1250 Peterson Dr., Wheeling, IL 60090

Company: Telezygology, Inc.
Model Tested: 7121CF
Report Number: 15143

FCC Rules and Regulations / Intentional Radiators

General Requirements

Part 15, Subpart B, Section 15.207 & 15.209

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name:	TZ CloudHub Plus RFID Module
Kind of Equipment:	Security and Access control.
Frequency Range:	125 kHz
Test Configuration:	It can operate both as a stand-alone device or as a network device. (Tested at 120 vac, 60 Hz)
Model Number(s):	7121CF
Model(s) Tested:	7121CF
Serial Number(s):	N/A
Date of Tests:	February 26 & 27, 2009
Test Conducted For:	Telezygology, Inc. 520 W. Erie Street Chicago, Illinois 60654

NOTICE: "This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government". Please see the "Additional Description of Equipment Under Test" page listed inside of this report.

SIGNATURE PAGE

Report By:

Arnom C. Rowe
Test Engineer
EMC-001375-NE

Reviewed By:

William Stumpf
OATS Manager

Approved By:

Brian Mattson
General Manager

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United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

D.L.S. Electronic Systems, Inc.

Wheeling, IL

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated 18 June 2005).

2008-10-01 through 2009-09-30

Effective dates

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2006-09-13)

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1.0 SUMMARY OF TEST REPORT

It was found that the TZ CloudHub Plus RFID Module, Model Number(s) 7121CF, **meets** the radio interference conducted and radiated emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Sections 15.207 & 15.209, general requirements for Intentional Radiators.

2.0 INTRODUCTION

On February 26 & 27, 2009, a series of radio frequency interference measurements was performed on TZ CloudHub Plus RFID Module, Model Number(s) 7121CF, Serial Number: N/A. The tests were performed according to the procedures of the FCC as stated in the "Methods of Measurement of Radio-Noise Emissions for Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" found in the American National Standards Institute, ANSI C63.4-2003. Tests were performed by personnel of D.L.S. Electronic Systems, Inc. who are responsible to Donald L. Sweeney, Senior EMC Engineer.

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at http://www.dlsemc.com/certificate. Our facilities are registered with the FCC, Industry Canada, and VCCI.

Main Test Facility:
D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, Illinois 60090

O.A.T.S. Test Facility:
D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128
FCC Registration Number: 334127

3.0 OBJECT

The purpose of this series of tests was to determine if the test sample could meet the radio frequency interference emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Sections 15.33, 15.207, 15.209 for Intentional Radiators (general requirements) that operate in the frequency range 9 kHz to 960 MHz and above.

4.0 TEST SET-UP

All emission tests were performed at D.L.S. Electronic Systems, Inc. and set up according to the ANSI C63.4-2003, Annex H. The conducted tests were performed with the test item placed on a non-conductive table (table top equipment), located in the test room. Equipment normally operated on the floor was tested by placing it on the metal ground plane. The ground plane has an electrical isolation layer over its surface approximately 7mm thick. The power line supplied was connected to a dual line impedance stabilization network electrically bonded to the ground plane, located on the floor. The networks were constructed per the requirements of the American National Standards Institute, ANSI C63.4-2003, Annex H.

All radiated emissions tests were performed with the test item placed on a 80 cm high rotating non-conductive table, located in the test room. Equipment normally operated on the floor was placed on a metal covered turntable which is flush with the surrounding conducting ground plane. The ground plane has an electrical isolation layer over its surface approximately 7 mm thick. The EUT is separated from the turntable ground plane by a non-conductive layer. The equipment under test was set up according to ANSI C63.4-2003, Sections 6 and 8.

5.0 TEST EQUIPMENT (Bandwidths and Detector Function)

All preliminary data below 1000 MHz was automatically plotted using the ESI 26/40 Fixed Tuned Receiver. The data was taken using Peak, Quasi-Peak or the Average Detector Functions as required. This information was then used to determine the frequencies of maximum emissions.

Below 1000 MHz, final data was taken using the ESI 26/40 Fixed Tuned Receiver. These plots were made using the Peak or Quasi-Peak Detector functions, with manual measurements performed on the questionable frequencies using the Quasi-Peak or the Average Detector Function of the ESI 26/40 Fixed Tuned Receiver as required.

