Synthesized. Signal Generator (9 KHz to 3200 MHz)	3537A01741	04/19/03
900928	Hewlett Packard	83752A	Synthesized Sweeper (0.01 to 20 GHz)	3610A00866	06/19/03
900154	Compliance Design Inc.	Roberts Dipole	Adjustable Elements Dipole Antenna (30-1000 MHz)	N/A	9/16/03

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER


SIGNATURE

FEBRUARY 3, 2003
DATE OF TEST

6 FCC RULES AND REGULATIONS PART 2 §2.1049 (C) (1) ; IC RSS-119 §6.4: OCCUPIED BANDWIDTH

OCCUPIED BANDWIDTH - COMPLIANCE WITH THE EMISSION MASKS

6.1 TEST PROCEDURE

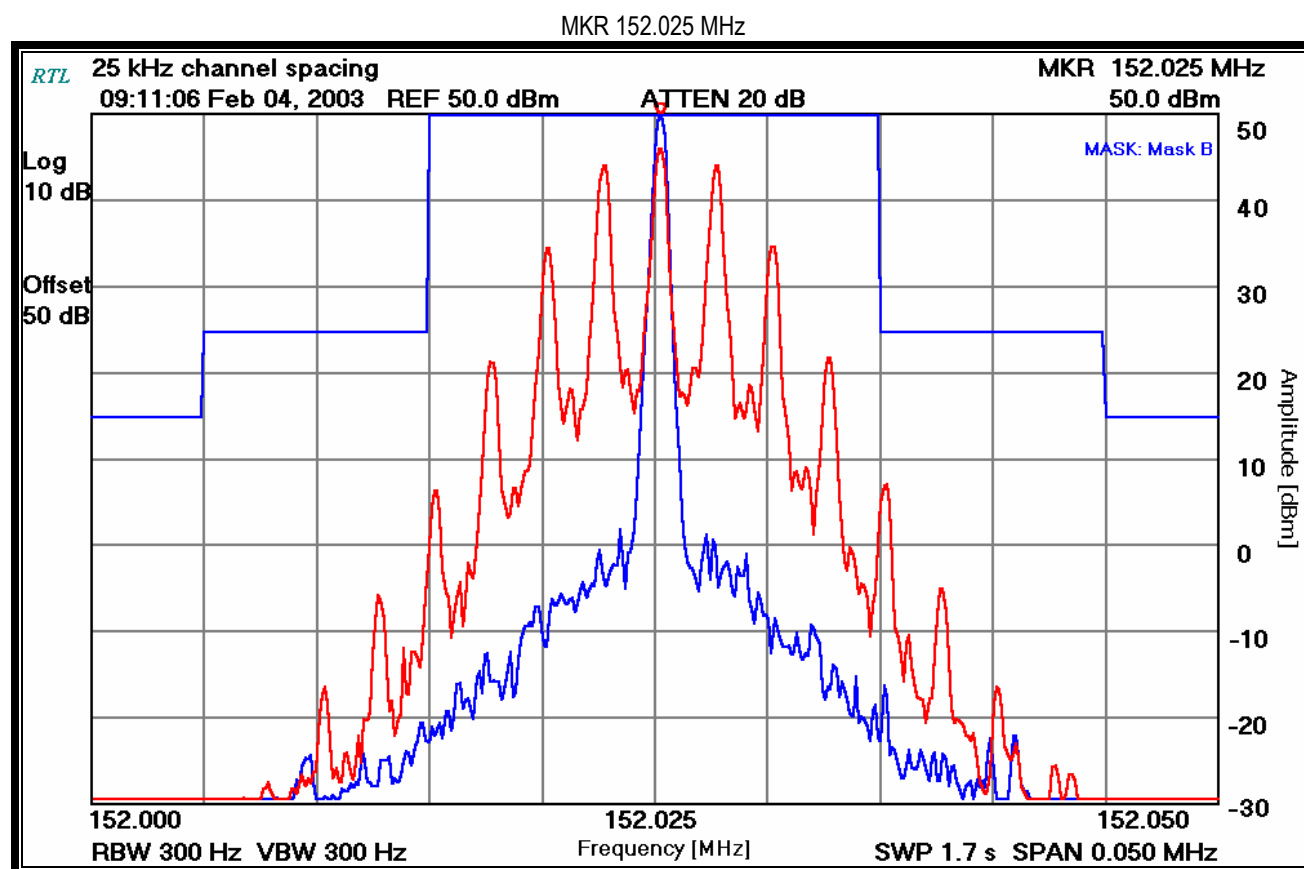
ANSI/TIA/EIA-603-1992, section 2.2.11 and TIA/EIA-102.CAAA-1999 section 2.2.5

Device with audio modulation: Transmitter is modulated with a 2500 Hz sine wave at an input level of 16 dB greater than that required to produce 50% of rated system deviation at 1000 Hz.

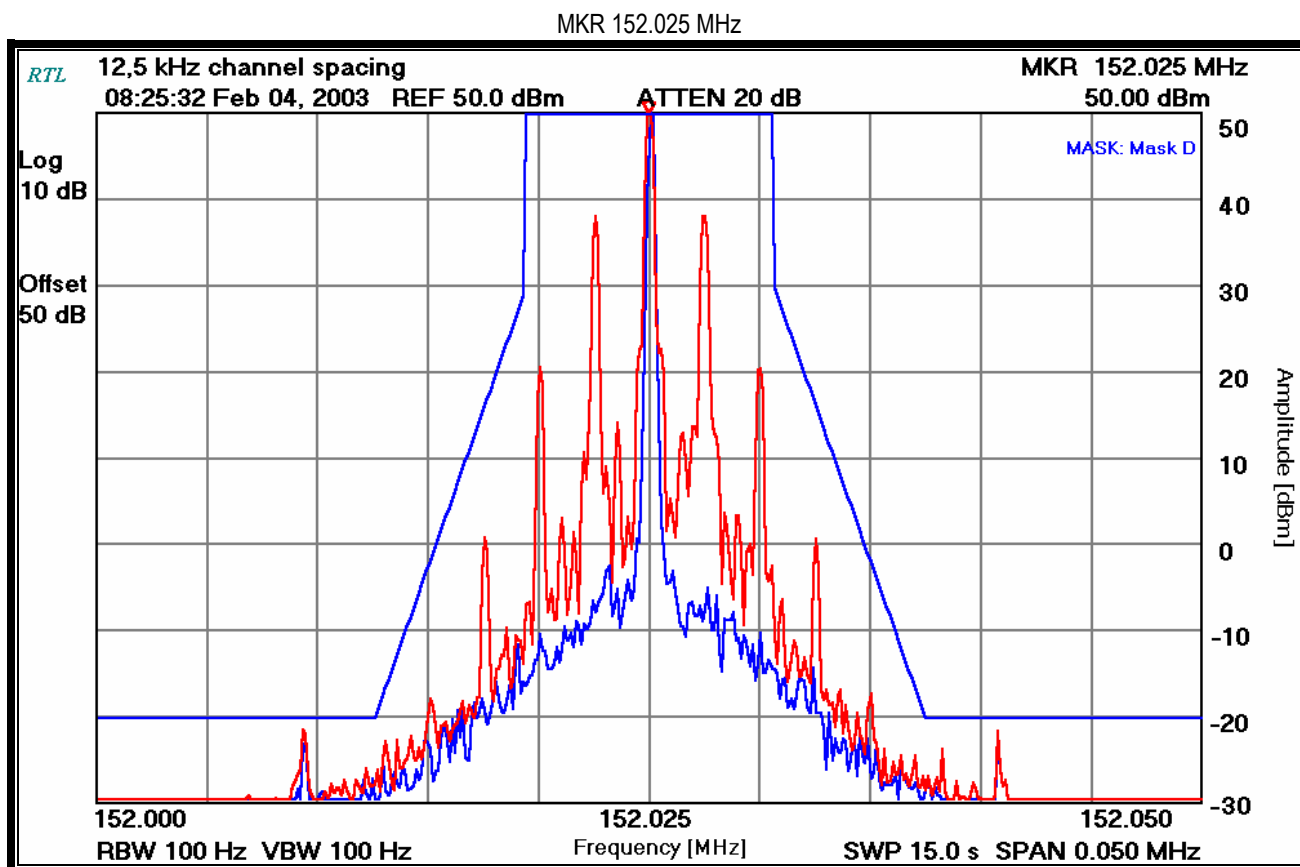
Device with digital modulation: Modulated to its maximum extent using a pseudo random data sequence - 9600bps

