



ComplianceTesting.com

Previously Flom Test Lab

EMI, EMC, RF Testing Experts Since 1963

toll-free: (866) 311-3268

fax: (480) 926-3598

<http://www.ComplianceTesting.com>

info@ComplianceTesting.com

Date: December 12, 2008

Applicant: FLEET DATA SYSTEMS, LLC
652 Bair Island Road
Suite 207
Redwood City, CA 94063

Attention of: Raymond Cheung
Ph: 650-799-4167
Fax: 509-352-8989
E-Mail: rcheung@fleetdatasys.com

Equipment: NZMOD-V3
FCC ID: WZF-KL7-NZMOD-V3
FCC Rules: Part 15.207, 15.209

Gentlemen:

Enclosed please find your copy of the Test Data Report for the referenced equipment.

Please keep the original on record for submission to the FCC.

Should you have any questions, please do not hesitate to call.

Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director



ComplianceTesting.com

Previously Flom Test Lab

EMI, EMC, RF Testing Experts Since 1963

toll-free: (866) 311-3268

fax: (480) 926-3598

<http://www.ComplianceTesting.com>

info@ComplianceTesting.com

Date: December 12, 2008

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: FLEET DATA SYSTEMS, LLC
Equipment: NZMOD-V3
FCC ID: WZF-KL7-NZMOD-V3
FCC Rules: 15.207, 15.209

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director



List Of Exhibits

(FCC **Certification** (Transmitters) - Revised 9/28/98)

Applicant: FLEET DATA SYSTEMS, LLC

FCC ID: WZF-KL7-NZMOD-V3

By Applicant:

1. Letter Of Authorization
2. Identification Drawings
 - Id Label
 - Location Info
 - Attestation Statement(S)
 - Location of Compliance Statement
3. Documentation: 2.1033(B)
 - (3) User Manual(S)
 - (4) Operational Description
 - (5) Block Diagram
 - (5) Schematic Diagram
 - (7) External Photographs
 - Internal Photographs
 - Parts List
 - Active Devices

By Compliance Testing:

- A. Testimonial & Statement of Certification
- B. Statement of Qualifications



ComplianceTesting.com
Previously Flom Test Lab
EMI, EMC, RF Testing Experts Since 1963

toll-free: (866) 311-3268
fax: (480) 926-3598
<http://www.ComplianceTesting.com>
info@ComplianceTesting.com

Test Report

for

FCC ID: WZF-KL7-NZMOD-V3

Model: NZMOD-V3

to

Federal Communications Commission

Rule Part(s) 15.207, 15.209

Date Of Report: December 12, 2008

On the Behalf of the Applicant: FLEET DATA SYSTEMS, LLC
652 Bair Island Road
Suite 207
Redwood City, CA 94063

Attention of: Raymond Cheung
Ph: 650-799-4167
Fax: 509-352-8989
E-Mail: rcheung@fleetdatasys.com

Supervised By:

Hoosamuddin S. Bandukwala, Lab Director

Test Report Revision History

Revision	Date	Revised By	Reason for revision
1.0	December 12, 2008	J Erhard	Original Document
2.0	October 15, 2009	J. Erhard	Correct Limits on radiated emissions table

The applicant has been cautioned as to the following:

15.21 Information to User.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories.

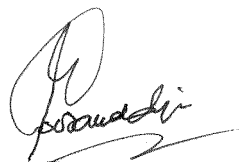
Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Testimonial And Statement Of Certification

This is to certify that:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.



Certifying Engineer:

Hoosamuddin S. Bandukwala, Lab Director

Table Of Contents

Rule	Description	Page
	Test Report	1
2.1033(c)	General Information Required	2
	Standard Test Conditions and Engineering Practices	4
	Test Results Summary	5
15.209	Radiated Emissions	6
15.207	A/C Powerline Conducted Emissions	8
RSS 210	99% Occupied Bandwidth	9
	Test Setup Photos	10
	Test Equipment Utilized	12

Required information per ISO 17025-2005, paragraph 5.10.2:

a) **Test Report**

b) Laboratory: Compliance Testing
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044A-1) Chandler, AZ 85225

c) Report Number: d08c0015

d) Client: FLEET DATA SYSTEMS, LLC

e) Identification: NZMOD-V3
FCC ID: WZF-KL7-NZMOD-V3
Description: Transmitter

f) EUT Condition: Not required unless specified in individual tests.

