EMC TEST REPORT

Report Number: 101083806BOX-001
Project Number: G101083806

Report Issue Date: March 25th, 2013

Product Designation: RLU7

Standards: CFR47 FCC Part 90:2013

Tested by:
Intertek Testing Services NA, Inc.
70 Codman Hill Road
Boxborough, MA 01719
USA

Client:
LoJack Corporation
40 Pequot Way
Canton, MA 02021
USA

Report prepared by Reviewer

Nicholas Abbondante / Transmitter Staff Engineer

Report reviewed by

Michael F. Murphy / Sr. Staff Engineer, EMC

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

2 Test Summary

Section	Test full name	Result
3	Client Information	
4	Description of Equipment Under Test	
5	System Setup and Method	
6	Occupied Bandwidth (FCC 2.1049, 90.20(e)(6), 90.209)	Pass
7	Emissions Mask (FCC 90.210(d))	Pass
8	Revision History	

Notes: This report is only a partial test to support a reduction in bandwidth Class 2 Permissive change filing and therefore only addresses those aspects of testing which would be affected by the reduction in bandwidth.

3 Client Information

This EUT was tested at the request of:

Company: LoJack Corporation
40 Pequot Way
Canton, MA 02021
USA
Contact: Mr. Vincent Ricci
Telephone: (781) 302-4332
Fax: (781) 302-2801
Email: vricci@lojack.com

4 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Vehicle Location Unit	LoJack Corporation	RLU7	0CAF013

Receive Date:	03/06/2013
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
The equipment under test is a vehicle installation test unit that gives installers more flexibility in installation locations. Changes made from the previously certified RLU7 include only a firmware update to reduce the bandwidth of the MSK carrier.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
3.6 & 7.2 VDC	Not label on the device	N/A	N/A

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	The RLU7 was powered from internal 3.6V & 7.2V Lithium battery packs and was programmed to transmit an MSK or FSK carrier repetitively during testing.
2	

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	The EUT was operating using test software with LoJack P/N 8415-0085-00, and version number 3.11.04

5 System Setup and Method

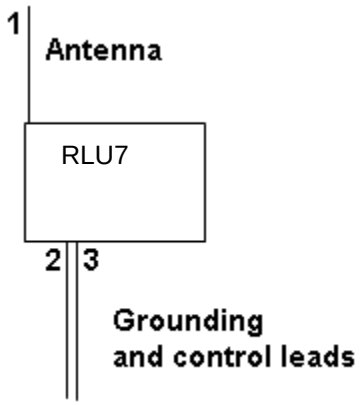
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
1	Antenna	1.067	None	None	Antenna
2	DC Ground	0.4	None	None	None
3	Control	0.4	None	None	None

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
None			

5.1 Method:

Configuration as required by ANSI/TIA-603-C:2004, FCC Parts 2 and 90:2013.

5.2 EUT Block Diagram:



6 Occupied Bandwidth

6.1 Method

Tests are performed in accordance with FCC CFR47 Part 2.1049, 90.209, and TIA-603-C.

TEST SITE: EMC Lab

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
ROS002'	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	06/13/2012	06/13/2013
CBLBNC2012-2'	50 Ohm Coaxial Cable	Pomona	RG-58 C/U	CBLBNC2012-2	09/14/2012	09/14/2013
DAV001'	Weather Station	Davis Instruments	7400	PE80519A61	08/28/2012	08/28/2014

