FCC INTENTIONAL RADIATOR
(CFR 47, Part 247, Subpart C)
COMPLIANCE TEST REPORT

for

Electromagnetic Emissions

of

WILCOXON BLUETOOTH™ RADIO MODULE WITH 3 DIFFERENT ANTENNAS

Model Number: C1B
Serial Number: 0019 B0200C2 0050

Test Standards:
FCC PART 15 INTENTIONAL RADIATOR TRANSMIT/RECEIVE SPURIOUS EMISSIONS
(CFR 47, Parts 15.205, 15.207, 15.209, 15.247, Subpart C) (DA 00-705/ANSI C63.4-1992)

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: JANUARY 8, 2003

FCC INTENTIONAL RADIATOR
(CFR 47, Part 247, Subpart C)
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MODEL C1B

Test Standards:
FCC PART 15 INTENTIONAL RADIATOR TRANSMIT/RECEIVE SPURIOUS EMISSIONS
(CFR 47, Parts 15.205, 15.207, 15.209, 15.247, Subpart C) (DA 00-705/ANSI C63.4-1992)

Prepared for:

HYPER CORPORATION
Pleasanton, CA 94566

Prepared by: Underwriters Laboratories Inc.

	Signature	**Date**
TEST TECHNICIAN	Wayne Fisher	1-13-03
TEST SUPERVISOR	Daryl Smith	1-13-03

LIST OF REVISIONS

REVISION NUMBER AND DATE	PAGE CHANGED	PAGE SUBSTITUTED	PAGE ADDED

REPRODUCTION CLAUSE

TABLE OF CONTENTS

VERIFICATION OF COMPLIANCE TESTING

Equipment Under Test:	Wilcoxon Bluetooth™ Radio Module with 3 different antennas
Model Number:	C1B
Serial Number:	0019 B0200C2 0050
Company:	Hyper Corporation 1279 Quarry Lane, Suite B Pleasanton, CA 94566
Test Standard:	FCC PART 15 INTENTIONAL RADIATOR TRANSMIT/RECEIVE SPURIOUS EMISSIONS (CFR 47, Parts 15.205, 15.207, 15.209, 15.247, Subpart C) (DA 00-705/ANSI C63.4-1992)
Frequency Range:	Radiated 30 MHz – 26.5 GHz Line Conducted Emissions 150KHz – 30MHz
Deviation:	C1B
Date Tested:	December 13, 2002
Test Technician:	Wayne Fisher

VERIFICATION OF COMPLIANCE TESTING (continued)

Test Results

FCC PART 15:

Radiated--Radiated scans ranged from 30 MHz to 26.5 GHz in both the horizontal and the vertical antenna polarizations. Analyzer settings were 120kHz Resolution Bandwidth from 30MHz to 1GHz and 1MHz from 1GHz to 26.5GHz. All radiated emissions were within the FCC PART 15 requirements for compliance.

The EUT was tested operating at maximum power on the low, middle, and high channels of the spurious emissions were maximized using the methods described in ANSI C63.4.

All spurious emissions were 20 dB down from the fundamental emission and complied with the restricted band compliance limits in 15.209, demonstrating compliance to the restricted band requirements in 15.205.

In the cases where emissions were averaged, the peak readings were less than 20 dB over the average limit.

The radiated emissions test results demonstrated that the unit complies with the band-edge compliance limits of 15.247(c).

Conducted--Conducted scans ranged from 150 KHz to 30 MHz on both the Line 1(Hot) and Line 2 (Neutral). Analyzer settings were standard for ANSI C63.4. All conducted emissions were within the FCC PART 15 requirements for compliance.

The above equipment was tested by Underwriters Laboratories, Inc., for compliance/conformance with the requirements set forth in the FCC PART 15 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 Part 15.247.

The following tables give a brief summary of tests performed on the Hyper Corporation, Wilcoxon Bluetooth™ Radio Module with 3 different antennas, Model C1B, in compliance with the above standards.

EMISSIONS

STANDARD	MEETS REQUIREMENTS (YES/NO)	COMMENTS
CFR 47 Part 15.247	Yes	Refer to Test Results, Section 2

GENERAL INFORMATION

Customer:	Hyper Corporation 1279 Quarry Lane, Suite B Pleasanton, CA. 94566
Contact Person:	Diana Eberhard
Phone Number:	(925) 462-9105
Equipment Under Test:	Wilcoxon Bluetooth™ Radio Module with 3 different antennas
Model Number:	C1B
Serial Number:	0019 B0200C2 0050

SYSTEM DESCRIPTION

Equipment Under Test

Wilcoxon Bluetooth™ Radio Module with 3 different antennas

Support Equipment

Casira Test Set

(Offsite) Bluetooth™ Test Set

(Offsite) Laptop Computer

EUT Test Program: Diagnostic software was used to put the EUT in its various channels and modes during testing.

PRODUCT INFORMATION

Description of Equipment Under Test: The unit is a Wilcoxon Bluetooth™ Radio Module capable of being fitted with three different antennas for transmitting/receiving Bluetooth™ signals. Manufactured by Wilcoxon Research Inc. is designed to be installed into other devices.
EUT and/or support equipment was received at Underwriters Laboratories, Inc., in good condition, on September 18, 2002 and again on December 11, 2002.

Housing Type: None

External Power Supply: EUT-Receives power from Host Casira Test Set

OSC./Clock Frequency: 16.00 MHz, 32.00 MHz

Transmit/Receive Frequency Range: 2.402 to 2.487 GHz

I/O PORT TYPE	QTY	TESTED WITH
1) Custom Interface	1	1
2) RF In/Out	1	1

OFFSITE SUPPORT EQUIPMENT

Equipment Type: Casira Bluetooth™ Test Set

Model Number: BCES301199/1

Serial Number: 5960 23 05 02

FCC ID Number: None

Manufacturer: Cambridge Silicon Radio Ltd.

Power Line Cord Type: Class II Transformer

I/O PORT TYPE	TERMINATED TO
1) Serial	Laptop Computer
2) USB	Unterminated
3) Module	EUT

Note: This device was used to exercise the EUT with RF packets. This device was placed in the center of the turntable at 80CM height.

OFFSITE 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	TERMINATED TO
1) Parallel	Bluetooth™ Test Set
2) Serial	CasiraTest Set

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 offsite as much was possible.

OFFSITE 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 opposite from the test antenna from the EUT and as much offsite as was possible.

PRODUCT CABLING INFORMATION

Equipment Under Test (EUT): Wilcoxon Bluetooth™ Radio Module with 3 different antennas

Cable: Parallel		**Shielded**
Used	**From:** Parallel	**Port On:** Compaq Laptop
	To: Parallel	**Port On:** Bluetooth™ Test Set
Connector Type: 25-pin Dsub		**Length:** 180 cm (70.2 inches)

Cable used during test was unbundled.

Cable: Serial		**Shielded**
Used	**From:** Serial	**Port On:** Compaq Laptop
	To: Serial	**Port On:** Casira Test Set
Connector Type: 9-pin Dsub		**Length:** 8.0 m (312 inches)

Cable used during test was unbundled.

SUMMARY
FCC PART 15

Company: Hyper Corporation

Equipment Under Test: Wilcoxon Bluetooth™ Radio Module with 3 different antennas

Model Number: C1B

Test Standard: FCC PART 15

Test Type: Line Conducted **Location:** Lab # 1

Test Technician: Wayne Fisher

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

1. Lowest Channel 2.402GHz / Transmit Max Power
2. Middle Channel 2.4412GHz / Transmit Max Power
3. Highest Channel 2.482GHz / Transmit Max Power
4. Receive Only

The EUT receives power from the host Casira test set. Testing was done with power at 110VAC/60Hz. For Conducted the highest (worst case #1 above) emissions recorded below. No difference in Line Conducted measurements was observed

Support Equipment: Casira Test Setup
Offsite Support Equipment: Bluetooth™ Test Set, Laptop Computer

EUT Power: 120 VAC/60 Hz Nominal **Power Cord:** Class II Transformer

Modification(s) made to EUT: None

Test Results: Passed

(The chart below shows the readings taken from the final data)

FREQ MHz	CORR'D dBµV/m	SITE CF	LIMIT		MARGIN		NOTE
			QP	AVG	QP	AVG	
0.15372	52.21PK	6.0	65.8	55.8	-13.59	-3.59	Line 1
0.21328	49.66PK	6.0	63.1	53.1	-13.94	-3.94	Line 1
0.15372	51.93PK	6.0	65.8	55.8	-13.87	-3.87	Line 2
0.16117	51.86PK	6.0	65.4	55.4	-13.54	-3.54	Line 2
0.18722	50.82PK	6.0	64.2	54.2	-13.38	-3.38	Line 2
0.24678	48.82PK	6.0	61.9	51.9	-13.08	-3.08	Line 2

