

Test Report

Prepared for: BK Technologies, Inc

Model: KNG-M400HP

Description: UHF Mobile Radio

Project #: p2540008

Test Results: Pass

FCC ID: K95KNGM400HP

To

FCC Part 90

Date of Issue: October 2, 2025

On the behalf of the applicant:

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Attention of:

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ISED Site Reg. #2044A-2

Reviewed / Authorized By:



Greg Corbin
Project Test Engineer

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Test Result Summary

Specification	Test Name	Pass, Fail, N/A	Comments
FCC			
90.205 2.1046	Carrier Output Power (Conducted)	Pass	
90.210(d) 2.1051	Unwanted Emissions (Transmitter Conducted)	Pass	
90.210(d) 2.1053	Field Strength of Spurious Radiation	Pass	
90.210(d) 2.1049(c)	Emission Masks (Occupied Bandwidth)	Pass	
2.1047(a)	Audio Low Pass Filter (Voice Input)	Pass	
2.1047(a)	Audio Frequency Response	Pass	
2.1047(b)	Modulation Limiting	Pass	
90.213(a)	Frequency Stability (Temperature Variation)	Pass	
90.213(a)	Frequency Stability (Voltage Variation)	Pass	
90.214	Transient Frequency Behavior	Pass	
2.202(g)	Necessary Bandwidth Calculation	Pass	

Statements of conformity are reported as:

- Pass - the measured value is below the acceptance limit, *acceptance limit = test limit*.
- Fail - the measured value is above the acceptance limit, *acceptance limit = test limit*.

References/Methods	Description
ANSI C63.4-2014	Method and Measurements of Radio-Noise Emissions from low-Voltage Electrical and Electronic Equipment in the range 9kHz to 40GHz.
ANSI C63.10:2020	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Ansi C63.26:2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
ANSI/TIA-603-E-2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ISO/IEC 17025:2017	General requirements for the Competence of Testing and Calibrations Laboratories

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	October 2, 2025	Madhava Gooduru	Original Document

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ANAB

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF Communiqué dated January 2009).

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.



Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II, Part 2, Subpart J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, ANSI C63.26-2015 and FCC Part 90.

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing.

In accordance with ANSI/TIA 603C, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104°F) unless the particular equipment requirements specified testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Environmental Conditions		
Temp (°C)	Humidity (%)	Pressure (mbar)
25.9 – 30.2	35.5 – 44.6	963.3 – 971.3

Measurement results, unless otherwise noted, are worst-case measurements.

EUT Description

Model:	KNG-M400HP
Serial:	Sample 1: 10102B0522443002 Sample 2: 10102B0522443001
Firmware:	v5.7.15
Software:	N/A
Description:	UHF Mobile Radio
Additional Information:	The EUT is a 100-watt Mobile transceiver using FM and C4FM modulation operating in the UHF band as noted in Table 1.
Power	13.8 vdc
Receipt of Sample(s):	Sample 1: 7/15/2025 Sample 2: 8/7/2025
EUT Condition:	Visual Damage No State of Development Production/Production Equivalent

EUT Operation during Tests

The transmitter is powered by 13.8 vdc.

The Mobile transceiver operates with NB (12.5 kHz Channel) and C4FM.

The output power was set to 100 watts for all tests.

Sample 2 used for Occupied Bandwidth, Emission Mask, Unwanted Emissions (Conducted) tests and Sample 1 used for the rest of tests.

Table 1 – Frequency Range, Modulation Type and Emission Designators

Frequency Range (MHz)	Modulation and Emission Designators		
FCC	FM_12.5kHz	P25 Phase1 C4FM	P25 Phase 2 TDMA
380-470	11K0F3E	8K10F1E 8K10F1D	8K10F1W

Table 2 - FCC Test Frequencies

Test Frequency (MHz)	FCC Rule Part
380.0125	90 (Extended frequency)
406.1125	90
420	90
429.9875	90
450.0125	90
460.0000	90
469.9875	90

Accessories:

Qty	Description	Length	Model	S/N
1	2 wire power cable from EUT to power supply	5 m	N/A	N/A
1	Multi-pin connector to BNC cable and Toggle from EUT Audio input	0.5 m	N/A	N/A
1	Standard Handheld Microphone with Straight Connector	2 m	KAA0276S	N/A
1	External speaker for Mobile Radio	2 m	KAA0261	NA

Modifications: None

The Applicant has been cautioned as to the following:

15.21: Information to the User

The user's manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a): Special Accessories

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Carrier Output Power (Conducted)

Engineer: Madhava Gooduru

Test Date: 7/22/2025, 8/13/25

Measurement Procedure

The Equipment Under Test (EUT) was connected to a spectrum analyzer through a 30 dB Power attenuator.

All cable and attenuator losses were input into the spectrum analyzer as a reference level offset to ensure accurate reading was obtained.

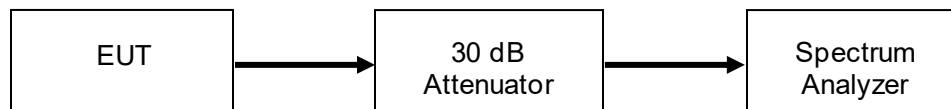
For FM, a CW signal and peak detector was used for performing output power measurements.

For C4FM, the channel power tool on the spectrum analyzer was used for performing output power measurements. Output power was recorded for highest power setting.