6.2 TEST DATA

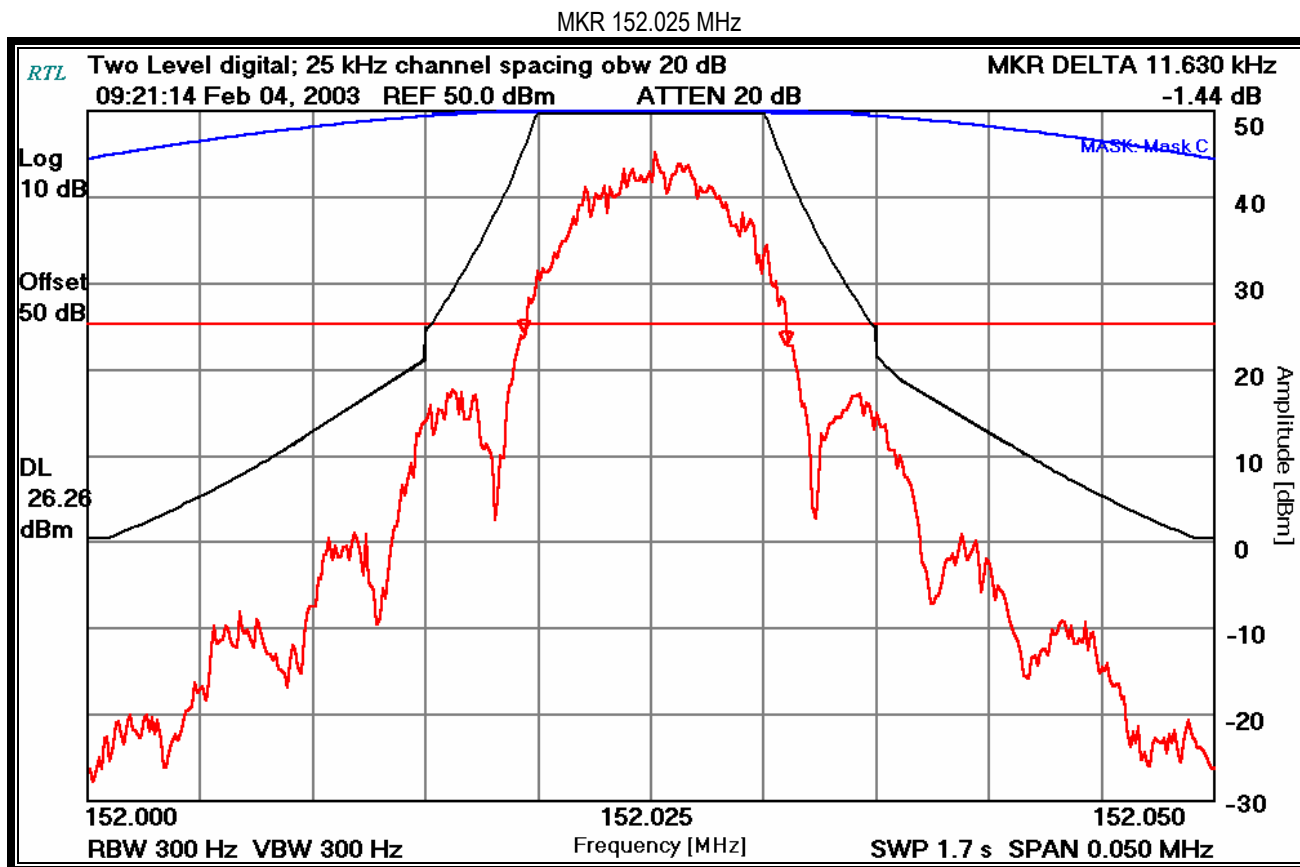
PLOT 6-1: OCCUPIED BANDWIDTH {25 KHZ CHANNEL BANDWIDTH; MASK B; (AUDIO MODULATION: 2500 HZ)}



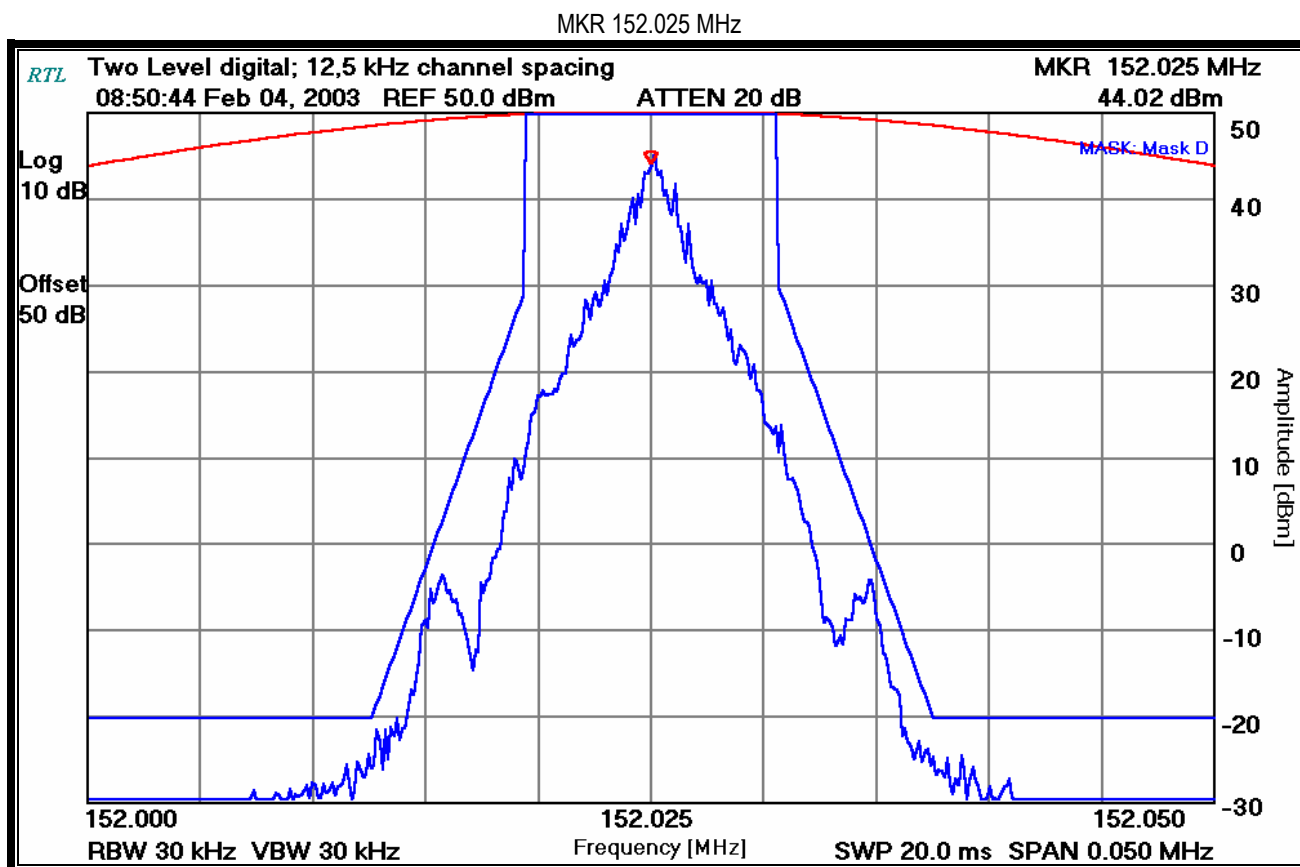
PLOT 6-2: OCCUPIED BANDWIDTH {12.5 KHZ CH. BANDWIDTH; MASK D; (AUDIO MODULATION: 2500 HZ)}



PLOT 6-3: OCCUPIED BANDWIDTH {25 KHZ CHANNEL BANDWIDTH; MASK C; (2 LEVEL DIGITAL MODULATION)}



PLOT 6-4: OCCUPIED BANDWIDTH {12.5 KHZ CHANNEL SPACING; MASK D; (2 LEVEL DIGITAL MODULATION)}



PLOT 6-5: OCCUPIED BANDWIDTH; MASK D (C4FM DIGITAL MODULATION)

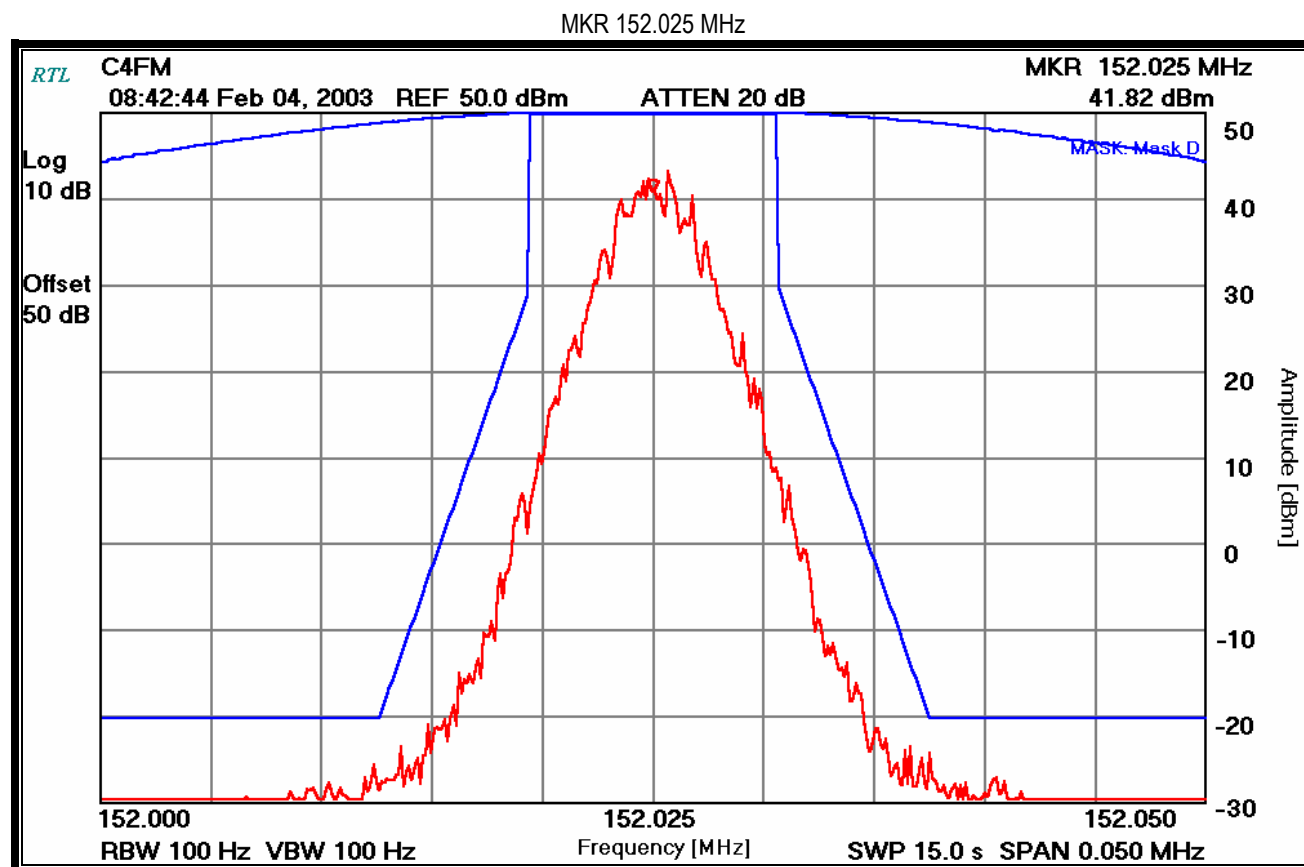


TABLE 6-1: TEST EQUIPMENT USED FOR TESTING (OCCUPIED BANDWIDTH)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901215	Hewlett Packard	8596EM (9kHz-12.8GHz)	EMC Analyzer	3826A00144	8/23/03
901228	Pasternack	PE7031-30	300W 30dB Attenuator	DC 1 GHz	Not Required
901139	Weinschel Corp.	48-20-34 DC-18GHz	Attenuator, 100W 20dB	BK5859	Not Required
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585	07/31/03
901055	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2545A04102	06/14/03

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER


SIGNATURE

FEBRUARY 4, 2003
DATE OF TEST

7 FCC RULES AND REGULATION PART 2 §2.1055; IC RSS-119 §7.0: FREQUENCY STABILITY

7.1 TEST PROCEDURE

ANSI/TIA/EIA-603-1992, section 2.2.2

The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.