SUMMARY
FCC PART 15

Company: Hyper Corporation

Equipment Under Test: Wilcoxon Bluetooth™ Radio Module with 3 different antennas

Model Number: C1B

Test Standard: FCC PART 15

Test Type: Radiated **Location:** 3 Meter Test Site # 1

Test Technician: Wayne Fisher

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

1. **Lowest Channel 2.402GHz / Transmit Max Power / EUT Upright / Magnetic Mount Ant.**
2. Lowest Channel 2.402GHz / Transmit Max Power / EUT Laying Flat / Magnetic Mount Ant.
3. Middle Channel 2.4412GHz / Transmit Max Power / EUT Upright / Magnetic Mount Ant.
4. Highest Channel 2.482GHz / Transmit Max Power / EUT Upright / Magnetic Mount Ant.
5. Lowest Channel 2.402GHz / Transmit Max Power / EUT Upright / Black Ant. Non-magnetic
6. Middle Channel 2.4412GHz / Transmit Max Power / EUT Upright / Black Ant. Non-magnetic
7. Highest Channel 2.482GHz / Transmit Max Power / EUT Upright / Black Ant. Non-magnetic
8. Lowest Channel 2.402GHz / Transmit Max Power / EUT Upright / PCB Ant.
9. Middle Channel 2.4412GHz / Transmit Max Power / EUT Upright / PCB Ant.
10. Highest Channel 2.482GHz / Transmit Max Power / EUT Upright / PCB Ant.
11. Receive Only / EUT Upright / Magnetic Mount Ant.

The EUT receives power from the host Casira test set. Testing was done with the host powered at 110VAC/60Hz. For Radiated (worst case #1 in **bold** above) emissions of most note are recorded below.

Support Equipment: Casira Test Setup
Offsite Support Equipment: Bluetooth™ Test Set, Laptop Computer

EUT Power: 120 VAC/60 Hz Nominal **Power Cord:** Class II Transformer

Modification(s) made to EUT: None

Test Results: Passed

(The chart below shows the readings taken from the final data)

FREQ MHz	CORR'D dBµV/m	SITE CF	LIMIT		MARGIN		NOTE
			QP	AVG	QP	AVG	
1470.51	48.6PK	-5.8	NA	54.0		-5.4	Vertical
1726.86	50.1PK	-4.7	NA	54.0		-3.9	Vertical
1798.88	48.7PK	-4.3	NA	54.0		-5.3	Vertical

Hyper Corp. Project #02SC15732
Wilcoxon Bluetooth Radio Mod.
Supp.: Casira Test Set,Laptop
Bluetooth Test Set.
120Vac/60Hz L1 - Jeremy Luong

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	.15372	46.21 pk	6	0	52.21	65.8	55.8
					Margin [dB]:	-13.59	-3.59
2	.19095	43.66 pk	6	0	49.66	64	54
					Margin [dB]:	-14.34	-4.34
3	.21328	43.16 pk	6	0	49.16	63.1	53.1
					Margin [dB]:	-13.94	-3.94
4	.3324	38.1 pk	6	0	44.1	59.4	49.4
					Margin [dB]:	-15.3	-5.3
5	.68603	27.5 pk	6	0	33.5	56	46
					Margin [dB]:	-22.5	-12.5
6	18.70621	19.28 pk	6	0	25.28	60	50
					Margin [dB]:	-34.72	-24.7

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

Hyper Corp. Project #02SC15732
Wilcoxon Bluetooth Radio Mod.
Supp.: Casira Test Set,Laptop
Bluetooth Test Set.
120Vac/60Hz L1 - Jeremy Luong

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
Range: 1 .15 - 30MHz						
.16493	10.35pk	6	0	16.35	65.2	55.2
				Margin [dB]:	-48.85	-38.85
.19095	5.96av	6	0	11.96	64	54
				Margin [dB]:	-52.04	-42.04
.21328	4.8av	6	0	10.8	63.1	53.1
				Margin [dB]:	-52.3	-42.3

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 Corp. Project #02SC15732
Wilcoxon Bluetooth Radio Mod.
Supp.: Casira Test Set,Laptop
Bluetooth Test Set.
120Vac/60Hz L2 - Jeremy Luong

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	.15372	45.93 pk	6	0	51.93	65.8	55.8
					Margin [dB]:	-13.87	-3.87
2	.16117	45.86 pk	6	0	51.86	65.4	55.4
					Margin [dB]:	-13.54	-3.54
3	.18722	44.82 pk	6	0	50.82	64.2	54.2
					Margin [dB]:	-13.38	-3.38
4	.24678	42.82 pk	6	0	48.82	61.9	51.9
					Margin [dB]:	-13.08	-3.08
5	.68603	25.27 pk	6	0	31.27	56	46
					Margin [dB]:	-24.73	-14.7
6	19.02634	21.52 pk	6	0	27.52	60	50
					Margin [dB]:	-32.48	-22.4

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 Part15 C Spurious
RADIATED EMISSION DATA

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER: CIB
TEST PROCEDURE: Part 15 C Spurious Emissions
SUPPORT EQUIPMENT: Carias Test Set
Offsite:Laptop/Bluetooth test set
TESTED BY: Wayne Fisher TEST SITE 1
DATE: December 12 2002

TIME: 10:00am Control RM Temp: 62 Deg.F Humidity: 48 %RH
EUT Room Temp: 62 Deg.F Humidity: 48 %RH
Magnetic Mount Antenna with short cable

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

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
Low Channel = 2.402GHz Fundamental									
2402.12	+114.4PK	-1.6	112.8	112.8		0.0		170	1.00
1470.51	+54.4PK	-5.8	48.6	60.0	54.0	-11.4	-5.4	180	1.00
1512.07	+59.0PK	-5.6	53.4	60.0	54.0	-6.6	-0.6	180	1.00
1512.07	+34.0VA	-5.6	28.4	60.0	54.0	-31.6	-25.6	180	1.00
1516.87	+61.7PK	-5.6	56.1	60.0	54.0	-3.9	+2.1	180	1.00
1516.87	+34.8VA	-5.6	29.2	60.0	54.0	-30.8	-24.8	180	1.00
1540.77	+67.5PK	-5.5	62.0	60.0	54.0	+2.0	+8.0	180	1.00
1540.77	+36.0VA	-5.5	30.5	60.0	54.0	-29.5	-23.5	180	1.00
1726.86	+54.8PK	-4.7	50.1	60.0	54.0	-9.9	-3.9	180	1.00
1798.88	+53.0PK	-4.3	48.7	60.0	54.0	-11.3	-5.3	225	1.00
2146.12	+52.5PK	-2.7	49.8	60.0	54.0	-10.2	-4.2	180	1.00
2210.00	+60.4PK	-2.4	58.0	60.0	54.0	-2.0	+4.0	10	1.00
2210.00	+39.1VA	-2.4	36.7	60.0	54.0	-23.3	-17.3	10	1.00
4803.98	+68.5PK	+4.3	72.8	60.0	54.0	+12.8	+18.8	170	1.00
4803.98	+46.5VA	+4.3	50.8	60.0	54.0	-9.2	-3.2	170	1.00
7206.54	+51.8PK	+8.5	60.3	60.0	54.0	+0.3	+6.3	175	1.00
7206.54	+34.0VA	+8.5	42.5	60.0	54.0	-17.5	-11.5	175	1.00
3263.60	+61.0PK	+0.5	61.5	60.0	54.0	+1.5	+7.5	170	1.00
3263.60	+38.7VA	+0.5	39.2	60.0	54.0	-20.8	-14.8	170	1.00
6751.20	+49.4PK	+8.6	58.0	60.0	54.0	-2.0	+4.0	165	1.00
6751.20	+34.4VA	+8.6	43.0	60.0	54.0	-17.0	-11.0	165	1.00

FCC Part15 C Spurious

RADIATED EMISSION DATA

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER: C1B
TEST PROCEDURE: FCC Part 15 C Spurious Emissions
SUPPORT EQUIPMENT: Carias Test Set
Offsite:Laptop/Bluetooth test set
TESTED BY: Wayne Fisher TEST SITE 1
DATE: December 12 2002

TIME: 1:00pm Control RM Temp: 62 Deg.F Humidity: 48 %RH
EUT Room Temp: 62 Deg.F Humidity: 48 %RH

