FCC PART 15 SUBPART B and C
TEST REPORT

for

STAR 3000 SYSTEM RFID READER

MODEL: STAR-3000-F

Prepared for

MOJIX, INC.
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DATE: FEBRUARY 20, 2012

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
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GENERAL REPORT SUMMARY

Compatible Electronics Inc. generates this electromagnetic emission test report, 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:	Star 3000 System RFID Reader Model: STAR-3000-F S/N: N/A
Product Description:	See Expository Statement
Modifications:	Please refer to Appendix B for details.
Customer:	Mojix, Inc 11075 Santa Monica Boulevard, Suite 350 Los Angeles, California 90025
Test Date(s):	September 20 and 26, 2011
Test Specifications:	Emissions requirements CFR Title 47, Part 15, Subpart B and Subpart C, sections 15.205,15.209 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 to 30 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and Subpart C, section 15.207.
2	Radiated RF Emissions for the Transmitter Portion 10 kHz – 9.3 GHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249.
3	Radiated RF Emissions for the Digital Portion 30 MHz – 1000 MHz	Complies with the **Class A** limits of CFR Title 47, Part 15, Subpart B.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Star 3000 System RFID Reader, Model: STAR-3000-F. The emissions 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 A** specification limits defined by CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205, 15.207, 15.209, and 15.249 for the transmitter portion.

This test report covers the FCC 15.249 portion of the RFID reader when it is in wireless mode. Please see the test report B11028D1 for when the RFID reader is in wired mode.

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.

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

Mojix, Inc.

Shawn Manesh	Senior VP Operations
Hassan Syed	Manger RF Design Group
Gus Mendoza	Engineer

Compatible Electronics Inc.

Alex Benitez	Test Technician
Kyle Fujimoto	Test Engineer
James Ross	Test Engineer

2.4 Date Test Sample was Received

The test sample was received prior to the date of testing.

2.5 Disposition of the Test Sample

The test sample has not yet been returned as of the date of this report.

2.6 Abbreviations and Acronyms

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

FCC	Federal Communications Commission
RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
ITE	Information Technology Equipment
LISN	Line Impedance Stabilization Network
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
N/A	Not Applicable
Ltd.	Limited
Inc.	Incorporated
IR	Infrared

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4: 2009	American National Standard for 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 – Emissions

The EUT was connected to a laptop, and power supply via its ethernet, DC in ports, respectively. Antennas were directly connected to CMD ANT 1 and the CMD ANT 2 port of the EUT.

The EUT was continuously transmitting.

The low, middle, and high channels were tested and were changed via the program on the laptop.

Note: The Sync in / Sync out ports of the EUT will not be used. Also USB ports 1 and 2 along with Ethernet port #2 are for diagnostic purposes only and will not be functional to the end user.

The Tx port of the EUT was also not terminated because this port is only used when the RFID Reader is in wired mode as part of a system that is certified to FCC 15.247. Please see the test report **B11028D1** for when the RFID Reader is in wired mode.

The antennas that will be used on the EUT will be ½ wave center-fed dipole antennas (ANT-916-CW-HWR-RPS) with reverse polarity SMA connector. The EUT will include reverse polarity TNC to reverse polarity SMA adapters so that these antennas can be connected to the EUT.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The final emissions data was taken in this mode of operation and any cables were maximized. All initial investigations were performed with the measurement receiver in manual mode scanning the frequency range continuously. Photographs of the test setup are in Appendix D of this report.

4.1.1 Cable Construction and Termination

Cable 1 This is a 50-foot unshielded cable connecting the RFID reader to the laptop. The cable has an RJ-45 connector at each end.

Cable 2 This is a 5-meter braid shielded cable connecting the RFID reader to the DC power supply. The cable has a Positronics FR11FP822LM5 connector at the RFID reader end and a Positronics P/N: 9942170007 connector at the DC power supply end. 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	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
STAR 3000 SYSTEM RFID READER	MOJIX, INC.	STAR-3000-F	N/A	VEDSTAR3000
POWER SUPPLY FOR RFID READER	TRACO POWER	TEX 120-124	N/A	N/A
LAPTOP	DELL	PP19L	N/A	N/A
(2) ANTENNAS	ANTENNA FACTOR	ANT-916-CW-HWR-RPS	N/A	N/A

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	2637A03618	May 27, 2011	May 27, 2012
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A13404	May 27, 2011	May 27, 2012
Quasi-Peak Adapter	Hewlett Packard	85650A	2430A00424	May 27, 2011	May 27, 2012
EMI Receiver	Rohde & Schwarz	ESIB40	100194	November 19, 2010	November 19, 2012
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
Loop Antenna	Com-Power	AL-130	17089	January 21, 2011	January 21, 2012
Biconical Antenna	Com Power	AB-900	15250	June 8, 2011	June 8, 2012
Log Periodic Antenna	Com Power	AL-100	16252	June 8, 2011	June 8, 2012
Horn Antenna	Com-Power	AH-118	071175	March 18, 2010	March 18, 2012
Preamplifier	Com-Power	PA-102	1017	January 11, 2011	January 11, 2012
Microwave Preamplifier	Com-Power	PA-118	181656	December 22, 2010	December 22, 2011
Turntable	Com Power	TT-100	N/A	N/A	N/A
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
RF CONDUCTED EMISSIONS TEST EQUIPMENT					
Emissions Program	Compatible Electronics	2.3 (SR19)	N/A	N/A	N/A
Transient Limiter	Seaward	252A910	1	November 2, 2010	November 2, 2011
LISN	Com Power	LI-215	12076	June 20, 2011	June 20, 2012
LISN	Com Power	LI-215	12090	June 20, 2011	June 20, 2012

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1.2 of this report for Emissions 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.

6.3 Facility Environmental Characteristics

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.

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 measurement receiver was used as a measuring meter. The data was collected with the measurement receiver 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 measurement receiver's input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the measurement receiver. 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 for conducted emissions.

