

Straubing, February 28, 2001

TEST - REPORT

No. 55503-00742-1

for

T2PG75MHz

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

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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1. Administrative Data

Equipment Under Test (EUT): T2PG75MHz
Serial number(s): Sample 2000.12.14
Type of equipment: R/C Transmitter
Type of emission: A1D
Parts/accessories: ---
FCC-ID: AZPT2PG-75

Applicant: Futaba Corporation
(full address) R/C Engineering Unit 1
1080, Yabutsuka Chosei-mura
Chosei-gun, Chiba-ken
299-4395 Japan
Contract identification: ---
Contact person: Mr. Nobumitsu Kanetsuna
Manufacturer: Futaba Corporation

Receipt of EUT: December 19, 2000
Dates of test: January 8 to 16, 2001
February 19, 2001
Note: ---

Responsible for testing: Rainer Heller
Responsible for test report: Rainer Heller

2. Identification of Test Laboratory

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

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

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

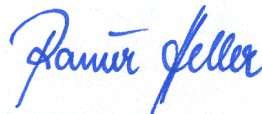
and

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

of the Federal Communication Commission (FCC).



Johann Roidt
Technical Manager



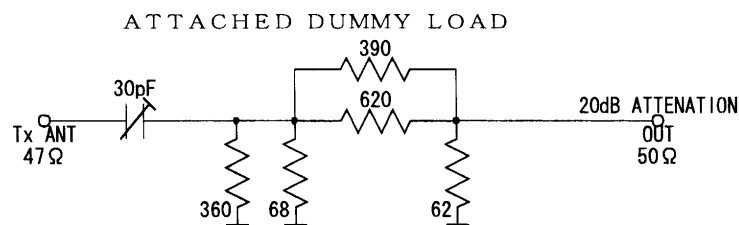
Rainer Heller
Test Engineer

4. Operation Mode of EUT

- transmitting continuously¹
- with battery supply nominal 12.0 V DC (8 x 1.5 AA cel)²
- antenna extended to maximum³

- operating with $f = 75.590$ 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.



Attach a resistor 4.7KOHM between No.18 and No.19 of FP2108T.

¹ Modulation as indicated on appropriate test record

² For conducted measurements replaced by external DC supply

³ 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

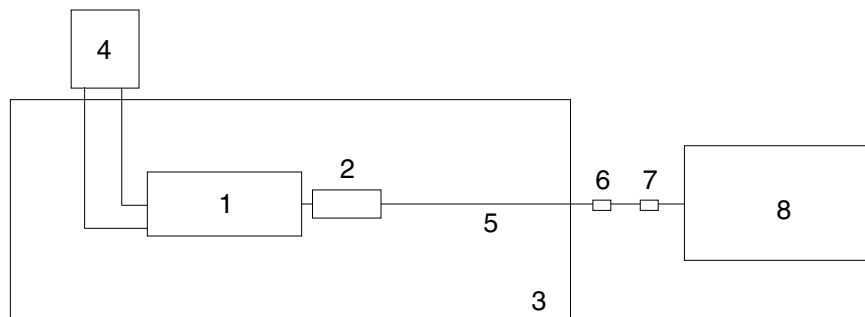


Figure 1: Measurement setup for testing on antenna connector

- | | |
|---------------------|---------------------|
| 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

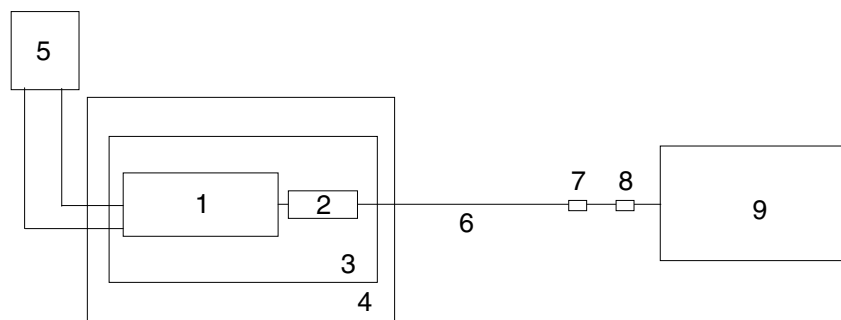


Figure 2: Measurement setup for testing within temperature test chamber

- | | |
|----------------------------|---------------------|
| 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. Preliminary 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. For final testing an open-area test-site was used. 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

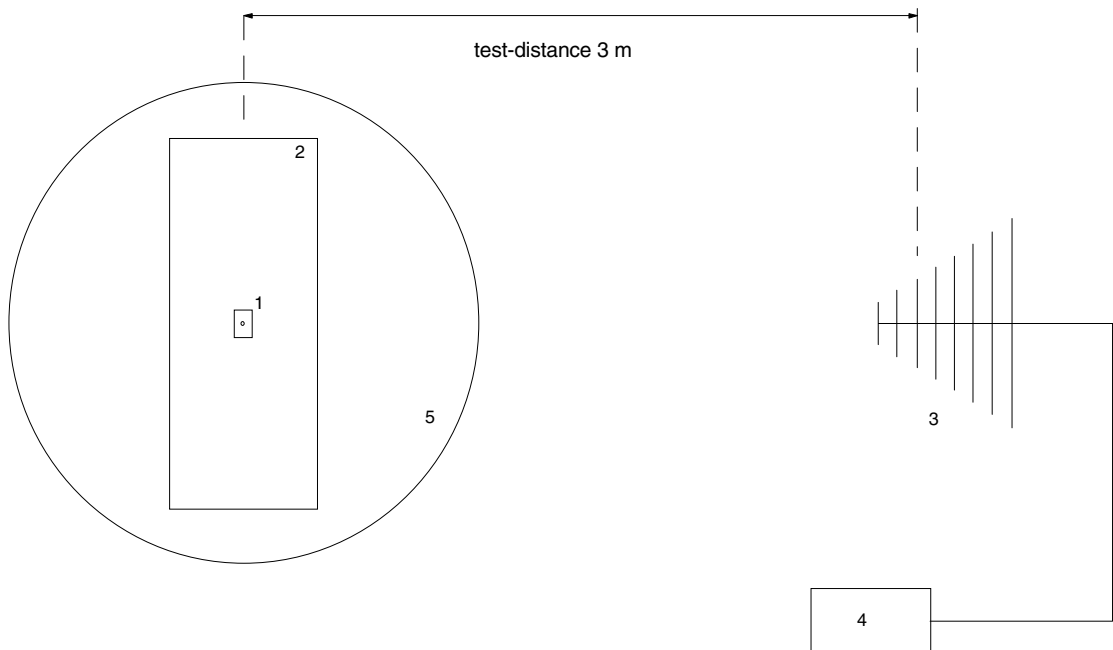


Figure 3: Measurement setup for radiated emission test

- 1 Transmitter (EUT)
- 2 Wooden table

- 3 Measurement antenna
- 4 Test receiver
- 5 Turn table

7. 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 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

8. 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

9. List of Measurements

CFR 47 Part 95 Subpart C / E CFR 47 Part 2 Subpart J			
Section(s):	Test	Page	Result
§95.639	Maximum transmitter power	20 - 27	Passed
§95.623	Frequency tolerance	28 - 49	Passed
§95.633	Emission bandwidth	50 - 51	Passed
§95.635	Unwanted radiation 30 MHz - 1 GHz	52 - 53	Passed

10. Test Results

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

EUT: T2PG75MHz
Serial number: Sample 2000.12.14
Applicant: Futaba Corporation
Mode: - transmitting continuously (TX mode)
- operating with f = 75.590 MHz
Date of test: January 15, 2001
Operator: Rainer Heller

Test conditions:

Temperature: +20°C
Nominal supply voltage: 12.0 V DC

Specifications:

Voltage range: ±15 % of nominal supply voltage

Supply voltage (V)	Modulation	Transmitter power (dBm)	Transmitter power (W)	Limit (W)
9.00	off	21.34	0.136	0.750
12.00	off	24.82	0.303	0.750
13.80	off	25.78	0.378	0.750
9.00	on	21.72	0.149	0.750
12.00	on	24.85	0.305	0.750
13.80	on	25.71	0.372	0.750

Result: Test passed

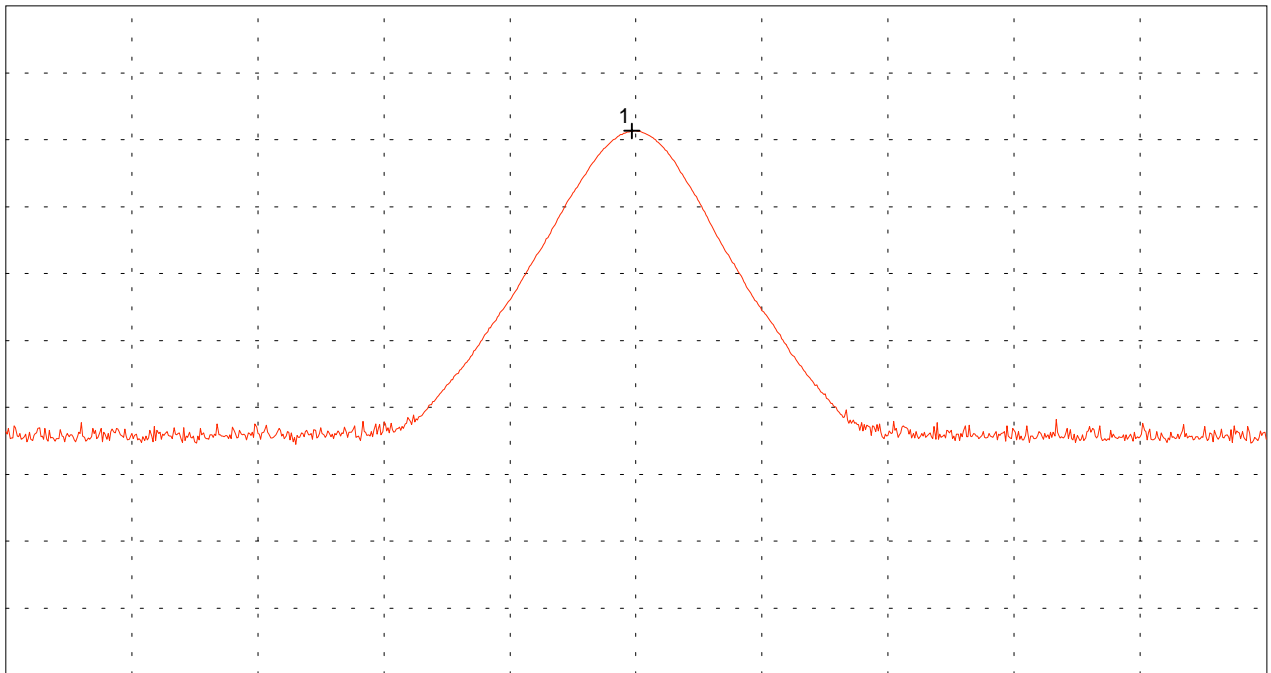
Maximum Transmitter Power acc. to FCC Part 95 Subpart C/E, §95.693

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with $f = 75.590$ MHz Tested on antenna connector via dummy load Temperature: +20°C Supply voltage: 9.00 V DC
Serial No.: Sample 2000.12.14	
Applicant: Futaba Corporation	

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 74.590 MHz
RBW 100 kHz

VBW 100 kHz

Stop 76.590 MHz
SWP 20 ms

Multi Marker List

No.	Freq.	Power
No. 1	75.583333 MHz	21.34 dBm

Tested by:
Rainer Heller

Date:
55503-00742-1

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01/15/2001

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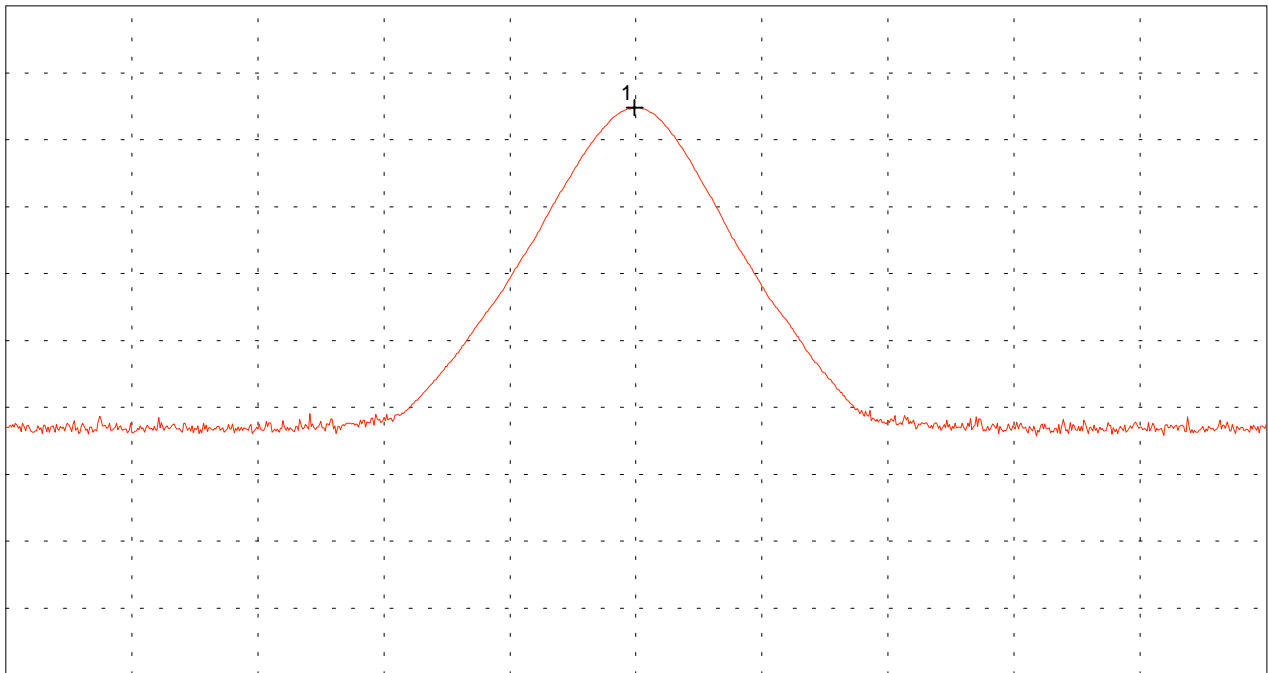
Maximum Transmitter Power acc. to FCC Part 95 Subpart C/E, §95.693

<p>Model: T2PG75MHz</p> <hr/> <p>Serial No.: Sample 2000.12.14</p> <hr/> <p>Applicant: Futaba Corporation</p> <hr/> <hr/> <hr/> <hr/>	<p>Mode:</p> <ul style="list-style-type: none"> - transmitting continuously (TX mode) - without modulation <p>- operating with f = 75.590 MHz</p> <p>Tested on antenna connector via dummy load</p> <p>Temperature: +20°C Supply voltage: 12.00 V DC</p>
---	--

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 74.590 MHz
RBW 100 kHz

VBW 100 kHz

Stop 76.590 MHz
SWP 20 ms

Multi Marker List

No. 1	75.587778 MHz	24.82 dBm
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Tested by:
Rainer Heller

Date:
55503-00742-1

Project-No.:
01/15/2001

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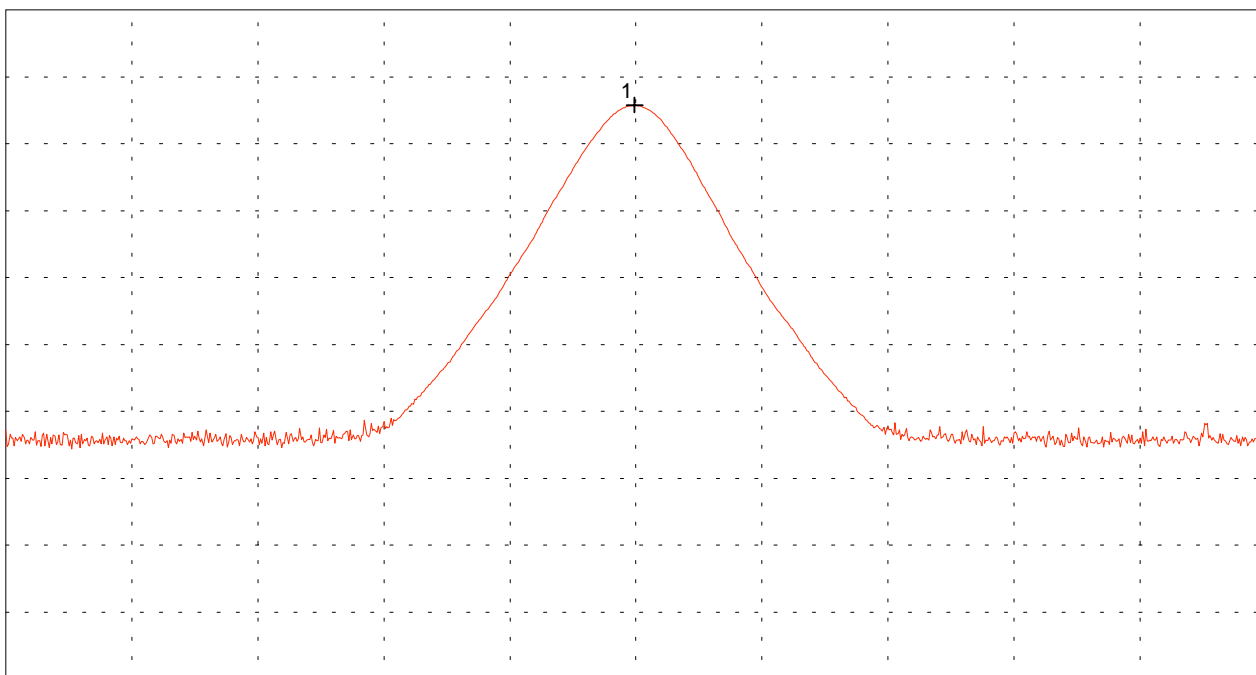
Maximum Transmitter Power acc. to FCC Part 95 Subpart C/E, §95.693

Model: T2PG75MHz	Mode:
Serial No.: Sample 2000.12.14	- transmitting continuously (TX mode) - without modulation
Applicant: Futaba Corporation	- operating with f = 75.590 MHz
	Tested on antenna connector via dummy load
	Temperature: +20°C Supply voltage: 13.80 V DC

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 74.590 MHz
RBW 100 kHz

VBW 100 kHz

Stop 76.590 MHz
SWP 20 ms

Multi Marker List

No.	Frequency	Power
No. 1	75.587778 MHz	25.78 dBm

Tested by:
Rainer Heller

Date:
55503-00742-1

Project-No.:
01/15/2001

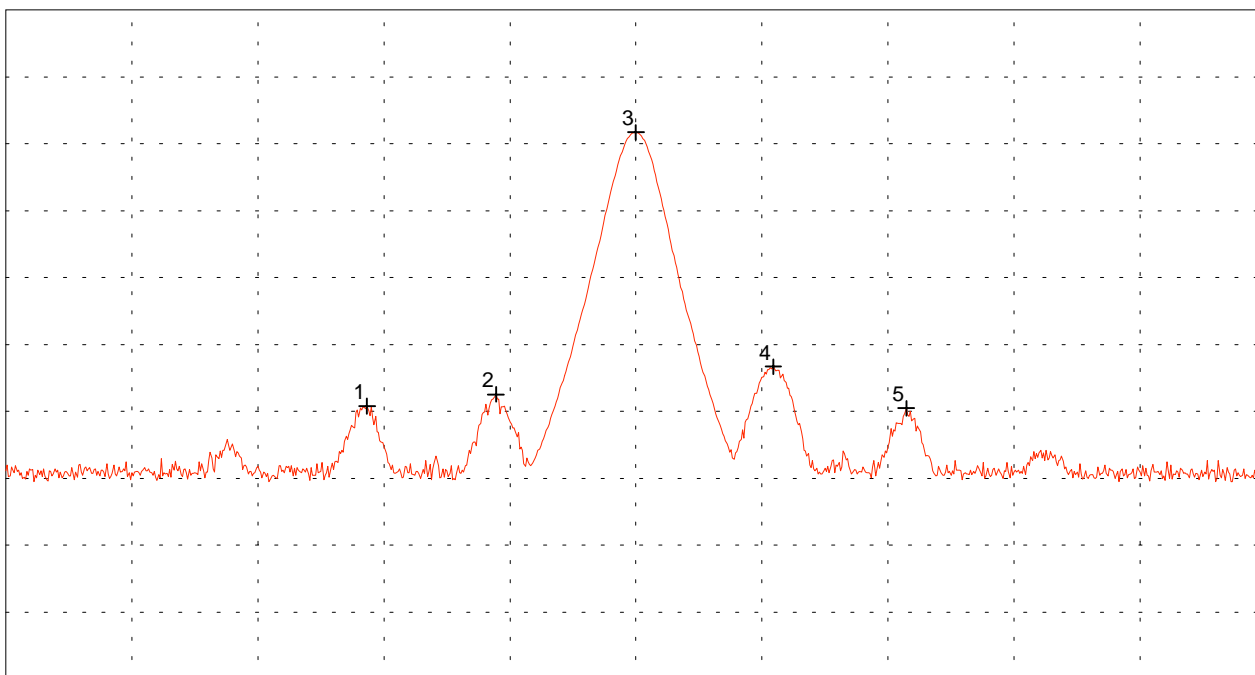
Maximum Transmitter Power acc. to FCC Part 95 Subpart C/E, §95.693

<p>Model: T2PG75MHz</p> <p>Serial No.: Sample 2000.12.14</p> <p>Applicant: Futaba Corporation</p>	<p>Mode:</p> <ul style="list-style-type: none"> - transmitting continuously (TX mode) - with modulation <p>- operating with f = 75.590 MHz</p> <p>Tested on antenna connector via dummy load</p> <p>Temperature: +20°C Supply voltage: 9.00 V DC</p>
---	--

Ref.Level 40 dBm
10 dB/Div.

