



# Retlif Testing Laboratories

3131 Detwiler Road, Harleysville, PA 19438  
215-256-4133 - Fax: 215-256-4130

CORPORATE OFFICE  
795 Marconi Avenue  
Ronkonkoma, NY 11779  
631-737-1500 Fax 631-737-1497  
(A NY Corporation)

BRANCH LABORATORIES  
101 New Boston Road  
Goffstown, NH 03045  
603-497-4600 Fax 603-497-5281

WASHINGTON  
REGULATORY OFFICE  
703-533-1614 Fax 703-533-1612



FCC Part 15, Subpart C, Section 15.231  
Industry Canada, RSS-210 and RSS-GEN  
Test Report

On

315 MHz Keyfob Transmitter  
FCC ID: PQTDORM05  
IC: 10735A-DORM05

**Customer Name:** Dorman Products, Inc.

**Customer P.O.:** PCN2568

**Date of Report:** June 12, 2013

**Test Report No:** R-1975P-3

**Test Start Date:** April 23, 2013

**Test Finish Date:** April 25, 2013

**Test Technician:** M. Seamans

**Approved By:** R.J. Reitz

**Report Prepared By:** C. Reitz

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## Technical Information

**Report Number:** R-1975P-3

**Customer:** Dorman Products, Inc.

**Address:** 3400 East Walnut Street  
Colmar, PA 18915

**Manufacturer:** Global Technical Software Services  
3705 Quakerbridge Road  
**Manufacturer Address:** Hamilton, New Jersey 08619

**Test Sample:** 315 MHz Keyfob Transmitter

**Model Numbers:** 13737, 13732, 13748, 13746, 13736, 13731, 13738

**FCC ID:** PQTDORM05

**IC:** 10735A-DORM05

**Type:** Security / Remote Control Transmitter

**Power Requirements:** 3 VDC Derived from a CR2032 Battery

**Frequency of Operation:** 315 MHz

**Equipment Class:** DSC

**Equipment Use:** Portable < 2.5 cm

### Test Specification:

FCC Rules and Regulations Part 15, Subpart C, Section 15.231  
Radio Standards Specification, RSS-210, Issue 8, June, 2010

### Test Procedure:

ANSI C63.4:2003  
RSS-GEN, Issue 3, December 2010



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### **Tests Performed**

The test methods performed on the 315 MHz Keyfob Transmitter are shown below:

<b>FCC Part 15, Subpart C</b>	<b>Industry Canada RSS-210</b>	<b>Industry Canada RSS-GEN</b>	<b>Test Method</b>
15.231(b)	A1.1.2(1)	N/A	Field Strength of Emissions
15.231(b)(2)	A1.1.2(2)	4.5	Duty Cycle Determination
15.231(b)(3)	A1.1.2(3)	N/A	Field Strength of Spurious Emissions
15.231(c)	A1.1.3	N/A	Bandwidth of Emission

### **General Test Requirements**

1. The measurement procedures of ANSI C63.4:2003 were utilized as specified in FCC Part 15, Subpart C, Section 15.31(a)(3) and IC RSS-GEN Section 4.1.
2. All radiated emissions measurements were performed on an Open Area Test Site (OATS), listed with the FCC and IC, in accordance with FCC Section 15.31(d) and IC Section 4.2.
3. The level of the fundamental field strength was recorded with a new battery installed in the EUT, in accordance with FCC Section 15.231(e) and IC Section 4.3(e).
4. All measurements were performed at the specified 3 meter test distance as required by FCC Section 15.31(f) and IC Section 7.25.
5. The EUT was rotated throughout 360 degrees for all radiated emissions measurements as specified in FCC Section 15.31(f)(5) and IC Section 4.3(h).
6. All readily accessible EUT controls were adjusted in such a manner as to maximize the level of emissions in accordance with FCC Section 15.31(g) and IC Section 4.3(h).
7. Appropriate accessories were attached to all EUT ports during the performance of radiated emissions measurements as required by FCC Section 15.31(i) and IC Section 4.3(d).
8. The EUT operated at a discrete frequency of 315 MHz.
9. The frequency spectrum was investigated from the lowest frequency generated in the device up to the 10<sup>th</sup> harmonic of the highest fundamental frequency in accordance with FCC Section 15.33(a)(1) and IC Section 4.9.
10. All measurements were taken with a peak detector function as specified in FCC Section 15.35(a) and IC Section 4.4. The duty cycle, calculated in accordance with FCC Section 15.35(c) and IC Section 4.5, was applied to the peak readings in order to obtain the average value of emissions. The peak value of emissions was verified to meet the 20 dB requirement of FCC Section 15.35(b) and IC Section 7.2.1.

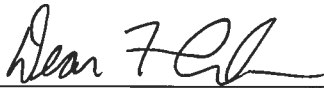


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## Certification and Signatures

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.



Dean Landers  
EMC Test Engineer



Richard J. Reitz  
Corporate Laboratory Manager  
INARTE Certified Engineer ATL-0036-E

### 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 test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.



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## **Requirements and Test Results**

### **Requirement:**

#### **FCC Section 15.231(a) - Periodic operation in the band 40.66 - 40.7 MHz and above 70 MHz**

The provisions of this Section are restricted to periodic operation within the band 40.66-40.7 MHz and above 70 MHz. Except as shown in Paragraph (e) of this Section, the intentional radiator is restricted to the transmissions of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal.

#### **IC RSS-210, A1.1 - Momentarily Operated Devices**

The frequency bands and field strength limits in Tables 4 and 5 are only for the transmission of a control signal such as that used with alarm systems, door openers, remote switches, etc. Radio control of toys or model aircrafts, and continuous transmissions such as voice or video are not permitted except as provided in A1.1.5. Data is permitted to be sent with a control signal.

- **Results:**  
The device was operated at a frequency of 315 MHz and is for the transmission of a control signal used for remote keyless vehicle entry.

