Test Report Serial Number:	**45461654 R2.0**
Test Report Date:	**28 April 2021**
Project Number:	**1532**

EMC Test Report - New Filing

Applicant:

Myriota

Myriota Pty Ltd.
Level 1, McEwin Building
Lot 14, North Terrace
Adelaide, SA 5000
Australia

Myriota

Myriota Canada
260 Holiday Inn Drive
Unit 30, Building B
Cambridge, ON, N3C 4E8

FCC ID:	IC Registration Number
2ATKL-DB2-25	**25148-DB225**
Product Model Number / HVIN	Host Marketing Name / HMN
DB2-25	**Developer Toolkit**

In Accordance With:

FCC 47 CFR Part 15 Subpart B
Unintentional Radiators

Approved By:

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

ilac-MRA ACCREDITED

Test Lab Certificate: 2470.01

Industry Canada

IC Registration 3874A-1

FCC Registration: CA3874

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1.0 DOCUMENT CONTROL

Revision History					
Samples Tested By:	Art Voss, P.Eng.		**Date(s) of Evaluation:**	29 January 2021	
Report Prepared By:	Art Voss, P.Eng.		**Report Reviewed By:**	Ben Hewson	
Report Revision	**Description of Revision**		**Revised Section**	**Revised By**	**Revision Date**
0.1	Initial Report		n/a	Art Voss	15 February
0.2	Draft Release		n/a	Art Voss	25 April 2021
1.0	Initial Release		n/a	Art Voss	26 April 2021
2.0	Revised Product Description		2.0	Art Voss	28 April 2020

2.0 CLIENT AND DUT INFORMATION

Client Information		
Applicant Name (FCC)	**Myriota Pty Ltd**	
Applicant Address (FCC)	Level 1, McEwin Building	
	Lot 14, North Terrace	
	Adelaide, SA 5000, Australia	
Applicant Name (ISED)	**Myriota Canada**	
Applicant Address (ISED)	260 Holiday Inn Drive	
	Unit 30, Building B	
	Cambridge, ON, N3C 4E8, Canada	
DUT (Host) Information		
Device Identifier(s):	**FCC ID:**	**2ATKL-DB2-25**
	ISED ID:	**25148-DB225**
Device Type:	Product Developer's Tool Kit	
Host Device Model(s) / HVIN:	DB2-25	
Host Marketing Name / HMN:	Developer Toolkit	
Host Firmware Version ID Number / FVIN:	-	
Test Sample Serial No.:	T/A Sample - Identical Prototype	
Antenna Make and Model:	n/a	
Antenna Type and Gain:	n/a	
DUT Power Source:	3VDC Alkaline Battery	
DUT Dimensions [LxWxD] (mm)	HL x W x D: 130mm x 90mm x 40mm	
Deviation(s) from standard/procedure:	None	
Modification of DUT:	None	
Integrated Module Information		
Module Manufacturer:	Myriota Pty Ltd	
Device Identifier(s):	**FCC ID:**	**2ATKL-M2-24**
	IC ID:	**25148-M224**
Device Type:	Satelite Communications Module	
Module Device Model(s) / HVIN:	M2-24	
Module Product Marketing Name / PMN:	Myriota Module	
Host Firmware Version ID Number / FVIN:	-	
Equipment Class (FCC):	Licensed Non-Broadcast Station Transmitter (TNB)	
Equipment Class (ISED):	Mobile Earth Station	
Transmit Frequency Range:	399.907 - 400.043MHz	
Test Channels:	n/a	
Manuf. Max. Rated Output Power:	0.5W (27dBm)	

Information regarding antenna type and gain provided by applicant.

3.0 SCOPE

Preface:

This Certification Report was prepared on behalf of:

Myriota Pty Ltd

,(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:

The DB2-25, FCC ID: 2ATKL-DB2-25, IC ID: 25148-DB225, is a developer's tool kit intended as a development aid for 3rd party product development using Myriota's certified module, FCC ID: 2ATKL-M2-24, IC ID: 25148-M224. The DB2-25 contains no other transmitters.

Requirement:

As per FCC 47 CFR 2§909, certification is required. Since the *Equipment* integrates a previously certified module and contains no other transmitter, only evaluation to FCC 47 CFR 15 Subpart B is required. This *Equipment* was evaluated with the same two antennas that were evaluated with the M2-24 module. As per FCC 47 CFR §2.10931 an RF Exposure (MPE) evaluation is required for this *Equipment* and the results of the RF Exposure (MPE) evaluation appear in a separate report.

Application:

This is an application new certification.

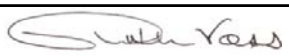
4.0 TEST RESULT SUMMARY

TEST SUMMARY						
Section	**Description of Test**	**Procedure Reference**	**Applicable Rule Part(s) FCC**	**Applicable Rule Part(s) ISED**	**Test Date**	**Result**
11.0	Radiated Rx Spurious Emissions	ANSI C63.4-2014	§2.1053 §15B	RSS-Gen ICES-003	29 Jan 2021	Pass

Test Station Day Log					
Date	**Ambient Temp (°C)**	**Relative Humidity (%)**	**Barometric Pressure (kPa)**	**Test Station**	**Tests Performed Section(s)**
29 Jan 2021	0.0	91	101.1	**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.