The EUT was evaluated over the temperature range -30°C to +50°C.

The temperature was initially set to -30°C and a 2-hour period was observed for stabilization of the EUT. The frequency stability was measured within one minute after application of primary power to the transmitter. The temperature was raised at intervals of 10 degrees centigrade through the range. A ½ an hour period was observed to stabilize the EUT at each measurement step and the frequency stability was measured within one minute after application of primary power to the transmitter. Additionally, the power supply voltage of the EUT was varied from 85% to 115% of the nominal voltage.

The worst-case test data are shown.

7.2 TEST DATA

7.2.1 FREQUENCY STABILITY/TEMPERATURE VARIATION

Limit is 2.5 ppm for device with a 12.5 kHz channel bandwidth. Worst case deviation was found to be 1.07 ppm at -30°C.

PLOT 7-1: TEMPERATURE FREQUENCY STABILITY

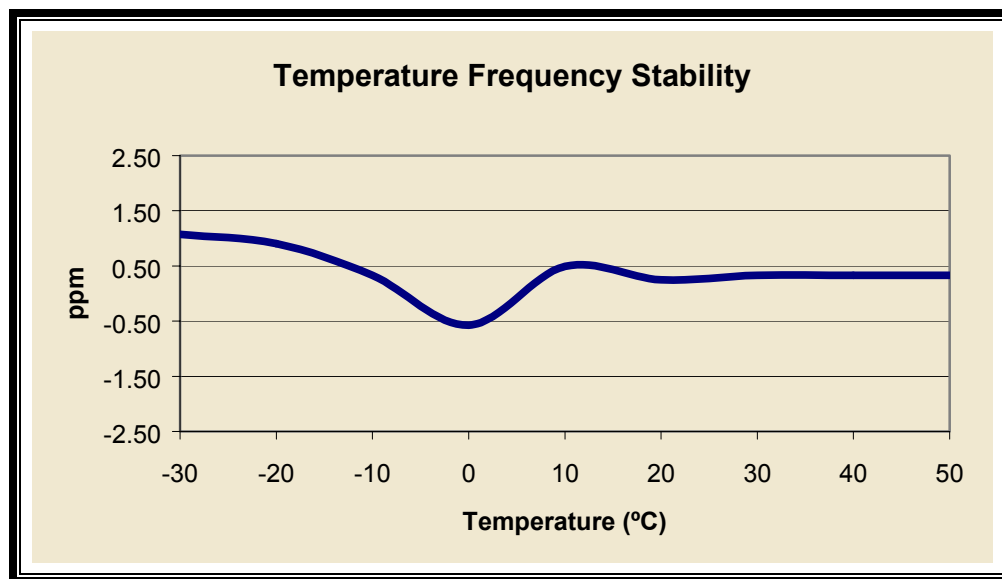


TABLE 7-1: FREQUENCY TEMPERATURE STABILITY; 152.025 MHZ

Temperature (°C)	Measured Frequency (MHz)	ppm
-30	152.025163	1.07
-20	152.025138	0.91
-10	152.025050	0.33
0	152.024913	-0.57
10	152.025075	0.49
20	152.025038	0.25
30	152.025050	0.33
40	152.025050	0.33
50	152.025050	0.33

TABLE 7-2: TEST EQUIPMENT USED FOR TESTING (FREQUENCY STABILITY/TEMPERATURE)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900946	Tenney Engineering, Inc.	TH65	Temperature Chamber	11380	02/04/03
901215	Hewlett Packard	8596EM (9kHz-12.8GHz)	EMC Analyzer	3826A00144	8/23/03
901228	Pasternack	PE7031-30	300W 30 dB Attenuator	DC 1 GHz	Not Required

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER


SIGNATURE

FEBRUARY 5, 2003
DATE OF TEST

7.2.2 FREQUENCY STABILITY/VOLTAGE VARIATION

Worst case deviation was found to be at 102VAC and 138VAC.

PLOT 7-2: VOLTAGE FREQUENCY STABILITY

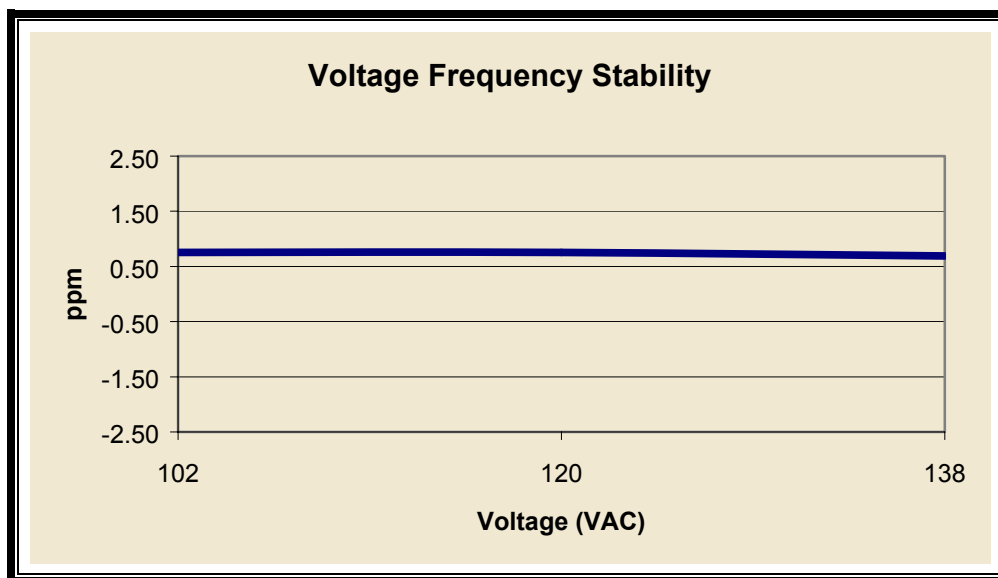


TABLE 7-3: FREQUENCY STABILITY/VOLTAGE VARIATION

Channel 2, 152.025 MHz was measured and found to be as follows:

Voltage (VAC)	Measured Frequency (MHz)	ppm
102	152.025115	0.76
120	152.025115	0.76
138	152.025105	0.69

TABLE 7-4: TEST EQUIPMENT USED FOR TESTING (FREQUENCY STABILITY/VOLTAGE)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901215	Hewlett Packard	8596EM (9kHz-12.8GHz)	EMC Analyzer	3826A00144	8/23/03
901228	Pasternack	PE7031-30	300W 30 dB Attenuator	DC 1 GHz	Not Required
901014	Kikusui	PCR4000L	Power Supply	DB001921	Not Required

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER


SIGNATURE

FEBRUARY 5, 2003
DATE OF TEST

8 FCC PART 2 §2.1047 (A): MODULATION CHARACTERISTICS - AUDIO FREQUENCY RESPONSE

8.1 TEST PROCEDURE

ANSI/TIA/EIA-603-1992, section 2.2.6

The audio frequency response is the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic.

The input audio level at 1000 Hz is set to produce 20% of the rated system deviation. This point is shown as the 0 dB reference level, noted DEVref.

The audio signal generator was varied from 100Hz to 5kHz with the input level held constant.

The deviation in kHz was recorded using a modulation analyzer as DEVfreq.

The response in dB relative to 1 kHz was calculated as follows:

Audio Frequency Response = $20 \text{ LOG } (\text{DEVfreq}/\text{DEVref})$

8.2 TEST DATA

PLOT 8-1: MODULATION CHARACTERISTICS - AUDIO FREQUENCY RESPONSE

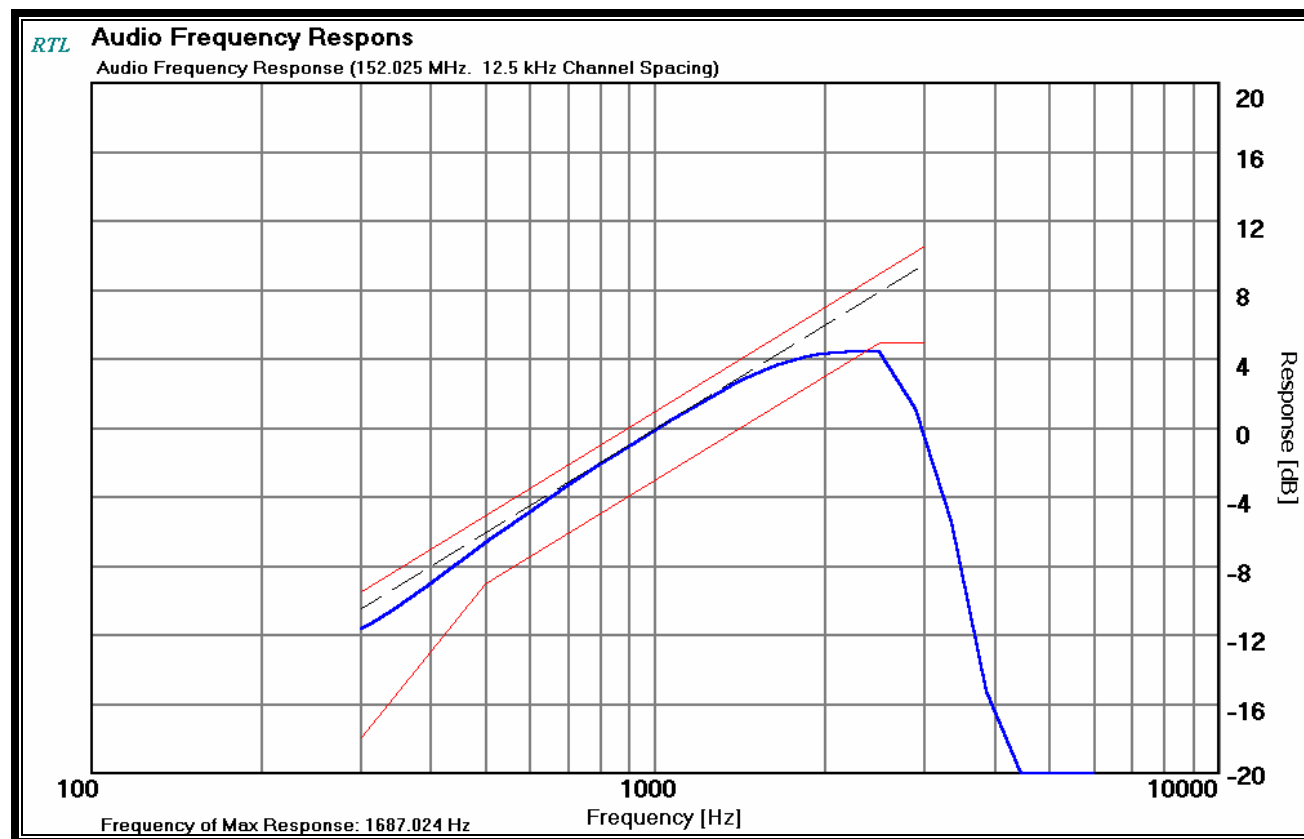


TABLE 8-1: TEST EQUIPMENT USED FOR TESTING (AUDIO FREQUENCY RESPONSE)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585	07/31/03
901118	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2406A00178	06/04/03
901054	Hewlett Packard	3586B	Selective Level Meter	1928A01892	08/31/03
901139	Weinschel Corp.	48-20-34 DC-18GHz	Attenuator, 100W 20dB	BK5859	Not Required
901228	Pasternack	PE7031-30	300W 30 dB Attenuator	DC 1 GHz	Not Required

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER


SIGNATURE

FEBRUARY 4, 2003
DATE OF TEST

9 FCC PART 2 §2.1047 (A) ; IC RSS-119 §6.6: MODULATION CHARACTERISTICS – AUDIO LOW PASS FILTER

9.1 TEST PROCEDURE

ANSI/TIA/EIA-603-1992, 2.2.15. The Audio Low Pass Filter Response is the frequency response of the post limiter low pass filter circuit above 3000 Hz.

9.2 TEST DATA

PLOT 9-1: MODULATION CHARACTERISTICS – AUDIO LOW PASS FILTER RESPONSE

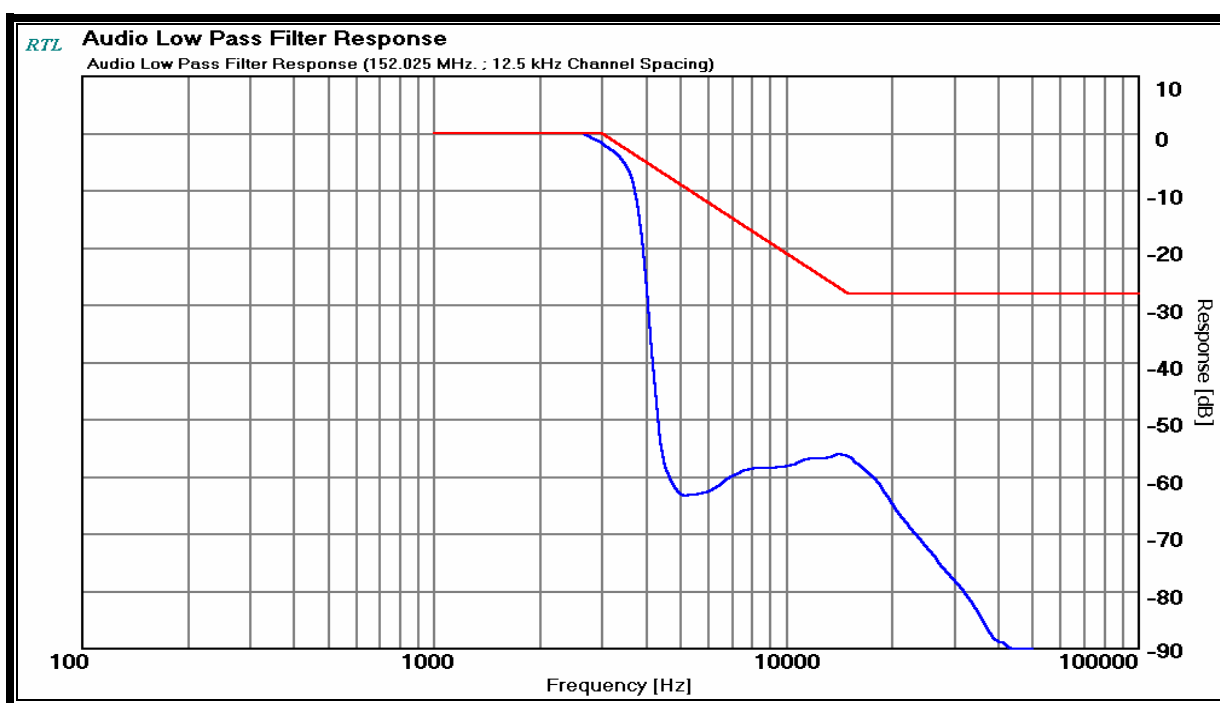


TABLE 9-1: TEST EQUIPMENT USED FOR TESTING (AUDIO LOW PASS FILTER RESPONSE)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585	07/31/03
901118	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2406A00178	06/04/03
901054	Hewlett Packard	3586B	Selective Level Meter	1928A01892	08/31/03
901139	Weinschel Corp.	48-20-34 DC-18GHz	Attenuator, 100W 20dB	BK5859	Not Required
901228	Pasternack	PE7031-30	300W 30 dB Attenuator	DC 1 GHz	Not Required

