



FCC CLASS B
(CFR 47, Part 15, Subpart B)
COMPLIANCE TEST REPORTS

for

Electromagnetic Emissions

of

POLYCOM BLUETOOTH RADIO MODULE

Model Number: None

Serial Number: 00:07:86:00:27:30

Test Standards:

CFR 47, Part 15, Subpart B-1998 (ANSI C63.4-1992), Spurious Emissions

Prepared for:

HYPER CORPORATION

1279 Quarry Lane, Suite B
Pleasanton, CA 94566

Prepared by:

Underwriters Laboratories, Incorporated

11825 Niles Canyon Road
Sunol, CA 94586
(925) 862-9051

REPORT DATE: NOVEMBER 19, 2002



**FCC CLASS B
CFR 47, Part 15, Subpart B
COMPLIANCE TEST REPORTS**

FOR

**POLYCOM BLUETOOTH RADIO MODULE
MODEL None**


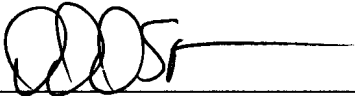
Test Standards:

CFR 47, Part 15, Subpart B-1998 (ANSI C63.4-1992), Spurious Emissions

Prepared for:

HYPER CORPORATION
Pleasanton, CA 94566

Prepared by: Underwriters Laboratories, Inc.

	Signature	Date
TEST TECHNICIAN	 _____ Wayne Fisher	<u>11/19/02</u>
TEST SUPERVISOR	 _____ Daryl Smith	<u>11/19/02</u>



LIST OF REVISIONS

**REVISION
NUMBER
AND DATE**

**PAGE
CHANGED**

**PAGE
SUBSTITUTED**

**PAGE
ADDED**



REPRODUCTION CLAUSE

Any reproduction of this document must be done in full. No single part of this document may be reproduced without written permission of Underwriters Laboratories, Inc., 11825 Niles Canyon Road, Sunol, CA 94586.



TABLE OF CONTENTS

<u>TITLE</u>	<u>PAGE</u>
TITLE PAGE.....	1
SIGNATURE PAGE.....	2
LIST OF REVISIONS.....	3
REPRODUCTION CLAUSE.....	4
TABLE OF CONTENTS.....	5
VERIFICATION OF COMPLIANCE TESTING.....	6
GENERAL INFORMATION.....	9
TEST RESULTS.....	9
SYSTEM DESCRIPTION.....	10
PRODUCT INFORMATION.....	11
SUPPORT EQUIPMENT.....	12
PRODUCT CABLING INFORMATION.....	14
SUMMARY.....	15
PHOTOGRAPHS.....	26
PERFORMANCE CRITERIA.....	32
TEST FACILITY.....	34
TEST EQUIPMENT.....	36
TEST METHODS.....	39
CLASS TYPES AND LIMITS.....	42
LABELING REQUIREMENTS.....	44
TEST PROCEDURES.....	49



VERIFICATION OF COMPLIANCE TESTING

Equipment Under Test: Polycom Bluetooth Radio Module

Model Number: None

Serial Number: 00:07:86:00:27:30

Company: Hyper Corporation
1279 Quarry Lane, Suite B
Pleasanton, CA 94566

Test Standard: CFR 47, Part 15, Subpart B-1998 (ANSI C63.4-1992),
Spurious Emissions

Frequency Range: Conducted 150 kHz - 30 MHz
Radiated 30 MHz - 25 GHz

Deviation: None

Date Tested: October 22, 2002

Test Technician: Wayne Fisher



VERIFICATION OF COMPLIANCE TESTING (continued)

Test Results

CFR 47:

Line Conducted--Line conducted scans ranged from 150 kHz to 30 MHz on both Line 1 (hot side) and Line 2 (neutral side) in accordance with CFR 47 Class B test standard. All line conducted emissions were within the CFR 47 Class B requirements for compliance.

Radiated--Radiated scans ranged from 30 MHz to 1 GHz in both the horizontal and the vertical antenna polarization. All radiated emissions were within the CFR 47 Class B requirements for compliance.

The above equipment was tested by Underwriters Laboratories, Inc., for compliance/conformance with the requirements set forth in the CFR 47 Class B Rules and Regulations. The said equipment in the configuration described in the report shows, that maximum emission levels emanating from the equipment are within the compliance/conformance requirements.



VERIFICATION OF COMPLIANCE TESTING (continued)

The emission and electromagnetic compatibility requirements for this test are those as stated in standards CFR 47 Class B.

The following tables give a brief summary of tests performed on the Hyper Corporation, Polycom Bluetooth Radio Module, Model None, in compliance with the above standards.

EMISSIONS

STANDARD	MEETS REQUIREMENTS (YES/NO)	COMMENTS
CFR 47 (1998)	Yes Class B	Refer to Test Results, Section 2



GENERAL INFORMATION

Customer: Hyper Corporation
1279 Quarry Lane, Suite B
Pleasanton, CA 94566

Contact Person: Kevin Marquess

Phone Number: (925) 462-9105

Equipment Under Test: Polycom Bluetooth Radio Module

Model Number: None

Serial Number: 00:07:86:00:27:30



SYSTEM DESCRIPTION

Equipment Under Test

Polycom Bluetooth Radio Module

Support Equipment

Laptop Computer

Bluetooth Test Set

EUT Test Program: Bluetooth diagnostic software was used to exercise the EUT during testing on a single frequency at a time.



PRODUCT INFORMATION

Description of Equipment Under Test: The unit is a Polycom Bluetooth Radio Module.

EUT and/or support equipment was received at Underwriters Laboratories, Inc., in good condition, on October 31, 2002.

