Test Report Serial Number:	45462009 2.0
Test Report Date:	5 May 2025
Project Number:	1682

EMC Test Report - New Filing

Applicant:

President Electronics USA
1007 Collier Center Way
Naples, FL, 34110
USA

FCC ID:
2AEOCPC220

Product Model Number / HVIN
JFK III FCC

Product Name / PMN
JFK III FCC

In Accordance With:

FCC 47 CFR Part 95 Subpart D, Part 15 Subpart B
Licensed Non-Broadcast Station Transmitter (TNB)

Approved By:

Ben Hewson, President
Celltech Labs Inc.
21-364 Lougheed Rd.
Kelowna, BC, V1X 7R8
Canada

Test Lab Certificate: 2470.01

IC Registration 3874A

FCC Registration: CA3874

Table of Contents

Table of Figures

Table of Plots

Table of Tables

1.0 REVISION HISTORY

Revision History					
Samples Tested By:	Art Voss, P.Eng.		**Date(s) of Evaluation:**	3-26 April, 2025	
Report Prepared By:	Art Voss, P.Eng.		**Report Reviewed By:**	Art Voss	
Report Revision	**Description of Revision**	**Revised Section**	**Revised By**	**Revision Date**	
1.0	Initial Release	n/a	Art Voss	20 April 2025	
2.0	Correct FCC ID	Cover	Art Voss	5 May 2025	
	Clarified Receiver Emissions	12.0			

2.0 APPLICANT AND DUT INFORMATION

Client Information	
Applicant Name (FCC)	**President Electronics USA**
Applicant Address (FCC)	1007 Collier Center Way
	Naples, FL, 34110
	USA
DUT Information	
Device Identifier(s):	**FCC ID:** **2AEOCPC220**
Device Type:	Mobile 4W AM / FM CBRS Transceiver
Device Model(s) / HVIN:	JFK III FCC
Device Marketing Name / PMN:	JFK III FCC
Firmware Version ID Number / FVIN:	-
Host Marketing Name / HMN:	-
Test Sample Serial No.:	TA Sample No. 1
Equipment Class (FCC):	Licensed Non-Broadcast Station Transmitter (TNB)
Transmit Frequency Range:	26.965MHz - 27.405MHz
Test Channels:	40 Channels
Manuf. Max. Rated Output Power:	4W (36dBm) DSB
Manuf. Max. Rated BW/Data Rate:	8kHz DSB
Antenna Make and Model:	n/a
Antenna Type and Gain:	0dBi (Typical), 3dBi (Max)
Modulation:	AM / FM
Mode:	Simplex
DUT Power Source:	12VDC
DUT Dimensions [WxLxH]	115mm x 150mm x45mm
Deviation(s) from standard/procedure:	None
Modification of DUT:	None

3.0 SCOPE

Preface:

This Certification Report was prepared on behalf of:

President Electronics USA

,(the '*Applicant*"), in accordance with the applicable Federal Communications Commission (FCC) CFR 47 and Innovation, Scientific and Economic Development (ISED) Canada rules parts and regulations (the '*Rules*'). The scope of this investigation was limited to only the equipment, devices and accessories (the '*Equipment*') supplied by the *Applicant*. The tests and measurements performed on this *Equipment* were only those set forth in the applicable *Rules* and/or the Test and Measurement Standards they reference. The *Rules* applied and the Test and Measurement Standards used during this evaluation appear in the Normative References section of this report. The limits set forth in the technical requirements of the applicable *Rules* were applied to the measurement results obtained during this evaluation and ,unless otherwise noted, these limits were used as the Pass/Fail criteria. The Pass/Fail statements made in this report apply to only the tests and measurements performed on only the *Equipment* tested during this evaluation. Where applicable and permissible, information including test and measurement data and/or results from previous evaluations of same or similar equipment, devices and/or accessories may be cited in this report.

Device Description:

The JFK III FCC is Mobile 4W AM / FM CBRS Transceiver.

Application:

This is an application for a New Certification, Single.

Regulatory Requirement:

As per FCC 47 CFR 2 Subpart I , Equipment Authorization is require for this *Equipment* by means of Certification in accordance with FCC 47 CFR §95 Subpart D, (CBRS), and ANSI C63.26.

Scope of Work:

The scope of this investigation is limited only to the evaluation of the JFK III FCC to determine compliance to the *Rules* identified herein.

RF Exposure:

The JFK III FCC is a mobile transceiver. As per FCC 47 CFR §2.1091, an RF Exposure (MPE) evaluation is required for this *Equipment* and the results of the RF Exposure (MPE) evaluation appear in a separate report.

4.0 TEST RESULT SUMMARY

TEST SUMMARY					
Referenced Standard(s):		**FCC CFR Title 47 Parts 2, 95D, 15B**			
Section	**Description of Test**	**Procedure Reference**	**Applicable Rule Part(s) FCC**	**Test Date**	**Result**
7.0	Conducted Power (Fundamental) Compliance to §2.1033(c)(8)	ANSI/TIA/EIA-382-A ANSI/TIA-603-E ANSI C63.26:2015 ANSI C63.4:2014	§2.1046 §2.1033(c)(8) §95.967	23 Apr 2025	**Complies**
8.0	Modulation Response	ANSI/TIA/EIA-382-A ANSI/TIA-603-E ANSI C63.26:2015 ANSI C63.4:2014	§2.1047 §95.975 §95.977	23-24 Apr 2025	**Complies**
9.0	Occupied Bandwidth	ANSI/TIA/EIA-382-A ANSI C63.26:2015 ANSI C63.4:2014	§2.1049 §95.973	25 Apr 2025	**Complies**
	Emission Mask	ANSI/TIA/EIA-382-A ANSI C63.26:2015 ANSI C63.4:2014	§2.1049 §95.979	25 Apr 2025	**Complies**
10.0	Conducted TX Spurious Emissions	ANSI/TIA/EIA-382-A ANSI C63.26:2015 ANSI C63.4:2014	§2.1051 §95.979	25 Apr 2025	**Complies**
11.0	Radiated TX Spurious Emissions	ANSI/TIA/EIA-382-A ANSI C63.26:2015 ANSI C63.4:2014	§2.1053 §95.979	3 Apr 2025	**Complies**
12.0	Radiated Receiver Emissions	ANSI C63.26:2015 ANSI C63.4:2014	§15 Subpart B §15.109(d)	3 Apr 2025	**Complies**
13.0	Frequency Stability	ANSI/TIA/EIA-382-A ANSI C63.26:2015 ANSI C63.4:2014	§2.1055 §95.965	26 Apr 20245	**Complies**

Test Station Day Log					
Date	Ambient Temp (°C)	Relative Humidity (%)	Barometric Pressure (kPa)	Test Station	Tests Performed Section(s)
3 Apr 2025	9.0	46	101.8	**OATS**	**11, 12**
23 Apr 2025	21.6	30	100.9	**EMC**	**7, 8**
24 Apr 2025	20.0	38	101.1	**EMC**	**8**
25 Apr 2025	16.0	35	101.3	**EMC**	**9, 10**
26 Apr 2025	22.1	16	101.5	**TC**	**13**

EMC - EMC Test Bench
OATS - Open Area Test Site
LISN - LISN Test Area
IMM - Immunity Test Area
SAC - Semi-Anechoic Chamber
TC - Temperature Chamber
ESD - ESD Test Bench
RI - Radiated Immunity Chamber

I attest that the data reported herein is true and accurate within the tolerance of the Measurement Instrument Uncertainty; that all tests and measurements were performed in accordance with accepted practices or procedures; and that all tests and measurements were performed by me or by trained personnel under my direct supervision. The results of this investigation are based solely on the test sample(s) provided by the client which were not adjusted, modified or altered in any manner whatsoever, except as required to carry out specific tests or measurements. This test report has been completed in accordance with ISO/IEC 17025.

Art Voss, P.Eng.
Technical Manager
Celltech Labs Inc.

20 April 2025
Date

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. F. VOSS
31327

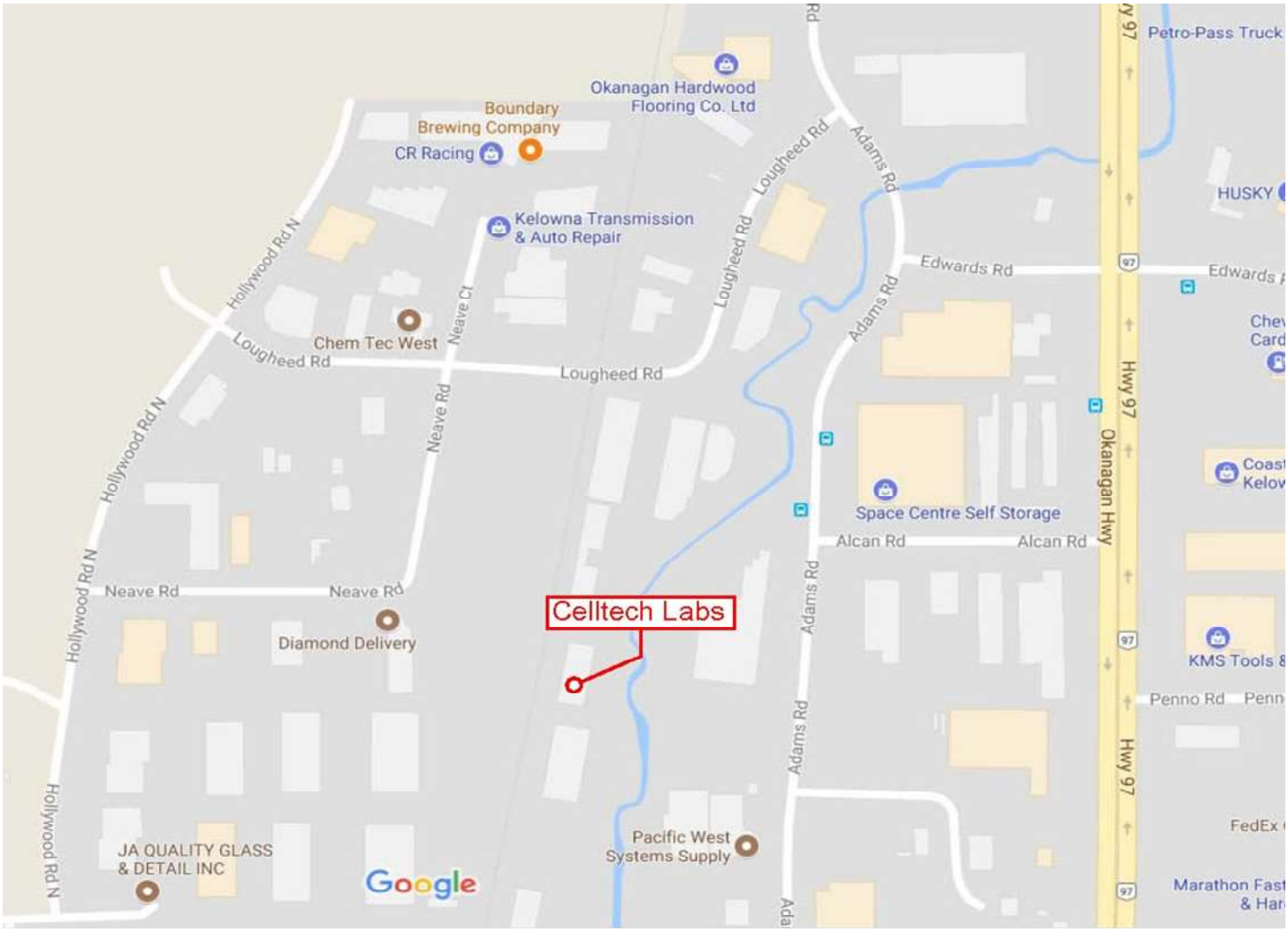
5.0 NORMATIVE REFERENCES

Normative References	
ISO/IEC 17025:2017	General requirements for the competence of testing and calibration laboratories
ANSI C63.4-2014	American National Standard of Procedures for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electric and Electronic Equipment in the Range of 9kHz to 40GHz
ANSI C63.26-2015	American National Standard of Procedures for Compliance Testing of Transmitters Used in Licensed Radio Services
ANSI/TIA-382-A	Minimum Standards - Citizens Band Radio Service Amplitude Modulated (AM) Transceivers Operating in the 27 MHz Band (Revision of EIA-382)
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards (Revision of TIA-603-D)
CFR	Code of Federal Regulations
Title 47:	Telecommunication
Part 2:	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR	Code of Federal Regulations
Title 47:	Telecommunication
Part 2:	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Subpart (2.1091):	Radiofrequency radiation exposure evaluation: mobile devices.
CFR	Code of Federal Regulations
Title 47:	Telecommunication
Part 15:	Radio Frequency Devices
Subpart B:	Unintentional Radiators
CFR	Code of Federal Regulations
Title 47:	Telecommunication
Part 95:	Personal Radio Service
Subpart D:	Citizens Band Radio Service (CBRS)

6.0 FACILITIES AND ACCREDITATIONS

Facility and Accreditation:

The facilities used to evaluate this device outlined in this report are located at 21-364 Lougheed Road, Kelowna, British Columbia, Canada V1X 7R8. The radiated emissions site (OATS) conforms to the requirements set forth in ANSI C63.4 and is filed and listed with the FCC under Test Firm Registration Number CA3874 and Industry Canada under Test Site File Number IC 3874A. Celltech is accredited to ISO 17025, through accrediting body A2LA and with certificate 2470.01.



7.0 CONDUCTED POWER

Test Procedure	
Normative Reference	**FCC 47 CFR §2.1046, §2.1033(c)(8), §95.967, RSS-236** **EIA/TIA-382-A, TIA-603-E**

Limits	
47 CFR §95.967	(a) When transmitting amplitude modulated (AM) voice signals or frequency modulated (FM) voice signals, the mean carrier power must not exceed 4 Watts.
RSS-236 4.6	The transmitter output power shall not exceed 4.0 watts for a DSB or FM signals.

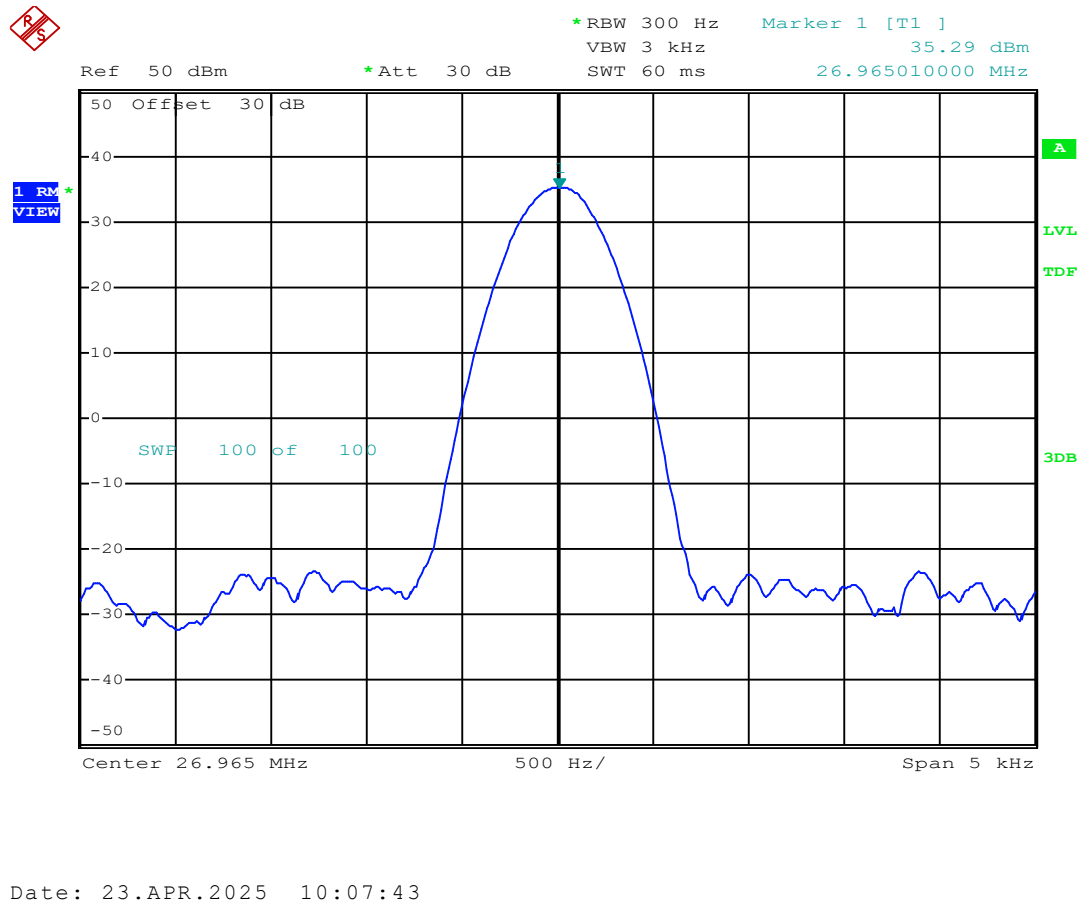
General Procedure	
EIA/TIA-382-A	**19. TRANSMITTER CARRIER POWER OUTPUT** Transmitter Carrier Power Output for this service is the power (rms) available at the output terminals of the transmitter when the output terminals are connected to a standard output load. This measurement shall be performed without modulation, at standard test. conditions.
TIA-603-E	**2.2.1 Conducted Carrier Output Power Rating** 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 Setup	Appendix A - Figure A.1

Measurement Procedure
The DUT was connected to a Spectrum Analyzer (SA) via a 30dB attenuator connected to the DUT's antenna port. The SA was configured as above using the Automatic 6dB Cursor Bandwidth measurement. The output power of the DUT was set to the manufacturer's highest output power setting at the Low, Mid and High frequency channels as permitted by the device. The DUT was set to transmit at its maximum Duty Cycle.

Plot 7.1 – Conducted Output Power, Channel 1, AM, 4W

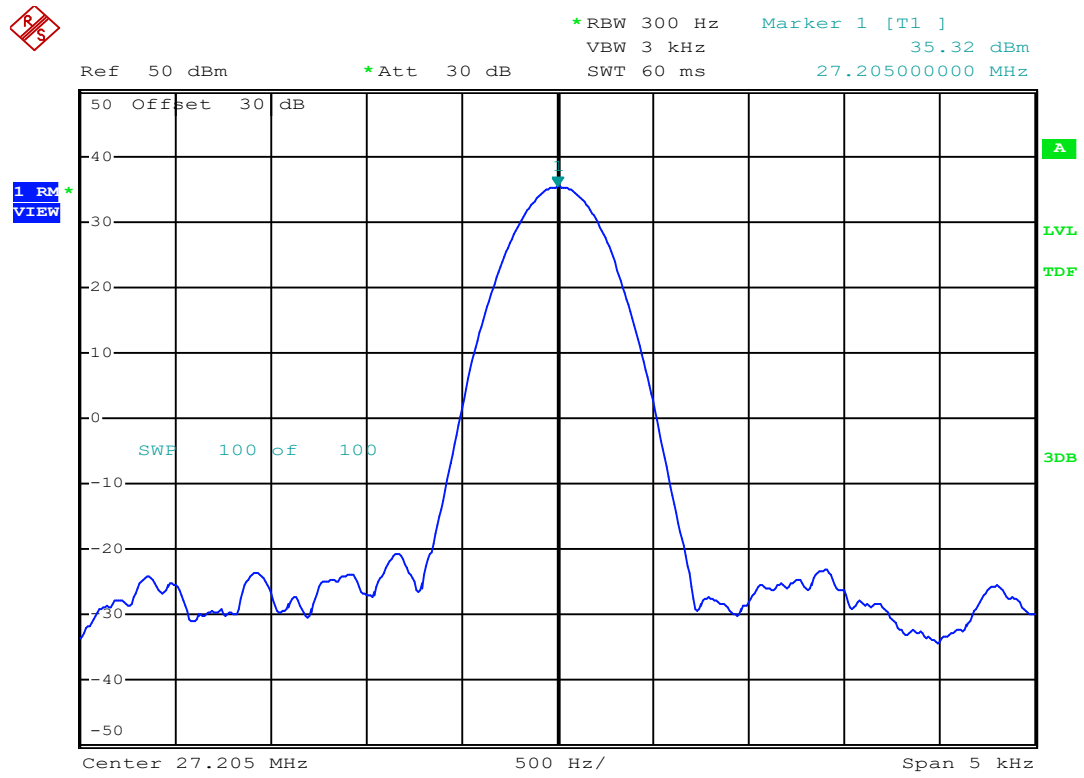
Conducted Power:



Channel:	**1**	**Channel Frequency:**	**26.965** **MHz**
Mode:	**AM**	**Modulation:**	**AM**
		Measured Power:	**35.29** **dBm**

Plot 7.2 – Conducted Output Power, Channel 20, AM, 4W

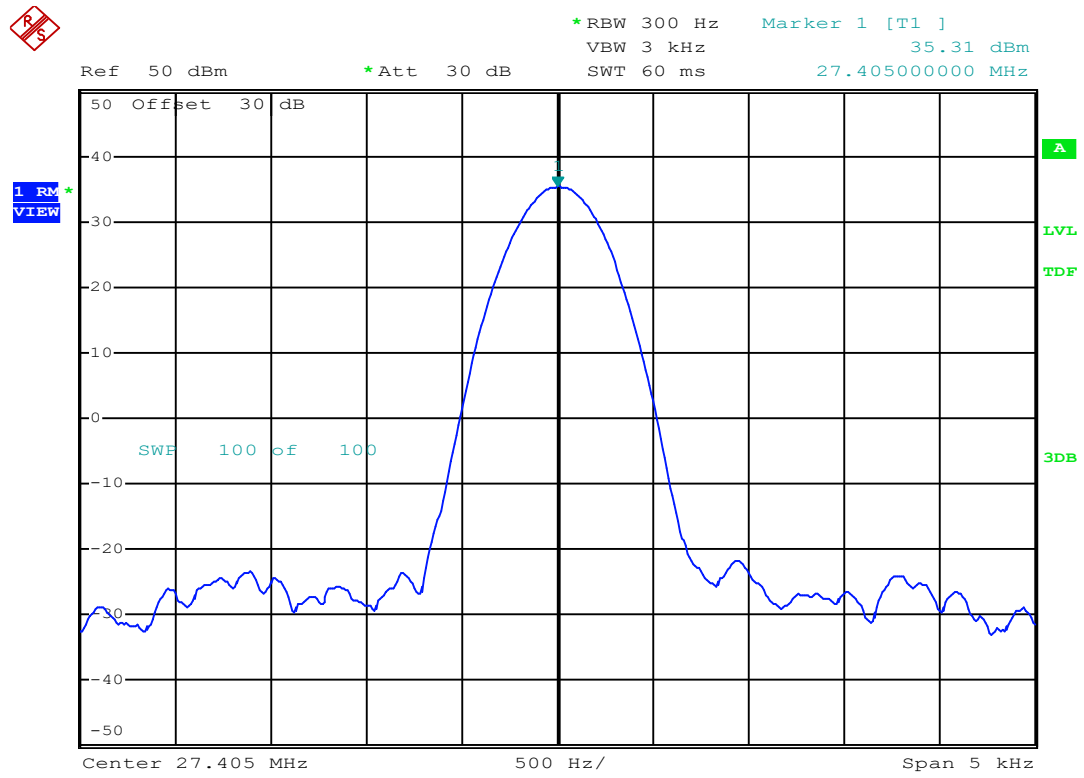
Conducted Power:



Channel:	**20**	**Channel Frequency:**	**27.205**	**MHz**
Mode:	**AM**	**Modulation:**	**AM**	
		Measured Power:	**35.32**	**dBm**

