

FCC Part 15 EMI TEST REPORT of

E.U.T. : Epox Bluetooth Printer Adapter

MODEL : BT-PA01

FCC ID. : QLHCAC0103

for

APPLICANT : EPoX COMPUTER CO., LTD.

ADDRESS : 346, Chung San Rd., Sec 2, 10 F1., Chung Ho City, Taipei
Hsien, 235 Taiwan, R.O.C.

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN

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LOSHAN TSUN, KWEISHAN HSIANG,
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Report Number : ET92S-03-093-02

TEST REPORT CERTIFICATION

Applicant : EPoX COMPUTER CO., LTD.
346, Chung San Rd., Sec 2, 10 F1., Chung Ho City, Taipei Hsien,
235 Taiwan, R.O.C.

Manufacturer : EPoX COMPUTER CO., LTD.
346, Chung San Rd., Sec 2, 10 F1., Chung Ho City, Taipei Hsien,
235 Taiwan, R.O.C.

Description of EUT :

a) Type of EUT : Epox Bluetooth Printer Adapter

b) Trade Name : Printer Adapter

c) Model No. : BT-PA01

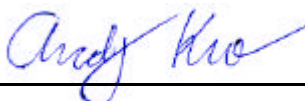
d) Power Supply : Adaptor (Model: SA0106-A; Input 100-240VAC, 0.3A, 50-60Hz;
Output: +6VDC, 1.2A; S/N: R00031100009)

Regulation Applied : FCC Rules and Regulations Part 15 Subpart B & C (2002)

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 : Apr. 21, 2003

Test Engineer : 

Approve & Authorized Signer : 

Signature

Win-Po Tsai

Manager of EMC Testing Department I

Electronics Testing Center, Taiwan

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1 OUTPUT POWER MEASUREMENT

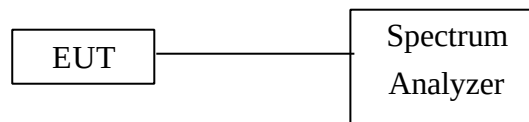
1.1 Standard Applicable

For frequency hopping system, according to 15.247(b), the maximum peak output power of the transmitter shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

1.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 5. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz and VBW to 3 MHz.
4. Measure the highest amplitude appearing on spectral display and record the level to calculate result data.
5. Repeat above procedures until all frequencies measured were complete.

Figure 5: Output power and measurement configuration.



1.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Plotter	Hewlett-Packard	7550A	N/A
Spectrum Analyzer	Hewlett-Packard	8564EC	09/10/2003

