



166 South Carter, Genoa City, WI 53128

Company: Andersen Corporation
Model Tested: 9017591
Report Number: 18703
Project Number: 5738

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart C – Intentional Radiators

Section 15.231

Periodic operation in the band 40.66 - 40.70 MHz
and above 70 MHz

Including Verification data for Subpart B - Unintentional Radiators
Sections 15.107 & 15.109 for the Receiver

THE FOLLOWING MEETS THE ABOVE TEST SPECIFICATION

Formal Name: Control Key Pad Console
Kind of Equipment: Control Key Pad with Transceiver
Frequency Range: 868.2 MHz
Test Configuration: Tabletop
Model Number(s): 9017591
Model(s) Tested: 9017591
Serial Number(s): none (Test Sample)
Date of Tests: January 23 to February 14, 2013
Test Conducted For: Andersen Corporation
100 Fourth Avenue North
Bayport, Minnesota 55003-1096, USA

NOTICE: “This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government”. Please see the "Description of Test Sample" page listed inside of this report.

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166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
Project Number:

Andersen Corporation
9017591
18703
5738

SIGNATURE PAGE

Tested By:

A handwritten signature in black ink that reads "Craig Brandt". The signature is written in a cursive style with a long horizontal stroke at the end.

Craig Brandt
Test Engineer

Reviewed By:

A handwritten signature in black ink that reads "William Stumpf". The signature is written in a cursive style with a long horizontal stroke at the end.

William Stumpf
OATS Manager

Approved By:

A handwritten signature in black ink that reads "Brian J. Mattson". The signature is written in a cursive style with a long horizontal stroke at the end.

Brian Mattson
General Manager



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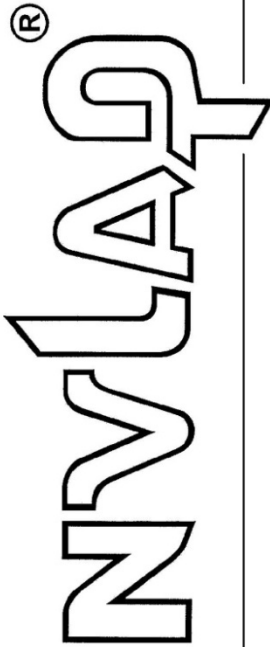


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United States Department of Commerce
National Institute of Standards and Technology



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 January 2009).*



For the National Institute of Standards and Technology

2012-10-01 through 2013-09-30

Effective dates



166 South Carter, Genoa City, WI 53128

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1.0 Summary of Test Report

It was determined that the Andersen Corporation Control Key Pad Console, Model 9017591, complies with the requirements of CFR 47 Part 15 Subpart C Section 15.231.

Subpart C Section 15.231 Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
15.231(c)	20 dB Emission Bandwidth	ANSI C63.4-2009 & ANSI C63.10-2009	1	Yes
15.231(a)(1)	Automatic Deactivation	ANSI C63.4-2009 & ANSI C63.10-2009	1	Yes
15.231(b)	Field Strength of Emissions - Fundamental and Spurious -	ANSI C63.4-2009 & ANSI C63.10-2009	1	Yes
15.35(c)	Duty Cycle Correction for Pulsed operation	ANSI C63.4-2009 & ANSI C63.10-2009	1	Yes

Note 1: Radiated emission measurement.

2.0 Introduction

In January & February of 2013, the Control Key Pad Console, Model 9017591, as provided from Andersen Corporation was tested to the requirements of CFR 47 Part 15 Subpart C Section 15.231. To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.

3.0 Test Facilities

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.

Wisconsin Test Facility:

D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128

Wheeling Test Facility:

D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090



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Company: Andersen Corporation
Model Tested: 9017591
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4.0 Description of Test Sample

Description:

This is a key pad control module for awning style power windows. It receives its power from the Power Unit. This electric device controls the Power Window Driver that opens and closes the window. It consists of a key pad, circuit board and plastic housing.

Type of Equipment / Frequency Range:

Wall mount / 868.2 MHz

Physical Dimensions of Equipment Under Test:

Length: 5 in x Width: 5 in x Height: 1 in

Power Source:

90-135 V, 60 Hz / 12-13.8 VDC

Switching Power Supply Frequency / Internal Frequencies:

132 kHz / 9.6 kHz, 4 MHz, 16 MHz

Transmit / Receive Frequencies Used For Test Purpose:

868.2 MHz

Type of Modulation(s) / Antenna Type:

Digital-Gaussian Frequency Shift Keying with a data rate of 100kbps / Integral antenna

Description of Circuit Board(s) / Part Number:

Console Board	HO21010063-X8 Revision 8
---------------	--------------------------



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5.0 Test Equipment

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

D.L.S. Wisconsin – OATS 2 Radiated 30 – 1000 MHz

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	1-3-13	1-3-14
Preamplifier	Rohde & Schwarz	TS-PR10	032001/004	9 kHz – 1 GHz	1-10-13	1-10-14
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	9-13-12	9-13-14
Antenna	EMCO	3146	1205	200 MHz – 1 GHz	9-19-12	9-19-14

AC LINE CONDUCTED TEST (Screen Room)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	4-12-12	4-12-13
LISN	Solar	9252-50-R-24-BNC	961019	9 kHz – 30 MHz	5-24-12	5-24-13
Filter- High-Pass	SOLAR	7930-120	090702	120 kHz – 30 MHz	1-7-13	1-11-14
Limiter	Electro-Metrics	EM-7600	706	9 kHz – 30 MHz	1-7-13	1-11-14

Radiated above 1 GHz - OATS 2

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
High Pass Filter	Planar Filter Co.	HP2G-1780-CD-SS	PF1227/0728	1.5GHz-18GHz	8-13-12	8-13-13
Preamp	Ciao	CA118-4010	101	1GHz-18GHz	2-27-12	2-27-13
Horn Antenna	EMCO	3115	6204	1-18GHz	6-16-11	6-16-13

6.0 Test Arrangements

Radiated Emissions Measurement Arrangement:

All radiated emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.4-2009 and ANSI C63.10-2009, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up.

Unless otherwise noted, the bandwidth of the measuring receiver / analyzer used during testing is shown below.

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
Above 1 GHz	1 MHz



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7.0 Test Conditions

Test Conditions recorded during test:

Temperature and Humidity:

68°F at 27% RH

Voltage:

120V, 60Hz

8.0 Modifications Made To EUT For Compliance

1. A ferrite (Fair-Rite 0431167281) was placed inside the transceiver unit at the Power Supply pcbrd (black & white wires, two passes) to lower broadband noise @ appx 83.5MHz.
2. Added Fair-Rite #0431164281 to power supply board output wires (one pass) inside unit.

9.0 Additional Descriptions

The Control Key Pad Console is wired to receive its power directly from the Power Unit, which can also run on battery power.

10.0 Results

Measurements were performed in accordance with ANSI C63.4-2009 and ANSI C63.10-2009. Graphical and tabular data can be found in Appendix B at the end of this report.

11.0 Conclusion

The Control Key Pad Console, Model 9017591, as provided from Andersen Corporation tested in January & February, 2013 **meets** the requirements of CFR 47 Part 15 Subpart C Section 15.231.



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Appendix A – Test Photos

Photo Information and Test Setup:

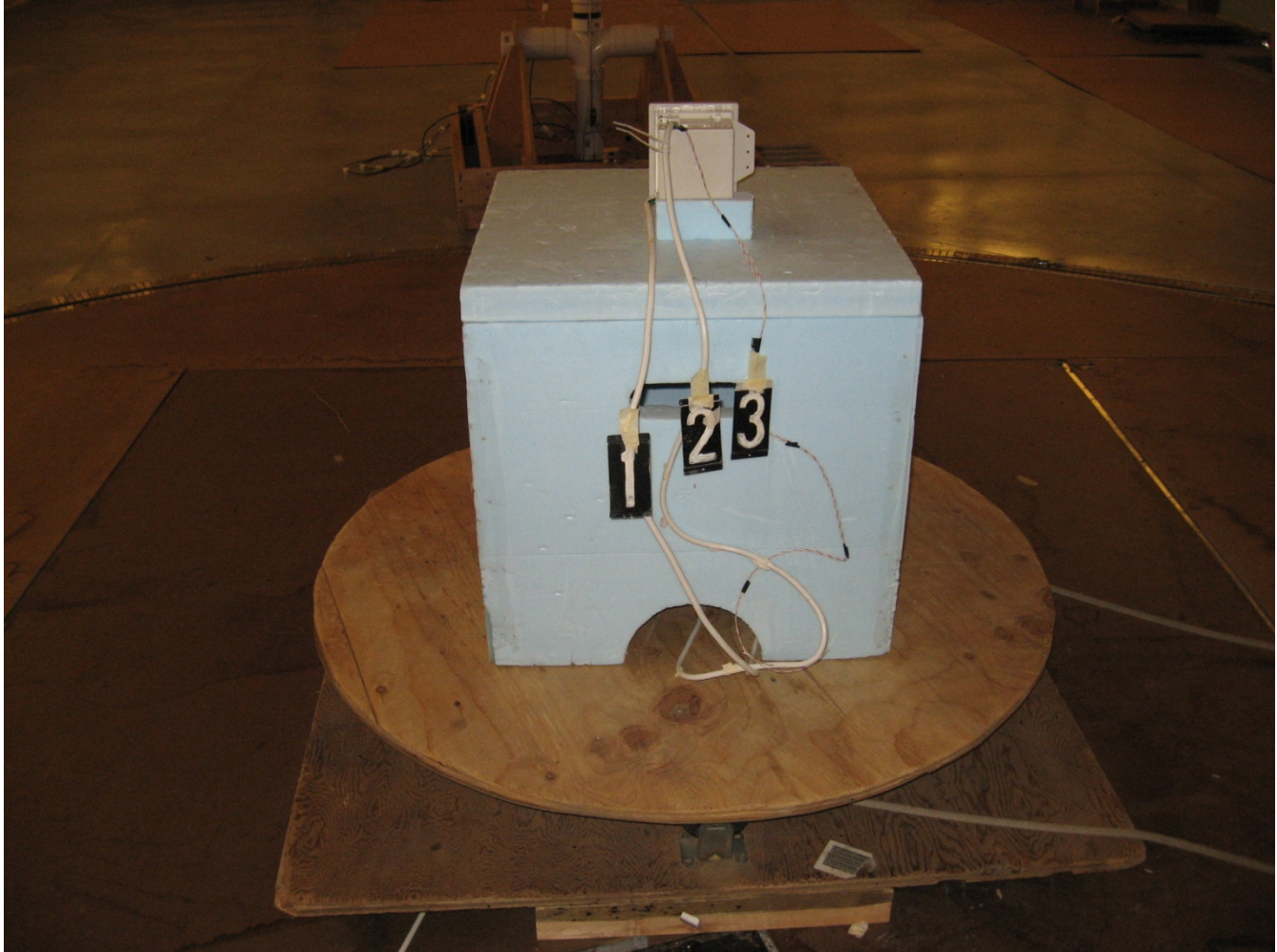
- Item 0: Andersen Corp. Control Key Pad Console, Model: 9017591
wired to Power Unit Model: 9017588
- Item 1: Unshielded AC Power Cord, 2 meters long
- Item 2: Unshielded Window Driver Cable, 1.2 meters long with plastic connector.
- Item 3: Unshielded RS-485 Cable, 1.2 meters long with plastic connector.

