Engineering and Testing for EMC and Safety Compliance

PART 90 TYPE CERTIFICATION REPORT

Vertex Standard Co., LTD.
4-8-8, Nakameguro
Meguro-ku, Tokyo 153-8644, Japan
81-(0)3-5725-6122

MODEL: VXR-7000U

FCC ID: K66VXR-7000U-2

November 14, 2000

STANDARDS REFERENCED FOR THIS REPORT	
PART 2: 1999	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS
PART 15: 1999	§15.109: RADIATED EMISSIONS LIMITS
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

FCC Rules Parts	Frequency Range	Output Power (W)	Freq. Tolerance	Emission Designator
90.210	400-430 MHz	10	2.5	11K0F3E
90	400-430 MHz	10	2.5	16K0F3E
90.210	400-430 MHz	50	2.5	11K0F3E
90	400-430 MHz	50	2.5	16K0F3E

REPORT PREPARED BY:

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Document Number: 2000438 / K66VXR-7000U-2

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1.0 GENERAL INFORMATION

The following FCC Part 90 Type Certification, is prepared on behalf of Yaesu USA. in accordance with Part 2, and Part 90, of the Federal Communications Commissions rules and regulations. The Equipment Under Test (EUT) was the VXR-7000U. 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 CFR 47, Part 90, ANSI C63.4 Methods of Measurement of Radio Noise Emissions, 1992, and TIA/EIA 603, 1992. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Some accessories are used to increase sensitivity and prevent overloading of the measuring instruments. These are explained in the appendix of this report. Calibration checks are performed regularly on the instruments, and all accessories including the high pass filter, preamplifier and cables.

All radiated and conducted emissions measurement were performed manually at Rhein Tech, Incorporated. The radiated emissions measurements required by the rules were performed on the three meter, open field, test range maintained by Rhein Tech Laboratories, Inc., 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. Complete description and site attenuation measurement data have been placed on file with the Federal Communications Commission. The power line conducted emission measurements were performed in a shielded enclosure also located at the Herndon, Virginia facility. Rhein Tech Laboratories, Inc. is on the FCC accepted lab list as a facility available to do measurement work for others on a contract basis.

1.1 TEST METHODOLOGY

All tests were performed according to the procedures in FCC Part 90, FCC Part 2, and FCC Part 15. Field strength of spurious radiation testing was performed at an antenna to EUT distance of 3 meters. Additionally, RF power output, spurious emissions at antenna terminal, occupied bandwidth, frequency stability versus temperature/voltage and modulated characteristics were measured per FCC Rules and Regulations: CFR 47, Part 90, October 1, 1997, Part 2, October 1, 1997, and Part 15, October 1, 1997.

1.2 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 Communication Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 1992).

1.3 RELATED SUBMITTAL(S)/GRANT(S)

1.4 EMISSIONS EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. LAB
PRE-AMPLIFIER	HEWLETT PACKARD	11975A	2304A00348	TEST EQUITY
PRE-AMPLIFIER	HEWLETT PACKARD			TEST EQUITY
PRE-AMPLIFIER (S/A 1)	RHEIN TECH	PR-1040	00001	RTL
PRE-AMPLIFIER (S/A 2)	RHEIN TECH	RTL2	900723	RTL
PRE-AMPLIFIER (S/A 3)	RHEIN TECH	8447F	2944A03783	RTL
PRE-AMPLIFIER (S/A 4)	RHEIN TECH	8447D	2727A05397	RTL
BICONICAL/LOG ANTENNA 1	ANTENNA RESEARCH	LPB-2520	1037	LIBERTY LABS
BICONICAL/LOG ANTENNA 2	ANTENNA RESEARCH	LPB-2520	1036	LIBERTY LABS
FIELD SITE SOURCE	EMCO	4610	9604-1313	RTL
FILTER (ROOM 1)	SOLAR	8130	947305	RTL
FILTER (ROOM 2)	SOLAR	8130	947306	RTL
HARMONIC MIXER 1	HEWLETT PACKARD	11970K	2332A00563	TELOGY
HARMONIC MIXER 2	HEWLETT PACKARD	11970A	2332A01199	TELOGY
HORN ANTENNA 1	EMCO	3160-10	9606-1033	EMCO
HORN ANTENNA 2	EMCO	3160-9	9605-1051	EMCO
HORN ANTENNA 3	EMCO	3160-7	9605-1054	EMCO
HORN ANTENNA 4	EMCO	3160-8	9605-1044	EMCO
HORN ANTENNA 5	EMCO	3160-03	9508-1024	EMCO
LISN (ROOM 1/L1)	SOLAR	7225-1	900727	ACUCAL
LISN (ROOM 1/L2)	SOLAR	7225-1	900726	ACUCAL
LISN (ROOM 2/L1)	SOLAR	7225-1	900078	ACUCAL
LISN (ROOM 2/L2)	SOLAR	7225-1	900077	ACUCAL
PRE-AMPLIFIER	HEWLETT PACKARD	8449B OPT	3008A00505	TELOGY
QUASI-PEAK ADAPTER (S/A 1)	HEWLETT PACKARD	85650A	3145A01599	ACUCAL
QUASI-PEAK ADAPTER (S/A 2)	HEWLETT PACKARD	85650A	2811A01276	ACUCAL
QUASI-PEAK ADAPTER (S/A 3)	HEWLETT PACKARD	85650A	2521A00473	ACUCAL
QUASI-PEAK ADAPTER (S/A 4)	HEWLETT PACKARD	85650A	2521A01032	ACUCAL
RF PRESELECTOR (S/A 1)	HEWLETT PACKARD	85685A	3146A01309	ACUCAL
SIGNAL GENERATOR (HP)	HEWLETT PACKARD	8660C	1947A02956	ACUCAL
SIGNAL GENERATOR (WAVETEK)	WAVETEK	3510B	4952044	ACUCAL
SPECTRUM ANALYZER 1	HEWLETT PACKARD	8566B	3138A07771	ACUCAL
EMI RECEIVER	HEWLETT PACKARD	8546A	3325A00159	ACUCAL
SPECTRUM ANALYZER 2	HEWLETT PACKARD	8567A	2841A00614	ACUCAL
SPECTRUM ANALYZER 4	HEWLETT PACKARD	8567A	2727A00535	ACUCAL
TUNABLE DIPOLE	EMCO	3121	274	LIBERTY LABS
HARMONIC MIXER	HEWLETT PACKARD	11970A	2332A01199	ACUCAL
HARMONIC MIXER	HEWLETT PACKARD	11970K	2332A00563	ACUCAL

1.5 Field Strength Calculation

This field strength calculation applies to FCC PART 47 § 15.109 measurements and is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FI(dBuV/m) = SAR(dBuV) + SCF(dB/m)$$

FI = Field Intensity
SAR = Spectrum Analyzer Reading
SCF = Site Correction Factor

The Site Correction Factor (SCF) used in the above equation is determined empirically, and is expressed in the following equation:

$$SCF(dB/m) = - PG(dB) + AF(dB/m) + CL(dB)$$

SCF = Site Correction Factor
PG = Pre-amplifier Gain
AF = Antenna Factor
CL = Cable Loss

The field intensity in microvolts per meter can then be determined according to the following equation:

$$FI(uV/m) = 10^{FI(dBuV/m)/20}$$

For example, assume a signal at a frequency of 125 MHz has a received level measured as 49.3 dBuV. The total Site Correction Factor (antenna factor plus cable loss minus preamplifier gain) for 125 MHz is -11.5 dB/m. The actual radiated field strength is calculated as follows:

$$49.3 \text{ dBuV} - 11.5 \text{ dB/m} = 37.8 \text{ dBuV/m}$$

$$10^{37.8/20} = 10^{1.89} = 77.6 \text{ uV/m}$$

A field strength calculation for substitution method FCC PART 2 § 2.1053(A) is calculated as by taking a radiated measurement of the device under test. An antenna is substituted for the device under test and a signal is transmitted with a signal generator until the level generated is equivalent to the original level on the spectrum analyzer. The cable loss from the substitution antenna is subtracted from the signal generator level, and this level is further corrected with the antenna gain corrected to a ½ wave dipole.

1.6 Conducted Measurement

The power line conducted emission measurements were performed for the AC line of the device under test, in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 80 centimeters high. Power was fed to the EUT through a 50 ohm / 50 microhenry Line Impedance Stabilization Network (EUT LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. A second LISN, the peripheral LISN, provides isolation for the EUT test peripherals. This peripheral LISN was also fed A.C. power. A metal power outlet box, which is bonded to the ground plane and electrically connected to the peripheral LISN, powers the EUT host peripherals.

