



Canada

RF Test Report

As per

RSS-210 Issue 9:2016, Annex B & FCC Part 15 Subpart 15.225:2016

Low Power Licence Exempt Radio
Communication Devices
Intentional Radiators
on the

Electronic Lock: E-Plex 7900

Issued by: **TÜV SÜD Canada Inc.**
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Abderrahmane
Ferhat,
Project Engineer

Testing produced for



See Appendix A for full client &
EUT details.



Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Table of Contents

Table of Contents	2
Report Scope	3
Summary	4
Test Results Summary	5
Notes, Justifications, or Deviations	6
Sample Calculation(s).....	6
Applicable Standards, Specifications and Methods.....	7
Document Revision Status	8
Definitions and Acronyms	9
Testing Facility	10
Calibrations and Accreditations.....	10
Testing Environmental Conditions and Dates	11
Detailed Test Results Section	12
Emission Mask.....	13
Carrier Frequency Stability.....	17
Transmitter Spurious Radiated Emissions	19
20dB and 99% Occupied Bandwidth.....	27
Appendix A – EUT Summary.....	31
Appendix B – EUT and Test Setup Photos.....	33

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Report Scope

This report addresses the EMC verification testing and test results of the **Electronic Lock: E-Plex 7900**, and is herein referred to as EUT (Equipment Under Test). The EUT was tested for compliance against the following standards:

RSS-210 Issue 9:2016, Annex B

FCC Part 15 Subpart C 15.225:2016

Test procedures, results, justifications, and engineering considerations, if any, follow later in this report.

This report does not imply product endorsement by any government, accreditation agency, or TÜV SÜD Canada Inc.

Opinions or interpretations expressed in this report, if any, are outside the scope of TÜV SÜD Canada Inc accreditations. Any opinions expressed do not necessarily reflect the opinions of TÜV SÜD Canada Inc, unless otherwise stated.

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Summary

The results contained in this report relate only to the item(s) tested.

EUT	Electronic Lock: E-Plex 7900
FCC Certification #, FCC ID:	2ASNP-E79X3562018
Industry Canada Certification #, IC:	24793-E79X3562018
EUT passed all tests performed	Yes
Tests conducted by	Abderrahmane Ferhat

For testing dates, see "Testing Environmental Conditions and Dates".

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Test Results Summary

Standard/Method	Description	Class/Limit	Result
FCC 15.203	Antenna Requirement	Unique	Pass See Justification
FCC 15.225 (a), (b), (c) RSS-210 B.6	Operation within the band 13.110-14.010 MHz (Field Strength)	--	Pass
FCC 15.225 (e) RSS-210 B.6	Operation within the band 13.110-14.010 MHz (Carrier Frequency Stability)	±0.01%	Pass
FCC 15.225 (d) FCC 15.209 RSS-GEN (Table 4)	Transmitter Spurious Radiated Emissions	Quasi-Peak	Pass
FCC 15.207 RSS-GEN (Table 3)	Power Line Conducted Emissions	Quasi-Peak, Average	N/A See Justification
FCC 15.215 (c) C63.10 Section 6.9	Occupied Bandwidth, Lower and Upper Band Edges	20dB OBW	Pass
RSS-GEN Section 6.6	Occupied Bandwidth	99% OBW	Pass
Overall Result			Pass

If the product as tested or otherwise complies with the specification, the EUT is deemed to comply with the requirement and is deemed a 'PASS' grade. If not 'FAIL' grade will be issued. Note that 'PASS' / 'FAIL' grade is independent of any measurement uncertainties. A 'PASS' / 'FAIL' grade within measurement uncertainty is marked with a '*'.

Client	dormakaba USA Inc	
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Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Notes, Justifications, or Deviations

The following notes, justifications for tests not performed or deviations from the above listed specifications apply:

For the antenna requirement specified in FCC 15.203, the unit used a custom loop antenna which is also not meant to be replaceable by the user.

The EUT does not have an antenna port and a modified module was not provided. All measurements were performed using the radiated method.

For the Restricted Bands of operation, the transmitter cover in this report is designed to only operate at 13.56 MHz.

Power line conducted emissions were not performed as the EUT is battery operated only.

Sample Calculation(s)

Radiated Emission Test

Margin = Limit – (Received Signal + Antenna Factor + Cable Loss – Pre-Amp Gain)

Margin = 50.5dBµV/m – (50dBµV + 10dB + 2.5dB – 20dB)

Margin = 8.0 dB (pass)

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Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Applicable Standards, Specifications and Methods

- ANSI C63.4:2014 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
- ANSI C63.10:2013 American National Standard For Testing Unlicensed Wireless Devices
- CFR 47 FCC 15 Code of Federal Regulations – Radio Frequency Devices, Subpart C:2015 Intentional Radiators
- RSS-GEN Issue 4 General Requirements and Information for the Certification of 2014 Radio Apparatus
- RSS-210 Issue Licence-Exempt Radio Apparatus: Category I Equipment 9:2016
- ISO 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories

Client	dormakaba USA Inc	
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Document Revision Status

Revision 000 - December 12, 2018 Initial Release
Revision 001 – March 17, 2019 Corrected FCC ID and IC numbers.

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Definitions and Acronyms

The following definitions and acronyms are applicable in this report.
See also ANSI C63.14.

AE – Auxiliary Equipment. A digital accessory that feeds data into or receives data from another device (host) that in turn, controls its operation.

BW – Bandwidth. Unless otherwise stated, this refers to the 20 dB bandwidth.

EMC – Electro-Magnetic Compatibility. The ability of an equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment.

EMI – Electro-Magnetic Immunity. The ability to maintain a specified performance when the equipment is subjected to disturbance (unwanted) signals of specified levels.

EUT – Equipment Under Test. A device or system being evaluated for compliance that is representative of a product to be marketed.

ITE – Information Technology Equipment with a primary function(s) of entry, storage, display, retrieval, transmission, processing, switching, or control, of data.

