



FCC TEST REPORT

REPORT NO.: RF920318R05

MODEL NO.: ERX10

RECEIVED: Mar. 18, 2003

TESTED: Mar. 19 ~ Mar. 22, 2003

APPLICANT: TRACKING TECHNOLOGY CORP.

ADDRESS: 602 WEBER STREET NORTH, WATERLOO,
ONTARIO, CANADA

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Lin, Chia Pau Tsuen, Linkou Hsiang,
Taipei, Taiwan, R.O.C.

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0528
ILAC MRA



Lab Code: 200102-0

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1. CERTIFICATION

PRODUCT : BUILT-IN ELECTRIC FIREPLACE ON/OFF REMOTE CONTROL
BRAND NAME : EZESTART
MODEL NO. : ERX10
APPLICANT : TRACKING TECHNOLOGY CORP.
STANDARDS : 47 CFR Part 15, Subpart C (Section 15.231), ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Mar. 19 ~ Mar. 22, 2003. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

CHECKED BY: Kelsey Chang **DATE:** Mar. 31, 2003

APPROVED BY: Dr. Alan Lane **DATE:** Mar. 31, 2003

Dr. Alan Lane

Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
STANDARD PARAGRAPH	TEST TYPE	RESULT	REMARK
15.207	Conducted Emission Test	N/A	Power supply is 12VDC from batteries
15.209 15.231(b)	Radiated Emission Test	PASS	Minimum passing margin is -12.1dBuV at 433.88MHz
15.231(c)	20dB Occupied Bandwidth	PASS	Meet the requirement of limit

NOTE: The receiver part to communicate with the EUT has been verified to comply with FCC Part 15, Subpart B, Class B (DoC). The test report can be provided upon request.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	BUILT-IN ELECTRIC FIREPLACE ON/OFF REMOTE CONTROL
MODEL NO.	ERX10
POWER SUPPLY	12VDC from Battery
MODULATION TYPE	ASK
CARRIER FREQUENCY OF EACH CHANNEL	433.92 MHz
BANDWIDTH OF EACH CHANNEL	NA
NUMBER OF CHANNEL	1
ANTENNA TYPE	Printed antenna
DATA CABLE	NA
I/O PORTS	NA

NOTE:

For more detailed features description of the EUT, please refer to the manufacturer's specifications or the User's Manual.

3.2 DESCRIPTION OF TEST MODES

One channels is provided to this EUT:

Channel	Frequency
1	433.92 MHz

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is the transmitter part of a BUILT-IN ELECTRIC FIREPLACE ON/OFF REMOTE CONTROL. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 15, Subpart C. (15.231)
ANSI C63.4 : 1992

All tests have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

NA

4. RADIATED EMISSION MEASUREMENT

4.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.231 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental		Field Strength of Spurious	
	uV/meter	dBuV/meter	uV/meter	dBuV/meter
40.66 – 40.70	2250	67.04	225	48.04
70 – 130	1250	61.94	125	41.94
130 – 174	1250 to 3750	61.94 to 71.48	125 to 375	41.94 to 51.48
174 – 260	3750	71.48	75	37.50
260 – 470	3750 to 12500	71.48 to 81.94	375 to 1250	51.48 to 61.94
Above 470	12500	81.94	1250	61.94

NOTE:

- (1) Where F is the frequency in MHz, the formula for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = $56.81818(F)-6136.3636$; for the band 260-470 MHz, uV/m at 3 meters = $41.6667(F)-7083.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.
- (2) The above field strength limits are specified at a distance of 3meters. The tighter limits apply at the band edges.

