Compliance Testing, LLC

Previously Flom Test Lab

EMI, EMC, RF Testing Experts Since 1963

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Test Report

Prepared for: Kenwood USA Corporation

Model: NX-320-K/-K2/-K3

Description: UHF Digital Transceiver

To

FCC Part 90

Date of Issue: January 23, 2013

On the behalf of the applicant:	**Kenwood USA Corporation** **Communications Division** **3970 Johns Creek Court** **Suwanee, GA 30024**
Attention of:	**Joel Berger, Research & Development** **Ph: (678) 474-4722** **E-Mail: jberger@kenwoodusa.com**

Prepared By
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Project No: p1310012

John Erhard
Project Test Engineer

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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	January 23, 2013	John Erhard	Original Document

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ILAC / A2LA

Compliance Testing, LLC, has been 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 joint ISO-ILAC-IAF Communiqué dated January 2009)

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to http://www.compliancetesting.com/labscope.html for current scope of accreditation.

Testing Certificate Number: **2152.01**

ilac-MRA

A2LA ACCREDITED TESTING CERT #2152.01

FCC OATS Reg, #933597

IC Reg. #2044A-1

> **Non-accredited tests contained in this report:**
>
> **N/A**

The Applicant has been cautioned as to the following:

15.21: **Information to the User**

The user's 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 an 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.

Test and Measurement Data
Sub-part
2.1033(c)(14):

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II, Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057, and the following individual Parts: 90.

Standard Test Conditions and Engineering Practices

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

In accordance with ANSI/C63.4-2009, 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.

Environmental Conditions		
Temp (ºC)	Humidity (%)	Pressure (mbar)
19.9	24.1	976.6

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

EUT Description

Model: NX-320-K/-K2/-K3
Description: UHF Digital Transceiver
Firmware: N/A
Software: N/A

Additional Information: None

EUT Operation during Tests:

The EUT was in a normal operating condition during testing.

Accessories: None

Cables: None

Modifications: None

Test Result Summary

| Specification	Test Name	Pass, Fail, N/A	Comments
2.1046	Carrier Output Power (Conducted)	Pass	
2.1051	Unwanted Emissions (Transmitter Conducted)	N/A	Not required for this C2PC
2.1053	Field Strength of Spurious Radiation	N/A	Not required for this C2PC
90.210	Emission Masks (Occupied Bandwidth)	Pass	
2.1047	Audio Low Pass Filter (Voice Input)	N/A	Not required for this C2PC
2.1047	Audio Frequency Response	N/A	Not required for this C2PC
2.1047(a)	Modulation Limiting	N/A	Not required for this C2PC
90.213	Frequency Stability (Temperature Variation)	N/A	Not required for this C2PC
90.213	Frequency Stability (Voltage Variation)	N/A	Not required for this C2PC
90.214	Transient Frequency Behavior	N/A	Not required for this C2PC
RSS-Gen	Receiver Spurious Emissions	N/A	Not required for this C2PC
2.202	Necessary Bandwidth Calculation	Pass	

Carrier Output Power (Conducted)

Name of Test:	Carrier Output Power (Conducted)	**Engineer:** John Erhard
Test Equipment Utilized:	i00118, i00331	**Test Date:** 1/23/2013

Test Procedure

The Equipment Under Test (EUT) was connected to a spectrum analyzer through a power attenuator. The RBW was set greater than 3X the occupied bandwidth and the VBW was 3X the RBW. The peak readings were taken and the result was then compared to the limit. An audio generator was connected to the EUT to ensure that a modulated signal was generated.

Test Setup

Audio Generator → EUT → 30 dB Power Attenuator → Spectrum Analyzer
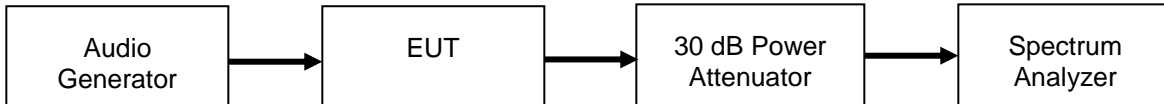
Peak Output Power

Tuned Frequency (MHz)	Recorded Measurement (dBm)	Recorded Measurement (Watts)	Result
470.05	36.97	4.98	Pass
491.05	36.98	4.99	Pass
511.95	36.99	5.00	Pass

Emission Masks (Occupied Bandwidth)

