



TTI-P-G166/98

Accredited Bluetooth Test Facility (BQTF)

**Addendum to
Test report no.: 2_2509-Pad/01
FCC Part 15.247
Toshiba Laptop TECRA 9000**

Table of Contents

1 General information

1.1 Notes

1.2 Testing laboratory

1.3 Details of applicant

1.4 Application details

1.5 Test item

1.6 Test standards

2 Technical test

2.1 Summary of test results

2.2 Test report

1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

1.2 Testing laboratory

CETECOM ICT Services GmbH

66117 Saarbrücken

Untertürkheimer Straße 6 - 10

Deutschland

Telephone : + 49 681 598 - 0

Telefax : + 49 681 598 - 9075

E-mail : info@ict.cetecom.de

Internet : www.cetecom.de

Accredited testing laboratory

DAR-registration number : TTI-P-G 166/98-30

1.3 Details of applicant

Name : Technology & Quality Management Division
Toshiba Corporation, Digital Media Network Company
Street : 1-1-1 Shibaura
City : Minarto-ku, Tokyo 198-8001
Country : Japan
Telephone : +81 (3) 3457 2565
Telefax : +81 (3) 5444 9404
Contact : Mr. Hideo Abe
Telephone : +81 (3) 3457 2565

1.4 Application details

Date of receipt of application : 05.02.02
Date of receipt of test item : 05.02.02
Date of test : 05.02.02

1.5 Test item

Type of equipment : **Laptop with integrated WLAN card and BLUETOOTH module**
Type designation : TECRA 9000
Manufacturer : - applicant -
Street :
City :
Country :
Serial number : MAC: 00022D4D002B

Additional informations:

Frequency : 2400 – 2483.5 MHz (here 2412 – 2462 MHz)
Type of modulation : 22M0P7D (DSSS) and 1M00FXD
Number of channels : 11 and 75
Antenna : integral antennas (dual band for WLAN, single band for Bluetooth)
Power supply : 3.3V DC powered by PC / Laptop and 5VDC via internal USB
Output power cond.max. : 81.3 mW and 1 mW
Type of equipment : Class B
Temperature range : +5°C - +35°C

1.6 Test standards: FCC Part 15 §15.247

2 Technical test

2.1 Summary of test results

This addendum was made to show that there are no additional spurious during the simultaneous use of both modules, WLAN and BLUETOOTH.

We use for the WLAN system a dual band film antenna, for BLUETOOTH a single band film antenna.

All measurement settings are according to FCC 15.35, 15.209, 15.247 and the „Guidance on measurement for DSSS systems“.

We use different settings if necessary to show compliance.

All other settings for RBW, VBW and sweep time are according to FCC requirements.

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

FINAL VERDICT: PASS

Technical responsibility for area of testing :

13.02.02 RSC 8412 Hausknecht

Date	Section	Name	Signature
------	---------	------	-----------

Technical responsibility for area of testing :