26 April 2021
Date

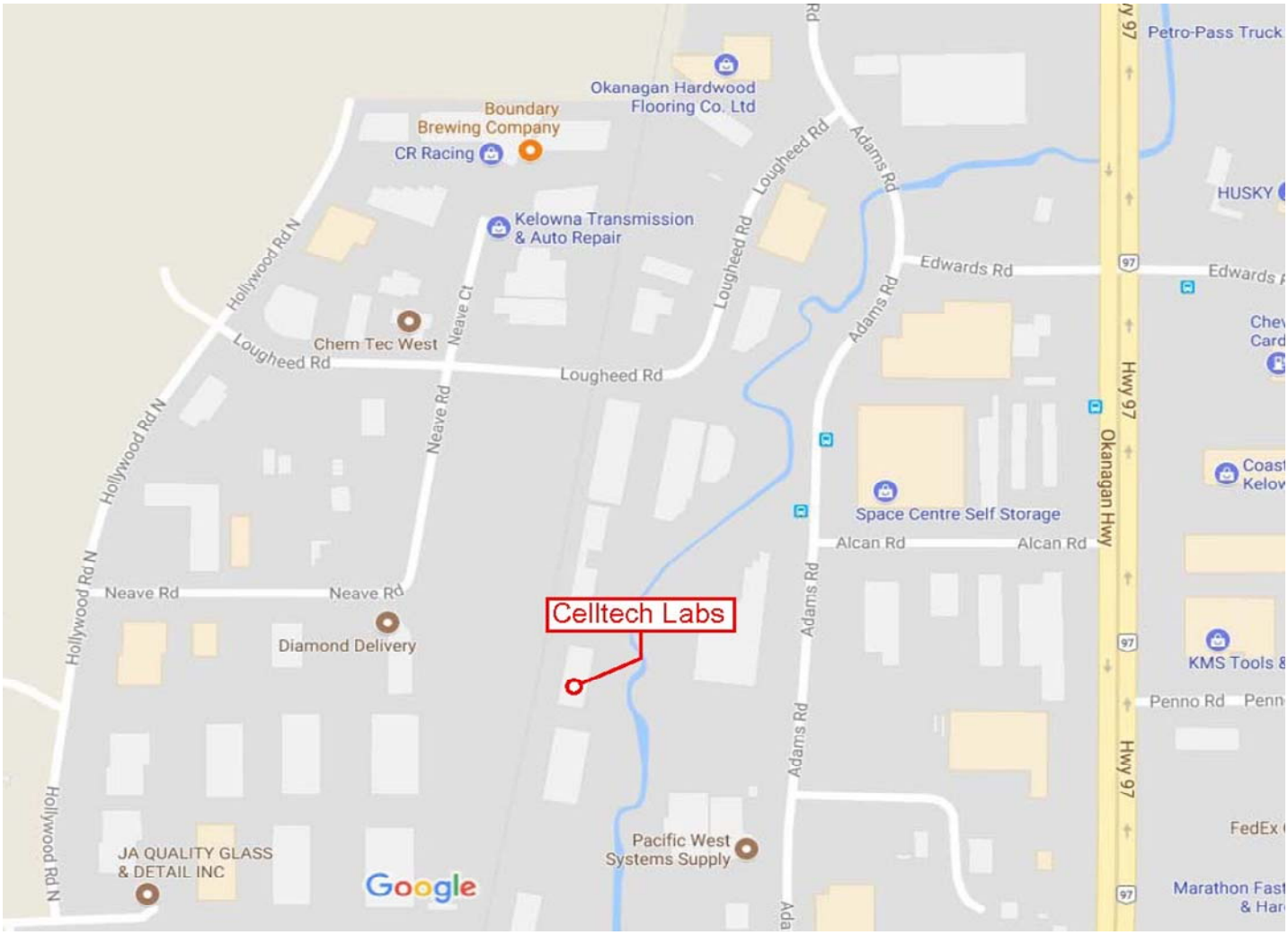
5.0 NORMATIVE REFERENCES

Normative References	
ISO/IEC 17025:2017	General requirements for the competence of testing and calibration laboratories
ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
CFR Title 47: Part 2:	Code of Federal Regulations Telecommunication Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR Title 47: Part 15 Subpart B:	Code of Federal Regulations Telecommunication Unintentional Radiators
ISED RSS-Gen Issue 5:	Innovation, Science and Economic Development Canada Spectrum Management and Telecommunications Radio Standards Specification General Requirements and Information for the Certification of Radiocommunication Equipment
ISED ICES-003 Issue 6, Jan 2016	Innovation, Science and Economic Development Canada Spectrum Management and Telecommunications Radio Standards Specification Information Technology Equipment (Including Digital Apparatus) — 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 Innovation, Science and Economic Development Canada under Test Site File Number ISED 3874A-1. 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
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

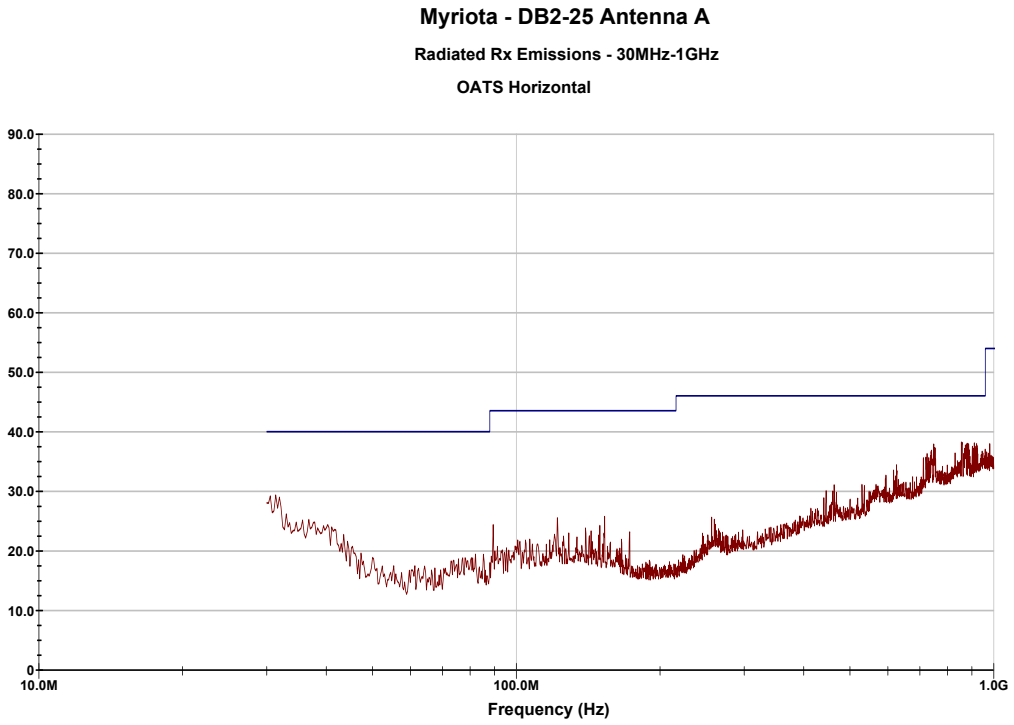
Test Setup	**Appendix A** **Figure A.1**

Measurement Procedure

The DUT was set up as per ANSI C63.4:2014. Emissions were scanned between 30MHz and 5GHz. The turntable was rotated 360 degrees and the antenna was elevated to 4m to optimize the measured emissions. The DUT was evaluated with the same two antennas that were evaluated with the M2-24 Module.

