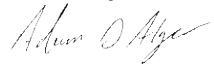


Test Report TR3747B

Equipment Under Test:	Trex Device Communicator
Requirement(s):	FCC: 15.247 ISED: RSS-247
Test Date(s):	11/6/2023-11/10/2023, 1/15/2024, 7/1/2025-7/3/2025, 7/22/2025
Prepared for:	R. Stahl HMI Systems Attn: Roman Cohnen Adolf-Grimme-Allee 8 Köln, Germany 50829

Report Issued by: Dylan Rosenfeldt, EMC Engineer	
Signature: 	Date: 7/31/2025
Report Reviewed by: Adam Alger, Sr. Manager, EMC Laboratory	
Signature: 	Date: 7/31/2025
Report Constructed by: Dylan Rosenfeldt, EMC Engineer	
Signature: 	Date: 7/31/2025

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Company: R. Stahl HMI Systems	Page 1 of 39	Name: Trex Device Communicator
Report: TR3747B		Model: TREX2-00NAW
Quote: NBO-04-2023-006145		Serial: EMC RF1, EMC RF2

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Ezurio Test Services in Review

The Ezurio laboratory located at W66 N220 Commerce Court Cedarburg, Wisconsin, 53012 USA is recognized through the following organizations:



A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025:2017 with Electrical (EMC) Scope

A2LA Certificate Number: 1255.01

Scope of accreditation includes all test methods listed herein unless otherwise noted



Federal Communications Commission (FCC) – USA

Accredited Test Firm Registration Number: 953492

Recognition of two 3 meter Semi-Anechoic Chambers



Innovation, Science and Economic Development Canada

Accredited U.S. Identification Number: US0218

Recognition of two 3 meter Semi-Anechoic Chambers

Company: R. Stahl HMI Systems	Page 3 of 39	Name: Trex Device Communicator
Report: TR3747B		Model: TREX2-00NAW
Quote: NBO-04-2023-006145		Serial: EMC RF1, EMC RF2

1 TEST REPORT SUMMARY

During **11/6/2023-11/10/2023, 1/15/2024, 7/1/2025-7/3/2025, 7/22/2025**, the Equipment Under Test (EUT), **Trex Device Communicator**, as provided by **R. Stahl HMI Systems**, was tested to the following requirements, for the purpose of a product filing:

FCC 15.247 / RSS-247

Requirements	Description	Method	Compliant
15.247(a)(2) RSS-247 Clause 5.2 (a)	6dB and 99% Occupied Bandwidth	ANSI C63.10 6.9.3, 11.8	Yes
15.247(b)(3) RSS-247 Clause 5.4 (d)	RF Output Power	ANSI C63.10 11.9	Yes
15.247(e) RSS-247 Clause 5.2 (b)	Power Spectral Density	ANSI C63.10 11.10	Yes
15.247(d) RSS-247 5.5	RF Spurious Emissions at the Transmitter Antenna Terminal	ANSI C63.10 11.11	Yes
FCC: 15.247 (d) ISED: RSS-GEN 8.10	Spurious Radiated Emissions in Restricted Bands	ANSI C63.10 11.12	Yes
2.1055(d) RSS-GEN 6.11	Frequency Stability	ANSI C63.10 6.8.2	Reported
FCC: 15.207 IC: RSS-GEN 8.8	AC Power Line Conducted Emissions	ANSI C63.10 6.2	Yes

Notice:

The results relate only to the item tested as configured and described in this report. Any additional configurations, modes of operation, or modifications made to the equipment under test after the specified test date(s) are at the decision of the client and may not apply to the data seen in this test report.

The decision rule for Pass / Fail assessment to the specification or standard listed in this test report has been agreed upon by the client and laboratory to be as follows:

Measurement Type	Rule
Emissions – Amplitude	0.5 dB below specified limit
Emissions – Frequency	1% less than the specification
Immunity	Tested at specified level

2 CLIENT INFORMATION

Company Name	R. Stahl HMI Systems
Contact Person	Roman Cohnen
Address	R. Stahl HMI Systems Adolf-Grimme-Allee 8 Köln, Germany 50829

2.1 Equipment Under Test (EUT) Information

The following information has been supplied by the client

Product Name	Trex Device Communicator
Model Number	TREX2-00NAW
Serial Number	EMC RF1, EMC RF2
Condition	Good
FCC ID	2AIM6-TREX2
IC ID	21553-TREX2

2.2 Product Description

Touchscreen tablet incorporating Bluetooth Classic, Bluetooth Low Energy, and 2.4GHz WLAN.

2.3 Modifications Incorporated for Compliance

None noted at time of test

2.4 Deviations and Exclusions from Test Specifications

None noted at time of test

2.5 Data rates and channels

Bluetooth LE (Low Energy) datarates: 1Mbps, 2Mbps. Channels tested: 0 (2402 MHz), 19 (2440 MHz), and 39 (2480 MHz).

2.6 Antenna Information

Manufacturer	Frequency Range (MHz)	Type	Peak Gain (dBi)
R.Stahl	2400-2483.5	PCB Dipole Antenna	4.03

3 REFERENCES

Publication	Edition	Date	AMD 1	AMD 2
FCC eCFR	-	2023	-	-
RSS-247	3	2023	-	-
RSS-GEN	5	2018	2019	2021
ANSI C63.10	-	2020	-	-

4 UNCERTAINTY SUMMARY

Using the guidance of the following publications the calculated measurement uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of $k = 2$.

References
CISPR 16-4-1
CISPR 16-4-2
CISPR 32
ANSI C63.23
A2LA P103
A2LA P103c
ETSI TR 100-028

Measurement Type	Configuration	Uncertainty $\pm$
Radiated Emissions	Biconical Antenna	5.0 dB
Radiated Emissions	Log Periodic Antenna	5.3 dB
Radiated Emissions	Horn Antenna	4.7 dB
AC Line Conducted Emissions	Artificial Mains Network	3.4 dB
Telecom Conducted Emissions	Asymmetric Artificial Network	4.9 dB
Disturbance Power Emissions	Absorbing Clamp	4.1 dB
Radiated Immunity	3 Volts/meter	2.2 dB
Conducted Immunity	CDN/EM/BCI	2.4/3.5/3.4 dB
EFT Burst/Surge	Peak pulse voltage	164 volts
ESD Immunity	15 kV level	1377 Volts

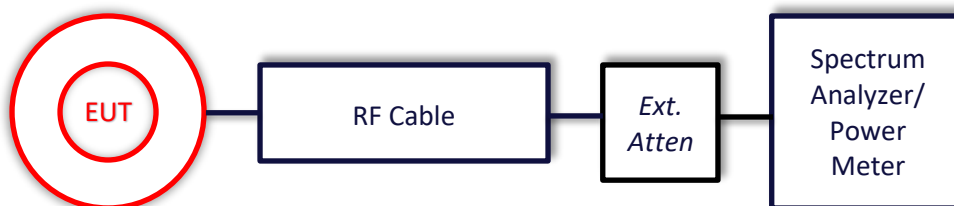
Parameter	ETSI U.C. $\pm$	U.C. $\pm$
Radio Frequency, from F0	1×10^{-7}	0.55×10^{-7}
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

5 TEST DATA

5.1 Antenna Port Conducted Emissions

Description of Measurement	The direct measurement of emissions at the antenna port of the EUT is achieved by use of a RF connection to a spectrum analyzer or power meter. The cable and attenuator factors are loaded into the analyzer or power meter allowing for direct measurement readings without the need for further corrections.
Example Calculations	Measurement (dBm) + Cable factor (dB) + External Attenuator (dB) = Corrected Reading (dBm) Margin (dB) = Limit (dBm) – Corrected Reading (dBm)

Block Diagram



5.1.1 Antenna Port Conducted Emissions – 99% and 6dB Bandwidth

Operator	Dylan Rosenfeldt	QA	Adam Hauke
Temperature	22.2°C	R.H. %	22.3%
Test Date	11/29/2023	Location	RF conducted Bench
Requirement	FCC: 15.247(a)(1) ICED: RSS-247 5.2	Method	ANSI C63.10 6.9.3, 11.8

Test Parameters

Frequency	2400 - 2483.5 MHz	Setup	Conducted RF
RBW	27 kHz, 56 kHz – 99% OBW 100kHz – DTS BW	VBW	270 kHz, 560 kHz – 99% OBW 1MHz – DTS BW
Detector(s)	Peak – Trace/Final	Settings	Trace Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/11/2023	4/11/2024	Active Calibration
EE 960197	Meter - Hygro- Thermometer	Control Company	90080-03	180045461	7/21/2023	7/21/2024	Active Calibration

