MEASUREMENT/TECHNICAL REPORT

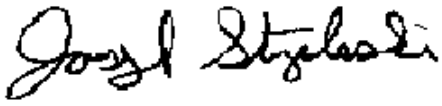
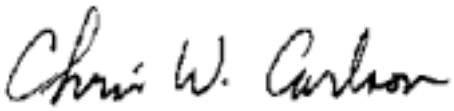
Safety 1st, Inc. Model 49236

FCC ID: MNJ49236T

APPLICATION FOR CERTIFICATION

RF Emission Measurements Performed For Determination of Compliance with the US Code of Federal Regulations Title 47, Chapter I, FCC Part 15 Subpart B As Required for Certification for Unintentional Radiators

Radiometrics Midwest Corporation Test Document RP-3974T
Issue Date: April 12, 1999
This report concerns: Original grant
Equipment type: Low Power Transmitter
Transition Rules per 15.37 are not requested.

Tests Performed For	*Test Facility*
Safety 1st, Inc. 210 Boylston St. Chestnut Hill, Massachusetts 02167	**Radiometrics Midwest Corporation** 12 East Devonwood Romeoville, IL 60446 Phone: (815) 293-0772 FAX: (815) 293-0820 radiomet@ix.netcom.com
Test Report Written By	*Test Report Approved By*
 Joseph Strzelecki Senior EMC Engineer NARTE EMC-000877-NE	 Chris W. Carlson Director of Engineering NARTE EMC-000921-NE

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1.0 General Information

1.1 Product Description

The Model 49236T (referred to as the EUT in this report) is a Low Power VHF Transceiver. The EUT is manufactured by Safety 1st, Inc.

1.2 Related Submittals

The associated transceiver is operated under part 15. It is subject to the FCC requirements pursuant to the Certification equipment authorization under Part 15 Subpart B, and will be submitted as FCC ID: MNJ49236R.

1.3 Tested System Details

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system which have grants, are:

Model Number Serial Number	FCC ID	Manufacturer & Description	Cable Descriptions
M/N: 49236 (EUT)	MNJ49236T	Safety 1st, Inc. Low Power VHF Transmitter	Power (1.8m, US) from transformer to EUT

Note: SH = Shielded; US = Unshielded; m = Cable Length in Meters,

1.4 Test Methodology

The test procedures used are in accordance with the ANSI document C63.4-1992, (July 17, 1992) "Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The specific procedures are described herein. Radiated testing was performed at an antenna to EUT distance of 3 meters. The antenna was raised and lowered from 1 to 4 meters.

1.5 Test Facility

The open area test site used to collect the radiated data is located on 8625 Helmar Road in Newark, Illinois. The open field test site has a metal ground screen. Details of the site characteristics are on file with the FCC. Conducted emission measurements and preliminary radiated emission scans were performed in shielded enclosure “A” at Radiometrics' Romeoville, Illinois EMI test lab. These sites have been fully described in a report and accepted by the FCC in a letter dated October 1, 1996 (31040/SIT 1300F2).

Conducted emission measurements were performed using a Line Impedance Stabilization Network (LISN) as the pick-up device. This device is constructed in accordance with the circuit diagram provided in Figure 3 of ANSI document C63.4-1992.

1.6 Test Equipment

Radiated emission measurements were performed with linearly polarized broadband antennas. The results obtained with these antennas can be correlated with results obtained with a tuned dipole antenna. When a radiated emission is detected approaching the specification limit, the measurement of the emission is repeated using a tuned dipole antenna with a Roberts Balun.

The radiated emission measurements were performed with a spectrum analyzer. The bandwidths of the spectrum analyzers are adjusted to the correct bandwidths as specified by the FCC Rules. The bandwidth used from 450 kHz to 30 MHz is 10 kHz and the bandwidth from 30 MHz to 1000 MHz is 100 or 120 kHz. In order to increase the sensitivity of the spectrum analyzer, a preamplifier was used. The preamplifiers used had sufficient dynamic range that ensured that an overload condition was not present during the tests.

2.0 System Test Configuration

2.1 Test System and Justification

Wiring was consistent with manufacturer's recommendations. The system was configured for testing in a typical fashion (as a customer would normally use it). Power was supplied at 115 VAC, 60 Hz single-phase to its external power supply.

