

FCC APPLICATION FOR CERTIFICATION

FOR

Good Mind Industries Co., Ltd.

22, Ta Yeou 2 Street, Ta Fa Industrial District, Ta Liao Shi,
Kaohsiung Hsien, Taiwan, R.O.C.

FCC ID.:C2S3688

July, 1998

Submitted to:

Federal Communications Commission

EQUIPMENT APPROVAL SERVICES

P.O. BOX 358315

Pittsburgh, PA 15251-3315

LIST OF EXHIBITS

Form 731

Title Page

List of Exhibits

Letter of Authorization

Exhibit A - Technical Report, Diagram

Exhibit B - Photographs

Exhibit C - Measurement Report

Exhibit D - Equipment ID Label

Exhibit E - User's Manual

Exhibit C

Measurement Rerort

Good Mind Industries Co., Ltd.

FCC ID.:C2S3688

CATV CONVERTER

FCC Part 15 Subpart B EMI TEST REPORT of

E.U.T. : CATV Converter

MODEL : 3688

FCC ID. : C2S3688

for

APPLICANT : GOOD MIND INDUSTRIES CO., LTD.

**ADDRESS : 22, TA YEOU 2 STREET, TA FA INDUSTRIAL
DISTRICT, TA LIAU HSI, KAOHSIUNG HSIEN,
TAIWAN, R.O.C.**

Test Performed by

**ELECTRONICS TESTING CENTER, TAIWAN
NO. 8 LANE 29, WENMING ROAD,
LOSHAN TSUN, KWEISHAN HSIANG,
TAOYUAN, TAIWAN, R.O.C.**

Tel:(03)3280026-32

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Report Number : ET87R-05-067

TEST REPORT NOTIFICATION

Applicant : GOOD MIND INDUSTRIES CO., LTD.
22, TA YEOU 2 STREET, TA FA INDUSTRIAL DISTRICT,
TA LIAU HSI, KAOHSIUNG HSIEN, TAIWAN, R.O.C.

Manufacturer : GOOD MIND ELECTRONICS (SHEN ZHEN) CO., LTD.
TUNG FANG INDUSTRIAL DISTRICT, SUNG KANG ZHEN,
BAO AN AREA SHEN ZHEN, CHINA.

Description of EUT :

a) Type of EUT : CATV Converter

b) Trade Name : GMI

c) Model No. : 3688

d) Power Supply : 120VAC, 60Hz, 16W

Regulation Applied : FCC Rules and Regulations Part 15 Subpart B (1993)

I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in ANSI C63.4, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relate only to the item tested.
2. The testing report shall not be reproduced expect in full, without the written approval of ETC.

Issued Date : JUL. 17, 1998

Test Engineer : Tien Lu Liao
(Tien Lu Liao)

Approve & Authorized Signer :

Will Yauo
Will Yauo, Supervisor
EMI Test Site of ELECTRONICS
TESTING CENTER, TAIWAN

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1 GENERAL INFORMATION

1.1 Product Description

- a) Type of EUT : CATV Converter
- b) Trade Name : GMI
- c) Model No. : 3688
- d) Power Supply : 120VAC, 60Hz, 16W

1.2 Characteristics of Device

The CATV Converter is intended for reception of CATV transmission. It performs a heterodyne conversion from a CATV channel to the out channel. The Video and Aural Signals have nominal 3 mV /75 Ohm output in NTSC format on channel 3 or 4.

1.3 Test Methodology

For CATV converter, both conducted, radiated, conducted RF output signal and spurious level and transfer switch isolation testing were performed according to the procedures in section 12.2 of ANSI C63.4(1992).

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the roof top of Building at No.34, 5 Lirn, Din Fu Tsun, Lin Kou, Taipei, Taiwan, R.O.C.

This site has been fully described in a report submitted to your office, and accepted in a letter dated Feb. 10 , 1997.

2 LIMITATIONS AND LABELING REQUIREMENT

2.1 Definition

Unintentional radiator:

A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:

A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :

A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business or industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

2.2 Limitation

(1) Conducted Emission Limits :

Class A Line Conducted Emission Limits :

Frequency MHz	Emissions μV	Emissions dB μV
0.45 - 1.705	1000	60.0
1.705 - 30.0	3000	69.5

Class B Line Conducted Emission Limits :

Frequency MHz	Emissions μ V	Emissions dB μ V
0.45 - 30.0	250	48.0

(2) Radiated Emission Limits :

According to 15.109 ,Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Class A Radiated Emission Limits :

Frequency MHz	Distance Meters	Radiated dB μ V/m	Radiated μ V/m
30 - 88	10	39.0	90
88 - 216	10	43.5	150
216 - 960	10	46.4	210
above 960	10	49.5	300

Class B Radiated Emission Limits :

Frequency MHz	Distance Meters	Radiated dB μ V/m	Radiated μ V/m
30 - 88	3	40.0	100
88 - 216	3	43.5	150
216 - 960	3	46.0	200
above 960	3	54.0	500

2.3 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.4 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in EUT is working.

The EUT was rotated to obtain the maximum level of radiated emissions .The antenna was varied in height above ground to obtain the maximum signal strength. The antenna height was varied from 1 to 4 meters.

3.2 Device for Tested System

Device	Manufacture	Model / FCC ID.	Description
CATV Converter*	Good Mind Co.	3688	1.8m Unshielded AC Power Cord
		N/A	1.1m Unshielded AV Cable
			1.5m Unshielded TV Cable × 2
TV	Action Co.	N/A	1.8m Unshielded AC Power Cord
		N/A	
Color TV Pattern	PHILIPS	PM5418 TDS2	1.8m Unshielded AC Power Cord
Generator		N/A	1.5m Unshielded Coaxial Cable

Remark “*” means equipment under test.

4 RADIATED EMISSION MEASUREMENT

4.1 Description for Radiated Emission Measured

According to § 15.33 (b), radiated emission frequency was measured from 30 MHz to 5GHz.

The field strength measurements of the receiver under test which was placed on an wooden turntable 0.8 meter in height. The receiving antenna polarized horizontally was varied from 1 to 4 meters and the wooden turntable was rotated through 360 degrees to obtain the highest reading on the field strength meter or on the display of the spectrum analyzer. And also, each emission was to be maximized by changing the orientation of the equipment under test. These measurements were repeated with the receiving antenna polarized vertically.

For CATV converter, it was operated with a appropriate RF signal of 25 dBmV applied to the RF input terminal.

According to FCC rule, for device submitted for notification in this report, the limit below 1 GHz is quasi peak and above 1 GHz is both peak and average applied. It is considered that the emission level is also in compliance with average limit when the measurement with peak function meets average limit. *All data listed in this section is derived with peak function detector.*

The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, the limit , and margin. Explanation of the Correction Factor is given in paragraph 4.3.

4.2 Radiated Emission Data

4.2.1 CATV Portion

Operation Mode : Normal

Test Date : JUL. 06, 1997

Temperature : 30 °C

Humidity: 50%

A. Fundamental Frequency

Tuned Frequency (MHz)	Radiated Frequency (MHz)	Meter Reading (dBuV)		Corrected Factor (dB)	Max. Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		H	V				
73.25	119.00	36.5	40.3	-11.2	29.1	43.5	-14.4
91.25	137.00	36.6	39.8	-11.1	28.7	43.5	-14.8
109.25	155.00	35.8	38.4	-10.1	28.3	43.5	-15.2
121.25	167.00	35.6	37.5	-9.7	27.8	43.5	-15.7
145.25	191.00	35.6	36.6	-9.3	27.3	43.5	-16.2
169.25	215.00	33.7	34.0	-7.2	26.8	43.5	-16.7
217.25	263.00	31.8	30.6	-5.0	26.8	46.0	-19.2
241.25	287.00	30.7	30.2	-4.1	26.6	46.0	-19.4
265.25	311.00	33.5	33.6	-7.2	26.4	46.0	-19.6
295.25	341.00	35.4	36.5	-9.4	27.1	46.0	-18.9
331.25	377.00	31.6	32.3	-5.8	26.5	46.0	-19.5
367.25	413.00	31.2	31.5	-5.7	25.8	46.0	-20.2
403.25	449.00	31.1	31.0	-5.5	25.6	46.0	-20.4
439.25	485.00	30.1	30.5	-4.2	26.3	46.0	-19.7
475.25	521.00	30.6	32.1	-4.5	27.6	46.0	-18.4
511.25	557.00	31.3	33.0	-4.9	28.1	46.0	-17.9
547.25	593.00	31.5	33.7	-4.6	29.1	46.0	-16.9
583.25	629.00	31.6	32.7	-3.8	28.9	46.0	-17.1
619.25	665.00	31.6	31.6	-2.2	29.4	46.0	-16.6
655.25	701.00	30.0	30.6	-0.9	29.7	46.0	-16.3
691.25	737.00	29.4	30.8	-0.7	30.1	46.0	-15.9
727.25	773.00	28.9	32.0	-0.8	31.2	46.0	-14.8
763.25	809.00	27.0	32.6	0.3	32.9	46.0	-13.1
799.25	845.00	24.3	33.3	1.3	34.6	46.0	-11.4

B. Second Harmonic

Tuned Frequency (MHz)	Radiated Frequency (MHz)	Meter Reading (dBuV)		Corrected Factor (dB)	Max. Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		H	V				
73.25	238.00	30.5	31.5	-5.3	26.2	46.0	-19.8
91.25	274.00	30.0	31.2	-4.7	26.5	46.0	-19.5
109.25	310.00	32.7	33.9	-7.2	26.7	46.0	-19.3
121.25	334.00	33.6	34.8	-8.5	26.3	46.0	-19.7
145.25	382.00	31.3	32.5	-5.9	26.6	46.0	-19.4
169.25	430.00	31.0	32.2	-5.3	26.9	46.0	-19.1
217.25	526.00	30.5	31.7	-4.6	27.1	46.0	-18.9
241.25	574.00	31.2	32.3	-5.0	27.3	46.0	-18.7
265.25	622.00	30.4	31.5	-3.9	27.6	46.0	-18.4
295.25	682.00	27.9	29.1	-1.2	27.9	46.0	-18.1
331.25	754.00	27.6	28.9	-0.7	28.2	46.0	-17.8
367.25	826.00	26.3	27.0	0.8	27.8	46.0	-18.2
403.25	898.00	25.7	26.8	1.1	27.9	46.0	-18.1
439.25	970.00	23.5	24.4	3.1	27.5	54.0	-26.5
475.25	1042.00	43.3	41.1	-9.5	33.8	54.0	-20.2
511.25	1114.00	43.0	41.8	-9.2	33.8	54.0	-20.2
547.25	1186.00	42.7	44.2	-8.9	35.3	54.0	-18.7
583.25	1258.00	42.4	44.5	-8.6	35.9	54.0	-18.1
619.25	1330.00	42.2	44.7	-8.2	36.5	54.0	-17.5
655.25	1402.00	42.0	44.8	-7.9	36.9	54.0	-17.1
691.25	1474.00	41.8	45.0	-7.6	37.4	54.0	-16.6
727.25	1546.00	41.4	45.4	-7.2	38.2	54.0	-15.8
763.25	1618.00	40.8	45.6	-6.8	38.8	54.0	-15.2
799.25	1690.00	40.4	45.8	-6.4	39.4	54.0	-14.6