The field strength of emission appearing within the restricted band shall not exceed the limits as following:

Frequencies (MHz)	Field Strength of Fundamental	
	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2 TEST INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 13, 2003
* HP Preamplifier	8447D	2944A08485	Apr. 29, 2003
* HP Preamplifier	8449B	3008A01201	Dec. 01, 2003
* HP Preamplifier	8449B	3008A01292	Aug. 07, 2003
*Spectrum Analyzer	8593E	3926A04191	Mar. 28, 2003
*Test Receiver	ESI7	838496/016	Feb. 23, 2004
SCHAFFNER Tunable Dipole Antenna	VHBA 9123	459	Nov. 22, 2003
SCHWARZBECK Tunable Dipole Antenna	UHA 9105	977	
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 02, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 03, 2003
* EMCO Horn Antenna	3115	9312-4192	Apr. 09, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	ADT_Radiated _V5.09	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jul. 11. 2003
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jul. 11. 2003

NOTE:

1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. “*” = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. 5.
5. The VCCI Site Registration No. is R-1039.

4.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

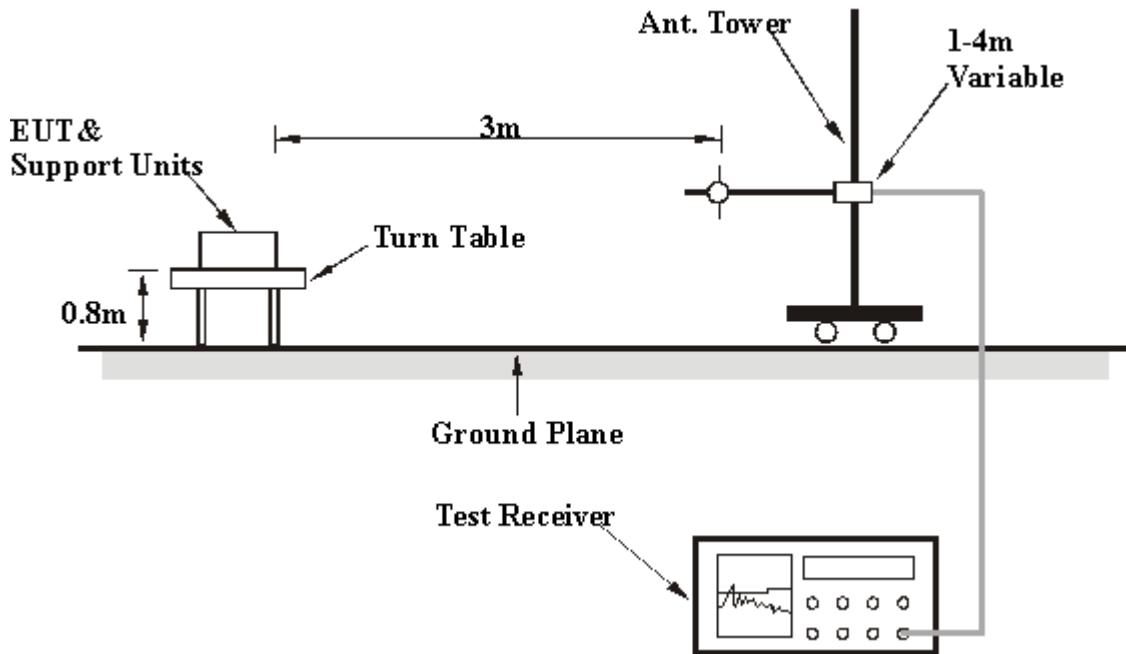
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

4.4 DEVIATION FROM TEST STANDARD

No deviation

4.5 TEST SETUP



For the actual test configuration, please refer to the related item in this test report - Photographs of the Test Configuration.

4.6 EUT OPERATING CONDITION

Set EUT under transmission condition continuously at specific channel frequency.