7.1.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer and EMI Receiver were used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument (the Loop Antenna contains a built in amplifier). The Com-Power Preamplifier Model: PA-102 was used for the frequencies from 30 MHz to 1 GHz, while the Com-Power Microwave Preamplifier Model: PA-118 was used for the frequencies above 1 GHz. The spectrum analyzer and the EMI Receiver were used in the peak detect mode with the "Max Hold" feature activated. In this mode, the measuring receiver 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 frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the EMI Receiver to keep the amplitude reading calibrated.

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 1000 MHz	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 by the Radiated Emission Manual Test software. 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 loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test (continued)

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 the final test data (10 meters for the Loop Antenna and also for the **Class A** portion of the testing for the digital portion).

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 15.209 and 15.249 for the transmitter portion.

The EUT complies with the **Class A** limits of CFR Title 47, Part 15, Subpart B for the digital portion.

7.1.3 RF Emissions Test Results

Table 1.0 CONDUCTED EMISSION RESULTS (120V)
RFID READER, Model: STAR-3000-F

Frequency MHz	Emission Level* dBuV	Specification Limit dBuV	Delta dB
0.701	45.22 (A)	46.00	-0.78
0.466	45.65 (A)	46.58	-0.92
0.464	45.46 (A)	46.62	-1.16
0.698	44.42 (A)	46.00	-1.58
1.055	42.34 (A)	46.00	-3.66
1.412	42.20 (A)	46.00	-3.80

Table 2.0 RADIATED EMISSION RESULTS
RFID READER, Model: STAR-3000-F

Frequency MHz	Emission Level* dBuV	Specification Limit dBuV	Delta dB
156.234	41.55 (QP)	43.50	-1.95
136.703	41.04 (QP)	43.50	-2.46
117.173	40.23	43.50	-3.27
58.575	35.71	39.10	-3.39
195.292	39.97	43.50	-3.53
312.478	42.46	46.00	-3.54

Notes:
* The complete emissions data is given in Appendix E of this report.
(A) Average Reading
(QP) Quasi-Peak Reading

**The factors for the antennas and preamplifier gain are attached in Appendix D of this report.

8. CONCLUSIONS

The Star 3000 System RFID Reader, Model: STAR-3000-F, as tested, meets all of the **Class A** specification limits defined in CFR Title 47, Part 15, Subpart B for the digital portion; and the **Class B** specification limits defined in CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249 for the transmitter portion.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP LAB CODES 200063-0, 200528-0, 200527-0

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

NVLAP listing links

Agoura Division / **Brea Division** / **Silverado/Lake Forest Division**

.Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."

ANSI listing CETCB

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).
US/EU MRA list NIST MRA site

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).
APEC MRA list NIST MRA site

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

VCCI Support member: Please visit http://www.vcci.jp/vcci_e/

FCC Listing, from FCC OET site
FCC test lab search https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm

Compatible Electronics IC listing can be found at:
http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.249 and/or FCC **Class B** 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.

- On the STAR 3000 side – Add a ferrite to the power supply cable on the STAR 3000 side (FairRite P/N: 0461164281)
- Ground the Ethernet Connector on the EUT to chassis ground via copper tape on the STAR 3000 side.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Star 3000 System RFID Reader
Model: STAR-3000-F
S/N: N/A

ALSO APPROVED UNDER THIS REPORT:

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

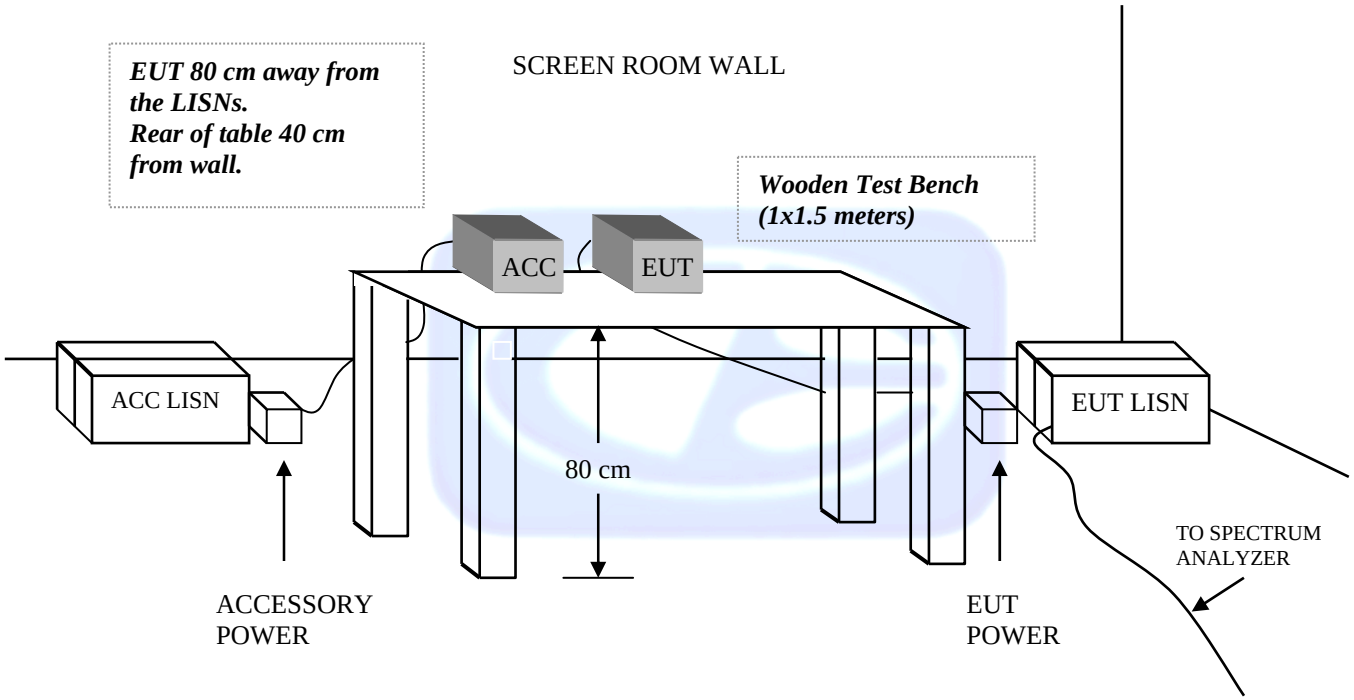
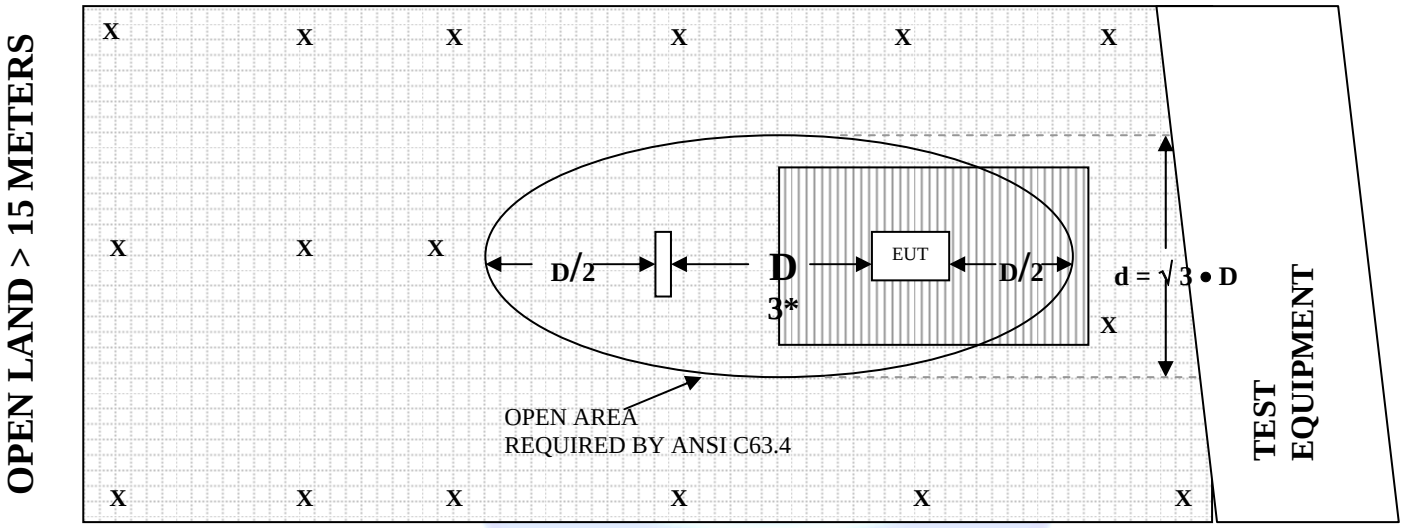


