

RF Test Report

Project Number: 5239587**Proposal:** SUW-202409007165**Report Number:** 5239587EMC02**Revision Level:** 1**Client:** Ergotron, Inc.**Equipment Under Test:** Encore 2.0 Medical Cart**Product Name:** Encore 2.0**Model Number:** ENC2**FCC ID:** 2AVU2-A0003419**IC:** 25915-A0003419**Applicable Standards:** FCC Part 15 Subpart C, § 15.247

RSS-247, Issue 3, August 2023

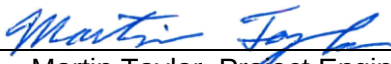
RSS-GEN, Issue 5, February 2021, Amendment 2

ANSI C63.10:2020

Report issued on: 18 March 2025**Report revised on:** 11 April 2025**Test Result:** Compliant

FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER: 3212.01

This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

Prepared by:
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1 Summary of Test Results

Test Description	Test Specification		Test Result
Bandwidth	15.247(a)(2)	RSS-247 S5.2 (a) RSS-GEN S6.7	Compliant
Output Power	15.247(b)(3)	RSS-247 S5.4 (d)	Compliant
Power Spectral Density	15.247(e)	RSS-247 S5.2 (b)	Compliant
Conducted Spurious Emissions / Band Edge	15.247(d)	RSS-247 S5.5	Compliant
Emissions in Restricted Frequency Bands	15.247(d) 15.205, 15.209	RSS-247 S5.5 RSS-GEN S8.9, S8.10	Compliant
Band Edge Emissions in Restricted Frequency Bands	15.205, 15.209	RSS-GEN S8.9, S8.10	Compliant
AC Powerline Conducted Emissions	15.207	RSS-GEN S8.8	Compliant
Antenna Requirement	15.203	RSS-GEN S6.8	Compliant ⁽¹⁾

(1) The device uses a RP SMA antenna connector which utilizes a non-standard RF connector that cannot be replaced by the end user.

1.1 Modifications Required for Compliance

None.

2 General Information

2.1 Client Information

Company Name: Ergotron Inc.
Address: 1181 Trapp Road
City, State, Zip, Country: Eagan MN 55121, USA

2.2 Test Laboratory

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA
Type of lab: Testing Laboratory
Certificate Number: 3212.01
FCC Designation Number: US1126
ISED CAB Identifier: US0186

2.3 General Information of EUT

Equipment Under Test: Medical Cart
Model Number: ENC2
Serial Number: EMC 3

Frequency Range: 2402 – 2480 MHz (BLE)
Antenna Gain: *RFA-25-C2M2-U-M70, Linear monopole, 2400-2500MHz, 2.0dBi
Max Output Power: BLE: -0.81dBm

Rated Voltage: 120Vac/60Hz
Test Voltage: 120Vac/60Hz

Sample Received Date: 16 January 2025
Dates of testing: 07 March 2025 to 10 March 2025

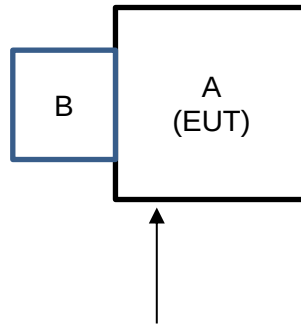
**Data was not measured by SGS laboratory and therefore SGS is not responsible for accuracy. Data obtained via customer, specification sheet, previous regulatory filing or other.*

2.4 Operating Modes and Conditions

The EUT was running test mode firmware which allowed the following:

- 1) selecting low, middle and high BLE channels;
- 2) selecting the modulation scheme as used in normal operation, but with high duty cycle;
- 3) selecting the data rate (1Mbps or 2Mbps);
- 4) setting the power level. [The power setting of 0dBm was used for all tests.]

2.5 EUT Connection Block Diagram



2.6 System Configurations

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Ergotron, Inc.	Medical Cart	ENC2	EMC 3
B	Ergotron, Inc	Rechargeable Battery	Mobius Battery	Multiple

2.7 Cable List

Cable reference	Port Name	Start	End	Cable Length (m)	Ferrite installed?	Shielded?
1	AC input	AC source	EUT	2.5	no	no

3 Bandwidth

3.1 Test Result

Test Description	Test Specification		Test Result
DTS Bandwidth (6dB)	15.247(a)(2)	RSS-247 S5.2 (a)	Compliant
Occupied Bandwidth (99%)	2.1049	RSS-GEN S6.7	Reported

3.2 Test Methods

The DTS 6dB bandwidth measurements were performed using the procedure from ANSI C63.10 clause 11.8.1, and the 99% occupied bandwidth measurements were performed using the procedure from ANSI C63.10 clause 6.9.3. These procedures are referenced in KDB 558074 D01 15.247 Meas Guidance v05r02.

Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

3.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.2 °C

Relative Humidity: 34.1 %

Atmospheric Pressure: 98.36 kPa

3.4 Test Equipment

Test End Date: 10-Mar-2025

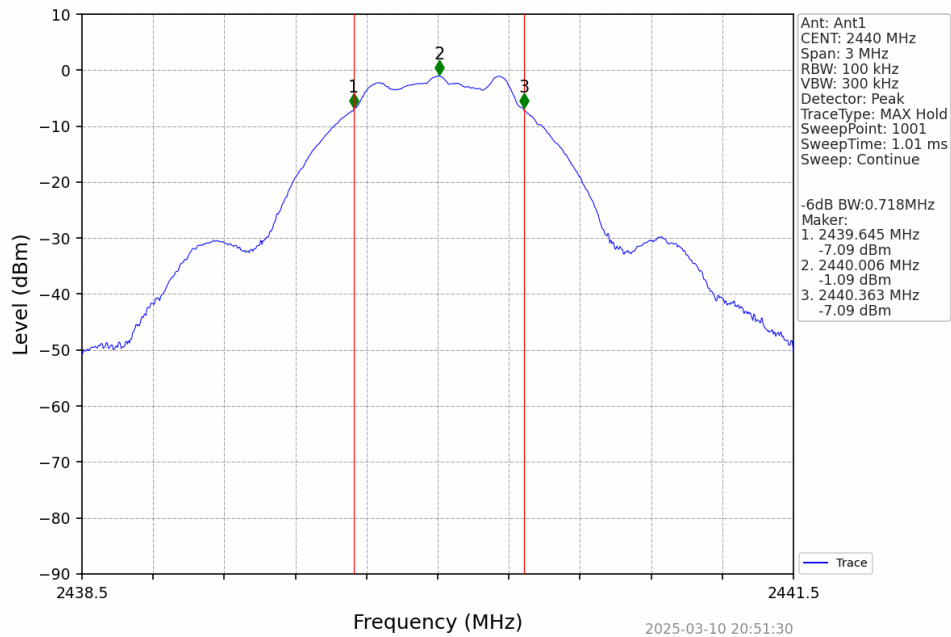
Tester: SGM

Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	TELEDYNE STORM MICROWAVE	084-0505-059	20109	20-Mar-2024	20-Mar-2025
TSTPASS SWITCHBOX	TSTPASS	SB2	23009	8-Apr-2024	8-Apr-2025
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ (Rental Unit)	103349	20-Aug-24	20-Aug-25

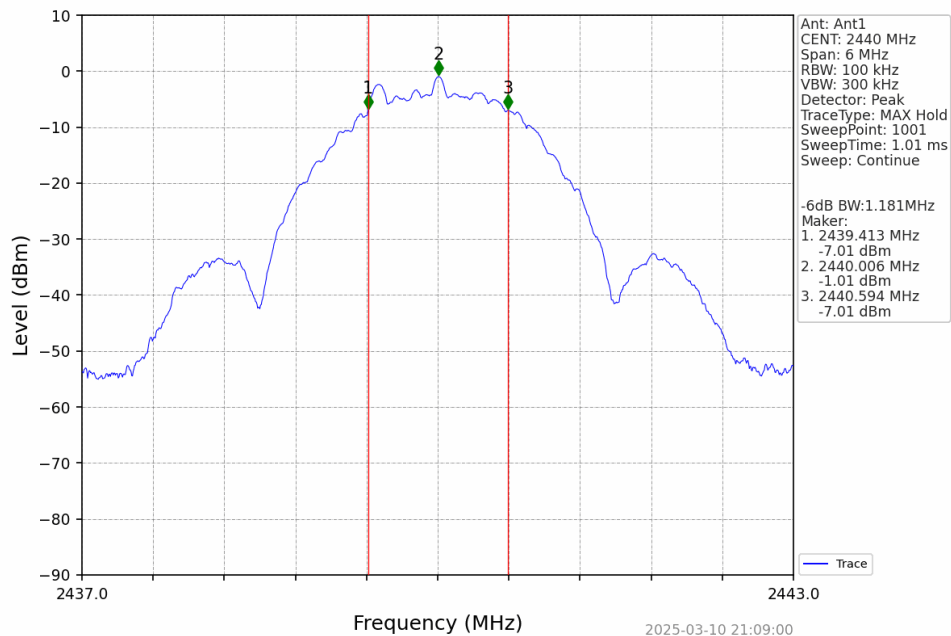
3.5 Test Data – DTS Bandwidth (6dB)

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.711	>=0.5	Pass
		2440	1	0.718	>=0.5	Pass
		2480	1	0.718	>=0.5	Pass
2M	SISO	2402	1	1.192	>=0.5	Pass
		2440	1	1.181	>=0.5	Pass
		2480	1	1.149	>=0.5	Pass

1M_MCH_2440MHz_Ant1_NTNV



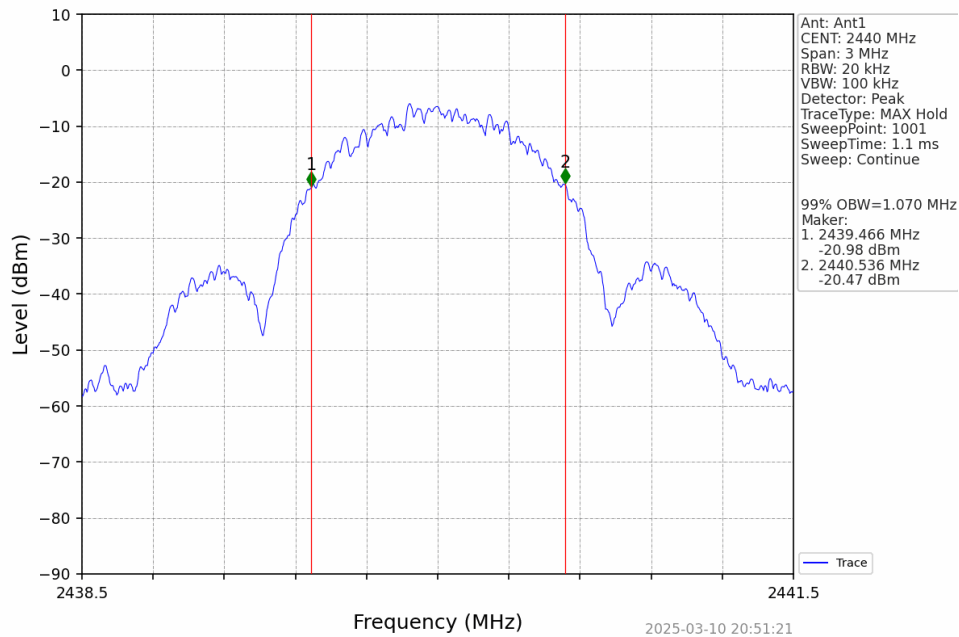
2M_MCH_2440MHz_Ant1_NTNV



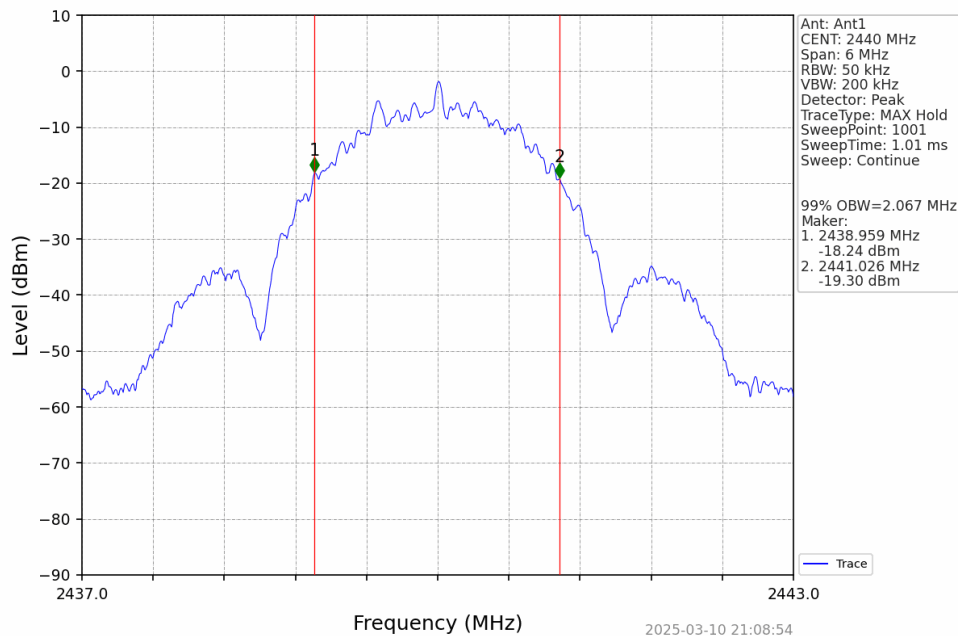
3.6 Test Data – 99% Occupied Bandwidth

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	1.059	/	Pass
		2440	1	1.070	/	Pass
		2480	1	1.067	/	Pass
2M	SISO	2402	1	2.044	/	Pass
		2440	1	2.067	/	Pass
		2480	1	2.087	/	Pass

1M_MCH_2440MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



4 Output Power

4.1 Test Result

Test Description	Test Specification		Test Result
Fundamental Emission Output Power	15.247(b)(3)	RSS-247 S5.4 (d)	Compliant

4.2 Test Method

Fundamental maximum peak conducted output power measurements were performed using the method described in ANSI C63.10:2013 clause 11.9.1.1. This procedure is referenced in KDB 558074 D01 15.247 Meas Guidance v05r02.

Limit

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. For using antennas with greater than 6dBi of gain, the limit is reduced in dB by the amount the gain exceeds 6dBi (e.g. for a 7.4dBi antenna, the limit is reduced from 30dBm to 28.6dBm). Also, the e.i.r.p. shall not exceed 4 Watts (36 dBm) based on RSS-247 S5.4 (d).