The bandwidths shown below are specified by ANSI C63.4-2003, Section 4.2.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz

A list of the equipment used can be found in Table 1. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

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6.0 AMBIENT MEASUREMENTS

For emissions measurements, broadband antennas and an EMI Test Receiver with a panoramic spectrum display are used. First the frequency range is scanned and displayed on the test receiver display. Next the scanned frequency range is divided into smaller ranges, and then it is manually tuned through to determine the emissions from the EUT. A headset or loudspeaker is connected to the test receiver's AM/FM demodulated output as an aid in detecting ambient signals and finding frequencies of significant emission from the EUT. If there is any doubt as to the source of the emission, it is further investigated by rotating the EUT, or by disconnecting the power from the EUT.

The EUT is set up in its typical configuration and operated in its various modes. For tabletop systems, cables are manipulated within the range of likely configurations. For floor-standing equipment, the cables are located in the same manner as the user would install them and no further manipulation is made. If the manner of cable installation is not known, or if it changes with each installation, cables or wires for floor-standing equipment shall be manipulated to the extent possible to produce the maximum level of emissions. For each mode of operation, the frequency spectrum is monitored. Variations in antenna height, antenna polarization, EUT azimuth, and cable or wire placement (each variable within bounds specified elsewhere) are explored to produce the emissions that have the highest amplitude relative to the limit. These methods are performed to the specifications in ANSI C63.4-2003.

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7.0 DESCRIPTION OF TEST SAMPLE: (See also Paragraph 8.0)

7.1 Description:

The TZ CloudHub Plus RFID interconnect module is designed to control up to 64 TZ devices for security and access control applications in commercial and residential environments. After initial setup with a PC running either the TZ Device Manager or a custom software application, the CloudHub can operate and log activity without a computer connected to its USB interface. The CloudHub features an on-board micro-controller, an internal RFID reader, and four independent RS-485 serial communication ports for connection to a TZ network. The network's utilization can be as simple as a single TZ Intevia device or one that is extended with TZ CloudLinks to include many more, including multiple TZ RFID readers or Wiegand inputs.

7.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Length: 152.4mm x Width: 90.8mm x Height: 40.1mm

7.3 LINE FILTER USED:

N/A

7.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

N/A

Clock Frequencies:

125 kHz

7.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

1. Mother board PN: 3045_00
2. Daughter board PN: 112072_01 A

8.0 ADDITIONAL DESCRIPTION OF TEST SAMPLE:
(See also Paragraph 7.0)

1: There were no additional descriptions noted at the time of test.

NOTE:

Cloudhub with 125 kHz transceiver.

