REPORT NO:	RF89052212
PRODUCT:	Wireless Temperature Monitor Transmitter
MODEL NO:	RT-910
SERIAL NO:	N/A
CLIENT:	FUNAI Radio & Communications Corp.
ADDRESS:	3F, No. 24, Chien Kou RD. T.E.P.Z., Tantzu, Taichung Taiwan, R.O.C.
ISSUED BY:	ADVANCE DATA TECHNOLOGY CORPORATION (ADT CORP.)
OFFICE ADDRESS:	11F, NO. 1, SEC. 4, NAN-KING EAST RD., TAIPEI, TAIWAN, R.O.C.
LABORATORY ADDRESS:	NO. 47, 14 LING, CHIA PAU TSUEN, LIN KOU HSIANG, TAIPEI HSIEN, TAIWAN, R.O.C.
TEST STANDARD:	47CFR Part 15, Subpart C (15.231)
TEST DATE:	June 3, 2000
TEST RESULT:	Pass

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Accredited Laboratory

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1. CERTIFICATION

Issue Date: June 8, 2000

PRODUCT:	Wireless Temperature Monitor Transmitter
MODEL NO:	RT-910
FCC ID:	OV4RT910
CLIENT:	FUNAI Radio & Communications Corp.
TEST STANDARD:	FCC 47CFR Part 15, Subpart C (Section 15.231) ANSI C63.4-1992

We, **ADVANCE DATA TECHNOLOGY CORPORATION,** hereby certify that one sample of the designated sample has been tested in our facility. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate representation of the measurements of the sample's EMC characteristics and the energy emitted under the conditions herein specified.

TESTED BY:	Ellis Wu **Ellis Wu**	**DATE:**	06/08/2000
CHECKED BY:	Delphine Hsu **Delphine Hsu**	**DATE:**	06/08/2000
APPROVED BY:	Alan Lane **Dr. Alan Lane, Manager**	**DATE:**	06/08/2000

2. SUMMARY OF TEST RESULTS & GENERAL STATEMENT OF CERTIFICATION

The EUT has been tested according to the following specifications:

47 CFR Part 15, Subpart C			
PARAGRAPH .	**TEST REQUIREMENTS**	**COMPLIANCE (YES/NO)**	**TEST RESULT**
15.107, 15.109	AC Power Conducted Emissions Spec.: 48 dBuV	N/A	N/A
15.231(c)	20dB Bandwidth	Yes	311.11kHz < 1084.80kHz
15.231(e)	Transmitter Radiated Emissions	Yes	Minimum passing margin is –5.0 dBuV at 867.81 MHz

Note 1 **:** The digital circuits and receiver portion of the EUT has been tested and verified to comply with FCC Part 15, Subpart B, Class B – Computing Devices (FCC DoC). The engineering test report can be provided upon FCC requests.

3. GENERAL INFORMATION

3.1 General Description of EUT

Product:	**Wireless Temperature Monitor**
Model No:	**RT-910**
Power Supply:	**Battery 3V × 1**
Modulation Type:	**ASK**
Operating Frequency:	**433.92MHz**
Number of Channel:	**1**
Channel Spacing:	**NA**
Rated RF output power level:	**NA**
Associated devices:	**N/A**

3.2 Specification:

Temperature Measuring range :	**18.0 ℃~43.0 ℃ (64.4℉~109.4℉)**
Temperature Accuracy :	**±0.1 ℃ (±0.2℉)**
Power Supply :	**3 Volts Lithium Button battery(CR2032)**
Range / Distance :	**30 Meter (98.5 Feet)**
Operating Environment :	**0 ℃ to 50 ℃, 15% to 95% RH**
Storage Temperature :	**-20 ℃ to 70 ℃**
Temperature transmitting period :	**every 10 sec.**

Note: Use of this thermometer is not intended to be a substitute for consulting with your physician.

The other detailed information, please refer to user's manual.