LISN – Line Impedance Stabilization Network

NCR – No Calibration Required

RF – Radio Frequency

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Testing Facility

Testing for EMC on the EUT was carried out at TÜV SÜD Canada testing lab in Laval, near Montréal, Québec, Canada. The testing lab has a calibrated 3m semi-anechoic chamber which allows measurements on an EUT that has a maximum width or length of up to 2m and a height of up to 3m. The chamber is equipped with a turntable that is capable of testing devices up to 3300lb in weight. This facility is capable of testing products that are rated for 120Vac and 240Vac single phase, or devices that are rated for a 208Vac 3 phase input. DC capability is also available for testing. The chamber is equipped with a mast that controls the polarization and height of the antenna. Control of the mast occurs in the control room adjoining the shielded chamber. Radiated emission measurements are performed using a BiLog antenna and a Horn antenna where applicable. Conducted emissions, unless otherwise stated, are performed using a LISN and using the Vertical Ground plane if applicable. For ESD testing, the HCP is 1.6m x 0.8m and the VCP is 0.5m x 0.5m. The reference ground plane, when applicable, is 1.6m x 1.6m.

Calibrations and Accreditations

The 3m semi-anechoic chamber is registered with Federal Communications Commission (FCC, CA6845) and Industry Canada (IC, 6844B-1). This chamber was calibrated for Normalized Site Attenuation (NSA) using test procedures outlined in ANSI C63.4 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The chamber is lined with ferrite tiles and absorption cones to minimize any undesired reflections. The NSA data is kept on file at TÜV SÜD Canada. For radiated susceptibility testing, a 16 point field calibration has been performed on the chamber. The field uniformity data is kept on file at TÜV SÜD Canada. TÜV SÜD Canada Inc is accredited to ISO 17025 by A2LA with Testing Certificate #2955.02. The laboratory's current scope of accreditation listing can be found as listed on the A2LA website. All measuring equipment is calibrated on an annual or bi-annual basis as listed for each respective test.

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Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Testing Environmental Conditions and Dates

Following environmental conditions were recorded in the facility during time of testing

Date	Test	Initials	Temperature (°C)	Humidity (%)	Pressure (kPa)
2018-06-29 2018-07-04	Radiated Emissions	AF	20 – 24	40 – 51	98.0 – 102.0
2018-09-07	Carrier Frequency Stability	AF	20 - 25	30 - 45	99 - 101

Client	dormakaba USA Inc	
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Detailed Test Results Section

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Emission Mask

Purpose

The purpose of this test is to ensure that the RF energy emitted from the EUT does not exceed the limits listed below as defined in the applicable test standard, as measured from a receiving antenna. This helps protect other devices which may be using the same spectrum allocations for similar or other purposes and also ensures the transmit range of the device is within the pre-determined suitable range. This also ensures public safety by not exceeding a level which has been deemed safe for human exposure.

Limits and Method

The limits are defined in FCC Part 15.225 (a), (b), (c) and RSS-210 B.6.

The field strength of any emissions within the bands given in the table below shall not exceed the limits specified. Method is using a loop antenna and converting to voltage based on the impedance of free space.

Frequency Range (MHz)	Limit (uV/m)¹ at 30m	Limit (dBuV/m)¹ at 3m
13.110 - 13.410	106	80.5
13.410 - 13.553	334	90.5
13.553 - 13.567	15,848	124.0
13.567 - 13.710	334	90.5
13.710 - 14.010	106	80.5

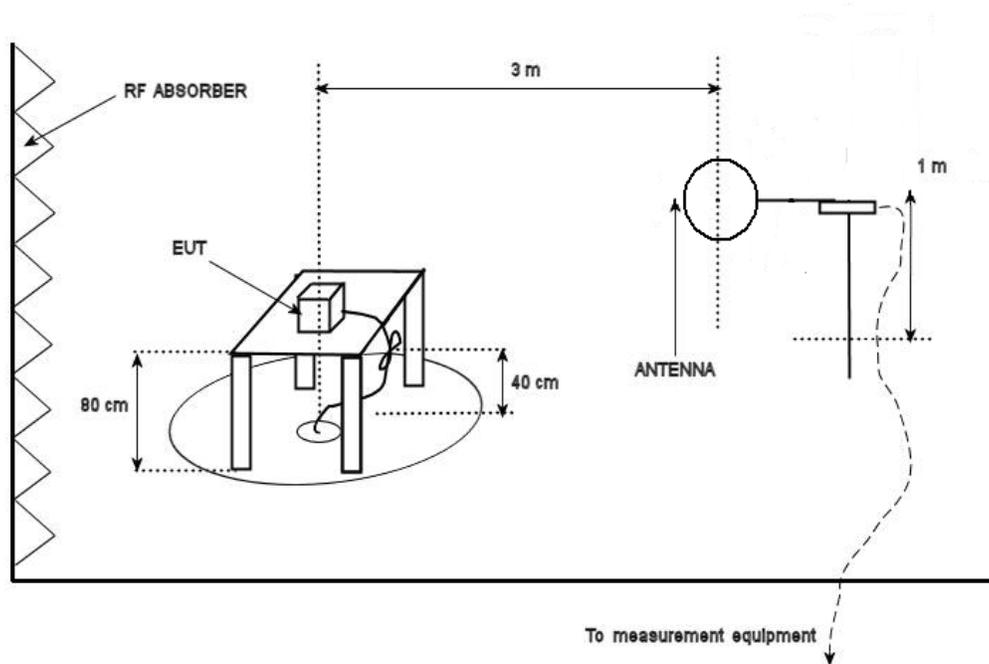
¹Limit is with a Quasi-Peak detector with bandwidths as defined in CISPR-16-1-1

Based on ANSI C63.4 Section 4.2, if the Peak detector measurements do not exceed the Quasi-Peak limits, where defined, then the EUT is deemed to have passed the requirements.

In accordance with FCC Part 15, section 15.31(f)(2), testing was performed at a 3 meter test distance and an extrapolation factor of 40 dB/decade was applied. For example, an extrapolation of 30m to 3m is $20\text{Log}(uV/m) + 40\text{Log}(30m/3m)$.