2.2 EUT Test Configuration

The EUT was tested as a stand-alone device. The EUT was in continuous transmit mode for testing.

2.3 Special Accessories

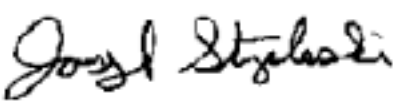
No special accessories were used during the tests in order to achieve compliance.

2.4 Equipment Modifications

The following modifications were made to the EUT by Radiometrics Midwest Corp. prior to the testing in order to achieve compliance with limits.

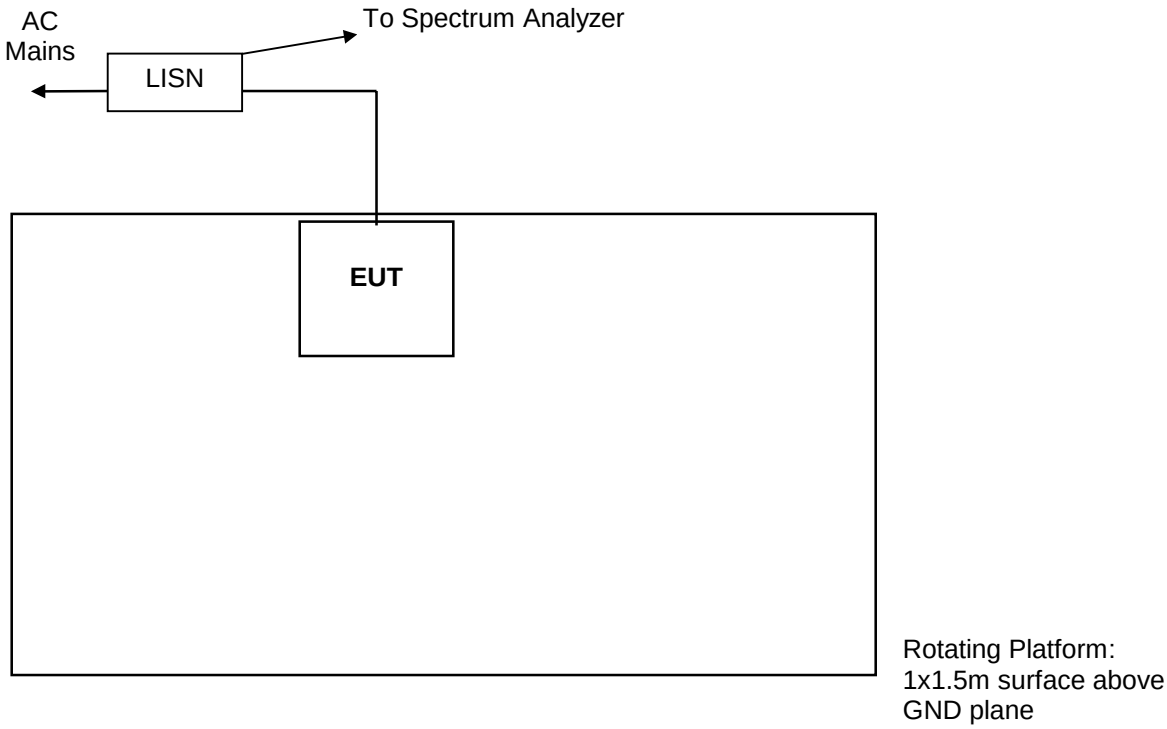
1) Resistor R47 was changed to 1.5 kOhms.
2) Resistor R55 was changed to 110 kOhms.

No PCB Layout changes were needed for the above modifications. Production units will have the above modifications made to them.

Authorized Signature  Date 4/12/1999

Joseph Strzelecki
Senior EMC Engineer
Authorized Agent for Safety 1st

Figure 2.1 Configuration of Tested System



Radiated Emissions:
- LISN's not used
- AC outlet with low-pass filter at the base of the turntable
- No vertical conductive wall
- Antenna height varied from 1 to 4 meters
- Distance from antenna to tested system is 3 meters

Notes:
- Not to Scale

Conducted Emissions:
- LISN's at least 80 cm from EUT chassis
- Vertical conductive plane 40 cm from rear of table top
- EUT power cord bundled
- Test platform is not rotated

3.0 Occupied Bandwidth Data

The occupied bandwidth of the RF output was measured using an Anritsu 2601 spectrum analyzer. The bandwidth was measured using the peak detector function and a narrow resolution bandwidth.