4.7 TEST RESULT

EUT	BUILT-IN ELECTRIC FIREPLACE ON/OFF REMOTE CONTROL	MODEL	ERX10
FREQUENCY RANGE	Below 1000 MHz	DETECTOR FUNCTION	Peak / Average
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 991 hPa		TESTED BY: Gary Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*433.88	68.7 AV	80.80	-12.10	1.10 H	274	49.10	19.60
2	*433.88	79.4 PK	100.80	-21.40	1.10 H	274	59.80	19.60
3	867.76	49.6 PK	80.80	-31.20	1.33 H	97	24.50	25.10
4	867.76	38.9 AV	60.80	-21.90	1.33 H	97	13.80	25.10

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*433.89	52.20AV	80.83	-28.60	1.00 V	335	32.60	19.60
2	*433.89	62.9 PK	100.83	-37.93	1.00 V	335	43.30	19.60
3	867.78	39.6 PK	80.80	-41.20	1.22 V	73	14.50	25.10
4	867.78	28.90AV	60.80	-31.90	1.22 V	73	3.80	25.10

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
2. Correction Factor(dB) = Pre-Amplifier Factor (dB) - Antenna Factor (dB) - Cable Factor (dB)
3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
4. The other emission levels were very low against the limit.
5. “ – “: N/A
6. Margin value = Emission level – Limit value.
7. “*” = Fundamental frequency
8. The average value of fundamental frequency is: Average = Peak value + Duty cycle
Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log \frac{(1.1\text{ms}^*7)+(322.22\mu\text{s}^*18)}{46.45\text{ms}} = -10.7\text{dB}$$

please see page 14 ~ 16 for plotted duty

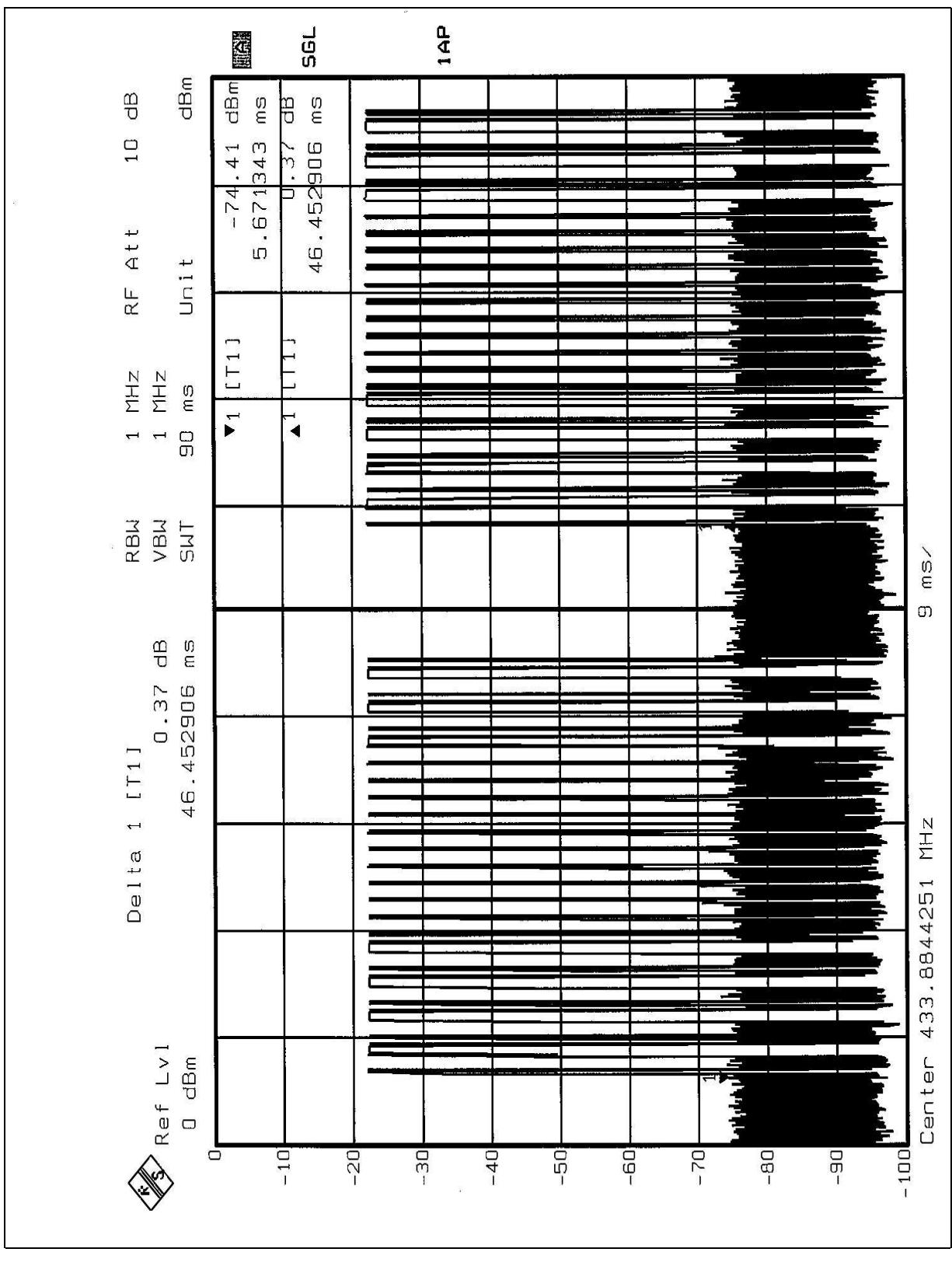
EUT		BUILT-IN ELECTRIC FIREPLACE ON/OFF REMOTE CONTROL	MODEL	ERX10
			FREQUENCY RANGE	Above 1 GHz
MODE		Transmitting	DETECTOR FUNCTION	Peak / Average
ENVIRONMENTAL CONDITIONS		25deg. C, 60%RH, 991 hPa	TESTED BY: Gary Chang	

