166 South Carter, Genoa City, WI 53128

Company:	California Eastern Laboratories
Model Tested:	ZICM357SP2-1
Report Number:	19073
DLS Project:	5953

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart C – Intentional Radiators
Section 15.247
Operation within the bands 902 - 928 MHz,
2400 - 2483.5 MHz, 5725 - 5875 MHz,
and 24.0 - 24.25 GHz.

Class II Permissive Change Report

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name:	MeshConnect ZICM357SP2-1 Zigbee Module
Kind of Equipment:	802.15.4 Wireless Module
Frequency Range:	2405-2480 MHz
Test Configuration:	Tabletop
Model Number(s):	ZICM357SP2-1
Model(s) Tested:	ZICM357SP2-1 (designated "ZICM357SP2-1c" on test data for class II version)
Serial Number(s):	5
Date of Tests:	June 3rd & 4th, 2013
Test Conducted For:	California Eastern Laboratories 4590 Patrick Henry Drive Santa Clara, CA 95054-1817, 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.

166 South Carter, Genoa City, WI 53128

Company:	California Eastern Laboratories
Model Tested:	ZICM357SP2-1
Report Number:	19073
DLS Project:	5953

SIGNATURE PAGE

Tested By:

Craig Brandt
Test Engineer

Reviewed By:

William Stumpf
OATS Manager

Approved By:

Brian Mattson
General Manager

Table of Contents

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 January 2009).

2012-10-01 through 2013-09-30
Effective dates

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)

1.0 Summary of Test Report

It was determined that the California Eastern Laboratories MeshConnect ZICM357SP2-1 Zigbee Module, Model ZICM357SP2-1 with the new antenna complies with the requirements of CFR 47 Part 15 Subpart C Section 15.247 to be added to FCC ID: W7S-ZICM357SP2 as a Class II Permissive Change.

Subpart C Section 15.247 Applicable Technical Requirements Tested to show compliance for a Class II Permissive Change for adding an additional antenna:

Section	Description	Procedure	Note	Compliant?
15.247(d) 15.205(a) 15.209(a)	Unwanted Emissions into Restricted Frequency Bands – Radiated	558074 D01 DTS Meas Guidance v03r01 ANSI C63.10-2009	1	Yes
15.247(d) 15.205(a) 15.209(a)	Band-Edge Measurements - Radiated	558074 D01 DTS Meas Guidance v03r01 & ANSI C63.10-2009	1	Yes

Note 1: Radiated emission measurement.

Testing was performed on the same physical unit (with the same serial number) that was tested for the original certification. Only the antenna changes. Any RF Conducted measurement will be the same. No modifications or adjustments were made to the maximum power output of the transmitter.

2.0 Introduction

In June, 2013 the MeshConnect ZICM357SP2-1 Zigbee Module, Model ZICM357SP2-1, as provided from California Eastern Laboratories was tested to the requirements of CFR 47 Part 15 Subpart C Section 15.247 for a Class II Permissive Change. 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

4.0 Description of Test Sample

Description:

The Test sample consists of an 802.15.4 specification compliant transceiver with a 100mW amplifier on the transmitter. The circuitry is mounted on an FR4 substrate which includes an integrated Printed circuit board antenna and shield covering the RF circuitry. Firmware was included which allowed different modes of operation to be set as the default state so that when DC power was applied, the unit would operate in that default state to facilitate testing of the DUT. The new version of the module utilizes a small host board with a cable to an external whip antenna. The purpose of this test report is to show continued compliance to the FCC rules when adding this new antenna to FCC ID:W7Z-ZICM357SP2 as a Class II Permissive Change.

Type of Equipment / Frequency Range:

Mobile / 2405-2480 MHz

Physical Dimensions of Equipment Under Test:

1 inch x 1 inch x 1 inch

Power Source:

3.6 VDC (Lab DC bench power supply used for testing)

Internal Frequencies:

24 MHz

Transmit / Receive Frequencies Used For Test Purpose:

Low channel(11): 2405 MHz, Middle channel(18): 2440 MHz, High channel(26): 2480 MHz
Additional channels tested - Channel 24: 2470 MHz; Channel 25: 2475 MHz

Type of Modulation(s) / Antenna Type for Class II Permissive Change:

Offset QPSK / Nearson Half Wave Dipole Antenna

Description of Circuit Board(s) / Part Number:

Host Board	0000-01-04-00-0000, Rev X2
DUT	0011-00-04-00-001, Rev X2

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.

(SITE 3) EMISSIONS TEST EQUIPMENT LIST

30 – 1000 MHz

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	7-23-12	7-23-13
Preamplifier	Rohde & Schwarz	TS-PR10	032001/005	9 kHz – 1 GHz	1-10-13	1-10-14
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	8-22-12	8-22-14
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	9-6-12	9-6-14

Additional if 1-18 GHz

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Filter- High-Pass	Q-Microwave	100462	1	4.2GHz-18GHz	5-23-13	5-23-14
Preamp	Ciao	CA118-4010	101	1GHz-18GHz	2-26-13	2-26-14
Horn Antenna	EMCO	3115	9903-5731	1-18GHz	6-29-11	6-29-13

Additional if 18-26 GHz

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
High Pass Filter	Planar	CL22500-9000-CD-SS	PF1229/0728	15-40 GHz	8-13-12	8-13-13
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18GHz-26GHz	8-13-12	8-13-13
Horn Antenna	EMCO	3116	2549	18 – 40GHz	9-6-12	9-6-14

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 FCC KDB 558074 D01 DTS Meas Guidance v03r01 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

7.0 Test Conditions

Normal Test Conditions:

Temperature and Humidity:

67°F at 59% RH

Supply Voltage:

3.6 VDC

8.0 Modifications Made To EUT For Compliance

Output power setting on channel 25 was changed from -6 to -12 (due to new FCC test procedures not allowing for duty cycle correction).

Output power setting on channel 26 was changed from -26 to -37 (due to new FCC test procedures not allowing for duty cycle correction).

9.0 Additional Descriptions

The EUT was powered with an external DC bench supply.

The EUT was tested stand-alone as for Single Modular Approval.

The EUT was programmed to transmit continuously at Low, Mid, and High channels.

The EUT was rotated through 3 orthoganal axis to find worst-case.

10.0 Results

Measurements were performed in accordance with FCC KDB 558074 D01 DTS Meas Guidance v03r01 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 MeshConnect ZICM357SP2-1 Zigbee Module, Model ZICM357SP2-1, as provided from California Eastern Laboratories, tested in June, 2013 **meets** the requirements of CFR 47 Part 15 Subpart C Section 15.247 for a Class II Permissive Change.

Appendix A – Test Photos

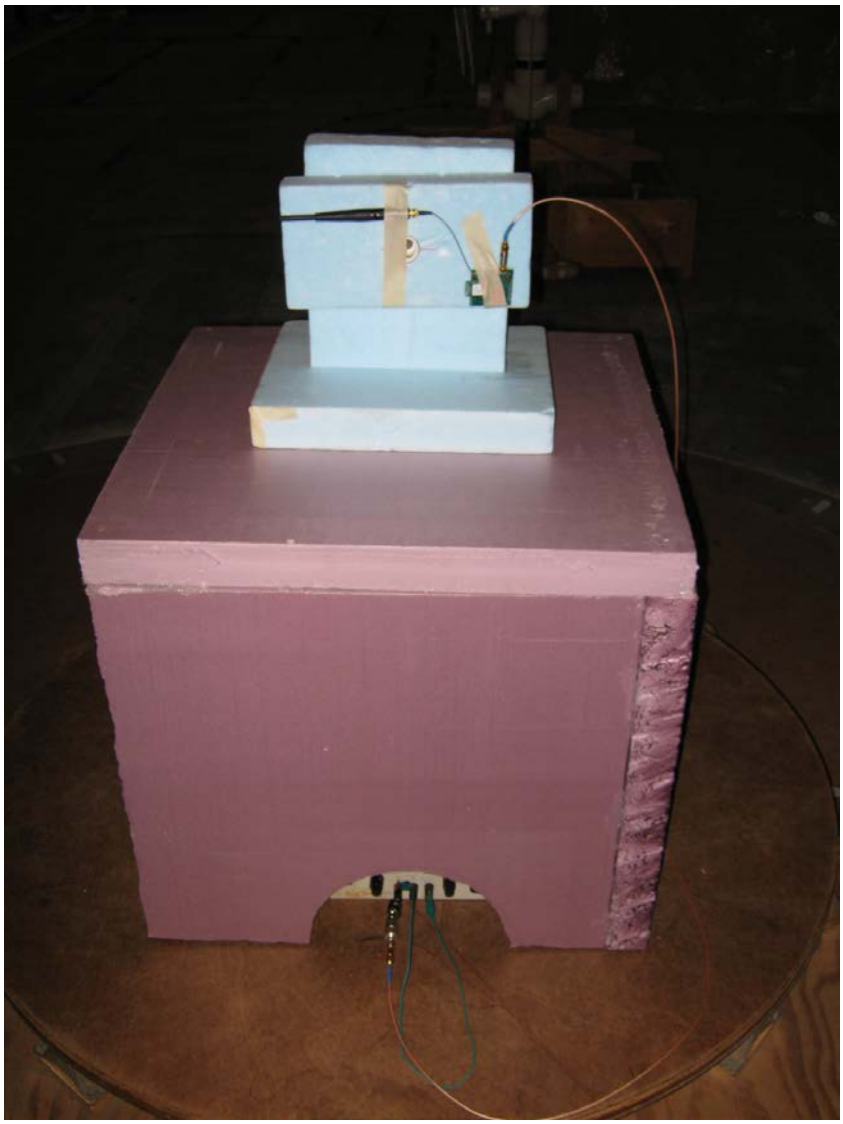
Photo Information and Test Setup:

Item 0: MeshConnect ZICM357SP2-1 Zigbee Module, Model ZICM357SP2-1
Item 1: Nearson Half Wave Dipole Antenna, Part Number S181AH-2450S
Item 2: Shielded DC Power cable (coax) to power EUT, 1.3 meter long with metal SMA connector.
Item 3: Hewlett Packard DC power supply Model 6291A

Radiated Emissions below 1 GHz – Position 1

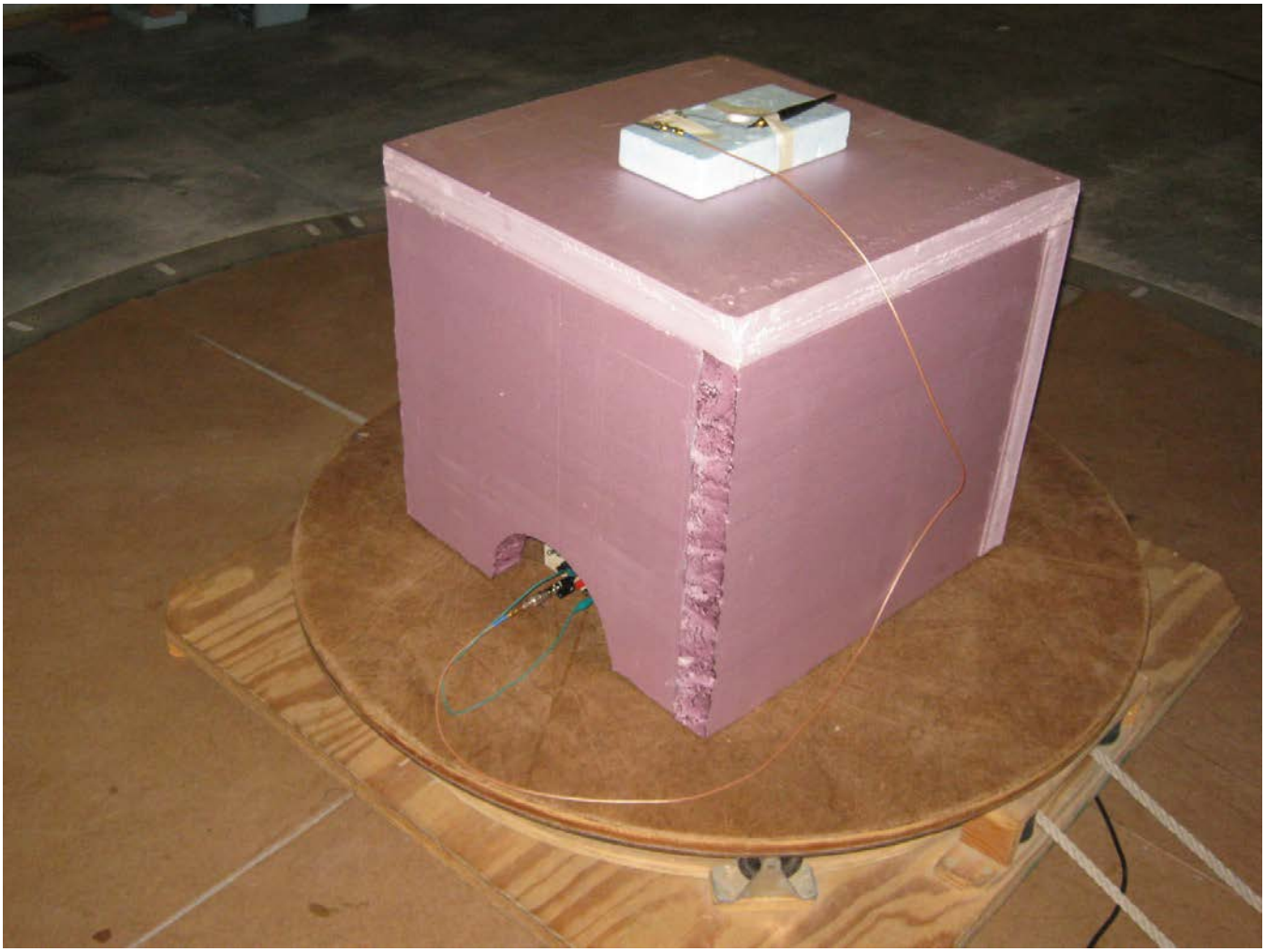
Appendix A

Radiated Emissions below 1 GHz – Position 2



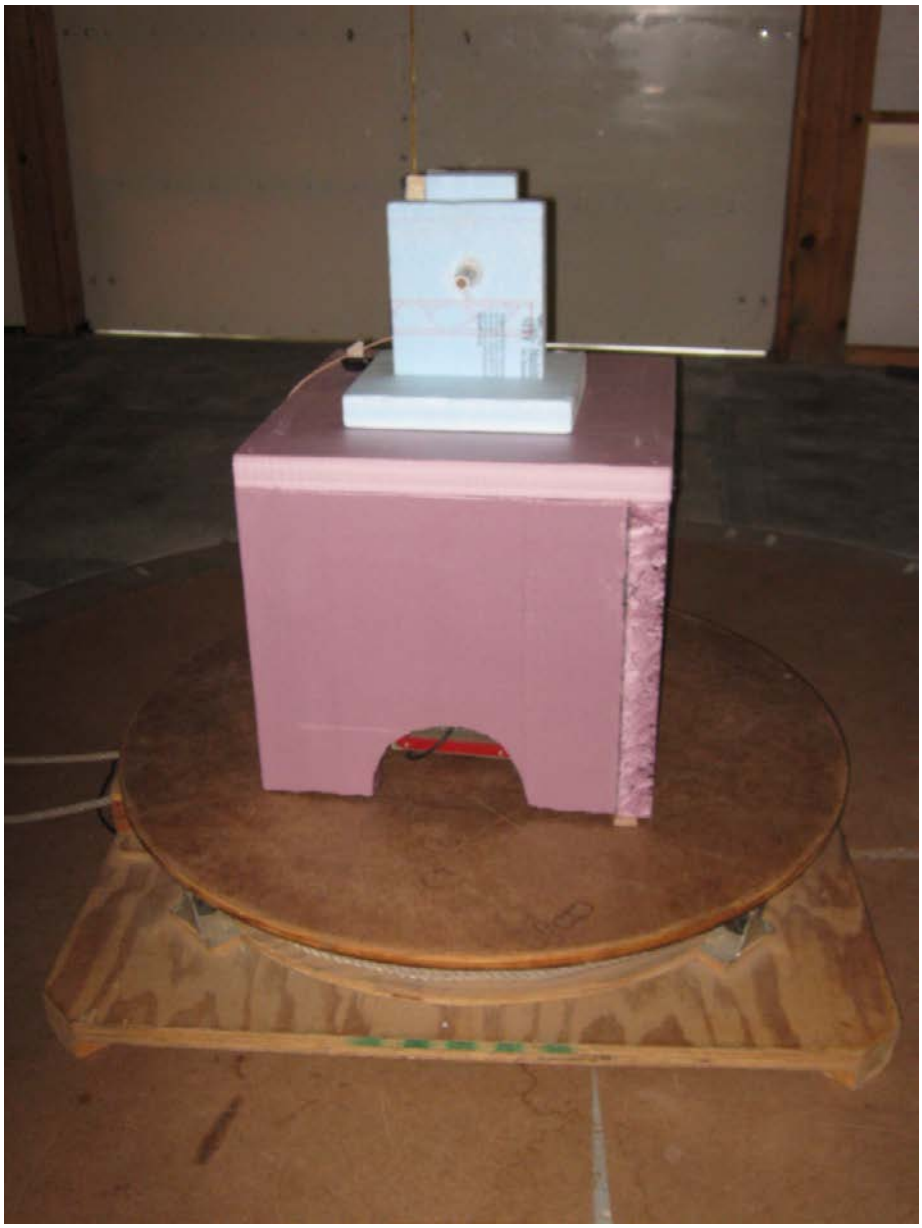
Appendix A

Radiated Emissions below 1 GHz – Position 3



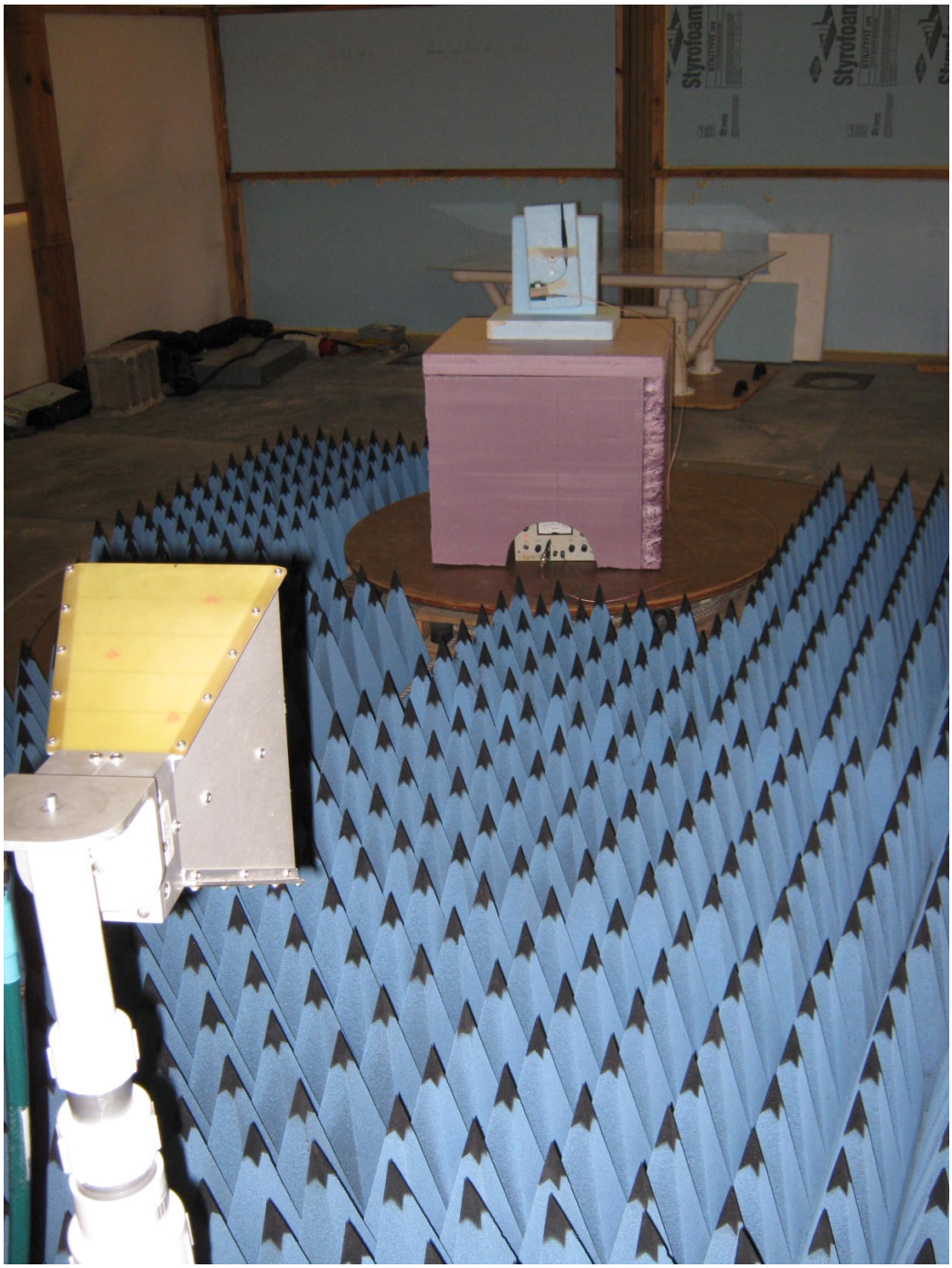
Appendix A

Radiated Emissions below 1 GHz – Back



Appendix A

Radiated Emissions above 1 GHz



Appendix B

1.0 Unwanted Emissions into Restricted Frequency Bands – Radiated

Rule Part:

15.247(d), 15.205(5), 15.209(a)

Test Procedure:

558074 D01 DTS Meas Guidance v03r01, 4/9/2013
12.0 Emissions in restricted frequency bands
12.1 Radiated emission measurements
Measurement Procedure – ANSI C63.10-2009

Limits:

15.209(a)

Results:

Compliant

Notes:

This was a radiated measurement. The EUT was transmitting from its an external whip antenna. The EUT was powered through a serial interface cable that was connected to the bench supply set to 3.6 VDC. The EUT was set to transmit continuously at its maximum power, with a modulating signal representative of the worst-case signal encountered in a real system operation on the low, middle, and high channels of the operating band.