C. Third Harmonic

Tuned Frequency (MHz)	Radiated Frequency (MHz)	Meter Reading (dBuV)		Corrected Factor (dB)	Max. Result (dBuV/m)	Limit (dBuV/m)	Margin
		H	V				dB
73.25	357.00	31.8	31.0	-9.2	22.6	46.0	-23.4
91.25	411.00	29.6	28.2	-5.7	23.9	46.0	-22.1
109.25	465.00	29.8	28.7	-4.8	25.0	46.0	-21.0
121.25	501.00	30.2	28.8	-4.1	26.1	46.0	-19.9
145.25	573.00	32.3	31.1	-5.0	27.3	46.0	-18.7
169.25	645.00	32.1	30.9	-3.6	28.5	46.0	-17.5
217.25	789.00	30.7	32.4	-0.4	32.0	46.0	-14.0
241.25	861.00	29.1	30.9	1.4	32.3	46.0	-13.7
265.25	933.00	28.6	30.4	2.0	32.4	46.0	-13.6
295.25	1023.00	48.3	51.7	-9.6	42.1	54.0	-11.9
331.25	1131.00	47.9	51.1	-9.1	42.0	54.0	-12.0
367.25	1239.00	45.3	48.7	-8.6	40.1	54.0	-13.9
403.25	1347.00	43.0	46.8	-8.2	38.6	54.0	-15.4
439.25	1455.00	42.8	46.5	-7.7	38.8	54.0	-15.2
475.25	1563.00	42.5	46.1	-7.1	39.0	54.0	-15.0
511.25	1671.00	42.3	45.7	-6.5	39.2	54.0	-14.8
547.25	1779.00	42.1	45.1	-5.9	39.2	54.0	-14.8
583.25	1887.00	42.3	44.9	-5.3	39.6	54.0	-14.4
619.25	1995.00	42.0	44.2	-4.6	39.6	54.0	-14.4
655.25	2103.00	41.8	44.3	-4.2	40.1	54.0	-13.9
691.25	2211.00	41.6	44.5	-3.8	40.7	54.0	-13.3
727.25	2319.00	41.5	44.2	-3.4	40.8	54.0	-13.2
763.25	2427.00	41.3	44.4	-3.0	41.4	54.0	-12.6
799.25	2535.00	41.1	44.3	-2.6	41.7	54.0	-12.3

D. Fourth Harmonic

Tuned Frequency (MHz)	Radiated Frequency (MHz)	Meter Reading (dBuV)		Corrected Factor (dB)	Max. Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		H	V				
73.25	476.00	29.2	31.1	-4.3	26.8	46.0	-19.2
91.25	548.00	31.2	32.7	-4.9	27.8	46.0	-18.2
109.25	620.00	32.4	32.5	-3.9	28.6	46.0	-17.4
121.25	668.00	31.3	31.3	-1.9	29.4	46.0	-16.6
145.25	764.00	30.3	30.4	-0.8	29.6	46.0	-16.4
169.25	860.00	28.2	28.3	1.4	29.7	46.0	-16.3
217.25	1052.00	43.9	49.6	-9.5	40.1	54.0	-13.9
241.25	1148.00	36.9	42.8	-9.0	33.8	54.0	-20.2
265.25	1244.00	37.1	43.6	-8.6	35.0	54.0	-19.0
295.25	1364.00	40.8	46.8	-8.1	38.7	54.0	-15.3
331.25	1508.00	44.5	50.9	-7.5	43.4	54.0	-10.6
367.25	1652.00	--	--	-6.6	--	54.0	--
403.25	1796.00	--	--	-5.8	--	54.0	--
439.25	1940.00	--	--	-4.9	--	54.0	--
475.25	2084.00	--	--	-4.3	--	54.0	--
511.25	2228.00	--	--	-3.7	--	54.0	--
547.25	2372.00	--	--	-3.2	--	54.0	--
583.25	2516.00	--	--	-2.7	--	54.0	--
619.25	2660.00	--	--	-2.2	--	54.0	--
655.25	2804.00	--	--	-1.8	--	54.0	--
691.25	2948.00	--	--	-1.4	--	54.0	--
727.25	3092.00	--	--	-1.0	--	54.0	--
763.25	3236.00	--	--	-0.6	--	54.0	--
799.25	3380.00	--	--	-0.3	--	54.0	--

Remark "--" means that the emission level is too low to be measured or attenuated more than 20 dB from limit.

E. Fifth Harmonic

Tuned Frequency (MHz)	Radiated Frequency (MHz)	Meter Reading (dBuV)		Corrected Factor (dB)	Max. Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		H	V				
73.25	595.00	33.5	32.7	-4.6	28.9	46.0	-17.1
91.25	685.00	28.5	31.0	-1.1	29.9	46.0	-16.1
109.25	775.00	27.1	32.3	-0.8	31.5	46.0	-14.5
121.25	835.00	24.6	33.6	1.0	34.6	46.0	-11.4
145.25	955.00	21.4	32.8	2.9	35.7	46.0	-10.3
169.25	1075.00	47.7	51.7	-9.4	42.3	54.0	-11.7
217.25	1315.00	47.6	51.4	-8.3	43.1	54.0	-10.9
241.25	1435.00	47.3	51.1	-7.8	43.3	54.0	-10.7
265.25	1555.00	48.3	52.1	-7.2	44.9	54.0	-9.1
295.25	1705.00	46.3	50.3	-6.3	44.0	54.0	-10.0
331.25	1885.00	45.2	49.1	-5.3	43.8	54.0	-10.2
367.25	2065.00	44.3	48.3	-4.4	43.9	54.0	-10.1
403.25	2245.00	--	--	-3.7	--	54.0	--
439.25	2425.00	--	--	-3.0	--	54.0	--
475.25	2605.00	--	--	-2.4	--	54.0	--
511.25	2785.00	--	--	-1.8	--	54.0	--
547.25	2965.00	--	--	-1.3	--	54.0	--
583.25	3145.00	--	--	-0.9	--	54.0	--
619.25	3325.00	--	--	-0.4	--	54.0	--
655.25	3505.00	--	--	0.0	--	54.0	--
691.25	3685.00	--	--	0.7	--	54.0	--
727.25	3865.00	--	--	1.5	--	54.0	--
763.25	4045.00	--	--	2.0	--	54.0	--
799.25	4225.00	--	--	2.0	--	54.0	--

Remark "--" means that the emission level is too low to be measured or attenuated more than 20 dB from limit.

G. Above fifth Harmonic

Radiated frequency above fifth harmonic is too low to be measured or a great margin from limit.

4.3 Field Strength Calculation

The field strength 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:

$$RESULT = READING + CORR. FACTOR$$

where CORR. FACTOR = Antenna FACTOR + Cable FACTOR

4.4 Equipment for Radiation Measurement

The following test equipment are used during the radiated test .

Equipment	Manufacturer	Model No.	Next Cal. Date
Test Receiver	Rohde and Schwarz	ESVS 30	12/19/1998
Spectrum Analyzer	Hewlett-Packard	8568B	10/16/1998
Quasi Peak Adapter	Hewlett-Packard	85650A	10/07/1998
Pre-selector	Hewlett-Packard	85685A	10/16/1998
Pre-Amplifier	Hewlett-Packard	8447D	05/18/1999
Pre-Amplifier	Hewlett-Packard	8449B	12/23/1998
Log Periodic Antenna	EMCO	3146	12/10/1999
Biconical Antenna	EMCO	3115	08/05/1998
Biconical Antenna	EMCO	3110	08/05/1998
Spectrum Analyzer	ADVANTEST	R3271	09/02/1998

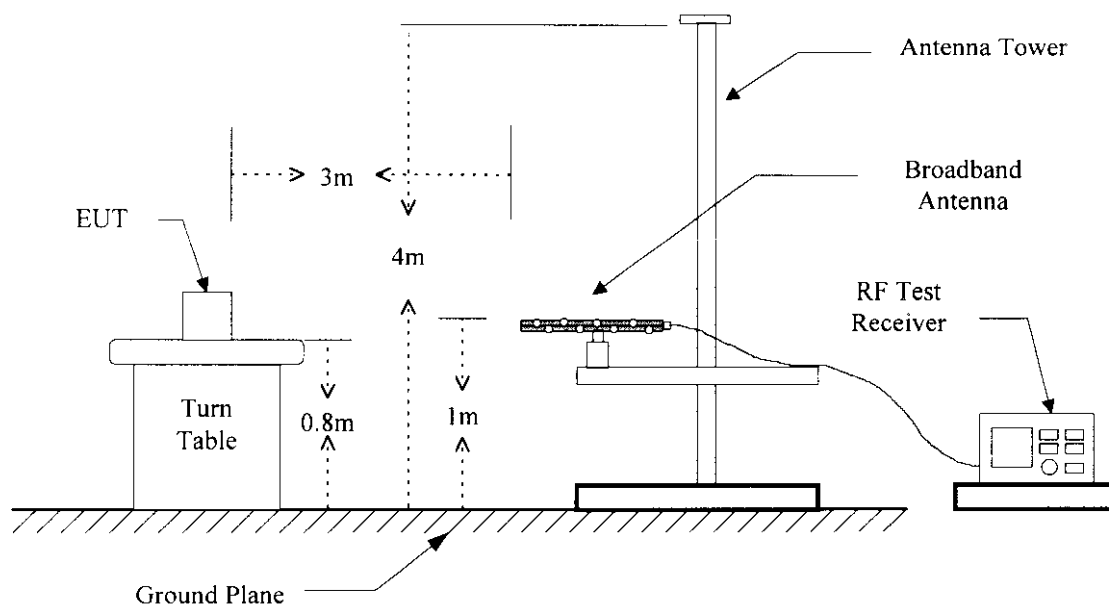
4.5 Measuring Instrument Setup

Explanation of measuring instrument setup when respective function is used in any frequency band is as following :

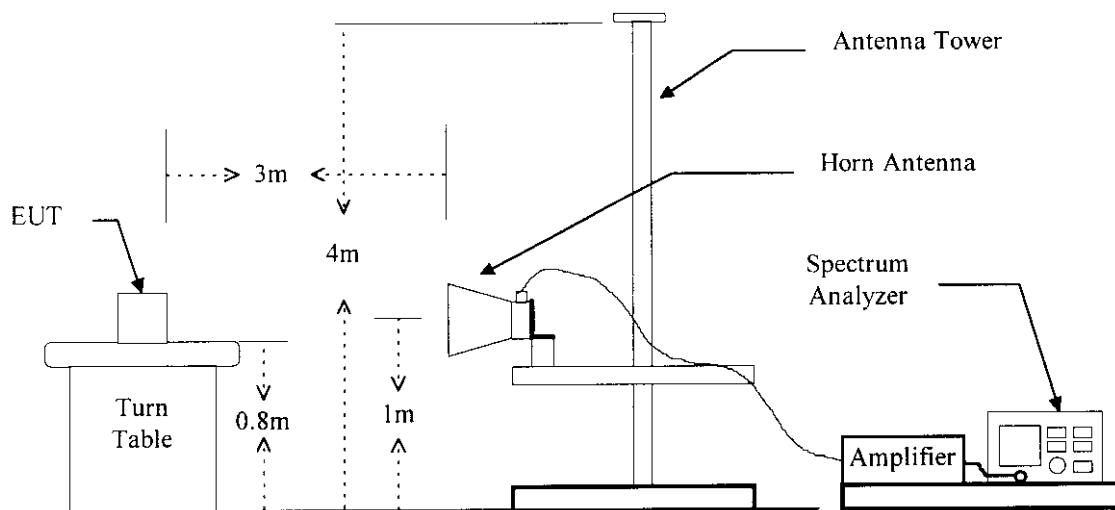
Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi Peak	120 kHz	N/A
	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	AVG	1 MHz	300Hz

4.7 Open Field Test Site Setup Diagram

Radiated Emission's Frequency Below 1 GHz



Radiated Emission's Frequency Above 1 GHz



5 CONDUCTED EMISSION MEASUREMENT

5.1 Description

The initial setup in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on following data pages, and these signals are the quasi-peaked.

For CATV converter, it was operated with a appropriate RF signal applied to the RF input terminal.

