Test Report Serial Number:	**45462002 1.0**
Test Report Date:	**24 February 2025**
Project Number:	**1679**

EMC Test Report -C2PC

Applicant:

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

FCC ID:
2AEOCP210

Product Model Number / HVIN
BILL III FCC

Product Name / PMN
BILL 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

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1.0 REVISION HISTORY

Revision History				
Samples Tested By:	Art Voss, P.Eng.	**Date(s) of Evaluation:**		15 Jan - 17 Feb, 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	24 February 2025

2.0 CLIENT 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:** **2AEOCPC210**
Device Type:	Mobile 4W AM / FM CBRS Transceiver
Device Model(s) / HVIN:	BILL III FCC
Device Marketing Name / PMN:	BILL 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 BILL III FCC is Mobile 4W AM / FM CBRS Transceiver.

Application:

This is an application for a Class II Permissive Change. The RF Transceiver of the BILL III FCC, FCC ID: **2AEOCPC210,** is identical in all respects to the BILL II FCC, FCC ID: **2AEOCPC210**, with the exception there have been modifications to the audio section to increase the audio performance. All other aspects of the BILL III FCC are identical to the BILL II FCC, including form factor.

Regulatory Requirement:

As per FCC 47 CFR 2 Subpart I , Equipment Authorization is require for this *Equipment* by means of a Class II Permissive Change 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 BILL III FCC for radiated spurious emissions, antenna port conducted power and antenna port spurious emissions.

RF Exposure:

The BILL III FCC is a mobile transceiver. Since the output power of the BILL III FCC is the same as the BILL II FCC, and an RF Exposure evaluation of the BILL II FCC was performed, an RF Exposure evaluation of the BILL III FCC is deemed unnecessary.

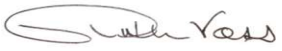
4.0 TEST RESULT SUMMARY

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	17 Feb 2024	**Complies**
8.0	Conducted TX Spurious Emissions	ANSI/TIA/EIA-382-A ANSI C63.26:2015 ANSI C63.4:2014	§2.1051 §95.979	17 Feb 2024	**Complies**
9.0	Radiated TX Spurious Emissions	ANSI/TIA/EIA-382-A ANSI C63.26:2015 ANSI C63.4:2014	§2.1053 §95.979	15 Jan 2025	**Complies**
10.0	Radiated Receiver Emissions	ANSI C63.26:2015 ANSI C63.4:2014	§15 Subpart B §15.109(d)	15 Jan 2025	**Complies**

Test Station Day Log					
Date	**Ambient Temp (°C)**	**Relative Humidity (%)**	**Barometric Pressure (kPa)**	**Test Station**	**Tests Performed Section(s)**
17 Feb 2025	21.6	17	102.8	**EMC**	**7, 8**
15 Jan 2025	-3.0	63	102.3	**OATS**	**9, 10**

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.

24 February 2025
Date

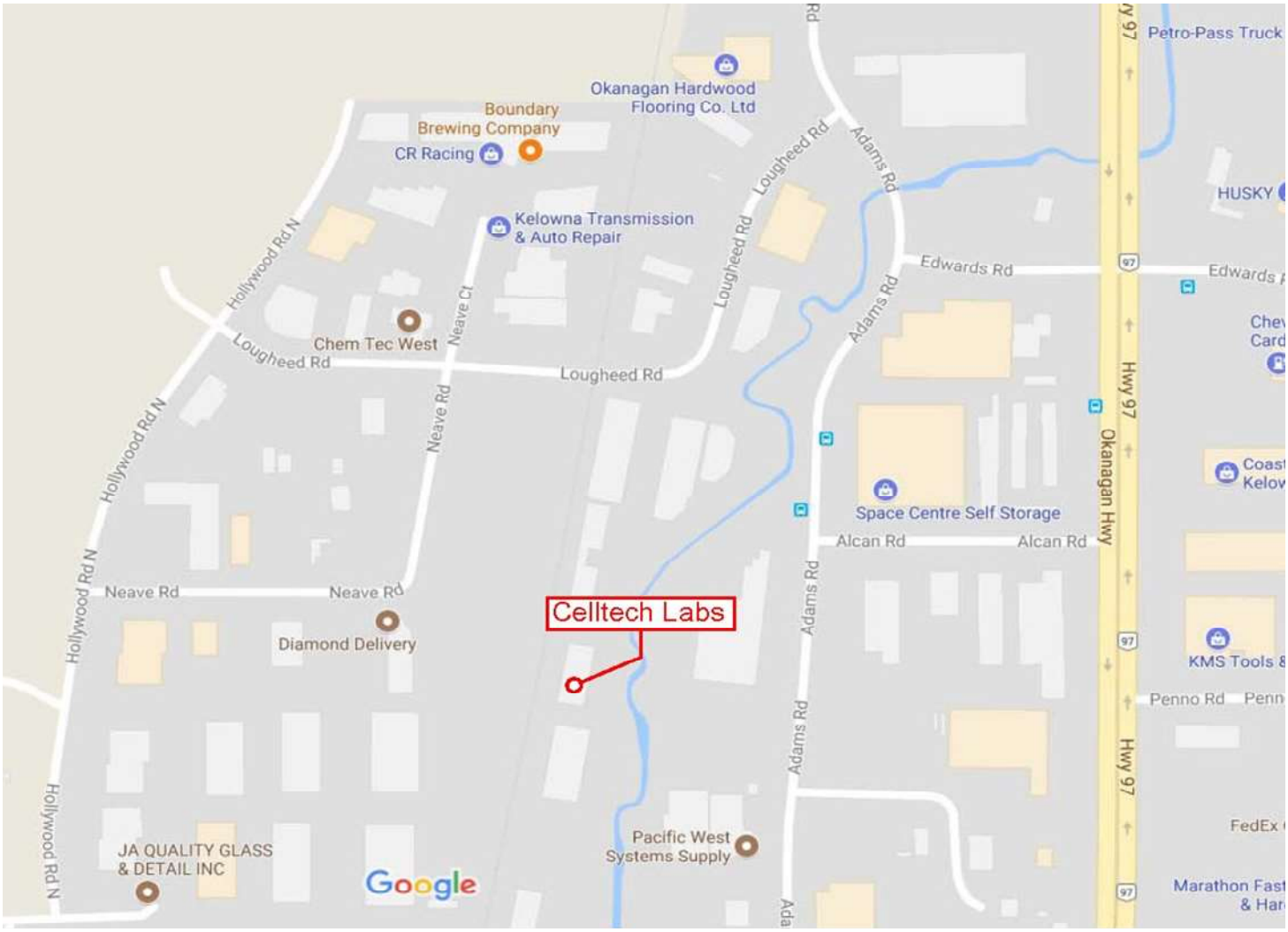
5.0 NORMATIVE REFERENCES

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.

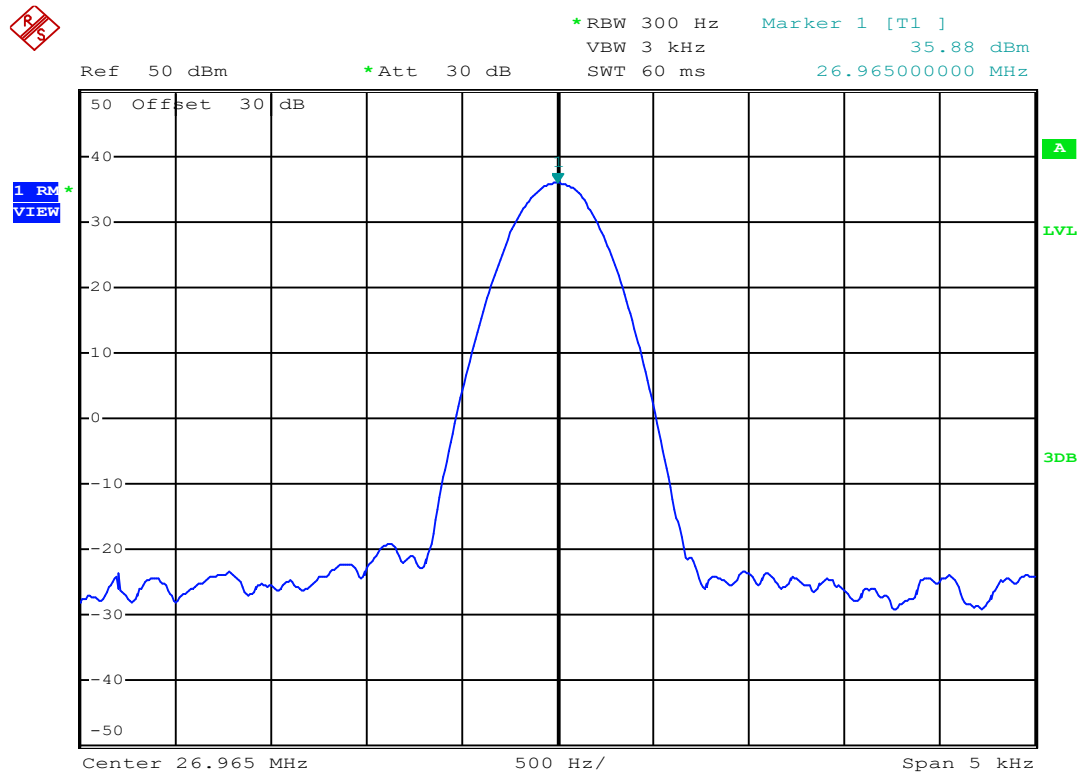
General Procedure	
EIA/TIA-382-A	**19. TRANSMITTER CARRIER POWER OUTPUT** Transmitter Carrier Power Output for this service is the power (rms) available at the output terminals of the transmitter when the output terminals are connected to a standard output load. This measurement shall be performed without 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:

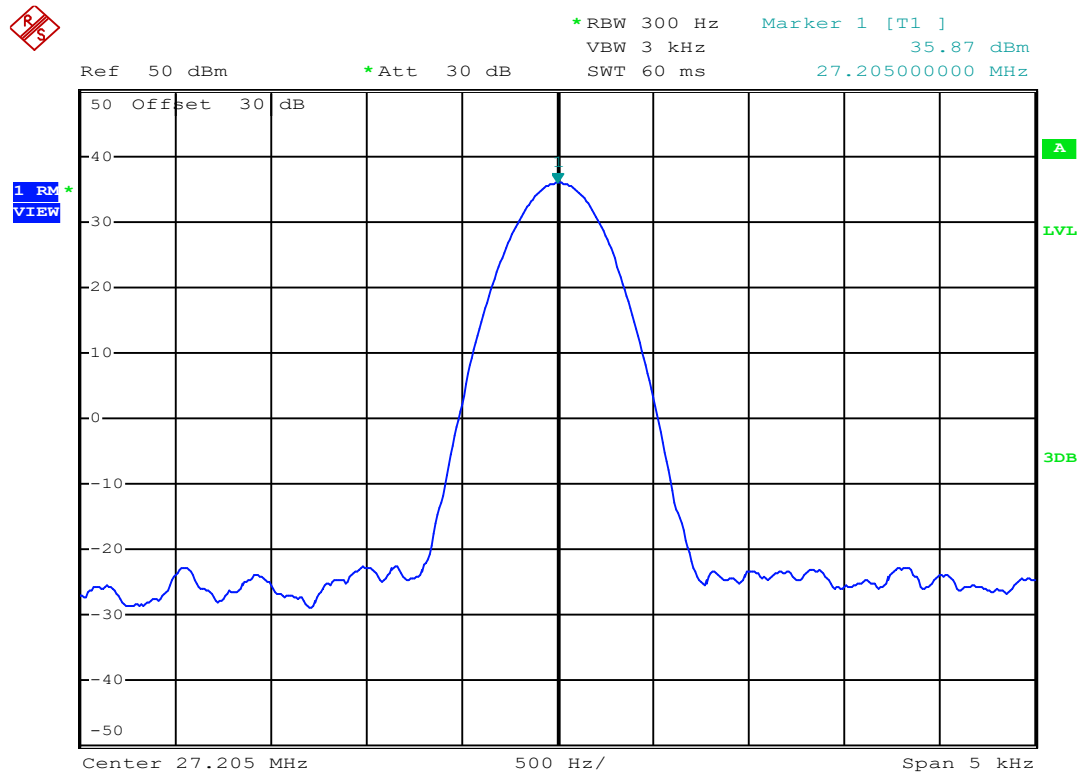


Date: 17.FEB.2025 11:05:43

Channel:	**1**	**Channel Frequency:**	**26.965**	**MHz**
Mode:	**AM**	**Modulation:**	**AM**	
		Measured Power:	**35.88**	**dBm**

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

Conducted Power:

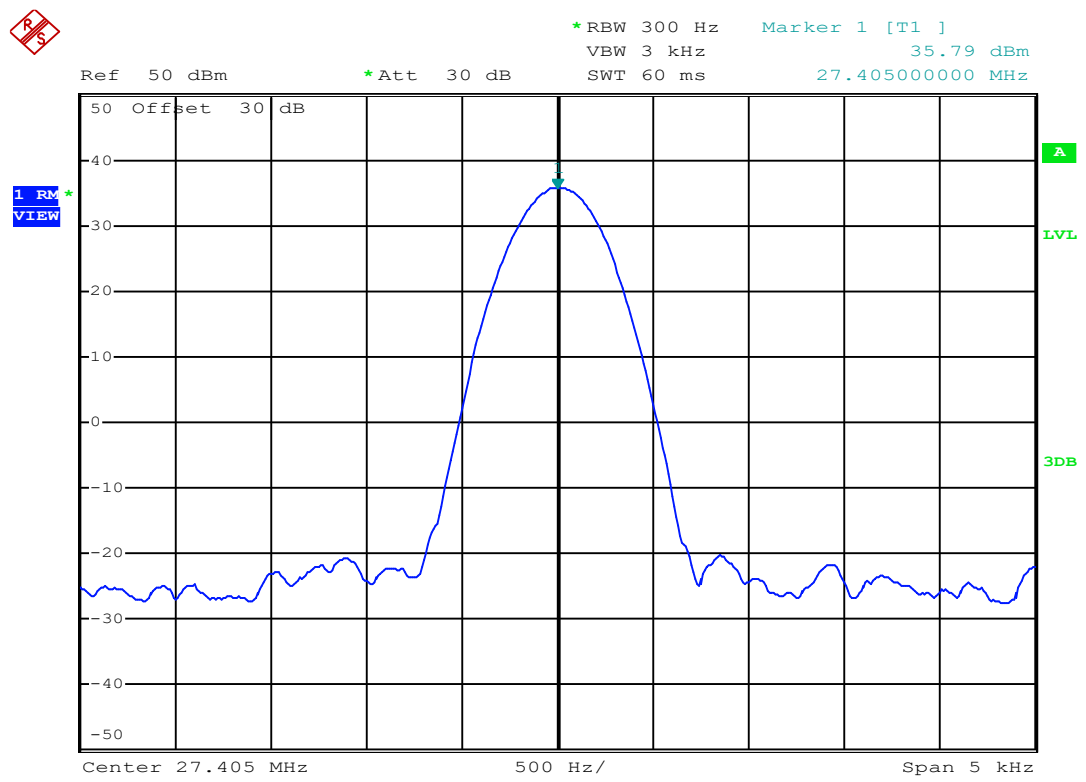


Date: 17.FEB.2025 11:03:17

Channel:	**20**	**Channel Frequency:**	**27.205**	**MHz**
Mode:	**AM**	**Modulation:**	**AM**	
		Measured Power:	**35.87**	**dBm**