The spectrum analyzer was connected to the A.C. line through an isolation transformer. The 50-ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar 400 kHz high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 400 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The analyzer's 6 dB bandwidth was set to 9 kHz. No video filter less than 10 times the resolution bandwidth was used. Average measurements are performed in linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by increasing the sweep time in order to obtain a calibrated measurement. The emission spectrum was scanned from (150/450) kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in this report.

1.7 Radiated Measurement

The radiated measurements applicable to FCC PART 47 § 15.109 entail the following methodology. Before final measurements of radiated emissions were made on the open-field three range, the EUT was scanned indoors at one meter and three meter distances if necessary in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to insure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three-meter, open-field test site. The EUT was placed on a nonconductive turntable approximately 0.8 meters above the ground plane. The spectrum was examined from 30 MHz to 1000 MHz using a Hewlett Packard 8566B spectrum analyzer, a Hewlett Packard 85650A quasi-peak adapter, and an Antenna Research bilog antenna. In order to gain sensitivity, an RTL PR-1040 preamplifier was connected in series between the antenna and the input of the spectrum analyzer.

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.

1.8 Conformance Statement

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 FCC Part 2, FCC Part 90 Certification methodology.

Typed/Printed Name: Desmond A. Fraser
Signature

Date: November 14, 2000
Position: President, (NVLAP Signatory)

Signature: 

Date: November 14, 2000

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.

2.0 STANDARD REQUIREMENTS

STANDARDS REFERENCED FOR THIS REPORT	
PART 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS
PART 15	§15.109: RADIATED EMISSIONS LIMITS
PART 90	PRIVATE LAND MOBILE RADIO SERVICES
ANSI	C63.4:1992
ANSI/TIA/EIA	603:1992

FREQUENCY RANGE	OUTPUT POWER (W)	FREQUENCY TOLERANCE	EMISSION DESIGNATOR
450-488 MHz	50	2.5 PPM	11K0F3E
450-488 MHz	50	2.5 PPM	16K0F3E
450-488 MHz	10	2.5 PPM	11K0F3E
450-488 MHz	10	2.5 PPM	16K0F3E

2.1 FCC PART 2 § 2.1046(A): CONDUCTED MEASUREMENT

TABLE 1: UNMODULATED OUTPUT POWER

Channel #	Tx Frequency (MHz)	Power meter Low power (W)	Power meter High power (W)	Channel spacing (kHz)
1	400.025	12.0	54.4	25
2	415.025	12.0	54.5	25
3	429.975	12.0	54.5	25
4	400.025	12.0	54.1	12.5
5	415.025	12.0	54.4	12.5
6	429.975	12.0	54.5	12.5

2.2 FCC PART 2 § 2.1053(A): MEASUREMENT REQUIRED: FIELD STRENGTH OF SPURIOUS RADIATION

TABLE 2: TX RADIATED EMISSIONS (CHANNEL 6) SUBSTITUTION METHOD (WORST CASE)

Frequency	S/G level (dBm)	Cable Loss	Difference in gain (ref. To 1/2 wave dipole)	Emission level (dBm)	Limit (dBm)	Margin
859.950	-17.4	3.8	-1.1	-22.3	-20.0	-2.3
1289.925	-22.6	6.3	2.6	-26.3	-20.0	-6.3
1719.900	-18.4	7.1	4.7	-20.8	-20.0	-0.8
2149.888	-34.6	9.0	4.9	-38.7	-20.0	-18.7
2579.863	-47.6	11.2	5.3	-53.5	-20.0	-33.5
3009.827	-45.5	12.6	6.3	-51.8	-20.0	-31.8
3439.802	-45.5	14.4	6.1	-53.8	-20.0	-33.8
3869.776	-51	16.7	5.9	-61.8	-20.0	-41.8
4299.751	n.f.					

2.3 FCC PART 2 § 2.1051: ANTENNA CONDUCTED SPURIOUS EMISSIONS

TABLE 3: Tx Antenna Conducted SPURIOUS EMISSIONS

Ch 2 (10W) TX

Frequency	Analyzer Reading (dBm)	Limit (dBm)	Margin
830.050	-30.5	-20.0	-10.5
1245.075	-30.0	-20.0	-10.0
1660.100	Noise floor		
2075.125	Noise floor		
2490.150	Noise floor		
2905.175	Noise floor		
3320.200	Noise floor		
3735.225	Noise floor		
4150.250	Noise floor		

Ch 2 (50W) TX

Frequency	Analyzer Reading (dBm)	Limit (dBm)	Margin
830.050	-27.0	-20.0	-7.0
1245.075	-30.3	-20.0	-10.3
1660.100	Noise floor		
2075.125	Noise floor		
2490.150	Noise floor		
2905.175	Noise floor		
3320.200	Noise floor		
3735.225	Noise floor		
4150.250	Noise floor		

Ch 5 (10W) TX

Frequency	Analyzer Reading (dBm)	Limit (dBm)	Margin
830.050	-28.7	-13.0	-15.7
1245.075	-31.2	-13.0	-18.2
1660.100	Noise floor		
2075.125	Noise floor		
2490.150	Noise floor		
2905.175	Noise floor		
3320.200	Noise floor		
3735.225	Noise floor		
4150.250	Noise floor		

Ch 5 (50W) TX

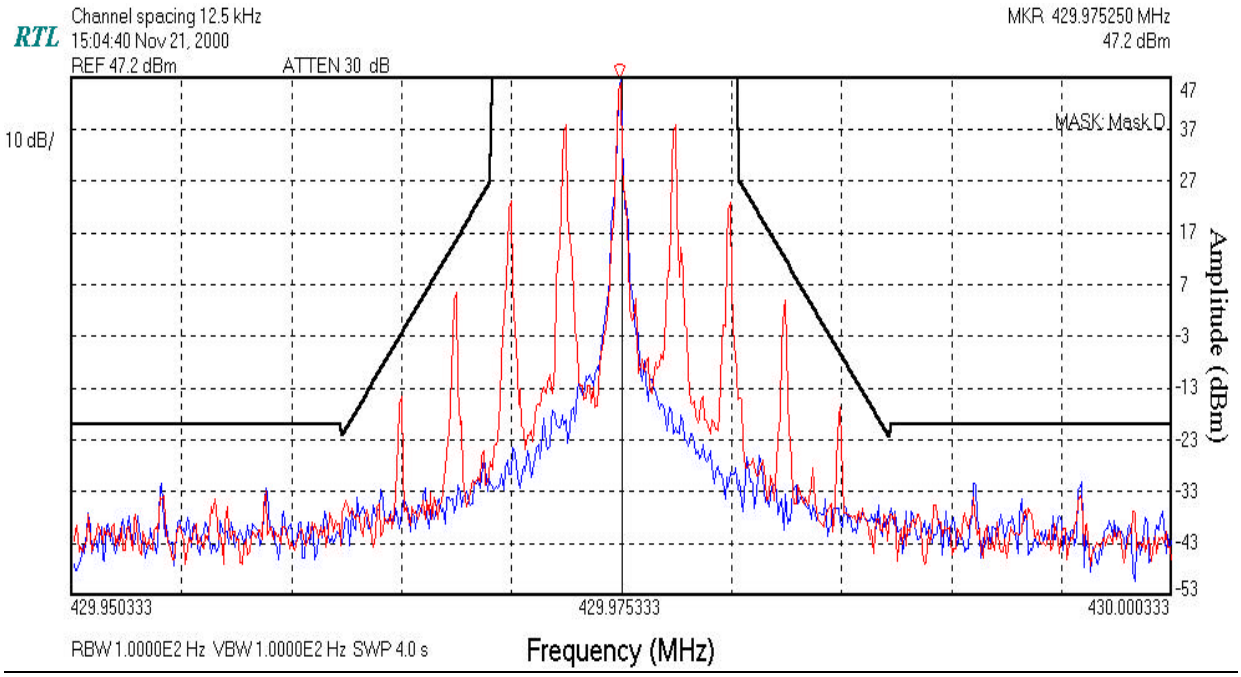
Frequency	Analyzer Reading (dBm)	Limit (dBm)	Margin

830.050	-25.2	-13.0	-12.2
1245.075	-28.7	-13.0	-15.7
1660.100	Noise floor		
2075.125	Noise floor		
2490.150	Noise floor		
2905.175	Noise floor		
3320.200	Noise floor		
3735.225	Noise floor		
4150.250	Noise floor		

