

## TEST REPORT

**Report Number: 104663935MPK-001**

**Project Number: G104663935**

**Issue Date: May 17, 2021**

**Revision Date: May 04, 2022**

**Testing performed on the**

**Merlin™ 2 PCS**

**Model Number: MER3700**

**FCC ID: RIA-MERLIN3700SYS**

**IC: 8454A-MERLIN3700SYS**

to

**FCC Part 15 Subpart C (15.225)**

**FCC Part 15 Subpart C (15.209)**

**ISED RSS-210 Issue 10**

For

**St. Jude Medical**

**Test Performed by:**

Intertek

1365 Adams Court

Menlo Park, CA 94025 USA


**Test Authorized by:**

St. Jude Medical

15900 Valley View Court

Sylmar, CA 91342 USA

Prepared by: \_\_\_\_\_

  
Anderson Soungpanya

Date: May 04, 2022

Reviewed by: \_\_\_\_\_

  
Krishna Vemuri

Date: May 04, 2022

*This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. This report must not be used to claim product endorsement by A2LA, NIST nor any other agency of the U.S. Government.*

Report No. 104663935MPK-001	
<b>Equipment Under Test:</b>	Merlin™ 2 PCS
<b>Model Number:</b>	MER3700
<b>Applicant:</b>	St. Jude Medical
<b>Contact:</b>	Himabindu Gandra
<b>Address:</b>	St. Jude Medical 15900 Valley View Court Sylmar, CA 91342
<b>Country:</b>	USA
<b>Tel. Number:</b>	(818) 493 2012
<b>Email:</b>	himabindu.gandra@abbott.com
<b>Applicable Regulation:</b>	FCC Part 15 Subpart C (15.225) FCC Part 15 Subpart C (15.209) ISED RSS-210 Issue 10
<b>Date of Test:</b>	May 03 - 07, 2021

***We attest to the accuracy of this report:***



Anderson Soungpanya  
Project Engineer



Krishna K Vemuri  
EMC Manager

## TABLE OF CONTENTS

<b>1.0</b>	<b>Summary of Tests</b> .....	<b>4</b>
<b>2.0</b>	<b>General Description</b> .....	<b>5</b>
2.1	Product Description .....	5
2.2	Related Submittal(s) Grants.....	6
2.3	Test Methodology.....	6
2.4	Test Facility .....	6
2.5	Measurement Uncertainty .....	6
<b>3.0</b>	<b>System Test Configuration</b> .....	<b>7</b>
3.1	Support Equipment.....	7
3.2	Block Diagram of Test Setup.....	8
3.3	Justification .....	9
3.4	Software Exercise Program.....	9
3.5	Mode of Operation during test.....	9
3.6	Modifications required for Compliance.....	9
3.7	Additions, deviations and exclusions from standards .....	9
<b>4.0</b>	<b>Measurement Results</b> .....	<b>10</b>
4.1	Field Strength of Fundamental and Radiated Emissions Outside the band .....	10
4.2	Frequency Tolerance .....	17
4.3	Occupied Bandwidth.....	19
4.4	Conducted Emissions FCC Part 15 Subpart C 15.207.....	22
<b>5.0</b>	<b>List of test equipment</b> .....	<b>26</b>
<b>6.0</b>	<b>Document History</b> .....	<b>27</b>

## 1.0 Summary of Tests

### NFC Transmitter:

TEST	REFERENCE FCC 15.225	REFERENCE RSS-210	RESULTS
Field Strength of Fundamental	15.225(a)	B.6	Complies
Radiated Emissions Outside the band	15.225(b), 15.225(c), 15.225(d), 15.209	B.6	Complies
Frequency Tolerance of the Carrier	15.225(e)	B.6	Complies
Line Conducted Emissions	15.207	RSS-GEN	Complies
Occupied Bandwidth	15.215	RSS-GEN	Complies
Antenna requirement	15.203	RSS-GEN	Complies <sup>1</sup>

<sup>1</sup> The EUT utilizes an internal Antenna.

### Inductive Transmitter:

TEST	REFERENCE FCC 15C	REFERENCE RSS-210	RESULTS
Radiated Emissions	15.209	RSS 210 (4.3)	Complies
Line Conducted Emissions	15.207	RSS-GEN	Complies
Occupied Bandwidth	15.215(c)	RSS-GEN	Complies
Antenna requirement	15.203	RSS-GEN	Complies <sup>2</sup>

<sup>2</sup> The EUT utilizes an internal Antenna.

## 2.0 General Description

### 2.1 Product Description

St. Jude Medical supplied the following description of the EUT:

Merlin™ 2 PCS Model MER3700 (Hardware) and Model MER3400 (Software) is a portable, dedicated programming system designed to interrogate, program, display data, and test implantable devices and leads. Merlin™ 2 PCS Model MER3700 and Model MER3400 programmer system is defined to be the programmer, all attached accessories, cables, and the telemetry interface to support implantable devices.

#### Overview of the EUT

<b>Applicant name &amp; address</b>	St. Jude Medical 15900 Valley View Court Sylmar, CA 91342 USA
<b>Contact info / Email</b>	Himabindu Gandra / himabindu.gandra@abbott.com
<b>Model</b>	MER3700
<b>FCC Identifier</b>	RIA-MERLIN3700SYS
<b>IC Identifier</b>	8454A-MERLIN3700SYS
<b>NFC Transmitter</b>	
<b>Operating Frequency</b>	13.553 - 13.567 MHz
<b>Number of Channels</b>	1
<b>Type of Modulation</b>	ASK
<b>Antenna Type</b>	Microstrip spiral antenna printed on NFC PCB board, 0 dBi
<b>Inductive Transmitter</b>	
<b>Operating Frequency</b>	Transmitter: 32.768 kHz Receiver: 65.536 kHz
<b>Number of Channels</b>	1
<b>Type of Modulation</b>	ASK (forward telemetry) / BPSK (backward telemetry)
<b>Antenna Type</b>	St. Jude Medical, Model 3630, Inductive coil antenna, 0 dBi

**EUT receive date:** May 03, 2021  
**EUT receive condition:** The pre-production version of the EUT was received in good condition with no apparent damage. As declared by the Applicant, it is identical to the production units.  
**Test start date:** May 03, 2021  
**Test completion date:** May 07, 2021

## 2.2 Related Submittal(s) Grants

None

## 2.3 Test Methodology

Radiated tests were performed at an antenna to EUT distance of 10 meters, unless stated otherwise in this test report. All other measurements were made in accordance with the procedures in part 2 of CFR 47.7, ANSI C63.10: 2013, RSS-210 Issue 10 & RSS-GEN Issue 5.