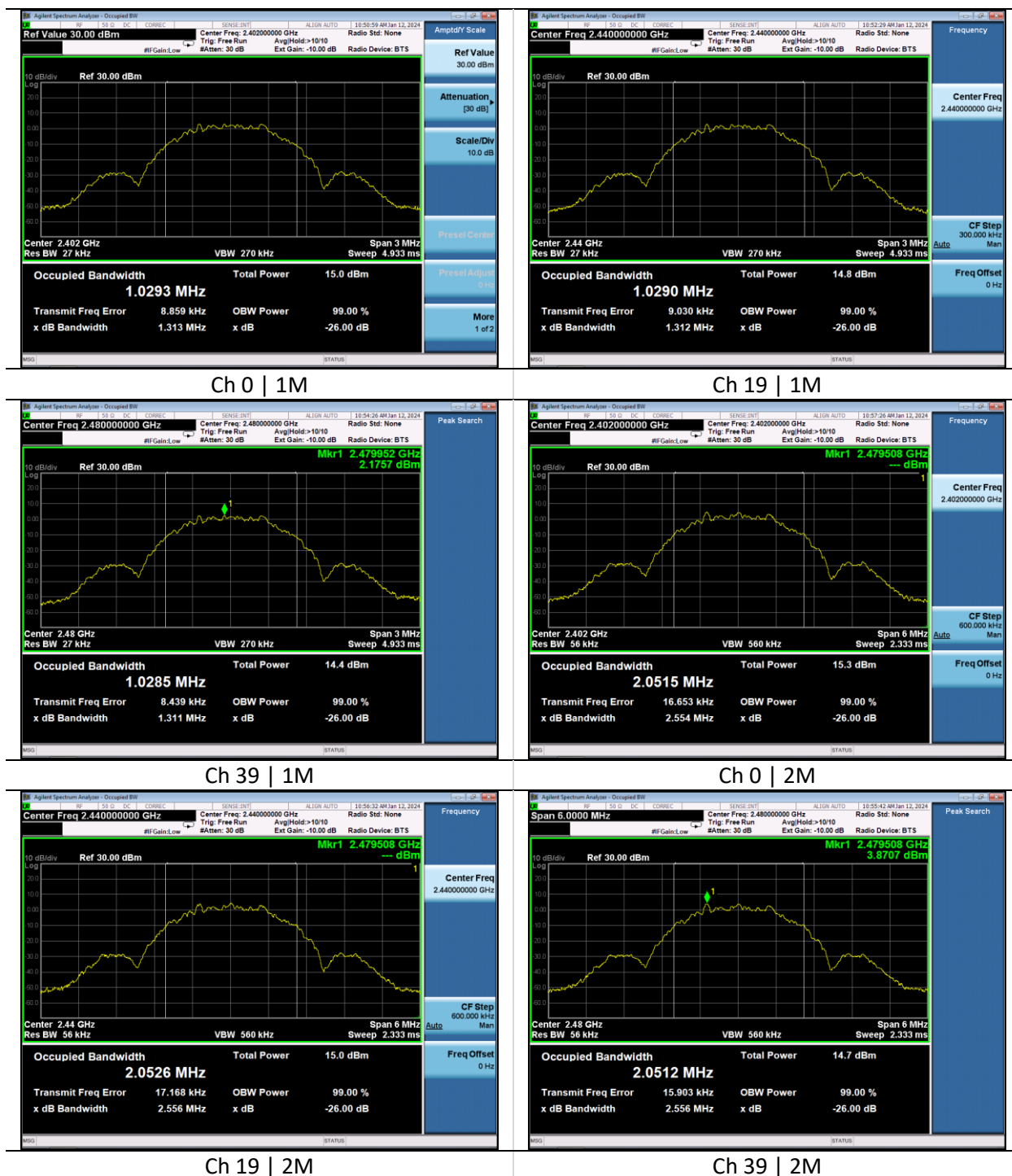
EUT Parameters

Input Power	15V Battery	Mode	BLE TX
Frequency	2402MHz, 2440MHz, 2480MHz	Channel	0 (2402MHz), 19 (2440MHz), 39 (2480MHz)
Data Rates	1M, 2M		

Table

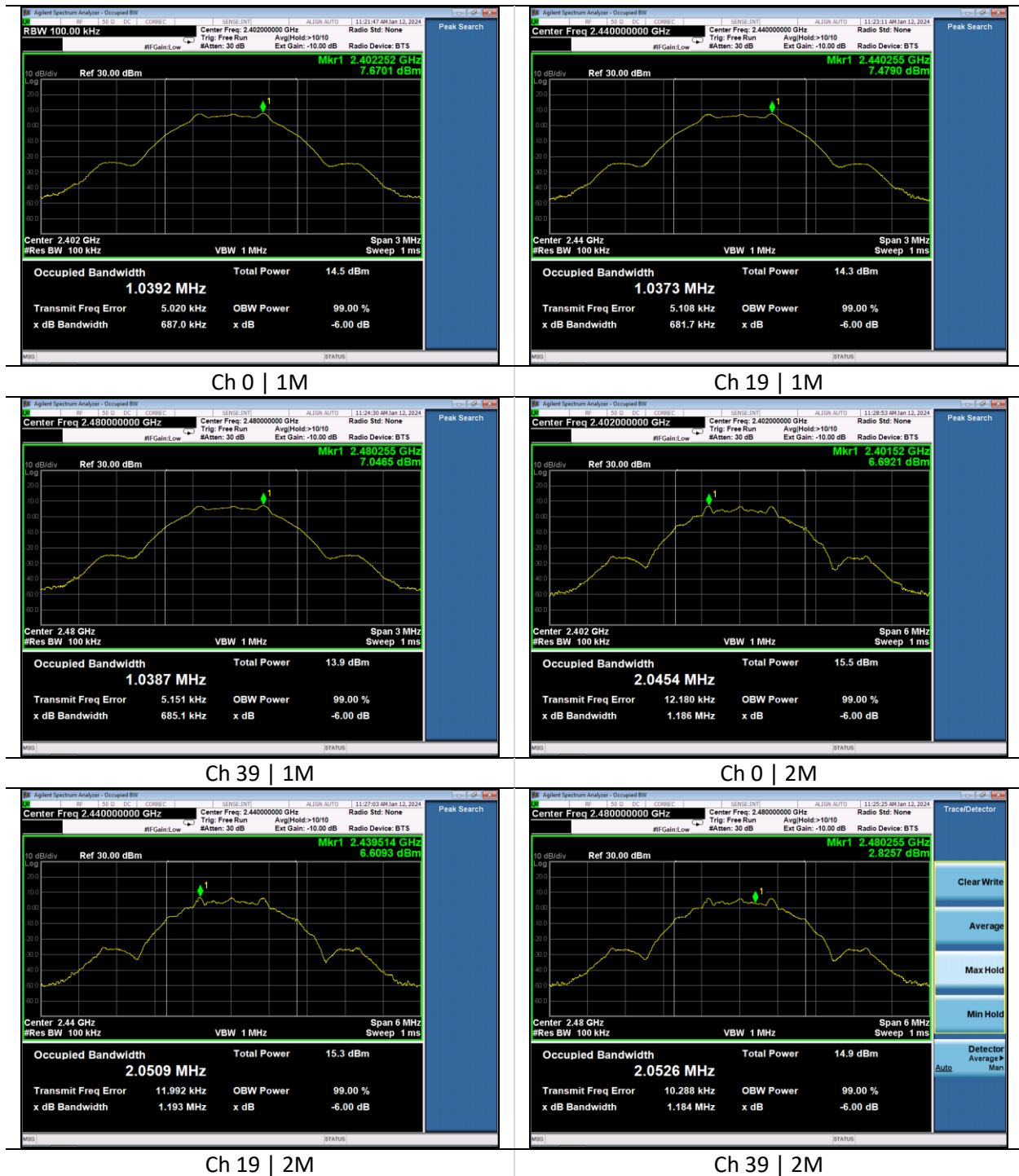
Frequency (MHz)	OBW (kHz)	DTS BW (kHz)	Limit (kHz)	Margin (kHz)	Data rate
2402	1029	687	500	187	1M
2440	1029	682	500	182	1M
2480	1029	685	500	185	1M
2402	2051	1186	500	686	2M
2440	2053	1193	500	693	2M
2480	2052	1184	500	684	2M

99% OBW Plots



Company: R. Stahl HMI Systems		Name: Trex Device Communicator
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Quote: NBO-04-2023-006145		Serial: EMC RF1, EMC RF2

