FCC PART 15, SUBPART C
TEST METHOD: ANSI C63.4-1992

for

MICRO ID CONTACTLESS PROGRAMMER

Model: DV103001

Prepared for

MICROCHIP TECHNOLOGY, INC.
2355 WEST CHANDLER BOULEVARD
CHANDLER, ARIZONA 85224-6199

Prepared by: _____

KYLE FUJIMOTO

Approved by: _____

SCOTT McCUTCHAN

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

DATE: NOVEMBER 5, 1998

	REPORT BODY	APPENDICES				TOTAL
		A	*B*	*C*	*D*	
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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 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: Micro ID Contactless Programmer
Model: DV103001
S/N: N/A

Modifications: No modifications were made to the EUT during testing.

Manufacturer: Microchip Technology, Inc.
2355 West Chandler Boulevard
Chandler, Arizona 85224-6199

Test Date: November 5, 1998

Test Specifications: EMI requirements
FCC Title 47, Part 15 Subpart B; and Subpart C, sections 15.205, 15.207 and 15.209

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 **Class B** limits of FCC Title 47, Part 15 Subpart B; and Subpart C, section 15.207
2	Radiated RF Emissions, 10 kHz – 1000 MHz	Complies with the **Class B** limits of FCC Title 47, Part 15 Subpart B; and Subpart C, sections 15.205 and 15.209

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Micro ID Contactless Programmer Model: DV103001. 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 EUT hereafter, are within the specification limits defined by FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, and 15.209.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI/EMC 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

Microchip Technology, Inc.

Youbok Lee	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 November 5, 1998

2.5 Disposition of the Test Sample

The test sample was returned to Microchip Technology, Inc. on November 9, 1998.

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
FCC Title 47, Part 15 Subpart C.	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators.
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.
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators.

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

The Micro ID Contactless Programmer Model: DV103001 (EUT) was connected to the computer and AC Adapter via its serial and power ports, respectively. The computer was connected to a printer, monitor, keyboard, and mouse via its parallel, video, keyboard, and mouse ports, respectively. The antenna is a loop hardwired to the PCB.

Modes the EUT was operated in

1. The EUT was continuously transmitting the programming signal at maximum RF signal at 125 kHz.

2. The EUT was transmitting a “blank check” signal when a command was sent from the computer via the RFLab program.

It was determined that the emissions were at their highest level when the EUT was operating in mode #1 for both spurious emissions and harmonics. The cables were moved to maximize the emissions. The final conducted as well as radiated data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in Appendix A.

4.1.1 Cable Construction and Termination

Cable 1 This is a 5 foot braid and foil shielded cable connecting the printer to the computer. It has a Centronics metallic type connector at the printer end and a D-25 pin metallic connector at the computer end. The shield of the cable was grounded to the chassis via the connectors.

Cable 2 This is a 6 foot braid and foil shielded cable connecting the monitor to the computer. It has a high density D-15 pin metallic connector at the computer end and is hard wired into the monitor. The cable was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connector.

Cable 3 This is a 6 foot braid and foil shielded cable connecting the EUT to the computer. It has a D-9 metallic connector at each end. The cable was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connectors.

Cable 4 This is a 6 foot unshielded cable connecting the EUT to the AC Adapter. It has a 1/8 inch power connector at the EUT end and is hard wired into the AC Adapter.

Cable 5 This is a 4 foot foil shielded cable connecting the keyboard to the computer. It has a 6 pin mini DIN connector at the computer end and is hard wired into the keyboard. The shield of the cable was grounded to the chassis via the connector.

Cable 6 This is a 6 foot foil shielded cable connecting the mouse to the computer. It has a 6 pin mini DIN connector at the computer end and is hard wired into the mouse. The shield of the cable was grounded to the chassis via the connector.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
MICRO ID CONTACTLESS PROGRAMMER (EUT)	MICROCHIP TECHNOLOGY, INC.	DV103001	N/A	OA3PG103001A
POWER ADAPTER	MICROCHIP TECHNOLOGY, INC.	PTF09075I	N/A	N/A
PRINTER	CITIZEN	LSP-10	1130060-73	DLK66TLSP-10
KEYBOARD	GATEWAY 2000	219600X-XX-XXX	06320284	D7J2196001-XX
MONITOR	PANASONIC	C1395	KB2530261	ACJ928KMX-F408
COMPUTER	DELL	MMP	CT4KZ	DoC
MOUSE	MICROSOFT	2.1A	00335870	C3KKMP1

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Spectrum Analyzer	Hewlett Packard	8566B	3701A22262	Dec. 9, 1997	Dec. 9, 1998
Preamplifier	Com Power	PA-102	1017	Feb. 16, 1998	Feb. 16, 1999
Quasi-Peak Adapter	Hewlett Packard	85650A	3303A01688	June 23, 1998	June 23, 1999
RF Attenuator	Com-Power	A-410	1602	Nov. 25, 1997	Nov. 25, 1998
LISN	Com Power	LI-200	1764	Jan. 3, 1998	Jan. 3, 1999
LISN	Com Power	LI-200	1771	Jan. 3, 1998	Jan. 3, 1999
LISN	Com Power	LI-200	1775	Jan. 3, 1998	Jan. 3, 1999
LISN	Com Power	LI-200	1780	Jan. 3, 1998	Jan. 3, 1999
Biconical Antenna	Com Power	AB-100	1548	Oct. 15, 1998	Oct. 15, 1999
Log Periodic Antenna	Com Power	AL-100	1117	Oct. 15, 1998	Oct. 15, 1999
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
Printer	Hewlett Packard	C5886A	SG7CM1P090	N/A	N/A
Monitor	Hewlett Packard	D5258A	DK74889705	N/A	N/A
Loop Antenna	Com-Power	AL-130	25309	Feb. 5, 1998	Feb. 5, 1999

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1.2 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 RF Emissions

7.1.1 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.

7.1.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. The Com Power Preamplifier Model: PA-102 was used to increase the sensitivity of the instrument between 30 MHz and 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. The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets. The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 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

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 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. Click on the link below to see the radiated data sheets.

8. CONCLUSIONS

The Micro ID Contactless Programmer Model: DV103001 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, and 15.209.

APPENDIX A

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modification 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.

Modifications:

No modifications were made to the EUT.