9.0 PHOTO INFORMATION AND TEST SET-UP

Item 0 TZ CloudHub Plus RFID Module
Model Number: 7121CF Serial Number: N/A

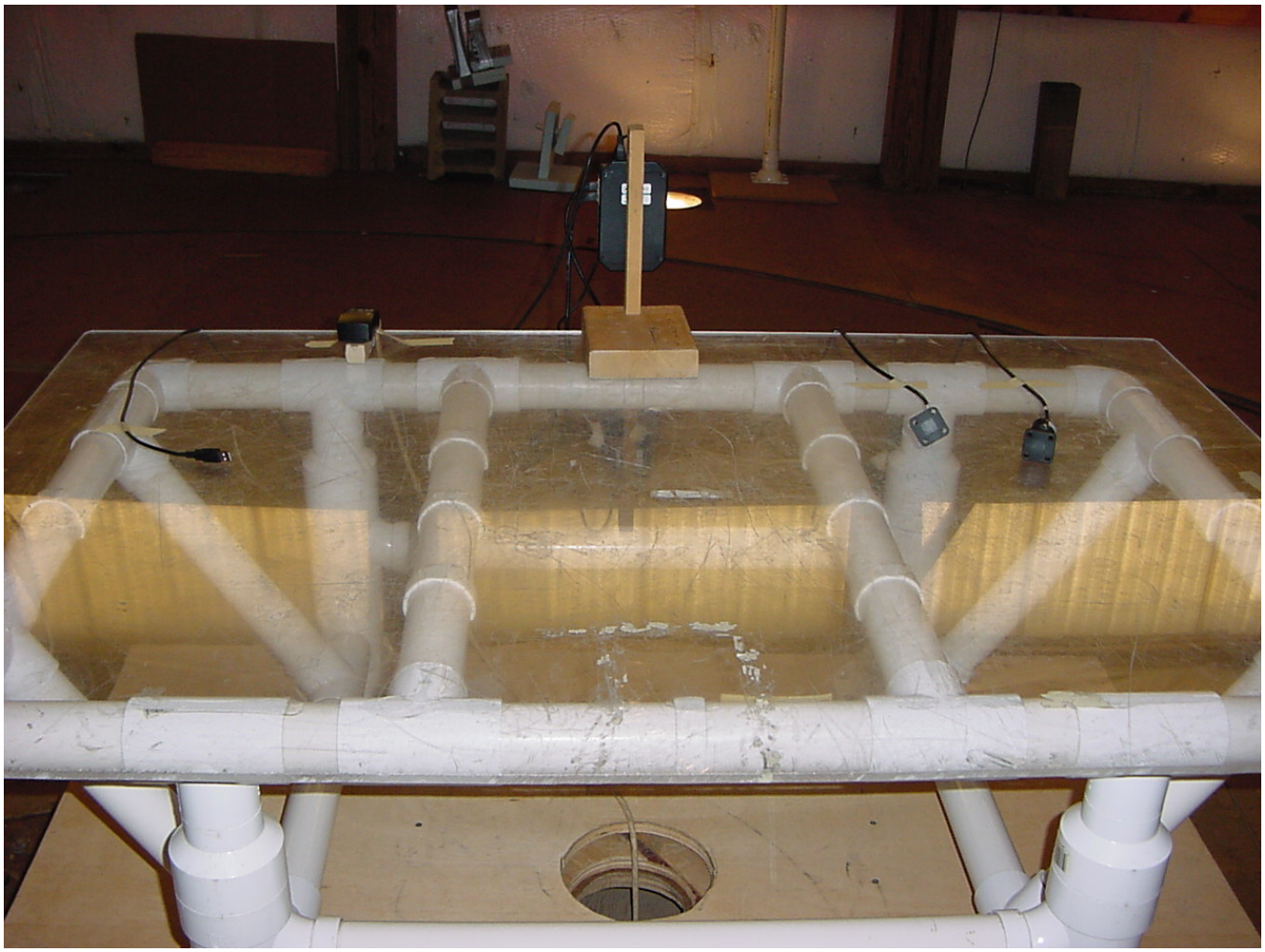
Item 1 Non-shielded TZ Intevia Radial with RS-485 cable. 5m
Model Number: 4110CF

Item 2 Non-shielded TZ Intevia Radial with RS-485 cable. 5m
Model Number: 4110CF

Item 3 Phihong Switching Power Supply
Model Number: PSM11R-120; Serial Number: Q04264

Item 4 Non-shielded USB cable. 1.5m

10.0 RADIATED PHOTOS TAKEN DURING TESTING



CLOUDHUB RADIATED FRONT

10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)

CLOUDHUB RADIATED BACK

10.0 CONDUCTED PHOTOS TAKEN DURING TESTING

CLOUDHUB AC LINE CONDUCTED FRONT

10.0 CONDUCTED PHOTOS TAKEN DURING TESTING (CON'T)

CLOUDHUB AC LINE CONDUCTED BACK

11.0 RESULTS OF TESTS

The radio interference emission charts can be seen on the pages at the end of this report. Data sheets indicating the test measurements taken during testing can also be found at the end of this report.

12.0 CONCLUSION

It was found that the TZ CloudHub Plus RFID Module, Model Number(s) 7121CF **meets** the radio interference conducted and radiated emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Sections 15.207 & 15.209, general requirements for Intentional Radiators.

TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	12/09
LISN	Solar	9252-50-R-24-BNC	961019	10 kHz – 30 MHz	7/09
Filter- High-Pass	SOLAR	7930-10	921541	12 kHz	1/10
Limiter	Electro-Metrics	EM-7600	706	10 kHz – 30 MHz	1/10
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	3/09
Antenna	EMCO	6502	2038	9 kHz – 30 MHz	8/09
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	3/09
Preamplifier	Rohde & Schwarz	TS-PR10	032001/004	9 kHz – 1 GHz	1/10
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	4/10
Antenna	EMCO	3146	1205	200 MHz – 1 GHz	4/10

All primary equipment is calibrated against known reference standards with a verified traceable path to NIST.

