

# FCC Part 15 Subpart B EMI TEST REPORT of

E.U.T. : DIGITAL SATELLITE  
RECEIVER

MODEL : IRD-2102S (PROSAT-2102S)  
FCC ID. : JJ6IRD2102S

for

**APPLICANT : EFA CO.**

**ADDRESS : NO. 3, TZU-CHIANG 4TH ROAD, CHUNGLI  
INDUSTRIAL ZONE, TAOYUAN HSIEN,  
TAIWAN, R.O.C.**

Test Performed by

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Report Number : ET87R-01-068

# TEST REPORT NOTIFICATION

Applicant : EFA CO.  
NO. 3, TZU-CHIANG 4TH ROAD, CHUNGLI INDUSTRIAL  
ZONE, TAOYUAN HSIEN, TAIWAN, R.O.C.

Manufacturer : EFA CO.  
NO. 3, TZU-CHIANG 4TH ROAD, CHUNGLI INDUSTRIAL  
ZONE, TAOYUAN HSIEN, TAIWAN, R.O.C

Description of EUT :

- a) Type of EUT : DIGITAL SATELLITE RECEIVER
- b) Trade Name : PROSAT
- c) Model No. : IRD-2102S (PROSAT-2102S)
- d) Power Supply : 120VAC, 60Hz, 300W MAX
- e) Frequency Range : 950MHz-2150MHz

Regulation Applied : FCC Rules and Regulations Part 15 Subpart B (1996)

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 : JUN. 05, 1998

Test Engineer : Tien Lu Liao  
( Tien Lu Liao )

Approve & Authorized Signer : Will Yauo  
Will Yauo, Supervisor  
EMI Test Site of ELECTRONICS  
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## 1 GENERAL INFORMATION

### 1.1 Product Description

- a) Type of EUT : DIGITAL SATELLITE RECEIVER
- b) Trade Name : PROSAT
- c) Model No. : IRD-2102S (PROSAT-2102S)
- d) Power Supply : 120VAC, 60Hz, 300W MAX
- e) Frequency Range : 950MHz-2150MHz

### 1.2 Characteristics of Device

The DIGITAL SATELLITE RECEIVER only DVB compatible. There are audio and video output for TV connection. It's easy controlled with front panel keys or remote controller.

### 1.3 Test Methodology

For DIGITAL SATELLITE RECEIVER, 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 Lin, 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<br>MHz | Emissions<br>$\mu V$ | Emissions<br>dB $\mu V$ |
|------------------|----------------------|-------------------------|
| 0.45 - 1.705     | 1000                 | 60.0                    |
| 1.705 - 30.0     | 3000                 | 69.5                    |

**Class B Line Conducted Emission Limits :**

| Frequency<br>MHz | Emissions<br>$\mu V$ | Emissions<br>dB $\mu V$ |
|------------------|----------------------|-------------------------|
| 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<br>MHz | Distance<br>Meters | Radiated<br>dB $\mu V/m$ | Radiated<br>$\mu V/m$ |
|------------------|--------------------|--------------------------|-----------------------|
| 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<br>MHz | Distance<br>Meters | Radiated<br>dB $\mu V/m$ | Radiated<br>$\mu V/m$ |
|------------------|--------------------|--------------------------|-----------------------|
| 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.

It was operated with a appropriate standard RF signal applied to the RF input terminal. During emission test.

#### 3.2 Device for Tested System

| Device                            | Manufacture | Model / FCC ID.                              | Description                                                                                                                                                                                                                                                         |
|-----------------------------------|-------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DIGITAL<br>SATELLITE<br>RECEIVER* | EFA CO.     | IRD-2102S<br>(PROSAT-2102S) /<br>JJ6IRD2102S | 1.5m Unshielded AC Power Cord<br>1.5m Unshielded AC Cable × 2<br>1.5m Unshielded AV Cable<br>5.0m Unshielded RG-6U 75 Ω Coaxial Cable<br>2.0m Unshielded S Type Cable<br>1.5m Unshielded TV Cable × 3<br>1.75m Unshielded 9pin Cable<br>1.5m Unshielded 25pin Cable |
| TV                                | Panasonic   | TC-14L1R                                     | 1.2m Unshielded AC Power Cord<br>1.0m Unshielded AV Cable × 1                                                                                                                                                                                                       |
| TV Test<br>Transmitter            | R & S       | SFQ                                          | 1.8m Unshielded AC Power Cord                                                                                                                                                                                                                                       |
| MPEG2<br>Measurement<br>Generator | R & S       | DVG                                          | 1.8m Unshielded AC Power Cord                                                                                                                                                                                                                                       |

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 DIGITAL SATELLITE RECEIVER, it was operated with a appropriate standard RF signal applied to the RF input terminal during emission test.

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.

And per FCC § 15.31 (m), measurements on intentional radiators or receiver shall be performed for each band as following :

| Frequency range over which device operate | Number of Frequencies | Location in the range of operation          |
|-------------------------------------------|-----------------------|---------------------------------------------|
| 1 MHz or less                             | 1                     | Middle                                      |
| 1 to 10 MHz                               | 2                     | 1 near top and 1 near bottom                |
| More than 10 MHz                          | 3                     | 1 near top, 1 near middle and 1 near bottom |

Here, we measured on the DIGITAL SATELLITE RECEIVER for 3 frequencies which covered the all operation range with this converter.

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 Receiver Local Oscillator Emissions**Operation Mode : A RF test signal applied to input terminalTest Date : JUN. 02, 1998      Temperature : 25 °C      Humidity: 68%**a. Local Oscillator Frequency 1429.379MHz**

| Frequency<br>(MHz) | Ant<br>Pol<br>H/V | Reading<br>(dBuV) |      | Factor<br>(dB) | Result @3m<br>(dBuV/m) |      | Limit @3m<br>(dBuV/m) |      | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(m) |
|--------------------|-------------------|-------------------|------|----------------|------------------------|------|-----------------------|------|----------------|---------------------------|---------------------|
|                    |                   | Peak              | Ave. |                | Peak                   | Ave. | Peak                  | Ave. |                |                           |                     |
| 1429.379           | V                 | 48.8              | --   | -7.8           | 41.0                   | --   | 74.0                  | 54.0 | -33.0          | 0                         | 1.20                |
| 2858.964           | V                 | 53.8              | --   | -1.6           | 52.2                   | --   | 74.0                  | 54.0 | -21.8          | 180                       | 1.50                |
| 4288.429           | H                 | 47.2              | --   | 2.0            | 49.2                   | --   | 74.0                  | 54.0 | -24.8          | 0                         | 1.50                |
| 5717.943           | V                 | 46.9              | --   | 4.4            | 51.3                   | --   | 74.0                  | 54.0 | -22.7          | 135                       | 1.50                |
| 7147.379           | H                 | 44.5              | --   | 5.6            | 50.1                   | --   | 74.0                  | 54.0 | -23.9          | 225                       | 1.50                |
| 8576.893           | H/V               | --                | --   | 6.8            | --                     | --   | 74.0                  | 54.0 | --             | --                        | --                  |
| 10006.407          | H                 | 45.9              | 38.1 | 7.4            | 53.3                   | 45.5 | 74.0                  | 54.0 | -8.5           | 135                       | 1.50                |

**b. Local Oscillator Frequency 2029.486MHz**

| Frequency<br>(MHz) | Ant<br>Pol<br>H/V | Reading<br>(dBuV) |      | Factor<br>(dB) | Result @3m<br>(dBuV/m) |      | Limit @3m<br>(dBuV/m) |      | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(m) |
|--------------------|-------------------|-------------------|------|----------------|------------------------|------|-----------------------|------|----------------|---------------------------|---------------------|
|                    |                   | Peak              | Ave. |                | Peak                   | Ave. | Peak                  | Ave. |                |                           |                     |
| 2029.486           | V                 | 51.1              | --   | -4.5           | 46.6                   | --   | 74.0                  | 54.0 | -27.4          | 0                         | 1.40                |
| 4058.971           | H                 | 49.1              | --   | 2.0            | 51.1                   | --   | 74.0                  | 54.0 | -22.9          | 90                        | 1.50                |
| 6088.457           | H                 | 42.1              | --   | 4.5            | 46.6                   | --   | 74.0                  | 54.0 | -27.4          | 225                       | 1.40                |
| 8117.943           | H                 | 41.4              | --   | 6.5            | 47.9                   | --   | 74.0                  | 54.0 | -26.1          | 350                       | 1.30                |
| 10147.429          | H/V               | --                | --   | 7.5            | --                     | --   | 74.0                  | 54.0 | --             | --                        | --                  |

**c. Local Oscillator Frequency 2629.600MHz**

| Frequency<br>(MHz) | Ant<br>Pol<br>H/V | Reading<br>(dBuV) |      | Factor<br>(dB) | Result @3m<br>(dBuV/m) |      | Limit @3m<br>(dBuV/m) |      | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(m) |
|--------------------|-------------------|-------------------|------|----------------|------------------------|------|-----------------------|------|----------------|---------------------------|---------------------|
|                    |                   | Peak              | Ave. |                | Peak                   | Ave. | Peak                  | Ave. |                |                           |                     |
| 2629.600           | V                 | 52.4              | 51.3 | -2.3           | 50.1                   | 49.0 | 74.0                  | 54.0 | -5.0           | 0                         | 1.40                |
| 5259.179           | V                 | 47.7              | 44.0 | 3.7            | 51.4                   | 47.7 | 74.0                  | 54.0 | -6.3           | 45                        | 1.30                |
| 7888.393           | V                 | 43.9              | --   | 6.4            | 50.3                   | --   | 74.0                  | 54.0 | -23.7          | 31                        | 1.30                |
| 10517.757          | H                 | 47.5              | 39   | 7.9            | 55.4                   | 46.9 | 74.0                  | 54.0 | -7.1           | 25                        | 1.30                |
| 13147.407          | H                 | 43.7              | --   | 10.5           | 54.2                   | --   | 74.0                  | 54.0 | -19.8          | 25                        | 1.30                |
| 15777.007          | H/V               | --                | --   | 8.3            | --                     | --   | 74.0                  | 54.0 | --             | --                        | --                  |

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

## 4.2.2 Other Spurious Emissions

Operation Mode : A RF test signal applied to input terminal

Test Date : JUN. 05, 1998      Temperature : 25 °C      Humidity: 73%

| Frequency<br>(MHz) | Ant-Pol<br>H/V | Meter<br>Reading<br>(dBV) | Corrected<br>Factor<br>(dB) | Result<br>@3m<br>(dBV/m) | Limit<br>@3m<br>(dBV/m) | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(m) |
|--------------------|----------------|---------------------------|-----------------------------|--------------------------|-------------------------|----------------|---------------------------|---------------------|
| 57.999             | H              | 53.0                      | -15.8                       | 37.2                     | 40.0                    | -2.8           | 90                        | 4.00                |
| 161.966            | H              | 43.8                      | -9.4                        | 34.4                     | 43.5                    | -9.1           | 270                       | 4.00                |
| 175.489            | H              | 49.2                      | -9.1                        | 40.1                     | 43.5                    | -3.4           | 270                       | 4.00                |
| 199.770            | H              | 45.1                      | -7.1                        | 38.0                     | 43.5                    | -5.5           | 90                        | 4.00                |
| 479.472            | H              | 48.7                      | -4.5                        | 44.2                     | 46.0                    | -1.8           | 0                         | 2.00                |
| 759.207            | H              | 39.3                      | -0.3                        | 39.0                     | 46.0                    | -7.0           | 270                       | 1.80                |