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

Conducted Power:

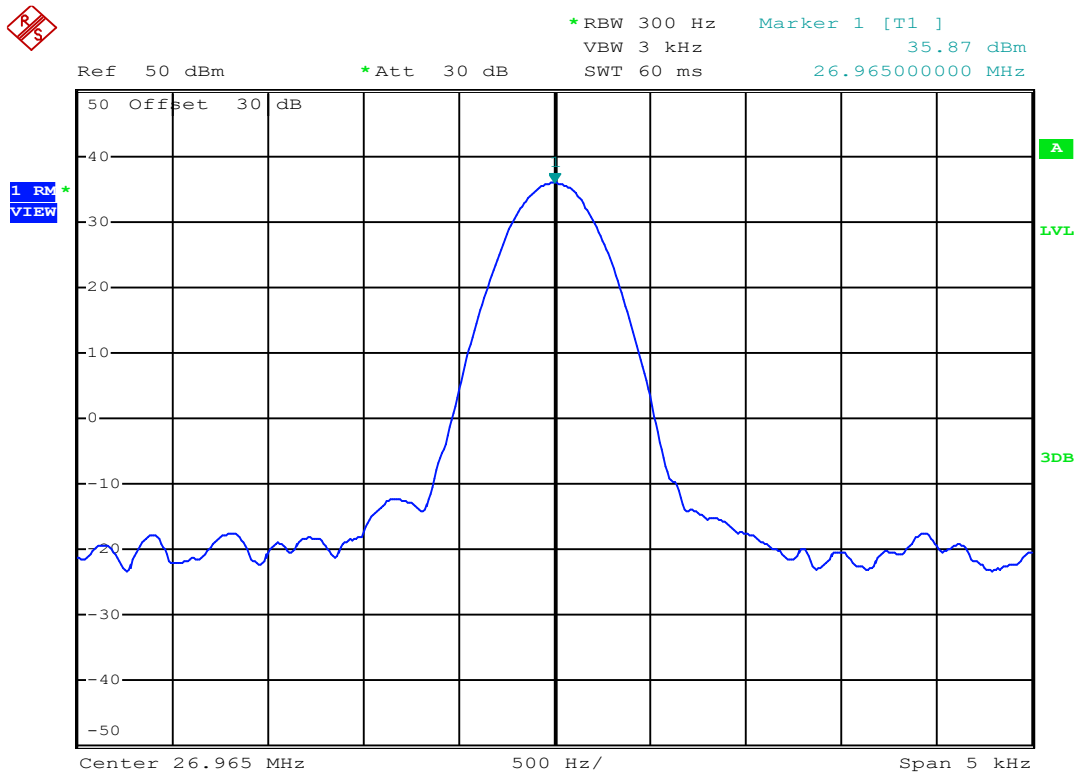


Date: 17.FEB.2025 11:04:04

Channel:	**40**	**Channel Frequency:**	**27.405**	**MHz**
Mode:	**AM**	**Modulation:**	**AM**	
		Measured Power:	**35.79**	**dBm**

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

Conducted Power:

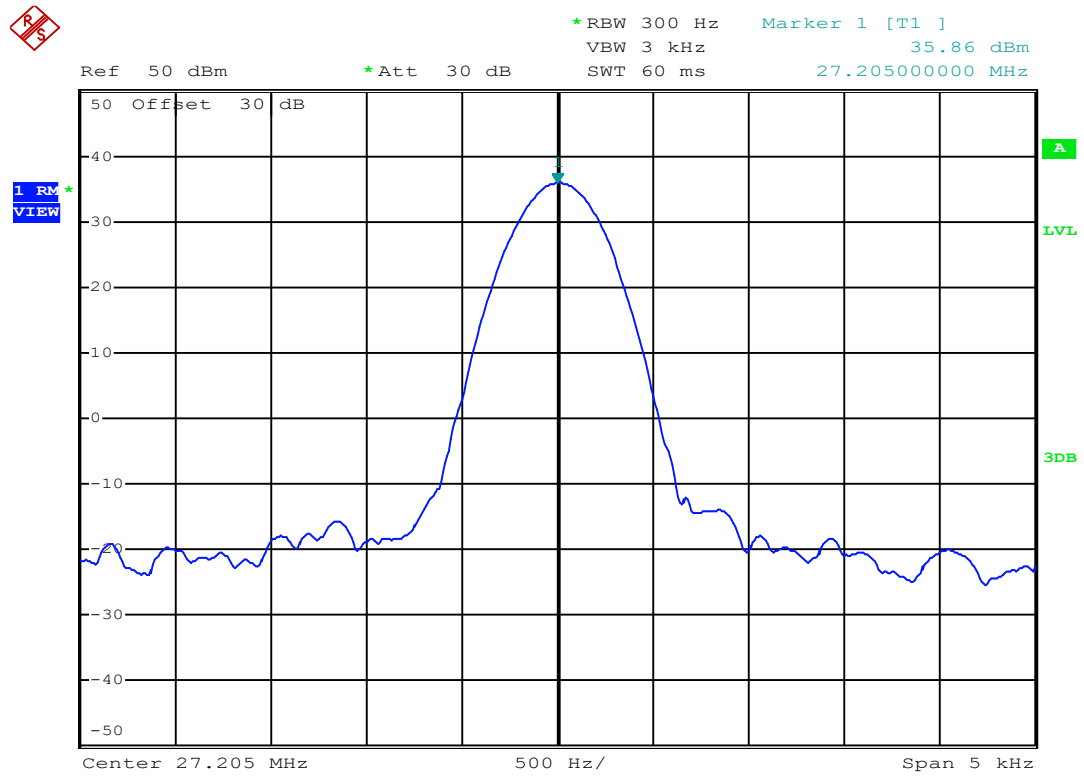


Date: 17.FEB.2025 11:06:31

Channel:	**1**	**Channel Frequency:**	**26.965**	**MHz**
Mode:	**FM**	**Modulation:**	**FM**	
		Measured Power:	**35.87**	**dBm**

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

Conducted Power:

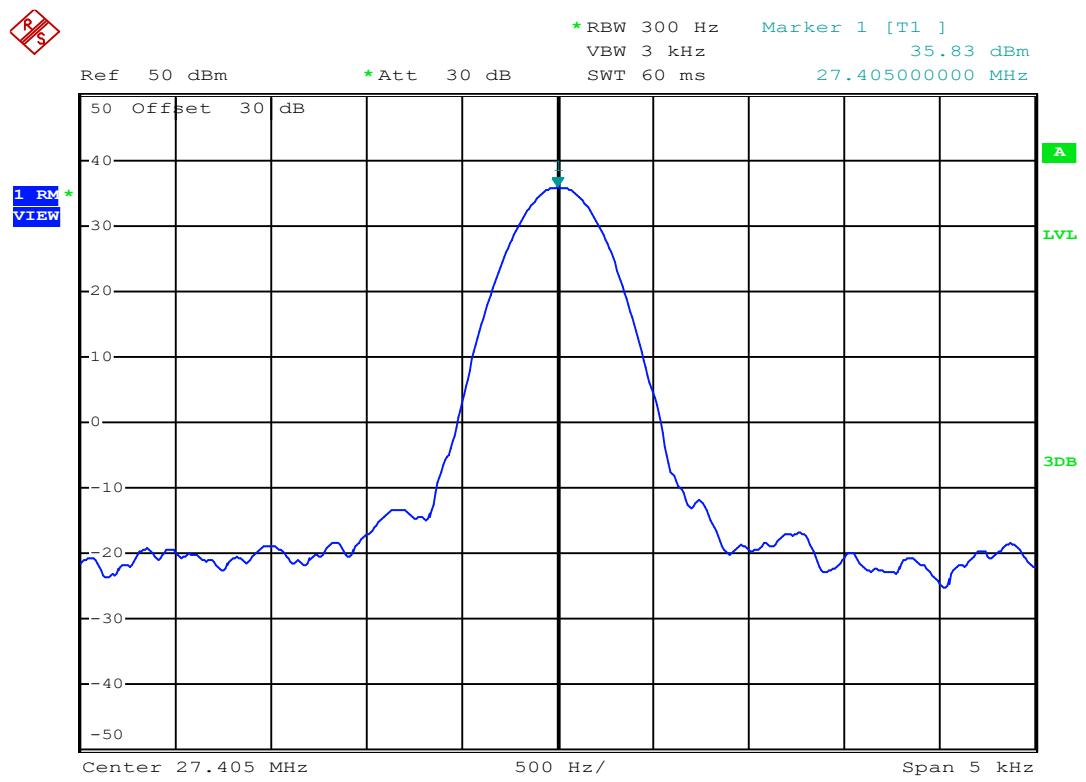


Date: 17.FEB.2025 11:07:12

Channel:	**20**	**Channel Frequency:**	**27.205**	**MHz**
Mode:	**FM**	**Modulation:**	**FM**	
		Measured Power:	**35.86**	**dBm**

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

Conducted Power:



Date: 17.FEB.2025 11:07:51

Channel:	**40**	**Channel Frequency:**	**24.405**	**MHz**
Mode:	**FM**	**Modulation:**	**FM**	
		Measured Power:	**35.83**	**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	26.97	AM	AM	35.88	36	0.12
20	27.21			35.87		0.13
40	27.41			35.79		0.21
1	26.97	FM	FM	35.87		0.13
20	27.21			35.86		0.14
40	24.41			35.83		0.17
					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 CONDUCTED OUT OF BAND SPURIOUS EMISSIONS

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

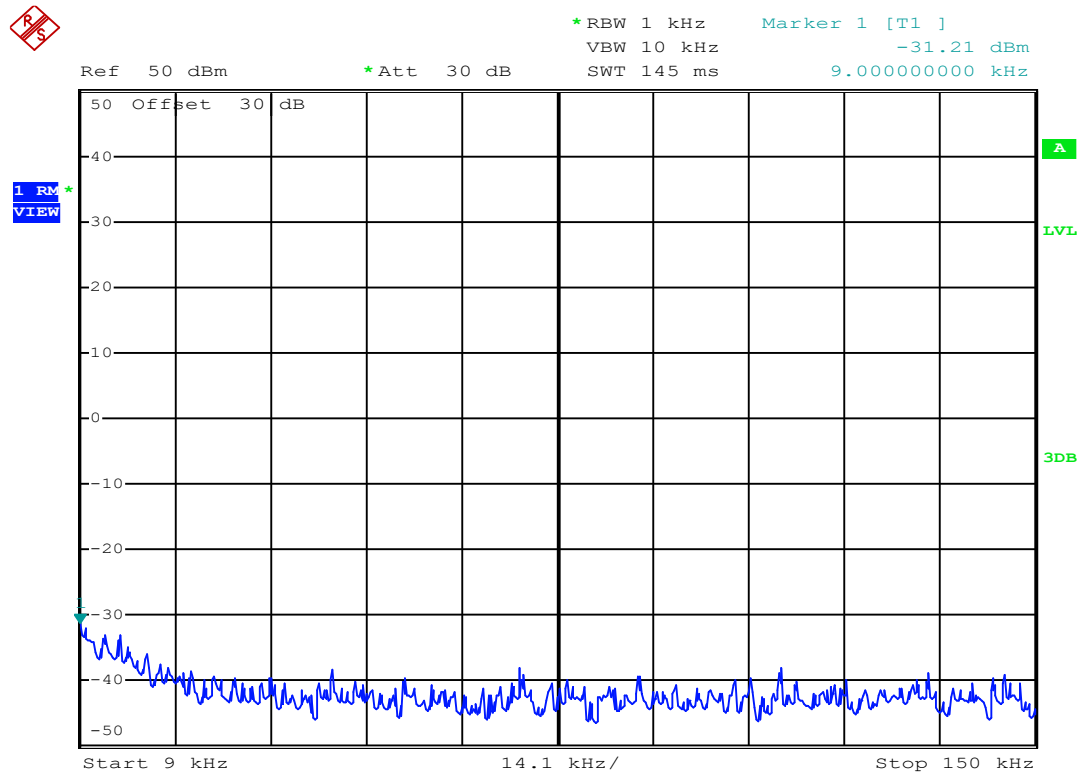
Limits	
47 CFR §95.979	Each CBRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section. (a) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) as specified in the applicable paragraphs 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 8.1 – Conducted Out of Band Emissions, 9kHz to 150kHz, Channel 20, AM

