FCC PART 15, SUBPART B and C
TEST REPORT

for

RFID READER

MODEL: WIRELESS STAR 1000

Prepared for

MOJIX, INC.
11075 SANTA MONICA BOULEVARD
LOS ANGELES, CALIFORNIA

Prepared by:_____

KYLE FUJIMOTO

Approved by:_____

MICHAEL CHRISTENSEN

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

DATE: SEPTEBMER 16, 2009

	REPORT	APPENDICES					TOTAL
	BODY	***A***	***B***	***C***	***D***	***E***	
PAGES	17	2	2	2	13	25	**61**

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

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

Device Tested:	RFID Reader Model: Wireless STAR 1000 S/N: N/A
Product Description:	See Expository Statement
Modifications:	The EUT was modified in order to meet the specifications. Please see the list located in Appendix B.
Manufacturer:	Mojix, Inc. 11075 Santa Monica Boulevard Los Angeles, California
Test Dates:	August 20 and 21, 2009
Test Specifications:	EMI requirements CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249
Test Procedure:	ANSI C63.4: 2003
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.207 Highest reading in relation to spec limit: 49.50 dBuV @ 0.155 MHz (*Uc = 0.63 dB)
2	Radiated RF Emissions 10 kHz – 9300 MHz (Transmitter Portion)	Complies with the limits of CFR Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.249 Highest reading in relation to spec limit: 29.41 dBuV @ 4636.8 MHz (*Uc = 3.05 dB)
3	Radiated RF Emissions 10 kHz – 9300 MHz (Digital and Receiver Portion)	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B. Highest reading in relation to spec limit: 44.94 dBuV @ 351.53 MHz (*Uc = 1.85 dB)

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the RFID Reader, Model: Wireless STAR 1000. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.249.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Mojix, Inc.

John Gevargiz VP Engineering

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer
Michael Christensen Lab Manager, Brea Division

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 was returned prior to the date of this report.

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
N/A	Not Applicable

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.4 2003	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

The RFID Reader, Model: Wireless STAR 1000 (EUT) was connected to a power supply and laptop via its DC power and ethernet ports, respectively. The laptop was also connected to an AC Adapter via its power port. The power supply was also connected to earth ground via a 2-meter cable. The laptop and its AC Adapter were placed 10 meters away from the test site. The EUT was continuously transmitting and receiving along with sending data to and from the laptop on a continuous basis.

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 1-meter braid and foil shielded cable connecting the EUT to the power supply. The cable has an Aphenol P/N: 97-3102A-20-27S connector at each end. The shield of the cable was grounded to the chassis via the connectors.

Cable 2 This is a 10-meter braid and foil shielded cable connecting the EUT to the laptop. The cable has a metallic RJ-45 connector at each end. The shield of the cable was grounded to the chassis via the connectors.

Cable 3 This is a 2-meter unshielded cable connecting the power supply to earth ground. The cable is hard wired at each end.

Cable 4 This is a 2-meter unshielded cable connecting the laptop to the AC Adapter. The cable has a one pin connector at the laptop end and is hard wired into the AC Adapter.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
RFID READER (EUT)	MOJIX, INC.	WIRELESS STAR 1000	N/A	VEDWSTAR1000
DC POWER SUPPLY	MOJIX, INC.	STAR-1000	07104018G137	N/A
LAPTOP	DELL	PP19L	CN-0MG532-70166-6BR-01LS	DoC
POWER SUPPLY (FOR LAPTOP)	DELL	AA22850	CN-05V092-16291-32Q-01VF	N/A
ANTENNA	ANTENNA FACTOR	ANT-916-CW-HWR-RPS	N/A	N/A

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS					
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08768	August 22, 2008	Aug. 22, 2009
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	3701A22262	August 22, 2008	Aug. 22, 2009
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	August 22, 2008	Aug. 22, 2009
EMI Receiver	Rohde & Schwarz	ESIB40	100194	September 17, 2008	Sept. 17, 2010
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
RF RADIATED EMISSIONS TEST EQUIPMENT					
Biconical Antenna	Com Power	AB-900	15250	February 23, 2009	Feb. 23, 2010
Log Periodic Antenna	Com Power	AL-100	16060	June 15, 2009	June 15, 2010
Preamplifier	Com-Power	PA-102	1017	January 12, 2009	Jan. 12, 2010
Loop Antenna	Com-Power	AL-130	17089	September 29, 2008	Sept. 29, 2009
Horn Antenna	Com-Power	AH-118	071175	June 27, 2008	June 27, 2010
Microwave Preamplifier	Com Power	PA-122	181921	March 12, 2009	March 12, 2010
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
RF RADIATED EMISSIONS TEST EQUIPMENT					
Emissions Program	Compatible Electronics	2.3 (SR19)	N/A	N/A	N/A
LISN	Com Power	LI-215	12076	September 29, 2008	Sept. 29, 2009
LISN	Com Power	LI-215	12090	September 29, 2008	Sept. 29, 2009
Transient Limiter	Com Power	252A910	1	September 26, 2008	Sept. 26, 2009

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was grounded to the laptop via the shield of the ethernet cable and to the power supply via the ground pin of the power cable.

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. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2003. 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:

Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.207

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 Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz and the Com Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz. The spectrum analyzer and EMI Receiver were used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

The 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 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 9.3 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 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 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 gunsight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test (con't)

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 10 meter test distance from 10 kHz to 30 MHz, and at a 3 meter test distance from 30 MHz to 9.3 GHz to obtain the final test data.

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.

8. CONCLUSIONS

The RFID Reader Model: Wireless STAR 1000 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.207, 15.209, and 15.249.

Note: For the unintentional radiator and receiver portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

APPENDIX A

LABORATORY RECOGNITIONS

LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

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

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

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

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

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

Federal Communications Commission

Industry Canada

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.249 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

Modifications:

1) Added a ferrite (FairRite P/N: 0431176451) to the external DC power cable.
2) Added a ferrite (FairRite P/N: 0443164251) to the AFE power cable.
3) Added a ferrite (FairRite P/N: 0446164281) to the AIA DC Power cable.
4) Added a ferrite (FairRite P/N: 0446164281) to the LED Ribbon Cable on the PCB side.
5) Ground the Ethernet port to the chassis via copper tape.
6) Added a ferrite (FairRite P/N: 0446167251) to the main DC input cable.
7) Added a ferrite (FairRite P/N: 0446164281) to the shielded Ethernet cable.
8) Added a ferrite (FairRite P/N: 0446167251) to the AC power cable on the power supply.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