4.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.2 °C

Relative Humidity: 34.1 %

Atmospheric Pressure: 98.36 kPa

4.4 Test Equipment

Test End Date: 10-Mar-2025

Tester: SGM

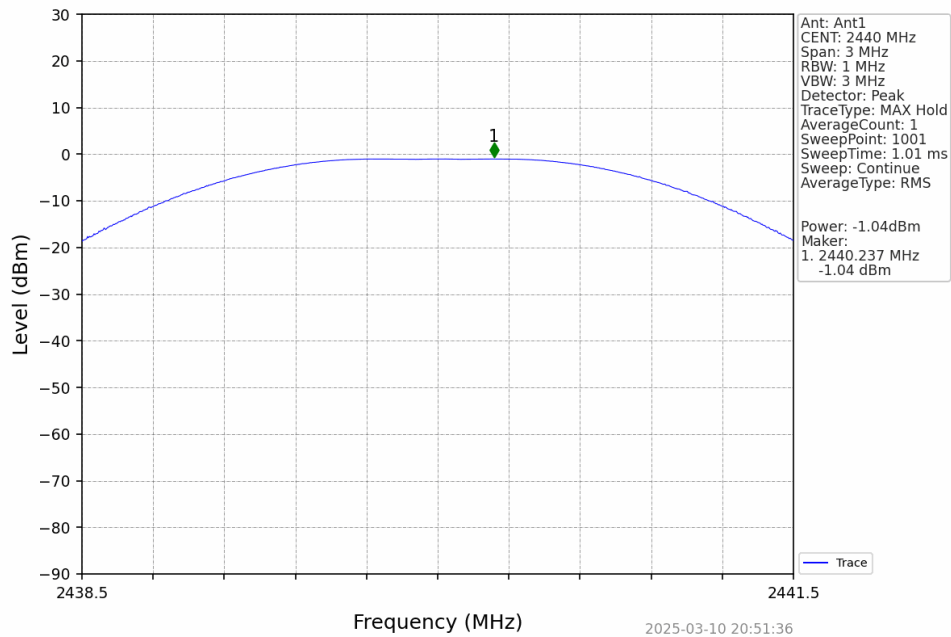
Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	TELEDYNE STORM MICROWAVE	084-0505-059	20109	20-Mar-2024	20-Mar-2025
TSTPASS SWITCHBOX	TSTPASS	SB2	23009	8-Apr-2024	8-Apr-2025
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ (Rental Unit)	103349	20-Aug-24	20-Aug-25

4.5 Test Data

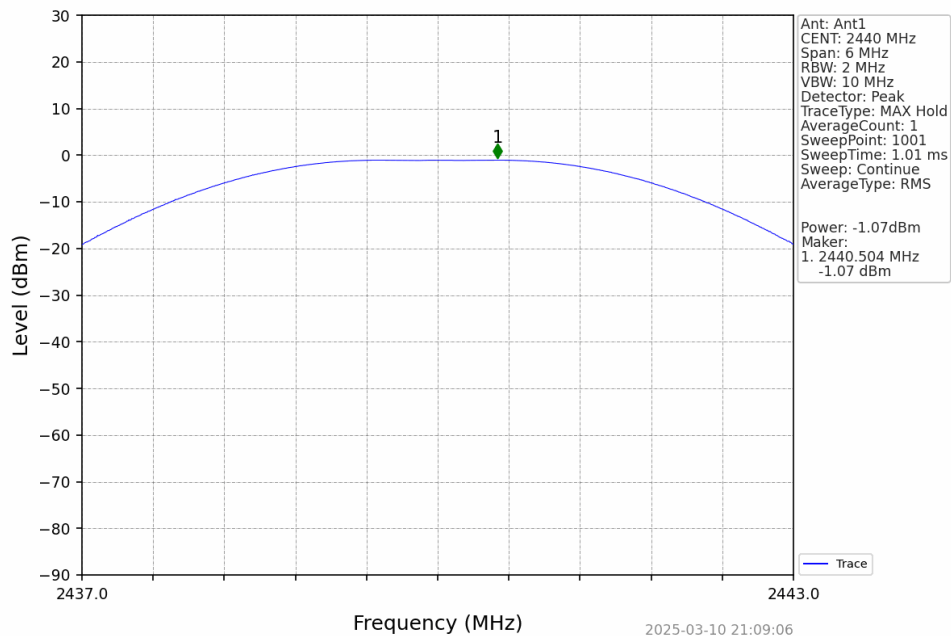
Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	-1.68	<=30	Pass
		2440	-1.04	<=30	Pass
		2480	-0.82	<=30	Pass
2M	SISO	2402	-1.69	<=30	Pass
		2440	-1.07	<=30	Pass
		2480	-0.81	<=30	Pass

Note1: Antenna Gain: Ant1: 2.00dBi;

1M_MCH_2440MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



5 Power Spectral Density

5.1 Test Result

Test Description	Test Specification		Test Result
Power Spectral Density	15.247(e)	RSS-247 S5.2 (b)	Compliant

5.2 Test Method

Peak power spectral density measurements were performed using the procedures from ANSI C63.10: 2013 clause 11.10.2. These procedures are referenced in KDB 558074 D01 15.247 Meas Guidance v05r02.

Limit

The maximum limit is 8 dBm / 3 kHz.

5.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.2 °C

Relative Humidity: 34.1 %

Atmospheric Pressure: 98.36 kPa

5.4 Test Equipment

Test End Date: 10-Mar-2025

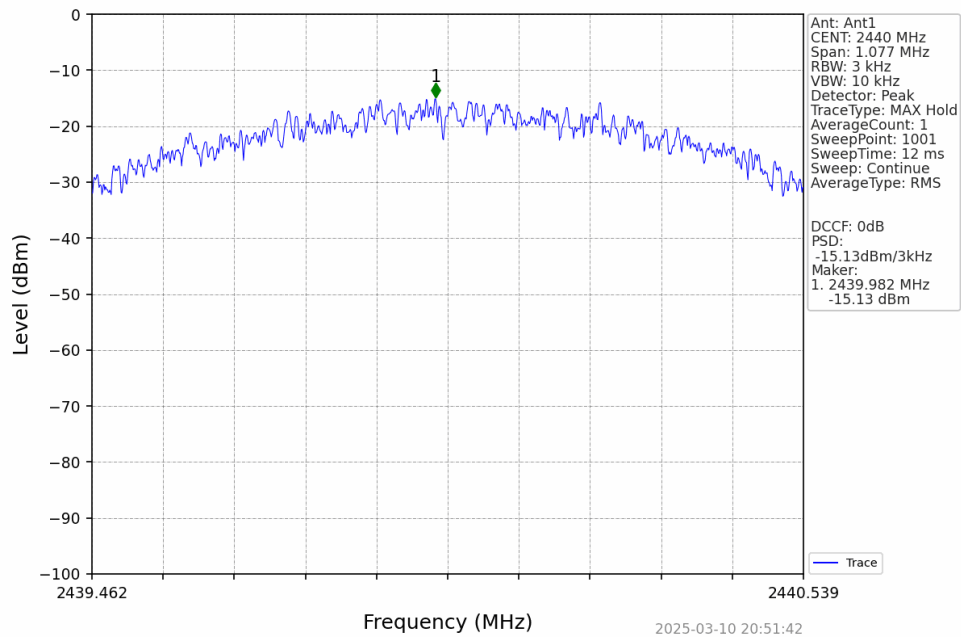
Tester: SGM

Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	TELEDYNE STORM MICROWAVE	084-0505-059	20109	20-Mar-2024	20-Mar-2025
TSTPASS SWITCHBOX	TSTPASS	SB2	23009	8-Apr-2024	8-Apr-2025
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ (Rental Unit)	103349	20-Aug-24	20-Aug-25

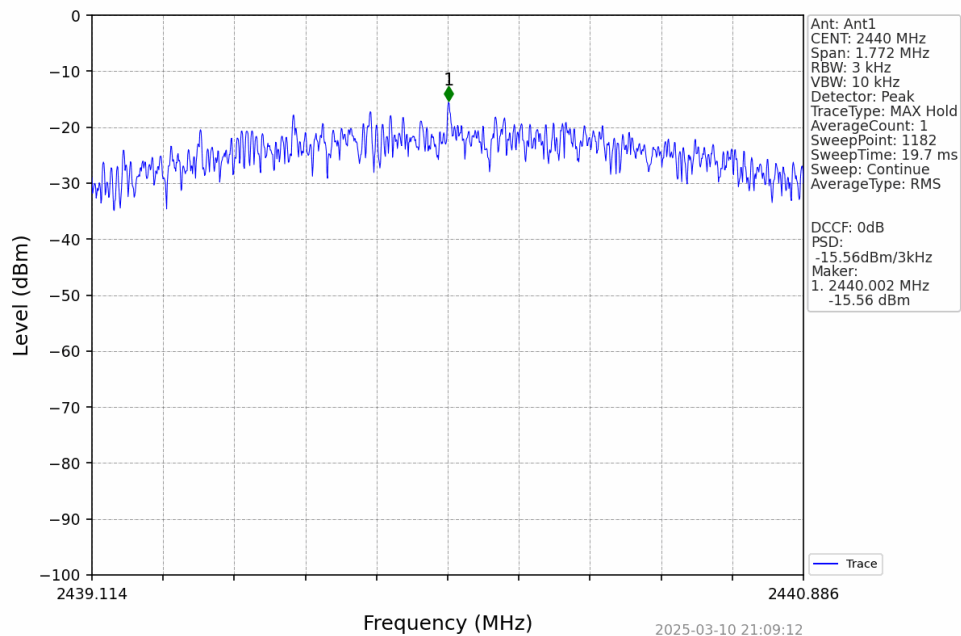
5.5 Test Data

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
1M	SISO	2402	-15.37	<=8	Pass
		2440	-15.13	<=8	Pass
		2480	-13.51	<=8	Pass
2M	SISO	2402	-16.84	<=8	Pass
		2440	-15.56	<=8	Pass
		2480	-16.95	<=8	Pass
Note1: Antenna Gain: Ant1: 2.00dBi:					

1M_MCH_2440MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



6 Conducted Spurious Emissions / Band Edge

6.1 Test Result

Test Description	Test Specification		Test Result
Conducted Spurious and Band Edge Emissions	15.247(d)	RSS-247 S5.5	Compliant

6.2 Test Method

Conducted band edge and spurious band emissions in non-restricted frequency bands were measured using the method defined in ANSI C63.10 clause 11.11. This procedure is referenced in KDB 558074 D01 15.247 Meas Guidance v05r02.

Limit

Because the maximum peak conducted output power was used to determine compliance with the output power limits, the limit in any 100 kHz band outside of the authorized band is 20 dB below the maximum in-band peak level.

6.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.2 °C

Relative Humidity: 34.1 %

Atmospheric Pressure: 98.36 kPa

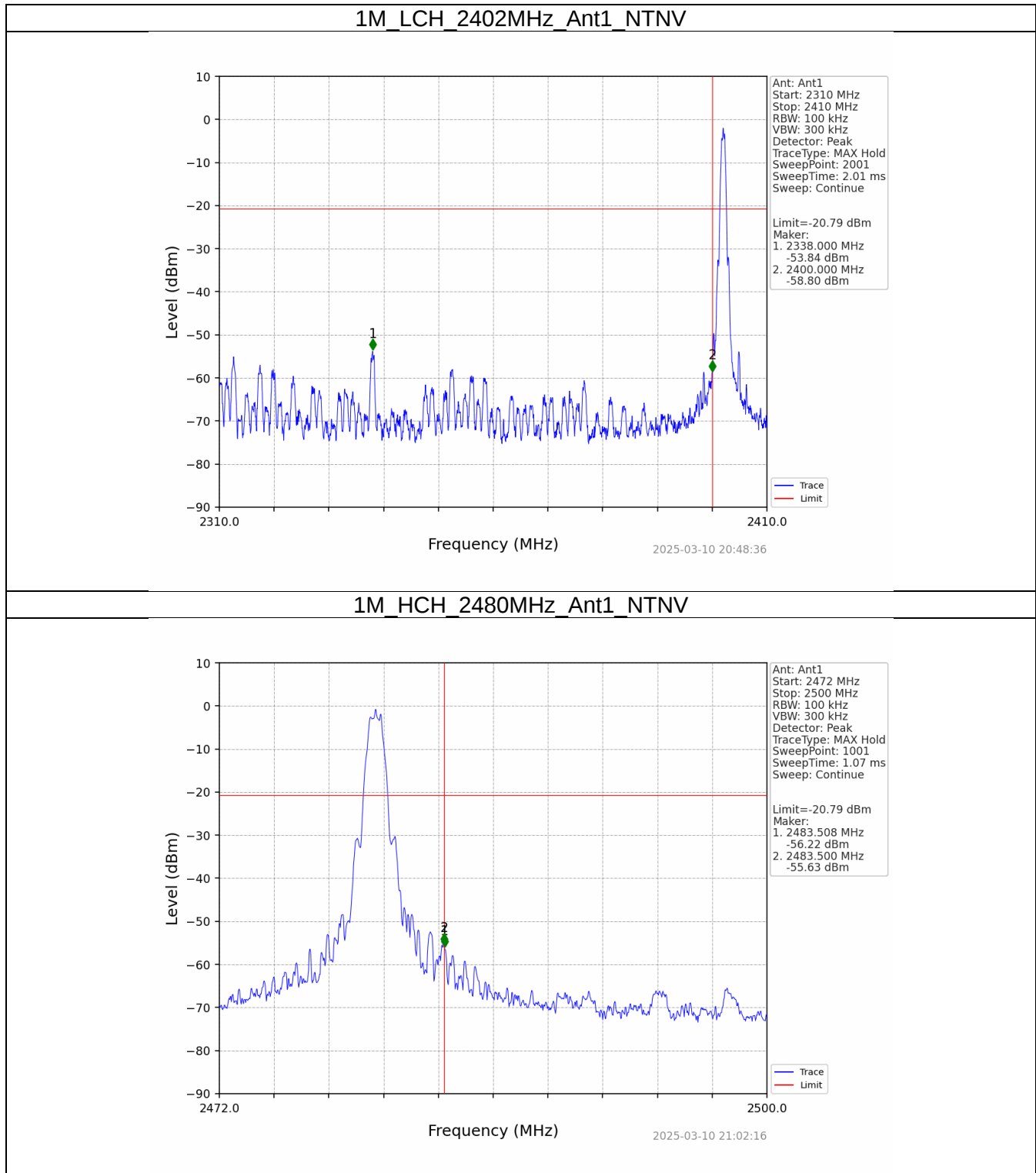
6.4 Test Equipment

Test End Date: 10-Mar-2025

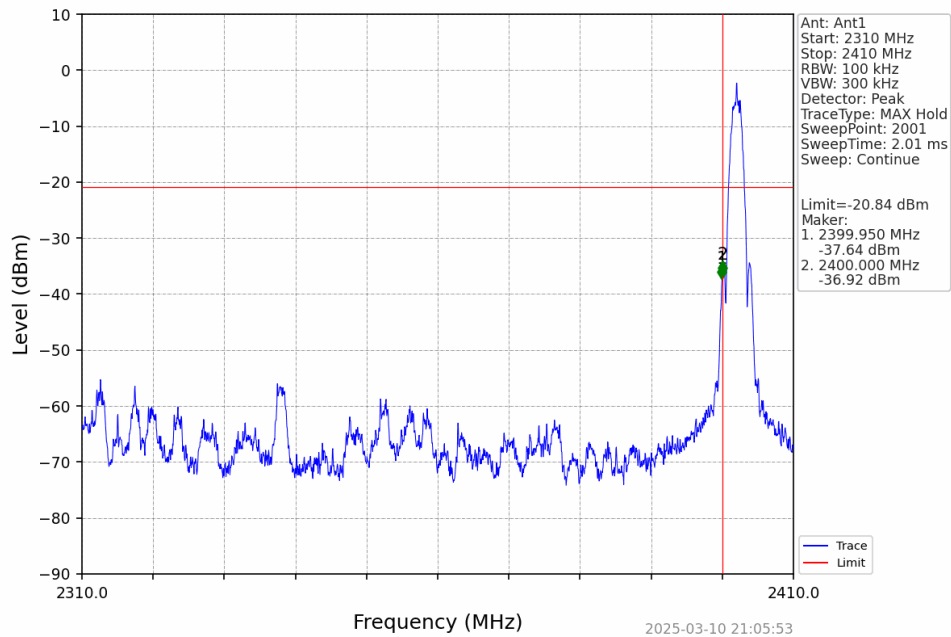
Tester: SGM

Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	TELEDYNE STORM MICROWAVE	084-0505-059	20109	20-Mar-2024	20-Mar-2025
TSTPASS SWITCHBOX	TSTPASS	SB2	23009	8-Apr-2024	8-Apr-2025
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ (Rental Unit)	103349	20-Aug-24	20-Aug-25

