FCC CFR47 PART 15 SUBPART C CERTIFICATION

CLASS II PERMISSIVE CHANGE TEST REPORT

FOR

900 MHZ CORDLESS TELEPHONE BASE UNIT

MODEL NUMBER: CS50,CS50-USB

BRAND NAME: PLANTRONICS

FCC ID: AL8CS50XXXX

REPORT NUMBER: 04U2887-3

ISSUE DATE: SEPTEMBER 10, 2004

Prepared for
PLANTRONICS, INC.
345 ENCINAL STREET
SANTA CRUZ, CA 95060
USA

Prepared by
COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD,
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888

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1. TEST RESULT CERTIFICATION

COMPANY NAME: PLANTRONICS, INC.
345 ENCINAL STREET
SANTA CRUZ, CA 95060, USA

EUT DESCRIPTION: 900 MHz Cordless Telephone Base Unit

MODEL: CS50, CS50-USB

DATE TESTED: SEPTEMBER 09, 2004

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved & Released For CCS By:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

CHIN PANG
EMC TECHNICIAN
COMPLIANCE CERTIFICATION SERVICES

2. EUT CLASS II PERMISSIVE DESCRIPTION

The EUT is the 900MHz Cordless Base Amplifier unit operates in frequency range from 902 to 928 MHz. The Base has the maximum output power 15.87dBm with antenna gain of 1.5dBi.

This is a Class II permissive change for FCC ID: AL8CS50XXXX, originally granted on 10/10/2003.

The major change filed under this application includes:

This modification provides for an alternate model number: CS50-USB. In this model, the one interface circuit to the handset jack of a corded telephone has been replaced with a USB interface and slightly modification has been done to the antenna and PC Board layout. Schematic remains unchanged. The information attached describes antennas changes.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4/2001, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

4. FACILITIES AND ACCREDITATION

4.1. FACILITIES AND EQUIPMENT

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

4.2. TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	1300
Japan	VCCI	CISPR 22 Two OATS and one conducted Site	R-1014, R-619, C-640
Norway	NEMKO	EN50081-1, EN50081-2, EN50082-1, EN50082-2, IEC61000-6-1, IEC61000-6-2, EN50083-2, EN50091-2, EN50130-4, EN55011, EN55013, EN55014-1, EN55104, EN55015, EN61547, EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN60945, EN61326-1	ELA 117
Norway	NEMKO	EN60601-1-2 and IEC 60601-1-2, the Collateral Standards for Electro-Medical Products. MDD, 93/42/EEC, AIMD 90/385/EEC	ELA-171
Taiwan	BSMI	CNS 13438	SL2-IN-E-1012
Canada	Industry Canada	RSS210 Low Power Transmitter and Receiver	IC2324 A,B,C, and F

5. CALIBRATION AND UNCERTAINTY

5.1. MEASURING INSTRUMENT CALIBRATION

The measurement instruments utilized to perform the tests documented in this report have been calibrated in accordance with the manufacturer's recommendations, and are traceable to national standards.

5.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5.3. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Due Date**
EMI Receiver, 9 kHz ~ 2.9 GHz	**HP**	**8542E**	**3942A00286**	**11/20/2004**
RF Filter Section	**HP**	**85420E**	**3705A00256**	**11/20/2004**
Spectrum Analyzer, 26.5 GHz	**HP**	**8593EM**	**3710A00205**	**10/1/2004**
Amplifier 1-26GHz	**MITEQ**	**NSP2600-SP**	**924342**	**4/25/2005**
Antenna, Horn 1 ~ 18 GHz	**EMCO**	**3115**	**6717**	**2/4/2005**
Antenna, Bilog, 25-2000MHz	**ARA**	**LPB-2520/A**	**NA**	**9/3/2005**
1.5GHz HPF	**MicroTronic**	**HPM13193**	**1**	**CNR**
LISN, 10 kHz ~ 30 MHz	**FCC**	**50/250-25-2**	**114**	**10/13/2004**
EMI Test Receiver	**R & S**	**ESHS 20**	**827129/006**	**7/18/2005**
Line Filter	**Lindgren**	**LMF-3489**	**497**	**CNR**

6. SETUP OF EQUIPMENT UNDER TEST

6.1. SETUP OF THE BASE (RF MODE)

SUPPORT EQUIPMENT

Standalone unit.

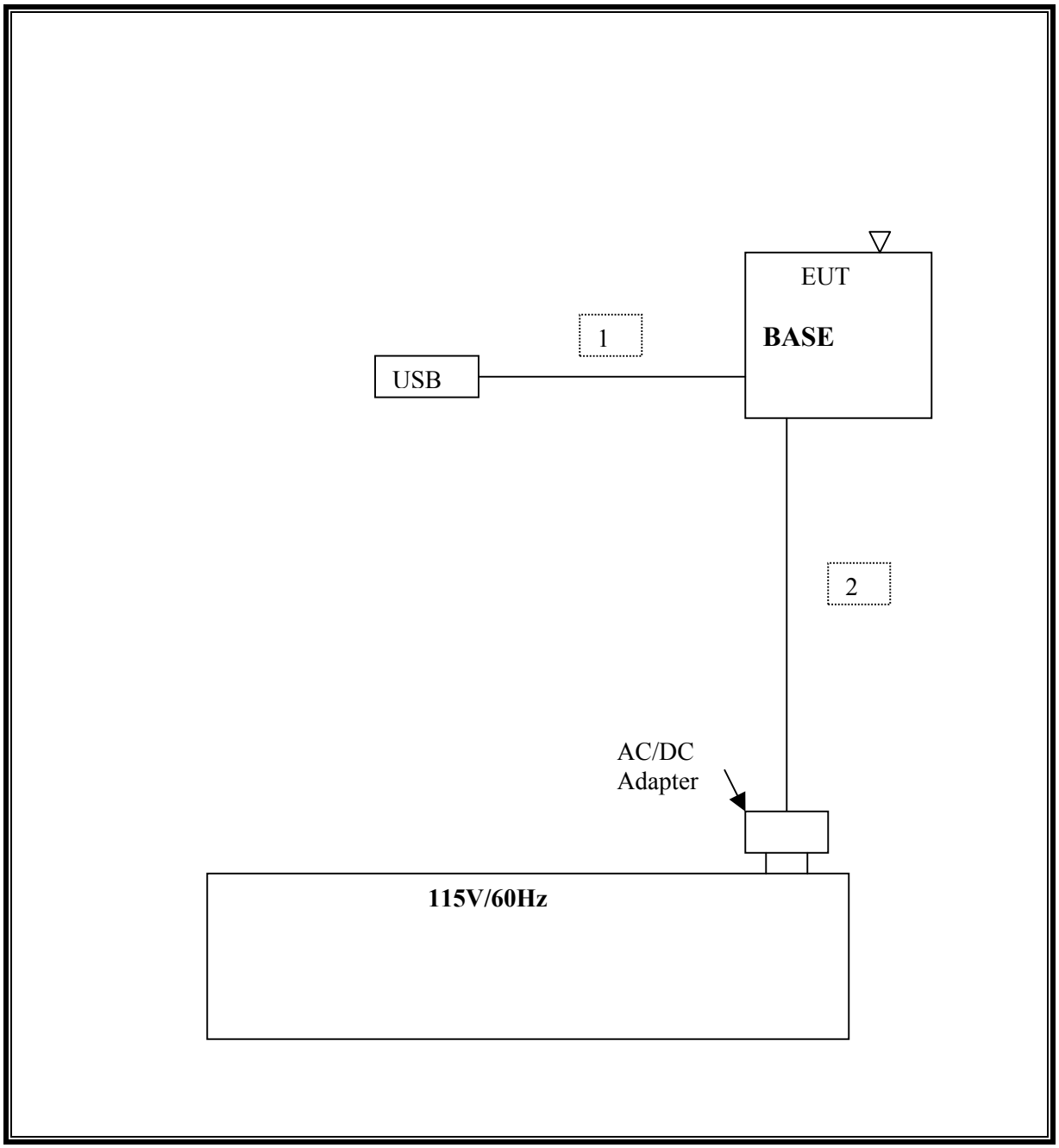
I/O CABLES

Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	USB	1	USB	Unshielded	2m	Ferrite on PC's end
2	DC	1	DC Power	Unshielded	2m	N/A

TEST SETUP

The Base was connected to the telephone set and communicates to the remote Head set.