Name of Test:	Emission Masks (Occupied Bandwidth)	**Engineer:** John Erhard
Test Equipment Utilized:	i00118, i00331	**Test Date:** 1/23/2013

Test Procedure

The EUT was connected to a spectrum analyzer through a power attenuator. A reference level plot is provided to verify that the peak power was established prior to testing the mask. A modulation frequency of 2.5 kHz at a level of 500 mVPP was input into the EUT.
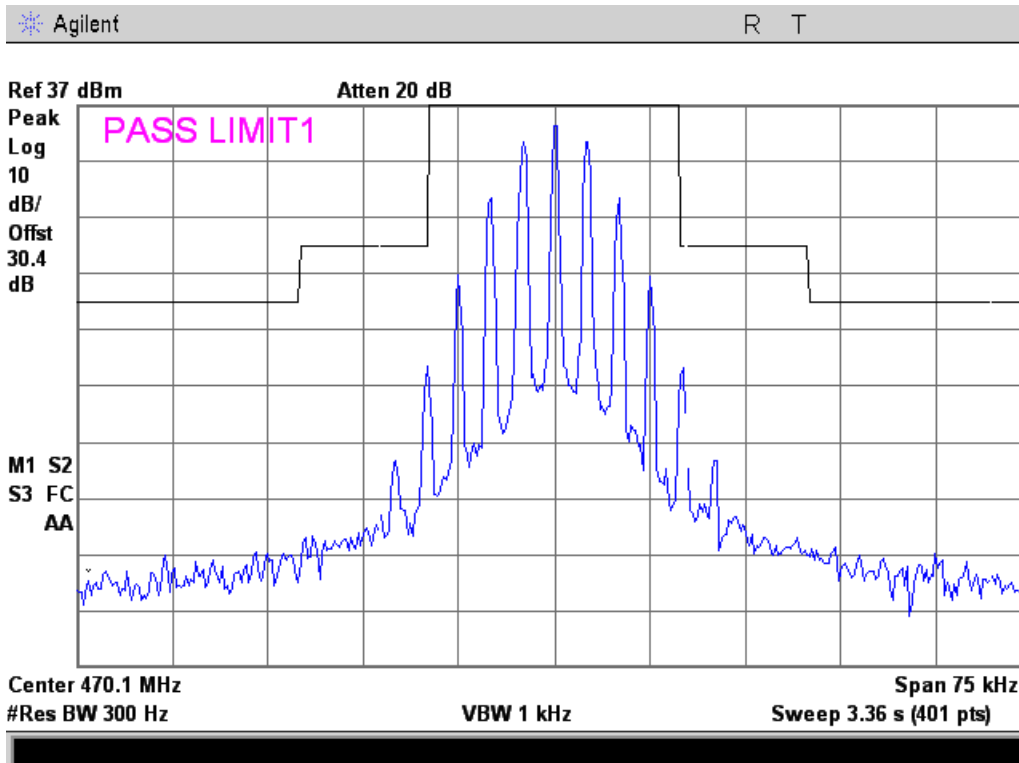
Test Setup

