Test Report (FRS Portion)

TEST PROCEDURES AND TEST SITE DESCRIPTION

DATE: November 14, 2005

FCC ID: AMWUT608
UNI-NO.: UT608ZH
MODEL: VHF250
DESCRIPTION: VHF MARINE WITH FRS RADIO

Tested by: Mr. Hiroshi Kambara, Uniden Engineering Dept.

MEASUREMENT ITEMS	Section No.
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NOTE: List of measurement equipment and test site description are included in this EXHIBIT.

1. DC Voltage & Current into Final Device 2.1033(C)(8)

To measure the DC Voltage and Current into Final Amplifying Device, the measuring equipment was connected to the actual P.C.Board of the transmitter.

FCC limits: Not specified

Test Results: Refer to test data

2. RF Output Power 2.1046 & 95.639

The unit was tuned-up in accordance with the alignment procedure stated in the EXHIBIT-6, and was loaded into a 50-ohm resistive termination. The unit was powered through its normally supplied power cable by a DC power supply. Power supply voltage was set to nominal voltage at the power supply terminals with the transmitter off.

The unit was operated for three consecutive test cycles of 15 minutes standby and 5 minutes in transmitting. At the end of the third 5 minutes period, the RF output power is measured. During the test, no components of the emission spectrum exceed the limit specified in the applicable rule part for occupied bandwidth or emission limitations.

FCC limits: 0.5 W ERP

Test Results: Refer to test data

3. Modulation Characteristics (Audio Roll-off) 2.1047

To measure the audio roll-off filter response, an audio frequency oscillator and AF VTVM were connected to the actual P.C.Board of the transmitter. AF VTVM and an oscilloscope monitored the output of the audio filter. An AF input level was maintained was maintained constant at least 10 dB below the saturation level at maximum response frequency. The measurement was made under the above conditions by varying the frequency between 1 kHz and 100 kHz.

FCC limits: 3 kHz - 20 kHz: $-60 \log_{10} (F/3)$ dB

Test Results: Refer to test data

4. Modulation Characteristics (Audio Frequency Response) 2.1047

The audio frequency response was measured in accordance with TIA/EIA Specification 603. Operate the unit under the standard test conditions and monitor the output with a modulation or a calibrated test receiver.
The input required to produce 30 percent modulation level was measured.

5. Modulation Characteristics (Modulation Limiting) 2.1047 & 95.637(a)

The transmitter shall be adjusted for full rated system deviation, 1000 Hz and reference it as 0dB input. With modulation frequencies of 300, 1000 and 3000 Hz respectively, vary the audio input to a level 20dB above that required at 100 Hz to produce 60% of rated system deviation. This is required for both up to and down modulation. Record the percent of full system deviation obtained as a function of input level.

FCC limits: +/-2.5 kHz deviation

Test Results: Refer to test data

6. Occupied Bandwidth 2.1049(c)(1) & 95.635(b)(1)(3)(7)

The spectrum of the modulated carrier was monitored by a panoramic method capable of 60dB amplitude range. The unit was modulated with a 2500 Hz audio signal at an input level 16dB above that required for 50% of maximum system deviation.

In case the 100Hz of CTCSS tone or 100 bps of digital coded data modulation is indicated for this transmitter, a representative measurement data for this operation is also presented.

Since the total deviation of the unit is designed as 4.7 kHz Div., the deviation of 2500Hz audio signal was set to 3.7 kHz Div., as the maximum deviation of tone or digital coded signal was continuously set to 1.0 kHz Div.

At first, tone or digital signal was disabled and set the 2500 Hz audio signal to 1.85 kHz deviation (= 50% of 3.7 kHz deviation). Then, the input level of 2500Hz audio signal was increased by 16dB. In this condition, the tone or digital coded signal was then enabled and imposed with 2500Hz audio signal.

FCC limits: a) -25dB (50 - 100% of assigned frequency)
b) -35dB (100 - 250% of assigned frequency)
c) $43 + 10\log_{10}$ (RF output power in Watts) dB

or 80dB, whichever is lesser attenuation
for more than 250% of assigned frequency

Test Results: Refer to test data

7. Spurious & Harmonic Emission at Antenna Terminal 2.1051

Spurious radiation are the radio frequency voltage or power generated within the equipment and appearing at the equipment's output terminals when properly loaded with its characteristic non-radiating load.