6dB DTS BW Plots



5.1.2 Antenna Port Conducted Emissions – RF Output Power

Operator	Dylan Rosenfeldt	QA	Adam Hauke
Temperature	22.6°C, 19.5°C	R.H. %	48.9%, 22.0%
Test Date	11/6/2023, 1/15/2024	Location	RF conducted Bench
Requirement	FCC: 15.247(b)(3) ICED: RSS-247 5.4	Method	ANSI C63.10 11.9.1.1

Limits:

30dBm

Test Parameters

Frequency	2400 - 2483.5 MHz	Setup	Conducted RF
RBW	3 MHz	VBW	50 MHz
Detector(s)	Peak – Trace/Final	Settings	Trace Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/11/2023	4/11/2024	Active Calibration
EE 960197	Meter - Hygro- Thermometer	Control Company	90080-03	180045461	7/21/2023	7/21/2024	Active Calibration

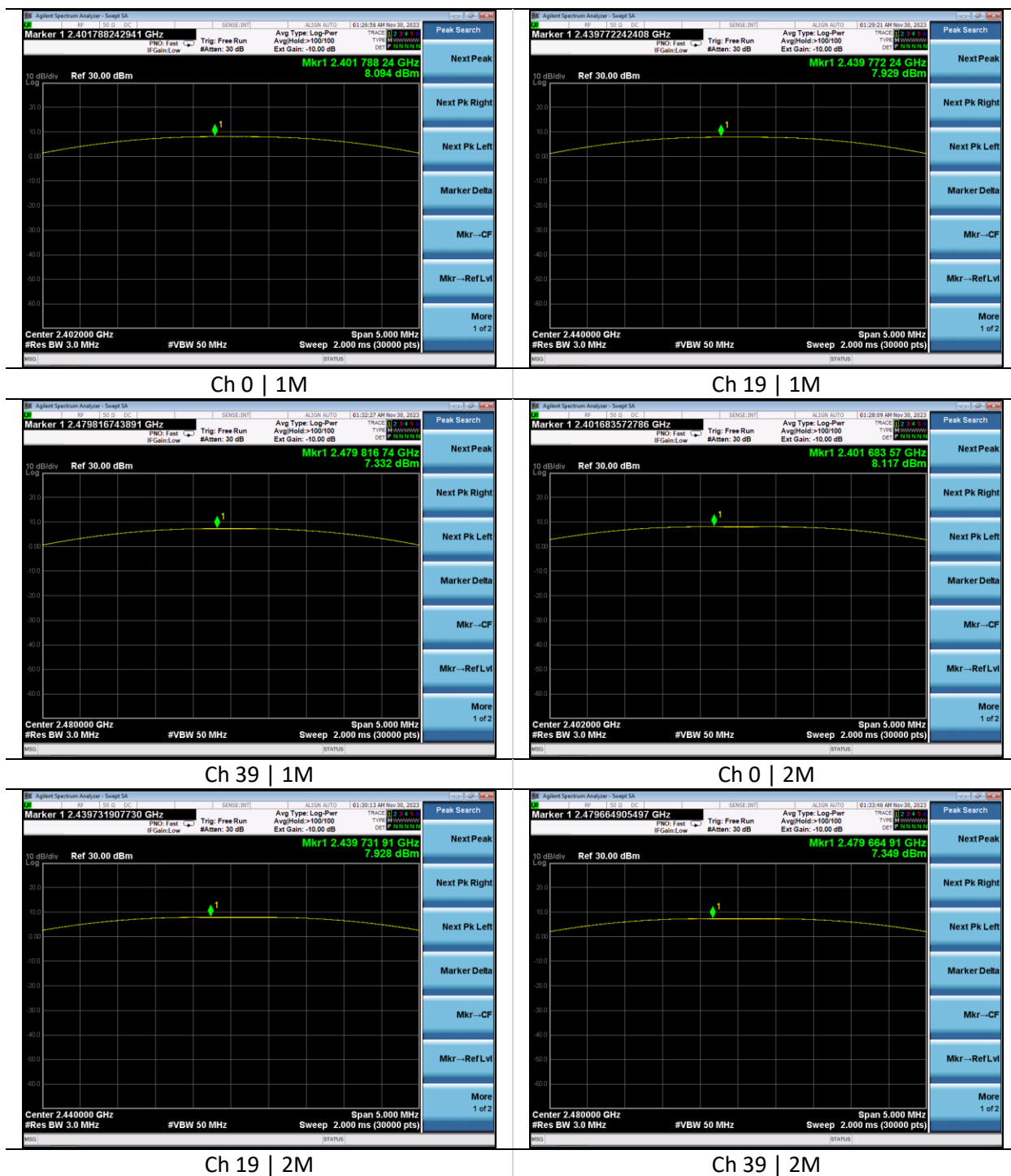
EUT Parameters

Input Power	15V Battery	Mode	BLE TX
Frequency	2402MHz, 2440MHz, 2480MHz	Channel	0 (2402MHz), 19 (2440MHz), 39 (2480MHz)
Data Rates	1M, 2M		

Table

Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)	Margin (dB)	Data rate
2402	8.1	30	21.9	1M
2440	7.9	30	22.1	1M
2480	7.3	30	22.7	1M
2402	8.1	30	21.9	2M
2440	7.9	30	22.1	2M
2480	7.3	30	22.7	2M

Plots



5.1.3 Antenna Port Conducted Emissions – Peak Power Spectral Density

Operator	Dylan Rosenfeldt	QA	Adam Hauke
Temperature	22.6°C, 19.5°C	R.H. %	48.9%, 22.0%
Test Date	11/6/2023, 1/15/2024	Location	RF conducted Bench
Requirement	FCC: 15.247(e) ICED: RSS-247 5.2	Method	ANSI C63.10 11.10.2

Limits:

30dBm

Test Parameters

Frequency	2400 - 2483.5 MHz	Setup	Conducted RF
RBW	100 kHz	VBW	300 kHz
Detector(s)	Peak – Trace/Final	Settings	Trace Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/11/2023	4/11/2024	Active Calibration
EE 960197	Meter - Hygro- Thermometer	Control Company	90080-03	180045461	7/21/2023	7/21/2024	Active Calibration

