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TEST REPORT

FCC Test for NX-1300-K3
Certification

APPLICANT
JVCKENWOOD Corporation

REPORT NO.
HCT-RF-2105-FC002

DATE OF ISSUE
May 14, 2021

Tested by
Kwon Jeong

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Additional Model(s)
NX-1300-K, NX-1300-K2, NX-1302-K

Applicant	**JVCKENWOOD Corporation** 1-16-2 Hakusan Midori-ku Yokohama-shi Kanagawa 226-8525 Japan
Product Name	UHF TRANSCEIVER
Model(s)	NX-1300-K3
FCC ID	K44501103
Test Standard Used	Part 2, 22, 74, 90
Frequency Range	450 MHz ~ 512 MHz

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test results were applied only to the test methods required by the standard.

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	May 14, 2021	Initial Release

The measurements shown in this report were made in accordance with the procedures specified in § 2.947. I assume full responsibility
for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.
HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

CONTENTS

1. GENERAL INFORMATION

Manufacturer:	JVCKENWOOD Corporation
Address:	1-16-2 Hakusan Midori-ku Yokohama-shi Kanagawa 226-8525 Japan
FCC ID:	K44501103
EUT Type:	UHF TRANSCEIVER
Model(s):	NX-1300-K3
Additional Model(s):	NX-1300-K, NX-1300-K2, NX-1302-K
Date(s) of Tests:	April 16, 2021 ~ May 12, 2021
Place of Tests:	HCT Co., Ltd. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

2. EUT DESCRIPTION

Power Supply Voltage	DC 7.5V
Output Power	5 W (Power output continuously variable to 1 W) (Max : 5.2 W)
Output Power (16K0F3E)	470-512 MHz : 5 W (Power output continuously variable to 1 W) 450-512 MHz : 2 W (Power output continuously variable to 1 W)
Battery type	KNB-45L Li-Ion Battery Pack (2000mA) KNB-53N Ni-MH Battery Pack (1400mA) KNB-29N Ni-MH Battery Pack (1500mA) KNB-69L Li-ion Battery Pack (2450mA) KNB-82LC (Li-ion Battery Pack) KNB-84L Li-Ion Battery Pack (2000mA)
Antenna	KRA-23M UHF Low Profile Helical Antenna (440-490 MHz) KRA-23M2 UHF Low Profile Helical Antenna (470-520 MHz) KRA-27M UHF Whip Antenna (440-490 MHz) KRA-27M2 UHF Whip Antenna (470-520 MHz) KRA-42M UHF Stubby Antenna (440-490 MHz) KRA-42M2 UHF Stubby Antenna (470-520 MHz)
Peak Antenna gain	KRA-23M UHF Low Profile Helical Antenna: 0 dBd KRA-23M2 UHF Low Profile Helical Antenna: 0 dBd KRA-27M UHF Whip Antenna: 0 dBd KRA-27M2 UHF Whip Antenna: 0 dBd KRA-42M UHF Stubby Antenna: 0 dBd KRA-42M2 UHF Stubby Antenna: 0 dBd
Type of Emission	16K0F3E, 11K0F3E: Analogue 8K30F1E, 8K30F1D, 8K30F7W: NXDN 7K60FXD, 7K60FXE: DMR 4K00F1E, 4K00F1D, 4K00F7W: NXDN 4K00F2D: CWID
Channel Bandwidth	25 kHz / 6.25 kHz / 12.5 kHz
Operating Temperature	-30 °C ~ +60 °C
Frequency Range	450 MHz ~ 512 MHz
Test Frequency	450.05 MHz / 481.05 MHz / 511.95 MHz
Test Frequency (16K0F3E)	2W : 450.05 MHz / 481.05 MHz / 511.95 MHz 5W : 470.05 MHz / 491.05 MHz / 511.95 MHz
Maximum deviation	16K0F3E: ± 5 kHz 11K0F3E: ± 2.5 kHz
Frequency Stability	± 1.0 ppm

3. TEST METHODOLOGY

TIA-603-E dated March 2016 entitled “Land Mobile FM or PM Communications Equipment Measurement and Performance Standards” were used in the measurement.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the FCC Rules Part 2 and Part 22, 74, 90.

3.3 GENERAL TEST PROCEDURES

Radiated Emissions
Radiated emission measurements are performed in the Fully-anechoic chamber. The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-E-2016. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission. The level and position of the maximized emission is recorded with the spectrum analyzer using a positive peak detector.
A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
The power is calculated by the following formula;

$$P_{d(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dB)}$$

Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.

The maximum EIRP is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting is programmed.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. WORST CASE CONFIGURATION AND MODE

Radiated test

1. NX-1300-K3 & Additional Models were tested and the worst case results are reported.
   (Worst case : NX-1300-K3)
2. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone + Microphone (High Power/ Low Power)
     Stand alone + Accessories (High Power/ Low Power)
     Stand alone + Microphone + Accessories (High Power/ Low Power)
   - Worstcase : Stand alone + Microphone (High Power)
3. All type of battery were investigated and the worst case configuration results are reported.
   - Battery type : KNB-45L, KNB-53N, KNB-29N, KNB-69L, KNB-82LC, KNB-84L
   - Worstcase : KNB-69L
4. All Antenna were investigated and the worst case configuration results are reported.
   - Antenna type : KRA-23M, KRA-23M2, KRA-27M, KRA-27M2, KRA-42M, KRA-42M2
   - Worstcase : KRA-27M, KRA-27M2
5. Measurements value show only up to 8 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Conducted test

1. NX-1300-K3 & Additional Models were tested and the worst case results are reported.
   (Worst case : NX-1300-K3)
2. Conducted Spurious Emission :
   All Power of operation were investigated and the worst case configuration results are reported.
   - Power : High Power/ Low Power
   - Worstcase : High Power
3. Frequency Stability :
   All Type of Emission were investigated and the worst case Type results are reported.
   - Worstcase : 16K0F3E, 11K0F3E, 4K00F2D
4. Transient Frequency Behavior :
   All Type of Emission were investigated and the worst case Type results are reported.
   - Worstcase : 16K0F3E, 11K0F3E, 4K00F1E/4K00F1D/4K00F7W

7. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Condition	Test Result
Carrier RF Output Power	§ 2.1046, § 22.565, § 74.461, § 90.205	CONDUCTED	PASS
Unwanted Emissions	§ 2.1051 § 22.359, § 74.462, § 74.535, § 90.210	CONDUCTED	PASS
Carrier Frequency Stability	§ 2.1055, § 22.355, § 74.464, § 90.213(a)		PASS
Audio Frequency Response	§ 2.1047(a)		PASS
Audio Low Pass Filter	§ 2.1047(a)		PASS
Modulation Limiting	§ 2.1047(b)		PASS
Transient Frequency Behavior	§ 74.462, § 90.214		PASS
Emission Mask	§ 2.1049, § 22.359, § 74.462, § 74.535, § 90.210		PASS
Adjacent Channel Power	§ 90.221		PASS
Field Strength of Spurious Radiation	§ 2.1053 § 22.359, § 74.462, § 74.535, § 90.210	RADIATED	PASS
Necessary Bandwidth	§ 2.202(g)	-	-

Test Limit

Test Description	Test Limit
Carrier RF Output Power	Varies
Unwanted Emissions	6.25 kHz: 55 + 10 log (P)dB 12.5 kHz: 50 + 10 log (P)dB 25 kHz: 43 + 10 log (P)dB
Carrier Frequency Stability	1 ppm
Audio Frequency Response	Varies
Audio Low Pass Filter	
Modulation Limiting	25 kHz = 5 kHz 12.5 kHz = 2.5 kHz
Transient Frequency Behavior	See Note2
Emission Mask	See Note1
Adjacent Channel Power	See Note3
Field Strength of Spurious Radiation	6.25 kHz: 55+ 10 log (P)dB 12.5 kHz: 50 + 10 log (P)dB 25 kHz: 43 + 10 log (P)dB

Note:

1. Emission Mask Limit :

Channel Bandwidth: 25kHz

Displacement Frequency (% of Authorized Bandwidth)	Minimum Attenuation (dB)
50 to 100	25 dB
100 to 250	35 dB
>250	$43 + 10 \log_{10}(COP)$

Channel Bandwidth: 12.5kHz

Channel Spacing (kHz)	Displacement Frequency Range	Minimum Attenuation (dB)
12.5 & 15	>5.625 kHz to 12.5 kHz	$7.27(f_d - 2.88)$
	>12.5 kHz	Whichever is less attenuation; 70 or $50 + 10 \log_{10}(COP)$

Channel Bandwidth: 6.25kHz

Channel Spacing (kHz)	Displacement Frequency Range	Minimum Attenuation (dB)
6.25 & 7.5	>3.0 kHz to 4.6 kHz	Whichever is less attenuation; 65 or $30 + 16.67(f_d - 3)$ or $55 + 10 \log_{10}(COP)$
	Greater than 4.6 kHz	Whichever is less attenuation; 65 or $55 + 10 \log_{10}(COP)$

2. Transient Frequency Behavior Limit :

Channel Bandwidth (kHz)	Time Intervals (Notes 1, 2)	Maximum Frequency Difference (kHz)	Transient Duration Limit (ms)	
			138-174 MHz	406.1-512 MHz
25	t_1	±25	5	10
	t_2	±12.5	20	25
	t_3	±25	5	10
12.5	t_1	±12.5	5	10
	t_2	±6.25	20	25
	t_3	±12.5	5	10
6.25	t_1	±6.25	5	10
	t_2	±3.125	20	25
	t_3	±6.25	5	10

3. Adjacent Channel Power:

Frequency offset(kHz)	Maximum ACP(dBc) for devices 1 watt and less	Maximum ACP(dBc) for devices above 1 watt
25	-55	-60
50	-70	-70
75	-70	-70

8. TEST RESULT

8.1 Carrier Output Power

▣ Definition

The conducted carrier power output rating for a transmitter is the power available at the output terminals of the transmitter when the output terminals are connected to the standard transmitter load.

▣ TEST CONFIGURATION

▣ TEST PROCEDURE

According to 2.2.1 in TIA-603-E Standard.

a) Connect the equipment as illustrated.

b) Measure the transmitter output power during the defined duty cycle(see 1.3.2).
Correct for all losses in the RF path.

c) The value recorded in step b) is the conducted carrier output power rating.

▣ TEST RESULTS(Carrier Output Power)

Certification	Type of Emission	Channel Bandwidth (kHz)	Test Frequency (MHz)	Carrier Output Power			
				High Power		Low Power	
				dBm	W	dBm	W
FCC	16K0F3E (2W)	25	450.05	32.60	1.82	29.21	0.83
			481.05	32.51	1.78	29.48	0.89
			511.95	32.89	1.94	29.73	0.94
FCC	16K0F3E (5W)	25	470.05	36.69	4.67	29.83	0.96
			491.05	36.47	4.44	29.51	0.89
			511.95	36.78	4.76	30.09	1.02
FCC	11K0F3E	12.5	450.05	36.86	4.86	29.57	0.91
			481.05	36.35	4.32	29.44	0.88
			511.95	36.58	4.55	30.04	1.01
FCC	8K30F1E, 8K30F1D, 8K30F7W	12.5	450.05	36.84	4.83	29.58	0.91
			481.05	36.47	4.44	29.60	0.91
			511.95	36.64	4.62	30.01	1.00
FCC	7K60FXD, 7K60FXE	12.5	450.05	36.83	4.82	29.73	0.94
			481.05	36.43	4.39	29.65	0.92
			511.95	36.78	4.77	30.22	1.05
FCC	4K00F1E, 4K00F1D, 4K00F7W	6.25	450.05	36.84	4.84	29.77	0.95
			481.05	36.33	4.30	29.65	0.92
			511.95	36.73	4.71	30.30	1.07
FCC	4K00F2D	6.25	450.05	36.54	4.51	29.73	0.94
			481.05	36.06	4.03	29.12	0.82
			511.95	36.09	4.06	29.13	0.82

▣ TEST RESULTS(ERP)

Certification	Type of Emission	Channel Bandwidth (kHz)	Test Frequency (MHz)	ERP			
				High Power		Low Power	
				dBm	W	dBm	W
FCC	16K0F3E (2W)	25	450.05	32.60	1.82	29.21	0.83
			481.05	32.51	1.78	29.48	0.89
			511.95	32.89	1.94	29.73	0.94
FCC	16K0F3E (5W)	25	470.05	36.69	4.67	29.83	0.96
			491.05	36.47	4.44	29.51	0.89
			511.95	36.78	4.76	30.09	1.02
FCC	11K0F3E	12.5	450.05	36.86	4.86	29.57	0.91
			481.05	36.35	4.32	29.44	0.88
			511.95	36.58	4.55	30.04	1.01
FCC	8K30F1E, 8K30F1D, 8K30F7W	12.5	450.05	36.84	4.83	29.58	0.91
			481.05	36.47	4.44	29.60	0.91
			511.95	36.64	4.62	30.01	1.00
FCC	7K60FXD, 7K60FXE	12.5	450.05	36.83	4.82	29.73	0.94
			481.05	36.43	4.39	29.65	0.92
			511.95	36.78	4.77	30.22	1.05
FCC	4K00F1E, 4K00F1D, 4K00F7W	6.25	450.05	36.84	4.84	29.77	0.95
			481.05	36.33	4.30	29.65	0.92
			511.95	36.73	4.71	30.30	1.07
FCC	4K00F2D	6.25	450.05	36.54	4.51	29.73	0.94
			481.05	36.06	4.03	29.12	0.82
			511.95	36.09	4.06	29.13	0.82

Note:

1. ERP = Carrier Output Power + Peak Antenna gain(0 dBd)

8.2 Carrier Frequency Stability

▣ Definition

The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.

▣ TEST CONFIGURATION

▣ TEST PROCEDURE

According to 2.2.2 in TIA-603-E Standard.

a) Connect the equipment as illustrated.

b) Operate the equipment in standby conditions for 15 minutes before proceeding.

c) Record the carrier frequency of the transmitter as *MCF* MHz

d) Calculate the ppm frequency error by the following:

ppm error = ((MCF_{MHz} / ACF_{MHz})-1)*10^6

where

MCF_{MHz} is the Measured Carrier Frequency in MHz

ACF_{MHz} is the Assigned Carrier Frequency in MHz

e) The value recorded in step d) is the carrier frequency stability.

▣ TEST RESULTS

(1) Frequency Stability (Temperature Variation)

450.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (2W)	+20(Ref)	450.050005916	0.0000000	0.0000	1.0
		-30	450.049984457	-0.0000215	-0.0477	
		-20	450.050013732	0.0000078	0.0174	
		-10	450.049993350	-0.0000126	-0.0279	
		0	450.050005742	-0.0000002	-0.0004	
		+10	450.050005916	0.0000000	0.0000	
		+30	450.050018474	0.0000126	0.0279	
		+40	450.050009467	0.0000036	0.0079	
		+50	450.050013675	0.0000078	0.0172	
	Low Power	+20(Ref)	450.049997045	0.0000000	0.0000	
		-30	450.049980972	-0.0000161	-0.0357	
		-20	450.050001174	0.0000041	0.0092	
		-10	450.049974617	-0.0000224	-0.0498	
		0	450.049983593	-0.0000135	-0.0299	
		+10	450.049997045	0.0000000	0.0000	
		+30	450.050015258	0.0000182	0.0405	
		+40	450.050010802	0.0000138	0.0306	
		+50	450.050002219	0.0000052	0.0115	

481.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (2W)	+20(Ref)	481.049995964	0.0000000	0.0000	1.0
		-30	481.050020537	0.0000246	0.0511	
		-20	481.049994840	-0.0000011	-0.0023	
		-10	481.049975518	-0.0000204	-0.0425	
		0	481.050009485	0.0000135	0.0281	
		+10	481.049995964	0.0000000	0.0000	
		+30	481.050012751	0.0000168	0.0349	
		+40	481.049977117	-0.0000188	-0.0392	
		+50	481.049996827	0.0000009	0.0018	
	Low Power	+20(Ref)	481.049999910	0.0000000	0.0000	
		-30	481.049989940	-0.0000100	-0.0207	
		-20	481.050025073	0.0000252	0.0523	
		-10	481.049985000	-0.0000149	-0.0310	
		0	481.050006330	0.0000064	0.0133	
		+10	481.049999910	0.0000000	0.0000	
		+30	481.050020506	0.0000206	0.0428	
		+40	481.049975412	-0.0000245	-0.0509	
		+50	481.049995705	-0.0000042	-0.0087	

511.95 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (2W)	+20(Ref)	511.949997212	0.0000000	0.0000	1.0
		-30	511.950020990	0.0000238	0.0464	
		-20	511.950004873	0.0000077	0.0150	
		-10	511.949976507	-0.0000207	-0.0404	
		0	511.949985379	-0.0000118	-0.0231	
		+10	511.949997212	0.0000000	0.0000	
		+30	511.949979564	-0.0000176	-0.0345	
		+40	511.949972012	-0.0000252	-0.0492	
		+50	511.950007456	0.0000102	0.0200	
	Low Power	+20(Ref)	511.950022486	0.0000000	0.0000	
		-30	511.950042909	0.0000204	0.0399	
		-20	511.950051833	0.0000293	0.0573	
		-10	511.950005256	-0.0000172	-0.0337	
		0	511.950011098	-0.0000114	-0.0222	
		+10	511.950022486	0.0000000	0.0000	
		+30	511.950032590	0.0000101	0.0197	
		+40	511.949993586	-0.0000289	-0.0564	
		+50	511.949996399	-0.0000261	-0.0510	

470.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (5W)	+20(Ref)	470.050458984	0.0000000	0.0000	1.0
		-30	470.050455285	-0.0000037	-0.0079	
		-20	470.050487671	0.0000287	0.0610	
		-10	470.050488177	0.0000292	0.0621	
		0	470.050469101	0.0000101	0.0215	
		+10	470.050458984	0.0000000	0.0000	
		+30	470.050459278	0.0000003	0.0006	
		+40	470.050443991	-0.0000150	-0.0319	
		+50	470.050476164	0.0000172	0.0366	
	Low Power	+20(Ref)	470.050464179	0.0000000	0.0000	
		-30	470.050486363	0.0000222	0.0472	
		-20	470.050472439	0.0000083	0.0176	
		-10	470.050488583	0.0000244	0.0519	
		0	470.050436199	-0.0000280	-0.0595	
		+10	470.050464179	0.0000000	0.0000	
		+30	470.050442237	-0.0000219	-0.0467	
		+40	470.050474640	0.0000105	0.0223	
		+50	470.050489643	0.0000255	0.0542	

491.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (5W)	+20(Ref)	491.050452575	0.0000000	0.0000	1.0
		-30	491.050429280	-0.0000233	-0.0474	
		-20	491.050426363	-0.0000262	-0.0534	
		-10	491.050478274	0.0000257	0.0523	
		0	491.050455724	0.0000031	0.0064	
		+10	491.050452575	0.0000000	0.0000	
		+30	491.050437507	-0.0000151	-0.0307	
		+40	491.050460360	0.0000078	0.0159	
		+50	491.050423480	-0.0000291	-0.0593	
	Low Power	+20(Ref)	491.050503474	0.0000000	0.0000	
		-30	491.050492293	-0.0000112	-0.0228	
		-20	491.050481673	-0.0000218	-0.0444	
		-10	491.050515931	0.0000125	0.0254	
		0	491.050478582	-0.0000249	-0.0507	
		+10	491.050503474	0.0000000	0.0000	
		+30	491.050475092	-0.0000284	-0.0578	
		+40	491.050508314	0.0000048	0.0099	
		+50	491.050529647	0.0000262	0.0533	

511.95 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (5W)	+20(Ref)	511.950485991	0.0000000	0.0000	1.0
		-30	511.950457651	-0.0000283	-0.0554	
		-20	511.950512848	0.0000269	0.0525	
		-10	511.950461008	-0.0000250	-0.0488	
		0	511.950465114	-0.0000209	-0.0408	
		+10	511.950485991	0.0000000	0.0000	
		+30	511.950466491	-0.0000195	-0.0381	
		+40	511.950472373	-0.0000136	-0.0266	
		+50	511.950501560	0.0000156	0.0304	
	Low Power	+20(Ref)	511.950525058	0.0000000	0.0000	
		-30	511.950500804	-0.0000243	-0.0474	
		-20	511.950552984	0.0000279	0.0545	
		-10	511.950531839	0.0000068	0.0132	
		0	511.950554013	0.0000290	0.0566	
		+10	511.950525058	0.0000000	0.0000	
		+30	511.950514424	-0.0000106	-0.0208	
		+40	511.950552085	0.0000270	0.0528	
		+50	511.950511787	-0.0000133	-0.0259	

450.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power (5W)	+20(Ref)	450.050433699	0.0000000	0.0000	1.0
		-30	450.050448528	0.0000148	0.0329	
		-20	450.050457755	0.0000241	0.0535	
		-10	450.050440863	0.0000072	0.0159	
		0	450.050417540	-0.0000162	-0.0359	
		+10	450.050433699	0.0000000	0.0000	
		+30	450.050420492	-0.0000132	-0.0293	
		+40	450.050455918	0.0000222	0.0494	
		+50	450.050449595	0.0000159	0.0353	
	Low Power	+20(Ref)	450.050464833	0.0000000	0.0000	
		-30	450.050440191	-0.0000246	-0.0548	
		-20	450.050465817	0.0000010	0.0022	
		-10	450.050452458	-0.0000124	-0.0275	
		0	450.050465334	0.0000005	0.0011	
		+10	450.050464833	0.0000000	0.0000	
		+30	450.050459177	-0.0000057	-0.0126	
		+40	450.050492802	0.0000280	0.0621	
		+50	450.050460564	-0.0000043	-0.0095	

481.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power (5W)	+20(Ref)	481.050456390	0.0000000	0.0000	1.0
		-30	481.050439725	-0.0000167	-0.0346	
		-20	481.050473963	0.0000176	0.0365	
		-10	481.050430632	-0.0000258	-0.0535	
		0	481.050435169	-0.0000212	-0.0441	
		+10	481.050456390	0.0000000	0.0000	
		+30	481.050451219	-0.0000052	-0.0108	
		+40	481.050439697	-0.0000167	-0.0347	
		+50	481.050447501	-0.0000089	-0.0185	
	Low Power	+20(Ref)	481.050493677	0.0000000	0.0000	
		-30	481.050500973	0.0000073	0.0152	
		-20	481.050483005	-0.0000107	-0.0222	
		-10	481.050507110	0.0000134	0.0279	
		0	481.050476168	-0.0000175	-0.0364	
		+10	481.050493677	0.0000000	0.0000	
		+30	481.050493496	-0.0000002	-0.0004	
		+40	481.050464237	-0.0000294	-0.0612	
		+50	481.050507174	0.0000135	0.0281	

511.95 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power (5W)	+20(Ref)	511.950521358	0.0000000	0.0000	1.0
		-30	511.950541964	0.0000206	0.0402	
		-20	511.950507345	-0.0000140	-0.0274	
		-10	511.950497748	-0.0000236	-0.0461	
		0	511.950515177	-0.0000062	-0.0121	
		+10	511.950521358	0.0000000	0.0000	
		+30	511.950520307	-0.0000011	-0.0021	
		+40	511.950537394	0.0000160	0.0313	
		+50	511.950523251	0.0000019	0.0037	
	Low Power	+20(Ref)	511.950526098	0.0000000	0.0000	
		-30	511.950515080	-0.0000110	-0.0215	
		-20	511.950516573	-0.0000095	-0.0186	
		-10	511.950530106	0.0000040	0.0078	
		0	511.950528456	0.0000024	0.0046	
		+10	511.950526098	0.0000000	0.0000	
		+30	511.950538739	0.0000126	0.0247	
		+40	511.950549433	0.0000233	0.0456	
		+50	511.950544186	0.0000181	0.0353	

450.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power (5W)	+20(Ref)	450.050030196	0.0000000	0.0000	1.0
		-30	450.050045688	0.0000155	0.0344	
		-20	450.050029207	-0.0000010	-0.0022	
		-10	450.050017099	-0.0000131	-0.0291	
		0	450.050010018	-0.0000202	-0.0448	
		+10	450.050030196	0.0000000	0.0000	
		+30	450.050044196	0.0000140	0.0311	
		+40	450.050048129	0.0000179	0.0398	
		+50	450.050042564	0.0000124	0.0275	
	Low Power	+20(Ref)	450.050009008	0.0000000	0.0000	
		-30	450.049997652	-0.0000114	-0.0252	
		-20	450.050038874	0.0000299	0.0664	
		-10	450.049997992	-0.0000110	-0.0245	
		0	450.050037232	0.0000282	0.0627	
		+10	450.050009008	0.0000000	0.0000	
		+30	450.049987973	-0.0000210	-0.0467	
		+40	450.050006686	-0.0000023	-0.0052	
		+50	450.050016806	0.0000078	0.0173	

481.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power (5W)	+20(Ref)	481.049999619	0.0000000	0.0000	1.0
		-30	481.049999900	0.0000003	0.0006	
		-20	481.049981933	-0.0000177	-0.0368	
		-10	481.050007980	0.0000084	0.0174	
		0	481.050023396	0.0000238	0.0494	
		+10	481.049999619	0.0000000	0.0000	
		+30	481.049984965	-0.0000147	-0.0305	
		+40	481.050014386	0.0000148	0.0307	
		+50	481.050015236	0.0000156	0.0325	
	Low Power	+20(Ref)	481.049998731	0.0000000	0.0000	
		-30	481.049993425	-0.0000053	-0.0110	
		-20	481.049983382	-0.0000153	-0.0319	
		-10	481.049974459	-0.0000243	-0.0505	
		0	481.049992130	-0.0000066	-0.0137	
		+10	481.049998731	0.0000000	0.0000	
		+30	481.050017777	0.0000190	0.0396	
		+40	481.050012635	0.0000139	0.0289	
		+50	481.049982671	-0.0000161	-0.0334	

511.95 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power (5W)	+20(Ref)	511.949996027	0.0000000	0.0000	1.0
		-30	511.949968344	-0.0000277	-0.0541	
		-20	511.949979024	-0.0000170	-0.0332	
		-10	511.949980606	-0.0000154	-0.0301	
		0	511.950021240	0.0000252	0.0492	
		+10	511.949996027	0.0000000	0.0000	
		+30	511.949979193	-0.0000168	-0.0329	
		+40	511.950023053	0.0000270	0.0528	
		+50	511.950001273	0.0000052	0.0102	
	Low Power	+20(Ref)	511.949999381	0.0000000	0.0000	
		-30	511.950002485	0.0000031	0.0061	
		-20	511.950020955	0.0000216	0.0421	
		-10	511.950000893	0.0000015	0.0030	
		0	511.949977961	-0.0000214	-0.0418	
		+10	511.949999381	0.0000000	0.0000	
		+30	511.950009596	0.0000102	0.0200	
		+40	511.950000071	0.0000007	0.0013	
		+50	511.950011147	0.0000118	0.0230	

(2) Frequency Stability (Voltage Variation)

450.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (2W)	85	6.38	450.050006893	0.0153	1.0
		100	7.50	450.050004920	0.0109	
		115	8.63	450.050005651	0.0126	
	Low Power	85	6.38	450.049996395	-0.0080	
		100	7.50	450.049995653	-0.0097	
		115	8.63	450.049995640	-0.0097	

481.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (2W)	85	6.38	481.049996327	-0.0076	1.0
		100	7.50	481.049996222	-0.0079	
		115	8.63	481.049995570	-0.0092	
	Low Power	85	6.38	481.049999800	-0.0004	
		100	7.50	481.050000889	0.0018	
		115	8.63	481.050000962	0.0020	

511.95 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (2W)	85	6.38	511.949997331	-0.0052	1.0
		100	7.50	511.949996850	-0.0062	
		115	8.63	511.949997417	-0.0050	
	Low Power	85	6.38	511.950021863	0.0427	
		100	7.50	511.950020661	0.0404	
		115	8.63	511.950020622	0.0403	

470.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (5W)	85	6.38	470.050456850	0.9719	1.0
		100	7.50	470.050453798	0.9654	
		115	8.63	470.050455630	0.9693	
	Low Power	85	6.38	470.050465398	0.9901	
		100	7.50	470.050465391	0.9901	
		115	8.63	470.050464252	0.9877	

491.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (5W)	85	6.38	491.050452357	0.9212	1.0
		100	7.50	491.050452738	0.9220	
		115	8.63	491.050453113	0.9227	
	Low Power	85	6.38	491.050402359	0.8194	
		100	7.50	491.050401959	0.8186	
		115	8.63	491.050401986	0.8186	

511.95 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power (5W)	85	6.38	511.950485983	0.9493	1.0
		100	7.50	511.950487475	0.9522	
		115	8.63	511.950486803	0.9509	
	Low Power	85	6.38	511.950424202	0.8286	
		100	7.50	511.950424813	0.8298	
		115	8.63	511.950425546	0.8312	

450.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power (5W)	85	6.38	450.050432012	0.9599	1.0
		100	7.50	450.050430130	0.9557	
		115	8.63	450.050431166	0.9580	
	Low Power	85	6.38	450.050425253	0.9449	
		100	7.50	450.050424752	0.9438	
		115	8.63	450.050424455	0.9431	

481.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power (5W)	85	6.38	481.050456803	0.9496	1.0
		100	7.50	481.050456815	0.9496	
		115	8.63	481.050457035	0.9501	
	Low Power	85	6.38	481.050423153	0.8796	
		100	7.50	481.050422079	0.8774	
		115	8.63	481.050422853	0.8790	

511.95 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power (5W)	85	6.38	511.950423139	0.8265	1.0
		100	7.50	511.950423429	0.8271	
		115	8.63	511.950422004	0.8243	
	Low Power	85	6.38	511.950426212	0.8325	
		100	7.50	511.950425342	0.8308	
		115	8.63	511.950425559	0.8313	

450.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power (5W)	85	6.38	450.050028632	0.0636	1.0
		100	7.50	450.050022973	0.0510	
		115	8.63	450.050026434	0.0587	
	Low Power	85	6.38	450.050009954	0.0221	
		100	7.50	450.050008617	0.0191	
		115	8.63	450.050008484	0.0189	

481.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power (5W)	85	6.38	481.049998356	-0.0034	1.0
		100	7.50	481.049997594	-0.0050	
		115	8.63	481.049998432	-0.0033	
	Low Power	85	6.38	481.049998786	-0.0025	
		100	7.50	481.049998755	-0.0026	
		115	8.63	481.049998777	-0.0025	

511.95 MHz

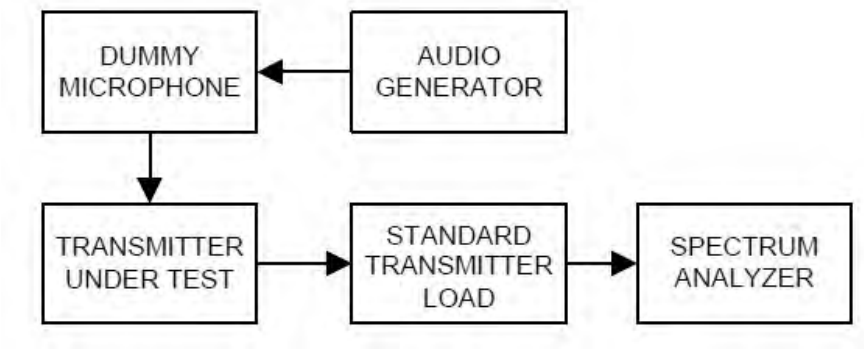
Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power (5W)	85	6.38	511.949994302	-0.0111	1.0
		100	7.50	511.949994269	-0.0112	
		115	8.63	511.949994180	-0.0114	
	Low Power	85	6.38	511.949998848	-0.0023	
		100	7.50	511.950000245	0.0005	
		115	8.63	511.949998526	-0.0029	

8.3 Occupied Bandwidth

▣ Definition

The transmitter sideband spectrum denotes the sideband power produced at a discrete frequency separation from the carrier up to the test bandwidth (see TIA-603-E Section 1.3.4.4) due to all sources of unwanted noise within the transmitter in a modulated condition.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

According to TIA-603-E Section 2.2.11.2

a) For EUT supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for +/- 2.5 kHz deviation (or 50 % modulation). (FM modulation).

b) With level constant, the signal level was increased 16 dB.

c) For EUT supporting digital modulation, the digital modulation mode was operated to its maximum extent.

d) Adjust the spectrum analyzer for the following setting:

1) RBW : 100Hz (Authorized Band 6 kHz),
100Hz (Authorized Band 11.25 kHz),
300Hz (Authorized Band 20 kHz)

2) VBW : Video Bandwidth at least 10 times the resolution bandwidth.

4) Sweep Speed : Sweep Speed slow enough to maintain measurement calibration.

5) Sampling Time : 10 times

6) Detector Mode = Positive Peak.

e) The occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

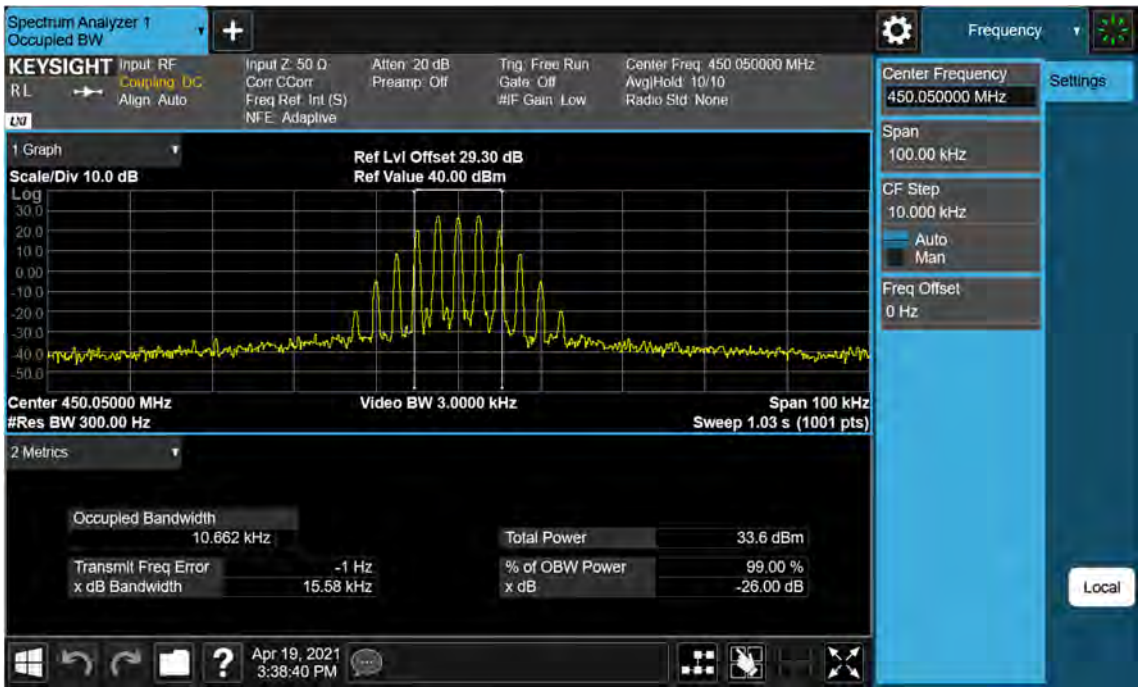
▣ TEST RESULTS

Certification	Type of Emission	Channel Bandwidth (kHz)	Power	Test Frequency (MHz)	Measured 99% OBW at Maximum Freq. Deviation(kHz)	Limit (kHz)
FCC	16K0F3E	25	High Power (2W)	450.05	10.662	20.00
				481.05	10.625	
				511.95	10.535	
			Low Power (1W)	450.05	14.774	
				481.05	14.619	
				511.95	14.631	
			High Power (5W)	470.05	14.712	
				491.05	14.631	
				511.95	14.588	
			Low Power (1W)	470.05	14.682	
				491.05	14.607	
				511.95	14.584	
FCC	11K0F3E	12.5	High Power (5W)	450.05	9.916	11.25
				481.05	9.885	
				511.95	9.903	
			Low Power	450.05	9.926	
				481.05	9.881	
				511.95	9.895	
FCC	8K30F1E, 8K30F1D, 8K30F7W	12.5	High Power (5W)	450.05	7.627	
				481.05	7.550	
				511.95	7.577	
			Low Power	450.05	7.605	
				481.05	7.535	
				511.95	7.580	
FCC	7K60FXD, 7K60FXE	12.5	High Power (5W)	450.05	7.546	
				481.05	7.293	
				511.95	7.450	
			Low Power	450.05	7.474	
				481.05	7.370	
				511.95	7.351	
FCC	4K00F1E, 4K00F1D, 4K00F7W	6.25	High Power (5W)	450.05	3.505	6.00
				481.05	3.514	
				511.95	3.514	
			Low Power	450.05	3.487	
				481.05	3.467	
				511.95	3.469	
FCC	4K00F2D	6.25	High Power (5W)	450.05	3.985	
				481.05	3.989	
				511.95	3.988	
			Low Power	450.05	4.018	
				481.05	4.010	
				511.95	4.013	