13.02.02 RSC8414 Ames

Date	Section	Name	Signature
------	---------	------	-----------

2.2 Testreport

TEST REPORT

report no. : 2-2509-Pad/01

TEST REPORT REFERENCE

LIST OF MEASUREMENTS

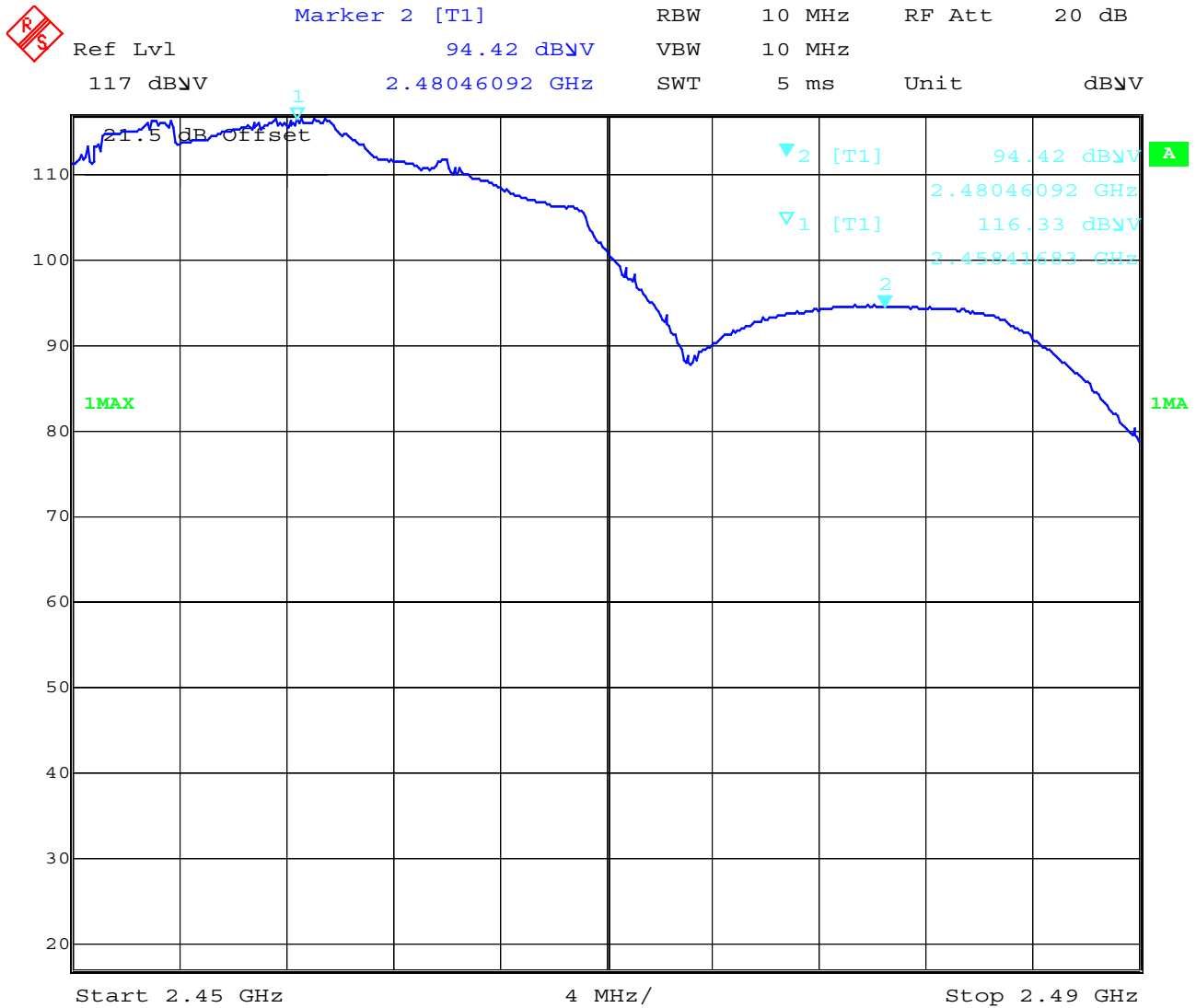
Paragraph	PARAMETER TO BE MEASURED	PAGE
	Transmitter parameters	
§ 15.247 (c)(1)	Emission limitations	7
	Test equipment listing	13
	Photographs of the equipment	15

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (1)

This plot shows the simultaneous transmission of BLUETOOTH and WLAN.

Here we show the PEAK power level of the simultaneous transmission.
We use 10 MHz RBW/VBW to set the analyzer level to the real value.