## 2.4 Test Facility

The radiated emission test site and conducted measurement facility used to collect the data is 10m semi-anechoic chamber located in Menlo Park, California. This test facility and site measurement data have been fully placed on file with the FCC and Industry Canada (Site # 2042L-1).

## 2.5 Measurement Uncertainty

Compliance with the limits was based on the results of the measurements and doesn't take into account the measurement uncertainty.

Estimated Measurement Uncertainty

Measurement	Expanded Uncertainty (k=2)		
	0.15 MHz – 1 GHz	1 GHz – 2.5 GHz	> 2.5 GHz
RF Power and Power Density – antenna conducted	-	0.7 dB	-
Unwanted emissions - antenna conducted	1.1 dB	1.3 dB	1.9 dB
Bandwidth – antenna conducted	-	30 Hz	-

Measurement	Expanded Uncertainty (k=2)		
	0.15 MHz – 30MHz	30 MHz – 1 GHz	1 GHz – 18 GHz
Radiated emissions	-	4.7	5.1 dB
AC mains conducted emissions	2.1 dB	-	-

### 3.0 System Test Configuration

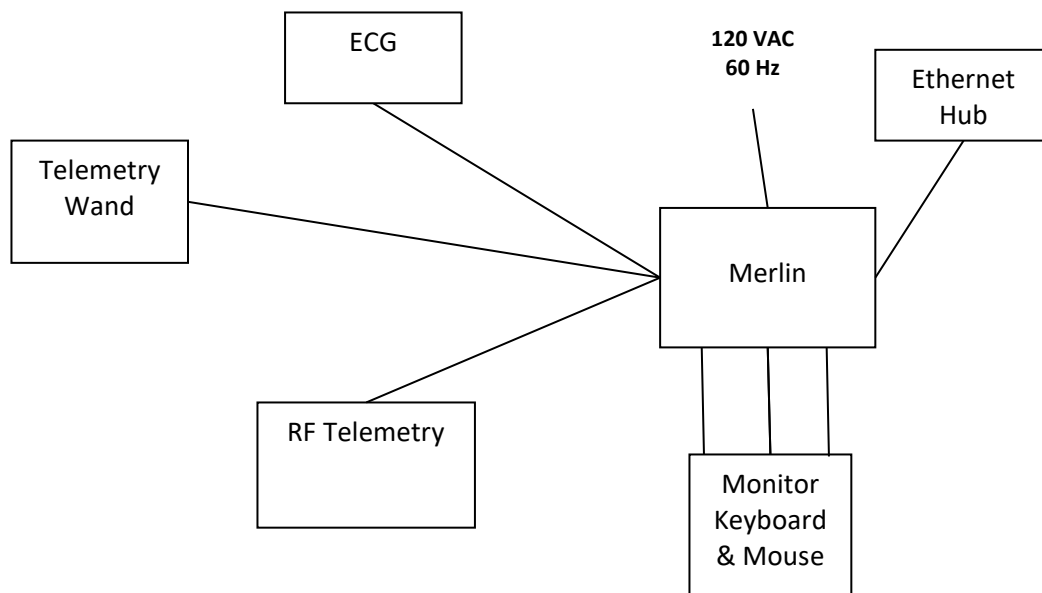
#### 3.1 Support Equipment

Support Equipment		
Description	Manufacturer	Model
Monitor	HP	E273i
Keyboard	Dell	KB4021
Mouse	HP	M-U0031-O
USB Drives x 4	Generic	NA
Ethernet Hub	Netgear	GS105NA

Equipment Under Test			
Description	Manufacturer	Model	Serial Number
Merlin™ 2 PCS	St. Jude Medical	MER3700	124000250
RF Telemetry	St. Jude Medical	Model 3638	010893
RF Wand	St. Jude Medical	Model 3630	Not Marked
ECG	St. Jude Medical	Model 3625	0332530619
Gallant HF Implantable Device	St. Jude Medical	CDHFA500Q	8009662

## 3.2 Block Diagram of Test Setup

The diagram shown below details the interconnection of the EUT and support equipment. For specific layout, refer to the test configuration photograph in the relevant section of this report.



**S** = Shielded  
**U** = Unshielded

**F** = With Ferrite  
**m** = Length in Meters



### 3.3 Justification

For radiated emission measurements the EUT is placed on a non-conductive table. The EUT was configured to continuously transmit.

The 32.768kHz Wand (Inductive Transmitter) was measured on all 3 Axis, X, Y and Z for Radiated Spurious. Data is presented with the worst-case configuration (the configuration which resulted in the highest emission levels).

### 3.4 Software Exercise Program

The Merlin Programmer MER3700 was operating at in following modes:

- a. NFC Mode: The device was continuously transmitting @ 13.56MHz signal with a NFC radio.
- b. BLE/Inductive Coexistence mode: The device is communicating with an implant by initiating the interrogation @32 KHz and then after initial identification of the implant, the continuous wireless communication is enabled @ 2.4 GHz (2402 – 2480 MHz).

### 3.5 Mode of Operation during test

The Merlin™ 2 PCS s was set up to continuously transmitting at 13.56MHz and 32.768kHz simultaneously.

### 3.6 Modifications required for Compliance

No modifications were made by the manufacturer to bring the EUT into compliance.

### 3.7 Additions, deviations and exclusions from standards

No additions, deviations or exclusion have been made from standard.

#### 4.0 Measurement Results

##### 4.1 Field Strength of Fundamental and Radiated Emissions Outside the band

###### 4.1.1 Requirements

###### FCC Rules 15.225

- a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter (84 dBuV) at 30 meters.
- b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

###### §15.209 Radiated emission limits; general requirements.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

#### 4.1.2 Procedure

##### Radiated Measurements Below 30 MHz

During the test the EUT is rotated and the measuring antenna angles are varied during the search for maximum signal level.

Radiated emissions are taken at ten meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Measurements for below 30 MHz were made at 10 meters. Data results below are corrected for distance back to 30 meters.

##### Radiated Measurements Above 30 MHz

During the test the EUT is rotated and the measuring antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at ten meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Measurements for above 30 MHz were made at 10 meters.

