



## **FCC PART 90 CLASS II PERMISSIVE CHANGE TEST REPORT**

APPLICANT	RELM WIRELESS CORP. – BK RADIO
	7100 TECHNOLOGY DRIVE
	WEST MELBOURNE FLORIDA 32094 USA
FCC ID	K95KNGM800
MODEL NUMBER	KNG-M800
PRODUCT DESCRIPTION	MOBILE 700-800MHz RADIO
DATE TESTED	04/12/13
TESTED BY	Clinton McClanahan
APPROVED BY	
TOTAL PAGES	13
TEST RESULTS	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

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## GENERAL REMARKS

This report contains the test data required to add Emissions Designator 8K10F1W to the existing grant K95KNGM800 via a Class II permissive change.

## Summary

The device under test does:

- ☒ fulfill the general approval requirements as identified in this test report  
☐ not fulfill the general approval requirements as identified in this test report

## Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made, under my supervision, at:

RELM WIRELESS CORP. – BK RADIO  
Engineering Lab  
4830 Bob Billings Parkway  
Suite 200 Lawrence KS. 66049

**Authorized Signatory Name:**

**Date: 4/12/13**

**Tested by:** Clinton McClanahan

**Signature:** *Clinton McClanahan*

## GENERAL INFORMATION

### DUT Specification

<b>DUT Description</b>	MOBILE 700-800MHz RADIO
<b>FCC ID</b>	K95KNGM800
<b>Model Number</b>	KNG-M800
<b>Operating Frequency</b>	763-870MHz
<b>No. of Channels</b>	2048
<b>Type of Emission</b>	8K10F1W
<b>Modulation</b>	FM
<b>DUT Power Source</b>	<input type="checkbox"/> 110-120Vac/50- 60Hz
	<input checked="" type="checkbox"/> DC Power 12V
	<input type="checkbox"/> Battery Operated Exclusively
<b>Test Item</b>	<input type="checkbox"/> Prototype
	<input type="checkbox"/> Pre-Production
	<input checked="" type="checkbox"/> Production
<b>Type of Equipment</b>	<input type="checkbox"/> Fixed
	<input checked="" type="checkbox"/> Mobile
	<input type="checkbox"/> Portable
<b>Test Conditions</b>	The temperature was 26°C with a relative humidity of 50%.
<b>Modification to the DUT</b>	None
<b>Test Exercise</b>	The DUT was placed in continuous transmit mode.
<b>Applicable Standards</b>	TIA-102.CCAA, TIA-102.CCAB, FCC CFR 47 Part 90
<b>Test Facility</b>	Relm Wireless Corp. – BK Radio

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## EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
PXA Signal Analyzer	Agilent	N9030A	MY51360190	03/22/12	03/22/14
Spectrum Analyzer	Hewlett Packard	8562E	08471	03/19/13	03/19/14

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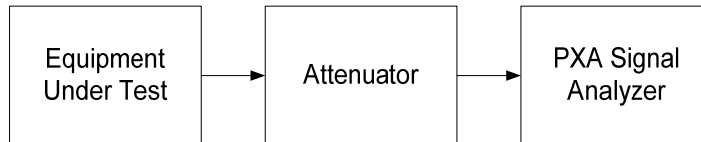
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## TEST SETUP

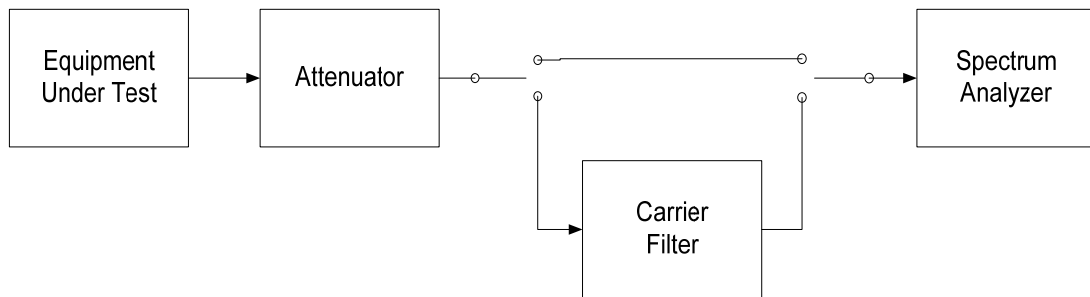
### 1. Occupied Bandwidth /Emission Mask 8K10F1W