5.2 Conducted Emission Data

5.2.1 CATV Portion

Test Date: JUL. 07, 1998Temperature : 25 °CHumidity: 58%Operation Mode : CH1

Input Level : 10mV

Output Channel : CH3

Frequency (MHz)	Reading (dBuV)		Factor (dB)	Result (dBuV)		Limit (dBuV)	Margin (dB)
	Va	Vb		Va	Vb		
0.450	25.5	20.6	0.2	25.7	20.8	48.0	-22.3
0.564	25.2	25.8	0.2	25.4	26.0	48.0	-22.0
3.999	24.6	26.9	0.3	24.9	27.2	48.0	-20.8
7.999	33.3	33.2	0.4	33.7	33.6	48.0	-14.3
16.002	29.6	30.2	0.8	30.4	31.0	48.0	-19.0
24.002	40.3	38.7	1.0	41.3	39.7	48.0	-6.7

Operation Mode : CH54

Input Level : 10mV

Output Channel : CH3

Frequency (MHz)	Reading (dBuV)		Factor (dB)	Result (dBuV)		Limit (dBuV)	Margin (dB)
	Va	Vb		Va	Vb		
0.450	25.7	20.9	0.2	25.9	21.1	48.0	-22.1
0.564	25.3	26.1	0.2	25.5	26.3	48.0	-21.7
7.999	33.5	33.7	0.4	33.9	34.1	48.0	-13.9
11.984	25.4	27.8	0.6	26.0	28.4	48.0	-19.6
16.002	30.1	30.7	0.8	30.9	31.5	48.0	-16.5
24.002	40.4	38.9	1.0	41.4	39.9	48.0	-6.6

Operation Mode : CH125

Input Level : 10mV

Output Channel : CH3

Frequency (MHz)	Reading (dBuV)		Factor (dB)	Result (dBuV)		Limit (dBuV)	Margin (dB)
	Va	Vb		Va	Vb		
0.450	25.8	21.1	0.2	26.0	21.3	48.0	-22.0
3.999	24.8	27.3	0.3	25.1	27.6	48.0	-20.4
7.999	33.4	33.6	0.4	33.8	34.0	48.0	-14.0
11.984	25.5	27.9	0.4	25.9	28.3	48.0	-19.7
16.002	29.9	30.5	0.6	30.5	31.1	48.0	-16.9
24.002	40.6	39.0	0.8	41.4	39.8	48.0	-6.6

Operation Mode : CH1

Input Level : 10mV

Output Channel : CH4

Frequency (MHz)	Reading (dBuV)		Factor (dB)	Result (dBuV)		Limit (dBuV)	Margin (dB)
	Va	Vb		Va	Vb		
0.450	24.5	17.8	0.2	24.7	18.0	48.0	-23.3
0.589	25.3	21.2	0.2	25.5	21.4	48.0	-22.5
7.999	31.7	31.2	0.4	32.1	31.6	48.0	-15.9
16.002	25.6	25.8	0.8	26.4	26.6	48.0	-21.4
24.002	35.4	33.5	1.0	36.4	34.5	48.0	-11.6
28.003	29.0	25.4	1.1	30.1	26.5	48.0	-17.9

Operation Mode : CH54

Input Level : 10mV

Output Channel : CH4

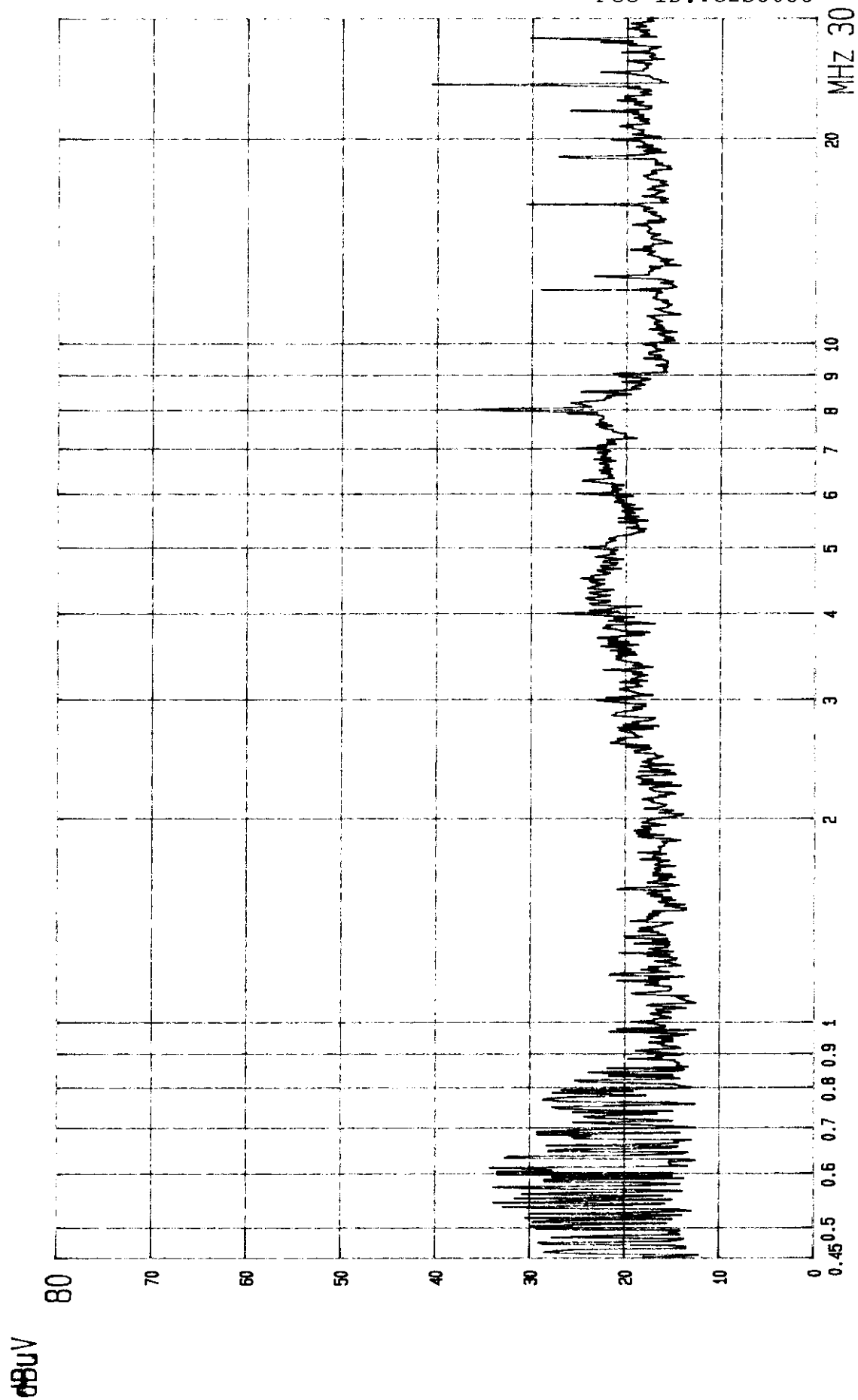
Frequency (MHz)	Reading (dBuV)		Factor (dB)	Result (dBuV)		Limit (dBuV)	Margin (dB)
	Va	Vb		Va	Vb		
0.450	24.6	17.9	0.2	24.8	18.1	48.0	-23.2
3.999	25.4	27.7	0.3	25.7	28.0	48.0	-20.0
7.999	31.8	31.4	0.4	32.2	31.8	48.0	-15.8
16.002	25.7	25.9	0.8	26.5	26.7	48.0	-21.3
24.002	35.6	33.7	1.0	36.6	34.7	48.0	-11.4
28.003	29.2	25.6	1.1	30.3	26.7	48.0	-17.7

