FCC PART 15, SUBPART B AND C
TEST REPORT

for

ICE 4000

Model: ICE 4000 900MHz

Prepared for

HYPERCOM CORPORATION
2851 WEST KATHLEEN ROAD
PHOENIX, ARIZONA 85053

Prepared by: _____

KYLE FUJIMOTO

Approved by: _____

SCOTT McCUTCHAN

COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
(714) 579-0500

DATE: APRIL 21, 2000

	REPORT BODY	APPENDICES				TOTAL
		A	*B*	*C*	*D*	
PAGES	16	2	2	13	28	61

TABLE OF CONTENTS

LIST OF APPENDICES

APPENDIX	TITLE
A	Modifications to the EUT
B	Additional Models Covered Under This Report
C	Diagrams, Charts and Photos • Test Setup Diagrams • Radiated Emissions Photos • Antenna and Effective Gain Factors
D	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Conducted Emissions Test Setup
2	Plot Map And Layout of Test Site

GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full with the written permission of Compatible Electronics.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested:	ICE 4000 Model: ICE 4000 900MHz S/N: 100001128824
Product Description:	See Expository Statement.
Modifications:	The EUT was not modified during the testing.
Manufacturer:	Hypercom Corporation 2851 West Kathleen Road Phoenix, Arizona 85053
Test Dates:	April 12 and 13, 2000
Test Specifications:	EMI requirements CFR Title 47, Part 15 Subpart B and Subpart C, Sections 15.205, 15.207, 15.209, and 15.249
Test Procedure:	ANSI C63.4: 1992
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 450 kHz - 30 MHz	Complies with the limits of **CFR** Title 47, Part 15, Subpart C, section 15.207
2	Radiated RF Emissions from the transmitter, 10 kHz – 9.3 GHz	Complies with the limits of **CFR** Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.249
3	Radiated RF Emissions from the digital circuitry, 30 MHz – 1 GHz	Complies with the **Class A** limits of **CFR** Title 47, Part 15, Subpart B
4	Radiated RF Emissions from the receiver, 10 kHz – 5 GHz	Complies with the **Class B** limits of **CFR** Title 47, Part 15, Subpart B

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on ICE 4000 Model: ICE 4000 900MHz. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 1992. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as the EUT hereafter, are within the specification limits defined by CFR Title 47, Part 15, Subpart C, sections 15.205, 15.207, and 15.209 for the transmitter portion of the EUT, the **Class A** specification limits defined by CFR Title 47, Part 15, Subpart B for the digital portion of the EUT, and the **Class B** specification limits defined by CFR Title 47, Part 15 Subpart B for the receiver portion of the EUT.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Hypercom Corporation

Sean Mentzer	Engineer

Compatible Electronics Inc.

Kyle Fujimoto	Test Engineer
Scott McCutchan	Lab Manager

2.4 Date Test Sample was Received

The test sample was received on April 12, 2000.

2.5 Disposition of the Test Sample

The test sample has not been returned to Hypercom Corporation as of April 21, 2000.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices
ANSI C63.4 1992	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

ICE 4000 Model: ICE 4000 900MHz (EUT) was connected to the pinpad and AC Adapter via its pin and power ports, respectively. The antenna connector on the PCB has a reverse polarity OMST connector. Note: The line port on the EUT will be covered up and sealed by a plastic cover during production and cannot be used. This is because there is no modem on this unit.

The EUT was operated as follows:

Transmitter and Receiver Portion: The EUT was continuously transmitting and receiving. The fundamental and harmonics of the transmitter were tested to the limits of section 15.209. The receiver and its harmonics were tested to the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

Digital Portion: The EUT was continuously transmitting. The clock harmonics of the EUT were tested to the **Class A** specification limits defined by CFR Title 47, Part 15, Subpart B.

Conducted Emissions: During the initial investigation, the EUT was tested in both transmit, receive, and idle modes. It was determined the conducted emission levels were highest when the EUT was continuously transmitting. The conducted emissions were tested to the limits of section 15.207.

The final radiated as well as conducted data was taken in the modes above. Please see Appendix D for the data sheets.

4.1.1 Cable Construction and Termination

Cable 1 This is a 4 foot unshielded cable connecting the EUT to the pinpad. It has an RJ-11 connector at the EUT end and is hard wired into the pinpad.

Cable 2 This is a 6 foot unshielded cable connecting the EUT to the AC Adapter. It has a 1/8 inch power adapter at the EUT end and is hard wired into the AC Adapter.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
DIGITAL TELEMETRY SYSTEM - Tx (EUT)	HYPERCOM CORPORATION	ICE 4000 900MHZ	100001128824	**NVA010164-002A**
PINPAD	HYPERCOM CORPORATION	S7SCR	N/A	**N/A**
AC ADAPTER	SKYNET ELECTRONIC COMPANY	SNP-K037	N/A	**N/A**

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Spectrum Analyzer	Hewlett Packard	8566B	3638A08768	Dec. 14, 1999	Dec. 14, 2000
Preamplifier	Com Power	PA-102	1017	Jan. 11, 2000	Jan. 11, 2001
Quasi-Peak Adapter	Hewlett Packard	85650A	3303A01688	Nov. 10, 1999	Nov. 10, 2000
RF Attenuator	Sertek	412-10	N/A	Nov. 22, 1999	Nov. 22, 2000
LISN	Com Power	LI-215	12075	Nov. 13, 1999	Nov. 13, 2000
LISN	Com Power	LI-215	12078	Nov. 13, 1999	Nov. 13, 2000
Biconical Antenna	Com Power	AB-100	1548	Oct. 14, 1999	Oct. 14, 2000
Log Periodic Antenna	Com Power	AL-100	16039	Oct. 14, 1999	Oct. 14, 2000
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
Turntable	Com Power	TT-100	N/A	N/A	N/A
Computer	Hewlett Packard	D5251A 888	US74458128	N/A	N/A
Microwave Preamplifier	Com-Power	PA-122	25195	Jan. 13, 2000	Jan. 13, 2001
Horn Antenna	Antenna Research	DRG-118/A	1053	Dec. 8, 1995	N/A
Loop Antenna	Com-Power	AL-130	25309	April 13, 1999	April 13, 2000

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak detector was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the spectrum analyzer input stage, and the spectrum analyzer offset was adjusted accordingly to read the actual data measured. The LISN output was read by the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for the conducted emissions test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 1992. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The initial test data was taken in manual mode while scanning the frequency ranges of 0.45 MHz to 1.6 MHz, 1.6 MHz to 5 MHz and 5 MHz to 30 MHz. The conducted emissions from the EUT were maximized for operating mode as well as cable placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the spectrum analyzer span adjusted to 1 MHz.

The final data was collected under program control by the HP 9000/300 in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave.

7.1 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, and the Com-Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

For the peak readings below 1000 MHz that were within 3 dB of the spec limit or higher, the quasi-peak adapter was used.

For the peak readings above 1000 MHz that were within 3dB of the spec limit or higher, the readings were averaged manually by narrowing the video filter down to 10 Hz and slowing the sweep time to keep the amplitude reading calibrated.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 9.3 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 1992. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain final test data. The final qualification data sheets are located in Appendix D.

7.2 Band Edge Plots of the Low and High Channels

A spectral plot of the fundamental for the EUT was shown to demonstrate the emissions at the band edges (902 and 928 MHz) were attenuated by at least 50 dB below the level of the fundamental or to the general radiated emissions limits in FCC Title 47, Subpart C, section 15.209, whichever is the lesser attenuation. Please see Appendix D for the spectral plot.

The spectral plots were taken at a distance of 3 meters, using the PA-102 Preamplifier to boost the signal level of any potential emissions outside the band edges.

8. CONCLUSIONS

The ICE 4000 Model: ICE 4000 900MHz meets all of the specification limits defined in CFR Title 47, Part 15, Subpart C, sections 15.205, 15.207, and 15.249 for the transmitter portion, the **Class A** specification limits defined in CFR Title 47, Part 15, Subpart B for the digital portion, and the **Class B** specification limits defined in CFR Title 47, Part 15, Subpart B for the receiver portion.

