

Test of Alien Technology RFID Reader ALR9650

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

Test Report Serial No.: ALNT33 A2 Rev A



TEST REPORT

FROM



Test of Alien Technology RFID Reader ALR9650

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

Test Report Serial No.: ALNT33 A2 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:** 10th November '08

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



CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
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

| | |
|-------------------------------------------------------------------|-------------------------------------|
| ACCREDITATION, LISTINGS & RECOGNITION | 5 |
| 1. TEST RESULT CERTIFICATE | 8 |
| 2. REFERENCES AND MEASUREMENT UNCERTAINTY | 9 |
| 2.1. Normative References | 9 |
| 2.2. Test and Uncertainty Procedures | 9 |
| 3. PRODUCT DETAILS AND TEST CONFIGURATIONS | 10 |
| 3.1. Technical Details | 10 |
| 3.2. Scope of Test Program..... | 11 |
| 3.3. Equipment Model(s) and Serial Number(s) | 14 |
| 3.4. Antenna Details | 14 |
| 3.5. Cabling and I/O Ports | 14 |
| 3.6. Test Configurations..... | 15 |
| 3.7. Equipment Modifications..... | 15 |
| 3.8. Deviations from the Test Standard | 15 |
| 3.9. Subcontracted Testing or Third Party Data | 15 |
| 4. TEST SUMMARY | 16 |
| 5. TEST RESULTS | 18 |
| 5.1. Device Characteristics | 18 |
| 5.1.1. 20 dB Bandwidth..... | 18 |
| 5.1.2. Transmitter Channels - Channel Spacing..... | 23 |
| 5.1.3. Transmitter Channels..... | 26 |
| 5.1.4. Output Power..... | 31 |
| 5.1.5. Maximum Permissible Exposure..... | 34 |
| 5.1.6. Conducted Spurious Emissions Transmitter..... | 35 |
| 5.1.7. Transmitter Radiated Spurious Emissions (above 1 GHz)..... | 45 |
| 5.1.8. Receiver Radiated Spurious Emissions (Stand-By Mode)..... | 84 |
| 5.1.9. Radiated Spurious Emissions (30M-1 GHz) | 89 |
| 5.1.10. AC Wireline Conducted Emissions (150 kHz – 30 MHz) | 96 |
| 6. PHOTOGRAPHS..... | 100 |
| 6.1. General Measurement Test Set-up | 100 |
| 6.2. Radiated Emissions >1 GHz..... | 101 |
| 6.3. Radiated Emissions <1 GHz..... | Error! Bookmark not defined. |
| 6.4. AC Wireline Conducted Emissions (150 kHz – 30 MHz) | 105 |
| 7. TEST EQUIPMENT DETAILS..... | 106 |

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
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 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**

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-IAF Communiqué dated 18 June 2005).



Presented this 13th day of August 2007.



President
For the Accreditation Council
Certificate Number 2381.01
Valid to February 29, 2008

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
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

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 | Directorate General of Telecommunications (DGT) | I | |
| | 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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 7 of 107

DOCUMENT HISTORY

| Document History | | |
|------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Revision | Date | Comments |
| Draft | | |
| | 12 th January 2008 | Initially released as report ALNT31-A2 12 th January '08. An additional three antennas were tested and the results included in this report (ALNT33-A2). Tested 23 October '08 Changes made to Section; 5.1.7 Transmitter Radiated Spurious Emissions (above 1GHz) |
| Rev A | 10 th November '8 | Initial Release |
| | | |
| | | |
| | | |

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 8 of 107

1. TEST RESULT CERTIFICATE

| | | | |
|----------------------|------------------------------------------------------------------------------------|-------------------|--------------------------------------------------------------------------------------------|
| Manufacturer: | Alien Technology 18220 Butterfield Blvd Morgan Hill California 95037, USA | Tested By: | MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA |
| EUT: | 915 MHz RFID Reader | Telephone: | +1 925 462 0304 |
| Model: | ALR9650 | Fax: | +1 925 462 0306 |
| S/N: | 001 | | |
| Test Date(s): | 29th Nov - 12th December '07 23 October '08 | Website: | 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:



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 th 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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 10 of 107

3. PRODUCT DETAILS AND TEST CONFIGURATIONS

3.1. Technical Details

| Details | Description |
|----------------------------------|-------------------------------------------------------------------------------------------------------------|
| Purpose: | Test of the Alien Technology RFID Reader ALR9650 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: | ALNT33 A2 Rev A |
| Date EUT received: | 13 th September 2007 |
| Standard(s) applied: | FCC 47 CFR Part15.247 & IC RSS-210 |
| Dates of test (from - to): | 29th Nov - 12th December '07 |
| No of Units Tested: | One |
| Type of Equipment: | 915 MHz RFID Reader |
| Manufacturers Trade Name: | Alien Smartenna |
| Model: | ALR9650 |
| Location for use: | Indoor |
| Antenna: | Internal and External |
| 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: | POE: 48Vdc, 0.4A ac/dc Converter: 90-264Vac 50/60 Hz/24 Vdc, 1.25A |
| Operating Temperature Range: | Client declared range : -20°C to +50°C (-4°F to 122°F) |
| ITU Emission Designator: | 45K9L1D |
| Microprocessor(s) Model: | Atmel AT91SAM9, AT91SAM7 |
| Clock/Oscillator(s): | 24 MHz, 25 MHz, 18.430 MHz 32.768 kHz |
| Frequency Stability: | Client declared : ±10ppm |
| EUT Dimensions: | 9" (22.9 cm) x 8.4" (21.3 cm) x 2.0" (5.1 cm) |
| EUT Weight : | 2.9 lbs (1.3 kg) |
| 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 test the Alien Technology RFID Reader ALR9650 in the frequency ranges 902 - 928 MHz against FCC 47 CFR Part 15.247 and Industry Canada RSS-210 specifications for radiated and conducted emissions for intentional radiators. The intentional radiator was tested in a simulated typical installation to demonstrate compliance with the stated standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of the EUT, orientation of the power and I/O cabling, antenna search height and antenna polarization.

Every effort was made to perform an impartial test using appropriate test equipment of known calibration.

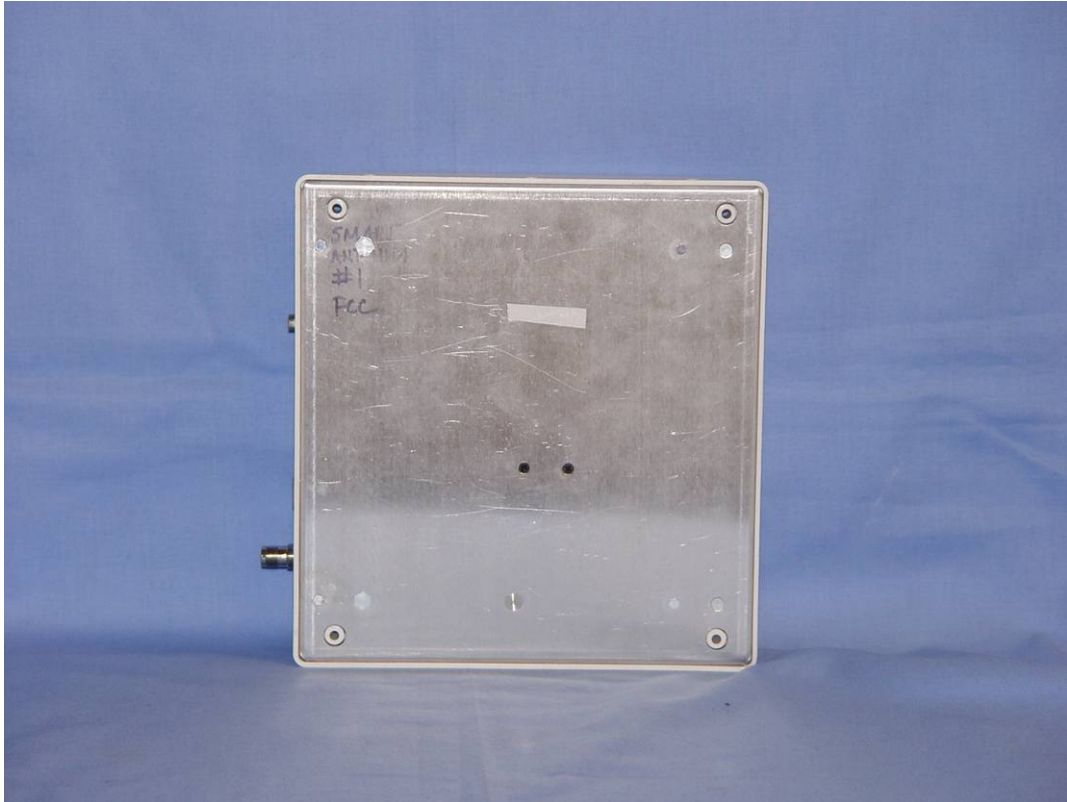
The Alien Technology RFID Reader ALR9650 (EUT) reader is a Frequency Hoping Spread Spectrum (FHSS) transceiver. The EUT required modification to bring it into compliance, see Section 3.7 "Equipment Modifications".

Alien Technology 915 MHz RFID Reader ALR9650



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 ALR9650



ITE 100-240Vac/+24Vdc 1.25A Converter



POE +48Vdc 0.4A



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.



3.3. 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 | ALR9650 | #1 |
| EUT | 90-264Vac/dc Power Supply 24Vdc/1.5A | I.T.E. Power Supply | SA-06-30S17R-V | R00065000 058 |
| EUT | Power Over Ethernet (POE) 100-250Vac, 0.5A +48Vdc, 0.4A | I.T.E. Power Supply | PW180 | KA4800F01 |
| EUT | 6 dBi Circular polarized antenna | -- | ALR-9611-CR | None |
| EUT | 6 dBi Linear polarized antenna | -- | ALR-9610-AL | None |
| Support | Latitude Laptop | Dell | C600, PP01L | None |

3.4. Antenna Details

1. Integral circular polarized antenna 6dBi
2. ALR-9611-CR circular polarized antenna 6dBi
3. ALR-9610-AL linear polarized antenna 6dBi

The following antennas were tested 23rd October 2008 as part of a follow-on program

4. Mobile Mark CVS915 Strip Antenna 2.5 dBi
5. ALR-9608-KIT Circular Patch 5"X5" Antenna 6 dBi
6. Cushcraft S9028PC Circular Patch 6 dBi

3.5. Cabling and I/O Ports

Number and type of I/O ports

1. RF Port (915 MHz)
7. 10/100BT Ethernet + POE (if required)
8. +24Vdc Supply
9. Serial Port (9 pin) Local Maintenance Terminal
10. Control input/output



3.6. Test Configurations

Test configurations

| Operating Channel | Frequencies (MHz) |
|-------------------|-------------------|
| 0 | 902.75 |
| 26 | 915.25 |
| 49 | 927.25 |

3.7. Equipment Modifications

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

1. Radiated Emissions 30M-1GHz (Section 5.1.9)

Problem

EUT (POE and ac/dc converter) failed Class A radiated emissions 30M-1GHz

Solution – POE Only

Client inserted;

- a).. series inductors on the POE line - 10uH
- b).. grounded digital earth to chassis
- c).. additional capacitor added to internal switching PSU - 0.01uF

Solution – ac/dc Converter Only

Client inserted all the above fixes (a-c) and included;

- d).. additional capacitor on dc supply input - 0.1uF
- e).. Ferrite added to dc supply cable, single turn 0446164951 Fair-rite

The above modifications were incorporated into the hardware therefore for the antennas tested 23rd October 2008 (Section 3.4 Antenna Details #4, #5, #6) no modifications were required to bring the equipment into compliance

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



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 | |

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 | Transmitter Radiated Spurious Emissions (above 1GHz) | Transmitter | Radiated | Complies | 5.1.7 |
| 4.10 §7.2.3 | | Standby | Radiated | Complies | 5.1.8 |
| 15.247(d) 15.205 15.209 A8.5 2.2 2.6 | Radiated Emissions below 1 GHz | | Radiated | Complies (Class A) | 5.1.9 |
| 15.207 7.2.2 | Conducted | AC Wireline Conducted Emissions | Conducted | Complies (Class A) | 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

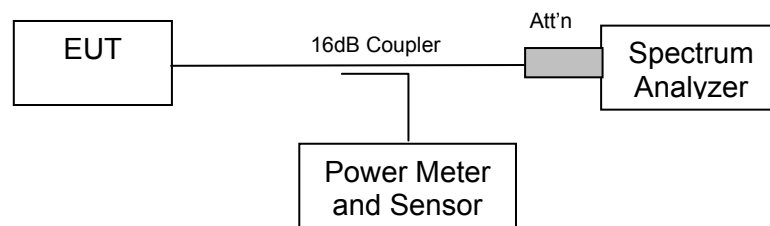
5.1.1. 20 dB Bandwidth

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



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 19 of 107

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 | 45.8918 | <500 |
| 26 | 915.75 | 45.2906 | |
| 49 | 927.25 | 45.6914 | |