Operation Mode : CH125

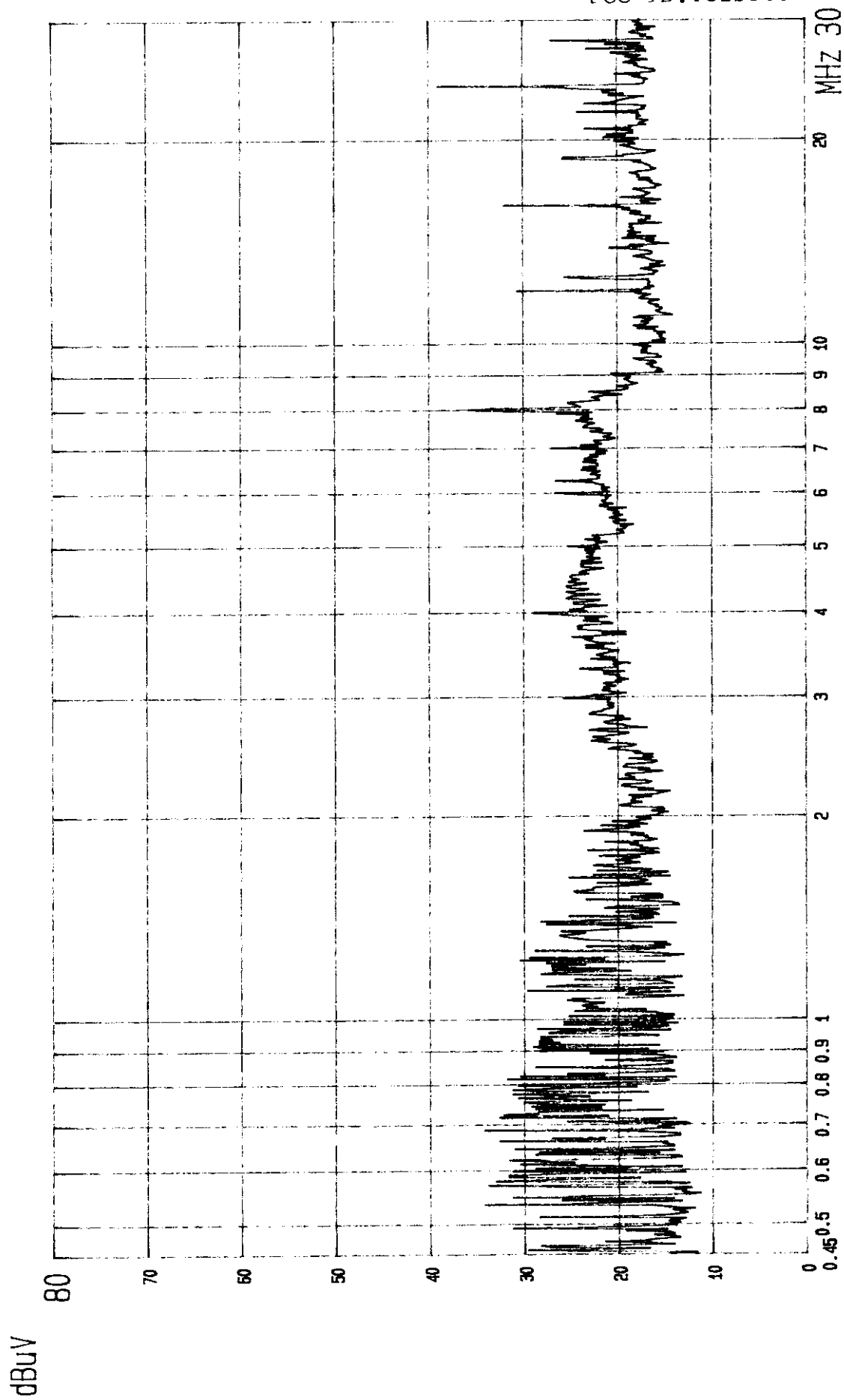
Input Level : 10mV

Output Channel : CH4

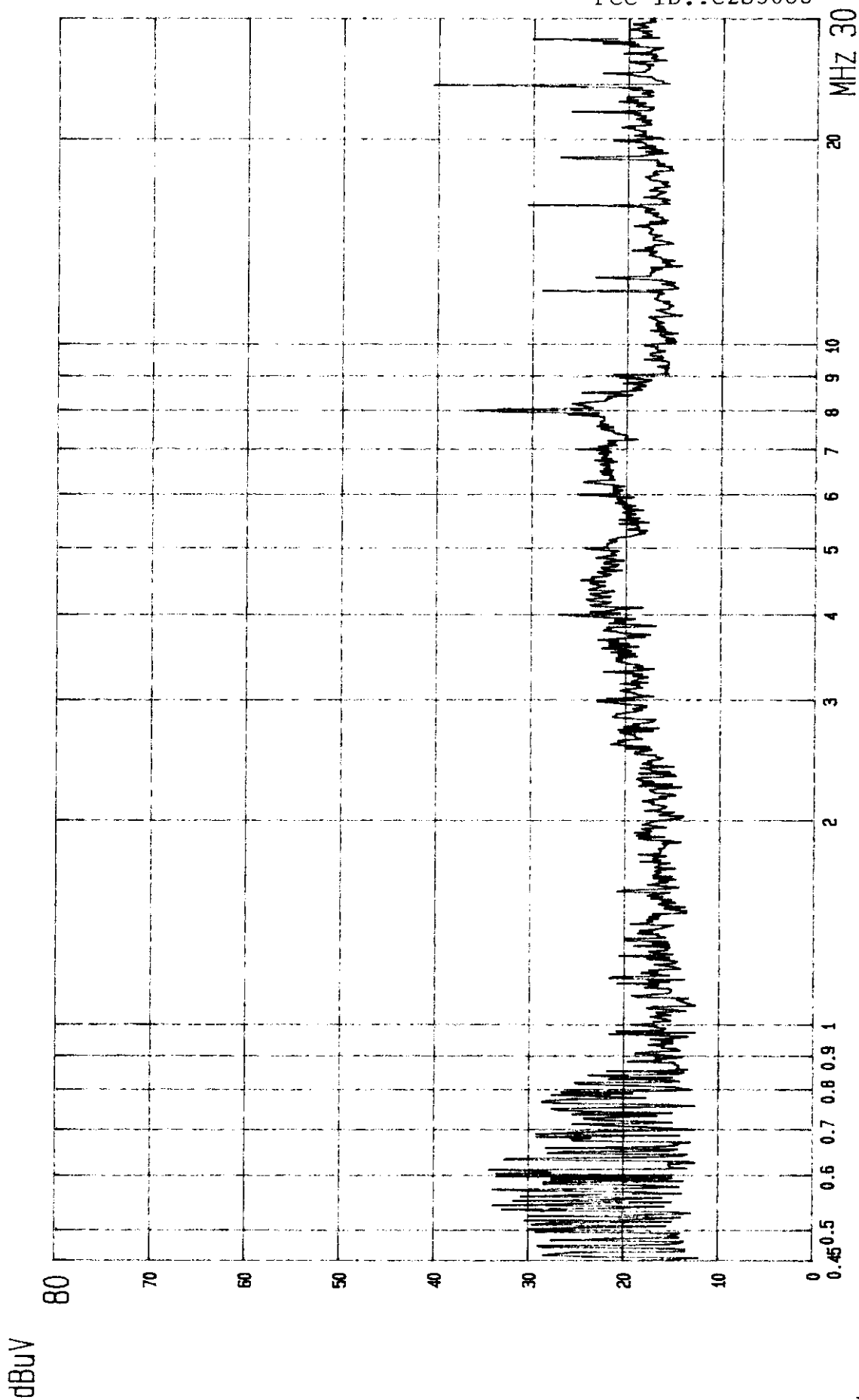
Frequency (MHz)	Reading (dBuV)		Factor (dB)	Result (dBuV)		Limit (dBuV)	Margin (dB)
	Va	Vb		Va	Vb		
0.450	24.7	18.1	0.2	24.9	18.3	48.0	-23.1
0.589	25.4	21.3	0.2	25.6	21.5	48.0	-22.4
3.999	25.6	28.0	0.3	25.9	28.3	48.0	-19.7
7.999	31.9	31.5	0.4	32.3	31.9	48.0	-15.7
16.002	25.9	26.1	0.8	26.7	27.0	48.0	-21.0
24.002	35.7	33.7	1.0	36.7	34.7	48.0	-11.3
28.003	29.1	25.6	1.1	30.2	26.7	48.0	-17.8



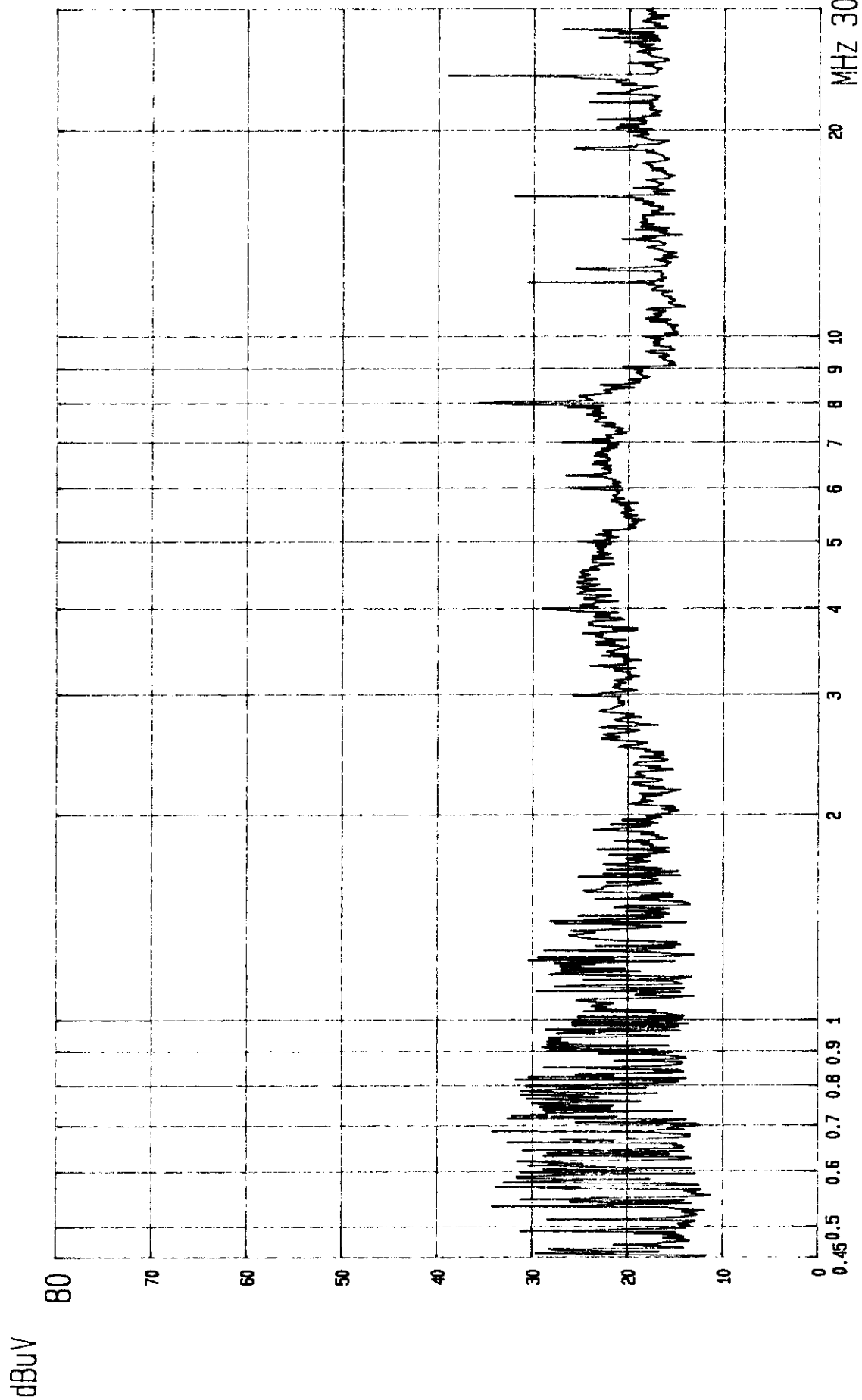
FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ B: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH1) ., O/P=CH3 LISN: Va ETC EMI LAB.



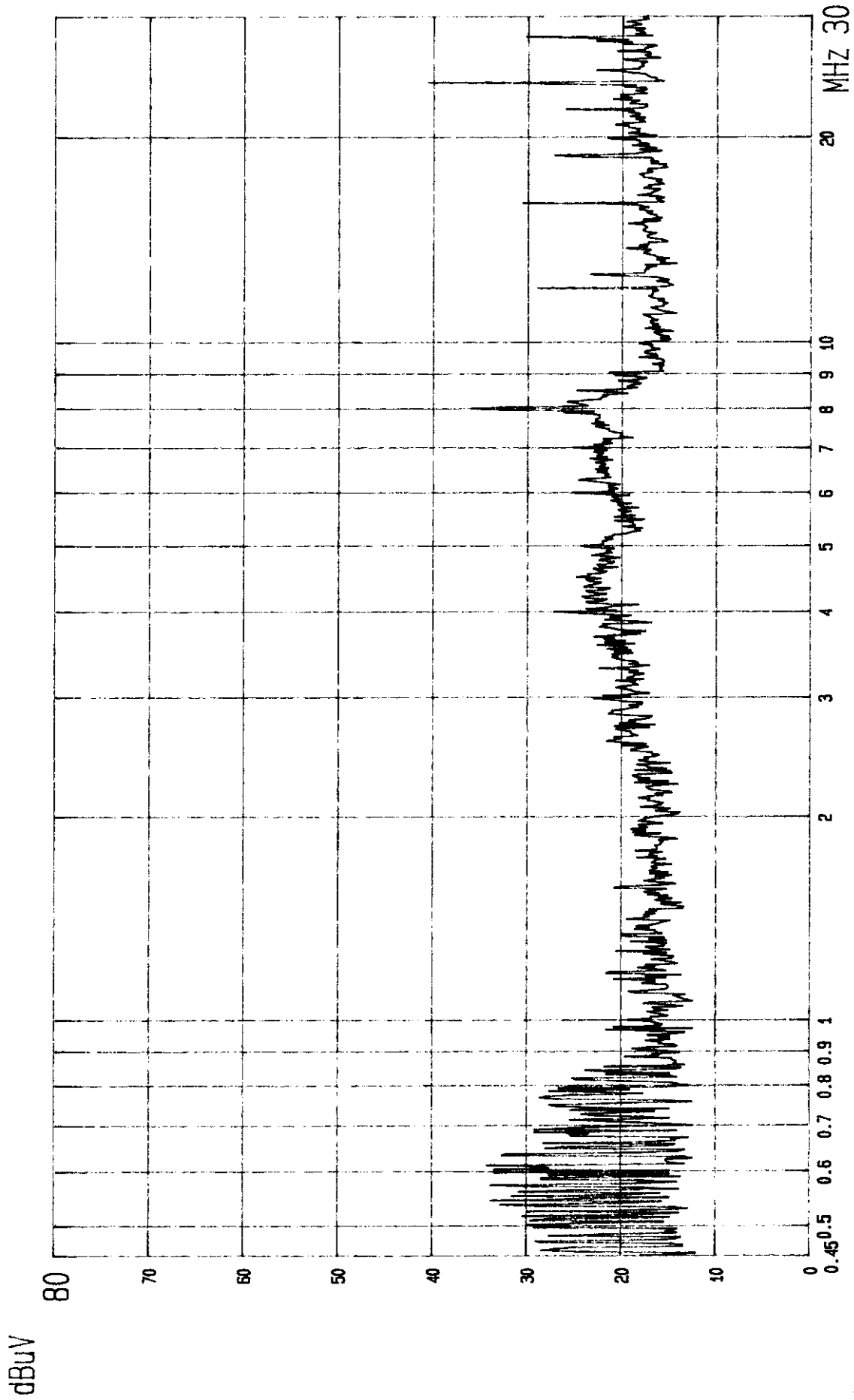
FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ 8: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH1) ., O/P=CH3 LISN: Vb ETC EMI LAB.