Test Method: TIA-102.CCAA 2.2.5  
Equipment Used: Agilent PXA Signal Analyzer (03-22-14)



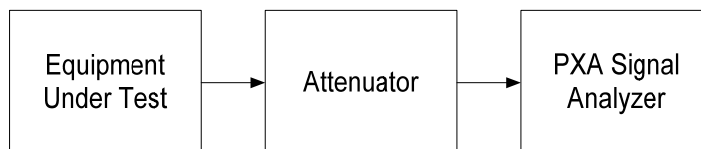
### 2. Conducted Spurious Emissions

Test Method: TIA-102.CCAA 2.2.7  
Equipment Used: Hewlett Packard 8562E Spectrum Analyzer (03-19-14)



### 3. Adjacent Channel Power Ratio

Test Method: TIA-102.CCAA 2.2.8 & TIA-102.CCAB 3.2.8  
Equipment Used: Agilent PXA Signal Analyzer (03-22-14)



## **MODULATION CHARACTERISTICS**

Note: this modulation characteristic is based on the APCO P25 TDMA Phase II Standard

**Part 2.1033(c)**

**Part 2.1033(c) (4)** Type of Emission: 8K10F1W

**Part 90.209**

**Part 90.207** BW=8.1KHZ from using 99% energy bandwidth  
F1W indicates digital TDMA.

Designator is therefore: 8K10F1W

## OCCUPIED BANDWIDTH

### Part 90.210(d) Emission Mask D - 12.5 kHz channel BW equipment.

For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

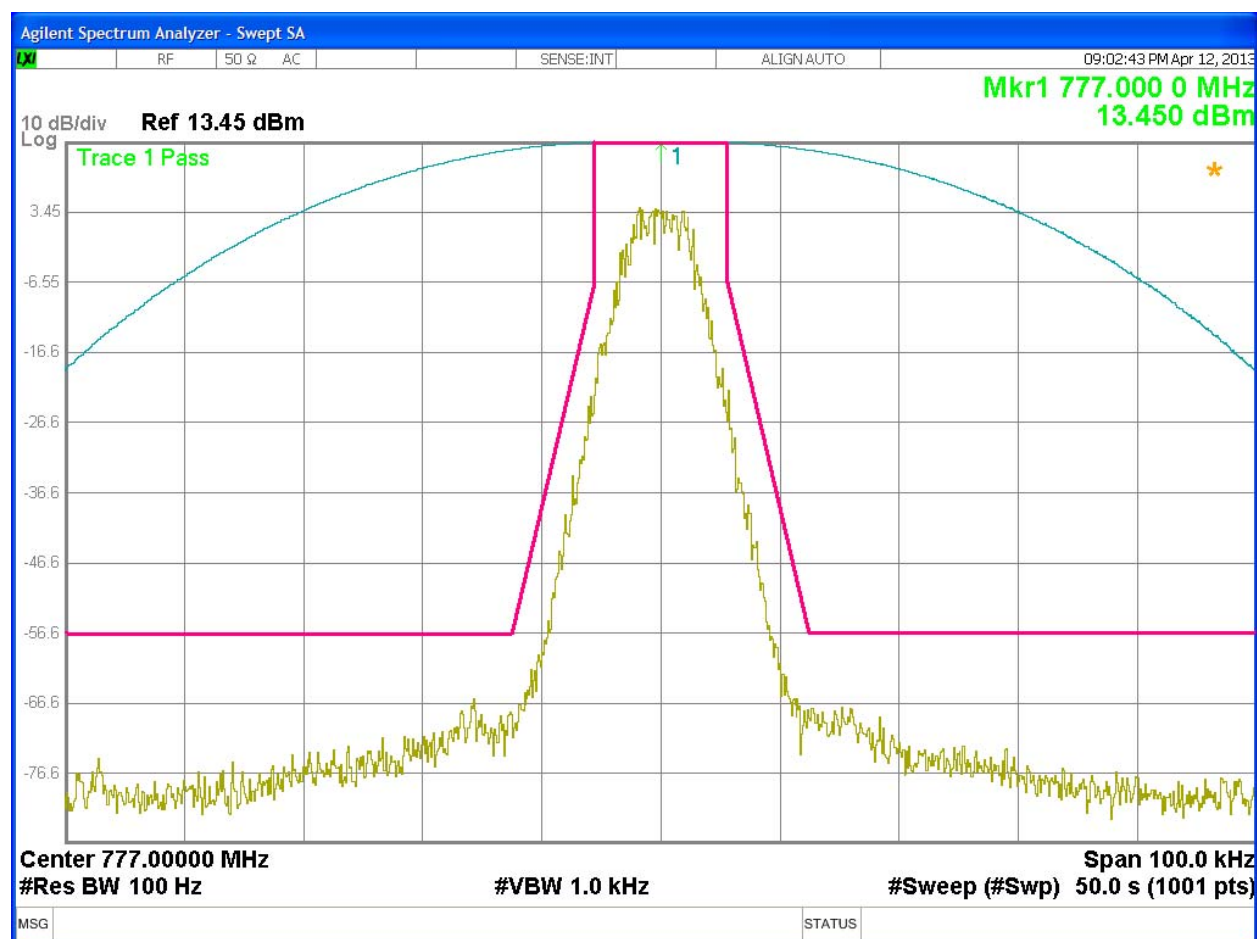
- (1) On any frequency from the center of the authorized bandwidth  $f_0$  to 5.625 kHz removed from  $f_0$ : Zero dB.
- (2) On any frequency from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least  $7.27 (f_d - 2.88 \text{ kHz})$  dB.
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 12.5 kHz: At least  $50 + 10\log(P)$  dB or 70 dB, whichever is the lesser attenuation.