Manufacturer Rated Power = 100 watts (50 dBm)

90.205(s)_FCC Output Power Limit = 120 w (20% of manufacturer rated power)

Test Setup



Transmitter Peak Output Power_ CW

Tuned Frequency	Power Level Setting	Output Power		Result
		dBm	watts	
380.0125	100	50.45	110.92	Pass
406.1125	100	50.61	115.08	Pass
420	100	50.52	112.72	Pass
429.9875	100	50.42	110.15	Pass
450.0125	100	50.27	106.41	Pass
460	100	50.31	107.40	Pass
469.9875	100	50.41	109.90	Pass

Transmitter Average Output Power_ C4FM

Tuned Frequency	Power Level Setting	Output Power		Result
		dBm	watts	
380.0125	100	50.39	109.40	Pass
406.1125	100	50.54	113.24	Pass
420	100	50.49	111.94	Pass
429.9875	100	50.44	110.66	Pass
450.0125	100	50.16	103.75	Pass
460	100	50.47	111.43	Pass
469.9875	100	50.10	102.33	Pass

Annex A Output Power

Refer to Annex A for Output Power plots.

Conducted Spurious Emissions

Engineer: Madhava Gooduru

Test Date: 7/28/25, 9/26/25

Test Procedure

The EUT was connected directly to a spectrum analyzer to verify that the EUT met the requirements for spurious emissions.

The resolution bandwidth was set for 100 kHz or 1 MHz as required per the rule section and the reference level was adjusted to ensure the system had sufficient dynamic range to measure spurious emissions.

A tunable notch filter was utilized for 30 MHz to 1 GHz to ensure the fundamental did not put the spectrum analyzer into compression.

The notch filter was replaced with a 1 GHz high pass filter that was used for measurements above 1 GHz.

The frequency range from 30 MHz to the 10th harmonic of the fundamental transmitter was observed and plotted.

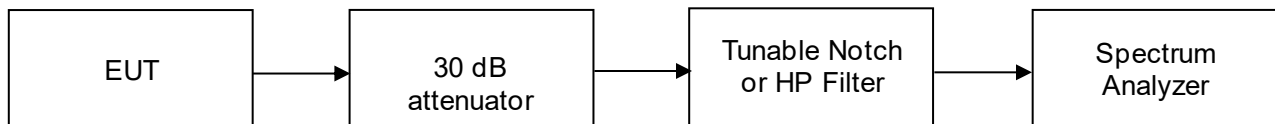
The conducted spurious emissions were recorded using FM and C4FM modulation.

The specification limit was set for -20 dBm for comparison to the emission mask “D” limit.

Note: A marker was placed on the fundamental frequency and the highest spurious emission. Only the fundamental TX signal exceeded the limit as shown in the spectrum analyzer screenshots.

The output power was set to 100 watts for all conducted spurious measurements.

Test Setup



Conducted Spurious Emissions Summary Test Table_ FM – Narrow band

Frequency Span	Tuned Frequency	Conducted Spurious		Limit	Margin	Result
		Frequency	Level			
MHz	MHz	MHz	dBm	dBm	dB	
30 - 1000	380.0125	417.87	-43.37	-20.00	-23.37	Pass
30 - 1000	406.1125	812.25	-42.33	-20.00	-22.33	Pass
30 - 1000	420	839.94	-43.68	-20.00	-23.68	Pass
30 - 1000	429.9875	859.94	-44.38	-20.00	-24.38	Pass
30 - 1000	450.0125	900.00	-42.21	-20.00	-22.21	Pass
30 - 1000	460	396.73	-41.16	-20.00	-21.16	Pass
30 - 1000	469.9875	402.67	-38.91	-20.00	-18.91	Pass
1000 - 5000	380.0125	1140.00	-38.51	-20.00	-18.51	Pass
1000 - 5000	406.1125	1218.50	-35.40	-20.00	-15.40	Pass
1000 - 5000	420	1260.00	-36.62	-20.00	-16.62	Pass
1000 - 5000	429.9875	1290.00	-37.39	-20.00	-17.39	Pass
1000 - 5000	450.0125	1350.00	-36.41	-20.00	-16.41	Pass
1000 - 5000	460	1380.00	-36.76	-20.00	-16.76	Pass
1000 - 5000	469.9875	1410.00	-38.18	-20.00	-18.18	Pass

Conducted Spurious Emissions Summary Test Table_ C4FM

Frequency Span	Tuned Frequency	Conducted Spurious		Limit	Margin	Result
		Frequency	Level			
MHz	MHz	MHz	dBm	dBm	dB	
30 - 1000	380.0125	410.85	-42.97	-20.00	-22.97	Pass
30 - 1000	406.1125	487.72	-48.22	-20.00	-28.22	Pass
30 - 1000	420	490.39	-49.96	-20.00	-29.96	Pass
30 - 1000	429.9875	859.96	-44.90	-20.00	-24.90	Pass
30 - 1000	450.0125	900.09	-42.83	-20.00	-22.83	Pass
30 - 1000	460	920.10	-44.49	-20.00	-24.49	Pass
30 - 1000	469.9875	939.98	-45.37	-20.00	-25.37	Pass
1000 - 5000	380.0125	3040.50	-45.09	-20.00	-25.09	Pass
1000 - 5000	406.1125	2843.00	-46.23	-20.00	-26.23	Pass
1000 - 5000	420	2940.00	-47.00	-20.00	-27.00	Pass
1000 - 5000	429.9875	1720.00	-44.50	-20.00	-24.50	Pass
1000 - 5000	450.0125	1800.00	-45.21	-20.00	-25.21	Pass
1000 - 5000	460	1840.00	-45.02	-20.00	-25.02	Pass
1000 - 5000	469.9875	1800.00	-43.87	-20.00	-23.87	Pass

Annex B Conducted Spurious Emission

Refer to Annex B for Conducted Spurious Emission plots.