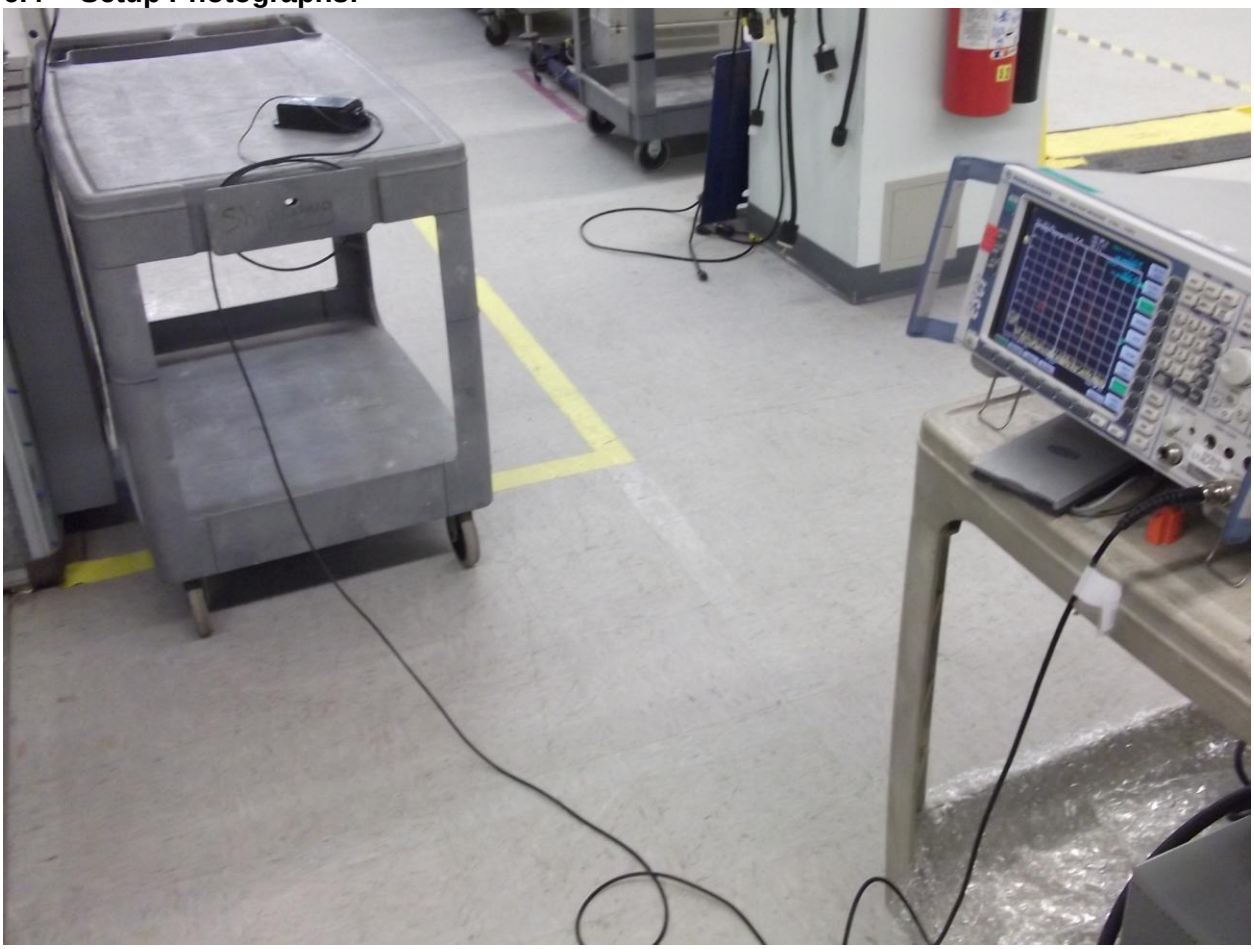
Software Utilized:

Name	Manufacturer	Version
None		

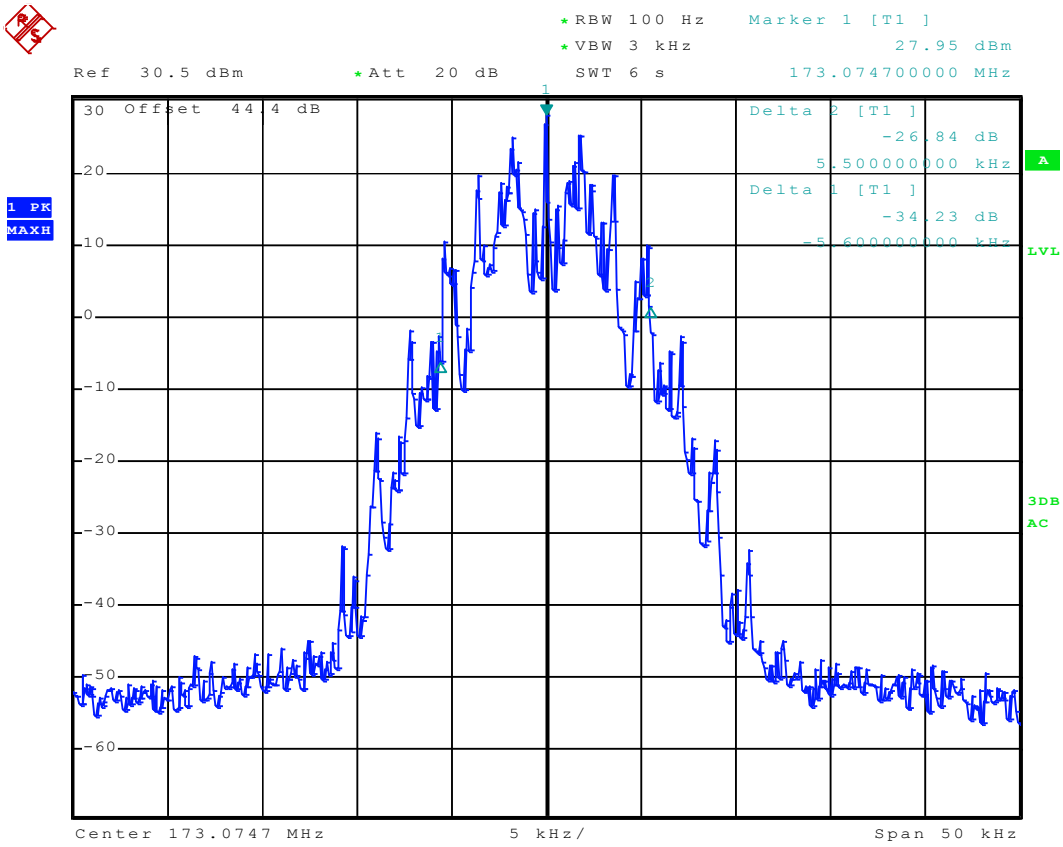
6.3 Results:

The sample tested was found to Comply. The occupied bandwidth must not exceed 11.25 kHz for a 12.5 kHz authorized bandwidth.