Plot 7.1 – Radiated Rx Emissions, 30 – 1000MHz, Antenna A, Horizontal

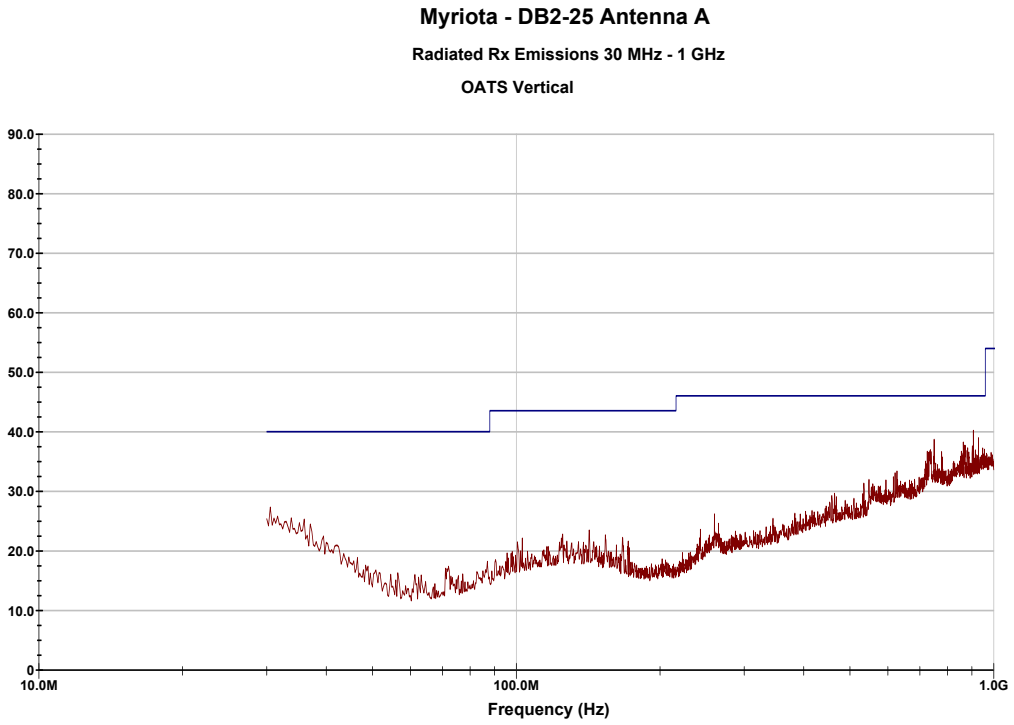
Radiated Emissions



Frequency Range:	Antenna Polarization:	Measured Emission:
30 - 1000 MHz	**Horizontal**	**37.9** dBuV/m
	Antenna:	Emission Frequency
	A	**748.7** MHz

Plot 7.2 – Radiated Rx Emissions, 30 – 1000MHz, Antenna A, Vertical

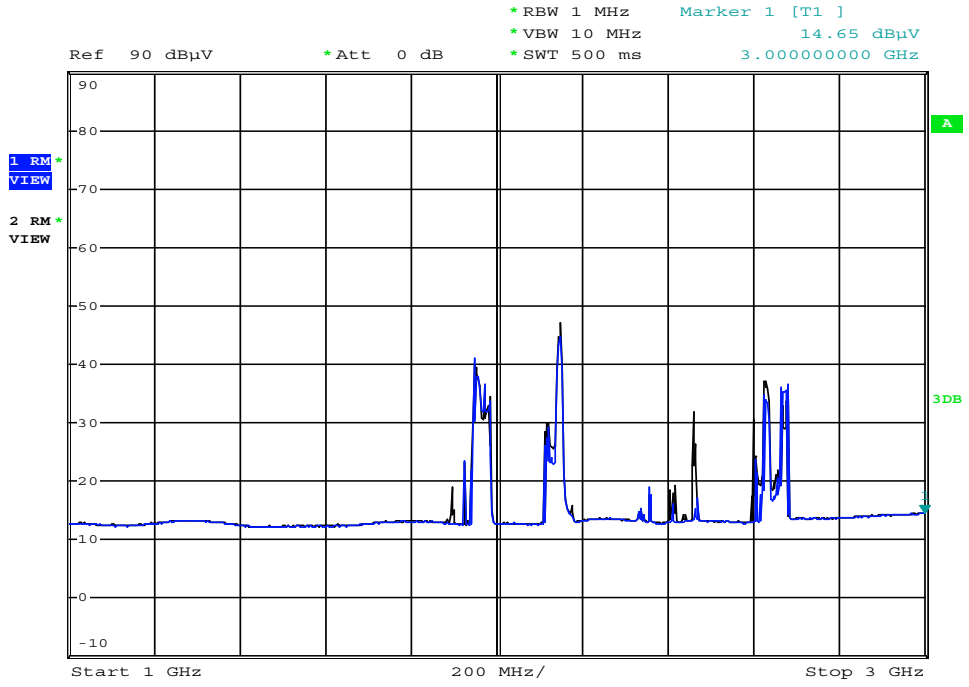
Radiated Emissions



Frequency Range:	Antenna Polarization:	Measured Emission:
30 - 1000 MHz	**Vertical**	**40.2** dBuV/m
	Antenna:	Emission Frequency
	A	**906.2** MHz