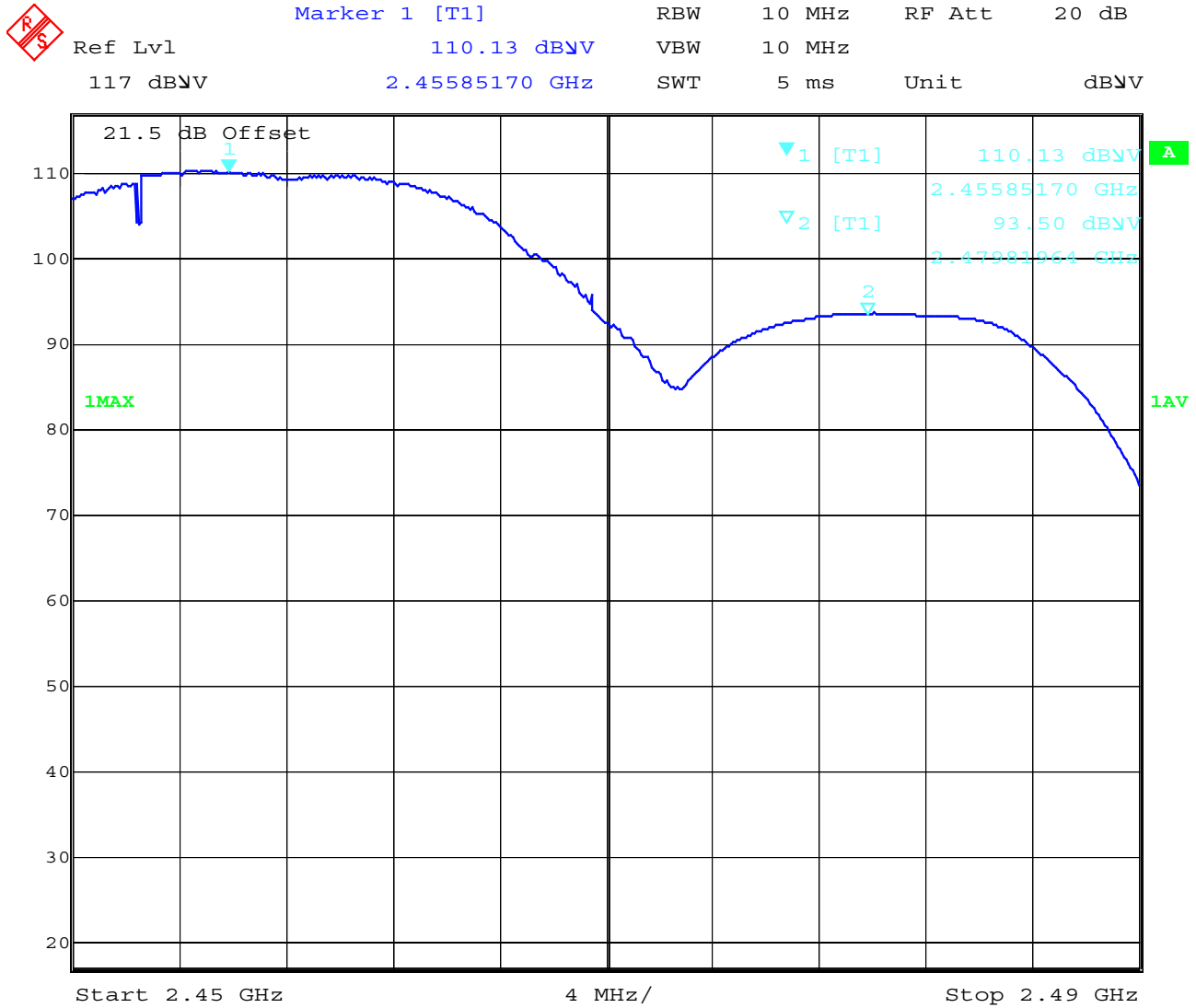


Date: 5.FEB.2002 11:27:28

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (1)

This plot shows the same frequencies with average detector.