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER

FCC Certification Report
Revision: 3.00


SIGNATURE

FEBRUARY 4, 2003
DATE OF TEST

10 FCC RULES AND REGULATIONS PART 2 §2.1047 (B) ; IC RSS-119 §6.6: MODULATION CHARACTERISTICS - MODULATION LIMITING

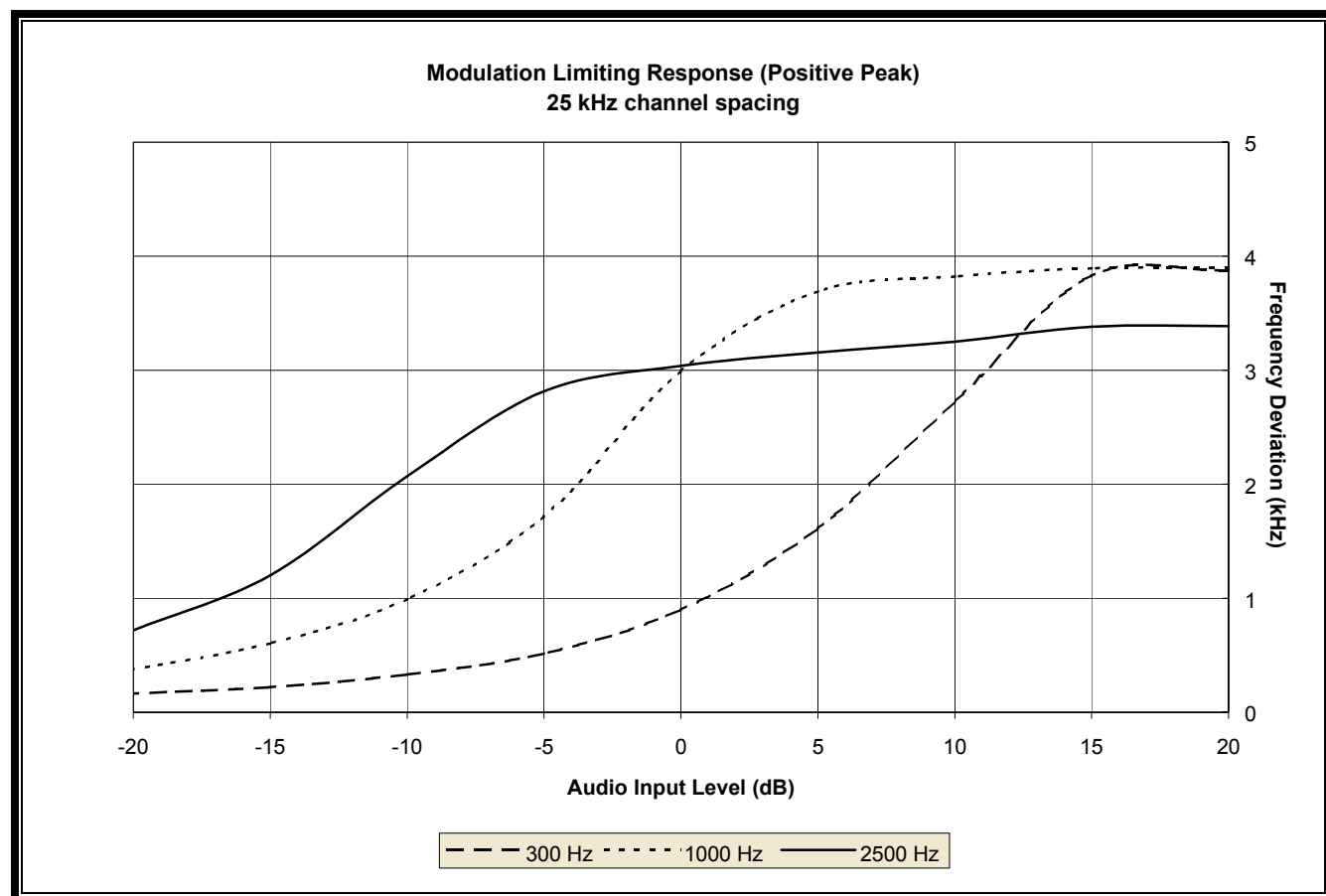
10.1 TEST PROCEDURE

ANSI/TIA/EIA-603-1992, section 2.2.3

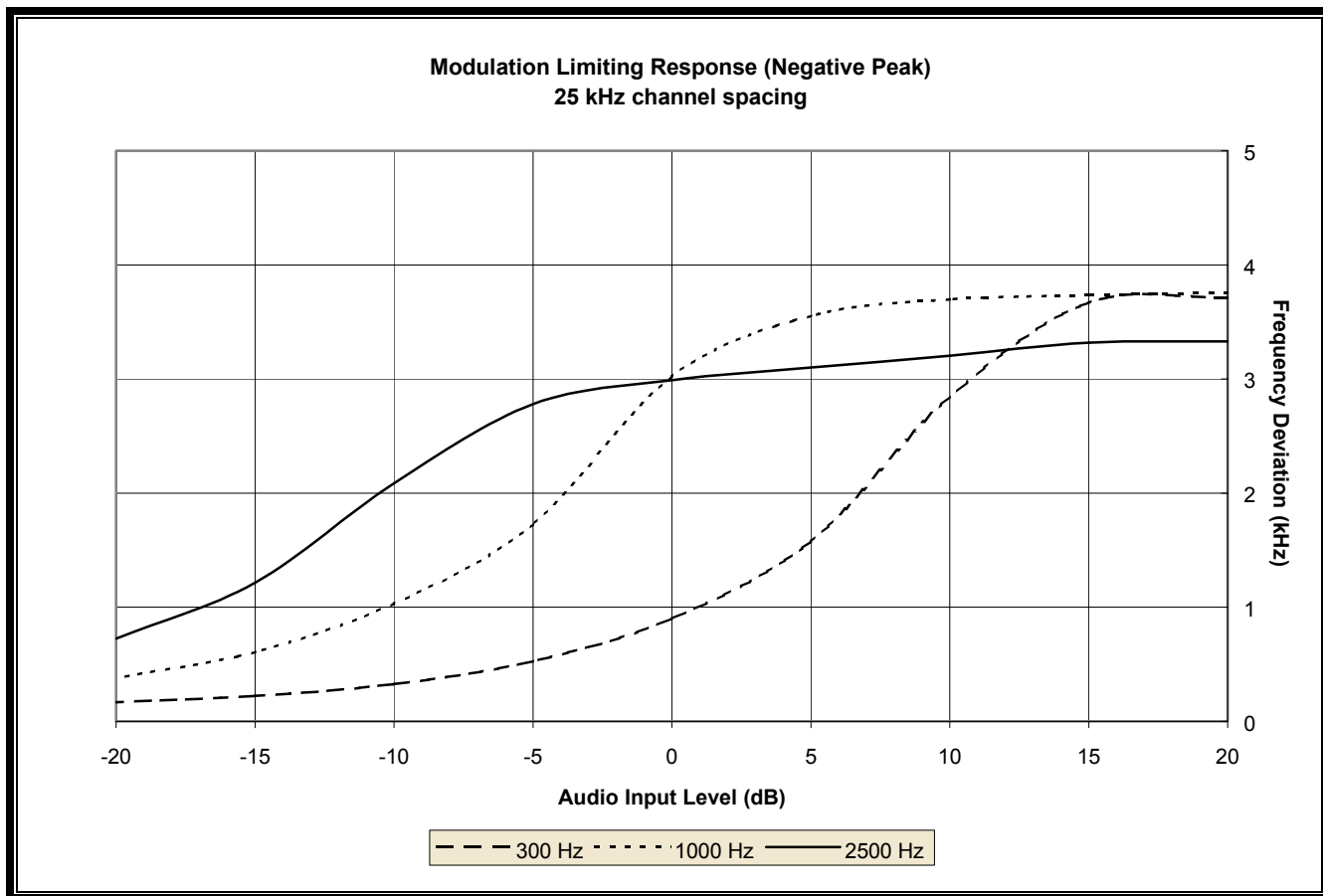
The transmitter is adjusted for full rated system deviation. The audio input level is adjusted for 60% of rated system deviation at 1000Hz. Using this level as a reference (0dB), the audio input level is varied from the reference to a level +20 dB above it, and -20 dB under it, for modulation frequencies of 300Hz, 1,000Hz, and 2,500Hz. The system deviation obtained as a function of the input level is recorded. Both Positive and Negative Peak deviations were recorded.

10.2 TEST DATA

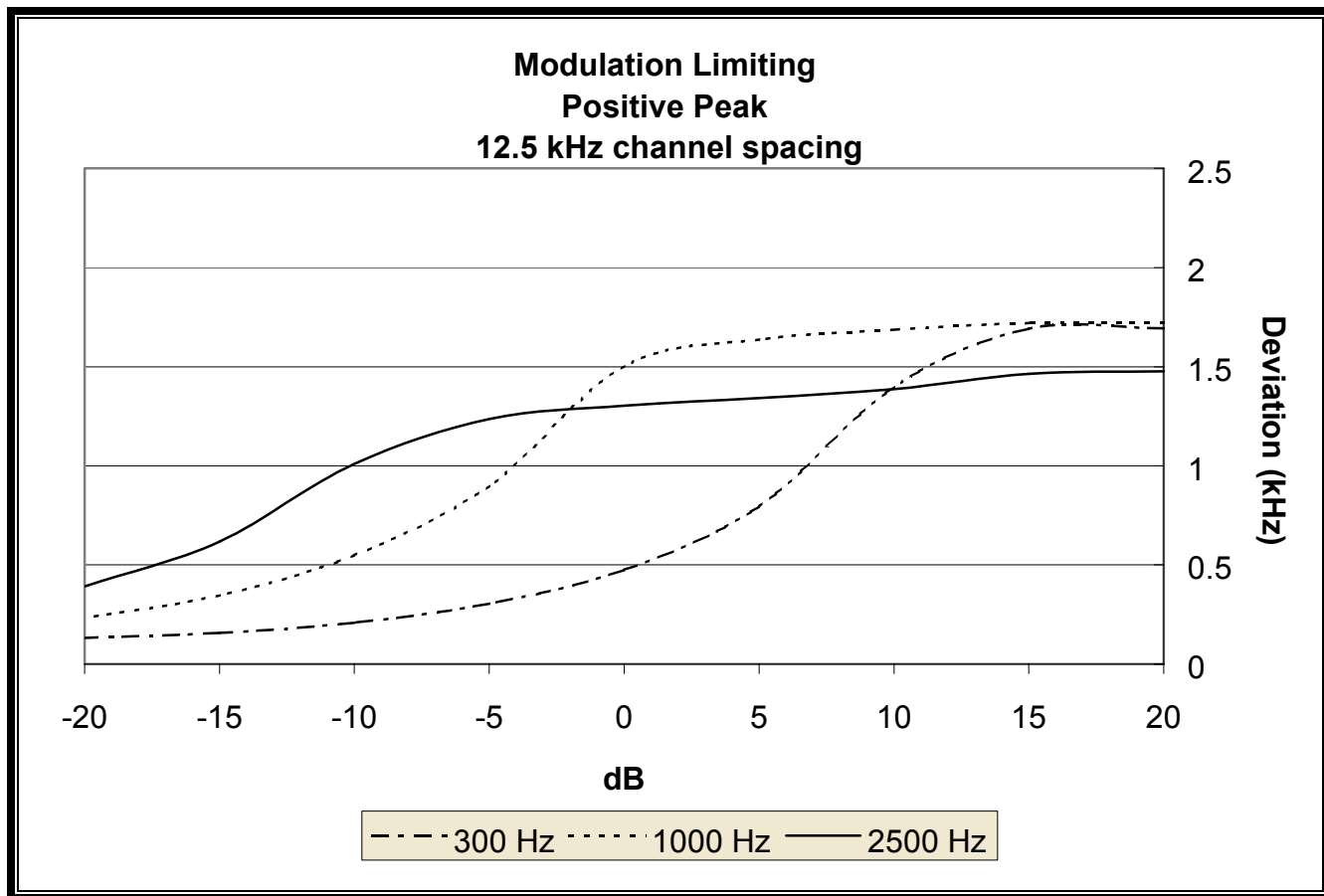
PLOT 10-1: MODULATION CHARACTERISTICS – MODULATION LIMITING: WIDE BAND POSITIVE PEAK