3.2 Description of Test mode

The EUT is only working in one channel (433.92 MHz) for data transmission.

3.3 Test Methodology

These tests were conducted on a sample of EUT for the evaluation in compliance with FCC CFR47 Part 15, Subpart C. (15.249)

Both conducted and radiated emissions measurements were conducted in accordance with ANSI C63.4:1992.

3.4 Support Units List

N/A

3.5 Configuration of System Under Test

Table

EUT	Wireless Temperature Monitor Model : RT910

4. GENERAL INFORMATION OF TEST FACILITY

4.1 Test Lab.:

☑ **Lin Kuo EMC Lab.**
No. 47, 14 Ling, Chia Pau Tsuen, Lin Kuo Hsiang, Taipei, Taiwan, R.O.C.

☐ **Hsin Chu EMC Lab.**
No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen, Chiung Lin Hsiang, R.O.C.

4.2 Calibration Interval :

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

5. TEST PROCEDURES AND TEST RESULTS

5.1 Conducted Emission Measurement

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to paragraph 15.207(a), measurements to demonstrate compliance with the conducted limit are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

5.2 Radiated Emission Measurement

5.2.1 Test instruments

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	**8590L**	**3544A01176**	**Apr. 18, 2001**
HP Preamplifier	**8447D**	**2944A08485**	**Oct. 23, 2000**
HP Preamplifier	**8347A**	**3307A01088**	**Sep. 09, 2000**
ROHDE & SCHWARZ TEST RECEIVER	**ESMI**	**839013/007 839379/002**	**Aug. 27, 2000**
SCHWARZBECK Tunable Dipole Antenna	**VHA 9103 UHA 9105**	**E101051 E101055**	**Nov. 25, 2000**
CHASE BILOG Antenna	**CBL6112A**	**2221**	**Aug. 10, 2000**
SCHWARZBECK Horn Antenna	**BBHA9120-D**	**D130**	**Jul. 09, 2000**
SCHWARZBECK Horn Antenna	**BBHA9170**	**123**	**Jan. 31, 2001**
EMCO Turn Table	**1060**	**1115**	**N/A**
SHOSHIN Tower	**AP-4701**	**A6Y005**	**N/A**
Open Field Test Site	**Site 5**	**ADT-R05**	**Aug. 09, 2000**

The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMAS document NIS81.

5.2.2 Test Procedure

a. The EUT was placed on the top of a turn table 0.8 meter above ground at a 3-meter open field 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.

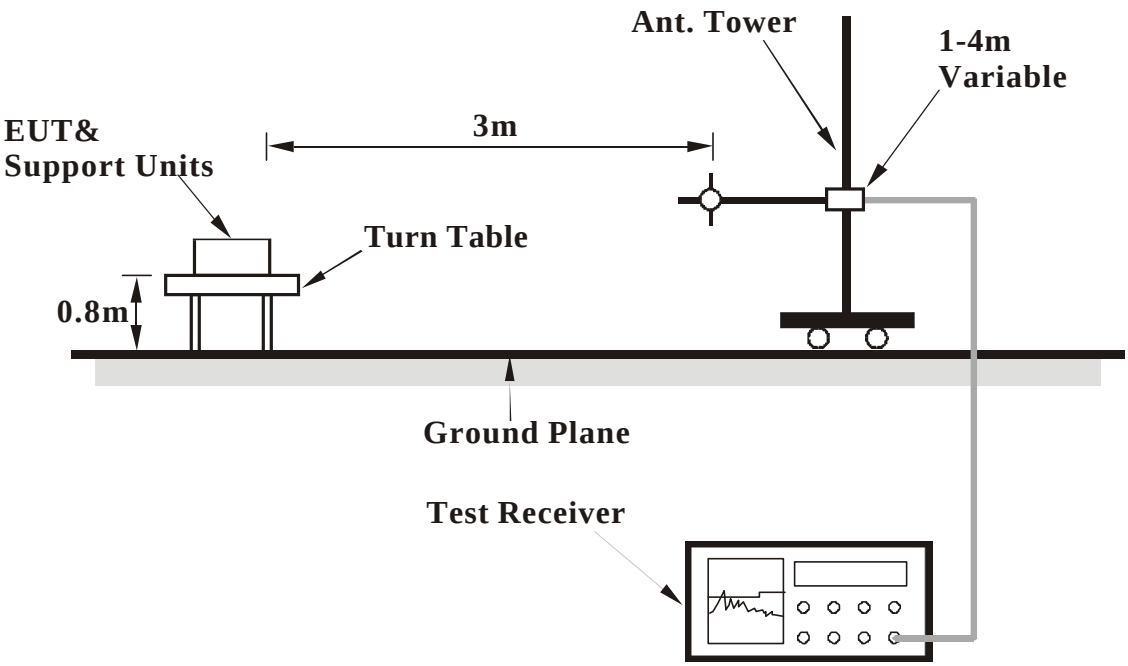
c. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to detect the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.

