



**BEC INCORPORATED**

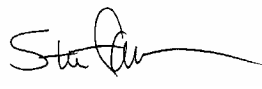
**SAR REPORT**

**TEST STANDARDS:  
FCC Part 15 Subpart C Intentional Radiator**

**ARRIS Model XG1-RM  
Rack Mount Set Top Box**

**REPORT BEC-1584-02**

**CUSTOMER:  
ARRIS Group Incorporated  
101 Tournament Drive  
Horsham, PA 19044**

**PREPARED BY:**   
Steve Fanella, Test Engineer

**REVIEWED and APPROVED BY:**   
Al Fanella, Test Director

The results described in this report relate only to the item(s) tested. This document shall not be reproduced except in full without prior written permission of BEC Incorporated





**TABLE OF CONTENTS**

**Notice To Customer ..... 3**  
**Revision History ..... 3**  
**1.0 Administrative Information ..... 4**  
    1.1 Project Details ..... 4  
    1.2 Maximum Permissible Exposure Calculation ..... 5  
    1.3 Maximum Permissible Exposure Calculation Results ..... 6



## Notice To Customer

This report and any recommendations it contains represent the result of BEC's testing and assessment on behalf of your company. Testing has been conducted according to accepted engineering standards and practices. This report reflects testing and assessment of product samples provided by your company and may not reflect the characteristics of other samples, especially those produced at different times. Therefore this report and its findings and recommendations, if implemented, should not be construed as an assurance or implied warranty for the continuing electromagnetic compatibility (EMC) of the product. **BEC shall not be liable for incidental or consequential damages, even if advised of the possibility thereof.**

BEC will not disseminate this report to other parties without your express permission. You may reproduce this report in its entirety including this notice and the entireties of any supplemental test reports on the same product (e.g. reports on additional testing following modification). However 'you may not reproduce portions of the report (except for the entirety of the summary section) or quote from it for any purpose without specific prior written permission from BEC'.

## Revision History

Revision #	Description of Changes	Date of Changes	Date Released
0	Test Report Initial Release	N/A	02/18/2015



## 1.0 Administrative Information

### 1.1 Project Details

<b>Project Number</b>	BEC-1584
<b>Set Top Box Manufacturer</b>	ARRIS Group Incorporated
<b>Set Top Box Model Number</b>	XG1-RM
<b>Set Top Box Serial Number</b>	M11446TD0198
<b>Set Top Box Sample Number</b>	1584-01 (Unmodified Antennas)
<b>Set Top Box Serial Number</b>	M11446TD0197
<b>Set Top Box Sample Number</b>	1584-02 (Modified With SMA Ports to the Antennas)
<b>FCC ID</b>	ACQ-XG1RM
<b>Frequency of Operation</b>	2400 - 2483.5 MHz
<b>Test Laboratory Location</b>	BEC Incorporated 970 East High Street Pottstown, PA 19464
<b>Test Performed For</b>	ARRIS Group Incorporated 101 Tournament Drive Horsham, PA 19044
<b>Test Personnel</b>	Paul Banker / Steve Fanella
<b>Technical Contact</b>	Mike Welty
<b>Date Received</b>	01/29/2014
<b>Condition Received</b>	Suitable for test
<b>Sample Type</b>	Production unit
<b>EUT Classification</b>	Unlicensed Unintentional Radiator
<b>FCC Classification</b>	DTS- Part 15 Digital Transmission System
<b>Applicable FCC Rule Part</b>	FCC Rules Part 15.247: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System



## 1.2 Maximum Permissible Exposure Calculation

### §15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

- (i) Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. *See* §1.1307(b)(1) of this chapter.

### §1.1307 Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.

(b)(1) The appropriate exposure limits in §§1.1310 and 2.1093 of this chapter are generally applicable to all facilities, operations and transmitters regulated by the Commission.

### §1.1310 Radiofrequency radiation exposure limits.

(2) At operating frequencies less than or equal to 6 GHz, the limits for maximum permissible exposure (MPE), derived from whole-body SAR limits and listed in Table 1 of paragraph (e) of this section, may be used instead of whole-body SAR limits as set forth in paragraph (a) through (c) of this section to evaluate the environmental impact of human exposure to RF radiation as specified in §1.1307(b), except for portable devices as defined in §2.1093 as these evaluations shall be performed according to the SAR provisions in §2.1093 of this chapter.

(4) Both the MPE limits listed in Table 1 of paragraph (e) of this section and the SAR limits as set forth in paragraph (a) through (c) of this section and in §2.1093 of this chapter are for continuous exposure, that is, for indefinite time periods. Exposure levels higher than the limits are permitted for shorter exposure times, as long as the average exposure over the specified averaging time in Table 1 is less than the limits. Detailed information on our policies regarding procedures for evaluating compliance with all of these exposure limits can be found in the FCC's *OET Bulletin 65*, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields," and in supplements to *Bulletin 65*, all available at the FCC's Internet Web site: <http://www.fcc.gov/oet/rfsafety>

### §2.1093 Radiofrequency radiation exposure evaluation: portable devices.

(b) For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.



From: OET Bulletin 65 Edition 97-02, page 19.

$$S = \frac{PG}{4\pi R^2} \quad (3)$$

where: S = Power Density (in appropriate units, e.g., mW/cm<sup>2</sup>)  
P = Power input to the antenna (in appropriate units, e.g., mW)  
G = Power Gain of the antenna in the direction of interest to an isotropic radiator  
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

or: 
$$S = \frac{\text{EIRP}}{4\pi R^2} \quad (4)$$

where: EIRP = equivalent (or effective) isotropically radiated power

### 1.3 Maximum Permissible Exposure Calculation Results

Effective Isotropic Radiated Power (EIRP) =

Antenna Power Output (dBW) + antenna gain (dBi) or  
Antenna Power Output (Watts) X numeric gain

Antenna Power	Antenna Gain	EIRP
dBW	dBi	dBW
-27.6498	3	-24.6498

Antenna Power	Antenna Gain	EIRP
Watts	numeric	Watts
.001718	1.9952	.003428

The value R, distance to the center of radiation of the antenna, is 20 cm.

$$S = \frac{\text{EIRP}}{4\pi R^2} = \frac{3.428 \text{ mW}}{4\pi(20)^2} = .000682 \text{ mW/cm}^2$$

**Results:** The calculated Power Density of the measurements for antenna 0 and antenna 1 of the ARRIS Model XG1-RM Rack Mount Set Top Box is 0.000682 mW/cm<sup>2</sup>. This complies with the limit of 1.0 mW/cm<sup>2</sup> from Table 1(B) of 47 CFR Part 1.1310. Therefore, no exposure evaluation is required.