## OCCUPIED BANDWIDTH PLOTS

Part 90.210(d) Emission Mask D - 12.5 kHz channel  
Frequency = 777MHz

Digital TDMA

8K10F1W



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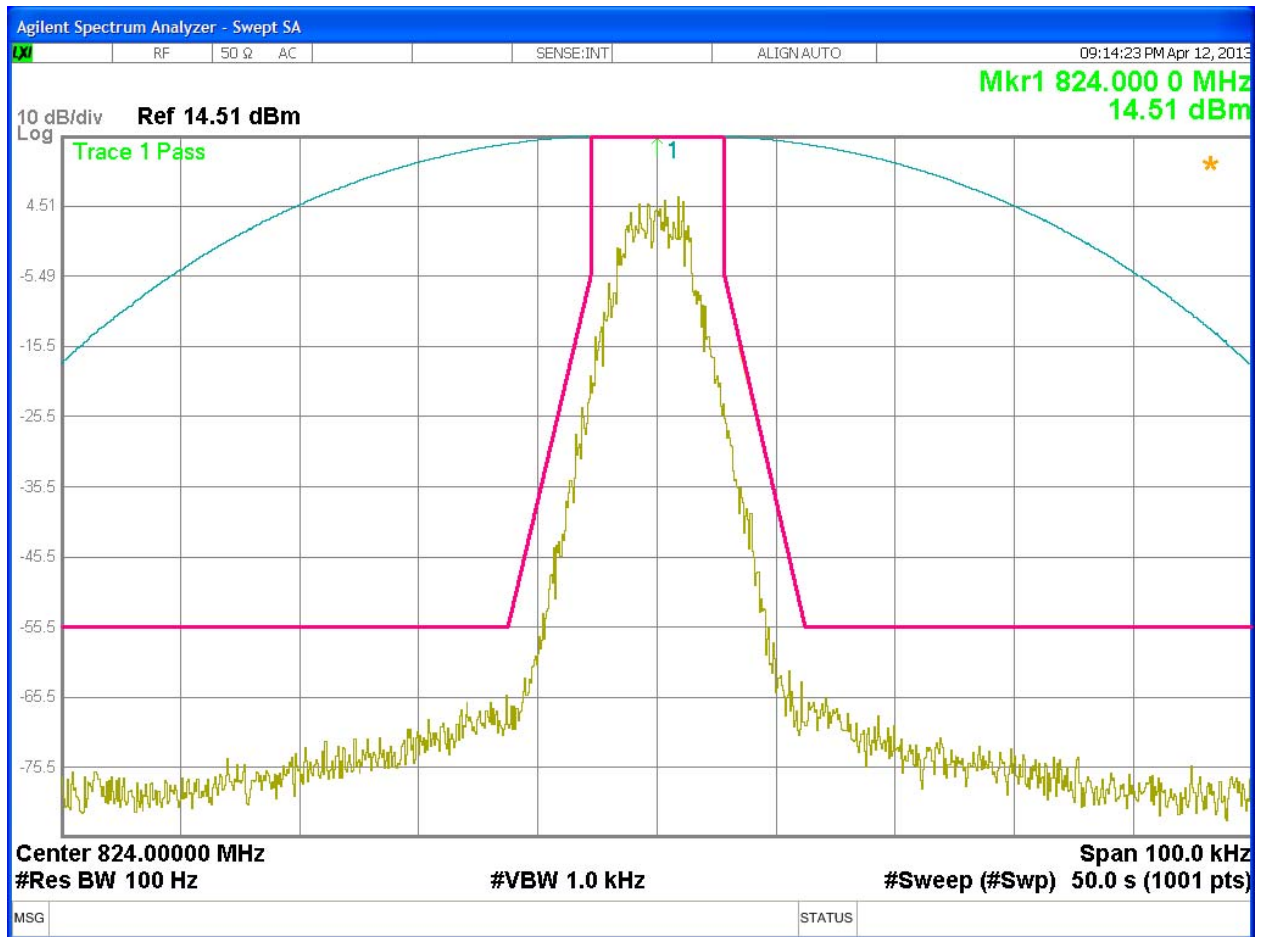
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**Part 90.210(d) Emission Mask D - 12.5 kHz channel**  
**Frequency = 824MHz**