1.4 Measurement Data

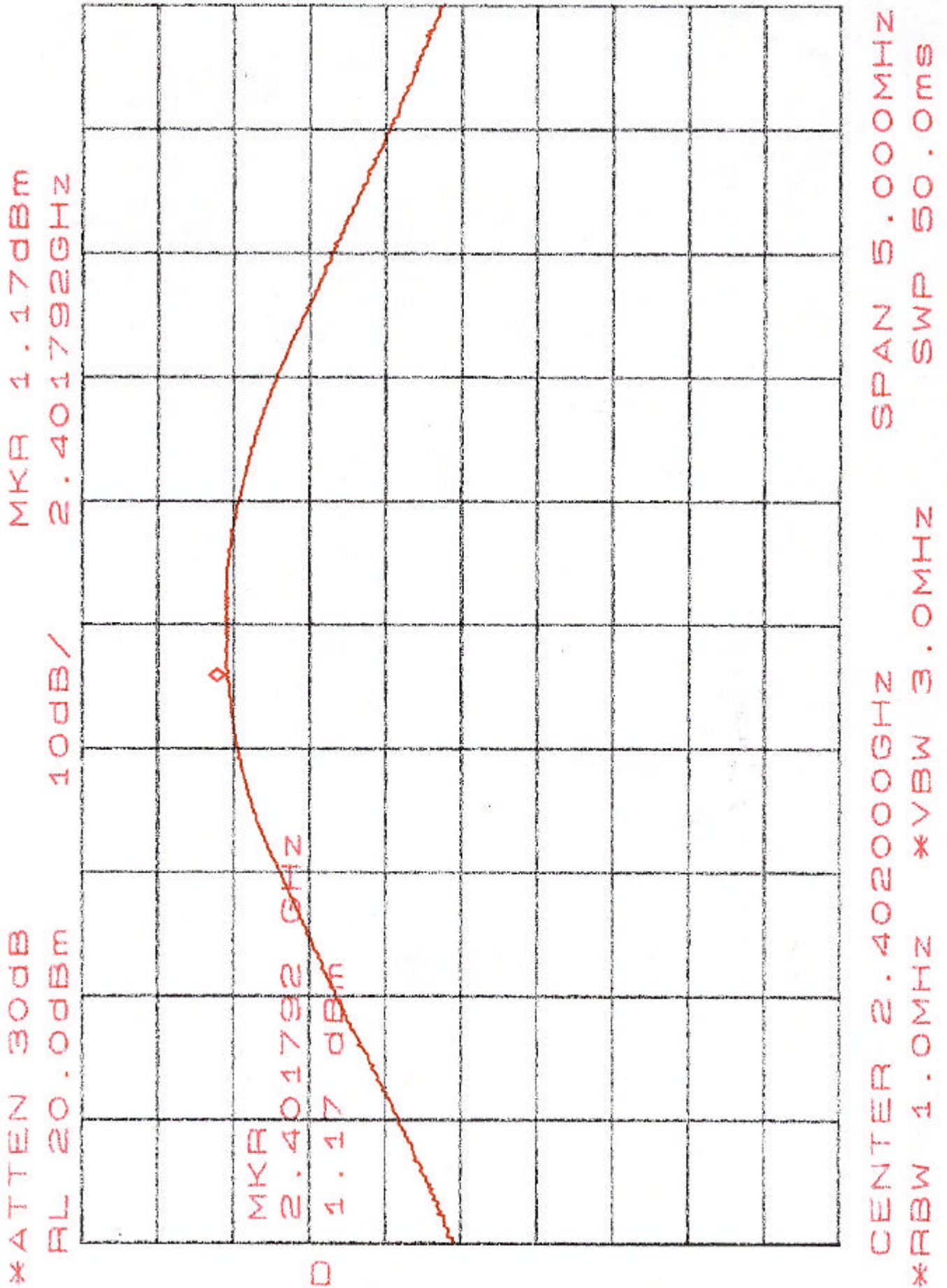
Test Date : Apr. 21, 2003

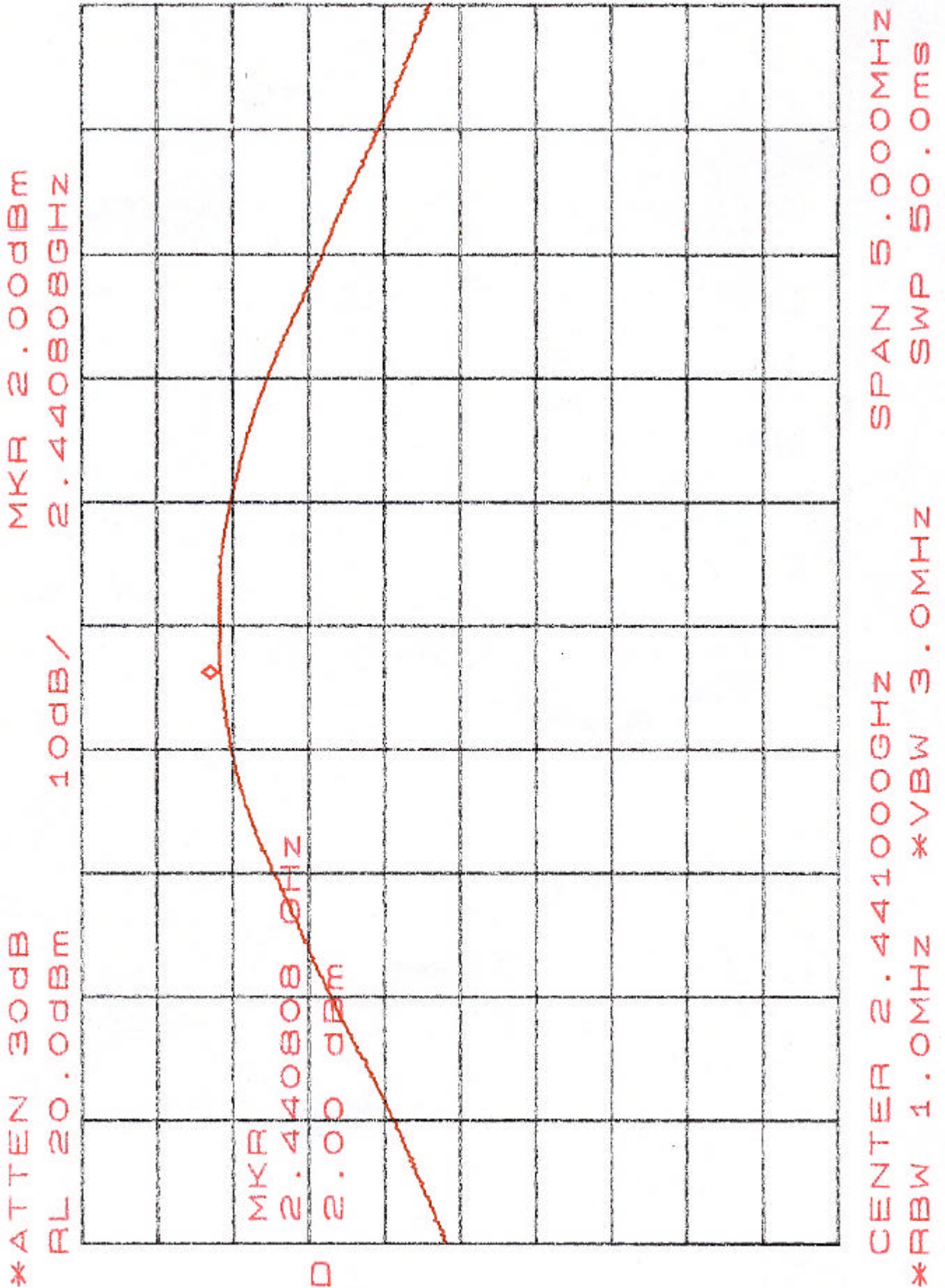
Temperature : 23 °C

Humidity: 78 %

- a) Channel 01 : Output Peak Power is +1.17 dBm or **1.31** mW
- b) Channel 40 : Output Peak Power is +2.00 dBm or **1.58** mW
- c) Channel 79 : Output Peak Power is +2.17 dBm or **1.65** mW

Note: Please see next pages for plotted datas







2 POWER SPECTRAL DENSITY

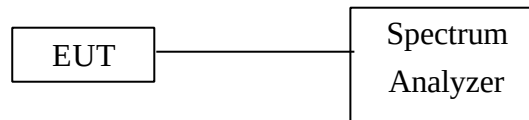
2.1 Standard Applicable

For frequency hopping system, according to 15.247(d), for digitally modulated, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

2.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 5. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 3kHz, VBW to 30 kHz, sweep 300kHz and sweep time 100 sec.
4. Measure the highest amplitude appearing on spectral display and record the level to calculate result data.
5. Repeat above procedures until all frequencies measured were complete.

Figure 5: Output power and measurement configuration.



2.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Plotter	Hewlett-Packard	7550A	N/A
Spectrum Analyzer	Hewlett-Packard	8564EC	09/10/2003