APPENDIX B

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

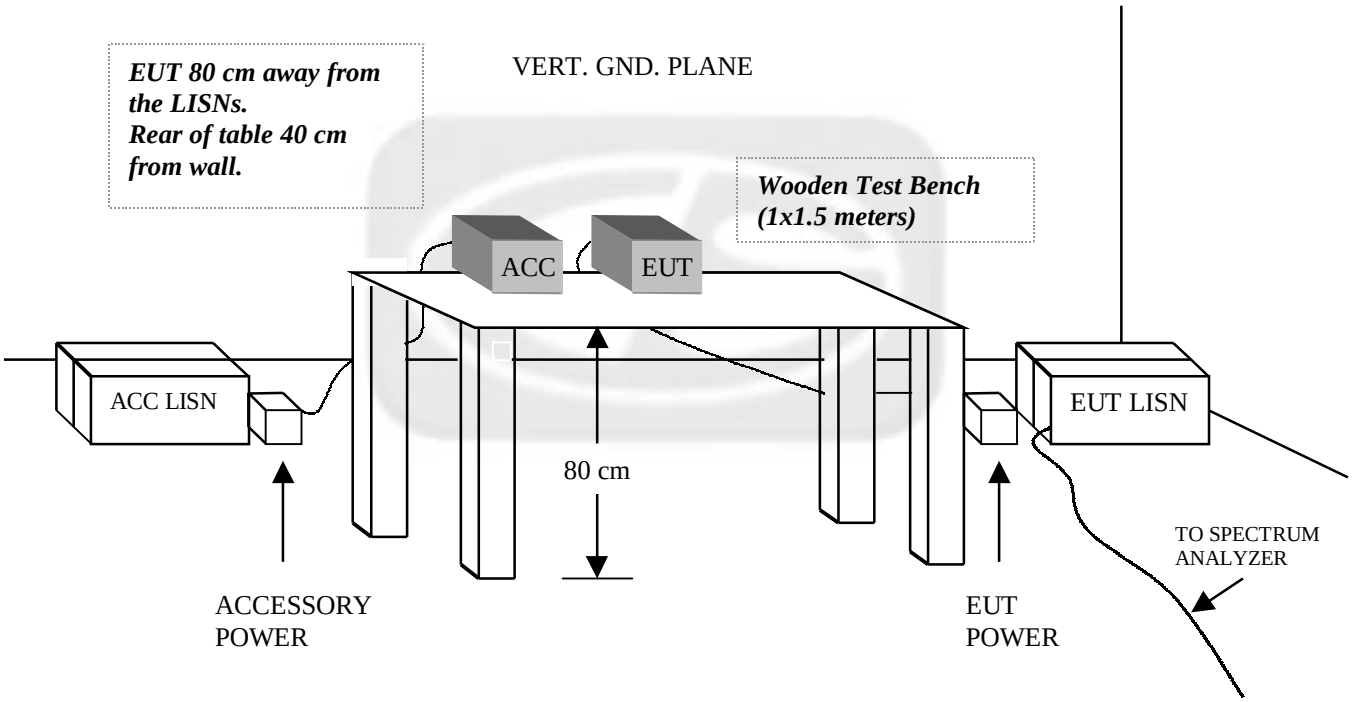
USED FOR THE PRIMARY TEST	Micro ID Contactless Programmer Model: DV103001 S/N: N/A

There were no additional models covered under this report.

APPENDIX C

DIAGRAMS, CHARTS AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP



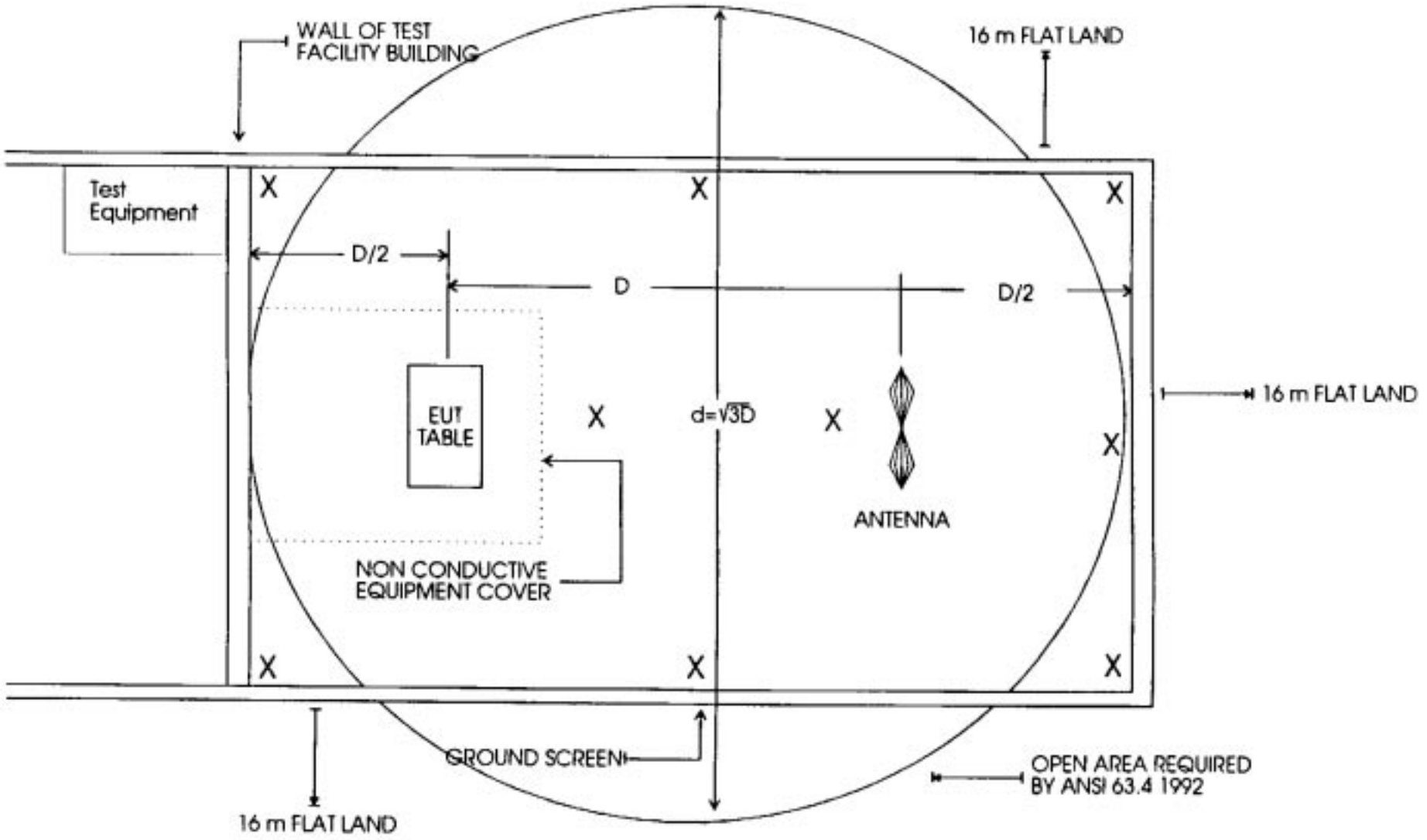


FIGURE 2: PLOT MAP AND LAYOUT OF TEST SITE “D”

FRONT VIEW

MICROCHIP TECHNOLOGY, INC.
MICRO ID CONTACTLESS PROGRAMMER
Model: DV103001
FCC SUBPART B and C - RADIATED EMISSIONS – 11-05-98