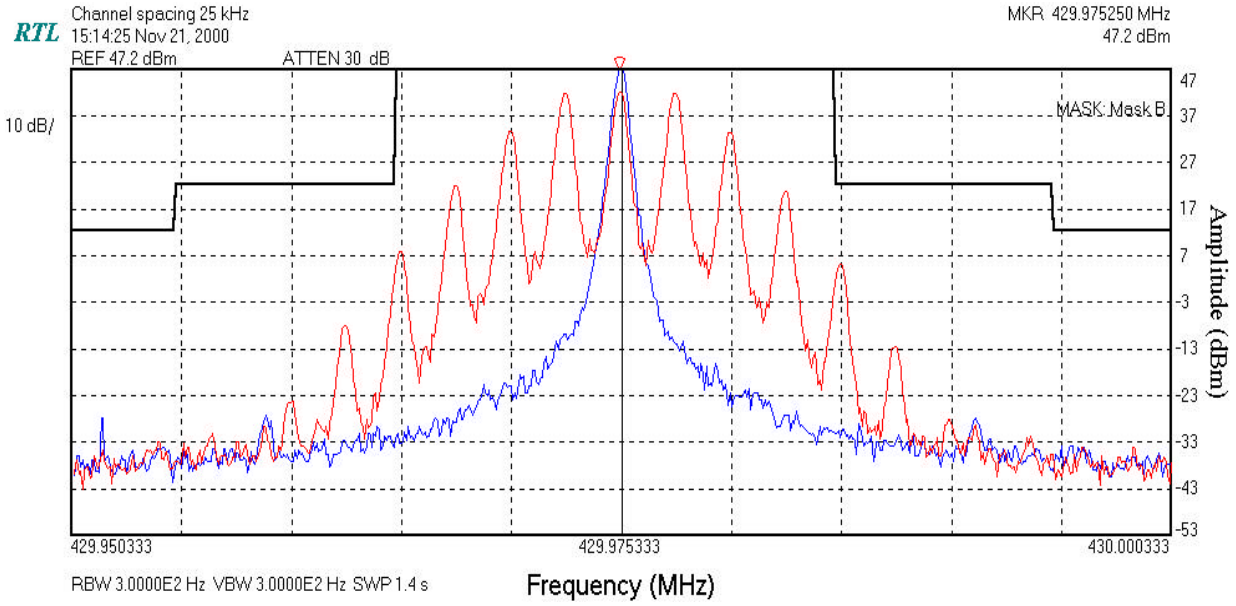
2.4 FCC PART 2 § 2.1049(C)(1): MEASUREMENT REQUIRED: OCCUPIED BANDWIDTH

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

NARROW BAND:



WIDE BAND:



2.5 FCC PART 2 § 2.1055(A): MEASUREMENT REQUIRED: FREQUENCY STABILITY

TABLE 4: FREQUENCY STABILITY

Channel number	Temperature Maximum frequency stability (ppm)
3	0.8

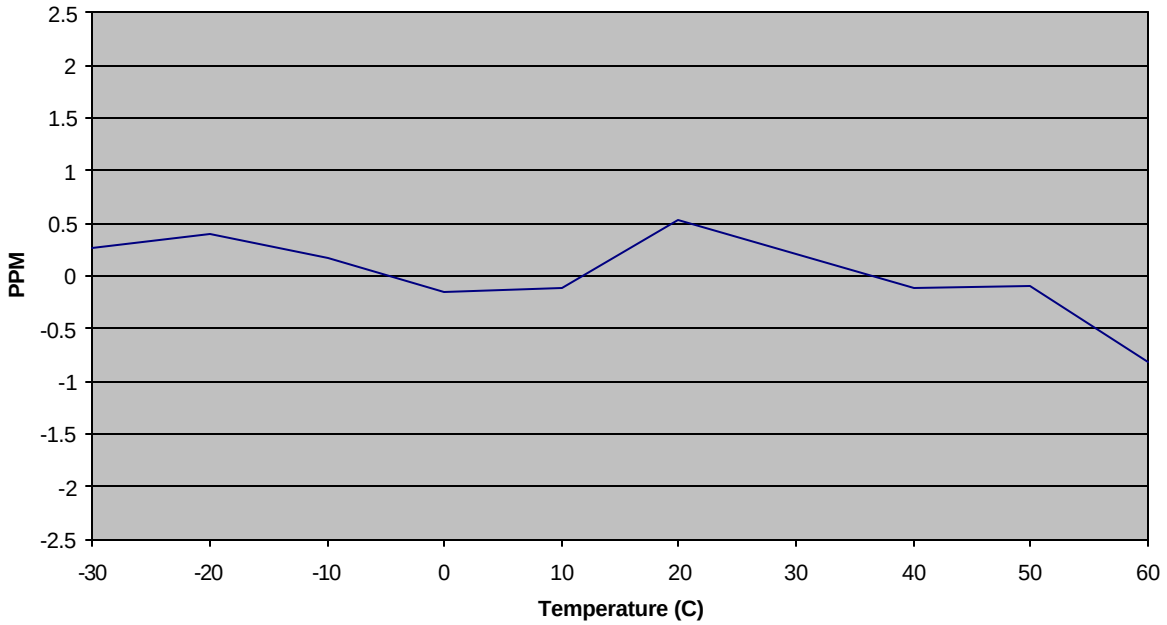
AC Voltage (primary supply voltage) Frequency Stability