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Typical Radiated Emissions Setup



Measurement Uncertainty

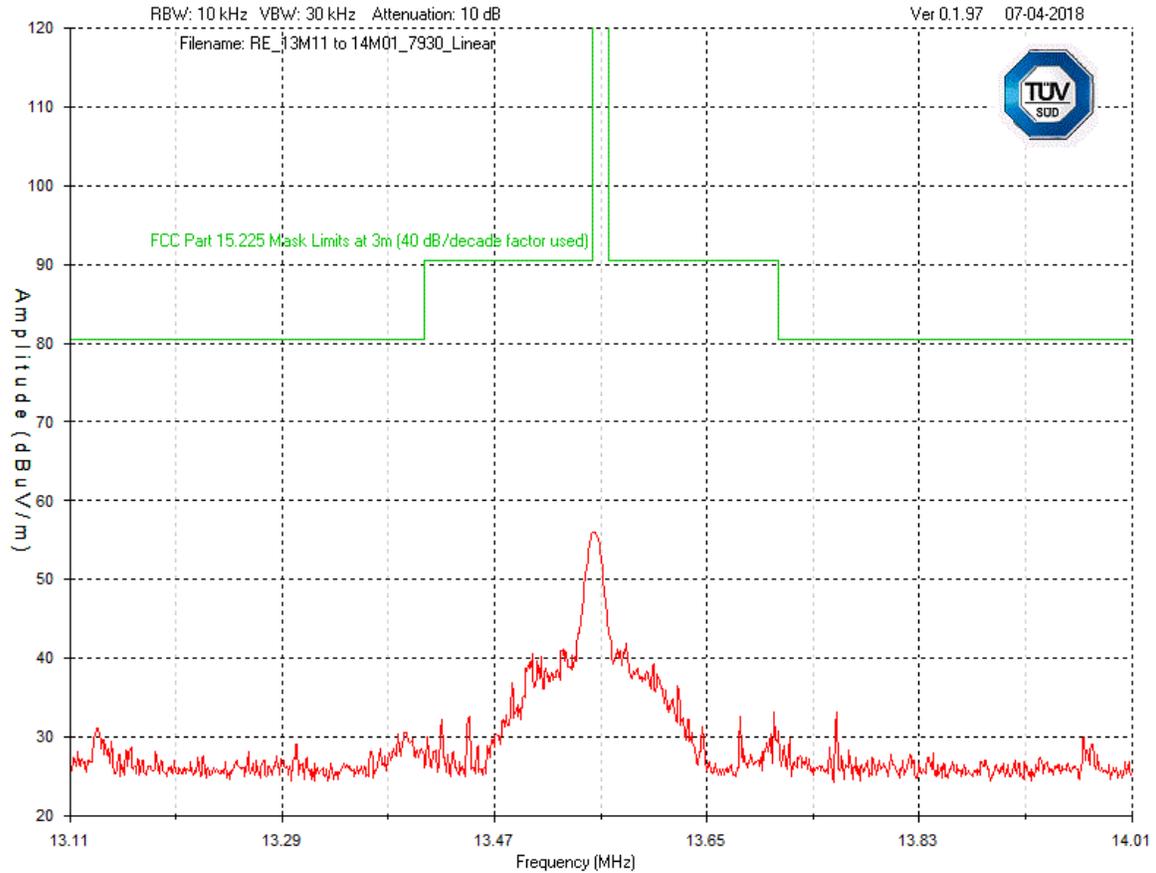
The expanded measurement uncertainty is calculated in accordance with CISPR 16-4-2 and is $\pm 4.25\text{dB}$ for 30MHz – 1GHz and $\pm 4.93\text{dB}$ for 1GHz – 18GHz with a 'k=2' coverage factor and a 95% confidence level.

Preliminary Graphs

The graphs shown below are maximized peak measurement graphs over a full 0-360°. The loop was orientated at 0 degrees and 90 degrees and a maximized reading is shown. To obtain the maximum emission, the loop antenna is positioned with its plane vertical and rotated about its vertical axis at the maximum azimuth position. This is then repeated with its plane horizontal, and rotated about the horizontal axis. The maximum obtained emission is presented.

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Peak Emission Mask



Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Final Measurements

Freq. (MHz)	Detect. Peak/QP	Received Signal (dBµV)	Atten Factor (dB)	Cable Factor (dB)	dBµA => dBµV conversion Factor	Ant. Factor (dB/m)	Pre-Amp (dB)	Level (dBµV/m)	Emission Limit (dBµV/m)	Margin (dB)	Results Pass/Fail
13.56	Peak	46.6	3	0.4	51.5	-13.9	-31.6	56	124	68	Pass
13.4253	Peak	22.8	3	0.4	51.5	-13.9	-31.6	32.2	90.5	58.3	Pass
13.4487	Peak	23.2	3	0.4	51.5	-13.9	-31.6	32.6	90.5	57.9	Pass
13.6785	Peak	23.2	3	0.4	51.5	-13.9	-31.6	32.6	90.5	57.9	Pass
13.7073	Peak	23.7	3	0.4	51.5	-13.9	-31.6	33.1	90.5	57.4	Pass
13.1334	Peak	21.8	3	0.4	51.5	-13.9	-31.5	31.3	80.5	49.2	Pass

Note:

Peak = Peak measurement

QP = Quasi-Peak measurement

See 'Appendix B – EUT and Test Setup Photos' for photos showing the test set-up and EUT axis.

Test Equipment List

Equipment	Model No.	Manufacturer	Last Calibration / Verification Date	Next Calibration / Verification Date	Asset #
Spectrum Analyzer	ESU-40	Rohde & Schwarz	2017-04-20	2019-04-20	4092
Loop Antenna	EM 6879	Electro-Metrics	2017-04-19	2019-04-19	4040
Attenuator 3 dB	FP-50-3	Trilithic	NCR	NCR	4028
LNA pre-amp	LNA-1450	RF Bay Inc.	2017-07-22	2019-07-22	4089
RF Cable 10m	LMR-400-10M-50OHM-MN-MN	LexTec	NCR	NCR	4025
RF Cable 7m	LMR-400-7M-50OHM-MN-MN	LexTec	NCR	NCR	4026
Emission software	0.1.97	Global EMC	NCR	NCR	58

Client	dormakaba USA Inc	
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Carrier Frequency Stability

Purpose

The purpose of this test is to ensure that the RF energy intentionally emitted from the EUT does not exceed the permitted bandwidth or level during extreme temperature variations. This helps protect radio broadcasts and receivers with spectrum nearby to the equipment under test from unwanted interference. This also helps ensure proper reception of the intended signal by ensuring the transmit frequency is correct over the expected temperature range.