d. For each suspected emission the EUT was arranged to its worst case and then tuned the antenna height from 1 meter to 4 meter and turned the turn table from 0 degree to 360 degrees to find the maximum reading.

e. Set the test-receiver system 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 peak values of EUT will be reported. Otherwise the emissions which do not have 10 dB margin will be re-tested one by one using the quasi- peak method or average method as specified and then reported.

5.2.3 Test Setup



5.2.4 Photograph of Test Setup

5.2.5 EUT Operating condition

1. Turn on the power of EUT.
2. Set the EUT to transmit at channel frequency.

5.2.6 Climate Condition

The temperature and related humidity: 25 ℃ and 65% RH

5.2.7 Test Results

ANTENNA POLARITY: Vertical		Detector Function : Peak Average				6 dB Bandwidth : 120 kHz.				Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
*433.91	18.4	40.5	40.3	58.9	58.7	92.9	72.9	-34.0	-14.2	139	326
867.81	23.3	15.8	-	39.1	-	46.0	-	-6.9	-	131	20

ANTENNA POLARITY: Horizontal		Detector Function : Peak Average				6 dB Bandwidth : 120 kHz.				Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
*433.91	18.4	52.1	51.8	70.5	70.2	92.9	72.9	-22.4	-2.7	100	208
867.81	23.3	17.1	-	41.0	-	46.0	-	-5.0	-	100	255

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value
5. The limit value is defined as per 15.231(e)
6. " * " : Fundamental Frequency

ANTENNA POLARITY: Vertical		Detector Function : Peak Average				6 dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1301.70	28.9	13.7	-	42.6	-	74.0	-	-31.4	-	201	322
1735.60	31.5	11.3	-	42.8	-	74.0	-	-31.2	-	201	241
2169.50	33.5	12.4	-	45.9	-	74.0	-	-28.1	-	100	-2
2603.40	34.9	12.5	-	47.4	-	74.0	-	-26.6	-	100	220

ANTENNA POLARITY: Horizontal		Detector Function : Peak Average				6 dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1301.70	28.9	13.0	-	41.9	-	74.0	-	-32.1	-	400	194
1735.62	31.5	12.0	-	43.5	-	74.0	-	-30.5	-	154	-2
2169.52	33.5	12.9	-	46.4	-	74.0	-	-27.6	-	162	157
2603.40	34.9	12.6	-	47.5	-	74.0	-	-26.5	-	149	-6

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value
5. The limit value is defined as per 15.231(e)