The unit was modulated with a 2500 Hz tone at an input level 16dB greater than that required 50% modulation. The spectrum was scanned from the lowest frequency generated in the equipment to the tenth harmonic of the carrier.
FCC limits: $43 + 10\log_{10}$ (RF output power in Watts) dB

Test Results: Refer to test data.

8. Field Strength of Spurious & Harmonic Radiation 2.1053

Measurement Procedure & Test Site Description

Field strength measurements of radiated spurious emissions were made on a 3-meter range maintained by Uniden Corporation in Japan. Complete description and measurement data of this test site have been placed on file with the Commission. The equipment was scanned for radiated emissions in a scheduled enclosure prior to open field testing.

For each spurious or harmonic frequency, the antenna was raised and lowered to obtain a maximum reading on the Spectrum Analyzer with antenna horizontally polarized. Then the turntable, on which the equipment under test was placed, was rotated a minimum of 360 degree to further increase the reading on the Spectrum Analyzer. This procedure was repeated with the antenna vertically polarized.

FCC limits: $43 + 10\log_{10}$ (RF output power in Watts) dB

Test Results: Refer to test data

9. Frequency Stability (Temperature) 2.1055(a)(2)

Frequency measurement was performed at the extremes of throughout the range -20 °C to +50 °C (-30 °C to +50 °C for GMRS) and at intervals of not more than 10 degrees C throughout the range. A period of time sufficient to stabilize all of the components in the equipment was allowed prior to frequency measurement.

The frequency of the unit was measured by extracting a sample of the carrier and measuring its center frequency by equipment having a degree accuracy at least 10 times that of the minimum to be measured.

FCC limits: 0.00025%, 2.5 ppm for FRS

Test Results: Refer to test data

10. Frequency Stability (Voltage) 2.1055(a)(2)

Frequency measurement was performed at the extremes of throughout the range 85% and 115% of the nominal voltage. Extracting a sample of the carrier and measuring its center frequency by equipment having degree accuracy at least 10 times that of the minimum to be measured measured the frequency of the unit.

FCC limits: 0.00025%, 2.5 ppm for FRS

Test Results: Refer to test data

1. DC Voltage & Current into Final Device 2.1033(C)(8)

FRS

0.5W POWER MODE		TX FINAL TRANSISTOR	
MEASURED FREQUENCY (MHz)	POWER (ERP) (Watts)	COLLECTOR VOLTAGE (V)	COLLECTOR CURRENT(A)
462.5625	0.34	7.5	0.71
467.7125	0.30	7.5	0.62

Note: ERP was measured based on substitution method using with standard dipole antenna.

2. RF Output Power -- ERP 2.1046

1)Li-ion BATTERY

MEASURED FREQUENCY (MHz)	POWER (ERP) (Watts)
462.5625	0.34
467.7125	0.30

*Li-ion Battery Voltage: 7.5V
(The state which carried out 5W continuation transmission for 9 minutes from the full charge battery.)

