

Test Report

Prepared for: Honeywell Intl. Inc.

Model: KTR 2280B

Description: Multi Mode Digital Radio

Serial Number: 24094219

FCC ID: ASYKTR2280B
ISED ID: 10900A-KTR2280B

To

FCC Part 2, 87
ISED RSS-141 issue 2 (June 2010)

Date of Issue: September 3, 2025

On the behalf of the applicant:

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ANAB Cert#: AT-2901
FCC Site Reg. 750616
ISED Site Reg. #2044A-2



Greg Corbin
Project Test Engineer

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All results contained herein relate only to the sample tested.

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	September 3, 2025	Greg Corbin	Original Document
2.0	November 11, 2025	Greg Corbin	Updated RBW information on page 8.

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Test Results Summary

Specification		Test Name	Pass, Fail, N/A	Comments
FCC	ISED			
2.1046 87.131	RSS-141 section 5.1, Table 1	Power and Emissions	Pass	
2.1051 87.139(a)(3)	RSS-141 section 5.2.2(c)	Emissions Limitations (Transmitter Conducted)	Pass	
2.1053 87.139(a)(3)	RSS-141 section 5.2.2(c)	Emissions Limitations (Transmitter Radiated)	Pass	
2.1049 87.139(a)	RSS-141 section 5.2.2	Emission Masks	Pass	
87.139(k)(1)(2)(3)	RSS-141 section 5.2.1	Adjacent Channel power	Pass	
2.1047	N/A	Audio Low Pass Filter Frequency Response	Pass	
2.1047 87.141	RSS-141 section 5.1, Table 1	Modulation Limiting	Pass	
2.1049 87.135	RSS-141 section 5.1, Table 1	Occupied Bandwidth	Pass	
2.1055 87.133(a)	RSS-141 section 5.1, Table 1	Frequency Stability (Temperature Variation)	Pass	
2.1055 87.133(a)	RSS-141 section 5.1, Table 1	Frequency Stability (Voltage Variation)	Pass	
87.137	RSS-141 section 5.1, Table 1	Types of Emission	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*.

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.



FCC Site Reg. #750616

IC Site Reg. #2044A-2

Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1051, 2.1053, 2.1055, 2.1057, ANSI C63.26-2015, the following individual Parts: FCC Part 87. ISSED RSS-Gen, RSS-141.

Standard Test Conditions 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		
Temperature (°C)	Humidity (%)	Pressure (mbar)
25.4 – 30.2	39.2 – 48.8	965 – 972.9

Measurement results, unless otherwise noted, are worse case measurements.

Video Bandwidth (VBW) statement

For any measurements using the Tektronix RTSA 5126A real time spectrum analyzer (CTL Asset i00424), the following note for VBW (found on page 120 of the RSA5100A user manual) applies to these measurements.

VBW

The VBW setting enables/disables the Video Bandwidth filter. VBW is used in traditional swept analyzers to reduce the effect of noise on the displayed signal. The VBW algorithm in the analyzer emulates the VBW filters of traditional swept analyzers.

The maximum VBW value is the current RBW setting. The minimum VBW value is 1/10,000 of the RBW setting. VBW is disabled when the Filter shape is set to CISPR.

NOTE. If you are following a procedure that says to "set VBW to three times the RBW value or greater", it means that the test should be conducted with no VBW effects. In the analyzer, this condition is met by disabling the VBW function.

Screen captures recorded using the real time spectrum analyzer can be identified by the Tek RSA5100A logo in the top left corner of the screen.

For all measurements the VBW filter was turned off when using the RTSA 5126A spectrum analyzer.

EUT Description

Model:	KTR 2280B
Serial:	24094219
Firmware:	Host Firmware P/N: 62005502-E03 MMDS Firmware P/N: 62005500-E04
Software:	Host Application SW P/N: 62005548-101 MMDS Application SW P/N: 62005543-101
HVIN	KTR 2280B
PMN	KTR 2280B
UPN	KTR2280B
FVIN	N/A
Description:	Multi-Mode Digital Radio
Additional Information:	The KTR 2280B is a 18 watt VHF communications radio operating from 118 – 137 MHz with 8.33 kHz / 25 kHz channel spacing. It uses AM and digital modulations.
Power	28 volts DC
Receipt of	August 22,2025
EUT Condition:	Visual Damage No State of Development Production/Production Equivalent

Emission Designators

System	FCC Designator	IC Designator
VHF Voice COM (25 KHz)	6K00A3E	6K00A3E
VHF Voice COM (8.33 KHz)	5K60A3E	5K60A3E
VHF Mode A (ACARS)	13K0A9W	13K0A9W
VDL Mode 2 (Mode 2)	14K0G1D	14K0G1D

Test Frequencies

VHF COMM BW (kHz)	8.333	25	8.333	25	8.333	25
VHF Freq entered in GUI (MHz)	118.005	118.000	127.005	127.000	136.990	136.975
VHF Actual Test Freq (MHz)	118.000	118.000	127.000	127.000	136.992	136.975
Mode 2 Freq (MHz)	118		127.000		136.975	
Mode A Freq (MHz)	118		127.025		136.975	
Note 1: For the conducted spurious emissions test, the lower test frequency of 118 MHz was changed to 120 MHz due to the tuning limitation of the band reject filter only tuning down to 120 MHz. 118 MHz was used for all other tests.						