Limits and Method

The limits are as defined in FCC Part 15, Section 15.225 (e) and RSS-210 B.6. The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20°C to $+50^{\circ}\text{C}$ 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.

Results

The EUT passed the requirements. Carrier signal remained within $\pm 0.01\%$ of the operating frequency.

Voltage, Temperature (V), ($^{\circ}\text{C}$)	Measured Frequency (MHz)	Deviation (MHz)	Deviation (%)	Result
Ambient (25)	13.559199			
6, -20	13.559279	-0.000080	-0.00059	Pass
6, -10	13.559279	-0.000080	-0.00059	Pass
6, 0	13.559199	0.000000	0	Pass
6, 20	13.559199	0.000000	0	Pass
6, 35	13.559199	0.000000	0	Pass
6, 50	13.559199	0.000000	0	Pass
4.5, 20	13.559199	0.000000	0	Pass
6.5, 20	13.559199	0.000000	0	Pass

Frequency Tolerance Table

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Test Equipment List

Equipment	Model No.	Manufacturer	Last Calibration / Verification Date	Next Calibration / Verification Date	Asset #
Spectrum Analyzer	ESU-40	Rohde & Schwarz	2017-04-20	2019-04-20	4092
Loop Antenna	EM 6879	Electro-Metrics	2017-04-19	2019-04-19	4040
Conditioning Chamber	GD-32-3-3	rtp russells	2017/01/14	2019/01/14	4099

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Transmitter Spurious Radiated Emissions

Purpose

The purpose of this test is to ensure that the RF energy unintentionally emitted from the EUT does not exceed the limits listed below as defined in the applicable test standard, as measured from a receiving antenna. This helps protect broadcast radio services such as television, FM radio, pagers, cellular telephones, emergency services, and so on, from unwanted interference.

Limits and Method

The limits are as defined in FCC Part 15, Section 15.209(a) and 15.225(d). The method is as defined in ANSI C63.10.

Frequency	Limit at 3m (dBuV/m)
0.009 MHz – 0.490 MHz	128.5 to 93.8 ¹
0.490 MHz – 1.705 MHz	73.8 to 63 ¹
1.705 MHz – 30 MHz	69.5 ¹
30 MHz – 88 MHz	40.0 ¹
88 MHz – 216 MHz	43.5 ¹
216 MHz – 960 MHz	46.0 ¹
Above 960 MHz	54.0 ¹
Above 1000 MHz	54.0 ²
Above 1000 MHz	74.0 ³

¹Limit is with a Quasi Peak detector with bandwidths as defined in CISPR-16-1-1 except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz where an Average detector is used.

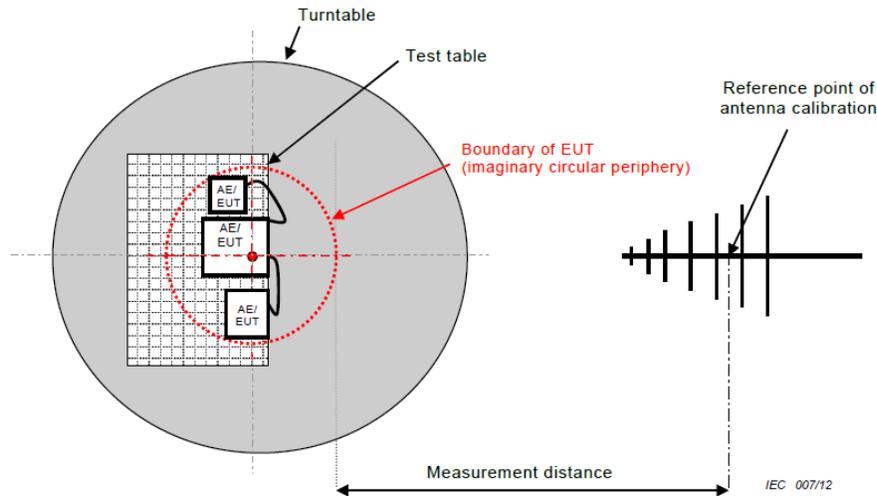
²Limit is with 1 MHz measurement bandwidth and using an Average detector

³Limit is with 1 MHz measurement bandwidth and using a Peak detector

Based on ANSI C63.4 Section 4.2, if the Peak detector measurements do not exceed the Quasi-Peak limits, where defined, then the EUT is deemed to have passed the requirements

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Typical Radiated Emissions Setup



Measurement Uncertainty

The expanded measurement uncertainty is calculated in accordance with CISPR 16-4-2 and is $\pm 4.25\text{dB}$ for 30MHz – 1GHz and $\pm 4.93\text{dB}$ for 1GHz – 18GHz with a 'k=2' coverage factor and a 95% confidence level.