ATT 20 dB

Ref. Offset 40.5 dB



Start 73.090 MHz
RBW 100 kHz

VBW 100 kHz

Stop 78.090 MHz
SWP 20 ms

Multi Marker List

No. 1	74.523333 MHz	-19.21 dBm
No. 2	75.034444 MHz	-17.46 dBm
No. 3	75.590000 MHz	21.72 dBm
No. 4	76.134444 MHz	-13.32 dBm
No. 5	76.662222 MHz	-19.54 dBm

Tested by:
Rainer Heller

Date:
55503-00742-1

Project-No.:
01/15/2001

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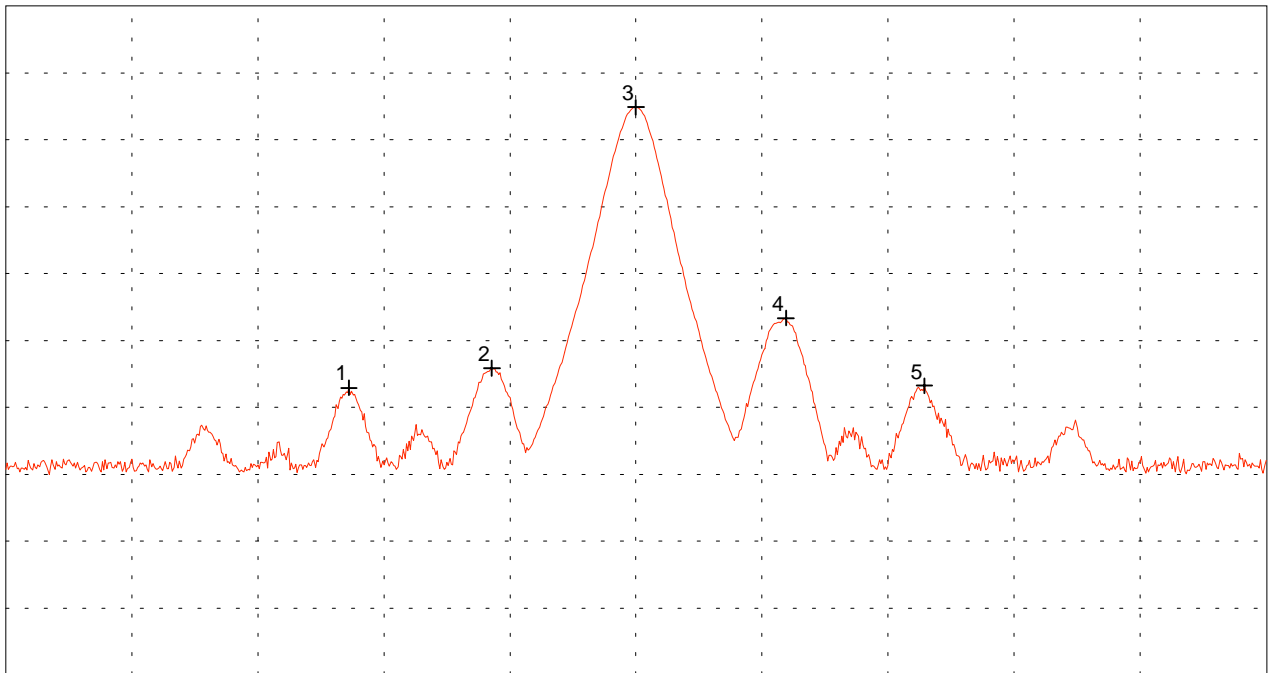
Maximum Transmitter Power acc. to FCC Part 95 Subpart C/E, §95.693

<p>Model: T2PG75MHz</p> <hr/> <p>Serial No.: Sample 2000.12.14</p> <hr/> <p>Applicant: Futaba Corporation</p> <hr/> <hr/> <hr/> <hr/>	<p>Mode:</p> <ul style="list-style-type: none"> - transmitting continuously (TX mode) - with modulation <p>- operating with f = 75.590 MHz</p> <p>Tested on antenna connector via dummy load</p> <p>Temperature: +20°C Supply voltage: 12.00 V DC</p>
---	---

Ref.Level 40 dBm
10 dB/Div.

ATT 20 dB

Ref. Offset 40.5 dB



Start 73.090 MHz
RBW 100 kHz

VBW 100 kHz

Stop 78.090 MHz
SWP 20 ms

Multi Marker List

No. 1	74.451111 MHz	-17.08 dBm
No. 2	75.017778 MHz	-14.16 dBm
No. 3	75.590000 MHz	24.85 dBm
No. 4	76.184444 MHz	-6.64 dBm
No. 5	76.734444 MHz	-16.78 dBm

<p>Tested by: Rainer Heller</p>
<p>Date: 55503-00742-1</p>

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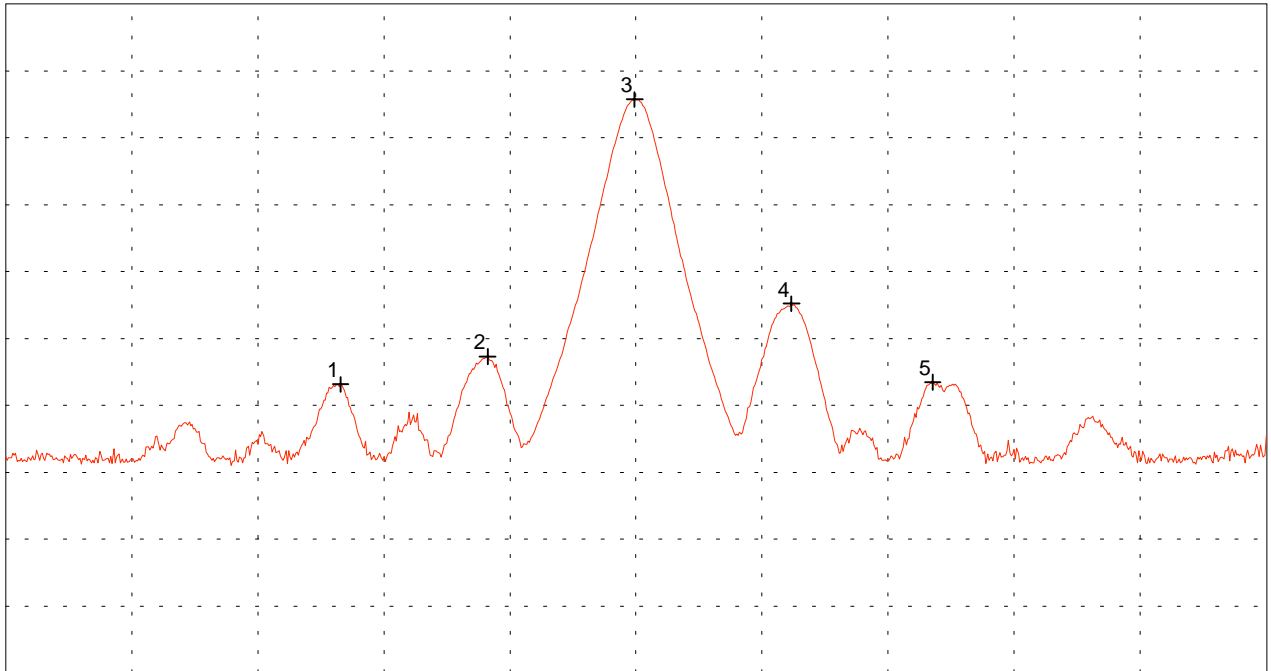
Maximum Transmitter Power acc. to FCC Part 95 Subpart C/E, §95.693

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - with modulation
Serial No.: Sample 2000.12.14	- operating with f = 75.590 MHz
Applicant: Futaba Corporation	Tested on antenna connector via dummy load
	Temperature: +20°C Supply voltage: 13.80 V DC

Ref.Level 40 dBm
10 dB/Div.

ATT 20 dB

Ref. Offset 40.5 dB



Start 73.090 MHz
RBW 100 kHz

VBW 100 kHz

Stop 78.090 MHz
SWP 20 ms

Multi Marker List

No. 1	74.417778 MHz	-16.88 dBm
No. 2	75.001111 MHz	-12.71 dBm
No. 3	75.584444 MHz	25.71 dBm
No. 4	76.206667 MHz	-4.81 dBm
No. 5	76.767778 MHz	-16.55 dBm

Tested by: Rainer Heller	Project-No.: 01/15/2001
Date: 55503-00742-1	Page 26 of 70 Pages

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

EUT: T2PG75MHz
Serial number: Sample 2000.12.14
Applicant: Futaba Corporation
Mode: - transmitting continuously (TX mode)
- with modulation
- with supply voltage 12 V DC
- antenna extended to maximum
- operating with $f = 75.590$ MHz
Date of test: February 19, 2001
Operator: Rainer Heller

Test conditions:

Temperature: +20°C
Voltage supply: Fully charged batteries (12.0 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 57.

Position of EUT	Frequency (MHz)	Polarization	Reading value (dB μ V)	Correction factor (dB)	ERP (dBm)	Limit (dBm)
vertical, antenna to top	75.590	vertical	109.6	-88.4	21.2	28.8
horizontal, antenna to right hand side	75.590	horizontal	105.9	-85.7	20.2	28.8
horizontal, back side on table	75.590	horizontal	104.8	-85.7	19.1	28.8

Result: Test passed

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

EUT: T2PG75MHz
Serial number: Sample 2000.12.14
Applicant: Futaba Corporation
Mode: - transmitting continuously (TX mode)
- without modulation
- operating with $f = 75.590$ MHz
Date of test: January 15, 2001
Operator: Rainer Heller

Test conditions:

Temperature: see table below
Supply voltage: 12.0 V DC

Specifications:

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

Temperature (°C)	Nominal carrier frequency (MHz)	Frequency measured (MHz)	Frequency deviation (Hz)	Frequency deviation (%)	Limit (%)
-30	75.590000	75.588787	-1213	-0.001605	0.002
-20	75.590000	75.589328	-672	-0.000889	0.002
-10	75.590000	75.589595	-405	-0.000536	0.002
±0	75.590000	75.589793	-207	-0.000274	0.002
+10	75.590000	75.589880	-120	-0.000159	0.002
+20	75.590000	75.589906	-94	-0.000124	0.002
+30	75.590000	75.589886	-114	-0.000151	0.002
+40	75.590000	75.589880	-120	-0.000159	0.002
+50	75.590000	75.589953	-47	-0.000062	0.002

Result: Test passed

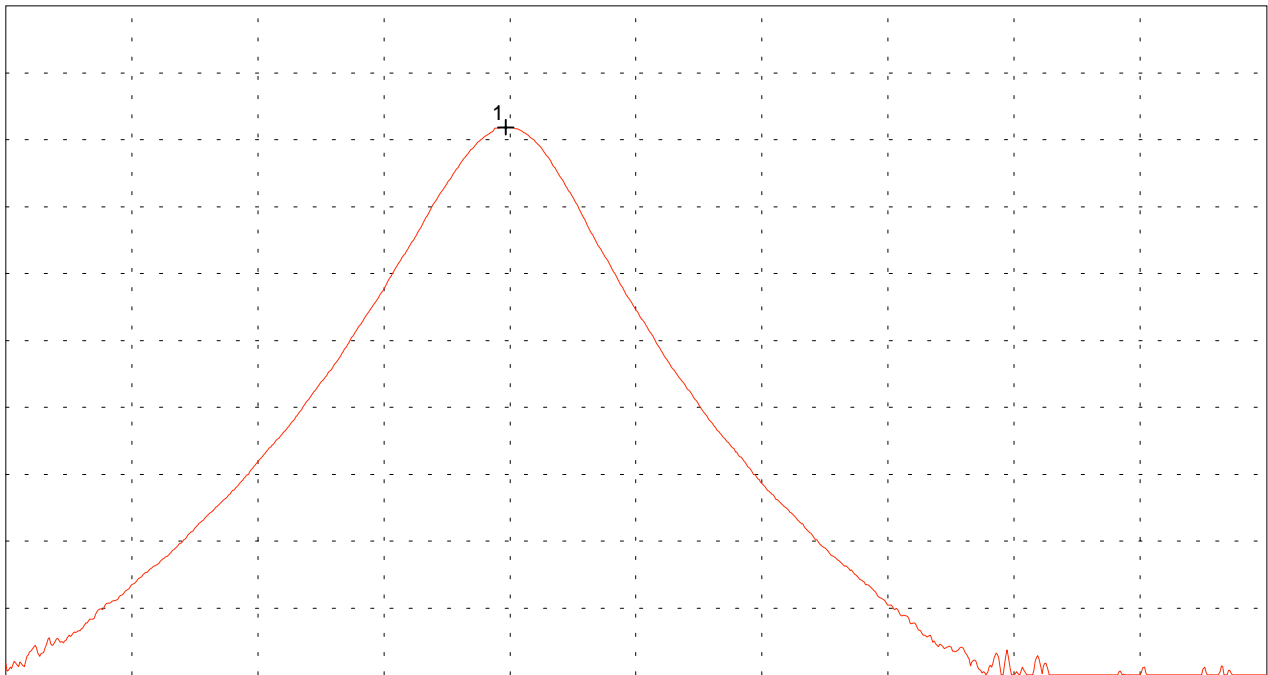
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with f = 75.590 MHz
Serial No.: Sample 2000.12.14	Tested on antenna connector via dummy load Temperature: -30°C Supply voltage: 12.00 V DC Note: Frequency count activated
Applicant: Futaba Corporation	

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.588 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.590 MHz
SWP 1.50 s

Multi Marker List		
No. 1	75.588787 MHz	21.87 dBm

Tested by: Rainer Heller
Date: 01/15/2001

Project-No.: 55503-00742-1
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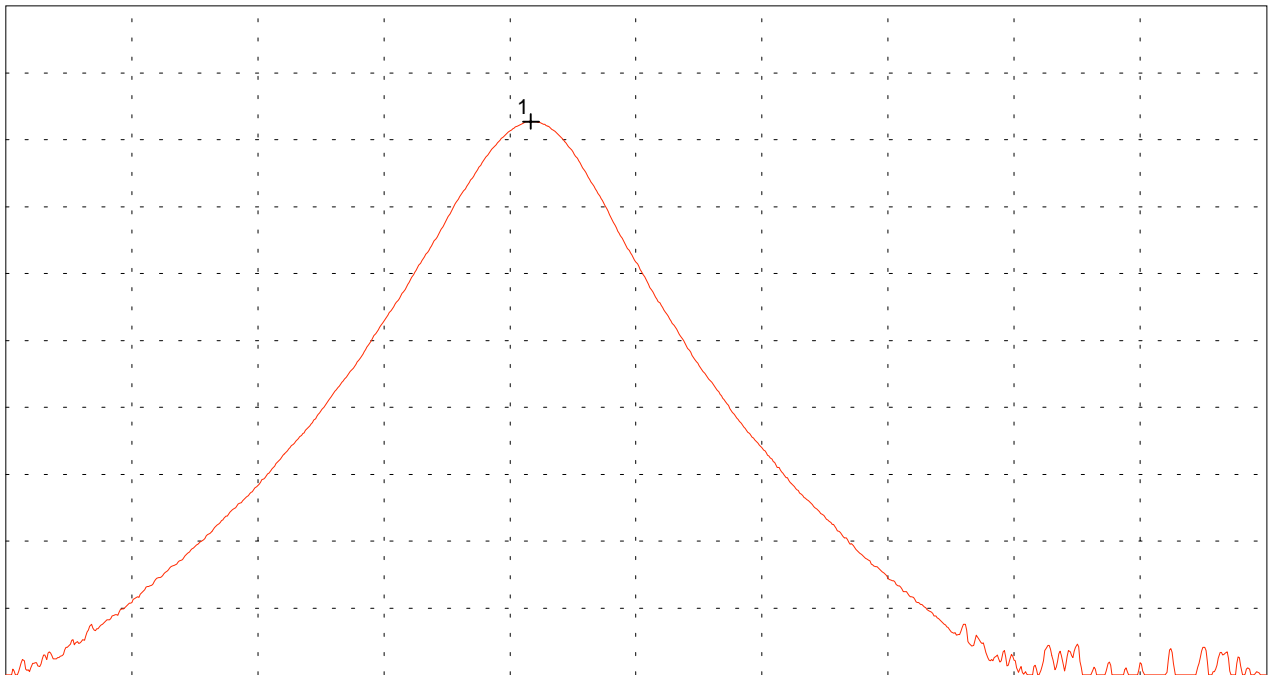
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with f = 75.590 MHz
Serial No.: Sample 2000.12.14	Tested on antenna connector via dummy load Temperature: -20°C Supply voltage: 12.00 V DC Note: Frequency count activated
Applicant: Futaba Corporation	

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.5885 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.5905 MHz
SWP 1.50 s

Multi Marker List

No.	Frequency	Power
No. 1	75.589328 MHz	22.74 dBm

Tested by: Rainer Heller	Project-No.: 55503-00742-1
Date: 01/15/2001	Page 30 of 70 Pages

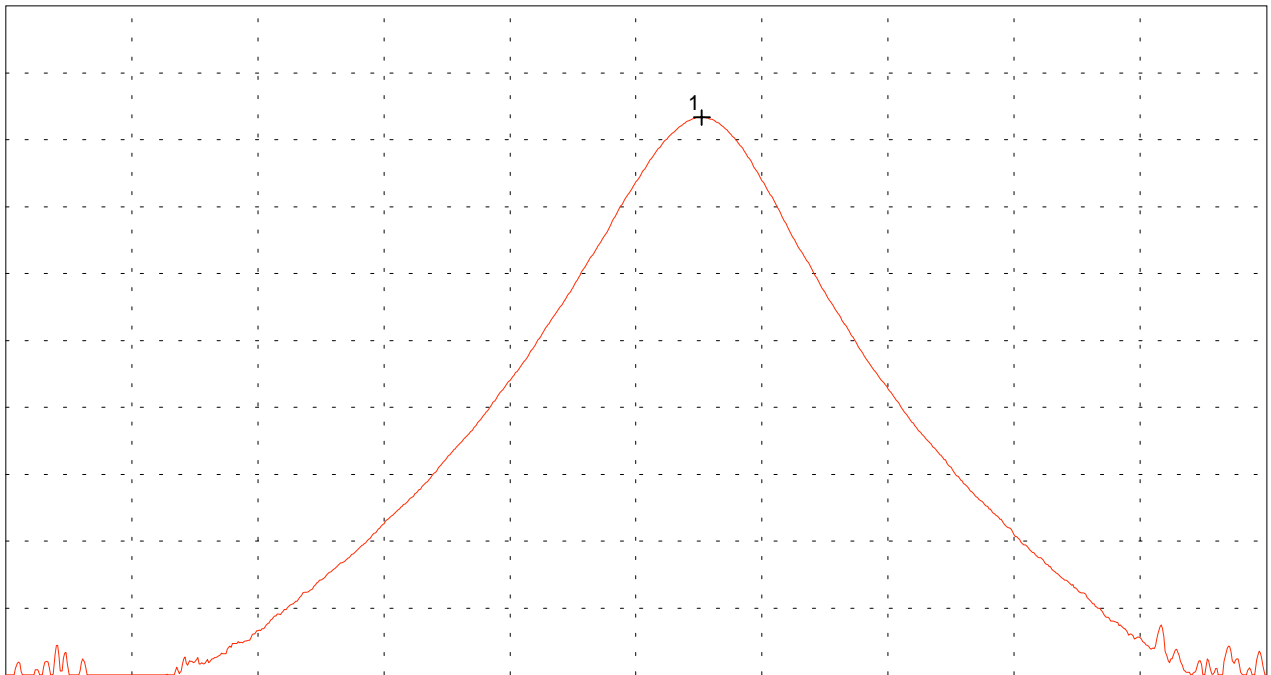
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with f = 75.590 MHz
Serial No.: Sample 2000.12.14	Tested on antenna connector via dummy load Temperature: -10°C Supply voltage: 12.00 V DC Note: Frequency count activated
Applicant: Futaba Corporation	