A broadband antenna was used to receive the modulated signal. The spectrum analyzer was set to the "MAX HOLD" mode to record the worst case of the modulation. The modulation was recorded while a 2500 Hz tone was injected into the microphone input. The level of the tone was sufficient to produce 85% modulation. The spectrum analyzer display was digitized and plotted. A limit was drawn on the plots based on the level of the modulated carrier. The plots of the occupied bandwidth for the EUT are supplied on the following pages.

Figure 3.1 Occupied Bandwidth Plot

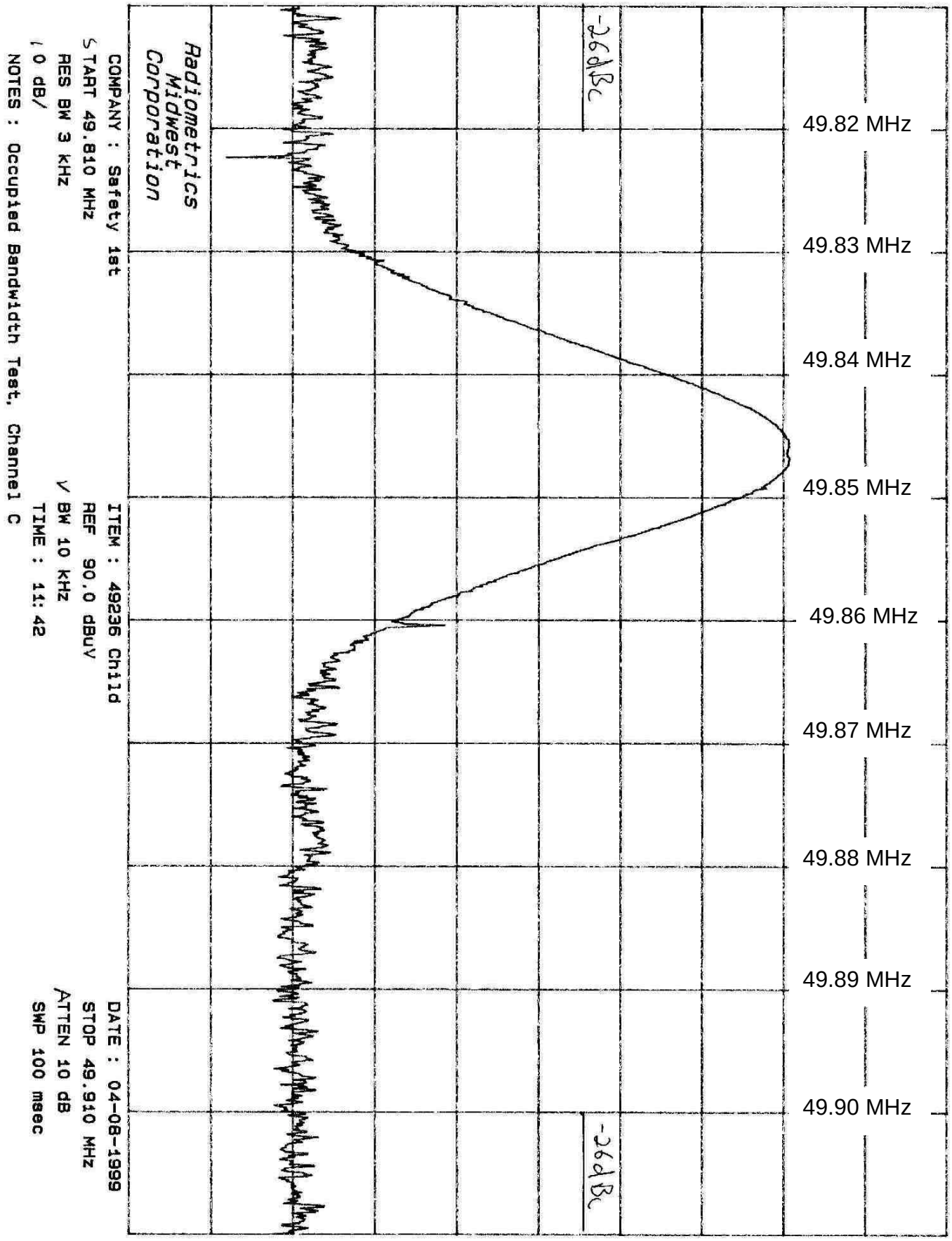
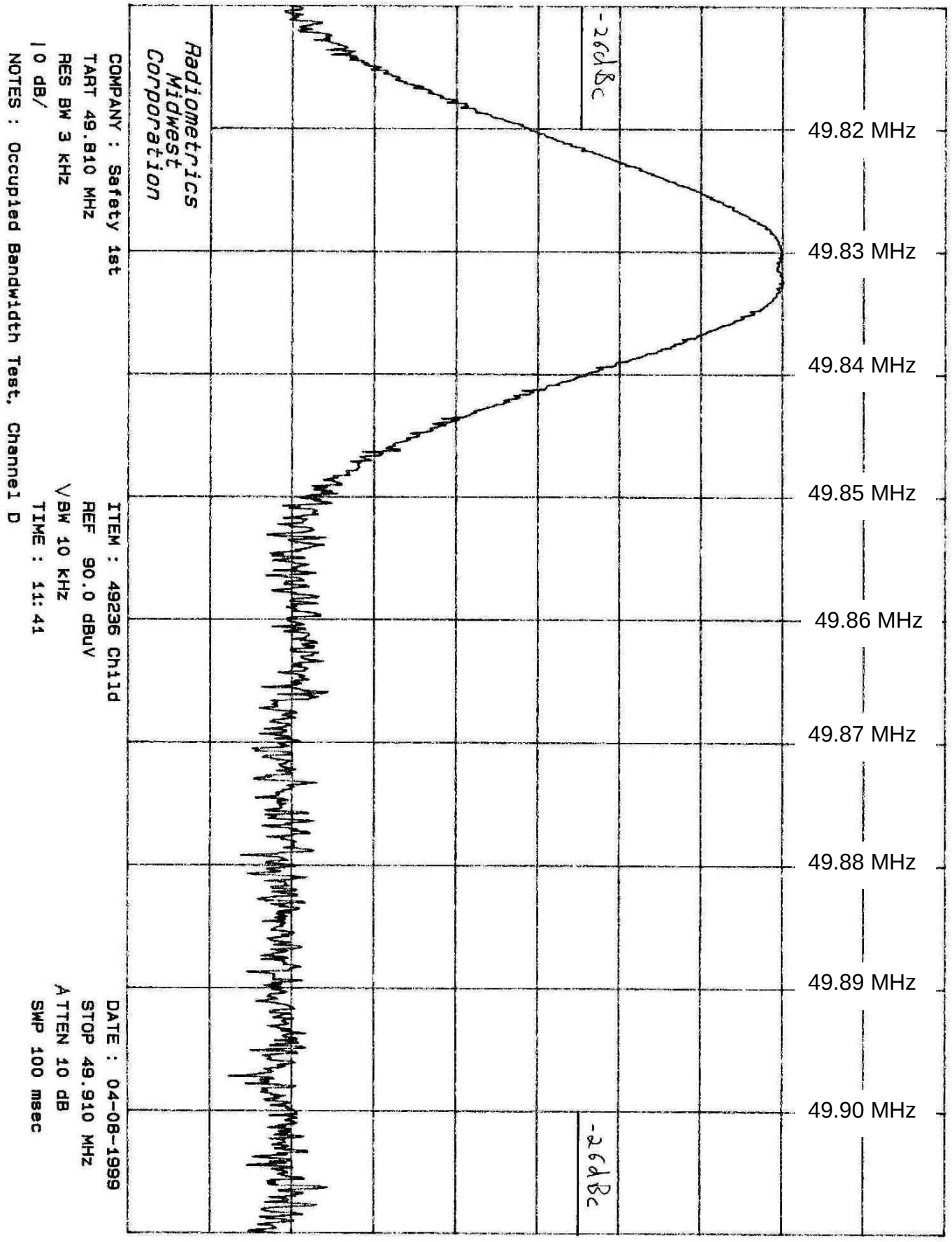


Figure 3.2 Occupied Bandwidth Plot



4.0 Radiated Emissions Data

The following table lists the highest measured emission frequencies, and measured levels and the limit. A sample calculation is given in paragraph 4.1.