Preliminary Graphs

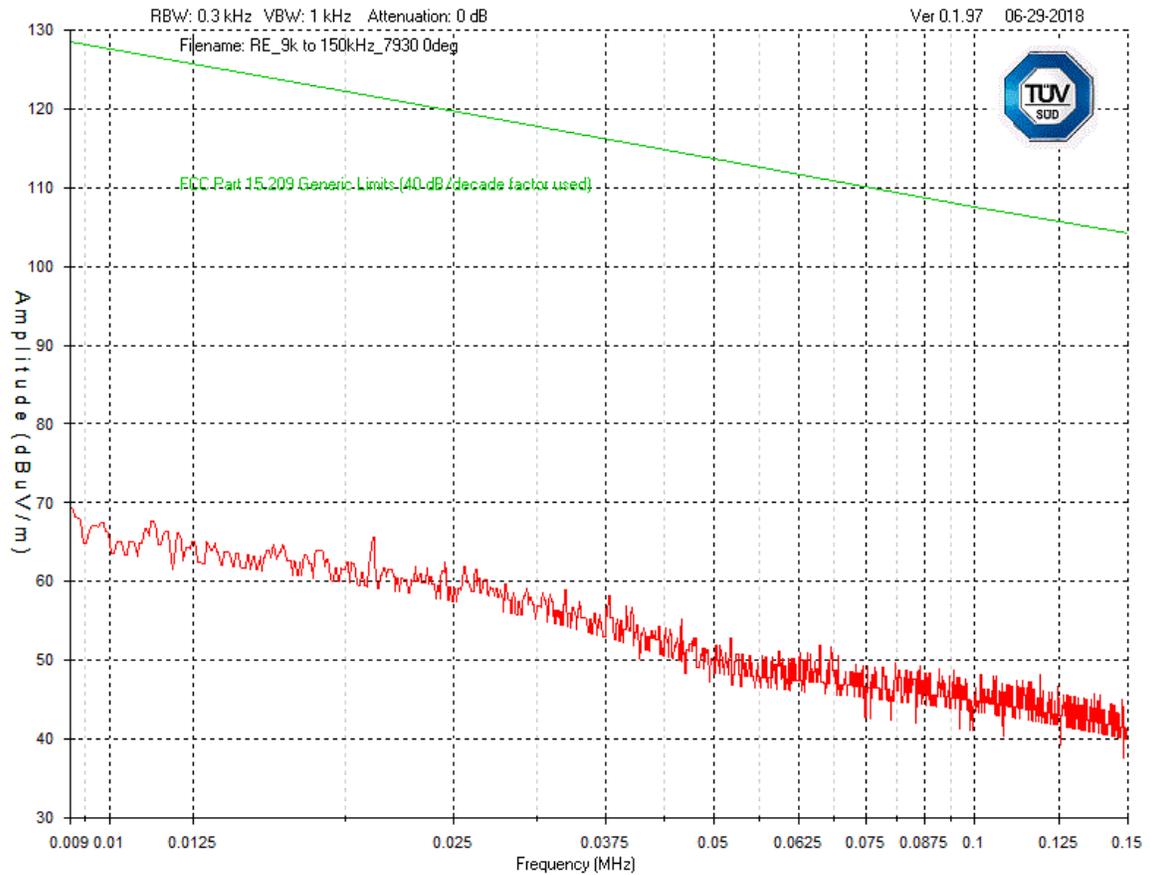
The graphs shown below are obtained at a 3m test distance and are maximized peak measurement graphs measured with a resolution bandwidth greater than or equal to the final required detector over a full 0-360°. This peaking process is done as a worst case measurement and enables the detection of frequencies of concern for final measurement. For final measurements with the appropriate detector, where applicable, please refer to the tables under Final Measurements.

In accordance with FCC Part 15, Subpart A, Section 15.33(a), the device is scanned to at least the 10th harmonic (A minimum of 135.6 MHz).

Devices scanned may be scanned at alternate test distances, and in accordance with FCC Part 15, Subpart A, Section 15.31(f), an extrapolation factor of 20 dB/decade was used above 30 MHz and 40 dB/decade below 30 MHz. For example, an extrapolation of 30m to 3m for frequencies below 30MHz is $20\text{Log}(uV/m) + 40\text{Log}(30m/3m)$.

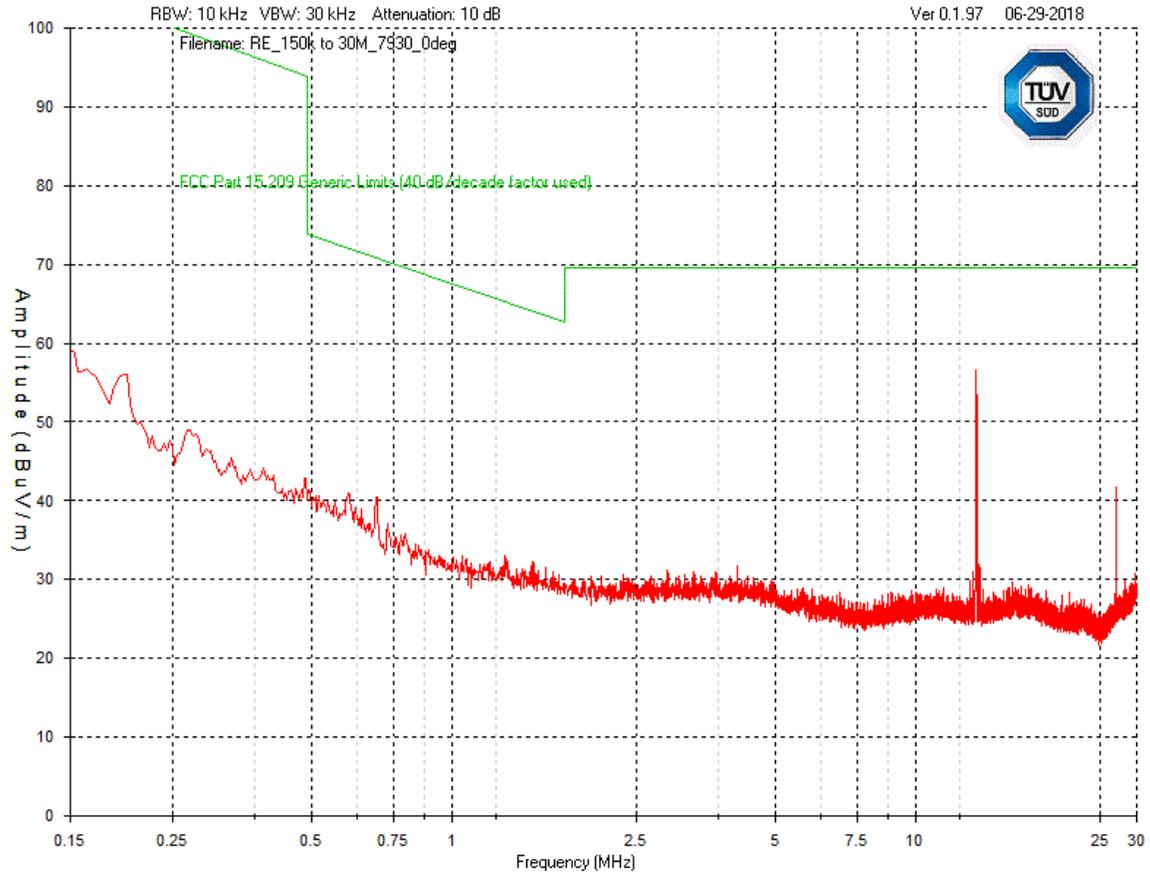
Client	dormakaba USA Inc	
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9 kHz – 150 kHz