Plot 7.3 – Conducted Output Power, Channel 40, AM, 4W

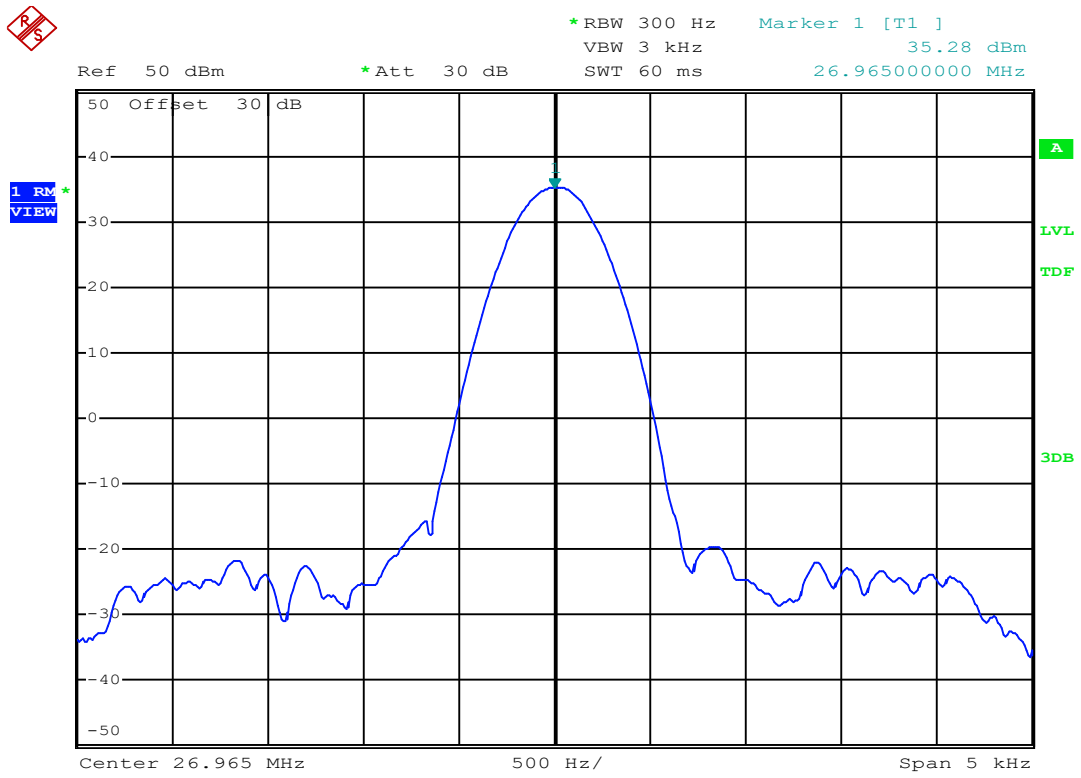
Conducted Power:



Channel:	**40**		**Channel Frequency:**	**27.405**	**MHz**
Mode:	**AM**		**Modulation:**	**AM**	
			Measured Power:	**35.31**	**dBm**

Plot 7.4 – Conducted Output Power, Channel 1, FM, 4W

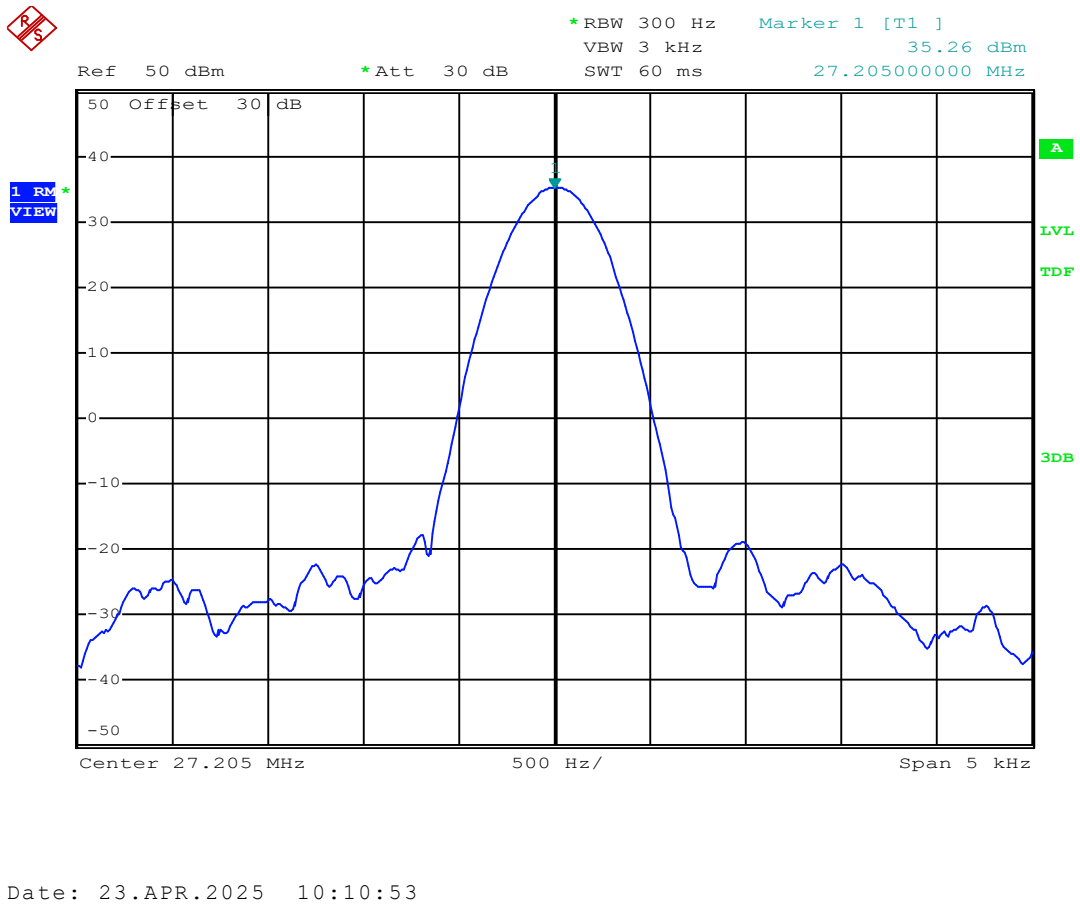
Conducted Power:



Channel:	1	**Channel Frequency:**	26.965 MHz
Mode:	FM	**Modulation:**	FM
		Measured Power:	35.28 dBm

Plot 7.5 – Conducted Output Power, Channel 20, FM, 4W

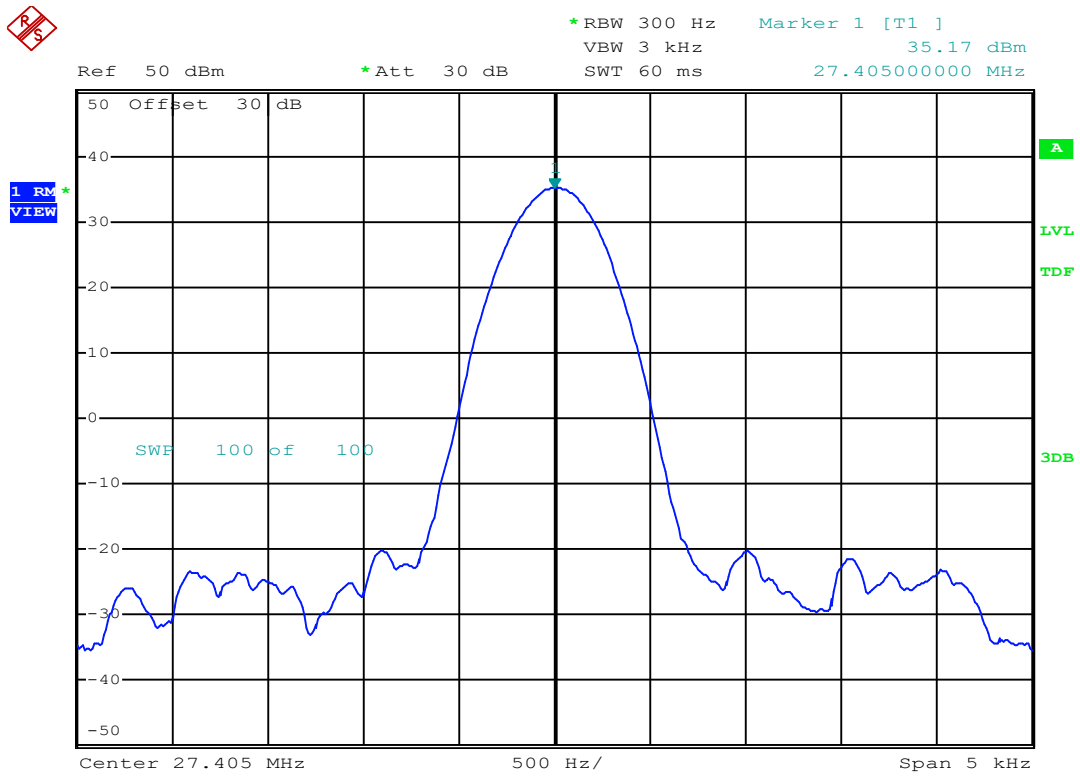
Conducted Power:



Channel:	**20**		**Channel Frequency:**	**27.205**	**MHz**
Mode:	**FM**		**Modulation:**	**FM**	
			Measured Power:	**35.26**	**dBm**

Plot 7.6 – Conducted Output Power, Channel 40, FM, 4W

Conducted Power:



Channel:	**40**		**Channel Frequency:**	**24.405**	**MHz**
Mode:	**FM**		**Modulation:**	**FM**	
			Measured Power:	**35.17**	**dBm**

Table 7.1 – Summary of Conducted Power Measurements (RMS), 4W

Conducted Power Measurement Results (4W):						
Channel Number	**Channel Frequency (MHz)**	**Mode**	**Modulation**	**Measured Power [P_{Meas}] (dBm)**	**Limit [P_{Lim}] (dBm)**	**Margin (dB)**
1	26.965	AM	AM	35.29	36	0.71
20	27.205			35.32		0.68
40	27.405			35.31		0.69
1	26.965	FM	FM	35.28		0.72
20	27.205			35.26		0.74
40	24.405			35.17		0.83
					Result:	**Complies**

Conducted Margin = P_{Limit} - P_{Meas}

Table 7.2 – Compliance to §2.1033(c)(8) – 13.8VDC, AM, FM

FCC CFR 47 §2.1033(c)(8): Power to Transmitter: AM (4W)							
Supply Voltage:	V =	13.80	VDC				
Measured Receiver Current:	IRx =	0.17	A				
Measured Total Current:	ITx =	1.11	A				
Transmitter Current (ITx - IRx):	IXmitter =	0.94	A				
Power to Transmitter:	PTx =	13.80	VDC	X	0.94	A =	**12.97 W**
Result:	**Complies**						

FCC CFR 47 §2.1033(c)(8): Power to Transmitter: FM (4W)							
Supply Voltage:	V =	13.80	VDC				
Measured Receiver Current:	IRx =	0.17	A				
Measured Total Current:	ITx =	1.14	A				
Transmitter Current (ITx - IRx):	IXmitter =	0.97	A				
Power to Transmitter:	PTx =	13.80	VDC	X	0.97	A =	**13.39 W**
Result:	**Complies**						

8.0 MODULATION RESPONSE

Test Conditions	
Normative Reference	**FCC 47 CFR §2.1047, §95.975**

Limits	
47 CFR §2.1047	a) Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.
47 CFR §95.975	Each CBRS transmitter type must be designed such that the modulation characteristics are in compliance with the rules in this section. (a) When emission type A3E is transmitted with voice modulation, the modulation percentage must be at least 85%, but not more than 100%. (b) When emission type A3E is transmitted by a CBRS transmitter having a transmitter output power of more than 2.5 W, the transmitter must contain a circuit that automatically prevents the modulation percentage from exceeding 100%. (c) When emission type F3E is transmitted the peak frequency deviation shall not exceed ±2 kHz.
RSS-236 4.9	When emission type A3E is transmitted by a CB transmitter having a total power of greater than 2.5 W, the CB transmitter must automatically prevent the modulation from exceeding 100%. When emission type F3E is transmitted by a CB transmitter the peak frequency deviation shall not exceed ±2 kHz.

Measurement Procedure	
TIA 382 25.2	**Transmitter Audio Frequency Response** Operate the transmitter under standard test conditions and monitor the output with a modulation monitor or calibrated test receiver. The audio input signal applied through a suitable impedance matching network, as specified by the manufacturer, shall be adjusted to obtain 50% modulation at the maximum audio frequency response of the transmitter, and this point shall be taken as the 0 dB reference level. Vary the modulating frequency from 100 Hz to 10,000 Hz and record the input levels necessary to maintain a constant 50% modulation. Graph the audio level in dB relative to the 0 dB reference level as a function of the modulating frequency. Record any audio frequency where it is impossible to perform the measurement.
TIA-603-E	**2.2.6 Audio Frequency Response** 2.2.6.2.1 Constant deviation test method (300 Hz to 3000 Hz) 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= $20\text{Log}(V_{FREQ}/V_{REF})$

Statement - Compliance to §95.977

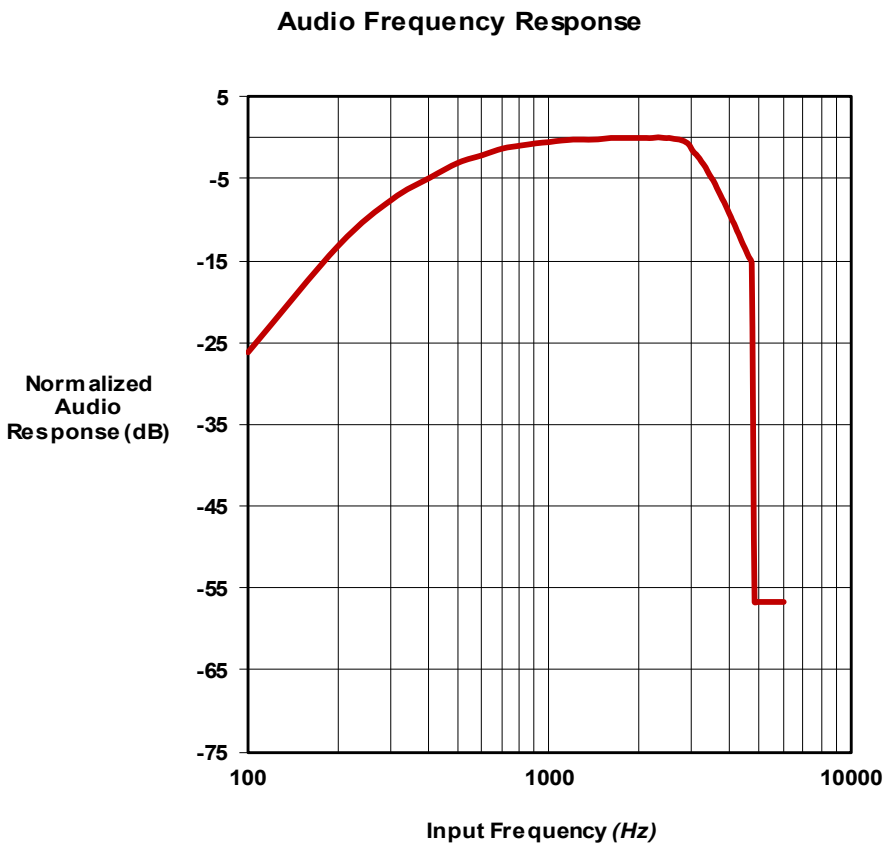
§95.977 CBRS tone transmissions.
In addition to the tones permitted under §95.377, CBRS transmitter types may be designed to transmit brief tones to indicate the beginning or end of a transmission.

This device is capable of transmitting a brief (less than one second) audio tone, “Roger Beep”, when the PTT button is released on the microphone indicating end of transmission. This function is user selectable and complies with the requirements of §95.377. See User’s Manual.

Plot 8.1 – Audio Frequency and Low Pass Filter Response, AM

Audio Frequency and Low Pass Filter Response (AM)

Measured Audio Response		
Freq	Audio Response (@ 50% MI)	
(Hz)	*(mV)*	*(dB)**
100	180.00	-26.167
200	40.00	-13.102
400	15.50	-4.868
600	11.25	-2.084
800	9.85	-0.930
1000	9.35	-0.477
1200	9.05	-0.194
1400	9.05	-0.194
1600	8.85	0.000
1800	8.85	0.000
2000	8.85	0.000
2200	**8.85**	0.000
2400	8.85	0.000
2600	8.95	-0.098
2800	9.25	-0.384
3000	10.65	-1.608
3200	12.35	-2.894
3400	14.85	-4.496
3600	17.85	-6.094
3800	21.85	-7.850
4000	26.85	-9.640
4200	32.50	-11.299
4400	39.50	-12.993
4600	47.50	-14.595
4800	6000.00	-56.624
10000	6000.00	-56.624
*** Normalize to 2200Hz**		

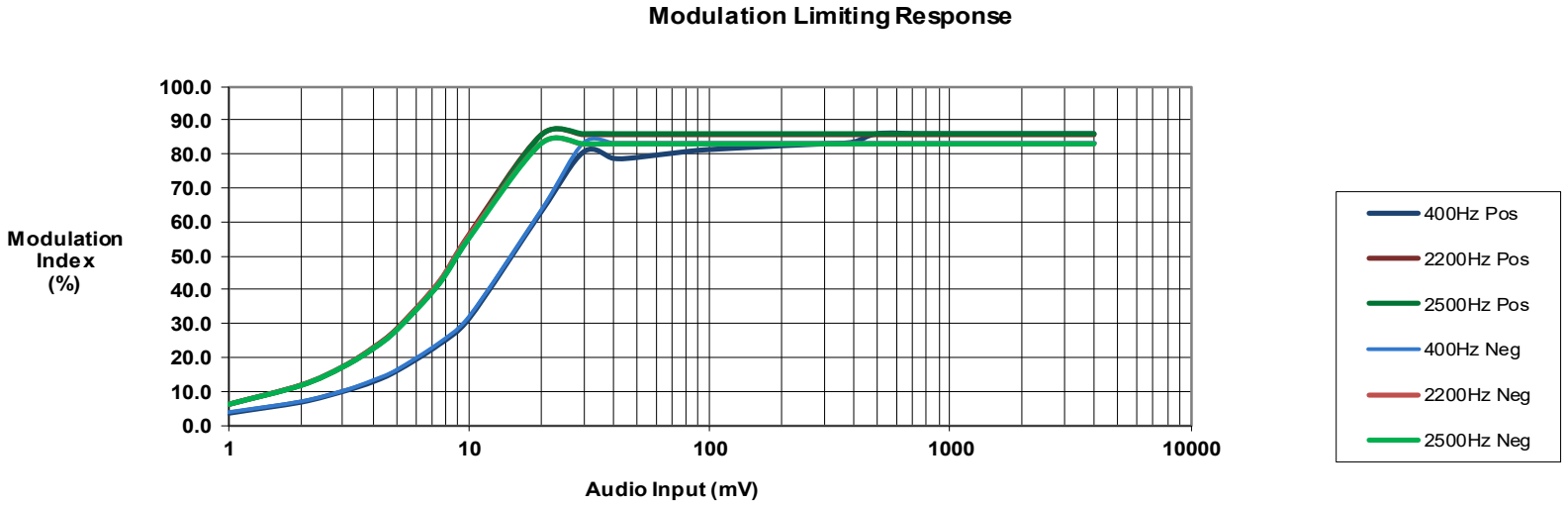


Note: 50% MI could not be achieved above 4800Hz.

Audio Frequency at -6dB Attenuation:	~3600Hz
Audio Frequency @ Maximum Response (f_{MAX}):	2200Hz
Audio Input @ Maximum Response (V_{MAX}):	8.85
Result:	Complies

Plot 8.2 – Modulation Limiting Response, AM

Modulation Limiting Response (AM)



Measured Modulation Response [Modulation Index (%)]

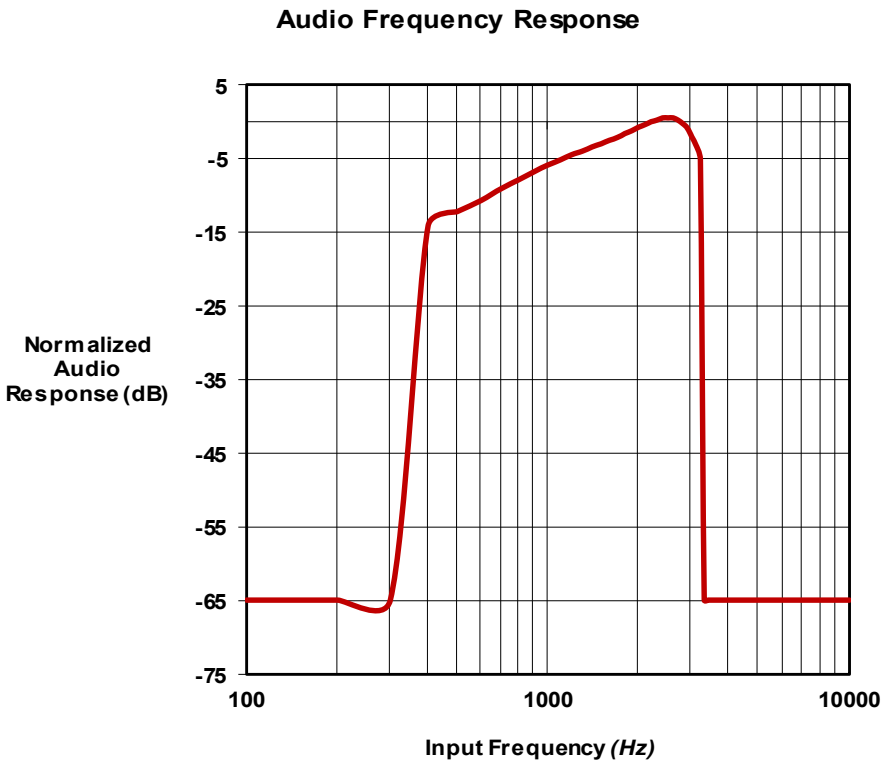
Freq (Hz)	Audio Input (mV)																						
	1	2	3	4	5	7.5	10	20	30	40	50	75	100	200	300	400	500	750	1000	2000	3000	4000	Deviation
400	3.5	6.8	10.0	12.9	16.0	23.8	31.5	63.0	80.6	78.7	79.0	80.5	81.3	82.4	83.0	83.5	86.0	86.0	86.0	86.0	86.0	86.0	Positive
2200	6.1	11.8	17.3	22.9	28.5	42.2	56.2	85.6	85.6	85.6	85.6	85.6	85.6	85.6	85.6	85.6	85.6	85.6	85.6	85.6	85.6	85.6	
2500	6.0	11.6	17.1	22.5	28.1	41.6	55.3	85.6	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	
400	3.5	6.7	9.8	13.0	16.0	23.9	31.7	63.1	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	Negative
2200	6.1	11.8	17.3	22.8	28.3	42.2	55.9	83.3	83.0	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	
2500	6.0	11.6	17.1	22.5	28.0	41.6	55.1	83.1	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	

Audio Frequency @ Maximum Deviation (f_{MAX}):	2200Hz
Audio Input @ Maximum Deviation (V_{MAX}):	8.85mV
V_{MAX} + 40dB:	885mV
Maximum Measured Modulation Index:	**86%**
Maximum Modulation Index Limit:	100%
Result:	**Complies**

Plot 8.3 – Audio Frequency and Low Pass Filter Response, FM

Audio Frequency and Low Pass Filter Response (FM)

Measured Audio Response		
Freq	Audio Response (@ 20% Deviation)	
(Hz)	*(mV)*	*(dB)**
100	6000.00	-64.807
300	6000.00	-64.807
500	14.00	-12.166
700	9.75	-9.024
900	7.50	-6.745
1100	6.25	-5.161
1300	5.45	-3.972
1500	4.85	-2.958
1700	4.40	-2.113
1900	3.95	-1.176
2100	3.60	-0.370
2300	3.35	0.255
2500	**3.25**	**0.519**
2700	3.35	0.255
2900	3.80	-0.839
3100	5.00	-3.223
3300	6000.00	-64.807
10000	6000.00	-64.807
*** Normalize to 2300Hz**		

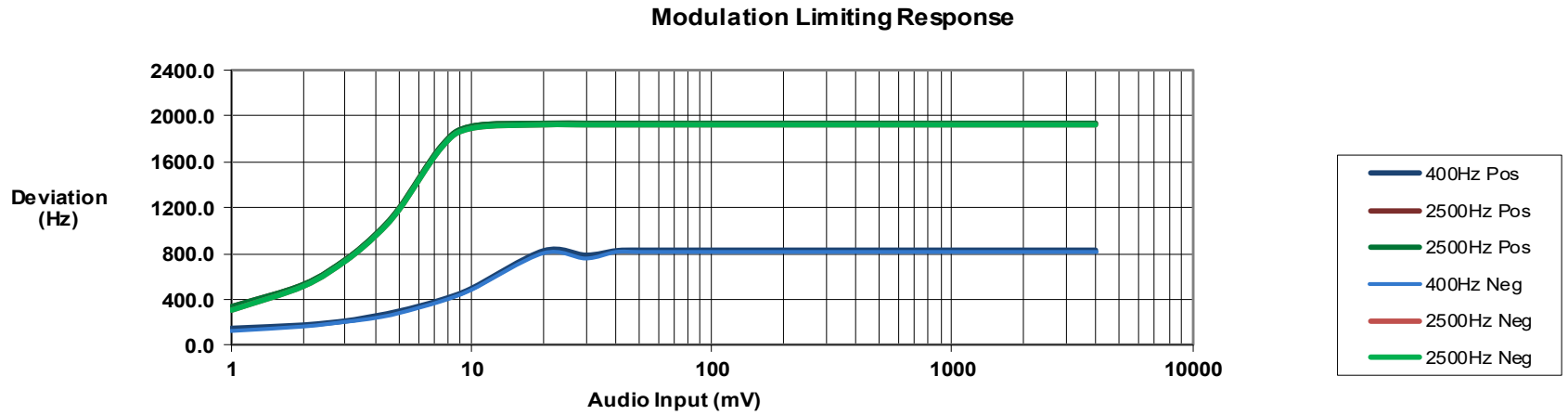


Note: 20% Deviation (+/-400Hz) could not be achieved above 3600Hz.

