



Test Report Serial Number:	45461788 R1.0
Test Report Date:	10 January 2023
Project Number:	1606

EMC Test Report - New Filing

Applicant:



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

FCC ID:

2AEOCUT569

Product Model Number / HVIN

MC KINLEY II FCC

IC Registration Number

20240-UT569

Product Name / PMN

MC KINLEY II FCC

In Accordance With:

FCC 47 CFR Part 15 Subpart B
 Unintentional Radiator (CXX)

RSS-GEN, ICES-003
 Information Technology Equipment (Including Digital Apparatus)
 — Limits and Methods of Measurement

Approved By:



Ben Hewson, President
 Celltech Labs Inc.
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 Canada



Test Lab Certificate: 2470.01



**Industry
Canada**

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:	2 -3 November 2022	
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	All	Art Voss	10 January 2023

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: 2AEOCUT569
	IC ID: 20240-UT569
Device Type:	Mobile 4W AM / FM / 12W AM SSB CBRS Transceiver
Device Model(s) / HVIN:	MC KINLEY II FCC
Device Marketing Name / PMN:	MC KINLEY II FCC
Firmware Version ID Number / FVIN:	-
Host Marketing Name / HMN:	-
Test Sample Serial No.:	#2
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:	AM Double-SideBand, FM: 4W (36dBm)
	AM Single-SideBand: 12W (40.8dBm)
Manuf. Max. Rated BW:	AM Double-SideBand, FM: 8kHz
	AM Single-SideBand: 4kHz
Antenna Make and Model:	n/a
Antenna Type and Gain:	0dBi (Typical), 3dBi (Max)
Modulation:	AM / FM / AM Upper-SideBand / AM Lower-SideBand
Mode:	Simplex
Weather Receiver (WX):	162.4 - 162.55MHz
DUT Power Source:	12 - 24VDC
DUT Dimensions [WxLxH]	172mm x 148mm x 52mm
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 MC KINLEY II FCC is Mobile 4W AM / FM and 12W AM Single-SideBand (SSB) CBRS Transceiver. The MC KINLEY II is capable of transmitting in AM Double-SideBand (A3E) and AM Lower and Upper Carrier Suppressed Side Band (J3E) modes as well as FM (F3E) mode. The MC KINLEY II FCC also contains a weather receiver operating at 162.4 to 162.55MHz.

Application:

This is an application for a New Certification, Single.

Regulatory Requirement:

As per FCC 47 CFR 2 Subpart I and the Radiocommunication Regulations of Canada, Equipment Authorization is required for this *Equipment* by means of Certification in accordance with FCC 47 CFR §95 Subpart D, CBRS, RSS-236 Iss. 2 and ANSI C63.26.

Scope of Work:

The scope of this investigation is limited only to the evaluation of the MC KINLEY II FCC to determine compliance to the *Rules* identified herein.

RF Exposure:

As per FCC 47 CFR §2.1091 and Canada Health Safety Code 6, an RF Exposure (MPE) evaluation is required for this *Equipment* and the results of the RF Exposure (MPE) evaluation appear in a separate report. Since this equipment is capable of multiple transmission modes, only the highest power mode is considered.

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	Applicable Rule Part(s) ISEDC	Test Date	Result
12.0	Radiated Receiver Emissions	ANSI C63.26:2015 ANSI C63.4:2014	§15 Subpart B §15.109(d)	ICES-003 RSS-Gen	2, 3 Nov 2022	Complies

Test Station Day Log					
Date	Ambient Temp (°C)	Relative Humidity (%)	Barometric Pressure (kPa)	Test Station	Tests Performed Section(s)
2 Nov 2022	0.0	87	101.5	OATS	7
3 Nov 2022	-2.0	80	102.4	OATS	7

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.

