849 NW State Road 45
Newberry, FL 32669 USA
Ph.: 888.472.2424 or
352.472.5500
Fax: 352.472.2030
Email: info@timcoengr.com
Website: www.timcoengr.com

FCC PART 15.249

UNLICENSED INTENTIONAL RADIATOR

TEST REPORT

Applicant	**IRISS INC.**
Address	**10306 TECHNOLOGY TERRACE BRADENTON FL 34211**
Product Model Number	DeltaTAlert
Product Description	RF Temperature Sensor
FCC ID:	2AE7JDELTATUS
Date Sample Received	1/18/2016
Date Tested	2/4/2016
Tested By	Tim Royer
Approved By	Cory Leverett

Report Number	Version Number	Description	Issue Date
123UT16TestReport	Rev.1	Initial Issue	2/8/2016

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GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

Summary

The device under test does:

☒ Fulfill the general approval requirements as identified in this test report
☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025: 2005 requirements.

I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669

Authorized Signatory Name:

Project Manager
Date:

Tim Royer
Project Manager:

Date: 2/8/2016

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GENERAL INFORMATION

EUT Specification

FCC Regulatory Standard	Title 47 CFR Part 2 & 15		
FCC ID	2AE7JDELTATUS		
Model	DELTA-T-US		
EUT Description	TRANSMITTER		
Operating Frequency	TX: 908.4 – 921.4MHz		
EUT Power Source	☐ 110–120Vac/50– 60Hz		
	☐ DC Power		
	☒ Battery Operated Exclusively		
Test Item	☐ Prototype	☐ Pre-Production	☒ Production
Type of Equipment	☒ Fixed	☐ Mobile	☐ Portable
Antenna Connector	None		
Antenna	Integral		
Test Conditions	Temperature: 24-26ºC Relative humidity: 50-65%		
Measurement Standards	ANSI C63.10-2013 (test methods) ANSI C63.4-2014 (Site Validation)		
Test Exercise	EUT was powered with 3 AA batteries and power setting was set to 36		

Test Supporting Equipment

Device	Manufacturer	Model	S/N	Supplied By	Use
Programming Unit	IRISS	B36Z1000-00 Rev3	EV059	IRISS	Programming

TEST RESULTS SUMMARY

Requirement	FCC Rule Part	Result
Fundamental & Harmonic Emissions	15.249 (a)(c)(e)	Pass
Occupied Bandwidth	15.215 (c)	Pass
Bandedge Compliance	15.249 (c)(d)(e) 15.209	Pass
Spurious Emissions	15.249 (c)(d)(e) 15.209	Pass
AC Power Line Conducted Emissions	15.207	NA
Restricted Band Emissions	15.205	NA
Antenna Requirements	15.203	Pass

Notes:

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RADIATION INTERFERENCE

Rules Part No.: FCC 15.249, 15.209

Requirements:

Frequency	Limits
Part 15.209 & RSS-GEN 8.9	
9 to 490 kHz	2400/F (kHz) µV/m @ 300 meters
490 to 1705 kHz	24000/F (kHz) µV/m @ 30 meters
1705 kHz to 30 MHz	29.54 dBµV/m @ 30 meters
30 – 88	40.0 dBµV/m @ 3 meters
80 – 216	43.5 dBµV/m @ 3 meters
216 – 960	46.0 dBµV/m @ 3 meters
Above 960	54.0 dBµV/m @ 3 meters
Part 15.249 & RSS-210 (i8) ANNEX A.2.9	
Fundamental 902 – 928 MHz	94.0 dBµV/m @ 3 meters
Fundamental 2.4 – 2.4835 GHz	94.0 dBµV/m @ 3 meters
Harmonics	54.0 dBµV/m @ 3 meters

Method of Measurement: ANSI C63.10 using a spectrum analyzer, a preselector, a quasi-peak adapter, and an appropriate antenna. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100 kHz with an appropriate sweep speed and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3 MHz above 1 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worst case emissions were reported. The spectrum was searched to at least the tenth (10) harmonic of the fundamental. Emissions were scanned from 30MHz to the tenth harmonic of the fundamental frequency at three places in the band. All emissions greater than 20 dB from the limit are not reported.

Formula of Conversion Factors: The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

Example:

Freq (MHz)	Meter Reading	+ ACF	+ CL = FS
33	20 dBuV	+ 10.36 dB	+ 0.5 = 30.86 dBuV/m @ 3m

Test Data: Peak Detector Used for all Measurement's unless otherwise noted in table.