Audio Frequency at -6dB Attenuation:	~3300Hz
Audio Frequency @ Maximum Response (f_{MAX}):	2500Hz
Audio Input @ Maximum Response (V_{MAX}):	3.25mV
Result:	Complies

Plot 8.4 – Modulation Limiting Response, FM

Modulation Limiting Response (FM)



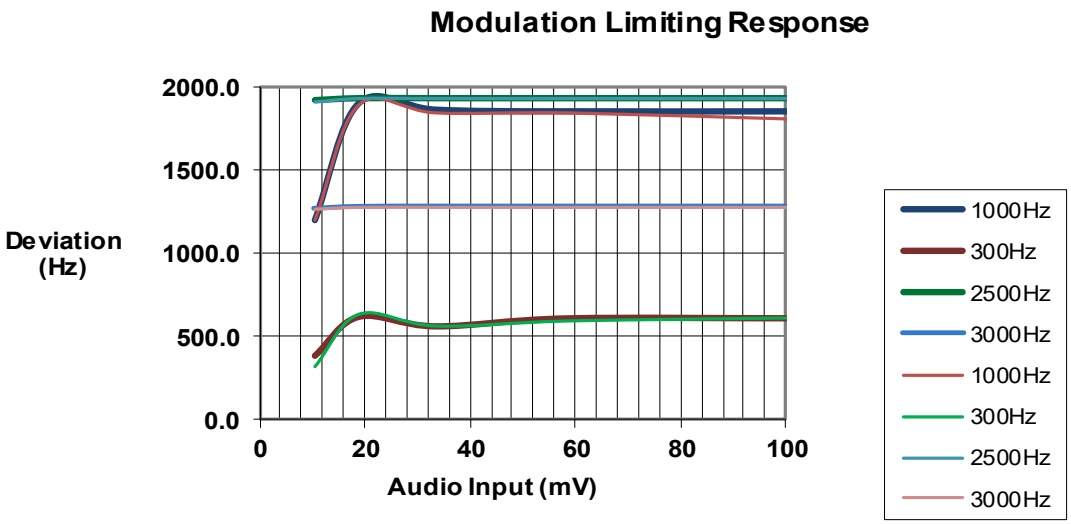
Measured Modulation Response: Frequency Deviation (Hz)

Freq (Hz)	Audio Input (mV)																						Deviation
	1	2	3	4	5	7.5	10	20	30	40	50	75	100	200	300	400	500	750	1000	2000	3000	4000	
400	140	170	205	250	290	390	490	820	780	820	825	825	825	825	825	825	825	825	825	825	825	825	Positive
2500	330	525	745	965	1192	1733	1905	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	
2500	330	525	745	965	1192	1733	1905	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	
400	130	170	210	245	285	390	490	810	765	820	820	820	820	820	820	820	820	820	820	820	820	820	Negative
2500	310	520	745	965	1190	1730	1900	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	
2500	310	520	745	965	1190	1730	1900	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	

Audio Frequency @ Maximum Response (f_{MAX}):	2500Hz
Audio Input @ Maximum Response (V_{MAX}):	3.25mV
V_{MAX} + 40dB:	325mV
Maximum Measured Deviation:	**1930Hz**
Maximum Deviation Limit:	2000Hz
Result:	**Complies**

Plot 8.5 – Modulation Limiting Response, FM (ANSI C63.26)

Modulation Limiting Response (FM): ANSI C63.26



Measured Modulation Response: Frequency Deviation (Hz)							
Freq	Audio Input					Deviation	
	+0dB	+5dB	+10dB	+15dB	+20dB		
(Hz)	10.5	18.90	33.60	58.80	105.00		
1000	1200	1900	1860	1850	1850	Positive	
300	380	620	560	610	610		
2500	1920	1930	1930	1930	1930		
3000	1270	1278	1280	1280	1280		
1000	1195	1890	1840	1840	1800	Negative	
300	320	630	560	590	610		
2500	1915	1930	1930	1930	1930		
3000	1260	1280	1280	1280	1280		
Audio Input @ 1000Hz @ 60% Deviation (+/- 1.2kHz) (V_{0dB}):						10.5	mV
Maximum Measured Deviation:						1930	Hz
Maximum Deviation Limit:						2000	Hz
Result:						Complies	

9.0 OCCUPIED BANDWIDTH AND EMISSION MASKS

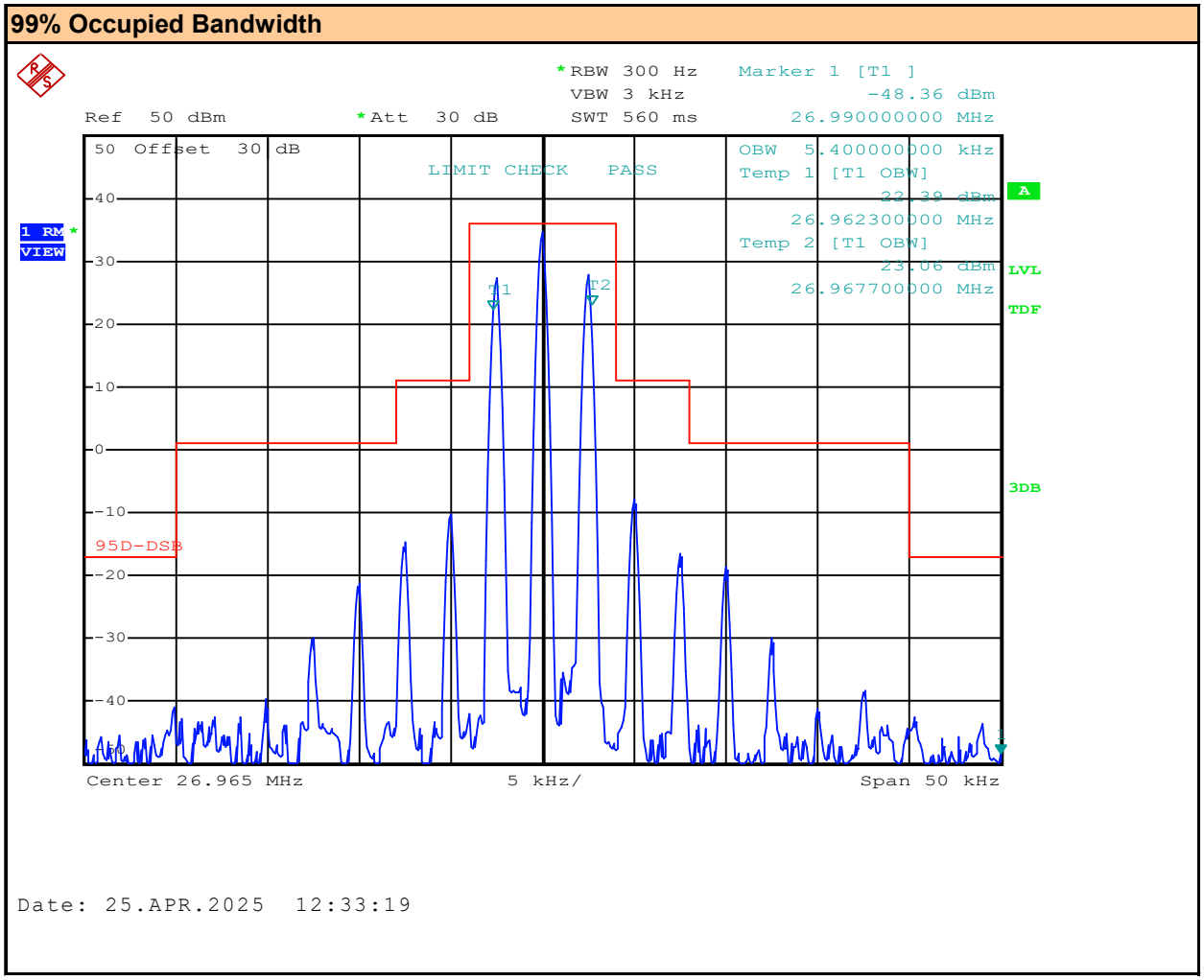
Test Conditions	
Normative Reference	**FCC 47 CFR §2.1049, §95.973**

Limits	
47 CFR §95.973	Each CBRS transmitter type must be designed such that the occupied bandwidth does not exceed the authorized bandwidth for the emission type under test. (a) AM and FM. The authorized bandwidth for emission types A3E and F3E is 8 kHz.
RSS-236 5.3.2	The authorized bandwidth for emission type A1D or A3E is 8 kHz.
47 CFR §95.979	Each CBRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section. (a) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) as specified in the applicable paragraphs listed in the following table: For A3E and F3E (1), (3), (5), (6) (1) 25 dB (decibels) in the frequency band 4 kHz to 8 kHz removed from the channel center frequency; (3) 35 dB in the frequency band 8 kHz to 20 kHz removed from the channel center frequency; (5) 53 + 10 log (P) dB in any frequency band removed from the channel center frequency by more than 250% of the authorized bandwidth. (6) 60 dB in any frequency band centered on a harmonic (i.e., an integer multiple of two or more times) of the carrier frequency.
RSS-236 4.4.4	For A1D and A3E: _ At least 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth. _ At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth. _ At least 53 + 10 log10 (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%. _ At least 60 dB on any frequency twice or greater than twice the fundamental frequency.

Measurement Procedure
TIA 382 23.2 Transmitter Modulation Occupied Bandwidth The transmitter is modulated by a sinusoidal audio signal applied to the microphone input jack. First, the frequency is adjusted to deliver 50% modulation at the highest audio response level (minimum applied audio level). Then the audio signal level is increased 16 dB and the audio frequency is readjusted to 2500 Hz The analyzer is adjusted to display each of the discrete modulation sidebands and their respective harmonic products within +/- 50 kHz of the carrier frequency.

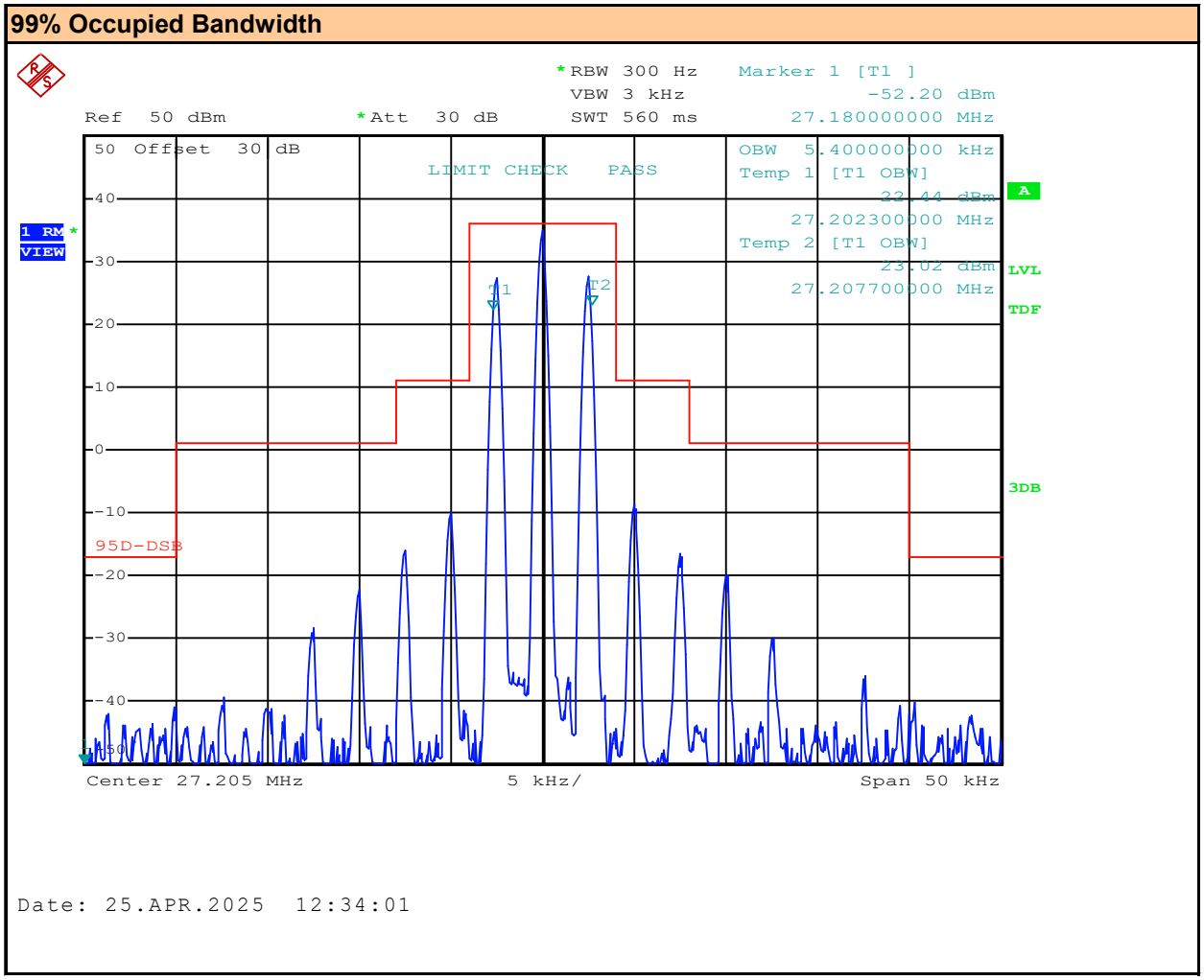
Test Setup	Appendix A Figure A.1

Plot 9.1 – Occupied Bandwidth, Channel 1, AM



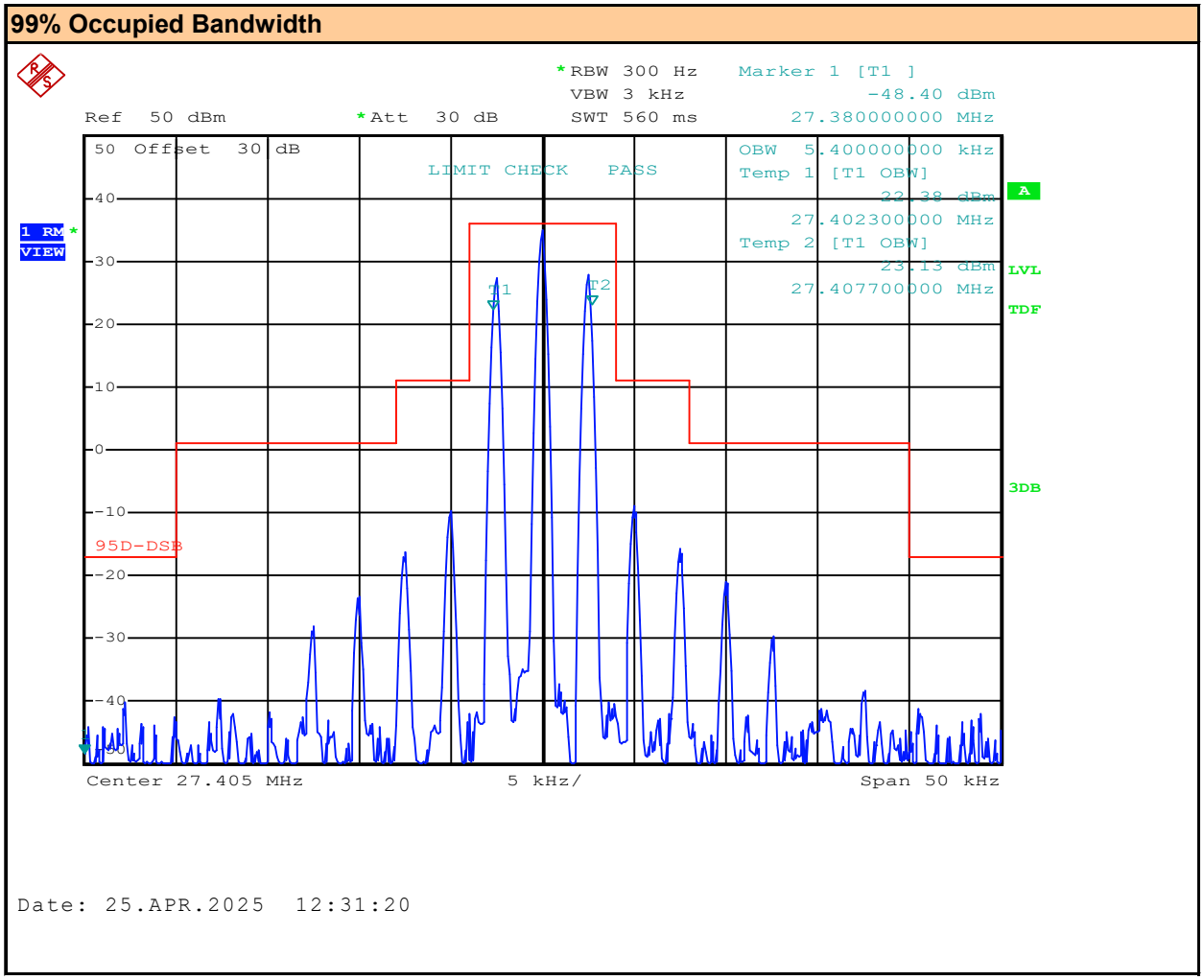
Channel:	**1**	**Channel Frequency:**	**26.965** **MHz**
Modulation:	**AM**	**Measured Occupied Bandwidth:**	**5.4** **kHz**

Plot 9.2 – Occupied Bandwidth, Channel 20, AM



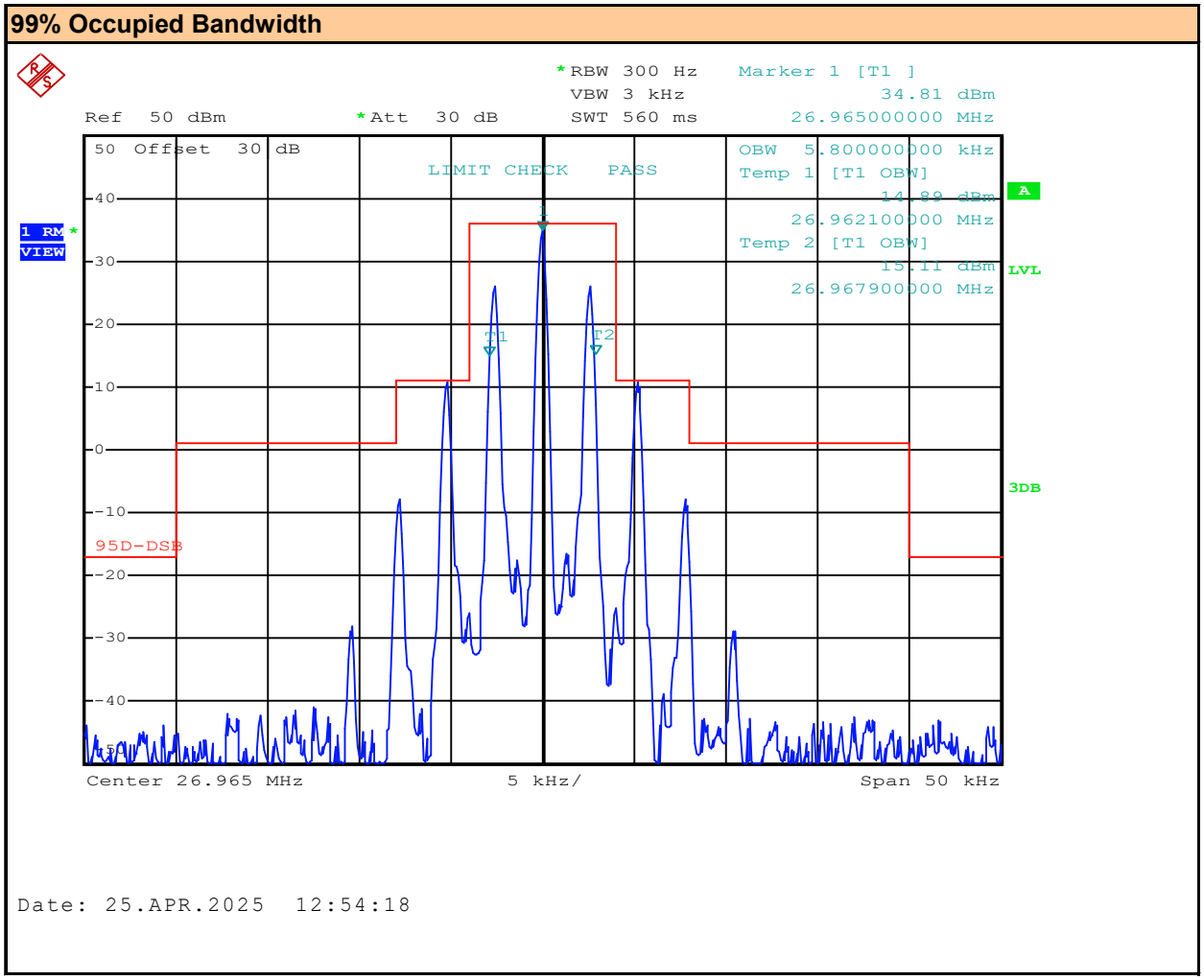
Channel:	**20**	**Channel Frequency:**	**27.205** **MHz**
Modulation:	**AM**	**Measured Occupied Bandwidth:**	**5.4** **kHz**

Plot 9.3 – Occupied Bandwidth, Channel 40, AM



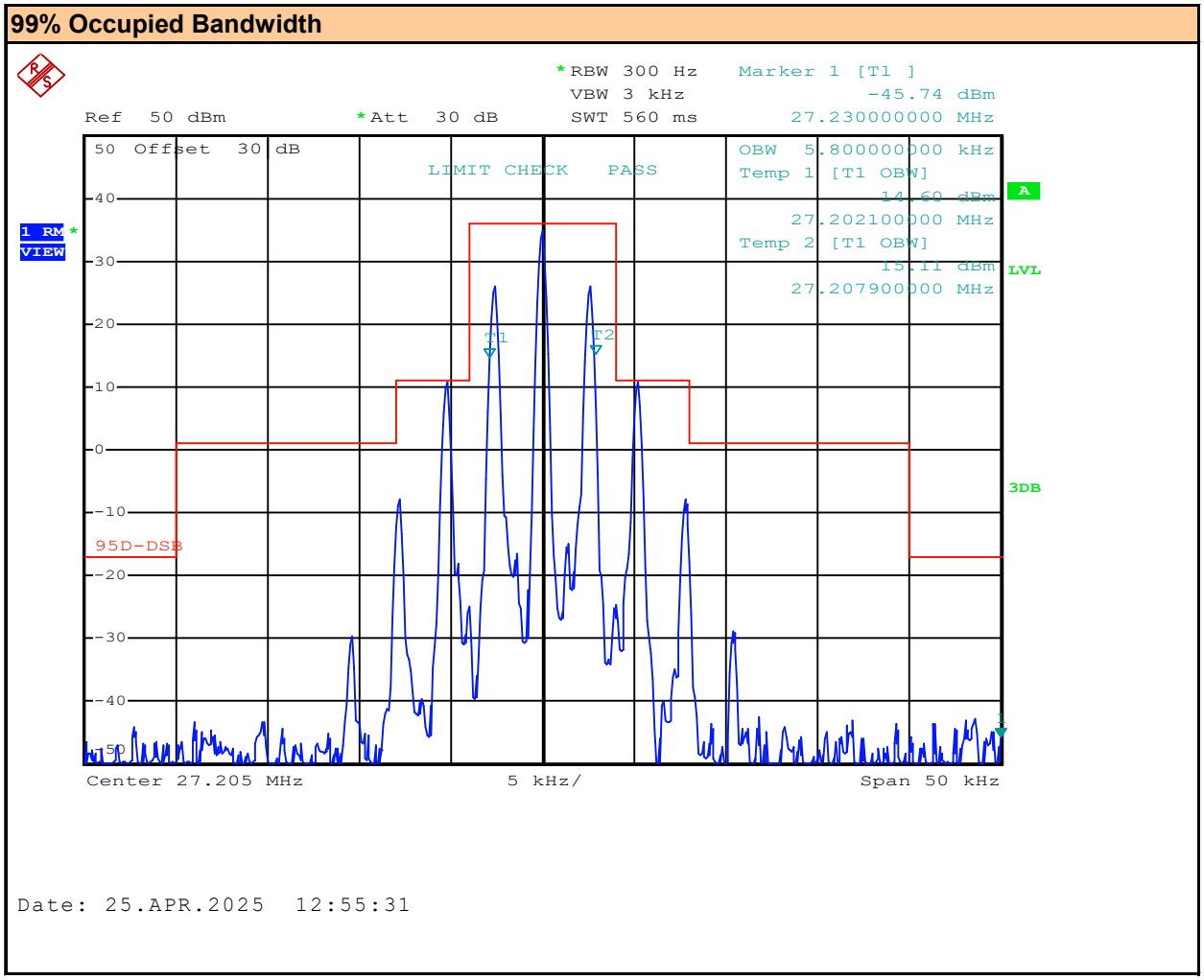
Channel:	**40**	**Channel Frequency:**	**27.405** **MHz**
Modulation:	**AM**	**Measured Occupied Bandwidth:**	**5.4** **kHz**

