



1250 Peterson Dr., Wheeling, IL 60090

Company: Telezygology, Inc.
Model Tested: 8101CF
Report Number: 15159

FCC Rules and Regulations / CFR 47

Receivers and all other Unintentional Radiators

Part 15, Subpart B, Sections 15.107a & 15.109a

THE FOLLOWING MEETS THE ABOVE TEST SPECIFICATION

Formal Name: TZ RFID Plus Wiegand Translator Module

Kind of Equipment: Security and Access control.

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): 8101CF

Model(s) Tested: 8101CF

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 test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP, NIST, or any agency of the U.S. Government". Please see the "Additional Description of Equipment Under Test" page listed inside of this report.

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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



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 Communiqué dated 18 June 2005).



2008-10-01 through 2009-09-30

Effective dates

Jolly S. Bruce
For the National Institute of Standards and Technology

NVLAP-01C (REV. 2005-09-13)



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1.0 SUMMARY OF TEST REPORT

It was found that the TZ RFID Plus Wiegand Translator Module, Model Number(s) 8101CF **meets** the radio interference Power Line Conducted and Radiated emission requirements of FCC "Rules and Regulations", Part 15, Subpart B, Sections 15.107a & 15.109a for Receivers and all other Unintentional Radiators.

2.0 INTRODUCTION

On February 26 & 27, 2009, a series of radio frequency interference measurements was performed on TZ RFID Plus Wiegand Translator Module, Model Number(s) 8101CF, Serial Number: N/A. All tests were performed according to the procedures of the FCC as stated in the American National Standards Institute, ANSI C63.4-2003.

These test procedures were performed by personnel of D.L.S. Electronic Systems, Inc. who are responsible to Donald L. Sweeney, Senior EMC Engineer.

3.0 OBJECT

The purpose of this series of tests was to determine if the test sample could meet the radio frequency emission requirements of the FCC Rules and Regulations, Part 15, Subpart B, Sections 15.107a & 15.109a for Receivers and all other Unintentional Radiators.

4.0 TEST FACILITY

All emission tests were performed at D.L.S. Electronic Systems, Inc. according to the American National Standards Institute, ANSI C63.4-2003.

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.



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5.0 TEST EQUIPMENT

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

6.0 POWER LINE CONDUCTED EMISSION MEASUREMENTS

Power Line Conducted emissions were measured in accordance with the American National Standards Institute, ANSI C63.4-2003. Plots and tabular data can be viewed in Appendix A of this test report.

All test measurements were made at a screen room temperature of **70°F** at **25%** relative humidity.

7.0 RADIATED EMISSION MEASUREMENTS

All tests were performed according to the procedures of ANSI C63.4-2003. Plots and tabular data can be viewed in Appendix B of this test report.

FCC Part 15.33b states that measurements shall be made up to the 5th harmonic of the highest clock or timing frequency of the EUT. The highest timing frequency in the TZ RFID Plus Wiegand Translator Module is .125 MHz. Therefore measurements were made up to 1000 MHz.

All radiated emissions measurements were made at a test room temperature of 68°F at 28% relative humidity.



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8.0 D.L.S. ELECTRONIC SYSTEMS, INC. MEASUREMENT UNCERTAINTY

Compliance with the limits in this standard are based on the results of the compliance measurement. Our calculated measurement uncertainty including the measurement instrumentation, associated connections between the various instruments in the measurement chain, and other contributions, are provided in this section of the test report.

Line Conducted Uncertainty		
Contribution	Probability Distribution	Uncertainty (+/- dB)
Combined Standard, Uncertainty	Normal	150 kHz – 30 MHz 1.05
Expanded Uncertainty	Normal (k=2)	2.10

Radiated Emission Uncertainty in MHz (1/4/08)									
		(+/- dB)	(+/- dB)	(+/- dB)	(+/- dB)	(+/- dB)	(+/- dB)	(+/- dB)	(+/- dB)
Contribution	Probability Distribution	3M	3M	3M	3M	10 M	10 M	10 M	10 M
		30-100	100-700	700-1000	700-1000	30-100	100-700	700-1000	700-1000
Combined Standard Uncertainty	Normal	1.70	1.62	1.66	1.55	1.64	1.58	1.66	1.54
Expanded Uncertainty	Normal (k=2)	3.40	3.23	3.33	3.11	3.29	3.16	3.31	3.09