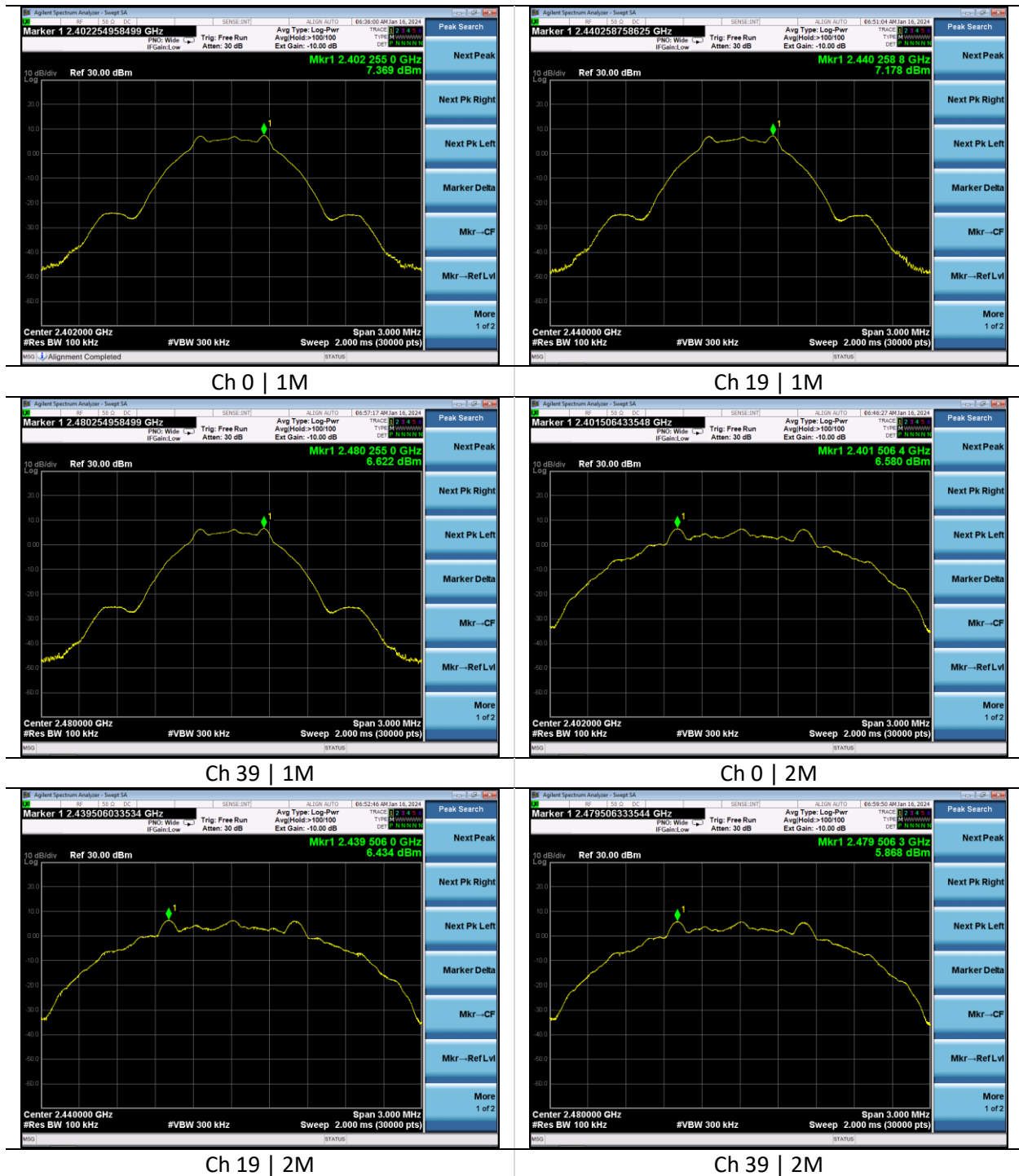
EUT Parameters

Input Power	15V Battery	Mode	BLE TX
Frequency	2402MHz, 2440MHz, 2480MHz	Channel	0 (2402MHz), 19 (2440MHz), 39 (2480MHz)
Data Rates	1M, 2M		

Table

Frequency (MHz)	Peak PSD (dBm/100kHz)	Limit (dBm/3kHz)	Margin (dB)	Data rate
2402	7.4	8	0.6	1M
2440	7.2	8	0.8	1M
2480	6.6	8	1.4	1M
2402	6.6	8	1.4	2M
2440	6.4	8	1.6	2M
2480	5.9	8	2.1	2M

Plots



5.1.4 Antenna Port Conducted Emissions – Spurious Emissions

Operator	Dylan Rosenfeldt	QA	Anthony Smith
Temperature	22.7°C	R.H. %	50.8%
Test Date	7/22/2025	Location	RF conducted Bench
Requirement	FCC: 15.247d ICED: RSS-247 5.5	Method	ANSI C63.10 11.11

Limits:

-20dBc

Test Parameters

Frequency	30-25000 MHz	Setup	Conducted RF
RBW	100 kHz	VBW	300 kHz
Detector(s)	Peak – Trace/Final	Settings	Trace Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	6/1/2025	6/1/2026	Active Calibration
EE 960197	Meter - Hygro- Thermometer	Control Company	90080-03	180045461	12/17/2024	12/17/2025	Active Calibration

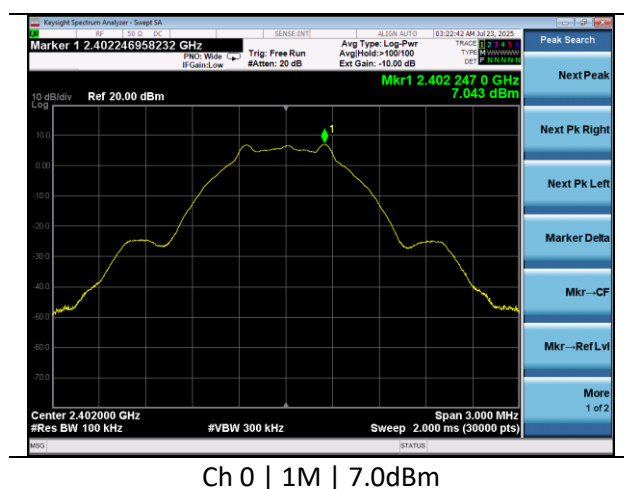
EUT Parameters

Input Power	15V Battery	Mode	BLE TX
Frequency	2402MHz, 2440MHz, 2480MHz	Channel	0 (2402MHz), 19 (2440MHz), 39 (2480MHz)
Data Rates	1M, 2M		

