

**TYPE OF EXHIBIT:** TEST REPORT

**FCC PART:** 2.1033 (b)(6)

**MANUFACTURER:** RITRON, INC.  
505 West Carmel Drive  
Carmel, IN 46032

**MODELS:** RQT-433-RCVR

**TYPE OF UNIT:** 433.92 MHz Keyfob Receiver

**FCC ID:** AIERIT32-433-RCVR

**DATE:** January 24, 2012

The following is a list of attached exhibits required by the Federal Communications Commission for the application to and grant of FCC Part 15 Certification. All tests are per ANSI C63.4-2003 where applicable.

Test Equipment List	2.947 (d)
Description of Measurement Facility	2.948 (a)(2)
Radiated Spurious Emissions	15.31(a)(3), 15.33(b)(3), 15.109(a)
Radiated Spurious Emissions Test Setup Photo	15.31(a)(3), 15.33(b)(3), 15.109(a)

**TYPE OF EXHIBIT:** TEST EQUIPMENT LIST  
**FCC PART:** 2.947 (d)  
**MANUFACTURER:** RITRON, INC.  
505 West Carmel Drive  
Carmel, IN 46032  
**MODELS:** RQT-433-RCVR  
**TYPE OF UNIT:** 433.92 MHz Keyfob Receiver  
**FCC ID:** AIERIT32-433-RCVR  
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The measured data in this report was obtained using one or more of the following pieces of equipment. The particular equipment used in any one test is detailed in the procedure for that test.

<u>ITEM</u>	<u>MANUFACTURER</u>	<u>MODEL NO.</u>	<u>SERIAL NO.</u>	<u>Last Cal</u>	<u>EXP Cal</u>
Spectrum Analyzer	Advantest	R3265A	75060189	21 OCT 2010	21 OCT 2011
Log Periodic Antenna	Electro-Metrics	LPA-25	8-102	17 MAY 2011 Confirmation	17 MAY 2013

Support equipment:

<u>ITEM</u>	<u>MANUFACTURER</u>	<u>MODEL NO.</u>	<u>SERIAL NO.</u>
Digital Multimeter	Fluke	179	82800086

Signed:



Michael A. Pickard - Project Engineer

<b>TYPE OF EXHIBIT:</b>	DESCRIPTION OF MEASUREMENT FACILITY
<b>FCC PART:</b>	2.948(a)(2)
<b>MANUFACTURER:</b>	RITRON, INC. 505 West Carmel Drive Carmel, IN 46032
<b>MODELS:</b>	RQT-433-RCVR
<b>TYPE OF UNIT:</b>	433.92 MHz Keyfob Receiver
<b>FCC ID:</b>	AIERIT32-433-RCVR
<b>DATE:</b>	January 24, 2012

The receiver spurious emissions measurements filed with this application were made on a site certified by RITRON, Inc. Data pertaining to this site is on file with the FCC and Industry Canada.

Firm Registration Number:	536261
Firm FRN:	0004-3348-76
FCC Reference:	ANSI STD C63.4-2003
Industry Canada Radio Standard:	Procedure 212

This site is used on a continuing basis exclusively by RITRON, Inc. and is utilized only for RF field strength measurements of equipment designed and manufactured by RITRON, Inc. It is not used for measurements by, or for, any other party on a contract basis or otherwise.

All other measurements are taken at RITRON's engineering laboratory in Carmel, IN.

Signed: Michael A. Pickard  
Michael A. Pickard - Project Engineer



Ritron Test Site

**TYPE OF TEST:** RADIATED SPURIOUS EMISSIONS

**FCC PART:** 15.31(a)(3), 15.33(b)(3), 15.109(a)

**MANUFACTURER:** RITRON, INC.  
505 West Carmel Drive  
Carmel, IN 46032

**MODELS:** RQT-433-RCVR

**TYPE OF UNIT:** 433.92 MHz Keyfob Receiver

**FCC ID:** AIERIT32-433-RCVR

**DATE:** October 5, 2011

**PROCEDURE:**

The RQT-433-RCVR is a fixed tuned, 433.92 MHz keyfob receiver with a 1<sup>st</sup> LO output of 423.22 MHz (RX – 10.7 MHz). There are no provisions to operate at any other frequency.

1. Field strength of spurious radiation of the RQT-433-RCVR was measured at the RITRON, Inc. 3-meter test site, details of which are on file with the FCC. Measurements were per ANSI C63.4-2003 Part 8.3.
2. The RQT-433-RCVR was installed in a host unit Ritron Model RQT-452, which supplied +9VDC to the EUT. This is the normal condition of installation and operation. There was no power applied to the radio frequency circuits of the host unit during the testing, it was used only to pass supply voltage to the EUT.
3. The RQT-433-RCVR was equipped with the non-removable, 433MHz, helical wound antenna include with the product. The RQT-433-RCVR has no provisions for any other antenna.
4. All field strength measurements were made with the Advantest R3265A Spectrum Analyzer connected to the Electro-Metrics LPA-25 log periodic antenna.
5. For each emission, the height and polarization of the field strength measuring antenna and orientation of the RQT-433-RCVR were varied to find maximum field strength.
6. The spectrum was searched from 30MHz – 846.44MHz (1<sup>st</sup> LO x 2) per FCC Part 15.33(b)(3).
7. Analyzer readings in dBm and the calibrated antenna factor were converted to field strength in dBμV/m as follows.

$$E(\text{dB}\mu\text{V/m}) = R_{\text{spur}}(\text{dBm}) + 107(\text{dB}) + \text{AF}(\text{dB})$$

where:  $R_{\text{spur}}$  is the measured spur in dBm at 3 meters  
AF is the calibrated antenna factor in dB

The results were converted to μV/m as follows and compared to the FCC limit of 200 μV/m.

$$E(\mu\text{V/m}) = 10^{(E(\text{dB}\mu\text{V/m}) / 20)}$$

8. Testing was repeated with the RQT-433-RCVR removed from the host Ritron Model RQT-452 and powered independently at +9VDC by 6 AA alkaline batteries. Test results were confirmed.

**RESULT:**

From 3 meters, no spurious radiation was detected at any height, polarization, or orientation. As a result, the -100dBm noise floor level of the spectrum analyzer is used in all calculations to confirm compliance. As indicated by the accompanying data, spurious radiation is well below the 200 μV/m FCC limit per Part 15.109(a).

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**FCC PART:** 15.31(a)(3), 15.33(b)(3), 15.109(a)

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**DATA:**

Horizontal					
Multiple of 1 <sup>st</sup> LO	Emission Frequency MHz	Rspur Reading dBm	Antenna Factor dB	Rspur Level E(μV/m)	FCC limit E(μV/m)
1	423.22	-100.0	20.9	24.83	200
2	846.44	-100.0	27.5	53.09	200

Vertical					
Multiple of 1 <sup>st</sup> LO	Emission Frequency MHz	Rspur Reading dBm	Rspur ERP dBm	Rspur Level E(μV/m)	FCC limit E(μV/m)
1	423.22	-100.0	20.9	24.83	200
2	846.44	-100.0	27.5	53.09	200

Signed:



Michael A. Pickard - Project Engineer

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**RQT-433-RCVR Radiated Spurious Emissions Test Setup Photos**

