



FCC Part 15, Subpart C, Section 15.247
Test Report

On

900 MHz Transceiver Housed in a Digital Clock
FCC ID: R73MOD-900-1

Customer Name: The Sapling Company, Inc.

Customer P.O.: 0021538

Date of Report: March 24, 2021

Test Report No: R-3362P-1

Test Start Date: January 29, 2021

Test Finish Date: March 24, 2021

Test Technician: D. Murphy, V. Desai, M. Nowak

Reviewed By: C. Reitz

Approved By: D. Rybicki

Report Prepared By: B. Bolton



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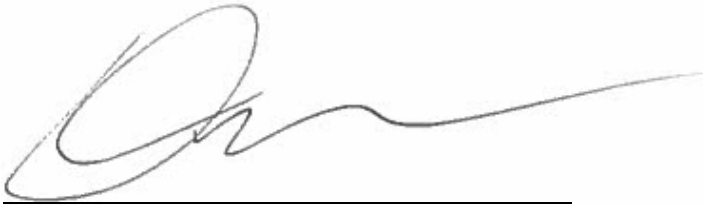


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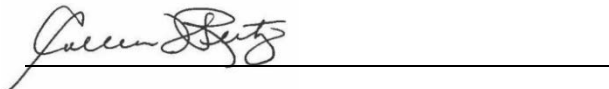
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Certification and Signatures

We certify that this report is a true representation of the results obtained from the tests of the equipment stated. We further certify that the measurements shown in this report were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.



David M. Rybicki
Laboratory Supervisor



Colleen T. Reitz
Chief of Documentation Innovation and Compliance

Non-Warranty Provision

The testing services have been performed, findings obtained and reports prepared in accordance with generally accepted laboratory principles and practices. This warranty is in lieu of all others, either expressed or implied.

Non-Endorsement

This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation, endorsement or certification of the product or material tested. This report must not be used by the client to claim product endorsement by ANSI National Accreditation Board (ANAB).



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Revision History

Revisions to this document are listed below; the latest revised document supersedes all previous issues of this document.

Revision	Date	Pages Affected
-	March 24, 2021	Original Release



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Report No. R-3362P-1

Technical Information

Report Number:	R-3362P-1
Customer:	The Sapling Company, Inc..
Address:	670 Louis Drive
	Warminster, PA 18974
Manufacturer:	The Sapling Company, Inc..
Manufacturer Address:	670 Louis Drive
	Warminster, PA 18974
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
FCC ID:	R73MOD-900-1
Power Requirements:	120 VAC, 60 Hz
Frequency of Operation:	902 – 928 MHz
Equipment Class:	FHSS
Equipment Use:	Fixed

Test Specification:

FCC Rules and Regulations Part 15, Subpart C, Section 15.247

Test Procedure:

ANSI C63.4:2014

ANSI C63.10:2013

Test Facility:

Retlif Testing Laboratories

3131 Detwiler Road

Harleysville, PA 19438

FCC Accreditation Designation Number: US2321



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Tests Performed

The test methods performed on the 900 MHz Transceiver Housed in a Digital Clock are shown in Table 1 below:

Table 1 – Test Methods

FCC Part 15, Subpart C	Test Method
15.247 (a)(1)	Channel Separation
15.247(a)(1)(i)	Occupied Bandwidth
	Number of Channels
	Occupancy Time
15.247(b)(2)	Peak Conducted Output
15.247(d)	Antenna Port, Conducted Emissions
15.247(d)	Out of Band / Band Edge Radiated Emissions, 9 kHz to 25 GHz
15.207(a)	Conducted Limits, 150 kHz to 30 MHz
15.209(a)	Field Strength of Spurious Emissions

Decision Rule:

The following decision rule was applied to the measurements obtained and results reported in this test report in accordance with Retlif Testing Laboratories Quality Procedure RQP-005:

Emissions:

- Complied: Acceptance based on simple acceptance; the measurement result being at or below the acceptance limit.
- Did Not-Comply: Rejection based on simple acceptance; the measurement result being above the acceptance limit.



All test methods listed above are included in Retlif Testing Laboratories ANSI National Accreditation Board (ANAB), ISO/IEC 17025 Scope of Accreditation, Certificate Number: L2320.02.



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Requirements and Test Results

FCC Section 15.247(a)(1)(i), Occupied Bandwidth, 20dB

The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

- Results:
The EUT 20 dB bandwidth was 78.333 kHz.

FCC Section 15.247(a)(1), Channel Separation

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals

- Results:
The EUT complies with the channel separation requirement above. The channel separation was measured to be 256.112 kHz.

FCC Section 15.247(a)(1)(i), Number of Channels

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies.

- Results:
The EUT complies with the number of channels requirement above. The number of channel frequencies is 51.

FCC Section 15.247(a)(1)(i), Occupancy Time

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

- Results:
The EUT complies with the Occupancy time requirements above. The total occupancy time within a 20 second period was measured to be 0.31 seconds.

FCC Sections 15.247(b)(2), Peak Conducted Output

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels.

- Results:
The EUT complies with the Power Output requirement. The maximum peak output power was measured and was found to be 9.68 mW.



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Requirements and Test Results (con't)

FCC Section 15.247(d), Out of Band Emissions

Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) must also comply with the radiated emissions limits specified in Section 15.209(a) (see Section 15.205(c)).

- Results:

In any 100 kHz bandwidth outside the frequency band in which the Spread spectrum intentional radiator was operating, the radio frequency power that was produced by the intentional radiator was at least 20 dB below that in the 100 kHz bandwidth within the band that contained the highest level of the desired power. All emissions, which fell within the restricted bands specified in 15.205(a), were measured and found to be in compliance with the limits specified in 15.209(a).

FCC Section 15.209(a), Field Strength of Spurious Emissions

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in Table 2.

Table 2 - Radiated Emission Limits

Frequency of Emission (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 to 88	100	3
88 to 216	150	3
216 to 960	200	3
Above 960	500	3

- Results:

The field strength of spurious radiated emissions did not exceed the limits specified in Table 2.



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FCC Section 15.207(a), Conducted Limits

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits shown in Table 3, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of the paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Table 3 - Conducted Emission Limits

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50
*Decreases due to logarithm of the frequency		

- Results:
The conducted emissions observed did not exceed the limits specified in Table 3.



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Requirements and Test Results (con't)

Field Strength Calculation/Conversion:

The maximized field strength of the emission was obtained as follows:

$$C_R = M_R + C_F$$

Where:

C_R = Corrected Reading in dB μ V/m

M_R = Uncorrected Meter Reading in dB μ V

C_F = Correction Factor in dB (Antenna Factor, Pre-amp + Cable Loss)

Example:

$$M_R = 15.35 \text{ dB}\mu\text{V}$$

$$C_F = 16.85 \text{ dB}$$

$$C_R = 15.35 \text{ dB}\mu\text{V} + 16.85 = 32.2 \text{ dB}\mu\text{V/m}$$

dB μ V/m is converted to μ V/M for comparison to the specified limit using the formula:

$$\text{invLog dB}\mu\text{V/M}/20$$

$$32.2 \text{ dB}\mu\text{V/m} = 40.74 \text{ }\mu\text{V/m}$$

RF Power Conversion:

Power readings in dBm may be converted to mW using the formula:

$$\text{InvLog dBm}/10$$

$$\text{Example: } 20\text{dBm} = 100\text{mW}$$



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Requirements and Test Results (con't)

FCC Section 15.247 (i), RF Exposure Limits

Spread Spectrum Transmitters operating under 15.247 must be operated in a manner that ensures the public is not exposed to RF energy levels in excess of the commission's guidelines. Based on the transmitter power and maximum antenna gain (see calculation below) the minimum separation distance was calculated to determine the distance for acceptable MPE power density levels to meet both the Occupational/Controlled Exposure and the General Population/Uncontrolled Exposure requirements of FCC Part 1.1310. The calculation below uses the more stringent General Population MPE Limits.

$$S = \frac{PG}{4\pi D^2}$$

D = Minimum Separation Distance in cm

S = Max allowed Power Density in mW/cm²

Per 1.1310 For the frequency range of 914.0 – 927.5 MHz S = 0.61 – 0.62 mW/cm²

Power (P) = Max power Input to Antenna = 10.66 mW

Gain (G) = Max Power Gain of Antenna = 5.14 dBi = 3.27 numeric

$$0.61\text{mW/cm}^2 = \frac{10.66 \times 3.27}{4\pi \times D^2} = \frac{34.86}{12.57 \times D^2}$$

$$D^2 = 4.55$$

$$D = 2.13 \text{ cm}$$



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Spectrum Analyzer Desensitization Considerations

Due to the nature of the emissions being measured, care was taken to ensure that the resolution bandwidth of the spectrum analyzer was adequate to provide accurate measurements. FCC specified bandwidths of 100 kHz and 1 MHz were utilized below and above 1 GHz, respectively.

General Notes

1. All radiated readings were taken utilizing a detector function specified on each data sheet at a test distance of 3 meters.
2. All measurements for were made with the device powered by 120 VAC, 60 Hz.
3. The frequency range was scanned as specified in each method. For radiated measurements all emissions not reported were more than 20 dB below the specified limit.