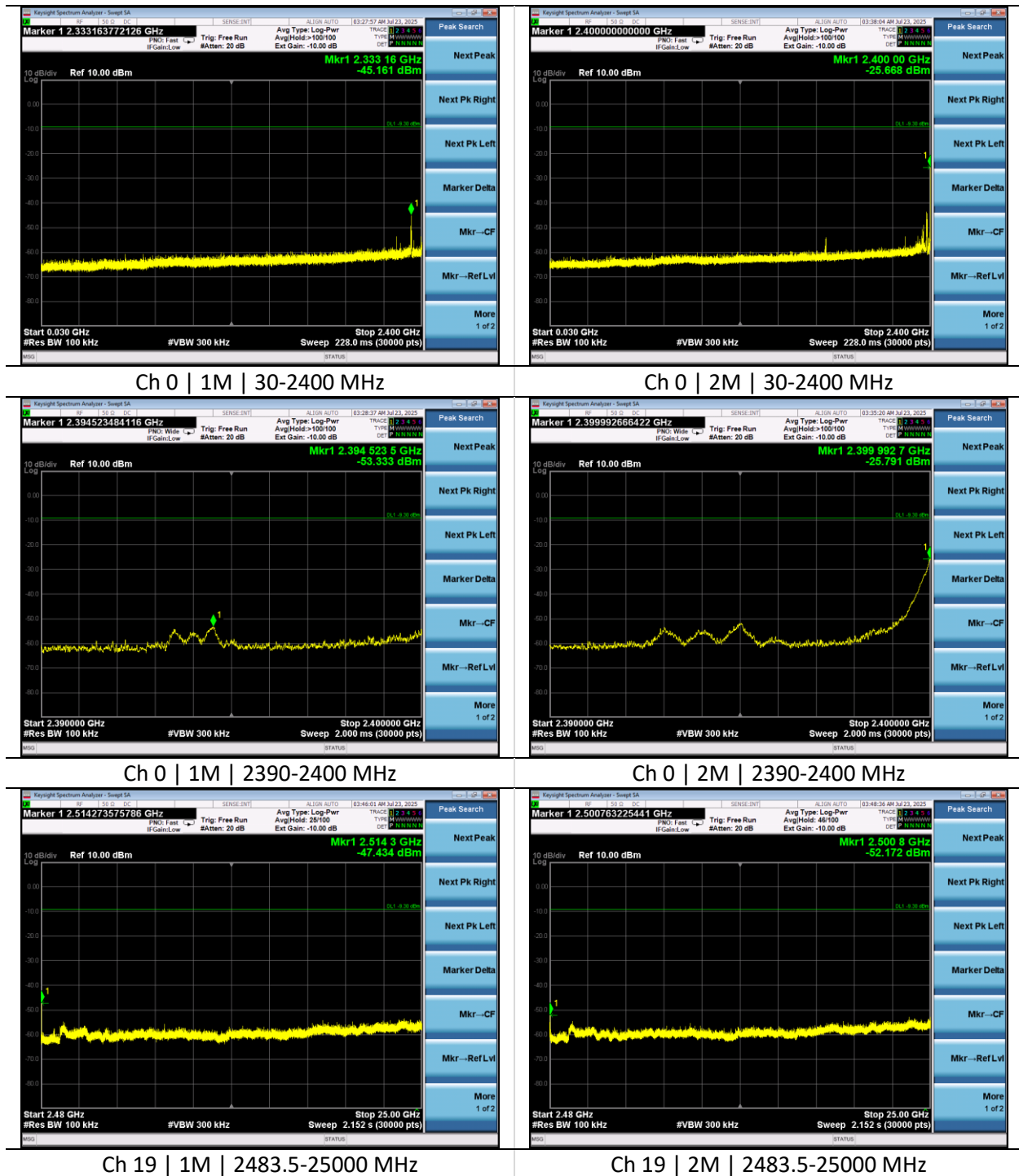
Table

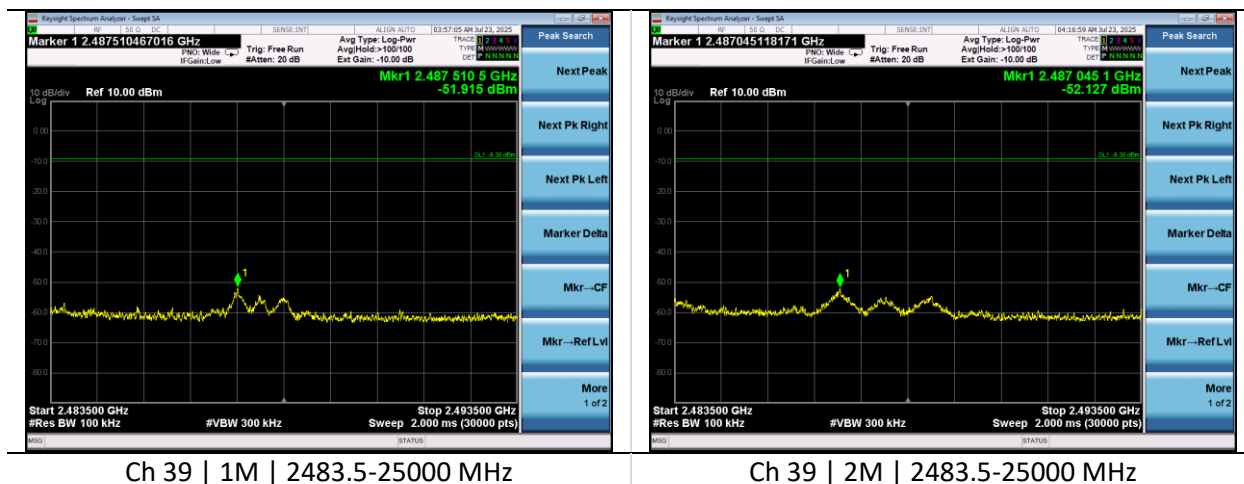
Channel	Mode	Frequency (MHz)	Measurement (dBm)	Limit (dBm)	Margin (dB)
0	1M	2333.2	-45.1	-13.0	32.1
0	2M	2400.0	-25.8	-13.0	12.8
19	1M	2367.4	-44.8	-13.0	31.8
39	1M	2556.0	-46.9	-13.0	33.9
39	2M	2487.0	-52.1	-13.0	39.1
0	1M	2333.2	-45.1	-13.0	32.1

Reference Level Plot



Worst Case Plots





5.1.5 Frequency Stability

Operator	Dylan Rosenfeldt	QA	Adam Hauke
Temperature	22.2°C	R.H. %	22.3%
Test Date	11/29/2023	Location	RF conducted Bench
Requirement	FCC: 2.1055(d) ISED: RSS-GEN 6.11	Method	ANSI C63.10 6.8.2

Test Parameters

Frequency	2402-2480 MHz	Voltage	102VAC, 120VAC, 138VAC 60Hz
Detector(s)	Peak	Settings	Max Hold
Notes	Tested on AC adapter		

Table

Channel	Voltage (V_{rms} 60Hz)	Center Frequency (Hz)
0	102	2402222520
	120	2402000458
	138	2401999402
19	102	2439999727
	120	2440000784
	138	2440000694
39	102	2480000226
	120	2479999929
	138	2479999840

5.2 Radiated Emissions

Description of Measurement	The frequency spectrum is investigated for intentional and / or unintentional signals emanating from the EUT by use of a standardized test site and measurement antenna. The antenna, cable, pre-amp, and other necessary measurement system correction factors are loaded onto the EMI receiver / spectrum analyzer when the measurements are performed allowing the data to be gathered and reported as corrected values. The maximum emissions from the EUT are determined by turn-table azimuth rotation (360°) and scanning of the measurement antenna. Maximized levels are noted at degree values of azimuth, measurement antenna height, and measurement antenna polarity.
Example Calculations	Measurement (dBμV) + Cable factor (dB) + Other (dB) + Antenna Factor (dB/m) = Corrected Reading (dBμV/m) Margin (dB) = Limit (dBμV/m) - Corrected Reading (dBμV/m) Example at 4000 MHz: Reading = 40 dBμV + 3.4 dB + 0.9 dB + 6.5 dB/m = 50.8 dBμV/m Average Limit = 20 log (500) = 54 dBμV/m Margin = 54 dBμV/m - 50.8 dBμV/m = 3.2 dB

Block Diagram



5.2.1 Radiated Emissions

Operator	Dylan Rosenfeldt	QA	Anthony Smith
Temperature	20-25°C	R.H. %	30-60%
Test Date	11/6/2023-11/17/2023, 6/30/2025	Location	Chamber 3
Requirement	FCC: 15.247(d) ISED: RSS-GEN 8.10	Method	ANSI C63.10 11.12

15.209 Limits:

Frequency (MHz)	Quasi-Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-25000	-	54.0	74.0

Test Parameters

Frequency	30-25000 MHz	Distance	3m
Detector(s)	Peak, Trace/Final Quasi-Peak, Final	Table height	80 cm (<1GHz) 150 cm (>1GHz)
RBW	120kHz (<1GHz) 1MHz (>1GHz)	VBW	1.2MHz (<1GHz) 3MHz (>1GHz) 470Hz (1M average VBW) 1kHz (2M average VBW)
Notes	Reduced VBW averaging used for average measurements Avg VBW = 1/on-time		
Example Calculations	1M Rate: Avg VBW = $1/(2.133\text{ms}) = 469\text{Hz}$ 2M Rate: Avg VBW = $1/(1.077\text{ms}) = 929\text{Hz}$		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960158	Antenna - Double Ridge Horn	ETS Lindgren	3117	109300	2/21/2025	2/21/2026	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	1/24/2025	1/24/2026	Active Verification
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/3/2025	4/3/2026	Active Calibration
AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	11/19/2024	11/19/2025	Active Calibration
AA 960220	Cable	A.H. Systems, Inc.	SAC-26G-6	552	1/28/2025	1/28/2026	Active Verification
AA 960209	Antenna - Low Noise Amplifier	Mini-Circuits	ZVA-213X-S+	037101808	11/19/2024	11/19/2025	Active Calibration
AA 960154	Filter - High Pass 2.4 GHz	KWM	HPF-L-14186	7272-02	4/3/2025	4/3/2026	Active Calibration
AA 960174	Antenna - Small Horn	ETS Lindgren	3116C-PA	00206880	12/2/2024	12/2/2025	Active Calibration
AA 960150	Antenna - Biconical	ETS Lindgren	3110B	0003-3346	12/9/2024	12/9/2025	Active Calibration
AA 960163	Antenna - Log Periodic	A.H. Systems, Inc.	SAS-512-2	500	12/11/2024	12/11/2025	Active Calibration

EUT Parameters

Input Power	15V Battery	Mode	BLE TX
Frequency	2402MHz, 2440MHz, 2480MHz	Channel	0 (2402MHz), 19 (2440MHz), 39 (2480MHz)
Data Rates	1M, 2M		

Band Edge Emissions Ch 0

Frequency (MHz)	EUT orientation	Polarity	Peak Reading (dBμV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Average Margin (dB)	Peak Margin (dB)	Mode
2487.9	Z	H	51.2	54.0	74.0	2.8	22.8	1M Ch 0
2333.6	Z	H	52.5	54.0	74.0	1.5	21.5	1M Ch 0
2490.2	Z	H	52.1	54.0	74.0	1.9	21.9	2M Ch 0
2378.9	Z	H	51.9	54.0	74.0	2.1	22.1	2M Ch 0

Note: Peak measurement complies with average limit

Band Edge Emissions Ch 39

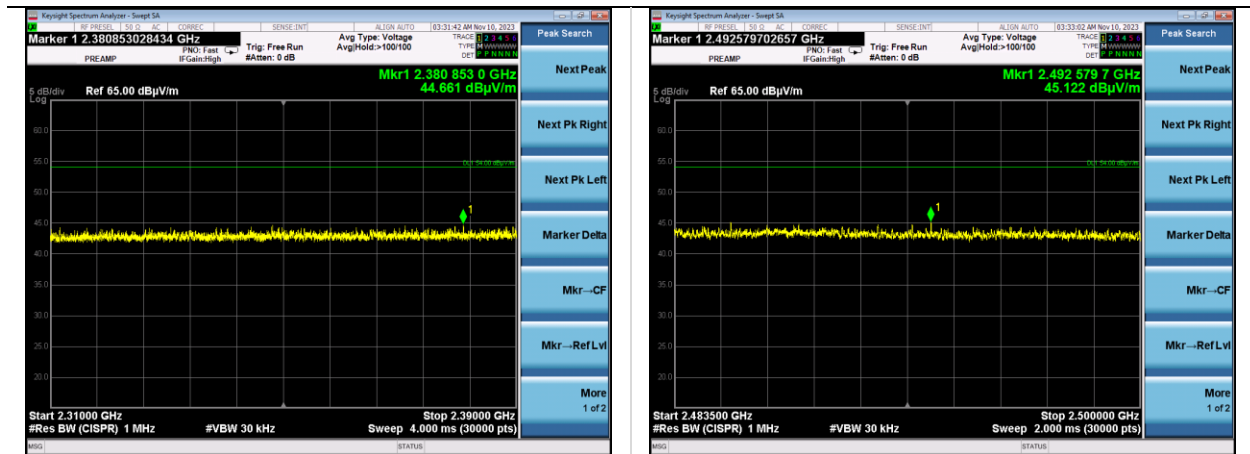
Frequency (MHz)	EUT orientation	Polarity	Peak Reading (dBμV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Average Margin (dB)	Peak Margin (dB)	Mode
2487.6	Y	H	52.0	54.0	74.0	2.0	22.0	1M Ch 39
2387.6	Y	H	52.1	54.0	74.0	1.9	21.9	1M Ch 39
2386.4	Y	H	51.0	54.0	74.0	3.0	23.0	2M Ch 39
2487.0	Y	H	51.7	54.0	74.0	2.3	22.3	2M Ch 39

