FCC PART 15, SUBPART B and C
TEST REPORT

for

InfoCube BASE

MODEL: 1

Prepared for

EMBEDDED PROCESSOR DESIGNS, INC.
677 CASE COVE ROAD
CANDLER, NORTH CAROLINA 28715

Prepared by:_____

JAMES ROSS

Approved by:_____

MICHAEL CHRISTENSEN

COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
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DATE: FEBRUARY 3, 2005

	REPORT	APPENDICES					TOTAL
	BODY	***A***	***B***	***C***	***D***	***E***	
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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 without the written permission of Compatible Electronics, unless done so in full.

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

Device Tested:	InfoCube Base Model: 1 S/N: N/A
Product Description:	See Expository Statement
Modifications:	The EUT was not modified during the testing.
Manufacturer:	Embedded Processor Designs, Inc. 677 Case Cove Road Candler, North Carolina 28715
Test Dates:	January 18, 19, and 20, 2005
Test Specifications:	EMI requirements CFR Title 47, Part 15 Subpart B; and Subpart C, Sections 15.205, 15207, 15.209 and 15.249
Test Procedure:	ANSI C63.4
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of Subpart C, section 15.207.
2	Radiated RF Emissions, 10 kHz - 9300 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of Subpart C, sections 15.205, 15.209, and 15.249.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the InfoCube Base Model: 1. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B; and the limits defined in Subpart C, sections 15.205, 15.207, 15.209, and 15.249.

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

Embedded Processor Designs, Inc.

David Thompson President

Compatible Electronics, Inc.

James Ross Test Engineer
Kyle Fujimoto Test Engineer
Michael Christensen Lab Manager

2.4 Date Test Sample was Received

The test sample was received on January 17, 2005.

2.5 Disposition of the Test Sample

The sample was returned to Embedded Processor Designs, Inc. on January 20, 2005.

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
LCD	Liquid Crystal Display

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 (including digital devices)
ANSI C63.4 2003	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

The InfoCube Base Model: 1 (EUT) was connected to modem #1, keypad, and AC Adapter via cable #1. Modem #1 was also connected to a test line simulator via its line port. The test line simulator was also connected to modem #2 via its other line port. The laptop was connected to modem #2 and an AC Adapter via its serial and power ports, respectively. Modem #1 and Modem #2 were also connected to AC Adapters via their power ports. The accessory equipment (modem #2, test line simulator, and laptop) were placed 50 feet away from the test site. The EUT was continuously transmitting and receiving. Also, different scripts (files) were being uploaded to the EUT from the laptop via the modems. The low, middle, and high channels were tested.

Note: Please see section 4.1.1, cables #1 through #3 for a more specific description on how modem #1, the keypad, and AC Adapter were connected to the EUT.

The EUT during the Transmit portion of the test was investigated for emissions to the limits of 15.205, 15.207, 15.209, and 15.249.

The EUT during the Receive portion of the test was investigated for emissions to the **Class B** limits CFR Title 47, Part 15, Subpart B.

The EUT during the Digital portion of the test was investigated for emissions to the **Class B** limits CFR Title 47, Part 15, Subpart B.

The final radiated data as well as conducted data were taken in the modes described above. Please see Appendix E for the data sheets.

4.1.1 Cable Construction and Termination

Cable 1 This is a 1.5 meter braid and foil shielded cable connecting the EUT to the modem #1. The cable has a D-9 pin metallic connector at the EUT end and a D-25 pin metallic connector at the modem #1 end. The shield of the cable was grounded to the chassis via the connectors.

Cable 2 This is a 2 meter unshielded cable connecting the D-25 pin metallic connector of cable #1 to the AC Adapter. The cable is hard wired at each end. The cable has a molded ferrite at the AC Adapter end.

Cable 3 This is a 5 foot 3 inch braid and foil shielded cable connecting the D-9 pin metallic connector of cable #1 to the keypad. The cable is hard wired at each end. The shield of the cable was grounded to the chassis via the connector.

Cable 4 This is a 50 foot unshielded cable connecting the test line simulator to modem #1. The cable has an RJ-11 connector at each end.

