

COMPLIANCE WORLDWIDE INC. TEST REPORT 109-08R1

In Accordance with the Requirements of

Industry Canada RSS 210, Issue 7, Annex II
Federal Communications Commission CFR Title 47 Part 15.231, Subpart C
Low Power License-Exempt Radio Communication Devices
Intentional Radiators
Issued to

Nel-Tech Labs
4 Ash Street Extension
Derry, NH 03038

for

Easy Touch Transmitter

FCC ID: UOXALLIANCE38591
IC: 3358A-TXTYPE2

Report Issued on February 8, 2008

Prepared by


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1. Scope

This test report certifies that the Nel Tech Labs, Inc. CVS Easy Touch 433MHz transmitter, as tested, meets the RSS 210 Annex II Rules and FCC Part 15.231, Subpart C requirements. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required

2. Product Details

- 2.1. Manufacturer:** Nel Tech Labs, Inc.
2.2. Model Number: Alliance 38591
2.3. Serial Number: TX0208000001
2.4. Description: Easy Touch Transmitter - 433 MHz
2.5. Power Source: 4.5 Volts (3 AAA Batteries)
2.6. EMC Modifications: None

3. Product Configuration

3.1. Cables

Cable Type	Length	Shield	From	To
N/A				

3.2. Support Equipment

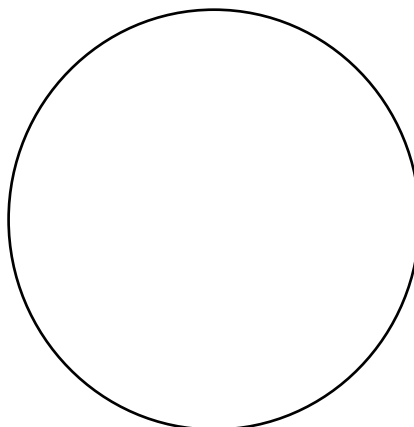
Device	Manufacturer	Model	Serial No.
None			

3.3. Operational Characteristics

Button was depressed and held in position.

3. Product Configuration (continued)

3.4. Block Diagram



4. Measurements Parameters

4.1 Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	3/13/2008
Biconilog Antenna	Com-Power	AC220	25509	8/21/2008
Horn Antenna	Electro-Metrics	EM-6961	6337	8/23/2008

4.2 Measurement & Equipment Setup

Test Date:	2/4/2008
Test Engineer:	Brian F Breault
Site Temperature (°C):	20.6
Relative Humidity (%RH):	30
Frequency Range:	30 MHz to 4.4 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	120 kHz (30 MHz – 1 GHz) 1 MHz (>1 GHz)
EMI Receiver Avg Bandwidth:	300 kHz (30 MHz – 1 GHz) 3 MHz (>1 GHz)
Detector Functions:	Peak, Quasi-Peak and Average
Antenna Height:	1 to 4 meters

4. Measurements Parameters (continued)

4.3 Test Procedure

Test measurements were made in accordance FCC Part 15.231: Operation within the bands 40.66 – 40.70 MHz and above 70 MHz.

The test methods used to generate the data in this test report are in accordance with ANSI C63.4: 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

Prior to testing, exploratory radiated emission measurements were made by rotating the device through its three orthogonal axes to determine the worst case orientation of the device under test. All measurements in this report were made with the device under test in the worst case orientation.

5. Measurement Summary

Test Requirement	FCC Requirement	Test Report Section	Result	Comment
Antenna Requirement	15.203	N.A	Compliant	Unit has a permanently mounted internal antenna.
Operational Requirement	15.231 (a)(1)	6.1	Compliant	
Radiated Field Strength of Fundamental	15.231 (b)	6.2	Compliant	
Radiated Field Strength of Harmonics	15.231 (b)(3)	6.3	Compliant	
Occupied Bandwidth	15.231 (c)	6.4	Compliant	
Spurious Radiated Emissions	15.231 (b)(3), 15.209	6.5	Compliant	
Conducted Emissions	15.207	N.A	N/A	Unit is battery operated
Determination of Average Factor (Duty Cycle)	15.35 (c)	6.6	Compliant	47.3% or -6.5 dB

6. Measurement Data

6.1. Operational Requirement

Requirement: A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released (section 15.231(a)(1).