Plot 9.4 – Occupied Bandwidth, Channel 1, FM



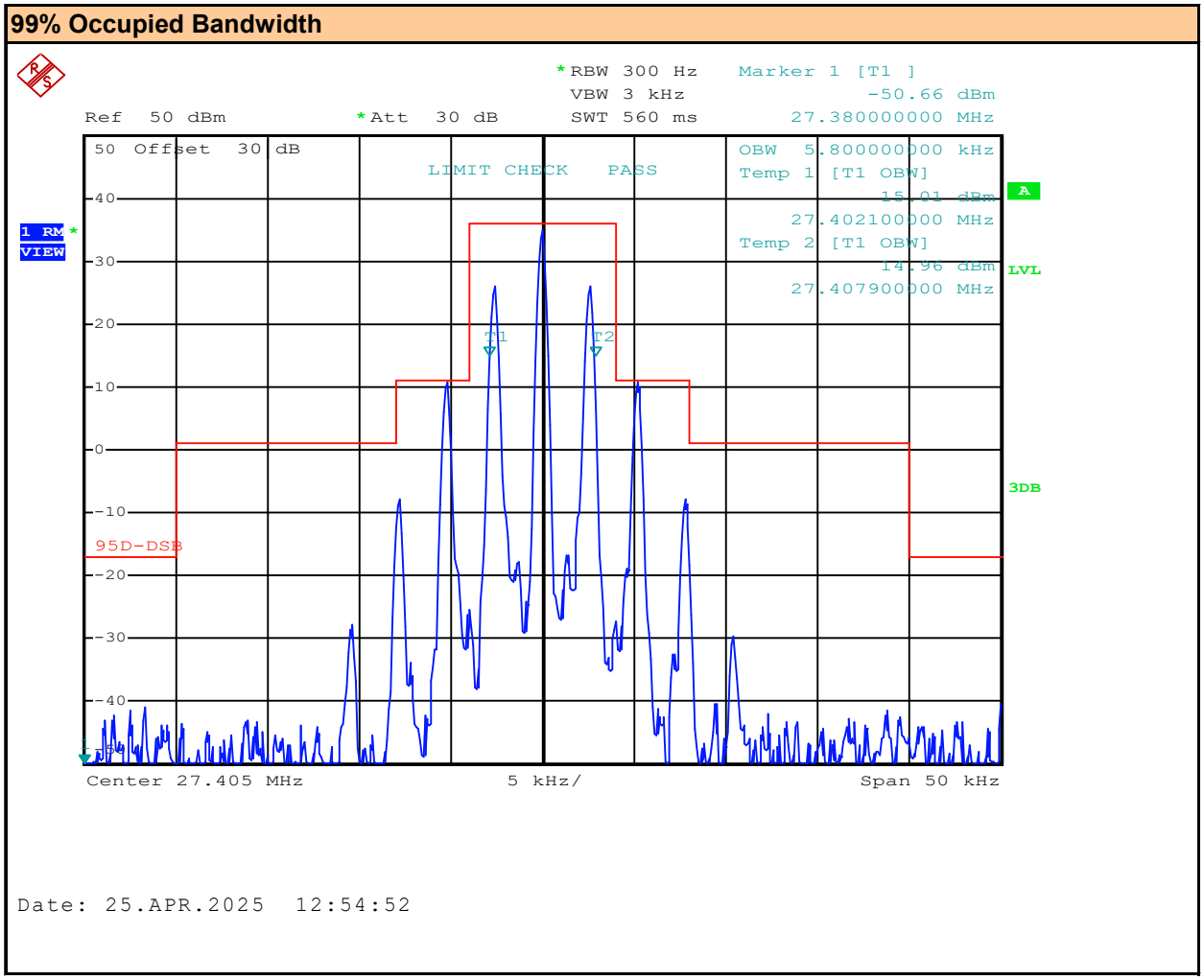
Channel:	**1**	**Channel Frequency:**	**26.965** **MHz**
Modulation:	**FM**	**Measured Occupied Bandwidth:**	**5.8** **kHz**

Plot 9.5 – Occupied Bandwidth, Channel 20, FM



Channel:	**20**	**Channel Frequency:**	**27.205** **MHz**
Modulation:	**FM**	**Measured Occupied Bandwidth:**	**5.8** **kHz**

Plot 9.6 – Occupied Bandwidth, Channel 40, FM



Channel:	**40**	**Channel Frequency:**	**27.405** **MHz**
Modulation:	**FM**	**Measured Occupied Bandwidth:**	**5.8** **kHz**

Table 9.1 - Summary of Occupied Bandwidth and Emission Mask Results

99% Occupied Bandwidth / Emissions Mask Results:						
Channel Number	Channel Frequency (MHz)	Modulation	Measured Occupied Bandwidth (kHz)	Limit (kHz)	Emission Designator	Emissions Mask Results
1	26.965	AM	5.40	8.00	5K40A3E	PASS
20	27.205		5.40		5K40A3E	PASS
40	27.405		5.40		5K40A3E	PASS
1	26.965	FM	5.80		5K80F3E	PASS
20	27.205		5.80		5K80F3E	PASS
40	27.405		5.80		5K80F3E	PASS
					Result:	Complies

10 CONDUCTED OUT OF BAND SPURIOUS EMISSIONS

Test Conditions	
Normative Reference	**FCC 47 CFR §95.979**

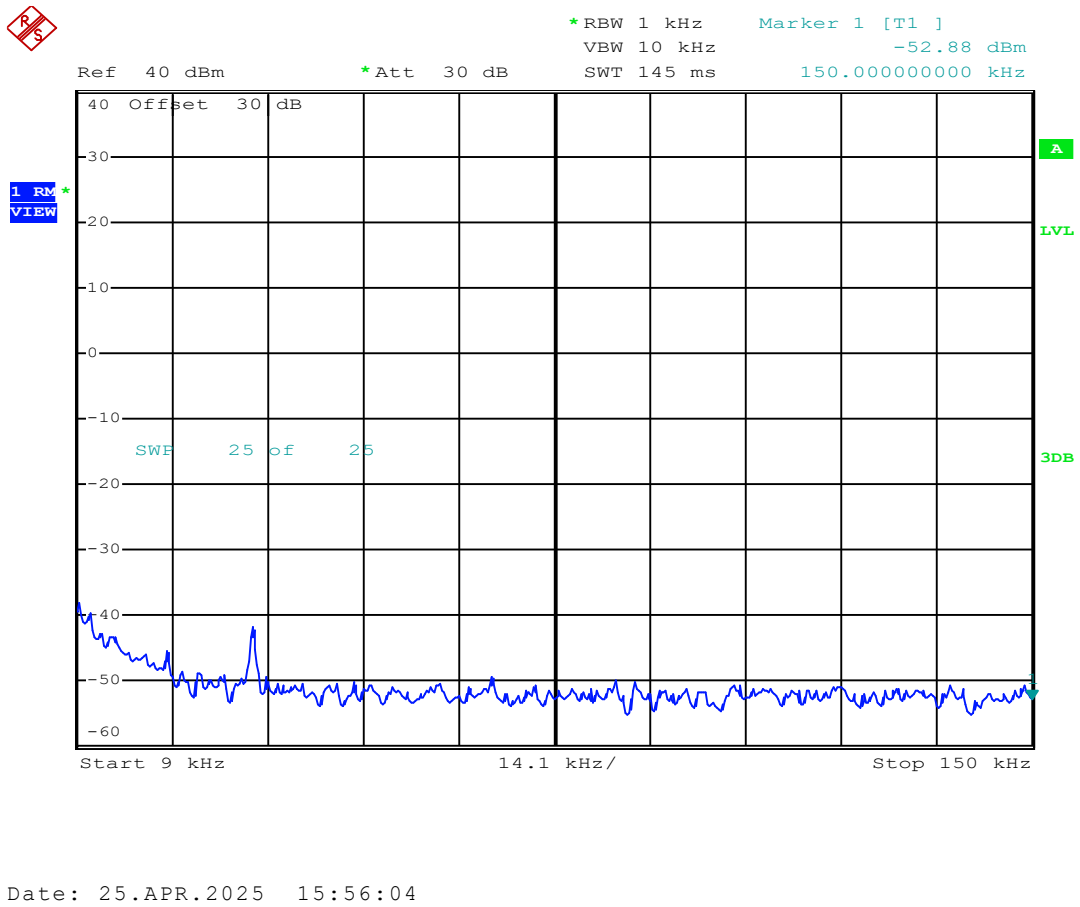
Limits	
47 CFR §95.979	Each CBRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section. (a) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) as specified in the applicable paragraphs listed in the following table: For A3E, F3E (1), (3), (5), (6) (1) 25 dB (decibels) in the frequency band 4 kHz to 8 kHz removed from the channel center frequency; (3) 35 dB in the frequency band 8 kHz to 20 kHz removed from the channel center frequency; (5) 53 + 10 log (P) dB in any frequency band removed from the channel center frequency by more than 250% of the authorized bandwidth. (6) 60 dB in any frequency band centered on a harmonic (i.e., an integer multiple of two or more times) of the carrier frequency.

Measurement Procedure	
TIA 382 21.2	**Transmitter Conducted Spurious and Harmonic Emissions** The transmitter RF output shall be connected to the standard nonradiating output load. The output shall be sampled and displayed using spectrum analysis techniques. 2500 Hz modulation shall be applied at a level 16 dB above that required to produce 50% modulation at the frequency of maximum response. The sampled output shall be analyzed from the lowest frequency generated in the equipment to the 10th harmonic of the fundamental signal and the levels of all spurious outputs attenuated not more than 20 dB below the maximum required attenuation shall be recorded.

Test Setup	
Appendix A	**A.1**

Plot 10.1 – Conducted Out of Band Emissions, 9kHz to 150kHz, Channel 20, AM

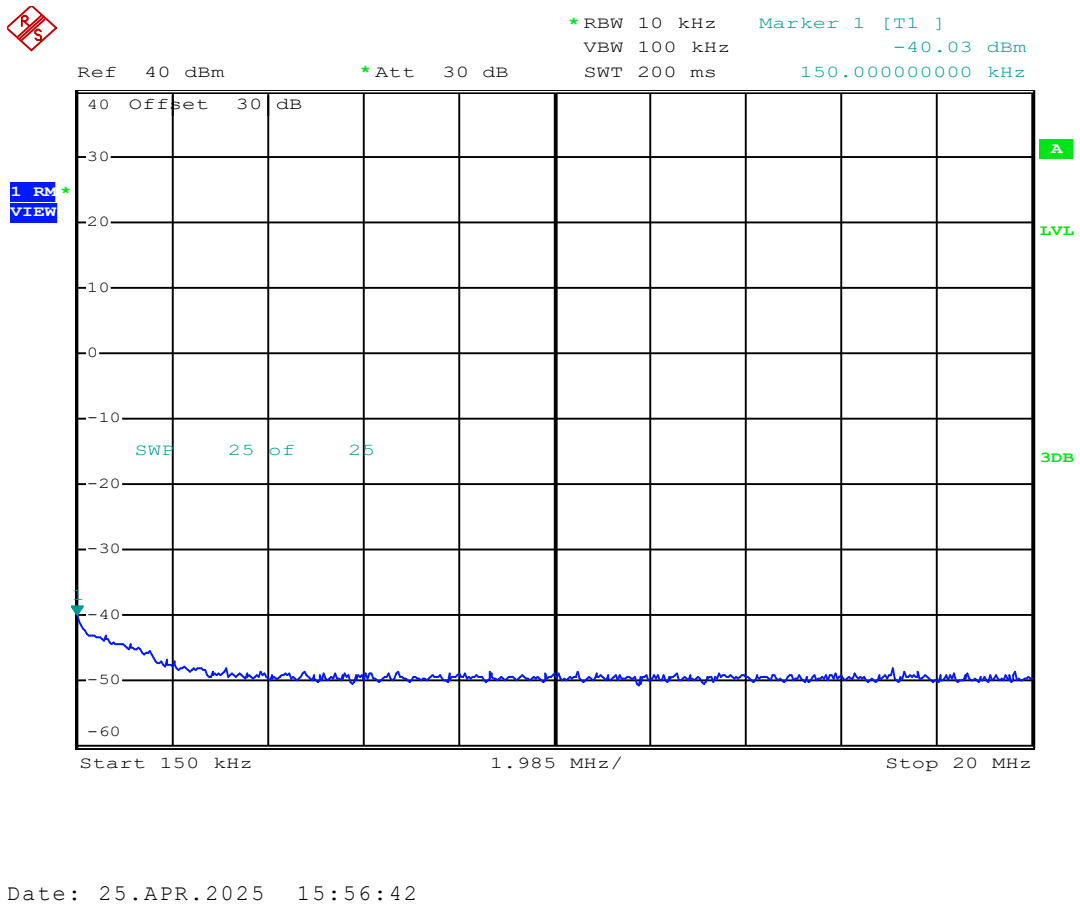
Conducted Spurious Emissions:



Channel:	**20**	**Channel Frequency:**	**27.205**	**MHz**
Modulation:	**AM**	**Emission Frequency:**	**ND**	**MHz**
		Measured Emission:	**ND**	**dBm**

Plot 10.2 – Conducted Out of Band Emissions, 150kHz – 20MHz, Channel 20, AM

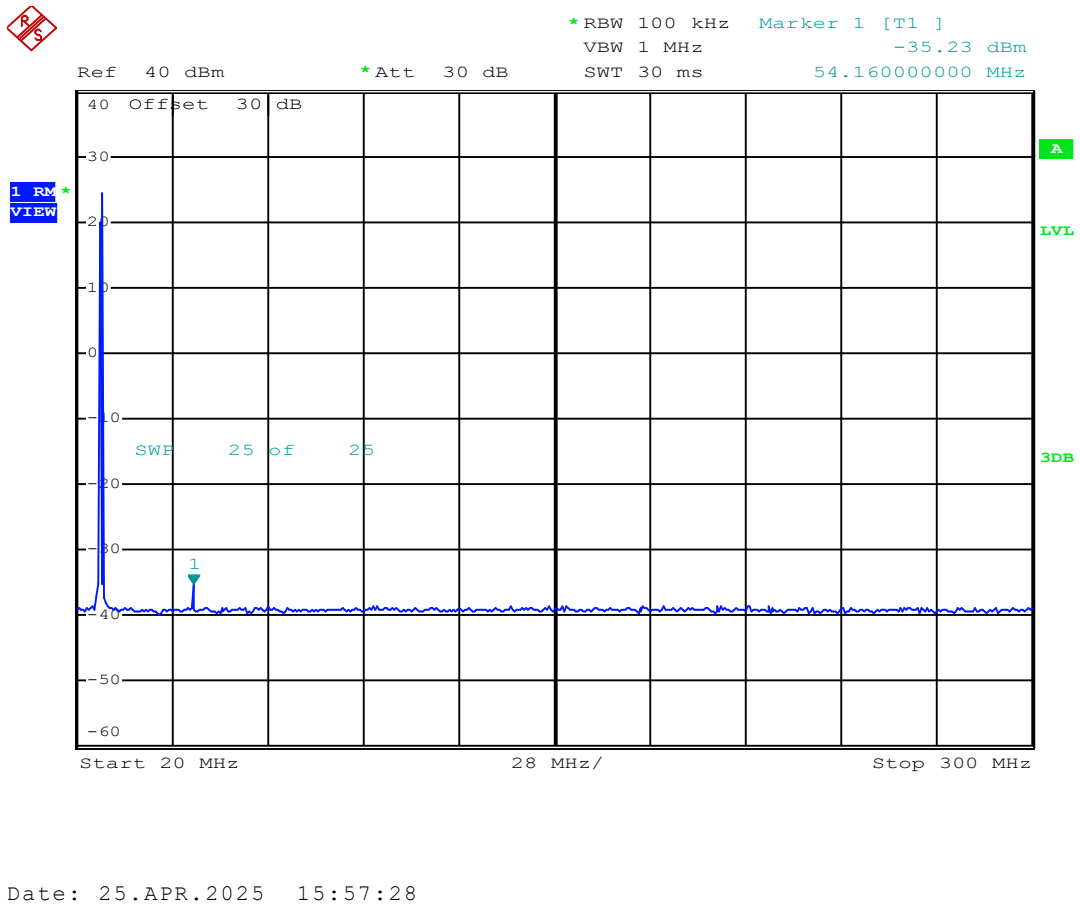
Conducted Spurious Emissions:



Channel:	**20**	**Channel Frequency:**	**27.205**	**MHz**
Modulation:	**AM**	**Emission Frequency:**	**ND**	**MHz**
		Measured Emission:	**ND**	**dBm**

Plot 10.3 – Conducted Out of Band Emissions, 20 – 1000MHz, Channel 20, AM

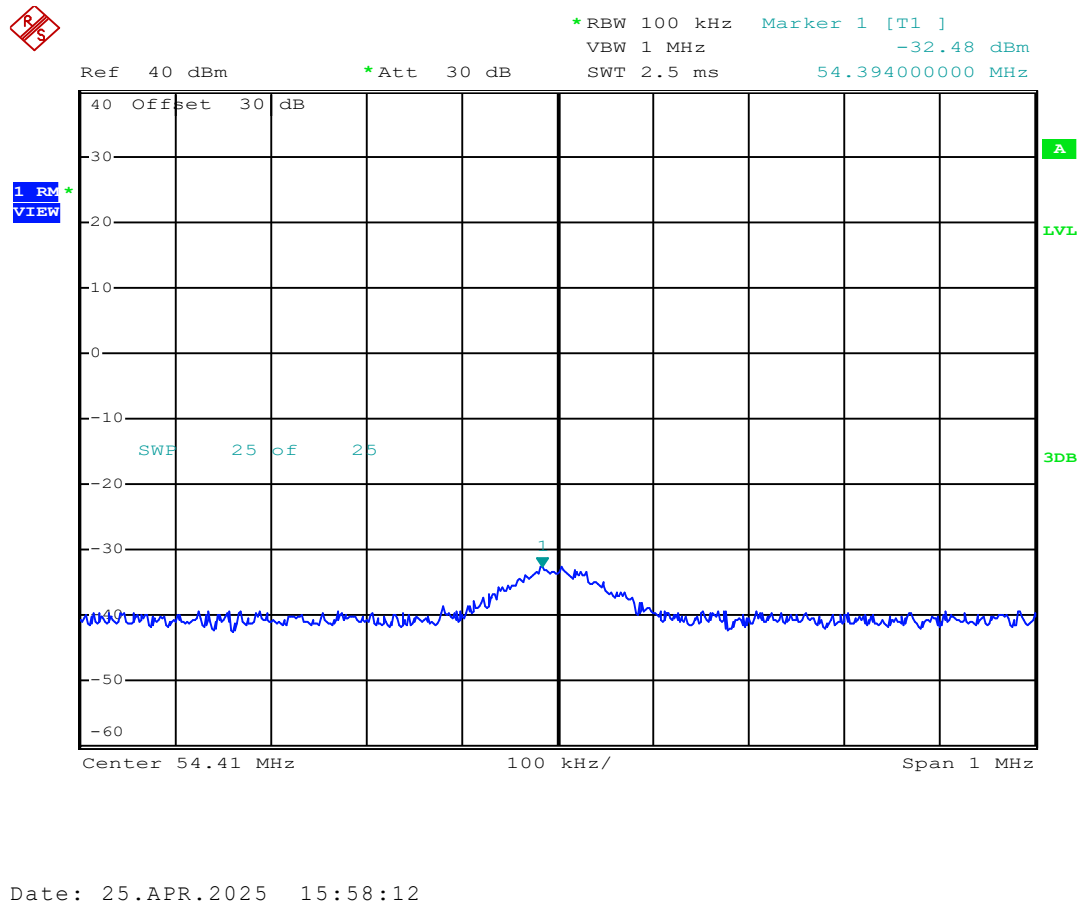
Conducted Spurious Emissions:



Channel:	**20**		**Channel Frequency:**	**27.205**	**MHz**
Modulation:	**AM**		**Emission Frequency:**	**ND**	**MHz**
Marker 1 = Fundamental			**Measured Emission:**	**ND**	**dBm**

Plot 10.4 – Conducted Out of Band Emissions, 2nd Harmonic, Channel 20, AM

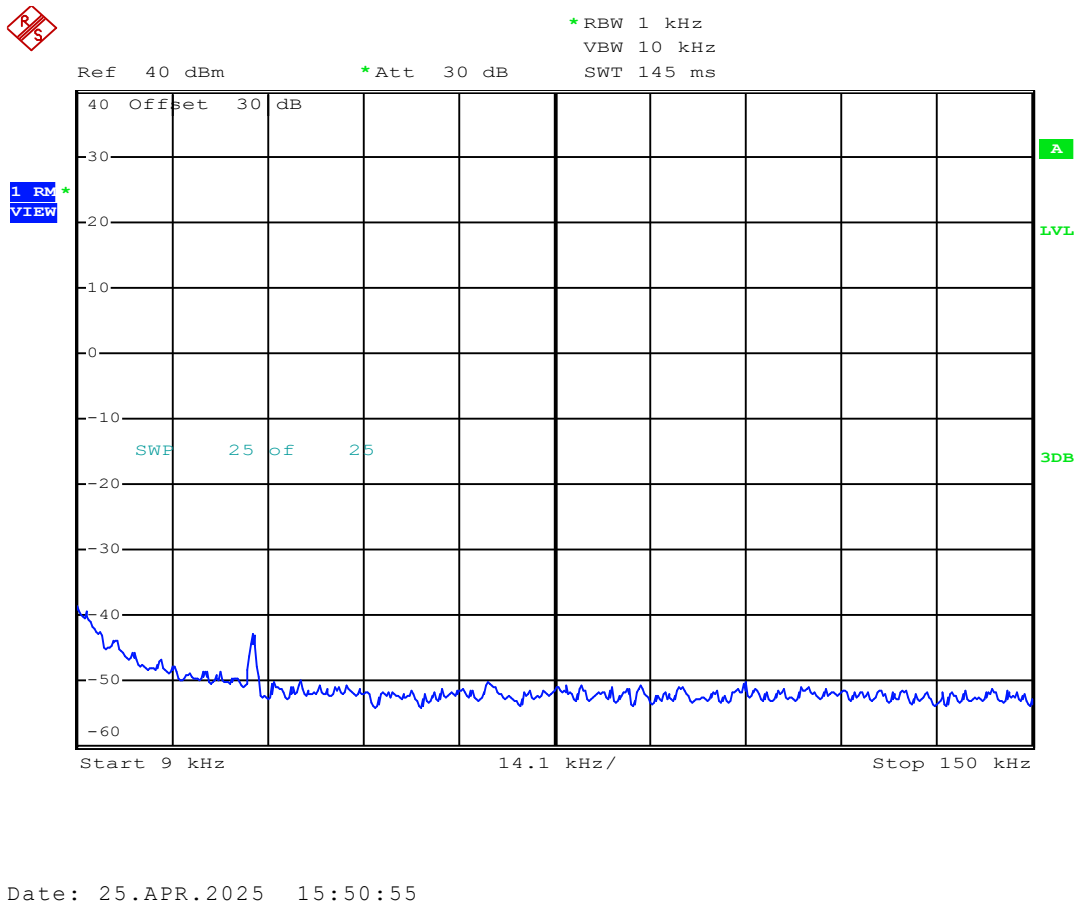
Conducted Spurious Emissions:



Channel:	**20**	**Channel Frequency:**	**27.205**	**MHz**
Modulation:	**AM**	**Emission Frequency:**	**54.394**	**MHz**
		Measured Emission:	**-32.48**	**dBm**

Plot 10.5 – Conducted Out of Band Emissions, 9kHz to 150kHz, Channel 20, FM

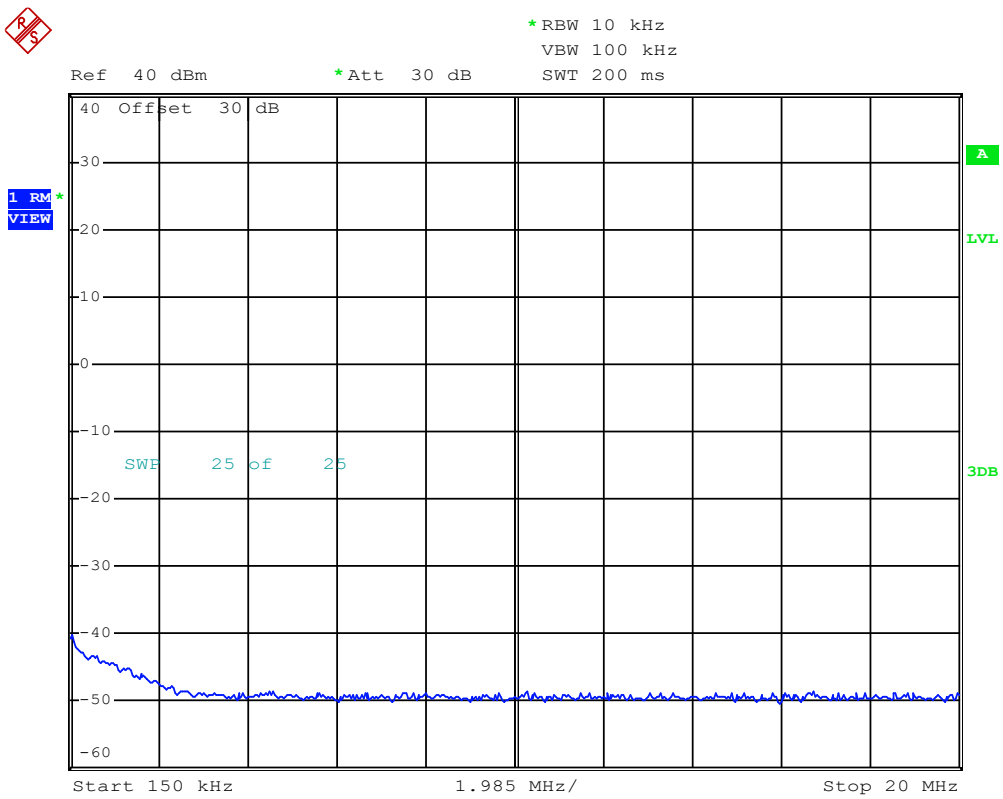
Conducted Spurious Emissions:



Channel:	**20**	**Channel Frequency:**	**27.205**	**MHz**
Modulation:	**FM**	**Emission Frequency:**	**ND**	**MHz**
		Measured Emission:	**ND**	**dBm**

Plot 10.6 – Conducted Out of Band Emissions, 150kHz – 20MHz, Channel 20, FM

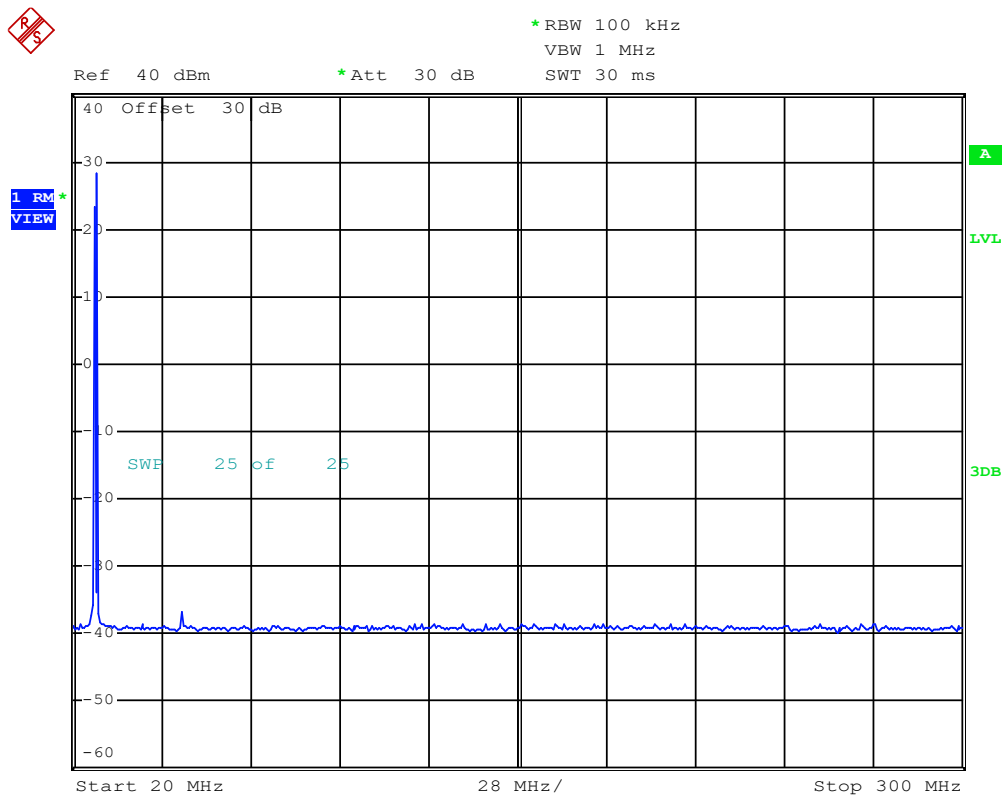
Conducted Spurious Emissions:



Channel:	20	Channel Frequency:	27.205	MHz
Modulation:	FM	Emission Frequency:	ND	MHz
		Measured Emission:	ND	dBm

Plot 10.7 – Conducted Out of Band Emissions, 20 – 1000MHz, Channel 20, FM

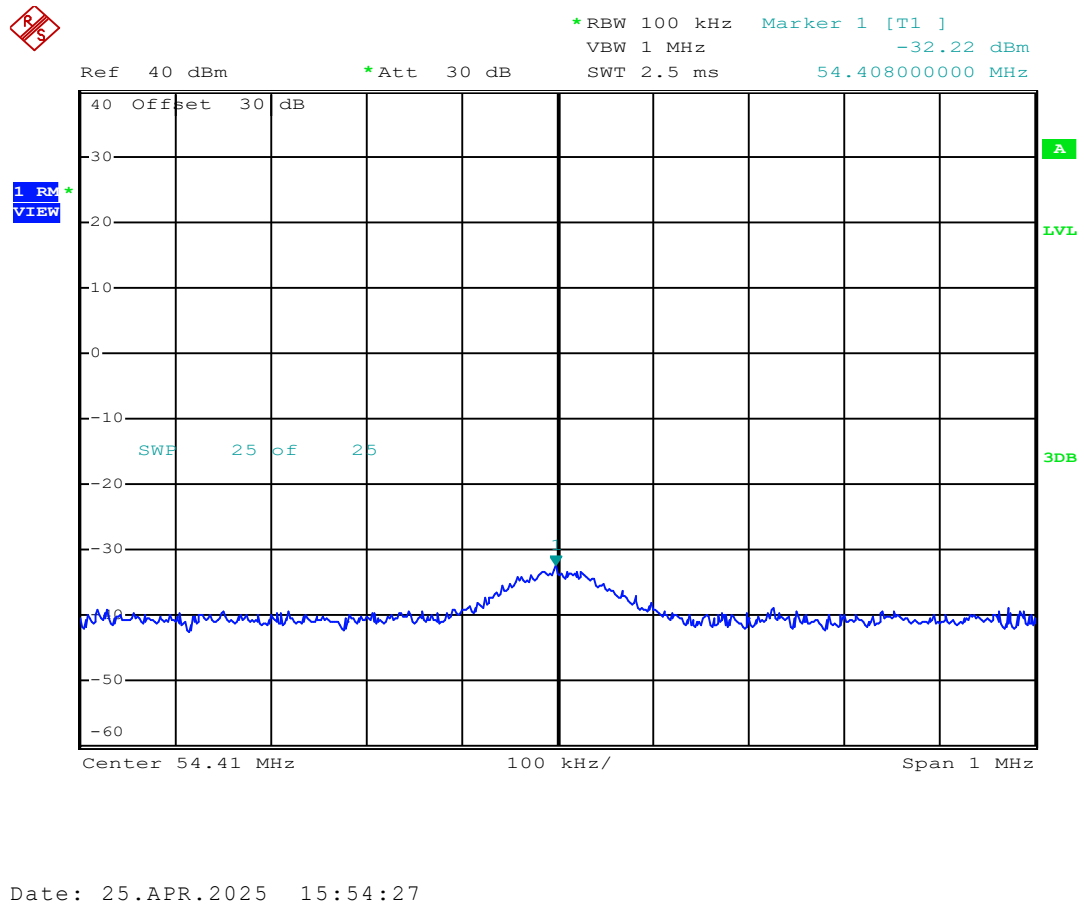
Conducted Spurious Emissions:



Channel:	20	**Channel Frequency:**	27.205 MHz
Modulation:	FM	**Emission Frequency:**	ND MHz
Marker 1 = Fundamental		**Measured Emission:**	ND dBm

Plot 10.8 – Conducted Out of Band Emissions, 2nd Harmonic, Channel 20, FM

Conducted Spurious Emissions:



Channel:	**20**	**Channel Frequency:**	**27.205**	**MHz**
Modulation:	**FM**	**Emission Frequency:**	**54.408**	**MHz**
		Measured Emission:	**-32.22**	**dBm**

Table 10.1 – Summary of Conducted Out of Band Emissions

Conducted Spurious Emissions Measurement Results:								
Channel Number	Frequency (MHz)	Modulation	Emission Power [P_{Em}] (dBm)	Emission Frequency (MHz)	Fundamental Measurment [P_{Fund}] (dBm)	Attenuation [Atten] (dB)	Limit (dB)	Margin (dB)
20	27.205	AM	-32.48	54.39	35.32	67.80	60	7.80
		FM	-32.22	54.41	35.26	67.48		7.48
							Complies	

Attenuation [Atten] = [P_{Fund}] - [P_{Em}]
Margin = Attenuation - Limit
ND = None Detected

11.0 RADIATED SPURIOUS TX EMISSIONS

Test Conditions	
Normative Reference	**FCC 47 CFR §95.979, RSS-236, ANSI C63.10**

Limits	
47 CFR §95.979 RSS-Gen RSS-236	Each CBRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section. (a) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) as specified in the applicable paragraphs listed in the following table: For A3E, F3E (1), (3), (5), (6) (1) 25 dB (decibels) in the frequency band 4 kHz to 8 kHz removed from the channel center frequency; (3) 35 dB in the frequency band 8 kHz to 20 kHz removed from the channel center frequency; (5) 53 + 10 log (P) dB in any frequency band removed from the channel center frequency by more than 250% of the authorized bandwidth. (6) 60 dB in any frequency band centered on a harmonic (i.e., an integer multiple of two or more times) of the carrier frequency. (c) Measurement conditions and procedures. Subject to additional measurement standards and procedures established pursuant to part 2, subpart J, the following conditions and procedures must be used. (1) The unwanted emissions limits requirements in this section must be met both with and without the connection of permitted attachments, such as external speakers, microphones, power cords and/or antennas.

Measurement Procedure

TIA 382 22.2 Transmitter Radiated Spurious and Harmonic Emissions

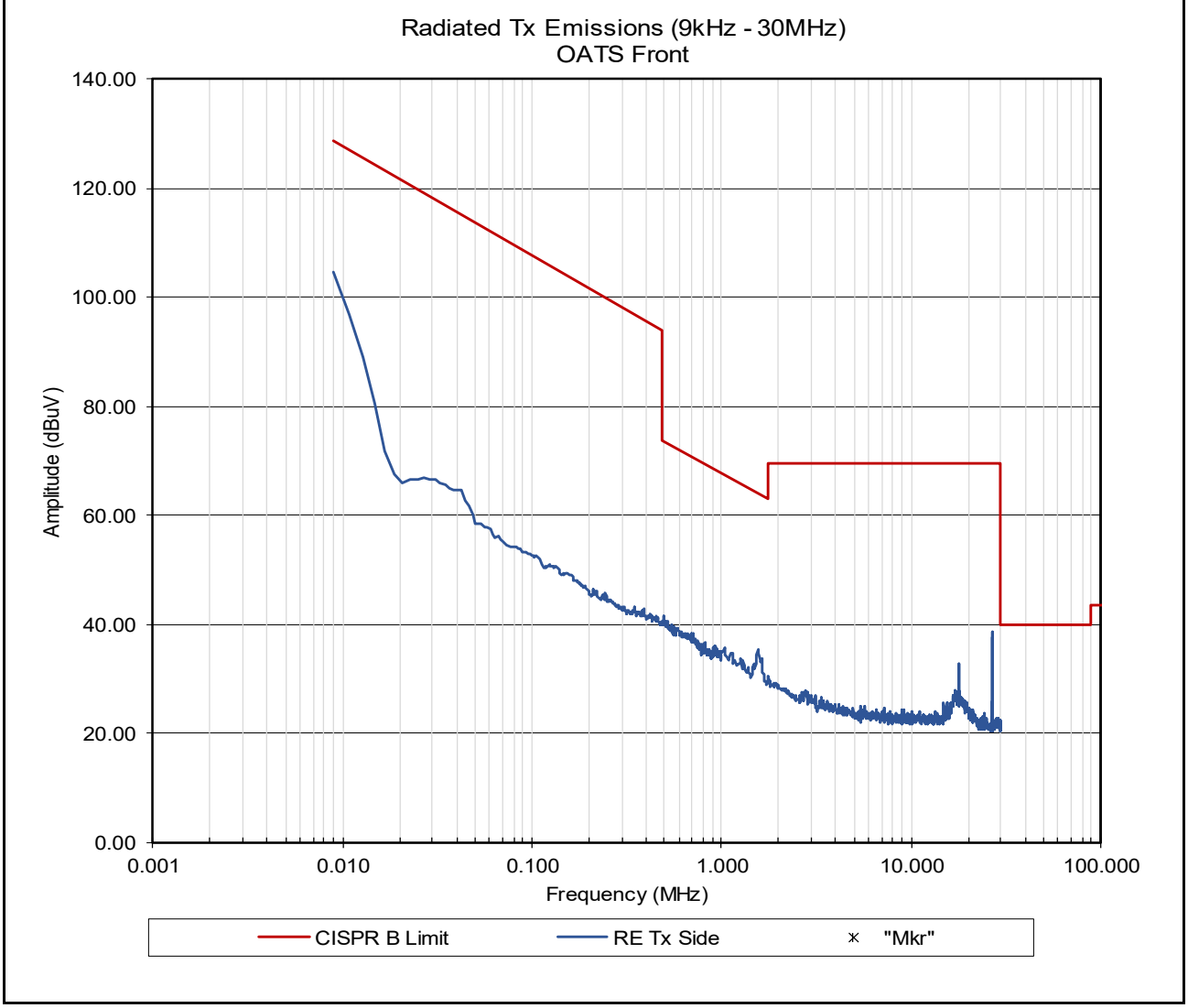
The transmitter shall be terminated in a nonradiating dummy load and shall be keyed but not modulated.

For each spurious frequency, raise and lower the receiver antenna to obtain a maximum reading on the FIM with the antenna at horizontal polarity. Then the turntable should be rotated to further increase this maximum reading. Repeat this procedure of raising and lowering the antenna and rotating the turntable until the highest possible signal has been obtained. The effect of the simulated accessory connections shall be noted, so that the measurement series producing the maximum radiation level can be recorded. Measurements were repeated with and without approved accessories.

Test Setup	Appendix A Figure A.3

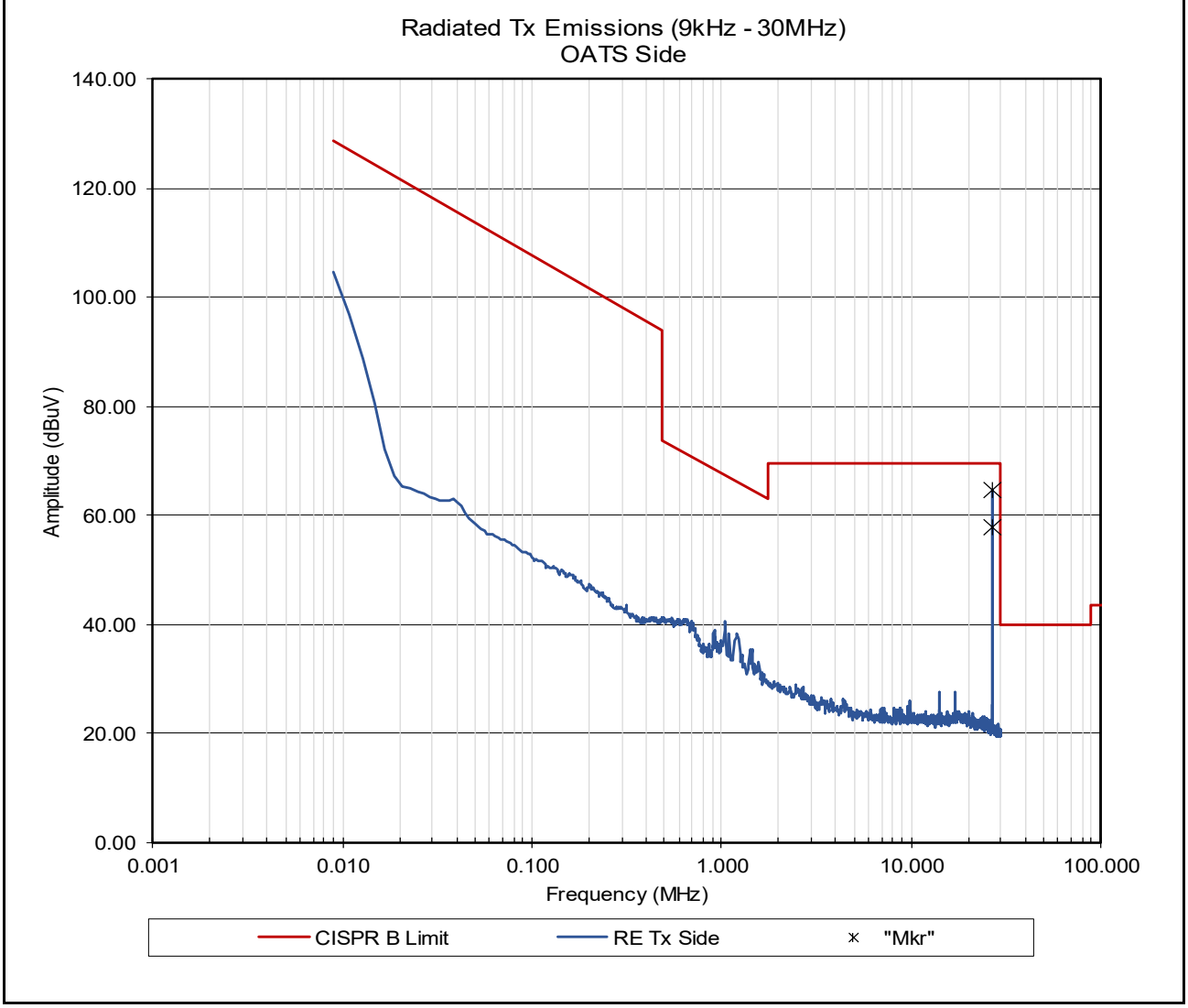
Plot 11.1 – Radiated Spurious Emissions OATS, 9kHz - 30MHz, without Accessories, Front

Radiated Tx Emissions:



Plot 11.2 – Radiated Spurious Emissions OATS, 9kHz - 30MHz, without Accessories, Side

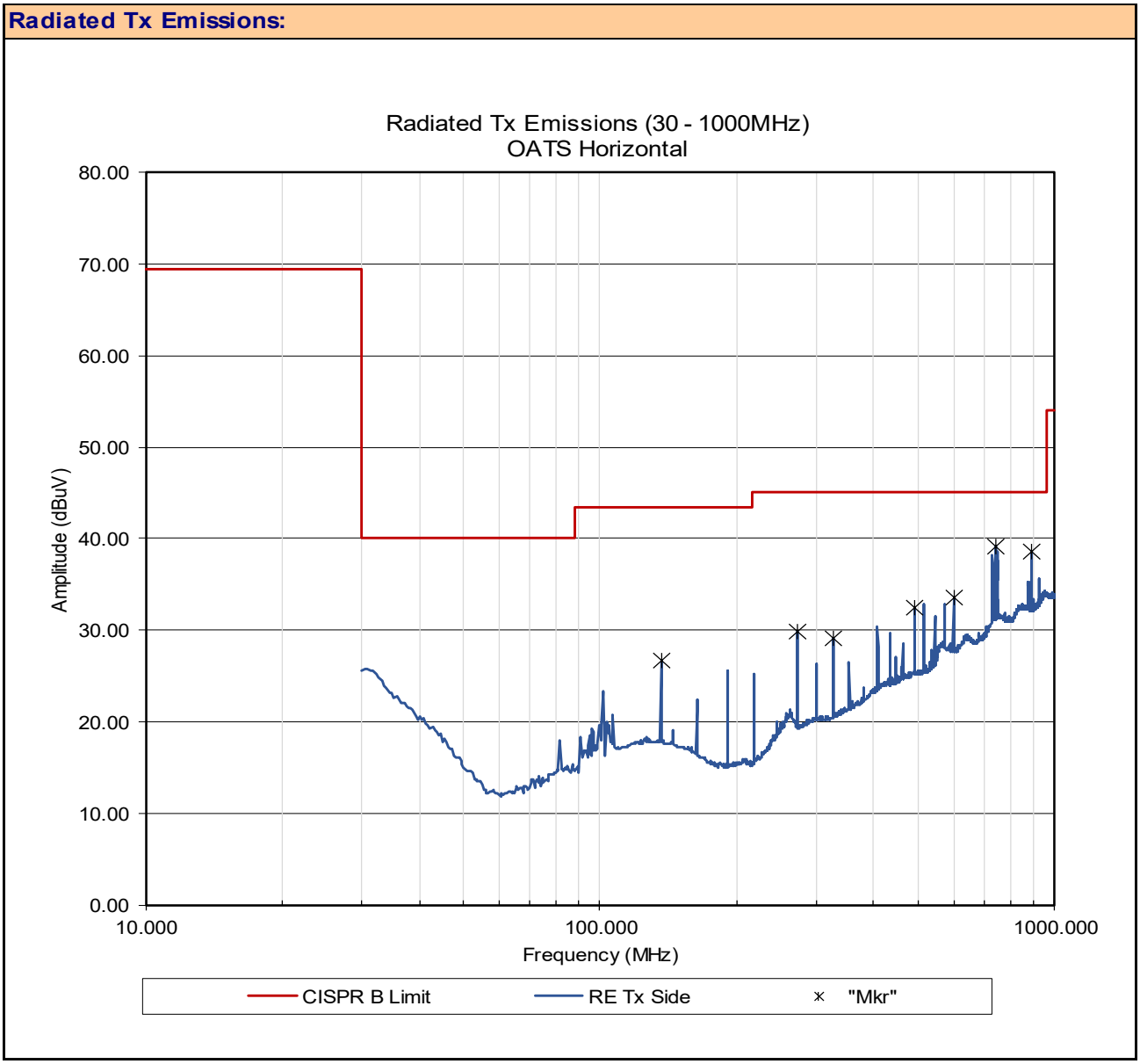
Radiated Tx Emissions:



Marker = Fundamental

Plot 11.3 – Radiated Spurious Emissions OATS, 30 - 1000MHz, without Accessories, Horizontal

Radiated Tx Emissions:



Plot 11.4 – Radiated Spurious Emissions OATS, 30 - 1000MHz, without Accessories, Vertical

Radiated Tx Emissions:

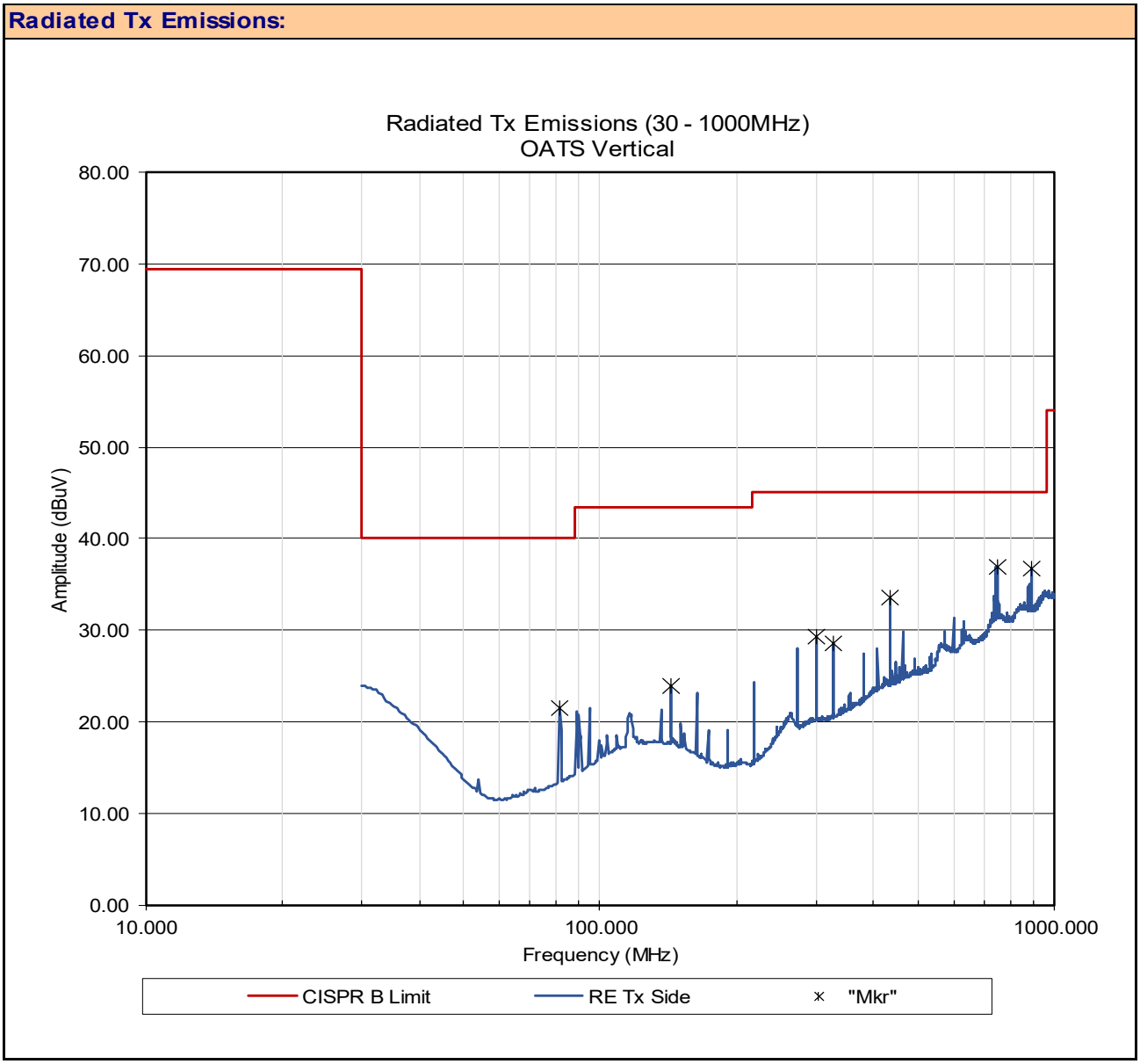


Table 11.1 – Summary of Radiated Tx Emissions, without Accessories

Summary of Radiated Tx Emissions w/o Accessories									
Measured Frequency Range (MHz)	Antenna Polarization	Emission Frequency (MHz)	Measured Emission [E_{Meas}] (dBuV)	Antenna ACF [ACF] (dB)	Cable Loss [L_C] (dB)	Amplifier Gain [G_A] (dB)	Corrected Emission [E_{Corr}] (dBuV/m)	Limit (dBuV)	Margin (dB)
.009 - 30	Front	**ND**	ND						-
.009 - 30	Side	**ND**	ND						-
30-1000	Horizontal	**136.04**	8.90 AV	16.60	1.12	0.00 (3)	**26.6** (2)	43.5	**16.9**
30-1000	Horizontal	**272.00**	10.50 AV	17.80	1.56	0.00 (3)	**29.9** (2)	45.0	**15.1**
30-1000	Horizontal	**326.50**	8.67 AV	18.75	1.71	0.00 (3)	**29.1** (2)	45.0	**15.9**
30-1000	Horizontal	**490.00**	7.23 AV	23.00	2.16	0.00 (3)	**32.4** (2)	45.0	**12.6**
30-1000	Horizontal	**598.50**	5.81 AV	25.30	2.40	0.00 (3)	**33.5** (2)	45.0	**11.5**
30-1000	Horizontal	**739.50**	7.90 AV	28.60	2.7	0.00 (3)	**39.2** (2)	45.0	**5.8**
30-1000	Horizontal	**886.50**	6.61 AV	29.10	2.90	0.00 (3)	**38.6** (2)	45.0	**6.4**
30-1000	Vertical	**81.48**	8.06 AV	12.50	0.91	0.00 (3)	**21.5** (2)	40.0	**18.5**
30-1000	Vertical	**143.08**	6.33 AV	16.49	1.14	0.00 (3)	**24.0** (2)	43.5	**19.5**
30-1000	Vertical	**299.00**	9.14 AV	18.50	1.63	0.00 (3)	**29.3** (2)	45.0	**15.7**
30-1000	Vertical	**326.50**	8.09 AV	18.75	1.71	0.00 (3)	**28.5** (2)	45.0	**16.5**
30-1000	Vertical	**435.50**	9.63 AV	22.00	2.01	0.00 (3)	**33.6** (2)	45.0	**11.4**
30-1000	Vertical	**750.50**	5.51 AV	28.70	2.69	0.00 (3)	**36.9** (2)	45.0	**8.1**
30-1000	Vertical	**889.50**	4.55 AV	29.25	2.91	0.00 (3)	**36.7** (2)	45.0	**8.3**
							Results:	**Complies**	

ND: No Emissions Detected above ambient or within 20dB of the limit

(2) Antenna ACF, Cable Loss and Amplifier Gain corrected in Spectrum Analyzer Transducer Factor

(3) External Amplier not used

$E_{Corr} = E_{Meas} + ACF^E + L_C - G_A$

Where ACF^E is the Electric Antenna Correction Factor

* Without Manufacturer's Accessories, ** With Manufacturer's Accessories

Summary of Radiated Tx Emissions ISED RSS-Gen 6.5 (Below 30MHz) w/o Accessories									
Measured Frequency Range (MHz)	Antenna Polarization	Emission Frequency (MHz)	Measured Emission [E_{Meas}] (dBuV)	Antenna ACF [ACF^H] (dB/Ωm)	Cable Loss [L_C] (dB)	Amplifier Gain [G_A] (dB)	Corrected Emission [H_{Corr}] (dBuA/m)	Limit (dBuA/m)	Margin (dB)
.009 - 30	Front	**ND**	ND						-
.009 - 30	Side	**ND**	ND						-

ND: No Emissions Detected above ambient or within 20dB of the limit

(2) Antenna ACF, Cable Loss and Amplifier Gain corrected in Spectrum Analyzer Transducer Factor

(3) External Amplier not used

$H_{Corr}(dBuA/m) = E_{Meas}(dBuV) + ACF^H(dB/\Omega m) + L_C - G_A$

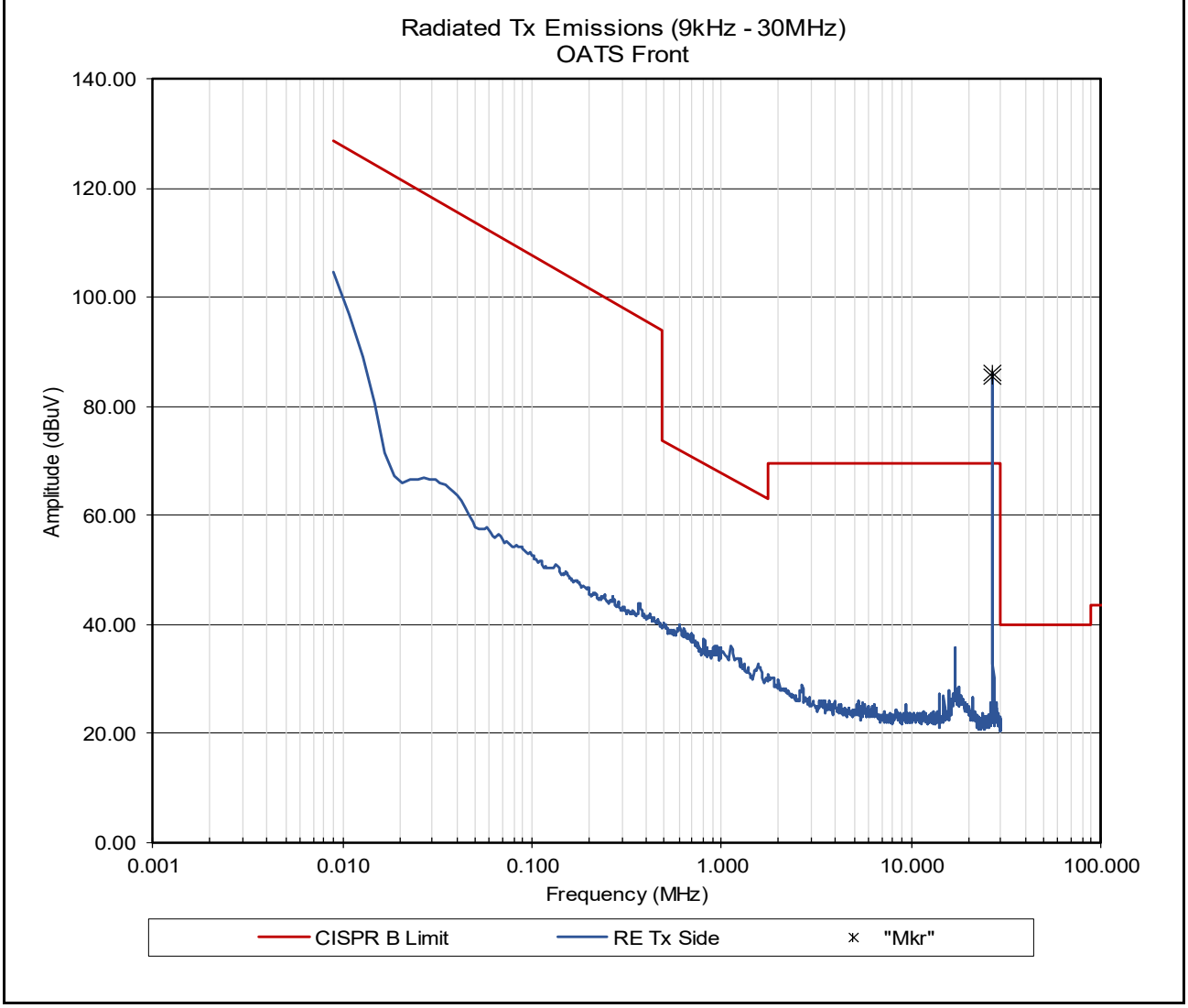
Where ACF^H is the Magnetic Antenna Correction Factor

$ACF^H(dB/\Omega m) = ACF^E(dB/m) - Z0(dB\Omega)$

Where $Z_0 = 120\pi\Omega = 377\Omega$, $Z_0(dB\Omega) = 20Log(377) = 51.5dB\Omega$

Plot 11.5 – Radiated Spurious Emissions OATS, 9kHz - 30MHz, with Accessories, Front

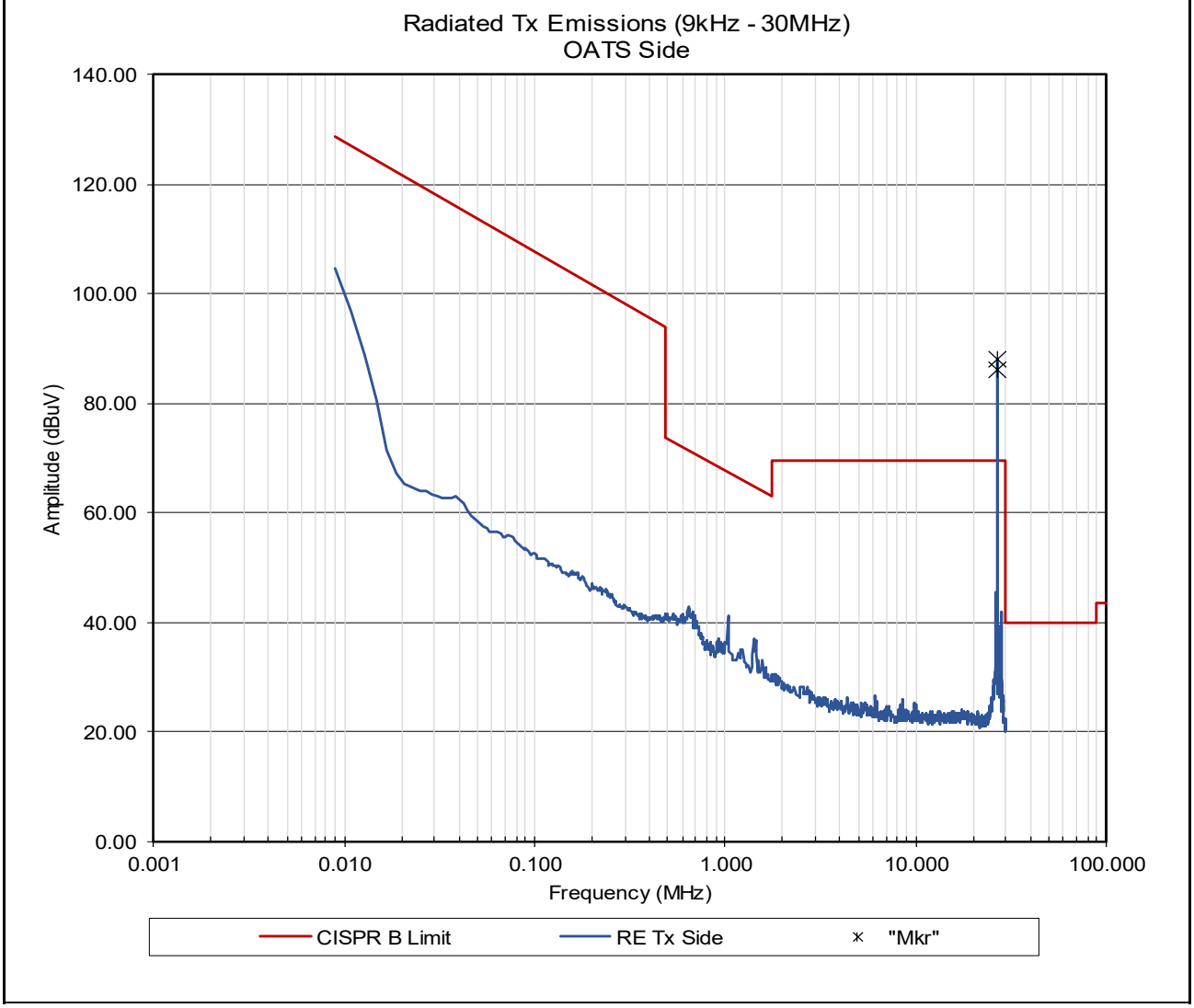
Radiated Tx Emissions:



Marker = Fundamental

Plot 11.6 – Radiated Spurious Emissions OATS, 9kHz - 30MHz, with Accessories, Side

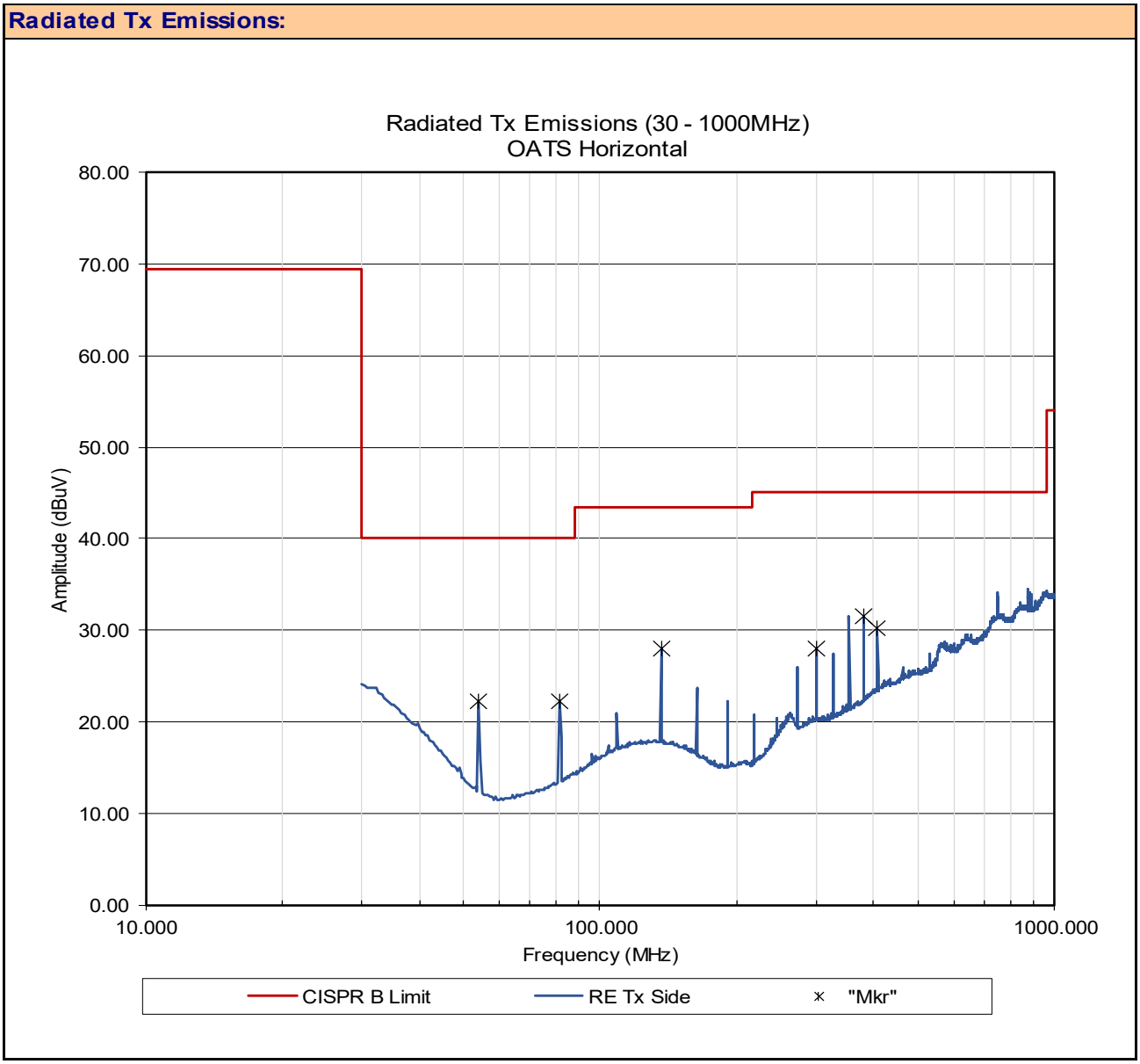
Radiated Tx Emissions:



Marker = Fundamental

Plot 11.7 – Radiated Spurious Emissions OATS, 30 - 1000MHz, with Accessories, Horizontal

Radiated Tx Emissions:



Plot 11.8 – Radiated Spurious Emissions OATS, 30 - 1000MHz, with Accessories, Vertical

Radiated Tx Emissions:

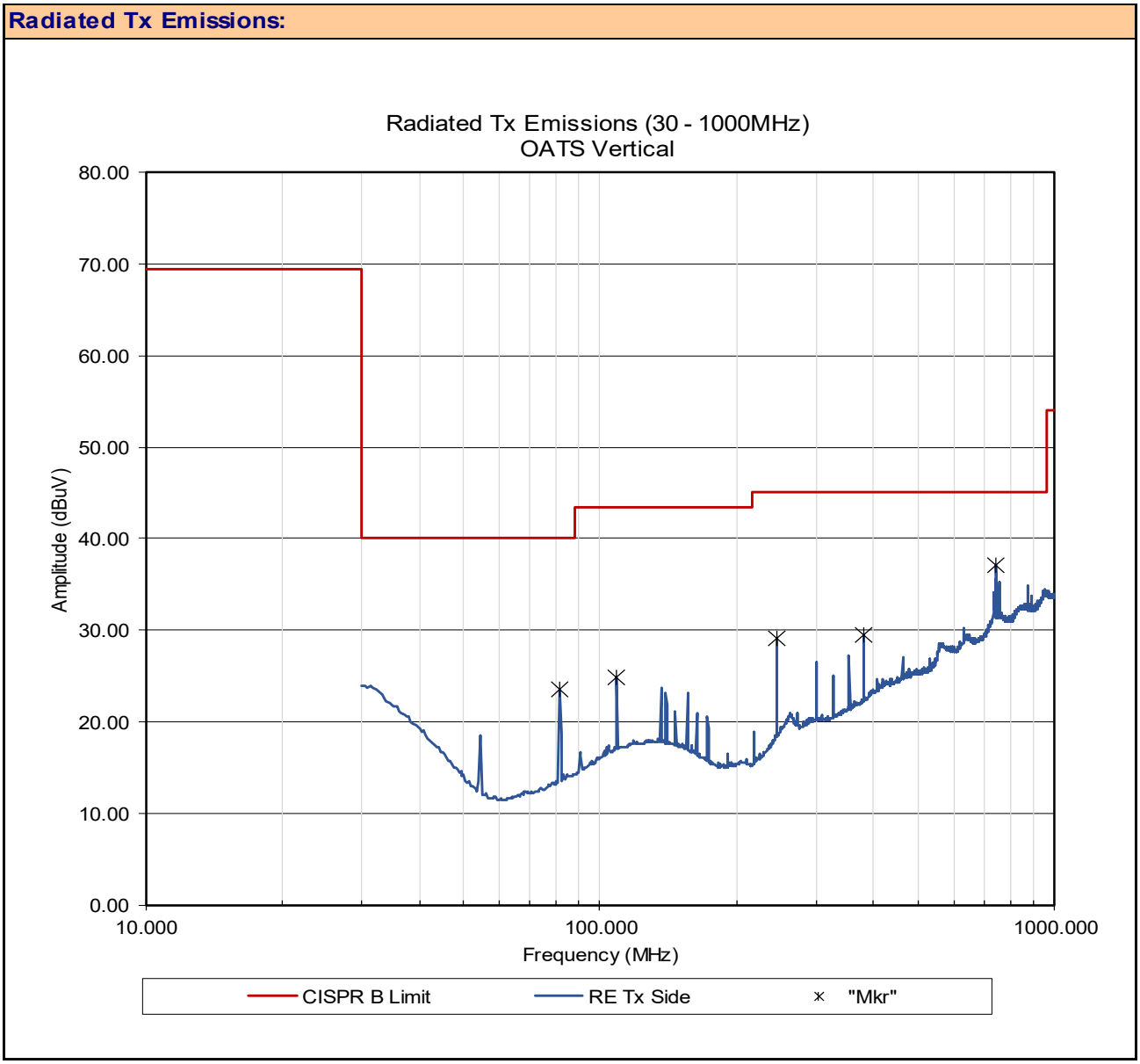


Table 11.2 – Summary of Radiated Tx Emissions, with Accessories

Summary of Radiated Tx Emissions w/ Accessories									
Measured Frequency Range (MHz)	Antenna Polarization	Emission Frequency (MHz)	Measured Emission [E_{Meas}] (dBuV)	Antenna ACF [ACF] (dB)	Cable Loss [L_C] (dB)	Amplifier Gain [G_A] (dB)	Corrected Emission [E_{Corr}] (dBuV/m)	Limit (dBuV)	Margin (dB)
.009 - 30	Front	**ND**	ND						-
.009 - 30	Side	**ND**	ND						-
30-1000	Horizontal	**54.20**	10.06 AV	11.46	0.78	0.00 (3)	**22.3** (2)	40.0	**17.7**
30-1000	Horizontal	**81.48**	8.85 AV	12.50	0.91	0.00 (3)	**22.3** (2)	40.0	**17.7**
30-1000	Horizontal	**136.04**	10.19 AV	16.60	1.12	0.00 (3)	**27.9** (2)	43.5	**15.6**
30-1000	Horizontal	**299.00**	7.94 AV	18.50	1.63	0.00 (3)	**28.1** (2)	45.0	**16.9**
30-1000	Horizontal	**381.00**	9.35 AV	20.40	1.86	0.00 (3)	**31.6** (2)	45.0	**13.4**
30-1000	Horizontal	**408.00**	6.71 AV	21.50	1.9	0.00 (3)	**30.1** (2)	45.0	**14.9**
30-1000	Vertical	**81.48**	10.16 AV	12.50	0.91	0.00 (3)	**23.6** (2)	40.0	**16.4**
30-1000	Vertical	**108.76**	7.78 AV	15.98	1.02	0.00 (3)	**24.8** (2)	43.5	**18.7**
30-1000	Vertical	**245.16**	10.79 AV	16.92	1.48	0.00 (3)	**29.2** (2)	45.0	**15.8**
30-1000	Vertical	**381.00**	7.14 AV	20.40	1.86	0.00 (3)	**29.4** (2)	45.0	**15.6**
30-1000	Vertical	**745.00**	5.75 AV	28.70	2.68	0.00 (3)	**37.1** (2)	45.0	**7.9**
							Results:		**Complies**

