

Test of Alien Technology RFID Reader ALR9900

To: FCC 47 CFR Part15.247 & IC RSS-210

Test Report Serial No.: VAFI01-U1 Rev A



# TEST REPORT

FROM



Test of Alien Technology RFID Reader ALR9900  
Class II Permissive Change FCC ID: P65ALR9900

To FCC 47 CFR Part15.247 & IC RSS-210

Test Report Serial No.: VAFI01-U1 Rev A

This report supersedes: None

**Manufacturer:** Alien Technology  
18220 Butterfield Blvd  
Morgan Hill  
California 95037, USA

**Product Function:** 915 MHz RFID Reader

**Copy No:** pdf    **Issue Date:** 15th February 2012

**This Test Report is Issued Under the Authority of:**

**MiCOM Labs, Inc.**  
440 Boulder Court, Suite 200  
Pleasanton, CA 94566 USA  
Phone: +1 (925) 462-0304  
Fax: +1 (925) 462-0306  
[www.micomlabs.com](http://www.micomlabs.com)



CERTIFICATE #2381.01

**MiCOM Labs is an ISO 17025 Accredited Testing Laboratory**



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 3 of 107

---

This page has been left intentionally blank

---

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



## TABLE OF CONTENTS

<b>ACCREDITATION, LISTINGS &amp; RECOGNITION .....</b>	<b>5</b>
<b>1. TEST RESULT CERTIFICATE .....</b>	<b>8</b>
<b>2. REFERENCES AND MEASUREMENT UNCERTAINTY .....</b>	<b>9</b>
2.1. Normative References .....	9
2.2. Test and Uncertainty Procedures .....	9
<b>3. PRODUCT DETAILS AND TEST CONFIGURATIONS .....</b>	<b>10</b>
3.1. Technical Details .....	10
3.2. Scope of Test Program .....	11
3.3. Equipment Model(s) and Serial Number(s) .....	15
3.4. Antenna Details .....	16
3.5. Cabling and I/O Ports .....	17
3.6. Test Configurations.....	18
3.7. Equipment Modifications.....	18
3.8. Deviations from the Test Standard .....	18
3.9. Subcontracted Testing or Third Party Data .....	18
<b>4. TEST SUMMARY .....</b>	<b>19</b>
<b>5. TEST RESULTS .....</b>	<b>21</b>
5.1. Device Characteristics .....	21
5.1.1. 20 dB Bandwidth.....	21
5.1.2. Transmitter Channels - Channel Spacing .....	26
5.1.3. Transmitter Channels.....	29
5.1.4. Output Power .....	34
5.1.5. Maximum Permissible Exposure.....	37
5.1.6. Conducted Spurious Emissions Transmitter .....	38
5.1.7. Conducted Spurious Emissions Stand-By .....	46
Conducted Stand-By Spurious Emissions 30M - 7 GHz.....	47
5.1.8. Radiated Emissions .....	49
5.1.9. Radiated Spurious Emissions – Digital Emissions.....	86
5.1.10. AC Wireline Conducted Emissions (150 kHz – 30 MHz) .....	96
<b>6. PHOTOGRAPHS.....</b>	<b>100</b>
6.1. General Measurement Test Set-Up .....	100
6.2. Radiated Emissions >1 GHz.....	102
6.3. Radiated Emissions <1 GHz.....	103
6.4. Cable Connections PSU AC Wireline Emissions.....	104
6.5. XP Power PSU AC Wireline Emissions .....	105
<b>7. TEST EQUIPMENT DETAILS.....</b>	<b>106</b>

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 5 of 107

## **ACCREDITATION, LISTINGS & RECOGNITION**

MiCOM Labs, Inc. an accredited laboratory complies with the international standard BS EN ISO/IEC 17025. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-01.pdf>



The American Association for Laboratory Accreditation

World Class Accreditation

### *Accredited Laboratory*

A2LA has accredited

## **MICOM LABS**

*Pleasanton, CA*

for technical competence in the field of

### **Electrical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-LAF Communiqué dated 8 January 2009).

Presented this 26th day of February 2008.



President & CEO  
For the Accreditation Council  
Certificate Number 2381.01  
Valid to February 28, 2010  
Revised November 17, 2009

*For the tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 6 of 107

## LISTINGS

MiCOM Labs test facilities are listed by the following organizations;

### North America

#### **United States of America**

Federal Communications Commission (FCC) Listing #: 102167

#### **Canada**

Industry Canada (IC) Listing #: 4143A

### Japan Registration

VCCI Membership Number: 2959

- Radiation 3 meter site; Registration No. R-2881
- Line Conducted, Registration Nos. C-3181 & T-1470
- Emissions; Registration Nos. C-3180 & T-1469

## RECOGNITION

### **APEC MRA (Asia-Pacific Economic Community Mutual Recognition Agreement)**

#### **Conformity Assessment Body (CAB) – MiCOM Labs**

Test data generated by MiCOM Labs is accepted in the following countries under the APEC MRA.

Country	Recognition Body	Phase	CAB Identification No.
Australia	Australian Communications and Media Authority (ACMA)	I	US0159
Hong Kong	Office of the Telecommunication Authority (OFTA)	I	
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)	I	
Singapore	Infocomm Development Authority (IDA)	I	
Taiwan	National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI)	I	

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 7 of 107

## DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	12 <sup>th</sup> January 2010	Initial Release  FCC ID: P65ALR9900 Product originally certified 5 <sup>th</sup> October 2007, MiCOM Labs Test Report ALNT25-A1, 4 <sup>th</sup> October 2007
Rev B	15th February 2012	Tested additional antenna, updated Section 5.1.8.5 Transmitter Radiated Spurious Emissions – Antenna RFID-v9.1

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 8 of 107

## 1. TEST RESULT CERTIFICATE

<b>Manufacturer:</b>	Alien Technology 18220 Butterfield Blvd Morgan Hill California 95037, USA	<b>Tested By:</b>	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
<b>EUT:</b>	915 MHz RFID Reader	<b>Telephone:</b>	+1 925 462 0304
<b>Model:</b>	ALR9900	<b>Fax:</b>	+1 925 462 0306
<b>S/N:</b>	JA0900005		
<b>Test Date(s):</b>	16th November 2011	<b>Website:</b>	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC 47 CFR Part15.247 & IC RSS-210	EQUIPMENT COMPLIES

MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

### Notes:

1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

Approved & Released for MiCOM Labs, Inc. by:



TEST CERTIFICATE #2381.01

\_\_\_\_\_  
Graeme Grieve  
Quality Manager MiCOM Labs,

\_\_\_\_\_  
Gordon Hurst  
President & CEO MiCOM Labs, Inc.

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



## 2. REFERENCES AND MEASUREMENT UNCERTAINTY

### 2.1. Normative References

Ref.	Publication	Year	Title
(i)	FCC 47 CFR Part 15.247	2007	Code of Federal Regulations
(ii)	Industry Canada RSS-210	Issue 7 June 2007	Low Power License-Exempt Radiocommunication Devices (All Frequency Bands)
(iii)	Industry Canada RSS-Gen	Issue 2 June 2007	General Requirements and Information for the Certification of Radiocommunication Equipment.
(iv)	ANSI C63.4	2003	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
(v)	CISPR 22/ EN 55022	1997 1998	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
(vi)	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
(vii)	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
(viii)	ETSI TR 100 028	2001	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
(ix)	A2LA	14 <sup>th</sup> September 2005	Reference to A2LA Accreditation Status – A2LA Advertising Policy

### 2.2. Test and Uncertainty Procedures

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 10 of 107

### 3. PRODUCT DETAILS AND TEST CONFIGURATIONS

#### 3.1. Technical Details

Details	Description
Purpose:	Test of the Alien Technology RFID Reader ALR9900 to FCC Part 15.247 and Industry Canada RSS-210 regulations
Applicant:	As Manufacturer
Manufacturer:	Alien Technology 18220 Butterfield Blvd Morgan Hill California 95037, USA
Laboratory performing the tests:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	VAFI01-U1 Rev A
Standard(s) applied:	FCC 47 CFR Part15.247 & IC RSS-210
Date EUT received:	15 <sup>th</sup> December 2009
Dates of test (from - to):	16th November 2011
No of Units Tested:	One
Type of Equipment:	915 MHz RFID Reader
Manufacturers Trade Name:	Enterprise Reader
Model:	ALR9900
Location for use:	Indoor
Declared Frequency Range(s):	902 - 928 MHz
Type of Modulation:	PR-ASK
Declared Nominal Output Power:	+30 dBm
EUT Modes of Operation:	FHSS
Transmit/Receive Operation:	Transceiver, Simplex
Rated Input Voltage and Current:	115Vac 60 Hz
Operating Temperature Range:	0°C to +50°C (client declared range)
ITU Emission Designator:	52K6L1D
Microprocessor(s) Model:	Intel Xscale
Clock/Oscillator(s):	20, 3.6864, 25 MHz, 32.768 kHz
Frequency Stability:	±20ppm
EUT Dimensions:	8" x 7" x 1.6"
EUT Weight :	2.21 lbs
Primary function of equipment:	Radio Frequency Identification (RFID) Reader

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



### 3.2. Scope of Test Program

The scope of the test program was to perform a Class II Permissive Change on the Alien Technology RFID Reader ALR9900 in the frequency ranges 902 - 928 MHz against FCC 47 CFR Part 15.247 and Industry Canada RSS-210 specifications for radiated emissions for intentional radiators. The intentional radiator was tested in a simulated typical installation to demonstrate compliance with the stated standards.

The Class II Permissive Change was to add a single antenna, see following description;

#### **Antenna Model Number:**

RFID-v9.1 915 MHz

This antenna was designed primarily for use in RFID applications such as soft drink vending machines where a carefully controlled read/write staging area is needed, together with insensitivity to the presence of liquids. Far-Field radiation has been minimized to eliminate interaction with directly adjacent sensors and the presence of Tags not in the desired staging area.

SPECIFICATIONS		
Nominal Impedance	50	Ohms
Center Frequency	915	MHz
Frequency Range of Operation	902 - 928	MHz
SWR Bandwidth (Min)	26	MHz
SWR (Max, 50 Ohm) <sup>1</sup>	2:1	
Read Range <sup>2</sup>	4	Inches
Nominal Gain <sup>3</sup>	-3.55 to 0.55	dbi
Maximum Input Power <sup>4</sup>	500	mw

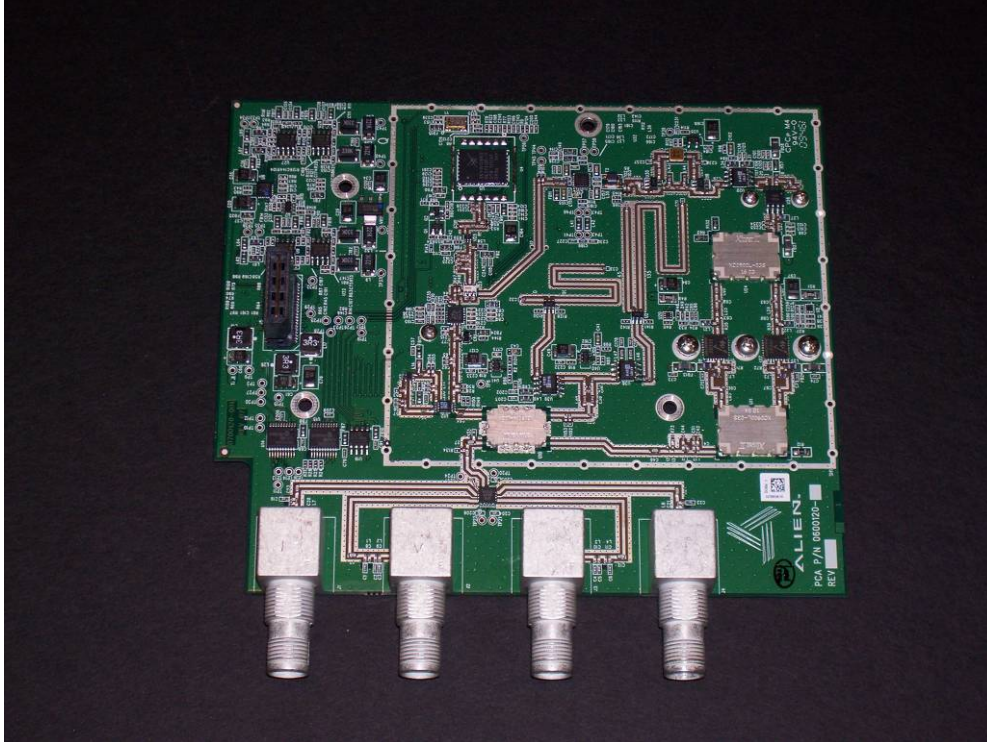
Notes
(1) SWR Typically 1.5:1
(2) RFID Tag centered over Antenna
(3) Depends on T-Attenuator option selected: 0 to -3dbi
(4) Typical Power needed for max read height is 50mw

Because of the small size of this radiator compared to wavelength, its far field pattern is almost perfectly isotropic, producing a maximum gain in the pattern of 0.55db. This occurs on a line drawn from the center through the gap in the resonator in the plane of the antenna. The EIRP is therefore .55db maximum over the isotropic reference. The inclusion of the onboard T-Attenuator reduces the EIRP by 1db to 4db, depending on the configuration chosen.

Maximum average power in normal operation is less than 50mw (0.05W). Power output needed from the Reader is 100mw at a 50% duty cycle, and losses in the transmission line, connectors, and antenna dielectric actually reduce that by about 2db, to 32mw. Peak envelope power (PEP) would be 64mw. The power density in normal operation at 12 inches would be 27mw/m<sup>2</sup> (0.027W per square meter), or less than 18x10<sup>-6</sup>/in<sup>2</sup> (0.000018W per square inch). Again these levels would be reduced by 1db to 4db depending on the vales chosen for the T-Attenuator.

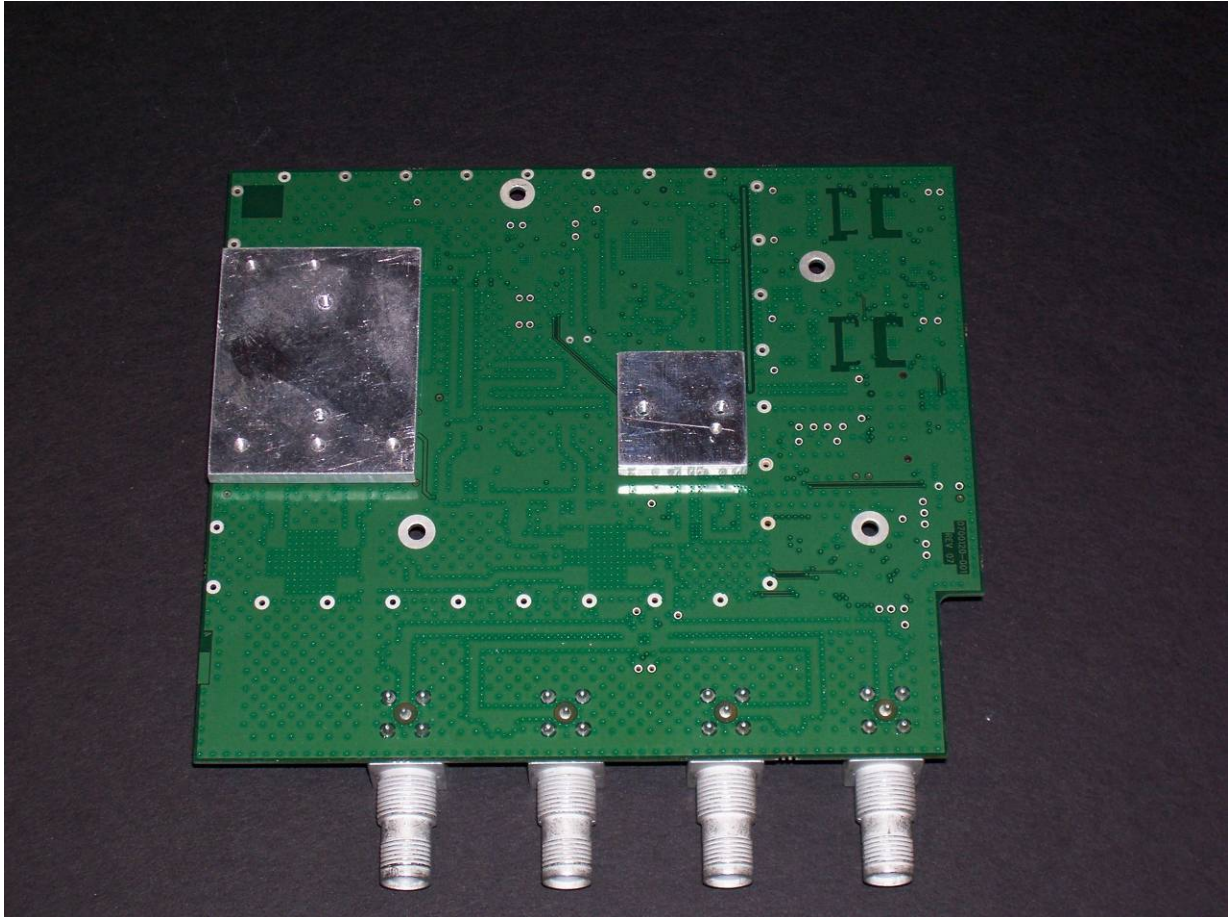
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

**RF PCB Part No. 06000120 Top**



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

**RF PCB Part No. 06000120 Underside**



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

### Alien Technology 915 MHz RFID Reader



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 15 of 107

**3.3. Equipment Model(s) and Serial Number(s)**

Type (EUT/Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	RFID Reader	Alien Technology	ALR9900	FA0700154
EUT	115Vac/dc Power Supply Unit 10 Vdc,2A 6 Vdc,2A -5Vdc/0.5A	Cable Connections, by Rong Horng Electronic Co Ltd	RHL-97575720 2505-6	D0629G
EUT	100-240Vac/dc PSU 9.75 Vdc, 2.5A +5.75Vdc, 3A -5.75 Vdc, 0.3A	XP Power	HUP45-30/#10045 -01	03485057-0631
EUT	Latitude Laptop	Dell	C600, PP01L	None

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 16 of 107

### 3.4. Antenna Details

Brand	Model	Type	Frequency	Antenna Gain
Alien	ALR-9608	Circular	902-928MHz	5.5dBic
Alien	ALR-9611/*	Circular	902-928MHz	6dBi
Laird	S9025PCRTN	Circular	902-928MHz	5.5dBi
Laird	S9025P R/L	Circular	902-928MHz	5.5dBic
Laird	S9026X	Circular	902-928MHz	6 dBic
Laird	S8056RC	Circular	860-960MHz	6dBi
Laird	S9028PC12NF	Circular	902-928MHz	7.5dBic
Laird	S9028PCL	Circular	902-928MHz	8 dBic
Laird	S8658WP R/L	Circular	865-960MHz	8.5dBic
Laird	S8658WPLE240 RTN	Circular	865-960MHz	8.5dBic
Laird	DCE8658WPR	Circular	865-960MHz	8.5dBic
Laird	S8658WPR12N F	Circular	865-956MHz	8.5dBi
Laird	DCE9028P R/L	Circular	902-928MHz	9dBic
Mobile Mark	PN10-915/*	Circular	850-980MHz	10dBic
Mobile Mark	PN12-915/* = EDN 228-221	Circular	902-928MHz	12dBic
Mobile Mark	PN12-868/*	Circular	860-960MHz	12dBic
Mobile Mark	BP6-915/*	Circular	902-928MHz	5.5dBic
Mobile Mark	PN7-915/*	Circular	902-928MHz	7dBic
Mobile Mark	PN8-915/*	Circular	902-928MHz	8dBi
MTI	MT-263007/*	Circular	902-928MHz	10dBic
MTI	MT-263020/*	Circular	902-928MHz	11dBic
MTI	MT-241026/*	Circular	865-956MHz	2.5dBic
MTI	MT-242042/*	Circular	902-928MHz	6.5dBic
MTI	MT-262013/*	Circular	902-928MHz	7.5dBic
MTI	MT-262024/*	Circular	902-928MHz	7.5dBic
MTI	MT-262031/*	Circular	902-928MHz	7.5dBic
MTI	MT-242043/*	Circular	865-956MHz	8.5 dBic
MTI	MT-262011/*	Circular	902-928MHz	8.5dBic
MTI	MT-262006/*	Circular	902-928MHz	9dBic

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.





**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 17 of 107

Laird	S9028SLP12NF	Linear	902-928MHz	8dBi
Laird	(IF 900) CAF 95956	Linear	880-960MHz	3dBi
Laird	S9028P12NF	Linear	902-928MHz	8dBi
Laird	S9028PV	Linear	902-928MHz	8dBi
Mobile Mark	CVO-915I	Linear	902-928MHz	2.5dBi
Mobile Mark	CVS-915I	Linear	902-928MHz	2.5dBi
Mobile Mark	BP6-915	Linear	902-928MHz	5.5dBi
MTI	MT-242044/*	Linear	902-928MHz	8dBi
Laird	S902ANFC	NF	902-928MHz	6dBi
Laird	S902ANFD	NF	902-928MHz	6dBi
Mobile Mark	NLM-915	NF	860-960MHz	N/A
MTI	MT-269508/*	NF	902-928MHz	N/A
Validfill, LLC	RFID-v9.1 915 MHz	NFLS	902-928MHz	-3.55 to 0.55dBi

NFLS - Near Field Magnetic Loop Sensor

### Tested Antenna

### 3.5. Cabling and I/O Ports

Number and type of I/O ports

1. RF Port (915 MHz)
1. 10/100BT Ethernet
2. dc Supply on single connector +10, +6, -5Vdc
3. Serial Port (9 pin) Local Maintenance Terminal
4. Control input/output

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 18 of 107

---

### 3.6. Test Configurations

Test configurations

Operating Channel	Frequencies (MHz)
0	902.75
26	915.75
49	927.25

### 3.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:

1. NONE

### 3.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:

1. NONE

### 3.9. Subcontracted Testing or Third Party Data

The following tests were performed by a MiCOM Labs approved test facility;-

1. NONE

---

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



#### 4. TEST SUMMARY

##### List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247**, **Industry Canada RSS-210** and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.247(a)(1) A8.1	20 dB BW	20 dB BW	Conducted	Complies	5.1.1
15.247(a)(1) A8.1	Transmitter Channels	Channel Spacing	Conducted	Complies	5.1.2
15.247(a)(1) A8.1	Transmitter Channels	Number of Channels	Conducted	Complies	5.1.3.1
		Channel Occupancy	Conducted	Complies	5.1.3.2
15.247(b)(2) A8.4	Output Power	Transmit Power	Conducted	Complies	5.1.4
15.247(i) 5.5	Maximum Permissible Exposure	Exposure to radio frequency energy levels	Conducted	Complies	5.1.5
15.247(d) A8.5	Conducted Spurious Emissions	Band Edge	Conducted	Complies	5.1.6
		Spurious Emissions Transmitter (1 to 10 GHz)	Conducted	Complies	
§7.2.3		Standby	Conducted	Complies	5.1.7

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



### List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247**, **Industry Canada RSS-210** and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.247(d) 15.205 15.209 A8.5 2.2 2.6 4.9	Radiated Emissions above 1 GHz	Transmitter	Radiated	Complies	5.1.8.1
4.10		Receiver	Radiated	Complies	5.1.8.2
15.247(d) 15.205 15.209 A8.5 2.2 2.6	Radiated Emissions below 1 GHz		Radiated	Complies	5.1.9
15.207 7.2.2	Conducted	AC Wireline Conducted Emissions	Conducted	Complies	5.1.10

**Note 1:** Test results reported in this document relate only to the items tested

**Note 2:** The required tests demonstrated compliance as per client declaration of test configuration, monitoring methodology and associated pass/fail criteria

**Note 3:** Section 3.7 - Equipment Modifications highlights the equipment modifications that were required to bring the product into compliance with the above test matrix

## 5. TEST RESULTS

### 5.1. Device Characteristics

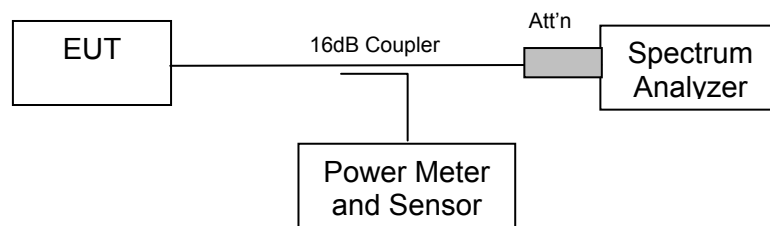
#### 5.1.1. 20 dB Bandwidth

**FCC, Part 15 Subpart C §15.247(a)(1)**  
**Industry Canada RSS-210 §A8.1**

#### Test Procedure

The 20 dB bandwidth is measured with a spectrum analyzer connected to the antenna terminal, while the EUT is operating in transmission mode at the appropriate center frequency and modulation.

#### Test Measurement Set up



Measurement set up for 20 dB bandwidth test



**Test Results for 20 dB Bandwidth**

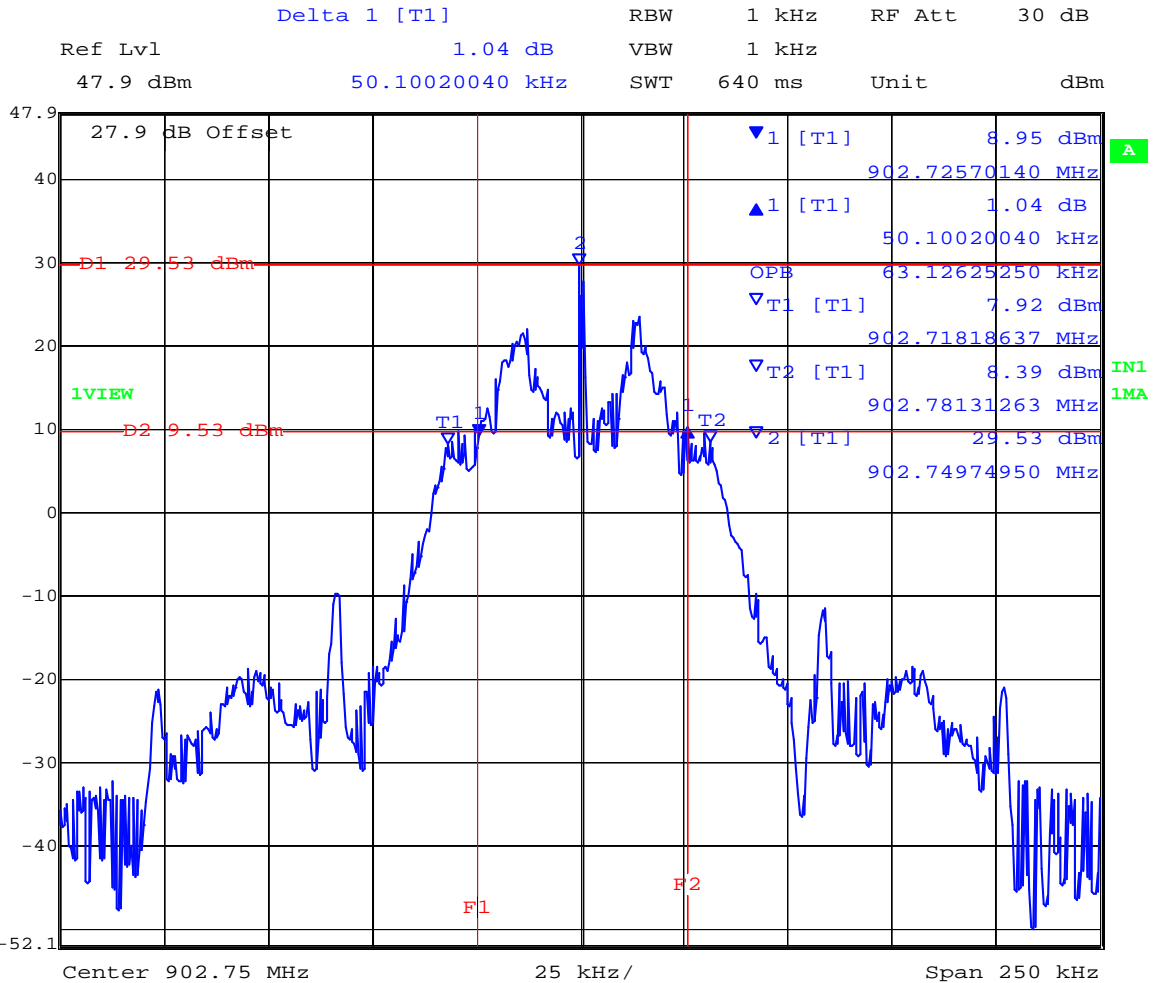
Ambient conditions.