6. 20 dB Bandwidth Measurement

6.1 Test Instruments

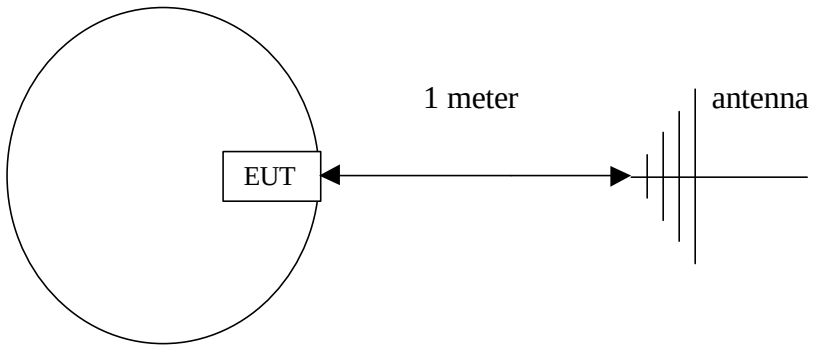
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	**ESMI**	**846839/018 848926/005**	**Dec. 03, 2000**
HP PLOTTER	**7475A**	**2641V27755**	**N/A**

The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

6.2 Test Procedure

The transmitter output was coupled to the spectrum analyzer through an antenna. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 100 kHz RBW and 100 kHz VBW,. The 20 dB bandwidth was measured and recorded.

6.3 Test Setup



6.4 EUT Operating condition

1. Turn on the power of EUT.
2. Set the EUT to transmit at channel frequency.

6.5 Climate Condition

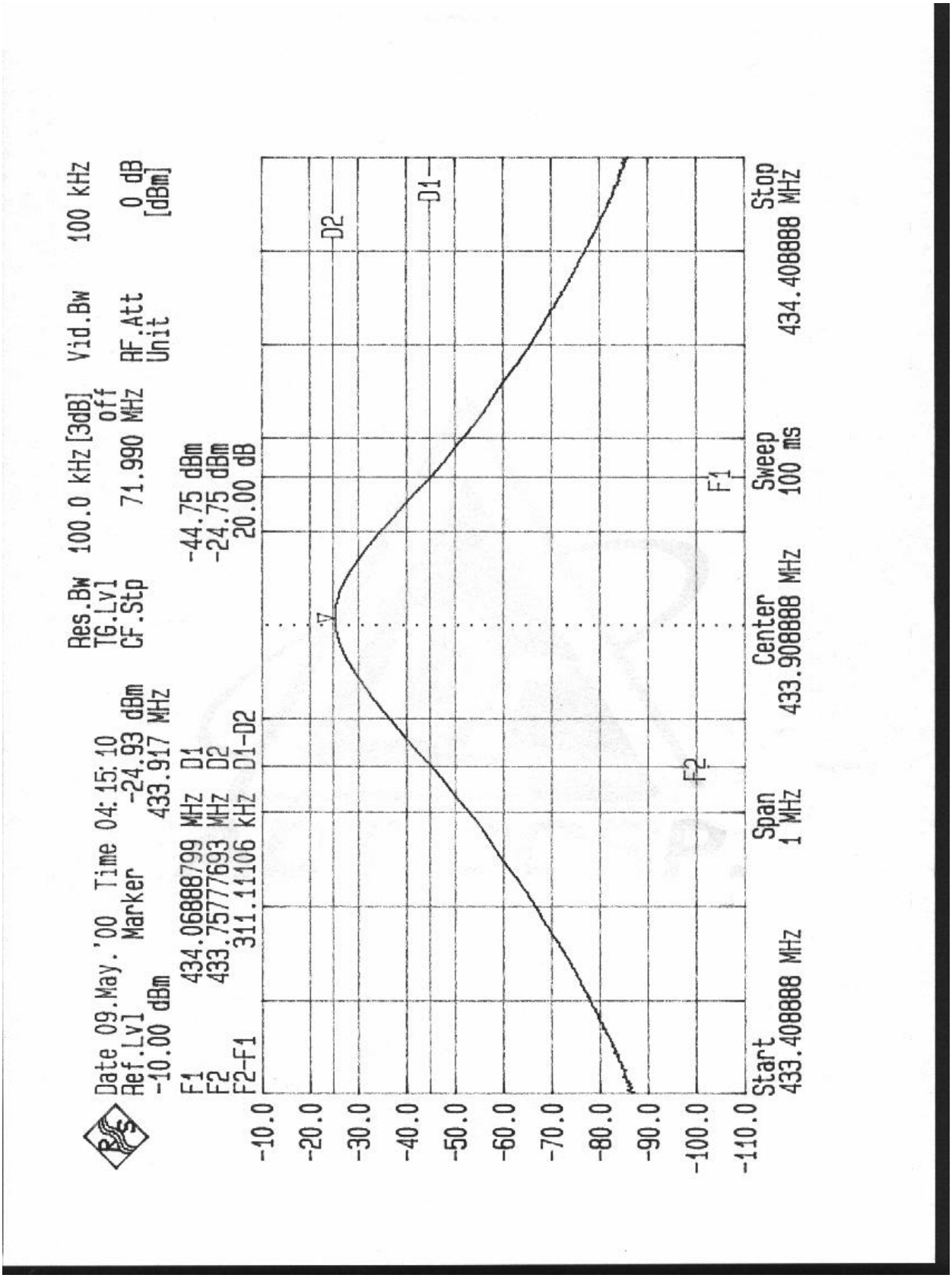
The temperature and related humidity: 18℃ and 78% RH