10 January 2023

Date



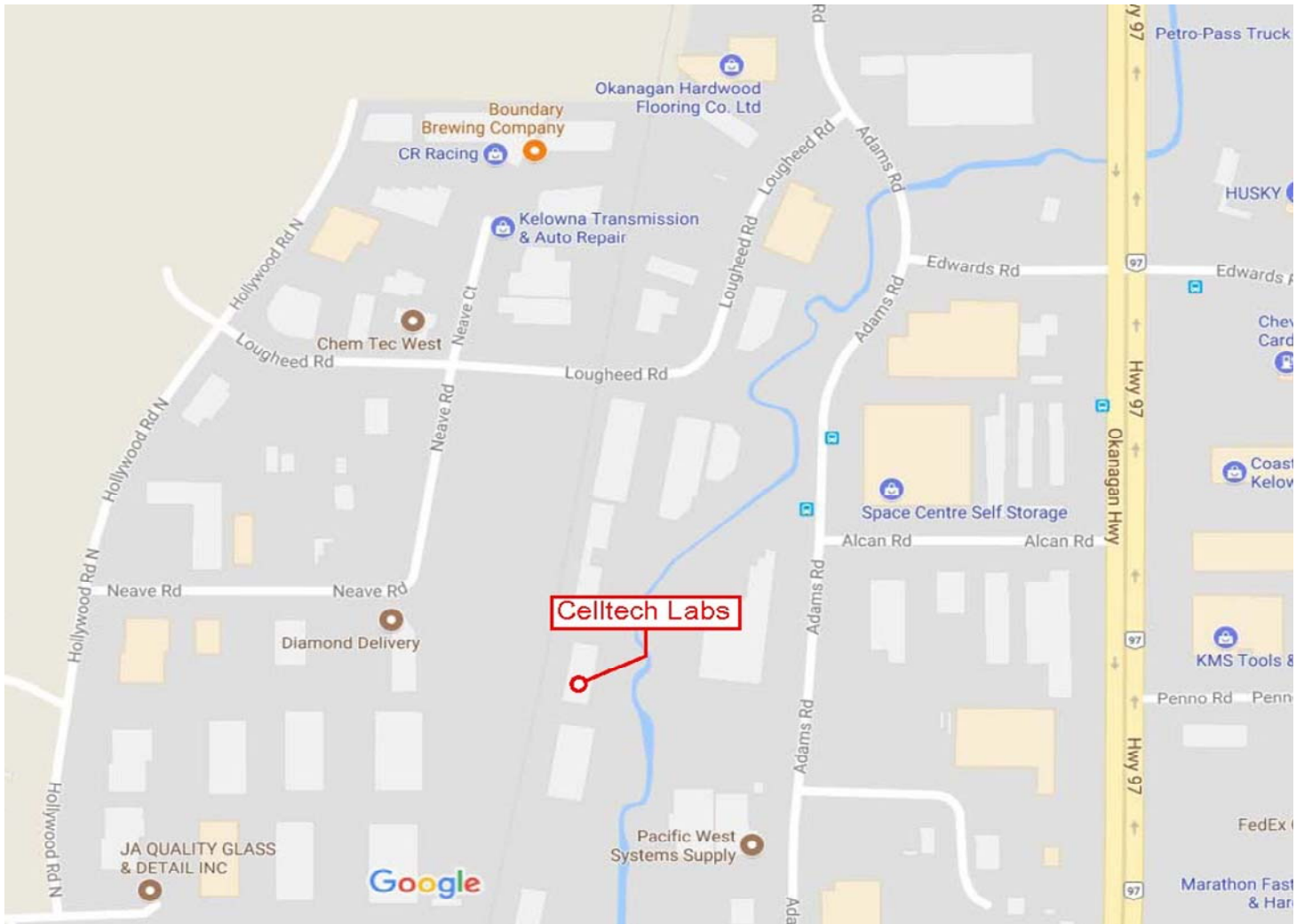
5.0 NORMATIVE REFERENCES

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/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 15: Radio Frequency Devices Subpart B: Unintentional Radiators
ISED	Innovation, Science and Economic Development Canada RSS-Gen Issue 5A1: Spectrum Management and Telecommunications Radio Standards Specification March 2019 General Requirements and Information for the Certification of Radiocommunication Equipment
ISED	Innovation, Science and Economic Development Canada Spectrum Management and Telecommunications Radio Standards Specification ICES-003 Issue 6: Information Technology Equipment (Including Digital Apparatus) — Jan 2016 Limits and Methods of Measurement

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 RADIATED RX EMISSIONS

Test Procedure

Normative Reference

FCC 47 CFR §15.109, ICES-003(6.2)
ANSI C64.4-2014

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 (d) For CB receivers, the field strength of radiated emissions within the frequency range of 25-30 MHz shall not exceed 40 microvolts/meter at a distance of 3 meters. The field strength of radiated emissions above 30 MHz from such devices shall comply with the limits in paragraph (a) of this section.
47 CFR §15.101	(b) Only those receivers that operate (tune) within the frequency range of 30-960 MHz, CB receivers and radar detectors are subject to the authorizations shown in paragraph (a) of this section. Receivers operating above 960 MHz or below 30 MHz, except for radar detectors and CB receivers, are exempt from complying with the technical provisions of this part but are subject to §15.5.
ICES-003(6.2.1)	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