Temperature: 17 to 23 °C    Relative humidity: 31 to 57 %    Pressure: 999 to 1012 mbar

**TABLE OF RESULTS**

Channel #	Center Frequency (MHz)	20 dB Bandwidth (kHz)	Specification (kHz)
0	902.75	50.1002	<500
26	915.75	51.1022	
49	927.25	53.6072	

**CH 0 902.75 MHz 20 dB Bandwidth**

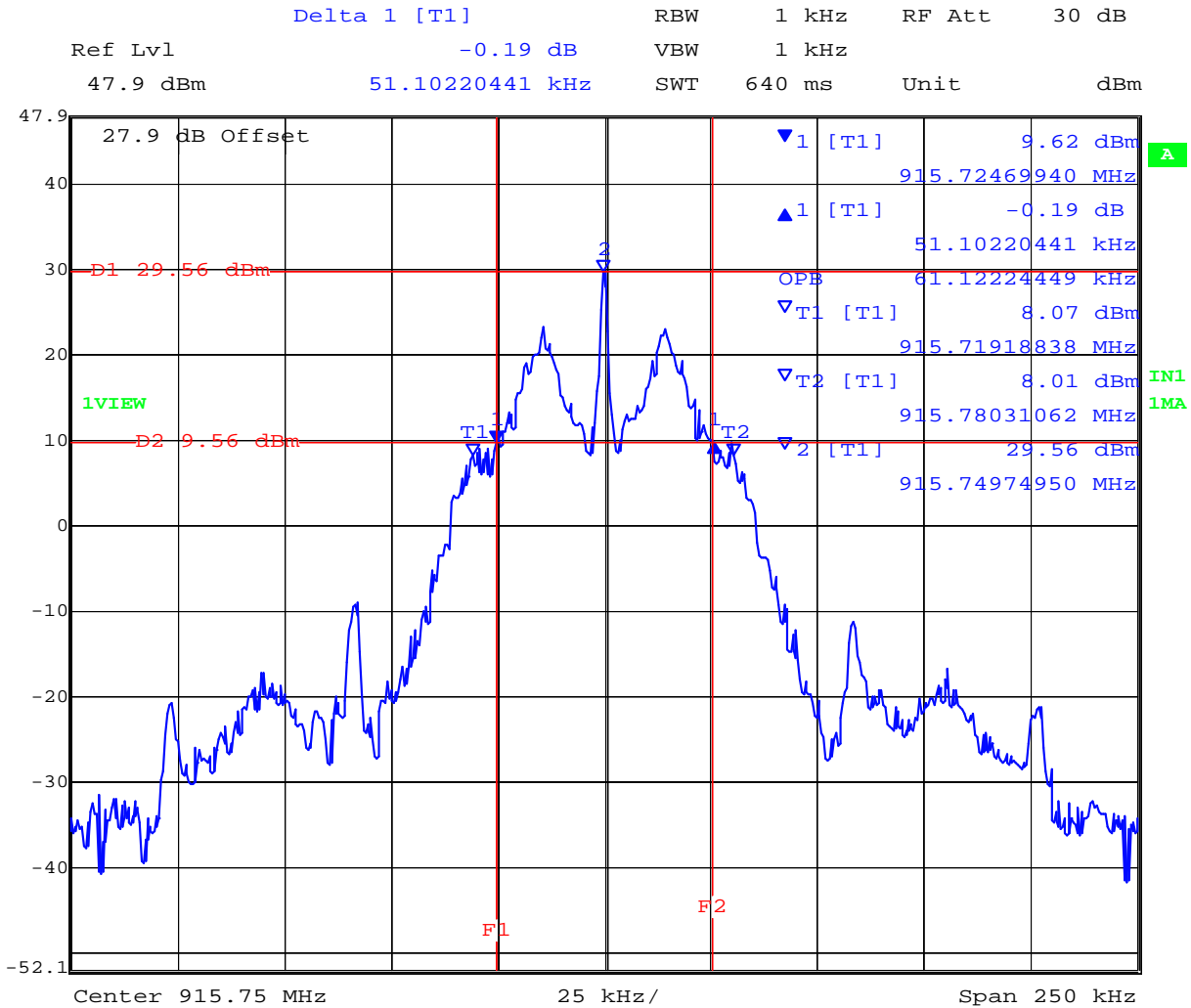


Date: 15.DEC.2009 09:29:46

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**CH 26 915.75 MHz 20 dB Bandwidth**

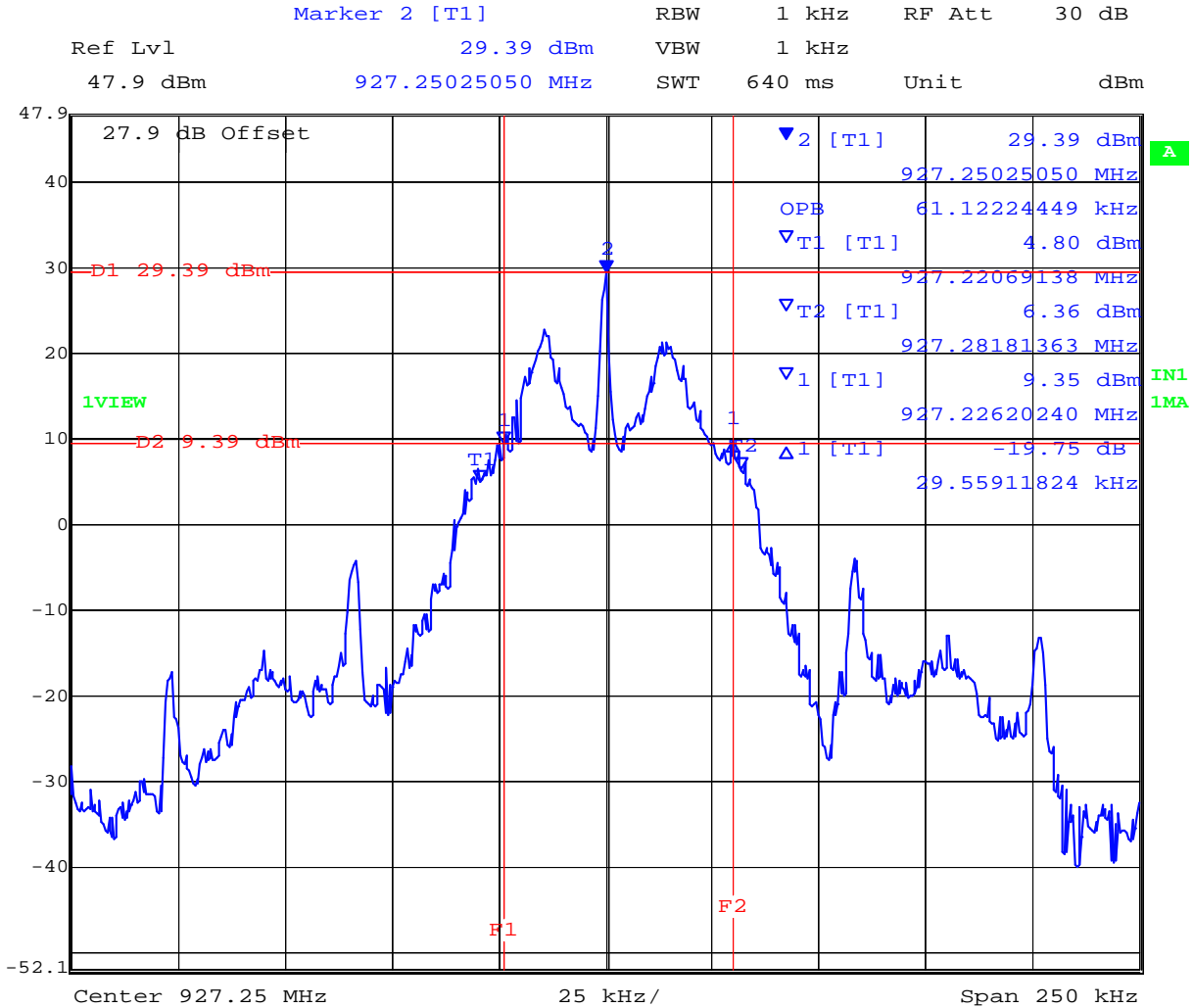


Date: 15.DEC.2009 09:44:45

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**CH 49 927.25 MHz 20 dB Bandwidth**



Date: 15.DEC.2009 09:51:42

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.





**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 25 of 107

**Specification**

**Limits**

**FCC §15.247 (a)(1)**  
**Industry Canada RSS-210 §8.1**

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 and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

**Laboratory Measurement Uncertainty for Spectrum Measurement**

Measurement uncertainty	±2.81 dB
-------------------------	----------

**Traceability**

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of RF Spectrum Mask'	0158, 0193, 0252, 0313, 0314, 0070, 0116, 0117

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

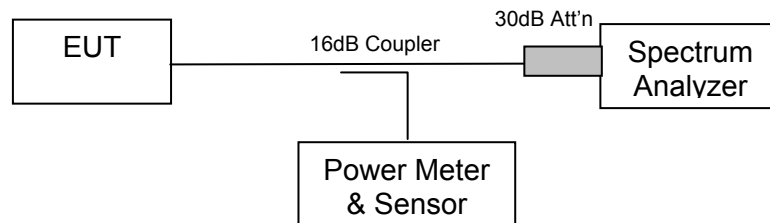
### 5.1.2. Transmitter Channels - Channel Spacing

**FCC, Part 15 Subpart C §15.247(a)(1)**  
**Industry Canada RSS-210 §8.1(2)**

#### **Test Procedure**

The channel spacing is measured with a spectrum analyzer connected to the antenna terminal, while the EUT is operating in transmission mode at the appropriate center frequency and modulation.

#### **Test Measurement Set up**



Measurement set up for Channel Spacing Test



Ambient conditions.

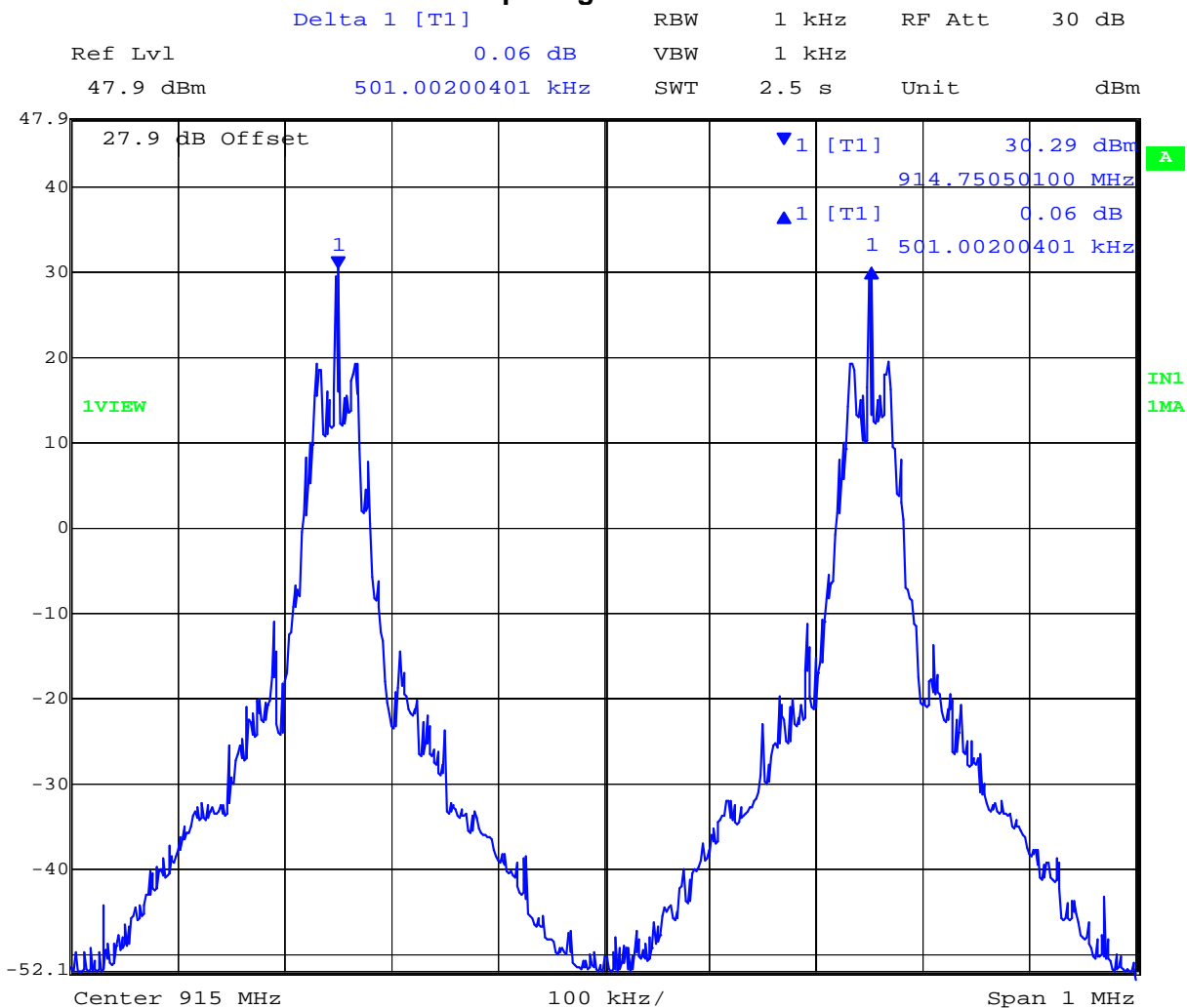
Temperature: 17 to 23 °C    Relative humidity: 31 to 57 %    Pressure: 999 to 1012 mbar

TABLE OF RESULTS

Channel(s)	Channel Spacing (KHz)	Specification
25-26	501.002	Greater than maximum 20 dB Bandwidth

Maximum 20 dB bandwidth = 52.6052 kHz

Channel Spacing for CH 25 – CH 26



Date: 15.DEC.2009 11:30:39

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 28 of 107

### Specification for Channel Spacing

#### Limits

**FCC §15.247 (a)(1)**  
**Industry Canada RSS-210 §A8.1(2)**

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.

### Laboratory Uncertainty for Frequency Measurements

Measurement uncertainty	$\pm 0.86$ ppm
-------------------------	----------------

### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-02 'Frequency Measurement'	0078, 0134, 0158, 0184, 0193, 0250, 0252 0310, 0312.

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

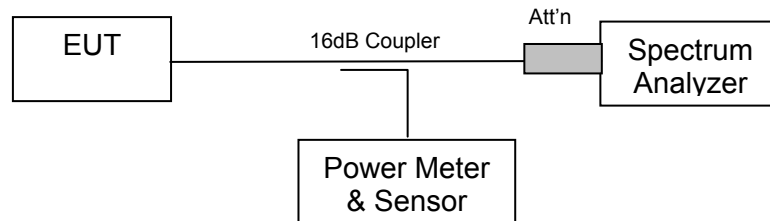
### 5.1.3. Transmitter Channels

#### 5.1.3.1. **Number of Channels** **FCC, Part 15 Subpart C §15.247(a)(1)** **Industry Canada RSS-210 §A8.1**

#### **Test Procedure**

The number of channels and channel occupancy is measured with a spectrum analyzer connected to the antenna terminal, while the EUT is operating in transmission mode at the appropriate center frequency and modulation.

#### **Test Measurement Set up**



Test set up to measure the number of channels and channel occupancy

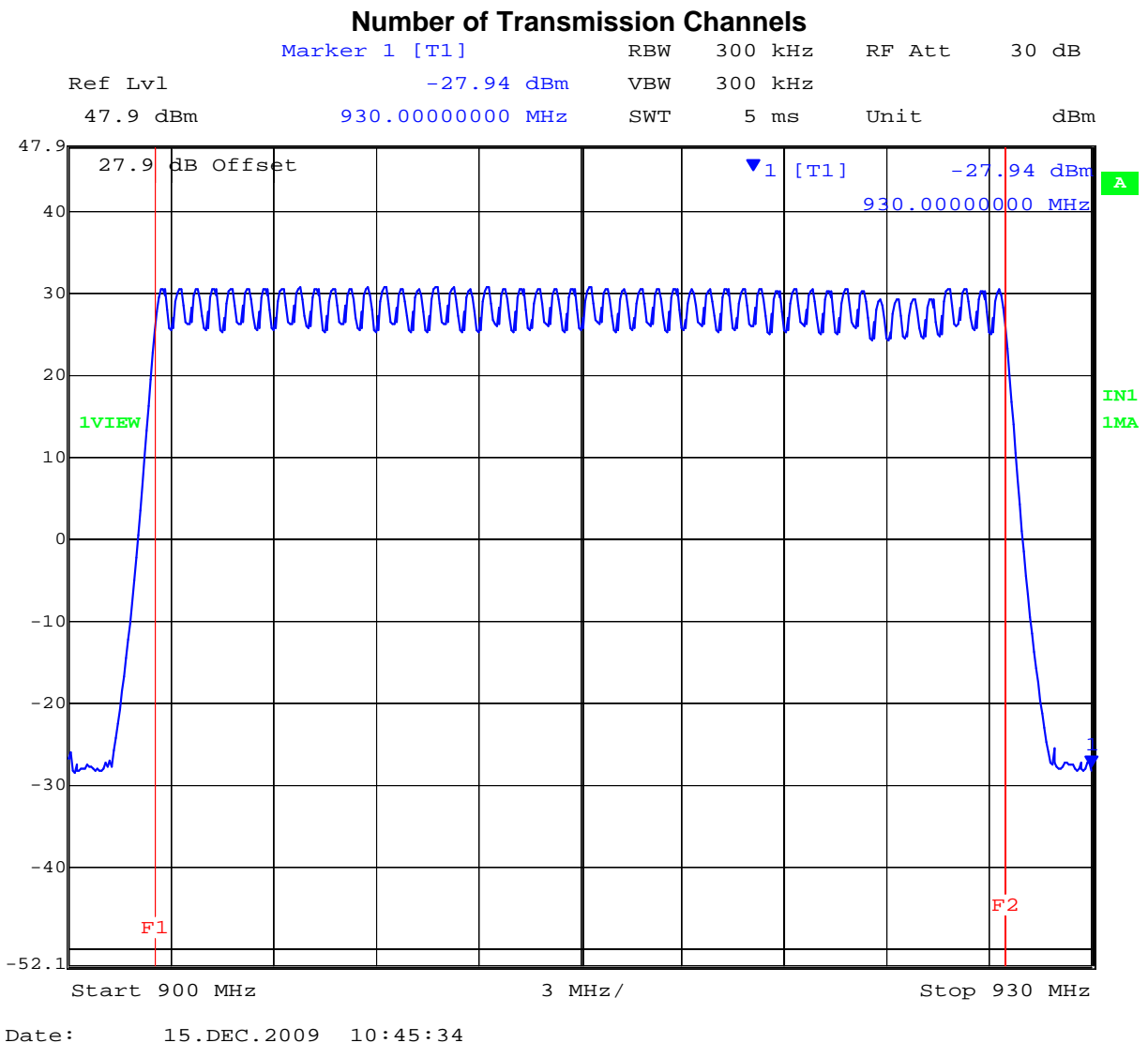


Ambient conditions.

Temperature: 17 to 23 °C    Relative humidity: 31 to 57 %    Pressure: 999 to 1012 mbar

TABLE OF RESULTS

Number of Channels	Specification
50	Minimum of 50 hopping channels



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**5.1.3.2. Channel Occupancy**  
**FCC, Part 15 Subpart C §15.247(a)(1)**  
**Industry Canada RSS-210 §A8.1**

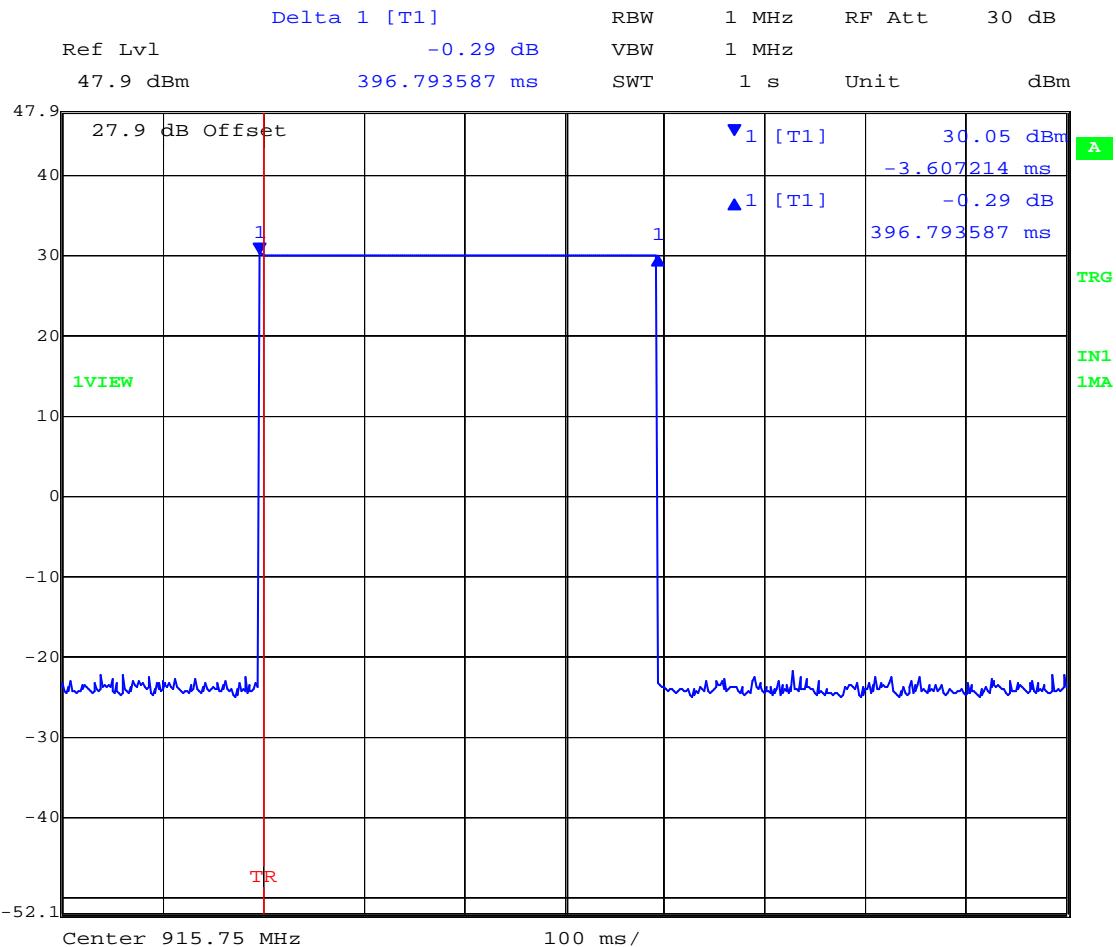
Ambient conditions.  
 Temperature: 17 to 23 °C    Relative humidity: 31 to 57 %    Pressure: 999 to 1012 mbar

**Channel Dwell Time**

TABLE OF RESULTS

Channel #	Center Frequency (MHz)	Channel Dwell Time (single channel) (mSecs)
26	914.75	396.79

**Channel dwell time Ch 26 915.75 MHz**



Date: 15.DEC.2009 10:49:31

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

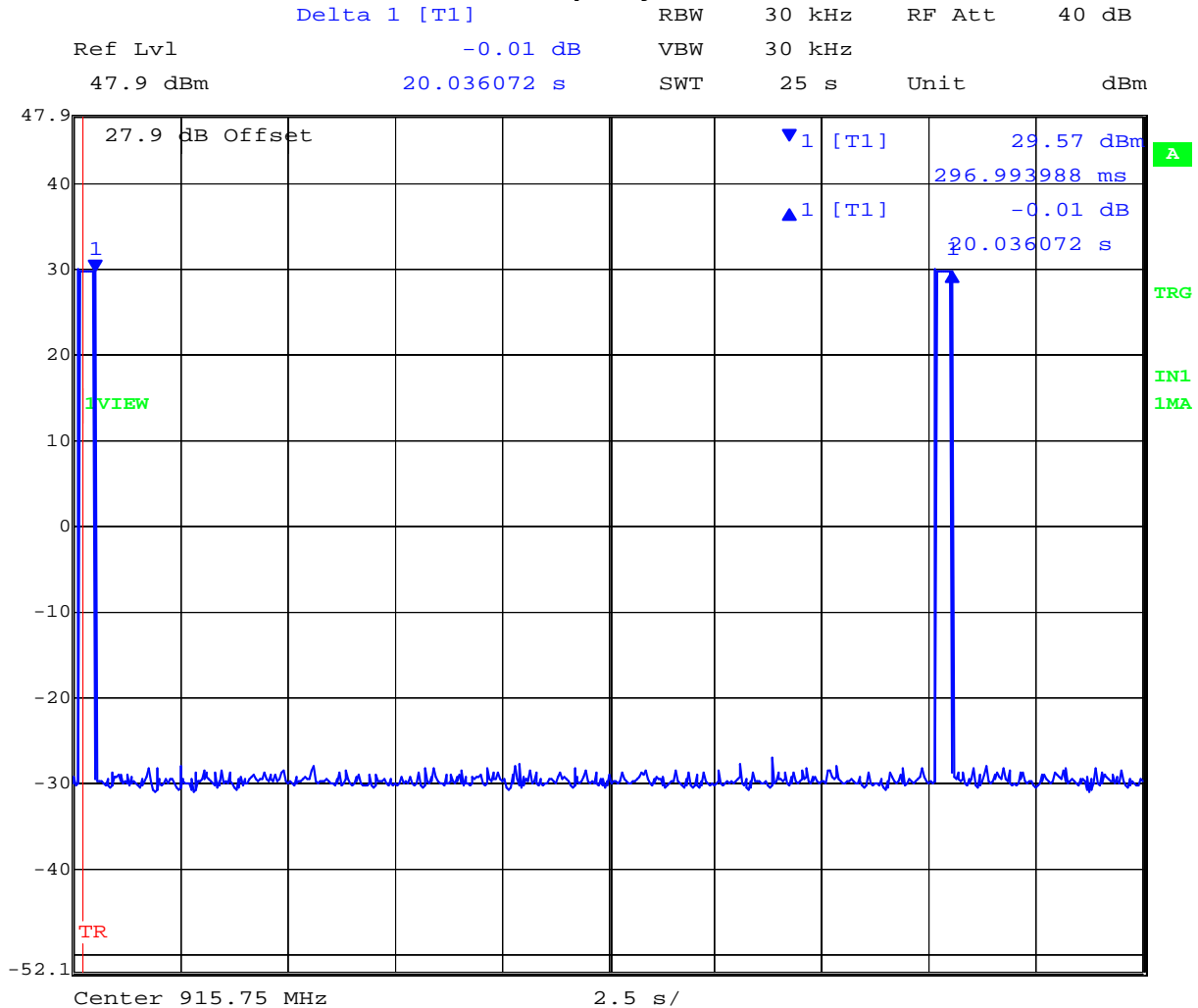


**Channel Occupancy**

TABLE OF RESULTS

Channel #	Center Frequency (MHz)	Channel Occupancy within 10 Second Period (mSeconds)
26	915.75	396.79

**Channel Occupancy 927.25 MHz**



Date: 15.DEC.2009 10:54:32

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.