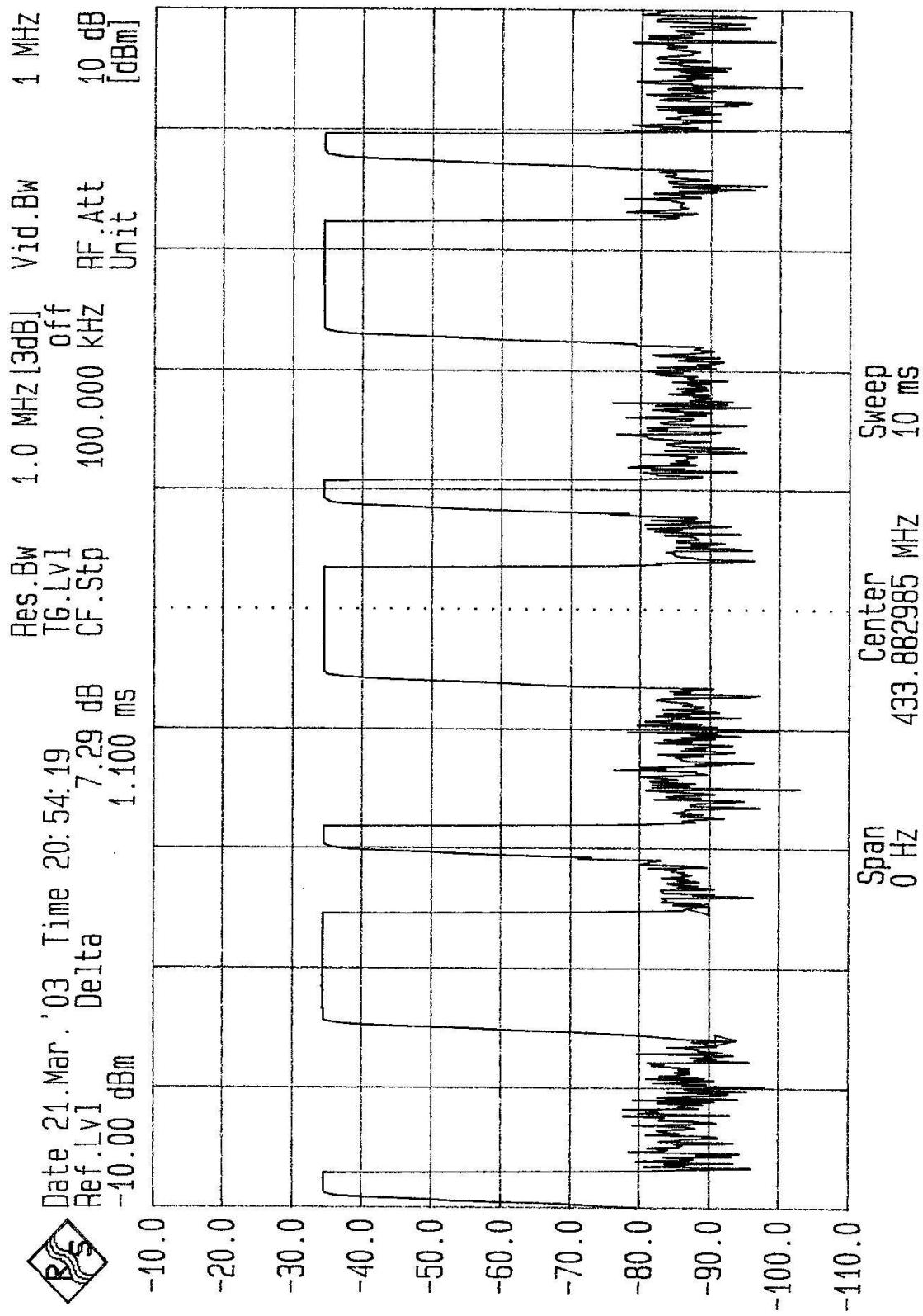
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1301.00	40.2 PK	74.00	-33.80	1.39 H	25	13.60	26.60
2	1735.00	39.7 PK	74.00	-34.30	1.33 H	328	12.00	27.70
3	2169.00	40.1 PK	74.00	-33.90	1.08 H	52	11.30	28.80