CH 0 902.75 MHz 20 dB Bandwidth



Date: 6.DEC.2007 12:18:46

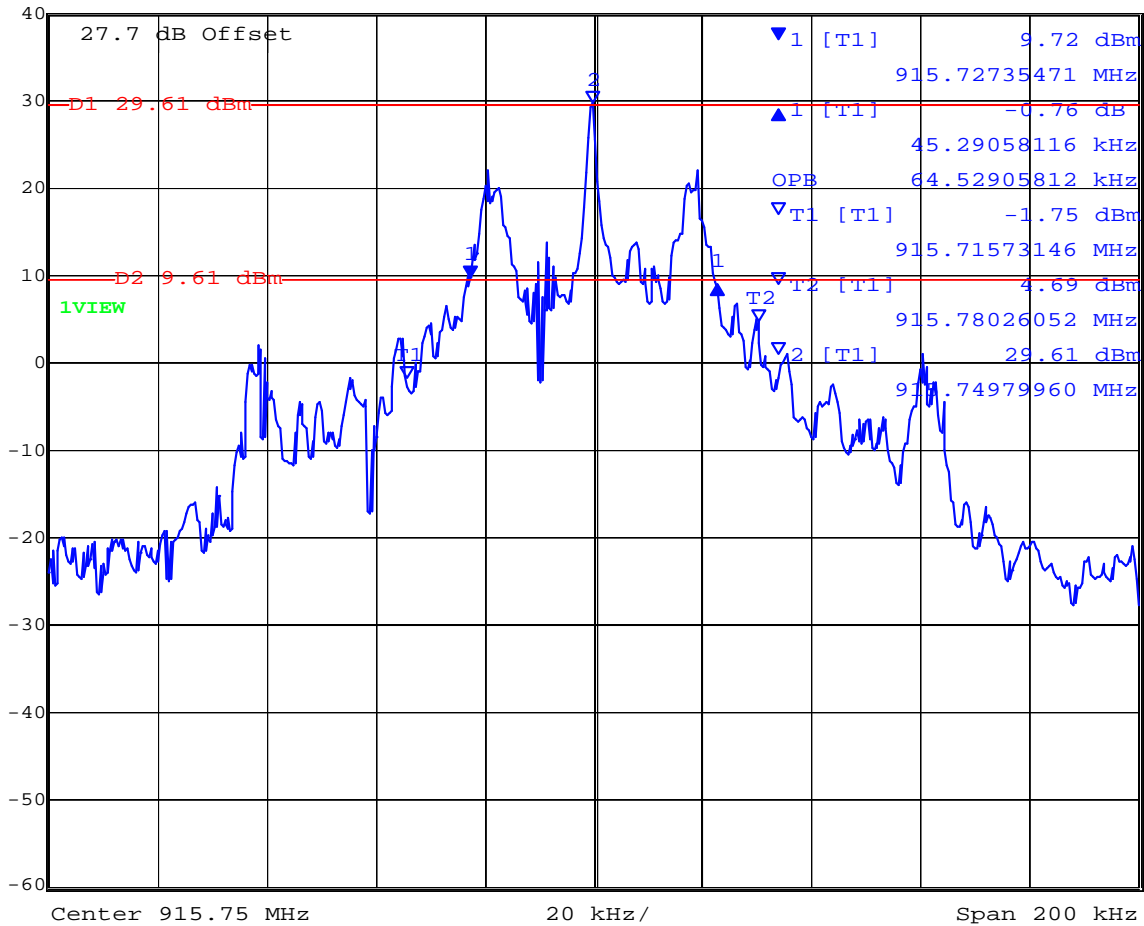
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



CH 26 915.75 MHz 20 dB Bandwidth



Delta 1 [T1] RBW 1 kHz RF Att 40 dB
 Ref Lvl -0.76 dB VBW 1 kHz
 40 dBm 45.29058116 kHz SWT 500 ms Unit dBm



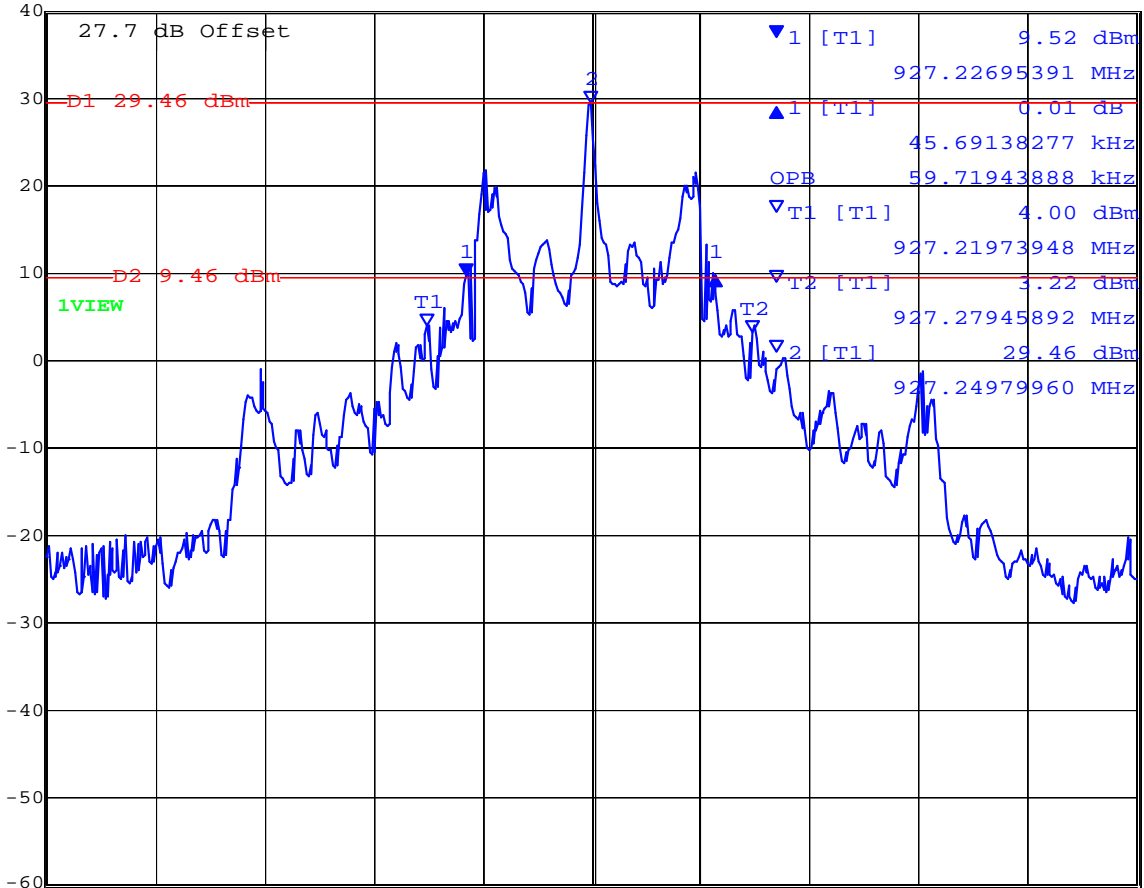
Date: 6 .DEC. 2007 12:22:33

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

Delta 1 [T1] RBW 1 kHz RF Att 40 dB
 Ref Lvl 0.01 dB VBW 1 kHz
 40 dBm 45.69138277 kHz SWT 500 ms Unit dBm



Center 927.25 MHz 20 kHz/ Span 200 kHz

Date: 6.DEC.2007 12:26:22

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 22 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.

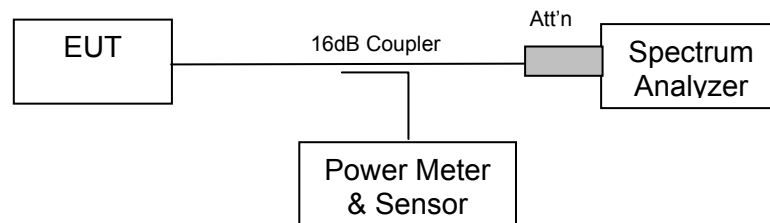
5.1.2. Transmitter Channels - Channel Spacing

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



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 24 of 107

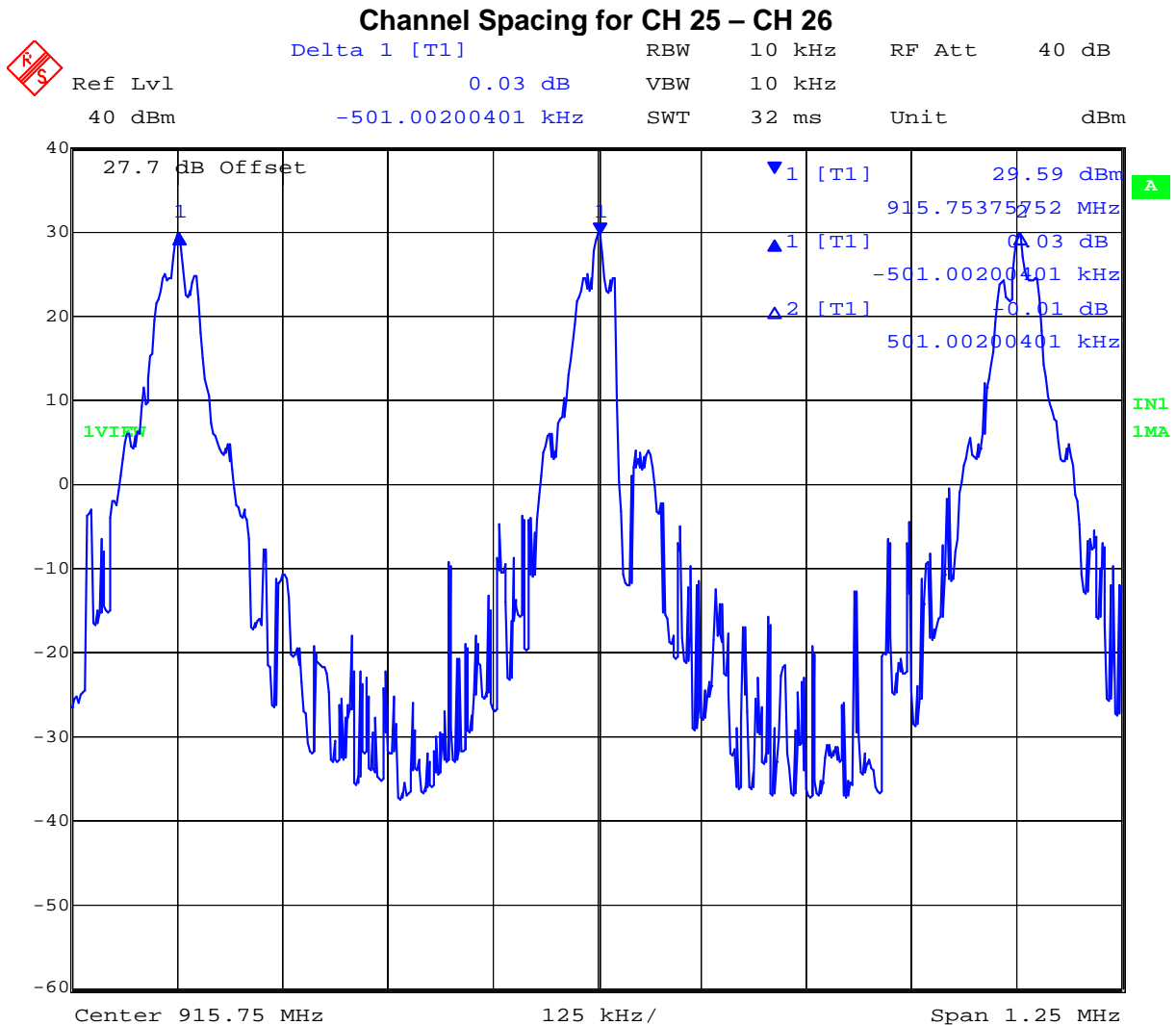
Ambient conditions.

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, 26-27 | 501.002 | Greater than maximum 20 dB Bandwidth |

Maximum 20 dB bandwidth = 52.6052 kHz



Date: 6.DEC.2007 12:42:13

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 25 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 | $\pm 0.86\text{ppm}$ |
|-------------------------|----------------------|

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

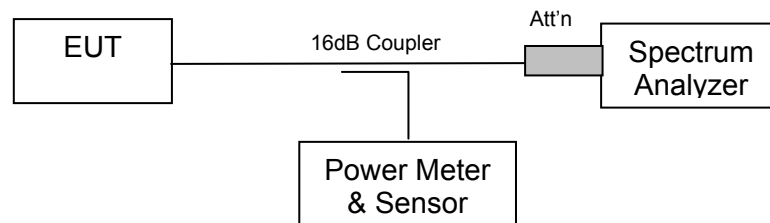
5.1.3.1. Number of Channels

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

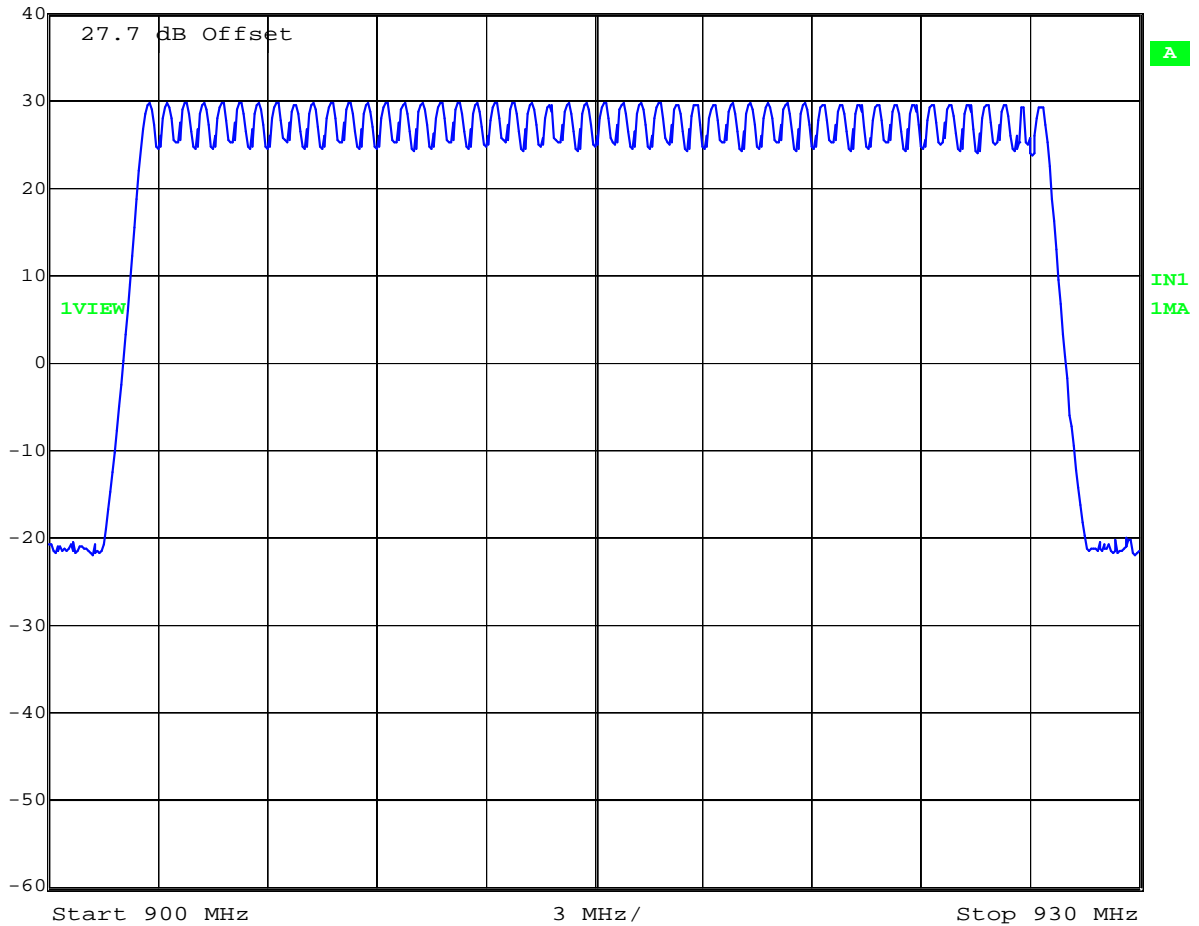
TABLE OF RESULTS

| Number of Channels | Specification |
|--------------------|--------------------------------|
| 50 | Minimum of 50 hopping channels |

Number of Transmission Channels



Ref Lvl 40 dBm RBW 300 kHz RF Att 40 dB
 VBW 300 kHz
 SWT 5 ms Unit dBm



Date: 6.DEC.2007 12:48:30

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.