## Specification for Number of Channels and Channel Occupancy

### Limits

**FCC, Part 15 Subpart C §15.247(a)(1)**  
**Industry Canada RSS-210 §A8.1**

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 and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

### Laboratory Uncertainty for Frequency Measurements

Measurement uncertainty	±0.86ppm
-------------------------	----------

### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-02 'Frequency Measurement'	0078, 0134, 0158, 0184, 0193, 0250, 0252 0310, 0312.

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

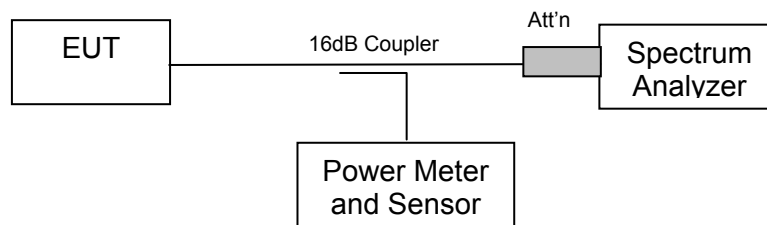
#### 5.1.4. Output Power

**FCC, Part 15 Subpart C §15.247(b)(2)**  
**Industry Canada RSS-210 §A8.4**

#### **Test Procedure**

The transmitter terminal of EUT was set for CW (continuous wave) operation and connected to the input of the power meter which was calibrated to measure power. The value of measured power including antenna cable loss was reported.

#### **Test Measurement Set up**



Measurement set up for Transmitter Output Power



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 35 of 107

---

### Measurement Results for Output Power

Ambient conditions.

Temperature: 17 to 23 °C    Relative humidity: 31 to 57 %    Pressure: 999 to 1012 mbar

#### TABLE OF RESULTS

Channel #	Center Frequency (MHz)	Power (dBm)
0	902.75	+29.60
26	915.75	+29.69
49	927.25	+29.70

---

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 36 of 107

## Specification

### Limits

**FCC, Part 15 Subpart C §15.247 (b)(2)** The maximum output power of the intentional radiator shall not exceed the following:

(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

**Industry Canada RSS-210 §A8.4**

For frequency hopping systems operating in the 902 - 928 MHz band, the maximum peak conducted power output power is not to exceed 1.0 W if the hopset uses 50 or more hopping channels and 0.25 W if the hopset uses less than 50 hopping channels.

### Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty

±1.33 dB

### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0193, 0252, 0313, 0314, 0070, 0116, 0117

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**5.1.5. Maximum Permissible Exposure**

**FCC, Part 15 Subpart C §15.247(i)**  
**Industry Canada RSS-Gen §5.5**

**Calculations for Maximum Permissible Exposure Levels**

Power Density = Pd (mW/cm<sup>2</sup>) = EIRP/(4πd<sup>2</sup>)

EIRP = P \* G

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

Numeric Gain = 10 ^ (G (dBi)/10)

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1.0 mW/cm<sup>2</sup>

Antenna Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance @ 1mW/cm <sup>2</sup> Limit(cm)	Minimum Separation Distance (cm)
6	4.0	+29.7	934	17.3	20*

**\*Note:** for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

**Specification**

**Maximum Permissible Exposure Limits**

**§15.247(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 levels in excess of the Commission’s guidelines.

**FCC §1.1310** Limit = 1mW / cm<sup>2</sup> from 1.310 Table 1

**RSS-Gen §5.5** Before equipment certification is granted, the applicable requirements of RSS-102 shall be met.

**Laboratory Measurement Uncertainty for Power Measurements**

Measurement uncertainty	±1.33 dB
-------------------------	----------

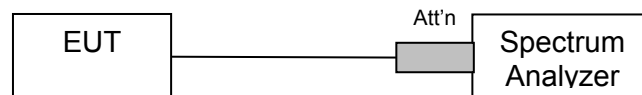
### 5.1.6. Conducted Spurious Emissions Transmitter

**FCC, Part 15 Subpart C §15.247(d)**  
**Industry Canada RSS-210 §A8.5**

#### **Test Procedure**

Conducted emissions were measured at a limit of 20 dB below the highest in-band spectral density measured with a spectrum analyzer connected to the antenna terminal. Emissions at the band edge were measured and recorded. Measurements were made while EUT was operating in transmit mode of operation at the appropriate center frequency.

#### **Test Measurement Set up**



Band-edge measurement test configuration

#### **Measurement Results of Conducted Spurious Emissions**

Ambient conditions.

Temperature: 17 to 23 °C    Relative humidity: 31 to 57 %    Pressure: 999 to 1012 mbar

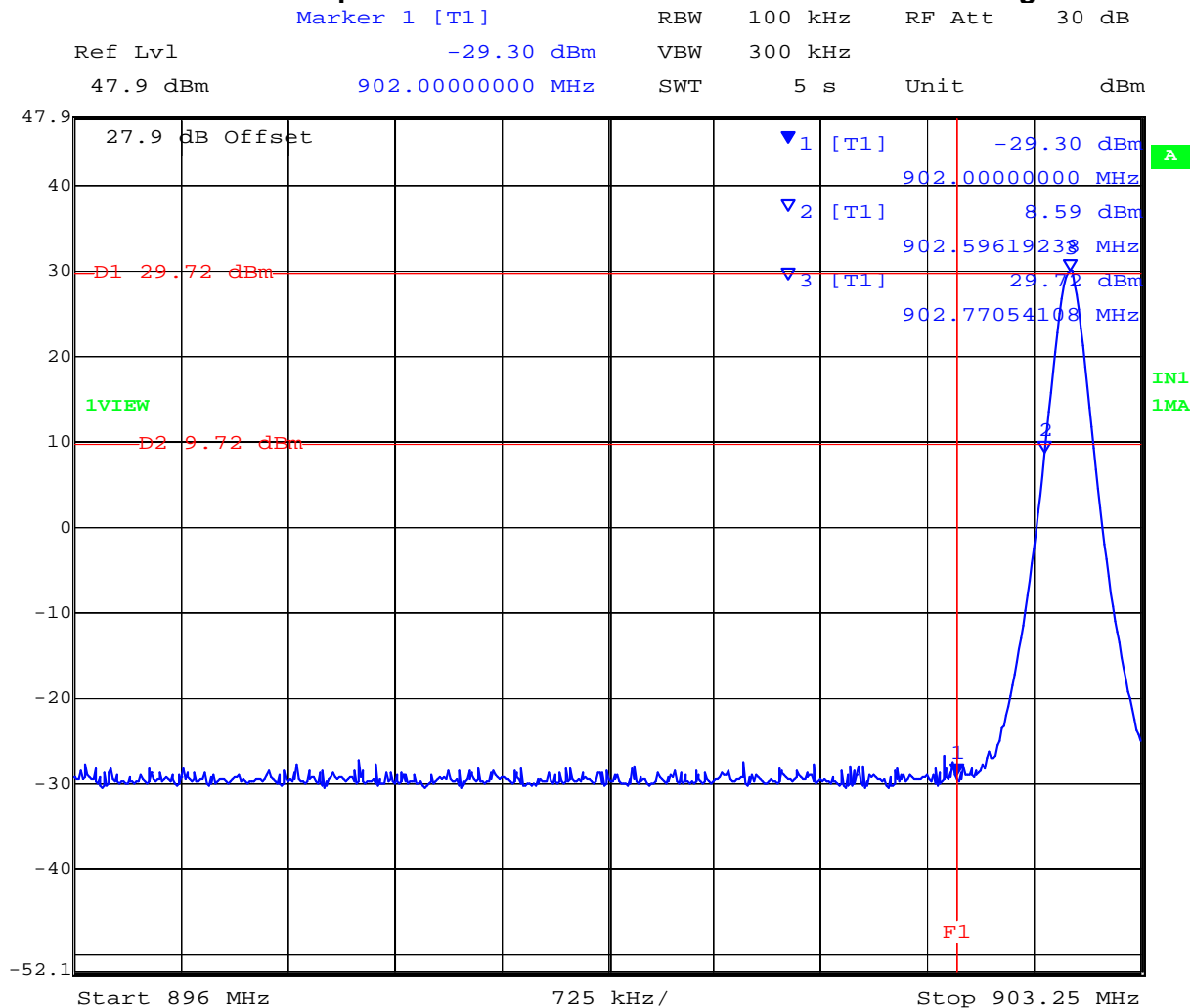


**Conducted Band-Edge Results**

TABLE OF RESULTS – 802.11b

Channel #	Center Frequency (MHz)	Band-edge Frequency (MHz)	Limit (dBm)	Amplitude @ Band-edge (dBm)	Margin (dB)
0	902.75	902.0	+9.72	-29.30	-39.02
49	927.25	928.0	+9.74	-27.99	-37.73

**Conducted Spurious Emissions at the 902 MHz Lower Band Edge**

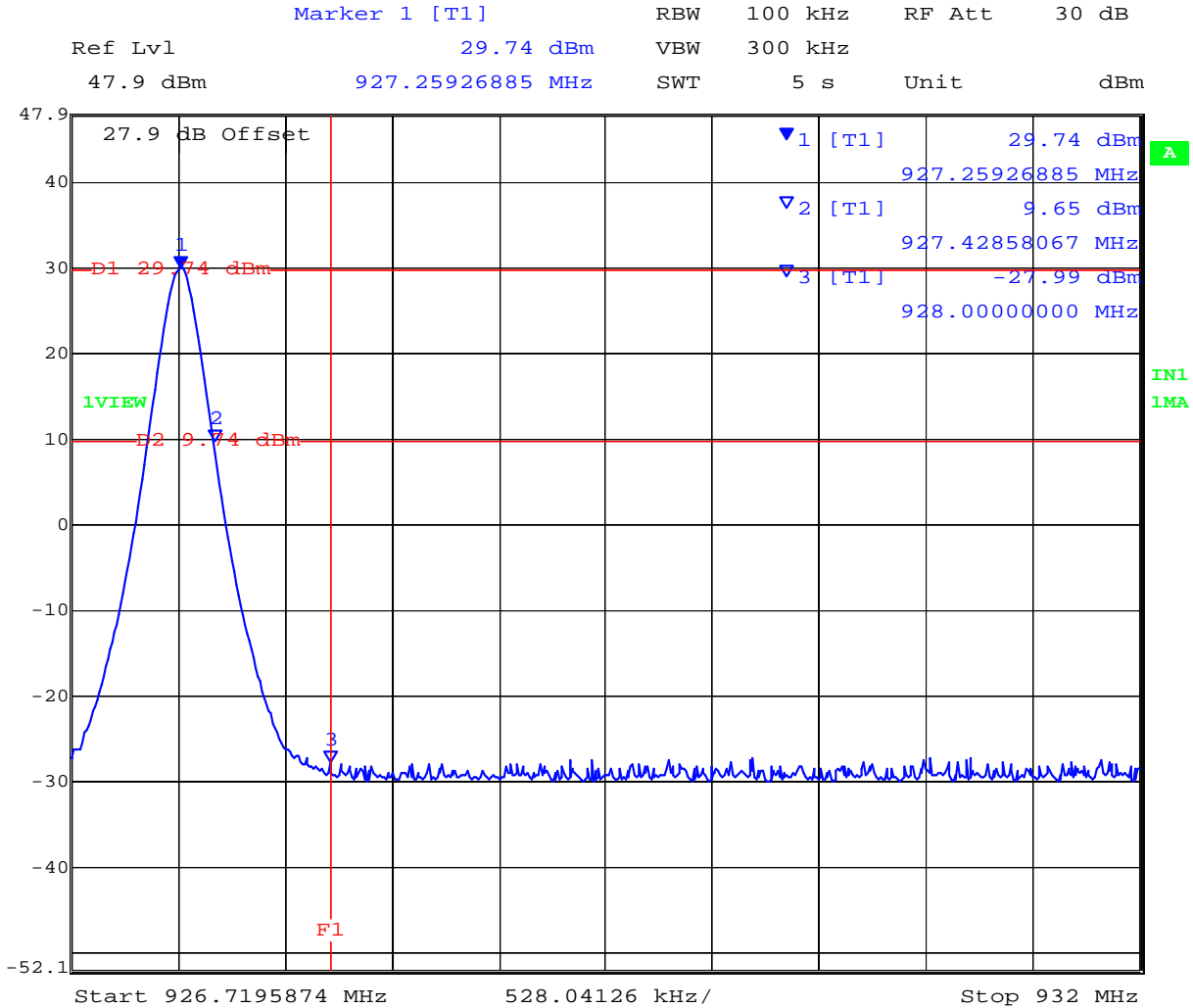


Date: 15.DEC.2009 10:05:47

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Conducted Spurious Emissions at the 928 MHz Upper Band Edge**



Date: 15.DEC.2009 10:08:46

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.





**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 41 of 107

### **Spurious Emissions (1-10 GHz)**

Conducted spurious emissions (1-10 GHz) are provided indicated by the following matrix. Measurements were performed with the transmitter tuned to the channel closest to the band-edge being measured. All emissions were maximized during measurement. Limits which were derived from the band-edge measurements provided below are drawn on each plot.

#### TABLE OF RESULTS

<b>Channel Centre Frequency (MHz)</b>	<b>Start Frequency (MHz)</b>	<b>Stop Frequency (MHz)</b>	<b>Maximum Emission Observed (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
902.75	30	10,000	-21.66	+9.60	-31.26

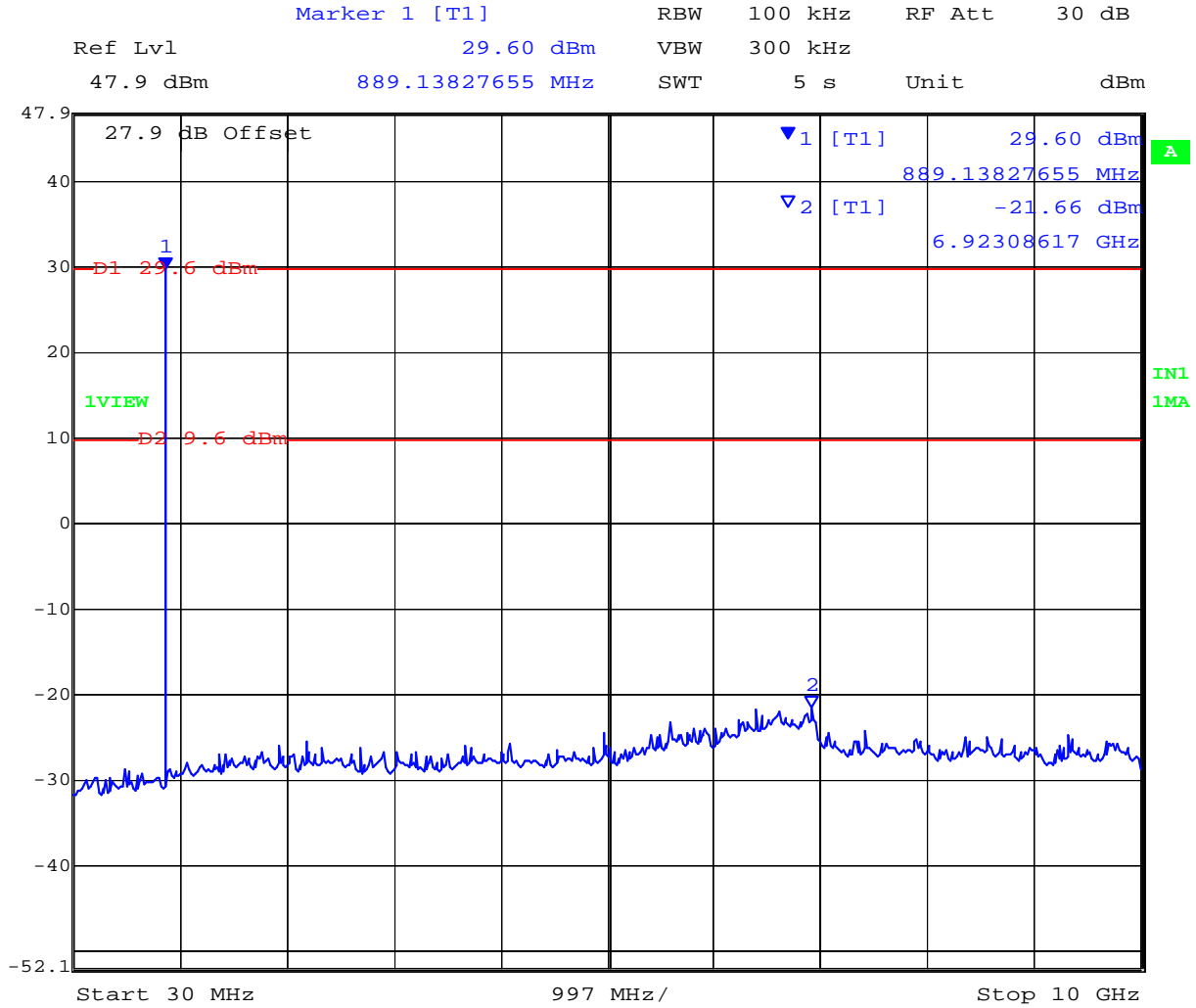
The emission breaking the limit line is the carrier.

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



### Conducted Transmitter Spurious Emissions

#### Channel 902.75 MHz - 30 MHz to 10,000 MHz



Date: 15.DEC.2009 10:15:36

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

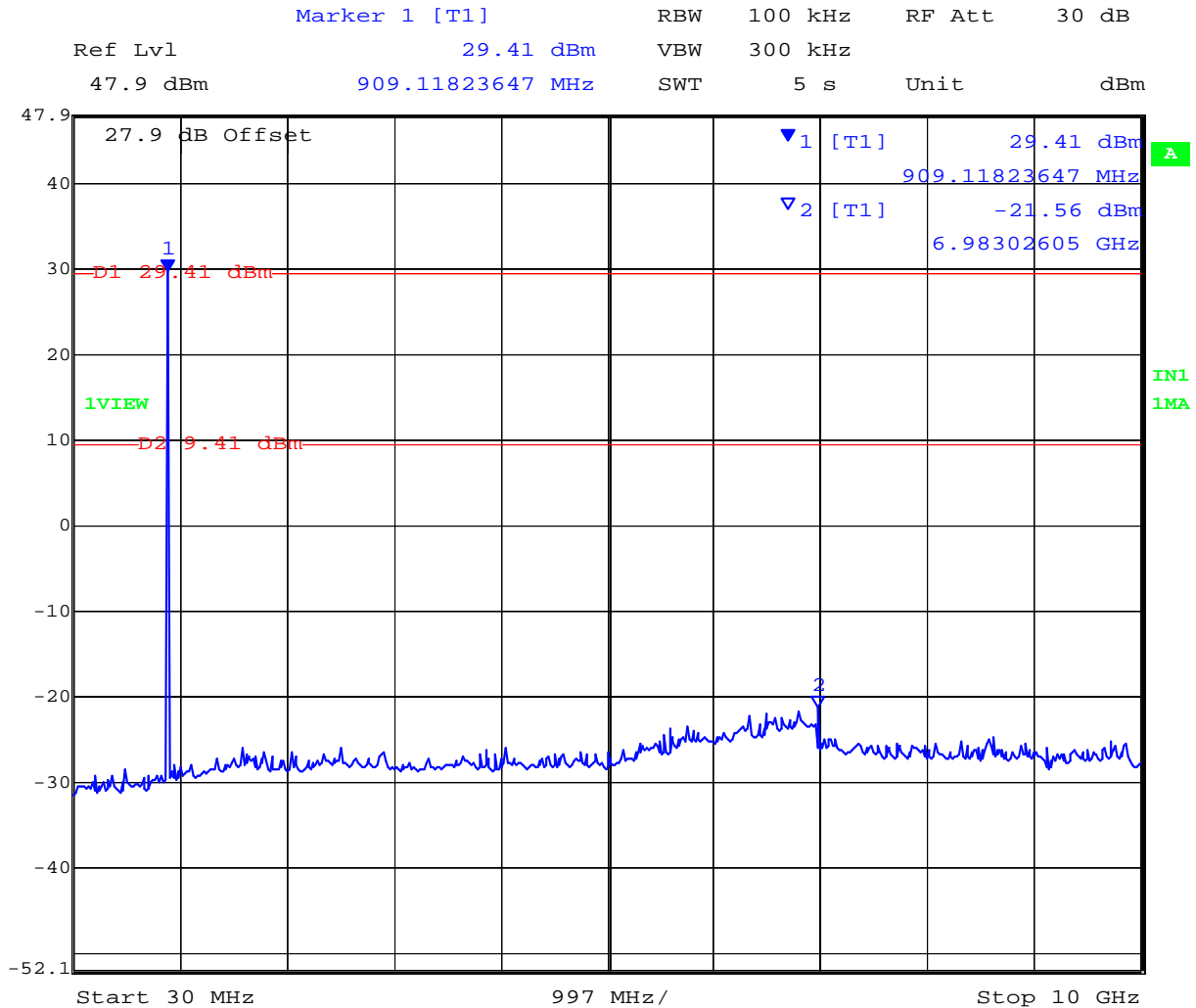


Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
915.75	30	10,000	-21.56	+9.41	-30.97

The emission breaking the limit line is the carrier.

### Conducted Transmitter Spurious Emissions

#### Channel 915.75 MHz - 30 MHz to 10,000 MHz



Date: 15.DEC.2009 10:14:07

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

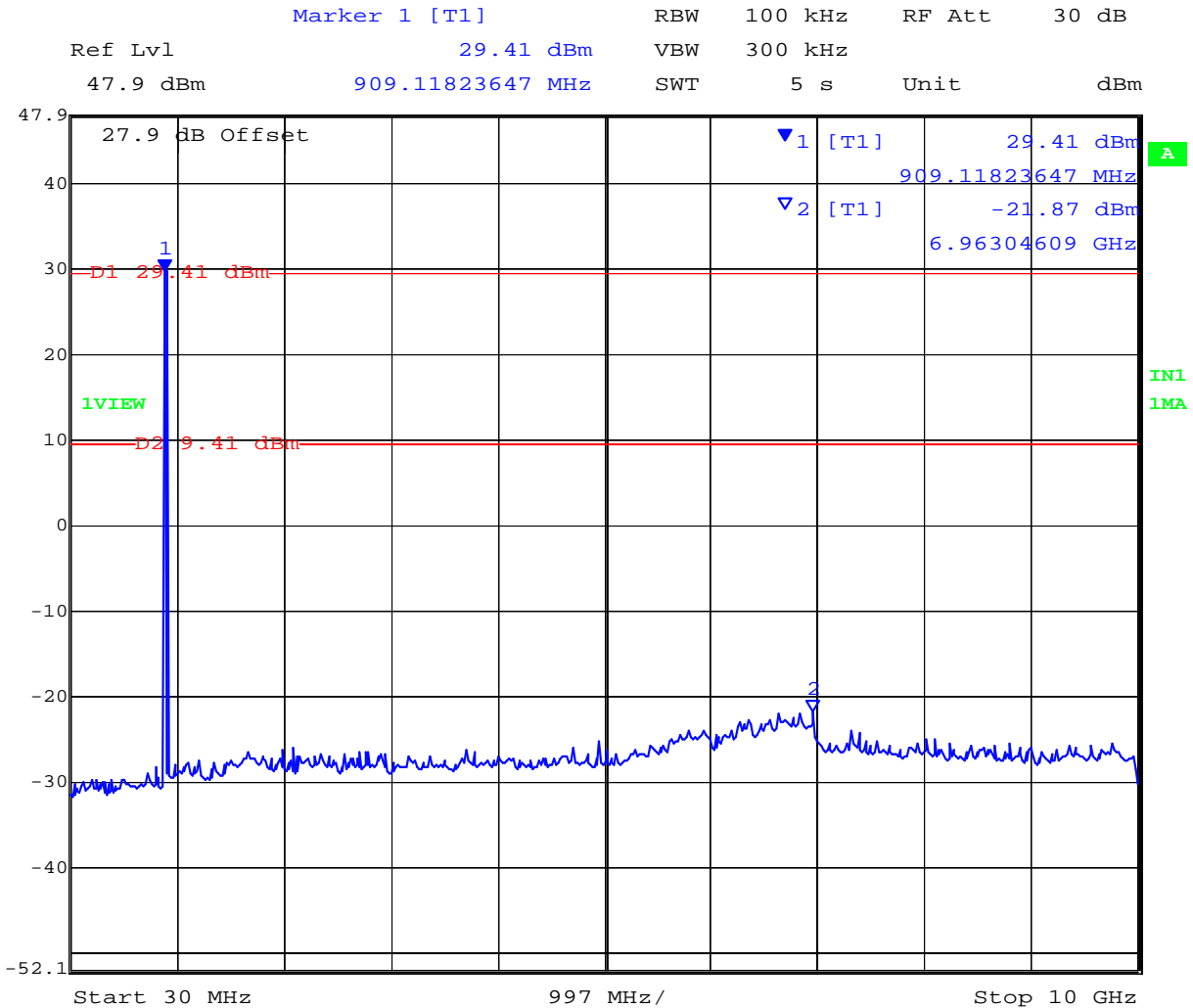


Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
927.25	30	10,000	-21.87	+9.41	-31.28

The emission breaking the limit line is the carrier.

### Conducted Transmitter Spurious Emissions

#### Channel 927.25 MHz - 30 MHz to 10,000 MHz



Date: 15.DEC.2009 10:10:44

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 45 of 107

## Specification

### Limits Band-Edge

Lower Limit Band-edge	Upper Limit Band-edge	Limit below highest level of desired power
902 MHz	928 MHz	≥ 20 dB

### FCC, Part 15 Subpart C §15.247(d)

### Industry Canada RSS-210 §A.5

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.

### Laboratory Measurement Uncertainty for Conducted Spurious Emissions

Measurement uncertainty	±2.37 dB
-------------------------	----------

### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-05 'Measurement of Spurious Emissions'	0287, 0158, 0193, 0252, 0313, 0314, 0070, 0116, 0117.