RFID Reader
Model: Wireless STAR 1000
S/N: N/A

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

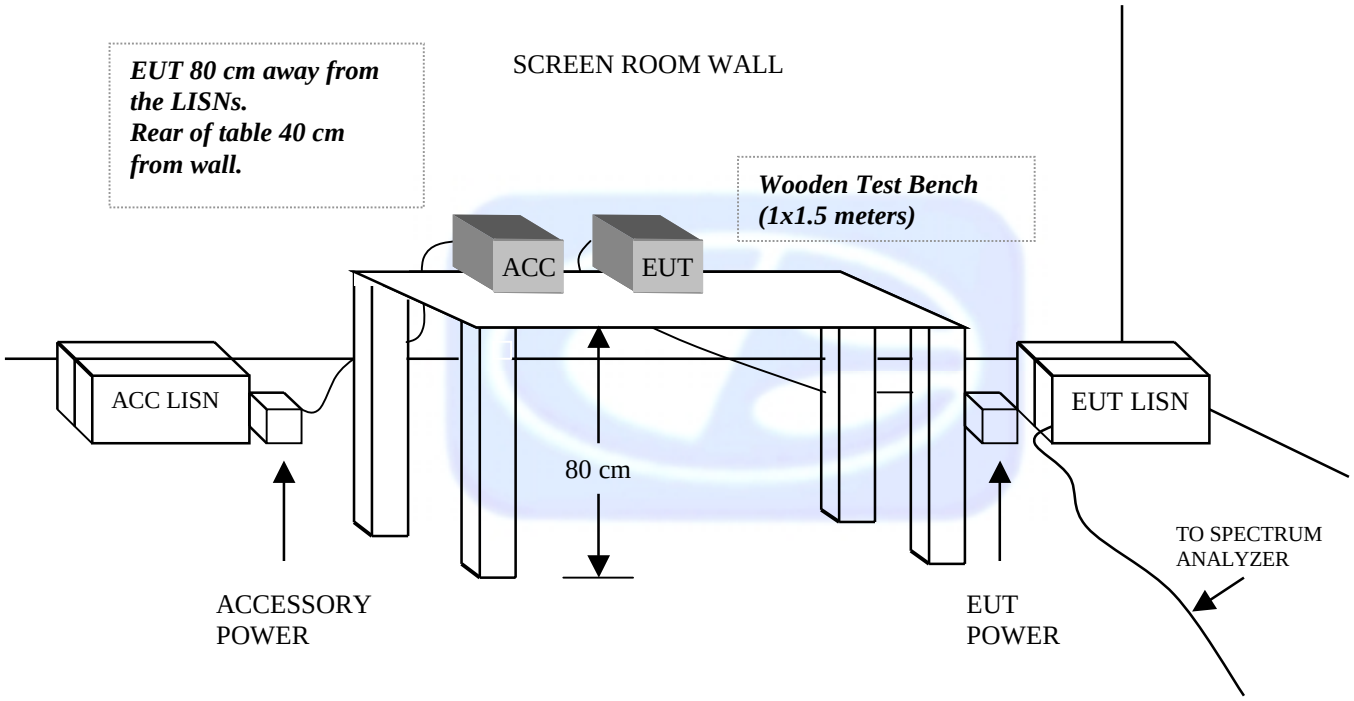
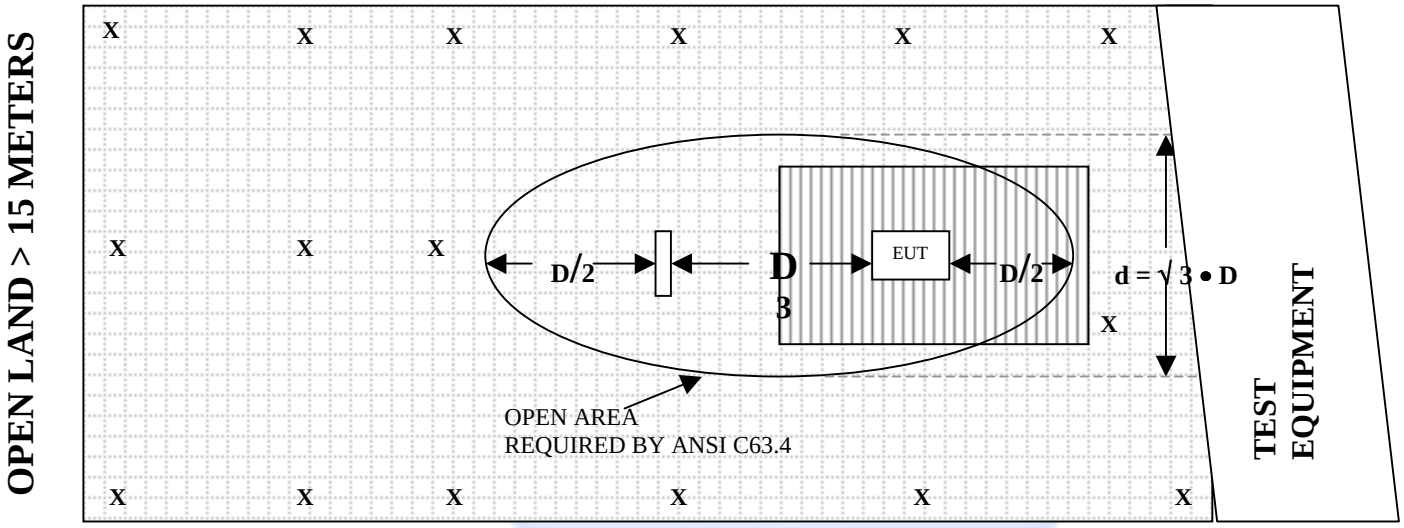


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE – 3 METERS

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

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

COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15250

CALIBRATION DATE: FEBRUARY 23, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	13.0	100	11.1
35	11.1	120	13.6
40	10.2	140	12.4
45	11.2	160	12.9
50	11.6	180	16.5
60	9.1	200	17.0
70	8.4	250	16.3
80	6.2	275	18.2
90	8.5	300	17.9

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16060

CALIBRATION DATE: JUNE 15, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	14.2	700	20.1
400	15.9	800	21.2
500	17.1	900	21.3
600	18.8	1000	22.3

COM POWER AH-118

HORN ANTENNA

S/N: 071175

CALIBRATION DATE: JUNE 27, 2008

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.5	10.0	39.4
1.5	25.4	10.5	39.7
2.0	28.3	11.0	39.0
2.5	28.9	11.5	40.0
3.0	29.7	12.0	39.7
3.5	30.8	12.5	41.7
4.0	31.4	13.0	42.7
4.5	32.6	13.5	41.2
5.0	33.7	14.0	41.6
5.5	34.4	14.5	43.2
6.0	34.7	15.0	42.3
6.5	35.4	15.5	39.3
7.0	37.0	16.0	41.7
7.5	37.4	16.5	39.6
8.0	37.6	17.0	43.0
8.5	37.6	17.5	47.1
9.0	38.5	18.0	46.2
9.5	38.6		

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: JANUARY 12, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	39.0	300	38.8
40	39.0	350	38.8
50	38.8	400	38.7
60	38.7	450	38.6
70	38.8	500	38.3
80	38.8	550	38.9
90	39.1	600	38.4
100	39.1	650	38.8
125	38.9	700	38.4
150	38.9	750	38.5
175	38.9	800	38.3
200	38.8	850	38.4
225	39.0	900	38.1
250	38.9	950	37.4
275	38.8	1000	38.1

COM-POWER PA-122

PREAMPLIFIER

S/N: 181921

CALIBRATION DATE: MARCH 12, 2009

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	36.46	10.0	35.06
1.5	35.36	10.5	34.82
2.0	34.76	11.0	33.12
2.5	34.94	11.5	34.33
3.0	34.59	12.0	34.75
3.5	34.55	12.5	33.94
4.0	34.25	13.0	35.50
4.5	33.89	13.5	34.89
5.0	34.22	14.0	36.56
5.5	34.81	14.5	36.06
6.0	35.74	15.0	36.67
6.5	36.51	15.5	36.84
7.0	36.66	16.0	34.31
7.5	35.72	16.5	35.11
8.0	33.28	17.0	35.35
8.5	33.11	17.5	34.11
9.0	34.71	18.0	33.88
9.5	35.50	18.5	32.20

COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: SEPTEMBER 29, 2008

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-41.57	9.93
0.01	-42.06	9.44
0.02	-42.43	9.07
0.05	-42.50	9.00
0.07	-42.10	9.40
0.1	-42.03	9.47
0.2	-44.50	7.00
0.3	-41.93	9.57
0.5	-41.90	9.60
0.7	-41.73	9.77
1	-41.23	10.27
2	-40.90	10.60
3	-41.20	10.30
4	-41.30	10.20
5	-40.70	10.80
10	-41.10	10.40
15	-42.17	9.33
20	-42.00	9.50
25	-42.20	9.30
30	-43.10	8.40

FRONT VIEW

MOJIX, INC.
RFID READER
MODEL: WIRELESS STAR 1000
FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
RFID READER
MODEL: WIRELESS STAR 1000
FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

MOJIX, INC.
RFID READER
MODEL: WIRELESS STAR 1000
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
RFID READER
MODEL: WIRELESS STAR 1000
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISISONS

DATA SHEETS

FCC 15.249

Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000

Date: 08/20/09
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	87.27	V	94	-6.73	Peak	1	180	
1808.88	40.2	V	74	-33.8	Peak	1.09	225	
1808.88	27.99	V	54	-26.01	Avg	1.09	225	
2713.32	36.66	V	74	-37.34	Peak	1.08	125	
2713.32	24.21	V	54	-29.79	Avg	1.08	125	
3617.76	38.21	V	74	-35.79	Peak	1.38	135	
3617.76	26.47	V	54	-27.53	Avg	1.38	135	
4522.2	41.06	V	74	-32.94	Peak	1.65	125	
4522.2	28.96	V	54	-25.04	Avg	1.65	125	
5426.64								**no emission found**
5426.64								
6331.08								**no emission found**
6331.08								
7235.52								**no emission found**
7235.52								
8139.96								**no emission found**
8139.96								
9044.4								**no emission found**
9044.4								

FCC 15.249

Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000

Date: 08/20/09
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	83.58	H	94	-10.42	Peak	1	135	
1808.88	39.34	H	74	-34.66	Peak	2.36	135	
1808.88	28.02	H	54	-25.98	Avg	2.36	135	
2713.32	36.87	H	74	-37.13	Peak	1.32	135	
2713.32	24.04	H	54	-29.96	Avg	1.32	135	
3617.76	38.53	H	74	-35.47	Peak	1.62	135	
3617.76	26.25	H	54	-27.75	Avg	1.62	135	
4522.2	40.91	H	74	-33.09	Peak	1.62	135	
4522.2	28.97	H	54	-25.03	Avg	1.62	135	
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.
RFID Reader
Model: Wireless STAR 1000

Date: 08/20/09
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	87.01	V	94	-6.99	Peak	1.5	90	
1831.8	33.63	V	74	-40.37	Peak	1.58	135	
1831.8	21.42	V	54	-32.58	Avg	1.58	135	
2747.7	36.46	V	74	-37.54	Peak	1.84	135	
2747.7	24.13	V	54	-29.87	Avg	1.84	135	
3663.6	38.91	V	74	-35.09	Peak	1.53	135	
3663.6	26.46	V	54	-27.54	Avg	1.53	135	
4579.5	41.39	V	74	-32.61	Peak	2.29	135	
4579.5	28.78	V	54	-25.22	Avg	2.29	135	
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.
RFID Reader
Model: Wireless STAR 1000

Date: 08/20/09
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	83.58	H	94	-10.42	Peak	1.5	90	
1831.8	34.85	H	74	-39.15	Peak	2.31	135	
1831.8	23.25	H	54	-30.75	Avg	2.31	135	
2747.7	36.67	H	74	-37.33	Peak	1.65	135	
2747.7	24.04	H	54	-29.96	Avg	1.65	135	
3663.6	39.61	H	74	-34.39	Peak	1.42	125	
3663.6	26.51	H	54	-27.49	Avg	1.42	125	
4579.5	41.52	H	74	-32.48	Peak	2.09	135	
4579.5	28.78	H	54	-25.22	Avg	2.09	135	
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.
RFID Reader
Model: Wireless STAR 1000

Date: 08/20/09
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	86.57	V	94	-7.43	Peak	1.5	135	
1854.72	38.57	V	74	-35.43	Peak	1.56	135	
1854.72	26.98	V	54	-27.02	Avg	1.56	135	
2782.08	38.74	V	74	-35.26	Peak	1.57	135	
2782.08	24.41	V	54	-29.59	Avg	1.57	135	
3709.44	39.08	V	74	-34.92	Peak	2.08	180	
3709.44	26.69	V	54	-27.31	Avg	2.08	180	
4636.8	41.31	V	74	-32.69	Peak	1.64	125	
4636.8	29.27	V	54	-24.73	Avg	1.64	125	
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.
RFID Reader
Model: Wireless STAR 1000

Date: 08/20/09
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	84.03	H	94	-9.97	Peak	1	90	
1854.72	35.45	H	74	-38.55	Peak	2.21	135	
1854.72	24.91	H	54	-29.09	Avg	2.21	135	
2782.08	36.32	H	74	-37.68	Peak	1.78	135	
2782.08	24.36	H	54	-29.64	Avg	1.78	135	
3709.44	39.14	H	74	-34.86	Peak	2.59	135	
3709.44	26.71	H	54	-27.29	Avg	2.59	135	
4636.8	42.03	H	74	-31.97	Peak	2.11	135	
4636.8	29.41	H	54	-24.59	Avg	2.11	135	
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. Date: 08/21/09

RFID Reader Labs: B and D

Model: Wireless STAR 1000 Tested By: Kyle Fujimoto

10 kHz to 1 GHz - Vertical and Horizontal Polarization

The Emissions were worst case from 10 kHz to 1 GHz when the EUT was in Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
75.15	21.05	V	40	-18.95	Peak	1	135	
78.09	28.96	V	40	-11.04	Peak	1	135	
78.09	28.33	H	40	-11.67	Peak	1	135	
109.48	18.31	V	43.5	-25.19	Peak	1	135	
117.15	40.75	H	43.5	-2.75	Peak	1	135	
117.16	25.04	V	43.5	-18.46	Peak	1	135	
117.75	15.04	V	43.5	-28.46	Peak	1	180	
136.68	38.21	H	43.5	-5.29	Peak	1	135	
136.69	41.21	V	43.5	-2.29	Peak	1	135	
136.69	40.89	V	43.5	-2.61	QP	1	135	
144.54	21.89	V	43.5	-21.61	Peak	1	135	
156.21	27.45	V	43.5	-16.05	Peak	1	135	
195.27	32.79	H	43.5	-10.71	Peak	1	135	
195.29	41.87	V	43.5	-1.63	Peak	1	180	
195.29	41.37	V	43.5	-2.13	QP	1	180	
234.33	42.21	V	46	-3.79	Peak	1	180	
234.33	41.99	V	46	-4.01	QP	1	180	
244.91	24.31	V	46	-21.69	Peak	1	180	
252.92	24.12	H	46	-21.88	Peak	1	135	
253.89	37.31	V	46	-8.69	Peak	1	90	
273.41	45.55	H	46	-0.45	Peak	1	135	
273.41	42.87	H	46	-3.13	Peak	1	135	
273.42	41.71	V	46	-4.29	Peak	1	135	
281.05	33.75	V	46	-12.25	Peak	1	90	
292.93	36.67	H	46	-9.33	Peak	1	135	
292.94	42.31	V	46	-3.69	Peak	1	225	