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9.0 DESCRIPTION OF TEST SAMPLE:

9.1 DESCRIPTION:

The TZ RFID Plus Wiegand Translator connects to a TZ network and provides access control by Radio Frequency Identification and by interpreting a Wiegand data stream from third party security modules, including RFID readers, magnetic card readers, and fingerprint scanners. It can operate both as a stand-alone device that controls a small group of fasteners, or as a network device that transmits information, like access attempts, to the rest of the network.

9.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Length: 88.9mm x Width: 63.5mm x Height: 25.4mm

9.3 INTERNAL CLOCK FREQUENCIES:

125 kHz

9.4 LINE FILTER:

N/A

9.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

PC Board

112009-01_A



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10.0 MODIFICATIONS MADE TO EUT FOR EMC COMPLIANCE:

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

11.0 CONCLUSION

It was found that the TZ RFID Plus Wiegand Translator Module, Model Number(s) 8101CF **meets** the radio interference Power Line Conducted and Radiated emission requirements of FCC Rules and Regulations, Part 15, Subpart B, Sections 15.107a & 15.109a for Receivers and all other Unintentional Radiators.

12.0 PHOTO INFORMATION AND TEST SET-UP

Item 0 TZ RFID Plus Wiegand Translator Module
Model Number: 8101CF; Serial Number: N/A

Item 1 Pihong Switching Power Supply
Model Number: PSM11R-120; Serial Number: Q04264

Item 2 TZ Cloudlink
Model Number: 7105CL; Serial Number 004

Item 3 Intra-system CAT 5 Ethernet cable. 1m



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13.0 ID PHOTO TAKEN DURING TESTING



TZ RFID RADIATED FRONT



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13.0 ID PHOTO TAKEN DURING TESTING



TZ RFID RADIATED BACK



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14.0 POWER LINE CONDUCTED PHOTO TAKEN DURING TESTING



TZ RFID AC LINE CONDUCTED FRONT



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14.0 POWER LINE CONDUCTED PHOTO TAKEN DURING TESTING (CON'T)



TZ RFID AC LINE CONDUCTED BACK



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TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Spectrum Analyzer	Hewlett Packard	8566B	3138A07914	100 Hz – 22 GHz	7/09
Quasi Peak Adapter	Hewlett Packard	8565A	3107A01519	9 kHz – 1 GHz	8/09
Spectrum Analyzer	Agilent	E4440A	MY46186545	3 Hz – 26.5 GHz	7/09
RF Preselector	Agilent	N9039A	MY46520231	9 kHz – 1 GHz	8/09
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	1/10
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	10/09
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	2/10
Antenna	EMCO	3104C	00054891	20 MHz – 200 MHz	2/10
Antenna	Electrometrics	LPA-25	1114	200 MHz – 1 GHz	2/10
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	3/09



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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.