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE – 3 METERS*

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

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

**** FOR THE LOOP ANTENNA AND CLASS A TESTING FOR THE DIGITAL PORTION, D IS 10 METERS.***

COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: JANUARY 21, 2011

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-41.9	9.6
0.01	-41.79	9.71
0.02	-41.43	10.07
0.05	-41.53	9.97
0.07	-41.47	10.03
0.1	-41.44	10.06
0.2	-41.61	9.89
0.3	-41.62	9.88
0.5	-41.66	9.84
0.7	-41.48	10.02
1	-41.13	10.37
2	-40.89	10.61
3	-41.00	10.50
4	-41.14	10.36
5	-41.02	10.48
10	-40.69	10.82
15	-40.41	11.09
20	-41.07	10.43
25	-42.10	9.40
30	-41.15	10.35

COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15250

CALIBRATION DATE: JUNE 8, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	10.90	100	9.50
35	11.00	120	12.10
40	11.80	140	11.40
45	11.60	160	12.40
50	11.40	180	15.70
60	9.80	200	16.20
70	7.00	250	16.10
80	5.70	275	19.00
90	7.00	300	9.50

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16252

CALIBRATION DATE: JUNE 8, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	13.50	700	20.40
400	15.50	800	20.60
500	15.80	900	20.10
600	20.20	1000	22.80

COM POWER AH-118

HORN ANTENNA

S/N: 071175

CALIBRATION DATE: MARCH 18, 2010

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	22.2	10.0	39.8
1.5	24.2	10.5	40.2
2.0	27.2	11.0	39.7
2.5	27.8	11.5	39.9
3.0	30.5	12.0	41.7
3.5	30.9	12.5	42.7
4.0	31.9	13.0	42.3
4.5	33.2	13.5	40.3
5.0	33.6	14.0	42.6
5.5	36.2	14.5	43.4
6.0	35.8	15.0	41.9
6.5	36.1	15.5	40.8
7.0	37.9	16.0	41.0
7.5	37.4	16.5	41.5
8.0	38.0	17.0	44.5
8.5	38.8	17.5	47.6
9.0	38.0	18.0	50.8
9.5	39.2		

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: JANUARY 11, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	38.1	300	38.1
40	38.2	350	38.0
50	38.2	400	37.9
60	38.2	450	37.7
70	38.2	500	37.6
80	38.2	550	37.9
90	38.2	600	37.9
100	38.1	650	37.7
125	38.2	700	37.9
150	38.2	750	37.5
175	38.2	800	37.6
200	38.2	850	37.6
225	38.2	900	37.0
250	38.2	950	37.2
275	38.2	1000	36.8

COM-POWER PA-118

PREAMPLIFIER

S/N: 181656

CALIBRATION DATE: DECEMBER 22, 2010

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.90	10.0	26.07
1.5	26.50	10.5	24.97
2.0	26.79	11.0	24.79
2.5	26.90	11.5	24.33
3.0	27.03	12.0	24.24
3.5	26.94	12.5	24.92
4.0	27.18	13.0	24.52
4.5	26.79	13.5	24.33
5.0	26.25	14.0	24.56
5.5	26.16	14.5	24.99
6.0	25.52	15.0	26.06
6.5	25.29	15.5	26.87
7.0	24.45	16.0	25.95
7.5	24.18	16.5	24.69
8.0	24.02	17.0	24.20
8.5	24.54	17.5	25.12
9.0	24.91	18.0	26.03
9.5	25.42		