Magnetic Mount Antenna with short cable

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

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
Low Channel = 2.402GHz Fundamental									
1 TO 18 GHz 3115 Horn Antenna at 3 meters Horz.									
2402.05	+101.5PK	-1.6	99.9	99.9		0.0		190	1.00
4804.40	+56.1PK	+4.3	60.4	60.0	54.0	+0.4	+6.4	60	1.00
4804.40	+39.9VA	+4.3	44.2	60.0	54.0	-15.8	-9.8	60	1.00
7206.06	+42.6PK	+8.5	51.1	60.0	54.0	-8.9	-2.9	180	1.00
7206.06	+34.0VA	+8.5	42.5	60.0	54.0	-17.5	-11.5	180	1.00
Middle Channel = 2.44101GHz Fundamental									
2441.01	+97.5PK	-1.4	96.1	96.1		0.0		160	1.00
4882.03	+52.4PK	+4.5	56.9	60.0	54.0	-3.1	+2.9	70	1.00
4882.03	+31.4VA	+4.5	35.9	60.0	54.0	-24.1	-18.1	70	1.00
7332.90	+43.3PK	+8.7	52.0	60.0	54.0	-8.0	-2.0	180	1.00
7332.90	+32.3VA	+8.7	41.0	60.0	54.0	-19.0	-13.0	180	1.00
1 TO 18 GHz 3115 Horn Antenna at 3 meters Vert.									
2441.08	+112.6PK	-1.4	111.2	111.2		0.0		180	1.00
4881.62	+62.3PK	+4.5	66.8	60.0	54.0	+6.8	+12.8	180	1.00
4881.62	+42.6VA	+4.5	47.1	60.0	54.0	-12.9	-6.9	180	1.00
7323.04	+55.4PK	+8.6	64.0	60.0	54.0	+4.0	+10.0	180	1.00
7323.04	+35.6VA	+8.6	44.2	60.0	54.0	-15.8	-9.8	180	1.00
1509.40	+49.5PK	-5.7	43.8	60.0	54.0	-16.2	-10.2	180	1.00

FCC Part15 C Spurious

RADIATED EMISSION DATA

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER: C1B
TEST PROCEDURE:
SUPPORT EQUIPMENT: Carias Test Set
Offsite:Laptop/Bluetooth test set
TESTED BY: Wayne Fisher TEST SITE 1
DATE: December 12 2002

TIME: 4:00pm Control RM Temp: 62 Deg.F Humidity: 48 %RH
EUT Room Temp: 62 Deg.F Humidity: 48 %RH

Magnetic Mount Antenna with short cable

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

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
Middle Channel = 2.44101GHz Fundamental									
1571.40	+59.0PK	-5.4	53.6	60.0	54.0	-6.4	-0.4	220	1.00
1571.40	+39.0VA	-5.4	33.6	60.0	54.0	-26.4	-20.4	220	1.00
1579.70	+63.0PK	-5.3	57.7	60.0	54.0	-2.3	+3.7	220	1.00
1579.70	+36.0VA	-5.3	30.7	60.0	54.0	-29.3	-23.3	220	1.00
High Channel = 2479.9GHz Fundamental									
2479.92	+109.2PK	-1.2	108.0	108.0		-0.0		230	1.00
2459.02	+70.2PK	-1.3	68.9	60.0	54.0	+8.9	+14.9	170	1.00
2459.02	+53.6VA	-1.3	52.3	60.0	54.0	-7.7	-1.7	170	1.00
4960.20	+55.3PK	+4.7	60.0	60.0	54.0	-0.0	+6.0	230	1.00
4960.20	+39.0VA	+4.7	43.7	60.0	54.0	-16.3	-10.3	230	1.00
7440.34	+45.7PK	+8.8	54.5	60.0	54.0	-5.5	+0.5	135	1.00
7440.34	+33.3VA	+8.8	42.1	60.0	54.0	-17.9	-11.9	135	1.00
2288.02	+69.5PK	-2.1	67.4	60.0	54.0	+7.4	+13.4	140	1.00
2288.02	+42.7VA	-2.1	40.6	60.0	54.0	-19.4	-13.4	140	1.00
1 TO 18 GHz 3115 Horn Antenna at 3 meters Horz.									
2479.93	+95.6PK	-1.2	94.4	94.4		-0.0		60	1.00
2469.30	+60.0PK	-1.2	58.8	60.0	54.0	-1.2	+4.8	170	1.00
2469.30	+53.6VA	-1.2	52.4	60.0	54.0	-7.6	-1.6	170	1.00
4960.14	+53.6PK	+4.7	58.3	60.0	54.0	-1.7	+4.3	315	1.00
4960.14	+39.3VA	+4.7	44.0	60.0	54.0	-16.0	-10.0	315	1.00

FCC Part15 C Spurious
RADIATED EMISSION DATA

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER: C1B
TEST PROCEDURE:
SUPPORT EQUIPMENT: Carias Test Set
Offsite:Laptop/Bluetooth test set
TESTED BY: Wayne Fisher TEST SITE 1
DATE: December 13 2002

TIME: 11:00am Control RM Temp: 62 Deg.F Humidity: 48 %RH
EUT Room Temp: 62 Deg.F Humidity: 48 %RH

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

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
2nd Antenna (black w/no magnet base) w/short cable									
Low Channel = 2.402GHz Fundamental									
1 TO 18 GHz 3115 Horn Antenna at 3 meters Vert.									
2402.00	+109.5PK	-1.6	107.9	107.9		0.0		170	1.00
1200.29	+53.0PK	-7.1	45.9	60.0	54.0	-14.1	-8.1	190	1.00
1511.76	+57.6PK	-5.6	52.0	60.0	54.0	-8.0	-2.0	260	1.00
1511.76	+38.9VA	-5.6	33.3	60.0	54.0	-26.7	-20.7	260	1.00
2212.40	+66.9PK	-2.4	64.5	60.0	54.0	+4.5	+10.5	315	1.00
2212.40	+42.6VA	-2.4	40.2	60.0	54.0	-19.8	-13.8	315	1.00
2178.10	+63.6PK	-2.6	61.0	60.0	54.0	+1.0	+7.0	265	1.00
2178.10	+40.0VA	-2.6	37.4	60.0	54.0	-22.6	-16.6	265	1.00
4804.20	+60.0PK	+4.3	64.3	60.0	54.0	+4.3	+10.3	280	1.00
4804.20	+42.0VA	+4.3	46.3	60.0	54.0	-13.7	-7.7	280	1.00
7205.78	+48.8PK	+8.5	57.3	60.0	54.0	-2.7	+3.3	180	1.00
7205.78	+34.0VA	+8.5	42.5	60.0	54.0	-17.5	-11.5	180	1.00
1 TO 18 GHz 3115 Horn Antenna at 3 meters Horz.									
2402.08	+103.2PK	-1.6	101.6	101.6		0.0		315	1.00
1511.99	+46.9PK	-5.6	41.3	60.0	54.0	-18.7	-12.7	45	1.00
2178.13	+53.2PK	-2.6	50.6	60.0	54.0	-9.4	-3.4	160	1.00
2210.14	+58.9PK	-2.4	56.5	60.0	54.0	-3.5	+2.5	200	1.00
2210.14	+39.8VA	-2.4	37.4	60.0	54.0	-22.6	-16.6	200	1.00

FCC Part15 C Spurious
RADIATED EMISSION DATA

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER: CIB
TEST PROCEDURE:
SUPPORT EQUIPMENT: Carias Test Set
Offsite:Laptop/Bluetooth test set
TESTED BY: Wayne Fisher TEST SITE 1
DATE: December 13 2002

TIME: 11:46am Control RM Temp: 62 Deg.F Humidity: 48 %RH
EUT Room Temp: 62 Deg.F Humidity: 48 %RH

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

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
2nd Antenna (black w/no magnet base) w/short cable									
Low Channel = 2.402GHz Fundamental									
4803.70	+54.9PK	+4.3	59.2	60.0	54.0	-0.8	+5.2	260	1.00
4803.70	+40.8VA	+4.3	45.1	60.0	54.0	-14.9	-8.9	260	1.00
7206.30	+44.3PK	+8.5	52.8	60.0	54.0	-7.2	-1.2	180	1.00
7206.30	+35.0VA	+8.5	43.5	60.0	54.0	-16.5	-10.5	180	1.00
Middle Channel = 2.4409GHz									
2440.94	+108.3PK	-1.4	106.9	106.9		0.0		260	1.00
1219.84	+53.3PK	-7.0	46.3	60.0	54.0	-13.7	-7.7	280	1.00
4881.98	+62.7PK	+4.5	67.2	60.0	54.0	+7.2	+13.2	100	1.00
4881.98	+41.9VA	+4.5	46.4	60.0	54.0	-13.6	-7.6	100	1.00
7323.22	+56.0PK	+8.6	64.6	60.0	54.0	+4.6	+10.6	270	1.00
7323.22	+35.4VA	+8.6	44.0	60.0	54.0	-16.0	-10.0	270	1.00
1 TO 18 GHz 3115 Horn Antenna at 3 meters Vert.									
2440.91	+111.0PK	-1.4	109.6	109.6		0.0		190	1.00
1220.00	+53.7PK	-7.0	46.7	60.0	54.0	-13.3	-7.3	180	1.00
1399.00	+53.3PK	-6.2	47.1	60.0	54.0	-12.9	-6.9	180	1.00
1550.88	+55.9PK	-5.5	50.4	60.0	54.0	-9.6	-3.6	190	1.00
4882.04	+59.0PK	+4.5	63.5	60.0	54.0	+3.5	+9.5	170	1.00
4882.04	+40.6VA	+4.5	45.1	60.0	54.0	-14.9	-8.9	170	1.00
7322.46	+48.8PK	+8.6	57.4	60.0	54.0	-2.6	+3.4	200	1.00