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MICROCHIP TECHNOLOGY, INC.
MICRO ID CONTACTLESS PROGRAMMER
Model: DV103001
FCC SUBPART B and C - RADIATED EMISSIONS – 11-05-98

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

MICROCHIP TECHNOLOGY, INC.
MICRO ID CONTACTLESS PROGRAMMER
Model: DV103001
FCC SUBPART B and C - CONDUCTED EMISSIONS – 11-05-98

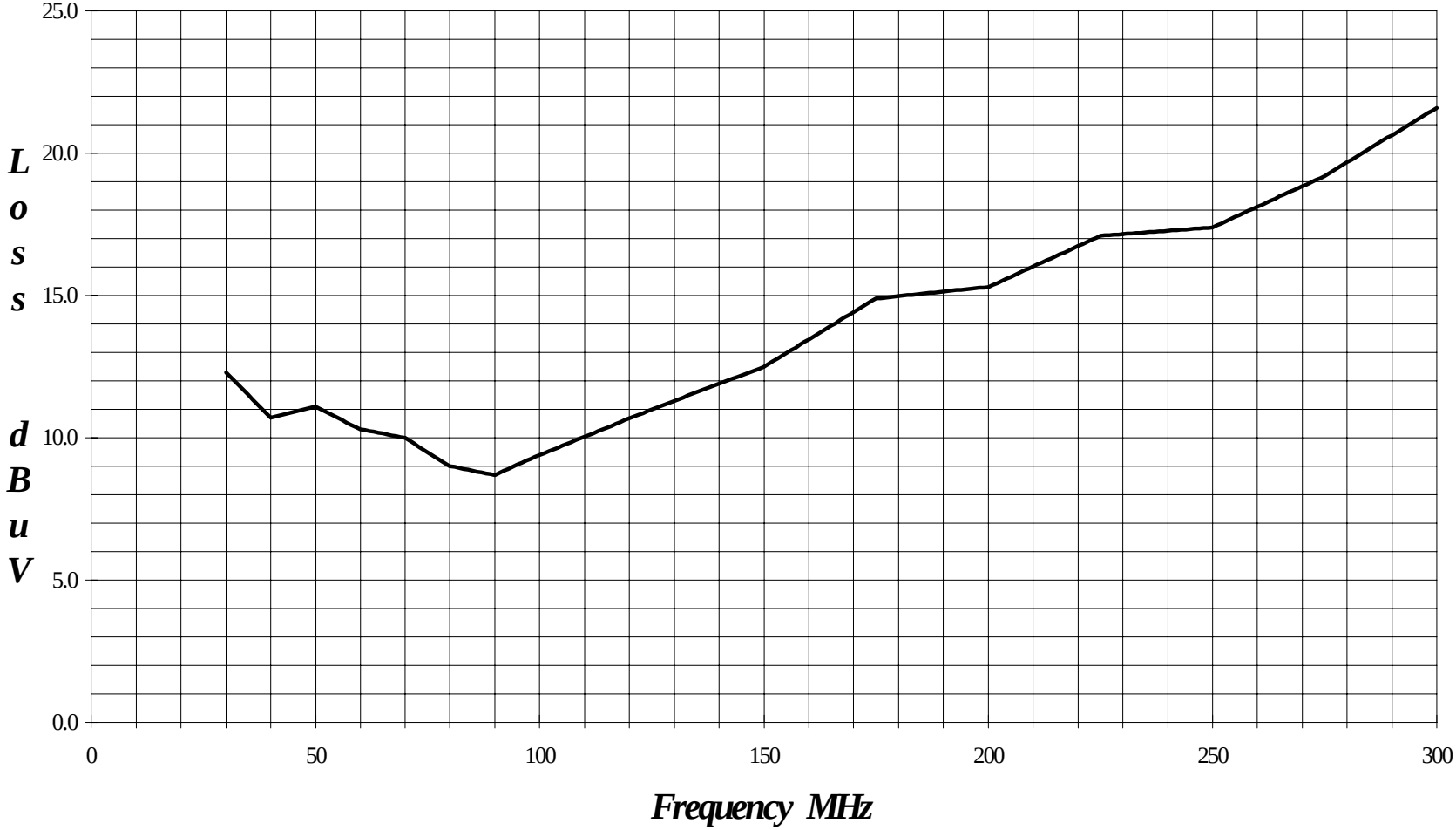
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW
MICROCHIP TECHNOLOGY, INC.
MICRO ID CONTACTLESS PROGRAMMER
Model: DV103001
FCC SUBPART B and C - CONDUCTED EMISSIONS – 11-05-98