2.4 Measurement Data

Test Date : Apr. 21, 2003

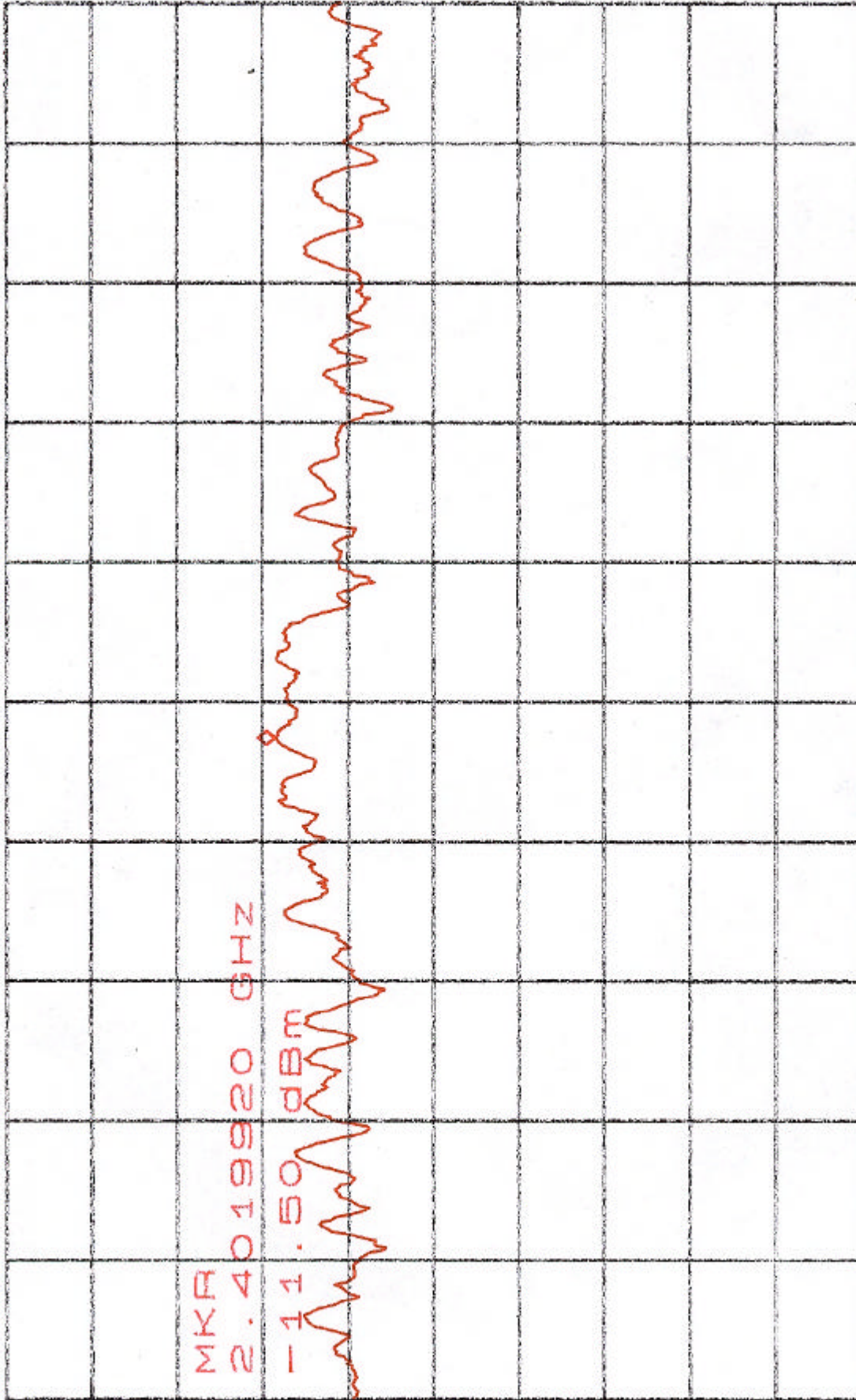
Temperature : 23 °C

Humidity: 78 %

- a) Channel 01 : Power Spectral Density is -11.50 dBm
- b) Channel 40 : Power Spectral Density is -10.67 dBm
- c) Channel 79 : Power Spectral Density is -10.50 dBm