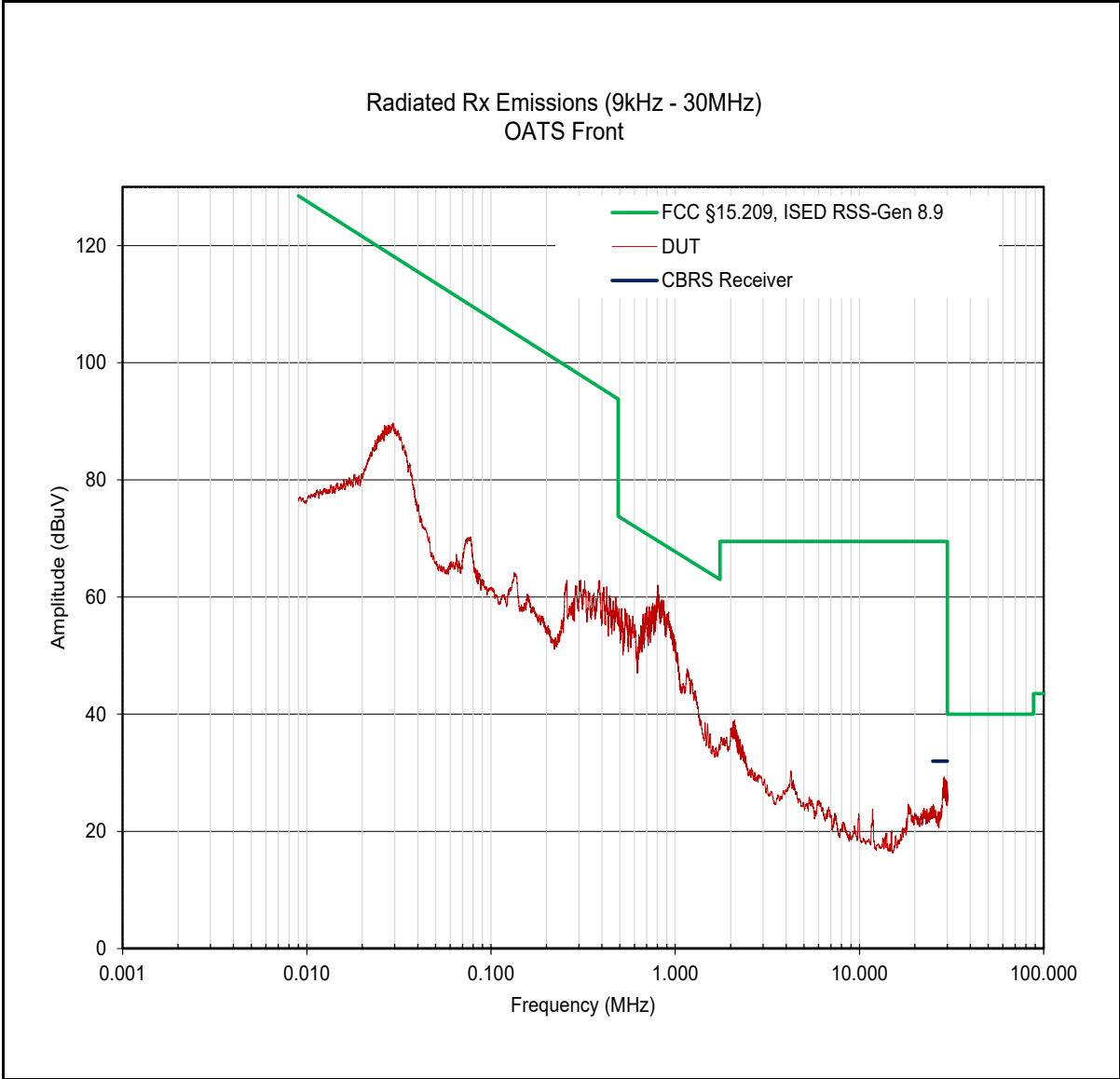
Figure A.1

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.

