FCC PART 15, SUBPART C
TEST REPORT

for

CARD PRINTER
Model: S820i with RFID AND LAMINATOR
FCC ID: MX5-S820I

Prepared for

ZEBRA TECHNOLOGIES CORP.
1001 FLYNN RD
CAMARILLO, CA 93012

Prepared by: 

ANDRE D. KHAN

Approved by: 

RUBY A. HALL

COMPATIBLE ELECTRONICS INC.
2337 TROUTDALE DRIVE
AGOURA, CALIFORNIA 91301
(818) 597-0600

DATE: OCTOBER 18, 2002

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GENERAL REPORT SUMMARY

This electromagnetic emission 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 except in full, without 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: Card Printer
Model: S820i
S/N: None

Product Description: This is a Card Printer with Laminator.

Modifications: The EUT was not modified during the testing.

Manufacturer: Zebra Technologies, Corp.
1001 Flynn Rd.
Camarillo, CA 93012

Test Date: October 03, 2002

Test Specifications: EMI requirements
FCC CFR Title 47, Part 15 Subpart C
Test Procedure: ANSI C63.4: 2000.

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Radiated RF Emissions, 10kHz to 1.0GHz	Complies with the limits of FCC CFR Title 47, Part 15 Subpart C 15.209 and 15.225.
2	Conducted Rf Emissions,450 kHz – 30 MHz	Complies with the limits of FCC CFR Title 47, Part 15 Subpart C 15.207 (a).

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Card Printer Model: S820i. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2000. 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 in FCC CFR Title 47, Subpart C 15.207 (a), 15.209 and 15.225.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 2337 Troutdale Drive, Agoura, California 91301. The temperature cycle testing was performed at Environment Associates, Inc. 9604 Variel Ave. Chatsworth, CA 91311.

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

Zebra Technologies, Corp.

Zaven Mangassarian	Compliance Engineer

Compatible Electronics Inc.

Andre D. Khan	Test Technician
Ruby A. Hall	Lab Manager

2.4 Date Test Sample was Received

The test sample was received on October 03, 2002.

2.5 Disposition of the Test Sample

The test sample remains at Compatible Electronics, Inc.

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 CFR Title 47, Subpart C.	FCC Rules – Intentional Radiators.
CISPR 16 1993	Specification for radio disturbance and immunity measuring apparatus and methods.
ANSI C63.4 2000	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

The EUT was installed inside the Card Printer and setup in a tabletop configuration. The Printer was connected to the laptop Computer via the Serial port. A Monitor, Mouse and Printer were also connected to the laptop via the video, and mouse and parallel ports respectively. The Printer was idle during the testing. The EUT (Transmitter) was active throughout the test.

The highest emissions were found when the EUT was running in the above configuration. The final radiated and conducted data was taken in this mode of operation. All initial investigations were performed with the spectrum analyzer in manual mode scanning the frequency range continuously. The EUT was setup and tested as shown in the photographs in Appendix D.

4.1.1 Photograph of Test Configuration – EMI

4.1.2 Cable Construction and Termination

Cable 1

This is a 2 meter, Foil shielded, round Serial cable connecting the EUT to Laminator via the Serial port. There is a metallic D9 pin connector at both ends of the cable. The cable was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connectors.

Cable 2

This is a 1.5 meter, Braid and foil shielded, round cable connecting the Printer to the laptop computer via the Parallel port. There is a 36 pin Centronics connector and built in ferrite at the printer end and a dB 25 pin connector with a built in ferrite at the Host computer 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 3

This is a 1.5 meter, braid and foil shielded, round cable connecting the Monitor to the laptop Computer via the Video port. There is an HD-15 pin connector at the Computer end and it is hardwired at the Monitor 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 1.5 meter, foil shielded, round cable connecting the external Modem to the laptop computer via the serial port. The cable has a metallic DB-9 pin connector at the laptop end of the cable and a DB-25 pin connector at the modem end. The shield of the cable was grounded to the chassis via the connectors. The cable was bundled to a length of 1 meter.

Cable 5

This is a 1.5 meter, unshielded, round cable connecting the Mouse to the laptop computer via the mouse port. There is a 6 pin mini DIN connector at the Computer end and it is hardwired at the Mouse end.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

#	EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER
1	CARD PRINTER (EUT)	ZEBRA TECHNOLOGIES CORP.	S820i	FCC ID: MX5-S820I
2	LAMINATOR	ZEBRA TECHNOLOGIES CORP.	S820i	None
3	MONITOR	VIEW SONIC	1449	3742968085
4	LAPTOP COMPUTER	IBM	2635-LEU	78-ADBH9
5	EXTERNAL MODEM	HAYES	07-00056	H19900173371
6	MOUSE	MICROSOFT	97599	00298743

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Spectrum Analyzer	Hewlett Packard	8566A	1904A00188	Jan. 28, 2002	Jan. 28, 2003
Quasi-Peak Adapter	Hewlett Packard	85650A	2043A00276	Jan. 28, 2002	Jan. 28, 2003
Preamplifier	Com Power	PA-102	01249	Mar. 25, 2002	Mar. 25, 2003
Biconical Antenna	Com Power	AB-100	01535	Mar. 26, 2002	Mar. 26, 2003
Log Periodic Antenna	Com Power	AL-100	01116	Mar. 06, 2002	Mar. 06, 2003
Horn Antenna	A. R. A.	DRG 118/A	1015	Dec. 18, 2001	Dec. 18, 2002
Microwave Amplifier	Com Power	PA-122	181915	Jun. 25, 2002	Jun. 25, 2003
Harmonic/Flicker Test System	Hewlett Packard	6842A	3531A00180	Feb. 08, 2002	Feb. 08, 2003
Antenna Mast	Com Power	AM-400	N/A	N/A	N/A
Turntable	Com Power	TT-106A	N/A	N/A	N/A
Computer	Hewlett Packard	Pavilion 4530	US91912022	N/A	N/A
Printer	Hewlett Packard	C6427B	MY066160TW	N/A	N/A
(Software) Radiated Emissions Transmitter Data Program	Compatible Electronics	DOC No: EMI_PART15 TX-B-0-50	Rev. A	N/A	N/A
(Software) Compatible Electronics Emissions Program	Compatible Electronics	Version 2.3 (SR21)	N/A	N/A	N/A
(Software) Compatible Electronics Data Capture Program	Compatible Electronics	N/A	N/A	N/A	N/A
Frequency Counter	Global Specialties	5003	G001742	Sep.26, 2002	Sep.26, 2003
Temperature Cycling Chamber	Envirotronics	ET-8-2-3	0285215	N/A	N/A

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 grounded through the power cord.