### **Requirement:**

#### **FCC Sections 15.231(a)(1)-(5)**

#### **Periodic operation in the band 40.66 - 40.7 MHz and above 70 MHz**

The following conditions were met in order to comply with the provisions for momentary operation:

#### **IC RSS-210, A1.1.1(a)-(d) - Types of Momentary Signals**

The following conditions were met in order to comply with the provisions for momentary operation:

FCC 15.231(a)(1): A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

IC A1.1.1(a): A manually operated transmitter shall employ a push-to-operate switch and be under manual control at all transmission times. When released, the transmitter shall cease transmission (holdover time of up to 5 seconds of operation).

- **Results:**  
The device is a manually operated, push to operate transmitter under manual control. The device ceased transmission within 5 seconds of deactivation.



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## Requirements and Test Results (con't)

FCC 15.231(a)(2): A transmitter activated automatically shall cease transmission within 5 seconds after activation.

IC A1.1.1(b): A transmitter activated automatically shall cease transmission with 5 seconds after activation, (i.e. maximum 5 seconds of operation).

- Results:  
Transmission is not automatically activated.

FCC 15.231(a)(3): Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

IC A1.1.1(c): Periodic transmissions at regular predetermined intervals are not permitted, except as provided in A1.1.5. However, polling or supervision transmissions, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed 2 seconds per hour for each transmitter.

- Results:  
The transmitter does not perform periodic transmissions.

FCC 15.231(a)(4): Intentional radiators which are employed for radio control purposes during emergencies involving fire, security and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

IC A1.1.1(d): Intentional radiators employed for radio control purposes during emergencies involving fire, security of goods (e.g. burglar alarms), and safety-of-life, when activated to signal an alarm, may operate during the interval of the alarm condition.

- Results:  
This device is not employed for radio control purposes during emergencies involving fire, security and safety for life.

FCC 15.231(a)(5): Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmission are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

- Results:  
The device is not employed for security systems.



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## Requirements and Test Results (con't)

### Requirement:

#### FCC Section 15.231(b) - Field Strength of Emissions

In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the limits specified in Table 1.

#### IC RSS-210, A1.1.2(1) - Field Strengths and Frequency Bands

The field strength of emissions from momentarily operated intentional radiators shall not exceed the limits specified in Table 1:

Table 1 - Test Limits, Field Strength of Emissions

Fundamental Frequency (MHz)	Field Strength of Fundamental microvolts/meter @ 3 meters (watts, e.i.r.p.) Quasi Peak or Average	Field Strength of Spurious Emissions microvolts/meter @ 3 meters Quasi Peak or Average
260 to 470	3,750 to 12,500**	375 to 1,250**

\*\*Linear Interpolations

For 260-470 MHz: FS (microvolts/m) = (41.67 x F) - 7,083

The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

The Fundamental and Harmonic Emissions limits for a device operating at 315 MHz are listed in Table 2.

Table 2 - Fundamental and Harmonic Limits

Frequency of Operation (MHz)	Fundamental (µV/m)		Harmonics (µV/m)	
	Average	Peak	Average	Peak
315	6042	60416	605	6042

- Results:

The Fundamental and Harmonics field strengths did not exceed the limits specified in Table 2 at a test distance of 3 meters, taken with an Average Detector. See Table 3 for the Fundamental and Harmonic emissions test results.

Table 3 - Fundamental and Harmonics Test Results

Fundamental Frequency (MHz)	Maximum Fundamental (µV/m)	Maximum Harmonics (µV/m)
315	1928.4	243.3



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## Requirements and Test Results (con't)

### Requirement:

#### FCC Section 15.231(b)(2) - Duty Cycle Determination-Pulsed Operation

Intentional radiators operating under the provisions of the Section shall demonstrate compliance with the limits on the field strength emissions, as shown in Table 1, based on the average value of the measured emissions. As an alternative, compliance with the limits in the Table 1 may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in Section 15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of Section 15.205 shall be demonstrated using the measurement instrumentation specified in that Section.

#### IC RSS-GEN, Paragraph 4.5, Pulsed Operation

When the field strength (or envelope power) is not constant or when it is in pulses, and an average detector is specified to be used, the value of field strength or power shall be determined by averaging over one complete pulse train, including blanking intervals within the pulse train, as long as the pulse train does not exceed 0.1 seconds. In cases where the pulse train exceeds 0.1 seconds, the average value (of field strength or output power) shall be determined during a 0.1 second interval during which the field strength or power is at its maximum value.

The unit's RF output was directly coupled to the input of the spectrum analyzer. The analyzer was set for a frequency span of 0 Hz. The sweep time was then adjusted in order to display one full pulse train. The transmitter on time was then summed and compared to the time for one full cycle in order to obtain the duty cycle. (See plots for additional information).

- Results:

The emissions did not exceed the limits specified in Table 1. See below for the exact method of calculating the average field strength.

Transmitter On Time = 100 milliseconds (maximum per cycle)  
Transmitter Cycle Time = 23.56 milliseconds (100 ms maximum)  
Transmitter Duty Cycle = 23.56 %

#### CALCULATION

1 pulse of 40.016  $\mu$ sec = 0.04001 milliseconds  
34 pulses of 180.072  $\mu$ sec = 6.1224 milliseconds  
47 pulses of 370.148  $\mu$ sec = 17.3969 milliseconds  
0.04001 + 6.1224 + 17.3969 = 23.56 milliseconds  
Duty Cycle (23.56/100) = 23.56 %  
Correction Factor =  $20 \log (0.2356)$  = -12.56 dB



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## Requirements and Test Results (con't)

### Requirement:

#### **FCC Section 15.231(b)(3) - Field Strength of Spurious Emissions**

The limits on the field strength of the spurious emissions specified in Table 1 are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in Table 1 or to the general limits shown in Section 15.209, whichever limit permits a higher field strength.

#### **IC RSS-210, A1.1.2(3) - Field Strength of Unwanted Emissions**

The limits on the field strength of unwanted emissions in Table 4 of RSS-210 are based on the fundamental frequency of the intentional radiator. Unwanted emissions shall be attenuated to the limits shown in Table 2 of RSS-210 or to the limits shown in Table 4 of RSS-210, whichever is less stringent.

- Results:  
No spurious emissions were observed within 20 dB of the specified limit.