2)ALKALINE BATTERY

MEASURED FREQUENCY (MHz)	POWER (ERP) (Watts)
462.5625	0.26
467.7125	0.24

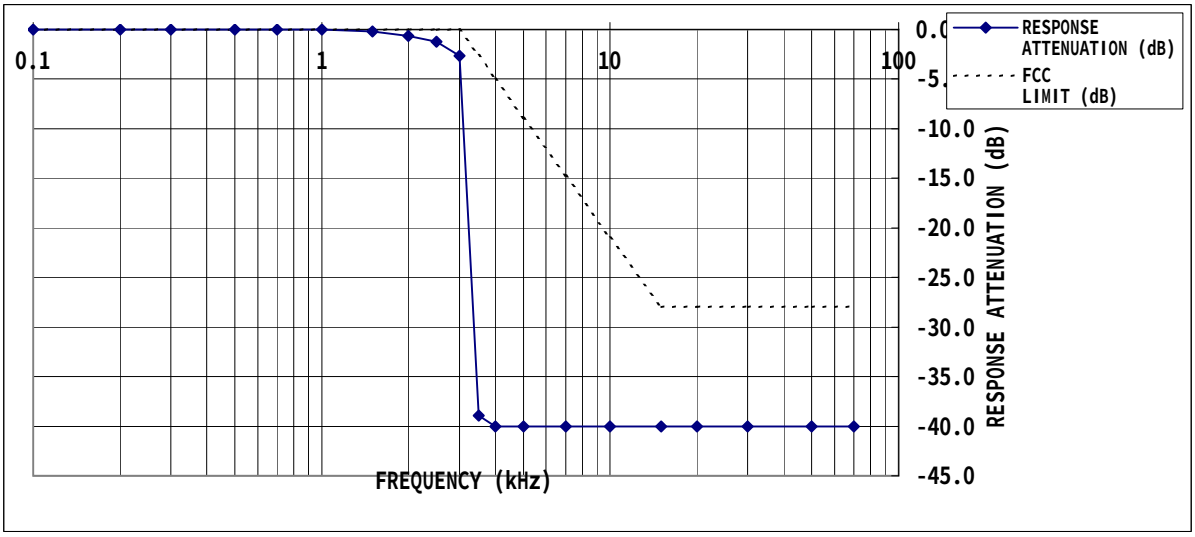
*Alkaline Battery Voltage:6.0V (new state)

Note: ERP was measured based on substitution method using with standard dipole antenna.

3. MODULATION CHARACTERISTICS (AUDIO ROLL-OFF RESPONSE) 2.987

CARRIER FREQUENCY: 156.80 MHz
OUTPUT POWER: 1 WATTS

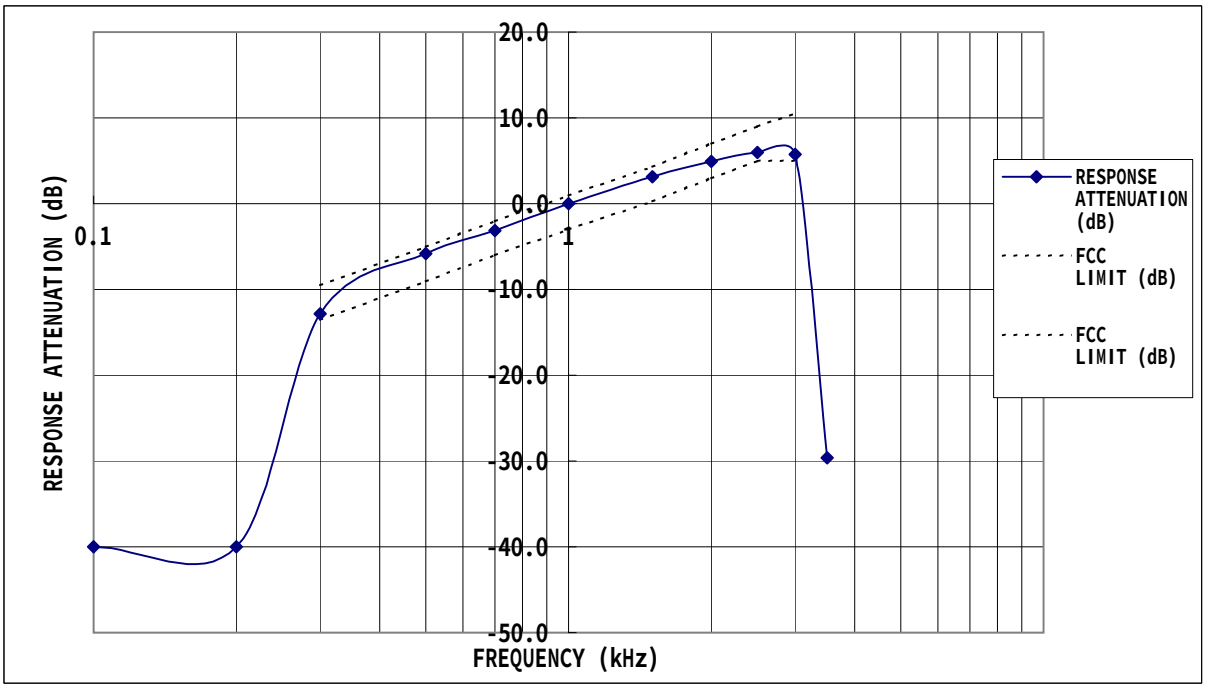
AUDIO FREQUENCY (kHz)	RESPONSE ATTENUATION (dB)	FCC LIMIT (dB)
0.1	0.0	--
0.2	0.0	--
0.3	0.0	--
0.5	0.0	--
0.7	0.0	--
1	0.0	--
1.5	-0.2	--
2	-0.6	--
2.5	-1.2	--
3	-2.7	0.0
3.5	-38.9	-2.6
4	-40.0	-5.0
5	-40.0	-8.9
7	-40.0	-14.7
10	-40.0	-21.0
15	-40.0	-28.0
20	-40.0	-28.0
30	-40.0	-28.0
50	-40.0	-28.0
70	-40.0	-28.0