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 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: 2000. 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 0.15 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 EUT Complies with the FCC Class B Conducted Specifications.

7.1.2 Radiated Emissions Test

The spectrum analyzer was used as a measuring meter along with a quasi-peak adapter. A Preamplifier was used to increase the sensitivity of the instrument. 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. This final reading is then recorded into the a Computer data recording program, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. The quasi-peak was used only for those readings, which are marked accordingly on the data sheets. The effective measurement bandwidth used for the radiated emissions test was according to the frequency measured (200 Hz for 10kHz-150kHz, 9 kHz for 0.150kHz-30MHz, 120 kHz for 30-1000MHz and 1 MHz for 1000MHz and above).

Broadband loop, biconical and log periodic antennas were used as transducers during the measurement. The loop antenna was used from 10 kHz to 30 MHz, the biconical antenna was used from 30 MHz to 300 MHz and the log periodic antenna was used from 300 MHz to 1 GHz. The frequency spans were wide (13.56 MHz to 30 MHz, 30 MHz to 88 MHz, 88 MHz to 216 MHz, 216 to 300 MHz and 300 MHz to 1 GHz) during preliminary investigations. The final data was taken with a frequency span of 1 MHz. Furthermore, the frequency span was reduced during the preliminary investigations as deemed necessary.

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: 2000. 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 test distance of 3 meters to obtain final test data. The test data is located in Appendix E.

Preliminary Testing and Monitoring:

Preliminary testing was done at a distance of 1 meter instead of 3 meters to determine the predominant harmonics and spurious emission frequencies. An open field test site was used for the preliminary investigations. Broadband antennas were used to scan large frequency bands while manipulating the unit. If and when any frequency was found to be above 30 microvolts/meter level (at a 1 meter distance), this frequency was recorded as a significant frequency. All significant frequencies were further examined carefully at a frequency span on the spectrum analyzer while changing the antenna height and EUT orientation. The EUT was tested again at a test distance of 3 meters to obtain the final test data. The bandwidth of the spectrum analyzer was varied to ensure that pulse desensitization did not occur.

7.1.3 RF Emissions Test Results

The fundamental and up to the 10th harmonic emissions are within the specifications.

ZEBRA TECHNOLOGIES, CORP.
CARD PRINTER

RADIATED EMISSIONS – SPURIOUS

The following bands were specifically scanned.
Frequency Band 13.56MHz – 138MHz

The spurious emissions were within the spec. limits.

RF Energy From The Card Printer and Laminator with RFID Transmitter
in MHz at 3 meters (µV/m)

13.36-13.41	<50
16.42-16.423	<50
16.69475-16.69525	<50
16.80425-16.80475	<50
25.5-25.67	<50
37.5-38.25	<100
73-746	<100
74.8-75.2	<100
108-121.94	<150
123-138	<150

RADIATED EMISSION – FREQUENCY TOLERANCE

The EUT was placed in a temperature cycling chamber. The chamber was set for –20 degrees and the EUT was exposed to this temperature for a period of 30 minutes. The temperature was subsequently increased in 10 degree steps up to + 50 degrees with a 30 minute acclimation periods between each temperature. At each temperature step the EUT was checked with a frequency counter to determine whether the carrier signal remained within 0.01% of the fundamental frequency at startup, 2 minutes, 5 minutes and 10 minutes after removal from the temperature chamber. The frequency tolerance of the carrier signal was maintained within 0.01% of the operating temperature variation testing –20 degrees to + 50 degrees C at normal voltage and variations at 85% to 115% at 20 degrees C.

7.1.4 Sample Calculations

A correction factor for the antenna, cable and a distance factor (if any) must be applied to the meter reading before a true field strength reading can be obtained. For greater efficiency and convenience, instead of using these correction factors for each meter reading, the specification limit was modified to reflect these correction factors at each frequency, so that the meter readings can be compared directly to the modified specification limit, referred to henceforth as the corrected meter reading limit (CML).

The equation can be derived in the following manner:

Specification limit (uV/m) log x 20 = Specification Limit in dBuV

(Specification distance / test distance) log x 40 = distance factor

(Specification Limit dBuV + distance factor) + Antenna factor – effective gain = Corrected Meter Limit

Note: When using an Active Antenna, the Antenna factor shall be subtracted due to the combination of the internal amplification and antenna loss. At lower frequencies the cable loss is negligible.

OR

Corrected Meter Reading = meter reading + F – A + C

where: F = antenna factor
A= amplifier gain
C = cable loss

Therefore, the equation for determining the corrected meter reading is:

CMR = spec. limit - F - A + C

A table of corrected meter reading limits was used to permit immediate comparison of the meter reading and determine if the emission level exceeded the specification limit at that frequency. The correction factors for the antenna and the amplifier gain are attached in Appendix D of this report. The data sheets are attached in Appendix E.

The distance factor D is 0 when the test is performed at the required specification distance.

8. CONCLUSIONS

The Card Printer Model: S820i meets all of the requirements of the FCC CFR, Title 47, Part 15, Subpart C 15.207 (a), 15.209 and 15.225.

APPENDIX A

LABORATORY ACCREDITATIONS

LABORATORY ACCREDITATIONS

Compatible Electronics has the following agency Accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200063-0

Voluntary Control Council for Interference - Registration Numbers: R-826, C-862, R-653 and C-669

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

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

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)

Conformity Assessment Body for the EMC directive under the US/EU MRA appointed by NIST.