Housing Type: None- bare board

Power Supply: External Removeable

AC Power Requirements: 100-240 VAC/60-50 Hz

Power Supply Manufacturer: Egston

Power Supply Model Number: N2GFSW3

Serial Number: None

DC Line Cord from Supply to EUT: Unshielded **Length:** 5 ft

OSC./Clock Frequency: (TX/RX = 2402MHz to 2480MHz)

<u>I/O PORT TYPE</u>	<u>QTY</u>	<u>TESTED WITH</u>
1) Serial	1	1
2) RF In/Out	1	1



SUPPORT EQUIPMENT

Equipment Type: Laptop Computer

Model Number: Armada 7800 6366/T/14.0/V/M/3

Serial Number: 7914CDJ30054

FCC ID Number: DoC

Manufacturer: Compaq Computers Inc..

Power Line Cord Type: Unshielded

I/O PORT TYPE

- 1) Parallel
- 2) Serial

TERMINATED TO

Bluetooth Test Set
EUT

Note: This device was used to exercise the EUT via the Bluetooth Test Set, and configure the EUT via serial connection. This device was placed on the floor to simulate being offsite as much as possible.



SUPPORT EQUIPMENT

Equipment Type: Bluetooth Test Set

Model Number: E1852A

Serial Number: DK41220199

FCC ID Number: None

Manufacturer: Agilent

Power Line Cord Type: Unshielded

I/O PORT TYPE

TERMINATED TO

1) Parallel

Laptop Computer

2) RF

Antenna

Note: This device was used to exercise the EUT with RF packets. This device was placed on the below the EUT to simulate being offsite as much as was possible.



PRODUCT CABLING INFORMATION

Equipment Under Test (EUT): Polycom Bluetooth Radio Module

Cable: Parallel

Shielded

Used From: Parallel

Port On: Compaq Laptop

To: Parallel

Port On: Bluetooth Test Set

Connector Type: 25p Dsub

Length: 180 cm (70.2 inches)

Cable used during test was unbundled.

Cable: SMA Coax

Shielded

Used From: RF in/out

Port On: Bluetooth Test Set

To: RF in/out

Port On: Antenna

Connector Type: SMA

Length: 1 m (39 inches)

Cable used during test was unbundled.

Cable: Serial

Shielded

Used From: Serial

Port On: Compaq Laptop

To: Serial

Port On: EUT

Connector Type: 9pin Dsub

Length: 1.8 m (70.2 inches)

Cable used during test was unbundled.



SUMMARY FCC CLASS B

Company: Hyper Corporation

Equipment Under Test: Polycom Bluetooth Radio Module

Model Number: None

Test Standard: FCC Class B

Test Type: Line Conducted

Location: Lab #1

Test Technician: Wayne Fisher

Assistant: None

EUT was scanned in the following setup(s): Mode/Configuration:

- 1) Low Channel / connected to support equipment
- 2) Middle Channel / connected to support equipment
- 3) High Channel / connected to support equipment
- 4) Worst Case above / axis rotated / connected to support equipment

The highest emission recorded were in the test setup #3.

Support Equipment: Laptop Computer / Bluetooth Test Set

EUT Power: 120Vac / 60Hz

Modification(s) made to EUT: None

Test Results: Passed

(The chart below shows the six highest (worst case) readings taken from the high channel data)

FREQ MHz	CORR'D dB μ V/m	SITE CF	LIMIT		MARGIN		NOTE
			QP	AVG	QP	AVG	
0.15745	50.63 PK	6.0	65.6	55.6	-14.97	-4.97	L2
0.1835	46.98 PK	6.0	64.3	54.3	-17.32	-7.32	L2
0.41429	30.96 AV	6.0	57.6	47.6	-26.64	-16.64	L1
0.58552	28.05 AV	6.0	56.0	47.0	-27.95	-17.95	L1
0.60413	31.27 PK	6.0	56.0	47.0	-24.73	-14.7	L2
18.56848	39.3 PK	6.0	60.0	50.0	-20.7	-10.7	L2



SUMMARY FCC CLASS B

Company: Hyper Corporation

Equipment Under Test: Polycom Bluetooth Radio Module

Model Number: None

Test Standard: FCC Class B

Test Type: Radiated

Location: 3 Meter Test Site #1

Test Technician: Wayne Fisher

Assistant: None

EUT was scanned in the following setup(s): Mode/Configuration:

- 1) Low Channel / connected to support equipment
- 2) Middle Channel / connected to support equipment
- 3) High Channel / connected to support equipment
- 4) Worst Case above / axis rotated / connected to support equipment

The highest emission recorded were in the test setup #3.

Support Equipment: Laptop Computer / Bluetooth Test Set

EUT Power: 120Vac / 60Hz

Modification(s) made to EUT: None

Test Results: Passed

(The chart below shows the six highest (worst case) readings taken from the high channel data)

FREQ MHz	CORR'D dB μ V/m	SITE CF	LIMIT		MARGIN		NOTE
			QP	AVG	QP	AVG	
4803.9	55.3AV	+4.3		54.0		-14.7	Horizontal
4803.7	48.1PK	+4.3		54.0		-5.9	Vertical
2344.4	47.5PK	-1.8		54.0		-6.5	Horizontal
24.18.09	45.8PK	-1.5		54.0		-8.2	Horizontal
2345.7	42.0PK	-1.8		54.0		-12.0	Vertical
1064.8	40.3PK	-7.7		54.0		-13.7	Horizontal



Hyper Corporation
 Polycom Bluetooth Radio Module
 Middle Channel TX
 Support:Power Supply/Laptop CP
 120Vac/60Hz Line1 W.Fisher