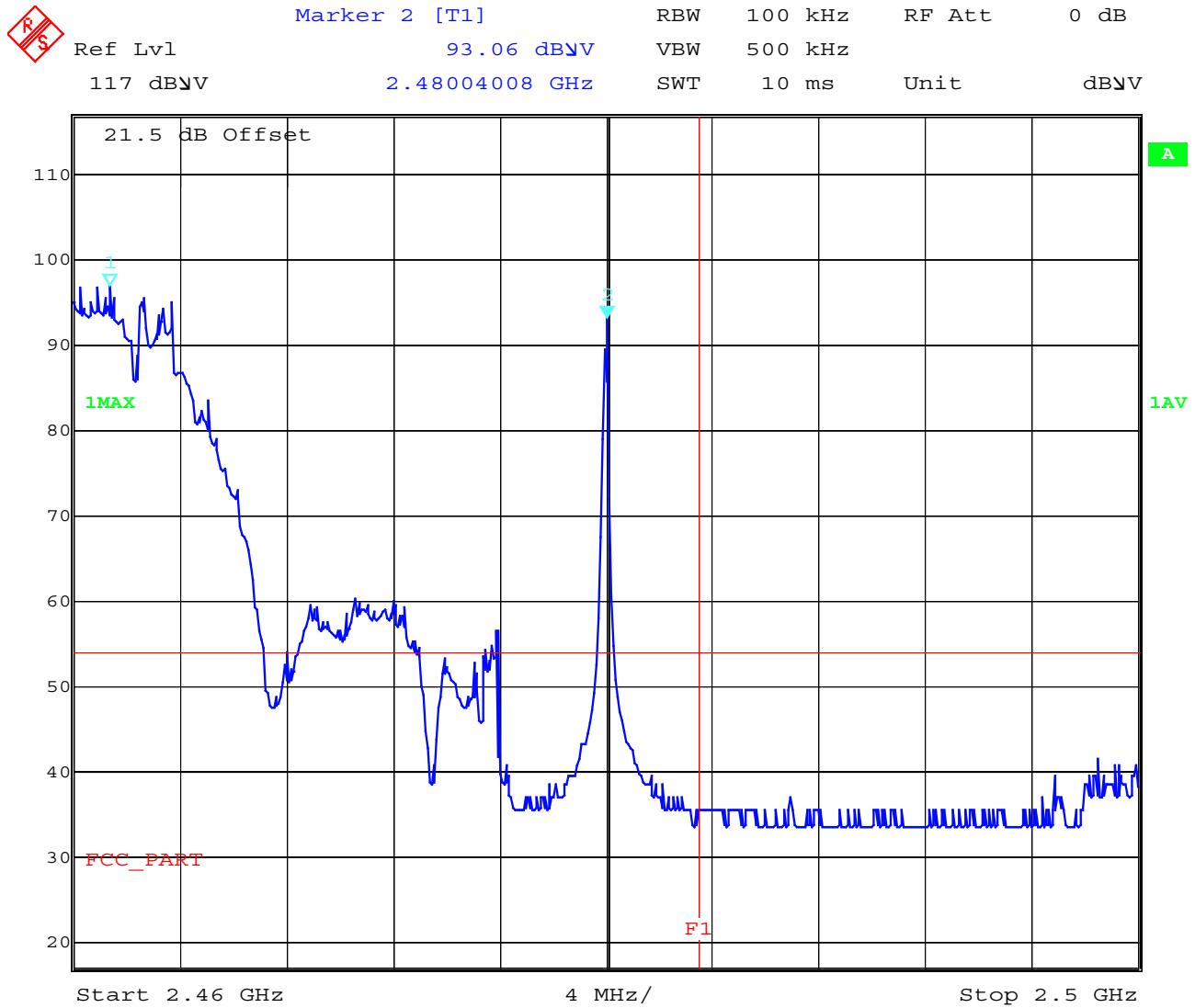


Date: 5.FEB.2002 11:29:01

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (1)

This plot shows the simultaneous transmission of BLUETOOTH and WLAN.