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

There were no modifications made to the EUT during the test.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	CARD PRINTER Model: S820i

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

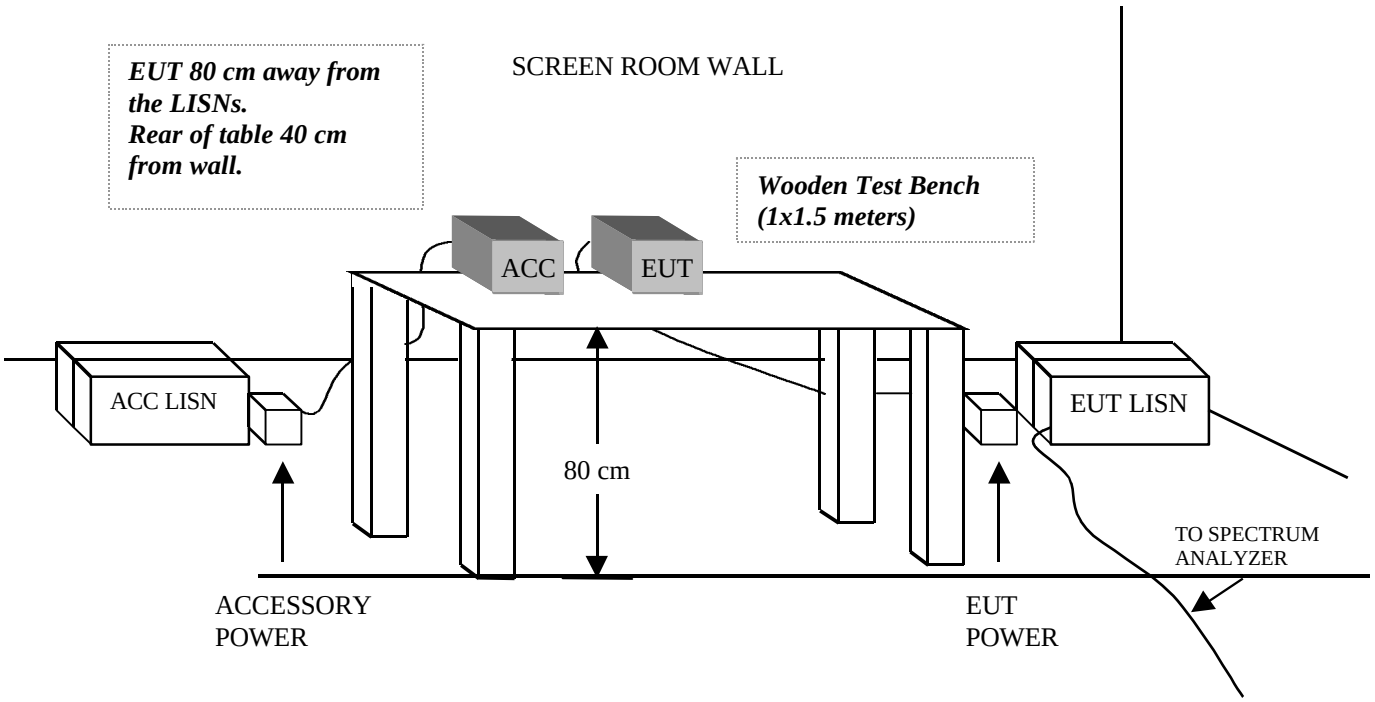
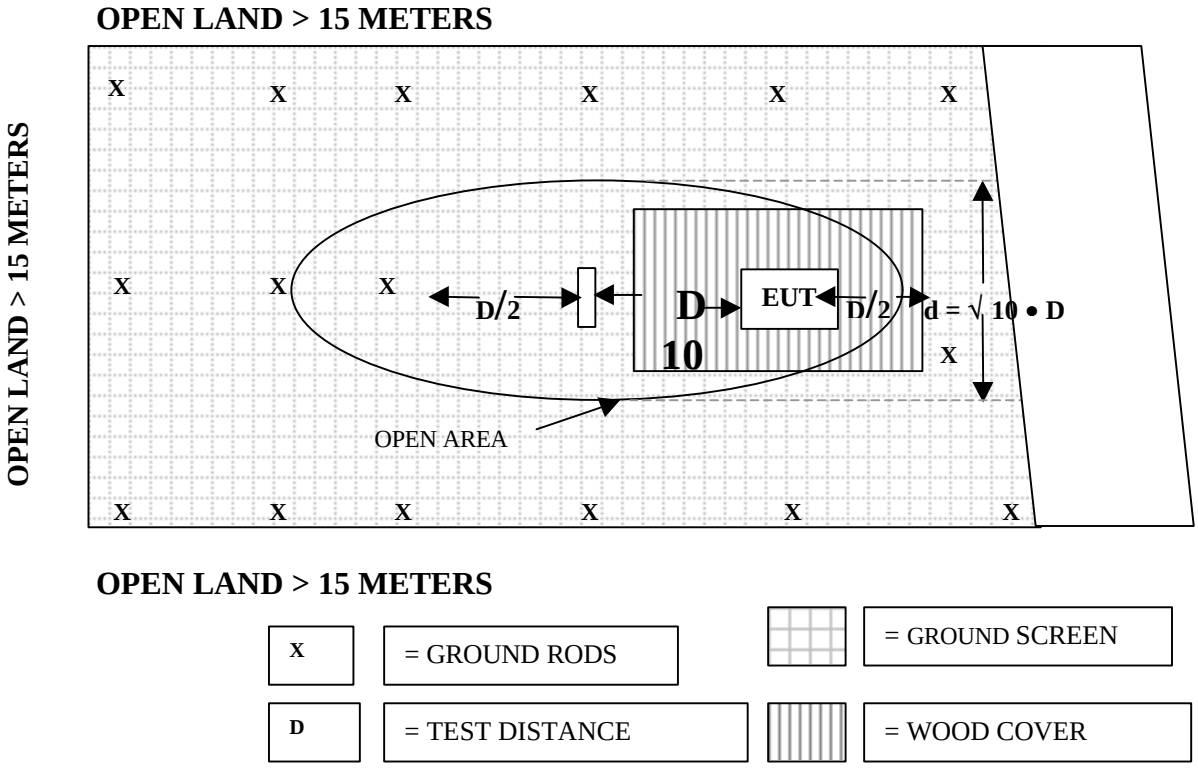


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE
(LAB F)



COM-POWER AB-100

BICONICAL ANTENNA

S/N: 1535

CALIBRATION DATE: MARCH 26, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	13.8	120	9.3
35	12.9	125	11.0
40	12.5	140	12.2
45	12.2	150	12.4
50	12.5	160	13.0
60	10.5	175	14.5
70	8.5	180	14.9
80	8.0	200	15.0
90	7.9	250	16.2
100	8.5	300	19.0

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 01116

CALIBRATION DATE: MARCH 6, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	11.70	700	19.80
400	11.80	800	22.40
500	15.90	900	22.20
600	17.30	1000	23.60

