

Transmitter Measured Data – Pursuant 47 CFR 2.1033(c), 2.1041

	<u>MEASUREMENT</u>	<u>EXHIBIT</u>	<u>REFERENCE</u>
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II.	Modulation Characteristics		2.1047
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	C. Modulation Limiting vs. Frequency	6B-3	2.1047(b)
	D. Modulation Limiting vs. Audio Level	6B-4	2.1047(b)
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	2. 12.5 kHz Audio (Voice)	6C-2	2.1049(c)(1)
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6A. RF Power Output Data – Pursuant 47 CFR 2.1033 (c) 8, 2.1046(a)

The RF power output was measured with the indicated voltage applied to, current into, and RF power into the final RF power amplifier.

Measured at 403.025MHz

At the maximum power setting:

Measured RF Output Power:	4 Watts
Measured DC Voltage:	7.50 Volts
Measured DC Current:	1.85 Amps
Primary Supply Voltage:	13.8 Volts

At the minimum power setting:

Measured RF Output Power:	0.275 Watts
Measured DC Voltage:	7.50 Volts
Measured DC Current:	0.65 Amps
Primary Supply Voltage:	13.8 Volts

Measured at 435.025MHz

At the maximum power setting:

Measured RF Output Power:	4 Watts
Measured DC Voltage:	7.50 Volts
Measured DC Current:	1.85 Amps
Primary Supply Voltage:	13.8 Volts

At the minimum power setting:

Measured RF Output Power:	0.275 Watts
Measured DC Voltage:	7.50 Volts
Measured DC Current:	0.65 Amps
Primary Supply Voltage:	13.8 Volts

Measured at 469.875MHz

At the maximum power setting:

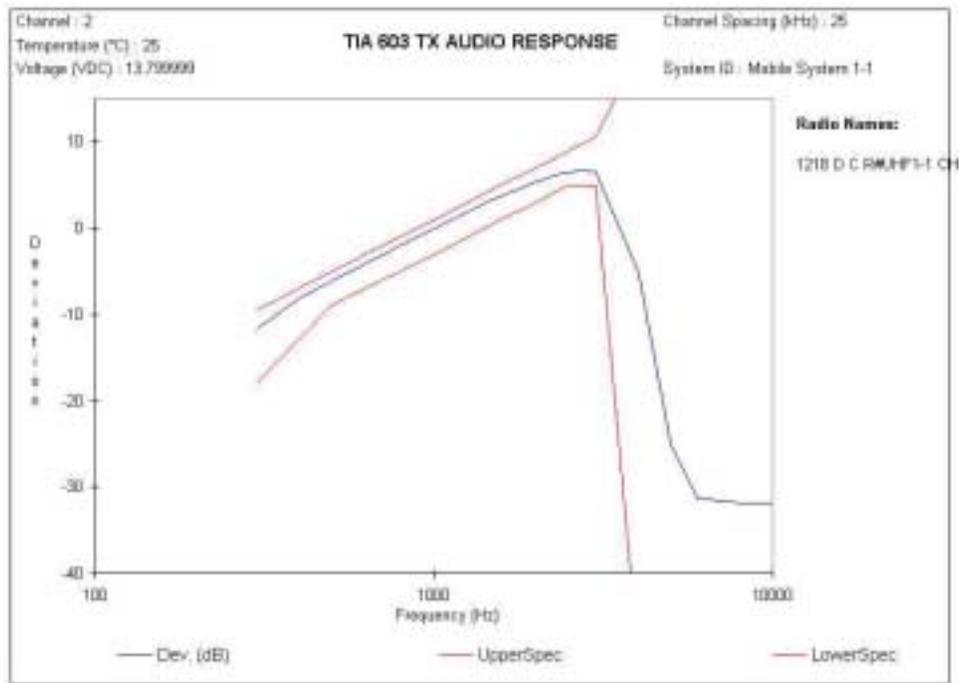
Measured RF Output Power:	4 Watts
Measured DC Voltage:	7.50 Volts
Measured DC Current:	1.85 Amps
Primary Supply Voltage:	13.8 Volts

At the minimum power setting:

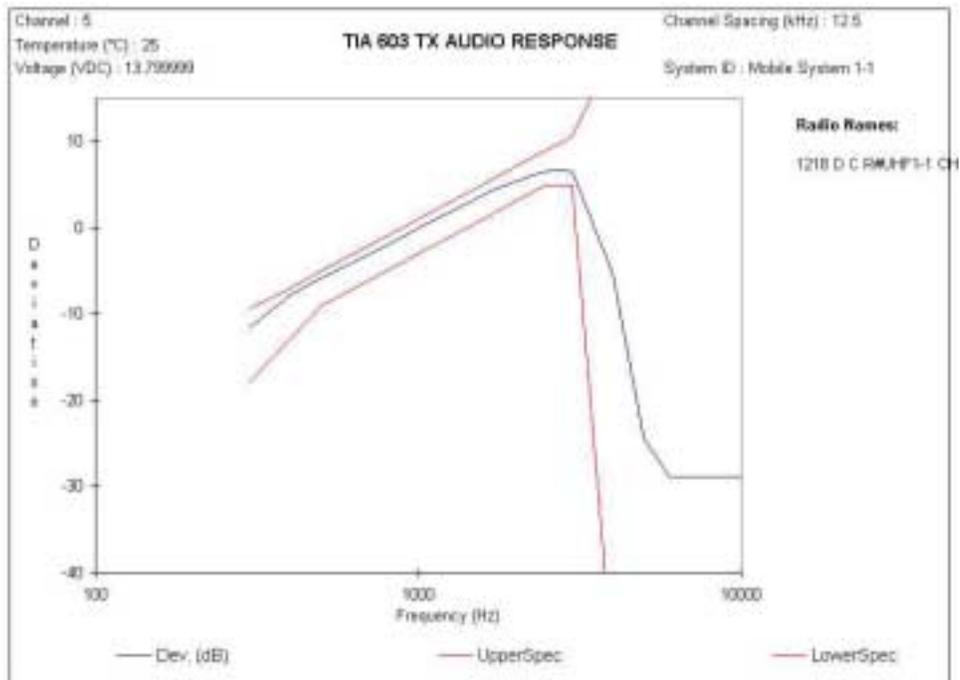
Measured RF Output Power:	0.275 Watts
Measured DC Voltage:	7.50 Volts
Measured DC Current:	0.65 Amps
Primary Supply Voltage:	13.8 Volts

6B-1. Audio Response – Pursuant 47 CFR 2.1033(c) 14, 2.1047(a)

25 kHz channel spacing. Measured at 435.025 MHz.

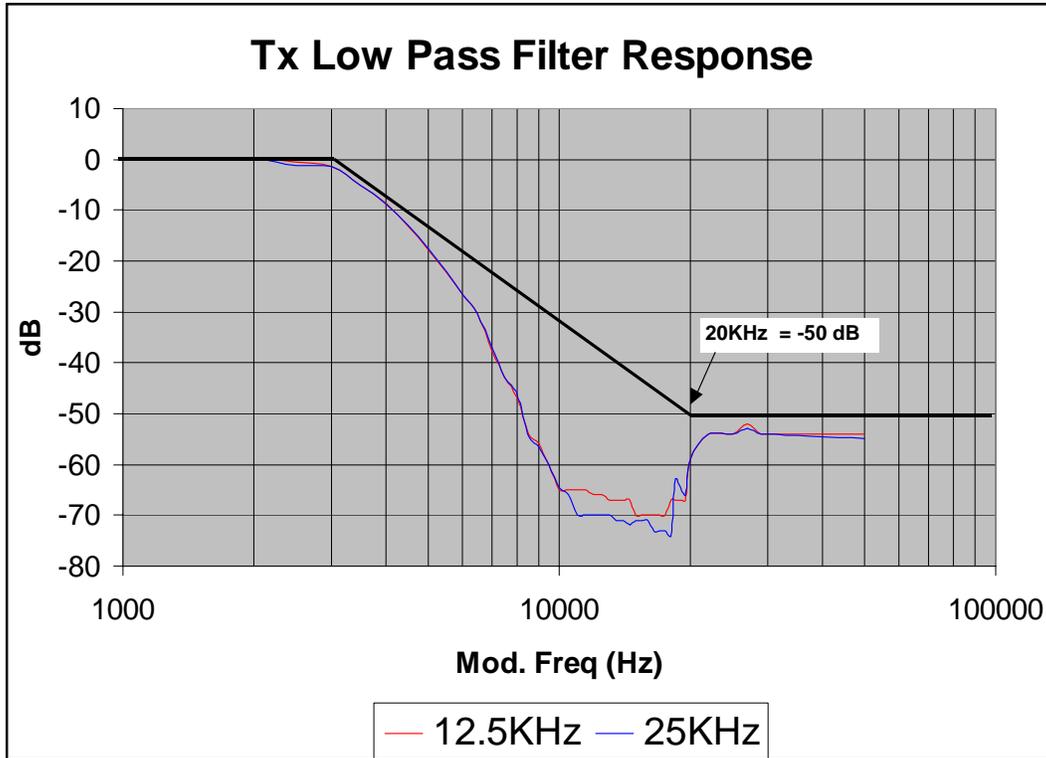


12.5 kHz channel spacing. Measured at 435.025 MHz.



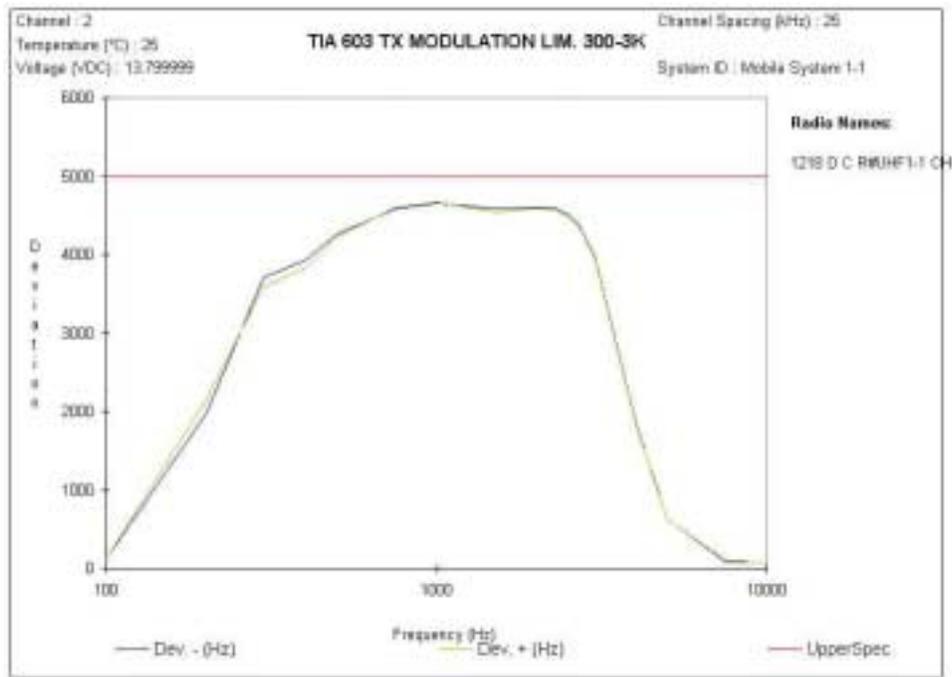
6B-2. Low Pass Filter Response – Pursuant 47 CFR 2.1033(c) 14, 2.1047(a)

25KHz and 12.5kHz channel spacing. Measured Frequency: 435.025 MHz.

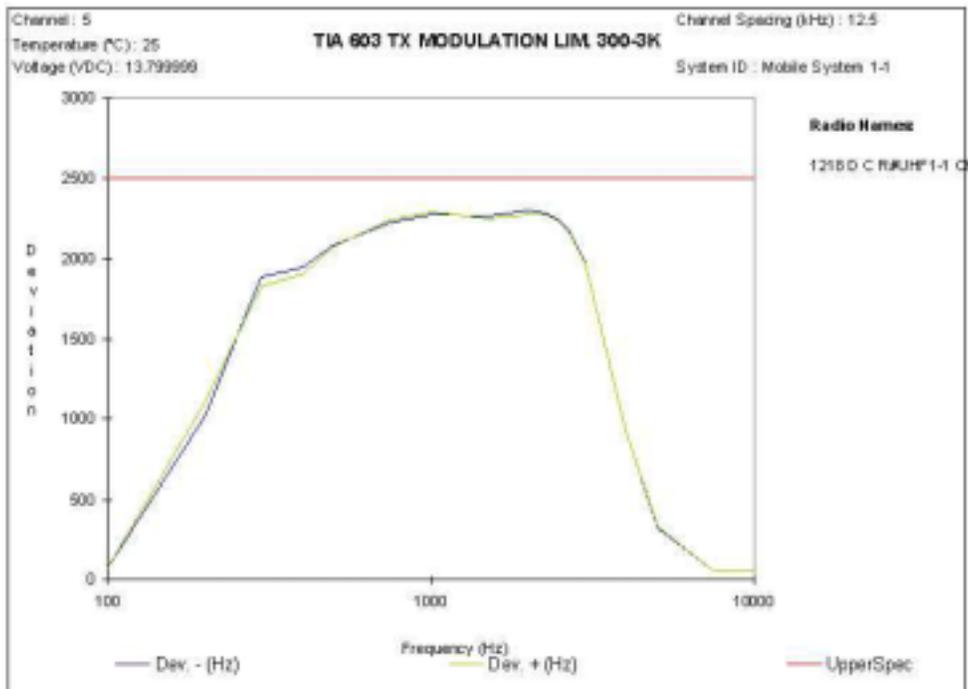


6B-3. Modulation Limiting versus Frequency – Pursuant 47 CFR 2.1033(c) 14, 2.1047(b)

25 kHz channel spacing. Measured at 435.025 MHz.



12.5 kHz channel spacing. Measured at 435.025 MHz.

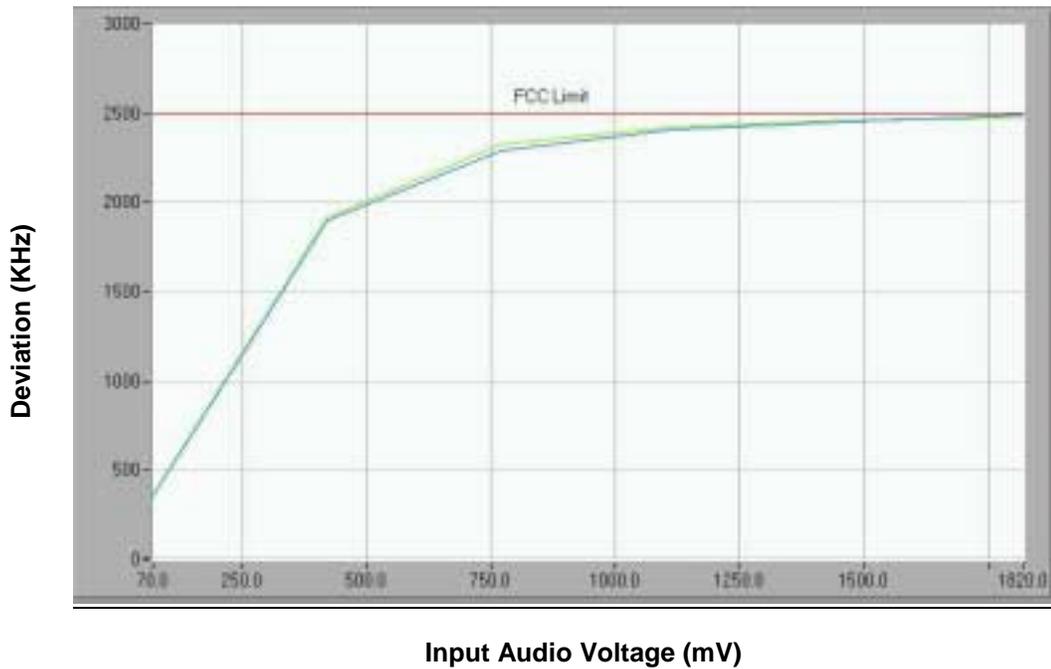


6B-4. Modulation Limiting vs. Audio Level – Pursuant 47 CFR 2.1033 (c) 14, 2.1047(b)

**Modulation Limiting, Deviation vs Input Audio
UHF_R1 435.025MHz, 25 kHz Channels**



**Modulation Limiting, Deviation vs Input Audio
UHF_R1 435.025MHz, 12.5 kHz Channels**



6C. Occupied Bandwidth – Pursuant 47 CFR 2.1033(c), 14, 2.1049**Necessary Bandwidth Calculations**

Carson's Rule for FM modulation is utilized to compute the bandwidth shown in the FCC emission designator for each type of modulation employed by the product. Carson's Rule is

$$BW = 2 * (M+D) \quad \text{where} \quad \begin{array}{l} BW = \text{Required bandwidth} \\ M = \text{Maximum modulating frequency} \\ D = \text{Deviation} \end{array}$$

Shown below are the calculations required for FCC ID: AZ492FT4848.

EXHIBIT 6C-1: 25 kHz Channel Spacing, Voice (2500 Hz Audio Tone)
Emission Designator: 16K0F3E

This modulation represents voice and so is band-limited to below 3 kHz by a bandpass filter. Therefore the maximum modulating frequency is 3 kHz with a 5 kHz deviation.

$$BW = 2 * (M + D) = 2 * (3 \text{ kHz} + 5 \text{ kHz}) = 16 \text{ kHz} \rightarrow 16K0$$

The modulation is a single FM voice channel, so the rest of the designator is F3E.

Therefore, the entire designator for 25 kHz channelization analog voice is 16K0F3E.

EXHIBIT 6C-2: 12.5 kHz Channel Spacing, Voice (2500 Hz Audio Tone)
Emission Designator: 11K0F3E

This modulation represents voice and so is band-limited to below 3 kHz by a bandpass filter. Therefore the maximum modulating frequency is 3 kHz with a 2.5 kHz deviation.

$$BW = 2 * (M + D) = 2 * (3 \text{ kHz} + 2.5 \text{ kHz}) = 11 \text{ kHz} \rightarrow 11K0$$

The modulation is a single FM voice channel, so the rest of the designator is F3E.

Therefore, the entire designator for 12.5 kHz channelization analog voice is 11K0F3E.

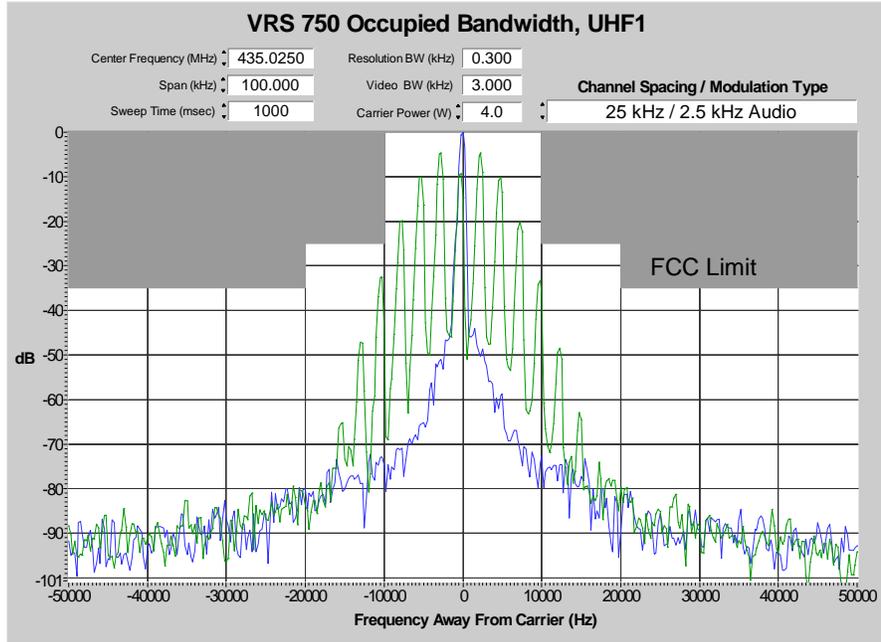
6C-1. Occupied Bandwidth – 25 kHz Audio – Pursuant 2.1049(c)(1)

High power. Measured at 435.025 MHz and 4 W.

Modulation: Voice (2500 Hz Audio Tone)

Modulation Designator: 16K0F3E

Channelization: 25 kHz (Mask B)

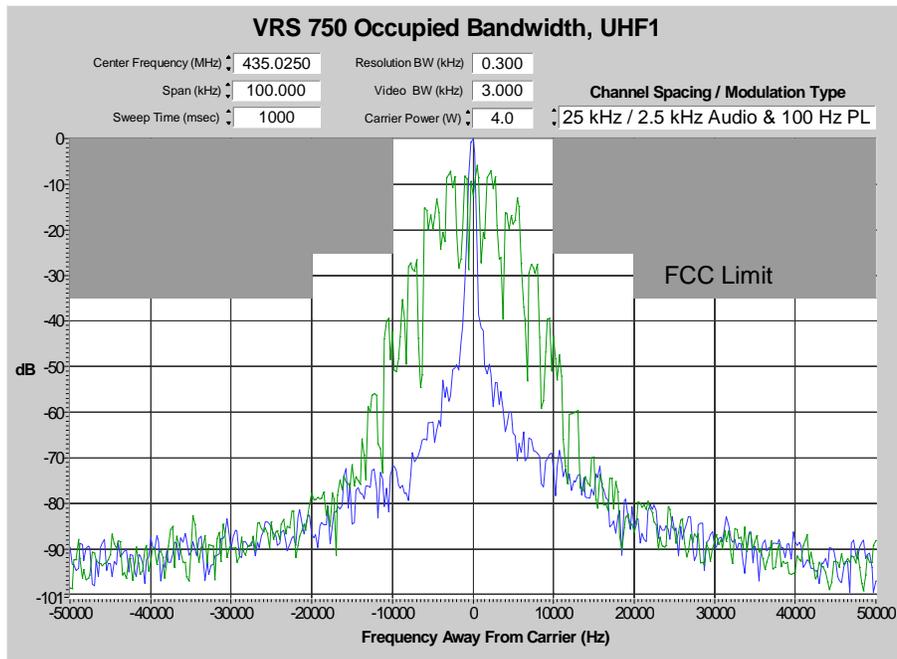


High power. Measured at 435.025 MHz and 4 W.

Modulation: Voice (2500 Hz Audio Tone with PL)

Modulation Designator: 16K0F3E

Channelization: 25 kHz (Mask B)



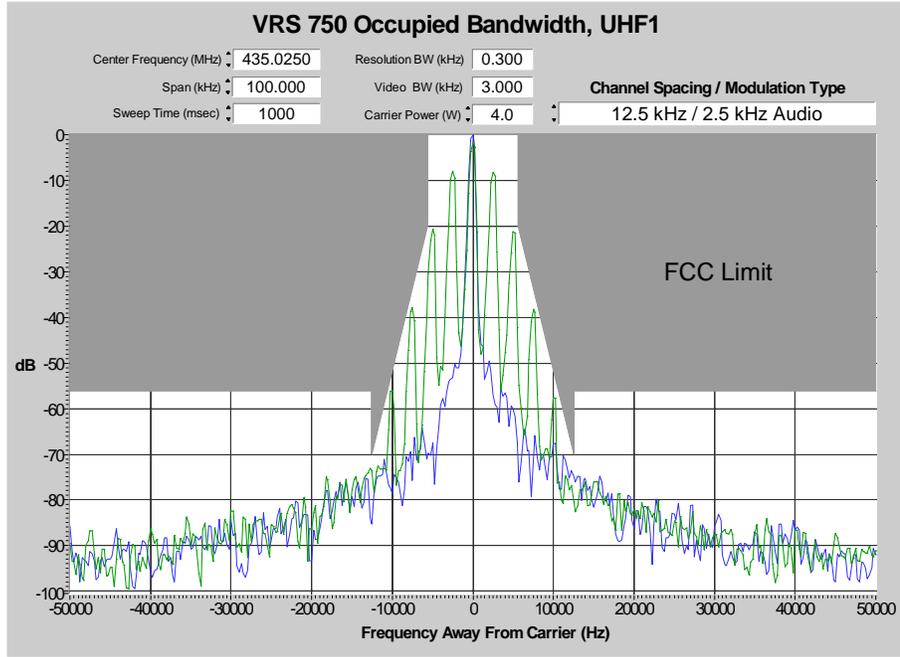
6C- 2. Occupied Bandwidth – 12.5 kHz Audio – Pursuant 2.1049(c)(1)

High power. Measured at 435.025 MHz and 4 W.

Modulation: Voice (2500 Hz Audio Tone)

Modulation Designator: 11K0F3E

Channelization: 12.5 kHz (Mask D)

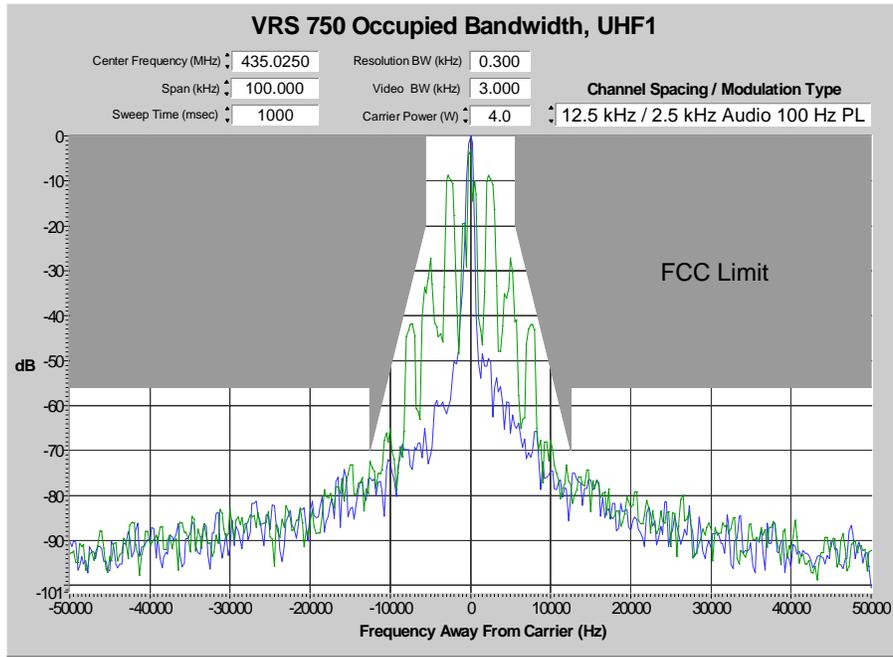


High power. Measured at 435.025 MHz and 4 W.

Modulation: Voice (2500 Hz Audio Tone with PL)

Modulation Designator: 11K0F3E

Channelization: 12.5 kHz (Mask D)



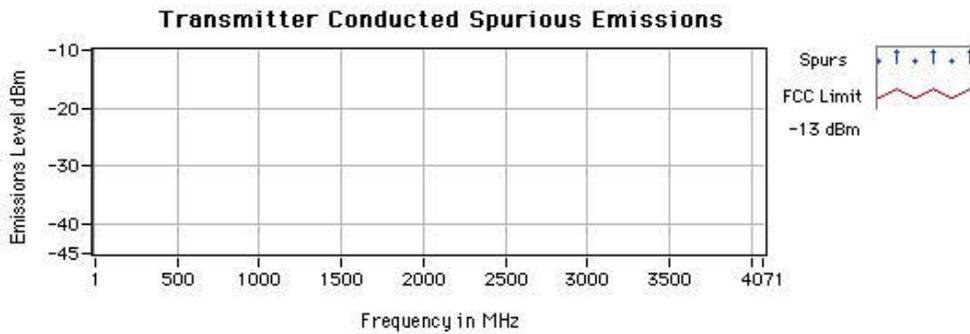
6D. Conducted Spurious Emissions – Pursuant 2.1051

Transmitter Conducted Spurious Emissions

FREQ: 403.02500 MHz

Power 275mW

Spur Frequency	FCC Limit	Measured Value (dBm)
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All Transmitter Spurious Emissions Tested to the 10th Harmonic

No Spurs Found Above -45 dBm

Motorola Plantation ATE Lab

Thu, Oct 11, 2001

Test Performed By: **Jerry Simpson**

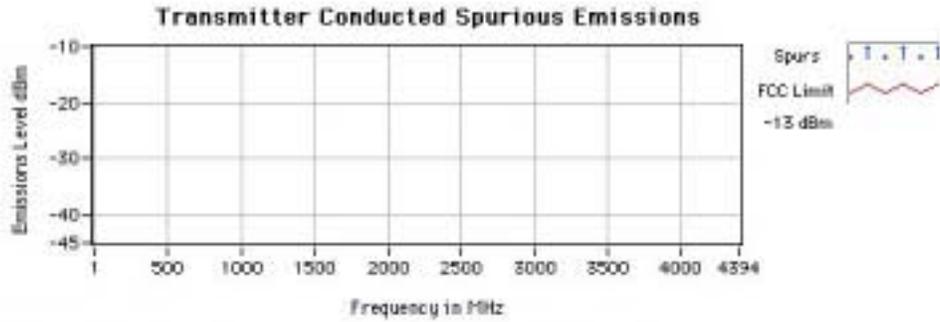
6D. Conducted Spurious Emissions (cont.)

Transmitter Conducted Spurious Emissions

FREQ: 435.02500 MHz

Power 275mW

Spur Frequency	FCC Limit	Measured Value (dBm)
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All Transmitter Spurious Emissions Tested to the 10th Harmonic

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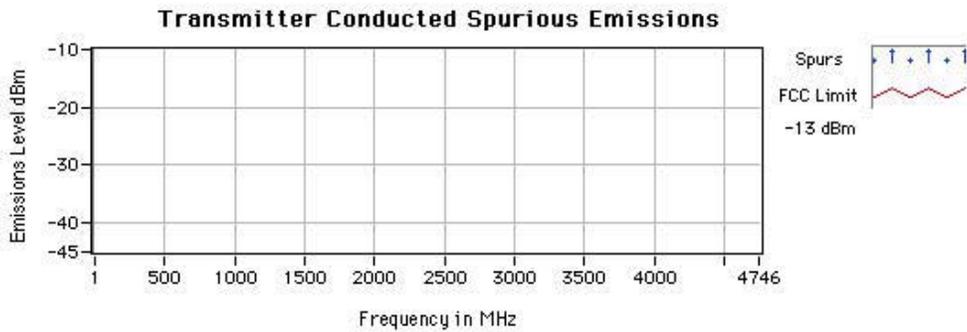
6D. Conducted Spurious Emissions (cont.)

Transmitter Conducted Spurious Emissions

FREQ: 469.87500 MHz

Power 275mW

Spur Frequency	FCC Limit	Measured Value (dBm)
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All Transmitter Spurious Emissions Tested to the 10th Harmonic

No Spurs Found Above -45 dBm

Motorola Plantation ATE Lab

Thu, Oct 11, 2001

Test Performed By : **Jerry Simpson**

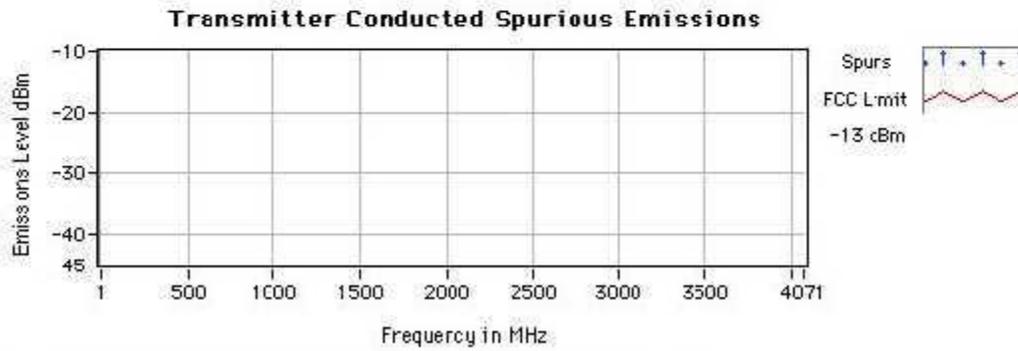
6D. Conducted Spurious Emissions (cont.)

Transmitter Conducted Spurious Emissions

FREQ: 403.02500 MHz

Power 4.0W

Spur Frequency	FCC Limit	Measured Value (dBm)
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All Transmitter Spurious Emissions Tested to the 10th Harmonic

No Spurs Found Above -45 dBm

Motorola Plantation ATE Lab

Tue, Oct 23, 2001

Test Performed By: **Jerry Simpson**

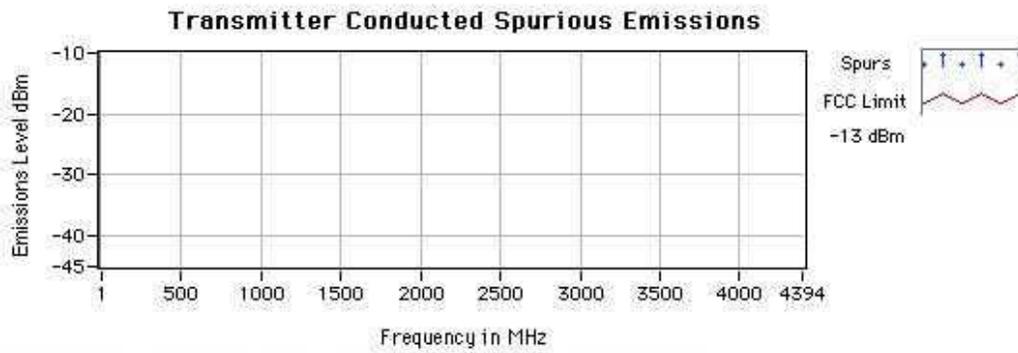
6D. Conducted Spurious Emissions (cont.)

Transmitter Conducted Spurious Emissions

FREQ: 435.02500 MHz

Power 4.0W

Spur Frequency	FCC Limit	Measured Value (dBm)
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All Transmitter Spurious Emissions Tested to the 10th Harmonic

No Spurs Found Above -45 dBm

Motorola Plantation ATE Lab

Tue, Oct 23, 2001

Test Performed By: **Jerry Simpson**

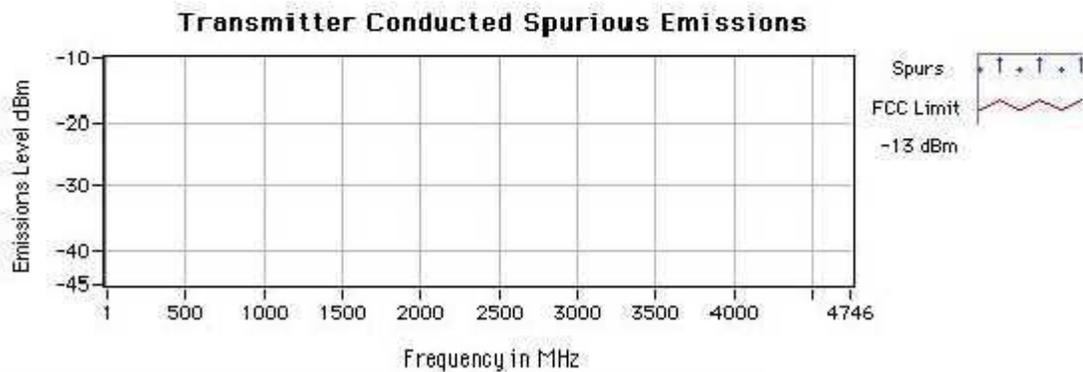
6D. Conducted Spurious Emissions (cont.)

Transmitter Conducted Spurious Emissions

FREQ: 469.87500 MHz

Power 4.0W

Spur Frequency	FCC Limit	Measured Value (dBm)
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All Transmitter Spurious Emissions Tested to the 10th Harmonic

No Spurs Found Above -45 dBm

Motorola Plantation ATE Lab

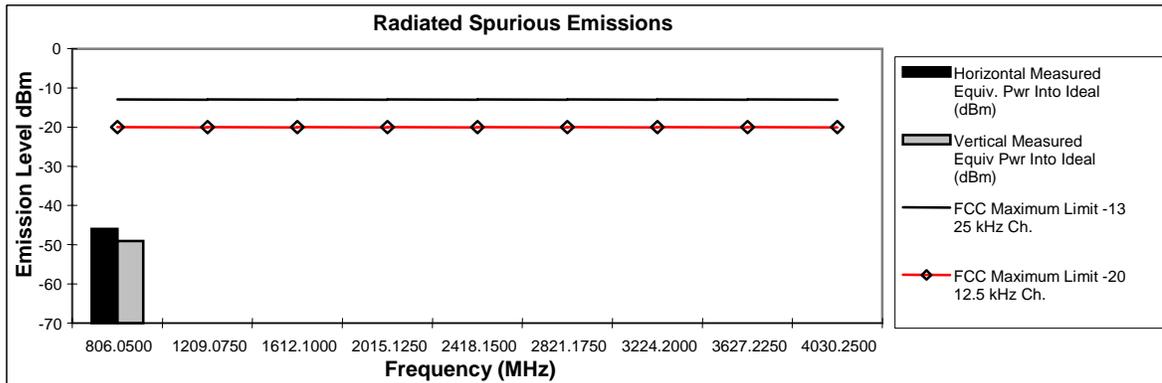
Tue, Oct 23, 2001

Test Performed By : **Jerry Simpson**

6E. Radiated Spurious Emissions – Pursuant 2.1053

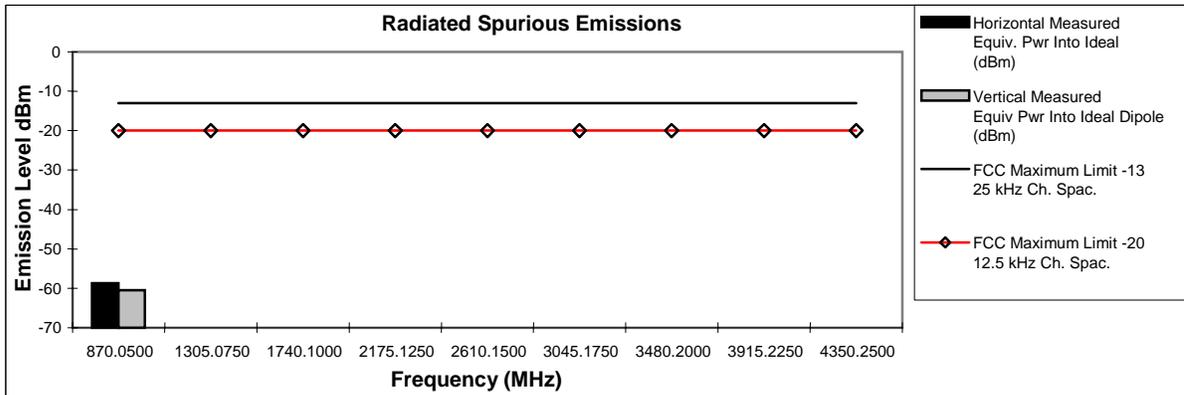
403.025 MHz 4 Watts Channel Spacing 25kHz

Frequency (MHz)	FCC Maximum Limit -13 (dBm) 25 kHz Ch. Spac.	FCC Maximum Limit -20 (dBm) 12.5 kHz Ch. Spac.	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
806.0500	-13	-20	-45.94	-49.08
1209.0750	-13	-20	*	*
1612.1000	-13	-20	*	*
2015.1250	-13	-20	*	*
2418.1500	-13	-20	*	*
2821.1750	-13	-20	*	*
3224.2000	-13	-20	*	*
3627.2250	-13	-20	*	*
4030.2500	-13	-20	*	*



435.025 MHz 4 Watts Channel Spacing 25kHz

Frequency (MHz)	FCC Maximum Limit -13 (dBm) 25 kHz Ch. Spac.	FCC Maximum Limit -20 (dBm) 12.5 kHz Ch. Spac.	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
870.0500	-13	-20	-58.72	-60.50
1305.0750	-13	-20	*	*
1740.1000	-13	-20	*	*
2175.1250	-13	-20	*	*
2610.1500	-13	-20	*	*
3045.1750	-13	-20	*	*
3480.2000	-13	-20	*	*
3915.2250	-13	-20	*	*
4350.2500	-13	-20	*	*

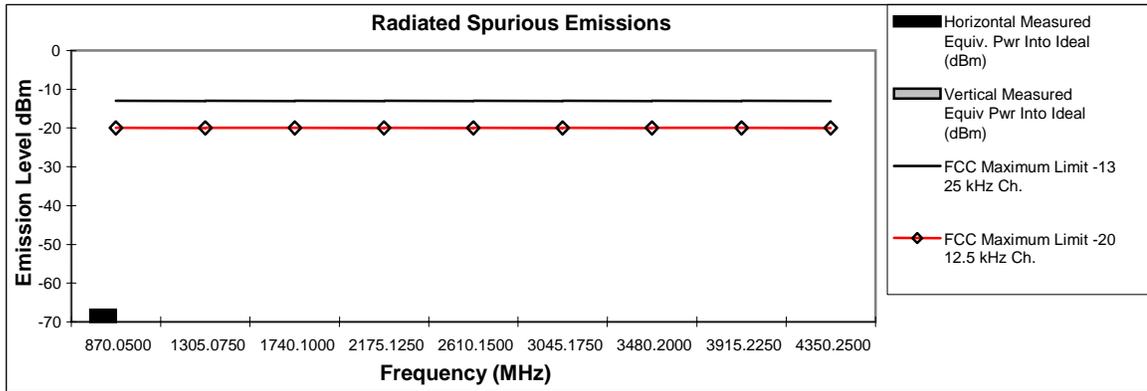


* Indicates the spurious emission was less than -70dBm or could not be detected due to noise limitations or ambients.

6E. Radiated Spurious Emissions (cont.)

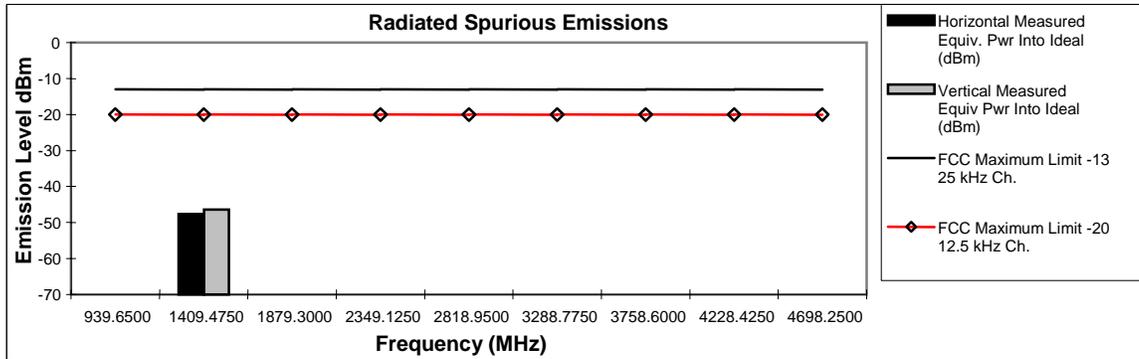
435.025 0.275 Watts Chan Spacing 25kHz

Frequency (MHz)	FCC Maximum Limit -13 (dBm) 25 kHz Ch. Spac.	FCC Maximum Limit -20 (dBm) 12.5 kHz Ch. Spac.	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
870.0500	-13	-20	-66.92	*
1305.0750	-13	-20	*	*
1740.1000	-13	-20	*	*
2175.1250	-13	-20	*	*
2610.1500	-13	-20	*	*
3045.1750	-13	-20	*	*
3480.2000	-13	-20	*	*
3915.2250	-13	-20	*	*
4350.2500	-13	-20	*	*



469.825 0.275 Watts Chan Spacing 25kHz

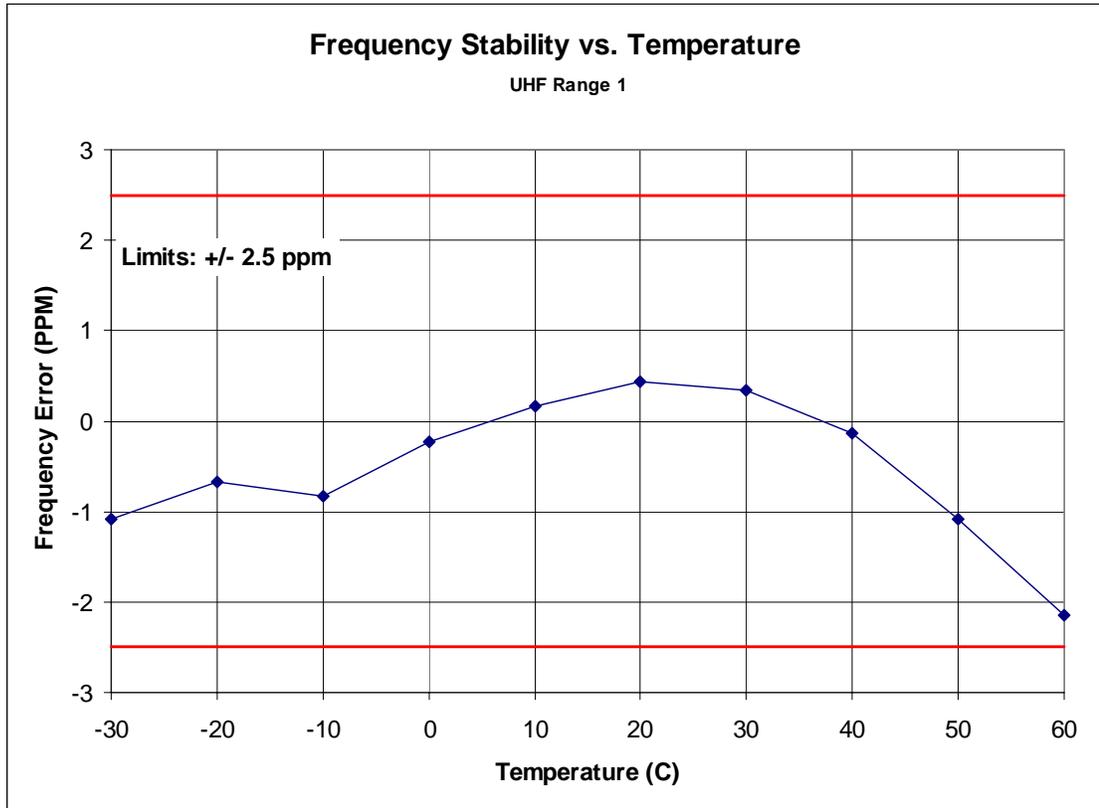
Frequency (MHz)	FCC Maximum Limit -13 (dBm) 25 kHz Ch. Spac.	FCC Maximum Limit -20 (dBm) 12.5 kHz Ch. Spac.	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
939.6500	-13	-20	*	*
1409.4750	-13	-20	-47.65	-46.43
1879.3000	-13	-20	*	*
2349.1250	-13	-20	*	*
2818.9500	-13	-20	*	*
3288.7750	-13	-20	*	*
3758.6000	-13	-20	*	*
4228.4250	-13	-20	*	*
4698.2500	-13	-20	*	*



* Indicates the spurious emission was less than -70dBm or could not be detected due to noise limitations or ambients.

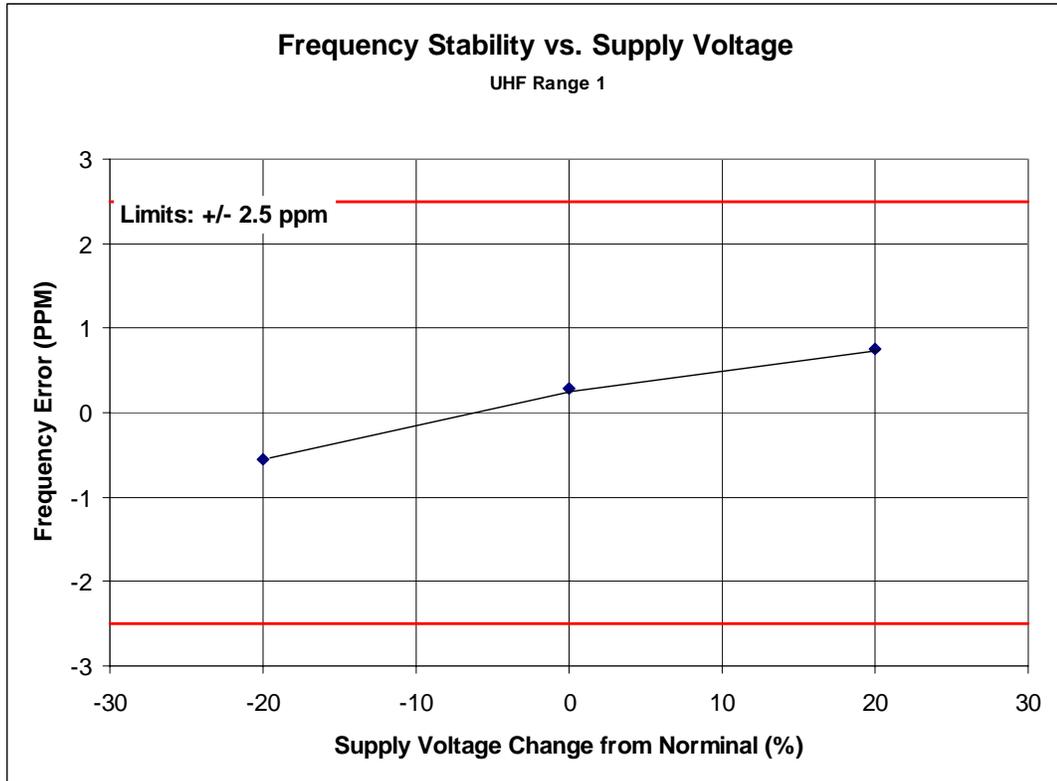
6F-1. Frequency Stability vs. Temperature – Pursuant 2.1055(a)(1), 2.1055(b), 90.213

Measured at 435.025 MHz.



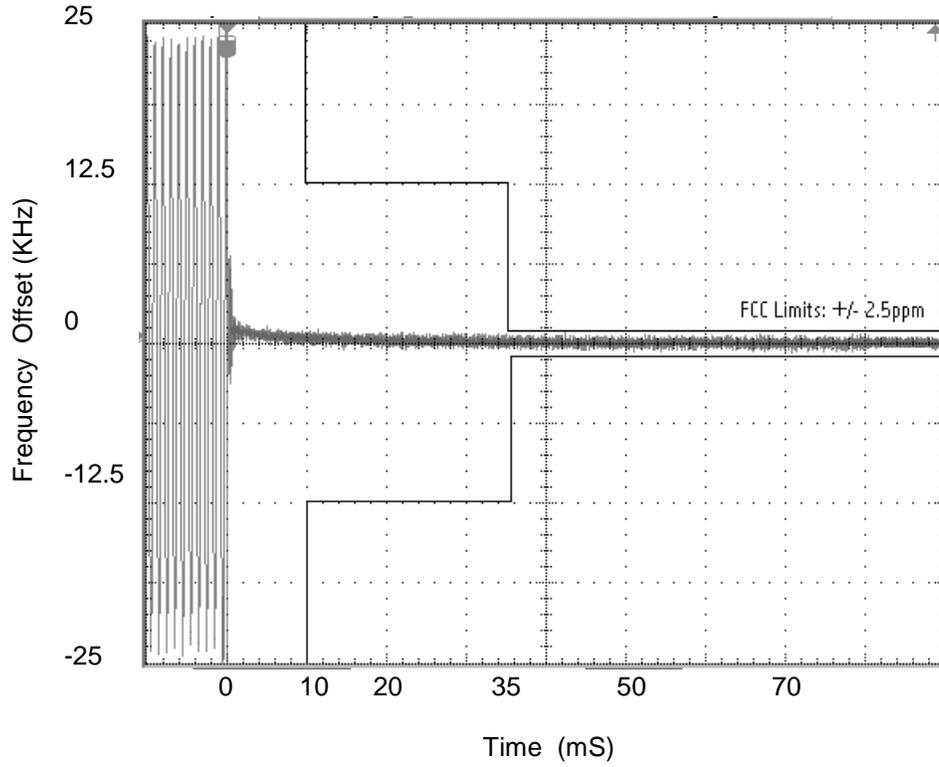
6F-2. Frequency Stability vs. Supply Voltage – Pursuant 2.1055(d)(1), 90.213

Measured at 435.025MHz.

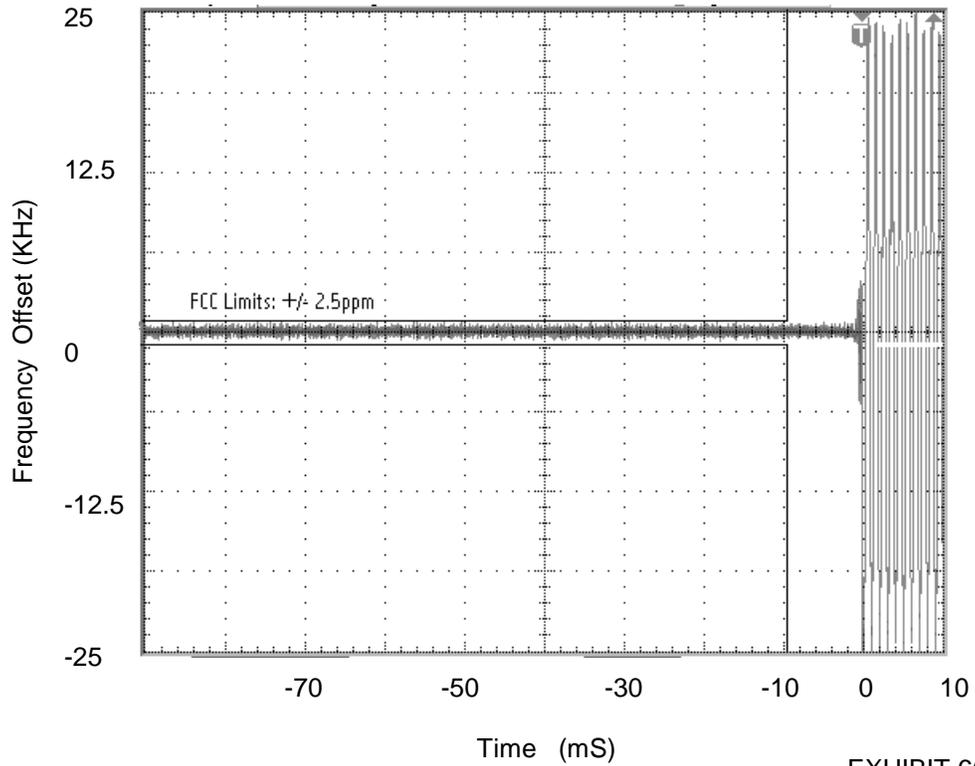


6G. Transient Frequency Behavior – Pursuant 90.214

Key 25 KHz channel spacing. Measured at 435.025MHz and 4W

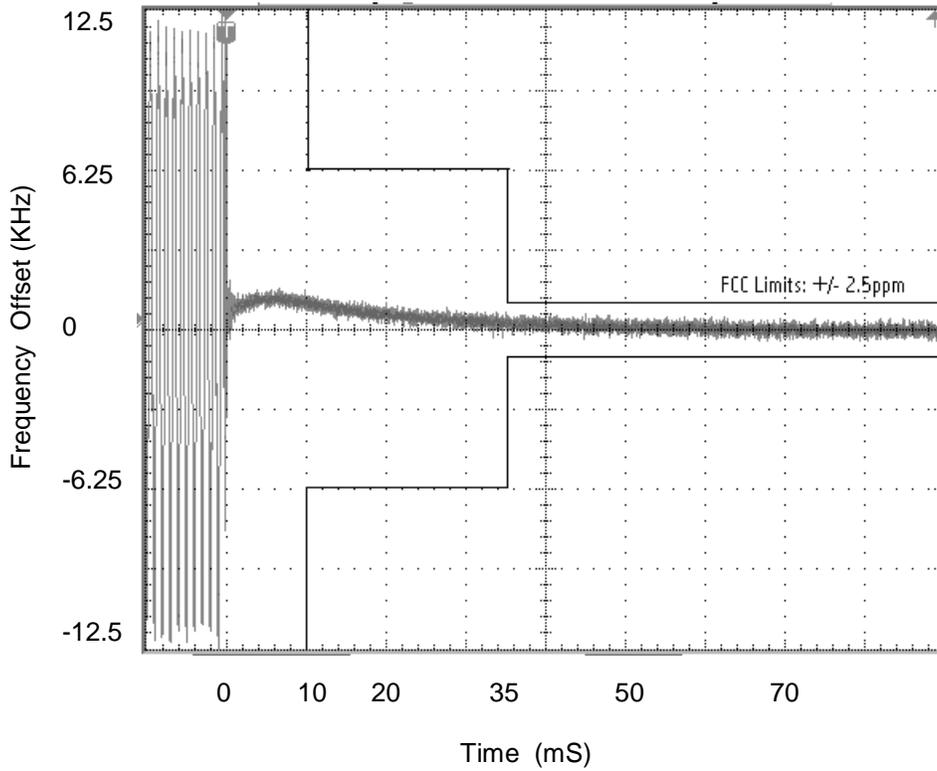


Dekey25kHz channel spacing. Measured at 435.025 and 4W.

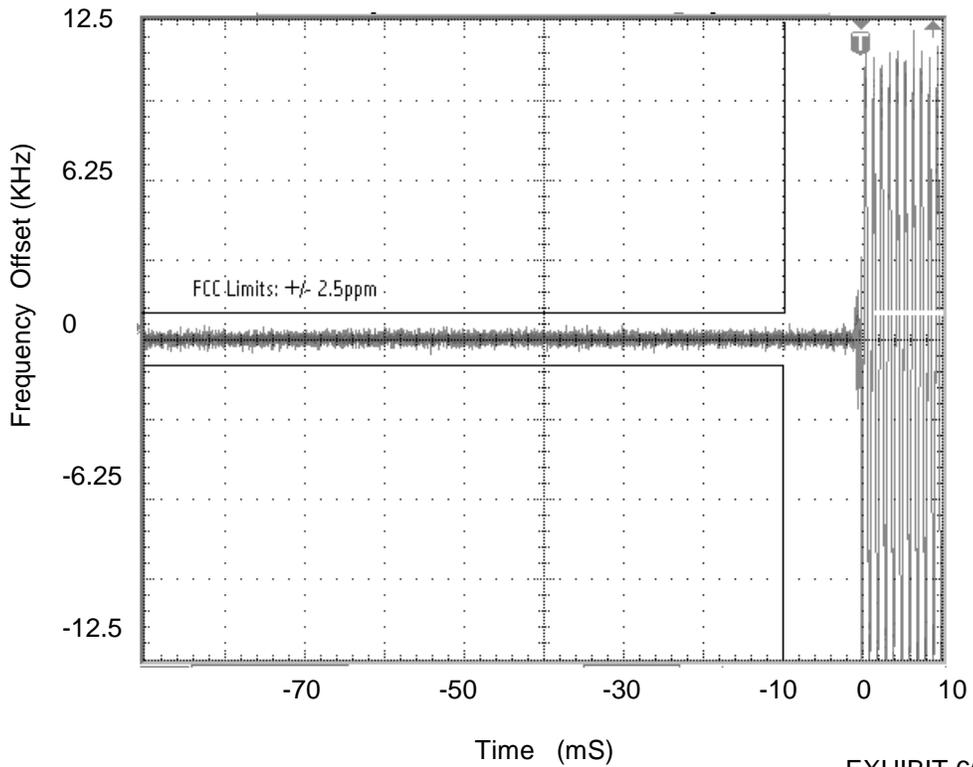


6G. Transient Frequency Behavior (cont.)

Keyup 12.5 kHz channel spacing. Measured at 435.025 MHz and 4 W.

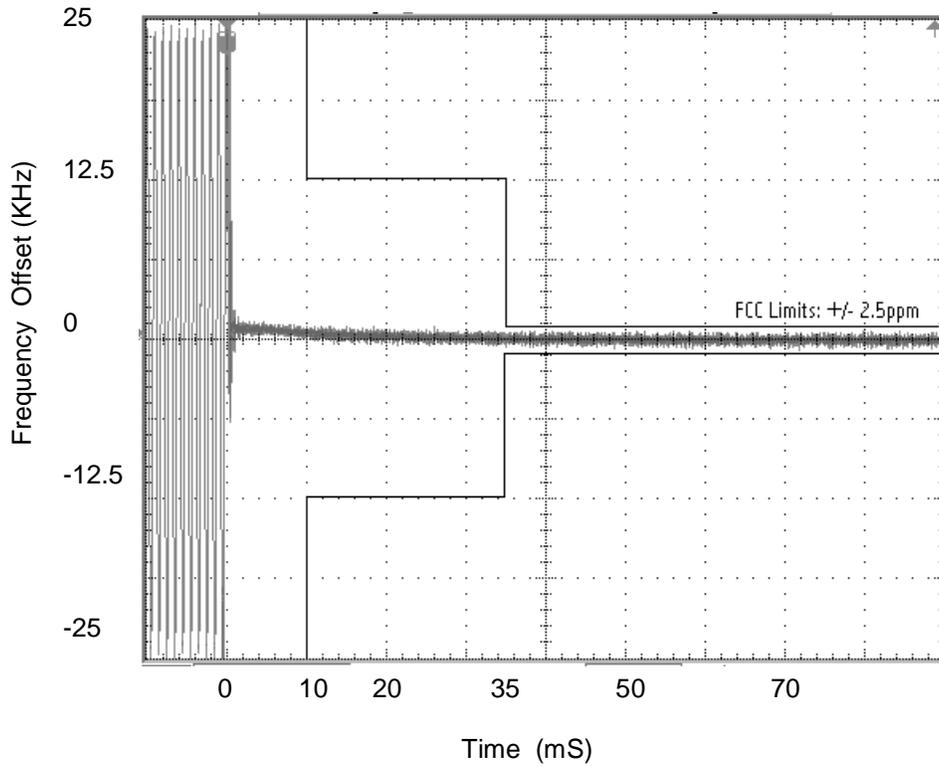


Dekey.12.5 kHz channel spacing.Measured at 435.025 MHz and 4 W.

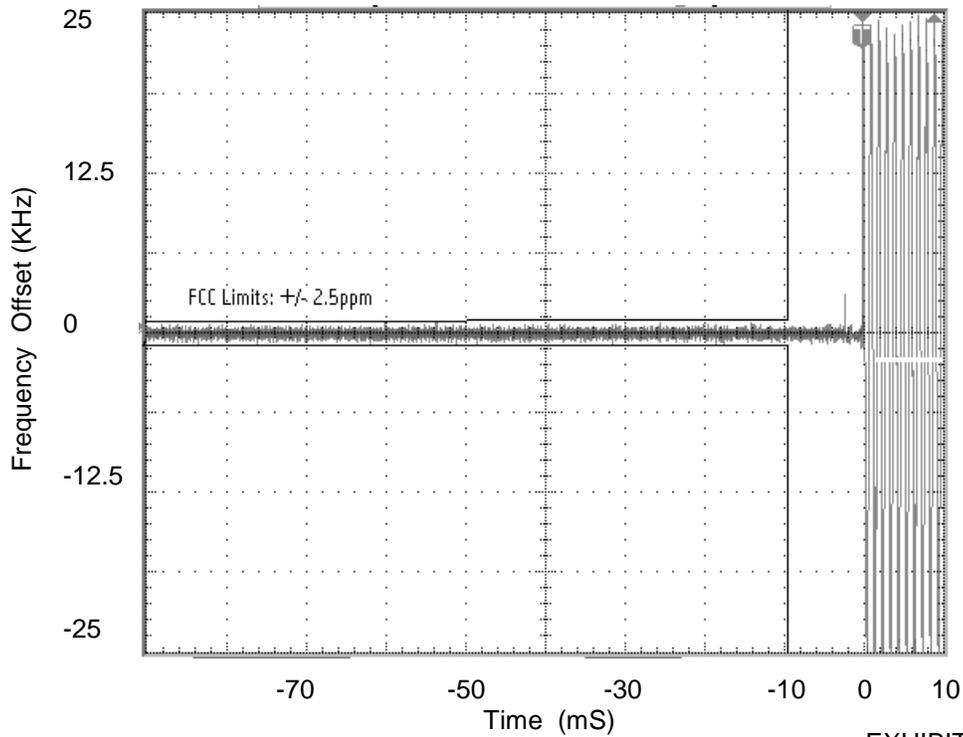


6G. Transient Frequency Behavior (cont.)

Keyup 25 kHz channel spacing. Measured at 435.025 MHz and 0.275 W.

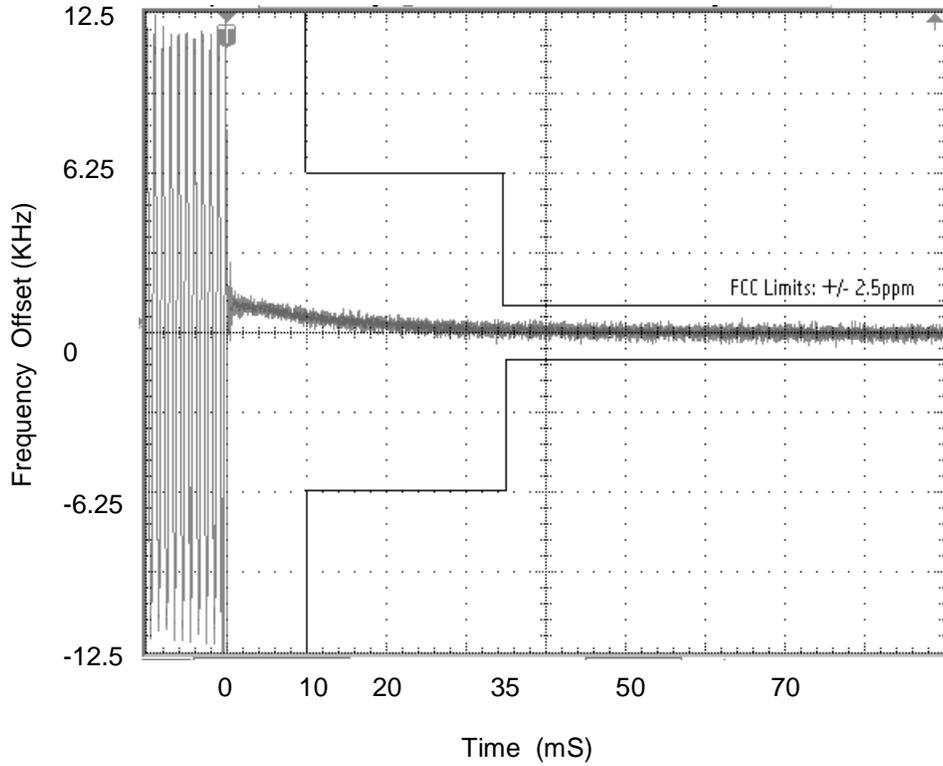


Dekey 25 kHz channel spacing. Measured at 435.025 MHz and 0.275 W.



6G. Transient Frequency Behavior (cont.)

Keyup 12.5 kHz channel spacing. Measured at 435.025 MHz and 0.275 W.



Dekey 12.5 kHz channel spacing. Measured at 435.025 MHz and 0.275 W.