SETUP DIAGRAM BASE



6.2. SETUP OF THE BASE (DIGITAL MODE)

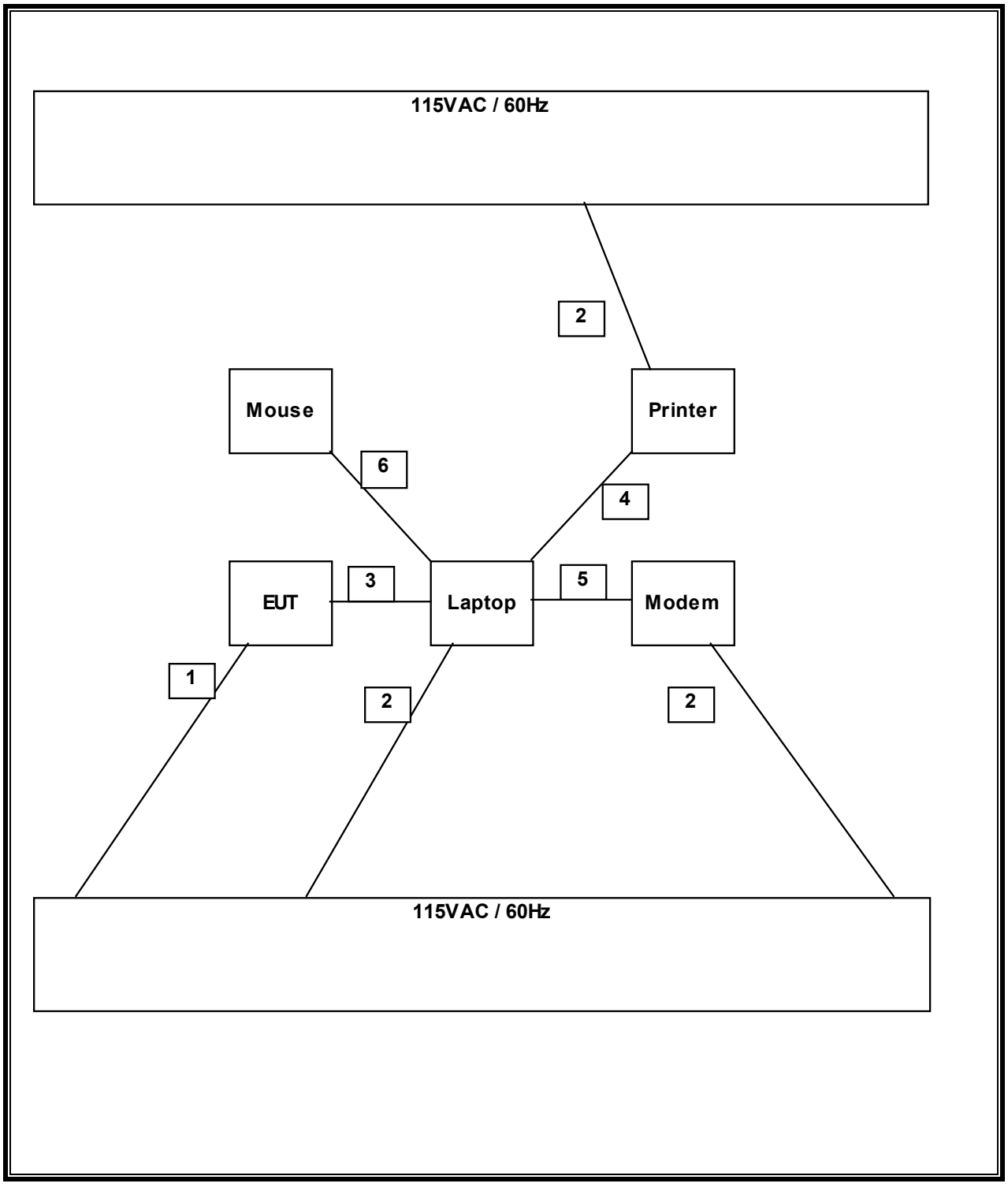
SUPPORT EQUIPMENT

TEST PERIPHERALS				
Device Type	**Manufacturer**	**Model Number**	**Serial Number**	**FCC ID**
MODEM	ACEEX	1414	9013537	IFAXDM1414
PRINTER	HP	2225C	2541S41679	BS46XU2225C
MOUSE	LOGITECH	N/A	LZB80414947	DZL211029
LAPTOP	HP	CRVSA-02T1-75	CNF3370PXK	DoC

I/O CABLES

TEST I / O CABLES								
Cable No	**I/O Port**	**# of I/O Port**	**Connector Type**	**Type of Cable**	**Cable Length**	**Data Traffic**	**Bundled**	**Remark**
1	AC/DC	1	US 115V	Un-shielded	2m	No	Yes	EUT at LC test
2	AC/DC	3	US 115V	Un-shielded	2m	No	No	N/A
3	USB	1	USB	Un-shielded	2m	Yes	No	N/A
4	Parallel	1	DB25	Shielded	2m	Yes	Yes	N/A
5	Serial	1	DB9	Shielded	1m	Yes	No	N/A
6	Mouse	1	PS/2	Un-shielded	2m	Yes	No	N/A

SETUP DIAGRAM FOR TESTS



7. APPLICABLE LIMITS AND TEST RESULTS

7.1. PEAK OUTPUT POWER

PEAK POWER LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt.

§15.247 (b) (4) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 1.5 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer with VBW >= VBW > EBW.
(RBW=3MHz; VBW=8MHz)

RESULTS

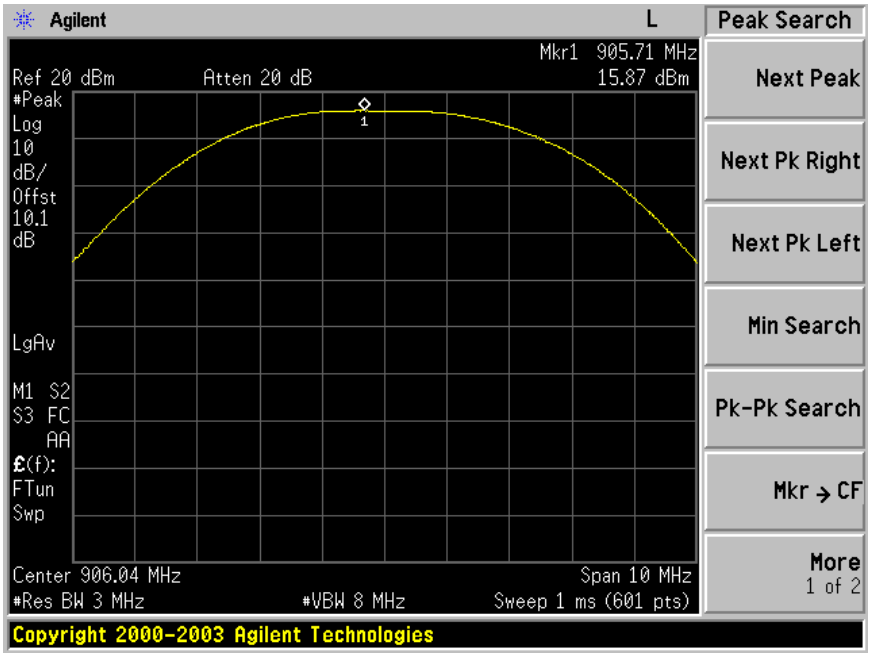
No non-compliance noted:

BASE

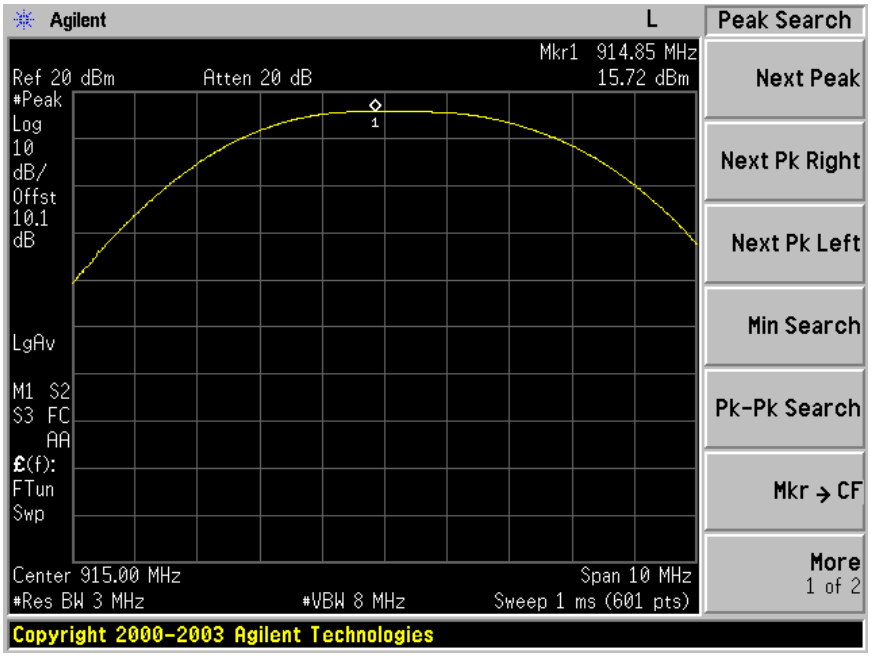
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	906	15.87	30	-14.13
Middle	915	15.72	30	-14.28
High	924	15.55	30	-14.45

