

FCC PART 90 AND RSS-119

TEST REPORT

APPLICANT	RELM WIRELESS CORP. – BK RADIO
	7100 TECHNOLOGY DRIVE
	WEST MELBOURNE FLORIDA 32094 USA
FCC ID	K95KNGP800C
IC	2116A-KNGP800C
MODEL NUMBER	KNG-P800
PRODUCT DESCRIPTION	PORTABLE 700-800MHz RADIO
DATE TESTED	5/10/11
TESTED BY	Abhinay Kuchikulla
APPROVED BY	Brian W. Jones, VP Engineering
TIMCO REPORT NO.	K95KNGP800C-Report.doc
TEST RESULTS	☒ PASS ☐ FAIL

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Applicant: RELM WIRELESS CORP. – BK RADIO
FCC ID: K95KNGP800C
IC: 2116A-KNGP800C
Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Relm Wireless Corp. – BK Radio.

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

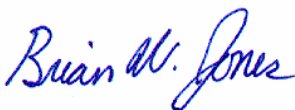
This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly.

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

Relm Wireless Corp. – BK Radio
7100 Technology Drive
West Melbourne, FL 32904

Authorized Signatory Name:



Brian W. Jones
VP Engineering

Date: June 30, 2011

Applicant: RELM WIRELESS CORP. – BK RADIO

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IC: 2116A-KNGP800C

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GENERAL INFORMATION
DUT Specification

DUT Description	PORTABLE 700-800MHz RADIO
FCC ID	K95KNGP800C
IC	2116A-KNGP800C
Model Number	KNG-P800
Operating Frequency	763-870MHz
Type of Emission	16K0F3E/11K0F3E/8K10F1E/8K10F1D/8K10F1W
Modulation	FM
DUT Power Source	☐ 110–120Vac/50– 60Hz
	☐ DC Power 12V
	☒ Battery Operated Exclusively
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☐ Fixed
	☐ Mobile
	☒ Portable
Test Conditions	Temperature: 26°C Relative humidity: 50%.
Modification to the DUT	None
Test Exercise	The DUT was placed in continuous transmit mode.
Applicable Standards	ANSI/TIA 603-C:2004, FCC CFR 47 Part 90
Test Facility	Relm Wireless Corp. – BK Radio

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EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Power Meter	Rohde & Schwarz	NRT	102870	01/11/10	01/11/12
Power Sensor	Rohde & Schwarz	NRT-Z14	100100	01/11/10	01/11/12
Spectrum Analyzer	Hewlett Packard	8562E	08471	02/25/11	02/25/12
RF Communication Test Set	Hewlett Packard	8920B	US39225186	03/11/11	03/11/12
Dynamic Signal Analyzer	Hewlett Packard	35670A	MY42506203	03/11/11	03/11/12
Spectrum Analyzer	Tektronix	3308A	J300156	10/08/10	10/08/11
Oscilloscope	Tektronix	MSO4104	C001715	03/21/11	03/21/13
Signal Generator	Rohde & Schwarz	SMB100A	100200	09/03/08	09/03/11

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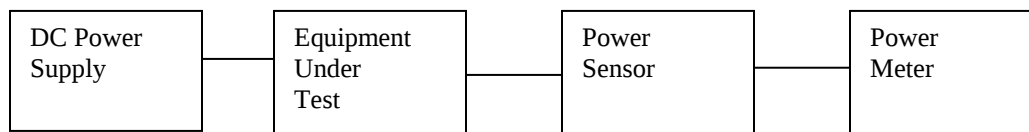
Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

TEST SETUP

1. RF Output Power

Test Method: TIA/EIA-603-A 2.2.1

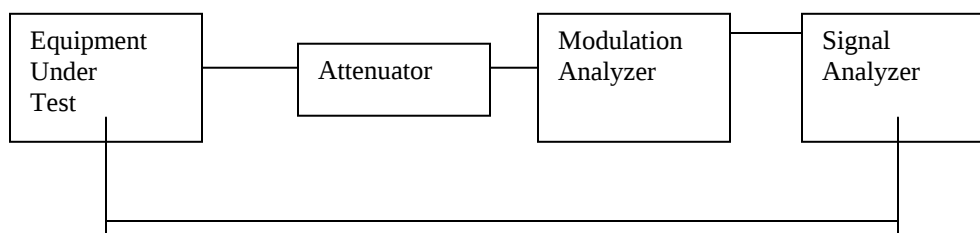
Equipment Used: Rohde & Schwarz NRT Power Meter (01-11-12), Rohde & Schwarz NRT-Z14 Power Sensor (01-11-12)



2. Audio Frequency Response

Test Method: TIA/EIA-603-A 2.2.6

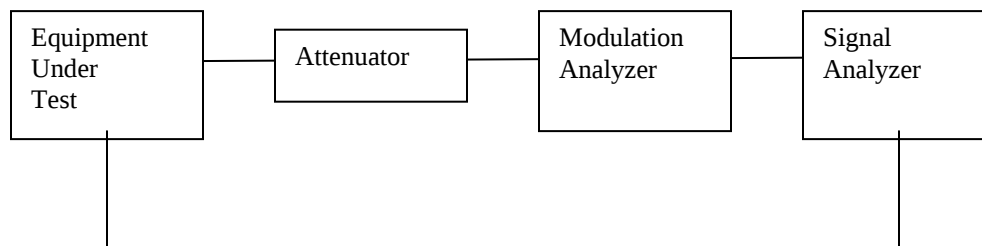
Equipment Used: Hewlett Packard 8920B RF Communication Test Set Modulation Analyzer (03-11-12), Hewlett Packard 35670A Signal Analyzer (03-11-12). No filters were used on the modulation analyzer.



3. Low Pass Filter Response

Test Method: TIA/EIA-603-A 2.2.15

Equipment Used: Hewlett Packard 8920B RF Communication Test Set Modulation Analyzer (03-11-12), Hewlett Packard 35670A Signal Analyzer (03-11-12). No filters were used on the modulation analyzer.



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4. Occupied Bandwidth /Emission Mask

No Modulation

16K0F3E

11K0F3E

8K10F1E

8K10F1D

Test Method: TIA/EIA-603-A 2.2.11 & TIA-102.CAAA-B 2.2.5

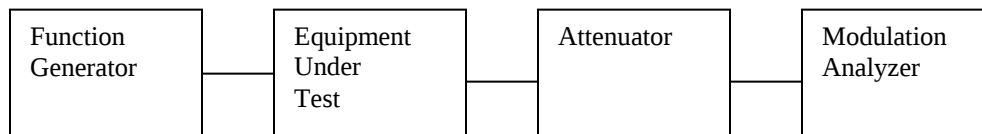
Equipment Used: Tektronix RSA 3308A Real-time Spectrum Analyzer (10-08-11)



5. Modulation Limiting

Test Method: TIA/EIA-603-A 2.2.3

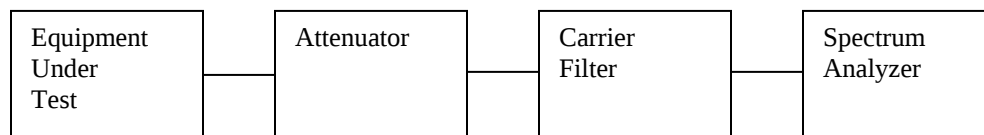
Equipment Used: Hewlett Packard 8920B RF Communication Test Set Modulation Analyzer (03-11-12)



6. Conducted Spurious Emissions

Test Method: TIA/EIA-603-A 2.2.13 & TIA-102.CAAA-B 2.2.7

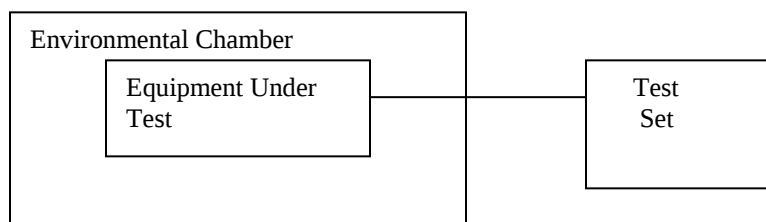
Equipment Used: Hewlett Packard 8562E Spectrum Analyzer (02-25-12)



7. Frequency Stability

Test Method: TIA/EIA-603-A 2.2.2

Equipment Used: Hewlett Packard 8920B RF Communication Test Set (03-11-12)



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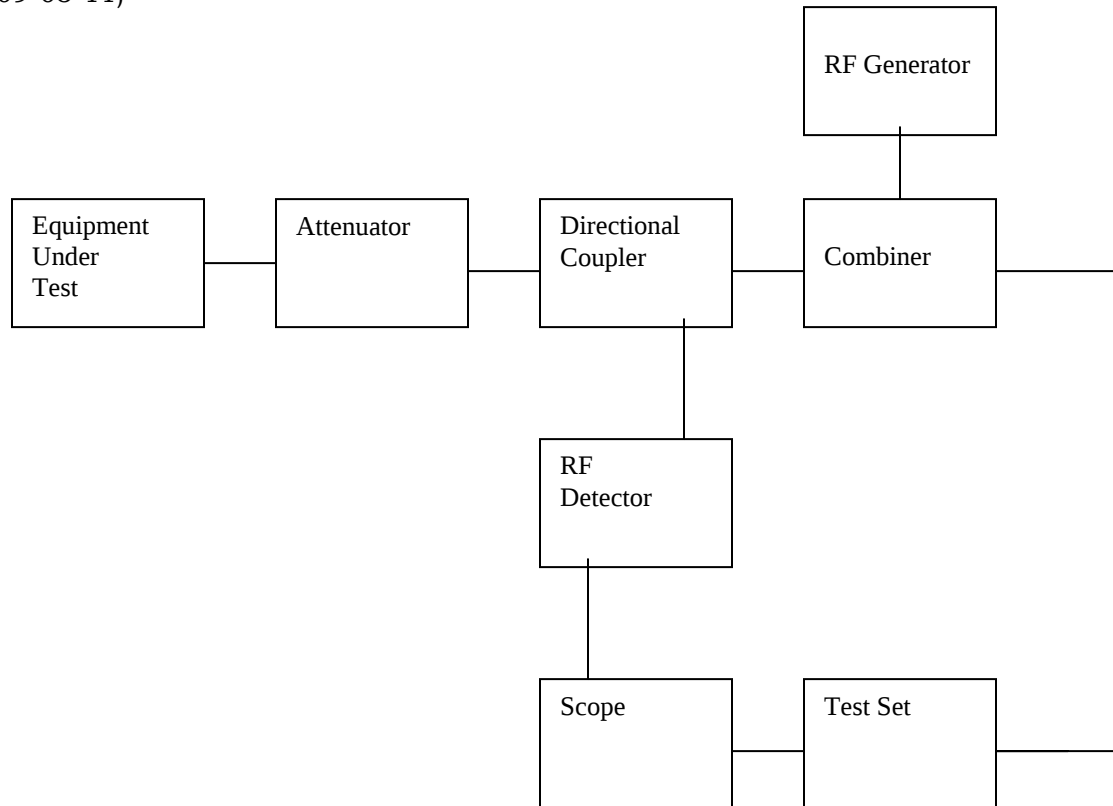
IC: 2116A-KNGP800C

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8. Transient Frequency Behavior

Test Method: TIA/EIA-603-A 2.2.19.3

Equipment Used: Hewlett Packard 8920B RF Communication Test Set (03-11-12), Tektronix MSO4104 Scope (03-21-13), Rohde & Schwarz SMB100A Signal generator (09-03-11)



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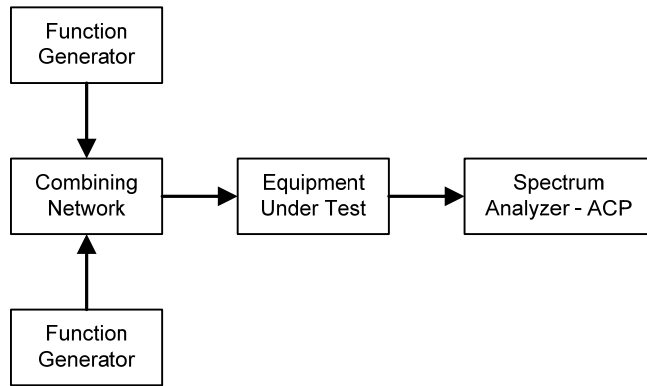
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9. Adjacent Channel Power Ratio

Test Method: TIA/EIA-603-A 2.2.14 & TIA-102.CAAA-B 2.2.8

Equipment Used: Hewlett Packard 8920B RF Communication Test Set (03-11-12),
Packard 8562E Spectrum Analyzer (02-25-12)



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RF POWER OUTPUT

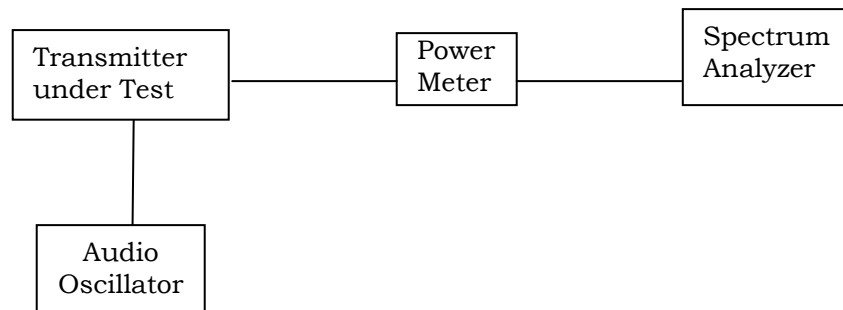
Rule Part No.: FCC Part 2.1046(a), IC RSS-119 4.1 and 5.4, RSS-GEN 4.8

Test Requirements:

Method of Measurement: RF power is measured by connecting a 50-ohm, resistive wattmeter to the RF output connector. With a nominal battery voltage, and the transmitter properly adjusted the RF output measures:

For the device has a fixed antenna, RF power is measured as ERP as the antenna is permanently attached. The substitution method was used. With a nominal battery voltage, and the transmitter properly adjusted the RF output measures:

Test Setup Diagram:



Test Data:

OUTPUT POWER 700MHz: HIGH – 2.99 Watts
LOW - 1.00 Watts

OUTPUT POWER 800MHz: HIGH – 3.49 Watts
LOW - 1.00 Watts

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Output Power - High

Frequency (MHz)	Power (Watts)	Voltage (Volts)	Current (Amperes)
763	2.99	10.8	0.678
777	2.98	10.8	0.699
793	2.98	10.8	0.735
805	2.97	10.8	0.757
806	3.49	10.8	0.853
824	3.48	10.8	0.889
851	3.48	10.8	0.908
870	3.48	10.8	0.924

Output Power- Low

Frequency (MHz)	Power (Watts)	Voltage (Volts)	Current (Amperes)
763	1.05	10.8	0.384
777	1.07	10.8	0.4
793	1.03	10.8	0.414
805	1.02	10.8	0.429
806	1.02	10.8	0.432
824	1.02	10.8	0.453
851	1.01	10.8	0.474
870	1.08	10.8	0.482

Part 2.1033 (C)(8) DC Input into the final amplifier

793 MHz

FOR LOW POWER SETTING INPUT POWER: $(10.8V)(0.414A) = 4.47$ Watts

FOR HIGH POWER SETTING INPUT POWER: $(10.8V)(0.757A) = 8.18$ Watts

870 MHz

FOR LOW POWER SETTING INPUT POWER: $(10.8V)(0.482A) = 4.62$ Watts

FOR HIGH POWER SETTING INPUT POWER: $(10.8V)(0.924A) = 9.98$ Watts

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MODULATION CHARACTERISTICS

Rule Part No.: Part 2.1047(a)(b) IC RSS-119 5.5

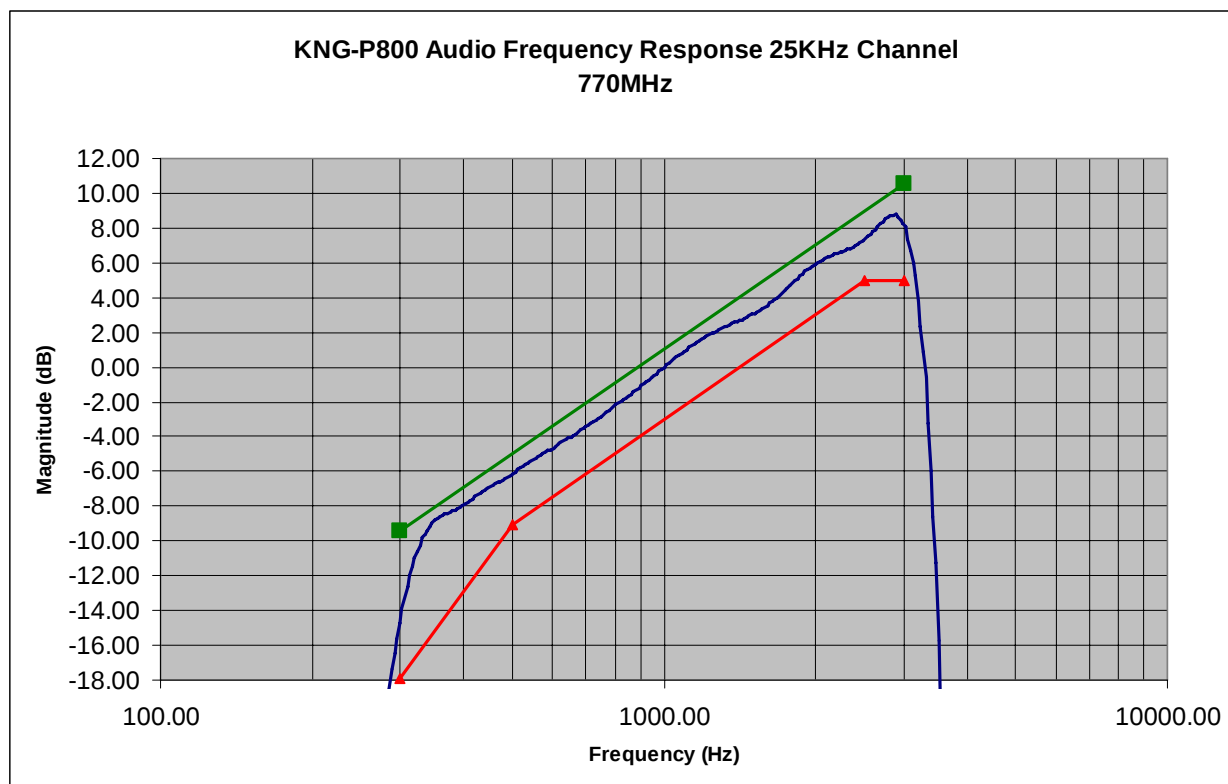
Test Requirements:

Method of Measurement:

Audio frequency response

The audio frequency response was measured in accordance with ANSI/TIA 603-C: 2004. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 – 5000Hz shall be submitted. The audio frequency response curve is shown below.