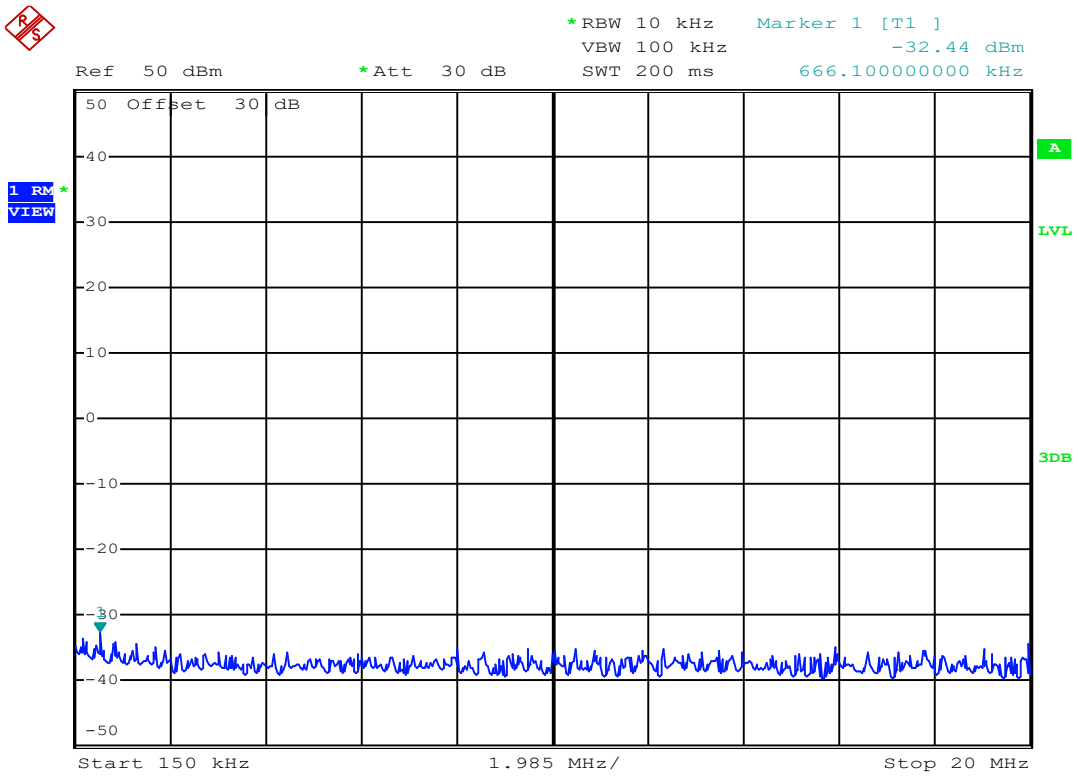
Conducted Spurious Emissions:



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

Plot 8.2 – Conducted Out of Band Emissions, 150kHz – 20MHz, Channel 20, AM

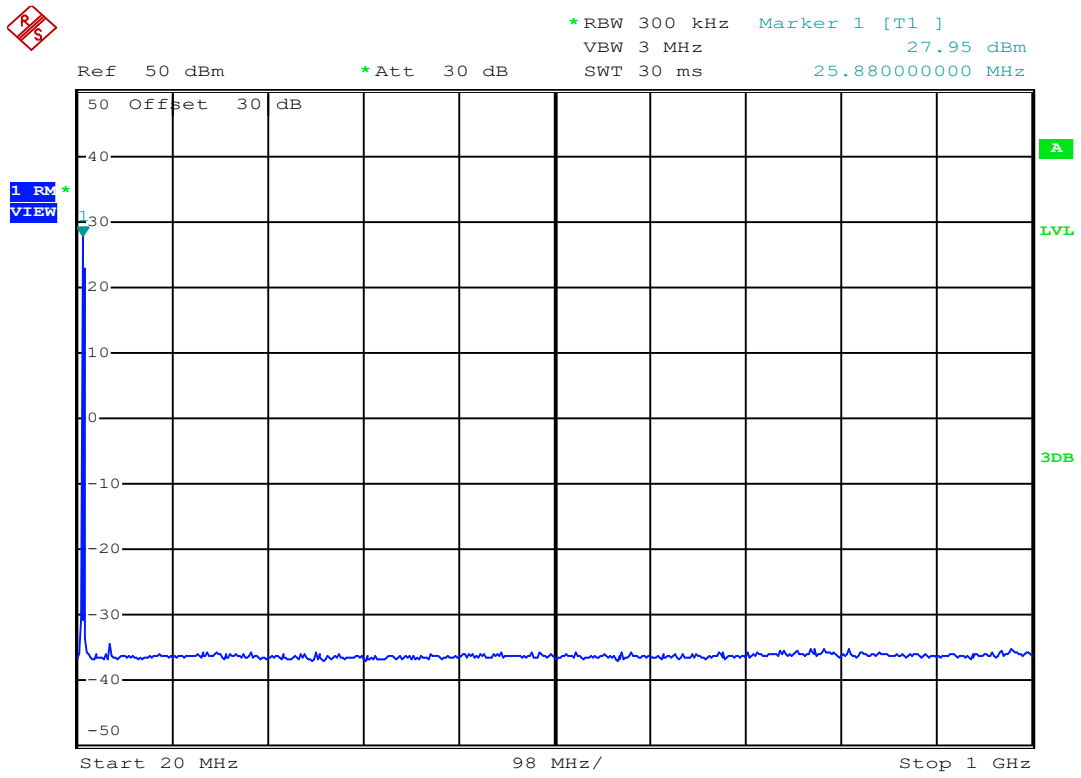
Conducted Spurious Emissions:



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

Plot 8.3 – Conducted Out of Band Emissions, 20 – 1000MHz, Channel 20, AM

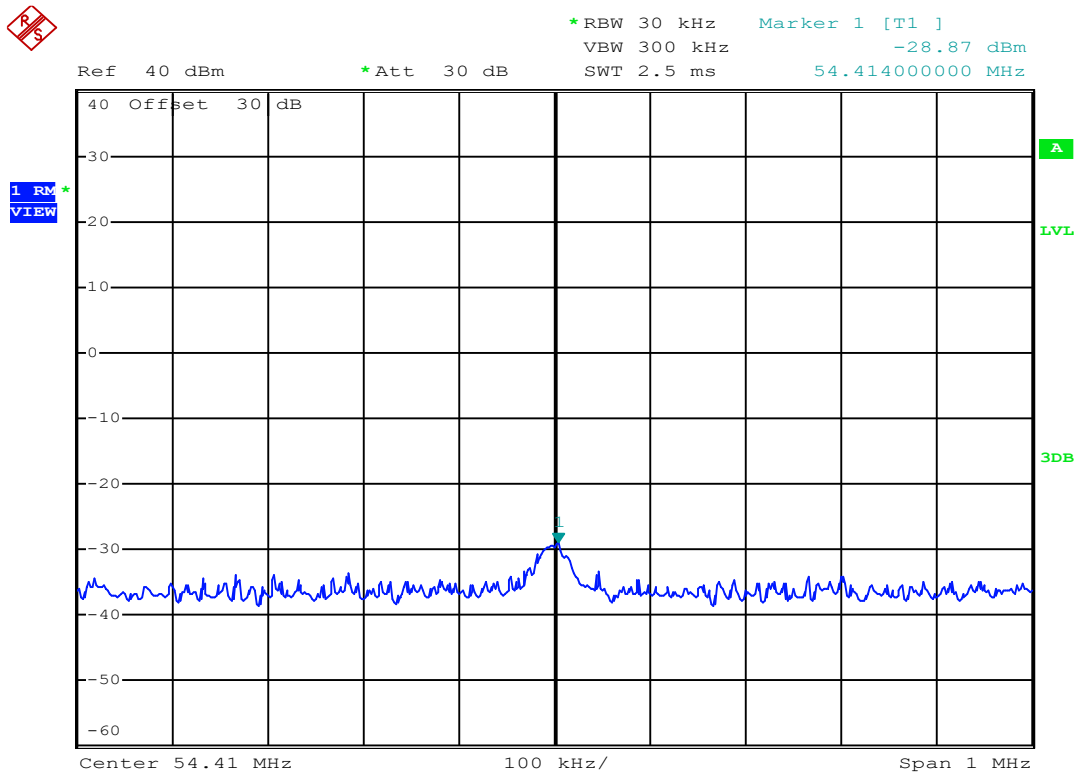
Conducted Spurious Emissions:



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

Plot 8.4 – Conducted Out of Band Emissions, 2nd Harmonic, Channel 20, AM

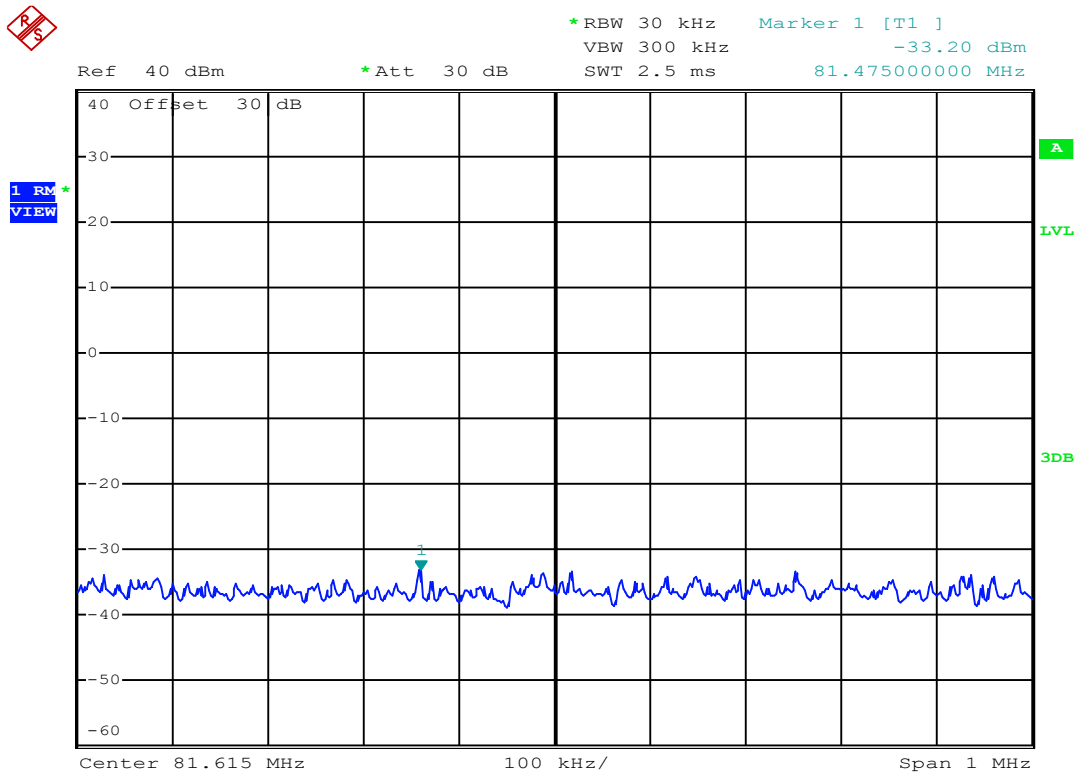
Conducted Spurious Emissions:



Channel:	**20**		**Channel Frequency:**	**27.205**	**MHz**
Modulation:	**AM**		**Emission Frequency:**	**54.41**	**MHz**
			Measured Emission:	**-28.87**	**dBm**

Plot 8.5 – Conducted Out of Band Emissions, 3rd Harmonic, Channel 20, AM

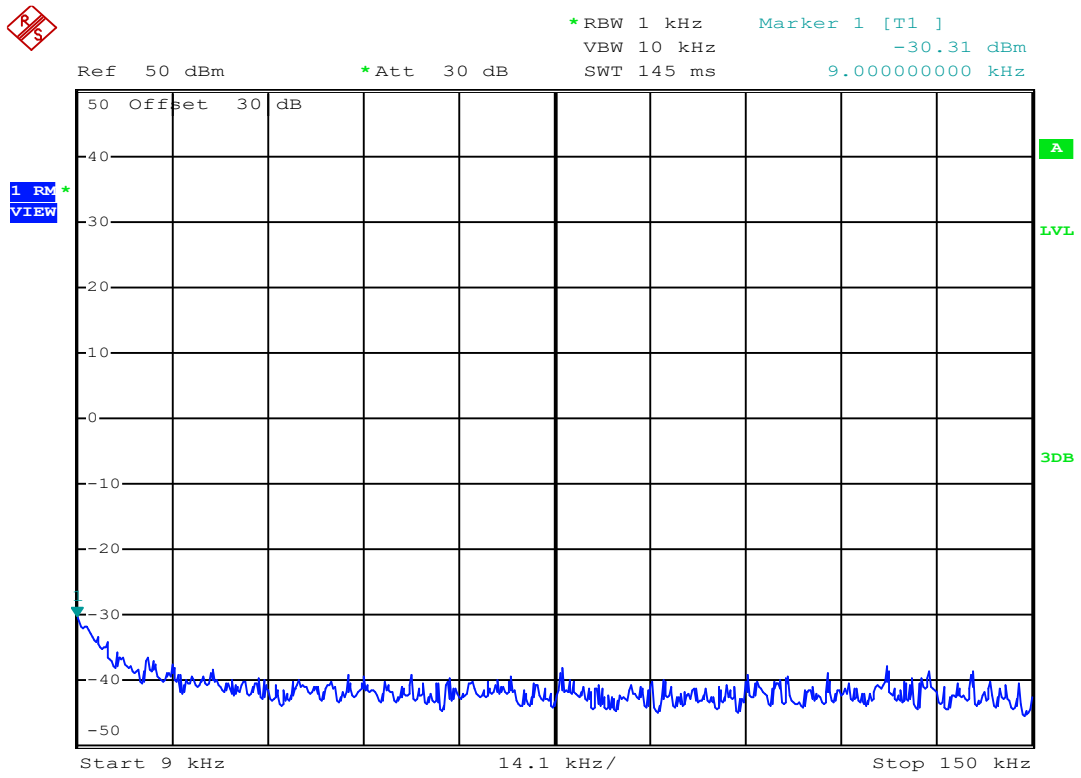
Conducted Spurious Emissions:



Channel:	**20**	**Channel Frequency:**	**27.205**	**MHz**
Modulation:	**AM**	**Emission Frequency:**	**81.61**	**MHz**
		Measured Emission:	**-40.95**	**dBm**

Plot 8.6 – Conducted Out of Band Emissions, 9kHz to 150kHz, Channel 20, FM

Conducted Spurious Emissions:

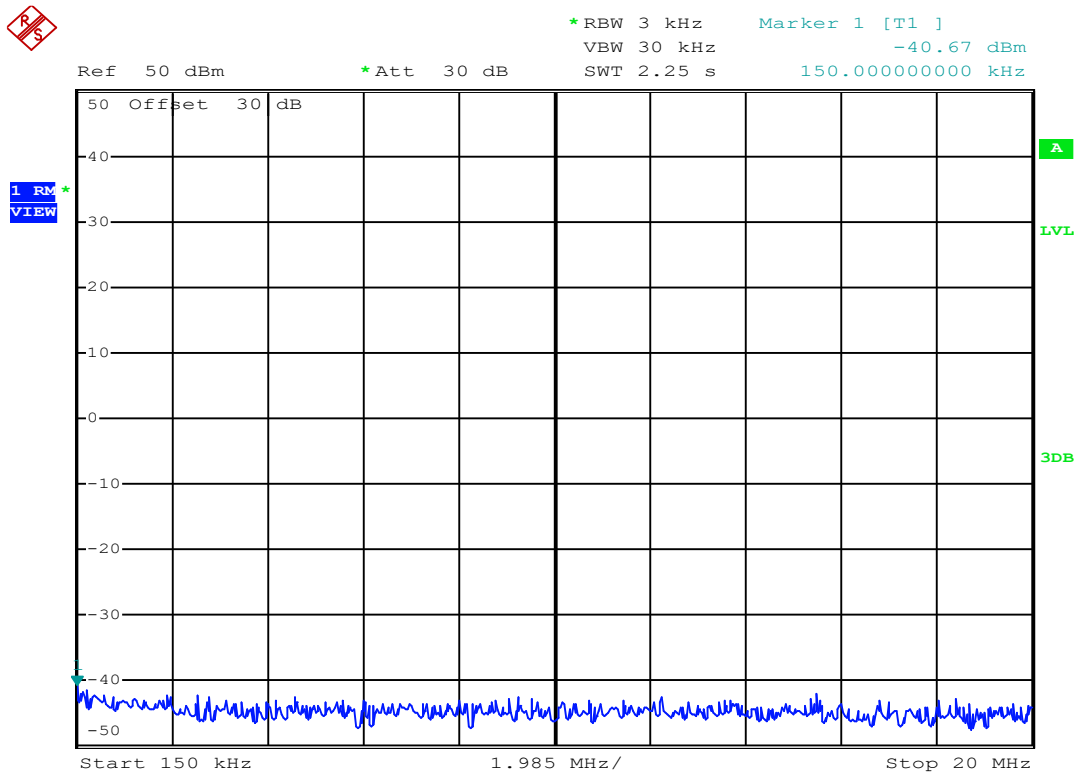


Date: 17.FEB.2025 11:13:05

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

Plot 8.7 – Conducted Out of Band Emissions, 150kHz – 20MHz, Channel 20, FM

Conducted Spurious Emissions:

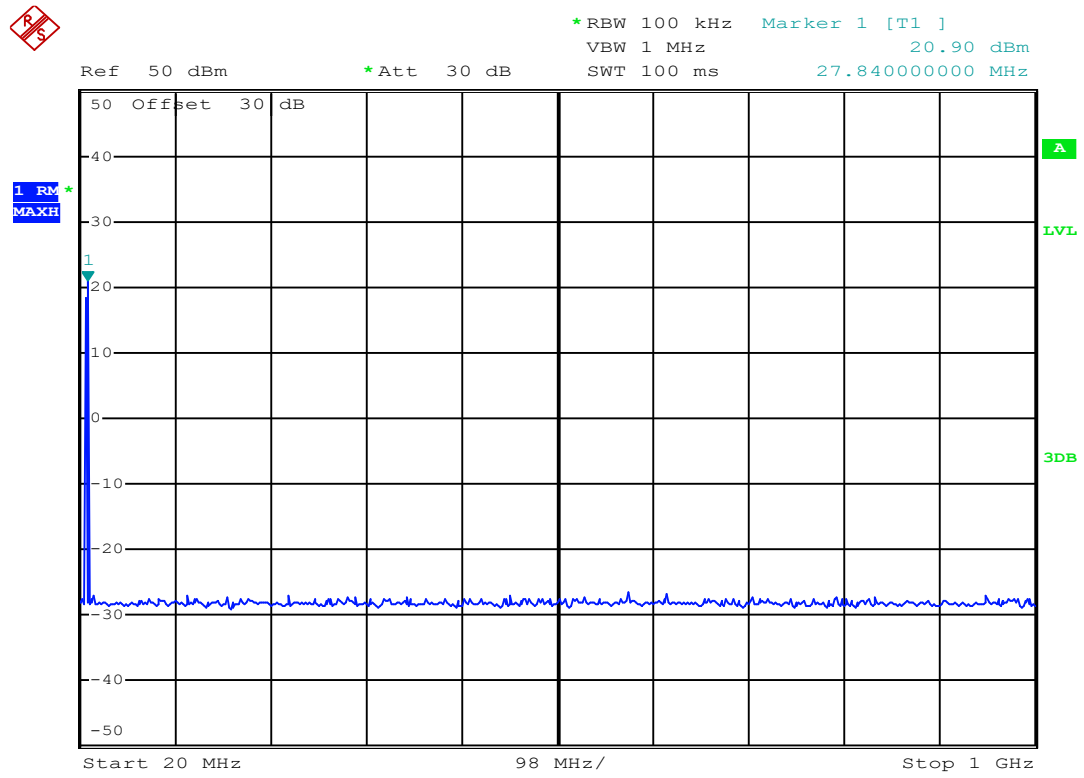


Date: 17.FEB.2025 11:13:43

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

Plot 8.8 – Conducted Out of Band Emissions, 20 – 1000MHz, Channel 20, FM

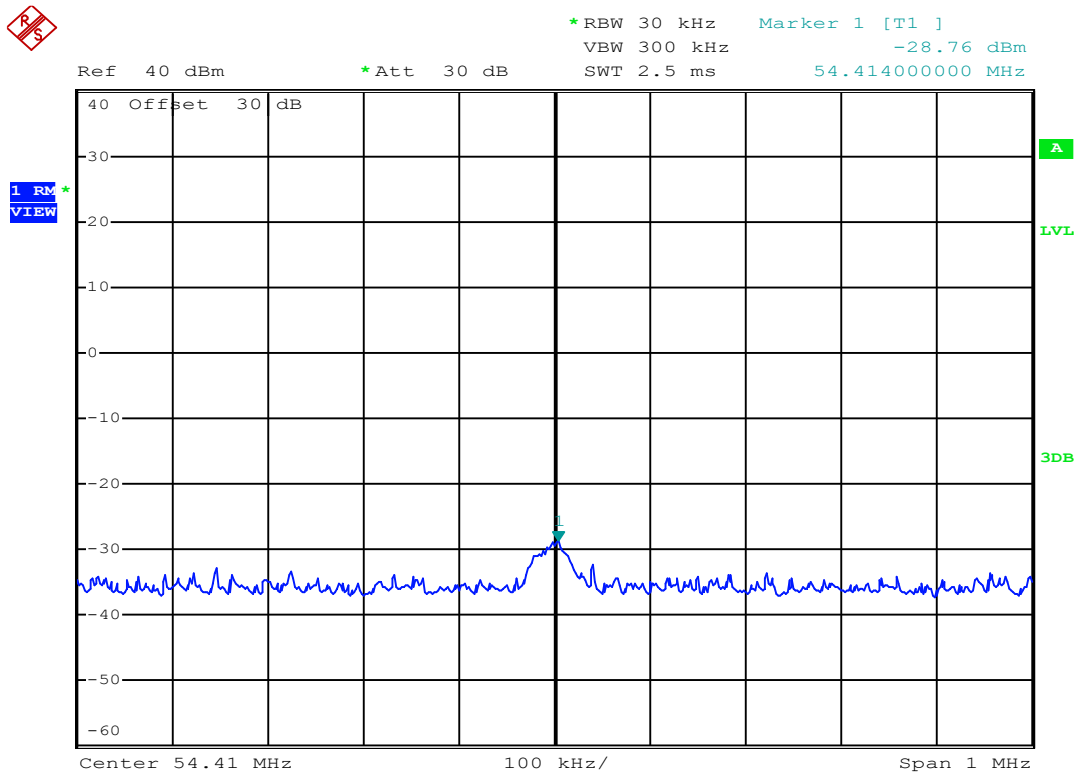
Conducted Spurious Emissions:



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

Plot 8.9 – Conducted Out of Band Emissions, 2nd Harmonic, Channel 20, FM

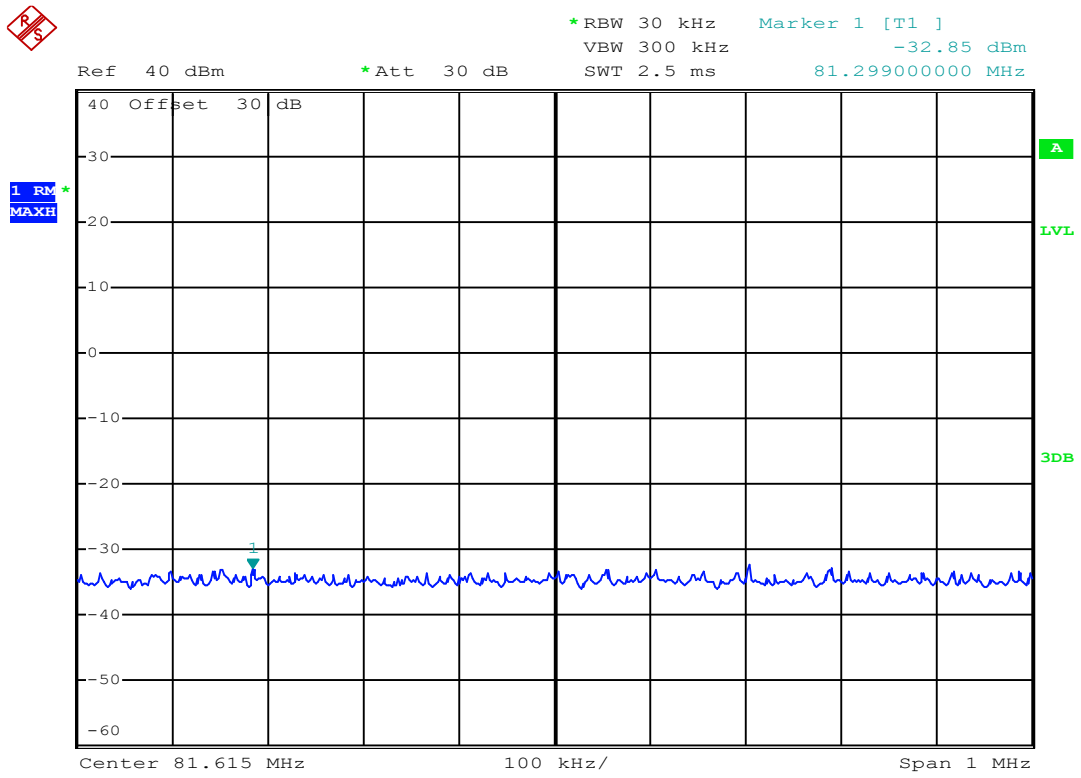
Conducted Spurious Emissions:



Channel:	**20**		**Channel Frequency:**	**27.205**	**MHz**
Modulation:	**FM**		**Emission Frequency:**	**54.41**	**MHz**
			Measured Emission:	**-33.9**	**dBm**

Plot 8.10 – Conducted Out of Band Emissions, 3rd Harmonic, Channel 20, FM

Conducted Spurious Emissions:



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

Table 8.1 – 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	-28.87	54.51	35.87	64.74	60	4.74
			-33.20	81.475	35.86	69.06		9.06
		FM	-28.76	54.41	35.86	64.62		4.62
								Complies

Attenuation [Atten] = [P_{Fund}] - [P_{Em}]

Margin = Attenuation - Limit

ND = None Detected

9.0 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

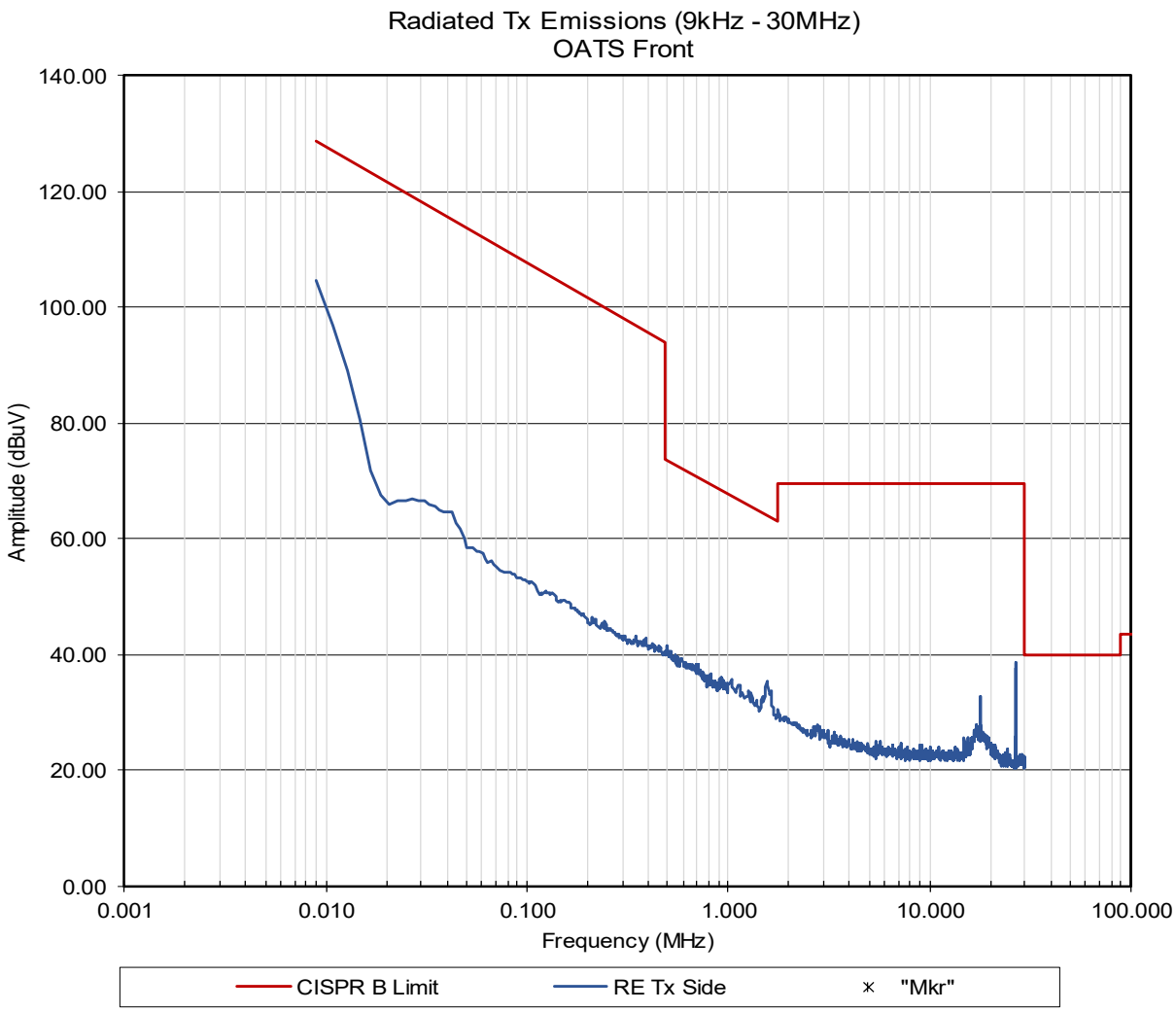
The transmitter shall be terminated in a nonradiating dummy load and shall be keyed but not modulated.