OUTPUT POWER BASE

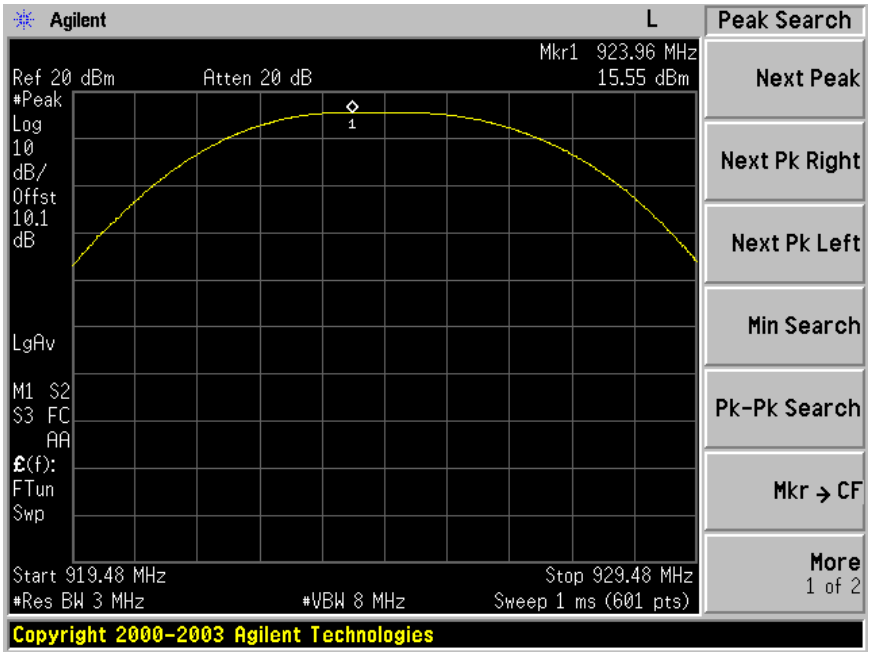
PEAK POWER LOW CH BASE



PEAK POWER MID CH BASE



PEAK POWER HIGH CH BASE



7.2. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.247 (c) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

The spectrum from 30 MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

Please referred to radiated spurious emissions.

7.3. RADIATED EMISSIONS

LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS

No non-compliance noted:

TX MODE:

NON-RESTRICTED BAND EDGE PLOT (LOW BAND EDGE, HORIZONTAL)

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

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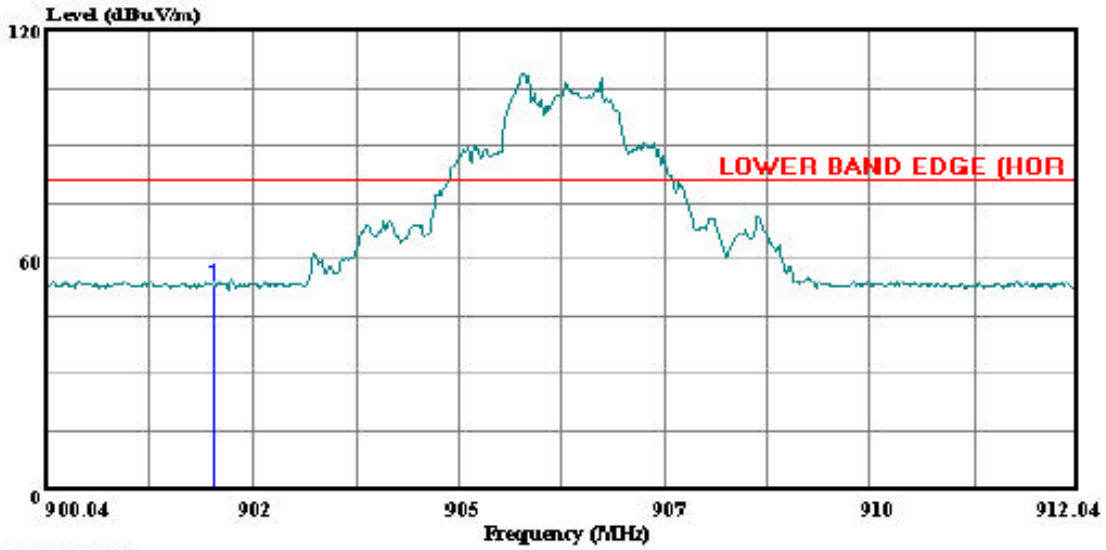

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Condition: LOWER BAND EDGE (HOR HORIZONTAL
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900,900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX,
: Fundamental, low ch, 906.04MHz

Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	901.996	Peak	27.51	25.45	52.95	80.82	-27.87

NON-RESTRICTED BAND EDGE PLOT (LOW BAND EDGE, VERTICAL)

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

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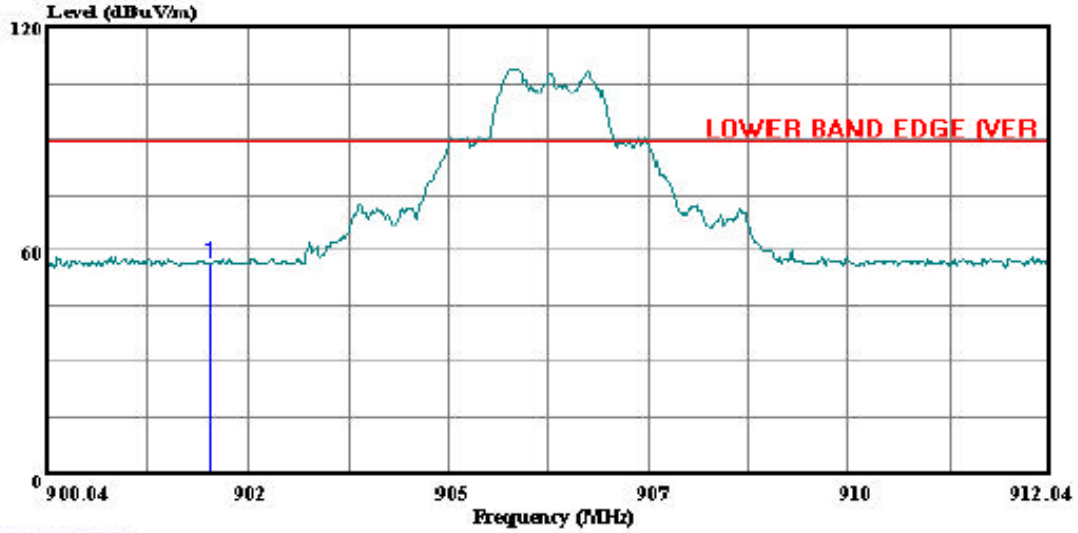

(Audix ATC)
Trace: 13 Ref Trace:

Condition: LOWER BAND EDGE (VERTICAL)
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900,900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX, low bandedge

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	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	901.996	Peak	31.00	25.45	56.45	89.32	-32.87

NON-RESTRICTED BAND EDGE PLOT (HIGH BAND EDGE, HORIZONTAL)

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
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Tel: (408) 463-0888
Fax: (408) 463-0885

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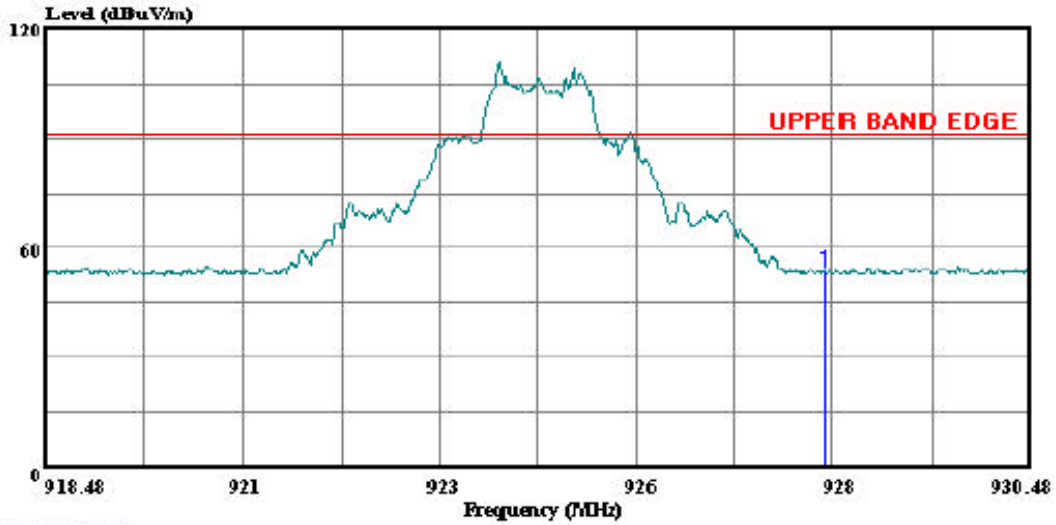