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Equipment List

FCC Section 15.247(a)(1), Occupied Bandwidth, Channel Separation, Number of Channels, and Occupancy Time

FCC Section 15.247(b)(2), Peak Conducted Output FCC Section 15.247(d), Antenna Port, Conducted Emissions

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1828	STORM	CABLE, COAXIAL	10 kHz - 18 GHz	MFR57500	1/21/2021	1/31/2022
713	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 26.5 GHz	ESIB26	3/19/2020	3/31/2021
8558	NARDA MICROWAVE	ATTENUATOR, COAXIAL	20 dB, DC - 11 GHz, 20W	768-20	5/14/2020	5/31/2021
8619	OMEGA	HYGROMETER	-20 to 70 deg. C, 0-99% RH	OM-73	3/16/2020	3/31/2021

FCC Section 15.247(d), Field Strength of Spurious Emissions

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
713D	MICRO-COAX	CABLE, COAXIAL	3 FT.	UFB311A1-0360-50U50U	10/8/2020	10/31/2021
713E	MICRO-COAX	CABLE, COAXIAL	6 FEET	UFB311A1-0720-50U50U	10/8/2020	10/31/2021
8017	ETS / EMCO	ANTENNA, DOUBLE RIDGED GUIDE	1 - 18 GHz	3115	12/2/2019	6/30/2021
8300	RETLIF	OPEN AREA TEST SITE, ATTENUATION	3/10 Meter OATS	RPA	5/7/2020	5/31/2022
8317	AGILENT / HP	PRE-AMPLIFIER	1 - 26.5 GHz, 30 dB	8449B	11/20/2020	5/31/2021
8637	AGILENT/HP	ANALYZER, SPECTRUM	30 Hz - 26.5 GHz	8563E	12/29/2020	12/31/2021
8668	DIGI-SENSE	HYGROMETER	0 - 50 deg. c, 10 - 90 % RH	20250-31	9/9/2020	9/30/2021

FCC Section 15.207(a), Conducted Limits

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
8079	ROHDE & SCHWARZ	RECEIVER, EMI	9 kHz - 30 MHz	ESH3	6/24/2020	6/30/2021
8366A	RETLIF	CABLE, COAXIAL	10 KHz - 1 GHz	20' BNC	5/14/2020	5/31/2021
8496	NARDA MICROWAVE	ATTENUATOR, COAXIAL	10 dB, DC - 11 GHz, 20 W	768-10	6/2/2020	6/30/2021
8619	OMEGA	HYGROMETER	-20 to 70 deg. C, 0-99% RH	OM-73	3/16/2020	3/31/2021
8633	SOLAR ELECTRONICS	LISN	50 uH, 150 kHz - 30 MHz	21106-50-BP-25-BNC	6/22/2020	6/30/2021
8634	SOLAR ELECTRONICS	LISN	50 uH, 150 kHz - 30 MHz	21106-50-BP-25-BNC	6/22/2020	6/30/2021
8689	COM-POWER	GENERATOR, COMB	100 kHz - 400 MHz	CGC-510E	8/17/2020	8/31/2021
8750	RIGOL	ANALYZER, SPECTRUM	9 kHz - 3.2 GHz	DSA832E	5/18/2020	5/31/2021



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FCC 15.247(a)(1)
Test Data, Channel Separation



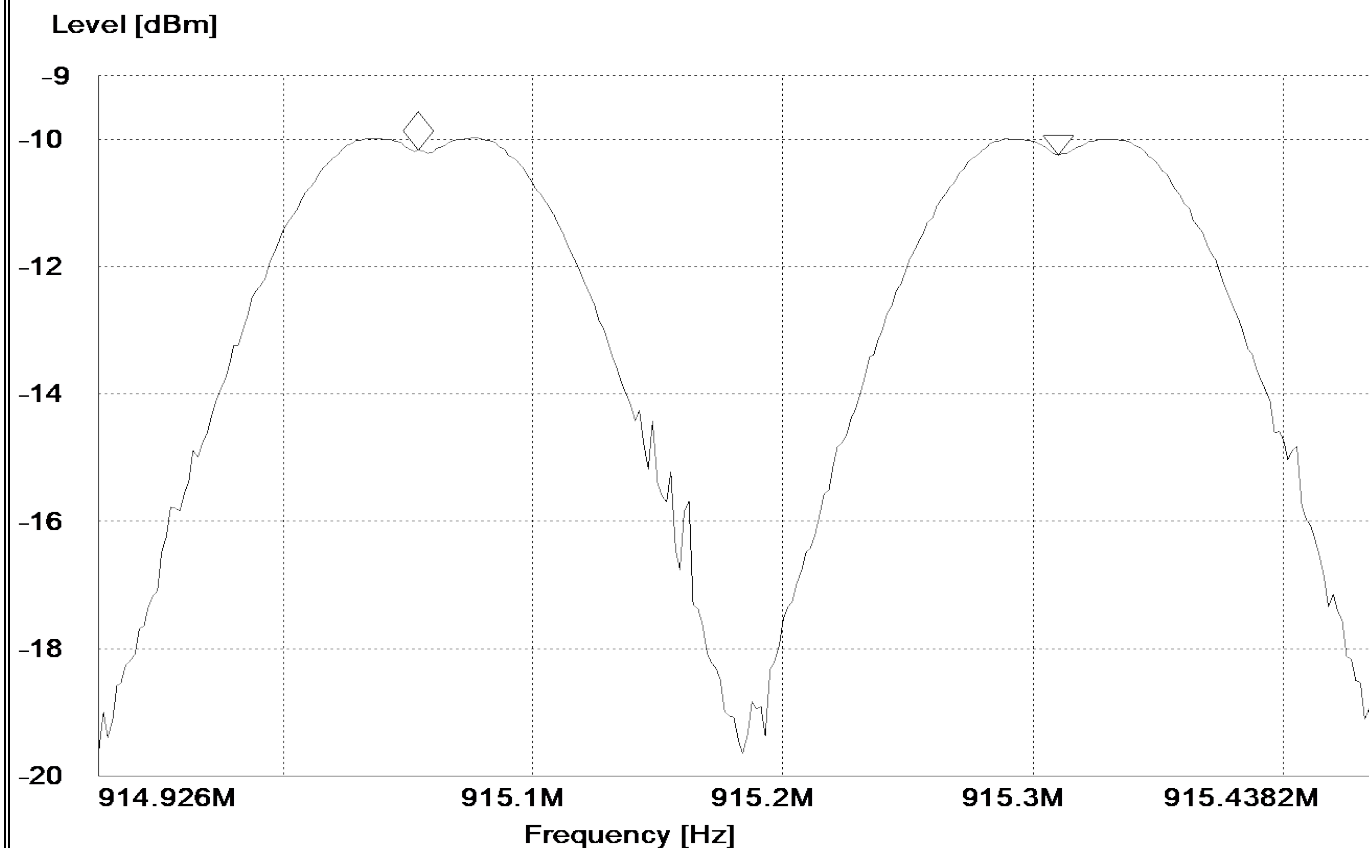
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EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(a)(1)
Method:	Channel Separation
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting
Technician:	M. Nowak
Date(s):	01/29/2021

Marker: 915.054108 MHz -10.17 dBm
Delta Mk: 256.112 kHz -0.08 dB



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FCC 15.247(a)(1)(i)
Test Data, Occupied Bandwidth, 20 dB

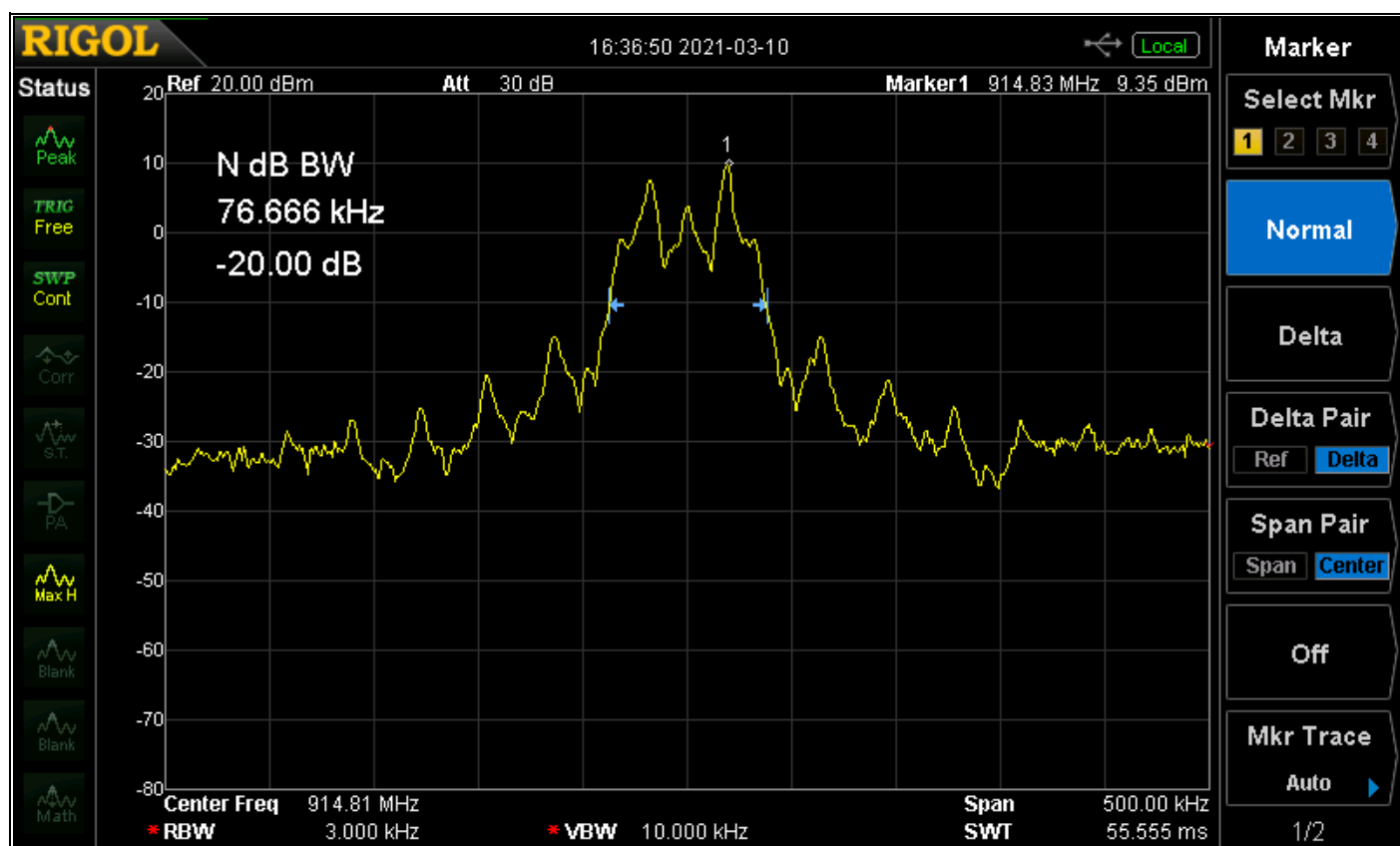


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Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(a)(1)(i)
Method:	Occupied Bandwidth, 20dB
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 914.81 MHz
Technician:	D. Murphy
Date(s):	03/10/2021

