FCC Part 95 Subpart C
EMI TEST REPORT

of

E.U.T. : Radio Controller

FCC ID. : JXMETX-41

MODEL : ETX-41

for

APPLICANT : Enjoy Model International Corp.
ADDRESS : 5th Fl., No. 48 Dah-An Street, Shijr City, Taipei Hsien, Taiwan

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN
NO. 34, LIN 5, DING FU TSUN, LINKOU HSIANG
TAIPEI HSIEN, TAIWAN, R.O.C.
Tel : (02)26023052 Fax : (02)26010910
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Report Number : ET94R-05-036

TEST REPORT CIRTIFICATION

Applicant : Enjoy Model International Corp.
5th Fl., No. 48 Dah-An Street, Shijr City, Taipei Hsien, Taiwan

Manufacturer : Enjoy Model International Corp.
5th Fl., No. 48 Dah-An Street, Shijr City, Taipei Hsien, Taiwan

Description of EUT :

a) Type of EUT	: Radio Controller
b) Trade Name	: N/A
c) Model No.	: ETX-41
d) FCC ID	: JXMETX-41
e) Working Frequency	: 72.03 MHz
f) Power Supply	: DC 12V

Regulation Applied : FCC Rules and Regulations Part 95 Subpart C

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.

Issued Date : Jul. 17, 2005

Test Engineer : Tien Lu Liau
(Tien Lu Liau)

Approve & Authorized Signer : Will Yauo
Will Yauo, Manager
EMC Dept. II of ELECTRONICS
TESTING CENTER, TAIWAN

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1. GENERAL INFORMATION

1.1 Product Description

a) Type of EUT	: Radio Controller
b) Trade Name	: N/A
c) Model No.	: ETX-41
d) FCC ID	: JXMETX-41
e) Working Frequency	: 72.03 MHz
f) Power Supply	: DC 12V

1.2 Characteristics of Device:

This equipment is a model controller which provides many functions and switches.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in chapter 13 of ANSI C63.4.
The Transmitter under test was operated continuously in its normal operating mode for the purpose of the measurements.
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 Transmitter under test.

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, Lin 5, Ding Fu Tsun, Linkou Hsiang, Taipei Hsien, Taiwan, R.O.C.
This site has been fully described in a report submitted to your office, and accepted in a letter dated Dec. 03, 2002.

2. REQUIREMENTS OF PROVISIONS

2.1 Definition

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Frequencies Available

According to sec. 95.623 of Part 95, the R/C transmitter channel frequencies are:
(MHz)

26.995	72.11	72.33	72.55	72.77	72.99	75.61	75.83
27.045	72.13	72.35	72.57	72.79	75.41	75.63	75.85
27.095	72.15	72.37	72.59	72.81	75.43	75.65	75.87
27.145	72.17	72.39	72.61	72.83	75.45	75.67	75.89
27.195	72.19	72.41	72.63	72.85	75.47	75.69	75.91
27.255	72.21	72.43	72.65	72.87	75.49	75.71	75.93
72.01	72.23	72.45	72.67	72.89	75.51	75.73	75.95
72.03	72.25	72.47	72.69	72.91	75.53	75.75	75.97
72.05	72.27	72.49	72.71	72.93	75.55	75.77	75.99
72.07	72.29	72.51	72.73	72.95	75.57	75.79	
72.09	72.31	72.53	72.75	72.97	75.59	75.81	

2.3 Limitation

(1) Maximum Transmitter Power

According to sec. 95.639 of Part 95, for R/C transmitters in the 72-76MHz frequency band, the carrier power shall not exceed 0.75W.

(2) Emission Bandwidth

According to sec. 95.633 of Part 95, the authorized bandwidth for any emission type transmitted by an R/C transmitter is 8 kHz.

(3) Unwanted Radiation

According to sec. 95.635 of Part 95, the power of each unwanted emission shall be less than TP as specified in the following:

At least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

At least 45 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 125% of the authorized bandwidth.