4. MODULATION CHARACTERISTICS (AUDIO FREQUENCY RESPONSE) 2.1047

CARRIER FREQUENCY: 156.80 MHz
OUTPUT POWER: 1 WATTS

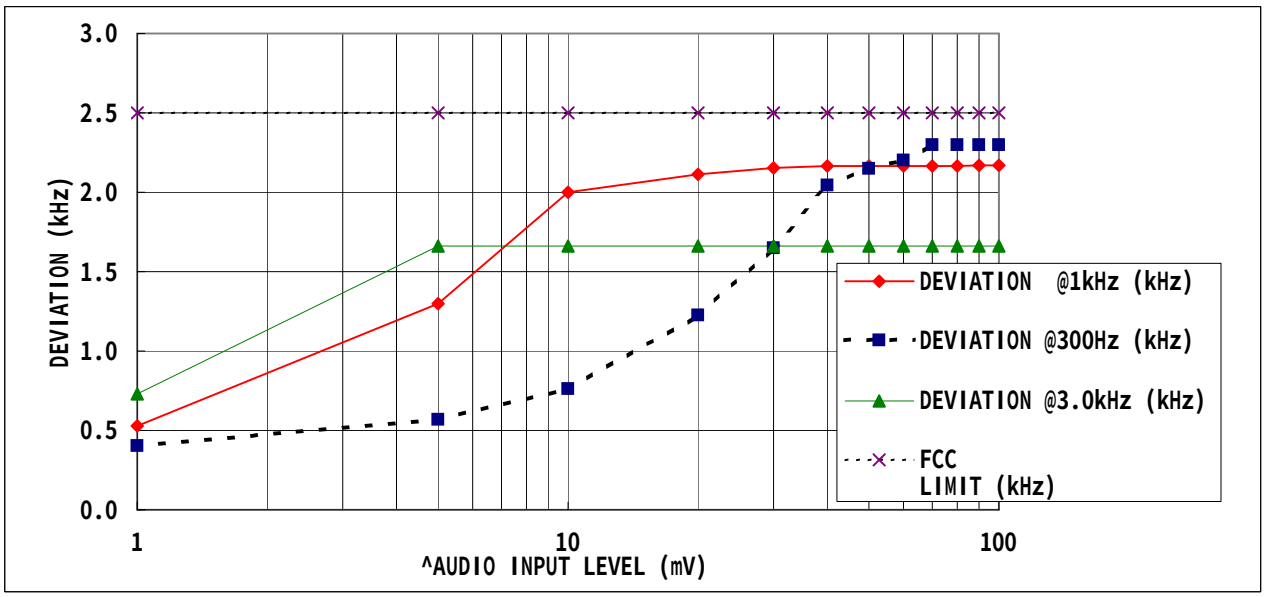
AUDIO FREQUENCY			
(kHz)			
0.1			
0.2			
0.3			