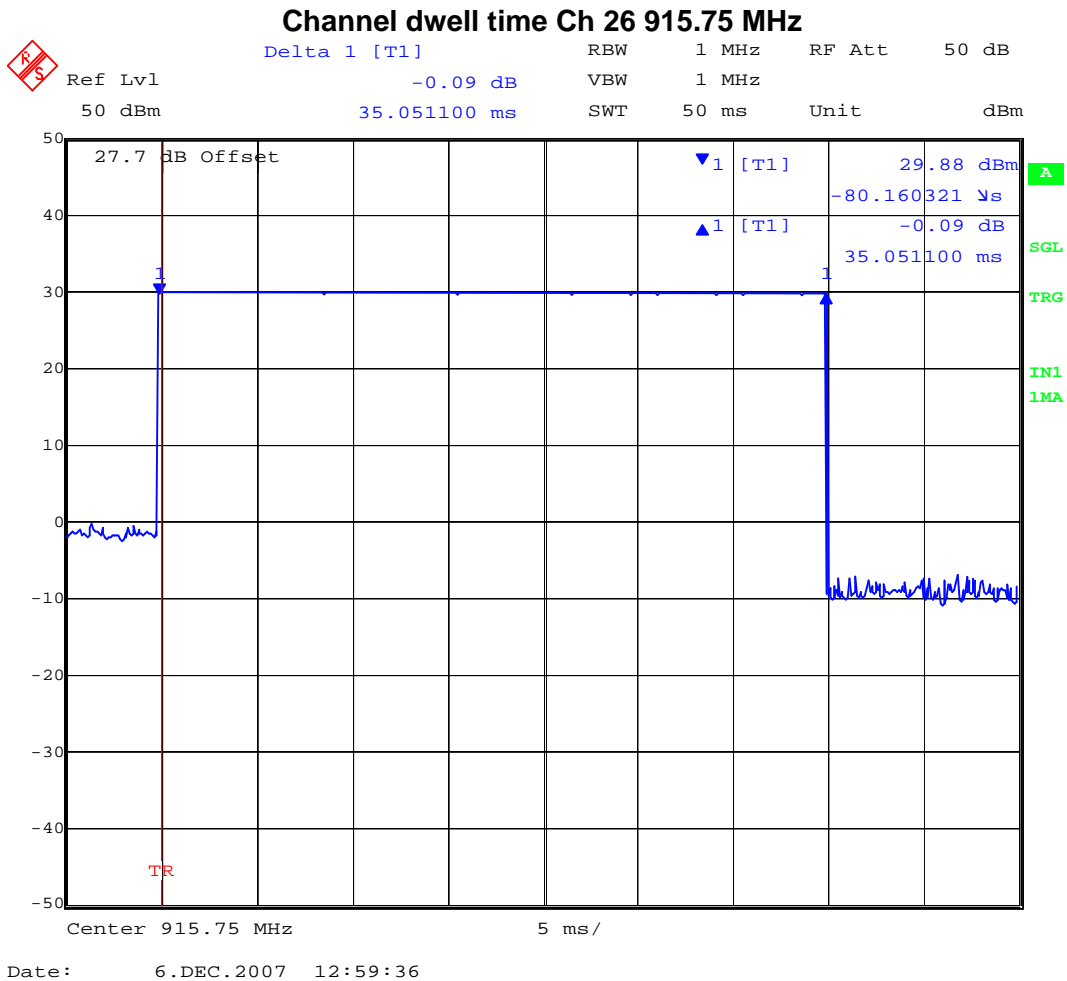
5.1.3.2. Channel Occupancy
FCC, Part 15 Subpart C §15.247(a)(1)
Industry Canada RSS-210 §A8.1

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 | 35.05 |



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.

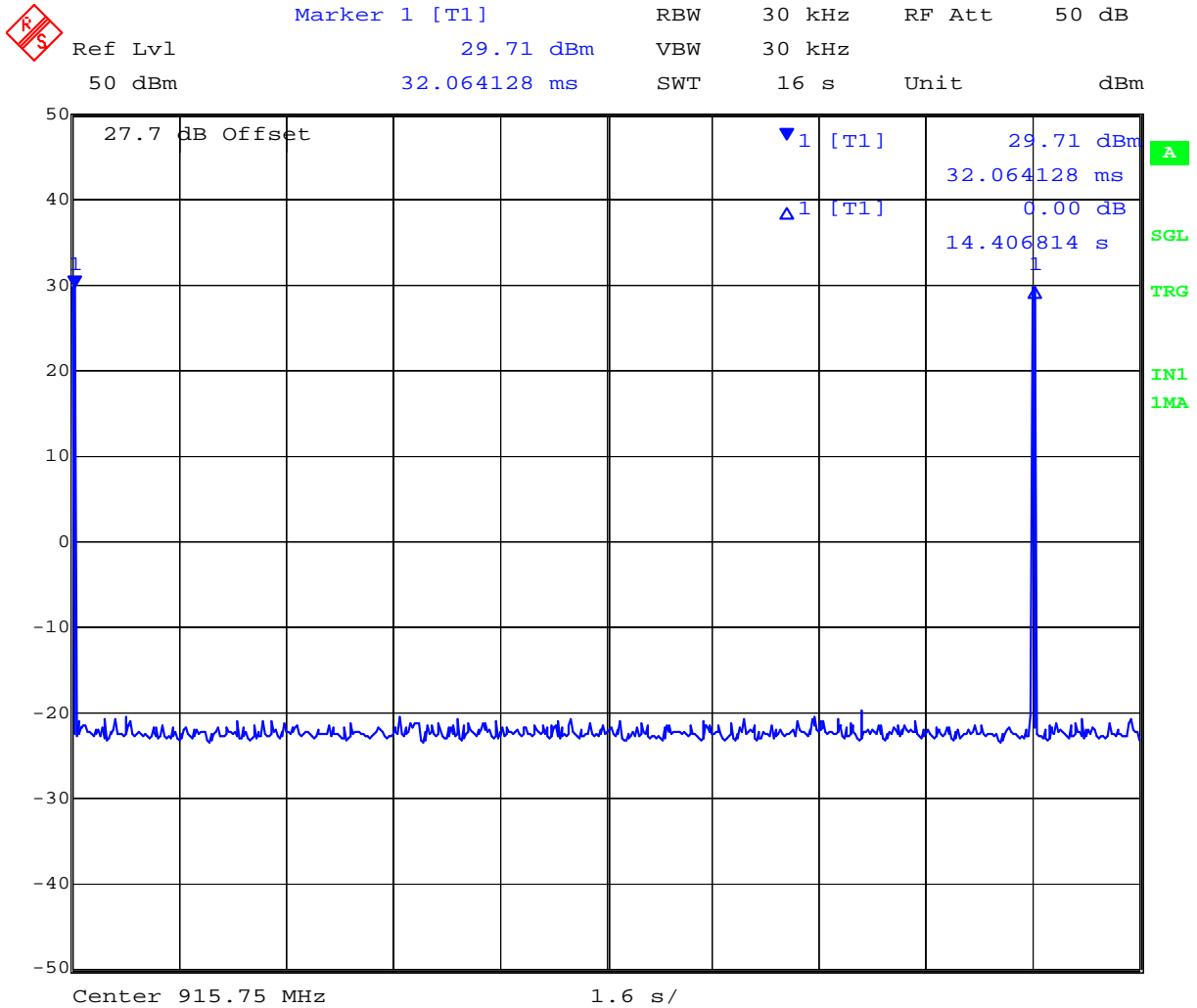


Channel Occupancy

TABLE OF RESULTS

| Channel # | Center Frequency (MHz) | Channel Occupancy within 10 Second Period (mSeconds) |
|-----------|------------------------|------------------------------------------------------|
| 26 | 915.75 | 35.05 |

Channel Occupancy 915.75 MHz



Date: 6.DEC.2007 13:04:04

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 30 of 107

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.

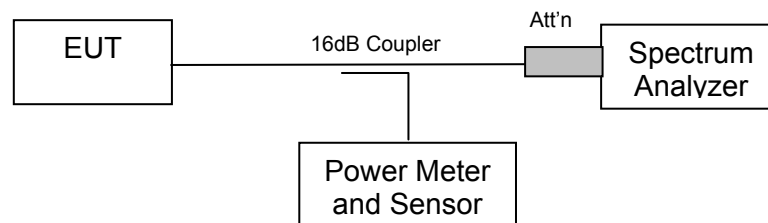
5.1.4. Output Power

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 32 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 | +29.45 |
| 49 | 927.25 | +29.10 |

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 33 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/cm²) = EIRP/(4πd²)

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/cm²

| Antenna Gain (dBi) | Numeric Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Calculated Safe Distance @ 1mW/cm ² Limit(cm) | Minimum Separation Distance (cm) |
|--------------------|------------------------|-------------------------|------------------------|----------------------------------------------------------|----------------------------------|
| 6 | 4.0 | +29.6 | 912.0 | 17.04 | 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 / cm² 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 |
|-------------------------|----------|

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.

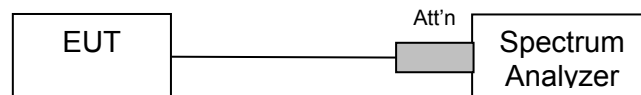
5.1.6. Conducted Spurious Emissions Transmitter

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

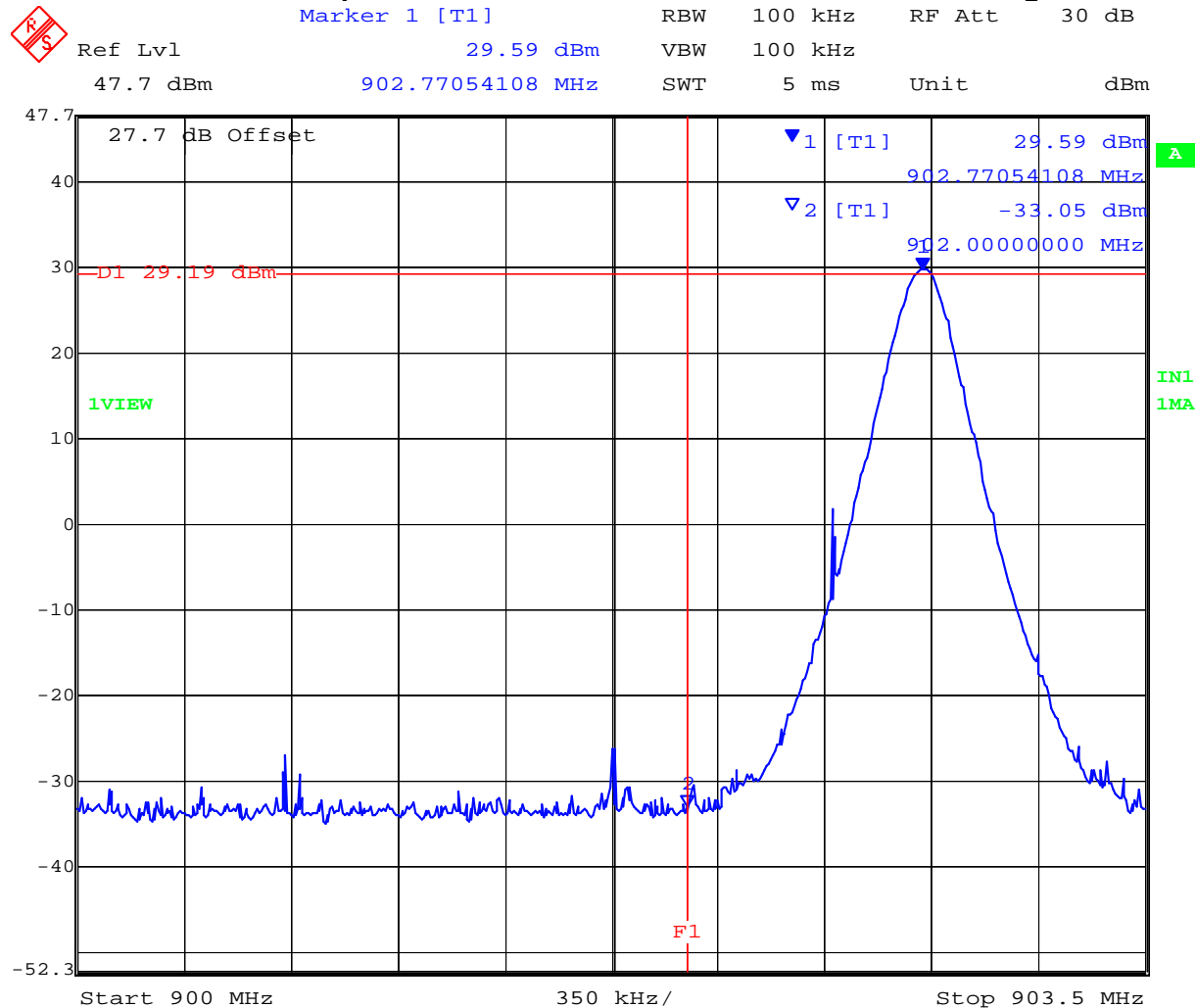


Conducted Band-Edge Results

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 | +9.59 | -33.05 | -42.62 |
| 49 | 927.25 | 928.0 | +9.19 | -33.49 | -42.68 |

