TÜV PRODUCT SERVICE

MEASUREMENT AND TECHNICAL REPORT

WIDCOMM, INC.
9645 Scranton Road, Suite 205
San Diego, CA 92121

DATE: 31 May 2001

This Report Concerns:	Original Grant: X		Class II Change:
Equipment Type:	Blue Connect, Model Blue Connect		

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?	Yes: **Defer until:**		No: X

Company Name **agrees to notify the Commission by:**	N/A

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37?	Yes:	No: X*

(*) FCC Part 15, Paragraphs 15.205; 15.209; 15.209(a); 15.247; 15.247(a)(1)(ii); 15.247(c)

Report Prepared by: **TÜV PRODUCT SERVICE**
10040 Mesa Rim Road
San Diego, CA 92121-2912
Phone: 858 546 3999
Fax: 858 546 0364

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1 GENERAL INFORMATION

1.1 Product Description

Form

EMC Test Plan and Constructional Data Form

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PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IN THE FIELD IS NO APPLICABLE.
Applicant -- NOTE: This information will be input into your test report as shown below

Company: Widcomm, Inc.

Address: 9645 Scranton Rd. #205

San Diego, CA 92121

Contact: Jeff Brayshaw   Position: Hardware Lead/Senior Staff Engineer

Phone: 858-795-3335   Fax: 858-457-5735

E-mail Address: jbrayshaw@widcomm.com

General Equipment Description – *NOTE: This information will be input into your test report as shown below.*

EUT Description: Bluetooth Network Access Point

EUT Name: Bluegate 1000

Model No.: Bluegate 1000   Serial No.: 378

Product Options: N/A

Configurations to be tested: Full operation with Ethernet active

Test Objective

☐ EMC Directive 89/336/EEC (EMC)   ☒ FCC: Class ☐ A ☒ B Part 15 __X__
Std: _____   ☐ VCCI: Class ☐ A ☐ B
☐ Machinery Directive 89/392/EEC (EMC)   ☐ BCIQ: Class ☐ A ☐ B
Std: _____   ☒ Canada: Class ☐ A ☒ B
☐ Medical Device Directive 93/42/EEC (EMC)   ☐ Australia: Class ☐ A ☐ B
Std: _____   ☐ Other: _____
☐ Vehicle Directive 72/245/EEC (EMC)
Std: _____
☐ FDA Reviewers Guidance for Premarket Notification Submissions (EMC)

Form

EMC Test Plan and Constructional Data Form

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TÜV Product Service Certification Requested

☐   Attestation of Conformity (AoC)   ☐   International EMC Mark (IEM)

☒   Certificate of Conformity (CoC)   ☒   Compliance Document

     Protection Class   (N/A for vehicles)   ☐   Class I   ☐   Class II   ☐   Class III

Attendance

Test will be: ☒   Attended by the customer   ☐   Unattended by the customer

Failure - *Complete this section if testing will not be attended by the customer.*

If a failure occurs, TUV Product Service should:

☐   Call contact listed above, if not available then stop testing.   (After hrs phone): _____

☒   Continue testing to complete test series.

☐   Continue testing to define corrective action.

☐   Stop testing.

EUT Specifications and Requirements

Length: _2.75"_   Width: _5.25"_   Height: _5"_   Weight: _0.975 lbs._

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: _6VDC_   (If battery powered, make sure battery life is sufficient to complete testing.)

\# of Phases: _single_

Current (Amps/phase(max)):   _1 amp_   Current (Amps/phase(nominal)):   _750mA_

Other: _DC Adapter is wall mount_

Other Special Requirements

Form

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Typical Installation and/or Operating Environment

Free standing desk or table top installation for industrial and small business use

EUT Power Cable					
☐ Permanent	OR	☒ Removable	Length (in meters):	2 meters typical
☐ Shielded	OR	☐ Unshielded		
☐ Not Applicable				

Form

EMC Test Plan and Constructional Data Form

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EUT Interface Ports and Cables												
Interface				Shielding								
Type	Analog	Digital	Qty	Yes	No	Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable	Permanent
EXAMPLE: *RS232*	☐	■	*2*	■	☐	*Foil over braid*	*Coaxial*	*Metallized 9-pin D-Sub*	*Characteristic Impedance*	*6*	■	☐
10/100 BaseT Ethernet	☐	☒		☐	☐	RJ45 Socket	CAT5	RJ45	100 Ohms	1m	☒	☐
DC Adapter	☒	☐		☐	☐	Two Wire with EMI Chip	Wire	Power Connector	6VDC Power	2m	☒	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
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	☐	☐		☐	☐						☐	☐

Form

EMC Test Plan and Constructional Data Form

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EUT Software .

Revision Level: BG1000_MB_REL_31.02.00

Description: Boot Code, Run Code, and Field Programmable Gate Array Image

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EUT Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing.
Consult with your TÜV Product Service Representative if additional assistance is required.

1.   Receive Mode: Channel Search and Ethernet Active

2.   Transmit Mode: Single Channel Hop { Low, Mid, High, or 1 of 79 channels }

3.   Transmit Mode: Full Hop on all channels

EUT System Components -- List and describe all components which are part of the EUT. For FCC testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc.)

Description	Model #	Serial #	FCC ID #
1 meter CAT 5 Cable	N/A	N/A	N/A
Wall Mount DC Adapter(ITE)	ACMN-33	N/A	N/A

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Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)			
Description	Model #	Serial #	FCC ID #
Toshiba Laptop	PT8100	60752144U	CJ6PN-27805-M5-E
Interface Adapter	Test Card	N/A	N/A

Oscillator Frequencies			
Frequency	Derived Frequency	Component # / Location	Description of Use
16MHz		Y1	Crystal
50MHz		U3	MPU
10.000MHz		Y2	TCXO

Power Supply			
Manufacturer	Model #	Serial #	Type
ITE	ACMN-23	N/A	☒ Switched-mode: (Frequency) 100kHz ☐ Linear ☐ Other:
			☐ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other:

Form

EMC Test Plan and Constructional Data Form

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Power Line Filters		
Manufacturer	*Model #*	*Location in EUT*

N/A

Critical EMI Components (Capacitors, ferrites, etc.)				
Description	*Manufacturer*	*Part # or Value*	*Qty*	*Component # / Location*
DC Adaptor Ferrite	Fair-Rite	0431164281	1	2" from power connector

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

Internal Shields and external Ferrite used on DC adaptor

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1 GENERAL INFORMATION (continued)

1.2 Related Submittal/Grant

None

1.3 Tested System Details

The FCC IDs for all equipment, plus descriptions of all cables used in the tested system are:

None

1.4 Test Methodology

Purpose of Test: To demonstrate compliance with the ANSI C63.4 setup.

Test Performed: X   1. Conducted Emissions, FCC Part 15, Paragraph 15.107(a); 15.247(a)(1)(ii); 15.247(c)
2. Radiated Emissions EN55022: 1992 Class B limit, 30 - 1,000 MHz, 10 meters
X   3. Radiated Emission per FCC Part 15, Paragraphs 15.109(a); 15.205; 15.209(a); and 15.247
4. Engineering evaluations
5. Frequency Stability, Part 2, Paragraph 2.995, and Part 87, Paragraph 87.133
X   6. RF Output Power, Part 2, Paragraph 2.1046

Both Conducted and radiated testing were performed according to the procedures in FCC/ANSI C63.4 and CSA 108.8 - M1983. Radiated testing was performed at an antenna-to-EUT distance of 3 meters (1 - 10 GHz).

1.5 Test Facility

The open area test site and conducted measurement data were tested by:

TÜV PRODUCT SERVICE
10040 Mesa Rim Road
San Diego, CA 92121-2912
Phone: 858 546 3999
Fax: 858 546 0364

The Test Site Data and performance comply with ANSI 63.4 and are registered with the FCC, 7435 Oakland Mills Rd, Columbia Maryland 21046. All Measurement Data is acquired according to the content of FCC Measurement Procedure and ANSI C63.4, unless supplemented with additional requirements as noted in the test report.

1.6 Part 2 Information

Direct sequence spread spectrum - N/A
Scanning receivers - N/A
59 - 64 GHz transmitters - N/A
Tune-up procedure - N/A

2. SYSTEM TEST CONFIGURATION

2.1   Justification

The EUT was initially tested for FCC emission in the following configuration:

See Block Diagram.

2.2   EUT Exercise Software

None

2.3   Special Accessories

None

2.4   Modification

None

2.5   Configuration of Tested System

See Block Diagram.

3   RADIATED EMISSION EQUIPMENT/DATA

The following data lists the significant emission frequencies, measured levels, correction factor (which includes cable and antenna corrections), the corrected reading, and the limit.

See following page(s).

See test setup photos for radiated emissions test setup.

REPORT No sc103413   TESTER: Rodel Resolme   SPEC: FCC Part 15 para *15.205, 15.209 & 15.247*

CUSTOMER Widcomm   TEST DIST: 3 Meters

E U T: Bluegate 1000 SN:378   TEST SITE: Roof

EUT MODE: Transmit mode   BICONICAL: N/A

DATE: May 21, 2001   LOG: N/A

NOTES: Duty Cycle= 100%   OTHER: 251
above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG
below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

v.beta1a

FREQ (MHz)	VERTICAL (dBuv) av	pk	HORIZONTAL (dBuv) pk	av	CF (dB/m)	MAX LEVEL (dBuV/m) pk	av	SPEC LIMIT (dBuV/m) pk	av	MARGIN (dB) av	pk	EUT Rotation	Antenna Height	Notes
2480	119.1	71.9	116	70.4	-4.6	114.5	67.3	74	54	40.51	13.3	238	1	high
4960	48.3	36.3	49.7	35.5	0.6	50.3	36.9	74	54	-23.7	-17.1	250	1	
7440	38.8	31.2	44.8	31.8	8.3	53.1	40.1	74	54	-20.9	-13.9	205	1.5	
9920	40.2	30.1	38.7	31.9	10.3	50.5	42.2	74	54	-23.5	-11.8			
2402	118.4	71.3	117.4	70	-5.0	113.4	66.3	74	54	39.45	12.3	119	1.5	Low
4804	50	37.1	49.2	36.7	0.2	50.2	37.3	74	54	-23.8	-16.7	209	1	
7206	44.7	32.5	44.2	31.7	7.8	52.5	40.3	74	54	-21.5	-13.7	207	1	
9608	41.7	30.3	40.8	30.3	9.9	51.6	40.2	74	54	-22.4	-13.8			
2436	118.7	71.9	117.1	71.4	-4.8	113.9	67.1	74	54	39.91	13.1	242	1.5	Mid
4872	46.4	35.4	46.4	35.4	0.4	46.8	35.8	74	54	-27.2	-18.2	140	1.5	
7308	41.3	31	47.3	34.6	8.0	55.3	42.6	74	54	-18.7	-11.4	249	1.5	
9744	41.7	30.3	40.9	32.3	10.0	51.7	42.3	74	54	-22.3	-11.7			