### 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 |
|----------------------|-----------------|-----------|----------------|
| EMI Receiver         | Hewlett-Packard | 8546A     | 02/11/1999     |
| 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     | 12/23/1998     |
| Pre-Amplifier        | Hewlett-Packard | 8449B     | 05/08/1999     |
| Horn Antenna         | EMCO            | 3115      | 08/05/1998     |
| Log Periodic Antenna | EMCO            | 3146      | 12/10/1999     |
| Biconical Antenna    | EMCO            | 3108      | 08/05/1998     |

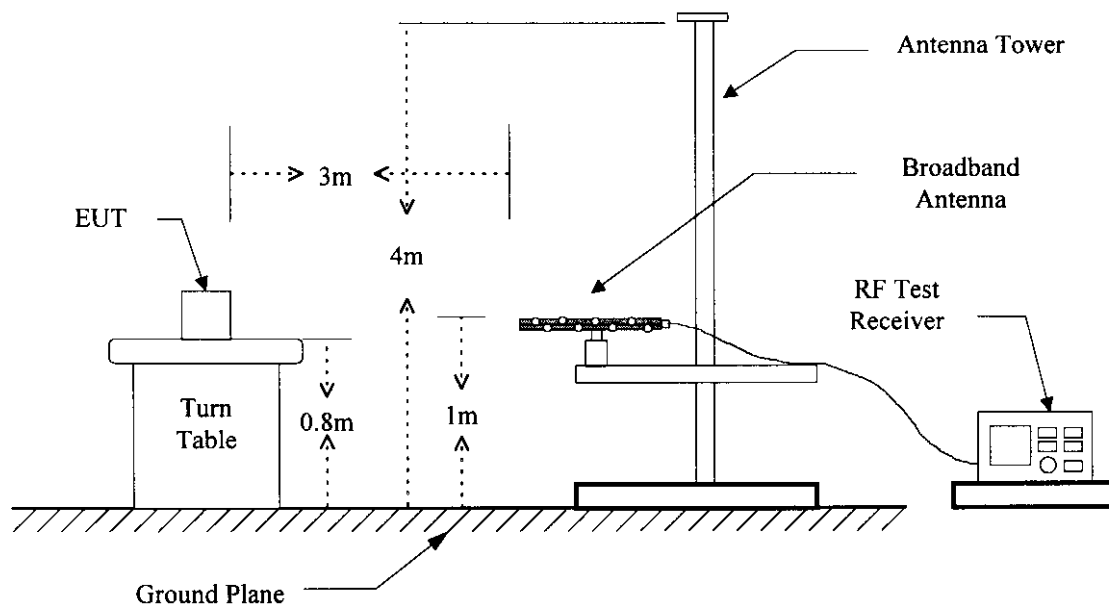
### 4.5 Measuring Instrument Setup

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

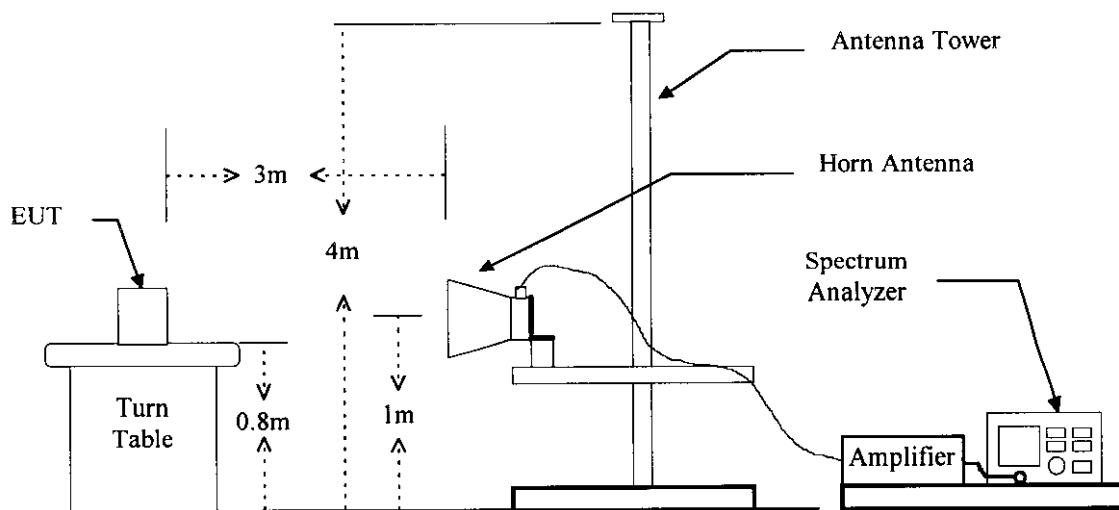
| Frequency Band (MHz) | Instrument        | Function   | Resolution bandwidth | Video Bandwidth |
|----------------------|-------------------|------------|----------------------|-----------------|
| 30 to 1000           | RF Test Receiver  | Quasi Peak | 120 kHz              | N/A             |
|                      | Spectrum Analyzer | Peak       | 100 kHz              | 100 kHz         |
| Above 1000           | Spectrum Analyzer | Peak       | 1 MHz                | 1 MHz           |
|                      | Spectrum Analyzer | Average    | 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 DIGITAL SATELLITE RECEIVER, it was operated with a RF signal applied to the RF input terminal. There is no significant change in radiated emissions when a 0 dBmV input signal is applied.

This conducted emission data is only reported with three input channels, for there is no significant change in other input channels during the preliminary tests.

### 5.2 Conducted Emission Data

A.

Test Date : JUN. 02, 1998      Temperature : 22 °C      Humidity: 85%

Receiver Frequency : 950MHz      Output Channel : CH3

| Frequency<br>(MHz) | Reading (dBuV) |      | Factor<br>(dB) | Result (dBuV) |      | Limit<br>(dBuV) | Margin<br>(dB) |
|--------------------|----------------|------|----------------|---------------|------|-----------------|----------------|
|                    | Va             | Vb   |                | Va            | Vb   |                 |                |
| 0.450              | 38.8           | 39.4 | 0.2            | 39.0          | 39.6 | 48.0            | -8.4           |
| 0.469              | 34.9           | 38.3 | 0.2            | 35.1          | 38.5 | 48.0            | -9.5           |
| 0.510              | 33.0           | 36.5 | 0.2            | 33.2          | 36.7 | 48.0            | -11.3          |
| 0.579              | 29.9           | 33.5 | 0.2            | 30.1          | 33.7 | 48.0            | -14.3          |
| 1.047              | 30.7           | 31.5 | 0.3            | 31.0          | 31.8 | 48.0            | -16.2          |
| 1.373              | 29.1           | 31.4 | 0.3            | 29.4          | 31.7 | 48.0            | -16.3          |

**B.**Test Date : JAN. 02, 1998      Temperature : 22 °C      Humidity: 85%

Receiver Frequency : 1550MHz      Output Channel : CH3

| Frequency<br>(MHz) | Reading (dBuV) |      | Factor<br>(dB) | Result (dBuV) |      | Limit<br>(dBuV) | Margin<br>(dB) |
|--------------------|----------------|------|----------------|---------------|------|-----------------|----------------|
|                    | Va             | Vb   |                | Va            | Vb   |                 |                |
| 0.450              | 39.0           | 39.6 | 0.2            | 39.2          | 39.8 | 48.0            | -8.2           |
| 0.469              | 35.2           | 38.5 | 0.2            | 35.4          | 38.7 | 48.0            | -9.3           |
| 0.510              | 33.2           | 36.7 | 0.2            | 33.4          | 36.9 | 48.0            | -11.1          |
| 0.579              | 30.1           | 33.7 | 0.2            | 30.3          | 33.9 | 48.0            | -14.1          |
| 1.047              | 30.9           | 31.7 | 0.3            | 31.2          | 32.0 | 48.0            | -16.0          |
| 1.373              | 29.3           | 31.6 | 0.3            | 29.6          | 31.9 | 48.0            | -16.1          |

**C.**Test Date : JAN. 02, 1998      Temperature : 22 °C      Humidity: 85%

Receiver Frequency : 2150MHz      Output Channel : CH3

| Frequency<br>(MHz) | Reading (dBuV) |      | Factor<br>(dB) | Result (dBuV) |      | Limit<br>(dBuV) | Margin<br>(dB) |
|--------------------|----------------|------|----------------|---------------|------|-----------------|----------------|
|                    | Va             | Vb   |                | Va            | Vb   |                 |                |
| 0.450              | 38.9           | 39.5 | 0.2            | 39.1          | 39.7 | 48.0            | -8.3           |
| 0.469              | 35.0           | 38.4 | 0.2            | 35.2          | 38.6 | 48.0            | -9.4           |
| 0.510              | 33.1           | 36.6 | 0.2            | 33.3          | 36.8 | 48.0            | -11.2          |
| 0.579              | 30.0           | 33.6 | 0.2            | 30.2          | 33.8 | 48.0            | -14.2          |
| 1.047              | 30.8           | 31.6 | 0.3            | 31.1          | 31.9 | 48.0            | -16.1          |
| 1.373              | 29.2           | 31.5 | 0.3            | 29.5          | 31.8 | 48.0            | -16.2          |

**D.**Test Date : JUN. 05, 1998      Temperature : 22 °C      Humidity: 85%

Receiver Frequency : 950MHz      Output Channel : CH4

| Frequency<br>(MHz) | Reading (dBuV) |      | Factor<br>(dB) | Result (dBuV) |      | Limit<br>(dBuV) | Margin<br>(dB) |
|--------------------|----------------|------|----------------|---------------|------|-----------------|----------------|
|                    | Va             | Vb   |                | Va            | Vb   |                 |                |
| 0.450              | 38.7           | 39.3 | 0.2            | 38.9          | 39.5 | 48.0            | -8.5           |
| 0.469              | 34.8           | 38.2 | 0.2            | 35.0          | 38.4 | 48.0            | -9.6           |
| 0.510              | 32.9           | 36.4 | 0.2            | 33.1          | 36.6 | 48.0            | -11.4          |
| 1.047              | 30.6           | 31.4 | 0.3            | 30.9          | 31.7 | 48.0            | -16.3          |
| 1.373              | 29.0           | 31.3 | 0.3            | 29.3          | 31.6 | 48.0            | -16.4          |
| 1.825              | 26.8           | 30.1 | 0.3            | 27.1          | 30.4 | 48.0            | -17.6          |

**E.**Test Date : JUN. 05, 1998      Temperature : 22 °C      Humidity: 85%

Receiver Frequency : 1550MHz      Output Channel : CH4

| Frequency<br>(MHz) | Reading (dBuV) |      | Factor<br>(dB) | Result (dBuV) |      | Limit<br>(dBuV) | Margin<br>(dB) |
|--------------------|----------------|------|----------------|---------------|------|-----------------|----------------|
|                    | Va             | Vb   |                | Va            | Vb   |                 |                |
| 0.450              | 38.6           | 39.1 | 0.2            | 38.8          | 39.3 | 48.0            | -8.7           |
| 0.469              | 34.6           | 38.3 | 0.2            | 34.8          | 38.5 | 48.0            | -9.5           |
| 0.510              | 33.1           | 36.7 | 0.2            | 33.3          | 36.9 | 48.0            | -11.1          |
| 1.047              | 30.8           | 31.6 | 0.3            | 31.1          | 31.9 | 48.0            | -16.1          |
| 1.373              | 29.1           | 31.5 | 0.3            | 29.4          | 31.8 | 48.0            | -16.2          |
| 1.825              | 27.1           | 30.4 | 0.3            | 27.4          | 30.7 | 48.0            | -17.3          |