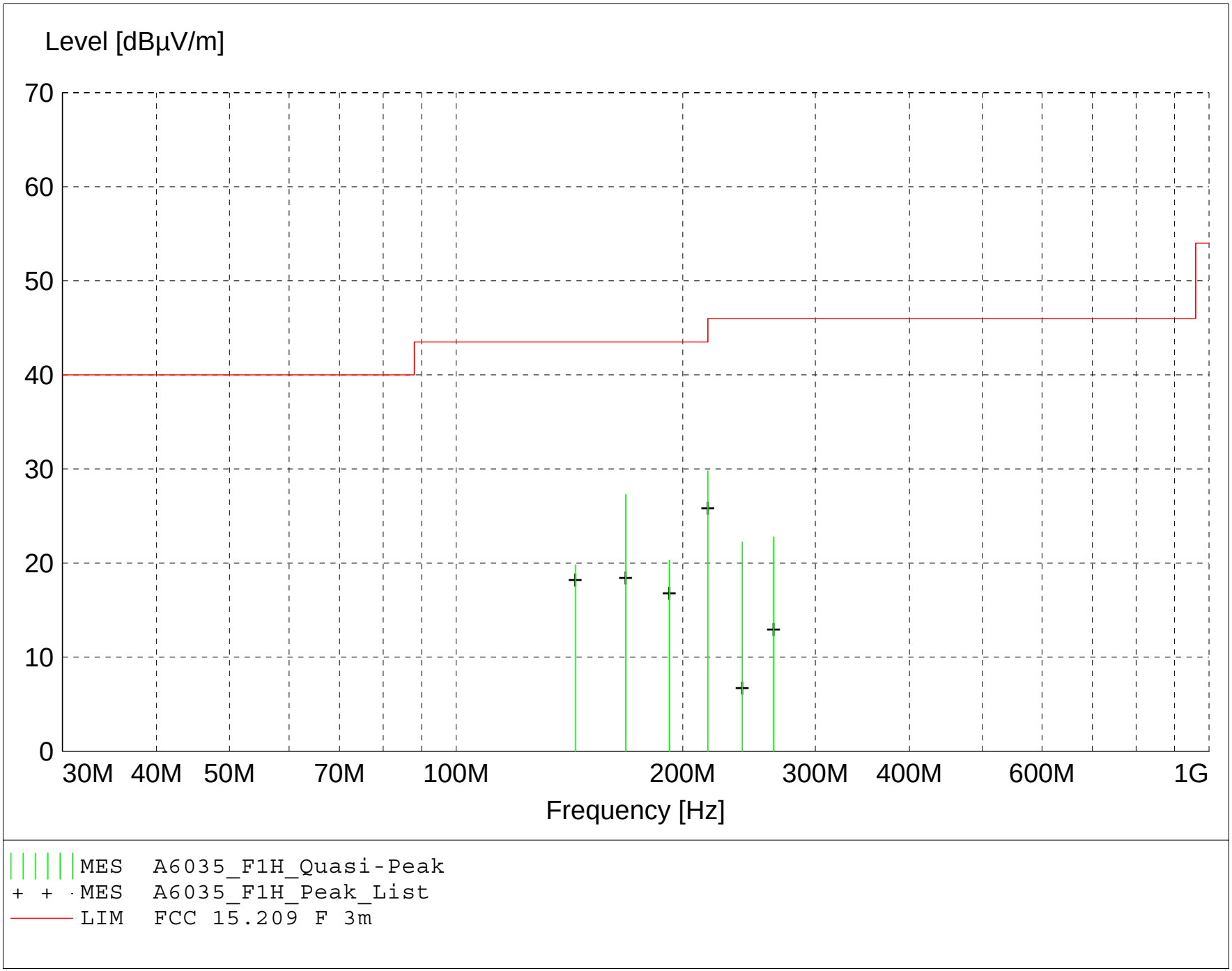
FCC Part 15.209

Electric Field Strength

```
EUT:                  ZICM357SP2-1c
Manufacturer:         California Eastern Laboratories
Operating Condition:  67 deg. F; 56% R.H.
Test Site:            DLS O.F. Site 3
Operator:             Craig B
Test Specification:   Continuous Transmit; power setting: -2
Comment:
                      Date:  06-04-2013
```

TEXT: "Horz 3 meters"

```
  Short Description:            Test Set-up

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

Equations:      Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)

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

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 dector

                #       Final maximized level using Peak detector
```


Level [dBµV/m]
70
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A6035_F1H_Quasi-Peak
MES A6035_F1H_Peak_List
LIM FCC 15.209 F 3m

MEASUREMENT RESULT: "A6035_F1H_Final"

6/4/2013 9:38AM

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		
215.990000	40.31	11.58	-22.1	29.8	43.5	13.7	2.20	270	QUASI-PEAK	None
168.000000	35.29	14.40	-22.4	27.3	43.5	16.2	2.10	250	QUASI-PEAK	None
192.000000	25.06	17.50	-22.3	20.3	43.5	23.2	2.40	225	QUASI-PEAK	None
263.990000	31.40	13.16	-21.8	22.8	46.0	23.2	3.20	215	QUASI-PEAK	None
144.000000	30.44	12.20	-22.8	19.8	43.5	23.7	2.40	50	QUASI-PEAK	None
239.990000	32.10	12.00	-21.9	22.2	46.0	23.8	2.00	220	QUASI-PEAK	None

