

Test Report

TEST PROCEDURES AND TEST SITE DESCRIPTION

MEASUREMENT ITEMS

- 5-1 Field Strength of Spurious Radiated Emission
- 5-2 Power Line Conducted Emissions

NOTE: Measurements in Scan Mode vs. Non-Scan Mode

The measurement data reported in the original file represented a non-scan mode for both of power line conducted emission and spurious radiated emission because no emission level exceeded that of the levels in the scan mode.

In scan mode, the receiver only stays at a particular frequency for as short as 20 ms in certain channels as the scanning interval may change depending on the number of the memorized channels. This means that true emission levels may change along with the number of the memorized channels in the scanning mode due to changes in the duty cycle of the emission level.

Therefore, we measured the device where each memorized channel was scanned for 3 different points of frequencies in each receiver coverage range as shown in the original file and we confirm that no emission level exceeds the level reported from the ones measured in the non-scan mode.

5-1 Field Strength of Spurious Radiated Emission

Test Procedure:

The measurements were performed in accordance with the ANSI C63.4-1992. Field Strength measurements of radiated spurious emissions were made at the open test site of 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 radio frequency spectrum was scanned in the range of 30 MHz to 10 GHz in accordance with the section 15.33(b) of the FCC Rules. The frequency below 1 GHz, the measurement was carried out by using CISPR quasi-peak detector, Rohde Schwartz EUS-2 Test Receiver or the Spectrum Analyzer in accordance with the sections 15.33(a) and 15.35(a). The frequency above 1 GHz, the measurement was carried out by using the Hewlett Packard 8566B Spectrum Analyzer in accordance with the section 15.35(b).

A bilog antenna CBL6111 was used to cover the range from 30 MHz to 1000 MHz. Narrowband tuned dipole antennas were used over the entire 25 to 1000 MHz range for precision measurements of field strength. Above 1000 MHz, a horn antenna was used.

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 degrees to further increase the reading on the Spectrum Analyzer. This procedure was repeated with the antenna vertically polarized. The unit under test was placed in its normal operating position on a turntable approximately 1 meter in height, with a normal power lead.

In order to convert the measured emission levels into field strength in dBuV/m, the actual field strength (E_f) is determined by algebraically adding the measured emission level (E_m) and the antenna correction factor (ACF) including the cable loss at the appropriate frequency.

$$E_f [\text{dBuV/m}] = E_m [\text{dBuV/m}] + \text{ACF} [\text{dB}]$$

FCC Limits:

Frequency	Field Strength at 3 meter	
30 - 88 MHz	40 dBuV/m	(100 uV/m)
88 - 216 MHz	43.5 dBuV/m	(150 uV/m)
216 - 960 MHz	46 dBuV/m	(200 uV/m)
Above 960 MHz	54 dBuV/m	(500 uV/m)

Test Results: Refer to the attached test reports. All emissions not reported were more than 20 dB below the limits.

5-2 Power Line Conducted Emissions

Test Procedure:

The measurements were performed in accordance with the ANSI C63.4-1992. During the measurements, a standard voltage source is fed into the unit under test through a power line impedance stabilization network.

FCC Limit:

The radio frequency voltage that is conducted back into the AC power line on any frequencies within the band from 450kHz to 30MHz shall not exceed 250uV (48 dBuV).

Test Results: Refer to the attached test reports. All emissions not reported were more than 20 dB below the limits.