6.6 Test Results

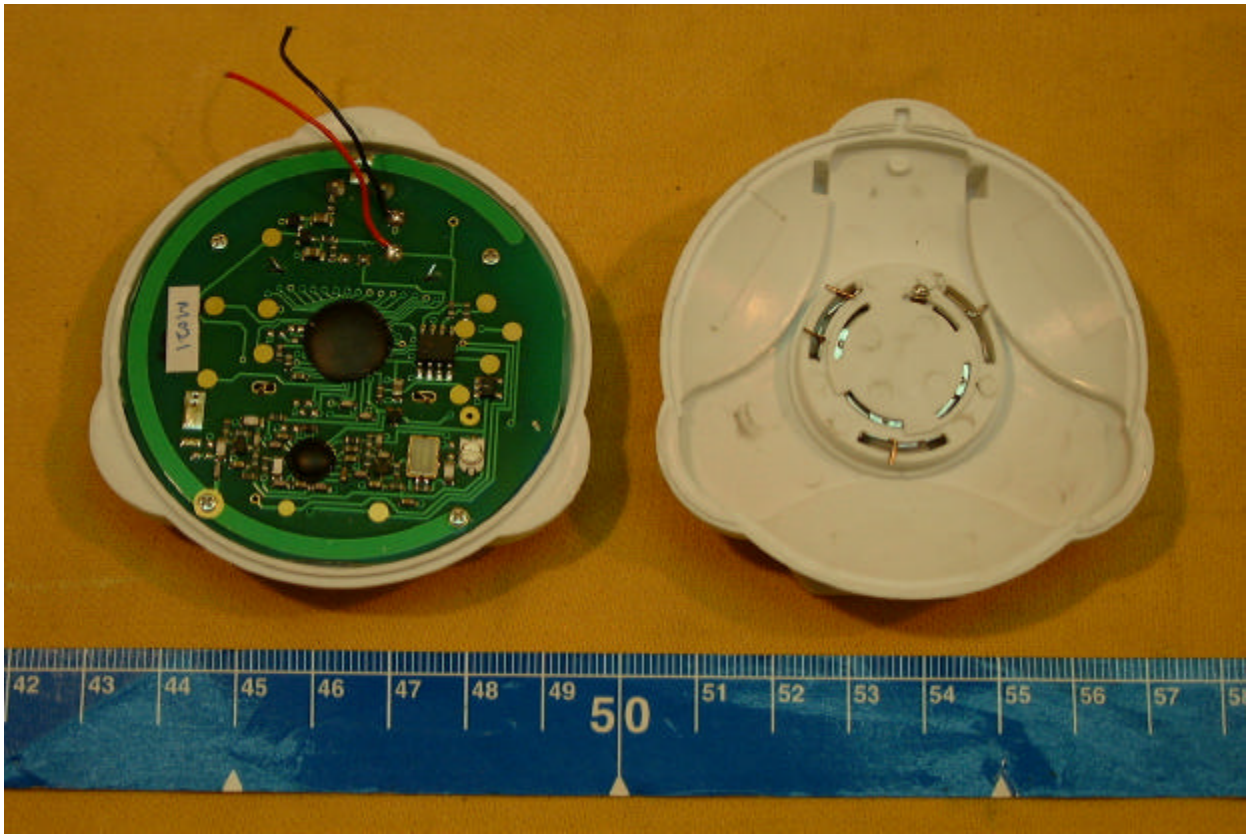
FREQUENCY (MHz)	20 dB BANDWIDTH (KHz)	MAXIMUM LIMIT (KHz)	PASS/FAIL
433.92	311.11	1084.80	PASS