APPENDIX A

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and C specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during the testing.

APPENDIX B

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	ICE 4000 Model: ICE 4000 900MHz S/N: 100001128824

There were no additional models covered under this report.

APPENDIX C

DIAGRAMS, CHARTS AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

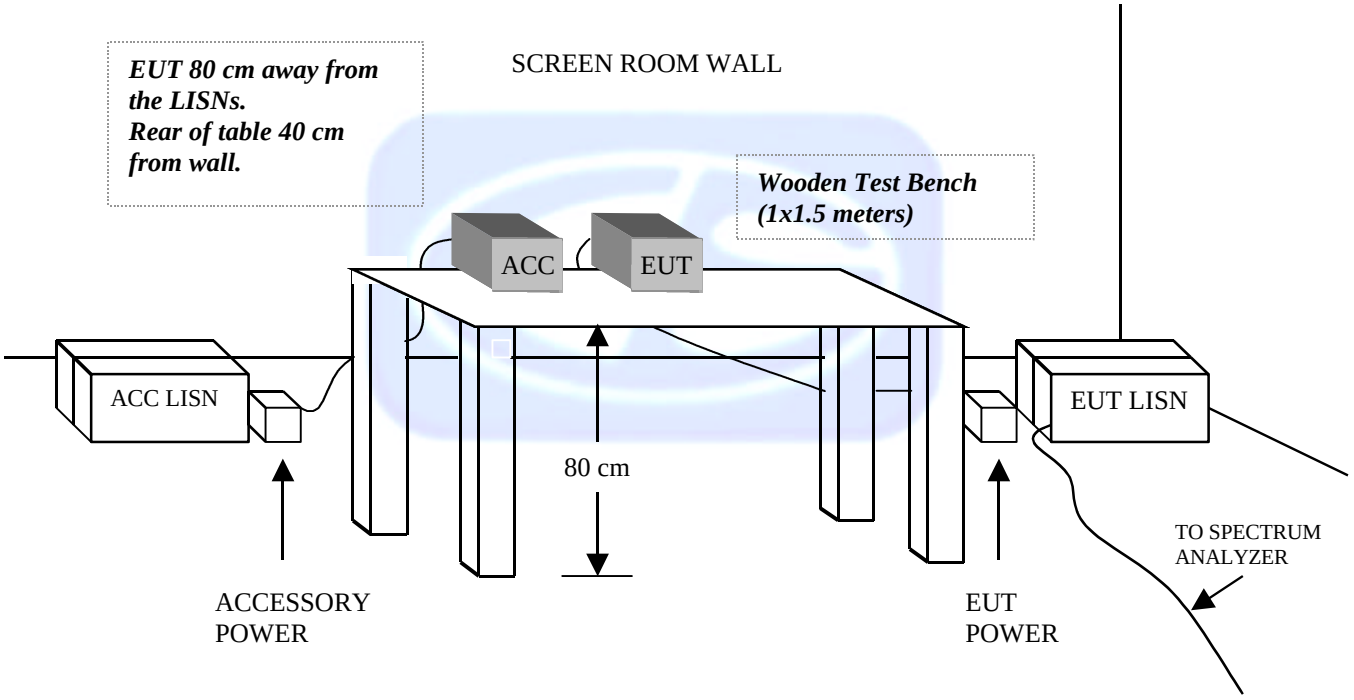
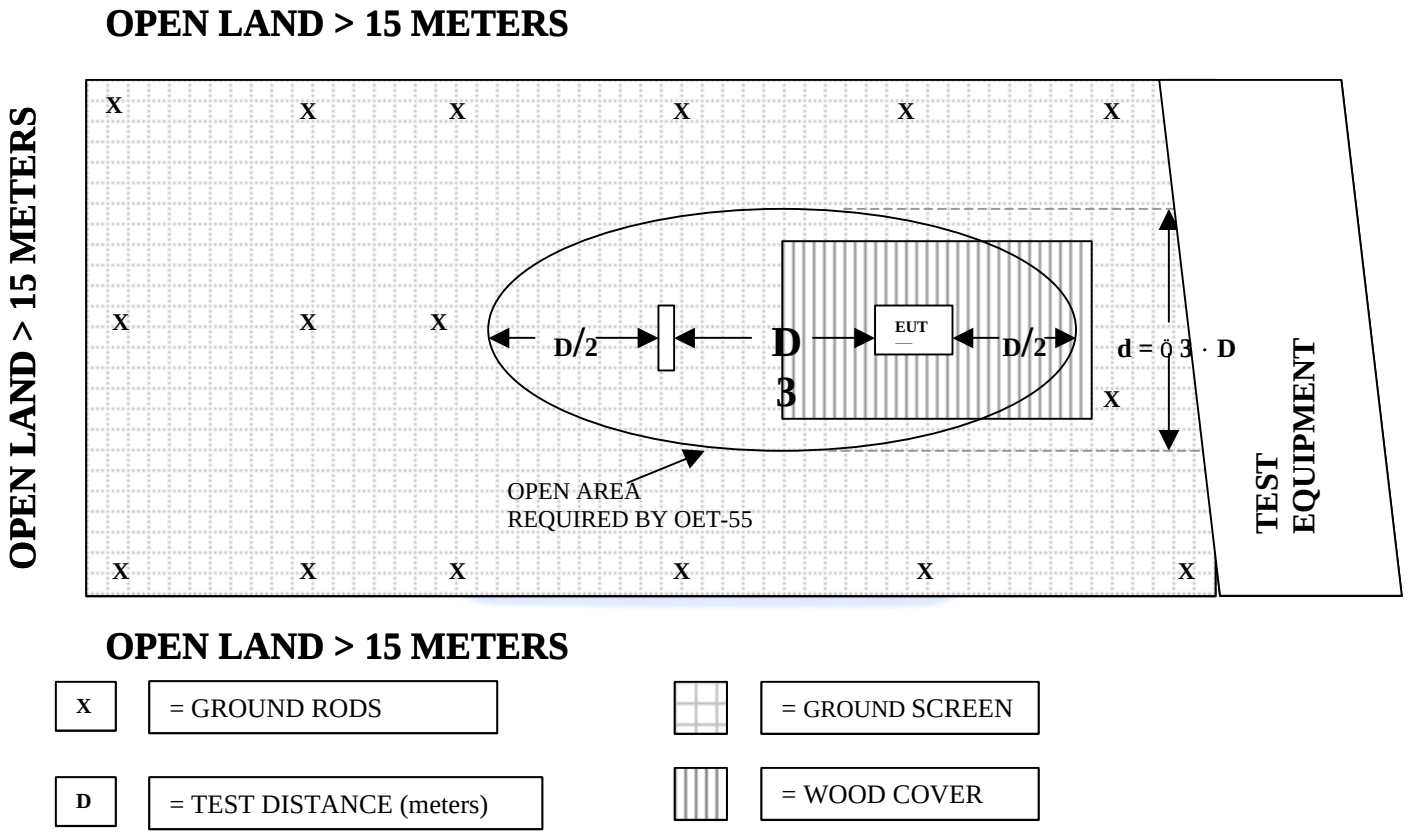