Radiated emission measurements were performed from 9kHz to 1 GHz.  
Analyzer resolution is:

200Hz or greater for 9kHz to 150kHz  
9 kHz or greater for 150kHz to 30 MHz  
120 kHz or greater for 30MHz to 1000 MHz  
For those frequencies quasi-peak detector applies

Data includes of the worst-case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

##### Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation is as follows:

$$FS = RA + AF + CF - AG - DCF$$

Where FS = Field Strength in dB ( $\mu\text{V}/\text{m}$ )

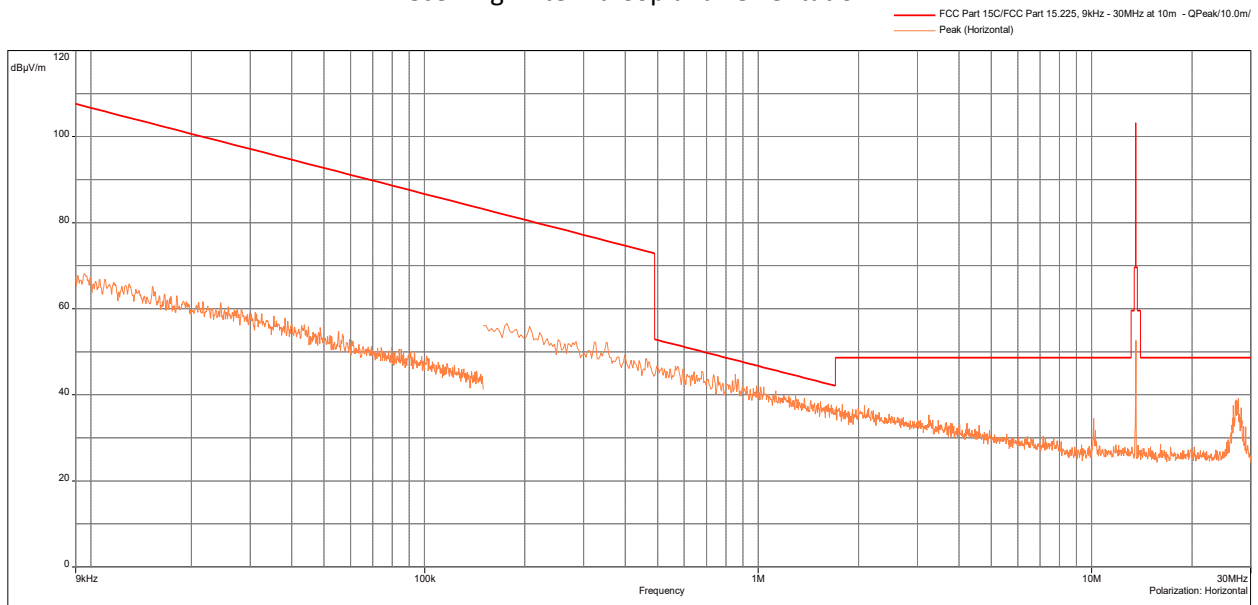
RA = Receiver Amplitude (including preamplifier) in dB ( $\mu\text{V}$ )  
CF = Cable Attenuation Factor in dB  
AF = Antenna Factor in dB (1/m)  
AG = Amplifier Gain in dB  
DCF = Distance Correction Factor

Note: FS was measured with loop antenna below 30MHz

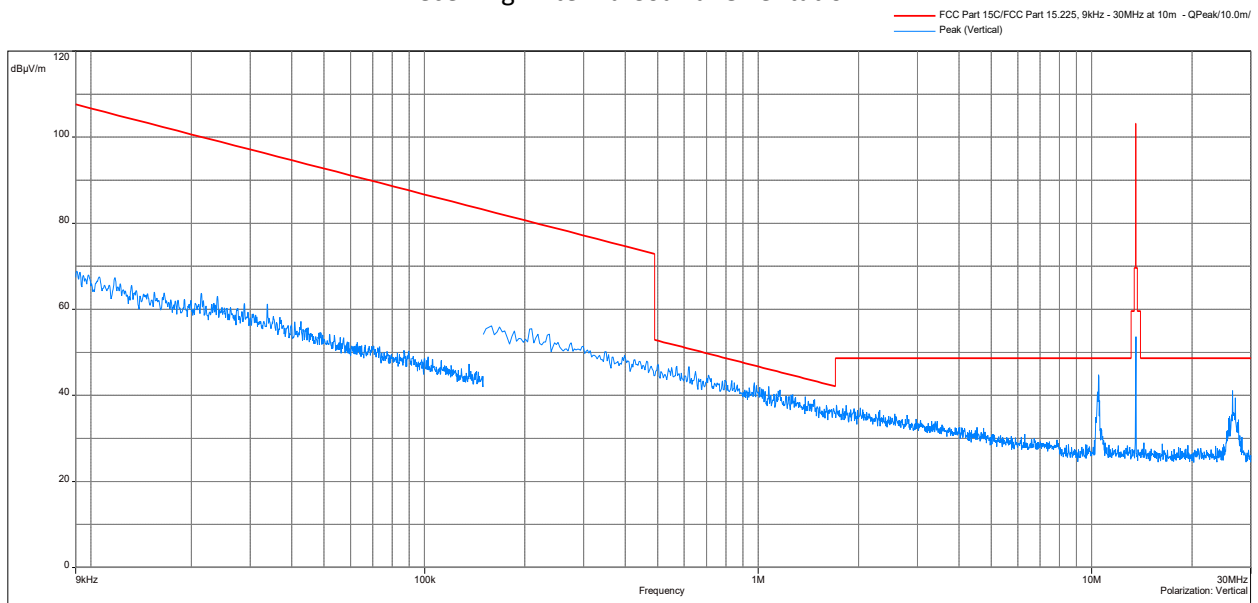
4.1.3 Test Result 15.225 (a) (b) (c) (d) and 15.209