Cable 5 This is a 2 meter unshielded cable connecting the test line simulator to the modem #2. The cable has an RJ-11 connector at each end.

Cable 6 This is a 2 meter braid and foil shielded cable connecting modem #2 to the laptop. The cable has a D-9 pin metallic connector at the EUT end and a D-25 pin metallic connector at the modem #2 end. The shield of the cable was grounded to the chassis via the connectors.

Cable 7 This is a 2 meter unshielded cable connecting modem #1 to the AC Adapter. The cable has 1/8 inch metallic power connector at the modem #1 end and is hard wired into the AC Adapter.

Cable 8 This is a 2 meter unshielded cable connecting modem #2 to the AC Adapter. The cable has 1/8 inch metallic power connector at the modem #2 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
InfoCube BASE (EUT)	EMBEDDED PROCESSOR DESIGNS, INC.	1	N/A	SWWTBD
LAPTOP	DELL	PP01L	P/N: 6P326 A01	N/A
TEST LINE SIMULATOR	TELTONE	TLS 3	N/A	N/A
AC ADAPTER FOR EUT	SINO-AMERICAN	SA110A-0520-C	N/A	N/A
MODEM (EUT END)	PRACTICAL PERIPHERALS	PM14400FXSA	N/A	DUPPM14400SA
AC ADAPTER FOR MODEM (EUT END)	KIC	48A-16-1000	N/A	N/A
MODEM (ACCESSORY END)	US ROBOTICS	SPORTSTER	210V53092081	CJE-0340
AC ADAPTER FOR MODEM	US ROBOTICS	HA-2050	N/A	N/A

5.2 EMI Test Equipment (Part 1)

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Radiate Emissions Data Capture Program	Compatible Electronics	2.0	N/A	N/A	N/A
Conducted Emissions Test Program	Compatible Electronics	SR19	N/A	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08784	June 16, 2004	June 16, 2005
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	3701A22279	June 16, 2004	June 16, 2005
Quasi-Peak Adapter	Hewlett Packard	85650A	2430A00424	June 16, 2004	June 16, 2005
Preamplifier	Com Power	PA-103	1582	March 11, 2004	March 11, 2005
Biconical Antenna	Com Power	AB-900	15250	March 12, 2004	March 12, 2005
Log Periodic Antenna	Com Power	AL-100	16202	February 18, 2004	Feb. 18, 2005
Computer	Hewlett Packard	D5251A 888	US74458128	N/A	N/A
Monitor	Hewlett Packard	D5258A	DK74889705	N/A	N/A
LISN	Com Power	LI-215	12076	October 26, 2004	Oct. 26, 2005
LISN	Com Power	LI-215	12090	October 26, 2004	Oct. 26, 2005
Transient Limiter	Seaward	252A910	K39-0220	September 20, 2004	Sept. 20, 2005

5.3 EMI Test Equipment for Brea Facility – Part 2

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
EMI Receiver	Rohde & Schwarz	ESIB40	100172	October 28, 2004	Oct. 28, 2005
Loop Antenna	Com-Power	AL-130	17089	September 4, 2004	Sept. 4, 2005
Horn Antenna	Antenna Research	DRG-118/A	1053	January 16, 2004	Jan. 16, 2006
Microwave Preamplifier	Com Power	PA-122	25195	August 19, 2004	Aug. 19, 2005

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. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this 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. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Section 15.207.

7.2 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 from 1 GHz to 9.3 GHz. Below 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. Above 1 GHz the EMI receiver was utilized in recording measurements.

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. 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) to maximize emissions (excluding the loop antenna where the height remained at 1 meter). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

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 E.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.205, 15.209, and 15.249.

8. CONCLUSIONS

The InfoCube Base Model: 1 meets all of the **Class B** specification limits defined in CFR Title 47, Part 15, Subpart B; and the specification limits of Subpart C, sections 15.205, 15.207, 15.209, and 15.249.