6.4 Setup Photographs:

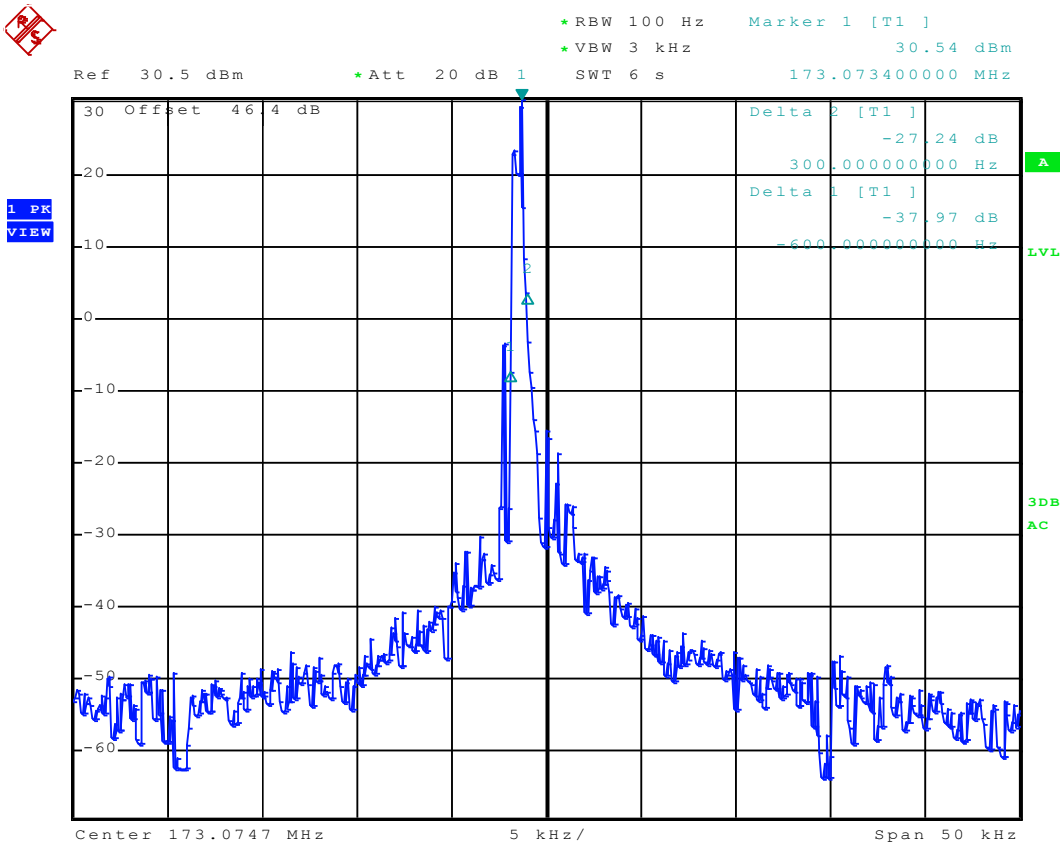


6.5 Plots/Data:



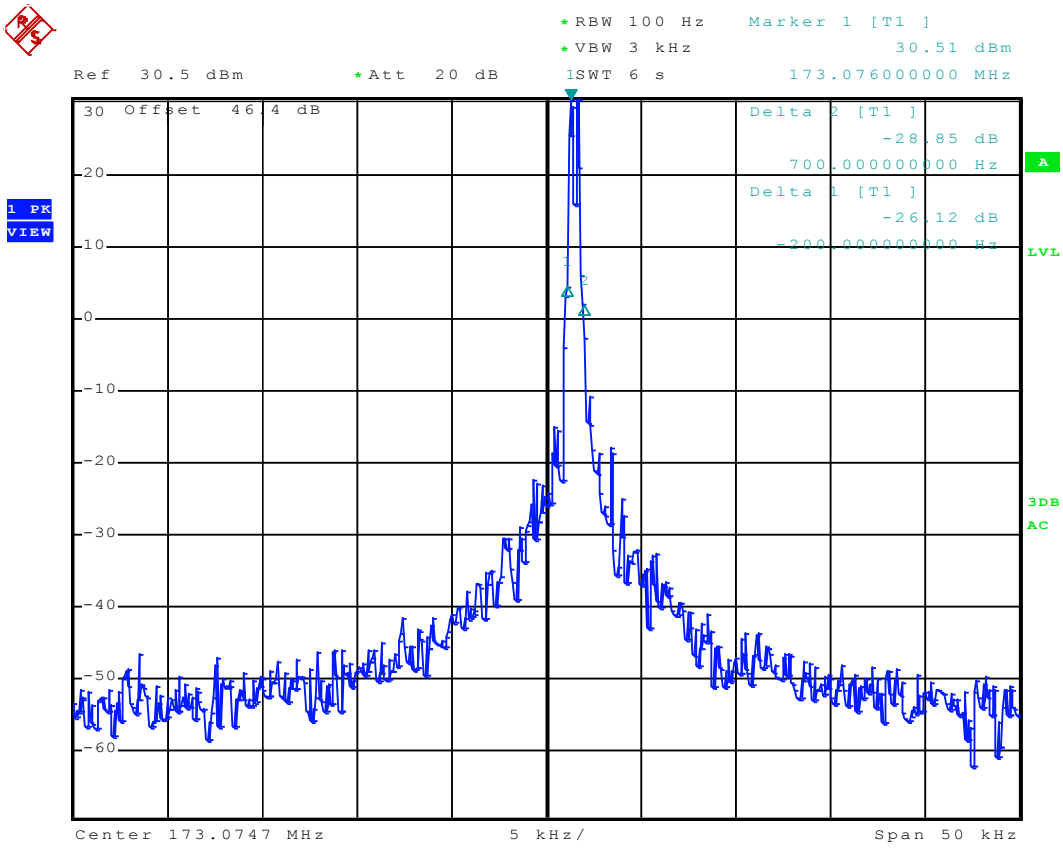
Date: 26.MAR.2013 20:19:08

MSK Occupied Bandwidth, 11.1 kHz



Date: 26.MAR.2013 20:40:50

FSK Low Carrier Occupied Bandwidth, 900 Hz



Date: 26.MAR.2013 20:29:36

FSK High Carrier Occupied Bandwidth, 900 Hz

Test Personnel:	Nicholas Abbondante	Test Date:	03/25/2013