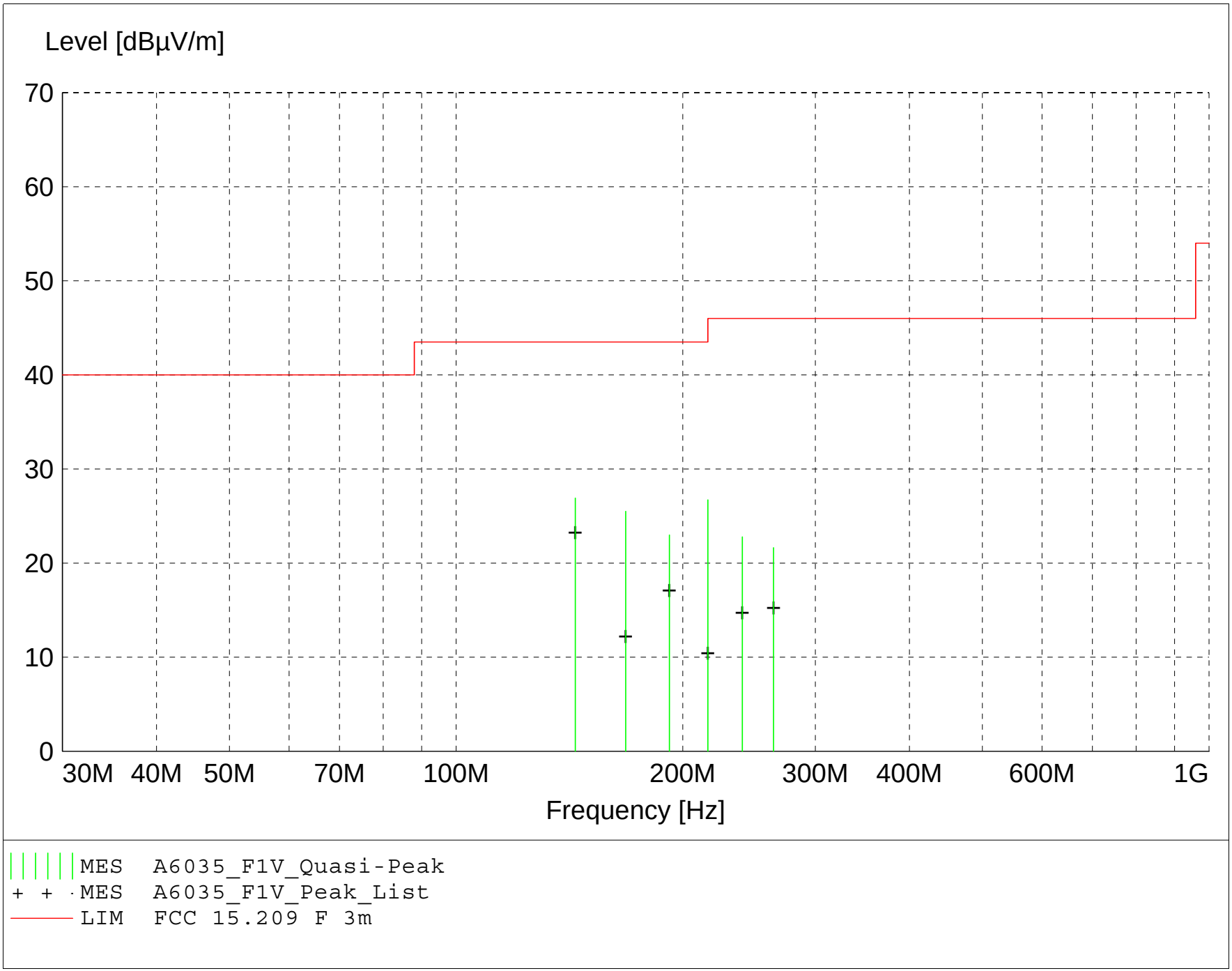
FCC Part 15.209

Electric Field Strength

```
EUT:                  ZICM357SP2-1c
Manufacturer:         California Eastern Laboratories
Operating Condition:  67 deg. F; 56% R.H.
Test Site:            DLS O.F. Site 3
Operator:             Craig B
Test Specification:   Continuous Transmit; power setting: -2
Comment:
                      Date:  06-04-2013
```