Note: Peak measurement complies with average limit

Plots

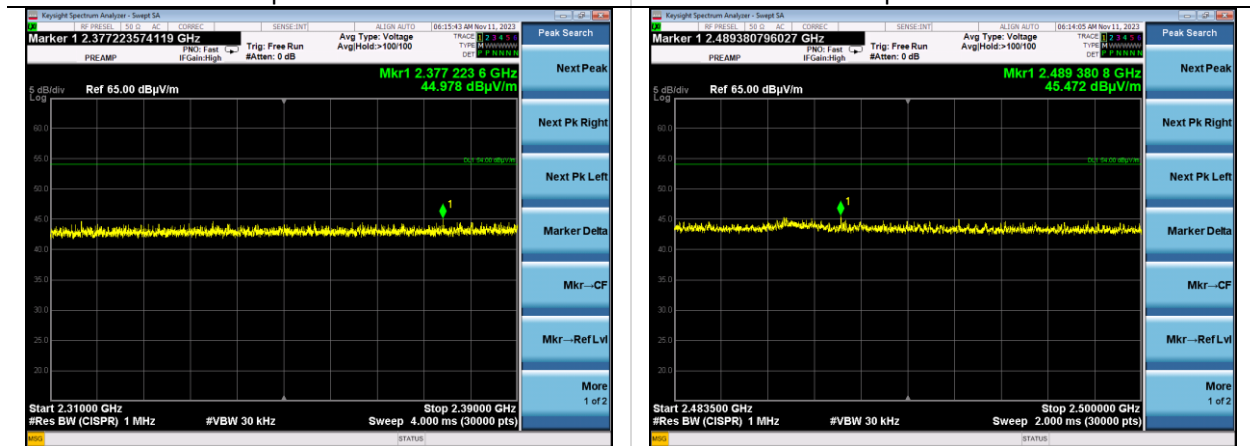


Plots



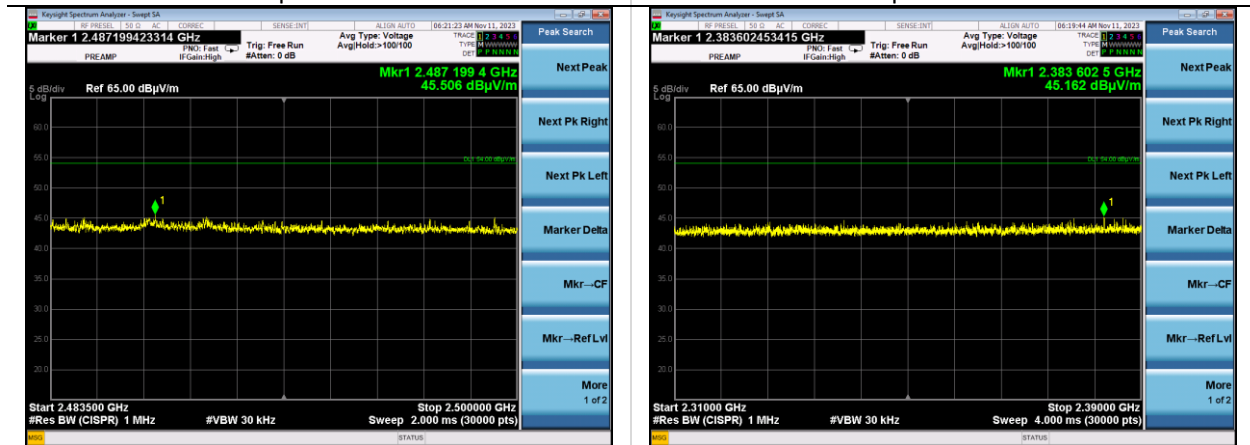
2M Ch 0 | 2310-2390 MHz

2M Ch 0 | 2483.5-2500 MHz



1M Ch 39 | 2310-2390 MHz

1M Ch 39 | 2483.5-2500 MHz



1DH5 Ch 0 | 2310-2390 MHz

1DH5 Ch 0 | 2483.5-2500 MHz

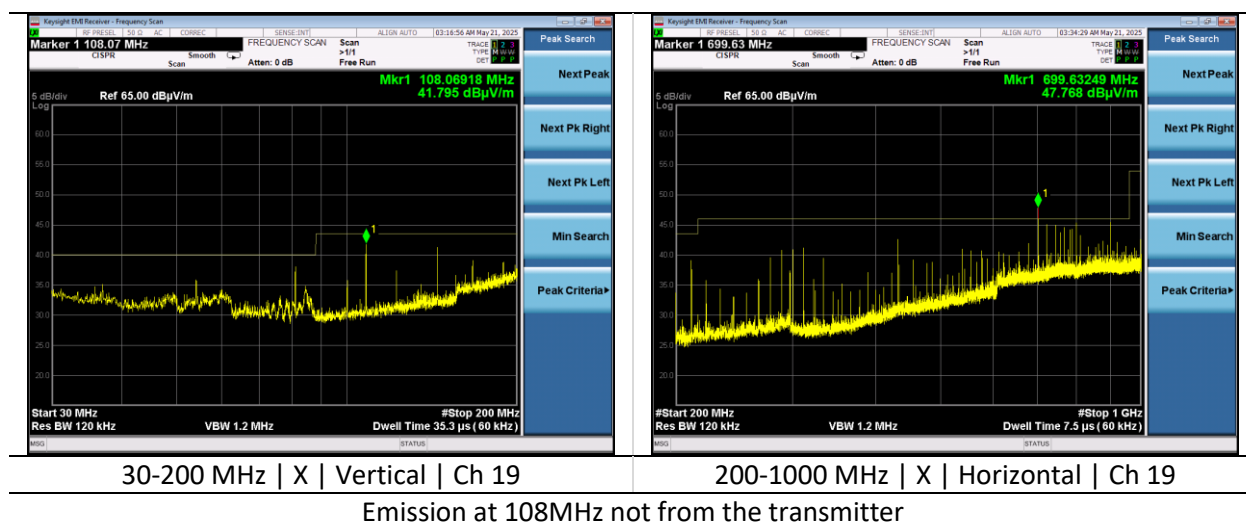
Screen captures at 30kHz VBW, Measurements taken with 3MHz VBW

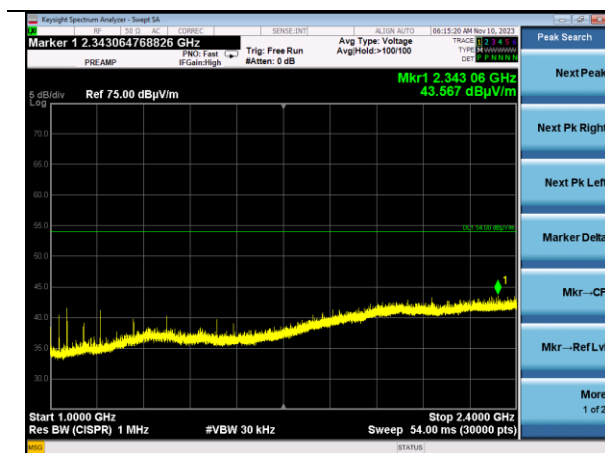
Spurious Emissions

Frequency (MHz)	EUT orientation	Antenna Polarity	Peak Reading (dBμV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Average Margin (dB)	Peak Margin (dB)	Channel
4880.1	Y	Vertical	47.9	54.0	74.0	6.1	26.1	19
4804.0	Y	Vertical	51.8	54.0	74.0	2.2	22.2	0
4959.9	Y	Vertical	45.0	54.0	74.0	9.0	29.0	39
4960.0	Y	Horizontal	45.3	54.0	74.0	8.7	28.7	39
4880.1	Y	Horizontal	45.3	54.0	74.0	8.7	28.7	19
4804.0	Y	Horizontal	49.5	54.0	74.0	4.5	24.5	0
4804.0	Z	Horizontal	53.0	54.0	74.0	1.0	21.0	0
4804.0	Z	Vertical	50.5	54.0	74.0	3.5	23.5	0
4880.0	Z	Horizontal	49.0	54.0	74.0	5.0	25.0	19
4880.0	X	Vertical	49.3	54.0	74.0	4.7	24.7	19
4804.0	X	Vertical	53.3	54.0	74.0	0.7	20.7	0
4804.1	X	Horizontal	50.3	54.0	74.0	3.7	23.7	0