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.5885 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.5905 MHz
SWP 1.50 s

Multi Marker List

No. 1	75.589595 MHz	23.35 dBm
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Tested by: Rainer Heller
Date: 01/15/2001

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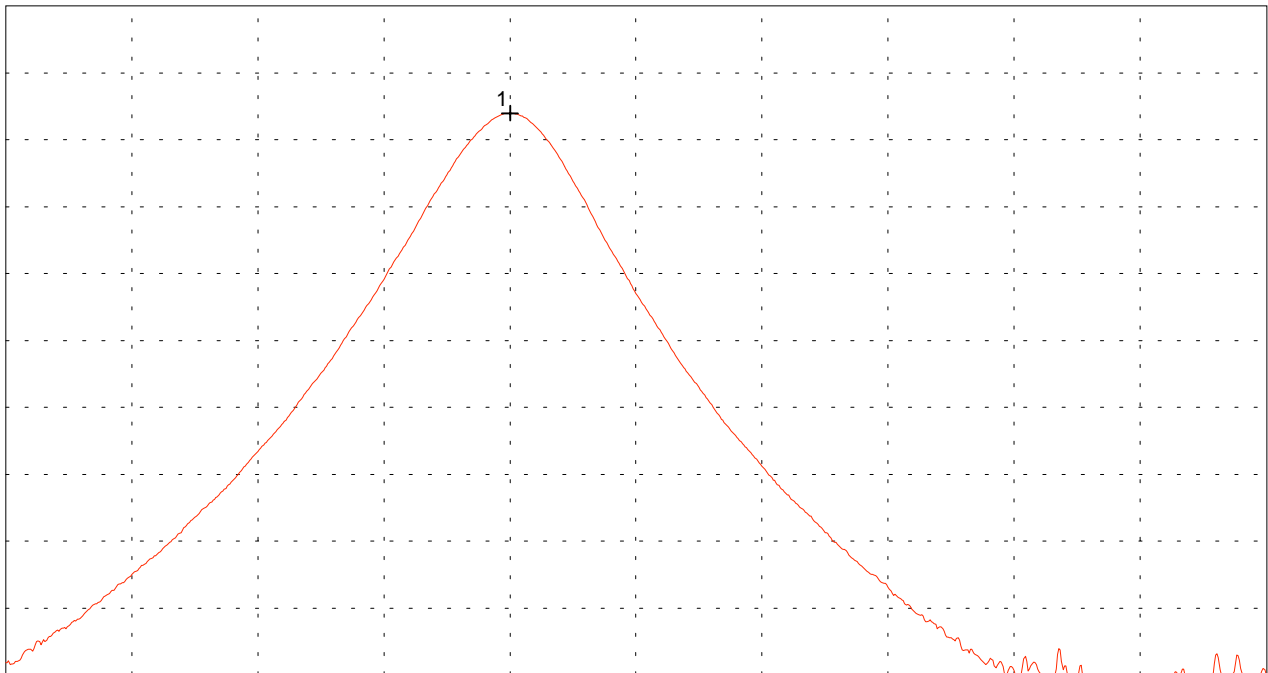
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with f = 75.590 MHz
Serial No.: Sample 2000.12.14	Tested on antenna connector via dummy load Temperature: ±0°C Supply voltage: 12.00 V DC Note: Frequency count activated
Applicant: Futaba Corporation	

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List		
No. 1	75.589793 MHz	23.96 dBm

Tested by: Rainer Heller
Date: 01/15/2001

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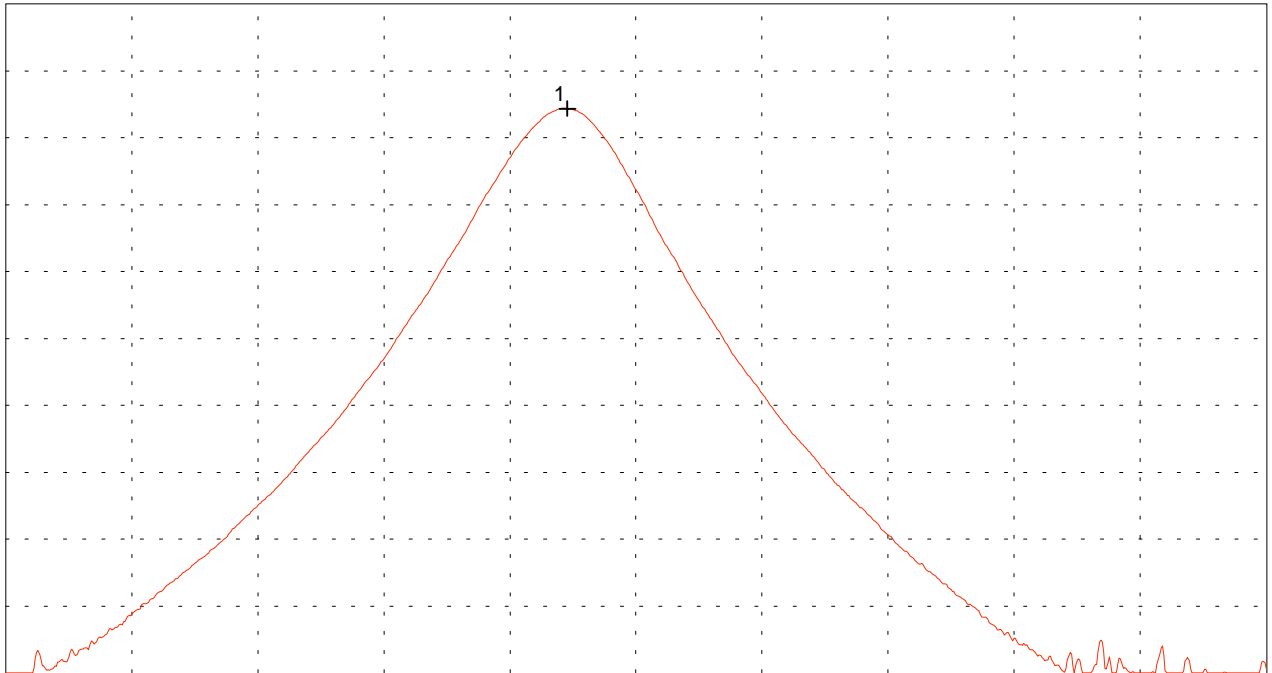
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with $f = 75.590$ MHz
Serial No.: Sample 2000.12.14	
Applicant: Futaba Corporation	Tested on antenna connector via dummy load
	Temperature: +10°C Supply voltage: 12.00 V DC
	Note: Frequency count activated

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List

No. 1	75.589880 MHz	24.36 dBm
-------	---------------	-----------

Tested by: Rainer Heller	Project-No.: 55503-00742-1
Date: 01/15/2001	Page 33 of 70 Pages

Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz
Serial No.: Sample 2000.12.14
Applicant: Futaba Corporation

Mode:
- transmitting continuously (TX mode)
- without modulation

- operating with $f = 75.590$ MHz

Tested on antenna connector via dummy load

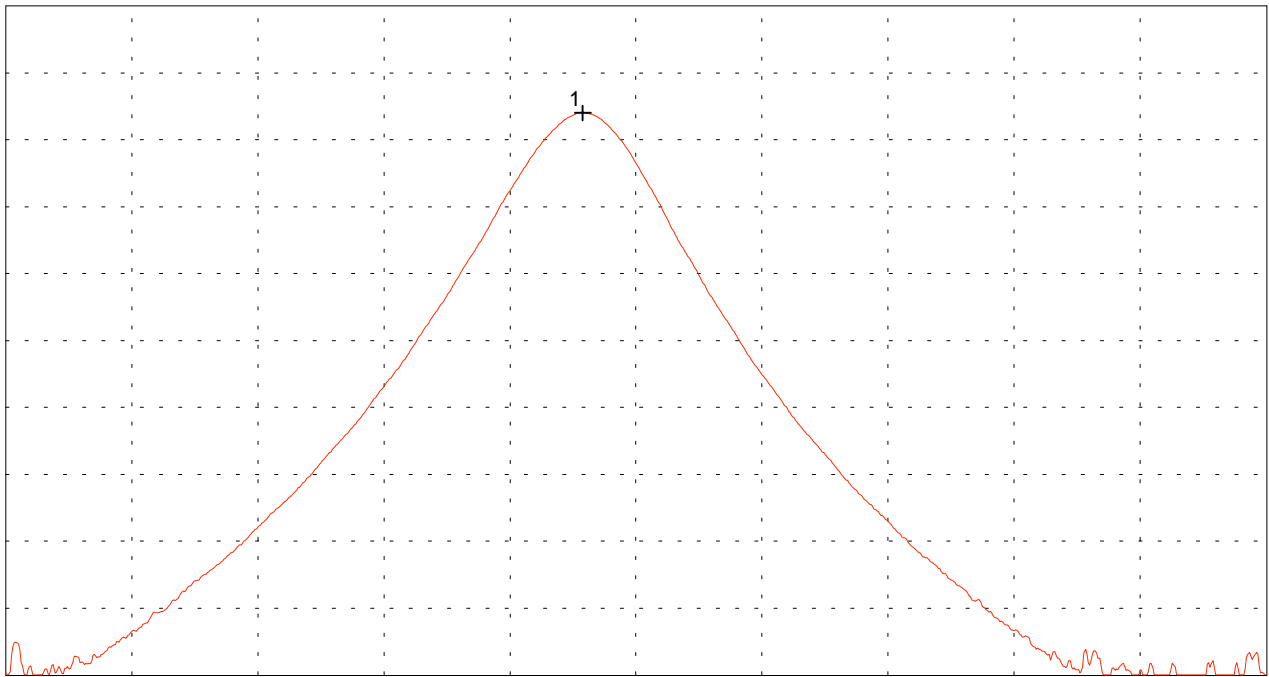
Temperature: +20°C
Supply voltage: 12.00 V DC

Note: Frequency count activated

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List

No.	Frequency (MHz)	Power (dBm)
No. 1	75.589906 MHz	24.01 dBm

Tested by: Rainer Heller
Date: 55503-00742-1

Project-No.: 01/15/2001
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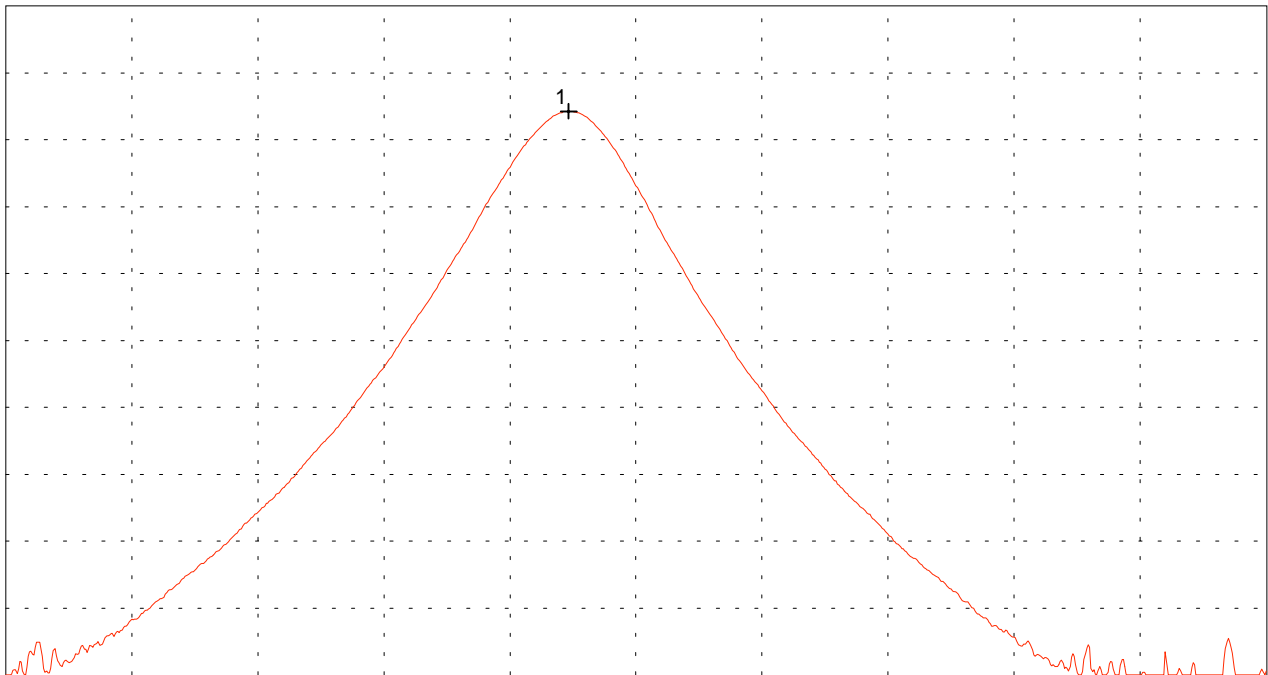
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with f = 75.590 MHz
Serial No.: Sample 2000.12.14	Tested on antenna connector via dummy load Temperature: +30°C Supply voltage: 12.00 V DC Note: Frequency count activated
Applicant: Futaba Corporation	

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List			
No. 1	75.589886 MHz	24.26 dBm	

Tested by: Rainer Heller
Date: 01/15/2001

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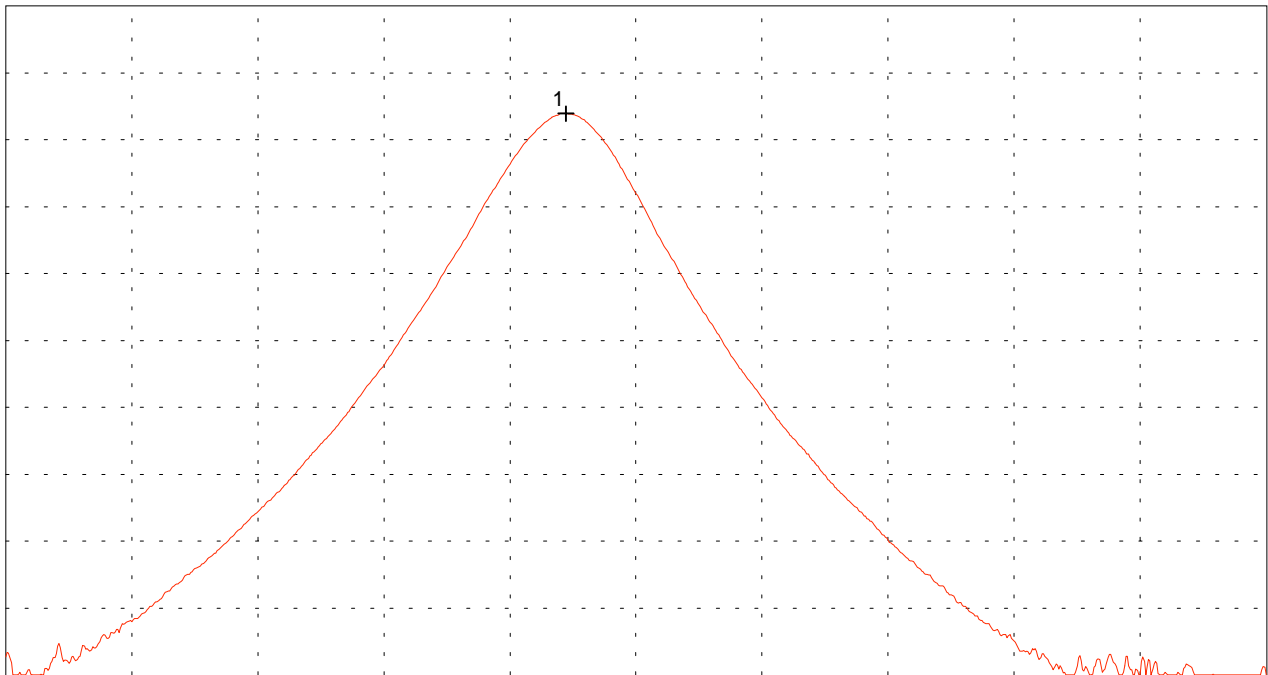
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

<p>Model: T2PG75MHz</p> <hr/> <p>Serial No.: Sample 2000.12.14</p> <hr/> <p>Applicant: Futaba Corporation</p> <hr/> <hr/> <hr/> <hr/>	<p>Mode:</p> <ul style="list-style-type: none"> - transmitting continuously (TX mode) - without modulation - operating with f = 75.590 MHz <p>Tested on antenna connector via dummy load</p> <p>Temperature: +40°C Supply voltage: 12.00 V DC</p> <p>Note: Frequency count activated</p>
---	---

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List

No.	Frequency (MHz)	Power (dBm)
No. 1	75.589880 MHz	23.93 dBm

<p>Tested by: Rainer Heller</p>
<p>Date: 01/15/2001</p>

<p>Project-No.: 55503-00742-1</p>
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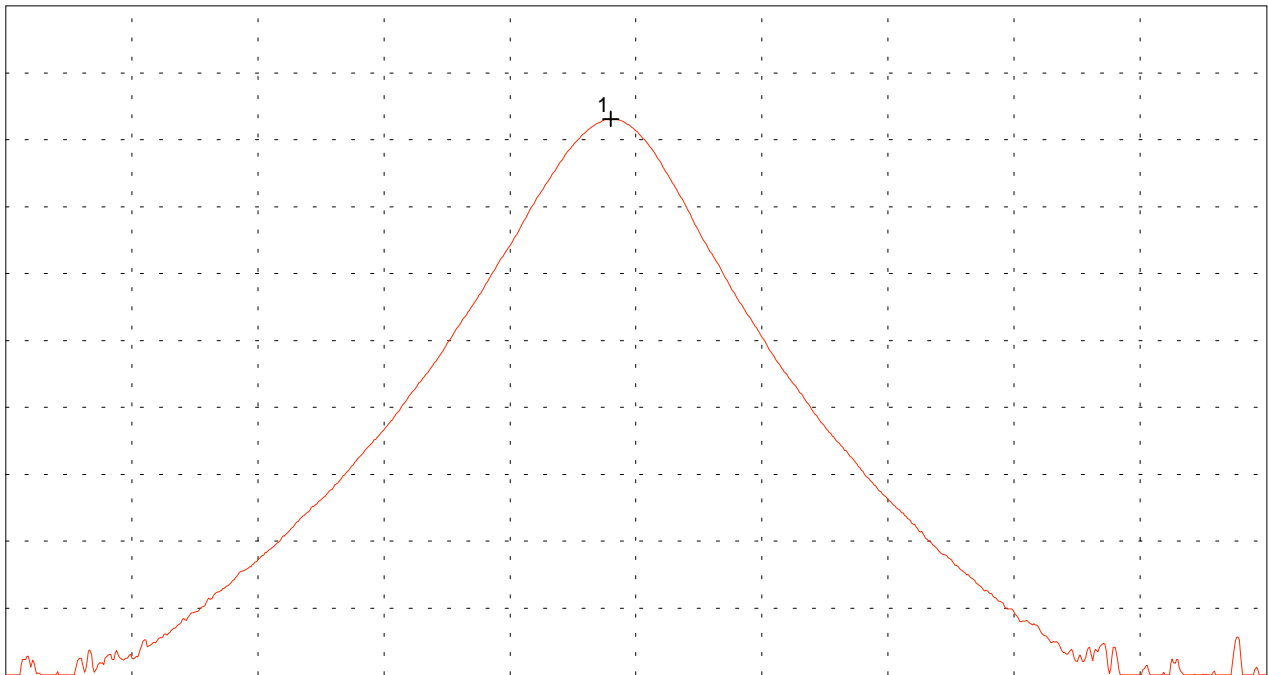
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