FRONT VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
MODEL: STAR-3000-F
FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
MODEL: STAR-3000-F
FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
MODEL: STAR-3000-F
RADIATED EMISSIONS – FCC CLASS A

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
MODEL: STAR-3000-F
RADIATED EMISSIONS – FCC CLASS A

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
MODEL: STAR-3000-F
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
MODEL: STAR-3000-F
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Model: STAR-3000-F

Date: 09/20/2011
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
904.44	86.73	V	94	-7.27	Peak	1	180	
1808.88	38.51	V	74	-35.49	Peak	1.25	135	
1808.88	26.11	V	54	-27.89	Avg	1.25	135	
2713.32	41.31	V	74	-32.69	Peak	1.35	155	
2713.32	29.29	V	54	-24.71	Avg	1.35	155	
3617.76	44.51	V	74	-29.49	Peak	1.45	165	
3617.76	31.65	V	54	-22.35	Avg	1.45	165	
4522.2	47.46	V	74	-26.54	Peak	1.55	175	
4522.2	34.64	V	54	-19.36	Avg	1.55	175	
5426.64								**no emissions found**
5426.64								
6331.08								**no emissions found**
6331.08								
7235.52								**no emissions found**
7235.52								
8139.96								**no emissions found**
8139.96								
9044.4								**no emissions found**
9044.4								

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Model: STAR-3000-F

Date: 09/20/2011
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
904.44	84.53	H	94	-9.47	Peak	1	135	
1808.88	37.87	H	74	-36.13	Peak	1.25	155	
1808.88	25.77	H	54	-28.23	Avg	1.25	155	
2713.32	42.81	H	74	-31.19	Peak	1.15	165	
2713.32	29.37	H	54	-24.63	Avg	1.15	165	
3617.76	44.89	H	74	-29.11	Peak	1.25	175	
3617.76	31.66	H	54	-22.34	Avg	1.25	175	
4522.2	47.66	H	74	-26.34	Peak	1.35	185	
4522.2	34.64	H	54	-19.36	Avg	1.35	185	
5426.64								**no emissions found**
5426.64								
6331.08								**no emissions found**
6331.08								
7235.52								**no emissions found**
7235.52								
8139.96								**no emissions found**
8139.96								
9044.4								**no emissions found**
9044.4								

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Model: STAR-3000-F

Date: 09/20/2011
Labs: B and D
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
915.9	84.99	V	94	-9.01	Peak	1.5	90	
1831.8	45.04	V	74	-28.96	Peak	1.25	225	
1831.8	32.98	V	54	-21.02	Avg	1.25	225	
2747.7	41.89	V	74	-32.11	Peak	1.35	255	
2747.7	29.42	V	54	-24.58	Avg	1.35	255	
3663.6	44.59	V	74	-29.41	Peak	1.25	265	
3663.6	31.73	V	54	-22.27	Avg	1.25	265	
4579.5	46.95	V	74	-27.05	Peak	1.35	285	
4579.5	34.57	V	54	-19.43	Avg	1.35	285	
5495.4								**no emissions found**
5495.4								
6411.3								**no emissions found**
6411.3								
7327.2								**no emissions found**
7327.2								
8243.1								**no emissions found**
8243.1								
9159								**no emissions found**
9159								

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Model: STAR-3000-F

Date: 09/20/2011
Labs: B and D
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
915.9	83.17	H	94	-10.83	Peak	1.5	90	
1831.8	38.99	H	74	-35.01	Peak	1.25	225	
1831.8	26.97	H	54	-27.03	Avg	1.25	225	
2747.7	37.51	H	74	-36.49	Peak	1.35	165	
2747.7	25.12	H	54	-28.88	Avg	1.35	165	
3663.6	40.11	H	74	-33.89	Peak	1.25	175	
3663.6	27.44	H	54	-26.56	Avg	1.25	175	
4579.5	42.74	H	74	-31.26	Peak	1.35	185	
4579.5	30.31	H	54	-23.69	Avg	1.35	185	
5495.4								**no emissions found**
5495.4								
6411.3								**no emissions found**
6411.3								
7327.2								**no emissions found**
7327.2								
8243.1								**no emissions found**
8243.1								
9159								**no emissions found**
9159								

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Model: STAR-3000-F

Date: 09/20/2011
Labs: B and D
Tested By: Kyle Fujimoto

High Channel
Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
927.36	91.96	V	94	-2.04	Peak	1.5	135	
1854.72	42.06	V	74	-31.94	Peak	1.25	155	
1854.72	27.55	V	54	-26.45	Avg	1.25	155	
2782.08	42.96	V	74	-31.04	Peak	1.35	165	
2782.08	29.41	V	54	-24.59	Avg	1.35	165	
3709.44	50.04	V	74	-23.96	Peak	1.25	135	
3709.44	40.45	V	54	-13.55	Avg	1.25	135	
4636.8	46.39	V	74	-27.61	Peak	1.35	145	
4636.8	34.44	V	54	-19.56	Avg	1.35	145	
5564.16								**no emissions found**
5564.16								
6491.52								**no emissions found**
6491.52								
7418.88								**no emissions found**
7418.88								
8346.24								**no emissions found**
8346.24								
9273.6								**no emissions found**
9273.6								

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Model: STAR-3000-F

Date: 09/20/2011
Labs: B and D
Tested By: Kyle Fujimoto

High Channel
Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
927.36	88.06	H	94	-5.94	Peak	1	90	
1854.72	39.21	H	74	-34.79	Peak	1.25	135	
1854.72	26.09	H	54	-27.91	Avg	1.25	135	
2782.08	41.32	H	74	-32.68	Peak	1.35	145	
2782.08	29.44	H	54	-24.56	Avg	1.35	145	
3709.44	45.43	H	74	-28.57	Peak	1.25	165	
3709.44	31.58	H	54	-22.42	Avg	1.25	165	
4636.8	45.59	H	74	-28.41	Peak	1.35	175	
4636.8	34.49	H	54	-19.51	Avg	1.35	175	
5564.16								**no emissions found**
5564.16								
6491.52								**no emissions found**
6491.52								
7418.88								**no emissions found**
7418.88								
8346.24								**no emissions found**
8346.24								
9273.6								**no emission found**
9273.6								