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE



FRONT VIEW

HYPERCOM CORPORATION
ICE 4000
MODEL: ICE 4000 900MHz
TRANSMIT AND RECEIVE PORTION - RADIATED EMISSIONS – 4-12-00

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

HYPERCOM CORPORATION
ICE 4000
MODEL: ICE 4000 900MHz
TRANSMIT AND RECEIVE PORTION - RADIATED EMISSIONS – 4-12-00

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

HYPERCOM CORPORATION
ICE 4000
MODEL: ICE 4000 900MHz
DIGITAL PORTION - RADIATED EMISSIONS – 4-13-00

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

HYPERCOM CORPORATION
ICE 4000
MODEL: ICE 4000 900MHz
DIGITAL PORTION - RADIATED EMISSIONS – 4-13-00

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

HYPERCOM CORPORATION
ICE 4000
MODEL: ICE 4000 900MHz
FCC SUBPART C - CONDUCTED EMISSIONS – 4-13-00

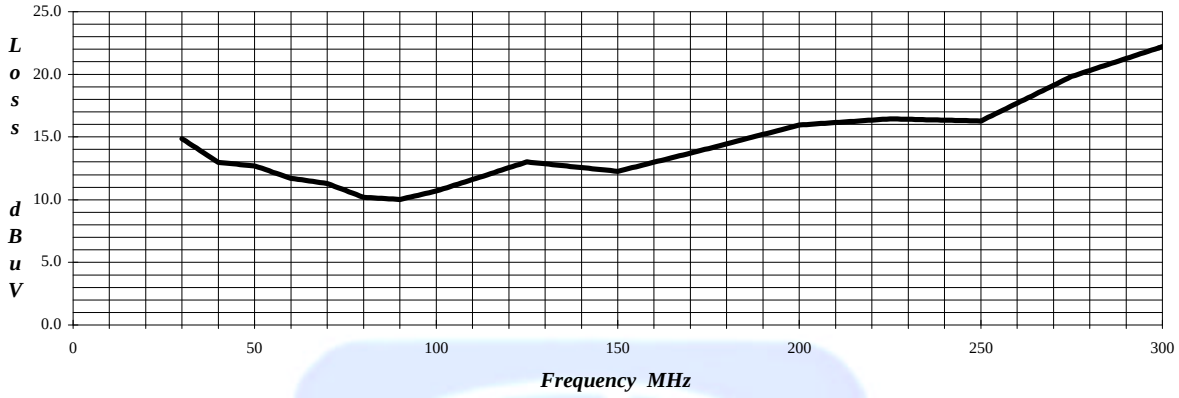
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

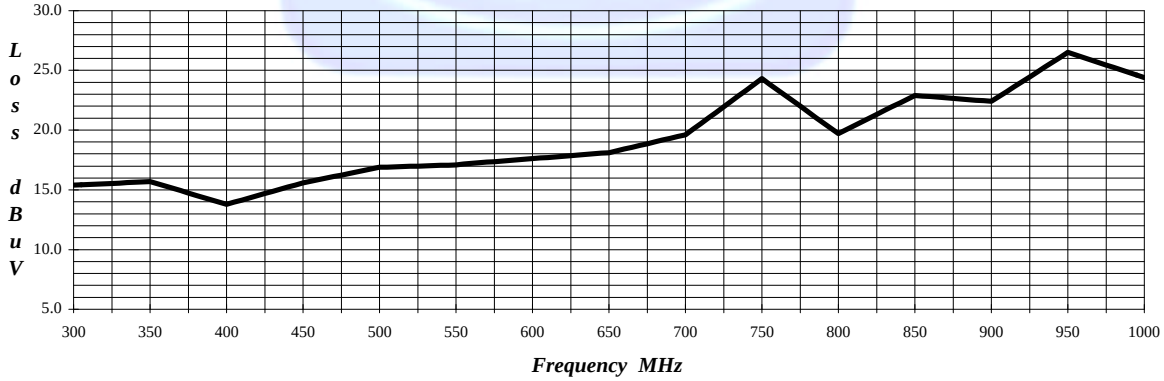
HYPERCOM CORPORATION
ICE 4000
MODEL: ICE 4000 900MHz
FCC SUBPART C - CONDUCTED EMISSIONS – 4-13-00

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

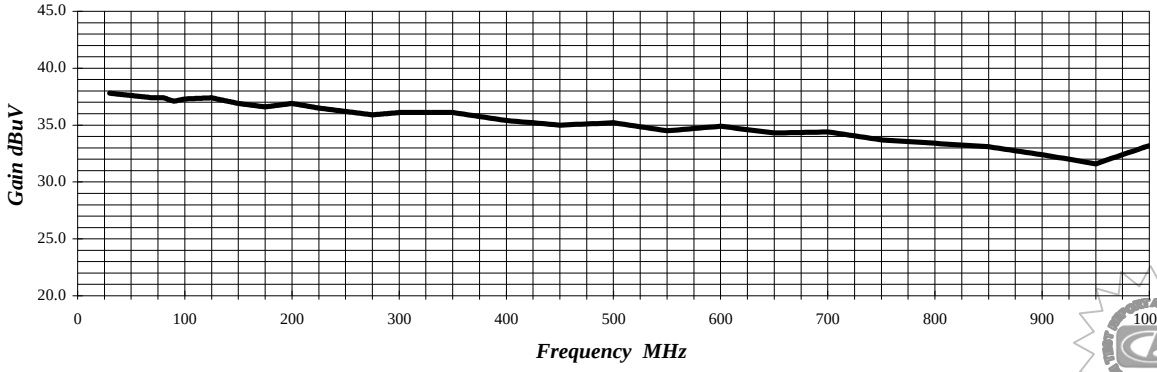
LAB "D" BICONICAL ANTENNA AB-100 S/N 01548 Cal: 10-14-99



LAB "D" LOG PERIODIC ANTENNA AL-100 S/N 16039 Cal: 10-14-99



PREAMPLIFIER EFFECTIVE GAIN AT 3 METERS PA-102 S/N: 1017 Lab "D"
Effective 1-16-99



COM-POWER PA-122

MICROWAVE PREAMPLIFIER

S/N: 25195

CALIBRATION DATE: JANUARY 13, 2000

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	34.4	9.0	30.7
1.1	34.1	9.5	31.5
1.2	34.2	10.0	31.0
1.3	34.1	10.5	31.4
1.4	33.9	11.0	30.7
1.5	33.8	11.5	29.5
1.6	33.0	12.0	27.8
1.7	33.3	12.5	31.4
1.8	33.3	13.0	31.0
1.9	31.9	13.5	31.0
2.0	32.7	14.0	31.5
2.5	31.8	14.5	30.2
3.0	31.7	15.0	29.2
3.5	31.9	15.5	30.1
4.0	31.0	16.0	29.0
4.5	31.4	16.5	27.8
5.0	31.1	17.0	30.8
5.5	31.0	17.5	31.5
6.0	32.0	18.0	30.8
6.5	31.6		
7.0	32.3		
7.5	32.9		
8.0	32.1		
8.5	31.6		

ANTENNA RESEARCH ASSOCIATES, INC.
11317 Frederick Avenue, Beltsville, MD 20705

E-FIELD ANTENNA FACTOR CALIBRATION

E(dB V/m) = Vo(dB V) + AFE(dB/m)

Model number : DRG-118/A

Frequency GHz	AFE dB/m	Gain dBi
1	22.3	8.0
2	26.7	9.5
3	29.7	10.1
4	29.5	12.8
5	32.3	12.0
6	32.4	13.4
7	36.1	11.0
8	37.4	10.9
9	36.8	12.5
10	39.5	10.7
11	39.6	11.5
12	39.8	12.0
13	39.7	12.8
14	41.8	11.3
15	41.9	11.9
16	38.1	16.3
17	41.0	13.9
18	46.5	8.9

Serial number : 1053
Job number : 96-092
Remarks : 3 meter calibration
Standards : LPD-118/A, TE-1000

Temperature : 72° F
Humidity : 56 %
Traceability : A01887
Date : December 08, 1995

Calibrated By

Com-Power Corporation

(949) 587-9800

Antenna Calibration

Antenna Type:	Loop Antenna
Model:	AL-130
Serial Number:	25309
Calibration Date:	4/13/99

Frequency MHz	Magnetic (dB/m)	Electric dB/m
0.01	-40.6	10.9
0.02	-41.5	10.0
0.03	-39.9	11.6
0.04	-40.2	11.3
0.05	-41.5	10.0
0.06	-41.1	10.4
0.07	-41.3	10.2
0.08	-41.6	9.9
0.09	-41.7	9.8
0.1	-41.7	9.8
0.2	-44.0	7.5
0.3	-41.6	9.9
0.4	-41.6	9.9
0.5	-41.7	9.8
0.6	-41.5	10.0
0.7	-41.4	10.1
0.8	-41.5	10.0
0.9	-41.6	9.9
1	-41.2	10.3
2	-40.5	11.0
3	-40.8	10.7
4	-41.0	10.5
5	-40.5	11.0
6	-40.5	11.0
7	-40.7	10.8
8	-40.8	10.7
9	-40.1	11.4
10	-40.4	11.1
12	-41.0	10.5
14	-42.1	9.4
15	-42.3	9.2
16	-42.7	8.8
18	-41.0	10.5
20	-41.1	10.4
25	-43.4	8.1
30	-45.3	6.2