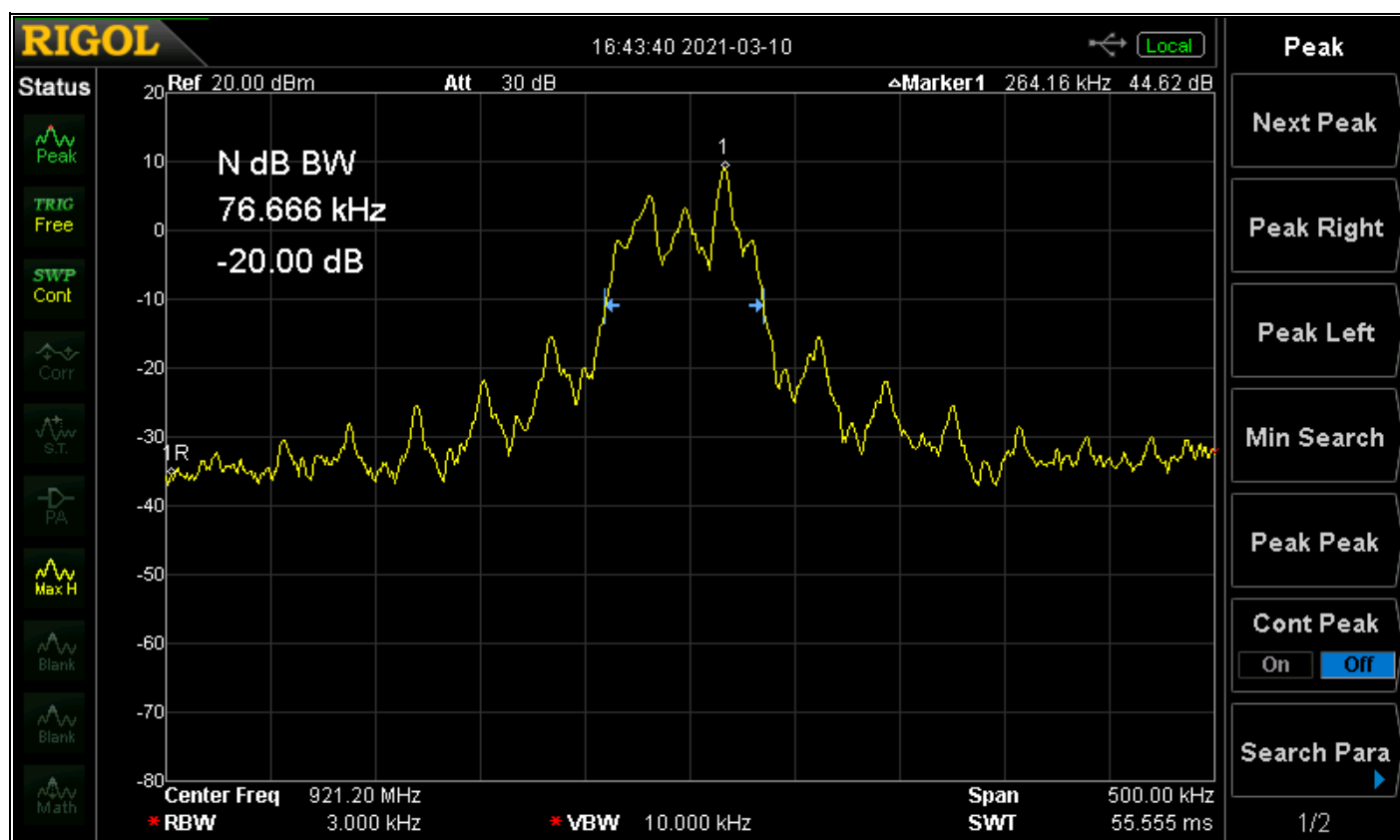


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Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(a)(1)(i)
Method:	Occupied Bandwidth, 20dB
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 921.2 MHz
Technician:	D. Murphy
Date(s):	03/10/2021

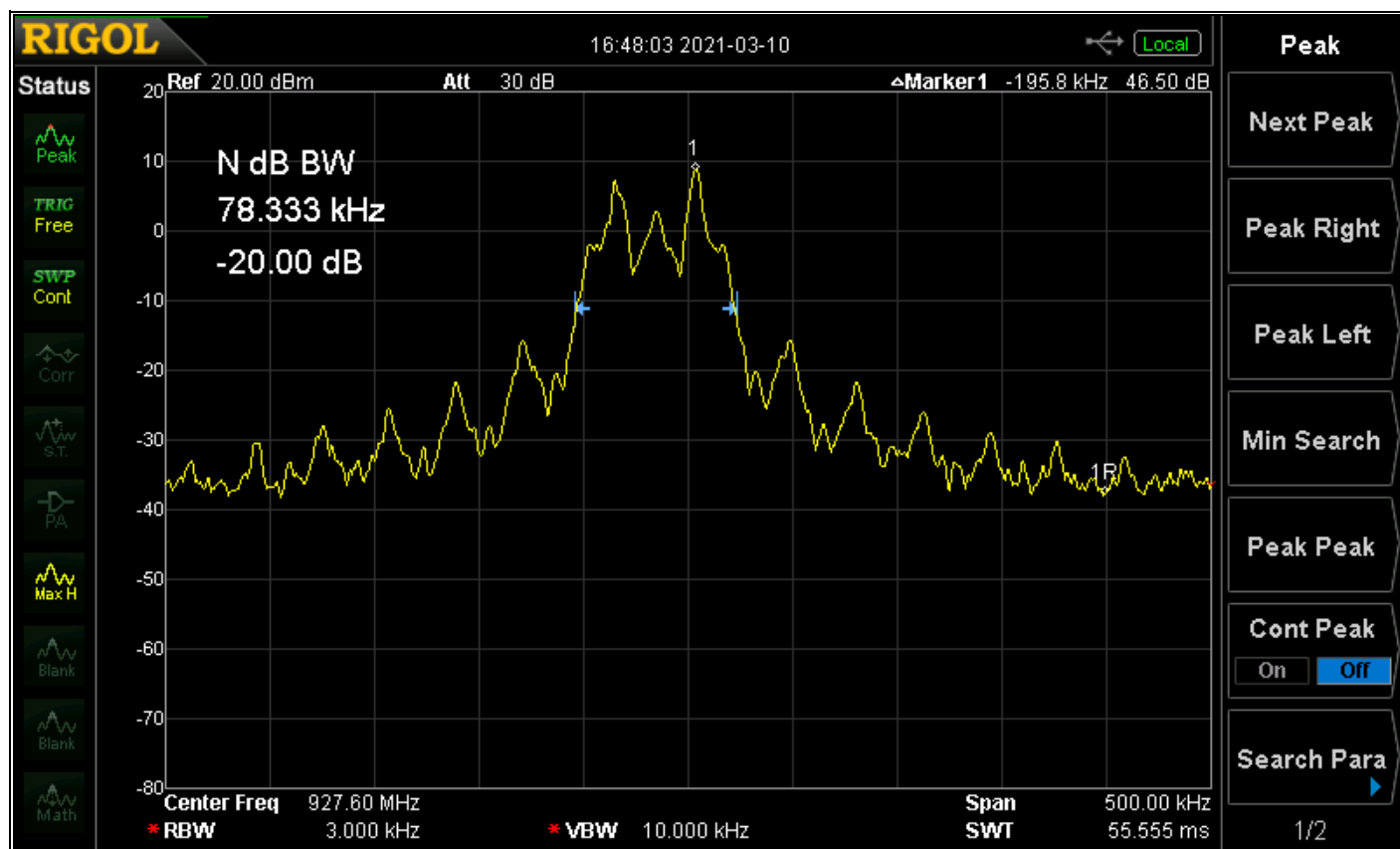


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Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(a)(1)(i)
Method:	Occupied Bandwidth, 20dB
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 927.56 MHz
Technician:	D. Murphy
Date(s):	03/10/2021



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FCC 15.247(a)(1)(i)
Test Data, Number of Channels



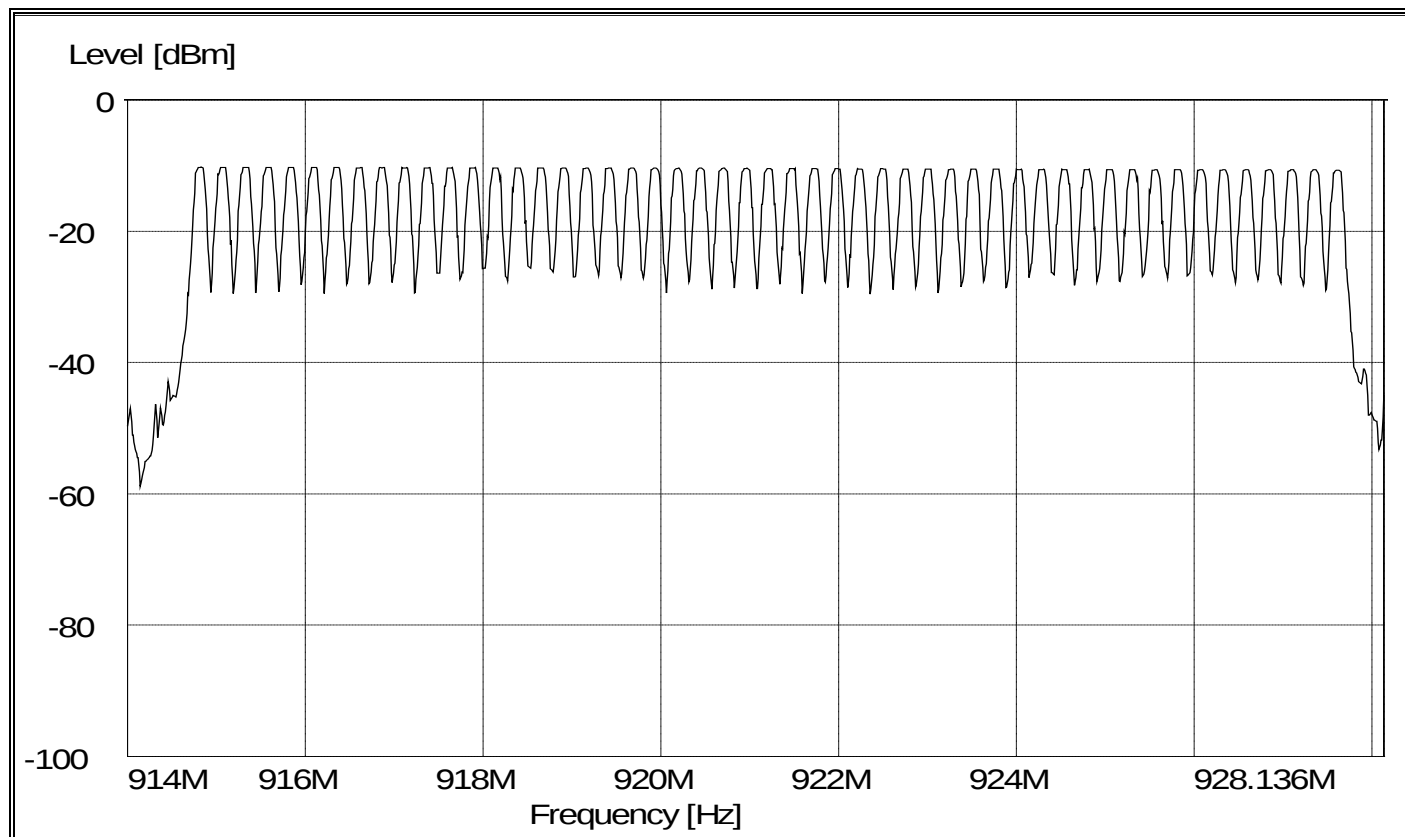
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Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(a)(1)(i)
Method:	Number of Channels
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting
Technician:	V. Desai
Date(s):	02/18/2021