Plot 7.3 – Radiated Rx Emissions, 1 – 3GHz, Antenna A, Horizontal

Radiated Emissions

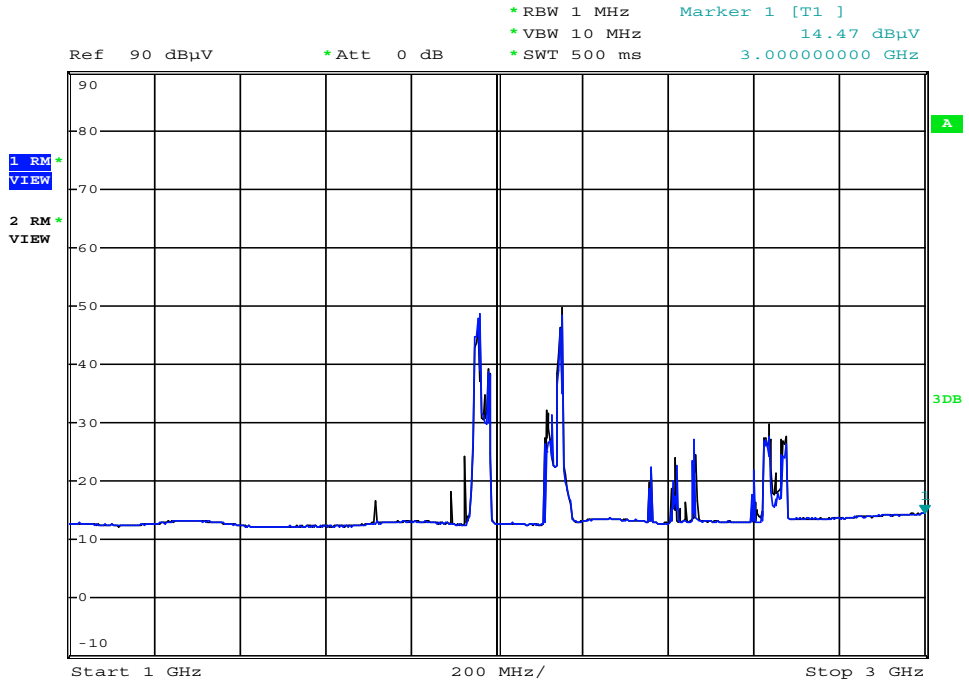


Date: 29.JAN.2021 15:36:48

Frequency Range:	Antenna Polarization:	Measured Emission:
1-3 GHz	**Horizontal**	**14.7** dBuV/m
Trace 2: **Ambient** Trace 1: **DUT + Ambient**	Antenna: **A**	Emission Frequency **3.0** GHz

Plot 7.4 – Radiated Rx Emissions, 1 – 3GHz, Antenna A, Vertical

Radiated Emissions

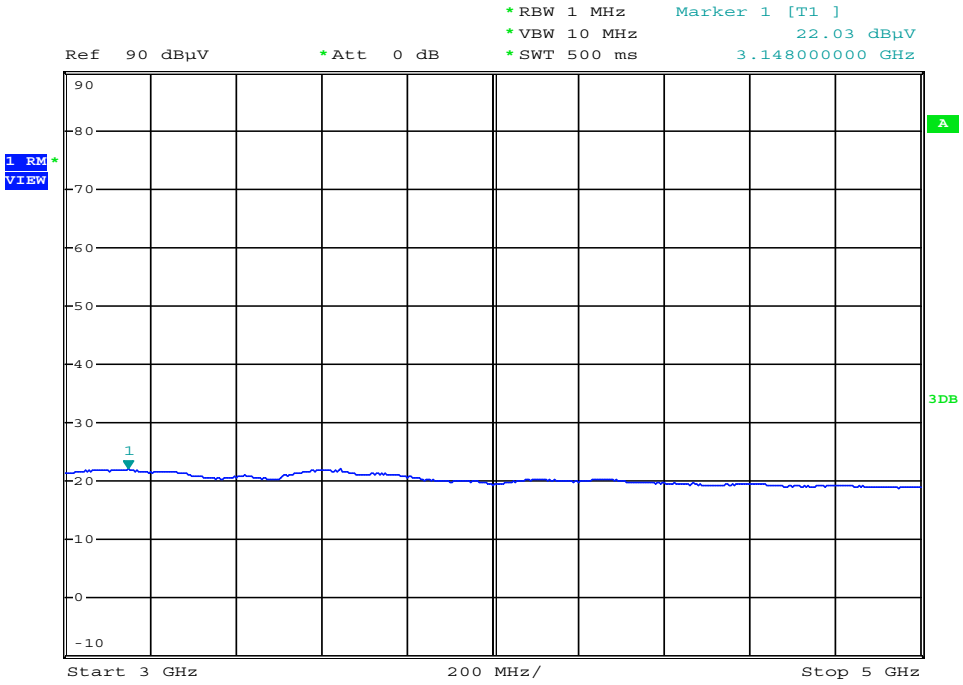


Date: 29.JAN.2021 17:24:08

Frequency Range:	Antenna Polarization:	Measured Emission:
1-3 GHz	**Vertical**	**14.47** dBuV/m
Trace 2: **Ambient** Trace 1: **DUT + Ambient**	Antenna: **A**	Emission Frequency **3.0** GHz

Plot 7.5 – Radiated Rx Emissions, 3 – 5GHz, Antenna A, Horizontal

Radiated Emissions

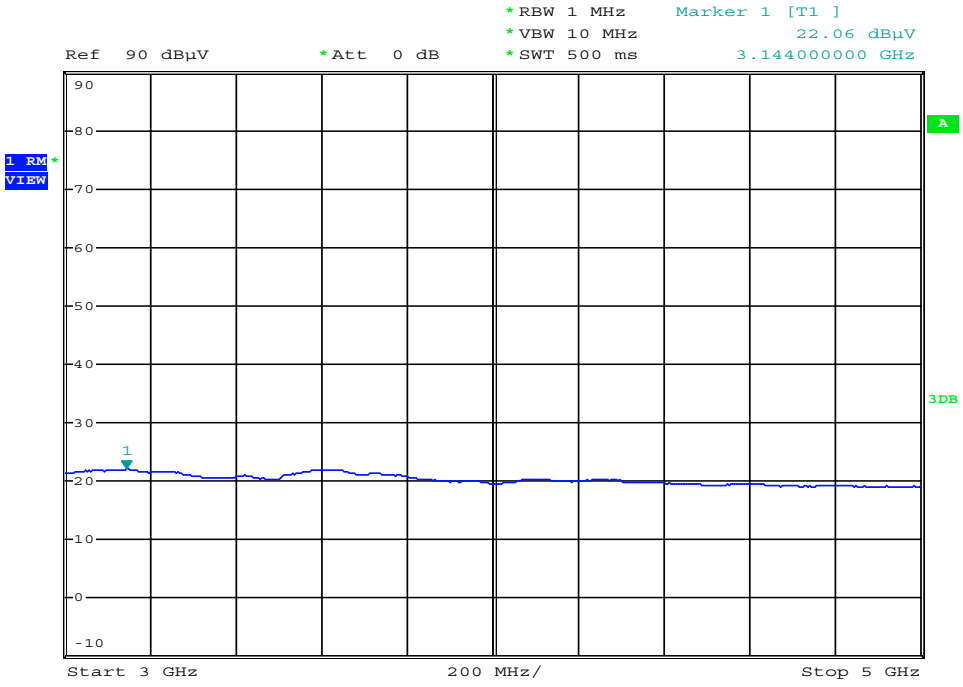


Date: 29.JAN.2021 15:10:36

Frequency Range:	Antenna Polarization:	Measured Emission:
3-5 GHz	**Horizontal**	**22.03** dBuV/m
Trace 2: **Ambient** Trace 1: **DUT + Ambient**	Antenna: **A**	Emission Frequency **3.15** GHz