Trans. Antenna Height	2 meter
Receiving Antenna Height	2 meter

APPENDIX D

DATA SHEETS

RADIATED DATA SHEETS
FOR THE TRANSMITTER PORTION

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	HYPERCOM CORPORATION	DATE	4/12/00
EUT	ICE 4000	DUTY CYCLE	N/A
MODEL	ICE 4000 900MHz	PEAK TO AVG	N/A
S/N	[redacted] 10000112 8824	TEST DIST.	3 METERS
TEST ENGINEER	KYLE FUJIMOTO	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Correcte Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m	Comments
916.7900	101.5	101.4 Q	H	1.0	180	Y	LOW	23.8	4.6	37.6	92.2	-1.8	94.0	
916.7900	102.3	102.2 Q	H	1.0	180	X	LOW	23.8	4.6	37.6	93.0	-1.0	94.0	
916.7900	103.0	102.9 Q	H	1.0	270	Z	LOW	23.8	4.6	37.6	93.7	-0.3	94.0	
916.7900	102.9	102.8 Q	V	1.0	0	Y	LOW	23.8	4.6	37.6	93.6	-0.4	94.0	
916.7900	102.3	102.2 Q	V	1.0	180	X	LOW	23.8	4.6	37.6	93.0	-1.0	94.0	
916.7900	103.0	102.9 Q	V	1.0	270	Z	LOW	23.8	4.6	37.6	93.7	-0.3	94.0	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

COMPATIBLE ELECTRONICS

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	HYPERCOM CORPORATION	DATE	4/12/00
EUT	ICE 4000	DUTY CYCLE	N/A
MODEL	ICE 4000 900MHz	PEAK TO AVG	N/A
S/N	[redacted] 10000112 8824	TEST DIST.	3 METERS
TEST ENGINEER	KYLE FUJIMOTO	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
1833.5800	48.1	45.9 A	H	1.0	90	Y	LOW	24.5	3.5	33.3	40.6	-13.4	54.0	
1833.5800	49.6	47.6 A	H	1.0	90	X	LOW	24.5	3.5	33.3	42.3	-11.7	54.0	
1833.5800	47.2	43.5 A	H	1.0	270	Z	LOW	24.5	3.5	33.3	38.2	-15.8	54.0	
1833.5800	46.9	41.6 A	V	1.5	90	Y	LOW	24.5	3.5	33.3	36.3	-17.7	54.0	
1833.5800	45.5	41.5 A	V	1.5	90	X	LOW	24.5	3.5	33.3	36.2	-17.8	54.0	
1833.5800	46.8	44.0 A	V	1.5	90	Z	LOW	24.5	3.5	33.3	38.7	-15.3	54.0	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

COMPATIBLE ELECTRONICS

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	HYPERCOM CORPORATION	DATE	4/12/00
EUT	ICE 4000	DUTY CYCLE	N/A
MODEL	ICE 4000 900MHz	PEAK TO AVG	N/A
S/N	[redacted] 10000112 8824	TEST DIST.	3 METERS
TEST ENGINEER	KYLE FUJIMOTO	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2750.3700	40.1	30.3 A	H	1.5	90	Y	LOW	28.2	4.5	31.8	**31.2**	**-22.8**	**54.0**	
2750.3700	38.6	31.8 A	H	1.5	90	X	LOW	28.2	4.5	31.8	**32.7**	**-21.3**	**54.0**	
2750.3700	41.3	33.2 A	H	1.5	180	Z	LOW	28.2	4.5	31.8	**34.1**	**-19.9**	**54.0**	
2750.3700	43.3	38.2 A	V	1.0	180	Y	LOW	28.2	4.5	31.8	**39.1**	**-14.9**	**54.0**	
2750.3700	36.9	30.1 A	V	1.0	180	X	LOW	28.2	4.5	31.8	**31.0**	**-23.0**	**54.0**	
2750.3700	41.2	32.0 A	V	1.0	180	Z	LOW	28.2	4.5	31.8	**32.9**	**-21.1**	**54.0**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

COMPATIBLE ELECTRONICS

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	HYPERCOM CORPORATION	DATE	4/12/00
EUT	ICE 4000	DUTY CYCLE	N/A
MODEL	ICE 4000 900MHz	PEAK TO AVG	N/A
S/N	[redacted] 100001128824	TEST DIST.	3 METERS
TEST ENGINEER	KYLE FUJIMOTO	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
3667.1600	36.0	27.9 A	H	1.0	90	Y	LOW	29.6	5.0	31.9	**30.6**	**-23.5**	**54.0**	
3667.1600	36.3	28.0 A	H	1.0	90	X	LOW	29.6	5.0	31.9	**30.7**	**-23.3**	**54.0**	
3667.1600	35.9	28.0 A	H	1.0	180	Z	LOW	29.6	5.0	31.9	**30.7**	**-23.3**	**54.0**	
3667.1600	36.4	28.0 A	V	1.0	90	Y	LOW	29.6	5.0	31.9	**30.7**	**-23.3**	**54.0**	
3667.1600	35.9	27.9 A	V	1.0	90	X	LOW	29.6	5.0	31.9	**30.6**	**-23.4**	**54.0**	
3667.1600	36.0	27.9 A	V	1.0	180	Z	LOW	29.6	5.0	31.9	**30.6**	**-23.4**	**54.0**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

COMPATIBLE ELECTRONICS

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	HYPERCOM CORPORATION	DATE	4/12/00
EUT	ICE 4000	DUTY CYCLE	N/A
MODEL	ICE 4000 900MHz	PEAK TO AVG	N/A
S/N	[redacted] 100001128824	TEST DIST.	3 METERS
TEST ENGINEER	KYLE FUJIMOTO	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
4583.9500	36.0	28.4 A	H	1.0	180	Y	LOW	30.9	5.6	31.4	33.5	-20.5	54.0	
4583.9500	36.7	28.4 A	H	1.0	180	X	LOW	30.9	5.6	31.4	33.5	-20.5	54.0	
4583.9500	37.5	28.3 A	H	1.0	180	Z	LOW	30.9	5.6	31.4	33.4	-20.6	54.0	
4583.9500	37.3	28.4 A	V	1.5	0	Y	LOW	30.9	5.6	31.4	33.5	-20.5	54.0	
4583.9500	38.4	28.3 A	V	1.5	0	X	LOW	30.9	5.6	31.4	33.4	-20.6	54.0	
4583.9500	36.6	28.4 A	V	1.5	0	Z	LOW	30.9	5.6	31.4	33.5	-20.6	54.0	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

COMPATIBLE ELECTRONICS

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	HYPERCOM CORPORATION	DATE	4/12/00
EUT	ICE 4000	DUTY CYCLE	N/A
MODEL	ICE 4000 900MHz	PEAK TO AVG	N/A
S/N	[redacted] 10000 1128824	TEST DIST.	3 METERS
TEST ENGINEER	KYLE FUJIMOTO	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
5500.7400	36.1	28.1 A	H	1.0	90	Y	LOW	32.4	6.0	31.0	**35.5**	**-18.5**	**54.0**	
5500.7400	37.7	28.2 A	H	1.0	180	X	LOW	32.4	6.0	31.0	**35.6**	**-18.4**	**54.0**	
5500.7400	35.5	28.2 A	H	1.0	90	Z	LOW	32.4	6.0	31.0	**35.6**	**-18.4**	**54.0**	
5500.7400	38.3	28.2 A	V	1.0	90	Y	LOW	32.4	6.0	31.0	**35.6**	**-18.4**	**54.0**	
5500.7400	37.4	28.2 A	V	1.0	90	X	LOW	32.4	6.0	31.0	**35.6**	**-18.4**	**54.0**	
5500.7400	35.3	28.2 A	V	1.0	90	Z	LOW	32.4	6.0	31.0	**35.6**	**-18.4**	**54.0**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