Note: 51 total channels



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FCC 15.247(a)(1)(i)
Test Data, Occupancy Time

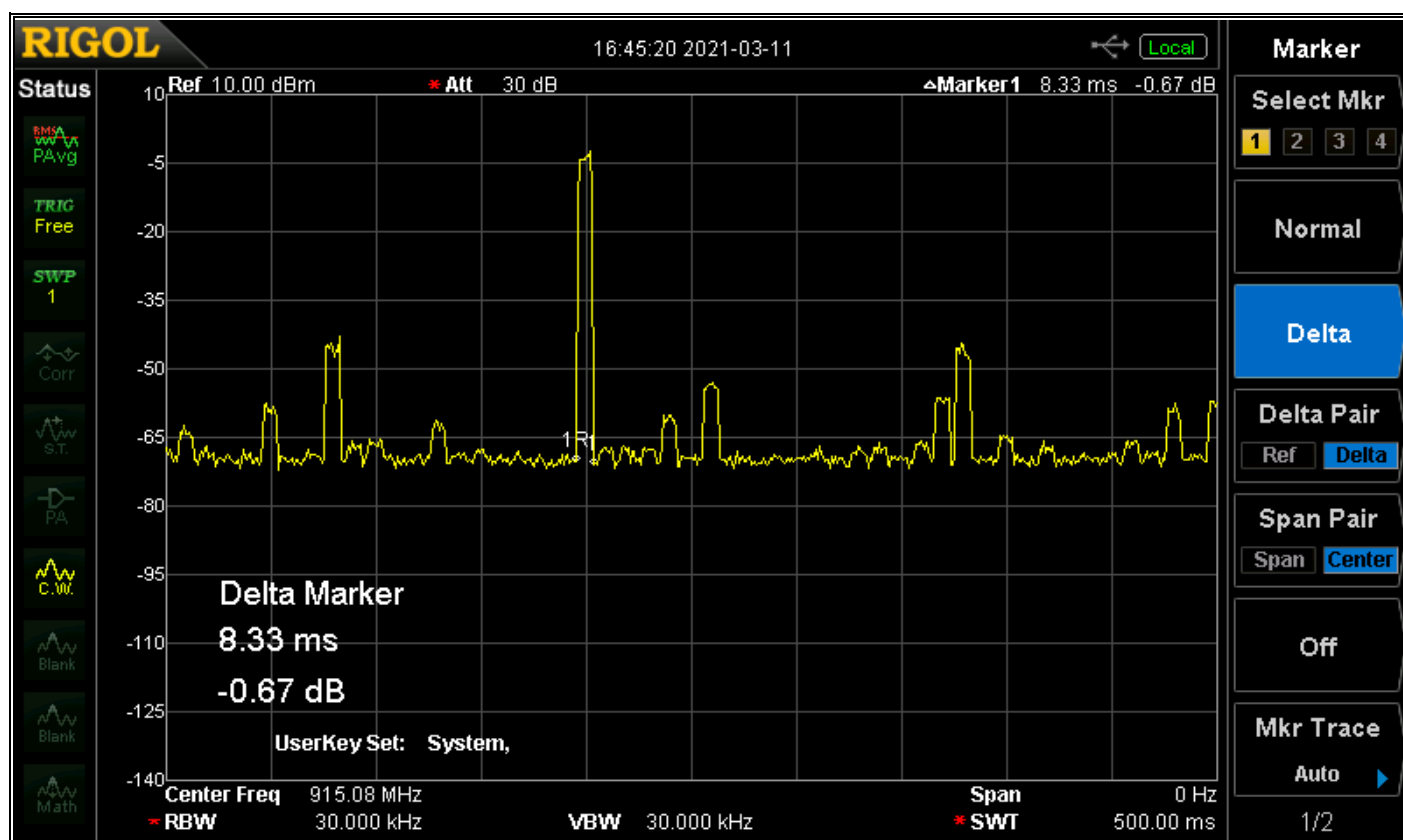


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Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(a)(1)(i)
Method:	Occupancy Time
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting
Technician:	D. Murphy
Date(s):	03/11/2021



8.33 ms Pulse width

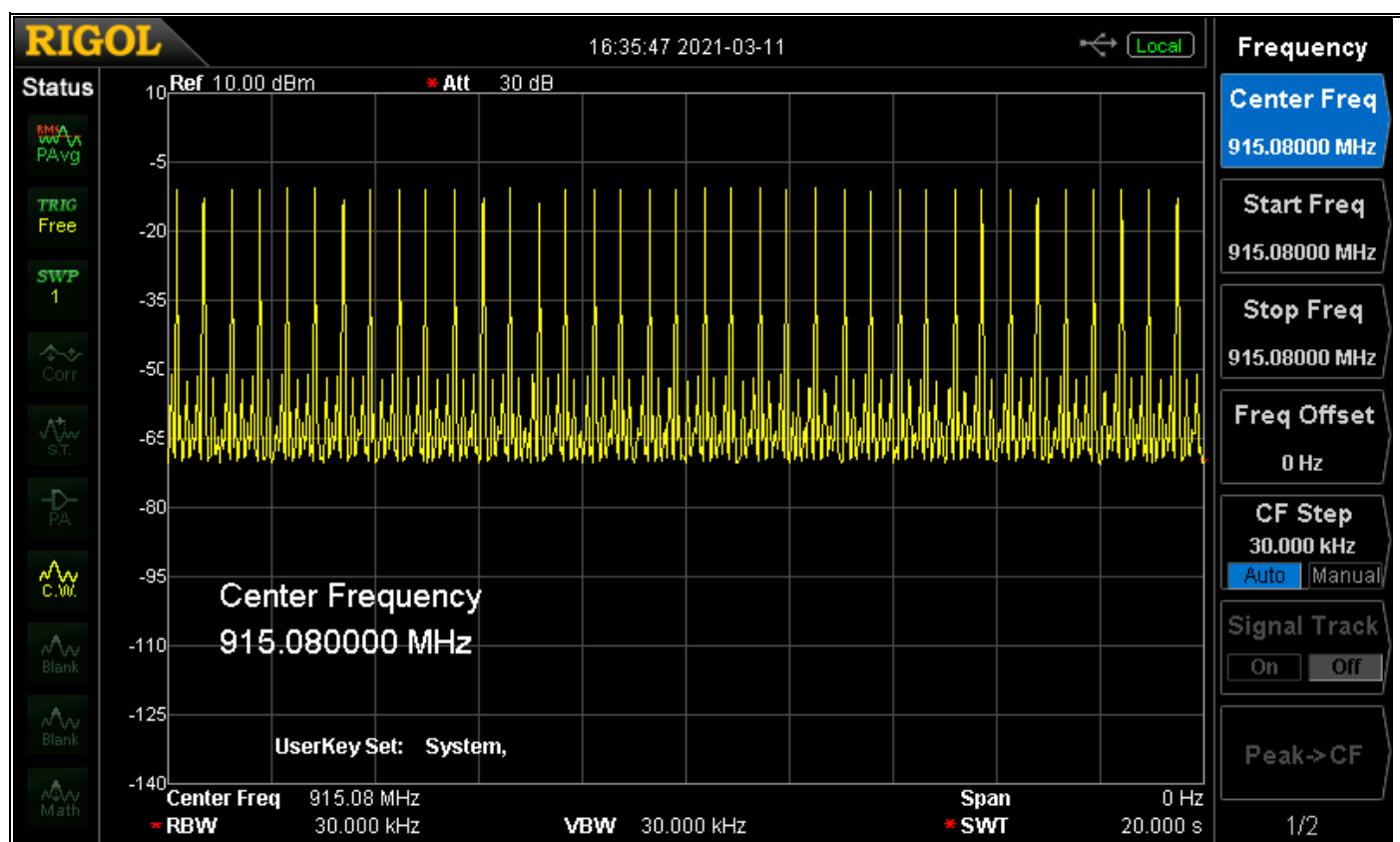


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Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(a)(1)(i)
Method:	Occupancy Time
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting
Technician:	D. Murphy
Date(s):	03/11/2021



37 Pulses within 20 seconds

The transit time per hop is measured at 8.33 msec with 37 pulses per 20 seconds
 $8.33 \text{ msec} \times 37 = 308.21 \text{ msec}$



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FCC 15.247(b)(2)
Test Data, Peak Conducted Output



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EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(b)(2)
Method:	Peak Conducted Output
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at frequency specified below
Technician:	D. Murphy
Date(s):	03/24/2021

Channel	Frequency	Power Output Measured	Correction Factor	Power Output Corrected	Power Output	Limit
	MHz	dBm	dB	dBm	mW	mW
Low	914.786	-9.92	20.2	10.28	10.66	1000
Middle	921.173	-10.06	20.2	10.14	10.33	1000
High	927.564	-10.91	20.2	9.29	8.49	1000