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REPORT No: sc103413   TESTER: Rodel Resolme   SPEC: FCC Part 15 para 15.209(a)

CUSTOMER: Widcomm   TEST DIST: 3 Meters

E U T: Bluegate 1000   TEST SITE: Roof

EUT MODE: Receive mode   BICONICAL: N/A

DATE: May 21, 2001   LOG: N/A

NOTES: Duty Cycle=   100%   OTHER: 251
             above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG
             below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

v.beta1a

FREQ (MHz)	VERTICAL (dBuv)		HORIZONTAL (dBuv)		CF (dB/m)	MAX LEVEL (dBuV/m)		SPEC LIMIT (dBuV/m)		MARGIN (dB)		EUT Rotation	Antenna Height
	av	pk	pk	av		pk	av	pk	av	pk	av		
1200	44.4	36.8	45.9	35.7	-12.5	33.4	24.3	74	54	-40.6	-29.7	228	1.5
2435	71.3	39.8	59	35.1	-4.8	66.5	35.0	74	54	-7.5	-19	312	1.2
3600	43	33.4	44.6	34.1	-0.7	43.9	33.4	74	54	-30.1	-20.6	0	1
4800	45.5	35.1	45	35	0.2	45.7	35.3	74	54	-28.3	-18.7	0	1

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REPORT NO: sc103413   SPEC: FCC Part 15 para 15.109(a)
COMPANY: Widcomm
EUT: Bluegate 1000 SN: 378
EUT MODE: Receive Mode
DATE: 17-May-01   TESTED BY: Rodel Resolme   TEST DISTANCE: 3 Meters

FREQUENCY (MHz)

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REPORT No: sc103413

SPEC: FCC Part 15 para 15.109(a)

CUSTOMER: Widcomm

TEST DIST: 3 Meters

E U T: Bluegate 1000 SN: 378

TEST SITE: 2

EUT MODE: Receive Mode

BICONICAL: 738

DATE: 17-May-01   TESTED BY: Rodel Resolme

LOG PERIODIC: 738

NOTES: Quasi-Peak with 120 KHz measurement bandwidth.

RCVR: 427

115VAC 60Hz

Temperature: 22   Relative Humidity: 50

EUT MARGIN   -0.4   dB at 528 MHz

ver 1.8

FREQUENCY (MHz)	VERTICAL measured (dBuv)	HORIZONTAL measured (dBuV)	CORRECTION FACTOR (dB/m)	MAXIMUM CORRECTED (dBuV/m)	SPECIFIED LIMIT (dBuV/m)	EUT MARGIN (dB)	EUT ROTATION (degrees)	ANTENNA HEIGHT (meters)
32.00	7	2.1	20.2	27.2	40	-12.8	0	1
40.00	4	2.3	19.3	23.3	40	-16.7	18	1
48.00	5	2.4	17.6	22.6	40	-17.4	50	1
50.00	4.6	1.6	17.2	21.8	40	-18.2	0	1
80.00	14.1	13.4	9.2	23.3	40	-16.7	125	1
112.00	15.1	8.5	13.7	28.8	43.5	-14.7	167	1
120.00	17.1	11.2	14.4	31.5	43.5	-12.0	200	1
128.00	15.8	15.6	13.9	29.7	43.5	-13.8	86	2.2
144.00	17.1	12.2	12.0	29.1	43.5	-14.4	199	1
150.00	15.6	10.7	11.4	27.0	43.5	-16.5	173	1
160.00	22.6	20.1	11.4	34.0	43.5	-9.5	337	1
176.00	11.6	11.7	12.2	23.9	43.5	-19.6	100	1.4
180.00	11.6	10.5	12.2	23.8	43.5	-19.7	50	1
192.00	23.2	24.8	13.1	37.9	43.5	-5.6	77	1.2
200.00	16.6	19.4	13.8	33.2	43.5	-10.3	88	1.2
208.00	15.1	18.2	14.4	32.6	43.5	-10.9	98	1.3
224.00	20	19.9	15.5	35.5	46	-10.5	301	1
240.00	13.2	12.3	16.5	29.7	46	-16.3	56	1
250.00	19	16	16.9	35.9	46	-10.2	311	1
256.00	20.9	20	17.1	38.0	46	-8.0	308	1
350.00	5.1	11	19.1	30.1	46	-16.0	100	1
384.00	12.6	8.5	19.6	32.2	46	-13.8	72	1.3
390.00	8.5	6	19.8	28.3	46	-17.7	78	1.3
400.00	15.7	13.2	20.1	35.8	46	-10.2	82	1.2
416.00	15.4	8.3	21.0	36.4	46	-9.6	80	1.2
432.00	20	13	21.1	41.1	46	-4.9	101	1
448.00	17	5	21.5	38.5	46	-7.5	103	1.1
464.00	20.8	16.2	22.1	42.9	46	-3.1	105	1
480.00	18.5	17	22.3	40.8	46	-5.2	112	1
490.00	14.3	11.2	22.9	37.2	46	-8.8	110	1
496.00	20.4	17	23.3	43.7	46	-2.3	113	1
500.00	13.6	10.3	23.5	37.1	46	-8.9	349	1

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REPORT No: sc103413   SPEC: FCC Part 15 para 15.109(a)

CUSTOMER: Widcomm   TEST DIST: 3 Meters

E U T: Bluegate 1000 SN: 378   TEST SITE: 2

EUT MODE: Receive Mode   BICONICAL: 738

DATE: 17-May-01   TESTED BY: Rodel Resolme   LOG PERIODIC: 738

NOTES: Quasi-Peak with 120 KHz measurement bandwidth.   RCVR: 427
115VAC 60Hz

Temperature: 22   Relative Humidity: 50

EUT MARGIN   -0.4   dB at 528 MHz   ver 1.8

FREQUENCY (MHz)	VERTICAL measured (dBuv)	HORIZONTAL measured (dBuV)	CORRECTION FACTOR (dB/m)	MAXIMUM CORRECTED (dBuV/m)	SPECIFIED LIMIT (dBuV/m)	EUT MARGIN (dB)	EUT ROTATION (degrees)	ANTENNA HEIGHT (meters)
510.00	7.2	5.7	23.8	**31.0**	46	-15.0	107	1
512.00	18	14.3	23.9	**41.9**	46	-4.1	110	1
518.00	13.5	8.3	24.0	**37.5**	46	-8.5	108	1
522.00	15.1	6.7	24.1	**39.2**	46	-6.8	105	1
528.00	21.4	17.6	24.2	**45.6**	46	-0.4	104	1
530.00	10.2	6.3	24.3	**34.5**	46	-11.6	246	1
534.00	16.2	11.3	24.3	**40.5**	46	-5.5	103	1
544.00	18	13	24.4	**42.4**	46	-3.6	104	1
560.00	20.2	14.7	24.3	**44.5**	46	-1.5	95	1
576.00	12.8	12.3	25.1	**37.9**	46	-8.1	96	1
590.00	11.4	8.8	25.4	**36.8**	46	-9.2	89	1
592.00	13.1	10.4	25.4	**38.5**	46	-7.5	85	1
800.00	12.4	15.3	29.5	**44.8**	46	-1.2	259	1

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REPORT NO:sc103413   SPEC: FCC Part 15 para 15.109(a)
COMPANY:Widcomm
EUTBluegate 1000 SN: 378
EUT MODE:Transmit Mode
DATE17-May-01   TESTED BY: Rodel Resolme   TEST DISTANCE: 3 Meters

FREQUENCY (MHz)

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REPORT No: sc103413	SPEC: FCC Part 15 para 15.109(a)

REPORT No: sc103413   SPEC: FCC Part 15 para 15.109(a)

CUSTOMER: Widcomm   TEST DIST: 3 Meters

E U T: Bluegate 1000 SN: 378   TEST SITE: 2

EUT MODE: Transmit Mode   BICONICAL: 738

DATE: 17-May-01   TESTED BY: Rodel Resolme   LOG PERIODIC: 738

NOTES: Quasi-Peak with 120 KHz measurement bandwidth.   RCVR: 427

115VAC 60Hz

Temperature: 28   Relative Humidity: 40

EUT MARGIN -0.3 dB at 528 MHz   ver 1.8

FREQUENCY (MHz)	VERTICAL measured (dBuv)	HORIZONTAL measured (dBuV)	CORRECTION FACTOR (dB/m)	MAXIMUM CORRECTED (dBuV/m)	SPECIFIED LIMIT (dBuV/m)	EUT MARGIN (dB)	EUT ROTATION (degrees)	ANTENNA HEIGHT (meters)
32.00	7.3	3	20.2	27.5	40	-12.5	0	1
40.00	4	2.4	19.3	23.3	40	-16.7	18	1
48.00	4.9	2.4	17.6	22.5	40	-17.5	50	1
50.00	5.5	2.4	17.2	22.7	40	-17.3	0	1
80.00	9.8	5	9.2	19.0	40	-21.0	147	1
112.00	19.4	9	13.7	33.1	43.5	-10.4	164	1
120.00	17.5	12	14.4	31.9	43.5	-11.6	200	1
128.00	18.3	15.2	13.9	32.2	43.5	-11.3	179	1
144.00	18.1	12.4	12.0	30.1	43.5	-13.4	225	1
150.00	16.5	10.6	11.4	27.9	43.5	-15.6	159	1
160.00	22.4	20.2	11.4	33.8	43.5	-9.7	350	1
176.00	12.2	13.8	12.2	26.0	43.5	-17.5	88	1.4
180.00	10.6	9	12.2	22.8	43.5	-20.7	171	1
192.00	22.9	23.4	13.1	36.5	43.5	-7.0	98	1.7
200.00	13	14.4	13.8	28.2	43.5	-15.3	95	1
208.00	19.4	22.6	14.4	37.0	43.5	-6.5	95	1.4
224.00	19.4	21.4	15.5	36.9	46	-9.1	121	1.3
240.00	13	15.7	16.5	32.2	46	-13.8	107	1
250.00	15	14	16.9	31.9	46	-14.2	300	1
256.00	16.8	18	17.1	35.1	46	-10.9	93	1
350.00	5	9.5	19.1	28.6	46	-17.5	100	1
384.00	10.3	10.7	19.6	30.3	46	-15.7	237	1
390.00	6	2	19.8	25.8	46	-20.2	0	1
400.00	14	10.6	20.1	34.1	46	-11.9	183	1.2
416.00	14.4	11.6	21.0	35.4	46	-10.6	114	1.3
432.00	19.8	15.5	21.1	40.9	46	-5.1	188	1.1
448.00	17.4	11.8	21.5	38.9	46	-7.1	181	1
464.00	21.2	16	22.1	43.3	46	-2.7	174	1
480.00	19.7	18	22.3	42.0	46	-4.0	182	1
490.00	15.2	9.1	22.9	38.1	46	-7.9	168	1
496.00	22	17.5	23.3	45.3	46	-0.7	162	1
500.00	16	6.5	23.5	39.5	46	-6.5	0	1

REPORT No: sc103413

SPEC: FCC Part 15 para 15.109(a)

CUSTOMER: Widcomm

TEST DIST: 3 Meters

E U T: Bluegate 1000 SN: 378

TEST SITE: 2

EUT MODE: Transmit Mode

BICONICAL: 738

DATE: 17-May-01   TESTED BY: Rodel Resolme

LOG PERIODIC: 738

NOTES: Quasi-Peak with 120 KHz measurement bandwidth.