Plot 7.6 – Radiated Rx Emissions, 3 – 5GHz, Antenna A, Vertical

Radiated Emissions

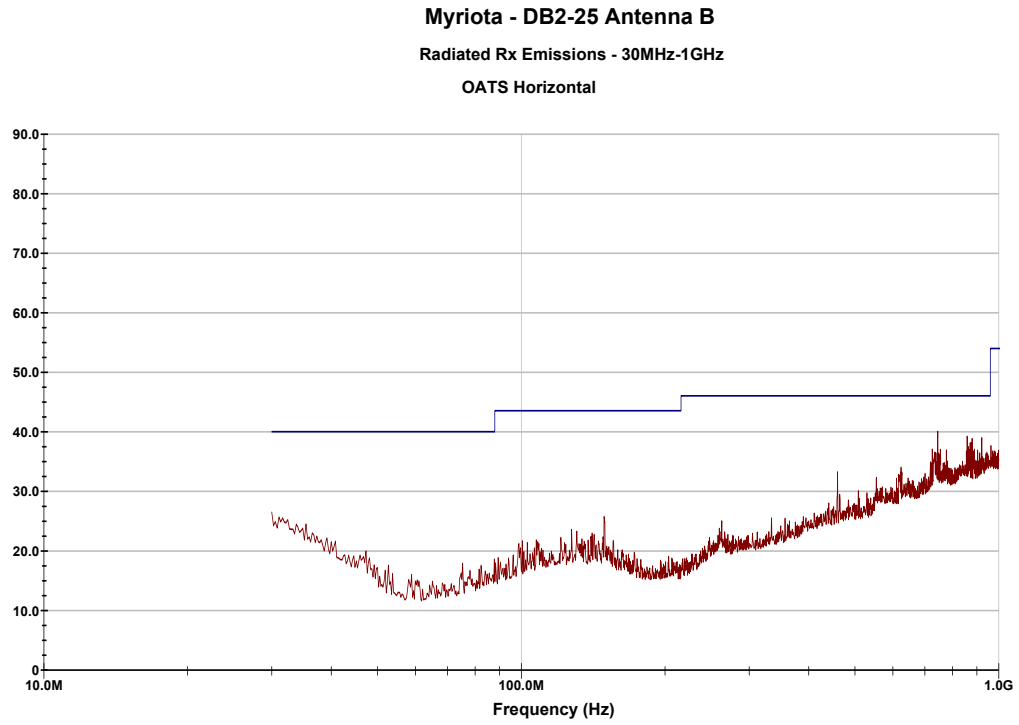


Date: 29.JAN.2021 15:10:58

Frequency Range:	Antenna Polarization:	Measured Emission:
3-5 GHz	**Vertical**	**22.06** dBuV/m
Trace 2: **Ambient** Trace 1: **DUT + Ambient**	Antenna: **A**	Emission Frequency **3.14** GHz

Plot 7.7 – Radiated Rx Emissions, 30 – 1000MHz, Antenna B, Horizontal

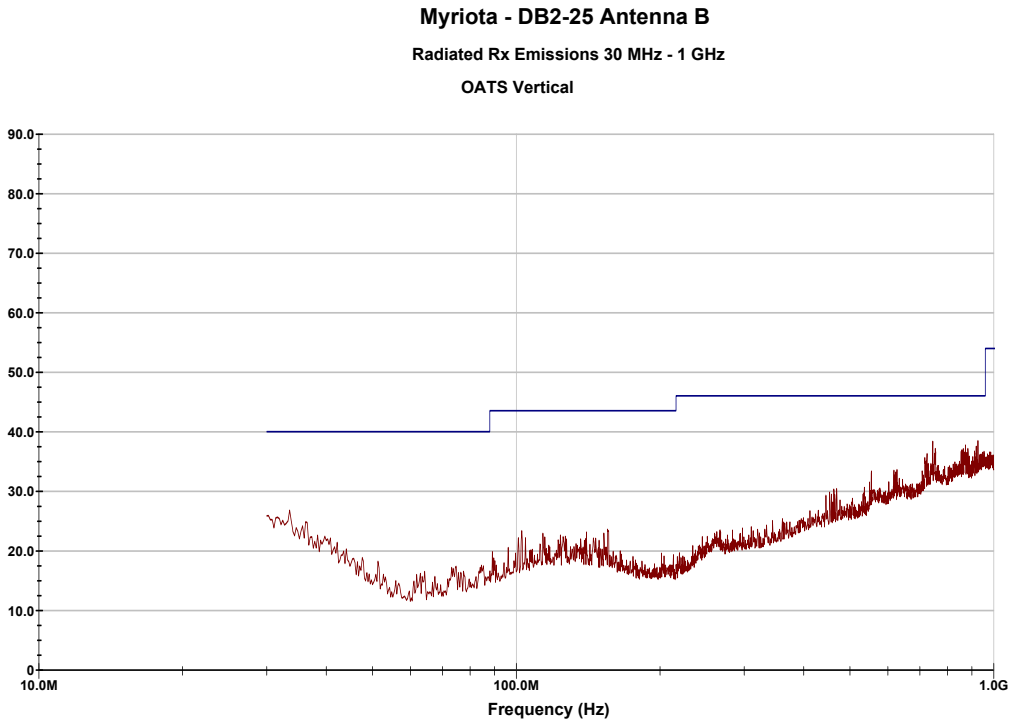
Radiated Emissions



Frequency Range:	Antenna Polarization:	Measured Emission:
30 - 1000 MHz	**Horizontal**	**40.1** dBuV/m
	Antenna:	Emission Frequency
	B	**745.2** MHz