FCC 15.249 and FCC Class B

Mojix, Inc.
STAR 3000 System RFID Reader
Model: STAR-3000-F

Date: 09/26/2011
Labs: B and D
Tested By: Kyle Fujimoto

Digital Portion and Non-Harmonic Emissions from the EUT

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 1 GHz to 9.3 GHz
								for both Vertical and Horizontal
								Polarizations
								No Emissions Found for the
								Non-Harmonic Emissions
								from 1 GHz to 9.3 GHz
								for both Vertical and Horizontal
								Polarizations

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Model: STAR-3000-F

Date: 09/20/2011
Lab: D
Tested By: Kyle Fujimoto

Band Edges

Transmit Mode - Vertical Polarization (Worst Case Polarization)

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
904.44	86.73	V	94	-7.27	Peak	1.25	45	Fundamental of
								Low Channel
902	49.19	V	46	3.19	Peak	1.25	45	Band Edge of
902	44.6	V	46	-1.4	QP	1.25	45	Low Channel

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Model: STAR-3000-F

Date: 09/20/2011
Lab: D
Tested By: Kyle Fujimoto

Band Edges

Transmit Mode - Vertical Polarization (Worst Case Polarization)

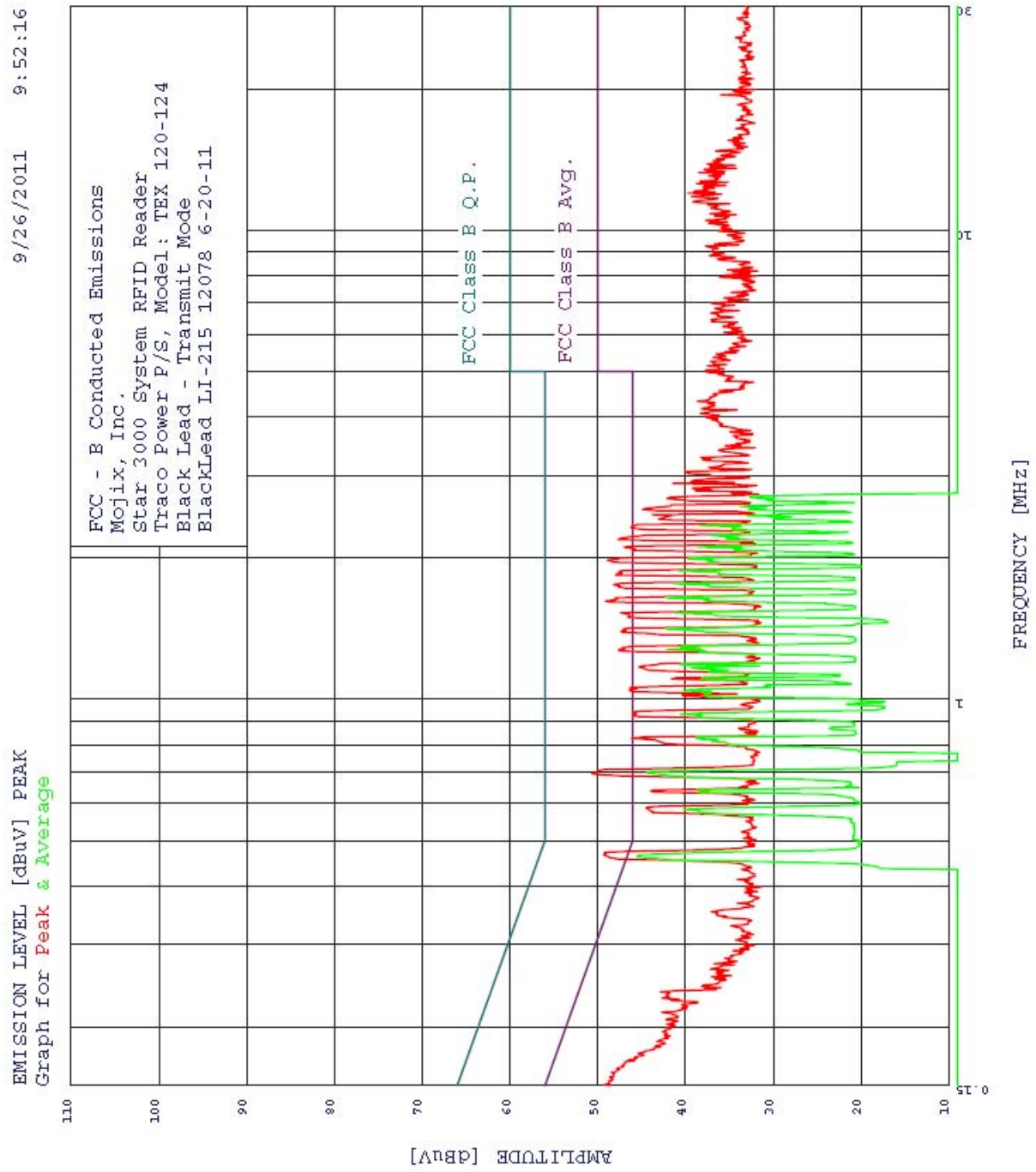
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
927.36	91.96	V	94	-2.04	Peak	1.25	315	Fundamental of
								High Channel
928	48.74	V	46	2.74	Peak	1.25	315	Band Edge of
928	43.3	V	46	-2.7	QP	1.25	315	High Channel

Test Location : Compatible Electronics **Page** : 1/1
Customer : Mojix_Inc. **Date** : 9/22/2011
Manufacturer : Mojix_Inc. **Time** : 11:06:51
Eut name : STAR 3000 System RFID Reader **Lab** : D
Model : N/A **Test Distance** : 3
Serial # : STAR-3000-F
Specification : FCC Class B
Distance correction factor (20 * log(test/spec) : 0.00
Test Mode : Qualification Scan
Emissions from the Transmitter
Radiated Emissions
Test Engineer: Kyle Fujimoto