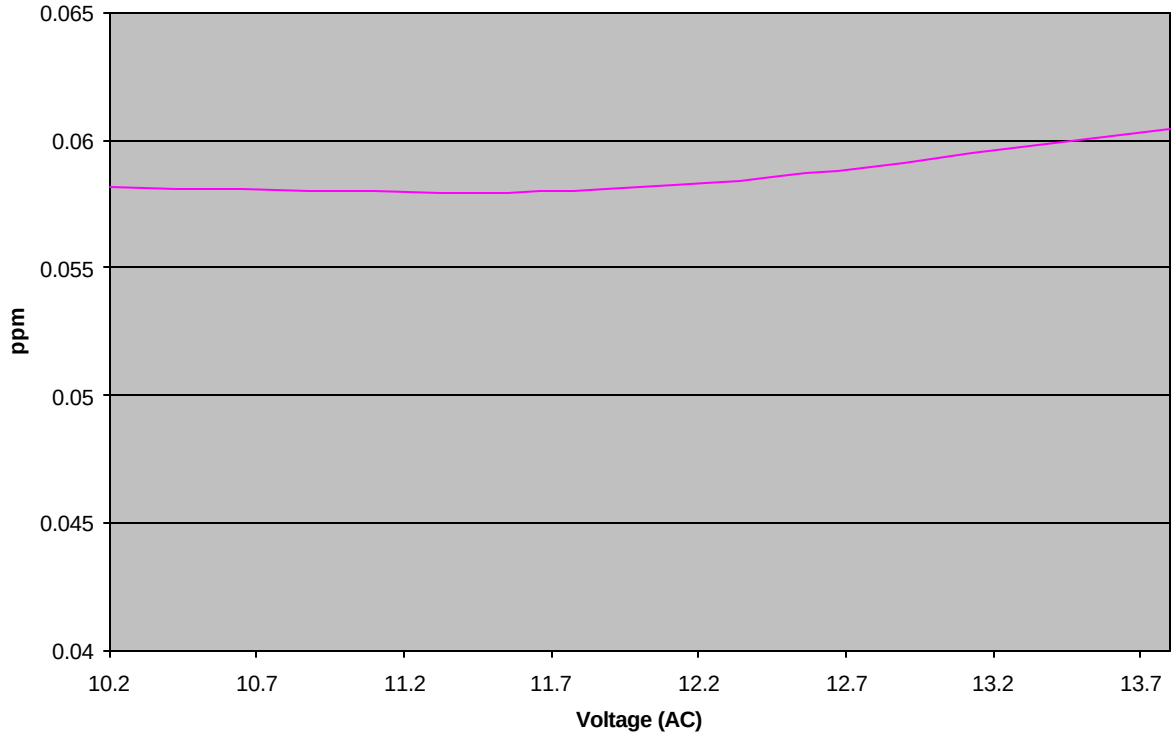
Nominal 120 VAC

Channel 3

Voltage	percentage	ppm
102	85	0.06
120	100	0.06
138	115	0.06

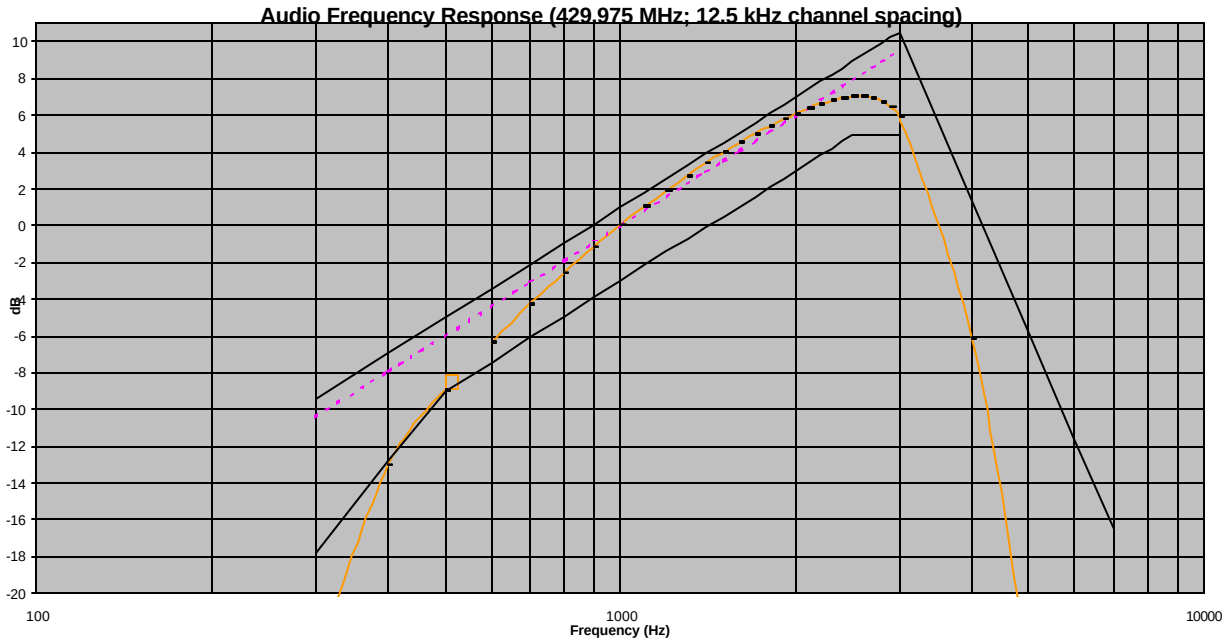
Temperature Frequency Stability; 429.975 MHz; 25 kHz channel spacing

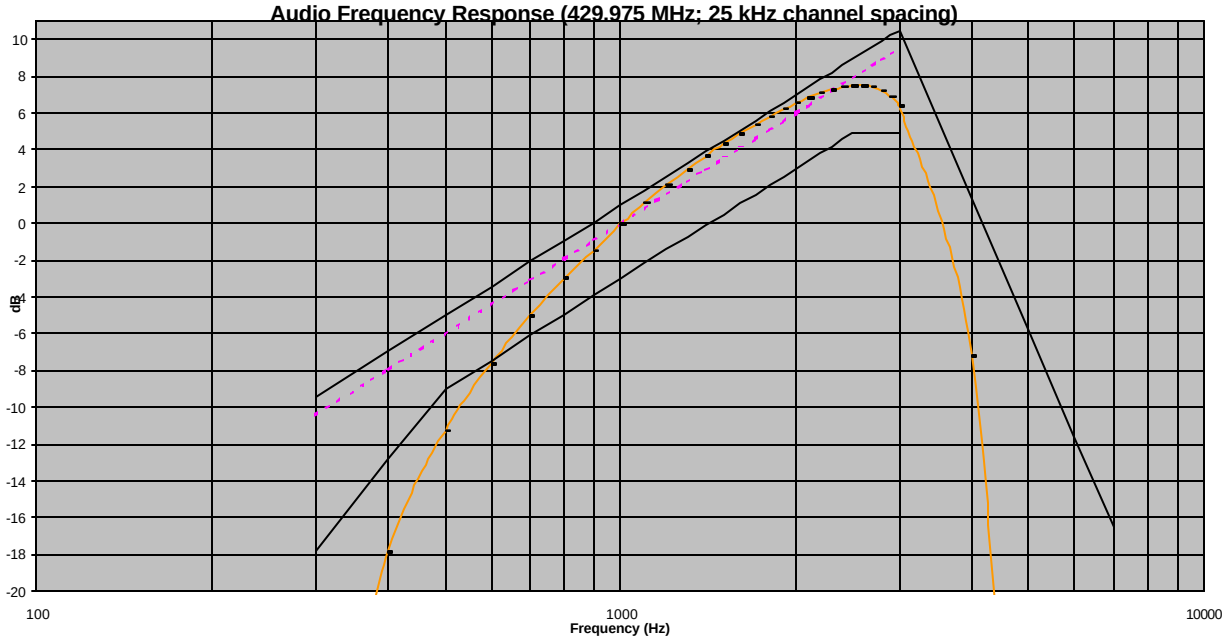




2.6 FCC PART 2 § 2.1047(A): MEASUREMENT REQUIRED: MODULATION CHARACTERISTICS (AUDIO FREQUENCY RESPONSE)

The input audio level at 1000Hz is set to produce 20% of the rated system deviation.

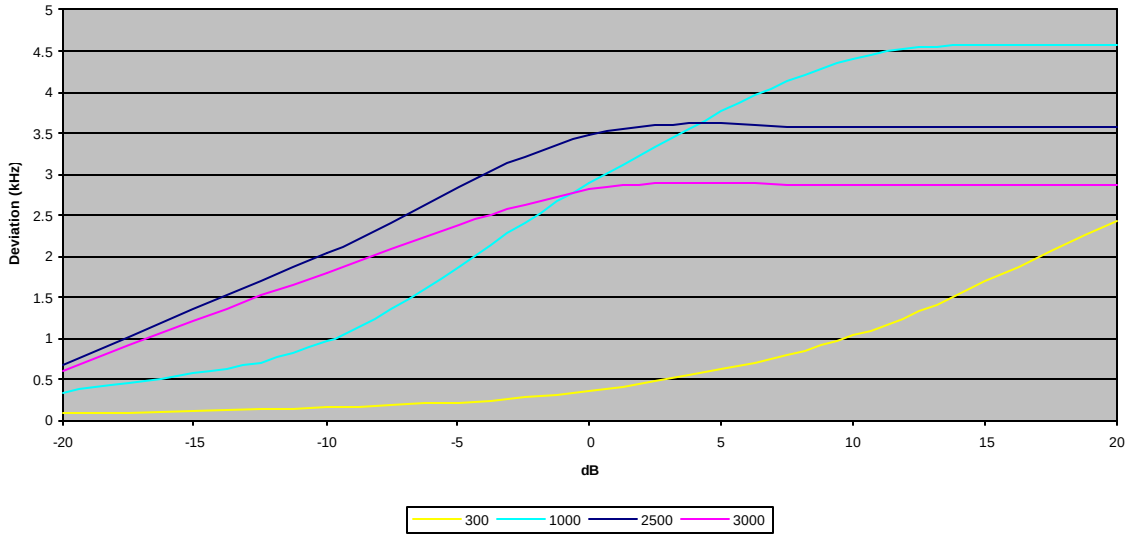




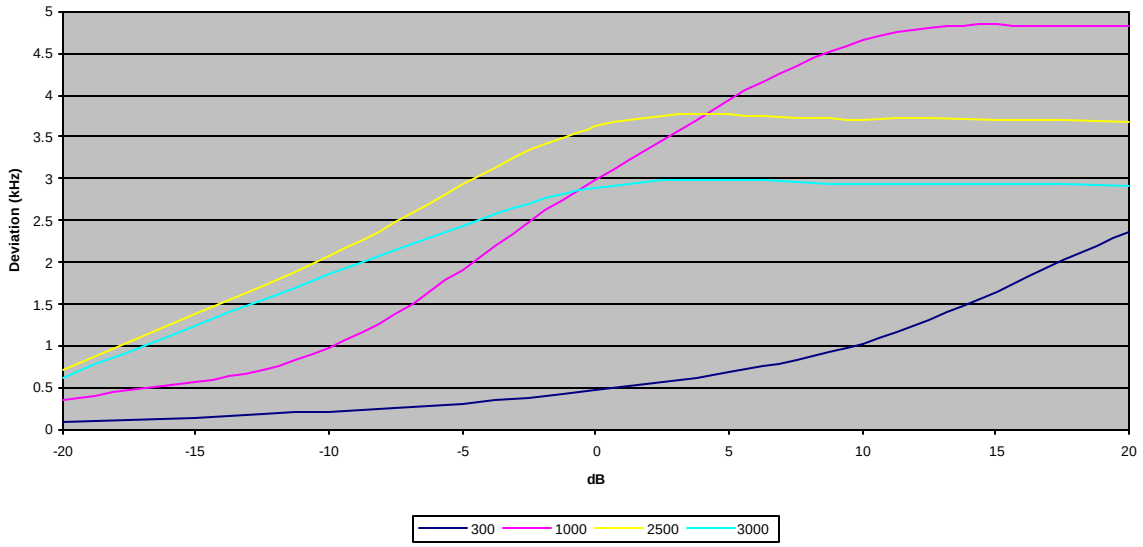
2.7 FCC PART 2 § 2.1047(B): MEASUREMENT REQUIRED: MODULATION CHARACTERISTICS (MODULATION LIMITING)

The transmitter is adjusted for full rated system deviation. The audio input level is adjusted for 60% of rated system deviation at 1000 Hz. Using this level as a reference (0 dB) the audio input level is varied from the reference to a level 20 dB above it for modulation frequencies of 300, 1000, and 3000 Hz wide band and 2550 Hz narrow band. The system deviation obtained as a function of the input level is recorded.