FCC 15.249 and FCC Class B

Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000

Date: 08/21/09
Labs: B and D
Tested By: Kyle Fujimoto

10 kHz to 1 GHz - Vertical and Horizontal Polarization
The Emissions were worst case from 10 kHz to 1 GHz when the EUT was in Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
312.47	39.27	H	46	-6.73	Peak	1	125	
312.58	40.44	V	46	-5.56	Peak	1	135	
332.01	31.76	H	46	-14.24	Peak	1	125	
332.01	35.38	V	46	-10.62	Peak	1	225	
351.53	45.34	H	46	-0.66	Peak	1	225	
351.53	44.94	H	46	-1.06	QP	1	225	
351.54	35.22	V	46	-10.78	Peak	1	135	
351.54	36.15	V	46	-9.85	Peak	1	225	
371.06	41.14	V	46	-4.86	Peak	1	225	
371.07	41.27	H	46	-4.73	Peak	1	225	
410.12	34.54	V	46	-11.46	Peak	1	125	
429.66	38.02	H	46	-7.98	Peak	1	180	
429.66	32.58	V	46	-13.42	Peak	1	90	
449.18	27.87	V	46	-18.13	Peak	1	90	
449.19	28.09	H	46	-17.91	Peak	1	125	
488.26	29.44	V	46	-16.56	Peak	1	90	
507.78	33.12	V	46	-12.88	Peak	1	90	
527.31	35.11	V	46	-10.89	Peak	1	180	
546.84	28.22	V	46	-17.78	Peak	1	180	
566.38	35.94	V	46	-10.06	Peak	1	180	
585.91	33.58	V	46	-12.42	Peak	1	180	
664.04	37.91	V	46	-8.09	Peak	1	180	
683.56	41.52	V	46	-4.48	Peak	1	180	
703.12	28.82	V	46	-17.18	Peak	1	180	
722.62	31.92	V	46	-14.08	Peak	1	180	
742.16	33.21	H	46	-12.79	Peak	1	125	
742.16	33.72	V	46	-12.28	Peak	1	180	
761.69	31.56	H	46	-14.44	Peak	1	125	
761.91	32.83	V	46	-13.17	Peak	1	0	
820.28	36.71	V	46	-9.29	Peak	1	0	
927.21	38.52	V	46	-7.48	Peak	1	0	

FCC 15.249 and FCC Class B

Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000

Date: 08/21/09
Labs: B and D
Tested By: Kyle Fujimoto

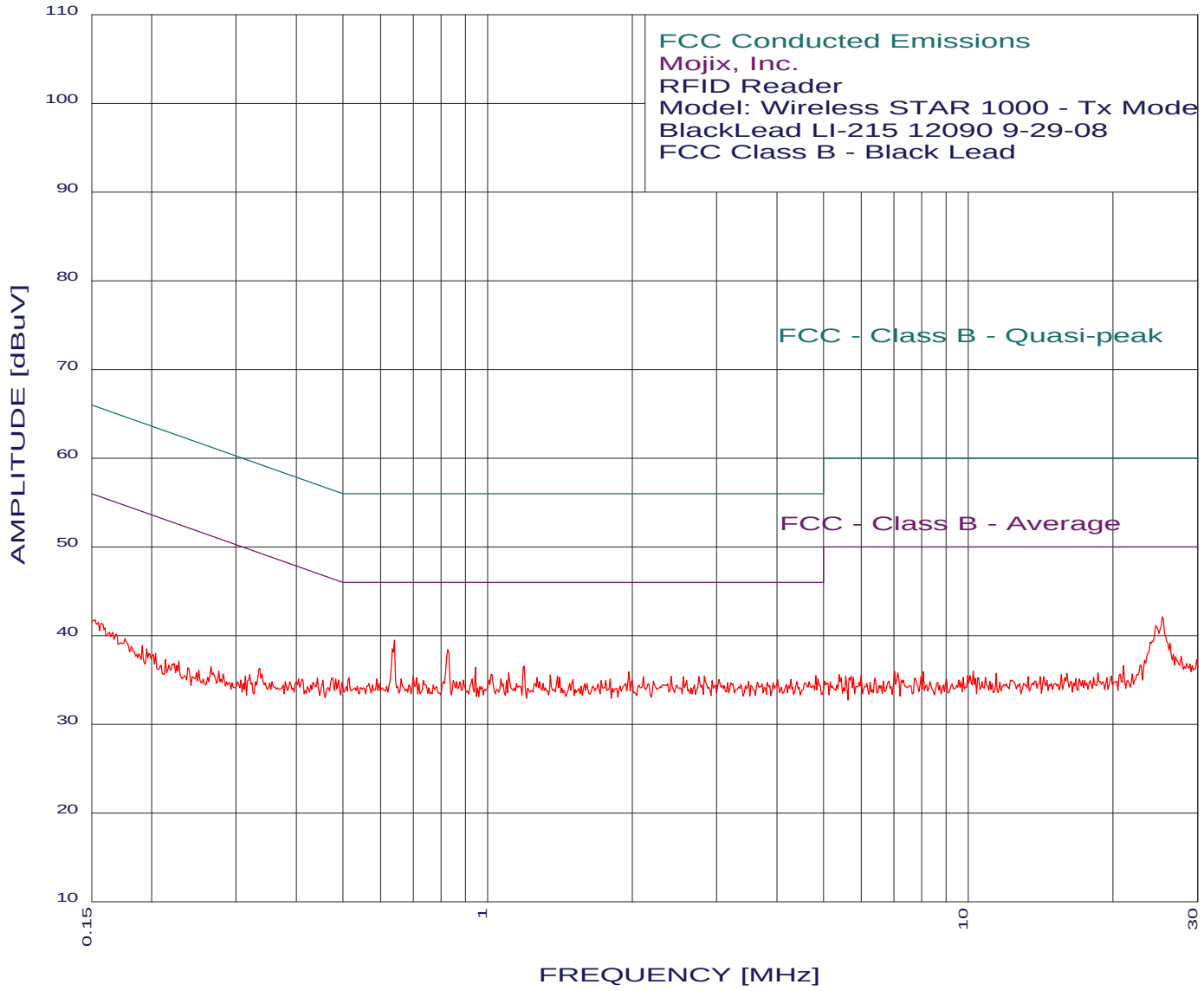
1 GHz to 9.3 GHz - Vertical and Horizontal Polarization

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions
								Detected from the Receive
								Mode from 1 GHz to 9.3 GHz
								No Emissions Detected
								from the Digital Portion from
								1 GHz to 9.3 GHz
								No Emissions Detected for
								the Non-Harmonic Tx
								Emissions from
								1 GHz to 9.3 GHz