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

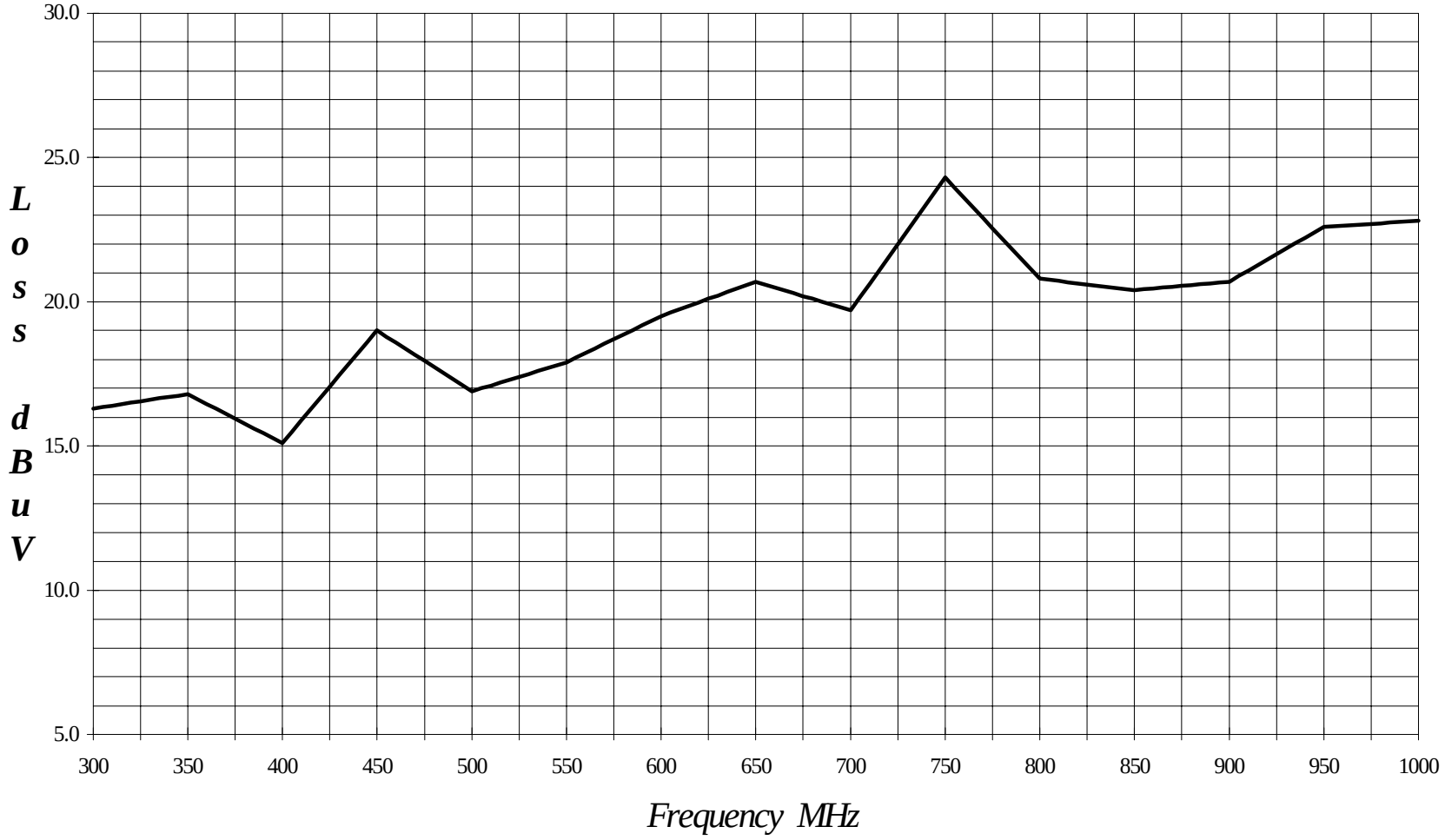
***Cal*: 10/15/98**

LAB "D" BICONICAL ANTENNA AB-100 S/N 01548



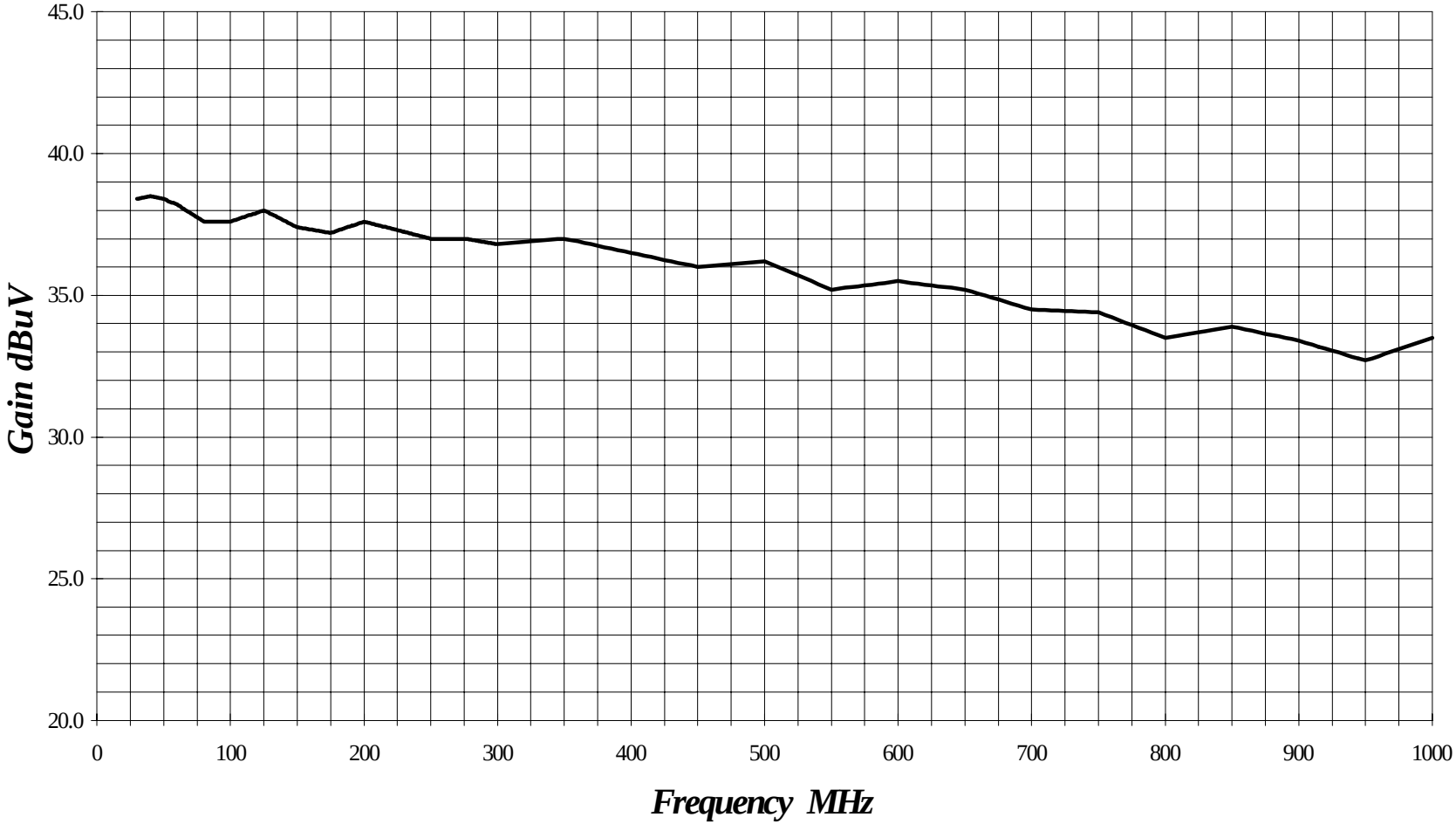
***Cal*: 10/15/98**

LAB "D" LOG PERIODIC ANTENNA AL-100 S/N 01117



Lab "D" Effective: **2/16/98** *Effective Gain = Preamplifier Gain – Cable Loss*

PREAMPLIFIER EFFECTIVE GAIN AT 3 METERS PA-102 S/N: 1017



COM-POWER PA-122

MICROWAVE PREAMPLIFIER

S/N: 25132

CALIBRATION DATE: OCTOBER 13, 1998

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	33.7	8.0	32.9
1.1	33.5	8.5	32.7
1.2	33.5	9.0	33.2
1.3	33.6	9.5	33.7
1.4	33.5	10.0	34.6
1.5	33.0	10.5	32.7
1.6	33.4	11.0	30.8
1.7	33.5	11.5	32.1
1.8	33.6	12.0	31.7
1.9	33.5	12.5	32.9
2.0	33.9	13.0	27.8
2.5	33.9	13.5	30.7
3.0	33.6	14.0	30.4
3.5	33.5	14.5	31.7
4.0	33.4	15.0	32.2
4.5	32.9	15.5	34.0
5.0	32.4	16.0	31.6
5.5	32.7	16.5	32.7
6.0	33.6	17.0	31.7
6.5	32.5	17.5	31.2
7.0	33.0	18.0	30.2
7.5	33.7		