Conducted Spurious Emissions at the 902 MHz Lower Band Edge



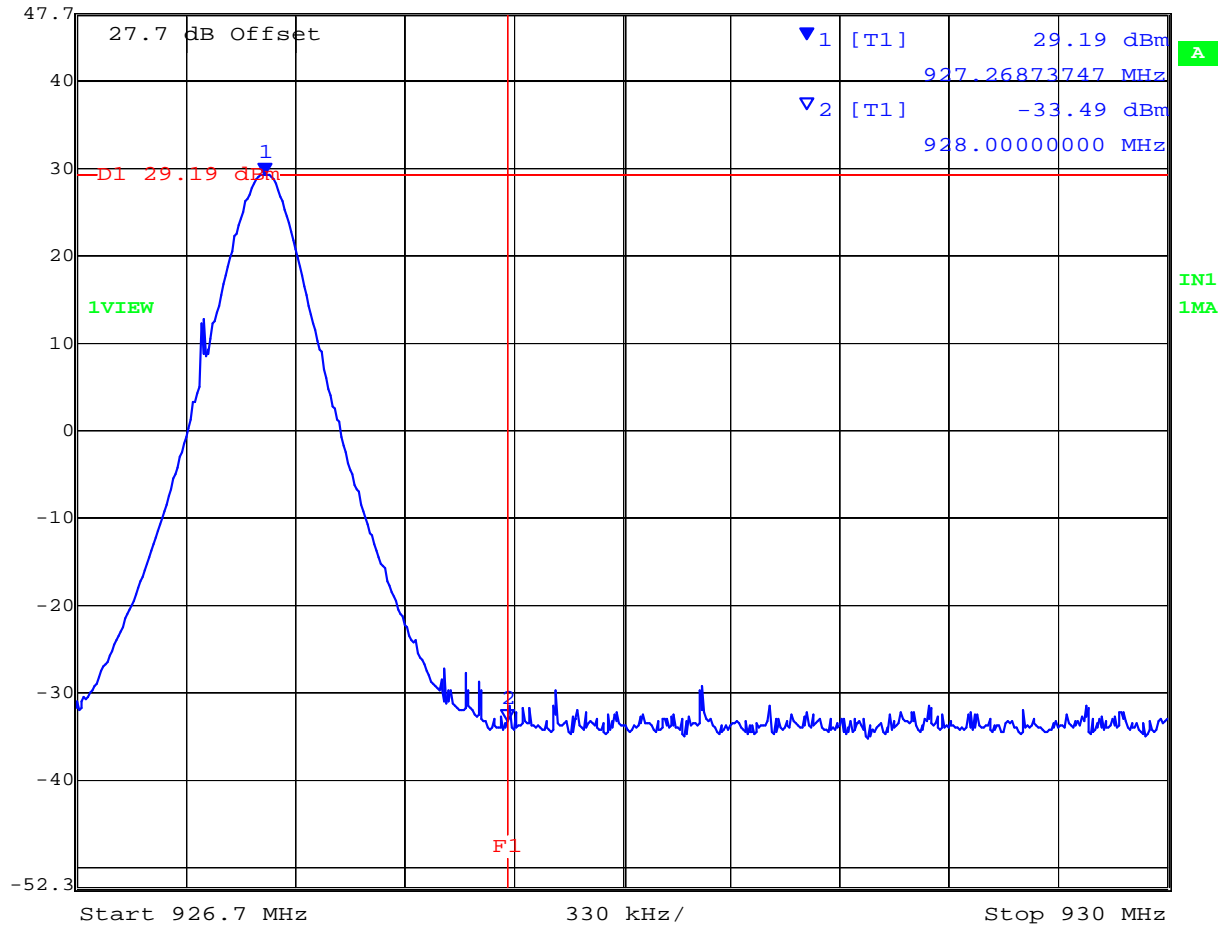
Date: 6.DEC.2007 13:16:53

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

Marker 1 [T1] RBW 100 kHz RF Att 30 dB
Ref Lvl 29.19 dBm VBW 100 kHz
47.7 dBm 927.26873747 MHz SWT 5 ms Unit dBm



Date: 6.DEC.2007 13:14:12

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.



Spurious Emissions (1-10 GHz)

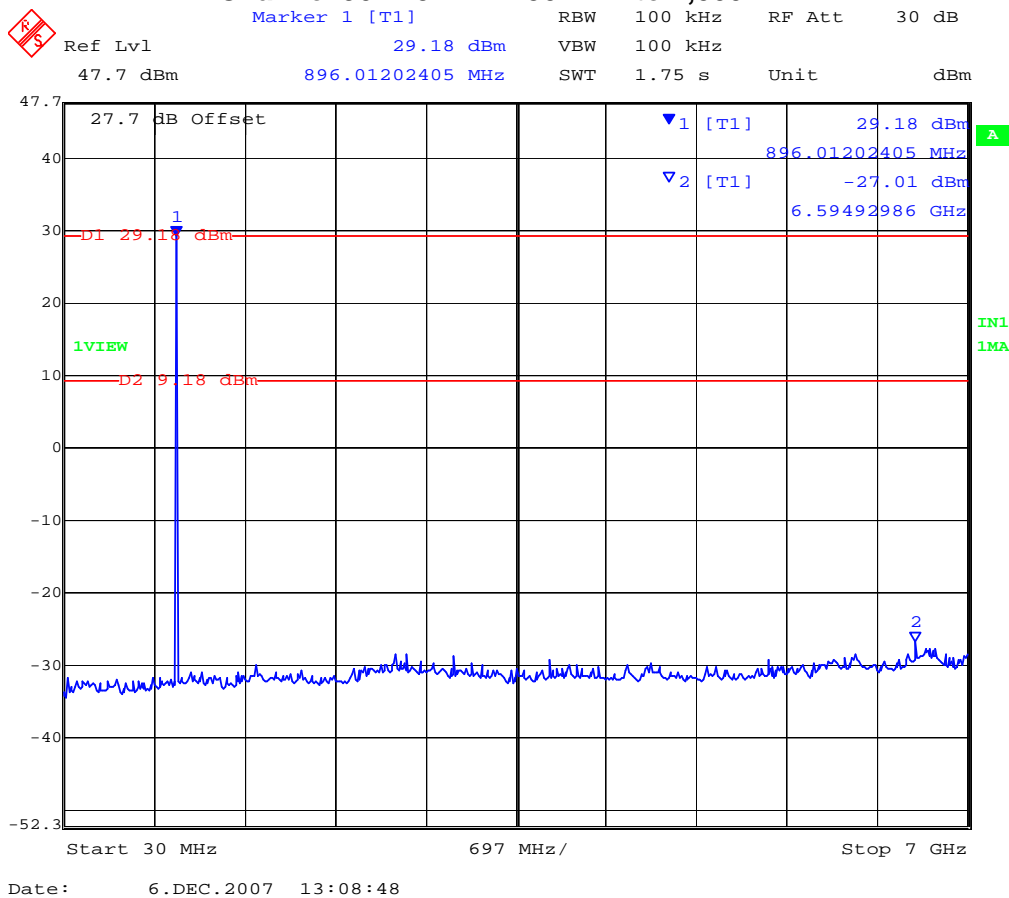
Conducted spurious emissions (1-10 GHz) are provided indicated by the following matrix. Measurements were performed with the transmitter tuned to the channel closest to the band-edge being measured. All emissions were maximized during measurement. Limits which were derived from the band-edge measurements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

TABLE OF RESULTS

| Channel Centre Frequency (MHz) | Start Frequency (MHz) | Stop Frequency (MHz) | Maximum Emission Observed (dBm) | Limit (dBm) | Margin (dB) |
|--------------------------------|-----------------------|----------------------|---------------------------------|-------------|-------------|
| 902.75 | 30 | 7,000 | -27.01 | +9.18 | -36.19 |
| | 7,000 | 10,000 | -23.63 | | -32.81 |

The emission breaking the limit line is the carrier.

**Conducted Transmitter Spurious Emissions
Channel 902.75 MHz - 30 MHz to 7,000 MHz**



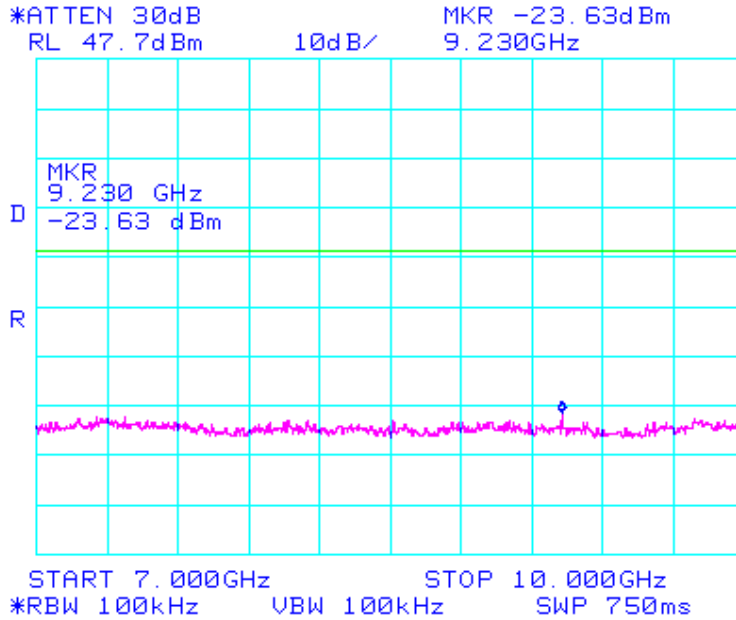
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 39 of 107

Conducted Transmitter Spurious Emissions

Channel 902.75 MHz 7 to 10 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.

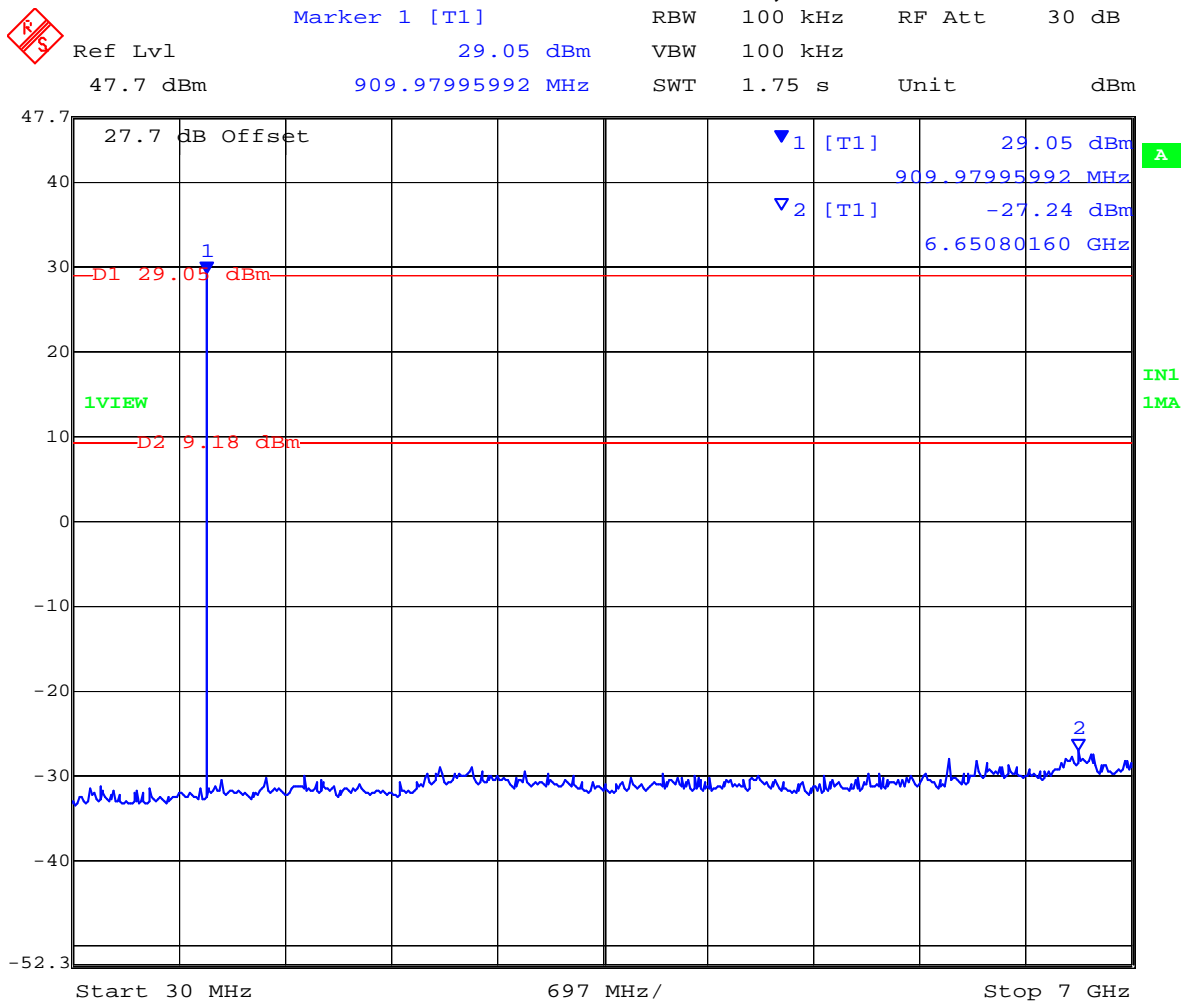


| Channel Centre Frequency (MHz) | Start Frequency (MHz) | Stop Frequency (MHz) | Maximum Emission Observed (dBm) | Limit (dBm) | Margin (dB) |
|--------------------------------|-----------------------|----------------------|---------------------------------|-------------|-------------|
| 915.75 | 30 | 7,000 | -27.24 | +9.18 | -36.42 |
| | 7,000 | 10,000 | -23.97 | | -33.15 |

The emission breaking the limit line is the carrier.

Conducted Transmitter Spurious Emissions

Channel 915.75 MHz - 30 MHz to 7,000 MHz



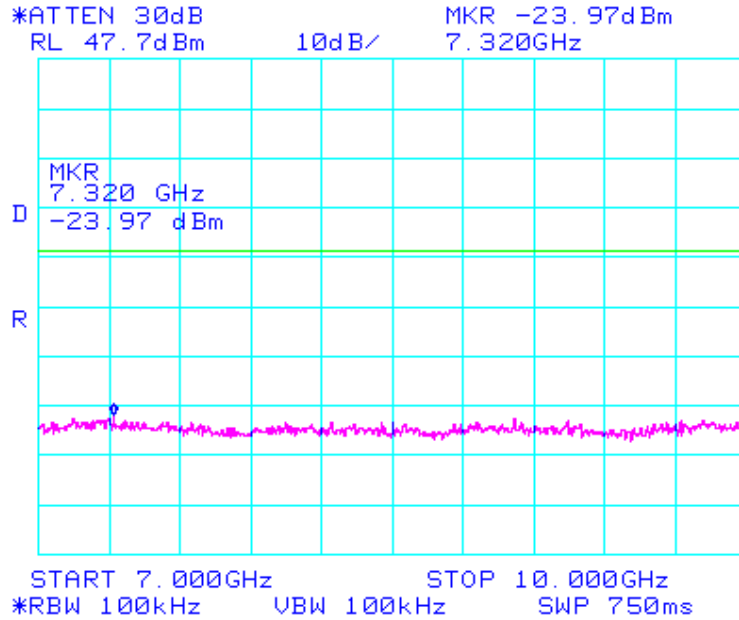
Date: 6.DEC.2007 13:10:24

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 915.75 MHz - 7 to 10 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.