**Radiated Spurious Emissions from 9 kHz to 30MHz**

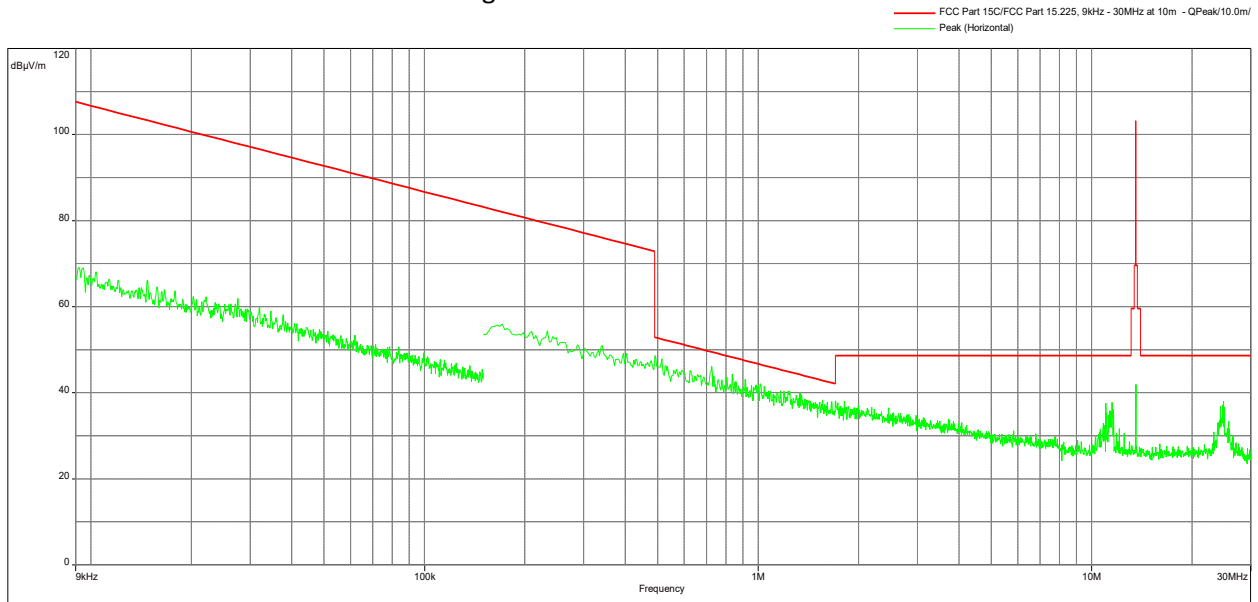
**Receiving Antenna Coplanar Orientation**



**Receiving Antenna Coaxial Orientation**



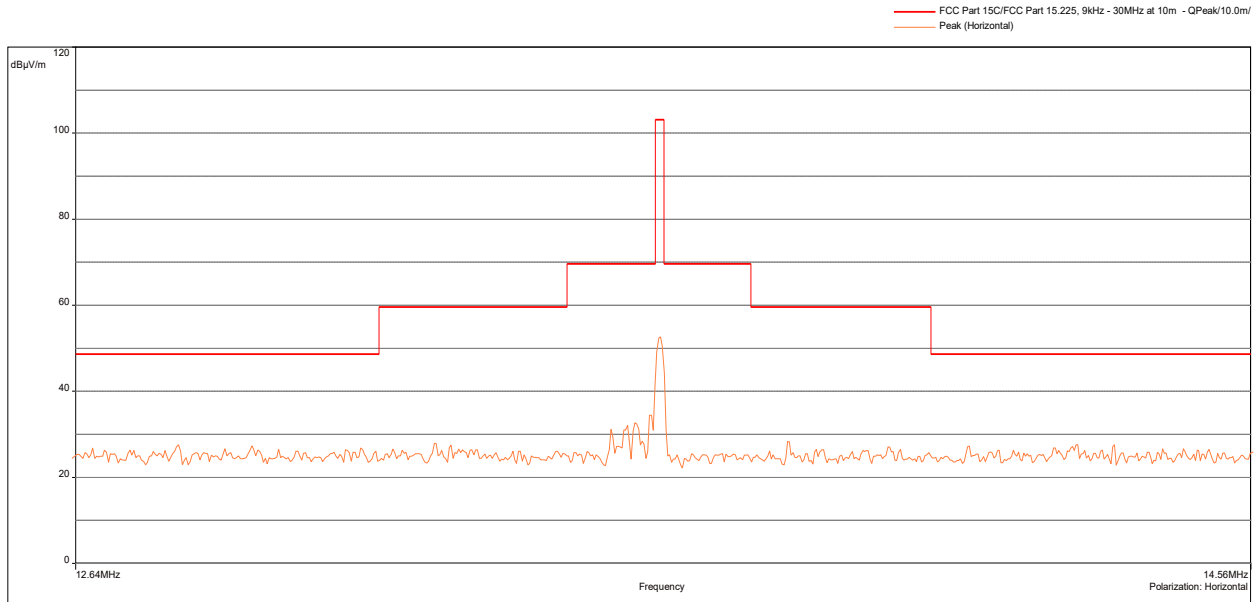
## Receiving Antenna Horizontal Orientation



### Test Result 15.209 Fundamental Emission for 32.768kHz Transmitter

Frequency (MHz)	Peak FS @10m dB(uV/m)	Limit@10m dB(uV/m)	Margin dB	Azumith deg	Comment	Correction dB
0.0327	61.19	96.59	-35.4	251	Coaxial	14.84
0.0327	58.37	96.59	-38.22	212	Coplanar	14.84
0.0327	60.08	96.59	-36.51	101	Horizontal	14.84