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Condition: UPPER BAND EDGE HORIZONTAL
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900,900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX,, high ch, 924.48MHz
: Fundamental

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	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	927.996	Peak	27.80	25.68	53.48	91.40	-37.92

NON-RESTRICTED BAND EDGE PLOT (HIGH BAND EDGE, VERTICAL)

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Morgan Hill, CA 95037
Tel: (408) 463-0888
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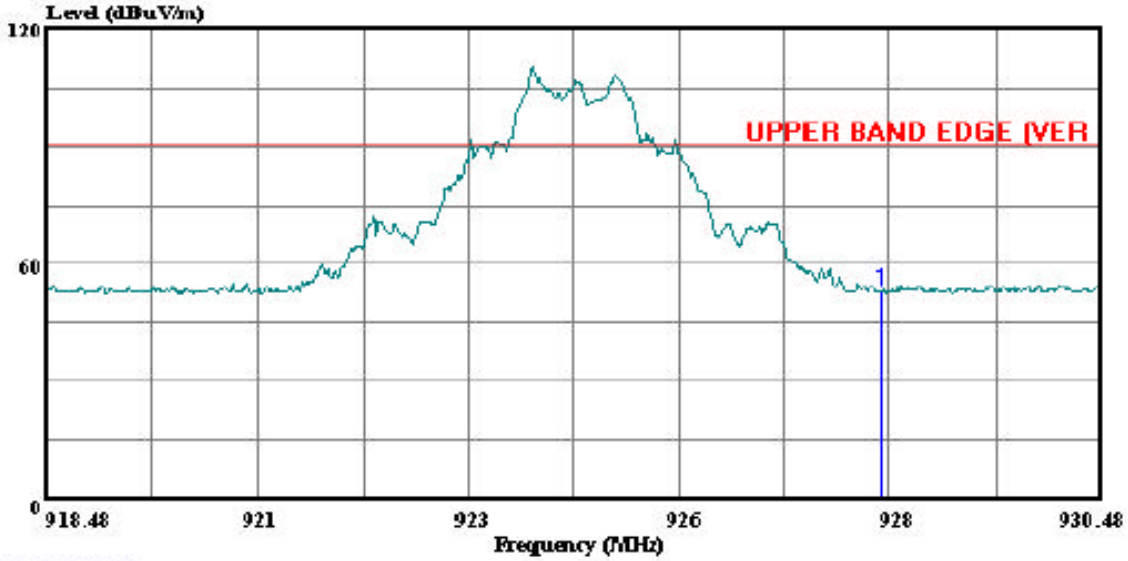

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Condition: UPPER BAND EDGE (VER VERTICAL
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900,900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX,, high ch, 924.48MHz
: Fundamental

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	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	927.996	Peak	27.53	25.68	53.21	90.47	-37.26

RESTRICTED BAND EDGE PLOT (LOW BAND EDGE, HORIZONTAL)

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

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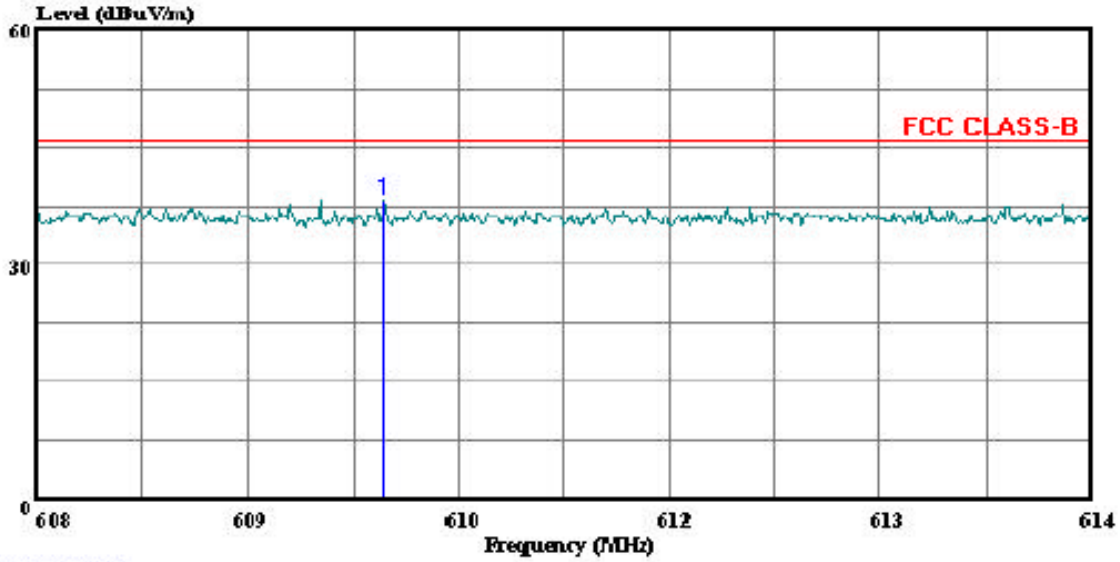

(Audix ATC)

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Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900, 900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX,, 906.04MHz
: low bandedge

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	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	609.974	Peak	16.30	21.91	38.21	46.00	-7.79

RESTRICTED BAND EDGE PLOT (LOW BAND EDGE, VERTICAL)

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

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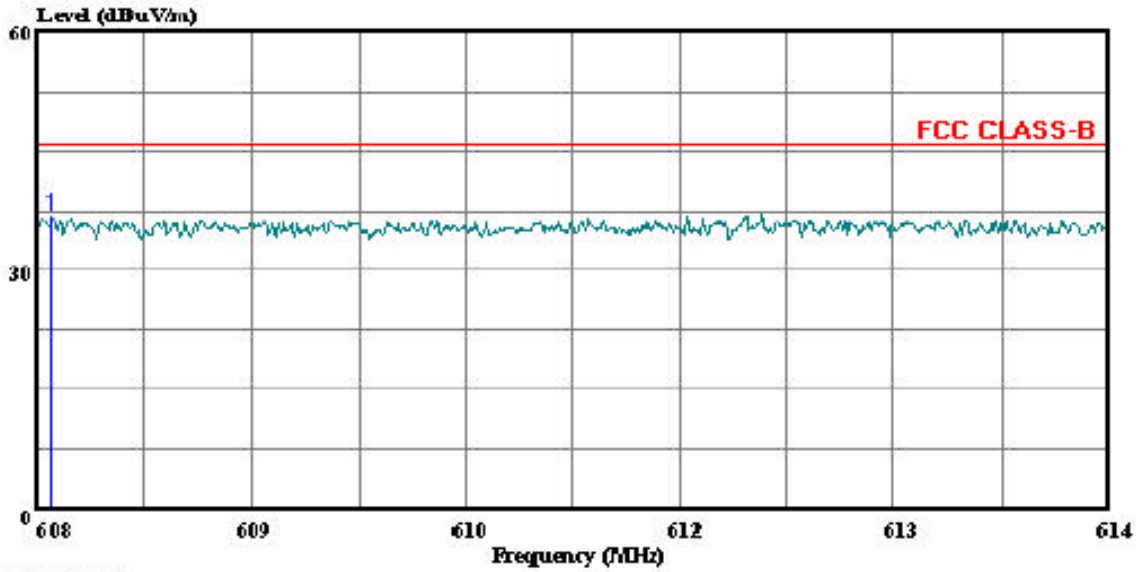

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Condition: FCC CLASS-B VERTICAL
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900, 900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX,, 906.04MHz
: low bandedge

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	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	608.084	Peak	14.91	21.90	36.81	46.00	-9.19

RESTRICTED BAND EDGE PLOT (HIGH BAND EDGE, HORIZONTAL)

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
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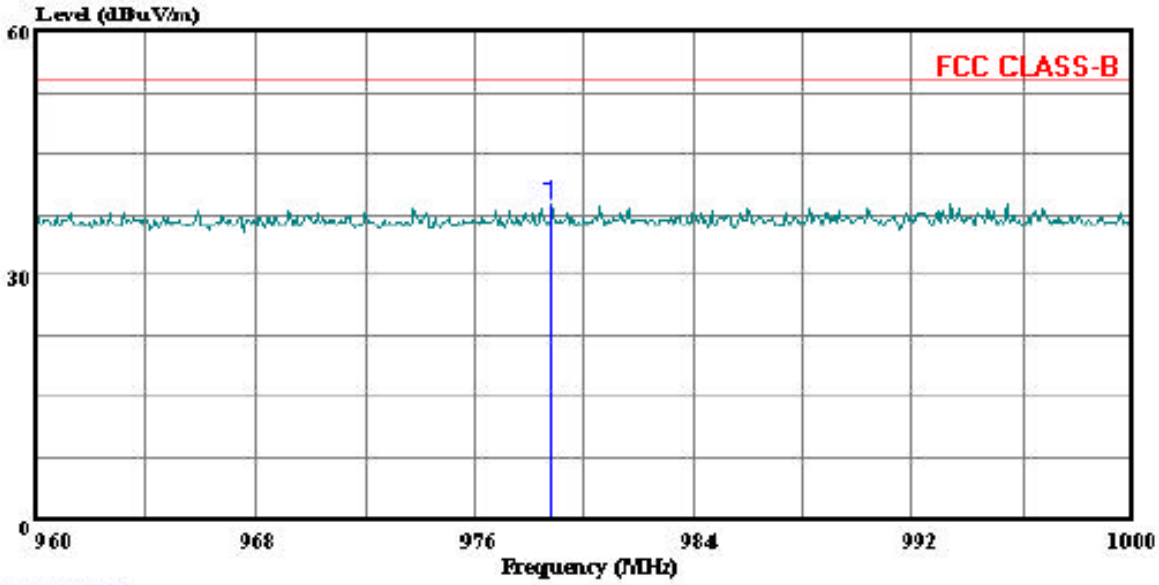