### Requirement:

#### **FCC Section 15.231(c) - Bandwidth of Emissions**

The bandwidth of the emissions shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

#### **IC RSS-210, A1.1.3 - Bandwidth of Momentary Signals**

For the purpose of Section A1.1, the 99% bandwidth shall be no wider than 0.25% of the center frequency for devices operating between 70-900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency.

- Results:  
The 20 dB bandwidth was measured and found to be 56.7 kHz.



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## **General Requirements FCC and IC**

### **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. The following formula was utilized:

$$\text{minimum bandwidth} = 1/\{\text{minimum pulse width (in seconds)} \times 1.5\} = \text{Hz}$$

Setting pulse desensitization equal to zero and utilizing the minimum observed pulse width of 40.016  $\mu\text{s}$  yields a minimum required bandwidth of 16660 Hz. FCC specified bandwidths of 100 kHz and 1 MHz were utilized below and above 1 GHz, respectively.



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## Equipment Lists

### **FCC Section 15.231(b) - Field Strength of Emissions IC RSS-210, A1.1.2(1) - Field Strength and Frequency Bands**

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1232	AGILENT / HP	PRE-AMPLIFIER	1 - 26.5GHz	8449B	5/30/2012	5/31/2013
3207	EMCO	ACTIVE LOOP	10 KHZ - 30 MHZ	6502	9/17/2012	9/30/2013
3258	EMCO ANTENNA	DOUBLE RIDGED GUIDE	1 GHZ - 18GHZ	3115	2/24/2012	8/31/2013
4029	RETLIF	OPEN AREA TEST SITE	3 / 10 Meters	RNH	7/24/2012	7/24/2015
5053	EMCO	BICONILOG ANTENNA	26 MHz - 3 GHz	3142C	11/14/2011	5/30/2013
R444	AGILENT / HP	SPECTRUM ANALYZER	100 Hz - 26.5 GHz	E7405A;A	7/6/2012	7/6/2013

### **FCC Section 15.231(b)(2) - Duty Cycle Determination - Pulsed Operation IC RSS-210, A1.1.2(2), RSS-GEN, 4.5 - Pulsed Operation**

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
R444	AGILENT / HP	SPECTRUM ANALYZER	100 Hz - 26.5 GHz	E7405A;A	7/6/2012	7/6/2013

### **FCC Section 15.231(b)(3) - Field Strength of Spurious Emissions IC RSS-210, A1.1.2(3) - Field Strength of Unwanted Emissions**

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1232	AGILENT / HP	PRE-AMPLIFIER	1 - 26.5GHz	8449B	5/30/2012	5/31/2013
3207	EMCO	ACTIVE LOOP	10 KHZ - 30 MHZ	6502	9/17/2012	9/30/2013
3258	EMCO ANTENNA	DOUBLE RIDGED GUIDE	1 GHZ - 18GHZ	3115	2/24/2012	8/31/2013
4029	RETLIF	OPEN AREA TEST SITE	3 / 10 Meters	RNH	7/24/2012	7/24/2015
5053	EMCO	BICONILOG ANTENNA	26 MHz - 3 GHz	3142C	11/14/2011	5/30/2013
R444	AGILENT / HP	SPECTRUM ANALYZER	100 Hz - 26.5 GHz	E7405A;A	7/6/2012	7/6/2013

### **FCC Section 15.231(c) - Bandwidth of Emission IC RSS-210, A1.1.3 - Bandwidth of Momentary Signals**

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
R444	AGILENT / HP	SPECTRUM ANALYZER	100 Hz - 26.5 GHz	E7405A;A	7/6/2012	7/6/2013



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**FCC Section 15.231(b) - Field Strength of Emissions  
IC RSS-210, A1.1.2(1) - Field Strength and Frequency Bands**

**Test Data**



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<b>Test Method:</b>		FCC Part 15 Subpart C, Field Strength of Emissions, Paragraph 15.231(b)					
		IC RSS-210, A1.1.2 (1) Field Strengths and Frequency Bands					
<b>Customer:</b>		Dorman Products			<b>Job No.:</b>	R-1975P-3	
<b>Test Sample:</b>		315 MHz Remote Keyless Transmitter					
<b>Model No.:</b>		13731					
<b>Operating Mode:</b>		Continuously transmitting a RF signal at 315 MHz					
<b>Technician:</b>		M. Seamans			<b>Date:</b>	4-25-13	
<b>Notes:</b>		Detector: Peak, Unless otherwise specified				Test Distance: 3 Meters	
Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Peak Limit
MHz	(V/H)/Meters	X / Y / Z	dBµV	dB	dBµV/m	uV/m	uV/m
315	V / 2.0	X	57.97	17.3	75.27	5800.96	60416
315	V / 2.0	Y	58.13	17.3	75.43	5908.81	
315	V / 1.0	Z	42.22	17.3	59.52	946.24	
315	H / 1.0	X	54.31	17.3	71.61	3806.27	
315	H / 1.0	Y	55.31	17.3	72.61	4270.71	
315	H / 1.0	Z	60.96	17.3	78.26	8184.65	60416
630	V / 1.0	X	9.94	24.66	34.60	53.70	6042
630	V / 2.0	Y	12.64	24.66	37.30	73.28	
630	V / 1.0	Z	5.97	24.66	30.63	34.00	
630	H / 1.0	X	7.46	24.66	32.12	40.36	
630	H / 1.0	Y	8.69	24.66	33.35	46.51	
630	H / 1.0	Z	7.34	24.66	32.00	39.81	6042
945	V / 1.0	X	6.61	31.00	37.61	75.95	6042
945	V / 1.0	Y	13.20	31.00	44.20	162.18	
945	V / 1.0	Z	16.23	31.00	47.23	229.88	
945	H / 1.0	X	17.00	31.00	48.00	251.19	
945	H / 1.0	Y	13.02	31.00	44.02	158.85	
945	H / 1.0	Z	20.24	31.00	51.24	364.75	6042
1260.00	V / 1.0	X	52.26	-2.90	49.36	293.76	6042
1260.00	V / 1.0	Y	53.87	-2.90	50.97	353.59	
1260.00	V / 1.0	Z	47.79	-2.90	44.89	175.59	
1260.00	H / 1.0	X	46.21	-2.90	43.31	146.39	
1260.00	H / 1.0	Y	47.87	-2.90	44.97	177.21	
1260.00	H / 1.0	Z	48.11	-2.90	45.21	182.18	6042
1575.00	V / 1.0	X	57.16	-2.00	55.16	572.80	5000
1575.00	V / 1.0	Y	57.85	-2.00	55.85	620.15	
1575.00	V / 1.0	Z	55.30	-2.00	53.30	462.38	
1575.00	H / 1.0	X	52.27	-2.00	50.27	326.21	
1575.00	H / 1.0	Y	58.51	-2.00	56.51	669.11	
1575.00	H / 1.0	Z	62.28	-2.00	60.28	1032.76	5000