Date: 5.FEB.2002 11:41:44


The red horizontal line shows the limit for restricted bands. (54 dBµV/m)

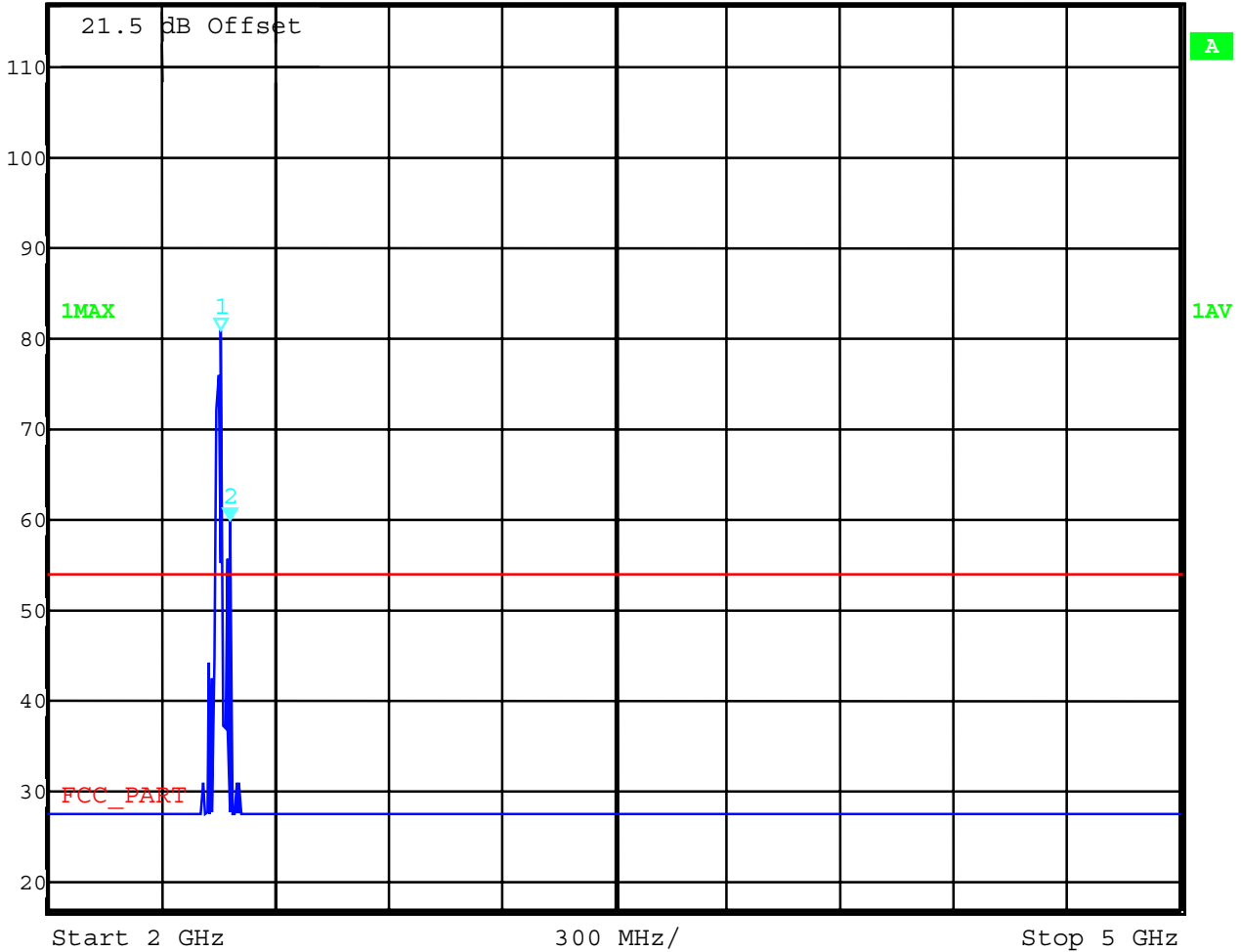
There is no problem with the restricted band above 2483.5 MHz.