This device under test has been verified to meet this requirement.

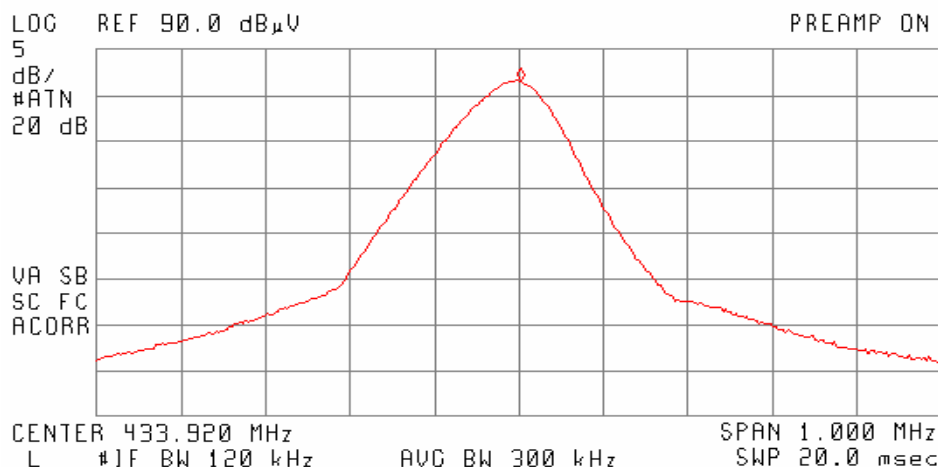
6.2. Radiated Field Strength of Fundamental (15.231, Section (b))

Requirement: The 3 meter field strength of the fundamental emissions from intentional radiators operated within the 260-470 MHz frequency bands shall comply with the limits specified in FCC Part 15.231, Section (b).

Frequency (MHz)	Amplitude (dBμV/m)		Average Limit (dBμV/m)	Margin (dB)	Ant Pol	Ant Ht	TT Pos	Result
	Peak	Average						
433.94	86.9	80.4	80.82	-0.42	H	100	310	Passed

14:06:00 FEB 06, 2008
109-08 Radiated Field Strength of Fundamental

FREQ 433.9 MHz
PEAK 86.9 dBμV
QP NOT SELECTED
AVG 79.2 dBμV



6. Measurement Data (continued)

6.3. Radiated Field Strength of Harmonics (15.231, Section (a))

Requirement: The 3 meter field strength of the harmonic emissions from intentional radiators operated within the 260-470 MHz frequency band shall comply with the limits specified in FCC Part 15.231, Section (b). Peak field strength may not be greater than 20 dB above the average limit.

6.3.1. Harmonics < 1 GHz

Frequency (MHz)	Amplitude (dBμV/m)		Q-P Limit	Margin (dB)	Ant Pol	Ant Ht	TT Pos	Result
	Peak	QP			H/V	cm	Deg	
867.843	56.1	55.7	60.82	-5.12	H	100	334	Passed

6.3.2. Harmonics > 1 GHz

Frequency (MHz)	Amplitude (dBμV/m)		Average Limit	Margin (dB)	Ant Pol	Ant Ht	TT Pos	Result
	Peak	Avg			H/V	cm	Deg	
1301.75 ¹	59.3	52.8	60.82	-8.02	H	100	0	Passed
1735.65	63.3	56.8	60.82	-4.02	V	123	194	Passed
2169.55	64.3	57.8	60.82	-3.02	V	123	10	Passed
2603.64	64.0	57.5	60.82	-3.32	H	170	30	Passed
3037.43	61.5	55.0	60.82	-5.82	H	165	150	Passed
3471.25	63.0	56.5	60.82	-4.32	H	209	28	Passed
3905.46 ¹	64.4	57.9	60.82	-2.92	H	182	34	Passed
4339.40 ¹	63.1	56.6	60.82	-4.22	H	188	64	Passed

¹ Frequency falls within the Restricted Bands of Operation. See FCC Part 15, Section 15.205 for additional information.