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APPENDIX A

CONDUCTED EMISSIONS DATA

AND

CHARTS TAKEN DURING TESTING

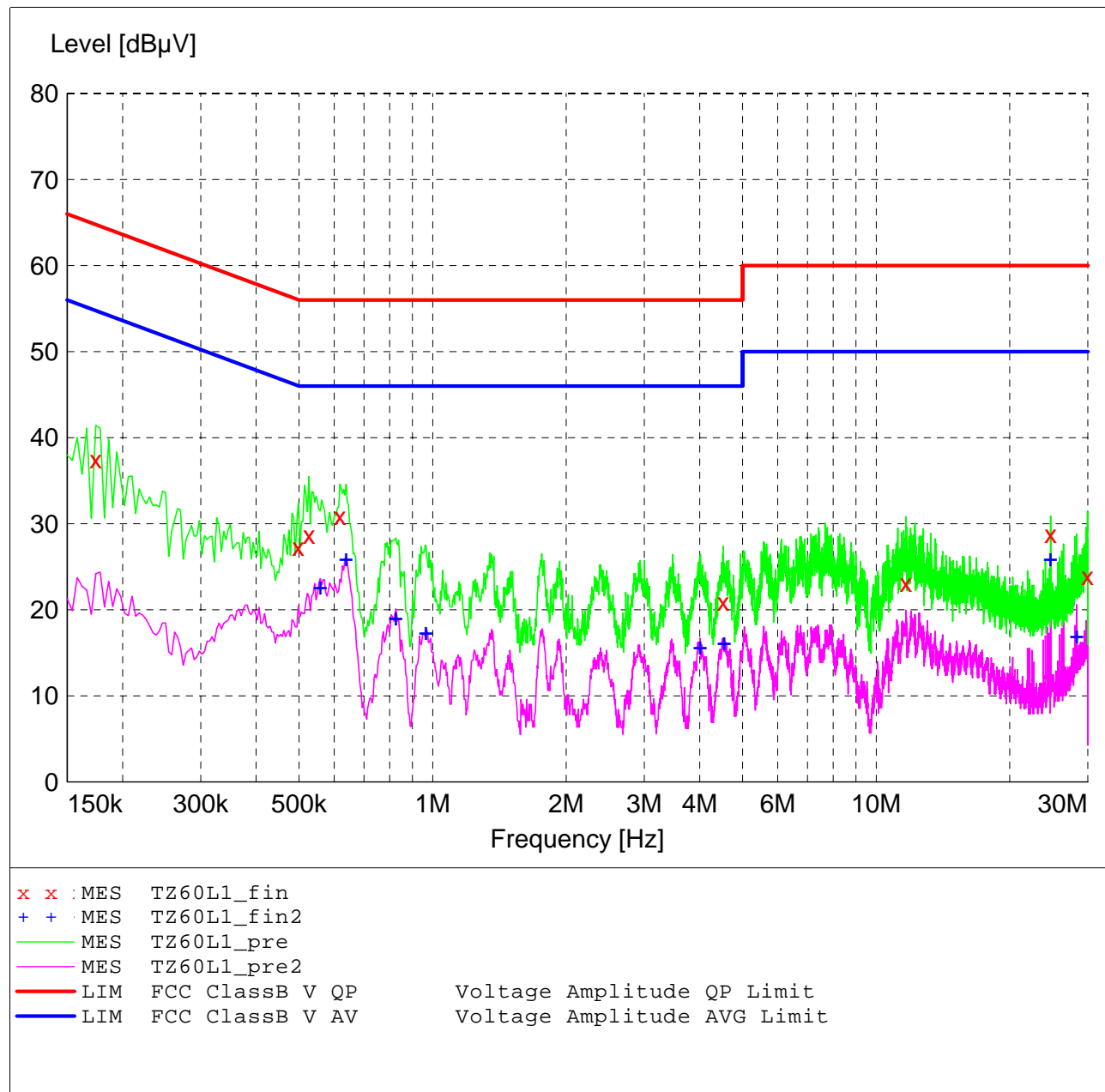
FCC Part 15 Class B

Voltage Mains Test

EUT: TZ RFID Plus Wiegand Translator 8101CF
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	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer	
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128	
CISPR AV							



MEASUREMENT RESULT: "TZ60L1_fin"

2/27/2009 9:04AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.174000	37.50	13.4	65	27.3	QP	---	---
0.498000	27.30	11.5	56	28.7	QP	---	---
0.526000	28.70	11.5	56	27.3	QP	---	---
0.618000	30.90	11.4	56	25.1	QP	---	---
4.518000	20.90	10.9	56	35.1	QP	---	---
11.670000	23.10	11.4	60	36.9	QP	---	---
24.738000	28.80	12.0	60	31.2	QP	---	---
29.966000	23.90	12.3	60	36.1	QP	---	---

MEASUREMENT RESULT: "TZ60L1_fin2"