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 dector

                #       Final maximized level using Peak detector
```


Level [dBµV/m]
70
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A6035_F1V_Quasi-Peak
MES A6035_F1V_Peak_List
LIM FCC 15.209 F 3m

MEASUREMENT RESULT: "A6035_F1V_Final"

6/4/2013 9:43AM

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		
144.000000	37.54	12.20	-22.8	26.9	43.5	16.6	1.00	315	QUASI-PEAK	None
215.990000	37.21	11.58	-22.1	26.7	43.5	16.8	1.00	135	QUASI-PEAK	None
168.000000	33.51	14.40	-22.4	25.5	43.5	18.0	1.00	180	QUASI-PEAK	None
192.000000	27.75	17.50	-22.3	23.0	43.5	20.5	1.00	135	QUASI-PEAK	None
239.990000	32.66	12.00	-21.9	22.8	46.0	23.2	1.00	180	QUASI-PEAK	None
263.990000	30.26	13.16	-21.8	21.6	46.0	24.4	1.00	160	QUASI-PEAK	None

166 South Carter, Genoa City, WI 53128

Company: California Eastern Laboratories
Model Tested: ZICM357SP2-1
Report Number: 19073
DLS Project: 5953

Radiated Spurious Emissions in Restricted Bands

Tested at a 3 Meter Distance 1 GHz to 18 GHz
Tested at a 1 Meter Distance 18 GHz to 26 GHz

EUT: ZICM357SP2-1c
Manufacturer: California Eastern Laboratories
Operating Condition: 67 deg F; 59% R.H.
Test Site: OATS 3
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: IEEE 802.15.4; Continuous transmit mode; Output power setting -2
Date: 06-03-2013
Notes: **(1)** Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
(2) Average measurements were taken with RBW = 1 MHz, VBW = 3 MHz, Detector = CISPR Average.
(3) All other restricted band emissions at least 20 dB under the limit.

Channel 11 (2.405 GHz):

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
4.810	Average	Vert	44.56	33.14	-36.3	41.4	54	12.6	Res. Band
4.810	Max Peak	Vert	53.96	33.14	-36.3	50.8	74	23.2	Res. Band
4.810	Average	Horz	45.76	33.14	-36.3	42.6	54	11.4	Res. Band
4.810	Max Peak	Horz	54.96	33.14	-36.3	51.8	74	22.2	Res. Band

166 South Carter, Genoa City, WI 53128

Company: California Eastern Laboratories
Model Tested: ZICM357SP2-1
Report Number: 19073
DLS Project: 5953

Radiated Spurious Emissions in Restricted Bands

Tested at a 3 Meter Distance 1 GHz to 18 GHz
Tested at a 1 Meter Distance 18 GHz to 26 GHz

EUT: ZICM357SP2-1c
Manufacturer: California Eastern Laboratories
Operating Condition: 67 deg F; 59% R.H.
Test Site: OATS 3
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: IEEE 802.15.4; Continuous transmit mode; Output power setting -2
Date: 06-03-2013
Notes: **(1)** Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
(2) Average measurements were taken with RBW = 1 MHz, VBW = 3 MHz, Detector = CISPR Average.
(3) All other restricted band emissions at least 20 dB under the limit.

Channel 18 (2.440 GHz):

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
4.880	Average	Vert	45.34	33.26	-36.5	42.1	54	11.9	Res. Band
4.880	Max Peak	Vert	54.64	33.26	-36.5	51.4	74	22.6	Res. Band
4.880	Average	Horz	46.74	33.26	-36.5	43.5	54	10.5	Res. Band
4.880	Max Peak	Horz	55.54	33.26	-36.5	52.3	74	21.7	Res. Band
7.320	Average	Vert	47.67	36.63	-33.8	50.5	54	3.5	Res. Band
7.320	Max Peak	Vert	56.37	36.63	-33.8	59.2	74	14.8	Res. Band
