

Straubing, July 03 2002

## **TEST - REPORT**

**No. 55503-20364**

**for**

**T4YBF 72  
R/C Transmitter**

Applicant: Futaba Corporation

Purpose of testing: To show compliance with

- FCC Code of Federal Regulations,  
CFR 47, Part 95
- FCC Code of Federal Regulations,  
CFR 47, Part 2, Subpart J

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**Note:**

The test data of this report relate only to the individual item which has been tested. This report shall not be reproduced except in full extent without the written approval of the testing laboratory.

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## Table of Contents

|      |                                                          |    |
|------|----------------------------------------------------------|----|
| 1.   | Administrative Data .....                                | 3  |
| 2.   | Identification of Test Laboratory .....                  | 4  |
| 3.   | Summary of Test Results .....                            | 5  |
| 4.   | Operation Mode of EUT.....                               | 6  |
| 5.   | Configuration of EUT and Peripheral Devices .....        | 7  |
| 6.   | Measuring Methods .....                                  | 8  |
| 6.1. | Maximum Transmitter Power (§95.639).....                 | 8  |
| 6.2. | Frequency tolerance (§95.623).....                       | 10 |
| 6.3. | Emission Bandwidth (§95.633) .....                       | 12 |
| 6.4. | Unwanted Emission 30 MHz - 1 GHz (§95.635, §95.639)..... | 13 |
| 7.   | Photographs of Test Setups .....                         | 15 |
| 8.   | Equipment List.....                                      | 17 |
| 9.   | Referenced Regulations .....                             | 19 |
| 10.  | List of Measurements .....                               | 20 |
| 11.  | Test Results .....                                       | 21 |
| 12.  | Additional Results.....                                  | 31 |

## 1. Administrative Data

Equipment Under Test (EUT): T4YBF 72  
Serial number(s): 001  
Type of equipment: R/C Transmitter  
Type of emission: F1D  
Parts/accessories: ---  
FCC-ID: AZPT4YBF-72

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Applicant:  
(full address) Futaba Corporation  
R/C Engineering Unit 1  
1080, Yabutsuka Chosei-son, Chosei-gun,  
Chiba-ken, 299-4395 Japan

Contract identification: ---

Contact person: Mr. Sakuma

Manufacturer: Futaba Corporation

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Receipt of EUT: June19, 2002

Dates of test: June 19 to 29, 2002

Note: ---

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Responsible for testing: Thomas Eberl

Responsible for test report: Thomas Eberl

## 2. Identification of Test Laboratory

|                                     |                                                                                                 |
|-------------------------------------|-------------------------------------------------------------------------------------------------|
| Test Laboratory:<br>(full address): | Senton GmbH EMI/EMC Test Center<br>Aeussere Fruehlingstrasse 45<br>D-94315 Straubing<br>Germany |
|-------------------------------------|-------------------------------------------------------------------------------------------------|

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|                 |                                   |
|-----------------|-----------------------------------|
| Contact person: | Mr. Johann Roidt                  |
| Communication:  | Telephone (+49) 0 94 21 / 55 22-0 |
|                 | Fax (+49) 0 94 21 / 55 22-99      |
|                 | eMail: Office@senton.de           |

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|                              |         |
|------------------------------|---------|
| FCC registration number:     | 90926   |
| Industry Canada file number: | IC 3050 |

### 3. Summary of Test Results

The tested sample complies with the requirements for set forth in the

**The Code of Federal Regulations 47, Part 95, Subpart C & E**

and

**The Code of Federal Regulations 47 Part 2, Subpart J.**

of the Federal Communication Commission (FCC).



Johann Roidt  
Technical Manager

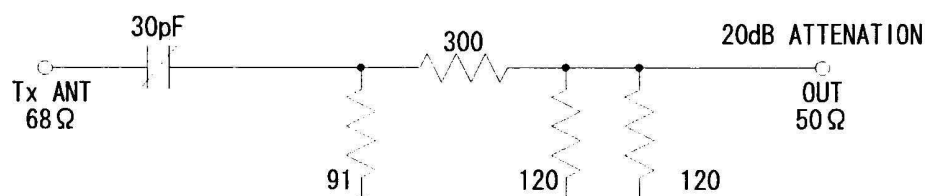


Thomas Eberl  
Test Engineer

#### 4. Operation Mode of EUT

- transmitting continuously<sup>1</sup>
- with accu pack supply nominal 9.6 V DC)<sup>2</sup>
- antenna extended to maximum<sup>3</sup>
  
- operating with  $f = 72.550 \text{ MHz}$

For conducted measurements a dummy load was used as delivered by applicant. A short description of the circuit and the method to stop modulation can be found in the following figure.



<sup>1</sup> Modulation as indicated on appropriate test record

<sup>2</sup> For conducted measurements replaced by external DC supply

<sup>3</sup> For radiated emissions only

## **5. Configuration of EUT and Peripheral Devices**

EUT is configured as stand-alone device

### **Configuration of cables of EUT**

Not applicable

### **Configuration of peripheral devices connected to EUT**

Not applicable

## 6. Measuring Methods

### 6.1. Maximum Transmitter Power (§95.639)

The maximum transmitter power was measured conducted and radiated.

#### 6.1.1. Conducted Maximum Transmitter Power

A spectrum analyzer / EMI test receiver was connected to the output of the transmitter power amplifier (conducted measurement) via dummy load while EUT was operating in transmit mode using the assigned frequency.

The trace mode of the spectrum analyzer was set to max hold with:  
RBW = 100 kHz, VBW = 100 kHz, span = 1 MHz, sweep = 20 ms (auto mode)

See figure 1 for the measurement setup.

Test equipment used (see equipment list for details):  
02, 18, 51, 69, 70, 71

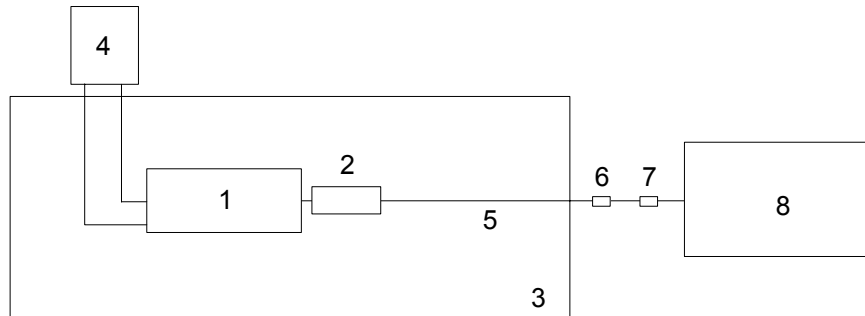


Figure 1: Measurement setup for testing on antenna connector

- |                     |                     |
|---------------------|---------------------|
| 1 Transmitter (EUT) | 5 Test cable        |
| 2 Dummy load        | 6 DC-block          |
| 3 Wooden table      | 7 Attenuator        |
| 4 DC power supply   | 8 Spectrum analyzer |

### **6.1.2. Radiated Maximum Transmitter Power**

Radiated Maximum Transmitter Power was measured with detector-function of the spectrum analyzer set to positive peak and trace mode max hold:

RBW = 100 kHz, VBW = 100 kHz, span = 1 MHz, sweep = 15 s

For measurement setup and procedure see section "Unwanted Emission 30 MHz - 1 GHz (§95.635, §95.639)" on Page 13.

## 6.2. Frequency tolerance (§95.623)

### 6.2.1. Frequency stability vs. temperature

The frequency stability vs. temperature was measured with a spectrum analyzer connected to the output of the transmitter power amplifier (conducted measurement) via dummy load while EUT was operating in transmit mode using the assigned frequency.

The trace mode of the spectrum analyzer was set to write with frequency count mode activated:

RBW = 100 Hz, VBW = 100 Hz, span = 20 kHz, sweep = 1.5 s (auto mode)

See figure 2 for the measurement setup.

Test equipment used (see equipment list for details):

02, 18, 51, 54, 69, 70, 71

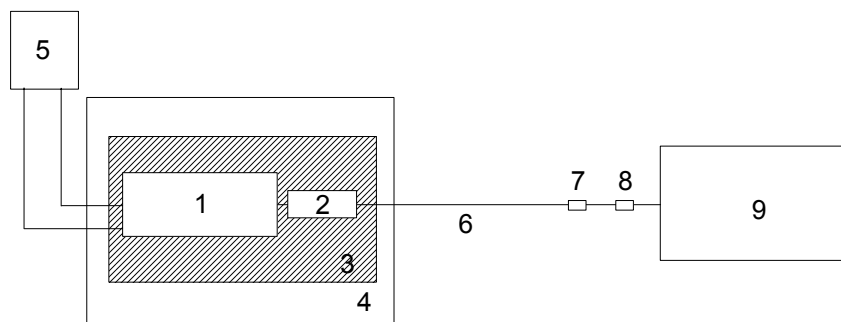


Figure 2: Measurement setup for testing within temperature test chamber

- |                            |                     |
|----------------------------|---------------------|
| 1 Transmitter (EUT)        | 6 Test cable        |
| 2 Dummy load               | 7 DC-block          |
| 3 Wooden support           | 8 Attenuator        |
| 4 Temperature test chamber | 9 Spectrum analyzer |
| 5 DC power supply          |                     |

### **6.2.2.Frequency stability vs. supply voltage**

The frequency stability vs. supply voltage was measured with a spectrum analyzer connected to the output of the transmitter power amplifier (conducted measurement) via dummy load while EUT was operating in transmit mode using the assigned frequency.

The trace mode of the spectrum analyzer was set to write with frequency count mode activated:

RBW = 100 Hz, VBW = 100 Hz, span = 20 kHz, sweep = 1.5 s (auto mode)

See figure 1 for the measurement setup.

Test equipment used (see equipment list for details):  
02, 18, 51, 69, 70, 71

### 6.3. Emission Bandwidth (§95.633)

The emission bandwidth was measured as occupied bandwidth with a spectrum analyzer connected to the output of the transmitter power amplifier (conducted measurement) via dummy load while EUT was operating in transmit mode using the assigned frequency.

The occupied bandwidth measurement was performed referring to 99% of total power:  
The trace mode of the spectrum analyzer was set to max hold with  
RBW = 30 Hz, VBW = 30 Hz, span = 40 kHz, sweep = 90 s

See figure 1 for the measurement setup.

Test equipment used (see equipment list for details):  
02, 18, 51, 69, 70, 71

#### **6.4. Unwanted Emission 30 MHz - 1 GHz (§95.635, §95.639)**

Radiated emissions were measured over the frequency range from 30 MHz to 1 GHz. For final testing the detector-function of the spectrum analyzer was set to positive peak and trace mode max hold:

RBW = 3 kHz, VBW = 10 kHz, span = 20 kHz, sweep = 10 s

Measurements were made in both the horizontal and vertical planes of polarization. The scans were taken in a semi-anechoic room using a spectrum analyzer with the detector function set to peak and resolution bandwidth set to 100 kHz. All tests were performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing. During the tests the EUT was rotated all around and the receiving-antenna was raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions.

Final testing was performed referring to substitution method as described in TIA/EIA-603, section 2.2.12 ("Radiated Spurious Emissions").

See figure 3 for the measurement setup.

Test equipment used (see equipment list for details):  
01, 06, 12, 15, 38, 39, 40, 41, 55, 58, 61, 64, 66

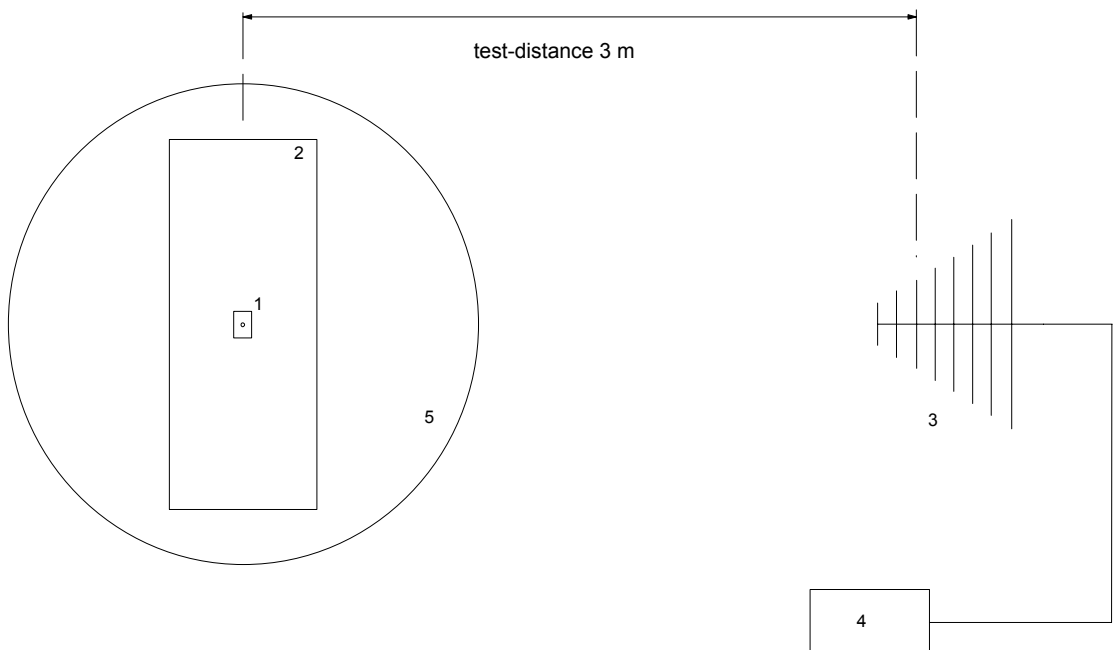
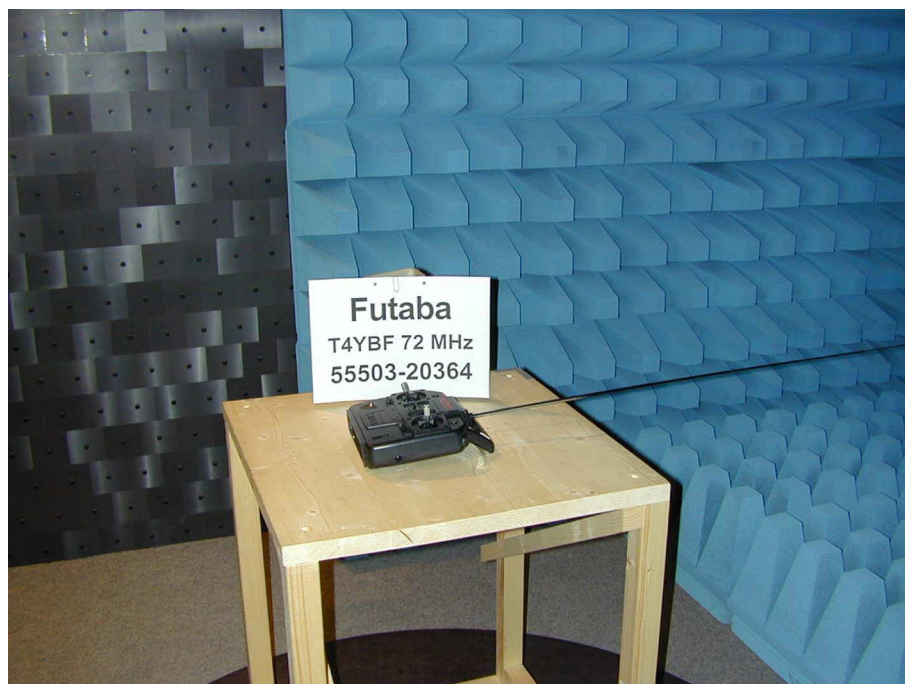