6. Measurement Data (continued)

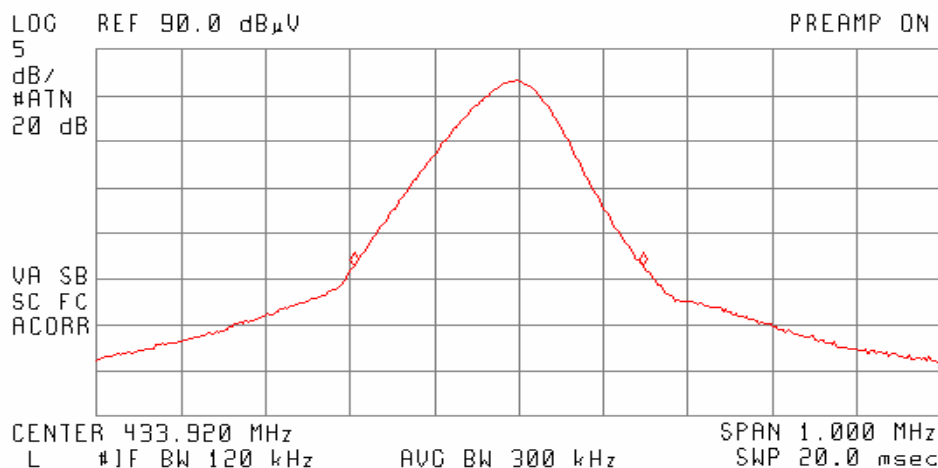
6.4. Occupied Bandwidth

Requirement: The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Fundamental Frequency	-20 dB Bandwidth	Limit	Result
(MHz)	(kHz)	(MHz)	P/F
433.9	343	1.08	Passed

14:04:51 FEB 06, 2008
109-08 Occupied Bandwidth

ACTV DET: PEAK
MEAS DET: PEAK AVG
MKRΔ 343 kHz
- .05 dB



6.5. Spurious Radiated Emissions, 30 MHz to 4.4 GHz (15.231, Section (b))

Requirement: Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

6. Measurement Data (continued)

6.5. Spurious Radiated Emissions, 30 MHz to 4.4 GHz (15.231, Section (b)) (continued)

6.5.1. Spurious Radiated Emissions Test Setup

6.5.1.1. Regulatory Limit: FCC Part 209, Quasi-Peak

Frequency Range (MHz)	Distance (Meters)	Limit (dB μ V/m)
30 to 88	3	40.0
88 to 216	3	43.5
216 to 960	3	46.0
Above 960	3	54.0

6.5.1.2. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	3/13/2008
Biconilog Antenna	Com-Power	AC220	25509	8/21/2008
Horn Antenna	Electro-Metrics	EM-6961	6337	8/23/2008

6.5.1.3. Measurement & Equipment Setup

Test Date: 2/4/2008
 Test Engineer: Brian F Breault
 Site Temperature (°C): 20.6
 Relative Humidity (%RH): 30
 Frequency Range: 30 MHz to 4.4 GHz
 Measurement Distance: 3 Meters
 EMI Receiver IF Bandwidth: 120 kHz (30 MHz – 1 GHz)
 1 MHz (>1 GHz)
 EMI Receiver Avg Bandwidth: 300 kHz (30 MHz – 1 GHz)
 3 MHz (>1 GHz)
 Detector Functions: Peak, Quasi-Peak and Average
 Antenna Height: 1 to 4 meters

6.5.1.4. Test Procedure

Test measurements were made in accordance with ANSI C63.4-2003, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

6.5.2. Spurious Radiated Emissions, 30 MHz to 1 GHz Test Results

There were no measurable spurious emissions other than the harmonic emission detailed in section 6.3.1.

6.5.3. Spurious Radiated Emissions, >1 GHz Test Results

There were no measurable spurious emissions other than the harmonic emissions detailed in section 6.3.2.

6. Measurement Data (continued)

6.6. Determination of Average Factor

Total Duration of 1 cycle: (46.5 ms Pulse Train + 13.125 ms Between Pulse Trains) = 59.625 ms

Total On-Time in 1 cycle: (15 x 450 μ s) + (26 x 825 μ s) = 28.2 ms

On-Time divided by cycle: 28.2 ms/59.625 ms = 0.473

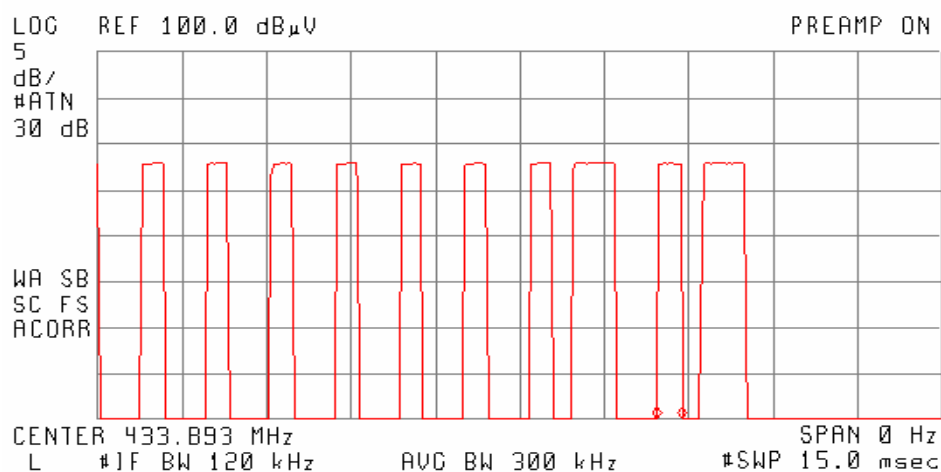
Average Factor: 20 log(0.473) = -6.5 dB

Note: The FCC and IC maximum allowed average factor is -20dB.

6.6.1. Short Pulse Width

15:04:55 FEB 25, 2008
Single Pulse Measurement - Short

ACTV DET: PEAK
MEAS DET: PEAK DP
MKRA 450.00 μ sec
2.21 dB



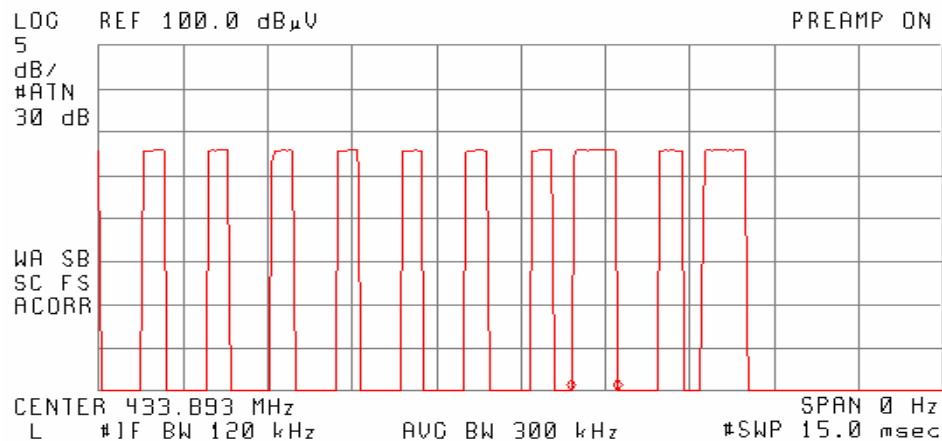
6. Measurement Data (continued)