**F.**Test Date : JUN. 05, 1998      Temperature : 22 °C      Humidity: 65%

Receiver Frequency : 2150MHz      Output Channel : CH4

| Frequency<br>(MHz) | Reading (dBuV) |      | Factor<br>(dB) | Result (dBuV) |      | Limit<br>(dBuV) | Margin<br>(dB) |
|--------------------|----------------|------|----------------|---------------|------|-----------------|----------------|
|                    | Va             | Vb   |                | Va            | Vb   |                 |                |
| 0.450              | 38.9           | 39.5 | 0.2            | 39.1          | 39.7 | 48.0            | -8.3           |
| 0.469              | 35.0           | 38.4 | 0.2            | 35.2          | 38.6 | 48.0            | -9.4           |
| 0.510              | 33.2           | 36.6 | 0.2            | 33.4          | 36.8 | 48.0            | -11.2          |
| 1.047              | 30.7           | 31.5 | 0.3            | 31.0          | 31.8 | 48.0            | -16.2          |
| 1.373              | 29.3           | 31.6 | 0.3            | 29.6          | 31.9 | 48.0            | -16.1          |
| 1.825              | 27.0           | 30.4 | 0.3            | 27.3          | 30.7 | 48.0            | -17.3          |

**5.3 Result Data Calculation**

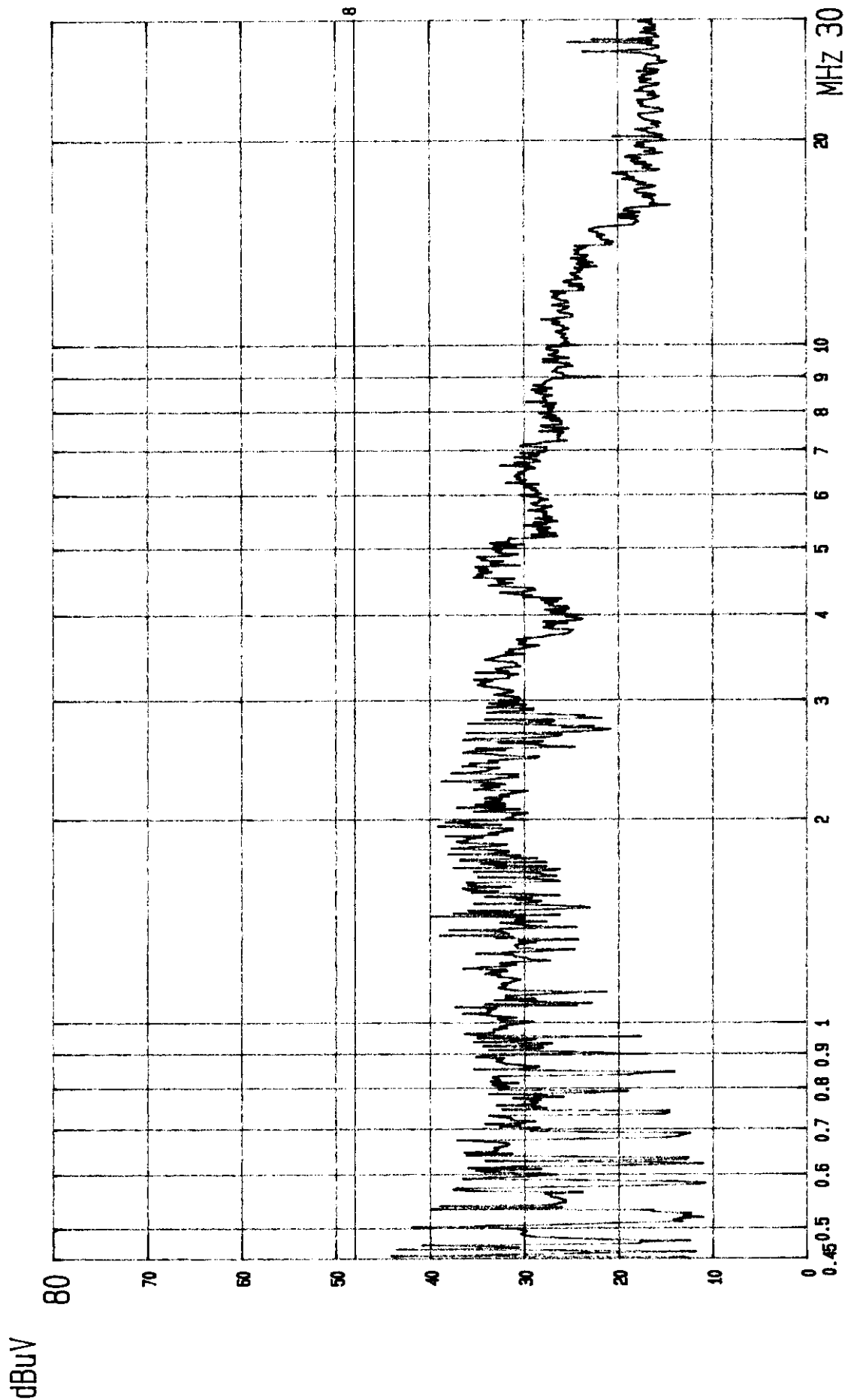
The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

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

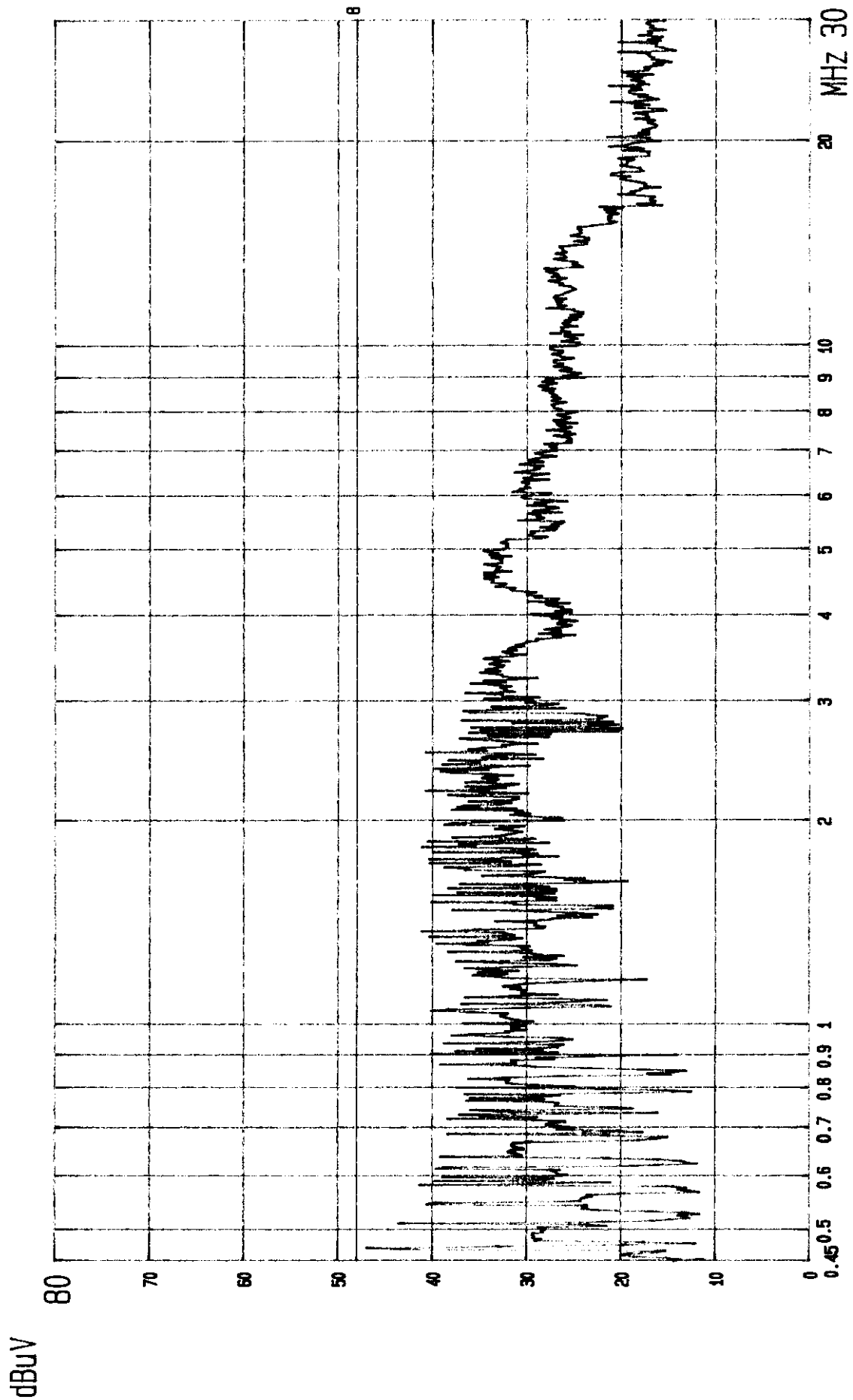
Assume a receiver reading of 22.5 dB  $\mu$  V is obtained, and LISN Factor is 0.1 dB, then the total of field strength is 22.6 dB  $\mu$  V.