**Digital TDMA**

**8K10F1W**



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## SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

### Part 2.1051(a)

#### Requirements:

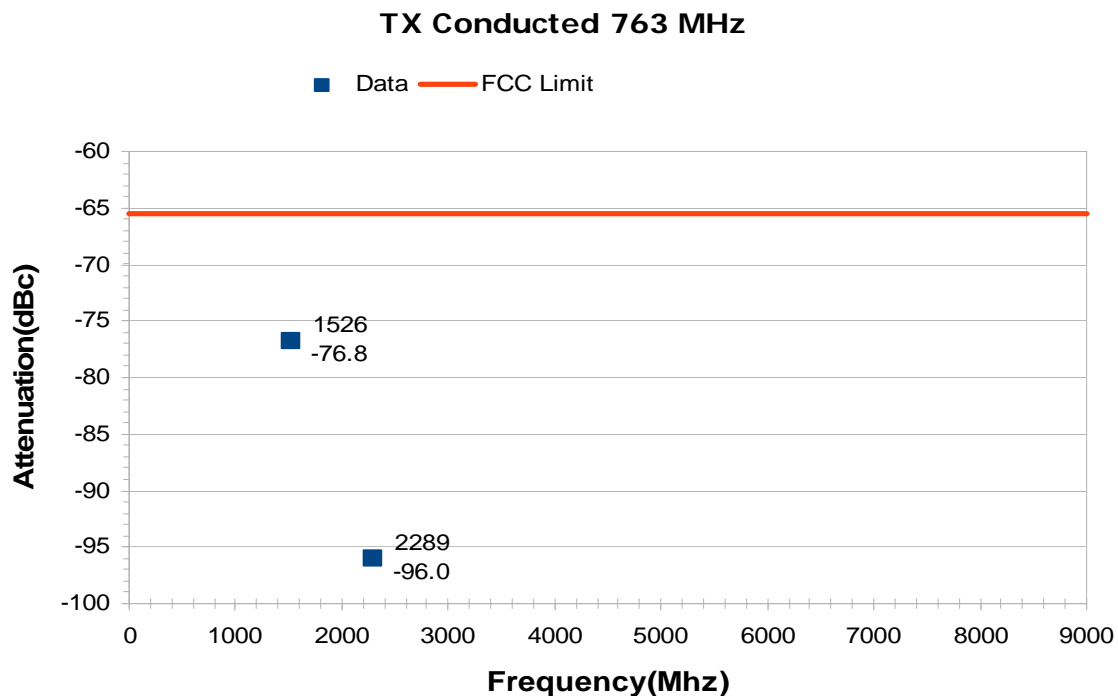
**700MHz**                       $12.5\text{kHz Channel Spacing} = 50 + 10\log(35.9) = 65.55 \text{ dBc}$