Plot 7.8 – Radiated Rx Emissions, 30 – 1000MHz, Antenna B, Vertical

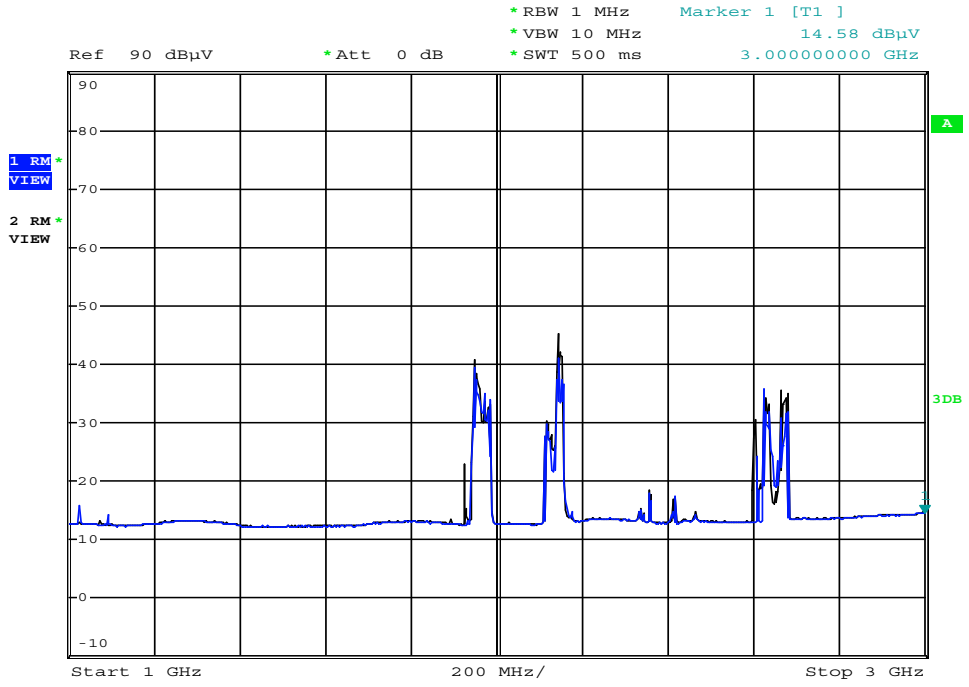
Radiated Emissions



Frequency Range:	Antenna Polarization:	Measured Emission:
30 - 1000 MHz	**Vertical**	**38.4** dBuV/m
	Antenna:	Emission Frequency
	B	**745.2** MHz

Plot 7.9 – Radiated Rx Emissions, 1 – 3GHz, Antenna B, Horizontal

Radiated Emissions

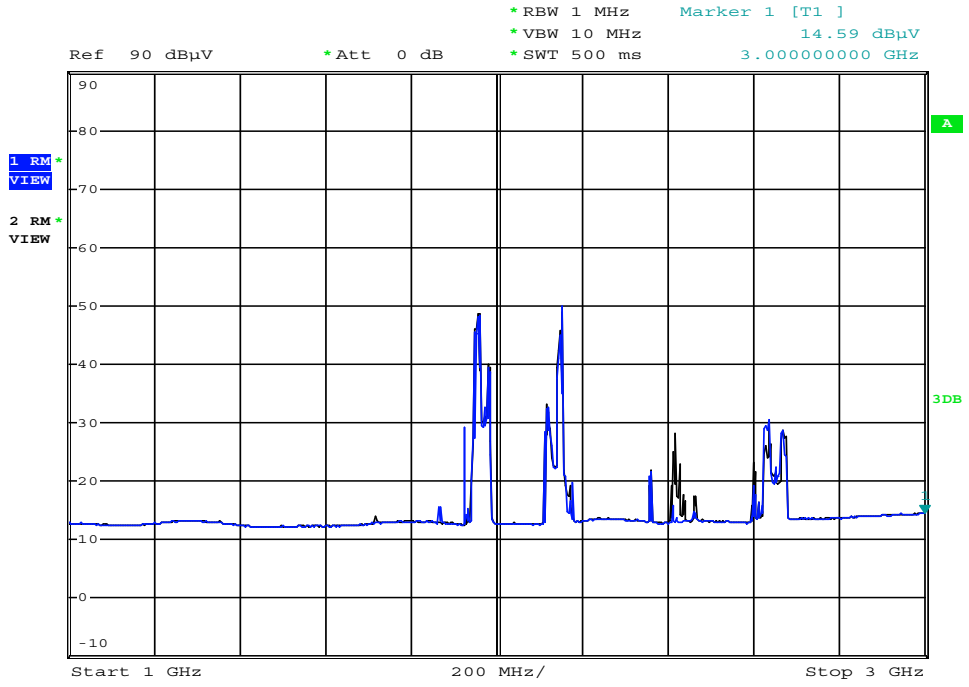


Date: 29.JAN.2021 15:45:59

Frequency Range:	Antenna Polarization:	Measured Emission:
1-3 GHz	**Horizontal**	**14.58** dBuV/m
Trace 2: **Ambient** Trace 1: **DUT + Ambient**	Antenna: **B**	Emission Frequency **3.0** GHz