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (1)

This plot shows the spectral behavior of the simultaneous transmission up to 5 GHz average.

 Marker 2 [T1] RBW 100 kHz RF Att 0 dB
Ref Lvl 59.92 dB Δ V VBW 500 kHz
117 dB Δ V 2.48096192 GHz SWT 760 ms Unit dB Δ V



Date: 5.FEB.2002 14:09:01

We use a small RBW/VBW to distinguish between the two signals (see marker 1 and 2)

EMISSION LIMITATIONS (Transmitter)

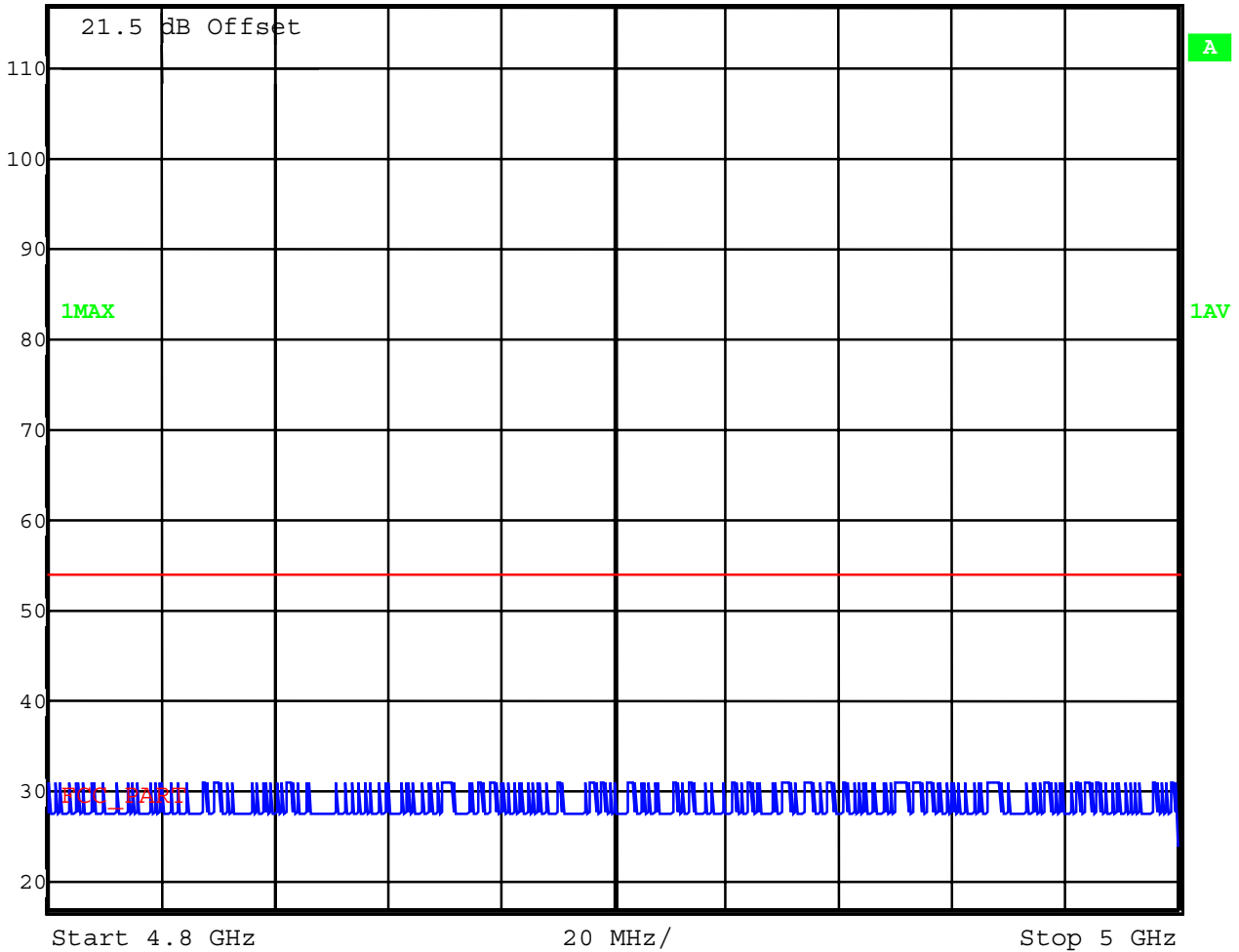
SUBCLAUSE § 15.247 (c) (1)

This is a plot of the range for the second harmonic.
No peaks found.



Ref Lvl
117 dB μ V

RBW 1 MHz RF Att 0 dB
VBW 1 MHz
SWT 5 s Unit dB μ V



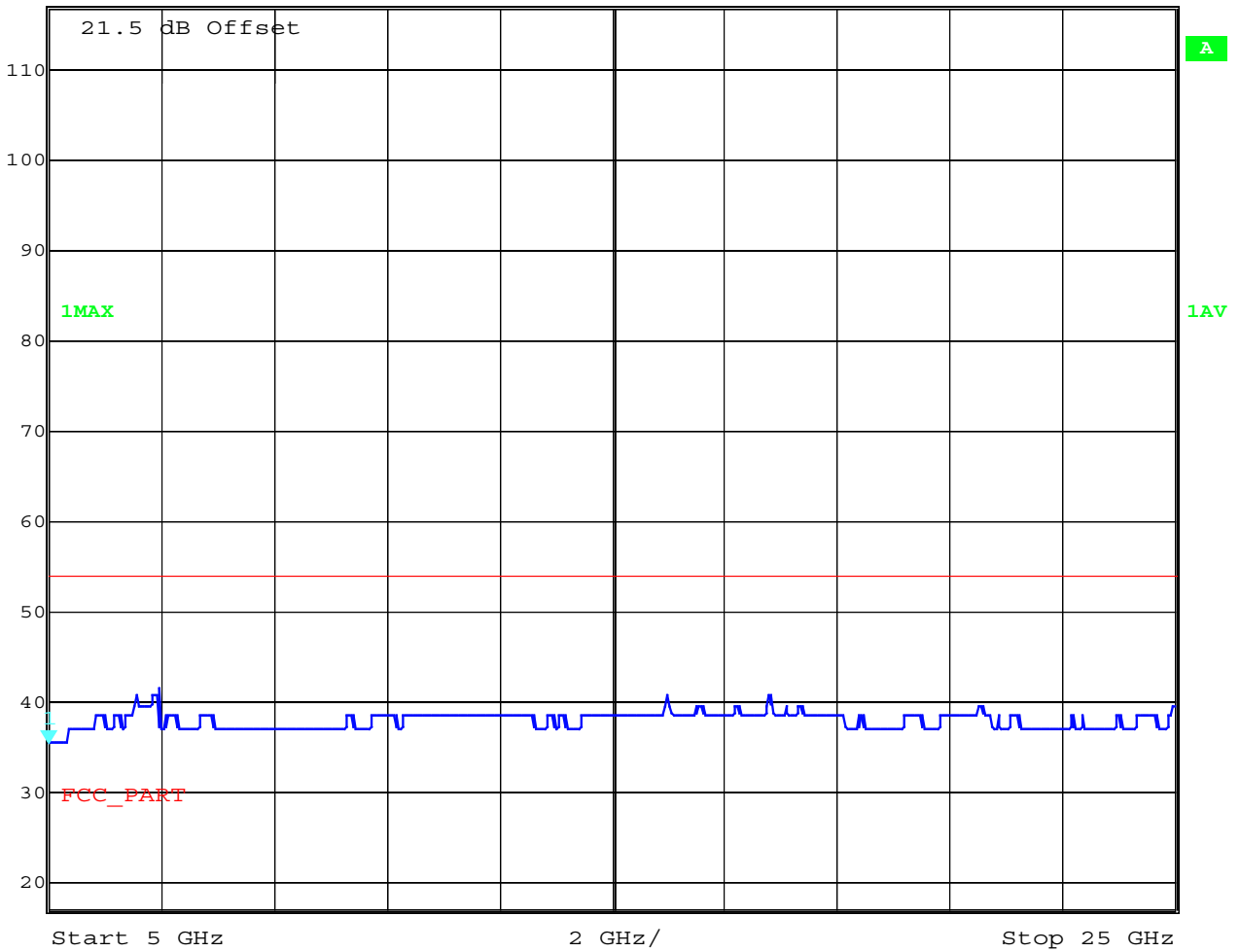
Date: 5.FEB.2002 14:10:19

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (1)

This is a plot of the frequency range up to 25 GHz.
No peaks found.

	Marker 1 [T1]	RBW	1 MHz	RF Att	0 dB
	Ref Lvl	35.41 dBµV	VBW	1 MHz	
	117 dBµV	5.00000000 GHz	SWT	5 s	Unit dBµV



Date: 5.FEB.2002 14:12:26

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860
03	Oscilloscope	7633	Tektronix	230054
04	Radio Analyzer	CMTA 54	Rohde & Schwarz	894 043/010
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012
08	Funktionsgenerator	AFGU	Rohde & Schwarz	862 480/032
09	Regeltrenntrafo	MPL	Erfi	91350
10	Netznachbildung	NNLA 8120	Schwarzbeck	8120331
11	Relais-Matrix	PSU	Rohde & Schwarz	893 285/020
12	Power-Meter	436 A	Hewlett-Packard	2101A12378
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616
15	Modulationsmeter	9008	Racal-Dana	2647
16	Frequenzzähler	5340 A	Hewlett-Packard	1532A03899
17	Absorber Schirmkabine	---	MWB	87400/002
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768
22	Biconical Antenne	3104	Emco	3758
23	Log. Per. Antenne	3146	Emco	2130
24	Double Ridge Horn	3115	Emco	3088
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008
27	Biconical Antenne	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenne	HL 223	Rohde & Schwarz	825 584/002
29	Relais-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Absorber Schirmkabine		Frankonia	