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2
Frequency	Reading	Factor	Factor	[dB(uVolts)]		
[MHz]	[dB(uV)]	[dB]	[dB]			
=====						
Range: 1 .15 - 30MHz						
.16493	28.11av	6	0	34.11	65.2	55.2
				Margin [dB]:	-31.09	-21.09
.17606	27.52av	6	0	33.52	64.7	54.7
				Margin [dB]:	-31.18	-21.18
.19095	25.88av	6	0	31.88	64	54
				Margin [dB]:	-32.12	-22.12
.29517	22.33av	6	0	28.33	60.4	50.4
				Margin [dB]:	-32.07	-22.07
.41429	24.96av	6	0	30.96	57.6	47.6
				Margin [dB]:	-26.64	-16.64
.58552	22.05av	6	0	28.05	56	46
				Margin [dB]:	-27.95	-17.95
.79398	19.1av	6	0	25.1	56	46
				Margin [dB]:	-30.9	-20.9
1.13644	19.01av	6	0	25.01	56	46
				Margin [dB]:	-30.99	-20.99
1.56824	17.91av	6	0	23.91	56	46
				Margin [dB]:	-32.09	-22.09
2.00004	16.72av	6	0	22.72	56	46
				Margin [dB]:	-33.28	-23.28

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection

LIMIT 1: CISPR22 Class B Cond-QP
 LIMIT 2: CISPR22 Class B Cond-AVG
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

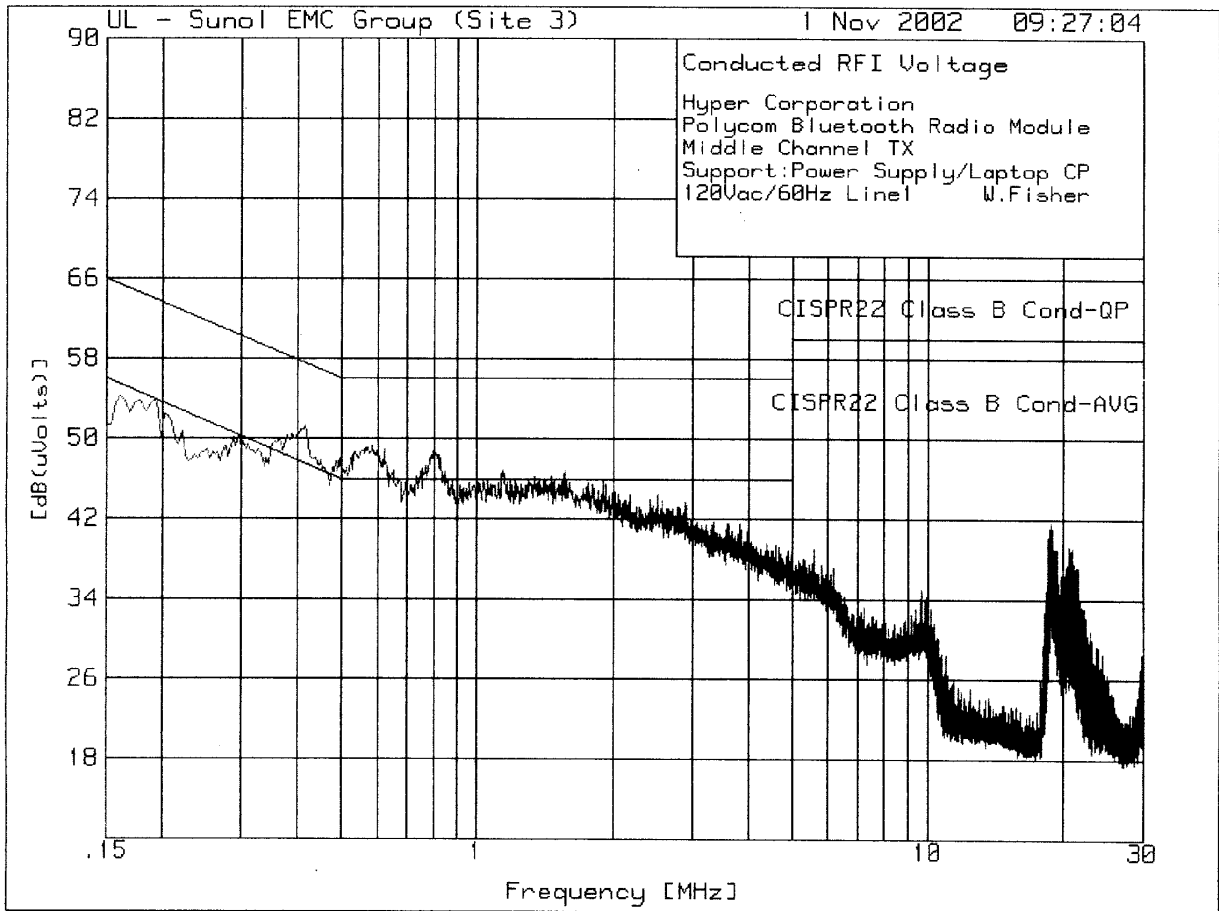


Hyper Corporation
 Polycom Bluetooth Radio Module
 Middle Channel TX
 Support:Power Supply/Laptop CP
 120Vac/60Hz Line1 W.Fisher

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
=====							
Range: 1 .15 - 30MHz -----							
1	.16117	48.24 pk	6	0	54.24	65.4	55.4
					Margin [dB]:	-11.16	-1.16
2	.17606	47.82 pk	6	0	53.82	64.7	54.7
					Margin [dB]:	-10.88	-.88
3	.19095	47.8 pk	6	0	53.8	64	54
					Margin [dB]:	-10.2	-.2
4	.29517	44.37 pk	6	0	50.37	60.4	50.4
					Margin [dB]:	-10.03	-.03
5	.41429	45.33 pk	6	0	51.33	57.6	47.6
					Margin [dB]:	-6.27	3.73
6	.58552	43.22 pk	6	0	49.22	56	46
					Margin [dB]:	-6.78	3.22
7	.79398	42.75 pk	6	0	48.75	56	46
					Margin [dB]:	-7.25	2.75
8	1.13644	40.9 pk	6	0	46.9	56	46
					Margin [dB]:	-9.1	.9
9	1.56824	40.83 pk	6	0	46.83	56	46
					Margin [dB]:	-9.17	.83
10	2.00004	39.48 pk	6	0	45.48	56	46
					Margin [dB]:	-10.52	-.52
11	18.80672	35.75 pk	6	0	41.75	60	50
					Margin [dB]:	-18.25	-8.25