Fundamental Radiated Emissions – Below 1 GHz, Front



Appendix A

Fundamental Radiated Emissions – Below 1 GHz, Back





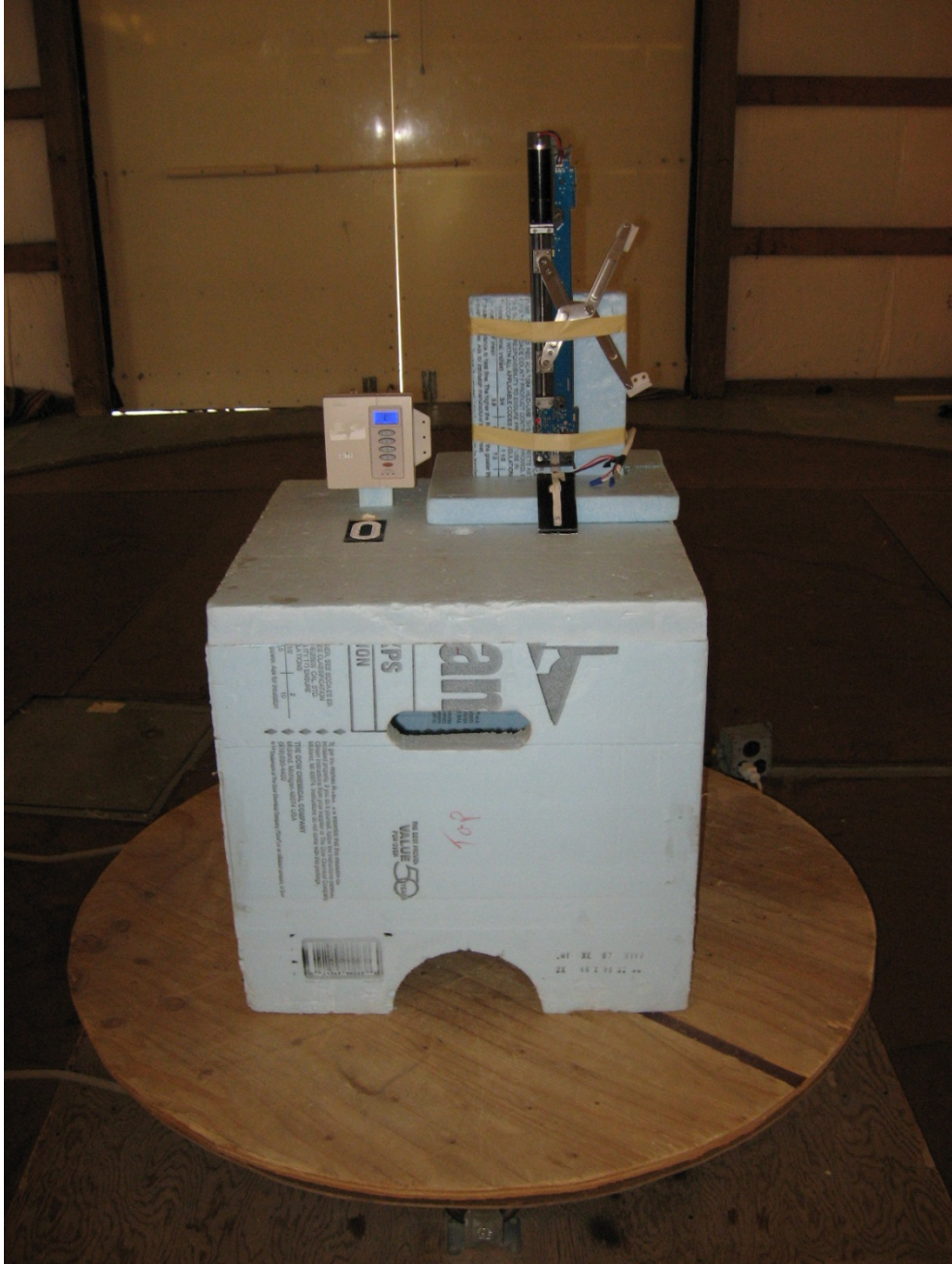
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Appendix A

- Item 0: Andersen Corp. Control Key Pad Console, Model: 9017591
wired to Power Unit, Model: 9017588
- Item 1: Power Window Driver, Model: 9018359

Radiated Emissions – Below 1 GHz, Front



Appendix A

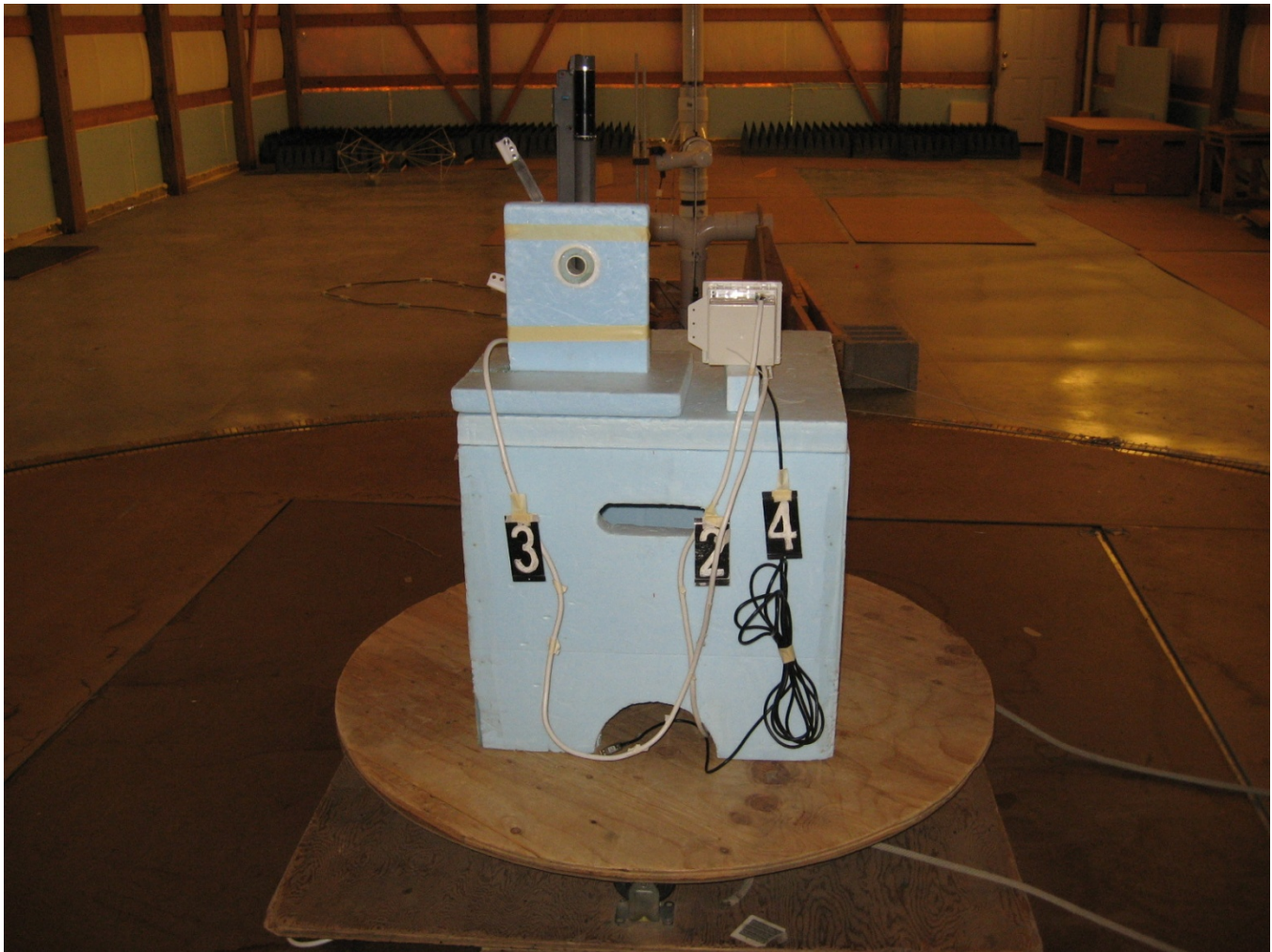
Radiated Emissions – Above 1 GHz, Front



Appendix A

- Item 2: Unshielded AC Power Cord, 2 meters long
- Item 3: Unshielded Window Driver Cable, 1.2 meters long with plastic connector.
- Item 4: Unshielded RS-485 Cable, 1.2 meters long with plastic connector.

Radiated Emissions – Back



Appendix A

AC Line Conducted Emissions, Front



Appendix A

AC Line Conducted Emissions, Back





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Appendix B – Measurement Data

1.0 Emission Bandwidth – 20 dB

Rule Part:

Section 15.231 (c)

Test Procedure:

ANSI C63.4-2009 and ANSI C63.10-2009

Limit:

Section 15.231 (c) :

$868.2 \text{ MHz} \times 0.25\% = 2.17 \text{ MHz}$

Results:

Compliant
20 dB bandwidth: **208.0 kHz**

Sample Equation(s):

None

Notes:

This was a radiated emissions measurement. The bandwidth was measured from the points 20 dB down from the modulated carrier.