PLOT 10-2: MODULATION CHARACTERISTICS – MODULATION LIMITING: WIDE BAND NEGATIVE PEAK



PLOT 10-3: MODULATION CHARACTERISTICS – MODULATION LIMITING: NARROW BAND POSITIVE PEAK



PLOT 10-4: MODULATION CHARACTERISTICS – MODULATION LIMITING: NARROW BAND NEGATIVE PEAK

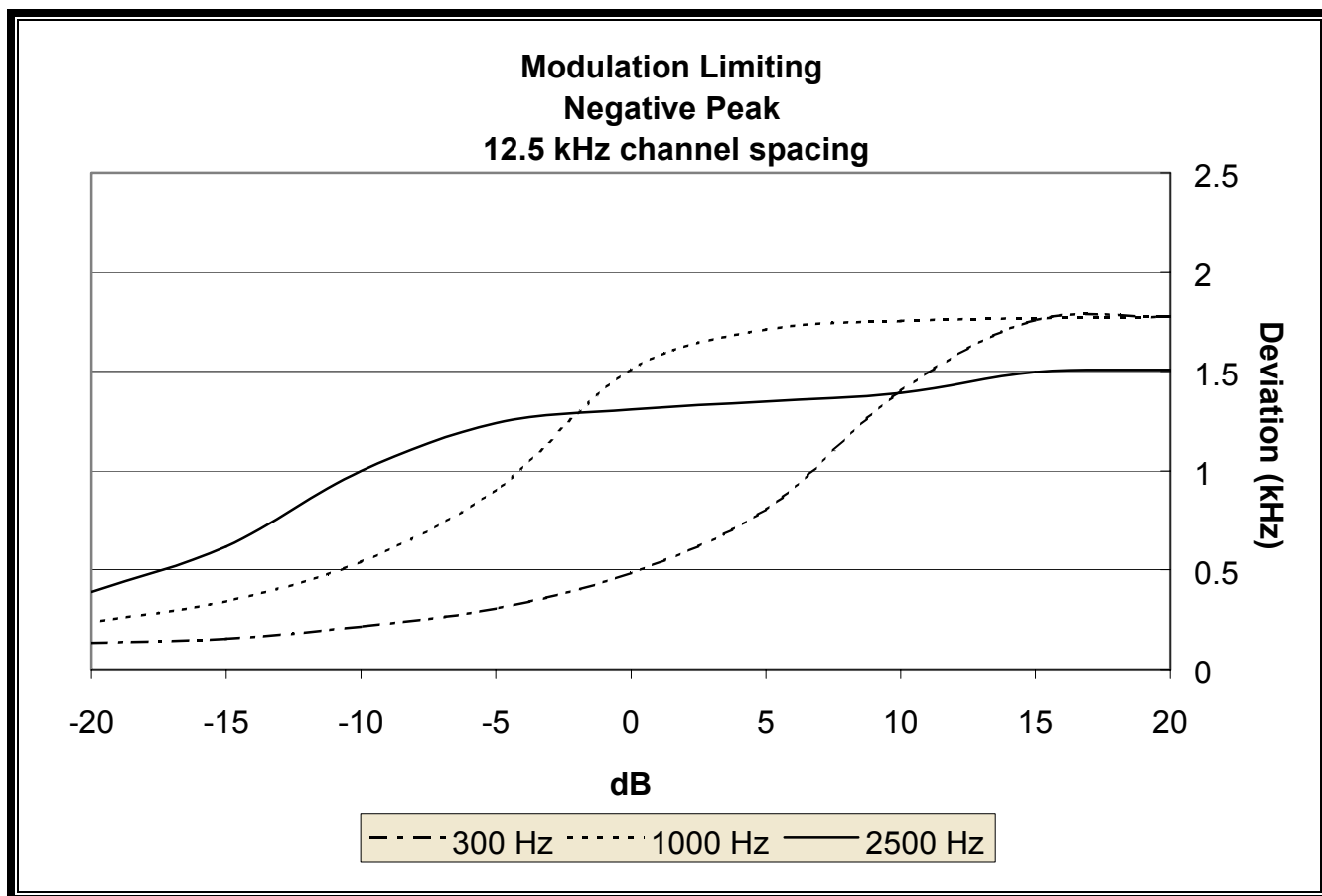


TABLE 10-1: TEST EQUIPMENT USED FOR TESTING (MODULATION LIMITING)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585	07/31/03
901118	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2406A00178	06/04/03
901139	Weinschel Corp.	48-20-34 DC-18GHz	Attenuator, 100W 20dB	BK5859	Not Required
901228	Pasternack	PE7031-30	300W 30 dB Attenuator	DC 1 GHz	Not Required

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER


SIGNATURE

FEBRUARY 4, 2003
DATE OF TEST

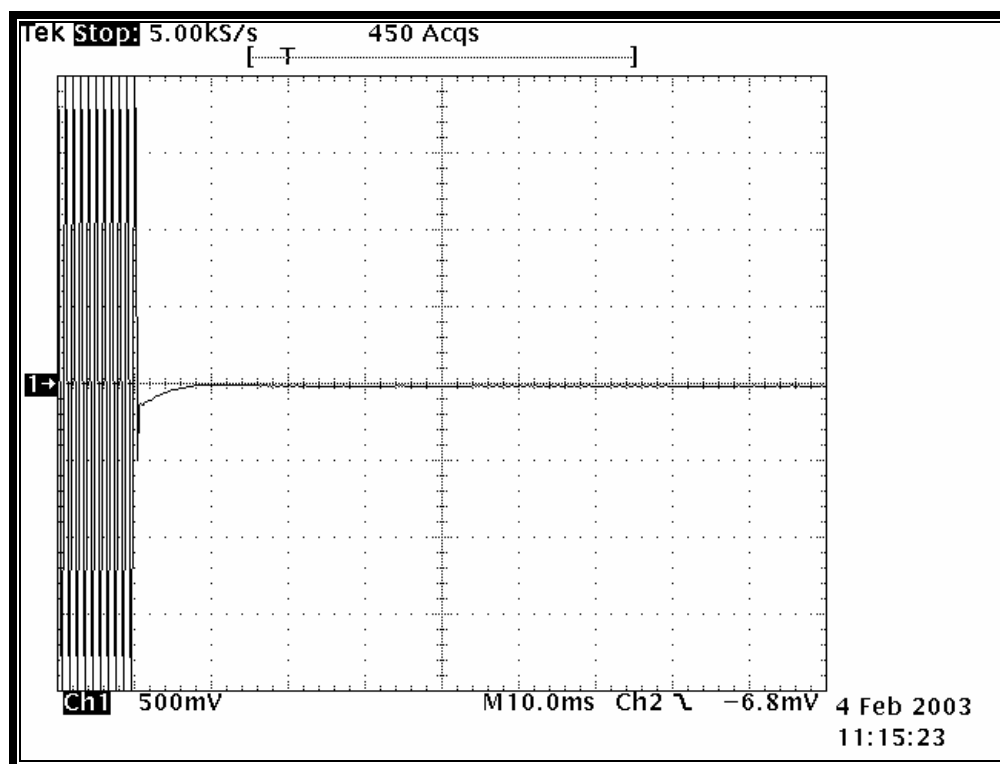
11 FCC RULES AND REGULATIONS PART 90 §90.214; IC RSS-119 §6.5: TRANSIENT FREQUENCY BEHAVIOR