5. MODULATION CHARACTERISTICS (MODULATION LIMITING) 2.1047

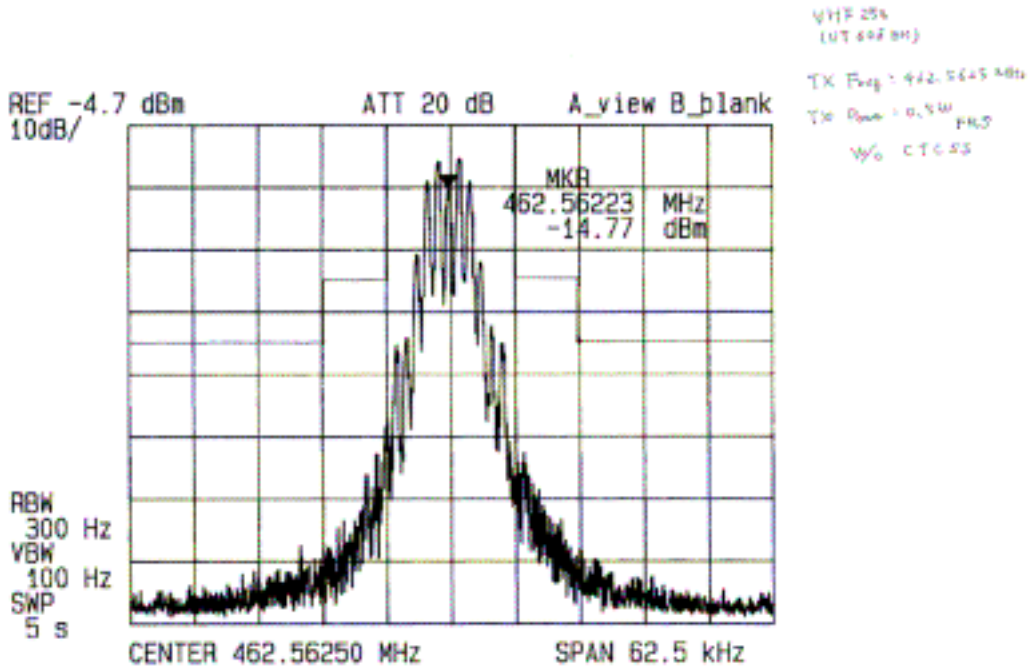
CARRIER FREQUENCY: 467.5625 MHz
OUTPUT POWER: 0.5 WATTS
MODULATUIN AUDIO+CTCSS (167.9Hz)

AUDIO INPUT LEVEL (mV)	DEVIATION @1kHz (kHz)	DEVIATION @300Hz (kHz)	DEVIATION @3.0kHz (kHz)	FCC LIMIT (kHz)
1	0.5	0.4	0.7	2.5
5	1.3	0.6	1.7	2.5
10	2.0	0.8	1.7	2.5
20	2.1	1.2	1.7	2.5
30	2.2	1.6	1.7	2.5
40	2.2	2.0	1.7	2.5
50	2.2	2.1	1.7	2.5
60	2.2	2.2	1.7	2.5
70	2.2	2.3	1.7	2.5
80	2.2	2.3	1.7	2.5
90	2.2	2.3	1.7	2.5
100	2.2	2.3	1.7	2.5