At least 55 dB on any frequency removed from the center of the authorized bandwidth by more than 125% up to and including 250% of the authorized bandwidth.

At least $56 + 10 \log_{10} (T)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

(4) Frequenciy Tolerance

According to sec. 95.623 of Part 95, all R/C transmitters capable of operation in the 72-76 MHz band that are manufactured in or imported into the United States, on or after March 1, 1992, or are marketed on or after March 1, 1993, must be maintained within a frequency tolerance of 0.002%.

2.4 Labeling Requirement

Each equipment for which a type acceptance application is filed on or after May 1,1981, shall bear an identification plate or label pursuant to §2.925（Identification of equipment） and § 2.926（FCC identifier）.

2.5 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.

3. MAXIMUM TRANSMITTER POWER MEASUREMENT

3.1 Provision Applicable

According to sec. 95.639 of Part 95, for R/C transmitters in the 72-76MHz frequency band, the carrier power shall not exceed 0.75W.

3.2 Measurement Procedure

ERP

A. Preliminary Measurement For Portable Devices

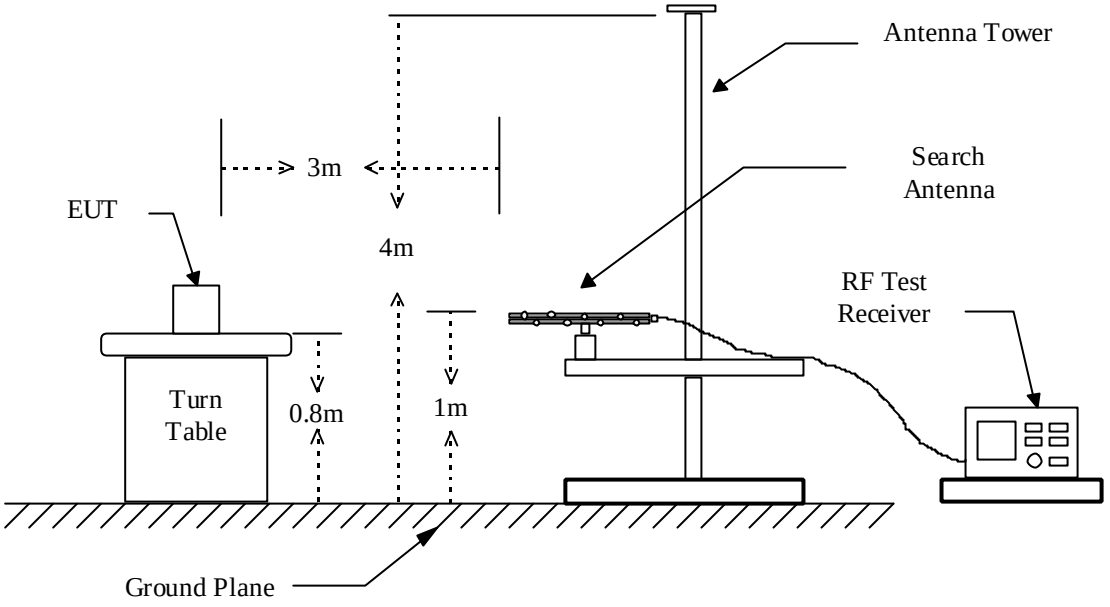
For portable devices, the following procedure was performed to determine the maximum emission axis of EUT:

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

B. Final Measurement

1. Setup the configuration per figure 1.
2. Adjust the analyzer for the carrier frequency on a 1 MHz frequency span and 100 kHz resolution bandwidth.
3. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 degree to 360 degree, and record the highest value indicated on spectrum analyzer as reference value.
4. Repeat step 3 with search antenna in vertical polarized orientations.
5. Replace the EUT with a tuned dipole antenna relative to each frequency in horizontally polarized orientation and as the same polarized orientation with search antenna. Connect the tuned dipole antenna to a standard signal generator (SG) via a low loss cable. Power on the SG and tune the right frequency in measuring as well as set SG at a appreciated output level. Rise and lower the search antenna to get the highest value on spectrum analyzer, and then hold this position. Adjust the SG output to get a value as close as that derived from step 3 on spectrum analyzer. Record this value for result calculated.
6. Repeat step 5 until all frequencies need to be measured were complete.
7. Repeat step 6 with both dipole antenna and search antenna in vertical polarized orientations.