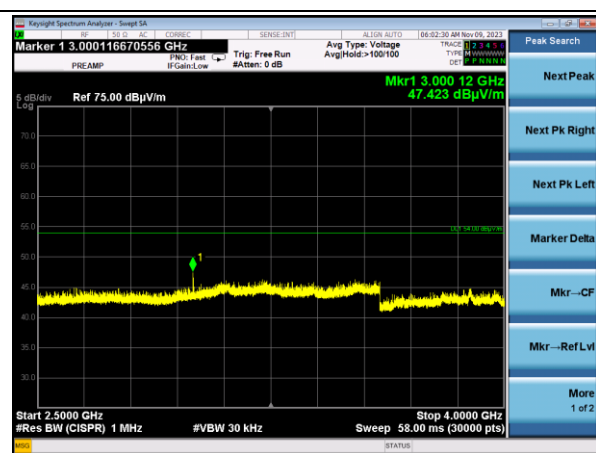
Note: Peak limit complies with average margin

Spurious Emissions Plots

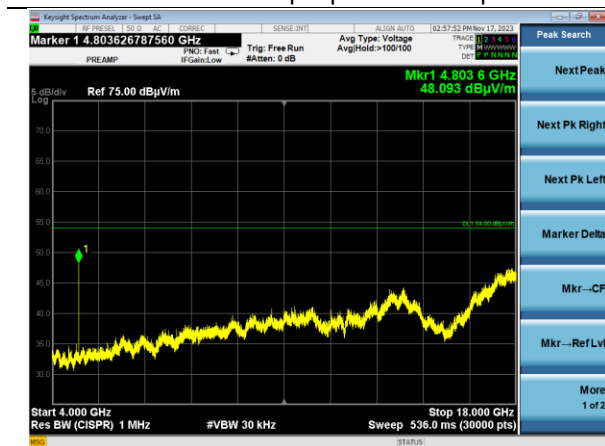




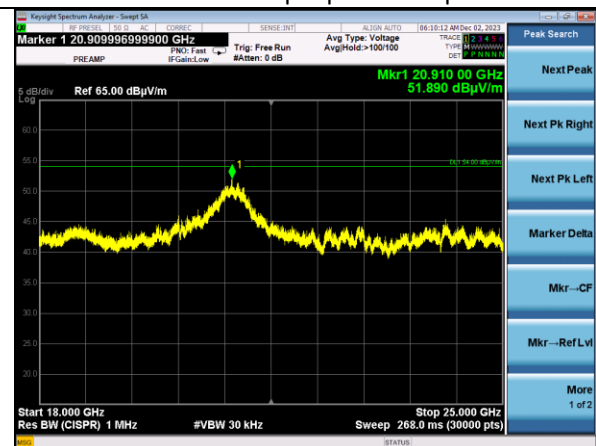
1000-2400 MHz | Z | Horizontal | Ch 0



2500-4000 MHz | X | Vertical | Ch 39



4-18 GHz | Z | Horizontal | Ch 0



18-25 GHz | all orientations and polarities |
~20cm from antenna

5.2.2 Spurious Radiated Emissions – Spot Checks

Operator	Dylan Rosenfeldt	QA	Anthony Smith
Temperature	19.7°C	R.H. %	70.1%
Test Date	7/3/2025	Location	Chamber 3
Requirement	FCC: 15.247(d) ISED: RSS-GEN 8.10	Method	ANSI C63.10 11.12

15.209 Limits:

Frequency (MHz)	Quasi-Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-25000	-	54.0	74.0

Test Parameters

Frequency	30-25000 MHz	Distance	3m
Detector(s)	Peak, Trace/Final Quasi-Peak, Final	Table height	80 cm (<1GHz) 150 cm (>1GHz)
RBW	120kHz (<1GHz) 1MHz (>1GHz)	VBW	1.2MHz (<1GHz) 3MHz (>1GHz) 470Hz (1M average VBW) 1kHz (2M average VBW)
Notes	Reduced VBW averaging used for average measurements Avg VBW = 1/on-time		
Example Calculations	1M Rate: Avg VBW = $1/(2.133\text{ms}) = 469\text{Hz}$ 2M Rate: Avg VBW = $1/(1.077\text{ms}) = 929\text{Hz}$		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960158	Antenna - Double Ridge Horn	ETS Lindgren	3117	109300	2/21/2025	2/21/2026	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	1/24/2025	1/24/2026	Active Verification
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/3/2025	4/3/2026	Active Calibration
AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	11/19/2024	11/19/2025	Active Calibration
AA 960220	Cable	A.H. Systems, Inc.	SAC-26G-6	552	1/28/2025	1/28/2026	Active Verification
AA 960209	Antenna - Low Noise Amplifier	Mini-Circuits	ZVA-213X-S+	037101808	11/19/2024	11/19/2025	Active Calibration
AA 960154	Filter - High Pass 2.4 GHz	KWM	HPF-L-14186	7272-02	4/3/2025	4/3/2026	Active Calibration
AA 960174	Antenna - Small Horn	ETS Lindgren	3116C-PA	00206880	12/2/2024	12/2/2025	Active Calibration
AA 960150	Antenna - Biconical	ETS Lindgren	3110B	0003-3346	12/9/2024	12/9/2025	Active Calibration
AA 960163	Antenna - Log Periodic	A.H. Systems, Inc.	SAS-512-2	500	12/11/2024	12/11/2025	Active Calibration