RCVR: 427

115VAC 60Hz

Temperature: 28   Relative Humidity: 40

EUT MARGIN   -0.3   dB at 528 MHz   ver 1.8

FREQUENCY (MHz)	VERTICAL measured (dBuv)	HORIZONTAL measured (dBuV)	CORRECTION FACTOR (dB/m)	MAXIMUM CORRECTED (dBuV/m)	SPECIFIED LIMIT (dBuV/m)	EUT MARGIN (dB)	EUT ROTATION (degrees)	ANTENNA HEIGHT (meters)
510.00	9.9	4	23.8	33.7	46	-12.3	0	1
512.00	19	14	23.9	42.9	46	-3.1	0	1
518.00	13	9	24.0	37.0	46	-9.0	0	1
522.00	13.9	7	24.1	38.0	46	-8.0	0	1
528.00	21.5	17	24.2	45.7	46	-0.3	250	1
530.00	8.4	4	24.3	32.7	46	-13.4	350	1
534.00	16	10.5	24.3	40.3	46	-5.7	180	1
544.00	18.2	13.5	24.4	42.6	46	-3.4	0	1
560.00	21.2	11	24.3	45.5	46	-0.5	0	1
576.00	13.5	7.8	25.1	38.6	46	-7.4	352	1
590.00	13	8.8	25.4	38.4	46	-7.6	352	1
592.00	14.5	8	25.4	39.9	46	-6.1	8	1
800.00	9.3	13.5	29.5	43.0	46	-3.0	99	1

Emissions Test Conditions: RADIATED EMISSIONS

The *RADIATED EMISSIONS* measurements were performed at the following test location :

☐ - Test not applicable

■ - Canyon #3 (Open Area Test Site), Carroll Canyon, San Diego

Testing was performed at a test distance of:

☐ -   1 meters
■ -   3 meters
☐ - 10 meters

Test Equipment Used :

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
3115	251	Antenna, Double Ridge Guide	EMCO	2495	10/01
LPB 2520/A	738	Antenna, LPB	Antenna Research	1169	05/30/01
8566B	10308	Spectrum Analyzer	Hewlett Packard	2332A2751	03/17/01
ESVS30	427	Receiver	Rohde & Schwarz	830350/006	11/01

Remarks:

Field Strength Calculation

If a preamplifier was used during the Radiated Emission Testing, it is required that the amplifier gain must be subtracted from the Spectrum Analyzer (Meter) Reading. In addition, a correction factor for the antenna , cable used and a distance factor, if any, must be applied to the Meter Reading before a true field strength reading can be obtained. In the automatic measurement, these considerations are automatically presented as a part of the print out. In the case of manual measurements and for greater efficiency and convenience, instead of using these correlation factors for each meter reading, the specification limit was modified to reflect these correlation factors at each frequency value so that the meter readings can be compared directly to the modified specification limit. This modified specification limit is referred to as the "Corrected Meter Reading Limit" or simply the CMRL, which is the actual field strength present at the antenna. The quantity can be derived in the following manner:

Corrected Meter Reading Limit (CMRL) = SAR + AF + CL - AG - DC

Where, SAR = Spectrum Analyzer Reading
          AF   = Antenna Factor
          CL   = Cable Loss
          AG   = Amplifier Gain (if any)
          DC   = Distance Correction (if any)

Assume the following situation: A meter reading of 29.4 dBuV was obtained from a Class A computing device measured at 83 MHz. Assume an antenna factor of 9.2 dB, a cable loss of 1.4 dB and amplifier gain of 20.0 dB at 83 MHz. The final field strength would be determined as follows:

CMRL = 29.4 dBuV + 9.2dB = 1.4 dB - 20 dB/M - 0.0 dB

CMRL = 20.0 dBuV/M

This result is well below the FCC and CSA Class A limit of 29.5 dbuV/m at 83 MHz.

For the manual mode of measurement, a table of corrected meter reading limit was used to permit immediate comparison of the meter reading to determine if the measure emission amplitude exceeded the specification limit at that specific frequency.

4   CONDUCTED EMISSIONS EQUIPMENT/DATA (15.107(a); 15.247(a)(1)(i); 15.247(a)(1)(ii); and 15.247(c))

See following page(s).

Emissions Test Conditions: CONDUCTED EMISSIONS (15.107(a); 15.247(a)(1)(i); 15.247(a)(1)(ii); and 15.247(c))

The *CONDUCTED EMISSIONS* measurements were performed at the following test location :

□ **- Test not applicable**

■ - SR-3, Shielded Room, 12' x 20' x 8', Metal Chamber

Test Equipment Used :

Spectrum Analyzer, Hewlett Packard, HP-8566B, P/N 744, S/N2311A02209, Cal: 02/02
Automatic Preselector, Model HP8445B, Hewlett Packard, S/N 1442A01127, P/N 809, Cal: verified
PreAmp 2-20 GHz, TUV, P/N 719, Cal: verified
900 MHz High Pass Filter, Sage, Model FF 6549-1, S/N 007, P/N 778, Cal: verified
Antenna, Horn, Electro Mechanics, Model 3115, S/N 2595, P/N 251, Cal: 10/01
Spectrum Analyzer, Hewlett Packard, HP-8566B, P/N 744, S/N 2618A02913, Cal: 09/01
Horn Antenna, 3115, P/N 453, EMCO, S/N 9412-4364, Cal: 10/01
Solar Electronics, Model 9252-50-R-24-BNC, LISN, P/N 458, Cal: 1/02
Rohde & Schwarz, EMI Test Receiver, Model ESHS30, P/N 459, S/N 832354/004, Cal: 1 / 02
Mini-Circuits, Model CAT-20, P/N 602, 20 dB attenuator, Cal: verified

Remarks:
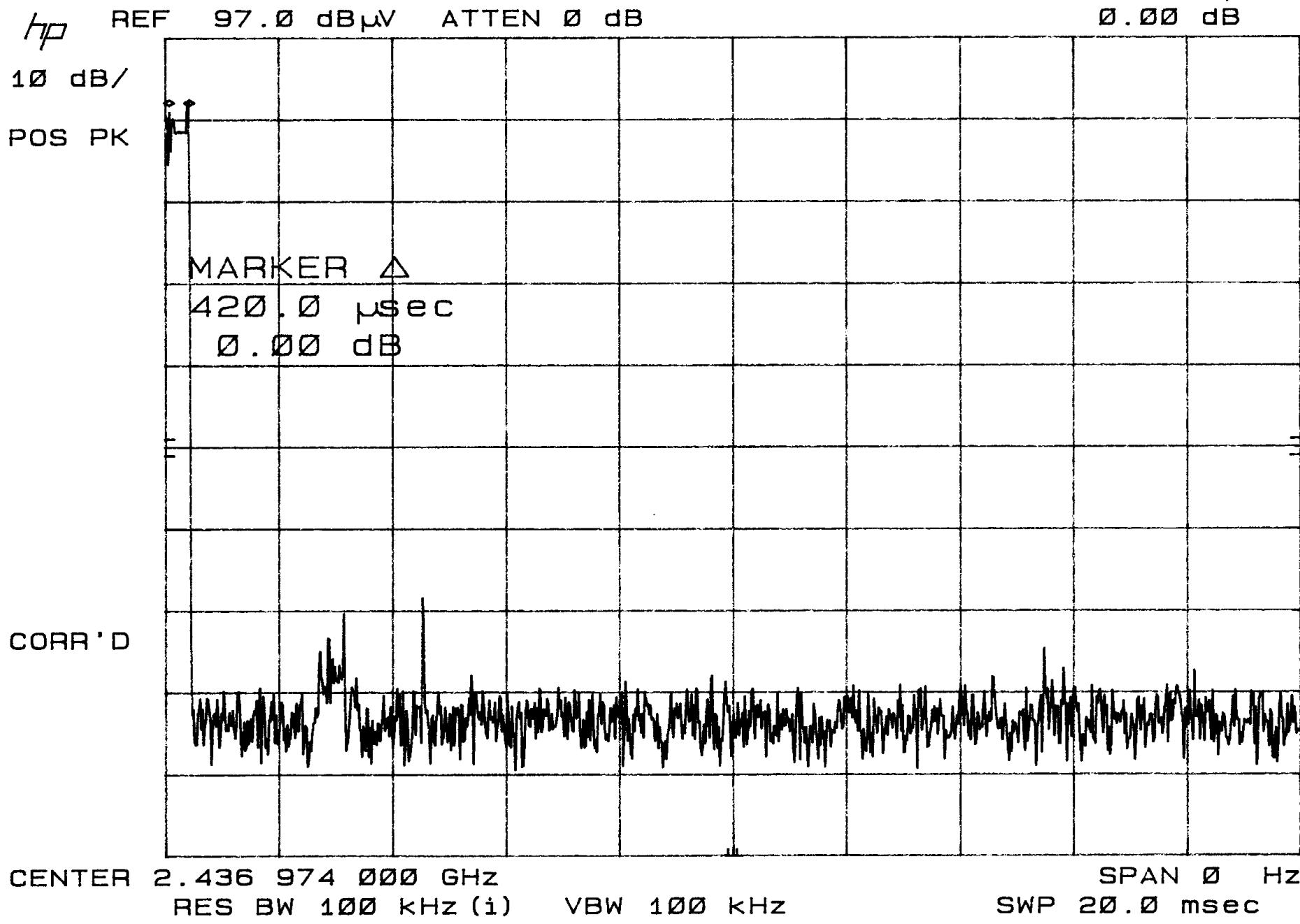
15. 247 @ (V)(i)