7.320	Average	Horz	48.67	36.63	-33.8	51.5	54	2.5	Res. Band
7.320	Max Peak	Horz	57.27	36.63	-33.8	60.1	74	13.9	Res. Band

166 South Carter, Genoa City, WI 53128

Company: California Eastern Laboratories
Model Tested: ZICM357SP2-1
Report Number: 19073
DLS Project: 5953

Radiated Spurious Emissions in Restricted Bands

Tested at a 3 Meter Distance 1 GHz to 18 GHz
Tested at a 1 Meter Distance 18 GHz to 26 GHz

EUT: ZICM357SP2-1c
Manufacturer: California Eastern Laboratories
Operating Condition: 67 deg F; 59% R.H.
Test Site: OATS 3
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: IEEE 802.15.4; Continuous transmit mode; Output power setting -2
Date: 06-03-2013
Notes: **(1)** Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
(2) Average measurements were taken with RBW = 1 MHz, VBW = 3 MHz, Detector = CISPR Average.
(3) All other restricted band emissions at least 20 dB under the limit.

Channel 24 (2.470 GHz):

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
4.940	Average	Vert	45.51	33.39	-36.4	42.5	54	11.5	Res. Band
4.940	Max Peak	Vert	54.61	33.39	-36.4	51.6	74	22.4	Res. Band
4.940	Average	Horz	46.71	33.39	-36.4	43.7	54	10.3	Res. Band
4.940	Max Peak	Horz	55.41	33.39	-36.4	52.4	74	21.6	Res. Band
7.410	Average	Vert	42.45	36.75	-32.9	46.3	54	7.7	Res. Band
7.410	Max Peak	Vert	53.05	36.75	-32.9	56.9	74	17.1	Res. Band
7.410	Average	Horz	42.85	36.75	-32.9	46.7	54	7.3	Res. Band
7.410	Max Peak	Horz	53.05	36.75	-32.9	56.9	74	17.1	Res. Band

Appendix B

2.0 Band-Edge Measurements – Radiated

Rule Part:

15.247(d)

Test Procedure:

558074 D01 DTS Meas Guidance v03r01, 4/9/2013
12.0 Emissions in restricted frequency bands
12.1 Radiated emission measurements
Measurement Procedure – ANSI C63.10-2009
Marker-Delta Method – ANSI C63.10:2009, Section 6.9.3

Limit:

15.209(a)

Results:

Compliant

Notes:

This was a radiated measurement. The EUT was transmitting from an external whip antenna. The EUT was powered through a serial interface cable that was connected to the bench supply set to 3.6 VDC. The EUT was set to transmit continuously at its maximum power, with a modulating signal representative of the worst-case signal encountered in a real system operation on the low, middle, and high channels of the operating band.

The highest channel (channel 26) power setting was reduced from -26* to -37 when the whip antenna is used in place of the trace antenna to meet the radiated upper band-edge requirement at the 2.4835 GHz restricted frequency band edge.

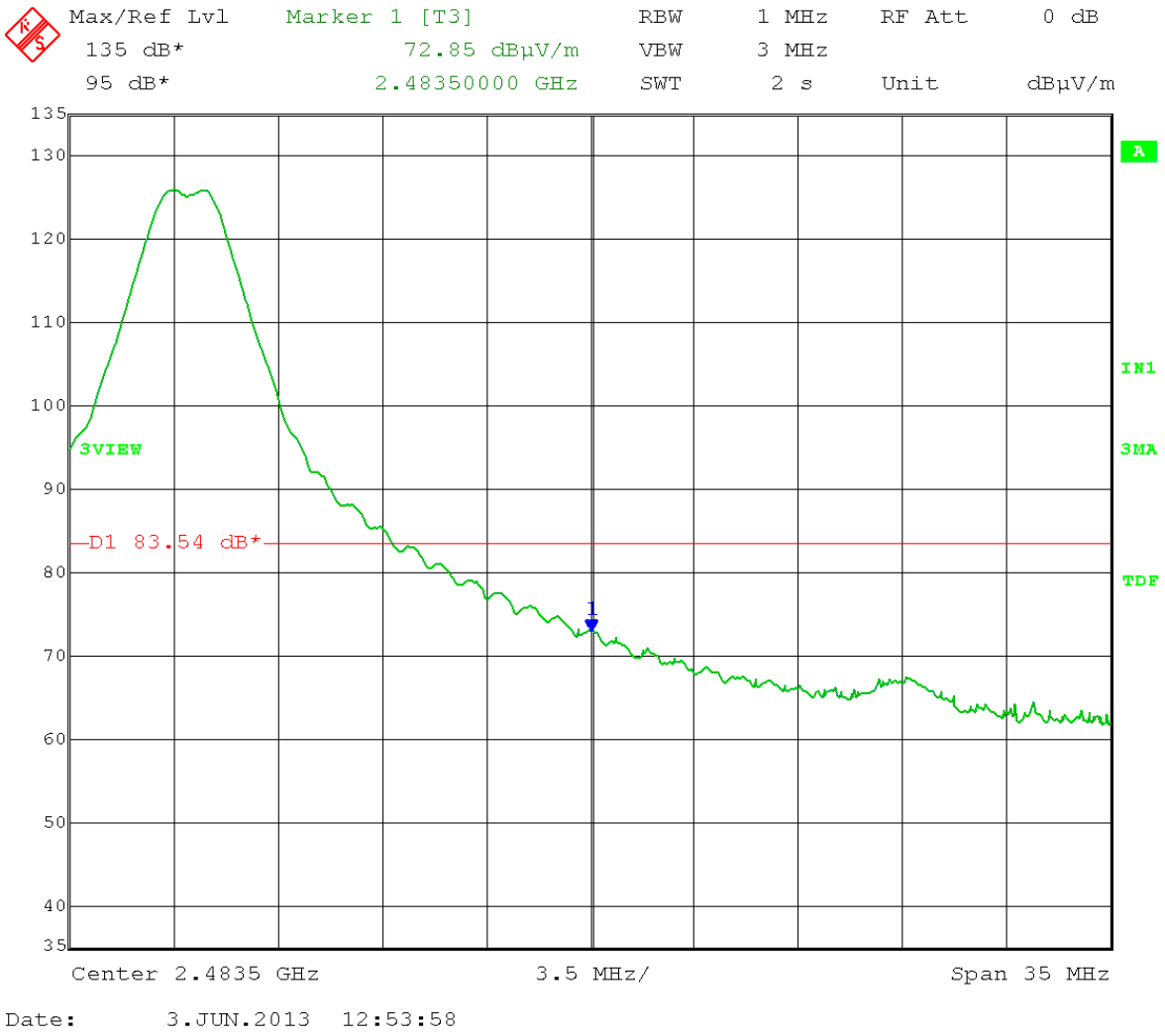
The next-to-highest channel (channel 25) power setting was reduced from -6* to -12 when the whip antenna is used in place of the trace antenna to meet the radiated upper band-edge requirement at the 2.4835 GHz restricted frequency band edge.

Testing was also performed on channel 24 to show that the output power setting for this channel does not need to be lowered to meet the band-edge requirements.

* as reported in original FCC report #17866.

Test Date: 06-03-2013
Company: California Eastern Laboratories
EUT: ZICM357SP2-1c
Test: Upper Band-Edge - Radiated