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

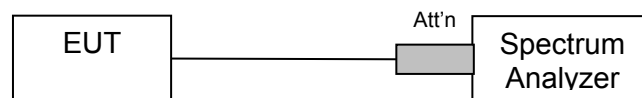
### 5.1.7. Conducted Spurious Emissions Stand-By

#### Industry Canada RSS-Gen §7.2.3

#### Test Procedure

Conducted Stand-By emissions were measured on the device on the mid channel. The EUT was placed in Stand-By mode and emissions were measured 30 MHz – 7 GHz.

#### Test Measurement Set up



Stand-By spurious emissions test configuration

#### Measurement Results of Stand –By Spurious Emissions

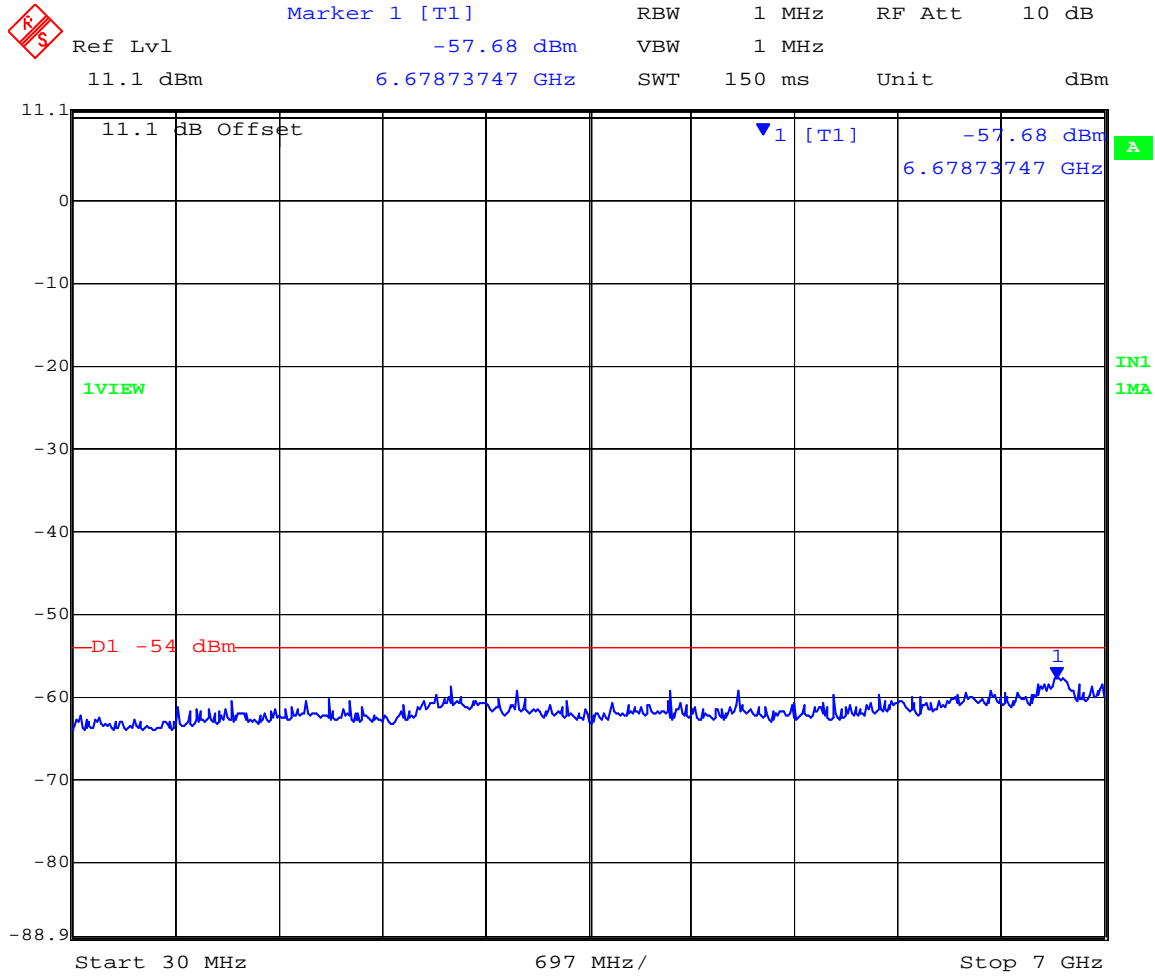
Ambient conditions.

Temperature: 17 to 23 °C    Relative humidity: 31 to 57 %    Pressure: 999 to 1012 mbar



**Conducted Stand-By Spurious Emissions 30M - 7 GHz**

**Stand-By Conducted Emissions 30 MHz – 7 GHz**



No emissions were observed breaking the limit.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 48 of 107

### Specification

Antenna Conducted Measurement

#### Industry Canada RSS-Gen §7.2.3

If the device has a detachable antenna of known antenna impedance, then the antenna conducted method is permitted in lieu of a radiated measurement.

Receiver spurious emissions at any discrete frequency shall not exceed 2 nanowatts (-57 dBm) in the band 30-1000 MHz, or 5 nanowatts (-53 dBm) above 1 GHz.

### Laboratory Measurement Uncertainty for Conducted Spurious Emissions

Measurement uncertainty	±2.37 dB
-------------------------	----------

### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-05 'Measurement of Spurious Emissions'	0287, 0158, 0193, 0252, 0313, 0314, 0070, 0116, 0117.

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



### 5.1.8. Radiated Emissions

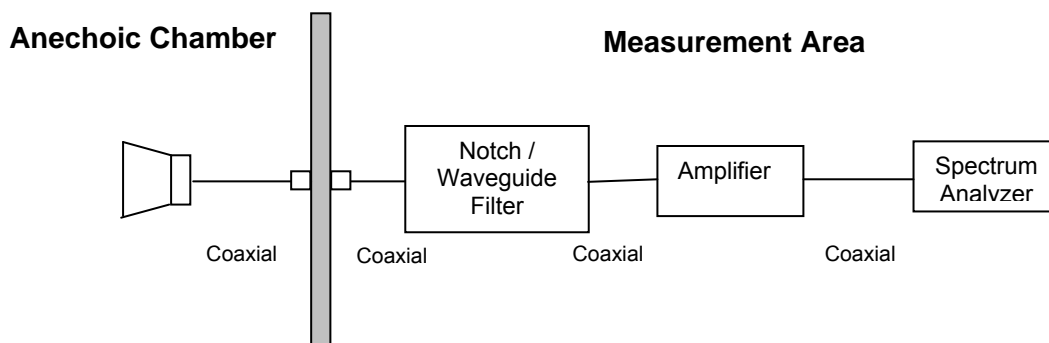
**FCC, Part 15 Subpart C §15.247(d)**  
**Industry Canada RSS-210 §A8.5**

#### **Test Procedure**

Radiated emissions above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter and waveguide filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.

All measurements on any frequency or frequencies over 1 MHz are based on the use of measurement instrumentation employing an average detector function. All measurements above 1 GHz were performed using a minimum resolution bandwidth of 1 MHz.

#### **Test Measurement Set up**



Measurement set up for Radiated Emission Test

#### **Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

$$FS = R + AF + CORR - FO$$

where: FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 50 of 107

---

For example:

Given receiver input reading of 51.5 dB $\mu$ V; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3 \text{ dB}\mu\text{V/m}$$

Conversion between dB $\mu$ V/m (or dB $\mu$ V) and  $\mu$ V/m (or  $\mu$ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (\mu\text{V/m}))}$$

$$40 \text{ dB}\mu\text{V/m} = 100 \mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250 \mu\text{V/m}$$

---

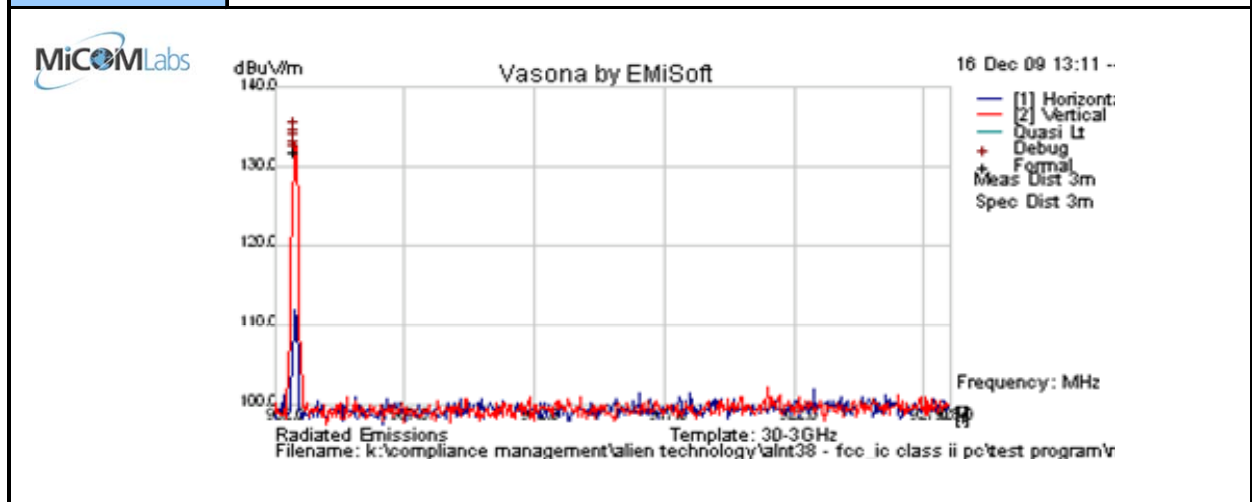
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**5.1.8.1. Transmitter Peak Emissions – Antenna S9028PV**

**Radiated Emissions – Antenna S9028PV; Peak Fundamental Emissions**

<b>Test Freq.</b>	902.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	902 MHz - 928 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	270 in Transmit Utility (29.8 dBm)	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>	Power level setting reduced to 270 (29.8 dBm), from a nominal of 285 (31.3dBm)		
<b>Test Notes 2</b>			



**Formally measured emission peaks**

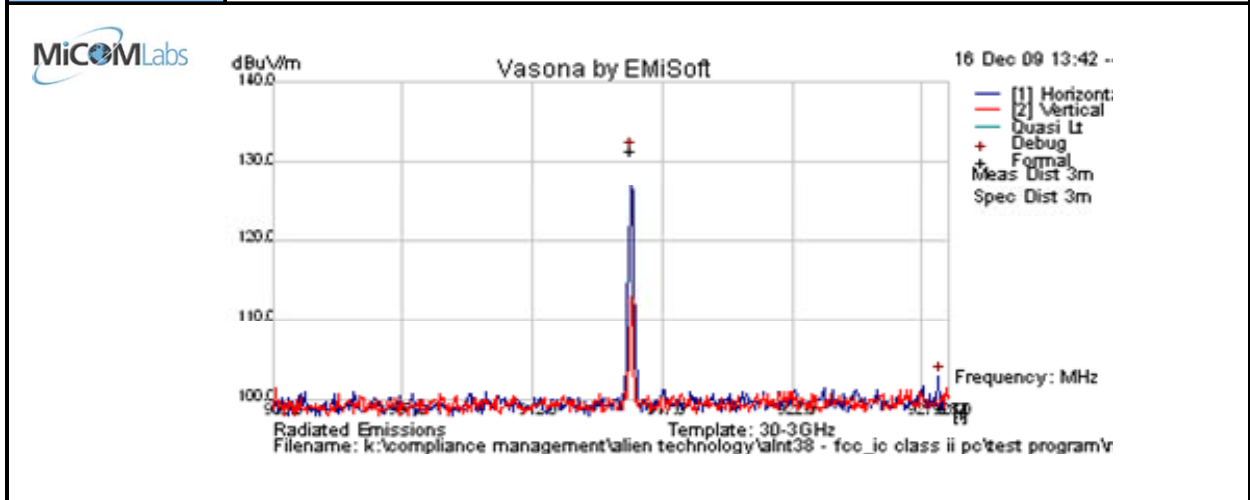
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg				Comments
902.764	91.7	17.3	22.8	131.8	Peak	H	150	0				FUND

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 52 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	902 MHz - 928 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	270 in Transmit Utility (29.7 dBm)	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>	Power level setting reduced to 270 (29.7 dBm), from a nominal of 285 (30.9dBm)		
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg				Comments
915.761	91.1	17.4	22.9	131.4	Peak	H	147	0				FUND

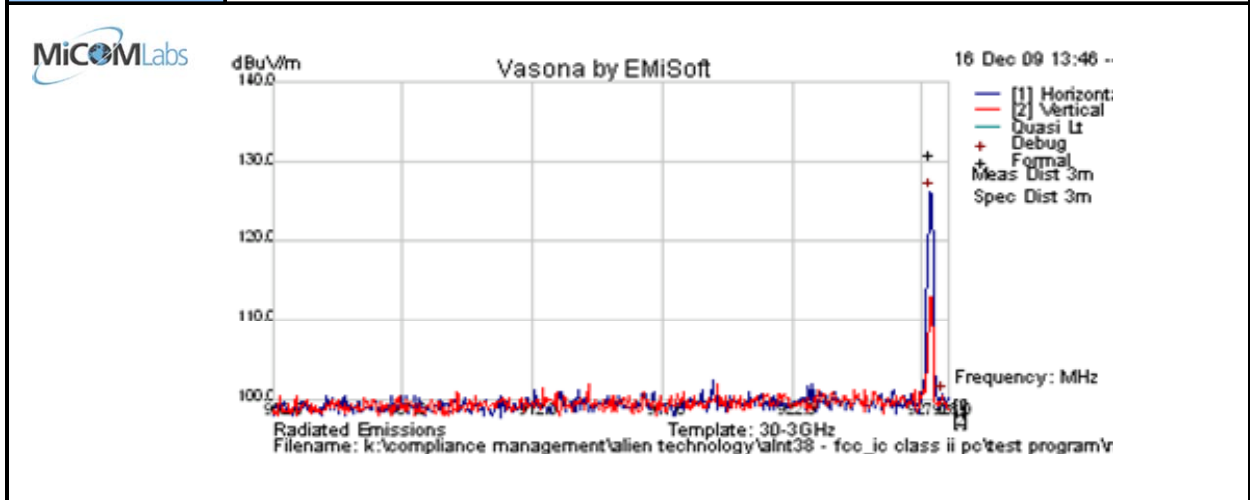
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 53 of 107

<b>Test Freq.</b>	927.25 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	902 MHz - 928 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	270 in Transmit Utility (29.3 dBm)	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>	Power level setting reduced to 270 (29.3 dBm), from a nominal of 285 (30.9dBm)		
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg				Comments
927.262	90.5	17.4	23.0	130.9	Peak	H	148	0				FUND

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

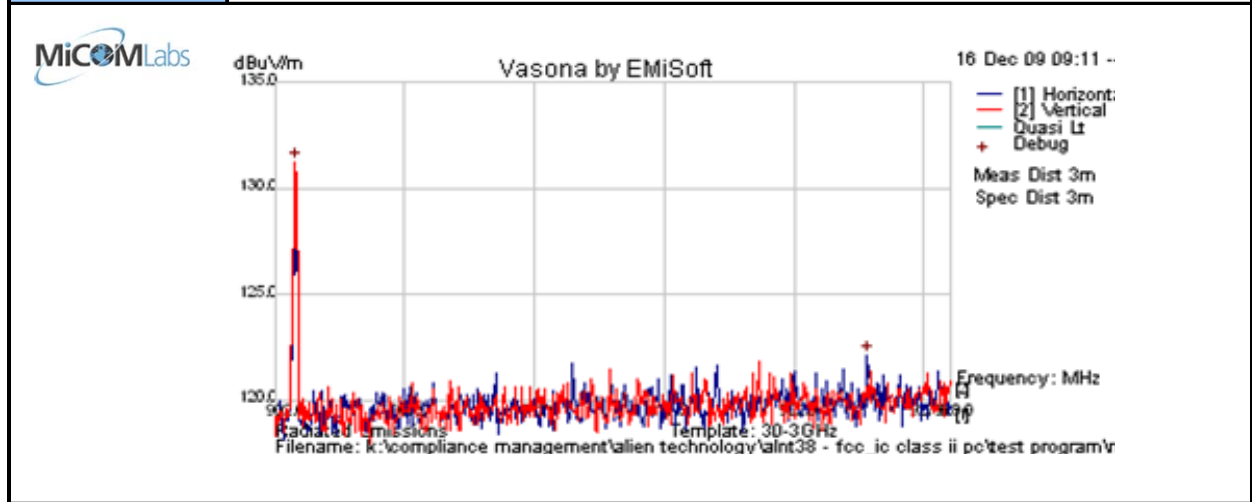
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 54 of 107

**5.1.8.2. Transmitter Peak Emissions – Antenna EDN 228-221**

<b>Test Freq.</b>	902.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	902 MHz - 928 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	260 in Transmit Utility (29.0 dBm)	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

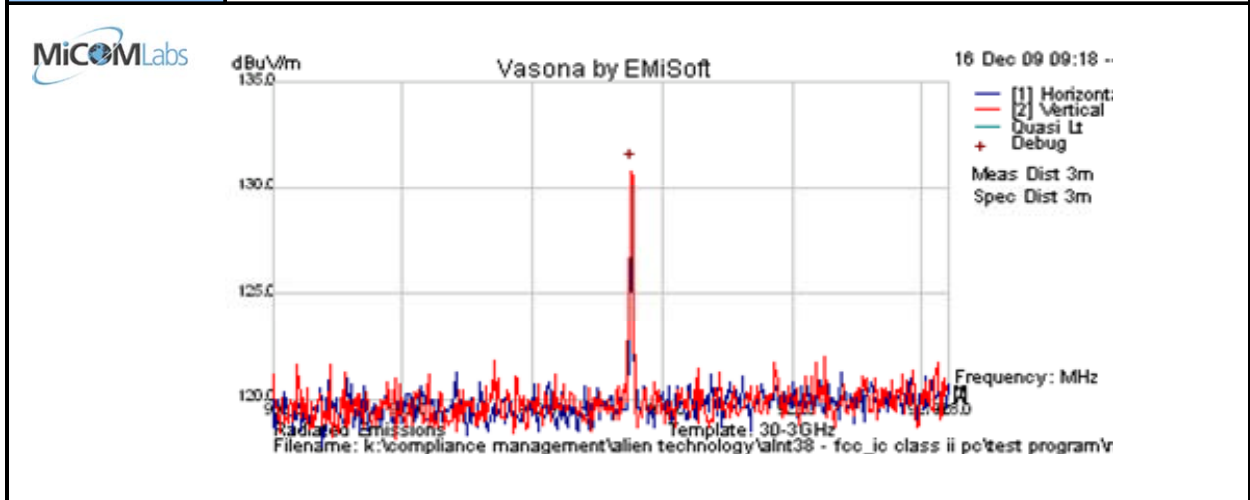
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg				Comments
902.752	71.2	37.3	22.8	131.3	Peak	V	122	13				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 55 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	902 MHz - 928 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	260 in Transmit Utility (29.0 dBm)	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg				Comments
915.758	70.9	37.4	22.9	131.2	Peak	V	105	0				FUND

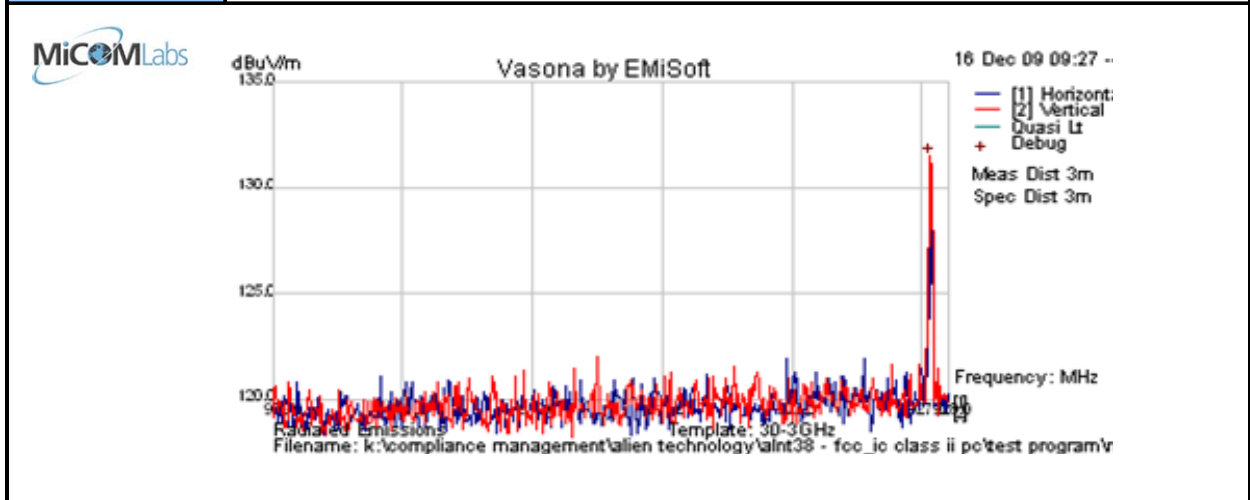
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 56 of 107

<b>Test Freq.</b>	927.25 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	902 MHz - 928 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	260 in Transmit Utility (28.43 dBm)	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg				Comments
927.267	70.7	37.4	23.0	131.1	Peak	V	109	1				FUND

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



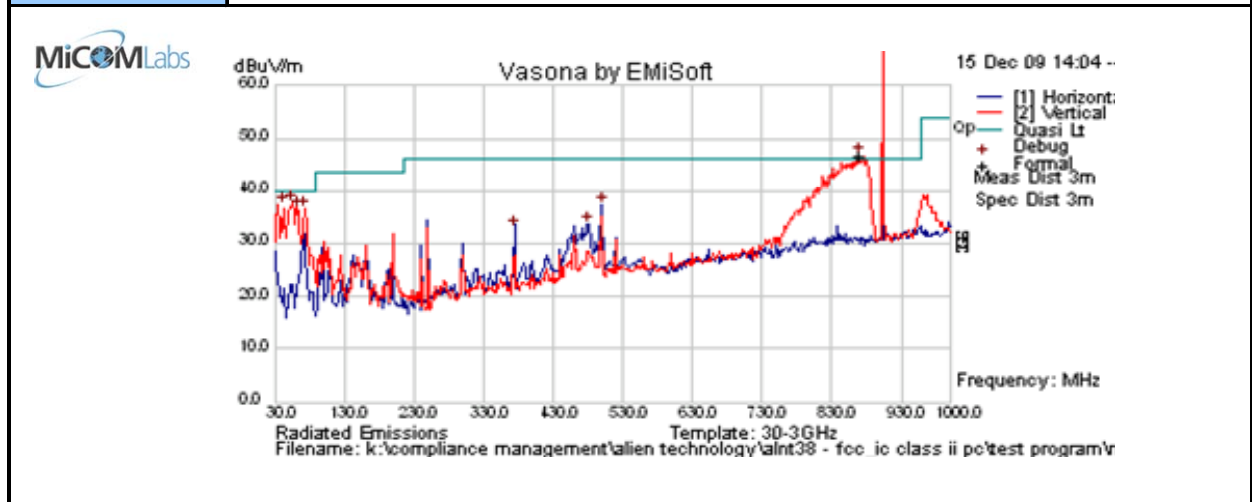


**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 57 of 107

### 5.1.8.3. Transmitter Radiated Spurious Emissions - Antenna S9028PV

#### Radiated Spurious Emissions – Antenna S9028PV [30-1000MHz]

Test Freq.	902.75 MHz	Engineer	CSB
Variant	PRASK	Temp (°C)	19
Freq. Range	30 MHz - 1000 MHz	Rel. Hum.(%)	40
Power Setting	285 in Transmit Utility (31.3 dBm)	Press. (mBars)	1009
Antenna	S9028PV	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
868.669	47.1	7.2	-7.6	46.7	Peak	V	100	0	111.8	-65.1	Pass	TX NRB

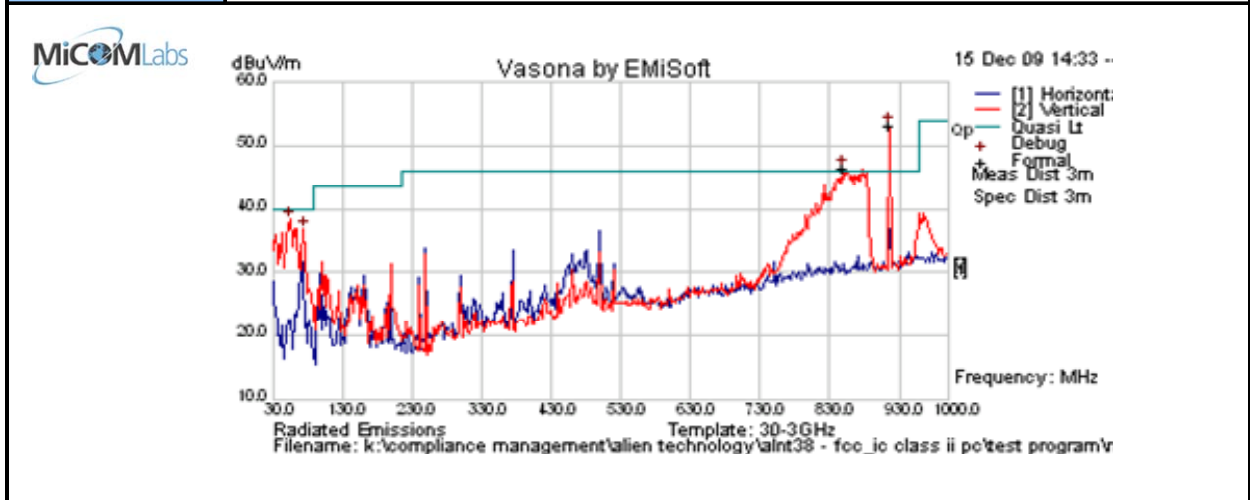
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 58 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	285 in Transmit Utility (30.9 dBm)	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
848.376754	47.1	7.2	-7.8	46.5	Peak [Scan]	V	100	0	111.4	-65.0	Pass	TX NRB

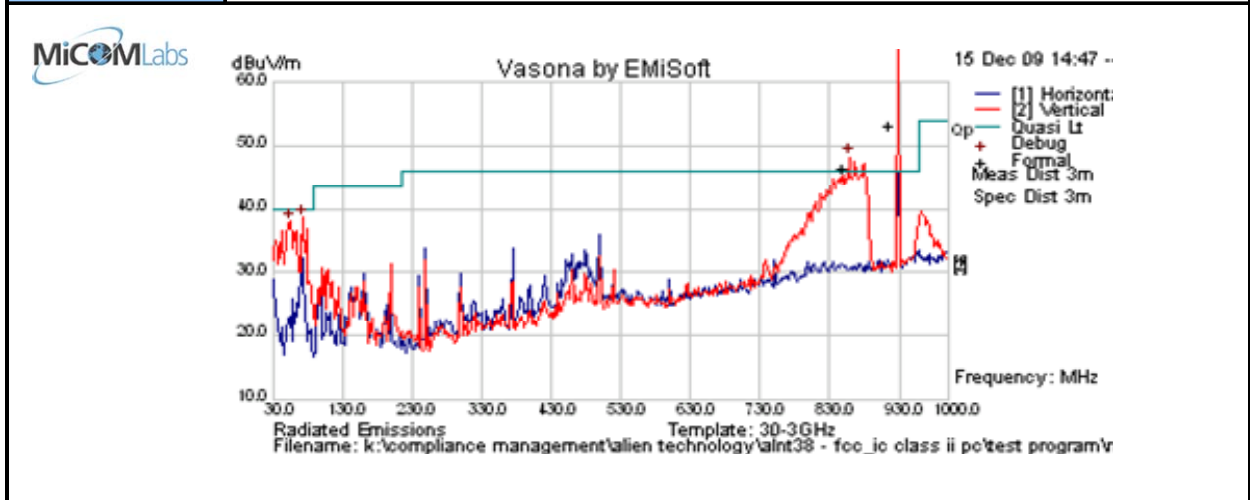
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 59 of 107