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Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900,900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX,, high ch, 924.48MHz
: High Bandedge

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	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	978.760	Peak	12.52	26.18	38.70	54.00	-15.30

RESTRICTED BAND EDGE PLOT (HIGH BAND EDGE, VERTICAL)

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Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

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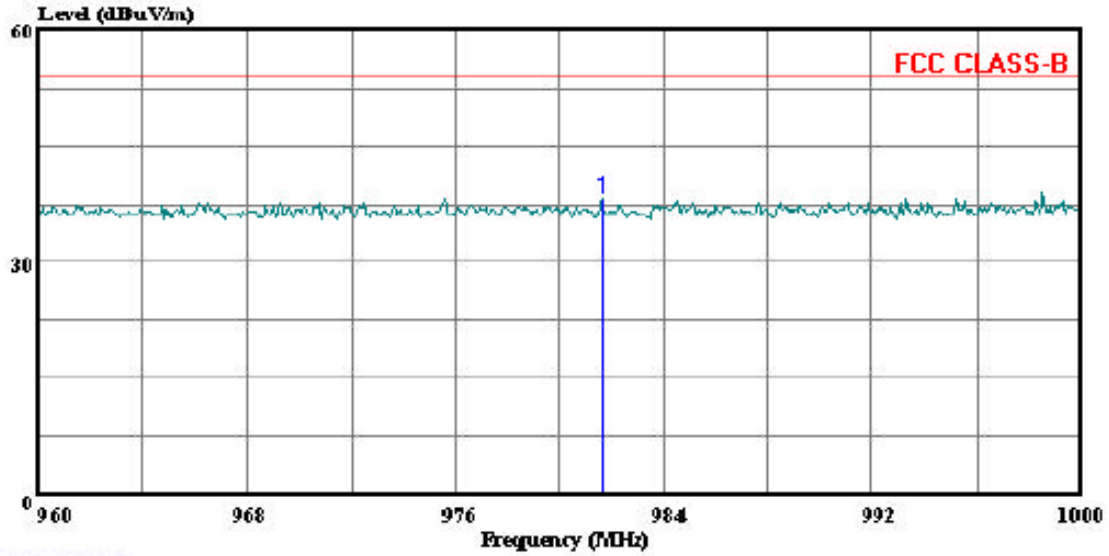


(Audix ATC)

Trace: 31 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900, 900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX,, high ch, 924.48MHz
: High Bandedge

Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	981.680	Peak	12.01	26.22	38.23	54.00	-15.77

HARMONICS AND SPURIOUS EMISSIONS (BASE)

09/09/04 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:Chin Pang
Project #:04U2887-3
Company:Clifford Technologies CD
EUT Descrip.:Bellringer 900, 900MHz Cordless Telephone Headset and Base
EUT M/N:CS50-USB
Test Target:FCC Class B
Mode Oper:TX

Test Equipment:

EMCO Horn 1-18GHz	Spectrum Analyzer	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz
T73; S/N: 6717 @3m	HP 8593EM Analyzer	T87 Miteq 924342		

Hi Frequency Cables: ☐ (2 ft) ☑ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

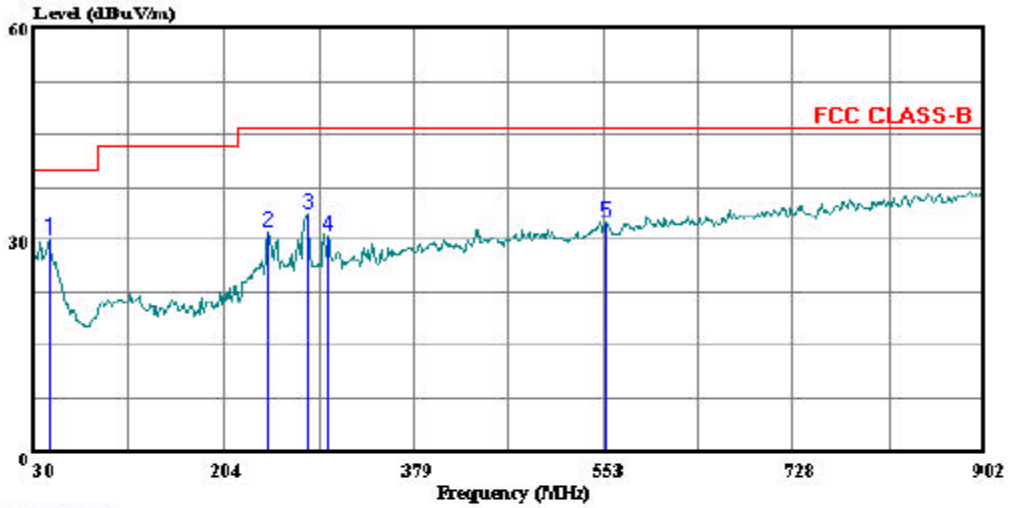
f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
Transmitting at low ch, 906.04MHz															
1.812	9.8	75.0	59.2	27.3	1.7	-43.3	0.0	1.0	61.7	45.9	74.0	54.0	-12.3	-8.1	V
2.718	9.8	81.7	58.7	30.0	2.0	-43.2	0.0	1.0	71.5	48.5	74.0	54.0	-2.5	-5.5	V
3.624	9.8	75.0	57.8	31.8	2.4	-43.7	0.0	1.0	66.5	49.3	74.0	54.0	-7.5	-4.7	V
4.530	9.8	60.4	44.6	33.1	2.8	-44.4	0.0	1.0	52.8	37.0	74.0	54.0	-21.2	-17.0	V
1.812	9.8	74.2	58.4	27.3	1.7	-43.3	0.0	1.0	60.9	45.1	74.0	54.0	-13.1	-8.9	H
2.718	9.8	80.2	57.2	30.0	2.0	-43.2	0.0	1.0	69.9	46.9	74.0	54.0	-4.1	-7.1	H
3.624	9.8	76.2	59.0	31.8	2.4	-43.7	0.0	1.0	67.7	50.5	74.0	54.0	-6.3	-3.5	H
4.530	9.8	63.5	47.7	33.1	2.8	-44.4	0.0	1.0	55.9	40.1	74.0	54.0	-18.1	-13.9	H
Transmitting at mid ch, 915.210MHz															
1.830	9.8	73.8	56.8	27.4	1.7	-43.3	0.0	1.0	60.5	43.5	74.0	54.0	-13.5	-10.5	V
2.746	9.8	79.6	58.6	30.0	2.0	-43.2	0.0	1.0	69.5	48.5	74.0	54.0	-4.5	-5.5	V
3.661	9.8	71.0	54.0	31.9	2.4	-43.7	0.0	1.0	62.6	45.6	74.0	54.0	-11.4	-8.4	V
4.576	9.8	60.4	43.4	33.1	2.8	-44.5	0.0	1.0	52.9	35.9	74.0	54.0	-21.1	-18.1	V
1.830	9.8	72.5	55.5	27.4	1.7	-43.3	0.0	1.0	59.2	42.2	74.0	54.0	-14.8	-11.8	V
2.746	9.8	72.8	55.8	30.0	2.0	-43.2	0.0	1.0	62.6	45.6	74.0	54.0	-11.4	-8.4	H
3.661	9.8	70.5	53.5	31.9	2.4	-43.7	0.0	1.0	62.0	45.0	74.0	54.0	-12.0	-9.0	H
4.576	9.8	60.3	43.3	33.1	2.8	-44.5	0.0	1.0	52.7	35.7	74.0	54.0	-21.3	-18.3	H
															H
Transmitting at high ch, 924.48MHz															
1.849	9.8	75.2	58.2	27.5	1.7	-43.3	0.0	1.0	62.0	45.0	74.0	54.0	-12.0	-9.0	V
2.772	9.8	82.0	59.0	30.1	2.0	-43.2	0.0	1.0	71.9	48.9	74.0	54.0	-2.1	-5.1	V
3.700	9.8	72.9	55.9	32.0	2.4	-43.7	0.0	1.0	64.5	47.5	74.0	54.0	-9.5	-6.5	V
4.622	9.8	60.0	43.0	33.2	2.8	-44.5	0.0	1.0	52.4	35.4	74.0	54.0	-21.6	-18.6	V
1.849	9.8	73.2	56.2	27.5	1.7	-43.3	0.0	1.0	60.0	43.0	74.0	54.0	-14.0	-11.0	H
2.772	9.8	74.4	56.0	30.1	2.0	-43.2	0.0	1.0	64.3	45.9	74.0	54.0	-9.7	-8.1	H
3.700	9.8	72.8	55.8	32.0	2.4	-43.7	0.0	1.0	64.4	47.4	74.0	54.0	-9.6	-6.6	H
4.622	9.8	59.6	42.6	33.2	2.8	-44.5	0.0	1.0	52.1	35.1	74.0	54.0	-21.9	-18.9	H
Note: No other spurious emissions were dtectected above the system noise floor up to 10GHz															