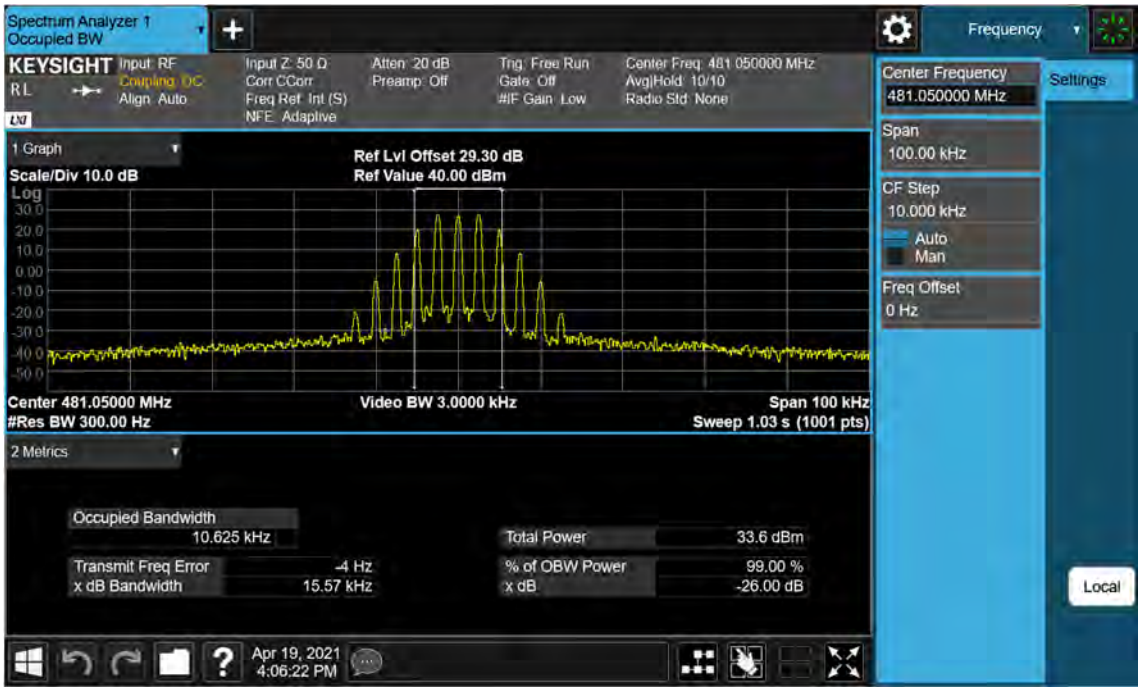
▣ Plots of 99% Bandwidth

16K0F3E_FCC

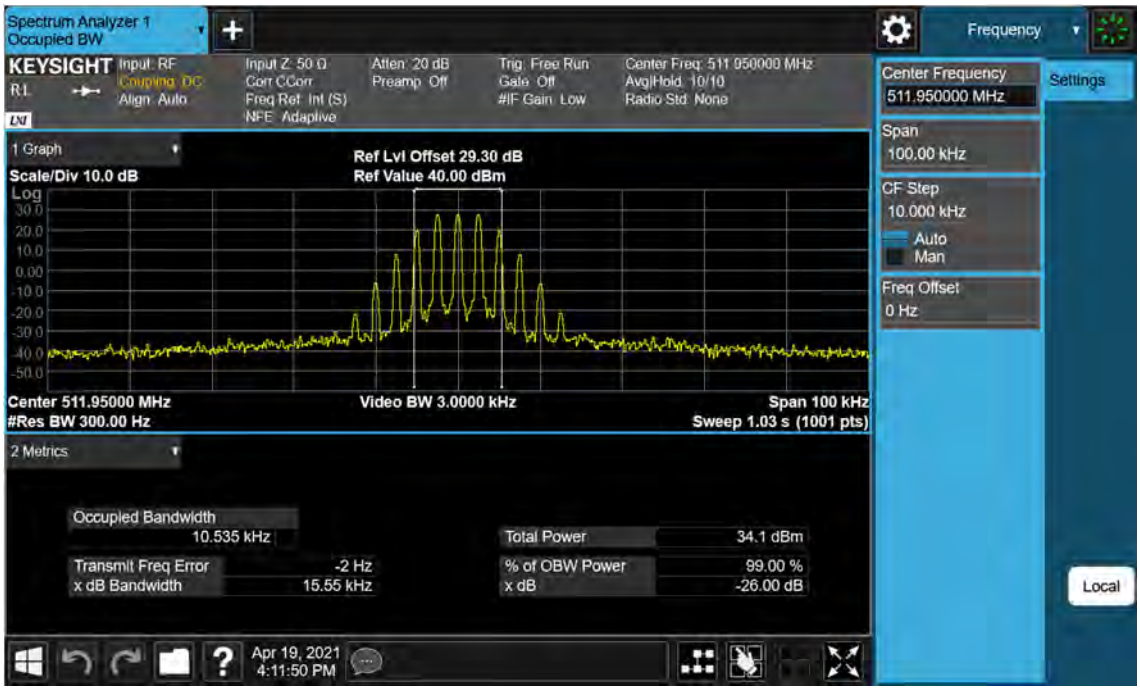
(450.05 MHz)_High_2W



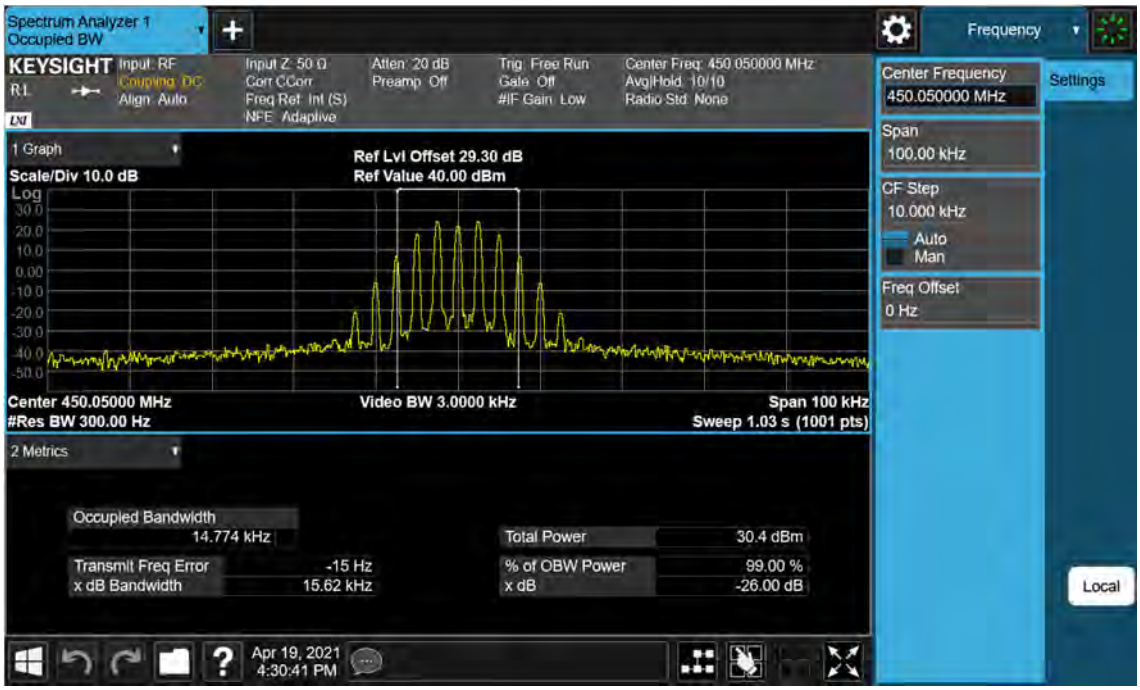
(481.05 MHz)_High_2W



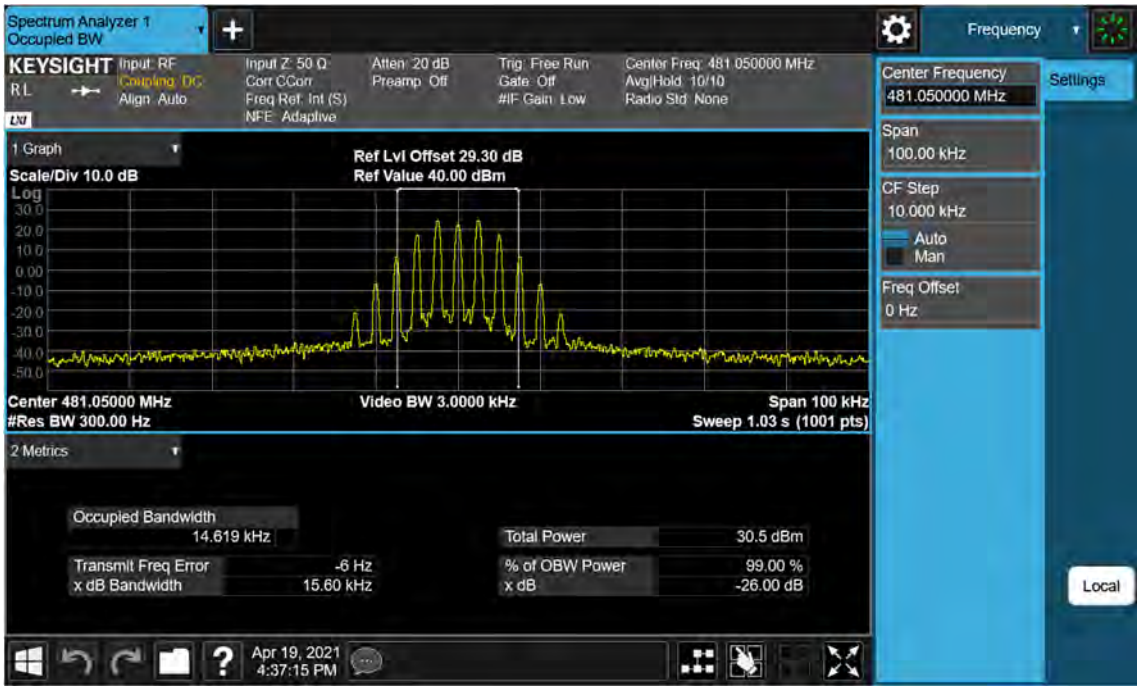
(511.95 MHz)_High_2W



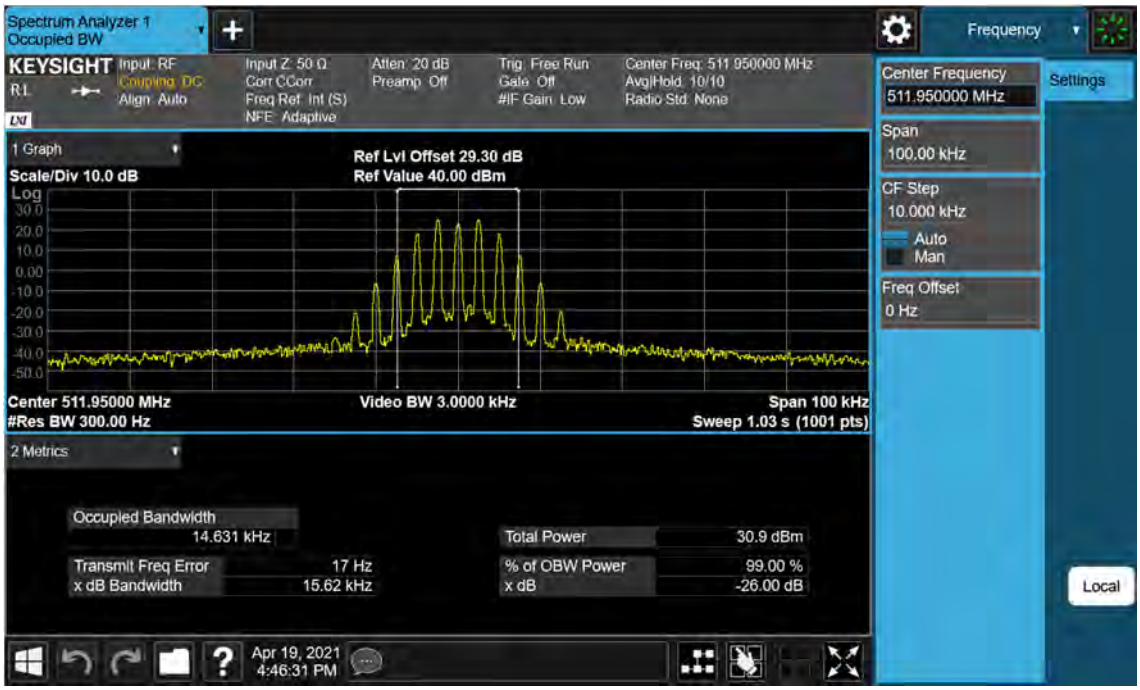
(450.05 MHz)_Low_1W



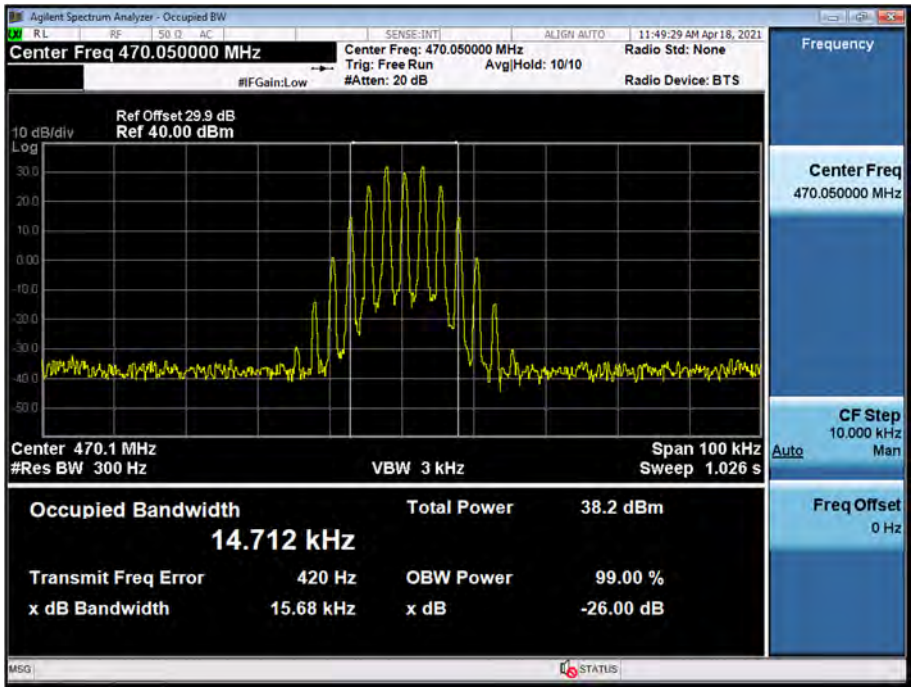
(481.05 MHz)_Low_1W



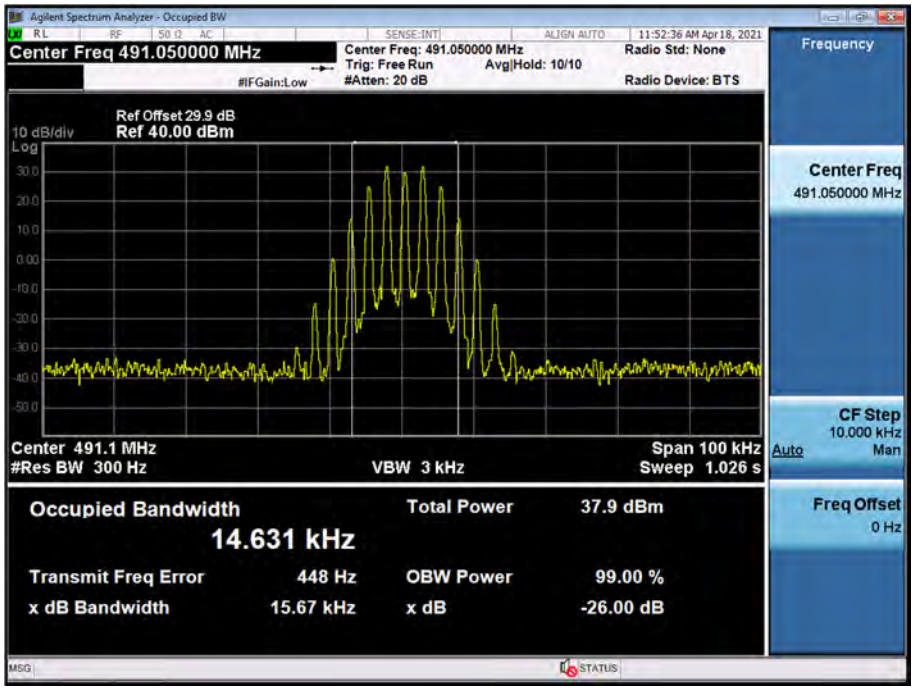
(511.95 MHz)_Low_1W



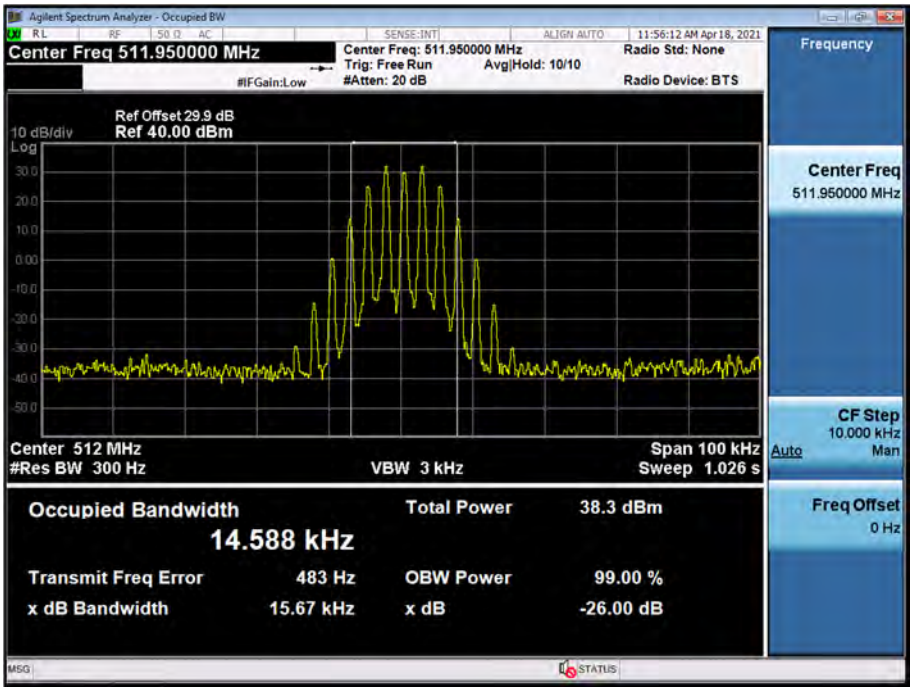
(470.05 MHz)_High_5W



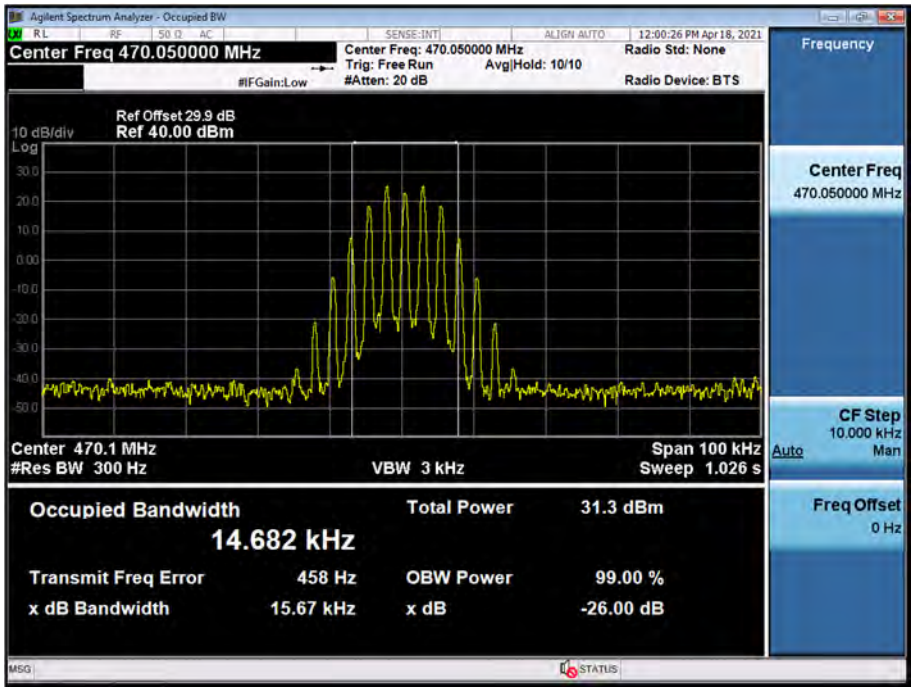
(491.05 MHz)_High_5W



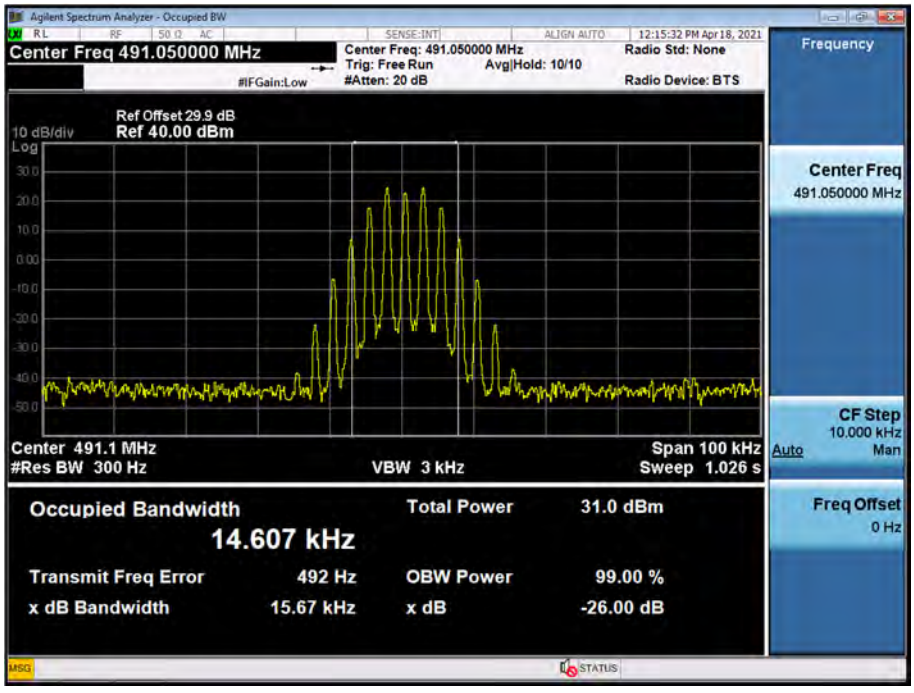
(511.95 MHz)_High_5W



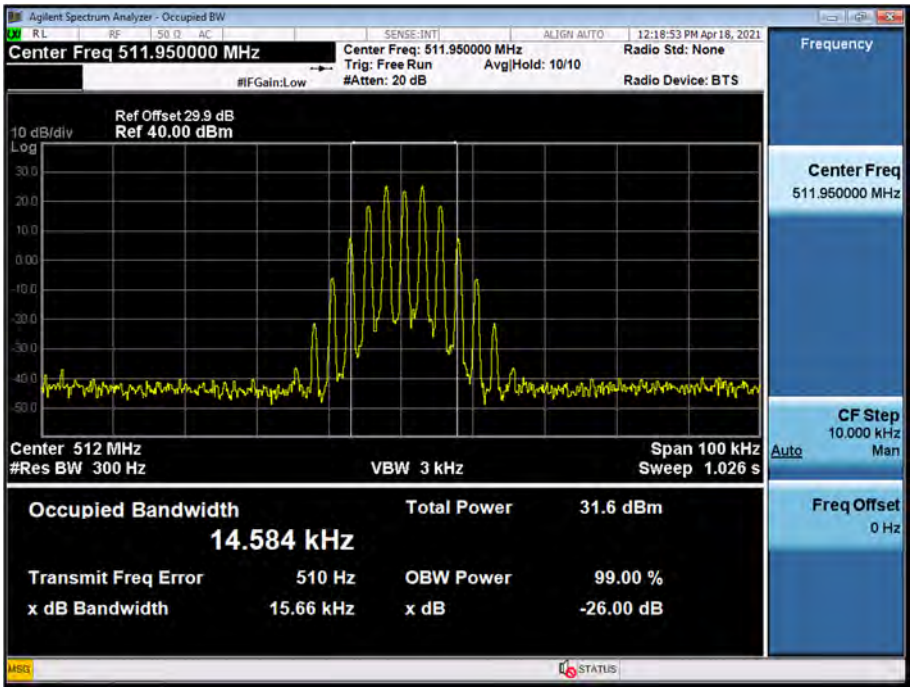
(470.05 MHz)_Low_1W



(491.05 MHz)_Low_1W

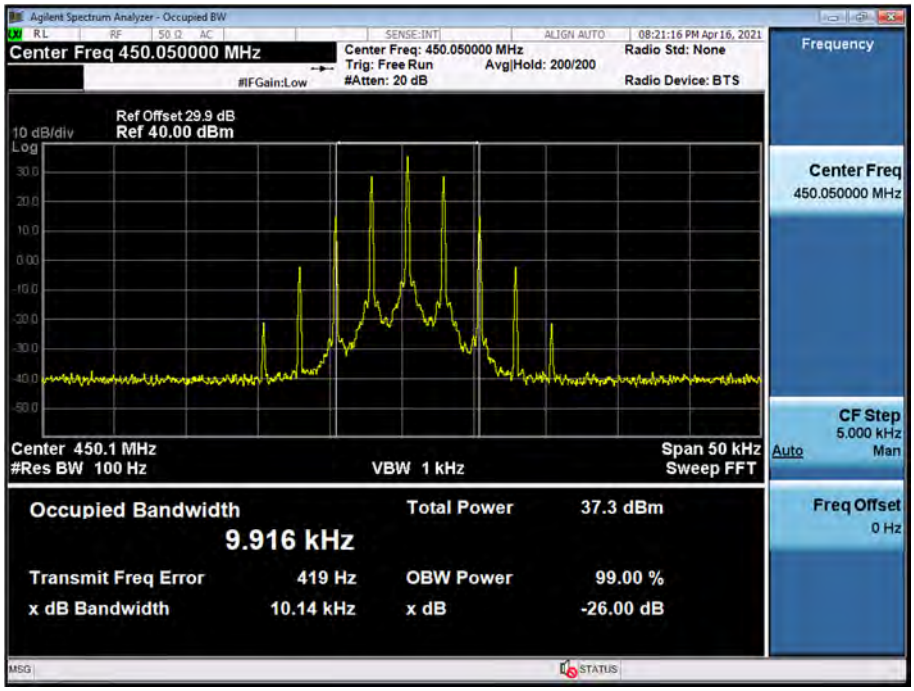


(511.95 MHz)_Low_1W

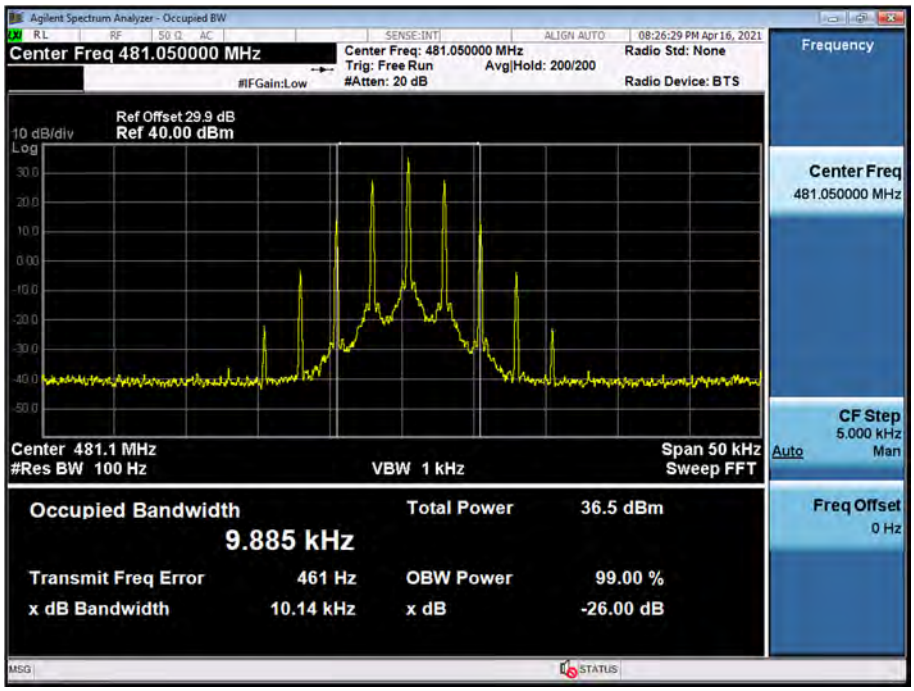


11K0F3E_FCC

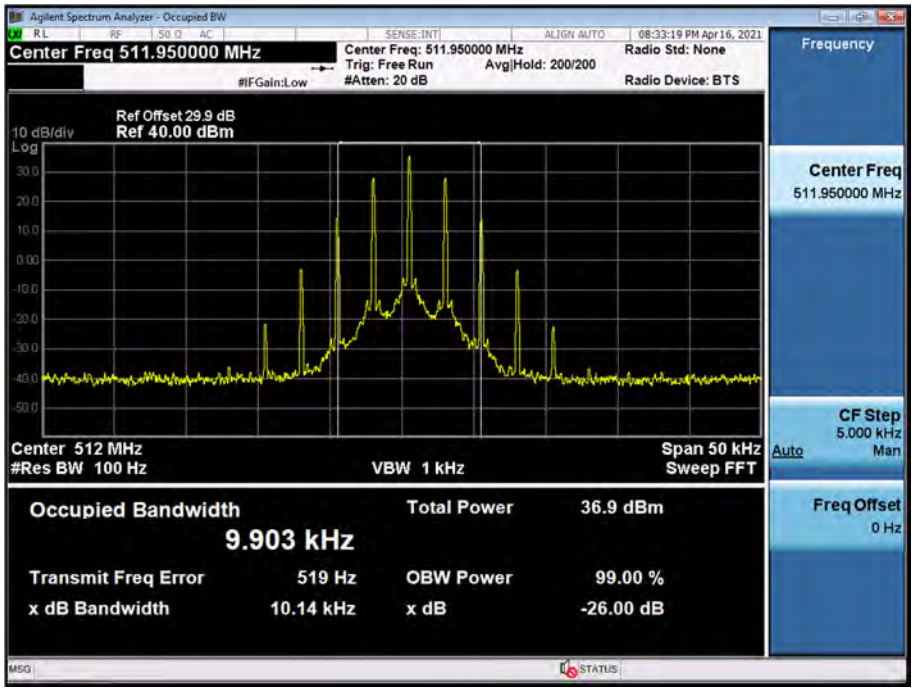
(450.05 MHz)_High_5W



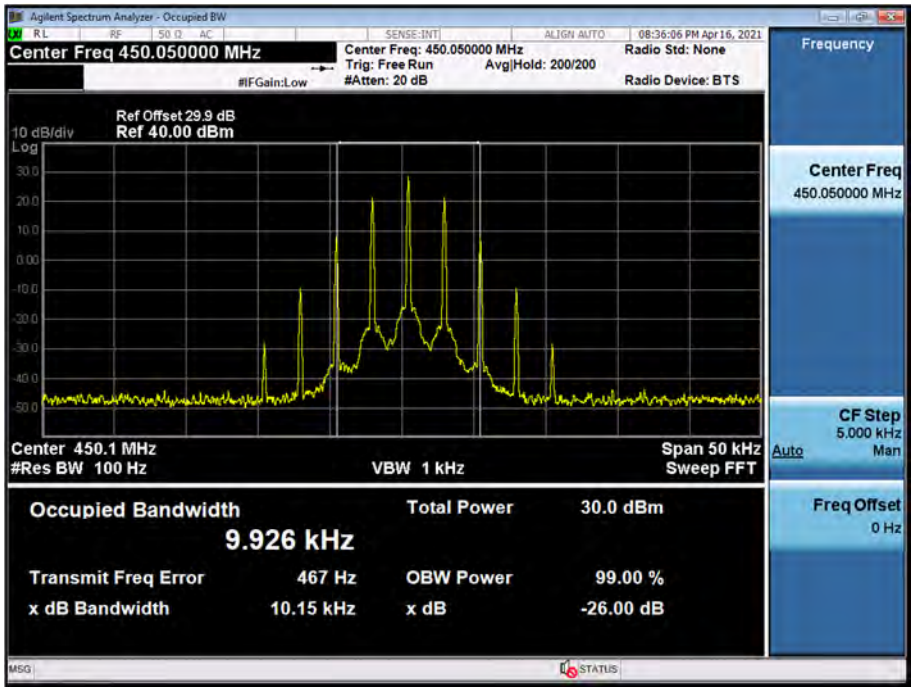
(481.05 MHz)_High_5W



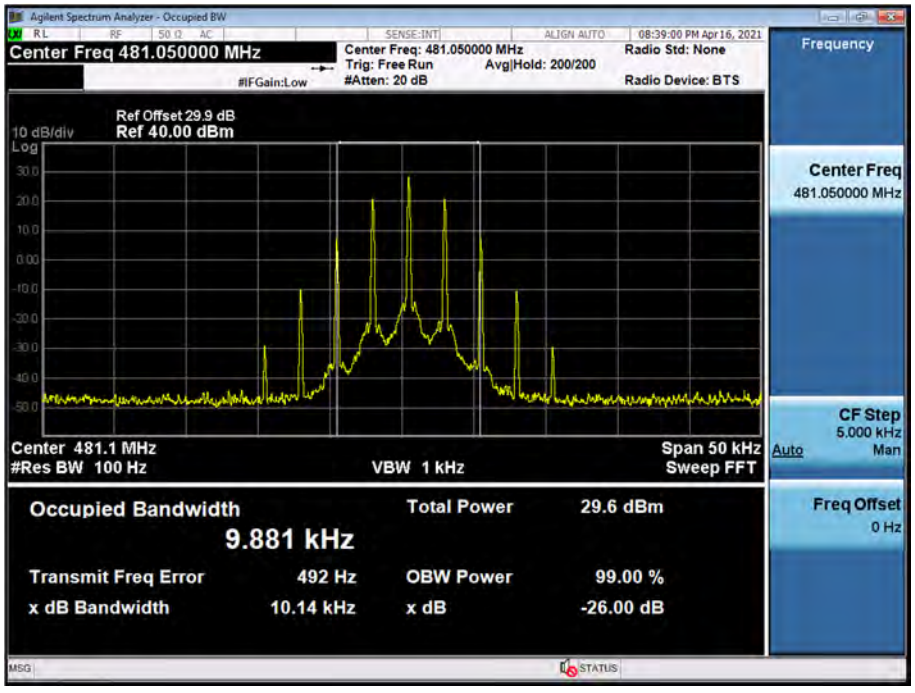
(511.95 MHz)_High_5W



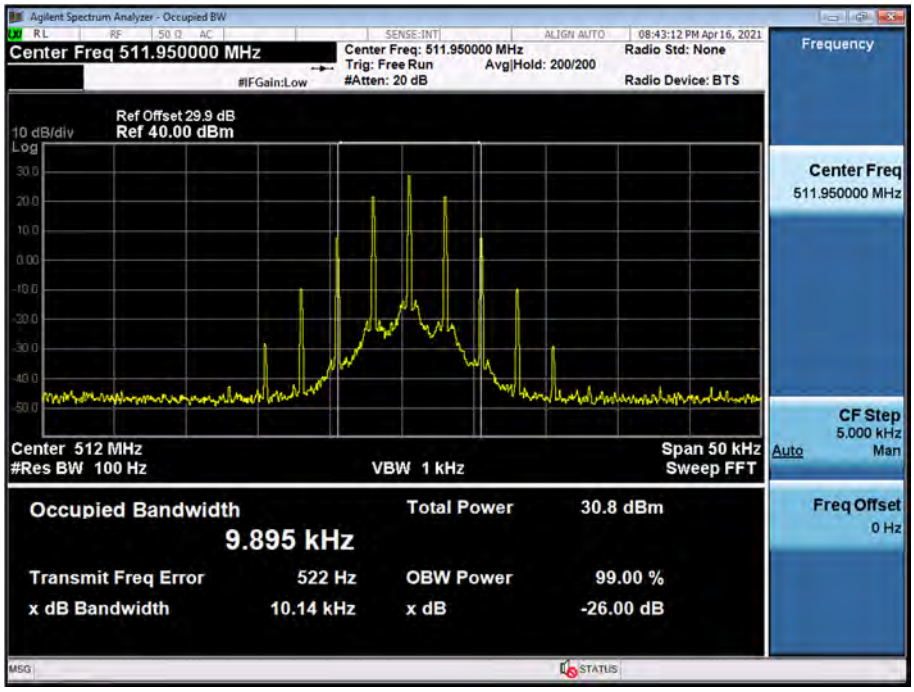
(450.05 MHz)_Low



(481.05 MHz)_Low

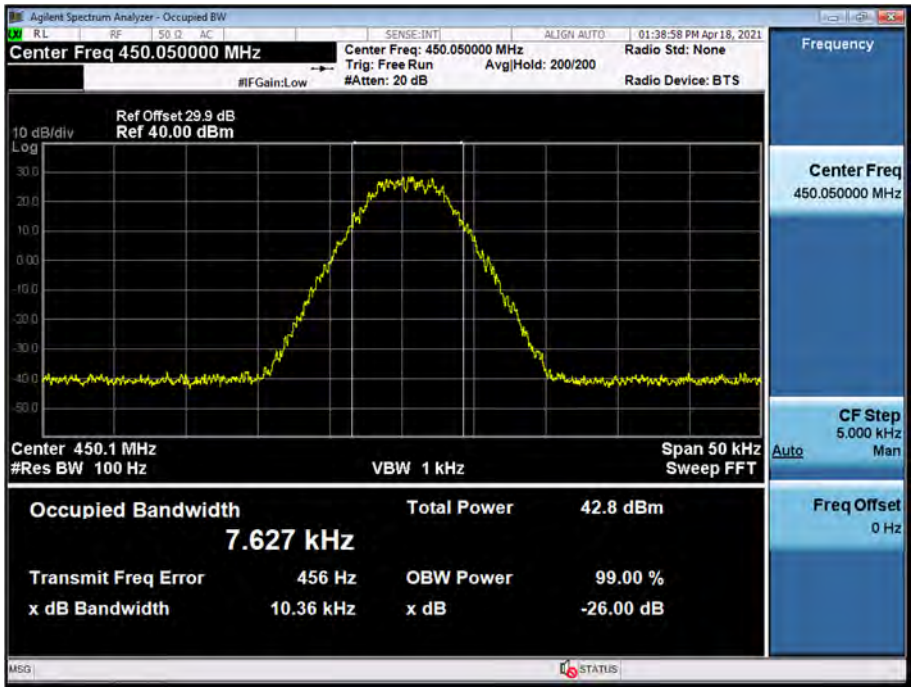


(511.95 MHz)_Low

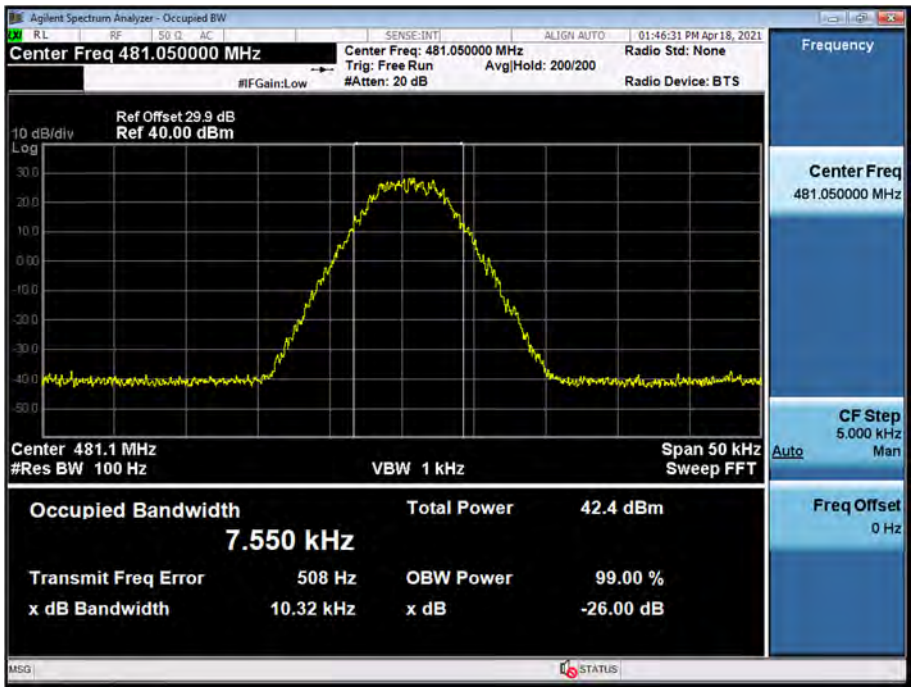


8K30F1E, 8K30F1D, 8K30F7W_FCC

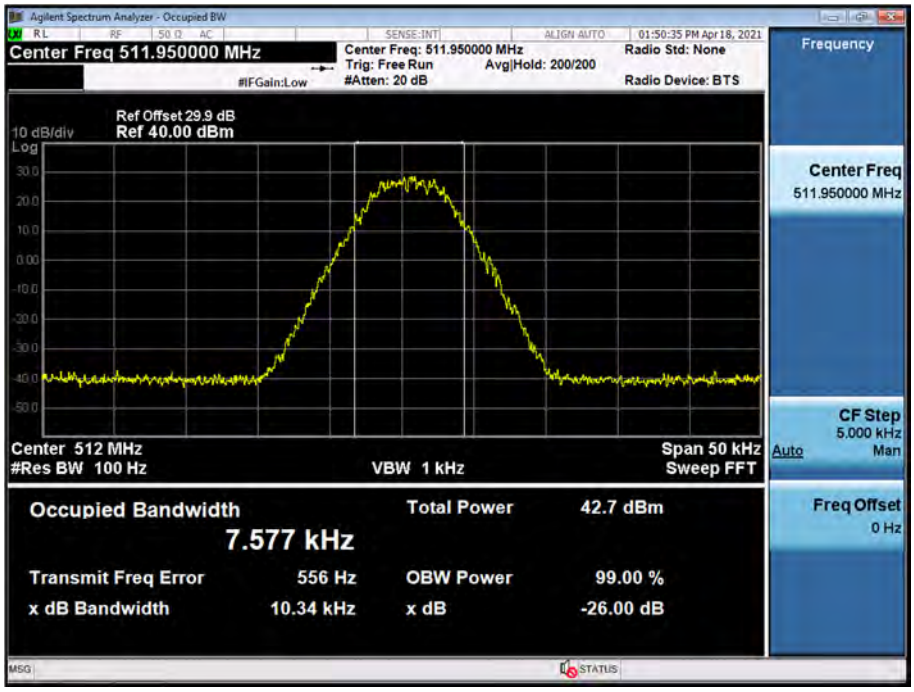
(450.05 MHz)_High_5W



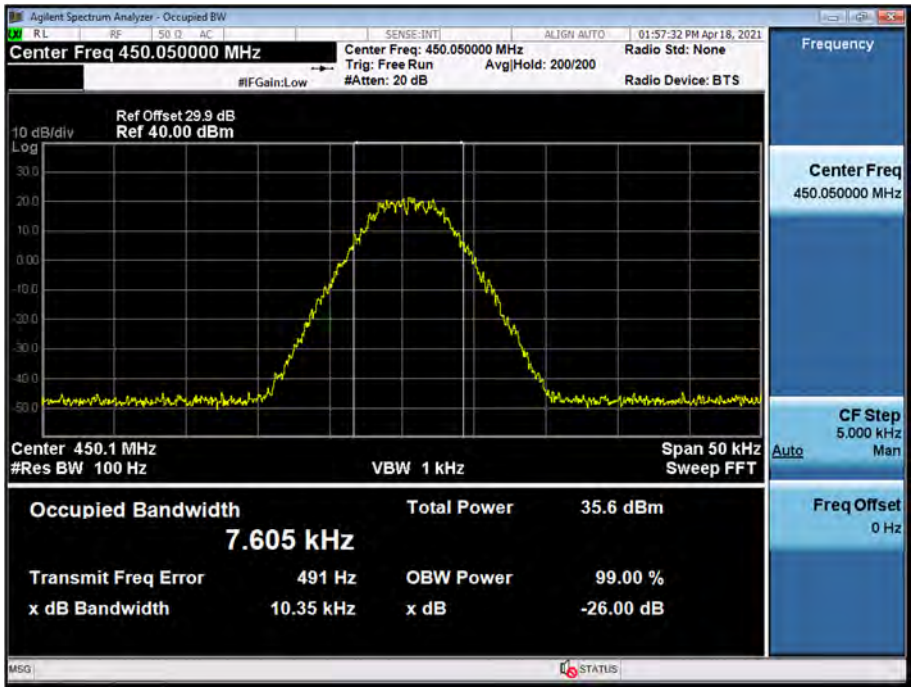
(481.05 MHz)_High_5W



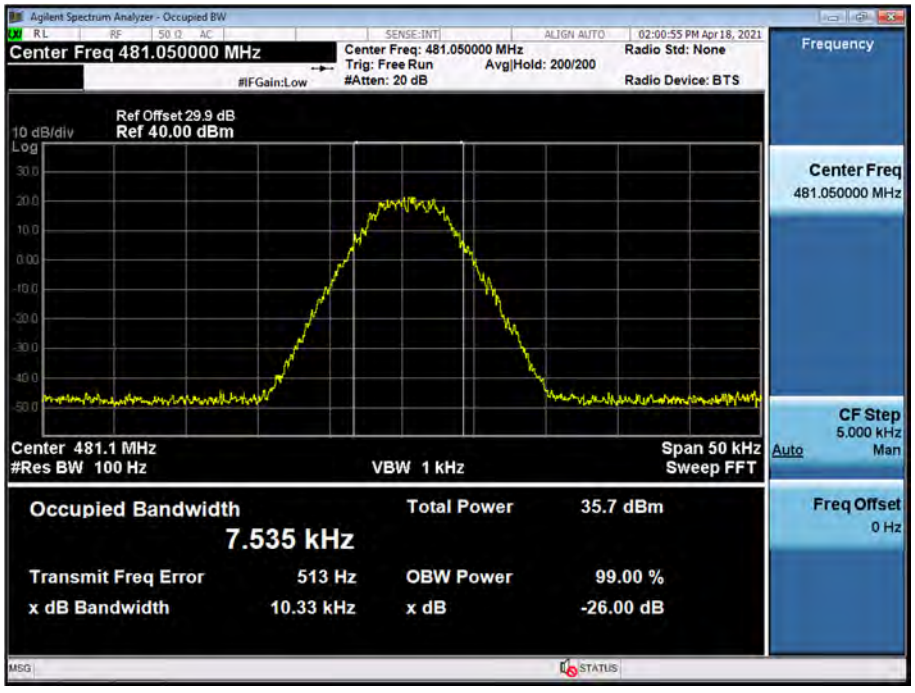
(511.95 MHz)_High_5W



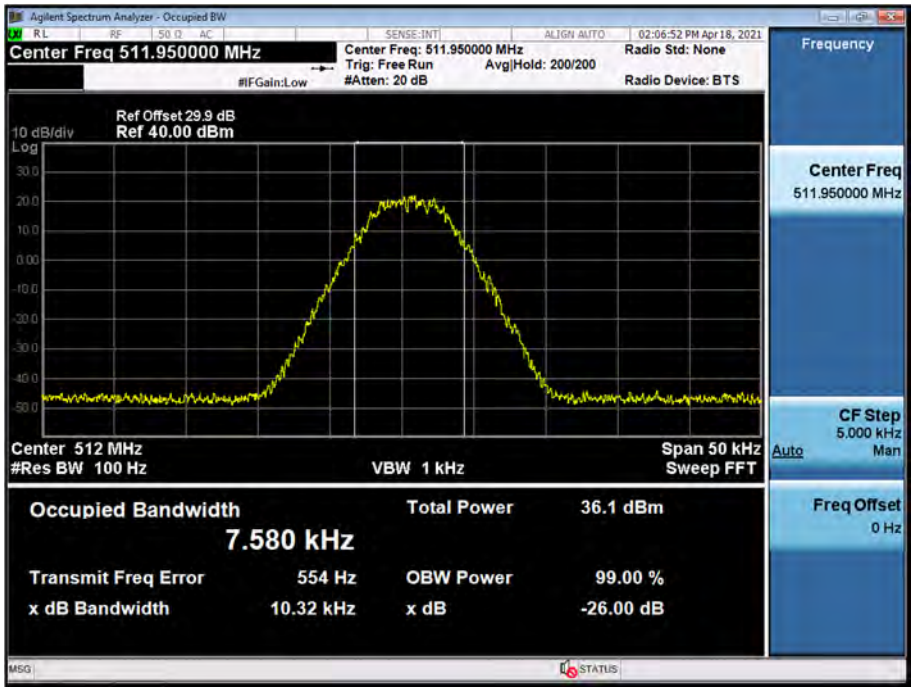
(450.05 MHz)_Low



(481.05 MHz)_Low

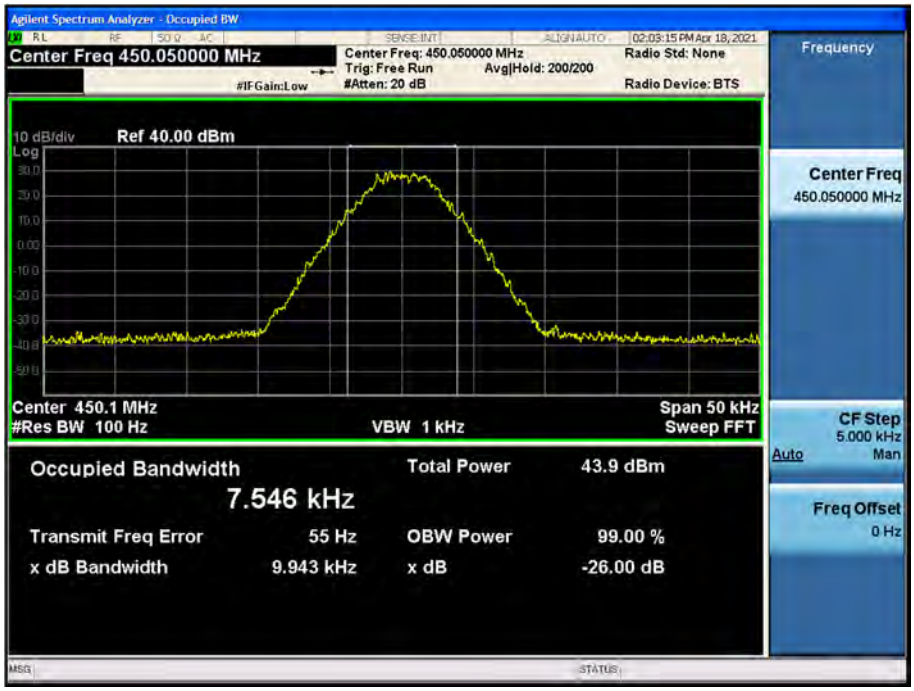


(511.95 MHz)_Low



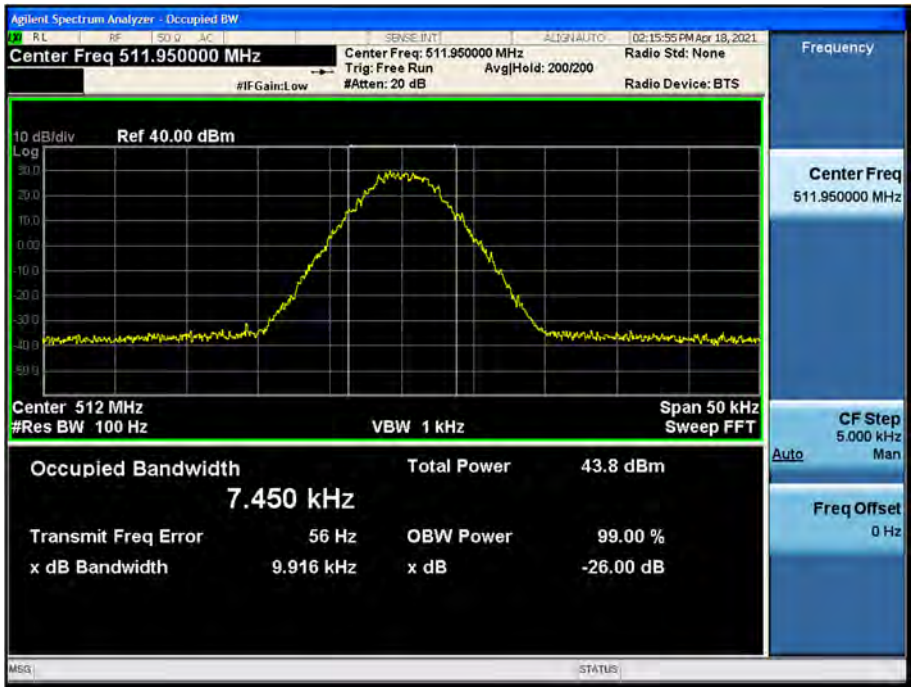
7K60FXD, 7K60FXE_FCC

(450.05 MHz)_High_5W

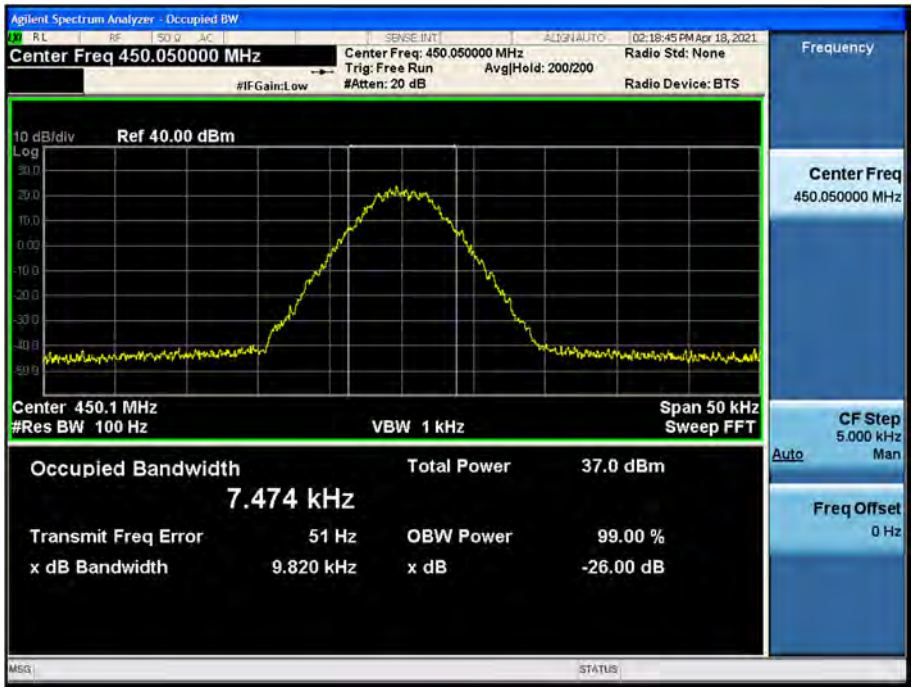


(481.05 MHz)_High_5W

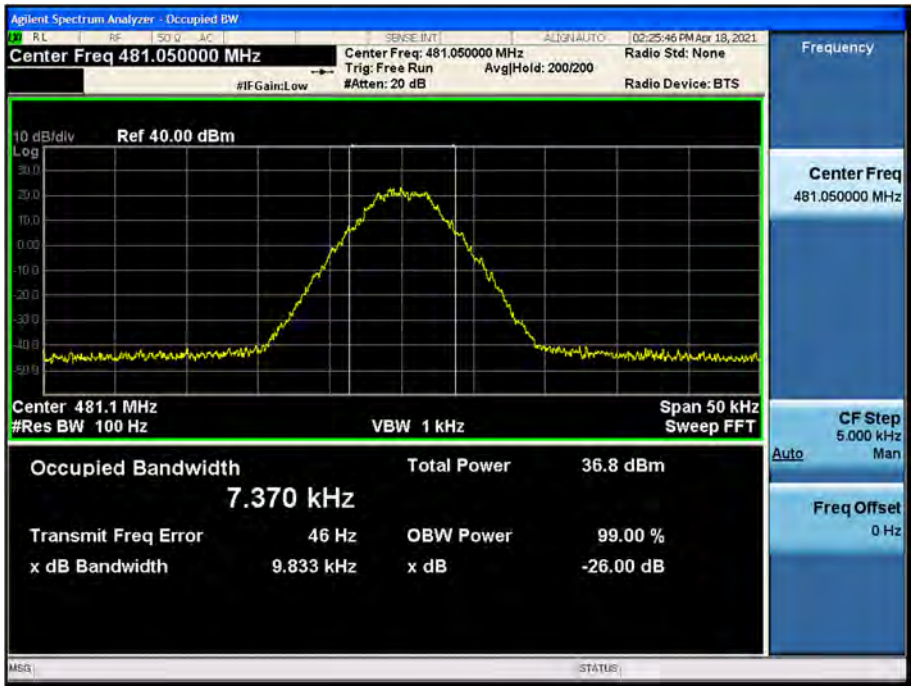
(511.95 MHz)_High_5W



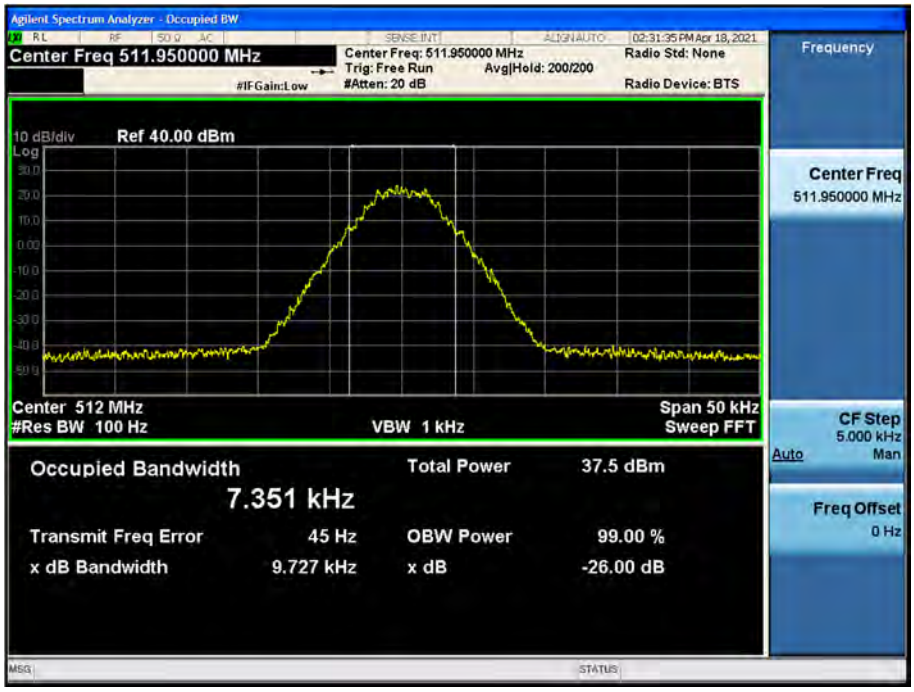
(450.05 MHz)_Low



(481.05 MHz)_Low

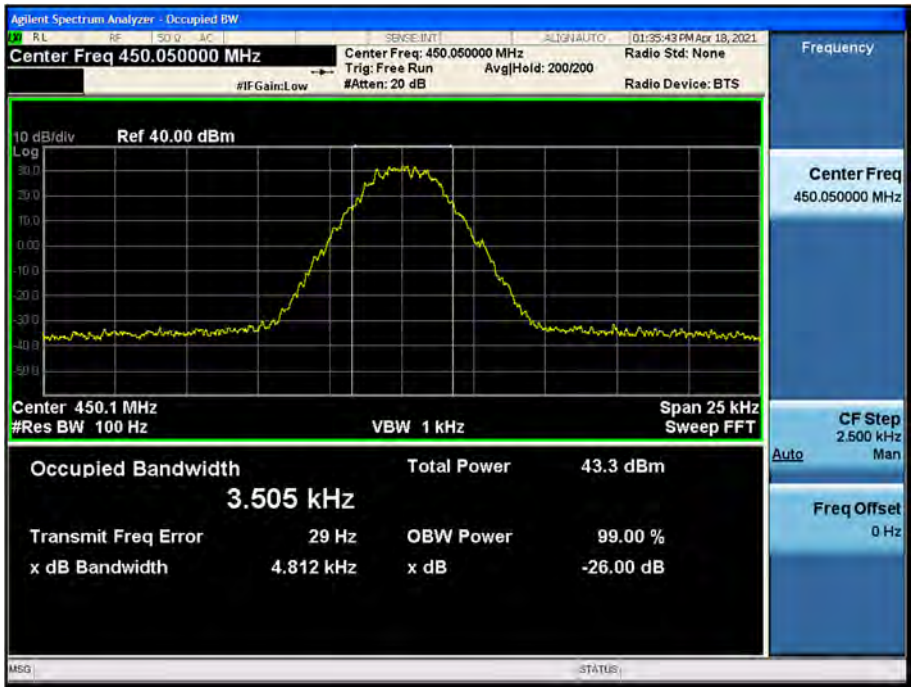


(511.95 MHz)_Low



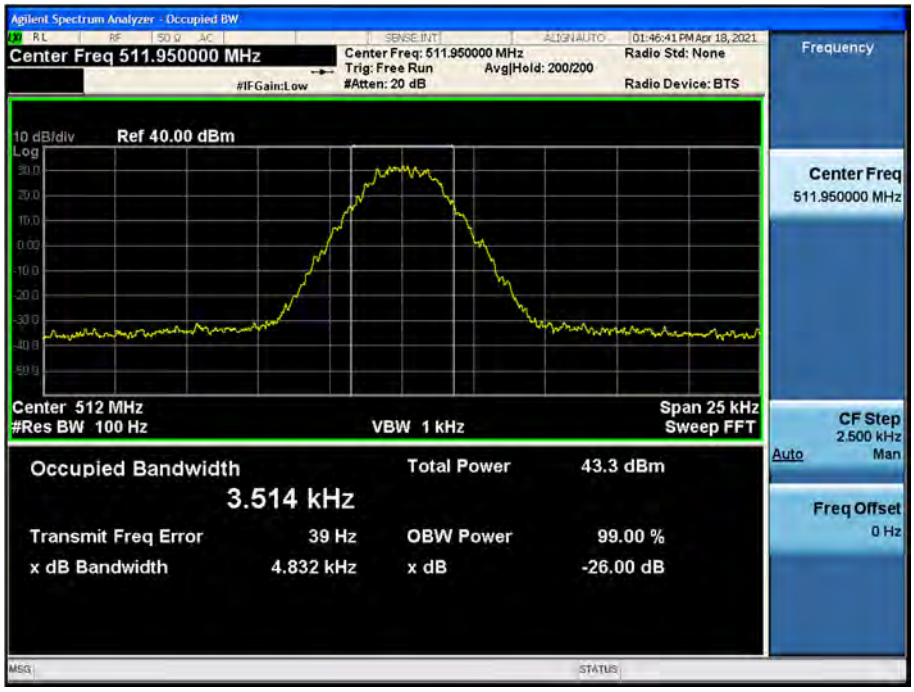
4K00F1E, 4K00F1D, 4K00F7W_FCC

(450.05 MHz)_High_5W

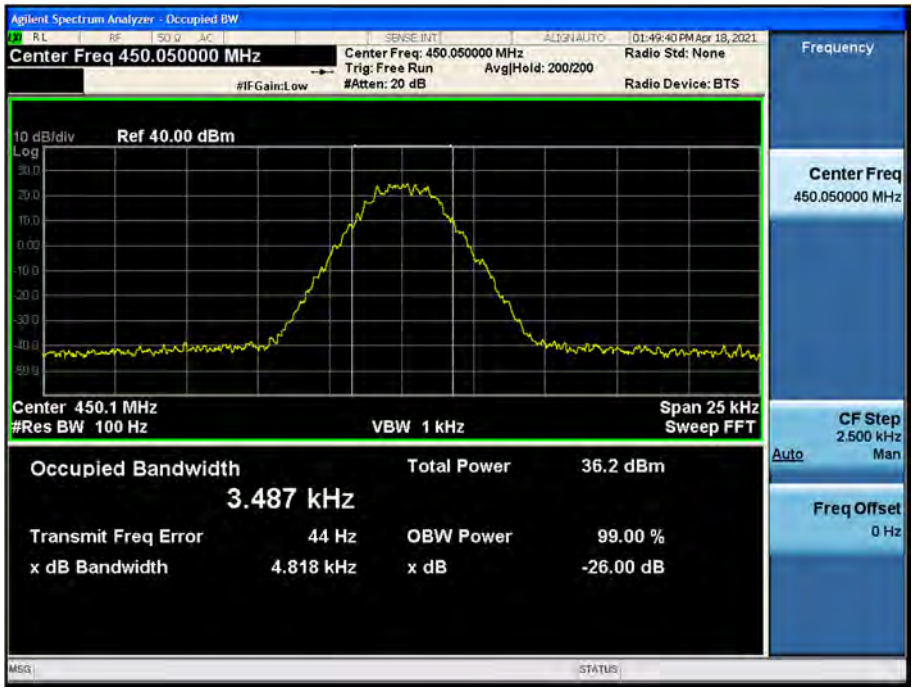


(481.05 MHz)_High_5W

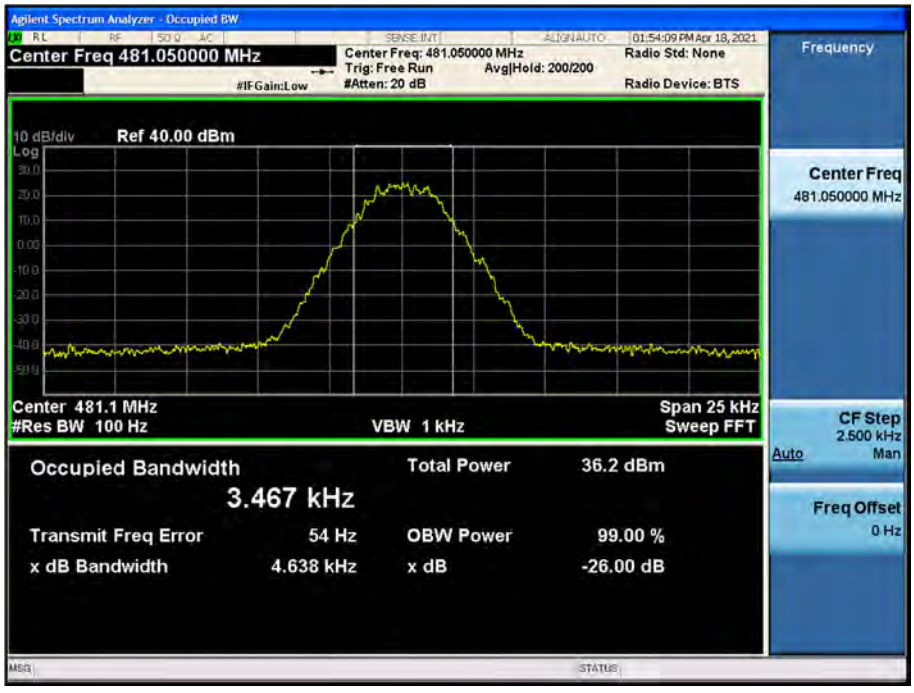
(511.95 MHz)_High_5W



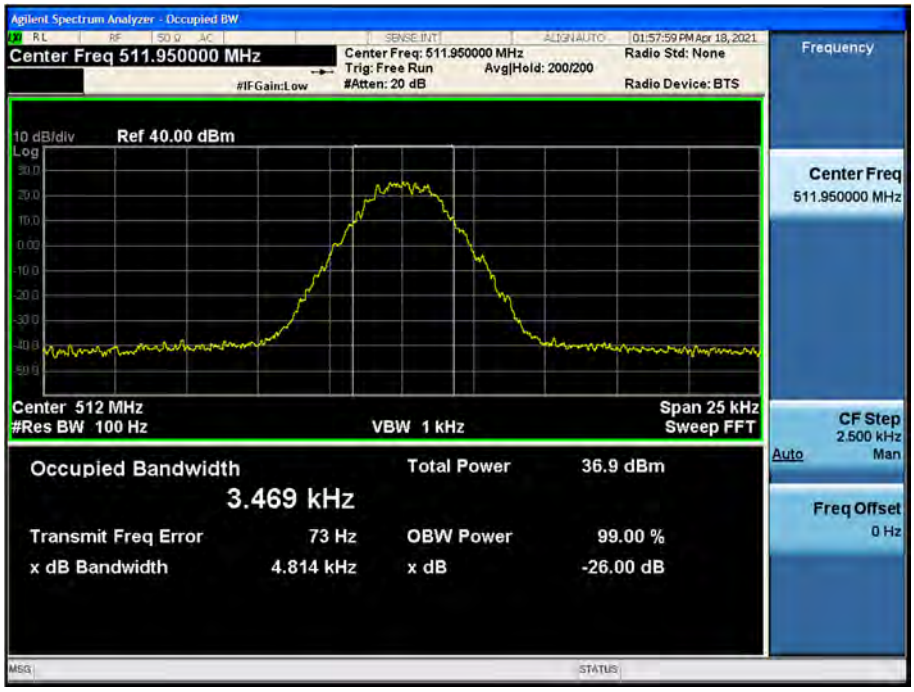
(450.05 MHz)_Low



(481.05 MHz)_Low

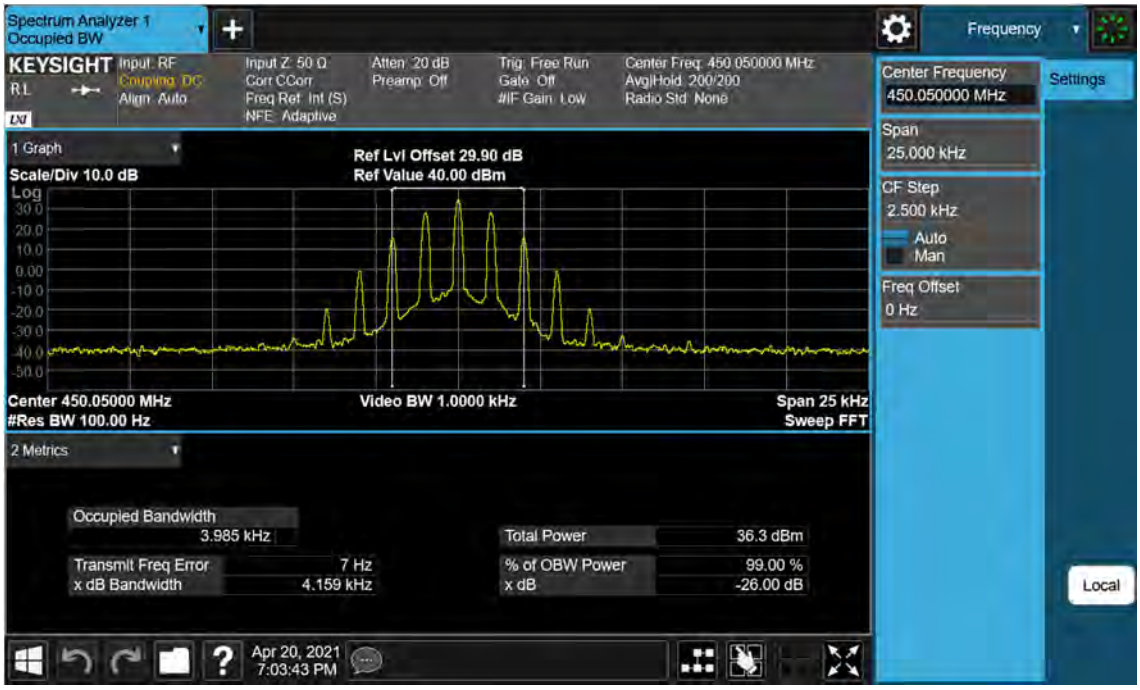


(511.95 MHz)_Low

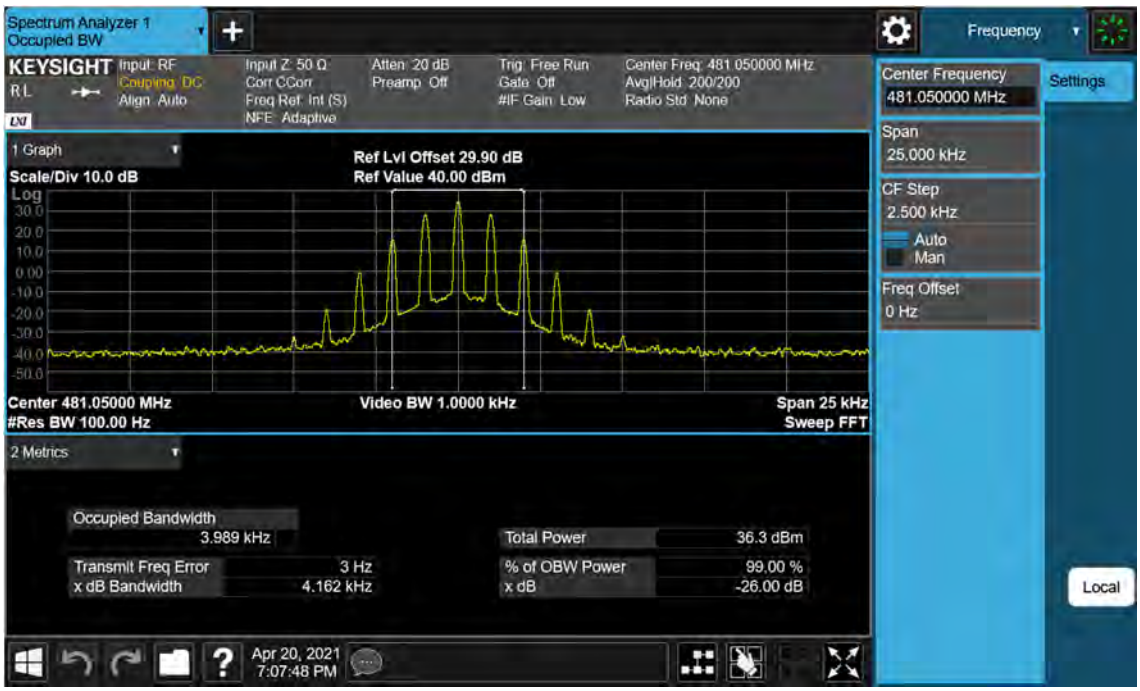


4K00F2D_FCC

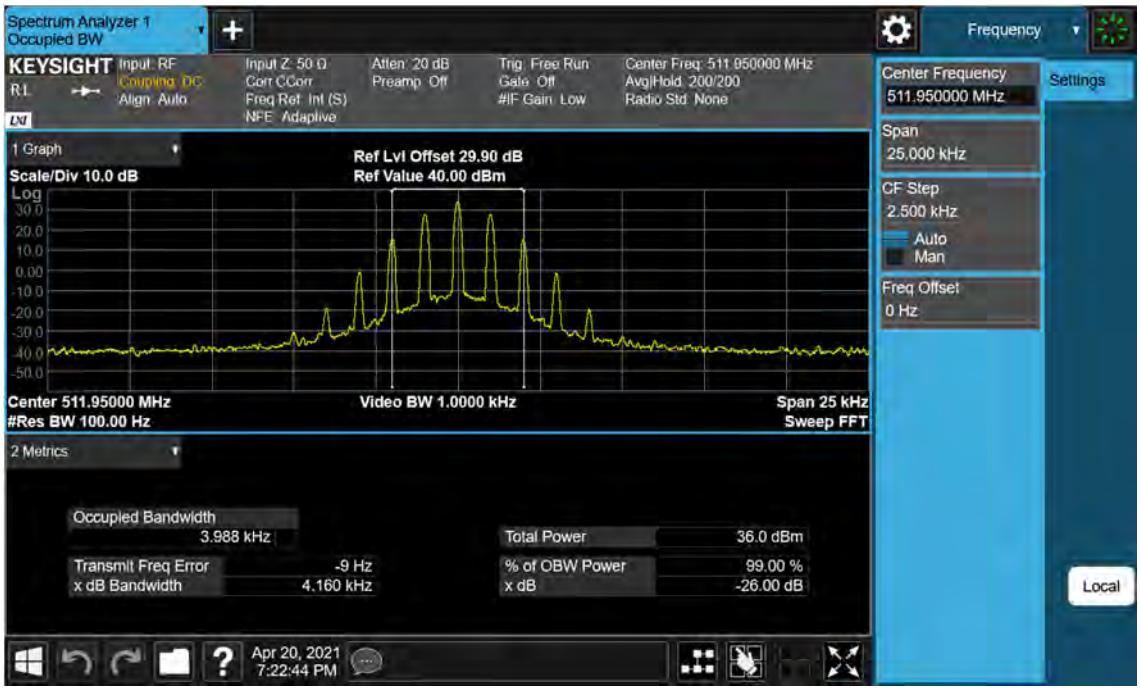
(450.05 MHz)_High_5W



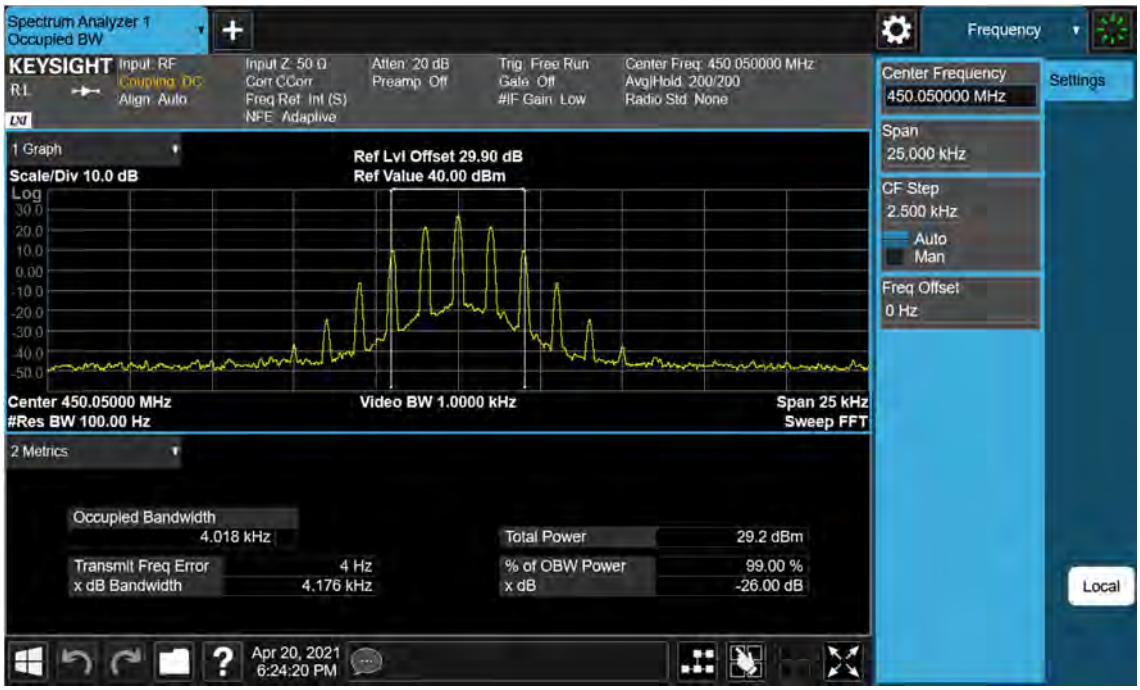
(481.05 MHz)_High_5W



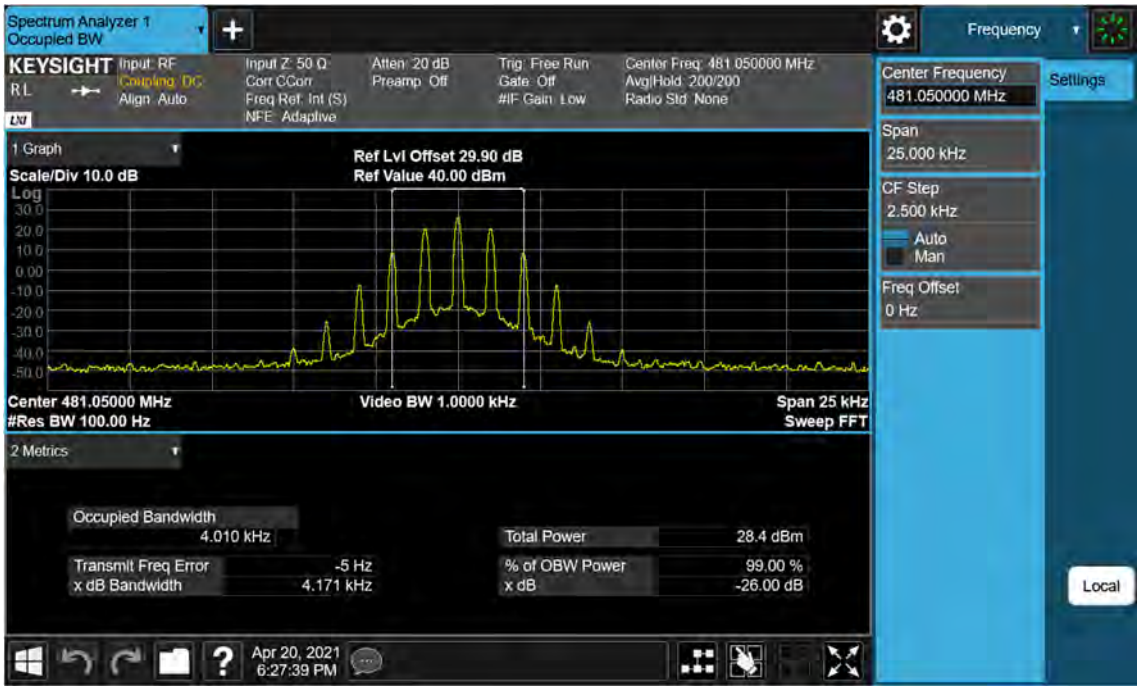
(511.95 MHz)_High_5W



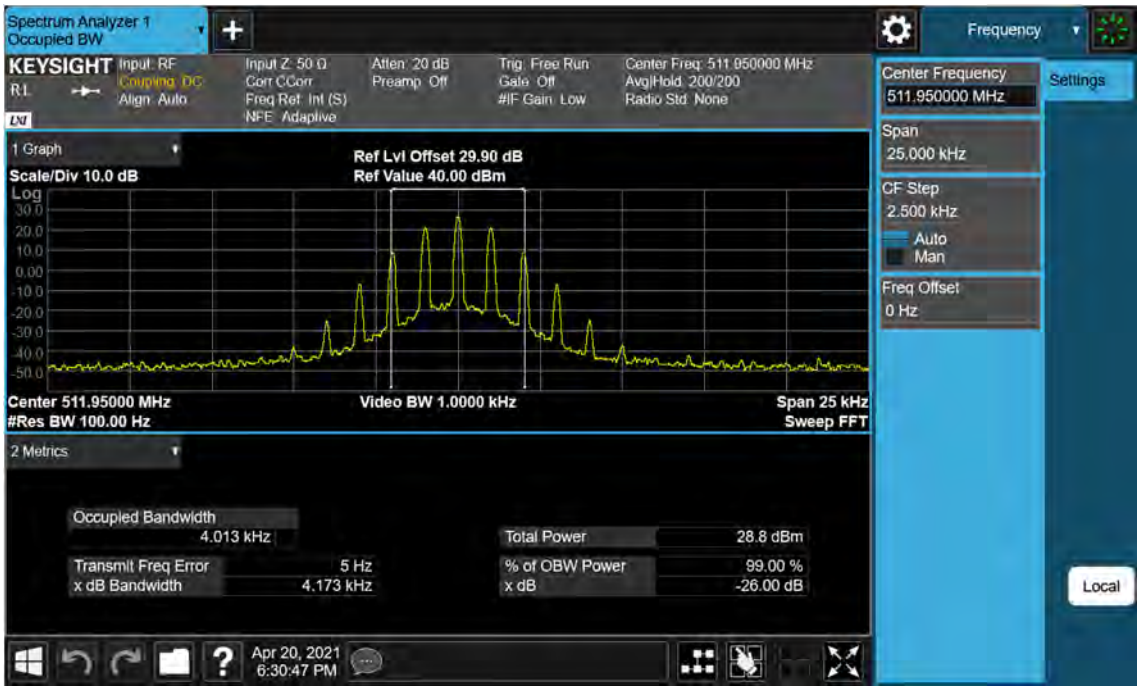
(450.05 MHz)_Low



(481.05 MHz)_Low



(511.95 MHz)_Low