FCC Part15 C Spurious

RADIATED EMISSION DATA

COMPANY:	Hyper Corporation
EQUIP. UNDER TEST:	Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER:	C1B
TEST PROCEDURE:	
SUPPORT EQUIPMENT:	Carias Test Set Offsite:Laptop/Bluetooth test set
TESTED BY:	Wayne Fisher TEST SITE 1
DATE:	December 13 2002

TIME: 1:00pm Control RM Temp: 62 Deg.F Humidity: 48 %RH
EUT Room Temp: 62 Deg.F Humidity: 48 %RH

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

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
2nd Antenna (black w/no magnet base) w/short cable									
Middle channel = 2.4409GHz Fundamental									
7322.46	+34.4VA	+8.6	43.0	60.0	54.0	-17.0	-11.0	200	1.00
High Channel = 2.480GHz									
2480.00	+100.4PK	-1.2	99.2	99.2		-0.0		180	1.00
2193.00	+62.0PK	-2.5	59.5	60.0	54.0	-0.5	+5.5	270	1.00
2193.00	+42.0VA	-2.5	39.5	60.0	54.0	-20.5	-14.5	270	1.00
2288.10	+68.0PK	-2.1	65.9	60.0	54.0	+5.9	+11.9	200	1.00
2288.10	+44.2VA	-2.1	42.1	60.0	54.0	-17.9	-11.9	200	1.00
4960.10	+57.5PK	+4.7	62.2	60.0	54.0	+2.2	+8.2	150	1.00
4960.10	+40.6VA	+4.7	45.3	60.0	54.0	-14.7	-8.7	150	1.00
7439.52	+43.0PK	+8.8	51.8	60.0	54.0	-8.2	-2.2	180	1.00
7439.52	+34.0VA	+8.8	42.8	60.0	54.0	-17.2	-11.2	180	1.00
1 TO 18 GHz 3115 Horn Antenna at 3 meters Horz.									
2480.02	+98.5PK	-1.2	97.3	97.3		-0.0		45	1.00
1239.36	+52.0PK	-6.9	45.1	60.0	54.0	-14.9	-8.9	220	1.00
2288.85	+60.3PK	-2.1	58.2	60.0	54.0	-1.8	+4.2	190	1.00
2288.85	+41.3VA	-2.1	39.2	60.0	54.0	-20.8	-14.8	190	1.00
4960.16	+53.8PK	+4.7	58.5	60.0	54.0	-1.5	+4.5	270	1.00
4960.16	+39.7VA	+4.7	44.4	60.0	54.0	-15.6	-9.6	270	1.00
7440.14	+43.4PK	+8.8	52.2	60.0	54.0	-7.8	-1.8	180	1.00

FCC Part15 C Spurious
RADIATED EMISSION DATA

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER: C1B
TEST PROCEDURE:
SUPPORT EQUIPMENT: Carias Test Set
Offsite:Laptop/Bluetooth test set
TESTED BY: Wayne Fisher TEST SITE 1
DATE: December 13 2002

TIME: 1:40pm Control RM Temp: 62 Deg.F Humidity: 48 %RH
EUT Room Temp: 62 Deg.F Humidity: 48 %RH

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

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
3rd Antenna (Small PCB) no cable used									
High Channel = 2.480GHz Fundamental									
2480.02	+108.6PK	-1.2	107.4	107.4		-0.0		120	1.00
1239.44	+48.8PK	-6.9	41.9	60.0	54.0	-18.1	-12.1	180	1.00
2288.10	+65.2PK	-2.1	63.1	60.0	54.0	+3.1	+9.1	190	1.00
2288.10	+42.6VA	-2.1	40.5	60.0	54.0	-19.5	-13.5	190	1.00
4960.17	+57.2PK	+4.7	61.9	60.0	54.0	+1.9	+7.9	270	1.00
4960.17	+40.6VA	+4.7	45.3	60.0	54.0	-14.7	-8.7	270	1.00
1 TO 18 GHz 3115 Horn Antenna at 3 meters Vert.									
2480.15	+112.0PK	-1.2	110.8	110.8		-0.0		225	1.00
1608.40	+52.6PK	-5.2	47.4	60.0	54.0	-12.6	-6.6	90	1.00
2287.99	+65.0PK	-2.1	62.9	60.0	54.0	+2.9	+8.9	90	1.00
2287.99	+40.8VA	-2.1	38.7	60.0	54.0	-21.3	-15.3	90	1.00
4960.09	+55.4PK	+4.7	60.1	60.0	54.0	+0.1	+6.1	45	1.00
4960.09	+40.0VA	+4.7	44.7	60.0	54.0	-15.3	-9.3	45	1.00
7440.65	+51.5PK	+8.8	60.3	60.0	54.0	+0.3	+6.3	240	1.00
7440.65	+35.6VA	+8.8	44.4	60.0	54.0	-15.6	-9.6	240	1.00

FCC Part15

RADIATED EMISSION DATA

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER: C1B
TEST PROCEDURE:
SUPPORT EQUIPMENT: Carias Test Set
Offsite:Laptop/Bluetooth test set
TESTED BY: Wayne Fisher TEST SITE 1
DATE: December 13 2002

TIME: 1:45pm Control RM Temp: 62 Deg.F Humidity: 48 %RH
EUT Room Temp: 62 Deg.F Humidity: 48 %RH

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

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
3rd Antenna (Small PCB) no cable used									
Middle Channel = 2.441GHz Fundamental									
2441.08	+114.4PK	-1.4	113.0		113.0		0.0	225	1.00
1560.72	+55.1PK	-5.4	49.7	60.0	54.0	-10.3	-4.3	80	1.00
1560.72	+41.3VA	-5.4	35.9	60.0	54.0	-24.1	-18.1	80	1.00
2281.10	+55.6PK	-2.1	53.5	60.0	54.0	-6.5	-0.5	135	1.00
2281.10	+37.5VA	-2.1	35.4	60.0	54.0	-24.6	-18.6	135	1.00
4882.19	+59.4PK	+4.5	63.9	60.0	54.0	+3.9	+9.9	90	1.00
4882.19	+40.5VA	+4.5	45.0	60.0	54.0	-15.0	-9.0	90	1.00
7323.24	+52.7PK	+8.6	61.3	60.0	54.0	+1.3	+7.3	90	1.00
7323.24	+35.4VA	+8.6	44.0	60.0	54.0	-16.0	-10.0	90	1.00

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

2441.02	+107.2PK	-1.4	105.8		105.8		0.0	180	1.00
1560.93	+49.5PK	-5.4	44.1	60.0	54.0	-15.9	-9.9	45	1.00
2281.10	+57.2PK	-2.1	55.1	60.0	54.0	-4.9	+1.1	190	1.00
2281.10	+36.0PK	-2.1	33.9	60.0	54.0	-26.1	-20.1	190	1.00
4882.17	+55.0PK	+4.5	59.5	60.0	54.0	-0.5	+5.5	315	1.00
4882.17	+38.5VA	+4.5	43.0	60.0	54.0	-17.0	-11.0	315	1.00
7322.94	+42.6PK	+8.6	51.2	60.0	54.0	-8.8	-2.8	270	1.00
7322.94	+36.0VA	+8.6	44.6	60.0	54.0	-15.4	-9.4	270	1.00

FCC Part15 C Spurious
RADIATED EMISSION DATA

COMPANY: Hyper Corporation
EQUIP. UNDER TEST: Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER: C1B
TEST PROCEDURE:
SUPPORT EQUIPMENT: Carias Test Set
Offsite:Laptop/Bluetooth test set
TESTED BY: Wayne Fisher TEST SITE 1
DATE: December 13 2002

TIME: 3:00pm Control RM Temp: 62 Deg.F Humidity: 48 %RH
EUT Room Temp: 62 Deg.F Humidity: 48 %RH