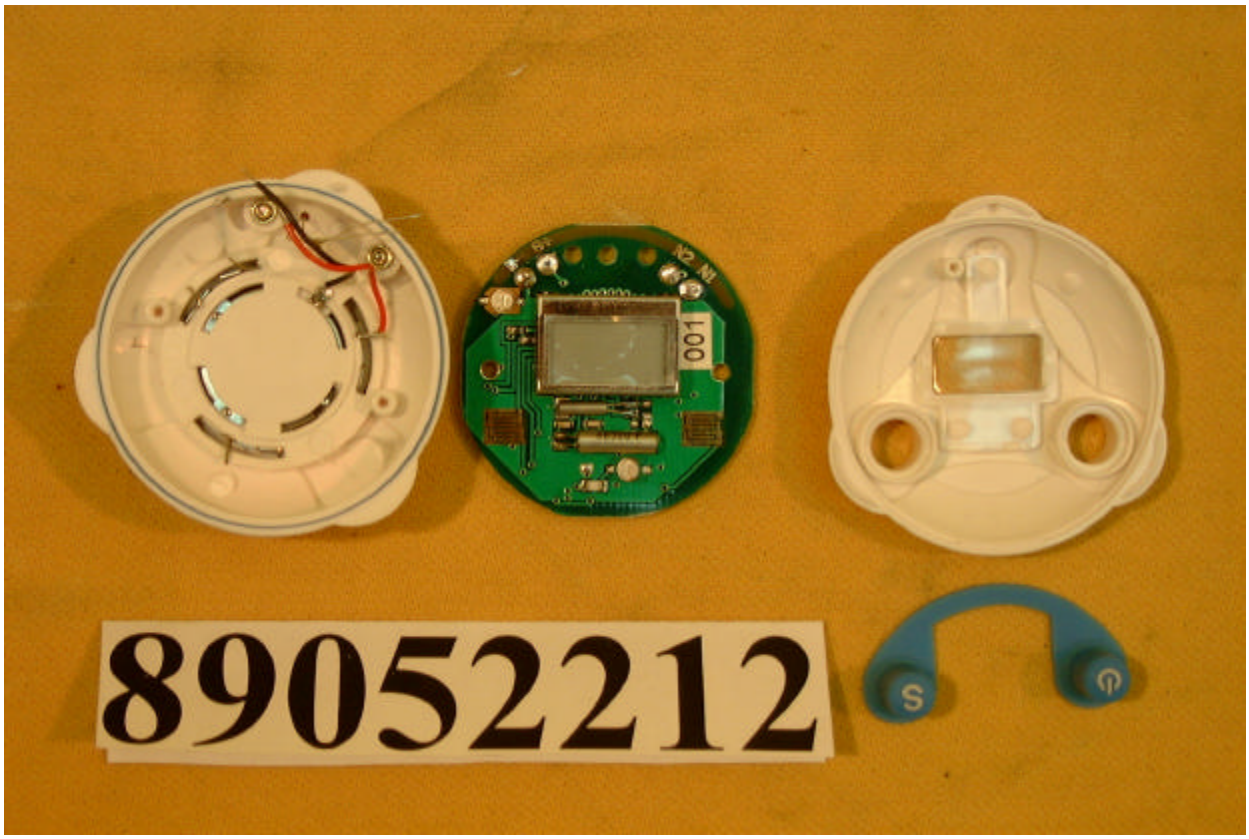
Remark : The bandwidth of the emission shall be no wider than 0.25% of the center frequency