Model : 49236T
Test Date : April 8, 1999
Notes : Pol = Antenna Polarization; V = Vertical; H = Horizontal
BC = Biconical; LP = Log Periodic; DP = Dipole; P = Peak; Q = QP
Correction Factors = cable loss - preamp gain
Test Distance: 3 Meters
Antennas Used: Biconical (30-200 MHz): Log-Periodic (200-1000 MHz)

Freq. (MHz)	meter Reading dBuV	Antenna Factor	Ant type/Pol	Correction Factors dB	Field Strength dBuV/m	Limit dBuV/m	Results Margin (dB)
33.2	36.5	11.4	V/BC	-26.1	21.8	40.0	18.2
49.8	101.1	2.6	V/DP	-25.8	77.9	80.0	2.1
66.5	38.0	7.9	V/BC	-25.4	20.5	40.0	19.5
99.7	40.6	13.0	V/BC	-24.9	28.7	43.5	14.8
149.5	38.3	14.3	V/BC	-24.1	28.5	43.5	15.0
199.4	35.4	18.0	V/BC	-23.7	29.7	43.5	13.8
249.2	38.7	12.2	V/LP	-22.8	28.1	46.0	17.9
299.1	31.0	14.3	V/LP	-22.1	23.2	46.0	22.8
49.8	80.6	12.8	H/BC	-25.8	67.6	80.0	12.4
99.7	39.6	13.0	H/BC	-24.9	27.7	43.5	15.8
149.5	36.9	14.3	H/BC	-24.1	27.1	43.5	16.4
199.4	34.6	18.0	H/BC	-23.7	28.9	43.5	14.6
249.2	39.2	12.2	H/LP	-22.8	28.6	46.0	17.4

Judgment: Passed by 2.1 dB

No Emissions were detected from 300 to 1000 MHz within 15 dB of the limits.

Test Personnel: Joseph Strzelecki
Senior EMC Engineer

4.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and by subtracting the Amplifier Gain from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where: FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Attenuation Factor
AG = Amplifier Gain

Assume a receiver reading of 49.5 dBuV is obtained. The Antenna Factor of 8.1 and a Cable Factor of 1.7 is added. The Amplifier Gain of 23.3 dB is subtracted, giving a field strength of 36 dBuV/m. The 36 dBuV/m can be mathematically converted to its corresponding level in uV/m.

FS = 49.5 + 8.1 + 1.7 - 23.3 = 36.0 dBuV/m
Level in uV/m = Common Antilogarithm [(36 dBuV/m)/20] = 63.1 uV/m

5.0 Conducted Emission Data

The initial step in collecting conducted data is a spectrum analyzer peak scan and the plotting of the measurement range. Significant peaks are then marked as shown on the following table, and these signals are then measured with the quasi-peak detector. The following represents the worst case emissions from the EUT and power cord, after testing all modes of operation. All readings are quasi-peak with a 9 kHz bandwidth and no video filter.

Model : 49236T
Test Date : April 7, 1999

Line Tested	Freq. MHz	Analyzer Reading dBuV	Cable Loss dB	Strength of Signal dBuV	Limit dBuV	Margin Limit dB
AC Hot	0.48	24#	0.1	24.1	48.0	23.9
AC Hot	10.0	24#	0.2	24.2	48.0	23.8
AC Hot	20.0	24#	0.3	24.3	48.0	23.7
Neutral	0.51	24#	0.1	24.1	48.0	23.9
Neutral	10.0	24#	0.2	24.2	48.0	23.8
Neutral	20.0	24#	0.3	24.3	48.0	23.7

Ambient Reading

Changing the frequency of the transmitter did not affect the emissions listed above.
Judgment: Passed by 23.7 dB

Test Personnel: Joseph Strzelecki
Senior EMC Engineer