CONDUCTED EMISSIONS

DATA SHEETS

EMISSION LEVEL [dBuV] PEAK 8/21/2009 15:28:06
Graph forPeak



COMPATIBLE ELECTRONICS

COMPATIBLE ELECTRONICS

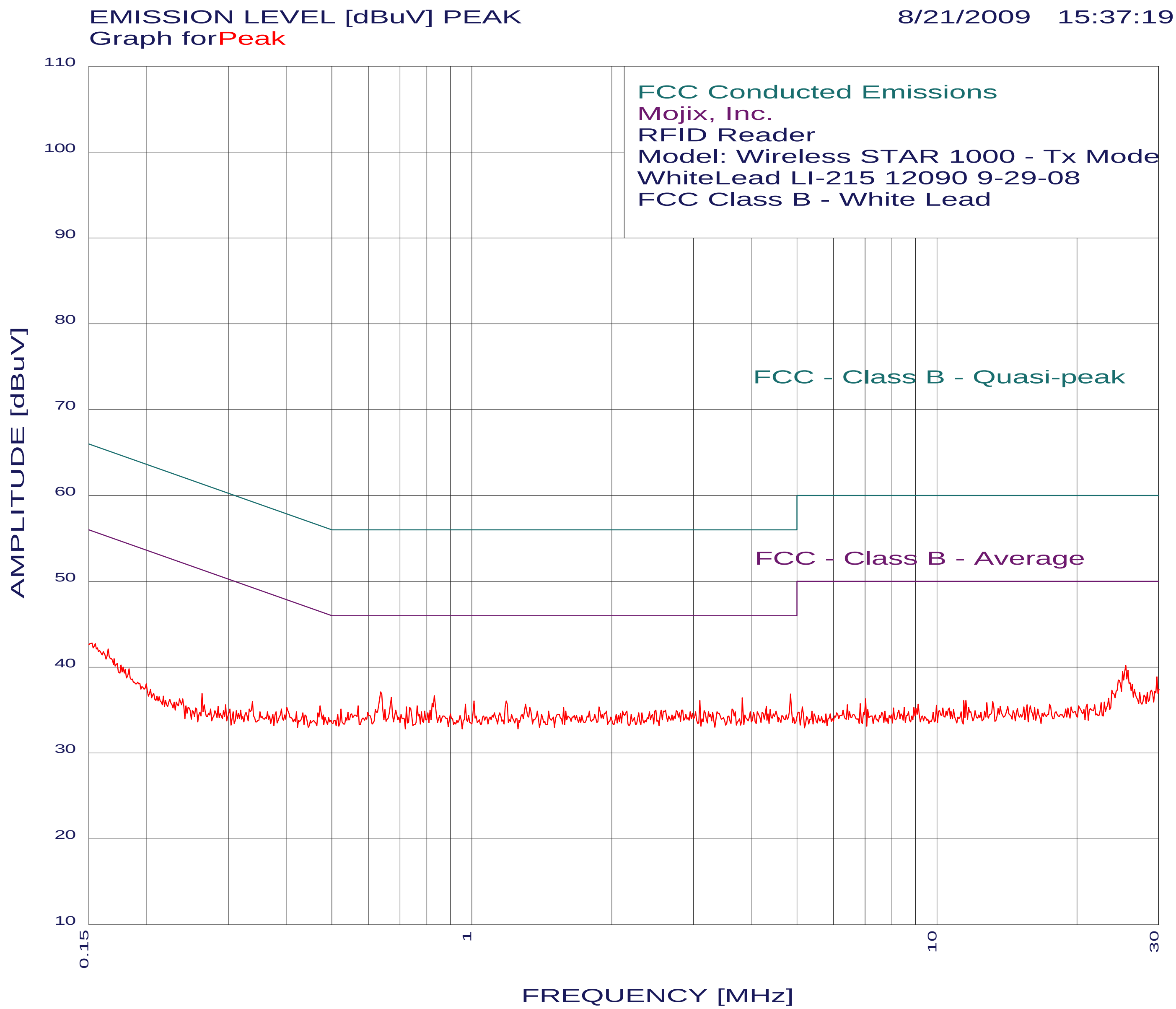
8/21/2009 15:28:06

Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000 - Tx Mode
FCC Class B - Black Lead
TEST ENGINEER : Kyle Fujimoto

---

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

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.641	39.50	46.00	-6.50
2	0.826	38.40	46.00	-7.60
3	25.336	42.07	50.00	-7.93
4	1.191	36.50	46.00	-9.50
5	0.944	36.40	46.00	-9.60
6	1.971	35.91	46.00	-10.09
7	1.106	35.80	46.00	-10.20
8	1.021	35.60	46.00	-10.40
9	1.352	35.50	46.00	-10.50
10	4.825	35.47	46.00	-10.53
11	2.826	35.43	46.00	-10.57
12	2.410	35.42	46.00	-10.58
13	1.397	35.40	46.00	-10.60
14	0.701	35.40	46.00	-10.60
15	2.751	35.33	46.00	-10.67
16	2.554	35.32	46.00	-10.68
17	2.111	35.31	46.00	-10.69
18	1.412	35.30	46.00	-10.70
19	1.269	35.20	46.00	-10.80
20	0.516	35.19	46.00	-10.81
21	1.800	35.11	46.00	-10.89
22	1.066	35.10	46.00	-10.90
23	0.929	35.10	46.00	-10.90
24	0.662	35.10	46.00	-10.90
25	0.589	35.09	46.00	-10.91
26	4.877	35.07	46.00	-10.93
27	4.272	35.06	46.00	-10.94
28	4.008	35.05	46.00	-10.95
29	3.027	35.03	46.00	-10.97
30	1.504	35.00	46.00	-11.00
31	0.890	35.00	46.00	-11.00
32	2.932	34.93	46.00	-11.07
33	2.002	34.91	46.00	-11.09
34	1.763	34.91	46.00	-11.09
35	1.094	34.90	46.00	-11.10
36	0.849	34.90	46.00	-11.10
37	0.735	34.90	46.00	-11.10
38	3.492	34.84	46.00	-11.16
39	0.484	35.09	46.27	-11.18
40	2.214	34.81	46.00	-11.19
41	0.489	34.99	46.18	-11.19
42	4.408	34.76	46.00	-11.24
43	3.820	34.75	46.00	-11.25
44	0.474	35.19	46.45	-11.25
45	3.644	34.74	46.00	-11.26
46	0.497	34.69	46.05	-11.36
47	3.209	34.64	46.00	-11.36
48	3.158	34.63	46.00	-11.37


EMISSION LEVEL [dBuV] PEAK
Graph forPeak
8/21/2009 15:37:19
FCC Conducted Emissions
Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000 - Tx Mode
WhiteLead LI-215 12090 9-29-08
FCC Class B - White Lead
FCC - Class B - Quasi-peak
FCC - Class B - Average
AMPLITUDE [dBuV]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30
FREQUENCY [MHz]
COMPATIBLE ELECTRONICS