Field Strength of Spurious Radiation

Engineer: Madhava Gooduru

Test Date: 09/30/2025

Test Procedure

The EUT was tested in a semi-anechoic chamber with the turntable set 3m from the receiving antenna.

A spectrum analyzer was used to verify that the EUT met the requirements for radiated emissions.

The EUT was tested by rotating it 360 degrees with the antenna in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure that the signal levels were maximized.

All cable and antenna correction factors were input into the spectrum analyzer ensuring an accurate measurement in ERP with the resultant power in dBm.

The EUT was set to transmit at maximum power with the RF output terminated with a 150-watt 50 ohm load.

Radiated spurious emissions were recorded with the EUT using CW and C4FM modulation.

The RBW was set to 100 kHz for measurements below 1 GHz and 1 MHz for measurements above 1 GHz.

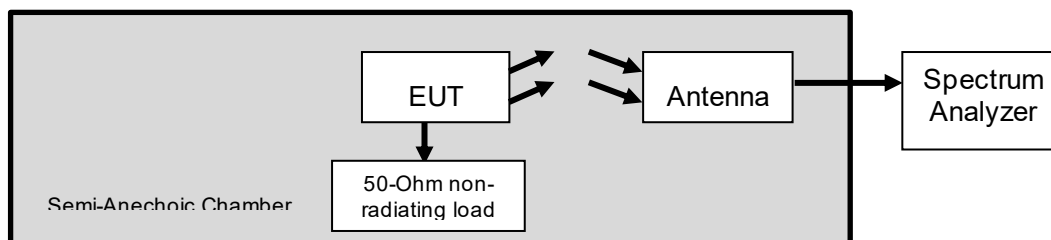
The VBW was set to 3 times the RBW.

The following formula was used for calculating the limits:

The worst case radiated spurious limit = $P_1 - (50 + 10\log(P_2)) = -20\text{dBm}$

On the 30 – 1000 MHz plots, marker 1 is the fundamental transmit frequency and is not subject to the -20 dBm limit.

Test Setup



Radiated Spurious Emissions Summary Test Table_ CW

Frequency Span	Tuned Frequency	Radiated Spurious		Limit	Margin	Result
		Frequency	Level			
MHz	MHz	MHz	dBm	dBm	dB	
30 - 1000	380.0125	760.022	-35.44	-20	-15.44	Pass
30 - 1000	406.1125	812.208	-29.40	-20	-9.40	Pass
30 - 1000	420	840.047	-30.00	-20	-10.00	Pass
30 - 1000	429.9875	860.029	-41.95	-20	-21.95	Pass
30 - 1000	450.0125	900.09	-37.67	-20	-17.67	Pass
30 - 1000	460	919.975	-35.99	-20	-15.99	Pass
30 - 1000	469.9875	939.957	-25.02	-20	-5.02	Pass
1000 - 5000	380.0125	1900.8	-30.26	-20	-10.26	Pass
1000 - 5000	406.1125	1219.2	-31.27	-20	-11.27	Pass
1000 - 5000	420	2100.8	-29.53	-20	-9.53	Pass
1000 - 5000	429.9875	1720.8	-26.68	-20	-6.68	Pass
1000 - 5000	450.0125	1800.8	-29.50	-20	-9.50	Pass
1000 - 5000	460	1380.8	-29.48	-20	-9.48	Pass
1000 - 5000	469.9875	1410.8	-27.89	-20	-7.89	Pass

Radiated Spurious Emissions Summary Test Table_ C4FM

Frequency Span	Tuned Frequency	Radiated Spurious		Limit	Margin	Result
		Frequency	Level			
MHz	MHz	MHz	dBm	dBm	dB	
30 - 1000	380.0125	760.022	-37.70	-20	-17.70	Pass
30 - 1000	406.1125	812.208	-28.11	-20	-8.11	Pass
30 - 1000	420	840.047	-29.88	-20	-9.88	Pass
30 - 1000	429.9875	860.029	-42.36	-20	-22.36	Pass
30 - 1000	450.0125	900.09	-30.48	-20	-10.48	Pass
30 - 1000	460	919.975	-36.58	-20	-16.58	Pass
30 - 1000	469.9875	939.957	-25.93	-20	-5.93	Pass
1000 - 5000	380.0125	1900.8	-30.52	-20	-10.52	Pass
1000 - 5000	406.1125	1219.2	-31.32	-20	-11.32	Pass
1000 - 5000	420	2100.8	-29.11	-20	-9.11	Pass
1000 - 5000	429.9875	1720.8	-26.59	-20	-6.59	Pass
1000 - 5000	450.0125	1800.8	-30.19	-20	-10.19	Pass
1000 - 5000	460	1380.8	-29.14	-20	-9.14	Pass
1000 - 5000	469.9875	1410.8	-27.58	-20	-7.58	Pass

Annex C Radiated Spurious Emission

Refer to Annex C for Radiated Spurious Emission plots with CW and C4FM modulation.

Emission Masks

Engineer: Madhava Gooduru

Test Date: 7/25/25, 9/26/25

Measurement Procedure

The EUT was connected to a spectrum analyzer through a 30 dB attenuator to verify that the EUT meets the required emissions mask.