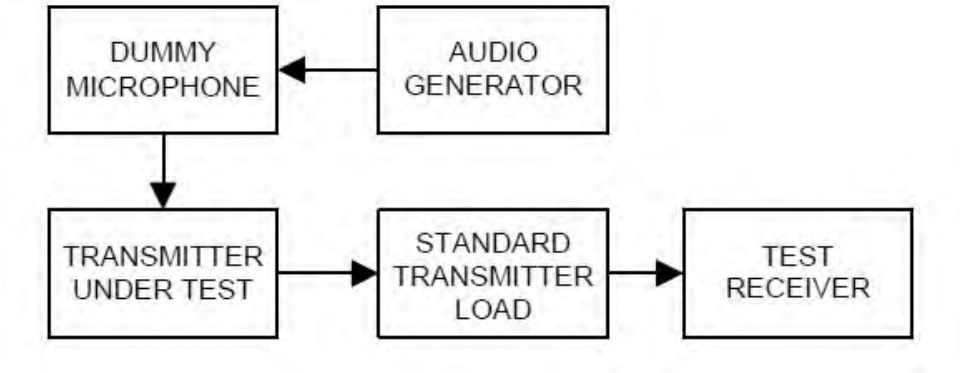


8.4 Modulation Limiting

▣ Definition

Modulation limiting is the transmitter circuit's ability to limit the transmitter from producing deviations in excess of a rated system deviation.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

According to 2.2.3 in TIA-603-E Standard.

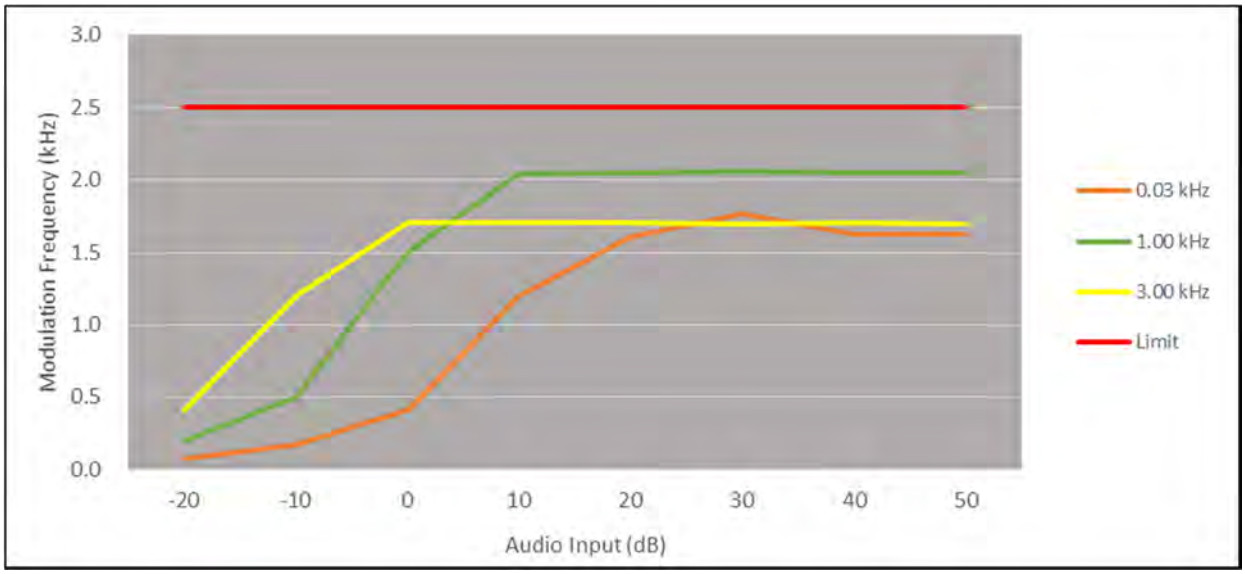
a) Connect the equipment as illustrated.
b) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
c) Set the test receiver to measure peak positive deviation.
   Set the audio bandwidth for ≤0.25 Hz to ≥15,000 Hz.
   Turn the de-emphasis function off.
d) Apply a 1000 Hz modulating signal to the transmitter from the audio frequency generator, and adjust the level obtain 60% of full rated system deviation.
e) Increase the level form the audio frequency generator by 20 dB in one step(rise time between the 10% and 90% points shall be 0.1 second maximum).
f) Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level.
g) With the level from the audio frequency generator held constant at the level obtained in step e), Slowly vary the audio frequency from 300 Hz to 3000 Hz and observe the steady-state deviation. Record the maximum deviation.
h) Set the test receiver to measure peak negative deviation and repeat steps d) through g).
i) The values recorded in steps g) and h) are the modulation limiting.

▣ TEST RESULTS (11K0F3E) _5W

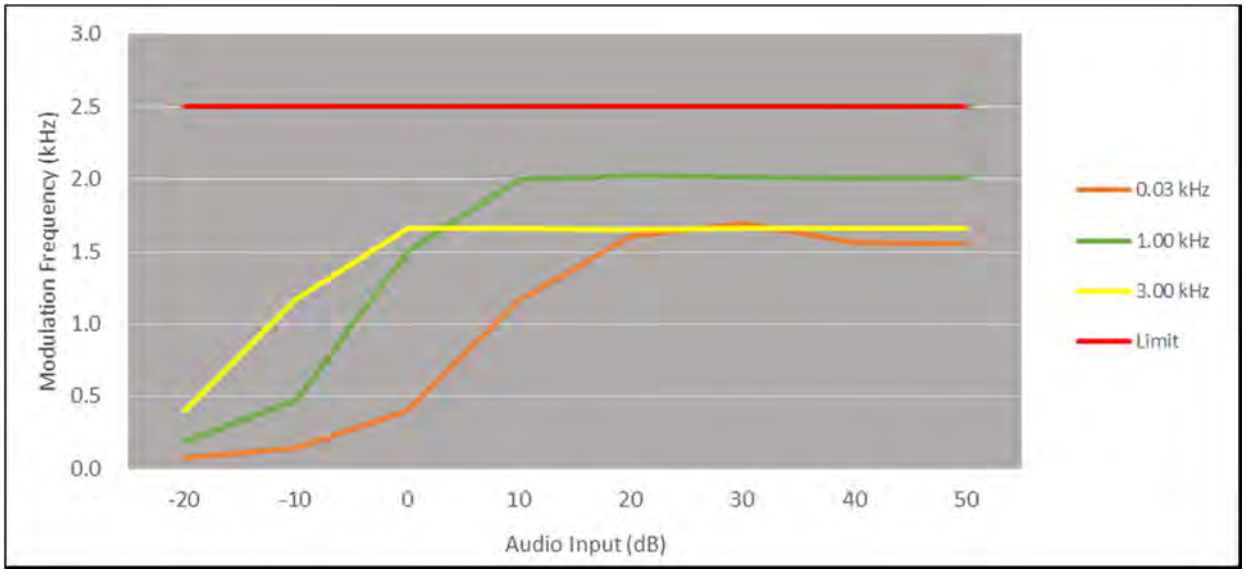
Positive Peaks

HIGH POWER

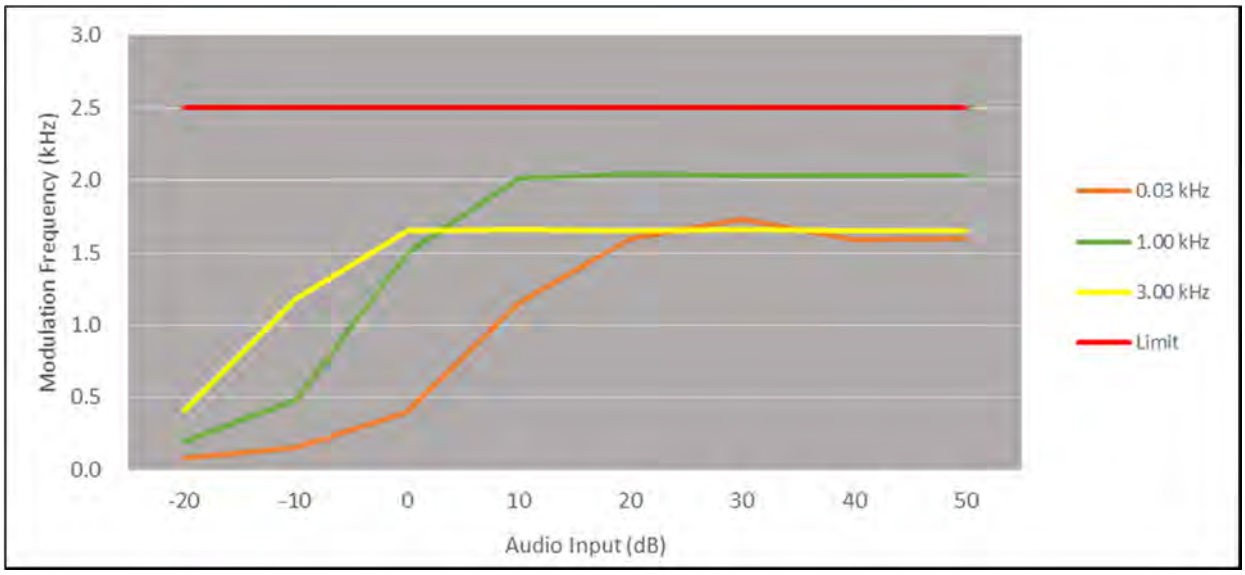
450.05 MHz



481.05 MHz

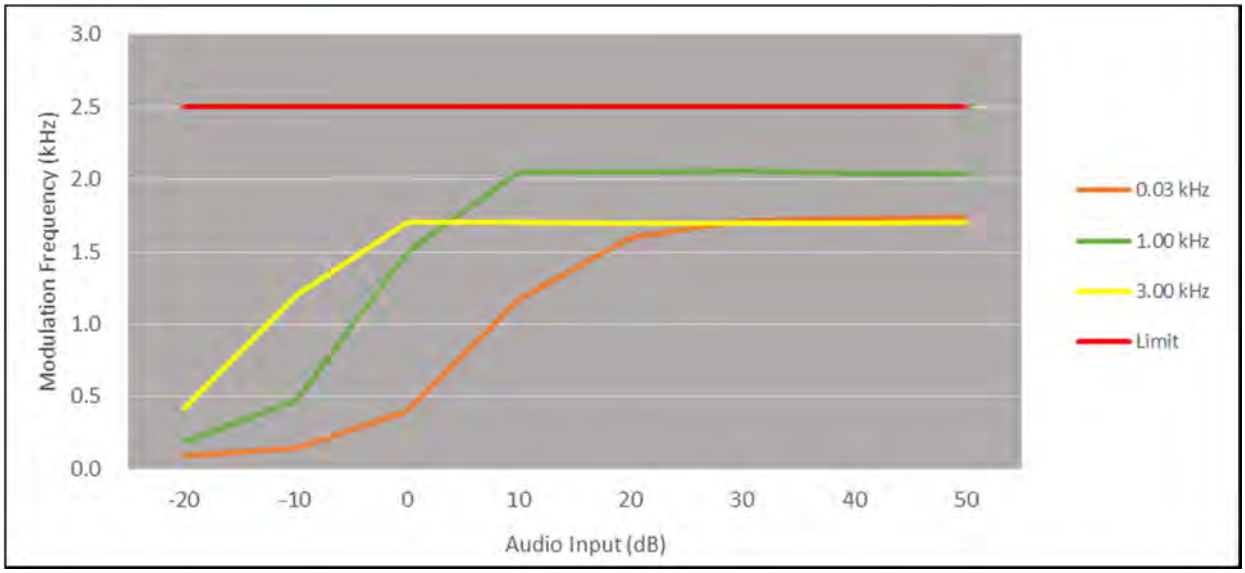


511.95 MHz

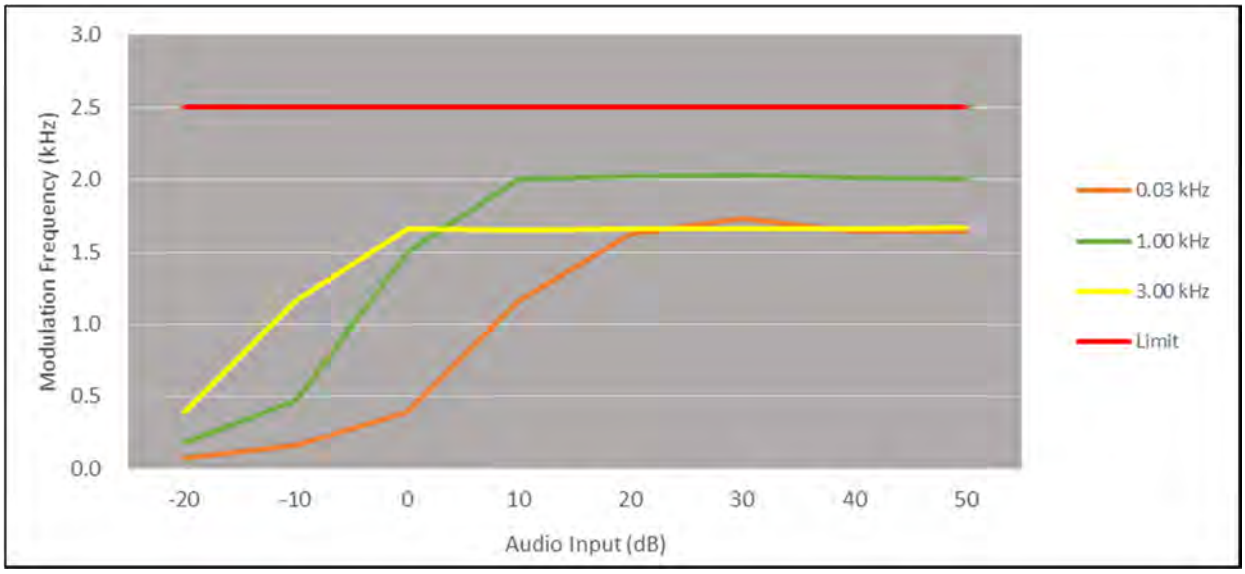

3.0
2.5
2.0
1.5
1.0
0.5
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input (dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

LOW POWER

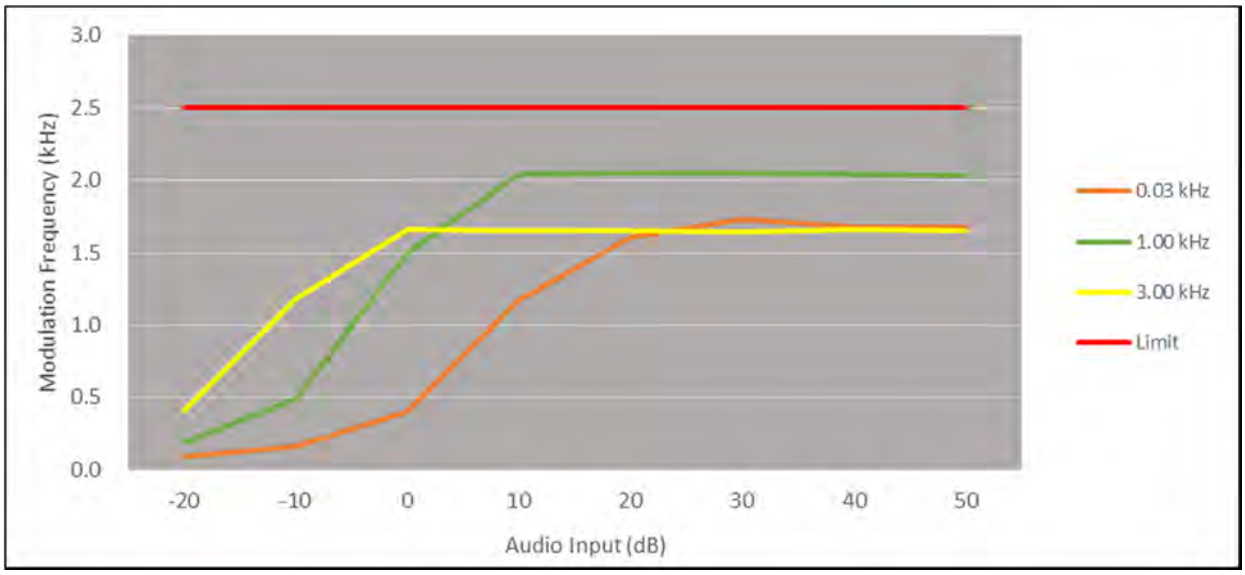
450.05 MHz



481.05 MHz



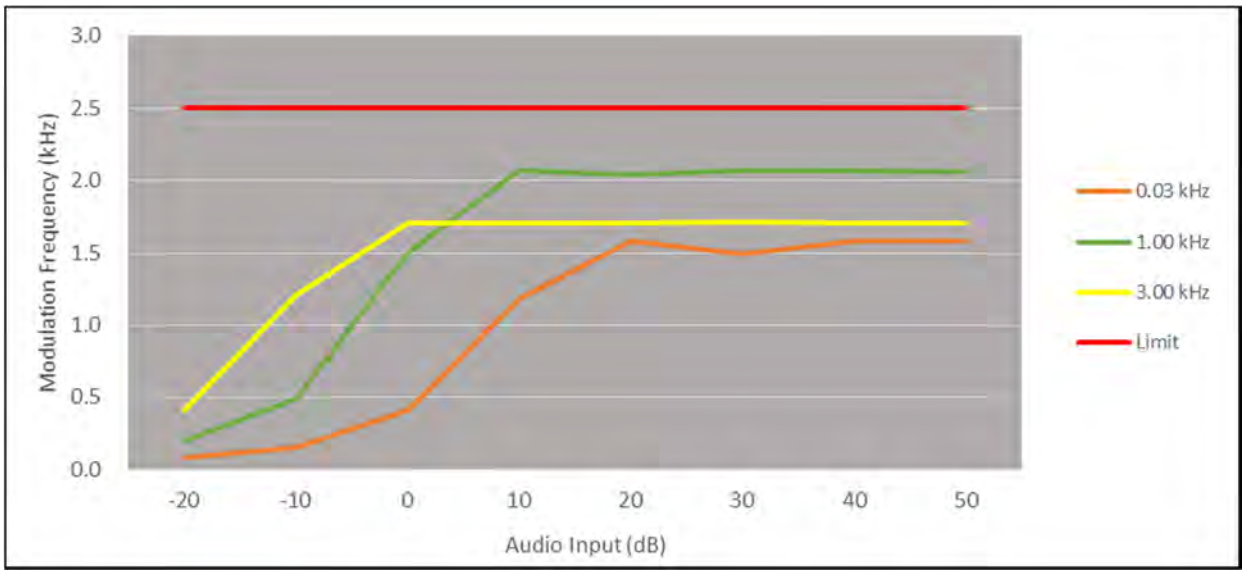
511.95 MHz


3.0
2.5
2.0
1.5
1.0
0.5
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input (dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

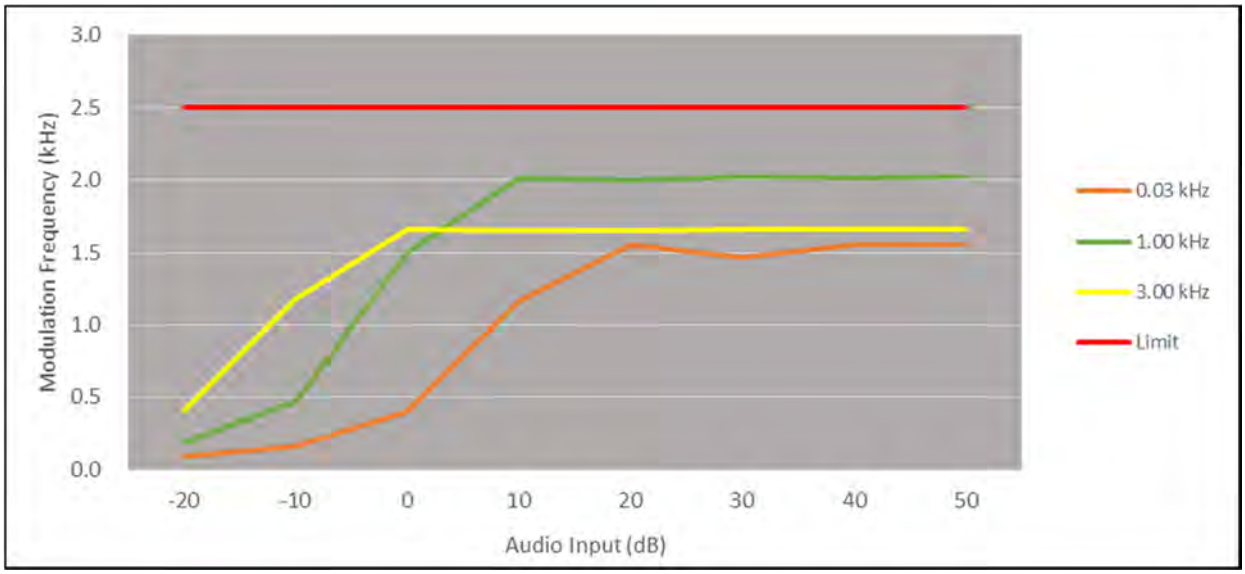
Negative Peaks

HIGH POWER

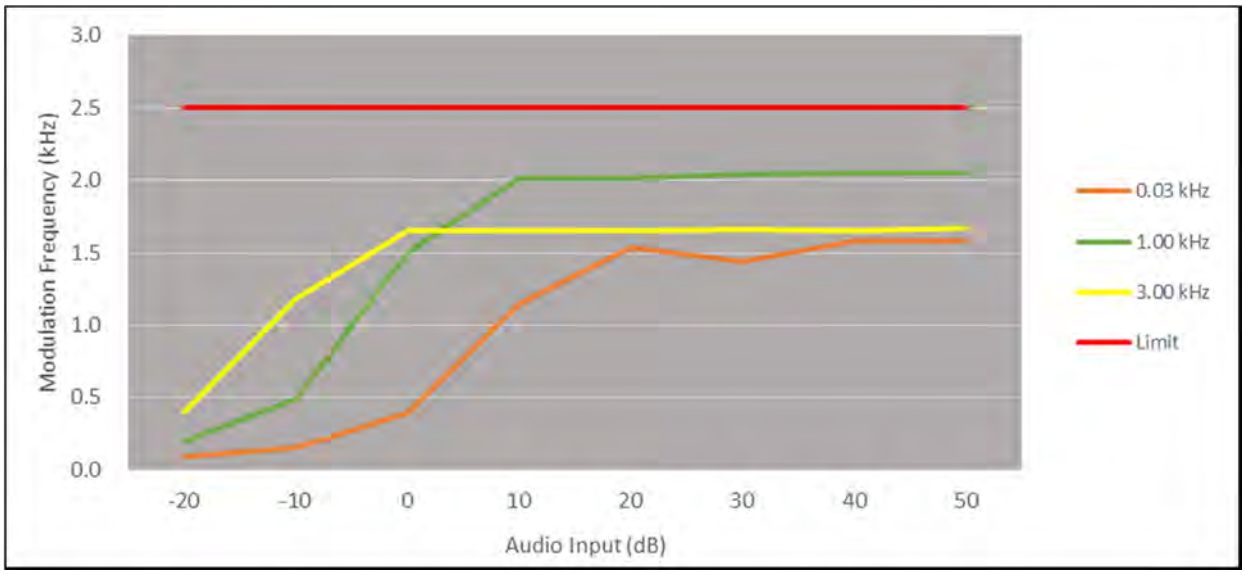
450.05 MHz



481.05 MHz

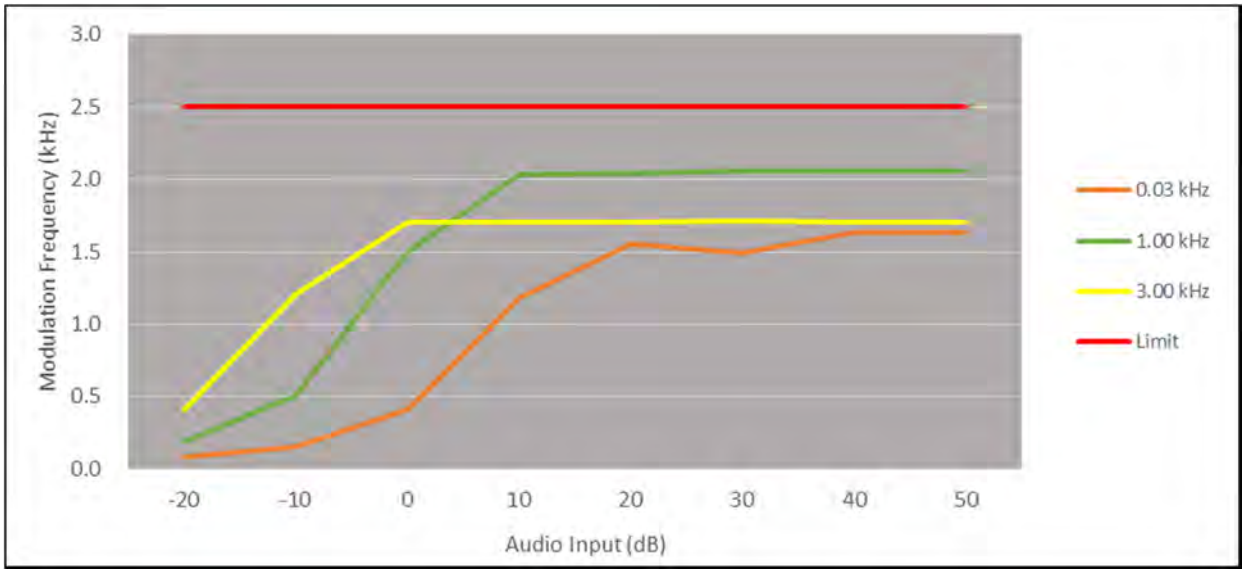


511.95 MHz

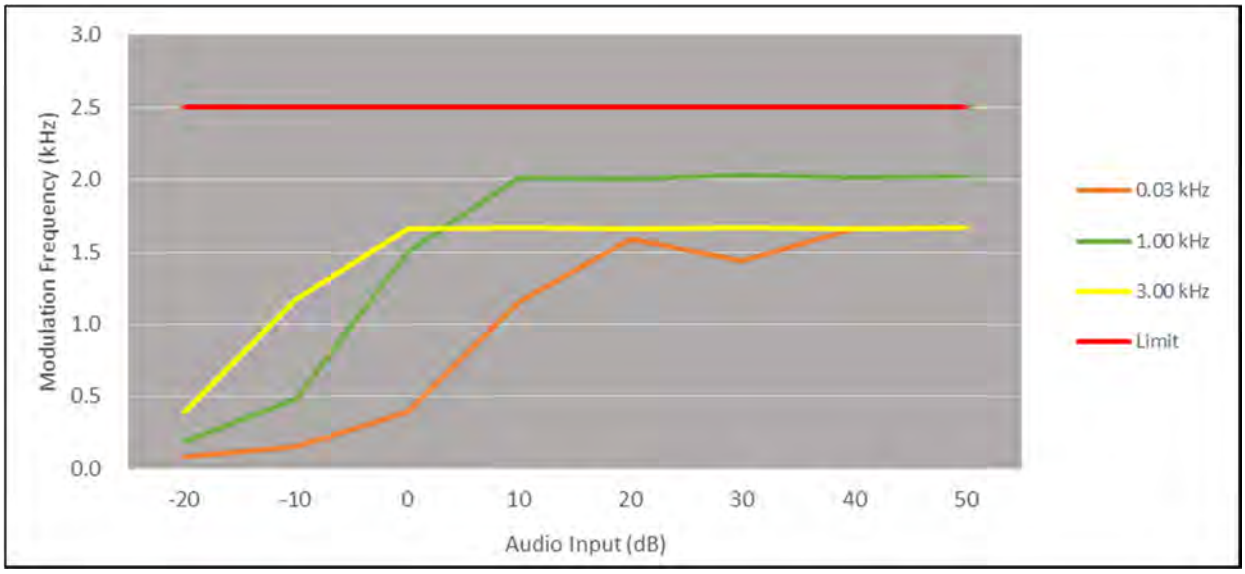

3.0
2.5
2.0
1.5
1.0
0.5
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input (dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

LOW POWER

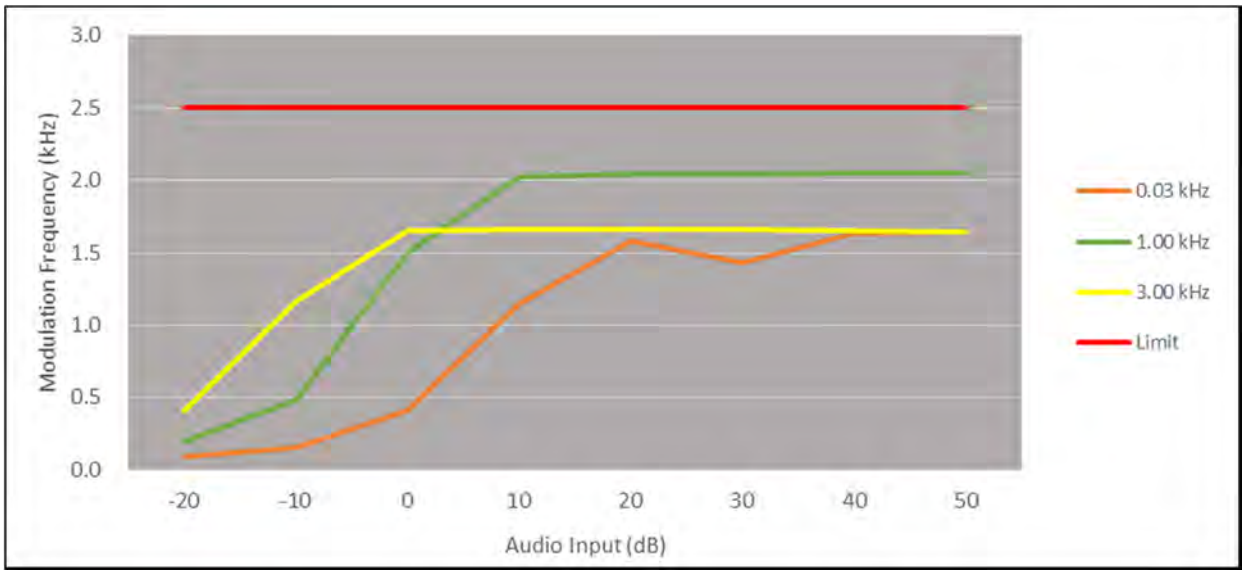
450.05 MHz



481.05 MHz



511.95 MHz

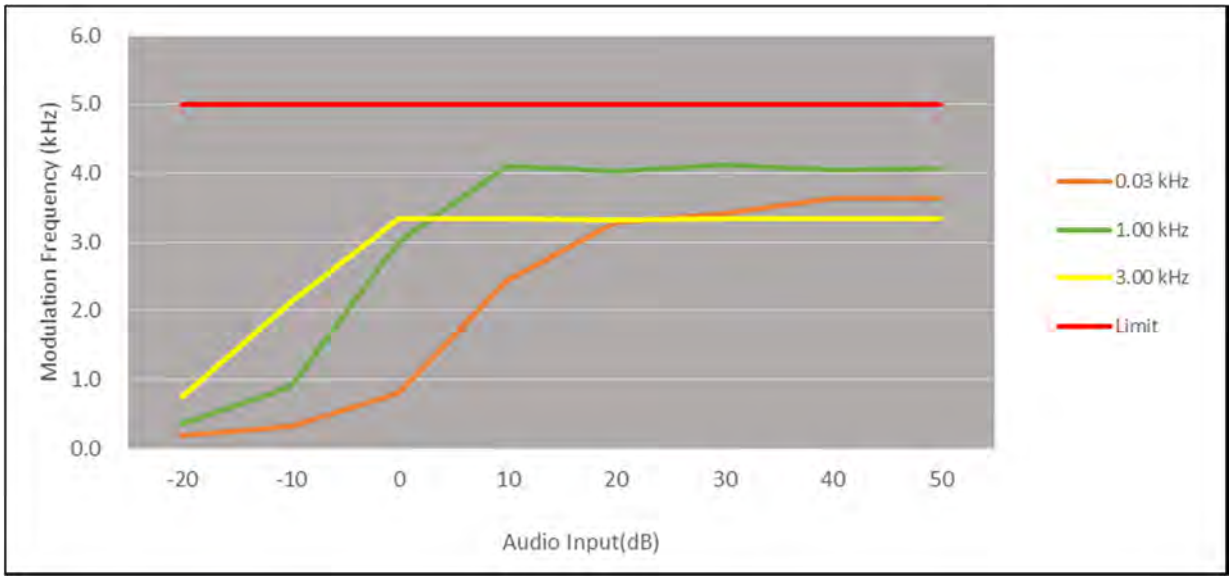

3.0
2.5
2.0
1.5
1.0
0.5
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input (dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