LIMIT 1: CISPR22 Class B Cond-QP
 LIMIT 2: CISPR22 Class B Cond-AVG
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 tm - Trace Math Result



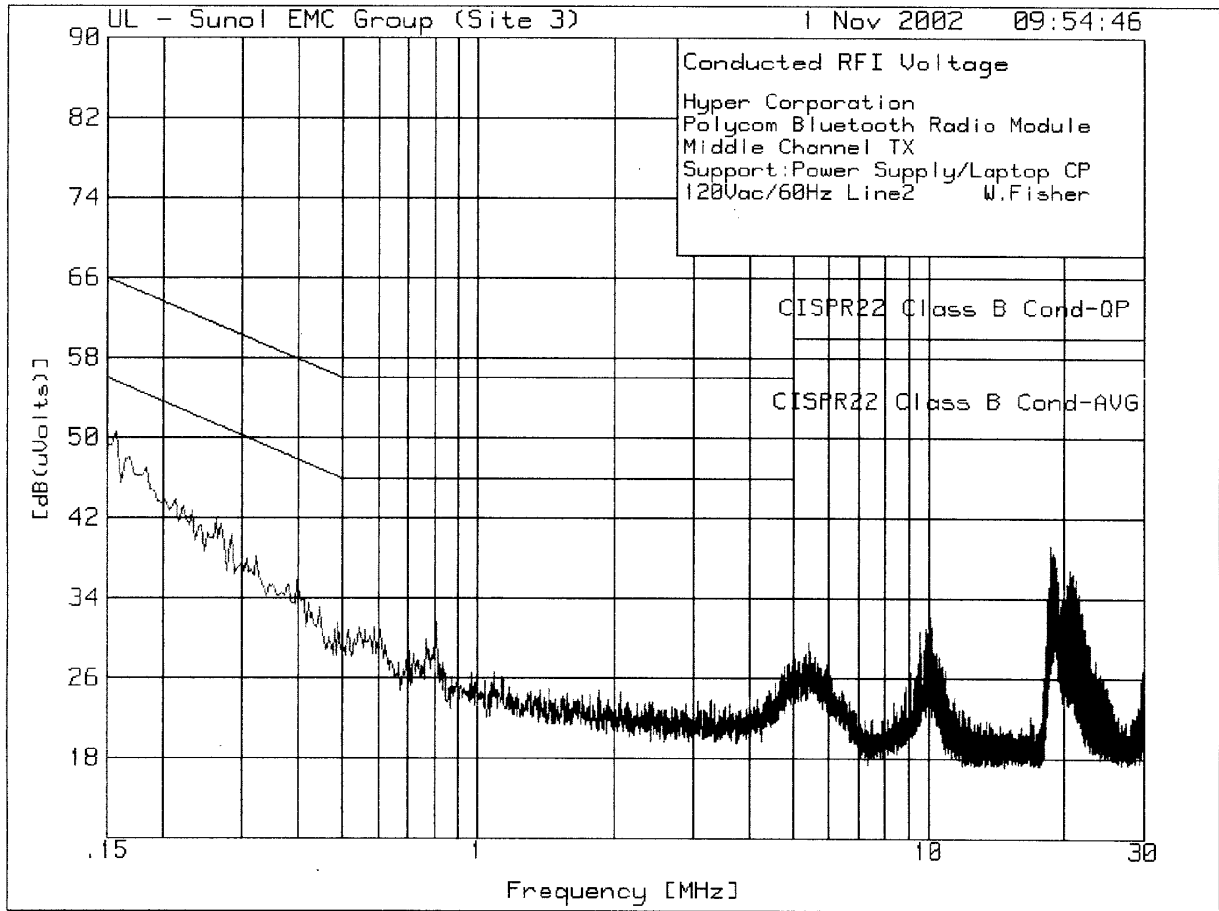


Hyper Corporation
 Polycom Bluetooth Radio Module
 Middle Channel TX
 Support:Power Supply/Laptop CP
 120Vac/60Hz Line2 W.Fisher

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
=====							
Range: 1 .15 - 30MHz -----							
1	.15745	44.63 pk	6	0	50.63	65.6	55.6
					Margin [dB]:	-14.97	-4.97
2	.1835	40.98 pk	6	0	46.98	64.3	54.3
					Margin [dB]:	-17.32	-7.32
3	.60413	25.27 pk	6	0	31.27	56	46
					Margin [dB]:	-24.73	-14.7
4	5.42465	23.58 pk	6	0	29.58	60	50
					Margin [dB]:	-30.42	-20.4
5	18.56848	33.3 pk	6	0	39.3	60	50
					Margin [dB]:	-20.7	-10.7

LIMIT 1: CISPR22 Class B Cond-QP
 LIMIT 2: CISPR22 Class B Cond-AVG
 LIMIT 3: NONE
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 tm - Trace Math Result





FCC CLASS B
RADIATED EMISSION DATA

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Polycom Bluetooth Radio Module

MODEL NUMBER:
TEST PROCEDURE: SPURIOUS EMISSIONS
SUPPORT EQUIPMENT: Power Supply / Laptop CPU
Bluetooth Test Set
TESTED BY: Wayne Fisher TEST SITE 4
DATE: November 1 2002

TIME: 10:47 Control RM Temp: 72 Deg.F Humidity: 34 %RH
EUT Room Temp: 74 Deg.F Humidity: 34 %RH

30MHz TO 200MHz Biconical Antenna at 3 meters Horz.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT		EUT MARGIN		POSITION	
				A	B	A	B	TBL	ANT
Middle Channel TX=2.441GHz									

200MHz to 400MHz Biconical Antenna at 3 meters Vert.
399.44 +17.0PK +22.4 39.4 57.0 46.0 -17.6 -6.6 170 1.00
399.44MHz is laptop related

400MHz to 1000MHz Biconical Antenna at 3 meters Vert.
532.60 +11.8PK +25.4 37.2 57.0 46.0 -19.8 -8.8 190 1.00
532.6MHz is laptop related and not EUT.

scans from 30MHz to 1GHz were repeated in Low and High Channels with no EUT related emissions observed within -15dBuV of the limit.