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

(714) 587-9800

Antenna Calibration

Antenna Type:	Loop Antenna
Model:	AL-130
Serial Number:	25309
Calibration Date:	2/5/98

Frequency MHz	Magnetic (dB/m)	Electric dB/m
0.01	-40.5	11.0
0.02	-41.6	9.9
0.03	-40.0	11.5
0.04	-40.3	11.2
0.05	-41.6	9.9
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	-41.8	9.7
0.2	-44.0	7.5
0.3	-41.6	9.9
0.4	-41.7	9.8
0.5	-41.7	9.8
0.6	-41.5	10.0
0.7	-41.5	10.0
0.8	-41.6	9.9
0.9	-41.6	9.9
1	-41.1	10.4
2	-40.7	10.8
3	-40.7	10.8
4	-40.9	10.6
5	-40.1	11.4
6	-40.0	11.5
7	-40.3	11.2
8	-39.8	11.7
9	-38.8	12.7
10	-40.8	10.7
12	-41.4	10.1
14	-41.4	10.1
15	-40.9	10.6
16	-40.8	10.7
18	-41.5	10.0
20	-41.5	10.0
25	-41.2	10.3
30	-41.4	10.1

Trans. Antenna Height	2 meter
Receiving Antenna Height	2 meter

APPENDIX D

DATA SHEETS

COMPATIBLE ELECTRONICS

RADIATED EMISSIONS

COMPANY NAME: MICROCHIP TECHNOLOGY INC. **DATE:** 11-5-98

EUT: MICRO ID™ CONTACTLESS PROGRAMMER **EUT S/N:** PROTOTYPE

EUT MODEL: DV103001 **LOCATION:** ■ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC SUBPART C **CLASS:** _____ **TEST DISTANCE:** 3 M **LAB:** D

ANTENNA: ■ LOOP ☐ BICONICAL ☐ LOG ☐ HORN **POLARIZATION:** ■ VERT ☐ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** KYLE F.

NOTES: DISTANCE FACTOR 40 LOG $\frac{300}{3}$ = 80 dB (0.009 - 0.490 MHZ)
40 LOG $\frac{30}{3}$ = 40 dB (0.490 - 30 MHZ)

Frequency (kHz)	Peak Reading (dBuV)	Avg. ☐ Q.P. ☐ (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
125.213	68.3	–	1.0	270	80.0	-9.7	-2.0	-27.6	25.6
162.44	59.8	–	1.0	90	80.0	-7.5	-12.7	-36.0	23.3
192.83	63.7	–	1.0	270	80.0	-7.5	-8.8	-30.7	21.9
228.23	61.7	–	1.0	270	80.0	-7.5	-10.8	-31.2	20.4
250.46	52.2	–	1.0	0	80.0	-9.9	-17.9	-37.5	19.6
375.64	51.4	–	1.0	270	80.0	-9.8	-18.8	-34.9	16.1
			NO	OTHER	EMISSIONS NOR				
			HARMONICS	FOUND	BEYOND	THIS	POINT		

* **CORRECTED READING** = METER READING - DISTANCE FACTOR - ANTENNA GAIN

** **DELTA** = CORRECTED READING - SPECIFICATION LIMIT

COMPATIBLE ELECTRONICS

RADIATED EMISSIONS

COMPANY NAME: MICROCHIP TECHNOLOGY INC. **DATE:** 11-5-98

EUT: MICRO ID™ CONTACTLESS PROGRAMMER **EUT S/N:** PROTOTYPE

EUT MODEL: DV103001 **LOCATION:** ■ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC SUBPART C **CLASS:** _____ **TEST DISTANCE:** 3M **LAB:** D

ANTENNA: ■ LOOP ☐ BICONICAL ☐ LOG ☐ HORN **POLARIZATION:** ☐ VERT ■ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** KYLE F.

NOTES: DISTANCE FACTOR $40 \log \frac{300}{3} = 80dB$ (0.009 - 0.490 MHZ)

$40 \log \frac{30}{3} = 40dB$ (0.490 - 30 MHZ)

Frequency (kHz)	Peak Reading (dBuV)	Avg. ☐ Q.P. ☐ (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
125.213	58.7	–	1.0	180	80.0	-9.7	-11.6	-37.2	25.6
162.44	52.7	–	1.0	180	80.0	-7.5	-19.8	-43.1	23.3
192.83	52.7	–	1.0	180	80.0	-7.5	-19.8	-41.7	21.9
228.08	50.8	–	1.0	180	80.0	-7.5	-21.7	-42.1	20.4
250.46	50.8	–	1.0	270	80.0	-9.9	-19.3	-38.9	19.6
375.64	43.7	–	1.0	180	80.0	-9.8	-26.5	-42.6	16.1
			NO OTHER EMISSIONS NOR						
			HARMONICS FOUND BEYOND THIS POINT						

* **CORRECTED READING** = METER READING - DISTANCE FACTOR - ANTENNA GAIN

** **DELTA** = CORRECTED READING - SPECIFICATION LIMIT

Test location: Compatible Electronics
Customer : MICROCHIP TECHNOLOGY, INC. Date : 11/ 5/1998
Manufacturer : SAME Time : 11.39
EUT name : MICRO ID CONTACTLESS PROGRAM Model: DV103001
Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
SPURIOUS EMISSIONS
TEMPERATURE 70 DEGREES F.
RELATIVE HUMIDITY 65%
TESTED BY: _____
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	33.13	60.10	0.50	11.80	38.93	33.47	40.00	-6.53
2V	37.38	58.00	0.50	11.12	38.97	30.65	40.00	-9.35
3V	49.38	56.80	0.59	11.08	39.00	29.47	40.00	-10.53
4V	61.25	59.50	0.70	10.26	38.86	31.60	40.00	-8.40
5V	65.25	56.00	0.70	10.14	38.74	28.10	40.00	-11.90
6V	80.05	51.80	0.70	9.00	38.30	23.20	40.00	-16.80
7V	86.78	62.20	0.77	8.80	38.37	33.40	40.00	-6.60
8V	93.79	58.00	0.84	8.97	38.44	29.37	43.50	-14.13
9V	109.26	53.40	0.94	9.99	38.69	25.64	43.50	-17.86
10V	115.06	60.40	0.96	10.36	38.80	32.92	43.50	-10.58
11V	116.56	54.70	0.97	10.46	38.83	27.29	43.50	-16.21
12V	120.04	58.00	0.98	10.68	38.90	30.76	43.50	-12.74
13V	127.82	62.30	1.02	11.17	38.95	35.54	43.50	-7.96
14V	136.53	53.20	1.09	11.69	38.82	27.17	43.50	-16.33
15V	163.40	41.80	1.31	13.79	38.60	18.29	43.50	-25.21
16V	197.74	54.00	1.40	15.26	38.96	31.70	43.50	-11.80
17V	199.76	56.50	1.40	15.30	39.00	34.20	43.50	-9.30
18V	299.38	41.60	1.80	21.54	38.60	26.34	46.00	-19.66
19V	325.09	50.40	1.85	16.55	38.75	30.05	46.00	-15.95
20V	332.87	50.20	1.87	16.63	38.80	29.90	46.00	-16.10
21V	350.09	47.00	1.90	16.80	38.90	26.80	46.00	-19.20
22V	366.24	53.80	1.93	16.25	38.71	33.28	46.00	-12.72
23V	399.32	44.70	2.00	15.12	38.50	23.32	46.00	-22.68
24V	463.00	60.00	2.28	18.45	38.33	42.40	46.00	-3.60
25V	575.25	51.50	2.95	18.71	38.30	34.86	46.00	-11.14
26V	602.89	49.90	3.02	19.57	38.51	33.99	46.00	-12.01
27V	705.30	50.10	3.53	20.19	38.02	35.80	46.00	-10.20