COM-POWER PA-102

PREAMPLIFIER

S/N: 1249

CALIBRATION DATE: MARCH 25, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	36.7	300	36.0
40	36.8	350	35.9
50	36.7	400	36.0
60	36.6	450	35.5
70	36.5	500	35.7
80	36.7	550	36.2
90	36.6	600	35.4
100	36.6	650	35.7
125	36.4	700	36.3
150	36.4	750	35.0
175	36.2	800	35.1
200	36.2	850	35.1
225	36.2	900	33.5
250	36.1	950	32.7
275	36.0	1000	32.3

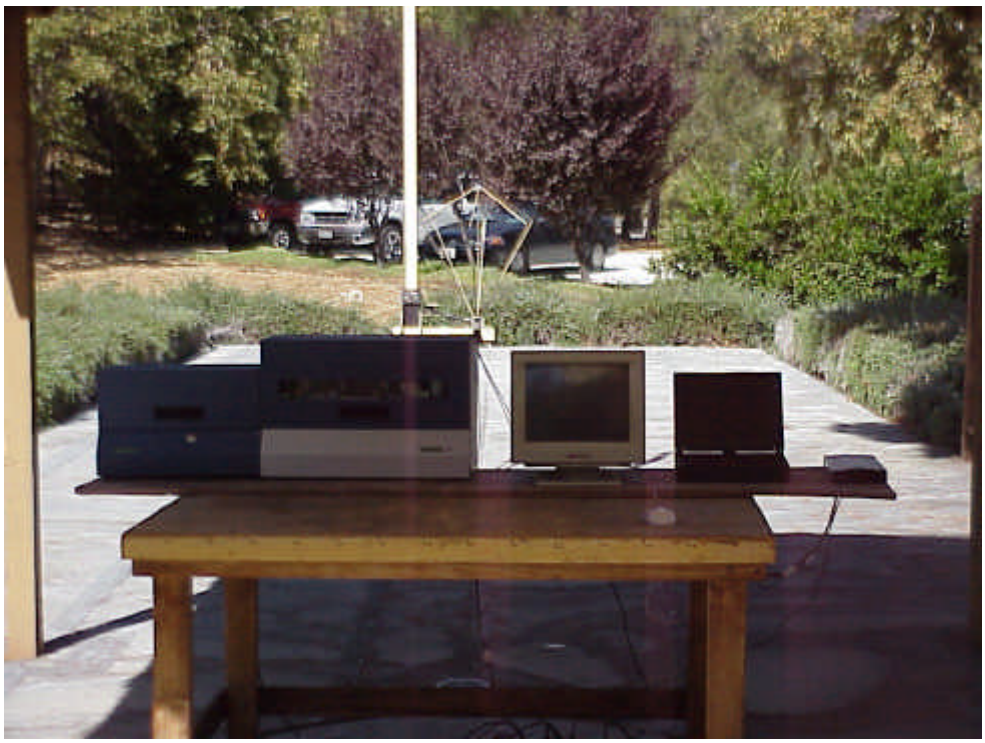
COM-POWER AL-130

ACTIVE LOOP ANTENNA

S/N: 17067

CALIBRATION DATE: MARCH 12, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
0.009	11.3	1	10.8
0.01	11.3	2	11.2
0.02	10.5	3	10.9
0.03	12.1	4	10.8
0.04	11.6	5	11.4
0.05	10.2	6	11.4
0.06	10.6	7	11.1
0.07	10.3	8	10.9
0.08	10.0	9	11.5
0.09	9.9	10	11.0
0.1	9.9	12	10.3
0.2	7.5	14	10.2
0.3	10.0	15	10.1
0.4	10.0	16	10.1
0.5	10.0	18	10.2
0.6	10.1	20	10.3
0.7	10.1	25	9.7
0.8	10.1	30	8.5
0.9	10.3		



FRONT VIEW

ZEBRA TECHNOLOGIES CORP.
CARD PRINTER
Model: S820i
FCC PART 15 SUBPART C - RADIATED EMISSIONS – 10-3-02

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

ZEBRA TECHNOLOGIES CORP.
CARD PRINTER
Model: S820i
FCC PART 15 SUBPART C - RADIATED EMISSIONS – 10-3-02

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

ZEBRA TECHNOLOGIES CORP.
CARD PRINTER
Model: S820i
FCC PART 15 SUBPART C - CONDUCTED EMISSIONS – 10-3-02

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

ZEBRA TECHNOLOGIES CORP.
CARD PRINTER
Model: S820i
FCC PART 15 SUBPART C - CONDUCTED EMISSIONS – 10-3-02

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

COMPANY NAME: Zebra Technologies **DATE:** 10-3-02

EUT: Card Printer **EUT S/N:**

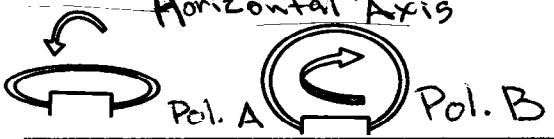
EUT MODEL: 5820i w/RFID And Laminator **LOCATION:** ☐ BREA ☐ SILVERADO ☑ AGOURA

SPECIFICATION: Fcc **CLASS:** B **TEST DISTANCE:** 3M **LAB:** F

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

☑ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** A. Khan

NOTES: The EUT was looked at 10KHz to 30MHz 40 Log
The Loop Antenna was Rotated on its vertical + Horizontal Axis



Frequency (MHz)	Peak Reading (dBuV/m)	Quasi-Peak (dBuV/m)	Antenna Height (meters)	Azimuth (degrees)	Delta * (dB)	Corrected Limit (dBuV/m)	Comments
13.56	22.70		1M	160°	-86.75	109.45	Pol. B
27.125	15.10		1M	160°	-45.24	60.34	Pol. B
13.56	17.90		1M	180°	-91.55	109.45	Pol. A
27.125	14.10		1M	180°	-46.24	60.34	Pol. A

* **DELTA** = METER READING - CORRECTED LIMIT

COMPATIBLE ELECTRONICS

Test Location	: Compatible Electronics	**Page**	: 1/1
Customer	: Zaven Magnassarian	**Date**	: 10/03/2002
Manufacturer	: Zebra Technologies	**Time**	: 11:06:24 AM
Eut name	: Card Printer	**Lab**	: F
Model	: S820I w/ RFID And Laminator	**Test Distance**	: 3.00 Meters
Serial #	:		
Specification	: FCC Pt. 15 - Class B		
Distance correction factor (20 * log(test/spec))			: 0.00
Test Mode	: Clock:13.56 MHz		