▣ TEST RESULTS(16K0F3E)_2W

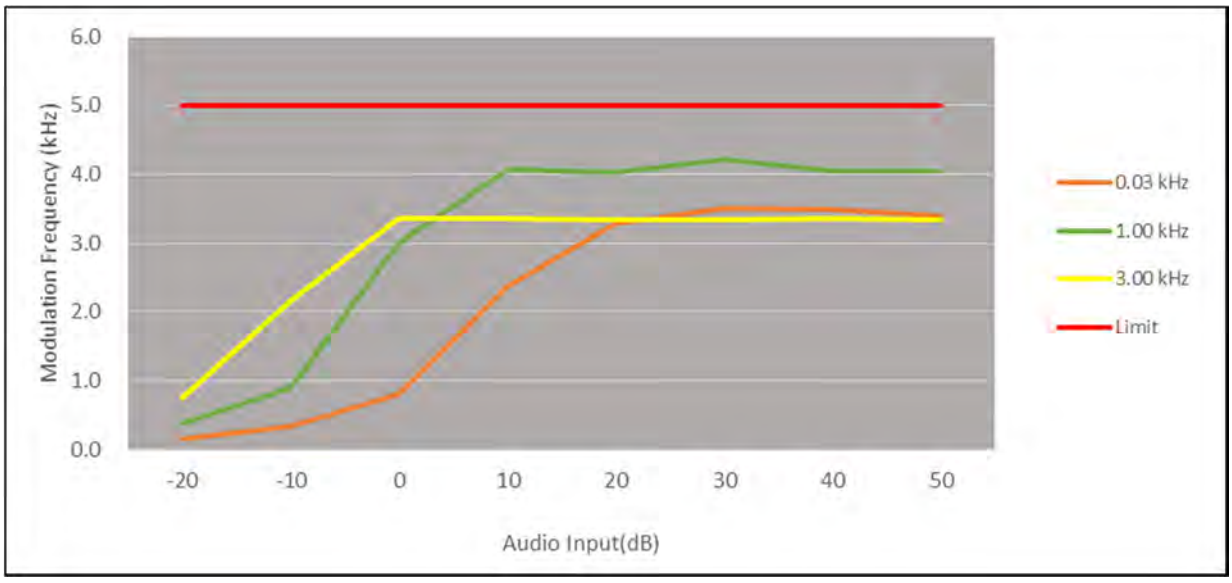
Positive Peaks

HIGH POWER

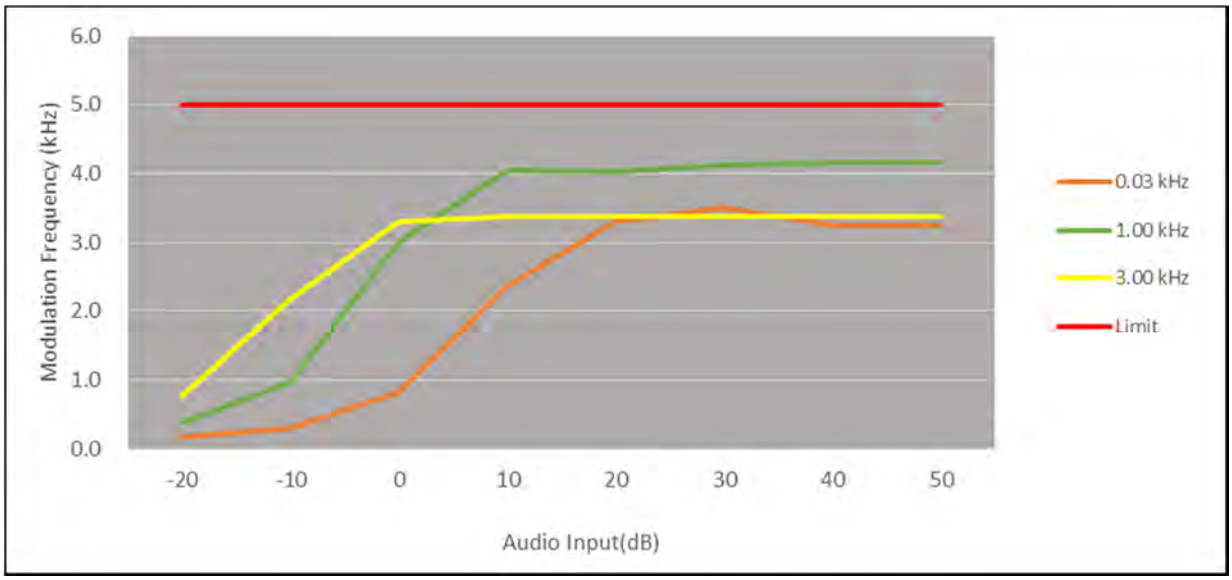
450.05 MHz



481.05 MHz

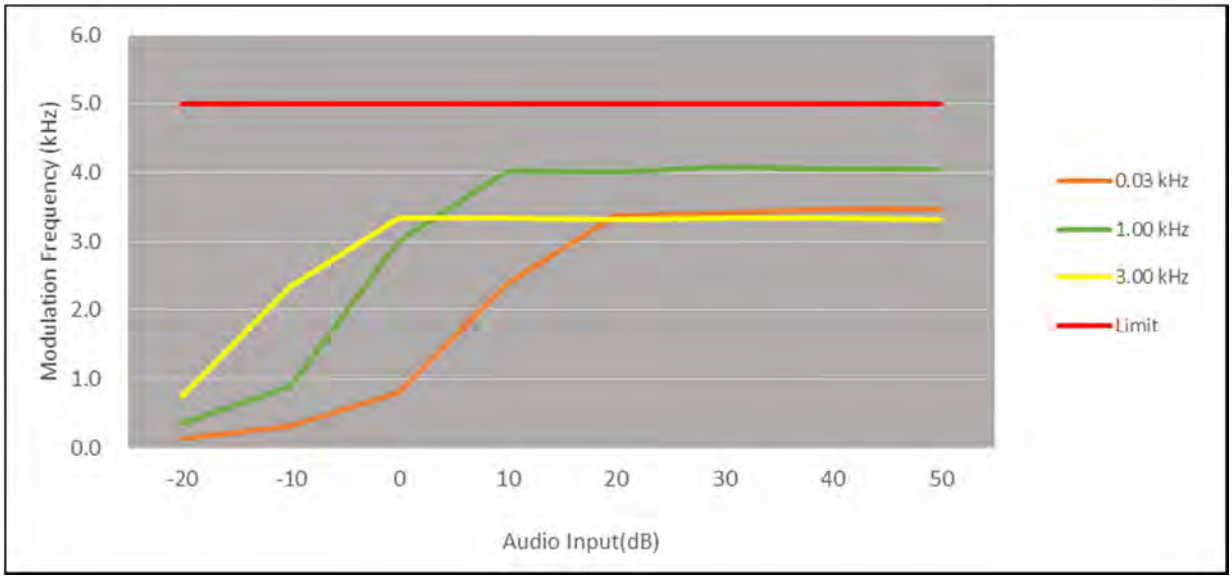


511.95 MHz

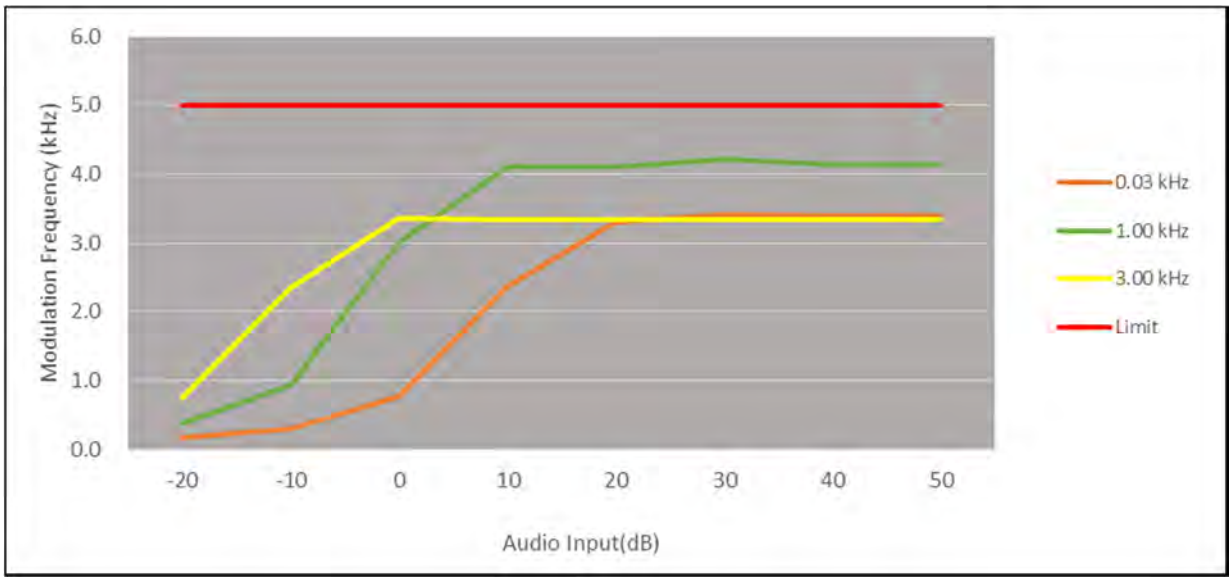

6.0
5.0
4.0
3.0
2.0
1.0
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input(dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

LOW POWER

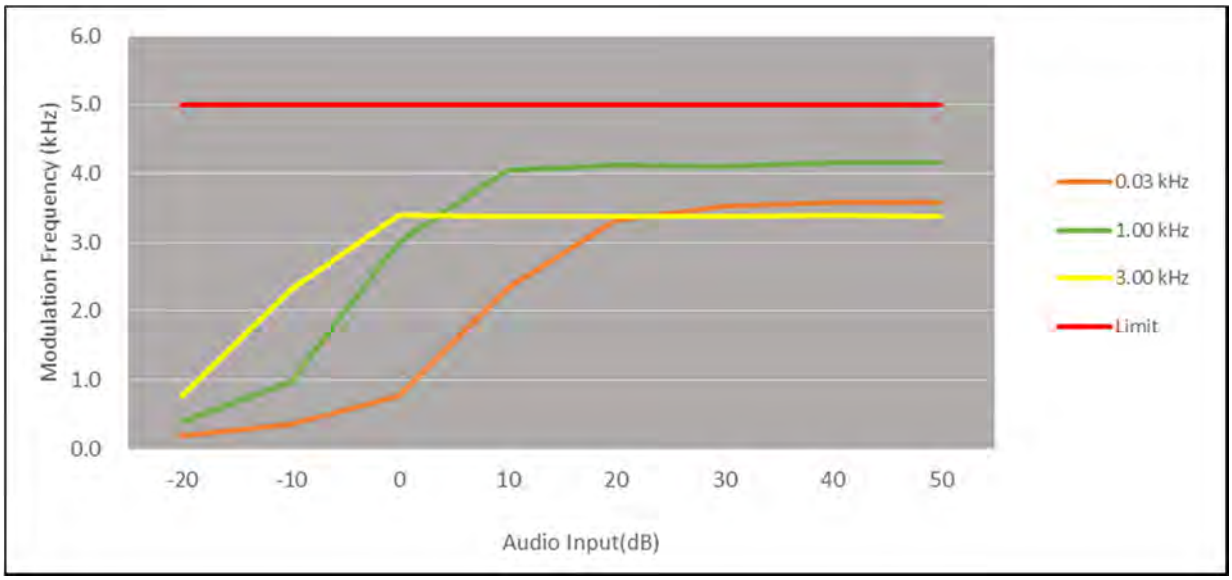
450.05 MHz



481.05 MHz



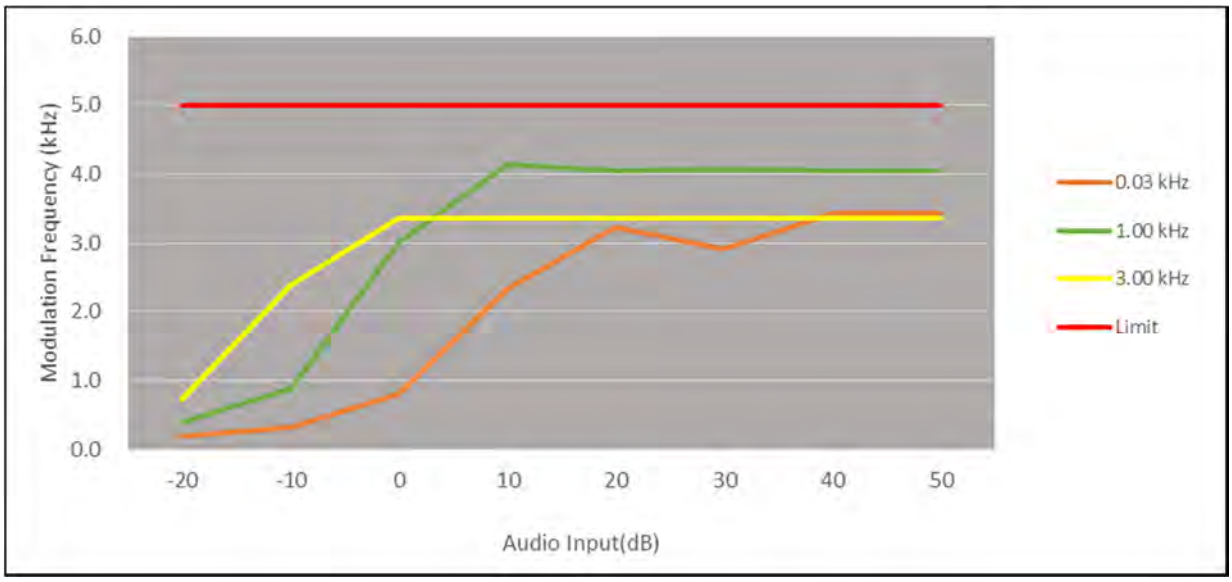
511.95 MHz


6.0
5.0
4.0
3.0
2.0
1.0
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input(dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

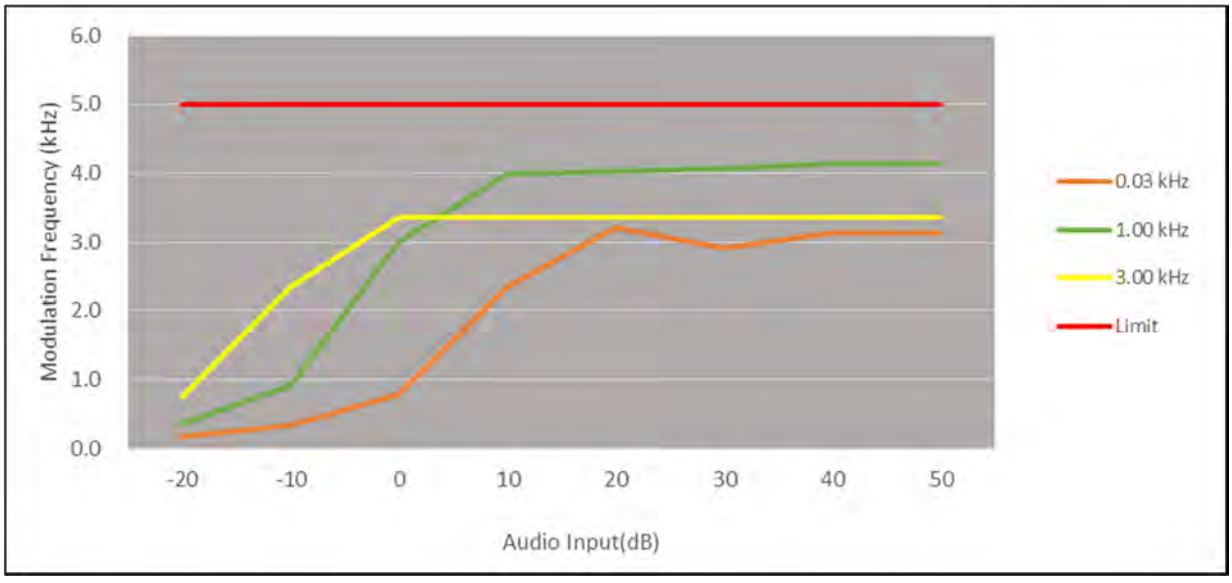
Negative Peaks

HIGH POWER

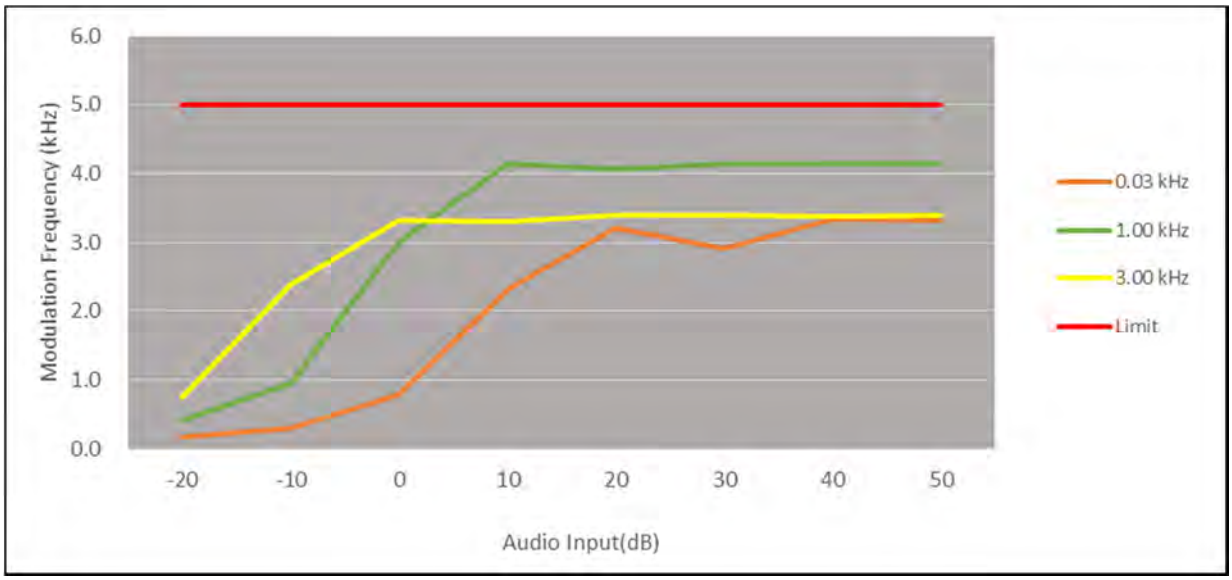
450.05 MHz



481.05 MHz

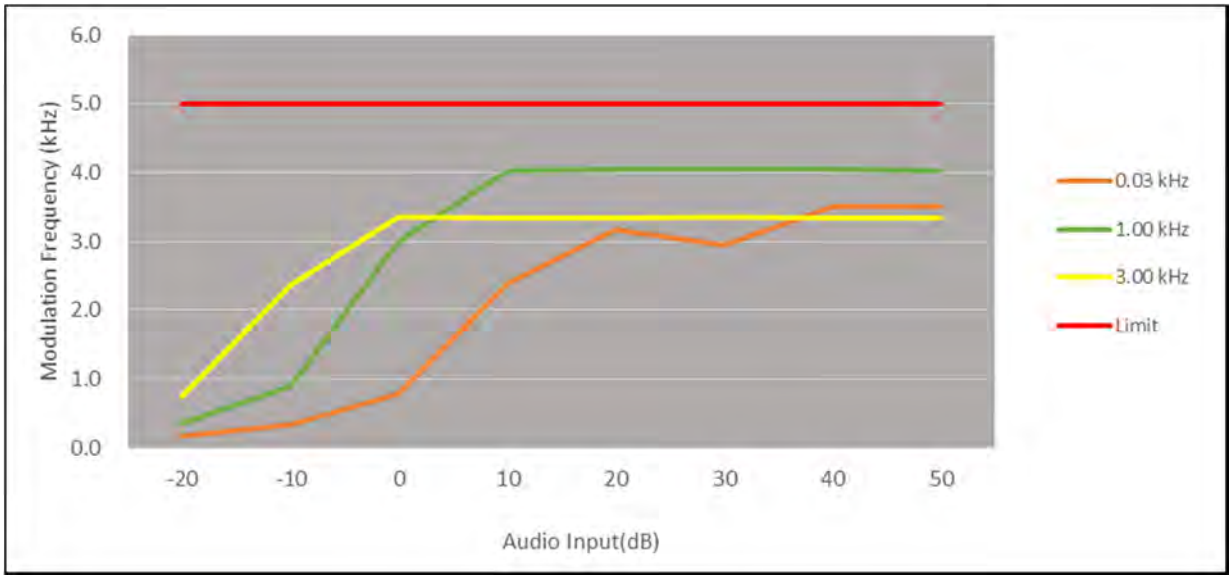


511.95 MHz

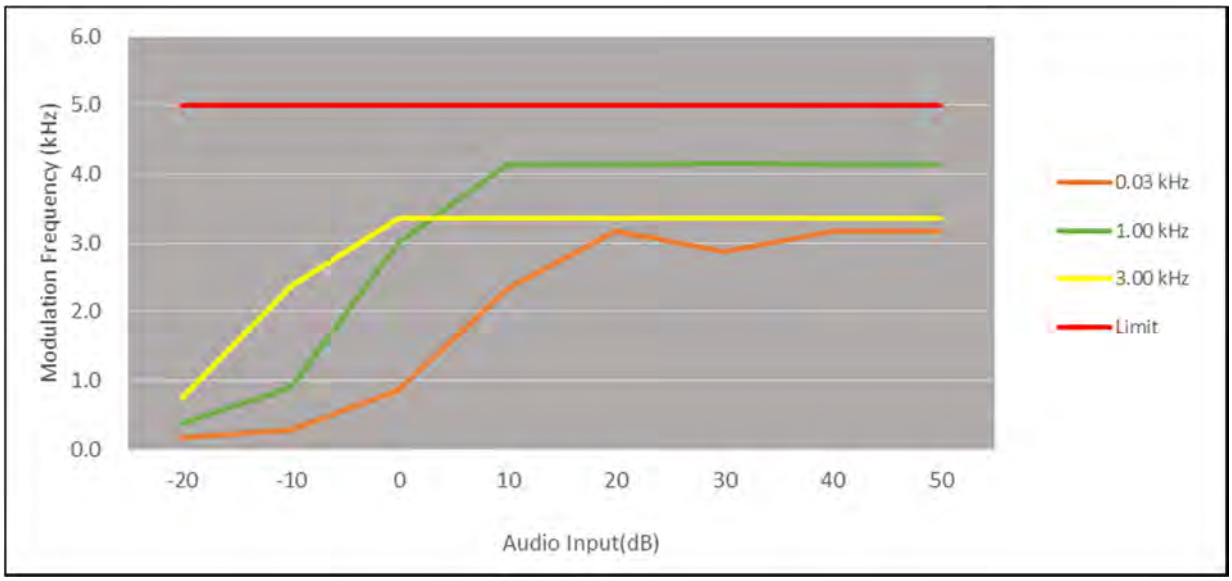

6.0
5.0
4.0
3.0
2.0
1.0
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input(dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

LOW POWER

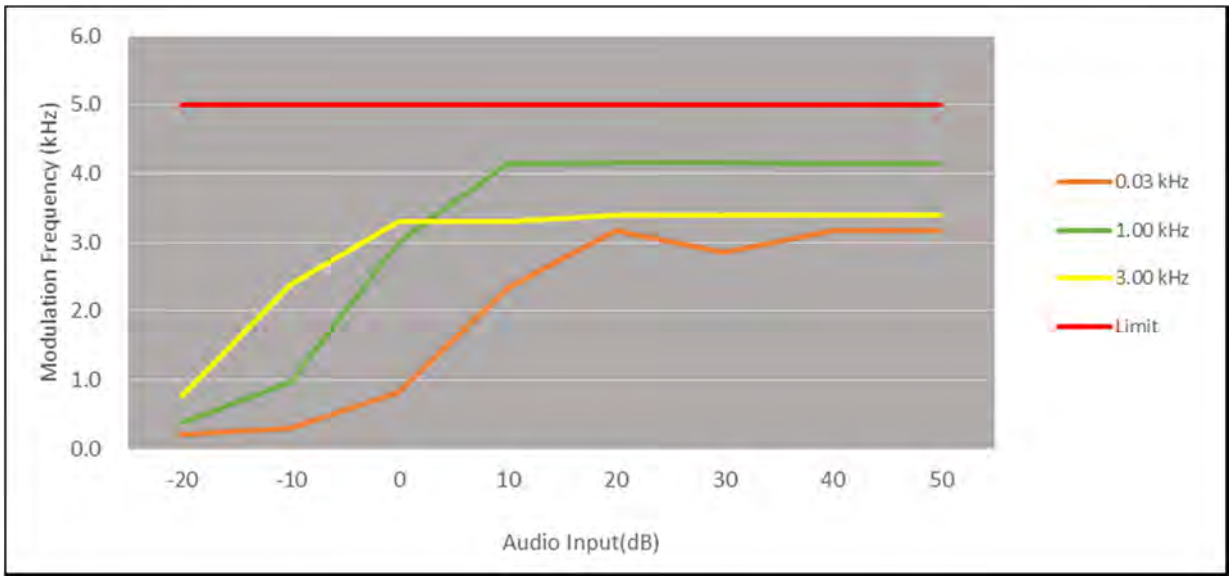
450.05 MHz



481.05 MHz



511.95 MHz

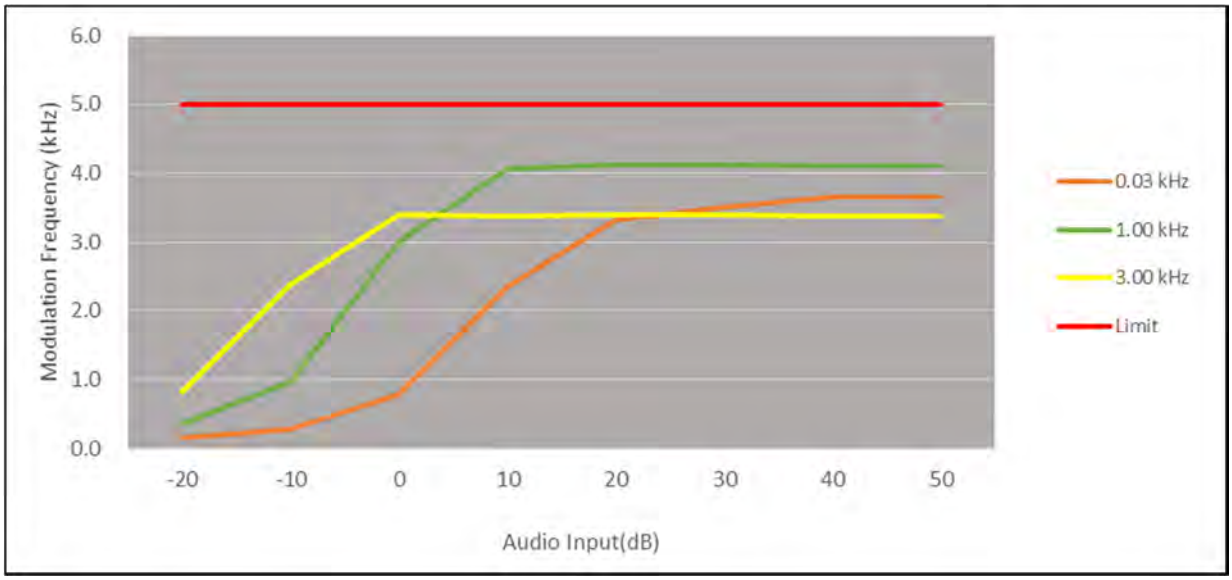

6.0
5.0
4.0
3.0
2.0
1.0
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input(dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

▣ TEST RESULTS(16K0F3E)_5W

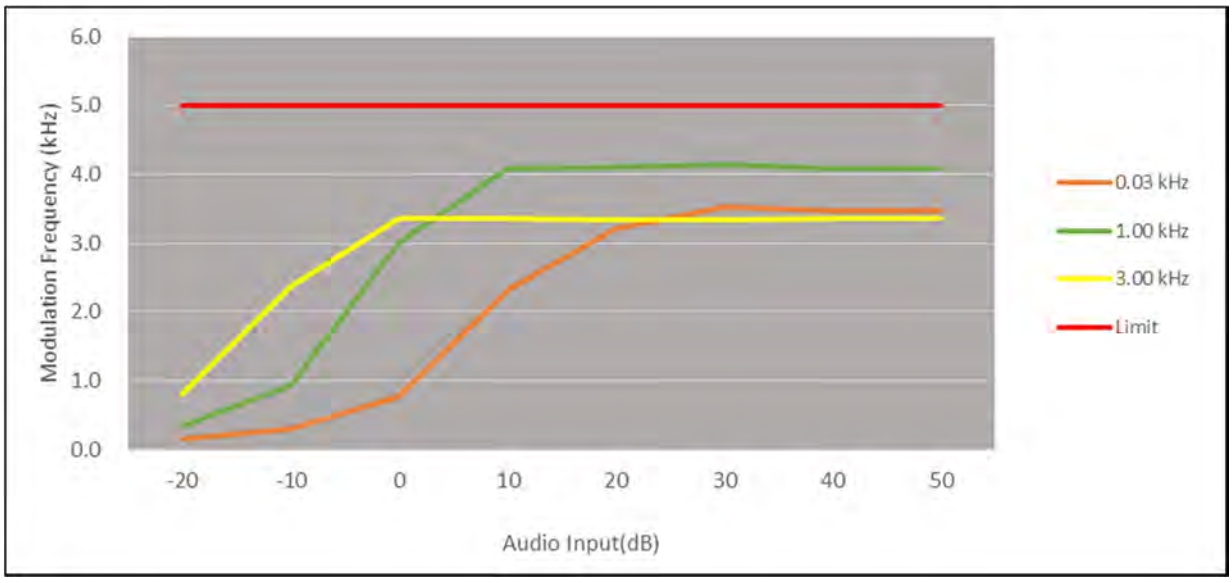
Positive Peaks

HIGH POWER

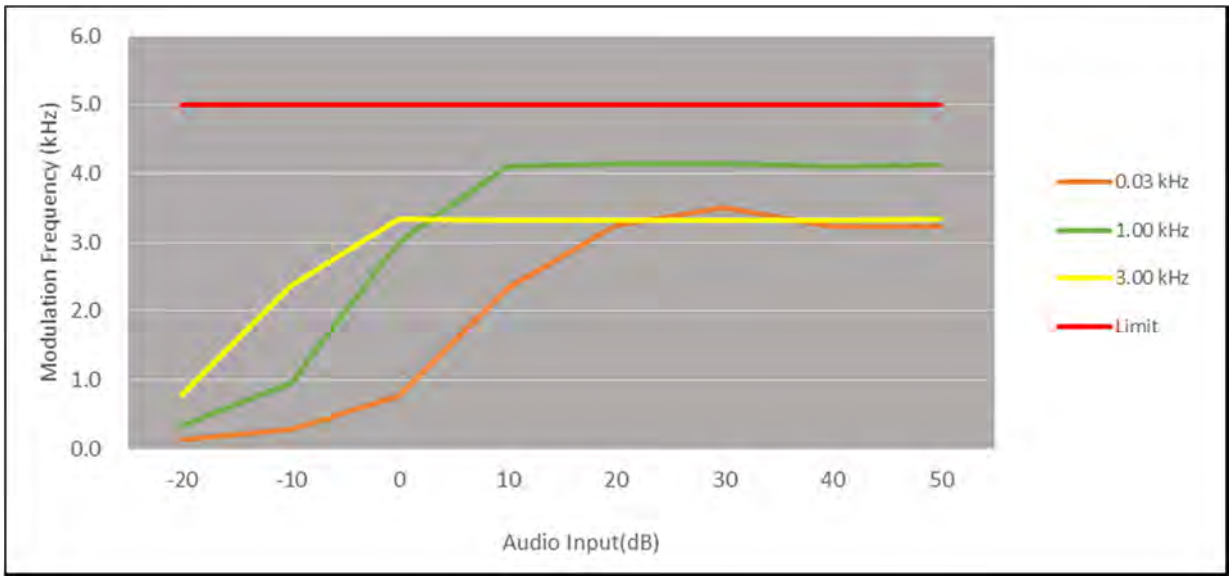
470.05 MHz



491.05 MHz

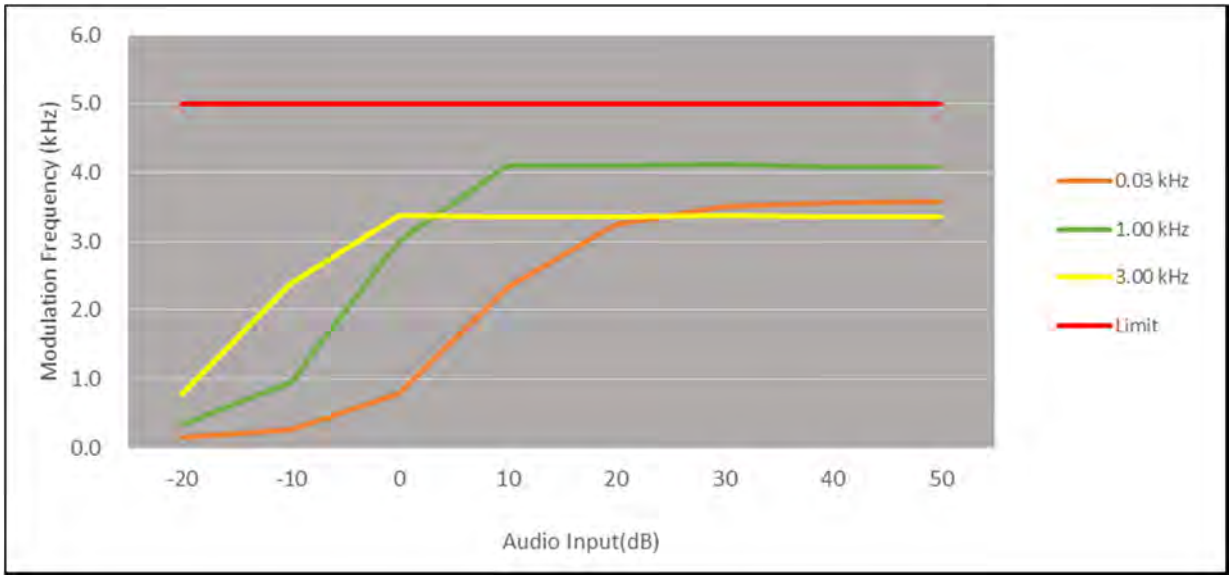


511.95 MHz

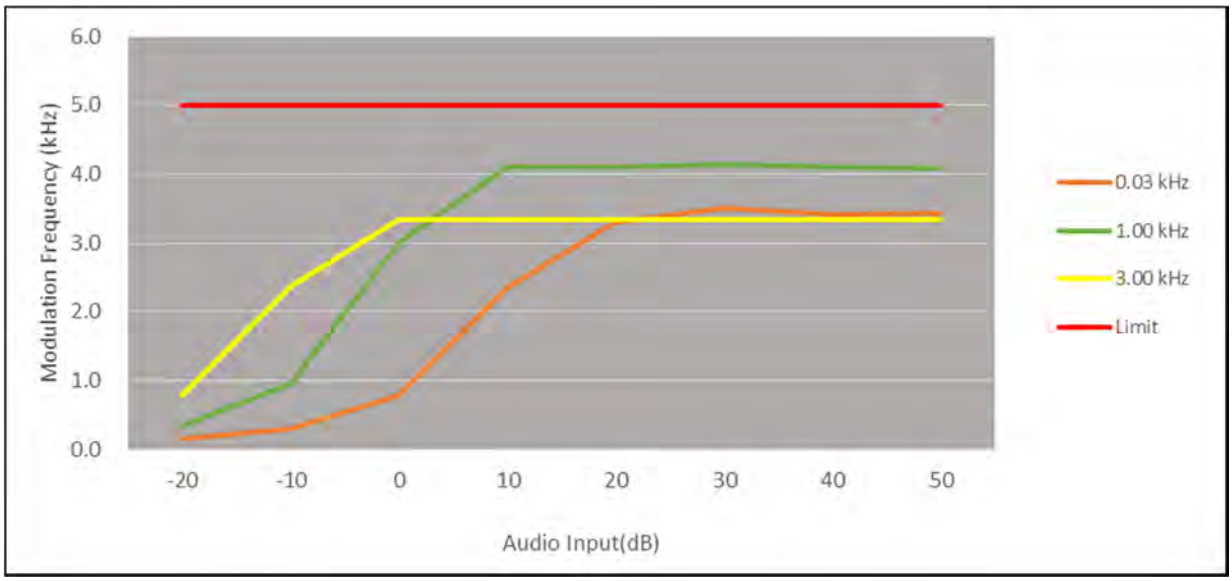

6.0
5.0
4.0
3.0
2.0
1.0
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input(dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

LOW POWER

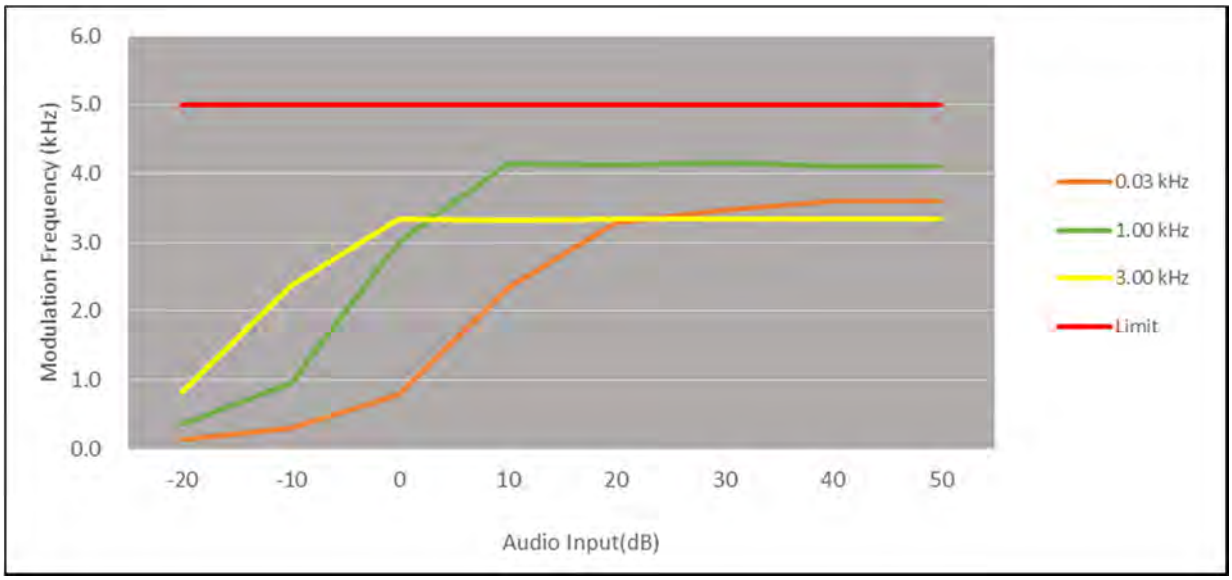
470.05 MHz



491.05 MHz



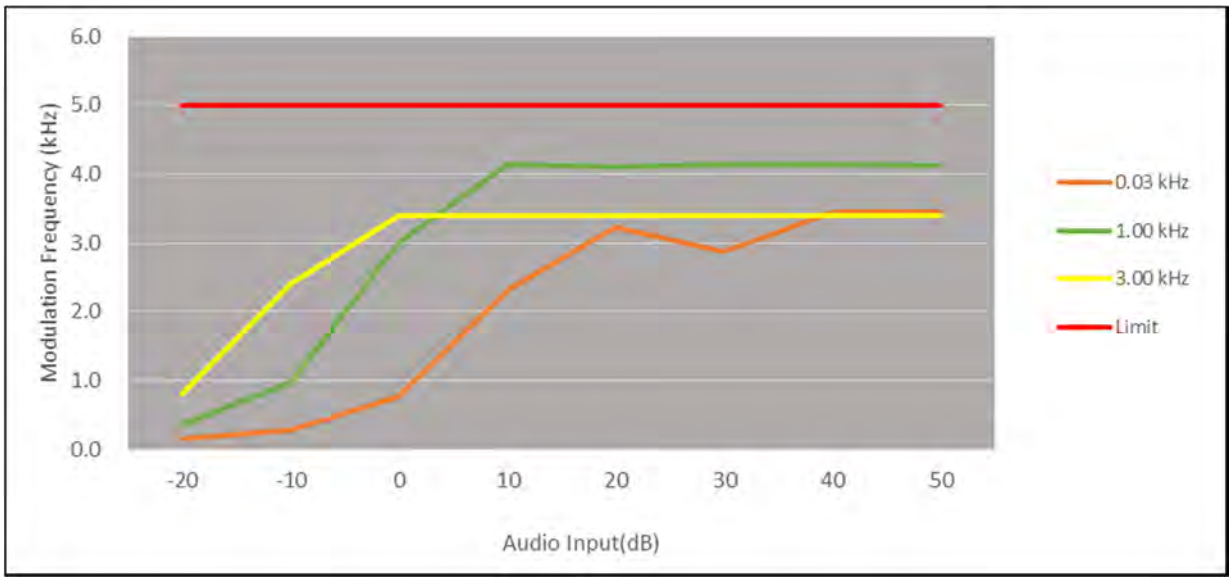
511.95 MHz


6.0
5.0
4.0
3.0
2.0
1.0
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input(dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

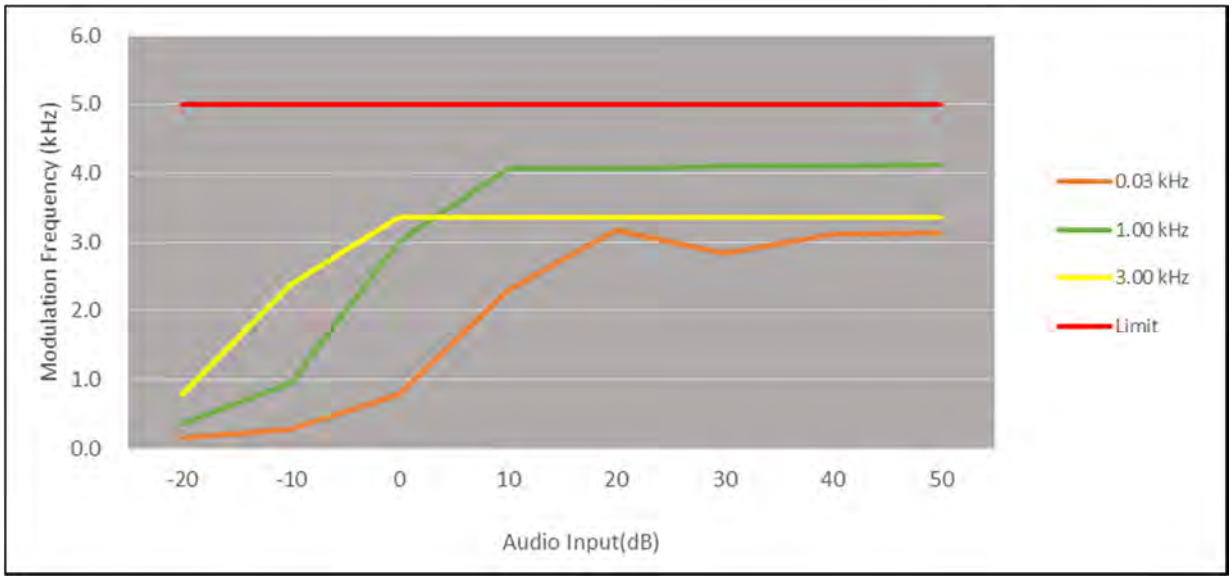
Negative Peaks

HIGH POWER

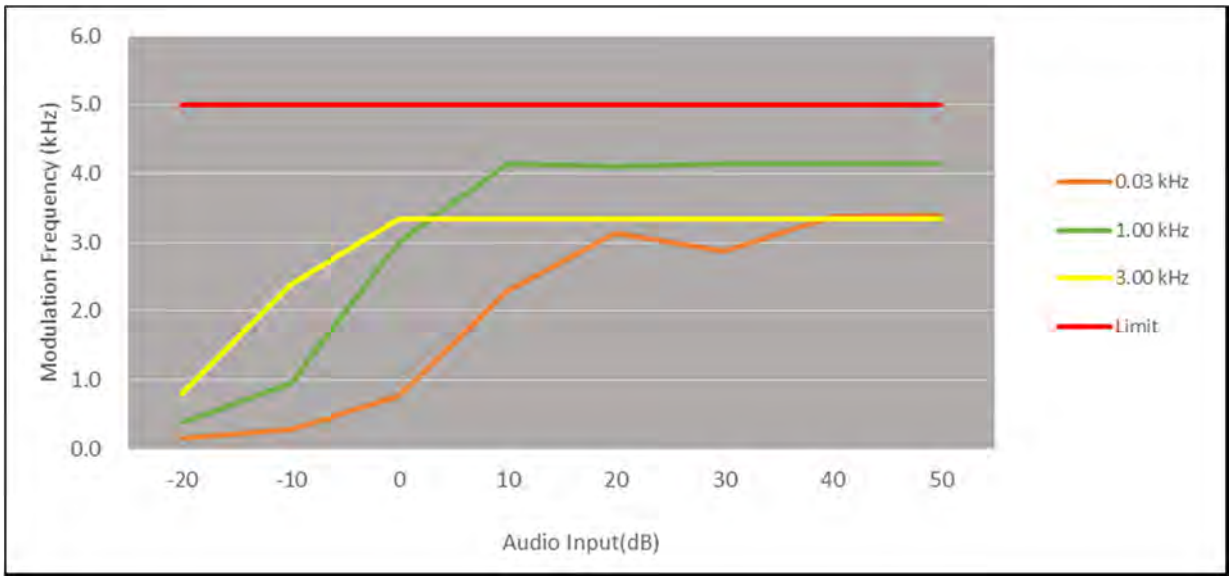
470.05 MHz



491.05 MHz

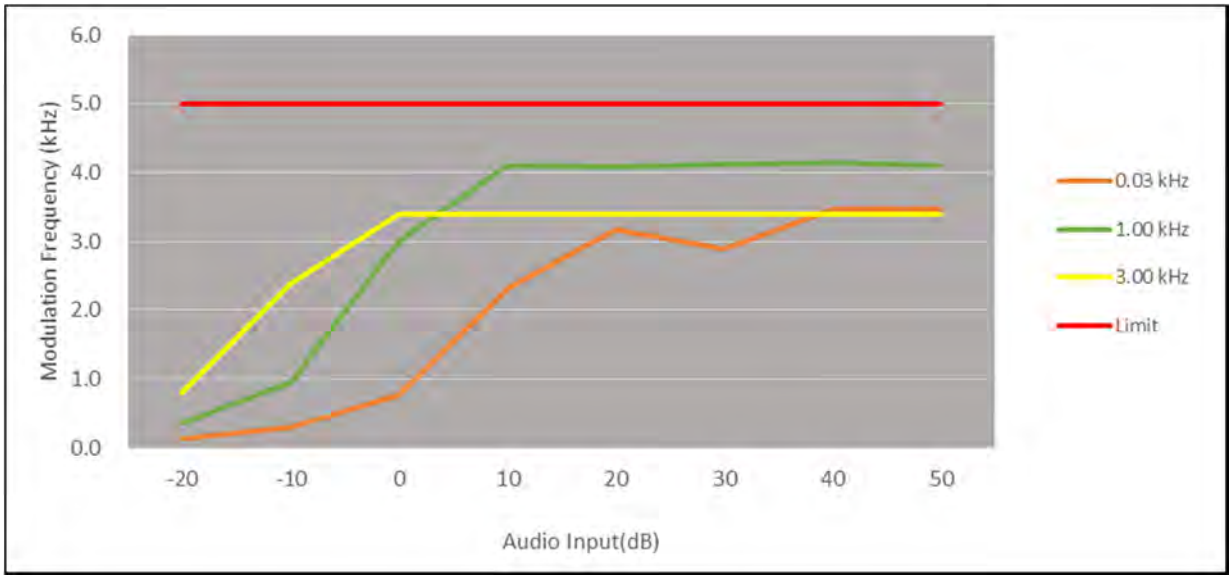


511.95 MHz

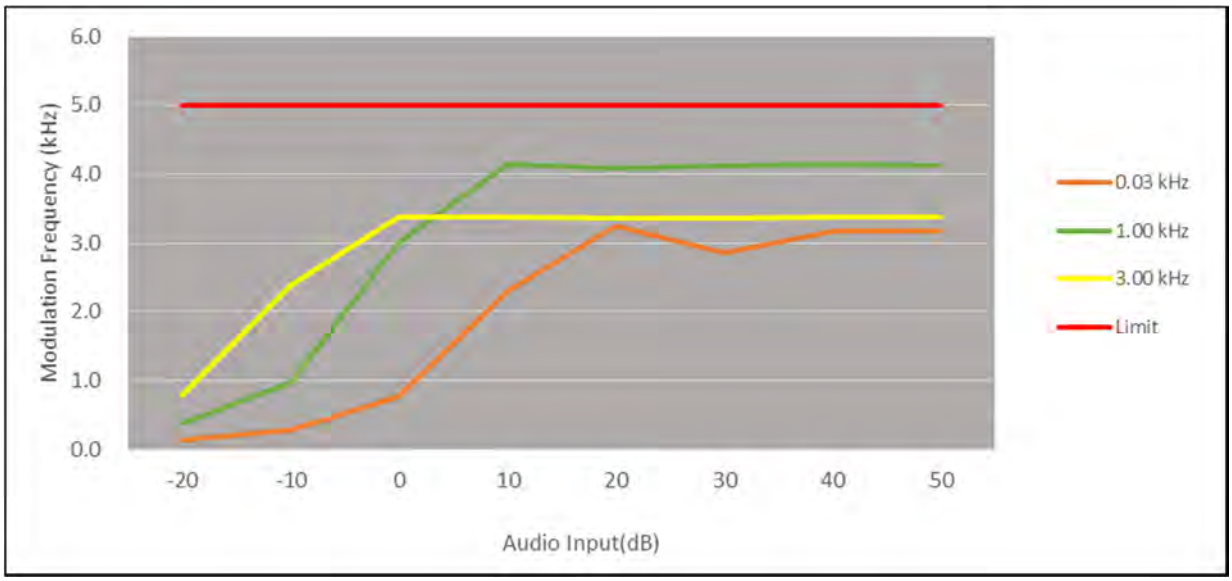

6.0
5.0
4.0
3.0
2.0
1.0
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input(dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

LOW POWER

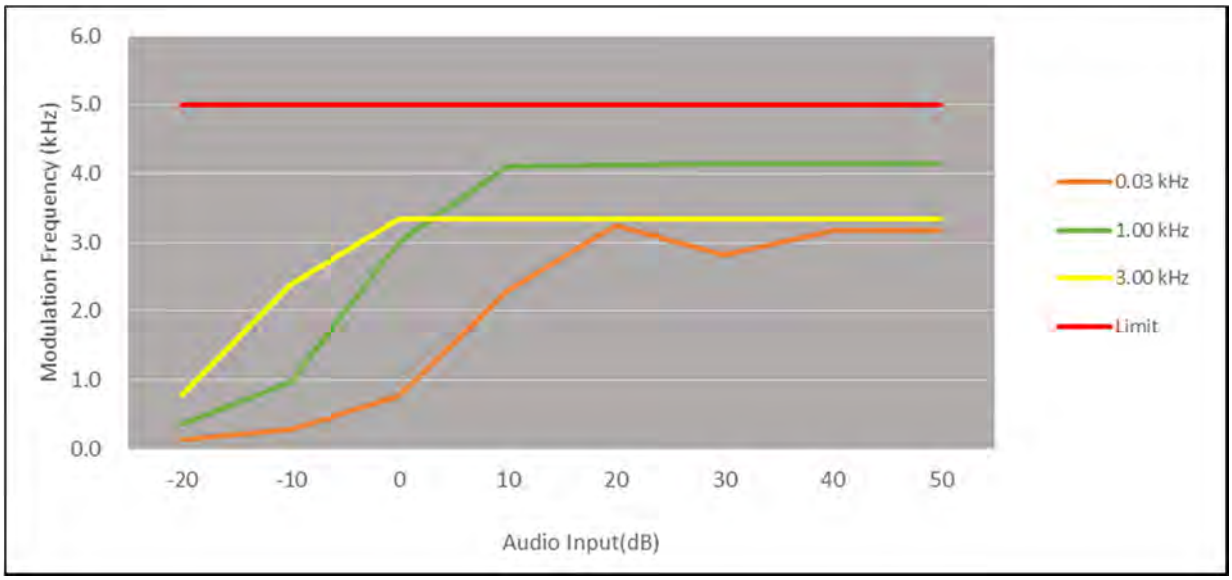
470.05 MHz



491.05 MHz



511.95 MHz

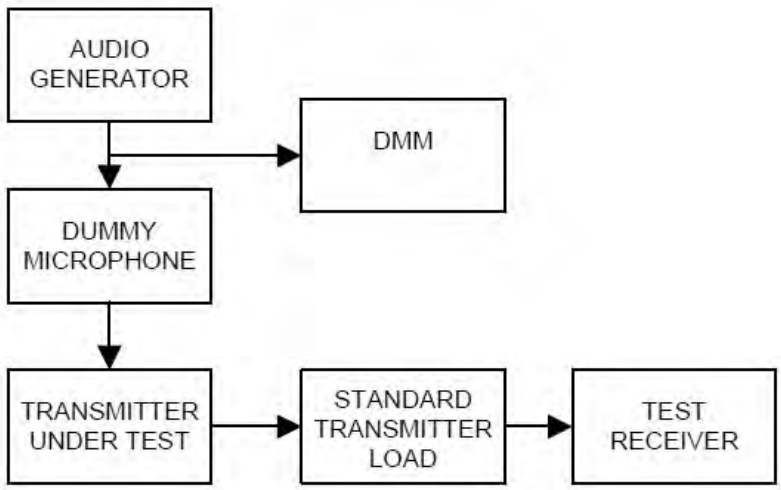

6.0
5.0
4.0
3.0
2.0
1.0
0.0
Modulation Frequency (kHz)
-20
-10
0
10
20
30
40
50
Audio Input(dB)
0.03 kHz
1.00 kHz
3.00 kHz
Limit

8.5 Audio Frequency Response / Audio Low Pass Filter Response

▣ Definition

The audio frequency response is the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

According to 2.2.6 in TIA-603-E Standard.

a) Connect the equipment as illustrated.

b) Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ≤ 50 Hz to ≥ 15,000 Hz. Turn the de-emphasis function off.

c) Set the DMM to measure rms voltage.

d) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.

e) Apply a 1000 Hz tone and adjust the audio frequency generator to produce 20% of the rated system deviation.

f) Set the test receiver to measure rms deviation and record the deviation reading.

g) Record the DMM reading as $V_{REF.}$

h) Set the audio frequency generator to the desired test frequency between 300 Hz and 3000 Hz.

i) Vary the audio frequency generator output level until the deviation reading that was recorded in step f) is obtained.

j) Record the DMM reading as $V_{FREQ.}$

k) Calculate the audio frequency response at the present frequency as:
audio frequency response = $20 * \log_{10}(V_{FREQ}/V_{REF})$

l) Repeat steps h) through k) for all the desired test frequencies.

Note

Audio Filter of the above result is substituted with the same structure as Audio Frequency Response.

On the transmission condition below 3kHz, Transceiver shows pre-emphasis condition of transmission function.