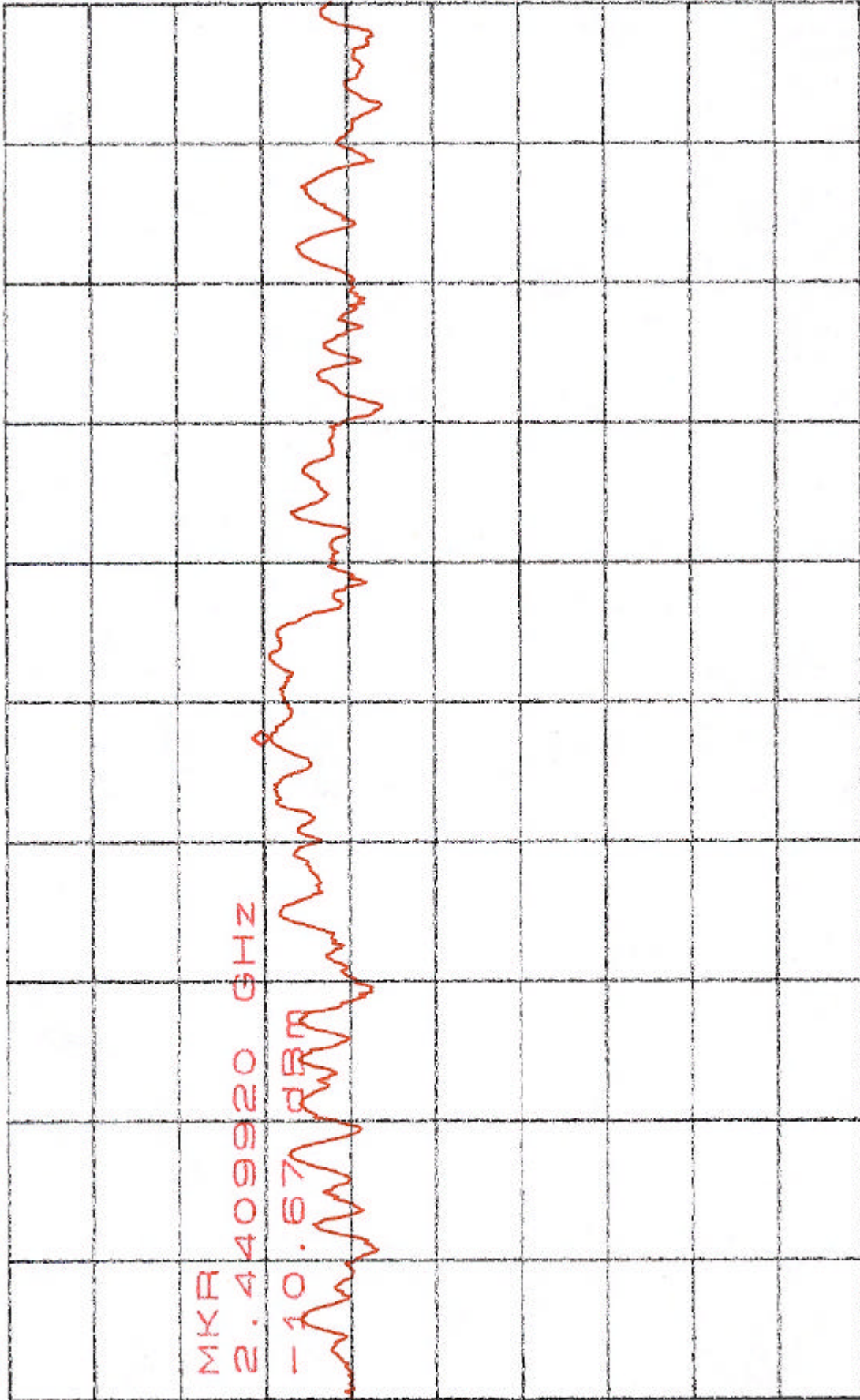
Note: Please see next pages for plotted datas