<b>Test Freq.</b>	927.25	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	285 in Transmit Utility (30.9 dBm)	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
865.214	48.7	7.2	-7.7	48.2	Peak [Scan]	V	100	0	110.9	-62.7	Pass	TX NRB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

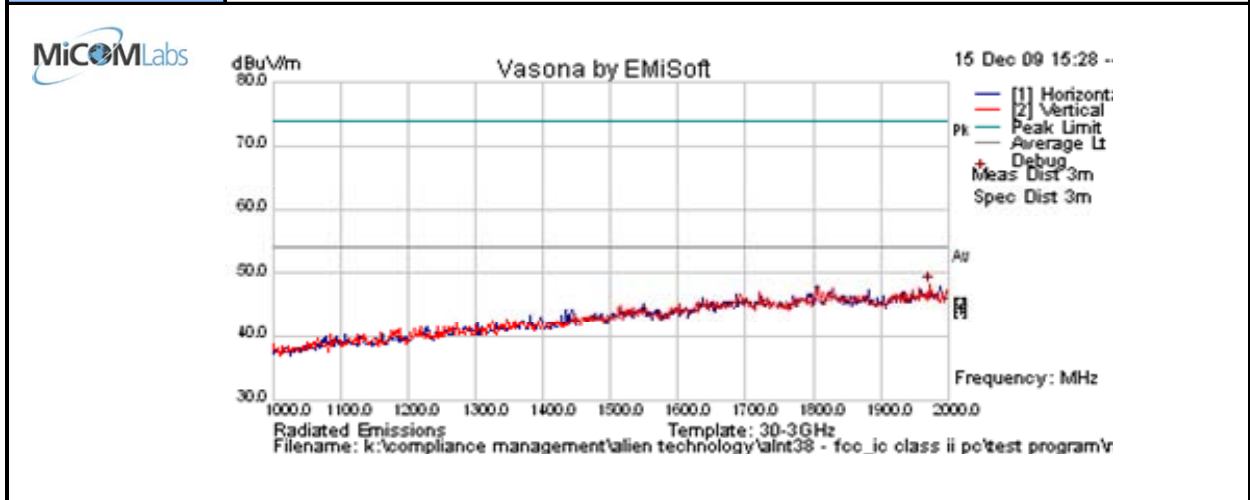
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 60 of 107

**Radiated Spurious Emissions – Antenna S9028PV [1000MHz – 2000MHz]**

<b>Test Freq.</b>	902.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	1000 MHz - 2000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	285 in Transmit Utility (31.3 dBm)	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

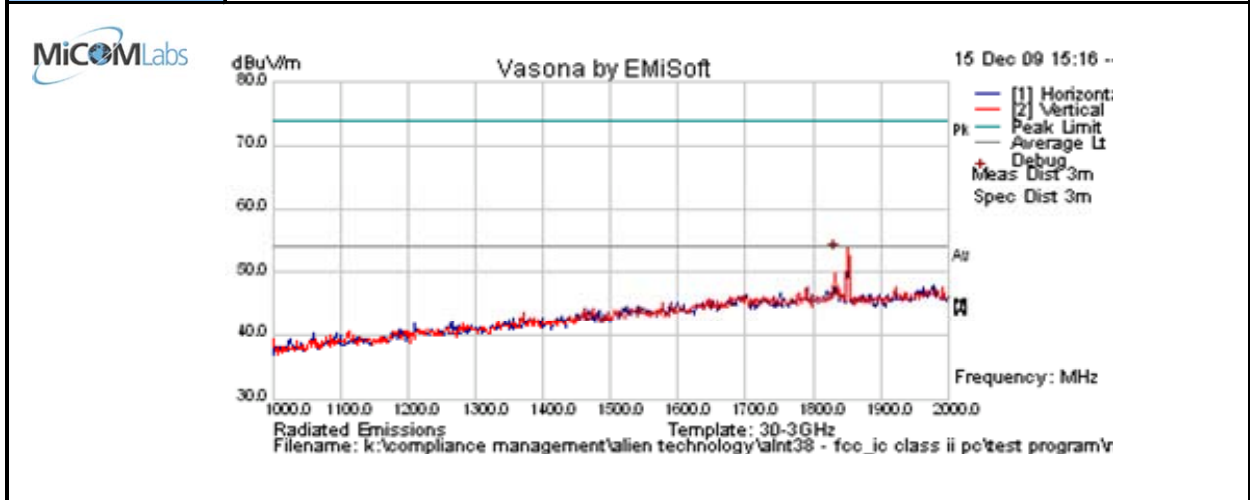
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No Emissions within 6dB of limit												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band; NRB = Non-Restricted Band												

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 61 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	1000 MHz - 2000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	285 in Transmit Utility (30.9 dBm)	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1831.493	43.7	9.8	-0.5	53.0	Peak	V	129	5	111.4	-58.4	Pass	NRB
1831.493	36.1	9.8	-0.5	45.4	Average	V	129	5	111.4	-66.0	Pass	NRB

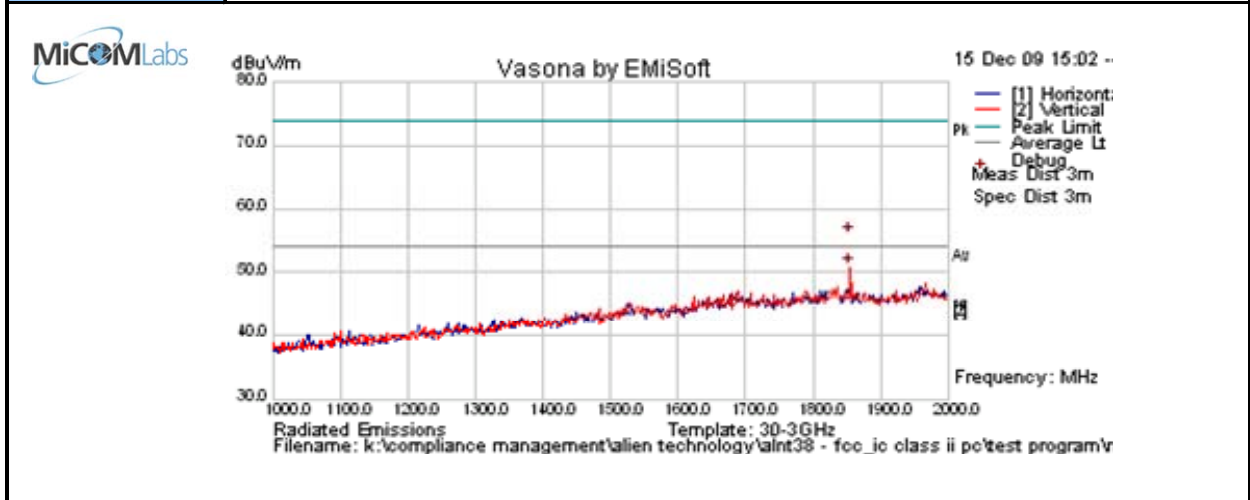
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 62 of 107

Test Freq.	927.25	Engineer	CSB
Variant	PRASK	Temp (°C)	19
Freq. Range	1000 MHz - 2000 MHz	Rel. Hum.(%)	40
Power Setting	285 in Transmit Utility (30.9 dBm)	Press. (mBars)	1009
Antenna	S9028PV	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1854.489	46.5	9.9	-0.6	55.9	Peak	V	112	11	110.9	-55.1	Pass	NRB
1854.489	41.6	9.9	-0.6	50.9	Average	V	112	11	110.9	-60.1	Pass	NRB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

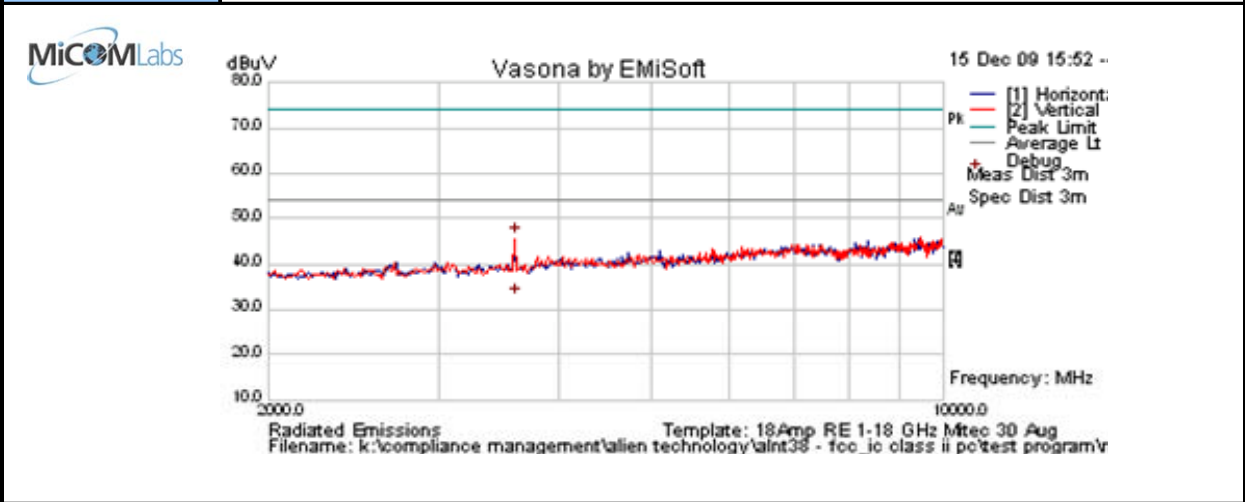
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 63 of 107

**Radiated Spurious Emissions – Antenna S9028PV [2000MHz – 10000MHz]**

<b>Test Freq.</b>	902.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	2000 MHz - 10000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	285 in Transmit Utility (31.3 dBm)	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
3610.984	52.0	3.7	-10.7	44.9	Peak Max	V	117	26	74.0	-29.1	Pass	RB
3610.984	42.7	3.7	-10.7	35.6	Average Max	V	117	26	54.0	-18.4	Pass	RB

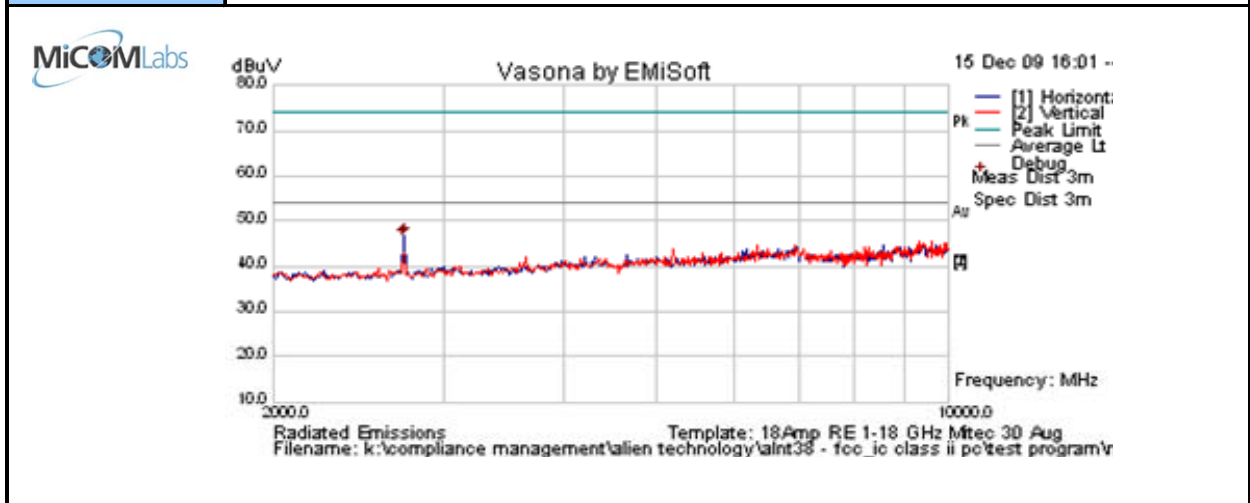
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 64 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	2000 MHz - 10000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	285 in Transmit Utility (30.9 dBm)	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2747.279	63.1	3.2	-11.5	54.8	Peak Max	H	186	8	74.0	-19.2	Pass	RB
2747.279	54.1	3.2	-11.5	45.7	Average Max	H	186	8	54.0	-8.3	Pass	RB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

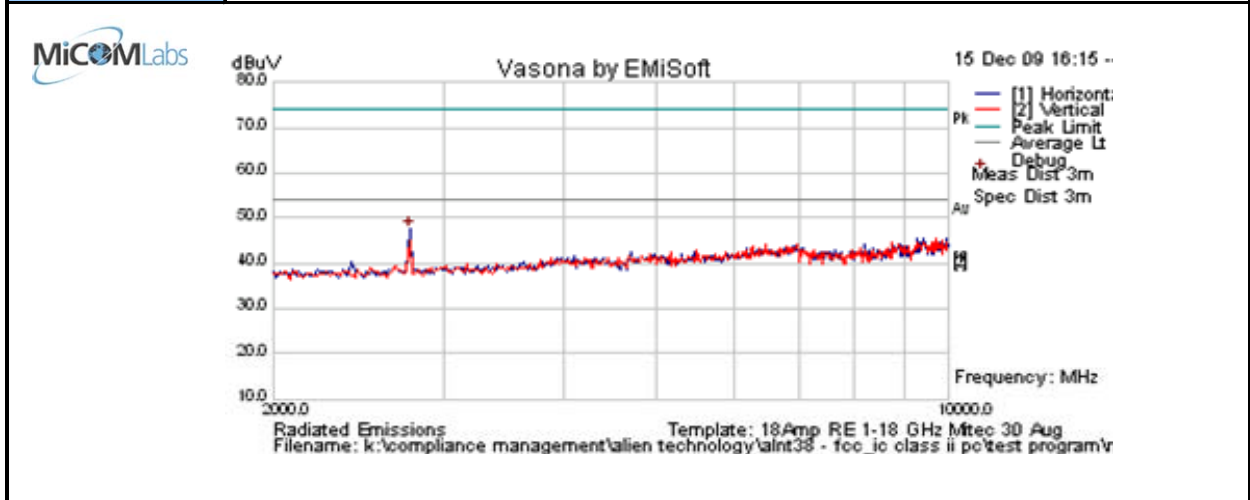
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.





**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 65 of 107

<b>Test Freq.</b>	927.25 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	2000 MHz - 10000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	285 in Transmit Utility (30.9 dBm)	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2781.831	66.6	3.2	-11.6	58.2	Peak Max	H	184	0	74.0	-15.8	Pass	RB
2781.831	57.6	3.2	-11.6	49.2	Average Max	H	184	0	54.0	-4.8	Pass	RB

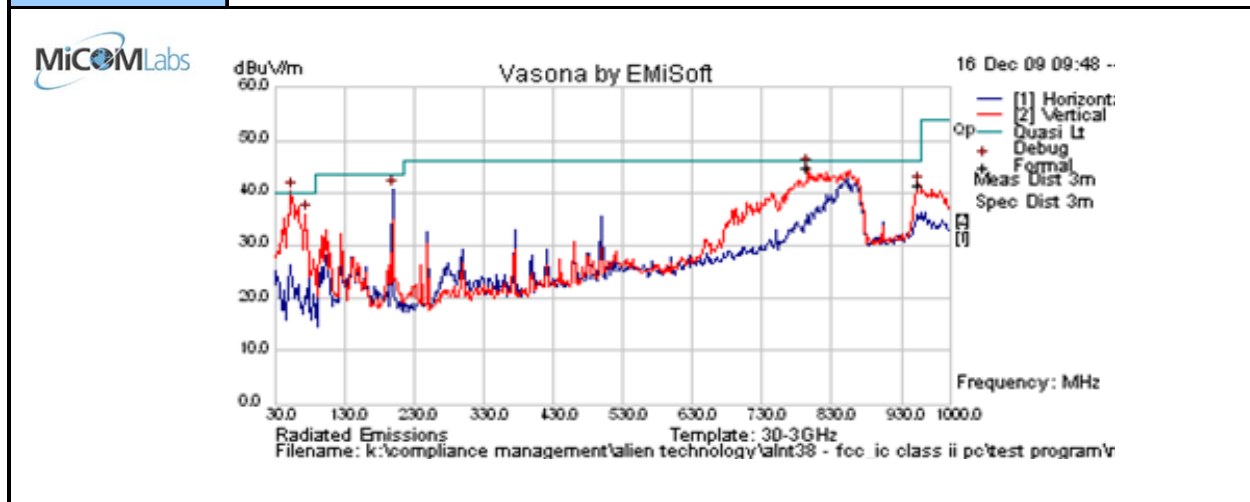
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

#### 5.1.8.4. Transmitter Radiated Spurious Emissions - Antenna EDN 228-221

#### Radiated Spurious Emissions – Antenna EDN 228-221 [30-1000MHz]

Test Freq.	902.75 MHz	Engineer	CSB
Variant	PRASK	Temp (°C)	19.5
Freq. Range	30 MHz - 1000 MHz	Rel. Hum.(%)	40
Power Setting	260 in Transmit Utility (29.0 dBm)	Press. (mBars)	1011
Antenna	EDN 228-221	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

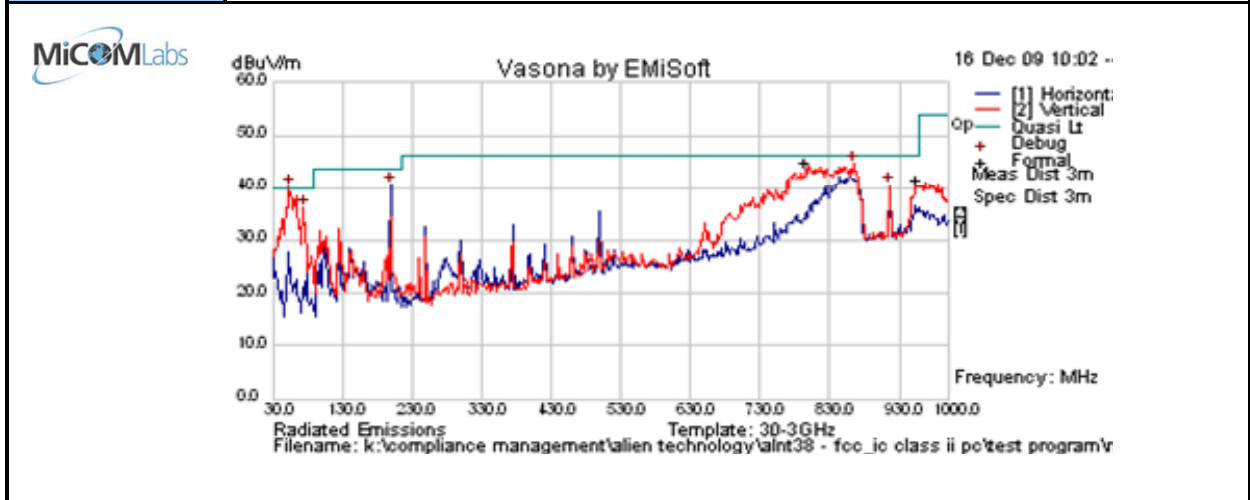
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
795.892	46.2	7.2	-8.4	45.0	Peak [Scan]	V	100	0	111.3	-66.3	Pass	NRB
955.291	40.7	7.6	-6.6	41.7	Peak [Scan]	V	100	0	111.3	-69.5	Pass	NRB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 67 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	260 in Transmit Utility (29.0 dBm)	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
863.928	45.2	7.2	-7.8	44.6	Peak [Scan]	V	100	0	111.2	-66.6	Pass	NRB
958.29	39.3	7.6	-6.5	40.4	Peak [Scan]	H	98	0	111.2	-70.8	Pass	NRB

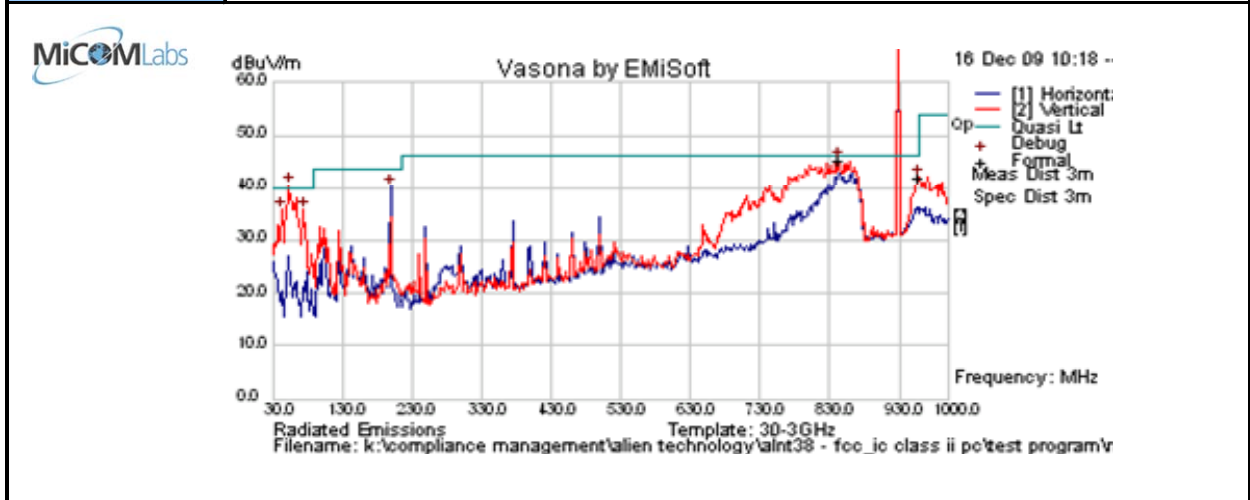
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 68 of 107

<b>Test Freq.</b>	927.25	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	260 in Transmit Utility (28.43 dBm)	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
842.545	46.0	7.2	-8.0	45.2	Peak [Scan]	V	100	0	111.1	-66.0	Pass	NRB
958.906	40.9	7.6	-6.4	42.0	Peak [Scan]	V	98	0	111.1	-69.1	Pass	NRB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

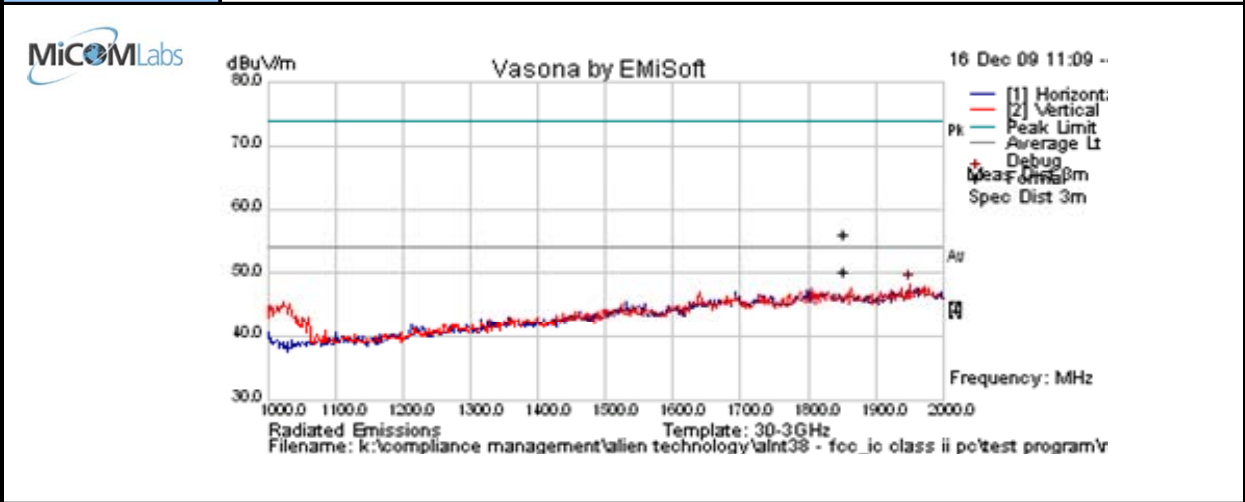
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 69 of 107

**Radiated Spurious Emissions – Antenna EDN 228-221 [1000MHz – 2000MHz]**

<b>Test Freq.</b>	902.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	1000 MHz - 2000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	260 in Transmit Utility (29.0 dBm)	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

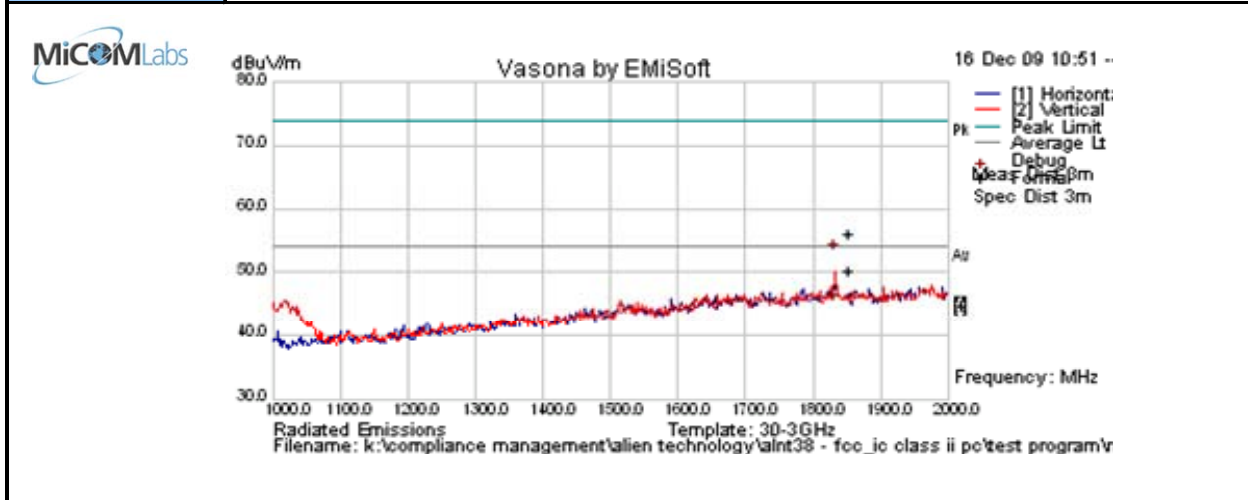
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No Emissions within 6dB of limit												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band; NRB = Non-Restricted Band												