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB
1V	40.680	44.20	1.42	12.46	36.79	21.28	40.00	-18.72
2V	54.246	47.60	1.64	11.61	36.66	24.20	40.00	-15.80
3V	67.787	51.40	1.86	8.92	36.52	25.65	40.00	-14.35
4V	81.369	44.70	2.01	7.99	36.69	18.01	40.00	-21.99
5V	108.502	46.00	2.31	8.86	36.53	20.64	43.50	-22.86
6V	122.147	51.50	2.47	10.04	36.42	27.59	43.50	-15.91
7V	124.605	52.90	2.50	10.87	36.40	29.86	43.50	-13.64
8V	134.542	49.90	2.58	11.78	36.40	27.86	43.50	-15.64
9V	137.641	49.10	2.61	12.02	36.40	27.33	43.50	-16.17
10V	169.864	44.30	3.02	14.00	36.24	25.09	43.50	-18.41
11H	40.680	42.00	1.42	12.46	36.79	19.08	40.00	-20.92
12H	54.240	39.40	1.64	11.61	36.66	16.00	40.00	-24.00
13H	66.319	52.30	1.83	9.20	36.54	26.80	40.00	-13.20
14H	81.351	43.80	2.01	7.99	36.69	17.11	40.00	-22.89
15H	108.786	51.30	2.31	8.87	36.52	25.96	43.50	-17.54
16H	122.598	48.40	2.47	10.19	36.42	24.65	43.50	-18.85
17H	129.176	50.10	2.54	11.35	36.40	27.58	43.50	-15.92
18H	134.995	51.10	2.58	11.81	36.40	29.10	43.50	-14.40
19H	195.223	44.40	3.26	14.98	36.20	26.44	43.50	-17.06
20H	200.759	48.70	3.31	15.02	36.20	30.83	43.50	-12.67
21H	242.347	51.90	3.64	16.03	36.13	35.44	46.00	-10.56
22V	336.750	58.10	4.85	11.74	35.93	38.76	46.00	-7.24
23V	399.701	46.60	5.20	11.80	36.00	27.60	46.00	-18.40
24V	431.071	43.30	5.20	13.17	35.68	25.99	46.00	-20.01
25V	529.611	41.70	5.82	16.34	36.00	27.86	46.00	-18.14
26H	303.445	47.00	4.44	11.70	35.99	27.16	46.00	-18.84
27H	336.680	45.30	4.85	11.74	35.93	25.96	46.00	-20.04
28H	368.717	46.20	5.08	11.77	35.94	27.11	46.00	-18.89

COMPATIBLE ELECTRONICS

10/03/2002 14:13:16

FCC Conducted Emissions
Zebra Technologies Corp.
Card Printer
S820i w/o RFID and Laminator
Line110V
Lab F Line Due 10-30-02
TEST ENGINEER : A.KHAN

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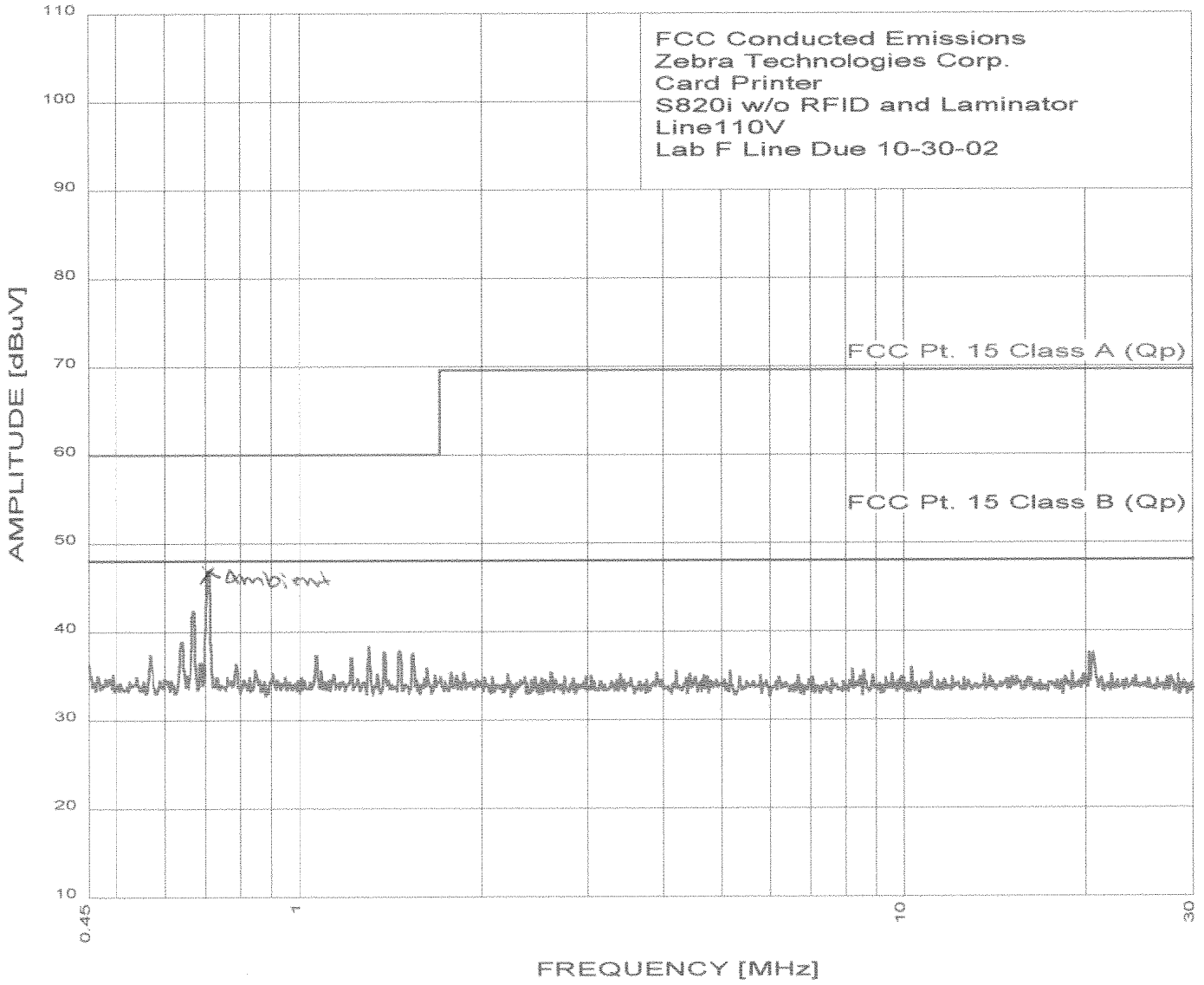
7 highest peaks above -50.00 dB of FCC Pt. 15 Class A (Qp) limit line
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV	Limit(dB)	Delta(dB)
1	0.705	46.60	60.00	-13.40 * Ambient
2	0.668	42.30	60.00	-17.70
3	0.638	38.80	60.00	-21.20
4	1.303	38.20	60.00	-21.80
5	1.465	37.70	60.00	-22.30
6	1.382	37.60	60.00	-22.40
7	0.450	36.20	60.00	-23.80