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<b>Test Method:</b>		FCC Part 15 Subpart C, Field Strength of Emissions, Paragraph 15.231(b)						
		IC RSS-210, A1.1.2 (1) Field Strengths and Frequency Bands						
<b>Customer:</b>		Dorman Products			<b>Job No.:</b>		R-1975P-3	
<b>Test Sample:</b>		315 MHz Remote Keyless Transmitter						
<b>Model No.:</b>		13731						
<b>Operating Mode:</b>		Continuously transmitting a RF signal at 315 MHz						
<b>Technician:</b>		M. Seamans			<b>Date:</b>		4-25-13	
<b>Notes:</b>		Detector: Peak, unless otherwise specified				Test Distance: 3 Meters		
Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Peak Limit	
MHz	(V/H)-Meters	X / Y / Z	dBµV	dB	dBµV/m	uV/m	uV/m	
1890.00	V / 1.0	X	48.05	-0.30	47.75	244.06	6042	
1890.00	V / 1.0	Y	46.57	-0.30	46.27	205.83		
1890.00	V / 1.0	Z	47.76	-0.30	47.46	236.05		
1890.00	H / 1.0	X	50.42	-0.30	50.12	320.63		
1890.00	H / 1.0	Y	46.29	-0.30	45.99	199.30		
1890.00	H / 1.0	Z	47.20	-0.30	46.90	221.31	6042	
2205.00	V / 1.0	X	45.97	0.90	46.87	220.55	5000	
2205.00	V / 1.0	Y	47.65	0.90	48.55	267.61		
2205.00	V / 1.0	Z	44.44	0.90	45.34	184.93		
2205.00	H / 1.0	X	48.52	0.90	49.42	295.80		
2205.00	H / 1.0	Y	45.55	0.90	46.45	210.14		
2205.00	H / 1.0	Z	50.02	0.90	50.92	351.56	5000	
2520.00	V / 1.0	X	44.53	2.20	46.73	217.02	6042	
2520.00	V / 1.0	Y	52.29	2.20	54.49	530.27		
2520.00	V / 1.0	Z	48.17	2.20	50.37	329.99		
2520.00	H / 1.0	X	51.44	2.20	53.64	480.84		
2520.00	H / 1.0	Y	52.13	2.20	54.33	520.60		
2520.00	H / 1.0	Z	53.17	2.20	55.37	586.81	6042	
2835.00	V / 1.0	X	43.80	5.10	48.90	278.61	5000	
2835.00	V / 1.0	Y	43.25	5.10	48.35	261.52		
2835.00	V / 1.0	Z	43.57	5.10	48.67	271.33		
2835.00	H / 1.0	X	46.19	5.10	51.29	366.86		
2835.00	H / 1.0	Y	42.86	5.10	47.96	250.03		
2835.00	H / 1.0	Z	44.00	5.10	49.10	285.10	5000	
3150.00	V / 1.0	X	43.73	6.00	49.73	306.55	6042	
3150.00	V / 1.0	Y	45.72	6.00	51.72	385.48		
3150.00	V / 1.0	Z	44.63	6.00	50.63	340.02		
3150.00	H / 1.0	X	46.72	6.00	52.72	432.51		
3150.00	H / 1.0	Y	42.43	6.00	48.43	263.94		
3150.00	H / 1.0	Z	43.26	6.00	49.26	290.40	6042	
The frequency range was scanned from 30 MHz to 3.2 GHz. All emissions not recorded were more than 20 dB								
below the specified limit. Emissions from the EUT do not exceed the specified limits.								
*Noise Floor Measurements ( Minimum system sensitivity)								



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<b>Test Method:</b>		FCC Part 15 Subpart C, Field Strength of Emissions, Paragraph 15.231(b)						
		IC RSS-210, A1.1.2 (1) Field Strengths and Frequency Bands						
<b>Customer:</b>		Dorman Products			<b>Job No.:</b>		R-1975P-3	
<b>Test Sample:</b>		315 MHz Remote Keyless Transmitter						
<b>Model No.:</b>		13731						
<b>Operating Mode:</b>		Continuously transmitting a RF signal at 315 MHz						
<b>Technician:</b>		M. Seamans			<b>Date:</b>		4-25-13	
<b>Notes:</b>		Average values calculated from Peak readings    Duty Cycle: 23.56%    Correction: -12.56dB						
Test Freq.	Antenna Pol./Height	EUT Orientation	Peak Reading	Duty Cycle Correction	Corrected Reading	Converted Reading	Avg. Limit	
MHz	(V/H)-Meters	X / Y / Z	dBµV/m	dB	dBµV/m	uV/m	uV/m	
315	V / 2.0	X	75.27	-12.56	62.714	1366.784	6042	
315	V / 2.0	Y	75.43	-12.56	62.874	1392.195		
315	V / 1.0	Z	59.52	-12.56	46.964	222.946		
315	H / 1.0	X	71.61	-12.56	59.054	896.809		
315	H / 1.0	Y	72.61	-12.56	60.054	1006.236		
315	H / 1.0	Z	78.26	-12.56	65.704	1928.413	6042	
630	V / 1.0	X	34.60	-12.56	22.044	12.653	605	
630	V / 2.0	Y	37.30	-12.56	24.744	17.266		
630	V / 1.0	Z	30.63	-12.56	18.074	8.0112		
630	H / 1.0	X	32.12	-12.56	19.564	9.5104		
630	H / 1.0	Y	33.35	-12.56	20.794	10.957		
630	H / 1.0	Z	32.00	-12.56	19.444	9.3799	605	
945	V / 1.0	X	37.61	-12.56	25.054	17.893	605	
945	V / 1.0	Y	44.20	-12.56	31.644	38.212		
945	V / 1.0	Z	47.23	-12.56	34.674	54.162		
945	H / 1.0	X	48.00	-12.56	35.444	59.183		
945	H / 1.0	Y	44.02	-12.56	31.464	37.428		
945	H / 1.0	Z	51.24	-12.56	38.684	85.940	605	
1260	V / 1.0	X	49.36	-12.56	36.804	69.214	605	
1260	V / 1.0	Y	50.97	-12.56	38.414	83.310		
1260	V / 1.0	Z	44.89	-12.56	32.334	41.371		
1260	H / 1.0	X	43.31	-12.56	30.754	34.490		
1260	H / 1.0	Y	44.97	-12.56	32.414	41.754		
1260	H / 1.0	Z	45.21	-12.56	32.654	42.923	605	
1575	V / 1.0	X	55.16	-12.56	42.604	134.958	500	
1575	V / 1.0	Y	55.85	-12.56	43.294	146.11		
1575	V / 1.0	Z	53.30	-12.56	40.744	108.943		
1575	H / 1.0	X	50.27	-12.56	37.714	76.859		
1575	H / 1.0	Y	56.51	-12.56	43.954	157.652		
1575	H / 1.0	Z	60.28	-12.56	47.724	243.332	500	