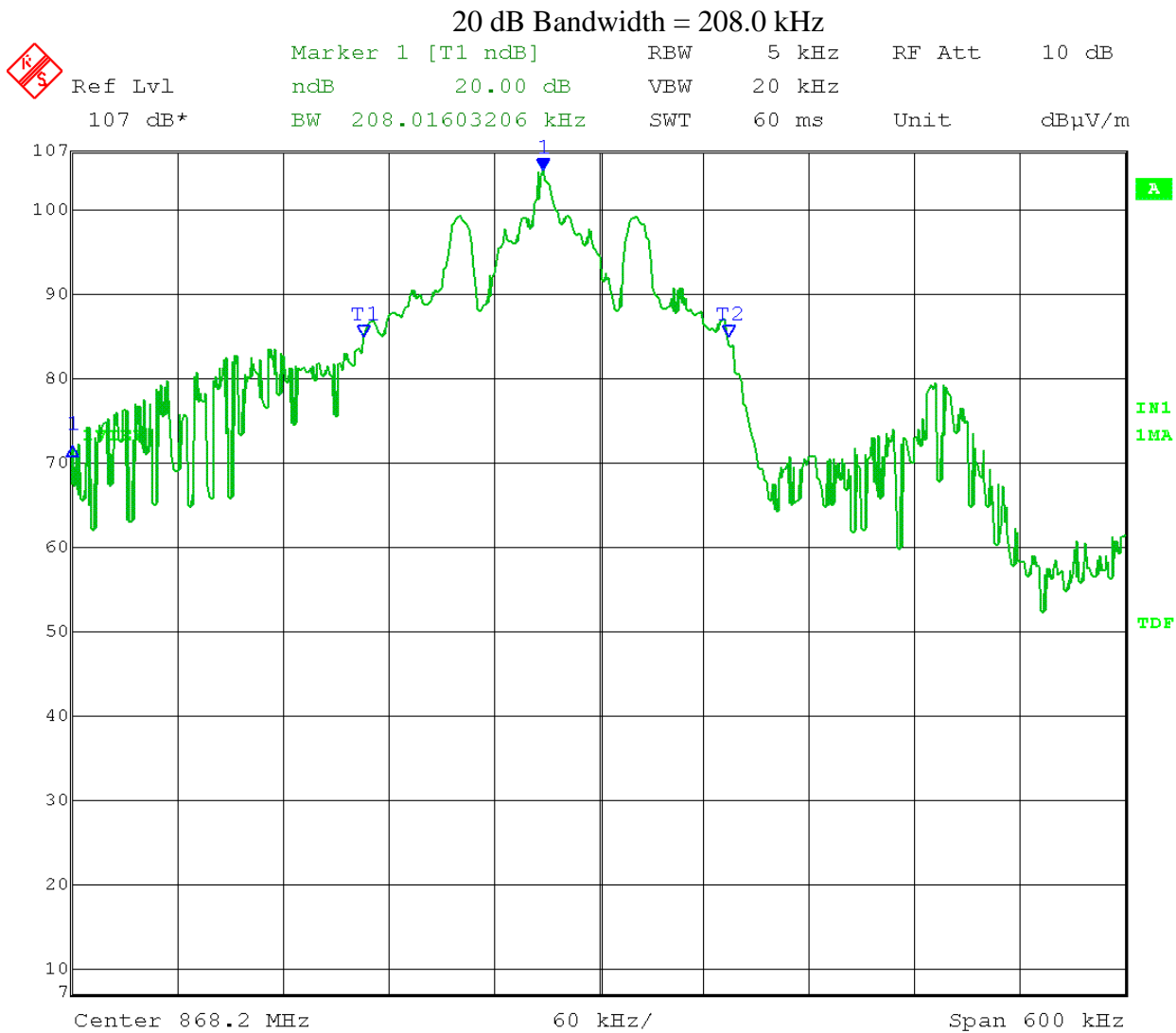
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Appendix B

Test Date: 01-24-2013
Company: Andersen Corporation
EUT: Wall Console Controller
Test: 20 dB Bandwidth
Operator: Craig B

Comment: SPAN 2 to 5 times occupied bandwidth
RBW between 1% and 5% of occupied bandwidth



Date: 25.JAN.2013 14:03:57



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Appendix B

2.0 Automatic Deactivation

Rule Part:

15.231 (a) (1) and 15.231 (a) (2)

Test Procedure:

ANSI C63.4-2009 and ANSI C63.10-2009

Limit:

A transmitter activated manually/automatically shall cease transmission within 5 seconds after activation.

Results:

Compliant
Time before deactivation: 6.613 ms

Sample Equation(s):

None

Notes:

None



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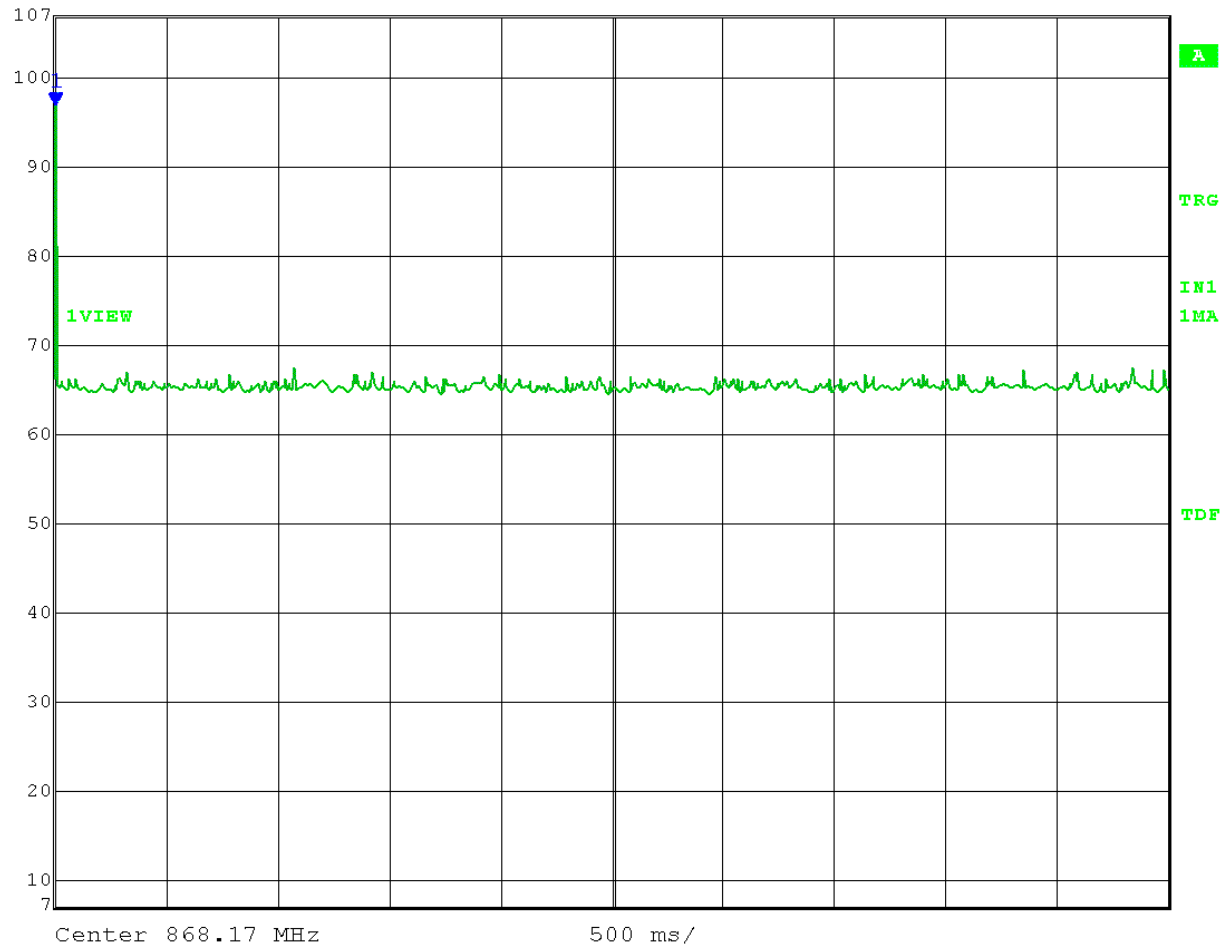
Company: Andersen Corporation
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Appendix B

Test Date: 01-28-2013
Company: Andersen Corporation
EUT: Wall Console Controller
Test: Dwell Time
Operator: Craig B

Comment: A transmitter activated manually/automatically shall cease transmission within 5 seconds after activation.

	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
	Ref Lvl	96.95 dB μ V/m	VBW	3 MHz	
	107 dB*	0.000000 s	SWT	5 s	Unit dB μ V/m



Date: 28.JAN.2013 10:35:02



166 South Carter, Genoa City, WI 53128

Company: Andersen Corporation
Model Tested: 9017591
Report Number: 18703
Project Number: 5738

Appendix B

3.0 Field Strength of Emissions – Fundamental and Spurious

Rule Part:

15.231 (b) including 15.205

Test Procedure:

ANSI C63.4-2009 and ANSI C63.10-2009

Limit:

Fundamental (F) $\mu\text{V}/\text{m}$ at 3 meters: 12,500 $\mu\text{V}/\text{m}$ at 3 meters
The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

Results:

Compliant

Sample Equation(s):

$$41.6667(F) - 7083.3333 = 10996.68 \mu\text{V}/\text{m} \text{ at } 3 \text{ meters}$$

$$20 * \log(12500) = 81.93 \text{ dB } \mu\text{V}/\text{m} \text{ at } 3 \text{ meters}$$

Final Corrected = Total Level - Duty Cycle Correction

Margin = Limit - Final Corrected

Level = Total Level - System Loss - Antenna Factor

Notes:

The emissions were measured of the fundamental and spurious at a distance of three meters between the EUT and the measuring antenna. Compliance is determined by comparing peak data, minus duty cycle correction, to the average limit.

Electric Field Strength

EUT: Wall Console Controller and Window Driver
Manufacturer: Andersen Windows
Operating Condition: 68 deg. F; 27% R.H.
Test Site: DLS O.F. Site 2
Operator: Jim O
Test Specification: FCC 15.231
Comment: Continuous Transmit 120Vac/60Hz
Date: 01-29-2013