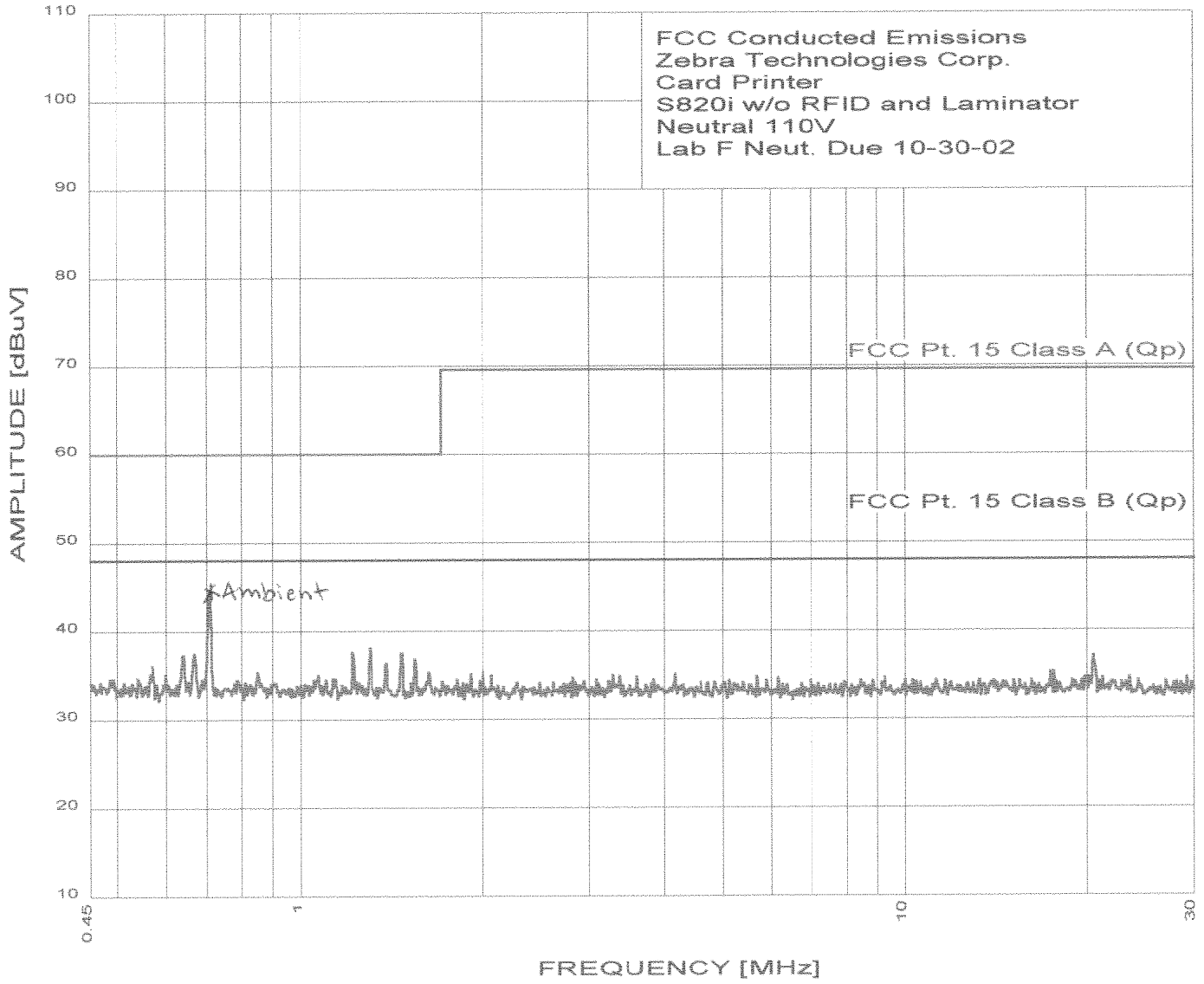
EMISSION LEVEL [dBuV] PEAK
Graph forPeak

10/03/2002 14:13:16



EMISSION LEVEL [dBuV] PEAK
Graph forPeak

10/03/2002 14:05:12



COMPATIBLE ELECTRONICS

10/03/2002 14:05:12

FCC Conducted Emissions
Zebra Technologies Corp.
Card Printer
S820i w/o RFID and Laminator
Neutral 110V
Lab F Neut. Due 10-30-02
TEST ENGINEER : A.KHAN

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7 highest peaks above -50.00 dB of FCC Pt. 15 Class A (Qp) limit line
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)	
1	0.708	44.30	60.00	-15.70	*Ambient
2	1.303	38.00	60.00	-22.00	
3	1.218	37.50	60.00	-22.50	
4	0.668	37.40	60.00	-22.60	
5	1.465	37.40	60.00	-22.60	
6	0.638	37.20	60.00	-22.80	
7	0.450	34.00	60.00	-26.00	

COMPATIBLE ELECTRONICS

10/03/2002 13:53:01

FCC Conducted Emissions
Zebra Technologies Corp.
Card Printer
S820i w/RFID and Laminator
line 110V
Lab F Line Due 10-30-02
TEST ENGINEER : A.KHAN