**FCC CLASS B
RADIATED EMISSION DATA**

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Polycom Bluetooth Radio Module

MODEL NUMBER:
TEST PROCEDURE: SPURIOUS EMISSIONS
SUPPORT EQUIPMENT: Power Supply / Laptop CPU
Bluetooth Test Set

TESTED BY: Wayne Fisher TEST SITE 1
DATE: October 31 2002

TIME: 11:00am Control RM Temp: 82 Deg.F Humidity: 38 %RH
EUT Room Temp: 72 Deg.F Humidity: 32 %RH

1 TO 18 GHz 3115 Horn Antenna at 3 meters Horz.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT		EUT MARGIN		POSITION	
				A	B	A	B	TBL	ANT
Low Channel TX=2.402GHz									
4803.90	+51.0PK	+4.3	55.3	60.0	54.0	-4.7	+1.3	0	0.00
4803.90	+35.0VA	+4.3	39.3	60.0	54.0	-20.7	-14.7	0	0.00
7206.00	+25.0PK	+8.5	33.5	60.0	54.0	-26.5	-20.5	0	0.00
2418.09	+47.3PK	-1.5	45.8	60.0	54.0	-14.2	-8.2	0	0.00
2344.40	+49.3PK	-1.8	47.5	60.0	54.0	-12.5	-6.5	0	0.00

1 TO 18 GHz 3115 Horn Antenna at 3 meters Vert.

1064.80	+48.0PK	-7.7	40.3	60.0	54.0	-19.7	-13.7	0	0.00
1530.40	+44.8PK	-5.6	39.2	60.0	54.0	-20.8	-14.8	0	0.00
2345.70	+43.8PK	-1.8	42.0	60.0	54.0	-18.0	-12.0	0	0.00
4803.70	+43.8PK	+4.3	48.1	60.0	54.0	-11.9	-5.9	0	0.00

Mid Channel TX=2.44103GHz

1077.65	+44.4PK	-7.6	36.8	60.0	54.0	-23.2	-17.2	0	0.00
4881.60	+40.4PK	+4.5	44.9	60.0	54.0	-15.1	-9.1	0	0.00
7332.67	+30.8PK	+8.7	39.5	60.0	54.0	-20.5	-14.5	0	0.00

1 TO 18 GHz 3115 Horn Antenna at 3 meters Horz.

4881.60	+48.0PK	+4.5	52.5	60.0	54.0	-7.5	-1.5	0	0.00
---------	---------	------	------	------	------	------	------	---	------



**FCC CLASS B
RADIATED EMISSION DATA**

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Polycom Bluetooth Radio Module

MODEL NUMBER:
TEST PROCEDURE: SPURIOUS EMISSIONS
SUPPORT EQUIPMENT: Power Supply / Laptop CPU
Bluetooth Test Set

TESTED BY: Wayne Fisher TEST SITE 1
DATE: October 31 2002

TIME: 2:00pm Control RM Temp: 82 Deg.F Humidity: 38 %RH
EUT Room Temp: 72 Deg.F Humidity: 32 %RH

1 TO 18 GHz 3115 Horn Antenna at 3 meters Horz.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT		EUT MARGIN		POSITION	
				A	B	A	B	TBL	ANT
Mid Channel TX=2.44103GHz									
4881.60	+34.0VA	+4.5	38.5	60.0	54.0	-21.5	-15.5	0	0.00
7332.60	+30.0PK	+8.7	38.7	60.0	54.0	-21.3	-15.3	0	0.00
High Channel TX=2.480GHz									
4960.00	+46.7PK	+4.7	51.4	60.0	54.0	-8.6	-2.6	0	0.00
7439.80	+35.0PK	+8.8	43.8	60.0	54.0	-16.2	-10.2	0	0.00
1 TO 18 GHz 3115 Horn Antenna at 3 meters Vert.									
4959.90	+45.9PK	+4.7	50.6	60.0	54.0	-9.4	-3.4	0	0.00
7440.00	+30.4PK	+8.8	39.2	60.0	54.0	-20.8	-14.8	0	0.00
Low Channel (worst case) / Receive mode									
2442.40	+38.1PK	-1.4	36.7	60.0	54.0	-23.3	-17.3	0	0.00
Low Channel TX=2.402GHz EUT angle rotated on table									
4803.95	+48.8PK	+4.3	53.1	60.0	54.0	-6.9	-0.9	0	0.00
4803.90	+34.0VA	+4.3	38.3	60.0	54.0	-21.7	-15.7	0	0.00
7205.90	+24.5PK	+8.5	33.0	60.0	54.0	-27.0	-21.0	0	0.00
1 TO 18 GHz 3115 Horn Antenna at 3 meters Horz.									
4803.00	+37.7PK	+4.3	42.0	60.0	54.0	-18.0	-12.0	0	0.00
7205.96	+24.0PK	+8.5	32.5	60.0	54.0	-27.5	-21.5	0	0.00