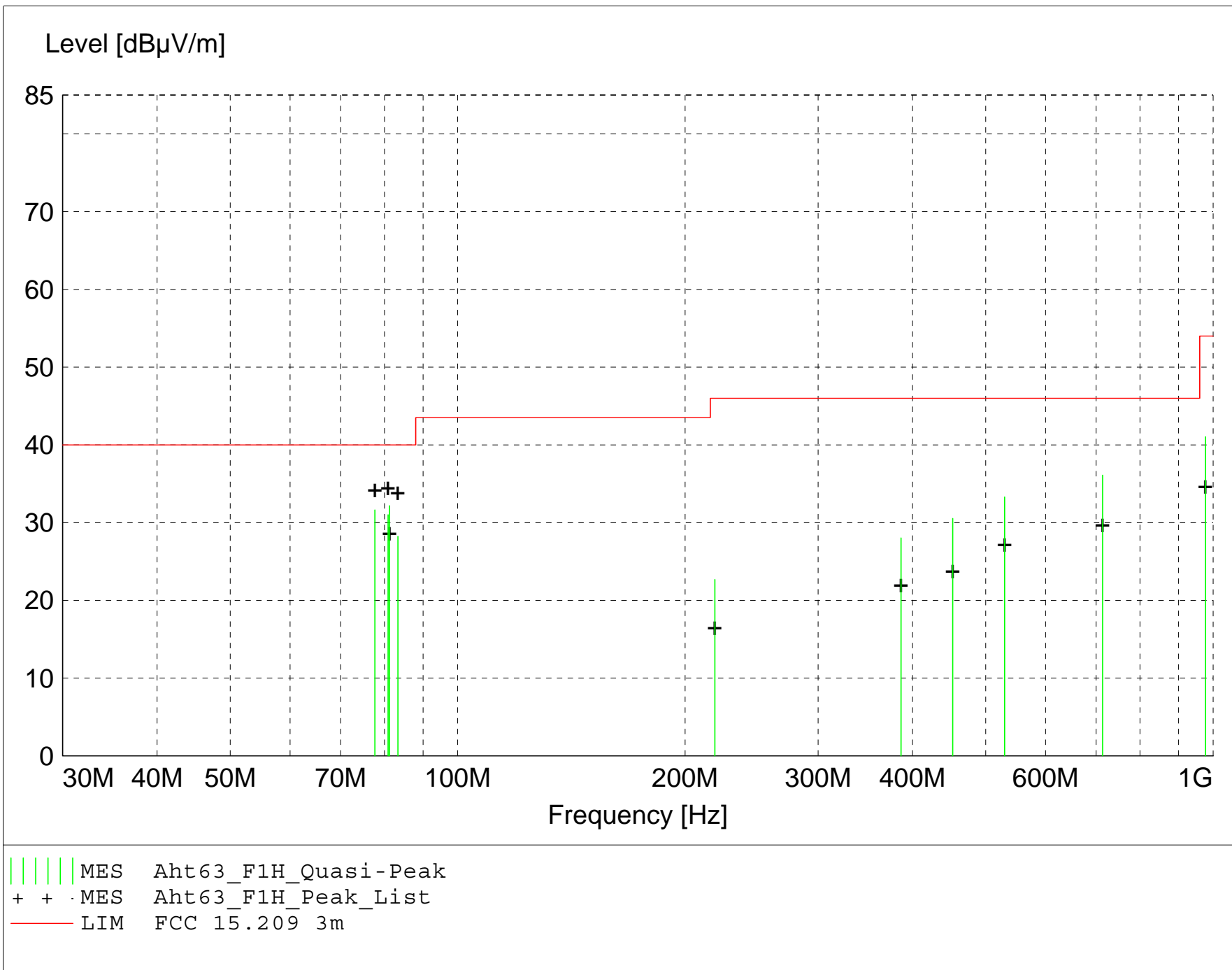
TEXT: "Horz 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Sample Equations: Total Level (dBµV/m) = Level (dBµV) + System Loss (dB) + Antenna Factor (dBµV/m)
24.6 = 35.51 + (-22.1) + 11.20
Margin (dB) = Limit (dBµV/m) - Total Level (dBµV/m)
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "Aht63_F1H_Final"

1/29/2013 3:05PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBµV	Factor	Loss	Level	dBµV/m	dB	Ant.	Angle	Detector	
		dBµV/m	dB	dBµV/m			m	deg		
81.240000	23.31	6.25	2.6	32.2	40.0	7.8	3.00	210	QUASI-PEAK	None
77.700000	23.16	5.90	2.6	31.6	40.0	8.4	3.00	240	QUASI-PEAK	None
80.880000	22.20	6.19	2.6	31.0	40.0	9.0	3.00	220	QUASI-PEAK	None
714.080000	8.57	21.16	6.4	36.1	46.0	9.9	3.00	0	QUASI-PEAK	NF
83.340000	18.97	6.60	2.7	28.2	40.0	11.8	3.00	200	QUASI-PEAK	None
529.760000	9.39	18.40	5.5	33.3	46.0	12.7	3.00	0	QUASI-PEAK	NF
977.120000	9.64	23.94	7.5	41.0	54.0	13.0	3.00	0	QUASI-PEAK	NF
452.240000	8.62	16.83	5.1	30.5	46.0	15.5	3.00	0	QUASI-PEAK	NF
386.240000	7.78	15.47	4.8	28.0	46.0	18.0	3.00	0	QUASI-PEAK	NF
218.960000	7.54	11.42	3.7	22.7	46.0	23.3	3.00	0	QUASI-PEAK	NF

Electric Field Strength

EUT: Wall Console Controller and Window Driver
Manufacturer: Andersen Windows
Operating Condition: 68 deg. F; 27% R.H.
Test Site: DLS O.F. Site 2
Operator: Jim O
Test Specification: FCC 15.231
Comment: Both units Continuous Transmit 120Vac/60Hz
Date: 01-29-2013

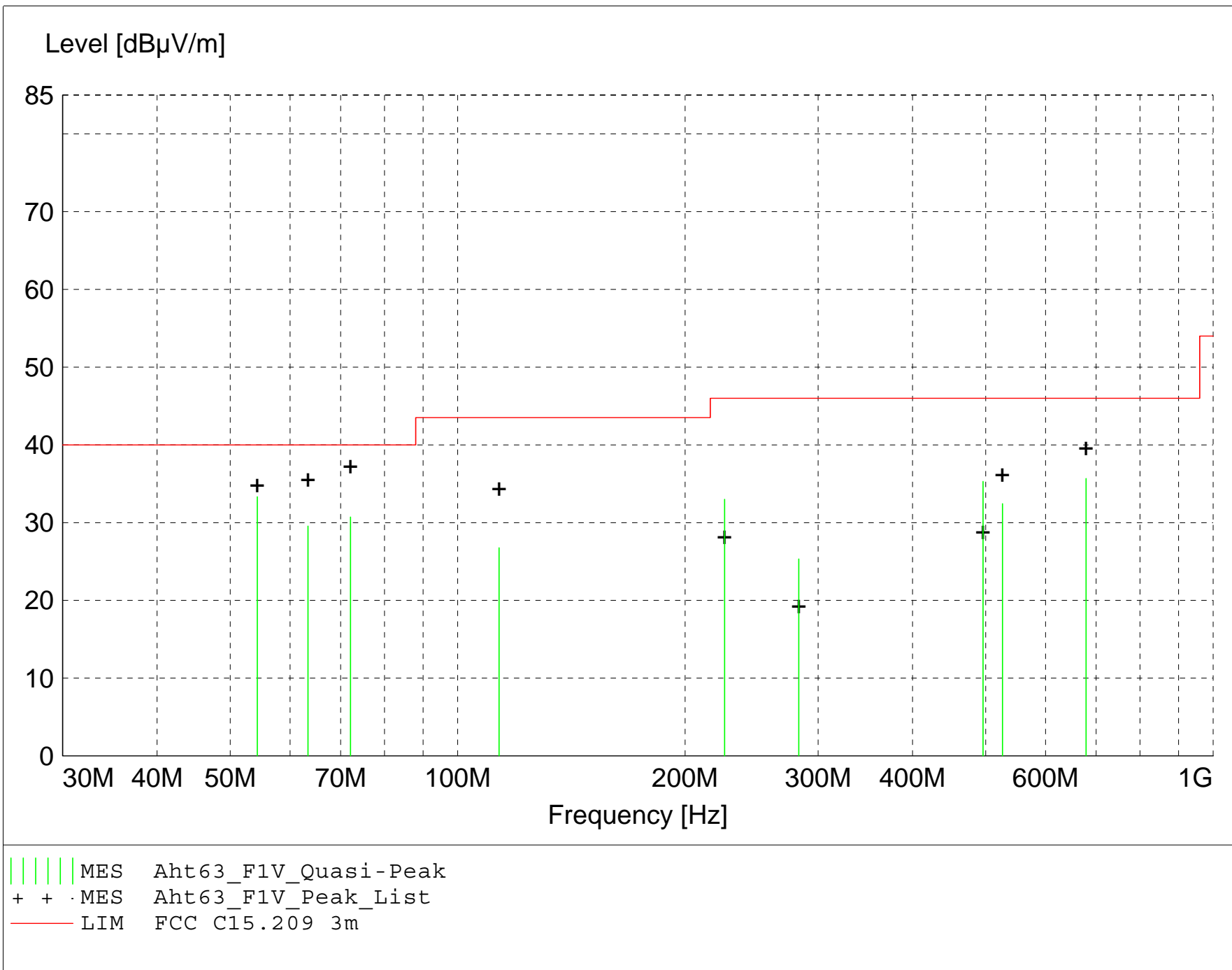
TEXT: "Vert 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations:
$$\begin{aligned} \text{Total Level (dB}\mu\text{V/m)} &= \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)} \\ 24.6 &= 35.51 + (-22.1) + 11.20 \end{aligned}$$
$$\begin{aligned} \text{Margin (dB)} &= \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)} \\ 15.4 &= 40 - 24.6 \end{aligned}$$

- Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "Aht63_F1V_Final"

1/29/2013 2:55PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBµV	Factor	Loss	Level	dBµV/m	dB	Ant.	Angle	Detector	
		dBµV/m	dB	dBµV/m			m	deg		
54.300000	19.82	11.17	2.3	33.3	40.0	6.7	1.00	210	QUASI-PEAK	None
72.120000	21.64	6.58	2.5	30.7	40.0	9.3	1.00	330	QUASI-PEAK	None
678.860000	8.57	20.88	6.2	35.7	46.0	10.3	1.00	0	QUASI-PEAK	NF
63.360000	17.86	9.26	2.4	29.6	40.0	10.4	1.00	330	QUASI-PEAK	None
495.840000	12.04	17.92	5.3	35.3	46.0	10.7	1.00	320	QUASI-PEAK	None
225.540000	17.88	11.31	3.8	33.0	46.0	13.0	1.00	30	QUASI-PEAK	None
526.220000	8.52	18.40	5.5	32.4	46.0	13.6	1.00	0	QUASI-PEAK	NF
113.460000	11.52	12.29	3.0	26.8	43.5	16.7	1.00	310	QUASI-PEAK	None
282.800000	7.60	13.61	4.1	25.3	46.0	20.7	1.00	30	QUASI-PEAK	None

Radiated Fundamental and Spurious Emissions – 1 GHz to 10 GHz Tested at a 3 Meter Distance

EUT: Wall Console Controller
Manufacturer: Andersen Corporation
Operating Condition: 66 deg F; 26% R.H.
Test Site: Site 2
Operator: Craig B
Test Specification: FCC Part 15.231(a) and 15.205
Comment: Transmit frequency: 868.2 MHz
Date: 02-12-13

Notes: All other emissions at least 20 dB under the limit.