RADIATION INTERFERENCE

Test Data: Radiated Emissions from 9 KHz – 10th harmonic

Tuned Freq MHz	Emission Frequency MHz	Meter Reading dBu V	Antenna Polarity	Coax Loss Db	Correction Factor dB/M	Field Strength dBu V/M	Margin
908.42	908.42	61.50	H	3.46	21.51	86.47	7.53
908.42	908.42	64.86	V	3.46	21.51	89.83	4.17
908.42	1815.50	9.55	H	4.94	30.72	45.21	8.79
915.00	915.00	58.39	H	3.47	22.00	83.86	10.14
915.00	915.00	61.39	V	3.47	22.00	86.86	7.14
915.00	1830.00	10.80	V	4.93	30.92	46.65	7.35
915.00	1830.60	11.52	H	4.93	30.93	47.38	6.62
921.40	921.40	61.03	V	3.48	22.18	86.69	7.31
921.40	921.40	66.16	H	3.48	22.18	91.82	2.18

Peak Detector Used for all Measurement's unless otherwise noted in table.

Results - Meets Requirements

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OCCUPIED BANDWIDTH

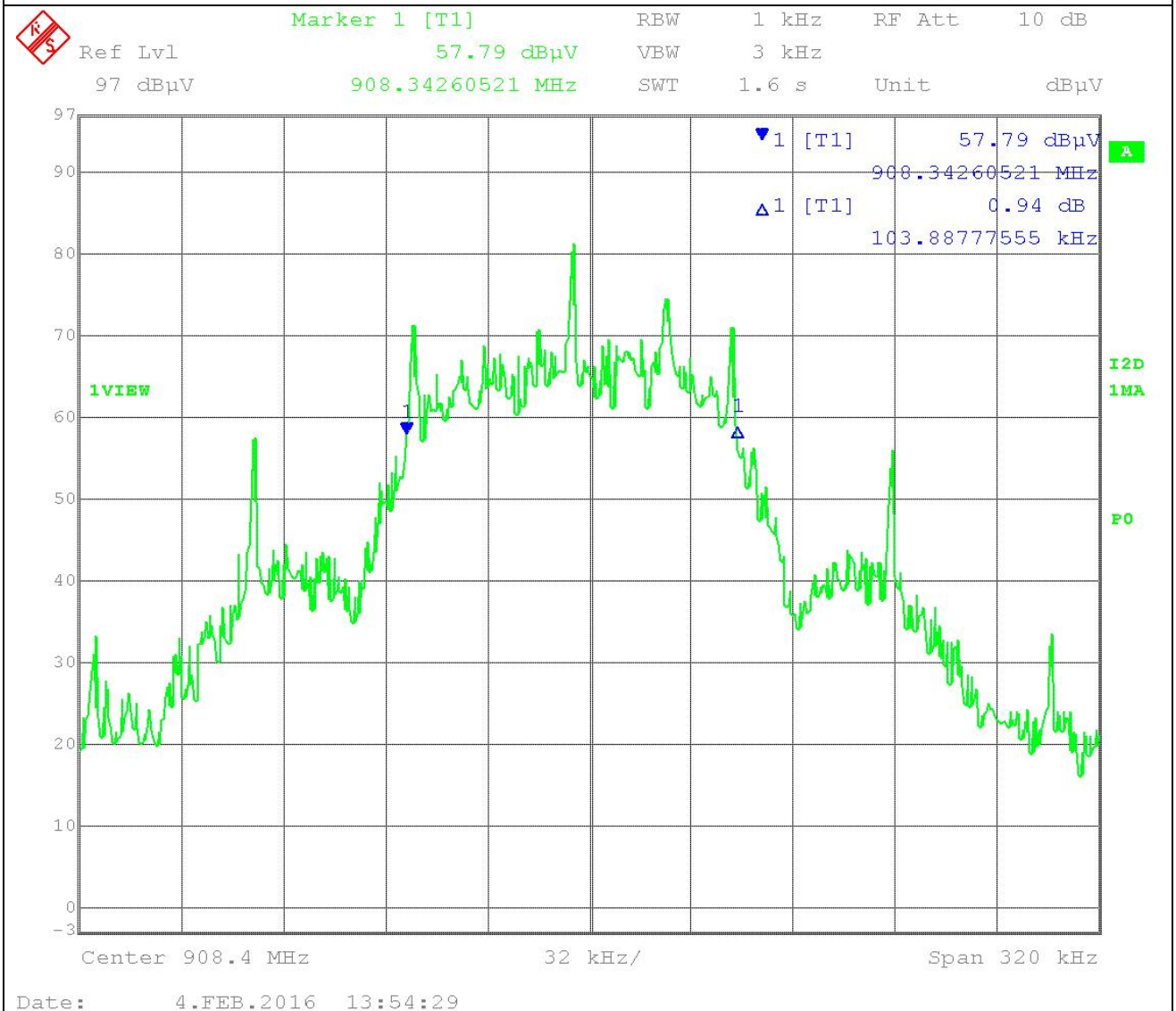
Rules Part No.: FCC 15.215(c)

Requirements: FCC requires that the 20 dB bandwidth of the emission shall be contained within the frequency band designated under which the equipment is operated.