AUDIO FREQUENCY RESPONSE PLOT

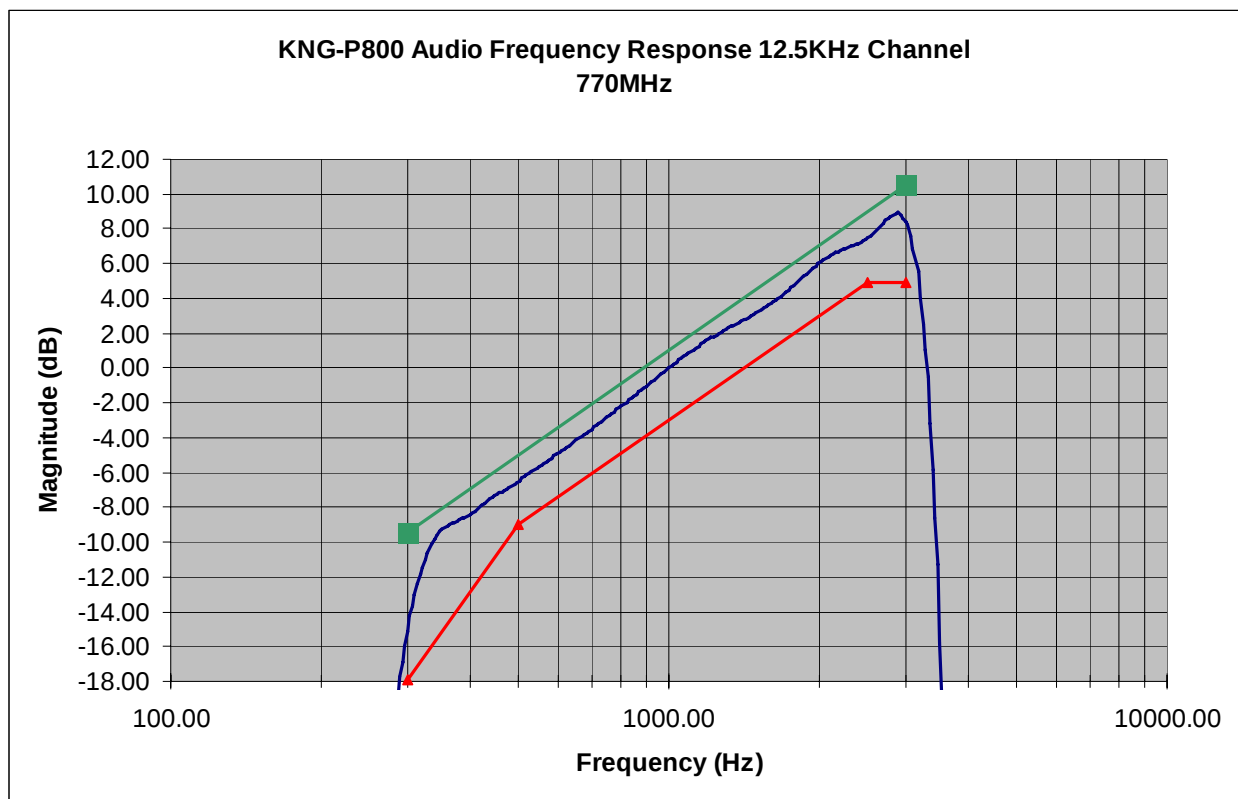


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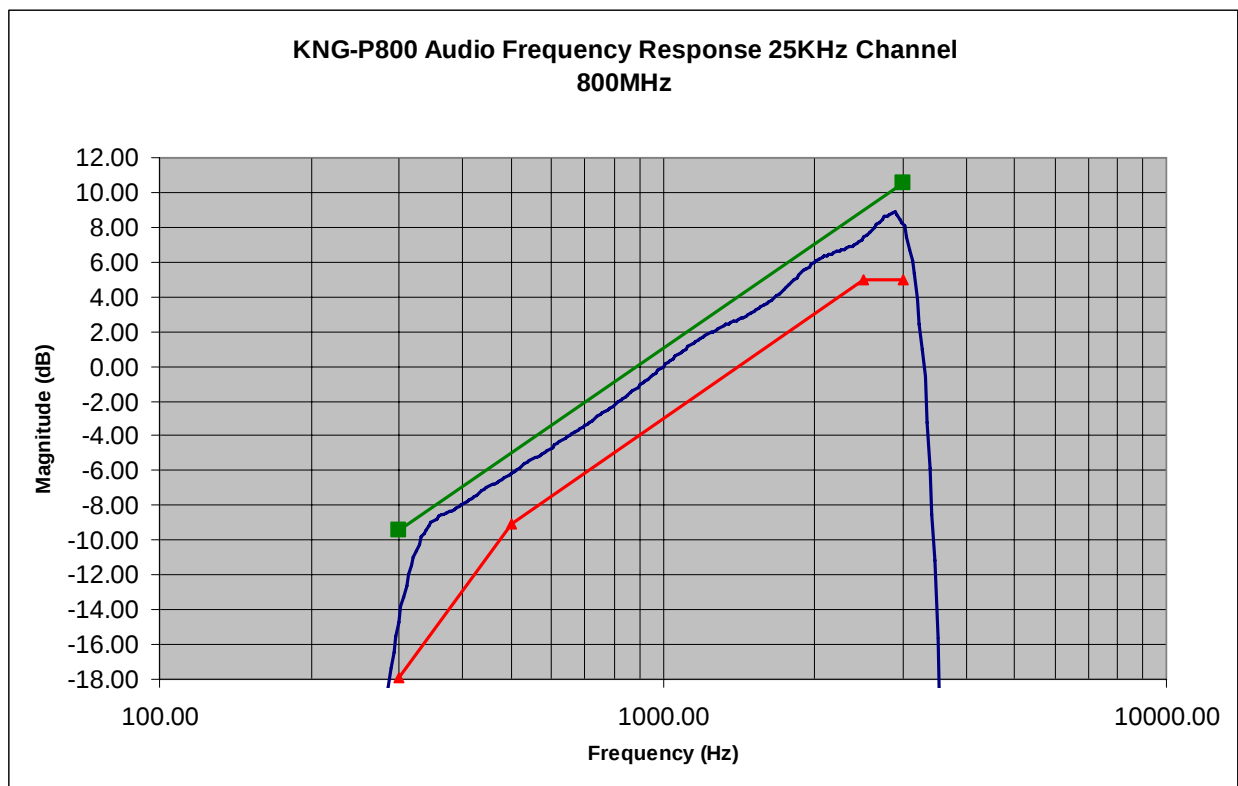


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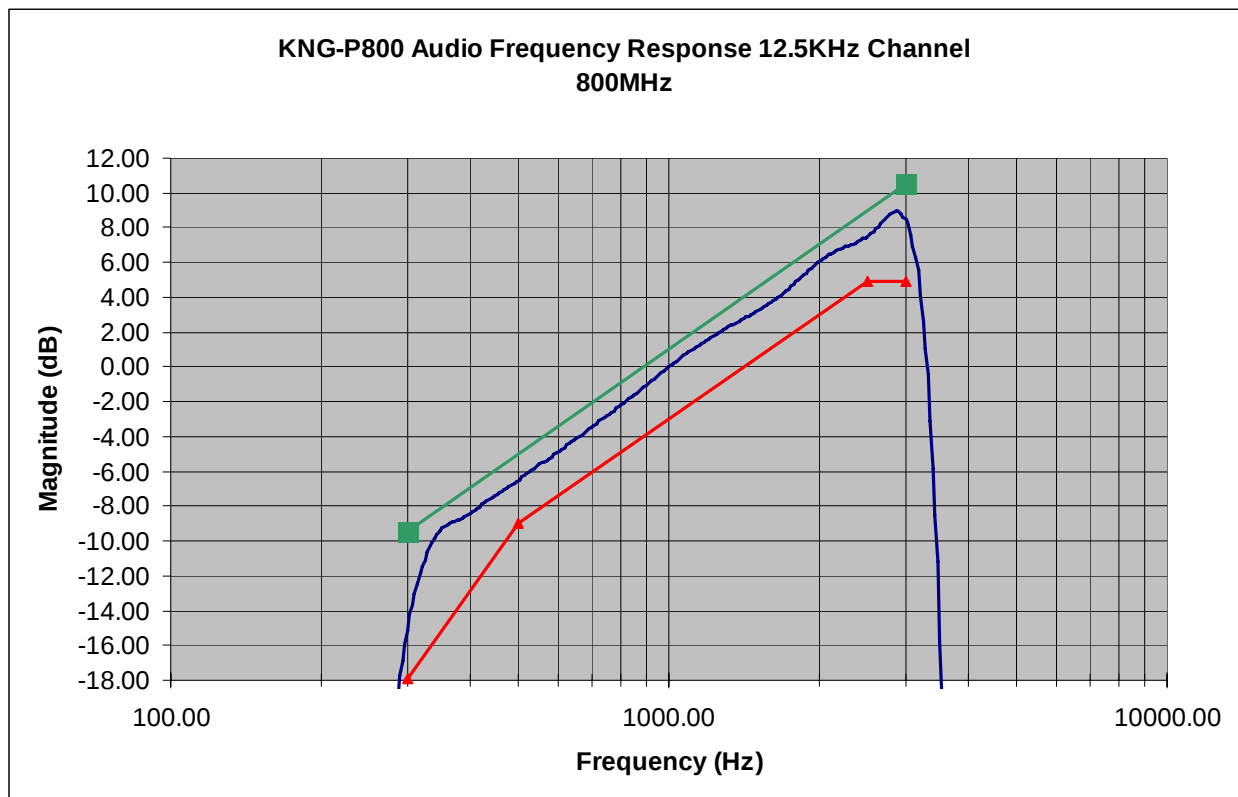


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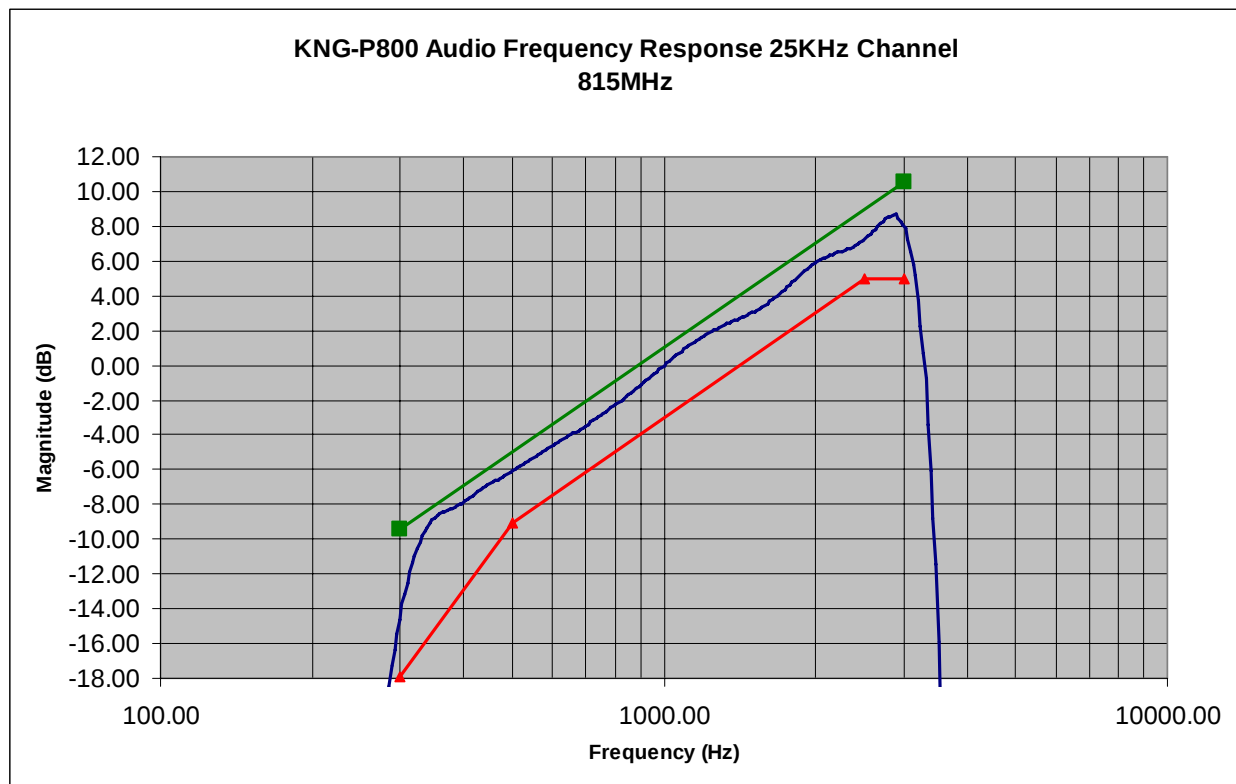


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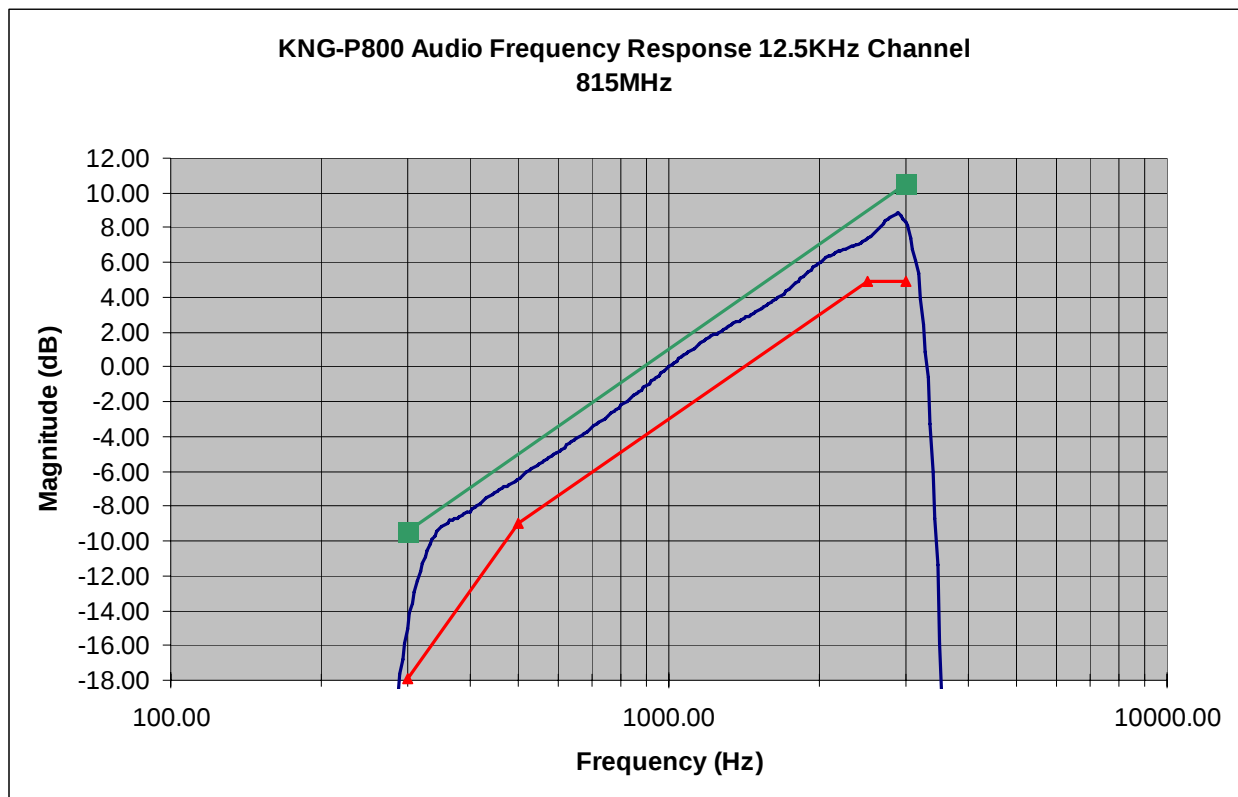


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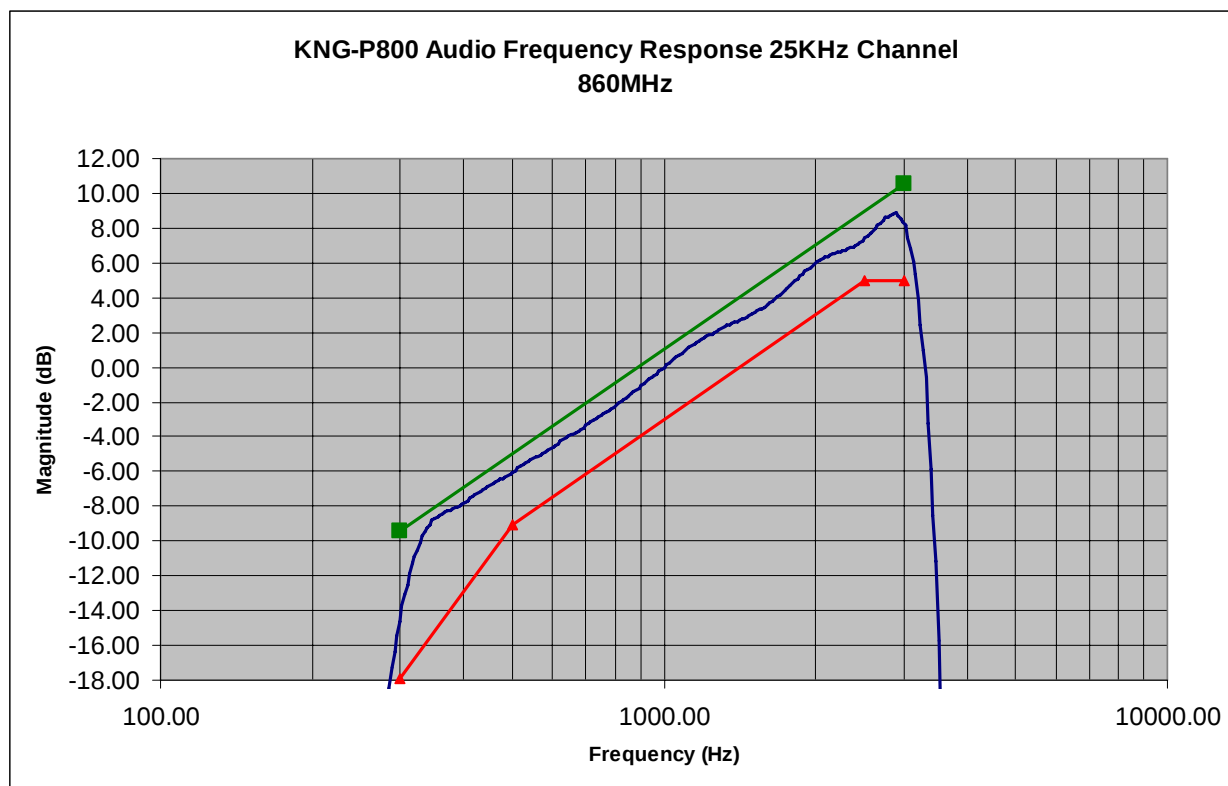