Frequency (MHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Duty Cycle Correction (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
868.2	Max Peak	Vert	52.99	23.13	7.0	0	83.1	101.93	18.8	1.10	40	Fundamental
868.2	Average	Vert	52.99	23.13	7.0	-23.59	59.5	81.93	22.4	1.10	40	Fundamental
868.2	Max Peak	Horz	53.28	23.13	7.0	0	83.4	101.93	18.5	1.30	180	Fundamental
868.2	Average	Horz	53.28	23.13	7.0	-23.59	59.8	81.93	22.1	1.30	180	Fundamental
1736.4	Max Peak	Vert	92.01	26.15	-54.4	0	63.8	81.93	18.2	1.20	200	Harmonic
1736.4	Average	Vert	92.01	26.15	-54.4	-23.59	40.2	61.93	21.8	1.20	200	Harmonic
1736.4	Max Peak	Horz	88.57	26.15	-54.4	0	60.3	81.93	21.6	1.00	180	Harmonic
1736.4	Average	Horz	88.57	26.15	-54.4	-23.59	36.7	61.93	25.2	1.00	180	Harmonic
2604.6	Max Peak	Vert	77.49	29.09	-55.7	0	50.9	81.93	31.1	1.30	0	Harmonic
2604.6	Average	Vert	77.49	29.09	-55.7	-23.59	27.3	61.93	34.6	1.30	0	Harmonic
2604.6	Max Peak	Horz	76.98	29.09	-55.7	0	50.4	81.93	31.6	1.00	45	Harmonic
2604.6	Average	Horz	76.98	29.09	-55.7	-23.59	26.8	61.93	35.2	1.00	45	Harmonic
3472.8	Max Peak	Vert	77.61	31.16	-56.4	0	52.4	81.93	29.6	1.00	100	Harmonic
3472.8	Average	Vert	77.61	31.16	-56.4	-23.59	28.8	61.93	33.2	1.00	100	Harmonic
3472.8	Max Peak	Horz	77.58	31.16	-56.4	0	52.3	81.93	29.6	1.70	10	Harmonic
3472.8	Average	Horz	77.58	31.16	-56.4	-23.59	28.8	61.93	33.2	1.70	10	Harmonic

Radiated Fundamental and Spurious Emissions – 1 GHz to 10 GHz Tested at a 3 Meter Distance

EUT: Wall Console Controller
Manufacturer: Andersen Corporation
Operating Condition: 66 deg F; 26% R.H.
Test Site: Site 2
Operator: Craig B
Test Specification: FCC Part 15.231(a) and 15.205
Comment: Transmit frequency: 868.2 MHz
Date: 02-12-13
Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Duty Cycle Correction (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4341.0	Max Peak	Vert	74.92	32.38	-56.6	0	50.7	74	23.3	1.70	100	Restricted Band
4341.0	Average	Vert	74.92	32.38	-56.6	-23.59	27.1	54	26.9	1.70	100	Restricted Band
4341.0	Max Peak	Horz	75.58	32.38	-56.6	0	51.4	74	22.6	1.60	30	Restricted Band
4341.0	Average	Horz	75.58	32.38	-56.6	-23.59	27.8	54	26.2	1.60	30	Restricted Band
5209.2	Max Peak	Vert	82.16	33.68	-56.4	0	59.4	81.93	22.5	1.10	170	Harmonic
5209.2	Average	Vert	82.16	33.68	-56.4	-23.59	35.9	61.93	26.1	1.10	170	Harmonic
5209.2	Max Peak	Horz	84.25	33.68	-56.4	0	61.5	81.93	20.4	1.00	180	Harmonic
5209.2	Average	Horz	84.25	33.68	-56.4	-23.59	37.9	61.93	24.0	1.00	180	Harmonic



166 South Carter, Genoa City, WI 53128

Company: Andersen Corporation
Model Tested: 9017591
Report Number: 18703
Project Number: 5738

Appendix B

4.0 Duty Cycle Correction

Rule Part:

15.35 (c)

Test Procedure:

ANSI C63.4-2009 and ANSI C63.10-2009

Limit:

Informative

Results:

Informative

Sample Equation(s):

See data

Notes:

Compliance is determined by comparing peak data, minus duty cycle correction, to the average limit.



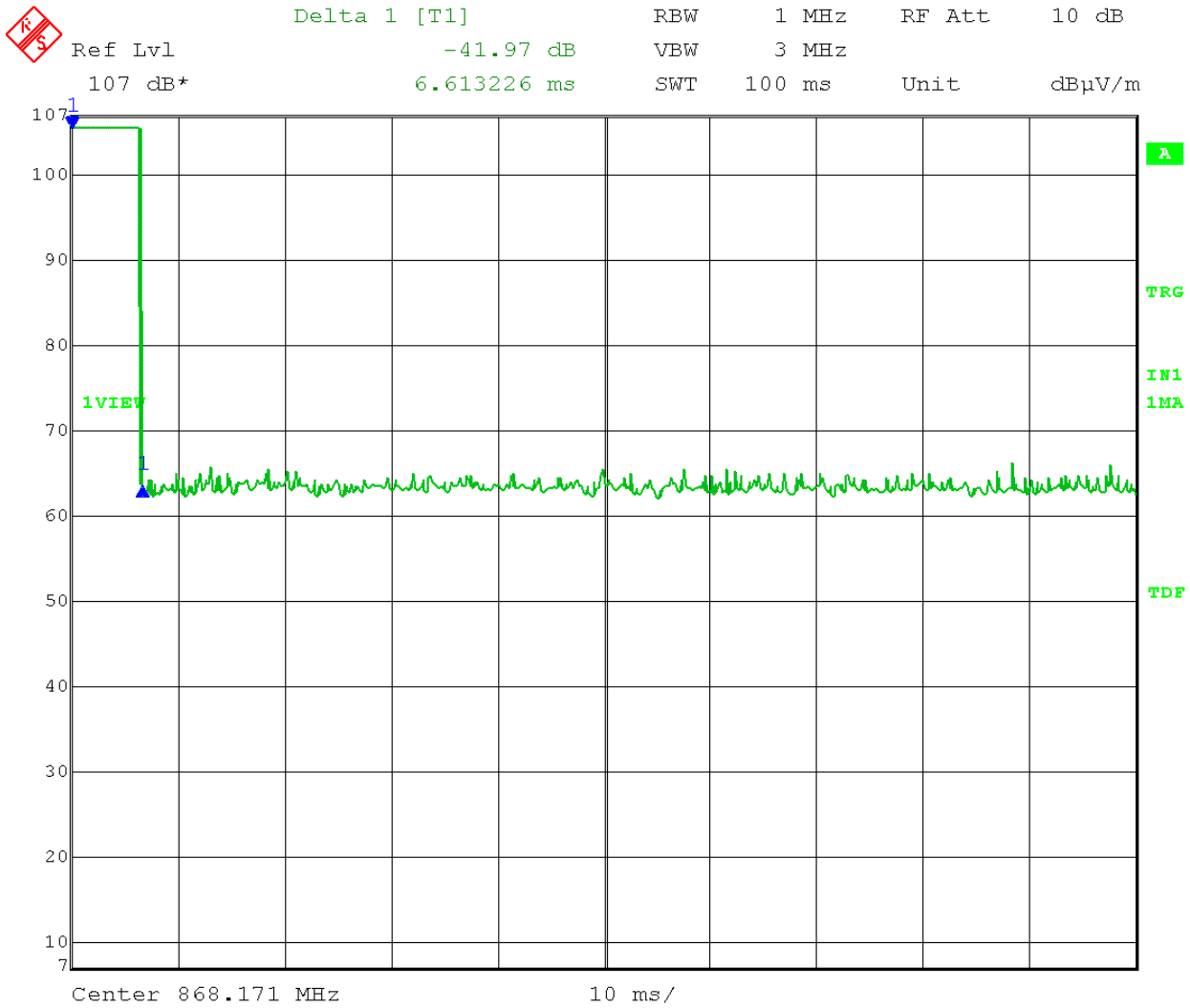
166 South Carter, Genoa City, WI 53128

Company: Andersen Corporation
Model Tested: 9017591
Report Number: 18703
Project Number: 5738

Appendix B

Test Date: 01-24-2013
Company: Andersen Corporation
EUT: Wall Console Controller
Test: Duty Cycle
Operator: Craig B

Comment: One pulses: 6.613 ms
Total ON time in 100 ms = 6.613 ms
Duty Cycle Correction Factor = $20 \log(6.613/100) = -23.59 \text{ dB}$



Date: 25.JAN.2013 13:57:14



166 South Carter, Genoa City, WI 53128

Company: Andersen Corporation
Model Tested: 9017591
Report Number: 18703
Project Number: 5738

Appendix B

5.0 AC Line Conducted Emissions

Rule Part:

Section 15.207 / Section 15.107

Test Procedure:

ANSI C63.4-2009 and ANSI C63.10-2009

Limit:

Class B

Results:

Compliant

Sample Equation(s):

See data

Notes:

AC Line Conducted Emissions tested with the EUT connected to the Power Unit (which is wired to the Power Window Driver), at 120VAC, 60Hz.