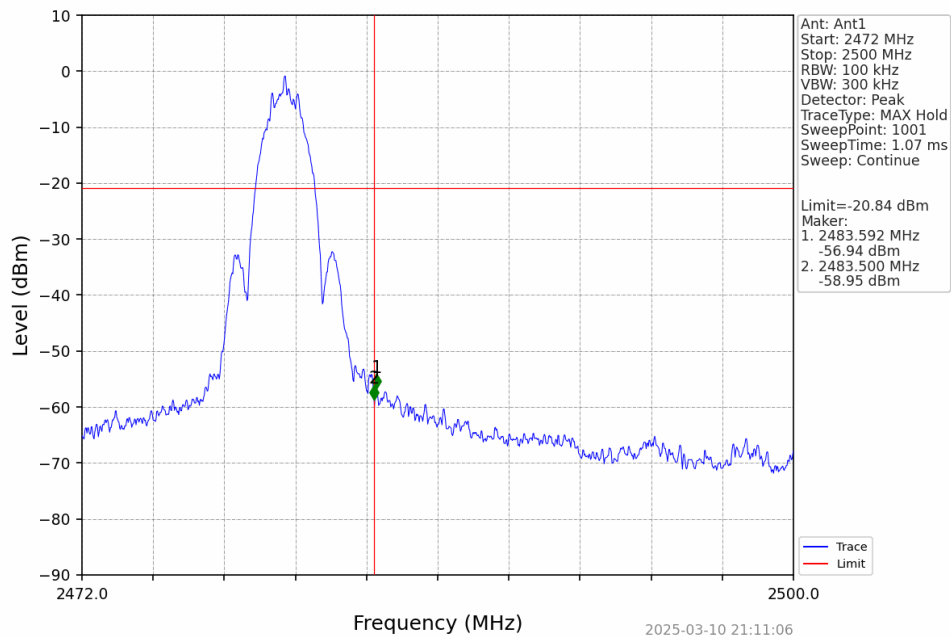
6.5 Test Data – DTS Band Edge



2M_LCH_2402MHz_Ant1_NTNV

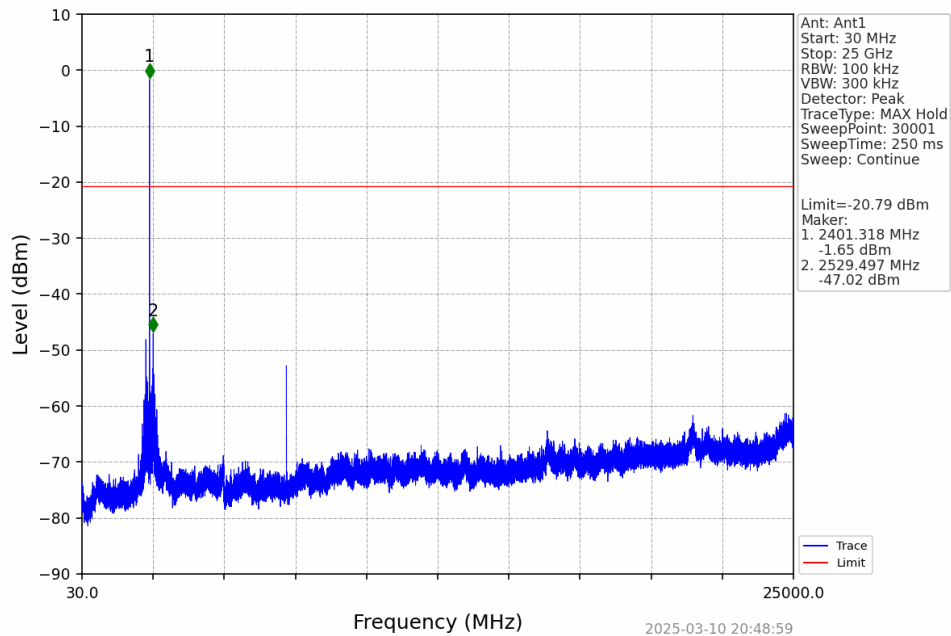


2M_HCH_2480MHz_Ant1_NTNV

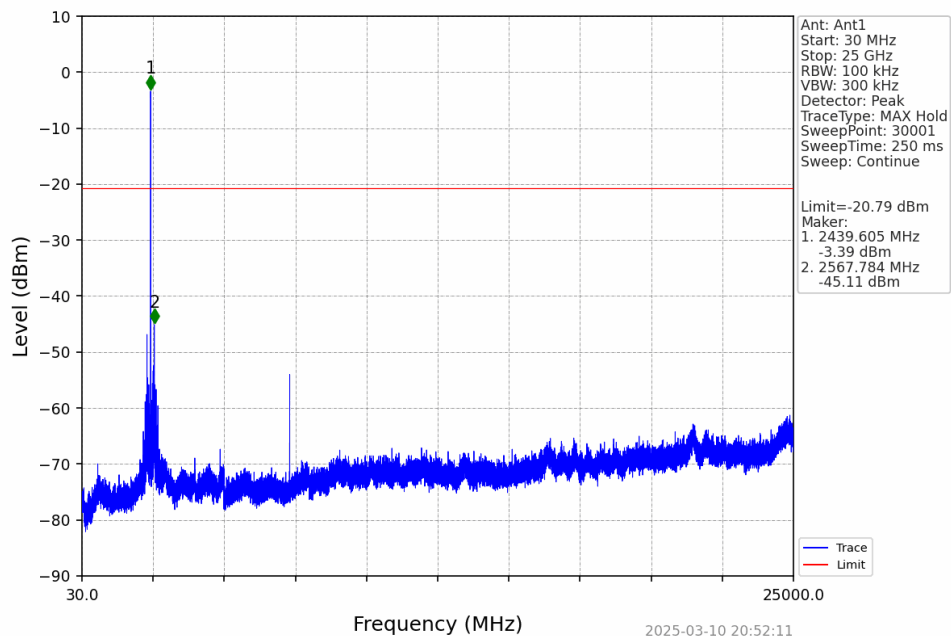


6.6 Test Data – DTS Conducted Spurious Emissions

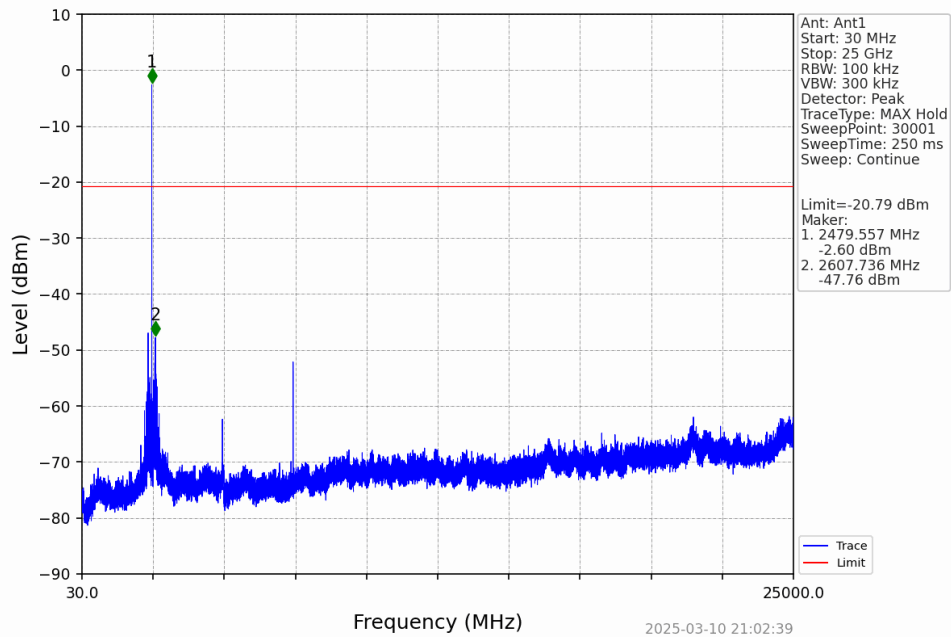
1M_LCH_2402MHz_Ant1_NTNV



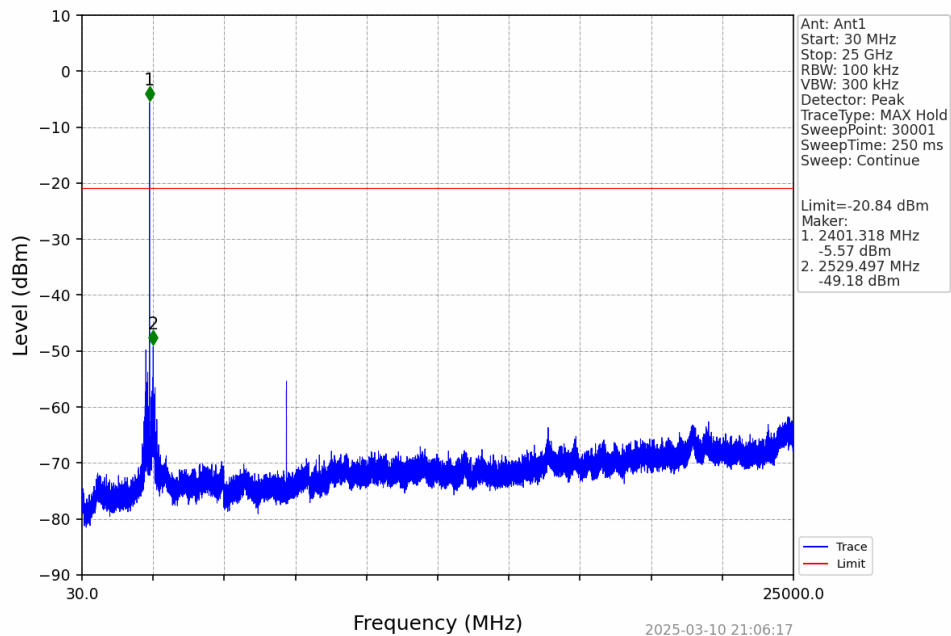
1M_MCH_2440MHz_Ant1_NTNV



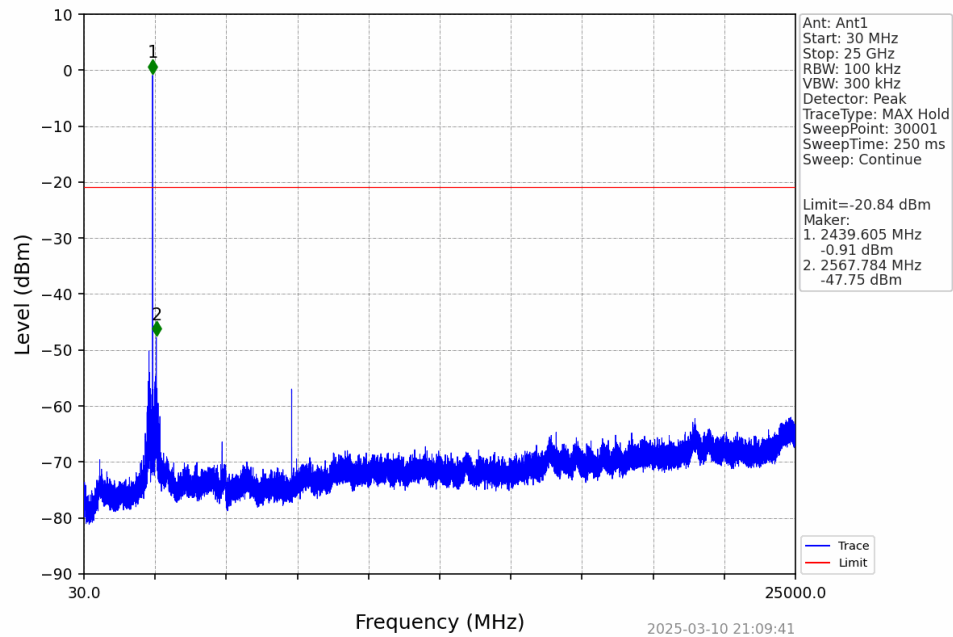
1M_HCH_2480MHz_Ant1_NTNV



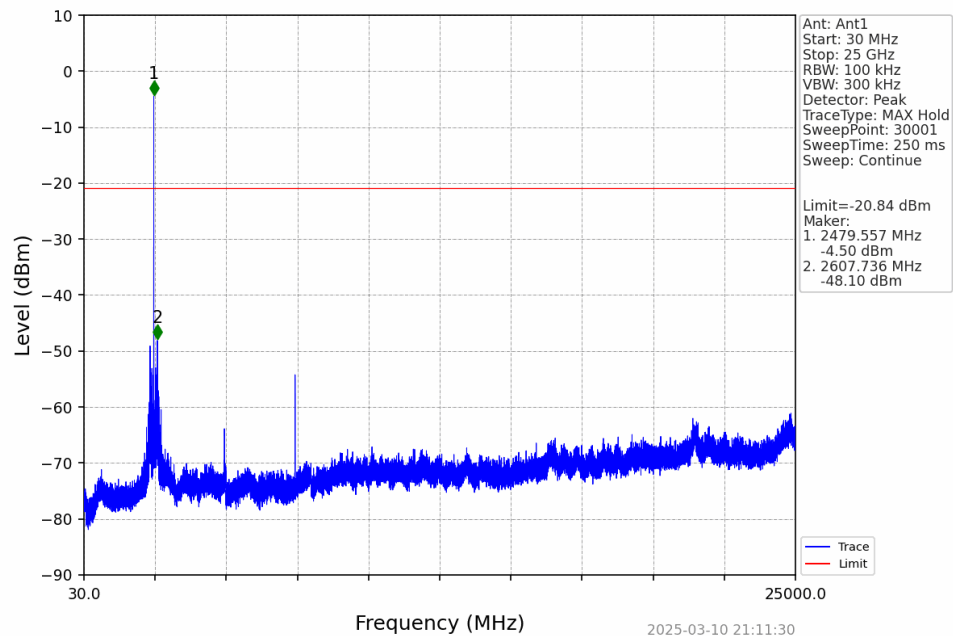
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



7 Emissions in Restricted Frequency Bands

7.1 Test Result

Test Description	Test Specification		Test Result
Emissions in Restricted Frequency Bands	15.247(d) 15.205, 15.209	RSS-247 S5.5 RSS-GEN S8.9, S8.10	Compliant

7.2 Test Method

Radiated emissions in restricted frequency bands were measured using methods defined in ANSI C63.10 clause 11.12. These procedures are referenced in KDB 558074 D01 15.247 Meas Guidance v05r02.