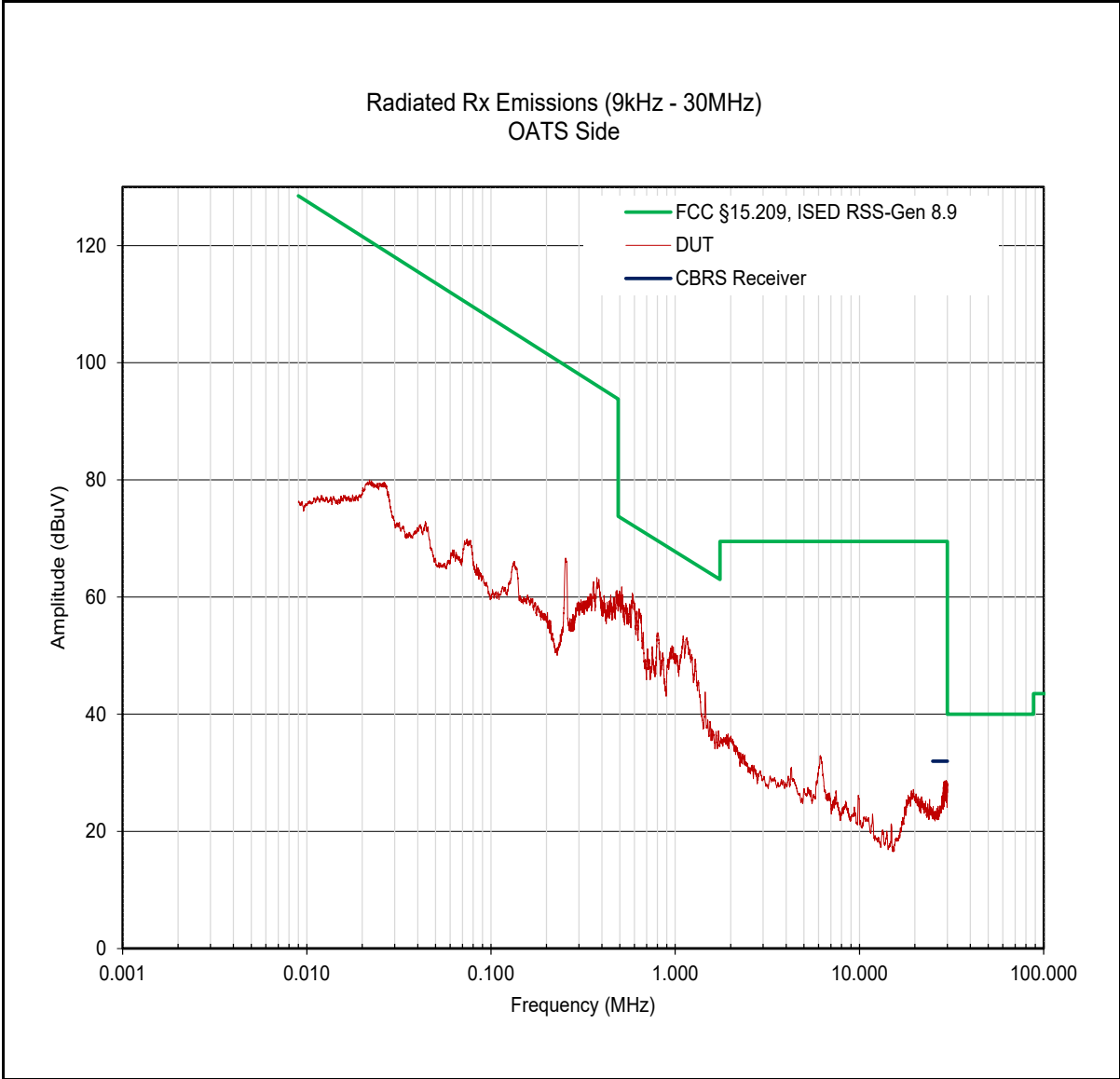
Plot 7.1 – Radiated Rx Emissions OATS, 9kHz - 30MHz, Front

Radiated Rx Emissions:

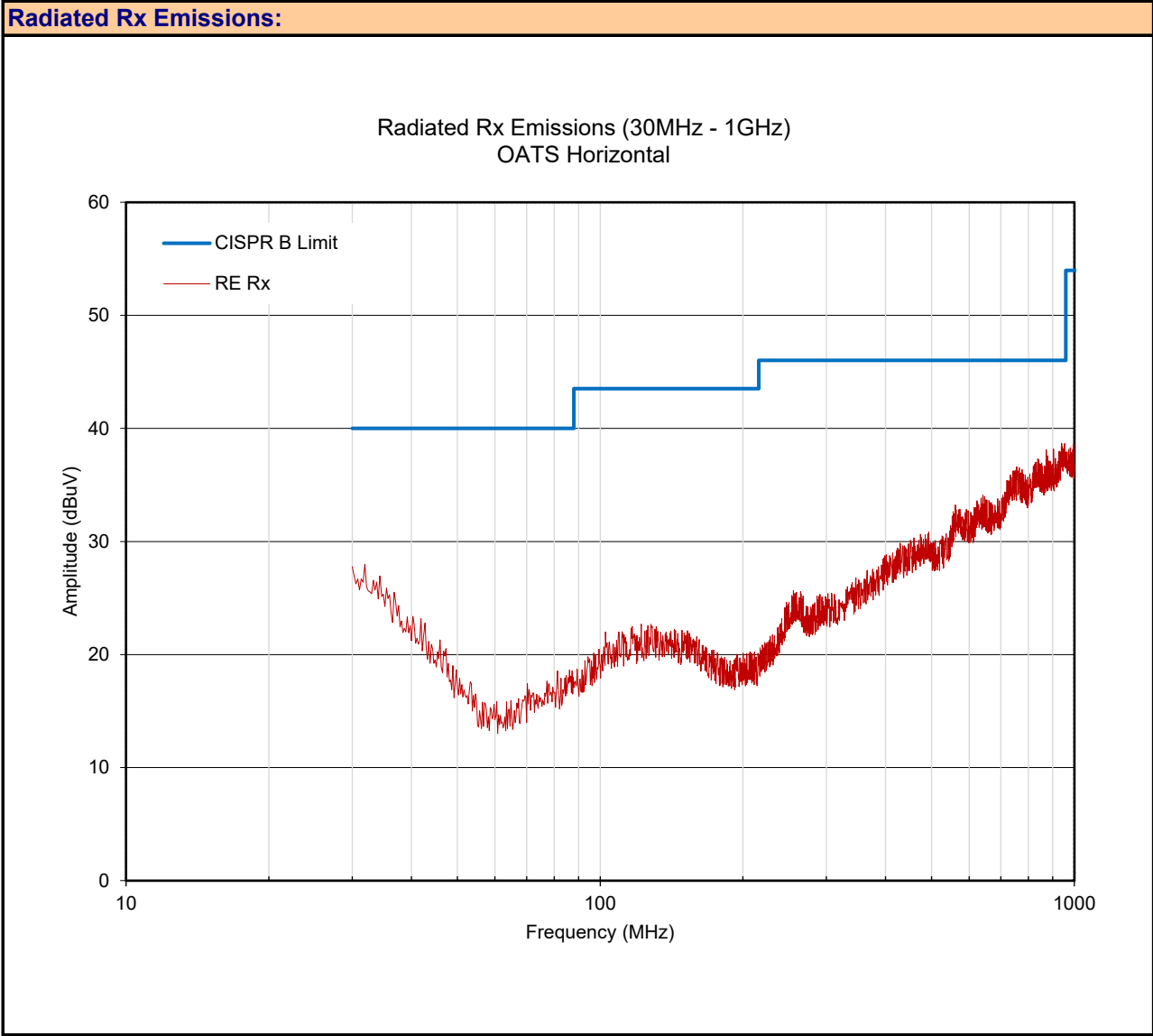


Plot 7.2 – Radiated Rx Emissions OATS, 9kHz - 30MHz, Side

Radiated Rx Emissions:



Plot 7.3– Radiated Spurious Emissions OATS, 30 - 1000MHz, Horizontal



Plot 7.4— Radiated Spurious Emissions OATS, 30 - 1000MHz, Vertical

Radiated Rx Emissions:

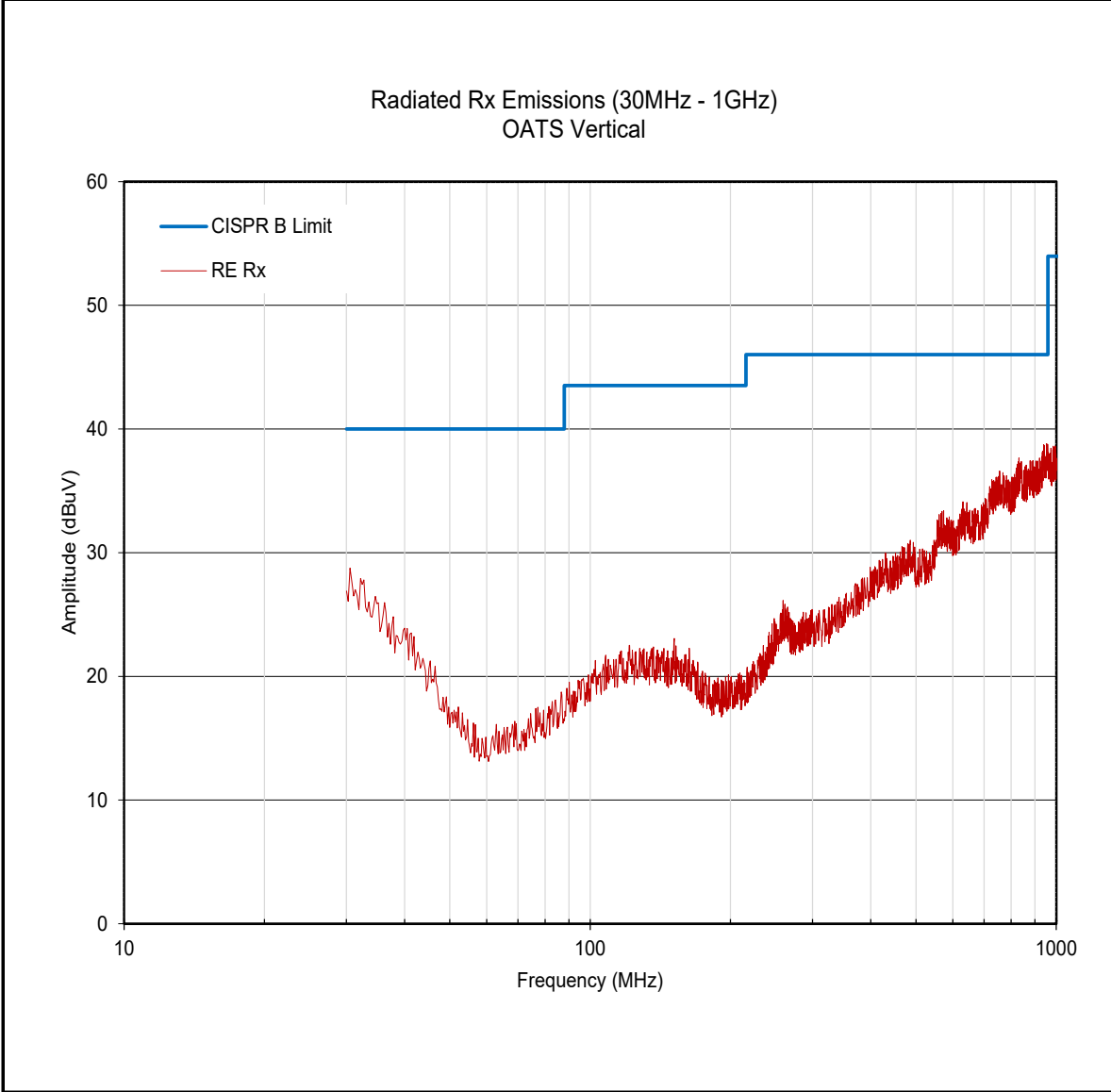


Table 7.1 – Summary of Radiated Rx Emissions

Summary of Radiated Rx Emissions (Restricted Band)											
Measured Frequency Range (MHz)	Channel Frequency (MHz)	Antenna Polarization	Emission Frequency	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)	
9kHz - 30MHz	-	Front	804kHz	- (1)	0.00	0.00	0.00 (3)	61.1 (2)	69.5	8.4	
9kHz - 30MHz	-	Side	512kHz	- (1)	0.00	0.00	0.00 (3)	61.4 (2)	73.4	12.0	
30-1000MHz	-	Horizontal	ND	ND (1)	0.00	0.00	0.00 (3)	ND (2)	56.9	n/a	
30-1000MHz	-	Vertical	ND	ND (1)	0.00	0.00	0.00 (3)	ND (2)	56.9	n/a	
Results:									Complies		

(1) No Emissions Detected (ND) above ambient or within 20dB of the limit

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

(3) External Amplifier not used

$$E_{\text{Corr}} = E_{\text{Meas}} + \text{ACF} + L_{\text{C}} - G_{\text{A}}$$

APPENDIX A – TEST SETUP DRAWINGS AND EQUIPMENT

Table A.1 – 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.1 – Test Setup Radiated Emissions Measurements Below 30MHz