EUT Operation during Tests

The EUT was operated under normal operating conditions at maximum output power.

The manufacturer provided 2 GUI interfaces to control the EUT.

The KTR2280B RS422 Head Simulator PN: 62005477-001 GUI was used for VHF Comm and Mode 2 control.

The Airsim -998-2470-548-KTR 2280_PA_P2P GUI was used for Mode A control.

Output Power (Conducted)

Engineer: Greg Corbin

Test Date: 8/26/2025

Test Procedure

The EUT was connected to the spectrum analyzer thru a 30 dB high power attenuator.

For the VHF Comm the detector was set to Peak max hold to measure the output power.

For VHF Comm, RBW = 100 kHz and VBW = 3X RBW

For Digital Modulations Mode 2 and Mode A, the channel power application on the spectrum analyzer was used to measure the output power.

For digital modulations, Mode 2 and Mode A, the RBW was left in Auto mode and set by the Channel Power Tool.

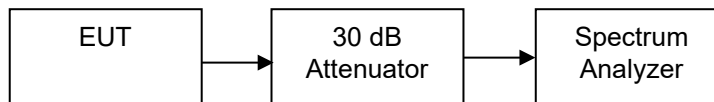
FCC Limit = 55 watts

Limit shown in output power tables is the FCC limit.

ISED Limit = +/- 1 dB of manufacturer rated power up to 55 watts

Mfr rated power = 18 watts (42.55 dBm)

Test Set-up



Output Power Test Summary Tables

VHF Comm CH BW = 8.33 kHz

Tuned Frequency	Measured Power	Measured Power	ISED Limit	FCC Limit	Result
MHz	dBm	W	dBm	W	Pass / Fail
118.000	42.92	19.588	41.55 – 43.55	55	Pass
127.000	42.90	19.498	41.55 – 43.55	55	Pass
136.992	42.94	19.679	41.55 – 43.55	55	Pass

VHF Comm CH BW = 25kHz

Tuned Frequency	Measured Power	Measured Power	ISED Limit	FCC Limit	Result
MHz	dBm	W	dBm	W	Pass / Fail
118.000	42.93	19.634	41.55 – 43.55	55	Pass
127.000	42.76	18.880	41.55 – 43.55	55	Pass
136.975	42.95	19.724	41.55 – 43.55	55	Pass

Mode A

Tuned Frequency	Measured Power	Measured Power	ISED Limit	FCC Limit	Result
MHz	dBm	W	dBm	W	Pass / Fail
118.000	43.38	21.777	41.55 – 43.55	55	Pass
127.000	43.41	21.928	41.55 – 43.55	55	Pass
136.975	43.36	21.677	41.55 – 43.55	55	Pass

Mode 2

Tuned Frequency	Measured Power	Measured Power	ISED Limit	FCC Limit	Result
MHz	dBm	W	dBm	W	Pass / Fail
118.000	42.47	17.660	41.55 – 43.55	55	Pass
127.000	42.65	18.408	41.55 – 43.55	55	Pass
136.975	42.49	17.742	41.55 – 43.55	55	Pass

Annex A Output Power

Refer to Annex A for Output Power plots.

Conducted Spurious Emissions

Engineer: Greg Corbin

Test Date: 8/28/2025

Test Procedure

The EUT was connected as shown in the test setup. The frequency of investigation was 30 MHz to 2 GHz. For 30 – 1000 MHz, a band reject filter was used. For 1 – 2 GHz, a 1 GHz highpass filter was used. The lower test frequency of 118 MHz was changed to 120 MHz due to the tuning limitation of the band reject filter only tuning down to 120 MHz.

RBW = 100 kHz for 30 – 1000 MHz.

RBW = 1 MHz from 1 – 2 GHz

Detector = Peak, max hold

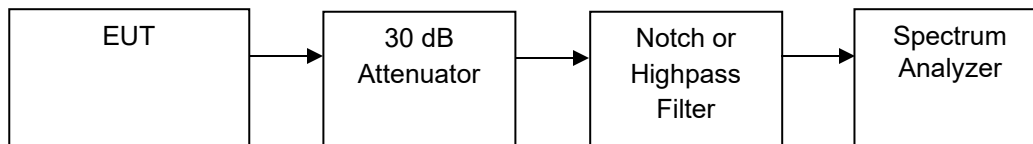
Per FCC Part 87.139(a)(3) and RSS-141 section 5.2.2(c),

When the frequency is removed from the assigned frequency by more than 250 percent of the authorized bandwidth the attenuation for aircraft station transmitters must be at least 40 dB.