Lowest, middle and highest channels were investigated – the device was commanded to continuously transmit on channels 0, 19 and 39.

Testing was performed with the EUT (cart) in an upright orientation as that is how it is always used.

Test distances for radiated tests:

- 9k to 30 MHz – Near field prescan to determine if there were any emissions
- 30 to 1000 MHz - The EUT to measurement antenna distance was 3 meters
- 1 to 18 GHz - The EUT to measurement antenna distance was 3 meters
- 18 to 26 GHz - The EUT to measurement antenna distance was 1 meter

Limits within restricted bands of operation:

Frequency	Limits ⁽¹⁾		Peak Limits dBuV/m
	Microvolts/m	dBuV/m	
30 - 88 MHz	100	40 ⁽²⁾	--
88 - 216 MHz	150	43.5 ⁽²⁾	--
216 - 960 MHz	200	46 ⁽²⁾	--
960 - 1000 MHz	500	54 ⁽²⁾	--
1 - 40 GHz	500	54 ⁽³⁾	74

(1) These limits are applicable to emissions outside of the intentional transmit frequency band.

(2) Quasi-peak limit

(3) Average limit

7.3 Test Site

10m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature: 24.26 °C

Relative Humidity: 21.2 %

Atmospheric Pressure: 97.42 kPa

7.4 Test Equipment

9kHz-30MHz

Test End Date: 7-Mar-2025

Tester: ZH

Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
ANTENNA, LOOP, ACTIVE	6502	ETS LINDGREN	B085752	24-Mar-2024	24-Mar-2026
N to N RF Cable	EM-B810NM-276	ECHELON	24022	15-Nov-2024	15-Nov-2025
N-FEMALE TO N-MALE RF CABLE	EM-B810NMNF-118	ECHELON	23010	17-Apr-2024	17-Apr-2025
RF CABLE NM TO NM, 0.01-18GHZ	90-195-118	TELEDYNE STORM MICROWAVE	20125	7-Aug-2024	7-Aug-2025
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ	22027	14-Nov-2024	14-Nov-2025

30-1000MHz

Test End Date: 7-Mar-2025

Tester: ZH

Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
ANTENNA, BILOG	JB6	SUNOL	B079690	19-Apr-2024	19-Apr-2026
N to N RF Cable	EM-B810NM-276	ECHELON	24021	15-Nov-2024	15-Nov-2025
RF CABLE	SF106	HUBER & SUHNER	B079713	20-Aug-2024	20-Aug-2025
RF CABLE NM TO NM, 0.01-18GHZ	90-195-118	TELEDYNE STORM MICROWAVE	20125	7-Aug-2024	7-Aug-2025
RF CABLE	SF106	HUBER & SUHNER	B085888	7-Aug-2024	7-Aug-2025
LOW NOISE AMPLIFIER	ZKL-2+	MINI-CIRCUITS	B079817	7-Aug-2024	7-Aug-2025
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ	22027	14-Nov-2024	14-Nov-2025

1-18GHz

Test End Date: 7-Mar-2025

Tester: DA

Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
ANTENNA, DRG HORN (MEDIUM)	3117	ETS LINDGREN	B079691	2-Aug-2024	2-Aug-2026
RF CABLE, NM TO NM.	90-195-157	TELEDYNE STORM MICROWAVE	21019	20-Mar-2024	20-Mar-2025
RF CABLE	SF106	HUBER & SUHNER	B085888	7-Aug-2024	7-Aug-2025
LOW NOISE AMPLIFIER	TS-PR18	ROHDE & SCHWARZ	15003	8-Oct-2024	8-Oct-2025
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ	22027	14-Nov-2024	14-Nov-2025
FILTER, HIGH PASS, >2800MHZ	HPM50111	MICRO-TRONICS	22017	14-Jun-2024	14-Jun-2025

18-26 GHz

Test End Date: 7-Mar-2025

Tester: ZH

Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
ANTENNA, HORN (SMALL)	LB-180400-20-C-KF	A-INFO	15007	17-Apr-2024	17-Apr-2025
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-138	TELEDYNE STORM MICROWAVE	20111	20-Mar-2024	20-Mar-2025
2.92MM MALE TO 2.92MM MALE RF CABLE	HULL140A-29P-29P-60	HASCO COMPONENTS	18033	20-Mar-2024	20-Mar-2025
LOW NOISE AMPLIFIER	NSP1840-HG	MITEQ	B087572	21-Oct-2024	21-Oct-2025
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ	22027	14-Nov-2024	14-Nov-2025

Software: TILE 7 software

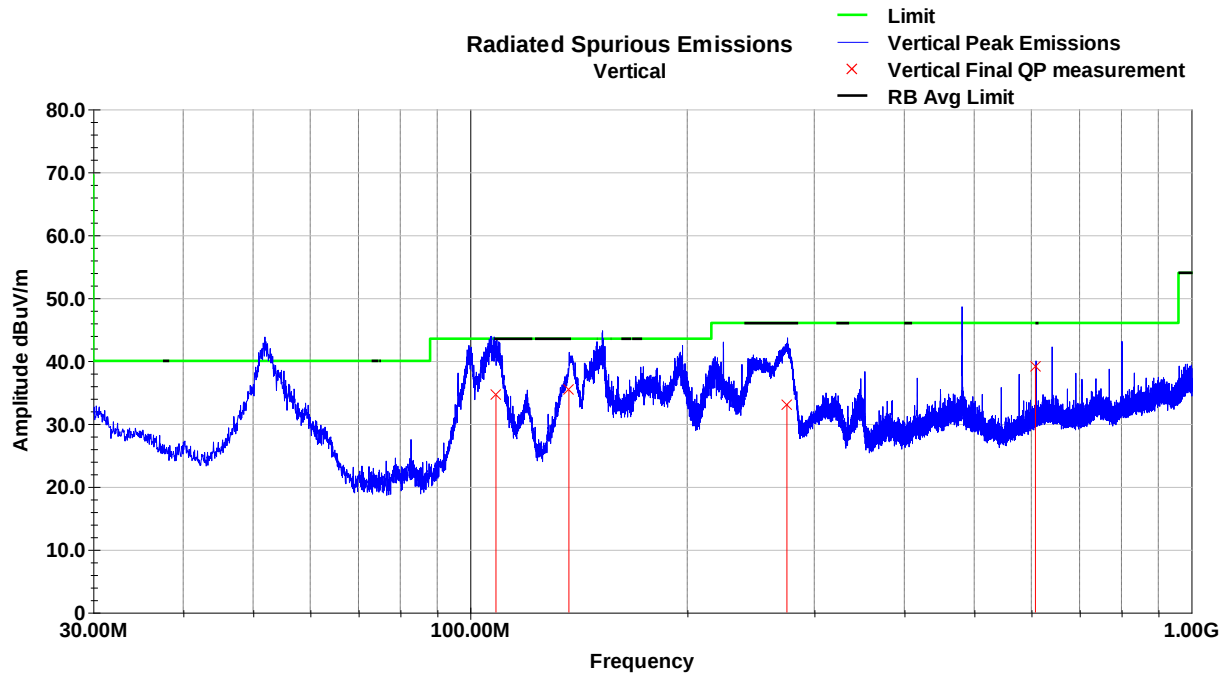
7.5 Test Data

No significant emissions were detected in the 9kHz to 30MHz frequency range within 20 dB of limits.

7.5.1 30-1000 MHz

Between 30MHz and 1000MHz, there was no significant deviation with respect to axis or channel.

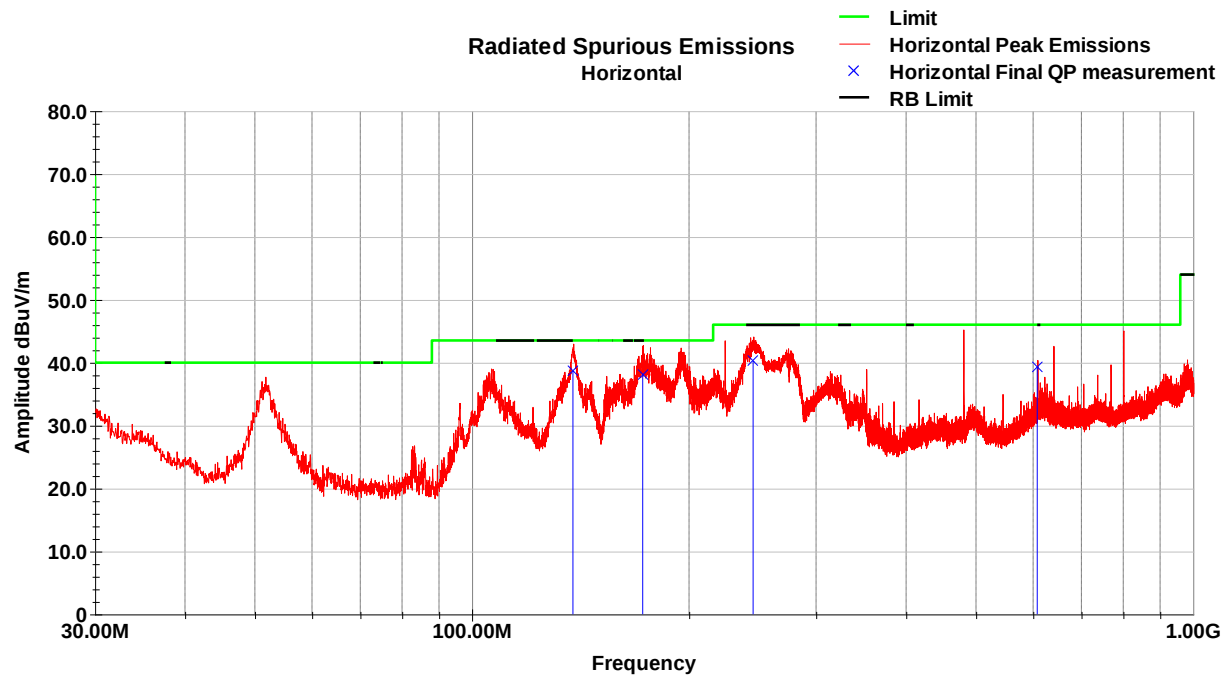
Vertical Radiated Emissions – Peak Plot – 2440MHz



Vertical Radiated Emissions – Tabular Data – 2440MHz

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
108.60	47.8	V	359.0	100.0	16.3	1.0	30.6	34.6	43.5	-9.0
137.06	47.5	V	131.0	100.0	17.4	1.1	30.6	35.4	43.5	-8.2
274.98	43.8	V	344.0	189.0	17.8	1.7	30.2	33.1	46.0	-12.9
608.03	42.6	V	24.0	143.0	23.7	2.4	29.7	39.1	46.0	-6.9
QP Value = Raw QP + AF + Loss - Amp										
Margin = QP Value - Limit										