APPENDIX A

AC POWER LINE CONDUCTED DATA

AND

CHARTS TAKEN DURING TESTING

FCC Part 15 Class B

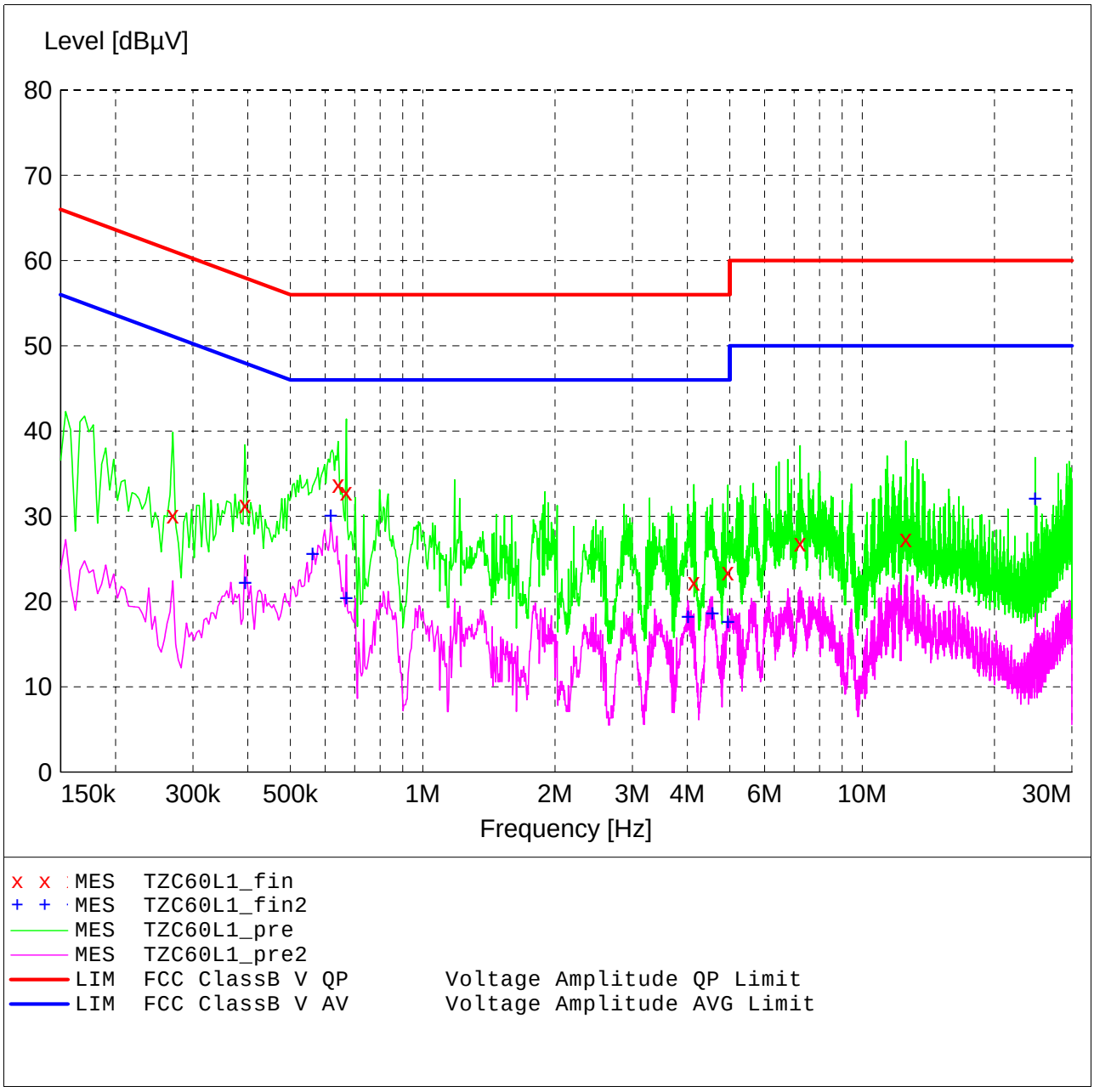
Voltage Mains Test

EUT:	TZ Cloudhub Plus RFID 7121CF
Manufacturer:	Telezygology
Operating Condition:	70 deg. F, 25% R.H.
Test Site:	DLS O.F. Site 1 (Screenroom)
Operator:	Adam A
Test Specification:	120 V 60 Hz
Comment:	Line 1
	Date: 02-27-2009