11.1 TEST PROCEDURE

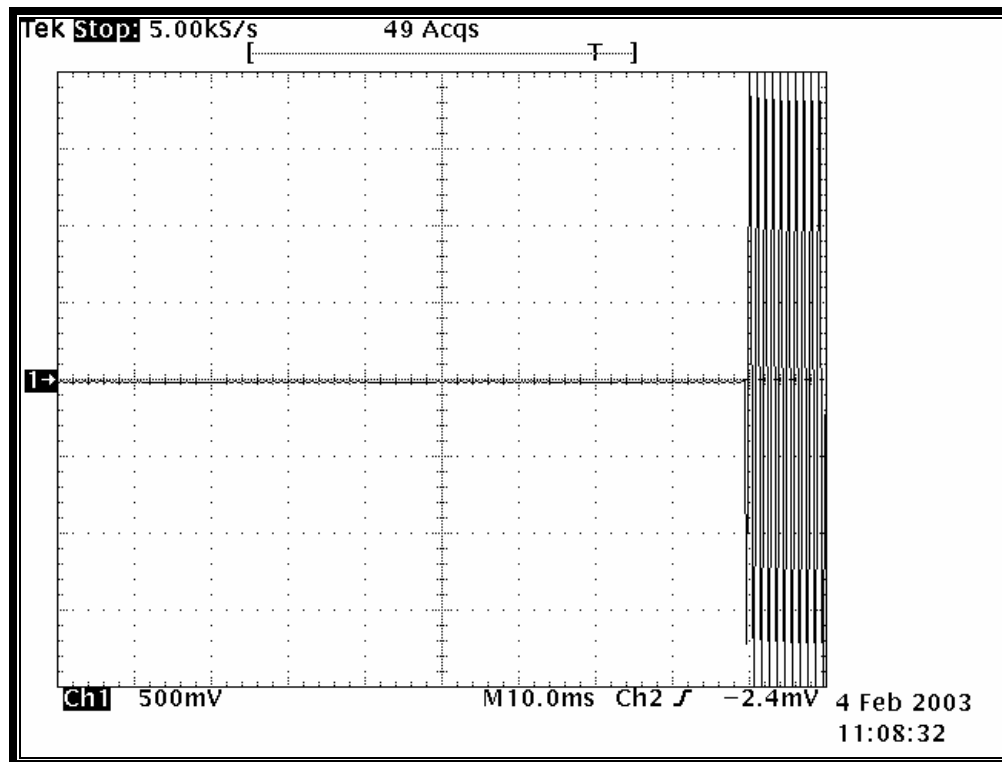
ANSI/TIA/EIA-603-1992, section 2.2.3

11.2 TEST DATA

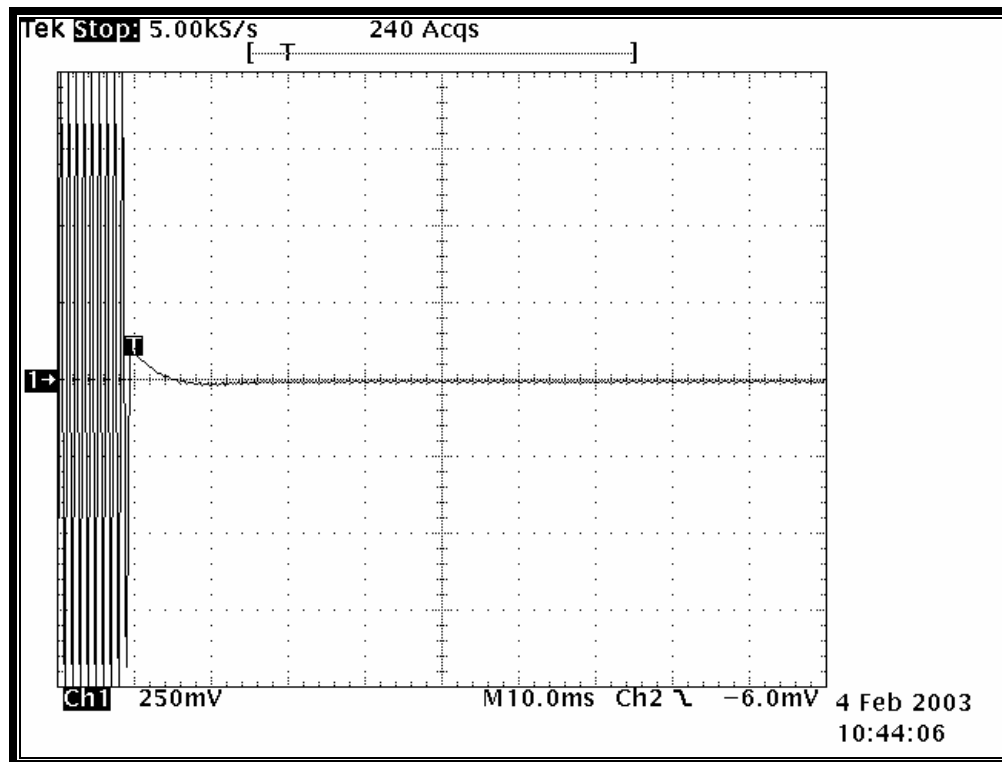
PLOT 11-1: TRANSIENT FREQUENCY BEHAVIOR – 152.025 MHz; WIDE BAND; CARRIER ON TIME



PLOT 11-2: TRANSIENT FREQUENCY BEHAVIOR – 15.2025 MHz; WIDE BAND; CARRIER OFF TIME



PLOT 11-3: TRANSIENT FREQUENCY BEHAVIOR – 152.025 MHz; NARROW BAND; CARRIER ON TIME



PLOT 11-4: TRANSIENT FREQUENCY BEHAVIOR – 152.025 MHZ; NARROW BAND; CARRIER OFF TIME

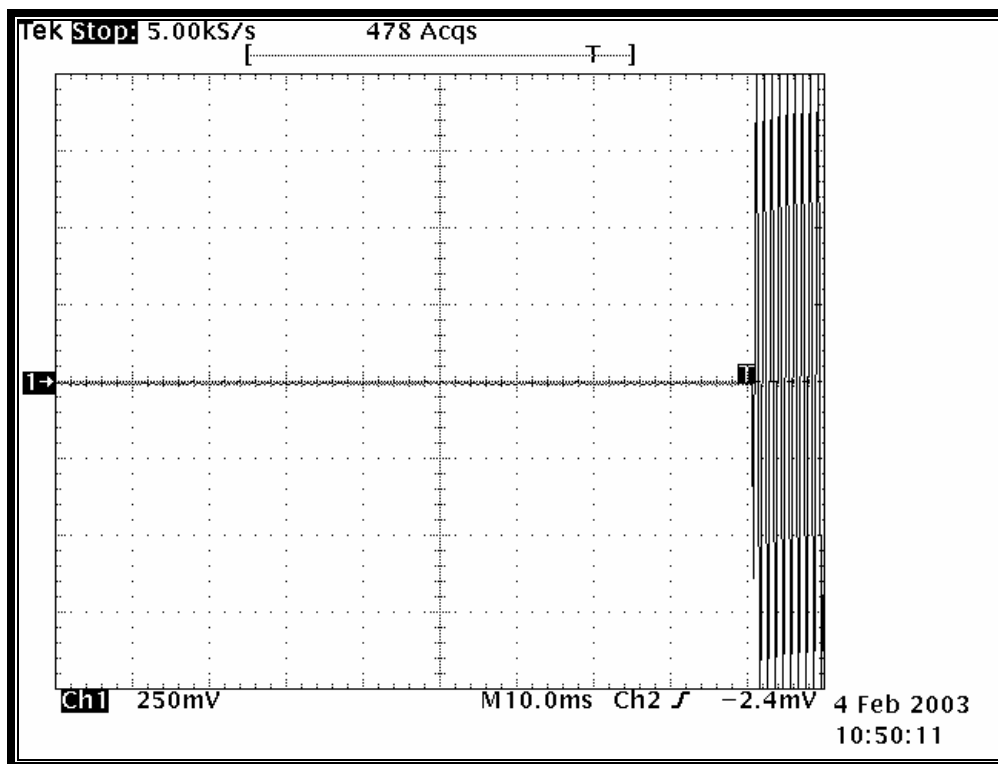


TABLE 11-1: TEST EQUIPMENT USED FOR TESTING (TRANSIENT FREQUENCY BEHAVIOR)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900917	Hewlett Packard	8648C	Signal Generator	3537A01741	04/19/03
901118	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2406A00178	06/14/03
900561	Tektronix	TDS540B	Oscilloscope	B020129	02/8/03
900352	Werlatone	C1795	Directional Coupler	4989	N/A
901140	Weinschel Corp.	47-10-34 DC-18GHz	Attenuator, 50W 10dB	BK6203	Not Required
901228	Pasternack	PE7031-30	300W 30 dB Attenuator	DC 1 GHz	Not Required
901138	Weinschel Corp.	48-40-34 DC-18GHz	Attenuator, 100W 40dB	BK5883	Not Required
901000	Pasternack	PE 2003	Power divider	N/A	Not Required

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER

Daniel W. Baltzell
SIGNATURE

FEBRUARY 4, 2003
DATE OF TEST

12 FCC RULES AND REGULATIONS PART 2 §2.202: NECESSARY BANDWIDTH AND EMISSION BANDWIDTH

Type of Emission: F3E, F1D, F1E

Necessary Bandwidth and Emission Bandwidth:

Voice – 12.5kHz channel separation:

Calculation:

Max modulation(M) in kHz: 3

Max deviation (D) in kHz: 2.5

Constant factor (K): 1 (assumed)

$B_n = 2 \times M + 2 \times D \times K = 11 \text{ kHz}$

Emission designator: 11K0F3E

Voice – 25kHz channel separation:

Calculation:

Max modulation(M) in kHz: 3

Max deviation (D) in kHz: 5

Constant factor (K): 1 (assumed)

$B_n = 2 \times M + 2 \times D \times K = 16 \text{ kHz}$

Emission designator: 16K0F3E

Digital voice and data - 25kHz channel separation:

Calculation:

Max modulation(B) in kHz: 9.6

Max deviation (D) in kHz: 3.0

Constant factor (K): 1 (assumed)

$B_n = 2(B)/2 + 2DK = 15.6 \text{ KHz}$

Emission designator: 15K6F1D, 15K6F1E

Measurement: 99.75% Occupied Bandwidth

$B_n = 12.8 \text{ KHz}$

Emission designator: 12K8F1D, 12K8F1E

C4FM – 9600 bps:

Measurement: 99.75% Occupied Bandwidth

$B_n = 9.25 \text{ KHz}$

Emission designator: 9K25F1D, 9K25F1E

Digital voice and data – 12.5kHz channel separation:

Calculation:

Max modulation(B) in kHz: 4.8

Max deviation (D) in kHz: 1.5

Constant factor (K) : 1(assumed)