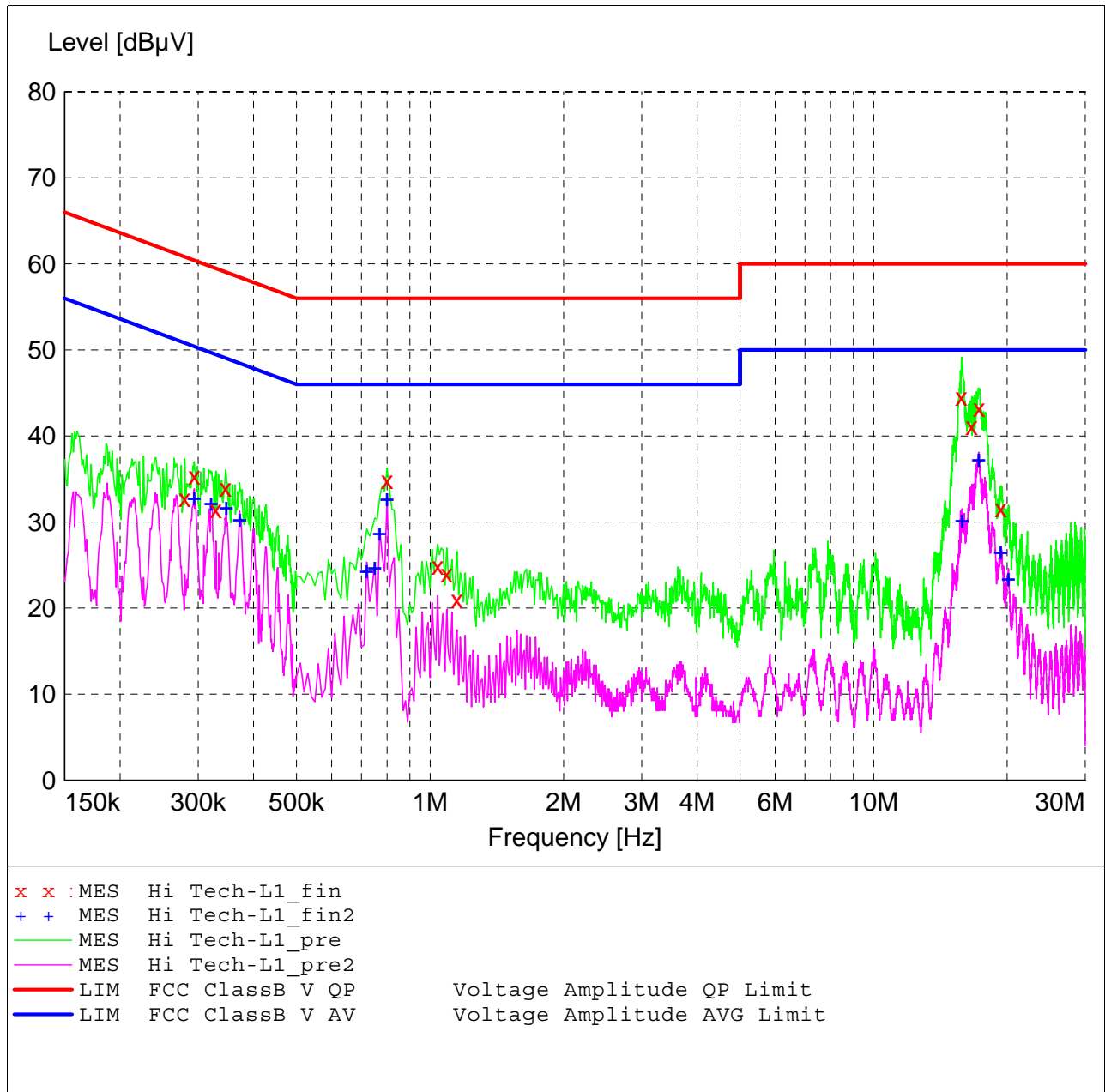
FCC Part 15.207 / 15.107 Class B

Voltage Mains Test

EUT: Wall Console Controller
 Manufacturer: Hi Tech Industries
 Operating Condition: 72 deg. F, 23% R.H.
 Test Site: DLS O.F. Screen Room
 Operator: Jim O
 Test Specification: 120 V 60 Hz
 Comment: Line 1
 Date: 01-27-2013

SCAN TABLE: "Line Cond SR Final"

Short Description:		Line Conducted Emissions					Transducer
Start	Stop	Step	Detector	Meas. Time	IF Bandw.		
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	3.0 s	9 kHz	LISN DLS#128	
CISPR AV							



MEASUREMENT RESULT: "Hi Tech-L1_fin"

1/28/2013 12:45PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.280000	32.80	11.9	61	28.0	QP
0.294000	35.40	11.9	60	25.0	QP
0.329000	31.50	11.6	60	28.0	QP
0.346000	34.00	11.5	59	25.1	QP
0.800000	34.90	10.8	56	21.1	QP
1.040000	24.90	10.6	56	31.1	QP
1.090000	24.00	10.6	56	32.0	QP
1.150000	21.00	10.6	56	35.0	QP
15.785000	44.50	11.3	60	15.5	QP
16.655000	41.20	11.3	60	18.8	QP
17.300000	43.20	11.3	60	16.8	QP
19.370000	31.60	11.4	60	28.4	QP

MEASUREMENT RESULT: "Hi Tech-L1_fin2"

1/28/2013 12:45PM

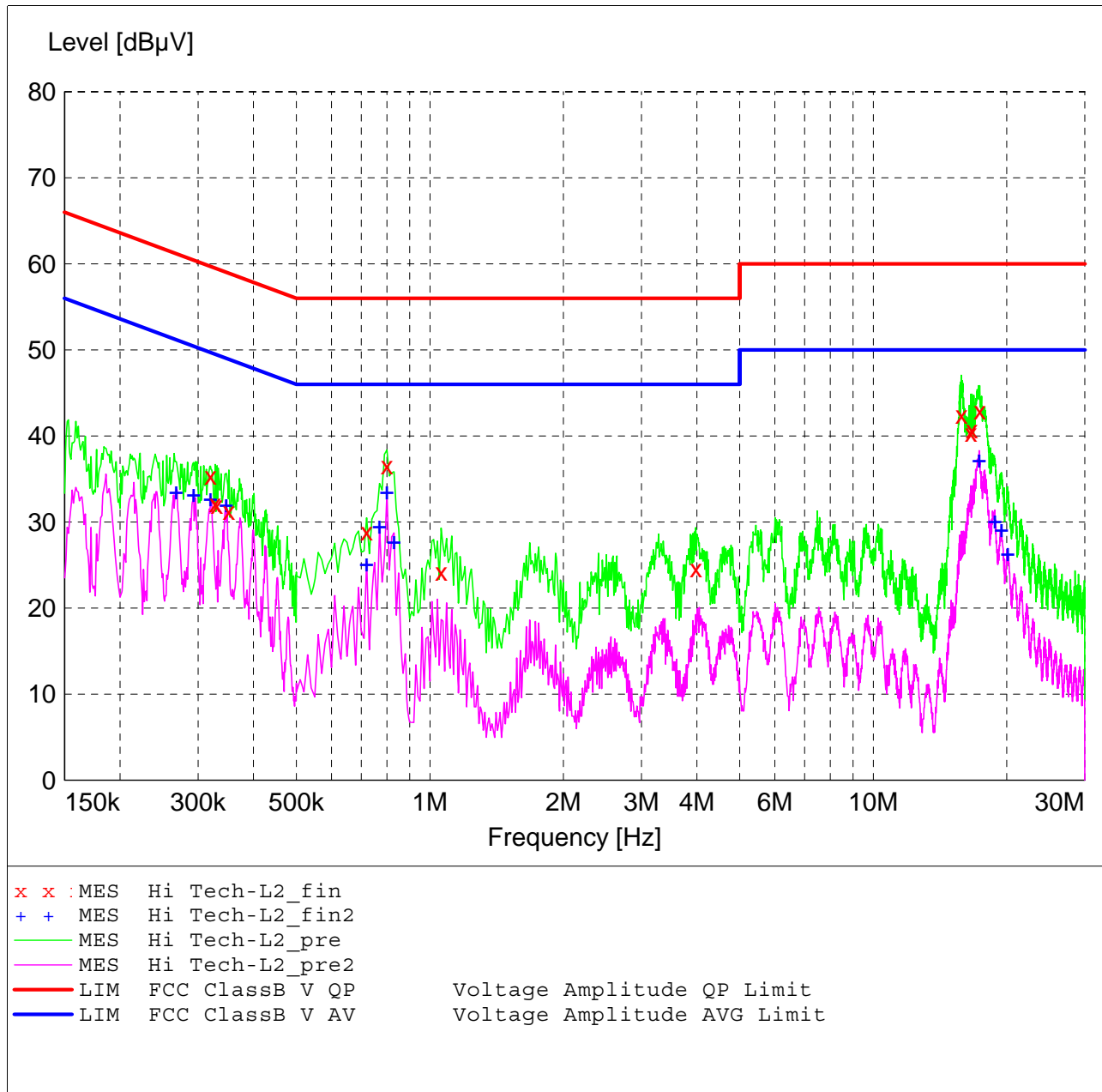
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.294000	32.90	11.9	50	17.5	CAV
0.321000	32.30	11.7	50	17.4	CAV
0.347000	31.80	11.5	49	17.2	CAV
0.372000	30.40	11.4	49	18.1	CAV
0.720000	24.40	10.9	46	21.6	CAV
0.750000	24.80	10.9	46	21.2	CAV
0.770000	28.80	10.9	46	17.2	CAV
0.800000	32.80	10.8	46	13.2	CAV
15.830000	30.30	11.3	50	19.7	CAV
17.255000	37.40	11.3	50	12.6	CAV
19.355000	26.60	11.4	50	23.4	CAV
20.135000	23.50	11.4	50	26.5	CAV

Voltage Mains Test

EUT: Wall Console controller
 Manufacturer: Hi Tech Industries
 Operating Condition: 72 deg. F, 23% R.H.
 Test Site: DLS O.F. Screen Room
 Operator: Jim O
 Test Specification: 120 V 60 Hz
 Comment: Line 2
 Date: 01-27-2013

SCAN TABLE: "Line Cond SR Final"

Short Description:			Line Conducted Emissions				Transducer
Start	Stop	Step	Detector	Meas. Time	IF Bandw.		
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	3.0 s	9 kHz	LISN DLS#128	
							CISPR AV



MEASUREMENT RESULT: "Hi Tech-L2_fin"

1/28/2013 12:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.320000	35.30	11.7	60	24.4	QP
0.328000	32.20	11.6	60	27.3	QP
0.331000	32.00	11.6	59	27.4	QP
0.352000	31.30	11.5	59	27.6	QP
0.720000	28.90	10.9	56	27.1	QP
0.800000	36.60	10.8	56	19.4	QP
1.060000	24.20	10.6	56	31.8	QP
3.980000	24.60	10.7	56	31.4	QP
15.800000	42.40	11.3	60	17.6	QP
16.610000	40.30	11.3	60	19.7	QP
16.700000	40.70	11.3	60	19.3	QP
17.390000	42.90	11.3	60	17.1	QP

MEASUREMENT RESULT: "Hi Tech-L2_fin2"

1/28/2013 12:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.268000	33.60	12.0	51	17.6	CAV
0.293000	33.30	11.9	50	17.1	CAV
0.320000	32.80	11.7	50	16.9	CAV
0.347000	32.10	11.5	49	16.9	CAV
0.720000	25.20	10.9	46	20.8	CAV
0.770000	29.60	10.9	46	16.4	CAV
0.800000	33.60	10.8	46	12.4	CAV
0.830000	27.80	10.8	46	18.2	CAV
17.330000	37.30	11.3	50	12.7	CAV
18.800000	30.20	11.3	50	19.8	CAV
19.445000	29.20	11.4	50	20.8	CAV
20.120000	26.40	11.4	50	23.6	CAV



166 South Carter, Genoa City, WI 53128

Company: Andersen Corporation
Model Tested: 9017591
Report Number: 18703
Project Number: 5738

Appendix B

6.0 Unintentional Radiated Emissions

Rule Part:

Section 15.109

Test Procedure:

ANSI C63.4-2009 and ANSI C63.10-2009

Limit:

Section 15.109 (a)

Results:

Compliant

Sample Equation(s):

See data

Notes:

This was a radiated emissions measurement. The EUT was wired to the Power Unit and Power Window Driver to operate at 120VC, 60 Hz. The EUT & Power Window Driver were placed in continuous receive mode.