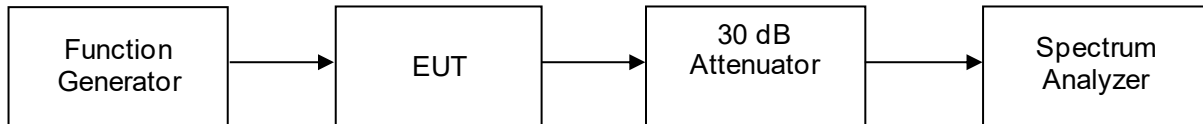
The reference level was set to the maximum power recorded previously.

Mask D was used for narrowband FM and C4FM.

For FM modulation, the transmitter was modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.

For C4FM modulation the internal C4FM standard test pattern was used.

Test Setup



Annex D Emission Mask

Refer to Annex D for Emission Mask plots.

Occupied Bandwidth

Engineer: Madhava Gooduru

Test Date: 8/13/25, 9/26/25

Measurement Procedure

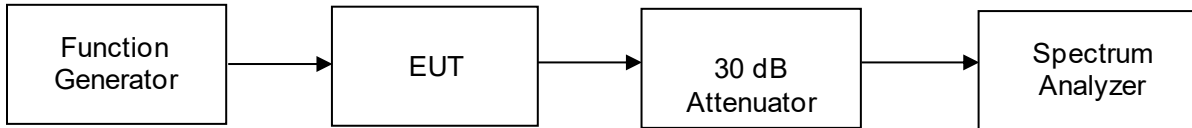
The EUT was connected to a spectrum analyzer through a 30 dB attenuator to verify that the EUT meets the required occupied bandwidth.

The internal occupied bandwidth tool built into the spectrum analyzer was used to record the -26 dB and 99% occupied bandwidth.

For FM modulation, the transmitter was modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.

For C4FM modulation the internal C4FM standard test pattern was used.

Test Setup



Occupied Bandwidth Summary Table

Tuned Frequency	Modulation	99%	-26 dB
MHz	NB, C4FM	kHz	kHz
380.0125	NB	9.9843	10.238
406.1125	NB	10.0044	10.239
420	NB	9.9545	10.231
429.9875	NB	9.9514	10.228
450.0125	NB	9.9654	10.242
460	NB	9.9701	10.254
469.9875	NB	9.9374	10.237
380.0125	C4FM	7.822	9.227
406.1125	C4FM	8.1383	10.758
420	C4FM	7.7756	9.581
429.9875	C4FM	8.005	9.636
450.0125	C4FM	7.796	9.613
460	C4FM	7.8427	9.935
469.9875	C4FM	7.8873	10.249

Annex E Occupied Bandwidth

Refer to Annex E for Occupied Bandwidth plots.

Transient Frequency Behavior

Engineer: Madhava Gooduru

Test Date: 9/26/25

Measurement Procedure

The EUT connected as shown below to a modulation analyzer through a 30 dB attenuator and power combiner to verify that the EUT meets the required Transient Frequency Behavior response per the specification.
This test is only applicable for FCC part 90 PTT radios in frequency range of 130 – 174 and 406 – 512 MHz
This test is performed for all analog modulation bandwidths. This test is performed on one channel only.

The modulation analyzer is a real time spectrum analyzer with integrated demodulation, audio measurement capabilities, and timing analysis.

An RF test signal of the same frequency as the EUT from the signal generator shall be modulated by a frequency of 1 kHz with a deviation equal to plus or minus the value of the channel spacing (separation).

The turn on and turn off Transmitter and transient timing was measured and recorded.

Part 90.214 transient frequency behavior requirements.

Time Intervals ^{1,2}	Maximum Frequency Difference ³	All Equipment	
		150 – 174 MHz	421 – 512 MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels			
t ₁ ⁴	±25.0 kHz	5.0 ms	10.0 ms
t ₂	±12.5 kHz	20.0 ms	25.0 ms
t ₃ ⁴	±25.0 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels			
t ₁ ⁴	±12.5 kHz	5.0 ms	10.0 ms
t ₂	±6.25 kHz	20.0 ms	25.0 ms
t ₃ ⁴	±12.5 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels			
t ₁ ⁴	±6.25 kHz	5.0 ms	10.0 ms
t ₂	±3.125 kHz	20.0 ms	25.0 ms
t ₃ ⁴	±6.25 kHz	5.0 ms	10.0 ms

¹ 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 the time period from the instant when the transmitter is turned off until t_{off} .

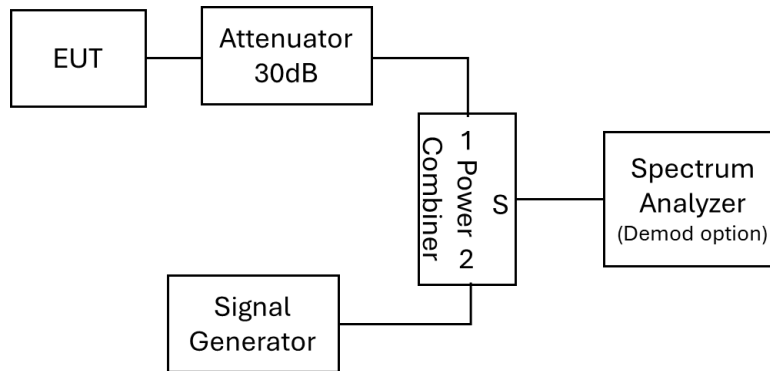
t_{off} is the instant when the 1 kHz test signal starts to rise.

² During the time from the end of t_2 to the beginning of t_3 , the frequency difference must not exceed the limits specified in §90.213.

³ Difference between the actual transmitter frequency and the assigned transmitter frequency.