Method of Measurement: ANSI C63.10 § 6.9 Occupied bandwidth tests

Test Data: Low End of Band

20 dB OCC BW = 103.8kHz



RESULTS MEET REQUIREMENTS

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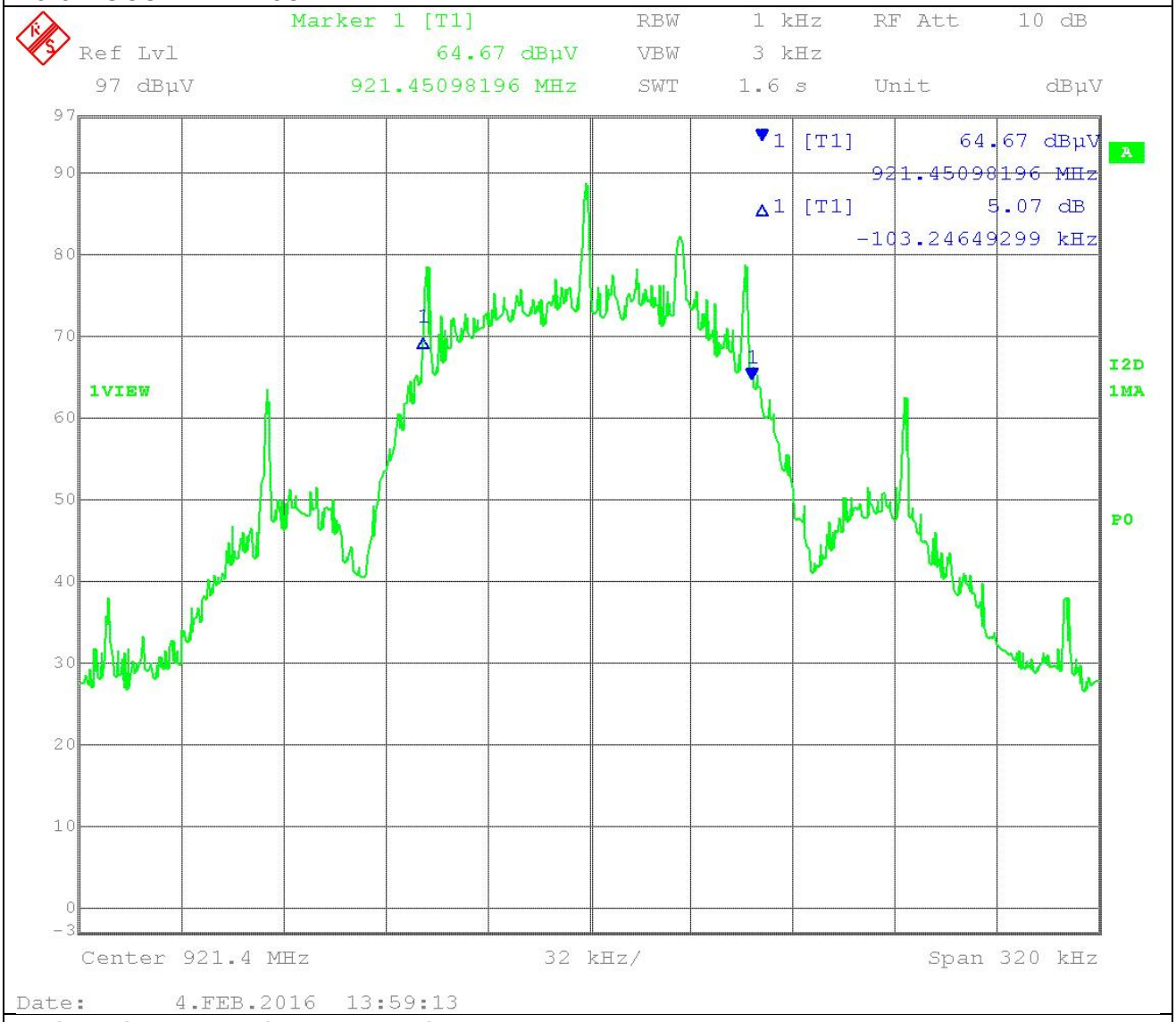
OCCUPIED BANDWIDTH