COMPATIBLE ELECTRONICS

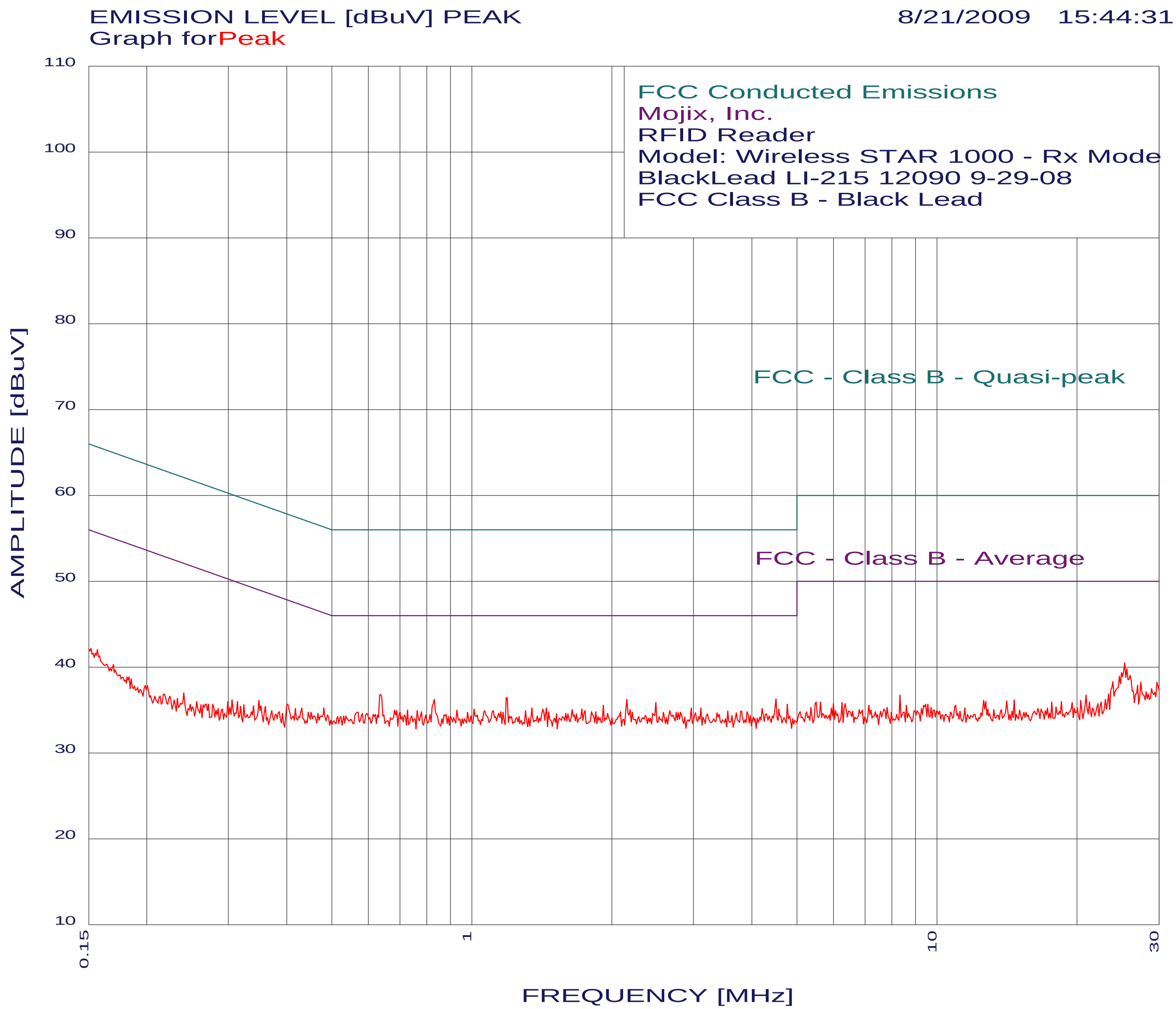
8/21/2009 15:37:19

Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000 - Tx Mode
FCC Class B - White Lead
TEST ENGINEER : Kyle Fujimoto

---

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

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.637	37.08	46.00	-8.92
2	4.851	36.82	46.00	-9.18
3	0.831	36.65	46.00	-9.35
4	0.672	36.49	46.00	-9.51
5	3.820	36.40	46.00	-9.60
6	25.471	40.18	50.00	-9.82
7	3.091	36.09	46.00	-9.91
8	1.184	36.06	46.00	-9.94
9	1.011	36.05	46.00	-9.95
10	1.304	35.66	46.00	-10.34
11	0.969	35.65	46.00	-10.35
12	25.740	39.61	50.00	-10.39
13	0.570	35.46	46.00	-10.54
14	0.763	35.45	46.00	-10.55
15	4.294	35.41	46.00	-10.59
16	1.879	35.36	46.00	-10.64
17	0.724	35.35	46.00	-10.65
18	1.577	35.26	46.00	-10.74
19	1.331	35.26	46.00	-10.74
20	0.735	35.25	46.00	-10.75
21	3.624	35.10	46.00	-10.90
22	0.524	35.07	46.00	-10.93
23	0.651	35.04	46.00	-10.96
24	4.384	35.01	46.00	-10.99
25	0.471	35.48	46.49	-11.01
26	2.840	34.98	46.00	-11.02
27	2.610	34.98	46.00	-11.02
28	2.554	34.97	46.00	-11.03
29	2.488	34.97	46.00	-11.03
30	0.814	34.95	46.00	-11.05
31	0.686	34.95	46.00	-11.05
32	3.158	34.89	46.00	-11.11
33	2.751	34.88	46.00	-11.12
34	29.696	38.87	50.00	-11.13
35	2.156	34.87	46.00	-11.13
36	1.790	34.86	46.00	-11.14
37	1.594	34.86	46.00	-11.14
38	1.464	34.86	46.00	-11.14
39	1.382	34.86	46.00	-11.14
40	0.792	34.85	46.00	-11.15
41	4.114	34.81	46.00	-11.19
42	3.966	34.80	46.00	-11.20
43	3.365	34.79	46.00	-11.21
44	3.226	34.79	46.00	-11.21
45	3.027	34.78	46.00	-11.22
46	2.410	34.77	46.00	-11.23
47	0.779	34.75	46.00	-11.25
48	4.029	34.70	46.00	-11.30



EMISSION LEVEL [dBuV] PEAK
Graph for Peak
8/21/2009 15:44:31
FCC Conducted Emissions
Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000 - Rx Mode
BlackLead LI-215 12090 9-29-08
FCC Class B - Black Lead
FCC - Class B - Quasi-peak
FCC - Class B - Average
AMPLITUDE [dBuV]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30
FREQUENCY [MHz]
COMPATIBLE ELECTRONICS

COMPATIBLE ELECTRONICS

8/21/2009 15:44:31

Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000 - Rx Mode
FCC Class B - Black Lead
TEST ENGINEER : Kyle Fujimoto