Rule part: FCC Part 15.247(d) and FCC Part 15.205
Operator: Craig B
Comment: Channel 24: Frequency – 2.470 GHz
Power setting -2 (full power)

Horizontal polarization
Detector: Peak
Test distance: 1 meter
Limit 83.54 dBµV/m

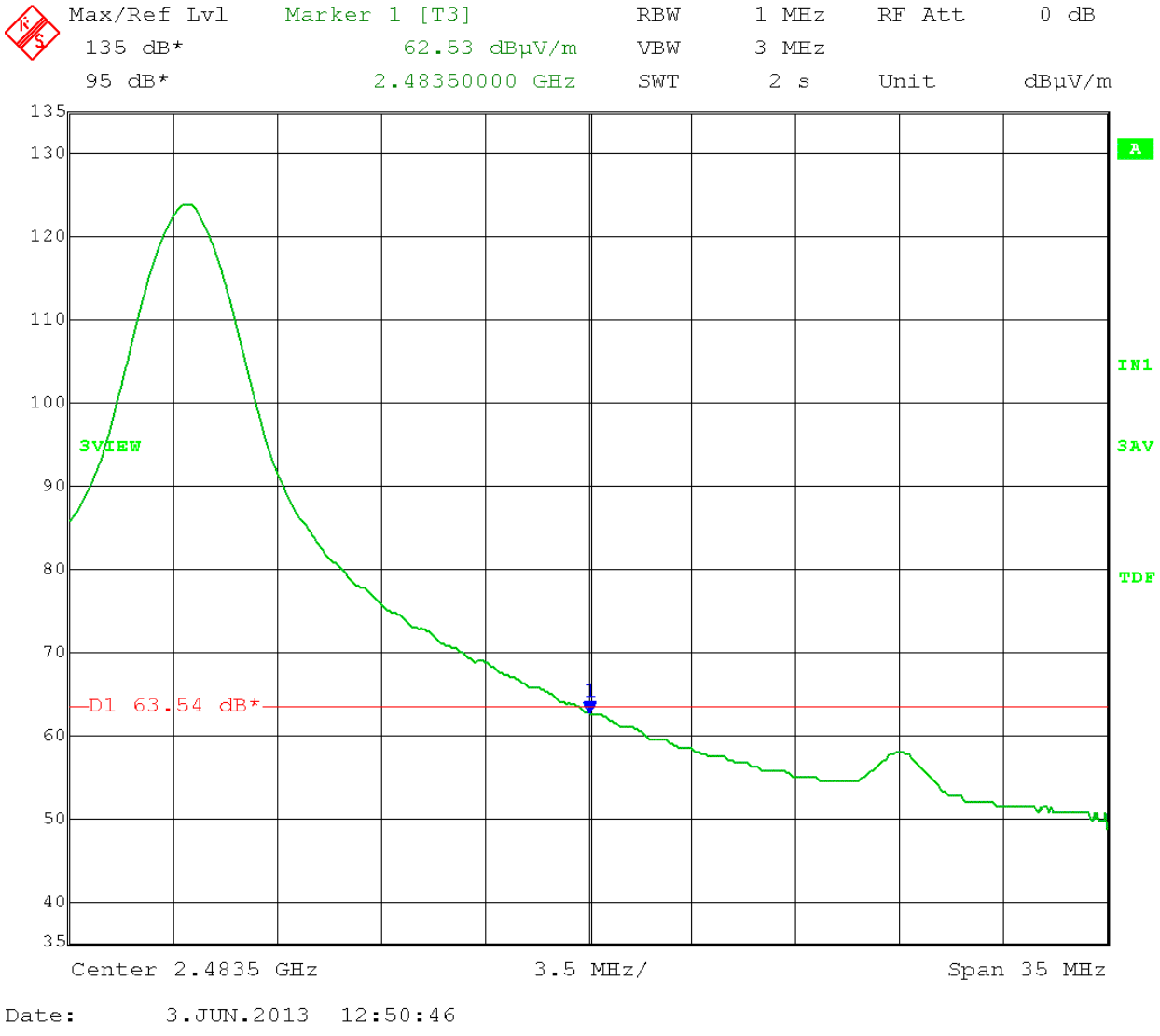


166 South Carter, Genoa City, WI 53128

Company: California Eastern Laboratories
Model Tested: ZICM357SP2-1
Report Number: 19073
DLS Project: 5953

Test Date: 06-03-2013
Company: California Eastern Laboratories
EUT: ZICM357SP2-1c
Test: Upper Band-Edge - Radiated
Rule part: FCC Part 15.247(d) and FCC Part 15.205
Operator: Craig B
Comment: Channel 24: Frequency – 2.470 GHz
Power setting -2 (full power)

Horizontal polarization
Detector: Average
Test distance: 1 meter
Limit 63.54 dBµV/m

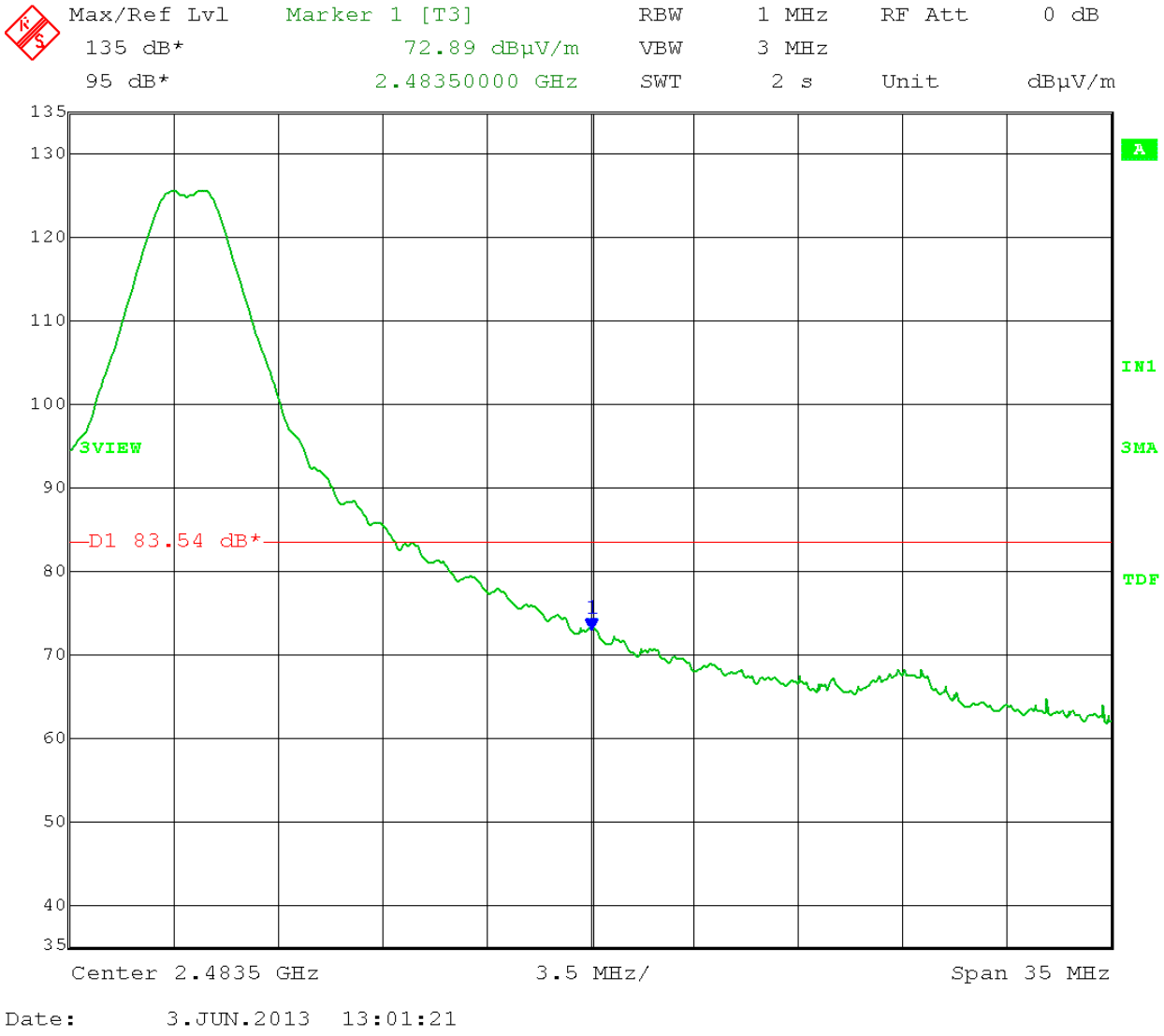


166 South Carter, Genoa City, WI 53128

Company: California Eastern Laboratories
Model Tested: ZICM357SP2-1
Report Number: 19073
DLS Project: 5953

Test Date: 06-03-2013
Company: California Eastern Laboratories
EUT: ZICM357SP2-1c
Test: Upper Band-Edge - Radiated
Rule part: FCC Part 15.247(d) and FCC Part 15.205
Operator: Craig B
Comment: Channel 24: Frequency – 2.470 GHz
Power setting -2 (full power)

Vertical polarization
Detector: Peak
Test distance: 1 meter
Limit 83.54 dBµV/m

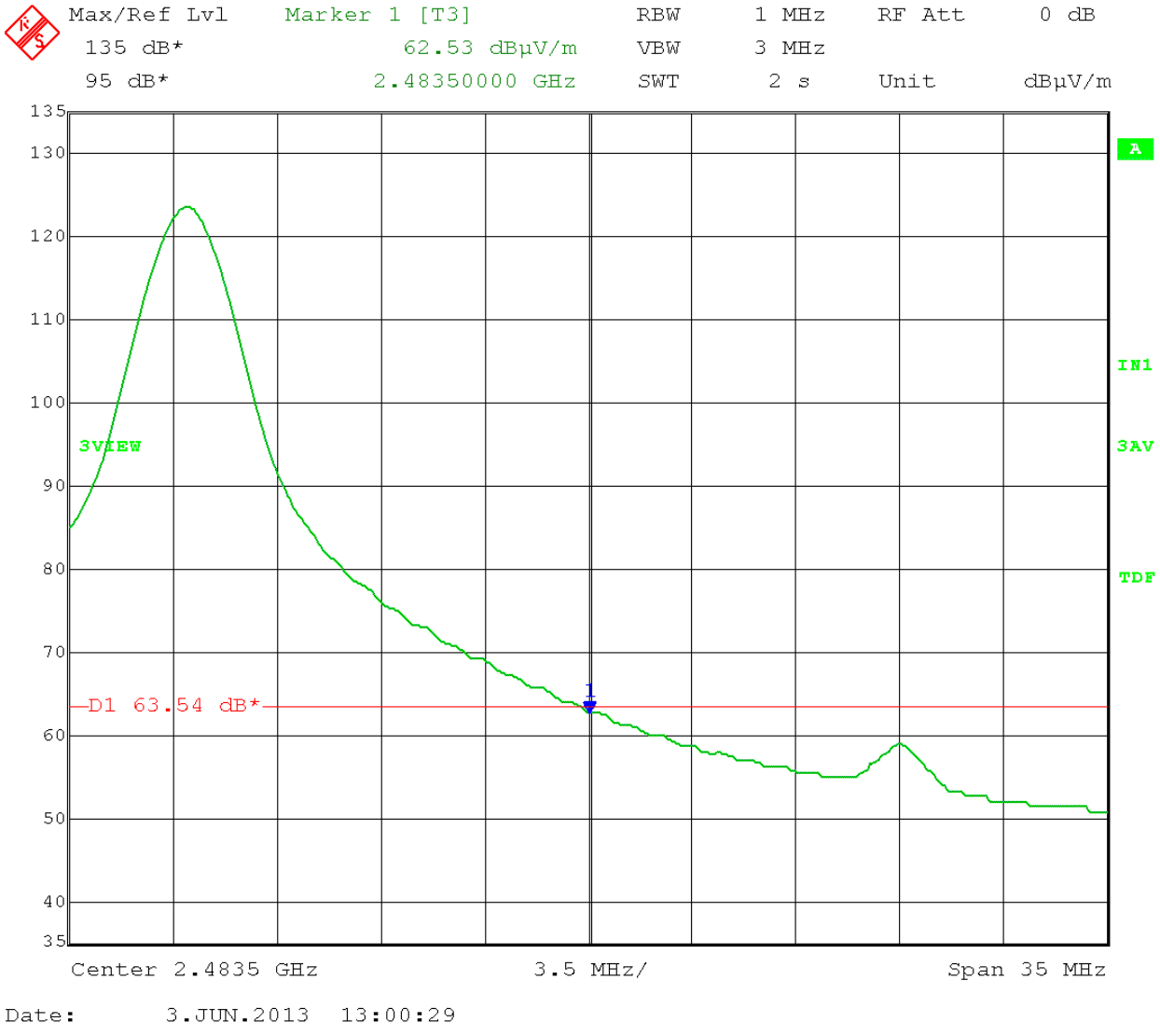


166 South Carter, Genoa City, WI 53128

Company: California Eastern Laboratories
Model Tested: ZICM357SP2-1
Report Number: 19073
DLS Project: 5953

Test Date: 06-03-2013
Company: California Eastern Laboratories
EUT: ZICM357SP2-1c
Test: Upper Band-Edge - Radiated
Rule part: FCC Part 15.247(d) and FCC Part 15.205
Operator: Craig B
Comment: Channel 24: Frequency – 2.470 GHz
Power setting -2 (full power)

Vertical polarization
Detector: Average
Test distance: 1 meter
Limit 63.54 dBµV/m



166 South Carter, Genoa City, WI 53128

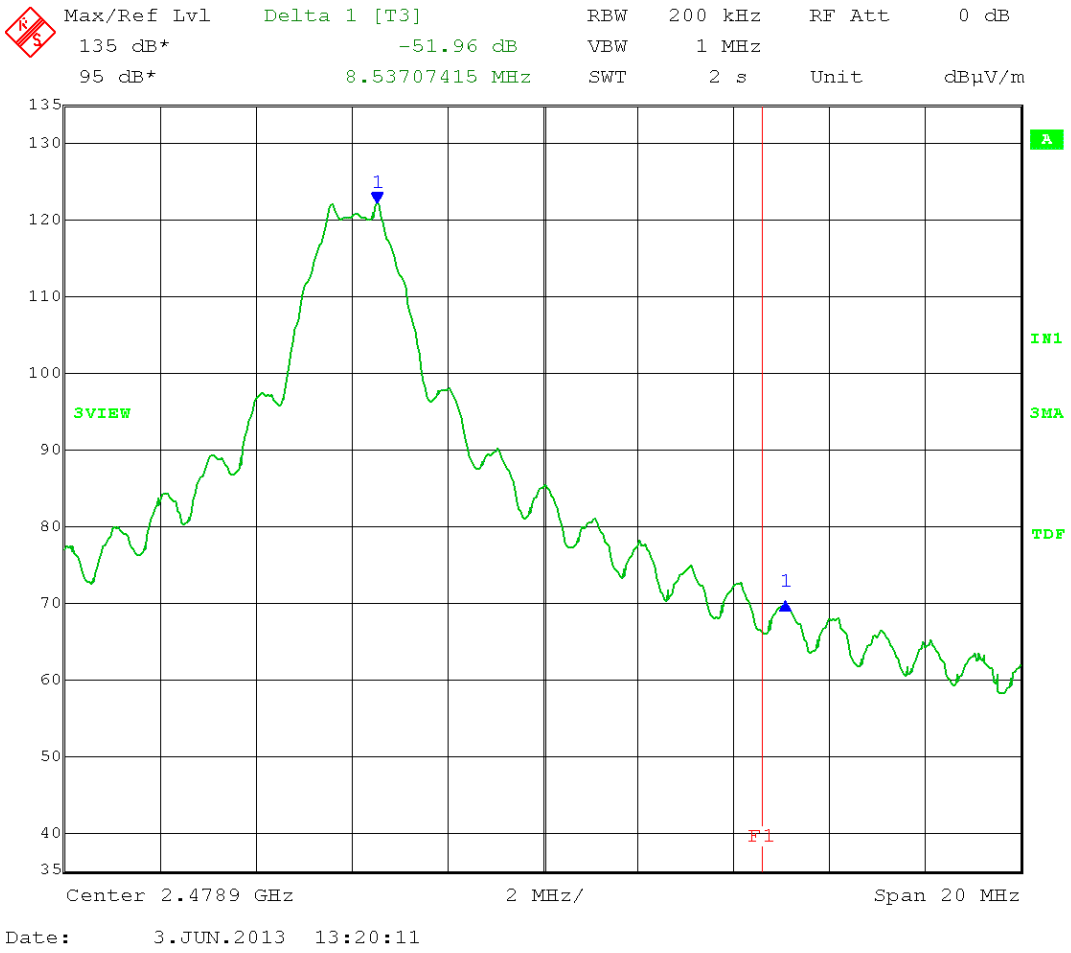
Company: California Eastern Laboratories
Model Tested: ZICM357SP2-1
Report Number: 19073
DLS Project: 5953

Test Date: 06-03-2013
Company: California Eastern Laboratories
EUT: ZICM357SP2-1c
Test: Upper Band-Edge Radiated – Marker Delta Method
Rule part: FCC Part 15.247(d) and FCC Part 15.205
Operator: Craig B
Comment: Channel 25: Frequency – 2.475 GHz
Power setting -11

Because the upper band-edge coincides with a restricted band, band-edge compliance for the upper band-edge was determined using the radiated marker-delta method as outlined in ANSI C63.10:2009 Section 6.9.3. The radiated field strength of the fundamental emission was first determined and then the marker-delta method was used to determine the field strength of the band-edge emissions.

Power setting reduced from -2 to -11.

Frequency (MHz)	Antenna Polarity (H/V)	Fundamental Field Strength (dBµV/m)	Delta-Marker (dB)	Band-Edge Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2475 (Peak)	H	109.31	-51.96	57.35	74	16.65
2475 (Avg)	H	105.70	-51.96	53.74	54	0.26



166 South Carter, Genoa City, WI 53128

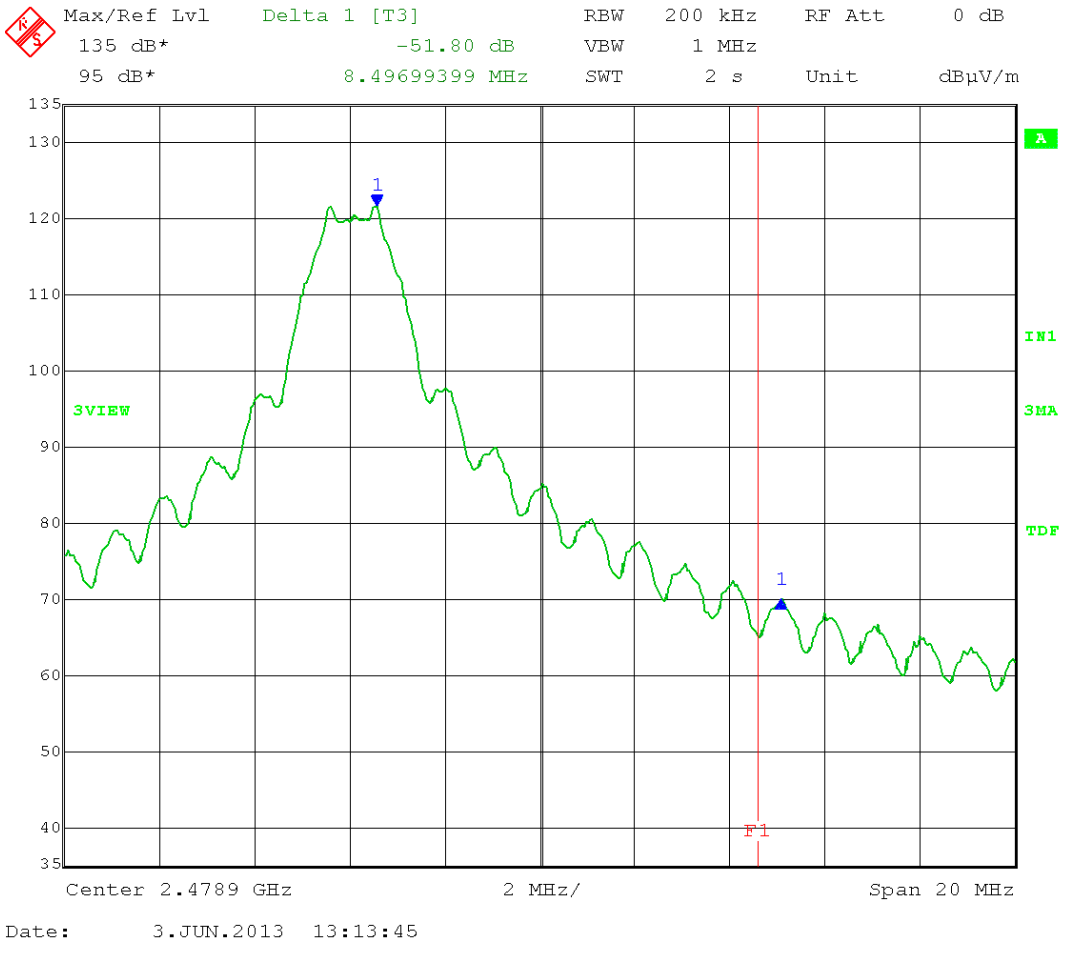
Company:	California Eastern Laboratories
Model Tested:	ZICM357SP2-1