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

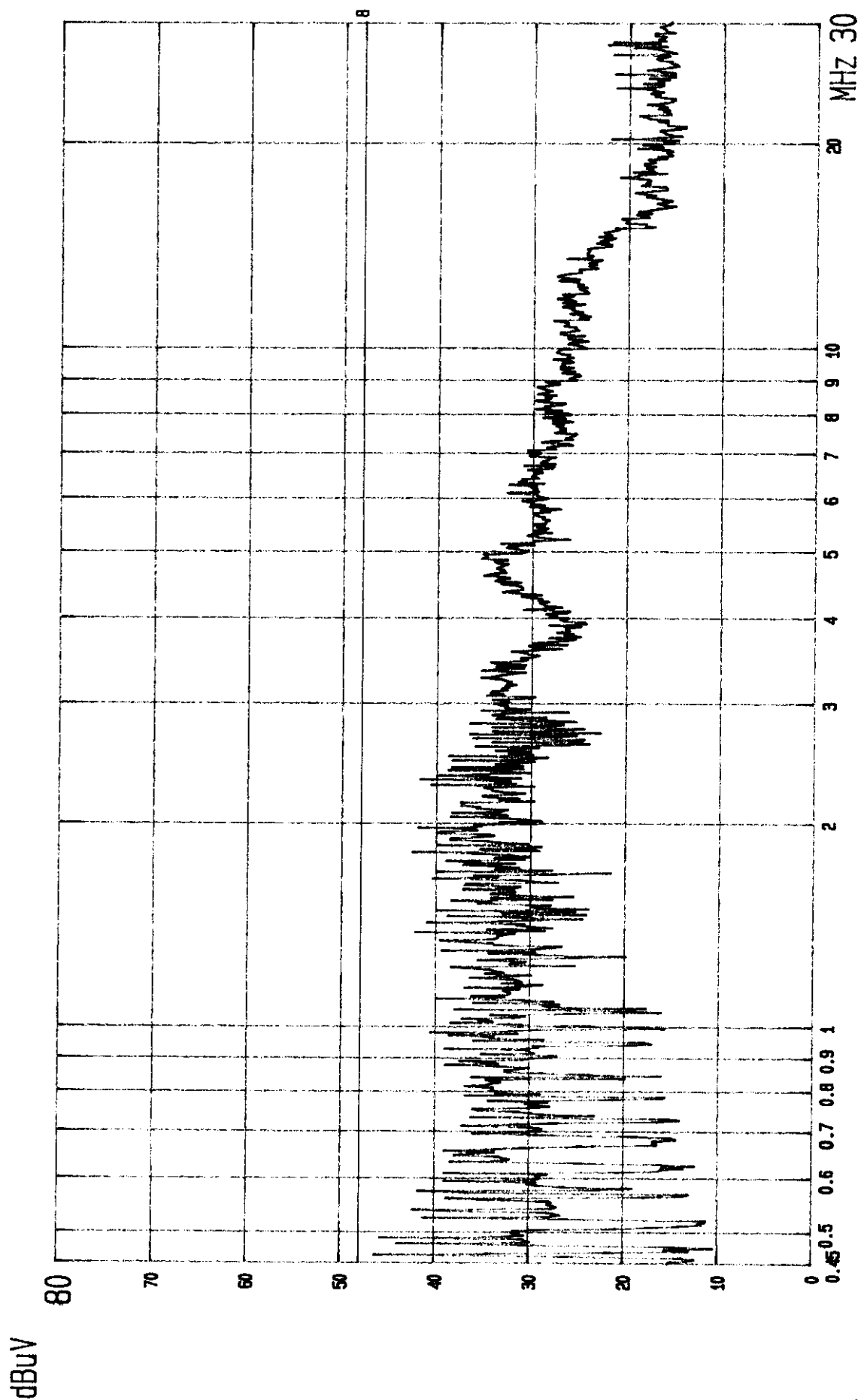
$$\begin{aligned} \text{Level in } \mu \text{ V} &= \text{Common Antilogarithm}[(22.6 \text{ dB } \mu \text{ V})/20] \\ &= 13.48 \mu \text{ V} \end{aligned}$$



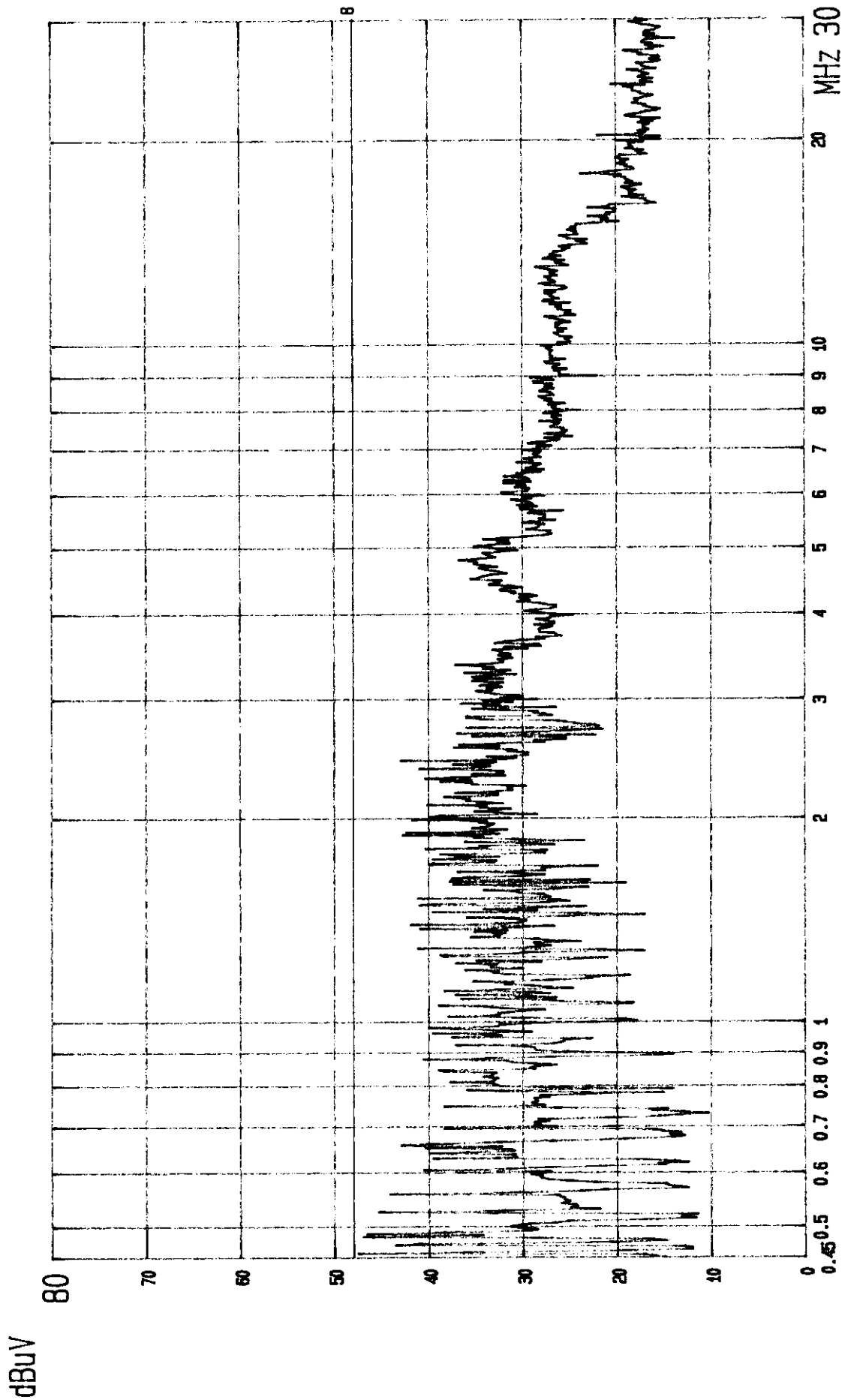
FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: QP. CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 950MHz O/P: CH3 POWER: 120V/60Hz LISN: Va ETC EMI LAB.



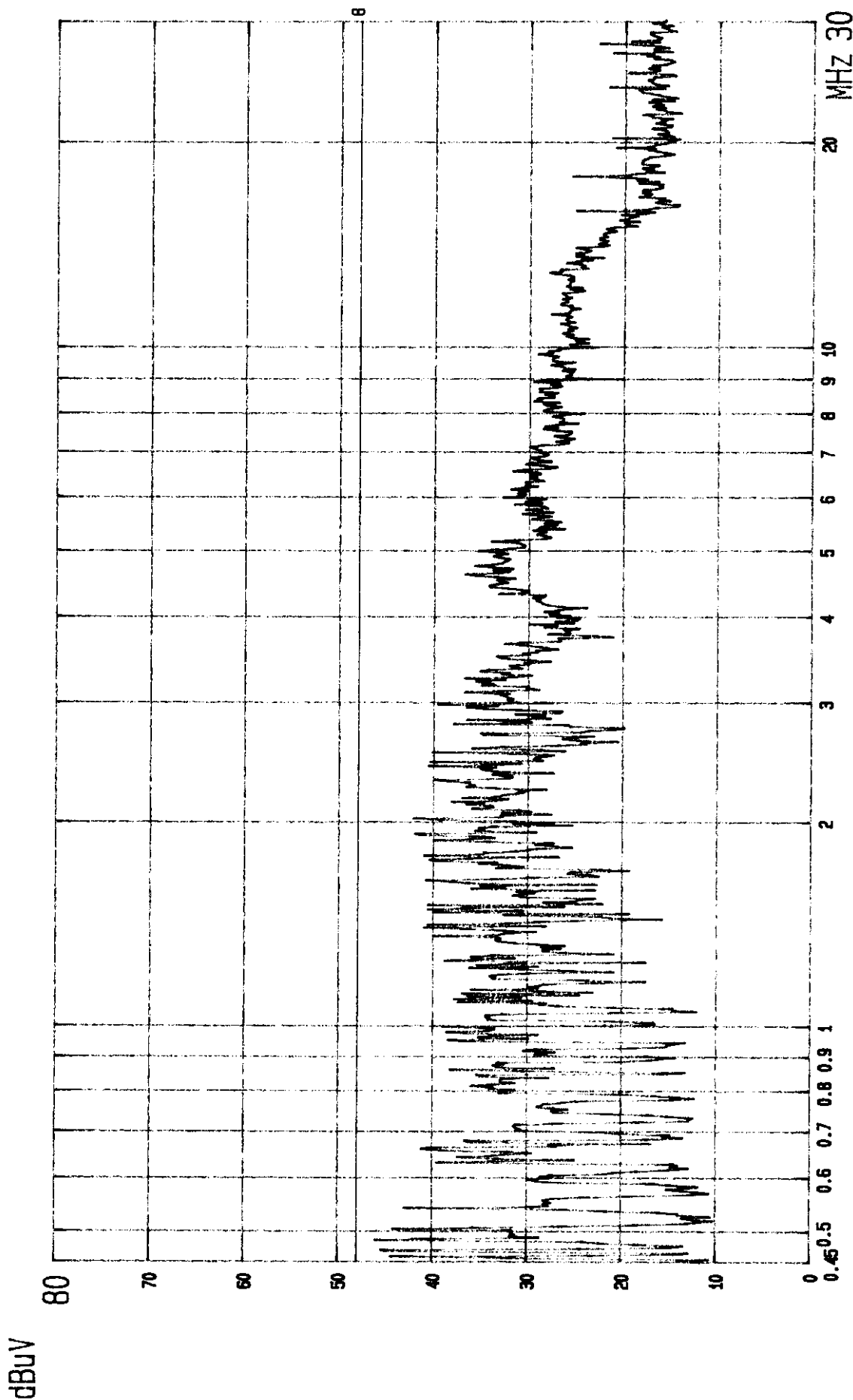
FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: QP. CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 950MHZ O/P: CH3 POWER: 120V/60HZ LISN: Vb ETC EMI LAB.