APPENDIX A

LABORATORY RECOGNITIONS

LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200528-0

Voluntary Control Council for Interference - Registration Numbers: R-983, C-1026, R-984 and C-1027

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.249 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 C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

InfoCube Base
Model: 1
S/N: N/A

There are no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

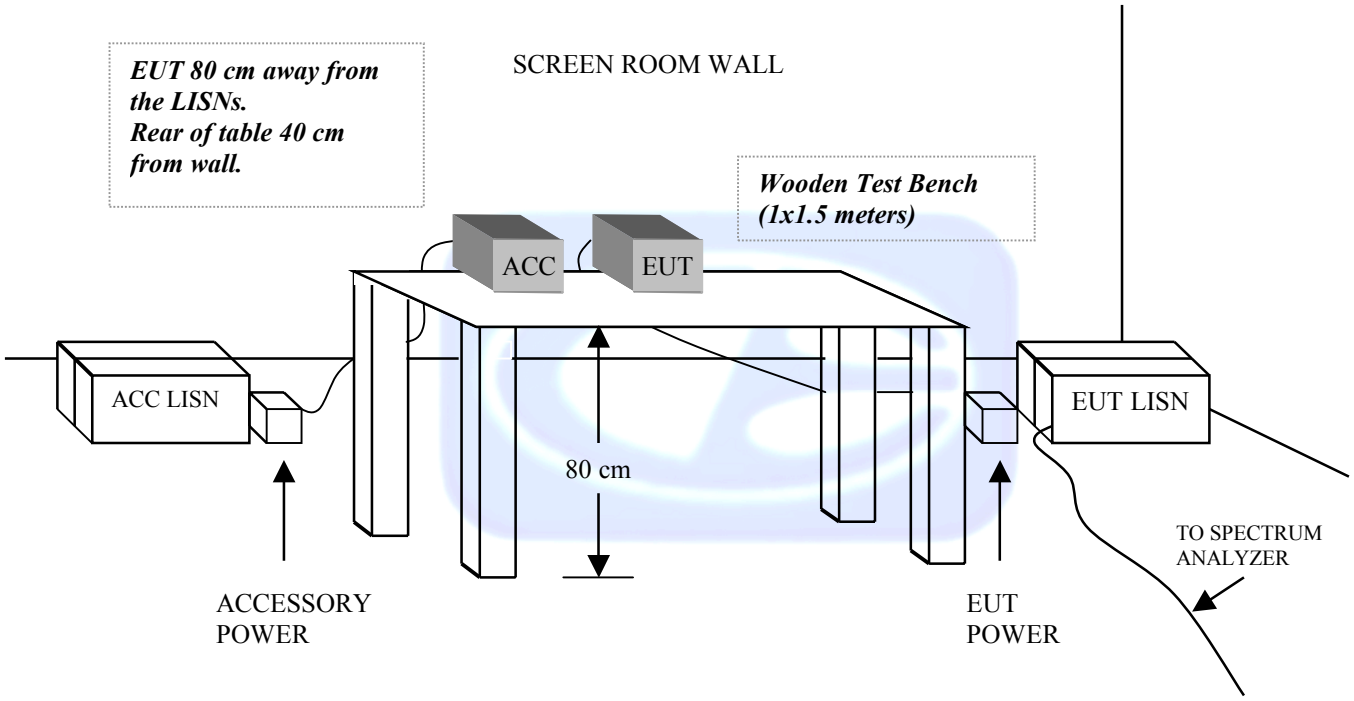
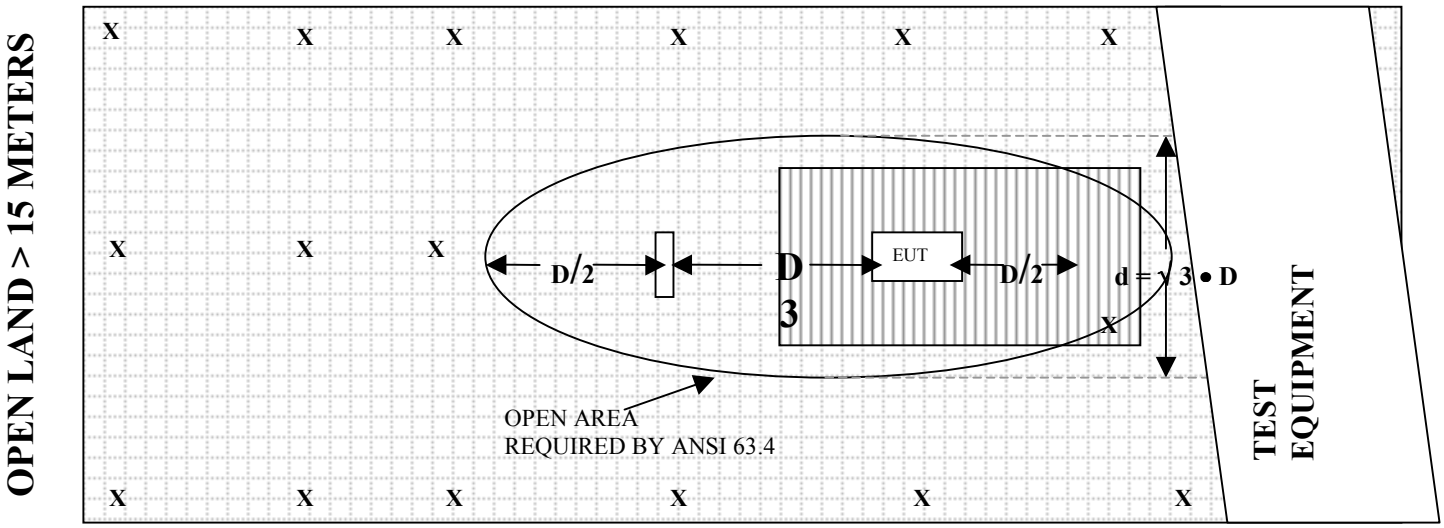