Report Number:	19073
DLS Project:	5953

Test Date:	06-03-2013
Company:	California Eastern Laboratories
EUT:	ZICM357SP2-1c
Test:	Upper Band-Edge Radiated – Marker Delta Method
Rule part:	FCC Part 15.247(d) and FCC Part 15.205
Operator:	Craig B
Comment:	Channel 25: Frequency – 2.475 GHz
	Power setting -12

Because the upper band-edge coincides with a restricted band, band-edge compliance for the upper band-edge was determined using the radiated marker-delta method as outlined in ANSI C63.10:2009 Section 6.9.3. The radiated field strength of the fundamental emission was first determined and then the marker-delta method was used to determine the field strength of the band-edge emissions.

Power setting reduced from -2 to -12.

Frequency (MHz)	Antenna Polarity (H/V)	Fundamental Field Strength (dBµV/m)	Delta-Marker (dB)	Band-Edge Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2475 (Peak)	V	108.41	51.80	56.61	74	17.39
2475 (Avg)	V	105.00	51.80	53.20	54	0.80

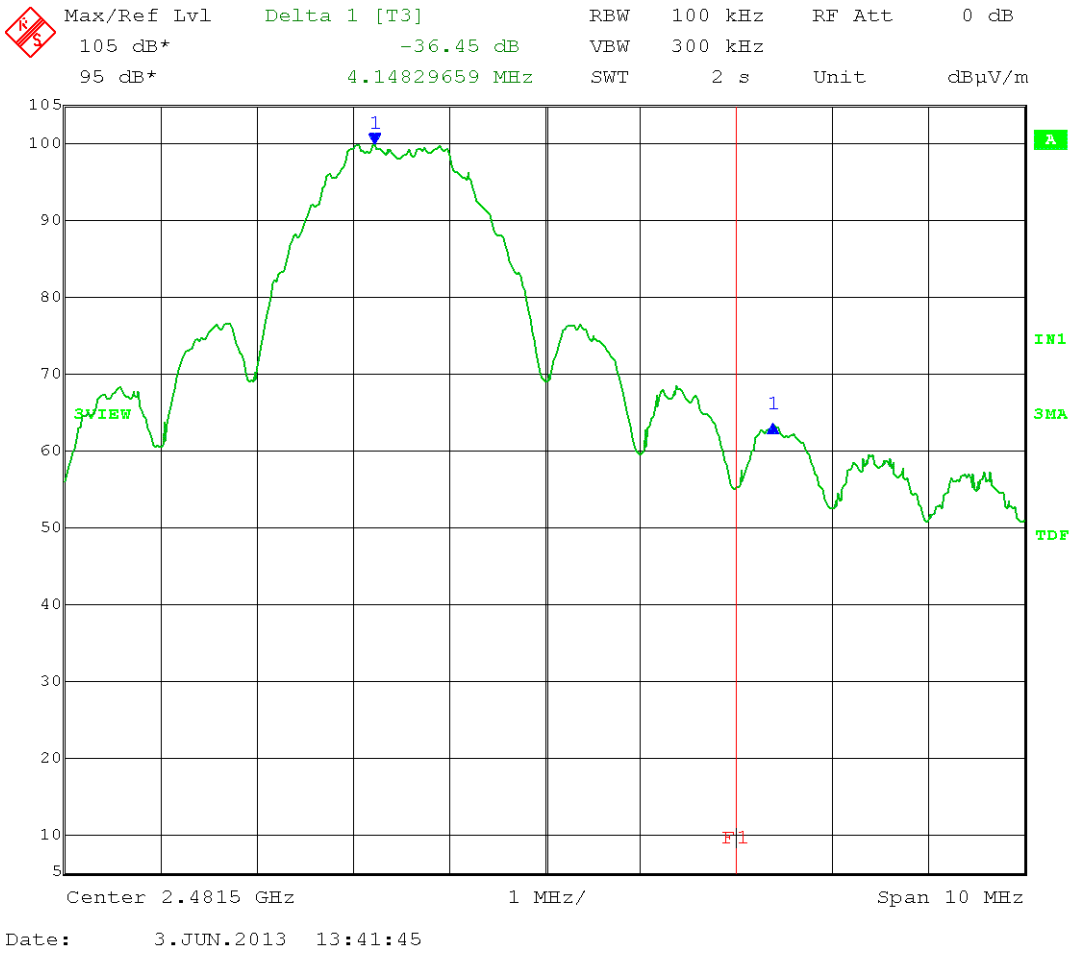


Test Date: 06-03-2013
Company: California Eastern Laboratories
EUT: ZICM357SP2-1c
Test: Upper Band-Edge Radiated – Marker Delta Method
Rule part: FCC Part 15.247(d) and FCC Part 15.205
Operator: Craig B
Comment: Channel 26: Frequency – 2.480 GHz
Power setting -37

Because the upper band-edge coincides with a restricted band, band-edge compliance for the upper band-edge was determined using the radiated marker-delta method as outlined in ANSI C63.10:2009 Section 6.9.3. The radiated field strength of the fundamental emission was first determined and then the marker-delta method was used to determine the field strength of the band-edge emissions.

Power setting reduced from -2 to -37.

Frequency (MHz)	Antenna Polarity (H/V)	Fundamental Field Strength (dBµV/m)	Delta-Marker (dB)	Band-Edge Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2480 (Peak)	H	93.95	-36.45	57.50	74	16.50
2480 (Avg)	H	90.12	-36.45	53.67	54	0.33

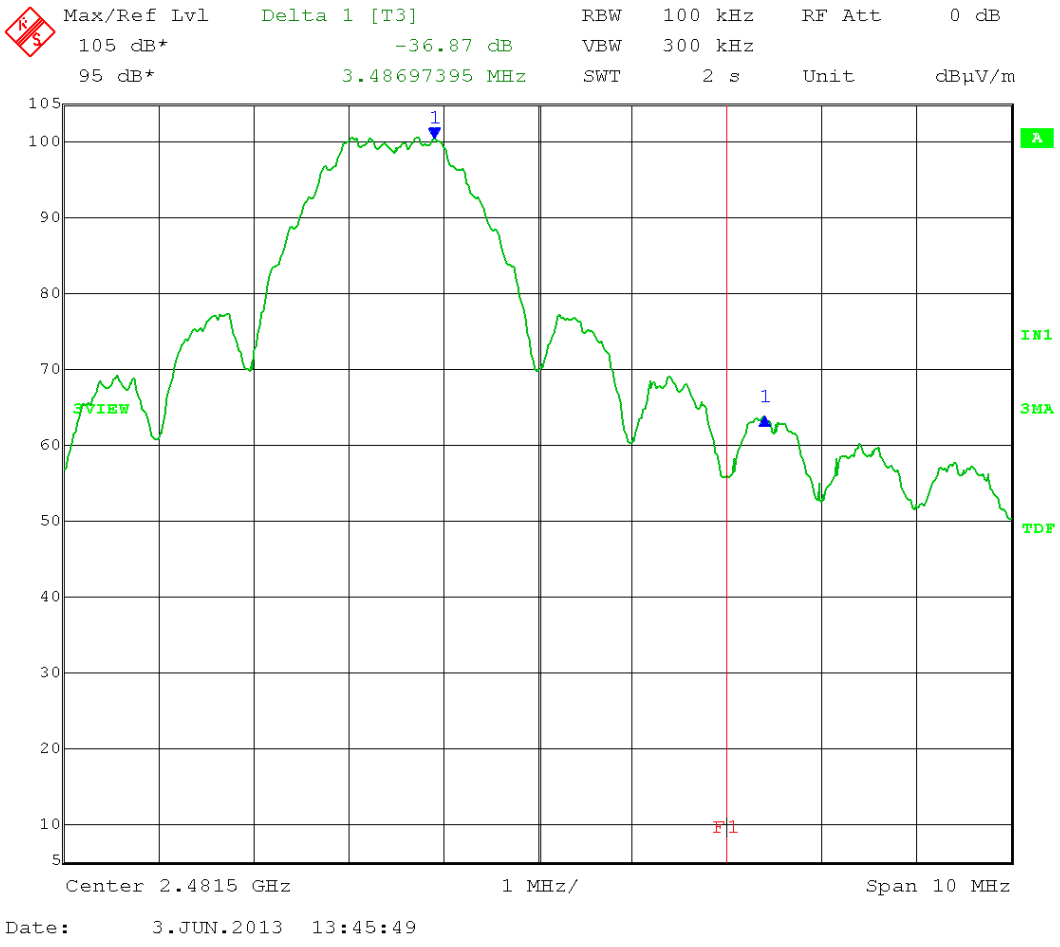


Test Date: 06-03-2013
Company: California Eastern Laboratories
EUT: ZICM357SP2-1c
Test: Upper Band-Edge Radiated – Marker Delta Method
Rule part: FCC Part 15.247(d) and FCC Part 15.205
Operator: Craig B
Comment: Channel 26: Frequency – 2.480 GHz
Power setting -30

Because the upper band-edge coincides with a restricted band, band-edge compliance for the upper band-edge was determined using the radiated marker-delta method as outlined in ANSI C63.10:2009 Section 6.9.3. The radiated field strength of the fundamental emission was first determined and then the marker-delta method was used to determine the field strength of the band-edge emissions.

Power setting reduced from -2 to -30.

Frequency (MHz)	Antenna Polarity (H/V)	Fundamental Field Strength (dBµV/m)	Delta-Marker (dB)	Band-Edge Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2480 (Peak)	V	94.48	-36.87	57.61	74	16.39
2480 (Avg)	V	90.79	-36.87	53.92	54	0.08



END OF REPORT

Revision #	Date	Comments	By
1.0	06-05-2013	Preliminary Release	JS
1.1	06-13-2013	Page 1 edit to 2480 & added charts on pages 26 & 28	JS
1.2	06-14-2013	Added page 5 note	JS