

*FCC PART 15.225
TEST REPORT*

for

CARD PRINTER with RFID
Model: P430I
FCC ID: I28-P430I

Prepared for

ZEBRA TECHNOLOGIES CORP.
1001 FLYNN RD
CAMARILLO, CA 93012

Prepared by: _____

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DATE: NOVEMBER 14, 2005

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	17	2	2	2	12	13	48

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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 with RFID
Model: P430I
S/N: None

Product Description: This is a card printer that can print on both sides of a PVC card in one pass through the printer.

Modifications: The EUT was not modified during the testing.

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

Test Date: September 20, 2005

Test Specifications: EMI requirements
FCC CFR Title 47, Part 15 Subpart C
Test Procedure: ANSI C63.4: 2003.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Radiated RF Emissions, 9kHz to 1GHz	The RFID Complies with the limits of FCC CFR Title 47, Part 15 Subpart C 15.209, 15.225 and 15.205
2	Conducted RF Emissions, 150 kHz – 30 MHz	The RFID 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 with RFID Model: P430I. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2003. The tests were performed in order to determine whether the electromagnetic emissions from the RFID portion of 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, 15.205 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 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

Zebra Technologies, Corp.

Jim Bennie Electrical Engineer

Compatible Electronics Inc.

Reynald O. Ramirez	Senior Test Engineer
Ruby A. Hall	Lab Manager

2.4 Date Test Sample was Received

The test sample was received on September 20, 2005.

2.5 Disposition of the Test Sample

The test sample remains at does not 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
RFID	Radio Frequency Identification

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. Subpart B	FCC Rules – Intentional Radiators. FCC Rules - Unintentional Radiators
CISPR 16 1993	Specification for radio disturbance and immunity measuring apparatus and methods.
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.

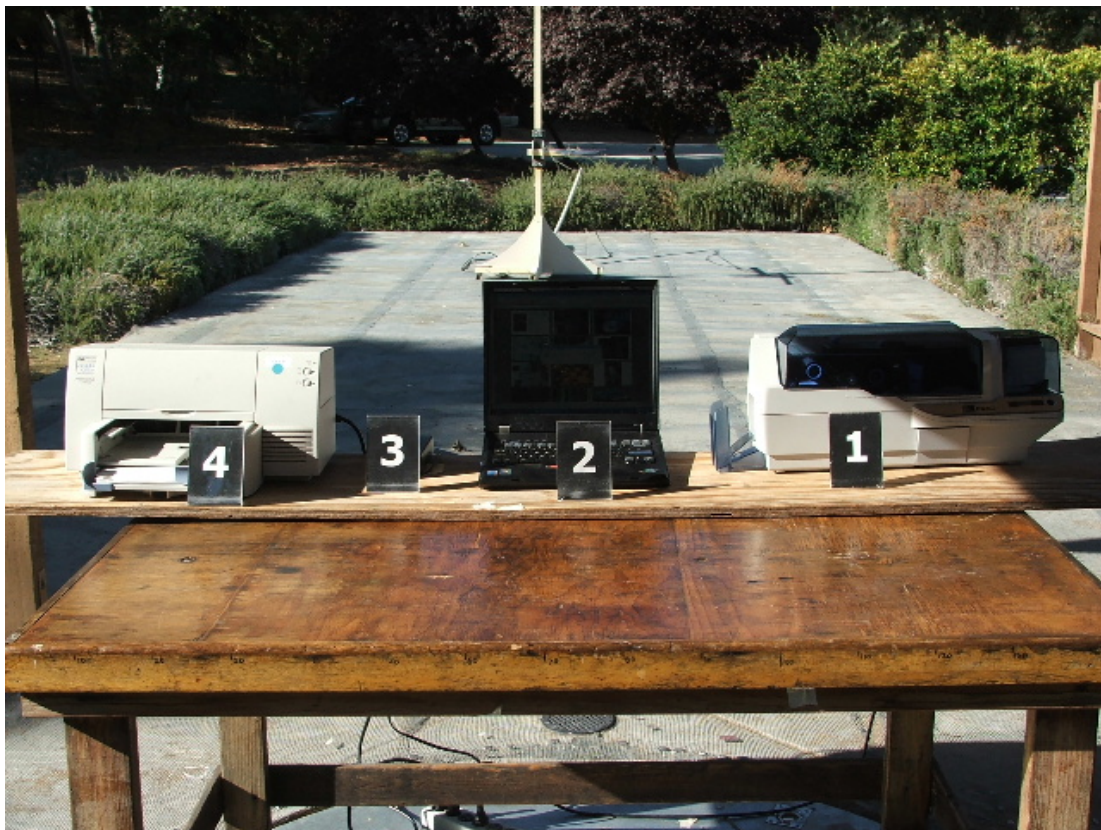
4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