Plot 7.10 – Radiated Rx Emissions, 1 – 3GHz, Antenna B, Vertical

Radiated Emissions

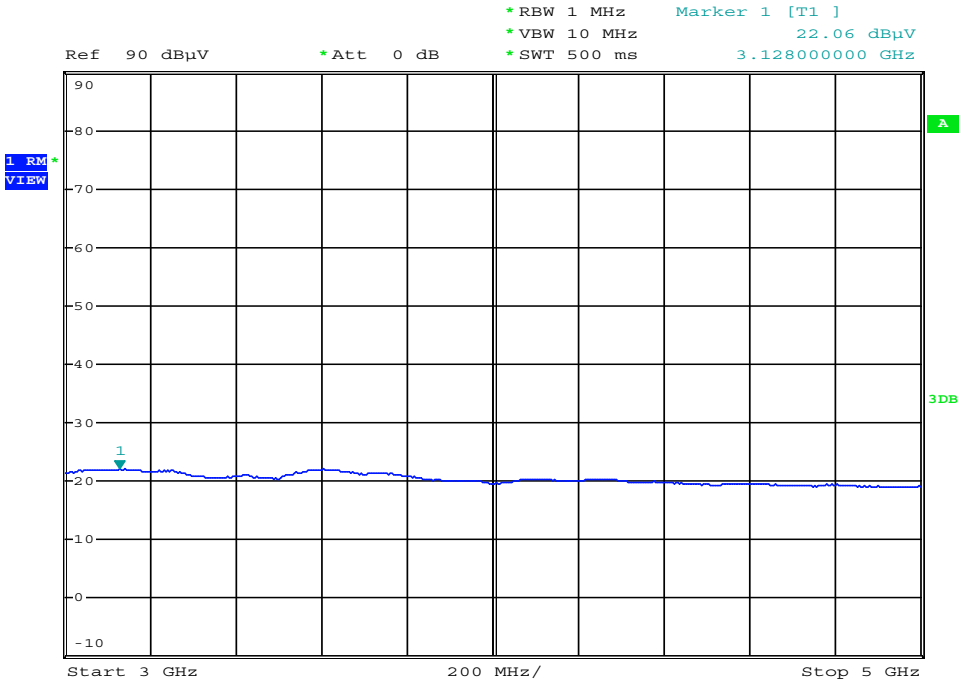


Date: 29.JAN.2021 17:13:13

Frequency Range:	Antenna Polarization:	Measured Emission:
1-3 GHz	**Vertical**	**14.59** dBuV/m
Trace 2: **Ambient** Trace 1: **DUT + Ambient**	Antenna: **B**	Emission Frequency **3.0** GHz

Plot 7.11 – Radiated Rx Emissions, 3 – 5GHz, Antenna B, Horizontal

Radiated Emissions

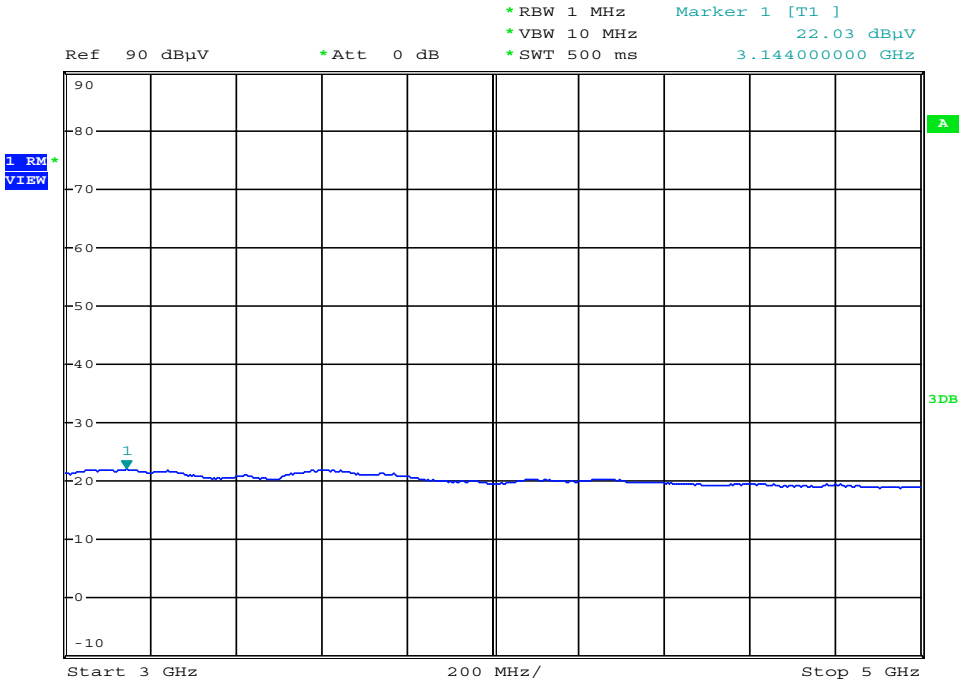


Date: 29.JAN.2021 15:16:05

Frequency Range:	Antenna Polarization:	Measured Emission:
3-5 GHz	**Horizontal**	**22.06** dBuV/m
Trace 2: **Ambient** Trace 1: **DUT + Ambient**	Antenna: **B**	Emission Frequency **3.13** GHz

Plot 7.12 – Radiated Rx Emissions, 3 – 5GHz, Antenna B, Vertical

Radiated Emissions



Date: 29.JAN.2021 15:15:20

Frequency Range:	Antenna Polarization:	Measured Emission:
3-5 GHz	**Vertical**	**22.03** dBuV/m
Trace 2: **Ambient** Trace 1: **DUT + Ambient**	Antenna: **B**	Emission Frequency **3.14** GHz

Table 7.1 – Summary of Radiated Rx Emissions Measurements (RMS)

§15.109, ICES-003 (6.2)									
	Emission Frequency (MHz)	DUT Antenna	Antenna Polarization	Measured Emission [E_{Meas}] (dBuV)	Cable Loss [L_C] (dB)	Antenna Correction [ACF] (dB)	Corrected Emission [E_{Corr}] (W)	Limit @3m [Limit] (dBuV/m)	Margin [Margin] (dB)
*	748.7 MHz	A	Horizontal	37.92			37.92	46.0	**8.1**
*	906.2 MHz		Vertical	40.21			40.21	46.0	**5.8**
**	3.0 GHz		Horizontal	14.65	1.00	30.16	45.81	54.0	**8.2**
**	3.0 GHz		Vertical	14.47	1.00	30.16	45.63	54.0	**8.4**
**	3.15 GHz		Horizontal	22.03	1.00	30.78	53.81	54.0	**0.2**
**	3.14 GHz		Vertical	22.06	1.00	30.78	53.84	54.0	**0.2**
*	745.2 MHz	B	Horizontal	40.08			40.08	46.0	**5.9**
*	745.2 MHz		Vertical	38.40			38.40	46.0	**7.6**
**	3.0 GHz		Horizontal	14.58	1.00	30.16	45.74	54.0	**8.3**
**	3.0 GHz		Vertical	14.59	1.00	30.16	45.75	54.0	**8.3**
**	3.13 GHz		Horizontal	22.06	1.00	30.78	53.84	54.0	**0.2**
**	3.14 GHz		Vertical	22.03	1.00	30.78	53.81	54.0	**0.2**
							Results:	**Complies**	

* Measurement Compensated for Cable Loss and Antenna Correction Factor
$E_{Corr} = E_{Meas} + L_C + AFC$
Margin = Limit - E_{Corr}