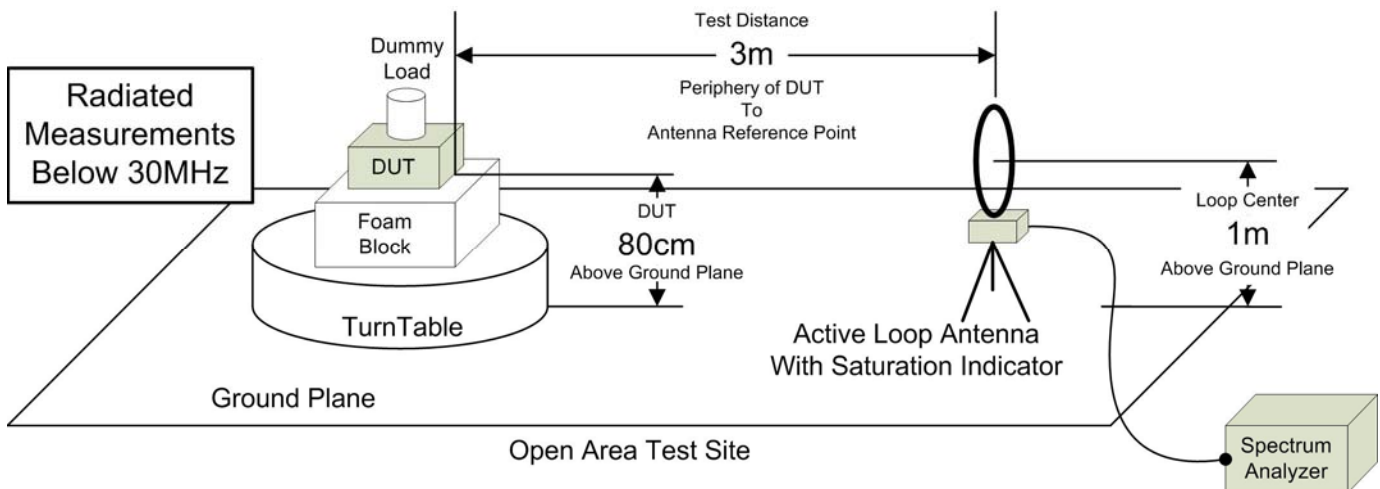


Figure A.2 – Test Setup Radiated Emissions Measurements 30-1000MHz

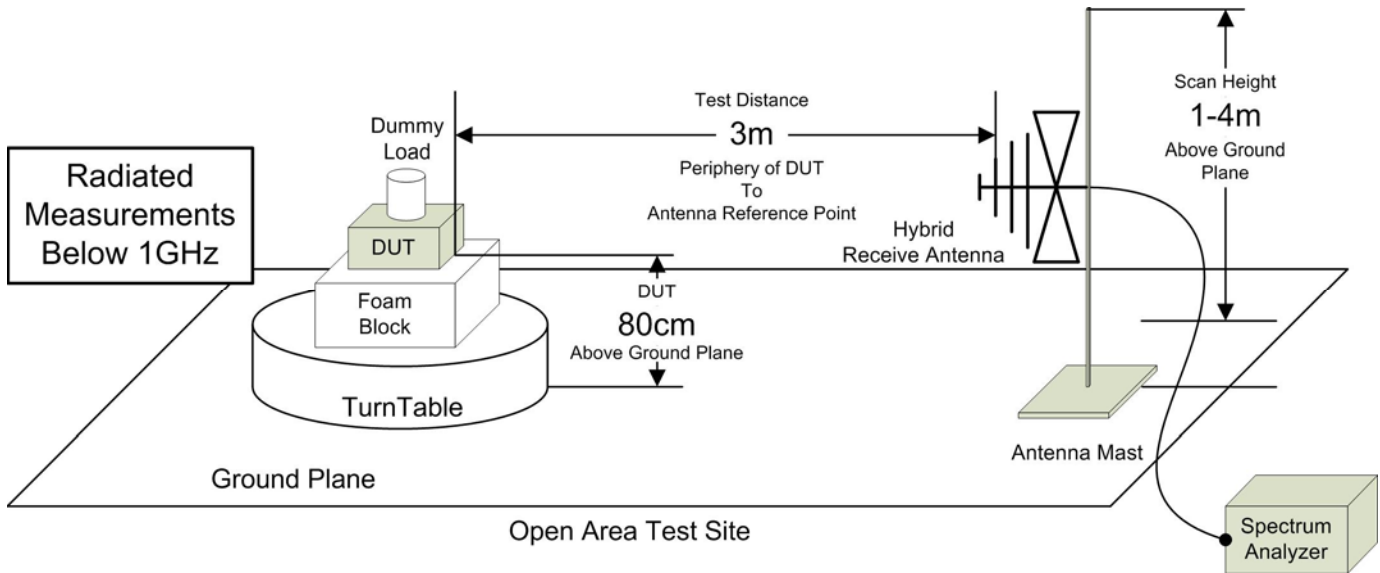
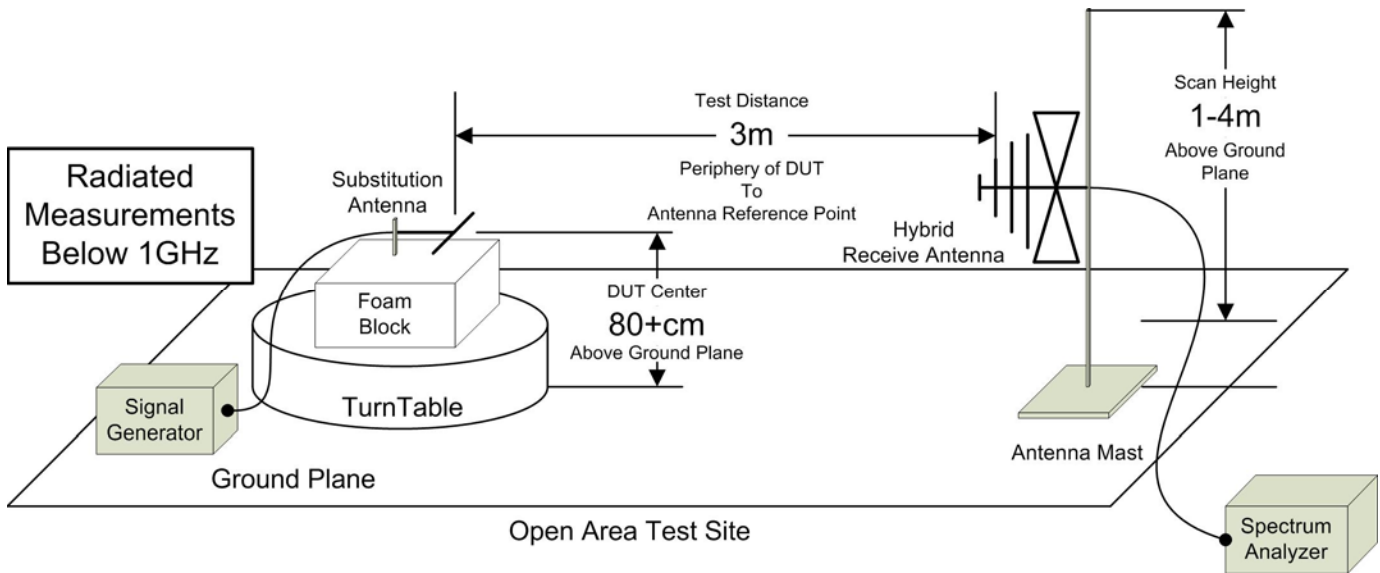