Figure 3: Measurement setup for radiated emission test

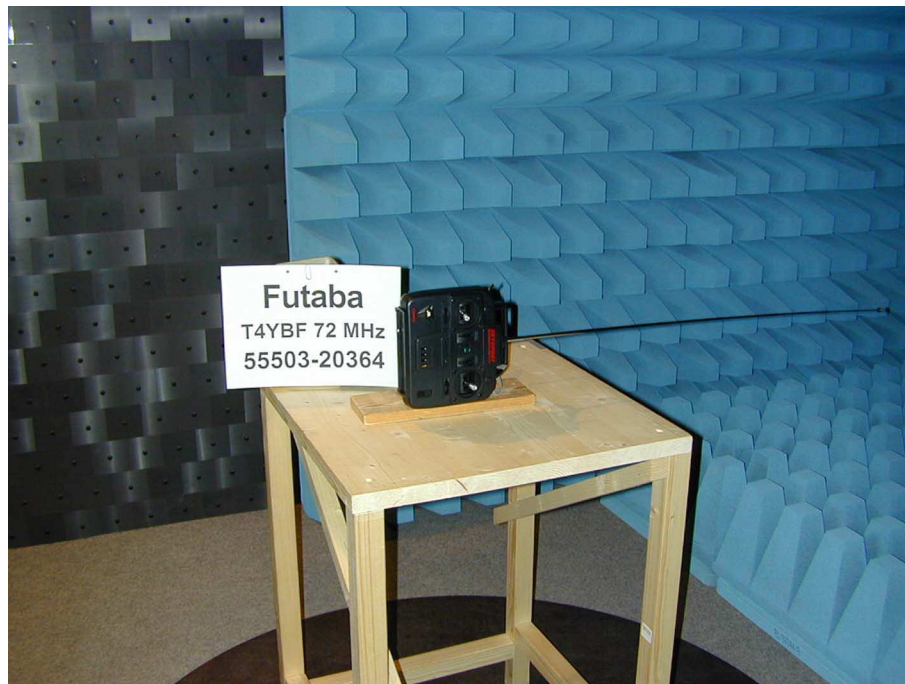
- |                                                                |                                                                                              |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <p><b>1</b> Transmitter (EUT)</p> <p><b>2</b> Wooden table</p> | <p><b>3</b> Measurement antenna</p> <p><b>4</b> Test receiver</p> <p><b>5</b> Turn table</p> |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------|

## 7. Photographs of Test Setups

### Test setup unwanted radiation 30 MHz - 1 GHz



**Test setup unwanted radiation 30 MHz - 1 GHz  
(continued)**



## 8. Equipment List

To facilitate reference to test equipment used for related tests, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory.

| No. | Type                 | Model        | Serial Number            | Manufacturer    |
|-----|----------------------|--------------|--------------------------|-----------------|
| 01  | Spectrum Analyzer    | R 3271       | 05050023                 | Advantest       |
| 02  | EMI Test Receiver    | ESMI         | 839379/013<br>839587/006 | Rohde & Schwarz |
| 03  | Test Receiver        | ESH 3        | 880112/032               | Rohde & Schwarz |
| 04  | Test Receiver        | ESHS 10      | 860043/016               | Rohde & Schwarz |
| 05  | Test Receiver        | ESV          | 881414/009               | Rohde & Schwarz |
| 06  | Test Receiver        | ESVP         | 881120/024               | Rohde & Schwarz |
| 07  | Audio Analyzer       | UPA          | 862954                   | Rohde & Schwarz |
| 08  | Power Meter          | NRVS         | 836856/015               | Rohde & Schwarz |
| 09  | Power Sensor         | NRV-Z52      | 837901/030               | Rohde & Schwarz |
| 10  | Power Sensor         | NRV-Z4       | 863828/015               | Rohde & Schwarz |
| 11  | Preamplifier         | ESV-Z3       | 860907/004               | Rohde & Schwarz |
| 12  | Preamplifier         | R14601       |                          | Advantest       |
| 13  | Preamplifier         | ACX/080-3030 | 32640                    | CTT             |
| 14  | Preamplifier         | ACO/180-3530 | 32641                    | CTT             |
| 15  | Signal generator     | SMY 01       | 830694/001               | Rohde & Schwarz |
| 16  | Signal Generator     | HP 8673 D    | 2930A00966               | Hewlett Packard |
| 17  | Waveform Generator   | HP 33120 A   | US34005375               | Hewlett Packard |
| 18  | Attenuator 20 dB     | 4776-20      | 9503                     | Narda           |
| 19  | Attenuator 10 dB     | 4776-10      | 9412                     | Narda           |
| 20  | Pulse Limiter        | ESH 3-Z2     | 1144                     | Rohde & Schwarz |
| 21  | Pulse Limiter        | 11947 A      | 3107A00566               | Hewlett Packard |
| 22  | V-Network            | ESH 3-Z5     | 862770/018               | Rohde & Schwarz |
| 23  | V-Network            | ESH 3-Z5     | 894785/005               | Rohde & Schwarz |
| 24  | V-Network            | ESH 3-Z5     | 830952/025               | Rohde & Schwarz |
| 25  | V-Network            | ESH 3-Z6     | 830722/010               | Rohde & Schwarz |
| 26  | V-Network            | NSLK 8127    | 8127152                  | Schwarzbeck     |
| 27  | V-Network            | NNLA 8119    | 8119148                  | Schwarzbeck     |
| 28  | V-Network            | SE 01        | 01                       | Senton          |
| 29  | T-Network            | ESH 3-Z4     | 890602/011               | Rohde & Schwarz |
| 30  | T-Network            | ESH 3-Z4     | 890602/012               | Rohde & Schwarz |
| 31  | High Impedance Probe | TK 9416      | 01                       | Schwarzbeck     |
| 32  | High Impedance Probe | TK 9416      | 02                       | Schwarzbeck     |
| 33  | Current Probe        | ESH 2-Z1     | 863366/18                | Rohde & Schwarz |
| 34  | Current Probe        | ESV-Z1       | 862553/3                 | Rohde & Schwarz |

| No. | Type                        | Model      | Serial Number | Manufacturer        |
|-----|-----------------------------|------------|---------------|---------------------|
| 35  | Absorbing Clamp             | MDS 21     | 80911         | Lüthi               |
| 36  | Absorbing Clamp             | MDS 21     | 79690         | Lüthi               |
| 37  | Loop Antenna                | HFH2-Z2    | 882964/1      | Rohde & Schwarz     |
| 38  | Biconical Antenna           | HK 116     | 842204/001    | Rohde & Schwarz     |
| 39  | Biconical Antenna           | HK 116     | 836239/02     | Rohde & Schwarz     |
| 40  | Log. Periodic Antenna       | HL 223     | 841516/023    | Rohde & Schwarz     |
| 41  | Log. Periodic Antenna       | HL 223     | 834408/12     | Rohde & Schwarz     |
| 42  | Horn Antenna                | 3115       | 9508-4553     | Emco                |
| 43  | Horn Antenna                | 3160-03    | 9112-1003     | Emco                |
| 44  | Horn Antenna                | 3160-04    | 9112-1001     | Emco                |
| 45  | Horn Antenna                | 3160-05    | 9112-1001     | Emco                |
| 46  | Horn Antenna                | 3160-06    | 9112-1001     | Emco                |
| 47  | Horn Antenna                | 3160-07    | 9112-1008     | Emco                |
| 48  | Horn Antenna                | 3160-08    | 9112-1002     | Emco                |
| 49  | Horn Antenna                | 3160-09    | 9403-1025     | Emco                |
| 50  | Digital multimeter          | 199        | 463386        | Keithley            |
| 51  | DC Power Supply             | NGSM 32/10 | 203           | Rohde & Schwarz     |
| 52  | DC Power Supply             | NGB        | 2455          | Rohde & Schwarz     |
| 53  | DC Power Supply             | NGA        | 386           | Rohde & Schwarz     |
| 54  | Temperature Test Chamber    | HT4010     | 07065550      | Heraeus             |
| 55  | Cable                       | RG214      | 1309          | Senton              |
| 56  | Cable                       | 200CM_001  | 1357          | Rosenberger         |
| 57  | Cable                       | 150CM_001  | 1479          | Rosenberger         |
| 58  | Cable Set EG1               | RG214      | 1189 - 1191   | Senton              |
| 59  | Cable Set Cabine 1          | RG214      |               | Senton              |
| 60  | Cable Set Cabine 2          | RG214      |               | Senton              |
| 61  | Cable Set Cabine 3          | RG214      |               | Senton              |
| 62  | Shielded Room               | No. 1      | 1451          | Senton              |
| 63  | Shielded Room               | No. 2      | 1452          | Senton              |
| 64  | Semi-anechoic Chamber       | No. 3      | 1453          | Siemens             |
| 65  | Shielded Room               | No. 4      | 1454          | Euroshield          |
| 66  | Open Area Test Site         | EG 1       |               | Senton              |
| 67  | Cable for Antenna Connector |            |               | Lucent Technologies |
| 68  | DC Block 0.01-18GHz         |            | 8037          | Inmet Corp.         |
| 69  | High pass filter            |            |               | Lucent Technologies |
| 69  | DC Block                    | 7006       | A2798         | Weinschel Corp.     |
| 70  | Cable for Antenna Connector |            |               | Senton              |
| 71  | Dummy load                  |            |               | Futaba Corporation  |

## 9. Referenced Regulations

All tests were performed with reference to the following regulations and standards:

|                                     |                            |                                                                                                                                                                    |                   |
|-------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <input checked="" type="checkbox"/> | CFR 47 Part 2              | Code of Federal Regulations Part 2 (Frequency Allocations And Radio Treaty Matters, General Rules And Regulations) of the Federal Communication Commission (FCC)   | October 1, 1999   |
| <input type="checkbox"/>            | CFR 47 Part 15 Subpart A   | Code of Federal Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)                                   | October 1, 1999   |
| <input type="checkbox"/>            | CFR 47 Part 15 Subpart B   | Code of Federal Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)                   | October 1, 1999   |
| <input type="checkbox"/>            | CFR 47 Part 15 Subpart C   | Code of Federal Regulations Part 15 (Radio Frequency Devices), Subpart C (Intentional Radiators) of the Federal Communication Commission (FCC)                     | October 1, 1999   |
| <input checked="" type="checkbox"/> | CFR 47 Part 95 Subpart C/E | Code of Federal Regulations Part 95 (Personal Radio Services), Subpart C/E (Radio Control(R/C) Radio Service) of the Federal Communication Commission (FCC)        | October 1, 1998   |
| <input type="checkbox"/>            | ANSI C63.4                 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz - 40 GHz | October, 1992     |
| <input type="checkbox"/>            | RSS-210                    | Radio Standards Specification RSS-210 Issue 2 for Low Power Licence-Exempt Radiocommunication Devices of Industry Canada                                           | February 24, 1996 |
| <input checked="" type="checkbox"/> | TIA/EIA-603                | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards                                                                                | February, 1993    |
| <input checked="" type="checkbox"/> | TIA/EIA-603-1              | Addendum to TIA/EIA-603                                                                                                                                            | March 4, 1998     |

## 10. List of Measurements

|                                                         |                                      |             |               |
|---------------------------------------------------------|--------------------------------------|-------------|---------------|
|                                                         |                                      |             |               |
| CFR 47 Part 95 Subpart C / E<br>CFR 47 Part 2 Subpart J |                                      |             |               |
|                                                         |                                      |             |               |
| <b>Section(s):</b>                                      | <b>Test</b>                          | <b>Page</b> | <b>Result</b> |
|                                                         |                                      |             |               |
| <b>§95.639</b>                                          | Maximum transmitter power            |             | Passed        |
| <b>§95.623</b>                                          | Frequency tolerance                  |             | Passed        |
| <b>§95.633</b>                                          | Emission bandwidth                   |             | Passed        |
| <b>§95.635</b>                                          | Unwanted radiation<br>30 MHz - 1 GHz |             | Passed        |
|                                                         |                                      |             |               |

## 11. Test Results

**MAXIMUM TRANSMITTER POWER - CONDUCTED****Section 95.639b3**

EUT: T4YBF 72  
Serial number: 001  
Applicant: Futaba Corporation  
Mode: - transmitting continuously (TX mode)  
- operating with  $f = 72.550$  MHz  
Date of test: June 20, 2002  
Operator: Thomas Eberl

**Test conditions:**

Temperature: +20°C  
Nominal supply voltage: 9.6V DC

**Specifications:**

Voltage range:  $\pm 15$  % of nominal supply voltage

| Supply voltage<br>(V) | Modulation | Transmitter power<br>(dBm) | Transmitter power<br>(W) | Limit<br>(W) |
|-----------------------|------------|----------------------------|--------------------------|--------------|
| 8.16                  | off        | 22.40                      | 0.174                    | 0.750        |
| 9.60                  | off        | 23.80                      | 0.240                    | 0.750        |
| 11.04                 | off        | 24.80                      | 0.302                    | 0.750        |
|                       |            |                            |                          |              |
| 8.16                  | on         | 22.40                      | 0.174                    | 0.750        |
| 9.60                  | on         | 23.80                      | 0.240                    | 0.750        |
| 11.04                 | on         | 24.80                      | 0.302                    | 0.750        |

**Result:** Test passed

**MAXIMUM TRANSMITTER POWER - RADIATED SECTION 95.639B3**

EUT: T4YBF 72  
Serial number: 001  
Applicant: Futaba Corporation  
Mode:  
- transmitting continuously (TX mode)  
- with modulation  
- with supply voltage 9.6 V DC  
- antenna extended to maximum  
- operating with  $f = 72.550$  MHz  
Date of test: June 20, 2002  
Operator: Thomas Eberl

**Test conditions:**

Temperature: +20°C  
Voltage supply: Fully charged batteries (9.6 V DC nominal)

**Note 1:**

Limit of 28.8 dBm corresponds to 0.75 W.