FIGURE 2: PLOT MAP AND LAYOUT OF THE 3 METER RADIATED TEST SITE

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

X	= GROUND RODS
	= GROUND SCREEN
D	= TEST DISTANCE (meters)
	= WOOD COVER

COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15250

CALIBRATION DATE: MARCH 12, 2004

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	9.80	120	12.90
35	10.40	125	13.20
40	12.20	140	11.70
45	12.40	150	11.90
50	10.60	160	13.20
60	8.00	175	15.90
70	8.40	180	16.40
80	6.70	200	16.40
90	8.90	250	17.70
100	10.50	300	19.10

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16202

CALIBRATION DATE: FEBRUARY 18, 2004

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	12.90	700	19.60
400	14.40	800	21.80
500	17.40	900	20.50
600	18.90	1000	22.70

COM-POWER PA-103

PREAMPLIFIER

S/N: 1582

CALIBRATION DATE: MARCH 11, 2004

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	32.4	300	32.3
40	32.4	350	32.2
50	32.4	400	32.2
60	32.5	450	32.0
70	32.4	500	32.0
80	32.3	550	31.8
90	32.3	600	31.7
100	32.3	650	31.7
125	32.4	700	31.7
150	32.2	750	31.9
175	32.4	800	31.4
200	32.4	850	31.4
225	32.5	900	31.0
250	32.3	950	31.4
275	32.1	1000	31.4

COM-POWER PA-122

MICROWAVE PREAMPLIFIER

S/N: 25195

CALIBRATION DATE: AUGUST 19, 2004

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	30.50	6.0	30.57
1.1	30.24	6.5	30.39
1.2	30.44	7.0	30.08
1.3	30.38	7.5	29.92
1.4	30.11	8.0	28.88
1.5	29.91	8.5	28.08
1.6	29.74	9.0	28.08
1.7	30.26	9.5	29.11
1.8	30.41	10.0	30.21
1.9	30.19	11.0	29.00
2.0	30.37	12.0	29.10
2.5	30.69	13.0	29.77
3.0	31.63	14.0	28.67
3.5	31.61	15.0	29.72
4.0	31.46	16.0	30.54
4.5	31.45	17.0	30.05
5.0	31.33	18.0	28.47
5.5	31.15		

ANTENNA RESEARCH DRG-118/A

HORN ANTENNA

S/N: 1053

CALIBRATION DATE: JANUARY 16, 2004

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.4	10.0	38.7
1.5	25.2	10.5	39.0
2.0	28.2	11.0	38.9
2.5	28.5	11.5	41.3
3.0	30.1	12.0	40.5
3.5	31.0	12.5	40.0
4.0	31.2	13.0	40.2
4.5	31.9	13.5	40.5
5.0	33.2	14.0	41.6
5.5	33.7	14.5	44.8
6.0	34.3	15.0	41.4
6.5	35.0	15.5	39.2
7.0	36.7	16.0	39.4
7.5	37.3	16.5	40.9
8.0	37.1	17.0	42.6
8.5	37.3	17.5	45.1
9.0	37.7	18.0	41.7
9.5	38.6		

COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: SEPTEMBER 4, 2004

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-40.8	10.7
0.01	-40.9	10.6
0.02	-41.8	9.7
0.05	-42.0	9.5
0.07	-41.5	10.0
0.1	-41.7	9.8
0.2	-44.1	7.4
0.3	-41.6	9.9
0.5	-41.5	10.0
0.7	-41.4	10.1
1	-41.0	10.5
2	-40.6	10.9
3	-40.8	10.7
4	-41.0	10.5
5	-40.4	11.1
10	-40.7	10.8
15	-41.6	9.9
20	-41.3	10.2
25	-43.0	8.5
30	-42.6	8.9

FRONT VIEW

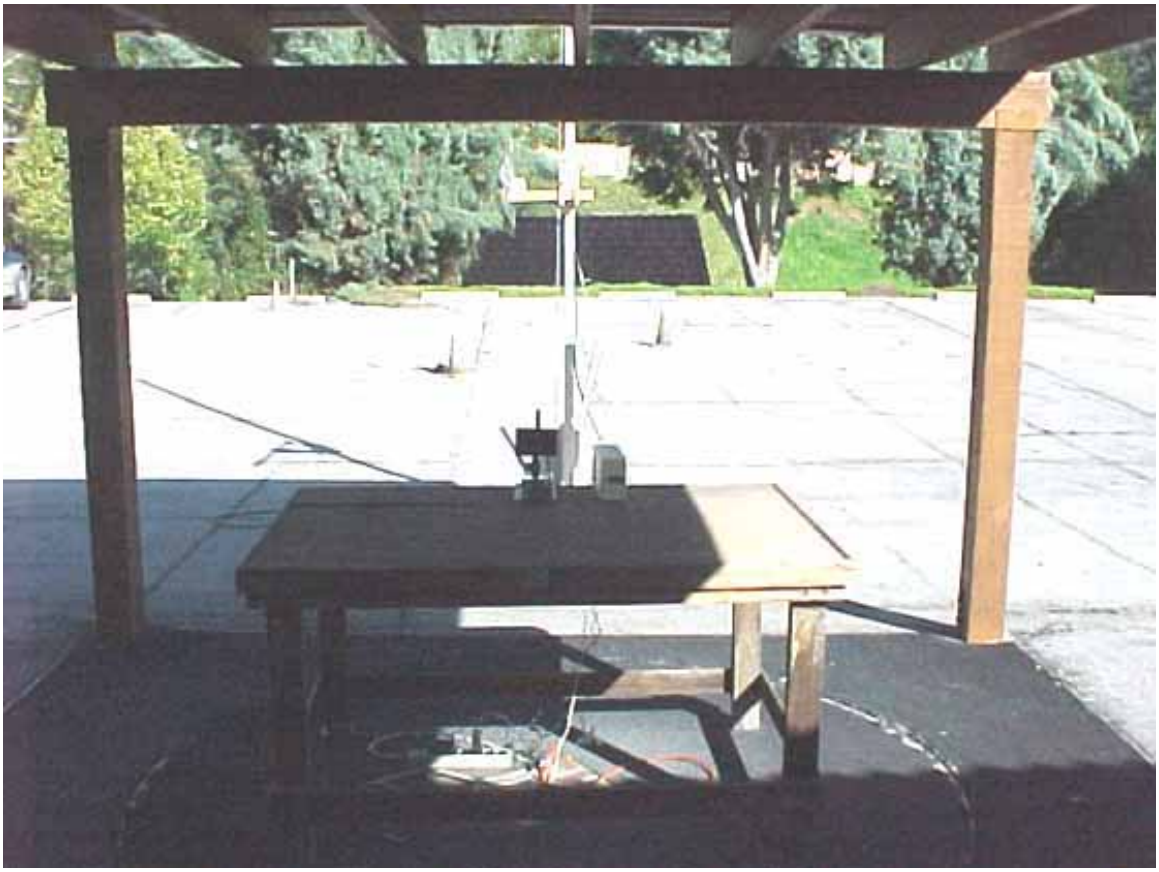
EMBEDDED PROCESSOR DESIGNS, INC.
InfoCube BASE
MODEL: 1
FCC SUBPART B AND FCC SUBPART C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