Figure 1 : Frequencies measured below 1 GHz configuration



3.3 Test Data

TEST DATE : MAY 22, 2005 TEMPERATURE : 26 °C HUMIDITY : 65 %

Frequency (MHz)	SA Reading (dBuV)	SG Reading (dBm)	Cable Loss (dB)	Result (dBm)	ERP (W)	Limit (W)
72.030	98.6	4.3	-0.5	3.8	0.002	0.75

3.3 Result Calculation

a. For ERP measurement:

Result = SG Reading + Cable Loss

b. $W = \log^{-1}[\frac{Result(dBm)}{10}]/1000$

3.4 Output Power Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSP	07/31/2005
Dipole Antenna	EMCO	3121C	06/06/2005
Signal Generator	HP	8656B	11/07/2005
RF Test Receiver	Rohde & Schwarz	ESVS 30	09/05/2005
Spectrum	Advantest	R3361C	08/10/2005
Preamplifier	Hewlett-Packard	8447D	08/12/2005
Log periodic Antenna	EMCO	3146	10/05/2005
Biconical Antenna	EMCO	3110B	10/05/2005

3.5 Measurement Setup Photos

4. EMISSION BANDWIDTH

4.1 Provisions Applicable

According to sec. 95.633 of Part 95, the authorized bandwidth for any emission type transmitted by an R/C transmitter is 8 kHz.

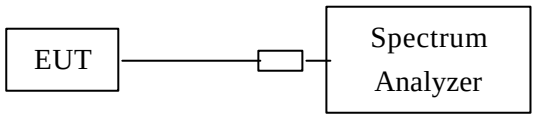
4.2 Measurement Method

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 2, and Install new batteries in the EUT. Turn on the EUT and set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. Plot the result on the screen of spectrum analyzer.

Figure 2 : Emission bandwidth measurement configuration



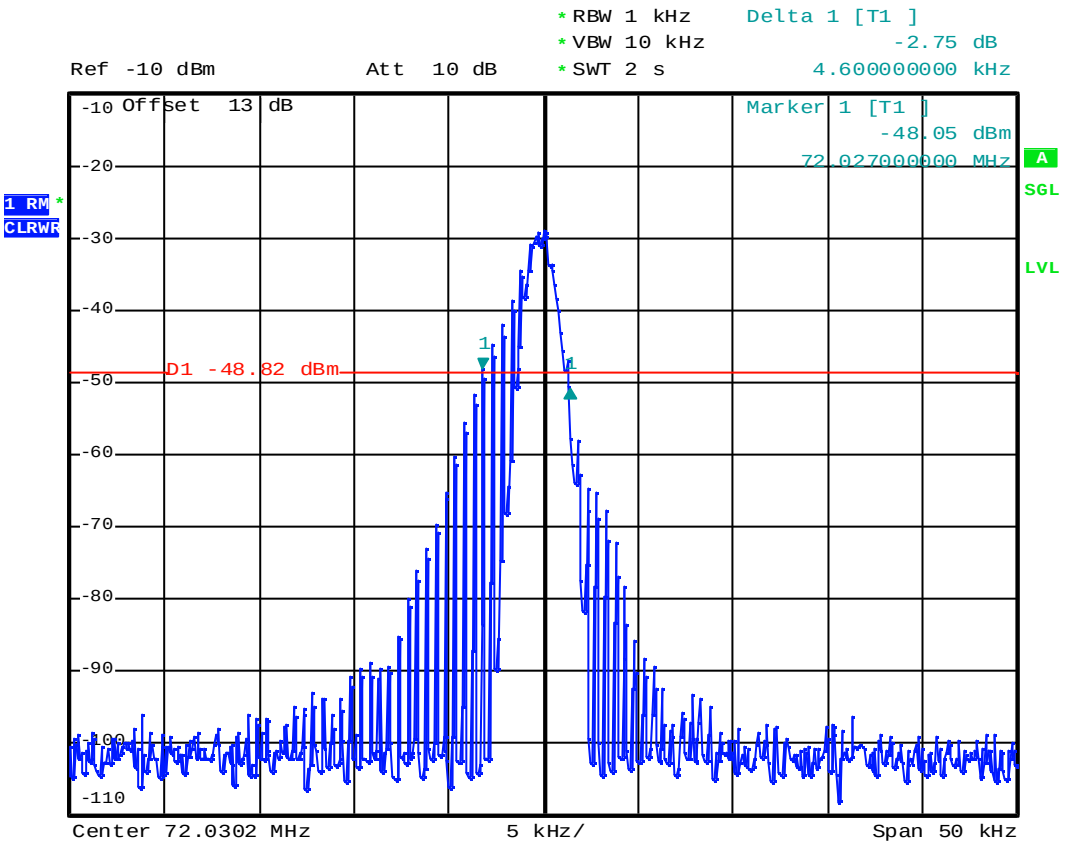
4.3 Emission Bandwidth Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Rohde & Schwarz	FSP	07/31/2005
Attenuator	Weinschel Engineering	1	N/A