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

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
3rd Antenna (small PCB) no cable used									
Low Channel = 2.402GHz Fundamental									
2402.03	+107.9PK	-1.6	106.3	106.3		0.0		140	1.00
1200.27	+51.2PK	-7.1	44.1	60.0	54.0	-15.9	-9.9	315	1.00
1560.74	+45.6PK	-5.4	40.2	60.0	54.0	-19.8	-13.8	135	1.00
2210.05	+55.5PK	-2.4	53.1	60.0	54.0	-6.9	-0.9	200	1.00
2210.05	+35.0VA	-2.4	32.6	60.0	54.0	-27.4	-21.4	200	1.00
2273.99	+55.3PK	-2.1	53.2	60.0	54.0	-6.8	-0.8	225	1.00
2273.99	+36.0VA	-2.1	33.9	60.0	54.0	-26.1	-20.1	225	1.00
4804.00	+63.0PK	+4.3	67.3	60.0	54.0	+7.3	+13.3	135	1.00
4804.00	+36.0VA	+4.3	40.3	60.0	54.0	-19.7	-13.7	135	1.00
7206.16	+46.0PK	+8.5	54.5	60.0	54.0	-5.5	+0.5	140	1.00
7206.16	+28.0VA	+8.5	36.5	60.0	54.0	-23.5	-17.5	140	1.00
1 TO 18 GHz 3115 Horn Antenna at 3 meters Vert.									
2402.08	+111.8PK	-1.6	110.2	110.2		0.0		135	1.00
1200.25	+54.9PK	-7.1	47.8	60.0	54.0	-12.2	-6.2	315	1.00
1560.79	+49.8PK	-5.4	44.4	60.0	54.0	-15.6	-9.6	315	1.00
2274.00	+52.0PK	-2.1	49.9	60.0	54.0	-10.1	-4.1	200	1.00
2335.00	+50.9PK	-1.9	49.0	60.0	54.0	-11.0	-5.0	170	1.00
4804.00	+62.9PK	+4.3	67.2	60.0	54.0	+7.2	+13.2	90	1.00

FCC Part15 C Spurious
RADIATED EMISSION DATA

COMPANY:	Hyper Corporation
EQUIP. UNDER TEST:	Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER:	C1B
TEST PROCEDURE:	
SUPPORT EQUIPMENT:	Carias Test Set Offsite:Laptop/Bluetooth test set
TESTED BY:	Wayne Fisher TEST SITE 1
DATE:	December 13 2002

TIME: 3:15pm Control RM Temp: 62 Deg.F Humidity: 48 %RH
EUT Room Temp: 62 Deg.F Humidity: 48 %RH

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

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
3rd Antenna (small PCB) no cable used									
Low Channel = 2.402GHz Fundamental									
7206.01	+52.0PK	+8.5	60.5	60.0	54.0	+0.5	+6.5	90	1.00
7206.01	+30.4VA	+8.5	38.9	60.0	54.0	-21.1	-15.1	90	1.00

FCC Part15 C Spurious
RADIATED EMISSION DATA

COMPANY:	Hyper Corporation
EQUIP. UNDER TEST:	Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER:	C1B
TEST PROCEDURE:	
SUPPORT EQUIPMENT:	Carias Test Set Offsite:Laptop/Bluetooth test set
TESTED BY:	Wayne Fisher TEST SITE 1
DATE:	December 17 2002

TIME: 9:59am Control RM Temp: 71 Deg.F Humidity: 48 %RH
EUT Room Temp: 64 Deg.F Humidity: 54 %RH

30MHz TO 300MHz Biconical Antenna at 3 meters Horz.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
Magnetic Base Antenna w/Short Cable /Low Channel = 2.402GHz Fund. TX									
30MHz TO 300MHz Biconical Antenna at 3 meters Horz.									
42.92	+17.9PK	+11.7	29.7	49.5	40.0	-19.8	-10.3	191	2.00
127.99	+9.1PK	+13.0	22.0	54.0	43.5	-32.0	-21.5	83	2.10
138.66	+13.3PK	+12.1	25.4	54.0	43.5	-28.6	-18.1	68	2.00
149.30	+14.2PK	+13.6	27.8	54.0	43.5	-26.2	-15.7	90	2.25
154.64	+11.5PK	+13.6	25.1	54.0	43.5	-28.9	-18.4	120	2.00
165.32	+11.0PK	+16.4	27.4	54.0	43.5	-26.6	-16.1	180	1.75
170.66	+9.5PK	+18.8	28.3	54.0	43.5	-25.7	-15.2	330	2.00
186.66	+9.5PK	+18.9	28.4	54.0	43.5	-25.6	-15.1	262	2.00
202.60	+8.7PK	+18.6	27.3	54.0	43.5	-26.7	-16.2	45	2.25
30MHz TO 300MHz Biconical Antenna at 3 meters Vert.									
117.33	+11.6PK	+14.3	25.9	54.0	43.5	-28.1	-17.6	10	1.30
133.34	+12.9PK	+12.0	24.9	54.0	43.5	-29.1	-18.6	0	1.50
138.66	+10.2PK	+12.1	22.3	54.0	43.5	-31.7	-21.2	90	1.00
149.33	+9.6PK	+13.6	23.2	54.0	43.5	-30.8	-20.3	0	1.25
154.67	+11.0PK	+13.6	24.6	54.0	43.5	-29.4	-18.9	13	2.10
165.32	+9.5PK	+16.4	25.9	54.0	43.5	-28.1	-17.6	0	2.00
202.66	+8.9PK	+18.6	27.5	54.0	43.5	-26.5	-16.0	0	2.00

FCC Part15 C Spurious
RADIATED EMISSION DATA

COMPANY:	Hyper Corporation
EQUIP. UNDER TEST:	Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER:	C1B
TEST PROCEDURE:	
SUPPORT EQUIPMENT:	Carias Test Set Offsite:Laptop/Bluetooth test set
TESTED BY:	Wayne Fisher TEST SITE 1
DATE:	December 17 2002

TIME: 12:00pm Control RM Temp: 71 Deg.F Humidity: 48 %RH
EUT Room Temp: 64 Deg.F Humidity: 54 %RH

200MHz to 400MHz Biconical Antenna at 3 meters Horz.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
200MHz to 400MHz Biconical Antenna at 3 meters Horz.									
316.70	+5.6PK	+20.1	25.7	57.0	46.0	-31.3	-20.3	0	2.25
200MHz to 400MHz Biconical Antenna at 3 meters Vert.									
320.33	+3.5PK	+20.2	23.7	57.0	46.0	-33.3	-22.3	0	1.25
400MHz to 1000MHz Biconical Antenna at 3 meters Horz.									
400.00	+2.2PK	+22.6	24.8	57.0	46.0	-32.2	-21.2	0	1.00
400MHz to 1000MHz Biconical Antenna at 3 meters Vert.									
400.47	+2.1PK	+22.6	24.7	57.0	46.0	-32.3	-21.3	0	1.25

FCC Part15 C Spurious
RADIATED EMISSION DATA

COMPANY:	Hyper Corporation
EQUIP. UNDER TEST:	Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER:	C1B
TEST PROCEDURE:	
SUPPORT EQUIPMENT:	Carias Test Set Offsite:Laptop/Bluetooth test set
TESTED BY:	Wayne Fisher TEST SITE 1
DATE:	December 17 2002

TIME: 2:30pm Control RM Temp: 73 Deg.F Humidity: 44 %RH
EUT Room Temp: 68 Deg.F Humidity: 45 %RH

30MHz TO 300MHz Biconical Antenna at 3 meters Horz.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
Magnetic Base Antenna w/Short Cable /Low Channel = 2.402GHz Fund. RX									
30MHz TO 300MHz Biconical Antenna at 3 meters Horz.									
127.99	+3.6PK	+13.0	16.6	54.0	43.5	-37.4	-26.9	45	1.75
138.66	+6.3PK	+12.1	18.4	54.0	43.5	-35.6	-25.1	180	2.00
149.33	+8.1PK	+13.6	21.7	54.0	43.5	-32.3	-21.8	0	1.50
30MHz TO 300MHz Biconical Antenna at 3 meters Vert.									
202.66	+4.1PK	+18.6	22.8	54.0	43.5	-31.2	-20.7	0	1.00
200MHz to 400MHz Biconical Antenna at 3 meters Horz.									
316.70	+6.5PK	+20.1	26.6	57.0	46.0	-30.4	-19.4	0	2.00
320.33	+3.3PK	+20.2	23.5	57.0	46.0	-33.5	-22.5	0	2.25
200MHz to 400MHz Biconical Antenna at 3 meters Vert.									
320.33	+3.3PK	+20.2	23.5	57.0	46.0	-33.5	-22.5	0	2.25