Pol	Freq	Rdng	Cable loss	Ant factor	Amp gain	Cor'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV	dBuV/m	dB
1V	36.834	55.80	0.49	11.31	38.17	29.42	40.00	-10.58
2H	36.885	43.90	0.49	11.31	38.17	17.53	40.00	-22.47
3V	47.455	58.50	0.75	11.50	38.20	32.55	40.00	-7.45
4H	47.506	54.90	0.75	11.50	38.20	28.95	40.00	-11.05
5V	83.326	65.60	1.13	6.15	38.20	34.68	40.00	-5.32
6H	121.112	53.70	1.10	12.06	38.19	28.67	43.50	-14.83
7V	121.117	60.80	1.10	12.06	38.19	35.77	43.50	-7.73
8H	140.618	60.00	1.16	11.43	38.20	34.40	43.50	-9.10
9V	162.153	55.40	1.25	12.77	38.20	31.23	43.50	-12.27
10H	162.158	50.20	1.25	12.78	38.20	26.03	43.50	-17.47
11H	200.006	56.70	1.40	16.20	38.20	36.10	43.50	-7.40
12V	300.003	51.60	1.90	13.50	38.10	28.90	46.00	-17.10
13H	312.478	64.80	1.95	13.78	38.07	42.46	46.00	-3.54
14V	312.501	49.40	1.95	13.78	38.07	27.06	46.00	-18.94
15H	366.694	51.40	2.03	14.90	37.97	30.36	46.00	-15.64
16V	366.697	50.20	2.03	14.90	37.97	29.16	46.00	-16.84

Test Location : Compatible Electronics **Page** : 1/1
Customer : Mojix Inc. **Date** : 9/19/2011
Manufacturer : Mojix Inc. **Time** : 15:35:47
Eut name : STAR 3000 System RFID Reader **Lab** : D
Model : STAR-3000-F **Test Distance** : 10
Serial # : TBD
Specification : FCC Class A
Distance correction factor (20 * log(test/spec) : 0.00
Test Mode : Digital Portion 30 MHz to 1000 MHz
Reading were verified to not be higher when
The Tx was turned on
Test Engineer: Kyle Fujimoto

Pol	Freq	Rdng	Cable loss	Ant factor	Amp gain	Cor'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV	dBuV/m	dB
1V	39.045	57.20	1.28	11.66	38.19	31.95	39.10	-7.15
2V	58.575	62.50	1.40	10.01	38.20	35.71	39.10	-3.39
3H	58.588	45.70	1.40	10.01	38.20	18.91	39.10	-20.19
4V	78.105	60.80	1.70	5.93	38.20	30.23	39.10	-8.87
5H	78.118	49.40	1.70	5.93	38.20	18.83	39.10	-20.27
6V	97.639	66.80	1.88	8.93	38.12	39.49	43.50	-4.01
7H	97.648	60.40	1.88	8.94	38.12	33.09	43.50	-10.41
8H	117.169	59.30	2.04	11.76	38.17	34.93	43.50	-8.57
9V	117.173	64.60	2.04	11.76	38.17	40.23	43.50	-3.27
10H	124.989	55.90	2.10	11.92	38.20	31.71	43.50	-11.79
11H	136.699	56.60	2.20	11.51	38.20	32.11	43.50	-11.39
12V	136.703	66.90	2.20	11.51	38.20	42.41	43.50	-1.09
13V	136.703Qp	65.53	2.20	11.51	38.20	41.04	43.50	-2.46
14V	150.009	55.70	2.30	11.92	38.20	31.72	43.50	-11.78
15H	156.229	57.20	2.35	12.22	38.20	33.57	43.50	-9.93
16V	156.234	65.60	2.35	12.22	38.20	41.97	43.50	-1.53
17V	156.234Qp	65.18	2.35	12.22	38.20	41.55	43.50	-1.95
18H	195.289	46.00	2.58	16.09	38.20	26.47	43.50	-17.03
19V	195.292	59.50	2.58	16.09	38.20	39.97	43.50	-3.53
20V	249.998	55.90	2.80	16.10	38.20	36.60	46.40	-9.80
21H	249.998	51.00	2.80	16.10	38.20	31.70	46.40	-14.70


9/26/2011 9:52:16
FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
Black Lead - Transmit Mode
BlackLead LI-215 12078 6-20-11
FCC Class B Q.P.
FCC Class B Avg.
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

page 1/1

9/26/2011 9:52:16

FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
FCC Class B - Black Lead - Transmit Mode
BlackLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.694	50.66	46.00	4.66**
2	1.620	49.10	46.00	3.10**
3	1.981	48.90	46.00	2.90**
4	0.466	49.30	46.58	2.73**
5	1.754	48.20	46.00	2.20**
6	1.840	47.90	46.00	1.90**
7	2.190	47.69	46.00	1.69**
8	1.269	47.60	46.00	1.60**
9	1.528	47.40	46.00	1.40**
10	1.397	47.30	46.00	1.30**
11	2.111	47.00	46.00	1.00**
12	1.049	46.40	46.00	0.40**
13	2.322	46.19	46.00	0.19**
14	0.826	46.13	46.00	0.13**
15	0.924	46.02	46.00	0.02**
16	1.172	45.30	46.00	-0.70**
17	2.540	44.88	46.00	-1.12**
18	0.586	44.49	46.00	-1.51**
19	0.637	43.98	46.00	-2.02**
20	2.475	43.78	46.00	-2.22**
21	2.423	43.09	46.00	-2.91**
22	2.679	42.08	46.00	-3.92**
23	1.106	41.60	46.00	-4.40**
24	2.885	41.47	46.00	-4.53
25	1.021	40.40	46.00	-5.60**
26	3.059	40.06	46.00	-5.94
27	2.916	39.37	46.00	-6.63
28	2.811	39.17	46.00	-6.83
29	2.781	38.87	46.00	-7.13
30	4.316	38.62	46.00	-7.38
31	4.071	38.33	46.00	-7.67
32	3.277	38.26	46.00	-7.74
33	4.159	38.23	46.00	-7.77
34	3.987	37.63	46.00	-8.37
35	4.980	37.60	46.00	-8.40
36	3.124	37.36	46.00	-8.64
37	0.238	42.83	52.17	-9.33
38	3.401	36.25	46.00	-9.75
39	4.552	36.21	46.00	-9.79
40	0.215	42.73	53.00	-10.28
41	12.003	39.69	50.00	-10.31
42	4.774	35.51	46.00	-10.49
43	3.474	35.45	46.00	-10.55
44	11.814	39.28	50.00	-10.72
45	11.498	39.15	50.00	-10.85
46	12.129	39.00	50.00	-11.00
47	3.722	34.94	46.00	-11.06
48	0.207	42.23	53.31	-11.08