**800MHz**                       $12.5\text{kHz Channel Spacing} = 50 + 10\log(40.3) = 66.05 \text{ dBc}$

**Method of Measurement:** The EUT was placed in continuous transmit test mode. The spectrum was scanned from 30MHz to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard TIA-102.CCA (August 2011).

#### Test Data:

##### Transmit Conducted 763MHz

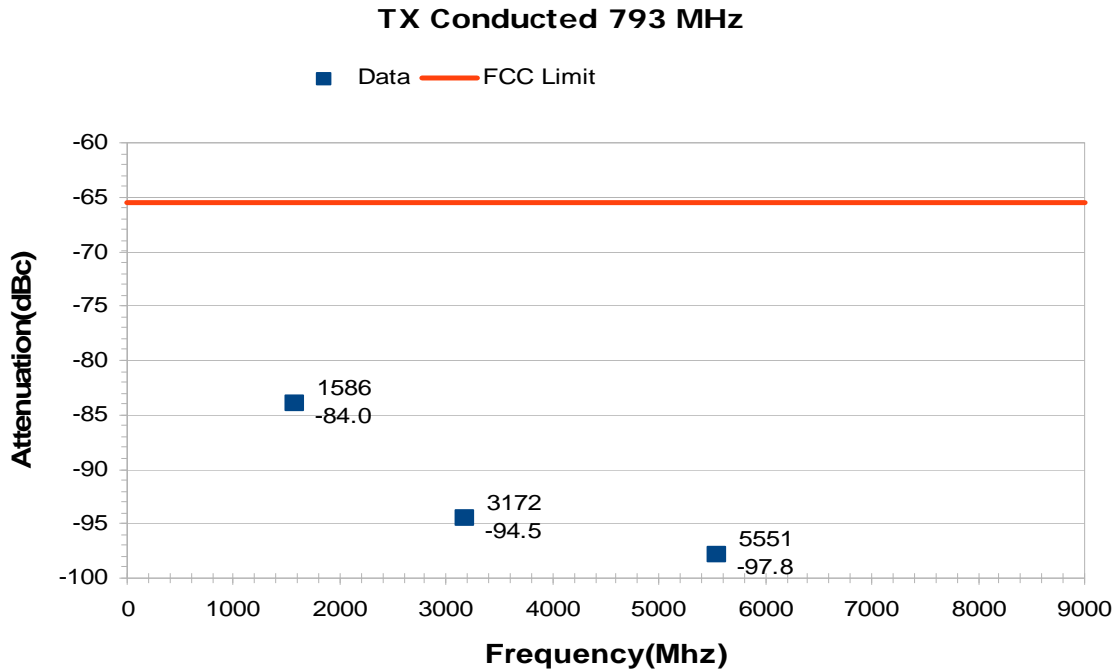


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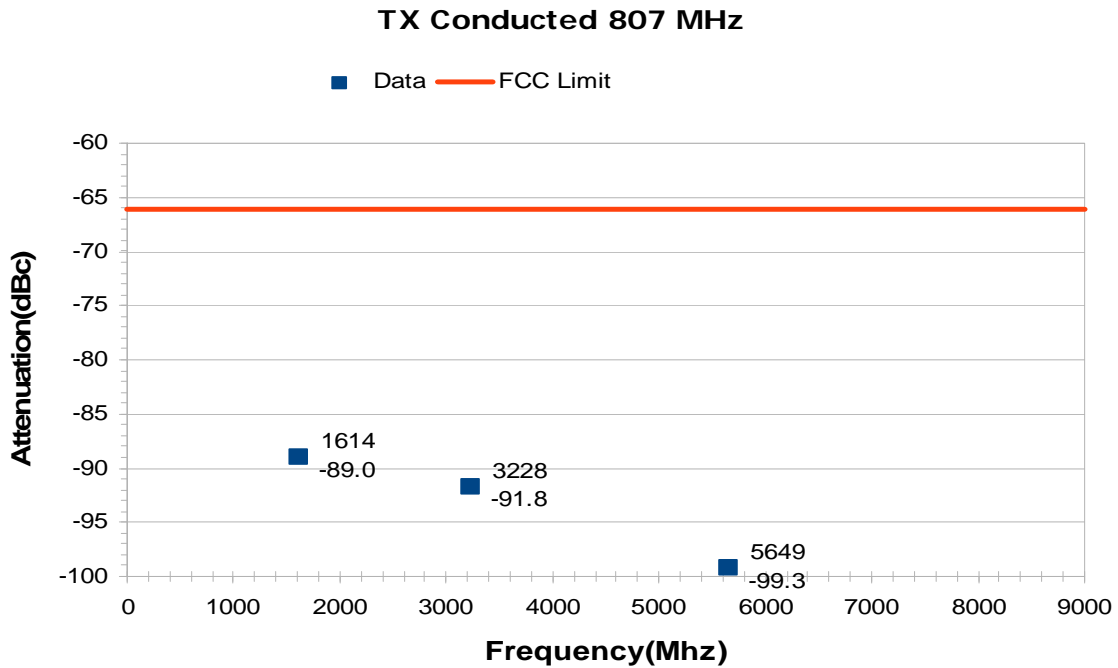
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## Transmit Conducted 793MHz