The output power reported on pages 8 and 9 was used to calculate the spurious dBc level reported in the table below. The highest emission from 30 MHz to 2 GHz is reported in the summary table below.

On the 30 – 1000 MHz plots, the reference marker (MR) is marking the fundamental signal which is exempt from the conducted spurious measurement.

Test Setup



Conducted Spurious Emissions Summary Table

Mode	Channel BW	Tuned Frequency	Output Power	Conducted Spurious			Limit	Margin	Result
				Frequency	Level				
				MHz	dBm	dBc			
VHF Comm	8.33	120	42.9	240.042	-33.7	76.6	40	36.6	Pass
VHF Comm	8.33	127	42.9	254.032	-27.85	70.75	40	30.75	Pass
VHF Comm	8.33	136.992	42.9	273.992	-39.1	82	40	42	Pass
VHF Comm	25	120	42.9	240.042	-29.6	72.5	40	32.5	Pass
VHF Comm	25	127	42.8	254.032	-28.1	70.9	40	30.9	Pass
VHF Comm	25	136.975	42.9	273.899	-35.8	78.7	40	38.7	Pass
Mode 2	25	120	42.5	240.042	-27.0	69.5	40	29.5	Pass
Mode 2	25	127	42.6	254.032	-40.6	83.2	40	43.2	Pass
Mode 2	25	136.975	42.5	111.703	-41.8	84.3	40	44.3	Pass
Mode A	25	120	43.4	240.042	-24.1	67.5	40	27.5	Pass
Mode A	25	127.025	43.4	254.032	-27.8	71.2	40	31.2	Pass
Mode A	25	136.975	43.4	273.992	-35.2	78.6	40	38.6	Pass

Annex B Conducted Spurious Emission

Refer to Annex B for Conducted Spurious Emission plots.

Field Strength of Spurious Radiation

Engineer: Greg Corbin

Test Date: 9/2/2025

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/EIRP with the resultant power in dBm. The EUT output was terminated into a 50 Ohm non-radiating load.

The frequency of investigation was from 30 MHz to 2 GHz.

RBW = 100 kHz for 30 – 1000 MHz.

RBW = 1 MHz from 1 – 2 GHz

Detector = Peak, max hold

Per FCC Part 87.139(a)(3) and RSS-141 section 5.2.2(c),

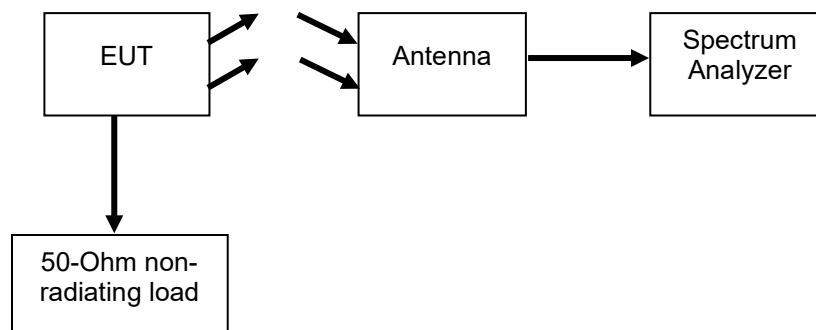
When the frequency is removed from the assigned frequency by more than 250 percent of the authorized bandwidth the attenuation for aircraft station transmitters must be at least 40 dB.

The output power reported on pages 8 and 9 was used to calculate the spurious dBc level reported in the table below.

For VHF Comm, the test was performed with the 8.33 kHz BW

On the 30 – 1000 MHz plots, the reference marker (MR) is marking the fundamental signal which is exempt from the radiated spurious measurement.

Test Setup



Radiated Spurious Emission Summary Tables

30 MHz – 1000 MHz

Mode	Tuned Frequency	Output Power	Radiated Spurious			Limit	Margin	Result
			Frequency	Level				
	MHz	dBm	MHz	dBm	dBc	dBc	dB	
VHF Comm	118	42.9	236.05	-58.1	101	40	61	Pass
VHF Comm	127	42.9	507.97	-53.15	96.05	41	55.05	Pass
VHF Comm	136.992	42.9	215.19	-58.0	100.9	42	58.9	Pass
Mode 2	118	42.5	214.90	-58.4	100.9	43	57.9	Pass
Mode 2	127	42.6	215.09	-58.2	100.8	44	56.8	Pass
Mode 2	136.975	42.5	215.19	-56.9	99.4	45	54.4	Pass
Mode A	118	43.4	471.98	-53.9	97.3	46	51.3	Pass
Mode A	127.025	43.4	508.06	-43.5	86.9	47	39.9	Pass
Mode A	136.975	43.4	547.93	-49.5	92.9	48	44.9	Pass