The Card Printer with RFID was setup in a tabletop configuration. The Printer was connected to the laptop computer via the USB port. A Ethernet option was also tested but was determined that the USB option emitted the highest emissions. A printer was also connected to the laptop computer. The Zebra P430I uses color dye-sublimation ribbons or thermal transfer ribbons to transfer digital images to a PVC card. Ribbon recognition and security is maintained through RFID technology within the printer. The RFID board and the contactless smartcards use separate transmitters each operating at a frequency of 13.56 MHz. in the ISM band. The RFID system uses an I CODE1 format. The Card Printer with RFID was continuously printing & transmitting 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 1.5 meter, foil shielded, round USB cable connecting the EUT to the laptop computer. There is a USB 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 2 meter, braid and foil shielded, round parallel cable connecting the Printer to the laptop computer. There is a metallic 36 pin Centronics type connector at the EUT end and a metallic DB-25 pin connector at the computer end 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.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

#	EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER
1	CARD PRINTER with RFID (EUT)	ZEBRA TECHNOLOGIES CORP.	P430I	FCC ID: I28-P430I
2	LAPTOP COMPUTER	IBM	2647-3CU	78-KMDCG
3	POWER SUPPLY (LAPTOP COMPUTER)	IBM	P/N: 02K6661	11802K66612122JY13T5K4
4	ACCESSORY PRINTER	HEWLETT PACKARD	C2162A	SG49R130MP

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Spectrum Analyzer	Hewlett Packard	8566B	2729A04566	Dec. 24, 2004	Dec. 24, 2005
Quasi-Peak Adapter	Hewlett Packard	85650A	2521A00682	Dec. 24, 2004	Dec. 24, 2005
Preamplifier	Com Power	CPPA-103	161068	Dec. 07, 2004	Dec. 07, 2005
LISN	Com Power	LI-215	12037	Oct. 15, 2004	Oct. 15, 2005
LISN (Accessory)	Com Power	LI-115	02030	Oct. 15, 2004	Oct. 15, 2005
Transient Limiter	Com Power	HZ560	#3549	Dec. 30, 2004	Dec. 30, 2005
Biconical Antenna	Com Power	AB-100	01535	Jan. 13, 2005	Jan. 13, 2006
Log Periodic Antenna	Com Power	AL-100	01116	Dec. 28, 2004	Dec. 28, 2005
Antenna Mast	Com Power	AM-400	N/A	N/A	N/A
Turntable	Com Power	TTW-595	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
Conducted Emissions Test Software	Compatible Electronics	SR21	3.1	N/A	N/A
Radiated Emissions Test Software	Compatible Electronics	Vcap1A	2.3	N/A	N/A

5.2.1 EMI Test Equipment (continued)

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Temperature Chamber	Despatch Industries, Inc.	16212A	149857	Mar. 09, 2004	Mar. 09, 2006
EMI Receiver	Rohde & Schwarz	ESIB40	100172	Oct. 28, 2004	Oct. 28 2005
Preamplifier	Com Power	CPPA-102	1017	Jan. 06, 2004	Jan. 06, 2005
Probe Set	Com Power	PS-400	1810	N.C.R.	N/A
Variac	Staco Energy Products	3PN1010	None	N.C.R.	N/A
Step-up Transformer 110V to 220V	Magnetek Triad	N-5MG	None	N.C.R.	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 AC 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: 2003. 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 final data was collected under program control by the computer in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The test data is located in Appendix E.

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 and 120 kHz for 30-1000MHz).

Broadband loop, biconical and log periodic antennas were used as transducers during the measurement. The loop antenna was used from 9 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 final data was taken with a frequency span of 1 MHz. Furthermore, the frequency span was reduced during the preliminary investigations as deemed necessary.

In the frequency range of 9kHz to 30MHz, a calibrated loop antenna was used and positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The loop antenna was also positioned horizontally at the specified distance from the EUT. The center of the loop shall be 1 m above the ground.

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: 2003. 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 Radiated Emissions – 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 Spectrum Analyzer 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 100% at 20 degrees C.

8. TEST PROCEDURE DEVIATIONS

There were no deviations from the test procedures.

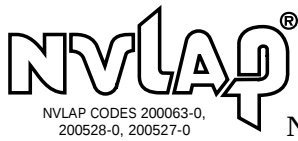
9. CONCLUSIONS

The Card Printer complies with Class A limits of the FCC CFR, title 47 part 15 subpart B, sec. 15.109, and 15.107.