hp REF 97.0 dBµV ATTEN 0 dB

MKR △ 420.0 µsec
0.00 dB

10 dB/

POS PK

MARKER △
420.0 µsec
0.00 dB

CORR'D

CENTER 2.436 974 000 GHz

SPAN 0 Hz

RES BW 100 kHz (i)   VBW 100 kHz

SWP 20.0 msec

26

5/18/01

REF   97.0 dBμV   ATTEN 0 dB

MKR 2.479 5 GHz
FWO   83.30 dBμV

hp

10 dB/

POS PK

START 2.470 GHz
RES BW 1 MHz (i)   VBW 1 MHz

STOP 2.573 GHz
SWP 20.0 msec   27

hp

REF   97.0 dBµV   ATTEN 0 dB
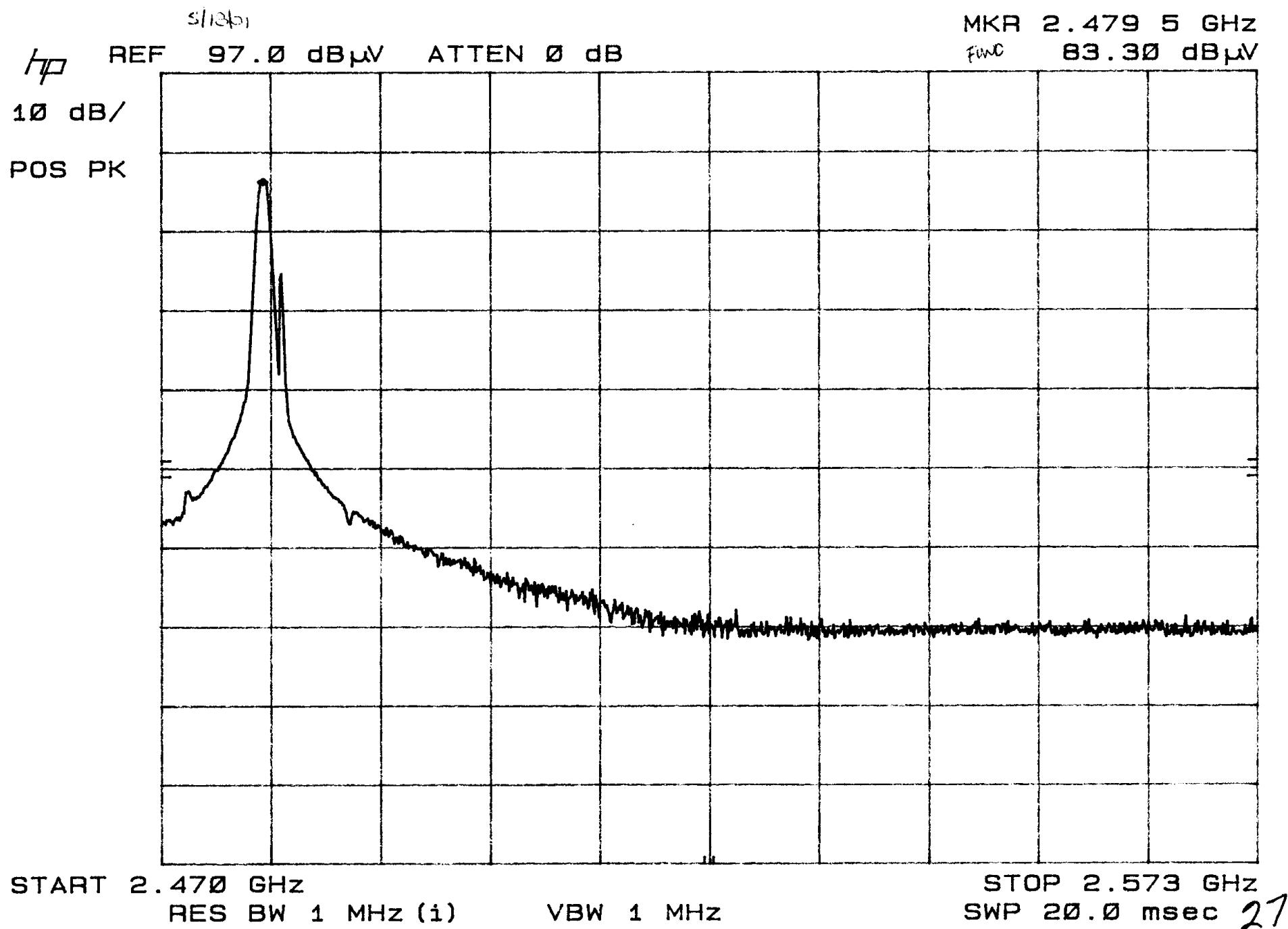
MKR 2.479 79 GHz
53.60 dBµV

10 dB/

POS PK

CENTER 2.479 8 GHz

SPAN 50.0 MHz

RES BW 1 MHz (i)   VBW 10 Hz   SWP 24.0 sec   28

MKR △-3.6 MHz
55.50 dB

hp

REF   97.0 dBµV   ATTEN 0 dB

10 dB/

POS PK
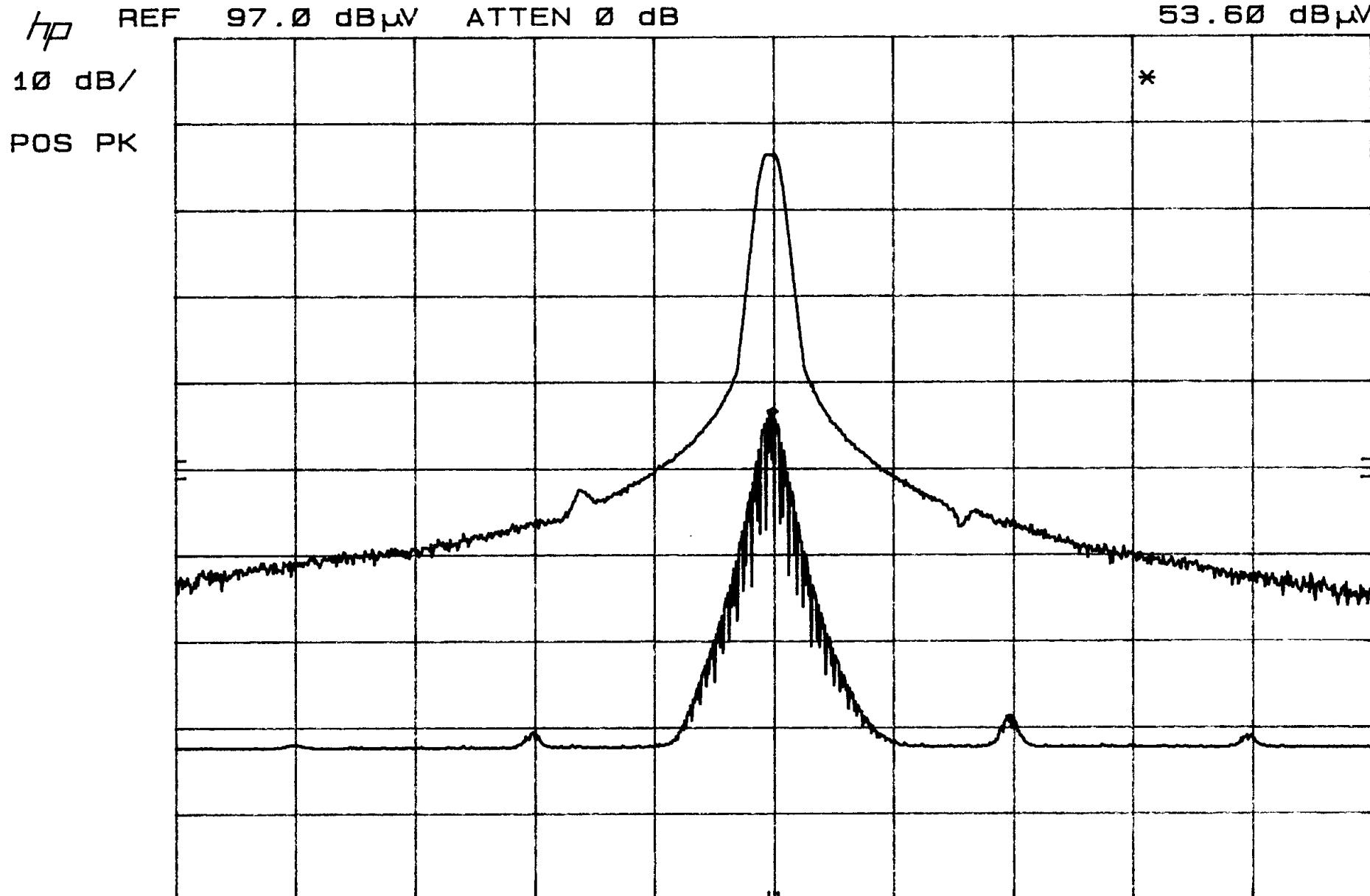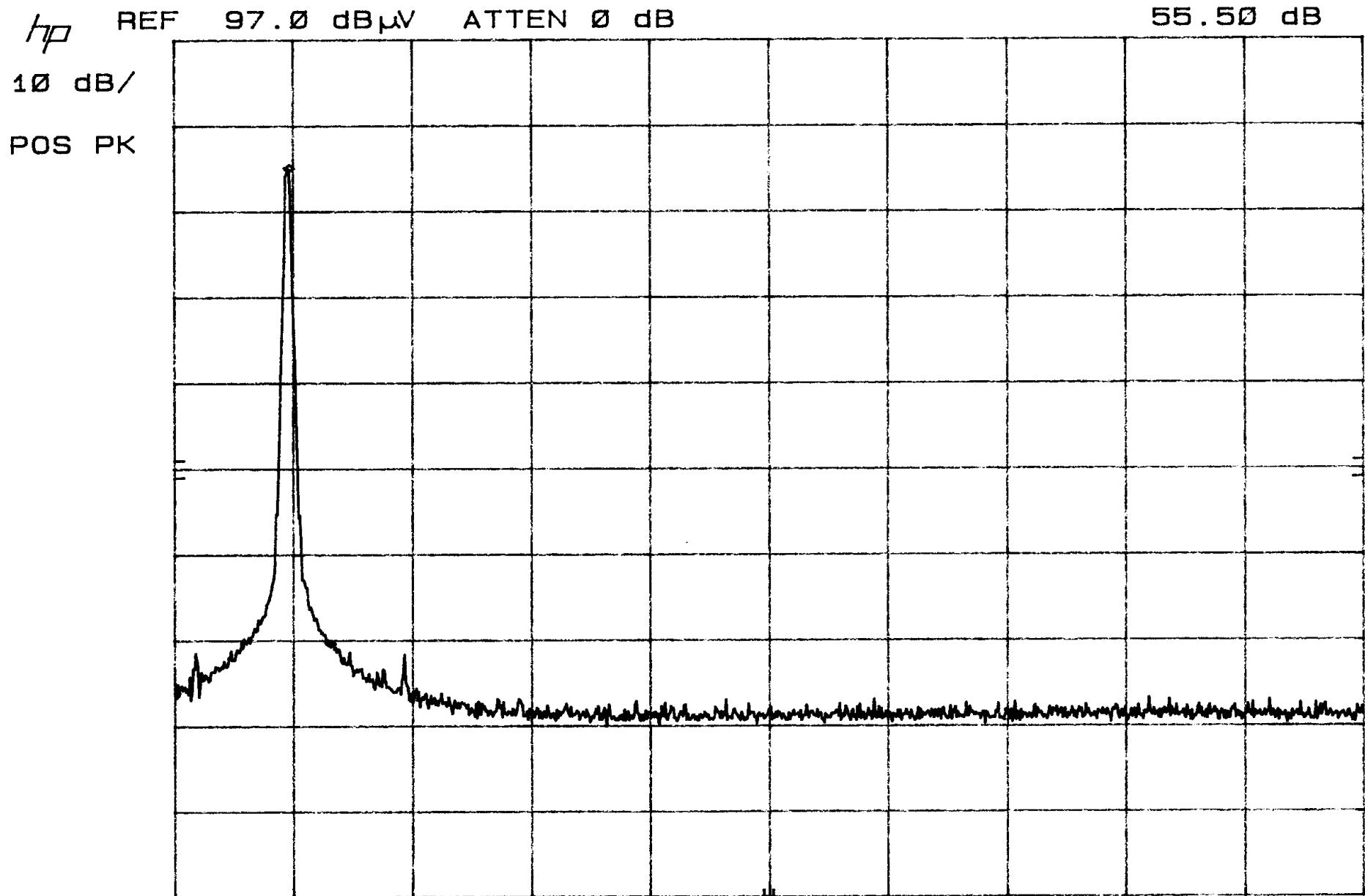
START 2.470 GHz
RES BW 100 kHz (i)   VBW 30 kHz
STOP 2.573 GHz
SWP 165 msec