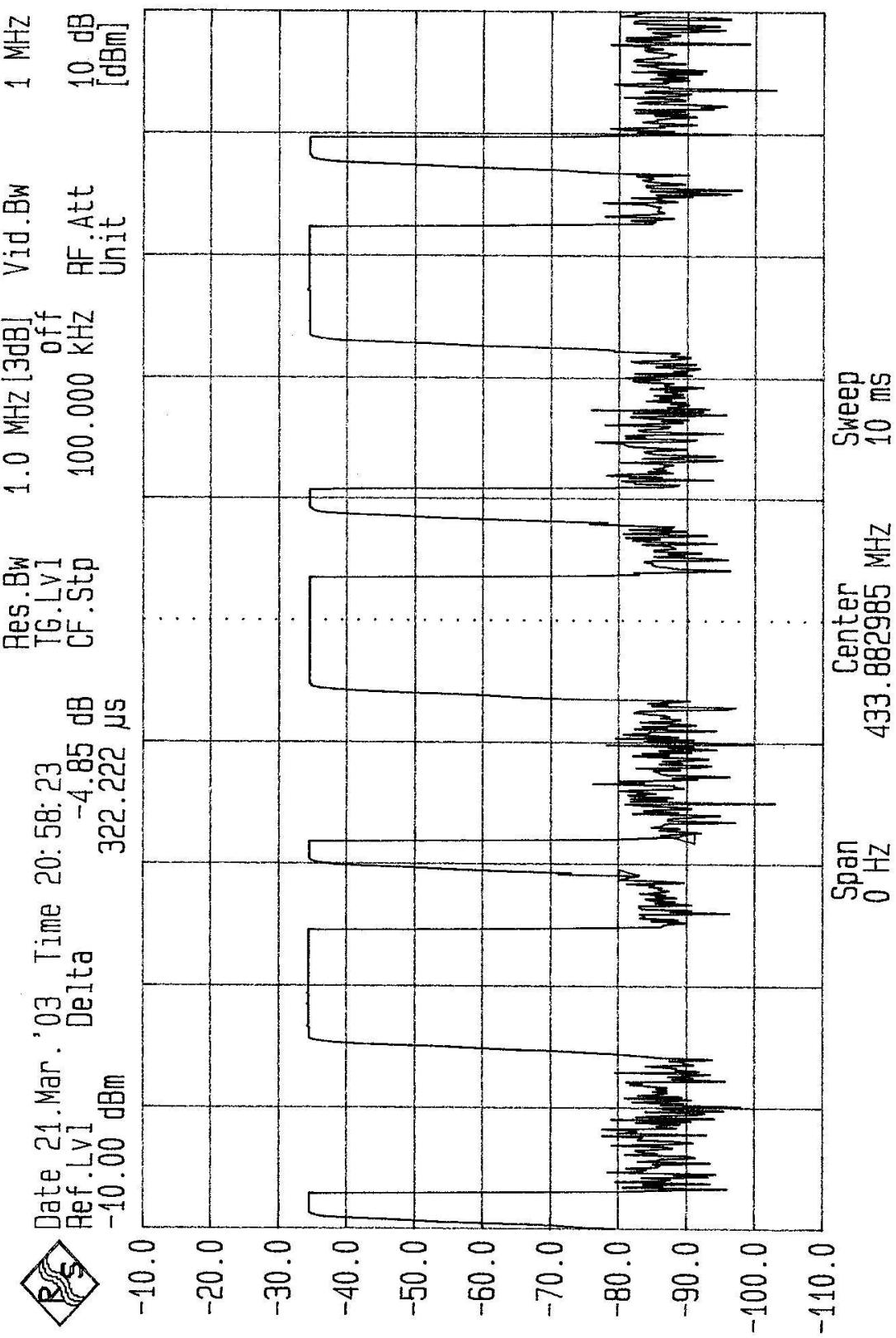
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1304.00	38.7 PK	74.00	-35.30	1.44 V	84	12.10	26.60
2	1735.00	36.5 PK	74.00	-37.50	1.13 V	251	8.80	27.70
3	2169.00	37.6 PK	74.00	-36.40	1.53 V	34	8.80	28.80