APPENDIX A

LABORATORY ACCREDITATIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS



For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

Silverado/Lake Forest Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2005270.htm>

Brea Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2005280.htm>

Agoura Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2000630.htm>



Compatible Electronics has been accredited by ANSI and appointed by the FCC to serve as a Telecommunications Certification Body (TCB). Compatible Electronics ANSI TCB listing can be found at: http://www.ansi.org/public/ca/ansi_cp.html



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA). Compatible Electronics NIST US/EU CAB listing can be found at: <http://ts.nist.gov/ts/htdocs/210/gsig/emc-cabs-mar02.pdf>



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA). Compatible Electronics NIST US/APEC CAB listing can be found at: <http://ts.nist.gov/ts/htdocs/210/gsig/apec/bsmi-cabs-may02.pdf>



Compatible Electronics has been validated by NEMKO against ISO/IEC 17025 under the NEMKO EMC Laboratory Authorization (ELA) program to all EN standards required by the European Union (EU) EMC Directive 89/336/EEC. Please follow the link to the Compatible Electronics' web site for each of our facilities NEMKO ELA certificate and scope of accreditation. <http://www.celectronics.com/certs.htm>

We are also certified/listed for IT products by the following country/agency:



Compatible Electronics VCCI listing can be found at:
http://www.vcci.or.jp/vcci_e/member/tekigo/setsubi_index_id.html

Just type "Compatible Electronics" into the Keyword search box.



Compatible Electronics FCC listing can be found at:
https://gulfoss2.fcc.gov/prod/oet/index_ie.html

Just type "Compatible Electronics" into the Test Firms search box.



Compatible Electronics IC listing can be found at:
http://spectrum.ic.gc.ca/~cert/labs/oats_lab_c_e.html

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 WITH RFID
Model: P430I

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

**FIGURE 1: CONDUCTED EMISSIONS TEST SETUP
(LAB F)**

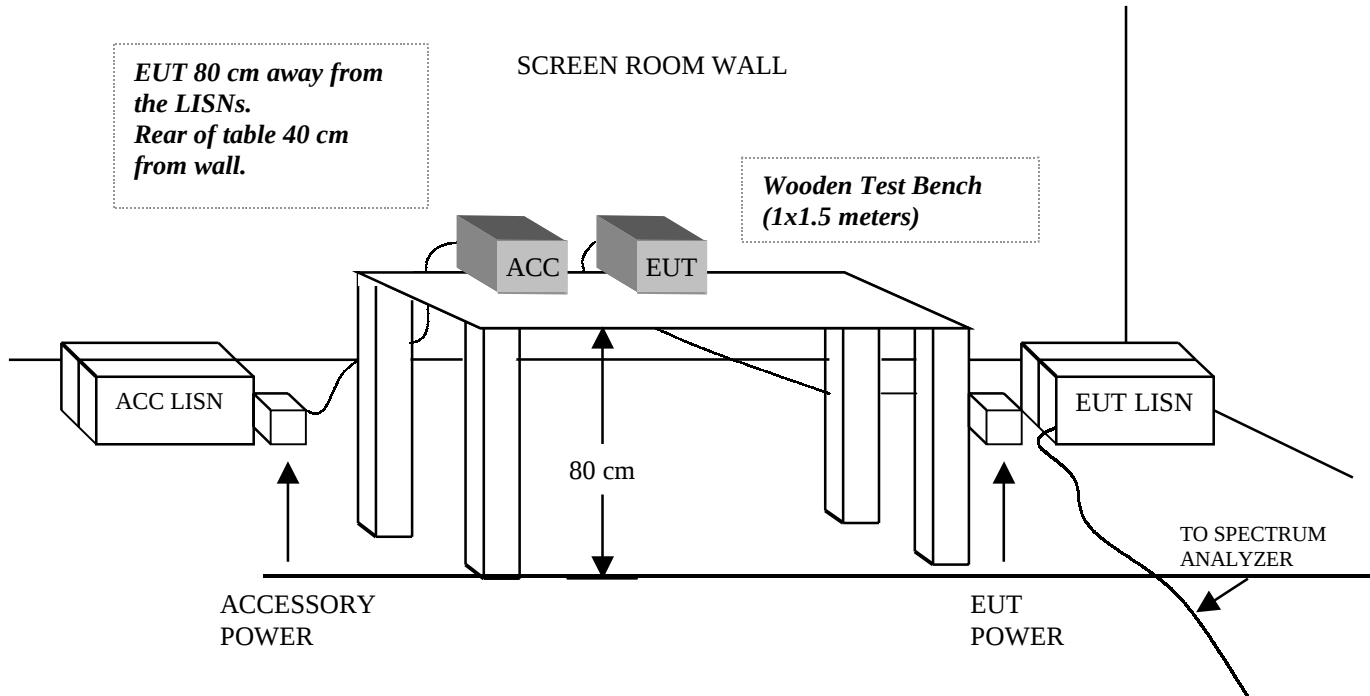
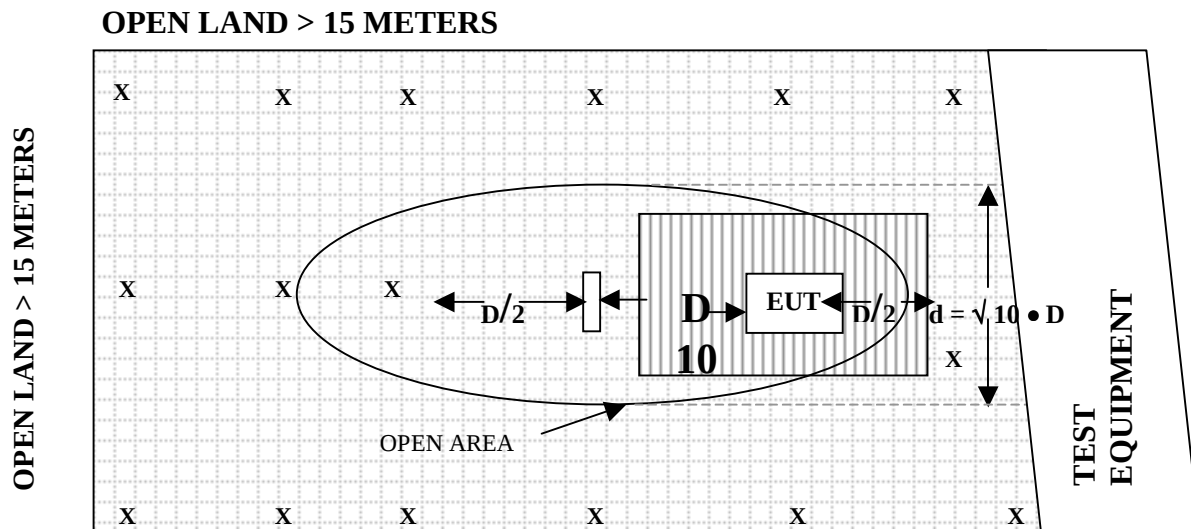
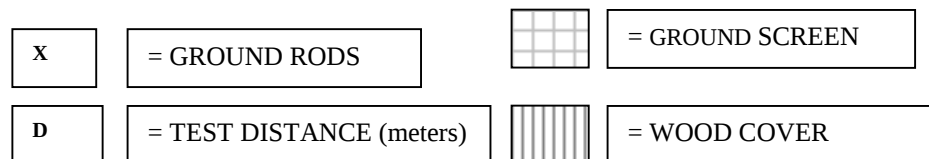