2/27/2009 9:04AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.558000	22.70	11.5	46	23.3	CAV	---	---
0.638000	26.00	11.4	46	20.0	CAV	---	---
0.826000	19.10	11.2	46	26.9	CAV	---	---
0.966000	17.40	11.1	46	28.6	CAV	---	---
4.010000	15.70	10.9	46	30.3	CAV	---	---
4.542000	16.20	10.9	46	29.8	CAV	---	---
24.738000	26.00	12.0	50	24.0	CAV	---	---
28.334000	17.00	12.2	50	33.0	CAV	---	---

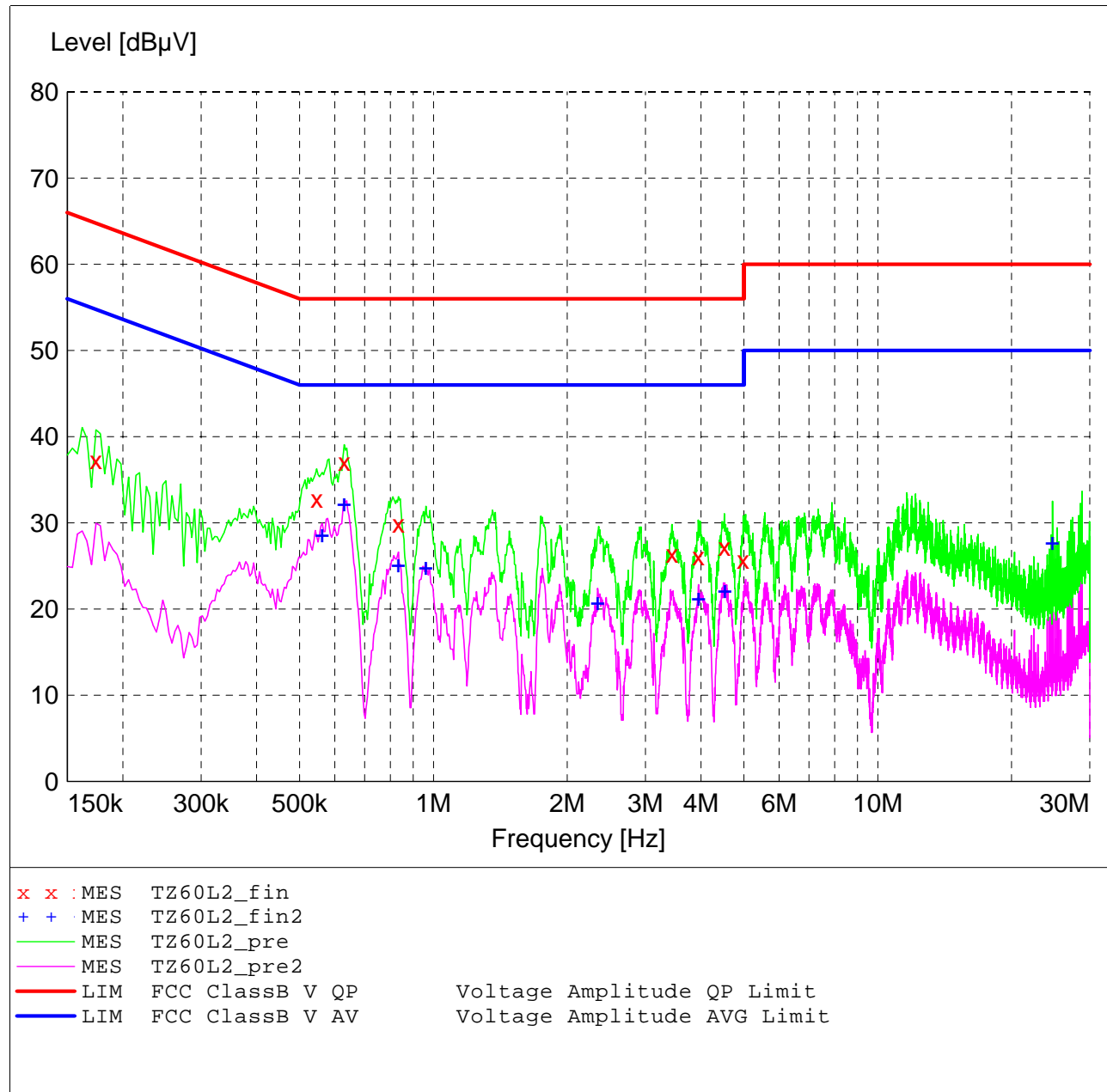
FCC Part 15 Class B

Voltage Mains Test

EUT: TZ RFID Plus Wiegand Translator 8101CF
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	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128
CISPR AV						