**Test Result 15.225 (a)(b)(c) Radiated Spurious Emissions Mask**



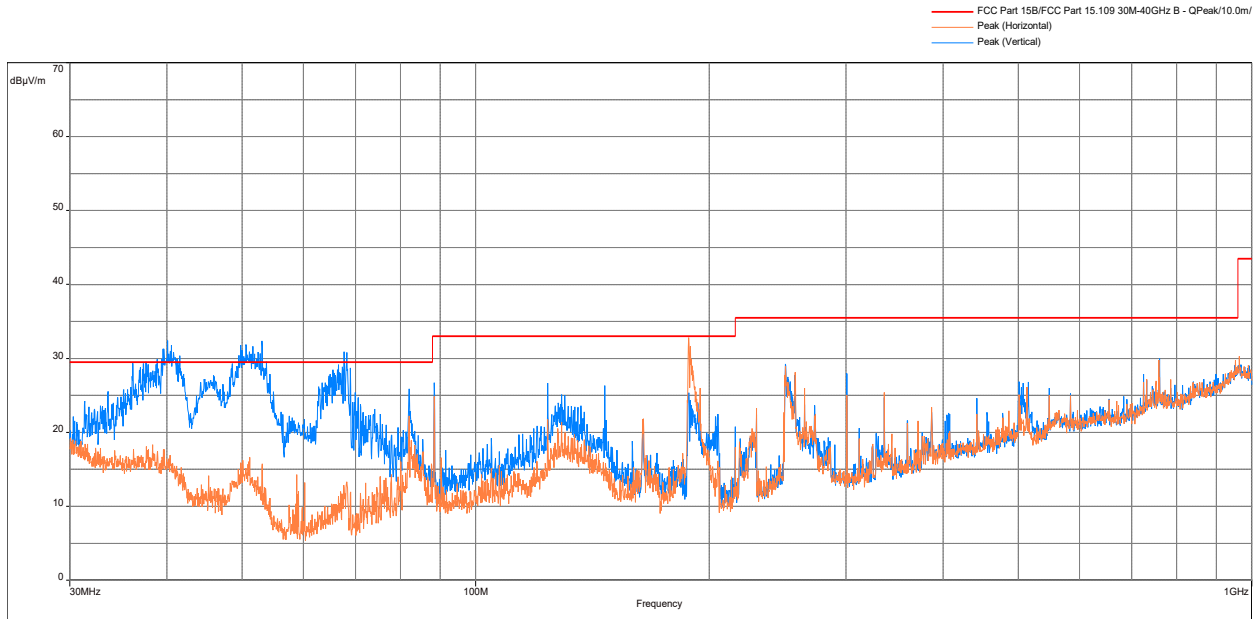
**Test Result 15.225 Fundamental Emission for 13.56MHz Transmitter**

Frequency (MHz)	Peak FS@10m dB(uV/m)	Limit@10m dB(uV/m)	Margin dB	Comment	Correction dB
13.56	53.68	103.1	-49.42	Coplanar	14.93

Note: Correction = AF+CF-AG- distance correction factor

Distance correction factor=40\*log<sub>10</sub>(limit distance/measured distance)

### Radiated Spurious Emissions from 30 to 1000 MHz



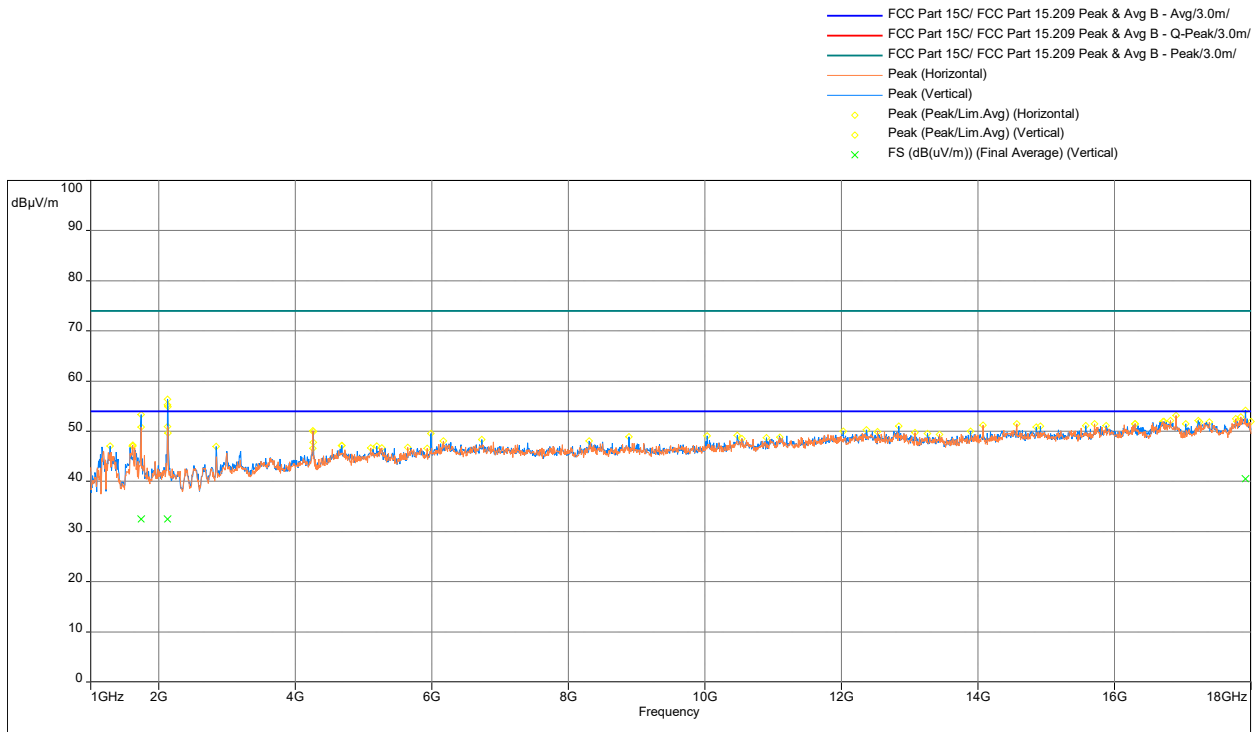
Model: ; Client: ; Comments: ; Test Date: 05/07/2021 11:55

Freq (MHz)	QP FS @10m dB(uV/m)	Limit @10m dB(uV/m)	Margin (dB)	Azimuth (deg)	Height (m)	Polarity	Correction (dB)
39.994	28.77	29.50	-0.73	175	3.02	Vertical	-13.54
53.084	28.82	29.50	-0.68	281	3.27	Vertical	-20.32
67.891	24.04	29.50	-5.46	260	2.18	Vertical	-20.93
82.121	25.88	29.50	-3.62	145	3.12	Vertical	-19.18
88.459	29.87	33.00	-3.13	240	3.88	Vertical	-18.20
188.175	32.82	33.00	-0.18	101	2.99	Vertical	-17.30

Note: FS = RA + Correction

Correction = AF + CF -AG

## Radiated Spurious Emissions from 1 to 18 GHz, Peak Scan vs Avg and Peak Limits



Frequency (MHz)	FS Av (dB(uV/m))	Ave Limit (dB(uV/m))	Ave Margin (dB)	Azimuth (deg)	Height (m)	Polarity	Peak Reading (dBuV)	Correction (dB)
1736.145	32.45	54	-21.55	31	2.84	Vertical	52.94	-16.69
2128.622	32.51	54	-21.49	45	1.58	Vertical	59.03	-14.92
17917.41	40.47	54	-13.53	358	1.76	Vertical	54.07	9.53

Note: FS = RA + Correction

Correction = AF + CF -AG

**Result** Complies by 0.18 dB for 15.209



## 4.2 Frequency Tolerance

### 4.2.1 Requirement FCC 15.225 (e)

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency over a temperature variation of  $-20$  degrees to  $+50$  degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

### 4.2.2 Procedure

The EUT was placed in the temperature chamber. The frequency counter was connected to the transmitter output. The carrier frequency was recorded with the primary supply voltage from 85% to 115% of the rated supply voltage as well as temperature variation.