** Please See the Average Readings on the Next Page and on the Plot

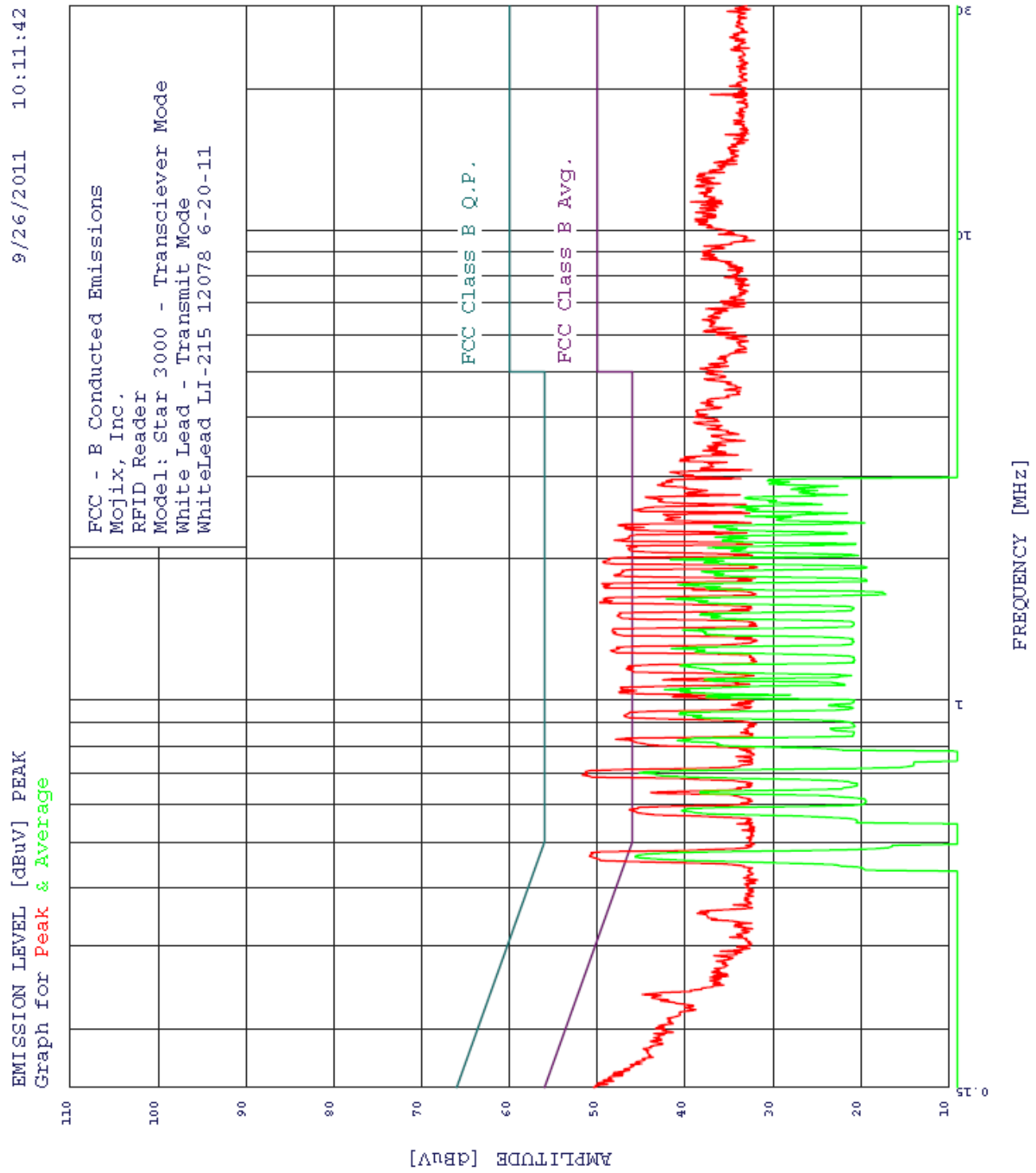
page 1/1

9/26/2011 9:52:16

FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
FCC Class B - Black Lead - Transmit Mode
BlackLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.464	45.46	46.62	-1.16
2	0.698	44.42	46.00	-1.58
3	1.412	42.20	46.00	-3.80
4	1.646	42.20	46.00	-3.80
5	1.276	42.10	46.00	-3.90
6	1.763	41.33	46.00	-4.67
7	1.528	41.18	46.00	-4.82
8	1.879	40.84	46.00	-5.16
9	1.290	40.57	46.00	-5.43
10	0.929	40.56	46.00	-5.44
11	1.184	40.51	46.00	-5.49
12	0.583	40.25	46.00	-5.75
13	1.043	40.25	46.00	-5.75
14	1.992	39.76	46.00	-6.24
15	1.166	39.33	46.00	-6.67
16	0.826	38.76	46.00	-7.24
17	0.641	38.65	46.00	-7.35
18	2.111	38.58	46.00	-7.42
19	0.577	38.54	46.00	-7.46
20	0.919	38.48	46.00	-7.52
21	2.346	38.45	46.00	-7.55
22	1.262	38.34	46.00	-7.66
23	1.106	38.14	46.00	-7.86
24	1.629	37.93	46.00	-8.07
25	1.032	37.86	46.00	-8.14
26	1.016	37.63	46.00	-8.37
27	1.745	37.55	46.00	-8.45
28	1.971	37.51	46.00	-8.49
29	1.148	37.23	46.00	-8.77
30	2.238	37.15	46.00	-8.85
31	0.814	37.00	46.00	-9.00
32	1.849	36.22	46.00	-9.78
33	2.201	35.35	46.00	-10.65
34	2.310	34.70	46.00	-11.30
35	2.089	34.50	46.00	-11.50
36	2.582	33.88	46.00	-12.12
37	2.462	33.01	46.00	-12.99
38	2.540	32.81	46.00	-13.19
39	2.707	32.66	46.00	-13.34
40	1.066	31.07	46.00	-14.93
41	2.665	30.83	46.00	-15.17
42	2.436	30.01	46.00	-15.99
43	1.594	24.07	46.00	-21.93
44	0.867	23.61	46.00	-22.39
45	0.651	21.80	46.00	-24.20
46	0.974	21.63	46.00	-24.37
47	0.662	21.25	46.00	-24.75
48	0.550	21.18	46.00	-24.82