MEASUREMENT RESULT: "TZ60L2_fin"

2/27/2009 9:09AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.174000	37.20	13.4	65	27.6	QP	---	---
0.546000	32.80	11.5	56	23.2	QP	---	---
0.630000	37.10	11.4	56	18.9	QP	---	---
0.834000	29.90	11.2	56	26.1	QP	---	---
3.442000	26.40	11.0	56	29.6	QP	---	---
3.946000	26.10	10.9	56	29.9	QP	---	---
4.518000	27.20	10.9	56	28.8	QP	---	---
4.978000	25.70	10.9	56	30.3	QP	---	---

MEASUREMENT RESULT: "TZ60L2_fin2"

2/27/2009 9:09AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.562000	28.70	11.4	46	17.3	CAV	---	---
0.630000	32.30	11.4	46	13.7	CAV	---	---
0.834000	25.20	11.2	46	20.8	CAV	---	---
0.962000	24.90	11.1	46	21.1	CAV	---	---
2.342000	20.80	11.1	46	25.2	CAV	---	---
3.950000	21.30	10.9	46	24.7	CAV	---	---
4.526000	22.20	10.9	46	23.8	CAV	---	---
24.742000	27.80	12.0	50	22.2	CAV	---	---



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APPENDIX B

RADIATED EMISSIONS DATA

AND

CHARTS TAKEN DURING TESTING

FCC Part 15 Class B

Electric Field Strength

EUT: TZ RFID Plus Wiegand Translator 8101CF
Manufacturer: Telezygology
Operating Condition: 68 deg. F; 28% R.H.
Test Site: DLS O.F. Site 2
Operator: Adam A
Test Specification: 120V 60Hz
Comment: 125 kHz transmit frequency
Date: 02-26-2009

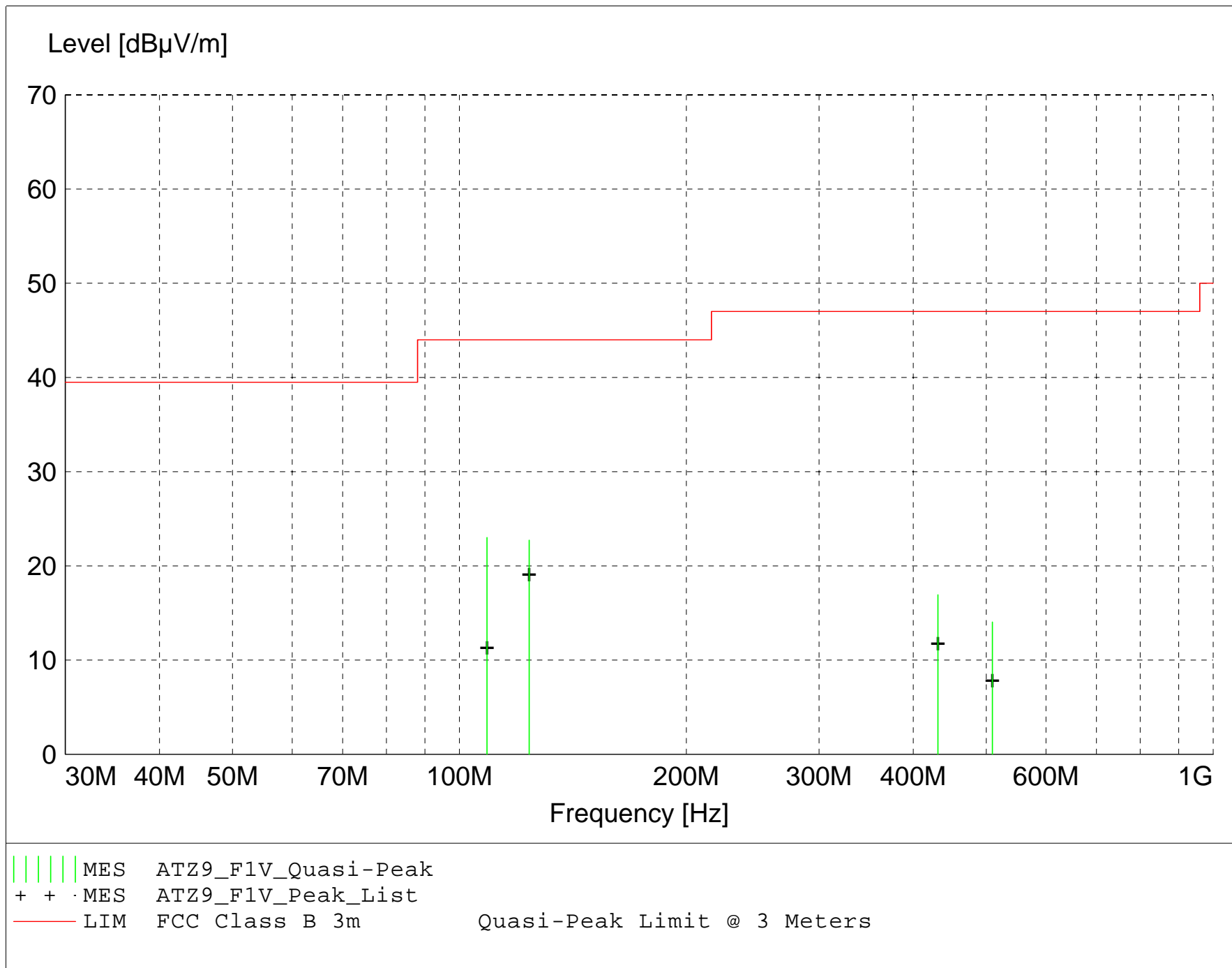
TEXT: "Site 2 MidV 3M"