Test location: Compatible Electronics
Customer : MICROCHIP TECHNOLOGY, INC
Manufacturer : SAME
EUT name : MICRO ID CONTACTLESS PROGRAMMER
Specification: Fcc_B Test distance: 3.0 mtrs
Distance correction factor(20*log(test/spec))
Test Mode :
SPURIOUS EMISSIONS
TEMPERATURE 70 DEGREES F.
RELATIVE HUMIDITY 65%
TESTED BY: KYLE FUJIMOTO

Date : 11/ 5/1998
Time : 12.53
Model: DV103001
Lab: D
: 0.00

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	33.16	52.10	0.50	11.80	38.93	25.46	40.00	-14.54
2H	37.96	54.30	0.50	11.03	38.98	26.85	40.00	-13.15
3H	49.02	52.20	0.59	11.06	39.00	24.85	40.00	-15.15
4H	57.02	54.40	0.67	10.54	38.93	26.68	40.00	-13.32
5H	61.26	56.90	0.70	10.26	38.86	29.00	40.00	-11.00
6H	65.28	55.50	0.70	10.14	38.74	27.60	40.00	-12.40
7H	73.28	63.00	0.70	9.67	38.50	34.87	40.00	-5.13
8H	78.62	57.00	0.70	9.14	38.34	28.50	40.00	-11.50
9H	81.40	52.30	0.71	8.96	38.31	23.66	40.00	-16.34
10H	82.77	60.40	0.73	8.92	38.33	31.72	40.00	-8.28
11H	85.51	58.70	0.76	8.83	38.36	29.93	40.00	-10.07
12H	101.80	53.30	0.91	9.52	38.54	25.19	43.50	-18.31
13H	127.71	57.80	1.02	11.16	38.96	31.03	43.50	-12.47
14H	144.09	55.80	1.15	12.15	38.69	30.40	43.50	-13.10
15H	197.77	54.60	1.40	15.26	38.96	32.30	43.50	-11.20
16H	199.80	50.00	1.40	15.30	39.00	27.70	43.50	-15.80
17H	346.61	41.20	1.89	16.77	38.88	20.98	46.00	-25.02
18H	362.38	52.40	1.92	16.38	38.75	31.95	46.00	-14.05
19H	432.39	48.10	2.13	17.63	38.31	29.55	46.00	-16.45
20H	463.05	54.10	2.28	18.45	38.33	36.50	46.00	-9.50
21H	707.28	48.30	3.54	20.37	38.03	34.18	46.00	-11.82
22H	952.50	40.70	4.30	22.61	37.03	30.57	46.00	-15.43

COMPATIBLE ELECTRONICS

11/5/1998 14:05:23

MICROCHIP TECHNOLOGY, INC.
MICRO ID CONTACTLESS PROGRAM
DV103001
FCC B - BLACK LEAD
TEST ENGINEER : Kyle Fujimoto
KYLE FUJIMOTO

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20 highest peaks above -50.00 dB of CLASS B limit line
Peak criteria : 0.10 dB, Curve : Peak

Peak#	Freq(Mhz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	24.850	45.58	48.00	-2.42
2	0.652	43.37	48.00	-4.63
3	0.485	43.07	48.00	-4.93
4	1.298	42.17	48.00	-5.83
5	0.462	41.87	48.00	-6.13
6	1.309	41.67	48.00	-6.33
7	0.458	41.37	48.00	-6.63
8	0.468	40.97	48.00	-7.03
9	0.567	40.47	48.00	-7.53
10	0.551	40.47	48.00	-7.53
11	0.560	40.37	48.00	-7.63
12	0.519	40.37	48.00	-7.63
13	0.532	40.27	48.00	-7.73
14	0.509	40.27	48.00	-7.73
15	0.500	40.27	48.00	-7.73
16	0.688	40.17	48.00	-7.83
17	0.492	40.07	48.00	-7.93
18	0.594	39.77	48.00	-8.23
19	0.526	39.77	48.00	-8.23
20	0.612	39.57	48.00	-8.43

SEE QUASI-PEAK READING ON NEXT PAGE AND ON PLOT

COMPATIBLE ELECTRONICS

11/5/1998 14:05:23

MICROCHIP TECHNOLOGY, INC.
MICRO ID CONTACTLESS PROGRAM
DV103001
FCC B - BLACK LEAD
TEST ENGINEER : Kyle Fujimoto
KYLE FUJIMOTO