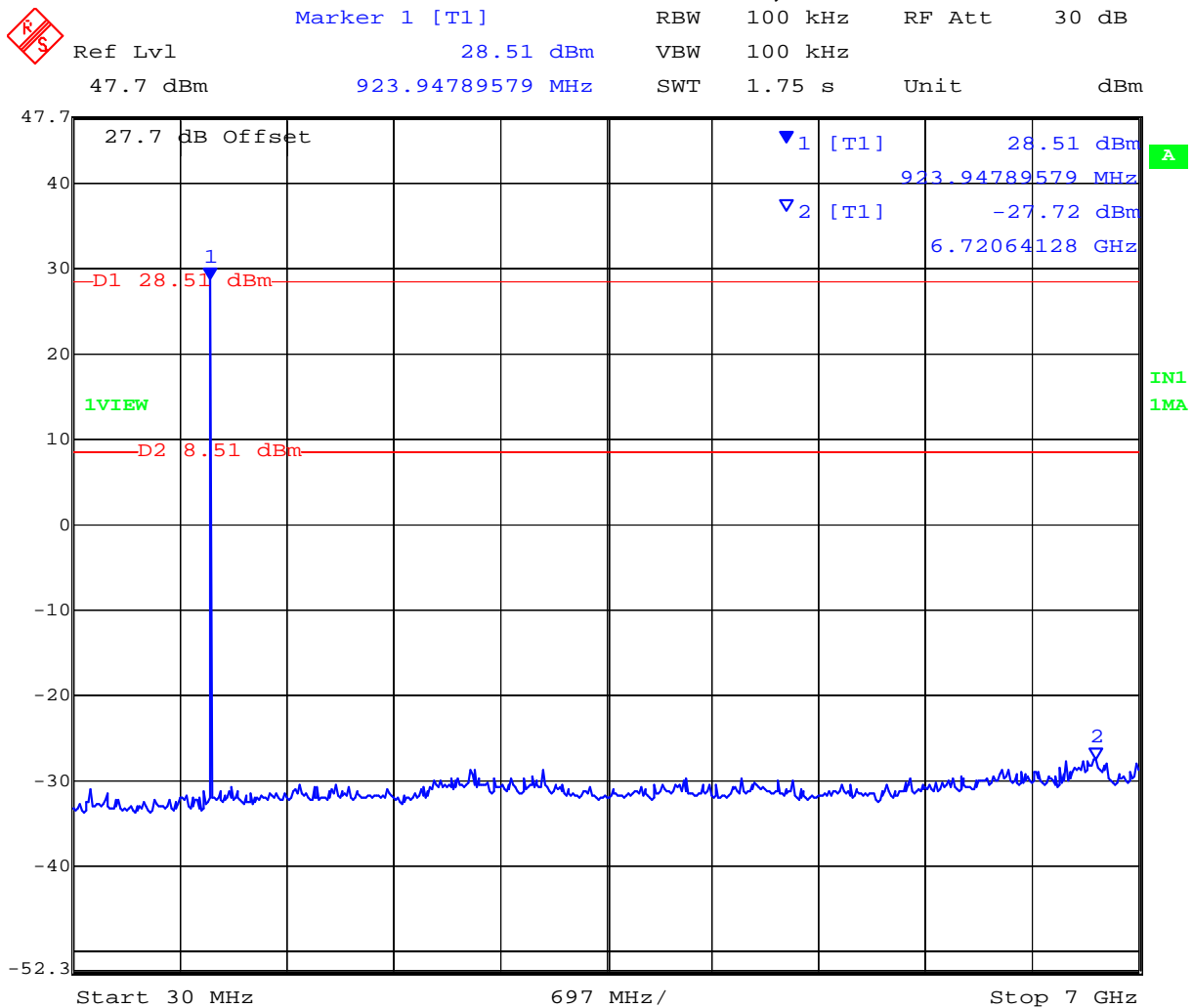


| Channel Centre Frequency (MHz) | Start Frequency (MHz) | Stop Frequency (MHz) | Maximum Emission Observed (dBm) | Limit (dBm) | Margin (dB) |
|--------------------------------|-----------------------|----------------------|---------------------------------|-------------|-------------|
| 927.25 | 30 | 7,000 | -27.72 | +8.51 | -36.23 |
| | 7,000 | 10,000 | -24.30 | | -32.81 |

The emission breaking the limit line is the carrier.

Conducted Transmitter Spurious Emissions

Channel 927.25 MHz - 30 MHz to 7,000 MHz



Date: 6.DEC.2007 13:12:07

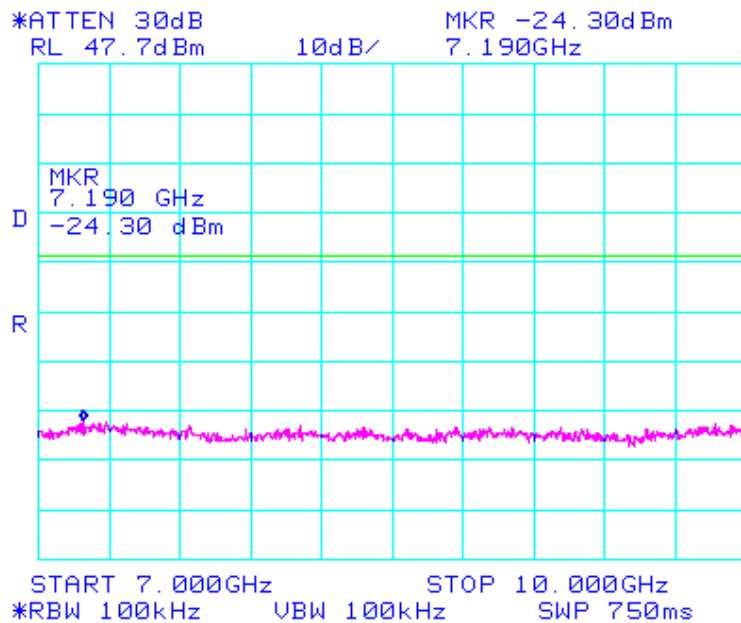
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 43 of 107

Conducted Transmitter Spurious Emissions

Channel 927.25 MHz - 7 to 10 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.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 44 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' | 0088, 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. Transmitter Radiated Spurious Emissions (above 1 GHz)

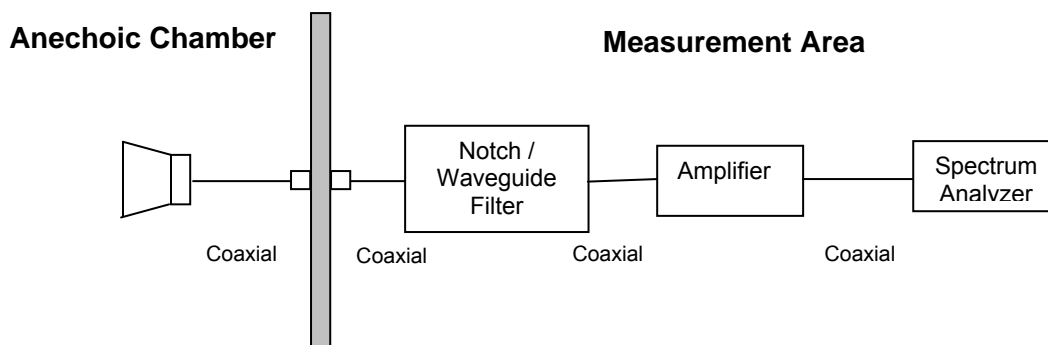
FCC, Part 15 Subpart C §15.247(d)
Industry Canada RSS-210 §A8.5

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 46 of 107

For example:

Given receiver input reading of 51.5 dB μ 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 μ V/m (or dB μ V) and μ V/m (or μ 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.



Radiated Spurious Emissions above 1 GHz

Ambient conditions.

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

Integral Antenna

Channel 0 – 902.75 MHz

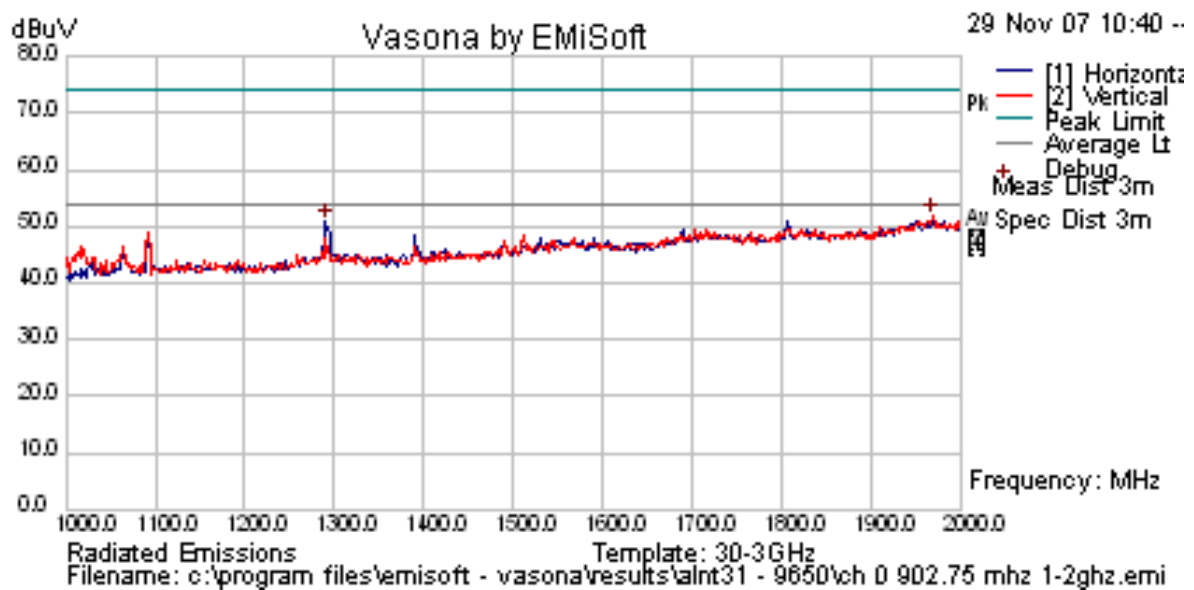
TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Poi | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 902.753 | 48.06 | | | 134.65 | Peak Emission | V | | | | | N/A | Peak |
| 9027.482 | 50.61 | 6.21 | -0.34 | 56.48 | Peak Max | H | 98 | 360 | 74 | -17.52 | Pass | |
| 8124.664 | 48.98 | 5.67 | -1.22 | 53.43 | Peak Max | V | 114 | 42 | 74 | -20.57 | Pass | |
| 5416.488 | 58.47 | 4.62 | -8.48 | 54.61 | Peak Max | V | 106 | 31 | 74 | -19.39 | Pass | |
| 4513.818 | 56.9 | 4.18 | -9.35 | 51.74 | Peak Max | V | 101 | 357 | 74 | -22.26 | Pass | |
| 9027.482 | 45.55 | 6.21 | -0.34 | 51.43 | Average Max | H | 98 | 360 | 54 | -2.57 | Pass | |
| 8124.664 | 43.09 | 5.67 | -1.22 | 47.54 | Average Max | H | 99 | 312 | 54 | -6.46 | Pass | |
| 5416.488 | 55.34 | 4.62 | -8.48 | 51.48 | Average Max | V | 106 | 31 | 54 | -2.52 | Pass | |
| 4513.818 | 54.48 | 4.18 | -9.35 | 49.31 | Average Max | H | 128 | 303 | 54 | -4.69 | Pass | |
| 1967.936 | 41.58 | 10.11 | 0.04 | 51.73 | Peak [Scan] | V | 100 | 0 | 114.65 | -62.92 | Pass | NRB |
| 1290.581 | 45.39 | 8.55 | -3.08 | 50.86 | Peak [Scan] | H | 100 | 0 | 114.65 | -63.79 | Pass | NRB |

Peak – Peak Emission

NRB – Non-restricted band emission

Ch 0 Integral Antenna Radiated Emissions Above 1 GHz (1 – 2 GHz)

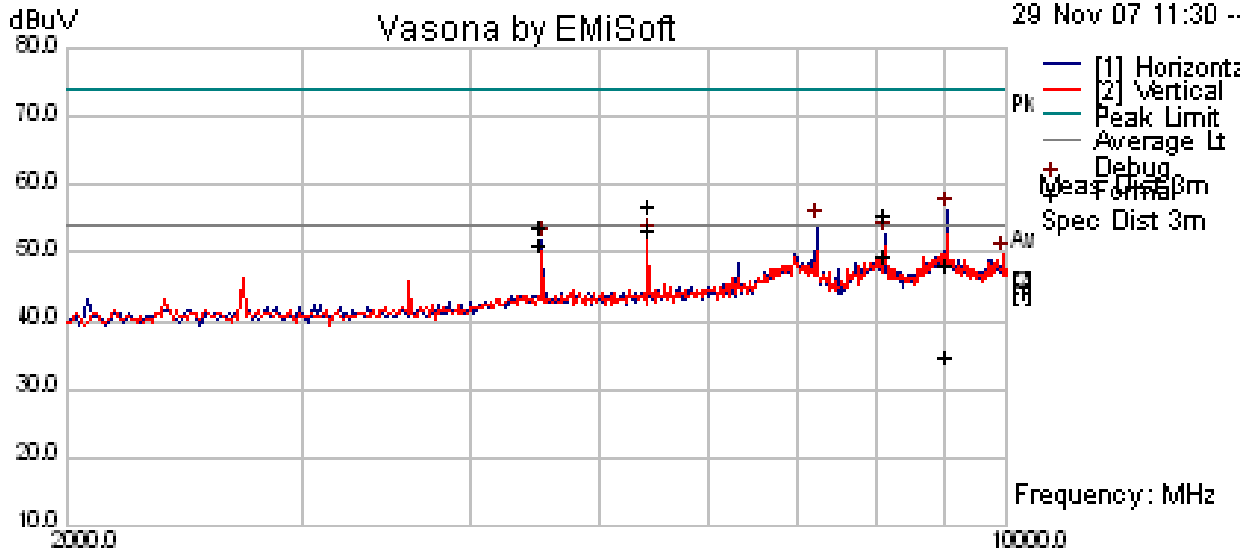


This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Integral Antenna

Ch 0 Integral Antenna Radiated Emissions Above 1 GHz (2 – 10 GHz)