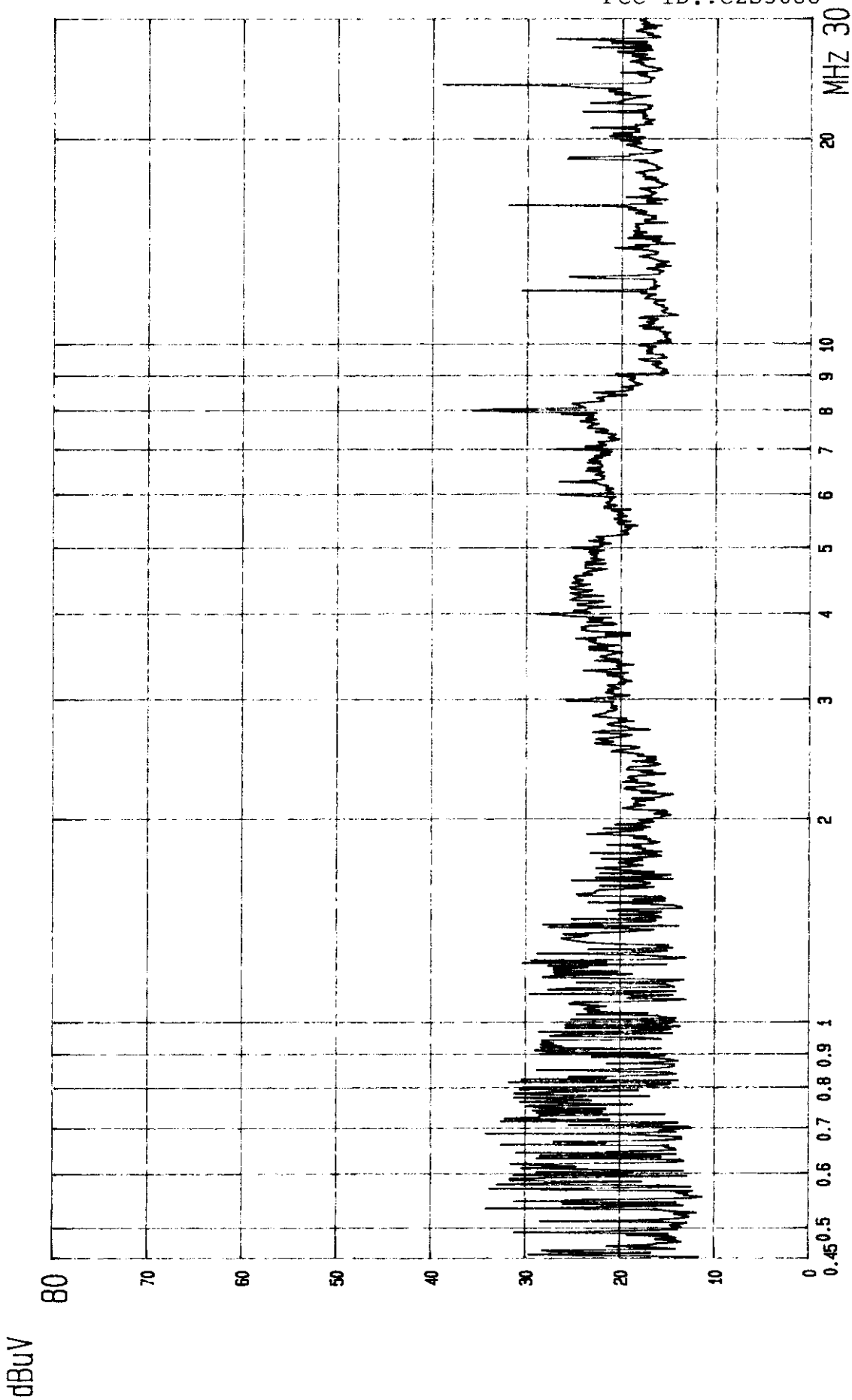
FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ 8: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH54) .., O/P=CH3 LISN: Va ETC EMI LAB.



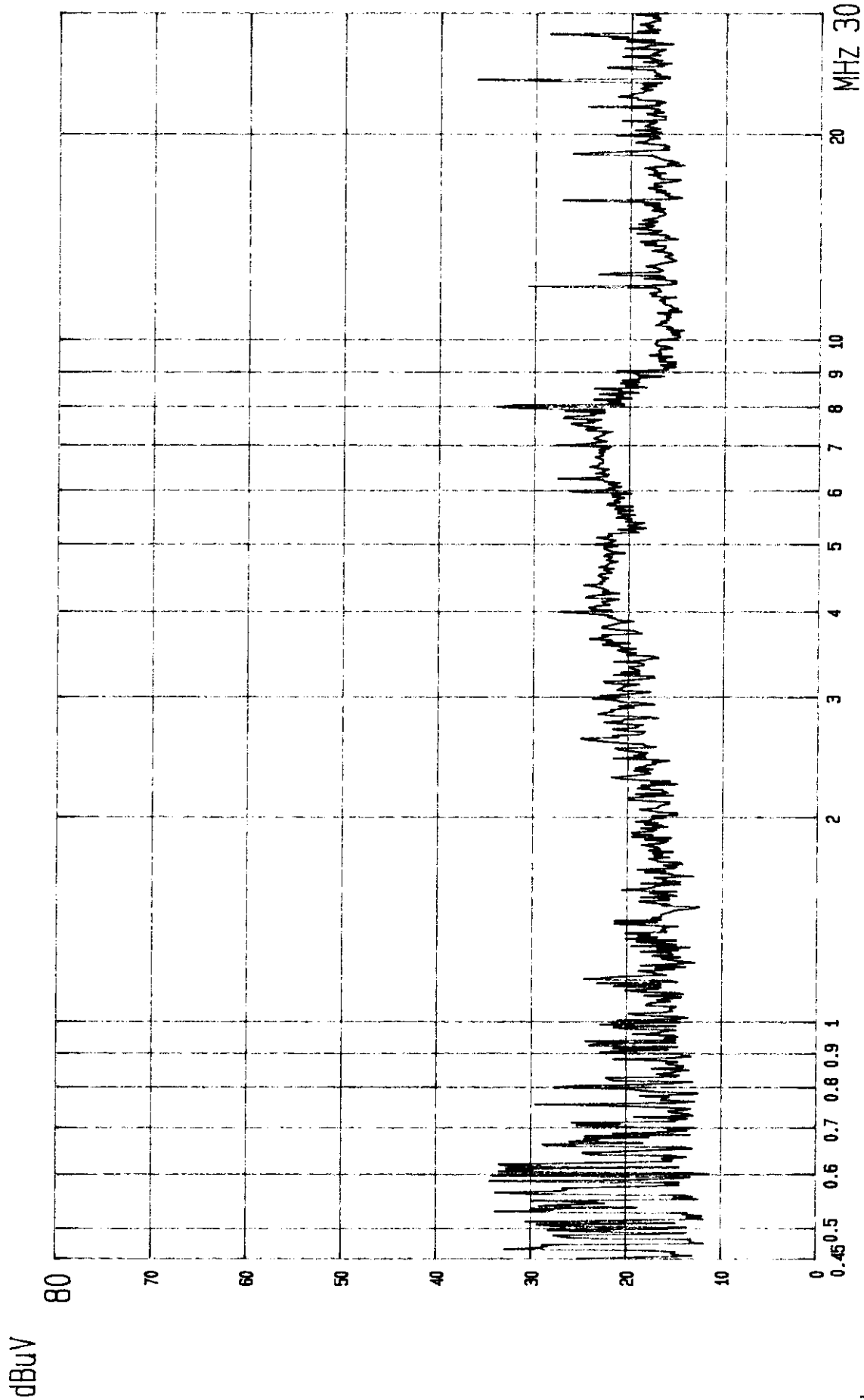
FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ 8: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH54) ., O/P=CH3 LISN: Vb ETC EMI LAB.



FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ 8: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH125) ., O/P=CH3 LISN: Va ETC EMI LAB.

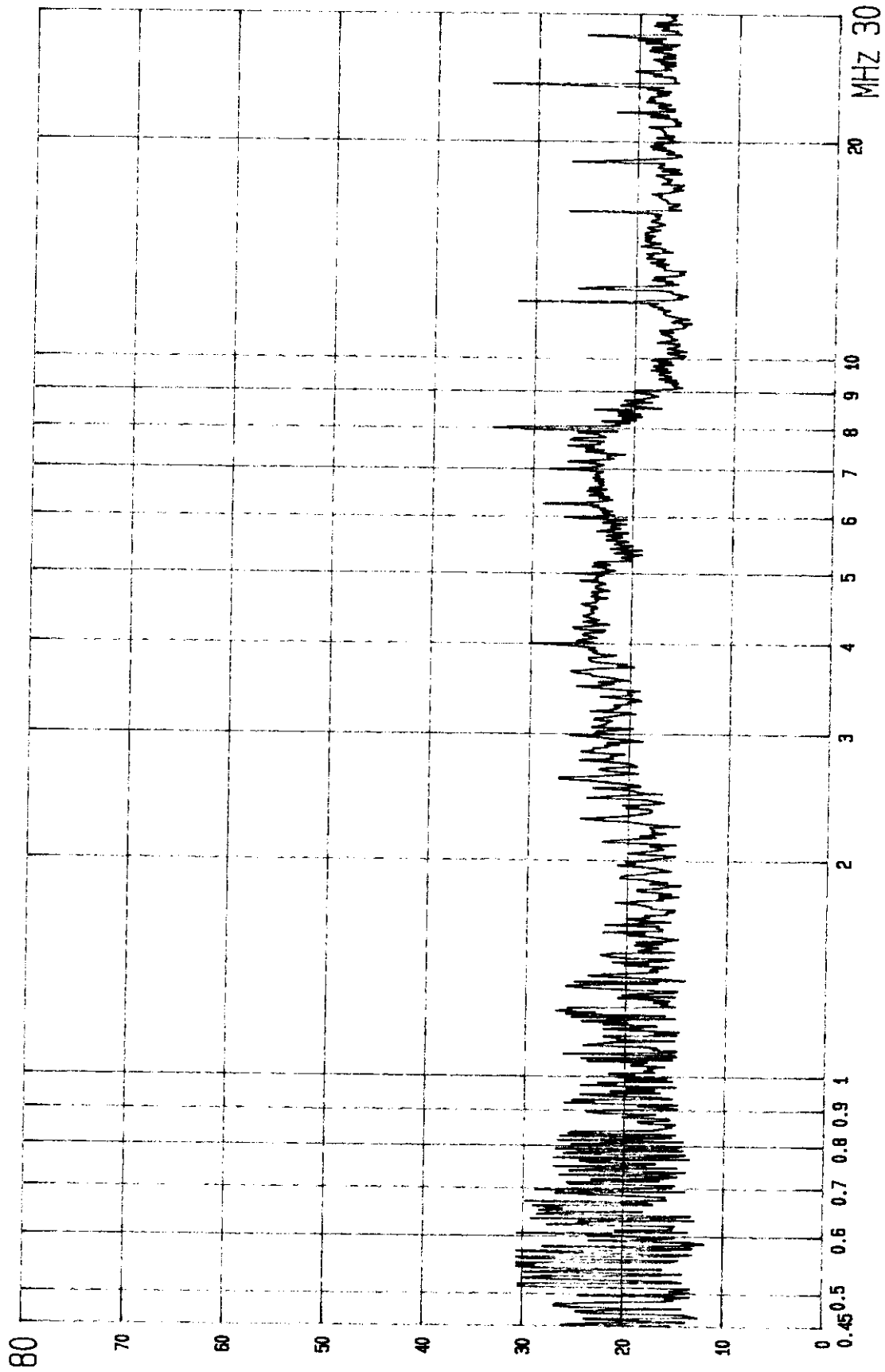


FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ 8: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH125) ., O/P=CH3 LISN: Vb ETC EMI LAB.