FCC Part15 C Spurious
RADIATED EMISSION DATA

COMPANY:	Hyper Corporation
EQUIP. UNDER TEST:	Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER:	CIB
TEST PROCEDURE:	
SUPPORT EQUIPMENT:	Carias Test Set Offsite:Laptop/Bluetooth test set
TESTED BY:	Wayne Fisher TEST SITE 1
DATE:	December 17 2002

TIME: 2:30pm Control RM Temp: 73 Deg.F Humidity: 44 %RH
EUT Room Temp: 68 Deg.F Humidity: 45 %RH

30MHz TO 300MHz Biconical Antenna at 3 meters Horz.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
Magnetic Base Antenna w/Short Cable /Low Channel = 2.402GHz Fund. RX									
30MHz TO 300MHz Biconical Antenna at 3 meters Horz.									
127.99	+3.6PK	+13.0	16.6	54.0	43.5	-37.4	-26.9	45	1.75
138.66	+6.3PK	+12.1	18.4	54.0	43.5	-35.6	-25.1	180	2.00
149.33	+8.1PK	+13.6	21.7	54.0	43.5	-32.3	-21.8	0	1.50
30MHz TO 300MHz Biconical Antenna at 3 meters Vert.									
202.66	+4.1PK	+18.6	22.8	54.0	43.5	-31.2	-20.7	0	1.00
200MHz to 400MHz Biconical Antenna at 3 meters Horz.									
316.70	+6.5PK	+20.1	26.6	57.0	46.0	-30.4	-19.4	0	2.00
320.33	+3.3PK	+20.2	23.5	57.0	46.0	-33.5	-22.5	0	2.25
200MHz to 400MHz Biconical Antenna at 3 meters Vert.									
320.33	+3.3PK	+20.2	23.5	57.0	46.0	-33.5	-22.5	0	2.25

FCC Part15 C Spurious
RADIATED EMISSION DATA

COMPANY:	Hyper Corporation
EQUIP. UNDER TEST:	Wilcoxon Bluetooth Radio Module with 3 different antennas
MODEL NUMBER:	C1B
TEST PROCEDURE:	
SUPPORT EQUIPMENT:	Carias Test Set Offsite:Laptop/Bluetooth test set
TESTED BY:	Wayne Fisher TEST SITE 1
DATE:	December 17 2002

TIME: 3:40pm Control RM Temp: 73 Deg.F Humidity: 44 %RH
EUT Room Temp: 68 Deg.F Humidity: 45 %RH

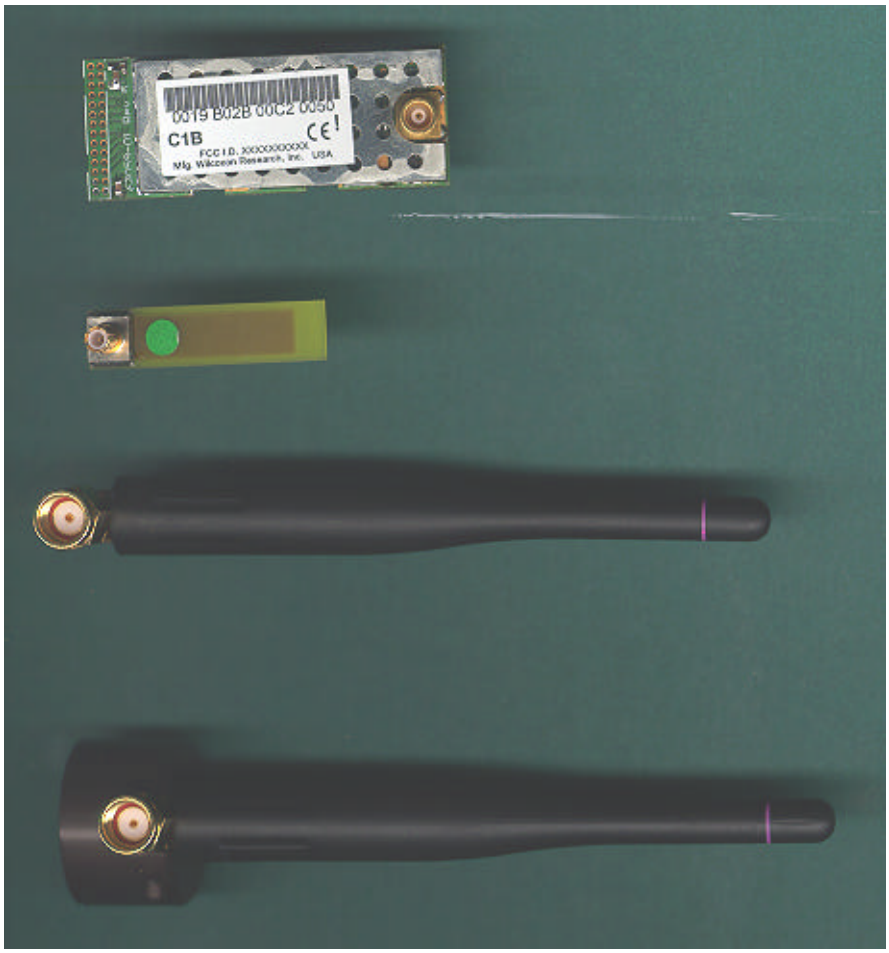
400MHz to 1000MHz Biconical Antenna at 3 meters Horz.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A	LIMIT B	EUT MARGIN A	EUT MARGIN B	POSITION TBL	POSITION ANT
400MHz to 1000MHz Biconical Antenna at 3 meters Horz.									
400.00	+2.5PK	+22.6	25.1	57.0	46.0	-31.9	-20.9	0	1.50
400MHz to 1000MHz Biconical Antenna at 3 meters Vert.									
400.47	+2.5PK	+22.6	25.1	57.0	46.0	-31.9	-20.9	10	2.25

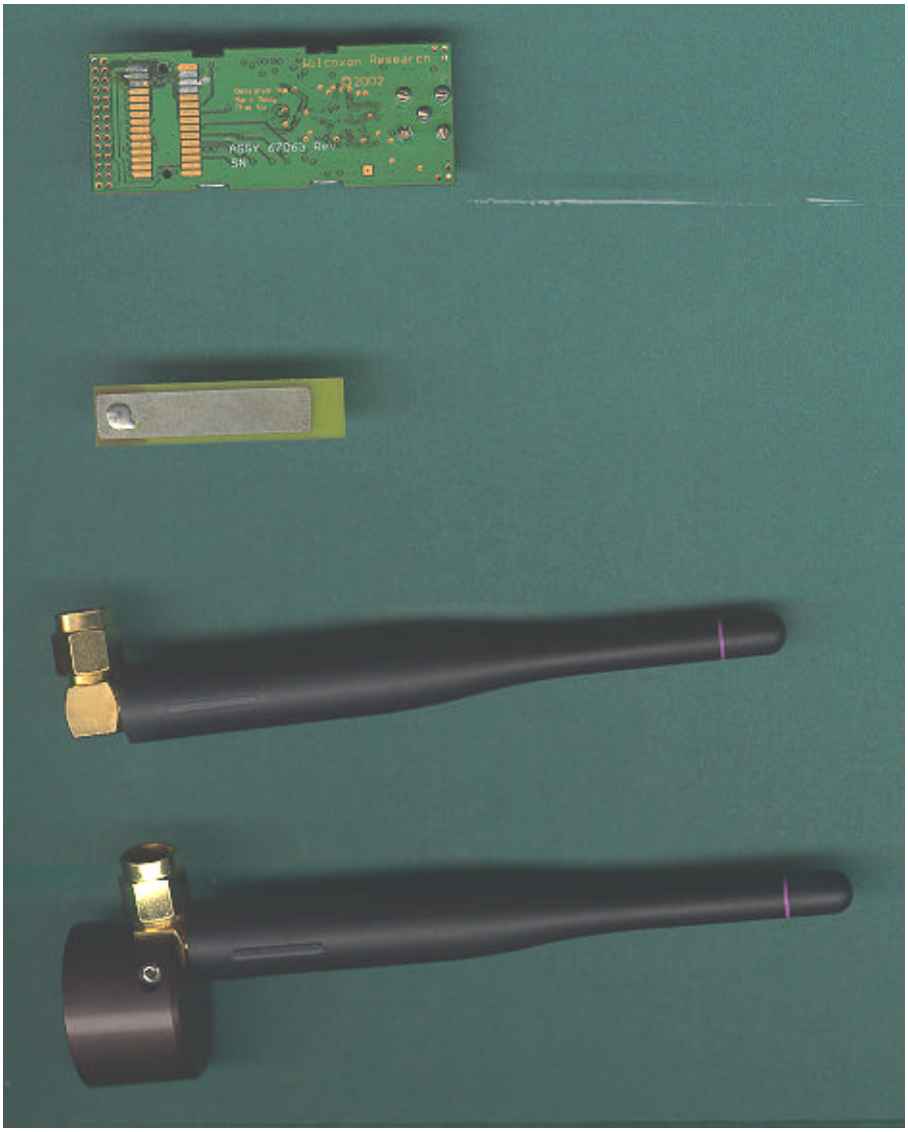
Note: Recorded Frequencies between 30-300MHz were peaks of pulsing emis