FCC Part 15.109 Class B

Electric Field Strength

EUT: Wall Console Controller & Window Driver
Manufacturer: Andersen Windows
Operating Condition: 68 deg. F; 26% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Receiver radiated emissions
Comment: both units in Continuous Receive mode
Date: 02-13-2013

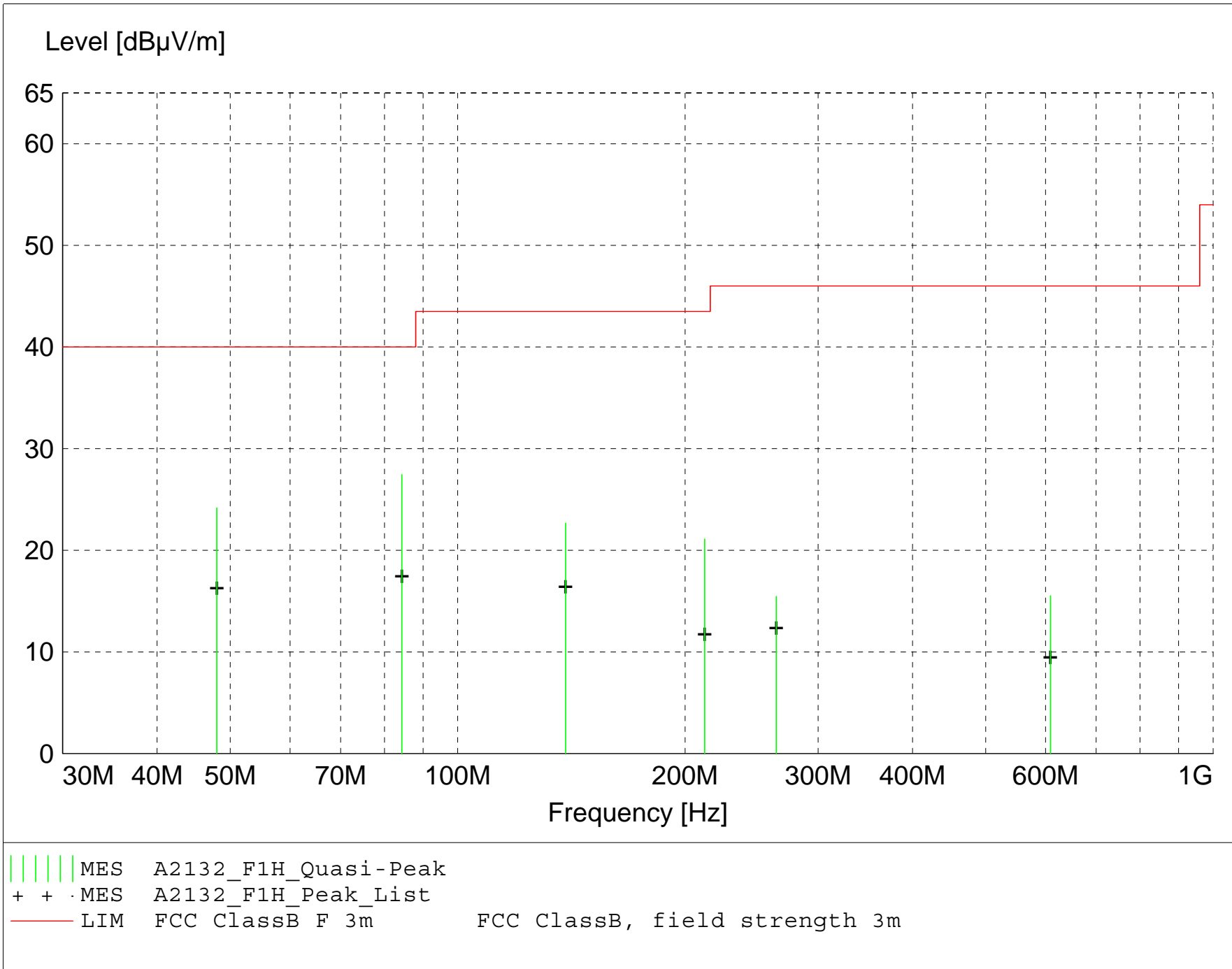
TEXT: "Horz 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Sample Equations: Total Level (dBµV/m) = Level (dBµV) + System Loss (dB) + Antenna Factor (dBµV/m)
24.6 = 35.51 + (-22.1) + 11.20
Margin (dB) = Limit (dBµV/m) - Total Level (dBµV/m)
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "A2132_F1H_Final"

2/13/2013 3:27PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBµV	Factor	Loss	Level	dBµV/m	dB	Ant.	Angle	Detector	
		dBµV/m	dB	dBµV/m			m	deg		
84.355000	43.28	6.87	-22.7	27.4	40.0	12.6	2.30	135	QUASI-PEAK	broadband
48.000000	35.39	11.90	-23.1	24.2	40.0	15.8	3.00	150	QUASI-PEAK	None
139.005000	32.69	12.30	-22.3	22.7	43.5	20.8	1.60	280	QUASI-PEAK	None
212.320000	31.37	11.61	-21.9	21.1	43.5	22.4	1.00	315	QUASI-PEAK	broadband
609.080000	15.94	19.28	-19.7	15.5	46.0	30.5	2.00	180	QUASI-PEAK	noise floor
264.060000	23.79	13.16	-21.5	15.5	46.0	30.5	1.60	225	QUASI-PEAK	None

FCC Part 15.109 Class B

Electric Field Strength

EUT: Wall Console Controller & Window Driver
Manufacturer: Andersen Windows
Operating Condition: 68 deg. F; 26% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Receiver radiated emissions
Comment: both units in Continuous Receive mode
Date: 02-13-2013

TEXT: "Vert 3 meters"

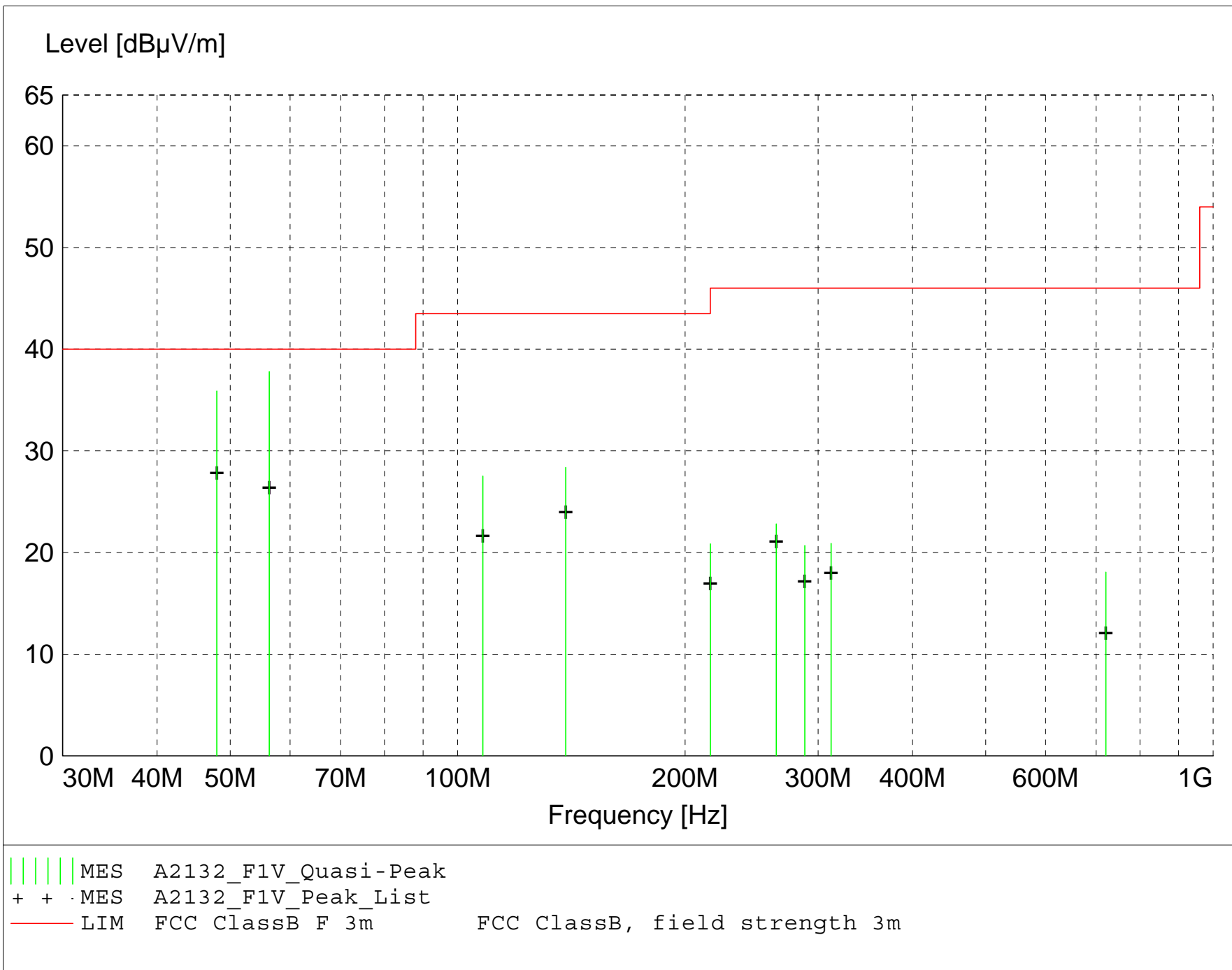
Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations: Total Level (dBµV/m) = Level (dBµV) + System Loss (dB) + Antenna Factor (dBµV/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin (dB) = Limit (dBµV/m) - Total Level (dBµV/m)
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "A2132_F1V_Final"

2/13/2013 3:12PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dB μ V	Factor	Loss	Level	dB μ V/m	dB	Ant.	Angle	Detector	
		dB μ V/m	dB	dB μ V/m	dB μ V/m		m	deg		
56.305000	49.92	10.87	-23.0	37.8	40.0	2.2	1.00	225	QUASI-PEAK	broadband
48.000000	47.11	11.90	-23.1	35.9	40.0	4.1	1.00	135	QUASI-PEAK	None
139.010000	38.39	12.30	-22.3	28.4	43.5	15.1	1.00	225	QUASI-PEAK	None
107.995000	38.22	11.70	-22.4	27.5	43.5	16.0	1.00	135	QUASI-PEAK	None
264.060000	31.16	13.16	-21.5	22.8	46.0	23.2	1.00	90	QUASI-PEAK	None
312.070000	27.13	15.06	-21.3	20.9	46.0	25.1	1.00	45	QUASI-PEAK	None
216.050000	31.20	11.48	-21.8	20.9	46.0	25.1	1.00	80	QUASI-PEAK	None
288.060000	28.25	13.82	-21.4	20.7	46.0	25.3	1.00	20	QUASI-PEAK	None
721.030000	15.87	21.40	-19.2	18.1	46.0	27.9	1.00	340	QUASI-PEAK	noise floor

FCC Part 15.109 Class B

Electric Field Strength

EUT: Wall Console Controller
Manufacturer: Andersen Windows
Operating Condition: 67 deg. F; 27% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification:
Comment: Continuous Receive mode
Date: 02-14-2013