Radiated Spurious 1 – 2 GHz

Mode	Tuned Frequency	Output Power	Radiated Spurious			Limit	Margin	Result
			Frequency	Level				
	MHz	dBm	MHz	dBm	dBc	dBc	dB	
VHF Comm	118	42.9	1949.69	-55.8	98.7	40	58.7	Pass
VHF Comm	127	42.9	1940.19	-55.5	98.4	41	57.4	Pass
VHF Comm	136.992	42.9	1940.19	-55.5	98.4	42	56.4	Pass
Mode 2	118	42.5	1960.00	-55.5	98	43	55	Pass
Mode 2	127	42.6	1937.99	-56.1	98.7	44	54.7	Pass
Mode 2	136.975	42.5	1930.99	-55.4	97.9	45	52.9	Pass
Mode A	118	43.4	1945.99	-55.9	99.3	46	53.3	Pass
Mode A	127.025	43.4	1270.13	-54.8	98.2	47	51.2	Pass
Mode A	136.975	43.4	1232.92	-52.7	96.1	48	48.1	Pass

Annex C Radiated Spurious Emission

Refer to Annex C for Radiated Spurious Emission plots.

Emission Mask

Engineer: Greg Corbin

Test Date: 8/27/2025

Test Procedure

The EUT was connected directly to a spectrum analyzer to verify that the EUT meets the required emissions mask per the following table.

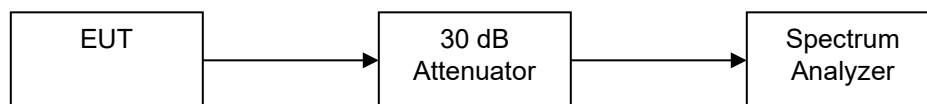
Mode	Emission	FCC Part 87	ISED RSS-141
VHF Comm	A3E	87.139(a)	Section 5.2.2
Mode A	A9W	87.139(a)	Section 5.2.2
Mode 2	G1D	87.139 (k)(1)(2)(3)	Section 5.2.1

A3E and A9W emissions need to meet the emission mask requirements of 87.139(a) and RSS-141 section 5.2.2.
G1D emissions need to meet the adjacent channel power requirements of 87.139(k)(1)(2)(3) and RSS-141 section 5.2.1.

RBW = 300 Hz

Detector = Peak, max hold

Test Setup



All emissions met the required emission masks. Refer to Annex D for details.

Annex D Emission Mask

Refer to Annex D for Emission mask plots.

Adjacent Channel Power

Engineer: Greg Corbin

Test Date: 9/3/2025

Test Procedure

A3E and A9W emissions need to meet the emission mask requirements of 87.139(a) and RSS-141 section 5.2.2.
G1D emissions need to meet the adjacent channel power requirements of 87.139(k)(1)(2)(3) and RSS-141 section 5.2.1.

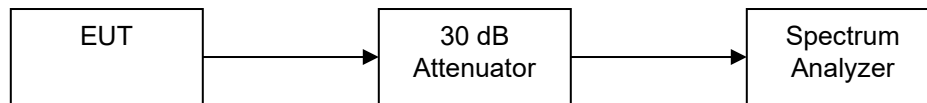
The EUT was connected directly to a spectrum analyzer to verify that the EUT meets the adjacent channel power requirements for G1D emissions.

On the plots, For adjacent channels 1 thru 4, the markers 1 thru 4 are set to the edges of the adjacent channel and the reference marker (MR) is set to the highest point in each adjacent channel. There is 1 plot for each lower and upper adjacent channel.

RBW = 300 Hz

Detector = Peak, max hold

Test Setup



Adjacent Channel Power Summary Tables

Lower Adjacent Channel	Adjacent Channel		Adjacent CH Power	Limit	Margin	Pass / Fail
Freq = 118 MHz	Start	Stop	dBm	dBm	dB	
	MHz	MHz				
1st Adjacent CH	117.9625	117.9875	-8.2	2	-10.2	Pass
2nd Adjacent CH	117.9375	117.9625	-36.8	-28	-8.8	Pass
3rd Adjacent CH	117.9125	117.9375	-38.3	-33	-5.3	Pass
4th Adjacent CH	117.8875	117.9125	-40	-38	-2	Pass

Upper Adjacent Channel	Adjacent Channel		Adjacent CH Power	Limit	Margin	Pass / Fail
Freq = 118 MHz	Start	Stop	dBm	dBm	dB	
	MHz	MHz				
1st Adjacent CH	118.0125	118.0375	-7.1	2	-9.1	Pass
2nd Adjacent CH	118.0375	118.0625	-36.2	-28	-8.2	Pass
3rd Adjacent CH	118.0625	118.0875	-37.2	-33	-4.2	Pass
4th Adjacent CH	118.0875	118.1125	-39.4	-38	-1.4	Pass