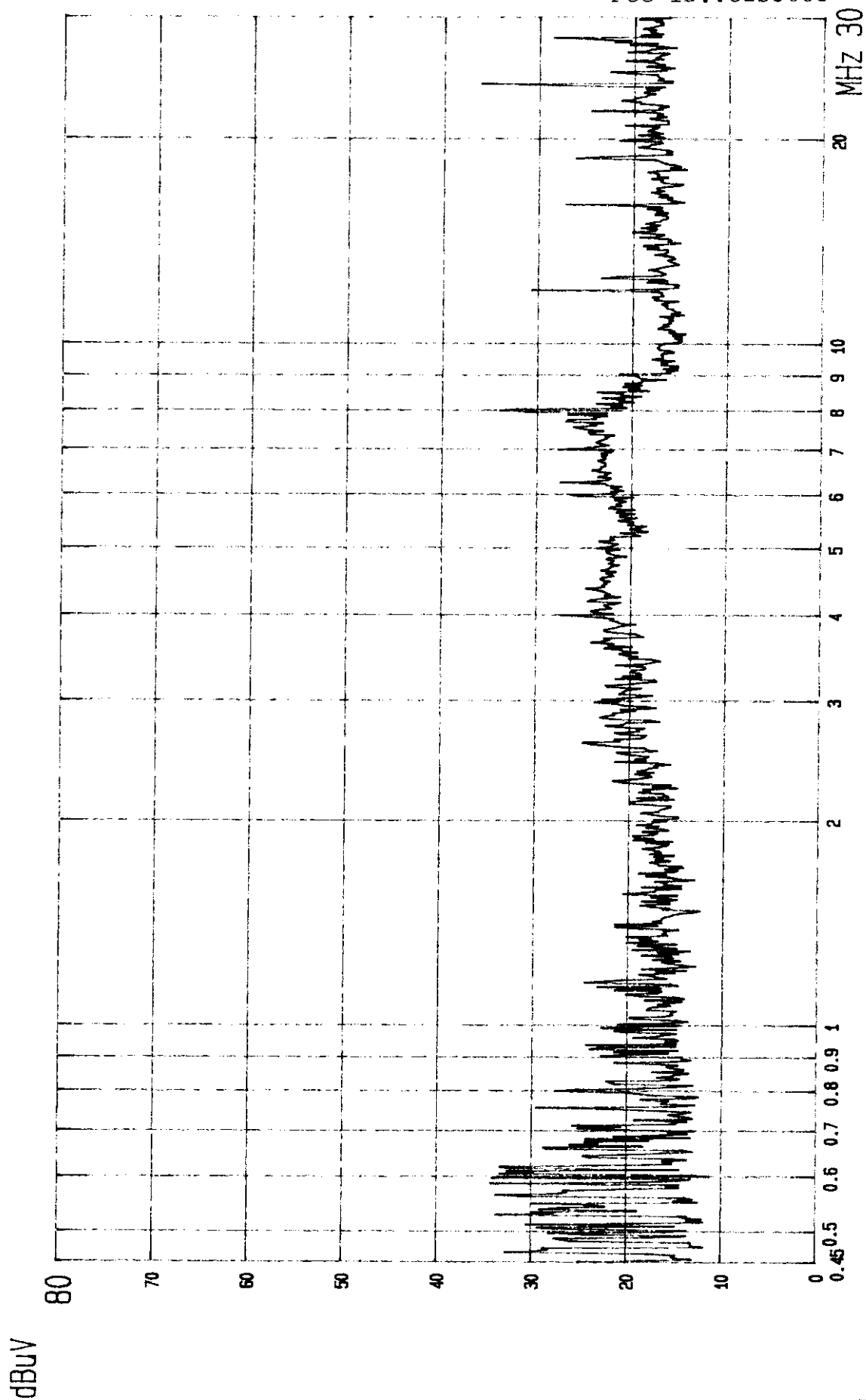


FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ 8: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH1) ., O/P=CH4 LISN: Va ETC EMI LAB.

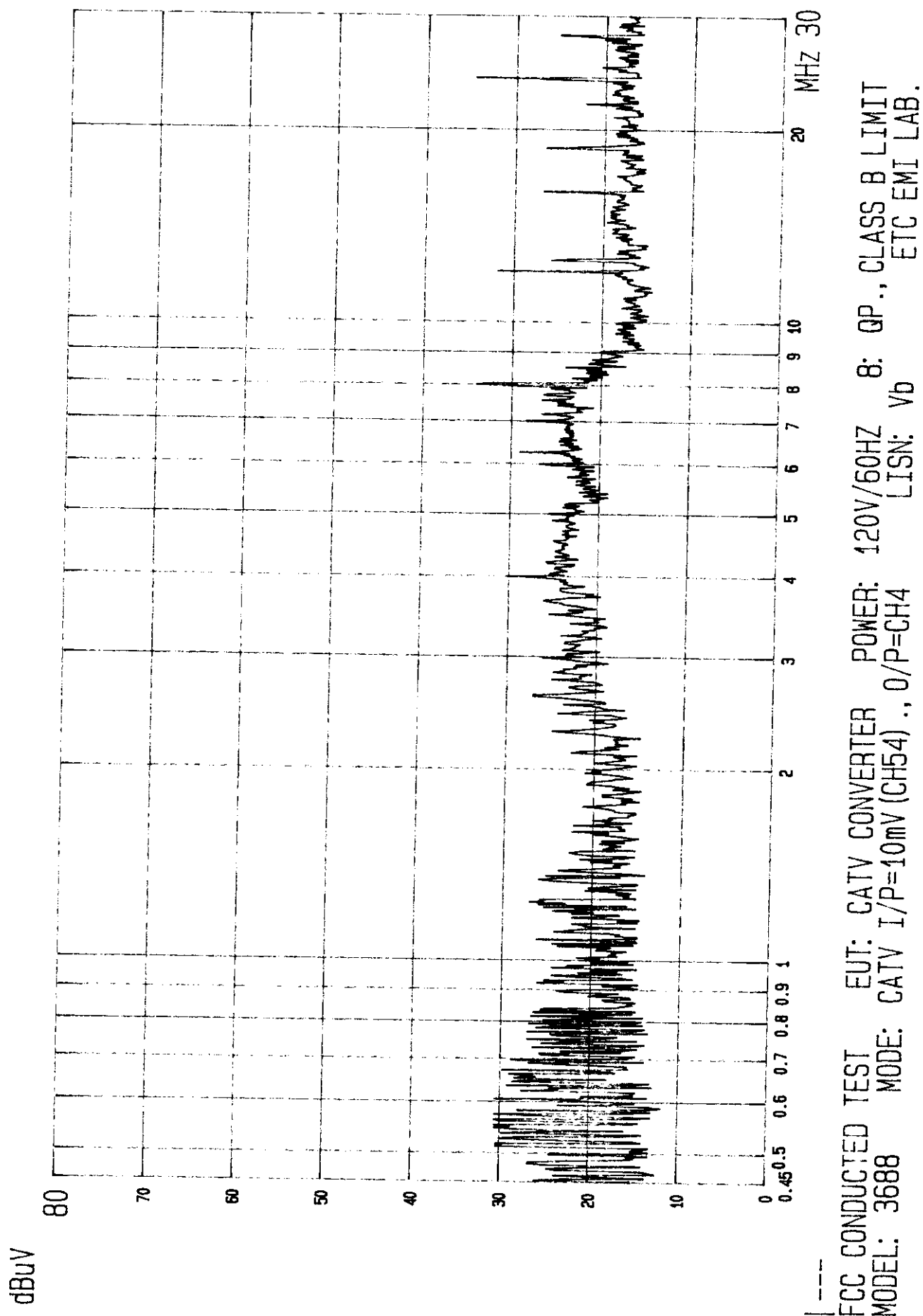
dBuV



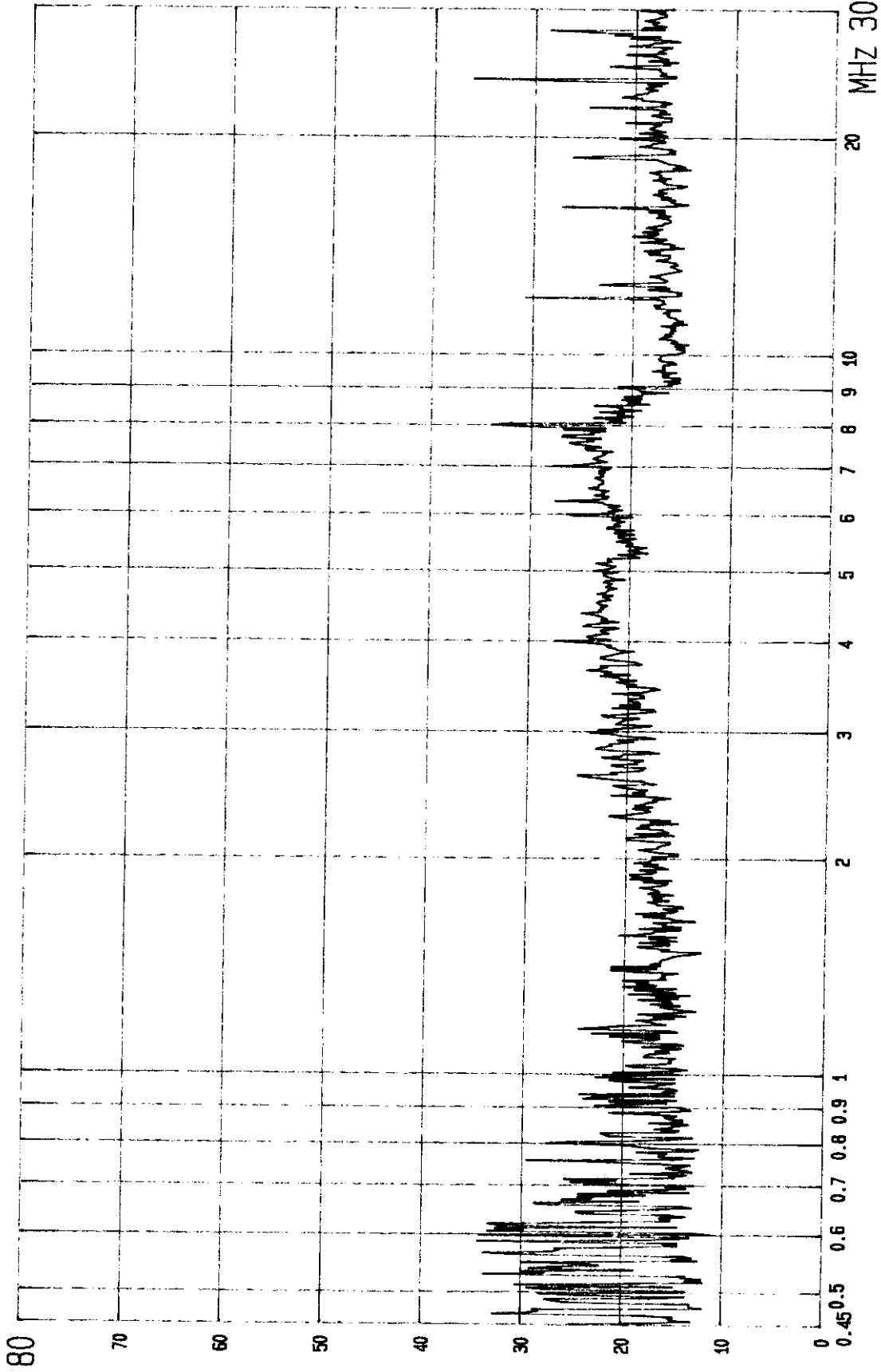
FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ 8: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH1) ., O/P=CH4 LISN: Vb ETC EMI LAB.