4.4 Measurement Data

TEST DATE : MAY 22, 2005 TEMPERATURE : 25 °C HUMIDITY : 60 %

Emission Bandwidth : 4.6 kHz



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5. UNWANTED RADIATION

5.1 Provisions Applicable

According to sec. 95.635 of Part 95, the power of each unwanted emission shall be less than TP as specified in the following:

At least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

At least 45 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 125% of the authorized bandwidth.

At least 55 dB on any frequency removed from the center of the authorized bandwidth by more than 125% up to and including 250% of the authorized bandwidth.

At least $56 + 10 \log_{10}$ (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

5.2 Measurement Procedure

ERP

A. Preliminary Measurement For Portable Devices

For portable devices, the following procedure was performed to determine the maximum emission axis of EUT:

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

B. Final Measurement

1. Setup the configuration per figure 1.
2. Adjust the analyzer for each frequency measured on a 1 MHz frequency span and 100 kHz resolution bandwidth.
3. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highth when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 degree to 360 degree, and record the highest value indicated on spectrum analyzer as reference value.

4. Repeat step 3 until all frequencies need to be measured were complete.
5. Repeat step 4 with search antenna in vertical polarized orientations.
6. Replace the EUT with a tuned dipole antenna relative to each frequency in horizontally polarized orientation and as the same polarized orientation with search antenna. Connect the tuned dipole antenna to a standard signal generator (SG) via a low loss cable. Power on the SG and tune the right frequency in measuring as well as set SG at a appreciated output level. Rise and lower the search antenna to get the highest value on spectrum analyzer, and then hold this position. Adjust the SG output to get a value as close as that derived from step 3 on spectrum analyzer. Record this value for result calculated.
7. Repeat step 6 until all frequencies need to be measured were complete.
8. Repeat step 7 with both dipole antenna and search antenna in vertical polarized orientations.

5.3 Measuring Instrument

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSP	07/31/2005
Dipole Antenna	EMCO	3121C	06/06/2005
Signal Generator	HP	8656B	11/07/2005
RF Test Receiver	Rohde & Schwarz	ESVS 30	09/05/2005
Spectrum	Advantest	R3361C	08/10/2005
Preamplifier	Hewlett-Packard	8447D	08/12/2005
Log periodic Antenna	EMCO	3146	10/05/2005
Biconical Antenna	EMCO	3110B	10/05/2005

5.4 Measurement Data

A. ERP

TEST DATE : MAY 22, 2005 TEMPERATURE : 26 °C HUMIDITY : 65 %

Frequency (MHz)	SA Reading (dBuV)	SG Reading (dBm)	Cable Loss (dB)	Result (dBm)	Limit (dBm)
86.434	51.3	-47.0	-0.5	-47.5	-26.0
144.058	33.1	-47.9	-0.9	-50.6	-26.0
216.084	11.3	-63.5	-1.1	-64.6	-26.0