Short Description: Test Set-up Vert30-1000MHz
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 26 SN: 837491/010

Antennas ---
Biconical -- EMCO 3104C SN: 0005-4892
Log Periodic -- Electro Metrics LPA-25 SN: 1205

Pre-Amp --- Rohde&Schwarz TS-PR10 SN: 032001/004

TEST SET-UP: EUT Measured at 3 Meters with VERTICAL Antenna Polarization



MEASUREMENT RESULT: "ATZ9_F1V_Final"

2/26/2009 3:00PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level			Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m	dB	m	deg		
108.780000	33.88	12.38	-23.2	23.0	44.0	21.0	1.00	35	QUASI-PEAK	None
123.740000	33.01	12.82	-23.1	22.7	44.0	21.3	1.00	80	QUASI-PEAK	None
431.360000	22.10	16.15	-21.3	16.9	47.0	30.1	1.00	90	QUASI-PEAK	None
509.420000	16.39	18.39	-20.7	14.0	47.0	33.0	1.00	90	QUASI-PEAK	None

FCC Part 15 Class B

Electric Field Strength

EUT: TZ RFID Plus Wiegand Translator 8101CF
Manufacturer: Telezygology
Operating Condition: 68 deg. F; 28% R.H.
Test Site: DLS O.F. Site 2
Operator: Adam A
Test Specification: 120V 60Hz
Comment: 125 kHz transmit frequency
Date: 02-26-2009