**Note 2:**

For calculation of correction factors see tables "Test Site Calibration 30 MHz - 1 GHz for ERP Measurements (Substitution Method)" starting on page 32.

| Position of EUT             | Frequency (MHz) | Polarisation V/H | Reading value (dBm) | Correction factor (dB) | ERP (dBm) | Limit (dBm) |
|-----------------------------|-----------------|------------------|---------------------|------------------------|-----------|-------------|
| vertical, antenna vertical  | 72.550          | V                | -7.95               | 24.74                  | 16.79     | 28.8        |
| horiz., antenna horizontal  | 72.550          | H                | -9.54               | 25.51                  | 15.97     | 28.8        |
| horiz., right side on table | 72.550          | H                | -9.38               | 25.5                   | 16.14     | 28.8        |

**Result:** Test passed

**FREQUENCY STABILITY VS. TEMPERATURE****Section 95.623c**

EUT: T4YBF 72  
Serial number: 001  
Applicant: Futaba Corporation  
Mode:  
- transmitting continuously (TX mode)  
- without modulation  
- operating with  $f = 72.550$  MHz  
Date of test: June 20, 2002  
Operator: Thomas Eberl

**Test conditions:**

Temperature: see table below  
Supply voltage: 9.6 V DC

**Specifications:**

Frequency tolerance:  $\pm 0.002$  % of nominal carrier frequency  
Temperature range: -30 to +50°C

| Temperature (°C) | Nominal car. frequency (MHz) | Frequency measured (MHz) | Frequency deviation (Hz) | Frequency deviation (%) | Limit (%) |
|------------------|------------------------------|--------------------------|--------------------------|-------------------------|-----------|
| -30              | 72.550                       | 72.54948                 | -520                     | 0.0007167               | 0.002     |
| -20              | 72.550                       | 72.55036                 | +360                     | 0.0004962               | 0.002     |
| -10              | 72.550                       | 72.55049                 | +490                     | 0.0006753               | 0.002     |
| 0                | 72.550                       | 72.55044                 | +440                     | 0.0006064               | 0.002     |
| +10              | 72.550                       | 72.55028                 | +280                     | 0.0003859               | 0.002     |
| +20              | 72.550                       | 72.55010                 | +10                      | 0.0000137               | 0.002     |
| +30              | 72.550                       | 72.54968                 | -320                     | 0.0004410               | 0.002     |
| +40              | 72.550                       | 72.54942                 | -580                     | 0.0007994               | 0.002     |
| +50              | 72.550                       | 72.54928                 | -720                     | 0.0009924               | 0.002     |

**Result:** Test passed

**FREQUENCY STABILITY VS. SUPPLY VOLTAGE****Section 95.623c**

EUT: T4YBF 72  
Serial number: 001  
Applicant: Futaba Corporation  
Mode:  
- transmitting continuously (TX mode)  
- without modulation  
- operating with  $f = 72.550$  MHz  
Date of test: June 20, 2002  
Operator: Thomas Eberl

**Test conditions:**

Temperature: +20°C  
Nominal supply voltage: 9.6 V DC

**Specifications:**

Frequency tolerance:  $\pm 0.002$  % of nominal carrier frequency  
Voltage range:  $\pm 15$  % of nominal supply voltage

| Supply voltage (V)  | Nominal car. frequency (MHz) | Frequency measured (MHz) | Frequency deviation (Hz) | Frequency deviation (%) | Limit (%) |
|---------------------|------------------------------|--------------------------|--------------------------|-------------------------|-----------|
| 8.16                | 72.550                       | 72.54980                 | -200                     | 0.0002756               | 0.002     |
| 8.50                | 72.550                       | 72.54985                 | -150                     | 0.0002067               | 0.002     |
| 9.00                | 72.550                       | 72.54990                 | -100                     | 0.0001378               | 0.002     |
| 9.60                | 72.550                       | 72.54991                 | -90                      | 0.0001240               | 0.002     |
| 10.00               | 72.550                       | 72.55001                 | +10                      | 0.0000137               | 0.002     |
| 10.50               | 72.550                       | 72.55003                 | +30                      | 0.0000413               | 0.002     |
| 11.04               | 72.550                       | 72.55004                 | +40                      | 0.0000551               | 0.002     |
| Batt. end point (V) |                              |                          |                          |                         |           |
| 6.5                 | 72.550                       | 72.54939                 | -610                     | 0.0008400               | 0.002     |

**Result:** Test passed

## EMISSION BANDWIDTH

## Section 95.633b

EUT: T4YBF 72  
 Serial number: 001  
 Applicant: Futaba Corporation  
 Mode:  
   - transmitting continuously (TX mode)  
   - with modulation  
   - operating with  $f = 72.550$  MHz  
 Date of test: June 20, 2002  
 Operator: Thomas Eberl

### Test conditions:

Temperature: +20°C  
 Supply voltage: 12.0 V DC

### Specifications:

Authorized bandwidth: 8 kHz

### Note:

Emission bandwidth was measured as occupied bandwidth. For details see plot on following page.

| Test procedure | Measured occupied bandwidth<br>(kHz) | Limit<br>(kHz) |
|----------------|--------------------------------------|----------------|
| TIA/EI-603     | 4.7                                  | 8.00           |

**Result:** Test passed

|                          |                                                                               |
|--------------------------|-------------------------------------------------------------------------------|
| Calculation              | $B_n = 2M + 2DK$                                                              |
| M = Modulation Frequency | M = 1.55 kHz                                                                  |
| D = Deviation            | D = 1.45 kHz                                                                  |
|                          | K = 1                                                                         |
|                          | $B_n = 2(1.55 \text{ kHz}) + 2(1.45 \text{ kHz}) = 3.1 + 2.9 = 6 \text{ kHz}$ |

**Type of Emission = 6K00F3E**

## EMISSION BANDWIDTH (CONTINUED))

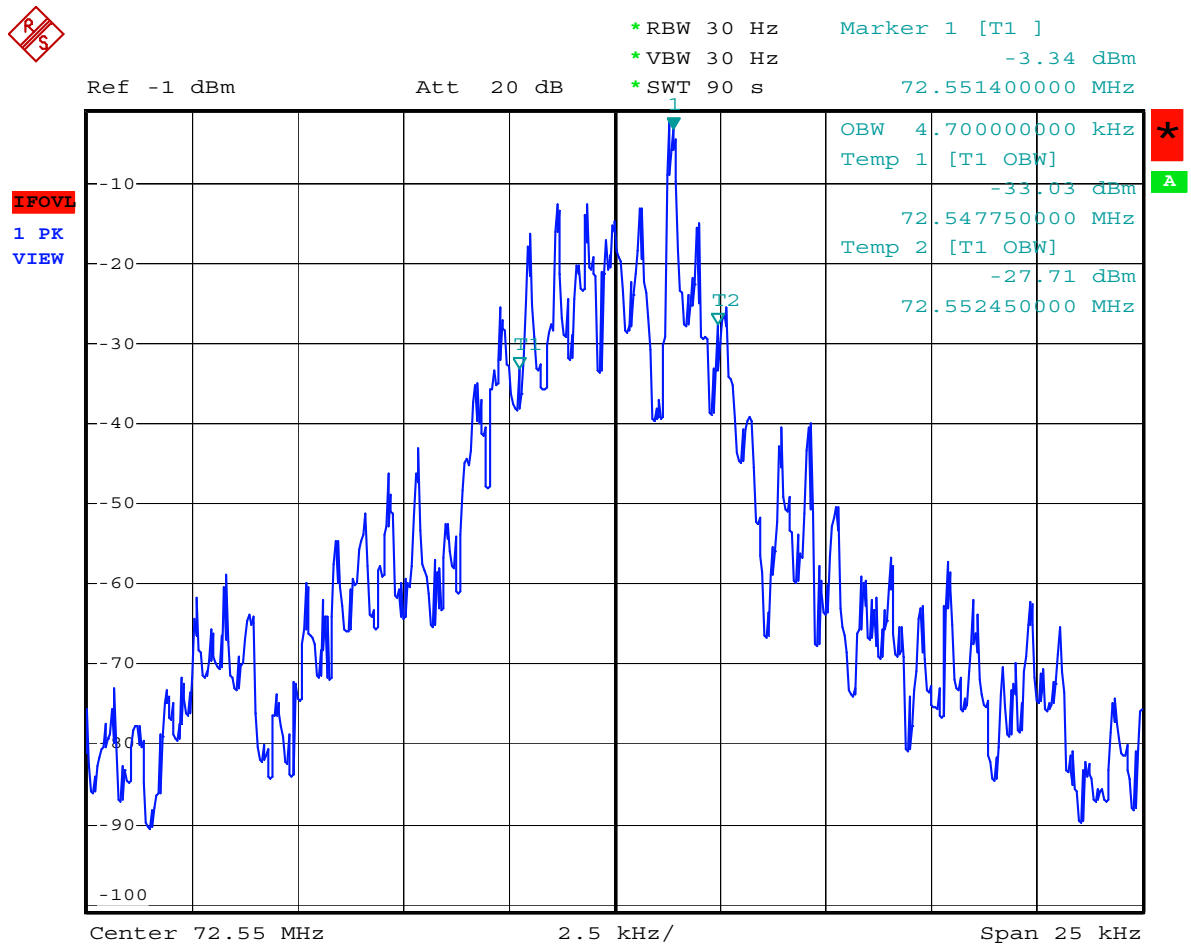
## Section 95.633b

### Specifications:

Authorized bandwidth: 8 kHz  
 Test procedure: TIA/EIA-603 (99% of total power with RBW as close to, but not less than 1% of the 99% power bandwidth)

### Note:

Tested on antenna connector via dummy load



## UNWANTED RADIATION 30 MHz - 1 GHz

## Section 95.635

EUT: T4YBF 72  
 Serial number: 001  
 Applicant: Futaba Corporation  
 Mode:  
 - transmitting continuously (TX mode)  
 - with modulation  
 - with supply voltage 9.6 V DC  
 - antenna extended to maximum  
 - operating with  $f = 72.550\text{MHz}$   
 - EUT in vertical position, antenna to the top

Date of test: June 19, 2002  
 Operator: Thomas Eberl

### Specifications:

Test-distance: 3 meters  
 Limit:  $10 \log(P_{\text{carrier}}) - 56 \text{ dB}$   
 with  $P_{\text{carrier}}$  as the maximum transmitter power limit for the unmodulated carrier according to §95.639

|                                         |                      |            |
|-----------------------------------------|----------------------|------------|
| Maximum transmitter power (conducted) : | 23.8 dBm             | 0.240 Watt |
| Maximum carrier power (radiated) :      | 16.79 dBm            | 0.047 Watt |
| Calculated limit (referring to TP) :    | -26.0 dBm (constant) |            |

| Frequency (MHz) | Polarization V/H | Reading value (dBm) | Correction factor (dB) | ERP (dBm) | Calculated limit (dBm) | Margin to limit (dB) |
|-----------------|------------------|---------------------|------------------------|-----------|------------------------|----------------------|
| 72.550          | V                | -7.95               | 24.74                  | 16.79     | 28.8                   | 12.01                |
| 217.650         | V                | -69.87              | 19.84                  | -50.02    | -26.0                  | 22.72                |
| 290.200         | V                | -76.72              | 25.78                  | -50.94    | -26.0                  | 23.64                |
| 362.750         | V                | -77.60              | 28.24                  | -59.36    | -26.0                  | 32.06                |
| 435.300         | V                | -70.88              | 28.11                  | -42.77    | -26.0                  | 15.47                |
| 507.850         | V                | -77.46              | 28.12                  | -49.33    | -26.0                  | 22.03                |
| 580.400         | V                | -82.19              | 30.67                  | -51.52    | -26.0                  | 24.22                |
| 652.950         | V                | -88.68              | 29.94                  | -58.74    | -26.0                  | 31.44                |
| 725.500         | H                | -85.30              | 31.07                  | -54.23    | -26.0                  | 26.93                |
| 798.050         | V                | -81.22              | 32.41                  | -48.82    | -26.0                  | 21.52                |
| 870.600         | V                | -88.86              | 34.17                  | -54.69    | -26.0                  | 27.39                |
| 943.600         | H                | -100.37             | 34.03                  | -66.34    | -26.0                  | 39.04                |

**Note:** For calculation of correction factors see tables "Test Site Calibration 30 MHz - 1 GHz for ERP Measurements (Substitution Method)" starting on page 32.

**Result:** Test passed

## UNWANTED RADIATION 30 MHz - 1 GHz

## Section 95.635

EUT: T4YBF 72  
 Serial number: 001  
 Applicant: Futaba Corporation  
 Mode:  
 - transmitting continuously (TX mode)  
 - with modulation  
 - with supply voltage 9.6 V DC  
 - antenna extended to maximum  
 - operating with  $f = 72.550$  MHz  
 - EUT in horizontal position with rear side on table

Date of test: June 19, 2002  
 Operator: Thomas Eberl

### Specifications:

Test-distance: 3 meters  
 Limit:  $10 \log(P_{\text{carrier}}) - 56$  dB  
 with  $P_{\text{carrier}}$  as the maximum transmitter power limit for the unmodulated carrier according to §95.639

|                                         |                      |            |
|-----------------------------------------|----------------------|------------|
| Maximum transmitter power (conducted) : | 23.8 dBm             | 0.240 Watt |
| Maximum carrier power (radiated) :      | 16.79 dBm            | 0.047 Watt |
| Calculated limit (referring to TP) :    | -26.0 dBm (constant) |            |

| Frequency (MHz) | Polarization V/H | Reading value (dBm) | Correction factor (dB) | ERP (dBm) | Calculated limit (dBm) | Margin to limit (dB) |
|-----------------|------------------|---------------------|------------------------|-----------|------------------------|----------------------|
| 72.550          | H                | -9.54               | 25.51                  | 15.97     | 28.8                   | 12.83                |
| 217.650         | H                | -72.94              | 20.37                  | -52.58    | -26.0                  | 25.28                |
| 290.200         | H                | -86.11              | 24.06                  | -62.05    | -26.0                  | 34.75                |
| 362.750         | H                | -77.49              | 27.82                  | -49.67    | -26.0                  | 22.37                |
| 435.300         | H                | -87.13              | 29.56                  | -57.57    | -26.0                  | 30.27                |
| 507.850         | H                | -96.88              | 28.61                  | -68.26    | -26.0                  | 40.96                |
| 580.400         | H                | -85.99              | 29.21                  | -56.79    | -26.0                  | 29.49                |
| 652.950         | H                | -85.84              | 29.75                  | -56.08    | -26.0                  | 28.78                |
| 725.500         | H                | -85.49              | 31.07                  | -54.43    | -26.0                  | 27.13                |
| 798.050         | H                | -80.03              | 31.60                  | -48.43    | -26.0                  | 21.13                |
| 870.600         | H                | -86.04              | 32.67                  | -53.37    | -26.0                  | 26.07                |
| 943.150         | H                | -95.26              | 34.03                  | -61.23    | -26.0                  | 33.93                |

**Note:** For calculation of correction factors see tables "Test Site Calibration 30 MHz - 1 GHz for ERP Measurements (Substitution Method)" starting on page 32.