Horizontal Radiated Emissions – Peak Plot – 2440MHz

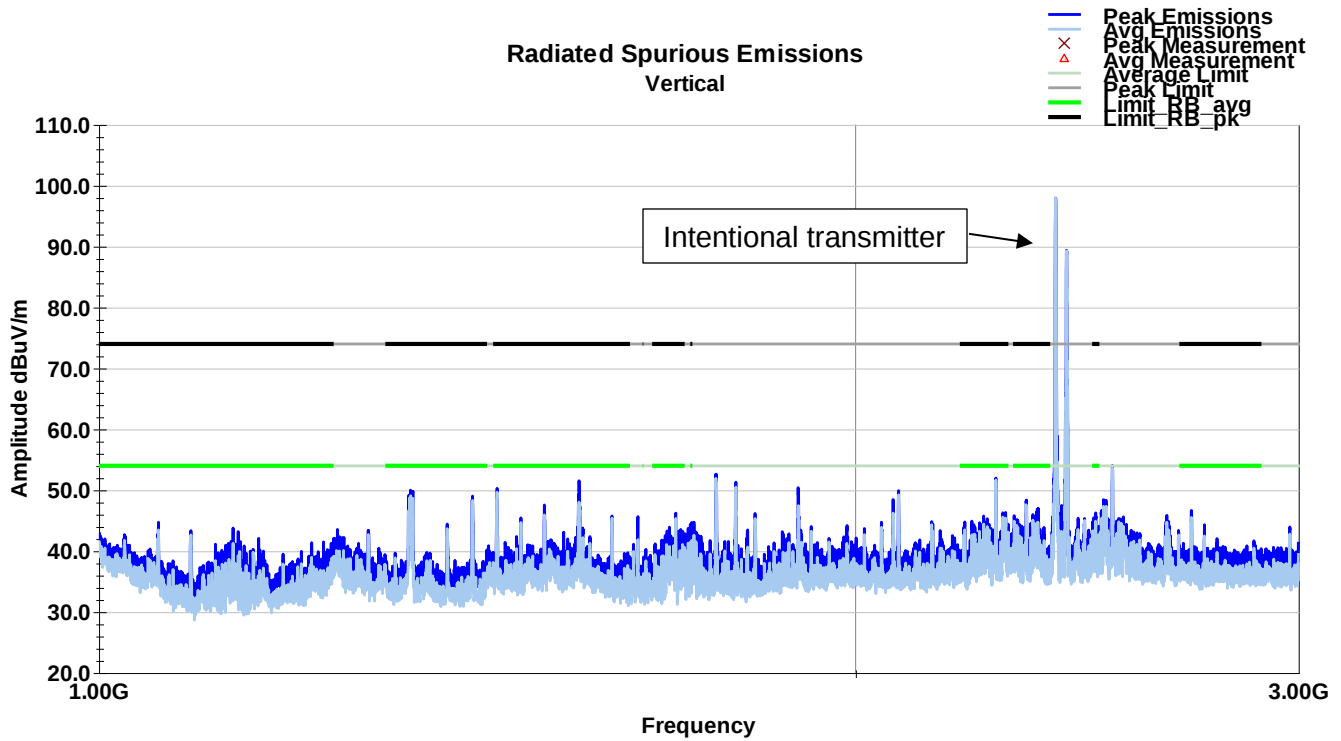


Horizontal Radiated Emissions – Tabular Data – 2440MHz

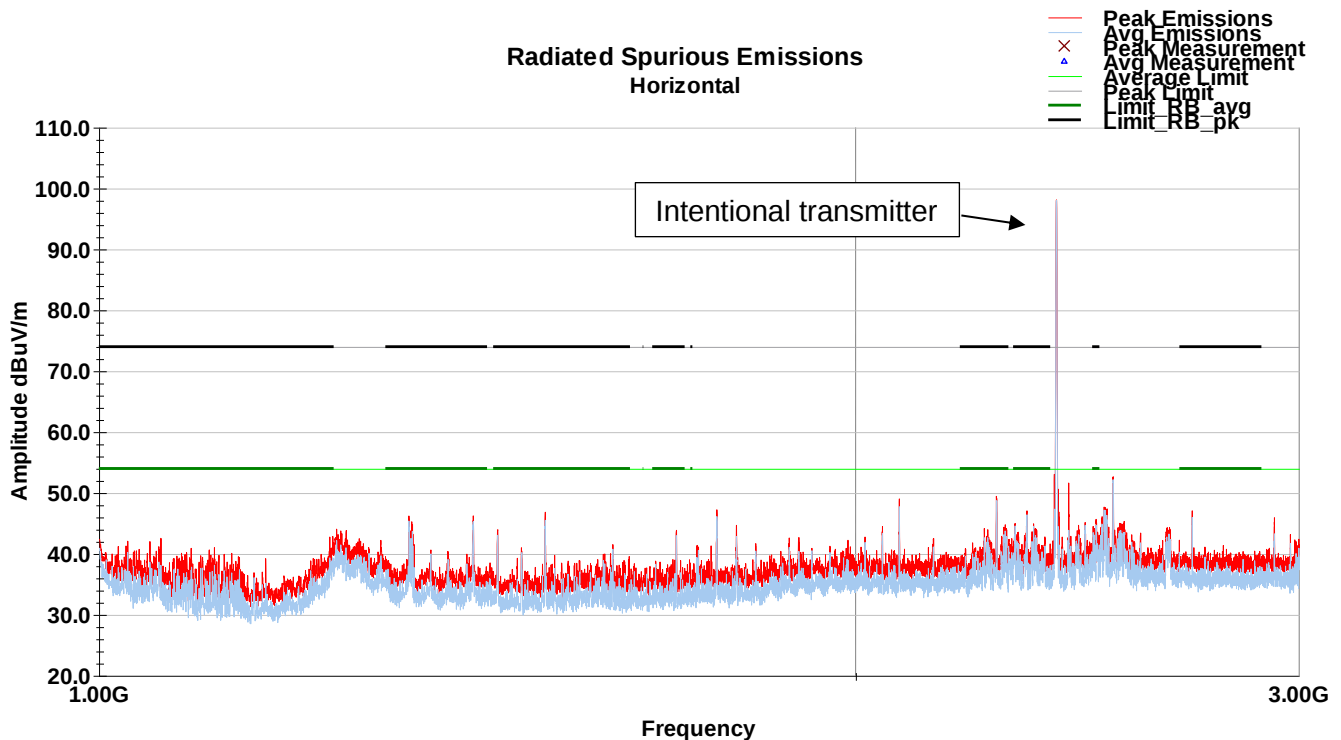
Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
138.02	50.9	H	285.0	216.0	17.3	1.1	30.6	38.7	43.5	-4.9
172.51	51.6	H	71.0	204.0	15.7	1.2	30.4	38.2	43.5	-5.4
245.38	52.7	H	132.0	100.0	16.3	1.5	30.3	40.3	46.0	-5.8
608.03	42.8	H	219.0	113.0	23.7	2.4	29.7	39.3	46.0	-6.7
QP Value = Raw QP + AF + Loss - Amp										
Margin = QP Value - Limit										

7.5.2 1-3 GHz

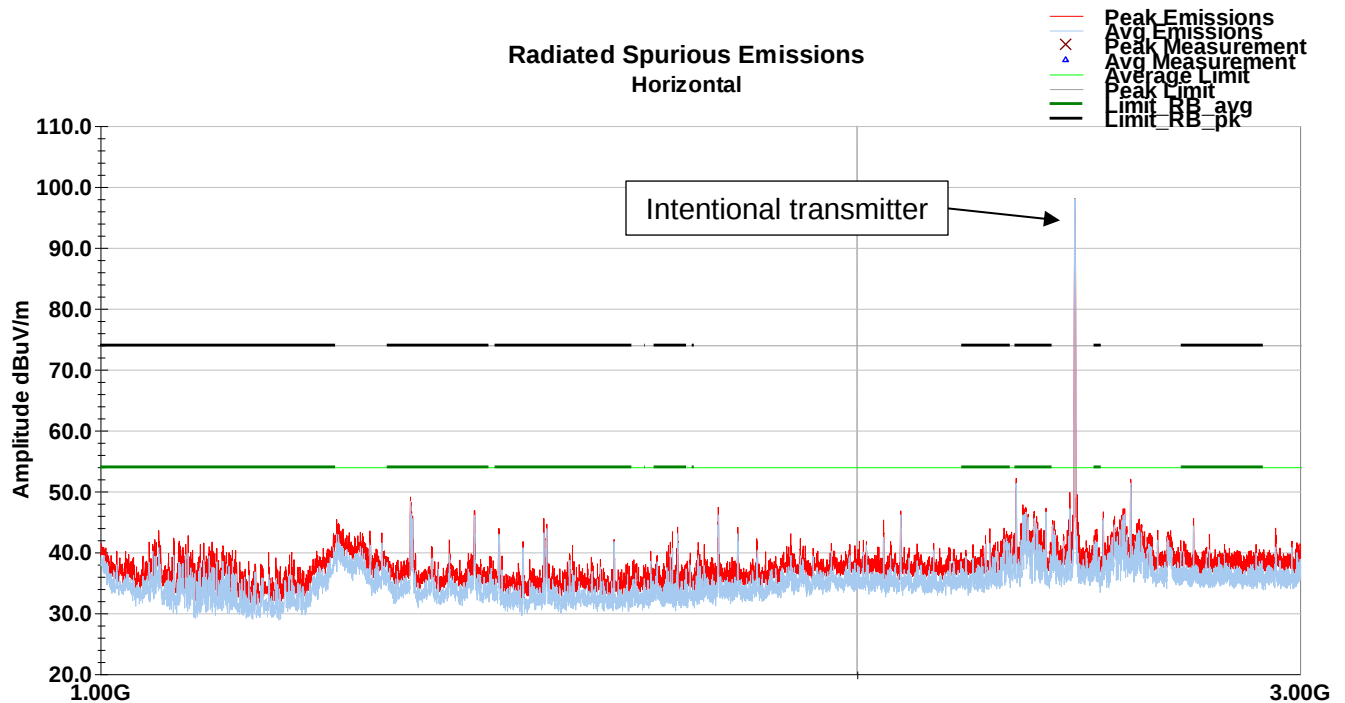
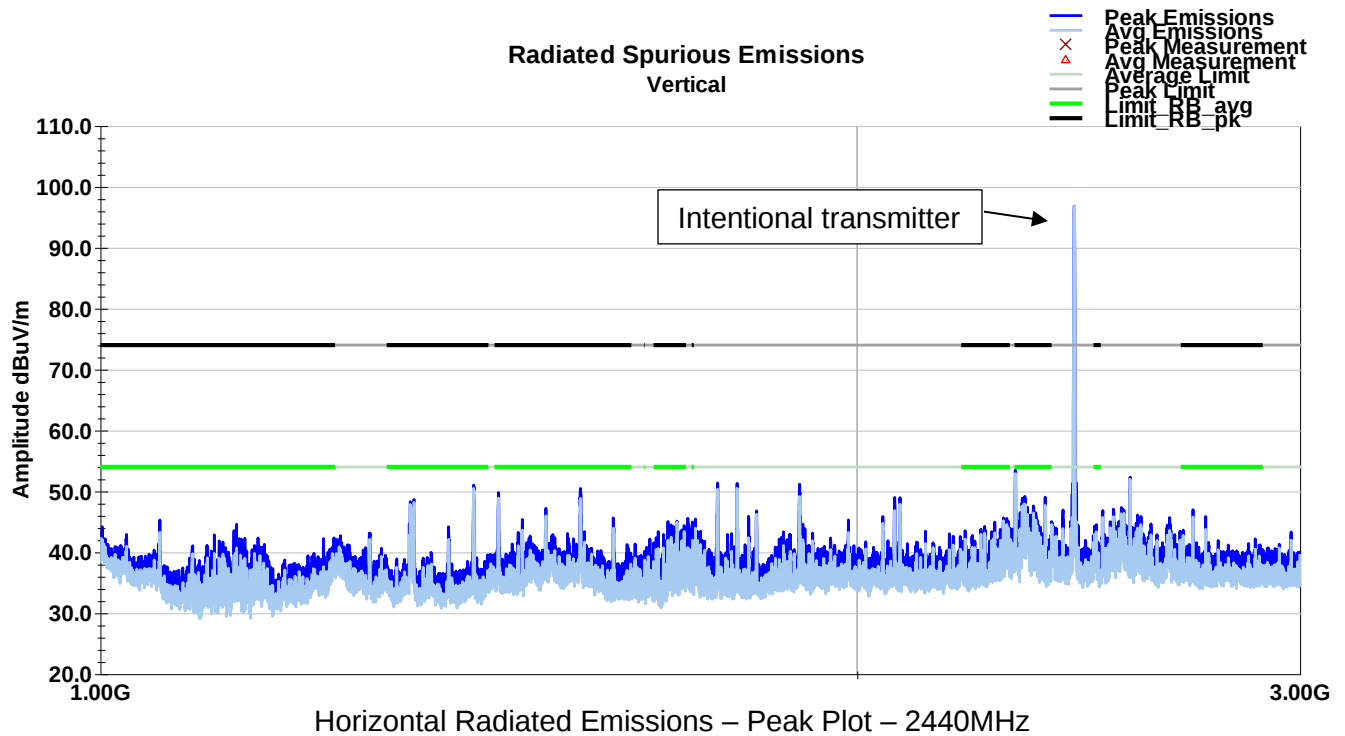
Vertical Radiated Emissions – Peak Plot – 2402MHz



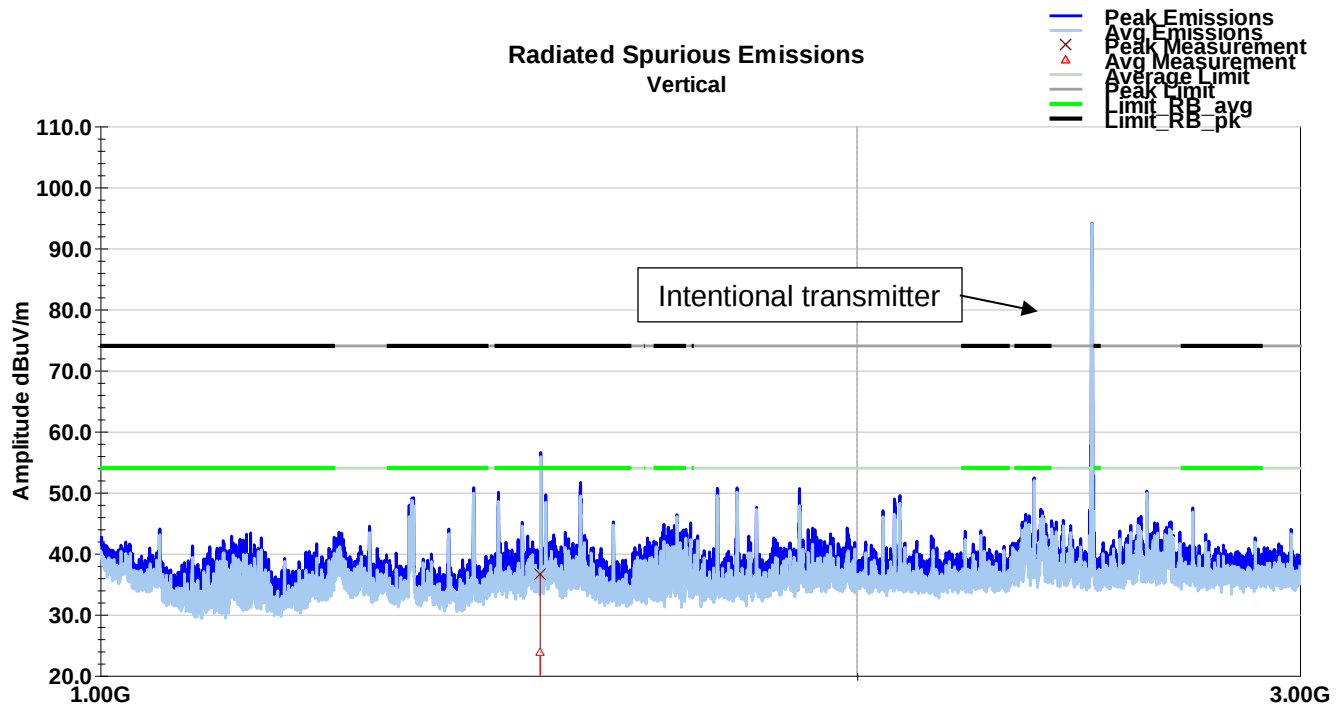
Horizontal Radiated Emissions – Peak Plot – 2402MHz