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 70 of 107

Test Freq.	915.75 MHz	Engineer	CSB
Variant	PRASK	Temp (°C)	19.5
Freq. Range	1000 MHz - 2000 MHz	Rel. Hum.(%)	40
Power Setting	260 in Transmit Utility (29.0 dBm)	Press. (mBars)	1011
Antenna	EDN 228-221	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1831.583	43.7	9.8	-0.5	53.0	Peak	V	155	41	111.2	-58.2	Pass	NRB
1831.583	35.8	9.8	-0.5	45.1	Average	V	155	41	111.2	-66.1	Pass	NRB

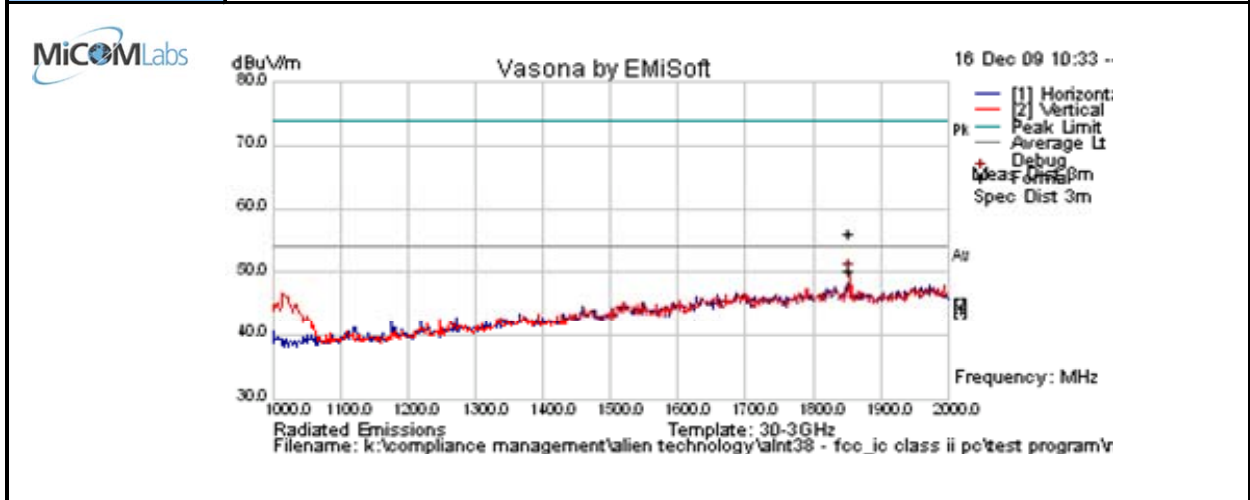
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 71 of 107

Test Freq.	927.25	Engineer	CSB
Variant	PRASK	Temp (°C)	19.5
Freq. Range	1000 MHz - 2000 MHz	Rel. Hum.(%)	40
Power Setting	260 in Transmit Utility (28.43 dBm)	Press. (mBars)	1011
Antenna	EDN 228-221	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1854.549	46.7	9.9	-0.6	56.0	Peak	V	109	23	111.1	-55.1	Pass	NRB
1854.549	40.8	9.9	-0.6	50.1	Average	V	109	23	111.1	-61.0	Pass	NRB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

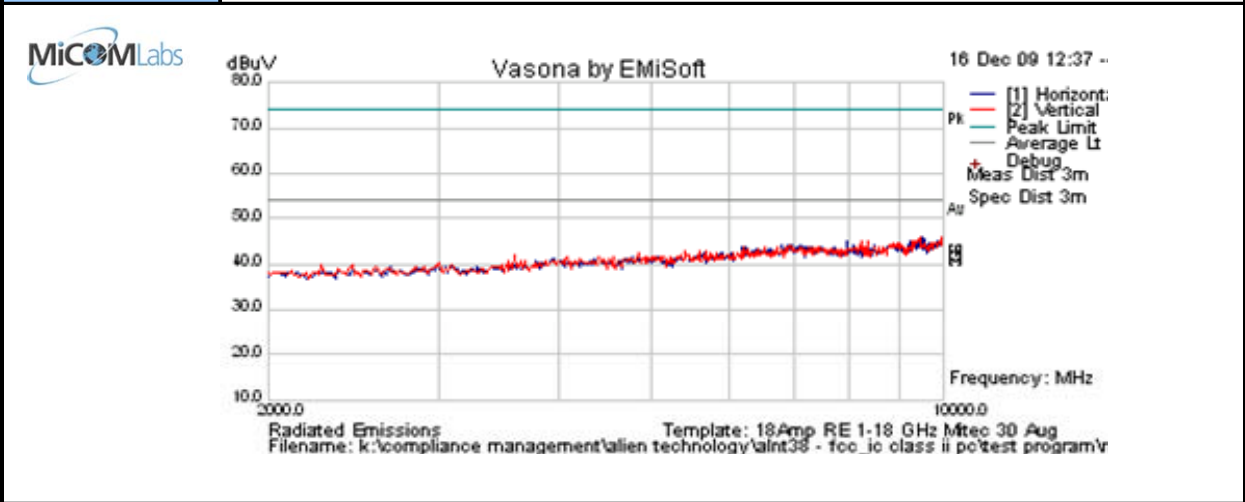
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 72 of 107

**Radiated Spurious Emissions – Antenna EDN 228-221 [2000MHz – 1000MHz]**

<b>Test Freq.</b>	902.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	2000 MHz - 10000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	260 in Transmit Utility (29.0 dBm)	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
No Radio Emissions within 6dB of limit												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band; NRB = Non-Restricted Band												

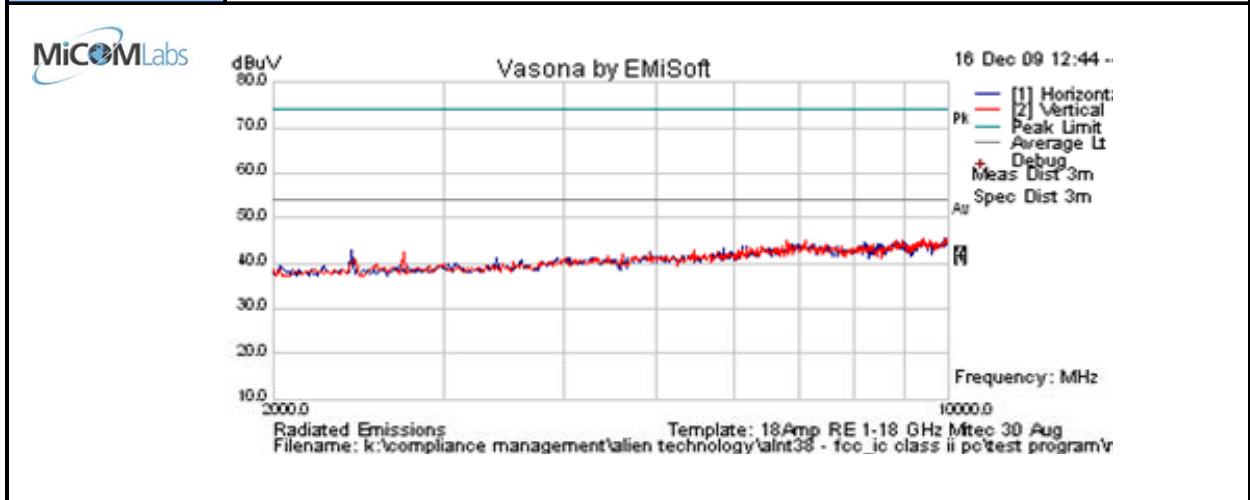
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.





**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 73 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	2000 MHz - 10000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	260 in Transmit Utility (29.0 dBm)	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>	0		
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
---------------	----------	------------	-------	------------	------------------	-----	--------	---------	------------	-----------	------------	----------

No Radio Emissions within 6dB of limit

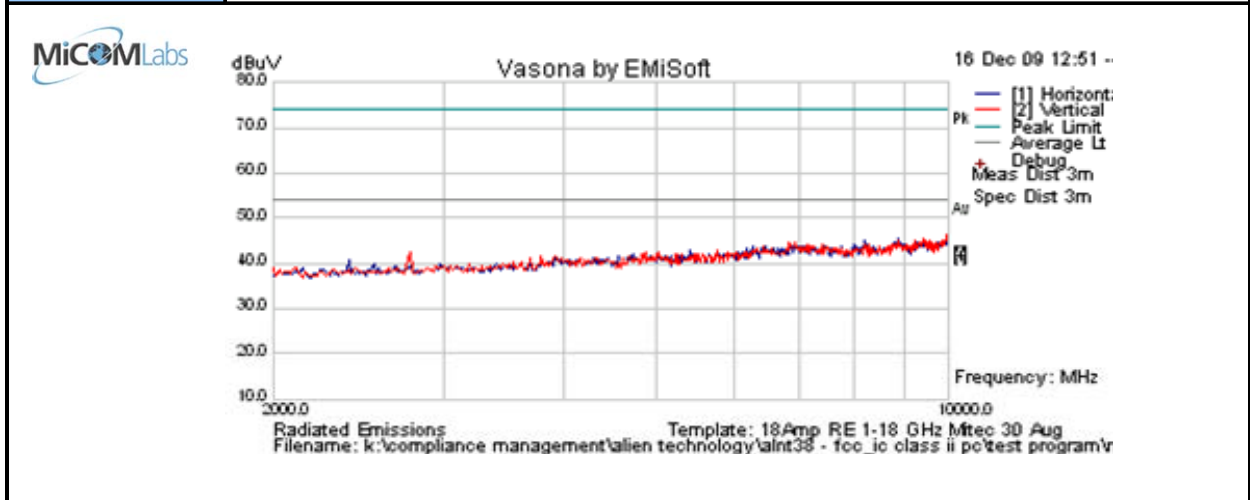
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 74 of 107

<b>Test Freq.</b>	927.25 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	2000 MHz - 10000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	260 in Transmit Utility (28.43 dBm)	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>	0		
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
---------------	----------	------------	-------	------------	------------------	-----	--------	---------	------------	-----------	------------	----------

No Radio Emissions within 6dB of limit

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 75 of 107

---

**5.1.8.5. Transmitter Radiated Spurious Emissions - Antenna RFID-v9.1 915 MHz Near Field Magnetic Loop Sensor**

---

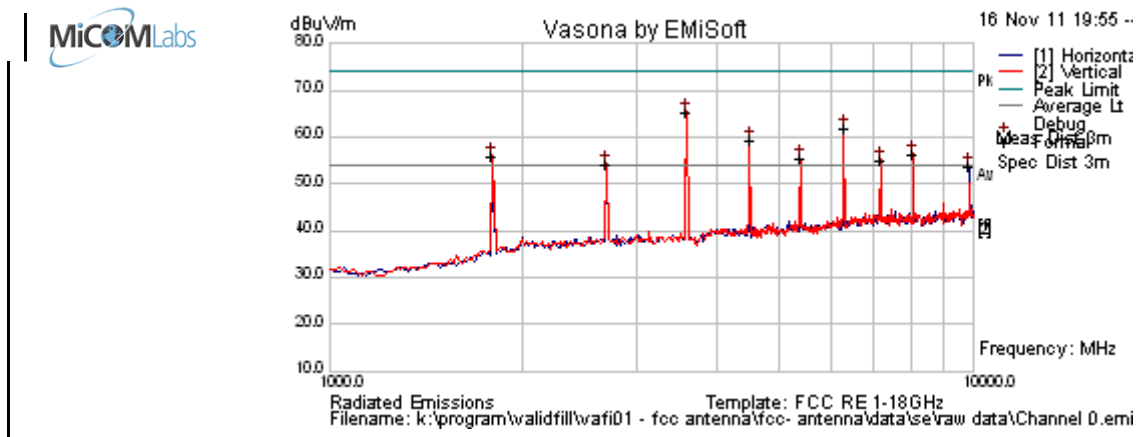
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 76 of 107

**Radiated Spurious Emissions – Antenna RFID-v9.1 915 MHz]**

<b>Test Freq.</b>	Channel 0	<b>Engineer</b>	GMH
<b>Variant</b>	N/A	<b>Temp (°C)</b>	23.5
<b>Freq. Range</b>	1000 MHz - 10000 MHz	<b>Rel. Hum.(%)</b>	34
<b>Power Setting</b>	Maximum	<b>Press. (mBars)</b>	1008
<b>Antenna</b>	PCB Antenna	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5391.305	57.79	4.62	-9.33	53.09	Peak Max	V	102	202	74	-20.91	Pass	RB
2695.628	60.08	3.16	-11.2	52	Peak Max	V	103	270	74	-22	Pass	RB
5391.305	51.08	4.62	-9.33	46.37	Average Max	V	102	202	54	-7.63	Pass	RB
2695.628	53.83	3.16	-11.2	45.75	Average Max	V	103	270	54	-8.25	Pass	RB
8087.454	56.4	5.7	-4.3	57.7	Peak Max	V	98	156	74.0	-16.3	Pass	RB
8087.454	43.2	5.7	-4.3	44.6	Average Max	V	98	156	54	-9.4	Pass	RB
3597.194	73.1	3.7	-11.3	65.4	Peak [Scan]	V					Pass	NRB
1793.587	66.6	2.6	-13.2	56.0	Peak [Scan]	V					Pass	NRB
6302.60521	64.4	5.0	-7.5	61.9	Peak [Scan]	V					Pass	NRB
7186.373	55.5	5.4	-5.7	55.2	Peak [Scan]	V					Pass	NRB
4498.998	65.2	4.2	-10.2	59.2	Peak [Scan]	V					Pass	NRB
9891.784	50.6	6.4	-3.4	53.7	Peak [Scan]	H					Pass	NRB

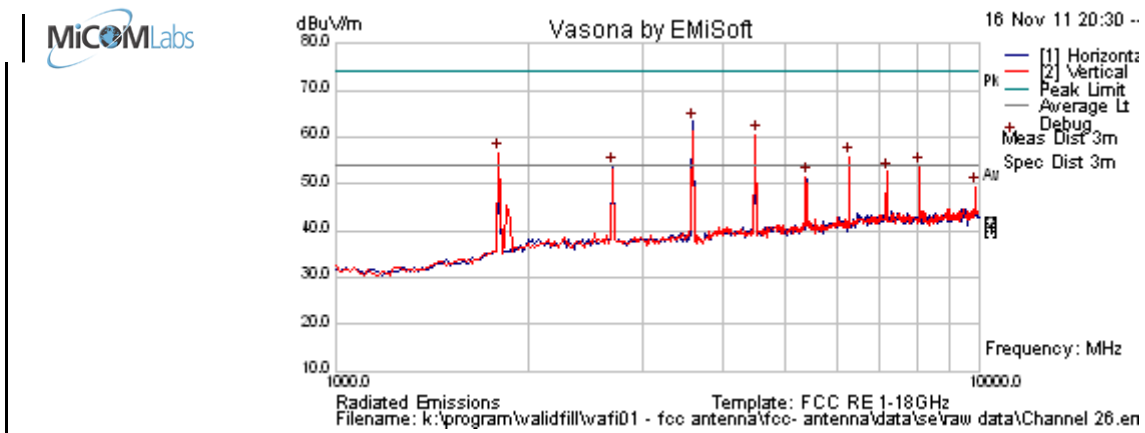
**Legend:** TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 77 of 107

<b>Test Freq.</b>	Channel 26	<b>Engineer</b>	GMH
<b>Variant</b>	N/A	<b>Temp (°C)</b>	23.5
<b>Freq. Range</b>	1000 MHz - 10000 MHz	<b>Rel. Hum.(%)</b>	34
<b>Power Setting</b>	Maximum	<b>Press. (mBars)</b>	1008
<b>Antenna</b>	PCB Antenna	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2707.522	63.0	3.2	-11.2	54.9	Peak Max	H	112	361	74.0	-19.1	Pass	RB
8098.147	55.9	5.6	-4.3	57.2	Peak Max	V	140	215	74.0	-16.8	Pass	RB
5402.666	58.7	4.6	-9.3	54.0	Peak Max	V	166	205	74	-20.0	Pass	RB
2707.522	56.8	3.2	-11.2	48.7	Average Max	H	112	361	54	-5.3	Pass	RB
8098.147	42.9	5.6	-4.3	44.3	Average Max	V	140	215	54	-9.7	Pass	RB
5402.666	51.75	4.62	-9.33	47.04	Average Max	V	166	205	54	-6.96	Pass	RB
3609.444	71.0	3.7	-11.3	63.4	Peak [Scan]	H					Pass	NRB
4511.248	66.5	4.2	-10.2	60.5	Peak [Scan]	V					Pass	NRB
1805.837	67.3	2.6	-13.2	56.7	Peak [Scan]	V					Pass	NRB
6296.819	58.3	5.0	-7.5	55.8	Peak [Scan]	V					Pass	NRB
7198.623	53.0	5.4	-5.7	52.7	Peak [Scan]	V					Pass	NRB
9904.034	46.3	6.4	-3.4	49.4	Peak [Scan]	H					Pass	NRB

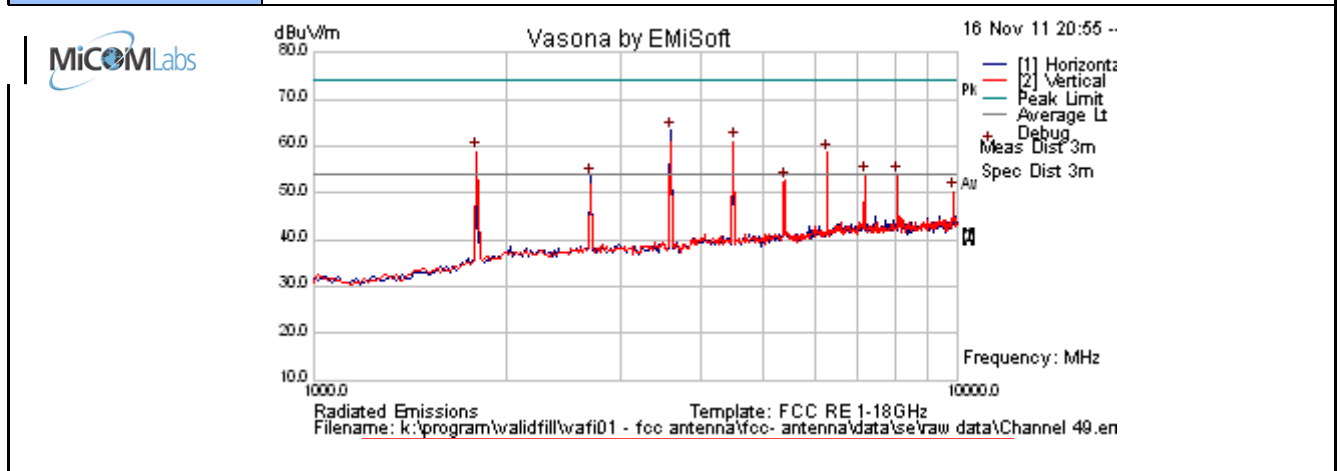
**Legend:** TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 78 of 107

<b>Test Freq.</b>	Channel 49	<b>Engineer</b>	GMH
<b>Variant</b>	N/A	<b>Temp (°C)</b>	23.5
<b>Freq. Range</b>	1000 MHz - 10000 MHz	<b>Rel. Hum.(%)</b>	34
<b>Power Setting</b>	Maximum	<b>Press. (mBars)</b>	1008
<b>Antenna</b>	PCB Antenna	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
8110.021	54.6	5.6	-4.3	56.0	Peak Max	V	141	216	74.0	-18.0	Pass	RB
2719.697	64.3	3.2	-11.2	56.2	Peak Max	H	98	142	74.0	-17.8	Pass	RB
5414.771	57.8	4.6	-9.3	53.1	Peak Max	V	201	204	74	-20.9	Pass	RB
8110.021	42.29	5.64	-4.29	43.65	Average Max	V	141	216	54	-10.35	Pass	RB
2719.697	57.96	3.16	-11.2	49.88	Average Max	H	98	142	54	-4.12	Pass	RB
5414.771	50.55	4.62	-9.33	45.85	Average Max	V	201	204	54	-8.15	Pass	RB
3621.694	70.9	3.7	-11.3	63.2	Peak [Scan]	H					Pass	NRB
4523.498	67.0	4.2	-10.2	61.0	Peak [Scan]	V					Pass	NRB
1818.087	69.3	2.6	-13.2	58.8	Peak [Scan]	V					Pass	NRB
6309.069	61.2	5.0	-7.5	58.7	Peak [Scan]	V					Pass	NRB
7210.873	53.9	5.4	-5.7	53.6	Peak [Scan]	V					Pass	NRB
9916.284	47.1	6.4	-3.4	50.2	Peak [Scan]	V					Pass	NRB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

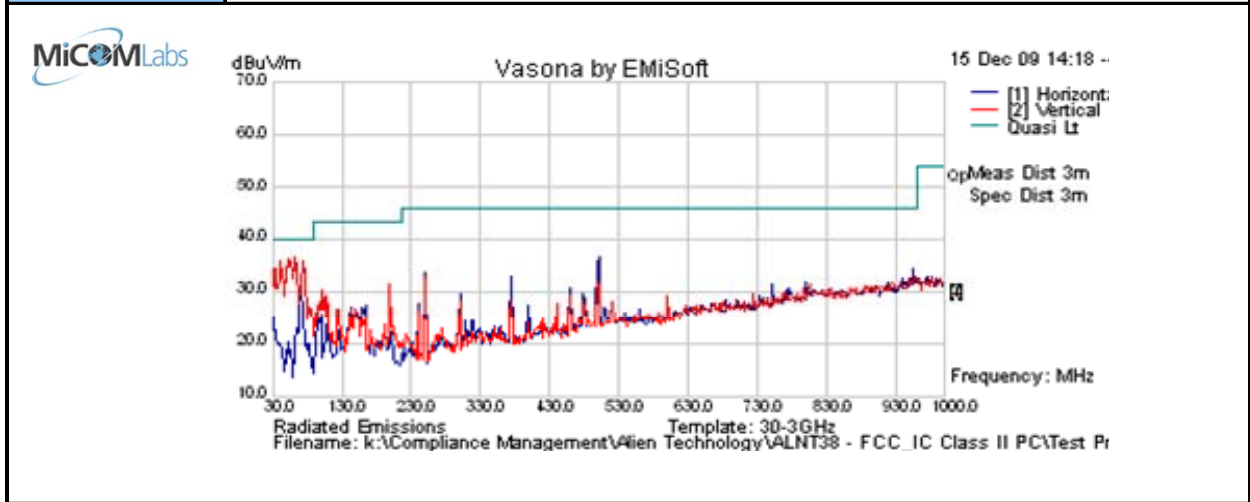
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 79 of 107

**5.1.8.6. Receiver Radiated Spurious Emissions - Antenna S9028PV**

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	Rx Mode	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

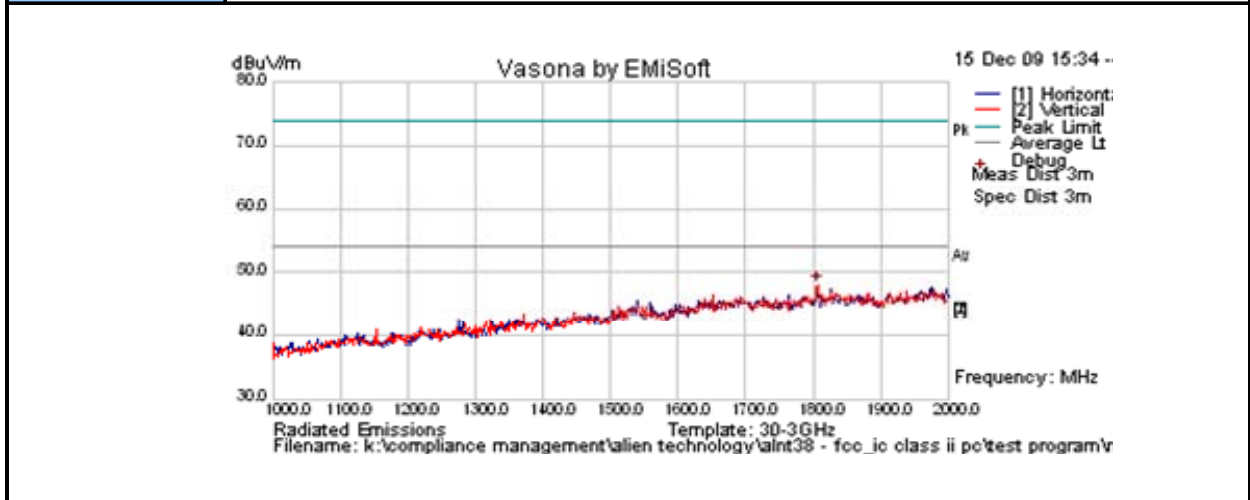
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No Radio Emissions within 6dB of limit												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 80 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	1000MHz- 2000MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	Rx Mode	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No Emissions within 6dB of limit												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												

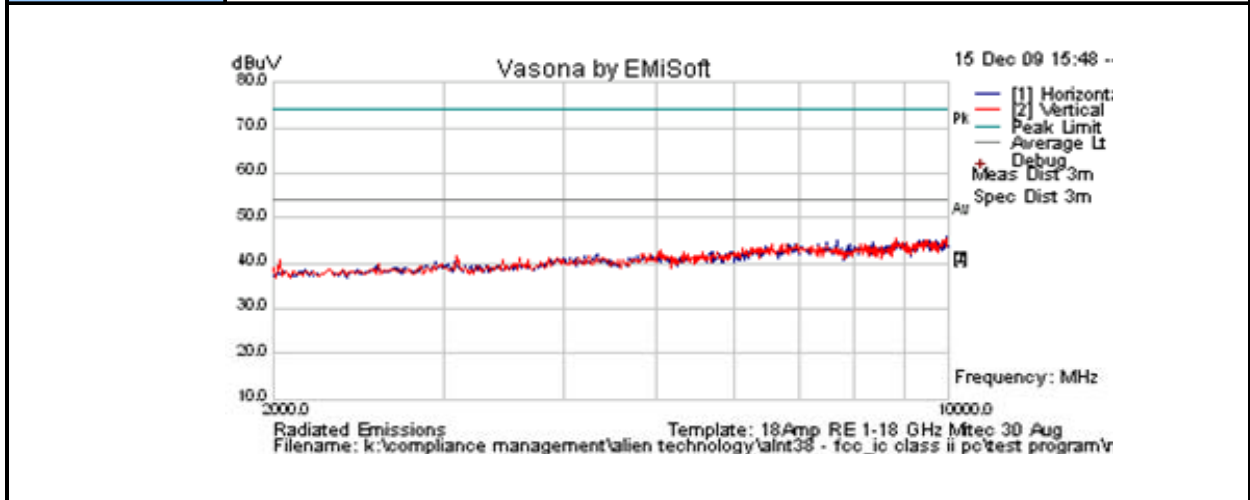
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.