TEXT: "Horz 3 meters"

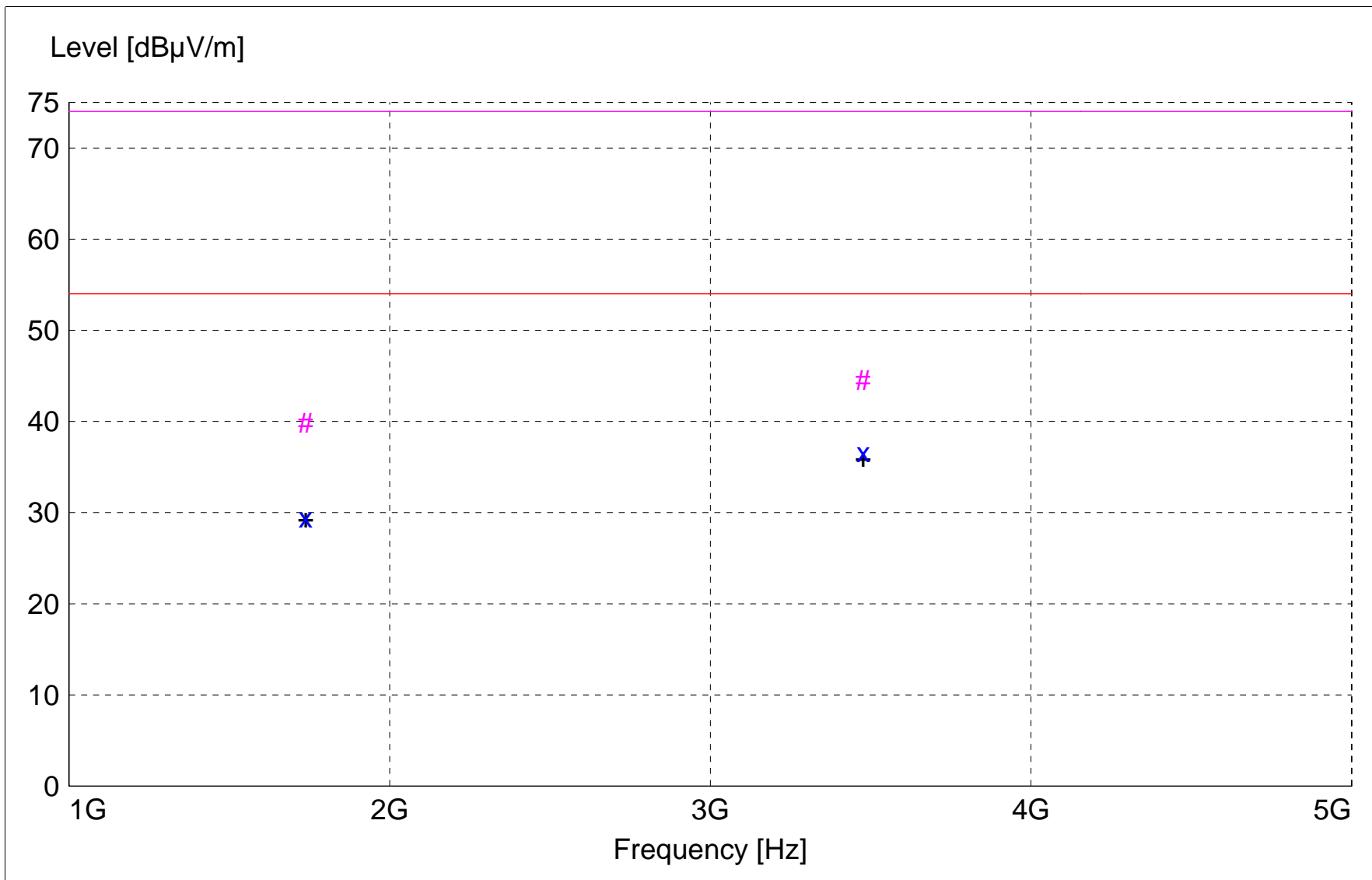
Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Sample Equations: Total Level (dBµV/m) = Level (dBµV) + System Loss (dB) + Antenna Factor (dBµV/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin (dB) = Limit (dBµV/m) - Total Level (dBµV/m)
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



```

x x :MES  A2142_sh_Average
# # :MES  A2142_sh_Peak
+ + :MES  A2142_sh_Peak_List
— — :LIM  FCC Class B F 3m AVG  Field Strength AVG Limit 3m
— — :LIM  FCC Class B F 3m PK   Field Strength PEAK Limit 3m

```

MEASUREMENT RESULT: "A2142_sh_Final"

2/14/2013 12:50PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dB μ V	Factor	Loss	Level	dB μ V/m	dB	Ant.	Angle	Detector	
		dB μ V/m	dB	dB μ V/m	dB μ V/m		m	deg		
3476.700000	44.51	31.17	-39.1	36.6	54.0	17.4	1.00	315	AVERAGE	None
1738.350000	43.09	26.16	-39.8	29.5	54.0	24.5	1.00	270	AVERAGE	None
3476.700000	52.50	31.17	-39.1	44.6	74.0	29.4	1.00	315	MAX PEAK	None
1738.350000	53.43	26.16	-39.8	39.8	74.0	34.2	1.00	270	MAX PEAK	None

FCC Part 15.109 Class B

Electric Field Strength

EUT: Wall Console Controller
Manufacturer: Andersen Windows
Operating Condition: 67 deg. F; 27% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification:
Comment: Continuous Receive mode
Date: 02-14-2013

TEXT: "Vert 3 meters"

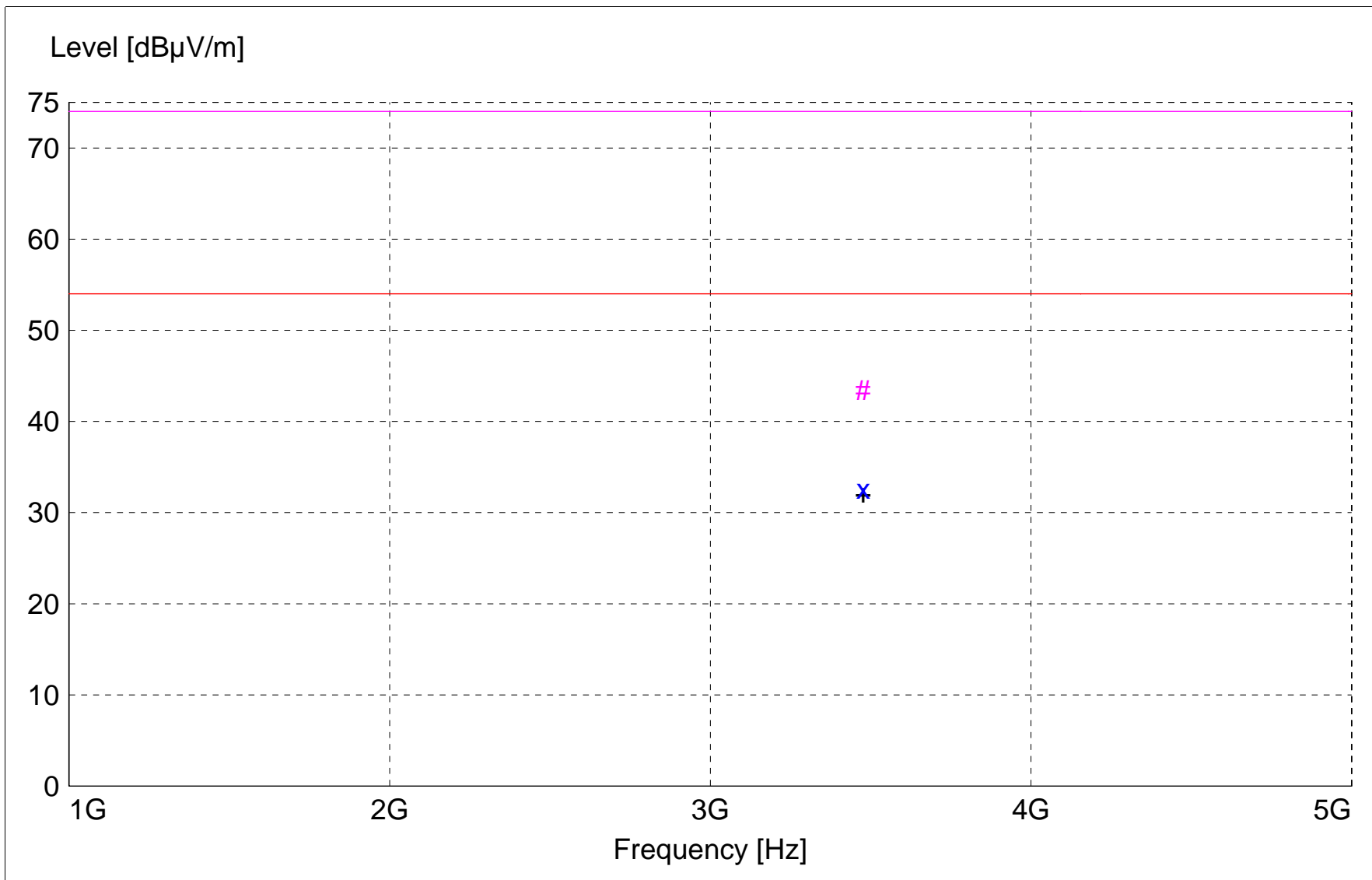
Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations: Total Level (dBµV/m) = Level (dBµV) + System Loss (dB) + Antenna Factor (dBµV/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin (dB) = Limit (dBµV/m) - Total Level (dBµV/m)
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



```

x x :MES A2142_sv_Average
# # :MES A2142_sv_Peak
+ + :MES A2142_sv_Peak_List
— (Red) LIM FCC Class B F 3m AVG Field Strength AVG Limit 3m
— (Magenta) LIM FCC Class B F 3m PK Field Strength PEAK Limit 3m

```

MEASUREMENT RESULT: "A2142_sv_Final"

2/14/2013 12:40PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dB μ V	Factor	Loss	Level	dB μ V/m	dB	Ant.	Angle	Detector	
		dB μ V/m	dB	dB μ V/m	dB μ V/m		m	deg		
3476.700000	40.50	31.17	-39.1	32.6	54.0	21.4	1.00	180	AVERAGE	None
3476.700000	51.36	31.17	-39.1	43.5	74.0	30.5	1.00	180	MAX PEAK	None



166 South Carter, Genoa City, WI 53128

Company: Andersen Corporation
Model Tested: 9017591
Report Number: 18703
Project Number: 5738

END OF REPORT

Revision #	Date	Comments	By
1.0	02-19-2013	Preliminary Release	JS
1.1	03-04-2013	Corrected Cover Pages 16, 18, 20 & 29	JS
1.2	03-07-2013	Removed incorrect notation on page 30	JS