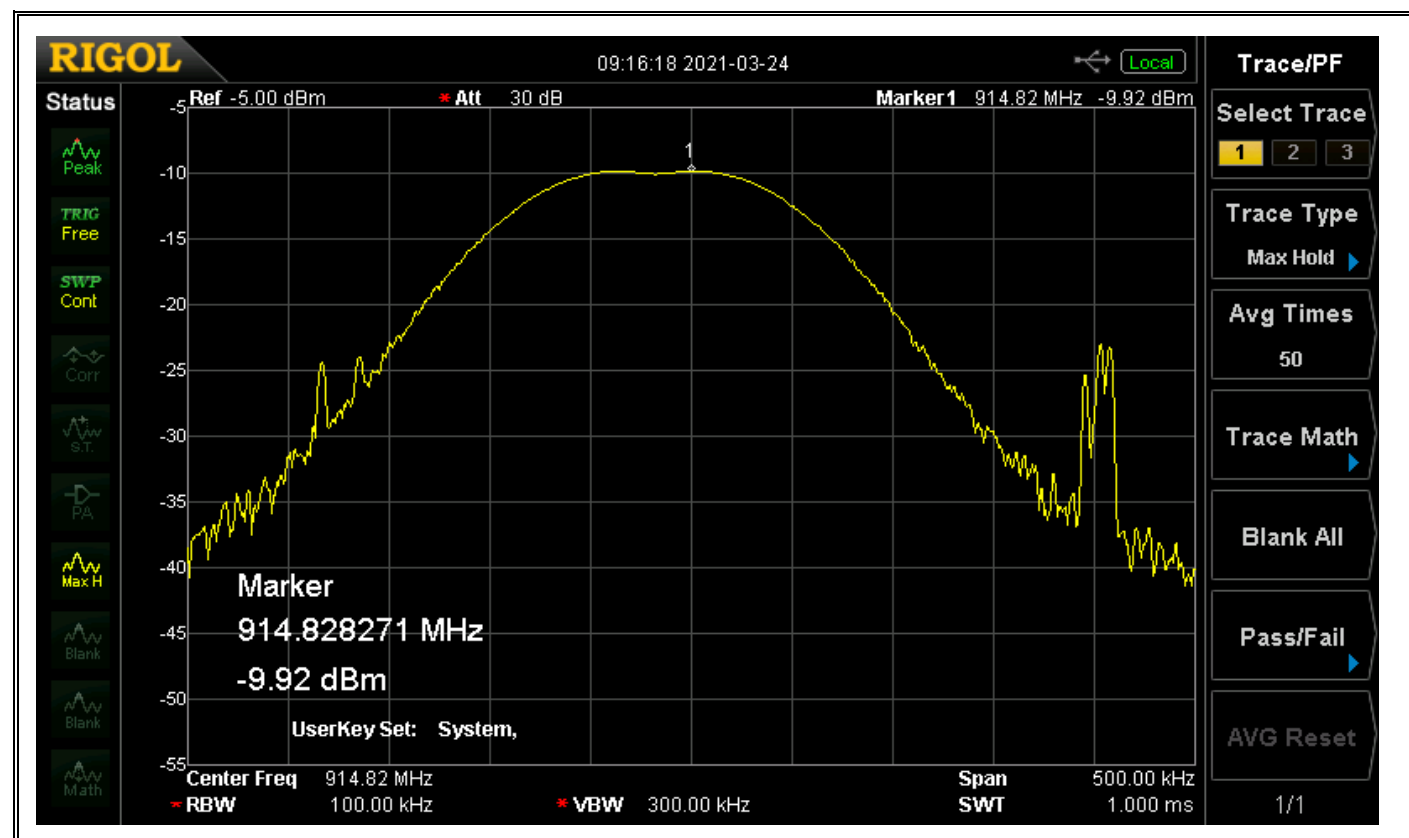


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Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(b)(2)
Method:	Peak Conducted Output
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 914.786 MHz
Technician:	D. Murphy
Date(s):	03/24/2021

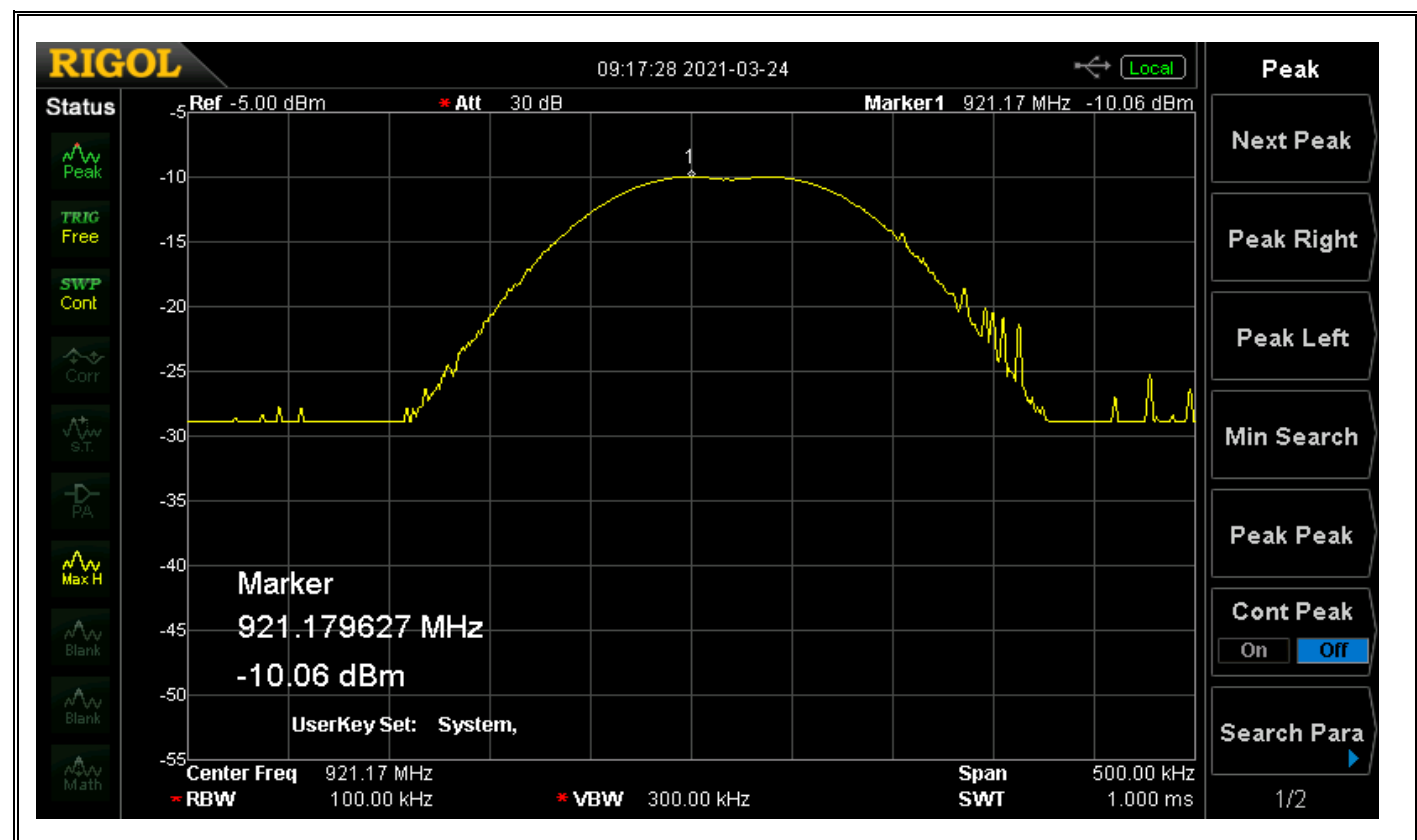


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Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(b)(2)
Method:	Peak Conducted Output
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 921.17 MHz
Technician:	D. Murphy
Date(s):	03/24/2021

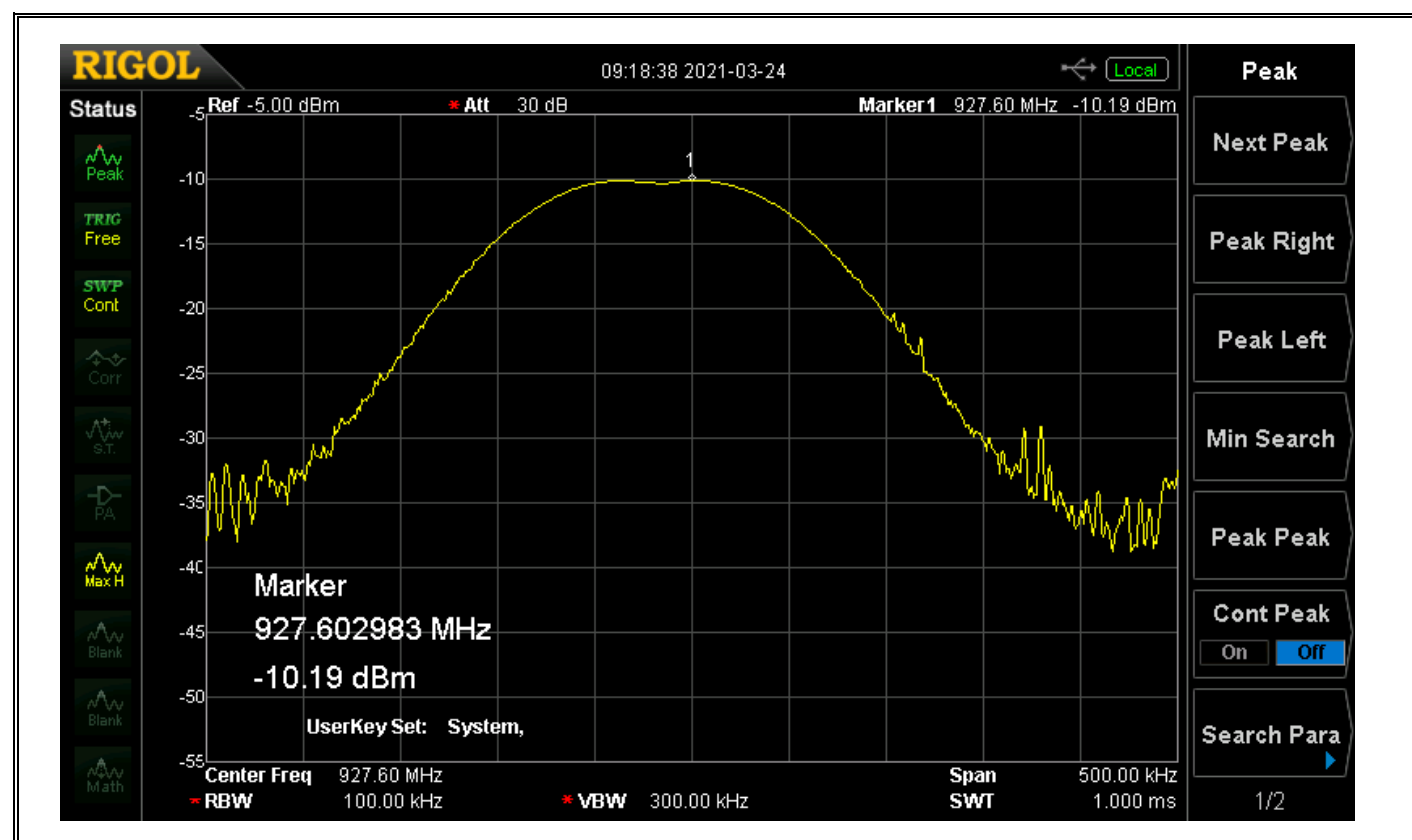


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EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(b)(2)
Method:	Peak Conducted Output
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 927.56 MHz
Technician:	D. Murphy
Date(s):	03/11/2021