ND: No Emissions Detected above ambient or within 20dB of the limit

(2) Antenna ACF, Cable Loss and Amplifier Gain corrected in Spectrum Analyzer Transducer Factor

(3) External Amplier not used

$E_{Corr} = E_{Meas} + ACF^E + L_C - G_A$

Where ACF^E is the Electric Antenna Correction Factor

* Without Manufacturer's Accessories, ** With Manufacturer's Accessories

Summary of Radiated Tx Emissions ISED RSS-Gen 6.5 (Below 30MHz) w/ Accessories									
Measured Frequency Range (MHz)	Antenna Polarization	Emission Frequency (MHz)	Measured Emission [E_{Meas}] (dBuV)	Antenna ACF [ACF^H] (dB/Ωm)	Cable Loss [L_C] (dB)	Amplifier Gain [G_A] (dB)	Corrected Emission [H_{Corr}] (dBuA/m)	Limit (dBuA/m)	Margin (dB)
.009 - 30	Front	**ND**	ND						-
.009 - 30	Side	**ND**	ND						-

ND: No Emissions Detected above ambient or within 20dB of the limit

(2) Antenna ACF, Cable Loss and Amplifier Gain corrected in Spectrum Analyzer Transducer Factor

(3) External Amplier not used

$H_{Corr}(dBuA/m) = E_{Meas}(dBuV) + ACF^H(dB/\Omega m) + L_C - G_A$

Where ACF^H is the Magnetic Antenna Correction Factor

$ACF^H(dB/\Omega m) = ACF^E(dB/m) - Z0(dB\Omega)$

Where $Z_0 = 120\pi\Omega = 377\Omega$, $Z_0(dB\Omega) = 20Log(377) = 51.5dB\Omega$

12.0 RADIATED SPURIOUS RECEIVER (RX) EMISSIONS

Test Procedure	
Normative Reference	**FCC 47 CFR §15.109, ICES-003(6.2)** **ANSI C63.4:2014**

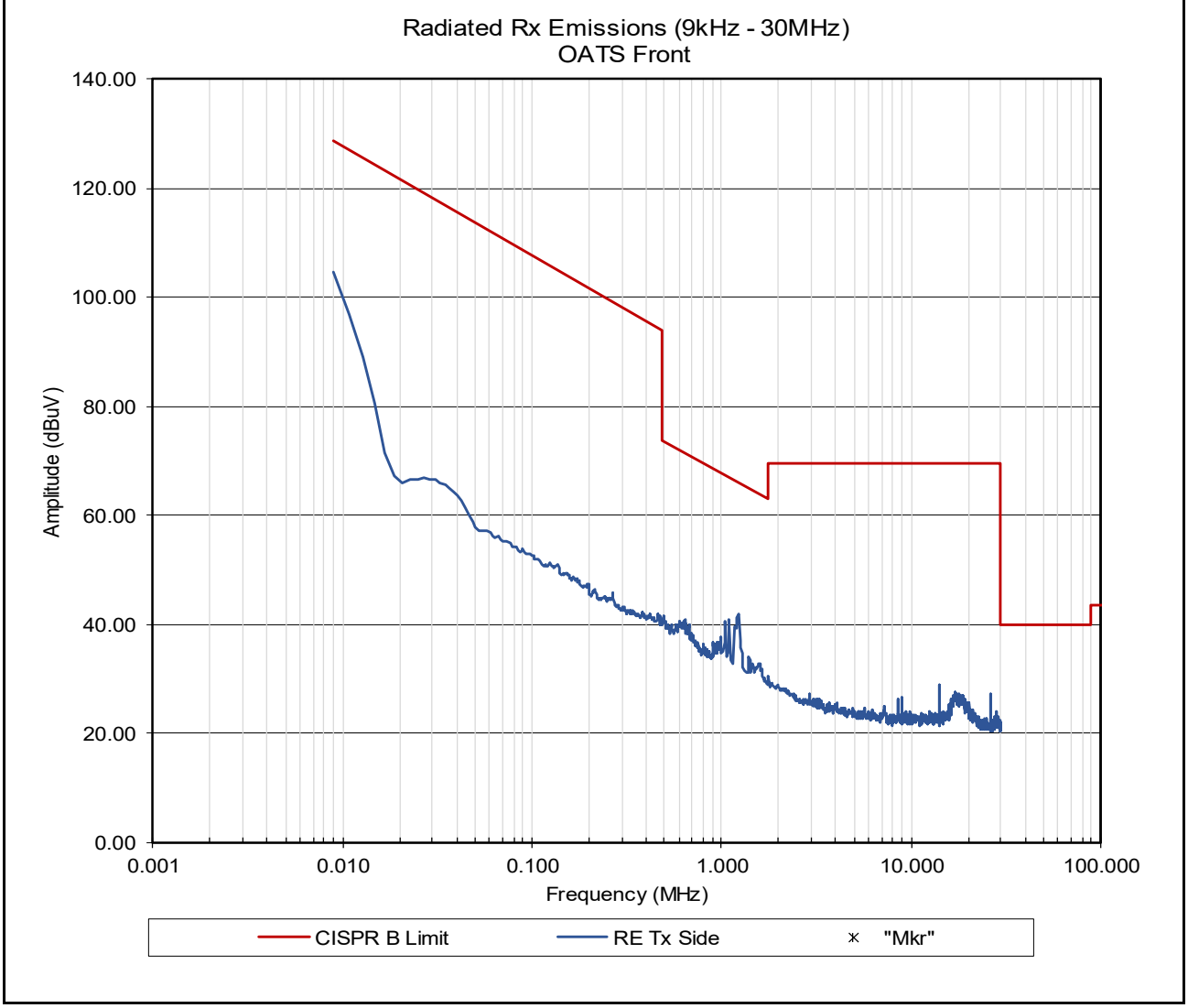
Limits	
47 CFR §15.109	(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values: 30-88MHz: 40dBuV/m 88-216MHz: 43.5dBuV/m 216-960MHz: 46dBuV/m > 960MHz: 54dBuV/m
ICES-003(6.2.1) RSS-Gen 8.9	6.2.1 - Radiated Emissions Limits Below 1 GHz Class B: ITE that does not meet the conditions for Class A operation shall comply with the Class B radiated limits set out in Table 5 determined at a distance of 3 metres. 30-88MHz: 40dBuV/m 88-216MHz: 43.5dBuV/m 216-960MHz: 46dBuV/m > 960MHz: 54dBuV/m

Test Setup	**Appendix A** **Figure A.3**

Measurement Procedure
The DUT was set up as per ANSI C63.4:2014. Emissions were scanned between 30MHz and 1000MHz. The turntable was rotated 360 degrees and the antenna was elevated to 4m to optimize the measured emissions.

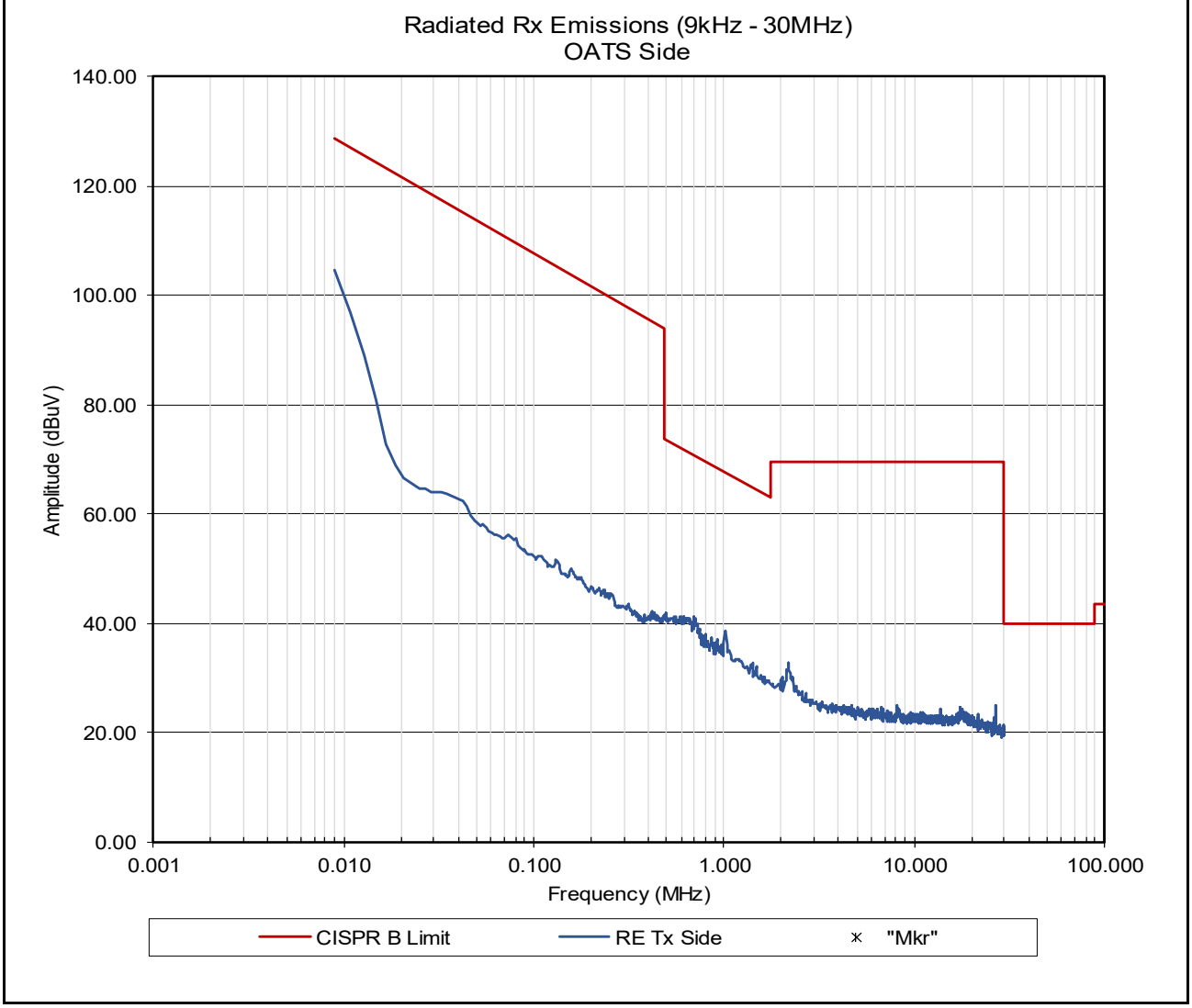
Plot 12.1 – Radiated Rx Emissions OATS, 9kHz - 30MHz, Front

Radiated Rx Emissions:



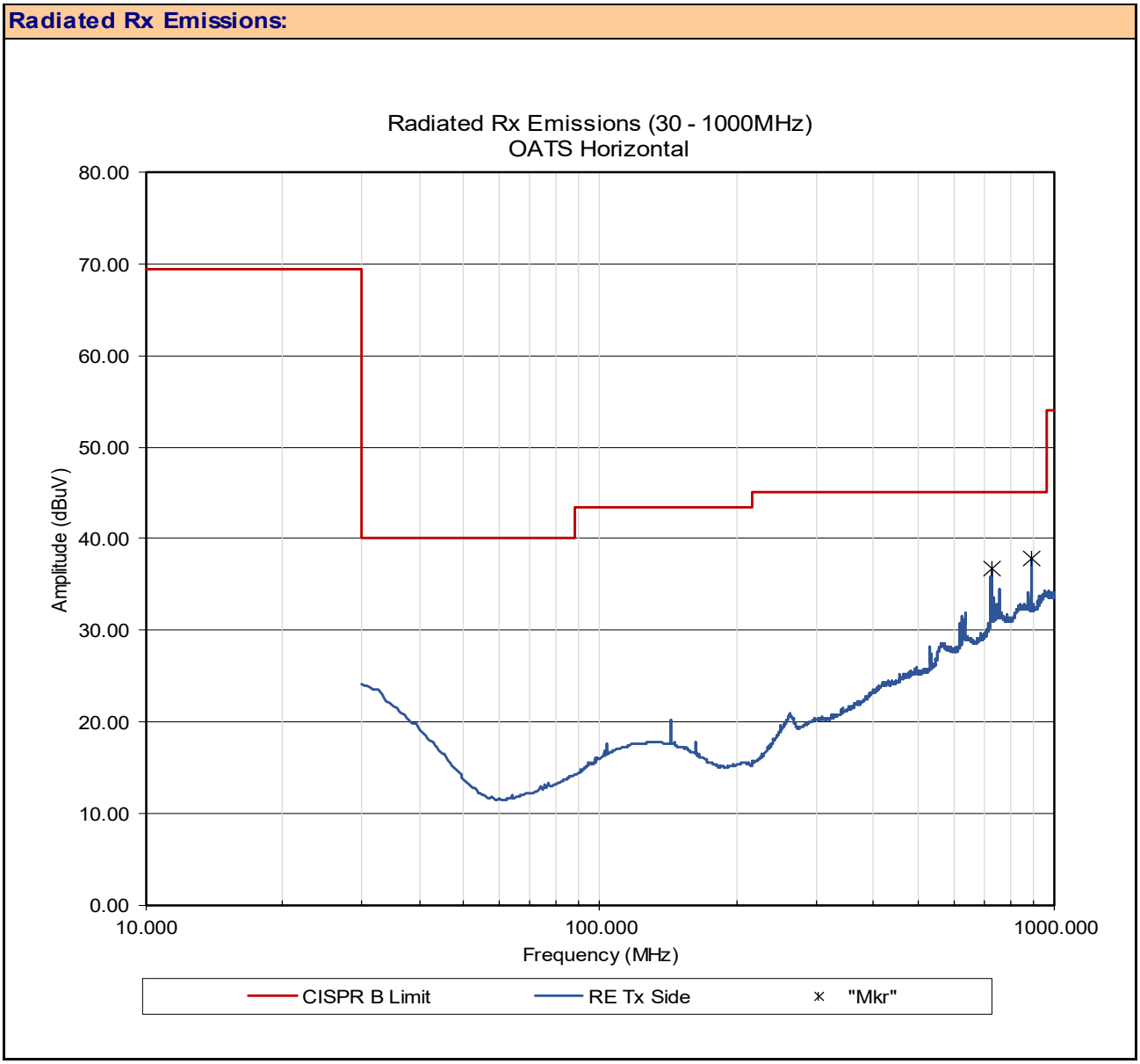
Plot 12.2 – Radiated Rx Emissions OATS, 9kHz - 30MHz, Side

Radiated Rx Emissions:



Plot 12.3– Radiated Spurious Emissions OATS, 30 - 1000MHz, Horizontal

Radiated Rx Emissions:



Plot 12.4– Radiated Spurious Emissions OATS, 30 - 1000MHz, Vertical

Radiated Rx Emissions:

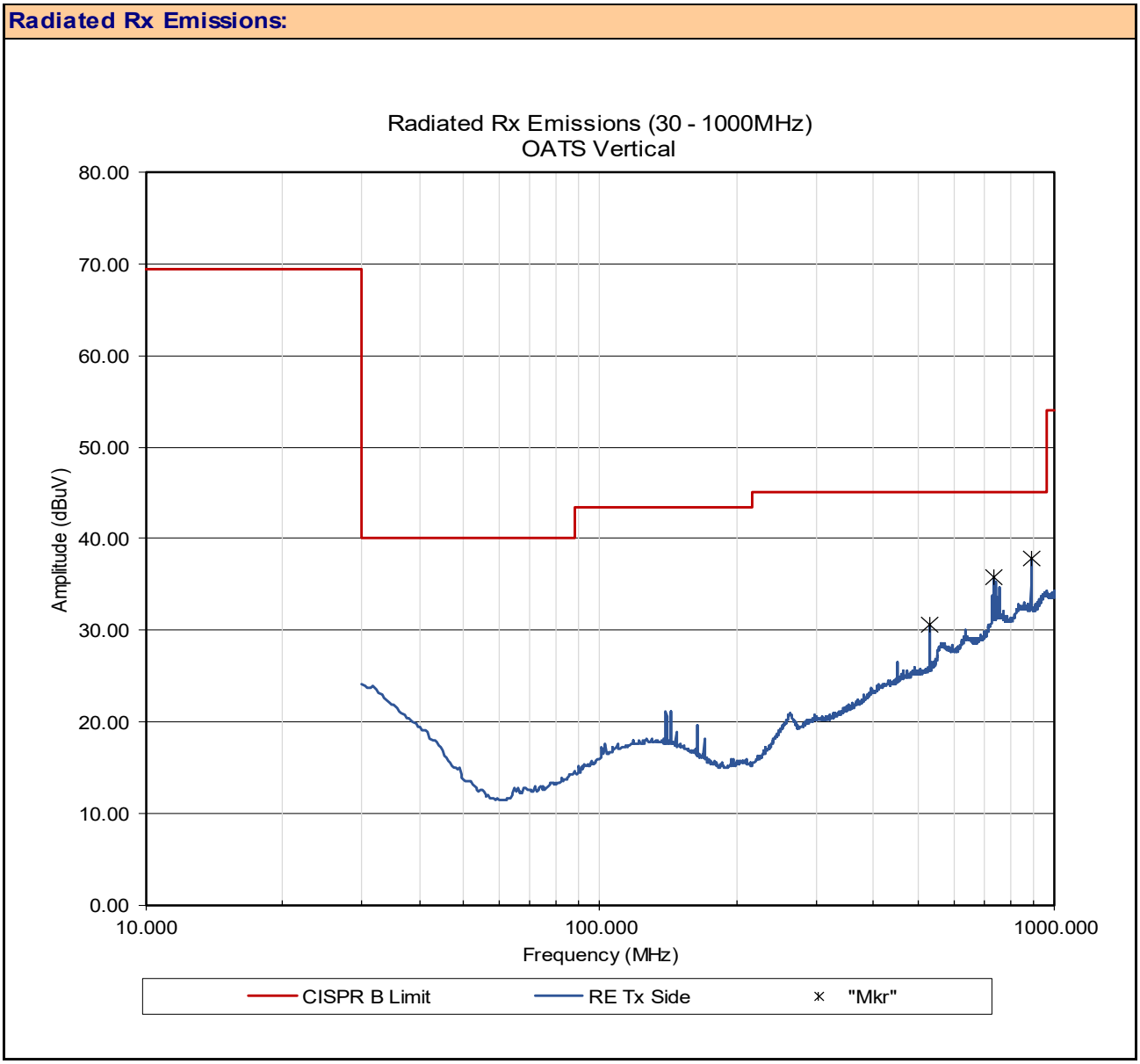


Table 12.1 – Summary of Radiated Receiver (Rx) Emissions

Summary of Radiated Rx Emissions									
Measured Frequency Range (MHz)	Antenna Polarization	Emission Frequency (MHz)	Measured Emission [E_{Meas}] (dBuV)	Antenna ACF [ACF] (dB)	Cable Loss [L_C] (dB)	Amplifier Gain [G_A] (dB)	Corrected Emission [E_{Corr}] (dBuV/m)	Limit (dBuV)	Margin (dB)
.009 - 30	Front	**ND**	ND AV						-
.009 - 30	Side	**ND**	ND AV						-
30-1000	Horizontal	**727.0000**	**5.8098** AV	28.20000	2.7	0.00 (3)	**36.7** (2)	45.0	**8.3**
30-1000	Horizontal	**888.0000**	**5.7478** AV	29.20000	2.9	0.00 (3)	**37.9** (2)	45.0	**7.1**
30-1000	Vertical	**530.0000**	**4.9200** AV	23.40000	2.3	0.00 (3)	**30.6** (2)	45.0	**14.4**
30-1000	Vertical	**732.0000**	**4.8400** AV	28.30000	2.7	0.00 (3)	**35.8** (2)	45.0	**9.2**
30-1000	Vertical	**886.0000**	**5.8954** AV	29.10000	2.9	0.00 (3)	**37.9** (2)	45.0	**7.1**
							Results:	**Complies**	

ND: No Emissions Detected above ambient or within 20dB of the limit
(2) Antenna ACF, Cable Loss and Amplifier Gain corrected in Spectrum Analyzer Transducer Factor
(3) External Amplier not used

$E_{Corr} = E_{Meas} + ACF^E + L_C - G_A$

Where ACF^E is the Electric Antenna Correction Factor
* Without Manufacturer's Accessories, ** With Manufacturer's Accessories

Summary of Radiated Rx Emissions ISED RSS-Gen 6.5 (Below 30MHz)									
Measured Frequency Range (MHz)	Antenna Polarization	Emission Frequency (MHz)	Measured Emission [E_{Meas}] (dBuV)	Antenna ACF [ACF^H] (dB/Ωm)	Cable Loss [L_C] (dB)	Amplifier Gain [G_A] (dB)	Corrected Emission [H_{Corr}] (dBuA/m)	Limit (dBuA/m)	Margin (dB)
.009 - 30	Front	**ND**	ND AV						-
.009 - 30	Side	**ND**	ND AV						-

ND: No Emissions Detected above ambient or within 20dB of the limit
(2) Antenna ACF, Cable Loss and Amplifier Gain corrected in Spectrum Analyzer Transducer Factor
(3) External Amplier not used

$H_{Corr}(dBuA/m) = E_{Meas}(dBuV) + ACF^H(dB/\Omega m) + L_C - G_A$

Where ACF^H is the Magnetic Antenna Correction Factor

$ACF^H(dB/\Omega m) = ACF^E(dB/m) - Z0(dB\Omega)$

Where $Z_0 = 120\pi\Omega = 377\Omega$, $Z_0(dB\Omega) = 20Log(377) = 51.5dB\Omega$

13.0 FREQUENCY STABILITY

Test Conditions	
Normative Reference	**FCC 47 CFR §2.1055, §95.965, RSS-Gen, ANSI C63.10**

Limits	
47 CFR §95.965	Each CBRS transmitter type must be designed such that the transmit carrier frequency (or in the case of SSB transmissions, the reference frequency) remains within 50 parts-per-million of the channel center frequencies specified in §95.963 under all normal operating conditions.

Measurement Procedure

47 CFR §2.1055 Frequency Stability

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From -30° to +50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement.