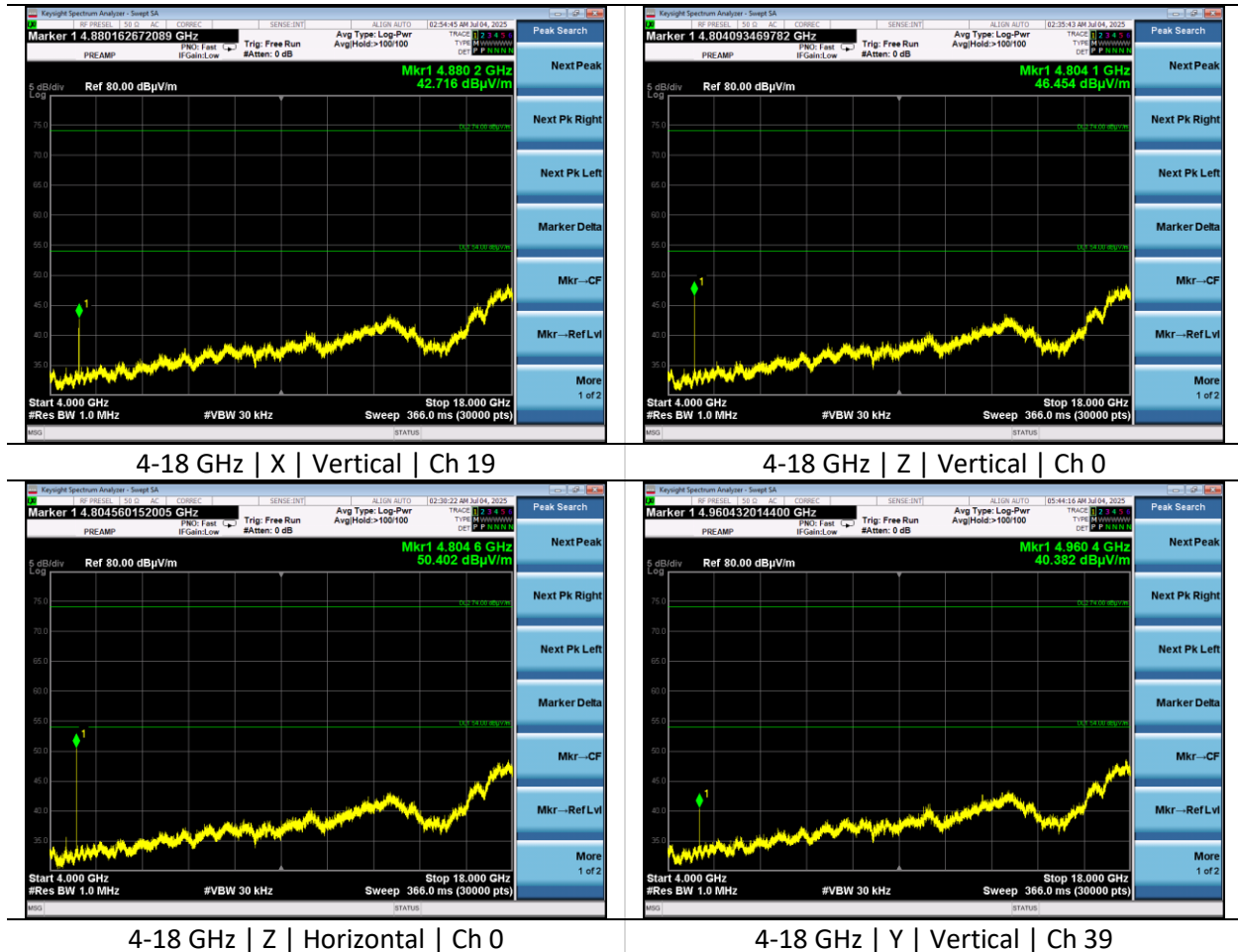
EUT Parameters

Input Power	15V Battery	Mode	BLE TX
Frequency	2402MHz, 2440MHz, 2480MHz	Channel	0 (2402MHz), 19 (2440MHz), 39 (2480MHz)
Data Rates	1M, 2M		

Spurious Emissions

Frequency (MHz)	EUT orientation	Antenna Polarity	Reading (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Measurement
4803.6	Z	H	52.7	74.0	21.3	pk
4804.0	Z	H	48.3	54.0	5.7	avg
4804.7	Y	V	53.5	74.0	20.5	pk
4804.0	Y	V	49.4	54.0	4.6	avg
4804.6	X	V	51.4	74.0	22.6	pk
4804.0	X	V	46.9	54.0	7.1	avg
4880.5	X	V	48.2	74.0	25.8	pk
4880.1	X	V	41.5	54.0	12.5	avg
4879.4	Z	H	49.7	74.0	24.3	pk
4880.1	Z	H	44.4	54.0	9.6	avg
4879.6	Y	V	50.1	74.0	23.9	pk
4880.1	Y	V	45.0	54.0	9.0	avg
4959.5	Y	V	47.0	74.0	27.0	pk
4960.1	Y	V	39.5	54.0	14.5	avg

Spurious Emissions Plots

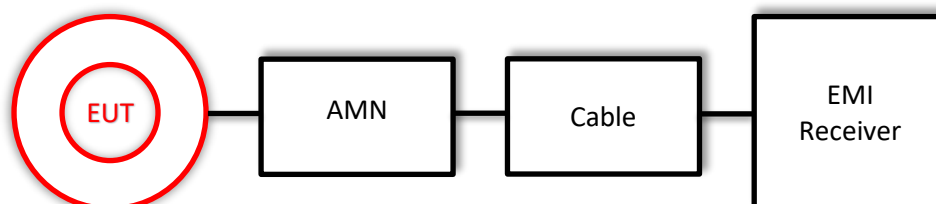


5.3 AC Mains Conducted Emissions

Description of Measurement	A line impedance stabilization network (LISN) or artificial mains network (AMN) allows the emissions of the power supply conductors to be measured while isolating the EUT from the supply mains. The AMN, cable, and other necessary measurement system correction factors are loaded onto the EMI receiver when the measurements are performed. The data is gathered and reported as the corrected values. Maximum emissions are determined with a peak max hold trace then measurements at a selection of the highest points are made with quasi-peak and average detectors. Results are recorded and compared to limit for each line. (e.g. line and neutral)
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Example Calculations	$\text{Measurement (dB}\mu\text{V)} + \text{Cable factor (dB)} + \text{Other (dB)} = \text{Corrected Reading (dB}\mu\text{V)}$
	$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V)} - \text{Corrected Reading (dB}\mu\text{V)}$

Block Diagram



5.3.1 AC Mains Conducted Emissions

Operator	Dylan Rosenfeldt	QA	Adam Alger
Temperature	22.1°C	R.H. %	27.6%
Test Date	12/14/2023	Location	AC Conducted Emissions Bench
Requirement	FCC: 15.207 ISED: RSS-GEN 8.8	Method	ANSI C63.10 6.2

15.209 Limits:

Frequency (MHz)	Quasi-Peak (dBμV)	Average (dBμV)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

*Decreases with the logarithm of the frequency

Test Parameters

Frequency	0.150-30 MHz	Distance	40cm from VCP >80cm from LISN
Detector(s)	Peak – Trace Quasi-Peak – Final Average – Final	Table height	80cm
RBW	9kHz	VBW	62kHz

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960088	Analyzer - EMI Receiver	Agilent	N9038A	MY51210138	12/10/2024	12/10/2025	Active Calibration
EE 960162	LISN	COM-POWER	LI-215A	191969	3/31/2025	3/31/2026	Active Calibration
EE 960197	Meter - Hygro-Thermometer	Control Company	90080-03	180045461	12/17/2024	12/17/2025	Active Calibration
LSC-211	Cable	Micro-Coax	UFB311A-0-1440-70U70U	64639 224071-002	1/29/2025	1/29/2026	Active Verification

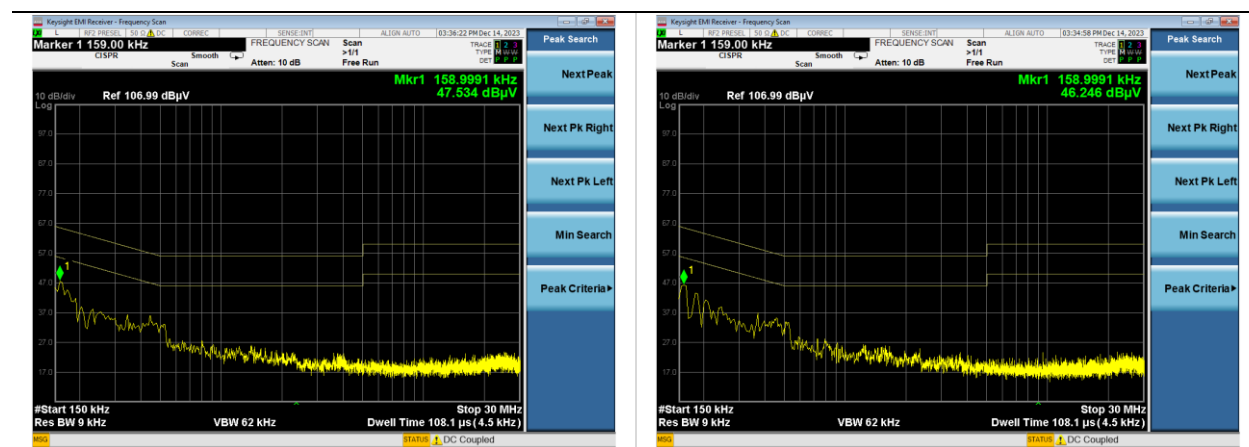
EUT Parameters

Input Power	15VDC battery charged on 120VAC adapter	Mode	BLE Transmitting
EUT	Plugged in, charging		

Table

Line	Frequency (MHz)	Peak Reading (dBμV)	Quasi-Peak Reading (dBμV)	Average Reading (dBμV)	Quasi-Peak Limit (dBμV)	Average Limit (dBμV)	Quasi-Peak Margin (dB)	Average Margin (dB)
1	0.150	52.6	47.9	32.8	66.0	56.0	18.1	23.2
1	0.487	36.6	33.8	28.6	56.2	46.2	22.4	17.6
1	1.234	27.4	22.1	14.8	56.0	46.0	33.9	31.2
2	0.150	55.0	48.5	34.6	66.0	56.0	17.5	21.4
2	0.483	37.3	34.0	28.1	56.3	46.3	22.3	18.2
2	1.212	26.3	22.4	15.3	56.0	46.0	33.6	30.7

Plots



L1 | 1M | Ch 19

L2 | 1M | Ch 19

Emissions do not change with channel

6 REVISION HISTORY

Version	Date	Notes	Person
0	7/30/2025	Initial Draft	Dylan Rosenfeldt
1	7/31/2025	Updated Draft	Dylan Rosenfeldt
2	7/31/2025	Final Draft	Dylan Rosenfeldt
3	8/5/2025	Updated Model Name	Dylan Rosenfeldt

END OF REPORT