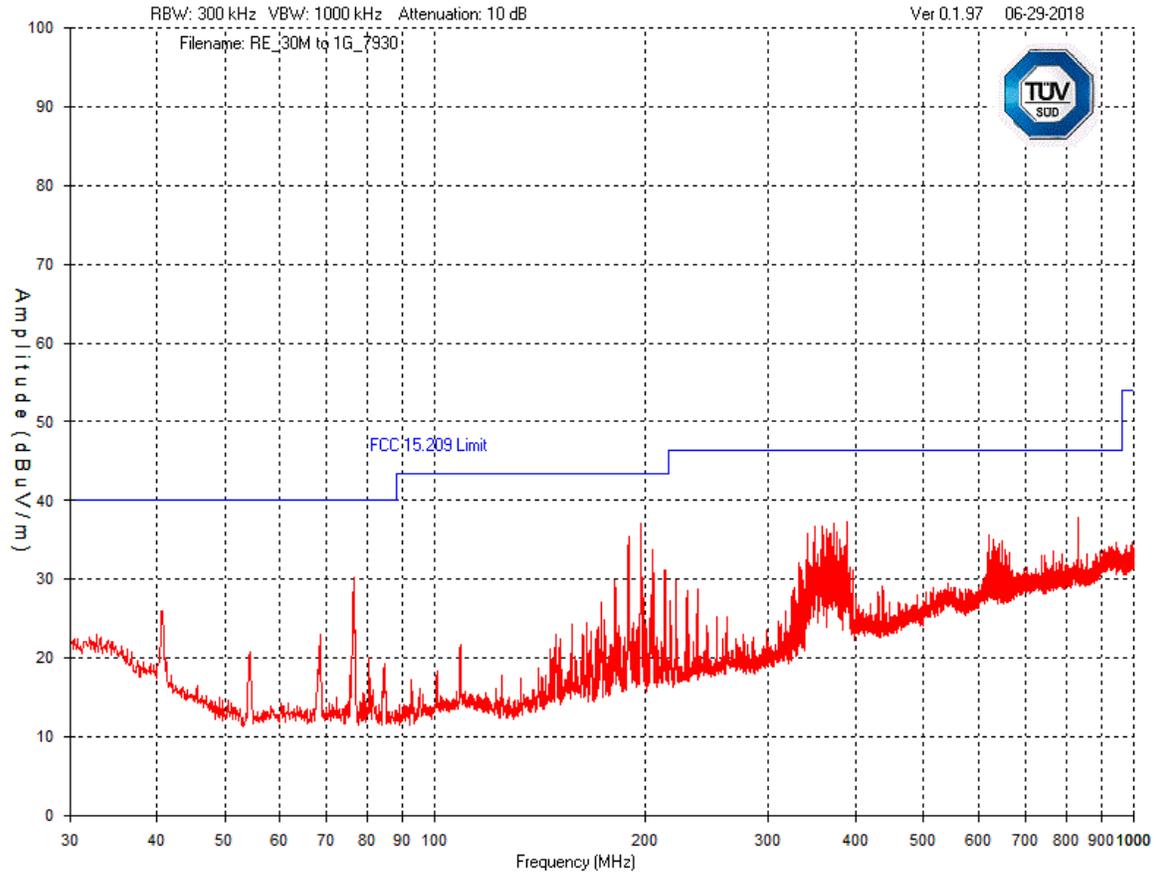
Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
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150 kHz – 30 MHz



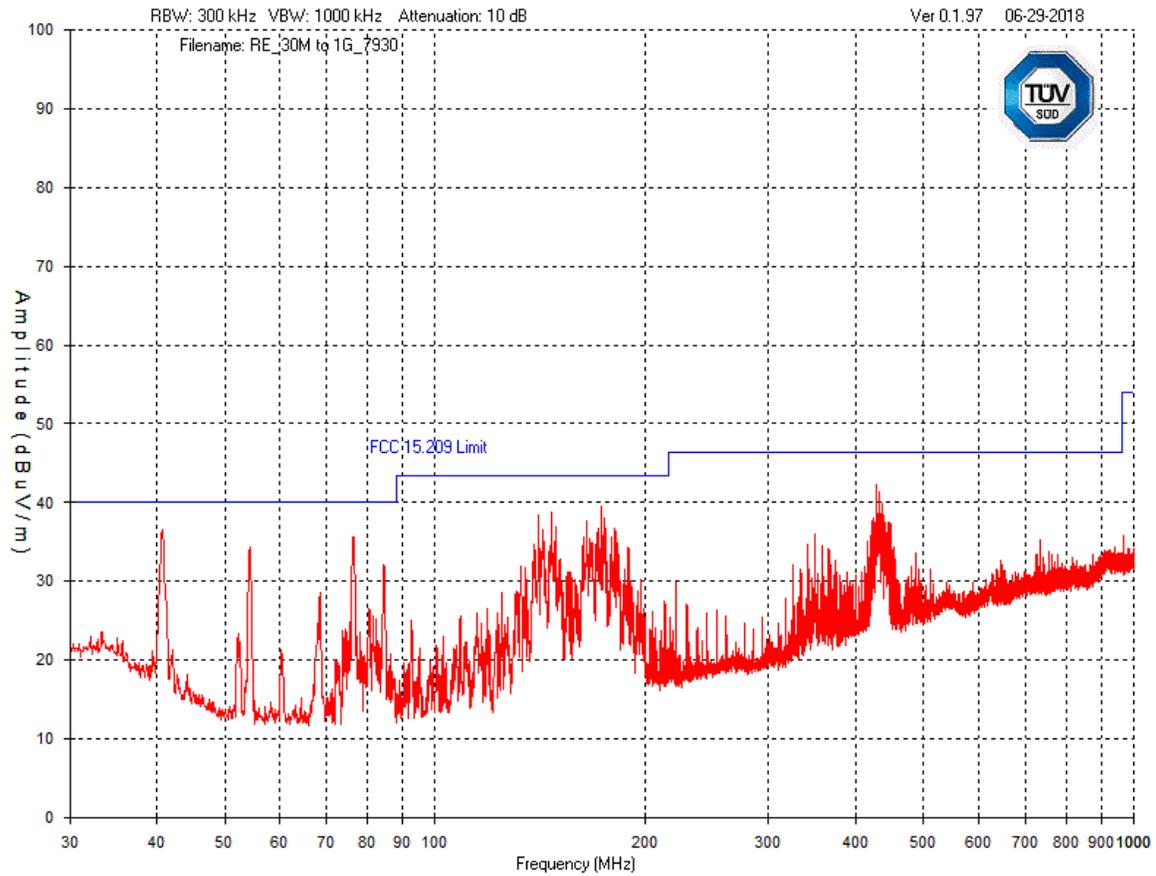
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**30 MHz – 1 GHz
Horizontal - Peak Emission Graph**