**Retlif Testing Laboratories**

Report No. R-1975P-3

<b>Test Method:</b>		FCC Part 15 Subpart C, Field Strength of Emissions, Paragraph 15.231(b)					
		IC RSS-210, A1.1.2 (1) Field Strengths and Frequency Bands					
<b>Customer:</b>		Dorman Products			<b>Job No.:</b>		R-1975P-3
<b>Test Sample:</b>		315 MHz Remote Keyless Transmitter					
<b>Model No.:</b>		13731					
<b>Operating Mode:</b>		Continuously transmitting a RF signal at 315 MHz					
<b>Technician:</b>		M. Seamans			<b>Date:</b>		4-25-13
<b>Notes:</b>		Average values calculated from Peak readings    Duty Cycle: 23.56%    Correction: -12.56dB					
Test Freq.	Antenna Pol./Height	EUT Orientation	Peak Reading	Duty Cycle Correction	Corrected Reading	Converted Reading	Avg. Limit
MHz	(V/H)-Meters	X / Y / Z	dBµV/m	dB	dBµV/m	uV/m	uV/m
1890.00	V / 1.0	X	47.75	-12.56	35.194	57.504	605
1890.00	V / 1.0	Y	46.27	-12.56	33.714	48.495	
1890.00	V / 1.0	Z	47.46	-12.56	34.904	55.616	
1890.00	H / 1.0	X	50.12	-12.56	37.564	75.544	
1890.00	H / 1.0	Y	45.99	-12.56	33.434	46.957	
1890.00	H / 1.0	Z	46.90	-12.56	34.344	52.143	605
2205.00	V / 1.0	X	46.87	-12.56	34.314	51.964	500
2205.00	V / 1.0	Y	48.55	-12.56	35.994	63.052	
2205.00	V / 1.0	Z	45.34	-12.56	32.784	43.571	
2205.00	H / 1.0	X	49.42	-12.56	36.864	69.695	
2205.00	H / 1.0	Y	46.45	-12.56	33.894	49.511	
2205.00	H / 1.0	Z	50.92	-12.56	38.364	82.832	500
2520.00	V / 1.0	X	46.73	-12.56	34.174	51.133	605
2520.00	V / 1.0	Y	54.49	-12.56	41.934	124.940	
2520.00	V / 1.0	Z	50.37	-12.56	37.814	77.750	
2520.00	H / 1.0	X	53.64	-12.56	41.084	113.292	
2520.00	H / 1.0	Y	54.33	-12.56	41.774	122.659	
2520.00	H / 1.0	Z	55.37	-12.56	42.814	138.261	605
2835.00	V / 1.0	X	48.90	-12.56	36.344	65.645	500
2835.00	V / 1.0	Y	48.35	-12.56	35.794	61.617	
2835.00	V / 1.0	Z	48.67	-12.56	36.114	63.929	
2835.00	H / 1.0	X	51.29	-12.56	38.734	86.437	
2835.00	H / 1.0	Y	47.96	-12.56	35.404	58.911	
2835.00	H / 1.0	Z	49.10	-12.56	36.544	67.174	500
3150.00	V / 1.0	X	49.73	-12.56	37.174	72.227	605
3150.00	V / 1.0	Y	51.72	-12.56	39.164	90.824	
3150.00	V / 1.0	Z	50.63	-12.56	38.074	80.112	
3150.00	H / 1.0	X	52.72	-12.56	40.164	101.906	
3150.00	H / 1.0	Y	48.43	-12.56	35.874	62.187	
3150.00	H / 1.0	Z	49.26	-12.56	36.704	68.423	605



**Retlif Testing Laboratories**

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**FCC Section 15.231(b)(2) - Duty Cycle Determination - Pulsed Operation**  
**IC RSS-210, A1.1.2(2), RSS-GEN, 4.5 - Pulsed Operation**