COMPATIBLE ELECTRONICS

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	HYPERCOM CORPORATION	DATE	4/12/00
EUT	ICE 4000	DUTY CYCLE	N/A
MODEL	ICE 4000 900MHz	PEAK TO AVG	N/A
S/N	[redacted] 10000112 8824	TEST DIST.	3 METERS
TEST ENGINEER	KYLE FUJIMOTO	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
6417.5300	38.3	30.4 A	H	1.0	180	Y	LOW	34.3	6.9	31.6	40.0	-14.0	54.0	
6417.5300	37.4	30.1 A	H	1.0	180	X	LOW	34.3	6.9	31.6	39.7	-14.3	54.0	
6417.5300	38.5	30.2 A	H	1.0	180	Z	LOW	34.3	6.9	31.6	39.8	-14.2	54.0	
6417.5300	37.1	30.0 A	V	1.0	90	Y	LOW	34.3	6.9	31.6	39.6	-14.4	54.0	
6417.5300	39.9	30.3 A	V	1.0	90	X	LOW	34.3	6.9	31.6	39.9	-14.1	54.0	
6417.5300	38.2	30.1 A	V	1.0	180	Z	LOW	34.3	6.9	31.6	39.7	-14.3	54.0	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	HYPERCOM CORPORATION	DATE	4/12/00
EUT	ICE 4000	DUTY CYCLE	N/A
MODEL	ICE 4000 900MHz	PEAK TO AVG	N/A
S/N	[redacted] 10000 11 28824	TEST DIST.	3 METERS
TEST ENGINEER	KYLE FUJIMOTO	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
7334.3200	37.5	29.2 A	H	1.0	180	Y	LOW	36.8	9.1	32.9	**42.2**	**-11.8**	**54.0**	
7334.3200	39.5	29.2 A	H	1.0	180	X	LOW	36.8	9.1	32.9	**42.2**	**-11.8**	**54.0**	
7334.3200	36.3	29.2 A	H	1.0	180	Z	LOW	36.8	9.1	32.9	**42.2**	**-11.9**	**54.0**	
7334.3200	37.3	28.9 A	V	1.0	180	Y	LOW	36.8	9.1	32.9	**41.9**	**-12.1**	**54.0**	
7334.3200	37.1	29.1 A	V	1.0	180	X	LOW	36.8	9.1	32.9	**42.1**	**-11.9**	**54.0**	
7334.3200	36.4	29.1 A	V	1.0	180	Z	LOW	36.8	9.1	32.9	**42.1**	**-11.9**	**54.0**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

COMPATIBLE ELECTRONICS

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	HYPERCOM CORPORATION	DATE	4/12/00
EUT	ICE 4000	DUTY CYCLE	N/A
MODEL	ICE 4000 900MHz	PEAK TO AVG	N/A
S/N	[redacted] 10000112 8824	TEST DIST.	3 METERS
TEST ENGINEER	KYLE FUJIMOTO	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
8251.1100	37.0	29.6 A	H	1.0	180	Y	LOW	37.4	8.1	32.1	**43.0**	**-11.0**	**54.0**	
8251.1100	37.9	29.7 A	H	1.0	180	X	LOW	37.4	8.1	32.1	**43.1**	**-10.9**	**54.0**	
8251.1100	38.9	29.7 A	H	1.0	180	Z	LOW	37.4	8.1	32.1	**43.1**	**-10.9**	**54.0**	
8251.1100	36.8	29.7 A	V	1.0	180	Y	LOW	37.4	8.1	32.1	**43.1**	**-10.9**	**54.0**	
8251.1100	37.1	29.7 A	V	1.0	90	X	LOW	37.4	8.1	32.1	**43.1**	**-11.0**	**54.0**	
8251.1100	36.7	29.5 A	V	1.0	90	Z	LOW	37.4	8.1	32.1	**42.9**	**-11.1**	**54.0**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	HYPERCOM CORPORATION	DATE	4/12/00
EUT	ICE 4000	DUTY CYCLE	N/A
MODEL	ICE 4000 900MHz	PEAK TO AVG	N/A
S/N	[redacted] 10000 1128824	TEST DIST.	3 METERS
TEST ENGINEER	KYLE FUJIMOTO	LAB	D

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
9167.9000	39.5	29.7 A	H	1.0	180	Y	LOW	36.8	9.4	31.5	44.4	-9.6	54.0	
9167.9000	39.2	29.6 A	H	1.0	270	X	LOW	36.8	9.4	31.5	44.3	-9.7	54.0	
9167.9000	37.1	29.6 A	H	1.0	270	Z	LOW	36.8	9.4	31.5	44.3	-9.7	54.0	
9167.9000	37.8	29.7 A	V	1.0	0	Y	LOW	36.8	9.4	31.5	44.4	-9.6	54.0	
9167.9000	38.3	29.6 A	V	1.0	0	X	LOW	36.8	9.4	31.5	44.3	-9.7	54.0	
9167.9000	39.1	29.7 A	V	1.0	0	Z	LOW	36.8	9.4	31.5	44.4	-9.7	54.0	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = SPEC LIMIT - CORRECTED READING

COMPATIBLE ELECTRONICS

Test location: Compatible Electronics
Customer : HYPERCOM CORP. Date : 4/13/2000
Manufacturer : HYPERCOM CORP. Time : 16.22
EUT name : ICE 4000
Model : ICE 4000 900MHZ
Specification: Fcc_A Test distance: 10.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
TEMPERATURE 86 DEGREES F.
RELATIVE HUMIDITY 45%
TESTED BY: Kyle Fujimoto
KYLE FUJIMOTO

NO EMISSIONS FOUND BETWEEN 10 kHz AND 30 MHz
FOR THE EUT IN EITHER POLARIZATION

RADIATED DATA SHEETS FOR THE RECEIVER PORTION

Test location: Compatible Electronics
Customer : HYPERCOM CORP. Date : 4/13/2000
Manufacturer : HYPERCOM CORP. Time : 8.41
EUT name : ICE 4000
Model : ICE 4000 900MHZ
Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode : RECEIVING MODE
TEMPERATURE 86 DEGREES F.
RELATIVE HUMIDITY 45%
TESTED BY: Kyle Fujimoto
KYLE FUJIMOTO

NO EMISSIONS FOUND FOR THE RECEIVING MODE
FOR THE EUT IN EITHER POLARIZATION

RADIATED DATA SHEETS FOR THE DIGITAL PORTION

Test location: Compatible Electronics
Customer : HYPERCOM CORP.
Manufacturer : HYPERCOM CORP.
EUT name : ICE 4000
Model : ICE 4000 900MHZ
Specification: Fcc_A Test distance: 10.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
TEMPERATURE 86 DEGREES F.
RELATIVE HUMIDITY 45%
TESTED BY: Kyle Fujimoto
KYLE FUJIMOTO