** Emissions Shown are Noise Floor

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 30 – 1000MHz

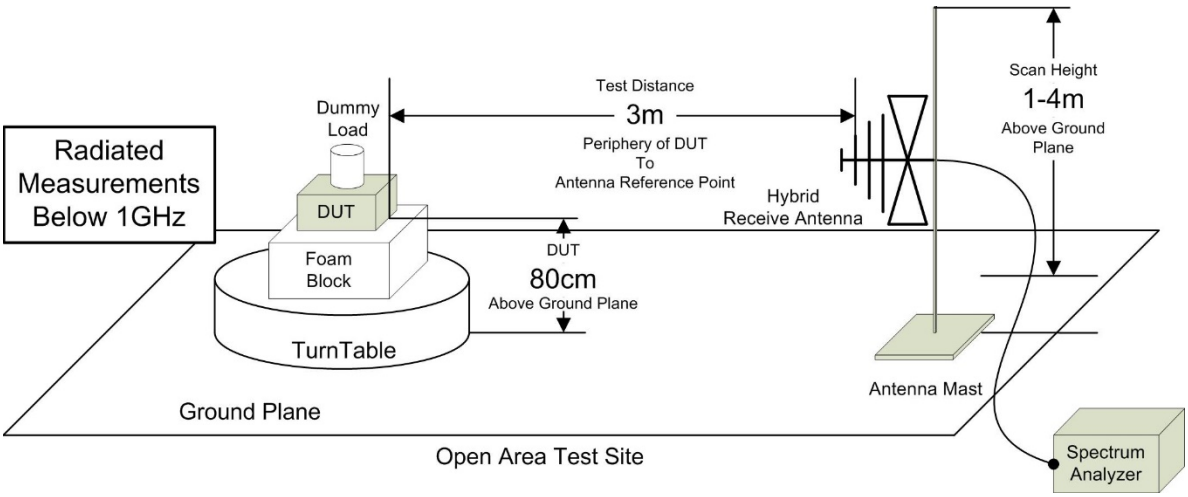


Figure A.2 – Test Setup Radiated Emissions Measurements 30 – 1000MHz w/ Signal Substitution

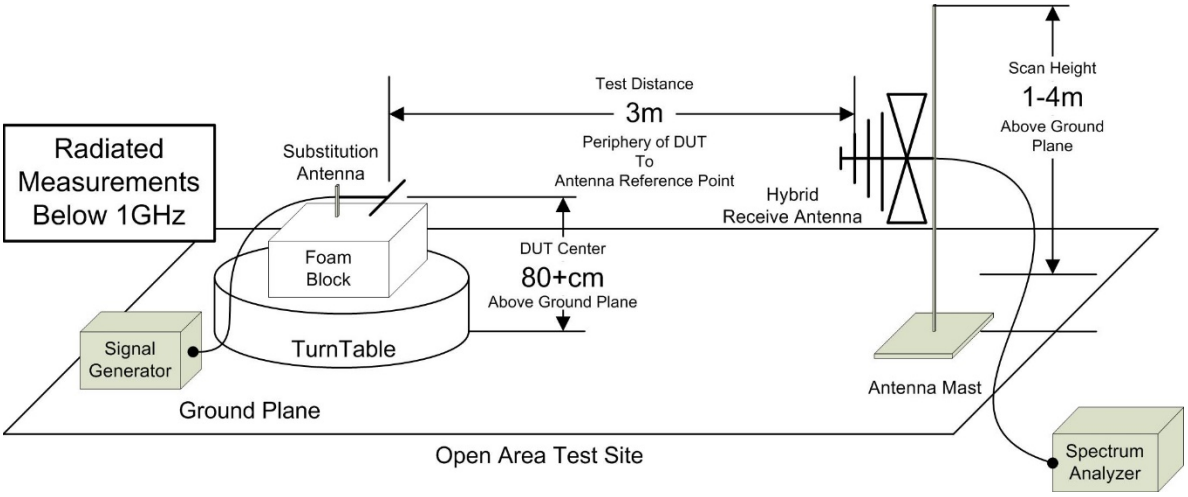
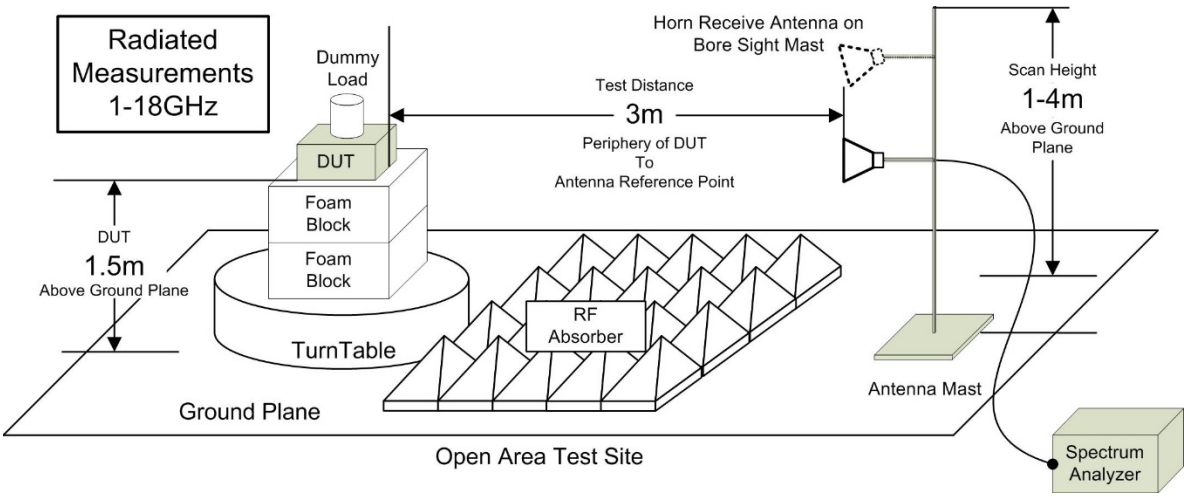


Figure A.3 – Test Setup Radiated Emissions Measurements 1 – 18GHz



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	3 Jan 2019	Triennial	3 Jan 2022
00034	ETS	3115	6267	Double Ridged Guide Horn	26 Nov 2018	Triennial	26 Nov 2021
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
00241	R&S	FSU40	100500	Spectrum Analyzer	15 May 2018	Triennial	15 May 2021
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
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} = 5.14dB 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