**Result:** Test passed

## UNWANTED RADIATION 30 MHz - 1 GHz

## Section 95.635

EUT: T4YBF 72  
 Serial number: 001  
 Applicant: Futaba Corporation  
 Mode:  
 - transmitting continuously (TX mode)  
 - with modulation  
 - with supply voltage 9.6 V DC  
 - antenna extended to maximum  
 - operating with  $f = 72.550$  MHz  
 - EUT in horizontal position with right side on table

Date of test: June 19, 2002  
 Operator: Thomas Eberl

### Specifications:

Test-distance: 3 meters  
 Limit:  $10 \log(P_{\text{carrier}}) - 56$  dB  
 with  $P_{\text{carrier}}$  as the maximum transmitter power limit for the unmodulated carrier according to §95.639

|                                         |                      |            |
|-----------------------------------------|----------------------|------------|
| Maximum transmitter power (conducted) : | 23.8 dBm             | 0.240 Watt |
| Maximum carrier power (radiated) :      | 16.79 dBm            | 0.047 Watt |
| Calculated limit (referring to TP) :    | -26.0 dBm (constant) |            |

| Frequency (MHz) | Polarization V/H | Reading value (dBm) | Correction factor (dB) | ERP (dBm) | Calculated limit (dBm) | Margin to limit (dB) |
|-----------------|------------------|---------------------|------------------------|-----------|------------------------|----------------------|
| 72.550          | H                | -9.38               | 25.51                  | 16.14     | 28.8                   | 12.66                |
| 217.650         | H                | -72.53              | 20.37                  | -52.17    | -26.0                  | 24.87                |
| 290.200         | H                | -85.79              | 24.06                  | -61.73    | -26.0                  | 34.43                |
| 362.750         | H                | -80.98              | 27.84                  | -53.15    | -26.0                  | 25.85                |
| 435.300         | H                | -86.54              | 29.56                  | 56.99     | -26.0                  | 29.69                |
| 507.850         | H                | -92.28              | 28.62                  | -63.67    | -26.0                  | 36.37                |
| 580.400         | H                | -89.50              | 29.2                   | -60.30    | -26.0                  | 33.00                |
| 652.950         | H                | -90.90              | 29.76                  | -61.14    | -26.0                  | 33.84                |
| 725.500         | V                | -87.21              | 29.52                  | -57.69    | -26.0                  | 30.39                |
| 798.050         | V                | -85.29              | 32.41                  | -52.89    | -26.0                  | 25.59                |
| 870.600         | V                | -90.26              | 34.17                  | -56.09    | -26.0                  | 28.79                |
| 943.150         | H                | -90.62              | 34.04                  | -56.58    | -26.0                  | 29.28                |

**Note:** For calculation of correction factors see tables "Test Site Calibration 30 MHz - 1 GHz for ERP Measurements (Substitution Method)" starting on page 32.

**Result:** Test passed

## 12. Additional Results

# Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Horizontal Polarization

Date of test: 06/25/2002  
Operator: T. Eberl

Test performed: automatically  
File name: default.emi

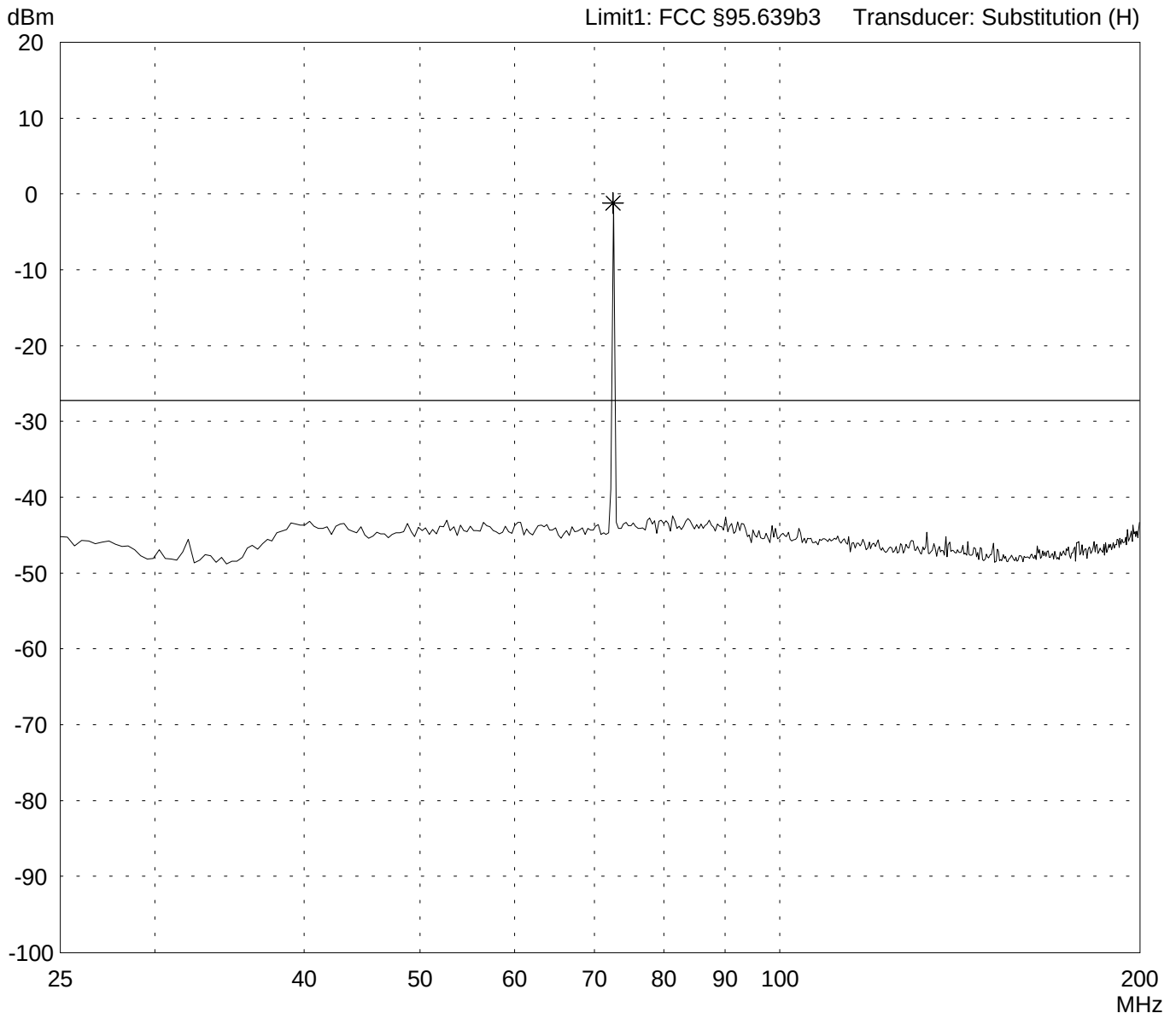
Comment:

- TX mode f= 72.550 Mhz

- EUT in vertical position

Detector:  
Peak

List of values:  
Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 32 of 55 Pages

|                                                                                 |
|---------------------------------------------------------------------------------|
| <p>Radiated Power Test 25 MHz - 200 MHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|---------------------------------------------------------------------------------|

|                                                                 |                                                                           |
|-----------------------------------------------------------------|---------------------------------------------------------------------------|
| Model:<br>T4YBF 72 MHz                                          | Comment:<br><br>- TX mode f= 72.550 Mhz<br><br>- EUT in vertical position |
| Serial no.:<br>001                                              |                                                                           |
| Applicant:<br>Futaba Corporation                                |                                                                           |
| Test site:<br>Fully anechoic room                               |                                                                           |
| Tested on:<br>Test distance 3 meters<br>Horizontal Polarization |                                                                           |
| Date of test: 06/25/2002<br>Operator: T. Eberl                  |                                                                           |
| Test performed: automatically<br>File name: default.emi         |                                                                           |

|                   |                                     |
|-------------------|-------------------------------------|
| Detector:<br>Peak | List of values:<br>Selected by hand |
|-------------------|-------------------------------------|

| <i>Frequency<br/>[MHz]</i> | <i>Reading<br/>[dBm]</i> | <i>Correction factor<br/>[dB]</i> | <i>Value<br/>[dBm]</i> | <i>Limit<br/>[dBm]</i> | <i>Limit<br/>exceeded</i> |
|----------------------------|--------------------------|-----------------------------------|------------------------|------------------------|---------------------------|
| 72.550000                  | -26.73                   | 25.51                             | -1.22                  | -27.25                 | *                         |

|                       |                              |                     |
|-----------------------|------------------------------|---------------------|
| Result:<br>Limit kept | Project file:<br>55503-20364 | Page 33 of 55 Pages |
|-----------------------|------------------------------|---------------------|

# Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Horizontal Polarization

Date of test:  
06/25/2002

Operator:  
T. Eberl

Test performed:  
automatically

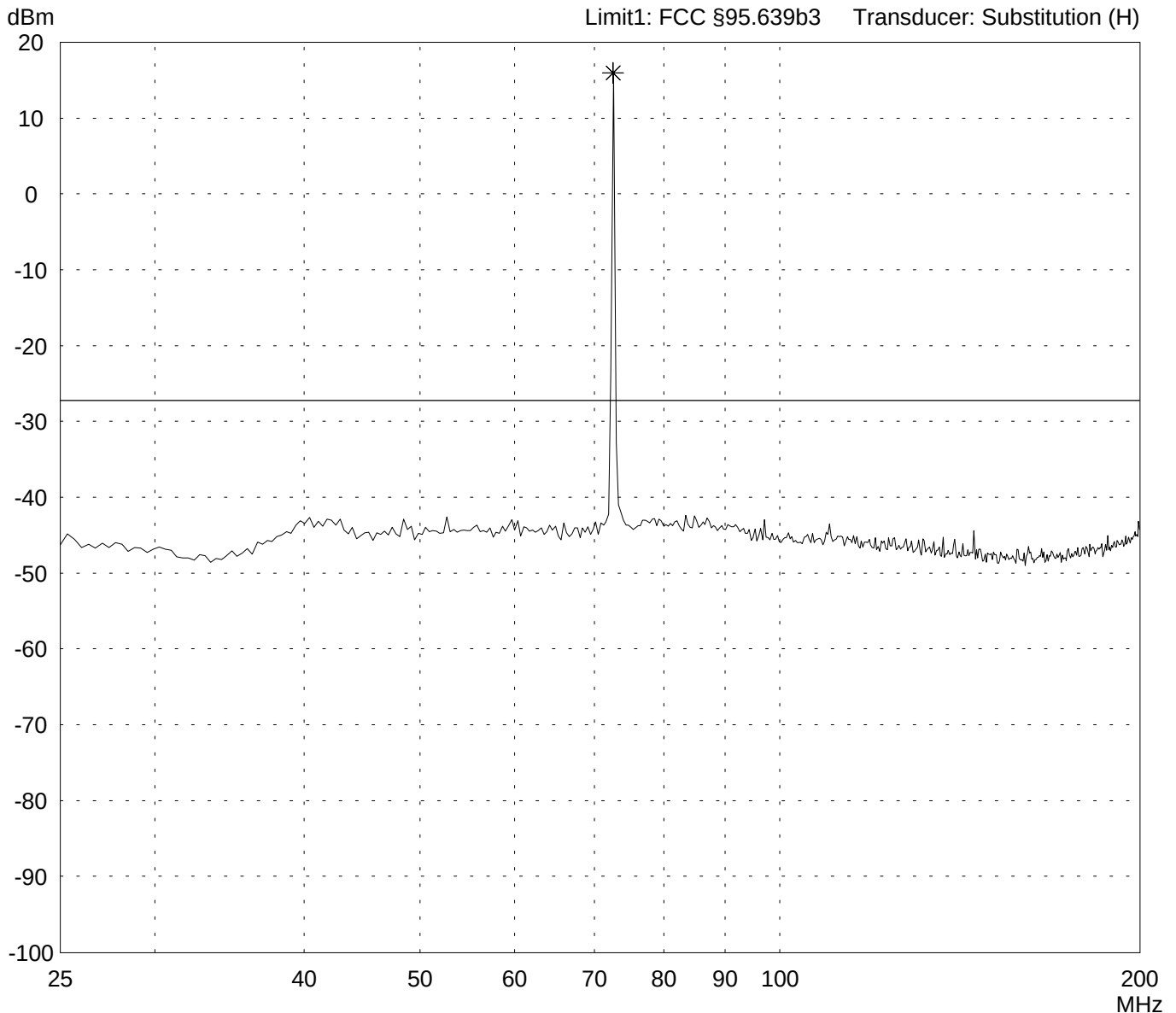
File name:  
default.emi

Comment:

- TX mode f= 72.550 Mhz
- EUT in horizontal position (rear side on table)

Detector:  
Peak

List of values:  
Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 34 of 55 Pages

|                                                                                 |
|---------------------------------------------------------------------------------|
| <p>Radiated Power Test 25 MHz - 200 MHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|---------------------------------------------------------------------------------|

|                                                                 |                           |
|-----------------------------------------------------------------|---------------------------|
| Model:<br>T4YBF 72 MHz                                          |                           |
| Serial no.:<br>001                                              |                           |
| Applicant:<br>Futaba Corporation                                |                           |
| Test site:<br>Fully anechoic room                               |                           |
| Tested on:<br>Test distance 3 meters<br>Horizontal Polarization |                           |
| Date of test:<br>06/25/2002                                     | Operator:<br>T. Eberl     |
| Test performed:<br>automatically                                | File name:<br>default.emi |

Comment:

- TX mode  $f = 72.550 \text{ Mhz}$
- EUT in horizontal position (rear side on table)

- EUT in horizontal position (rear side on table)