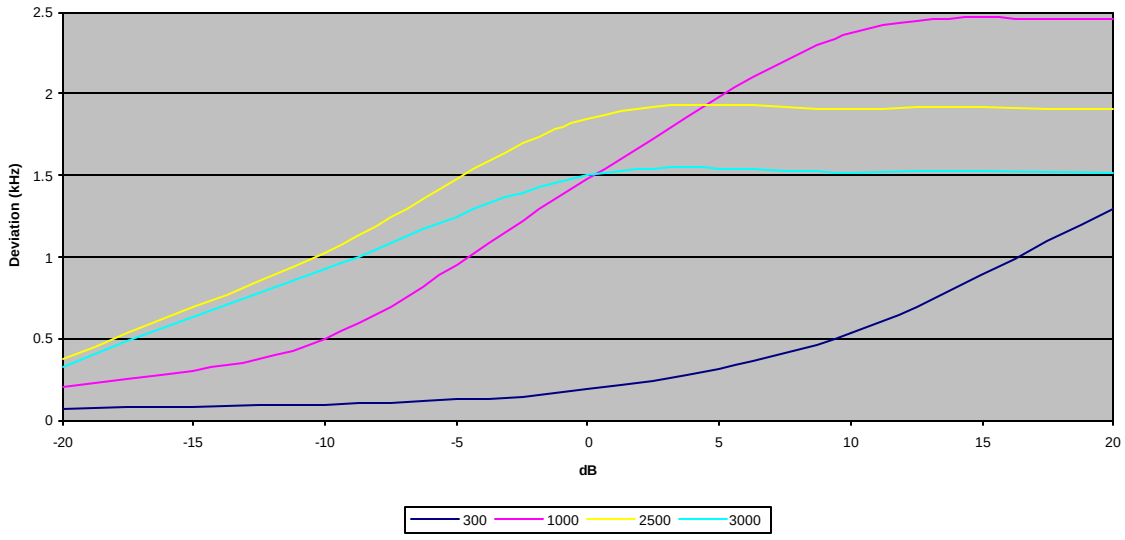
Modulation Limiting (429.975 MHz; 25 kHz channel spacing; Positive Peak)



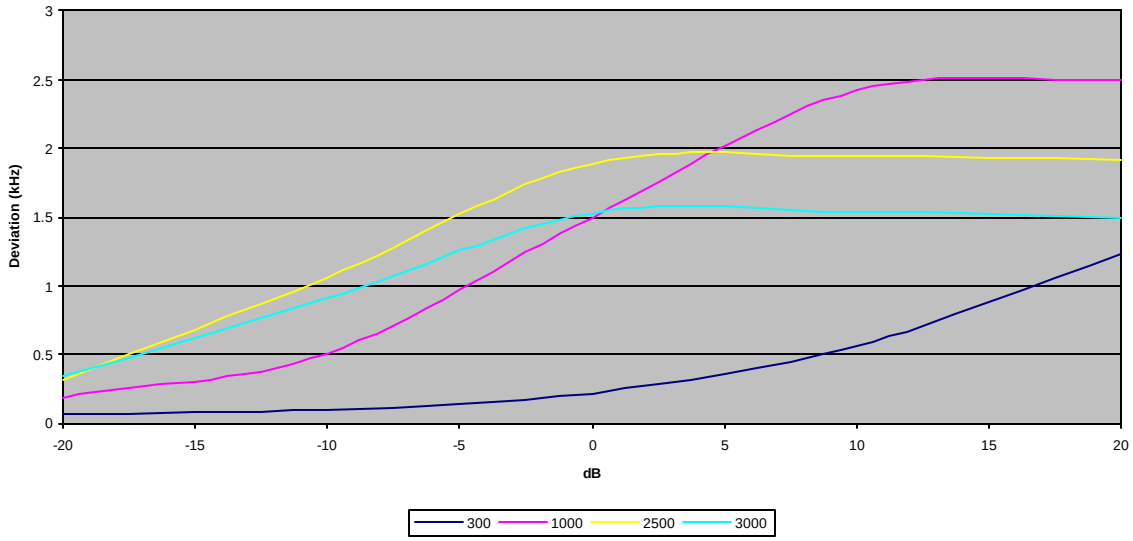
Modulation Limiting (479.975 MHz; 25 kHz channel spacing; Negative Peak)



Modulation Limiting (429.975 MHz; 12.5 kHz channel spacing; Positive Peak)

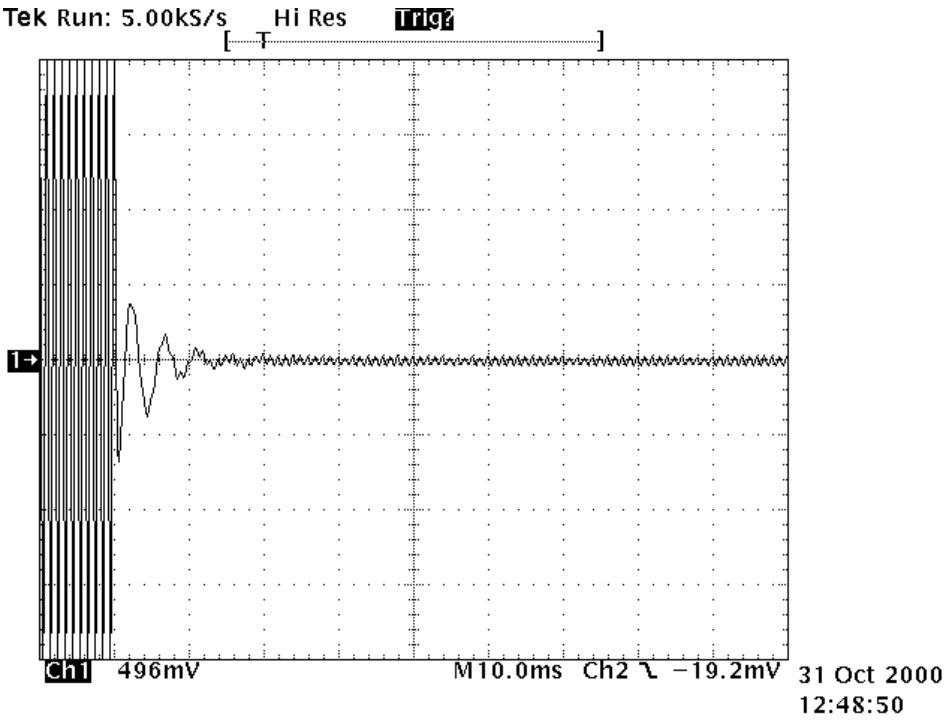


Modulation Limiting (429.975 MHz; 12.5 kHz channel spacing; Negative Peak)