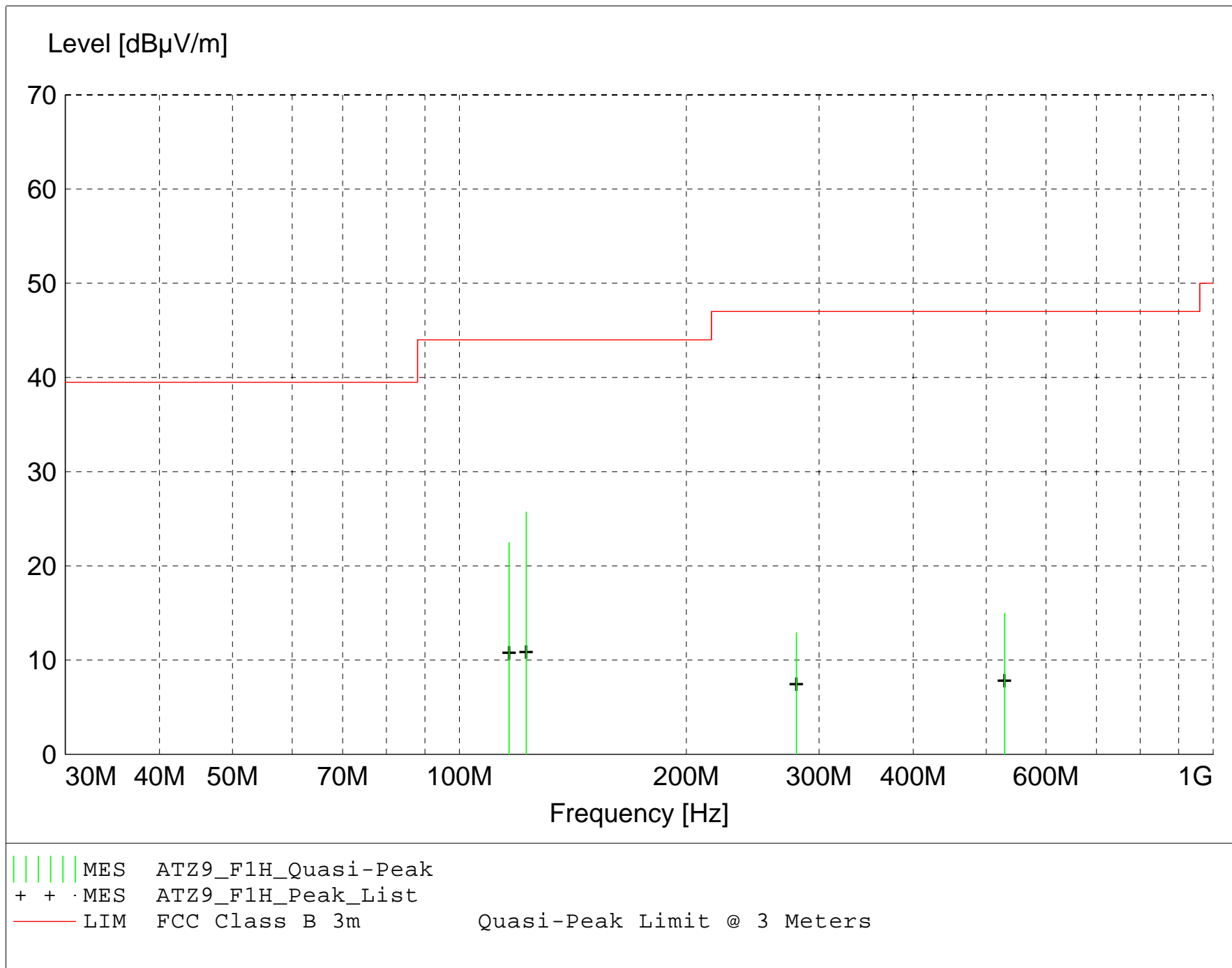
TEXT: "Site 2 MidH 3M"

Short Description: Test Set-up Horz30-1000MHz
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 26 SN: 837491/010

Antennas ---
Biconical -- EMCO 3104C SN: 0005-4892
Log Periodic -- Electro Metrics LPA-25 SN: 1205

Pre-Amp --- Rohde&Schwarz TS-PR10 SN: 032001/004

TEST SET-UP: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization



MEASUREMENT RESULT: "ATZ9_F1H_Final"

2/26/2009 3:06PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level			Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m	dB	m	deg		
122.640000	36.03	12.79	-23.1	25.7	44.0	18.3	2.20	170	QUASI-PEAK	None
116.400000	32.79	12.82	-23.1	22.5	44.0	21.5	2.20	160	QUASI-PEAK	None
528.860000	17.36	18.26	-20.7	15.0	47.0	32.0	2.50	270	QUASI-PEAK	None
279.980000	21.50	13.49	-22.1	12.9	47.0	34.1	2.10	0	QUASI-PEAK	None