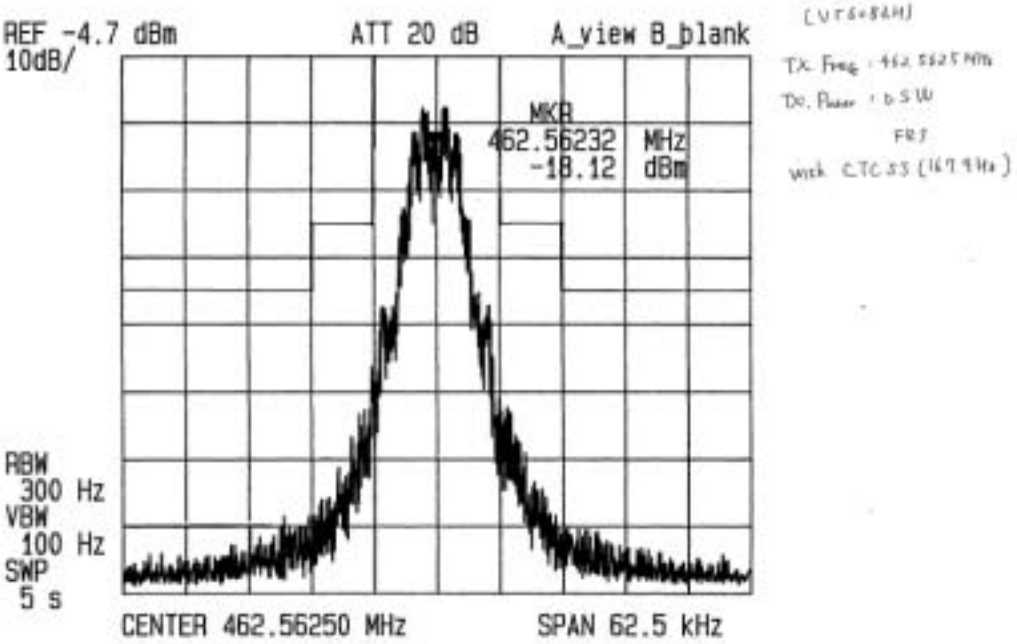


6. OCCUPIED BANDWIDTH 2.1049(c)(1)

FRS MODE: W/O CTCSS



FRS MODE: W/H CTCSS



7. SPURIOUS & HARMONICS EMISSION AT ANTENNA TERMINAL 2.1051

1) TX: FRS

Harmonics of Carrier	462.5625MHz [dBc]	467.7125MHz [dBc]
1	-	-
2	-56.8	-54.1
3	-67.8	-62.0
4	less than -85	less than -85
5	less than -85	less than -85
6	less than -85	less than -85
7	less than -85	less than -85
8	less than -85	less than -85
9	less than -85	less than -85
10	less than -85	less than -85

2) RX: FRS

CONDUCTED	462.5625-38.25MHz [dBm]	467.7125-38.25MHz [dBm]
1	-62.8	-62.3
2	-84.8	less than -90
3	-81.9	-74.1
4	-83.3	less than -90
5	less than -90	less than -90
6	-78.3	-78.0
7	less than -90	less than -90
8	less than -90	less than -90
9	less than -90	less than -90
10	less than -90	less than -90

3) RX: AIR BAND

CONDUCTED	108.0-38.25MHz [dBm]	137.0-38.25MHz [dBm]
1	-75.50	-67.02
2	-69.47	-68.52
3	-79.55	-76.60
4	-89.60	-81.57
5	-88.57	-82.40
6	-84.87	less than -90
7	less than -90	less than -90
8	less than -90	less than -90
9	less than -90	less than -90
10	less than -90	less than -90

4) RX: WIDE FM

CONDUCTED	87.9-10.8MHz [dBm]	107.9-10.8MHz [dBm]
1	-71.00	-66.07
2	-68.50	-66.32
3	-89.60	-77.42
4	-86.35	-81.52
5	-83.27	-83.55
6	-80.57	less than -90
7	less than -90	less than -90
8	less than -90	less than -90
9	less than -90	less than -90
10	less than -90	less than -90

5) RX: AM

CONDUCTED	0.5+38.25MHz [dBm]	1.8+38.25MHz [dBm]
1	-66.33	-68.33
2	-71.00	-70.67
3	-78.50	-81.50
4	-77.33	-75.33
5	-85.67	less than -90
6	-81.50	-80.33
7	less than -90	less than -90
8	-88.00	-84.00
9	less than -90	less than -90
10	less than -90	less than -90

8. FIELD STRENGTH OF SPURIOUS & HARMONICS RADIATION

2.1053 & 95.635(b) (7)

*Ni-MH BATTERY

1) Frequency at which tuned: 462.5625 MHz

EMISSIONS (MHz)	DUT, PLACED V/H	ANT, POLARITY V/H	ATTENUATION (dBc)	FCC LIMIT (dBc)	MARGIN (dB)
FULL POWER: 0.5 WATTS					
925.125	H	H	39.0	33.9	5.1
1387.688	-	-	-	33.9	>20
1850.250	-	-	-	33.9	>20