ENGINEERING TEST DATA SHEET

CUSTOMER: Hyper Corporation PROJECT #: 02SC14379
 UNIT: Polycom Bluetooth Radio Module PART/MODEL NO.: None
 STANDARD: FCC Class B Spurious Radiated Emissions
 SERIAL NO.: Proto#1
 CONDUCTED BY: Wayne Fisher WITNESSED BY: Kevin Marquess
 DATE OF TEST: October 22, 2002

ENVIRONMENTAL CONDITIONS

TEMPERATURE: 68°F
 HUMIDITY: 38%
 ATM PRESSURE: 1023mbar

PRIMARY POWER MEASUREMENTS

<u>TEST EQUIPMENT</u>	<u>S/N</u>	<u>CALIBRATION DUE</u>
Fluke 8022A	2500588	03-11-03

HOST POWER REQUIRED PER TEST PLAN: 120VAC
 MEASURED VOLTAGE: A.C., 60 Hz
 LINE-TO-LINE: 120Vac
 HIGH LINE-TO-GND: 120Vac
 RETURN LINE-TO-GND: 0Vac

EUT POWER GROUNDING

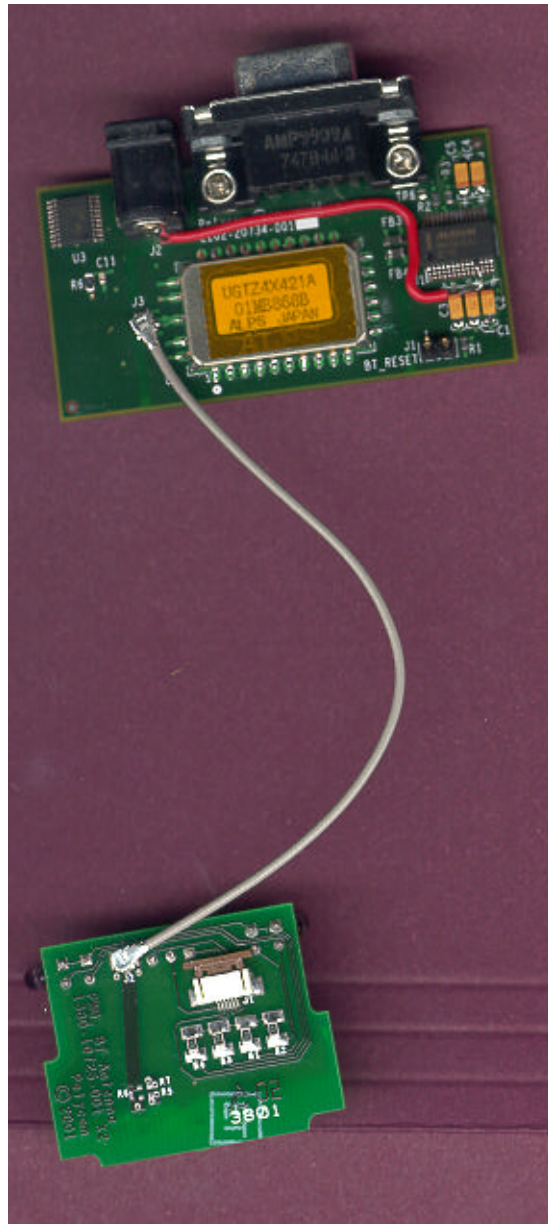
HOW IS EUT ACTUALLY GROUNDED? FLOATING
 REMARKS: Grounded through host laptop.



PHOTOGRAPHS

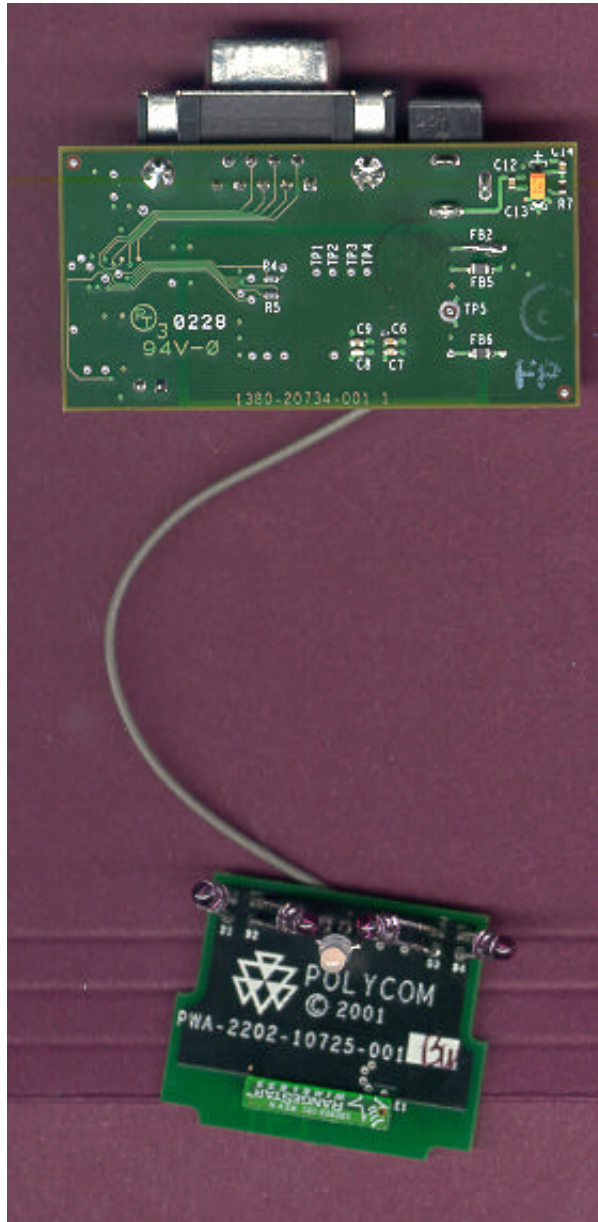


Equipment Under Test (EUT)





Equipment Under Test (EUT)





Radiated





Line Conducted





Site 1 / 3 Meter Test Site





PERFORMANCE CRITERIA



Performance Criteria:

CFR 47, Part 15:

For Line Conducted test, emissions must not exceed the limits stated in CFR 47, Part 15, Subpart B, Section 107-(b).