**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 81 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	2000MHz-10000MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	Rx Mode	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
---------------	----------	------------	-------	--------------	------------------	-----	--------	---------	--------------	-----------	------------	----------

No Emissions within 6dB of limit

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
---------	---

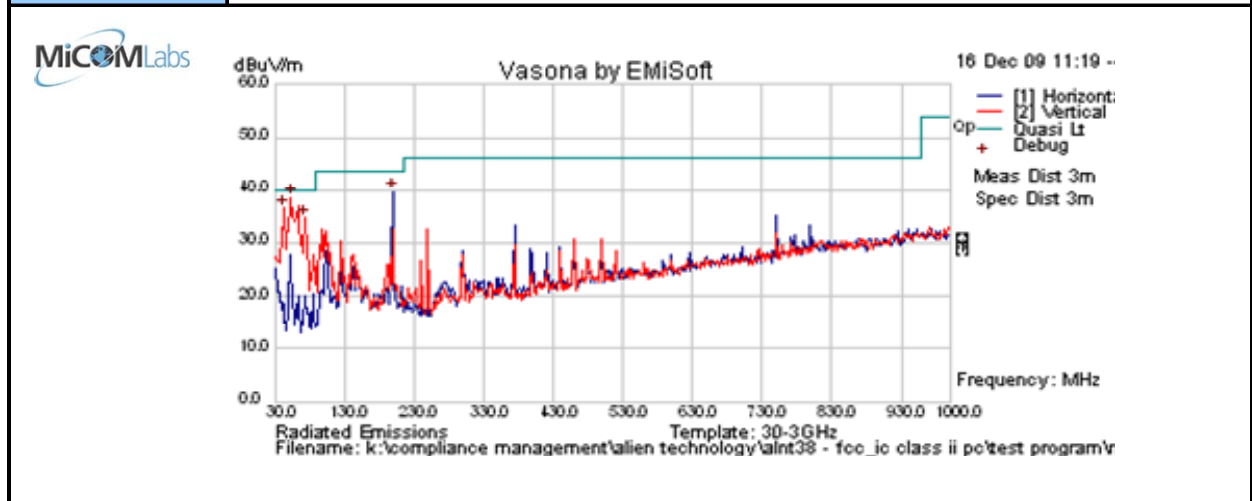
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 82 of 107

**5.1.8.7. Receiver Radiated Spurious Emissions - Antenna EDN 228-221**

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	Rx Mode	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

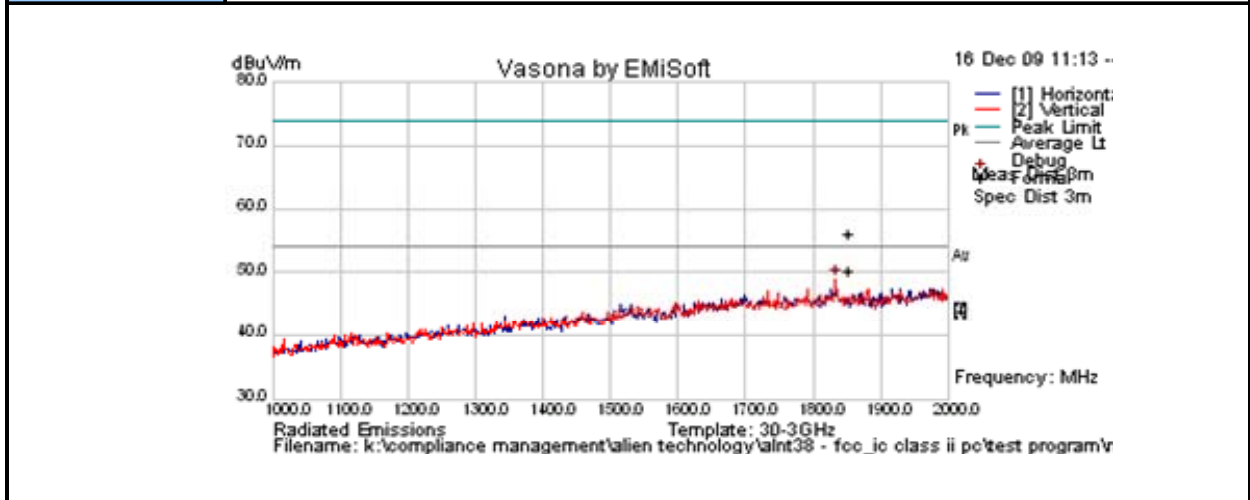
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No Radio Emissions within 6dB of limit												
<b>Legend:</b>	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 83 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	1000MHz- 2000MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	Rx Mode	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
---------------	----------	------------	-------	--------------	------------------	-----	--------	---------	--------------	-----------	------------	----------

No Radio Emissions within 6dB of limit

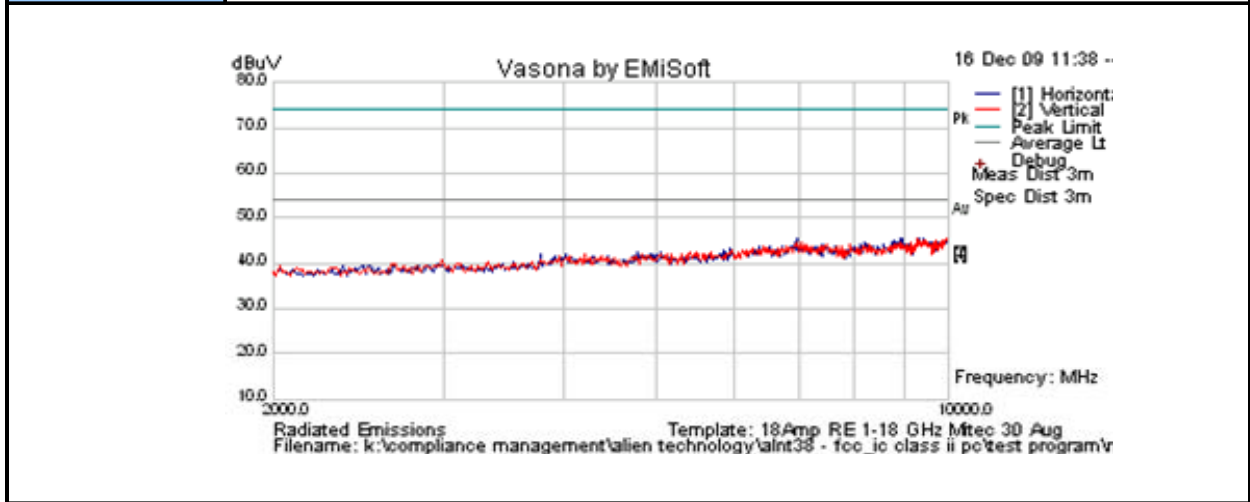
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
---------	---

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 84 of 107

<b>Test Freq.</b>	915.75 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	PRASK	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	2000MHz-10000MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	Rx Mode	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
---------------	----------	------------	-------	--------------	------------------	-----	--------	---------	--------------	-----------	------------	----------

No Radio Emissions within 6dB of limit

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
---------	---

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 85 of 107

**FCC, Part 15 Subpart C §15.247(d)**  
**Industry Canada RSS-210 §A8.5**

### Specification

**FCC Part 15 Subpart C §15.247(d)**  
**Industry Canada §A8.5**

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.

### Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
-------------------------	---------------

### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'	0287, 0335, 0338, 0158, 0134, 0304, 0311, 0315, 0310, 0312

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

### 5.1.9. Radiated Spurious Emissions – Digital Emissions

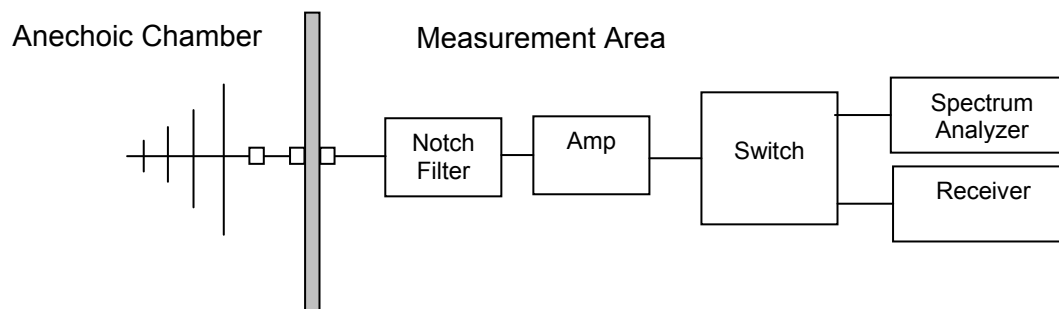
#### FCC, Part 15 Subpart C §15.247(d), §15.205, 15.109

##### Test Procedure

Preliminary radiated emissions were measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarity. The emissions are recorded with a CISPR compliant spectrum analyzer in peak hold mode. Emissions closest to the limits are measured in the quasi-peak mode with the tuned receiver using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed. A photograph of the test set-up in the anechoic chamber in Section 6 Test Set-Up Photographs.

A notch filter with >70 dB of rejection was used to remove the fundamental frequency.

##### Test Measurement Set up



##### Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. In this test facility, the Antenna Factor, Cable Loss, and Amplifier Gains are loaded into the Rohde & Schwarz Receiver and the corrected field strength can be read directly on the receiver.

$$FS = R + AF + CORR$$

where:

FS = Field Strength  
R = Measured Receiver Input Amplitude  
AF = Antenna Factor  
CORR = Correction Factor = CL – AG + NFL  
CL = Cable Loss  
AG = Amplifier Gain



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 87 of 107

---

For example:

Given a Receiver input reading of 51.5dB $\mu$ V; Antenna Factor of 8.5dB; Cable Loss of 1.3dB; Falloff Factor of 0dB, an Amplifier Gain of 26dB and Notch Filter Loss of 1dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3\text{dB}\mu\text{V/m}$$

Conversion between dB $\mu$ V/m (or dB $\mu$ V) and  $\mu$ V/m (or  $\mu$ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (\mu\text{V/m}))}$$

$$40 \text{ dB}\mu\text{V/m} = 100\mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250\mu\text{V/m}$$

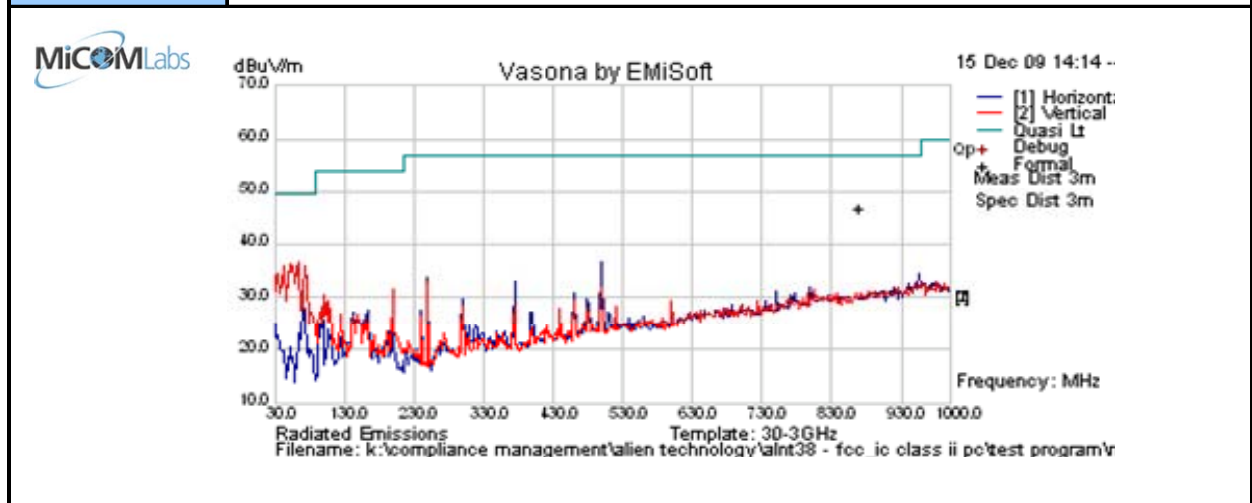
---

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**5.1.9.1. Radiated Digital Emissions – Antenna S9028PV; Class A Limit**

<b>Test Freq.</b>	N/A	<b>Engineer</b>	CSB
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	N/A	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>	Digital Emissions only. Tx on EUT was turned on and off to verify digital and transmitter emissions.		
<b>Test Notes 2</b>	Digital emissions values were taken with transmitter on full power for max current draw		



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
42.972	52.8	3.6	-19.2	37.2	Peak [Scan]	V	200	0	49.5	-12.3	Pass	DIG
53.567	57.5	3.8	-23.6	37.7	Peak [Scan]	V	100	0	49.5	-11.8	Pass	DIG
63.004	56.0	3.8	-23.4	36.5	Peak [Scan]	V	200	0	49.5	-13.0	Pass	DIG
73.731	55.4	3.9	-22.8	36.5	Peak [Scan]	V	200	0	49.5	-13.0	Pass	DIG
480.005	40.2	5.9	-12.5	33.6	Peak [Scan]	V	98	0	57	-23.4	Pass	DIG
499.985	43.7	6.0	-12.6	37.2	Peak [Scan]	V	98	0	57	-19.8	Pass	DIG

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

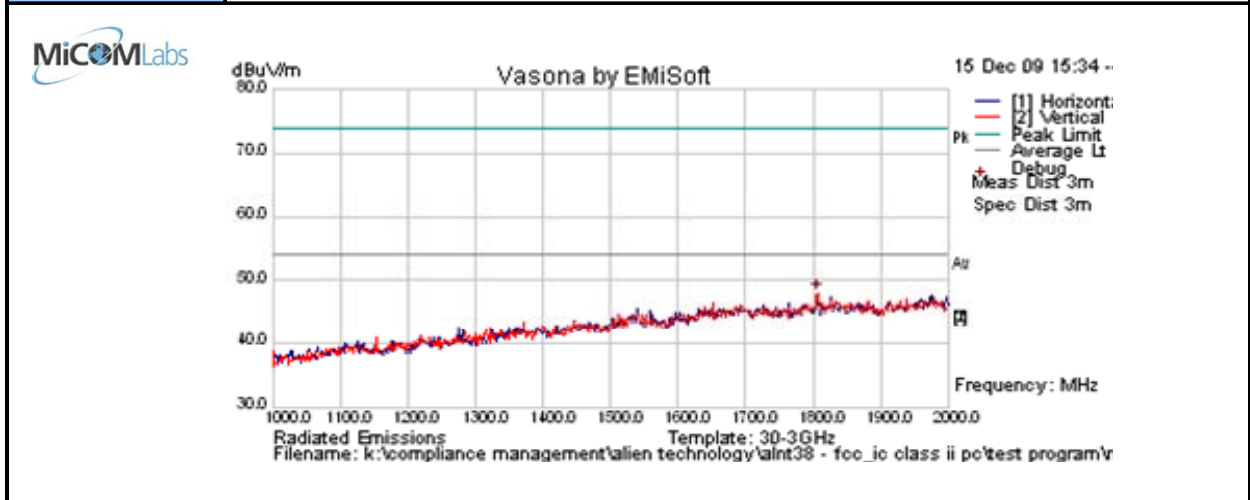
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.





**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 89 of 107

<b>Test Freq.</b>	N/A	<b>Engineer</b>	CSB
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	1000-2000MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	N/A	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>	Digital Emissions only. Tx on EUT was turned on and off to verify digital and transmitter emissions.		
<b>Test Notes 2</b>	Digital emissions values were taken with transmitter on full power for max current draw		



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
---------------	----------	------------	-------	--------------	------------------	-----	--------	---------	--------------	-----------	------------	----------

No Emissions within 6dB of limit

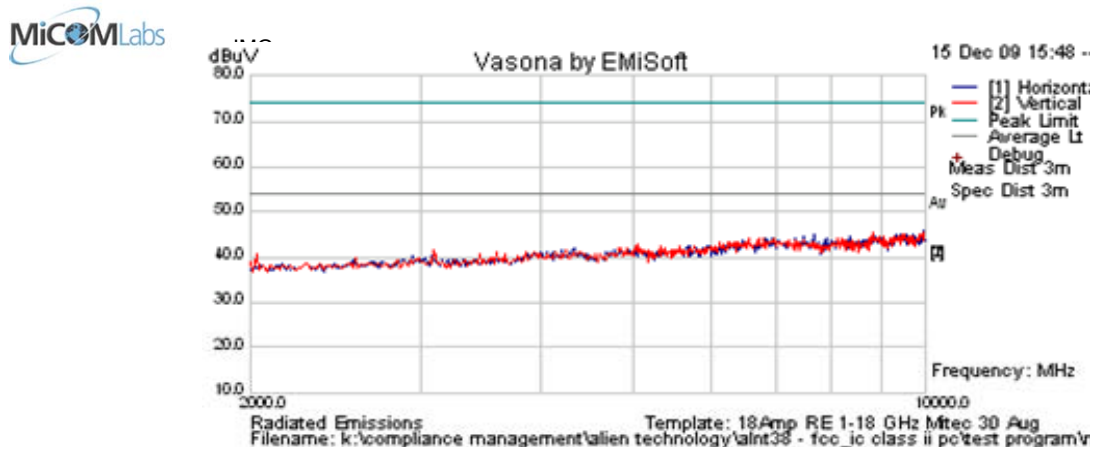
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
---------	---

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 90 of 107

<b>Test Freq.</b>	N/A	<b>Engineer</b>	CSB
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	2000MHz - 10000MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	N/A	<b>Press. (mBars)</b>	1009
<b>Antenna</b>	S9028PV	<b>Duty Cycle (%)</b>	100%
<b>Test Notes 1</b>	Digital Emissions only. Tx on EUT was turned on and off to verify digital and transmitter emissions.		
<b>Test Notes 2</b>	Digital emissions values were taken with transmitter on full power for max current draw		



**Formally measured emission peaks**

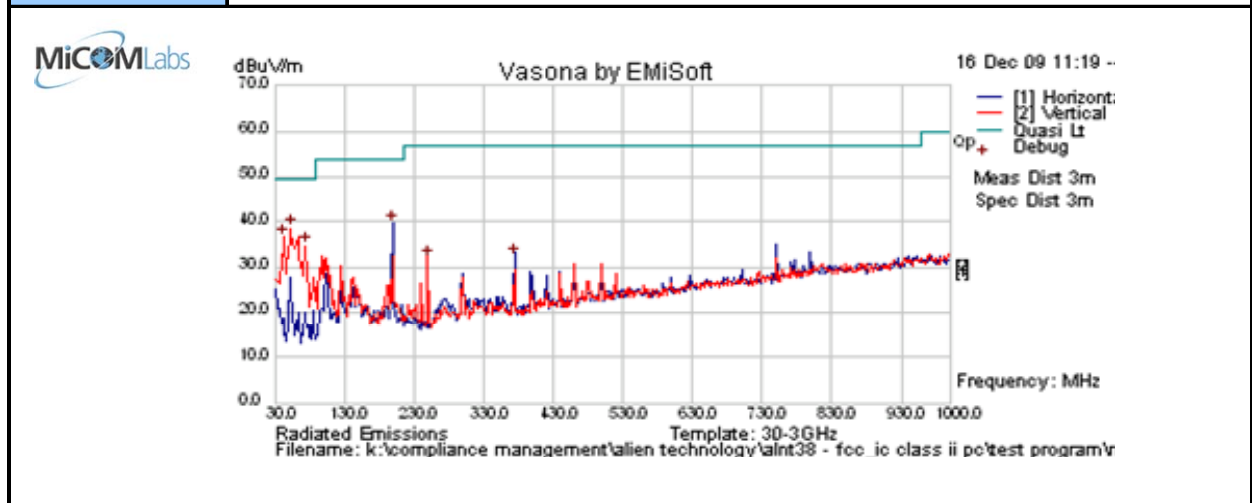
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No Emissions within 6dB of limit												
Legend:		TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission										

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**5.1.9.2. Radiated Digital Emissions – Antenna EDN 228-221; Class A Limit**

<b>Test Freq.</b>	N/A	<b>Engineer</b>	CSB
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	N/A	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	N/A
<b>Test Notes 1</b>	Digital Emissions only. Tx on EUT was turned on and off to verify digital and transmitter emissions.		
<b>Test Notes 2</b>	Digital emissions values were taken with transmitter on full power for max current draw		



**Formally measured emission peaks**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
53.924	58.4	3.8	-23.6	38.5	Peak [Scan]	V	100	0	49.5	-11.0	n/a	
42.962	52.1	3.6	-19.1	36.6	Peak [Scan]	V	100	0	49.5	-13.0	n/a	
199.067	52.9	4.8	-17.9	39.7	Peak [Scan]	H	100	0	54	-14.3	n/a	
74.609	53.5	3.9	-22.8	34.6	Peak [Scan]	V	100	0	49.5	-14.9	n/a	
374.974	41.8	5.6	-15.1	32.2	Peak [Scan]	H	98	0	57	-24.8	n/a	
250.011	45.6	5.0	-18.8	31.8	Peak [Scan]	V	98	0	57	-25.2	n/a	

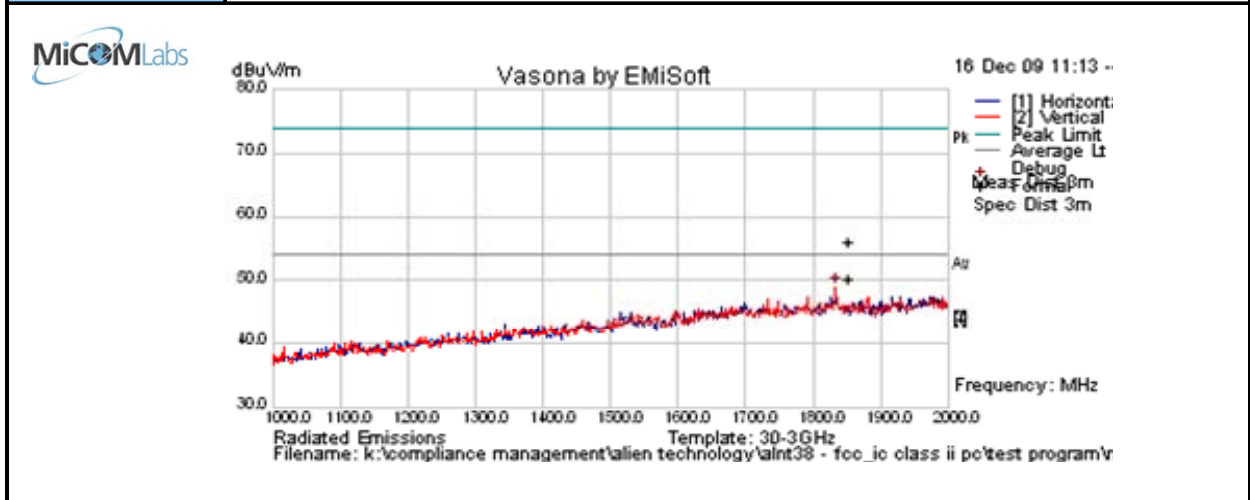
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 92 of 107

<b>Test Freq.</b>	N/A	<b>Engineer</b>	CSB
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	1000-2000MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	N/A	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	N/A
<b>Test Notes 1</b>	Digital Emissions only. Tx on EUT was turned on and off to verify digital and transmitter emissions.		
<b>Test Notes 2</b>	Digital emissions values were taken with transmitter on full power for max current draw		



**Formally measured emission peaks**

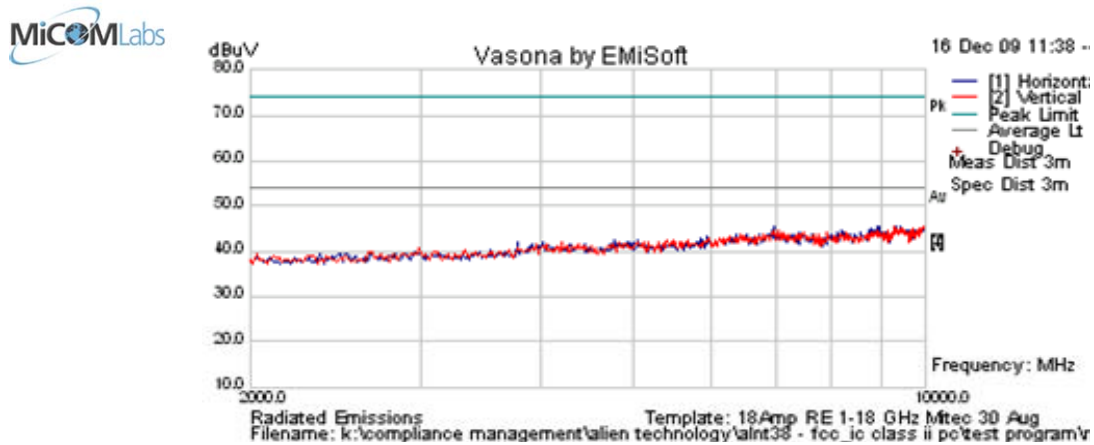
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No Emissions within 6dB of limit												
Legend:		TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band; NRB = Non-Restricted Band										

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 93 of 107

<b>Test Freq.</b>	N/A	<b>Engineer</b>	CSB
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	2000MHz - 10000MHz	<b>Rel. Hum.(%)</b>	40
<b>Power Setting</b>	N/A	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	EDN 228-221	<b>Duty Cycle (%)</b>	N/A
<b>Test Notes 1</b>	Digital Emissions only. Tx on EUT was turned on and off to verify digital and transmitter emissions.		
<b>Test Notes 2</b>	Digital emissions values were taken with transmitter on full power for max current draw		



### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No Emissions within 6dB of limit												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band; NRB = Non-Restricted Band												

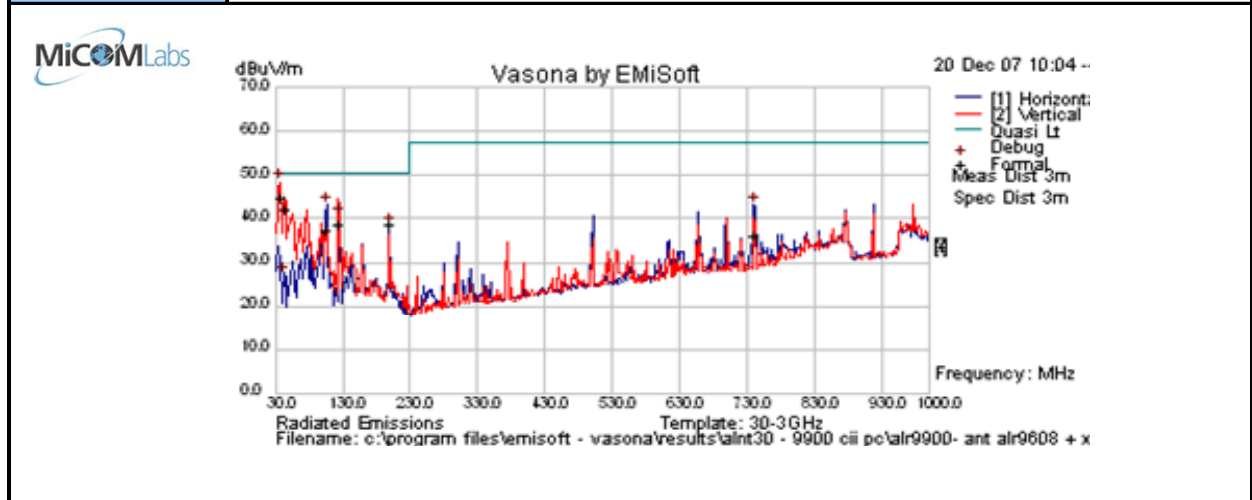
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 94 of 107

### 5.1.9.3. Radiated Digital Emissions – XP Power PSU Class A Device

<b>Test Freq.</b>	915.75	<b>Engineer</b>	GMH
<b>Variant</b>	Power Supply Emissions	<b>Temp (°C)</b>	20.5
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	Full Power - 29.8 dBm	<b>Press. (mBars)</b>	105
<b>Antenna</b>	N/A	<b>Duty Cycle (%)</b>	N/A
<b>Test Notes 1</b>	Test Data for power supply from previous test report ALNT30-A3 Rev A;		
<b>Test Notes 2</b>			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
38.888	52.95	3.55	-13.7	42.79	Quasi Max	V	132	74	50.5	-7.71	Pass	
106.694	48.84	4.21	-17.83	35.23	Quasi Max	V	114	246	50.5	-15.27	Pass	
125.006	48.25	4.33	-15.89	36.7	Quasi Max	V	98	156	50.5	-13.8	Pass	
199.046	48.86	4.75	-17.02	36.59	Quasi Max	V	173	196	50.5	-13.91	Pass	
739.996	36.01	6.82	-8.88	33.96	Quasi Max	V	166	171	57.5	-23.54	Pass	
45.736	55.04	3.64	-18.42	40.26	Quasi Max	V	98	360	50.5	-10.24	Pass	

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band; NRB = Non-Restricted Band

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Specification**

**Limits**

**§15.205 (a)** Except as shown in paragraph (d) of 15.205 (a), only spurious emissions are permitted in any of the frequency bands listed.