## Transmit Conducted 807MHz

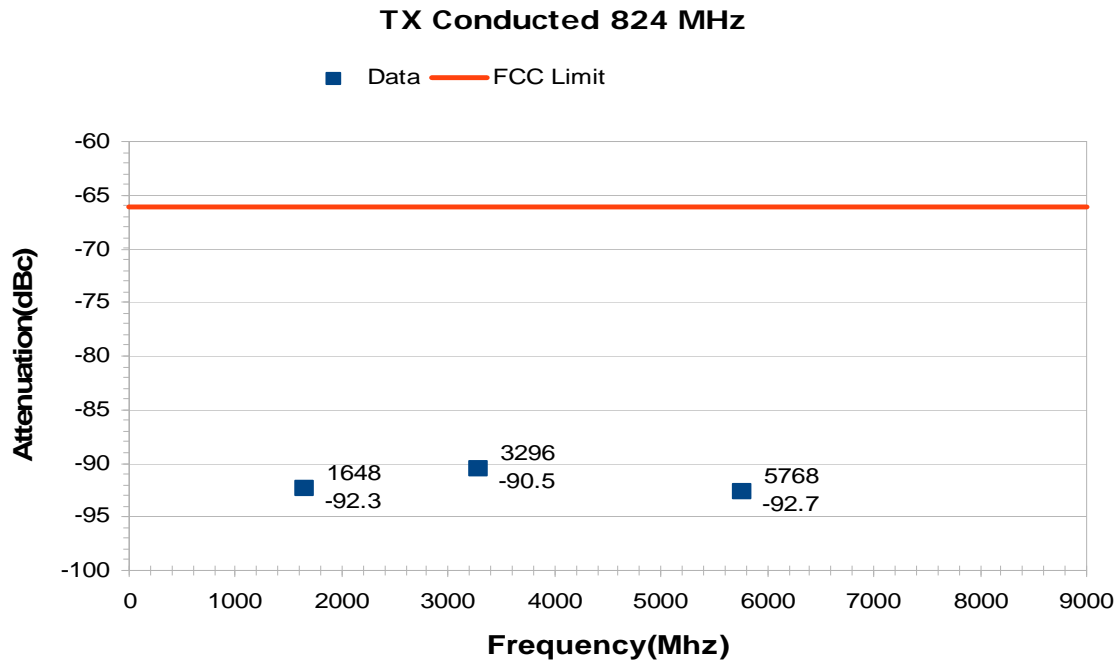


Applicant: RELM WIRELESS CORP. - BK RADIO

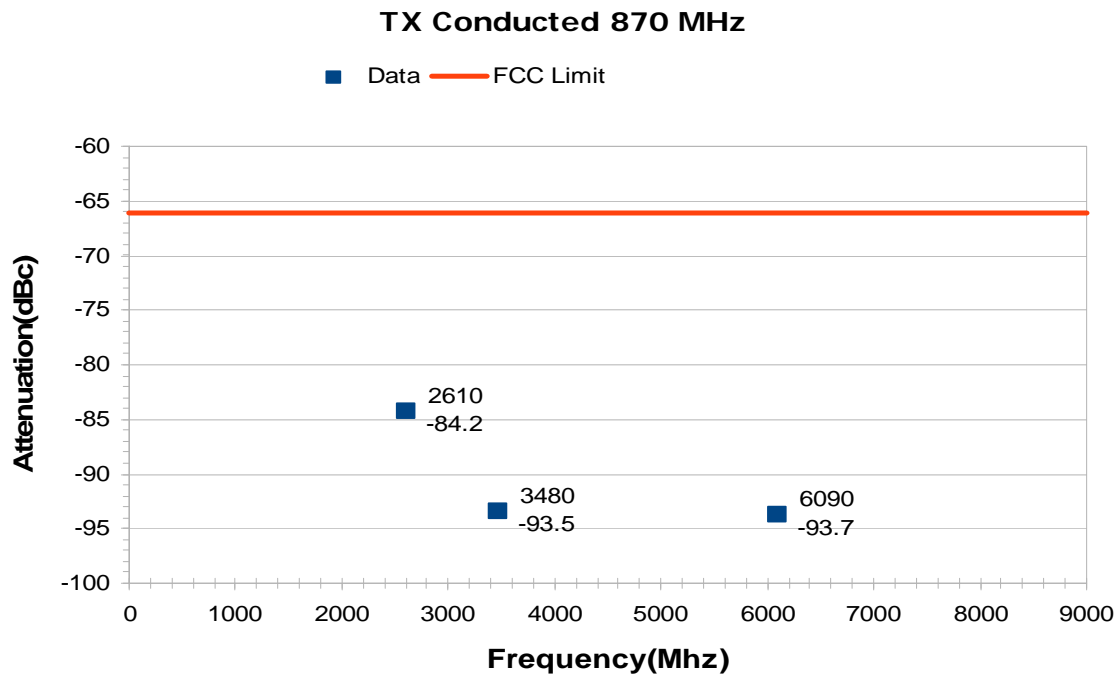
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## Transmit Conducted 824MHz



## Transmit Conducted 870MHz



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## ADJACENT CHANNEL POWER

### Part 90.543

Emission limitation – Adjacent Channel Power

APCO 12.5 KHz Channel Spacing		Digital TDMA	770MHz	
Offset Frequency (KHz)	Measurement Bandwidth (KHz)	Adjacent Channel Power Ratio (dB)		
		FCC Limit	Lower	Upper
9.375	6.25	-40	-40.62	-42.94
15.625	6.25	-60	-73.15	-73.73
21.875	6.25	-60	-76.16	-75.97
37.5	25	-60	-74.37	-74.42
62.5	25	-65	-80.58	-80.39
87.5	25	-65	-83.92	-83.79
150	100	-65	-78.29	-78.09
250	100	-65	-81.97	-81.80
350	100	-65	-85.28	-85.05
>400 to 12MHz	30 (Swept)	-75	<-75	<-75
12MHz to Rx	30 (Swept)	-75	<-75	<-75
Rx Band	30 (Swept)	-100	<-100	<-100

APCO 12.5 KHz Channel Spacing		Digital TDMA	800MHz	
Offset Frequency (KHz)	Measurement Bandwidth (KHz)	Adjacent Channel Power Ratio (dB)		
		FCC Limit	Lower	Upper
9.375	6.25	-40	-40.89	-40.62
15.625	6.25	-60	-74.09	-73.46
21.875	6.25	-60	-76.81	-77.23
37.5	25	-60	-75.50	-75.41
62.5	25	-65	-81.77	-81.25
87.5	25	-65	-84.25	-84.18
150	100	-65	-78.39	-78.27
250	100	-65	-82.03	-81.91
350	100	-65	-85.45	-85.33
>400 to 12MHz	30 (Swept)	-75	<-75	<-75
12MHz to Rx	30 (Swept)	-75	<-75	<-75
Rx Band	30 (Swept)	-100	<-100	<-100

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