4.2.3 Test Results 15.225 (e)

Nominal Frequency: 13.5591170 kHz

Voltage (AC)	Temperature (C )	Measured Frequency (kHz)	Deviation (%)	Limit (%)
120	50	13.5591007	-0.0001204	± 0.01
120	40	13.5591050	-0.0000886	± 0.01
120	30	13.5591459	0.0002127	± 0.01
120	20	13.5591170	0.0000000	± 0.01
120	10	13.5591715	0.0004018	± 0.01
120	0	13.5591803	0.0004668	± 0.01
120	-10	13.5592717	0.0011405	± 0.01
120	-20	13.5591531	0.0002659	± 0.01
108	20	13.5591141	-0.0000213	± 0.01
132	20	13.5591076	-0.0000697	± 0.01

<b>Result</b>	<b>Complies</b>
---------------	-----------------

### 4.3 Occupied Bandwidth FCC 15.215

#### 4.3.1 Requirements

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

#### 4.3.2 Procedure

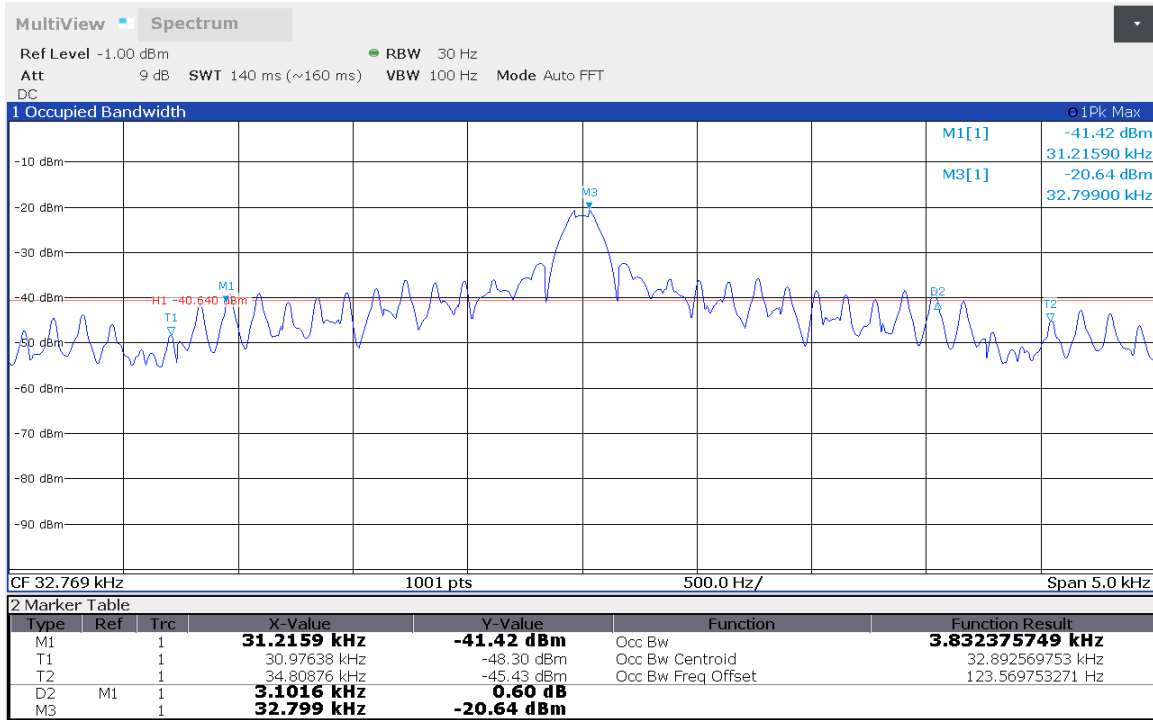
The EUT was setup to transmit in normal operating condition.

Measurements were made with the loop antenna in close proximity of the EUT. Following the procedures of ANSI 63.10: 2013, the 20dB bandwidth measurements were taken. The following plots show Occupied Bandwidth.

## 4.3.3 Test Results

Frequency (kHz)	-20 dB Channel Bandwidth (kHz)	99% Channel Bandwidth (kHz)
32.768	3.10	3.83