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**30 MHz – 1 GHz
Vertical - Peak Emission Graph**



Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Final Measurements

The EUT passed.

Supply			Battery 4x1.5Vdc							
Freq. (MHz)	Detector Peak/QP	Received Signal (dB μ V)	Antenna Factor (dB/m)	Atten Factor (dB)	Cable Factor (dB)	Pre-Amp (dB)	Level (dB μ V /m)	QP Limit (dB)	QP Margin (dB)	Pass/Fail
Horizontal Antenna Polarization										
197.007	QP	38.2	10.9	3	1.4	-33.3	20.2	43.5	23.3	Pass
189.045	QP	37.2	10.6	3	1.3	-33.3	18.8	43.5	24.7	Pass
830.954	QP	23.5	23	3	2.7	-32.7	19.5	46.4	26.9	Pass
387.9	QP	30.9	16.8	3	1.9	-33.3	19.3	46.4	27.1	Pass
371.393	QP	33.4	16.2	3	1.8	-33.3	21.1	46.4	25.3	Pass
349.352	QP	35.1	16.3	3	1.8	-33.3	22.9	46.4	23.5	Pass
Vertical Antenna Polarization										
40.6807	QP	52.4	12.3	3	0.6	-32.9	35.4	40	4.6	Pass
172.733	QP	44.4	9.6	3	1.3	-33.4	24.9	43.5	18.6	Pass
427.807	QP	35.1	17.6	3	1.9	-33.3	24.3	46.4	22.1	Pass
76.3153	QP	42.9	7.5	3	0.8	-33.4	20.8	40	19.2	Pass
146.808	QP	40.1	9.3	3	1.1	-33.4	20.1	43.5	23.4	Pass
431.982	QP	34.5	17.5	3	1.9	-33.3	23.6	46.4	22.8	Pass

Note:

Peak = Peak measurement

QP = Quasi-Peak measurement

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Test Equipment List

Equipment	Model No.	Manufacturer	Last Calibration / Verification Date	Next Calibration / Verification Date	Asset #
Spectrum Analyzer	ESU-40	Rohde & Schwarz	2017-04-20	2019-04-20	4092
BiLog Antenna	3142-E	ETS	2016-11-16	2018-11-16	4002
Horn Antenna	ATH1G18G	AR	2017-04-25	2019-04-25	4003
Biconical Antenna	EM-6913	Electro-Metrics	2017-05-02	2019-05-02	4060
Log Periodic Antenna	LPA-25	Electro-Metrics	2017-04-20	2019-04-20	4087
Loop Antenna	EM 6879	Electro-Metrics	2017-04-19	2019-04-19	4040
Attenuator 3 dB	FP-50-3	Trilithic	NCR	NCR	4028
LNA pre-amp	LNA-1450	RF Bay Inc.	2017-07-22	2019-07-22	4089
1-26.5GHz preamp	8449B	Agilent	2017-09-09	2019-09-09	4006
RF Cable 10m	LMR-400-10M-50OHM-MN-MN	LexTec	NCR	NCR	4025
RF Cable 7m	LMR-400-7M-50OHM-MN-MN	LexTec	NCR	NCR	4026
Emission software	0.1.97	Global EMC	NCR	NCR	58

FCC - 15.209 - Radiated Emissions_Rev1

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

20dB and 99% Occupied Bandwidth

Purpose

The purpose of this test is to verify that intentional radiators operating under the alternative provisions to the general emission limits are designed to ensure 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. This helps ensure the utilization of the frequency allocation and prevent corruption of data by ensuring adequate data separation to distinguish the reception of the intended information.

Limits and Method

The limit is as specified in FCC Part 15.215(c) and RSS-GEN Section 6.6 and the method is given in ANSI C63.10.

Frequency Band: $F_{MIN} = 13.110$ MHz and $F_{MAX} = 14.010$ MHz

Results

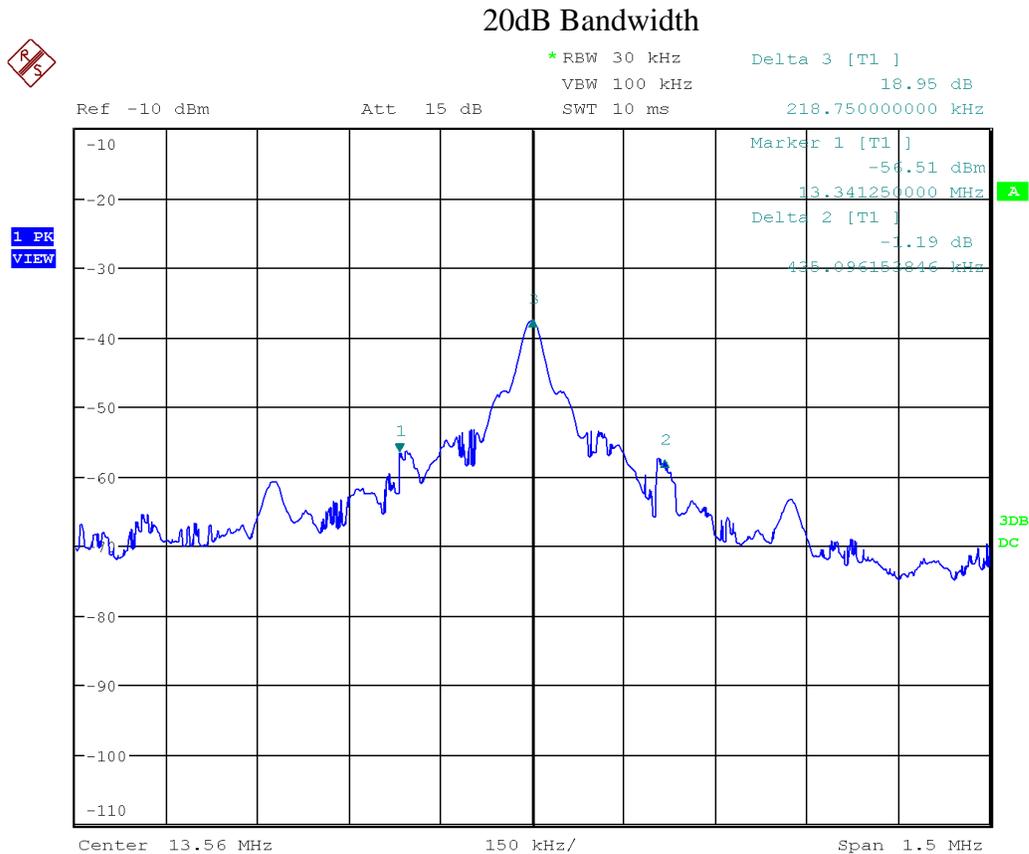
The EUT passed. The 20dB BW measured from F_{LOW} to F_{HIGH} was within the specified F_{MIN} and F_{MAX} . The 99% BW was measured using the 99% BW function of the spectrum analyzer.