Retlif Testing Laboratories

Report No. R-3362P-1

FCC 15.247(d)
Test Data, Antenna Port, Conducted Emissions, Out of Band

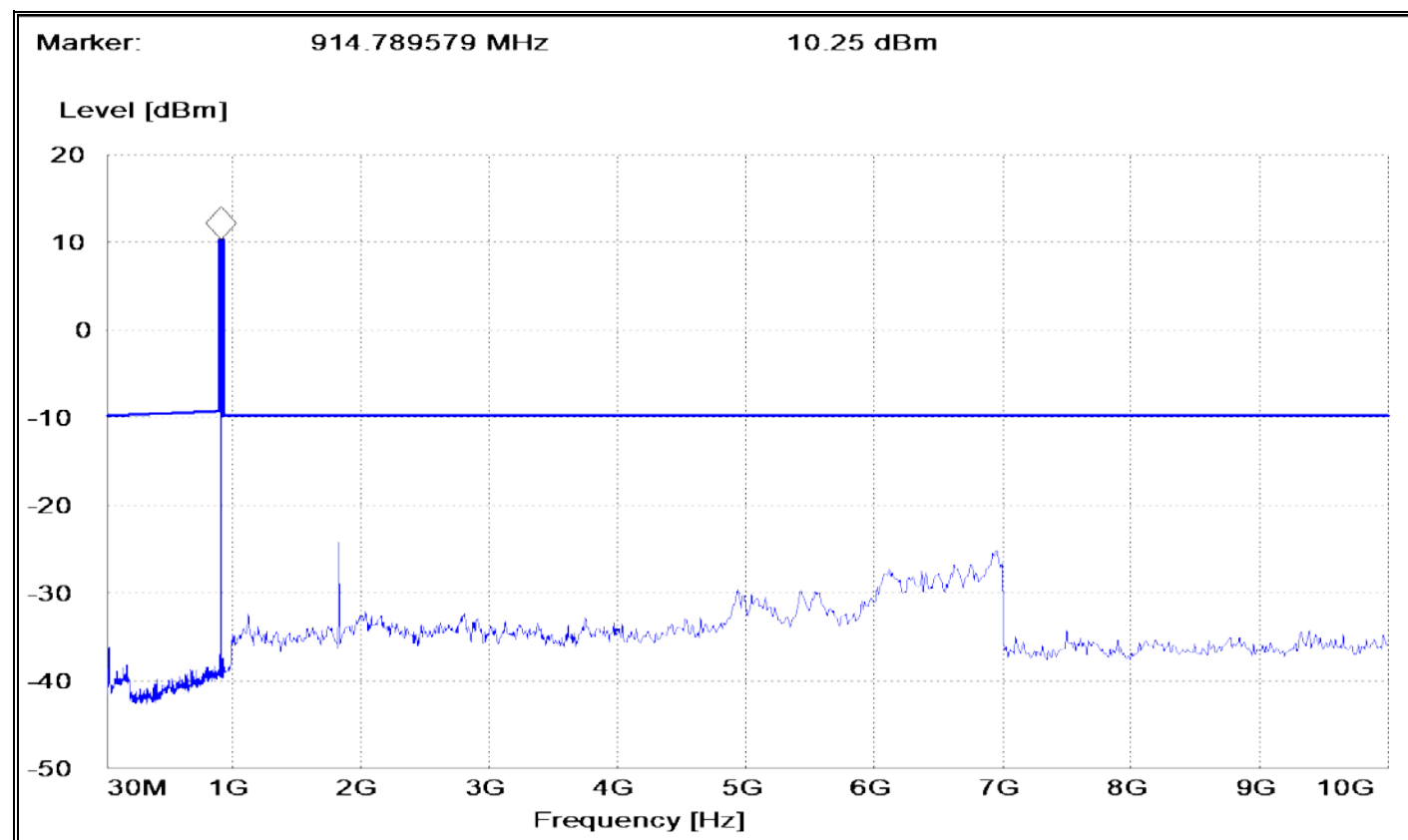


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Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(d)
Method:	Antenna Port, Conducted Emissions, Out of Band
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 914.78 MHz
Technician:	V. Desai
Date(s):	02/18/21

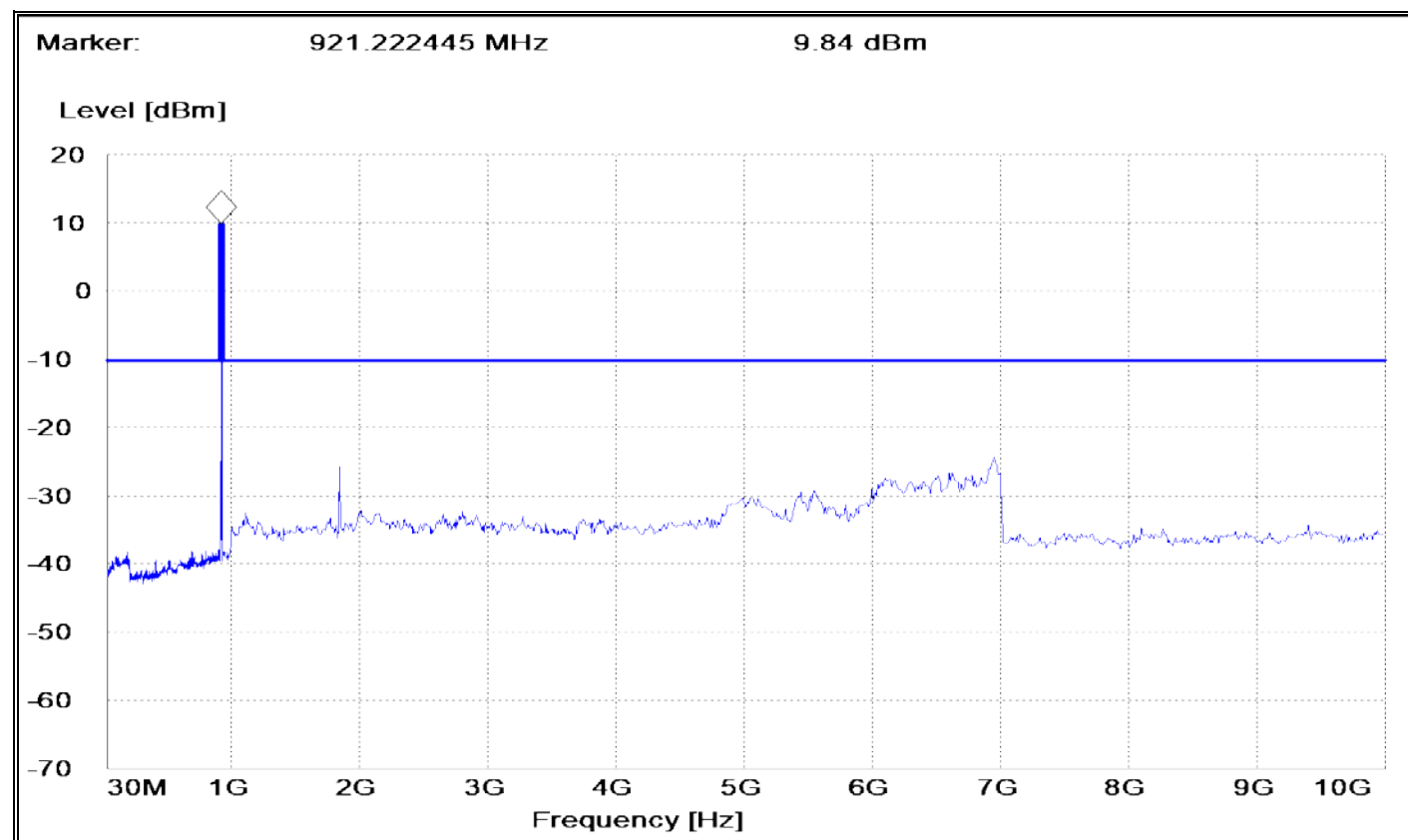


Retlif Testing Laboratories

Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(d)
Method:	Antenna Port, Conducted Emissions, Out of Band
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 921.22 MHz
Technician:	V. Desai
Date(s):	02/18/21