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE (LAB F)



OPEN LAND > 15 METERS



COM-POWER AL-130
ACTIVE LOOP ANTENNA

S/N: 17067

CALIBRATION DATE: MARCH 11, 2005

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
0.009	9.46	1	10.51
0.01	10.19	2	10.9
0.02	10.36	3	11.07
0.03	10.04	4	11.06
0.04	10.6	5	10.89
0.05	10.39	6	10.8
0.06	10.16	7	10.94
0.07	9.99	8	10.96
0.08	9.89	9	11.49
0.09	10.29	10	11.23
0.1	10.09	15	12.1
0.2	10.26	20	11.31
0.3	10.19	25	10.73
0.4	10.56	30	9.44
0.5	10.24		
0.6	10.9		
0.7	10.1		
0.8	10.27		
0.9	10.3		

COM-POWER AB-100

BICONICAL ANTENNA

S/N: 1535

CALIBRATION DATE: JAN. 13, 2005

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	16.0	120	10.7
35	13.8	125	11.2
40	13.6	140	11.7
45	13.2	150	12.6
50	12.4	160	13.6
55	11.2	175	14.3
60	10.6	180	13.7
65	9.7	200	15.8
70	9.5	225	16.7
80	7.7	250	15.8
90	8.4	275	16.5
100	9.3	300	18.9

COM-POWER AL-100
LOG PERIODIC ANTENNA

S/N: 01116

CALIBRATION DATE: DEC. 28, 2004

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	12.1	650	19.8
330	16.7	700	20.5
340	15.2	725	21.4
350	14.0	750	23.0
360	14.1	800	25.2
370	13.2	850	24.7
400	13.9	900	25.0
425	13.5	925	24.4
450	13.9	950	25.6
500	15.6	975	25.3
550	16.9	1000	24.4
600	16.5		

COM-POWER PA-103**PREAMPLIFIER****S/N: 161068****CALIBRATION DATE: DEC. 7, 2004**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	33.3	300	32.7
40	33.3	350	32.8
50	33.2	400	32.7
60	33.2	450	32.5
70	33.2	500	32.6
80	33.2	550	32.4
90	33.2	600	32.1
100	33.0	650	32.6
125	33.1	700	32.1
150	33.1	750	32.2
175	33.0	800	32.0
200	32.9	850	32.1
225	32.8	900	32.0
250	32.9	950	31.8
275	32.9	1000	31.5



FRONT VIEW

ZEBRA TECHNOLOGIES CORP.
CARD PRINTER with RFID
Model: P430I

FCC PART 15 SUBPART C - RADIATED EMISSIONS – 9-20-05

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

ZEBRA TECHNOLOGIES CORP.