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

SPURIOUS EMISSIONS 30 TO 902 MHz BASE (HORIZONTAL)

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 6 File#: 2887_Clifford.EMIDate: 09-09-2004 Time: 09:12:03



(Audix ATC)
Trace: 5 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900, 900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX

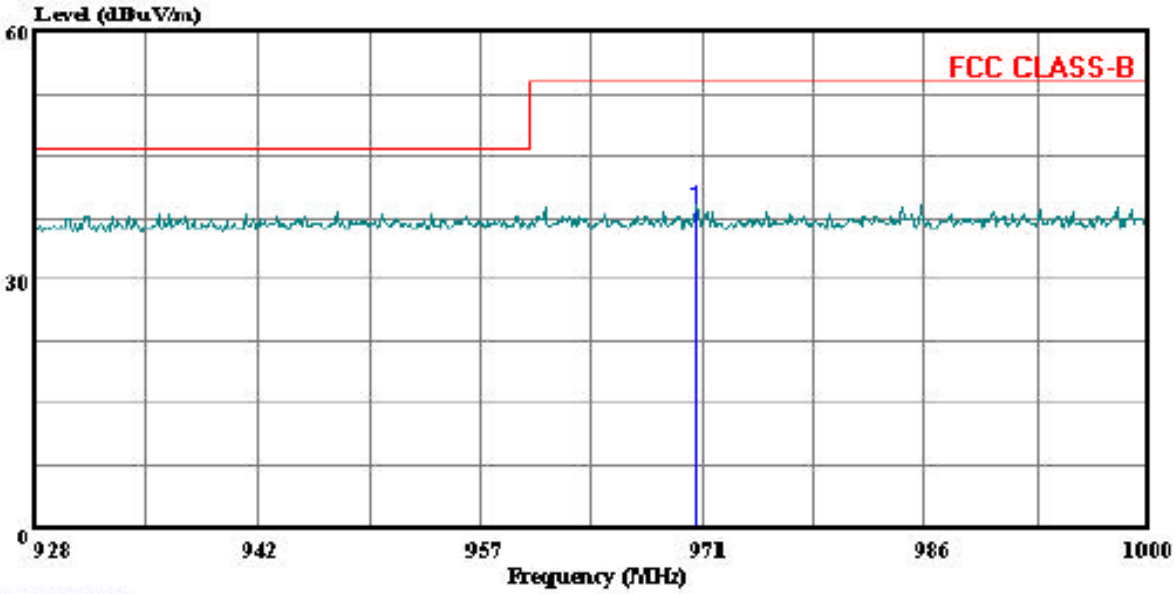
Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	44.824	Peak	11.47	18.78	30.25	40.00	-9.75
2	245.384	Peak	16.53	14.76	31.29	46.00	-14.71
3	282.008	Peak	18.19	15.59	33.78	46.00	-12.22
4	299.448	Peak	14.69	15.85	30.54	46.00	-15.46
5	554.944	Peak	11.36	21.04	32.40	46.00	-13.60

SPURIOUS EMISSIONS 928 TO 1000MHz BASE (HORIZONTAL)

561F Monterey Road
Morgan Hill, CA 9503
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 8 File#: 2887_Clifford.EMIDate: 09-09-2004 Time: 09:14:49



(Audix ATC)

Trace: 7 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900,900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX

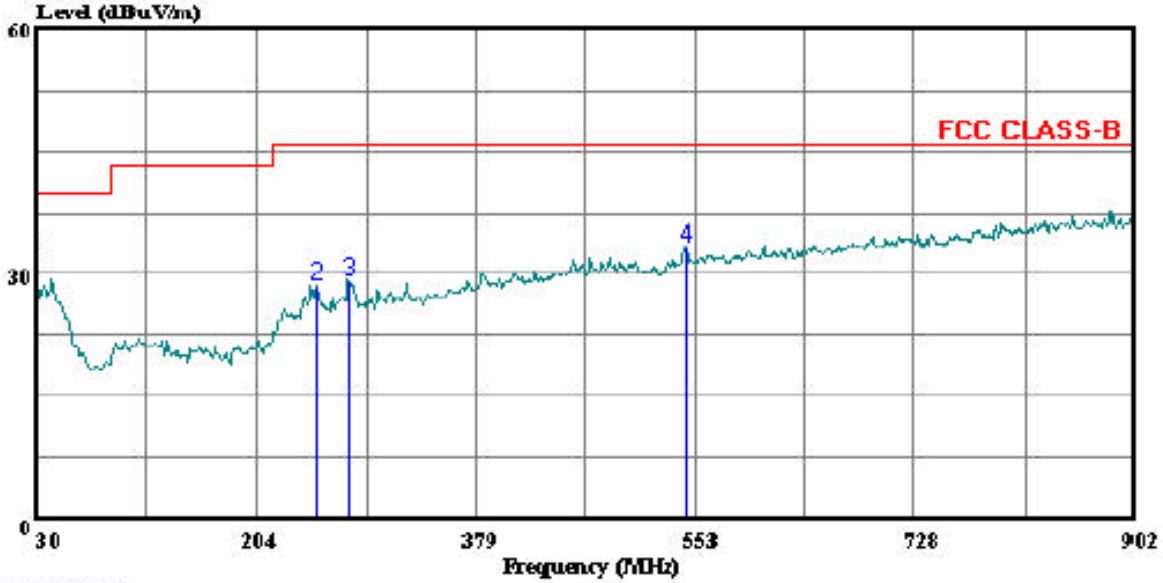
Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	970.696	Peak	12.45	26.10	38.55	54.00	-15.45

SPURIOUS EMISSIONS 30 TO 902 MHz BASE (VERTICAL)

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 2 File#: 2887_Clifford.EMIDate: 09-09-2004 Time: 09:03:39



(Audix ATC)

Trace: 1 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Chin Pang
Project #: : 04U2887-3
Company: : Clifford Technologies CD
EUT: : Bellringer 900, 900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX

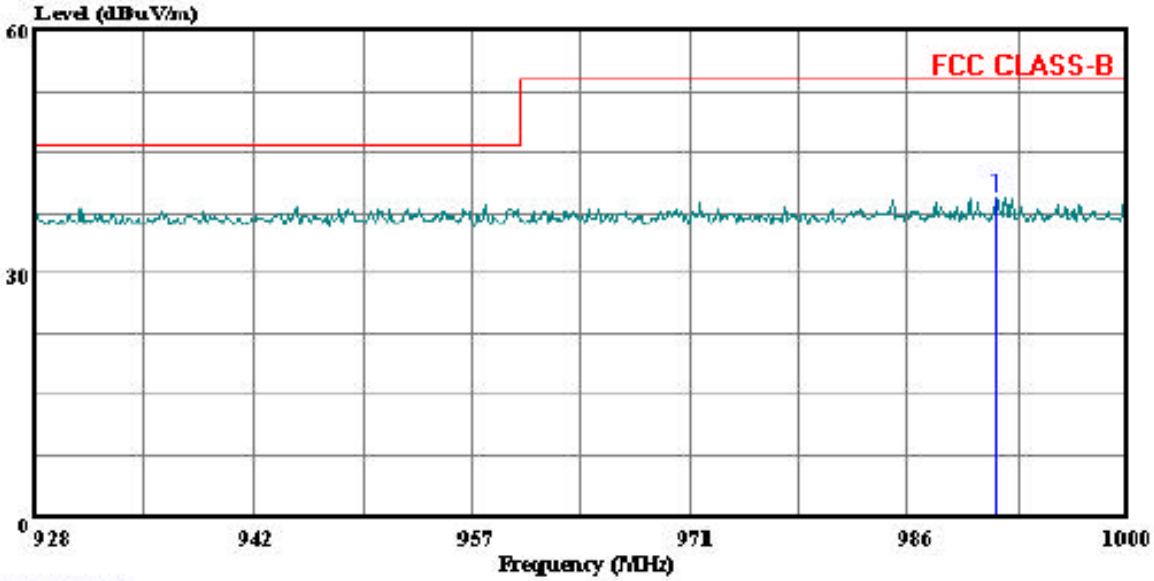
Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	30.000	Peak	13.51	18.78	32.29	40.00	-7.71
2	251.488	Peak	13.31	15.14	28.46	46.00	-17.54
3	278.520	Peak	13.57	15.54	29.11	46.00	-16.89
4	546.224	Peak	12.31	20.90	33.21	46.00	-12.79