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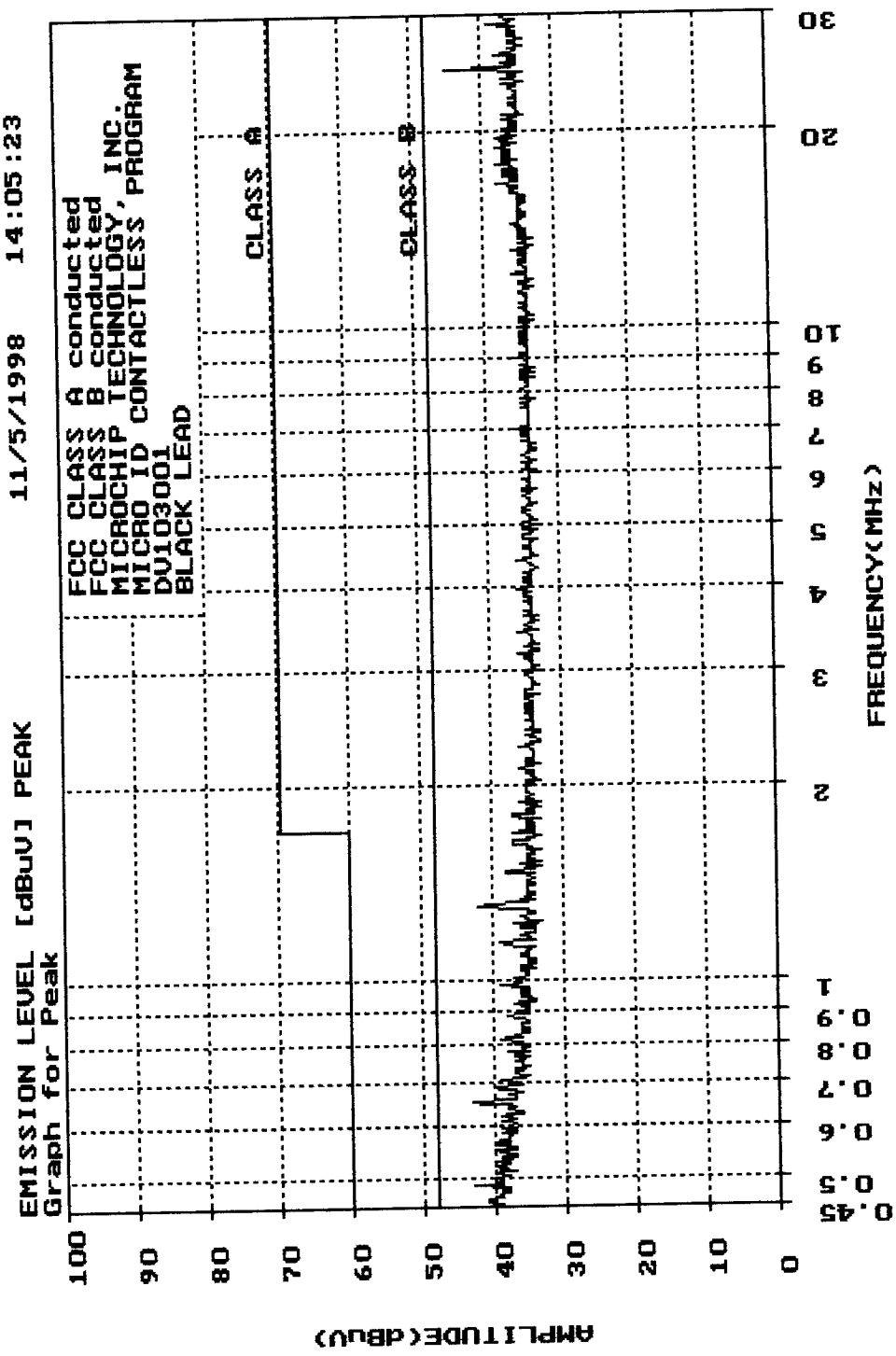
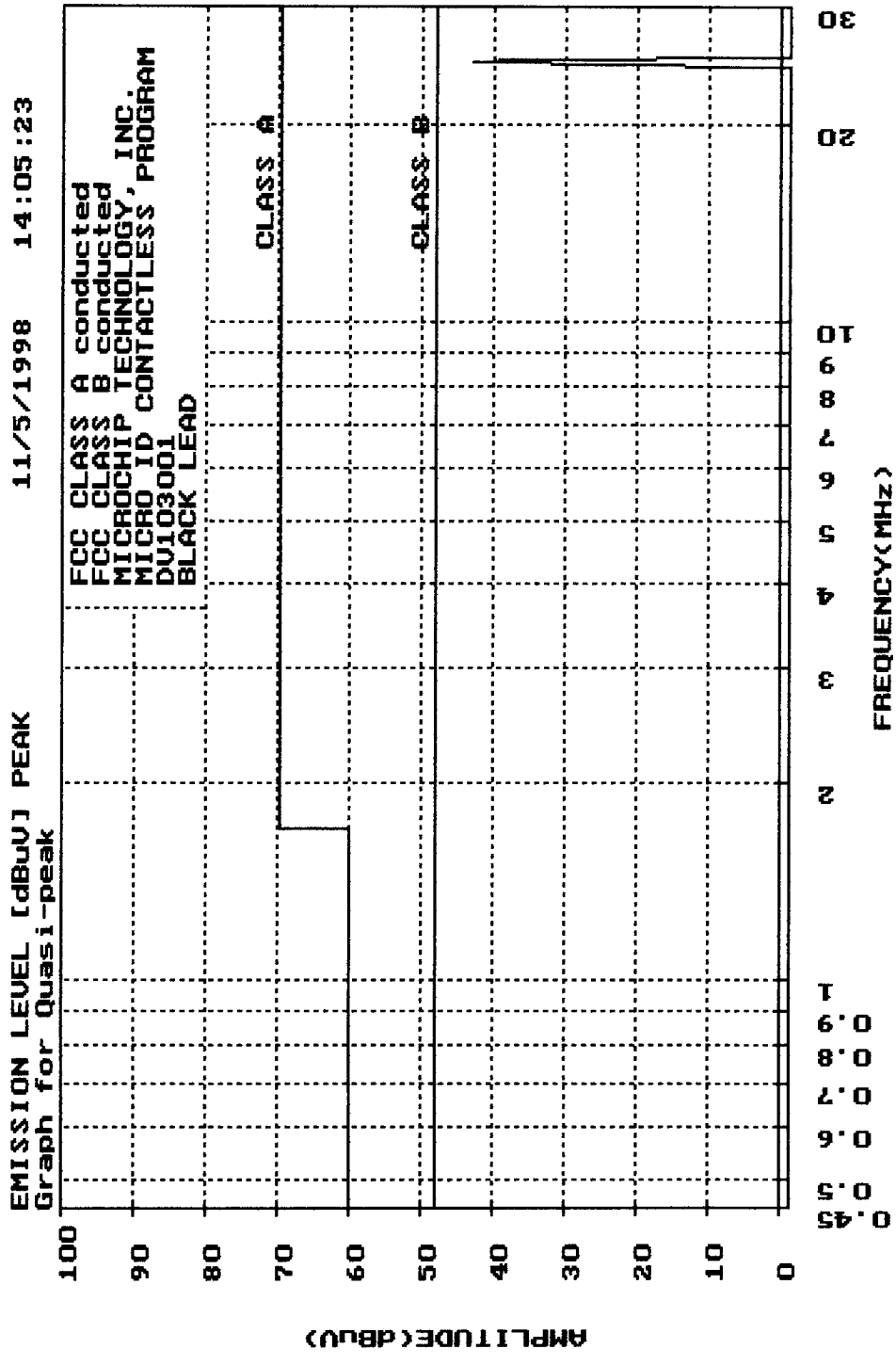
1 highest peaks above -50.00 dB of CLASS B limit line
Peak criteria : 0.10 dB, Curve : Quasi-peak

Peak#	Freq(Mhz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	24.850	43.41	48.00	-4.59