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.







5. 20dB OCCUPIED BANDWIDTH MEASUREMENT

5.1 LIMITS OF 20dB OCCUPIED BANDWIDTH MEASUREMENT

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for device operating above 70 MHz and below 900 MHz.

Fundamental Frequency (MHz)	Limit of 20 dB Bandwidth(kHz)
433.92	1084.8

5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

NOTE:

The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

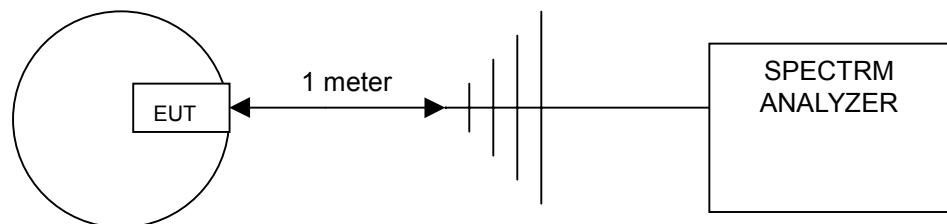
5.3 TEST PROCEDURES

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW= 10KHz, VBW = 30KHz of spectrum analyzer with suitable frequency span. The occupied bandwidth was measured and recorded.

5.4 DEVIATION FROM TEST STANDARD

No deviation

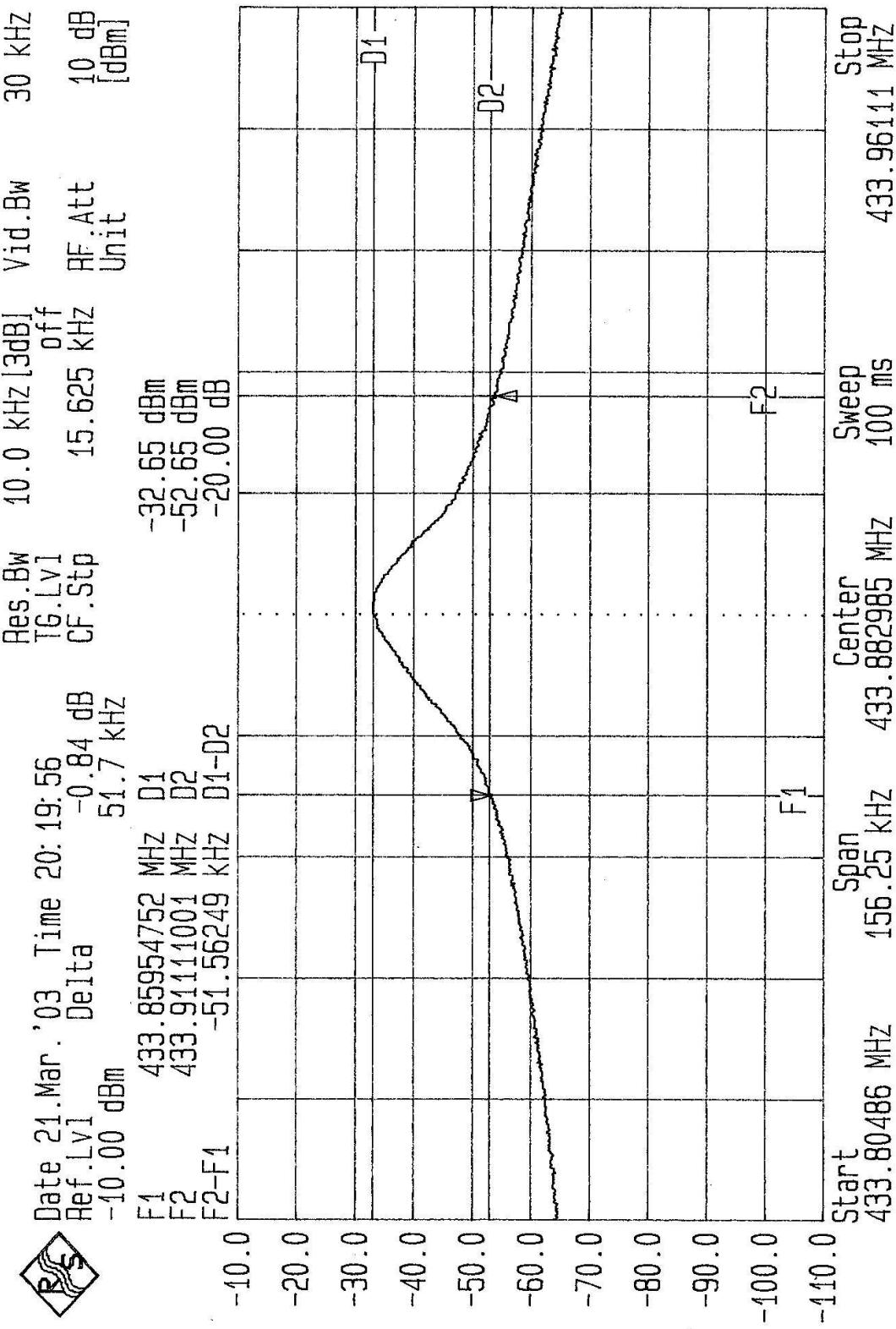
5.5 TEST SETUP



5.6 TEST RESULTS

Frequency (MHz)	20 dB bandwidth (kHz)	Maximum limit (kHz)	PASS/FAIL
433.92	51.562	1084.80	PASS

The plot of test result is attached as below.



6. PHOTOGRAPHS OF THE TEST CONFIGURATION

RADIATED EMISSION TEST





7. INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
New Zealand	MoC
Norway	NEMKO
R.O.C.	BSMI, DGT, CNLA

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Lin Kou EMC Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

Hsin Chu EMC Lab:
Tel: 886-35-935343
Fax: 886-35-935342

Lin Kou Safety Lab:
Tel: 886-2-26093195
Fax: 886-2-26093184

Lin Kou RF&Telecom Lab:
Tel: 886-3-3270910
Fax: 886-3-3270892

Email: service@mail.adt.com.tw
Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.