5-1 Test Result: Field Strength of Radiated Emissions

Tuned Frequency (MHz)	Emission Frequency (MHz)	Measured Level (dBuV)	Pol.	ACF (dB)	Field Strength (dBuV/m)	FCC Limit (dBuV/m)	MARGIN (dB)
(1) Test Results (29.000 - 54.000 MHz Band)							
30.050	51.450	12.2	V	9.7	21.9	40.0	18.1
40.840	62.240	11.6	V	7.5	19.1	40.0	20.9
49.900	427.800	6.6	V	21.3	27.9	46.0	18.1
(2) Test Results (137.000 - 174.000 MHz Band)							
138.150	116.750	13.4	V	12.7	26.1	43.5	17.4
	350.250	12.7	V	18.5	31.2	46.0	14.8
	467.000	14.1	H	21.6	35.7	46.0	10.3
	583.750	6.5	V	26.0	32.5	46.0	13.5
	700.500	3.7	V	25.6	29.3	46.0	16.7
162.400	141.000	16.9	V	12.5	29.4	43.5	14.1
	423.000	20.8	V	21.0	41.8	46.0	4.2
	564.000	13.2	V	24.5	37.7	46.0	8.3
	705.000	8.9	V	25.5	34.4	46.0	11.6
	846.000	11.9	V	27.0	38.9	46.0	7.1
	987.000	6.1	V	30.5	36.6	54.0	17.4
173.225	151.825	19.2	V	12.7	31.9	43.5	11.6
	303.650	14.4	V	17.5	31.9	46.0	14.1
	455.475	21.4	V	21.0	42.4	46.0	3.6
	607.300	6.2	H	26.3	32.5	46.0	13.5
	759.125	12.0	V	25.0	37.0	46.0	9.0
	910.950	16.6	V	27.8	44.4	54.0	9.6
(3) Test Results (406.000 - 512.000 MHz Band)							
406.875	128.492	18.7	V	12.6	31.3	43.5	12.2
	256.983	19.1	V	14.7	33.8	46.0	12.2
	385.475	18.7	V	20.3	39.0	46.0	7.0
	513.967	11.6	V	23.5	35.1	46.0	10.9
	770.950	10.0	V	26.0	36.0	46.0	10.0
453.250	143.950	20.1	V	12.5	32.6	43.5	10.9
	287.900	12.7	V	17.3	30.0	46.0	16.0
	431.850	17.3	V	21.0	38.3	46.0	7.7
	575.800	11.2	V	24.5	35.7	46.0	10.3
	719.750	13.5	V	24.8	38.3	46.0	7.7
	863.700	6.1	V	27.0	33.1	46.0	12.9
	1295.550	1.8	H	33.5	35.3	54.0	18.7
511.913	163.504	23.3	V	12.5	35.8	43.5	7.7
	327.008	19.0	V	18.0	37.0	46.0	9.0
	490.513	12.7	H	23.3	36.0	46.0	10.0
	654.017	8.1	V	25.0	33.1	46.0	12.9
	817.521	8.9	V	26.8	35.7	46.0	10.3
	981.025	12.1	V	31.0	43.1	54.0	10.9

Note: Other emissions not reported were more than 20dB below the FCC limits.

5-2 Test Result: Power Line Conducted Emissions

Tuned Frequency (MHz)	Emission Frequency (MHz)	Measured Level (dBuV)
NO EMISSIONS EXCEED 20dB BELOW THE FCC LIMIT. (See attached example for 40.84MHz reception.)		

All emissions not reported were more than 20 dB below the limit.