⁴ If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

Test Setup



Transient Frequency Test Results

Tuned Frequency = 460 MHz			
Channel Bandwidth = 12.5 kHz			
Time Interval	Frequency Error	Limit	Pass / Fail
	(kHz)	(kHz)	
t1	0.582	± 12.5	Pass
t2	0.496	± 6.25	Pass
t3	0.246	± 12.5	Pass

Annex F Transient Frequency Behavior

Refer to Annex F for Transient Frequency Behavior plots.

Audio Low Pass Filter (Voice Input)

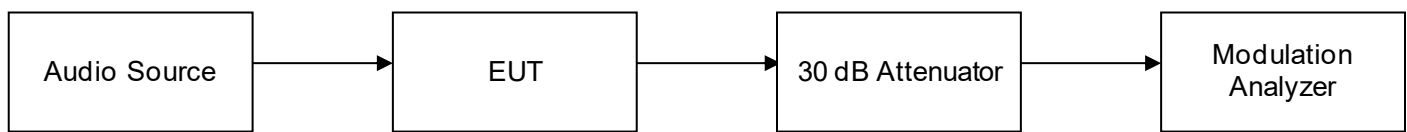
Engineer: Madhava Gooduru

Test Date: 8/6/25

Measurement Procedure

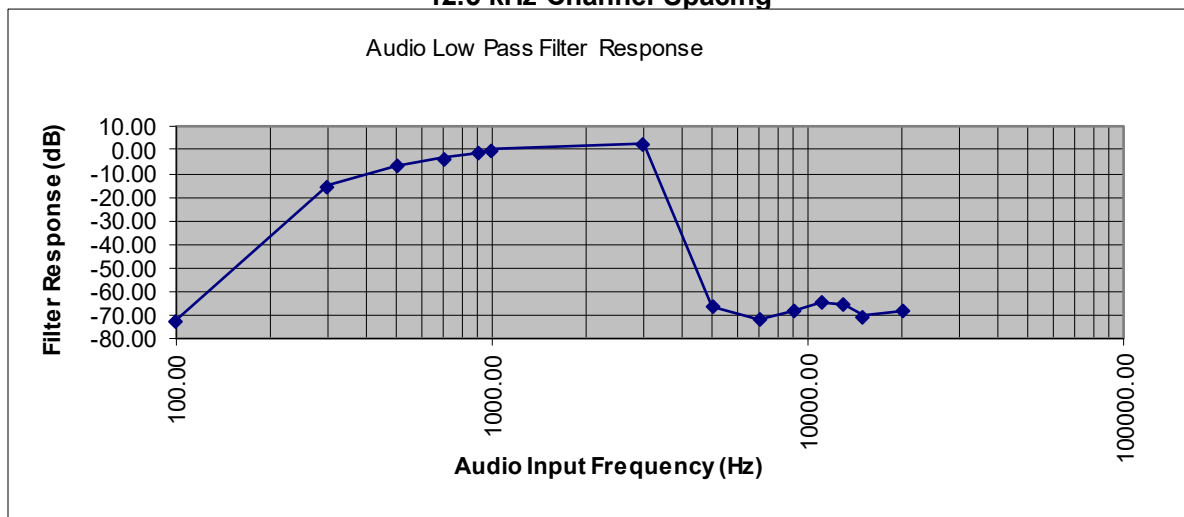
The EUT was connected directly to a modulation analyzer through an attenuator. Set the audio frequency generator to 1 kHz and adjust the level for 60% deviation per manufacturer's specifications. The audio source was tuned from 100 Hz to 20 kHz and the audio frequency response was measured and plotted. The modulation analyzer is a real time spectrum analyzer with integrated demodulation, audio measurement capabilities, and timing analysis. The Audio Low Pass Filter test data was recorded for 12.5 kHz channel spacing.

Test Setup



Test Results

12.5 kHz Channel Spacing



Audio Frequency Response

Engineer: Madhava Gooduru

Test Date: 8/6/25

Measurement Procedure

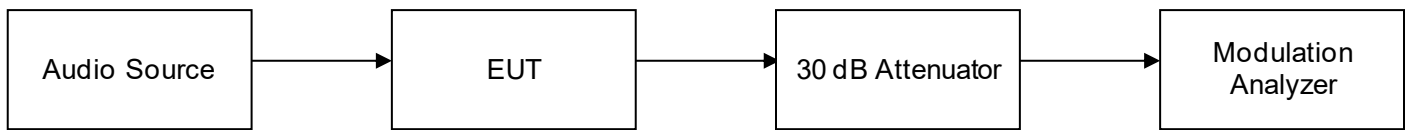
The EUT was connected directly to a modulation analyzer through an attenuator.

The audio frequency was set to 1 kHz and the level was adjusted for 20% deviation according to the manufacturer's instructions.