2) Frequency at which tuned: 467.7125 MHz

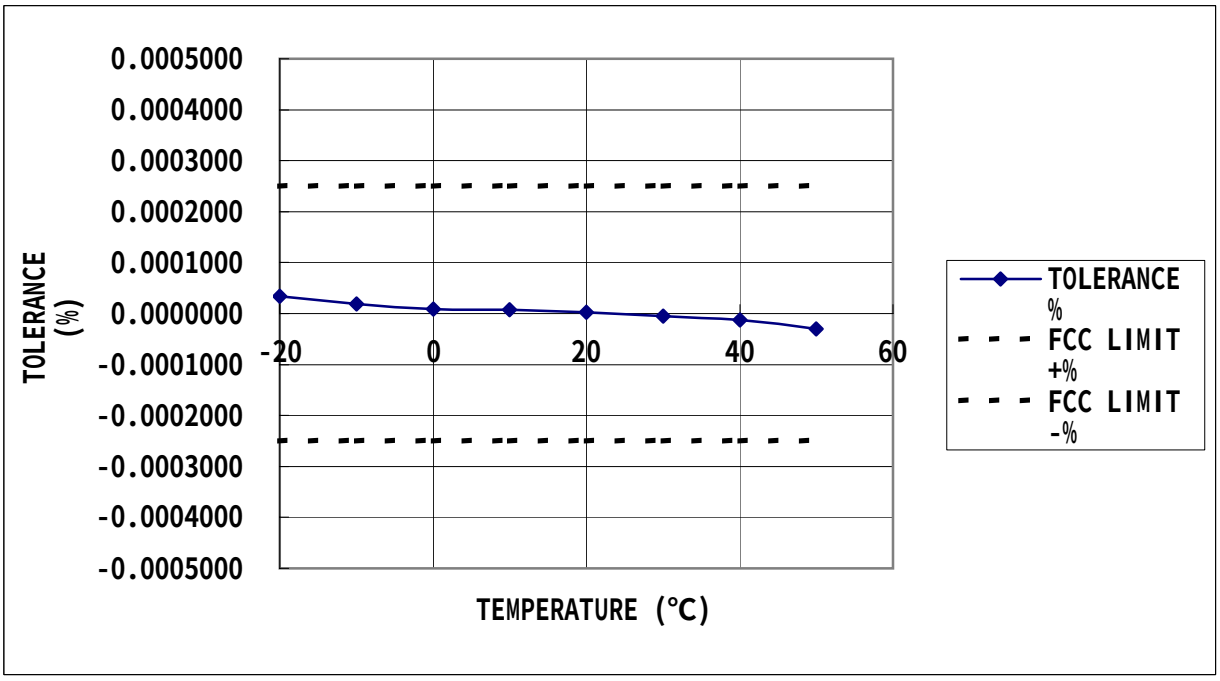
EMISSIONS (MHz)	DUT, PLACED V/H	ANT, POLARITY V/H	ATTENUATION (dBc)	FCC LIMIT (dBc)	MARGIN (dB)
FULL POWER: 0.5 WATTS					
935.425	H	H	37.9	33.9	4.0
1403.138	-	-	-	33.9	>20
1870.850	-	-	-	33.9	>20

Note: All spurious emissions note reported were attenuated by at least 20 dB below the FCC limit.

9. FREQUENCY STABILITY (TEMPERATURE RANGE) 2.1055

CENTER FREQUENCY : 467.5625 MHz

TEMPERATURE	FREQ.	TOLERANCE		FCC LIMIT	
℃	MHz	Hz	%	+%	-%
-20	467.56266	161	0.0000344	0.00025	-0.00025
-10	467.56259	91	0.0000195	0.00025	-0.00025
0	467.56254	42	0.0000090	0.00025	-0.00025
10	467.56253	34	0.0000073	0.00025	-0.00025
20	467.56251	12	0.0000026	0.00025	-0.00025
30	467.56248	-22	-0.0000047	0.00025	-0.00025
40	467.56244	-56	-0.0000120	0.00025	-0.00025
50	467.56236	-140	-0.0000299	0.00025	-0.00025