29

Widcomm
Blue Gate 100
20dB Bandwidth
High
5/18/01
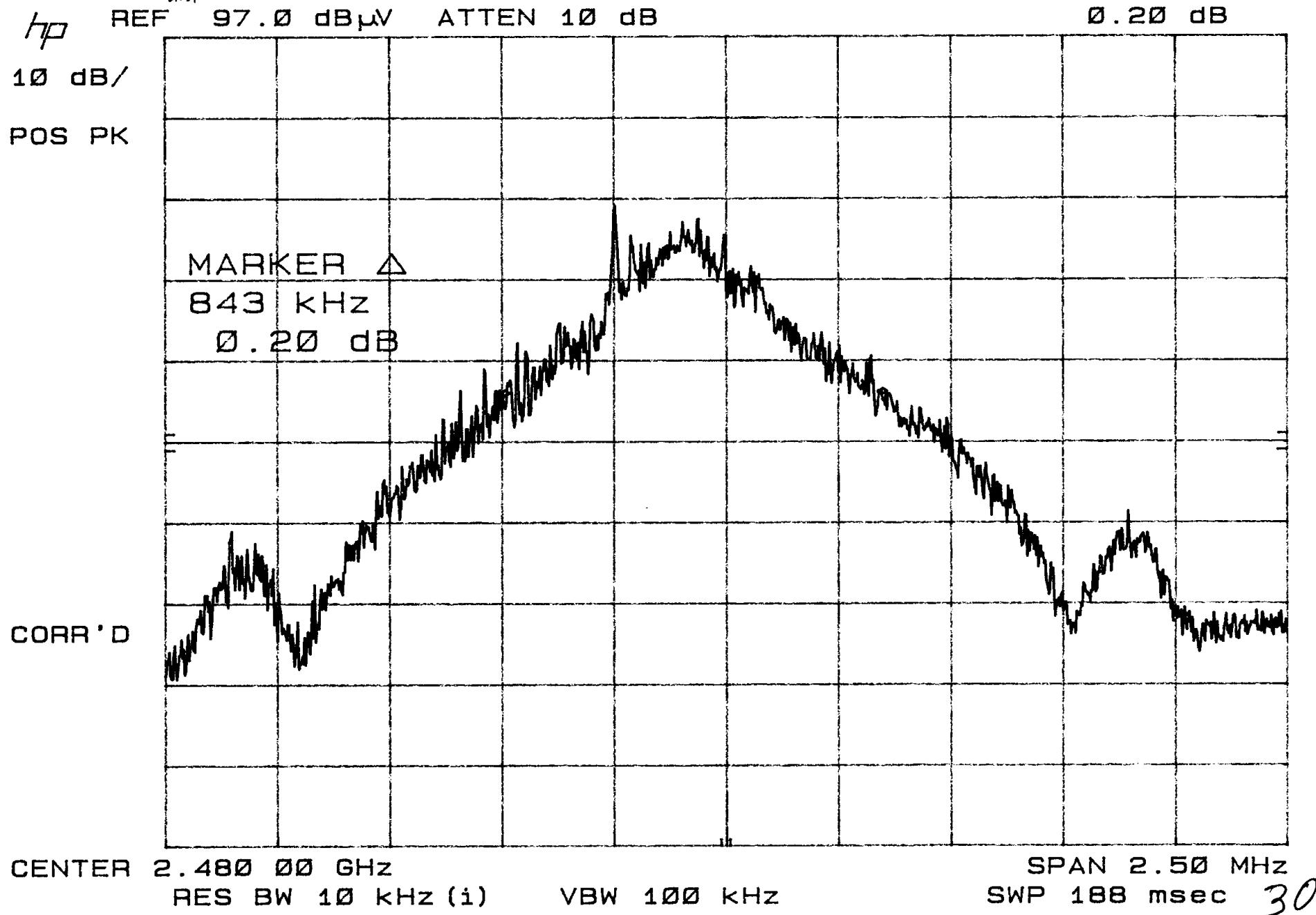
15 247 (a)(i)(c.i)

MKR △ 843 kHz
0.20 dB

hp

REF   97.0 dBμV   ATTEN 10 dB

10 dB/

POS PK

MARKER △
843 kHz
0.20 dB

CORR'D

CENTER 2.480 00 GHz   SPAN 2.50 MHz
RES BW 10 kHz (i)   VBW 100 kHz   SWP 188 msec   30

15.247 (a)(1)(iii)

MKR △ 743 kHz
0.20 dB

REF   97.0 dBμV   ATTEN 10 dB

10 dB/

POS PK

MARKER △
743 kHz
0.20 dB

CORR'D

CENTER 2.436 00 GHz   SPAN 2.50 MHz
RES BW 10 kHz (i)   VBW 100 kHz   SWP 188 msec   31

REF   97.0 dBμV   ATTEN 10 dB

MKR △ 635 kHz
0.20 dB

hp

10 dB/

POS PK

MARKER △
635 kHz
0.20 dB

CORR'D

CENTER 2.402 00 GHz
RES BW 10 kHz (i)   VBW 100 kHz

SPAN 2.50 MHz
SWP 188 msec

32

Part 15, 15.247 (a)(1)(ii)

MKR △ 1.00 MHz
−1.60 dB

hp

REF   97.0 dBμV   ATTEN 0 dB

10 dB/

POS PK

MARKER △

1.00 MHz

−1.60 dB

CORR'D

CENTER 2.440 0 GHz   SPAN 10.0 MHz
RES BW 100 kHz (i)   VBW 100 kHz   SWP 20.0 msec   33