Lower Adjacent Channel	Adjacent Channel		Adjacent CH Power	Limit	Margin	Pass / Fail
Freq = 127 MHz	Start	Stop				
	MHz	MHz				
1st Adjacent CH	126.9625	126.9875	-7.4	2	-9.4	Pass
2nd Adjacent CH	126.9375	126.9625	-36.4	-28	-8.4	Pass
3rd Adjacent CH	126.9125	126.9375	-37.8	-33	-4.8	Pass
4th Adjacent CH	126.8875	126.9125	-39.6	-38	-1.6	Pass

Upper Adjacent Channel	Adjacent Channel		Adjacent CH Power	Limit	Margin	Pass / Fail
Freq = 127 MHz	Start	Stop				
	MHz	MHz				
1st Adjacent CH	127.0125	127.0375	-7.9	2	-9.9	Pass
2nd Adjacent CH	127.0375	127.0625	-36.9	-28	-8.9	Pass
3rd Adjacent CH	127.0625	127.0875	-39.1	-33	-6.1	Pass
4th Adjacent CH	127.0875	127.1125	-39.9	-38	-1.9	Pass

Lower Adjacent Channel	Adjacent Channel		Adjacent CH Power	Limit	Margin	Pass / Fail
Freq = 136.975 MHz	Start	Stop				
	MHz	MHz				
1st Adjacent CH	136.9375	136.9625	-9.3	2	-11.3	Pass
2nd Adjacent CH	136.9125	136.9375	-36.5	-28	-8.5	Pass
3rd Adjacent CH	136.8875	136.9125	-38.5	-33	-5.5	Pass
4th Adjacent CH	136.8625	136.8875	-40.5	-38	-2.5	Pass

Upper Adjacent Channel	Adjacent Channel		Adjacent CH Power	Limit	Margin	Pass / Fail
Freq = 136.975 MHz	Start	Stop				
	MHz	MHz				
1st Adjacent CH	136.9875	137.0125	-8.5	2	-10.5	Pass
2nd Adjacent CH	137.0125	137.0375	-36.1	-28	-8.1	Pass
3rd Adjacent CH	137.0375	137.0625	-37.3	-33	-4.3	Pass
4th Adjacent CH	137.0625	137.0875	-39	-38	-1	Pass

Per 87.139(k)(3):

The amount of power measured over a 16 kHz channel bandwidth centered on the first adjacent 25 kHz channel shall not exceed -18 dBm.

87.139(k)(3) Adjacent CH Power in 16 kHz BW Summary Table

Adjacent CH	Tuned freq	CH BW	Adj. CH Center Freq	16 kHz CH BW		CH Power	Limit	Margin	Result
	MHz	kHz		Start Freq	Stop Freq				
1st Lower	118	0.025	117.975	117.967	117.983	-24.0	-18	-6.0	Pass
1st Upper			118.025	118.017	118.033	-24.4	-18	-6.4	Pass
1st Lower	127	0.025	126.975	126.967	126.983	-24.2	-18	-6.2	Pass
1st Upper			127.025	127.017	127.033	-24.8	-18	-6.8	Pass
1st Lower	136.975	0.025	136.95	136.942	136.958	-24.3	-18	-6.3	Pass
1st Upper			137	136.992	137.008	-25.7	-18	-7.7	Pass

Annex E Adjacent Channel Power

Refer to Annex E for Adjacent Channel Power plots.

Audio Low Pass Filter Frequency Response

Engineer: Greg Corbin

Test Date: 8/29/2025

Test Procedure

The equipment was set up as shown. The audio frequency was input into the EUT test fixture "Comm Mic In" port.

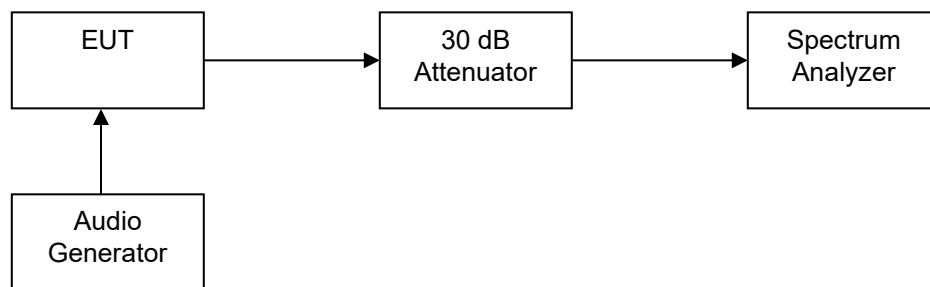
With the audio frequency set to 1 kHz the amplitude was adjusted to set the modulation depth to 60%.

The demodulated audio frequency was measured using the spectrum analyzer audio analysis tool.

The audio frequency was swept from 100 Hz to 5 kHz and the demodulated output was recorded.

Audio lowpass filter Frequency Response was measured for 8.33 kHz and 25 kHz channel bandwidths.