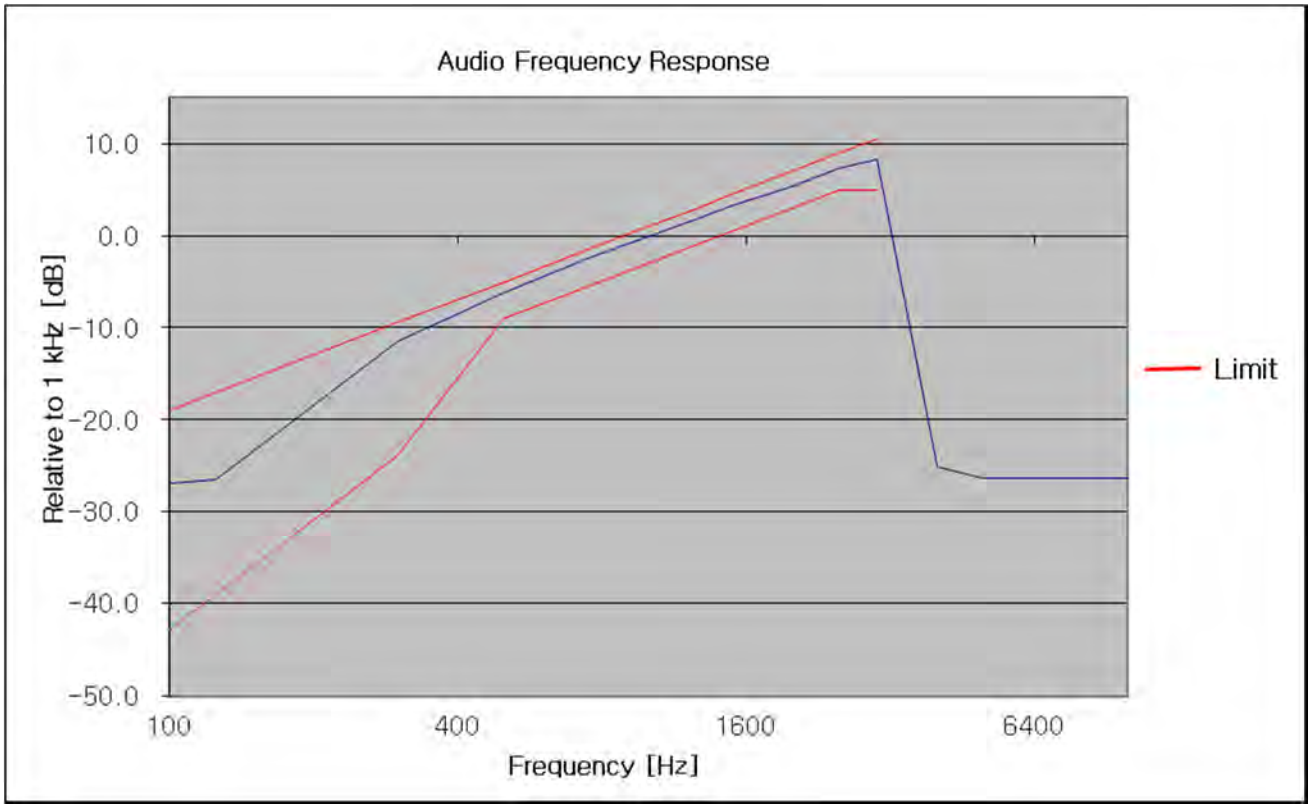
On the transmission condition above 3kHz, Transceiver shows Audio Low Pass Filter.

▣ TEST RESULTS (11K0F3E)_5W

HIGH POWER

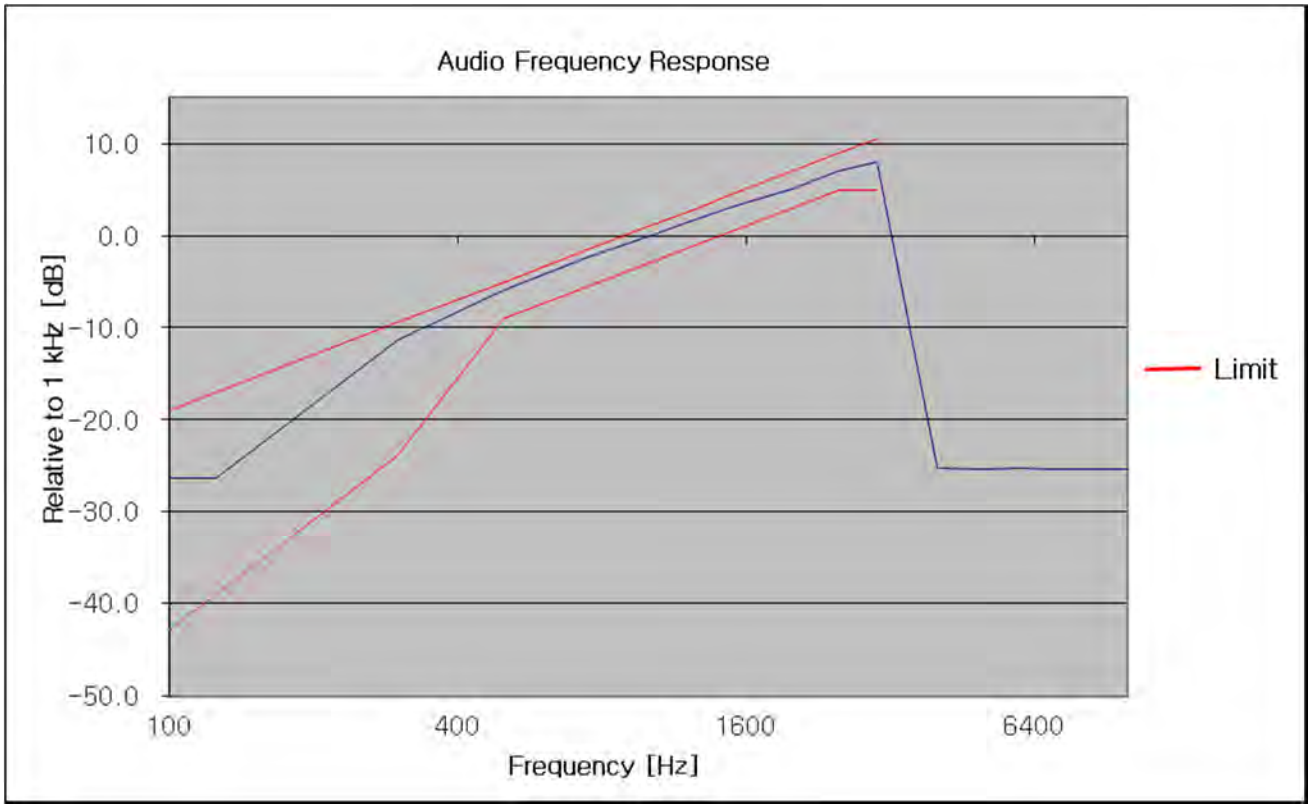
450.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-26.88	-18.93	-42.86
125	-26.52	-17.00	-39.00
300	-11.53	-9.42	-23.84
500	-6.11	-5.00	-9.00
750	-2.42	-1.49	-5.49
1000	0.00	1.00	-3.00
1250	1.81	2.93	-1.07
1500	3.23	4.51	0.51
2000	5.33	7.00	3.00
2500	7.28	8.93	4.93
3000	8.35	10.51	4.93
4000	-25.11	-	-
5000	-26.31	-	-
6000	-26.28	-	-
7000	-26.35	-	-
8000	-26.29	-	-
9000	-26.29	-	-
10000	-26.34	-	-
20000	-26.37	-	-
30000	-26.35	-	-
40000	-26.28	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

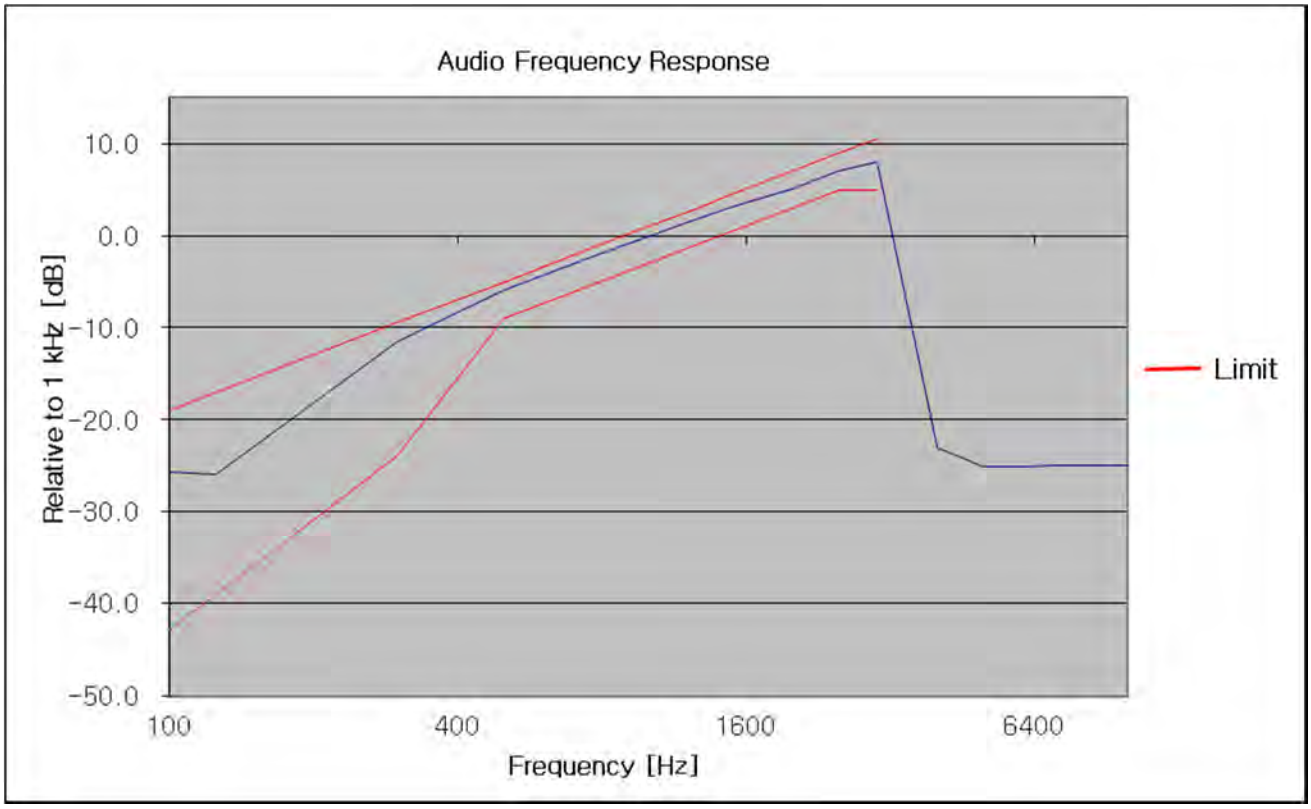
481.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-26.35	-18.93	-42.86
125	-26.30	-17.00	-39.00
300	-11.34	-9.42	-23.84
500	-5.88	-5.00	-9.00
750	-2.31	-1.49	-5.49
1000	0.00	1.00	-3.00
1250	1.76	2.93	-1.07
1500	3.12	4.51	0.51
2000	5.14	7.00	3.00
2500	7.06	8.93	4.93
3000	8.07	10.51	4.93
4000	-25.29	-	-
5000	-25.38	-	-
6000	-25.25	-	-
7000	-25.35	-	-
8000	-25.41	-	-
9000	-25.37	-	-
10000	-25.40	-	-
20000	-25.35	-	-
30000	-25.33	-	-
40000	-25.37	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

511.95 MHz

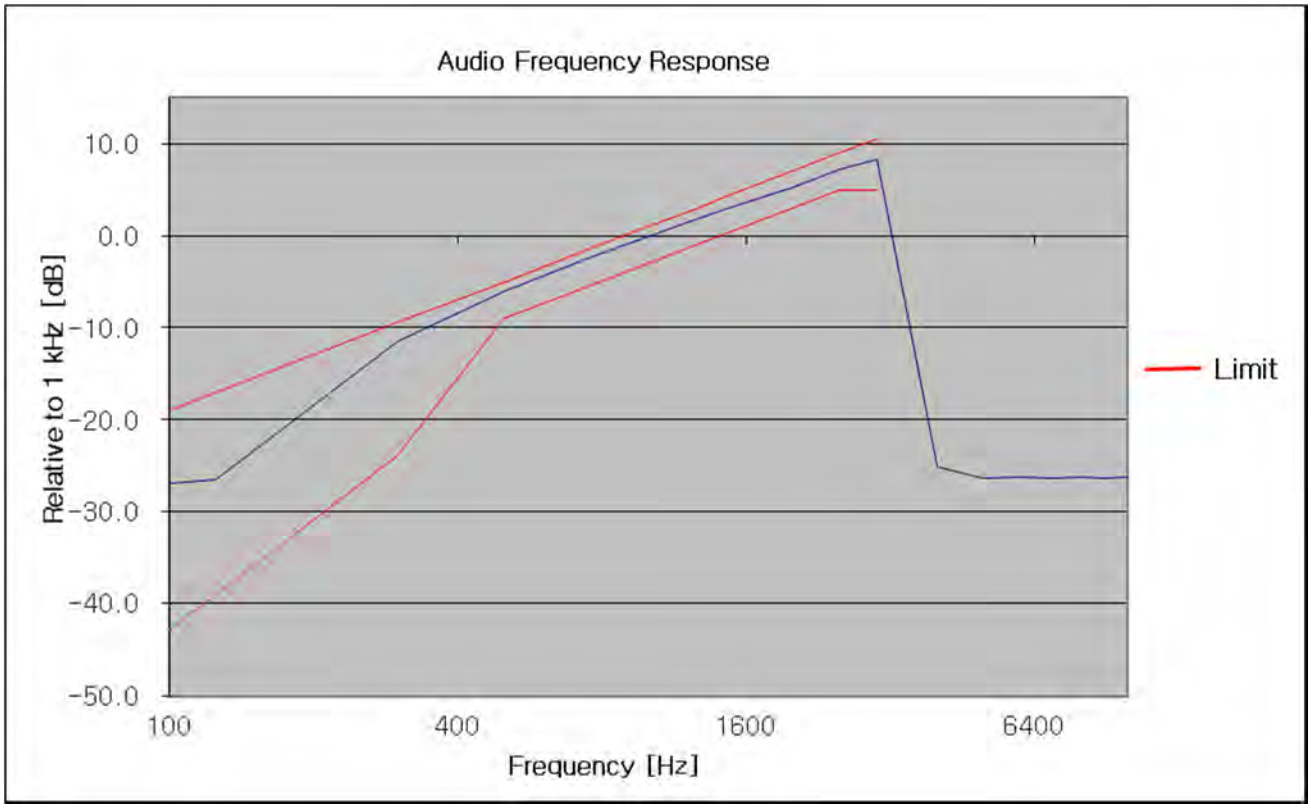
Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-25.70	-18.93	-42.86
125	-25.86	-17.00	-39.00
300	-11.49	-9.42	-23.84
500	-5.94	-5.00	-9.00
750	-2.38	-1.49	-5.49
1000	0.00	1.00	-3.00
1250	1.74	2.93	-1.07
1500	3.14	4.51	0.51
2000	5.10	7.00	3.00
2500	7.02	8.93	4.93
3000	8.00	10.51	4.93
4000	-23.06	-	-
5000	-25.03	-	-
6000	-25.08	-	-
7000	-24.91	-	-
8000	-24.96	-	-
9000	-24.90	-	-
10000	-24.96	-	-
20000	-25.02	-	-
30000	-24.96	-	-
40000	-25.03	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

LOW POWER

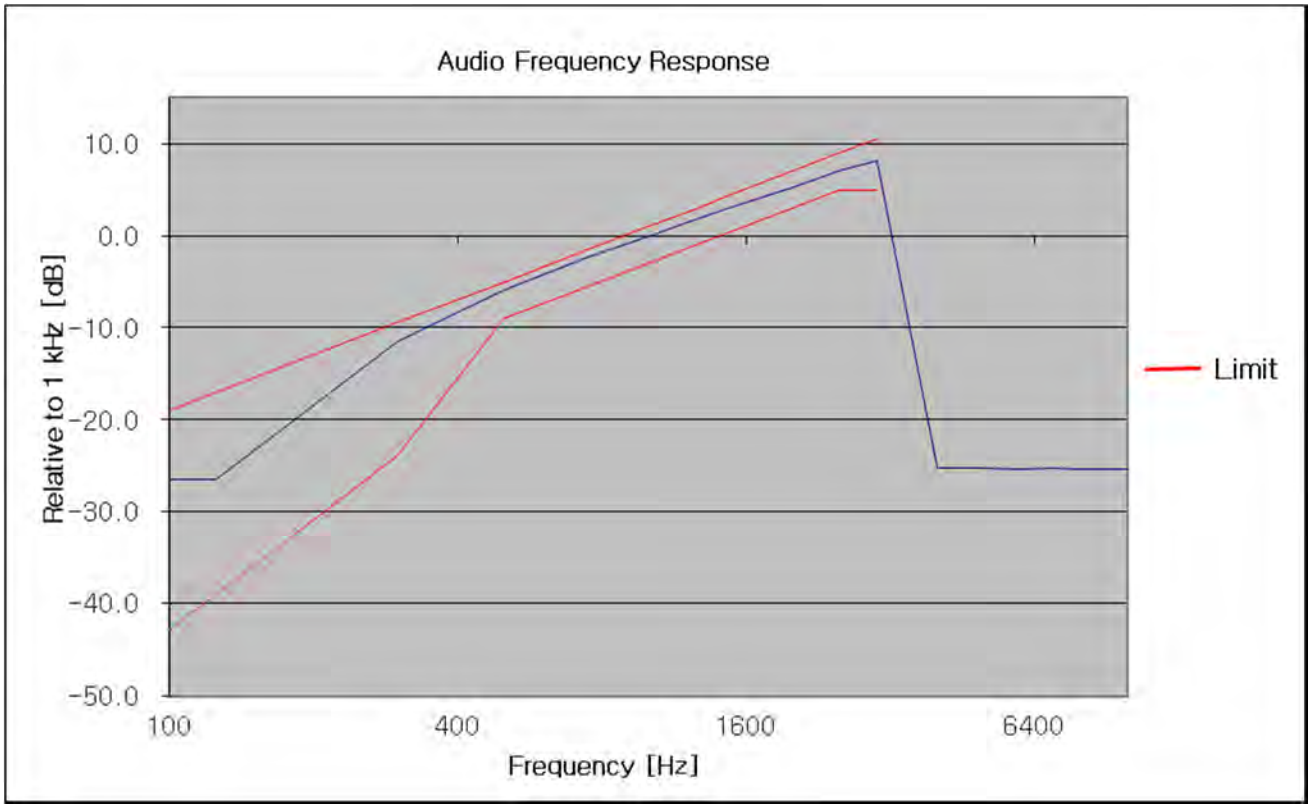
450.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-26.90	-18.93	-42.86
125	-26.48	-17.00	-39.00
300	-11.48	-9.42	-23.84
500	-6.03	-5.00	-9.00
750	-2.35	-1.49	-5.49
1000	0.00	1.00	-3.00
1250	1.81	2.93	-1.07
1500	3.20	4.51	0.51
2000	5.25	7.00	3.00
2500	7.22	8.93	4.93
3000	8.24	10.51	4.93
4000	-25.07	-	-
5000	-26.29	-	-
6000	-26.20	-	-
7000	-26.33	-	-
8000	-26.26	-	-
9000	-26.28	-	-
10000	-26.24	-	-
20000	-26.34	-	-
30000	-26.20	-	-
40000	-26.34	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

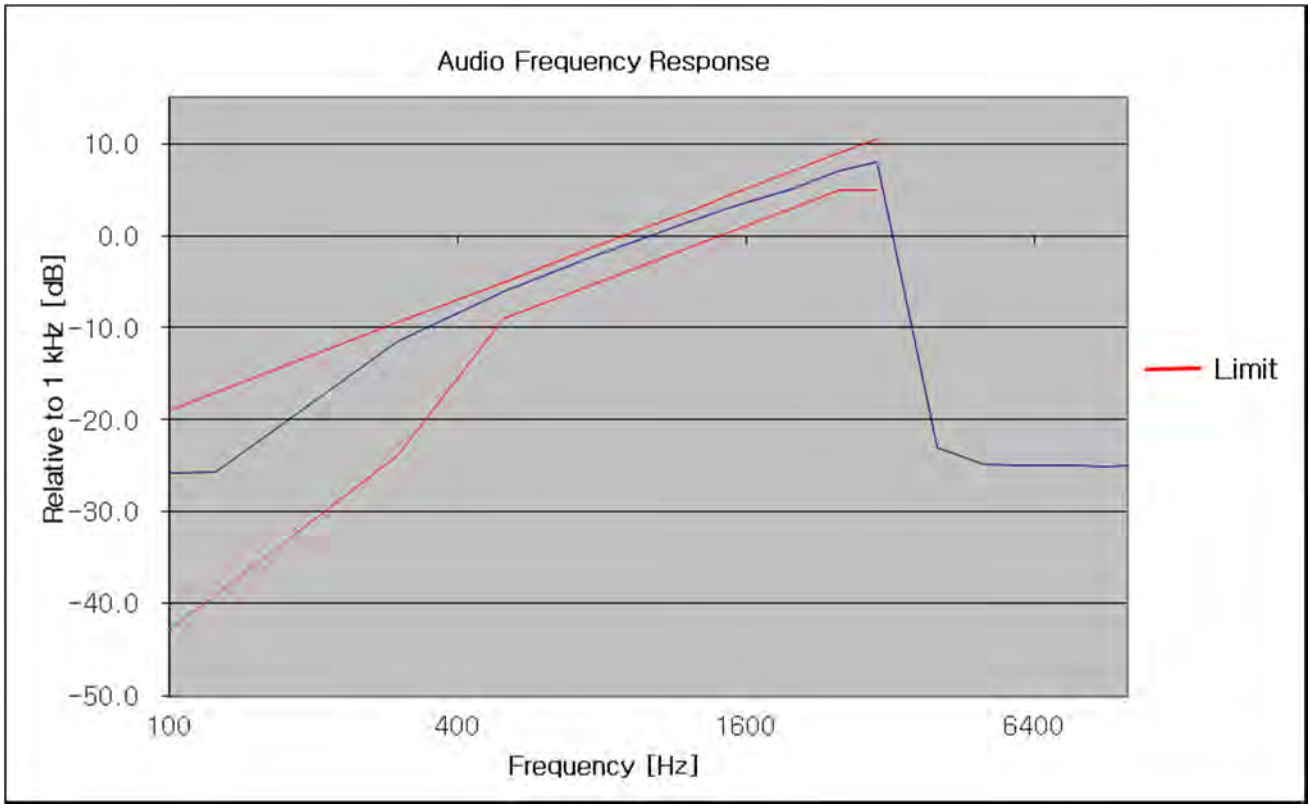
481.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-26.47	-18.93	-42.86
125	-26.47	-17.00	-39.00
300	-11.44	-9.42	-23.84
500	-5.95	-5.00	-9.00
750	-2.31	-1.49	-5.49
1000	0.00	1.00	-3.00
1250	1.74	2.93	-1.07
1500	3.16	4.51	0.51
2000	5.17	7.00	3.00
2500	7.10	8.93	4.93
3000	8.11	10.51	4.93
4000	-25.22	-	-
5000	-25.26	-	-
6000	-25.32	-	-
7000	-25.22	-	-
8000	-25.34	-	-
9000	-25.37	-	-
10000	-25.36	-	-
20000	-25.29	-	-
30000	-25.28	-	-
40000	-25.34	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

511.95 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-25.76	-18.93	-42.86
125	-25.70	-17.00	-39.00
300	-11.51	-9.42	-23.84
500	-6.00	-5.00	-9.00
750	-2.37	-1.49	-5.49
1000	0.00	1.00	-3.00
1250	1.72	2.93	-1.07
1500	3.14	4.51	0.51
2000	5.09	7.00	3.00
2500	7.00	8.93	4.93
3000	7.99	10.51	4.93
4000	-23.06	-	-
5000	-24.88	-	-
6000	-24.96	-	-
7000	-24.93	-	-
8000	-24.91	-	-
9000	-25.04	-	-
10000	-24.93	-	-
20000	-24.94	-	-
30000	-24.97	-	-
40000	-25.02	-	-

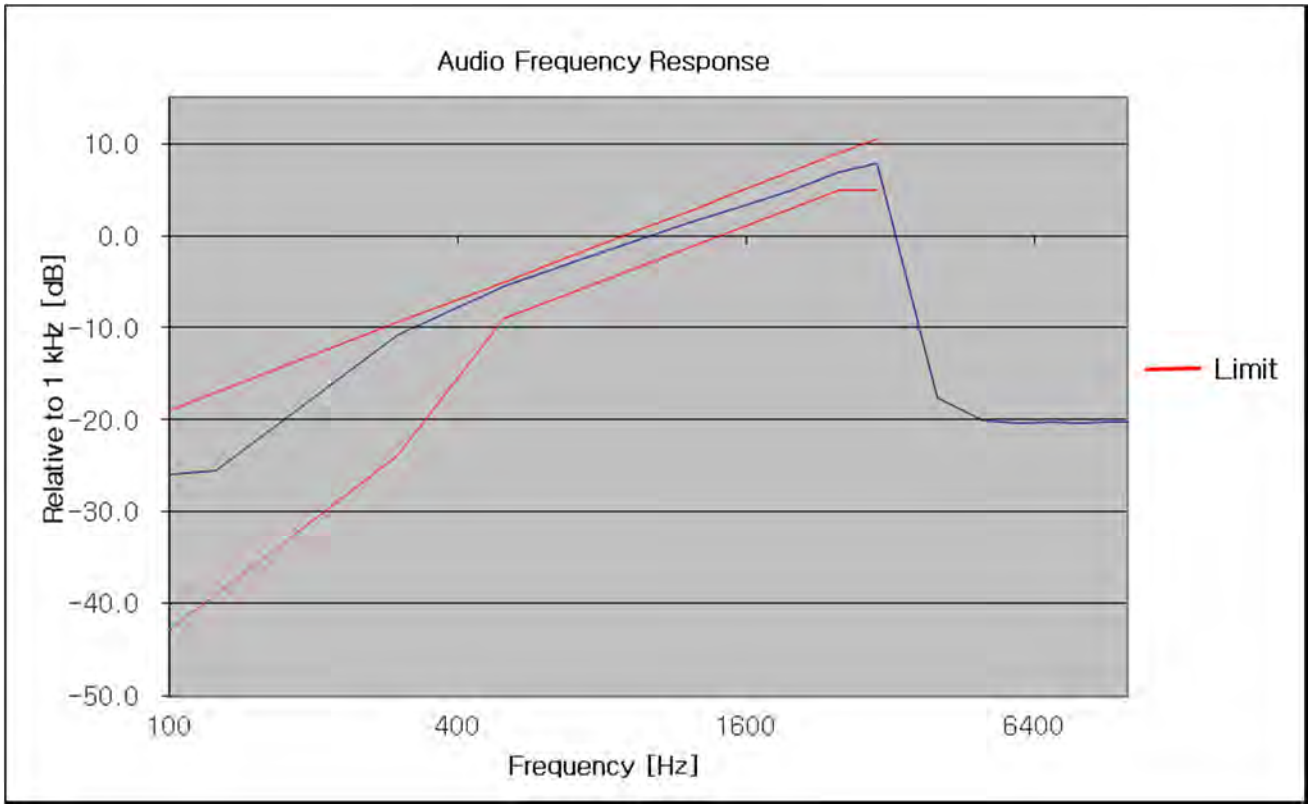

Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

▣ TEST RESULTS (16K0F3E)_2W

HIGH POWER

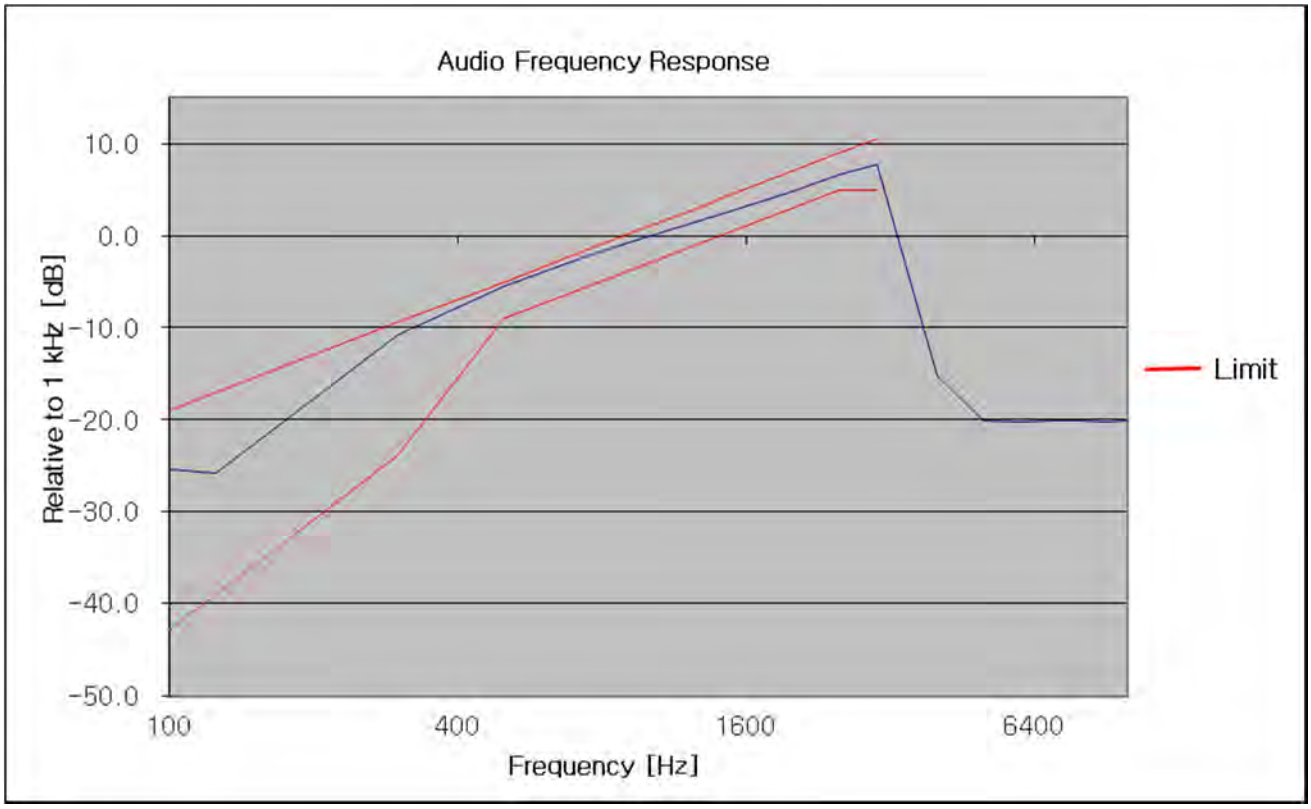
450.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-25.92	-18.93	-42.86
125	-25.55	-17.00	-39.00
300	-10.72	-9.42	-23.84
500	-5.42	-5.00	-9.00
750	-2.33	-1.49	-5.49
1000	0.00	1.00	-3.00
1250	1.63	2.93	-1.07
1500	2.92	4.51	0.51
2000	4.91	7.00	3.00
2500	6.93	8.93	4.93
3000	7.91	10.51	4.93
4000	-17.65	-	-
5000	-20.11	-	-
6000	-20.32	-	-
7000	-20.25	-	-
8000	-20.31	-	-
9000	-20.23	-	-
10000	-20.22	-	-
20000	-20.23	-	-
30000	-20.21	-	-
40000	-20.25	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

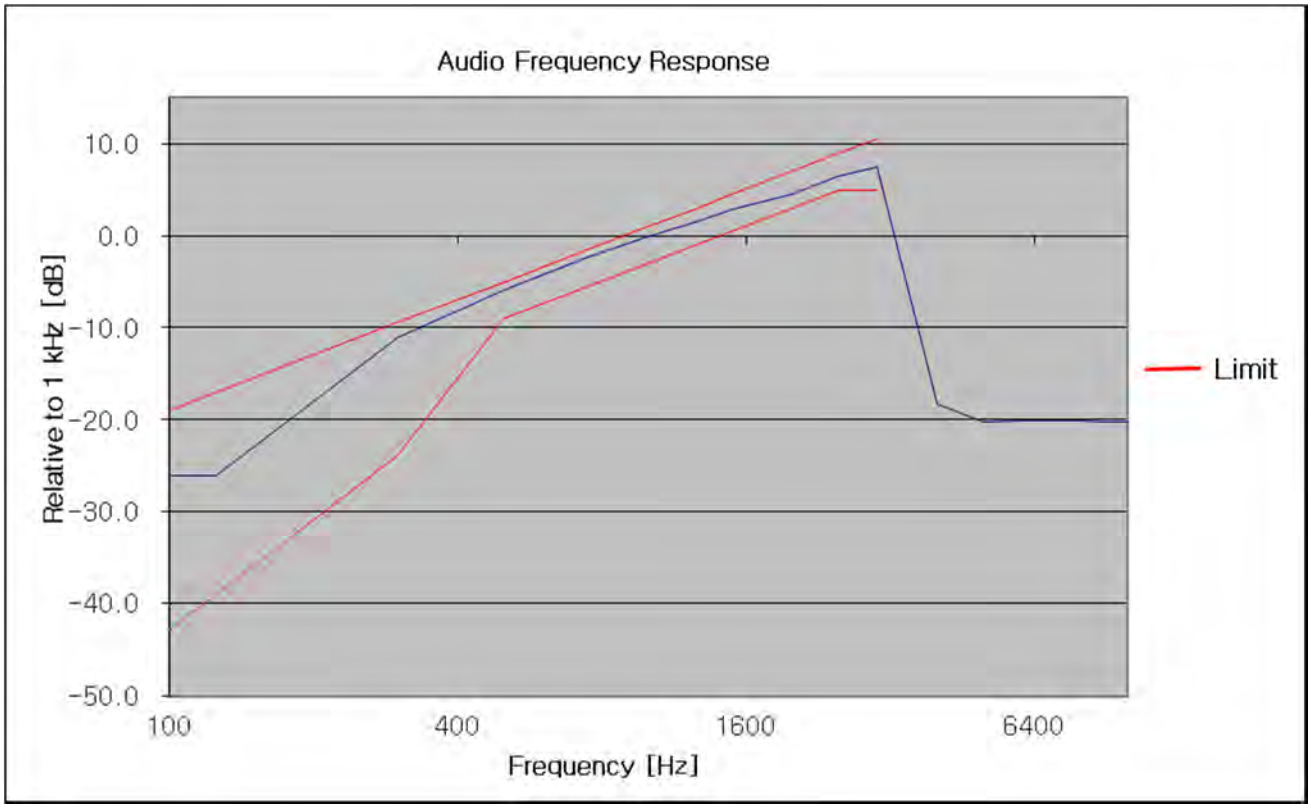
481.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-25.41	-18.93	-42.86
125	-25.73	-17.00	-39.00
300	-10.76	-9.42	-23.84
500	-5.51	-5.00	-9.00
750	-2.10	-1.49	-5.49
1000	0.00	1.00	-3.00
1250	1.48	2.93	-1.07
1500	2.77	4.51	0.51
2000	4.75	7.00	3.00
2500	6.65	8.93	4.93
3000	7.67	10.51	4.93
4000	-15.22	-	-
5000	-20.13	-	-
6000	-20.24	-	-
7000	-20.13	-	-
8000	-20.13	-	-
9000	-20.23	-	-
10000	-20.07	-	-
20000	-20.23	-	-
30000	-20.23	-	-
40000	-20.13	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

511.95 MHz

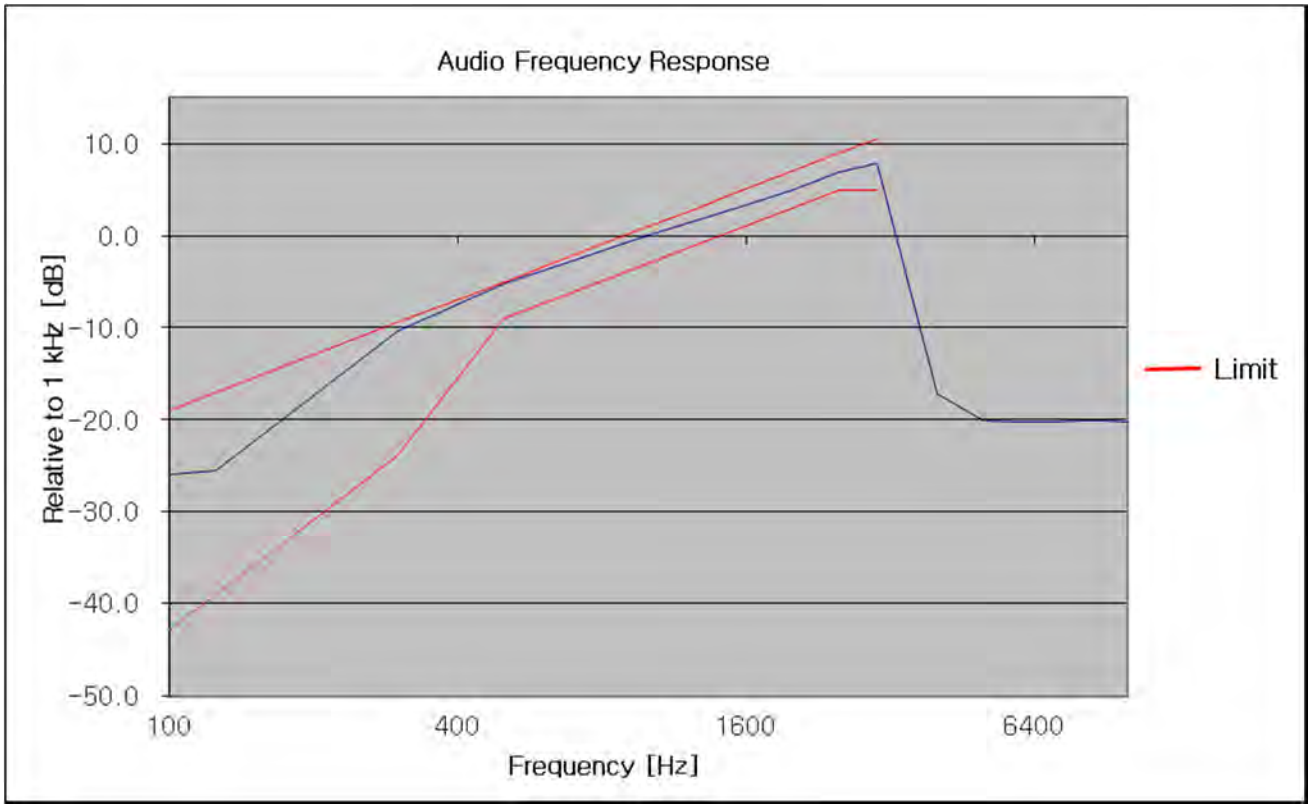
Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-26.11	-18.93	-42.86
125	-26.11	-17.00	-39.00
300	-11.07	-9.42	-23.84
500	-5.85	-5.00	-9.00
750	-2.30	-1.49	-5.49
1000	0.00	1.00	-3.00
1250	1.52	2.93	-1.07
1500	2.82	4.51	0.51
2000	4.53	7.00	3.00
2500	6.43	8.93	4.93
3000	7.40	10.51	4.93
4000	-18.33	-	-
5000	-20.23	-	-
6000	-20.09	-	-
7000	-20.08	-	-
8000	-20.07	-	-
9000	-20.20	-	-
10000	-20.17	-	-
20000	-20.00	-	-
30000	-20.12	-	-
40000	-20.04	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

LOW POWER

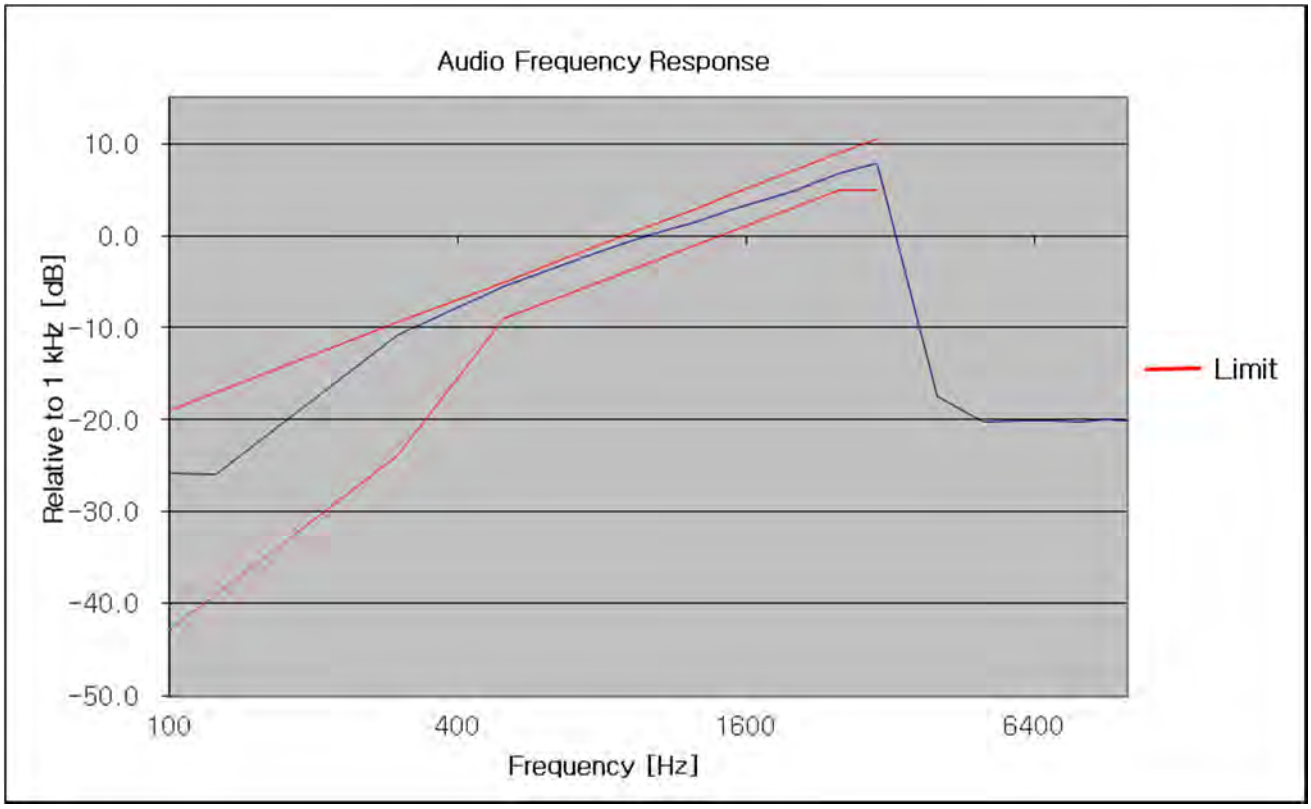
450.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-25.88	-18.93	-42.86
125	-25.48	-17.00	-39.00
300	-10.36	-9.42	-23.84
500	-5.24	-5.00	-9.00
750	-2.11	-1.49	-5.49
1000	0.02	1.00	-3.00
1250	1.59	2.93	-1.07
1500	2.90	4.51	0.51
2000	4.94	7.00	3.00
2500	6.90	8.93	4.93
3000	7.94	10.51	4.93
4000	-17.21	-	-
5000	-20.09	-	-
6000	-20.22	-	-
7000	-20.16	-	-
8000	-20.02	-	-
9000	-20.07	-	-
10000	-20.28	-	-
20000	-20.19	-	-
30000	-20.15	-	-
40000	-20.19	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

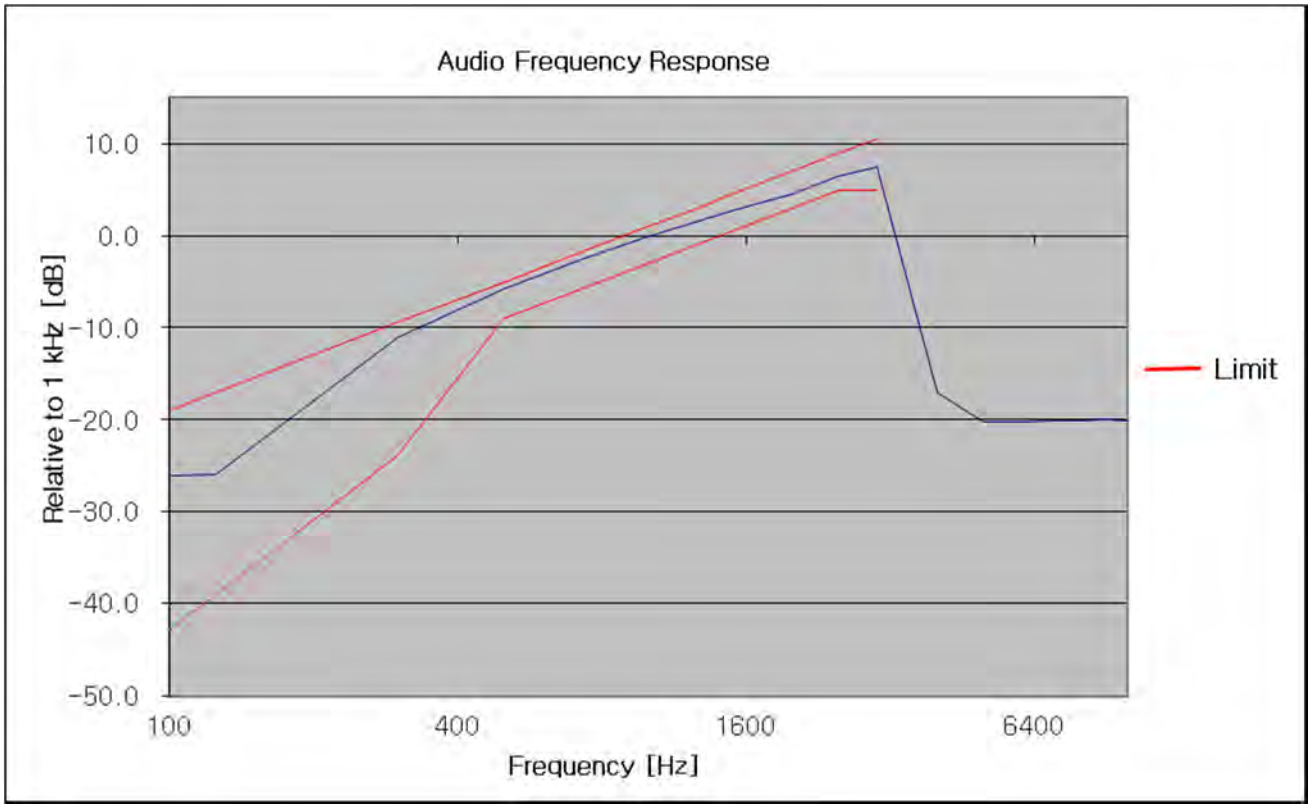
481.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-25.81	-18.93	-42.86
125	-25.92	-17.00	-39.00
300	-10.83	-9.42	-23.84
500	-5.48	-5.00	-9.00
750	-2.08	-1.49	-5.49
1000	0.02	1.00	-3.00
1250	1.51	2.93	-1.07
1500	2.91	4.51	0.51
2000	4.84	7.00	3.00
2500	6.79	8.93	4.93
3000	7.82	10.51	4.93
4000	-17.51	-	-
5000	-20.16	-	-
6000	-20.13	-	-
7000	-20.14	-	-
8000	-20.17	-	-
9000	-20.00	-	-
10000	-20.02	-	-
20000	-20.04	-	-
30000	-20.02	-	-
40000	-20.06	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

511.95 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-26.09	-18.93	-42.86
125	-25.93	-17.00	-39.00
300	-11.11	-9.42	-23.84
500	-5.81	-5.00	-9.00
750	-2.24	-1.49	-5.49
1000	-0.02	1.00	-3.00
1250	1.52	2.93	-1.07
1500	2.77	4.51	0.51
2000	4.59	7.00	3.00
2500	6.49	8.93	4.93
3000	7.49	10.51	4.93
4000	-17.03	-	-
5000	-20.17	-	-
6000	-20.17	-	-
7000	-20.02	-	-
8000	-20.09	-	-
9000	-20.00	-	-
10000	-20.09	-	-
20000	-20.02	-	-
30000	-20.05	-	-
40000	-20.12	-	-

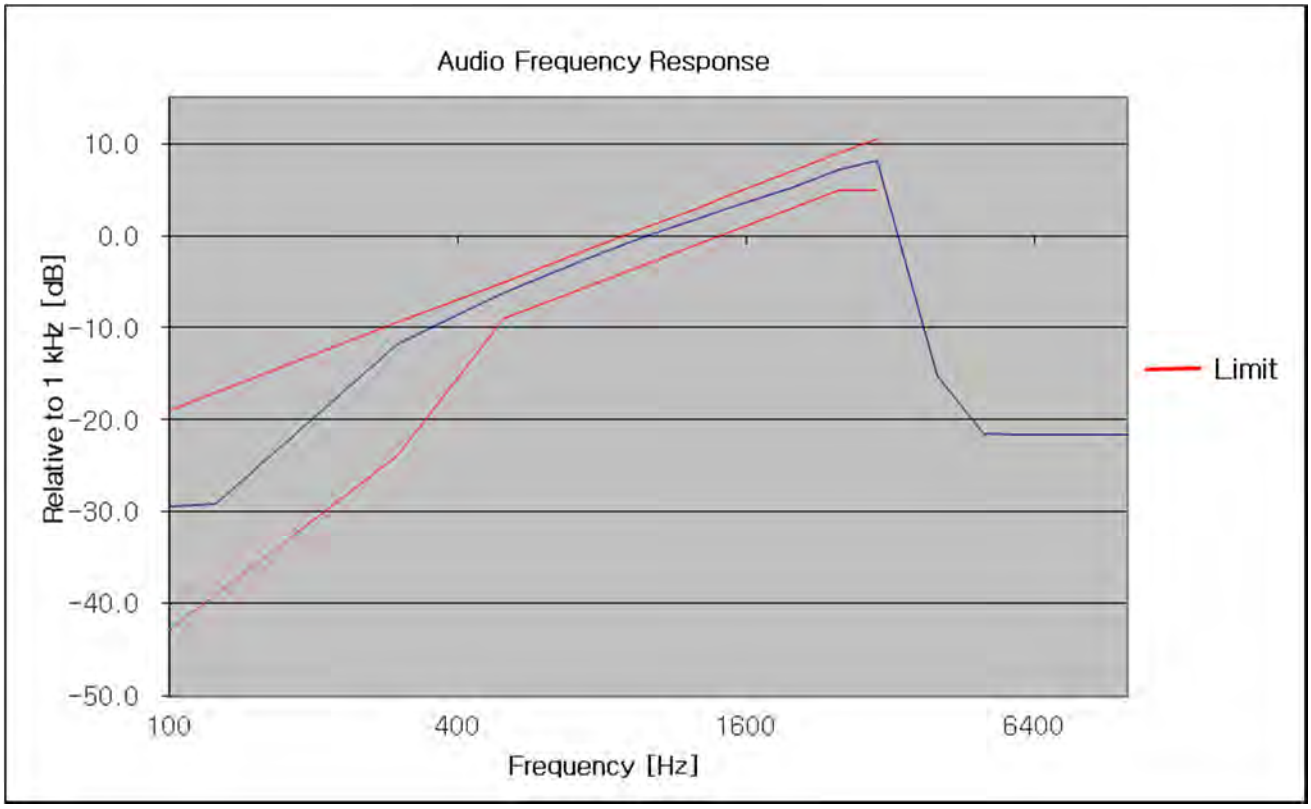

Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

▣ TEST RESULTS (16K0F3E)_5W

HIGH POWER

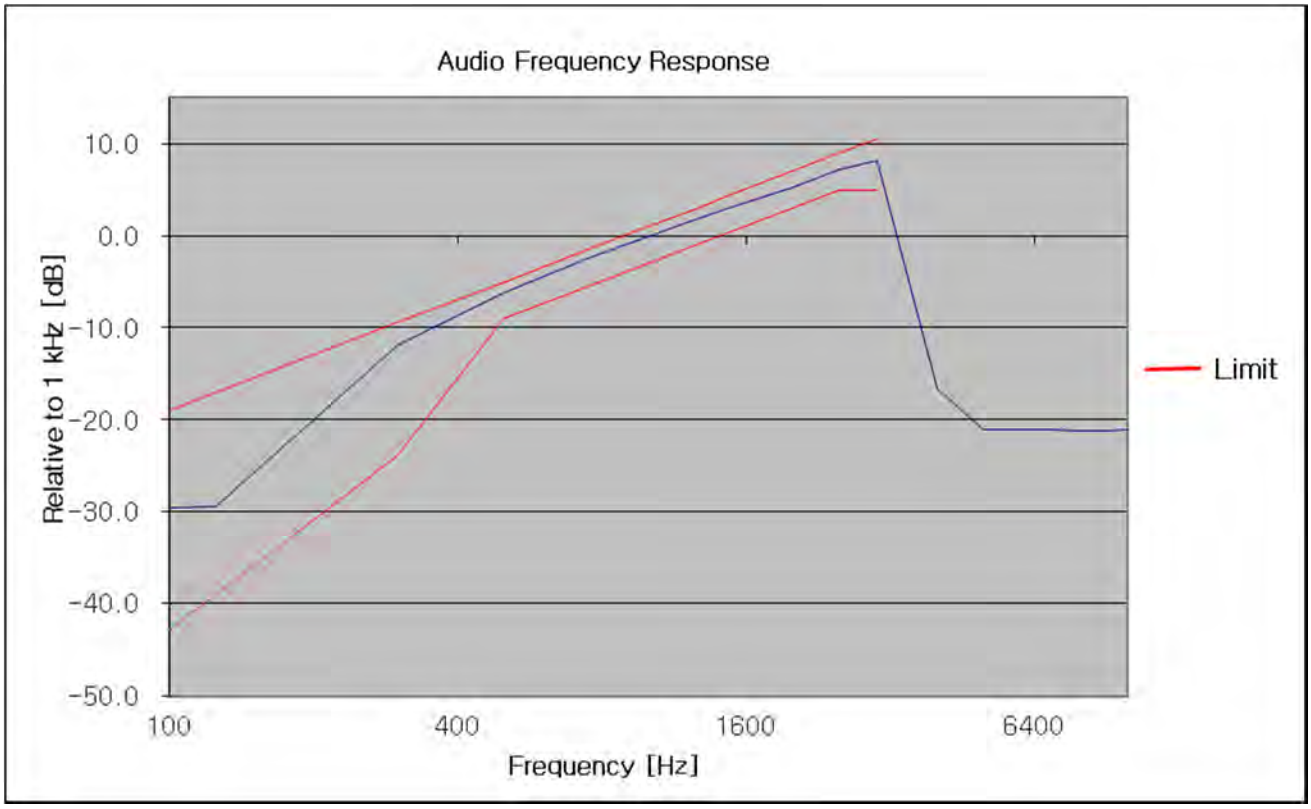
470.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-29.47	-18.93	-42.86
125	-29.12	-17.00	-39.00
300	-11.78	-9.42	-23.84
500	-6.16	-5.00	-9.00
750	-2.43	-1.49	-5.49
1000	0.02	1.00	-3.00
1250	1.78	2.93	-1.07
1500	3.19	4.51	0.51
2000	5.22	7.00	3.00
2500	7.16	8.93	4.93
3000	8.17	10.51	4.93
4000	-15.22	-	-
5000	-21.49	-	-
6000	-21.61	-	-
7000	-21.59	-	-
8000	-21.57	-	-
9000	-21.56	-	-
10000	-21.59	-	-
20000	-21.54	-	-
30000	-21.52	-	-
40000	-21.57	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