Date : 4/13/2000
Time : 11.19

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1V	49.24	54.80	1.50	12.70	38.69	30.31	39.10	-8.79
2V	59.11	49.00	1.50	11.81	38.79	23.54	39.10	-15.56
3V	61.49	50.60	1.52	11.66	38.81	24.97	39.10	-14.13
4V	61.55	50.60	1.52	11.66	38.82	24.96	39.10	-14.14
5V	86.01	50.50	1.80	10.11	38.68	23.73	39.10	-15.37
6V	98.39	55.50	1.88	10.63	38.60	29.41	43.50	-14.09
7V	99.64	50.80	1.90	10.71	38.60	24.81	43.50	-18.69
8V	108.24	52.10	2.00	11.49	38.67	26.92	43.50	-16.58
9V	110.63	50.30	2.03	11.71	38.69	25.35	43.50	-18.15
10V	118.03	60.40	2.12	12.38	38.74	36.16	43.50	-7.34
11V	122.95	56.90	2.18	12.82	38.78	33.12	43.50	-10.38
12V	127.88	56.30	2.21	12.92	38.79	32.64	43.50	-10.86
13V	135.21	53.10	2.24	12.70	38.76	29.68	43.50	-13.82
14V	137.74	57.60	2.25	12.62	38.75	33.72	43.50	-9.78
15V	147.58	51.50	2.29	12.32	38.71	27.40	43.50	-16.10
16V	157.36	54.40	2.42	12.79	38.73	30.88	43.50	-12.62
17V	167.19	53.40	2.58	13.50	38.77	30.71	43.50	-12.79
18V	172.12	47.40	2.65	13.86	38.79	25.12	43.50	-18.38
19V	177.03	52.00	2.71	14.22	38.78	30.15	43.50	-13.35
20V	186.86	40.90	2.75	14.96	38.71	19.90	43.50	-23.60
21V	196.68	49.90	2.79	15.70	38.63	29.76	43.50	-13.74
22V	206.51	44.40	2.83	16.08	38.65	24.66	43.50	-18.84
23V	226.19	47.10	2.92	16.43	38.79	27.66	46.40	-18.74
24V	245.85	48.40	3.23	16.30	38.63	29.30	46.40	-17.10

Test location: Compatible Electronics
Customer : HYPERCOM CORP.
Manufacturer : HYPERCOM CORP.
EUT name : ICE 4000
Model : ICE 4000 900MHZ
Specification: Fcc_A Test distance: 10.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
TEMPERATURE 86 DEGREES F.
RELATIVE HUMIDITY 45%
TESTED BY: Kyle Fujimoto
KYLE FUJIMOTO

Date : 4/13/2000
Time : 11.19

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1H	49.25	52.90	1.50	12.70	38.69	28.41	39.10	-10.69
2H	59.07	44.30	1.50	11.81	38.79	18.82	39.10	-20.28
3H	61.50	57.30	1.52	11.66	38.81	31.67	39.10	-7.43
5H	68.90	48.50	1.59	11.38	38.89	22.58	39.10	-16.52
6H	86.05	51.10	1.80	10.10	38.68	24.32	39.10	-14.78
7H	98.37	59.20	1.88	10.62	38.60	33.10	43.50	-10.40
8H	99.62	52.20	1.90	10.71	38.60	26.21	43.50	-17.29
9H	108.22	52.60	2.00	11.49	38.67	27.42	43.50	-16.08
10H	118.08	57.90	2.12	12.38	38.74	33.66	43.50	-9.84
11H	122.97	53.00	2.18	12.83	38.78	29.23	43.50	-14.27
12H	127.90	50.70	2.21	12.92	38.79	27.04	43.50	-16.46
13H	135.25	49.50	2.24	12.70	38.76	25.68	43.50	-17.82
14H	137.69	60.10	2.25	12.62	38.75	36.22	43.50	-7.28
15H	137.70	59.32	2.25	12.62	38.75	35.44	43.50	-8.06
16H	147.55	53.20	2.29	12.32	38.71	29.10	43.50	-14.40
17H	157.36	55.20	2.42	12.79	38.73	31.68	43.50	-11.82
18H	167.25	53.50	2.58	13.51	38.77	30.82	43.50	-12.68
19H	172.13	48.10	2.65	13.86	38.79	25.82	43.50	-17.68
20H	177.08	55.60	2.71	14.23	38.78	33.76	43.50	-9.74
21H	186.86	55.80	2.75	14.96	38.71	34.80	43.50	-8.70
22H	196.68	56.70	2.79	15.70	38.63	36.56	43.50	-6.94
24H	206.57	51.00	2.83	16.08	38.65	31.26	43.50	-12.24
25H	226.18	51.30	2.92	16.43	38.79	31.86	46.40	-14.54
26H	245.84	52.80	3.23	16.30	38.63	33.70	46.40	-12.70
27H	265.52	44.90	3.42	18.48	38.54	28.26	46.40	-18.14
28H	265.52	43.80	3.42	18.48	38.54	27.16	46.40	-19.24

Test location: Compatible Electronics
Customer : HYPERCOM CORP. Date : 4/13/2000
Manufacturer : HYPERCOM CORP. Time : 11.19
EUT name : ICE 4000
Model : ICE 4000 900MHZ
Specification: Fcc_A Test distance: 10.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
TEMPERATURE 86 DEGREES F.
RELATIVE HUMIDITY 45%
TESTED BY: Kyle Fujimoto
KYLE FUJIMOTO

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1V	304.87	48.50	3.55	15.44	38.60	28.89	46.40	-17.51
2V	314.66	50.10	3.65	15.49	38.60	30.64	46.40	-15.76
3V	319.55	47.50	3.70	15.52	38.60	28.12	46.40	-18.28
4V	324.48	44.90	3.84	15.54	38.60	25.68	46.40	-20.72
5V	334.31	44.10	3.94	15.60	38.60	25.04	46.40	-21.36
6V	344.16	44.10	4.01	15.65	38.60	25.16	46.40	-21.24
7V	353.99	43.50	4.04	15.53	38.60	24.47	46.40	-21.93
8V	368.69	47.30	4.05	14.96	38.60	27.71	46.40	-18.69
9V	373.64	47.80	4.07	14.77	38.60	28.04	46.40	-18.36
10V	383.48	43.70	4.09	14.39	38.60	23.58	46.40	-22.82
11V	393.36	40.60	4.21	14.01	38.60	20.22	46.40	-26.18
12V	516.07	51.40	4.90	16.95	38.32	34.93	46.40	-11.47
13V	565.27	50.50	5.34	17.25	38.93	34.16	46.40	-12.24
14V	614.37	55.10	5.49	17.77	38.33	40.03	46.40	-6.37
15V	614.37	55.01	3.74	17.77	38.33	38.19	46.40	-8.21
16V	663.52	50.30	5.70	18.55	38.37	36.17	46.40	-10.22

Test location: Compatible Electronics
Customer : HYPERCOM CORP. Date : 4/13/2000
Manufacturer : HYPERCOM CORP. Time : 11.19
EUT name : ICE 4000
Model : ICE 4000 900MHZ
Specification: Fcc_A Test distance: 10.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
TEMPERATURE 86 DEGREES F.
RELATIVE HUMIDITY 45%
TESTED BY: Kyle Fujimoto
KYLE FUJIMOTO

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1H	304.83	50.10	3.55	15.44	38.49	30.60	46.40	-15.80
2H	319.51	43.20	3.70	15.52	38.60	23.82	46.40	-22.58
3H	324.54	48.60	3.75	15.54	38.60	29.29	46.40	-17.11
4H	331.34	48.70	3.81	15.58	38.60	29.49	46.40	-16.91
5H	334.39	48.60	3.84	15.60	38.60	29.44	46.40	-16.96
6H	354.03	49.20	4.01	15.53	38.60	30.14	46.40	-10.27
7H	368.70	49.00	4.04	14.96	38.60	36.00	46.40	-16.26
8H	393.28	42.40	4.09	14.02	38.60	21.91	46.40	-24.49
9H	403.14	42.20	4.12	13.88	38.57	21.63	46.40	-24.77
10H	417.83	50.10	4.21	14.42	38.42	30.31	46.40	-16.09
11H	442.41	44.60	4.35	15.32	38.18	36.09	46.40	-20.31
12H	466.99	51.00	4.54	16.03	38.03	33.54	46.40	-12.86
13H	491.56	49.60	4.73	16.66	37.93	33.06	46.40	-13.34
14H	516.08	50.50	4.90	16.95	38.32	34.03	46.40	-12.37
15H	540.68	53.90	5.04	17.05	38.96	37.03	46.40	-9.37
16H	589.82	53.30	5.34	17.51	38.48	37.67	46.40	-8.73
17H	614.37	51.00	5.49	17.77	38.33	35.93	46.40	-10.47
18H	638.96	42.60	5.63	18.03	38.38	27.88	46.40	-18.52
19H	663.55	45.00	5.70	18.55	38.37	30.88	46.40	-15.52
20H	688.08	40.50	5.70	19.28	38.32	27.08	46.40	-19.32
21H	712.65	43.60	5.83	19.86	38.27	31.02	46.40	-15.38