SCAN TABLE: "Line Cond Scrn RmFin"

Short Description: Line Conducted Emissions

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak CISPR AV	2.0 s	9 kHz	LISN DLS#128



MEASUREMENT RESULT: "TZC60L1_fin"

2/27/2009 9:52AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.270000	30.20	12.3	61	30.9	QP	---	---
0.394000	31.40	11.7	58	26.6	QP	---	---
0.642000	33.80	11.4	56	22.2	QP	---	---
0.670000	32.90	11.3	56	23.1	QP	---	---
4.142000	22.30	10.9	56	33.7	QP	---	---
4.946000	23.50	10.9	56	32.5	QP	---	---
7.222000	26.90	11.1	60	33.1	QP	---	---
12.570000	27.40	11.4	60	32.6	QP	---	---

MEASUREMENT RESULT: "TZC60L1_fin2"

2/27/2009 9:52AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.394000	22.20	11.7	48	25.8	CAV	---	---
0.562000	25.60	11.4	46	20.4	CAV	---	---
0.618000	30.10	11.4	46	15.9	CAV	---	---
0.670000	20.40	11.3	46	25.6	CAV	---	---
4.018000	18.20	10.9	46	27.8	CAV	---	---
4.566000	18.60	10.9	46	27.4	CAV	---	---
4.946000	17.60	10.9	46	28.4	CAV	---	---
24.758000	32.10	12.0	50	17.9	CAV	---	---