PHOTOGRAPHS

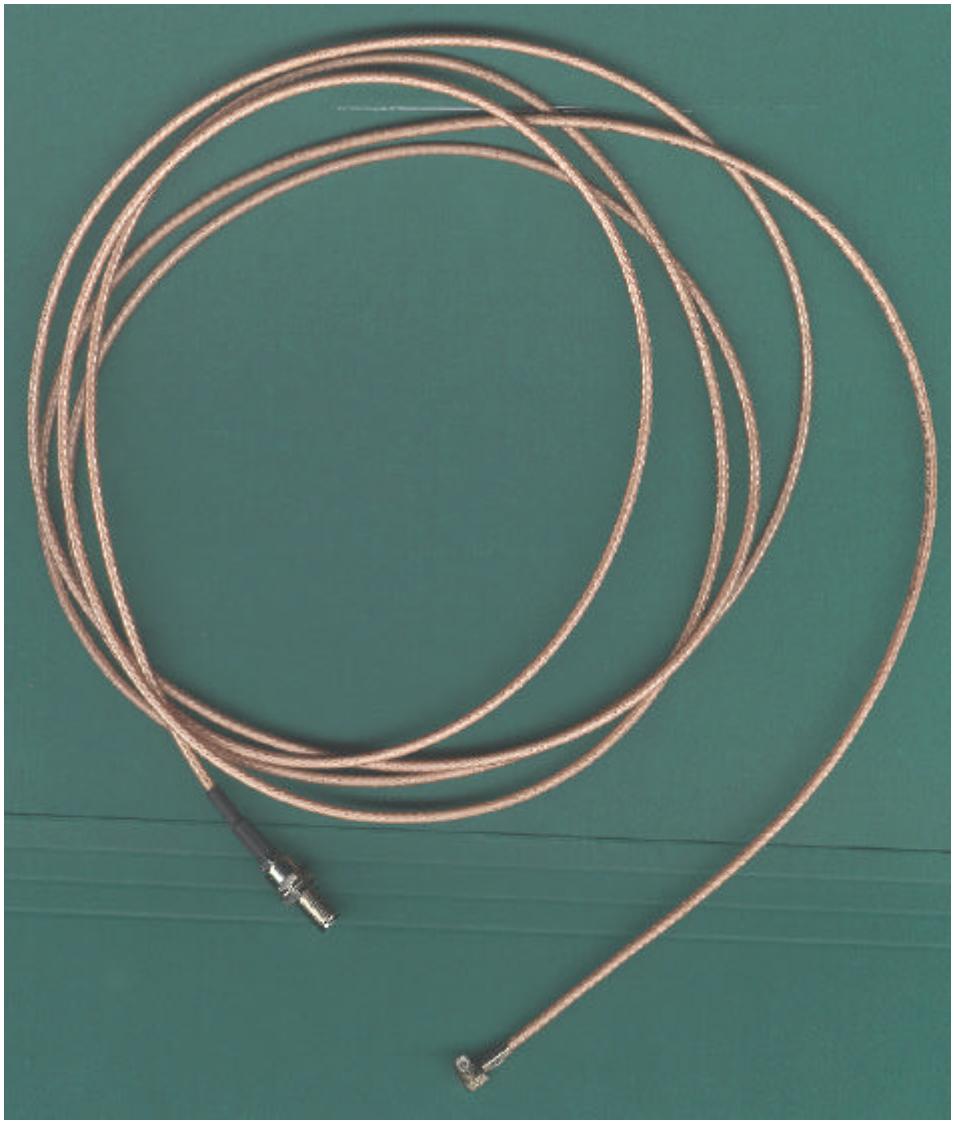
Equipment Under Test (EUT)
Component Side