Test location: Compatible Electronics
Customer : HYPERCOM CORP. Date : 4/13/2000
Manufacturer : HYPERCOM CORP. Time : 16.22
EUT name : ICE 4000
Model : ICE 4000 900MHZ
Specification: Fcc_A Test distance: 10.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
TEMPERATURE 86 DEGREES F.
RELATIVE HUMIDITY 45%
TESTED BY: Kyle Fujimoto
KYLE FUJIMOTO

NO EMISSIONS FOUND BETWEEN 10 kHz AND 30 MHz
FOR THE EUT IN EITHER POLARIZATION

CONDUCTED EMISSION DATA SHEETS

COMPATIBLE ELECTRONICS

4/13/2000 12:18:37

HYPERCOM CORPORATION
ICE 4000
MODEL: ICE 4000 900 MHz
FCC C - BLACK LEAD
TEST ENGINEER : Kyle Fujimoto
KYLE FUJIMOTO

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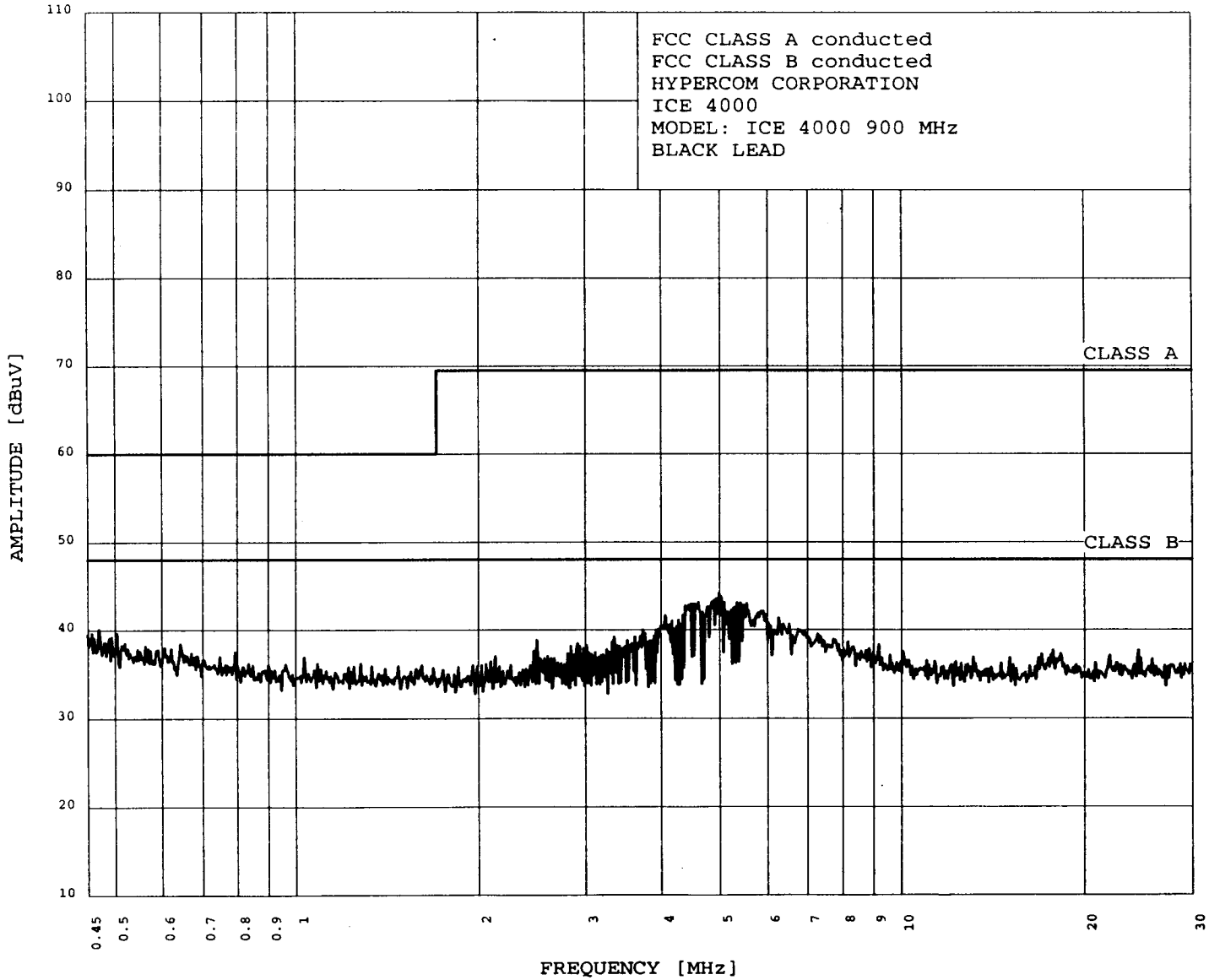
25 highest peaks above -50.00 dB of CLASS B limit line
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV	Limit(dB)	Delta(dB)
1	4.996	44.16	48.00	-3.84
2	5.100	43.16	48.00	-4.84
3	4.613	43.14	48.00	-4.86
4	5.412	43.08	48.00	-4.92
5	5.344	43.08	48.00	-4.92
6	5.547	42.99	48.00	-5.01
7	4.518	42.93	48.00	-5.07
8	4.480	42.93	48.00	-5.07
9	4.789	42.65	48.00	-5.35
10	5.299	42.58	48.00	-5.42
11	5.231	42.27	48.00	-5.73
12	4.689	42.04	48.00	-5.96
13	4.346	41.72	48.00	-6.28
14	4.066	41.61	48.00	-6.39
15	6.268	41.33	48.00	-6.67
16	4.276	41.12	48.00	-6.88
17	4.311	40.62	48.00	-7.38
18	4.241	40.42	48.00	-7.58
19	3.739	39.99	48.00	-8.01
20	3.900	39.30	48.00	-8.70
21	3.630	39.18	48.00	-8.82
22	3.351	39.16	48.00	-8.84
23	2.499	38.82	48.00	-9.18
24	3.867	38.79	48.00	-9.21
25	3.835	38.79	48.00	-9.21