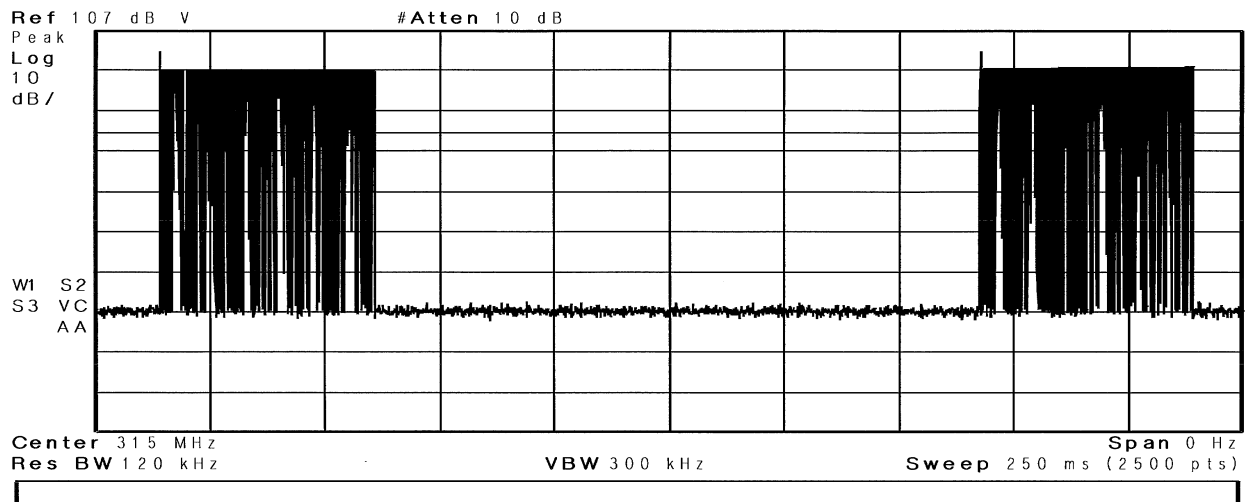
**Test Data**



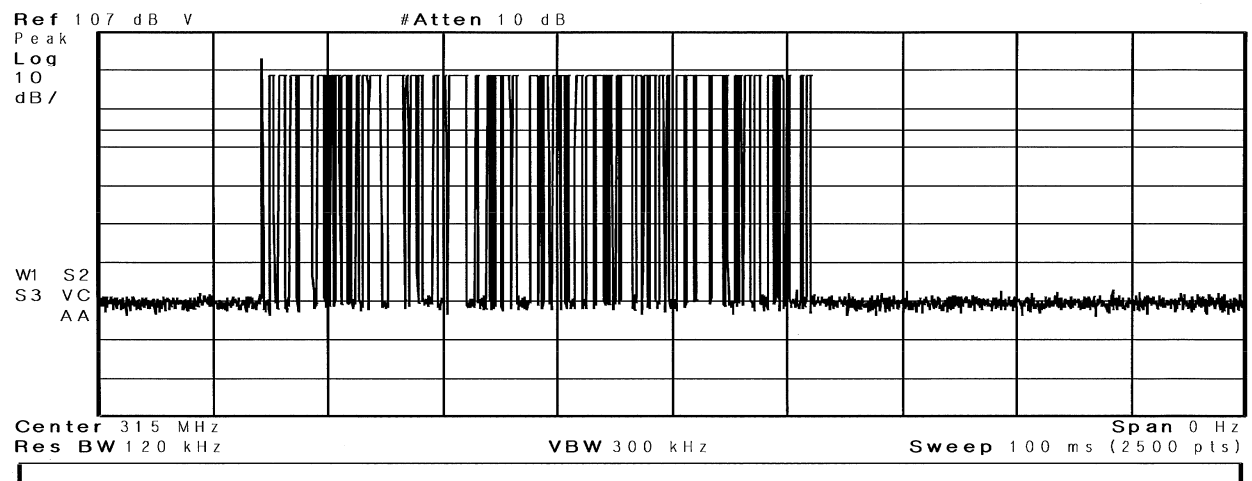
**Retlif Testing Laboratories**

Report No. R-1975P-3

Agilent 10:55:55 Apr 23, 2013



Agilent 10:56:43 Apr 23, 2013



Test Method: FCC Part 15.231(b), Duty Cycle Determination IC RSS-210 A1.1.2(2) Pulsed Operation

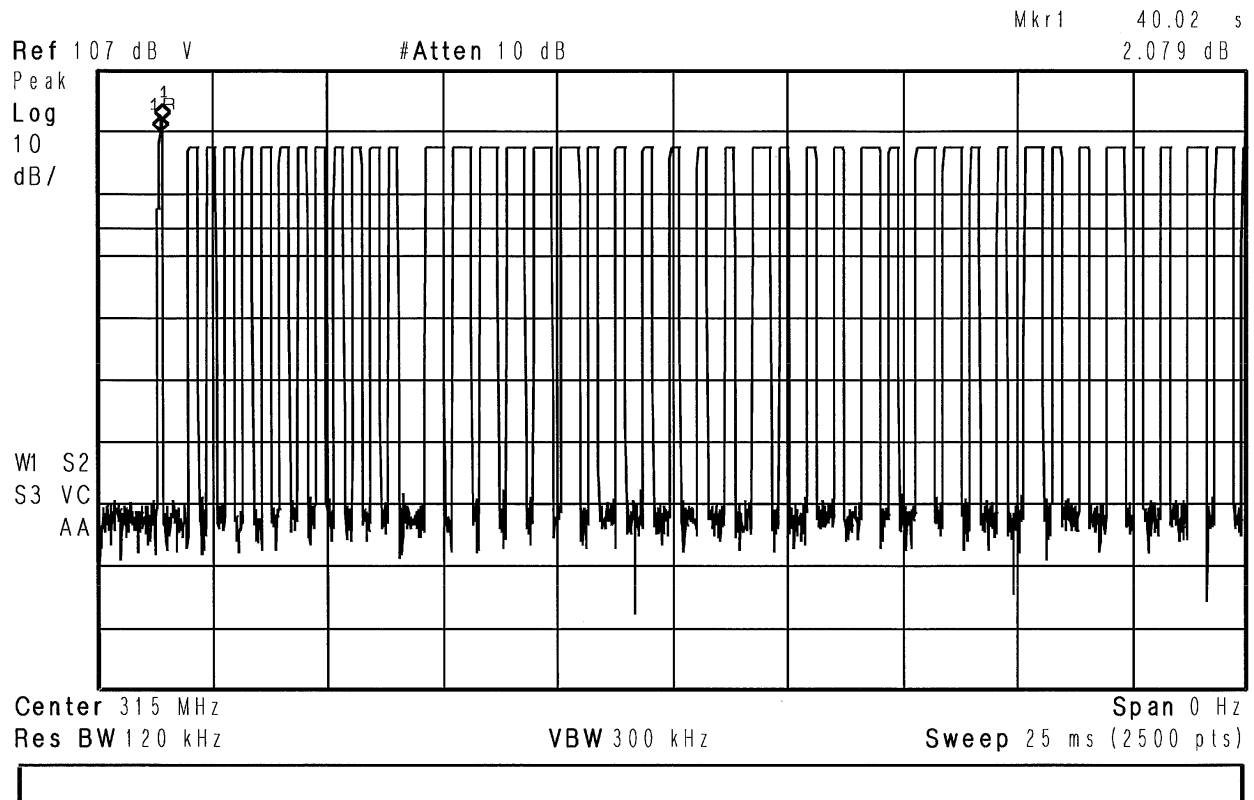
Notes: Measurement of cycle time = 23.5594238mSec.