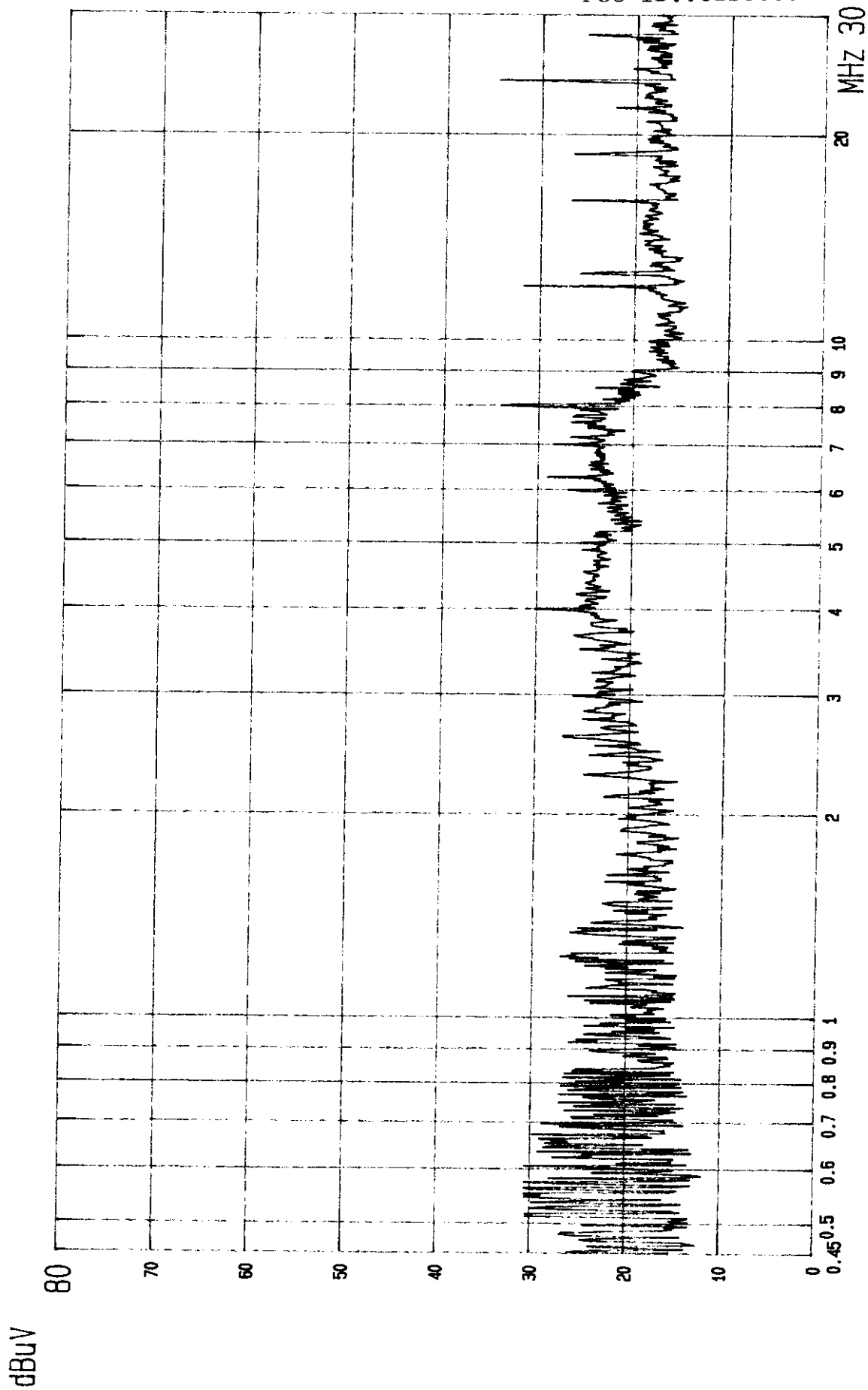
FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ 8: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH54) ., O/P=CH4 LISN: Va ETC EMI LAB.



dBuV



FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ 8: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH125) .., O/P=CH4 LISN: Va ETC EMI LAB.



FCC CONDUCTED TEST EUT: CATV CONVERTER POWER: 120V/60HZ 8: QP., CLASS B LIMIT
MODEL: 3688 MODE: CATV I/P=10mV (CH125) ., O/P=CH4 LISN: Vb ETC EMI LAB.

5.3 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

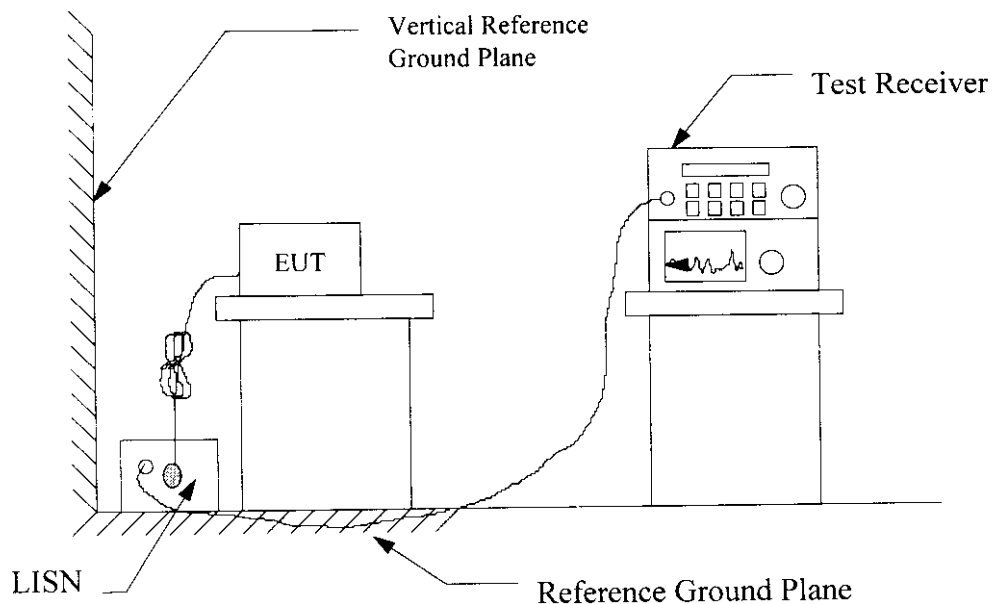
$$\textbf{RESULT} = \textbf{READING} + \textbf{LISN FACTOR}$$

Assume a receiver reading of 22.5 dB μ V is obtained, and LISN Factor is 0.1 dB, then the total of field strength is 22.6 dB μ V.

$$\text{RESULT} = 22.5 + 0.1 = 22.6 \text{ dB } \mu \text{ V}$$

$$\begin{aligned} \text{Level in } \mu \text{ V} &= \text{Common Antilogarithm}[(22.6 \text{ dB } \mu \text{ V})/20] \\ &= 13.48 \mu \text{ V} \end{aligned}$$

5.5 Conducted Measuring Setup Diagram



5.6 Conducted Measurement Equipment

The following test equipment are used during the conducted test .

Equipment	Manufacturer	Model No.	Next Cal. Date
RF Test Receiver	Rohde and Schwarz	ESH3	01/04/1999
Spectrum Monitor	Rohde and Schwarz	EZM	N.C.R.
Line Impedance Stabilization network	Kyoritsu	KNW-407	12/01/1998
Line Impedance Stabilization network	Rohde and Schwarz	ESH2-Z5	08/18/1998
Printer	Rohde and Schwarz	PUD-3	N.C.R.
Plotter	Hewlett-Packard	7440A	N/A
Shielded Room	Riken		N.C.R.

6 RF OUTPUT LEVEL MEASUREMENT

6.1 Measurement Description

According to section 12.2.5 of ANSI C63.4, the output signal level is the maximum voltage level present at the output terminal of a TV interface device on a particular frequency during normal use of the device.

For CSTD, it shall be supplied with input RF signal level of 25 dB(mV). Measure the signal level at the visual and aural carrier frequencies of the output channel.

6.2 Data of Measurement

A. Output Channel : 3

Input Signal Level :25dB(mV)

Frequency Tuned (MHz)	Frequency Measured (MHz)		Meter Reading (dBm)		Matching Pad Loss (dB)	Result (uV)		Limit (uV)	
	Visual	Aural	Visual	Aural		Visual	Aural	Visual	Aural
73.25	61.28	65.79	59.9	50.6	0.5	1047.1	358.9	6000	1342
403.25	61.25	65.79	59.1	50.6	0.5	955.0	358.9	6000	1342
799.25	61.28	56.74	60.1	50.2	0.5	1071.5	342.8	6000	1342

Note : The audio channel showed above table is the one generating higher output level of tow audio channels.

B. Output Channel : 4

Input Signal Level :25 dB(mV)

Frequency Tuned (MHz)	Frequency Measured (MHz)		Meter Reading (dBm)		Matching Pad Loss (dB)	Result (uV)		Limit (uV)	
	Visual	Aural	Visual	Aural		Visual	Aural	Visual	Aural
73.25	67.25	62.76	57.5	49.8	0.5	794.3	327.3	6000	1342
403.25	67.25	62.74	58.8	50.7	0.5	922.6	363.1	6000	1342
799.25	67.25	62.71	59.9	50.8	0.5	1047.1	367.3	6000	1342

Note : The audio channel showed above table is the one generating higher output level of tow audio channels.

6.3 Calculation of Data Measured

The measuring data for output signal level is calculated as following formula :

$$\text{Result (uV)} = \left[10^{\frac{(\text{Reading} + \text{Pad Loss})}{10}} \times 75 \times 10^{-3} \right]^{\frac{1}{2}} \times 10^6$$

6.4 Equipment for RF Output Level Measurement

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Hewlett-Packard	8568B	10/16/1998
Matching Pad	ANRITSU CO., LTD.	MP-614A	N/A
Pre-selector	Hewlett-Packard	85685A	10/16/1998

The parameters of Spectrum Analyzer is set as following while measurement is performed :

Resolution Bandwidth : 100 KHz
 Video Bandwidth : 100 KHz
 Frequency Span : 10 MHz
 Sweep Time : 200 ms
 Function : Peak

7 CONDUCTED SPURIOUS EMISSION MEASUREMENT

7.1 Description of Measurement

According to section 12.2.5 of ANSI C63.4, the output signal level is the maximum voltage level present at the output terminal of a TV interface device on a particular frequency during normal use of the device.

For CSTD, it shall be supplied with input RF signal level of 25 dB(mV). Measure the signal level at the visual and aural carrier frequencies of the output channel.

7.2 Data of Measurement

A. Output Channel :3

Input Signal Level : 25 dBmV

Frequency Tuned : 73.25 MHz (CH 01)

Spurious Frequency (MHz)	Meter Reading (dBm)	Matching Pad Loss (dB)	Amplifier Gain (dB)	Attenuator (dB)	Limit (uV)	Result (uV)
122.51	-78.8	0.5	25	3	6000	2.65
245.07	-84.1					1.44
306.34	-83.1					1.61
735.23	-83.5					1.54
801.01	-81.6					1.92

Frequency Tuned : 403.25 MHz (CH 54)

Spurious Frequency (MHz)	Meter Reading (dBm)	Matching Pad Loss (dB)	Amplifier Gain (dB)	Attenuator (dB)	Limit (uV)	Result (uV)
122.51	-78.6	0.5	25	3	6000	2.71
245.07	-83.9					1.47
306.34	-82.9					1.65
735.23	-83.3					1.58
801.01	-81.4					1.96

Frequency Tuned : 799.25 MHz (CH 125)

Spurious Frequency (MHz)	Meter Reading (dBm)	Matching Pad Loss (dB)	Amplifier Gain (dB)	Attenuator (dB)	Limit (uV)	Result (uV)
122.51	-78.4	0.5	25	3	6000	2.77
245.07	-83.7					1.50
306.34	-82.8					1.67
735.23	-83.1					1.61
801.01	-81.2					2.01

B. Output Channel :4

Input Signal Level : 25 dBmV

Frequency Tuned : 73.25 MHz (CH 01)

Spurious Frequency (MHz)	Meter Reading (dBm)	Matching Pad Loss (dB)	Amplifier Gain (dB)	Attenuator (dB)	Limit (uV)	Result (uV)
134.50	-77.7	0.5	25	3	6000	3.00
336.24	-82.8					1.67
672.54	-83.9					1.47
801.01	-81.4					1.96
807.06	-83.9					1.47

Frequency Tuned : 403.25 MHz (CH 54)