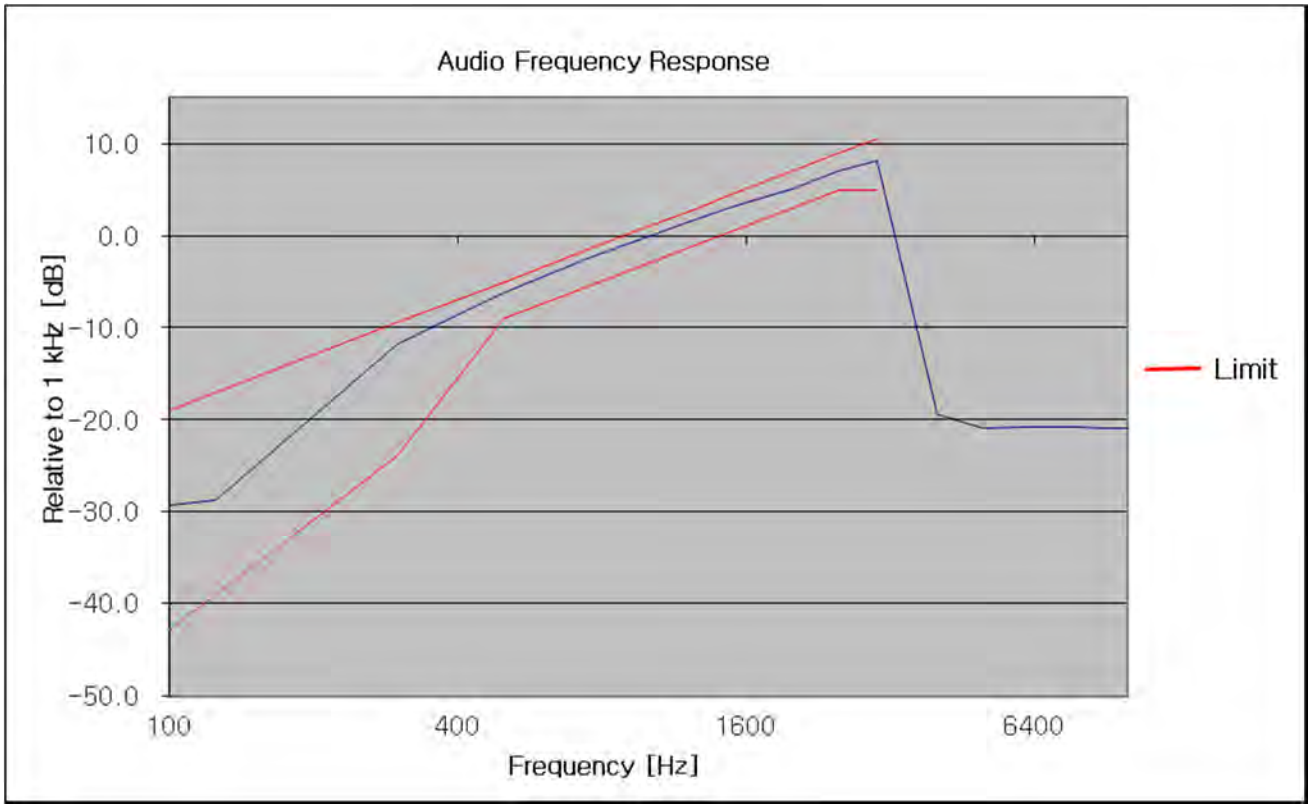
491.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-29.50	-18.93	-42.86
125	-29.45	-17.00	-39.00
300	-11.87	-9.42	-23.84
500	-6.19	-5.00	-9.00
750	-2.44	-1.49	-5.49
1000	-0.02	1.00	-3.00
1250	1.76	2.93	-1.07
1500	3.19	4.51	0.51
2000	5.20	7.00	3.00
2500	7.14	8.93	4.93
3000	8.14	10.51	4.93
4000	-16.62	-	-
5000	-21.09	-	-
6000	-21.07	-	-
7000	-21.03	-	-
8000	-21.18	-	-
9000	-21.14	-	-
10000	-21.10	-	-
20000	-21.04	-	-
30000	-21.23	-	-
40000	-21.10	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

511.95 MHz

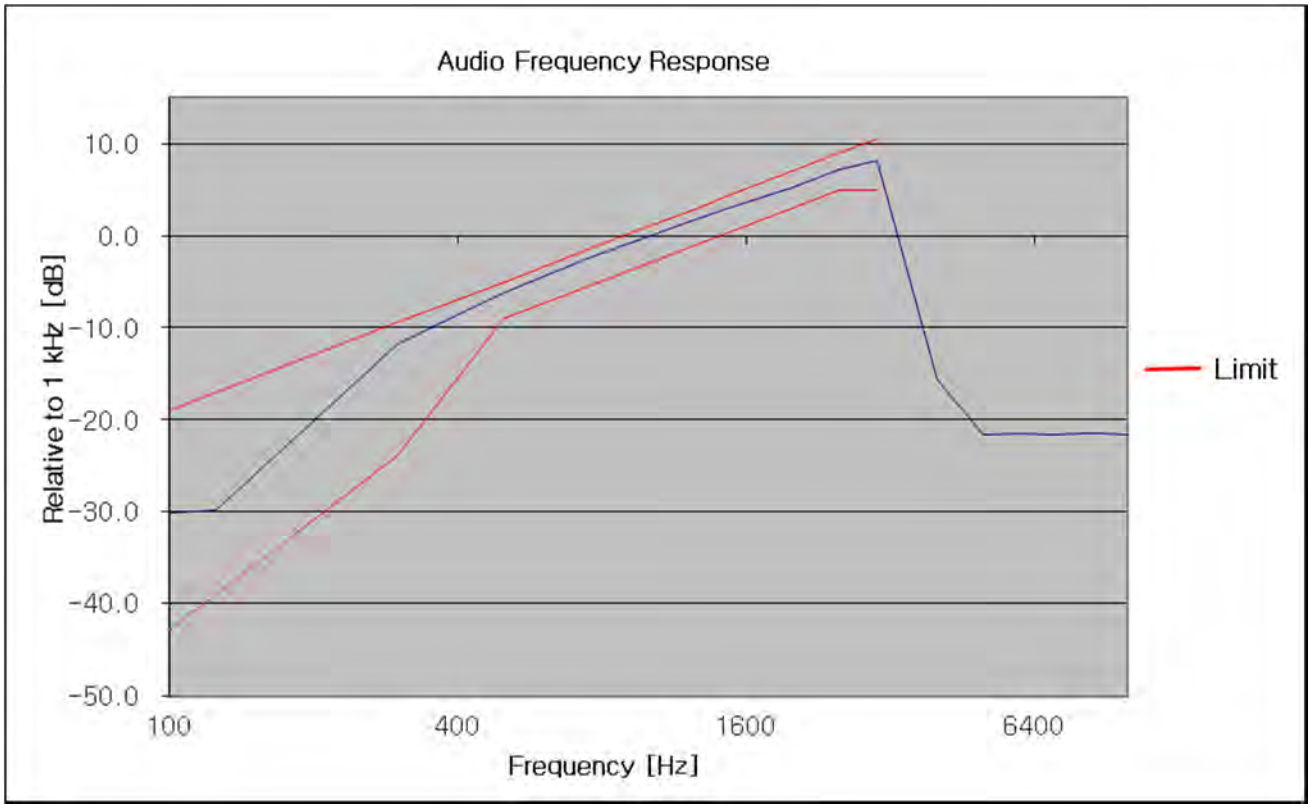
Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-29.24	-18.93	-42.86
125	-28.75	-17.00	-39.00
300	-11.80	-9.42	-23.84
500	-6.19	-5.00	-9.00
750	-2.46	-1.49	-5.49
1000	-0.02	1.00	-3.00
1250	1.74	2.93	-1.07
1500	3.16	4.51	0.51
2000	5.16	7.00	3.00
2500	7.10	8.93	4.93
3000	8.09	10.51	4.93
4000	-19.37	-	-
5000	-20.90	-	-
6000	-20.85	-	-
7000	-20.73	-	-
8000	-20.79	-	-
9000	-20.87	-	-
10000	-20.87	-	-
20000	-20.93	-	-
30000	-20.79	-	-
40000	-20.89	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

LOW POWER

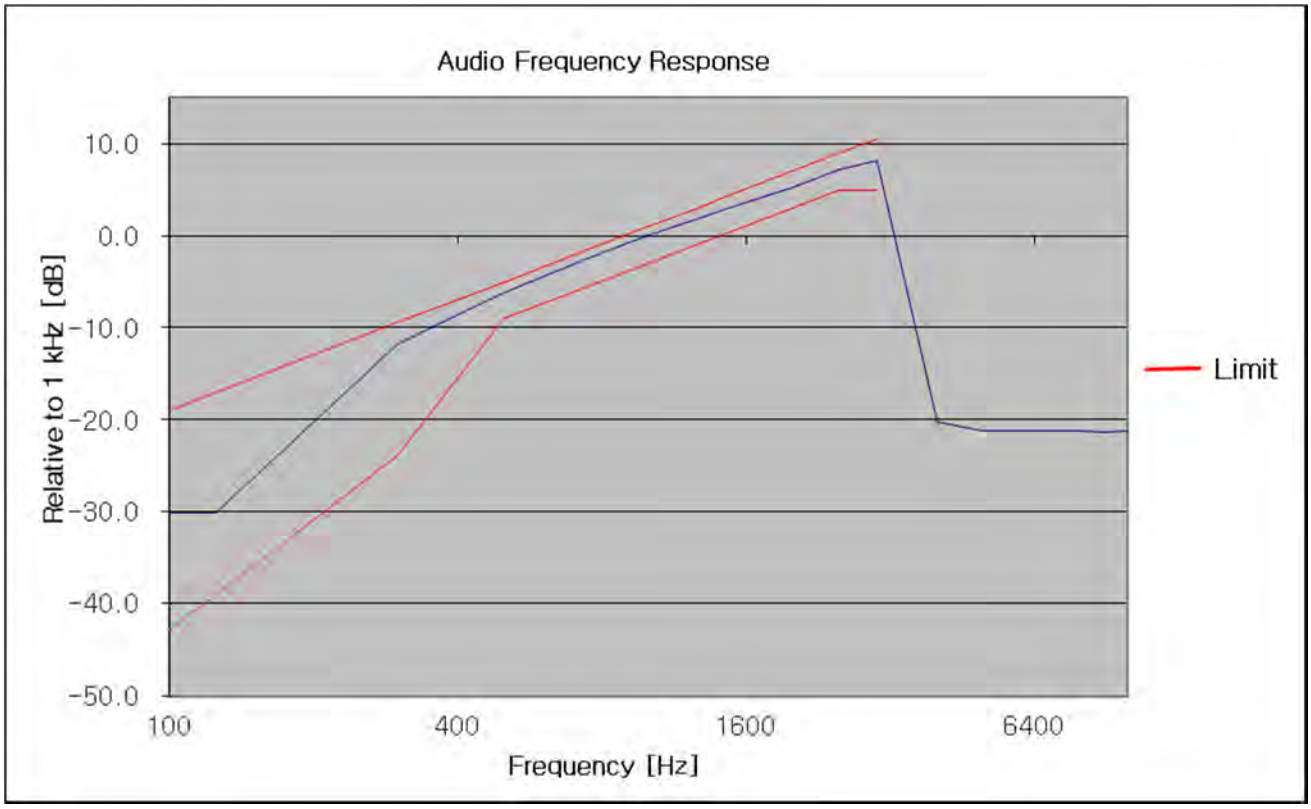
470.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-30.11	-18.93	-42.86
125	-29.81	-17.00	-39.00
300	-11.77	-9.42	-23.84
500	-6.16	-5.00	-9.00
750	-2.44	-1.49	-5.49
1000	0.00	1.00	-3.00
1250	1.79	2.93	-1.07
1500	3.19	4.51	0.51
2000	5.23	7.00	3.00
2500	7.18	8.93	4.93
3000	8.19	10.51	4.93
4000	-15.63	-	-
5000	-21.62	-	-
6000	-21.53	-	-
7000	-21.62	-	-
8000	-21.52	-	-
9000	-21.50	-	-
10000	-21.62	-	-
20000	-21.65	-	-
30000	-21.50	-	-
40000	-21.47	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

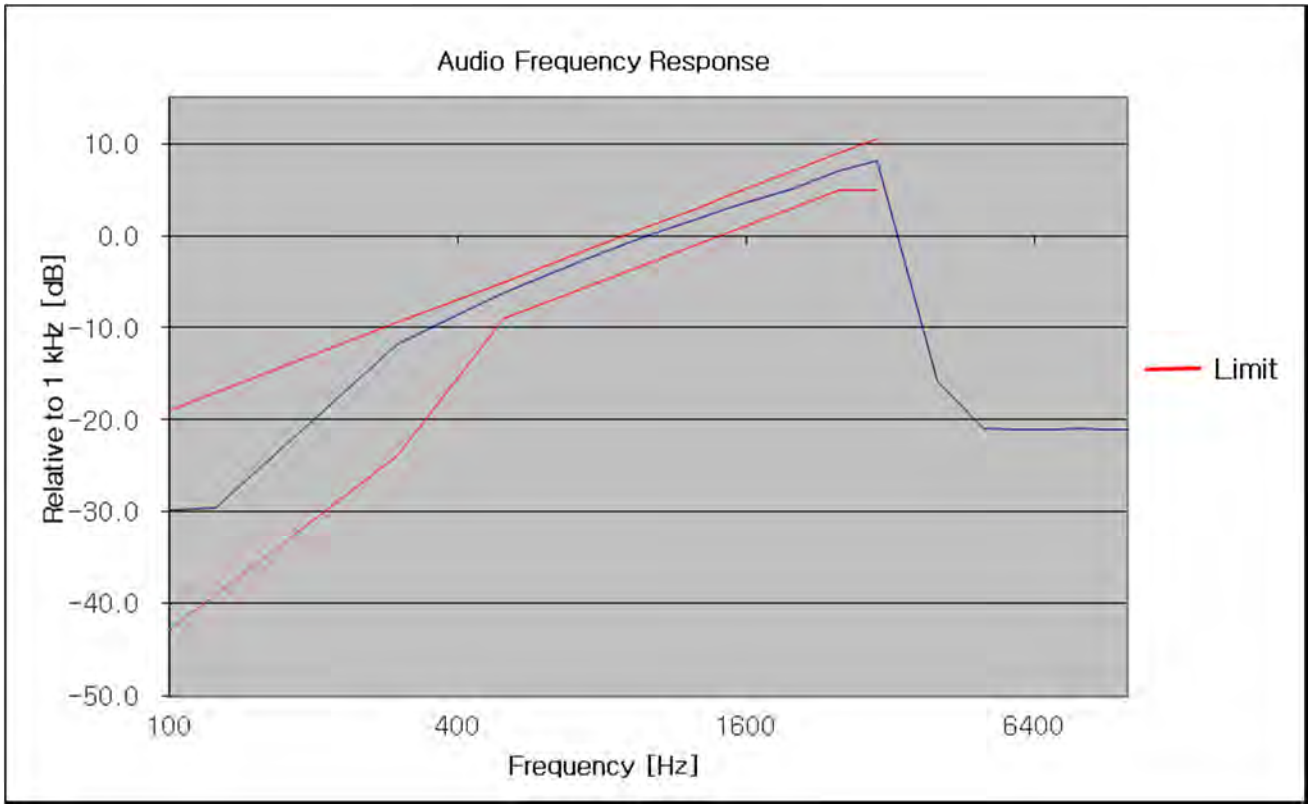
491.05 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-30.14	-18.93	-42.86
125	-30.14	-17.00	-39.00
300	-11.77	-9.42	-23.84
500	-6.16	-5.00	-9.00
750	-2.41	-1.49	-5.49
1000	0.03	1.00	-3.00
1250	1.78	2.93	-1.07
1500	3.18	4.51	0.51
2000	5.21	7.00	3.00
2500	7.16	8.93	4.93
3000	8.16	10.51	4.93
4000	-20.23	-	-
5000	-21.26	-	-
6000	-21.21	-	-
7000	-21.15	-	-
8000	-21.15	-	-
9000	-21.32	-	-
10000	-21.14	-	-
20000	-21.34	-	-
30000	-21.21	-	-
40000	-21.34	-	-


Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

511.95 MHz

Frequency (Hz)	Attenuation Rel. to 1kHz (dB)	Upper limit (dB)	Lower limit (dB)
100	-29.84	-18.93	-42.86
125	-29.60	-17.00	-39.00
300	-11.72	-9.42	-23.84
500	-6.14	-5.00	-9.00
750	-2.42	-1.49	-5.49
1000	0.03	1.00	-3.00
1250	1.78	2.93	-1.07
1500	3.17	4.51	0.51
2000	5.15	7.00	3.00
2500	7.10	8.93	4.93
3000	8.09	10.51	4.93
4000	-15.80	-	-
5000	-20.93	-	-
6000	-20.99	-	-
7000	-21.02	-	-
8000	-20.86	-	-
9000	-21.02	-	-
10000	-21.04	-	-
20000	-20.90	-	-
30000	-21.04	-	-
40000	-20.87	-	-

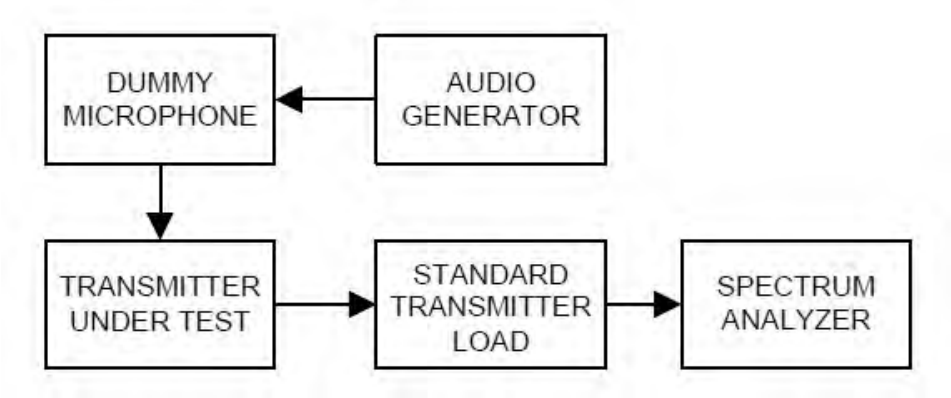

Audio Frequency Response
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
Relative to 1 kHz [dB]
100
400
1600
6400
Frequency [Hz]
Limit

8.6 Emission Mask

▣ Definition

The transmitter sideband spectrum denotes the sideband power produced at a discrete frequency separation from the carrier up to the test bandwidth (see 1.3.4.4) due to all sources of unwanted noise within the transmitter in a modulated condition.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

According to 2.2.11 in TIA-603-E Standard.

a) Connect the equipment as illustrated. Use the table to determine the spectrum analyzer resolution bandwidth:

Spectrum Analyzer Resolution Bandwidth

Frequency Band (MHz)	Mask for Equipment with Audio Low Pass Filter	Mask for Equipment without Low Pass Filter	Spectrum Analyzer Resolution Bandwidth (Hz)
25-50	B	C	300
72-76	B	C	300
138-174	NTIA	NTIA	300
150-174	B	C	300
150-174	D or E	D or E	100
406-420	NTIA	NTIA	300
421-512	B	C	300
421-512	D or E	D or E	100
806-821/851-866	B or EA	G or EA	300
821-824/866-869	B	H	300
896-901/935-940	I	J	300

b) Adjust the spectrum analyzer for the following settings:

1) Resolution Bandwidth per the above table

2) Video Bandwidth at least 10 times the resolution bandwidth.

3) Sweep Speed slow enough to maintain measurement calibration.

4) Detector Mode = Positive Peak.

5) Span that will allow proper viewing of the test bandwidth (see 1.3.4.4).

c) Set the center frequency of the spectrum analyzer to the assigned transmitter frequency. Key the transmitter, and set the level of the unmodulated carrier to a full scale reference line. This is the 0 dB reference for the measurement.

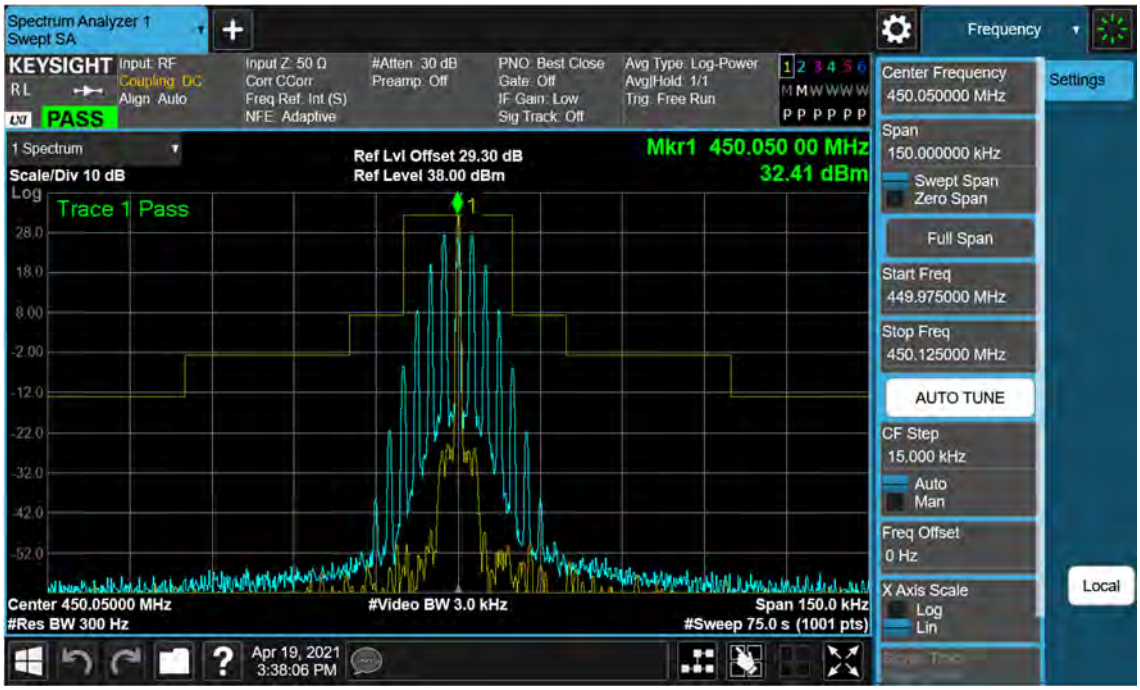
d) Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation. The input level shall be established at the frequency of maximum response of the audio modulating circuit. Transmitters employing digital modulation techniques that bypass the limiter and the audio low-pass filter shall be modulated as specified by the manufacturer.

e) Record the resulting spectrum analyzer presentation of the emission level with an on-line recording device or in a photograph. It is recommended that the emission limit (as given in 3.2.11) be drawn on the plotted graph or photograph. The spectrum analyzer presentation is the sideband spectrum.