Test Setup



Audio Low Pass Filter Frequency Response test data

Frequency	8.33 kHz		25 kHz	
	Attenuation	Attenuation – referenced to 1 kHz	Attenuation	Attenuation – referenced to 1 kHz
kHz	dB	dB	dB	dB
0.1	-23.9	-16	-24.1	-16.2
0.2	-12	-4.1	-12.1	-4.2
0.3	-16	-8.1	-16	-8.1
0.4	-8.9	-1	-8.9	-1
0.5	-11	-3.1	-11	-3.1
0.6	-8.9	-1	-8.9	-1
0.7	-8.6	-0.7	-8.5	-0.6
0.8	-8.7	-0.8	-8.6	-0.7
0.9	-7.7	0.2	-7.8	0.1
1	-7.9	0	-8.1	-0.2
1.1	-7.7	0.2	-8	-0.1
1.2	-7.8	0.1	-7.6	0.3
1.3	-8.1	-0.2	-8.1	-0.2
1.4	-7.6	0.3	-7.5	0.4
1.5	-8.1	-0.2	-8.1	-0.2
1.6	-8	-0.1	-8.1	-0.2
1.7	-8.1	-0.2	-8.1	-0.2
1.8	-8.6	-0.7	-8.7	-0.8
1.9	-8.4	-0.5	-8.3	-0.4
2	-9.1	-1.2	-9.2	-1.3
2.2	-9.5	-1.6	-9.5	-1.6
2.4	-10	-2.1	-10	-2.1
2.6	-12.1	-4.2	-12.1	-4.2
2.8	-17.8	-9.9	-17.7	-9.8
3	-26.4	-18.5	-26.4	-18.5
3.2	-39.5	-31.6	-40	-32.1
3.4	-46.1	-38.2	-46.1	-38.2
3.6	-48.7	-40.8	-48.7	-40.8
3.8	-75.1	-67.2	-75.1	-67.2
4	-102	-94.1	-98.7	-90.8
4.2	-98.1	-90.2	-102.4	-94.5
4.4	-96.8	-88.9	-104	-96.1
4.6	-103.2	-95.3	-100.8	-92.9
4.8	-100.5	-92.6	-100.6	-92.7
5	-100	-92.1	-102.5	-94.6

Modulation Limiting

Engineer: Greg Corbin

Test Date: 8/29/2025

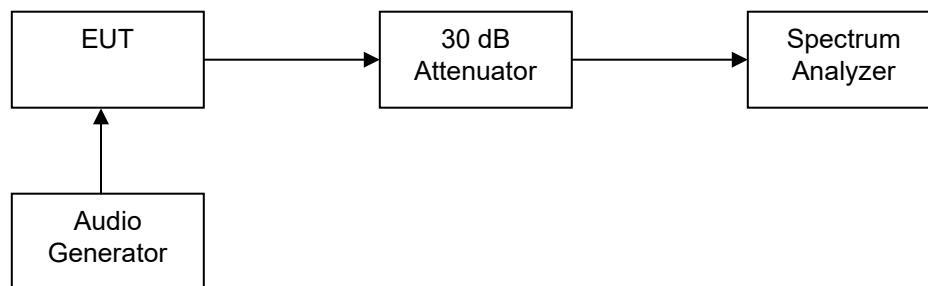
Test Procedure

The equipment was set up as shown. The audio frequency was input into the EUT test fixture "Comm Mic In" port.

The audio signal was varied from 1 mV to 2.5 v and the modulation limiting was recorded across the frequency range of 0.1 – 5 kHz.

The modulation limiting was measured using the audio summary tool on the spectrum analyzer.

Test Setup



Modulation Limiting test results

Input Voltage (mV _{peak})	Frequency (kHz)				
	0.1	0.5	1	3	5
Modulation Limiting (%)					
1	5.9	6.6	6.3	5	6.8
10	6.9	8	7.8	5	7.7
20	7	8.2	11.4	5.8	6.8
50	6.6	11.6	15.6	5.3	6.3
100	9.5	17.3	23.9	6.6	6.7
200	11.6	35.4	43.5	10	5.6
500	14.2	47.8	61.8	12	6.3
1000	16.6	60.9	82.2	13.6	5.8
1500	18.7	77.4	83.9	16.7	7.6
2000	35.2	80.5	83	28.7	7.1
2500	52.5	80	81.4	39.8	5.8

Occupied Bandwidth

Engineer: Greg Corbin

Test Date: 8/26/2025

Test Procedure

The equipment was set up as shown.

The 99% and -26 dB bandwidth were recorded.