Retlif Testing Laboratories

Report No. R-1975P-3

Agilent 11:00:47 Apr 23, 2013



Test Method: FCC Part 15.231(b), Duty Cycle Determination IC RSS-210 A1.1.2(2) Pulsed Operation

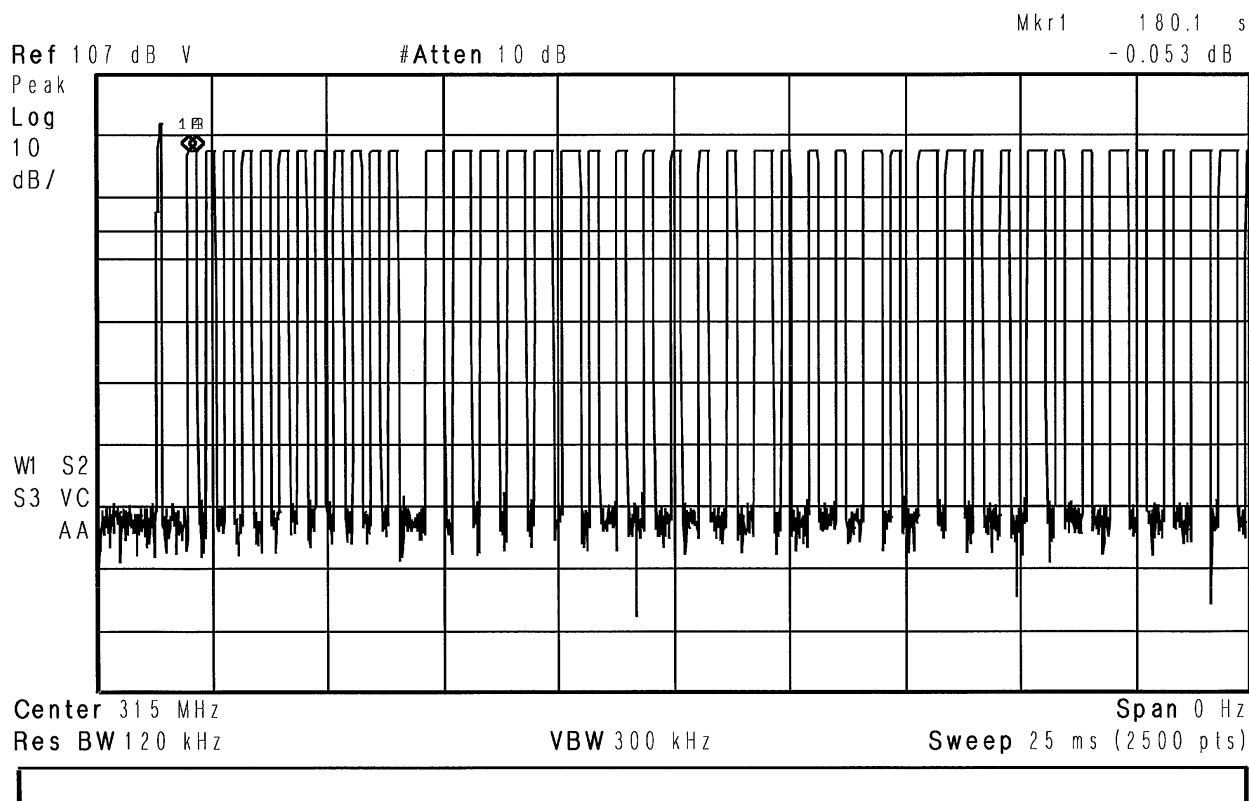
Notes: Pulse width 1 = 0.040016ms; 1 pulse