Audio Generator → EUT → 30 dB Power Attenuator → Spectrum Analyzer
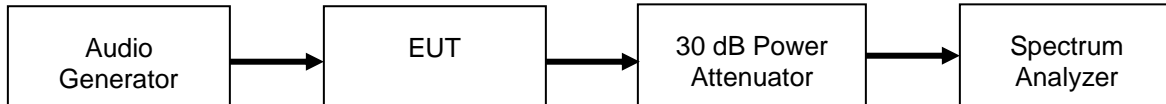
470.05 MHz Bandwidth Plots
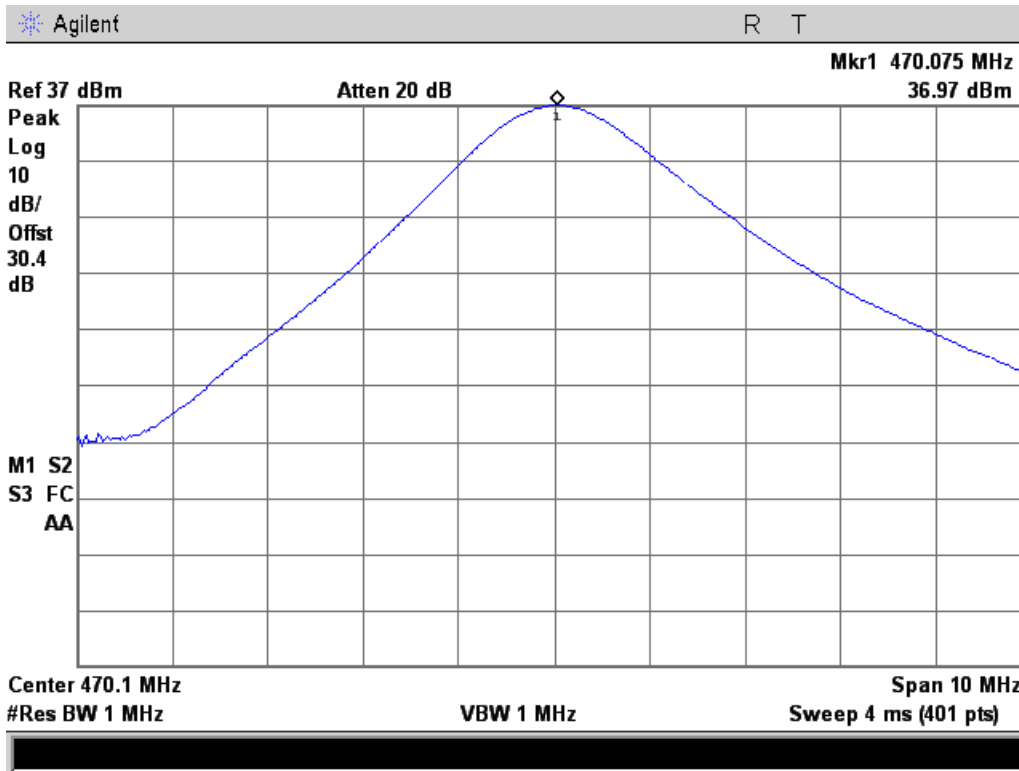
Reference