$B_n = 2(B)/2 + 2DK = 7.8 \text{ KHz}$

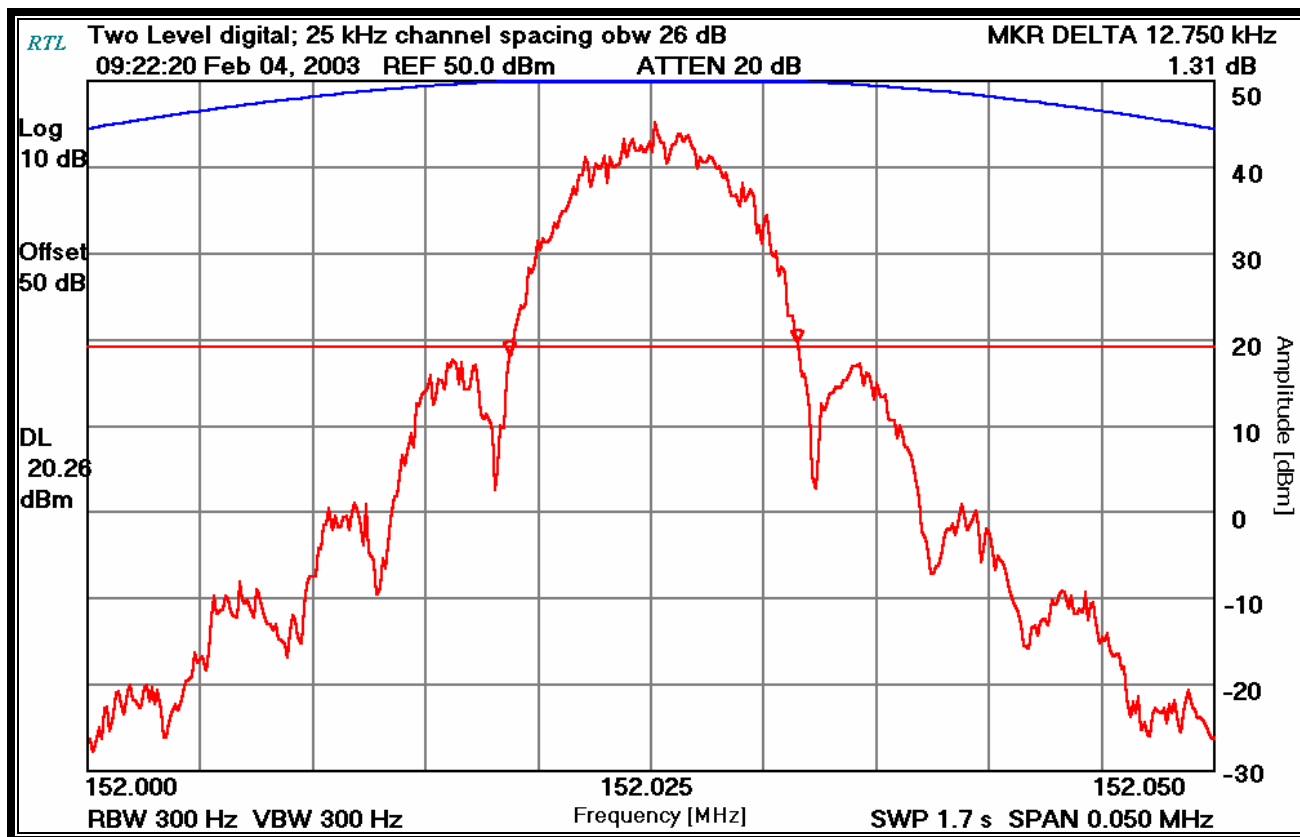
Emission designator: 7K8F1D, 7K8F1E

Measurement: 99.75% Occupied Bandwidth

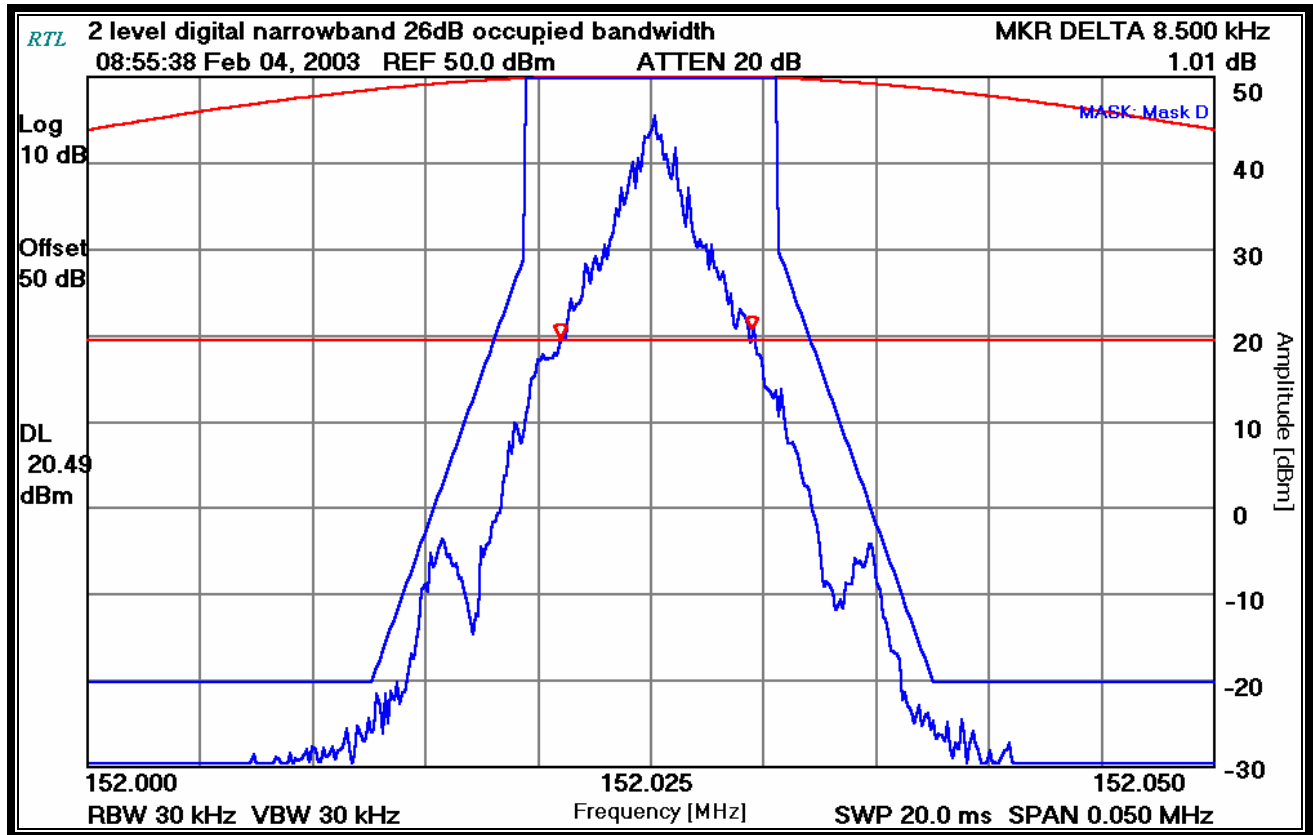
$B_n = 8.5 \text{ KHz}$

Emission designator: 8K5F1D, 8K5F1E

PLOT 12-1: 26 DB EMISSION BANDWIDTH; WIDEBAND 2 LEVEL DIGITAL MODULATION; 12.75 KHZ



PLOT 12-2: 26 DB EMISSION BANDWIDTH; NARROWBAND 2 LEVEL DIGITAL MODULATION; 8.5 KHZ



PLOT 12-3: 26 DB EMISSION BANDWIDTH; C4FM DIGITAL MODULATION; 9.25 KHZ

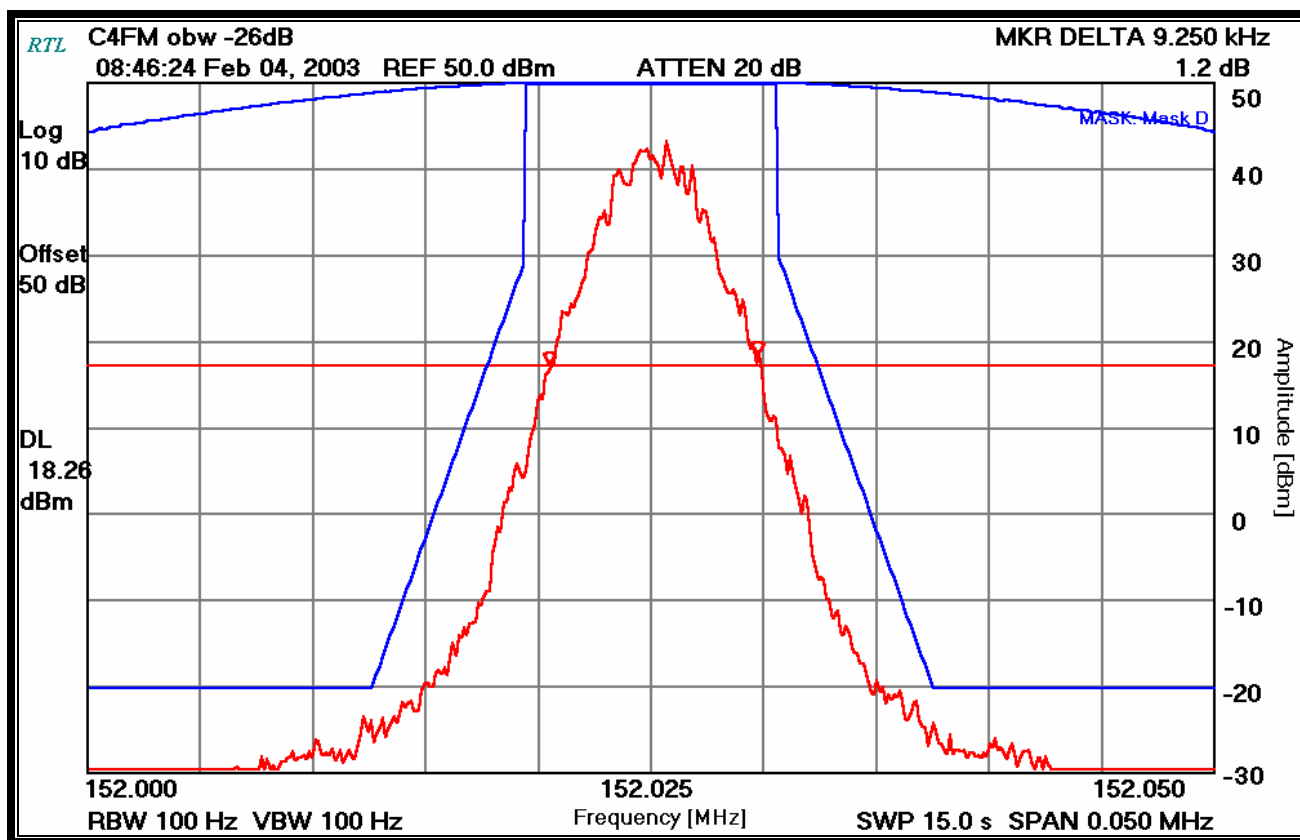


TABLE 12-1: TEST EQUIPMENT USED FOR NECESSARY AND EMISSION BANDWIDTH MEASUREMENTS

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901215	Hewlett Packard	8596EM (9kHz-12.8GHz)	EMC Analyzer	3826A00144	8/23/03
901139	Weinschel Corp.	48-20-34 DC-18GHz	Attenuator, 100W 20dB	BK5859	Not Required
901228	Pasternack	PE7031-30	300W 30 dB Attenuator	DC 1 GHz	Not Required

TEST PERSONNEL:

DANIEL BALTZELL
TEST ENGINEER


Signature

FEBRUARY 4, 2003
Date Of Test

13 CONCLUSION

The data in this measurement report demonstrates that the **M/A COM, Inc. MASTRIII VHF Basestation with Sitepro; FCC ID: OWDTR-0017-E**, complies with all the requirements of FCC Part 90 and Industry Canada RSS-119.