EMISSION LEVEL [dBuV] PEAK
Graph for Peak
11/5/1998 14:05:23
FCC CLASS A conducted
FCC CLASS B conducted
MICROCHIP TECHNOLOGY, INC.
MICRO ID CONTACTLESS PROGRAM
DU103001
BLACK LEAD
CLASS A
CLASS B
AMPLITUDE(dBuV)
FREQUENCY(MHz)
100
90
80
70
60
50
40
30
20
10
0
0.45
0.5
0.6
0.7
0.8
0.9
1
2
3
4
5
6
7
8
9
10
20
30


EMISSION LEVEL [dBuV] PEAK
Graph for Quasi-peak
11/5/1998 14:05:23
FCC CLASS A conducted
FCC CLASS B conducted
MICROCHIP TECHNOLOGY, INC.
MICRO ID CONTACTLESS PROGRAM
DV103001
BLACK LEAD
CLASS A
CLASS B
AMPLITUDE(dBuV)
FREQUENCY(MHz)
100
90
80
70
60
50
40
30
20
10
0
0.45
0.5
0.6
0.7
0.8
0.9
1
2
3
4
5
6
7
8
9
10
20
30

COMPATIBLE ELECTRONICS

11/5/1998 14:14:46

MICROCHIP TECHNOLOGY, INC.
MICRO ID CONTACTLESS PROGRAM
DV103001
FCC B - WHITE LEAD
TEST ENGINEER : Kyle Fujimoto
KYLE FUJIMOTO

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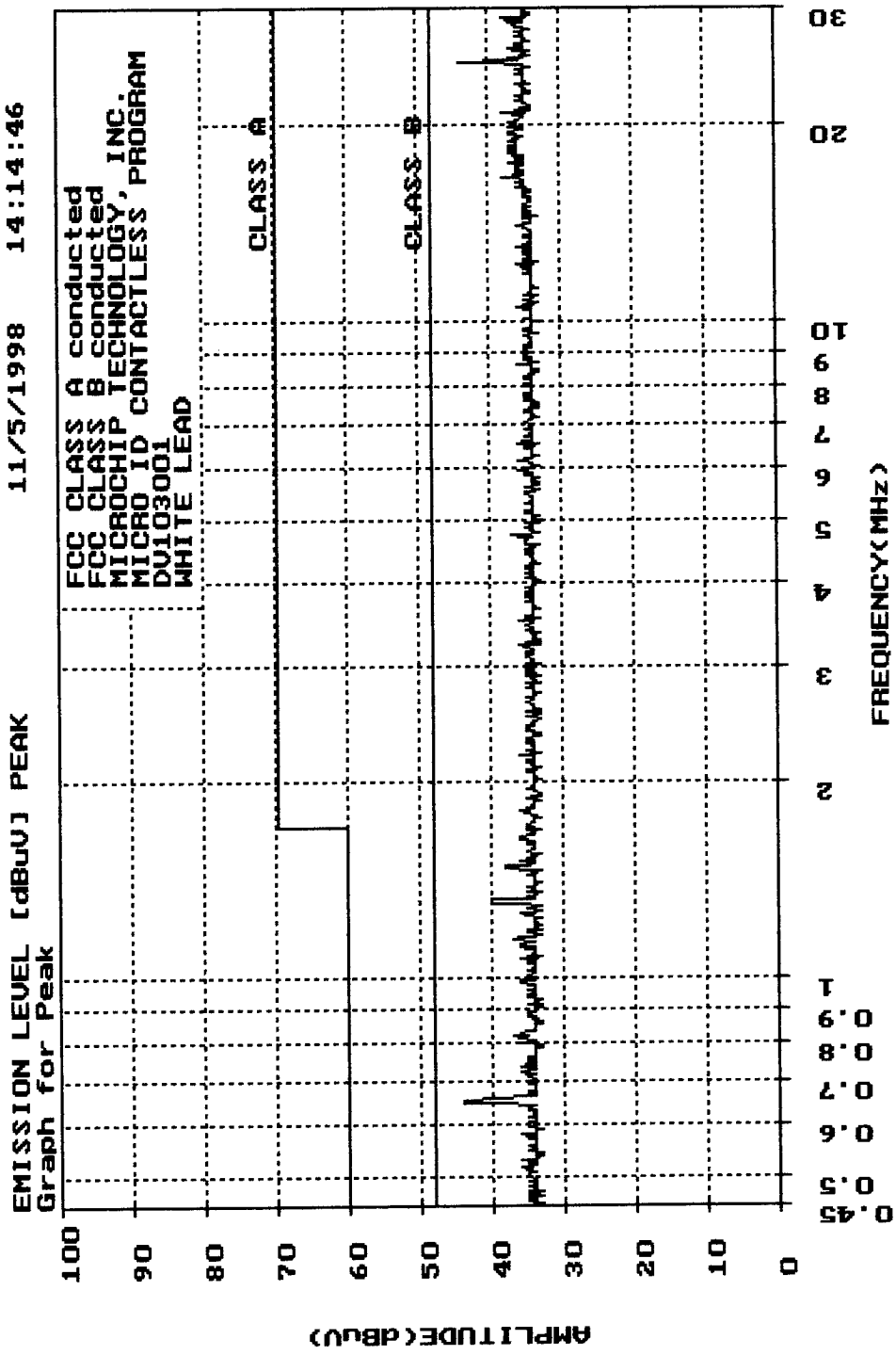
20 highest peaks above -50.00 dB of CLASS B limit line
Peak criteria : 0.10 dB, Curve : Peak

Peak#	Freq(Mhz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	24.850	44.84	48.00	-3.16
2	0.652	44.38	48.00	-3.62
3	1.319	40.58	48.00	-7.42
4	1.484	38.98	48.00	-9.02
5	29.033	38.34	48.00	-9.66
6	20.748	38.20	48.00	-9.80
7	16.597	38.02	48.00	-9.98
8	19.394	37.77	48.00	-10.23
9	17.978	37.59	48.00	-10.41
10	17.467	37.47	48.00	-10.53
11	25.259	37.35	48.00	-10.65
12	18.839	37.34	48.00	-10.66
13	19.798	37.29	48.00	-10.71
14	1.144	37.28	48.00	-10.72
15	26.028	37.27	48.00	-10.73
16	28.550	37.23	48.00	-10.77
17	18.442	37.12	48.00	-10.88
18	18.283	37.11	48.00	-10.89
19	4.727	37.08	48.00	-10.92
20	0.817	37.08	48.00	-10.92


EMISSION LEVEL [dBuV] PEAK
Graph for Peak
11/5/1998 14:14:46
FCC CLASS A conducted
FCC CLASS B conducted
MICROCHIP TECHNOLOGY, INC.
MICRO ID CONTACTLESS PROGRAM
DV103001
WHITE LEAD
CLASS A
CLASS B
AMPLITUDE(dBuV)
FREQUENCY(MHz)
100
90
80
70
60
50
40
30
20
10
0
0.45
0.5
0.6
0.7
0.8
0.9
1
2
3
4
5
6
7
8
9
10
20
30