9/26/2011 10:11:42
FCC - B Conducted Emissions
Mojix, Inc.
RFID Reader
Model: Star 3000 - Transciever Mode
White Lead - Transmit Mode
WhiteLead LI-215 12078 6-20-11
FCC Class B Q.P.
FCC Class B Avg.
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

page 1/1

9/26/2011 10:11:42

FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
FCC Class B - White Lead - Transmit Mode
WhiteLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.694	51.73	46.00	5.73**
2	0.466	50.87	46.58	4.30**
3	1.611	49.70	46.00	3.70**
4	1.772	49.48	46.00	3.48**
5	1.971	49.36	46.00	3.36**
6	1.276	48.49	46.00	2.49**
7	1.404	48.30	46.00	2.30**
8	1.849	48.08	46.00	2.08**
9	2.190	48.06	46.00	2.06**
10	0.826	47.89	46.00	1.89**
11	1.512	47.71	46.00	1.71**
12	2.358	47.66	46.00	1.66**
13	1.043	47.54	46.00	1.54**
14	1.066	47.35	46.00	1.35**
15	0.929	46.95	46.00	0.95**
16	2.322	46.86	46.00	0.86**
17	1.166	46.67	46.00	0.67**
18	2.134	46.66	46.00	0.66**
19	2.100	46.46	46.00	0.46**
20	0.586	46.34	46.00	0.34**
21	2.540	45.85	46.00	-0.15**
22	2.707	44.54	46.00	-1.46**
23	0.637	43.94	46.00	-2.06**
24	2.870	43.13	46.00	-2.87**
25	1.106	42.56	46.00	-3.44**
26	2.488	42.45	46.00	-3.55**
27	2.423	42.25	46.00	-3.75**
28	3.059	41.73	46.00	-4.27
29	1.016	41.43	46.00	-4.57**
30	3.226	40.65	46.00	-5.35
31	3.260	40.55	46.00	-5.45
32	0.153	49.91	55.82	-5.91
33	3.294	40.06	46.00	-5.94
34	2.751	40.04	46.00	-5.96**
35	0.156	49.32	55.69	-6.37
36	1.717	39.19	46.00	-6.81**
37	3.903	39.01	46.00	-6.99
38	4.008	38.82	46.00	-7.18
39	0.160	48.23	55.47	-7.24
40	0.162	48.13	55.38	-7.25
41	4.114	38.72	46.00	-7.28
42	0.237	44.89	52.21	-7.32
43	3.107	38.24	46.00	-7.76
44	4.294	38.21	46.00	-7.79
45	3.401	37.97	46.00	-8.03
46	4.825	37.80	46.00	-8.20
47	4.954	37.59	46.00	-8.41
48	3.781	37.50	46.00	-8.50

** Please See the Average Readings on the Next Page and on the Plot

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FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
FCC Class B - White Lead - Transmit Mode
WhiteLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.701	45.22	46.00	-0.78
2	0.466	45.65	46.58	-0.92
3	1.055	42.34	46.00	-3.66
4	1.646	42.16	46.00	-3.84
5	1.992	41.66	46.00	-4.34
6	1.290	41.58	46.00	-4.42
7	0.822	40.90	46.00	-5.10
8	1.763	40.83	46.00	-5.17
9	0.934	40.69	46.00	-5.31
10	0.944	40.60	46.00	-5.40
11	1.184	40.60	46.00	-5.40
12	1.043	40.51	46.00	-5.49
13	0.583	40.42	46.00	-5.58
14	1.412	40.31	46.00	-5.69
15	0.924	39.09	46.00	-6.91
16	1.269	38.83	46.00	-7.17
17	1.620	38.46	46.00	-7.54
18	1.520	38.33	46.00	-7.67
19	0.637	38.30	46.00	-7.70
20	1.879	38.11	46.00	-7.89
21	1.960	37.85	46.00	-8.15
22	1.106	37.82	46.00	-8.18
23	1.389	37.81	46.00	-8.19
24	1.735	37.59	46.00	-8.41
25	1.016	37.58	46.00	-8.42
26	2.111	37.41	46.00	-8.59
27	1.496	37.05	46.00	-8.95
28	2.346	36.74	46.00	-9.26
29	1.154	36.69	46.00	-9.31
30	1.849	36.66	46.00	-9.34
31	2.226	36.61	46.00	-9.39
32	0.805	36.39	46.00	-9.61
33	2.179	35.78	46.00	-10.22
34	2.310	35.24	46.00	-10.76
35	2.077	34.76	46.00	-11.24
36	2.582	34.51	46.00	-11.49
37	2.693	33.24	46.00	-12.76
38	2.462	33.18	46.00	-12.82
39	2.540	33.06	46.00	-12.94
40	2.932	30.63	46.00	-15.37
41	2.885	30.46	46.00	-15.54
42	2.651	30.45	46.00	-15.55
43	2.423	29.61	46.00	-16.39
44	2.811	27.95	46.00	-18.05
45	2.766	27.05	46.00	-18.95
46	0.974	23.65	46.00	-22.35
47	0.872	23.46	46.00	-22.54
48	1.338	20.98	46.00	-25.02