FCC Part 15 Class B

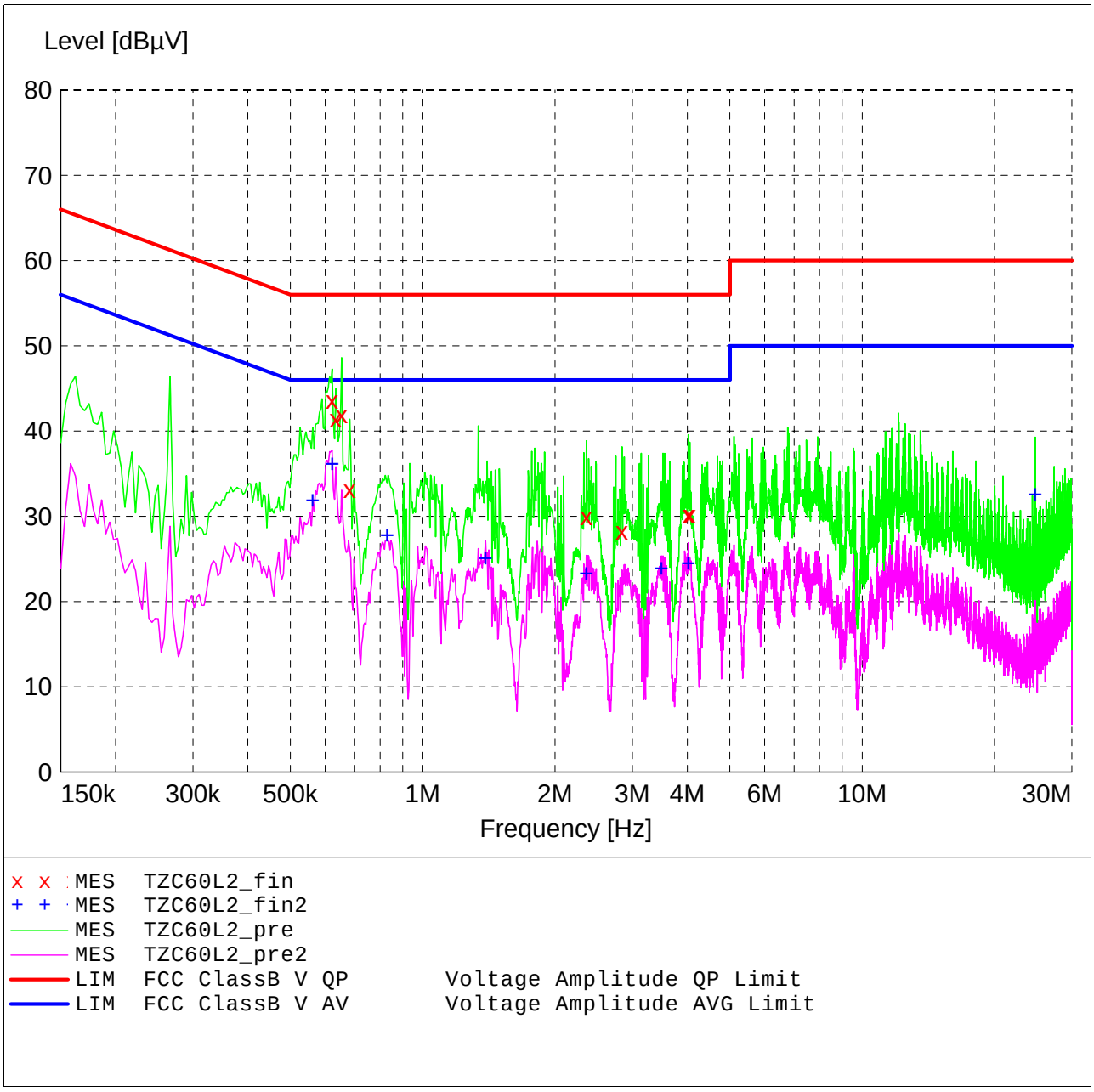
Voltage Mains Test

EUT:	TZ Cloudhub Plus RFID 7121CF
Manufacturer:	Telezygology
Operating Condition:	70 deg. F, 25% R.H.
Test Site:	DLS O.F. Site 1 (Screenroom)
Operator:	Adam A
Test Specification:	120 V 60 Hz
Comment:	Line 2
	Date: 02-27-2009

SCAN TABLE: "Line Cond Scrn RmFin"

Short Description: Line Conducted Emissions

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak CISPR AV	2.0 s	9 kHz	LISN DLS#128



MEASUREMENT RESULT: "TZC60L2_fin"

2/27/2009 9:48AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.622000	43.60	11.4	56	12.4	QP	---	---
0.634000	41.40	11.4	56	14.6	QP	---	---
0.654000	41.90	11.3	56	14.1	QP	---	---
0.682000	33.20	11.3	56	22.8	QP	---	---
2.358000	30.00	11.1	56	26.0	QP	---	---
2.842000	28.30	11.1	56	27.7	QP	---	---
4.022000	30.20	10.9	56	25.8	QP	---	---
4.054000	30.20	10.9	56	25.8	QP	---	---

MEASUREMENT RESULT: "TZC60L2_fin2"

2/27/2009 9:48AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.562000	31.90	11.4	46	14.1	CAV	---	---
0.622000	36.20	11.4	46	9.8	CAV	---	---
0.830000	27.80	11.2	46	18.2	CAV	---	---
1.390000	25.10	11.0	46	20.9	CAV	---	---
2.358000	23.30	11.1	46	22.7	CAV	---	---
3.494000	23.90	11.0	46	22.1	CAV	---	---
4.022000	24.50	10.9	46	21.5	CAV	---	---
24.762000	32.60	12.0	50	17.4	CAV	---	---