Test Data: High End of Band

20 dB OCC BW = 103.2kHz



RESULTS MEET REQUIREMENTS

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BAND-EDGE

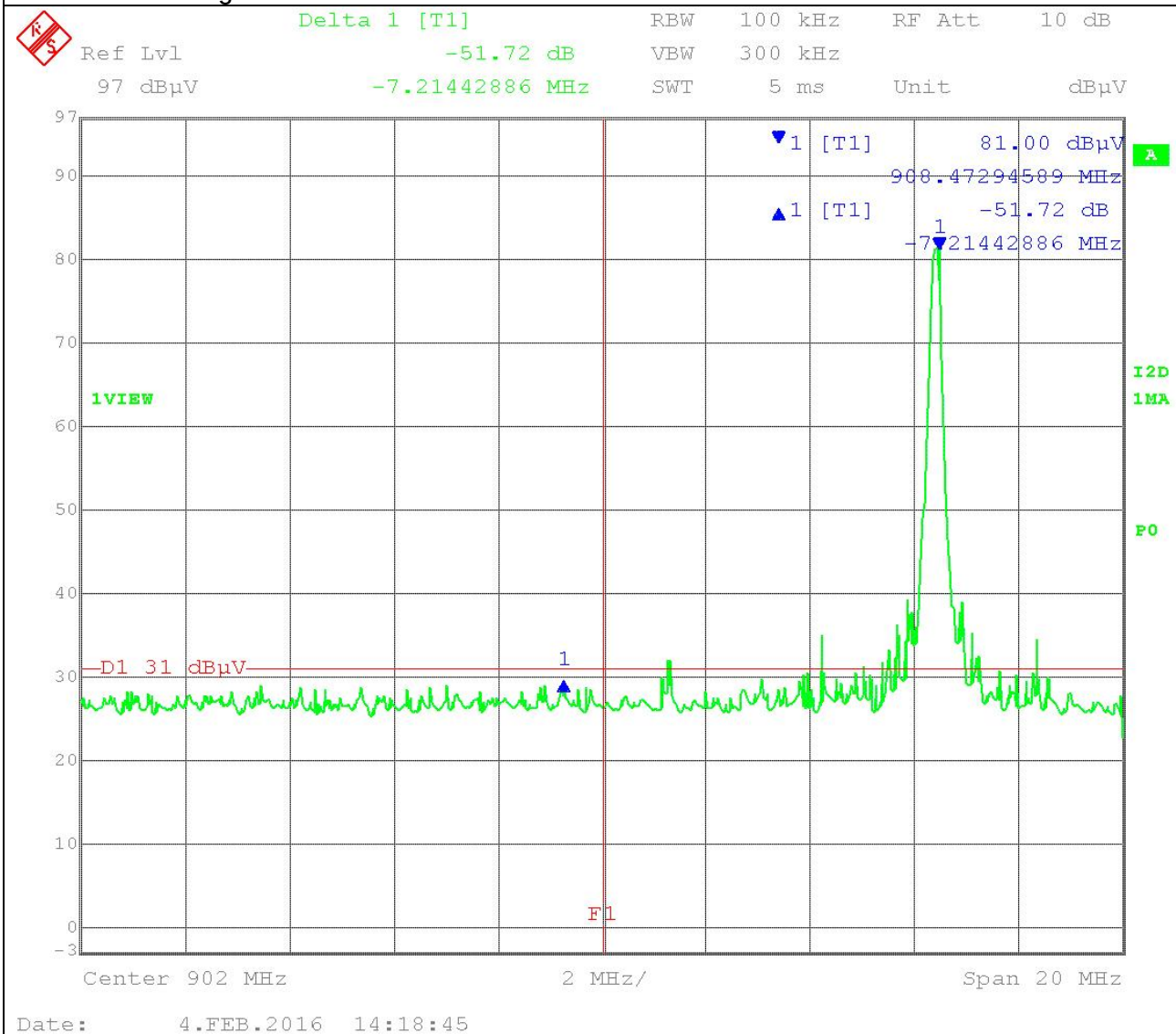
Rules Part No.: FCC 15.249(d

Requirements: The field strength of any emissions appearing outside the bandedges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