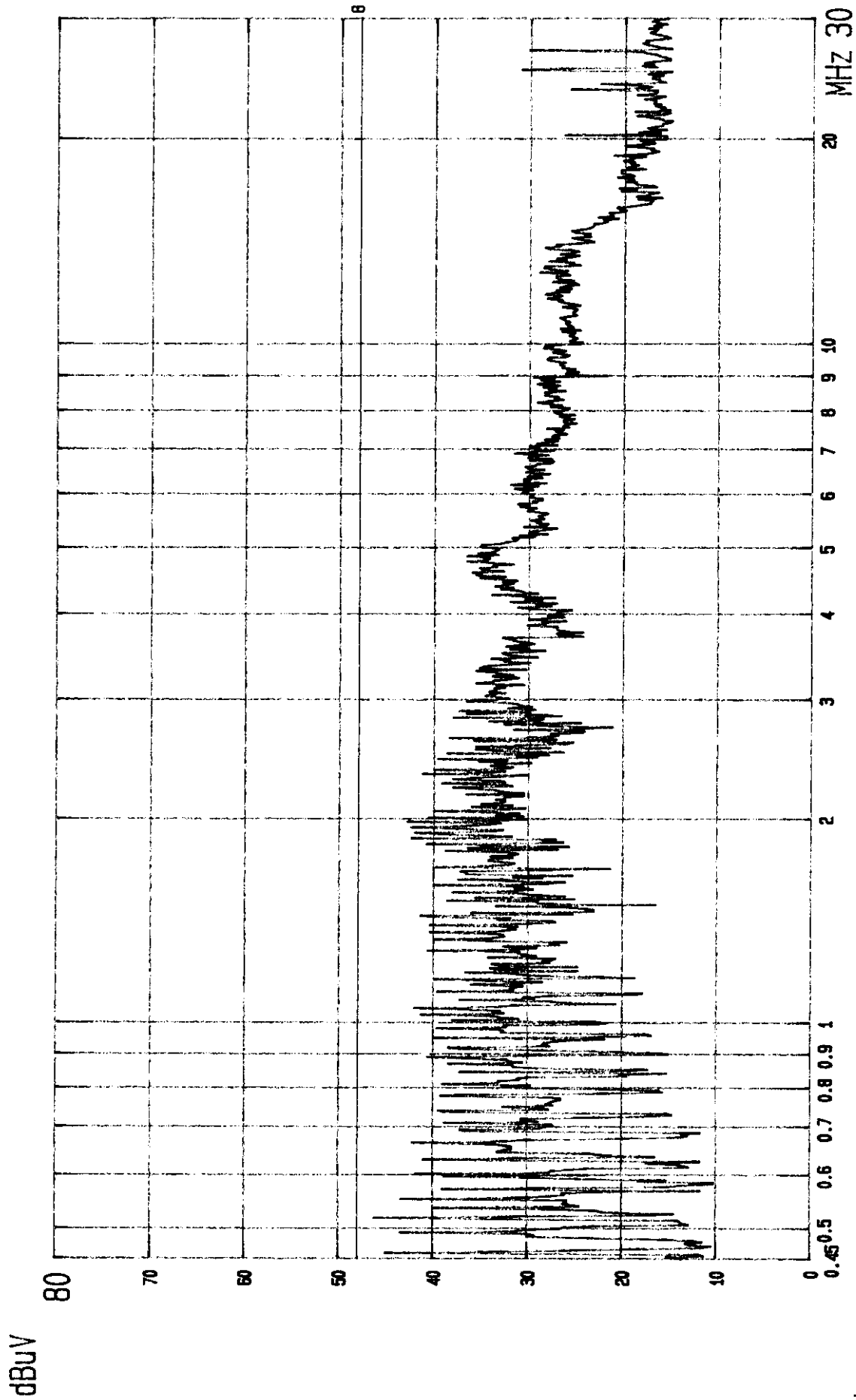
FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: QP. CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 1550MHZ O/P: CH3 POWER: 120V/60HZ LISN: Va ETC EMI LAB.



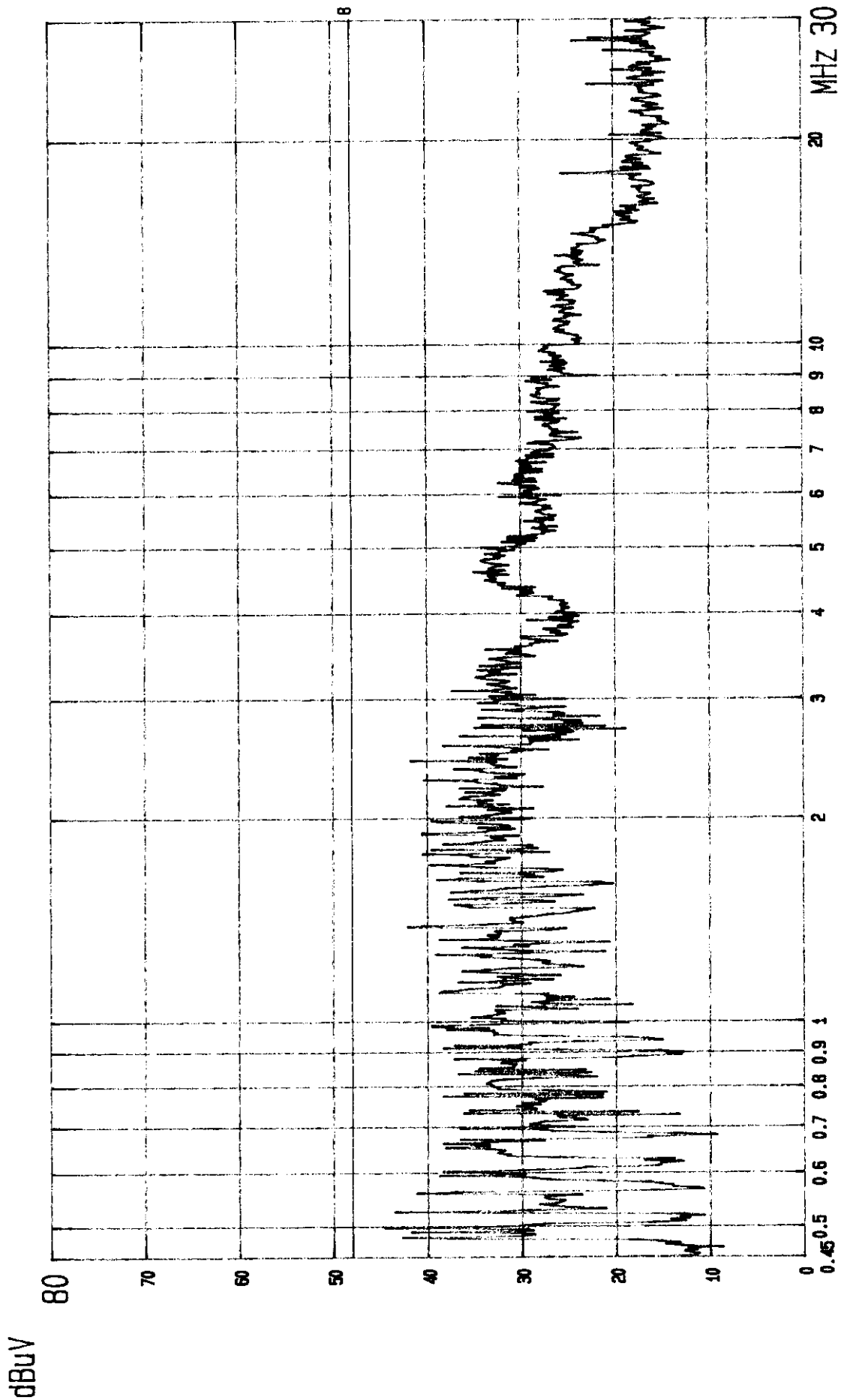
FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: QP. CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 1550MHZ O/P: CH3 POWER: 120V/60Hz LISN: Vb ETC EMI LAB.



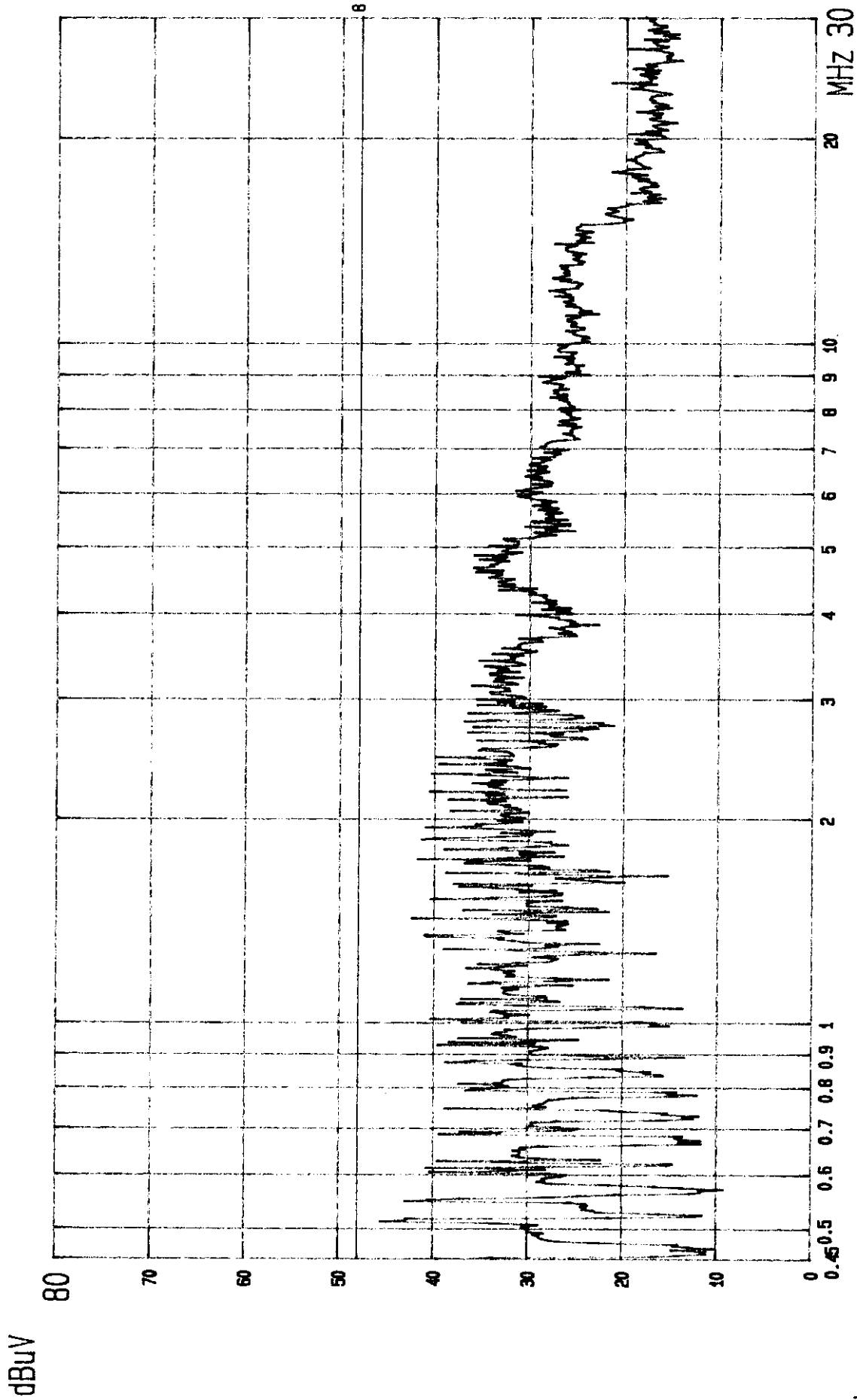
FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: QP. CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 2150MHz O/P: CH3 POWER: 120V/60Hz LISN: Va ETC EMI LAB.