<p>Model: T2PG75MHz</p> <hr/> <p>Serial No.: Sample 2000.12.14</p> <hr/> <p>Applicant: Futaba Corporation</p> <hr/> <hr/> <hr/> <hr/>	<p>Mode:</p> <ul style="list-style-type: none"> - transmitting continuously (TX mode) - without modulation - operating with f = 75.590 MHz <p>Tested on antenna connector via dummy load</p> <p>Temperature: +50°C Supply voltage: 12.00 V DC</p> <p>Note: Frequency count activated</p>
---	---

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List		
No. 1	75.589953 MHz	23.12 dBm

<p>Tested by: Rainer Heller</p>
<p>Date: 01/15/2001</p>

<p>Project-No.: 55503-00742-1</p>
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FREQUENCY STABILITY VS. SUPPLY VOLTAGE**Section 95.623c**

EUT: T2PG75MHz
Serial number: Sample 2000.12.14
Applicant: Futaba Corporation
Mode: - transmitting continuously (TX mode)
- without modulation
- operating with $f = 75.590$ MHz
Date of test: January 15, 2001
Operator: Rainer Heller

Test conditions:

Temperature: +20°C
Nominal supply voltage: 12.0 V DC

Specifications:

Frequency tolerance: ± 0.002 % of nominal carrier frequency
Voltage range: ± 15 % of nominal supply voltage

Supply voltage (V)	Nominal carrier frequency (MHz)	Frequency measured (MHz)	Frequency deviation (Hz)	Frequency deviation (%)	Limit (%)
9.00	75.590000	75.589902	-98	-0.000130	0.002
9.50	75.590000	75.589909	-91	-0.000120	0.002
10.00	75.590000	75.589911	-89	-0.000118	0.002
10.50	75.590000	75.589913	-87	-0.000115	0.002
11.00	75.590000	75.589913	-87	-0.000115	0.002
11.50	75.590000	75.589911	-89	-0.000118	0.002
12.00	75.590000	75.589906	-94	-0.000124	0.002
12.50	75.590000	75.589904	-96	-0.000127	0.002
13.00	75.590000	75.589900	-100	-0.000132	0.002
13.50	75.590000	75.589891	-109	-0.000144	0.002
13.80	75.590000	75.589888	-112	-0.000148	0.002

Result: Test passed

Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model:
T2PG75MHz

Serial No.:
Sample 2000.12.14

Applicant:
Futaba Corporation

Mode:

- transmitting continuously (TX mode)
- without modulation

- operating with f = 75.590 MHz

Tested on antenna connector via dummy load

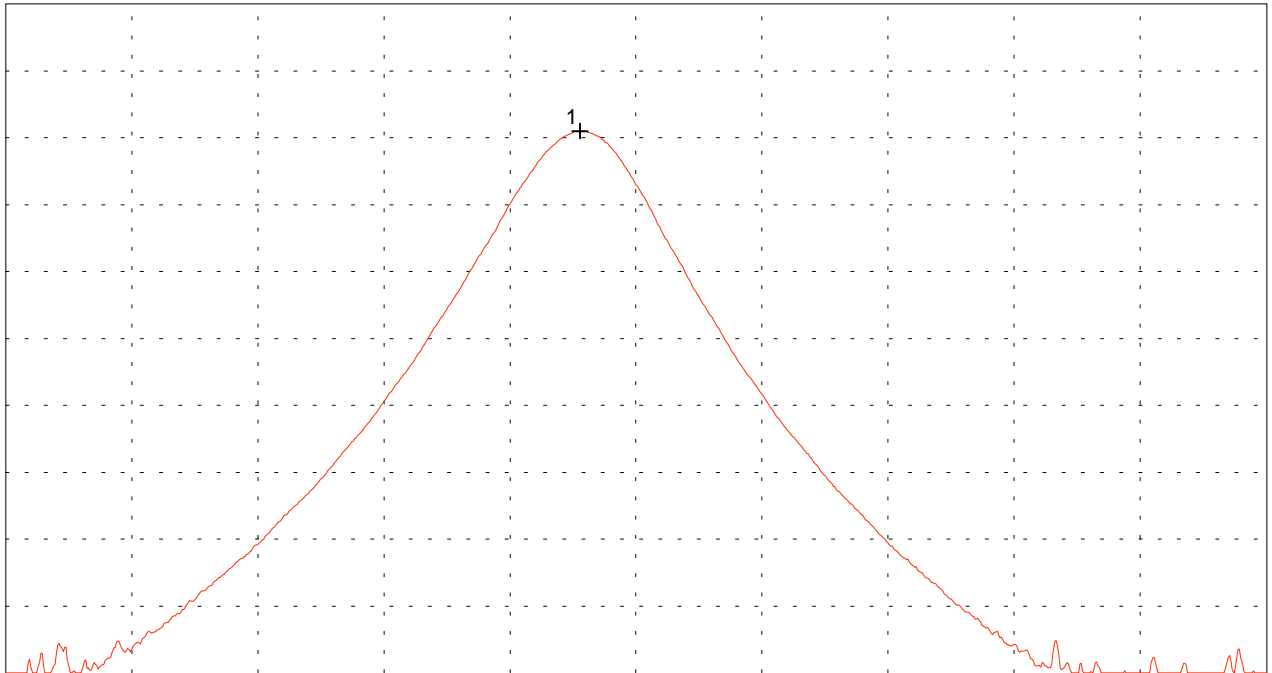
Temperature: +20°C
Supply voltage: 9.00 V DC

Note: Frequency count activated

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List			
No. 1	75.589902 MHz	21.01 dBm	

Tested by:
Rainer Heller

Date:
55503-00742-1

Project-No.:
01/15/2001

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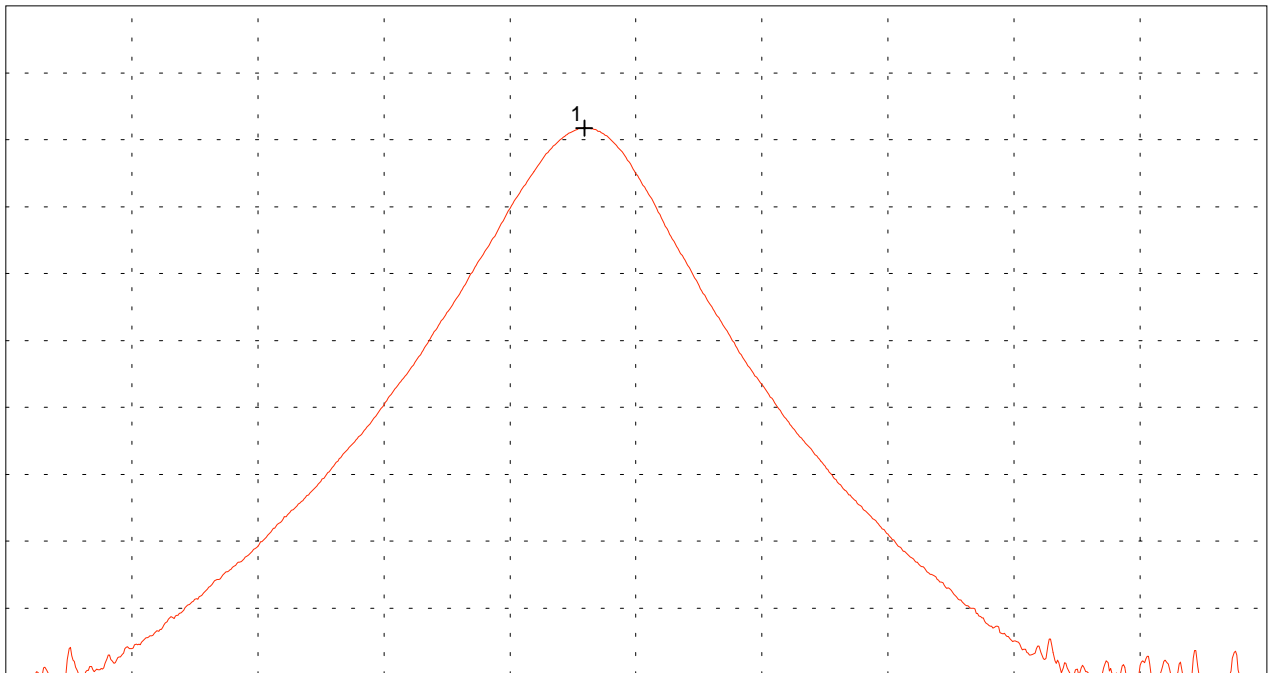
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation
Serial No.: Sample 2000.12.14	- operating with $f = 75.590$ MHz
Applicant: Futaba Corporation	Tested on antenna connector via dummy load
	Temperature: +20°C Supply voltage: 9.50 V DC
	Note: Frequency count activated

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List		
No. 1	75.589909 MHz	21.75 dBm

Tested by: Rainer Heller
Date: 55503-00742-1

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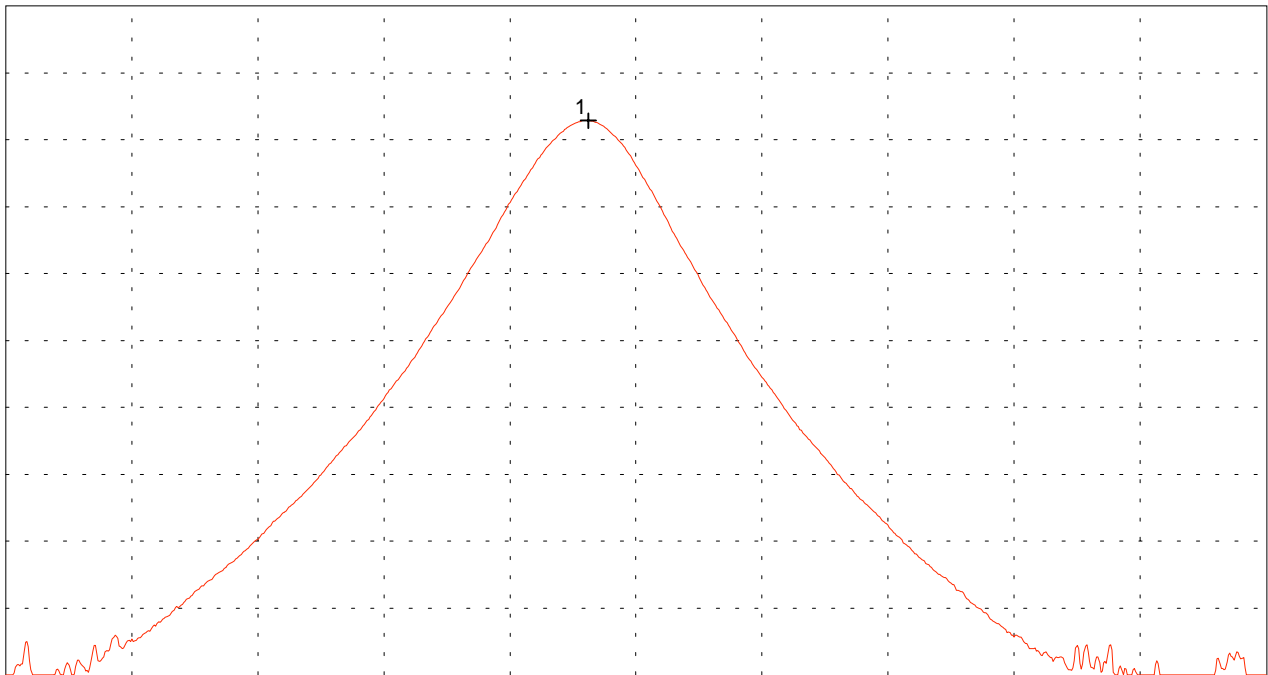
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with $f = 75.590$ MHz
Serial No.: Sample 2000.12.14	Tested on antenna connector via dummy load Temperature: +20°C Supply voltage: 10.50 V DC Note: Frequency count activated
Applicant: Futaba Corporation	

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List		
No. 1	75.589913 MHz	22.84 dBm

Tested by: Rainer Heller
Date: 55503-00742-1

Project-No.: 01/15/2001
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Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model:
T2PG75MHz

Serial No.:
Sample 2000.12.14

Applicant:
Futaba Corporation

Mode:

- transmitting continuously (TX mode)
- without modulation

- operating with $f = 75.590$ MHz

Tested on antenna connector via dummy load

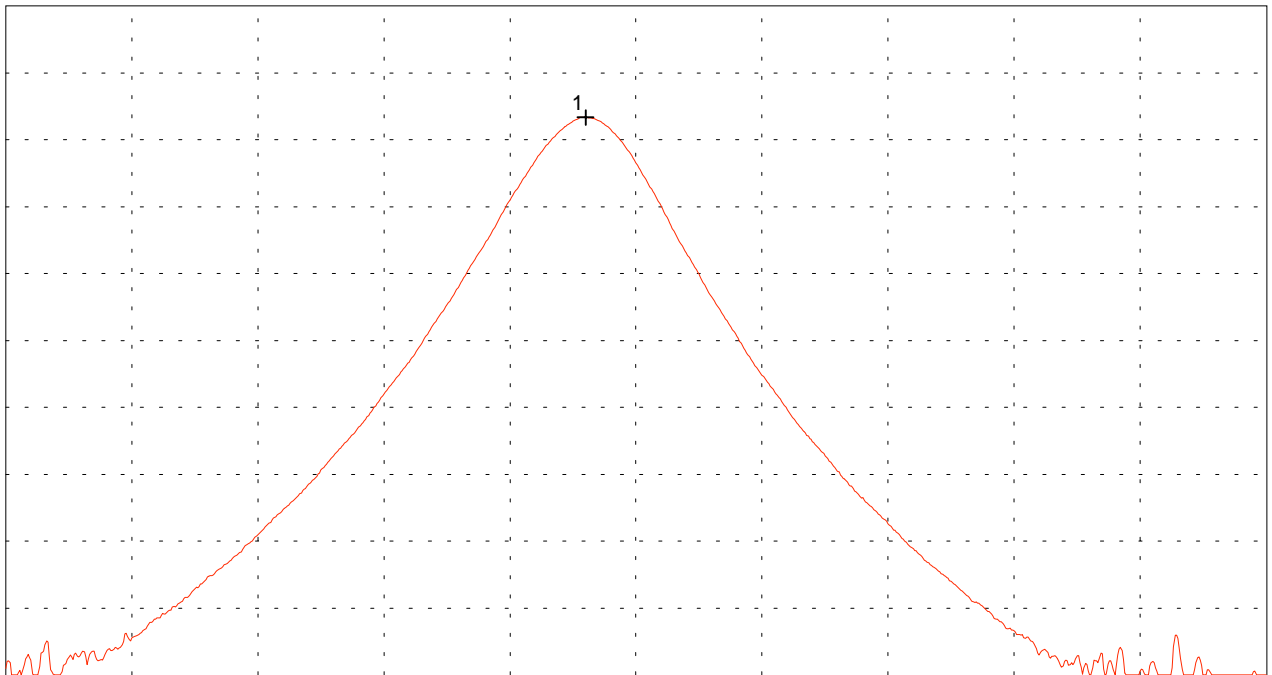
Temperature: +20°C
Supply voltage: 11.00 V DC

Note: Frequency count activated

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List

No.	Frequency (MHz)	Power (dBm)
No. 1	75.589913 MHz	23.32 dBm

Tested by:
Rainer Heller

Date:
55503-00742-1

Project-No.:
01/15/2001

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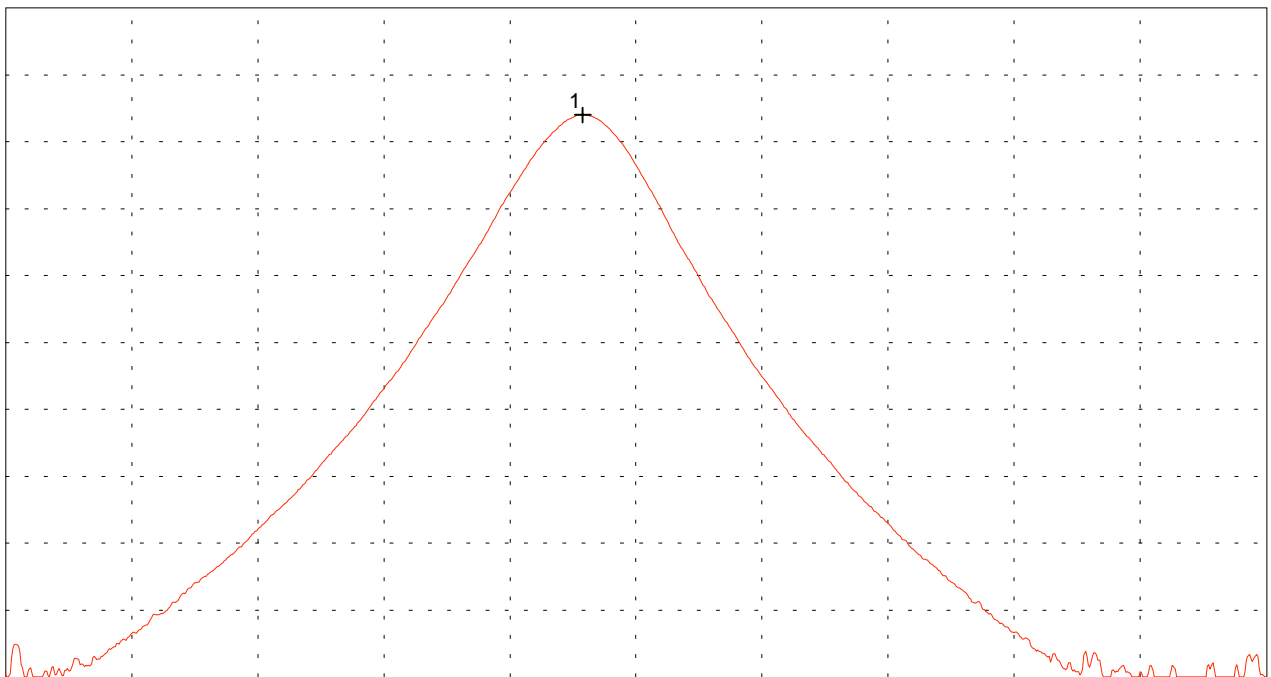
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with $f = 75.590$ MHz Tested on antenna connector via dummy load Temperature: +20°C Supply voltage: 12.00 V DC Note: Frequency count activated
Serial No.: Sample 2000.12.14	
Applicant: Futaba Corporation	

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List

No. 1	75.589906 MHz	24.01 dBm
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Tested by: Rainer Heller
Date: 55503-00742-1

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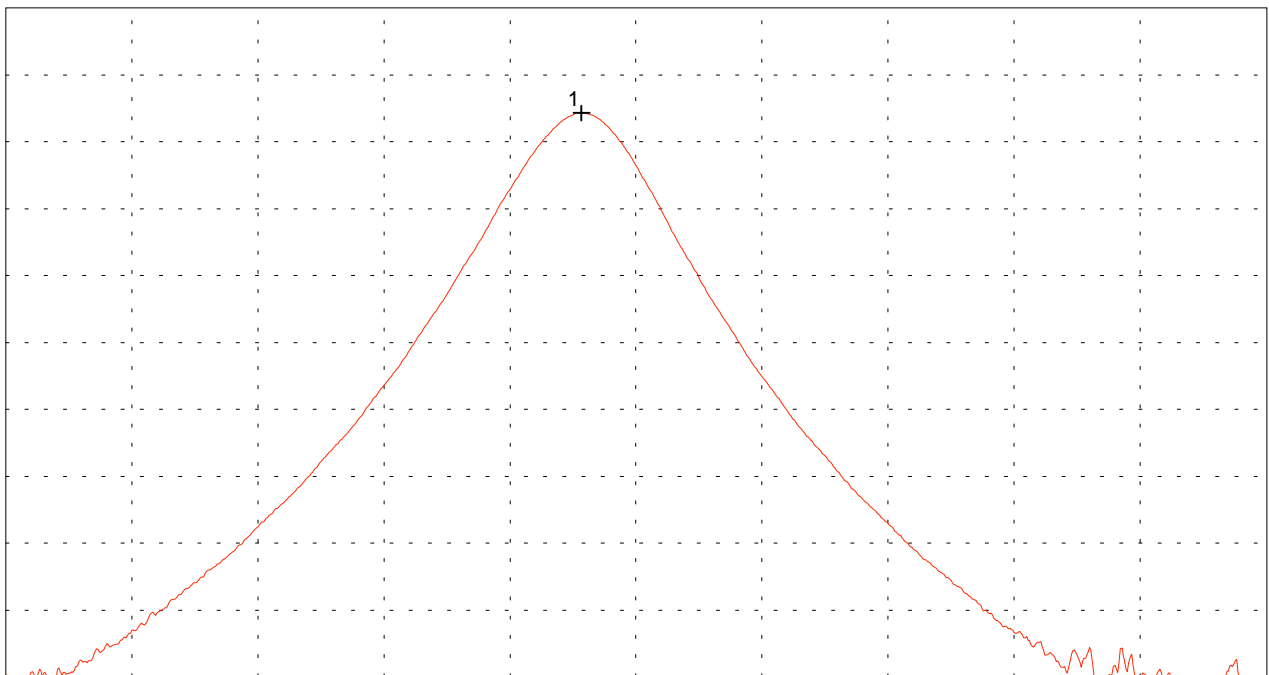
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation
Serial No.: Sample 2000.12.14	- operating with $f = 75.590$ MHz
Applicant: Futaba Corporation	Tested on antenna connector via dummy load
	Temperature: +20°C Supply voltage: 12.50 V DC
	Note: Frequency count activated