Method of Measurement: ANSI C63.10 § 6.10 Band-edge testing

Test Data: Lower Bandedge

Lower Band Edge =51.72 dBc



RESULTS MEET REQUIREMENTS

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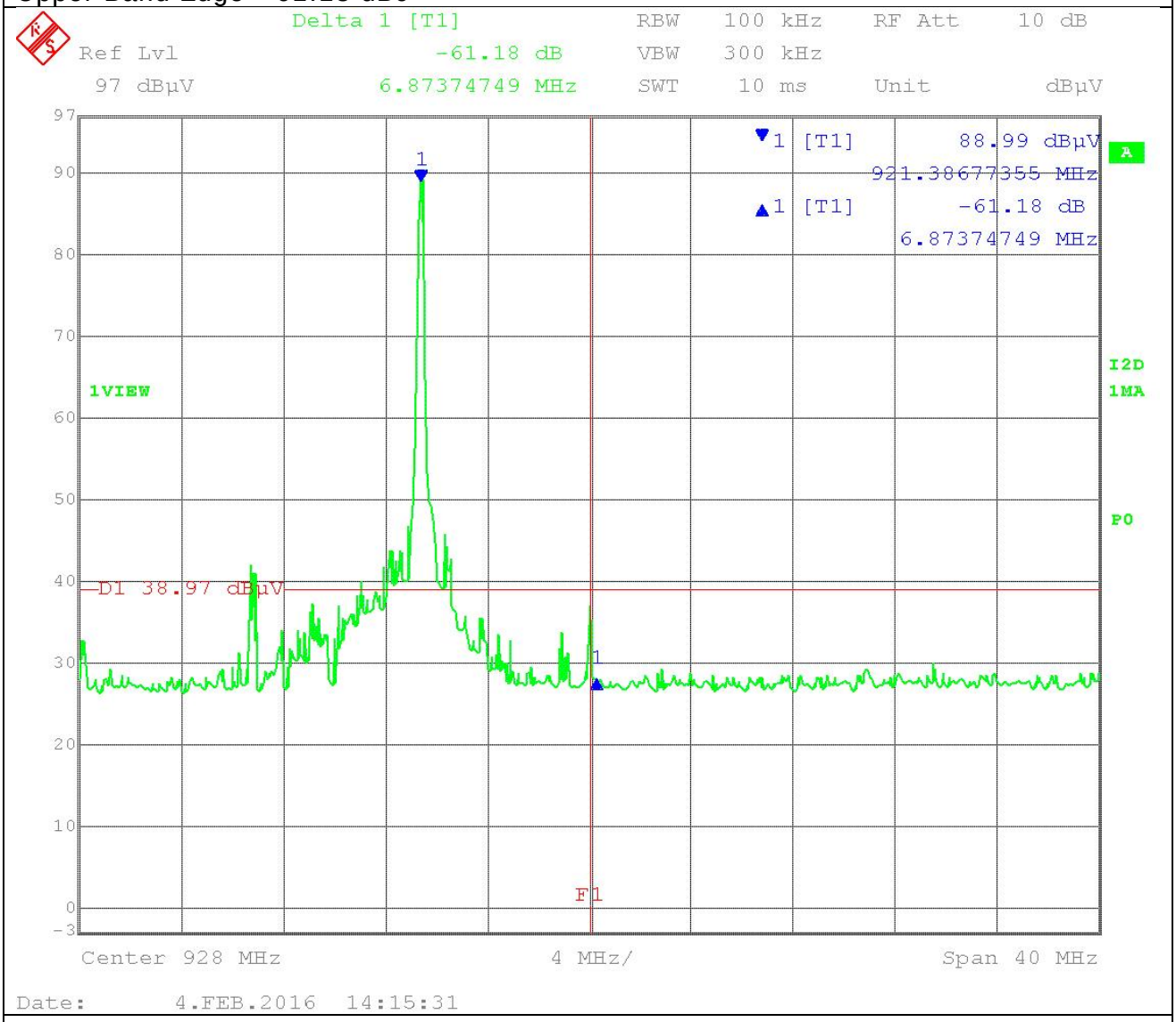
BAND-EDGE

Test Data: Upper Bandedge

Upper Band Edge =61.18 dBc



RESULTS MEET REQUIREMENTS

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EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Biconnical	Eaton	94455-1	1057	11/18/15	11/18/17
Antenna: Log-Periodic	Eaton	96005	1122	07/14/15	07/14/17
Antenna: Passive Loop	EMC Test Systems	EMCO 6512	9706-1211	07/09/15	07/09/17
CHAMBER	Panashield	N/A	N/A	01/05/16	03/01/16
Antenna: Double-Ridged Horn/ETS Horn 1	ETS-Lindgren	3117	00035923	06/13/14	06/13/16
EMI Test Receiver R & S ESU 40 Chamber	Rohde & Schwarz	ESU 40	100320	12/15/14	12/15/17

***EMI RECEIVER SOFTWARE VERSION**

The receiver firmware used was version 4.43 Service Pack 3

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