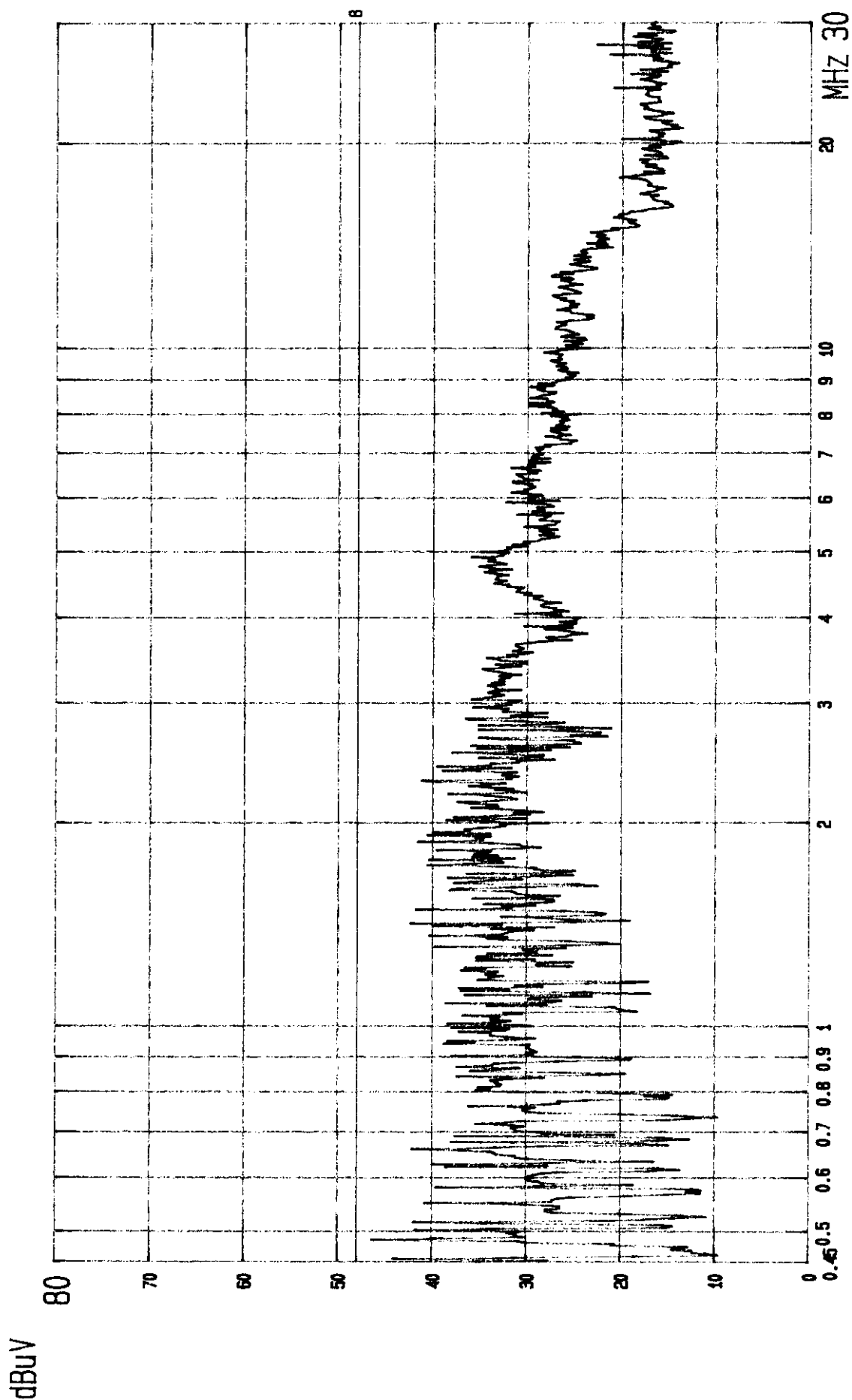
FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: QP, CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 2150MHZ O/P: CH3 POWER: 120V/60Hz LISN: Vb ETC EMI LAB.



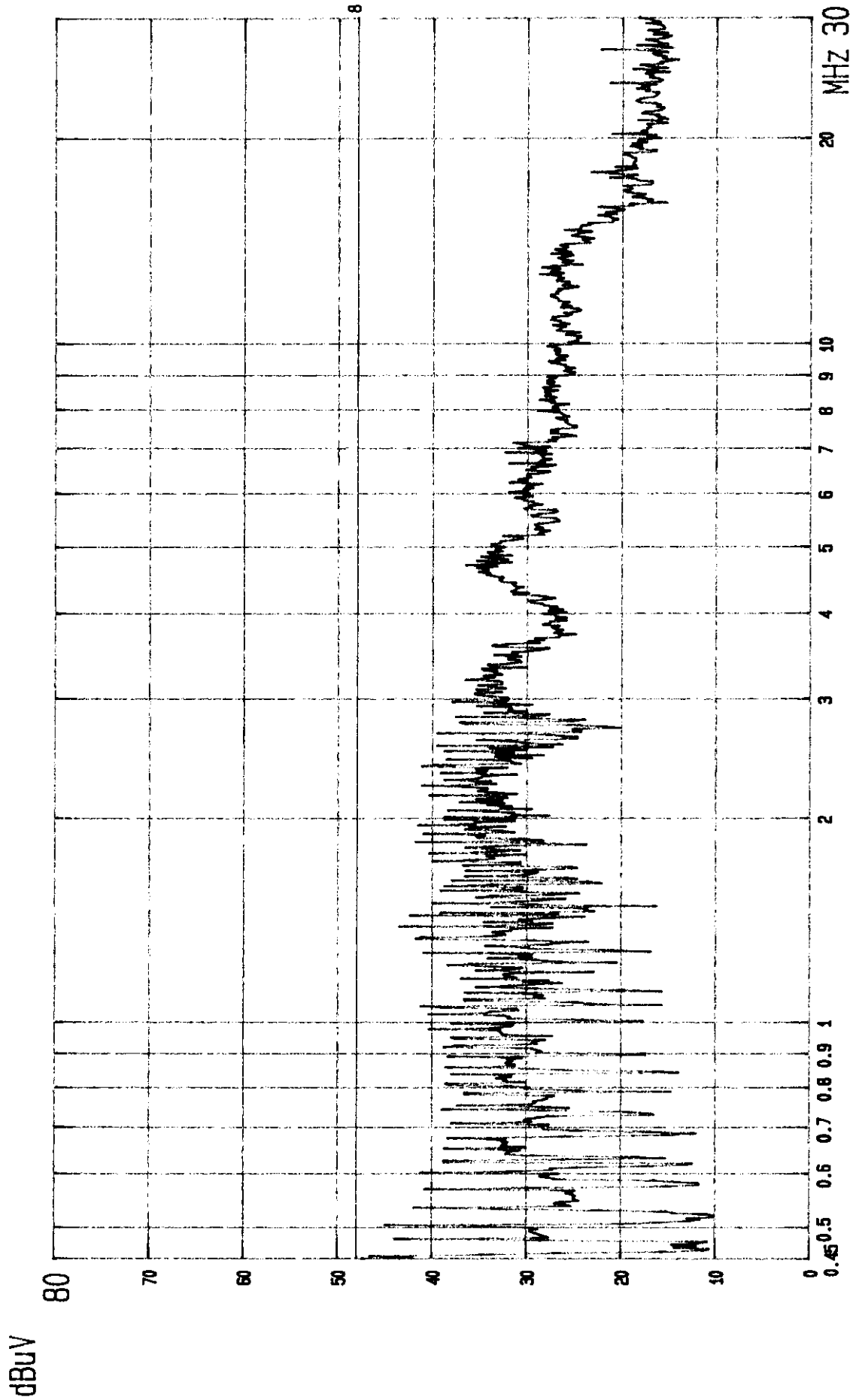
FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: GP. CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 950MHz O/P: CH4 POWER: 120V/60Hz LISN: Va ETC EMI LAB.



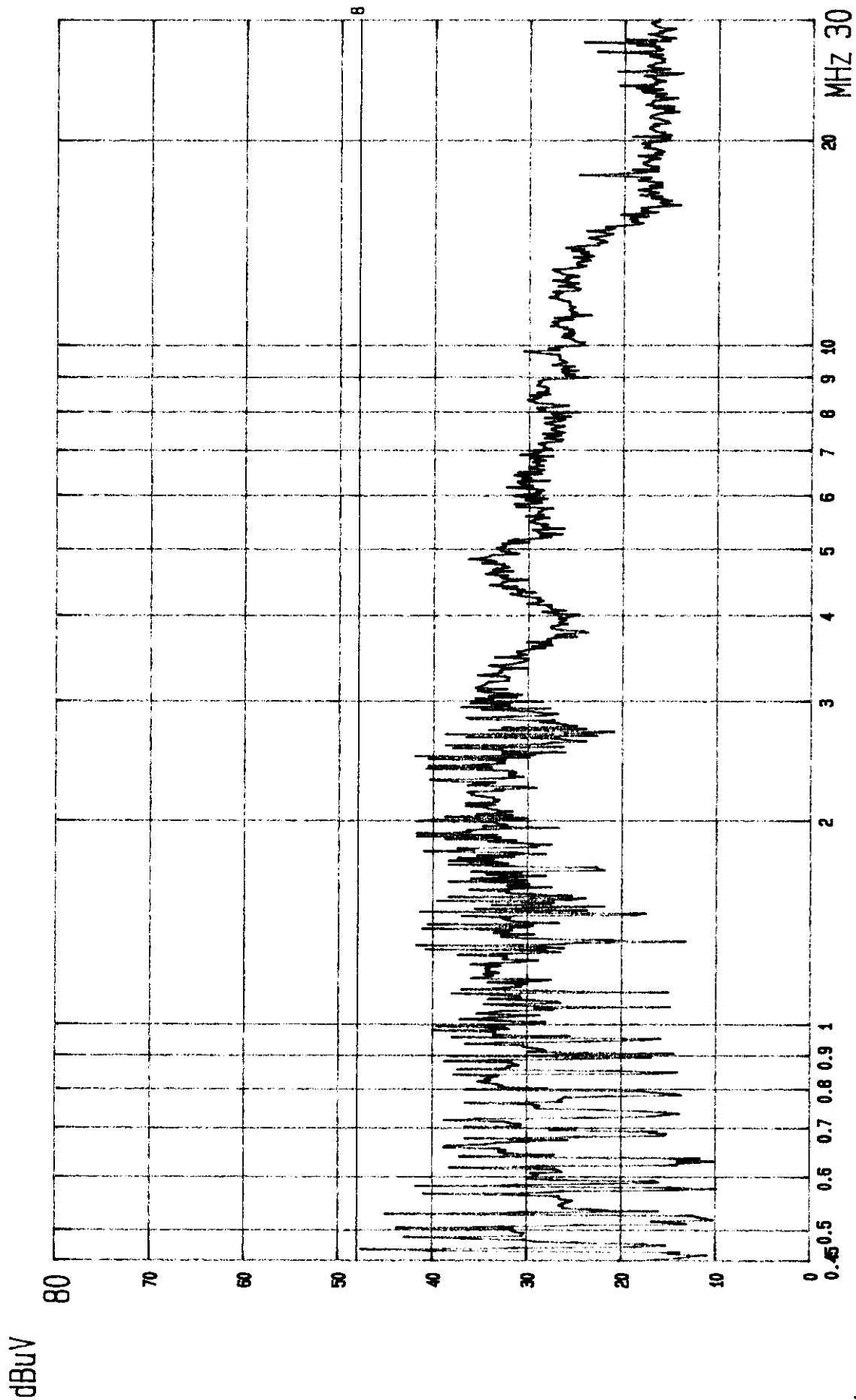
FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8:QP, CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 950MHZ O/P: CH4 POWER: 120V/60HZ LISN: Vb ETC EMI LAB.