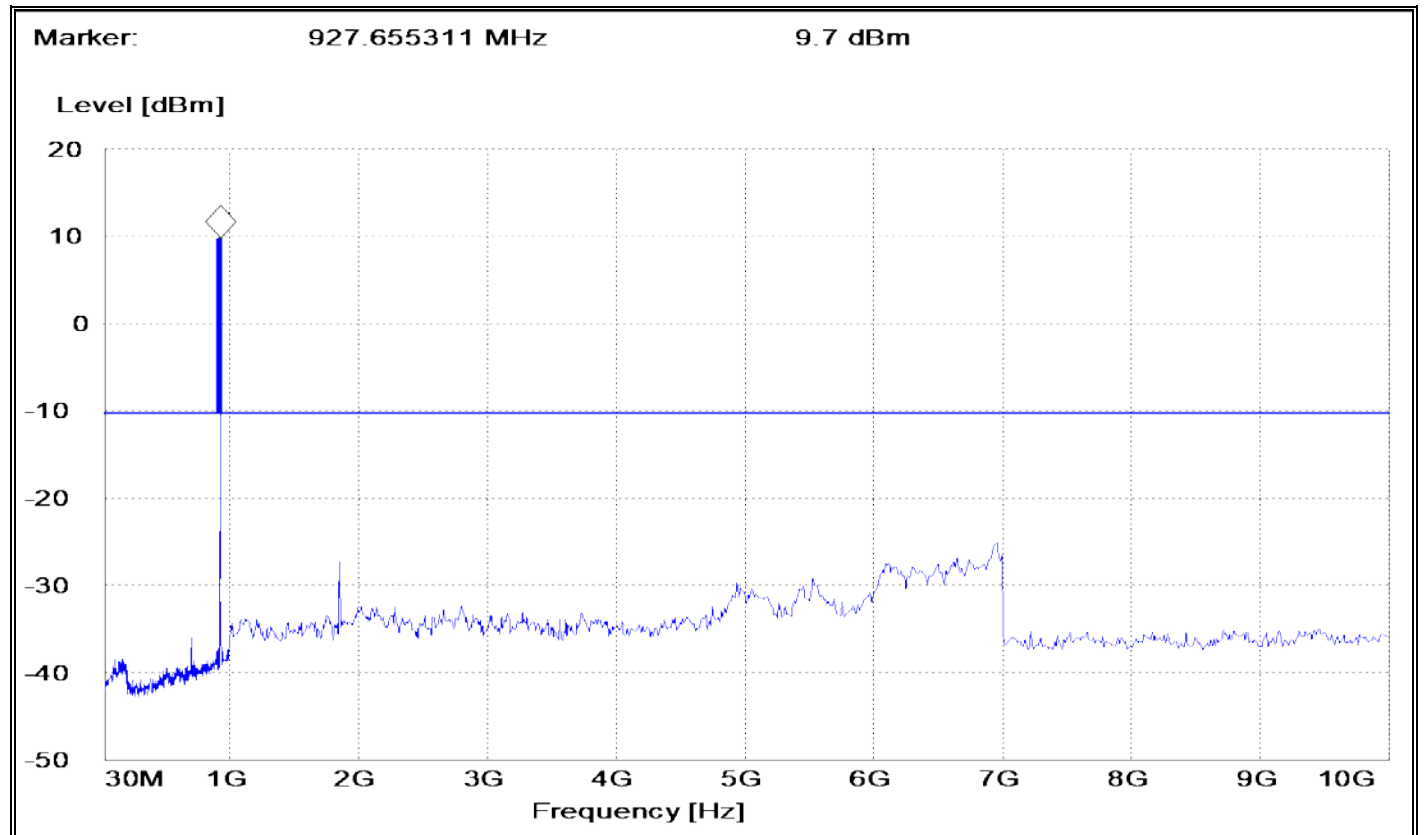


Retlif Testing Laboratories

Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(d)
Method:	Antenna Port, Conducted Emissions, Out of Band
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 927.65 MHz
Technician:	V. Desai
Date(s):	02/18/21



Retlif Testing Laboratories

Report No. R-3362P-1

FCC Part 15.247, Paragraph (d)
Test Data, Antenna Port, Conducted Emissions, Band Edge Emissions

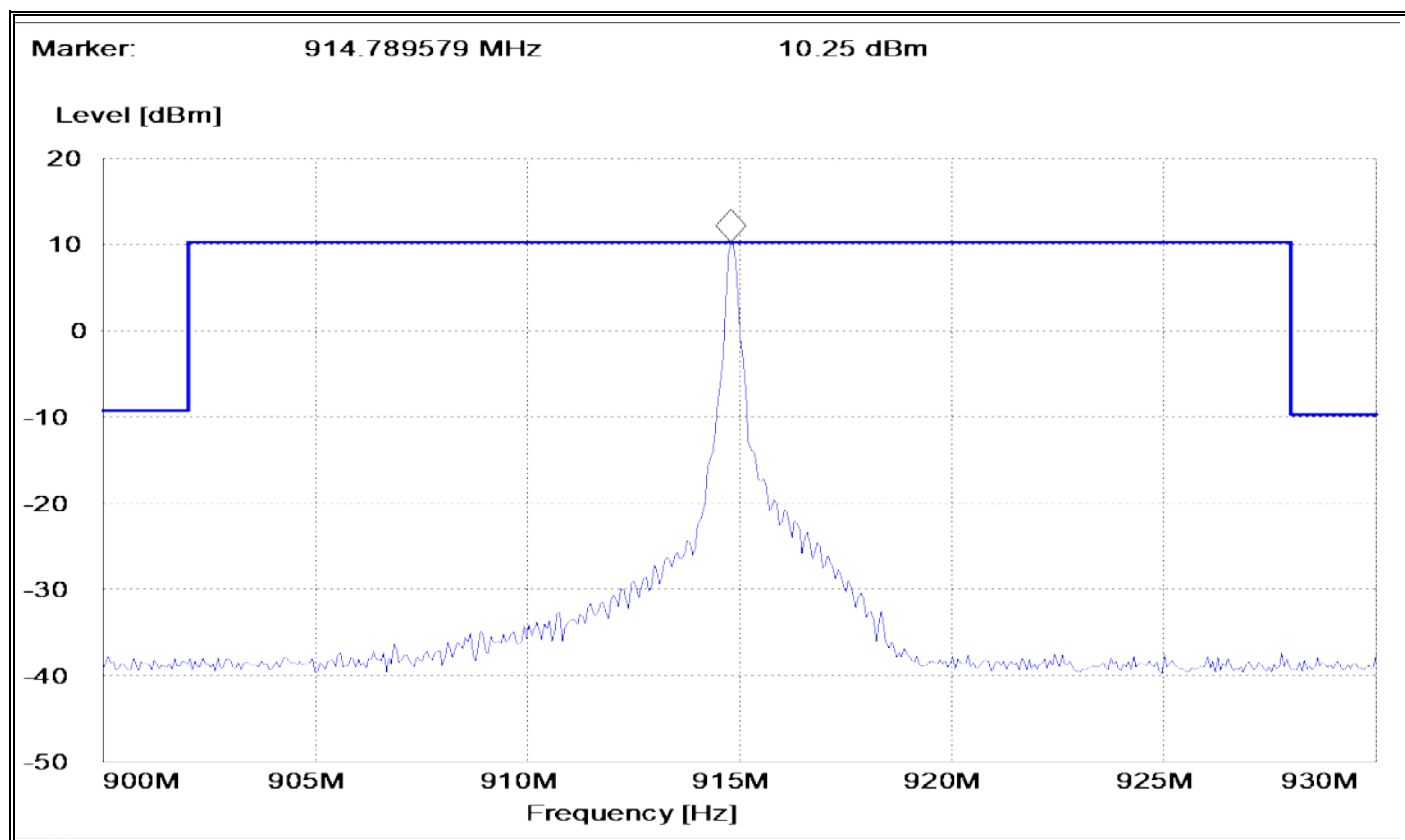


Retlif Testing Laboratories

Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(d)
Method:	Antenna Port, Conducted Emissions, Band Edge Emissions
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 914.78 MHz
Technician:	V. Desai
Date(s):	02/18/21

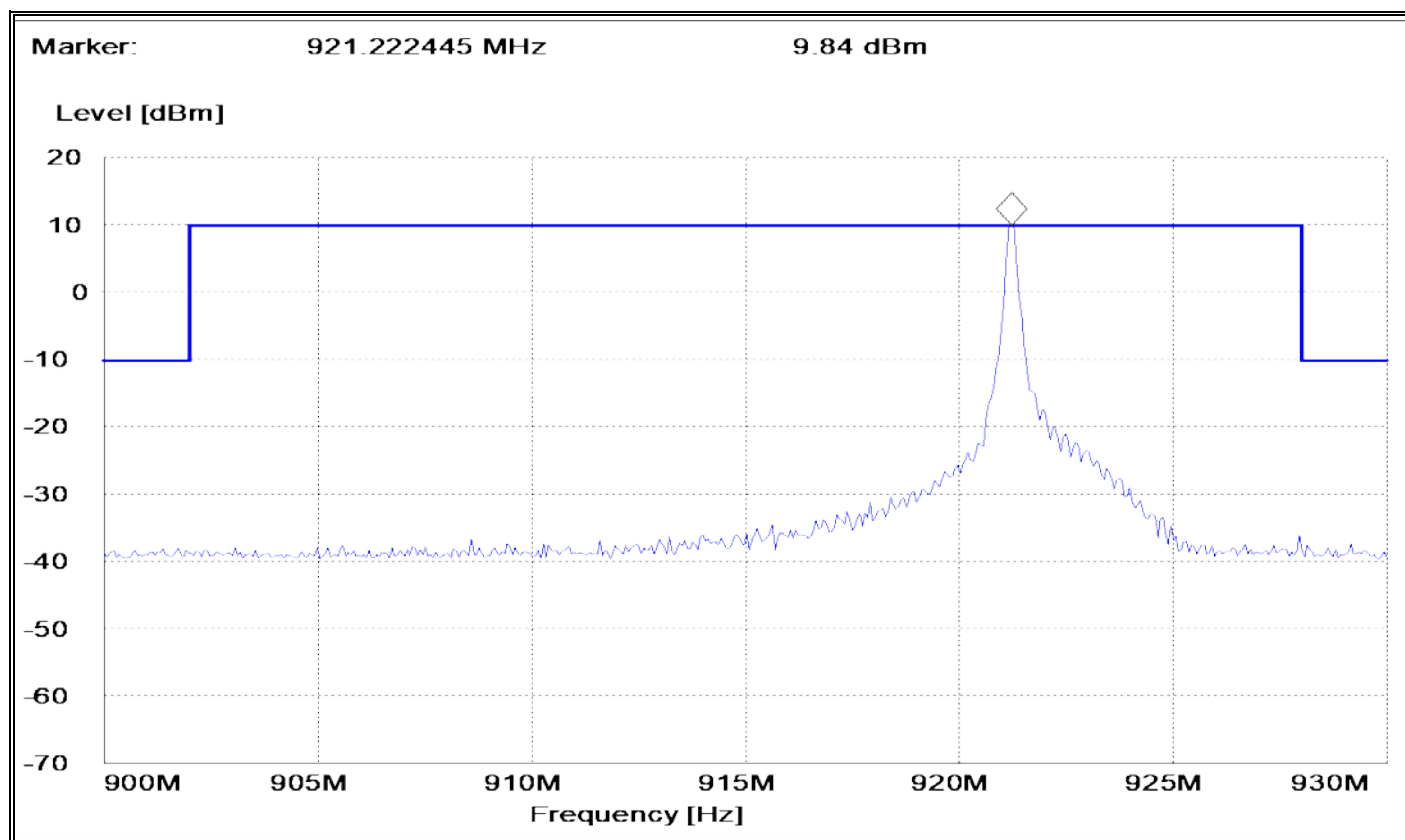


Retlif Testing Laboratories

Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(d)
Method:	Antenna Port, Conducted Emissions, Band Edge Emissions
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 921.22 MHz
Technician:	V. Desai
Date(s):	02/18/21