Carrier Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
13.56	435.096	728.365

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Graphs

The graphs showed below shows the OBW during the operation of the device. This is measured by a max hold on the spectrum analyzer and the highest resolution bandwidth that is sufficiently low to exhibit the bandwidth of the channel during operation of the EUT. Max hold is performed for a duration of not less than 1 minute.



Date: 4.JUL.2018 18:00:14

Client	dormakaba USA Inc
Product	Electronic Lock: E-Plex 7900
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016



99% Bandwidth



*RBW 30 kHz Marker 1 [T1]
 VBW 100 kHz -37.46 dBm
 SWT 10 ms 13.560000000 MHz

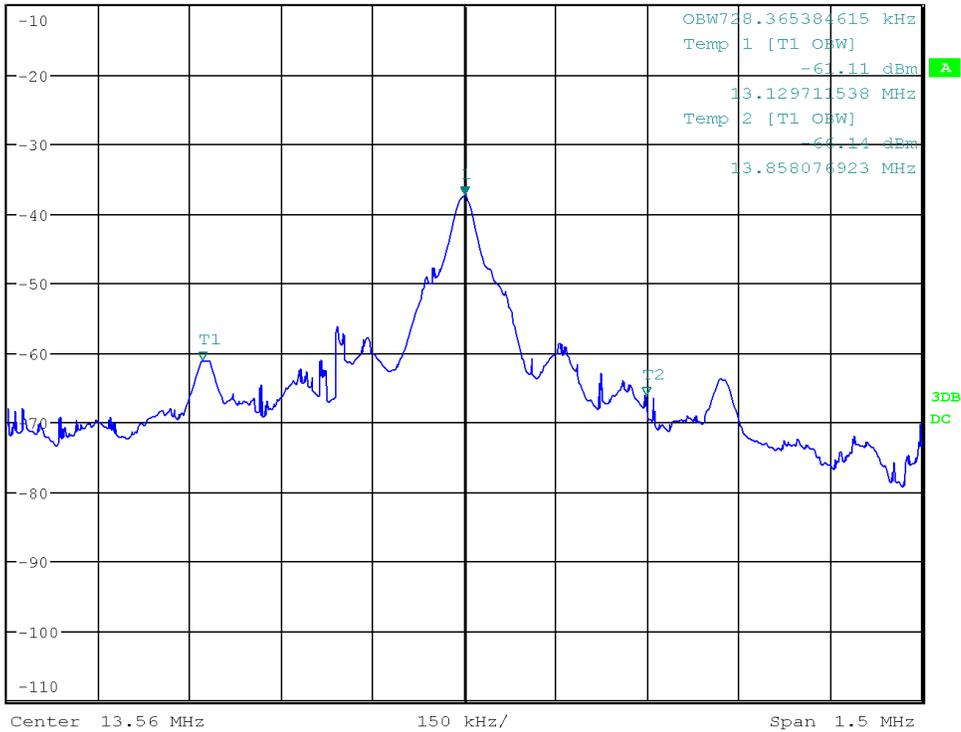
Ref -10 dBm

Att 5 dB

SWT 10 ms

13.560000000 MHz

1 PK
VIEW



Date: 4.JUL.2018 17:44:07

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Test Equipment List

Equipment	Model No.	Manufacturer	Last Calibration / Verification Date	Next Calibration / Verification Date	Asset #
Spectrum Analyzer	ESU-40	Rohde & Schwarz	2017-04-20	2019-04-20	4092
Loop Antenna	EM 6879	Electro-Metrics	2017-04-19	2019-04-19	4040
Attenuator 3 dB	FP-50-3	Trilithic	NCR	NCR	4028
LNA pre-amp	LNA-1450	RF Bay Inc.	2017-07-22	2019-07-22	4089
RF Cable 10m	LMR-400-10M-50OHM-MN-MN	LexTec	NCR	NCR	4025
RF Cable 7m	LMR-400-7M-50OHM-MN-MN	LexTec	NCR	NCR	4026
Emission software	0.1.97	Global EMC	NCR	NCR	58

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Appendix A – EUT Summary

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

For further details for filing purposes, refer to filing package.

General EUT Description

E-Plex 7900 locks with HiD iClass Credentials of SeoS, Classic and Elite. This electronic door lock implements iClass RFID credentials to grant access.

Note the EUT is considered to have been received the date of the commencement of the first test, unless otherwise stated.

Client	dormakaba USA Inc	
Product	Electronic Lock: E-Plex 7900	
Standard(s)	RSS-210 Issue 9:2016, Annex B FCC Part 15 Subpart 15.225:2016	

Appendix B – EUT and Test Setup Photos

Refer to Test Setup exhibit for EUT and Test Setup photos.