16K0F3E Mask

491.05 MHz Bandwidth Plots

Reference
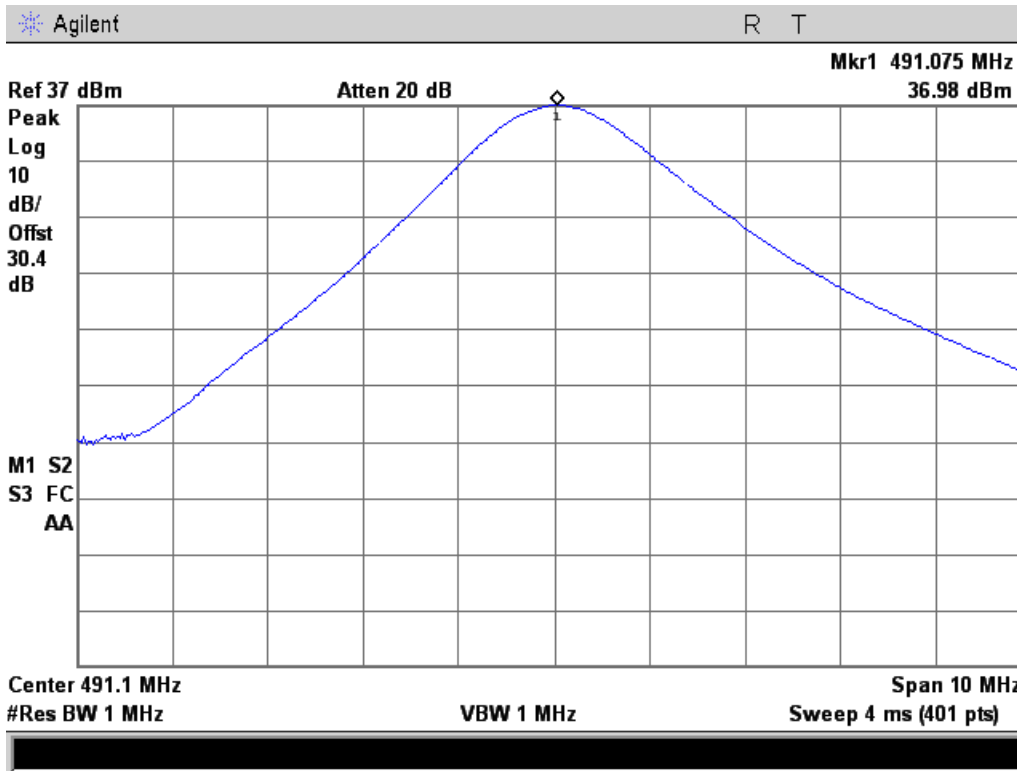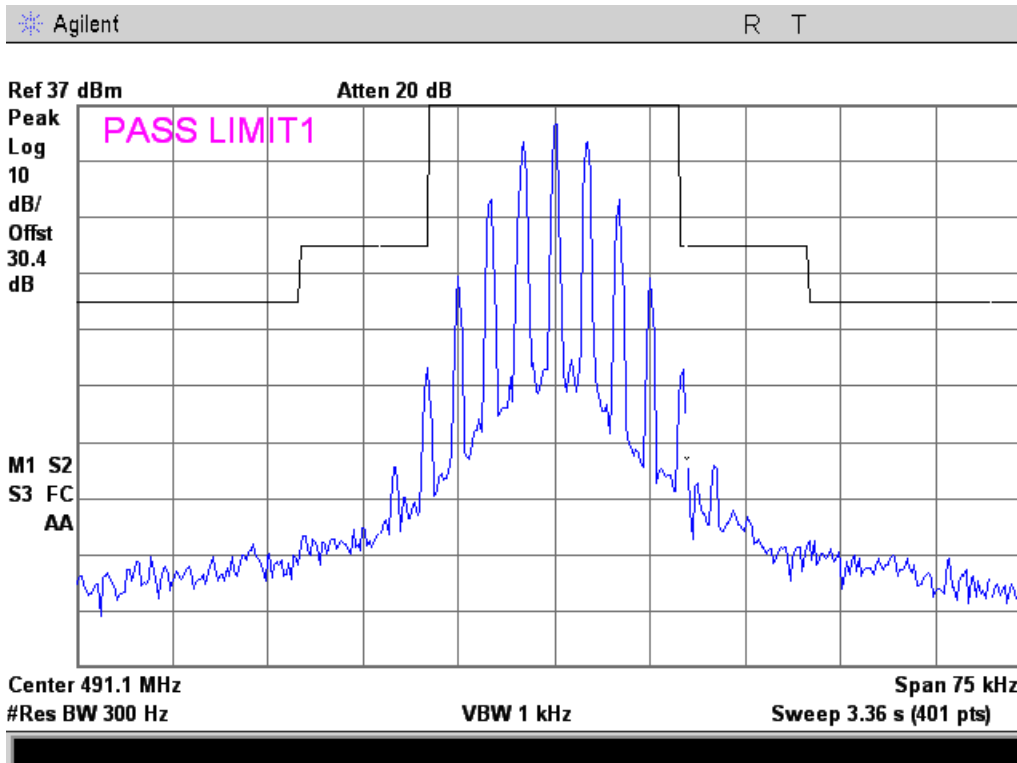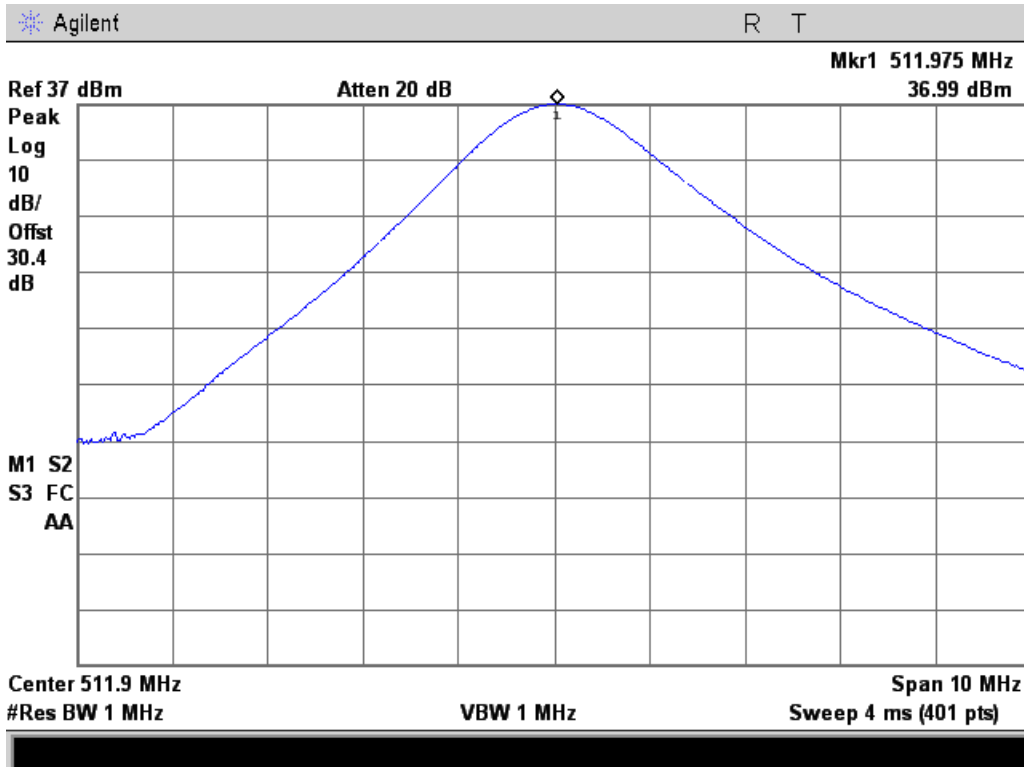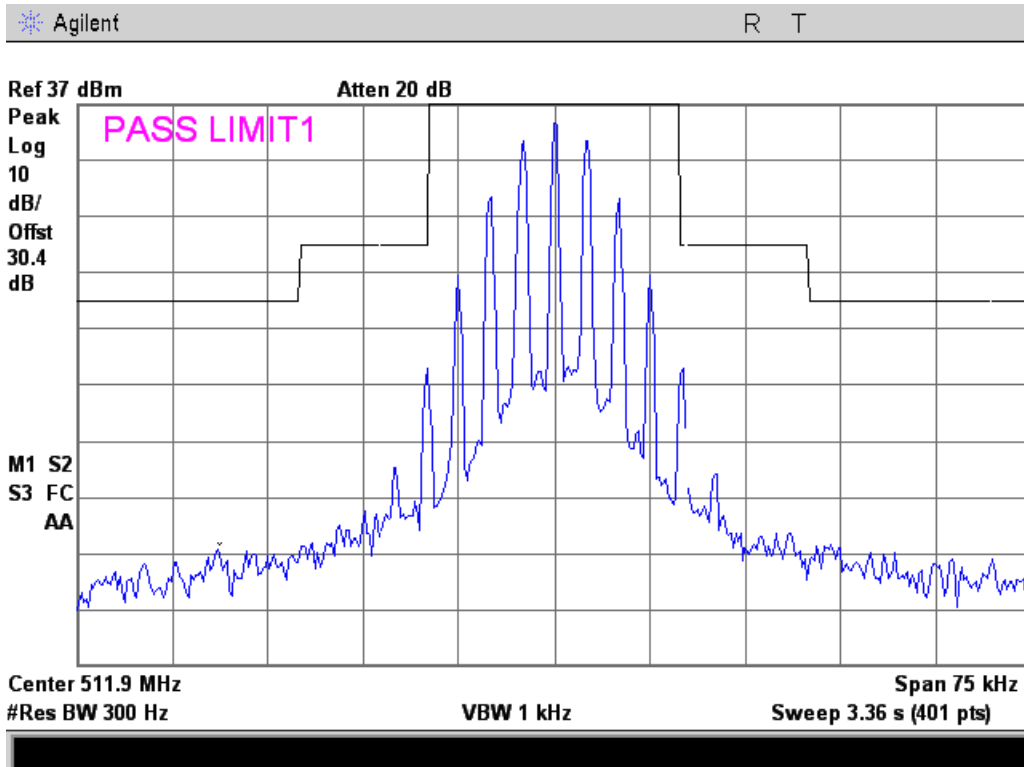

16K0F3E Mask

511.95 MHz Bandwidth Plots

Reference

16K0F3E Mask

Necessary Bandwidth Calculations

Name of Test:	Necessary Bandwidth Calculations	**Engineer:** John Erhard
Test Specification:	2.202	**Test Date:** 1/23/2013

Modulation = 16K0F3E		
Necessary Bandwidth Calculation:		
Maximum Modulation (M) kHz	=	3
Maximum Deviation (D), kHz	=	5
Constant Factor (K)	=	1
Necessary Bandwidth (B_N), kHz	=	(2xM)+(2xDxK)
		16.0

Test Equipment Utilized

Description	Manufacturer	Model Number	CT Asset #	Last Cal Date	Cal Due Date
Function Generator	HP	33120A	i00118	Verified on:1/23/13	
Spectrum Analyzer	Agilent	E4407B	i00331	4/20/12	4/20/13

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