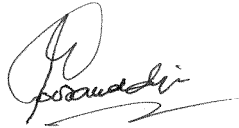
g) Report Date: December 12, 2008

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with Compliance Testing internal quality manual.

m) Supervised by:



Hoosamuddin S. Bandukwala, Lab Director

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.



List Of General Information Required For Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to 15.231

Sub-Part 2.1033

(c)(1):

Name and Address of Applicant: FLEET DATA SYSTEMS, LLC

(c)(2): **FCC ID:** WZF-KL7-NZMOD-V3

Model Number: NZMOD-V3

(c)(3): **Instruction Manual(s):**

Please See Attached Exhibits

(c)(4): **Type of Emission:** FSK

(c)(5): **FREQUENCY RANGE, MHz:** 125 kHz

(c)(6): **Power Rating, W:** -93.5 dBm (0.0 W)
_____ Switchable _____ Variable X N/A

(c)(7): **Maximum Power Rating, W:** -88 dBm (0.0 W)

15.203: **Antenna Requirement:**

 X The antenna is permanently attached to the EUT
_____ The antenna uses a unique coupling
_____ The EUT must be professionally installed
_____ The antenna requirement does not apply

Subpart 2.1033 (continued)**(c)(8): Circuit Diagram/Circuit Description:**

Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Please See Attached Exhibits

(c)(9): Label Information:

Please See Attached Exhibits

(c)(10): Photographs:

Please See Attached Exhibits

(c)(11): Digital Modulation Description:

☐ Attached Exhibits

☒ N/A

(c)(12): Test And Measurement Data:

Follows

Sub-part
2.1033(b):

Test And Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2 and the following individual Parts: 15.207, 15.209; Intentional Radiators

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-2003, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

A2LA

"A2LA has accredited Compliance Testing in Chandler, AZ for technical competence in the field of Electrical testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO 17025:2005 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Please refer to www.a2la.org for current scope of accreditation.

Certificate number: 2152.01



FCC OATS Reg. #933597

IC O.A.T.S. Number: 2044A-1

Test Results Summary

Specification	Test Name	Pass, Fail, N/A	Comments
15.209	Radiated Emissions	Pass	
15.207	A/C Powerline Conducted Emissions	Pass	

Name of Test: Radiated Emissions
Specification: 15.209
Test Equipment Utilized i00033, i00326

Engineer: J Erhard
Test Date: 12/05/2008

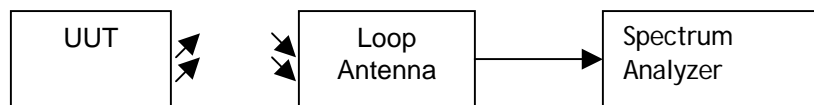
Test Procedure

The UUT was tested in a semi-anechoic chamber 1m from the receiving active loop antenna. The UUT was tested by rotating it 360° with the antennas in the X, Y, and Z-axis to ensure the TX signal levels were maximized. All emissions from the fundamental to greater than the 10th harmonic were examined.

Correction Factor = Antenna Correction Factor + Distance Correction Factor + Cable Loss

Distance Correction Factor = 40 LOG D1/D2

Test Setup



Radiated Emissions

Emission Freq (kHz)	Measured Value (dBuV/m)	Correction Factor (dB)	Corrected Value (dBuV/m)	Limit (dBuV/m)	Margin dB
125	87.56	115.48	-27.92	25.67	-53.59
249.98	45	114.98	-69.98	19.65	-89.63
374.98	54.8	114.98	-60.18	16.12	-76.3
500.082	39.27	74.98	-35.71	33.63	-69.34
624.92	45.96	74.98	-29.02	31.69	-60.71
750.06	35.25	74.98	-39.73	30.10	-69.83
874.99	40.36	75.18	-34.82	28.76	-63.58
999.92	33.49	74.78	-41.29	27.60	-68.89
1125.01	36.54	74.78	-38.24	26.58	-64.82
1249.98	30.2	74.78	-44.58	25.67	-70.25

Measurements from 110 kHz to 490 kHz are average measurements all other measurements are quasi-peak.