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List			
No. 1	75.589904 MHz	24.29 dBm	

Tested by: Rainer Heller
Date: 55503-00742-1

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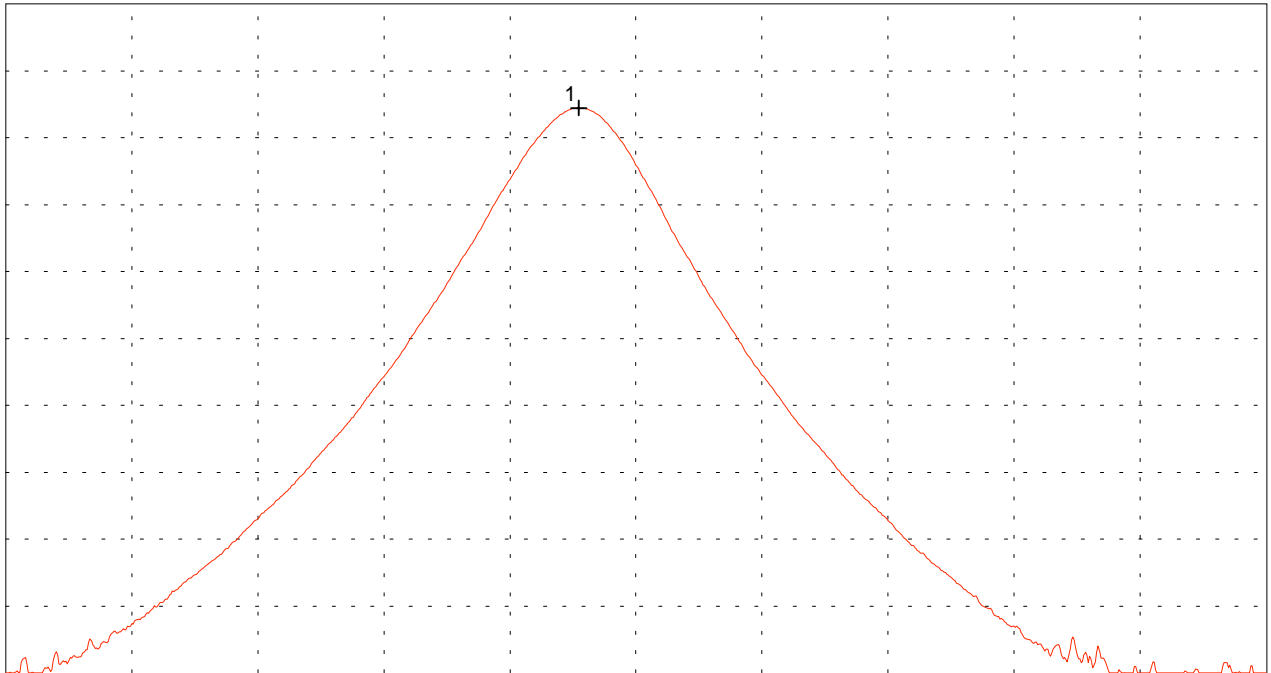
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with $f = 75.590$ MHz
Serial No.: Sample 2000.12.14	
Applicant: Futaba Corporation	Tested on antenna connector via dummy load
	Temperature: +20°C Supply voltage: 13.00 V DC
	Note: Frequency count activated

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List

No. 1	75.589900 MHz	24.46 dBm
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Tested by: Rainer Heller
Date: 55503-00742-1

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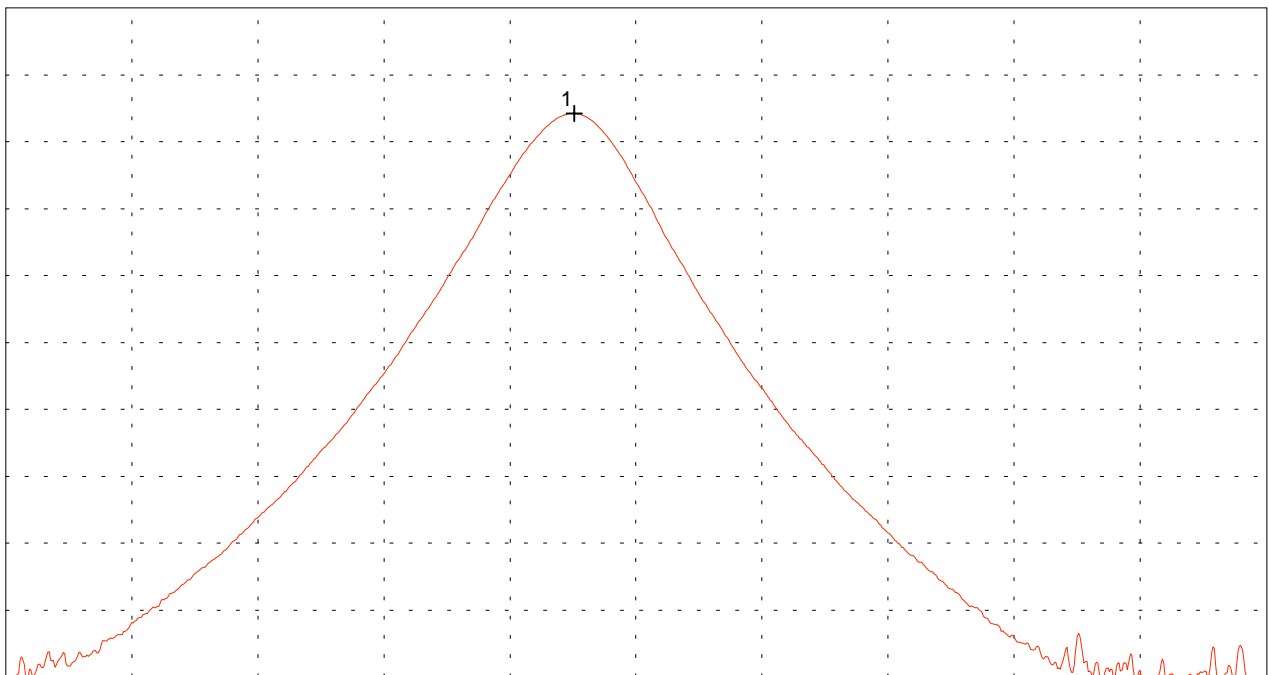
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

Model: T2PG75MHz	Mode: - transmitting continuously (TX mode) - without modulation - operating with $f = 75.590$ MHz Tested on antenna connector via dummy load Temperature: +20°C Supply voltage: 13.50 V DC Note: Frequency count activated
Serial No.: Sample 2000.12.14	
Applicant: Futaba Corporation	

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List

No.	Frequency (MHz)	Power (dBm)
No. 1	75.589891 MHz	24.24 dBm

Tested by:
Rainer Heller

Date:
55503-00742-1

Project-No.:
01/15/2001

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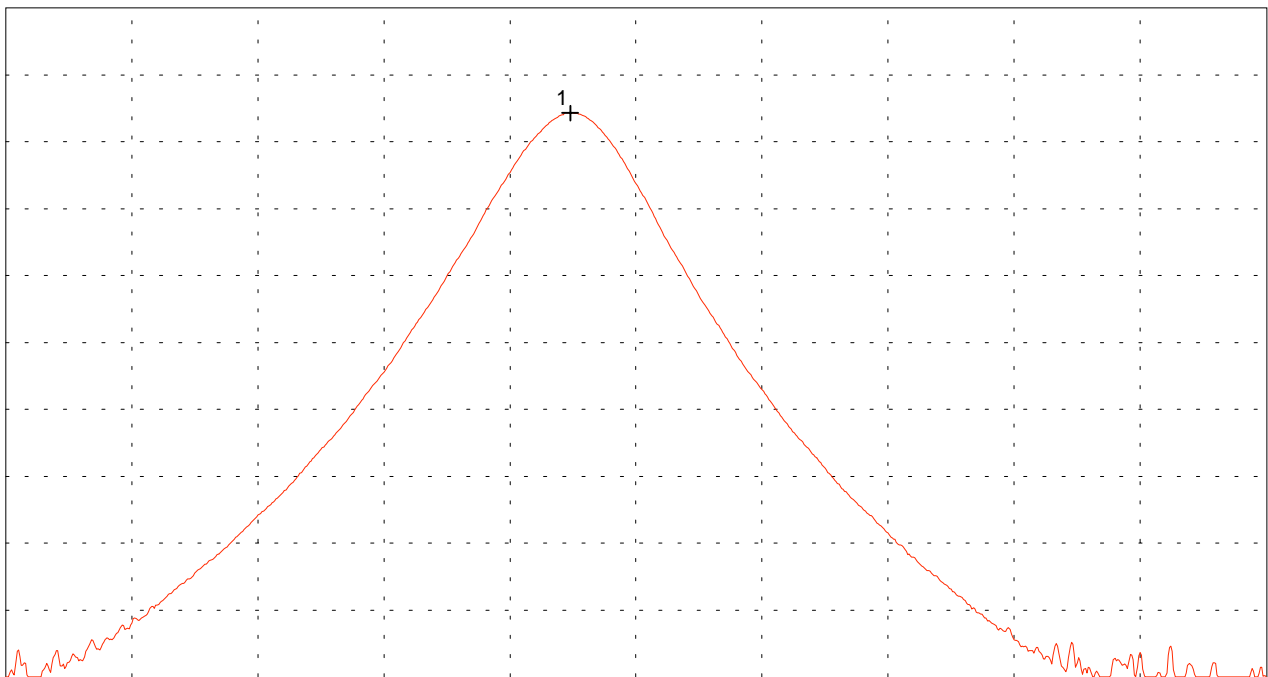
Frequency Stability acc. to FCC Part 95 Subpart C/E, §95.623c

<p>Model: T2PG75MHz</p> <hr/> <p>Serial No.: Sample 2000.12.14</p> <hr/> <p>Applicant: Futaba Corporation</p> <hr/> <hr/> <hr/> <hr/>	<p>Mode:</p> <ul style="list-style-type: none"> - transmitting continuously (TX mode) - without modulation <ul style="list-style-type: none"> - operating with $f = 75.590$ MHz <p>Tested on antenna connector via dummy load</p> <p>Temperature: +20°C Supply voltage: 13.80 V DC</p> <p>Note: Frequency count activated</p>
---	---

Ref.Level 40 dBm
10 dB/Div.

ATT 30 dB

Ref. Offset 40.5 dB



Start 75.589 MHz
RBW 100 Hz

VBW 100 Hz

Stop 75.591 MHz
SWP 1.50 s

Multi Marker List			
No. 1	75.589888 MHz	24.31 dBm	

<p>Tested by: Rainer Heller</p>
<p>Date: 55503-00742-1</p>

<p>Project-No.: 01/15/2001</p>
<p>Page 49 of 70 Pages</p>

EMISSION BANDWIDTH**Section 95.633b**

EUT: T2PG75MHz
Serial number: Sample 2000.12.14
Applicant: Futaba Corporation
Mode: - transmitting continuously (TX mode)
- with modulation
- operating with $f = 75.590$ MHz
Date of test: January 16, 2001
Operator: Rainer Heller

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 (kHz)	Limit (kHz)
TIA/EIA-603	1.71	8.00

Result: Test passed

EMISSION BANDWIDTH (CONTINUED))

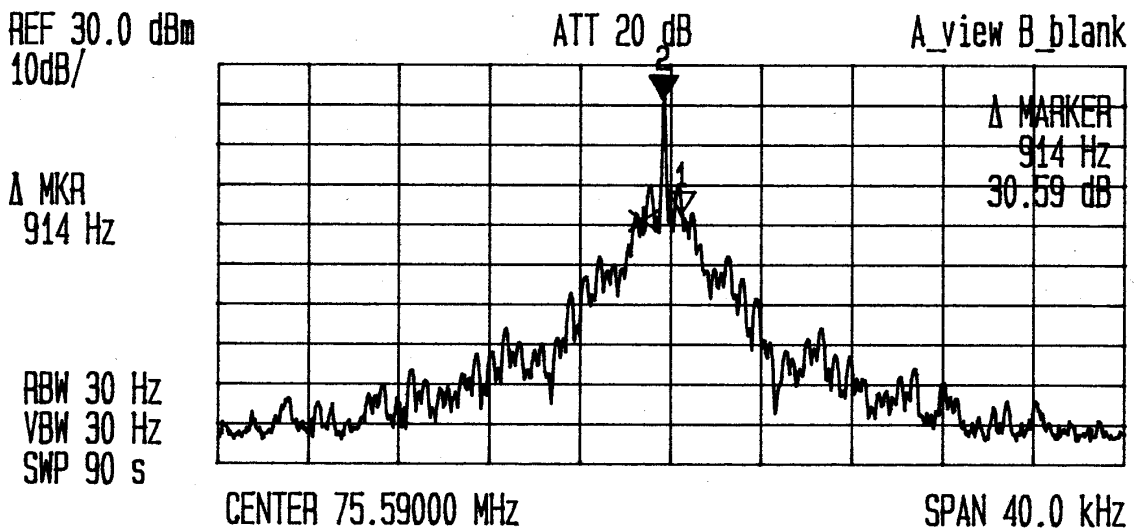
Section 95.633b

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



*** Multi Marker List ***

No.1:	1.71 kHz	1.13 dB	A
No.2:	914 Hz	30.59 dB	A
No.3:			
No.4:			
No.5:			
No.6:			
No.7:			
No.8:			
Δ:	75.58874 MHz	-8.63 dBm	A

UNWANTED RADIATION 30 MHz - 1 GHz

Section 95.635

EUT: T2PG75MHz
 Serial number: Sample 2000.12.14
 Applicant: Futaba Corporation

Mode: - transmitting continuously (TX mode)
 - with modulation
 - with supply voltage 12 V DC
 - antenna extended to maximum
 - operating with $f = 75.590$ MHz
 - EUT in vertical position, antenna to the top

Date of test: February 19, 2001
 Operator: Rainer Heller

Specifications:

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

Maximum transmitter power (conducted):		24.8 dBm	0.303 Watt			
Maximum carrier power (radiated):		20.5 dBm	0.112 Watt			
Calculated limit (referring to TP):		-27.2 dBm				
Frequency (MHz)	Polarization	Reading value (dB μ V)	Correction factor (dB)	ERP (dBm)	Calculated limit (dBm)	Margin to limit (dB)
37.795	vertical	34.1	-81.9	-47.8	-27.2	20.6
75.590	vertical	108.9	-88.4	20.5	28.8	8.2
113.385	vertical	37.2	-85.4	-48.2	-27.2	20.9
151.180	vertical	39.3	-80.9	-41.6	-27.2	14.4
226.770	vertical	34.4	-75.5	-41.1	-27.2	13.9
264.565	vertical	23.6	-74.6	-51.0	-27.2	23.8
302.360	vertical	35.9	-77.1	-41.2	-27.2	13.9
340.155	vertical	33.8	-76.9	-43.1	-27.2	15.9
377.950	vertical	29.8	-75.8	-46.0	-27.2	18.7
415.745	vertical	20.2	-74.3	-54.1	-27.2	26.8
453.540	vertical	27.3	-73.6	-46.3	-27.2	19.0
491.335	vertical	24.8	-71.4	-46.6	-27.2	19.4
529.130	horizontal	26.4	-73.1	-46.7	-27.2	19.5
604.720	vertical	20.3	-68.4	-48.1	-27.2	20.9
680.310	horizontal	21.3	-70.9	-49.6	-27.2	22.4
718.105	horizontal	16.6	-69.6	-53.0	-27.2	25.7

Note: For calculation of correction factors see tables "Test Site Calibration 30 MHz - 1 GHz for ERP Measurements (Substitution Method)" starting on page 57.

Result: Test passed

UNWANTED RADIATION 30 MHz - 1 GHz

Section 95.635

EUT: T2PG75MHz
 Serial number: Sample 2000.12.14
 Applicant: Futaba Corporation

Mode: - transmitting continuously (TX mode)
 - with modulation
 - with supply voltage 12 V DC
 - antenna extended to maximum
 - operating with $f = 75.590$ MHz
 - EUT in horizontal position with back side on table

Date of test: February 19, 2001
 Operator: Rainer Heller

Specifications:

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

Maximum transmitter power (conducted):		24.8 dBm	0.303 Watt			
Maximum carrier power (radiated):		18.3 dBm	0.068 Watt			
Calculated limit (referring to TP):		-27.2 dBm				
Frequency (MHz)	Polarization	Reading value (dB μ V)	Correction factor (dB)	ERP (dBm)	Calculated limit (dBm)	Margin to limit (dB)
75.590	horizontal	104.0	-85.7	18.3	28.8	10.4
113.385	horizontal	37.2	-85.6	-48.4	-27.2	21.1
151.180	horizontal	45.2	-83.4	-38.2	-27.2	11.0
188.975	horizontal	28.7	-82.9	-54.2	-27.2	27.0
226.770	horizontal	36.1	-80.2	-44.1	-27.2	16.9
264.565	horizontal	31.5	-76.5	-45.0	-27.2	17.8
302.360	horizontal	44.4	-81.0	-36.6	-27.2	9.3
340.155	horizontal	37.2	-78.7	-41.5	-27.2	14.3
377.950	horizontal	34.7	-77.6	-42.9	-27.2	15.6
415.745	horizontal	29.9	-74.1	-44.2	-27.2	16.9
453.540	horizontal	35.5	-74.6	-39.1	-27.2	11.8
491.335	horizontal	28.2	-74.9	-46.7	-27.2	19.5
529.130	horizontal	28.7	-73.1	-44.4	-27.2	17.2
566.925	horizontal	23.6	-71.9	-48.3	-27.2	21.0
604.720	horizontal	25.9	-73.6	-47.7	-27.2	20.5
642.515	horizontal	19.9	-71.4	-51.5	-27.2	24.3
680.310	horizontal	24.5	-70.9	-46.4	-27.2	19.2
718.105	horizontal	19.8	-69.6	-49.8	-27.2	22.5
831.490	horizontal	13.9	-69.7	-55.8	-27.2	28.5

Note: For calculation of correction factors see tables "Test Site Calibration 30 MHz - 1 GHz for ERP Measurements (Substitution Method)" starting on page 57.

Result: Test passed

11. Additional Results

DUTY CYCLE (DATA TRAIN)

EUT: T2PG75MHz
Serial number: Sample 2000.12.14
Applicant: Futaba Corporation
Mode: - transmitting continuously (TX mode)
- with modulation
- operating with $f = 75.590$ MHz
Date of test: January 16, 2001
Operator: Rainer Heller

Test conditions:

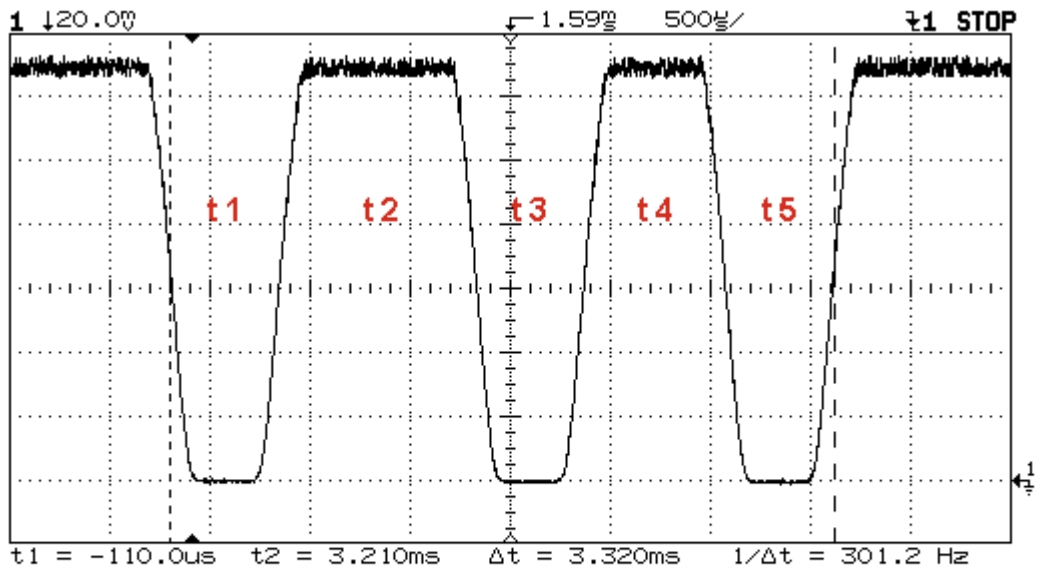
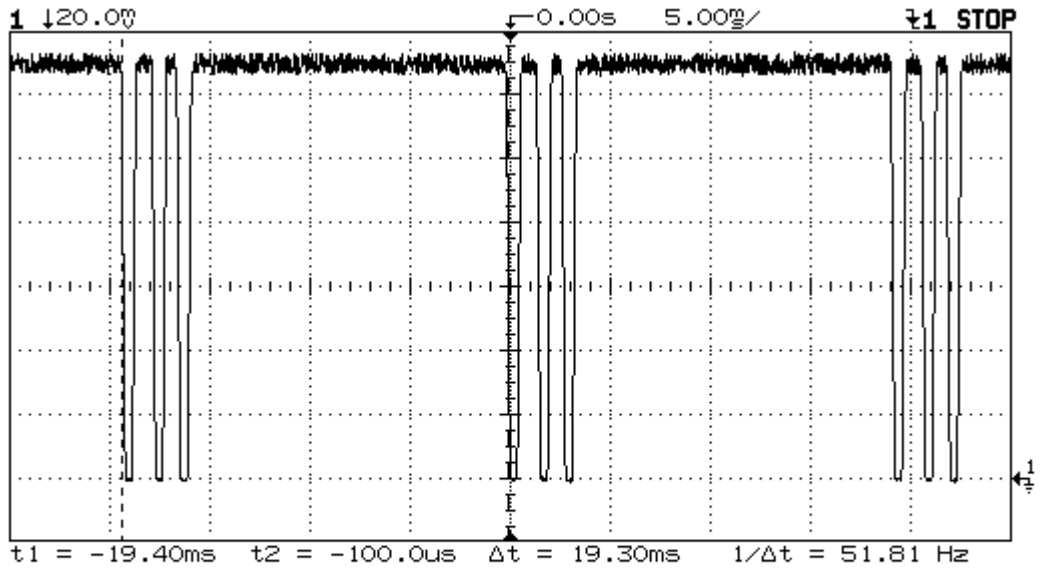
Temperature: +20°C
Supply voltage: 12.0 V DC

Note:

For details see plots on following page.

Description	Designation	Measured time (ms)
Period time	T	19.300
Off time	t 1	0.550
On time	t 2	0.970
Off time	t 3	0.550
On time	t 4	0.700
Off time	t 5	0.550

DUTY CYCLE (DATA TRAIN) - CONTINUED))



Test Site Calibration 30 MHz - 1 GHz for ERP Measurements (Substitution Method)

Test site: Open area test site, EG I
 Test distance: 3 metres
 Date: 02/19/2001
 Operator: R. Heller
 Transmit antennae: Biconical antenna HK 116, Rohde & Schwarz, inv.-no. A-1261
 Log.-per. antenna HL 223, Rohde & Schwarz, inv.-no. A-1519
 Receiving antennae: Biconical antenna HK 116, Rohde & Schwarz, inv.-no. A-1518
 Log.-per. antenna HL 223, Rohde & Schwarz, inv.-no. A-1262
 Signal source: Signal generator SMY 01, Rohde & Schwarz, inv.-no. A-1627, connected
 to transmit antenna via cable set (inv.-no. 1300 & 1309 & EG1 N1), nominal
 power at signal generator set to -20 dBm (except for carrier frequency)
 Test receiver: ESVP, Rohde & Schwarz, inv.-no. A-1025
 Antennae heights: TX antenna (h1): 1 metre
 RX antenna (h2): 1 - 4 metres variable
 Antenna position: TX antenna: center of turn table
 Polarization: horizontal

Frequency [MHz]	Transmit signal TX direct [dBm]	Attenuation TX antenna cable [dB]	TX antenna gain		True transmit signal TX true [dBm]	EMI-receiver reading RX true [dBµV]	Correction for reading in "dBµV" [dB]
			(isotropic) [dBi]	(dipole) [dBd]			
37.795	-20.1	0.9	-9.86	-12.01	-33.01	45.7	-78.7
75.590	20.0	1.4	-0.63	-2.78	15.82	101.5	-85.7
113.385	-20.0	1.8	1.00	-1.15	-22.95	62.6	-85.6
151.180	-20.0	2.2	1.72	-0.43	-22.63	60.8	-83.4
188.975	-20.1	2.4	2.12	-0.03	-22.53	60.4	-82.9
226.770	-20.1	2.8	2.64	0.49	-22.41	57.8	-80.2
264.565	-20.1	3.1	2.53	0.38	-22.82	53.7	-76.5
302.360	-20.1	3.4	7.00	4.85	-18.65	62.3	-81.0
340.155	-20.1	3.8	7.12	4.97	-18.93	59.8	-78.7
377.950	-20.1	4.4	7.06	4.91	-19.59	58.0	-77.6
415.745	-20.1	4.8	6.80	4.65	-20.25	53.8	-74.1
453.540	-20.1	5.0	6.90	4.75	-20.35	54.2	-74.6
491.335	-20.1	5.3	6.83	4.68	-20.72	54.2	-74.9
529.130	-20.1	5.2	7.05	4.90	-20.40	52.7	-73.1
566.925	-20.2	5.3	7.16	5.01	-20.49	51.4	-71.9
604.720	-20.2	5.4	6.94	4.79	-20.81	52.8	-73.6
642.515	-20.1	5.6	6.91	4.76	-20.94	50.5	-71.4
680.310	-20.2	5.7	6.52	4.37	-21.53	49.4	-70.9
718.105	-20.2	5.4	6.60	4.45	-21.15	48.4	-69.6
755.900	-20.2	6.7	7.35	5.20	-21.70	48.7	-70.4
793.695	-20.2	7.0	7.20	5.05	-22.15	48.3	-70.4
831.490	-20.2	6.9	7.20	5.05	-22.05	47.6	-69.7
869.285	-20.2	7.1	6.67	4.52	-22.78	45.4	-68.2
907.080	-20.2	7.0	7.04	4.89	-22.31	44.1	-66.4
944.875	-20.2	7.4	7.64	5.49	-22.11	44.9	-67.0
982.670	-20.2	7.6	7.07	4.92	-22.88	43.1	-66.0

Test Site Calibration 30 MHz - 1 GHz for ERP Measurements (Substitution Method)

Test site: Open area test site, EG I
 Test distance: 3 metres
 Date: 02/19/2001
 Operator: R. Heller
 Transmit antennae: Biconical antenna HK 116, Rohde & Schwarz, inv.-no. A-1261
 Log.-per. antenna HL 223, Rohde & Schwarz, inv.-no. A-1519
 Receiving antennae: Biconical antenna HK 116, Rohde & Schwarz, inv.-no. A-1518
 Log.-per. antenna HL 223, Rohde & Schwarz, inv.-no. A-1262
 Signal source: Signal generator SMY 01, Rohde & Schwarz, inv.-no. A-1627, connected
 to transmit antenna via cable set (inv.-no. 1300 & 1309 & EG1 N1), nominal
 power at signal generator set to -20 dBm (except for carrier frequency)
 Test receiver: ESVP, Rohde & Schwarz, inv.-no. A-1025
 Antennae heights: TX antenna (h1): 1 metre
 RX antenna (h2): 1 - 4 metres variable
 Antenna position: TX antenna: center of turn table
 Polarization: vertical

Frequency [MHz]	Transmit signal TX direct [dBm]	Attenuation TX antenna cable [dB]	TX antenna gain		True transmit signal TX true [dBm]	EMI-receiver reading RX true [dBμV]	Correction for reading in "dBμV" [dB]
			(isotropic) [dBi]	(dipole) [dBd]			
37.795	-20.1	0.9	-9.86	-12.01	-33.01	48.9	-81.9
75.590	20.0	1.4	-0.63	-2.78	15.82	104.2	-88.4
113.385	-20.0	1.8	1.00	-1.15	-22.95	62.4	-85.4
151.180	-20.0	2.2	1.72	-0.43	-22.63	58.3	-80.9
188.975	-20.1	2.4	2.12	-0.03	-22.53	48.5	-71.0
226.770	-20.1	2.8	2.64	0.49	-22.41	53.1	-75.5
264.565	-20.1	3.1	2.53	0.38	-22.82	51.8	-74.6
302.360	-20.1	3.4	7.00	4.85	-18.65	58.4	-77.1
340.155	-20.1	3.8	7.12	4.97	-18.93	58.0	-76.9
377.950	-20.1	4.4	7.06	4.91	-19.59	56.2	-75.8
415.745	-20.1	4.8	6.80	4.65	-20.25	54.0	-74.3
453.540	-20.1	5.0	6.90	4.75	-20.35	53.2	-73.6
491.335	-20.1	5.3	6.83	4.68	-20.72	50.7	-71.4
529.130	-20.1	5.2	7.05	4.90	-20.40	49.2	-69.6
566.925	-20.2	5.3	7.16	5.01	-20.49	50.0	-70.5
604.720	-20.2	5.4	6.94	4.79	-20.81	47.6	-68.4
642.515	-20.1	5.6	6.91	4.76	-20.94	46.3	-67.2
680.310	-20.2	5.7	6.52	4.37	-21.53	48.1	-69.6
718.105	-20.2	5.4	6.60	4.45	-21.15	46.7	-67.9
755.900	-20.2	6.7	7.35	5.20	-21.70	43.6	-65.3
793.695	-20.2	7.0	7.20	5.05	-22.15	42.5	-64.6
831.490	-20.2	6.9	7.20	5.05	-22.05	43.5	-65.6
869.285	-20.2	7.1	6.67	4.52	-22.78	40.4	-63.2
907.080	-20.2	7.0	7.04	4.89	-22.31	40.4	-62.7
944.875	-20.2	7.4	7.64	5.49	-22.11	40.2	-62.3
982.670	-20.2	7.6	7.07	4.92	-22.88	37.3	-60.2

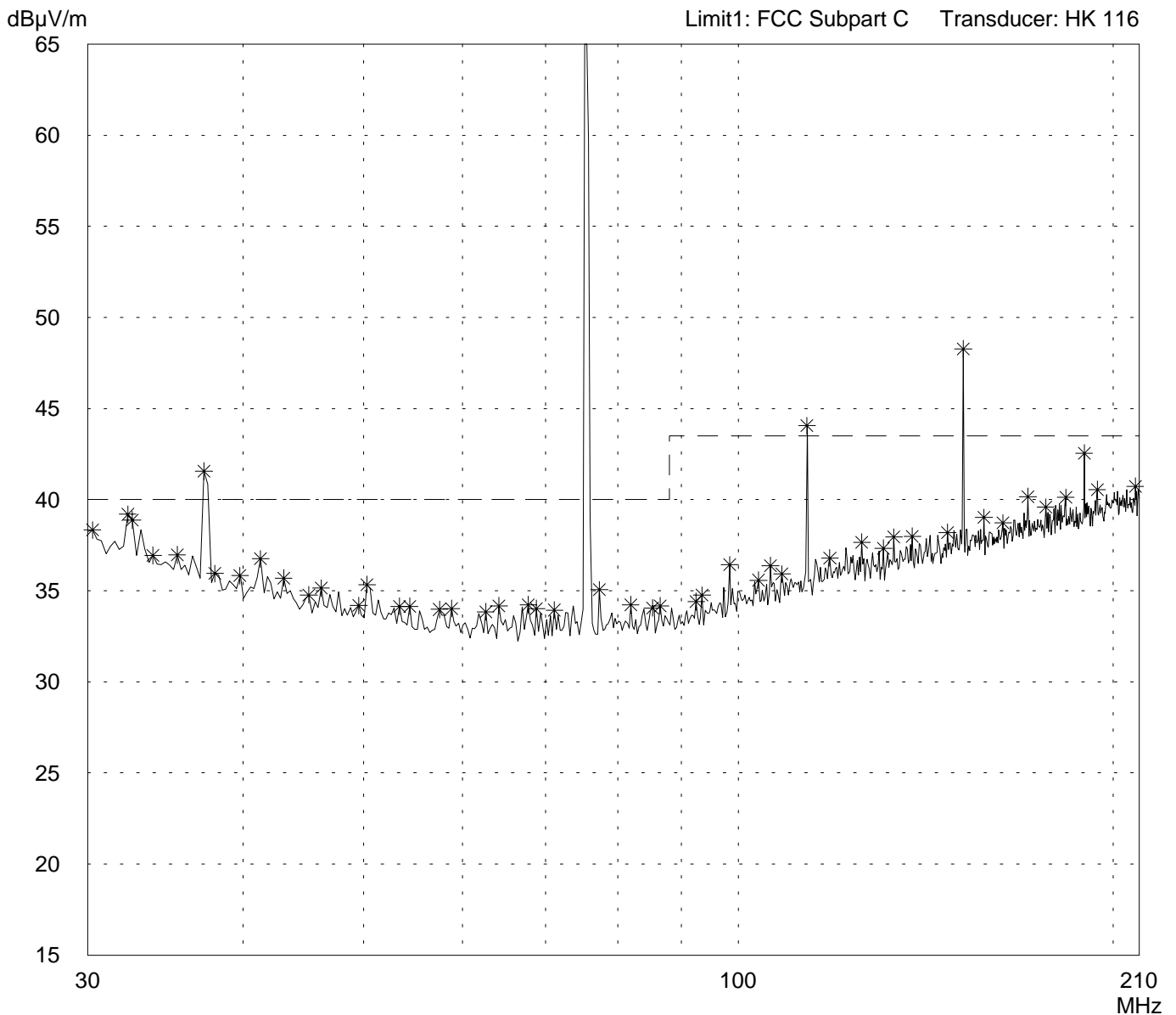
Radiated Emission Test 30 MHz - 210 MHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode:
- transmitting continuously (TX mode)
- with modulation
- with supply voltage 12 V DC
- antenna extended to maximum
- operating with f = 75.590 MHz
- EUT in vertical position, antenna to the top

Detector: Peak

List of values: 10 dB Margin	50 Subranges
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Result: Prescan

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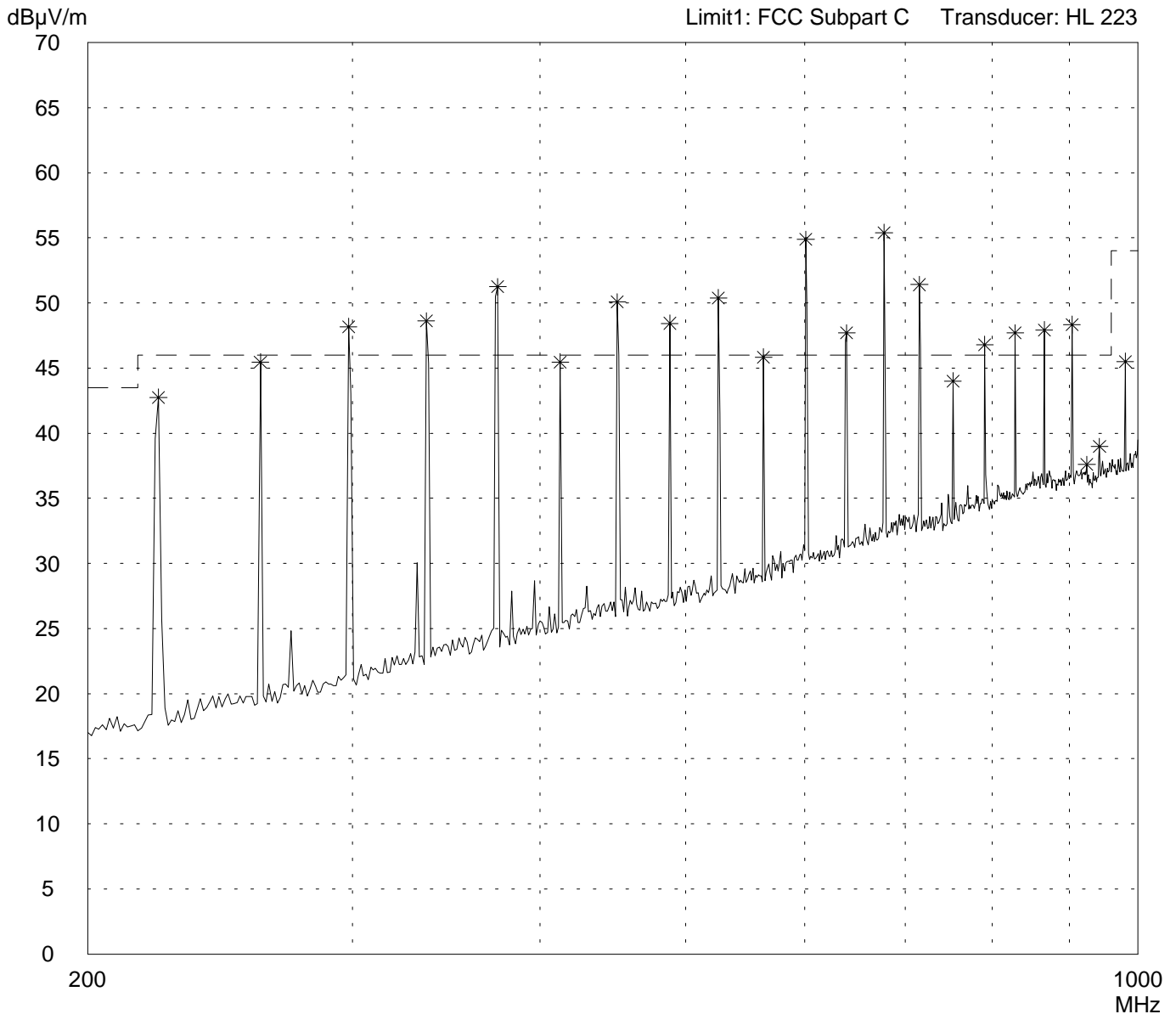
Radiated Emission Test 200 MHz - 1 GHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode:
- transmitting continuously (TX mode)
- with modulation
- with supply voltage 12 V DC
- antenna extended to maximum
- operating with f = 75.590 MHz
- EUT in vertical position, antenna to the top
Note: Highpass filter WHKS200-10SS used