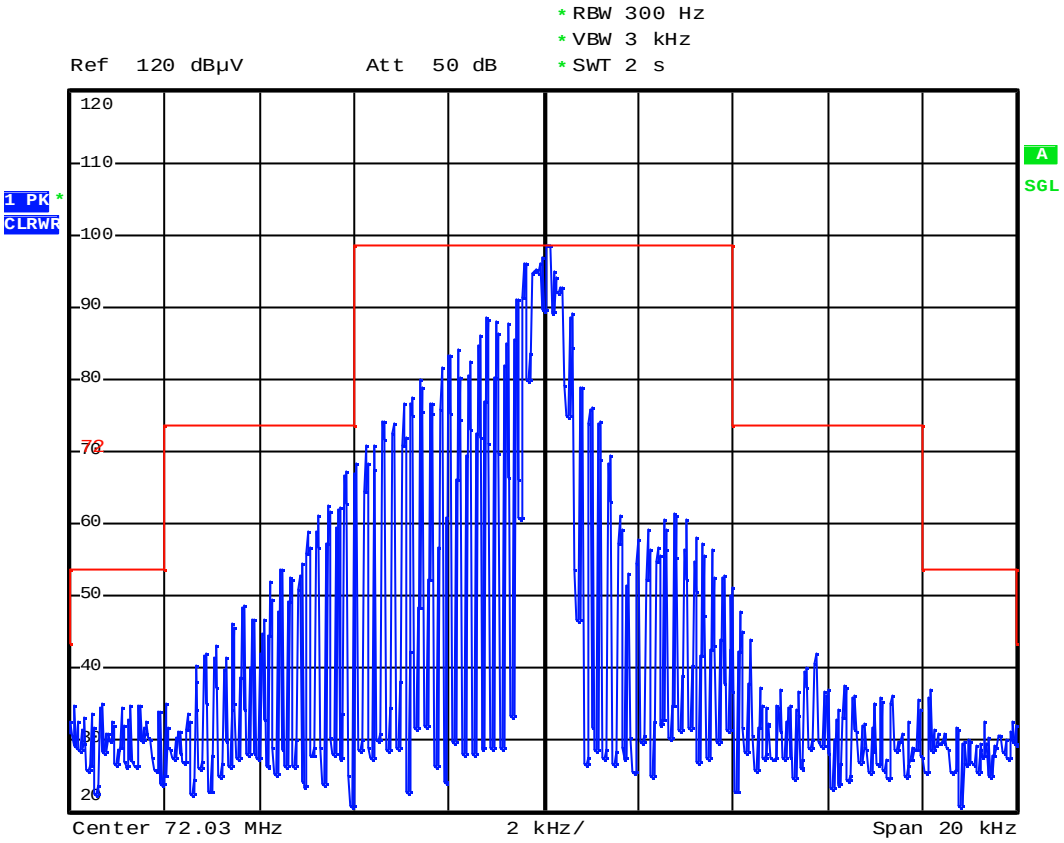
Note :

1. Result calculation is as following :
   a. For ERP measurement:
      Result = SG Reading + Cable Loss
   b. $W = \log^{-1}[\frac{\text{Result(dBm)}}{10}]/1000$
2. Limit calculation is as following :
   T(dB) - 56 - 10 $\log_{10}$ (T) dB = 4.8 – 56 - 10 $\log_{10}$ (0.003) = -26.0 dBm

B. Emission Mask

TEST DATE : JUN. 01, 2005 TEMPERATURE : 24 °C HUMIDITY : 63 %

Note: Please refer to the test plot next page.