APPENDIX B

RADIATED DATA

AND

CHARTS TAKEN DURING TESTING

9 kHz – 30 MHz

FCC Part 15.209

Radiated Field Strength

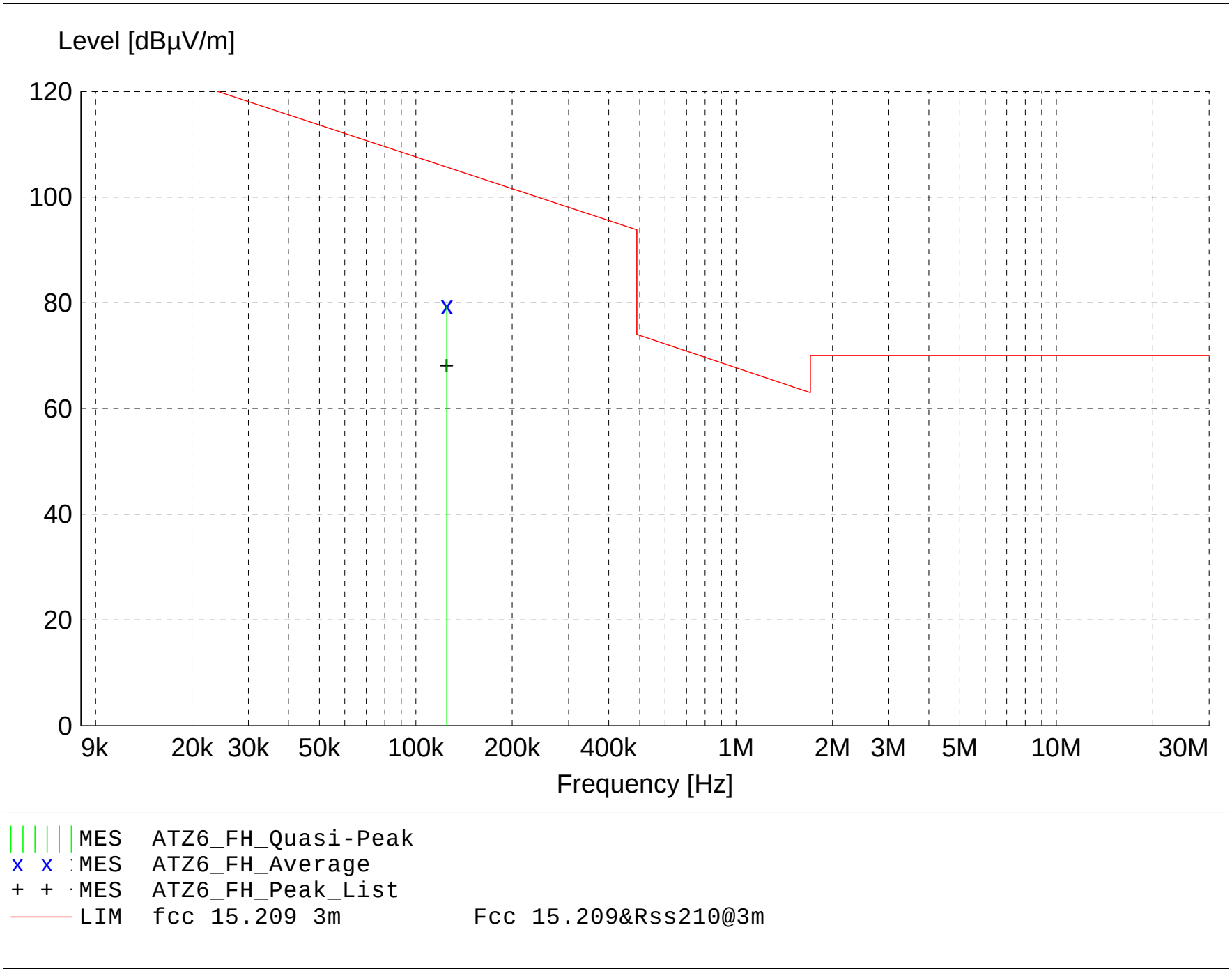
EUT: TZ Cloudhub Plus RFID 7121CF
Manufacturer: Telezygology
Operating Condition: 68 deg F; 27% R.H.
Test Site: DLS O.F. Site 2
Operator: Adam A
Test Specification: Operating Continuously
Comment: 125 kHz Transmit Frequency
DATE: 02-26-2009

TEXT: "Site 2 LowH 3M"

Short Description: Test Set-up 10kHz to 30MHz H
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI40 SN: 837808/005

Antennas --- EMCO Active Loop Model: 6502 SN: 1027

TEST SET-UP: EuT Measured at 3 Meters with H-FIELD Antenna


Level [dBµV/m]
120
100
80
60
40
20
0
9k
20k
30k
50k
100k
200k
400k
1M
2M
3M
5M
10M
30M
Frequency [Hz]
MES ATZ6_FH_Quasi-Peak
MES ATZ6_FH_Average
MES ATZ6_FH_Peak_List
LIM fcc 15.209 3m
Fcc 15.209&Rss210@3m

MEASUREMENT RESULT: "ATZ6_FH_Final"

2/26/2009 11:31AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
0.124950	69.07	10.40	0.1	79.5	105.7	26.1	1.00	180	AVERAGE	None

APPENDIX C

20 dB BANDWIDTH GRAPHS

PART 15.209

1250 Peterson Dr., Wheeling, IL 60090

Company: Telezygology, Inc.
Model Tested: 7121CF
Report Number: 15143

Test Date: 02-26-2009
Company: Telezygology
EUT: TZ Cloudhub Plus RFID 7121CF
Test: 20 dB Bandwidth
Operator: Adam A
Comment: Transmit = 125 kHz

20 dB bandwidth = 51.1 Hz