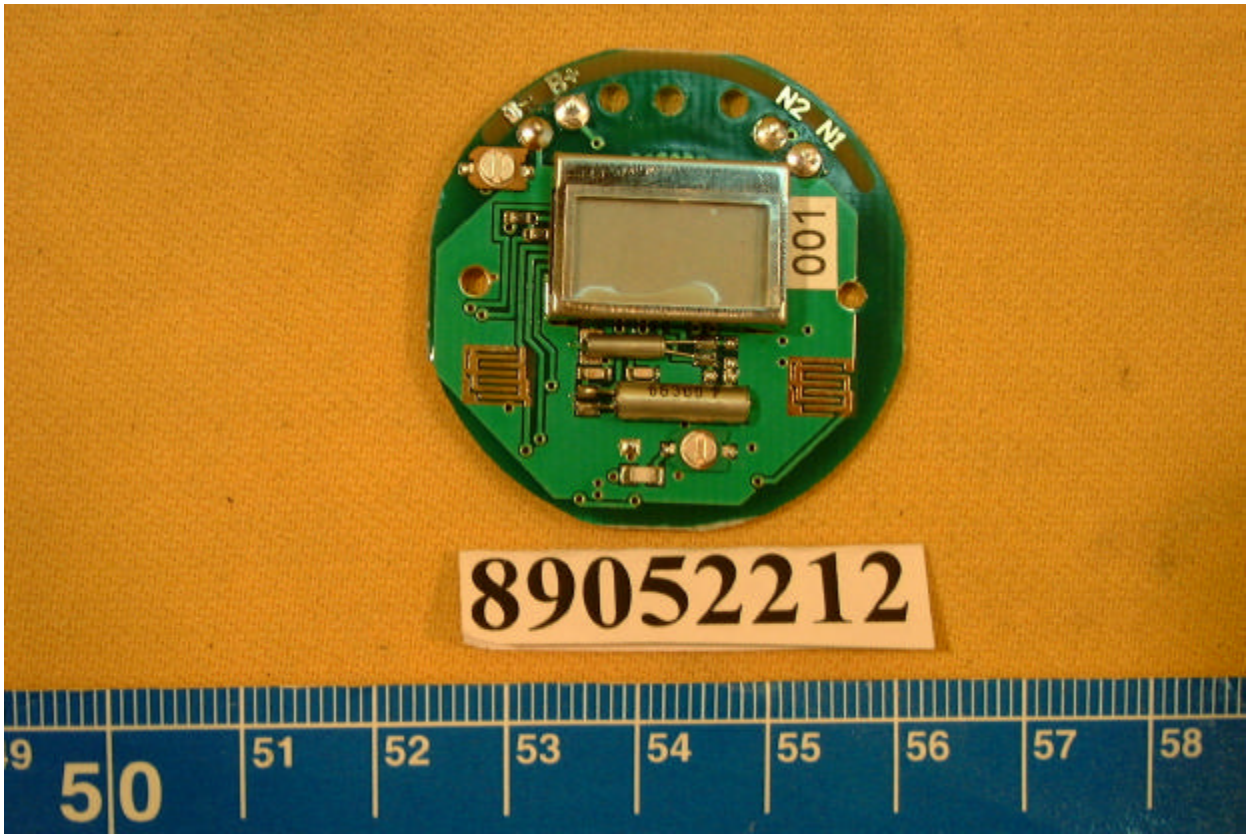
The spectrum plots of test result are attached as below.