CARD PRINTER with RFID

Model: P430I

FCC PART 15 SUBPART C - RADIATED EMISSIONS – 9-20-05

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

ZEBRA TECHNOLOGIES CORP.

CARD PRINTER with RFID

Model: P430I

FCC PART 15 SUBPART C - CONDUCTED EMISSIONS – 9-20-05

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

ZEBRA TECHNOLOGIES CORP.
CARD PRINTER with RFID
Model: P430I

FCC PART 15 SUBPART C - CONDUCTED EMISSIONS – 9-20-05

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



ZEBRA TECHNOLOGIES CORP.

CARD PRINTER with RFID

Model: P430I

FCC PART 15 SUBPART C – FREQUENCY TOLERANCE EMISSIONS – 9-29-05

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

APPENDIX E

DATA SHEETS



RADIATED EMISSIONS

COMPANY NAME: Zebra Tech. Corp. DATE: 9/20/05

EUT: Card Printer EUT S/N: _____

EUT MODEL: P430I LOCATION: ☐ BREA ☐ SILVERADO ☒ AGOURA

SPECIFICATION: FCC 15.225 CLASS: _____ TEST DISTANCE: 3m LAB: F

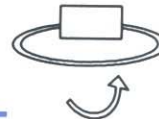
ANTENNA: ☒ LOOP ☐ BICONICAL ☐ LOG ☐ HORN POLARIZATION: ☐ VERT ☐ HORIZ

☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: R. Ramirez

NOTES: Detector Function : Normal 9kHz

Pol. A

Pol. B



Corrected

Frequency (MHz)	Peak Reading (dBuV/m)	Quasi- Peak (dBuV/m)	Antenna Height (meters)	Azimuth (degrees)	Delta * (dB)	Corrected Limit (dBuV/m)	Comments
13.56	41.10	54.31			-69.69	124	

* DELTA = METER READING - CORRECTED LIMIT

CALCULATION OF LIMIT:

Spec limit: $15,848 \text{ uV/m} = 15,848 \log_{10} 20 = 83.99 \text{ dBuV/m}$

$30\text{m to } 3\text{m} = 30/3 = 10 \log_{10} 40 = 40$

LIMIT=123.99



Test Location : Compatible Electronics
Customer :
Manufacturer : Zebra Technologies, Corp.
Eut name : Card Printer
Model : P430I
Serial # : none
Specification : FCC Pt. 15- Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : Engineering
 Clocks: 13.56MHz.
 Test Engineer: R. Ramirez

Page : 1/1
Date : 09/20/2005
Time : 01:46:47 PM
Lab : F
Test Distance : 3.00 Meters

Pol	Freq MHz	Reading dBuV	Cable loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
1V	27.129	24.70	1.80	10.15	0.00	36.65	69.54	-32.89



Test Location : Compatible Electronics
Customer :
Manufacturer : Zebra Technologies, Corp.
Eut name : Card Printer
Model : P430I
Serial # : none
Specification : FCC Pt. 15- Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : Engineering
 Clocks: 13.56MHz.
 Test Engineer: R. Ramirez

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Date : 09/20/2005
Time : 02:11:48 PM
Lab : F
Test Distance : 3.00 Meters

Pol	Freq MHz	Reading dBuV	Cable loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
1V	40.689	42.60	2.02	13.54	33.29	24.86	40.00	-15.14
2V	54.249	48.70	2.33	11.37	33.20	29.21	40.00	-10.79
3V	67.809	47.70	2.42	9.59	33.20	26.51	40.00	-13.49
4V	81.369	47.60	2.70	7.80	33.20	24.90	40.00	-15.10
5V	108.494	53.80	2.94	9.93	33.04	33.63	43.50	-9.87
6V	122.050	45.80	2.99	10.91	33.09	26.61	43.50	-16.89
7V	135.610	43.20	3.09	11.56	33.10	24.75	43.50	-18.75
8H	40.686	42.80	2.02	13.54	33.29	25.07	40.00	-14.93
9H	54.248	43.80	2.33	11.37	33.20	24.31	40.00	-15.69
10H	67.808	42.20	2.42	9.59	33.20	21.01	40.00	-18.99
11H	81.368	42.30	2.70	7.80	33.20	19.60	40.00	-20.40
12H	108.499	48.70	2.94	9.93	33.04	28.53	43.50	-14.97
13H	122.052	41.40	2.99	10.91	33.09	22.21	43.50	-21.29
14H	135.604	45.80	3.09	11.56	33.10	27.35	43.50	-16.15