For Radiated test, emissions must not exceed the limits stated in CFR 47, Part 15, Subpart B, Section 109-(b).



TEST FACILITY



TEST FACILITY

Location: 11825 Niles Canyon Road
Sunol, CA 94586

The emission tests were performed at Underwriters Laboratories, Inc. at the Sunol facility, located at 11825 Niles Canyon Road, Sunol, California, on an open field test site.

Description: At the Sunol facility, there are four 3/10 m open area test sites, two line conducted labs and two indoor conducted/radiated engineering labs. The OATS and the LC labs are constructed and calibrated to meet the FCC requirements in documents OST-55/MP-4 and ANSI C63.4 1992.

NVLAP Accreditation: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC 17025 and the relevant requirements of ISO 9002 as suppliers of calibration or test results. The specific scope includes IEC/CISPR 22:1993, Amendment 1:1995, Amendment 2:1996, CNS 13438:1997, FCC Method - 47 CFR Part 15, and AS/NZS 3548 testing.



NVLAP Lab code: 200252-0 (Santa Clara, CA)

NVLAP Lab code: 200535-0 (Sunol, CA)

FCC has also accepted Underwriters Laboratories, Inc. facility site for filing applications for certification and notification.

GENERAL TESTING INFORMATION

Security Classification

The test sample was unclassified



TEST EQUIPMENT



MEASURING INSTRUMENT SETTINGS

TEST TYPE	DETECTOR	FREQUENCY RANGE	RESOLUTION BANDWIDTH	VIDEO BANDWIDTH
Conducted	Peak/QP/Avg	150 kHz-30 MHz	10 kHz/100 kHz	100 kHz
Radiated	Peak/QP/Avg	30 MHz-1 GHz	100 kHz	100 kHz/10 kHz
Radiated	Peak/Avg	Above 1 GHz	1 MHz	1 MHz/300 kHz

Note: All readings on data pages are taken with the detector in peak mode unless otherwise stated. All readings were taken with a one second sweep unless otherwise noted.



EQUIPMENT LIST

RADIATED AND LINE CONDUCTED EMISSIONS

USED (X)	ASSET #	EQUIPMENT TYPE	MANUFACTURER	Serial #	Model #	CAL. DUE
<input checked="" type="checkbox"/>	8598	Biconical Antenna	Compliance Design	109	B100	01-17-03
<input checked="" type="checkbox"/>	8574	Biconical Antenna	Compliance Design	None	B300	06-28-03
<input checked="" type="checkbox"/>	8578	Biconical Antenna	Compliance Design	None	B200	11-13-02
<input checked="" type="checkbox"/>	8576	Horn Antenna 1-18GHz	EMCO	9104-3647	3115	11-15-02
<input checked="" type="checkbox"/>	8503	Horn Antenna 1-18GHz	EMCO	US36433008/9	3115	12-10-02
<input checked="" type="checkbox"/>	8580	LISN	Fischer Custom Communications	None	CISPR M	12-10-02
<input checked="" type="checkbox"/>	8618	Pre-Amplifier	Hewlett Packard	3008A00272	8449B	04-24-03
<input checked="" type="checkbox"/>	8104	Signal Generator	Hewlett Packard	250A00201	8673D	11-19-02
<input checked="" type="checkbox"/>	1944	Spectrum Analyzer / Microwave System	Hewlett Packard	US36433008	84125C	01-07-03
<input checked="" type="checkbox"/>	8560	Spectrum Analyzer/Reciever	Hewlett Packard	3807A00456	8546A	09-01-03
<input checked="" type="checkbox"/>	8559	RF Filter Section	Hewlett Packard	3704A00424	85460A	09-01-03
<input checked="" type="checkbox"/>	8557	Spectrum Analyzer	Tektronix	B020370	2782	06-11-03
<input checked="" type="checkbox"/>	8114	Horn Antenna 18- 26.5GHz	Hewlett Packard	971313-004	3160-09	01-07-03



TEST METHODS



TEST METHODS (LINE CONDUCTED TEST)

- 1) The equipment will be set up according to the test standard to simulate typical actual usage. When the EUT is a table-top system, a wooden table with a height of 0.8 meters is used which is placed on the ground plane according to the test standard. When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, will be placed according to the test standard.
- 3) All I/O cables are positioned to simulate typical actual usage according to the test standard.
- 4) The EUT receives AC power through a Line Impedance Stabilization Network (LISN) which is grounded to the ground plane.
- 5) Support equipment, if used, will receive AC power through a second LISN.
- 6) Emissions are measured on each current carrying line of the EUT using a spectrum analyzer connected to the LISN powering the EUT.
- 7) During the emission measurement, the I/O cable placement position is adjusted in order to maximize the emission measurement level.
- 8) Emission frequency and amplitude are recorded into a computer in which correction factors are used to calculate the emission level and compare the reading to the applicable limit.