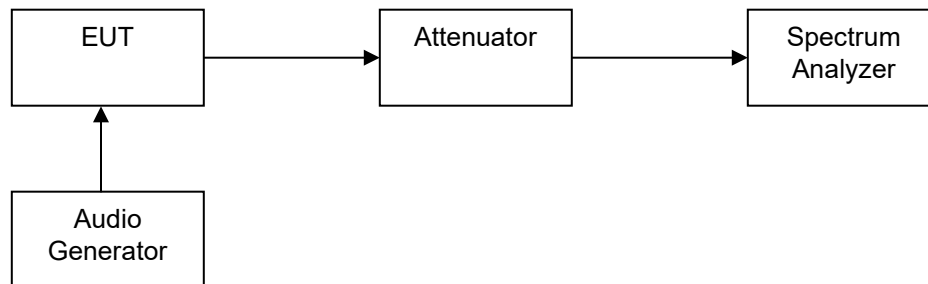
The RBW was selected to be within 1% to %5 of the OCC BW.

For A3E emissions, the audio frequency was input into the EUT test fixture "Comm Mic In" port.

A 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation was used.

Mode 2 and Mode A have their own internal modulation.

Test Setup



Mode	Channel Bandwidth	Frequency	Occupied BW		Result
			99%	-26 dB	
	kHz	MHz	kHz	kHz	
VHF Comm	8.33	118	5.40	5.58	Pass
VHF Comm	8.33	127	5.41	5.55	Pass
VHF Comm	8.33	136.992	5.37	5.59	Pass
VHF Comm	25	118	5.40	5.57	Pass
VHF Comm	25	127	5.40	5.53	Pass
VHF Comm	25	136.975	5.40	5.50	Pass
Mode 2	25	118	12.2	14.9	Pass
Mode 2	25	127	12.2	14.9	Pass
Mode 2	25	136.975	12.1	14.8	Pass
Mode A	25	118	5.61	6.38	Pass
Mode A	25	127.025	5.68	6.37	Pass
Mode A	25	136.975	5.55	6.33	Pass

Annex F Occupied Bandwidth

Refer to Annex F for Occupied Bandwidth plots.

Frequency Stability (Temperature Variation)

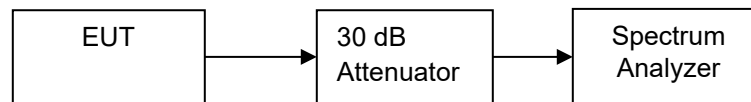
Engineer: Greg Corbin

Test Date: 8/29/2025

Test Procedure

The EUT was placed in an environmental test chamber and the RF output was connected directly to a spectrum analyzer. The frequency counter function on the spectrum analyzer was used to measure the frequency. 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.

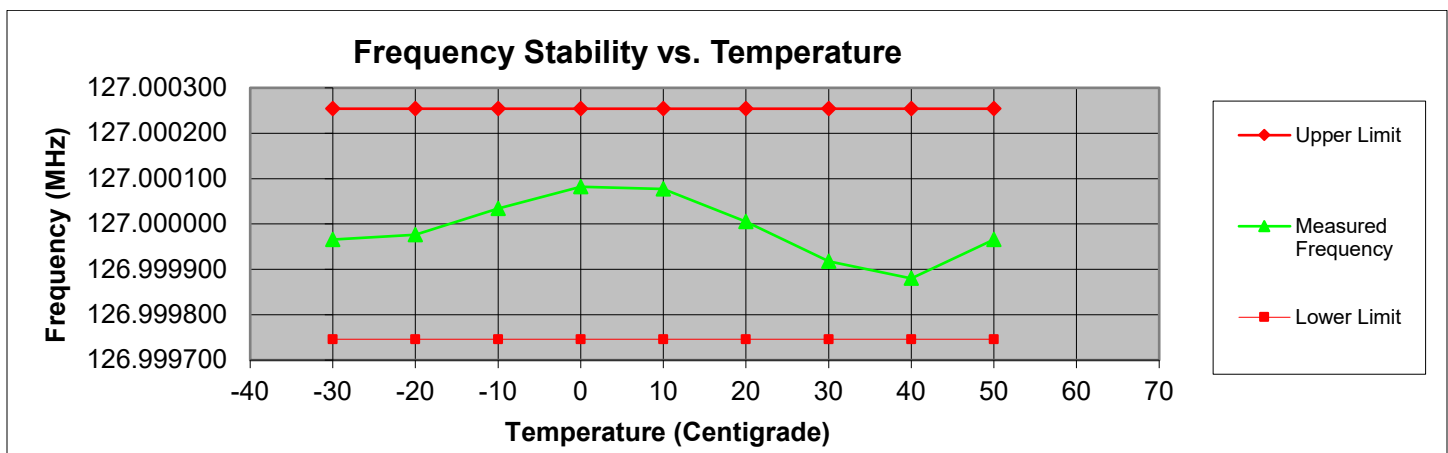
Test Setup



Measurement Results

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
127.000	-30	2.0	126.999966	127.000254	126.999746	-0.000288	0.000220
127.000	-20	2.0	126.999976	127.000254	126.999746	-0.000278	0.000230
127.000	-10	2.0	127.000034	127.000254	126.999746	-0.000220	0.000288
127.000	0	2.0	127.000082	127.000254	126.999746	-0.000172	0.000336
127.000	10	2.0	127.000077	127.000254	126.999746	-0.000177	0.000331
127.000	20	2.0	127.000005	127.000254	126.999746	-0.000249	0.000259
127.000	30	2.0	126.999918	127.000254	126.999746	-0.000336	0.000172
127.000	40	2.0	126.999880	127.000254	126.999746	-0.000374	0.000134
127.000	50	2.0	126.999966	127.000254	126.999746	-0.000288	0.000220