Test Location : Compatible Electronics
Customer :
Manufacturer : Zebra Technologies, Corp.
Eut name : Card Printer
Model : P430I
Serial # : none
Specification : FCC Pt. 15- Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : Engineering
 Clocks: 14.7456, 32, 24, 10MHz.
 Test Engineer: R. Ramirez
 Spurious Emissions

Page : 1/2
Date : 09/20/2005
Time : 02:25:52 PM
Lab : F
Test Distance : 3.00 Meters

Pol	Freq MHz	Reading dBuV	Cable loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
1V	49.637	57.10	2.19	12.46	33.20	38.55	40.00	-1.45
2V	49.640Qp	54.81	2.19	12.45	33.20	36.26	40.00	-3.74
3V	58.986	60.00	2.47	10.72	33.20	39.99	40.00	-0.01
4V	59.000Qp	55.55	2.47	10.72	33.20	35.54	40.00	-4.46
5V	73.756	57.00	2.52	8.80	33.20	35.11	40.00	-4.89
6V	32.008	56.20	1.92	15.08	33.30	39.90	40.00	-0.10
7V	32.010Qp	55.30	1.92	15.07	33.30	39.00	40.00	-1.00
8V	64.032	49.70	2.46	9.87	33.20	28.83	40.00	-11.17
9V	72.035	54.70	2.46	9.11	33.20	33.08	40.00	-6.92
10V	117.979	53.40	2.97	10.57	33.07	33.87	43.50	-9.63
11V	128.029	47.40	3.03	11.31	33.10	28.63	43.50	-14.87
12V	147.462	40.10	3.18	12.38	33.10	22.56	43.50	-20.94
13V	160.008	44.50	3.24	13.60	33.06	28.28	43.50	-15.22
14V	192.044	48.30	3.37	14.99	32.93	33.73	43.50	-9.77
15V	224.026	42.50	3.50	16.67	32.80	29.86	46.00	-16.14
16V	240.060	44.10	3.56	16.15	32.86	30.95	46.00	-15.05
17V	250.040	44.20	3.60	15.80	32.90	30.70	46.00	-15.30
18H	32.011	51.30	1.92	15.07	33.30	35.00	40.00	-5.00
19H	49.619	38.60	2.19	12.46	33.20	20.05	40.00	-19.95
20H	58.991	41.00	2.47	10.72	33.20	20.99	40.00	-19.01
21H	72.051	44.50	2.46	9.11	33.20	22.88	40.00	-17.12
22H	73.769	41.80	2.52	8.79	33.20	19.91	40.00	-20.09
23H	192.034	54.10	3.37	14.99	32.93	39.53	43.50	-3.97
24H	240.064	53.40	3.56	16.15	32.86	40.25	46.00	-5.75
25H	250.037	44.30	3.60	15.80	32.90	30.80	46.00	-15.20
26V	336.071	50.50	4.02	15.78	32.77	37.53	46.00	-8.47
27V	352.012	51.40	4.12	14.02	32.80	36.74	46.00	-9.26
28V	398.129	40.70	4.49	13.86	32.70	26.34	46.00	-19.66
29V	412.907	38.10	4.50	13.69	32.65	23.64	46.00	-22.36
30V	480.072	38.20	4.62	14.94	32.56	25.21	46.00	-20.79
31V	511.994	45.00	4.70	15.92	32.55	33.07	46.00	-12.93
32H	336.070	56.00	4.02	15.78	32.77	43.03	46.00	-2.97
33H	336.079Qp	54.77	4.02	15.78	32.77	41.80	46.00	-4.20
34H	352.000	52.00	4.12	14.02	32.80	37.34	46.00	-8.66
35H	398.129	43.70	4.49	13.86	32.70	29.34	46.00	-16.66



COMPATIBLE ELECTRONICS

Test Location : Compatible Electronics
Customer :
Manufacturer : Zebra Technologies, Corp.
Eut name : Card Printer
Model : P430I
Serial # : none
Specification : FCC Pt. 15- Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : Engineering
Clocks: 14.7456, 32, 24, 10MHz.
Test Engineer: R. Ramirez
Spurious Emissions