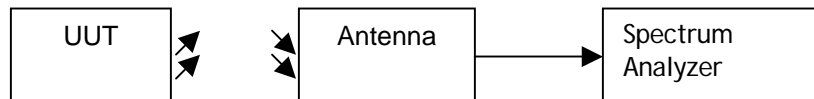
Name of Test: Radiated Emissions
Specification: 15.109
Test Equipment Utilized i00049, i00088, i00089

Engineer: J Erhard
Test Date: 12/10/2008

Test Procedure

The UUT was tested in an Open Area Test Site (OATS) set 3m from the receiving antenna. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Emissions. The UUT was tested by rotating it 360° with the antennas in both the vertical and horizontal orientation and raised from 1 to 4 meters to ensure the TX signal levels were maximized. All emissions from 30 MHz to 1 GHz were examined.

Test Setup



Settings

RBW = 100 KHz

VBW = 100KHz

Detector – Quasi Peak

Sample Calculations

Corrected Value = Measured Value + Correction factor

Correction factor = ACF + Cable loss

Radiated Emissions

Emission Freq (MHz)	Measured Value (dBuV/m)	Correction Factor (dB)	Corrected Value (dBuV/m)	Limit (dBuV/m)	Margin dB
230.202	14.4	17.1	31.5	47.0	-15.5
354.087	14.1	17.5	31.6	47.0	-15.4
469.558	14.1	20.0	34.1	47.0	-12.9
541.276	15.3	21.6	36.9	47.0	-10.1
650.310	14.1	24.1	38.2	47.0	-8.8
860.738	14.8	26.9	41.7	47.0	-5.3

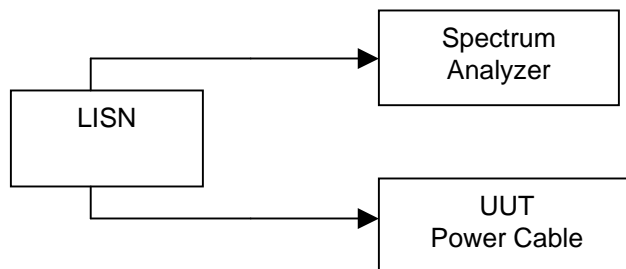
Name of Test: A/C Powerline Conducted Emissions
Specification: 15.207
Test Equipment Utilized: i00033, i00270

Engineer: J Erhard
Test Date: 12/10/2008

Test Procedure

The UUT power cable connected to a LISN and the monitored output of the LISN was connected directly to a spectrum analyzer. The conducted emissions from 150 kHz to 30 MHz were monitored and compared to the specification limits.

Test Setup



Line 1 Test Results

Emission Frequency	Monitored Level (dBuV/m)	Correction Factor (dB)	Attenuation (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
29.711 MHz	39.97	0.1	10	51.15	60	-8.85
27.545 MHz	41.08	0.2	10	52.33	60	-7.67
27.235 MHz	43.03	0.2	10	54.27	60	-5.73
26.926 MHz	43.25	0.2	10	54.49	60	-5.51
26.616 MHz	42.43	0.2	10	53.66	60	-6.34
26.307 MHz	41.06	0.2	10	52.29	60	-7.71

Line 2 Test Results

Emission Frequency	Monitored Level (dBuV/m)	Correction Factor (dB)	Attenuation (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
29.721 MHz	36.93	0.2	10	48.21	60	-11.79
29.409 MHz	37.57	0.2	10	48.84	60	-11.16
29.1 MHz	37.13	0.2	10	48.4	60	-11.6
27.242 MHz	39.31	0.2	10	50.55	60	-9.45
26.929 MHz	39.1	0.2	10	50.34	60	-9.66
26.622 MHz	38.42	0.2	10	49.65	60	-10.35