Detector: Peak

List of values:
10 dB Margin 50 Subranges



Result: Prescan

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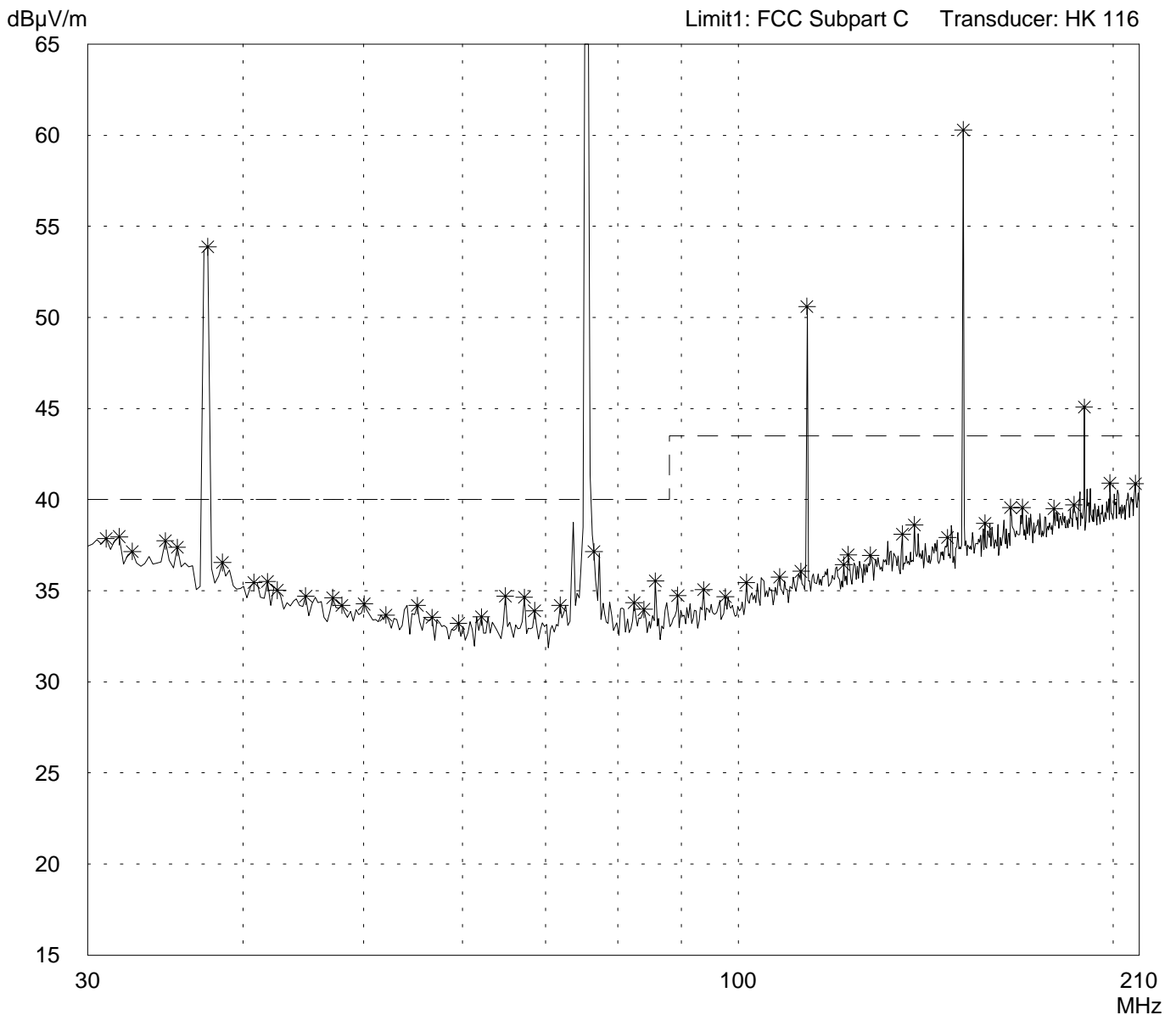
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Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode:
- transmitting continuously (TX mode)
- with modulation
- with supply voltage 12 V DC
- antenna extended to maximum
- operating with $f = 75.590$ MHz
- EUT in vertical position, antenna to the top

Detector: Peak

List of values:
10 dB Margin
50 Subranges



Result: Prescan

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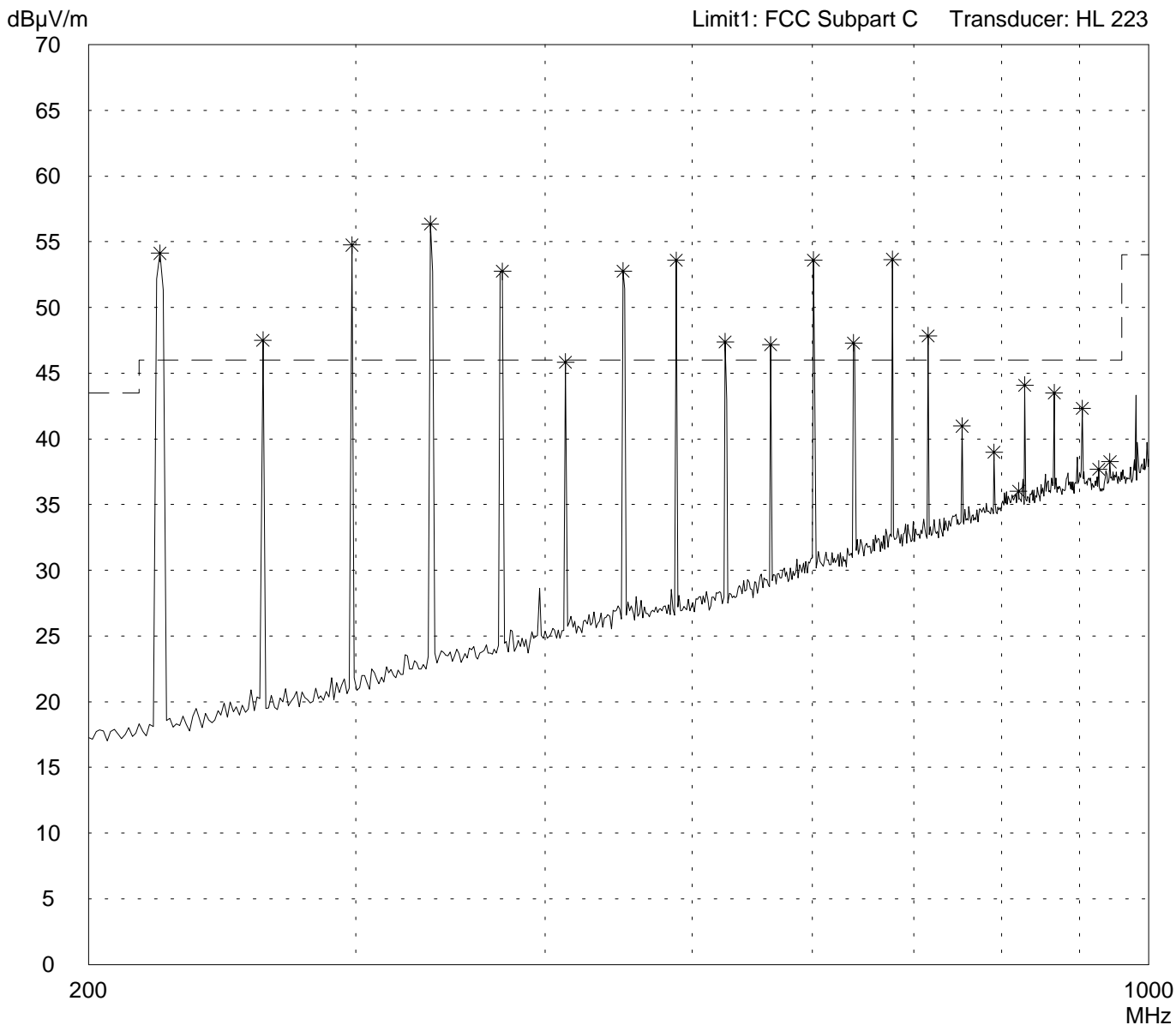
Radiated Emission Test 200 MHz - 1 GHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode: - transmitting continuously (TX mode) - with modulation - with supply voltage 12 V DC - antenna extended to maximum - operating with $f = 75.590$ MHz - EUT in vertical position, antenna to the top Note: Highpass filter WHKS200-10SS used

Detector: Peak

List of values: 10 dB Margin	50 Subranges
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Result: Prescan

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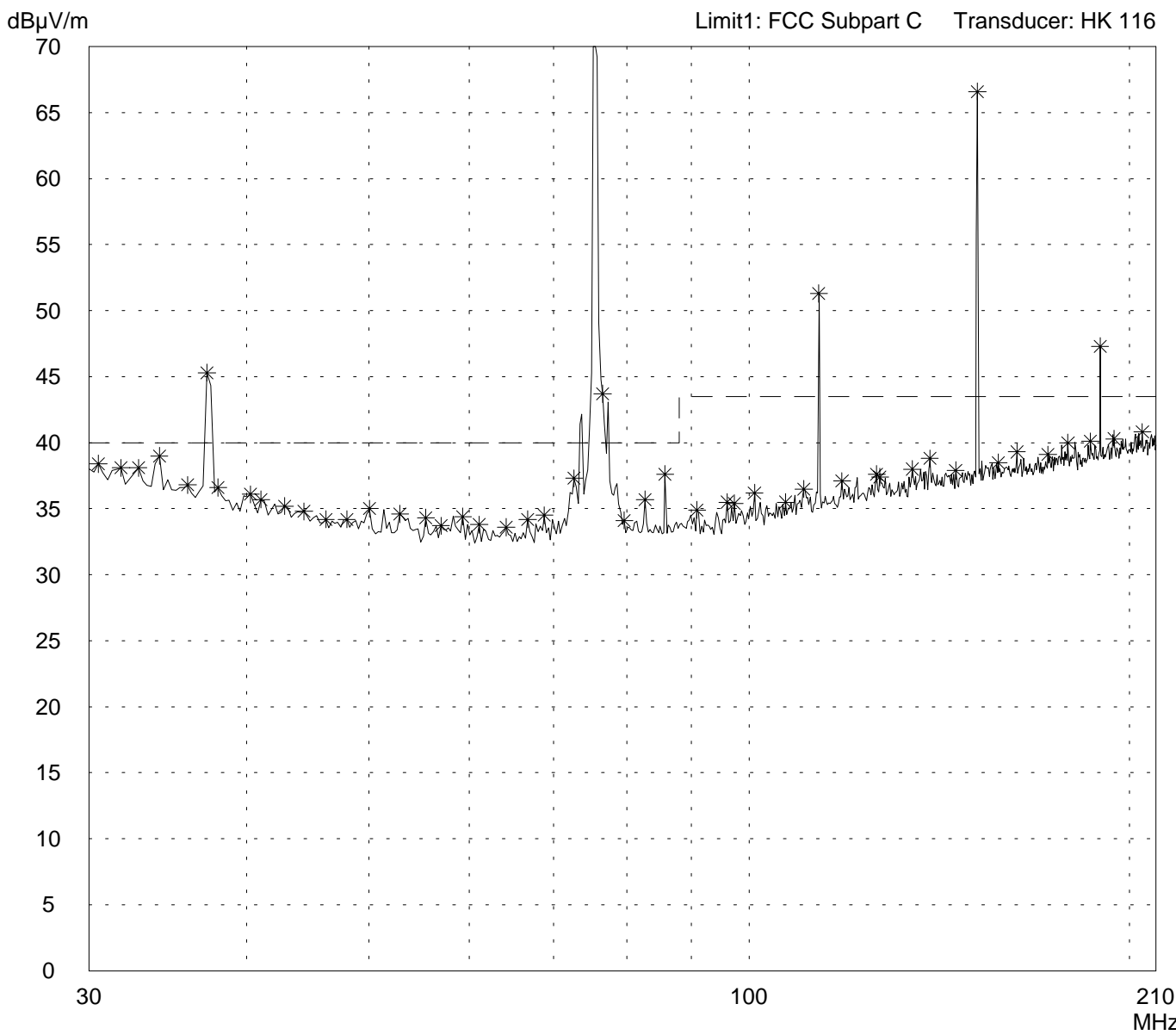
Radiated Emission Test 30 MHz - 210 MHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode:
- transmitting continuously (TX mode)
- with modulation
- with supply voltage 12 V DC
- antenna extended to maximum
- operating with f = 75.590 MHz
- EUT in horizontal position, antenna to right hand side

Detector: Peak

List of values:
10 dB Margin
50 Subranges



Result: Prescan

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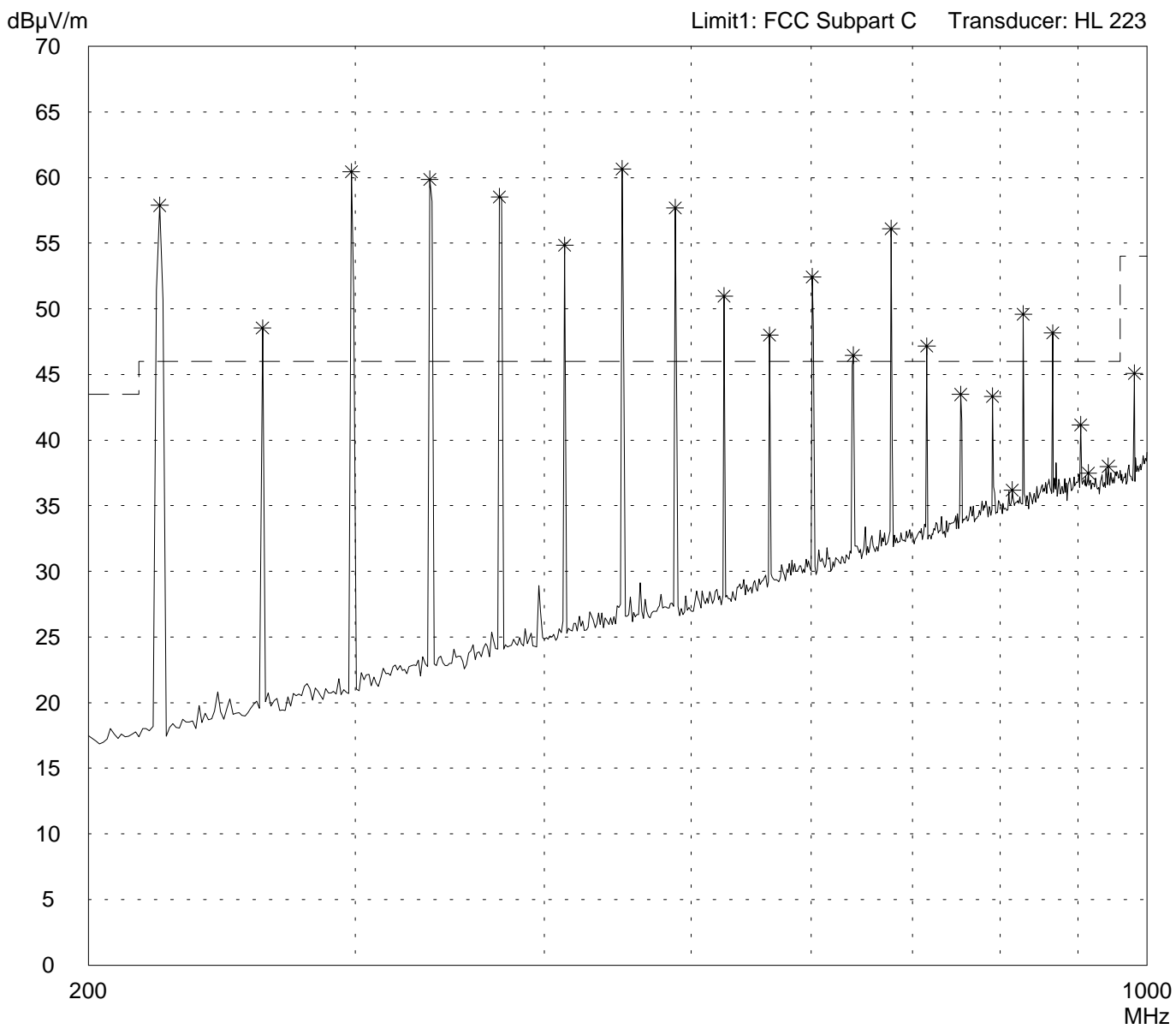
Radiated Emission Test 200 MHz - 1 GHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode:
- transmitting continuously (TX mode)
- with modulation
- with supply voltage 12 V DC
- antenna extended to maximum
- operating with f = 75.590 MHz
- EUT in horizontal position, antenna to right hand side
Note: Highpass filter WHKS200-10SS used

Detector: Peak

List of values:
10 dB Margin
50 Subranges



Result: Prescan

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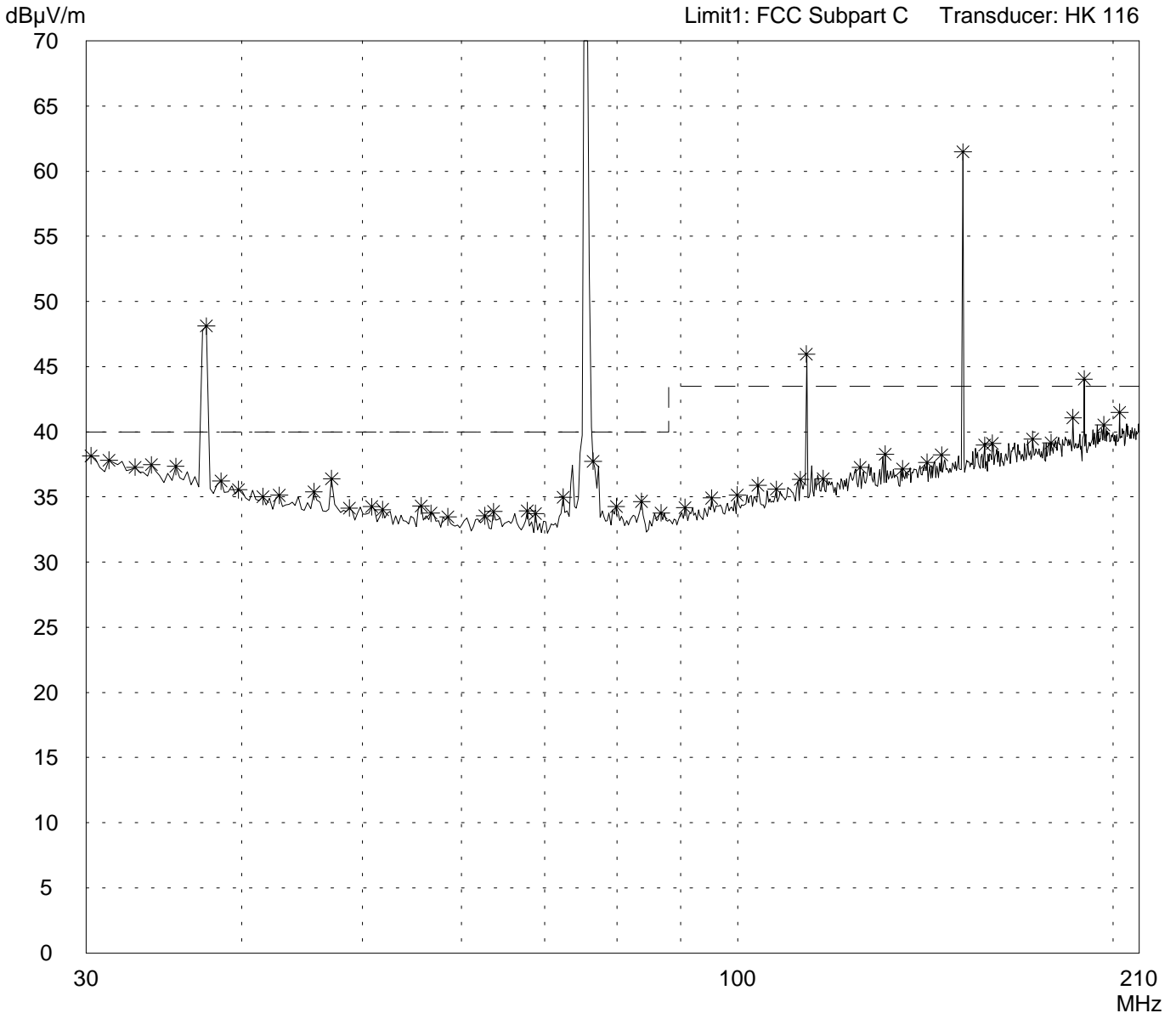
Radiated Emission Test 30 MHz - 210 MHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode:
- transmitting continuously (TX mode)
- with modulation
- with supply voltage 12 V DC
- antenna extended to maximum
- operating with f = 75.590 MHz
- EUT in horizontal position, antenna to right hand side