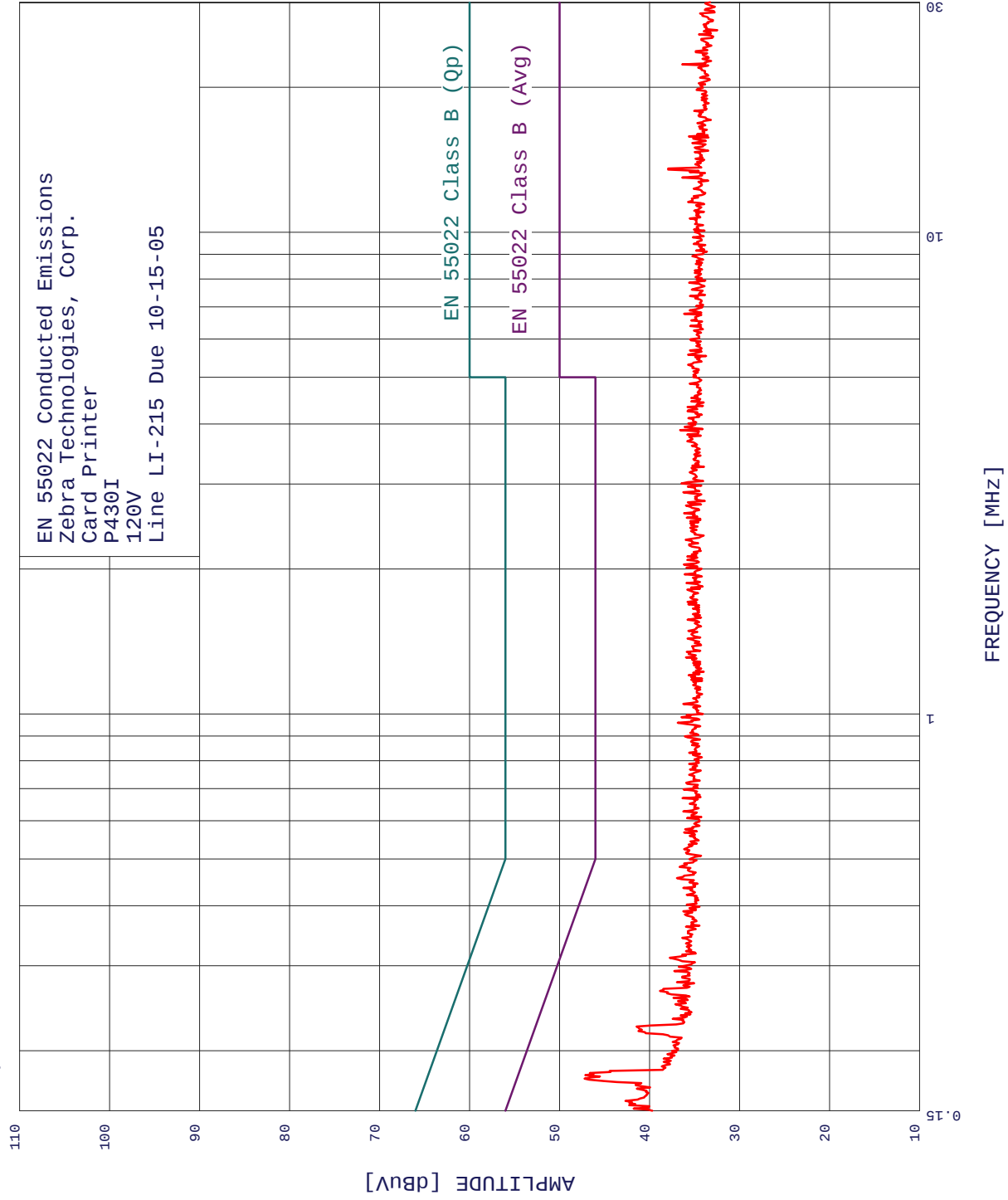
Page : 2/2
Date : 09/20/2005
Time : 02:25:52 PM
Lab : F
Test Distance : 3.00 Meters

Pol	Freq MHz	Reading dBuV	Cable loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
36H	412.891	42.20	4.50	13.69	32.65	27.74	46.00	-18.26
37H	479.999	45.70	4.62	14.94	32.56	32.70	46.00	-13.30
38H	511.997	41.30	4.70	15.92	32.55	29.37	46.00	-16.63