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6. FREQUENCY STABILITY MEASUREMENT

6.1 Provisions Applicable

According to §2.1055 (a)(1), the frequency stability shall be measured with variation of ambient temperature from -30°C to +50°C centigrade.
According to §2.1055 (d)(2), for hand carried, battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.
According to §95.623 (c), all R/C transmitters capable of operation in the 72-76 MHz band that are manufactured in or imported into the United States, on or after March 1, 1992, or are marketed on or after March 1, 1993, must be maintained within a frequency tolerance of 0.002%.

6.2 Measurement Procedure

A) Frequency stability versus environmental temperature

1. Setup the configuration per figure 3 for frequencies measured at ambient temperature if it is within 15°C to 25°C. Otherwise, an environmental chamber set for a temperature of 20°C shall be used. Install new batteries in the EUT.

2. Turn on EUT and set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.

3. Set the temperature of chamber to 50°C. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.

4. Repeat step 2 with a 10°C decreased per stage until the lowest temperature -30°C is measured, record all measurement frequencies.

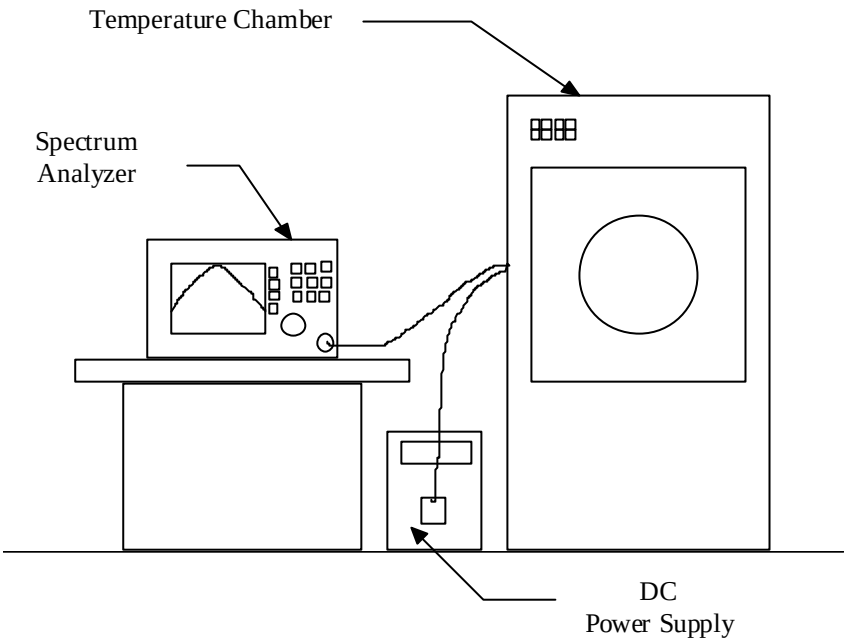
B) Frequency stability versus input voltage

1. Setup the configuration per figure 7 for frequencies measured at ambient temperature if it is within 15°C to 25°C. Otherwise, an environmental chamber set for a temperature of 20°C shall be used. Install new batteries in the EUT.

2. Set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.

3. For battery operated only device, supply the EUT primary voltage at the battery operating end point which is specified by the manufacturer and record the frequency.

Figure 3 : Frequency stability measurement configuration



6.3 Measurement Instrument

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Rohde & Schwarz	FSP	07/31/2005
Temperature Chamber	MALLIER	MCT-2X-M	11/01/2005

6.4 Measurement Data

A) Frequency stability versus environmental temperature

Temperature(°C)	Tuned Frequency(MHz)	Frequency Deviations(Hz)	Frequency Deviations(%)	Limit(%)
50	72.030060	40	0.000056	0.002
40		-60	-0.000083	
30		-160	-0.000222	
20		-260	-0.000361	
10		40	0.000056	
0		-260	-0.000361	
-10		-100	-0.000139	
-20		60	0.000083	
-30		-120	-0.000167	

B) Frequency stability versus input voltage

Voltage(V)	Tuned Frequency(MHz)	Frequency Deviations(Hz)	Frequency Deviations(%)	Limit(%)
10.8	72.030060	-180	-0.000250	0.002