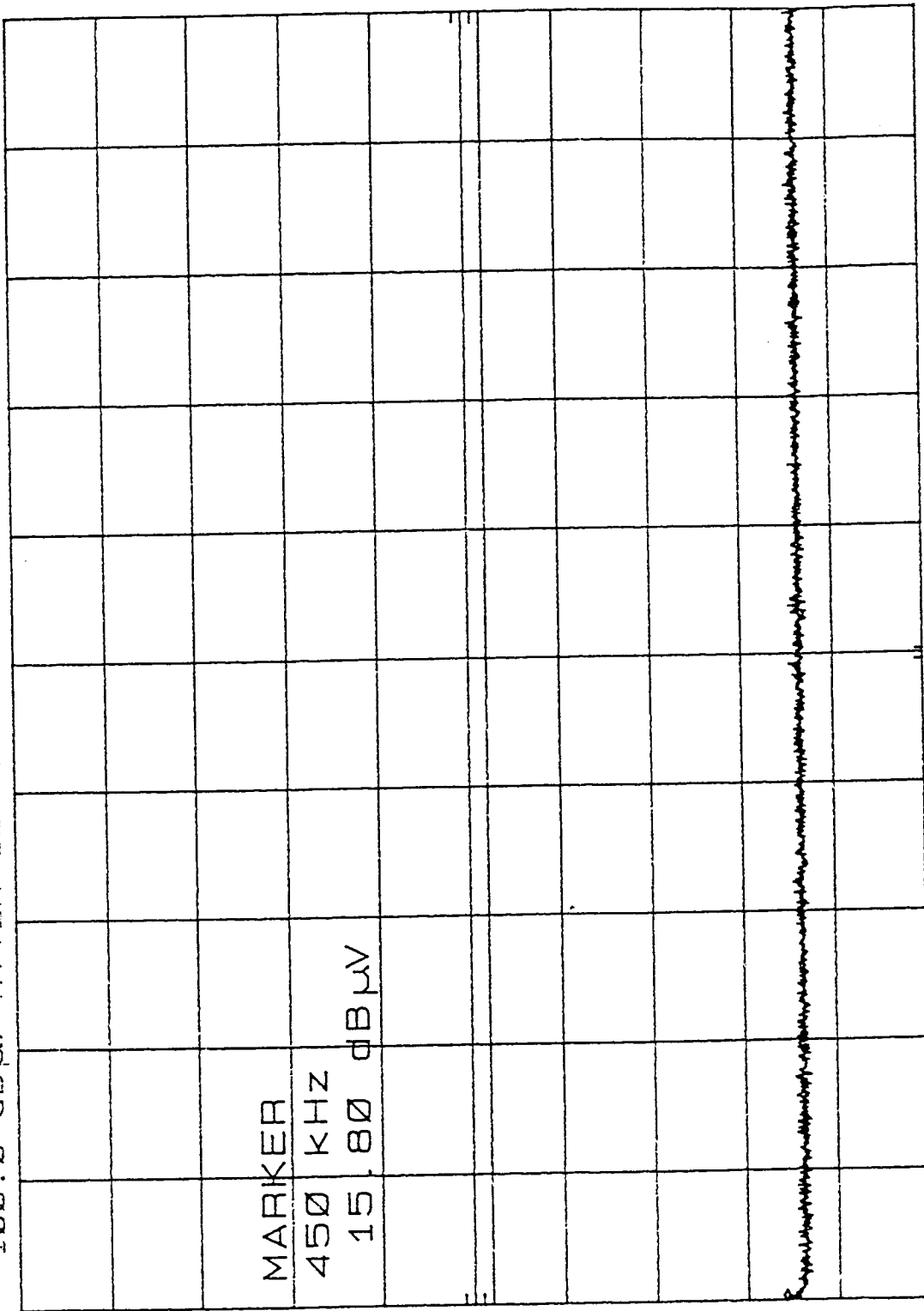
01-21-99 EUT: UB298Z AC LINE 40.840MHZ
REF 100.0 dBμV ATTN 10 dB

MARKER 450 KHZ
15.80 dBμV

START 450 KHZ
RES BW 30 KHZ

STOP 30.0 MHZ
SWP 8.87 sec

10 dB/



LIST OF MEASUREMENT EQUIPMENTS

ENG-NO	TEST EQUIPMENT	TYPE	MFR	SERIAL NO.	CATEGORY	CODE
0271	SPECTRUM ANALYZER	R3361A	ADVANTEST	91730373	2171	5
1388	LISN	KNW407	KYOURITSU	8-833-21		4
1287	AMPLIFIER	AFS30010040020	MITEQ	138315	2171	D
1294	ANTENNA (BILOG)	CBL6111	CHASE	1057	2121	D
1305	SPECTRUM ANALYZER	8566B	HP	2504A01433	2171	D
1306	SPECTRUM ANALYZER DISPLAY	85662A	HP	2403A09044	2171	D
1602	ANTENNA (DIPOLE)	3120-B1	EMCO	0075		D
1603	ANTENNA (DIPOLE)	3120-B2	EMCO	0076		D
1604	ANTENNA (DIPOLE)	3120-B3	EMCO	0076		D