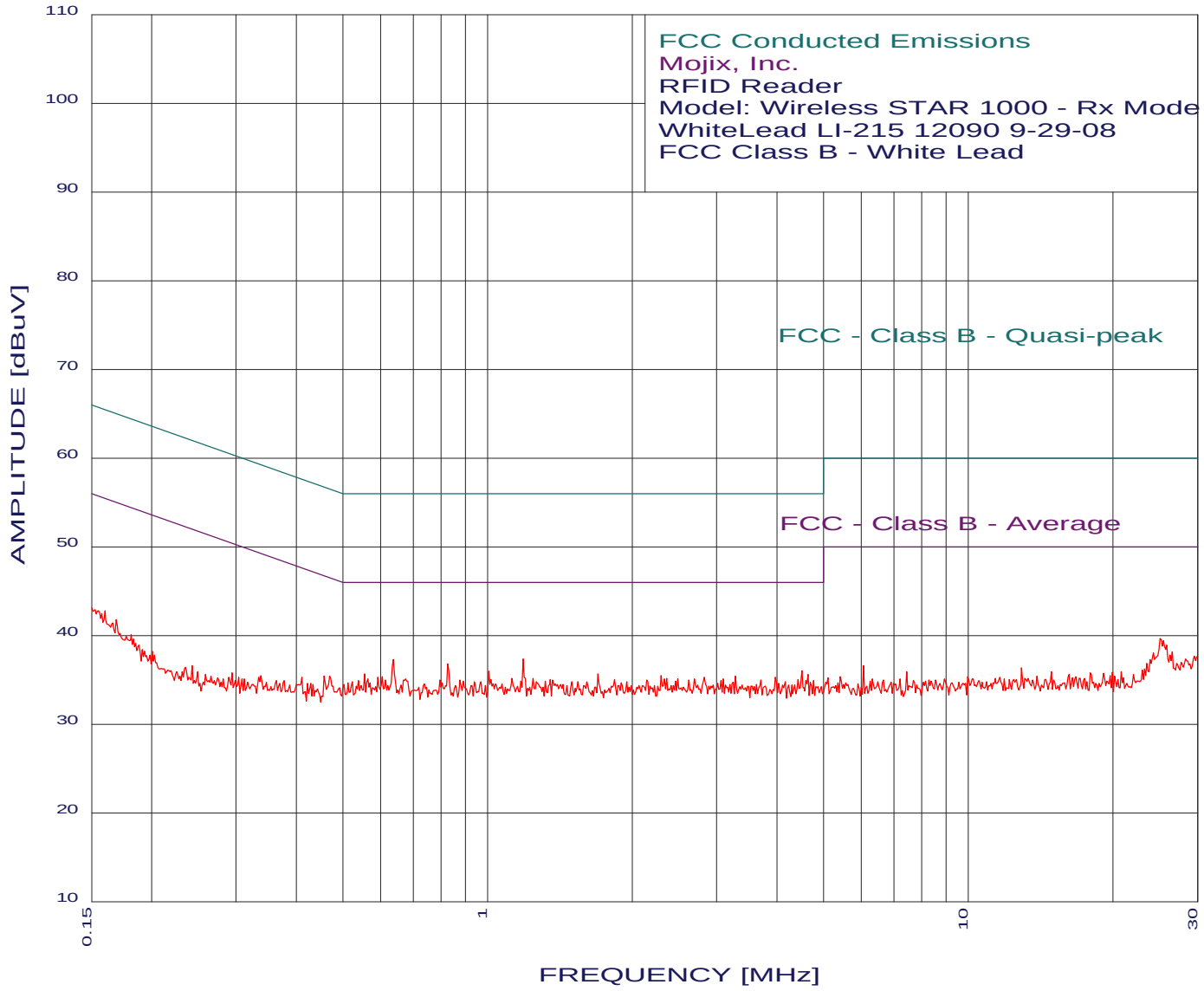
---

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

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.637	36.80	46.00	-9.20
2	25.336	40.47	50.00	-9.53
3	1.191	36.40	46.00	-9.60
4	4.504	36.26	46.00	-9.74
5	2.156	36.21	46.00	-9.79
6	0.831	36.20	46.00	-9.80
7	2.488	35.82	46.00	-10.18
8	25.605	39.80	50.00	-10.20
9	4.774	35.67	46.00	-10.33
10	1.918	35.51	46.00	-10.49
11	3.107	35.23	46.00	-10.77
12	2.963	35.23	46.00	-10.77
13	1.449	35.20	46.00	-10.80
14	1.345	35.20	46.00	-10.80
15	4.204	35.16	46.00	-10.84
16	1.726	35.11	46.00	-10.89
17	1.419	35.10	46.00	-10.90
18	1.011	35.10	46.00	-10.90
19	4.576	35.06	46.00	-10.94
20	1.646	35.01	46.00	-10.99
21	0.929	35.00	46.00	-11.00
22	0.728	35.00	46.00	-11.00
23	0.683	35.00	46.00	-11.00
24	2.665	34.92	46.00	-11.08
25	1.754	34.91	46.00	-11.09
26	1.304	34.90	46.00	-11.10
27	1.112	34.90	46.00	-11.10
28	1.066	34.90	46.00	-11.10
29	0.763	34.90	46.00	-11.10
30	0.481	35.19	46.32	-11.12
31	3.800	34.85	46.00	-11.15
32	3.547	34.84	46.00	-11.16
33	2.089	34.81	46.00	-11.19
34	1.849	34.81	46.00	-11.19
35	1.810	34.81	46.00	-11.19
36	1.464	34.80	46.00	-11.20
37	1.154	34.80	46.00	-11.20
38	0.779	34.80	46.00	-11.20
39	3.903	34.75	46.00	-11.25
40	2.811	34.73	46.00	-11.27
41	2.582	34.72	46.00	-11.28
42	2.214	34.71	46.00	-11.29
43	1.166	34.70	46.00	-11.30
44	0.979	34.70	46.00	-11.30
45	0.701	34.70	46.00	-11.30
46	0.570	34.69	46.00	-11.31
47	3.702	34.65	46.00	-11.35
48	3.365	34.64	46.00	-11.36

EMISSION LEVEL [dBuV] PEAK
Graph forPeak

8/21/2009 15:41:36



COMPATIBLE ELECTRONICS

COMPATIBLE ELECTRONICS

8/21/2009 15:41:36

Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000 - Rx Mode
FCC Class B - White Lead
TEST ENGINEER : Kyle Fujimoto

---

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

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.184	37.36	46.00	-8.64
2	0.637	37.28	46.00	-8.72
3	0.826	36.75	46.00	-9.25
4	4.504	36.01	46.00	-9.99
5	1.006	35.95	46.00	-10.05
6	0.555	35.68	46.00	-10.32
7	1.699	35.66	46.00	-10.34
8	25.067	39.64	50.00	-10.36
9	4.648	35.62	46.00	-10.38
10	2.298	35.47	46.00	-10.53
11	3.277	35.39	46.00	-10.61
12	0.605	35.33	46.00	-10.67
13	3.966	35.30	46.00	-10.70
14	2.826	35.28	46.00	-10.72
15	0.592	35.27	46.00	-10.73
16	2.358	35.17	46.00	-10.83
17	1.243	35.16	46.00	-10.84
18	1.124	35.15	46.00	-10.85
19	0.564	35.12	46.00	-10.88
20	3.091	35.09	46.00	-10.91
21	2.693	35.08	46.00	-10.92
22	0.676	35.08	46.00	-10.92
23	2.488	35.07	46.00	-10.93
24	1.840	35.06	46.00	-10.94
25	1.352	35.06	46.00	-10.94
26	3.702	35.00	46.00	-11.00
27	2.624	34.98	46.00	-11.02
28	2.145	34.97	46.00	-11.03
29	1.367	34.96	46.00	-11.04
30	0.876	34.95	46.00	-11.05
31	4.774	34.92	46.00	-11.08
32	0.538	34.89	46.00	-11.11
33	3.059	34.88	46.00	-11.12
34	2.462	34.87	46.00	-11.13
35	1.318	34.86	46.00	-11.14
36	0.890	34.85	46.00	-11.15
37	0.469	35.38	46.53	-11.16
38	4.159	34.81	46.00	-11.19
39	0.524	34.77	46.00	-11.23
40	1.950	34.76	46.00	-11.24
41	1.611	34.76	46.00	-11.24
42	1.544	34.76	46.00	-11.24
43	1.496	34.76	46.00	-11.24
44	0.969	34.75	46.00	-11.25
45	0.939	34.75	46.00	-11.25
46	4.696	34.72	46.00	-11.28
47	3.243	34.69	46.00	-11.31
48	0.513	34.67	46.00	-11.33

BAND EDGES

DATA SHEETS

FCC 15.249

Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000

Date: 08/20/09
Labs: B and 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	87.27	V	94	-6.73	Peak	1.25	45	Fundamental of
								Low Channel
902	50.52	V	46	4.52	Peak	1.25	45	Band Edge of
902	45.44	V	46	-0.56	QP	1.25	45	Low Channel