Vertical Radiated Emissions – Peak Plot – 2440MHz



Vertical Radiated Emissions – Peak Plot – 2480MHz



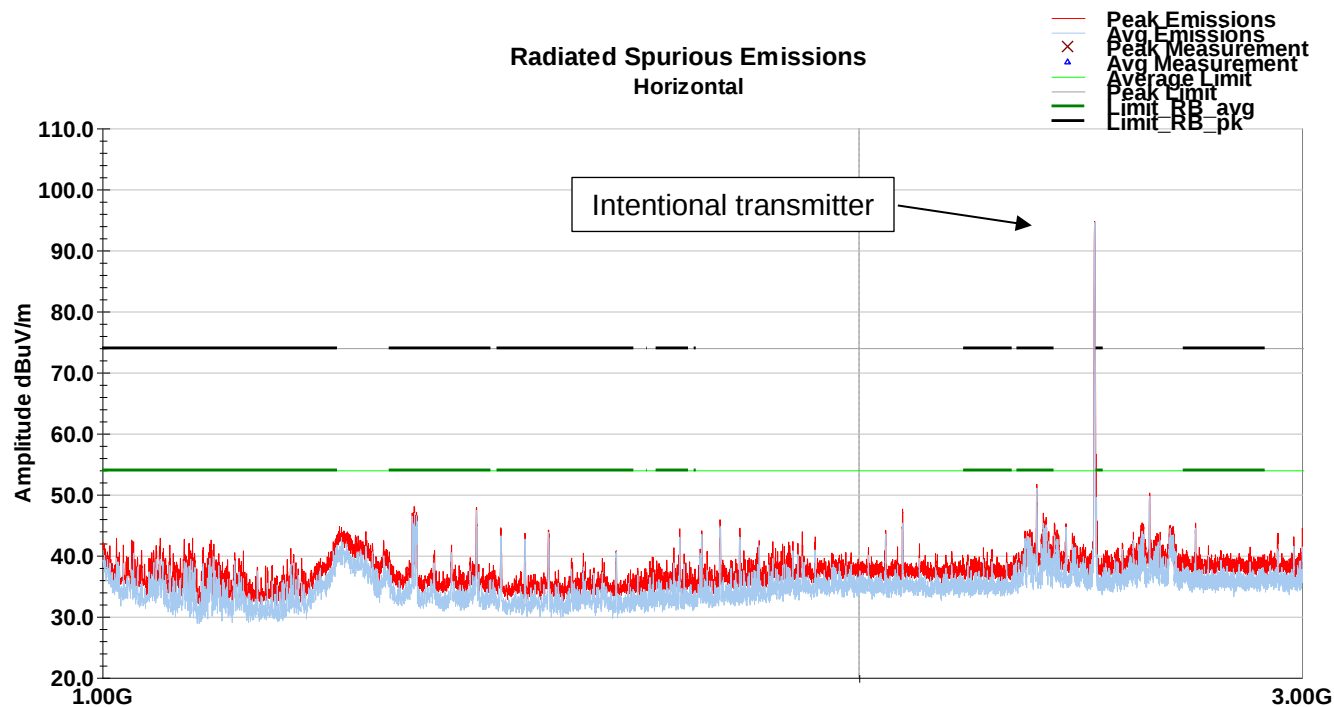
Vertical Radiated Emissions – Peak Data – 2480MHz

Frequency MHz	Raw Pk dBuV	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	Final Pk dBuV/m	Limit dBuV/m	Margin dB
1496.32	50.0	V	251.0	206.0	28.2	1.2	42.8	36.6	74.0	-37.4
Final Pk = Raw Pk + AF + Loss - Amp										
Margin = Final Pk - Limit										

Vertical Radiated Emissions – Average Data – 2480MHz

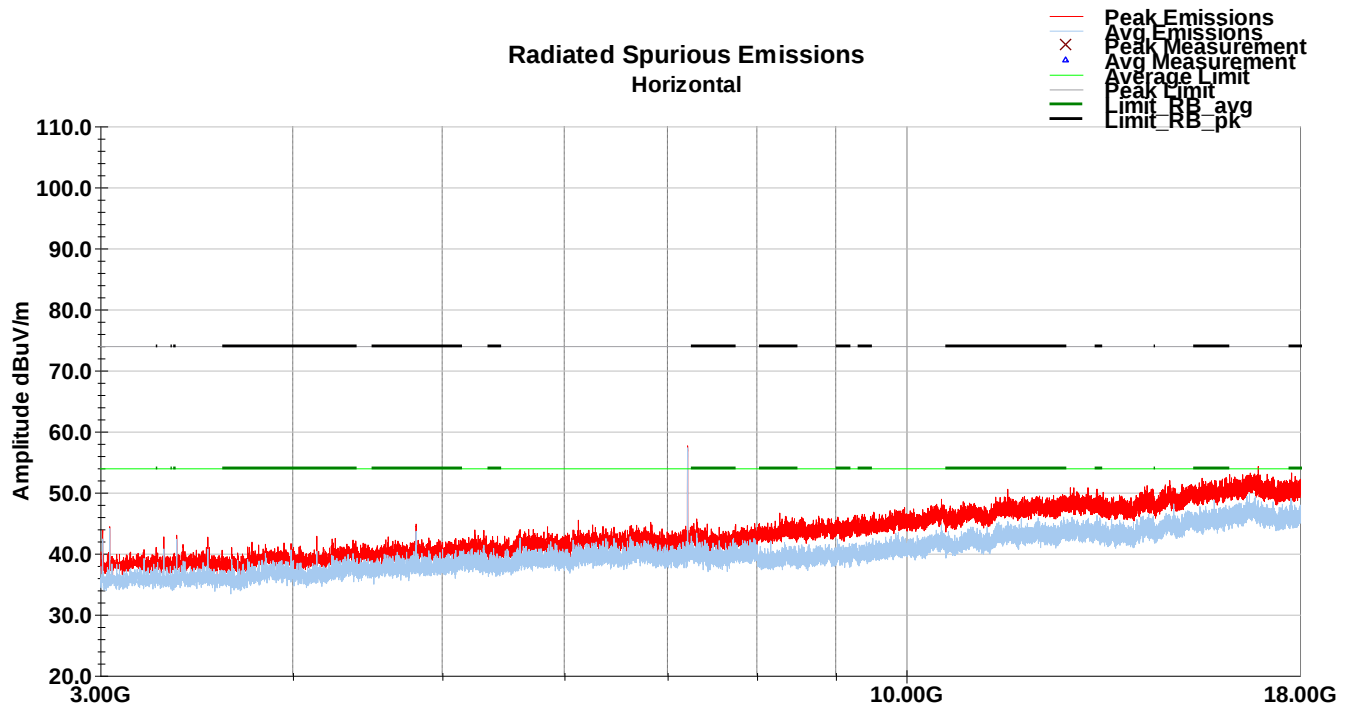
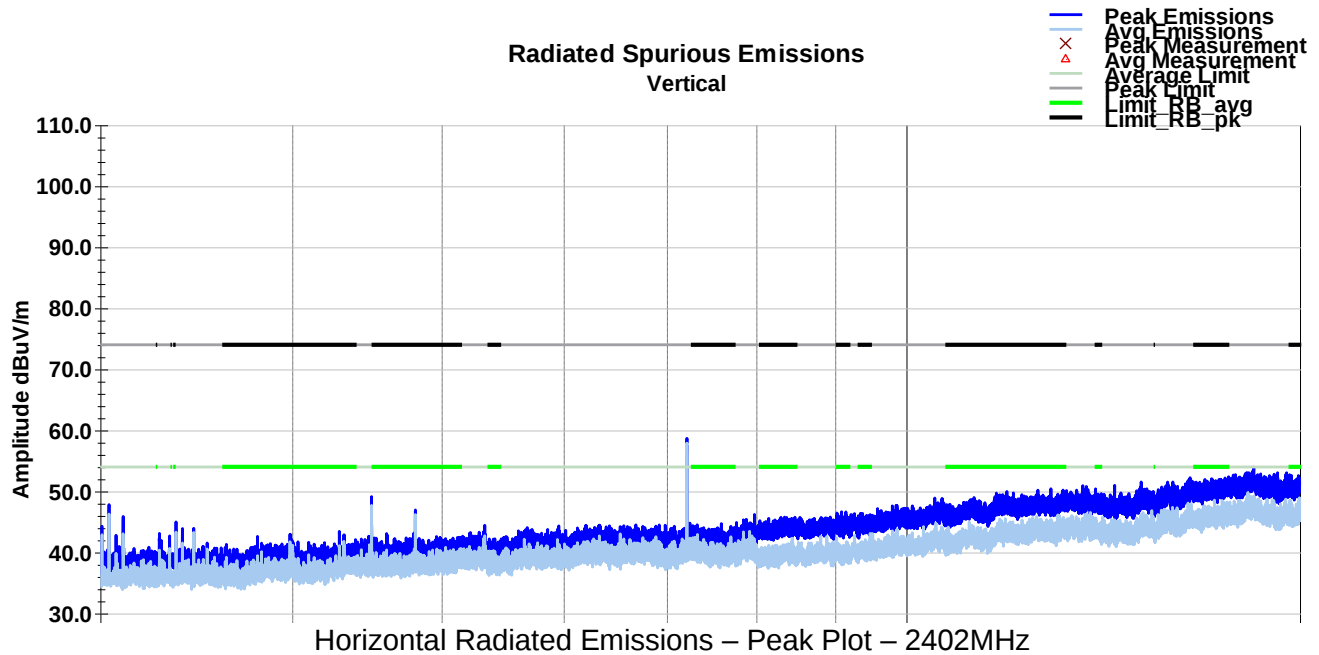
Frequency MHz	Raw Avg dBuV	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	Final Avg dBuV/m	Limit (dBuV/m)	Margin (dB)
1496.32	37.2	V	251.0	206.0	28.2	1.2	42.8	23.9	54.0	-30.1
Final Avg = Raw Avg + AF + Loss - Amp										
Margin = Final Avg - Limit										

Horizontal Radiated Emissions – Peak Plot – 2480MHz

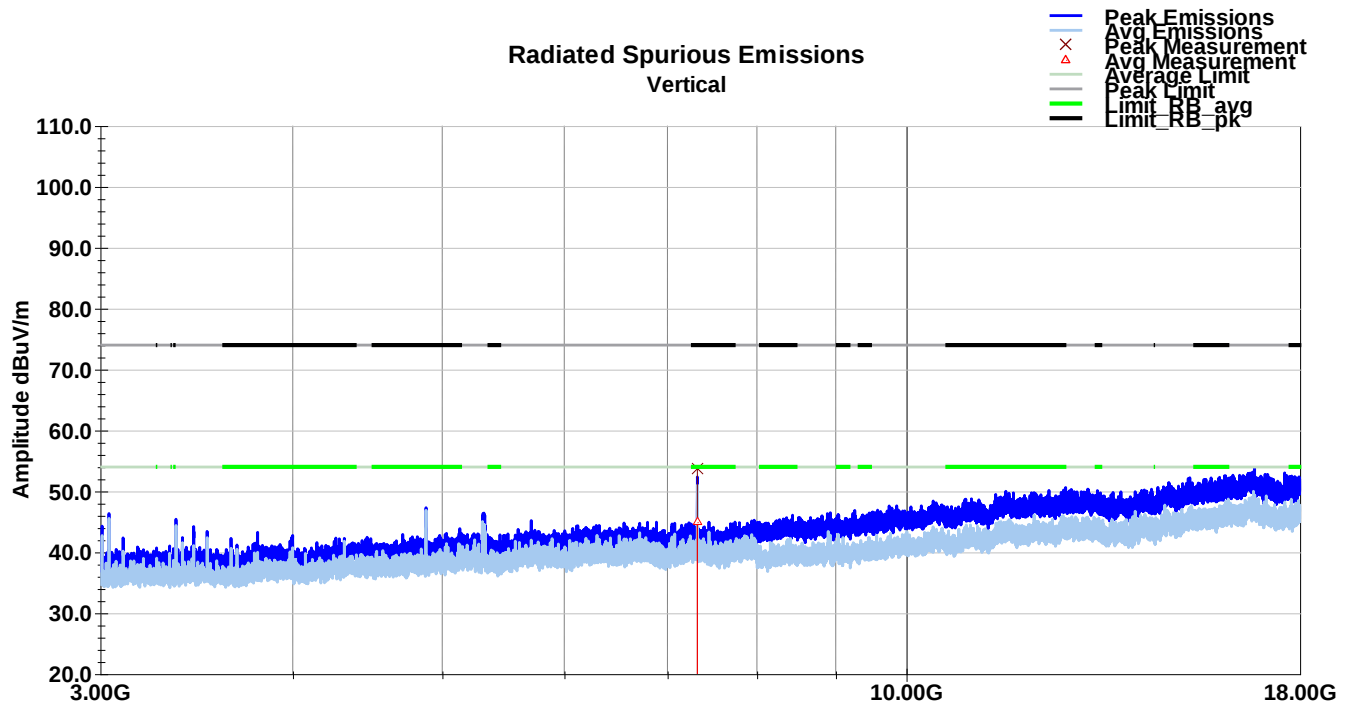


7.5.3 3-18 GHz

Vertical Radiated Emissions – Peak Plot – 2402MHz



Vertical Radiated Emissions – Peak Plot – 2440MHz

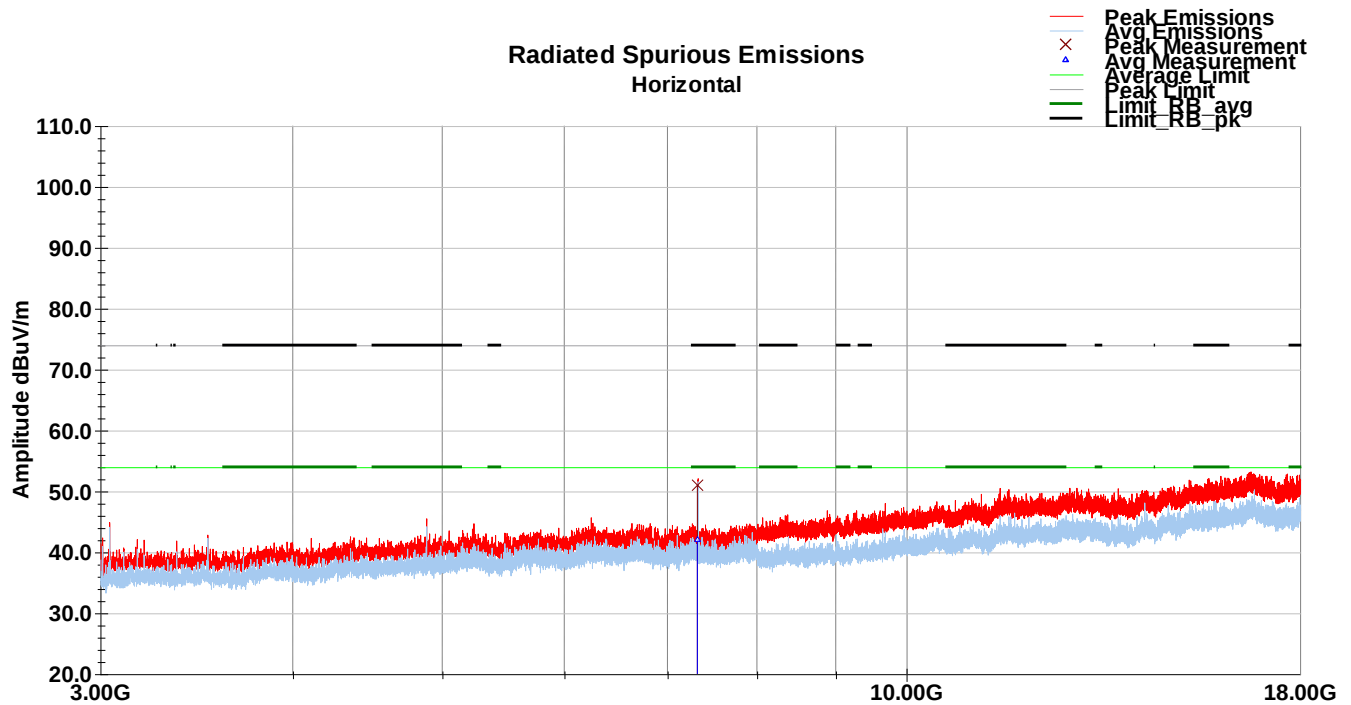

Vertical Radiated Emissions – Tabular Data – 2440MHz
Peak

Frequency MHz	Raw Pk dBuV	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	Final Pk dBuV/m	Limit dBuV/m	Margin dB
7320.78	58.6	V	150.0	164.0	35.7	2.9	41.9	55.3	74.0	-18.7
Final Pk = Raw Pk + AF + Loss - Amp										
Margin = Final Pk - Limit										