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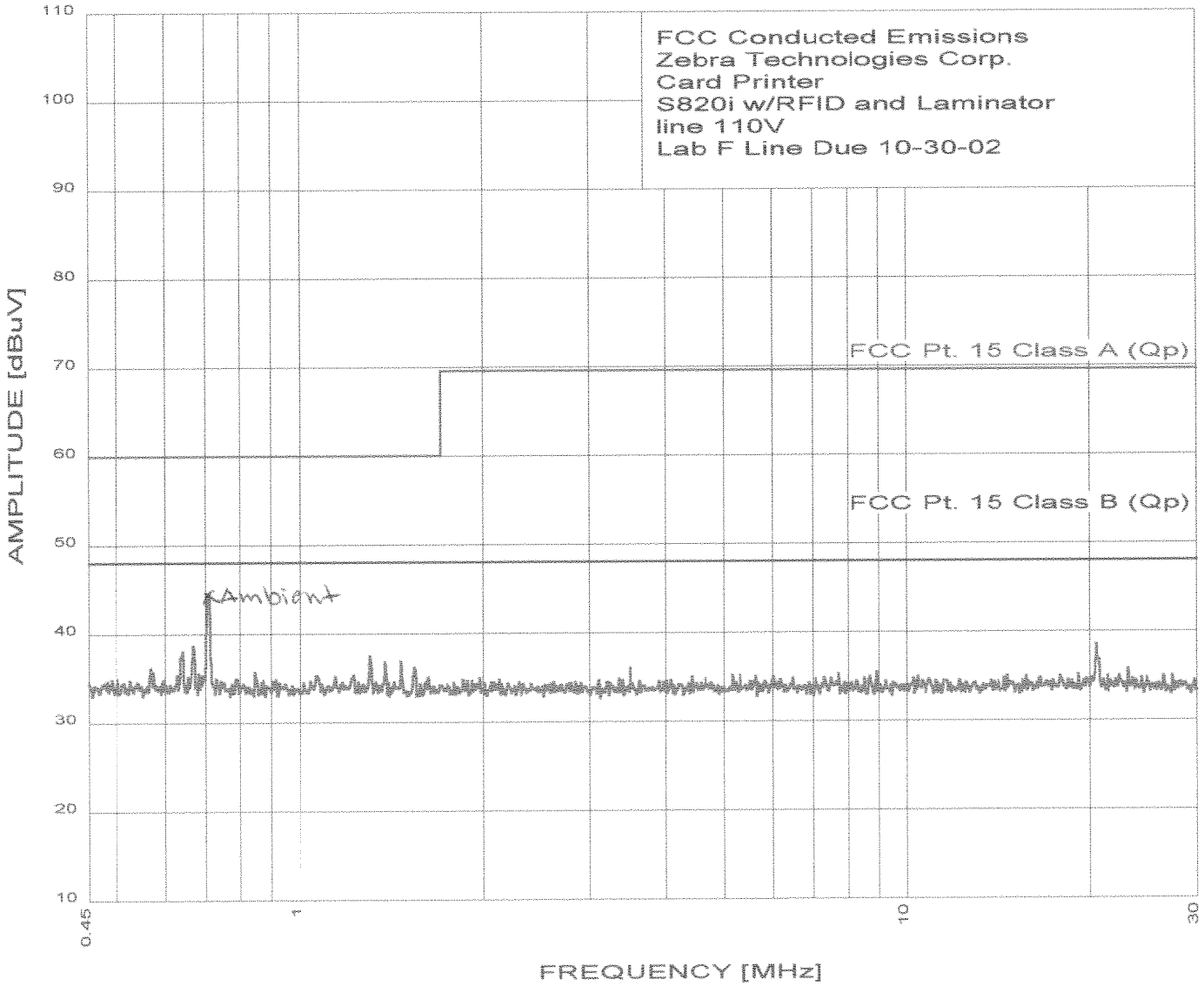
7 highest peaks above -50.00 dB of FCC Pt. 15 Class A (Qp) limit line
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV	Limit(dB)	Delta(dB)	
1	0.708	44.10	60.00	-15.90	*Ambient
2	0.668	38.60	60.00	-21.40	
3	0.641	38.00	60.00	-22.00	
4	1.303	37.40	60.00	-22.60	
5	1.465	36.80	60.00	-23.20	
6	1.382	36.70	60.00	-23.30	
7	0.450	34.40	60.00	-25.60	

EMISSION LEVEL [dBuV] PEAK
Graph forPeak

10/03/2002 13:53:01



COMPATIBLE ELECTRONICS

10/03/2002 13:57:55

FCC Conducted Emissions
Zebra Technologies Corp.
Card Printer
S820i w/RFID and Laminator
Neutral 110V
Lab F Neut. Due 10-30-02
TEST ENGINEER : A.KHAN