Detector:   
Peak

List of values:  
Selected by hand

Selected by hand

| <i>Frequency<br/>[MHz]</i> | <i>Reading<br/>[dBm]</i> | <i>Correction factor<br/>[dB]</i> | <i>Value<br/>[dBm]</i> | <i>Limit<br/>[dBm]</i> | <i>Limit<br/>exceeded</i> |
|----------------------------|--------------------------|-----------------------------------|------------------------|------------------------|---------------------------|
| 72.550000                  | -9.54                    | 25.51                             | 15.97                  | -27.25                 | *                         |

|            |  |
|------------|--|
| Result:    |  |
| Limit kept |  |

Project file: 55503-20364 Page 35 of 55 Pages

55503-20364 Page 35 of 55 Pages

Page 35 of 55 Pages

# Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Horizontal Polarization

Date of test:  
06/25/2002

Operator:  
T. Eberl

Test performed:  
automatically

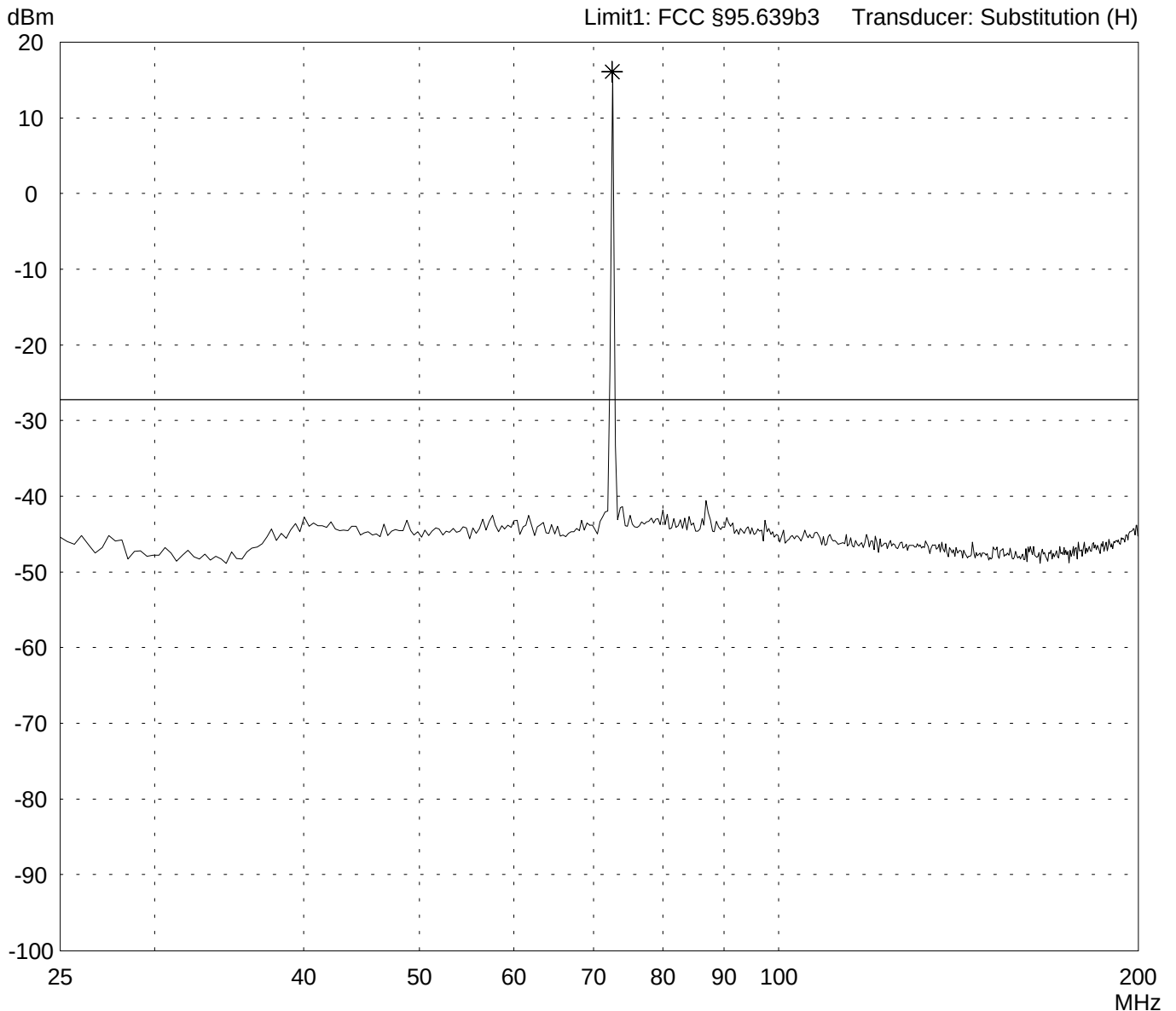
File name:  
default.emi

Comment:

- TX mode f= 72.550 Mhz
- EUT in horizontal position (right side on table)

Detector:  
Peak

List of values:  
Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 36 of 55 Pages

|                                                                                 |
|---------------------------------------------------------------------------------|
| <p>Radiated Power Test 25 MHz - 200 MHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|---------------------------------------------------------------------------------|

|                                                                               |                                                                                                   |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Model:<br><b>T4YBF 72 MHz</b>                                                 | Comment:<br><br>- TX mode f= 72.550 Mhz<br><br>- EUT in horizontal position (right side on table) |
| Serial no.:<br><b>001</b>                                                     |                                                                                                   |
| Applicant:<br><b>Futaba Corporation</b>                                       |                                                                                                   |
| Test site:<br><b>Fully anechoic room</b>                                      |                                                                                                   |
| Tested on:<br><b>Test distance 3 meters</b><br><b>Horizontal Polarization</b> |                                                                                                   |
| Date of test:<br><b>06/25/2002</b>                                            |                                                                                                   |
| Operator:<br><b>T. Eberl</b>                                                  |                                                                                                   |
| Test performed:<br><b>automatically</b>                                       |                                                                                                   |
| File name:<br><b>default.emi</b>                                              |                                                                                                   |

|                   |                                     |
|-------------------|-------------------------------------|
| Detector:<br>Peak | List of values:<br>Selected by hand |
|-------------------|-------------------------------------|

| Frequency<br>[MHz] | Reading<br>[dBm] | Correction factor<br>[dB] | Value<br>[dBm] | Limit<br>[dBm] | Limit<br>exceeded |
|--------------------|------------------|---------------------------|----------------|----------------|-------------------|
| 72.550000          | -9.38            | 25.51                     | 16.14          | -27.25         | *                 |

|                       |                              |                     |
|-----------------------|------------------------------|---------------------|
| Result:<br>Limit kept | Project file:<br>55503-20364 | Page 37 of 55 Pages |
|-----------------------|------------------------------|---------------------|

# Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Horizontal Polarization

Date of test:  
06/19/2002

Operator:  
T. Eberl

Test performed:  
automatically

File name:  
default.emi

Comment:

- TX mode f= 72.550 MHz

- EUT in vertical position

Detector:  
Peak

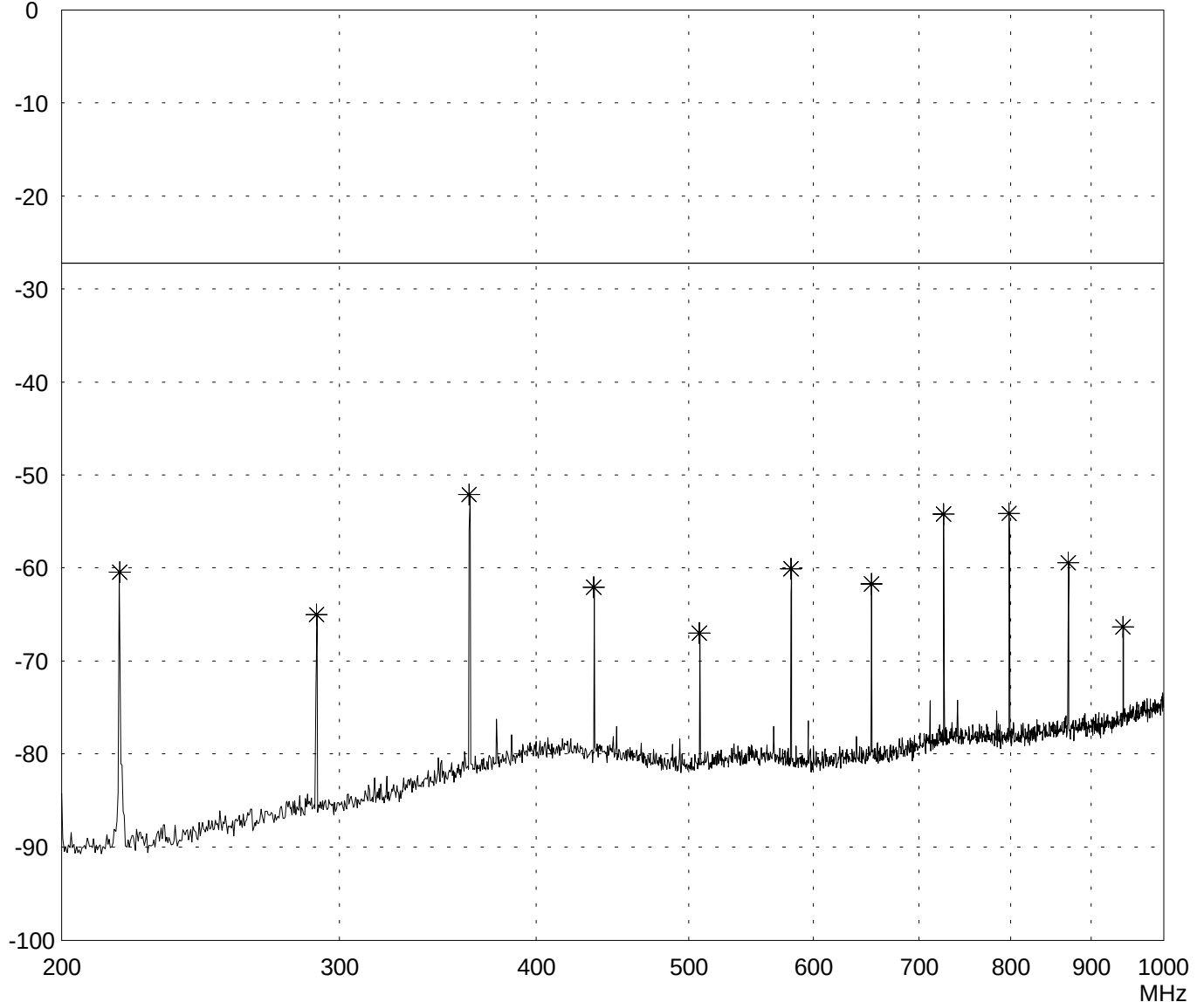
List of values:

Selected by hand

dBm  
0

Limit1: FCC §95.639b3

Transducer: Substitution (H)



Result:  
Limit kept

Project file:  
55503-20364

Page 38 of 55 Pages

# Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Horizontal Polarization

Date of test: 06/19/2002  
Operator: T. Eberl

Test performed: automatically  
File name: default.emi

Comment:

- TX mode f= 72.550 MHz
- EUT in vertical position

Detector:  
Peak

List of values:  
Selected by hand

| <i>Frequency<br/>[MHz]</i> | <i>Reading<br/>[dBm]</i> | <i>Correction factor<br/>[dB]</i> | <i>Value<br/>[dBm]</i> | <i>Limit<br/>[dBm]</i> | <i>Limit<br/>exceeded</i> |
|----------------------------|--------------------------|-----------------------------------|------------------------|------------------------|---------------------------|
| 217.650000                 | -80.83                   | 20.37                             | -60.46                 | -27.25                 |                           |
| 290.200000                 | -89.11                   | 24.06                             | -65.05                 | -27.25                 |                           |
| 362.750000                 | -79.92                   | 27.82                             | -52.10                 | -27.25                 |                           |
| 435.300000                 | -91.64                   | 29.56                             | -62.08                 | -27.25                 |                           |
| 507.850000                 | -95.65                   | 28.61                             | -67.03                 | -27.25                 |                           |
| 580.400000                 | -89.30                   | 29.21                             | -60.09                 | -27.25                 |                           |
| 652.950000                 | -91.50                   | 29.75                             | -61.74                 | -27.25                 |                           |
| 725.500000                 | -85.30                   | 31.07                             | -54.23                 | -27.25                 |                           |
| 798.050000                 | -85.73                   | 31.60                             | -54.13                 | -27.25                 |                           |
| 870.600000                 | -92.10                   | 32.67                             | -59.43                 | -27.25                 |                           |
| 943.150000                 | -100.37                  | 34.03                             | -66.34                 | -27.25                 |                           |

Result:  
Limit kept

Project file:  
55503-20364

Page 39 of 55 Pages

# Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Horizontal Polarization

Date of test:  
06/19/2002

Operator:  
T. Eberl

Test performed:  
automatically

File name:  
default.emi

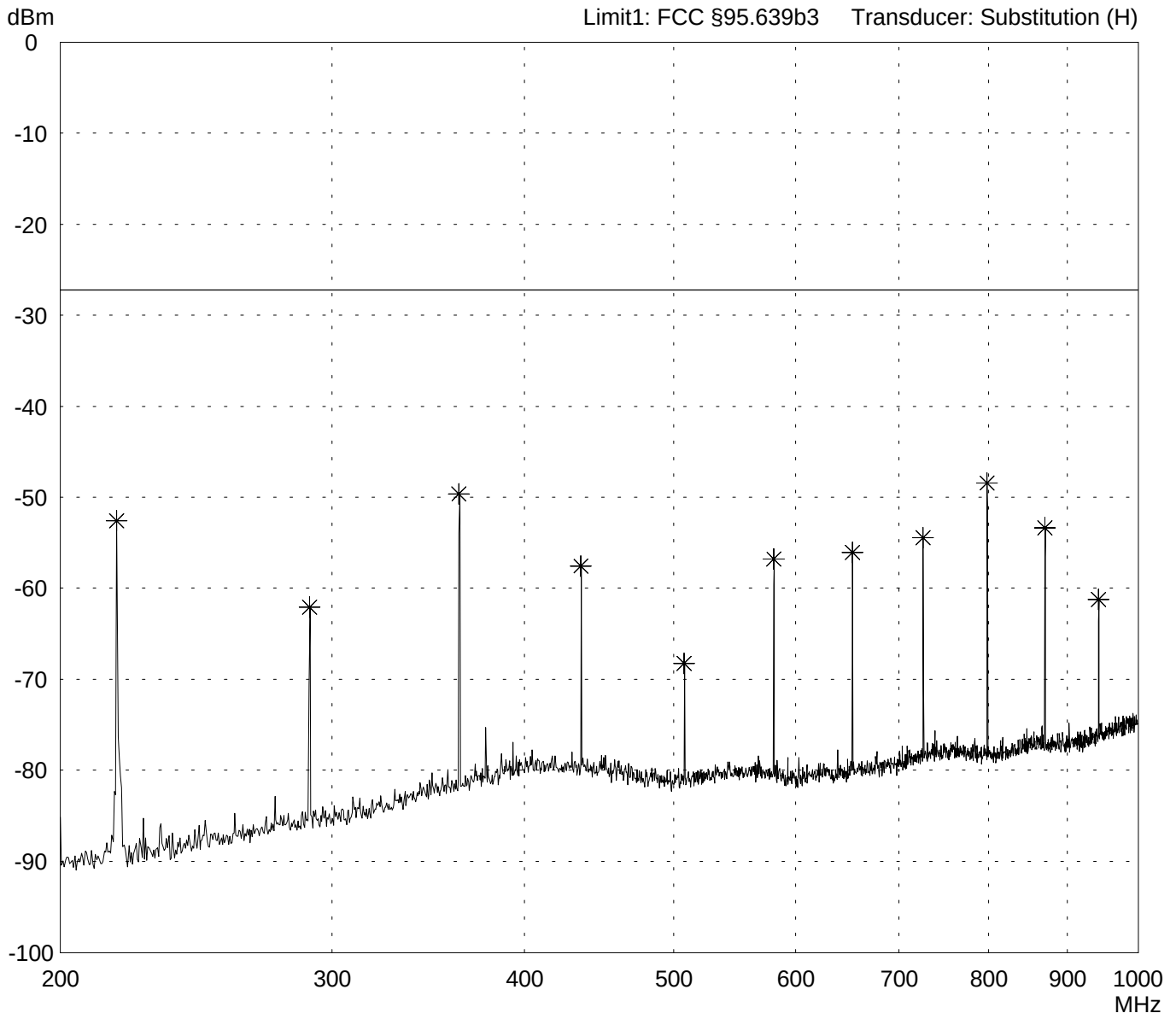
Comment:

- TX mode f= 72.550 MHz

- EUT in horizontal position (rear side on table)