Retlif Testing Laboratories

Report No. R-1975P-3

Agilent 11:01:51 Apr 23, 2013



**Test Method:** FCC Part 15.231(b), Duty Cycle Determination IC RSS-210 A1.1.2(2) Pulsed Operation

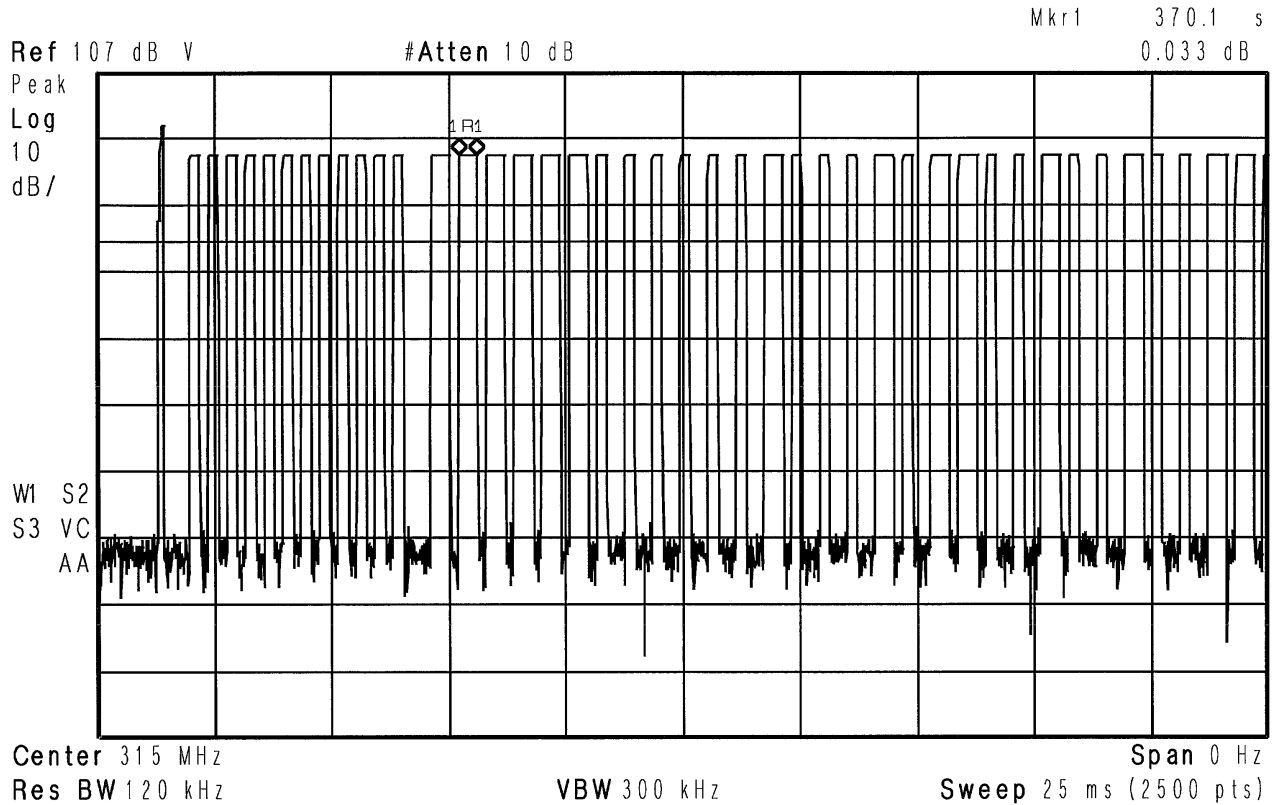
**Notes:** Pulse width 2 = 180.072us; 34 pulses



**Retlif Testing Laboratories**

Report No. R-1975P-3

\* Agilent 11:04:04 Apr 23, 2013



**Test Method:** FCC Part 15.231(b), Duty Cycle Determination IC RSS-210 A1.1.2(2) Pulsed Operation

**Notes:** Pulse width 3 = 370.148ms; 47 pulses



**Retlif Testing Laboratories**

Report No. R-1975P-3

**FCC Section 15.231(b)(3) - Field Strength of Spurious Emissions  
IC RSS-210, A1.1.2(3) - Field Strength of Unwanted Emissions**

**Test Data**



**Retlif Testing Laboratories**

Report No. R-1975P-3

Test Method:	FCC Part 15 Subpart C, Field Strength of Spurious Emissions, Section 15.231(b).						
	IC RSS-210, A1.1.2 (3) Field Strength of Unwanted Emissions						
Customer:	Dorman Products				Job No.:	R-1975P-3	
Test Sample:	315 MHz Remote Keyless Transmitter						
Model No.:	13731				Serial No.:	N/A	
Operating Mode:	Continuously transmitting a RF signal at 315.MHz						
Technician:	M. Seamans				Date:	4-25-13	
Notes: Test Distance: 3 Meters      Detector: Quasi-Peak from 30 MHz to 1 GHz, Average above 1 GHz							
Transmit Frequency	Test Frequency	Antenna/ EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit At 300 Meters
MHz	MHz	Polarization/	dBuV	dB	dBuV/m	uV/m	uV/m
315.00	0.009	-	-	-	-	-	2400/F(kHz)
315.00	0.490	-	-	-	-	-	2400/F(kHz)
Transmit Frequency	Test Frequency	Antenna/ EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit At 30 Meters
MHz	MHz	Polarization/ Axis	dBuV	dB	dBuV/m	uV/m	uV/m
315.00	0.490	-	-	-	-	-	24000/F(kHz)
		-	-	-	-	-	
	1.705	-	-	-	-	-	24000/F(kHz)
	1.705	-	-	-	-	-	30.00
		-	-	-	-	-	
315.00	30.00	-	-	-	-	-	30.00
Transmit Frequency	Test Frequency	Antenna/ EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit At 3 Meters
MHz	MHz	Polarization/	dBuV	dB	dBuV/m	uV/m	uV/m
315.00	30.00	-	-	-	-	-	100.00
		-	-	-	-	-	
	*35.00	H	6.25	16.24	22.49	13.32	
		-	-	-	-	-	
	88.00	-	-	-	-	-	100.00
	88.00	-	-	-	-	-	150.00
		-	-	-	-	-	
	*110.00	V	7.22	10.03	17.25	7.29	
	*195.00	H	15.14	12.40	27.54	23.82	
	*205.00	H	3.91	12.32	16.23	6.48	
		-	-	-	-	-	
	216.00	-	-	-	-	-	150.00
	216.00	-	-	-	-	-	200.00
		-	-	-	-	-	
	*600.00	H	-2.51	24.18	21.67	12.12	
		-	-	-	-	-	
	960.00	-	-	-	-	-	200.00
	960.00	-	-	-	-	-	500.00
	*995.00	H	-4.58	29.15	24.57	16.92	
		-	-	-	-	-	
315.00	3200.00	-	-	-	-	-	500.00
	The frequency range was scanned from 9 kHz to 3.2 GHz.						
	The emissions observed from the EUT do not exceed the specified limits.						
	Emissions not recorded were more than 20dB under the specified limit.						
	*Noise Floor Measurements (minimum sensitivity of the receiver system).						



**Retlif Testing Laboratories**

Report No. R-1975P-3

**FCC Section 15.231(c) - Bandwidth of Emission  
IC RSS-210, A1.1.3 - Bandwidth of Momentary Signals**

**Test Data**



**Retlif Testing Laboratories**

Report No. R-1975P-3



**Retlif Testing Laboratories, R-1932P-3**

**FCC Section 15.231(c) Bandwidth of Emission**

Customer: Dorman Products  
 Test Sample: 315MHz Remote Keyless Transmitter  
 Model Number: 13731  
 Test Specification: FCC Part 15, Subpart C, Section 15.231  
 Mode of Operation: Continuously transmitting a RF signal at 315 MHz  
 Technician/Date: M. Seamans / 4-23-13

**Agilent** 13:41:42 Apr 23, 2013