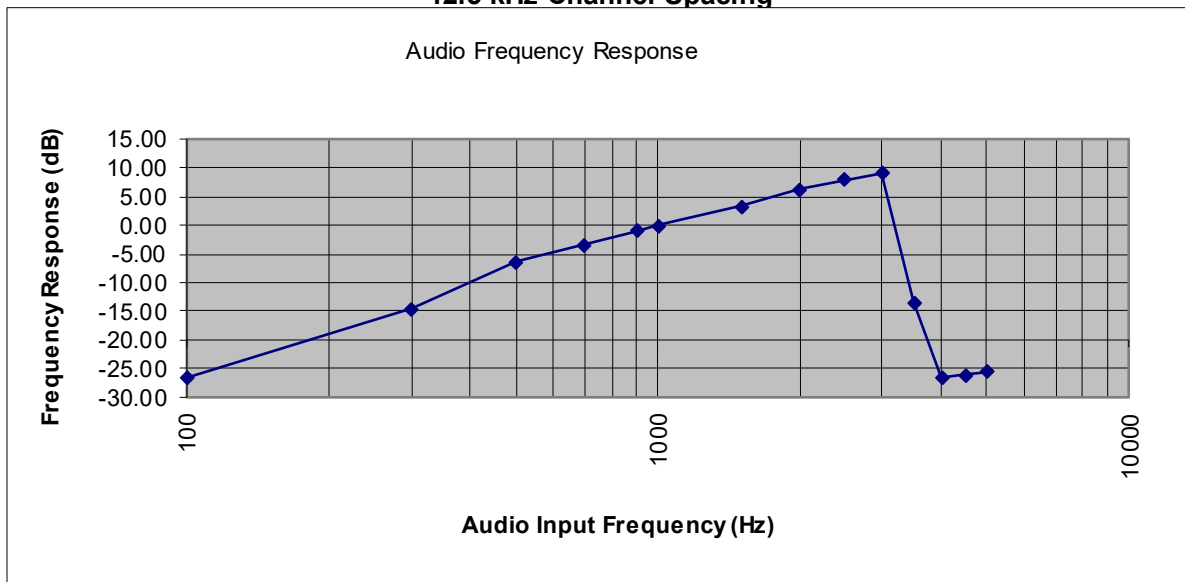
The audio source was tuned from 100 Hz to 5000 Hz and the audio frequency response was measured and plotted. The modulation analyzer is a real time spectrum analyzer with integrated demodulation, audio measurement capabilities, and timing analysis.

The Audio Frequency Response test data was recorded for 12.5 kHz channel spacing.

Test Setup



12.5 kHz Channel Spacing



Modulation Limiting

Engineer: Madhava Gooduru

Test Date: 8/6/25

Measurement Procedure

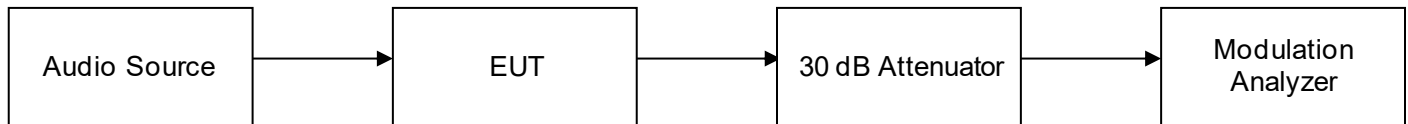
The EUT was connected directly to a modulation analyzer through an attenuator.

The audio frequency was set to 1 kHz and the level was adjusted for 60% deviation according to the manufacturer's instructions. The input level was then set to 16 dB above the level used for 50 % modulation.

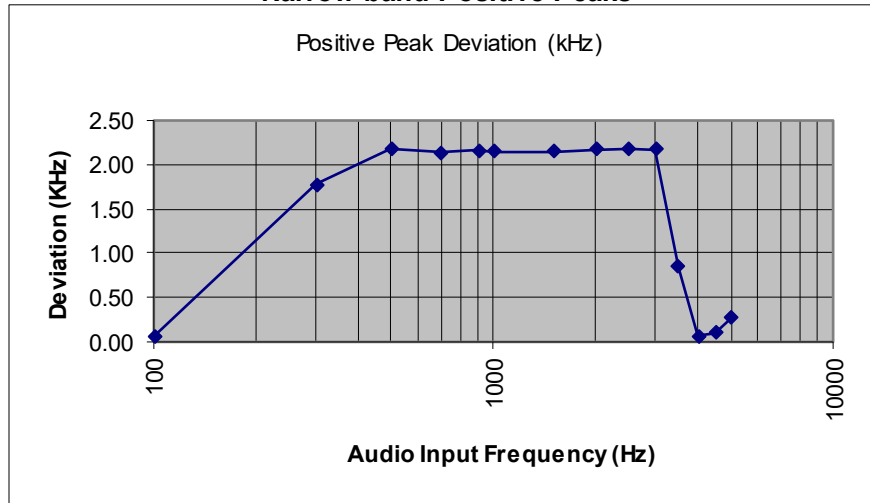
The audio source was tuned from 100 Hz to 5000 Hz and the audio frequency response was measured and plotted. The modulation analyzer is a real time spectrum analyzer with integrated demodulation, audio measurement capabilities, and timing analysis.

The Modulation Limiting test data was recorded for 12.5 kHz channel spacing.