Detector: Peak

List of values:	50 Subranges
10 dB Margin	



Result: Prescan

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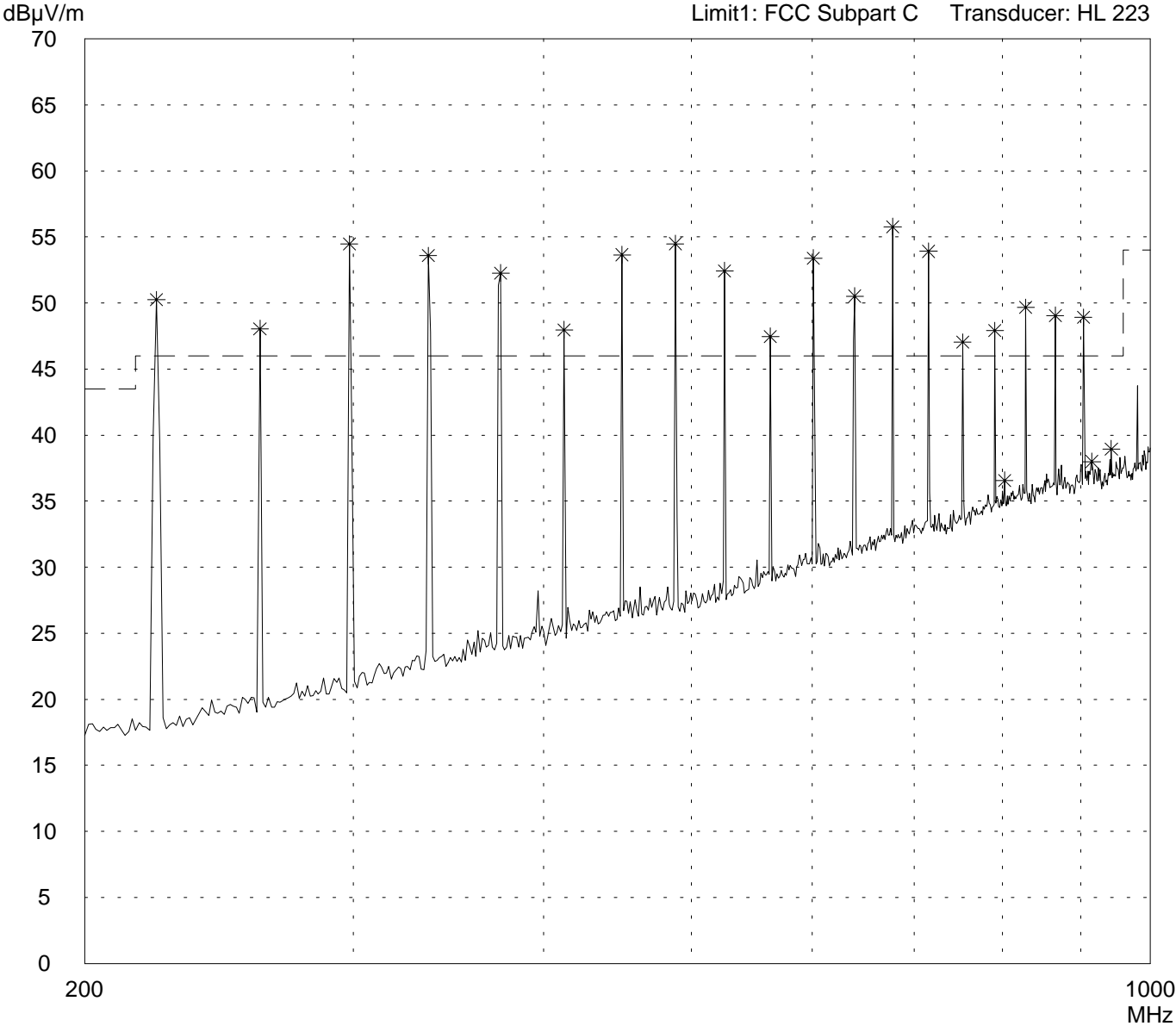
Radiated Emission Test 200 MHz - 1 GHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

<p>Mode:</p> <ul style="list-style-type: none"> - transmitting continuously (TX mode) - with modulation - with supply voltage 12 V DC - antenna extended to maximum <p>- operating with $f = 75.590$ MHz</p> <p>- EUT in horizontal position, antenna to right hand side</p> <p>Note: Highpass filter WHKS200-10SS used</p>
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Detector: Peak

List of values: 10 dB Margin	50 Subranges
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Result: Prescan

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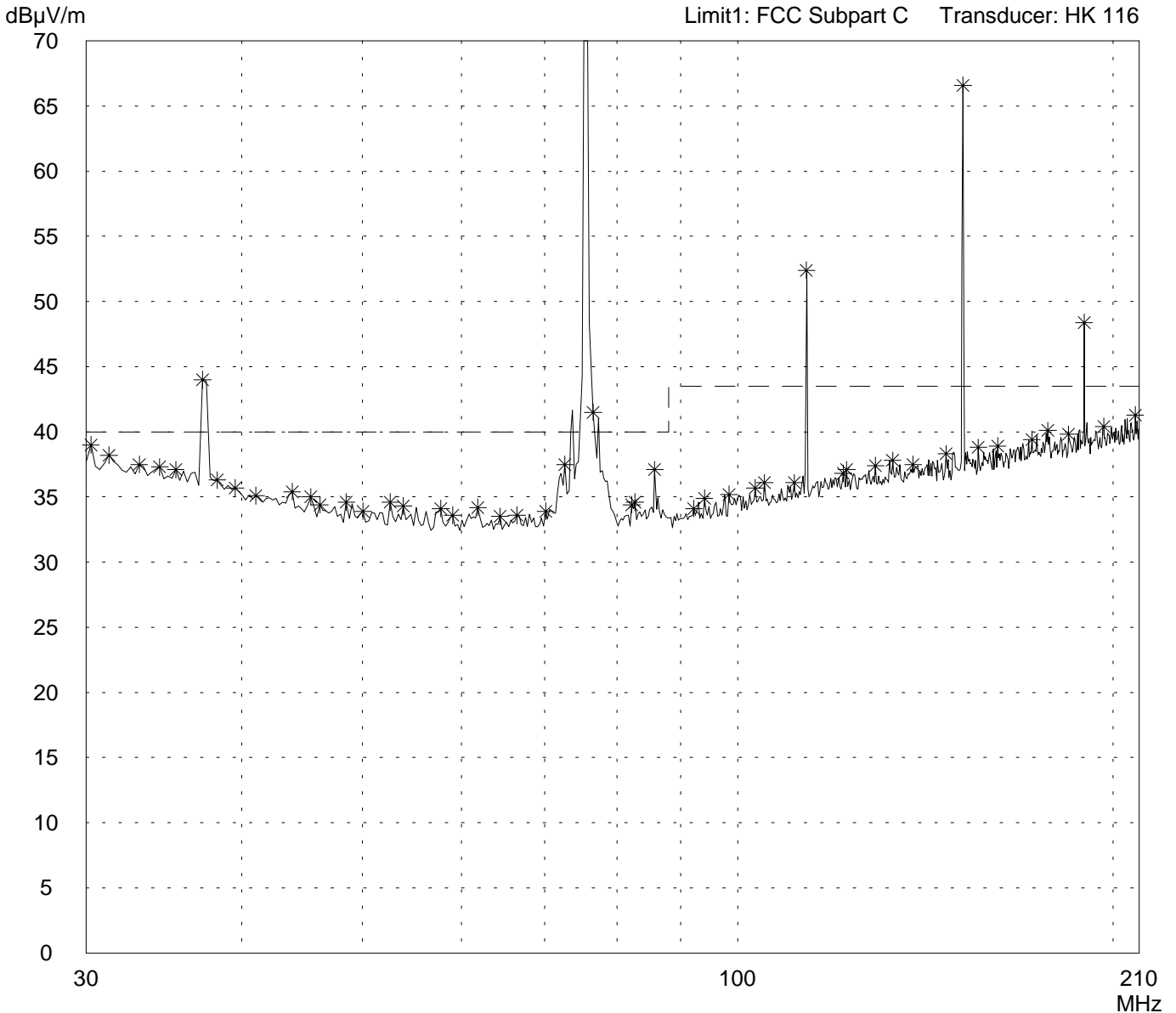
Radiated Emission Test 30 MHz - 210 MHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode:
- transmitting continuously (TX mode)
- with modulation
- with supply voltage 12 V DC
- antenna extended to maximum
- operating with f = 75.590 MHz
- EUT in horizontal position with back side on table

Detector: Peak

List of values:
10 dB Margin
50 Subranges



Result: Prescan

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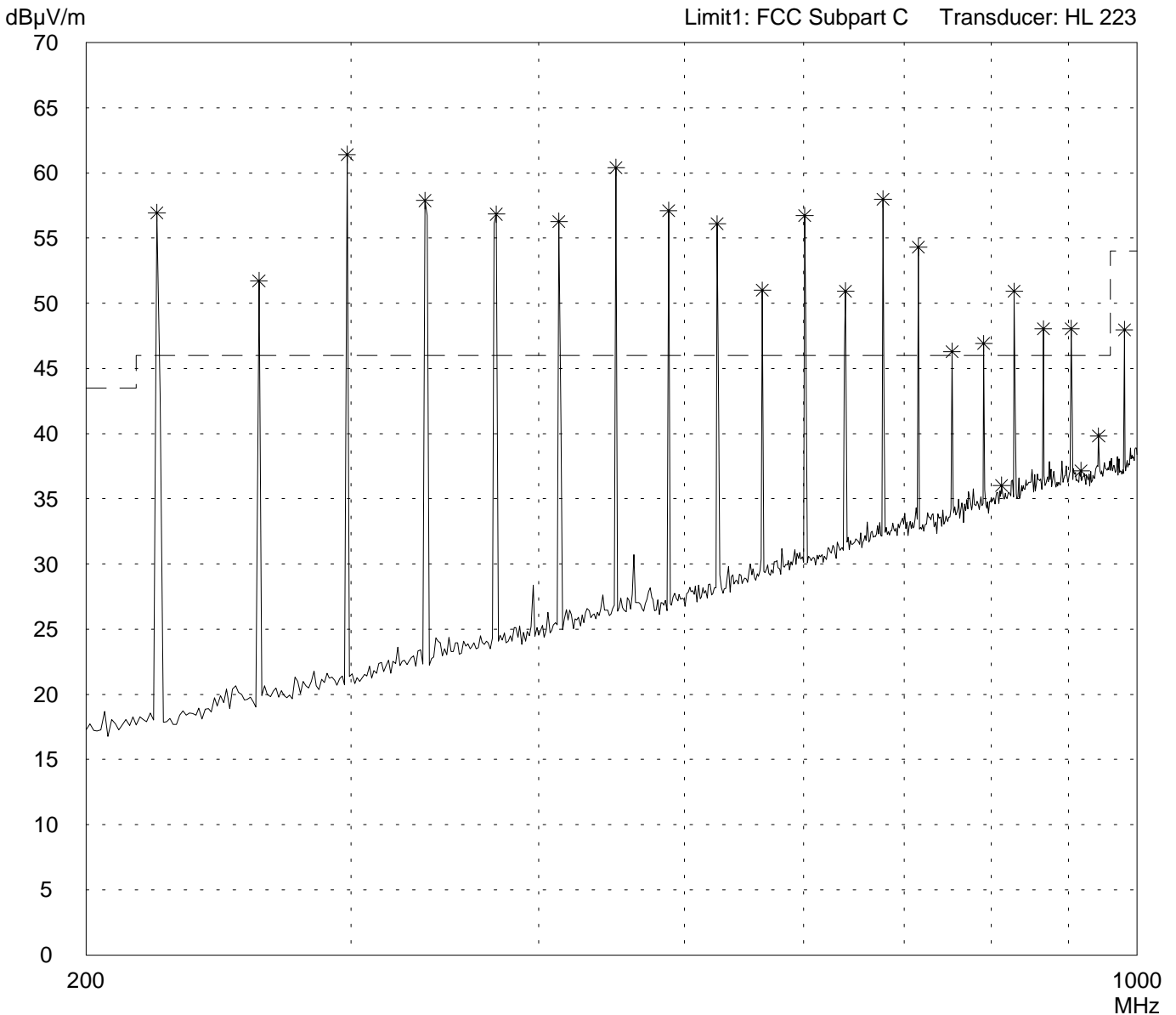
Radiated Emission Test 200 MHz - 1 GHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode: - transmitting continuously (TX mode) - with modulation - with supply voltage 12 V DC - antenna extended to maximum - operating with $f = 75.590$ MHz - EUT in horizontal position with back side on table Note: Highpass filter WHKS200-10SS used

Detector: Peak

List of values: 10 dB Margin	50 Subranges
---------------------------------	--------------



Result: Prescan

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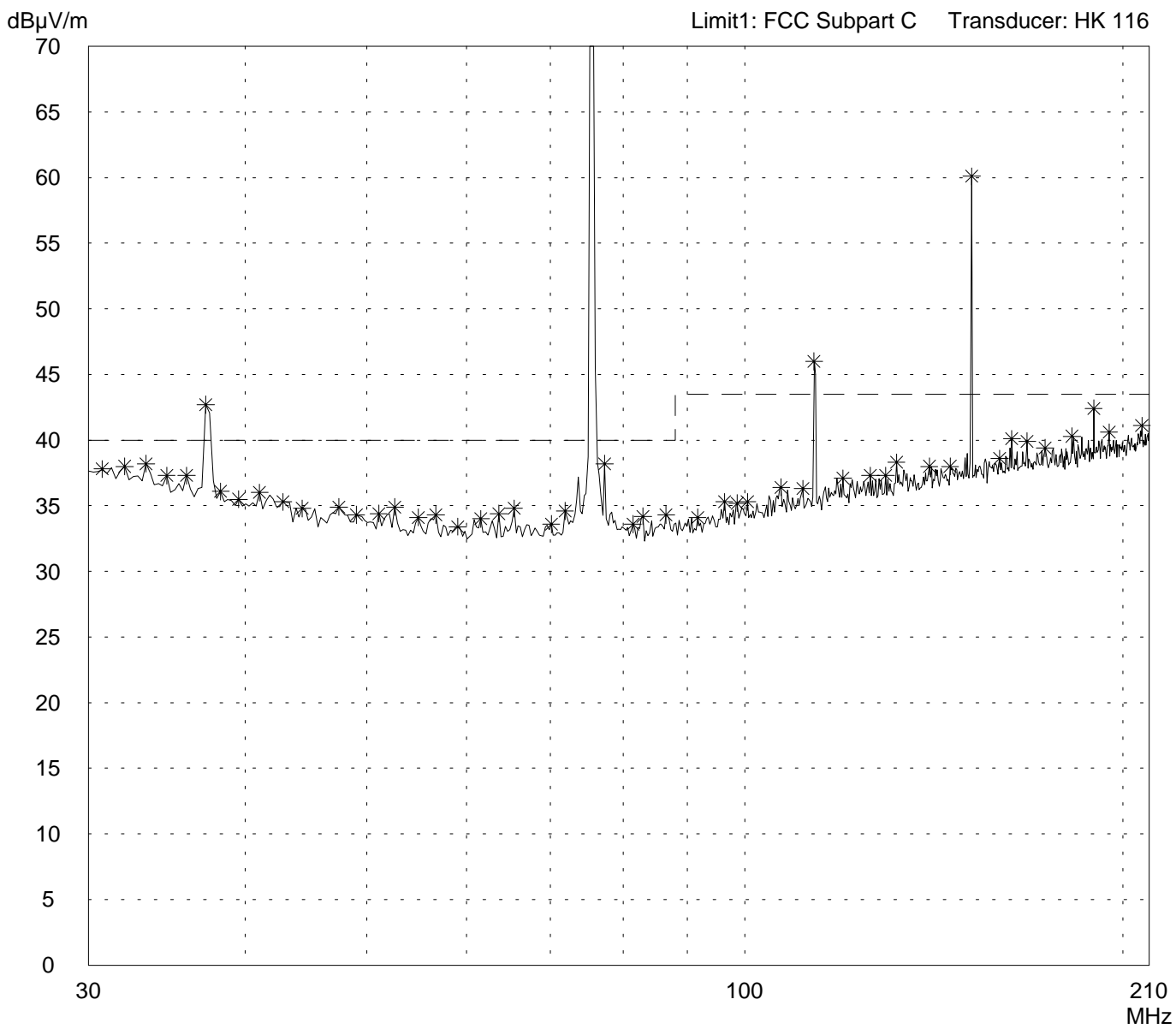
Radiated Emission Test 30 MHz - 210 MHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode:
- transmitting continuously (TX mode)
- with modulation
- with supply voltage 12 V DC
- antenna extended to maximum
- operating with f = 75.590 MHz
- EUT in horizontal position with back side on table

Detector: Peak

List of values:
10 dB Margin 50 Subranges



Result: Prescan

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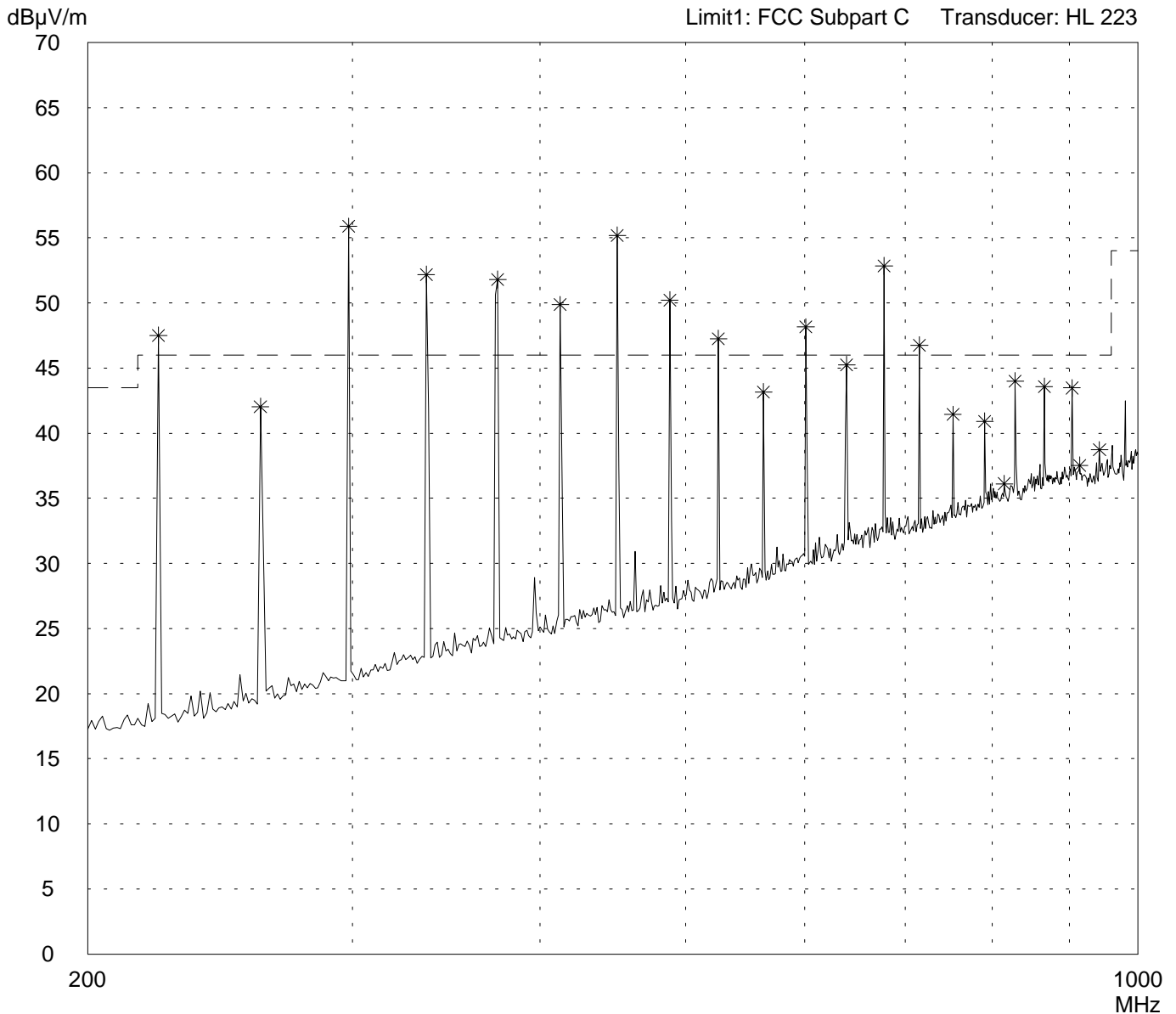
Radiated Emission Test 200 MHz - 1 GHz according to FCC Part 95 Subpart C/E

Model: T2PG75MHz	
Serial no.: Sample 2000.12.14	
Applicant: Futaba Corporation	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 01/08/2001	Operator: R. Heller
Test performed: automatically	File name:

Mode: - transmitting continuously (TX mode) - with modulation - with supply voltage 12 V DC - antenna extended to maximum - operating with $f = 75.590$ MHz - EUT in horizontal position with back side on table Note: Highpass filter WHKS200-10SS used

Detector: Peak

List of values: 10 dB Margin	50 Subranges
---------------------------------	--------------



Result: Prescan

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