EMBEDDED PROCESSOR DESIGNS, INC.
InfoCube BASE
MODEL: 1
FCC SUBPART B AND FCC SUBPART C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

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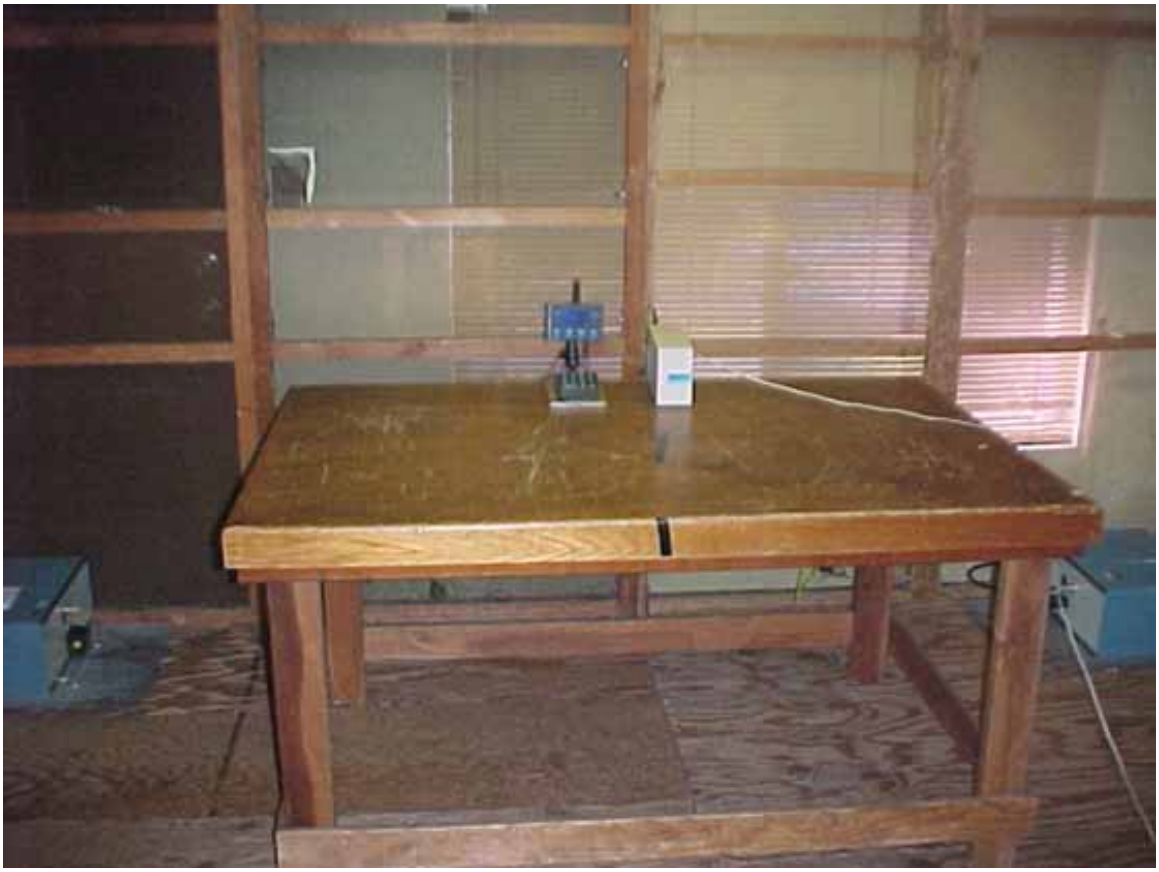

FRONT VIEW

EMBEDDED PROCESSOR DESIGNS, INC.
InfoCube BASE
MODEL: 1
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

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