FCC 15.249

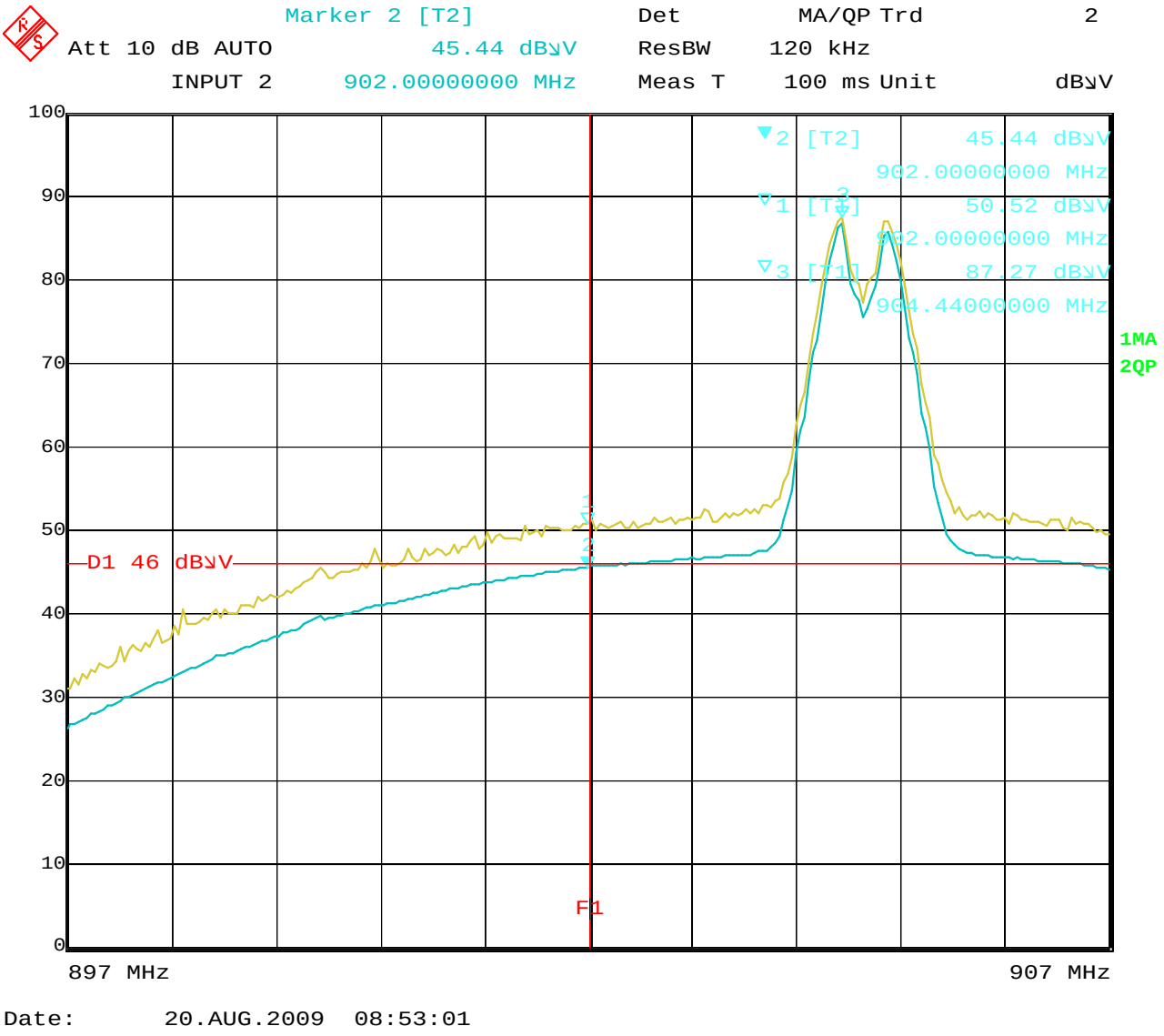
Mojix, Inc.
RFID Reader
Model: Wireless STAR 1000

Date: 08/20/09
Labs: B and D
Tested By: Kyle Fujimoto

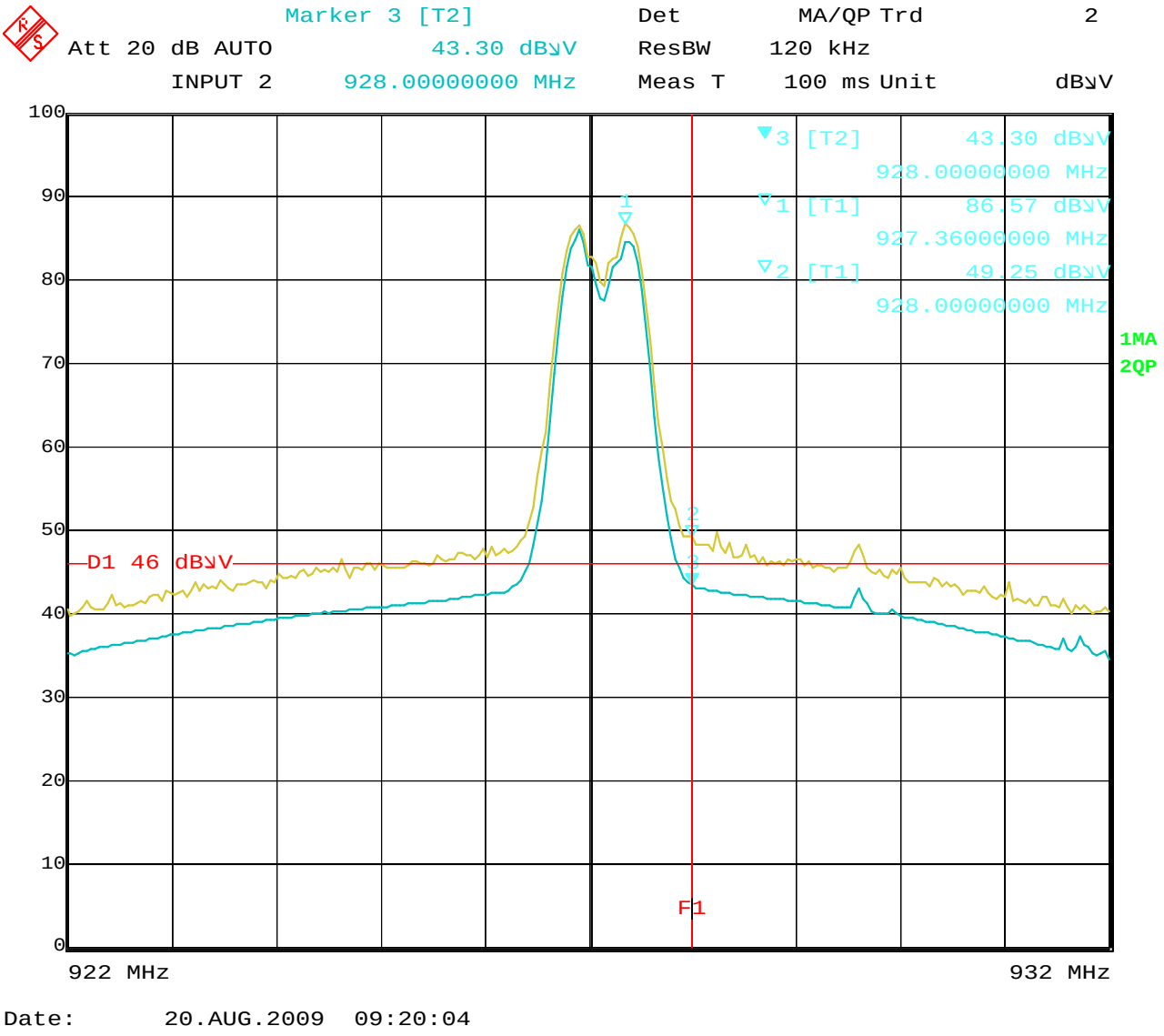
Band Edges

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	86.57	V	94	-7.43	Peak	1.25	315	Fundamental of
								High Channel
928	49.25	V	46	3.25	Peak	1.25	315	Band Edge of
928	43.3	V	46	-2.7	QP	1.25	315	High Channel



Band Edge – Low Channel – Vertical Polarization (Worst Case)



Band Edge – High Channel – Vertical Polarization (Worst Case)