Average

Frequency MHz	Raw Avg dBuV	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	Final Avg dBuV/m	Limit (dBuV/m)	Margin (dB)
7320.78	50.2	V	150.0	164.0	35.7	2.9	41.9	46.8	54.0	-7.1
Final Avg = Raw Avg + AF + Loss - Amp										
Margin = Final Avg - Limit										

Horizontal Radiated Emissions – Peak Plot – 2440MHz

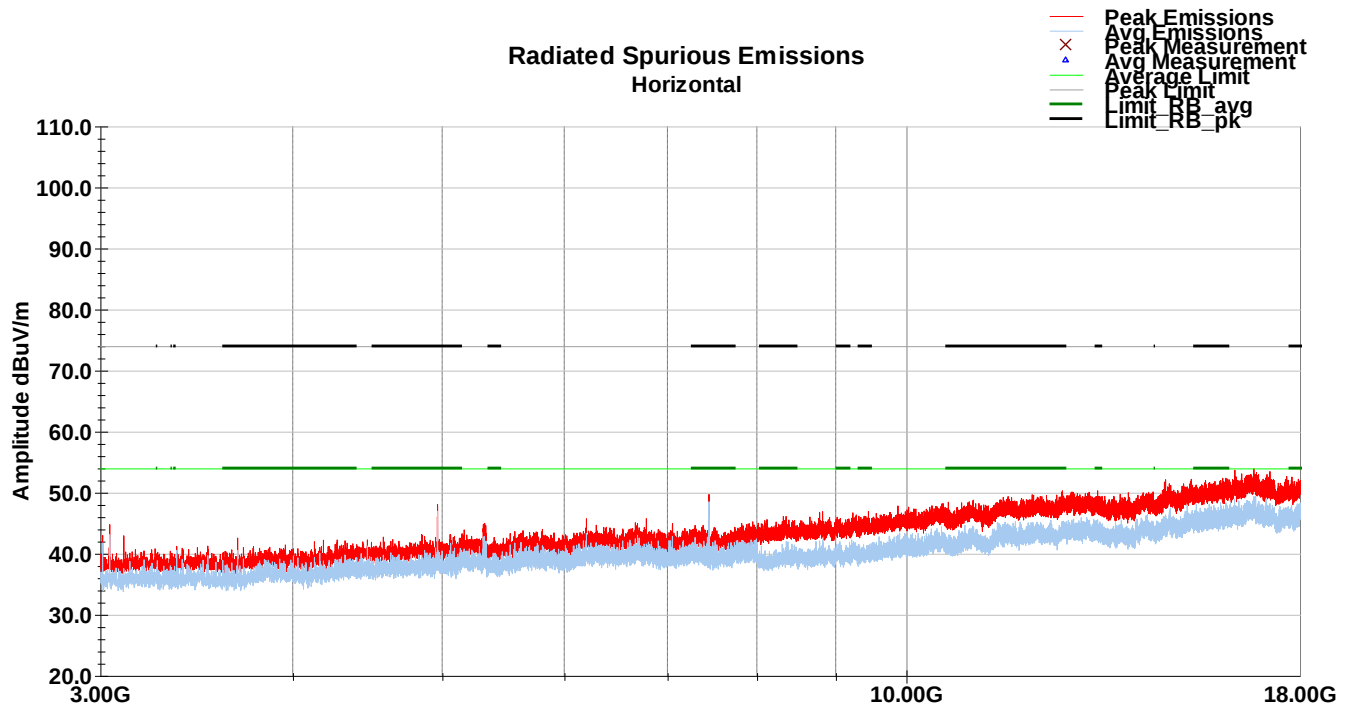
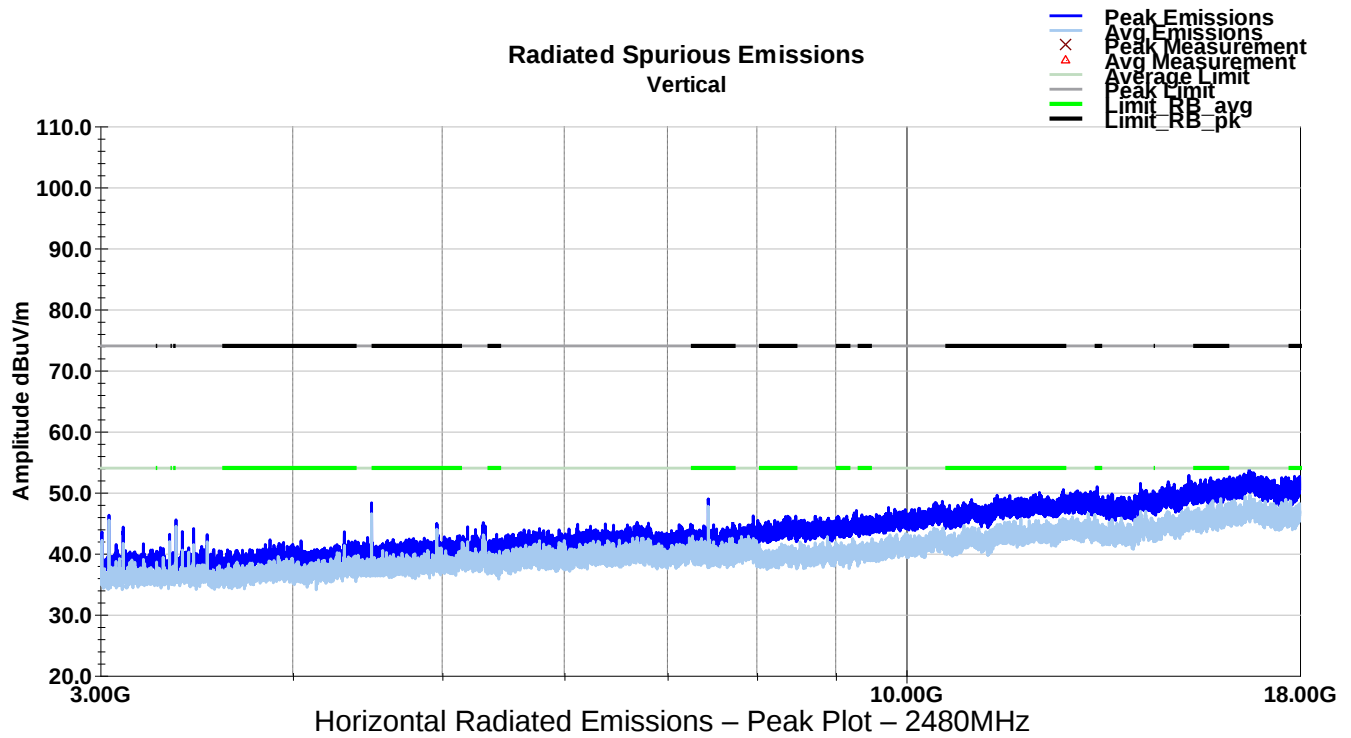

Horizontal Radiated Emissions – Tabular Data – 2440MHz
Peak

Frequency MHz	Raw Pk dBuV	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	Final Pk dBuV/m	Limit dBuV/m	Margin dB
7319.38	54.3	H	111.0	244.0	35.7	2.9	41.9	51.0	74.0	-23.0
Final Pk = Raw Pk + AF + Loss - Amp										
Margin = Final Pk - Limit										

Average

Frequency MHz	Raw Avg dBuV	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	Avg Value dBuV/m	Limit (dBuV/m)	Margin (dB)
7319.38	45.4	H	111.0	244.0	35.7	2.9	41.9	42.1	54.0	-11.9
Final Avg = Raw Avg + AF + Loss - Amp										
Margin = Final Avg - Limit										

Vertical Radiated Emissions – Peak Plot – 2480MHz



Note: No Disturbance Emissions within 20 dB of the limit from 18-26 GHz

8 Band Edge Emissions in Restricted Frequency Bands

8.1 Test Result

Test Description	Test Specification		Test Result
Band Edge Emissions in Restricted Frequency Bands	15.205, 15.209	RSS-GEN S8.9, 8.10	Compliant

8.2 Test Method

Field strength measurements were performed at the restricted band edges of 2390MHz and 2483.5MHz. Measurements were made using the conducted methods defined in ANSI C63.10: 2013 clause 11.12.2. The measurements were converted to a radiated field strength equivalent using the equations defined in that section. Both peak and average measurements were performed at the antenna port. These procedures are referenced in KDB 558074 D01 15.247 Meas Guidance v05r02.

A reference level offset was applied to the spectrum analyzer so that conducted measurements represent field strength measurements in dBμV/m.

Results are reported for only BLE 2Mbps data mode since that is the worst case for this test.

8.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.2 °C

Relative Humidity: 34.1 %

Atmospheric Pressure: 98.36 kPa

8.4 Test Equipment

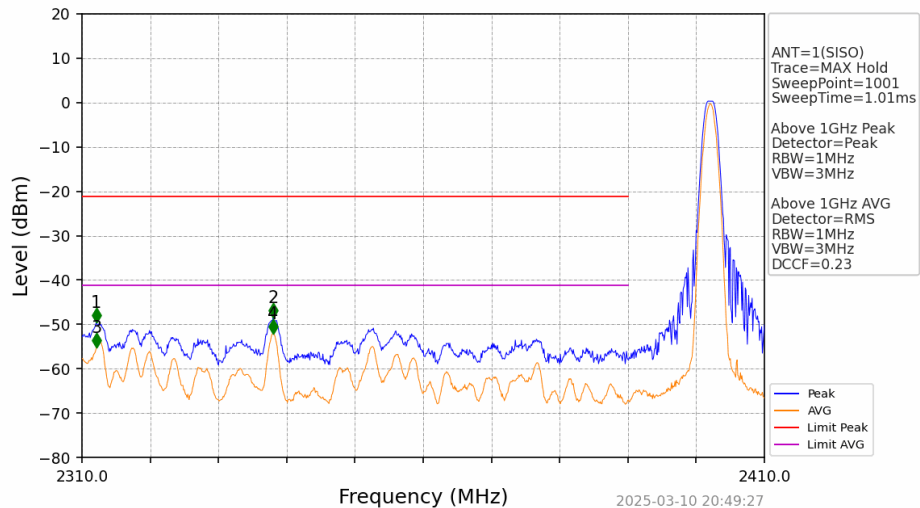
Test End Date: 10-Mar-2025

Tester: SGM

Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	TELEDYNE STORM MICROWAVE	084-0505-059	20109	20-Mar-2024	20-Mar-2025
TSTPASS SWITCHBOX	TSTPASS	SB2	23009	8-Apr-2024	8-Apr-2025
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ (Rental Unit)	103349	20-Aug-24	20-Aug-25

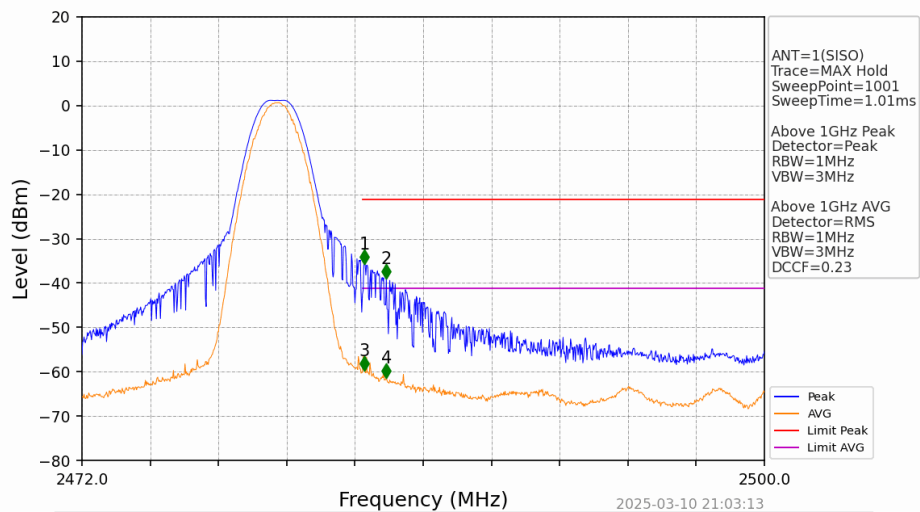
8.5 Test Data

1M_LCH_2402MHz_Ant1_NTNV



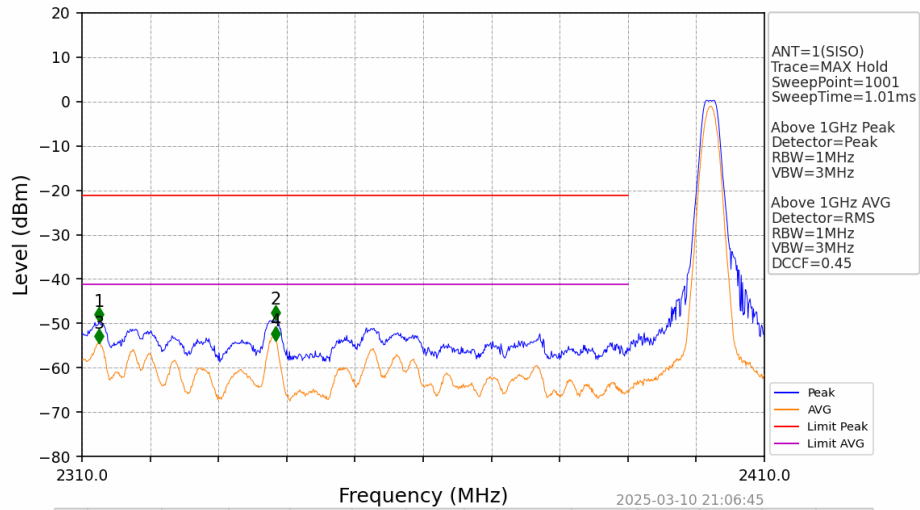
No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	2312.100	-49.52	-21.20	28.32	Pass	Peak	3	2312.100	-57.23	-41.20	14.03	Pass	AVG
2	2338.000	-48.42	-21.20	27.22	Pass	Peak	4	2338.000	-54.06	-41.20	10.86	Pass	AVG