Spurious Frequency (MHz)	Meter Reading (dBm)	Matching Pad Loss (dB)	Amplifier Gain (dB)	Attenuator (dB)	Limit (uV)	Result (uV)
134.50	-77.5	0.5	25	3	6000	3.07
336.24	-82.6					1.71
672.54	-83.7					1.50
801.01	-81.3					1.98
807.06	-83.7					1.50

Frequency Tuned : 799.25 MHz (CH 125)

Spurious Frequency (MHz)	Meter Reading (dBm)	Matching Pad Loss (dB)	Amplifier Gain (dB)	Attenuator (dB)	Limit (uV)	Result (uV)
134.50	-77.3	0.5	25	3	6000	3.14
336.24	-82.4					1.75
672.54	-83.5					1.54
801.01	-81.1					2.03
807.06	-83.5					1.54

7.3 Calculation of Data Measured

The measuring data for output signal level is calculated as following formula :

$$\text{Result (uV)} = \left[10^{\frac{(\text{Reading} + \text{Pad Loss} - \text{Amplifier Gain} + \text{Att.})}{10}} \times 75 \times 10^{-3} \right]^{\frac{1}{2}} \times 10^6$$

7.4 Equipment for Conducted Spurious Measurement

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Hewlett-Packard	8568B	10/16/1998
Matching Pad	ANRITSU CO., LTD.	MP-614A	N/A
Pre-selector	Hewlett-Packard	85685A	10/16/1998
Pre-Amplifier	Hewlett-Packard	8447D	12/23/1998

The parameters of Spectrum Analyzer is set as following while measurement is performed :

Resolution Bandwidth : 100 KHz
 Video Bandwidth : 100 KHz
 Frequency Span : 10 MHz
 Sweep Time : 200 ms
 Function : Peak

8 ANTENNA TRANSFER SWITCH MEASUREMENT

The converter uses 75 Ohm unbalanced coaxial cables for interconnection of the RF modulator output signal to the TV set.

When the EUT is connected, the user no longer has any need to receive standard over-the-air broadcast signals. Per FCC rules 15.115 (3); a transfer switch is not required.

4. Fine Tuning

- Use "F+/F-" keys to adjust for best picture.
- Press "MEM" key, then, "F+" key to store the fine tuning with the channel in the memory.
- Press "MEM" key, then, "F-" key to delete the fine tuning of the channel from the memory.
- Press "CFT" key to return the frequency to nominal value. If the fine Tuning were being done too fall off.

Note : If the picture is not good for all of the channels, turn off the AFT on your TV set and tune the picture with the TV fine tuning Knob. Then, turn on the AFT and all of the channels will be tuned.

5 Favorite Channel

5.1 Store a channel in the memory

- Select the channel to be as a favorite channel.
- Press "MEM" key, then, "MR" key.
- Press the "MR" key before the "CC" disappears.
- A favorite channel is indicated by a red dot on the display.

5.2 Recall the favorite channel

- Use "MR" key to recall all of the favorite channels.
- Each time the "MR" key is pressed, the next highest favorite channel number, along with its aerial/CATV mode will be selected. No need to press TV/CATV key for aerial/CATV mode selection.

5.3 To delete a favorite channel.

- Call out the favorite channel to be deleted.
- Press "MEM" key, then "MR" key.
- The deletion of the favorite channel is confirmed by the turn off of the red dot on display.

6. Volume Control

6.1 TV Set-Up

- Firstly, using remote handset of the converter to turn up the TV sound as high as it will go.
- Then, using TV's volume control to adjust for a volume level as loud as you think you will ever want it. After this adjustment, the volume control on the TV set should not be touched. Control of the sound volume should be done only by use of the remote handset of the converter.

6.2 Volume Control

- Press the "▲" key to turn up the sound.
- Press the "▼" key to turn down the sound.
- The converter remembers the last volume you set with remote handset.

7. MUTE

- Press "MUTE" key to turn off the sound.
- Press "MUTE" key again, or either of the volume control key to restore the sound.

8. LCR : LAST CHANNEL RECALL

Press "LCR" key to change back to last channel watched.

9. SLEEP TIMER

This timer allows the converter and the TV set to be on for a preset amount of time and, then, turn off automatically. The TV set must be plugged to the outlet of the converter for the converter to turn the TV off.

9.1 To set the sleep Timer

- Press "SLEEP" key to be in SLEEP TIMER mode, and the display shows "0".

- Within 3 second, press "SLEEP" key for a second time and the display shows "9.0", the maximum amount of time off : 90 minutes. This will also start the timer.
- To choose a shorter time, press the "SLEEP" key within 3 second of the last press. This decrease the time in 15 minutes increments, until the time displays "0". The "0" stops the timer.
- 3 seconds after setting of the timer and stop pressing the "SLEEP" key, the converter returns to channel display.
- The sleep timer indicator lit up to indicate the actuation of the timer. When the timer reaches "0" automatically, it will turn off the converter and the TV set.

9.2 To check the sleep timer

- Press "SLEEP" key once and the time remaining will be displayed for 2 seconds.

9.3 To cancel the sleep timer

- Press "SLEEP" key repeatedly until the display shows "0".

10. PARENTAL LOCK

The converter incorporates an electronic locking system to prevent children from viewing channels with adult programs.

10.1 To lock a channel

- Press the "P-Lock" key, followed by the "F +" and P-LOCK indicator will turn on for this channel. No picture and no sound on TV.
- Press the "F +" key before the "CC" disappears to complete the parental lock.
- The completion of the locking will be indicated by a display of "CC".

10.2 To unlock for viewing

- Select a channel have been P-locked.
- Press "P-Lock" key and, then, enter the passcode: 2999
- Press "MEM" key within 2 seconds of the last entry. If the code is correct, the picture and sound will be resumed.
- Once you unlock one of those locked channels, all the locked channels will be unlocked. To lock them all again, simply press "PWR" key to turn off the converter for 1 seconds and then press "PWR" key to turn on the converter. All of those channels will be locked again.

10.3 To change the passcode

- Select out a P-locked channel.
- Unlock the channel, per procedure 10.2.
- Pressing "P-Lock" key and, then, enter the new passcode and followed by pressing "F+" key.

Note : Make sure that you do not forget the new passcode as there is no way of unlocking the channel without it. If necessary, write the passcode down and keep it in a safe place.

10.4 To delete the lock

- Select the channel with its lock to be deleted.
- Unlock the channel, per procedure 10.2
- After the channel been unlocked, press "P-Lock" key and, then, "F -" button to delete the parental lock from the channel. The parental lock indicator will turn off for this channel.

Channel Frequency Table

Channel NO.	TV		CATV		Channel NO.	TV		CATV	
	STD	STD	H.R.C	I.R.C		STD	STD	H.R.C	I.R.C
1.	73.25	73.25	72.00	73.25	64.	771.25	463.25	462.00	463.25
2.	55.25	55.25	54.00	55.25	65.	777.25	469.25	468.00	469.25
3.	61.25	61.25	60.00	61.25	66.	783.25	475.25	474.00	475.25
4.	67.25	67.25	66.00	67.25	67.	789.25	481.25	480.00	481.25
5.	77.25	77.25	78.00	79.25	68.	795.25	487.25	486.00	487.25
6.	83.25	83.25	84.00	85.25	69.	801.25	493.25	492.00	493.25
7.	175.25	175.25	174.00	175.25	70.		499.25	498.00	499.25
8.	181.25	181.25	180.00	181.25	71.		505.25	504.00	505.25
9.	187.25	187.25	186.00	187.25	72.		511.25	510.00	511.25
10.	193.25	193.25	192.00	193.25	73.		517.25	516.00	517.25
11.	199.25	199.25	198.00	199.25	74.		523.25	522.00	523.25
12.	205.25	205.25	204.00	205.25	75.		529.25	528.00	529.25
13.	211.25	211.25	210.00	211.25	76.		535.25	534.00	535.25
14.	471.25	121.25	120.00	121.25	77.		541.25	540.00	541.25
15.	477.25	127.25	126.00	127.25	78.		547.25	546.00	547.25
16.	483.25	133.25	132.00	133.25	79.		553.25	552.00	553.25
17.	489.25	139.25	138.00	139.25	80.		559.25	558.00	559.25
18.	495.25	145.25	144.00	145.25	81.		565.25	564.00	565.25
19.	501.25	151.25	150.00	151.25	82.		571.25	570.00	571.25
20.	507.25	157.25	156.00	157.25	83.		577.25	576.00	577.25
21.	513.25	163.25	162.00	163.25	84.		583.25	582.00	583.25
22.	519.25	169.25	168.00	169.25	85.		589.25	588.00	589.25
23.	525.25	217.25	216.00	217.25	86.		595.25	594.00	595.25
24.	531.25	223.25	222.00	223.25	87.		601.25	600.00	601.25
25.	537.25	229.25	228.00	229.25	88.		607.25	606.00	607.25
26.	543.25	235.25	234.00	235.25	89.		613.25	612.00	613.25
27.	549.25	241.25	240.00	241.25	90.		619.25	618.00	619.25
28.	555.25	247.25	246.00	247.25	91.		625.25	624.00	625.25
29.	561.25	253.25	252.00	253.25	92.		631.25	630.00	631.25
30.	567.25	259.25	258.00	259.25	93.		637.25	636.00	637.25
31.	573.25	265.25	264.00	265.25	94.		643.25	642.00	643.25
32.	579.25	271.25	270.00	271.25	95.		91.25	90.00	91.25
33.	585.25	277.25	276.00	277.25	96.		97.25	96.00	97.25
34.	591.25	283.25	282.00	283.25	97.		103.25	102.00	103.25
35.	597.25	289.25	288.00	289.25	98.		109.25	108.00	109.25
36.	603.25	295.25	294.00	295.25	99.		115.25	114.00	115.25
37.	609.25	301.25	300.00	301.25	100.		649.25	648.00	649.25
38.	615.25	307.25	306.00	307.25	101.		655.25	654.00	655.25
39.	621.25	313.25	312.00	313.25	102.		661.25	660.00	661.25
40.	627.25	319.25	318.00	319.25	103.		667.25	666.00	667.25
41.	633.25	325.25	324.00	325.25	104.		673.25	672.00	673.25
42.	639.25	331.25	330.00	331.25	105.		679.25	678.00	679.25
43.	645.25	337.25	336.00	337.25	106.		685.25	684.00	685.25
44.	651.25	343.25	342.00	343.25	107.		691.25	690.00	691.25
45.	657.25	349.25	348.00	349.25	108.		697.25	696.00	697.25
46.	663.25	355.25	354.00	355.25	109.		703.25	702.00	703.25
47.	669.25	361.25	360.00	361.25	110.		709.25	708.00	709.25
48.	675.25	367.25	366.00	367.25	111.		715.25	714.00	715.25
49.	681.25	373.25	372.00	373.25	112.		721.25	720.00	721.25
50.	687.25	379.25	378.00	379.25	113.		727.25	726.00	727.25
51.	693.25	385.25	384.00	385.25	114.		733.25	732.00	733.25
52.	699.25	391.25	390.00	391.25	115.		739.25	738.00	739.25
53.	705.25	397.25	396.00	397.25	116.		745.25	744.00	745.25
54.	711.25	403.25	402.00	403.25	117.		751.25	750.00	751.25
55.	717.25	409.25	408.00	409.25	118.		757.25	756.00	757.25
56.	723.25	415.25	414.00	415.25	119.		763.25	762.00	763.25
57.	729.25	421.25	420.00	421.25	120.		769.25	768.00	769.25
58.	735.25	427.25	426.00	427.25	121.		775.25	774.00	775.25
59.	741.25	433.25	432.00	433.25	122.		781.25	780.00	781.25
60.	747.25	439.25	438.00	439.25	123.		787.25	786.00	787.25
61.	753.25	445.25	444.00	445.25	124.		793.25	792.00	793.25
62.	759.25	451.25	450.00	451.25	125.		799.25	798.00	799.25
63.	765.25	457.25	456.00	457.25					