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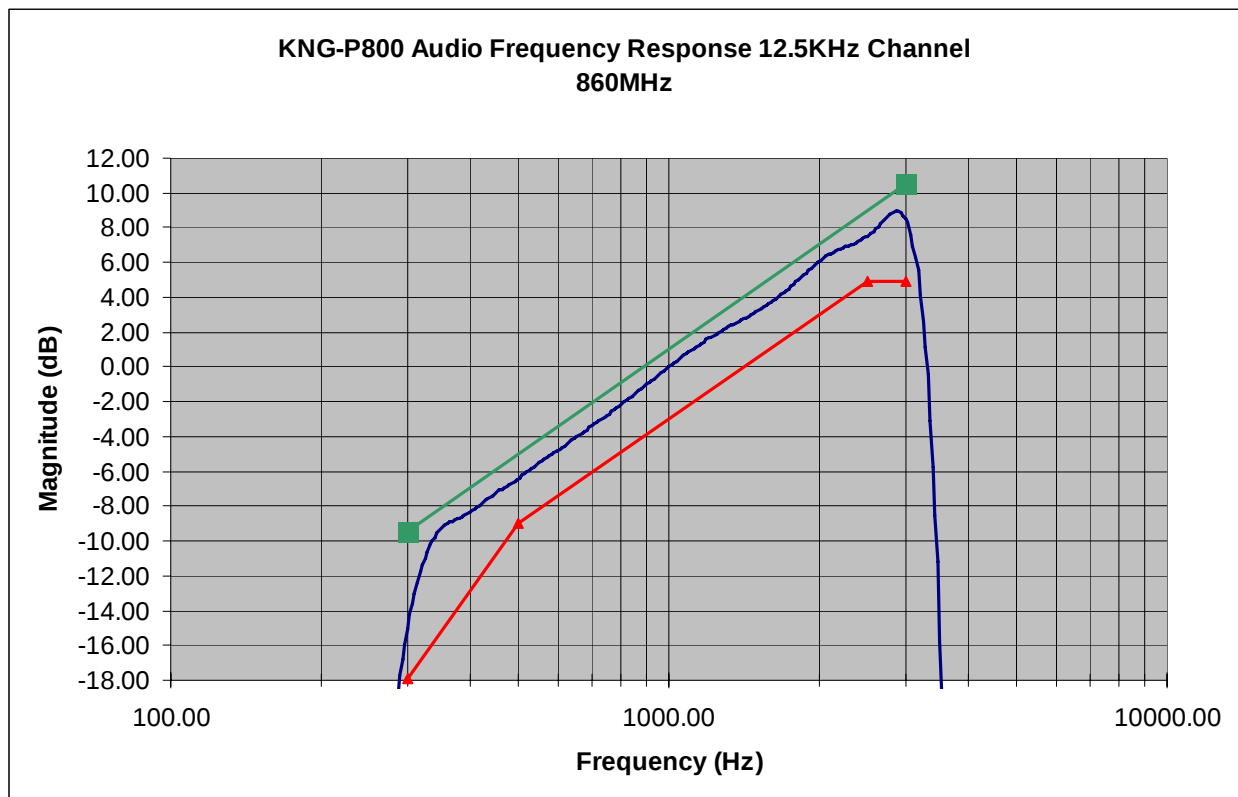


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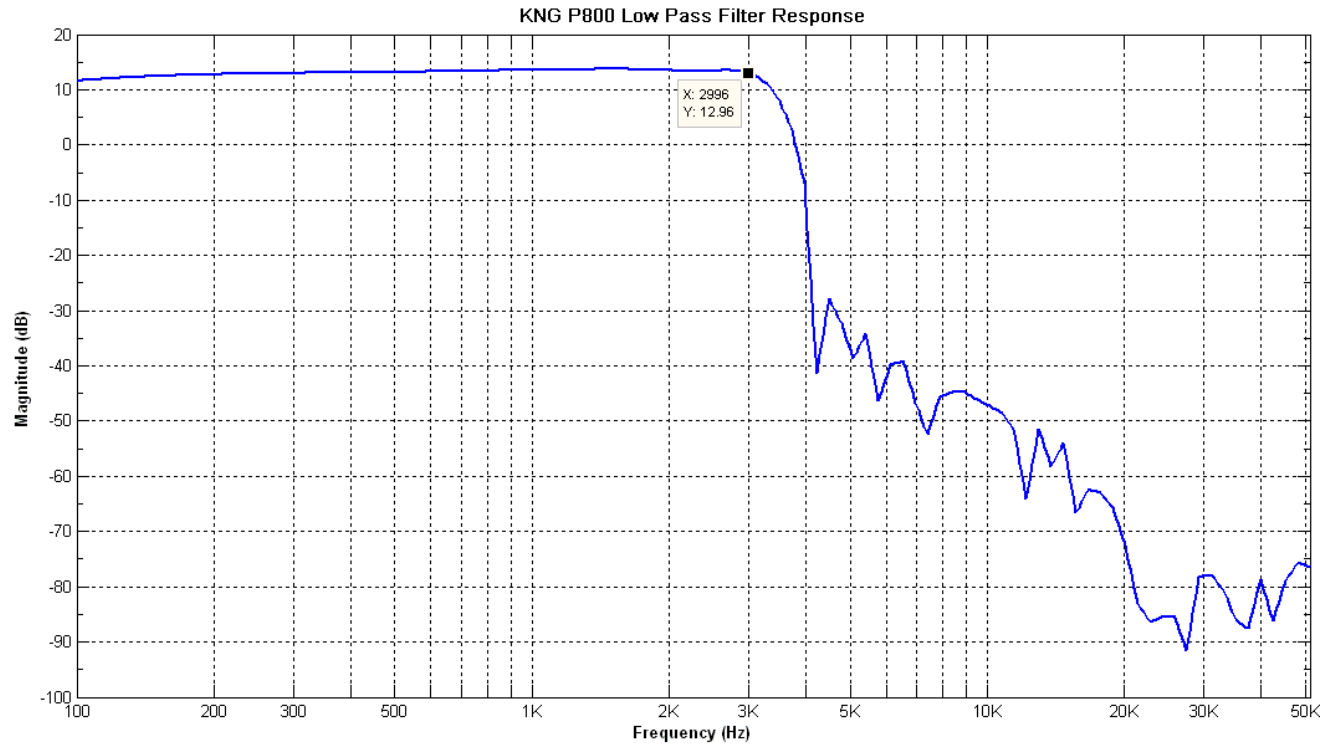
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VOICE MODULATED COMMUNICATION EQUIPMENT

Part 2.1047(a): For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all the circuitry installed between the modulation limiter and the modulated stage shall be submitted.

AUDIO LOW PASS FILTER.



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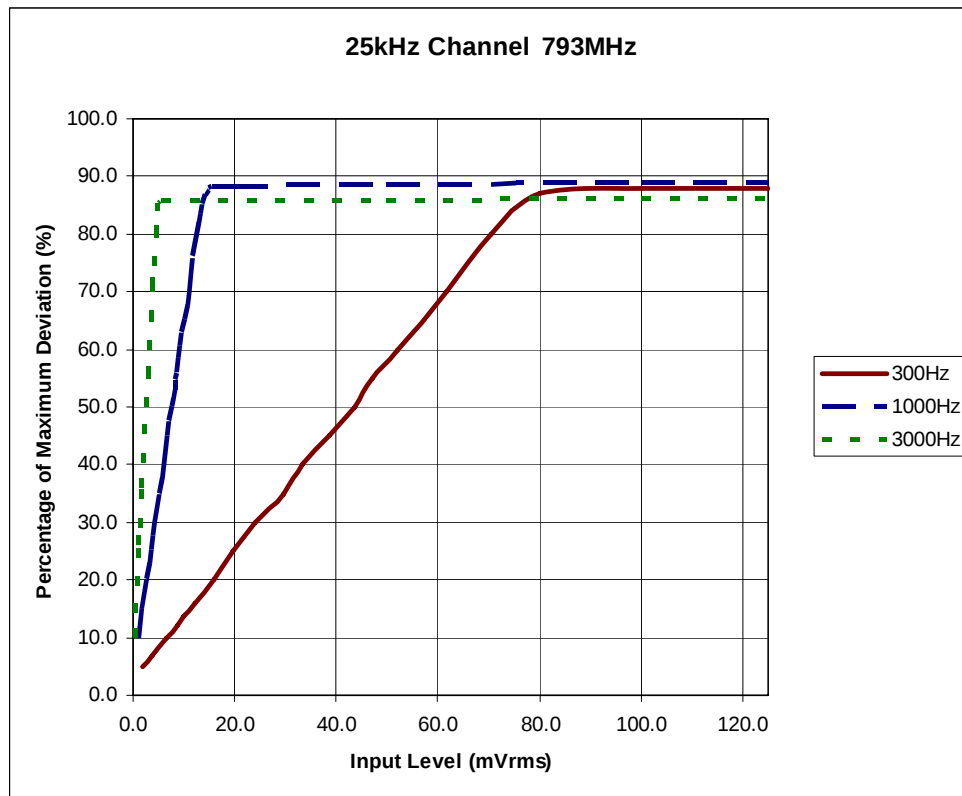
AUDIO INPUT VERSUS MODULATION

Rule Part No.: FCC Part 2.1047(b) & 90, IC RSS-119 5.2

Test Requirements:

Method of Measurement: **Modulation shall not exceed 100%**, The audio input level needed for a particular percentage of modulation was measured in accordance with ANSI/TIA 603-C: 2004. The audio input curves versus modulation are shown below. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.

Test data:

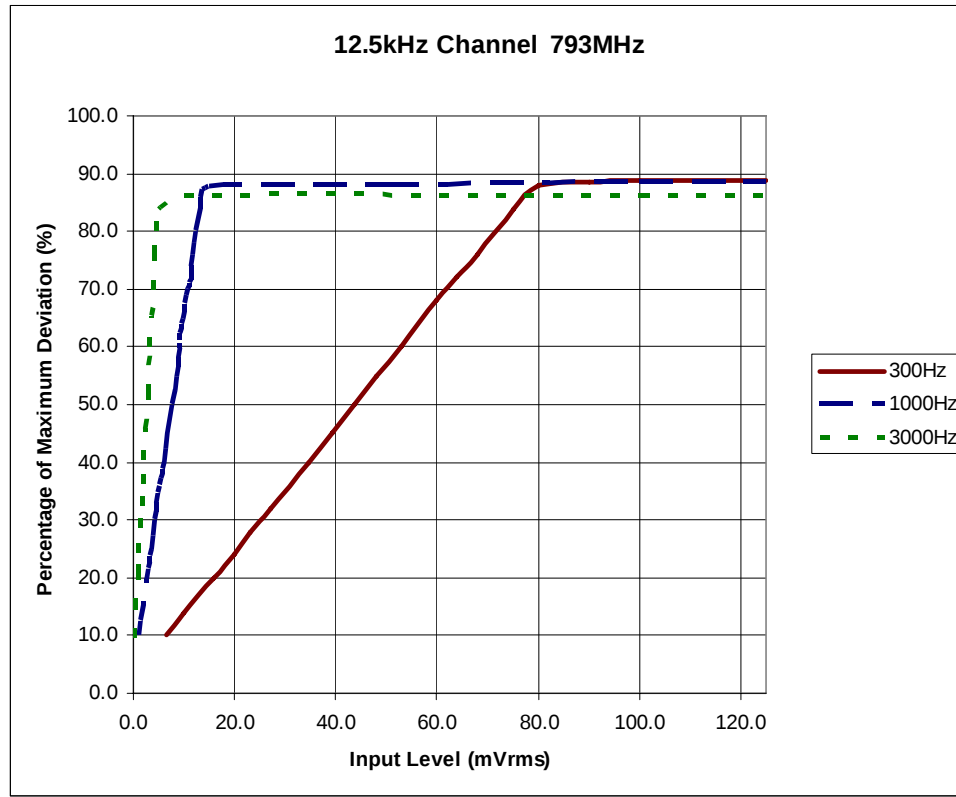


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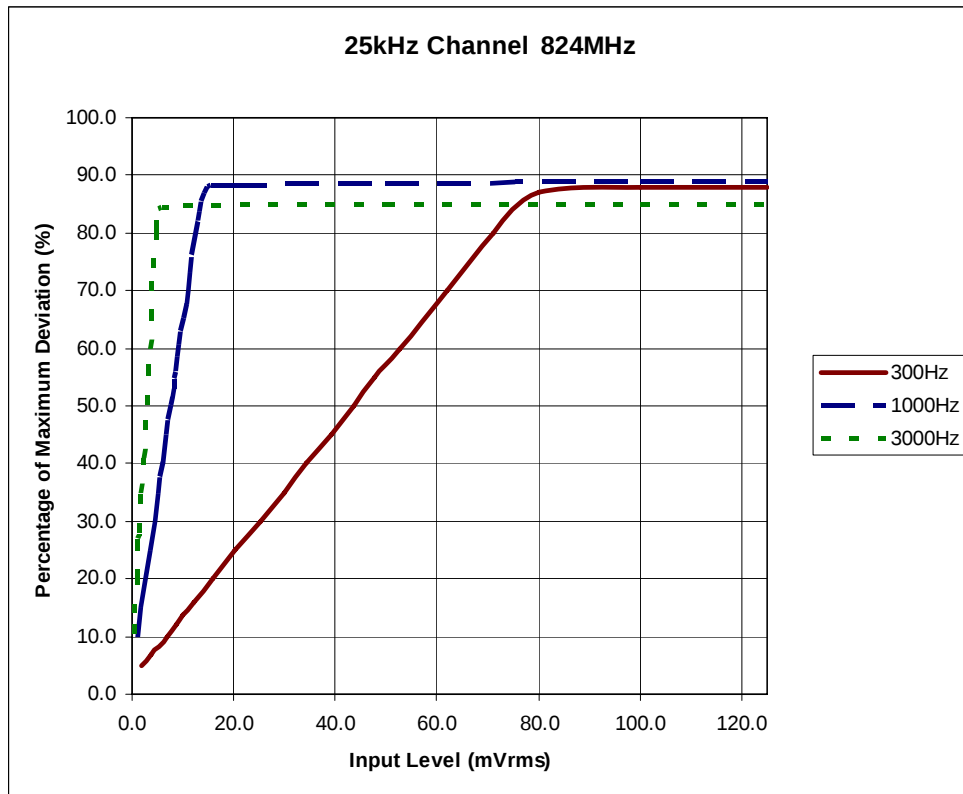


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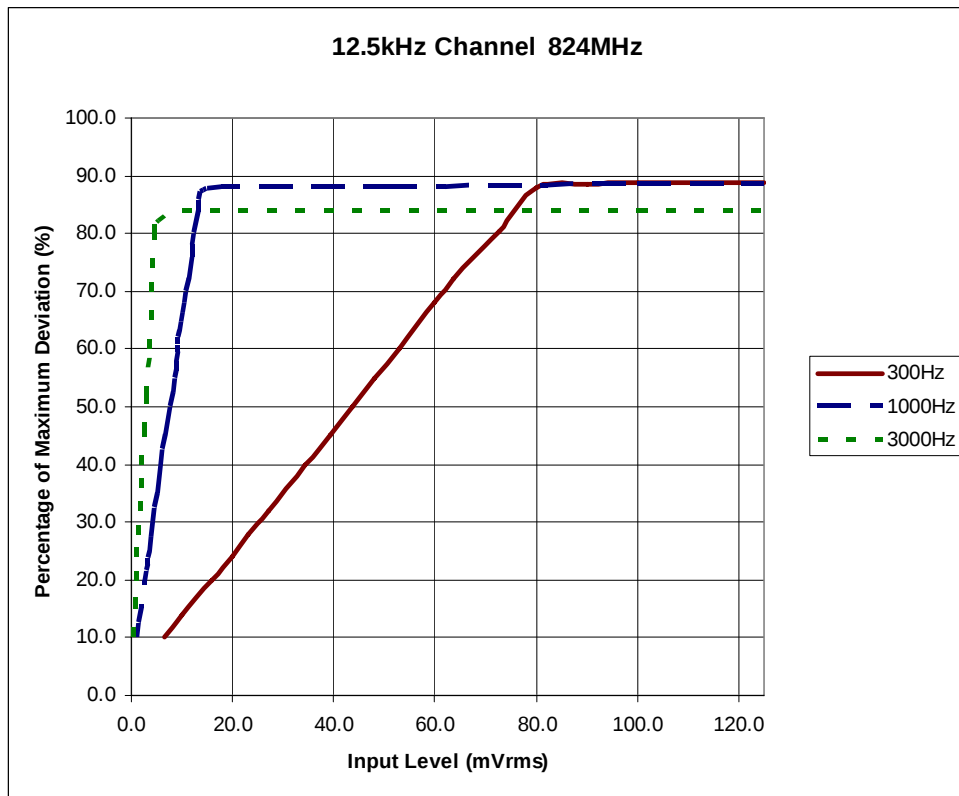


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OTHER MODULATION CHARACTERISTICS

Part 2.1033(c)

Part 2.1033(c) (4) Type of Emission: 16K0F3E

FCC Part 90.209, IC RSS-119 5.5

Part 90.207 $BW=2*(M+D) = 2*(3 \text{ kHz}+5\text{KHZ})=16\text{kHz} \rightarrow 16\text{K0}$
F3E indicates voice.

Designator is therefore: 16K0F3E

Part 2.1033(c)

Part 2.1033(c) (4) Type of Emission: 11K0F3E

Part 90.209

Part 90.207 $BW=2*(M+D)=2*(3 \text{ kHz}+2.5 \text{ K})=11 \text{ kHz} \rightarrow 11\text{K0}$
F3E indicates voice.

Designator is therefore: 11K0F3E

Part 2.1033(c)

Part 2.1033(c) (4) Type of Emission: 8K10F1D

Part 90.209

Part 90.207 $BW=8.1 \text{ kHz}$ from using 99% energy bandwidth
F1D indicates digital data.

Designator is therefore: 8K10F1D

Part 2.1033(c)

Part 2.1033(c) (4) Type of Emission: 8K10F1E

Part 90.209

Part 90.207 $BW=8.1 \text{ kHz}$ from using 99% energy bandwidth
F1E indicates digital voice.

Designator is therefore: 8K10F1E

Applicant: RELM WIRELESS CORP. – BK RADIO

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OCCUPIED BANDWIDTH

FCC Part 2.1049(c), RSS-GEN 4.6 EMISSION BANDWIDTH FCC Part 90.210(b) RSS-119 4.2 25kHz Channel Spacing

Data in the plots show that on any frequency removed from the assigned frequency by more than 50%, but not more than 100%: At least 25dB. On any frequency removed from the assigned frequency by more than 100%, but not more than 250%: At least 35 dB. On any frequency removed from the assigned frequency by more than 250%, of the authorized bandwidth: At least $43 + 10\log(P)$ dB.

Part 90.210(c) 12.5kHz Channel Spacing Not Equipped with a Low Pass Filter

For transmitters that are not equipped with an audio low pass filter pursuant to S90.211 (b), the power of any emission must be attenuated below the un-modulated carrier output power as follows; (1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5 kHz but not more than 10 kHz: At least $83 \log(f_d/5)$ dB; (2) ON any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 10 kHz, but not more than 250% of the authorized bandwidth: At least $29 \log(f_d/11)$ dB or 50 dB, whichever is the lesser attenuation; (3) On any frequency removed from the center of the authorized bandwidth by more than 250% of the authorized bandwidth: At least $43 + 10 \log(P_o)$ dB.

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.