1M_HCH_2480MHz_Ant1_NTNV



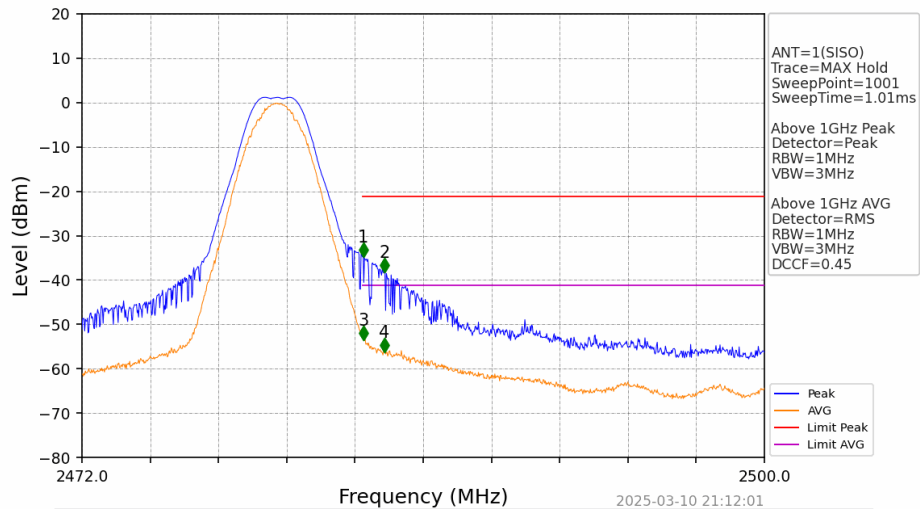
No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	2483.592	-35.71	-21.20	14.51	Pass	Peak	3	2483.592	-61.67	-41.20	18.47	Pass	AVG
2	2484.488	-39.04	-21.20	17.84	Pass	Peak	4	2484.488	-63.40	-41.20	20.20	Pass	AVG

2M_LCH_2402MHz_Ant1_NTNV



No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	2312.500	-49.58	-21.20	28.38	Pass	Peak	3	2312.500	-56.36	-41.20	13.16	Pass	AVG
2	2338.400	-49.07	-21.20	27.87	Pass	Peak	4	2338.400	-55.90	-41.20	12.70	Pass	AVG

2M_HCH_2480MHz_Ant1_NTNV



No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	2483.536	-34.76	-21.20	13.55	Pass	Peak	3	2483.536	-55.49	-41.20	12.29	Pass	AVG
2	2484.404	-38.23	-21.20	17.03	Pass	Peak	4	2484.404	-58.26	-41.20	15.06	Pass	AVG

9 AC Powerline Conducted Emissions

9.1 Test Result

Test Description	Test Specification		Test Result
AC Powerline Conducted Emissions	FCC 15.207	RSS-Gen	Compliant

9.2 Test Method

With the receiver's resolution bandwidth was set to 9 kHz, exploratory scans were performed over the measuring frequency range (0.15 MHz to 30 MHz) using a max hold mode incorporating a Peak detector and Average detector and using the TILE! software. The final test data was measured using a Quasi-Peak detector and Average detector and compared against the limits indicated in the table below.

Frequency Range	Limits (dBuV)
0.15 to 0.5 MHz	Avg 56 to 46 QP 66 to 56
0.5 to 5 MHz	Avg 46 Pk 56
5 to 30 MHz	Avg 50 Pk 60

9.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.67 °C

Relative Humidity: 19.5 %

Atmospheric Pressure: 99.57 kPa

9.4 Test Equipment

Test End Date: 16-Jan-2025

Tester: EW

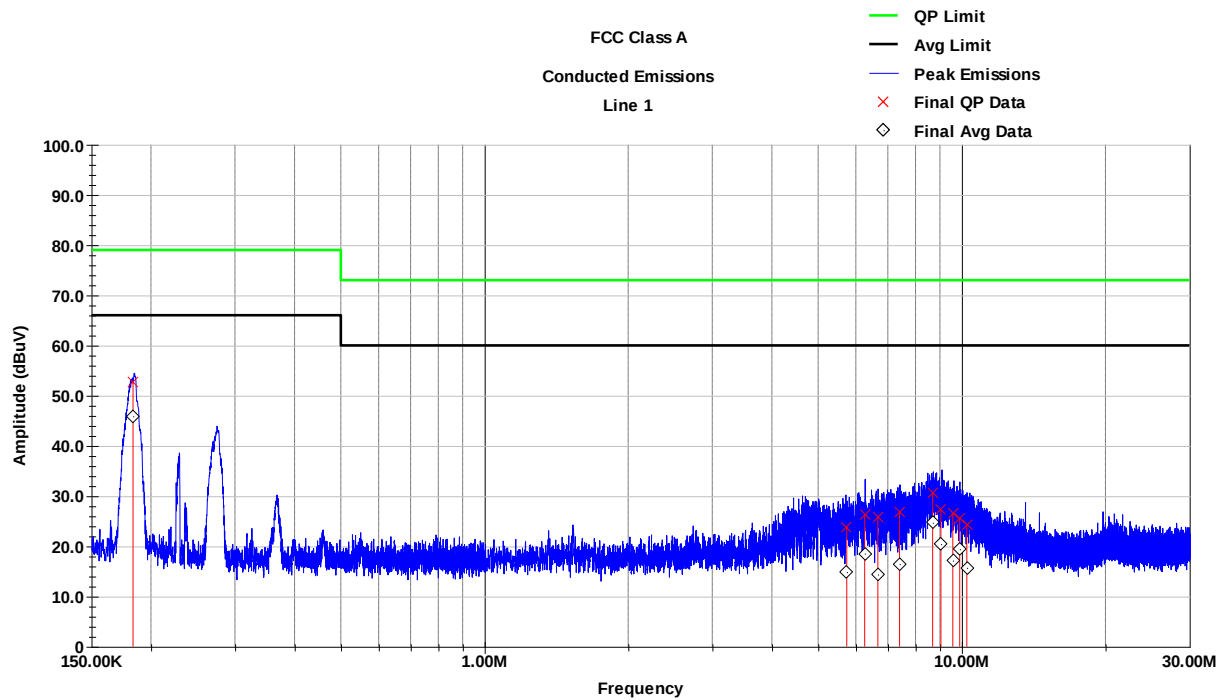
Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
LINE IMPEDANCE STABILIZATION NETWORK	NNB 51	TESEQ	B085882	22-Apr-2024	22-Apr-2025
RF CABLE	UC-N-MM-78	MAURY MICROWAVE	17017	7-Aug-2024	7-Aug-2025
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ	22032	2-Jan-2025	2-Jan-2026

Software:

TILE! software profile "Conducted Emissions 240521" dated May 21, 2024

9.5 Test Data – 120V 60Hz

Line 1 Conducted Emissions – Peak Plot



Line 1 Conducted Emissions – Tabular Data

Frequency MHz	LISN dB	CF dB	TL dB	Raw Avg dBuV	Final Avg dBuV	Avg Limit dBuV	Avg Margin dB	Raw QP dBuV	Final QP dBuV	QP Limit dBuV	QP Margin dB
0.183	9.8	0.00	0.0	36.1	45.9	66.0	-20.1	42.8	52.6	79.0	-26.4
5.74	9.8	0.00	0.0	5.0	14.9	60	-45.1	13.9	23.8	73.0	-49.2
6.26	9.8	0.00	0.0	8.7	18.6	60	-41.4	16.4	26.3	73.0	-46.7
6.669	9.8	0.00	0.0	4.5	14.4	60	-45.6	16.0	25.9	73.0	-47.1
7.404	9.8	0.00	0.0	6.6	16.5	60.0	-43.5	16.8	26.7	73.0	-46.3
8.688	9.9	0.00	0.0	14.8	24.7	60.0	-35.3	20.6	30.5	73.0	-42.5
9.043	9.9	0.00	0.0	10.5	20.4	60.0	-39.6	17.3	27.2	73.0	-45.8
9.578	9.9	0.00	0.0	7.2	17.2	60.0	-42.8	16.5	26.5	73.0	-46.5
9.903	9.9	0.00	0.0	9.5	19.4	60.0	-40.6	15.6	25.5	73.0	-47.5
10.248	9.9	0.10	0.0	5.8	15.7	60.0	-44.3	14.5	24.4	73.0	-48.6

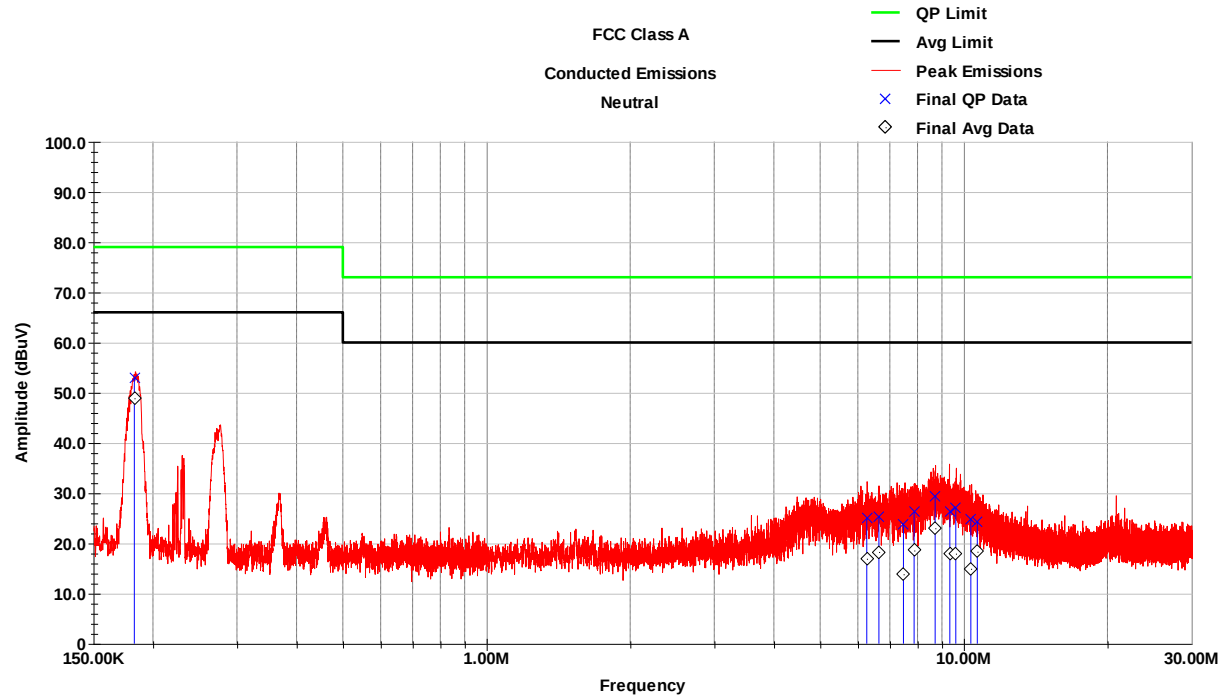
Final QP = Raw QP + LISN + CF + TL

QP Margin = Final QP - QP Limit

Final Avg = Raw Avg + LISN + CF + TL

Avg Margin = Final Avg - Avg Limit

Neutral Conducted Emissions – Peak Plot



Neutral Conducted Emissions – Tabular Data

Frequency MHz	LISN dB	CF dB	TL dB	Raw Avg dBuV	Final Avg dBuV	Avg Limit dBuV	Avg Margin dB	Raw QP dBuV	Final QP dBuV	QP Limit dBuV	QP Margin dB
0.183	9.8	0.00	0.0	39.1	48.9	66.0	-17.1	43.1	52.8	79.0	-26.2
6.263	9.9	0.00	0.0	7.0	16.9	60	-43.1	15.1	25	73.0	-48.0
6.64	9.9	0.00	0.0	8.4	18.3	60	-41.7	15.4	25.3	73.0	-47.7
7.476	9.9	0.00	0.0	3.9	13.9	60	-46.1	13.8	23.7	73.0	-49.3
7.869	9.9	0.00	0.0	8.7	18.6	60.0	-41.4	16.3	26.3	73.0	-46.7
8.709	9.9	0.00	0.0	13.1	23.0	60.0	-37.0	19.5	29.5	73.0	-43.5
9.348	9.9	0.00	0.0	7.9	17.9	60.0	-42.1	16.4	26.3	73.0	-46.7
9.623	9.9	0.00	0.0	8.0	18.0	60.0	-42.0	17.1	27.1	73.0	-45.9
10.349	9.9	0.10	0.0	5.0	14.9	60.0	-45.1	14.8	24.7	73.0	-48.3
10.675	9.9	0.10	0.0	8.4	18.3	60.0	-41.7	14.4	24.3	73.0	-48.7

Final QP = Raw QP + LISN + CF + TL

QP Margin = Final QP - QP Limit

Final Avg = Raw Avg + LISN + CF + TL

Avg Margin = Final Avg - Avg Limit

10 Measurement Uncertainty

The measurement uncertainty figures are calculated in accordance with TR 100 028-1 [2] and correspond to an expansion factor (coverage factor) $k = 2$ (which provides confidence levels of 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Measurement uncertainty is not used to adjust the measurements to determine compliance.

Parameter	Expanded Uncertainty for Normal k factor equal to 2	
	Required	Laboratory Actual
all emissions, radiated	± 6 dB	± 4.8 dB
temperature	$\pm 1^{\circ}\text{C}$	$\pm 0.5^{\circ}\text{C}$
humidity	± 5 %	$\pm 3.5\%$
DC and low frequency voltages	± 3 %	$\pm 0.4\%$
Conducted disturbance at mains port using AMN	± 3.4 dB	± 2.5 dB

11 Revision History

Revision Level	Description of changes	Revision Date
0	Initial Release	18 March 2025
1	Model Number updated	11 April 2025