**§15.205 (a)** Except as shown in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

**§15.109 (b)** The field strength of radiated emissions from a Class A digital device, as determined at a distance of 3 meters, shall not exceed the following:

**§15.109 (b)** Limit Matrix Class A digital device

Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance (meters)
30-88	100	49.5	3
88-216	150	54.0	3
216-960	200	57.0	3
Above 960	500	60.0	3

**Laboratory Measurement Uncertainty for Radiated Emissions**

Measurement uncertainty	+5.6/ -4.5 dB
-------------------------	---------------

**Traceability**

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'	0287, 0335, 0338, 0158, 0134, 0304, 0311, 0315, 0310, 0312, 0341

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

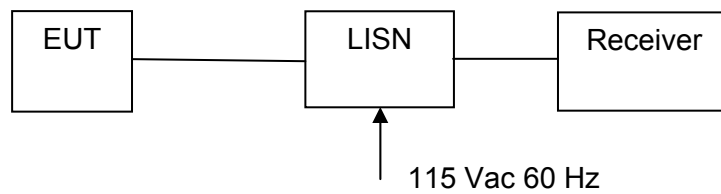
### 5.1.10. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

**FCC, Part 15 Subpart C §15.207**  
**Industry Canada RSS-Gen §7.2.2**

#### **Test Procedure**

The EUT is configured in accordance with ANSI C63.4. The conducted emissions are measured in a shielded room with a spectrum analyzer in peak hold in the first instance. Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation. The highest emissions relative to the limit are listed.

#### **Test Measurement Set up**



Measurement set up for AC Wireline Conducted Emissions Test

#### **Measurement Results for AC Wireline Conducted Emissions (150 kHz – 30 MHz)**

Ambient conditions.

Temperature: 17 to 23 °C    Relative humidity: 31 to 57 %    Pressure: 999 to 1012 mbar

#### **Radio Parameters:**

Transmitting on Channel 26. 915.25 MHz

Transmit Power +30 dBm

Active antenna port was terminated in a 50Ω termination

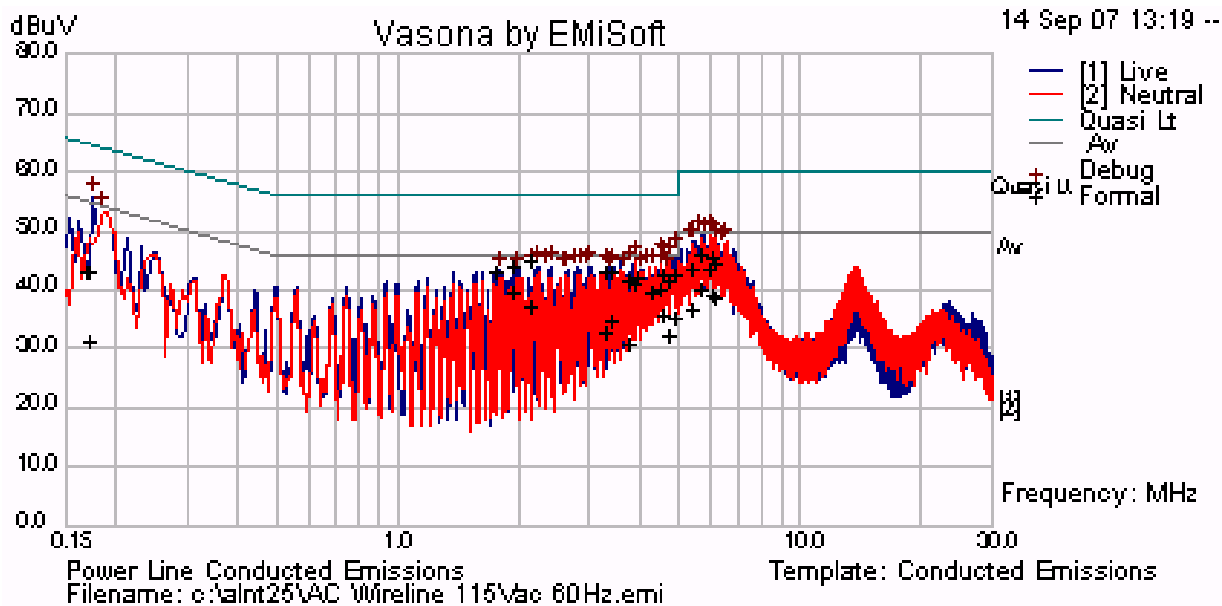


TABLE OF RESULTS – Cable Connections PSU

115 Vac 60 Hz

Freq (MHz)	Line	Peak (dB $\mu$ V)	QP (dB $\mu$ V)	QP Limit (dB $\mu$ V)	QP Margin (dB)	Ave. (dB $\mu$ V)	Ave. Limit (dB $\mu$ V)	Ave. Margin (dB)
1.986	Live	43.35	41.82	56	-14.18	43.45	46	-8.66
1.800	Live	43.32	42.29	56	-13.71	36.89	46	-9.11
2.175	Live	43.48	40.99	56	-13.47	34.88	46	-11.12
5.715	Live	49.31	43.83	60	-16.17	38.05	50	-11.95
4.657	Live	45.37	40.30	56	-15.70	33.64	46	-12.36
4.968	Live	46.50	40.10	56	-15.90	32.97	46	-13.03

AC Wireline - Conducted Emissions (150 kHz – 30 MHz)  
Cable Connections PSU



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

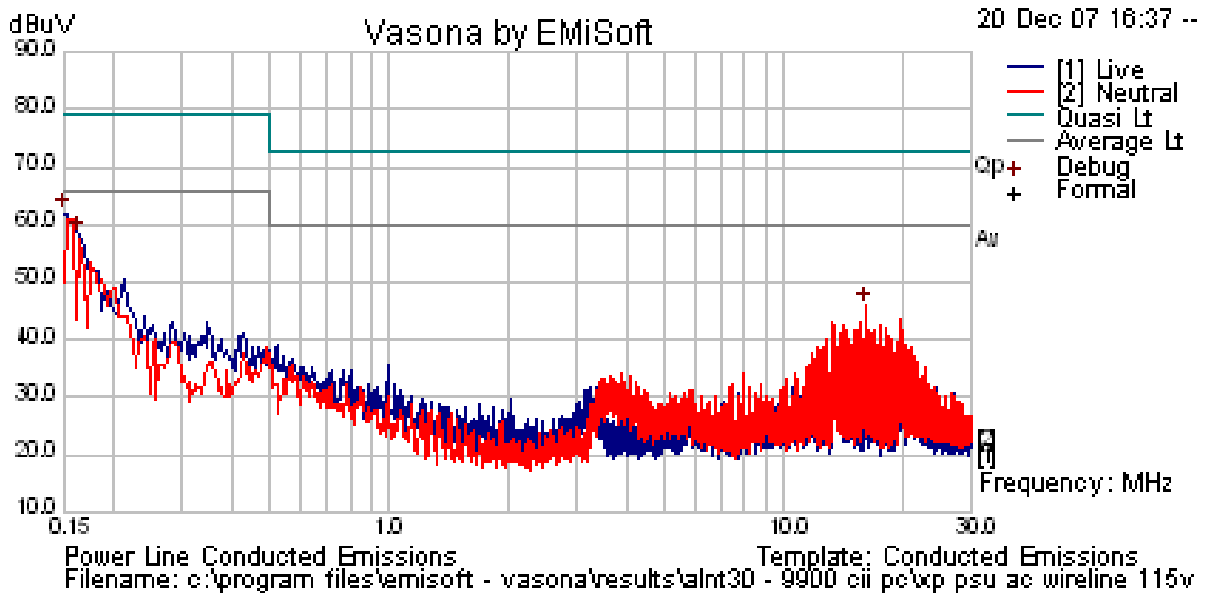


TABLE OF RESULTS – XP Power PSU

115 Vac 60 Hz

Freq (MHz)	Line	Peak (dB $\mu$ V)	QP (dB $\mu$ V)	QP Limit (dB $\mu$ V)	QP Margin (dB)	Ave. (dB $\mu$ V)	Ave. Limit (dB $\mu$ V)	Ave. Margin (dB)
0.15	Neut.	62.04	50.59	79	-28.41	37.59	66	-28.41
0.163	Neut.	58.50	45.98	79	-33.02	19.85	66	-46.15
16.229	Neut.	45.93	45.94	73	-27.06	44.39	60	-15.61

AC Wireline - Conducted Emissions (150 kHz – 30 MHz)  
XP Power PSU



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



## Specification

### Limit

**§15.207 (a)** Except as shown in paragraphs (b) and (c) of this section, 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 in the following table, as measured using a 50  $\mu\Omega$  line impedance stabilization network (LISN), see §15.207 (a) matrix below. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

#### **RSS-Gen §7.2.2**

The radio frequency voltage that is conducted back into the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The tighter limit applies at the frequency range boundaries.

#### **§15.207 (a)** and **RSS-Gen §7.2.2** Limit Matrix

The lower limit applies at the boundary between frequency ranges

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency

#### Laboratory Measurement Uncertainty for Conducted Emissions

Measurement uncertainty	$\pm 2.64$ dB
-------------------------	---------------

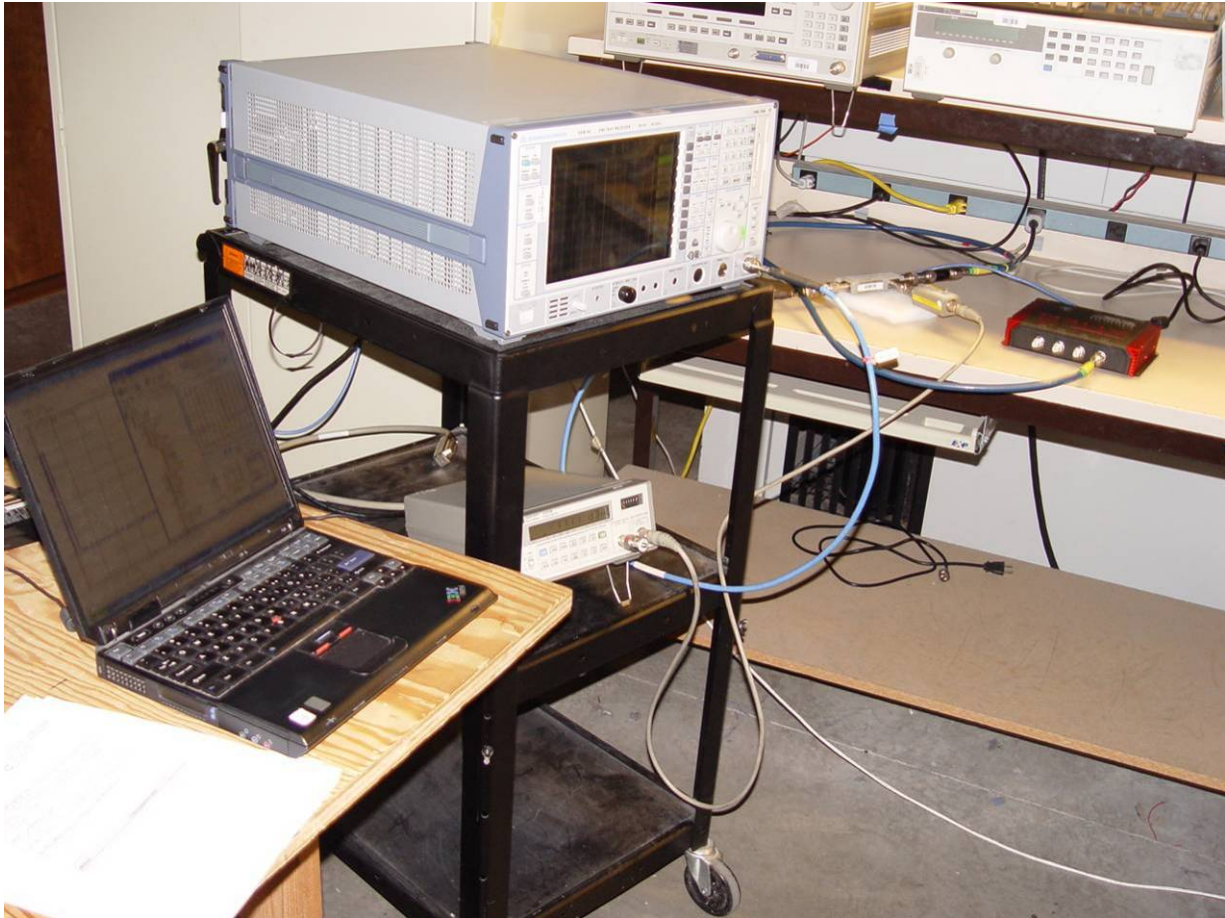
#### Traceability

Method	Test Equipment Used
Measurements were made per Sanmina work instruction	0190, 0193

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

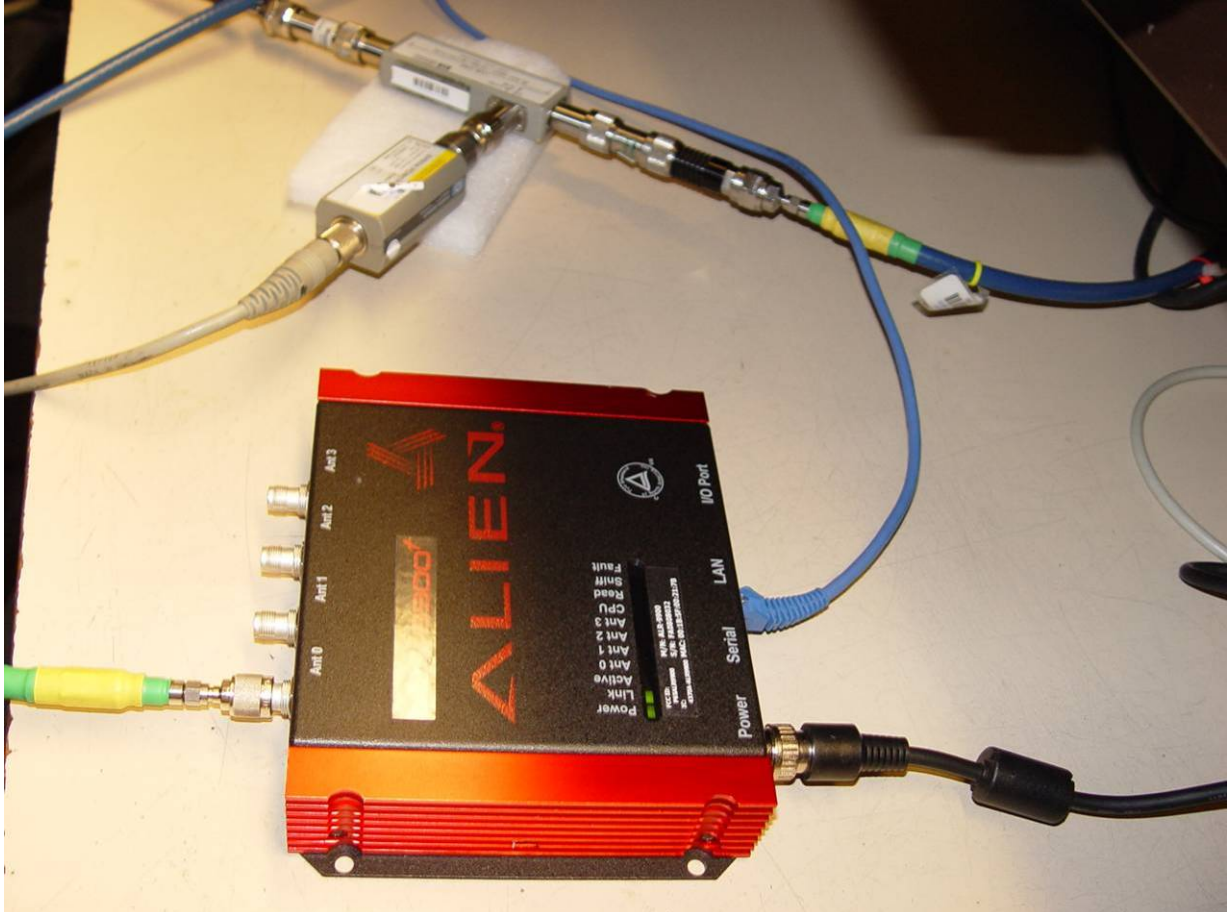
## 6. PHOTOGRAPHS

### 6.1. General Measurement Test Set-Up



---

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

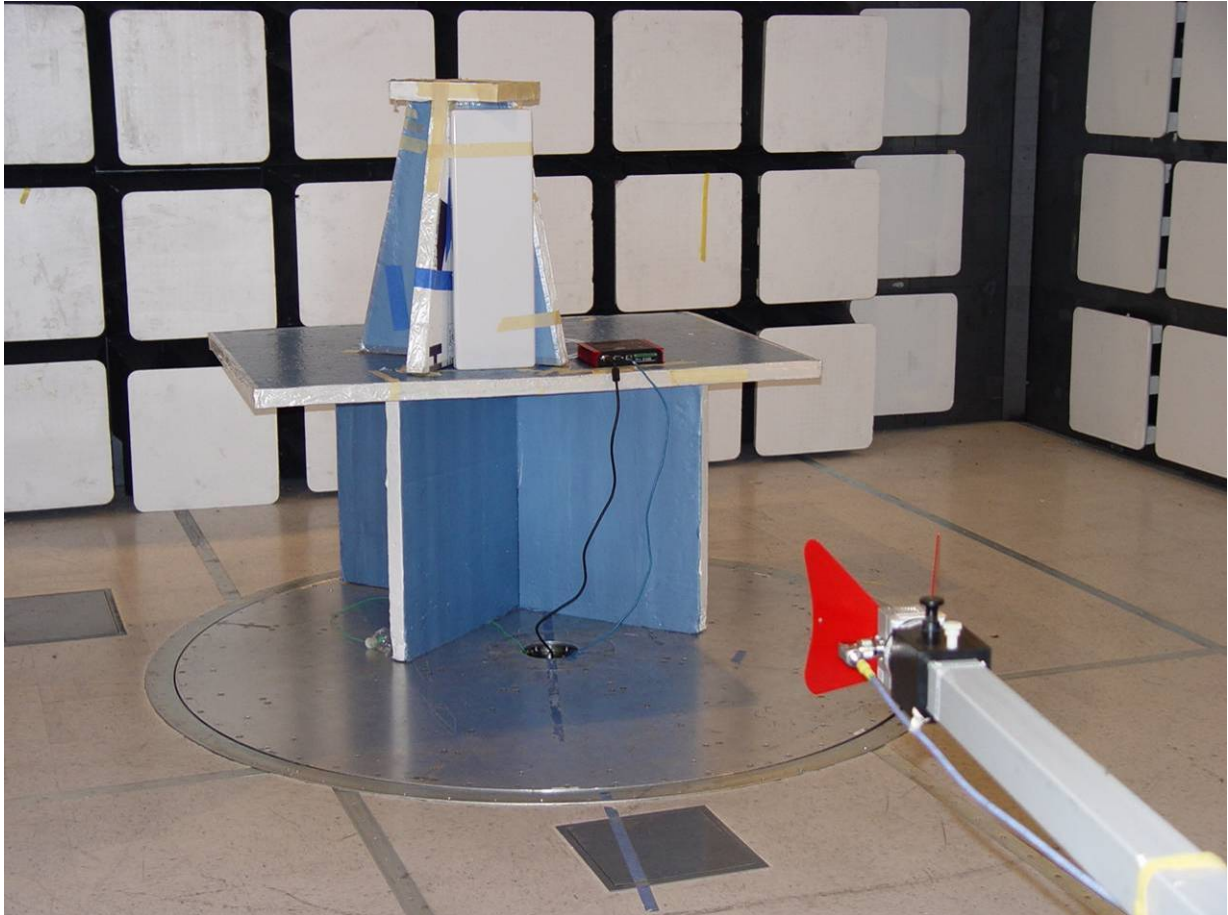
## 6.2. Radiated Emissions >1 GHz



RFID-v9.1 915 MHz  
**Near Field Magnetic Loop Sensor Antenna**

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

### 6.3. Radiated Emissions <1 GHz



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

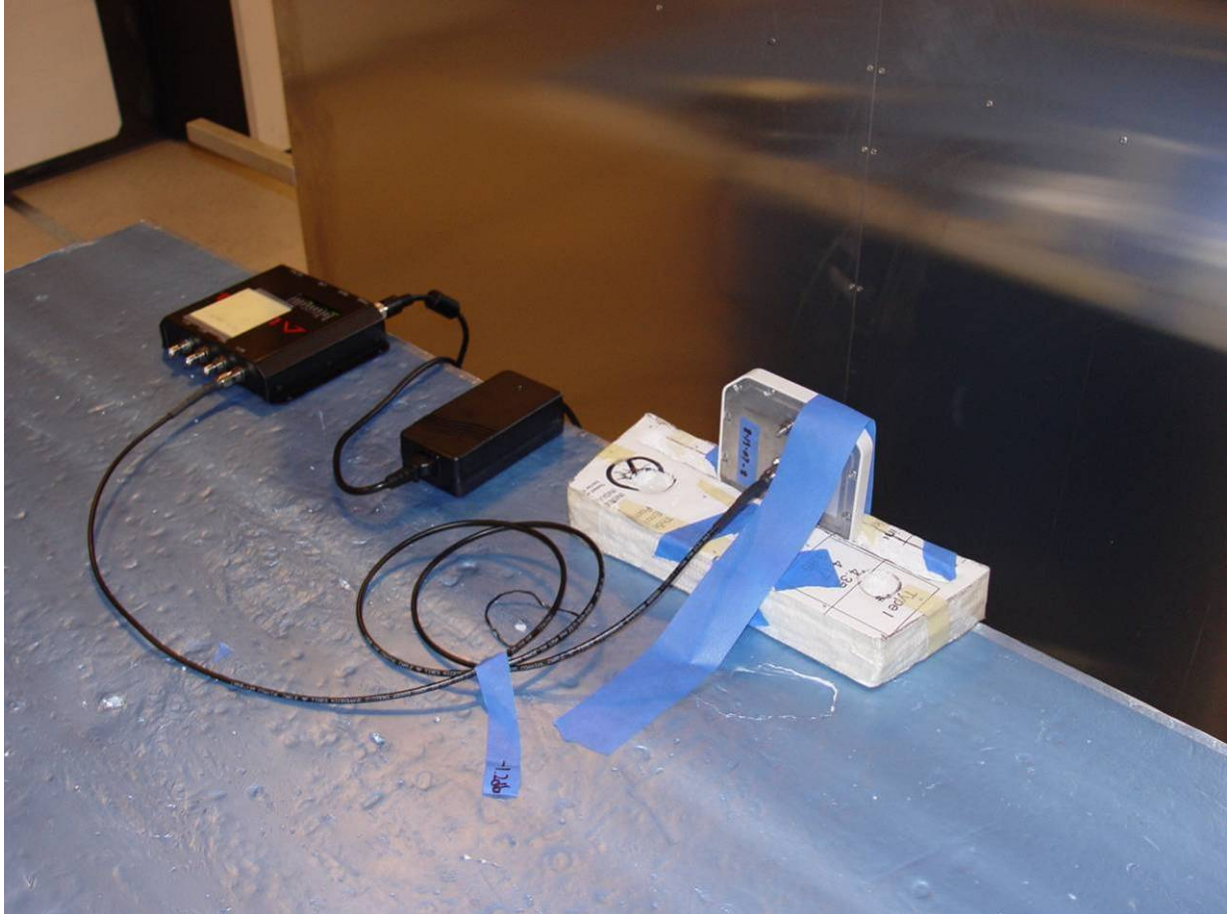
#### 6.4. Cable Connections PSU AC Wireline Emissions



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



## 6.5. XP Power PSU AC Wireline Emissions



---

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Alien Technology RFID Reader ALR9900  
**To:** FCC 47 CFR Part15.247 & IC RSS-210  
**Serial #:** VAFI01-U1 Rev A  
**Issue Date:** 15th February 2012  
**Page:** 106 of 107

## 7. TEST EQUIPMENT DETAILS

Asset #	Instrument	Manufacturer	Part #	Serial #
0070	Power Meter	Hewlett Packard	437B	3125U11552
0116	Power Sensor	Hewlett Packard	8485A	3318A19694
0117	Power Sensor	Hewlett Packard	8487D	3318A00371
0158	Barometer /Thermometer	Control Co.	4196	E2844
0184	Pulse Limiter	Rhode & Schwarz	ESH3Z2	357.8810.52
0190	LISN	Rhode & Schwarz	ESH3Z5	836679/006
0223	Power Meter	Hewlett Packard	HP EPM-442A	US37480256
0251	K-Cable	Megaphase	Sucoflex 104	Unknown
0252	K-Cable	Megaphase	Sucoflex 104	Unknown
0253	K-Cable	Megaphase	Sucoflex 104	Unknown
0256	K-Cable	Megaphase	Sucoflex 104	Unknown
0271	Amplifier	1 to 26.5 GHz	MiCOM	--
0287	EMI Receiver	Rhode & Schwarz	ESIB 40	100201
0293	BNC Cable	Megaphase	1689 1GVT4	15F50B001
0307	BNC Cable	Megaphase	1689 1GVT4	15F50B002
0310	2m SMA Cable	Micro-Coax	UFA210A-0-0787-3G03G0	209089-001
0312	3m SMA Cable	Micro-Coax	UFA210A-1-1181-3G0300	209092-001
0313	Coupler	Hewlett Packard	86205A	3140A01285
0314	30 dB N-Type Attenuator	ARRA	N944-30	1623
0335	Horn Antenna	The Electro-Mechanics Company	3117	00066580
0337	Amplifier	30 MHz – 3 GHz	MiCOM	--
0338	Antenna (30M-3GHz)	Sunol Sciences	JB3	A052907
0341	902-928 MHz Notch Filter	EWT	EWT-14-0199	H1
0363	Switch	MiCOM Labs	--	--

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



440 Boulder Court, Suite 200  
Pleasanton, CA 94566, USA  
Tel: 1.925.462.0304  
Fax: 1.925.462.0306  
[www.micomlabs.com](http://www.micomlabs.com)