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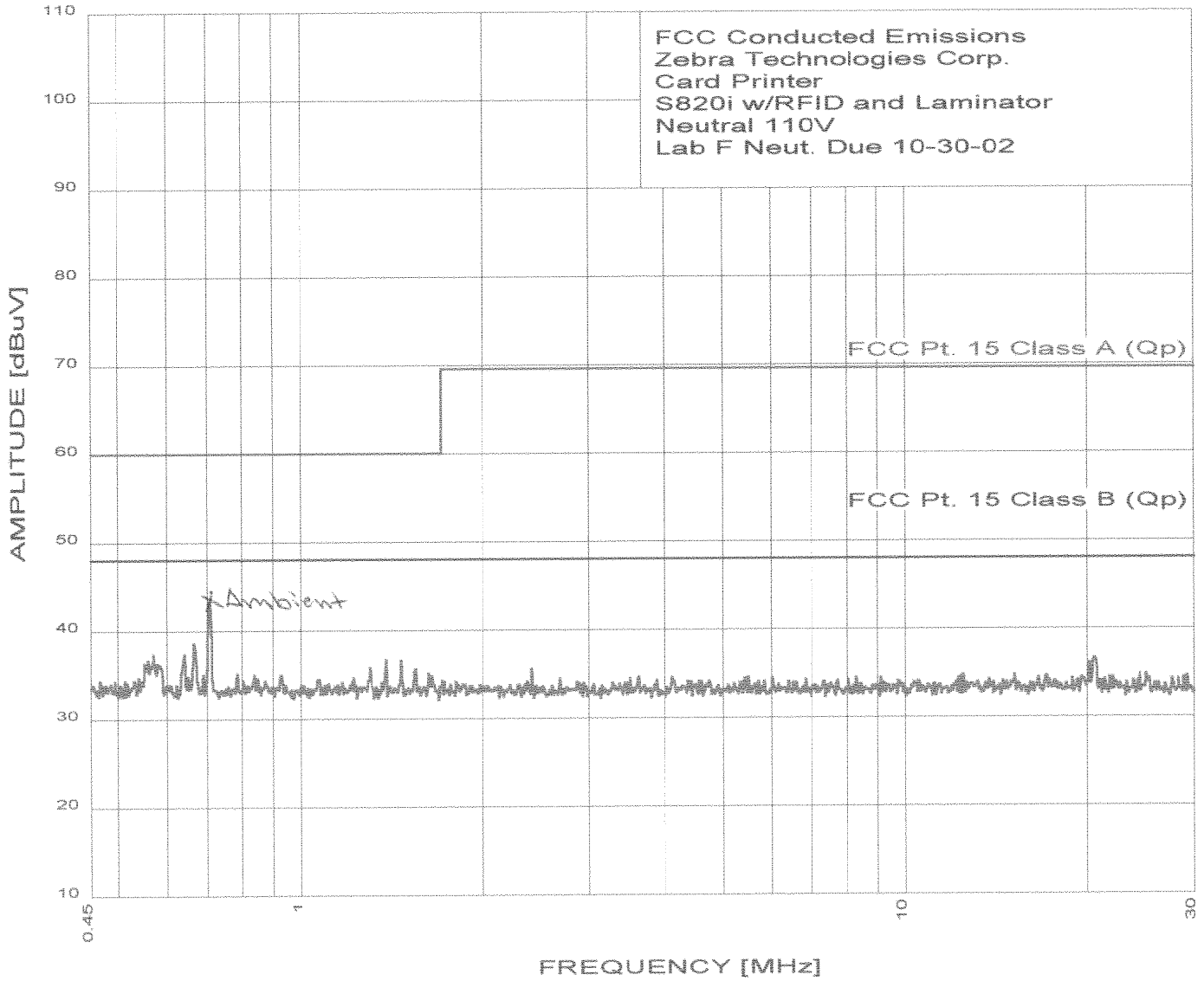
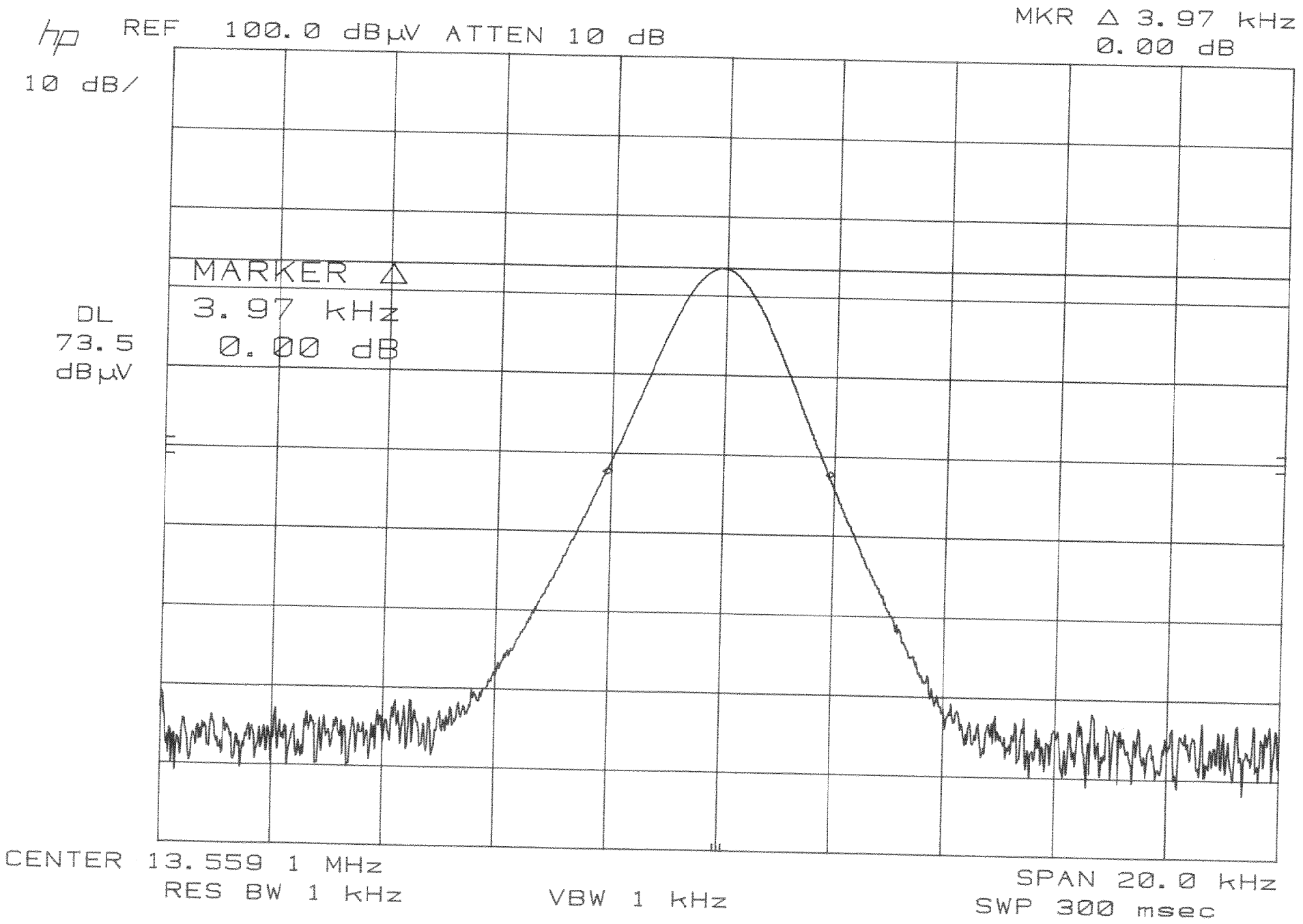
7 highest peaks above -50.00 dB of FCC Pt. 15 Class A (Qp) limit line
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV	Limit(dB)	Delta(dB)
1	0.705	43.20	60.00	-16.80 Ambient
2	0.665	38.50	60.00	-21.50
3	0.569	37.30	60.00	-22.70
4	0.641	37.30	60.00	-22.70
5	1.387	36.60	60.00	-23.40
6	1.465	36.50	60.00	-23.50
7	0.450	33.40	60.00	-26.60

EMISSION LEVEL [dBuV] PEAK
Graph forPeak

10/03/2002 13:57:55




hp
REF 100.0 dBµV ATTEN 10 dB
MKR Δ 3.97 kHz
0.00 dB
10 dB/
MARKER Δ
3.97 kHz
0.00 dB
DL
73.5
dBµV
CENTER 13.559 1 MHz
RES BW 1 kHz
VBW 1 kHz
SPAN 20.0 kHz
SWP 300 msec