Data Sample:

Freq. MHz	Corr'd dB μ V	Site CF	Limit dB μ V	Margin dB μ V	Line
2.47	46.0	6.0	48.0	-2.0	L1

Freq.	= Emission frequency in MHz
Corr'd dB μ V	= RAW reading converted to dB V and CF added
Site CF	= Correction Factors for pad/cable losses
Limit dB μ V	= Limit stated in standard
Margin dB μ V	= Reading in reference to limit
Note	= Current carrying line of reading



TEST METHODS (RADIATED TEST)

- 1) The equipment will be set up according to the test standard to simulate typical actual usage. When the EUT is a table-top system, a wooden table with a height of 0.8 meters is used which is placed on the ground plane according to the test standard. When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, will be placed according to the test standard.
- 3) All I/O cables are positioned to simulate typical actual usage according to the test standard.
- 4) The antenna is placed at some given distance away from the EUT as stated in the test standard. The antenna connects to the analyzer via a cable and at times a preamp is used.
- 5) Emissions are scanned and measured rotating the EUT to 360 degrees, positioning cable placement, and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarizations in order to maximize the emission reading level.
- 6) Emission frequency, amplitude, antenna position, polarization, and table position are recorded into a computer in which correction factors are used to calculate the emission level and compare the reading to the applicable limit.

Data Sample:

Freq. MHz	Corr'd dB μ V	Site CF	Limit dB μ V	Margin dB μ V	Table Pos.	Ant Pos.
76.57	44.2	-12.8	40.0	-5.3	180	1.5V

Freq.	= Emission frequency in MHz
Corr'd dB μ V	= RAW reading converted to dB μ V and CF added
Site CF	= Correction Factors for pad/cable losses
Limit dB μ V	= Limit stated in standard
Margin dB μ V	= Reading in reference to limit
Table Position	= EUT placement in reference to antenna
Antenna Position	= Antenna polarization and height above ground plane



CLASS TYPES AND LIMITS



FCC CLASS TYPES AND LIMITS

CLASS A COMPUTING DEVICE

A computing device which is marketed for use in a commercial or business environment; exclusive of a device which is marketed for use by the general public, or which is intended to be used in the home. Reference: Section 15.3 (h).

CLASS B COMPUTING DEVICE

A computing device that is marketed for use in a residential environment notwithstanding use in a commercial, business, or industrial environment. Examples of such devices include, but are not limited to: electronic games, personal computers, calculators, and similar devices that are marketed for the general public. Reference: Section 15.3 (i).

NOTE: A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B computing device, and in fact is encouraged to do so, provided the device complies with the technical standards for a Class B computing device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a computing device as a Class B computing device, regardless of its intended use.



LABELING REQUIREMENTS



FCC CLASS A LABELING REQUIREMENT

Section 15.19 of the Code of Federal Regulation

- A) The Class A computing device subject to **verification** by the Commission shall be identified pursuant to par. 2.925 et seq of this Chapter. In addition, the label shall include the following statement:

THIS DEVICE COMPLIES WITH PART 15 OF THE
FCC RULES. OPERATION IS SUBJECT TO THE
FOLLOWING TWO CONDITIONS:
(1) THIS DEVICE MAY NOT CAUSE HARMFUL
INTERFERENCE, AND (2) THIS DEVICE MUST
ACCEPT ANY INTERFERENCE RECEIVED,
INCLUDING INTERFERENCE THAT MAY CAUSE
UNDESIRE OPERATION.

- B) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified in this section is required to be affixed only to the main control unit.
- C) When the device is so small or for such use that it is not practicable to place the statement specified in this section on it, the information required by these paragraphs shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.
- D) The label shall not be a stick-on paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, silkscreened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or use of a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.



FCC CLASS B LABELING REQUIREMENT

Section 15.19 of the Code of Federal Regulation

- A) The Class B computing device subject to **certification** by the Commission shall be identified pursuant to par. 2.925 et seq of this Chapter. In addition, the label shall include the following statement:

FCC ID: XXXXXXXXXXXXXXXXXXXX

THIS DEVICE COMPLIES WITH PART 15 OF THE
FCC RULES. OPERATION IS SUBJECT TO THE
FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL
INTERFERENCE, AND (2) THIS DEVICE MUST
ACCEPT ANY INTERFERENCE RECEIVED,
INCLUDING INTERFERENCE THAT MAY CAUSE
UNDESIRE OPERATION.

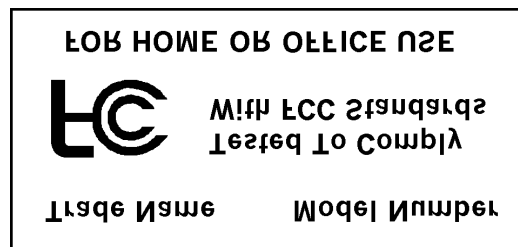
- B) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified in this section is required to be affixed only to the main control unit.
- C) When the device is so small or for such use that it is not practicable to place the statement specified in this section on it, the information required by these paragraphs shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.
- D) The label shall not be a stick-on paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, silkscreened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or use of a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.



DoC LABELING REQUIREMENTS

- A) The Class B computing device, subject to authorization under a **Declaration of Conformity (DoC)**, shall be labeled in a conspicuous location on the device and shall contain the following information:

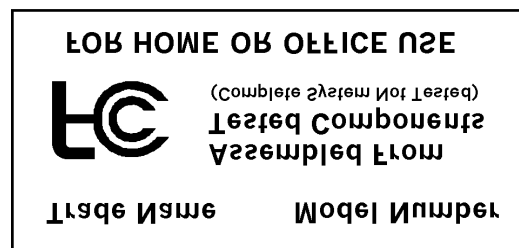
Use the following label if product is authorized based on testing of the product or system:





DoC LABELING REQUIREMENTS (continued)

Use the following label if product is based on assembly using separately authorized components and the resulting product is not separately tested:



- B)** When a device is so small or for such use that it is not practicable to place the statement specified on it, such as for a CPU board or plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.
- C)** The label shall not be a stick-on paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, silkscreened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or use of a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.



TEST PROCEDURES
For
FCC CLASS B
(CFR 47, Part 15, Subpart B)
COMPLIANCE TEST REPORTS

Contact:

Hyper Corporation
1279 Quarry Lane, Suite B
Pleasanton, CA 94566