COMPATIBLE ELECTRONICS

EMISSION LEVEL [dBuV] PEAK
Graph for Peak

4/13/2000 12:18:37



COMPATIBLE ELECTRONICS

4/13/2000 12:20:28

HYPERCOM CORPORATION
ICE 4000
MODEL: ICE 4000 900MHz
FCC C - WHITE LEAD
TEST ENGINEER : Kyle Fujimoto
KYLE FUJIMOTO

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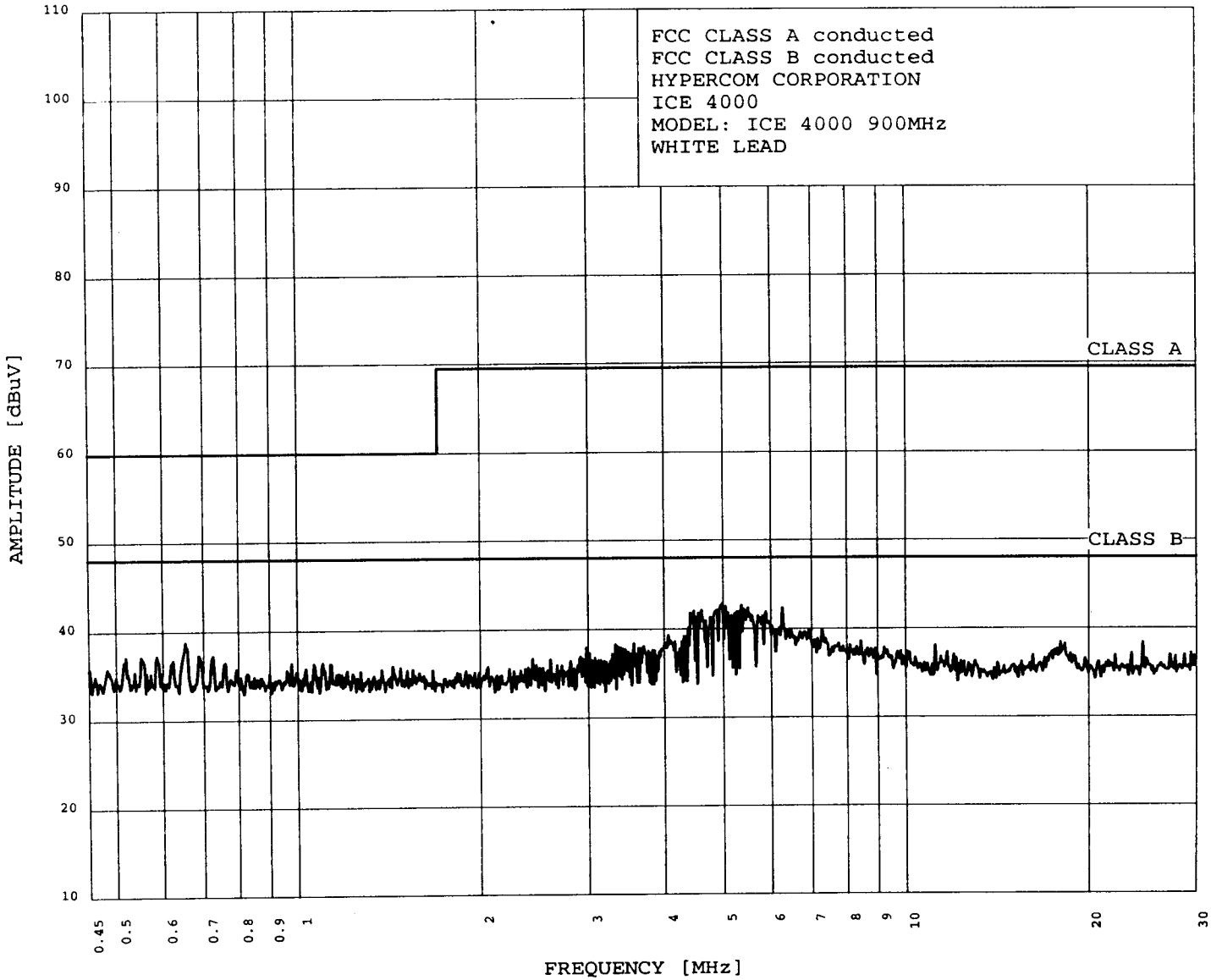
25 highest peaks above -50.00 dB of CLASS B limit line
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV	Limit(dB)	Delta(dB)
1	4.996	42.92	48.00	-5.08
2	5.367	42.64	48.00	-5.36
3	5.059	42.52	48.00	-5.48
4	6.268	42.31	48.00	-5.69
5	4.893	42.12	48.00	-5.88
6	4.613	42.11	48.00	-5.89
7	4.480	42.00	48.00	-6.00
8	5.299	41.94	48.00	-6.06
9	5.886	41.88	48.00	-6.12
10	5.231	41.73	48.00	-6.27
11	5.164	41.53	48.00	-6.47
12	5.812	41.47	48.00	-6.53
13	4.769	41.31	48.00	-6.69
14	4.518	41.30	48.00	-6.70
15	4.066	39.29	48.00	-8.71
16	4.346	39.20	48.00	-8.80
17	4.311	39.20	48.00	-8.80
18	0.655	38.77	48.00	-9.23
19	4.276	38.60	48.00	-9.40
20	17.978	38.37	48.00	-9.63
21	3.571	38.37	48.00	-9.63
22	24.544	38.31	48.00	-9.69
23	3.324	38.26	48.00	-9.74
24	3.706	38.08	48.00	-9.92
25	11.189	38.07	48.00	-9.93

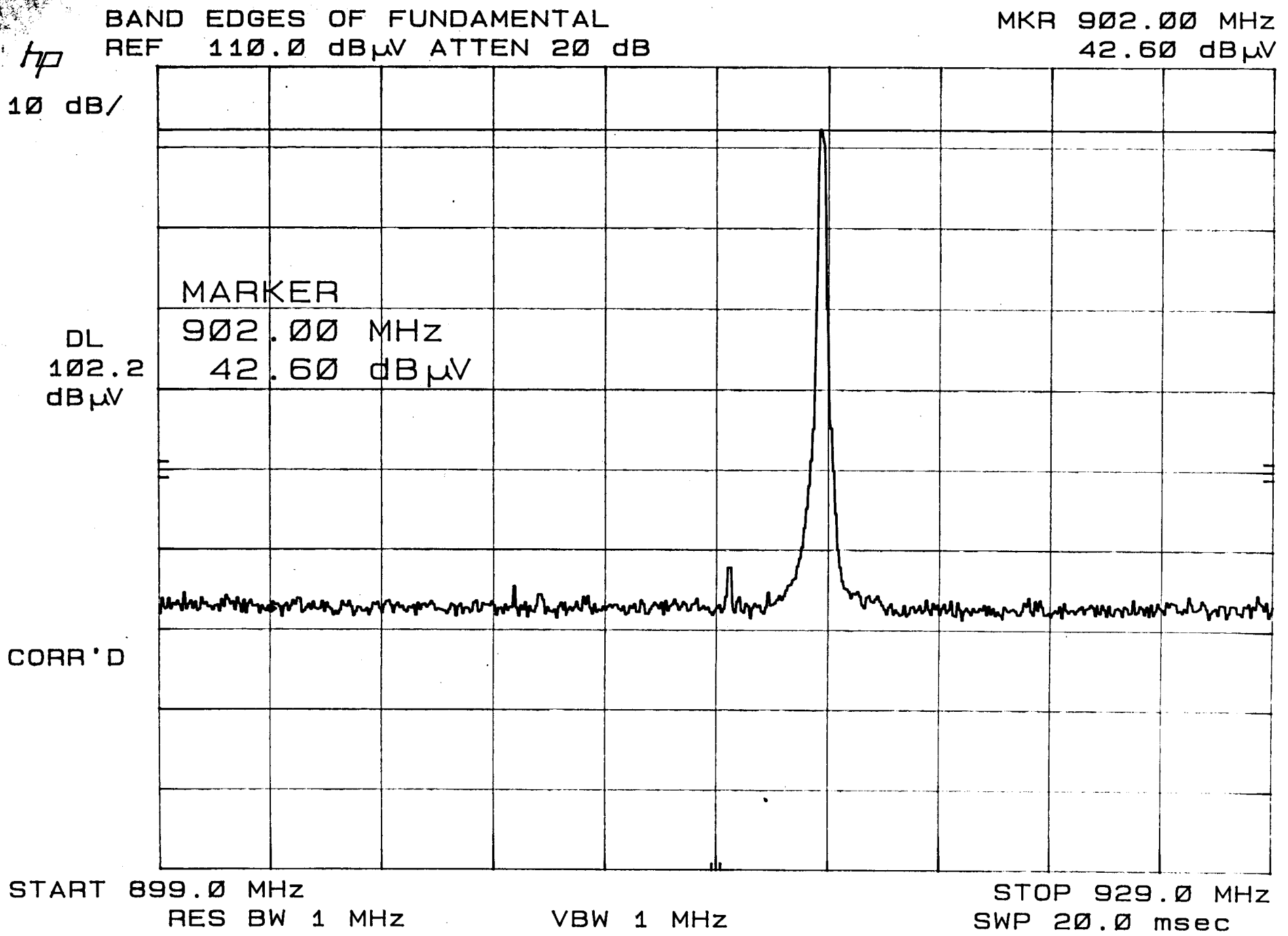
EMISSION LEVEL [dBuV] PEAK
Graph for Peak

4/13/2000 12:20:28



COMPATIBLE ELECTRONICS

BAND EDGE
DATA SHEETS


BAND EDGES OF FUNDAMENTAL
REF 110.0 dBµV ATTEN 20 dB
MKR 902.00 MHz
42.60 dBµV
10 dB/
MARKER
902.00 MHz
42.60 dBµV
DL
102.2
dBµV
CORR'D
START 899.0 MHz
RES BW 1 MHz
VBW 1 MHz
STOP 929.0 MHz
SWP 20.0 msec