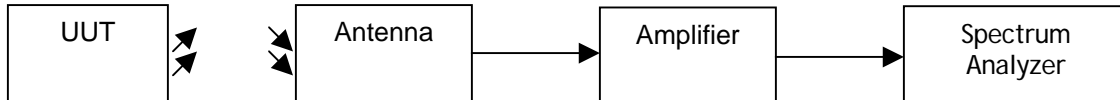
Name of Test: 99% Occupied Bandwidth
Specification: RSS 210 Industry Canada Only
Test Equipment Utilized i00033, i00089

Engineer: J Erhard
Test Date: 12/10/2008

Test Procedure

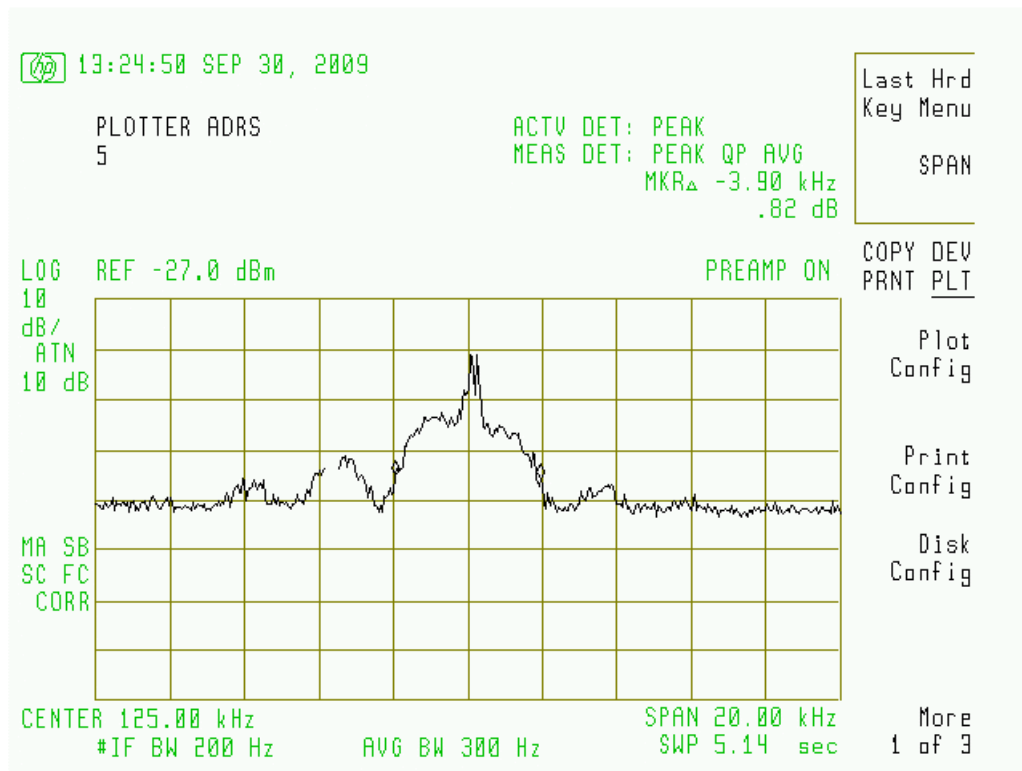
The UUT was tested on an Open Area Test Site (OATS) at a distance of 3 meter from the receiving antenna. The Span was set wide enough to capture the entire transmit spectrum and the resolution bandwidth was set to at least 1% of the span. The analyzer was set to max hold the 99% bandwidth was measured.

Test Setup



Occupied Bandwidth Summary

Frequency	Recorded Measurement	Result
125 KHz	3.90 kHz	Pass



Radiated Emissions Test Setup Photos



AC Conducted Emissions Test Setup Photos



Test Equipment Utilized

Description	MFG	Model Number	CT Asset Number	Last Cal Date	Cal Due Date
Spectrum Analyzer	HP	85462A	i00033	10/14//08	10/14//09
LISN	FCC	FCC-LISN-50-32-2-01	i00270	9/17/08	9/17/10
Loop Antenna	EMCO	6507	i00326	1/19/2008	1/19/2009

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT