

Nemko Test Report: 134808-1TRFWL

Applicant: HeathCo LLC
2445 Nashville Road
Bowling Green, KY
42102 USA

Apparatus: Wireless Button

FCC ID: BJ4-64WDB45TX

In Accordance With: FCC Part 15 Subpart C, 15.231
Periodic operation in the band 40.66–40.70 MHz
and above 70 MHz.

Authorized By: 
Kevin Ma, Wireless/EMC Specialist

Date:

Total Number of Pages: 15

TABLE OF CONTENTS

Section 1 : Report Summary	3
Section 2 : Equipment Under Test.....	4
2.1 Identification of Equipment Under Test (EUT).....	4
2.2 Accessories	4
2.3 EUT Description.....	4
2.4 Technical Specifications of the EUT	5
2.5 EUT Setup diagram	5
2.6 Operation of the EUT during testing	5
2.7 Modifications incorporated in the EUT	5
Section 3 : Test Conditions.....	6
3.1 Specifications	6
3.2 Deviations From Laboratory Test Procedures	6
3.3 Test Environment	6
3.4 Measurement Uncertainty.....	6
3.5 Test Equipment.....	6
Section 4 : Results Summary	7
4.1 FCC Part 15 Subpart C : Test Results	7
Appendix A : Test Results.....	8
Clause 15.209(a) Radiated Emissions within Restricted Bands	8
Clause 15.231(a) Conditions for intentional radiators to comply with periodic operation	11
Clause 15.231(b) Radiated Emissions	12
Clause 15.231(c) 20 dB Bandwidth.....	13
Appendix B : Setup Photographs	14
Appendix C : Block Diagram of Test Setups	15

Section 1 : Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003.

The assessment summary is as follows:

Apparatus Assessed:	Wireless Button
Specification:	FCC Part 15 Subpart C, 15.231
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release
Test Location:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
Registration Number:	176392 (3 m Semi-Anechoic Chamber)
Tests Performed By:	Andrey Adelberg, Senior Wireless/EMC Specialist
Test Dates:	August 20 and September 9, 2009

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Nemko Canada Inc. authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko Canada Inc. accepts no responsibility for damages, if any suffered by any third party as a result of decisions made or actions based on this report.



Section 2 : Equipment Under Test

2.1 Identification of Equipment Under Test (EUT)

The following information identifies the EUT under test:

Type of Equipment:	Wireless Button
Model Name or Number:	WB-6445-TX
Serial Number:	None
Nemko Sample Number:	1
FCC ID:	BJ4-64WDB45TX
Date of Receipt:	August 14, 2009

2.2 Accessories

No additional accessories were used to exercise the EUT during testing.

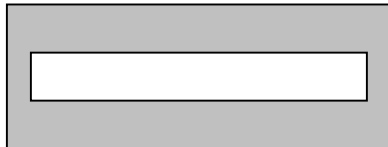
2.3 EUT Description

EUT is a wireless button that transmits at 315 MHz.

2.4 Technical Specifications of the EUT

Operating Frequency:	315 MHz
Modulation:	On/Off Keying
Occupied Bandwidth:	55.3 kHz
Emission Designator:	55K3L1D
Antenna Data:	Internal
Power Supply Requirements:	3 V battery type: CR 2032

2.5 EUT Setup diagram



2.6 Operation of the EUT during testing

The EUT was forced to transmit constantly by applying pressure on the button.

2.7 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

Section 3 : Test Conditions

3.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.231

Periodic operation in the band 40.66–40.70 MHz and above 70 MHz.

3.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range : 15–30 °C
 Humidity range : 20–75 %
 Pressure range : 86–106 kPa
 Power supply range : ±5 % of rated voltages

3.4 Measurement Uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95 % and can be found in Nemko Canada document MU-003.

3.5 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Cal. Date	Next Cal.
3 m EMI Test Chamber	TDK	SAC-3	FA002047	May 06/09	May 06/10
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 26	FA002043	Dec. 16/08	Dec. 16/09
Horn Antenna #2	EMCO	3115	FA000825	Jan. 21/09	Jan. 21/10
Bilog	Sunol	JB3	FA002108	Jan. 27/09	Jan. 27/10
1 – 18 GHz Amplifier	JCA	JCA118-503	FA002091	Oct 2/08	Oct 2/09

COU – Calibrate on Use

NCR – No Calibration Required

Section 4 : Results Summary

This section contains the following:

FCC Part 15 Subpart C : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No : not applicable / not relevant.

Y Yes : Mandatory i.e. the apparatus shall conform to these tests.

N/T Not Tested, mandatory but not assessed. (See Report Summary)

4.1 FCC Part 15 Subpart C : Test Results

Part 15	Test Description	Required	Result
15.31(e)	Variation of Power source	N	
15.207(a)	Powerline Conducted Emissions	N	
15.209(a)	Radiated Emissions within Restricted Bands	Y	PASS
15.231(a)(1)	Manually operated transmitter	Y	PASS
15.231(a)(2)	Automatically activated transmitter	N	
15.231(a)(3)	Periodic transmissions at regular predetermined intervals	N	
15.231(a)(4)	Radiators used in cases of emergency	N	
15.231(a)(5)	Set-up information for security systems	N	
15.231(b)	Radiated Emissions	Y	PASS
15.231(c)	20 dB Bandwidth	Y	PASS
15.231(d)	Devices operating within the frequency band 40.66-40.70 MHz	N	
15.231(e)	Radiated emissions for Periodic radiators	N	

Appendix A : Test Results

Clause 15.209(a) Radiated Emissions within Restricted Bands

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength		Measurement Distance (meters)
	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	
0.009–0.490	2400/F	67.6–20log(F)	300
0.490–1.705	24000/F	87.6–20log(F)	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
Above 960	500	54.0	3

Note: F = fundamental frequency in kHz

Test Results: Pass

Additional Observations:

The Spectrum was searched from 30 MHz to the 10th Harmonic.

These results apply to emissions found in the Restricted bands defined in FCC Part 15 Subpart C, 15.205.

New batteries were used throughout the test.

All measurements were performed using a Peak Detector with 100 kHz RBW/VBW below 1 GHz and a 1 MHz RBW/VBW above 1 GHz at a distance of 3 meters.

No emissions, within 20 dB below the limit, were found.

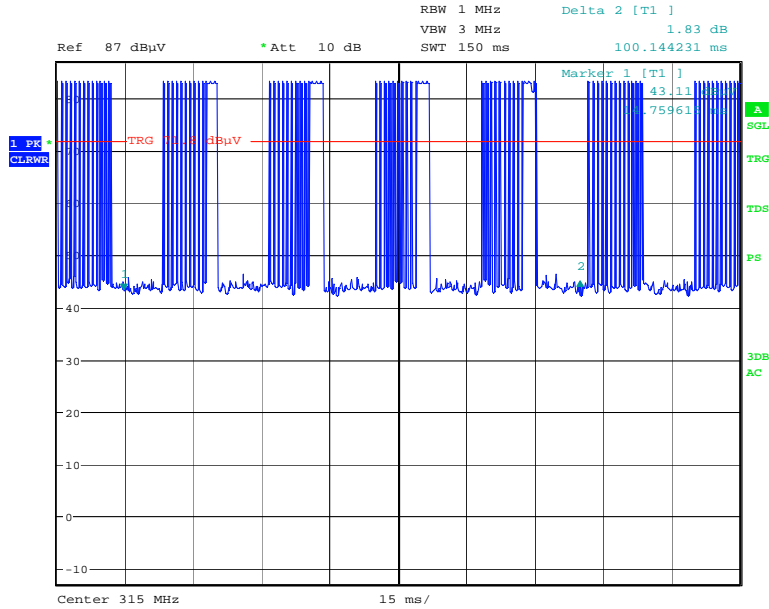
Duty Cycle:

Time:	No of short	Number of long	Short length, μs	Long length, μs	Number of bursts	Total Tx duration, ms
100 ms	10	3	320.5	649	4	20.608

Duty cycle (average factor) calculation:

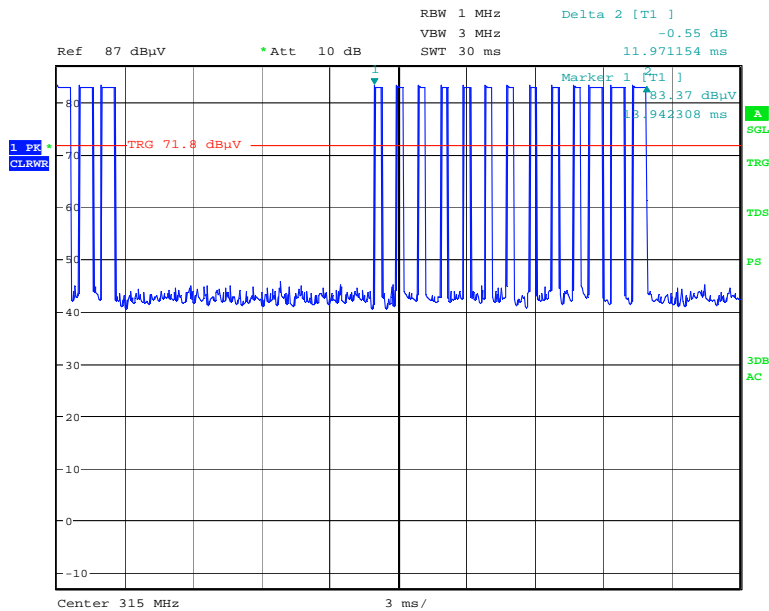
$$20\log_{10}\left(\frac{20.6}{100}\right) = 13.719 \text{ dB}$$

Transmissions within 100 ms:



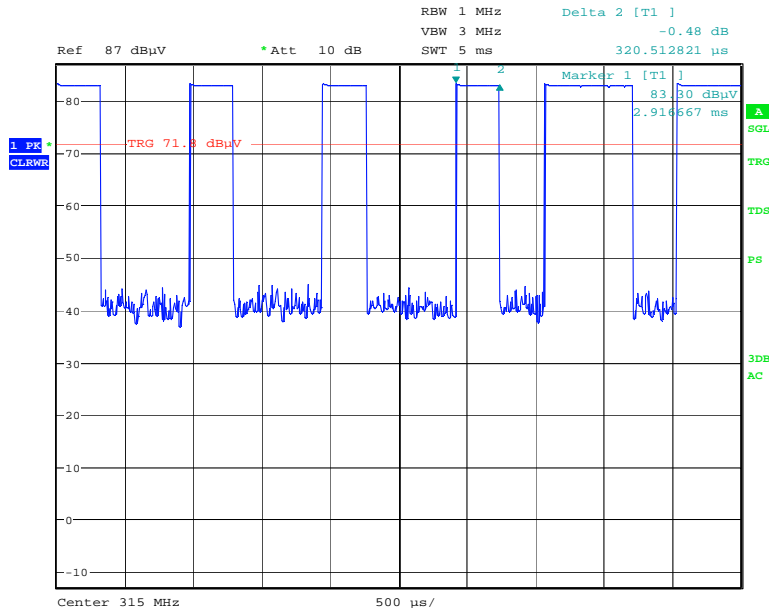
Date: 18.AUG.2009 14:43:36

Single transmission (burst):



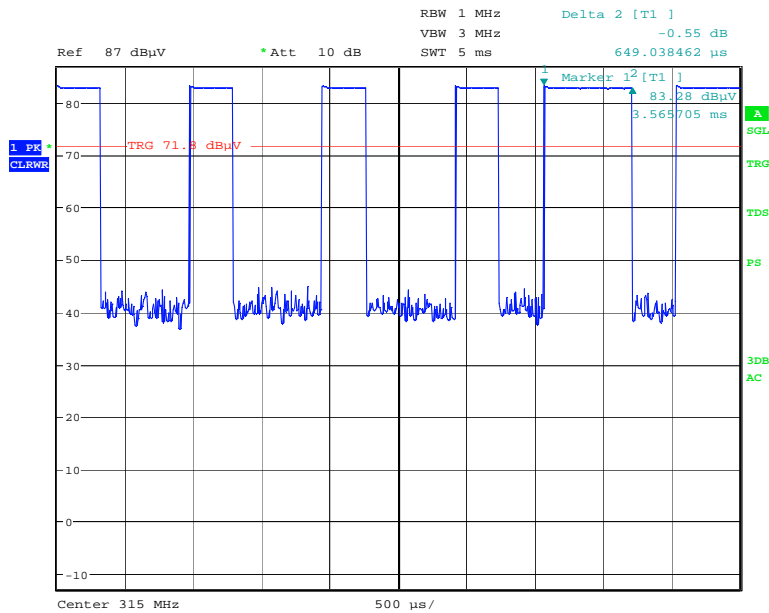
Date: 18.AUG.2009 14:46:04

Short pulse width:



Date: 18.AUG.2009 14:49:51

Long pulse width:



Date: 18.AUG.2009 14:50:34

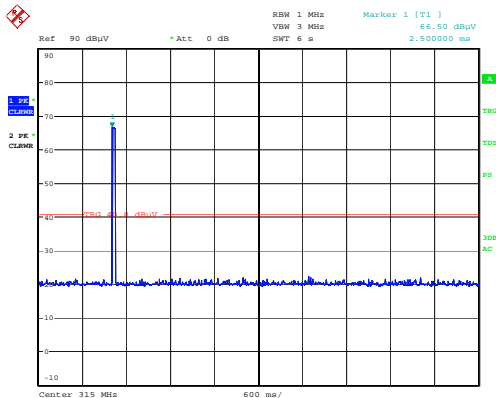
Clause 15.231(a) Conditions for intentional radiators to comply with periodic operation

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.
- (4) Intentional radiators, which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.
- (5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

Test Results: Pass

- (1) The EUT ceases transmission immediately after the button is being released:



Date: 19_AUG_2009 10:53:18

- (2) The EUT is not activated automatically.
- (3) There are no periodic transmissions.
- (4) The EUT is not intended to be used during emergencies.
- (5) The EUT is not intended to be used in security systems.

Clause 15.231(b) Radiated Emissions

In addition to the provisions of 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental		Field Strength of Spurious Emissions	
	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)
40.66–40.70	2,250	67	225	47
70–130	1,250	61.9	125	41.9
130–174	1,250 to 3,750	61.9 to 71.5	125 to 375	41.9 to 51.5
174–260	3,750	71.5	375	51.5
260–470	3,750 to 12,500	71.5 to 81.9	375 to 1,250	51.5 to 61.9
Above 470	12,500	81.9	1,250	61.9

Test Results: Pass

Additional Observations:

The Spectrum was searched from 30 MHz to the 10th Harmonic.

All measurements were performed using a Peak Detector with 100 kHz RBW/VBW below 1 GHz and a 1 MHz RBW/VBW above 1 GHz at a distance of 3 meters. New batteries were used throughout the test.

Frequency MHz	Polarization	Peak FS $\text{dB}\mu\text{V/m}$	Peak Limit $\text{dB}\mu\text{V/m}$	Margin dB	Avg Factor dB	Avg FS $\text{dB}\mu\text{V/m}$	Avg Limit $\text{dB}\mu\text{V/m}$	Margin dB
315	V	83.55	95.62	12.07	13.72	69.83	75.62	5.79
315	H	79.30	95.62	16.32	13.72	65.58	75.62	10.04
630	V	42.23	75.62	33.39	13.72	28.51	55.62	27.11
630	H	46.23	75.62	29.39	13.72	32.51	55.62	23.11
945	V	47.46	75.62	28.16	13.72	33.74	55.62	21.88
945	H	44.09	75.62	31.53	13.72	30.37	55.62	25.25
1260	V	45.91	75.62	29.71	13.72	32.19	55.62	23.43
1260	H	41.23	75.62	34.39	13.72	27.51	55.62	28.11
1890	V	49.92	75.62	25.70	13.72	36.20	55.62	19.42
1890	H	49.16	75.62	26.46	13.72	35.44	55.62	20.18
3150	V	62.71	75.62	12.91	13.72	48.99	55.62	6.63
3150	H	54.12	75.62	21.50	13.72	40.40	55.62	15.22

Duty Cycle:

Time:	No of short	Number of long	Short length, μs	Long length, μs	Number of bursts	Total Tx duration, ms
100 ms	10	3	320.5	649	4	20.608

Duty cycle (average factor) calculation: $20 \log_{10} \left(\frac{20.6}{100} \right) = 13.719 \text{ dB}$



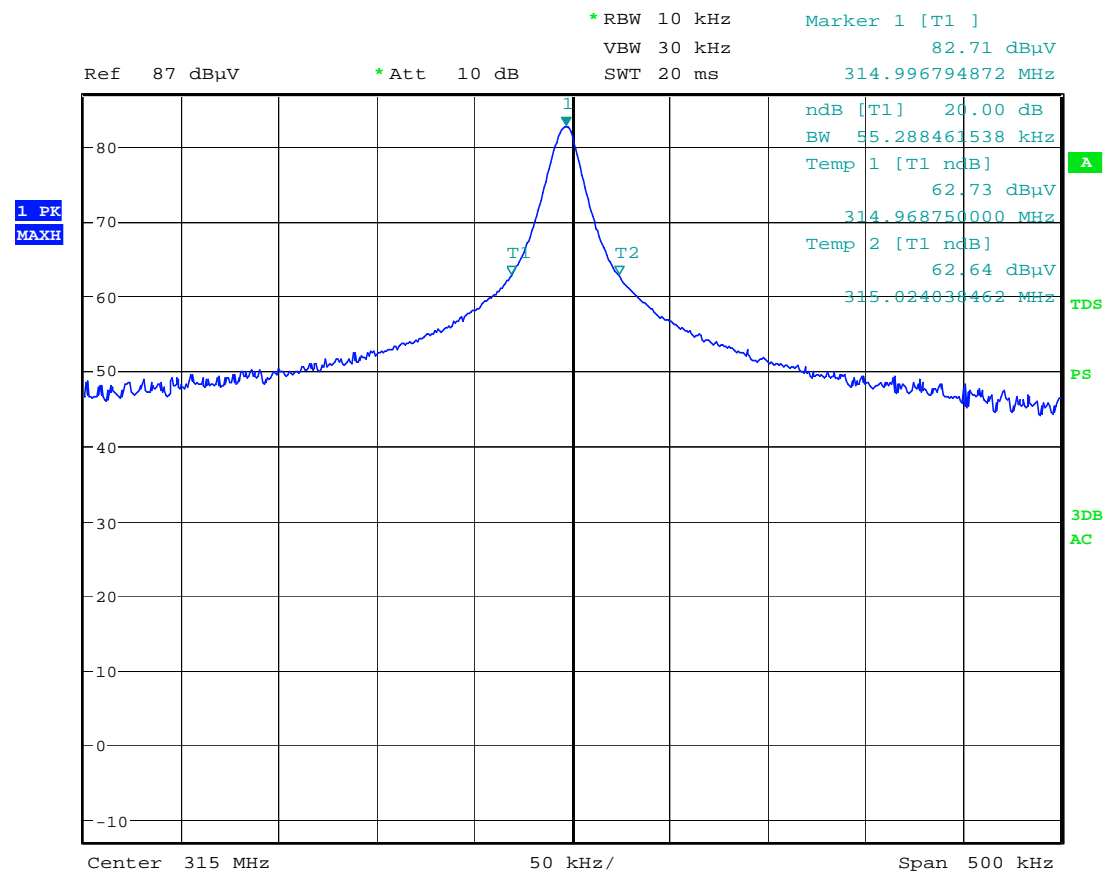
Nemko Canada Inc.

Clause 15.231(c) 20 dB Bandwidth

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. For devices operating above 900 MHz, the emission shall be no wider than 0.5 % of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Results: Pass

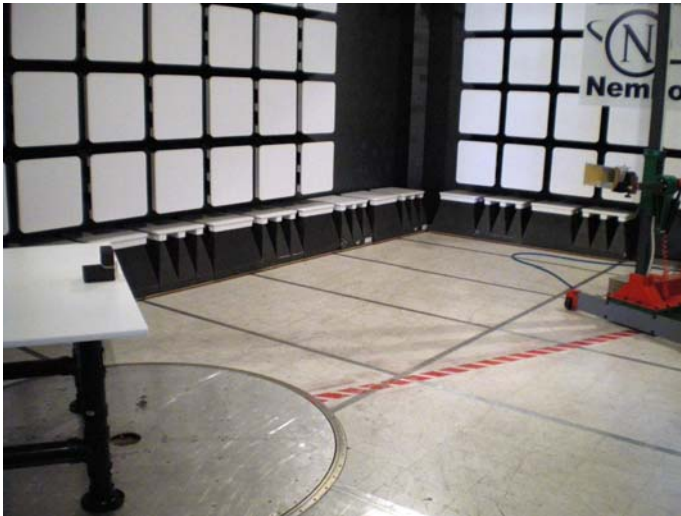
20 dB Bandwidth:



Date: 18.AUG.2009 15:02:35

Appendix B : Setup Photographs

Spurious Emissions Setup:



Appendix C : Block Diagram of Test Setups

Radiated Emissions above 30 MHz Test Site