hp
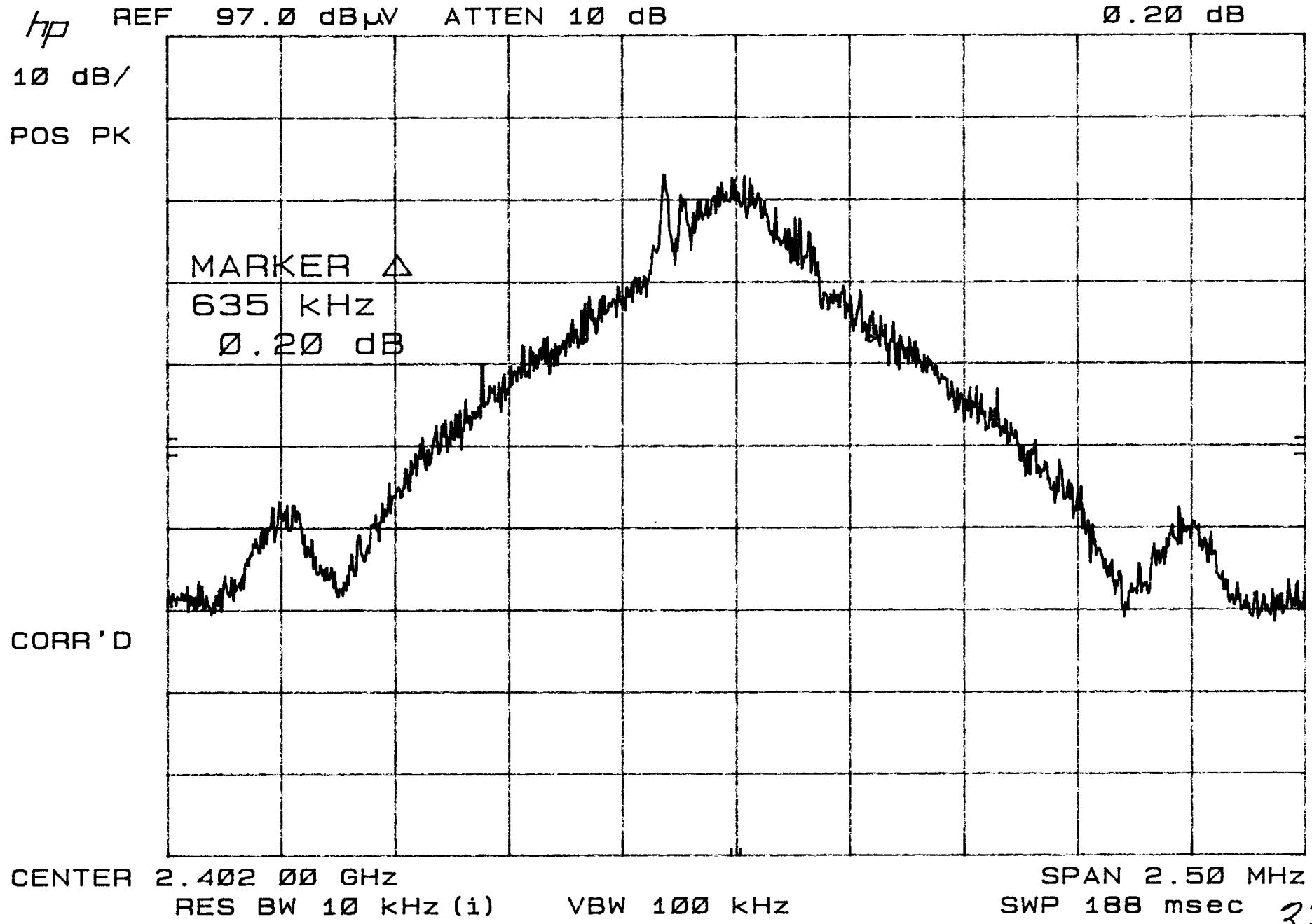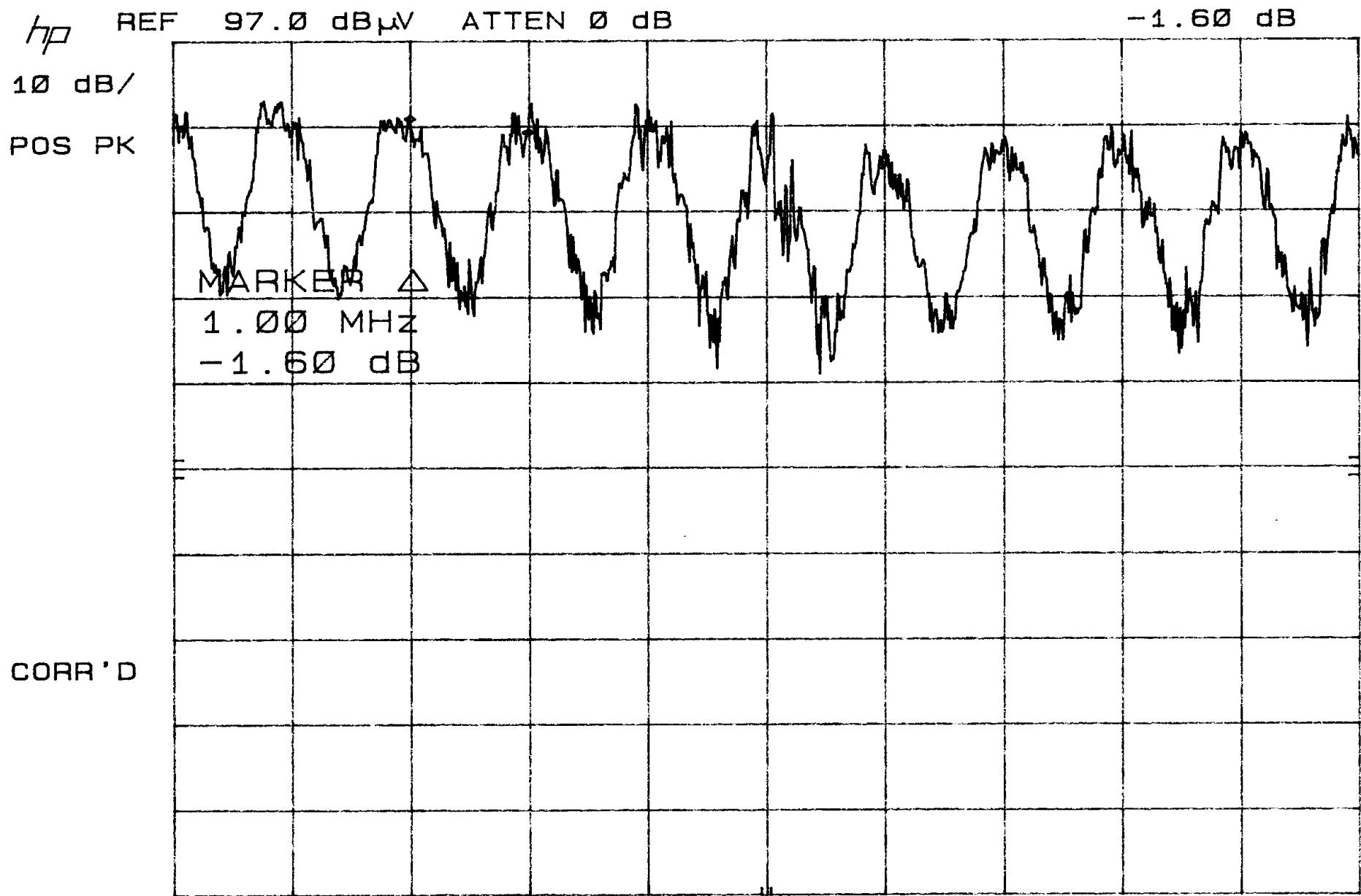
REF   97.0 dBμV   ATTEN 0 dB

MKR △ 78.3 MHz
−4.00 dB

10 dB/

POS PK

CORR'D

START 2.400 GHz
RES BW 300 kHz (i)   VBW 3 MHz

STOP 2.500 GHz
SWP 20.0 msec   34
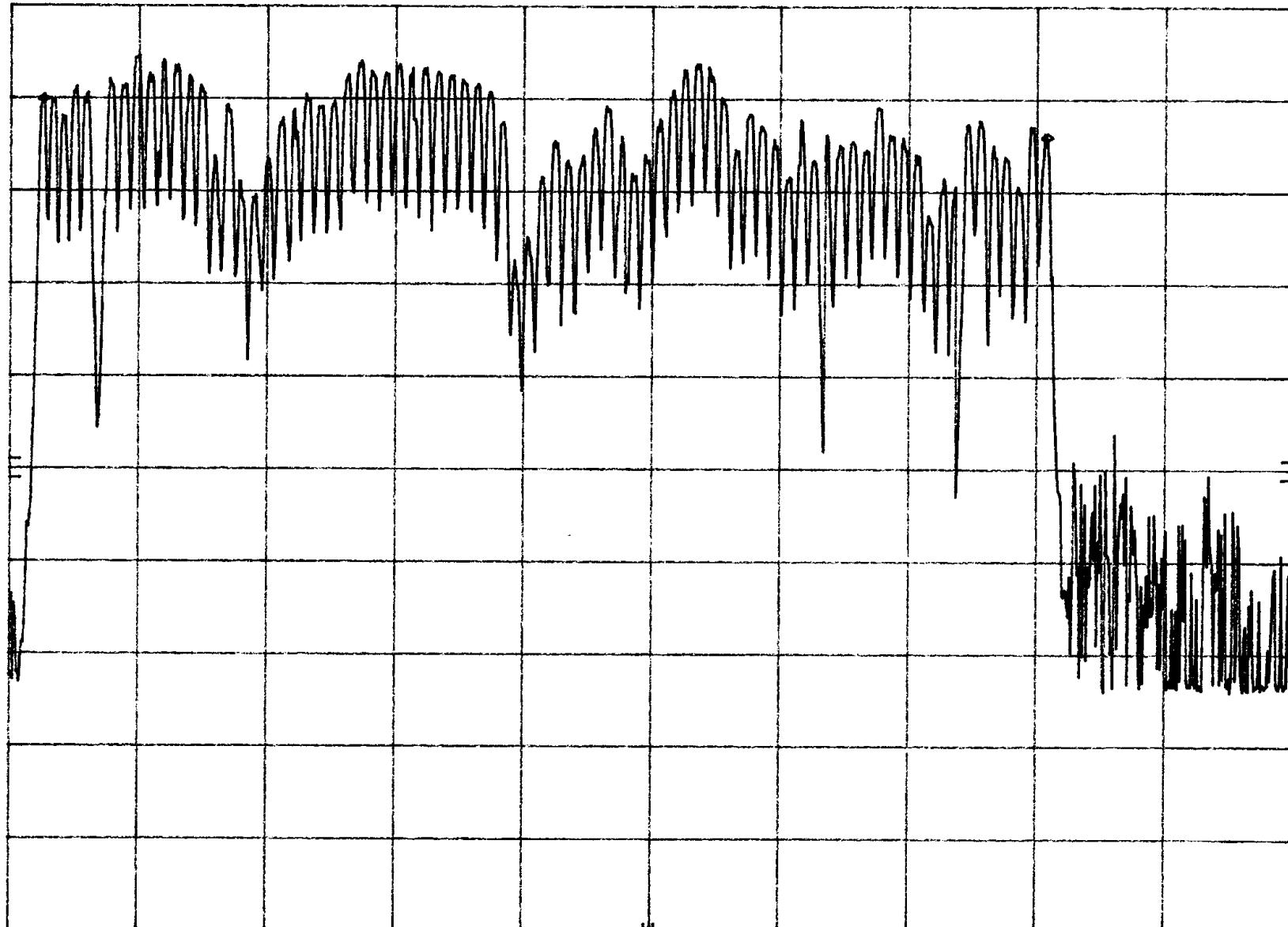
EUT hopping
channel occupancy

Part 15.247 @ (a) (i)

hp

REF 97.0 dBμV   ATTEN 0 dB

MKR △ 9.780 sec
0.30 dB

10 dB/

POS PK

MARKER △
9.780 sec
0.30 dB

CORR'D

CENTER 2.436 974 000 GHz

SPAN 0 Hz

RES BW 100 kHz (i)   VBW 100 kHz

SWP 10.0 sec

35

output
(.1 watt) (handwritten, circled)

OUTPUT POWER MEASUREMENT RESULTS

LOW	MID	HIGH
2402 MHz	2436 MHz	2480 MHz
113.4 dBμV/m	113.9 dBμV/m	114.5 dBμV/m
18.1 dBm	18.6 dBm	83.2 mW
64.6 mW	72.4 mW	.0832W
.0646W	.0724W	

36 (handwritten)

TUV Product Service
Powerline Conducted Emissions

EUT: Bluegate 1000
Manuf: Widcomm
Op Cond: Transmit Hopping
Operator: Rodel Resolme RR
Test Spec: FCC Class B
Comment: 115Vac 60Hz Line 1 SN:378
                SC103413
Date: 21. May 01   14:02

Scan Settings (2 Ranges)

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO LN	OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO LN	OFF	60dB

Transducer No.	Start	Stop	Name
1	100k	30M	20dBLISN

Final Measurement: x QP
                   Meas Time: 1 s
                   Subranges: 25
                   Acc Margin: 30dB