33	Steuerrechner	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Reciever	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Controler	HD 100	Deisel	100/322/93
37	Relais Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relais Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spektrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Meßempfänger	ESH 3	Rohde & Schwarz	890 174/002
43	Meßempfänger	ESVP	Rohde & Schwarz	891 752/005
44	Biconi Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011
45	Logper Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461
47	Logper Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002
48	Polarisationsnetzwerk	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridge G Horn Antenne 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105
51	Audio Analyzer	UPD	Rohde & Schwarz	1030.7500.04
52	Steuerrechner	PSM 7	Rohde & Schwarz	883 086/026
53	DC V-Netzwerk	ESH3-Z6	Rohde & Schwarz	861 406/005
54	DC V-Netzwerk	ESH3-Z6	Rohde & Schwarz	893 689/012
55	AC 2 Phasen V-Netzwerk	ESH3-Z5	Rohde & Schwarz	861 189/014
56	AC 2 Phasen V-Netzwerk	ESH3-Z5	Rohde & Schwarz	894 981/019
57	AC-3 Phasen V-Netzwerk	ESH2-Z5	Rohde & Schwarz	882 394/007
58	Stromversorgung	6032A	Rohde & Schwarz	2933A05441
59	HF-Test Empfänger	ESVP.52	Rohde & Schwarz	881 487/021
60	Spectrum Monitor	EZM	Rohde & Schwarz	883 086/026
61	HF-Test Empfänger	ESH3	Rohde & Schwarz	881 515/002
62	Relais Matrix	PSU	Rohde & Schwarz	882 943/029
63	Relais Matrix	PSU	Rohde & Schwarz	828 628/007
64	Spectrum Analyzer	FSIQ 26	Rohde & Schwarz	119.6001.27
67				