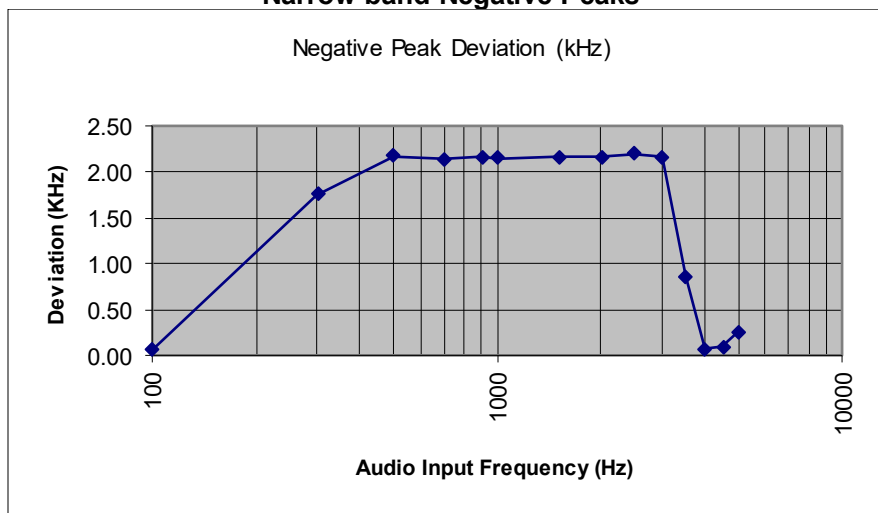
Test Setup



Narrow band Positive Peaks



Narrow band Negative Peaks



Frequency Stability

Engineer: Madhava Gooduru

Test Date: 8/14/2025

Measurement Procedure

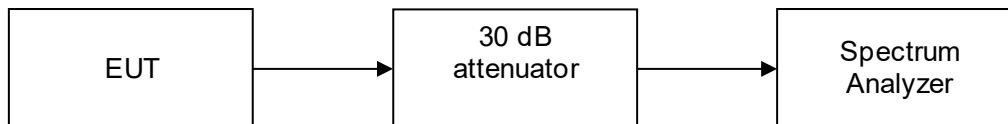
The EUT was placed in an environmental test chamber and the RF output was connected directly to a spectrum analyzer. The temperature was varied from -30°C to 50°C in 10°C increments.

After a sufficient time for temperature stabilization the RF output frequency was measured.

At 20°C the power supply voltage to the EUT was varied from 85% to 115% of the nominal value and the RF output was measured.

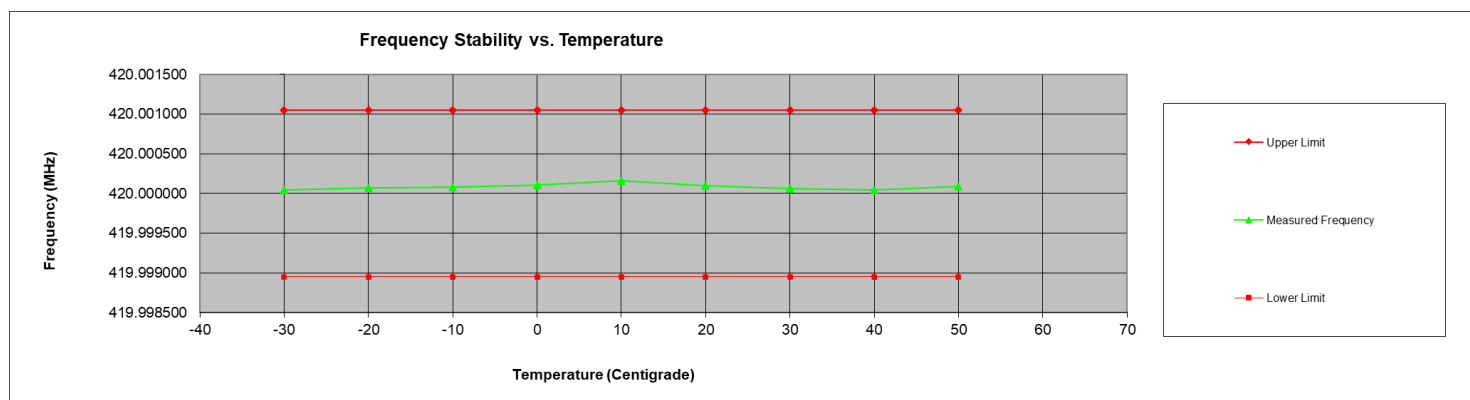
The transmitter DC input = 13.8 vdc.

