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 & IC RSS-210

UNLICENSED INTENTIONAL RADIATOR

TEST REPORT

Applicant	ENERNET CORPORATION
Address	307 DEWITTSHIRE ROAD SYRACUSE NEW YORK 13214 USA
FCC ID	TGD12200
IC Certification Number	6120A-12200
Model Number	12200C
Product Description	FURNACE MOUNTED TRANSMITTER
Date Sample Received	6/4/2015
Final Test Date	7/10/2015
Tested By	Tim Royer
Approved By	Cory Leverett

Report Number	Version Number	Description	Issue Date
1370AUT15TestReport	Rev1	Initial Issue	7/14/2015

Table of Contents

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, under my supervision, at:

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

Authorized Signatory Name:

Project Manager
Date: 7/14/2015

Table of Contents

GENERAL INFORMATION

EUT Specification

FCC Regulatory Standard	Title 47 CFR Part 2 & 15		
IC Regulatory Standard	RSS-210 (i8) & RSS-GEN (i4)		
FCC ID	**TGD12200**		
IC CERT	**6120A-12200**		
Model	12200C		
EUT Description	FURNACE MOUNTED TRANSMITTER		
Operating Frequency	TX:916.5MHz		
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	Integrated on circuit board		
Test Facility	**Timco Engineering Inc. located at 849 NW State Road 45 Newberry, FL 32669 USA.**		
Test Conditions	Temperature: 24-26ºC Relative humidity: 50-65%		
Measurement Standards	ANSI C63.10-2013 (test methods) ANSI C63.4-2009 (Site Validation)		
Test Exercise	RF Transmitting by pressing PB3 Button		

Test Supporting Equipment

Device	Manufacturer	Model	S/N	Supplied By	Use
N/A	---	---	---	---	---

TEST RESULTS SUMMARY

Requirement	FCC Rule Part	IC RSS	Result
Fundamental & Harmonic Emissions	15.249 (a)	210 § A2.9	Pass
Bandedge Compliance	15.249 (d)	210 § A2.9(b)	Pass
Spurious Emissions	15.249 (d)	210 § A2.9(b)	Pass
Occupied Bandwidth	15.215 (c)	GEN § 6.6	Pass
AC Power Line Conducted Emissions	15.207	GEN § 8.8	NA(1)
Restricted Band of Operation	15.205	GEN § 8.10	Pass
Antenna Requirements	15.203	GEN § 8.3	Pass

Notes:

1. The EUT does not provide provisions for connecting to the public line utility.

Table of Contents

RADIATION INTERFERENCE

Rules Part No.: FCC 15.249, 15.209 & IC RSS-210 ANNEX A2.9(b), GEN § 8.9

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 § 6.4, 6.5, & 6.6 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:

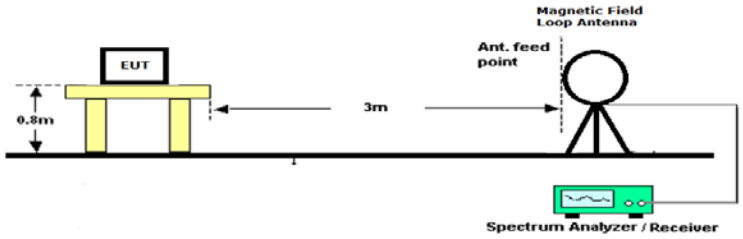
Freq (MHz)	Meter Reading	+ ACF	+ CL = FS
33	20 dBuV	+ 10.36 dB	+ 0.5 = 30.86 dBuV/m @ 3m

Table of Contents

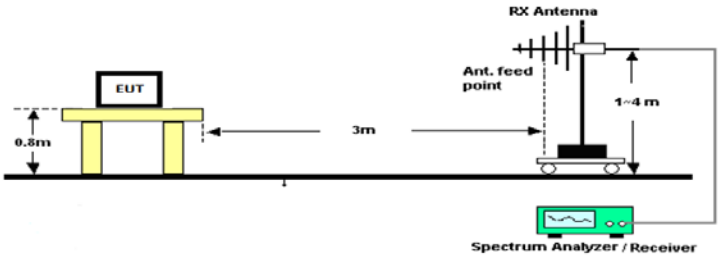
RADIATION INTERFERENCE

Setup Diagram:

Emissions below 30 MHz



Emissions 30 – 1000 MHz



Emissions above 1 GHz

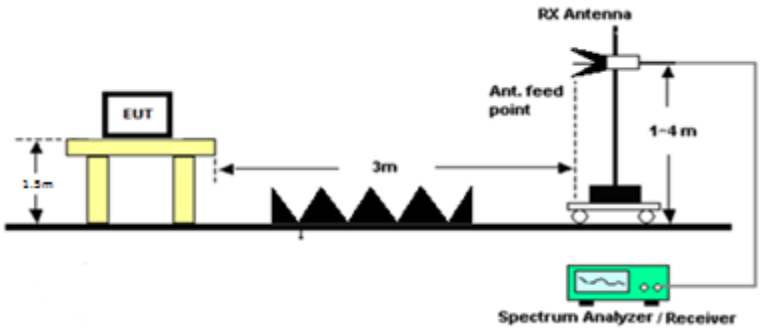


Table of Contents

RADIATION INTERFERENCE

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

Tuned Frequency (MHz)	Emission Frequency (MHz)	Meter Reading (dBuV)	Ant. Polarity	Coax Loss (dB)	Correction Factor (dB/m)	Field Strength (dBuV/m)	Margin (dB)
916.5	0.01	-3.9	H	0.00	17.06	13.21	26.79
916.5	0.07	-9.1	H	0.00	11.63	2.51	37.49
916.5	0.15	-8.1	H	0.00	11.25	3.12	36.88
916.5	829.62	2.33	V	1.99	22.29	26.61	19.39
916.5	916.50	60.4	V	2.40	23.37	86.15	7.85
916.5	1,833.00	2.8	H	2.99	30.24	35.99	18.01
916.5	1,833.00	6.8	H	2.99	30.24	40.05	13.95
916.5	2,749.60	6.3	H	3.42	32.52	42.22	11.78
916.5	2,749.60	6.5	H	3.42	32.52	42.41	11.59
916.5	3,666.05	4.5	V	4.20	33.03	41.70	12.30
916.5	3,666.05	5.5	H	4.20	33.03	42.75	11.25
916.5	4,617.60	4.9	H	4.81	34.09	43.79	10.21
916.5	5,499.07	4.2	V	5.15	34.55	43.86	10.14
916.5	5,521.50	4.8	H	5.16	34.59	44.52	9.48
916.5	6,415.58	2.5	H	5.42	35.62	43.56	10.44
916.5	6,415.58	3.0	V	5.42	35.62	44.00	10.00
916.5	7,332.10	4.0	V	5.80	36.01	45.76	8.24
916.5	7,332.10	4.0	H	5.80	36.01	45.76	8.24
916.5	8,248.61	2.8	H	6.30	35.99	45.10	8.90
916.5	8,248.61	3.0	H	6.30	35.99	45.32	8.68
916.5	9,165.12	2.5	V	6.65	36.28	45.38	8.62
916.5	9,165.12	3.7	H	6.65	36.28	46.67	7.33

Note: Emissions Greater than 20 dB from the limit are not reported.

Table of Contents

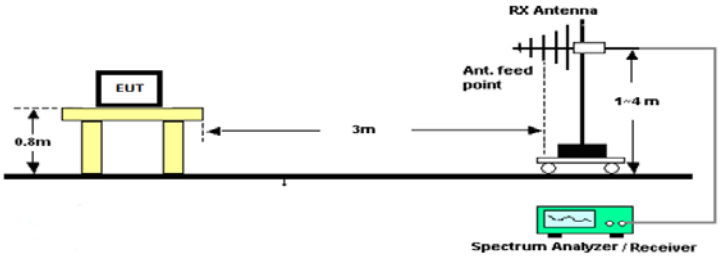
OCCUPIED BANDWIDTH

Rules Part No.: FCC 15.215(c) & IC RSS-GEN § 6.6

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. Industry Canada 99% Bandwidth reporting only

Method of Measurement:
ANSI C63.10 § 6.9.2 Occupied bandwidth—relative measurement procedure
ANSI C63.10 § 6.9.3 Occupied bandwidth—power bandwidth (99%) measurement

Setup Diagram:



Test Data:

Tuned Frequency (MHz)	20 dB BW (KHz)	99% BW (KHz)
916.512	66.185	163.2

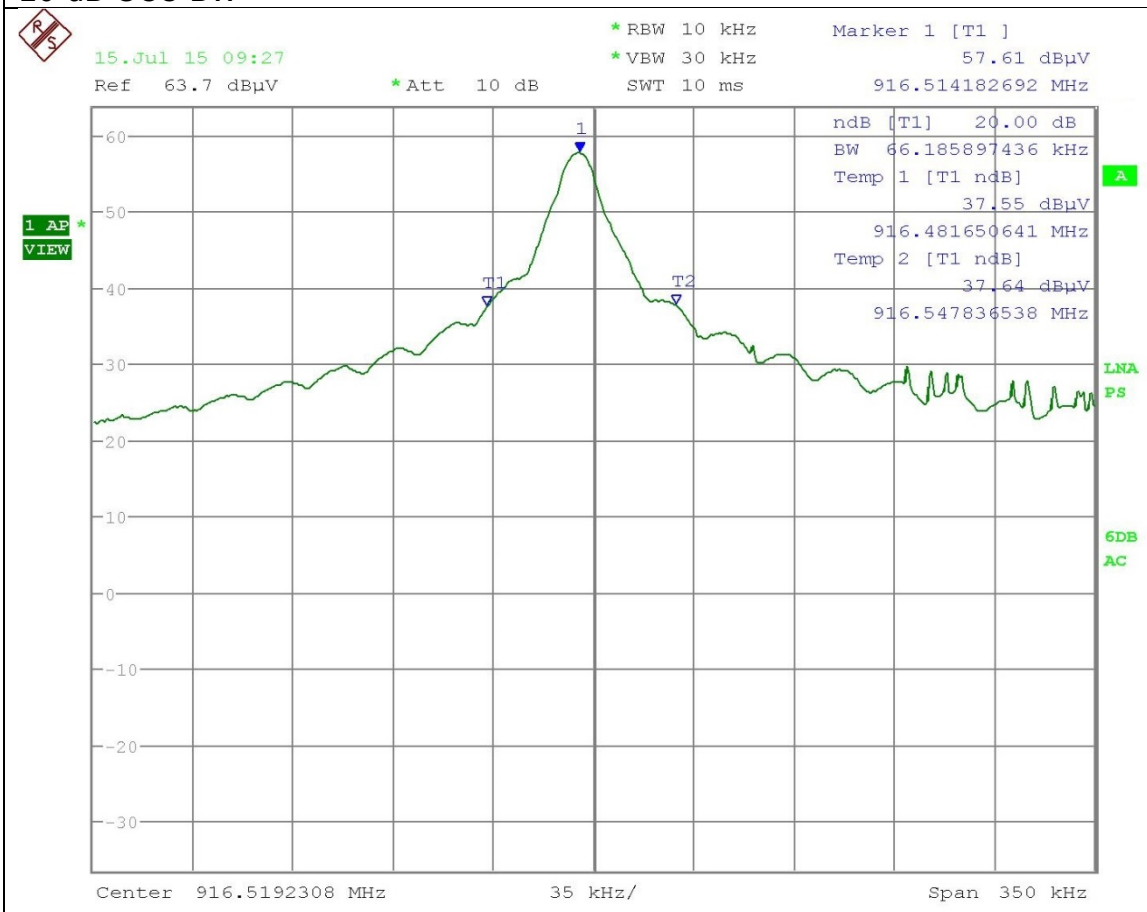
RESULTS MEET REQUIREMENTS

Table of Contents

OCCUPIED BANDWIDTH

Test Data:

20 dB OCC BW



Date: 15.JUL.2015 09:27:35

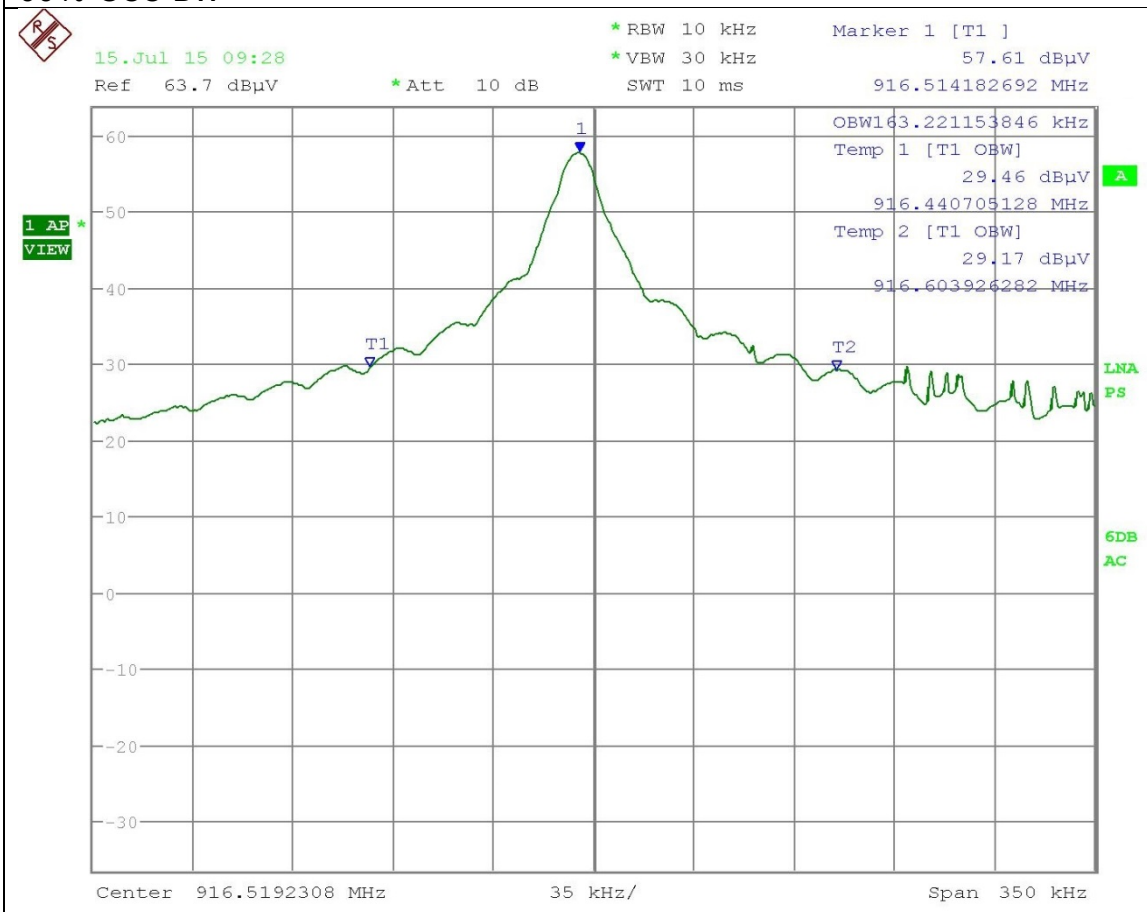
RESULTS MEET REQUIREMENTS

Table of Contents

OCCUPIED BANDWIDTH

Test Data:

99% OCC BW



Date: 15.JUL.2015 09:28:17

RESULTS MEET REQUIREMENTS

Table of Contents

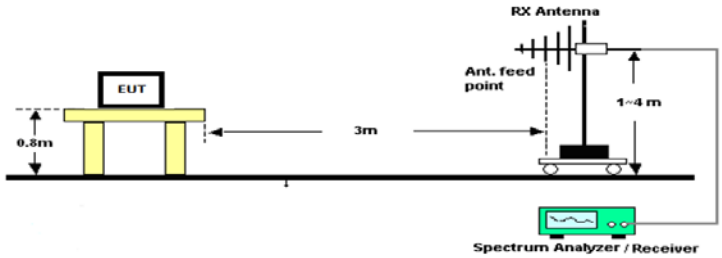
BAND-EDGE

Rules Part No.: FCC 15.249(d) & IC RSS-210 § A2.9(b)

Requirements: The field strength of any emissions appearing outside 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 § 6.10.4 Authorized band-edge measurements

Setup Diagram:



Test Data:

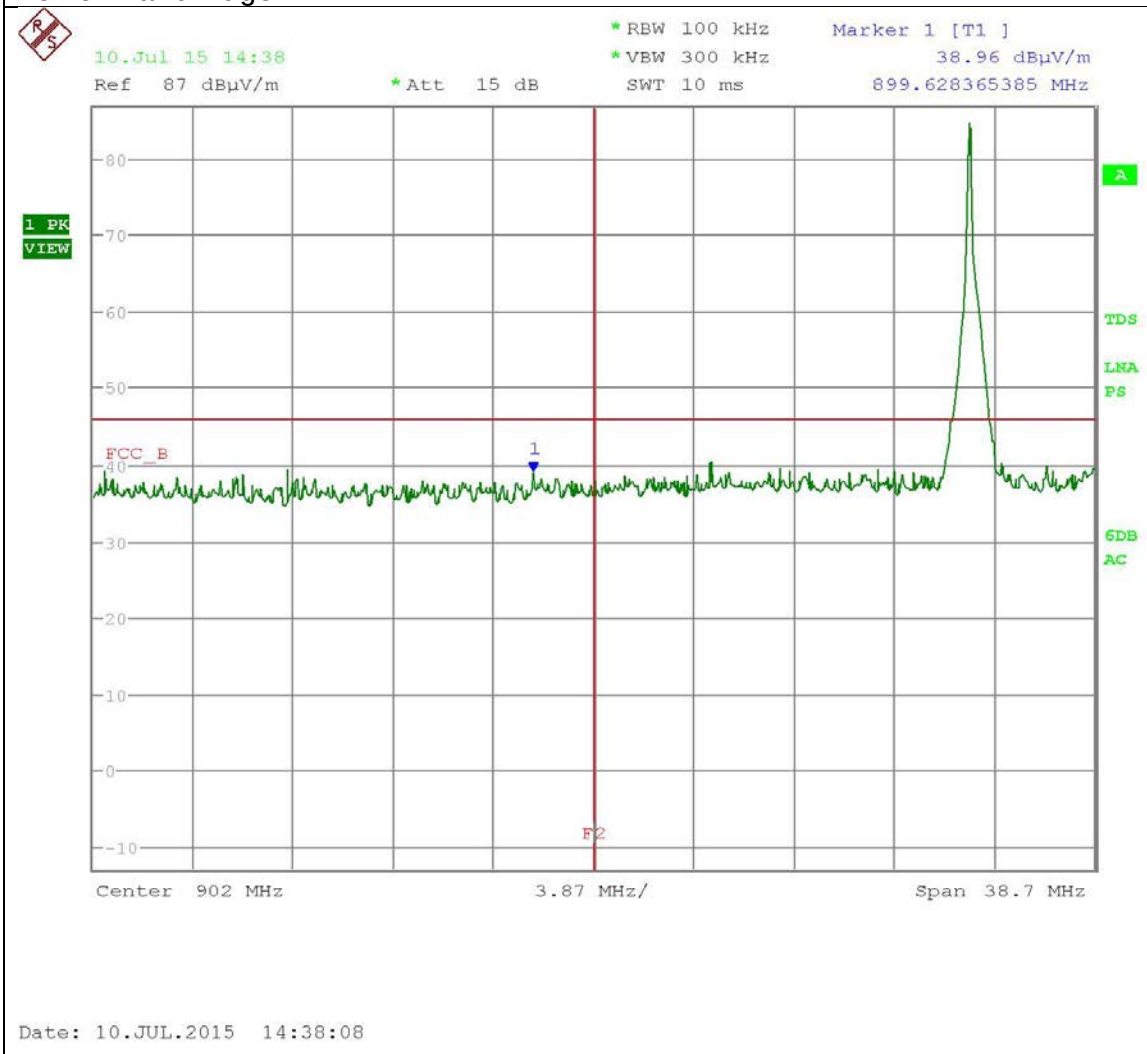
Band-edge	Measured Level (dBc)	Limit (dBc)	Margin (dB)
Lower	38.96	50	11.04
Upper	41.13	50	8.87

RESULTS MEET REQUIREMENTS

Table of Contents

Test Data:

Lower Band Edge



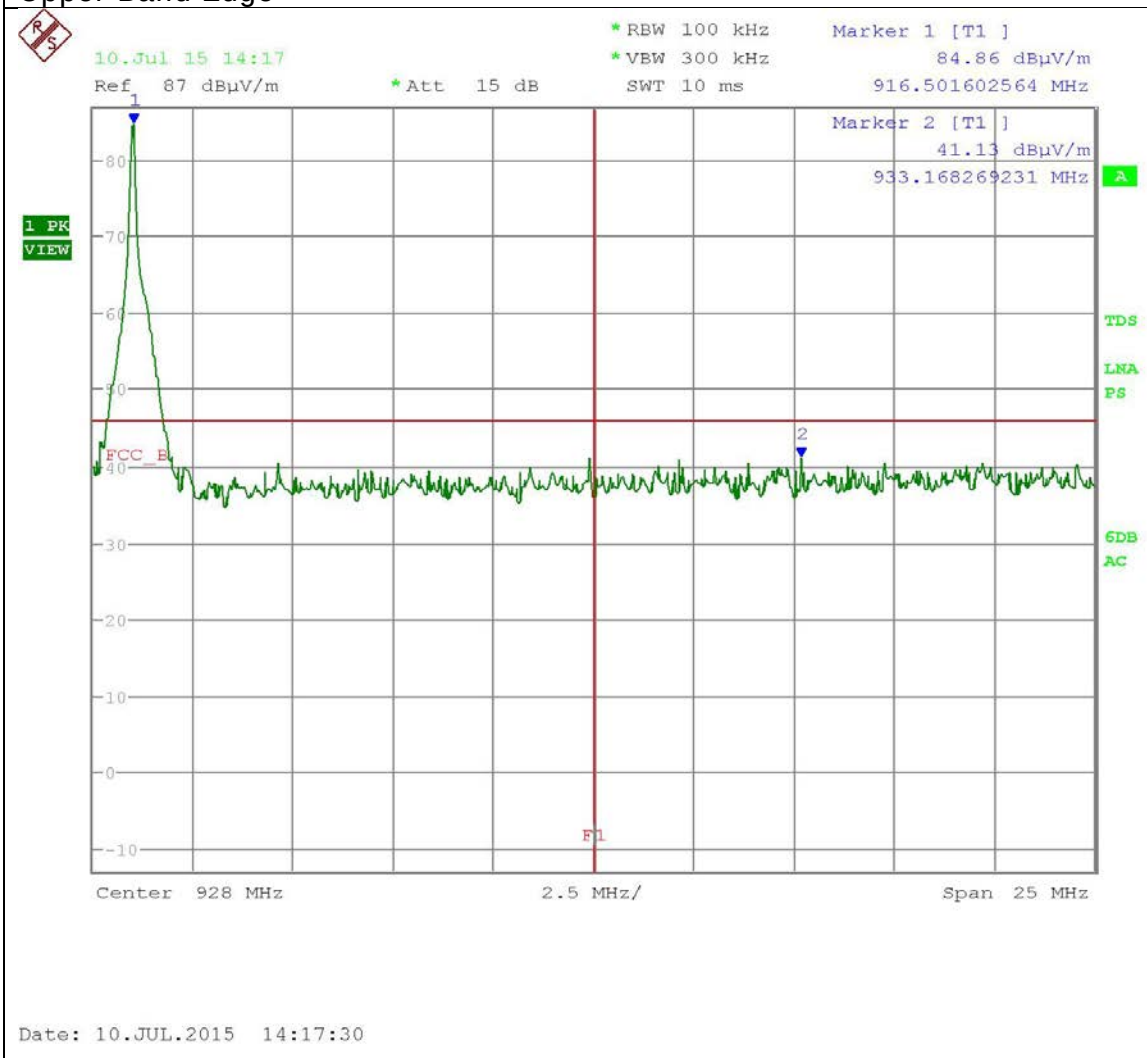
RESULTS MEET REQUIREMENTS

Table of Contents

BAND-EDGE

Test Data:

Upper Band Edge



RESULTS MEET REQUIREMENTS

Table of Contents

EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Biconnical Chamber	Eaton Chamber	94455-1	1057	06/14/13	12/14/15
Antenna: Log-Periodic Chamber	Eaton	96005	1243	05/31/13	11/30/15
Antenna: Passive	EMC Test Systems	EMCO 6512	9706-1211	06/14/12	07/14/15
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	12/31/13	12/31/15
Ant: Double-Ridged Horn/ETS Horn 1 Ch	ETS-Lindgren Chamber	3117	00035923	06/13/14	06/13/16
EMI Test Receiver R & S ESU 40 Chamber	Rohde & Schwarz	ESU 40	100320	03/11/14	03/11/16

*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3

Table of Contents