37
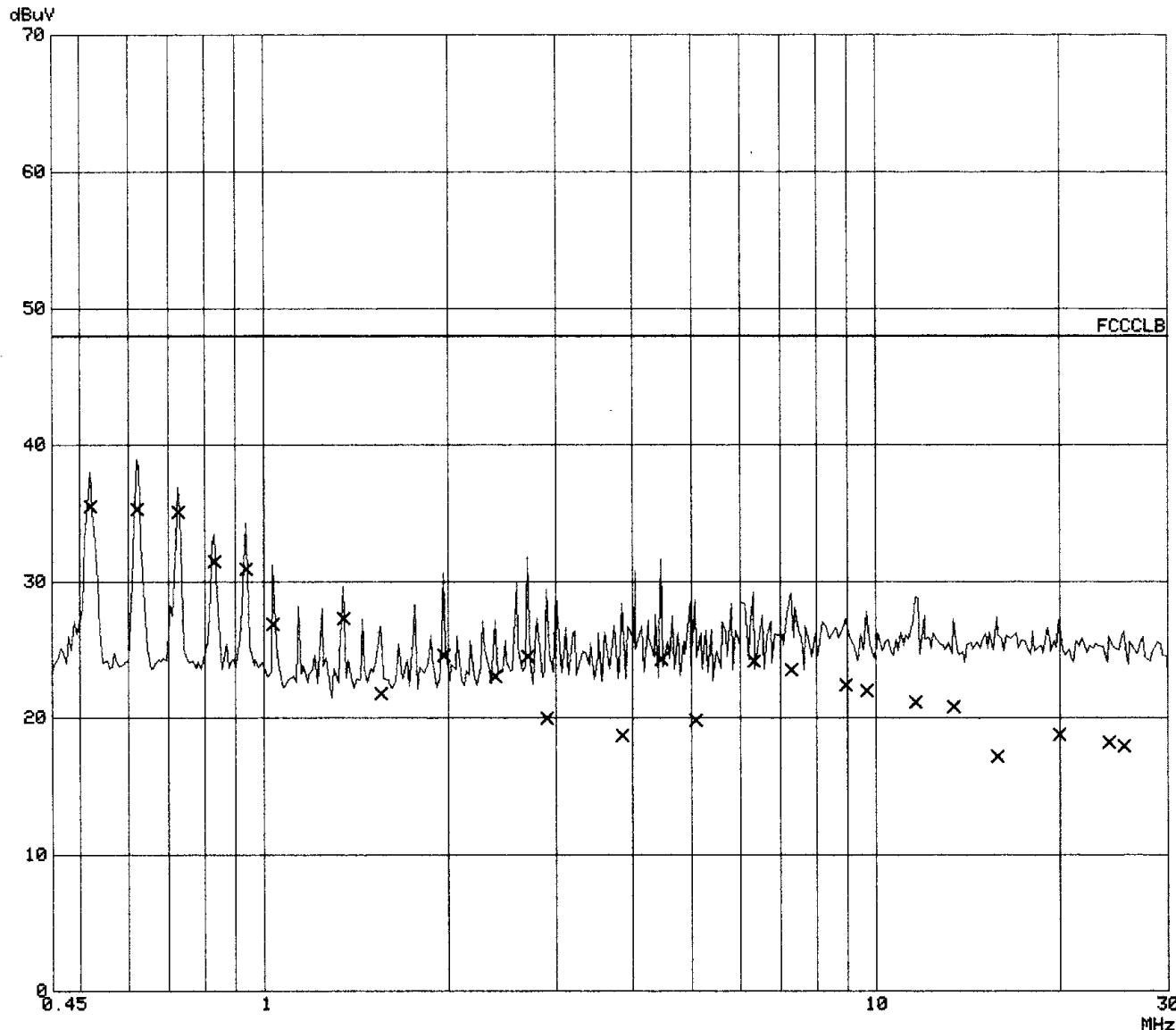
TUV Product Service
Powerline Conducted Emissions

EUT: Bluegate 1000
Manuf: Widcomm
Op Cond: Transmit Hopping
Operator: Rodel Resolme *(signature)*
Test Spec: FCC Class B
Comment: 115Vac 60Hz Line 1 SN:378
                SC103413
Date: 21. May 01 14:02

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV	
0.52000	35.5	48.0	*-12.5 db*
0.62000	35.3	48.0	
0.72500	35.1	48.0	
0.83000	31.5	48.0	
0.93500	30.9	48.0	
1.03500	26.9	48.0	
1.35000	27.3	48.0	
1.55000	21.8	48.0	
1.97000	24.6	48.0	
2.39000	23.1	48.0	
2.70000	24.5	48.0	
2.89500	20.0	48.0	
3.85000	18.7	48.0	
4.46000	24.3	48.0	
5.07500	19.8	48.0	
6.33000	24.1	48.0	
7.26500	23.5	48.0	
8.92000	22.4	48.0	
9.65000	22.0	48.0	
11.61500	21.1	48.0	
13.38500	20.8	48.0	
15.81000	17.2	48.0	
19.92500	18.8	48.0	
24.07000	18.2	48.0	
25.52000	18.0	48.0	

* limit exceeded

38

TUV Product Service
Powerline Conducted Emissions

EUT:	Bluegate 1000
Manuf:	Widcomm
Op Cond:	Transmit Hopping
Operator:	Rodel Resolme
Test Spec:	FCC Class B
Comment:	115Vac 60Hz Line 2 SN:378
	SC103413
Date:	21. May 01 13:55

Scan Settings (2 Ranges)

---------- Frequencies -----------			----------- Receiver Settings -----------					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO LN	OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO LN	OFF	60dB

Transducer No.	Start	Stop	Name
1	100k	30M	20dBLISN

Final Measurement: x QP

Meas Time:	1 s
Subranges:	25
Acc Margin:	30dB
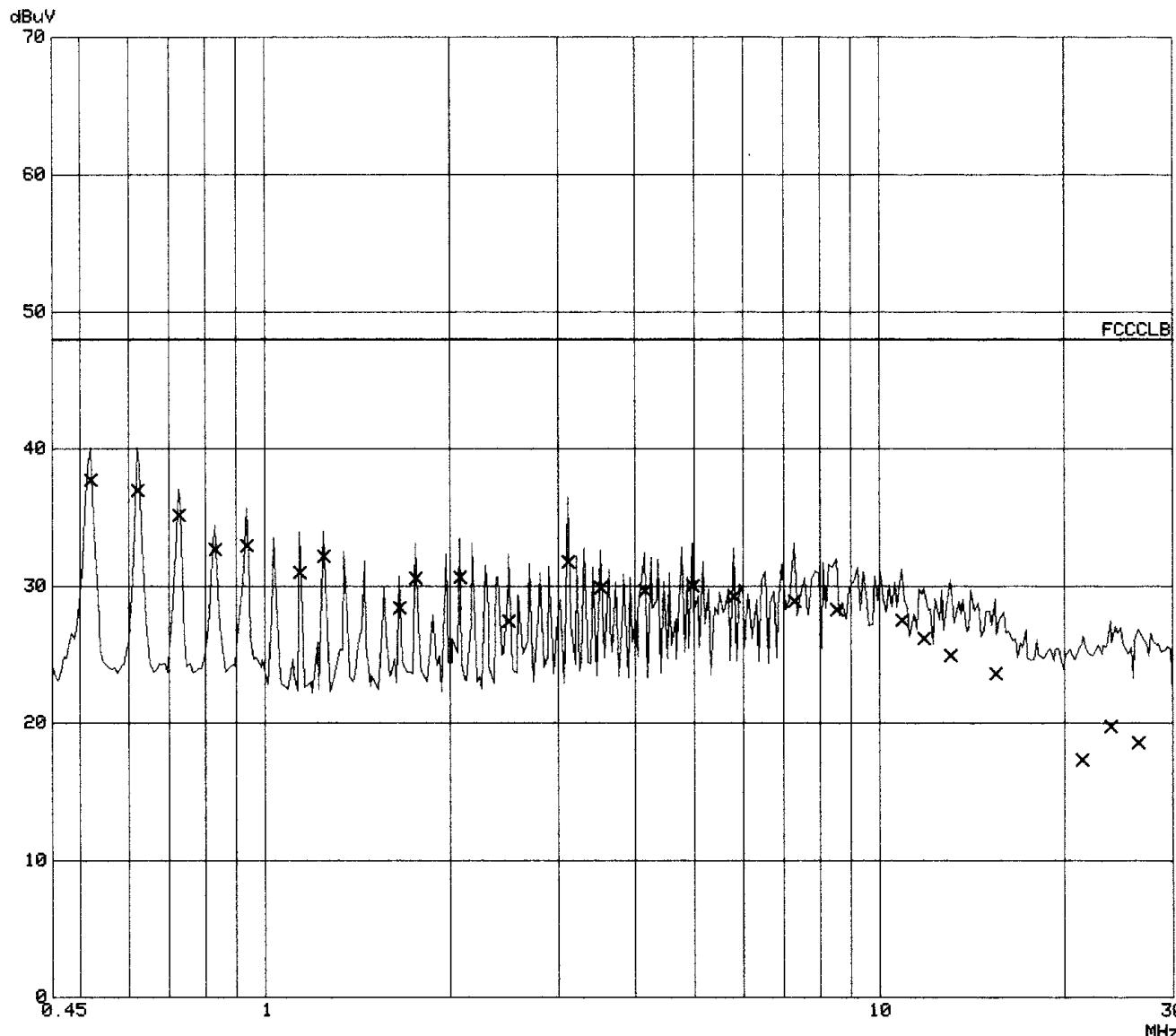
39

TUV Product Service
Powerline Conducted Emissions

EUT: Bluegate 1000
Manuf: Widcomm
Op Cond: Transmit Hopping
Operator: Rodel Resolme
Test Spec: FCC Class B
Comment: 115Vac 60Hz Line 2 SN:378
              SC103413
Date: 21. May 01 13:55

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.52000	37.7	48.0
0.62000	37.0	48.0
0.72500	35.2	48.0
0.83000	32.6	48.0
0.93500	32.9	48.0
1.14000	31.0	48.0
1.24500	32.2	48.0
1.65500	28.4	48.0
1.76000	30.5	48.0
2.07500	30.6	48.0
2.49500	27.4	48.0
3.11000	31.8	48.0
3.52500	29.9	48.0
4.14500	29.7	48.0
4.97500	30.0	48.0
5.80500	29.2	48.0
7.26000	28.9	48.0
8.50500	28.3	48.0
10.89000	27.5	48.0
11.82500	26.2	48.0
13.06500	24.9	48.0
15.45500	23.6	48.0
21.35000	17.3	48.0
23.75500	19.8	48.0
26.45500	18.6	48.0

* limit exceeded

TUV Product Service
Powerline Conducted Emissions

```
EUT:            Bluegate 1000
Manuf:          Widcomm
Op Cond:        Receive mode
Operator:       Rodel Resolme
Test Spec:      FCC Class B
Comment:        115Vac 60Hz Line 2 SN:378
                SC103413
Date:           21. May 01  13:48
```

Scan Settings (2 Ranges)