SPURIOUS EMISSIONS 928 TO 1000 MHz BASE (VERTICAL)

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 4 File#: 2887_Clifford.EMIDate: 09-09-2004 Time: 09:08:27



(Audix ATC)
Trace: 3 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator : Chin Pang
Project # : 04U2887-3
Company : Clifford Technologies CD
EUT : Bellringer 900,900MHz Cordless Telephone Headset
: and Base
Model No: : CS50-USB
Configuration: : EUT only
Target of Test: : FCC Class B
Mode of Operation: TX

Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	991.504	Peak	13.03	26.35	39.38	54.00	-14.62

DIGITAL MODE:

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 4 File#: CLIFFORD.EMI Date: 08-04-2004 Time: 10:13:24
Audix ATC

Condition: FCC CLASS-B 3m SUNOL BILOG 12/22/04 HORIZONTAL
Test Operator: : HITESH SOLANKI
Project #: : 04U2887 - 2
Company: : PLANTRONICS, INC.
EUT: : DECT WIRELESS HEADSET SYSTEM
Model No: : CS50-USB
Configuration: : EUT WITH LAPTOP (WITH PRINTER, MOUSE &
: MODEM)
Target of Test: : CLASS B
Mode of Operation: CONTINOUS DATA ON USB PORT

Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	293.840	Peak	14.14	15.80	29.94	46.00	-16.06
2	400.540	Peak	17.66	18.23	35.89	46.00	-10.11
3	533.430	Peak	13.21	21.01	34.22	46.00	-11.78
4	577.080	Peak	14.33	21.84	36.17	46.00	-9.83
5	667.290	Peak	16.65	23.21	39.86	46.00	-6.14
6	722.580	Peak	14.79	24.20	38.99	46.00	-7.01
7	801.150	Peak	13.31	25.03	38.34	46.00	-7.66

VERTICAL

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 2 File#: CLIFFORD.EMI Date: 08-04-2004 Time: 09:57:07
Audix ATC

Condition: FCC CLASS-B 3m SUNOL BILOG 12/22/04 VERTICAL
Test Operator: : HITESH SOLANKI
Project #: : 04U2887 - 2
Company: : PLANTRONICS, INC.
EUT: : DECT WIRELESS HEADSET SYSTEM
Model No: : CS50-USB
Configuration: : EUT WITH LAPTOP (WITH PRINTER, MOUSE &
: MODEM)
Target of Test: : CLASS B
Mode of Operation: CONTINOUS DATA ON USB PORT

Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	266.680	Peak	17.14	14.87	32.01	46.00	-13.99
2	400.540	Peak	18.39	18.23	36.62	46.00	-9.38
3	468.440	Peak	15.56	19.88	35.44	46.00	-10.56
4	533.430	Peak	14.35	21.01	35.36	46.00	-10.64
5	577.080	Peak	14.71	21.84	36.55	46.00	-9.45
6	633.340	Peak	18.09	22.44	40.53	46.00	-5.47
7	667.290	Peak	17.88	23.21	41.09	46.00	-4.91
8	722.580	Peak	17.77	24.20	41.97	46.00	-4.03
9	775.930	Peak	17.85	24.52	42.37	46.00	-3.63
10	800.180	Peak	16.79	25.02	41.81	46.00	-4.19

7.4. POWERLINE CONDUCTED EMISSIONS

LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

No non-compliance noted:

6 WORST EMISSIONS FOR TX MODE

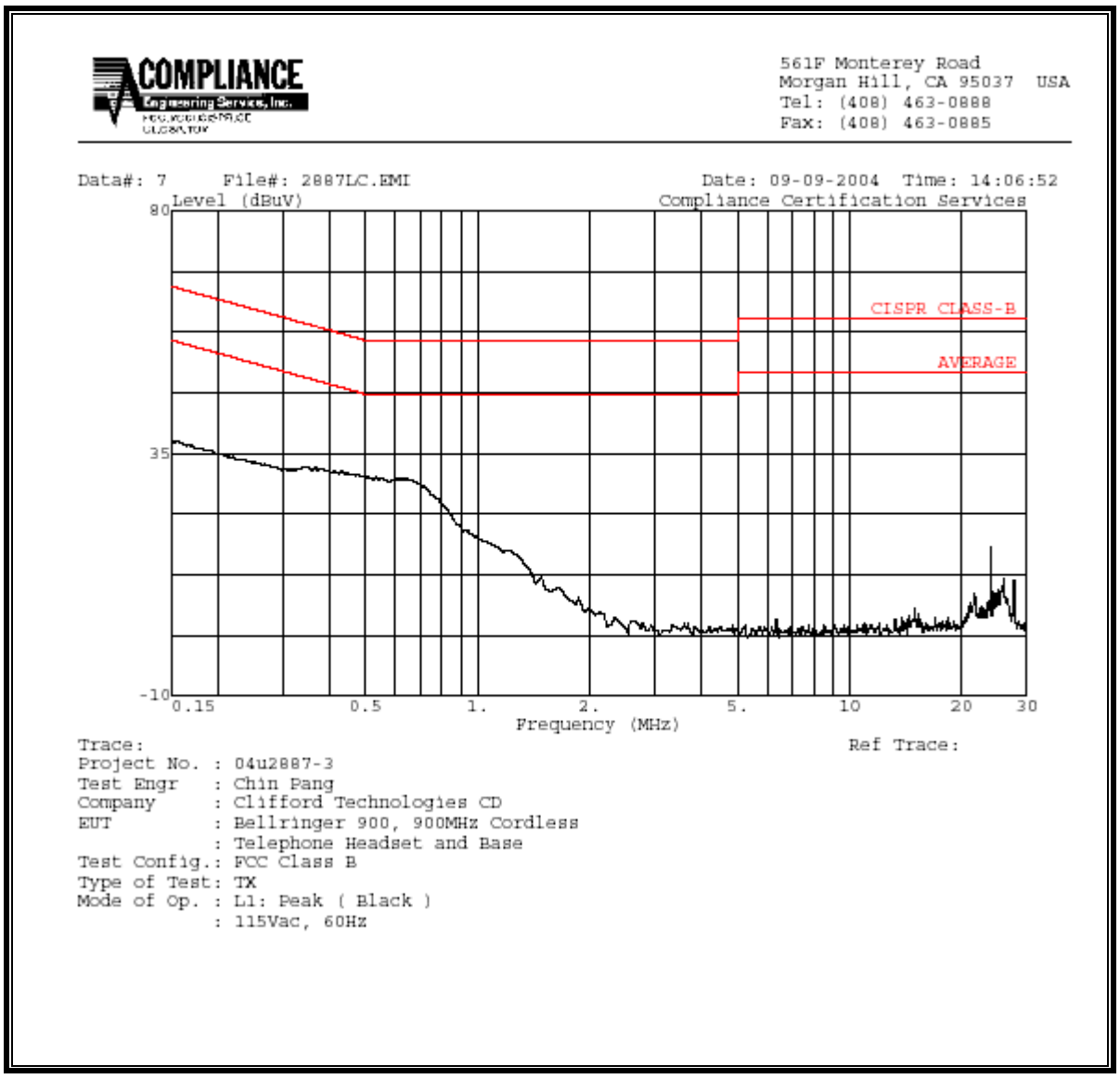
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.16	37.30	--	--	0.00	65.80	55.80	-28.50	-18.50	L1
0.67	30.06	--	--	0.00	56.00	46.00	-25.94	-15.94	L1
24.01	17.78	--	--	0.00	60.00	50.00	-42.22	-32.22	L1
0.16	35.47	--	--	0.00	65.83	55.83	-30.36	-20.36	L2
0.34	29.86	--	--	0.00	60.54	50.54	-30.68	-20.68	L2
24.01	17.64	--	--	0.00	60.00	50.00	-42.36	-32.36	L2
6 Worst Data									