Radiated Emissions Template: 18Amp RE 1-18 GHz Mitec 30 Aug
Filename: c:\program files\emisoft - vasona\results\alnt31 - 9650\ch 0 902.75 mhz 2-10ghz.emi

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 49 of 107

Integral Antenna

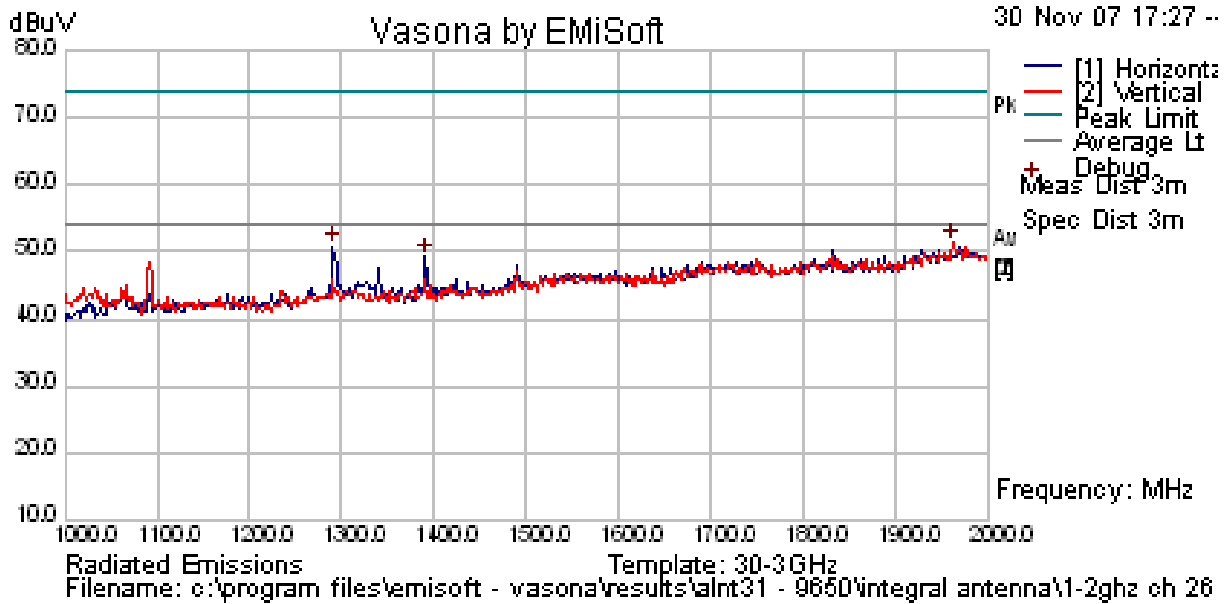
Channel 26 – 915.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 915.758 | | | | 134.23 | Peak Emission | | | | | | N/A | Peak |
| 9157.511 | 51.38 | 6.22 | -0.62 | 56.98 | Peak Max | V | 104 | 76 | 74 | -17.02 | Pass | |
| 9157.511 | 46.73 | 6.22 | -0.62 | 52.33 | Average Max | V | 104 | 76 | 54 | -1.67 | Pass | |
| 1961.924 | 41.38 | 10.1 | -0.06 | 51.42 | Peak [Scan] | V | 100 | 0 | 114.23 | -62.81 | Pass | NRB |
| 1290.581 | 45.29 | 8.55 | -3.08 | 50.76 | Peak [Scan] | H | 100 | 0 | 114.23 | -63.47 | Pass | NRB |
| 1390.782 | 44.03 | 8.73 | -3.34 | 49.41 | Peak [Scan] | H | 100 | 0 | 114.23 | -64.82 | Pass | NRB |

Peak – Peak Emission
 NRB – Non-restricted band emission

Ch 26 Integral Antenna Radiated Emissions Above 1 GHz (1 – 2GHz)

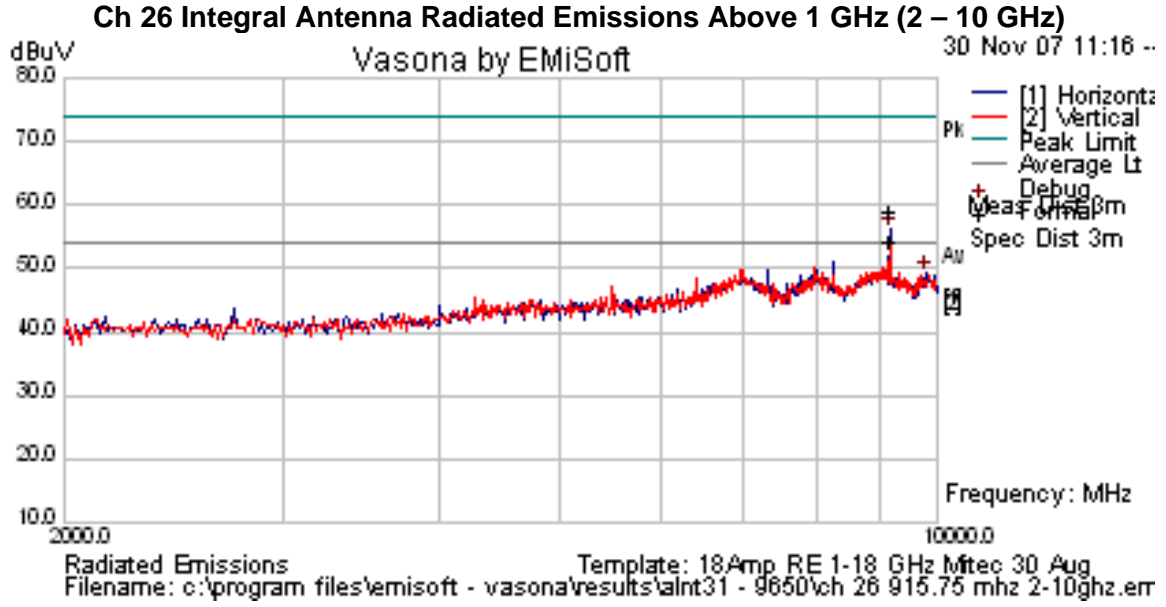


This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 50 of 107

Integral 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.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 51 of 107

Integral Antenna

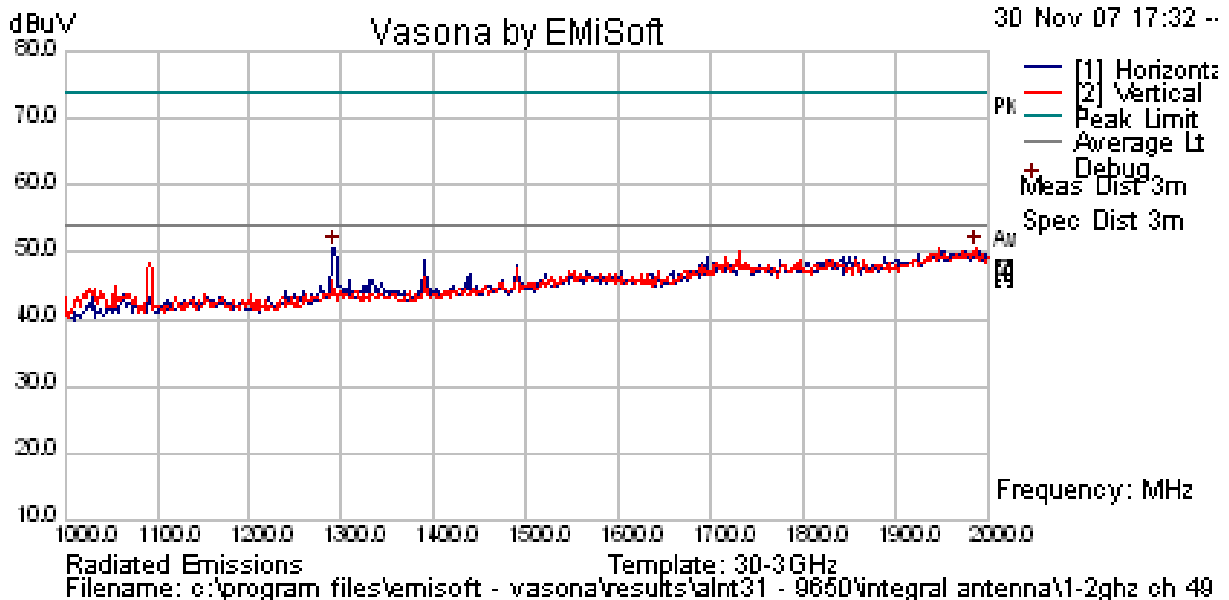
Channel 49 – 915.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 927.252 | | | | 134.86 | Peak Emission | V | | | | | N/A | Peak |
| 9272.348 | 48.73 | 6.23 | -0.83 | 54.13 | Peak Max | H | 110 | 350 | 74 | -19.87 | Pass | |
| 9272.348 | 41.82 | 6.23 | -0.83 | 47.22 | Average Max | H | 110 | 350 | 54 | -6.78 | Pass | |
| 1290.581 | 45.18 | 8.55 | -3.08 | 50.65 | Peak [Scan] | H | 100 | 0 | 114.86 | -64.21 | Pass | NRB |
| 1985.972 | 40.4 | 10.13 | 0.05 | 50.58 | Peak [Scan] | V | 100 | 0 | 114.86 | -64.28 | Pass | NRB |

Peak – Peak Emission
 NRB – Non-restricted band emission

Ch 49 Integral Antenna Radiated Emissions Above 1 GHz (1 – 2GHz)

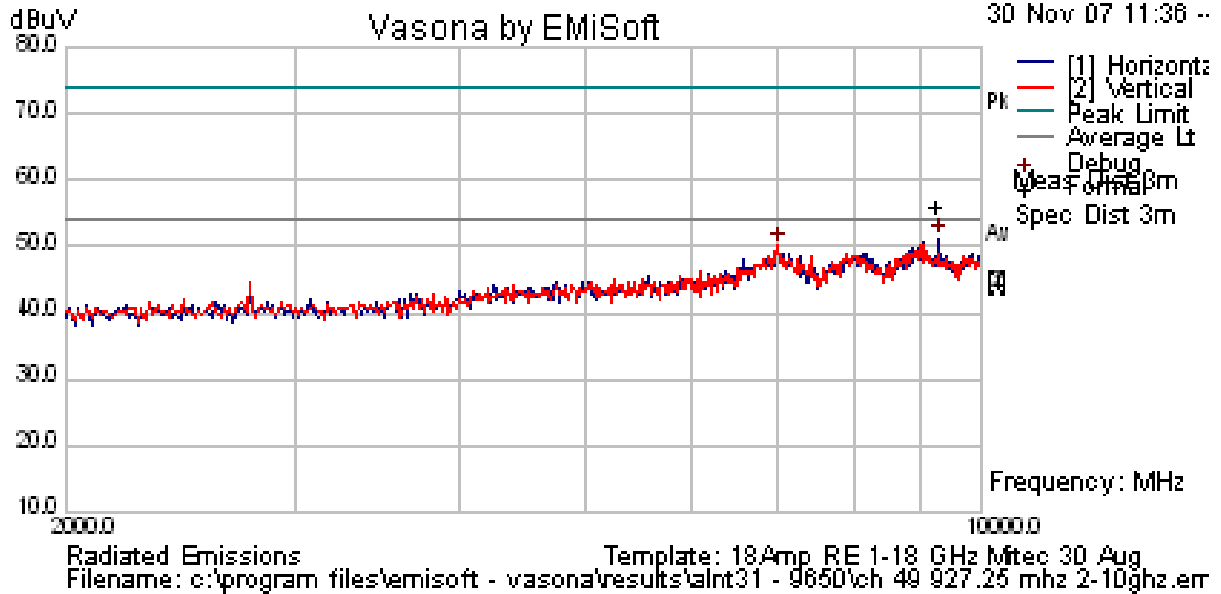


This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Integral Antenna

Ch 49 Integral Antenna Radiated Emissions Above 1 GHz (2 – 10 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.