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**

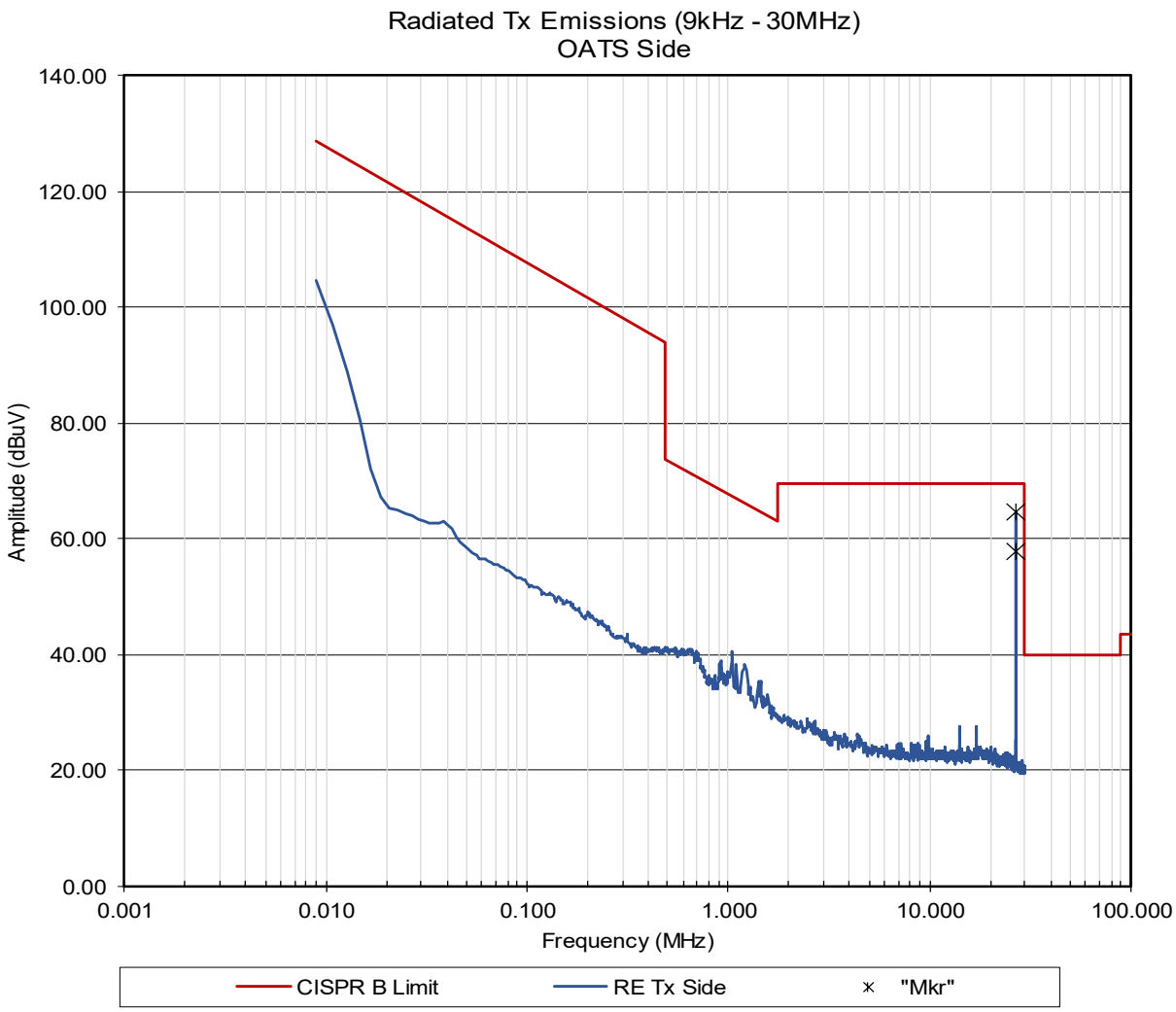
Plot 9.1 – Radiated Spurious Emissions OATS, 9kHz - 30MHz, without Accessories, Front

Radiated Tx Emissions:



Plot 9.2 – Radiated Spurious Emissions OATS, 9kHz - 30MHz, without Accessories, Side

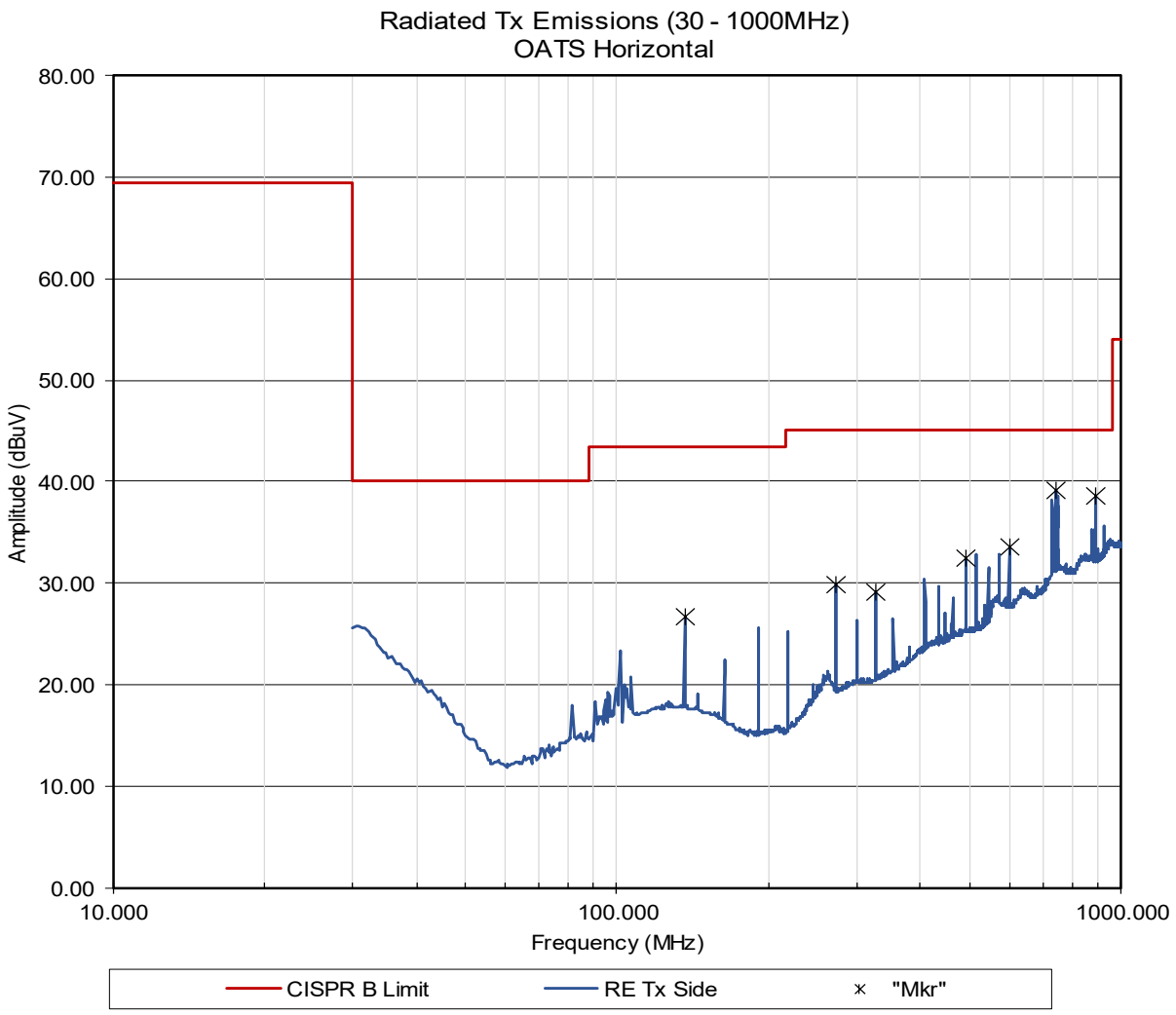
Radiated Tx Emissions:



Marker = Fundamental

Plot 9.3 – Radiated Spurious Emissions OATS, 30 - 1000MHz, without Accessories, Horizontal

Radiated Tx Emissions:



Plot 9.4 – Radiated Spurious Emissions OATS, 30 - 1000MHz, without Accessories, Vertical

Radiated Tx Emissions:

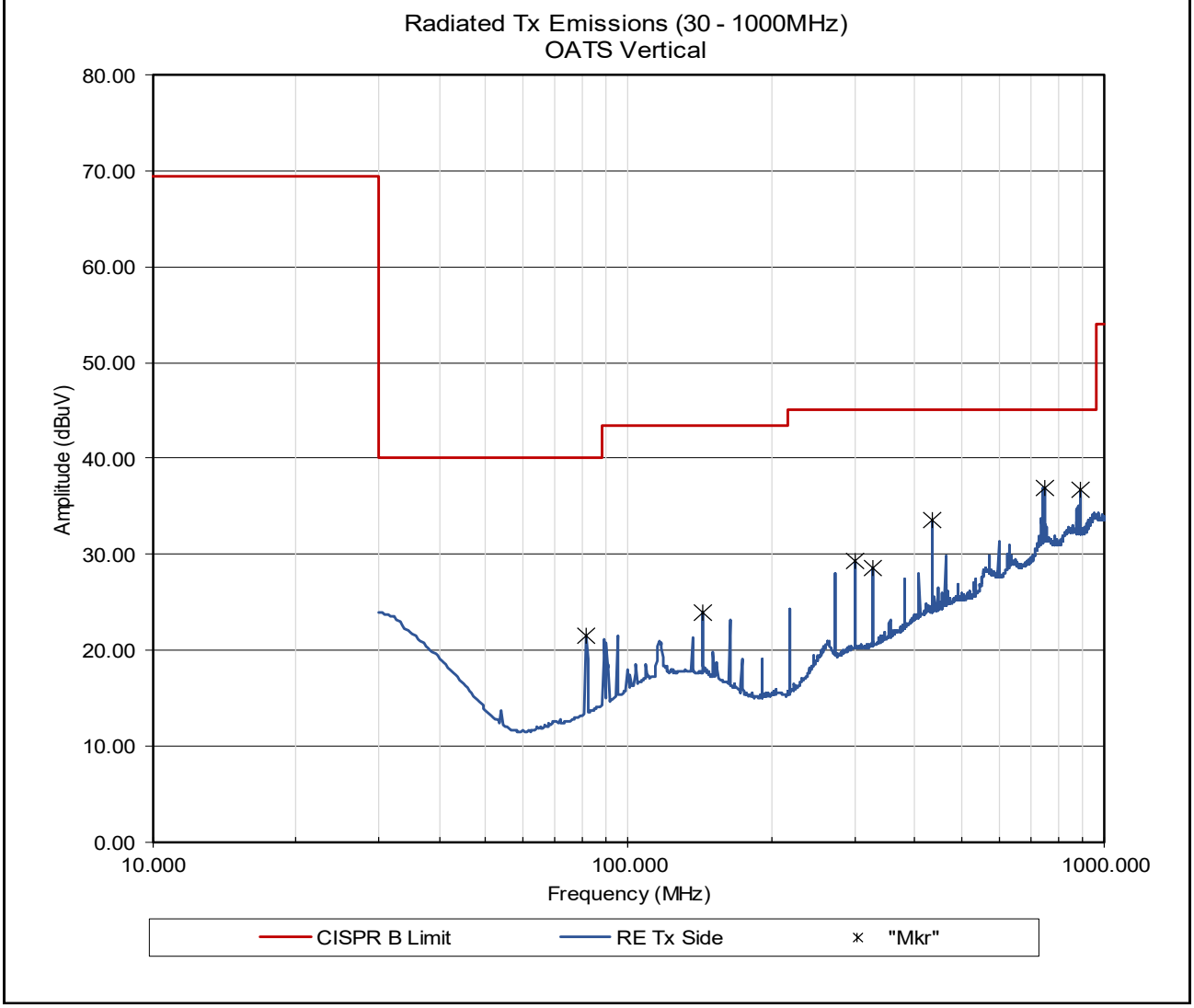


Table 9.1 – Summary of Radiated Tx Emissions, without Accessories

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

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

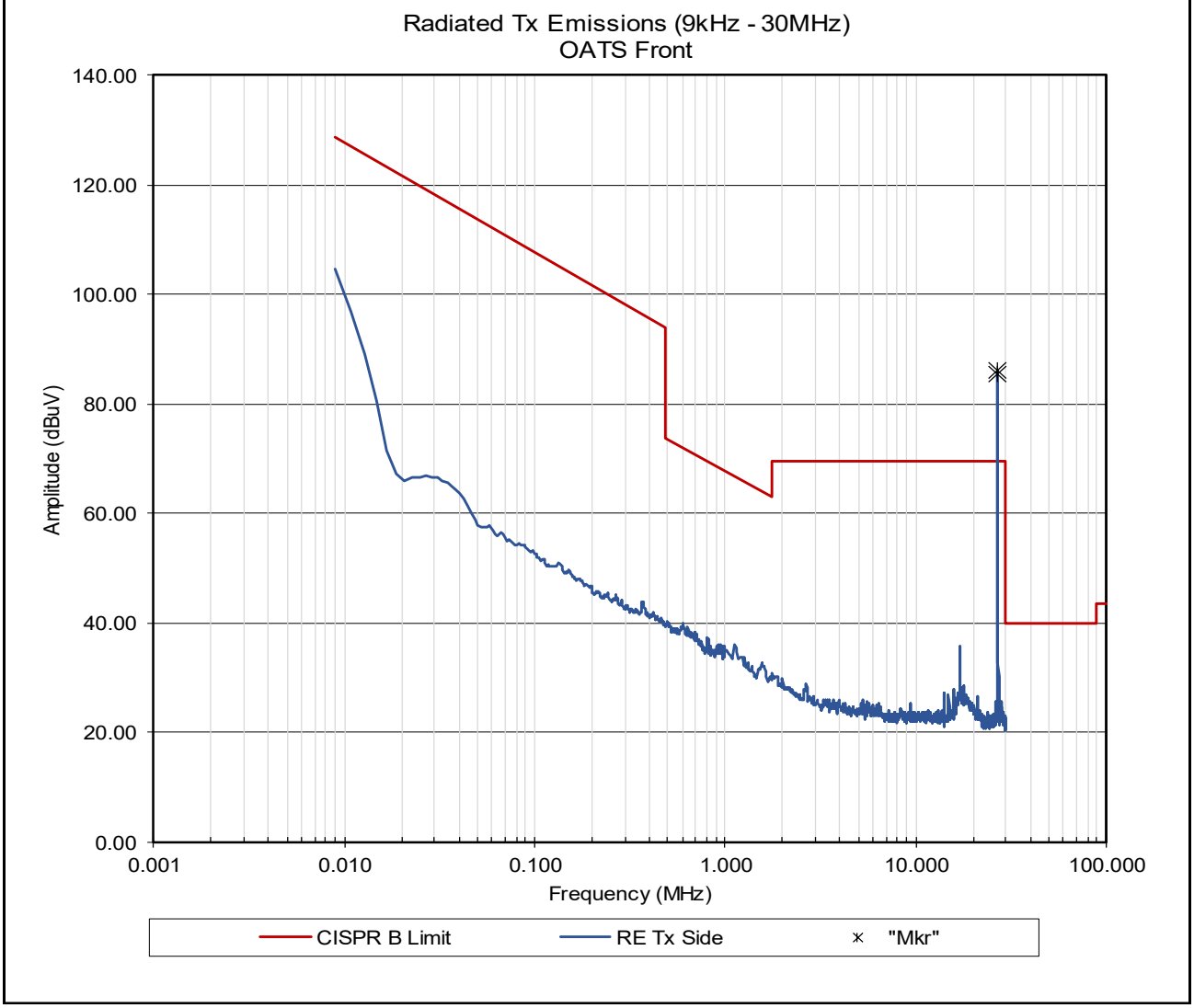
Where ACF^H is the Magnetic Antenna Correction Factor

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

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

Plot 9.5 – Radiated Spurious Emissions OATS, 9kHz - 30MHz, with Accessories, Front

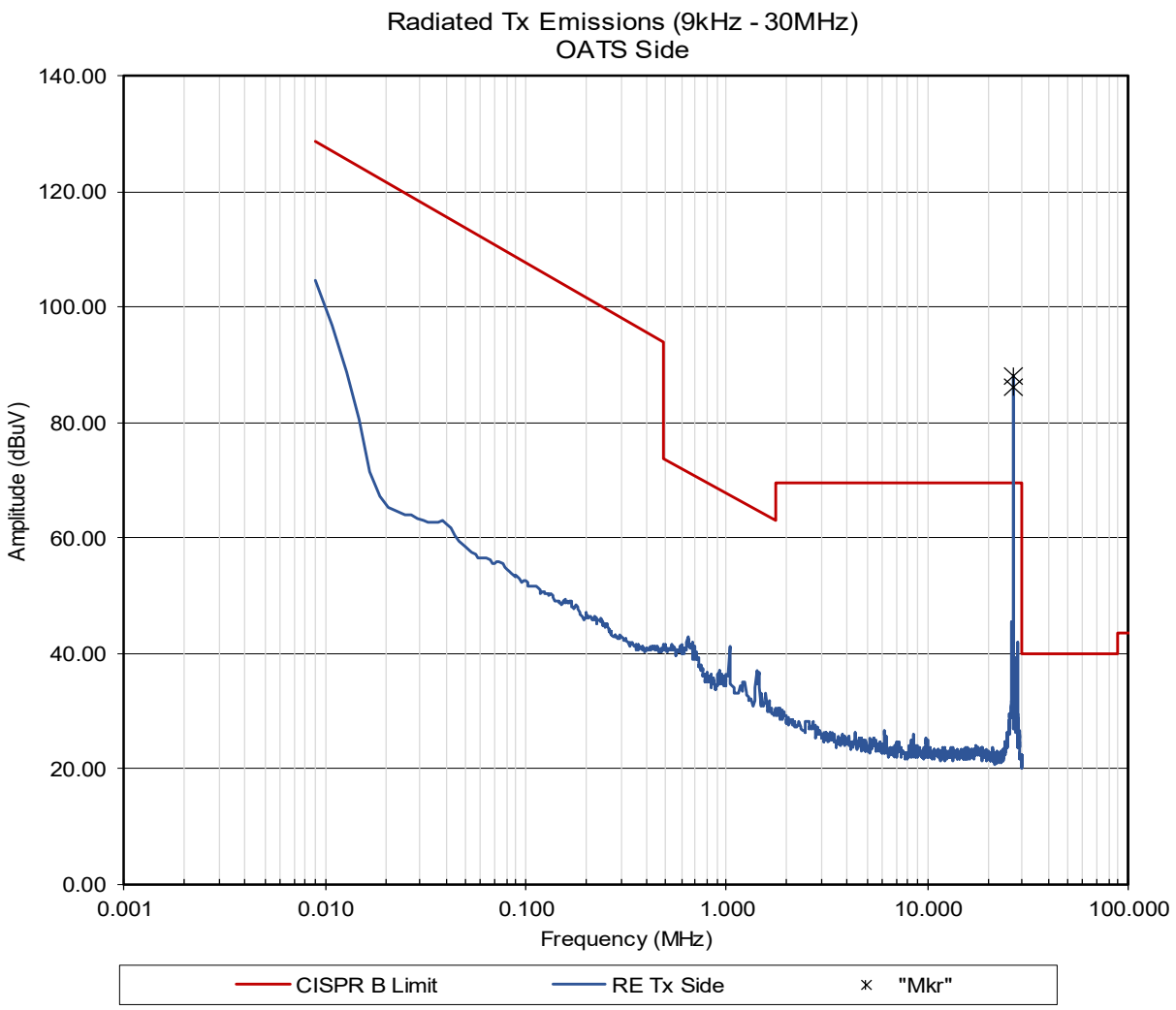
Radiated Tx Emissions:



Marker = Fundamental

Plot 9.6 – Radiated Spurious Emissions OATS, 9kHz - 30MHz, with Accessories, Side

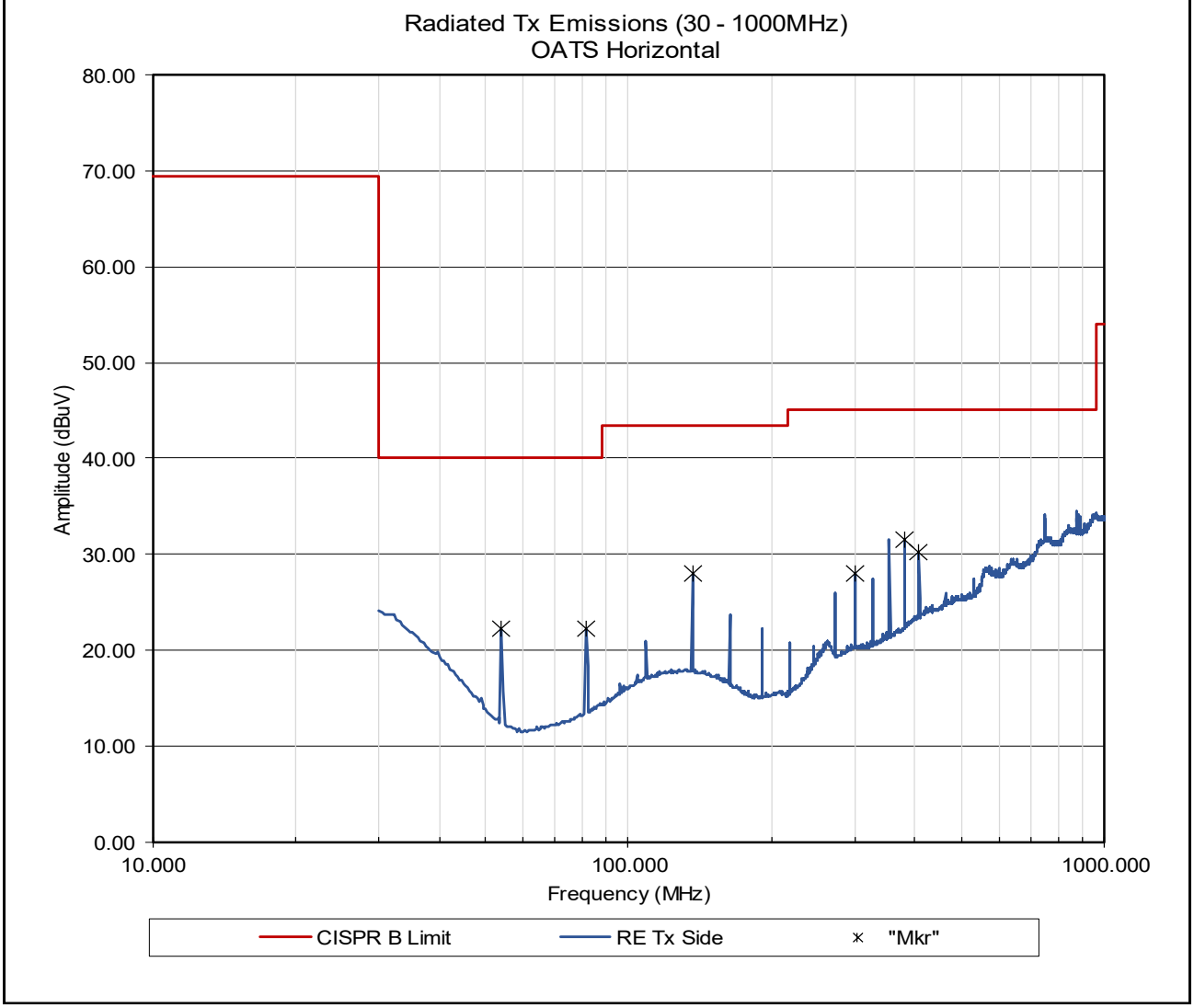
Radiated Tx Emissions:



Marker = Fundamental

Plot 9.7 – Radiated Spurious Emissions OATS, 30 - 1000MHz, with Accessories, Horizontal

Radiated Tx Emissions:



Plot 9.8 – Radiated Spurious Emissions OATS, 30 - 1000MHz, with Accessories, Vertical

Radiated Tx Emissions:

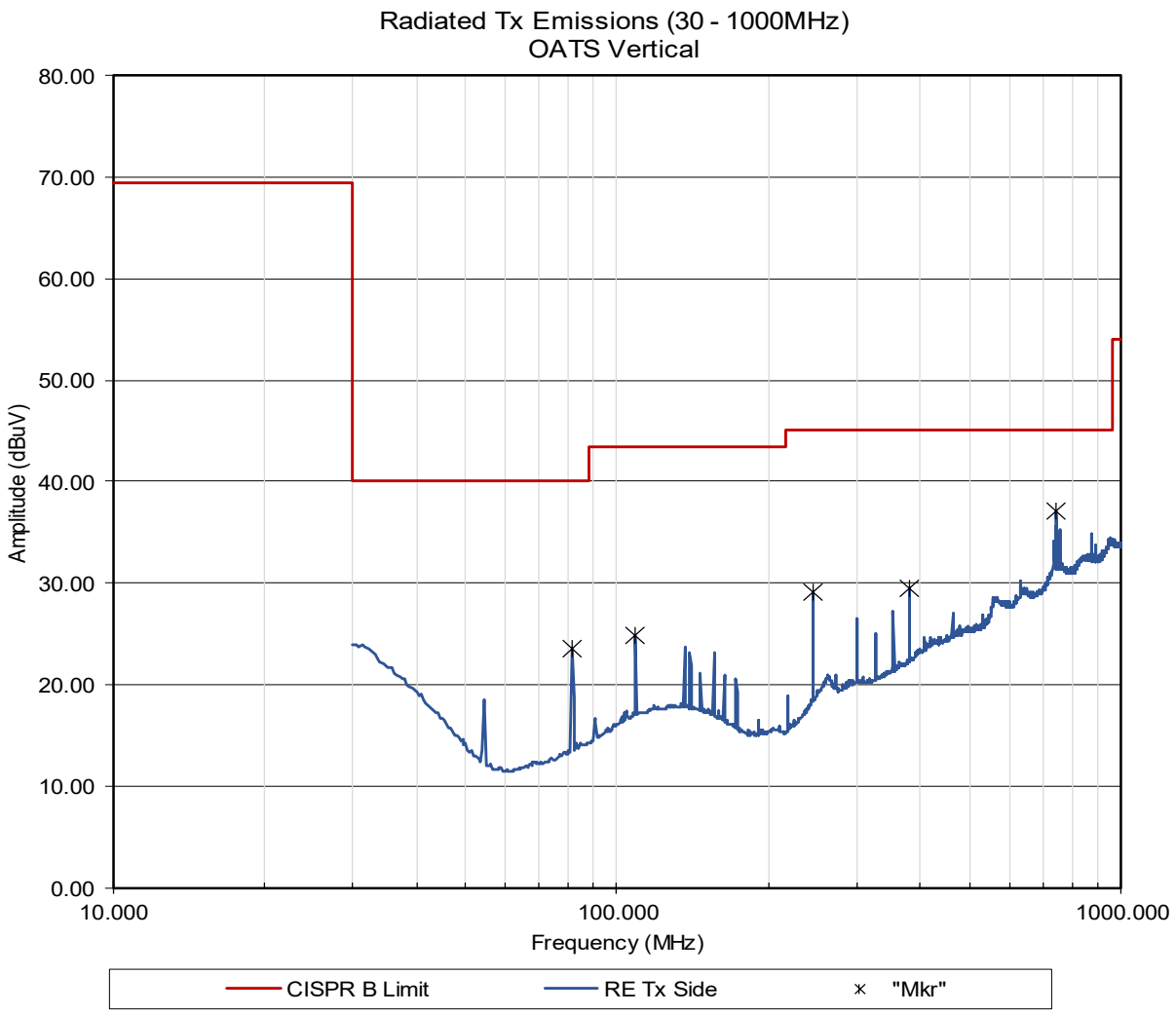


Table 9.2 – Summary of Radiated Tx Emissions, with Accessories

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

10.0 RADIATED SPURIOUS RX EMISSIONS

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

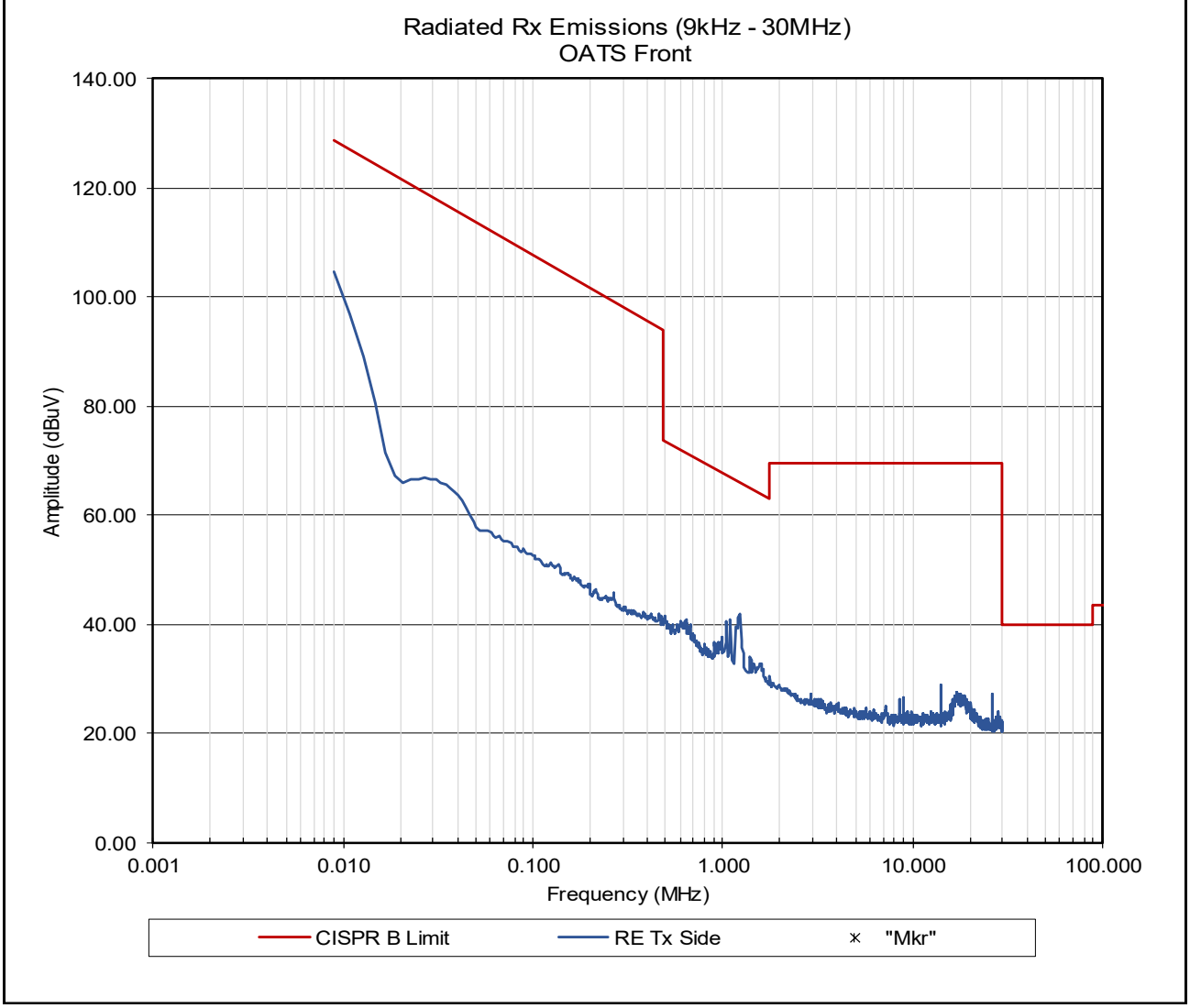
Limits	
47 CFR §15.109	(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values: 30-88MHz: 40dBuV/m 88-216MHz: 43.5dBuV/m 216-960MHz: 46dBuV/m > 960MHz: 54dBuV/m
ICES-003(6.2.1) RSS-Gen 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.

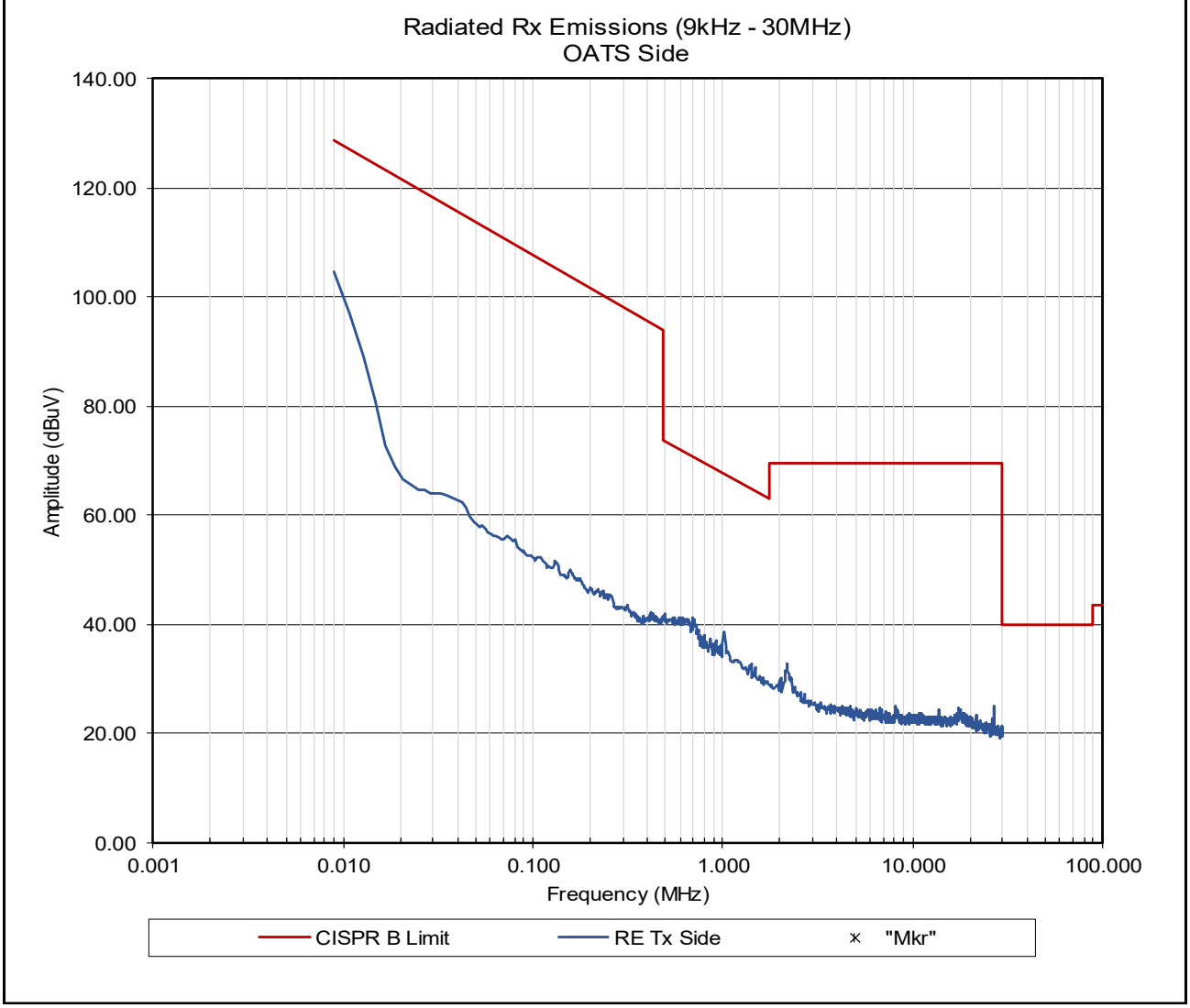
Plot 10.1 – Radiated Rx Emissions OATS, 9kHz - 30MHz, Front

Radiated Rx Emissions:



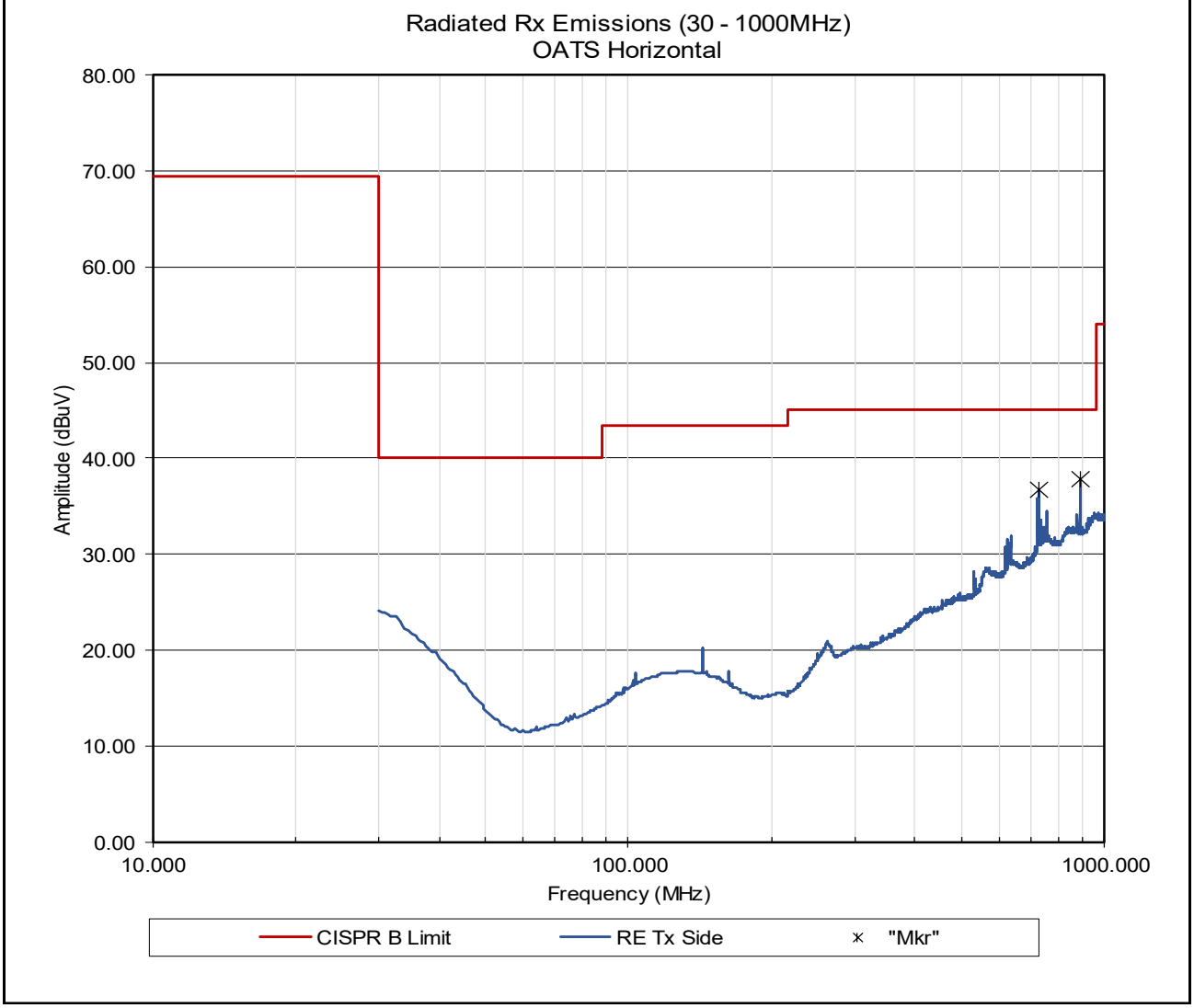
Plot 10.2 – Radiated Rx Emissions OATS, 9kHz - 30MHz, Side

Radiated Rx Emissions:



Plot 10.3– Radiated Spurious Emissions OATS, 30 - 1000MHz, Horizontal

Radiated Rx Emissions:



Plot 10.4– Radiated Spurious Emissions OATS, 30 - 1000MHz, Vertical

Radiated Rx Emissions:

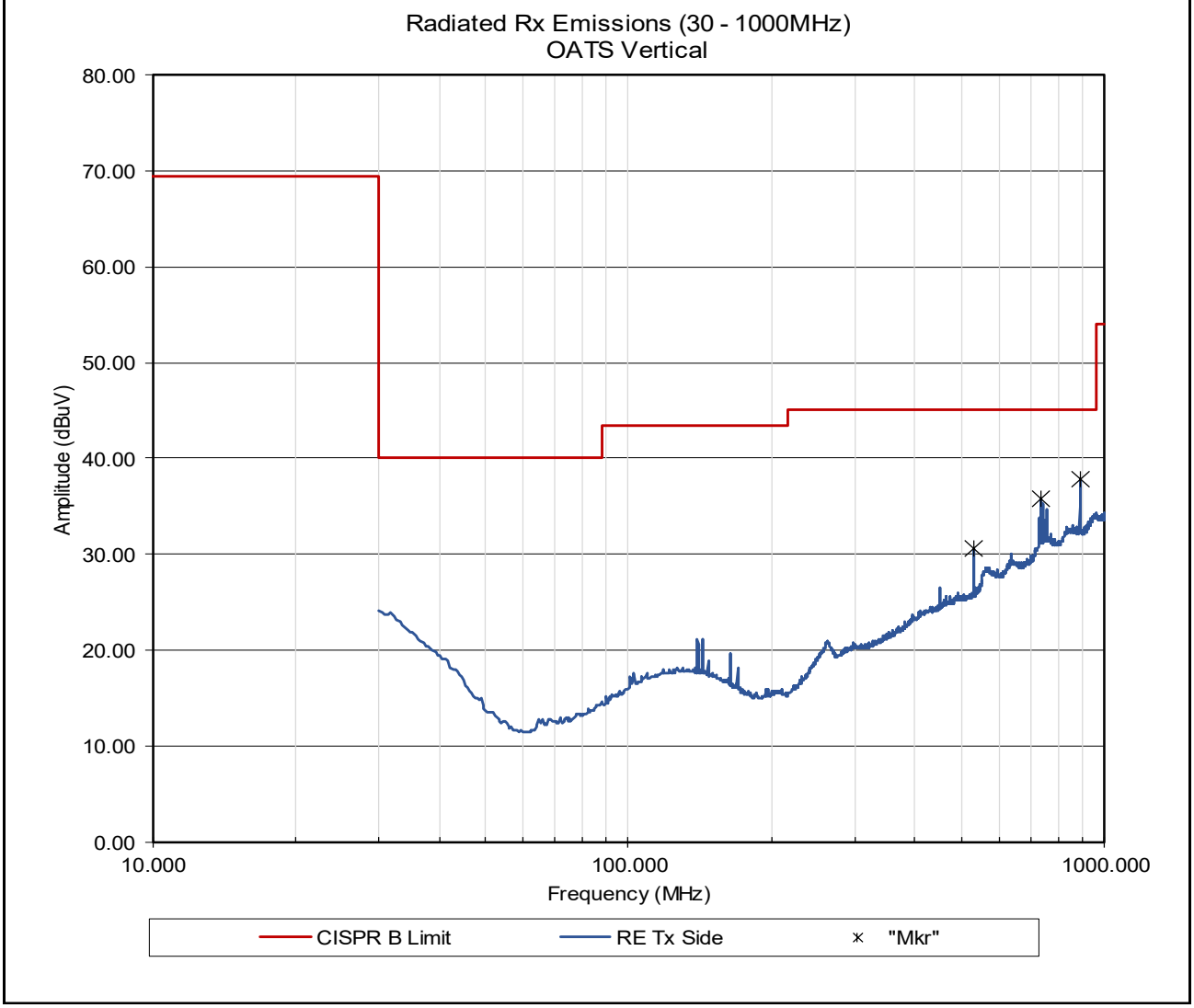


Table 10.1 – Summary of Radiated Rx Emissions

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

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

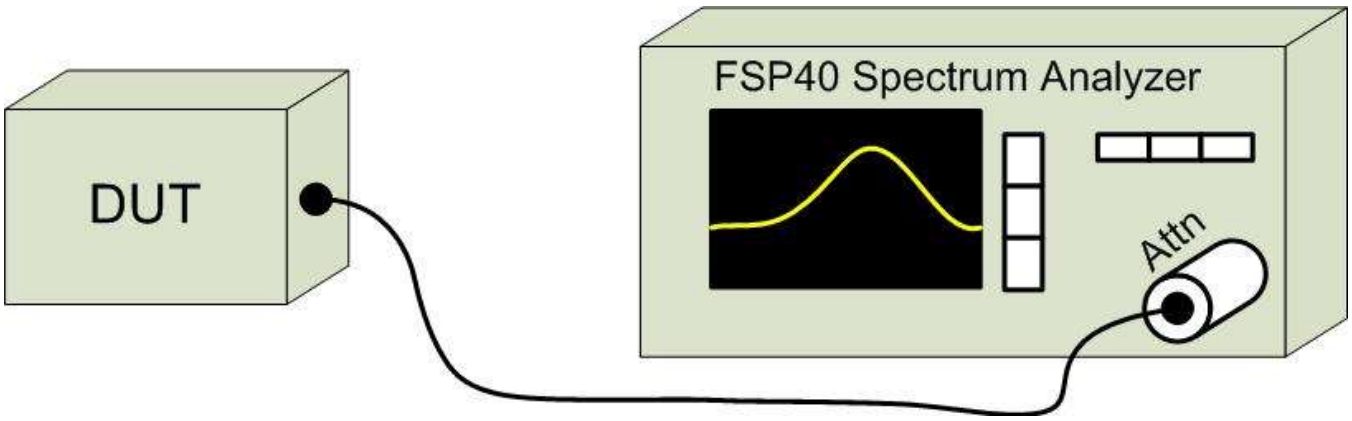


Table A.2 – Setup - Audio Modulation Equipment

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

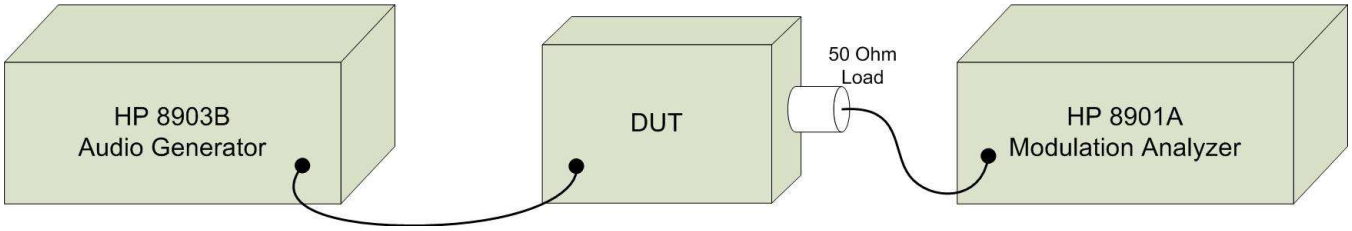


Table A.3 – Setup - Radiated Emissions Equipment

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

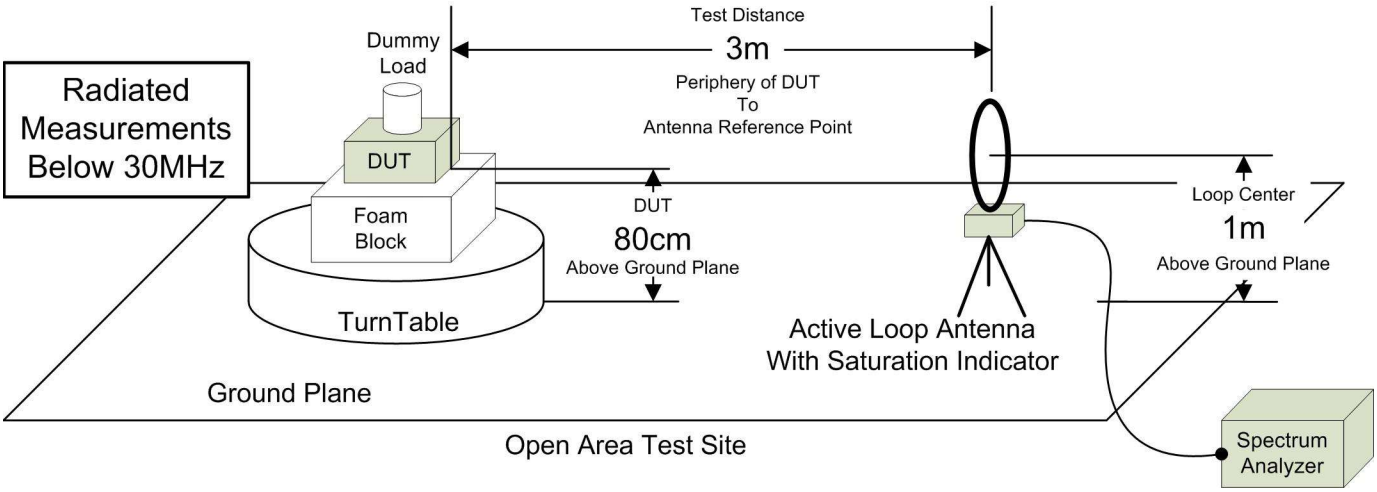


Figure A.4 – Test Setup Radiated Emissions Measurements 30-1000MHz

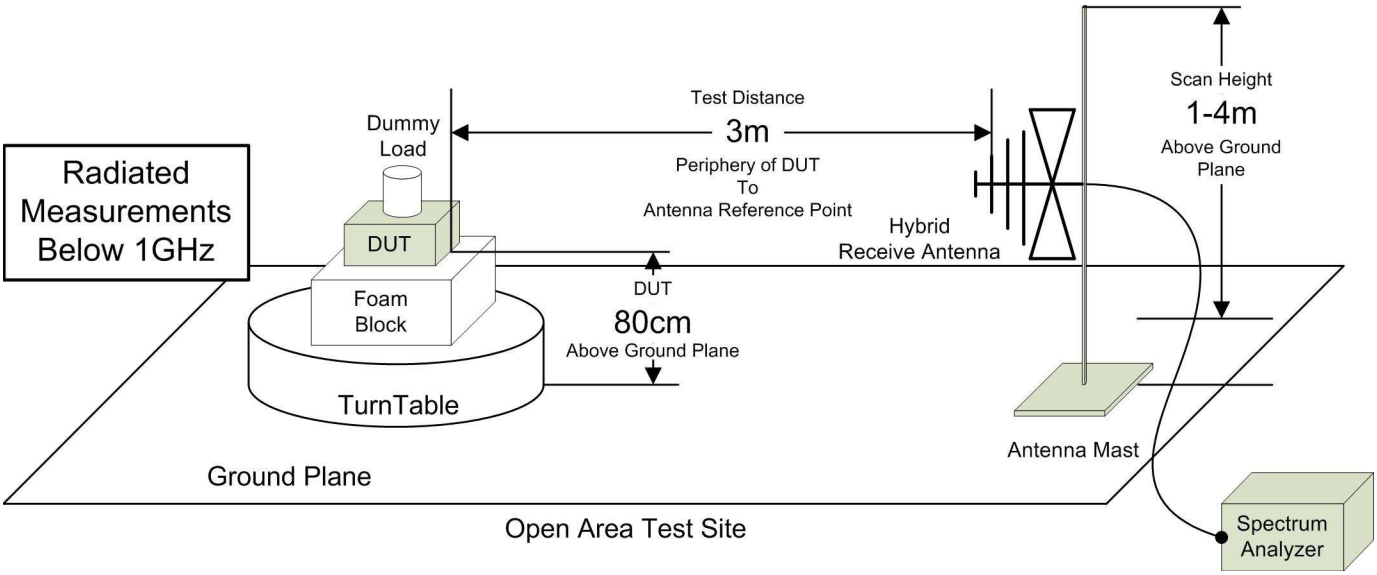
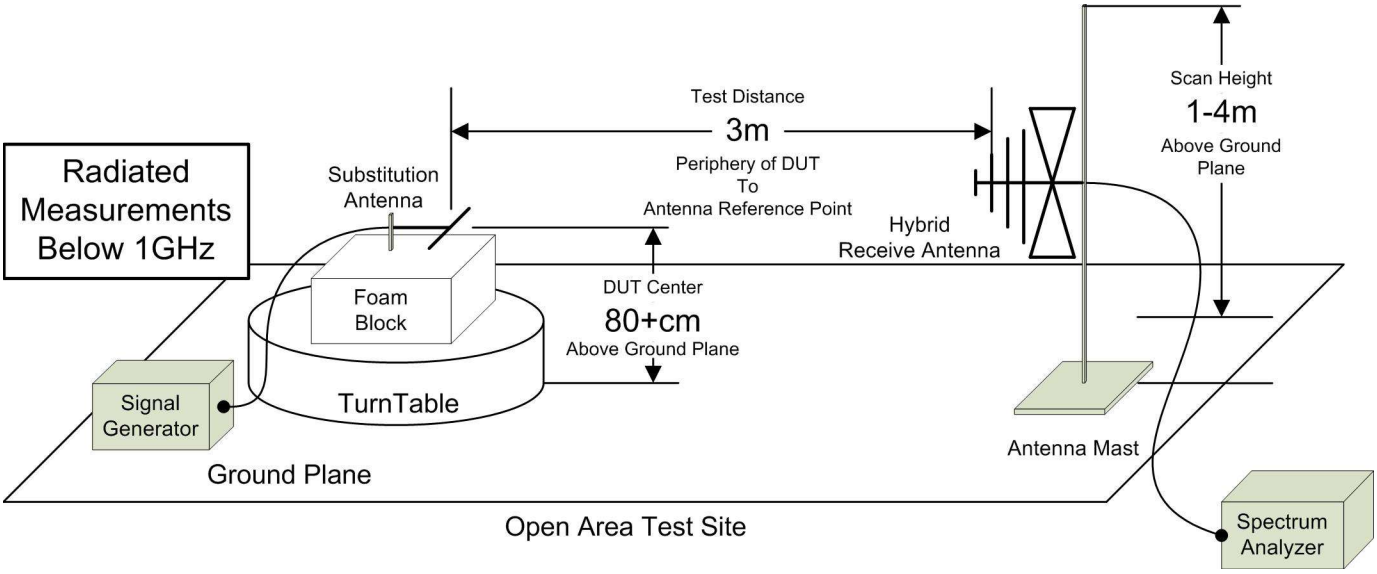


Figure A.5 – Test Setup Radiated Emissions Measurements 30-1000MHz



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
00035	ETS	3115	6276	Double Ridged Guide Horn	4 Mar 2022	Triennial	4 Mar 2025
00241	R&S	FSU40	100500	Spectrum Analyzer	6 Sep 2024	Triennial	6 Sep 2027
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
00263	Koaxis	KP10-1.00M-TD	263	1m Armoured Cable	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