Frequency Stability (Voltage Variation)

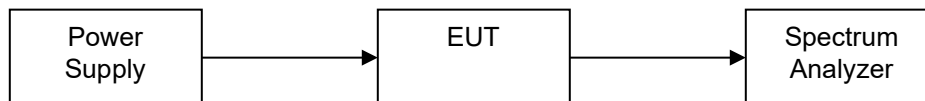
Engineer: Greg Corbin

Test Date: 8/29/2025

Test Procedure

The EUT was placed in a temperature chamber at $20 \pm 5^\circ\text{C}$ and connected directly to a spectrum analyzer. The power supply voltage to the EUT was varied from 85% to 115% (23.8 – 32.2 vdc) of the nominal value and the RF output was measured.

Test Setup

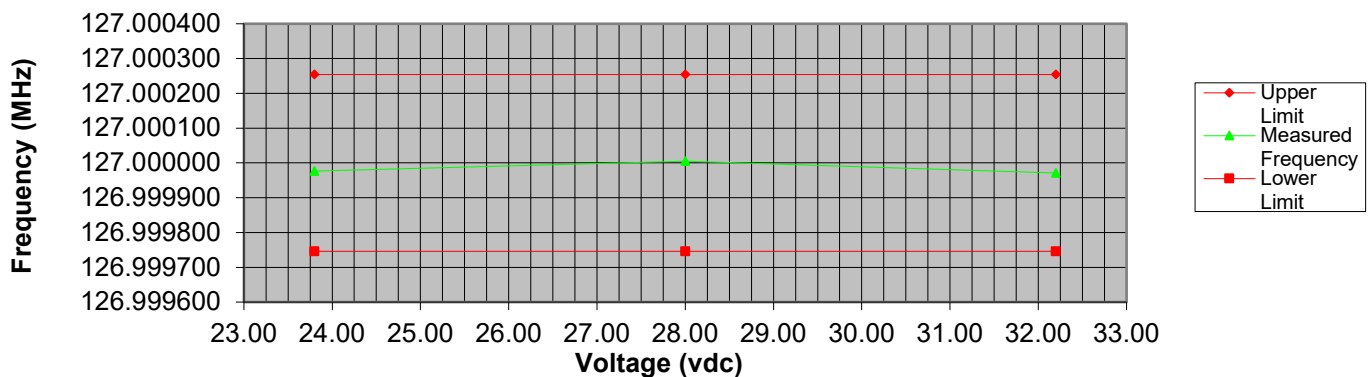


Test Results

Frequency Stability vs Voltage

Tuned Frequency	Tolerance	Voltage	Measured Frequency	Upper Limit	Lower Limit	Upper Margin	Lower Margin
MHz	PPM	vdc	MHz	MHz	MHz	MHz	MHz
127.000	2.0	23.80	126.999976	127.000254	126.999746	-0.000278	0.000230
127.000	2.0	28.00	127.000005	127.000254	126.999746	-0.000249	0.000259
127.000	2.0	32.20	126.999971	127.000254	126.999746	-0.000283	0.000225

Frequency Stability vs. Voltage



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 $\pm U_{lab}$ (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
Horn Antenna	ARA	DRG-118/A	i00271	8/9/24	8/9/26
Temp./humidity/pressure monitor (Main Lab)	Omega Engineering	iBTHX-W-5	i00686	1/25/25	1/25/26
Data Logger	Fluke	Hydra Data Bucket	i00343	7/1/25	7/1/26
Attenuator, 30 dB, 150W	Weinschel	49-30-33	SN: NU412	Verified on: 5/20/25	
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	2/27/25	2/27/27
Spectrum Analyzer	Textronix	RSA5126A	i00424	7/1/25	7/1/26
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: 8/28/25	
Signal Generator	Agilent	E4438C	i00457	12/14/24	12/14/25
Voltmeter	Fluke	87-iii	i00319	6/9/25	6/9/26
MXE EMI receiver	Keysight	N9038A	i00552	3/17/25	3/17/26
Temperature Chamber	Thermotron	SE-1000-3-3	i00557	Verified on: 8/29/25	
Preamplifier	Eravant	SBB-0115034019-2F2F-E3	i00722	Verified on: 8/15/2025	
Preamplifier	Com-Power	PAM-103	i00734	Verified on: 8/15/2025	
Tunable Band Reject Filter	Telonic Berkeley	TTR 190-3EE	i00692	Verified on: 8/28/25	

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

END OF TEST REPORT