ATTEN 30dB MKR -11.50dBm
RL 20.0dBm 2.4019920GHz
10dB/



CENTER 2.402000000GHz SPAN 300.000000GHz
*VBW 10KHz *RES 100000
*FREQ 2.4019920GHz

ATTEN 30dB
FRL 20.0dBm
MKR -10.67dBm
2.4409920GHz
10dB/

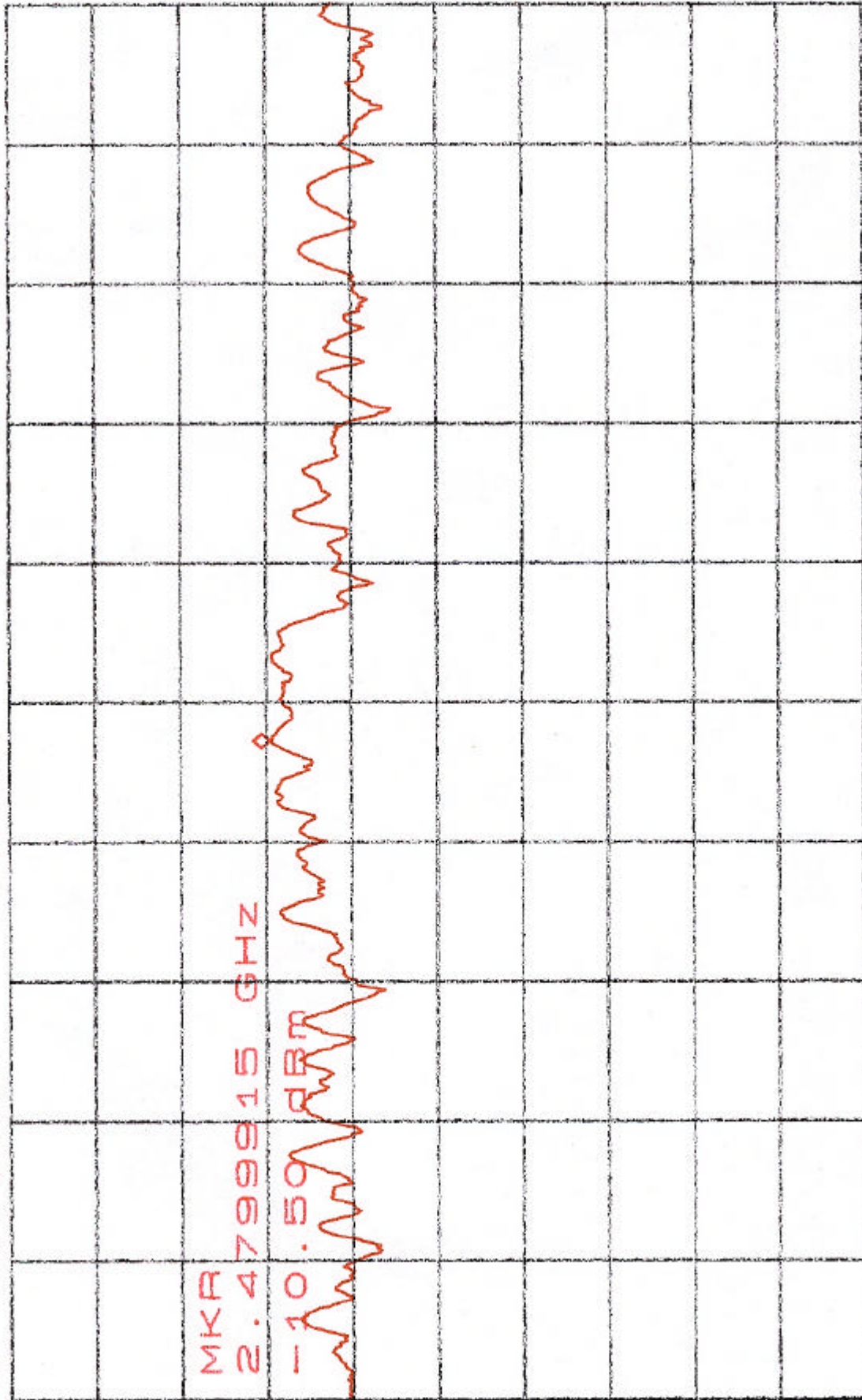


CENTER 2.4410000GHz
*RBW 3.0KHz
SPAN 300.0KHz
*VBW 10KHz
*SWP 100SFC

MKR -10.50dBm
2.4799915GHz

10dB/

ATTEN 30dB
RL 20.0dBm



SPAN 300.0KHZ
*SWP 100SEC

CENTER 2.48000000GHZ
*RBW 3.0KHZ *VBW 10KHZ

3 RF Exposure Evaluation

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency radiation as specified in 1.1307(b) LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(nW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	1	30

F=Frequency in MHz

3.1 Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d =power density in mW/cm²

P_{out} =output power to antenna in mW

G=gain of antenna in linear scale

π =3.1416

R=distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

3.2 EUT Operation condition

A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3.3 Test Result of RF Exposure Evaluation

Test Date : Apr. 21, 2003 Temperature : 23°C Humidity: 78 %

Product: Epox Bluetooth Printer Adapter

Test Item: RF Exposure Evaluation Data

Test site: No. 2 chamber

Test Mode: Normal Operation

3.3.1 Antenna Gain

Antenna Gain: The maximum Gain is 1.5 dBi.

3.3.2 Output Power Into Antenna & RF Exposure Evaluation Distance

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Minimum allowable Distance ®From Skin(cm)
01	2402	+1.17	0.40
40	2441	+2.00	0.43
79	2480	+2.17	0.44

The distance r (4th column) calculated from the Friis transmission formula is far shorter than 20 cm separation requirement. So, RF exposure limit warning or SAR test are not required.