EMISSION LEVEL [dBuV] PEAK
Graph for Peak

8/01/2005 10:55:12





EN 55022 Conducted Emissions
Zebra Technologies, Corp.
Card Printer
P430I
120V

Line LI-215 Due 10-15-05
TEST ENGINEER : R. Ramirez

6 highest peaks above -50.00 dB of EN 55022 Class B (Avg) limit line

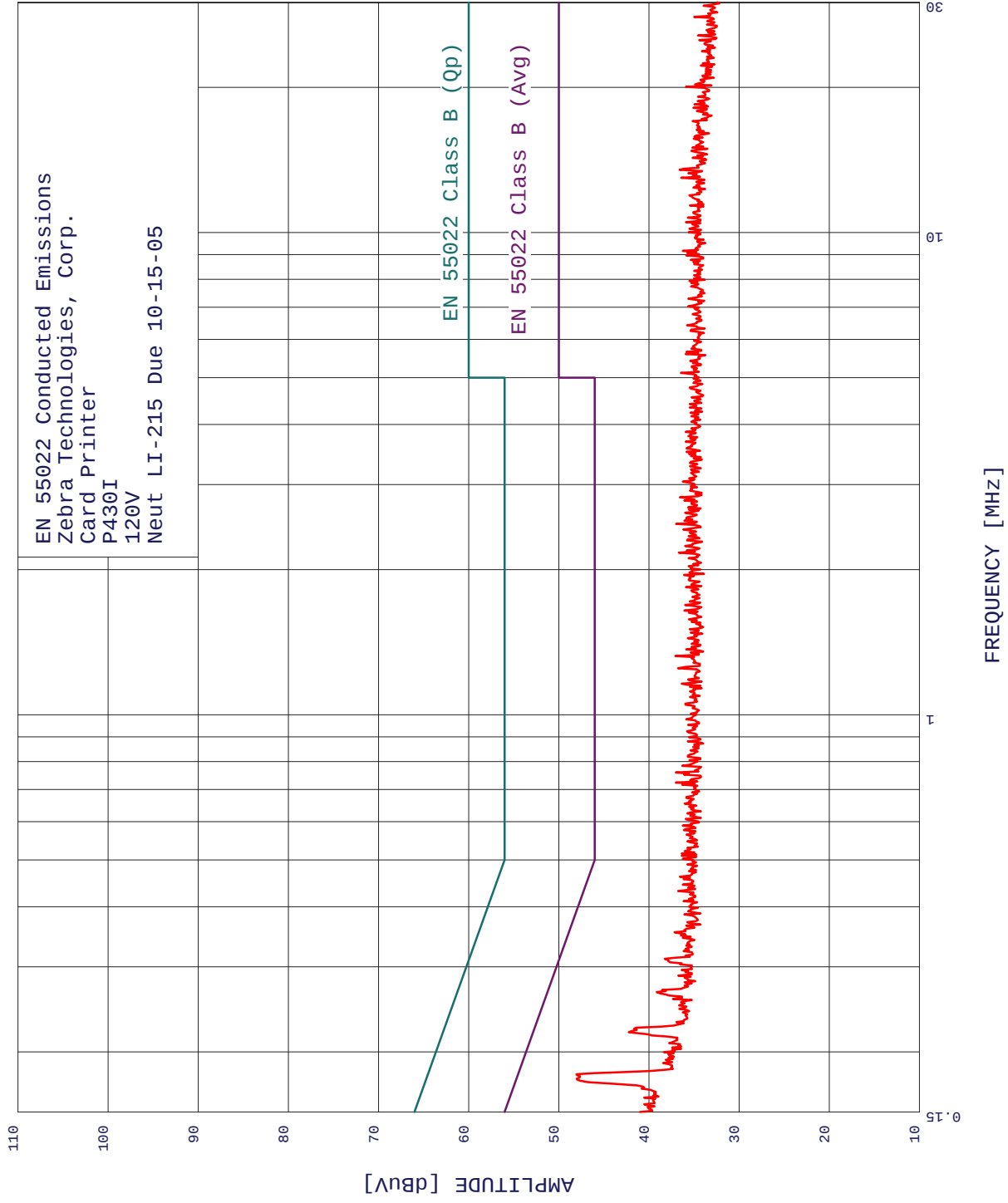
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.175	47.21	54.72	-7.51
2	0.224	41.43	52.65	-11.23
3	13.486	37.92	50.00	-12.08
4	0.266	38.84	51.24	-12.41
5	22.310	36.37	50.00	-13.63
6	0.150	39.69	56.00	-16.31



EMISSION LEVEL [dBuV] PEAK
Graph for Peak

8/01/2005 10:59:22





EN 55022 Conducted Emissions
Zebra Technologies, Corp.
Card Printer
P430I
120V

Neut LI-215 Due 10-15-05
TEST ENGINEER : R. Ramirez

7 highest peaks above -50.00 dB of EN 55022 Class B (Avg) limit line

Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.180	48.02	54.50	-6.48
2	1.325	37.06	46.00	-8.94
3	2.488	36.97	46.00	-9.03
4	0.220	42.23	52.83	-10.59
5	0.312	38.25	49.92	-11.67
6	0.266	39.14	51.24	-12.10
7	0.150	41.00	56.00	-15.00

COMPATIBLE ELECTRONICS

Test Location : Compatible Electronics
Customer :
Manufacturer :
Eut name :
Model :
Serial # :
Specification : FCC Pt. 15- Class B
Distance correction factor ($20 * \log(\text{test}/\text{spec})$) : 0.00
Test Mode :
Page : 1/1
Date : 05/03/2006
Time : 07:37:58 AM
Lab : F
Test Distance : 3.00 Meters

Pol	Freq MHz	Reading dBuV	Cable loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
1V	13.553	28.20	1.53	10.19	0.00	39.92	40.00	-0.08
2V	13.567	25.70	1.53	10.18	0.00	37.42	40.00	-2.58