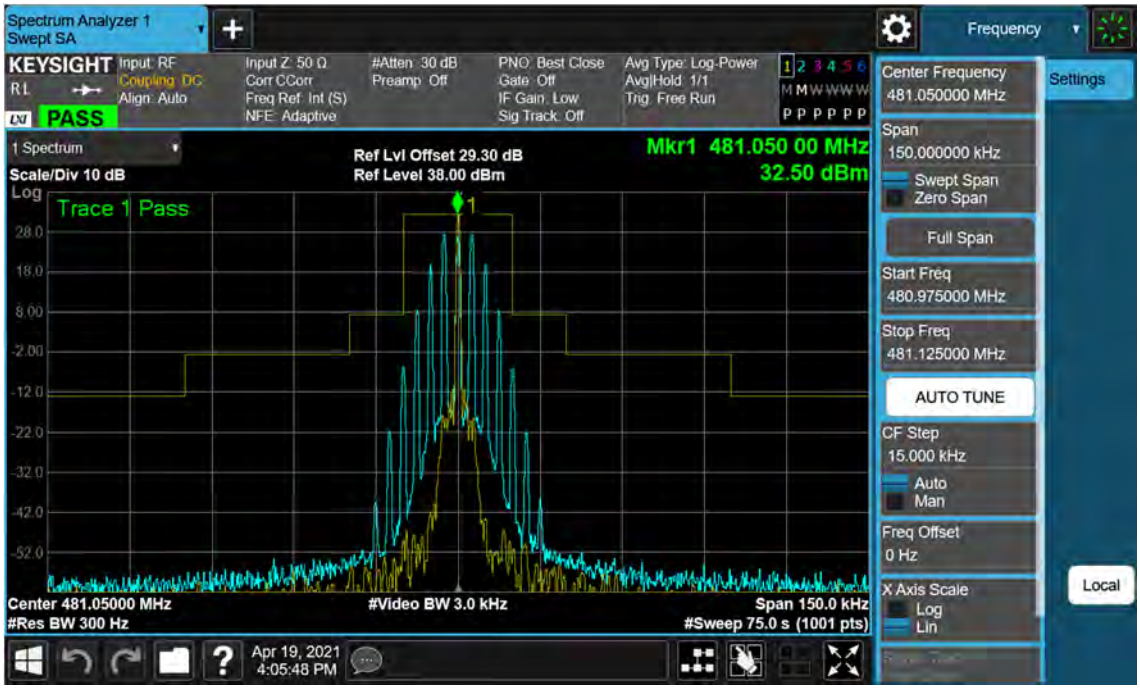
▣ Plots of Emission Mask

16K0F3E_FCC

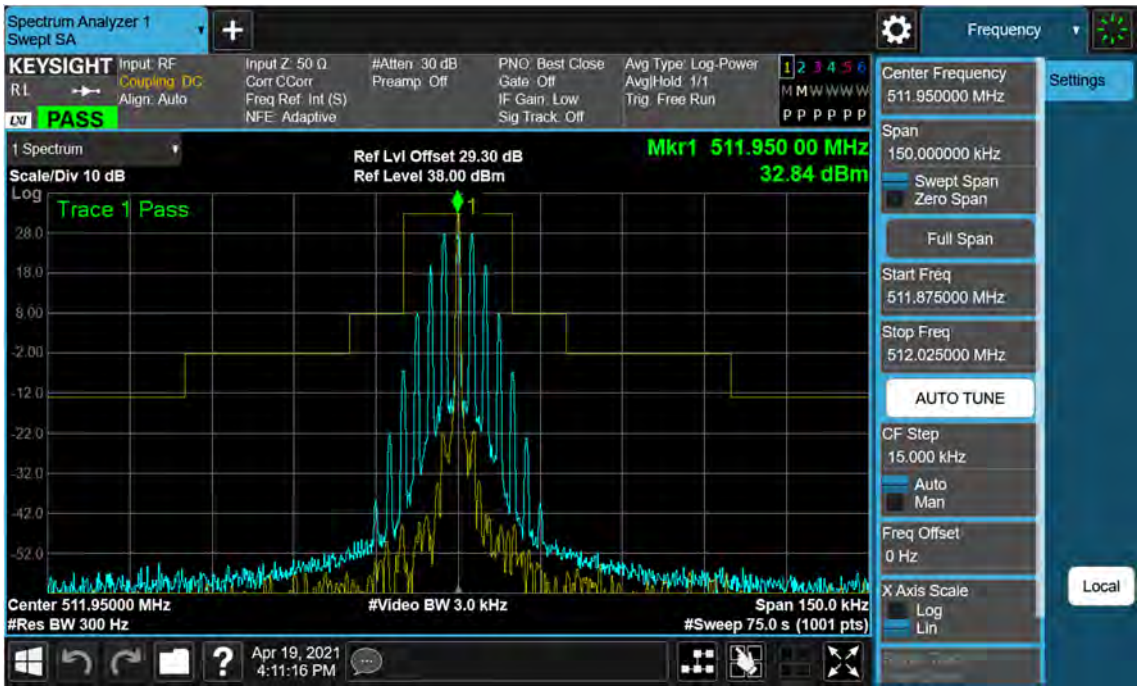
(450.05 MHz)_High_2W



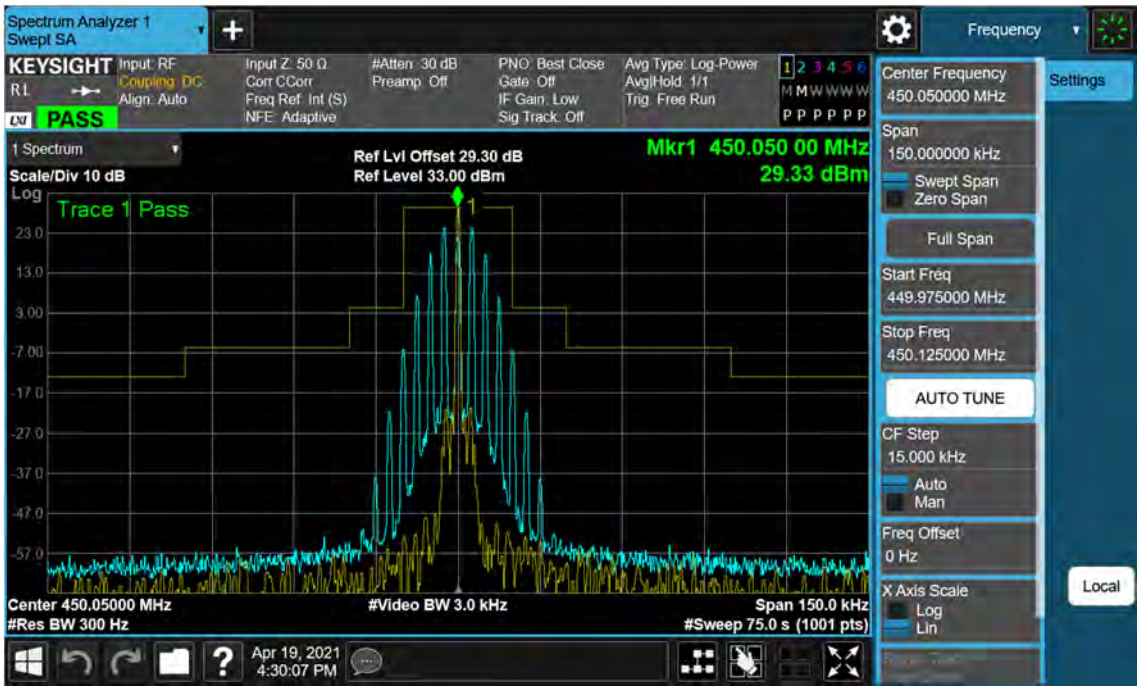
(481.05 MHz)_High_2W



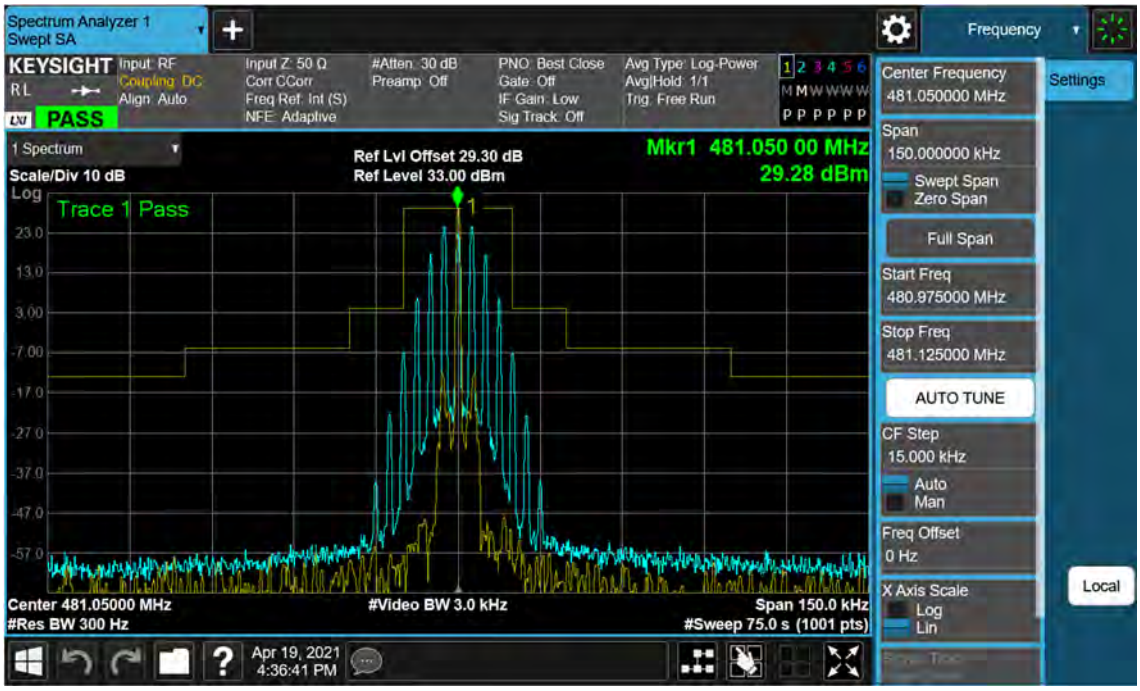
(511.95 MHz)_High_2W



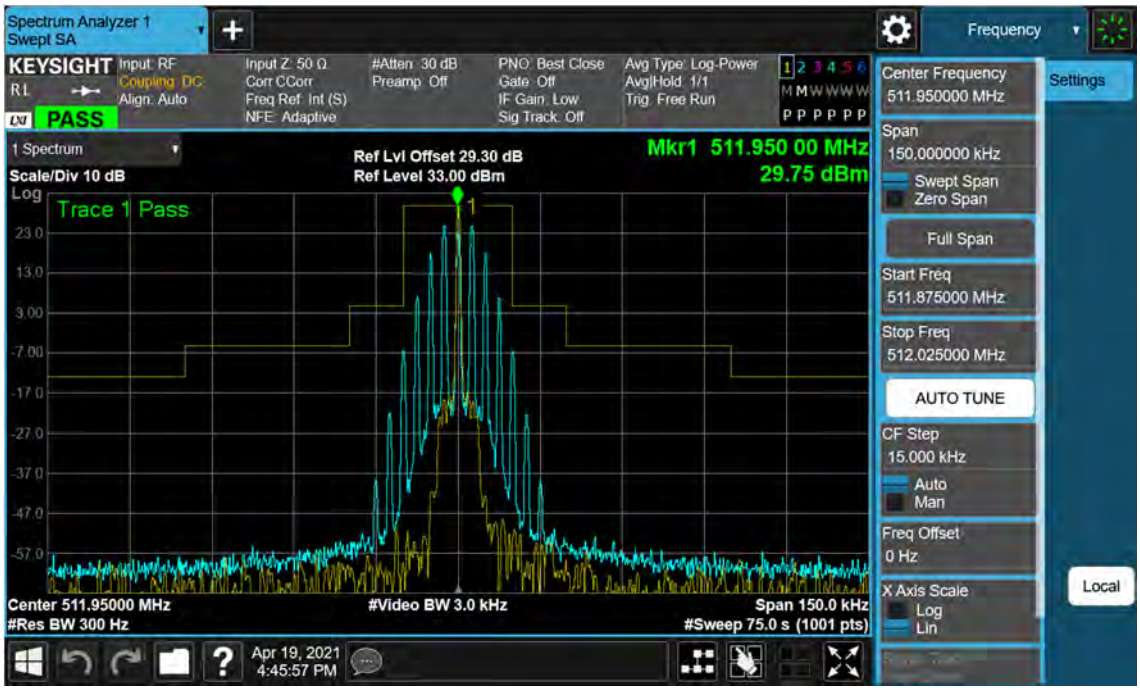
(450.05 MHz)_Low_1W



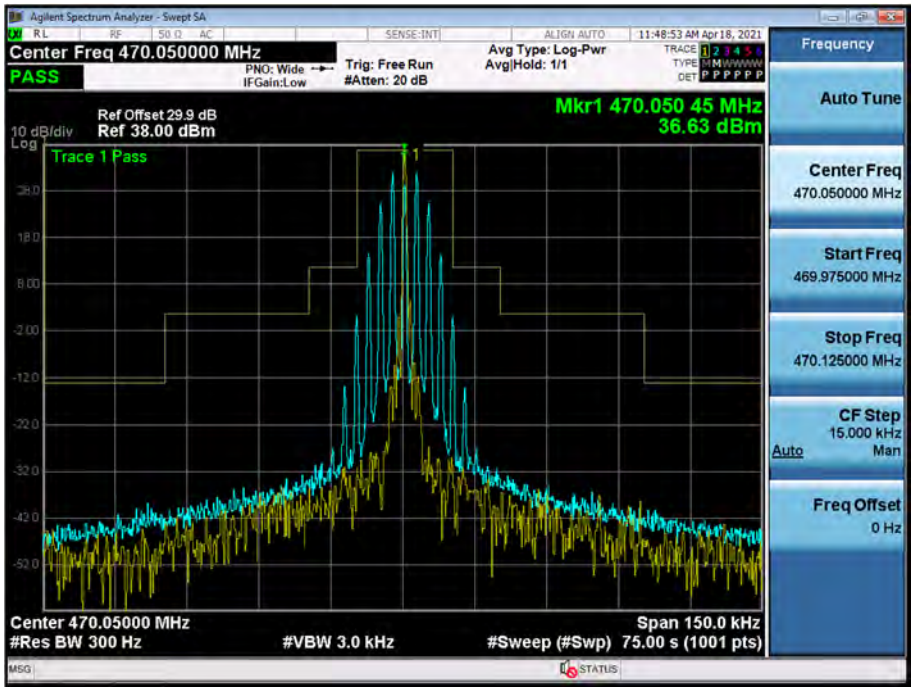
(481.05 MHz)_Low_1W



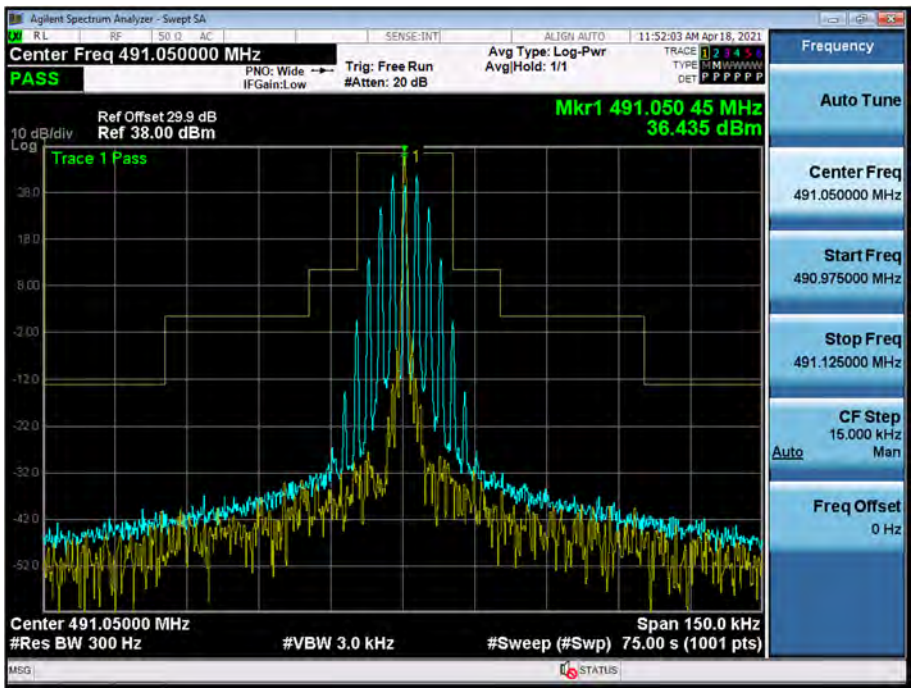
(511.95 MHz)_Low_1W



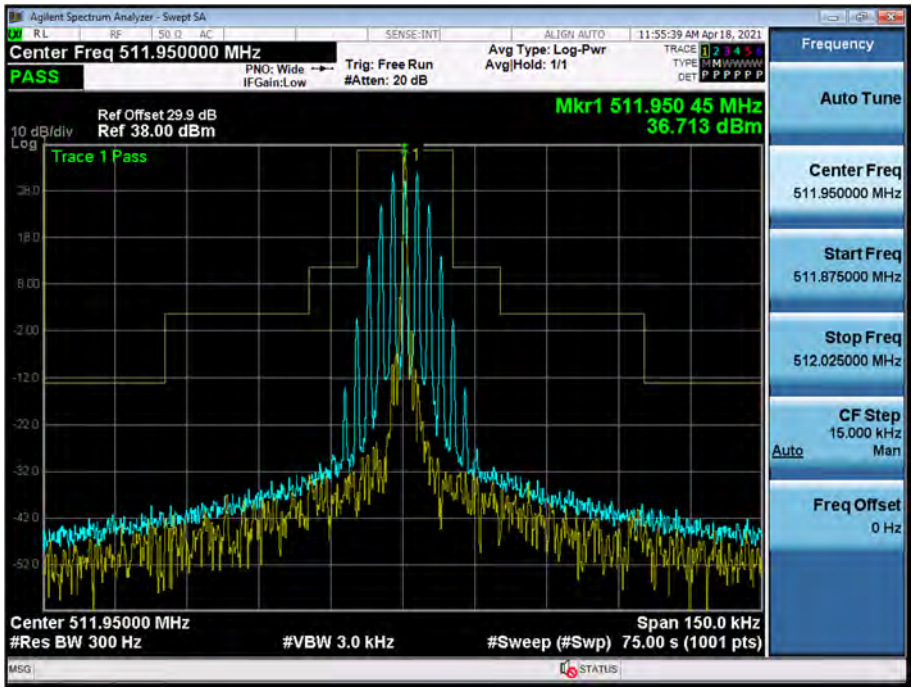
(470.05 MHz)_High_5W



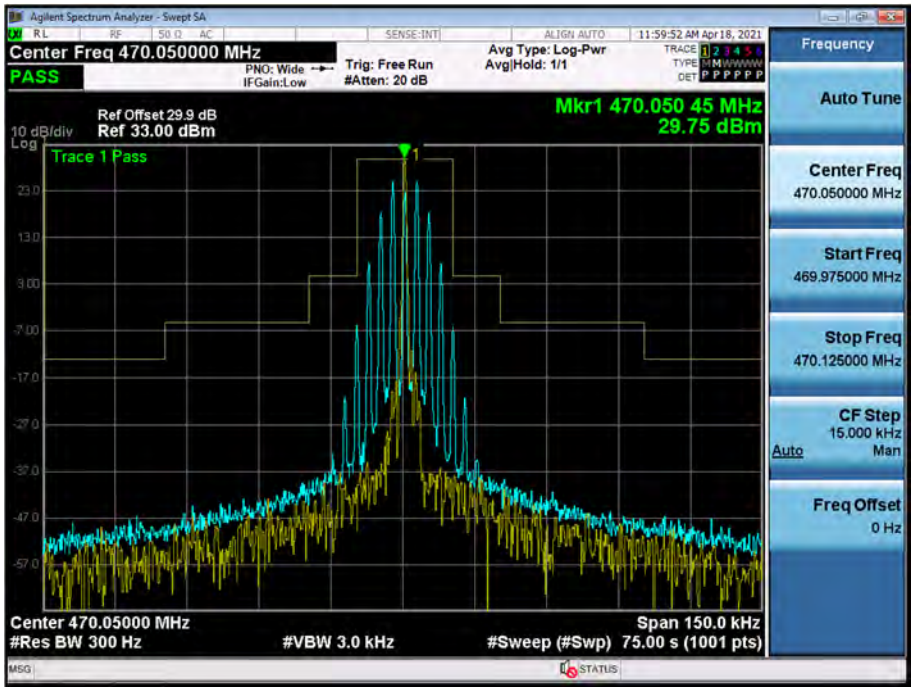
(491.05 MHz)_High_5W



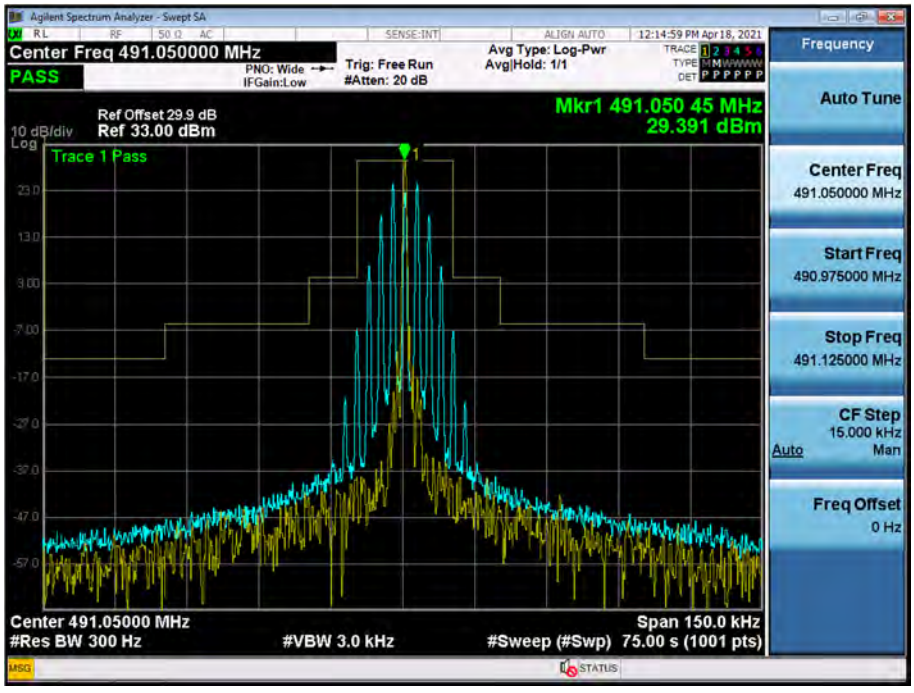
(511.95 MHz)_High_5W



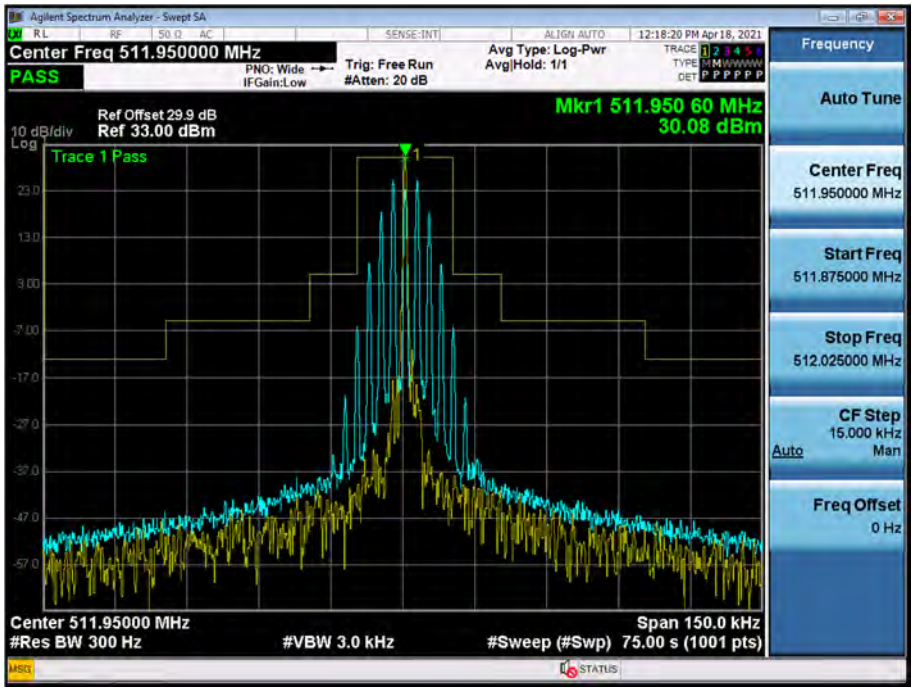
(470.05 MHz)_Low_1W



(491.05 MHz)_Low_1W

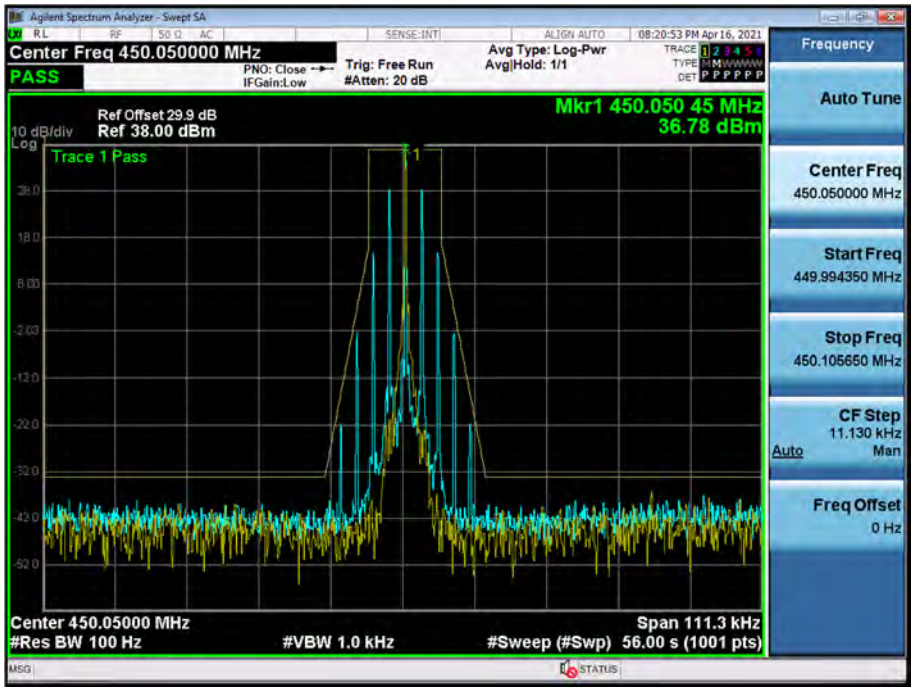


(511.95 MHz)_Low_1W

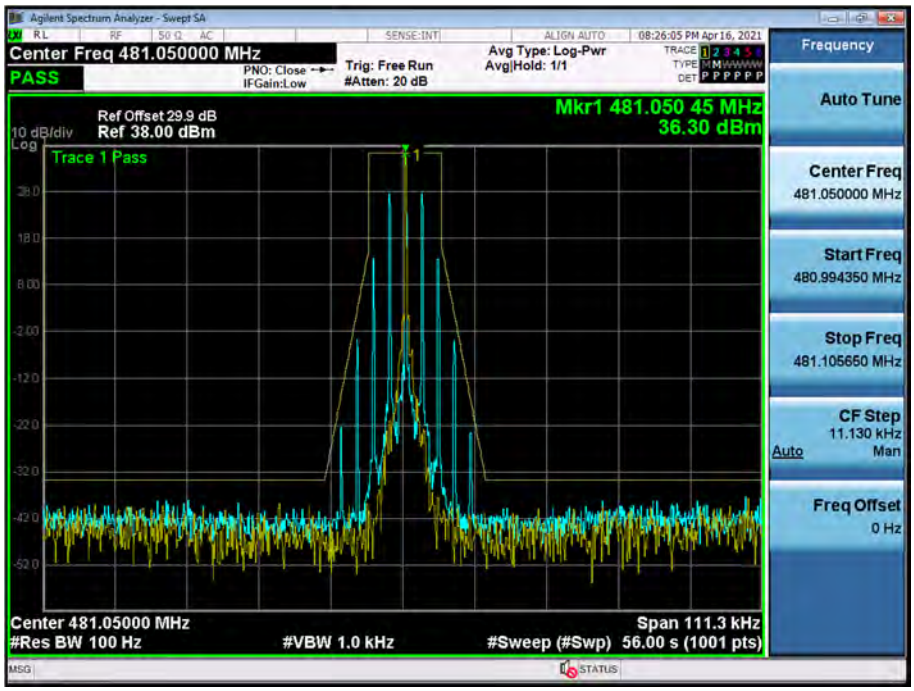


11K0F3E_FCC

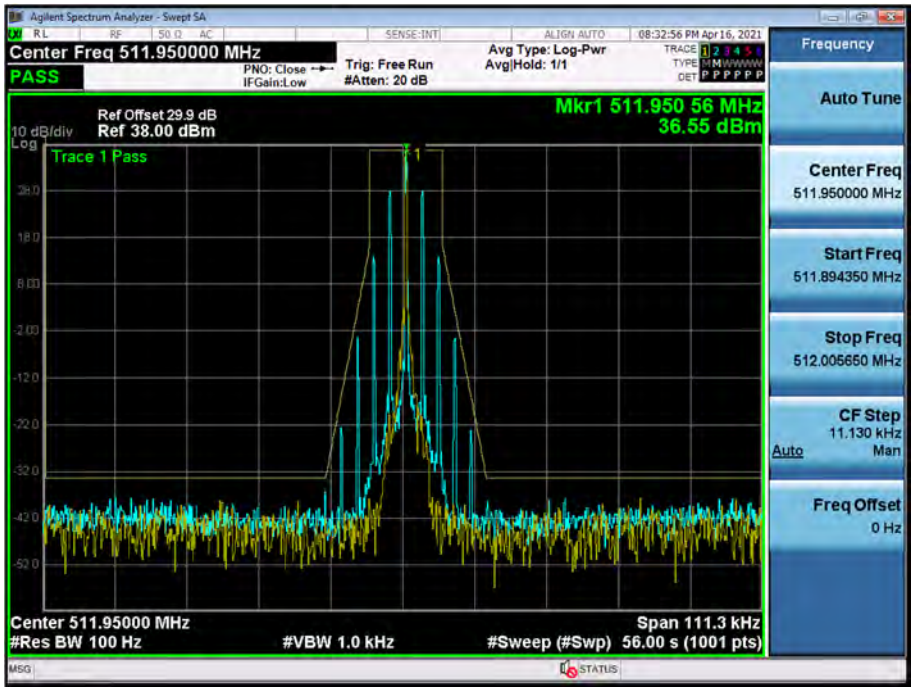
(450.05 MHz)_High



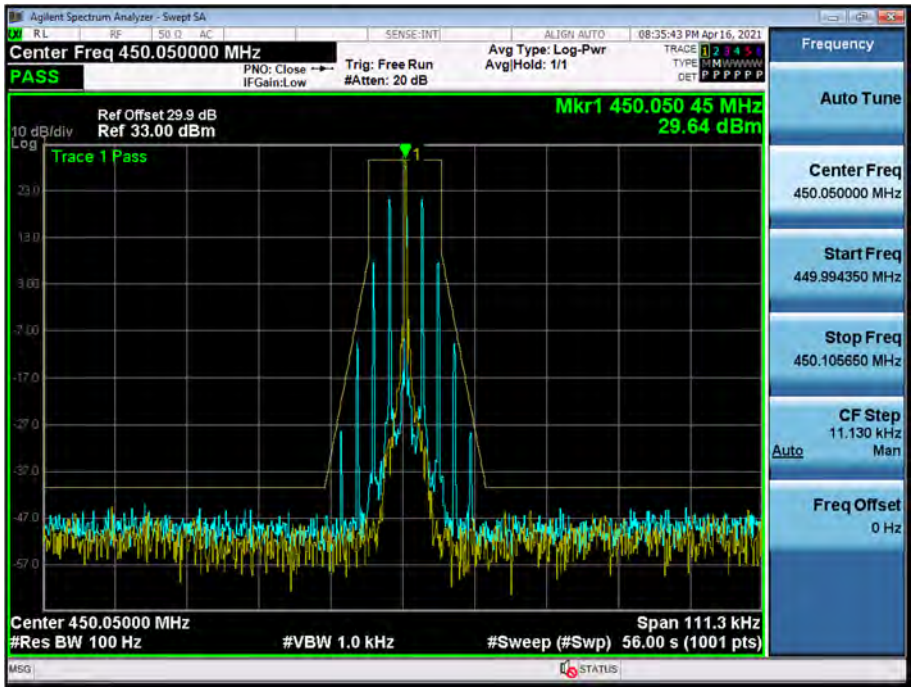
(481.05 MHz)_High



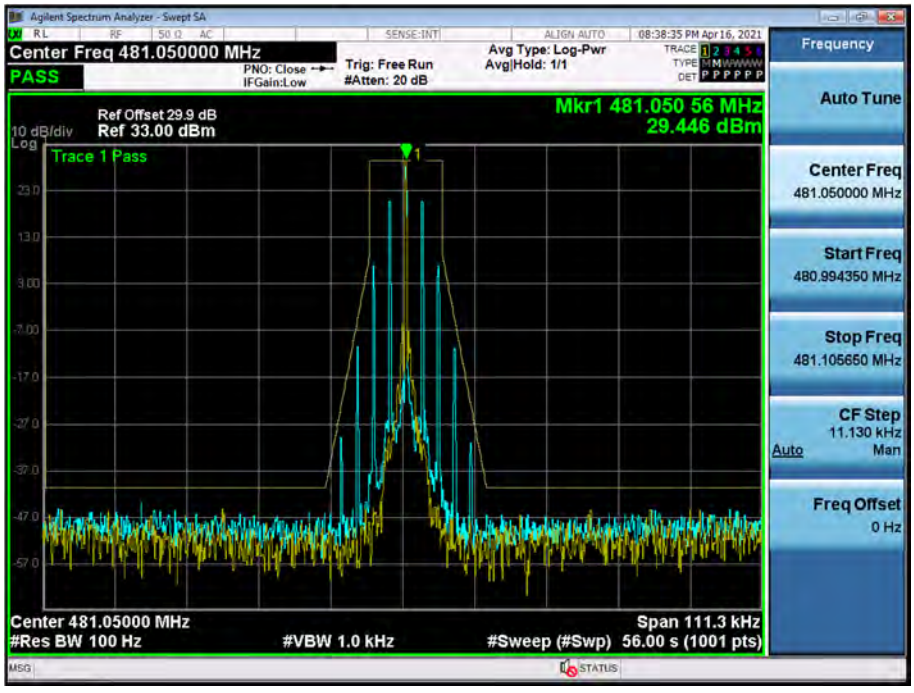
(511.95 MHz)_High



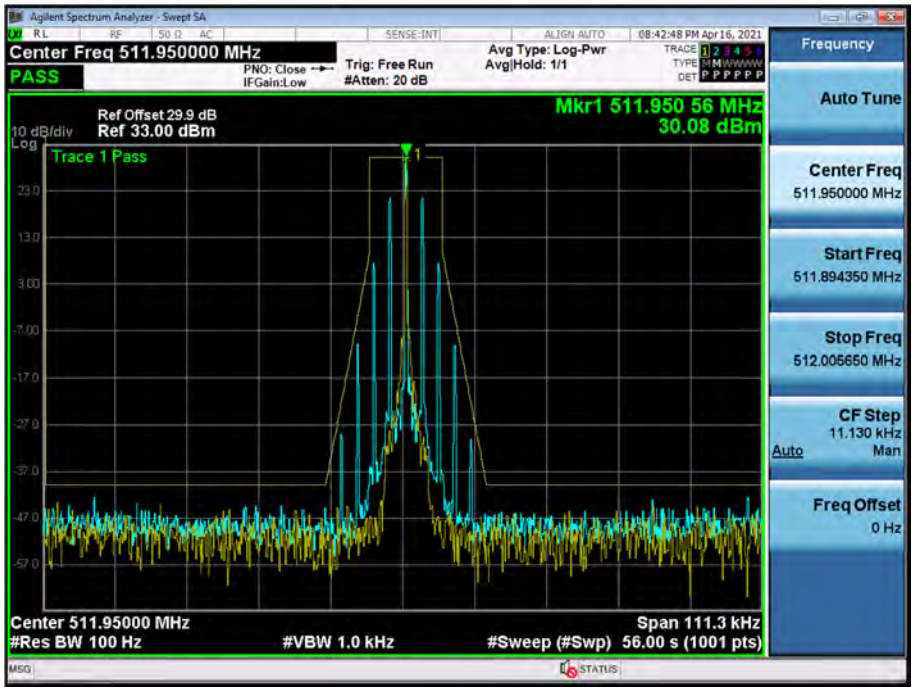
(450.05 MHz)_Low



(481.05 MHz)_Low

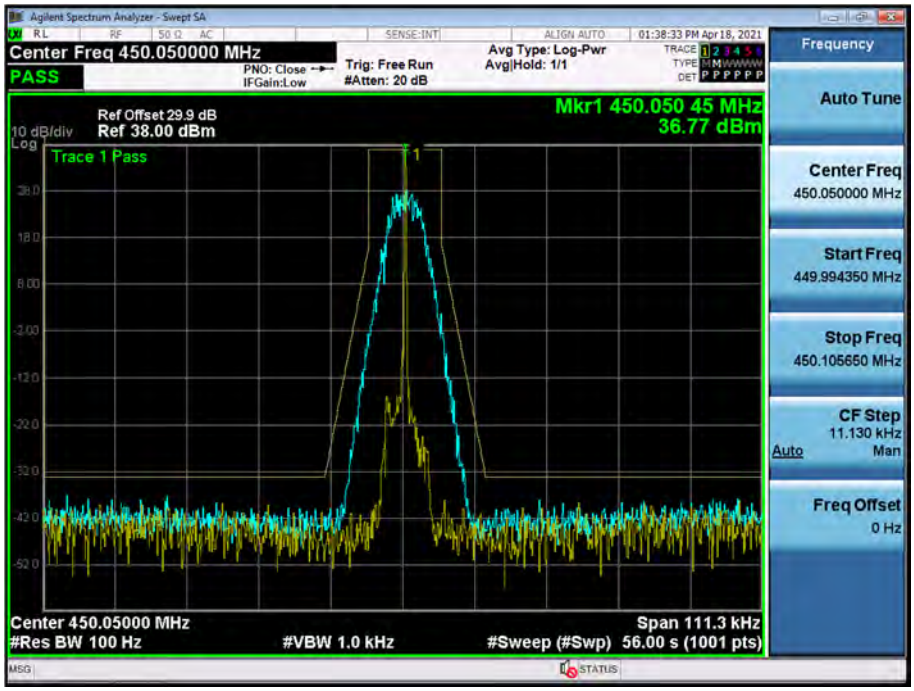


(511.95 MHz)_Low

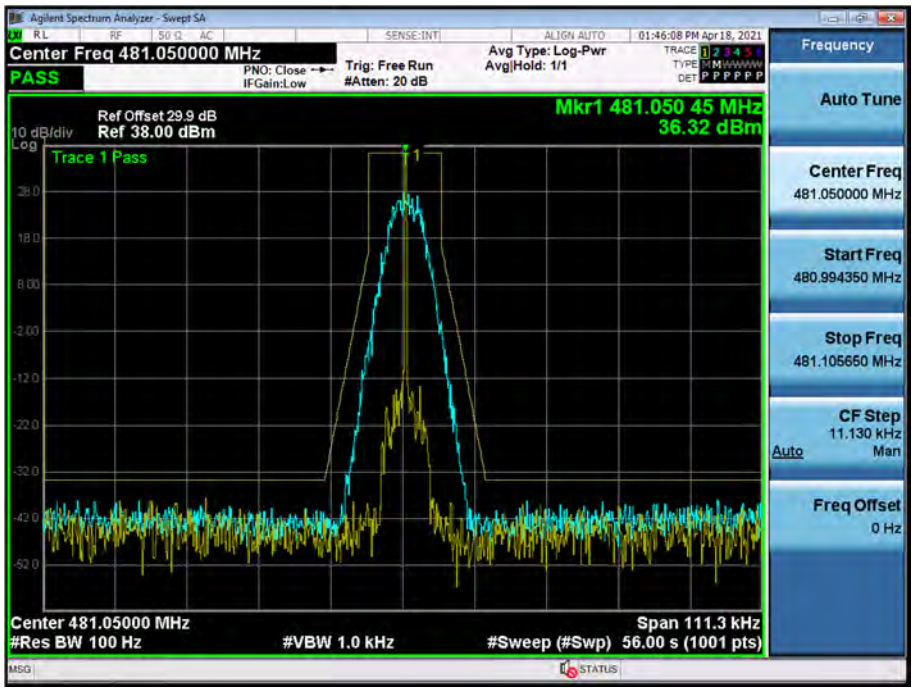


8K30F1E, 8K30F1D, 8K30F7W_FCC

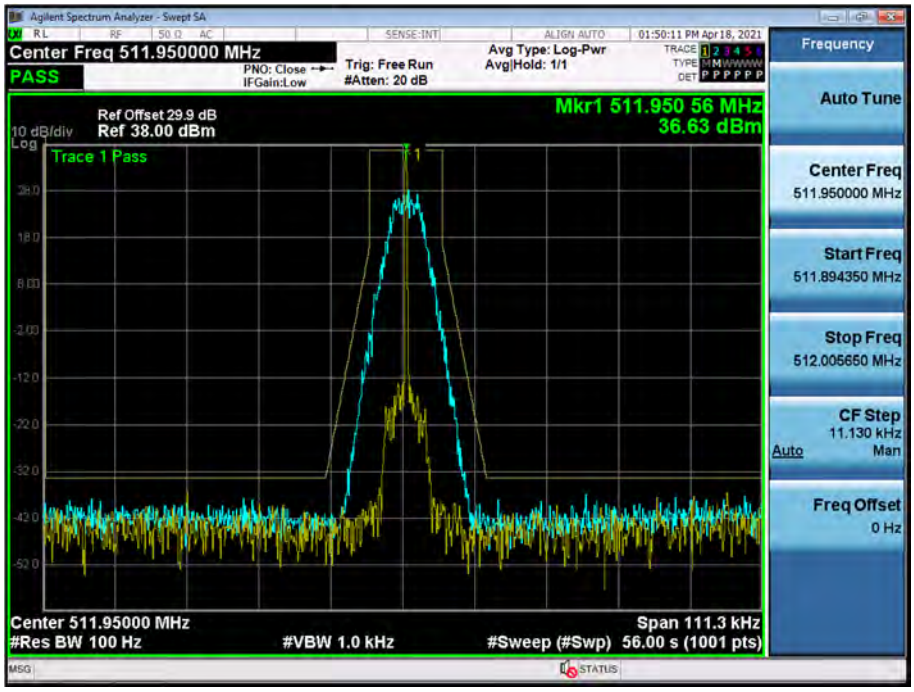
(450.05 MHz)_High



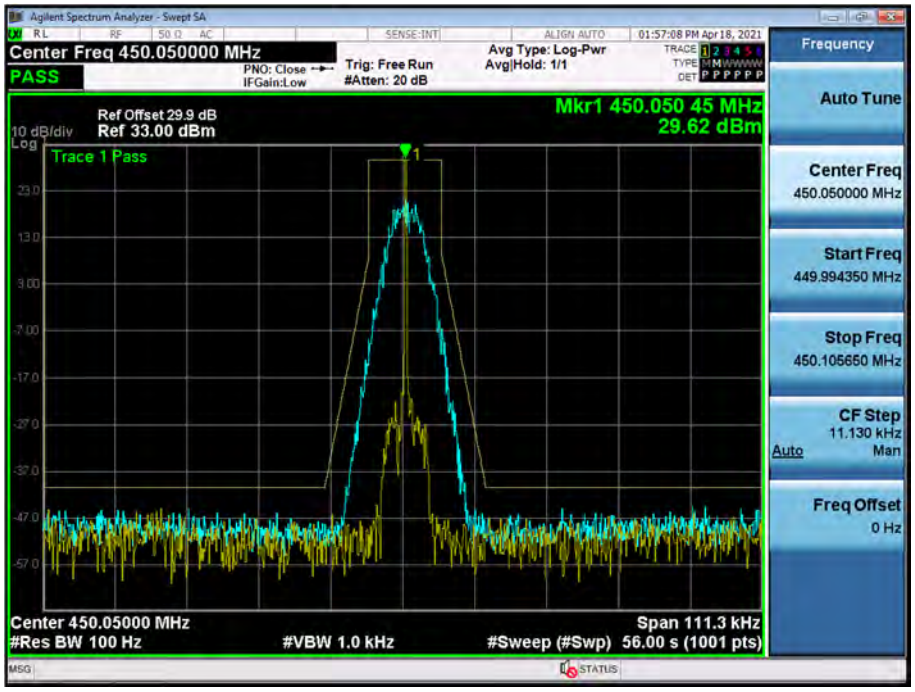
(481.05 MHz)_High



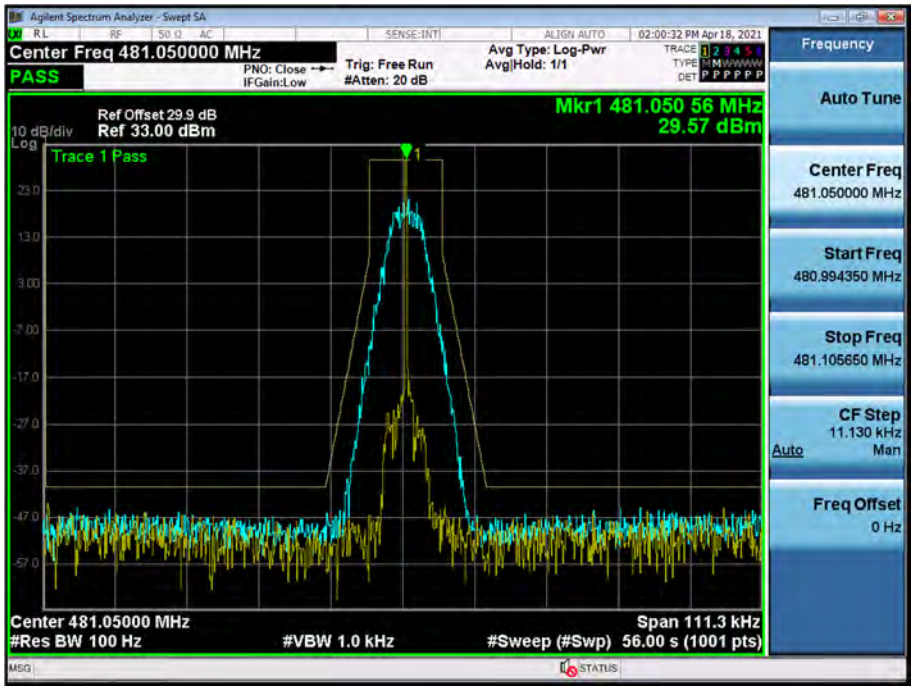
(511.95 MHz)_High



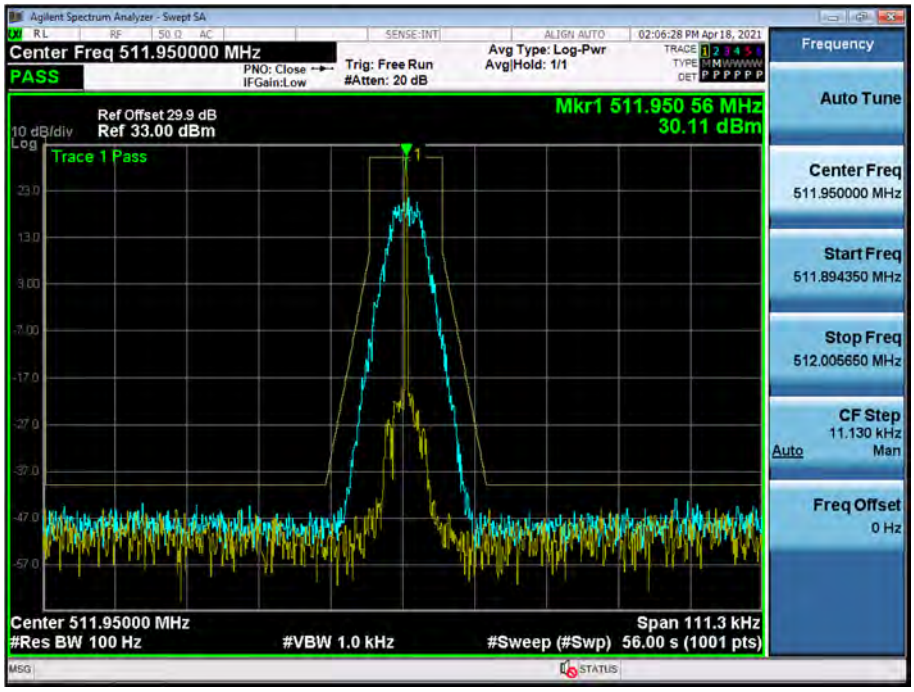
(450.05 MHz)_Low



(481.05 MHz)_Low

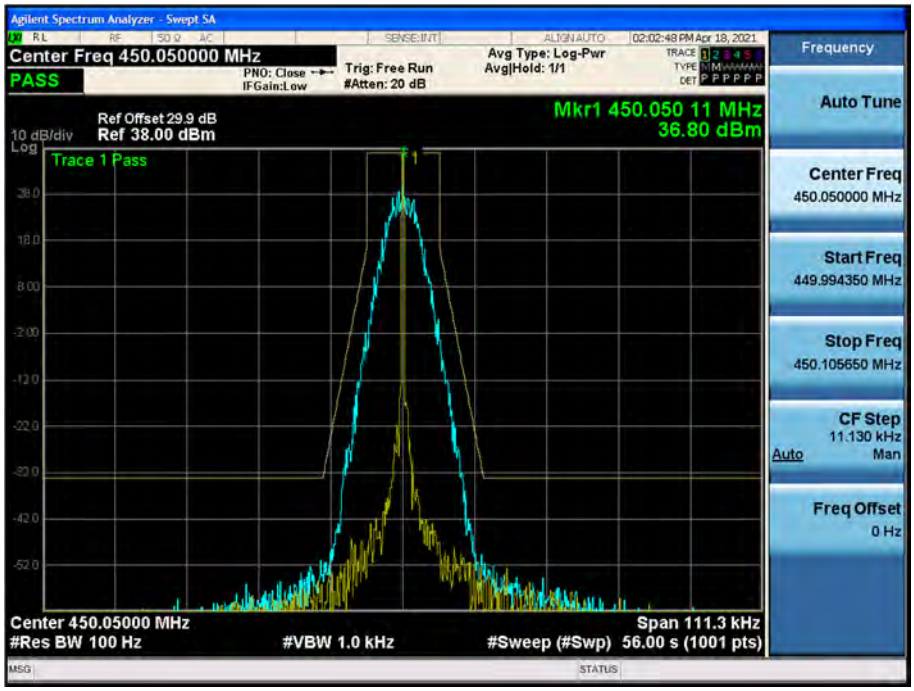


(511.95 MHz)_Low

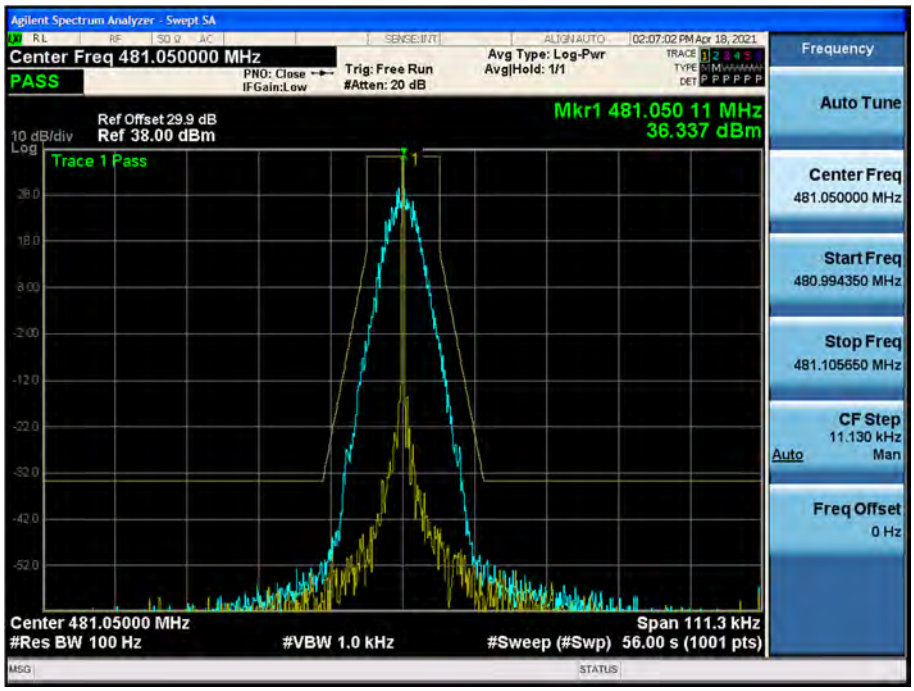


7K60FXD, 7K60FXE_FCC

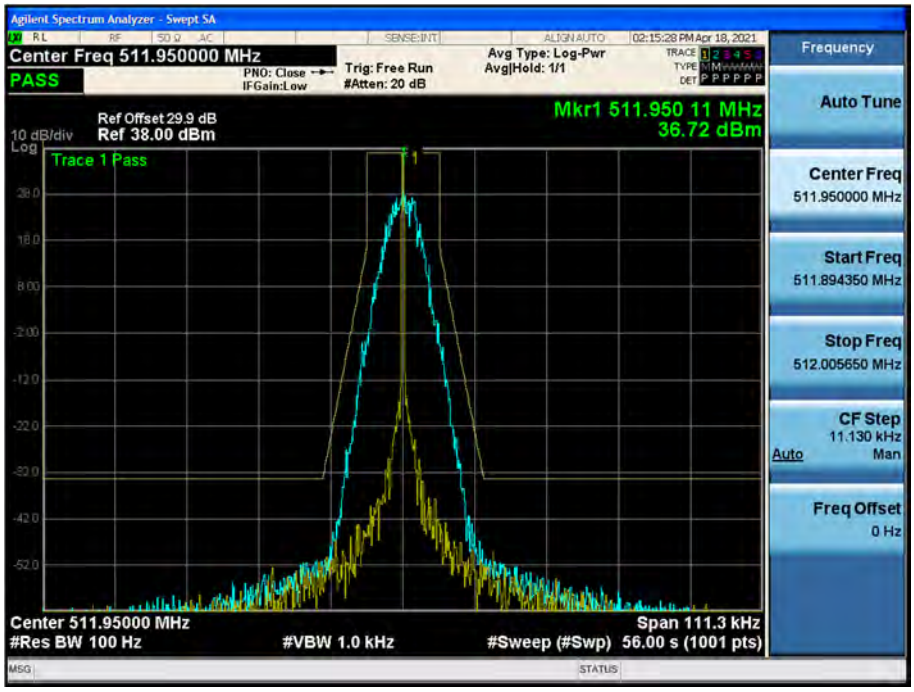
(450.05 MHz)_High



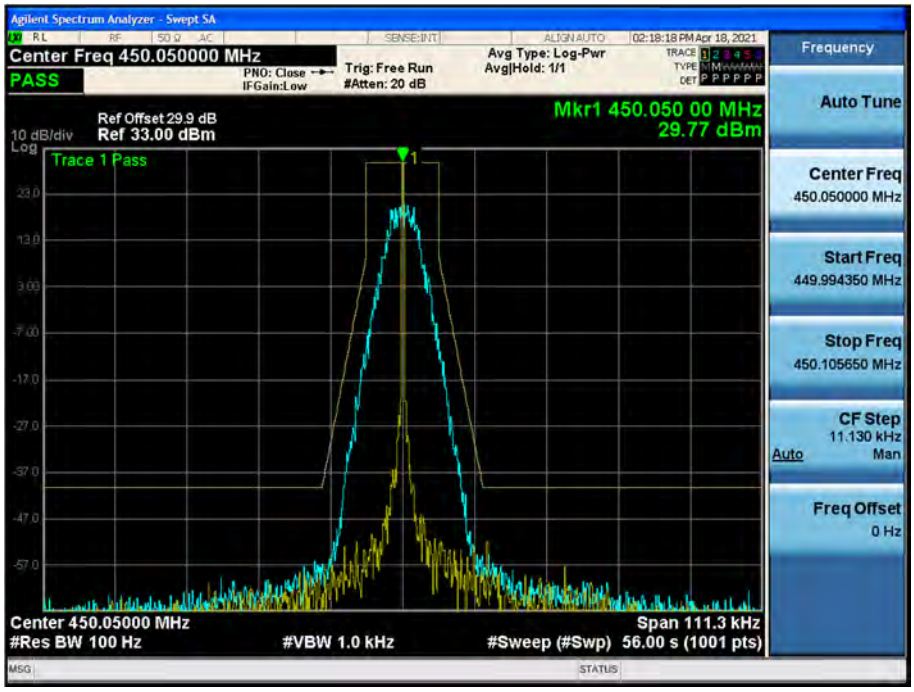
(481.05 MHz)_High



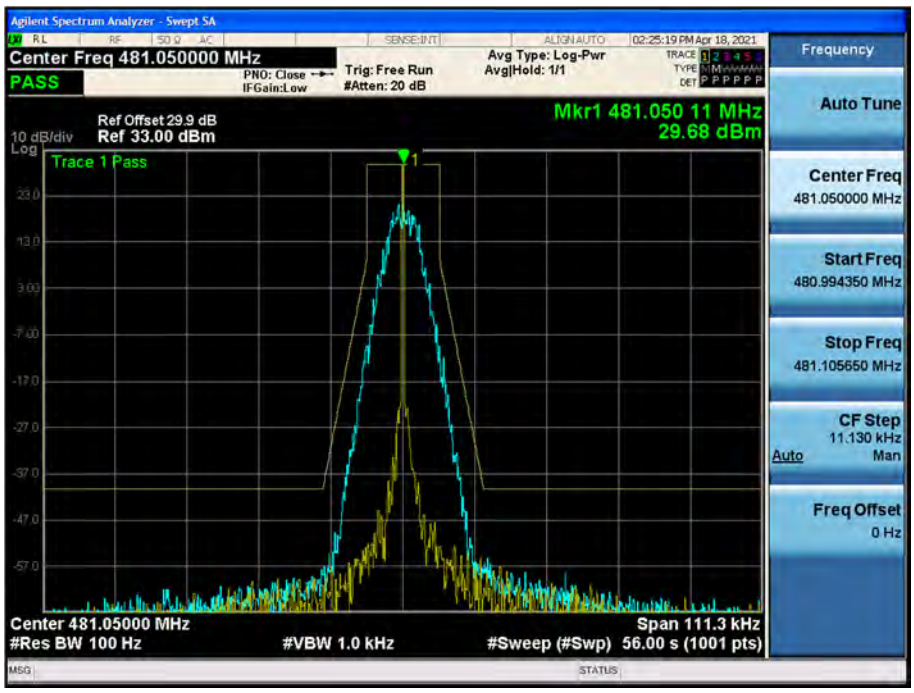
(511.95 MHz)_High



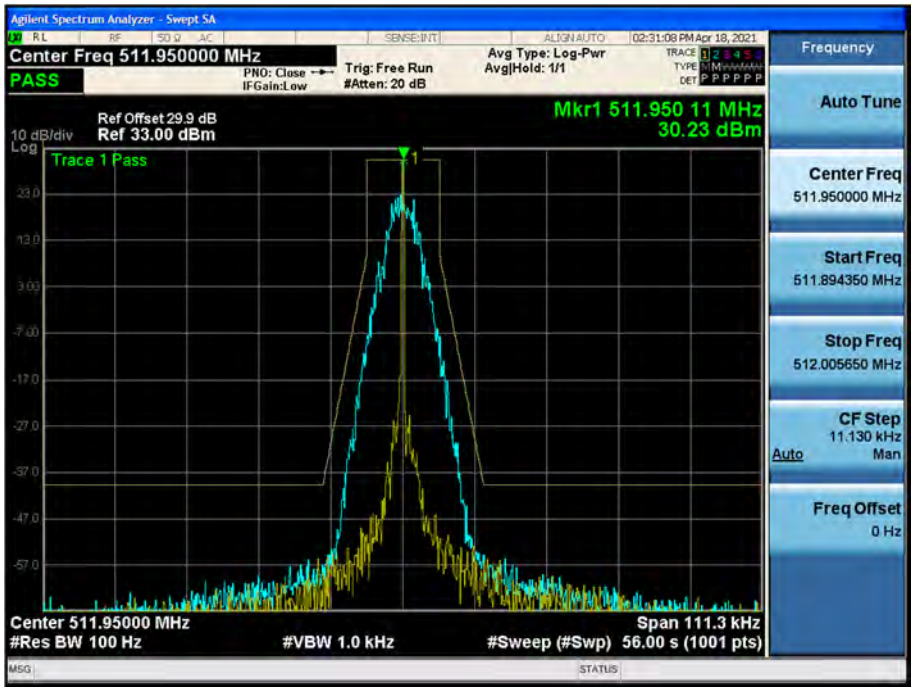
(450.05 MHz)_Low



(481.05 MHz)_Low

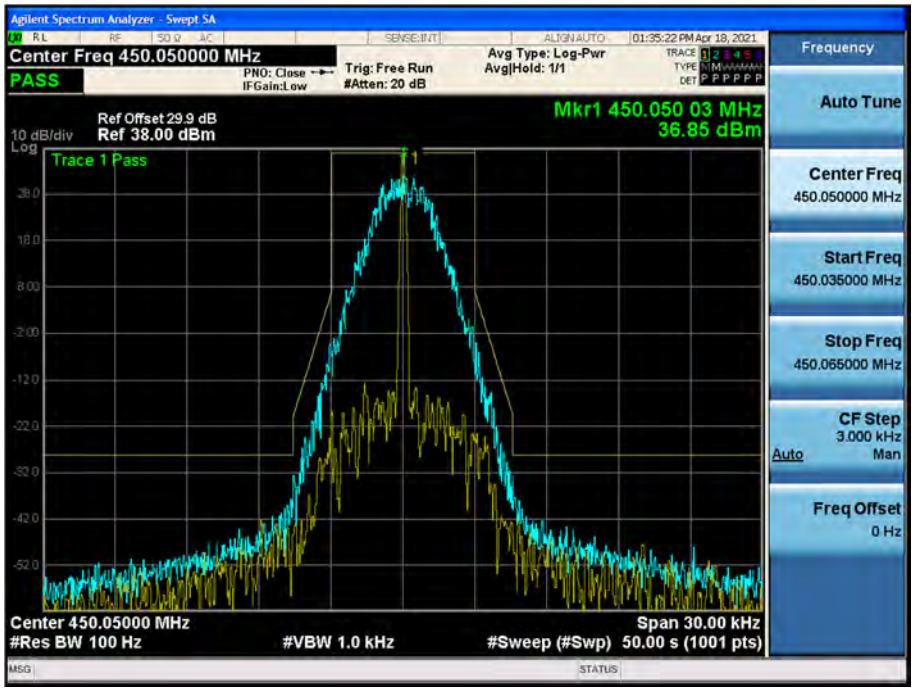


(511.95 MHz)_Low

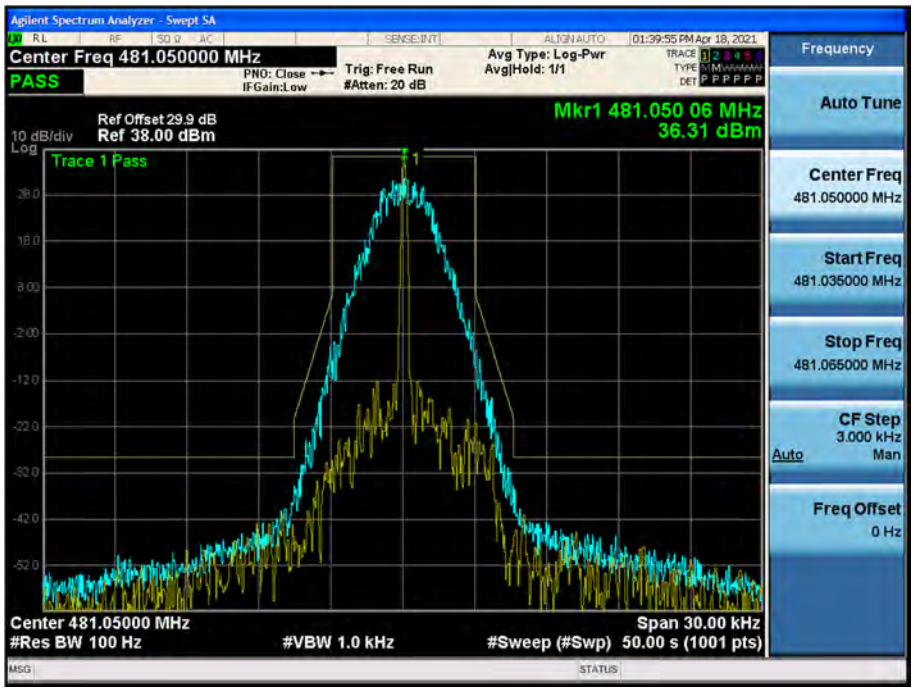


4K00F1E, 4K00F1D, 4K00F7W_FCC

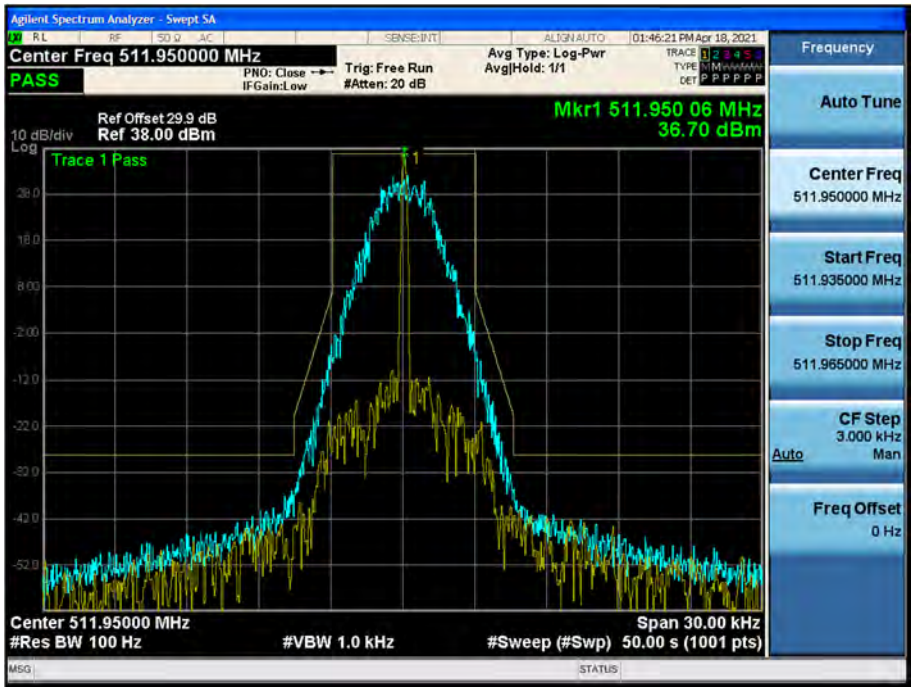
(450.05 MHz)_High



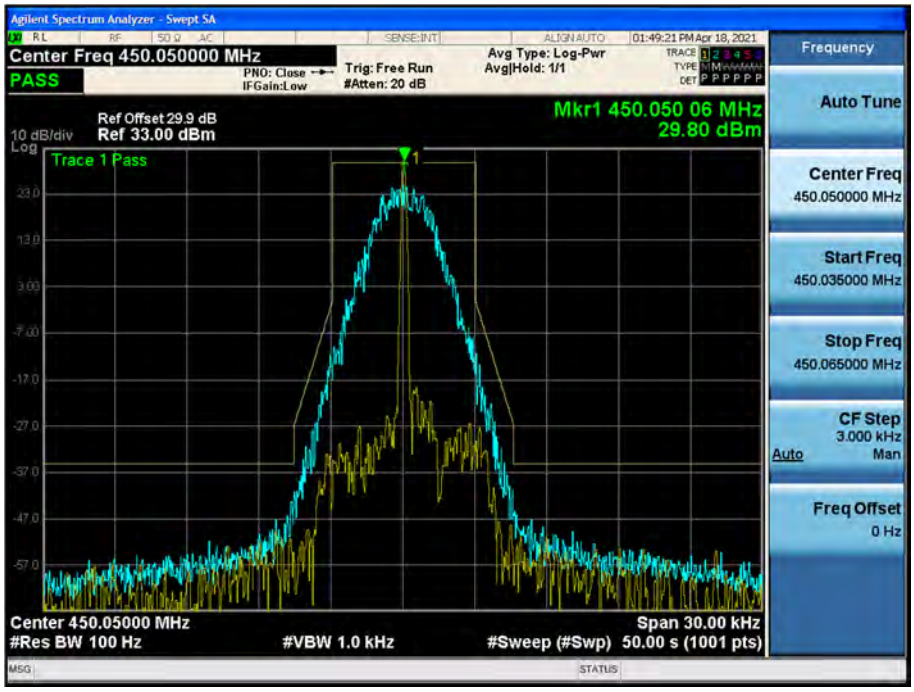
(481.05 MHz)_High



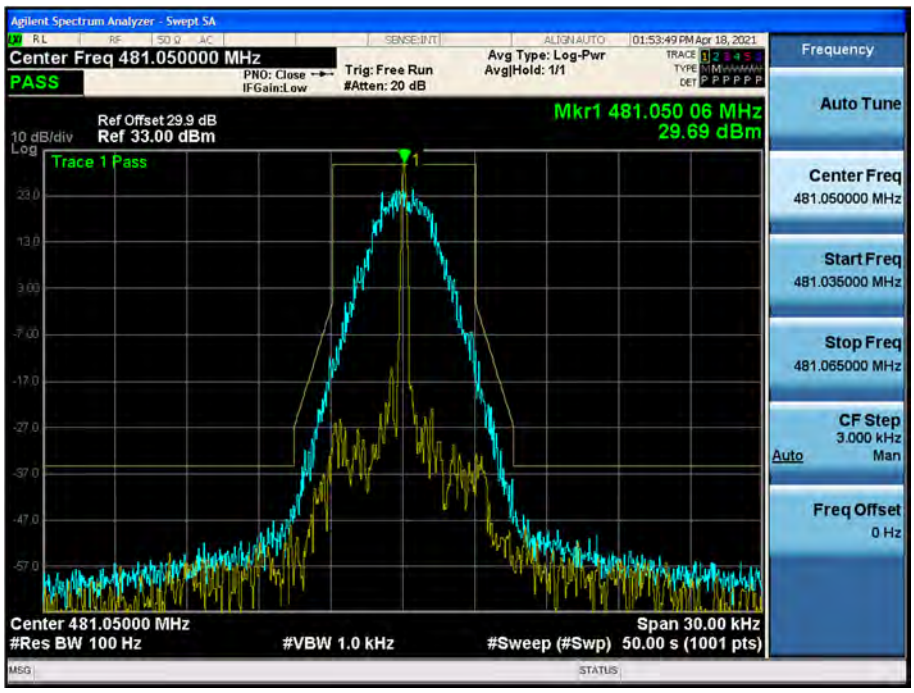
(511.95 MHz)_High



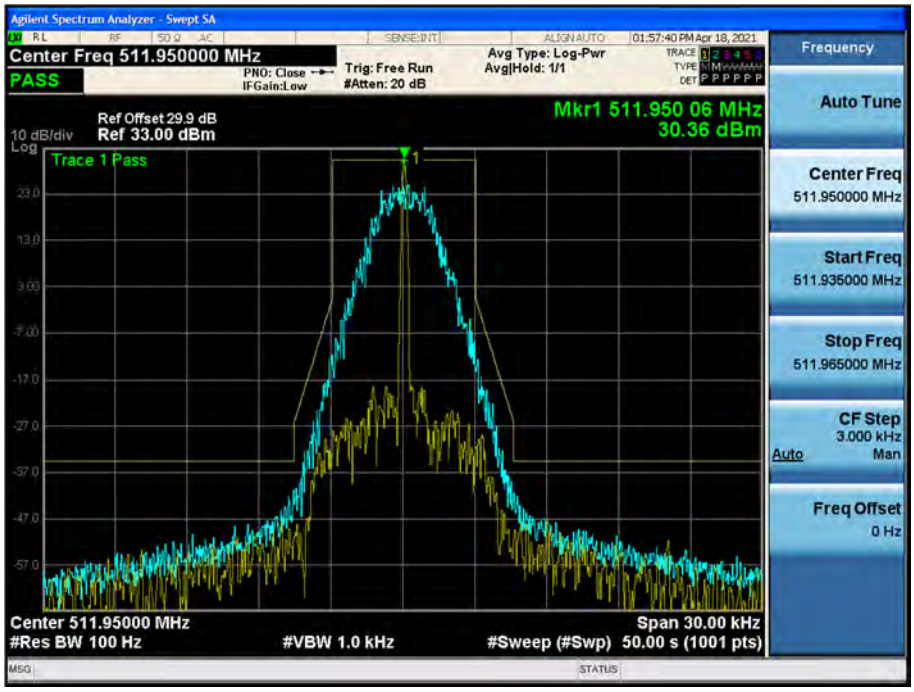
(450.05 MHz)_Low



(481.05 MHz)_Low

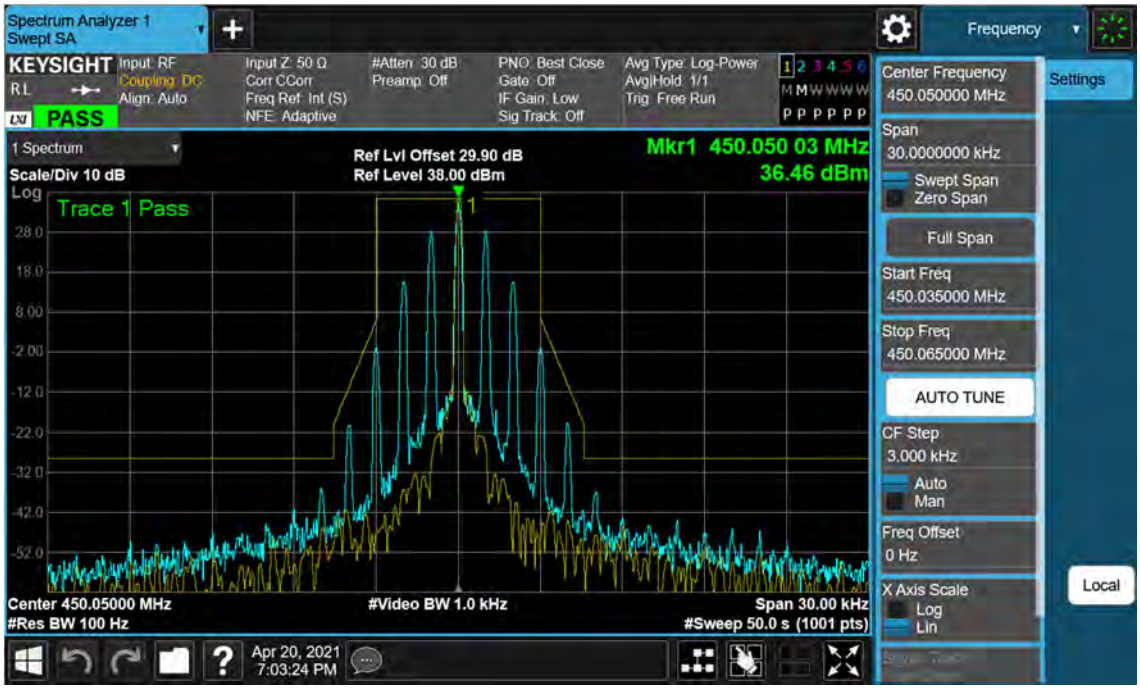


(511.95 MHz)_Low

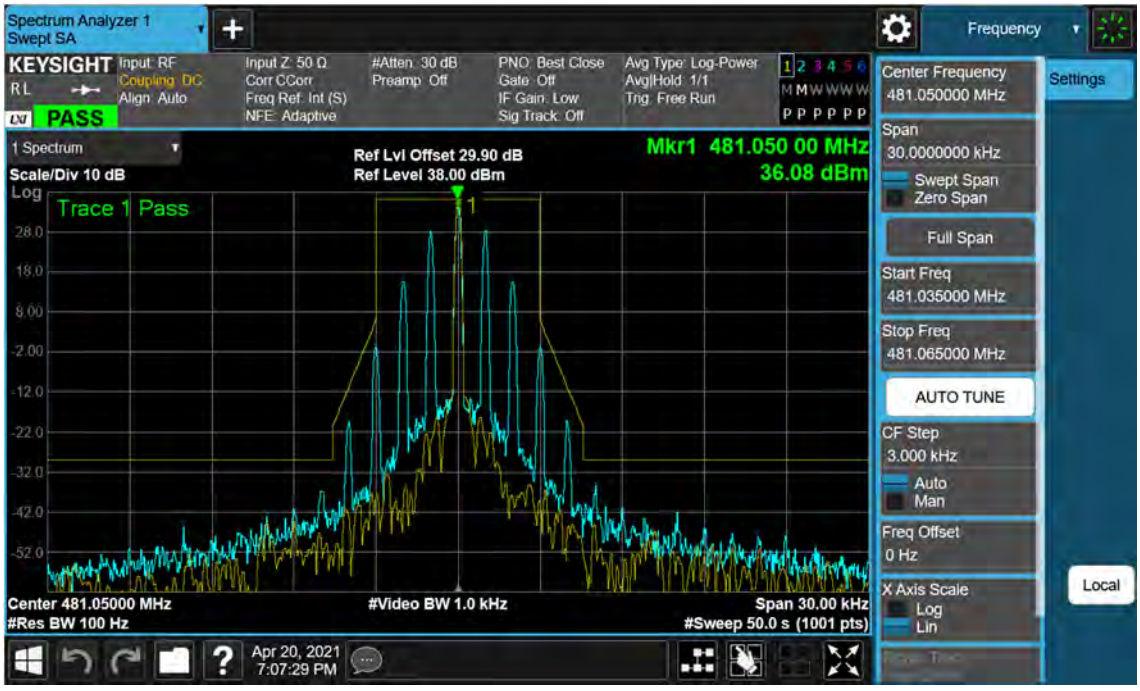


4K00F2D_FCC

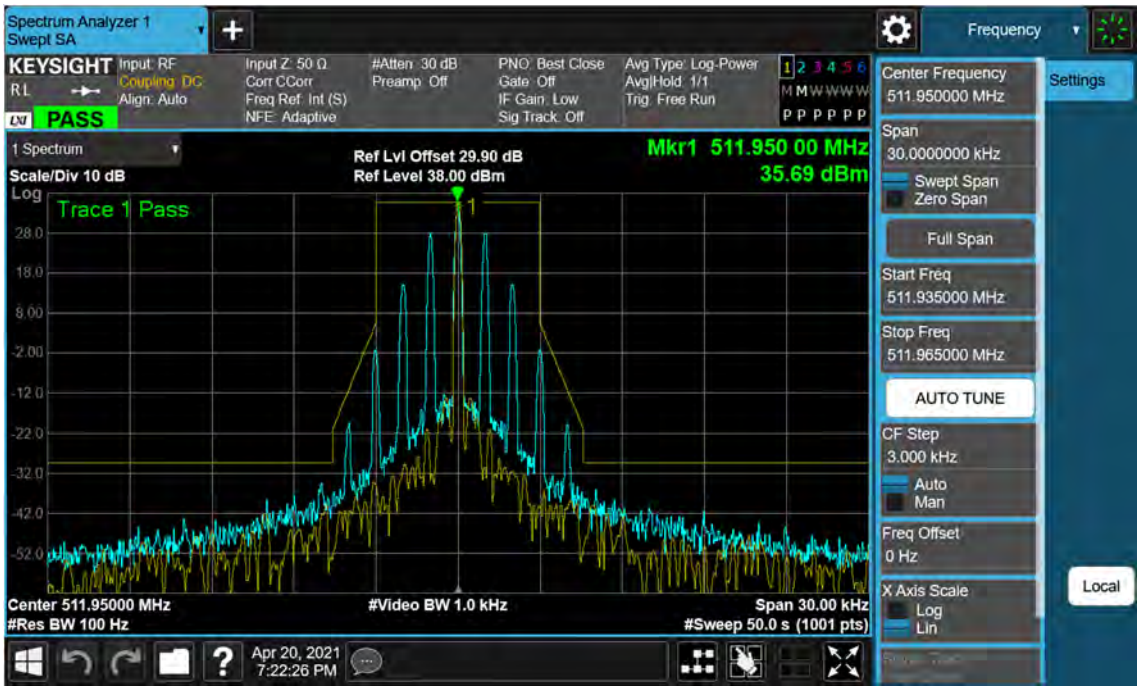
(450.05 MHz)_High



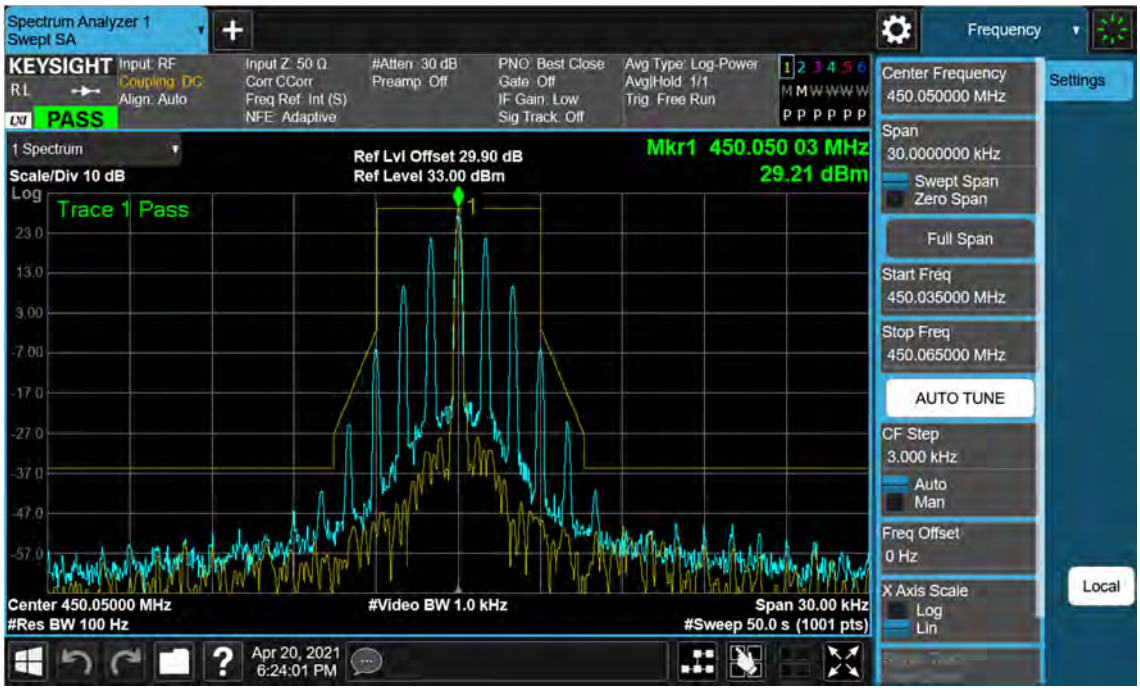
(481.05 MHz)_High



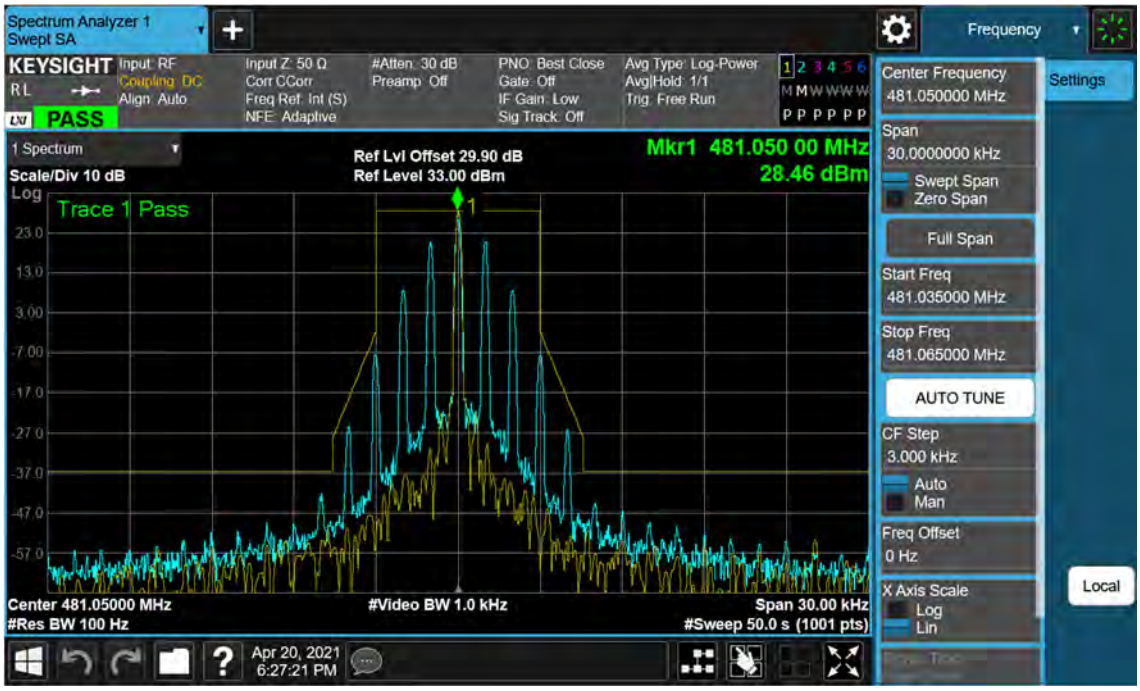
(511.95 MHz)_High



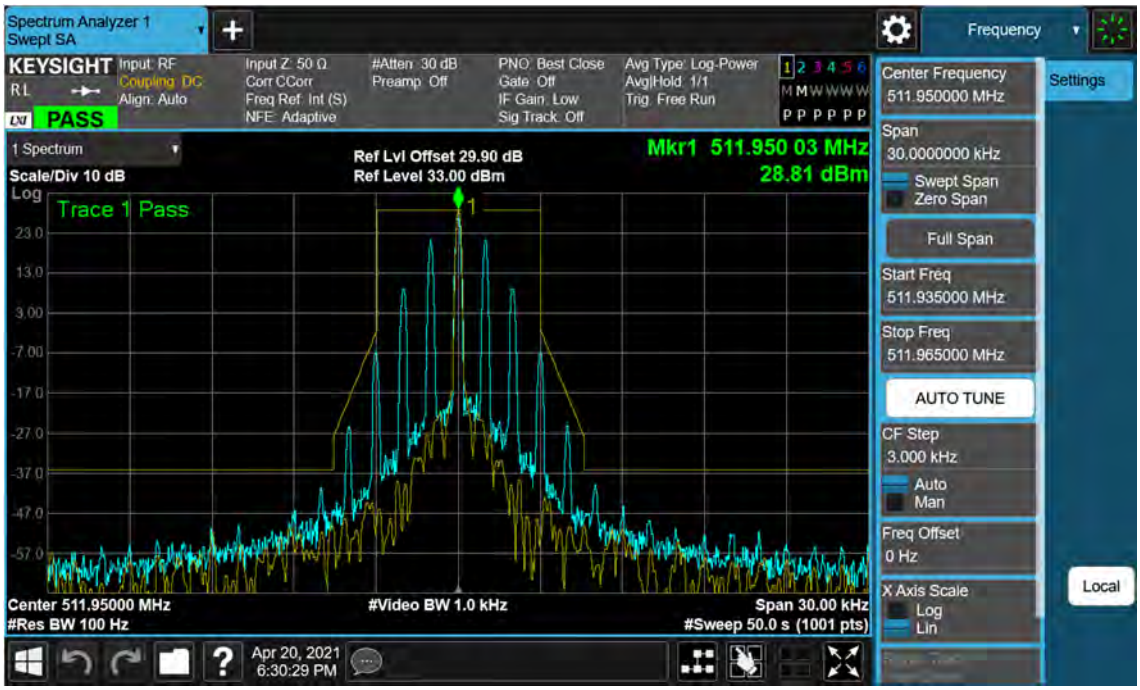
(450.05 MHz)_Low



(481.05 MHz)_Low



(511.95 MHz)_Low



8.7 Transient Frequency Behavior

▣ Definition