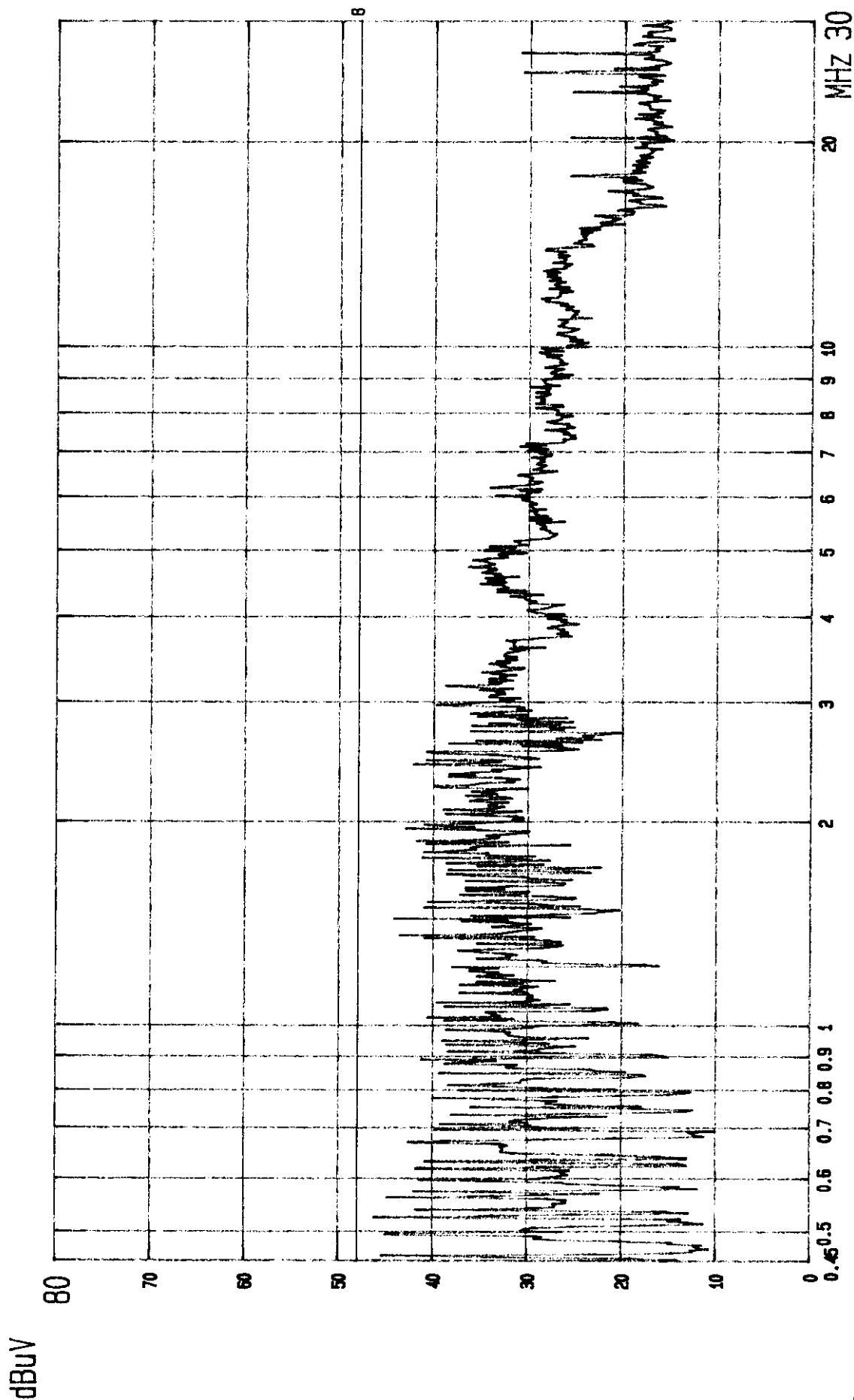
FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: QP. CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 1550MHZ O/P: CH4 POWER: 120V/60HZ LISN: Va ETC EMI LAB.



FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: QP. CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 1550MHz O/P: CH4 POWER: 120V/60Hz LISN: Vb ETC EMI LAB.

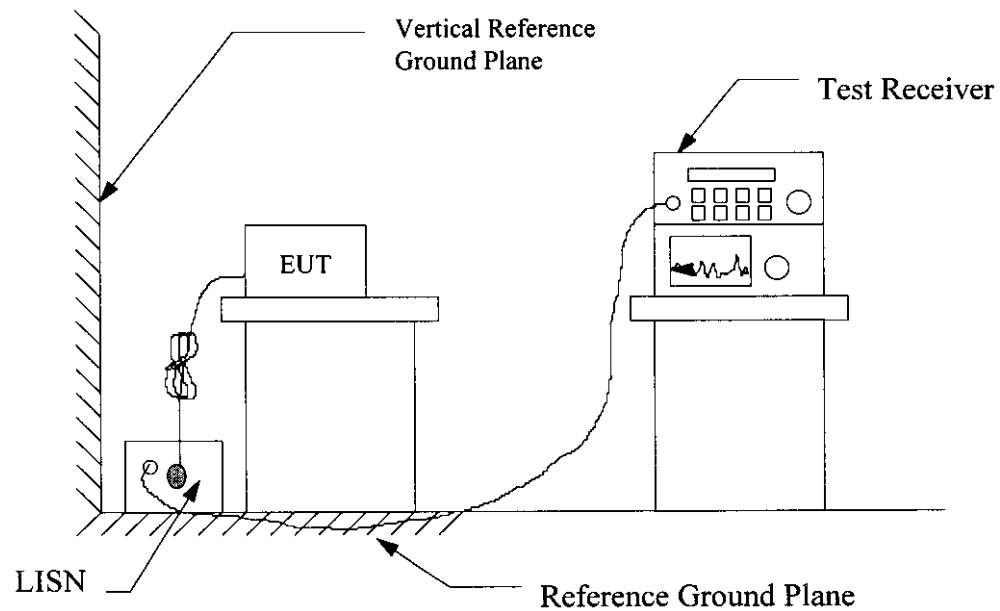


FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: QP. CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 2150MHz O/P: CH4 POWER: 120V/60Hz LISN: Va ETC EMI LAB.



FCC CONDUCTED TEST EUT: DIGITAL SATELLITE RECEIVER 8: QP. CLASS B LIMIT  
MODEL: IRD-2102S MODE: I/P: 2150MHZ O/P: CH4 POWER: 120V/60HZ LISN: Vb ETC EMI LAB.

## 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   | 12/10/1998     |
| 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.

A standard test RF signal is applied to SAT in terminal. Measure the signal level at the visual and aural carrier frequencies of the output channel.

### 6.2 Data of Measurement

Test Date : JUN. 05, 1998      Temperature : 22 °C      Humidity: 85%

A.      Output Channel : 3

Receiver Local Oscillator Frequency : 1429.379MHz

| Frequency |       | Loss<br>dB | Reading in dBuV |       | Result in uV |       | Limit in uV |       |
|-----------|-------|------------|-----------------|-------|--------------|-------|-------------|-------|
| Video     | Audio |            | Video           | Audio | Video        | Audio | Video       | Audio |
| 61.24     | 56.79 | 0.5        | 65.8            | 50.9  | 2065.4       | 371.5 | 3000        | 671   |

Receiver Local Oscillator Frequency : 2029.486MHz

| Frequency |       | Loss<br>dB | Reading in dBuV |       | Result in uV |       | Limit in uV |       |
|-----------|-------|------------|-----------------|-------|--------------|-------|-------------|-------|
| Video     | Audio |            | Video           | Audio | Video        | Audio | Video       | Audio |
| 61.24     | 56.79 | 0.5        | 65.7            | 50.8  | 2041.7       | 367.3 | 3000        | 671   |

Receiver Local Oscillator Frequency : 2629.600MHz

| Frequency |       | Loss<br>dB | Reading in dBuV |       | Result in uV |       | Limit in uV |       |
|-----------|-------|------------|-----------------|-------|--------------|-------|-------------|-------|
| Video     | Audio |            | Video           | Audio | Video        | Audio | Video       | Audio |
| 61.24     | 56.79 | 0.5        | 65.7            | 51.0  | 2041.7       | 375.8 | 3000        | 671   |

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

## B. Output Channel : 4

Receiver Local Oscillator Frequency : 1429.379MHz

| Frequency |       | Loss<br>dB | Reading in dBuV |       | Result in uV |       | Limit in uV |       |
|-----------|-------|------------|-----------------|-------|--------------|-------|-------------|-------|
| Video     | Audio |            | Video           | Audio | Video        | Audio | Video       | Audio |
| 67.23     | 62.79 | 0.5        | 66.6            | 52.2  | 2264.6       | 431.5 | 3000        | 671   |

Receiver Local Oscillator Frequency : 2029.486MHz

| Frequency |       | Loss<br>dB | Reading in dBuV |       | Result in uV |       | Limit in uV |       |
|-----------|-------|------------|-----------------|-------|--------------|-------|-------------|-------|
| Video     | Audio |            | Video           | Audio | Video        | Audio | Video       | Audio |
| 67.23     | 62.79 | 0.5        | 66.5            | 52.1  | 2238.7       | 426.6 | 3000        | 671   |

Receiver Local Oscillator Frequency : 2629.600MHz

| Frequency |       | Loss<br>dB | Reading in dBuV |       | Result in uV |       | Limit in uV |       |
|-----------|-------|------------|-----------------|-------|--------------|-------|-------------|-------|
| Video     | Audio |            | Video           | Audio | Video        | Audio | Video       | Audio |
| 67.23     | 62.79 | 0.5        | 66.5            | 52.2  | 2238.7       | 431.5 | 3000        | 671   |

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 :

$$\text{Result (uV)} = \left[ 10^{\frac{(\text{Reading} + \text{Pad Loss})}{20}} \right]$$

### 6.4 Equipment for RF Output Level Measurement

| Equipment         | Manufacturer    | Model No. | Next Cal. Date |
|-------------------|-----------------|-----------|----------------|
| Spectrum analyzer | ADVANTEST       | R3271     | 09/02/1998     |
| 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  
Input Impedance : 75Ω

## 7 RF 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.

A standard testRF signal is applied to SAT in terminal. Measure the signal level at the visual and aural carrier frequencies of the output channel.