Applicant: RELM WIRELESS CORP. – BK RADIO

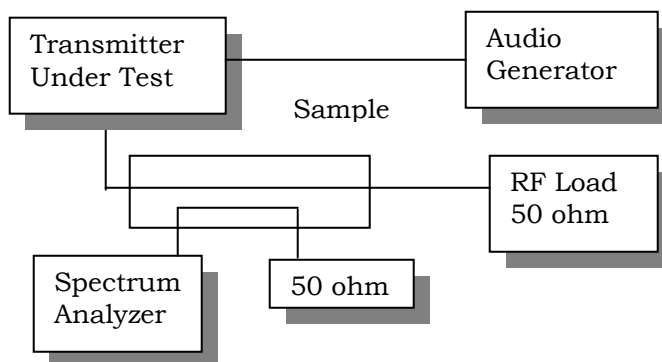
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Method of Measurement: ANSI/TIA 603-C: 2004

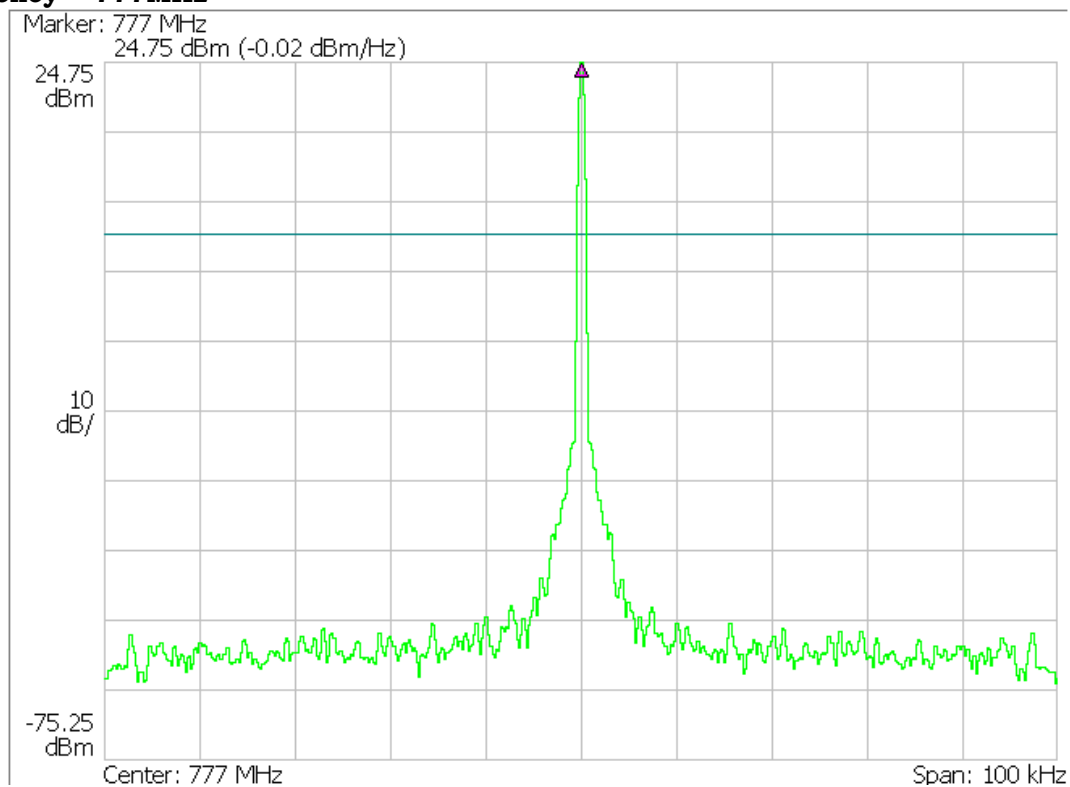
Test Setup Diagram:



OCCUPIED BANDWIDTH PLOTS

Occupied Bandwidth No Modulation

Frequency = 777MHz



Applicant: RELM WIRELESS CORP. – BK RADIO

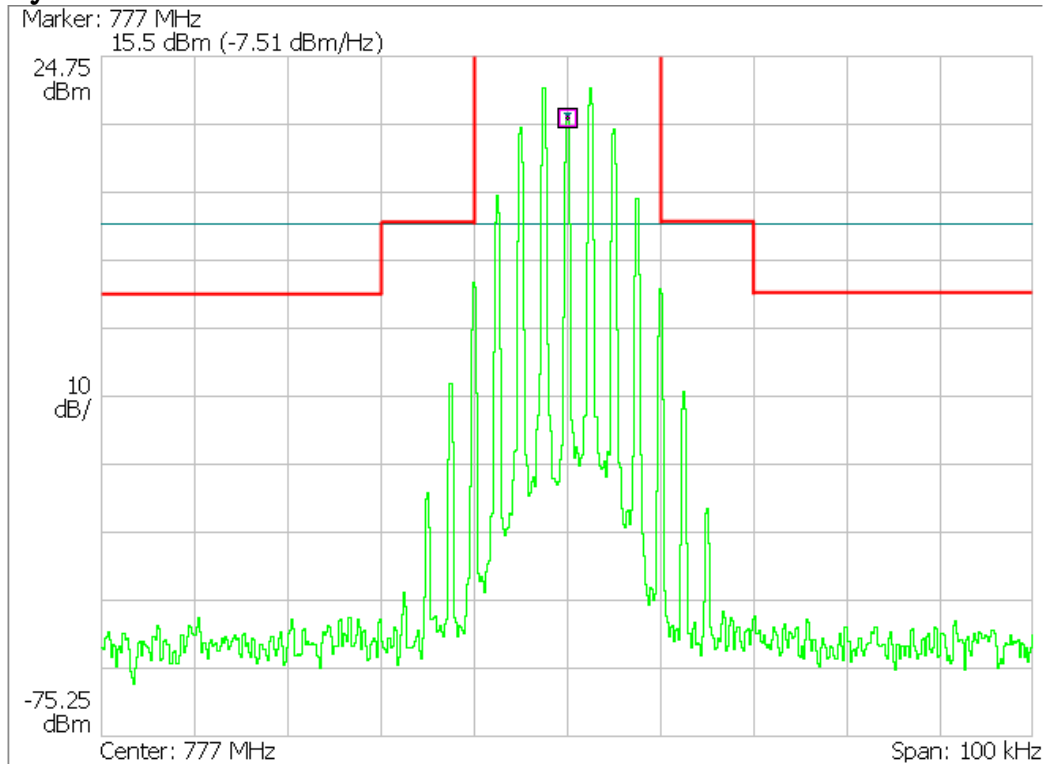
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Part 90.210(b) Emission Mask B - 25 kHz channel
Frequency = 777MHz

Analog Voice 16K0F3E



Applicant: RELM WIRELESS CORP. - BK RADIO

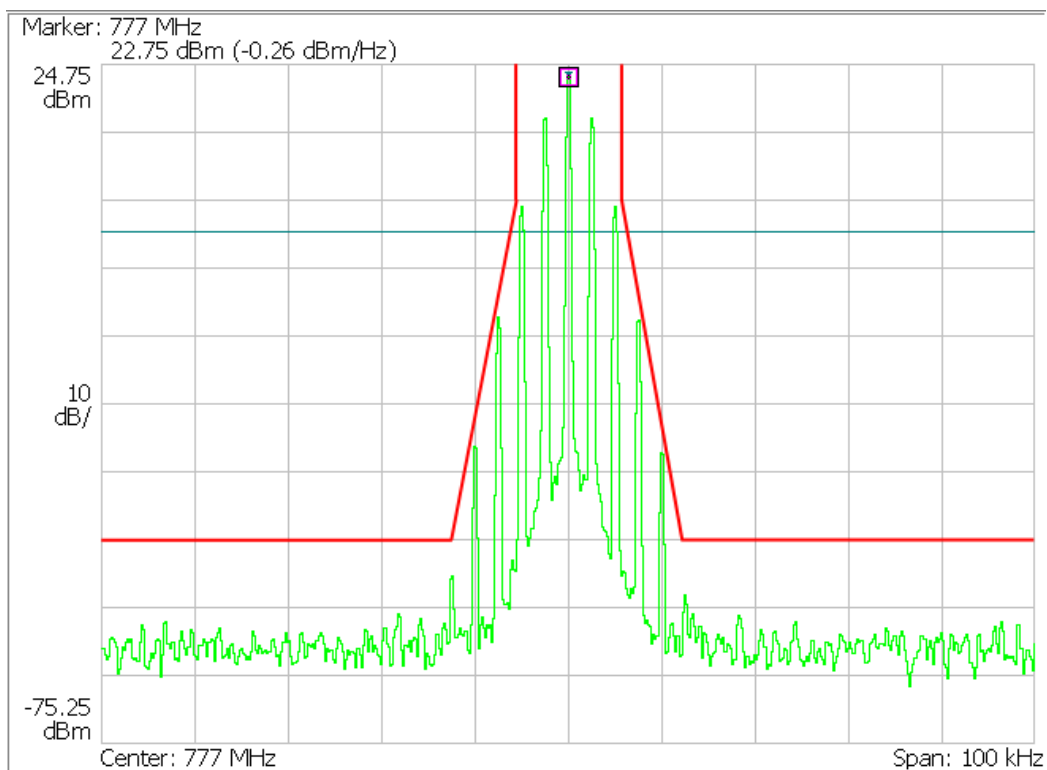
FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

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

Analog Voice 11K0F3E



Applicant: RELM WIRELESS CORP. – BK RADIO

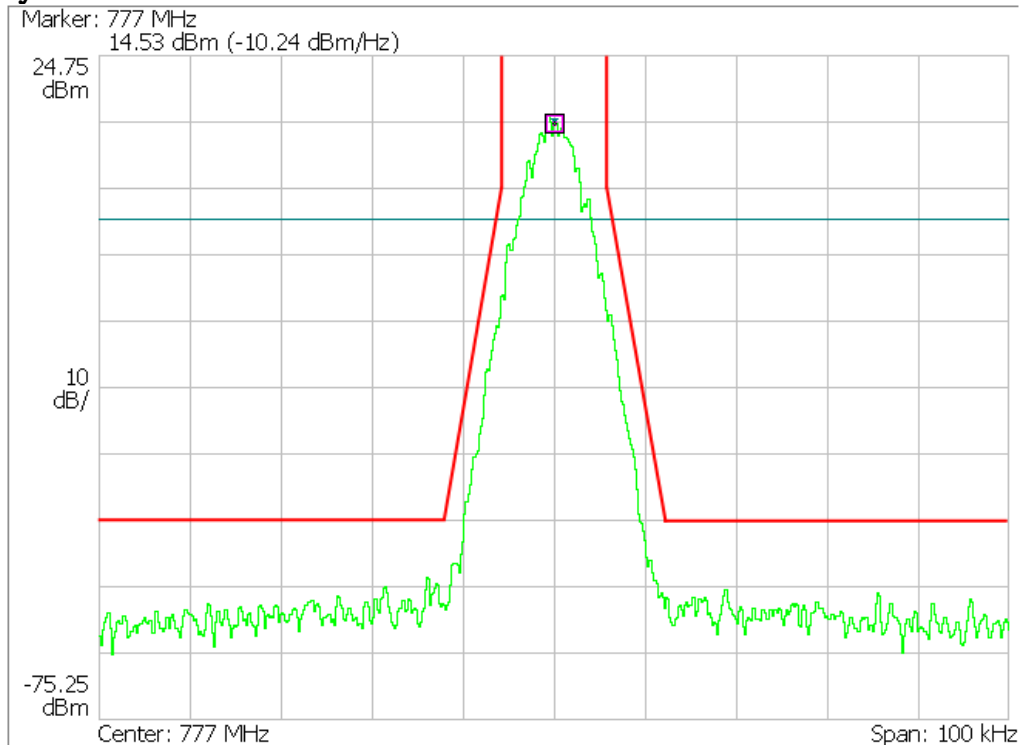
FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

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

Digital Voice 8K10F1E



Applicant: RELM WIRELESS CORP. – BK RADIO

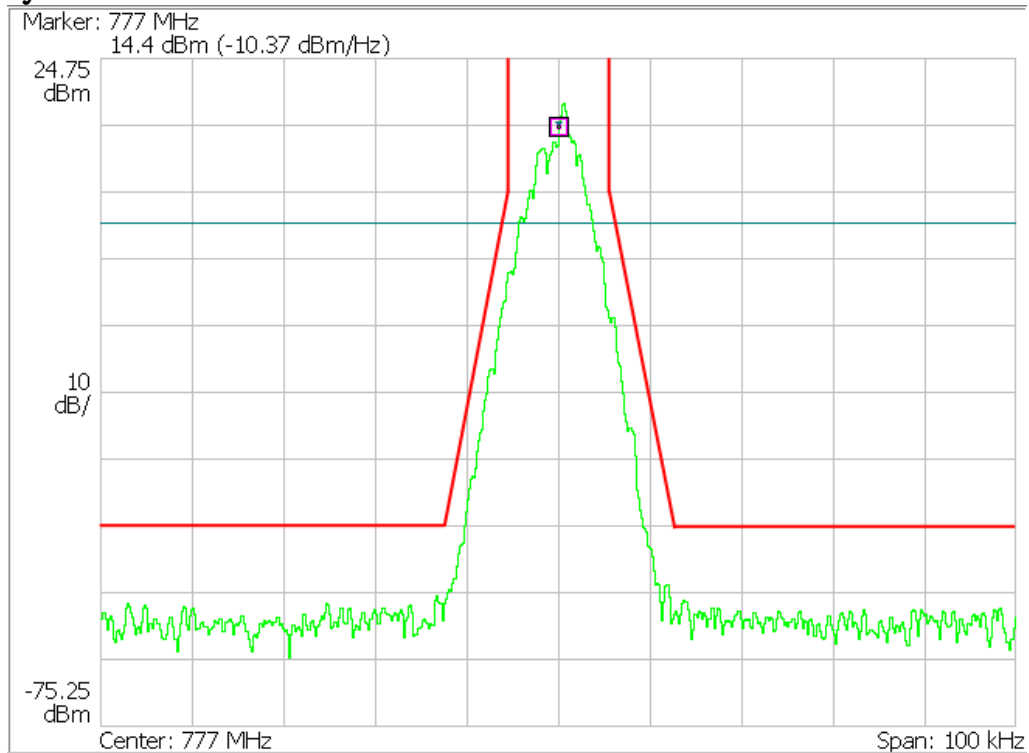
FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

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

Digital Data 8K10F1D



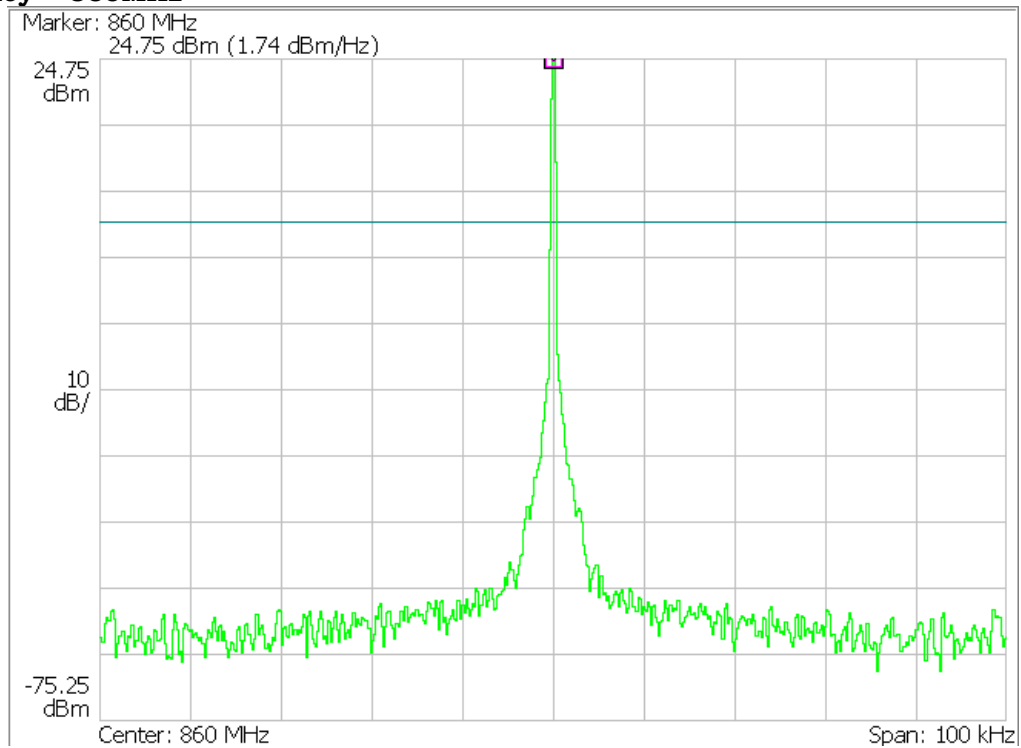
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Occupied Bandwidth No Modulation
Frequency = 860MHz



Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Part 90.210(b) Emission Mask B - 25 kHz channel
Frequency = 860MHz

Analog Voice 16K0F3E



Applicant: RELM WIRELESS CORP. – BK RADIO

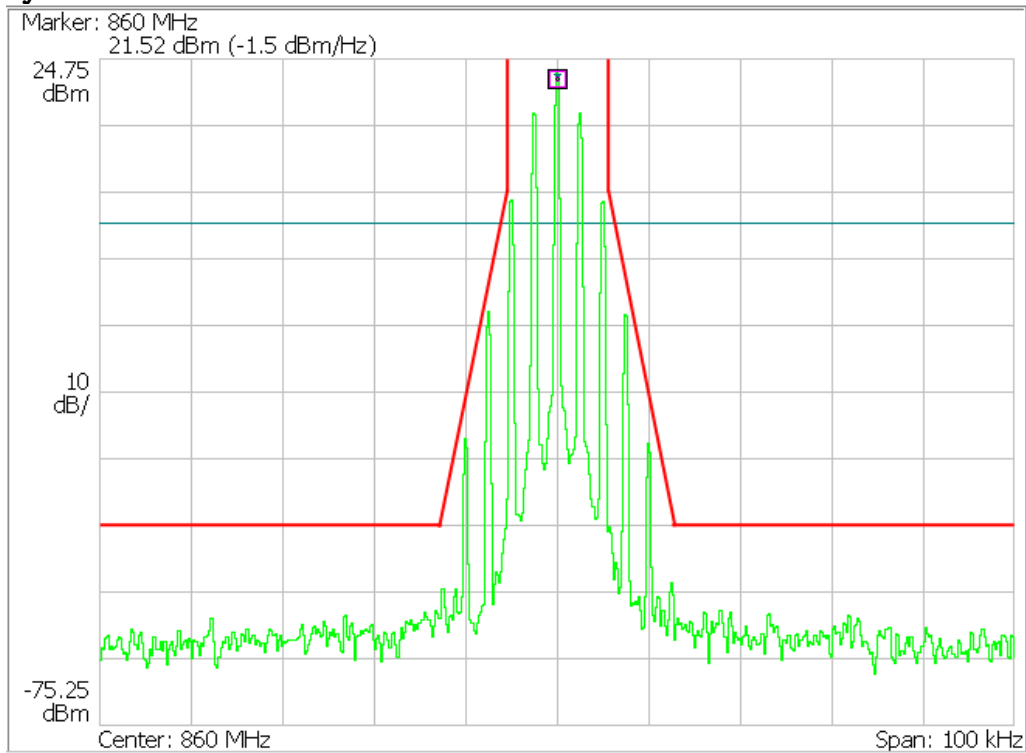
FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Part 90.210(d) Emission Mask D - 12.5 kHz channel
Frequency = 860MHz

Analog Voice 11K0F3E



Applicant: RELM WIRELESS CORP. – BK RADIO

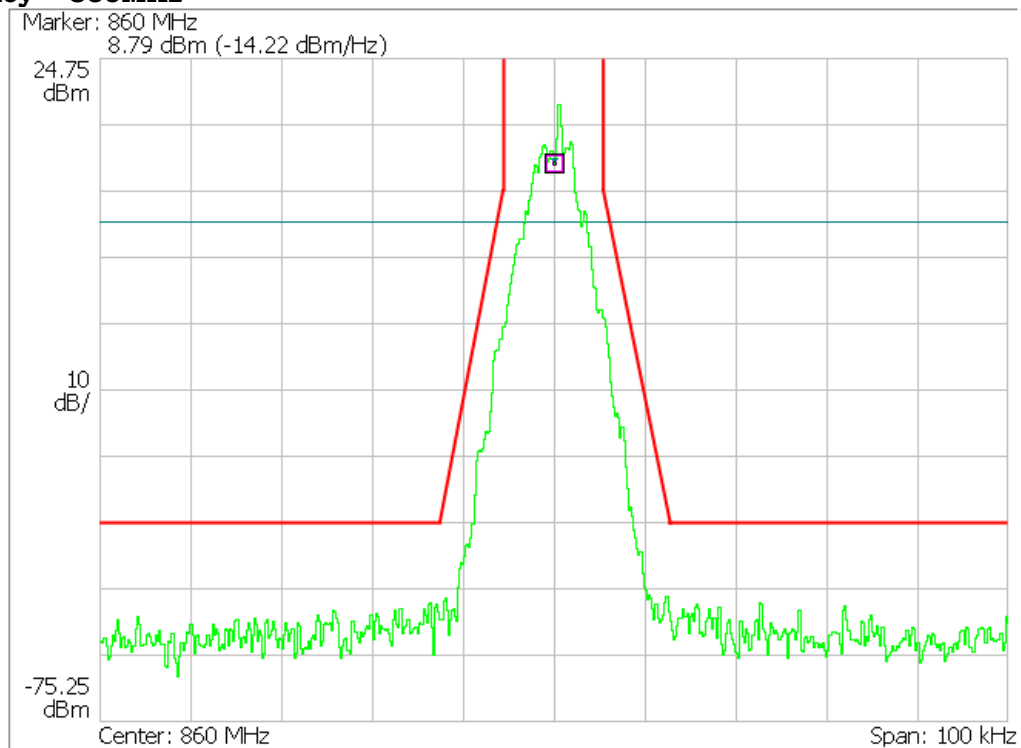
FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Part 90.210(d) Emission Mask D - 12.5 kHz channel
Frequency = 860MHz

Digital Voice 8K10F1E



Applicant: RELM WIRELESS CORP. – BK RADIO

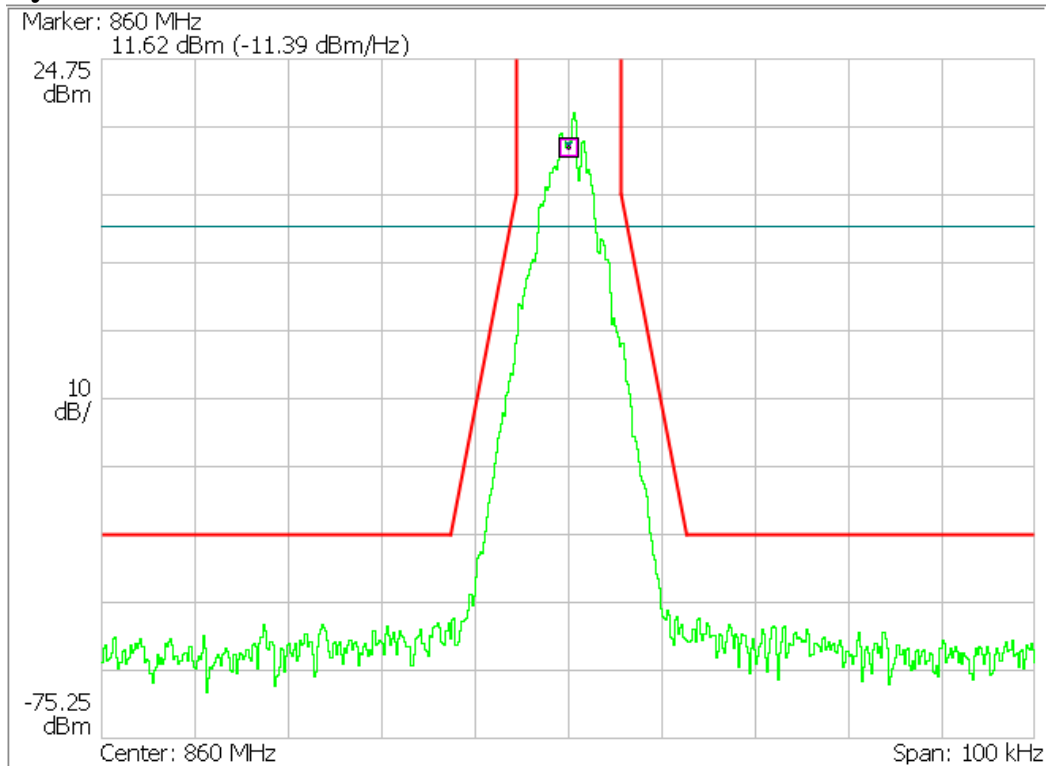
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IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Part 90.210(d) Emission Mask D - 12.5 kHz channel
Frequency = 860MHz

Digital Data 8K10F1D



Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Rule Part No.: FCC Part 2.1051(a), RSS-GEN 7.1.4

Requirements:

700MHz

25kHz Channel Spacing = $43 + 10\log(2.99) = 47.8$ dBc

12.5kHz Channel Spacing = $50 + 10\log(2.99) = 54.8$ dBc

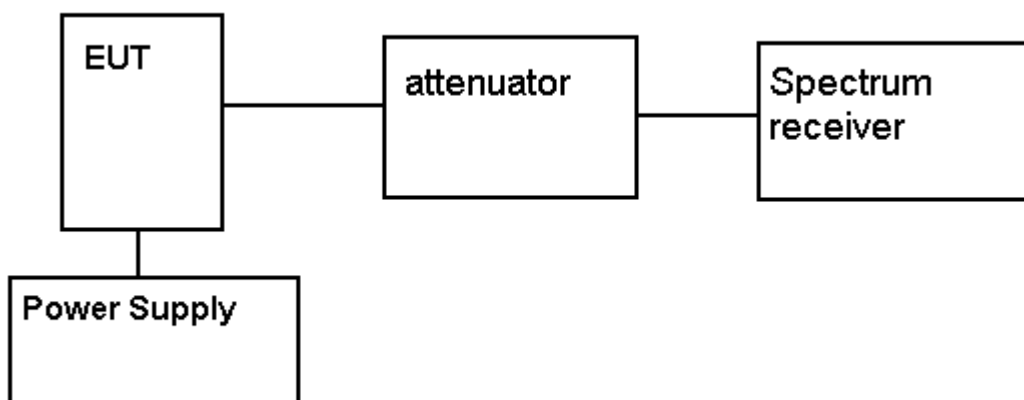
800MHz

25kHz Channel Spacing = $43 + 10\log(3.49) = 48.4$ dBc

12.5kHz Channel Spacing = $50 + 10\log(3.49) = 55.4$ dBc

Method of Measurement: The carrier was modulated 100% using a 2500 Hz tone. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard ANSI/TIA 603-C: 2004.

Method of Measuring Conducted Spurious Emissions



Applicant: RELM WIRELESS CORP. – BK RADIO

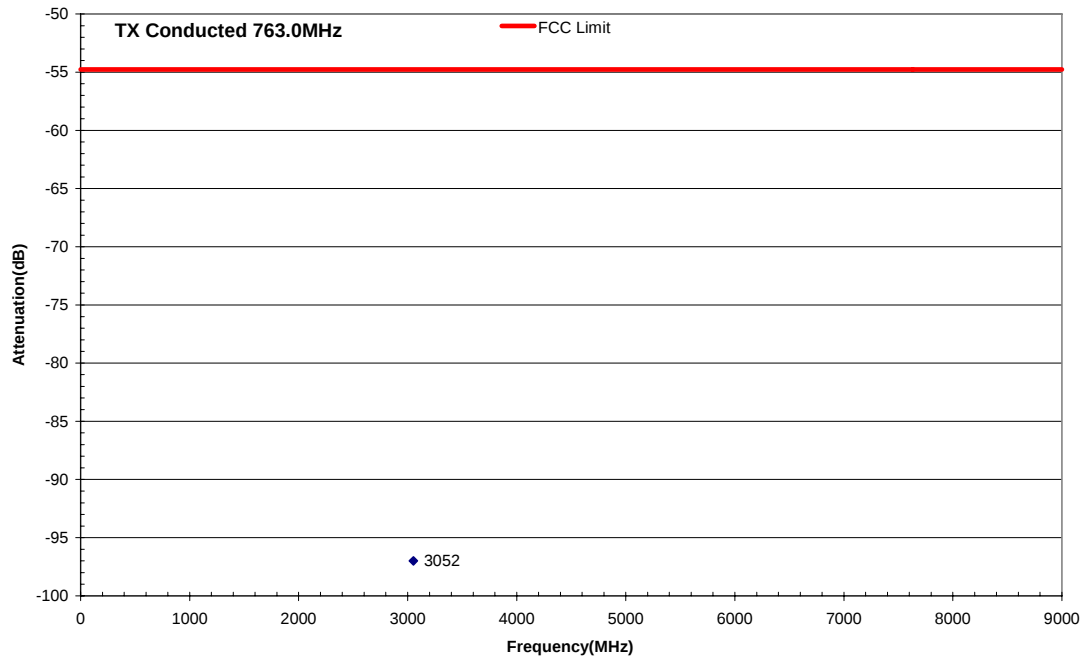
FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Test Data:

Transmit Conducted 763MHz



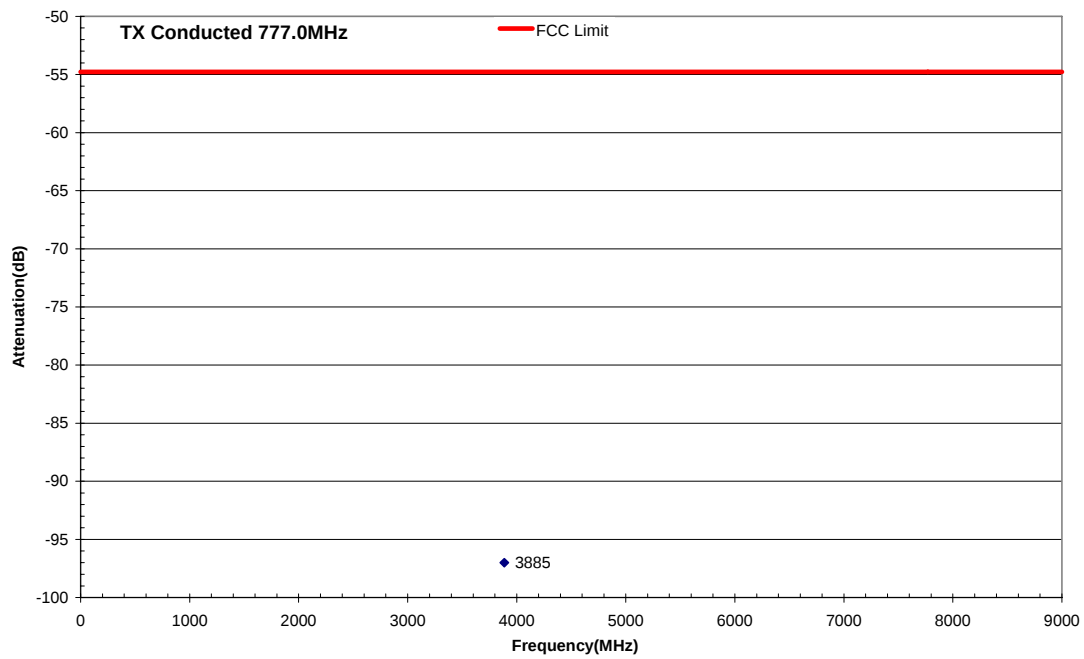
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

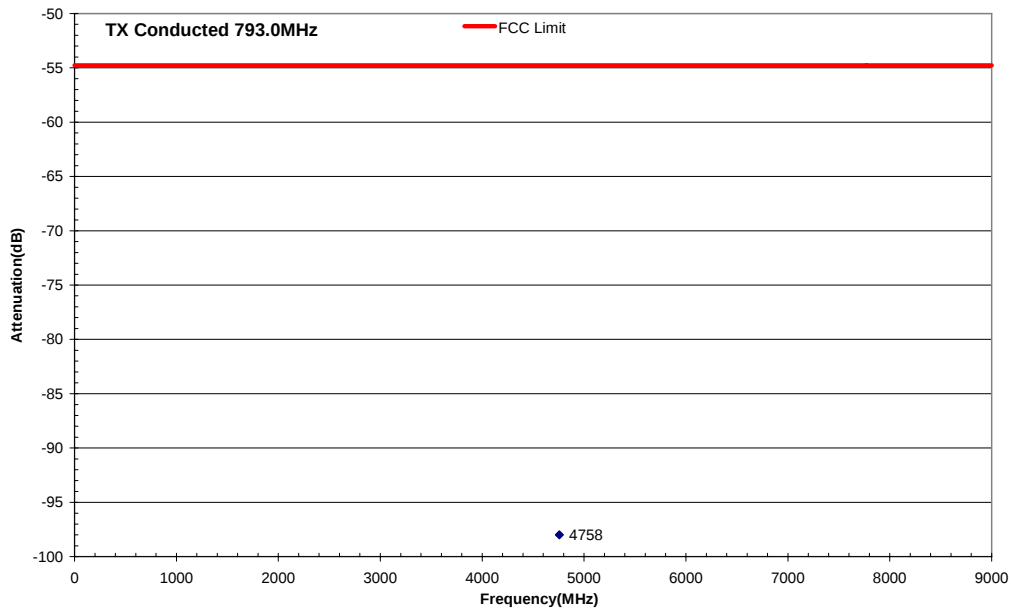
IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Transmit Conducted 777MHz



Transmit Conducted 793MHz



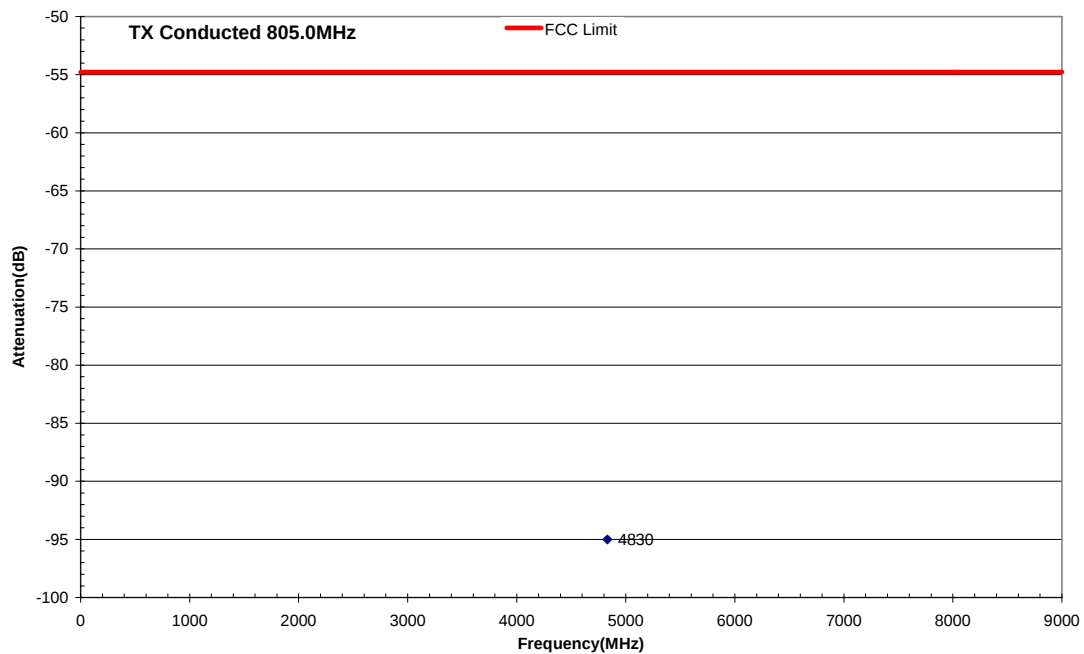
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

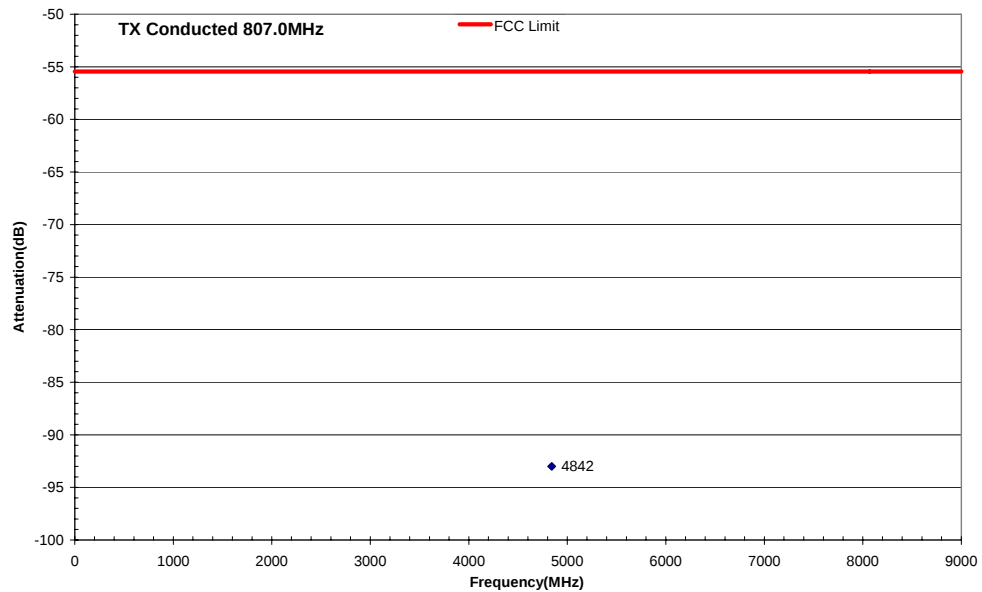
IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Transmit Conducted 805MHz



Transmit Conducted 807MHz



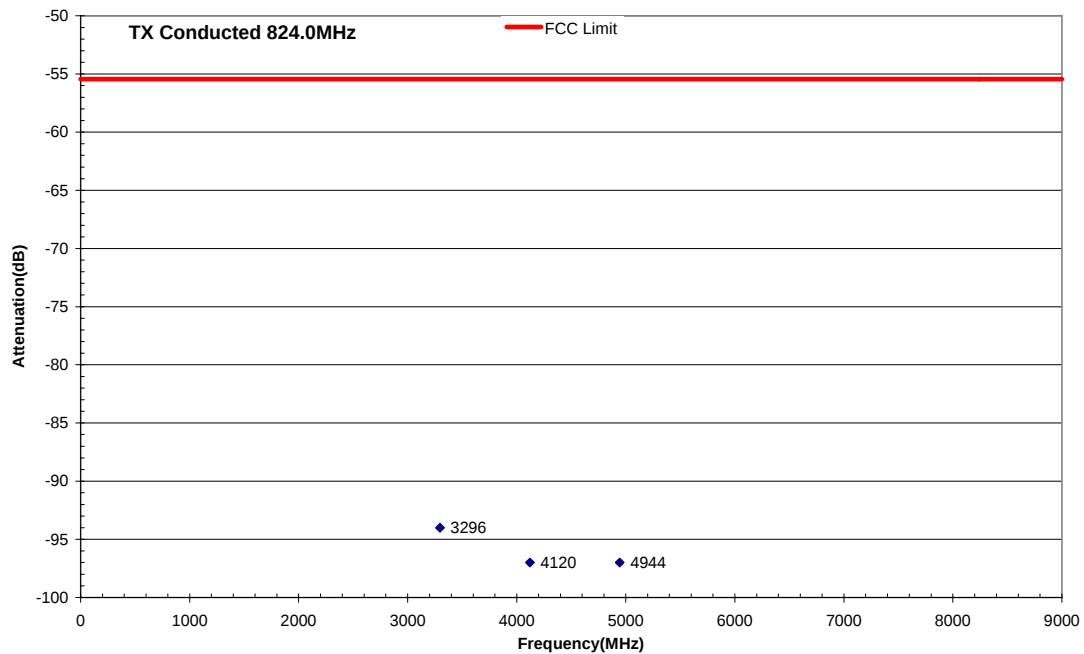
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

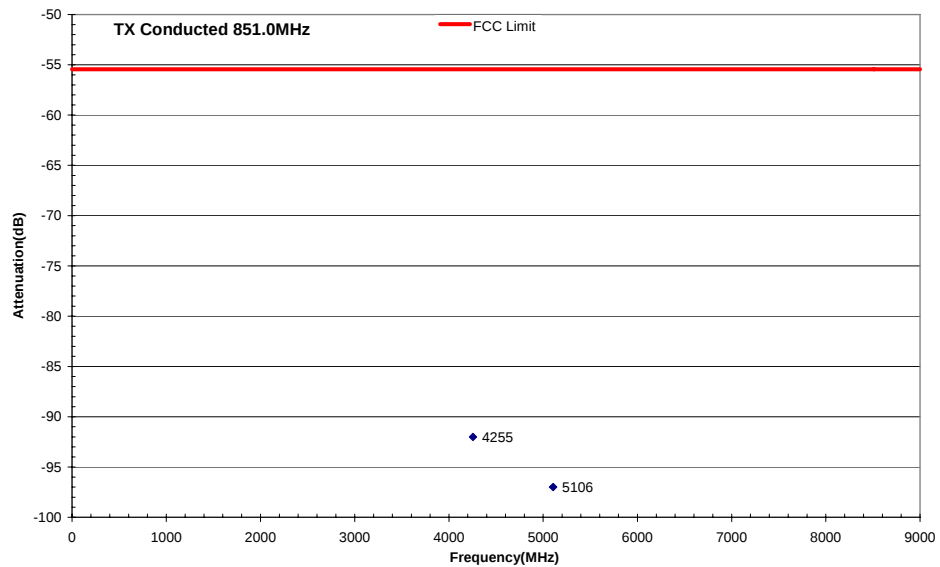
IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Transmit Conducted 824MHz



Transmit Conducted 851MHz



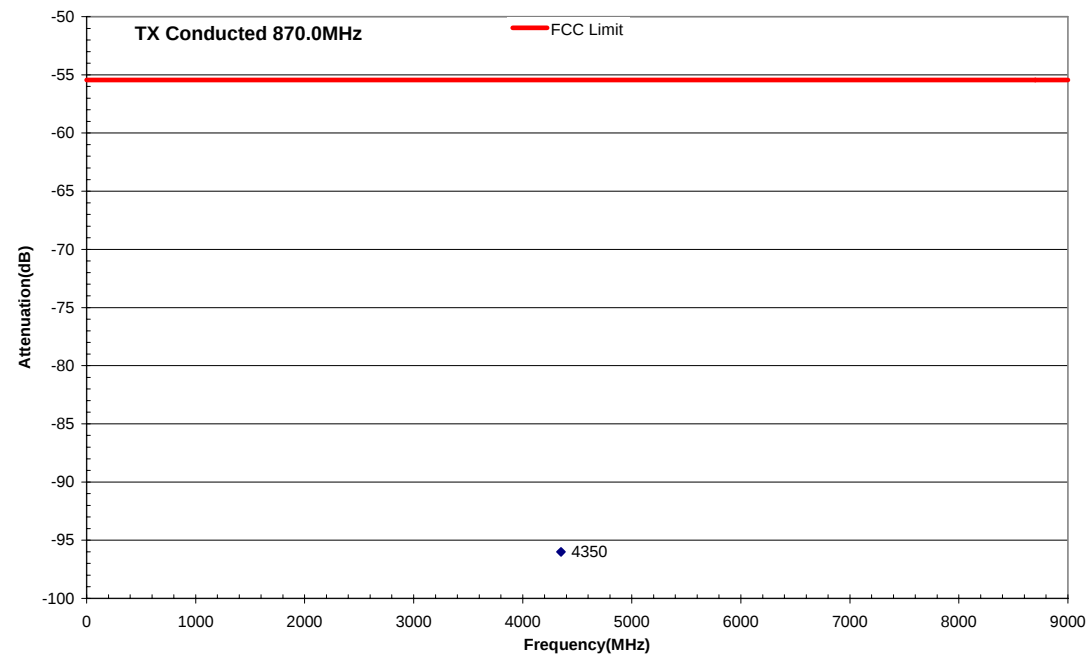
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Transmit Conducted 870MHz



Applicant: RELM WIRELESS CORP. – BK RADIO
FCC ID: K95KNGP800C
IC: 2116A-KNGP800C
Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

FREQUENCY STABILITY

Rule Parts. No.: FCC Part 2.1055, Part 90.213, RSS-119 5.3, RSS-GEN 7.2.4

Requirements: Temperature range requirements: -30 to +50° C.
Voltage Variation +, -15%
±2.5 PPM

Method of Measurements: ANSI/TIA 603-C: 2004.

Test Data:

Frequency Stability Over Temperature at 793MHz

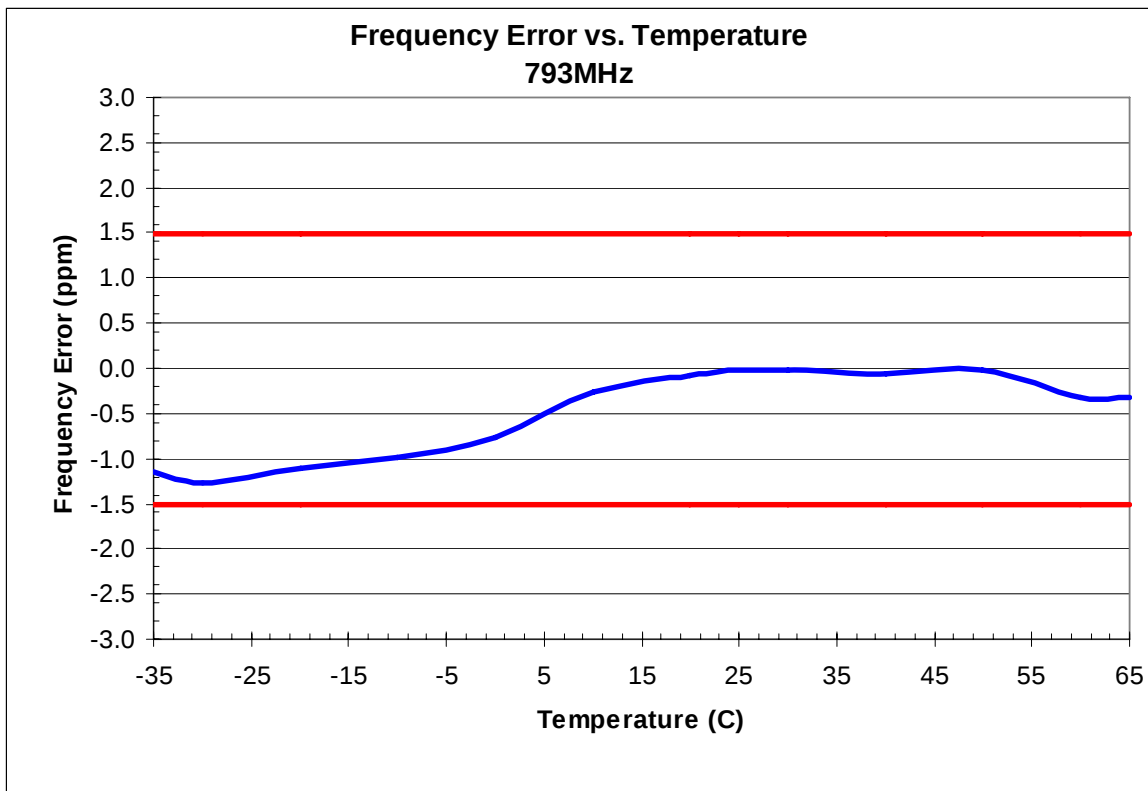
Assigned Frequency - 793 MHz		
Temperature (°C)	Frequency (MHz)	Frequency Stability (PPM)
-30	792.998992	-1.271
-20	792.999120	-1.11
-10	792.999212	-0.994
0	792.999387	-0.773
+10	792.999789	-0.266
+20	792.999938	-0.073
+30	792.999980	-0.025
+40	792.999945	-0.069
+50	792.999980	-0.025

Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc



Frequency Stability Over Temperature at 824MHz

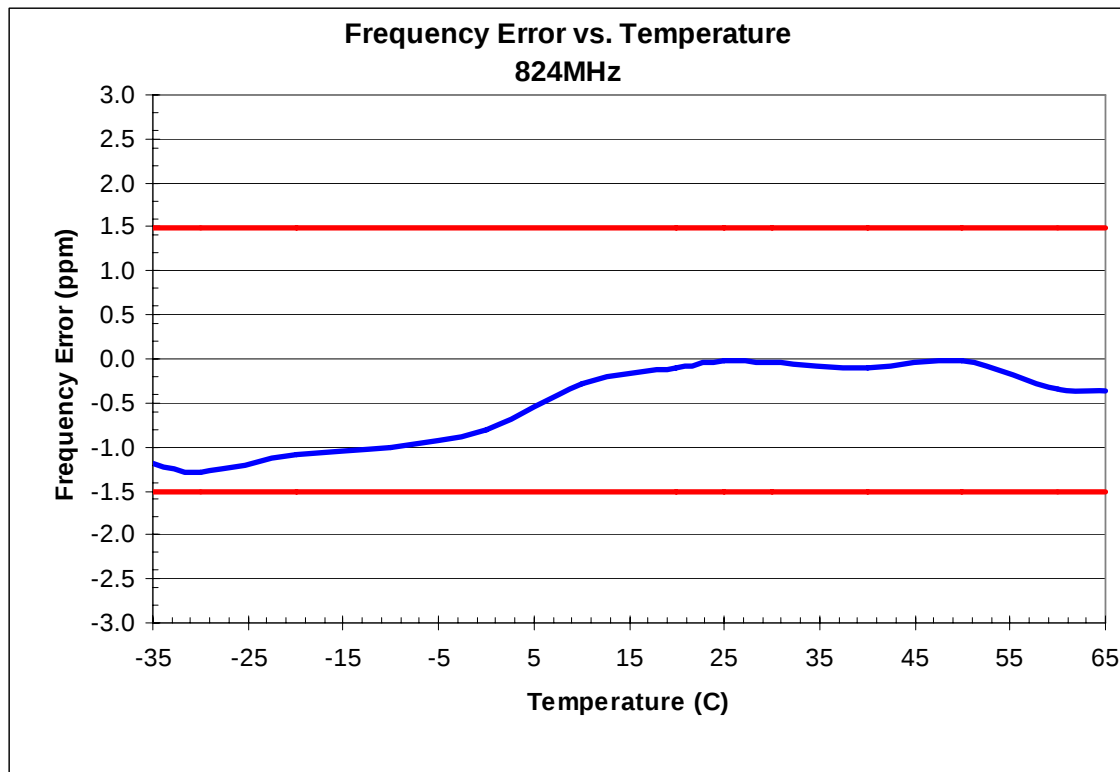
Assigned Frequency - 824 MHz		
Temperature (°C)	Frequency (MHz)	Frequency Stability (PPM)
-30	823.998945	-1.280
-20	823.999098	-1.095
-10	823.999175	-1.001
0	823.999338	-0.803
+10	823.999772	-0.277
+20	823.999917	-0.101
+30	823.999970	-0.036
+40	823.999922	-0.095
+50	823.999990	-0.012

Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc



Frequency Stability Over Voltage at 793MHz

Battery Voltage = 10.8V

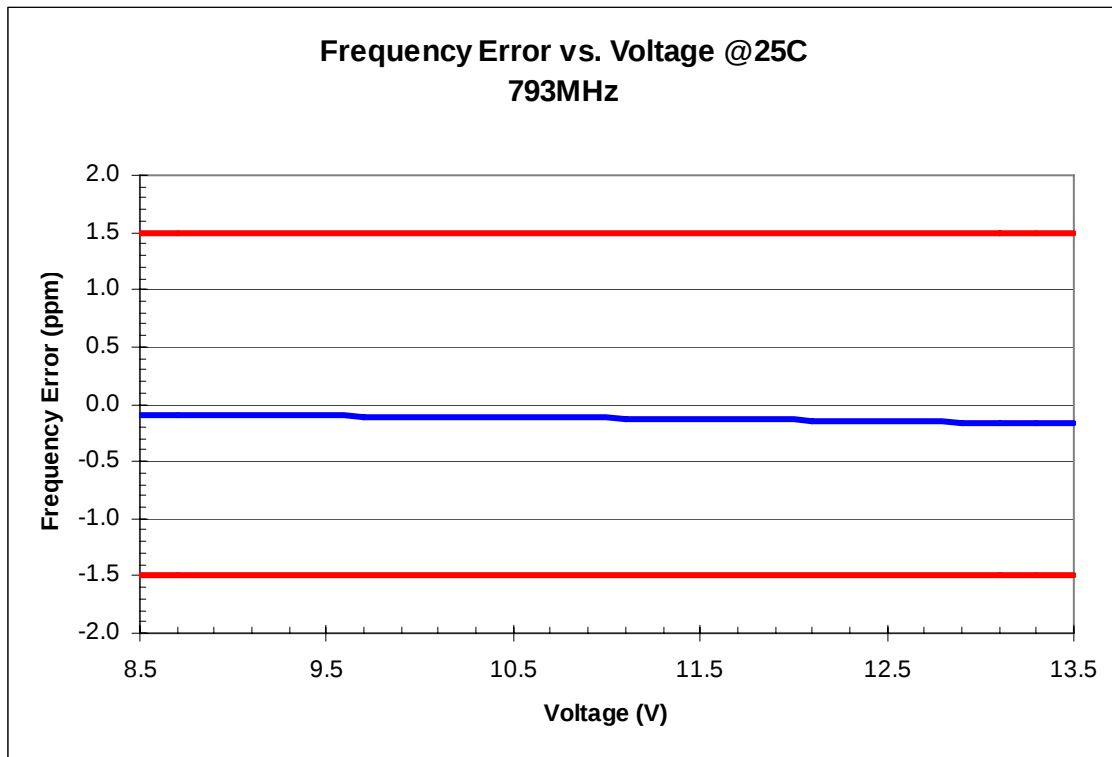
Assigned Frequency = 793MHz		
% Battery	Frequency (MHz)	Frequency Stability (PPM)
-15%	792.999920	-0.101
0	792.999905	-0.12
+15%	792.999882	-0.149

Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc



Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

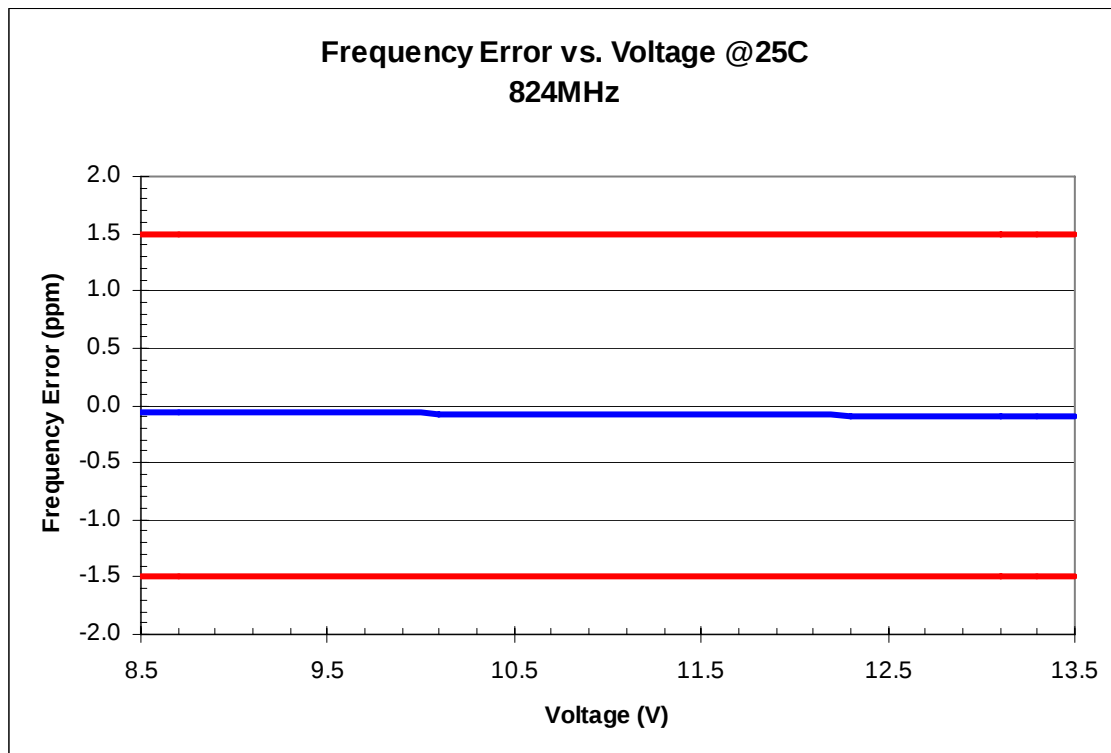
IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Frequency Stability Over Voltage at 824MHz

Battery Voltage = 10.8V

Assigned Frequency = 824MHz		
% Battery	Frequency (MHz)	Frequency Stability (PPM)
-15%	823.999945	-0.067
0	823.999944	-0.068
+15%	823.999943	-0.069



Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

TRANSIENT FREQUENCY BEHAVIOR

FCC Part 2.1055(a)(1)

FCC Part 90.214, IC RSS-119 5.8

REQUIREMENTS: Transmitters designed to operate in the 806-940MHz frequency bands must maintain transient frequencies within the maximum transient frequencies within the maximum frequency difference limits during the time intervals indicated:

Time Intervals	Maximum frequency difference	All Equipment
		806-940MHz

Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels

t_1^*	± 25.0 kHz	20.0 ms
t_2	± 12.5 kHz	50.0 ms
t_3^*	± 25.0 kHz	10.0 ms

Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels

t_1^*	± 12.5 kHz	20.0 ms
t_2	± 6.25 kHz	50.0 ms
t_3^*	± 12.5 kHz	10.0 ms

Transient Frequency Difference Limits

Time Interval	Maximum Permitted Frequency Difference for 25 kHz Channel Spacing (kHz)	Maximum Permitted Frequency Difference for 12.5 kHz Channel Spacing (kHz)
t_1 or t_3	25	12.5
t_2	12.5	6.25

t_{on} is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

t_1 is the time period immediately following t_{on} .

t_2 is the time period immediately following t_1 .

t_3 is time period from the instant when the transmitter is turned off until t_{off}

t_{off} is the instant when the 1 KHz test signal starts to rise.

*** If the transmitter carrier output power rating is 6 watts or less, the frequency difference during the time period may exceed the maximum frequency difference for the time period.**

Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

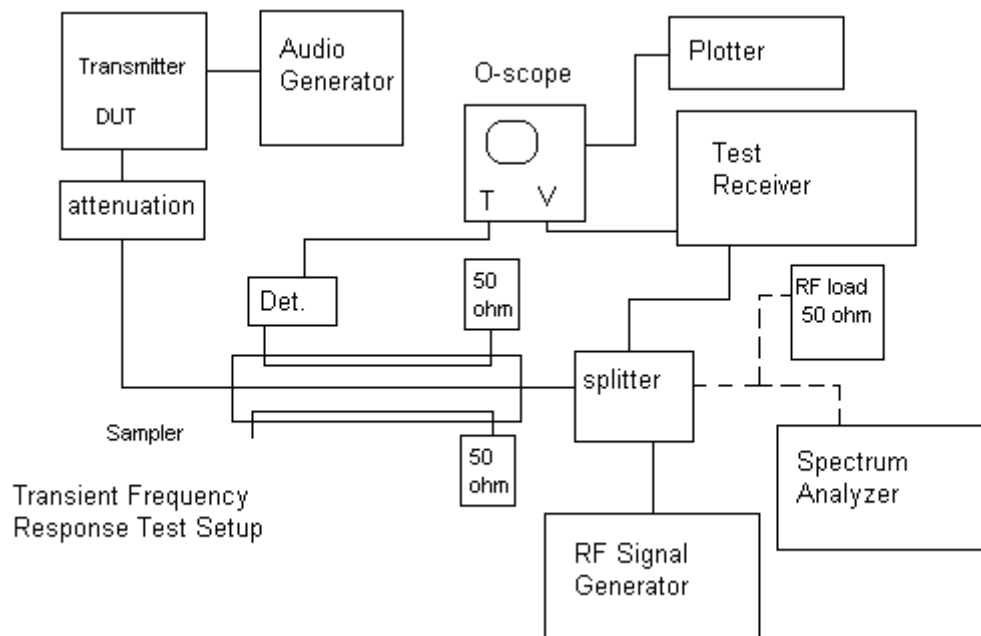
TEST PROCEEDURE: ANSI/TIA 603-C: 2004, the levels were set as follows:

Using the variable attenuator the transmitter level was set to 40 dB below the test receivers maximum input level, then the transmitter was turned off.

With the transmitter off the signal generator was set 20dB below the level of the transmitter in the above step, this level will be maintained with the signal generator through-out the test.

Reduce the attenuation between the transmitter and the RF detector by 30 dB.

With the levels set as above, the transient frequency behavior was observed and recorded.



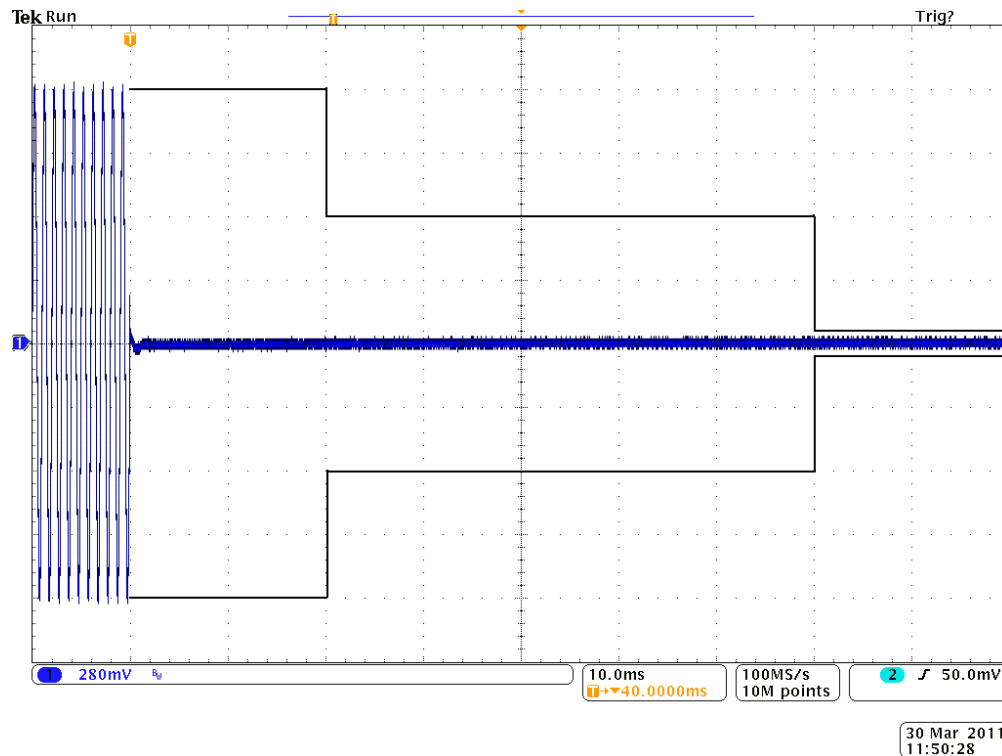
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

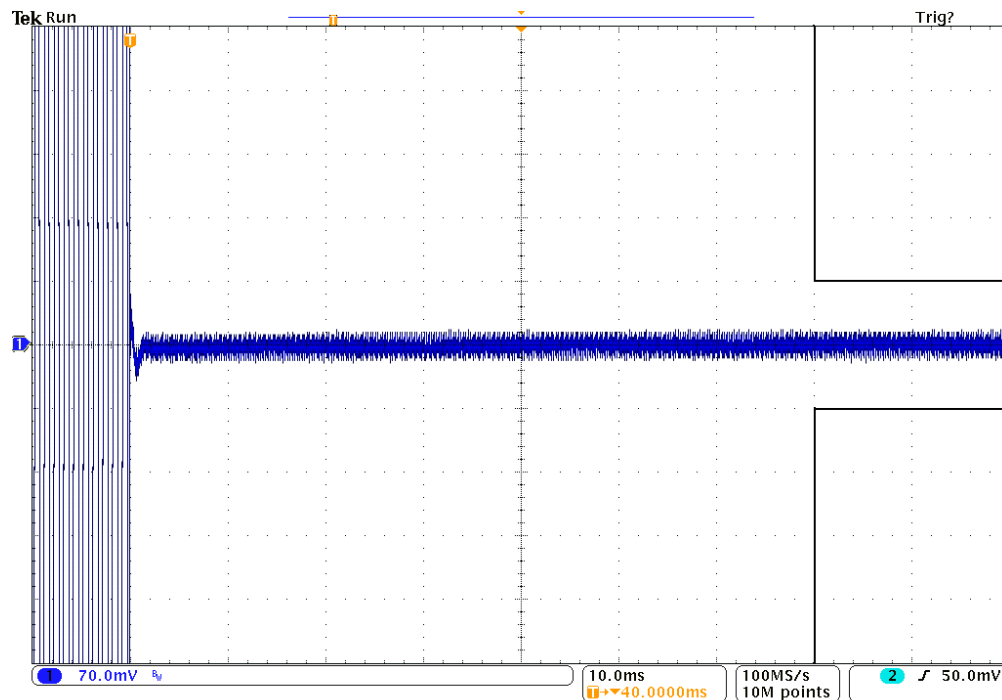
Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

Transient Frequency Response – Test Data
25 kHz Channel 851 MHz TX ON



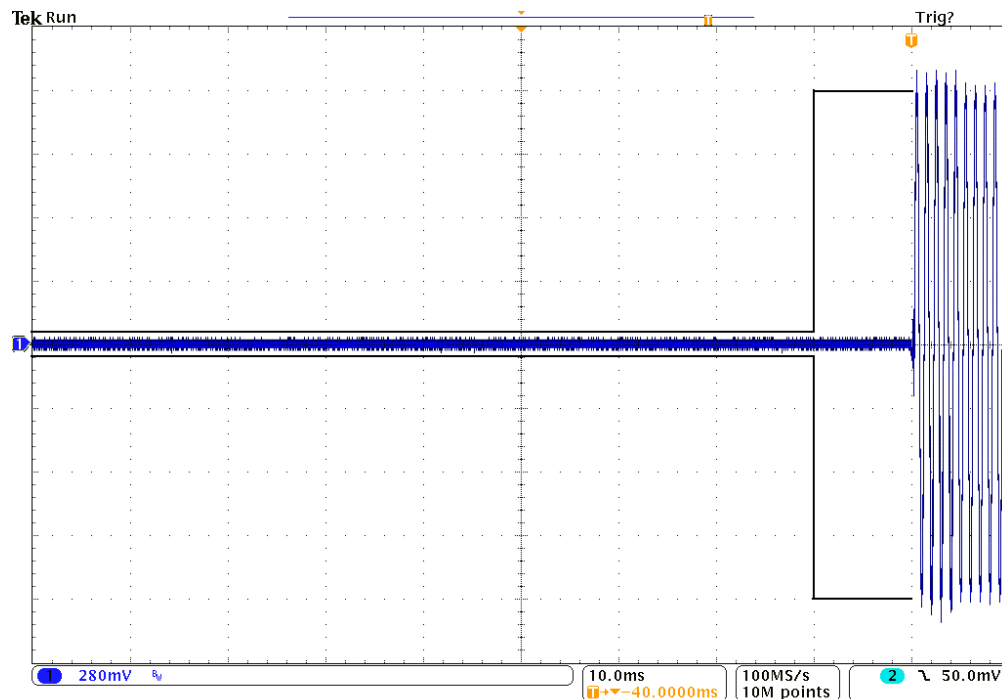
Applicant: RELM WIRELESS CORP. – BK RADIO
FCC ID: K95KNGP800C
IC: 2116A-KNGP800C
Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

25 kHz Channel 851 MHz TX ON ZOOMED



30 Mar 2011
12:48:10

25 kHz Channel 851 MHz TX OFF



30 Mar 2011
11:51:56

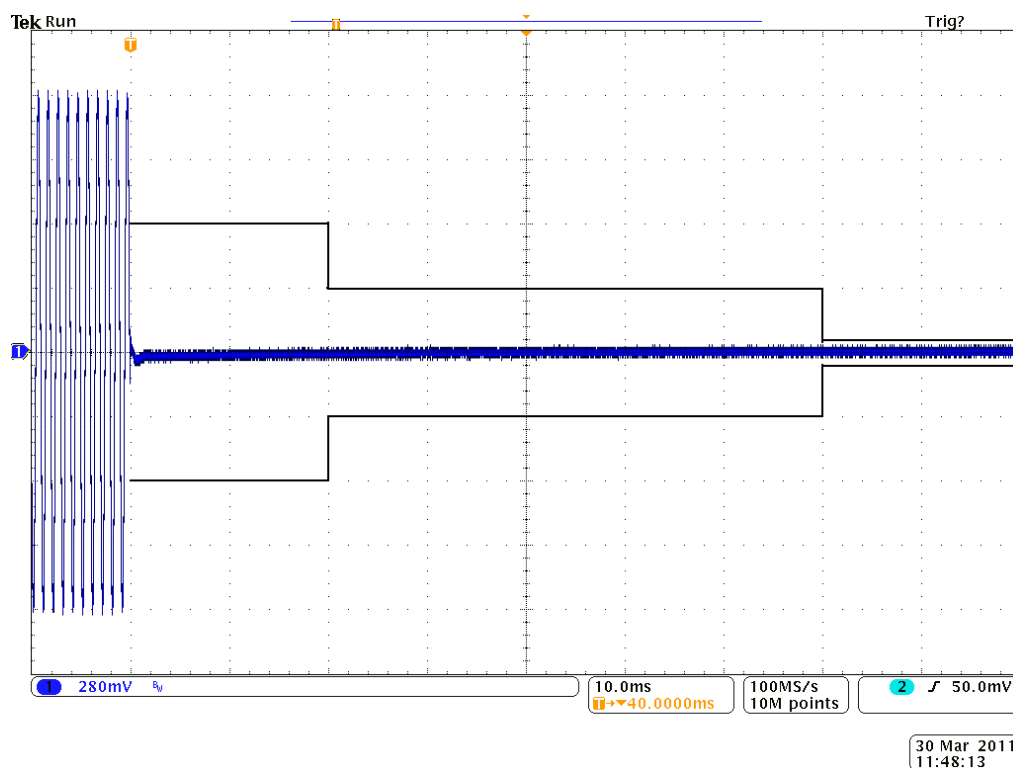
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

12.5 kHz Channel 851 MHz TX ON



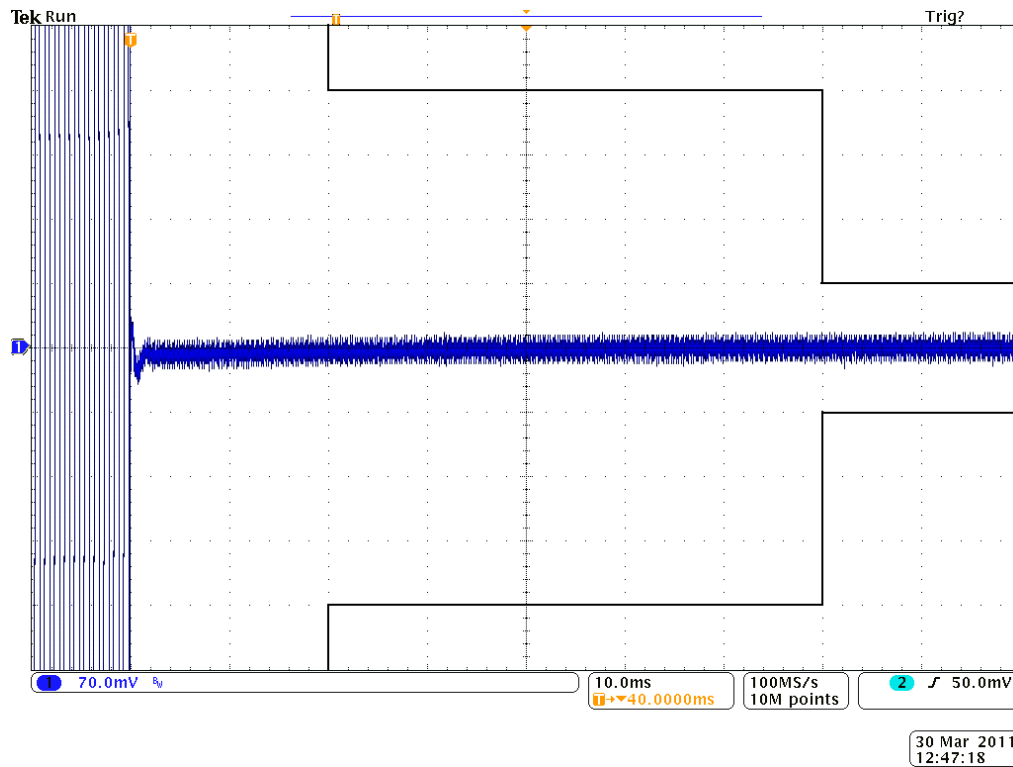
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

12.5 kHz Channel 851 MHz TX ON ZOOMED



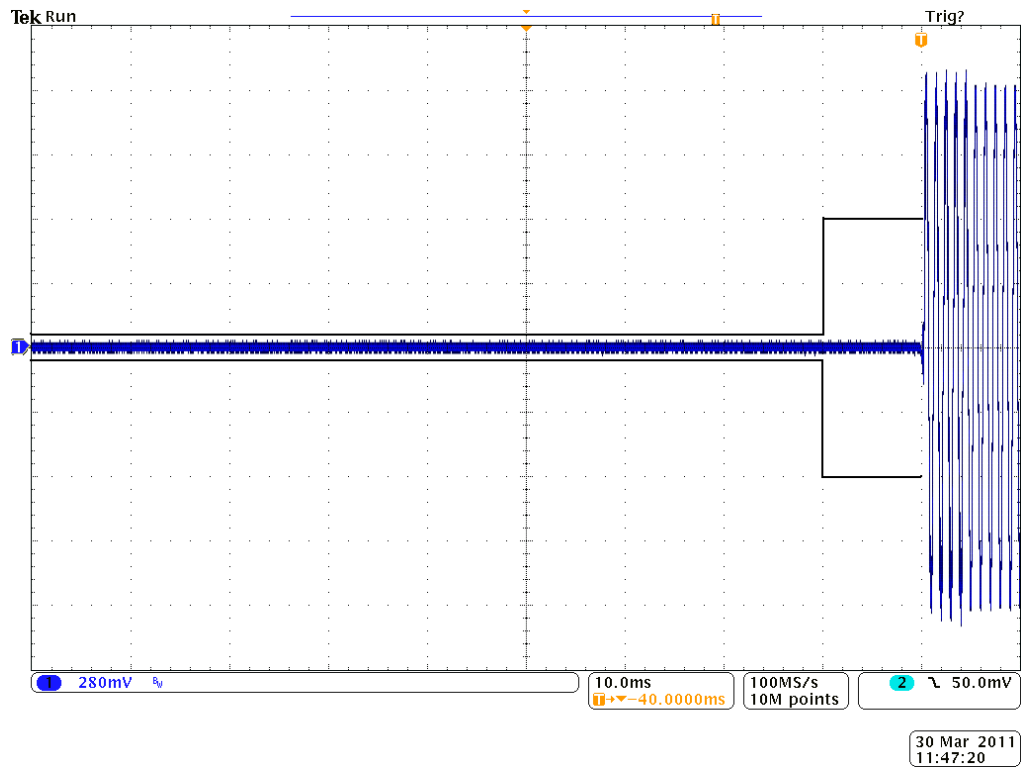
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

12.5 kHz Channel 851 MHz TX OFF



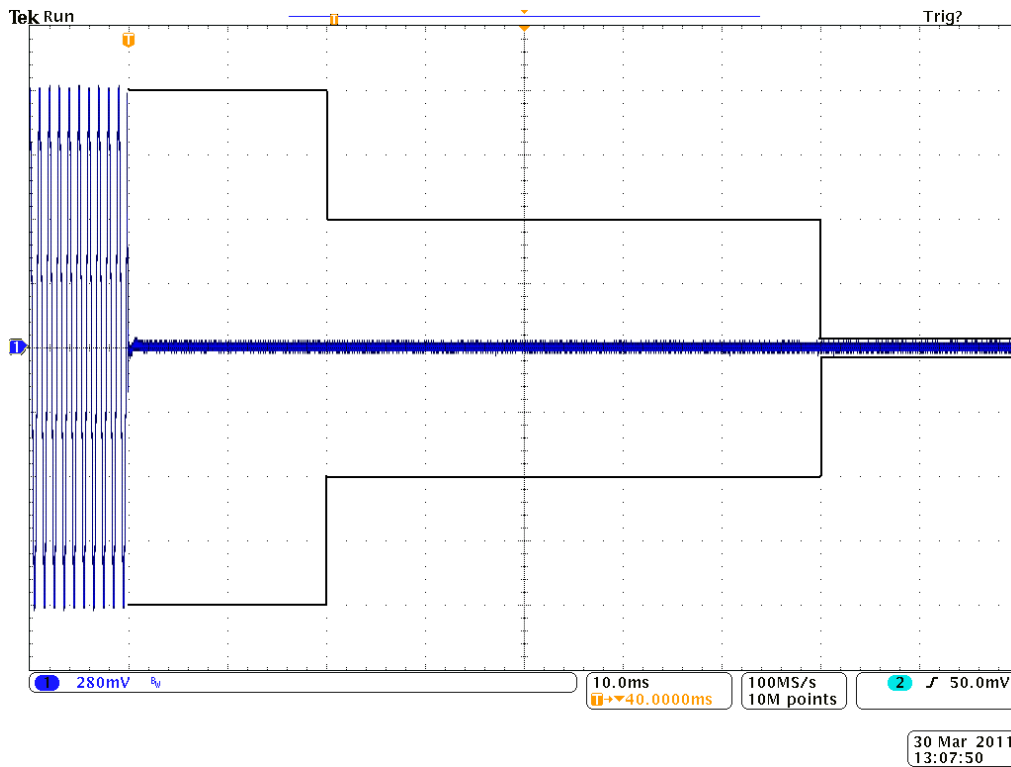
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

25 kHz Channel 775 MHz TX ON



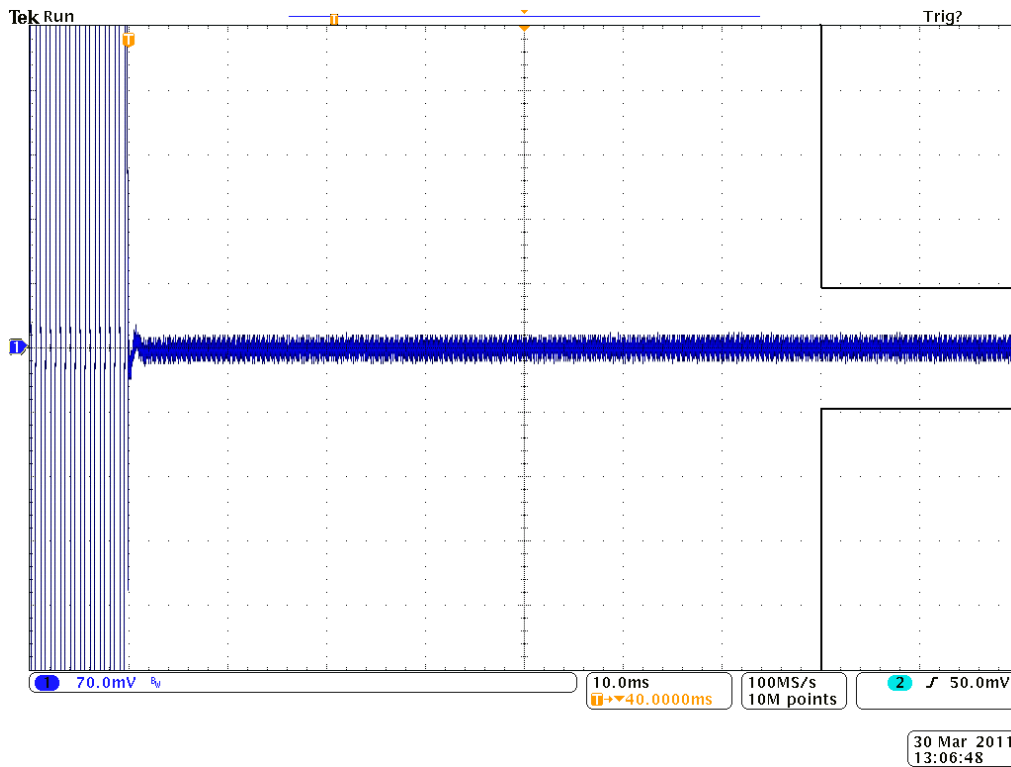
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

25 kHz Channel 775 MHz TX ON ZOOMED



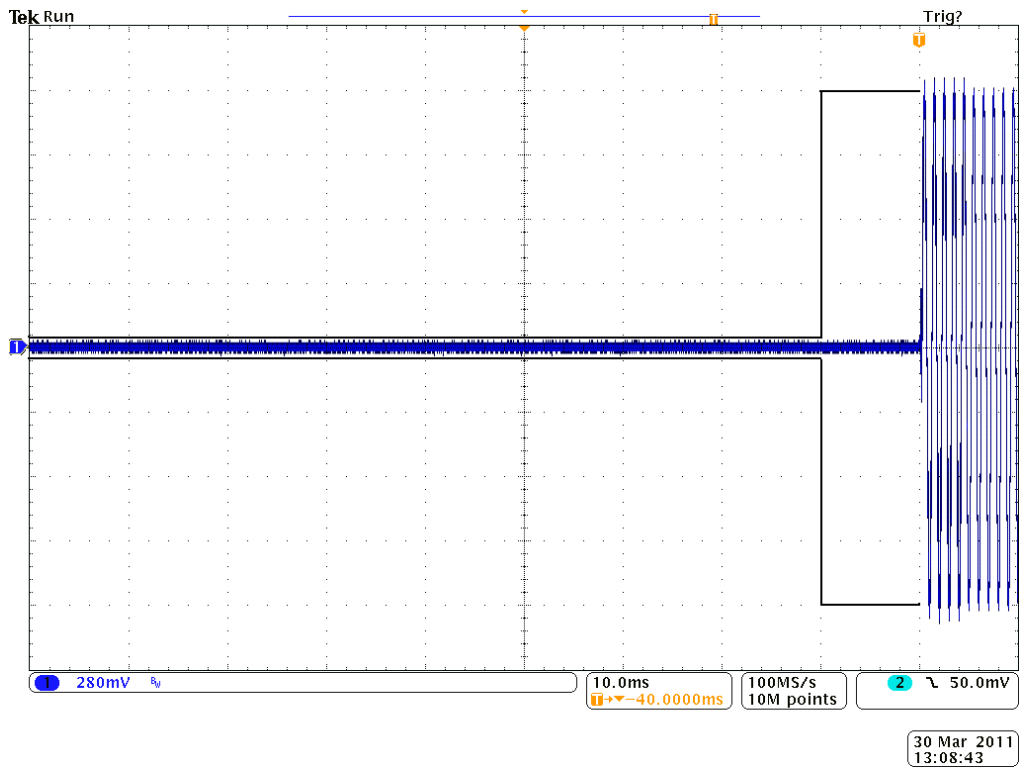
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

25 kHz Channel 775 MHz TX OFF



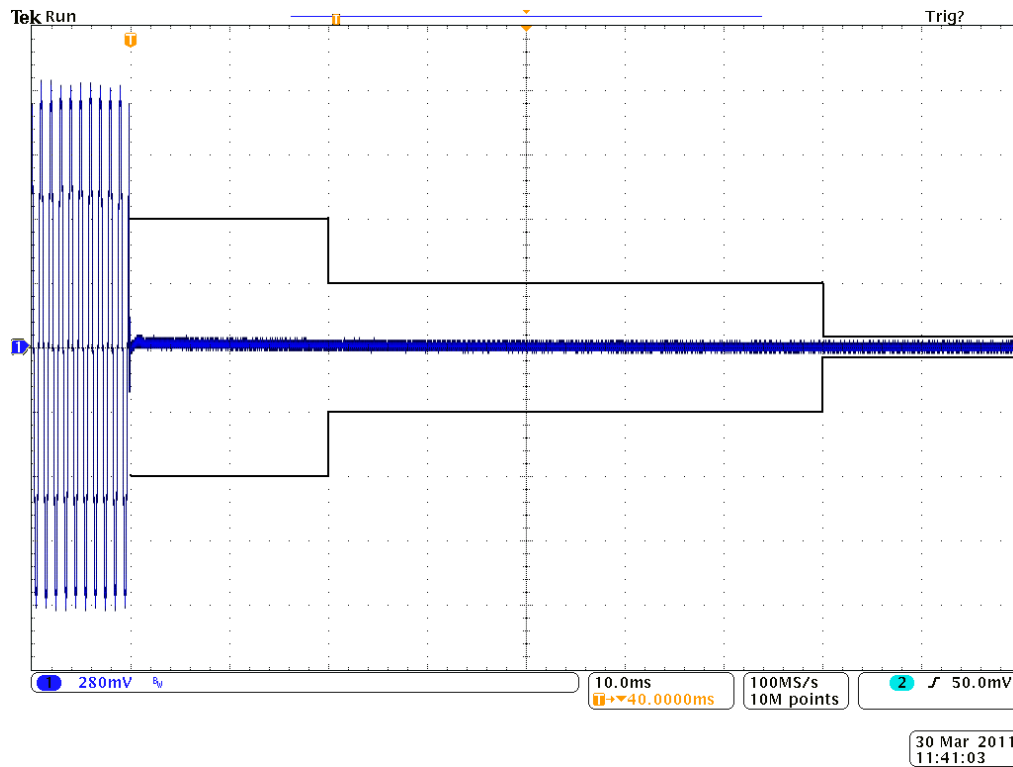
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

12.5 kHz Channel 775 MHz TX ON



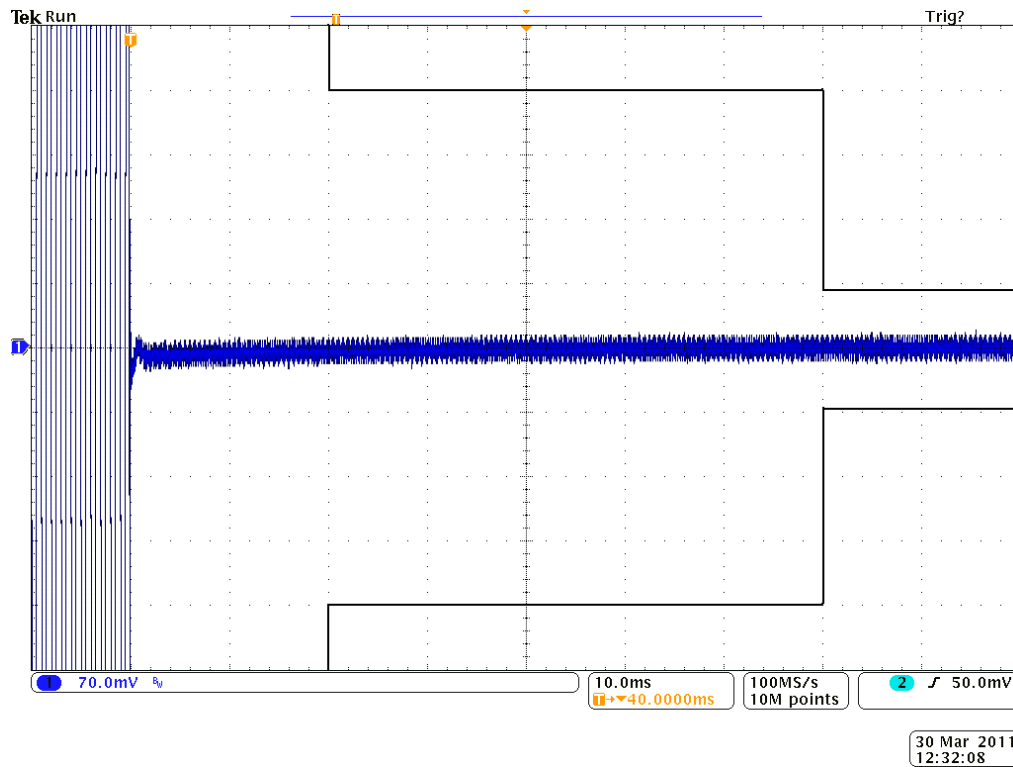
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

12.5 kHz Channel 775 MHz TX ON ZOOMED



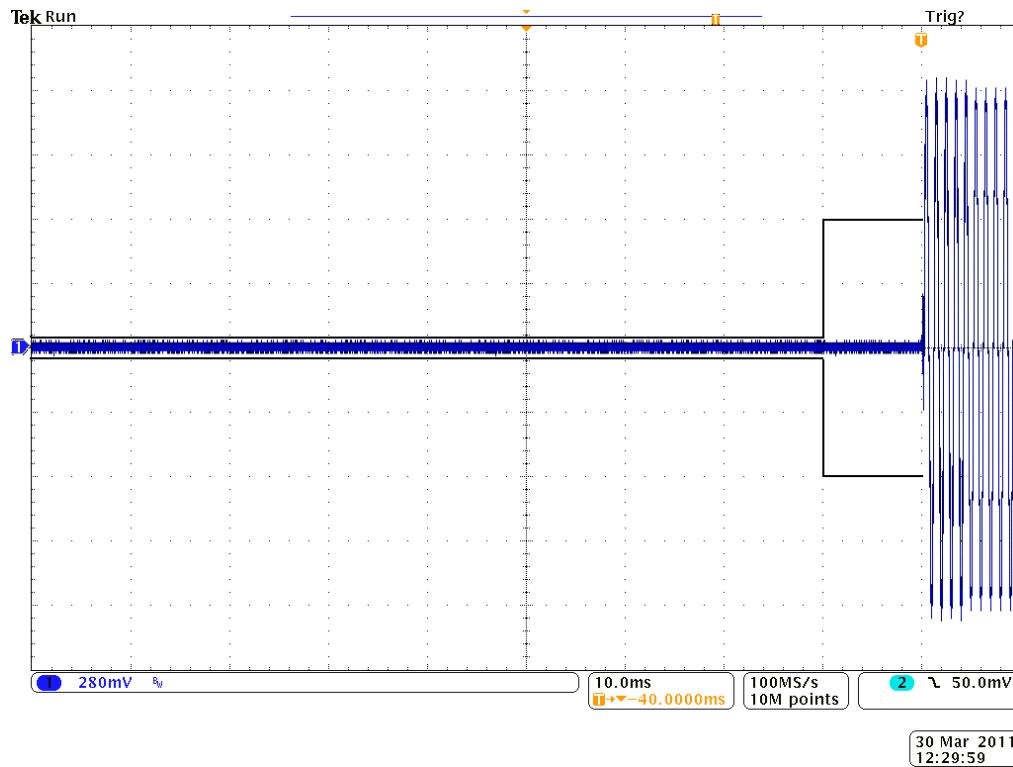
Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

12.5 kHz Channel 775 MHz TX OFF



Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

ADJACENT CHANNEL POWER

Part 90.543

Emission limitation – Adjacent Channel Power

Analog 25 kHz Channel Spacing		770 MHz		
Offset Frequency (kHz)	Measurement Bandwidth (kHz)	Adjacent Channel Power Ratio (dB)		
		FCC Limit	Lower	Upper
15.625	6.25	-40	-70.2	-72.9
21.875	6.25	-60	-78	-78.1
37.5	25	-60	-71.3	-71.6
62.5	25	-65	-71.6	-71.4
87.5	25	-65	-70.9	-71.1
150	100	-65	-69	-68.7
250	100	-65	-71.3	-71.7
350	100	-65	-73.7	-74.1
>400 to 12MHz	30 (Swept)	-75	< -75	< -75
12MHz to Rx	30 (Swept)	-75	< -75	< -75
Rx Band	30 (Swept)	-100	< -100	< -100

Analog 12.5 kHz Channel Spacing		770 MHz		
Offset Frequency (kHz)	Measurement Bandwidth (kHz)	Adjacent Channel Power Ratio (dB)		
		FCC Limit	Lower	Upper
9.375	6.25	-40	-45.5	-52.3
15.625	6.25	-60	-76.4	-76.5
21.875	6.25	-60	-76.8	-76.9
37.5	25	-60	-71.3	-71.6
62.5	25	-65	-71.2	-71.5
87.5	25	-65	-72.3	-72.4
150	100	-65	-67.5	-67
250	100	-65	-72.3	-72.4
350	100	-65	-75.3	-75.7
>400 to 12 MHz	30 (Swept)	-75	< -75	< -75
12MHz to Rx	30 (Swept)	-75	< -75	< -75
Rx Band	30 (Swept)	-100	< -100	< -100

Applicant: RELM WIRELESS CORP. – BK RADIO

FCC ID: K95KNGP800C

IC: 2116A-KNGP800C

Report: Z:\R\RELM_K95\961AUT11\Extra961AUT11\K95KNGP800C-Report (3).doc

APCO 12.5 kHz Channel Spacing		Voice	770 MHz	
Offset Frequency (KHz)	Measurement Bandwidth (KHz)	Adjacent Channel Power Ratio (dB)		
		FCC Limit	Lower	Upper
9.375	6.25	-40	-42.3	-44.2
15.625	6.25	-60	-75.8	-75.6
21.875	6.25	-60	-75.7	-74.9
37.5	25	-60	-72.2	-72.1
62.5	25	-65	-72.1	-73.3
87.5	25	-65	-70.6	-70.9
150	100	-65	-68.9	-68.1
250	100	-65	-70.8	-70.9
350	100	-65	-72.6	-72.6
>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		Data	770 MHz	
Offset Frequency (KHz)	Measurement Bandwidth (KHz)	Adjacent Channel Power Ratio (dB)		
		FCC Limit	Lower	Upper
9.375	6.25	-40	-41.1	-41.8
15.625	6.25	-60	-77.4	-77.7
21.875	6.25	-60	-76.1	-75.8
37.5	25	-60	-70.4	-71
62.5	25	-65	-70.3	-70
87.5	25	-65	-72.3	-73.2
150	100	-65	-69.4	-69
250	100	-65	-73	-72.3
350	100	-65	-72.5	-72.9
>400 to 12MHz	30 (Swept)	-75	< -75	< -75
12MHz to Rx	30 (Swept)	-75	< -75	< -75
Rx Band	30 (Swept)	-100	< -100	< -100

Applicant: RELM WIRELESS CORP. – BK RADIO

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Adjacent Channel Coupled Power Ratio - 795MHz

25KHz 795MHz

Analog 25 kHz Channel Spacing		795 MHz		
Offset Frequency (KHz)	Measurement Bandwidth (KHz)	Adjacent Channel Power Ratio (dB)		
		FCC Limit	Lower	Upper
15.625	6.25	-40	-77.1	-74.7
21.875	6.25	-60	-76	-76.1
37.5	25	-60	-69.9	-71.2
62.5	25	-65	-70	-70.5
87.5	25	-65	-70.5	-71.1
150	100	-65	-67.5	-67.8
250	100	-65	-69.3	-69.8
350	100	-65	-72.5	-71.1
>400 to 12MHz	30 (Swept)	-75	< -75	< -75
12MHz to Rx	30 (Swept)	-75	< -75	< -75
Rx Band	30 (Swept)	-100	< -100	< -100

Analog 12.5 kHz Channel Spacing		795 MHz		
Offset Frequency (KHz)	Measurement Bandwidth (KHz)	Adjacent Channel Power Ratio (dB)		
		FCC Limit	Lower	Upper
9.375	6.25	-40	-46	-52.6
15.625	6.25	-60	-76.8	-76.9
21.875	6.25	-60	-76	-76
37.5	25	-60	-70.1	-70.1
62.5	25	-65	-70.8	-70.3
87.5	25	-65	-72.5	-70.8
150	100	-65	-69.4	-69.2
250	100	-65	-69.6	-70
350	100	-65	-69.8	70.1
>400 to 12MHz	30 (Swept)	-75	< -75	< -75
12MHz to Rx	30 (Swept)	-75	< -75	< -75
Rx Band	30 (Swept)	-100	< -100	< -100

Applicant: RELM WIRELESS CORP. – BK RADIO

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APCO 12.5 kHz Channel Spacing		Voice	795 MHz	
Offset Frequency (KHz)	Measurement Bandwidth (KHz)	Adjacent Channel Power Ratio (dB)		
		FCC Limit	Lower	Upper
9.375	6.25	-40	-41.9	-43.4
15.625	6.25	-60	-76.3	-76
21.875	6.25	-60	-75.4	-75.7
37.5	25	-60	-70.4	-69.6
62.5	25	-65	-69.5	-69.8
87.5	25	-65	-70.6	-71.2
150	100	-65	-69.4	-68.4
250	100	-65	-68.2	-68
350	100	-65	-69.7	-69.7
>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		Data	795 MHz	
Offset Frequency (KHz)	Measurement Bandwidth (KHz)	Adjacent Channel Power Ratio (dB)		
		FCC Limit	Lower	Upper
9.375	6.25	-40	-41.6	-43
15.625	6.25	-60	-74.8	-75.5
21.875	6.25	-60	-75.6	-76.3
37.5	25	-60	-69.2	-69.8
62.5	25	-65	-70.3	-69.4
87.5	25	-65	-70.2	-70.5
150	100	-65	-69.6	-69.1
250	100	-65	-70.6	-69.8
350	100	-65	-69.7	-69.4
>400 to 12MHz	30 (Swept)	-75	< -75	< -75
12MHz to Rx	30 (Swept)	-75	< -75	< -75
Rx Band	30 (Swept)	-100	< -100	< -100

Applicant: RELM WIRELESS CORP. – BK RADIO

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