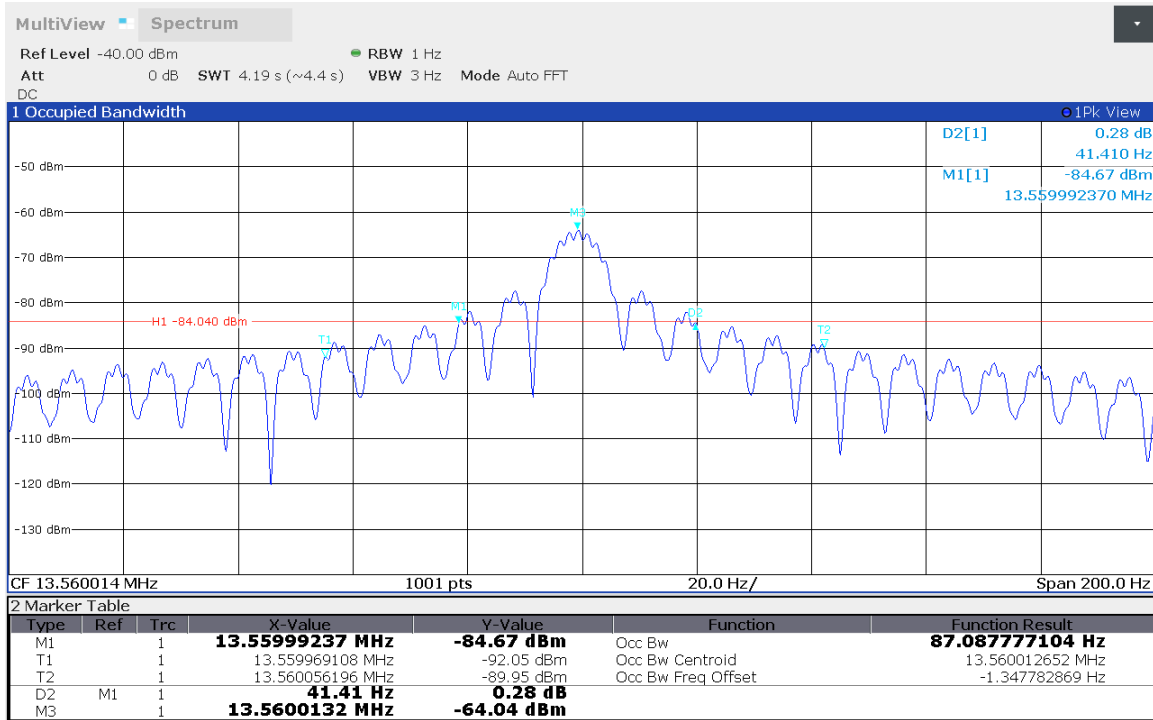
-20dB & 99% Channel Bandwidth Plot



12:31:36 06.05.2021

Frequency (MHz)	-20 dB Channel Bandwidth (Hz)	99% Channel Bandwidth (Hz)
13.56	41.41	87.07

-20dB & 99% Channel Bandwidth Plot



10:44:36 06.05.2021

#### 4.4 Conducted Emissions FCC Part 15 Subpart C 15.207

##### 4.4.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C (15.207) & RSS 210.

**TEST SITE:** 10m ALSE

##### Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucisp
AC Line Conducted Emissions	150 kHz - 30 MHz	2.1 dB	3.4dB

As shown in the table above our radiated emissions  $U_{lab}$  is less than the corresponding  $U_{CISPR}$  reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11.

##### 4.4.2 Procedure:

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. An AMN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

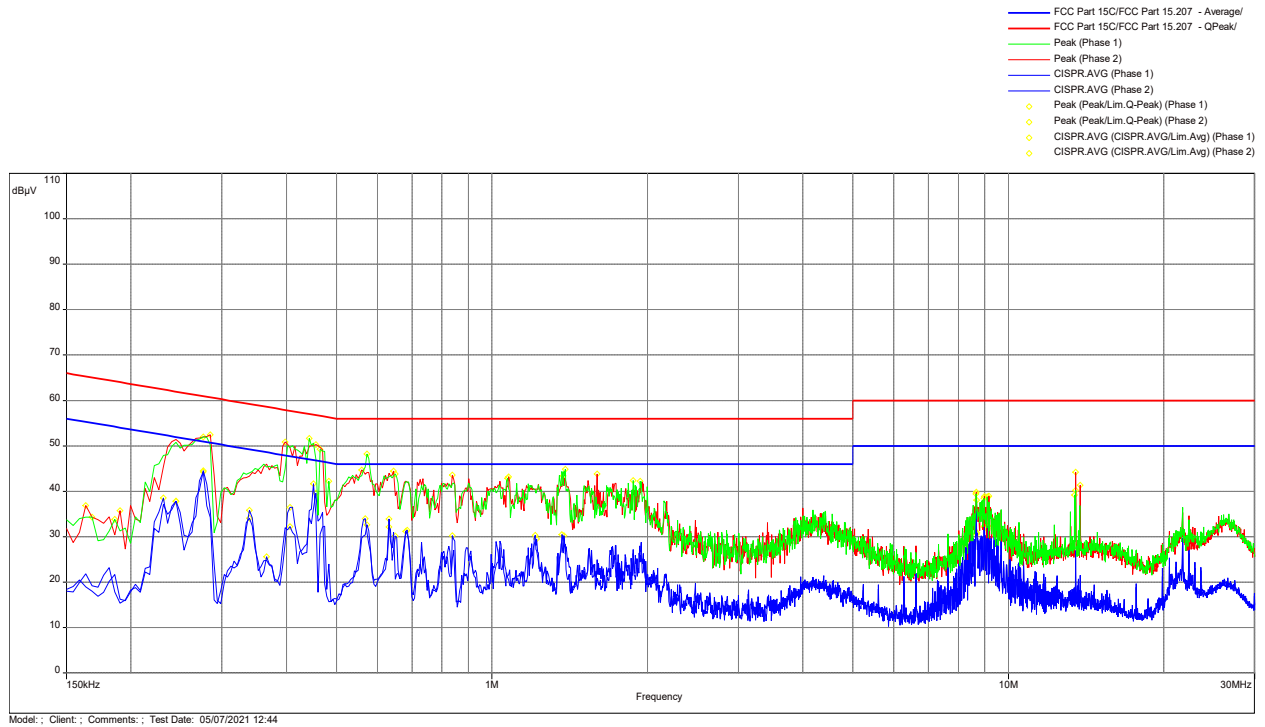
The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

Floor standing EUT are placed on a horizontal metal ground plane and isolated from the ground plane by resting on an insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

EUT was placed in transmission mode then tested for conducted emissions per 15.207 to ensure the device complies with 15.207.