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	100k	30M	20dBLISN

```
Final Measurement: x QP
                   Meas Time:    1 s
                   Subranges:    25
                   Acc Margin:   30dB
```
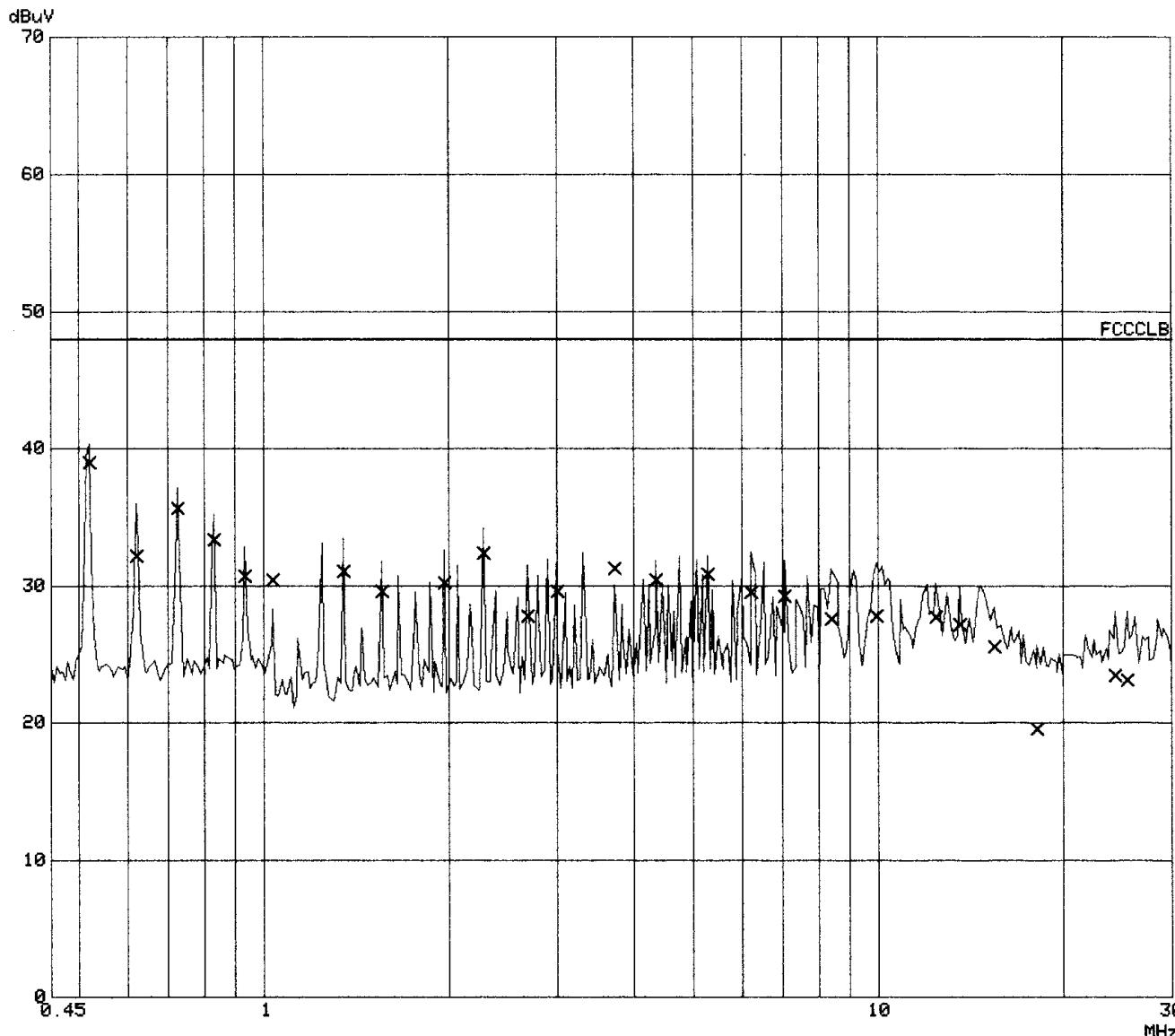
TUV Product Service
Powerline Conducted Emissions

EUT: Bluegate 1000
Manuf: Widcomm
Op Cond: Receive mode
Operator: Rodel Resolme _RR_
Test Spec: FCC Class B
Comment: 115Vac 60Hz Line 2 SN:378
               SC103413
Date: 21. May 01   13:48

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.52000	39.0	48.0 -9dB
0.62000	32.2	48.0
0.72500	35.7	48.0
0.83000	33.3	48.0
0.93000	30.7	48.0
1.03500	30.4	48.0
1.35000	31.0	48.0
1.55500	29.6	48.0
1.97000	30.2	48.0
2.28000	32.4	48.0
2.69000	27.8	48.0
3.00500	29.6	48.0
3.73000	31.2	48.0
4.35000	30.4	48.0
5.28500	30.9	48.0
6.21500	29.5	48.0
7.04500	29.3	48.0
8.39000	27.6	48.0
9.94500	27.8	48.0
12.43500	27.7	48.0
13.57500	27.2	48.0
15.44000	25.6	48.0
18.13500	19.6	48.0
24.35500	23.5	48.0
25.50000	23.1	48.0

* limit exceeded

42

TUV Product Service
Powerline Conducted Emissions

EUT: Bluegate 1000
Manuf: Widcomm
Op Cond: Receive mode
Operator: Rodel Resolme
Test Spec: FCC Class B
Comment: 115Vac 60Hz Line 1 SN:378
              SC103413
Date: 21. May 01   13:41

Scan Settings (2 Ranges)

¦--------- Frequencies ------------¦		¦----------- Receiver Settings -------------¦
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO LN	OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO LN	OFF	60dB

Transducer No.	Start	Stop	Name
1	100k	30M	20dBLISN

Final Measurement: x QP

              Meas Time: 1 s
              Subranges: 25
              Acc Margin: 30dB

43
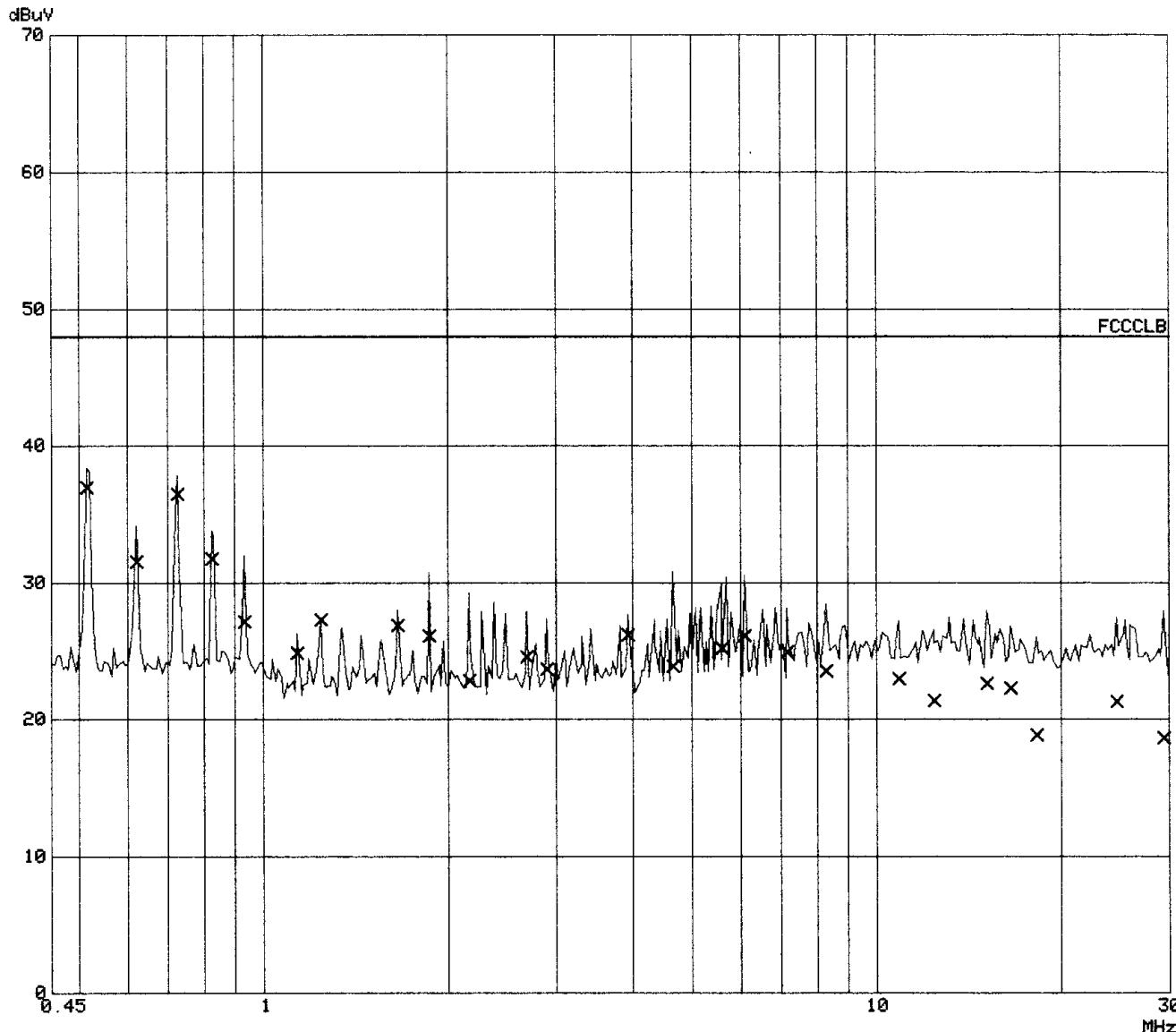
TUV Product Service
Powerline Conducted Emissions

EUT: Bluegate 1000
Manuf: Widcomm
Op Cond: Receive mode
Operator: Rodel Resolme ℚℛ
Test Spec: FCC Class B
Comment: 115Vac 60Hz Line 1 SN:378
                SC103413
Date: 21. May 01 13:41

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV	
0.51500	36.9	48.0	-11.1dB
0.62000	31.6	48.0	
0.72500	36.5	48.0	
0.82500	31.7	48.0	
0.93000	27.2	48.0	
1.13500	24.9	48.0	
1.24000	27.3	48.0	
1.65500	26.9	48.0	
1.86000	26.1	48.0	
2.17000	22.9	48.0	
2.69000	24.5	48.0	
2.90000	23.7	48.0	
3.93000	26.2	48.0	
4.65500	23.9	48.0	
5.58500	25.2	48.0	
6.10500	26.1	48.0	
7.14000	24.9	48.0	
8.28000	23.6	48.0	
10.86500	23.0	48.0	
12.41500	21.4	48.0	
15.11000	22.7	48.0	
16.56000	22.3	48.0	
18.21000	18.8	48.0	
24.63500	21.3	48.0	
29.39500	18.7	48.0	

* limit exceeded

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ATTESTATION STATEMENT

GENERAL REMARKS:

SUMMARY:

All tests were performed per CFR 47, *FCC Part 15, Paragraphs 15.109(a); 15.205; 15.209; 15.209(a); 15.247(a)(1)(ii); 15.247(c)*

■ - Performed

The Equipment Under Test

■ - **Fulfills** the requirements of CFR 47, *FCC Part 15, Paragraphs 15.107(a); 15.205; 15.209; 15.209(a); 15.247(c); 15.247(a)(1)(ii); 15.247(c)*

- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:

[signature]

Jim Owen
(EMC Engineer)