Detector:  
Peak

List of values:  
Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 40 of 55 Pages

|                                                                                |
|--------------------------------------------------------------------------------|
| <p>Radiated Power Test 200 MHz - 1 GHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|--------------------------------------------------------------------------------|

|                                                                 |                                                                                                  |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Model:<br>T4YBF 72 MHz                                          | Comment:<br><br>- TX mode f= 72.550 MHz<br><br>- EUT in horizontal position (rear side on table) |
| Serial no.:<br>001                                              |                                                                                                  |
| Applicant:<br>Futaba Corporation                                |                                                                                                  |
| Test site:<br>Fully anechoic room                               |                                                                                                  |
| Tested on:<br>Test distance 3 meters<br>Horizontal Polarization |                                                                                                  |
| Date of test:<br>06/19/2002                                     |                                                                                                  |
| Test performed:<br>automatically                                | File name:<br>default.emi                                                                        |

|                   |                                     |
|-------------------|-------------------------------------|
| Detector:<br>Peak | List of values:<br>Selected by hand |
|-------------------|-------------------------------------|

| <i>Frequency<br/>[MHz]</i> | <i>Reading<br/>[dBm]</i> | <i>Correction factor<br/>[dB]</i> | <i>Value<br/>[dBm]</i> | <i>Limit<br/>[dBm]</i> | <i>Limit<br/>exceeded</i> |
|----------------------------|--------------------------|-----------------------------------|------------------------|------------------------|---------------------------|
| 217.600000                 | -72.94                   | 20.37                             | -52.58                 | -27.25                 |                           |
| 290.200000                 | -86.11                   | 24.06                             | -62.05                 | -27.25                 |                           |
| 362.750000                 | -77.49                   | 27.82                             | -49.67                 | -27.25                 |                           |
| 435.300000                 | -87.13                   | 29.56                             | -57.57                 | -27.25                 |                           |
| 507.850000                 | -96.88                   | 28.61                             | -68.26                 | -27.25                 |                           |
| 580.400000                 | -85.99                   | 29.21                             | -56.79                 | -27.25                 |                           |
| 652.950000                 | -85.84                   | 29.75                             | -56.08                 | -27.25                 |                           |
| 725.500000                 | -85.49                   | 31.07                             | -54.43                 | -27.25                 |                           |
| 798.050000                 | -80.03                   | 31.60                             | -48.43                 | -27.25                 |                           |
| 870.600000                 | -86.04                   | 32.67                             | -53.37                 | -27.25                 |                           |
| 943.150000                 | -95.26                   | 34.03                             | -61.23                 | -27.25                 |                           |

|                       |                              |                     |
|-----------------------|------------------------------|---------------------|
| Result:<br>Limit kept | Project file:<br>55503-20364 | Page 41 of 55 Pages |
|-----------------------|------------------------------|---------------------|

# Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Horizontal Polarization

Date of test: 06/19/2002  
Operator: T. Eberl

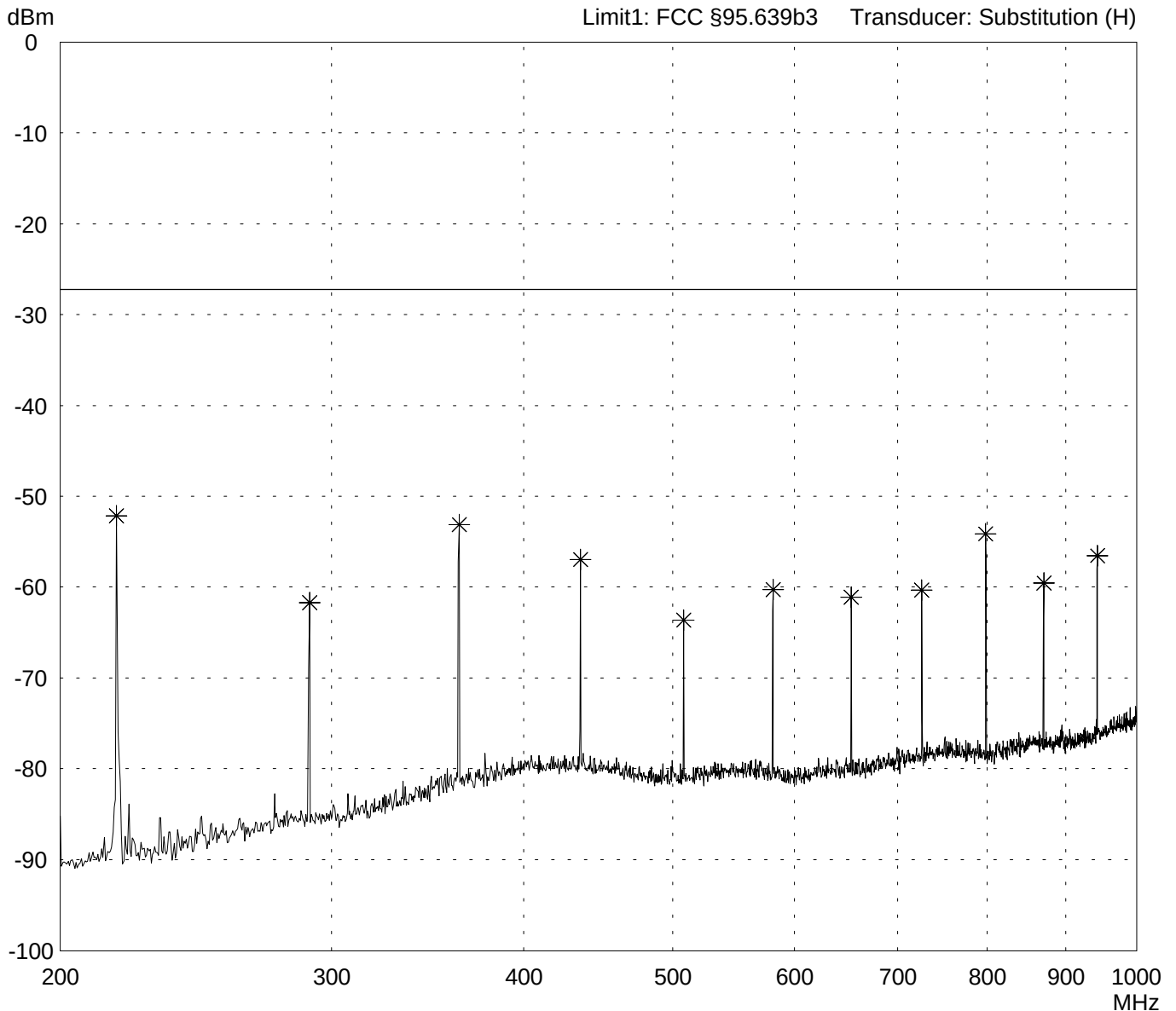
Test performed: automatically  
File name: default.emi

Comment:

- TX mode f= 72.550 MHz
- EUT in horizontal position (right side on table)

Detector:  
Peak

List of values:  
Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 42 of 55 Pages

|                                                                                |
|--------------------------------------------------------------------------------|
| <p>Radiated Power Test 200 MHz - 1 GHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|--------------------------------------------------------------------------------|

|                                                                 |                           |                                                                                                   |
|-----------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------------------|
| Model:<br>T4YBF 72 MHz                                          |                           | Comment:<br><br>- TX mode f= 72.550 MHz<br><br>- EUT in horizontal position (right side on table) |
| Serial no.:<br>001                                              |                           |                                                                                                   |
| Applicant:<br>Futaba Corporation                                |                           |                                                                                                   |
| Test site:<br>Fully anechoic room                               |                           |                                                                                                   |
| Tested on:<br>Test distance 3 meters<br>Horizontal Polarization |                           |                                                                                                   |
| Date of test:<br>06/19/2002                                     | Operator:<br>T. Eberl     |                                                                                                   |
| Test performed:<br>automatically                                | File name:<br>default.emi |                                                                                                   |

|                   |                                     |
|-------------------|-------------------------------------|
| Detector:<br>Peak | List of values:<br>Selected by hand |
|-------------------|-------------------------------------|

[illegible]

|                       |                              |                     |
|-----------------------|------------------------------|---------------------|
| Result:<br>Limit kept | Project file:<br>55503-20364 | Page 43 of 55 Pages |
|-----------------------|------------------------------|---------------------|

# Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Vertical Polarization

Date of test:  
06/25/2002

Operator:  
T. Eberl

Test performed:  
automatically

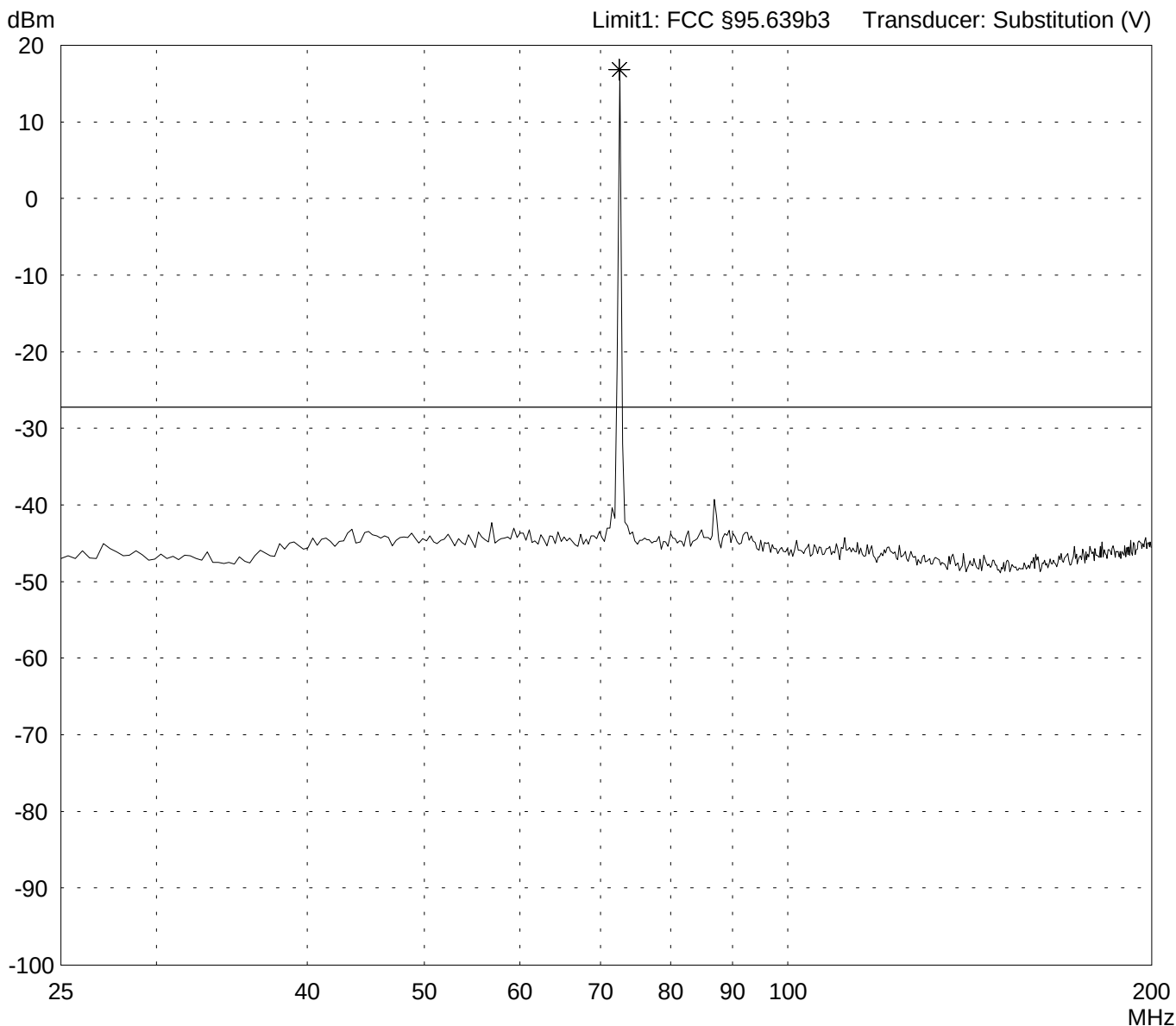
File name:  
default.emi

Comment:

- TX mode f= 72.550 Mhz
- EUT in vertical position

Detector:  
Peak

List of values:  
Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 44 of 55 Pages

|                                                                                 |
|---------------------------------------------------------------------------------|
| <p>Radiated Power Test 25 MHz - 200 MHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|---------------------------------------------------------------------------------|

|                                                               |                           |                                                                           |
|---------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------|
| Model:<br>T4YBF 72 MHz                                        |                           | Comment:<br><br>- TX mode f= 72.550 Mhz<br><br>- EUT in vertical position |
| Serial no.:<br>001                                            |                           |                                                                           |
| Applicant:<br>Futaba Corporation                              |                           |                                                                           |
| Test site:<br>Fully anechoic room                             |                           |                                                                           |
| Tested on:<br>Test distance 3 meters<br>Vertical Polarization |                           |                                                                           |
| Date of test:<br>06/25/2002                                   | Operator:<br>T. Eberl     |                                                                           |
| Test performed:<br>automatically                              | File name:<br>default.emi |                                                                           |

|                   |                                     |
|-------------------|-------------------------------------|
| Detector:<br>Peak | List of values:<br>Selected by hand |
|-------------------|-------------------------------------|

| <i>Frequency<br/>[MHz]</i> | <i>Reading<br/>[dBm]</i> | <i>Correction factor<br/>[dB]</i> | <i>Value<br/>[dBm]</i> | <i>Limit<br/>[dBm]</i> | <i>Limit<br/>exceeded</i> |
|----------------------------|--------------------------|-----------------------------------|------------------------|------------------------|---------------------------|
| 72.550000                  | -7.95                    | 24.74                             | 16.79                  | -27.25                 | *                         |

|                       |                              |                     |
|-----------------------|------------------------------|---------------------|
| Result:<br>Limit kept | Project file:<br>55503-20364 | Page 45 of 55 Pages |
|-----------------------|------------------------------|---------------------|

# Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Vertical Polarization

Date of test:  
06/25/2002

Operator:  
T. Eberl

Test performed:  
automatically

File name:  
default.emi

Comment:

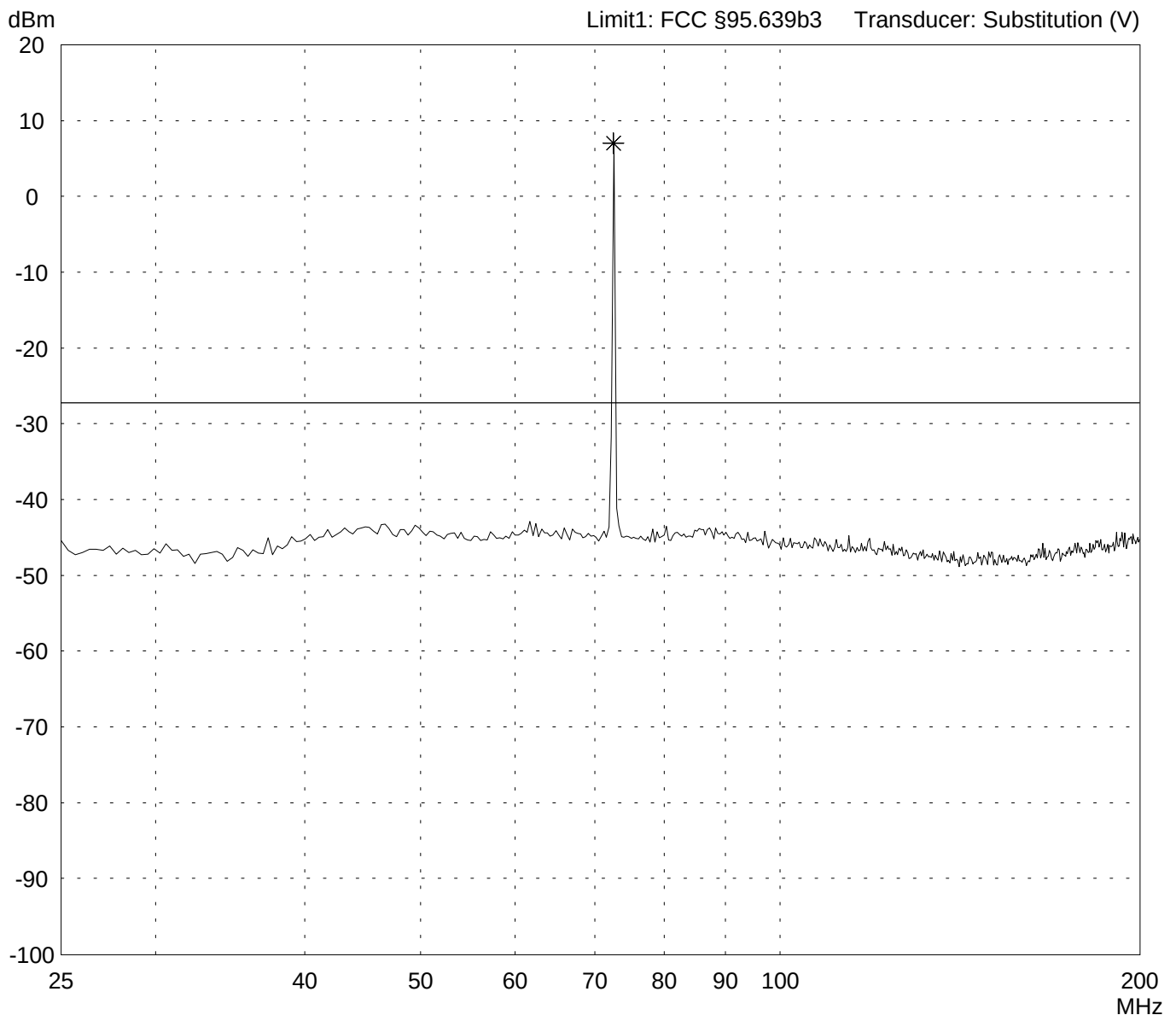
- TX mode f= 72.550 Mhz

- EUT in horizontal position (rear side on table)

Detector:  
Peak

List of values:

Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 46 of 55 Pages

|                                                                                 |
|---------------------------------------------------------------------------------|
| <p>Radiated Power Test 25 MHz - 200 MHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|---------------------------------------------------------------------------------|

|                                                               |                           |                                                                                                  |
|---------------------------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------|
| Model:<br>T4YBF 72 MHz                                        |                           | Comment:<br><br>- TX mode f= 72.550 Mhz<br><br>- EUT in horizontal position (rear side on table) |
| Serial no.:<br>001                                            |                           |                                                                                                  |
| Applicant:<br>Futaba Corporation                              |                           |                                                                                                  |
| Test site:<br>Fully anechoic room                             |                           |                                                                                                  |
| Tested on:<br>Test distance 3 meters<br>Vertical Polarization |                           |                                                                                                  |
| Date of test:<br>06/25/2002                                   | Operator:<br>T. Eberl     |                                                                                                  |
| Test performed:<br>automatically                              | File name:<br>default.emi |                                                                                                  |

|                   |                                     |
|-------------------|-------------------------------------|
| Detector:<br>Peak | List of values:<br>Selected by hand |
|-------------------|-------------------------------------|

| Frequency<br>[MHz] | Reading<br>[dBm] | Correction factor<br>[dB] | Value<br>[dBm] | Limit<br>[dBm] | Limit<br>exceeded |
|--------------------|------------------|---------------------------|----------------|----------------|-------------------|
| 72.550000          | -17.72           | 24.74                     | 7.02           | -27.25         | *                 |

|                       |                              |                     |
|-----------------------|------------------------------|---------------------|
| Result:<br>Limit kept | Project file:<br>55503-20364 | Page 47 of 55 Pages |
|-----------------------|------------------------------|---------------------|

# Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Vertical Polarization

Date of test:  
06/25/2002

Operator:  
T. Eberl

Test performed:  
automatically

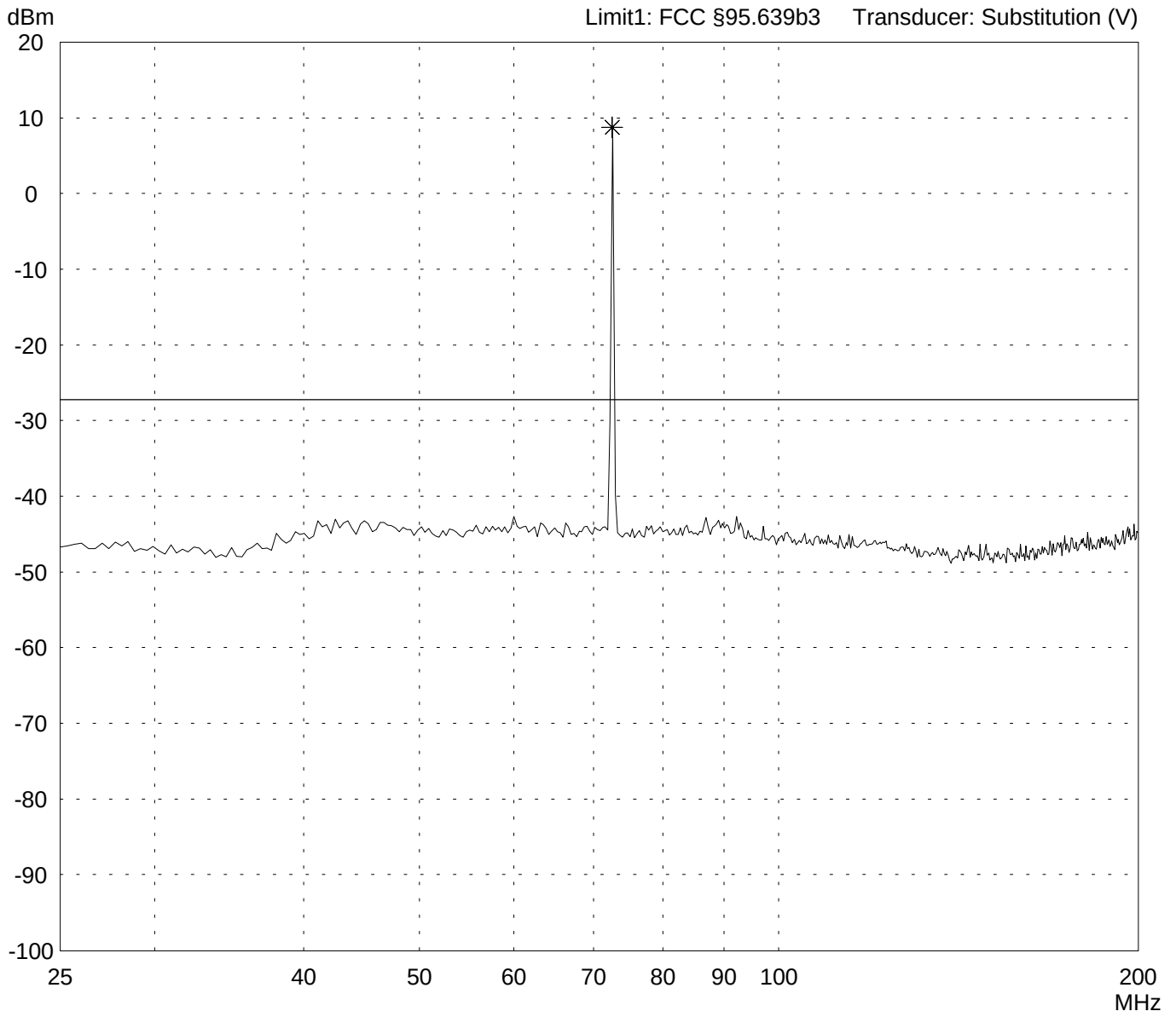
File name:  
default.emi

Comment:

- TX mode f= 72.550 Mhz
- EUT in horizontal position (right side on table)

Detector:  
Peak

List of values:  
Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 48 of 55 Pages

|                                                                                 |
|---------------------------------------------------------------------------------|
| <p>Radiated Power Test 25 MHz - 200 MHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|---------------------------------------------------------------------------------|

|                                                               |                                                                                                   |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Model:<br>T4YBF 72 MHz                                        | Comment:<br><br>- TX mode f= 72.550 Mhz<br><br>- EUT in horizontal position (right side on table) |
| Serial no.:<br>001                                            |                                                                                                   |
| Applicant:<br>Futaba Corporation                              |                                                                                                   |
| Test site:<br>Fully anechoic room                             |                                                                                                   |
| Tested on:<br>Test distance 3 meters<br>Vertical Polarization |                                                                                                   |
| Date of test: 06/25/2002<br>Operator: T. Eberl                |                                                                                                   |
| Test performed: automatically<br>File name: default.emi       |                                                                                                   |

|                   |                                     |
|-------------------|-------------------------------------|
| Detector:<br>Peak | List of values:<br>Selected by hand |
|-------------------|-------------------------------------|

| <i>Frequency<br/>[MHz]</i> | <i>Reading<br/>[dBm]</i> | <i>Correction factor<br/>[dB]</i> | <i>Value<br/>[dBm]</i> | <i>Limit<br/>[dBm]</i> | <i>Limit<br/>exceeded</i> |
|----------------------------|--------------------------|-----------------------------------|------------------------|------------------------|---------------------------|
| 72.550000                  | -16.01                   | 24.74                             | 8.74                   | -27.25                 | *                         |

|                       |                              |                     |
|-----------------------|------------------------------|---------------------|
| Result:<br>Limit kept | Project file:<br>55503-20364 | Page 49 of 55 Pages |
|-----------------------|------------------------------|---------------------|

# Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Vertical Polarization

Date of test: 06/19/2002      Operator: T. Eberl

Test performed: automatically      File name: default.emi

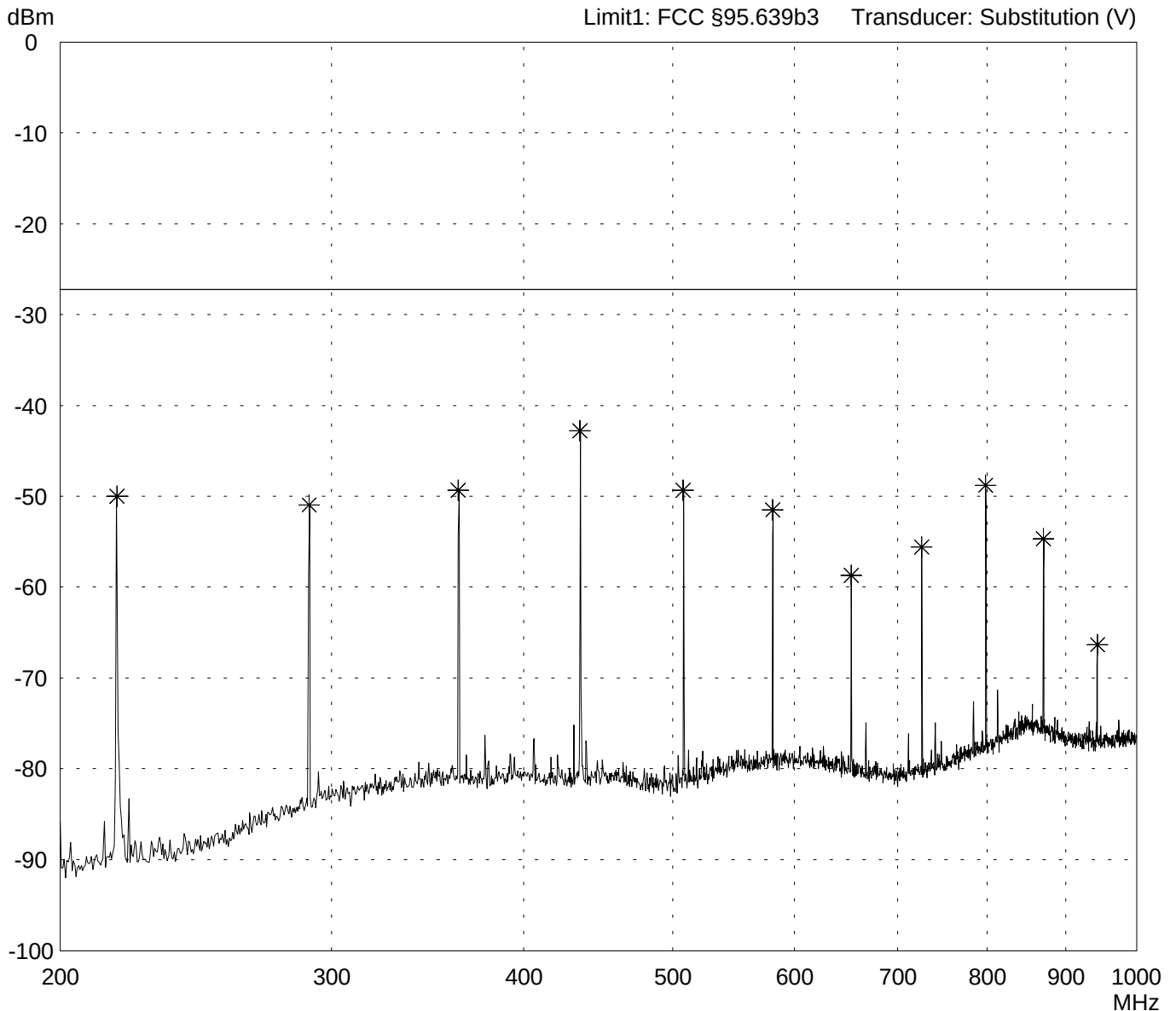
Comment:

- TX mode f= 72.550 MHz

- EUT in vertical position

Detector:  
Peak

List of values:  
Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 50 of 55 Pages

|                                                                                |
|--------------------------------------------------------------------------------|
| <p>Radiated Power Test 200 MHz - 1 GHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|--------------------------------------------------------------------------------|

|                                                                             |                                                                           |                                  |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------|
| Model:<br><b>T4YBF 72 MHz</b>                                               | Comment:<br><br>- TX mode f= 72.550 MHz<br><br>- EUT in vertical position |                                  |
| Serial no.:<br><b>001</b>                                                   |                                                                           |                                  |
| Applicant:<br><b>Futaba Corporation</b>                                     |                                                                           |                                  |
| Test site:<br><b>Fully anechoic room</b>                                    |                                                                           |                                  |
| Tested on:<br><b>Test distance 3 meters</b><br><b>Vertical Polarization</b> |                                                                           |                                  |
| Date of test:<br><b>06/19/2002</b>                                          |                                                                           | Operator:<br><b>T. Eberl</b>     |
| Test performed:<br><b>automatically</b>                                     |                                                                           | File name:<br><b>default.emi</b> |

|                   |                                     |
|-------------------|-------------------------------------|
| Detector:<br>Peak | List of values:<br>Selected by hand |
|-------------------|-------------------------------------|

| <i>Frequency<br/>[MHz]</i> | <i>Reading<br/>[dBm]</i> | <i>Correction factor<br/>[dB]</i> | <i>Value<br/>[dBm]</i> | <i>Limit<br/>[dBm]</i> | <i>Limit<br/>exceeded</i> |
|----------------------------|--------------------------|-----------------------------------|------------------------|------------------------|---------------------------|
| 217.650000                 | -69.87                   | 19.84                             | -50.02                 | -27.25                 |                           |
| 290.200000                 | -76.72                   | 25.78                             | -50.94                 | -27.25                 |                           |
| 362.750000                 | -77.60                   | 28.24                             | -49.36                 | -27.25                 |                           |
| 435.300000                 | -70.88                   | 28.11                             | -42.77                 | -27.25                 |                           |
| 507.850000                 | -77.46                   | 28.12                             | -49.33                 | -27.25                 |                           |
| 580.400000                 | -82.19                   | 30.67                             | -51.52                 | -27.25                 |                           |
| 652.950000                 | -88.68                   | 29.94                             | -58.74                 | -27.25                 |                           |
| 725.500000                 | -85.10                   | 29.52                             | -55.58                 | -27.25                 |                           |
| 798.050000                 | -81.22                   | 32.41                             | -48.82                 | -27.25                 |                           |
| 870.600000                 | -88.86                   | 34.17                             | -54.69                 | -27.25                 |                           |
| 943.600000                 | -99.58                   | 33.21                             | -66.37                 | -27.25                 |                           |

|                       |                              |                     |
|-----------------------|------------------------------|---------------------|
| Result:<br>Limit kept | Project file:<br>55503-20364 | Page 51 of 55 Pages |
|-----------------------|------------------------------|---------------------|

# Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Vertical Polarization

Date of test: 06/19/2002  
Operator: T. Eberl

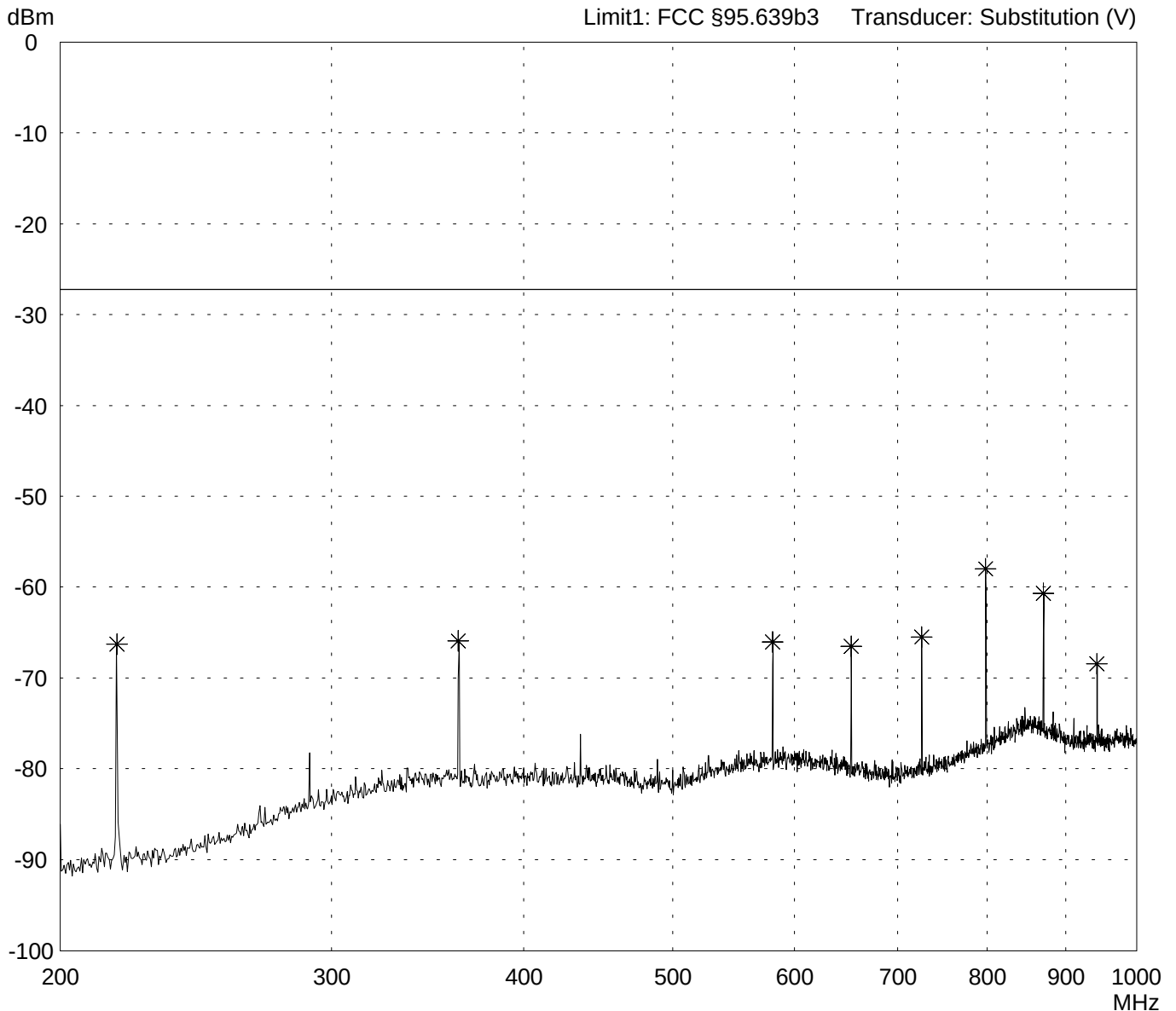
Test performed: automatically  
File name: default.emi

Comment:

- TX mode f= 72.550 MHz
- EUT in horizontal position (rear side on table)

Detector:  
Peak

List of values:  
Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 52 of 55 Pages

|                                                                                |
|--------------------------------------------------------------------------------|
| <p>Radiated Power Test 200 MHz - 1 GHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|--------------------------------------------------------------------------------|

|                                                               |                           |                                                                                                  |
|---------------------------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------|
| Model:<br>T4YBF 72 MHz                                        |                           | Comment:<br><br>- TX mode f= 72.550 MHz<br><br>- EUT in horizontal position (rear side on table) |
| Serial no.:<br>001                                            |                           |                                                                                                  |
| Applicant:<br>Futaba Corporation                              |                           |                                                                                                  |
| Test site:<br>Fully anechoic room                             |                           |                                                                                                  |
| Tested on:<br>Test distance 3 meters<br>Vertical Polarization |                           |                                                                                                  |
| Date of test:<br>06/19/2002                                   | Operator:<br>T. Eberl     |                                                                                                  |
| Test performed:<br>automatically                              | File name:<br>default.emi |                                                                                                  |

|                   |                                     |
|-------------------|-------------------------------------|
| Detector:<br>Peak | List of values:<br>Selected by hand |
|-------------------|-------------------------------------|

[illegible]

|                       |                              |                     |
|-----------------------|------------------------------|---------------------|
| Result:<br>Limit kept | Project file:<br>55503-20364 | Page 53 of 55 Pages |
|-----------------------|------------------------------|---------------------|

# Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 95 Subpart C/E

Model:  
T4YBF 72 MHz

Serial no.:  
001

Applicant:  
Futaba Corporation

Test site:  
Fully anechoic room

Tested on:  
Test distance 3 meters  
Vertical Polarization

Date of test: 06/19/2002  
Operator: T. Eberl

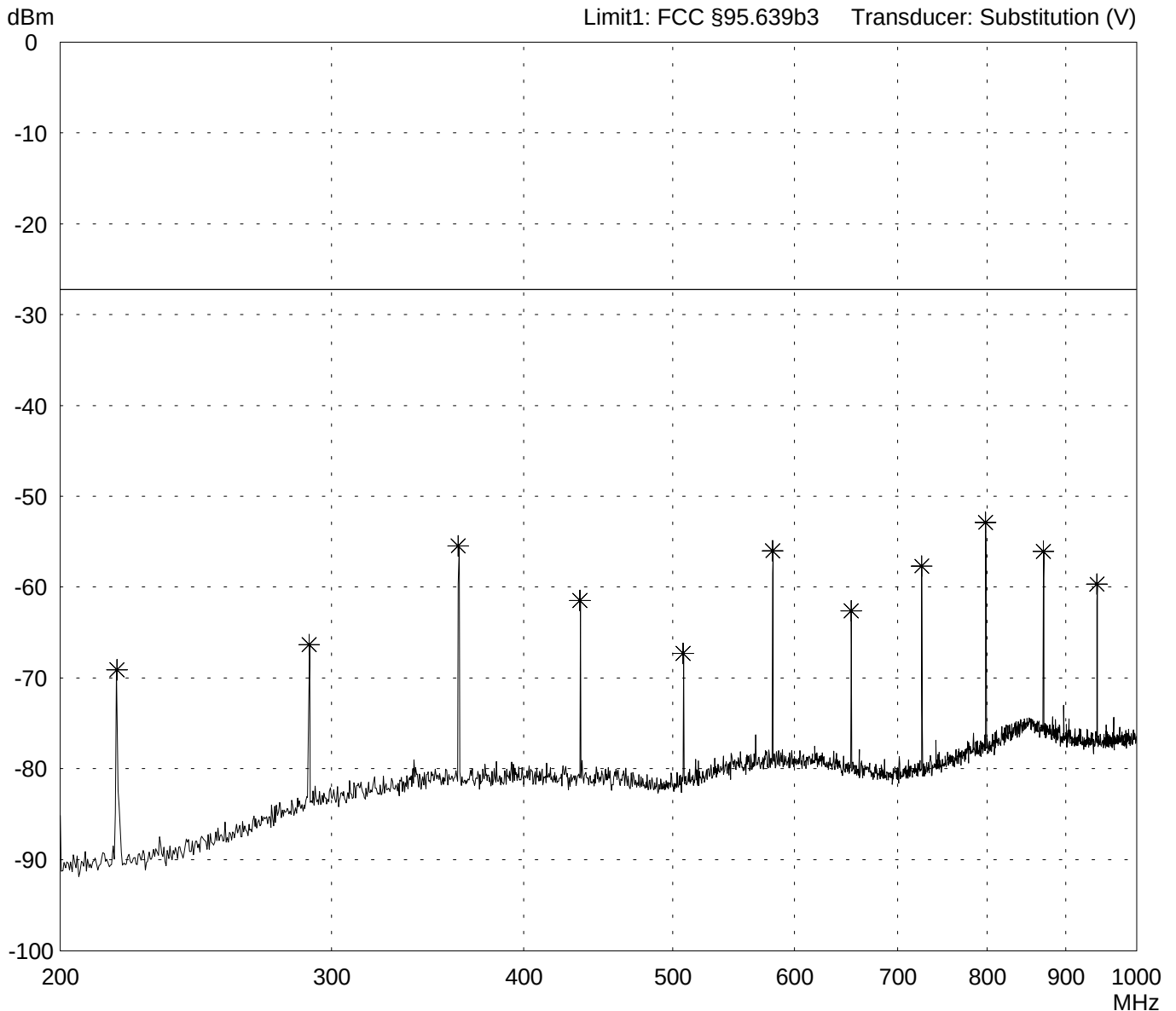
Test performed: automatically  
File name: default.emi

Comment:

- TX mode f= 72.550 MHz
- EUT in horizontal position (right side on table)

Detector:  
Peak

List of values:  
Selected by hand



Result:  
Limit kept

Project file:  
55503-20364

Page 54 of 55 Pages

|                                                                                |
|--------------------------------------------------------------------------------|
| <p>Radiated Power Test 200 MHz - 1 GHz<br/>acc. to FCC Part 95 Subpart C/E</p> |
|--------------------------------------------------------------------------------|

|                                                               |                           |                                                                                                   |
|---------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------------------|
| Model:<br>T4YBF 72 MHz                                        |                           | Comment:<br><br>- TX mode f= 72.550 MHz<br><br>- EUT in horizontal position (right side on table) |
| Serial no.:<br>001                                            |                           |                                                                                                   |
| Applicant:<br>Futaba Corporation                              |                           |                                                                                                   |
| Test site:<br>Fully anechoic room                             |                           |                                                                                                   |
| Tested on:<br>Test distance 3 meters<br>Vertical Polarization |                           |                                                                                                   |
| Date of test:<br>06/19/2002                                   | Operator:<br>T. Eberl     |                                                                                                   |
| Test performed:<br>automatically                              | File name:<br>default.emi |                                                                                                   |

|                   |                                     |
|-------------------|-------------------------------------|
| Detector:<br>Peak | List of values:<br>Selected by hand |
|-------------------|-------------------------------------|

| <i>Frequency<br/>[MHz]</i> | <i>Reading<br/>[dBm]</i> | <i>Correction factor<br/>[dB]</i> | <i>Value<br/>[dBm]</i> | <i>Limit<br/>[dBm]</i> | <i>Limit<br/>exceeded</i> |
|----------------------------|--------------------------|-----------------------------------|------------------------|------------------------|---------------------------|
| 217.650000                 | -88.97                   | 19.84                             | -69.13                 | -27.25                 |                           |
| 290.200000                 | -92.11                   | 25.78                             | -66.33                 | -27.25                 |                           |
| 362.750000                 | -83.69                   | 28.24                             | -55.45                 | -27.25                 |                           |
| 435.300000                 | -89.60                   | 28.11                             | -61.49                 | -27.25                 |                           |
| 507.850000                 | -95.44                   | 28.12                             | -67.32                 | -27.25                 |                           |
| 580.400000                 | -86.67                   | 30.67                             | -56.00                 | -27.25                 |                           |
| 652.950000                 | -92.58                   | 29.94                             | -62.64                 | -27.25                 |                           |
| 725.500000                 | -87.21                   | 29.52                             | -57.69                 | -27.25                 |                           |
| 798.050000                 | -85.29                   | 32.41                             | -52.89                 | -27.25                 |                           |
| 870.600000                 | -90.26                   | 34.17                             | -56.09                 | -27.25                 |                           |
| 943.150000                 | -92.86                   | 33.21                             | -59.65                 | -27.25                 |                           |

|                       |                              |                     |
|-----------------------|------------------------------|---------------------|
| Result:<br>Limit kept | Project file:<br>55503-20364 | Page 55 of 55 Pages |
|-----------------------|------------------------------|---------------------|