Figure A.3 – Test Setup Radiated Emissions Measurements 30-1000MHz



APPENDIX B – EQUIPMENT LIST AND CALIBRATION

Equipment List					Last	Calibration	Calibration
Asset Number	Manufacturer	Model Number	Serial Number	Description	Calibrated	Interval	Due
00050	Chase	CBL-6111A	1607	Bilog Antenna	16 Nov 2020	Triennial	16 Nov 2023
00085	EMCO	6502	9203-2724	Loop Antenna	6 Sep 2022	Triennial	6 Sep 2025
00333	HP	85685A	3010A01095	RF Preselector	23 Jun 2020	Triennial	30 Jun 2023
00049	HP	85650A	2043A00162	Quasi-peak Adapter	23 Jun 2020	Triennial	23 Jun 2023
00051	HP	8566B	2747A05510	Spectrum Analyzer	23 Jun 2020	Triennial	23 Jun 2023
00223	HP	8901A	3749A07154	Modulation Analyzer	10 Dec 2020	Triennial	10 Dec 2023
00224	HP	8903B	3729A18691	Audio Analyzer	11 Dec 2020	Triennial	11 Dec 2023
00241	R&S	FSU40	100500	Spectrum Analyzer	10 Aug 2021	Triennial	10 Aug 2024
00003	HP	53181A	3736A05175	Frequency Counter	23 Jun 2020	Triennial	23 Jun 2023
00250	Circuit Test	DMR-1800	TE182	Digital Multi-Meter - DVM	23 Jun 2020	Triennial	23 Jun 2023
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
00263B	Koaxis	KP10-1.00M-TD	263B	1m Armoured Cable	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

$$U_{LAB} = 5.14\text{dB} \quad U_{CISPR} = 6.3\text{dB}$$

Radiated Emissions 200MHz - 1000MHz

$$U_{LAB} = 5.90\text{dB} \quad U_{CISPR} = 6.3\text{dB}$$

Radiated Emissions 1GHz - 6GHz

$$U_{LAB} = 4.80\text{dB} \quad U_{CISPR} = 5.2\text{dB}$$

Radiated Emissions 6GHz - 18GHz

$$U_{LAB} = 5.1\text{dB} \quad U_{CISPR} = 5.5\text{dB}$$

Power Line Conducted Emissions 9kHz to 150kHz

$$U_{LAB} = 2.96\text{dB} \quad U_{CISPR} = 3.8\text{dB}$$

Power Line Conducted Emissions 150kHz to 30MHz

$$U_{LAB} = 3.12\text{dB} \quad U_{CISPR} = 3.4\text{dB}$$

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

$$U_{LAB} = 1.0\text{dB} \quad U_{CISPR} = \text{n/a}$$

Frequency/Bandwidth 9kHz - 40GHz

$$U_{LAB} = 0.1\text{ppm} \quad U_{CISPR} = \text{n/a}$$

Temperature

$$U_{LAB} = 1^{\circ}\text{C} \quad U_{CISPR} = \text{n/a}$$

END OF REPORT