Antenna ALR-9611CR

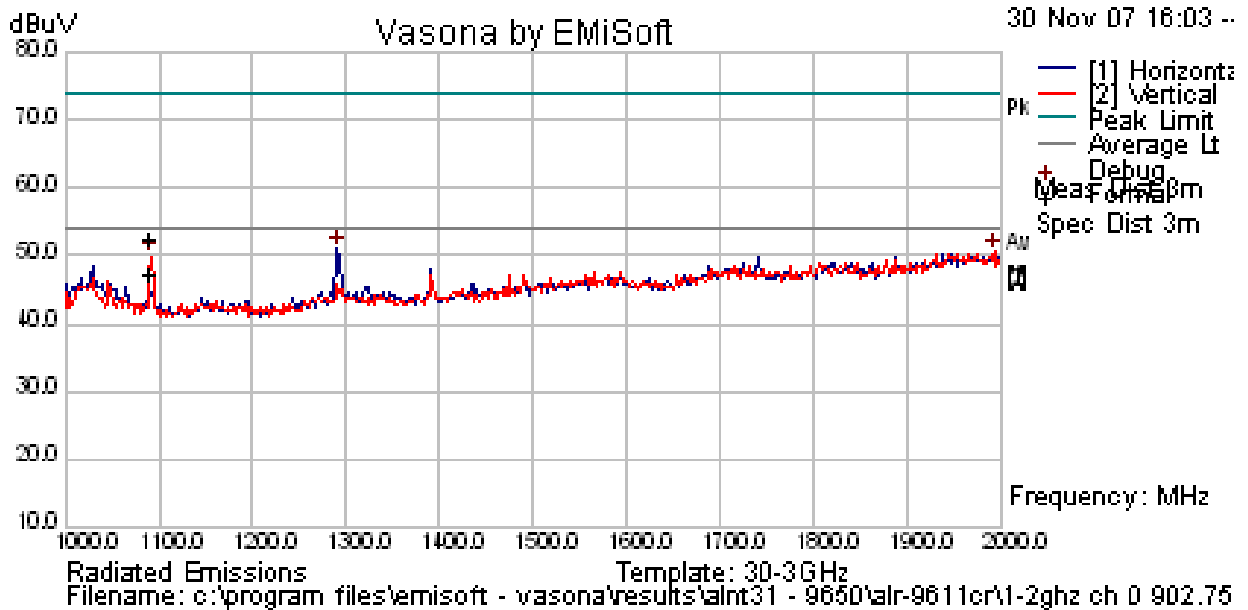
Channel 0 – 902.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 902.751 | | | | 135.23 | Peak Emission | | | | | | N/A | Peak |
| 7222.089 | 50.4 | 5.43 | -2.93 | 52.9 | Peak Max | H | 100 | 42 | 74 | -21.1 | Pass | |
| 9027.58 | 46.48 | 6.21 | -0.34 | 52.35 | Peak Max | H | 100 | 42 | 74 | -21.65 | Pass | |
| 8124.569 | 47.54 | 5.67 | -1.22 | 51.99 | Peak Max | H | 100 | 245 | 74 | -22.01 | Pass | |
| 7222.089 | 49.49 | 5.43 | -2.93 | 51.99 | Average Max | H | 100 | 42 | 54 | -2.01 | Pass | |
| 9027.58 | 45.96 | 6.21 | -0.34 | 51.83 | Average Max | H | 100 | 42 | 54 | -2.17 | Pass | |
| 8124.569 | 46.9 | 5.67 | -1.22 | 51.35 | Average Max | H | 100 | 245 | 54 | -2.65 | Pass | |
| 1092.619 | 47.71 | 7.89 | -5 | 50.61 | Peak Max | V | 98 | 58 | 74 | -23.39 | Pass | |
| 1092.619 | 42.5 | 7.89 | -5 | 45.4 | Average Max | V | 98 | 58 | 54 | -8.6 | Pass | |
| 1290.581 | 45.64 | 8.55 | -3.08 | 51.1 | Peak [Scan] | H | 100 | 0 | 115.23 | -64.13 | Pass | NRB |
| 1993.988 | 40.56 | 10.14 | -0.13 | 50.57 | Peak [Scan] | V | 100 | 0 | 115.23 | -64.66 | Pass | NRB |

Peak – Peak Emission
 NRB – Non-restricted band emission

Ch 0 Antenna ALR-9611CR Radiated Emissions Above 1 GHz (1 – 2 GHz)

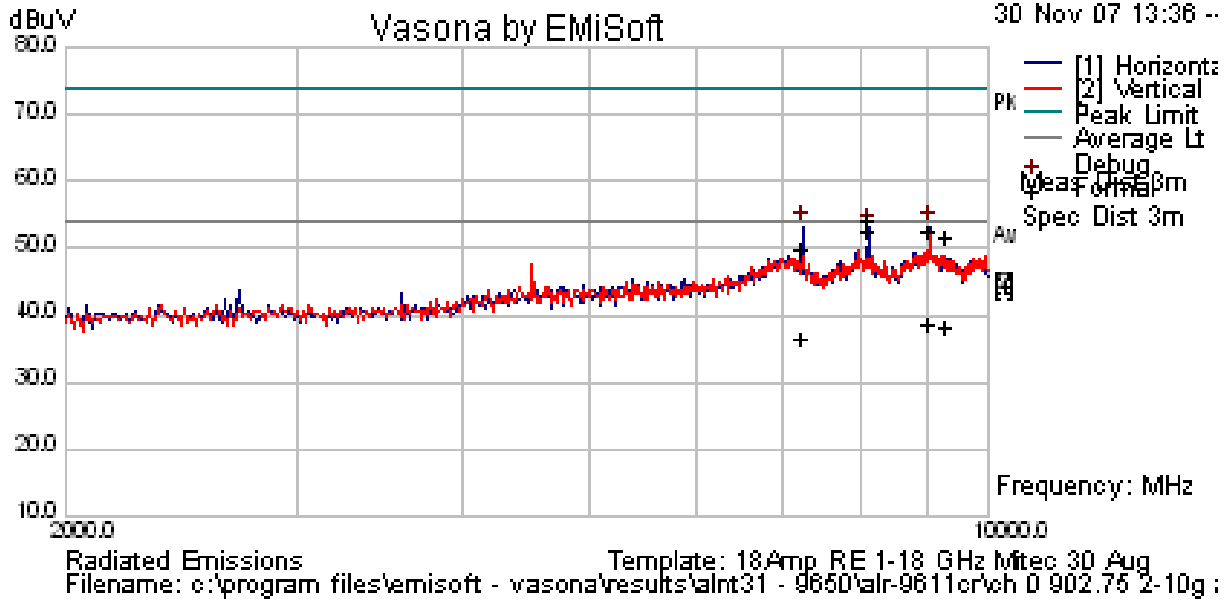


This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Antenna ALR-9611CR

Ch 0 Antenna ALR-9611CR Radiated Emissions Above 1 GHz (2 – 10 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.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 55 of 107

Antenna ALR-9611CR

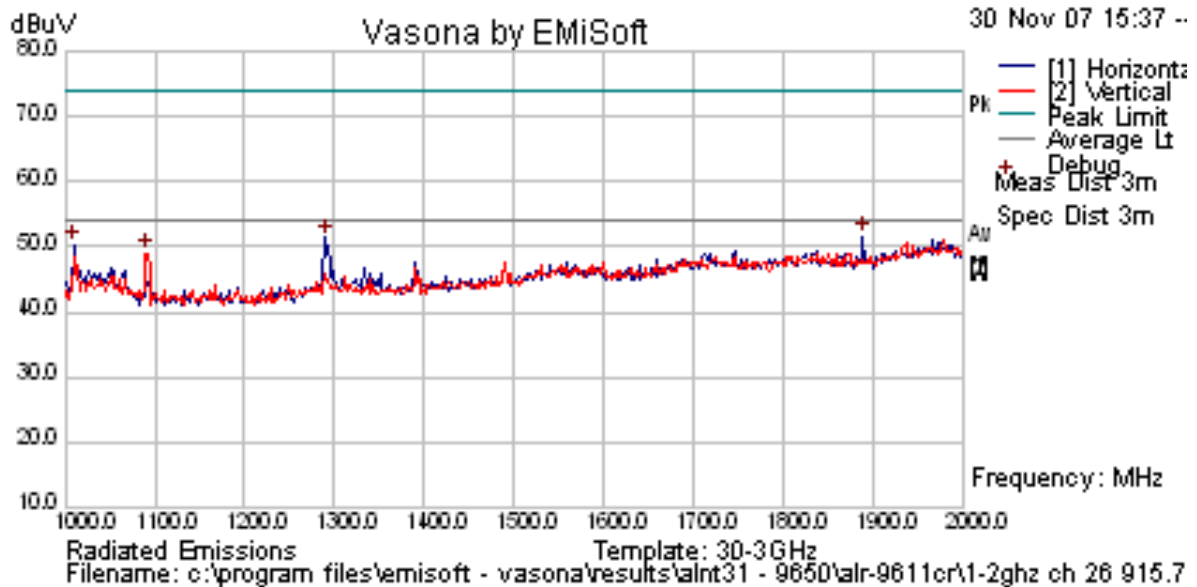
Channel 26 – 915.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 915.753 | | | | 134.34 | Peak Emission | V | | | | | N/A | Peak |
| 9157.55 | 48.73 | 6.22 | -0.62 | 54.33 | Peak Max | V | 98 | 42 | 74 | -19.67 | Pass | |
| 7325.992 | 50.46 | 5.45 | -3.56 | 52.35 | Peak Max | V | 137 | 244 | 74 | -21.65 | Pass | |
| 1010.02 | 48.62 | 7.71 | -5.99 | 50.34 | Peak Max | H | 100 | 0 | 74 | -23.66 | Pass | |
| 1090.18 | 46.15 | 7.89 | -5.02 | 49.02 | Peak Max | V | 100 | 0 | 74 | -24.98 | Pass | |
| 9157.55 | 41.72 | 6.22 | -0.62 | 47.32 | Average Max | V | 98 | 42 | 54 | -6.68 | Pass | |
| 7325.992 | 46.86 | 5.45 | -3.56 | 48.75 | Average Max | V | 98 | 244 | 54 | -5.25 | Pass | |
| 1010.02 | 48.62 | 7.71 | -5.99 | 50.34 | Average Max | H | 100 | 0 | 54 | -3.66 | Pass | |
| 1090.18 | 46.15 | 7.89 | -5.02 | 49.02 | Average Max | V | 100 | 0 | 54 | -4.98 | Pass | |
| 1887.776 | 42.04 | 9.98 | -0.42 | 51.59 | Peak [Scan] | H | 100 | 0 | 114.34 | -62.75 | Pass | NRB |
| 1290.581 | 46.09 | 8.55 | -3.08 | 51.56 | Peak [Scan] | H | 100 | 0 | 114.34 | -62.78 | Pass | NRB |

Peak – Peak Emission
 NRB – Non-restricted band emission

Ch 26 Antenna ALR-9611CR Radiated Emissions Above 1 GHz (1 – 2GHz)

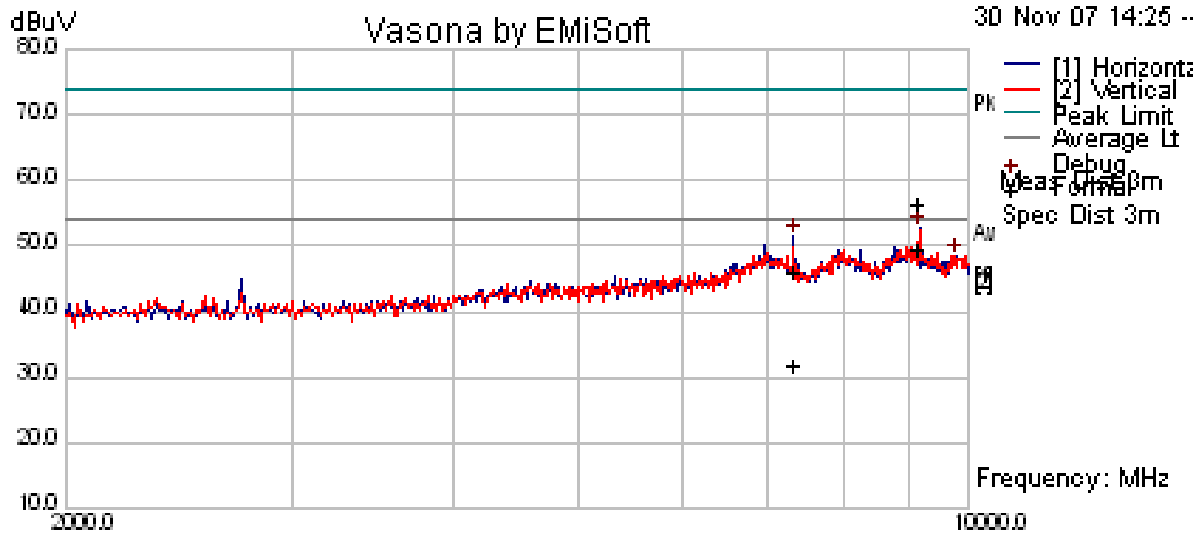


This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Antenna ALR-9611CR

Ch 26 Antenna ALR-9611CR Radiated Emissions Above 1 GHz (2 – 10 GHz)



Radiated Emissions Template: 18Amp RE 1-18 GHz Mitec 30 Aug
Filename: c:\program files\emisoft - vasona\results\alnt31 - 9650\alr-9611cr\ch 26 915.75 2-10g

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.



Antenna ALR-9611CR

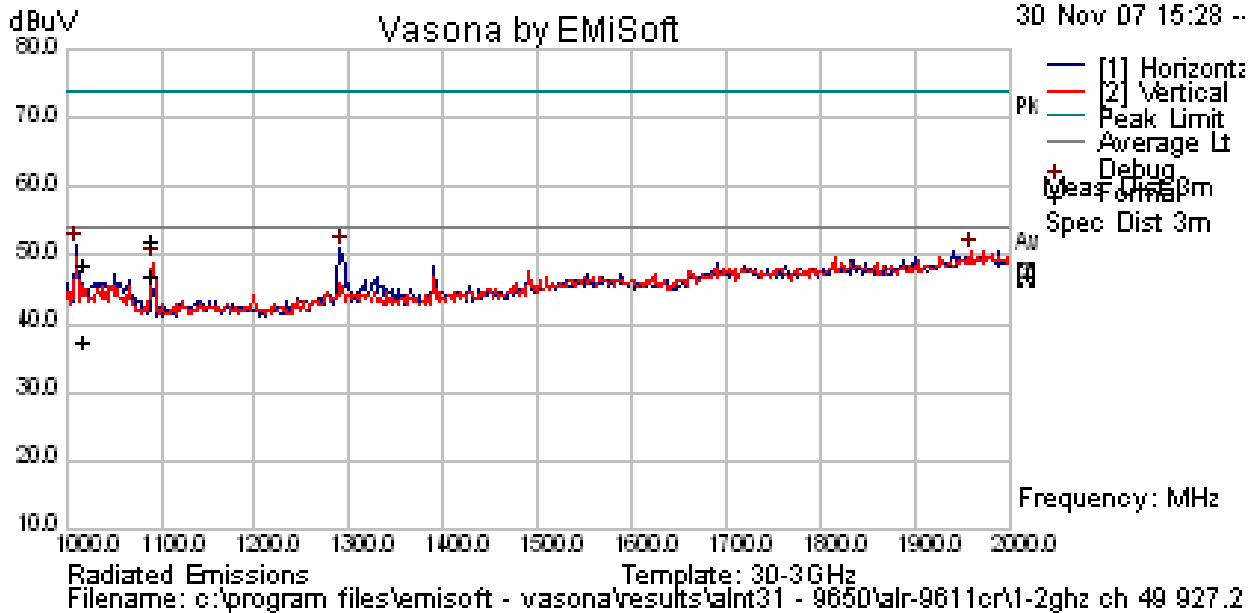
Channel 49 – 927.25 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 927.253 | | | | 134.23 | Peak Emission | | | | | | N/A | Peak |
| 1019.759 | 44.58 | 7.74 | -5.85 | 46.46 | Peak Max | V | 98 | 9 | 74 | -27.54 | Pass | |
| 1092.635 | 47.06 | 7.89 | -5 | 49.96 | Peak Max | V | 153 | 49 | 74 | -24.04 | Pass | |
| 1019.759 | 33.57 | 7.74 | -5.85 | 35.45 | Average Max | H | 112 | 199 | 54 | -18.55 | Pass | |
| 1092.635 | 41.85 | 7.89 | -5 | 44.75 | Average Max | V | 153 | 49 | 54 | -9.25 | Pass | |
| 8996.108 | 44.48 | 6.21 | -0.45 | 50.24 | Peak [Scan] | H | 100 | 0 | 114.23 | -63.99 | Pass | NRB |