6.6. Determination of Average Factor (continued)

6.6.2. Long Pulse Width

15:03:31 FEB 25, 2008
Single Pulse Measurement - Long

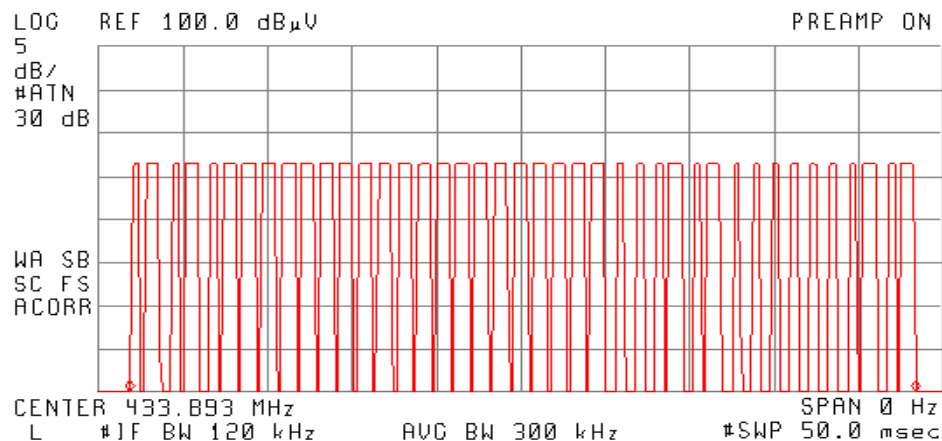
ACTV DET: PEAK
MEAS DET: PEAK QP
MKR Δ 825.00 μ sec
7.31 dB



6.6.3. Pulse Train

15:08:47 FEB 25, 2008
Single Pulse Train

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR Δ 46.500 msec
1.76 dB



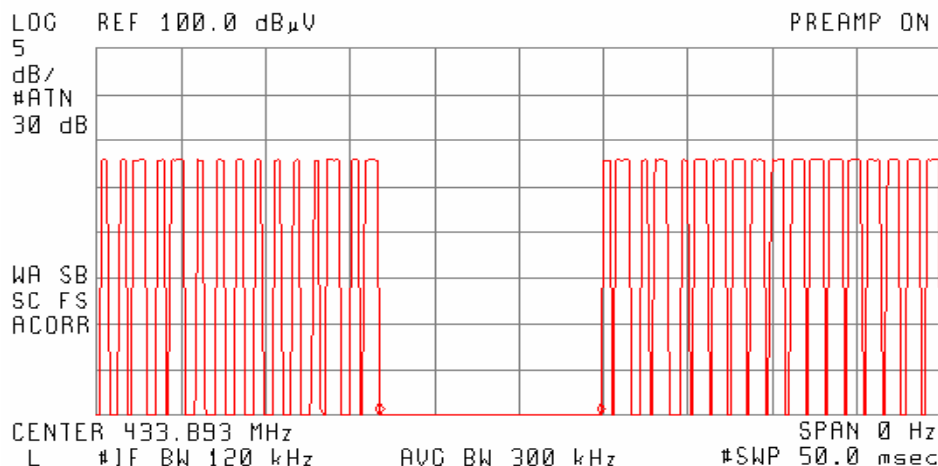
6. Measurement Data (continued)

6.6. Determination of Average Factor (continued)

6.6.3. Time Between Pulses

15:12:59 FEB 25, 2008
Time Off

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR_A -13.125 msec
.56 dB



7. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with Federal Communications Commission (FCC) and Industry Canada standards. A description of the test sites is on file with the FCC (registration number **96392**) and Industry Canada (file number **IC 3023**).

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022.

Both sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or table top.