Transient frequency behavior is a measure of the difference, as a function in time, of the actual transmitter frequency to the assigned transmitter frequency when the transmitted RF output power is switched on or off.

▣ TEST CONFIGURATION

▣ TEST PROCEDURE

According to 2.2.19 in TIA-603-E Standard.

a) Connect the equipment as illustrated.

b) Connect the output of the standard transmitter load to the RF power meter.
Supply sufficient attenuation via the RF attenuator to provide a level that is approximately 40 dB below the maximum allowable input to the modulation domain analyzer.

c) Unkey the transmitter.

d) Disconnect the RF power meter and connect the modulation domain analyzer in its place.
Set the envelope trigger of the modulation domain analyzer to the minimum level that will trigger when the transmitter is keyed.

e) Reduce the attenuation of the RF attenuator so that the input to the modulation domain analyzer is increased by 30 dB when the transmitter is keyed.

f) Set the modulation domain analyzer to trigger on the rising edge of the waveform in order to capture a single-shot turn-on of the transmitter signal.

g) Adjust the display of the modulation domain analyzer for proper viewing of the transmitter transient behavior. Set the time base reference to the left for observing the transmitter turn-on transient.

h) Key the transmitter.

i) Observe the stored display of the modulation domain analyzer.
The signal trace shall be maintained within the allowable limits during the periods t_1 and t_2, and shall also remain within limits following t_2.

j) Adjust the modulation domain analyzer to trigger on the falling edge of the transmitter waveform in order to capture a single-shot turn-off transient of the transmitter signal.

k) Adjust the display of the modulation domain analyzer for proper viewing of the transmitter transient behavior. Set the time base reference to the right for observing the transmitter turn-off transient.

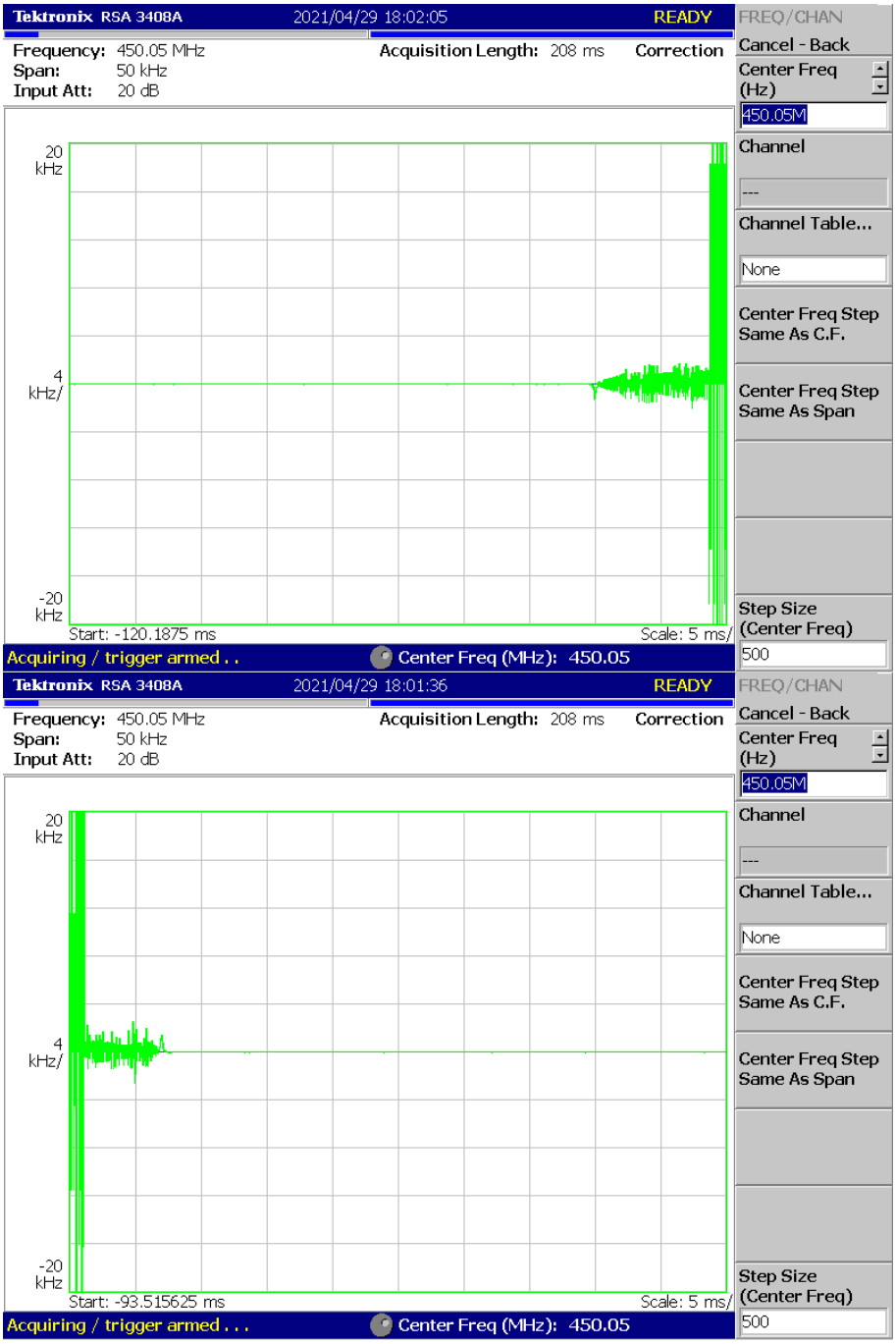
l) Unkey the transmitter.

m) Observe the stored display of the modulation domain analyzer. The signal trace shall be maintained within the allowable limits during the period t_3.

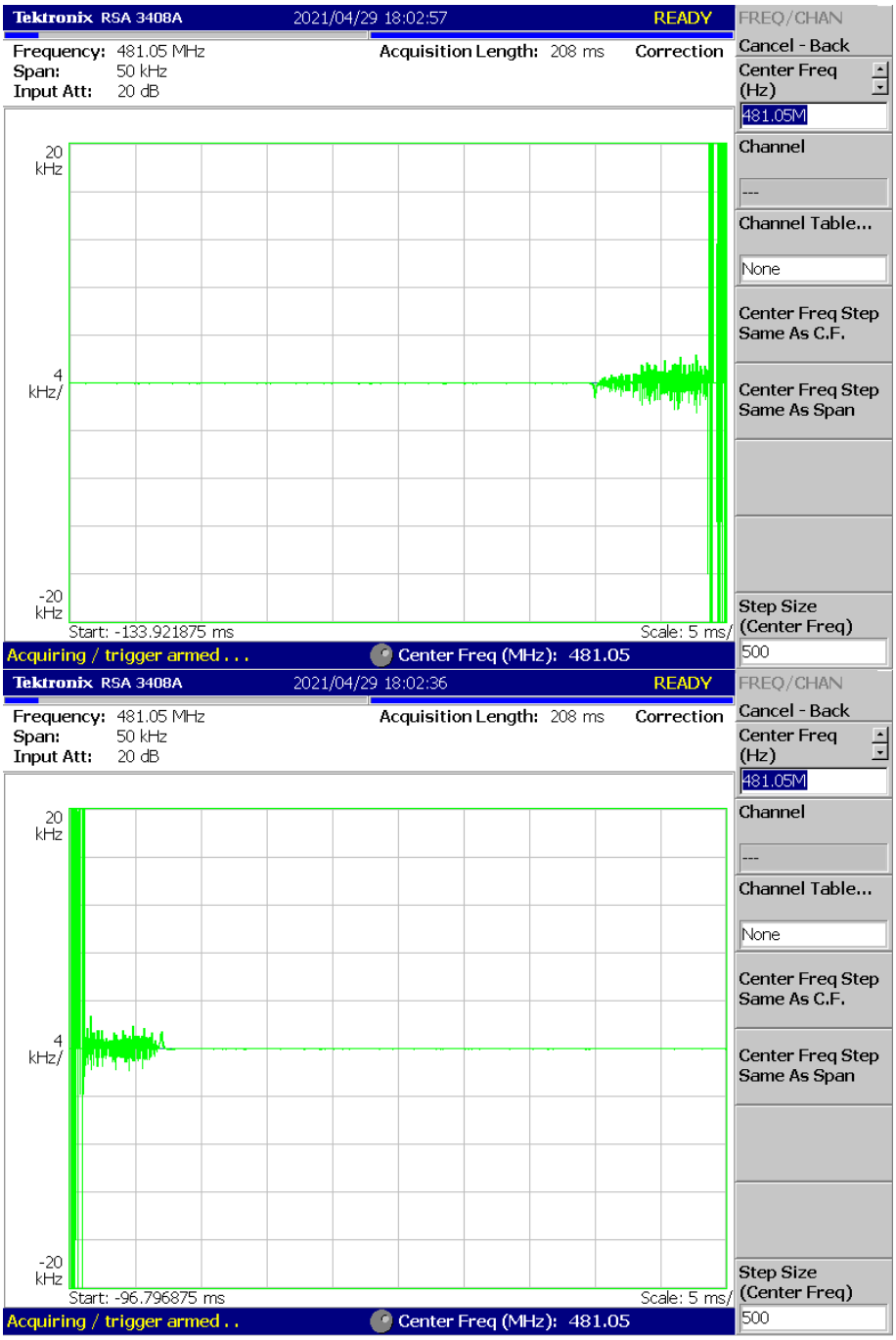
▣ Plots of Transient Frequency Behavior

16K0F3E_1W

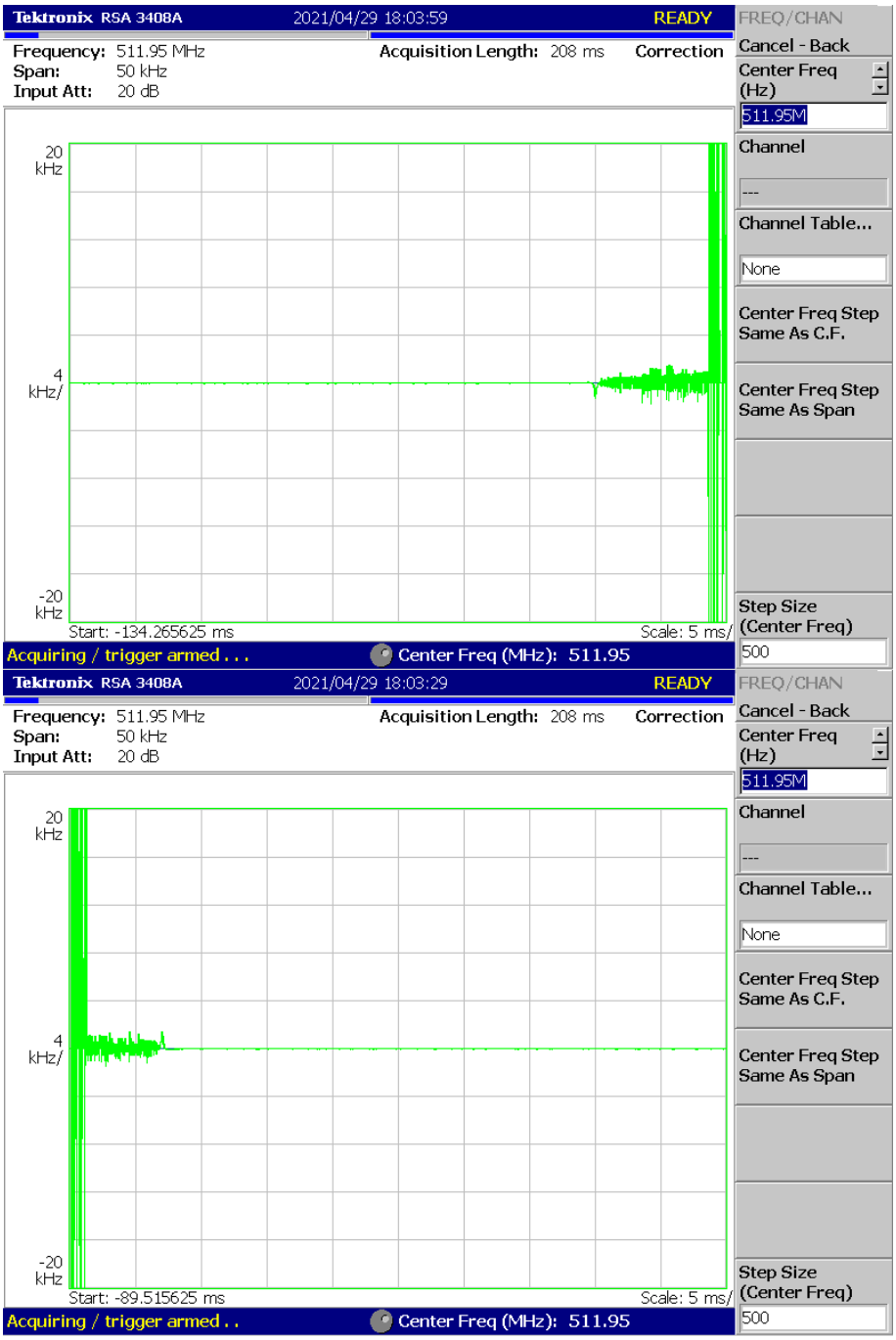
(450.05 MHz)_Low



(481.05 MHz)_ Low

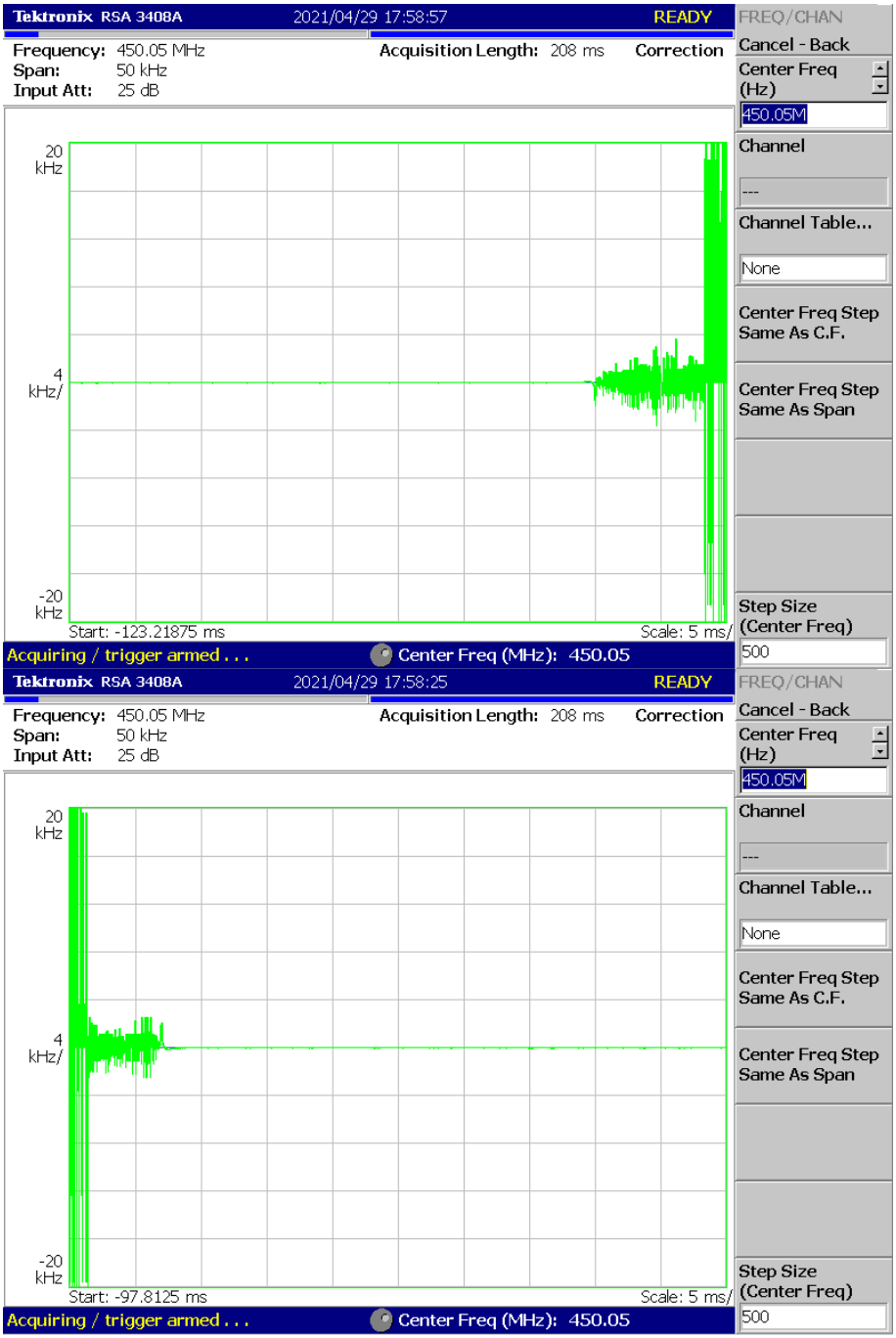


(511.95 MHz)_ Low

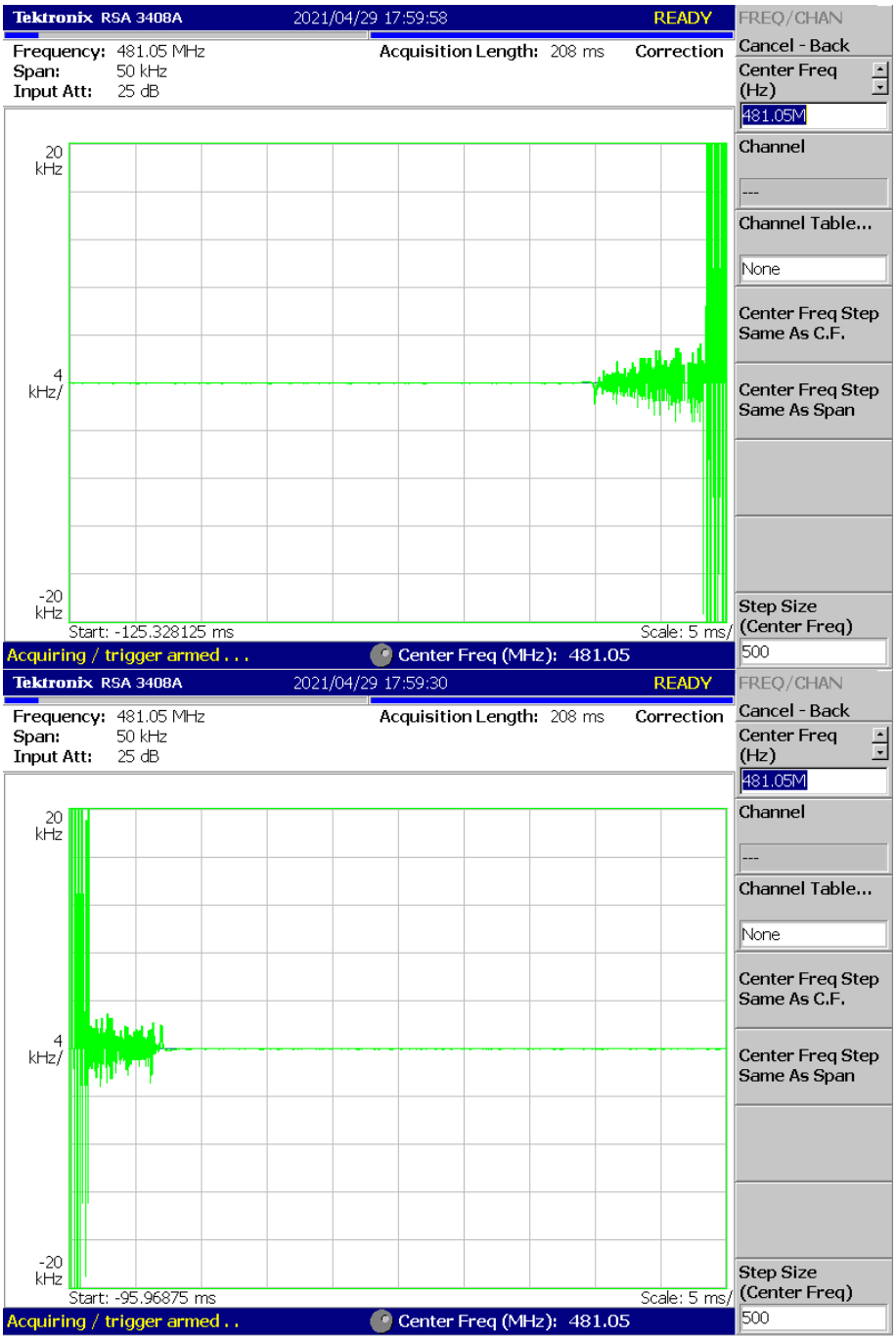


16K0F3E_2W

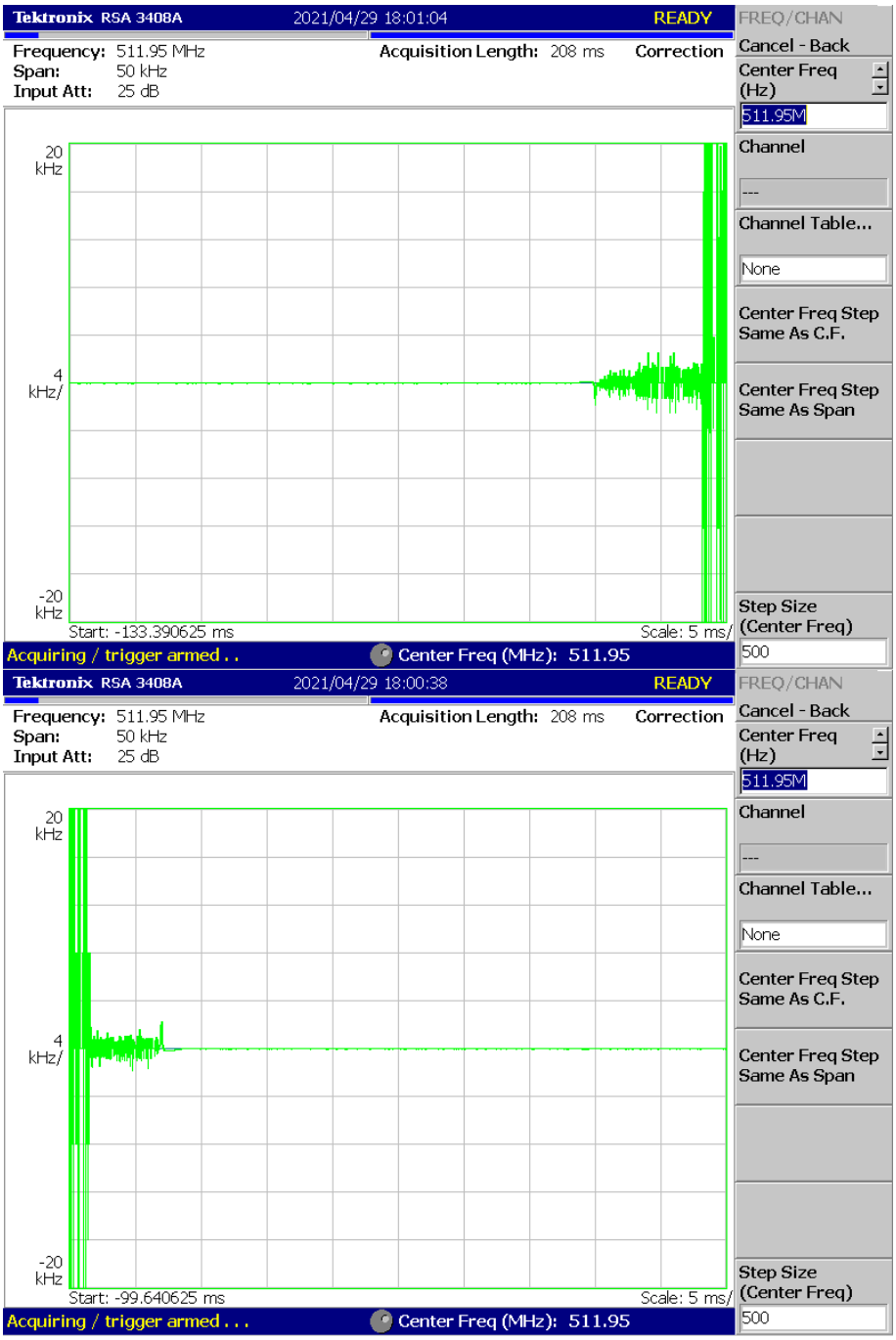
(450.05 MHz)_High



(481.05 MHz)_High

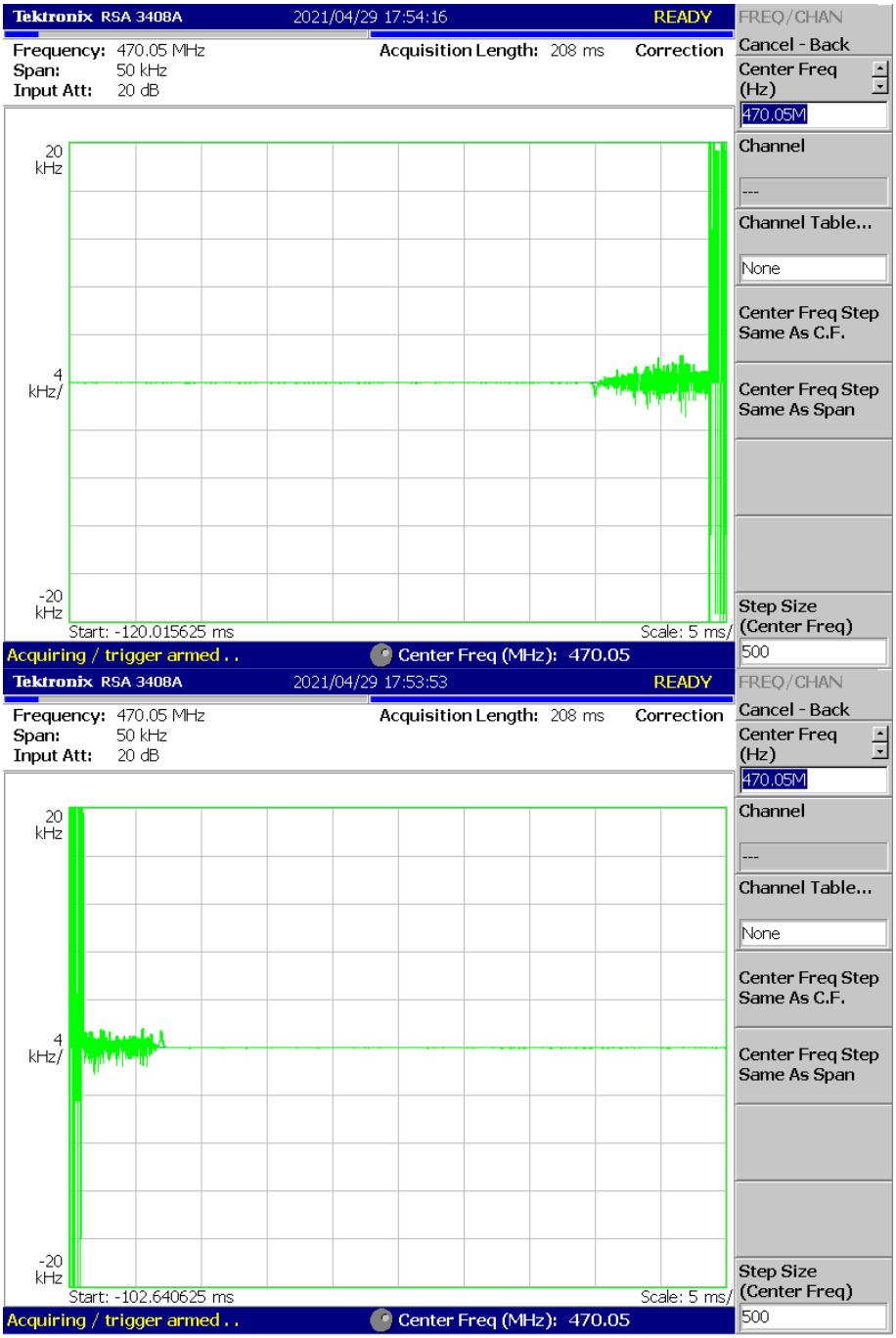


(511.95 MHz)_High

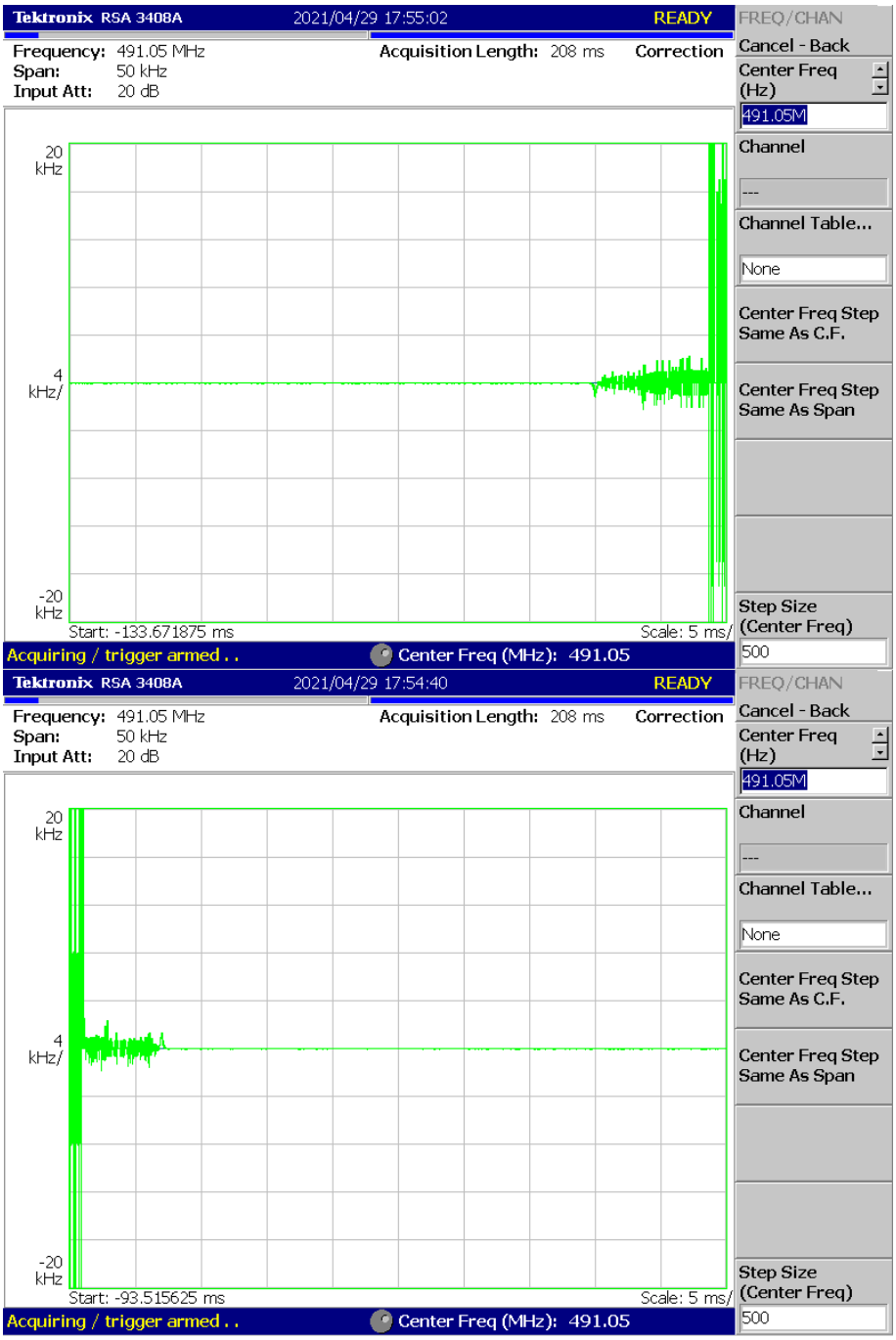


16K0F3E_1W

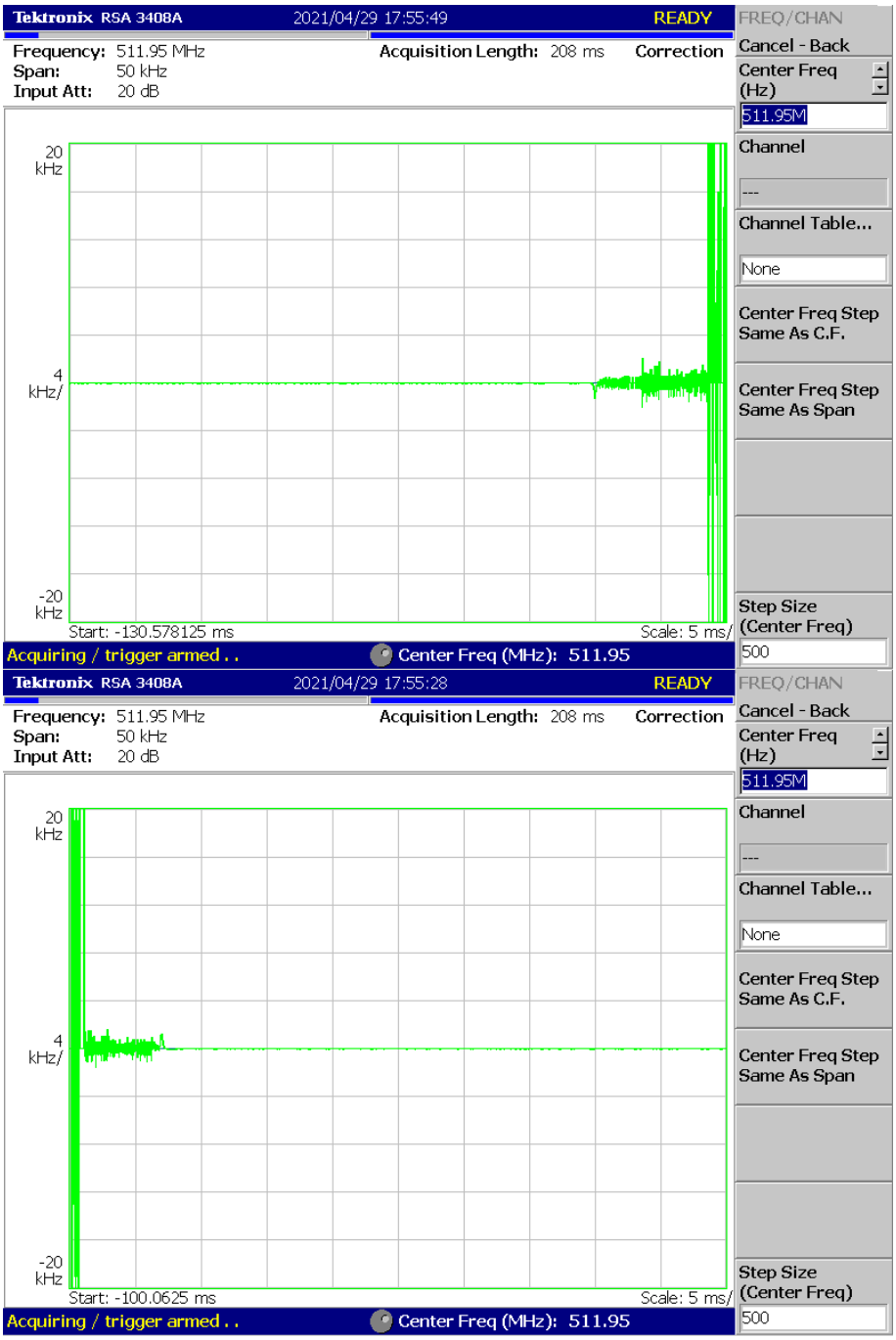
(470.05 MHz)_ Low



(491.05 MHz)_ Low

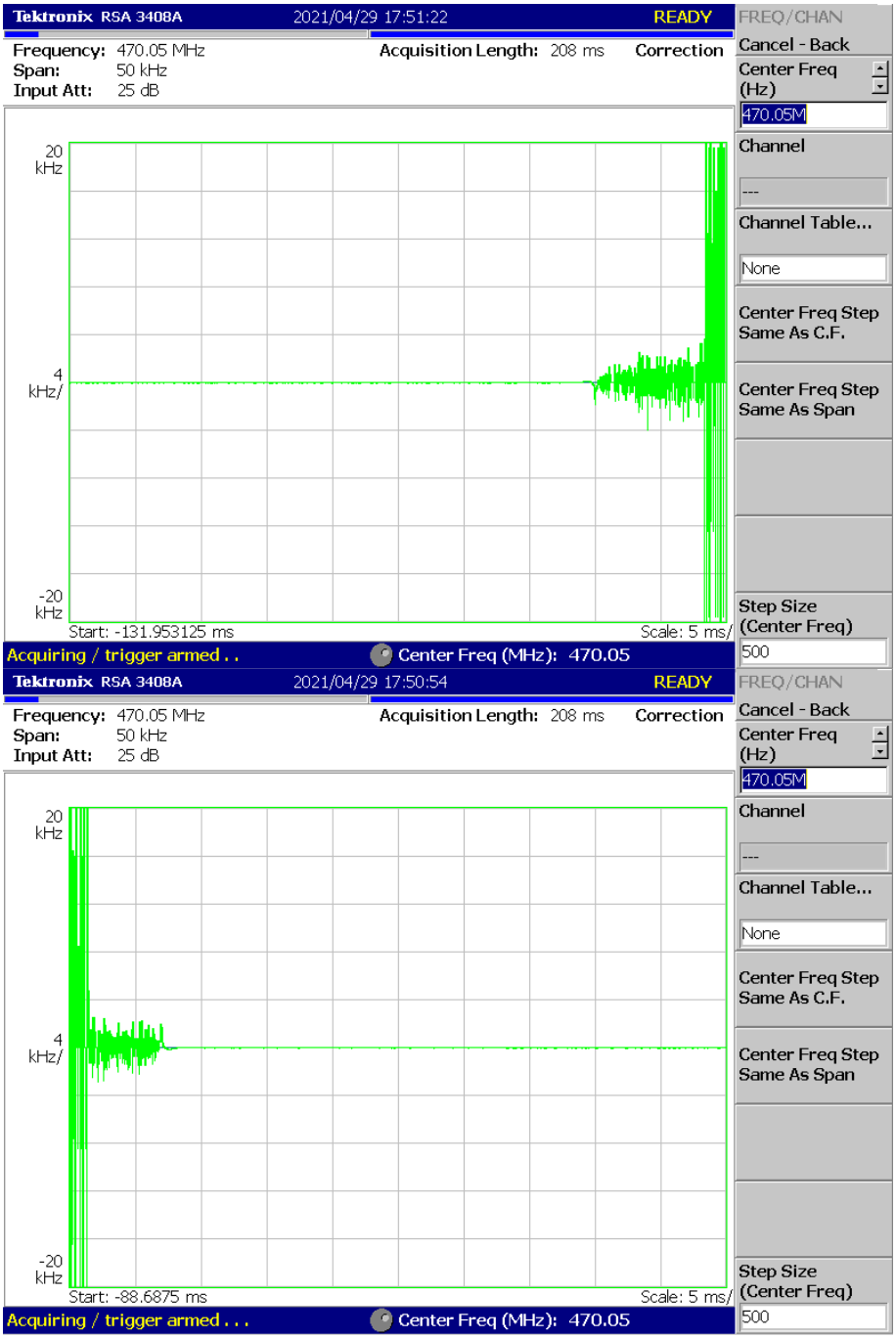


(511.95 MHz)_ Low

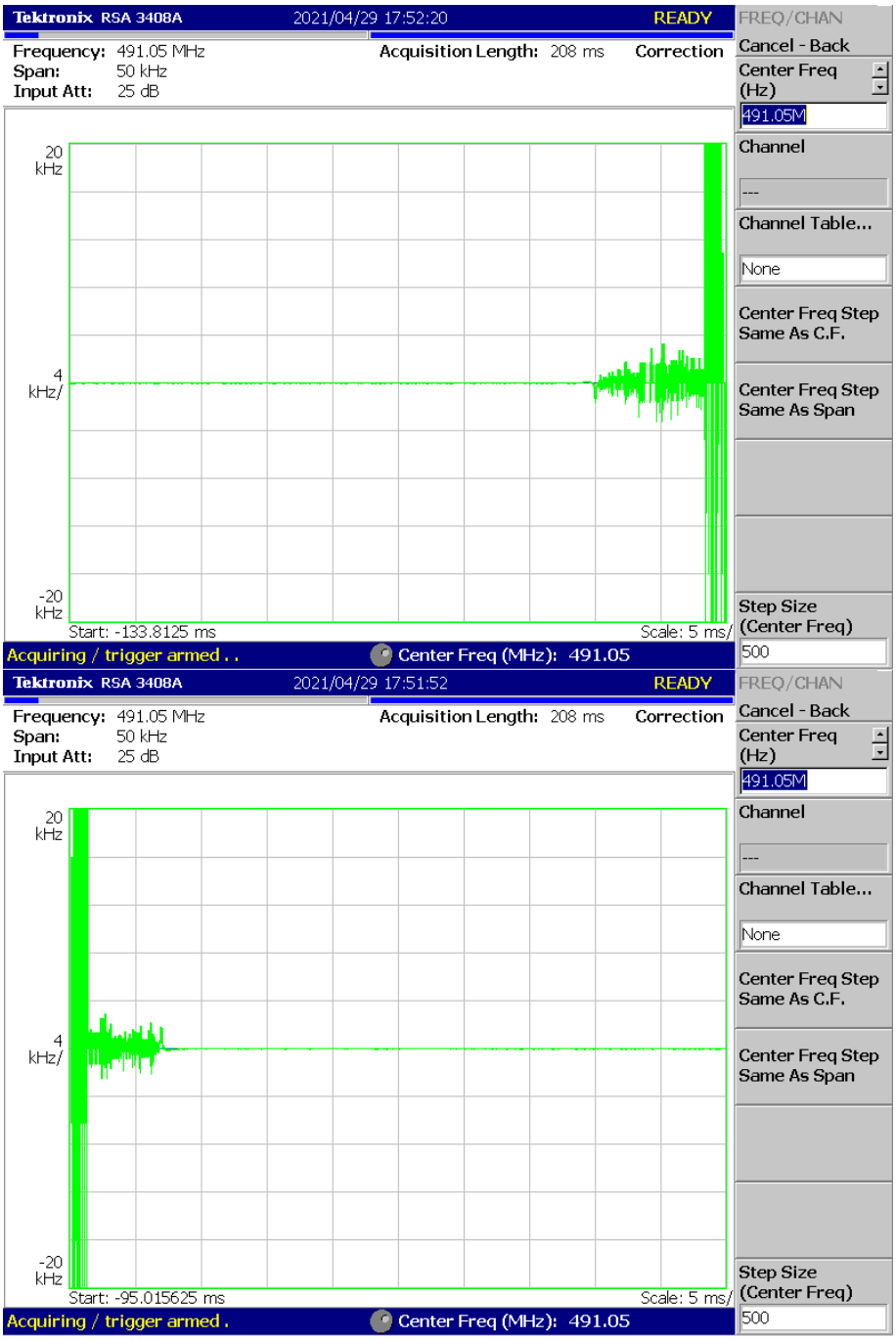


16K0F3E_5W

(470.05 MHz)_High



(491.05 MHz)_High



(511.95 MHz)_High