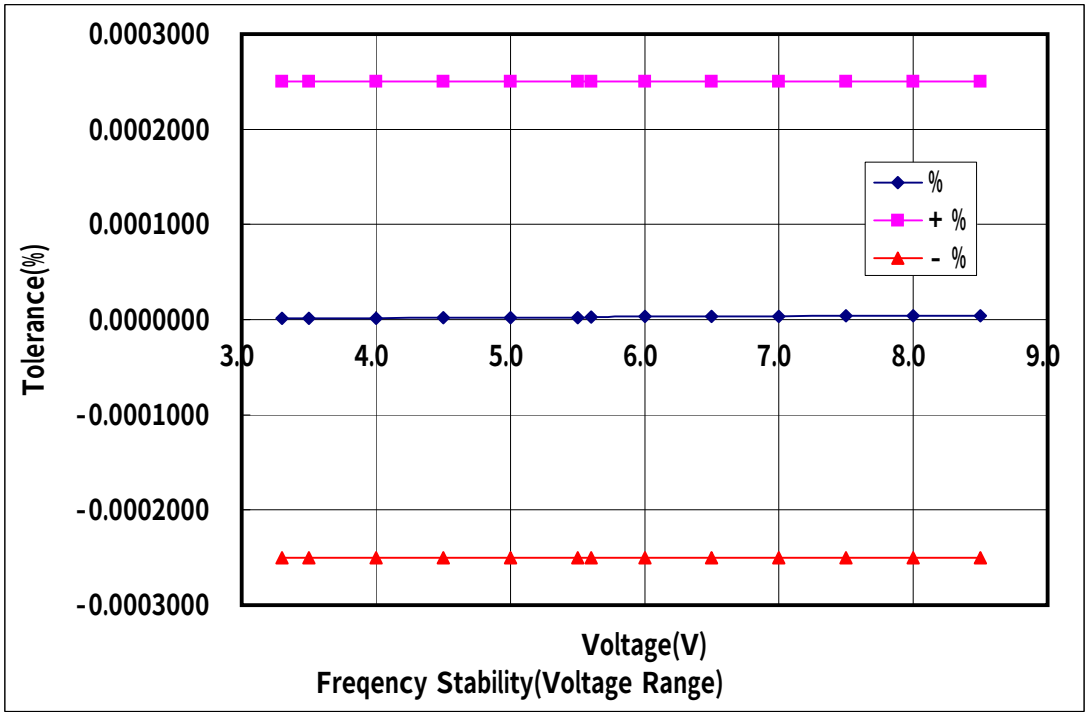


10. FREQUENCY STABILITY (VOLTAGE RANGE) 2.1055

CENTER FREQUENCY : 467.5625 MHz

VOLTAGE	FREQ.	TOLERANCE		FCC LIMIT	
(V)	MHz	Hz	%	+ %	- %
3.3	467.56251	6	0.0000013	0.00025	-0.00025
3.5	467.56251	6	0.0000013	0.00025	-0.00025
4.0	467.56251	7	0.0000015	0.00025	-0.00025
4.5	467.56251	9	0.0000019	0.00025	-0.00025
5.0	467.56251	10	0.0000021	0.00025	-0.00025
5.5	467.56251	10	0.0000021	0.00025	-0.00025
5.6	467.56251	14	0.0000030	0.00025	-0.00025
6.0	467.56252	15	0.0000032	0.00025	-0.00025
6.5	467.56252	17	0.0000036	0.00025	-0.00025
7.0	467.56252	16	0.0000034	0.00025	-0.00025
7.5	467.56252	18	0.0000038	0.00025	-0.00025
8.0	467.56252	19	0.0000041	0.00025	-0.00025
8.5	467.56252	19	0.0000041	0.00025	-0.00025

*Battery end point(Li-ion Battery) : 5.6V
*Battery end point(Alkaline Battery) : 3.3V



LIST OF MEASUREMENT EQUIPMENTS

ENG-NO	TEST EQUIPMENT	TYPE	MFR	SERIAL NO.	Last Calibrtation
1287	AMPLIFIER	AFS30010040020	MITEQ	138315	N/A
2022	MICROWAVE PREAMPLIFIER	8349B	ADVANTEST	3205A04450	N/A
1294	ANTENNA(BILOG)	CBL6112A	CHASE	2350	N/A
1602	ANTENNA(DIPOLE)	3120-B1	EMCO	0075	11-Jul-03
1603	ANTENNA(DIPOLE)	3120-B2	EMCO	0076	11-Jul-03
1604	ANTENNA(DIPOLE)	3120-B3	EMCO	0076	11-Jul-03
1560	ANTENNA(HORN)(18GHz)	3115	EMCO	2167	N/A
N/A	ANTENNA(HORN)(24GHz)	94287.24	NIPPON KOSYUHA	60.1	N/A
1388	LISN	KNW407	KYOURITSU	8-833-21	N/A
0682	POWER SUPPLY	AA300	TAKASAGO	31783013	N/A
0857	SPECTRUM ANALYZER (13GHz)	E7400A	AGILENT	US40240145	20-Jun-05
0205	SPECTRUM ANALYZER (8.4GHz)	R3265	ADVANTEST	25060158	N/A
1008	SPECTRUM ANALYZER (40GHz)	8564E	ADVANTEST	3425A00182	18-Apr-05