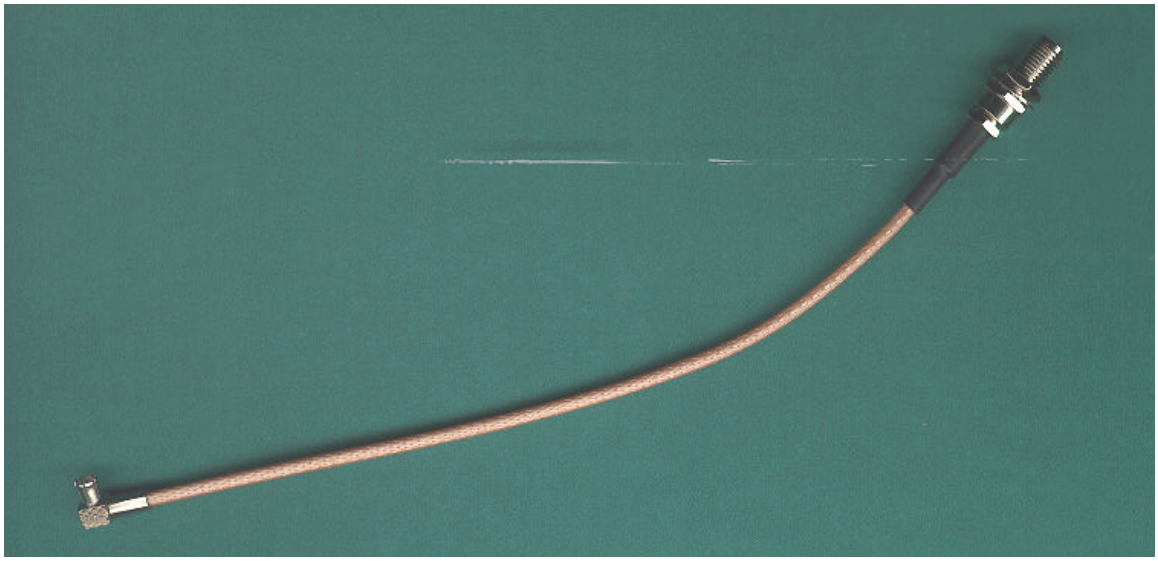
Equipment Under Test (EUT)
Solder Side



Equipment Under Test (EUT)
Long Cable

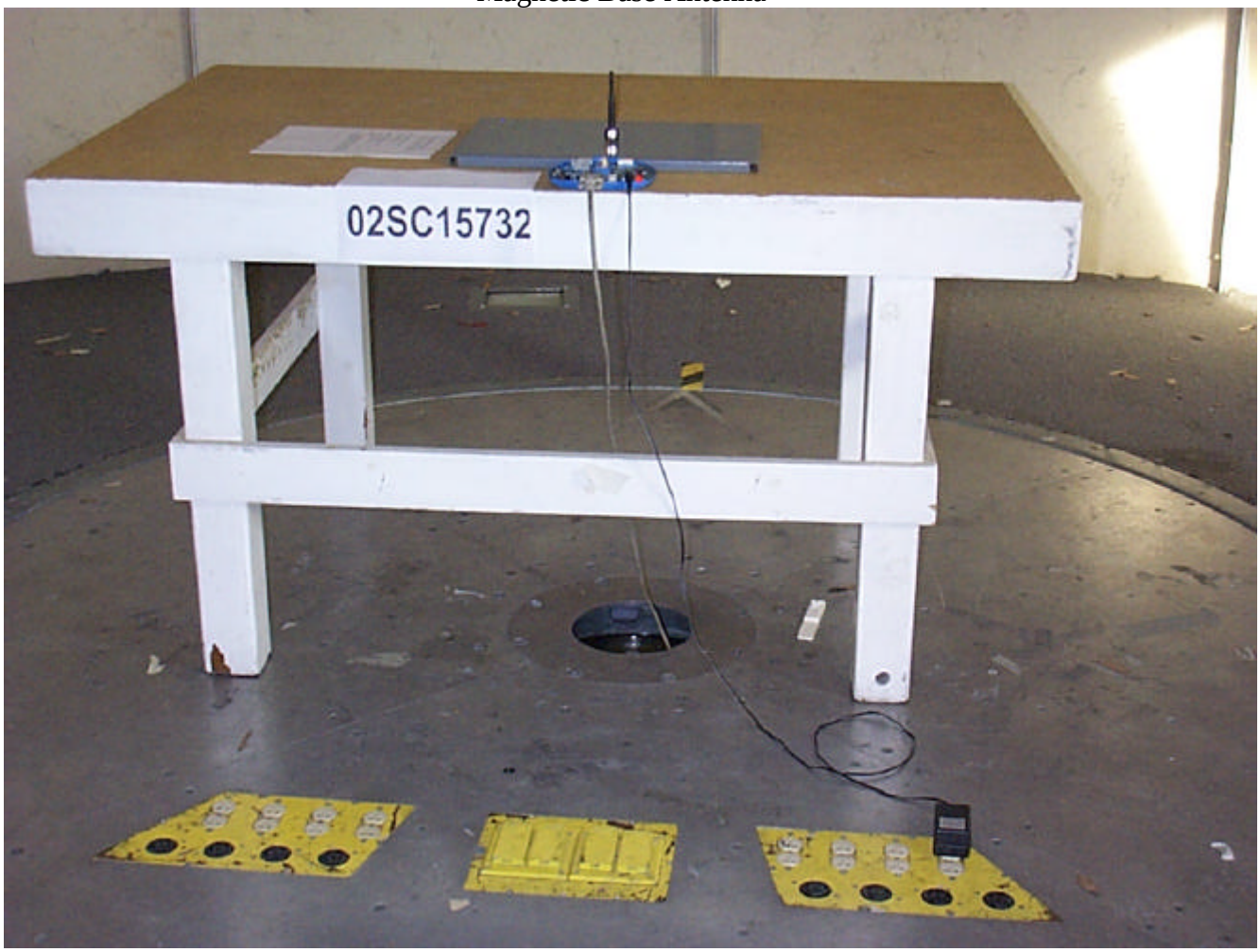


Equipment Under Test (EUT)
Short Cable

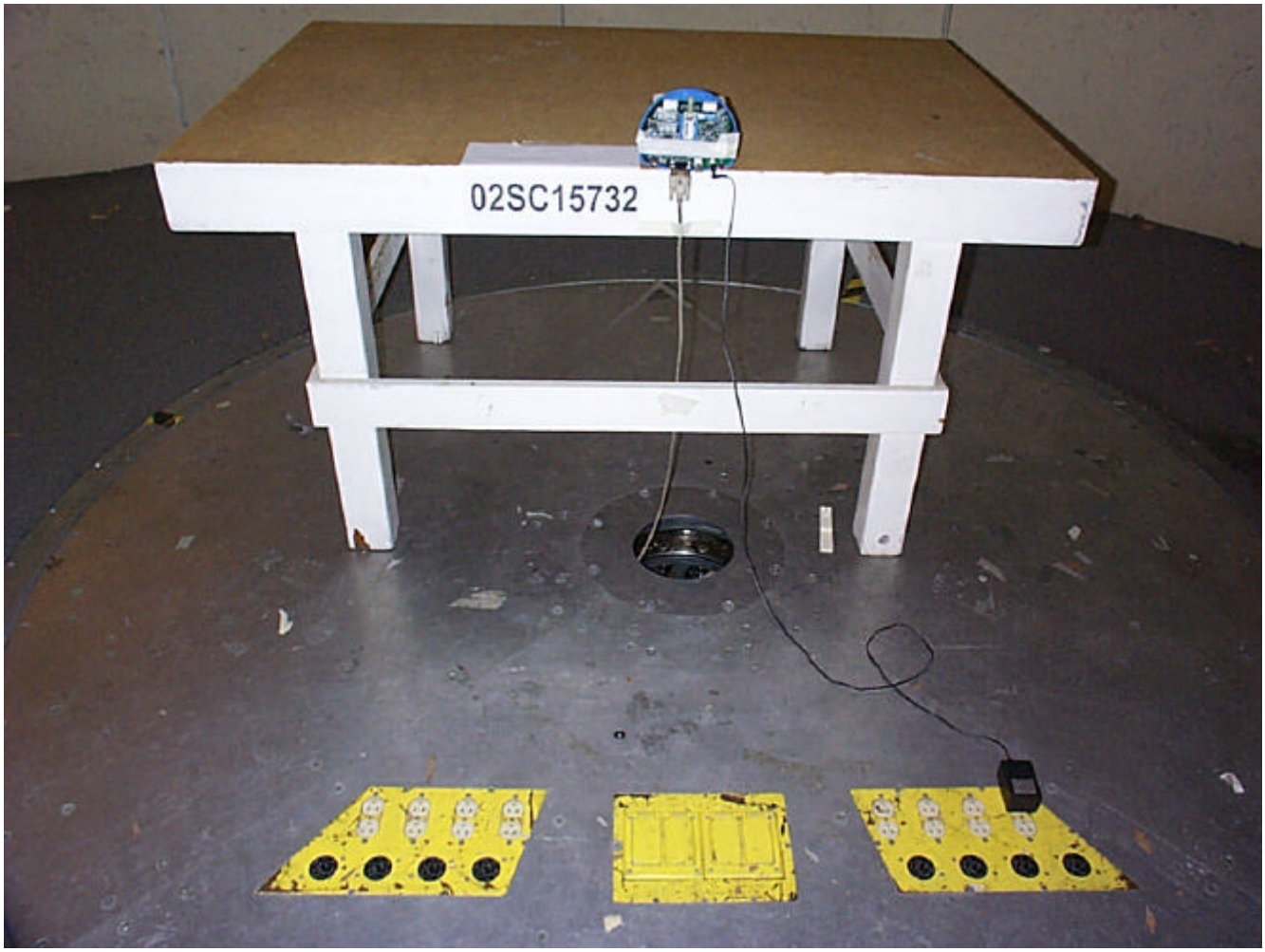


Radiated
Non-Magnetic Antenna

Radiated
Magnetic Base Antenna



Radiated
PCB Antenna



Line Conducted

Site 1 / 3 Meter Test Site

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	120 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.

EQUIPMENT LIST

RADIATED AND LINE CONDUCTED EMISSIONS

USED (X)	ASSET #	EQUIPMENT TYPE	MANUFACTURER	Serial #	Model #	CAL. DUE
X	8564	Biconical Antenna	EMCO	9210-1581	3110	10-10-03
X	8565	Biconical Antenna	Compliance Design	None	B200	11-06-03
X	8574	Biconical Antenna	Compliance Design	None	B300	06-28-03
X	8570	Horn Antenna	EMCO	9609-4906	3115	10-04-03
X	8580	LISN	FCC	None	CISPR M	01-23-03
X	8618	Pre-Amplifier	Hewlett Packard	3008A00272	8449B	04-24-03
X	8560	Spectrum Analyzer/Reciever	Hewlett Packard	3807A00456	8546A	07-01-03
X	8559	RF Filter Section	Hewlett Packard	3704A00424	85460A	07-01-03
X	8541	Spectrum Analyzer/Reciever	Hewlett Packard	3807A00465	8546A	06-20-03
X	8542	RF Filter Section	Hewlett Packard	3704A00422	85460A	06-20-03
X	8557	Spectrum Analyzer	Tektronix	B020370	2782	06-11-03
X	8114	Horn Ant 18-26.5GGHz	EMCO for HP	971313-004	3160-09	01-23-03
X	1944	1-40GHz Microwave Test System	Hewlett Packard	US36433008	85124C	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 dBµV	Site CF	Limit dBµV	Margin dBµV	Line
2.47	46.0	6.0	48.0	-2.0	L1

Freq. = Emission frequency in MHz
Corr'd dBµV = RAW reading converted to dB V and CF added
Site CF = Correction Factors for pad/cable losses
Limit dBµV = Limit stated in standard
Margin dBµV = 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 dBµV	Site CF	Limit dBµV	Margin dBµV	Table Pos.	Ant Pos.
76.57	44.2	-12.8	40.0	-5.3	180	1.5V

Freq. = Emission frequency in MHz
Corr'd dBµV = RAW reading converted to dBµV and CF added
Site CF = Correction Factors for pad/cable losses
Limit dBµV = Limit stated in standard
Margin dBµV = 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

Performance Criteria:

15.205 Restriction bands of operation:
Of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in 15.209. At frequencies equal to or less than 1000MHz, compliance with the limits in 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector.

15.207 Conducted Limits:
For an intentional radiator which 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 with the banc 450kHz to 30 MHz shall not exceed 250 microvolts. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

15.209 Radiated emission limits; general requirements:
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)
0.009-0.490……..	2400/F(kHz)	300
0.490-1.705……..	24000/F(kHz)	30
1.705-30.0…….	30	30
30-88…….	100**	3
88-216……..	150**	3
216-960…….	200**	3
Above 960……	500	3

15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
Operation under the provisions of this section is limited to frequency hopping and direct sequence spread spectrum intentional radiators that comply with the following provisions set fourth in CFR 47 Parts 0-19.