6 WORST EMISSIONS FOR DIGITAL MODE

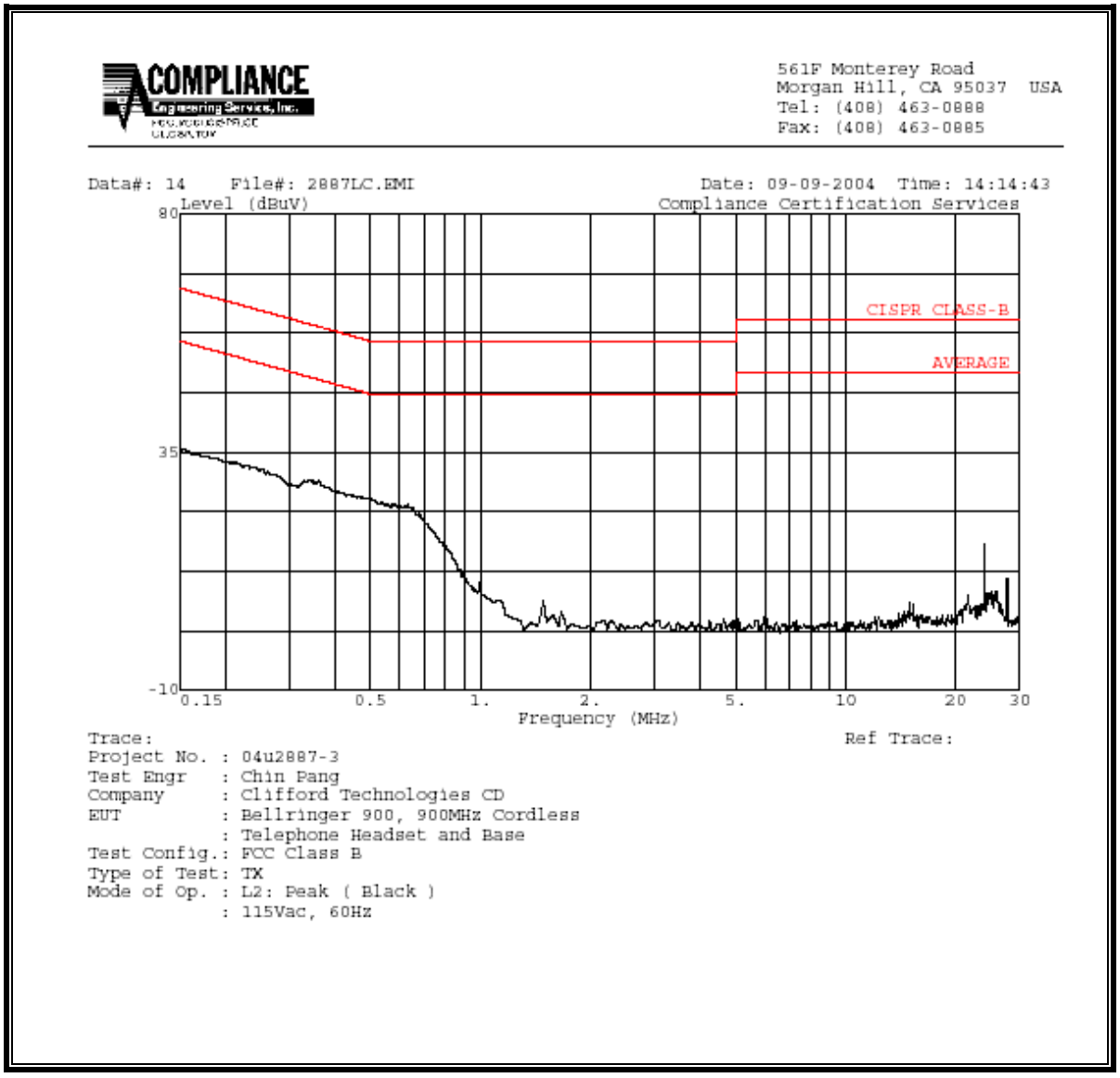
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.16	43.56	--	--	0.00	65.69	55.69	-22.13	-12.13	L1
0.65	32.69	--	--	0.00	56.00	46.00	-23.31	-13.31	L1
12.00	17.18	--	--	0.00	60.00	50.00	-42.82	-32.82	L1
0.15	45.30	--	--	0.00	66.00	56.00	-20.70	-10.70	L2
0.62	38.24	--	--	0.00	56.00	46.00	-17.76	-7.76	L2
12.06	13.62	--	--	0.00	60.00	50.00	-46.38	-36.38	L2
6 Worst Data									

TX MODE:

LINE 1 RESULT



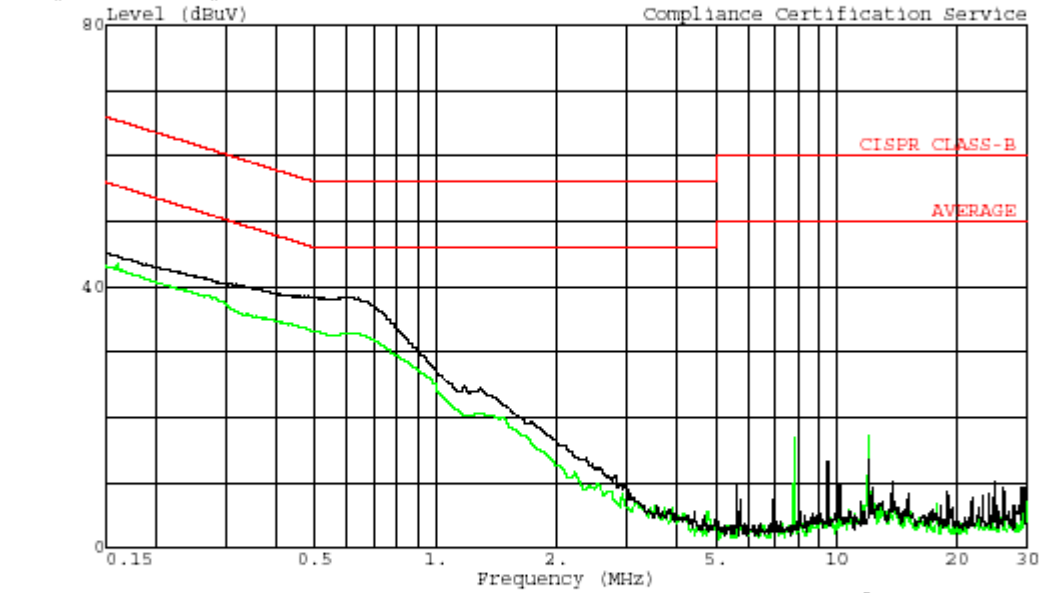
LINE 2 RESULT



DIGITAL MODE:

L1 & L2 RESULTS

561F Monterey Road,
Morgan Hill, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888



Trace: B Ref Trace:
Project # : 04u2887
Test Operator : HITESH SOLANKI
Company : PLANTRONICS, INC.
EUT : DECT WIRELESS HEADSET SYSTEM
Model : CS50-USB
Configuration : EUT WITH LAPTOP & SUPPORT EQUIPMENT
Mode of Operation: CONTINOUS DATA ON USB PORT
Target of Test : 115VAC/ 60Hz
: PEAK: L1(BLACK); L2 (GREEN)

8. SETUP PHOTOS

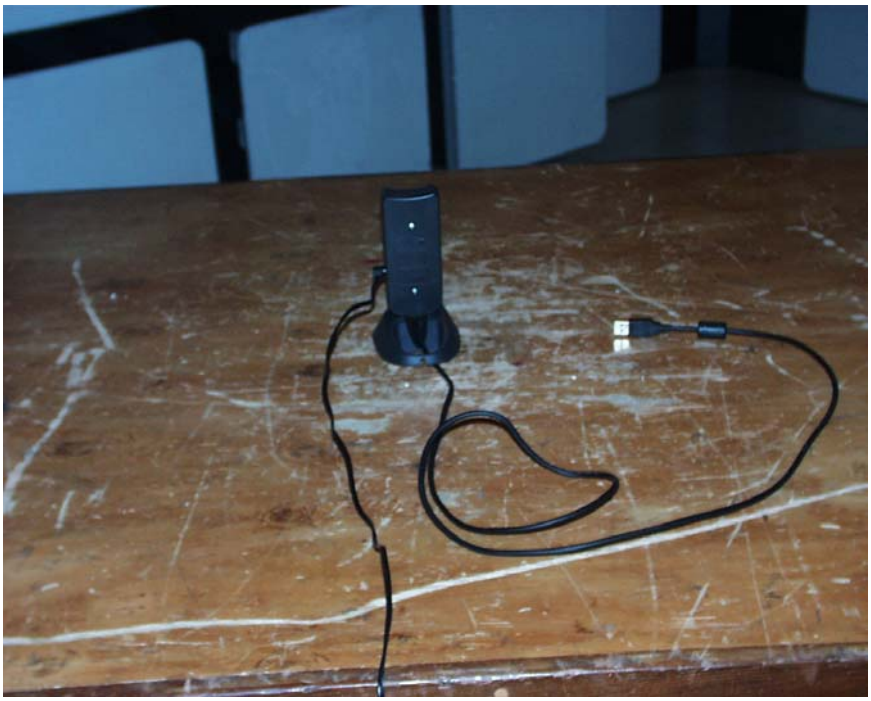
ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO BASE

RADIATED RF MEASUREMENT SETUP

RADIATED FRONT PHOTO BASE

RADIATED BACK PHOTO BASE



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO BASE

LINE CONDUCTED BACK PHOTO BASE

END OF REPORT