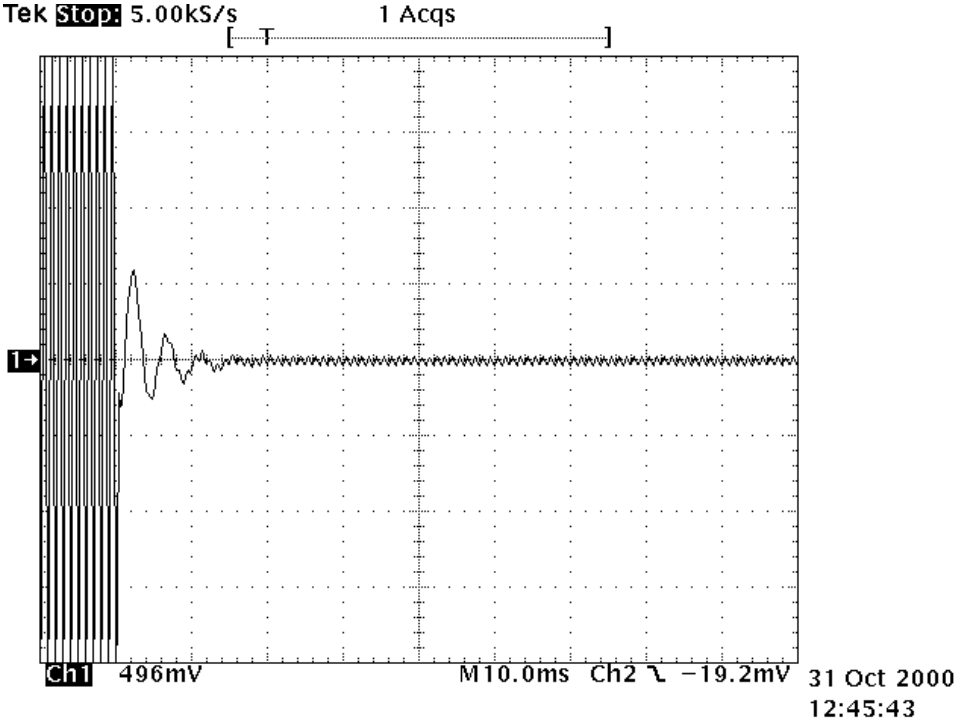


2.8 FCC PART 90 § 90.214: TRANSIENT FREQUENCY BEHAVIOR

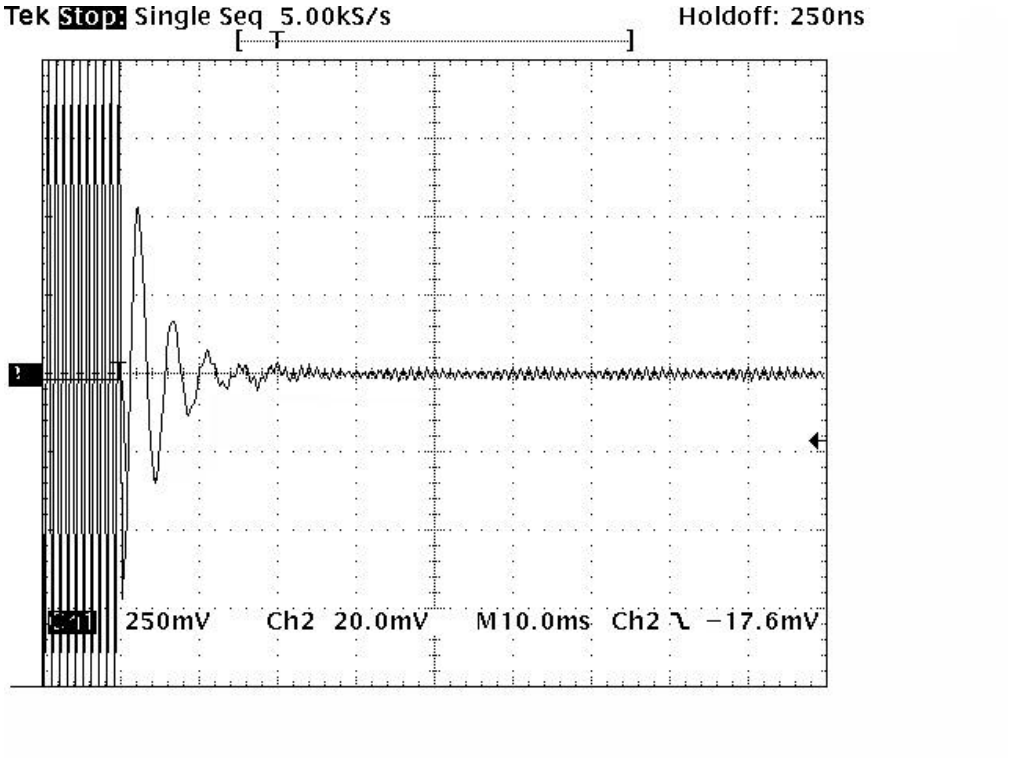
ON Time test results:



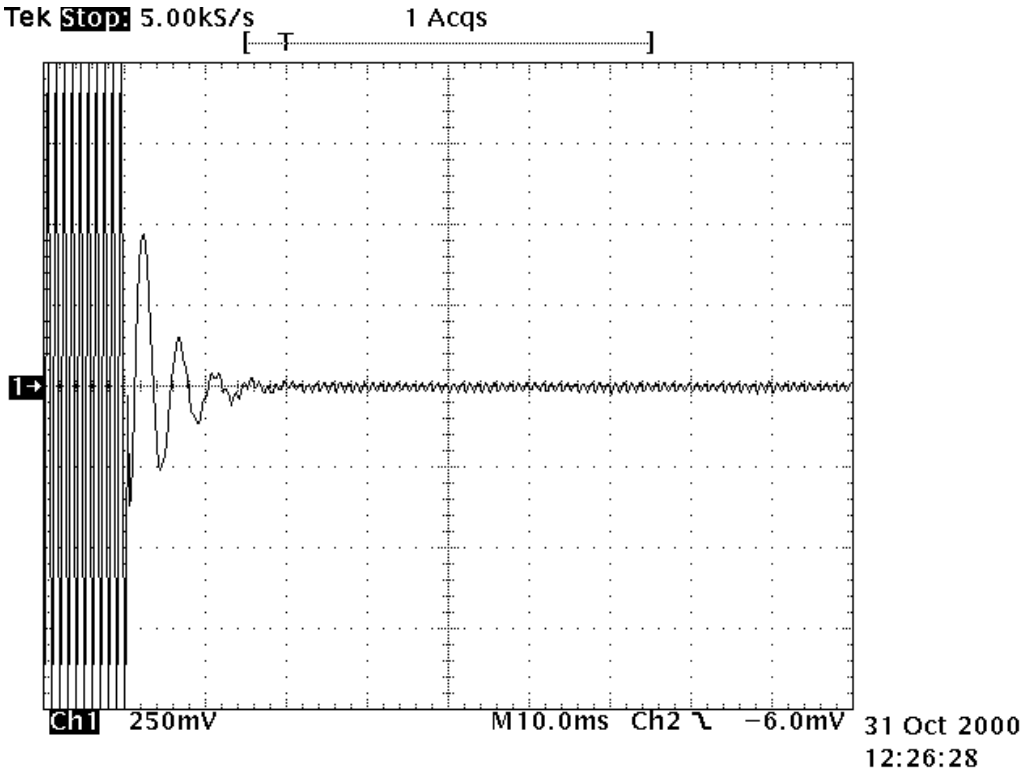
Ch 3 10 W ; 25 kHz channel spacing



Ch 3 50W; 25 kHz channel spacing

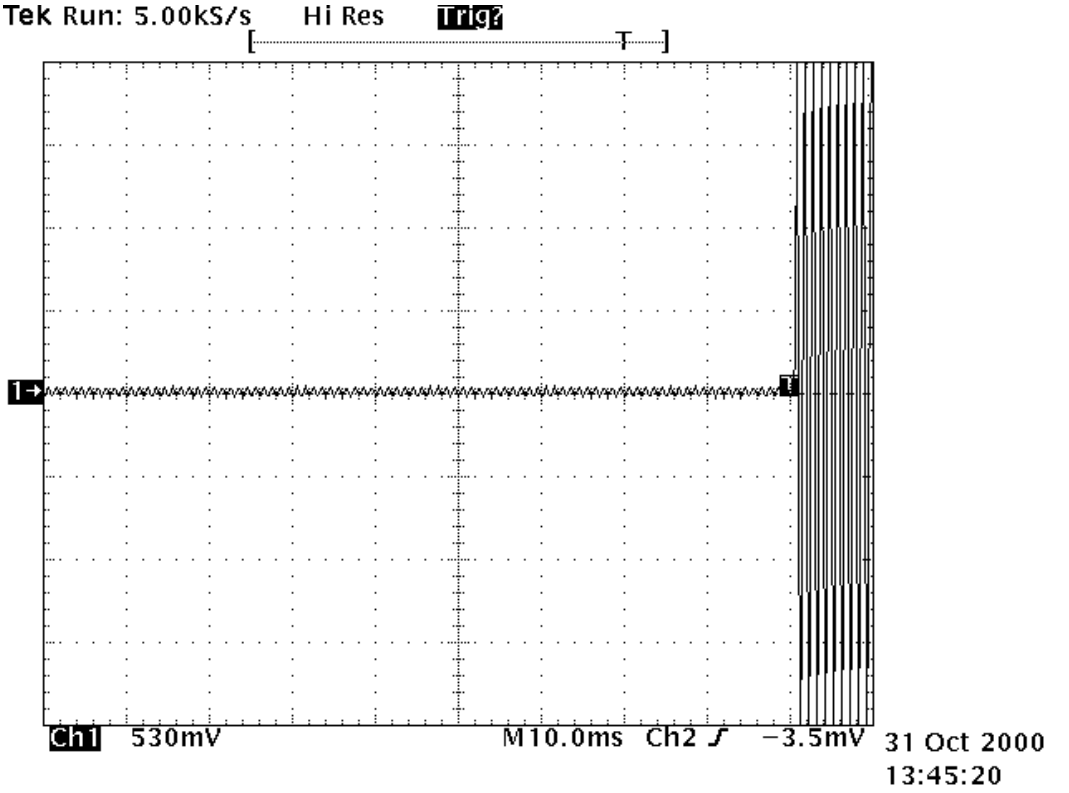


Ch 6 10W; 12.5 kHz channel spacing

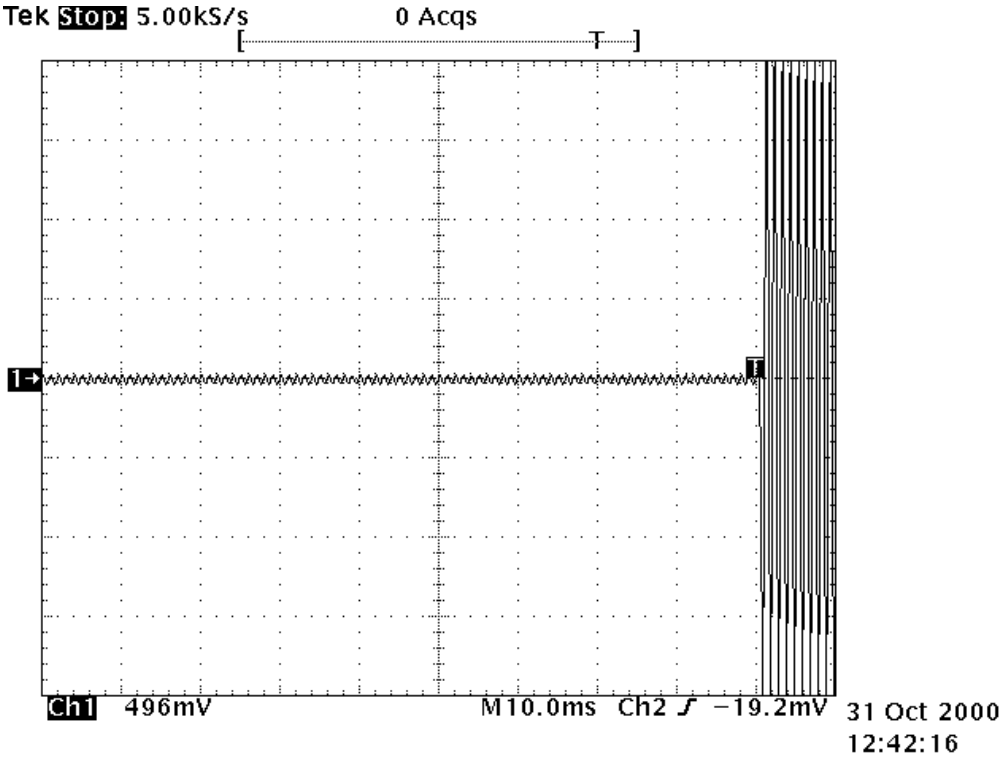


Ch6 50W; 12.5 kHz channel spacing

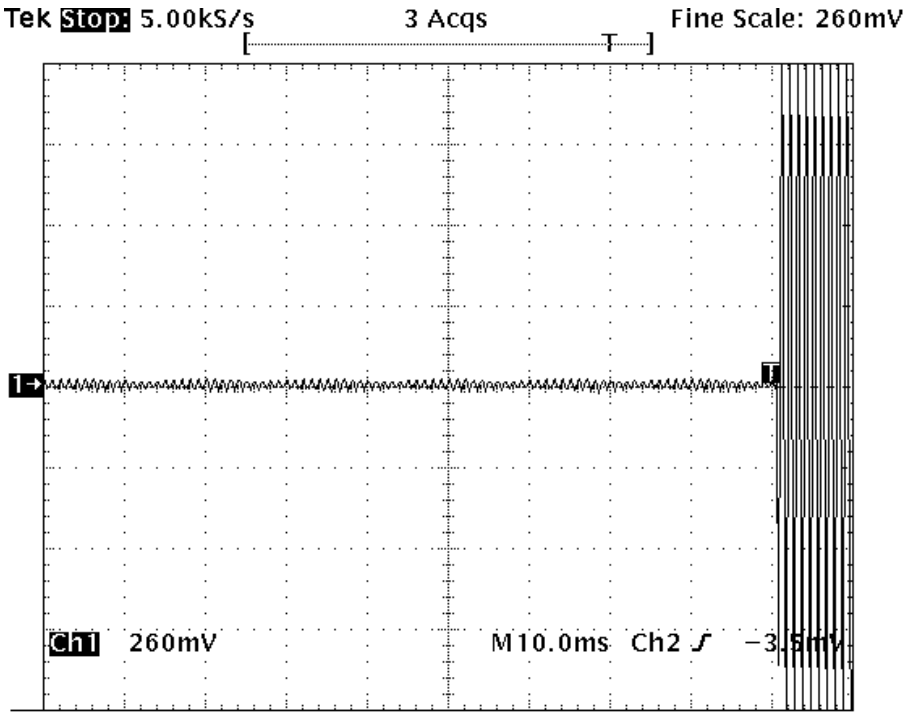
OFF Time test results:



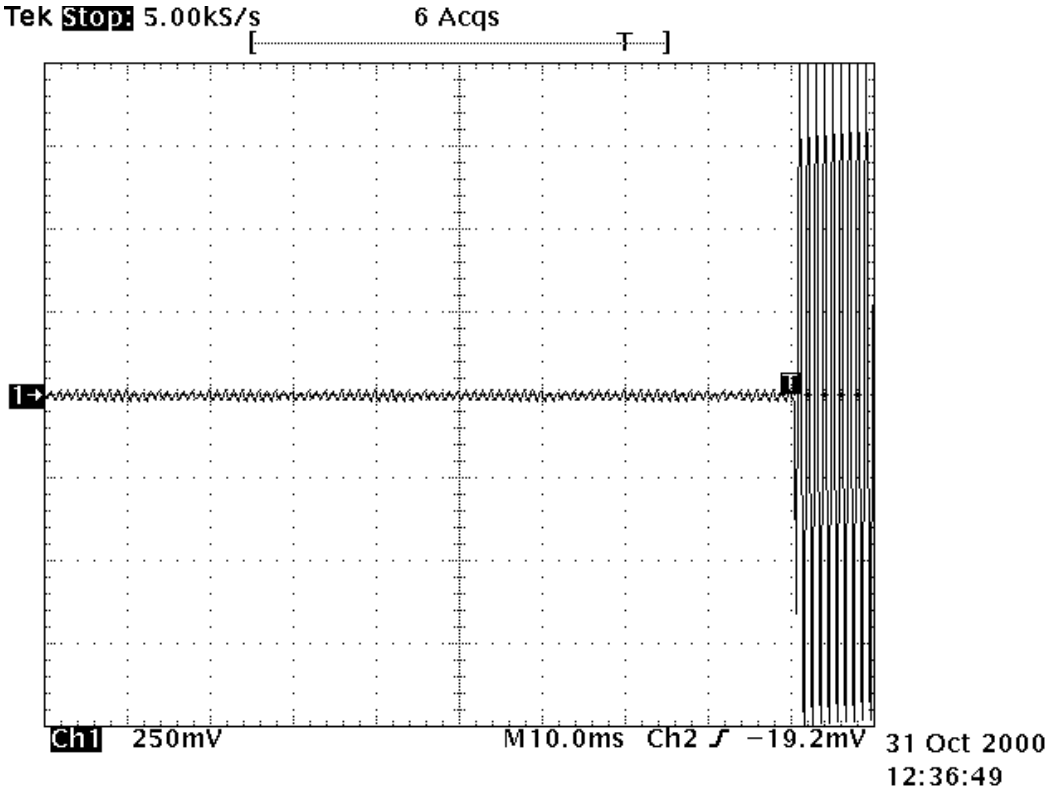
Ch 3 10W; 25 kHz channel spacing



Ch3 50W; 25 kHz channel spacing



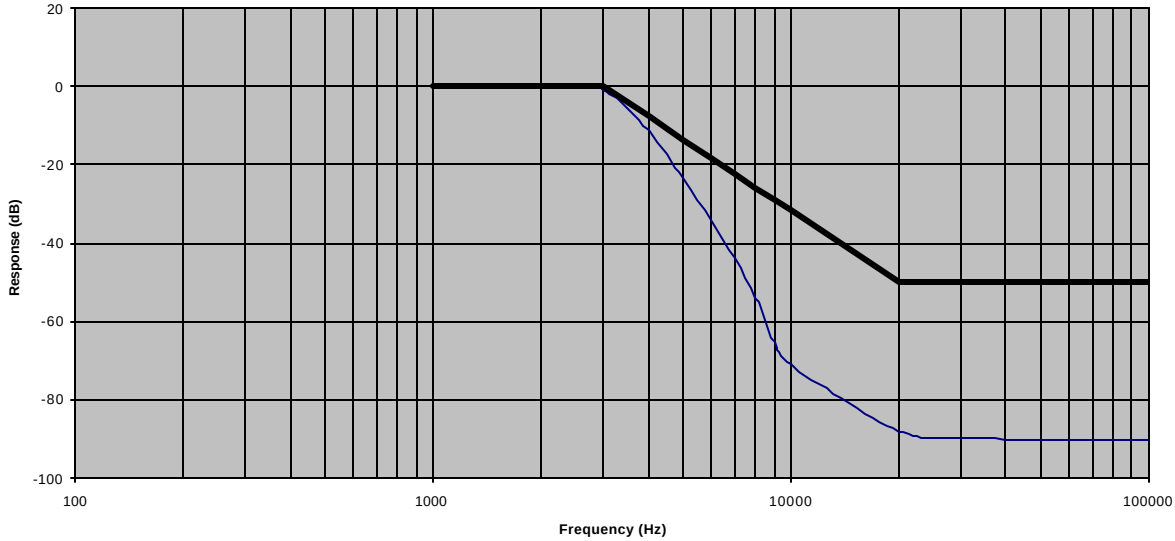
Ch 6 10W; 12.5 kHz channel spacing



Ch 6 50W; 12.5 kHz channel spacing

2.9 FCC PART 2 § 2.1047(A): AUDIO LOW PASS FILTER RESPONSE

Audio Low Pass Filter Response (25 kHz channel spacing)



2.10 FCC PART 47 § 15.111: ANTENNA POWER CONDUCTION FOR RECEIVERS

TABLE 5: Rx Conducted EMISSIONS

Channel Number	Tuned Frequency RX (MHz)	Frequency Measured (MHz)	Analyzer Reading (dBm)	Limit (dBm) (2nW)	Margin
1	415.025	341.675	-74.3	-57.0	-17.3
1	415.025	683.350	-84.9	-57.0	-27.9
2	429.975	356.625	-69.9	-57.0	-12.9
2	429.975	713.25	-85.2	-57.0	-28.2
3	400.025	326.675	-76.5	-57.0	-19.5
3	400.025	653.350	-84.5	-57.0	-27.5

2.11 FCC PART 47 § 15.107: Conducted EMISSIONS

TABLE 6: Conducted EMISSIONS

50W TX Repeater mode Ch 6

NEUTRAL SIDE (Line 1)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B Limit (dBuV)	FCC B Margin (dBuV)
1.516	Pk	39.2	1.2	40.4	48.0	-7.6
2.504	Pk	44.0	1.5	45.5	48.0	-2.5
2.504	Pk	44.0	1.5	45.5	48.0	-2.5
2.606	Pk	45.1	1.5	46.6	48.0	-1.4
2.684	Pk	45.7	1.5	47.2	48.0	-0.8
2.789	Pk	44.4	1.6	46.0	48.0	-2.0
2.901	Pk	41.8	1.6	43.4	48.0	-4.6
28.110	Pk	26.3	3.4	29.7	48.0	-18.3

HOT SIDE (Line 2)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B Limit (dBuV)	FCC B Margin (dBuV)
1.175	Pk	38.0	1.0	39.0	48.0	-9.0
2.352	Pk	42.0	1.3	43.3	48.0	-4.7
2.470	Pk	44.4	1.4	45.8	48.0	-2.2
2.564	Pk	45.8	1.4	47.2	48.0	-0.8
2.658	Pk	46.5	1.4	47.9	48.0	-0.1
2.746	Pk	46.0	1.4	47.4	48.0	-0.6
2.854	Pk	43.3	1.4	44.7	48.0	-3.3
24.800	Pk	16.3	3.7	20.0	48.0	-28.0

2.12 FCC PART 47 § 15.109: Radiated EMISSIONS

TABLE 7: Radiated EMISSIONS

Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
144.000	Qp	H	120	2.4	32.5	-16.9	15.6	43.5	-27.9
200.000	Qp	H	90	2.5	31.1	-17.8	13.3	43.5	-30.2
326.670	Qp	V	120	1.4	28.4	-12.7	15.7	46.0	-30.3
327.500	Qp	H	0	2.5	24.0	-12.1	11.9	46.0	-34.1
527.931	Qp	H	120	1.4	23.5	-7.7	15.8	46.0	-30.2
527.946	Qp	V	0	1.0	28.3	-7.6	20.7	46.0	-25.3
980.024	Qp	V	30	1.0	30.3	-2.5	27.8	54.0	-26.2

3.0 SYSTEM TEST CONFIGURATION

3.1 JUSTIFICATION

The EUT was tested in all three orthogonal planes in order to determine worst case emission. The EUT was investigated and tested from 9 kHz to the 10th harmonics.

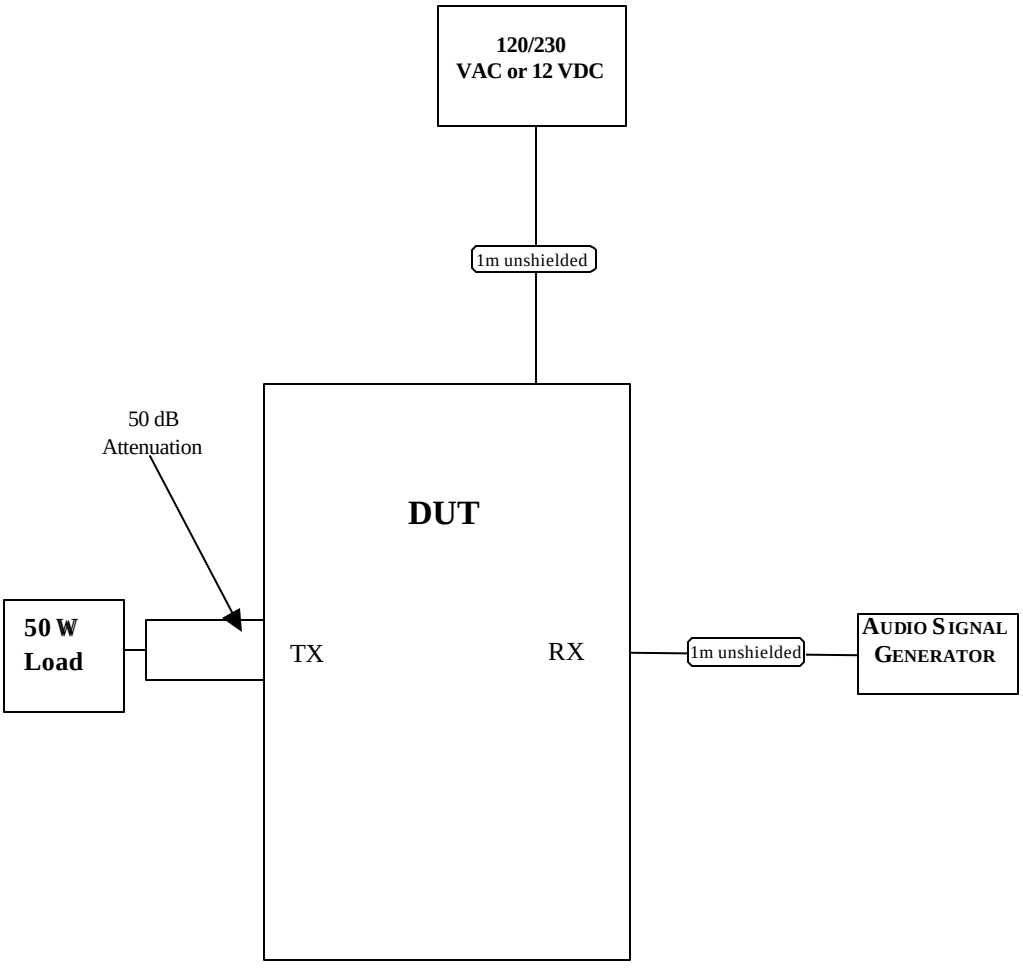
3.2 EUT EXERCISE DESCRIPTION

The EUT was exercised using external modulation into the RX port for repeater mode, or the front RJ-45 for the transceiver mode.

3.3 SPECIAL ACCESSORIES

N/A.

3.4 BLOCK DIAGRAM OF TESTED SYSTEM



APPENDIX A
TEST CONFIGURATION PICTURES

A1: EMISSIONS TEST PHOTOS

Conducted Line Emissions

Radiated Emissions

A2: TEST PHOTOS

Temperature Frequency Stability