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 90	Limit Applied:	11.25 kHz
Input Voltage:	Fresh Battery	Ambient Temperature:	21 ºC
Pretest Verification w/ Ambient Signals or BB Source:	**Ambient**	Relative Humidity:	17 %
		Atmospheric Pressure:	991 mbars

Deviations, Additions, or Exclusions: None

7 Emissions Mask

7.1 Method

Tests are performed in accordance with FCC CFR47 Part 90.210, and TIA-603-C.

TEST SITE: EMC Lab

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
ROS002'	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	06/13/2012	06/13/2013
CBLBNC2012-2'	50 Ohm Coaxial Cable	Pomona	RG-58 C/U	CBLBNC2012-2	09/14/2012	09/14/2013
DAV001'	Weather Station	Davis Instruments	7400	PE80519A61	08/28/2012	08/28/2014

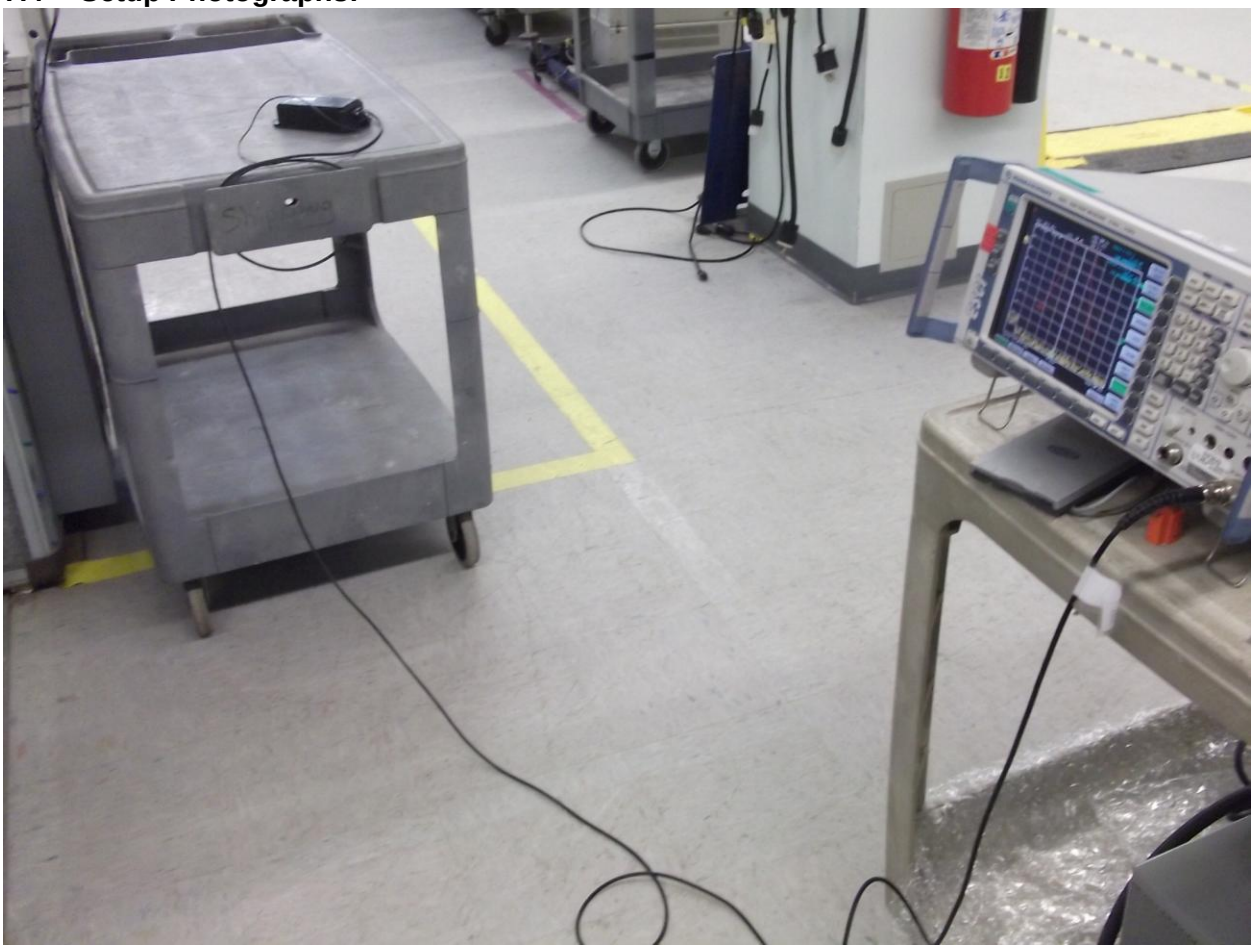
Software Utilized:

Name	Manufacturer	Version
None		

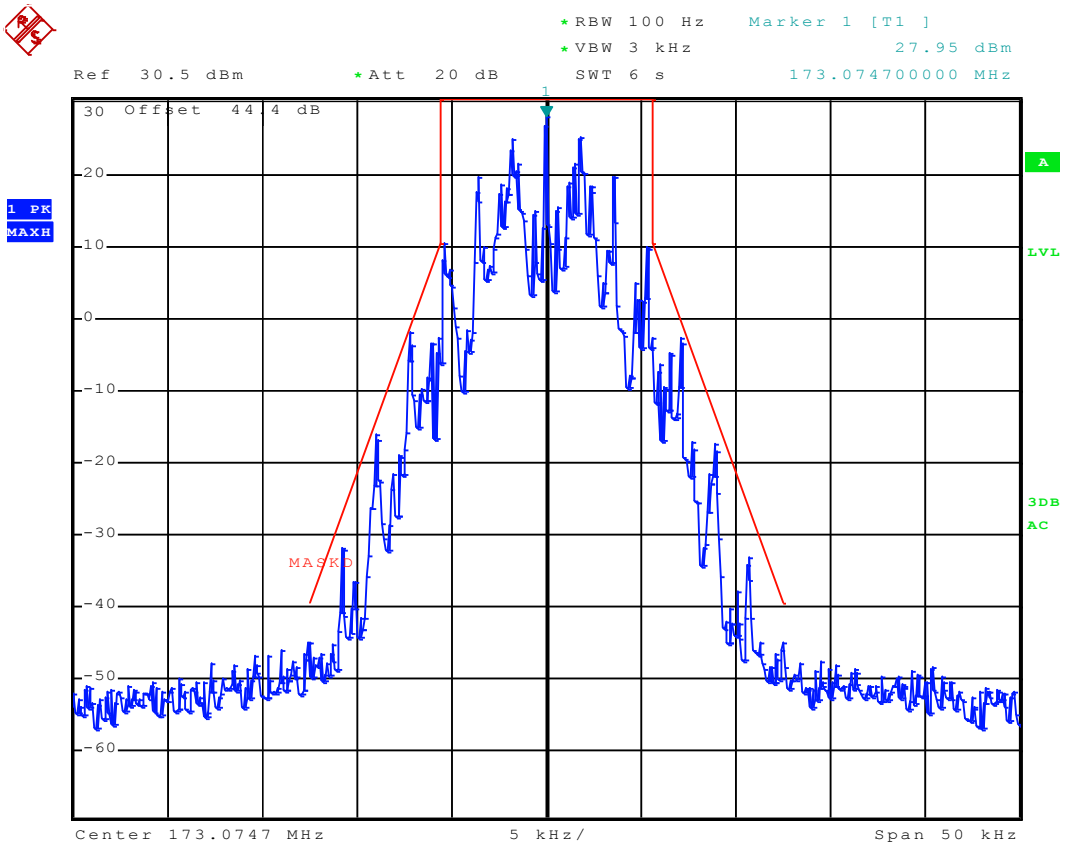
7.3 Results:

The transmitter waveform envelope must meet the requirements of emissions mask D for 12.5 kHz authorized bandwidth equipment. The sample tested was found to Comply.

7.4 Setup Photographs:

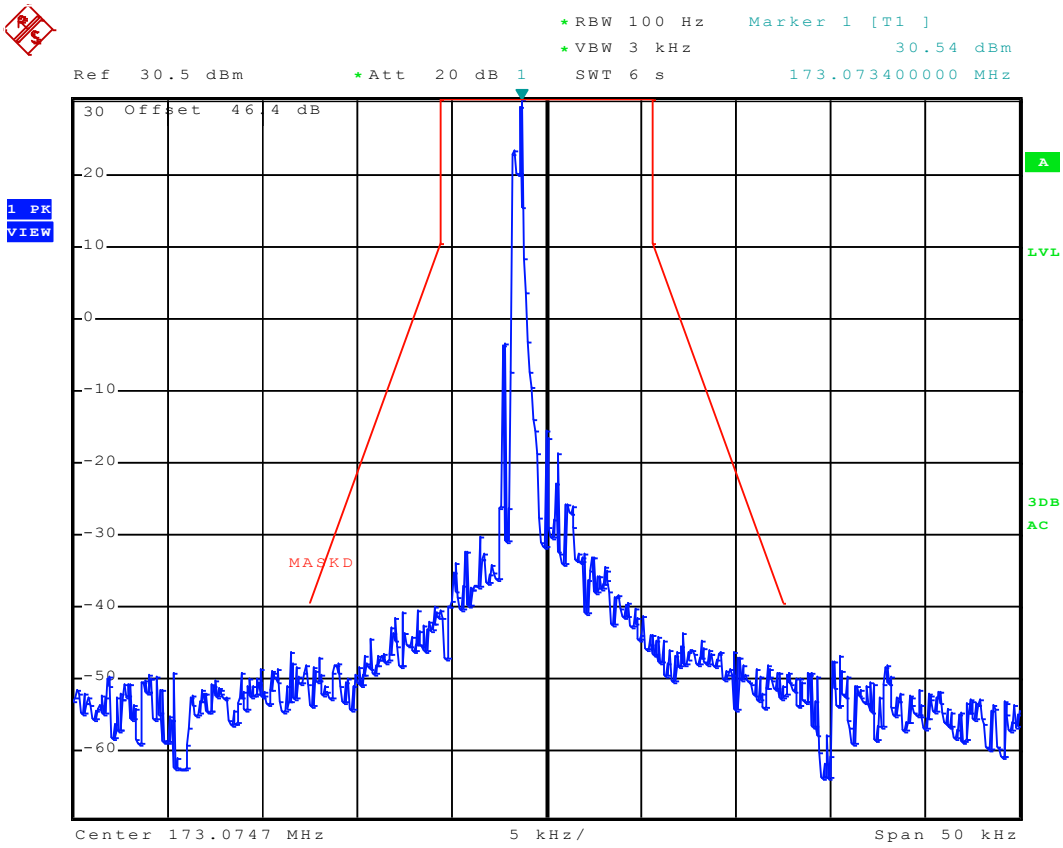


7.5 Plots/Data:



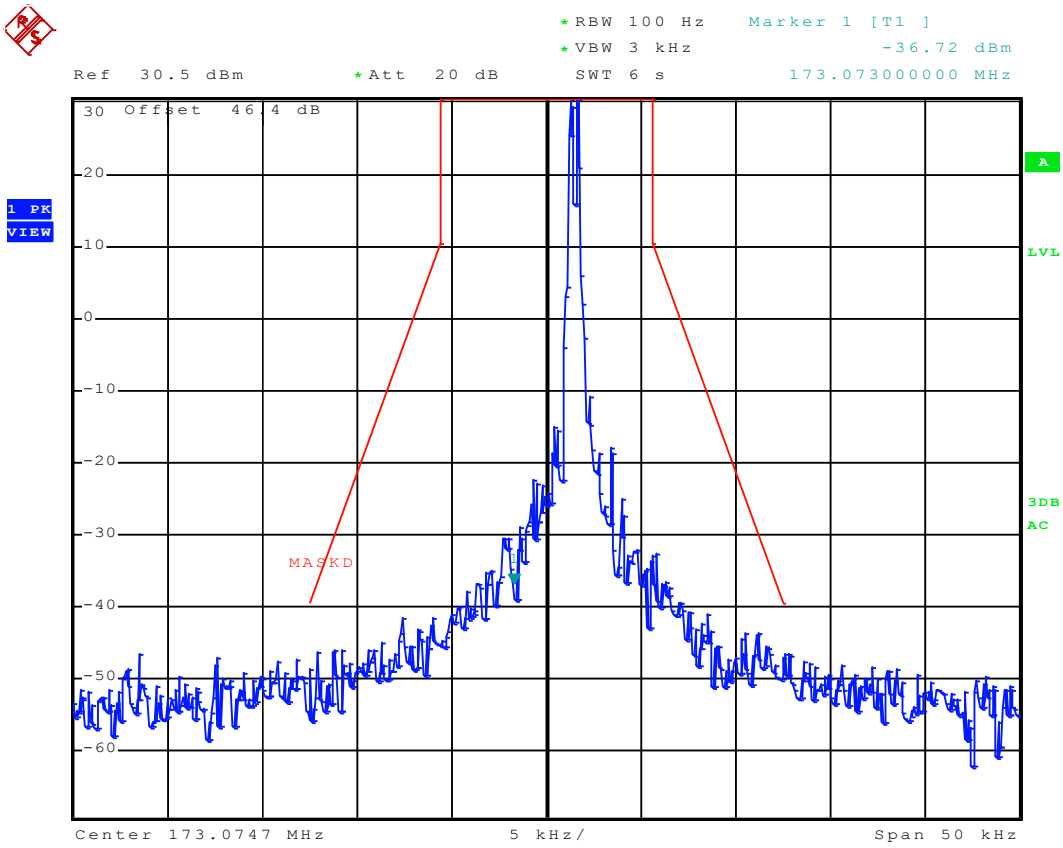
Date: 26.MAR.2013 20:17:30

MSK Mask D



Date: 26.MAR.2013 20:41:15

FSK Low Carrier Mask D



Date: 26.MAR.2013 20:27:19

FSK High Carrier Mask D

Test Personnel:	Nicholas Abbondante	Test Date:	03/25/2013
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 90	Limit Applied:	Mask D
Input Voltage:	Fresh Battery		
Pretest Verification w/ Ambient Signals or BB Source:	**Ambient**	Ambient Temperature:	21 ºC
		Relative Humidity:	17 %
		Atmospheric Pressure:	991 mbars

Deviations, Additions, or Exclusions: None

8 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	03/25/2013	101083806BOX-001		MFM	Original Issue