Measurement Setup



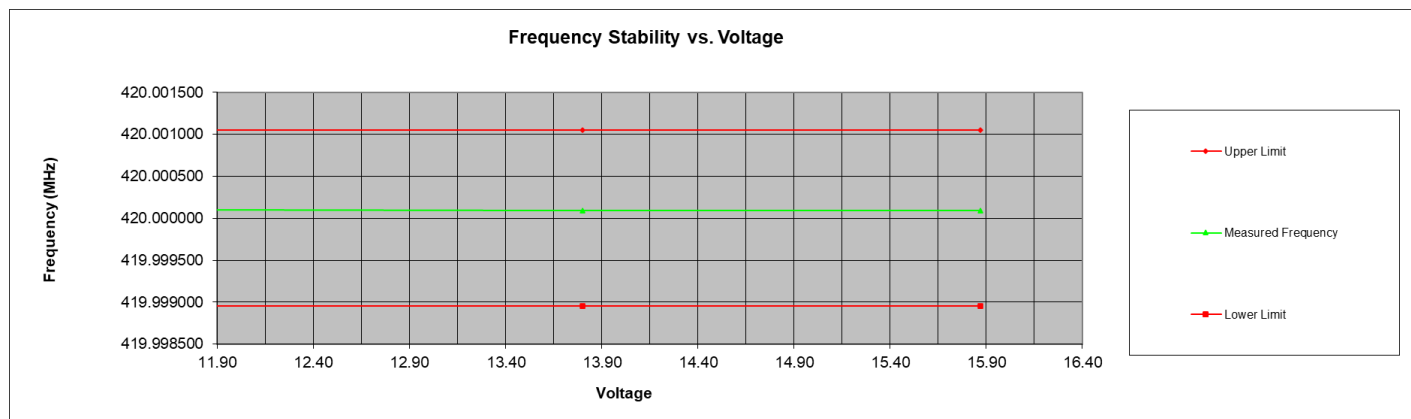
Frequency Stability vs Temperature

Tuned Frequency	Temperature	Tolerance	Measured Frequency	Upper Limit	Lower Limit	Upper Margin	Lower Margin
(MHz)	(deg C)	(PPM)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)
420	-30	2.5	420.000043	420.001050	419.998950	-0.001007	0.001093
420	-20	2.5	420.000073	420.001050	419.998950	-0.000977	0.001123
420	-10	2.5	420.000076	420.001050	419.998950	-0.000974	0.001126
420	0	2.5	420.000103	420.001050	419.998950	-0.000947	0.001153
420	10	2.5	420.000161	420.001050	419.998950	-0.000889	0.001211
420	20	2.5	420.000095	420.001050	419.998950	-0.000955	0.001145
420	30	2.5	420.000065	420.001050	419.998950	-0.000985	0.001115
420	40	2.5	420.000046	420.001050	419.998950	-0.001004	0.001096
420	50	2.5	420.000086	420.001050	419.998950	-0.000964	0.001136



Frequency Stability vs Voltage

Tuned Frequency	Tolerance	Voltage	Measured Frequency	Upper Limit	Lower Limit	Upper Margin	Lower Margin
(MHz)	(PPM)	(V)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)
420	2.5	11.73	420.000100	420.001050	419.998950	-0.000950	0.001150
420	2.5	13.80	420.000095	420.001050	419.998950	-0.000955	0.001145
420	2.5	15.87	420.000090	420.001050	419.998950	-0.000960	0.001140



Necessary Bandwidth Calculations

Engineer: Madhava Gooduru

Test Date: 7/28/2025

Modulation = 11K0F3E		
Necessary Bandwidth Calculation:		
Maximum Modulation (M), kHz	=	3
Maximum Deviation (D), kHz	=	2.5
Constant Factor (K)	=	1
Necessary Bandwidth (B _N), kHz	=	(2xM)+(2xDxK)
	=	11.0

Modulation = 8K10F1E, 8K10F1W, 8K10F1D		
Necessary Bandwidth Calculation:		
Data Rate (R) Kbps	=	9.6
Maximum Deviation (D), kHz	=	3.111
Signaling States	=	4
Constant Factor (K)	=	0.531
Necessary Bandwidth (B _N), kHz	=	(R/log ₂ S)+2DK
	=	8.1

Measurement Uncertainty

Measurement Uncertainty (U_{lab}) for Compliance Testing is listed in the table below.

Measurement	U_{lab}
Radio Frequency	$\pm 3.3 \times 10^{-8}$
RF Power, conducted	$\pm .54$ dB
RF Power Density, conducted	± 1.0 dB
Conducted Emissions	± 0.94 dB
Radiated Emissions 9kHz-30MHz	± 2.76 dB
Radiated Emissions 30MHz-1000MHz	± 4.25 dB
Radiated Emissions – 1GHz-18GHz	± 4.49 dB
Temperature	± 1.5 deg C
Humidity	± 4.3 %
DC voltage	± 0.20 VDC
AC Voltage	± 1.2 VAC

The reported expanded uncertainty $\pm U_{lab}(\text{dB})$ has been estimated at a 95% confidence level ($k=2$)

U_{lab} is less than or equal to U_{ETSI} therefore

- Compliance is deemed to occur if no measured disturbance exceeds the disturbance limit
- Non-Compliance is deemed to occur if any measured disturbance exceeds the disturbance limit

Test Equipment Utilized

Description	Manufacturer	Model #	CT Asset #	Last Cal Date	Cal Due Date
Signal Generator	Agilent	E4438C	I00457	12/14/2024	12/14/2025
Digital Radio Test Set	Aeroflex	3920B	I00524	Verified on: 8/6/25	
Tunable Notch Filter	Eagle	TNF-1-(250 - 850MHz)	i00124	Verified on: 7/28/25	
Horn Antenna	ARA	DRG-118/A	i00271	8/9/2024	8/9/2026
Temp./humidity/pressure monitor (Main Lab)	Omega Engineering	iBTHX-W-5	i00686	1/25/2025	1/25/2026
Data Logger	Fluke	Hydra Data Bucket	i00343	7/1/2025	7/1/2026
Attenuator, 30 dB, 150W	Narda	769-30	i00347	Verified on: 7/28/25	
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	2/27/25	2/27/27
Spectrum Analyzer	Textronix	RSA5126A	i00424	7/1/2025	7/1/2026
Spectrum Analyzer	Agilent	E4445A	I00471	1/25/2025	1/25/2026
3 Meter Semi-Anechoic Chamber	Panashield	3 Meter Semi-Anechoic Chamber	i00428	7/13/23	7/13/26
Highpass Filter (1 GHz)	K&L	7IH40-980/T6000-O/O	i00432	Verified on: 7/28/25	
Voltmeter	Fluke	79iii	i00499	10/15/24	10/15/25
MXE EMI receiver	Keysight	N9038A	i00552	3/17/2025	3/17/2026
Temperature Chamber	Thermotron	SE-1000-3-3	i00557	Verified on: 8/14/25	
DC Power Supply	Keysight	N7973A	i00565	Verified on: 7/22/25	
Preamplifier	COM-Power	PAM-103	i00734	Verified on: 7/21/25	
Preamplifier	Eravant	SBB-0115034019-2F2F-E3	i00756	Verified on: 7/21/25	

In addition to the above-listed equipment, standard RF connectors and cables were utilized in the testing of the equipment described. Prior to testing, these components were tested to verify proper operation.

END OF TEST REPORT