### 7.2 Measurement Data

Test Date : JAN. 13, 1998      Temperature : 20 °C      Humidity: 55%

A. Output Channel :3

Receiver Local Oscillator Frequency : 1429.379MHz

| Frequency<br>MHz | Meter<br>Reading<br>dBuV | ATT.<br>dB | Amplifier<br>Gain<br>dB | Pad<br>Loss<br>dB | Result<br>in<br>dBuV | Result<br>in<br>uV | Limit<br>in<br>uV |
|------------------|--------------------------|------------|-------------------------|-------------------|----------------------|--------------------|-------------------|
| 54.001           | 53.7                     | 3          | -25                     | 0.5               | 32.2                 | 40.7               | 94.8              |
| 80.984           | 33.1                     | 3          | -25                     | 0.5               | 11.6                 | 3.8                | 94.8              |
| 134.514          | 30.4                     | 3          | -25                     | 0.5               | 8.9                  | 2.8                | 94.8              |
| 336.285          | 33.1                     | 3          | -25                     | 0.5               | 11.6                 | 3.8                | 94.8              |
| 479.486          | 38.0                     | 3          | -25                     | 0.5               | 16.5                 | 6.7                | 94.8              |
| 729.078          | 36.0                     | 3          | -25                     | 0.5               | 14.5                 | 5.3                | 94.8              |

Note : Measuring instrument input impedance is set to 75 Ohms when perform this item of measurement and a built in pre-amplifier is active.

Output Channel :3

Receiver Local Oscillator Frequency : 2029.486MHz

| Frequency<br>MHz | Meter<br>Reading<br>dBuV | ATT.<br>dB | Amplifier<br>Gain<br>dB | Pad<br>Loss<br>dB | Result<br>in<br>dBuV | Result<br>in<br>uV | Limit<br>in<br>uV |
|------------------|--------------------------|------------|-------------------------|-------------------|----------------------|--------------------|-------------------|
| 54.001           | 53.8                     | 3          | -25                     | 0.5               | 32.3                 | 41.2               | 94.8              |
| 80.984           | 33.2                     | 3          | -25                     | 0.5               | 11.7                 | 3.8                | 94.8              |
| 134.514          | 30.5                     | 3          | -25                     | 0.5               | 9.0                  | 2.8                | 94.8              |
| 336.285          | 33.2                     | 3          | -25                     | 0.5               | 11.7                 | 3.8                | 94.8              |
| 479.486          | 38.1                     | 3          | -25                     | 0.5               | 16.6                 | 6.8                | 94.8              |
| 729.078          | 36.1                     | 3          | -25                     | 0.5               | 14.6                 | 5.4                | 94.8              |

Receiver Local Oscillator Frequency :2629.600MHz

| Frequency<br>MHz | Meter<br>Reading<br>dBuV | ATT.<br>dB | Amplifier<br>Gain<br>dB | Pad<br>Loss<br>dB | Result<br>in<br>dBuV | Result<br>in<br>uV | Limit<br>in<br>uV |
|------------------|--------------------------|------------|-------------------------|-------------------|----------------------|--------------------|-------------------|
| 54.001           | 53.9                     | 3          | -25                     | 0.5               | 32.4                 | 41.7               | 94.8              |
| 80.984           | 33.3                     | 3          | -25                     | 0.5               | 11.8                 | 3.9                | 94.8              |
| 134.514          | 30.6                     | 3          | -25                     | 0.5               | 9.1                  | 2.9                | 94.8              |
| 336.285          | 33.3                     | 3          | -25                     | 0.5               | 11.8                 | 3.9                | 94.8              |
| 479.486          | 38.2                     | 3          | -25                     | 0.5               | 16.7                 | 6.8                | 94.8              |
| 729.078          | 36.2                     | 3          | -25                     | 0.5               | 14.7                 | 5.4                | 94.8              |

Note : Measuring instrument input impedance is set to 75 Ohms when perform this item of measurement and a built in pre-amplifier is active.

## B. Output Channel :4

Receiver Local Oscillator Frequency : 1429.379MHz

| Frequency<br>MHz | Meter<br>Reading<br>dBuV | ATT.<br>dB | Amplifier<br>Gain<br>dB | Pad<br>Loss<br>dB | Result<br>in<br>dBuV | Result<br>in<br>uV | Limit<br>in<br>uV |
|------------------|--------------------------|------------|-------------------------|-------------------|----------------------|--------------------|-------------------|
| 54.001           | 52.9                     | 3          | -25                     | 0.5               | 31.4                 | 37.2               | 94.8              |
| 80.981           | 36.9                     | 3          | -25                     | 0.5               | 15.4                 | 5.9                | 94.8              |
| 134.514          | 46.5                     | 3          | -25                     | 0.5               | 25.0                 | 17.8               | 94.8              |
| 336.285          | 37.6                     | 3          | -25                     | 0.5               | 16.1                 | 6.4                | 94.8              |
| 479.486          | 39.0                     | 3          | -25                     | 0.5               | 17.5                 | 7.5                | 94.8              |
| 729.078          | 36.8                     | 3          | -25                     | 0.5               | 15.3                 | 5.8                | 94.8              |

Receiver Local Oscillator Frequency : 2029.486MHz

| Frequency<br>MHz | Meter<br>Reading<br>dBuV | ATT.<br>dB | Amplifier<br>Gain<br>dB | Pad<br>Loss<br>dB | Result<br>in<br>dBuV | Result<br>in<br>uV | Limit<br>in<br>uV |
|------------------|--------------------------|------------|-------------------------|-------------------|----------------------|--------------------|-------------------|
| 54.001           | 53.0                     | 3          | -25                     | 0.5               | 31.5                 | 37.6               | 94.8              |
| 80.984           | 37.0                     | 3          | -25                     | 0.5               | 15.5                 | 6.0                | 94.8              |
| 134.514          | 46.6                     | 3          | -25                     | 0.5               | 25.1                 | 18.0               | 94.8              |
| 336.285          | 37.7                     | 3          | -25                     | 0.5               | 16.2                 | 6.5                | 94.8              |
| 479.486          | 39.1                     | 3          | -25                     | 0.5               | 17.6                 | 7.6                | 94.8              |
| 729.078          | 36.9                     | 3          | -25                     | 0.5               | 15.4                 | 5.9                | 94.8              |

Receiver Local Oscillator Frequency : 2629.600MHz

| Frequency<br>MHz | Meter<br>Reading<br>dBuV | ATT.<br>dB | Amplifier<br>Gain<br>dB | Pad<br>Loss<br>dB | Result<br>in<br>dBuV | Result<br>in<br>uV | Limit<br>in<br>uV |
|------------------|--------------------------|------------|-------------------------|-------------------|----------------------|--------------------|-------------------|
| 54.001           | 53.1                     | 3          | -25                     | 0.5               | 31.6                 | 38.0               | 94.8              |
| 80.984           | 37.1                     | 3          | -25                     | 0.5               | 15.6                 | 6.0                | 94.8              |
| 134.514          | 46.7                     | 3          | -25                     | 0.5               | 25.2                 | 18.2               | 94.8              |
| 336.285          | 37.8                     | 3          | -25                     | 0.5               | 16.3                 | 6.5                | 94.8              |
| 479.486          | 39.2                     | 3          | -25                     | 0.5               | 17.7                 | 7.7                | 94.8              |
| 729.078          | 37.0                     | 3          | -25                     | 0.5               | 15.5                 | 6.0                | 94.8              |

Note : Measuring instrument input impedance is selected with 75 Ohms when perform this item of measurement and a built in pre-amplifier is active.

### 7.3 Calculation of Data Measured

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

$$\text{Result (uV)} = \left[ 10^{\frac{(\text{Reading} + \text{Pad Loss} - \text{Amplifier Gain} + \text{Att.})}{20}} \right]$$

### 7.4 Equipment for Conducted Spurious Measurement

| Equipment         | Manufacturer    | Model No. | Next Cal. Date |
|-------------------|-----------------|-----------|----------------|
| Spectrum analyzer | ADVANTEST       | R3271     | 09/02/1998     |
| 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  
 Input Impedance : 75Ω

## 8 ANTENNA TRANSFER SWITCH MEASUREMENT

### 8.1 Description for measurement

For TV interface devices, according to § 15.115(c)(ii), isolation of transfer switch shall not exceed 0.346 times the square root of R ( same as the R in RF output signal ).

A standard testRF signal is applied to SAT in terminal.

### 8.2 Data of Measurement

A. Output Channel :3

Receiver Local Oscillator Frequency : 1429.379MHz

| Meter Reading<br>(dBm) | Corrected Factor<br>( dB ) | Result<br>(uV) | Limit<br>(uV) | Margin<br>(uV) |
|------------------------|----------------------------|----------------|---------------|----------------|
| -81.5                  | -21.5                      | 1.9            | 3.0           | 0.56           |

Receiver Local Oscillator Frequency : 2029.486MHz

| Meter Reading<br>(dBm) | Corrected Factor<br>( dB ) | Result<br>(uV) | Limit<br>(uV) | Margin<br>(uV) |
|------------------------|----------------------------|----------------|---------------|----------------|
| -81.4                  | -21.5                      | 2.0            | 3.0           | 0.59           |

Receiver Local Oscillator Frequency : 2629.600MHz

| Meter Reading<br>(dBm) | Corrected Factor<br>( dB ) | Result<br>(uV) | Limit<br>(uV) | Margin<br>(uV) |
|------------------------|----------------------------|----------------|---------------|----------------|
| -81.3                  | -21.5                      | 2.0            | 3.0           | 0.56           |

Note :

1. Measuring instrument input impedance is selected with 75 Ohms when perform this item of measurement and a built in pre-amplifier is active.
2. Corrected factor includes matching pad loss or attenuator attenuation ( if any), cable loss and amplifier gain (if any), that is :  

$$= \text{pad loss} + \text{attenuation} - \text{amplifier gain}$$

## B. Output Channel :4

Receiver Local Oscillator Frequency : 1429.379MHz

| Meter Reading<br>(dBm) | Corrected Factor<br>( dB ) | Result<br>(uV) | Limit<br>(uV) | Margin<br>(uV) |
|------------------------|----------------------------|----------------|---------------|----------------|
| -81.3                  | -21.5                      | 2.0            | 3.0           | 0.10           |

Receiver Local Oscillator Frequency : 2029.486MHz

| Meter Reading<br>(dBm) | Corrected Factor<br>( dB ) | Result<br>(uV) | Limit<br>(uV) | Margin<br>(uV) |
|------------------------|----------------------------|----------------|---------------|----------------|
| -81.2                  | -21.5                      | 2.0            | 3.0           | 0.59           |

Receiver Local Oscillator Frequency : 2629.600MHz

| Meter Reading<br>(dBm) | Corrected Factor<br>( dB ) | Result<br>(uV) | Limit<br>(uV) | Margin<br>(uV) |
|------------------------|----------------------------|----------------|---------------|----------------|
| -81.1                  | -21.5                      | 2.0            | 3.0           | 0.61           |

Note :

1. Measuring instrument input impedance is selected with 75 Ohms when perform this item of measurement and a built in pre-amplifier is active.
2. Corrected factor includes matching pad loss or attenuator attenuation ( if any), cable loss and amplifier gain (if any), that is :  

$$= \text{pad loss} + \text{attenuation} - \text{amplifier gain}$$

### 8.3 Result Calculation

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

### 8.4 Measuring Instrument

| Equipment         | Manufacturer    | Model No. | Next Cal. Date |
|-------------------|-----------------|-----------|----------------|
| Spectrum Analyzer | ADVANTEST       | R3271     | 09/02/1998     |
| Amplifier         | Hewlett-Packard | 8447D     | 12/23/1998     |

The parameters of RF test receiver is set as following while measurement is performed :

Resolution Bandwidth : 100 KHz  
 Video Bandwidth : 100 KHz  
 Frequency Span : 1 MHz  
 Sweep Time : 200 ms  
 Function : Peak