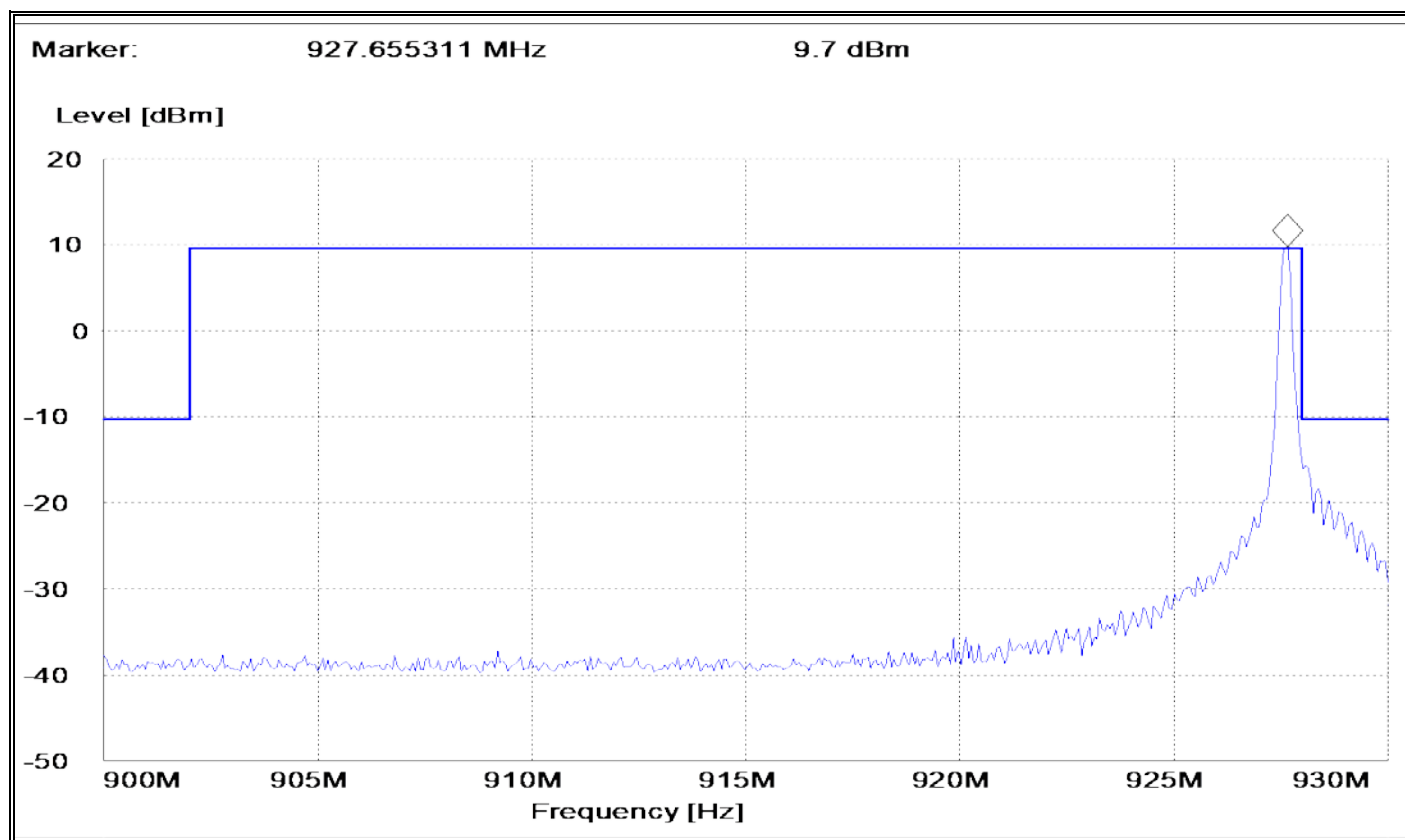


Retlif Testing Laboratories

Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15.247(d)
Method:	Antenna Port, Conducted Emissions, Band Edge Emissions
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 927.65 MHz
Technician:	V. Desai
Date(s):	02/18/21



Retlif Testing Laboratories

Report No. R-3362P-1

FCC 15.207(a)
Test Data, Conducted Limits



Retlif Testing Laboratories

Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15, Subpart C, Section 15.207 (a), Conducted Emissions
Method:	ANSI C63.10, Section 6.2., AC power-line conducted emission measurements
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting
Technician:	D. Murphy
Date(s):	02/19/2021
Temperature:	20.3 °C
Relative Humidity:	27.2 %
Lead Tested:	120 VAC, 60 Hz, Hot

The frequency range was scanned from 0.15 MHz to 30 MHz.

The six highest emissions relative to the limit are presented.

The emissions observed from the EUT do not exceed the specified limits.

Frequency	Detector	Meter Reading	Total Correction Factor	Corrected Reading	Limit	Margin
MHz	–	dBµV	dB	dBµV	dBµV	dB
0.2495	Peak	23.5	10.1	33.6	–	–
0.2495	Quasi-Peak	21.1	10.1	31.2	61.8	30.6
0.2495	Average	21.1	10.1	31.2	51.8	20.6
2.6375	Peak	19.2	10.2	29.4	–	–
2.6375	Quasi-Peak	14.3	10.2	24.5	56.0	31.5
2.6375	Average	11.1	10.2	21.3	46.0	24.7
10.4980	Peak	10.1	10.4	20.5	–	–
10.4980	Quasi-Peak	0.8	10.4	11.2	60.0	48.8
10.4980	Average	-2.5	10.4	7.9	50.0	42.1
16.3188	Peak	13.6	10.4	24.0	–	–
16.3188	Quasi-Peak	2.4	10.4	12.8	60.0	47.2
16.3188	Average	-1.6	10.4	8.8	50.0	41.2
25.5200	Peak	15.7	10.6	26.3	–	–
25.5200	Quasi-Peak	8.8	10.6	19.4	60.0	40.6
25.5200	Average	0.9	10.6	11.5	50.0	38.5
29.7513	Peak	16.7	10.6	27.3	–	–
29.7513	Quasi-Peak	7.6	10.6	18.2	60.0	41.8
29.7513	Average	0.2	10.6	10.8	50.0	39.2

* Peak measurements are recorded for informational purposes only.



Retlif Testing Laboratories

Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15, Subpart C, Section 15.207 (a), Conducted Emissions
Method:	ANSI C63.10, Section 6.2., AC power-line conducted emission measurements
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting
Technician:	D. Murphy
Date(s):	02/19/2021
Temperature:	20.3 °C
Relative Humidity:	27.2 %
Lead Tested:	120 VAC, 60 Hz, Neutral

The frequency range was scanned from 0.15 MHz to 30 MHz.
The six highest emissions relative to the limit are presented.
The emissions observed from the EUT do not exceed the specified limits.

Frequency	Detector	Meter Reading	Total Correction Factor	Corrected Reading	Limit	Margin
MHz	–	dBµV	dB	dBµV	dBµV	dB
0.8465	Peak	9.9	10.1	20.0	–	–
0.8465	Quasi-Peak	-0.9	10.1	9.2	56.0	46.8
0.8465	Average	-3.7	10.1	6.4	46.0	39.6
2.5878	Peak	12.6	10.2	22.8	–	–
2.5878	Quasi-Peak	0.5	10.2	10.7	56.0	45.3
2.5878	Average	-3.1	10.2	7.1	46.0	38.9
11.5428	Peak	15.1	10.4	25.5	–	–
11.5428	Quasi-Peak	6.9	10.4	17.3	60.0	42.7
11.5428	Average	-0.6	10.4	9.8	50.0	40.2
17.3137	Peak	15.1	10.5	25.6	–	–
17.3137	Quasi-Peak	4.5	10.5	15.0	60.0	45.0
17.3137	Average	-0.4	10.5	10.1	50.0	39.9
18.3585	Peak	14.6	10.5	25.1	–	–
18.3585	Quasi-Peak	4.0	10.5	14.5	60.0	45.5
18.3585	Average	-0.3	10.5	10.2	50.0	39.8
27.8110	Peak	16.2	10.6	26.8	–	–
27.8110	Quasi-Peak	6.7	10.6	17.3	60.0	42.7
27.8110	Average	2.5	10.6	13.1	50.0	36.9

* Peak measurements are recorded for informational purposes only.



Retlif Testing Laboratories

Report No. R-3362P-1

FCC 15.209(a)
Test Data, Field Strength of Spurious Emissions



Retlif Testing Laboratories

Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15, Subpart C, Section 12.247(d) and Section 15.209(a), Field Strength Spurious Emissions and Harmonic
Method:	ANSI C63.4, Section 8, Radiated Emission Measurements, 1 GHz to 10 GHz
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 921 MHz
Technician:	M. Nowak
Date(s):	02/03/2021
Temperature:	7.8 °C
Relative Humidity:	38.0 %
Detector:	Peak
Test Distance:	3m

Notes: The frequency range was scanned from 1 GHz to 10 GHz

The emissions observed from the EUT do not exceed the specified limits. Only emissions that fall under the restricted bands listed in 15.205(a) are shown here.

Frequency	Antenna Pol /Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
GHz	(V/H) / (m)	Degrees	dBuV	dB	dBuV/m	uV/m	uV/m
1.0							500
I							I
4.605	H / 1.00	180.0	47.3	1.3	48.6	269.16	I
I							I
10.0							500



Retlif Testing Laboratories

Report No. R-3362P-1

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15, Subpart C, Section 12.247(d) and Section 15.209(a), Field Strength Spurious Emissions and Harmonic
Method:	ANSI C63.4, Section 8, Radiated Emission Measurements, 1 GHz to 10 GHz
Job Number/Customer:	R-3362P-1 / The Sapling Company, Inc..
Test Sample:	900 MHz Transceiver Housed in a Digital Clock
Model Number:	D-CCA-RF-900-1
Operating Mode:	Displaying Time, Continuously Transmitting at 928 MHz
Technician:	M. Nowak
Date(s):	02/03/2021
Temperature:	7.8 °C
Relative Humidity:	38.0 %
Detector:	Peak
Test Distance:	3m

Notes: The frequency range was scanned from 1 GHz to 10 GHz

The emissions observed from the EUT do not exceed the specified limits. Only emissions that fall under the restricted bands listed in 15.205(a) are shown here.

Frequency	Antenna Pol /Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
GHz	(V/H) / (m)	Degrees	dBuV	dB	dBuV/m	uV/m	uV/m
1.0							500
I							I
4.640	H / 1.00	180.0	47.5	1.5	49.0	281.84	I
I							I
10.0							500



Retlif Testing Laboratories

Report No. R-3362P-1