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:

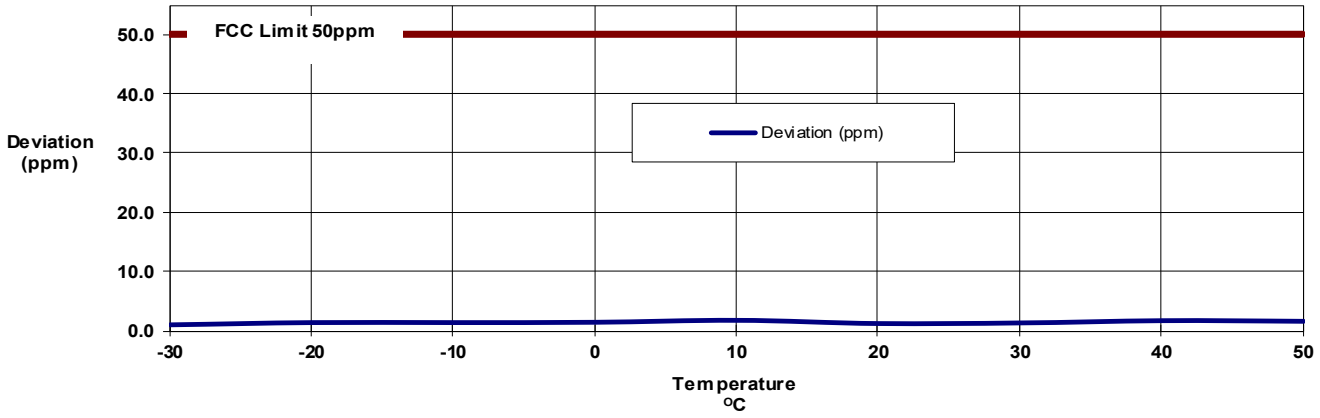
(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

Test Setup	Appendix A Figure A.4

Table 13.1 – Summary of Frequency Stability Results (AM)

Frequency Stability

Nominal Frequency (MHz):	27.205
Nominal Channel BW (KHz):	CW
Nominal Voltage (VDC):	13.8
Nominal Temperature (°C):	20



Frequency Stability Measurements (Temperature)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (Hz)	Deviation [Absolute] (ppm)
-30	27.205000	27.2050280	28	1.03
-20		27.2050373	37	1.37
-10		27.2050377	38	1.39
0		27.2050392	39	1.44
10		27.2050477	48	1.75
20		27.2050336	34	1.23
30		27.2050356	36	1.31
40		27.2050457	46	1.68
50		27.2050428	43	1.57
			Maximum Deviation:	1.75
			Maximum Limit:	50.00
			Result:	Complies

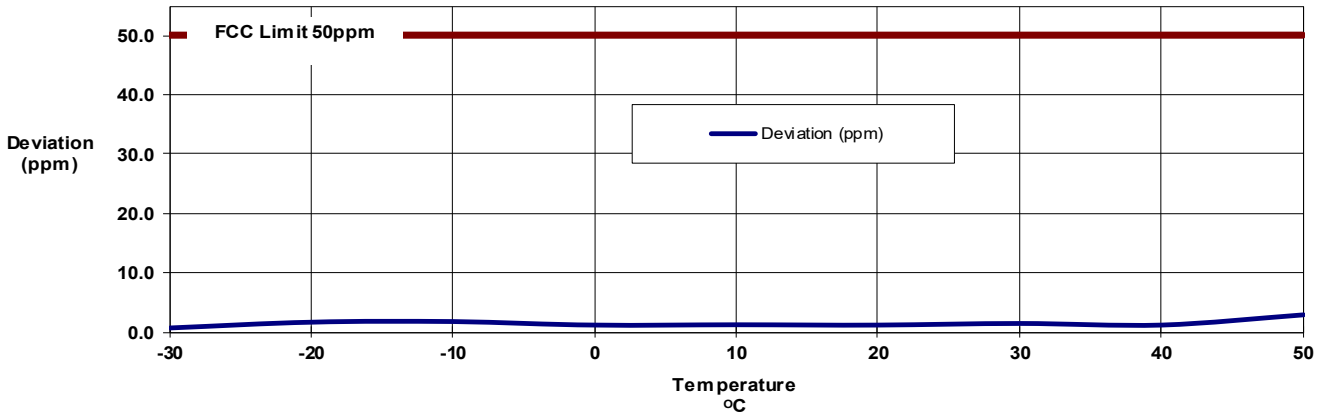
Frequency Stability Measurements (Voltage)

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (Hz)	Deviation [Absolute] (ppm)
15.9 (115%)	27.205000	27.2050343	34	1.26
13.8 (100%)		27.2050336	34	1.23
11.7 (85%)		27.2050318	32	1.17
		Maximum Deviation:		1.26
		Maximum Limit:		50.00
		Result:		Complies

Table 13.2 – Summary of Frequency Stability Results (FM)

Frequency Stability

Nominal Frequency (MHz):	27.205
Nominal Channel BW (KHz):	CW
Nominal Voltage (VDC):	13.8
Nominal Temperature (°C):	20



Frequency Stability Measurements (Temperature)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (Hz)	Deviation [Absolute] (ppm)
-30	27.205000	27.2050214	21	0.79
-20		27.2050486	49	1.79
-10		27.2050503	50	1.85
0		27.2050342	34	1.26
10		27.2050363	36	1.34
20		27.2050343	34	1.26
30		27.2050421	42	1.55
40		27.2050349	35	1.28
50		27.2050821	82	3.02
			Maximum Deviation:	3.02
			Maximum Limit:	50.00
			Result:	Complies

Frequency Stability Measurements (Voltage)

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (Hz)	Deviation [Absolute] (ppm)
15.9 (115%)	27.205000	27.2050352	35	1.29
13.8 (100%)		27.2050343	34	1.26
11.7 (85%)		27.2050366	37	1.35
			Maximum Deviation:	1.35
			Maximum Limit:	50.00
			Result:	Complies

APPENDIX A – TEST SETUP DRAWINGS AND EQUIPMENT

Table A.1 – Setup - Conducted Measurements Equipment

Equipment List			
Asset Number	**Manufacturer**	**Model Number**	**Description**
00241	R&S	FSU40	Spectrum Analyzer

Figure A.1 – Test Setup Conducted Measurements

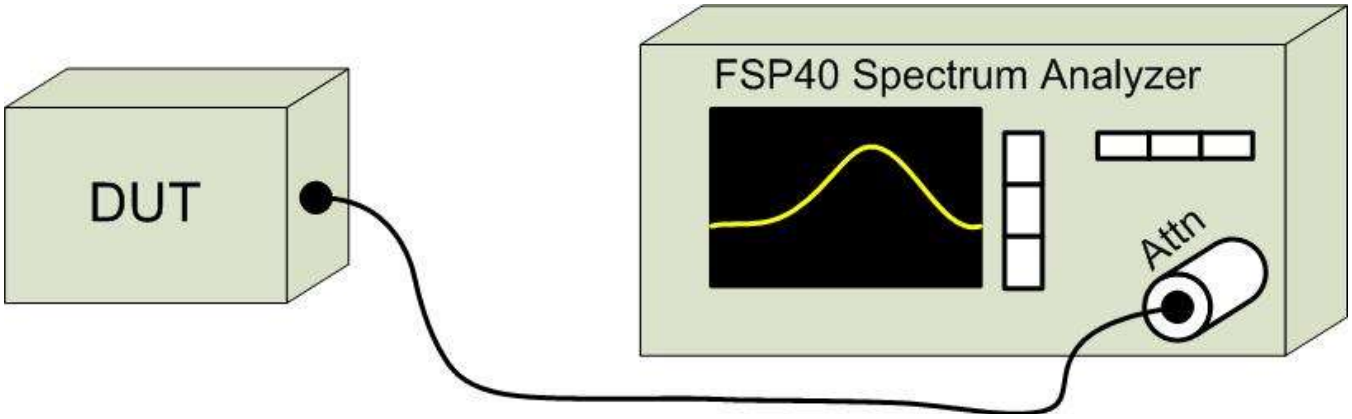


Table A.2 – Setup - Audio Modulation Equipment

Equipment List			
Asset Number	**Manufacturer**	**Model Number**	**Description**
00028	HP	8901A	Modulation Analyzer
00027	HP	8903B	Audio Analyzer/Generator

Figure A.2 – Test Setup Audio Modulation Response Measurements

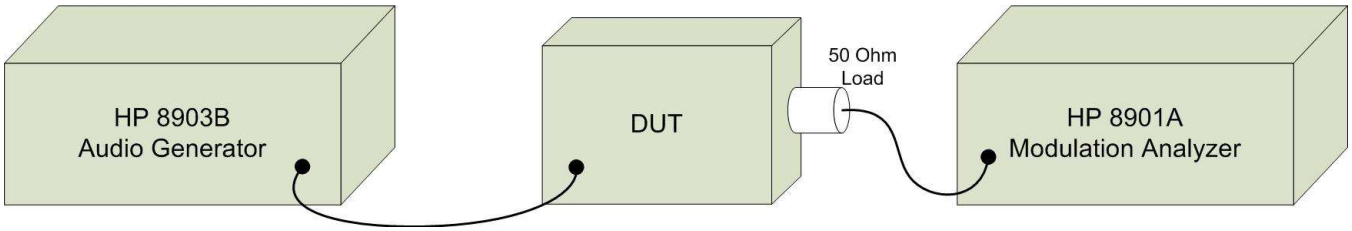


Table A.3 – Setup - Radiated Emissions Equipment

Equipment List			
Asset Number	**Manufacturer**	**Model Number**	**Description**
00051	HP	8566B	Spectrum Analyzer
00049	HP	85650A	Quasi-peak Adapter
00047	HP	85685A	RF Preselector
00072	EMCO	2075	Mini-mast
00073	EMCO	2080	Turn Table
00071	EMCO	2090	Multi-Device Controller
00265	Miteq	JS32-00104000-58-5P	Microwave L/N Amplifier
00241	R&S	FSU40	Spectrum Analyzer
00050	Chase	CBL-6111A	Bilog Antenna
00275	Coaxis	LMR400	25m Cable
00276	Coaxis	LMR400	4m Cable
00278	TILE	34G3	TILE Test Software
00034	ETS	3115	Double Ridged Guide Horn

CNR: Calibration Not Required
COU: Calibrate On Use

Figure A.3 – Test Setup Radiated Emissions Measurements Below 30MHz

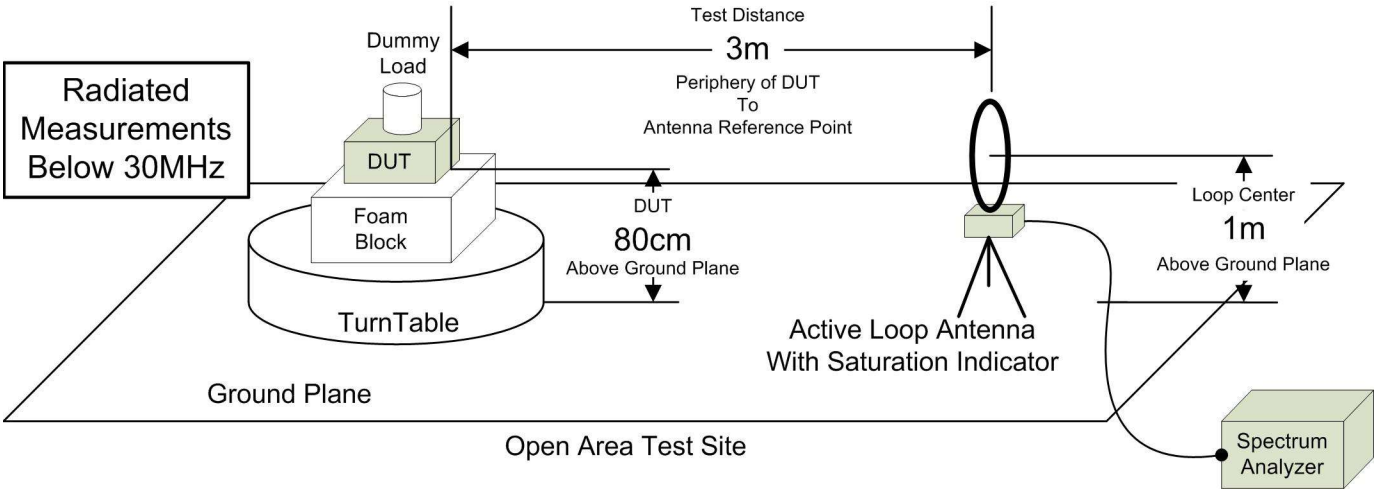


Figure A.4 – Test Setup Radiated Emissions Measurements 30-1000MHz

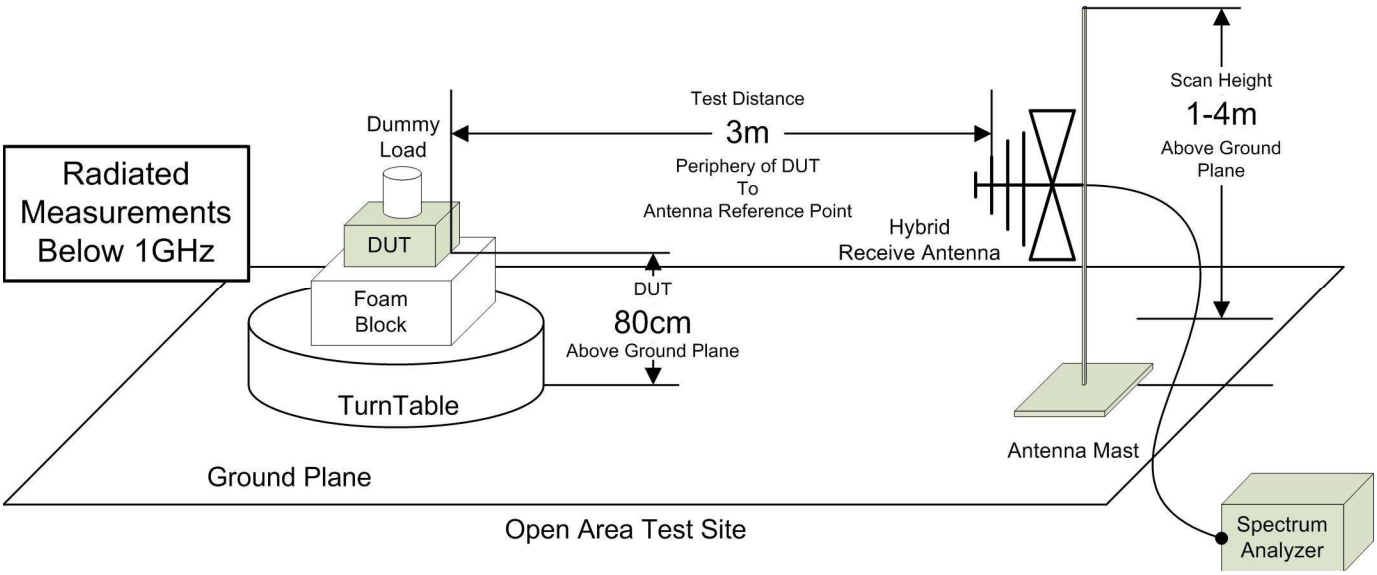


Figure A.5 – Test Setup Radiated Emissions Measurements 30-1000MHz

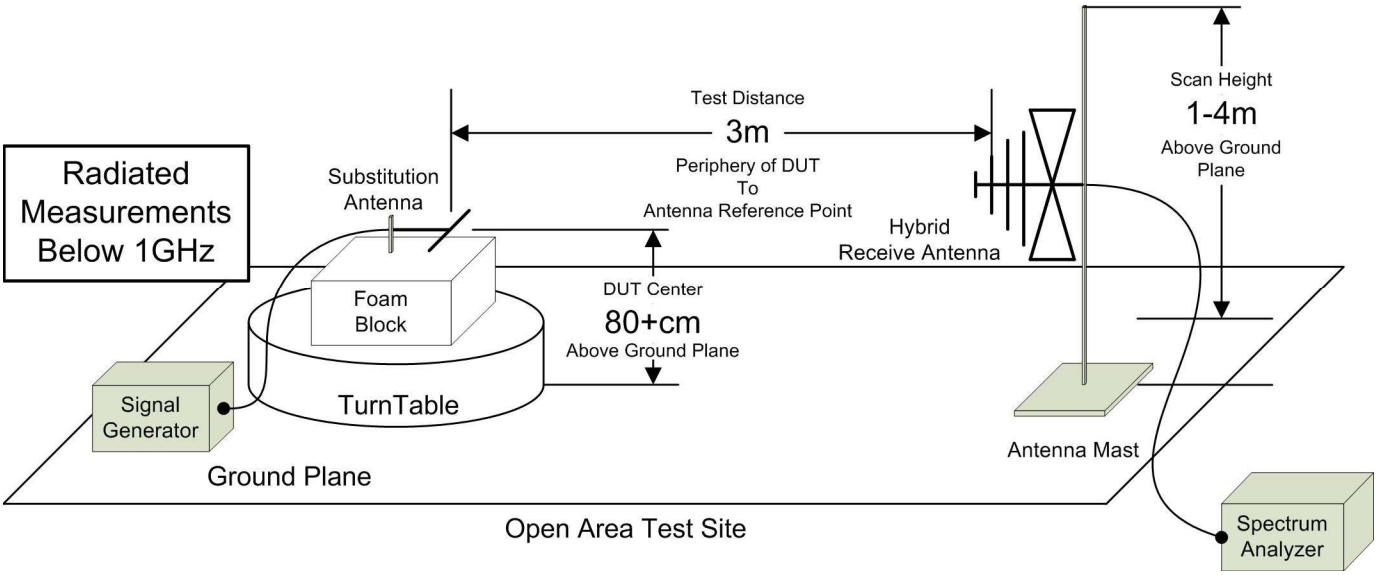
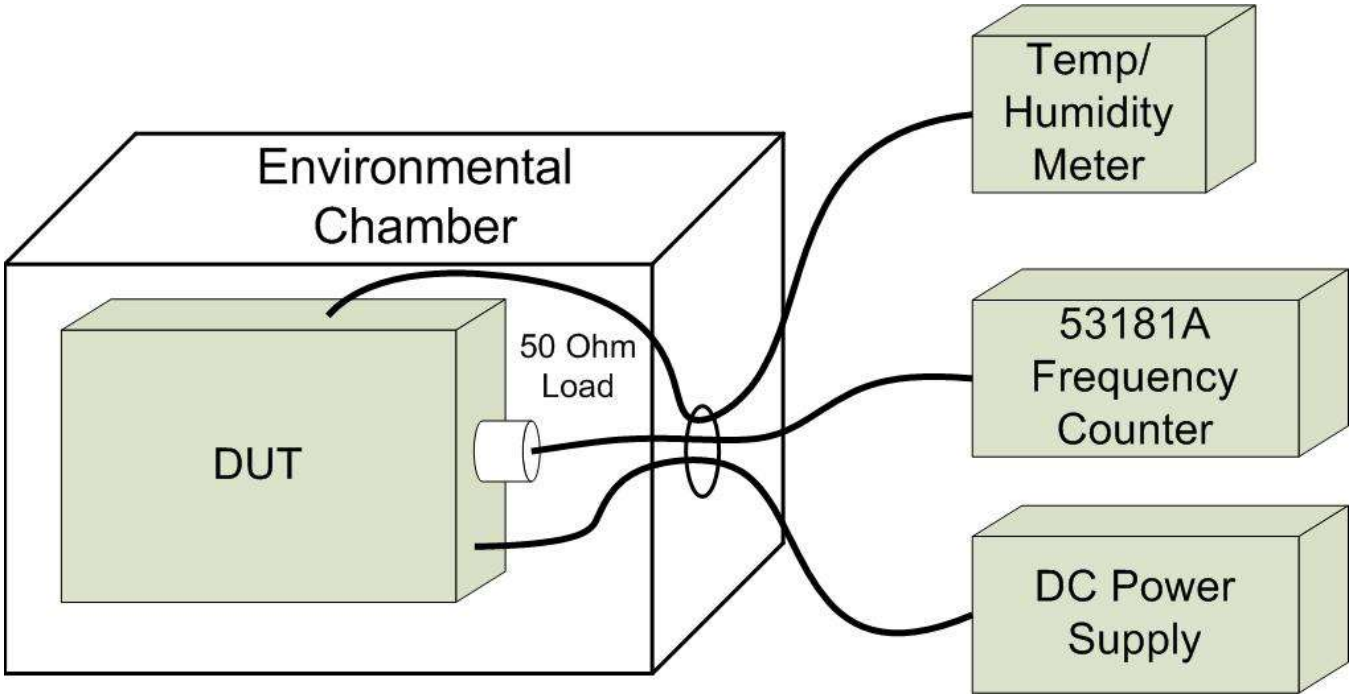


Table A.4 – Setup - Frequency Stability Measurement Equipment

Equipment List			
Asset Number	**Manufacturer**	**Model Number**	**Description**
n/a	ESPEC	ECT-2	Environmental Chamber
00003	HP	53181A	Frequency Counter
n/a	HP	E3611A	Power Supply
00234	VWR	61161-378	Temp/Humidity Meter

Figure A.6 – Test Setup Frequency Stability Measurements



APPENDIX B – EQUIPMENT LIST AND CALIBRATION

Equipment List							
Asset Number	Manufacturer	Model Number	Serial Number	Description	Last Calibrated	Calibration Interval	Calibration Due
00050	Chase	CBL-6111A	1607	Bilog Antenna	16 Nov 2023	Triennial	16 Nov 2026
00085	EMCO	6502	9203-2724	Loop Antenna	6 Sep 2022	Triennial	6 Sep 2025
00223	HP	8901A	3749A07154	Modulation Analyzer	10 Jan 2024	Triennial	10 Jan 2027
00224	HP	8903B	3729A18691	Audio Analyzer	COU		COU
00241	R&S	FSU40	100500	Spectrum Analyzer	6 Sep 2024	Triennial	6 Sep 2027
00005	HP	8648D	3847A00611	Signal Generator	28 Jun 2023	Triennial	28 Jun 2026
00003	HP	53181A	3736A05175	Frequency Counter	28 Jun 2023	Triennial	28 Jun 2026
00250	Circuit Test	DMR-1800	TE182	Digital Multi-Meter - DVM	26 Jun 2023	Triennial	26 Jun 2026
00071	EMCO	2090	9912-1484	Multi-Device Controller	n/a	n/a	n/a
00072	EMCO	2075	0001-2277	Mini-mast	n/a	n/a	n/a
00073	EMCO	2080	0002-1002	Turn Table	n/a	n/a	n/a
00081	ESPEC	ECT-2	0510154-B	Environmental Chamber	NCR	n/a	CNR
00234	VWR	61161-378	140320430	Temp/Humidity Meter	New	Triennial	New
00201	HP	E3611A	KR83015294	DC Power Supply	COU	n/a	COU
00263	Koaxis	KP10-1.00M-TD	263	1m Armoured Cable	COU	n/a	COU
00065	Pasternack	PE7014-30	n/a	30dB, 5W Attenuator	COU	n/a	COU
00130	Pasternack	PE7019-30	n/a	30dB, 50W Attenuator	COU	n/a	COU
00275	TMS	LMR400	n/a	25m Cable	COU	n/a	COU
00278	TILE	34G3	n/a	TILE Test Software	NCR	n/a	NCR

NCR: No Calibration Required
COU: Calibrate On Use

APPENDIX C – MEASUREMENT INSTRUMENT UNCERTAINTY

CISPR 16-4 Measurement Uncertainty (U_{LAB})	
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence interval using a coverage factor of k=2	
Radiated Emissions 30MHz - 200MHz	
U_{LAB} = 5.14dB U_{CISPR} = 6.3dB	
Radiated Emissions 200MHz - 1000MHz	
U_{LAB} = 5.90dB U_{CISPR} = 6.3dB	
Radiated Emissions 1GHz - 6GHz	
U_{LAB} = 4.80dB U_{CISPR} = 5.2dB	
Radiated Emissions 6GHz - 18GHz	
U_{LAB} = 5.1dB U_{CISPR} = 5.5dB	
Power Line Conducted Emissions 9kHz to 150kHz	
U_{LAB} = 2.96dB U_{CISPR} = 3.8dB	
Power Line Conducted Emissions 150kHz to 30MHz	
U_{LAB} = 3.12dB U_{CISPR} = 3.4dB	
If the calculated uncertainty U_{lab} is **less** than U_{CISPR} then:	
1	Compliance is deemed to occur if **NO** measured disturbance exceeds the disturbance limit
2	Non-Compliance is deemed to occur if **ANY** measured disturbance **EXCEEDS** the disturbance limit
If the calculated uncertainty U_{lab} is **greater** than U_{CISPR} then:	
3	Compliance is deemed to occur if **NO** measured disturbance, increased by (U_{lab} - U_{CISPR}), exceeds the disturbance limit
4	Non-Compliance is deemed to occur if **ANY** measured disturbance, increased by (U_{lab} - U_{CISPR}), **EXCEEDS** the disturbance limit

Other Measurement Uncertainties (U_{LAB})
RF Conducted Emissions 9kHz - 40GHz
U_{LAB} = 1.0dB U_{CISPR} = n/a
Frequency/Bandwidth 9kHz - 40GHz
U_{LAB} = 0.1ppm U_{CISPR} = n/a
Temperature
U_{LAB} = 1^{O}C U_{CISPR} = n/a

END OF REPORT