4.4.3 Test Result 15.207

**Conducted Disturbance, 120V 60Hz, 9kHz to 30MHz**



Frequency (MHz)	Peak (dBμV)	Lim.Q-Peak (dBμV)	Margin (dB)	Line	Correction (dB)
0.164	36.87	65.28	-28.41	Phase 2	10.99
0.168	34.32	65.06	-30.74	Phase 1	10.99
0.186	33.83	64.21	-30.38	Phase 1	10.98
0.191	35.76	64.01	-28.26	Phase 2	10.97
0.276	51.98	60.94	-8.95	Phase 1	10.98
0.285	52.42	60.67	-8.25	Phase 2	10.97
0.398	50.86	57.91	-7.05	Phase 2	10.98
0.443	51.66	57.01	-5.36	Phase 1	10.99
0.456	50.29	56.77	-6.48	Phase 2	10.99
0.465	49.22	56.60	-7.38	Phase 1	10.99
0.483	42.20	56.29	-14.09	Phase 1	10.99
0.560	44.67	56.00	-11.33	Phase 2	11.01
0.573	48.25	56.00	-7.75	Phase 1	11.00
0.645	44.45	56.00	-11.55	Phase 2	11.02
0.650	43.79	56.00	-12.21	Phase 1	11.02
0.839	43.55	56.00	-12.45	Phase 2	11.02
1.073	42.88	56.00	-13.12	Phase 1	11.01
1.077	43.17	56.00	-12.83	Phase 2	11.01
1.374	43.38	56.00	-12.62	Phase 2	11.02
1.388	44.88	56.00	-11.12	Phase 1	11.02
1.599	43.80	56.00	-12.20	Phase 2	11.02
1.878	42.38	56.00	-13.62	Phase 1	11.02
1.937	42.26	56.00	-13.74	Phase 1	11.02
8.660	39.41	60.00	-20.59	Phase 1	11.22
8.664	39.82	60.00	-20.18	Phase 2	11.22
8.687	38.09	60.00	-21.91	Phase 1	11.22
8.975	38.45	60.00	-21.55	Phase 1	11.21
8.979	38.89	60.00	-21.11	Phase 2	11.21
9.096	38.76	60.00	-21.24	Phase 1	11.21
9.132	38.69	60.00	-21.31	Phase 2	11.22
9.173	38.92	60.00	-21.08	Phase 2	11.22
13.439	39.15	60.00	-20.85	Phase 1	11.24
13.493	40.22	60.00	-19.78	Phase 1	11.24
13.511	44.18	60.00	-15.82	Phase 2	11.24
13.776	41.32	60.00	-18.68	Phase 2	11.24



Frequency (MHz)	Peak (dBµV)	Lim. Avg (dBµV)	Margin (dB)	Line	Correction (dB)
0.231	38.52	52.41	-13.89	Phase 1	10.98
0.245	37.83	51.94	-14.11	Phase 1	10.98
0.245	37.81	51.94	-14.13	Phase 2	10.98
0.276	44.26	50.94	-6.67	Phase 1	10.98
0.276	44.50	50.94	-6.43	Phase 2	10.98
0.339	35.84	49.23	-13.38	Phase 1	10.98
0.339	34.06	49.23	-15.17	Phase 2	10.98
0.366	25.61	48.59	-22.98	Phase 2	10.98
0.407	36.50	47.72	-11.22	Phase 1	10.99
0.407	32.22	47.72	-15.50	Phase 2	10.99
0.452	41.63	46.85	-5.21	Phase 1	10.99
0.456	39.58	46.77	-7.18	Phase 2	10.99
0.569	33.95	46.00	-12.05	Phase 1	11.00
0.573	32.65	46.00	-13.35	Phase 2	11.00
0.632	33.89	46.00	-12.11	Phase 2	11.02
0.632	32.12	46.00	-13.88	Phase 1	11.02
0.650	30.11	46.00	-15.89	Phase 1	11.02
0.681	31.15	46.00	-14.85	Phase 1	11.03
0.686	31.44	46.00	-14.56	Phase 2	11.03
0.839	30.26	46.00	-15.74	Phase 2	11.02
1.212	30.32	46.00	-15.68	Phase 1	11.01
1.221	29.48	46.00	-16.52	Phase 2	11.01
1.365	30.48	46.00	-15.52	Phase 1	11.02
1.379	30.22	46.00	-15.78	Phase 2	11.02
8.435	30.46	50.00	-19.54	Phase 1	11.23
8.660	36.10	50.00	-13.90	Phase 2	11.22
8.664	35.84	50.00	-14.16	Phase 1	11.22
8.687	30.59	50.00	-19.41	Phase 1	11.22
8.696	30.84	50.00	-19.16	Phase 2	11.22
8.975	32.14	50.00	-17.86	Phase 2	11.21
8.979	32.34	50.00	-17.66	Phase 1	11.21
9.092	31.69	50.00	-18.31	Phase 1	11.21
9.092	31.80	50.00	-18.20	Phase 2	11.21
9.132	32.41	50.00	-17.59	Phase 2	11.22
9.132	32.32	50.00	-17.68	Phase 1	11.22
9.677	31.01	50.00	-18.99	Phase 2	11.23

<b>Result:</b>	<b>Complies by 5.36 dB</b>
----------------	----------------------------

## 5.0 List of test equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model/Type	Asset #	Cal Int	Cal Due
EMI Receiver	Rohde and Schwarz	ESU40	ITS 00961	12	03/09/22
Active Loop Antenna	COM-Power	AL-130R	ITS 01589	12	11/04/21
Active Horn Antenna	ETS-Lindgren	3117-PA	ITS 1636	12	12/17/21
Notch Filter	Micro-Tronics	BRC50702	ITS 01166	12	06/11/21
BI-Log Antenna	Teseq	CBL611D	ITS 01058	12	11/12/21
Pre-Amplifier	Sonoma Instrument	310N	ITS 01714	12	11/13/21
RF Cable	TRU Corporation	TRU CORE 300	ITS 01462	12	09/01/21
RF Cable	TRU Corporation	TRU CORE 300	ITS 01465	12	09/01/21
RF Cable	TRU Corporation	TRU CORE 300	ITS 01470	12	09/01/21
RF Cable	TRU Corporation	TRU CORE 300	ITS 01342	12	09/01/21
RF Cable	Mega Phase	EMC1-K1K1-236	ITS 01538	12	06/12/21
RF Cable	Mega Phase	TM40-K1K1-19	ITS 01654	12	07/04/21
Spectrum Analyzer	Rohde and Schwarz	FSW43	ITS 01818	12	07/09/21
Loop Sensor	Solar Electronics	7334-1	ITS 01608	12	11/10/21
Temperature Chamber	ESPEC	BTX-475	ITS 01436	12	10/20/21
Transient Limiter	Com-Powwer	LIT-153A	ITS 01457	12	11/13/21
LISN	Fischer Custom Communication	FCC-LISN-50-50-M-H	ITS 00551	12	11/16/21

Software used for emission compliance testing utilized the following:

Name	Manufacturer	Version	Template/Profile
BAT-EMC	Nexio	3.20.0.14	Abbott_Merlin.bpp
RS Commander	Rohde Schwarz	1.6.4	Not Applicable (Screen grabber)

## 6.0 Document History

Revision/ Job Number	Writer Initials	Reviewer Initials	Date	Change
1.0 / G104663935	AS	KV	May 17, 2021	Original document
1.1 / G104663935	AS	KV	May 04, 2022	Updated antenna information, company name and contact information.

**END OF REPORT**