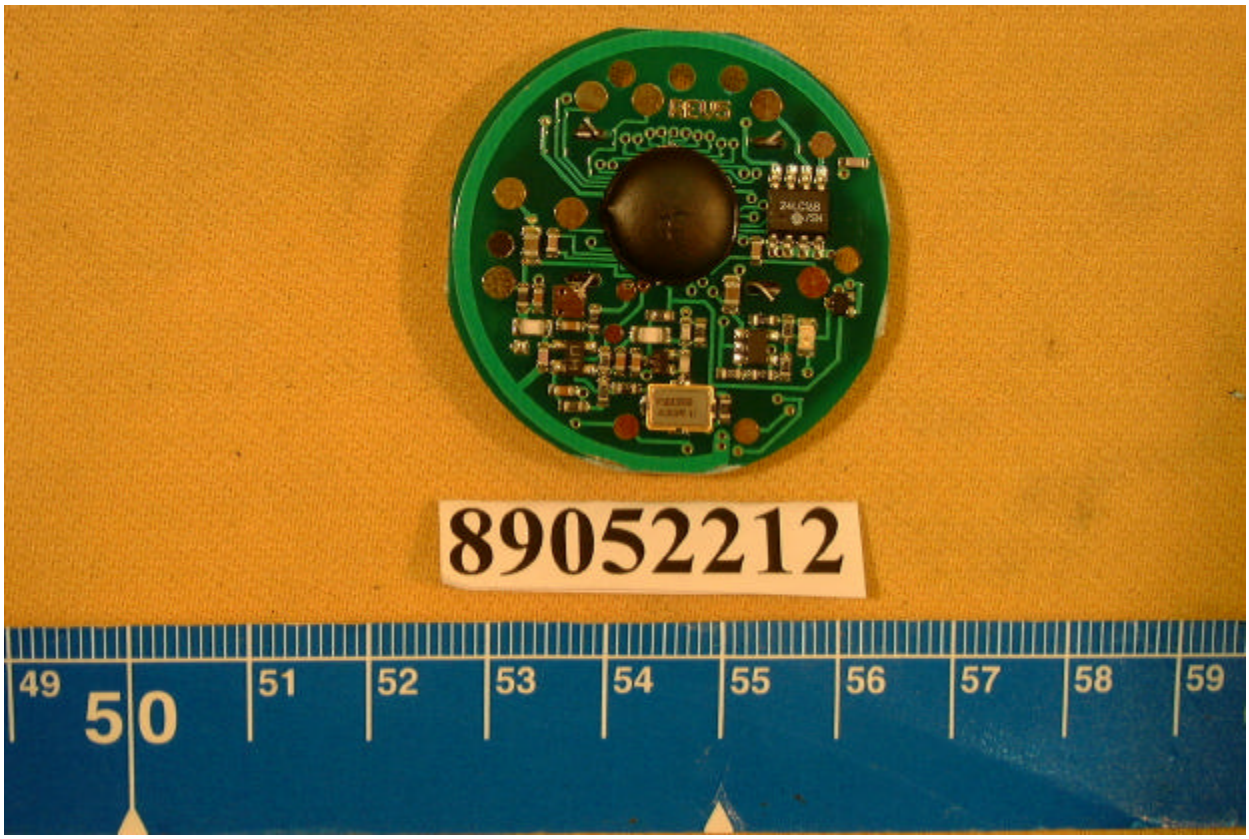

Date 09.May.'00 Time 04:15:10
Ref.Lvl
-10.00 dBm
Marker
-24.93 dBm
433.917 MHz
F1 434.06888799 MHz D1
F2 433.75777693 MHz D2
F2-F1 311.11106 kHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 71.990 MHz
-44.75 dBm
-24.75 dBm
20.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
D2
D1
F2
F1
Start 433.408888 MHz
Span 1 MHz
Center 433.908888 MHz
Sweep 100 ms
Stop 434.408888 MHz

7. EUT Photos




89052212


N2 N1
001
89052212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