Peak – Peak Emission
 NRB – Non-restricted band emission

Ch 49 Antenna ALR-9611CR Radiated Emissions Above 1 GHz (1 – 2GHz)

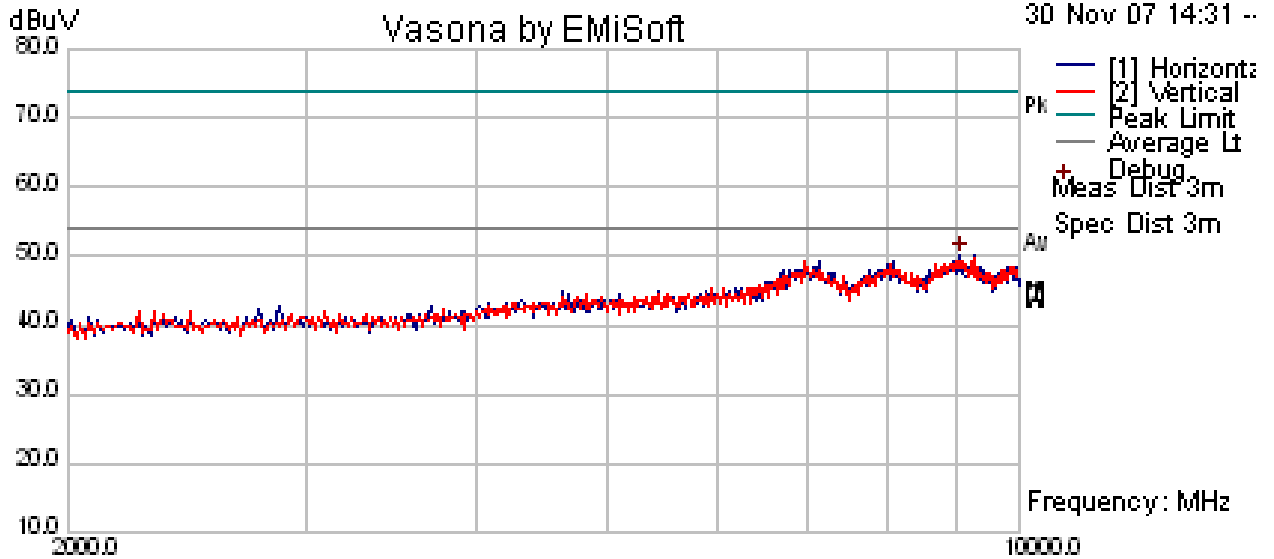


This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Antenna ALR-9611CR

Ch 49 Antenna ALR-9611CR Radiated Emissions Above 1 GHz (2 – 10 GHz)



Radiated Emissions Template: 18Amp RE 1-18 GHz Mitec 30 Aug
Filename: c:\program files\emisoft - vasona\results\alnt31 - 9650\alr-9611cr\ch 49 927.25 2-10g

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.



Antenna ALR-9610AL

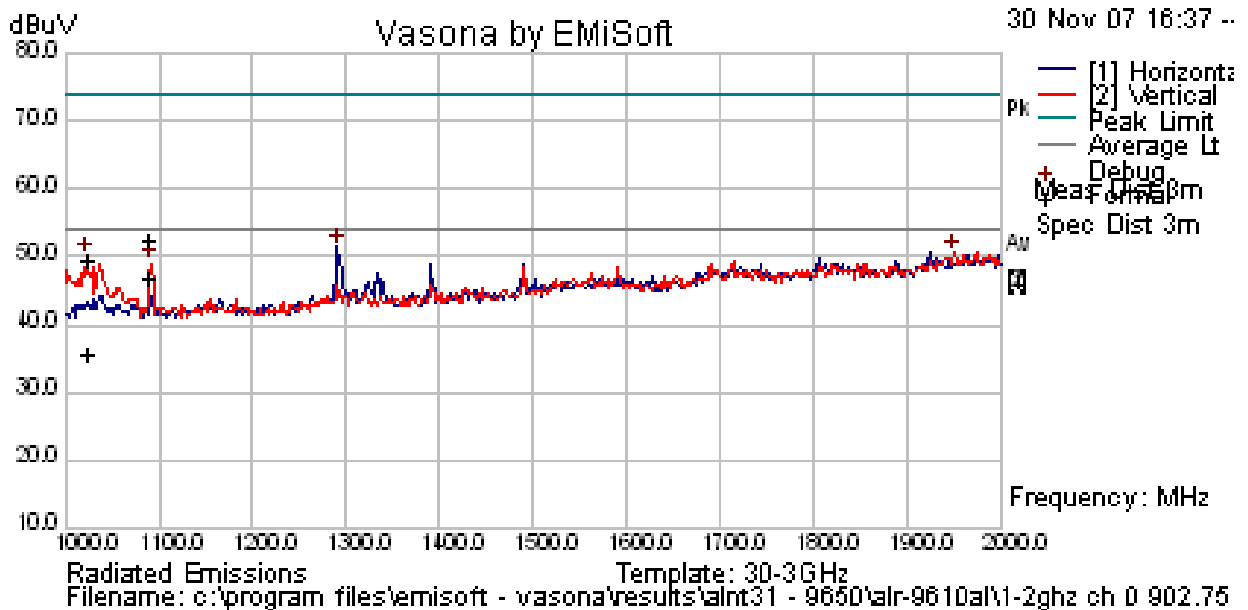
Channel 0 – 902.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 902.751 | | | | 135.62 | Peak Emission | V | | | | | N/A | Peak |
| 9027.455 | 46.5 | 6.21 | -0.34 | 52.37 | Peak Max | V | 127 | 149 | 74 | -21.63 | Pass | |
| 8124.724 | 46.56 | 5.67 | -1.22 | 51.01 | Peak Max | V | 135 | 98 | 74 | -22.99 | Pass | |
| 7222.094 | 49.99 | 5.43 | -2.93 | 52.49 | Peak Max | V | 134 | 360 | 74 | -21.51 | Pass | |
| 1092.555 | 47.58 | 7.89 | -5 | 50.48 | Peak Max | V | 106 | 58 | 74 | -23.52 | Pass | |
| 1026.623 | 45.25 | 7.75 | -5.73 | 47.26 | Peak Max | V | 123 | 176 | 74 | -26.74 | Pass | |
| 9027.455 | 45.87 | 6.21 | -0.34 | 51.74 | Average Max | H | 98 | 49 | 54 | -2.26 | Pass | |
| 8124.724 | 47.38 | 5.67 | -1.22 | 51.83 | Average Max | H | 98 | 47 | 54 | -2.17 | Pass | |
| 7222.094 | 48.52 | 5.43 | -2.93 | 51.02 | Average Max | H | 98 | 47 | 54 | -2.98 | Pass | |
| 1092.555 | 41.95 | 7.89 | -5 | 44.85 | Average Max | V | 106 | 58 | 54 | -9.15 | Pass | |
| 1026.623 | 31.6 | 7.75 | -5.73 | 33.62 | Average Max | V | 123 | 176 | 54 | -20.38 | Pass | |
| 1949.9 | 40.54 | 10.08 | -0.1 | 50.52 | Peak [Scan] | V | 100 | 0 | 54 | -3.48 | Pass | NRB |
| 1290.581 | 45.9 | 8.55 | -3.08 | 51.37 | Peak [Scan] | H | 100 | 0 | 54 | -2.63 | Pass | NRB |

Peak – Peak Emission
 NRB – Non-restricted band emission

Ch 0 Antenna ALR-9610AL Radiated Emissions Above 1 GHz (1 – 2 GHz)



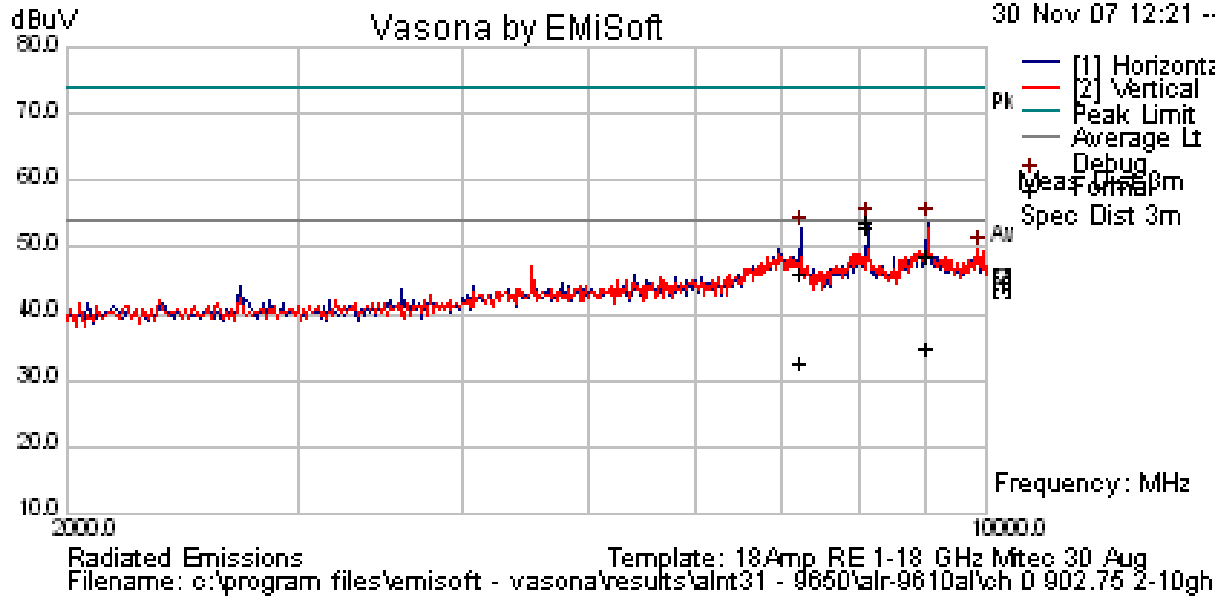
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 60 of 107

Antenna ALR-9610AL

Ch 0 Antenna ALR-9610AL Radiated Emissions Above 1 GHz (2 – 10 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.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 61 of 107

Antenna ALR-9610AL

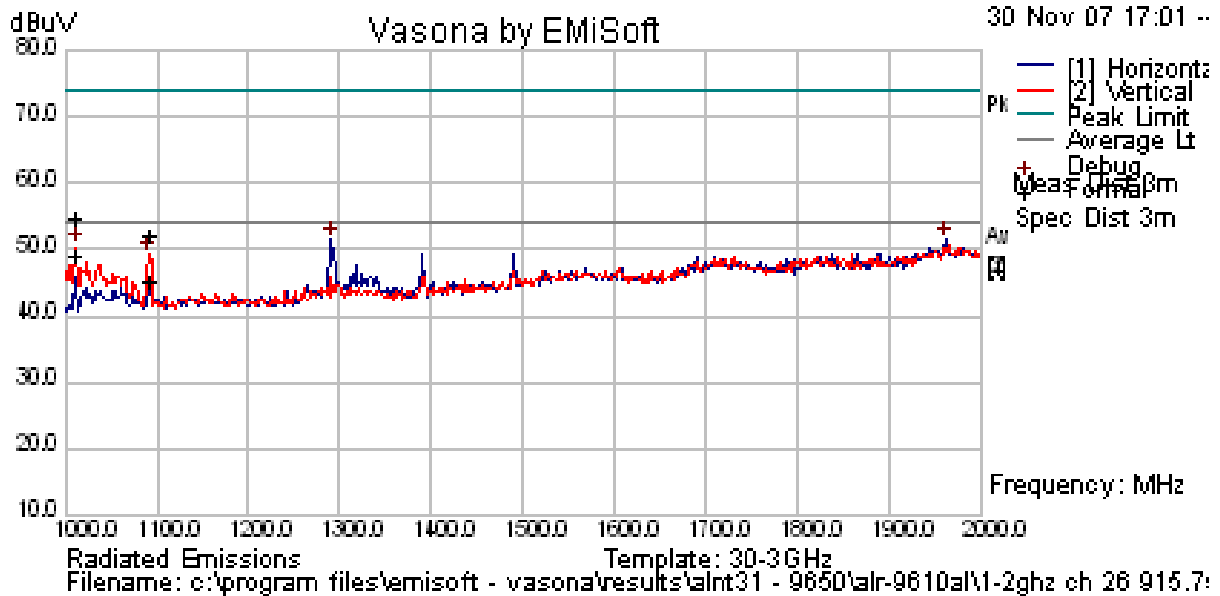
Channel 26 – 915.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 915.752 | | | | 134.96 | Peak Emission | V | | | | | | Peak |
| 1011.633 | 50.74 | 7.72 | -5.97 | 52.49 | Peak Max | V | 98 | 199 | 74 | -21.51 | Pass | |
| 1092.895 | 47.19 | 7.9 | -5 | 50.09 | Peak Max | V | 98 | 56 | 74 | -23.91 | Pass | |
| 1011.633 | 45.14 | 7.72 | -5.97 | 46.89 | Average Max | V | 98 | 199 | 54 | -7.11 | Pass | |
| 1092.895 | 40.06 | 7.9 | -5 | 42.96 | Average Max | V | 98 | 56 | 54 | -11.04 | Pass | |
| 9157.495 | 48.85 | 6.22 | -0.62 | 54.45 | Peak Max | V | 98 | 86 | 74 | -19.55 | Pass | |
| 9157.495 | 43.83 | 6.22 | -0.62 | 49.43 | Average Max | H | 98 | 357 | 54 | -4.57 | Pass | |
| 1961.924 | 41.46 | 10.1 | -0.06 | 51.5 | Peak [Scan] | H | 100 | 0 | 54 | -2.5 | Pass | NRB |
| 1290.581 | 45.93 | 8.55 | -3.08 | 51.39 | Peak [Scan] | H | 100 | 0 | 54 | -2.61 | Pass | NRB |

Peak – Peak Emission
 NRB – Non-restricted band emission

Ch 26 Antenna ALR-9610AL Radiated Emissions Above 1 GHz (1 – 2GHz)

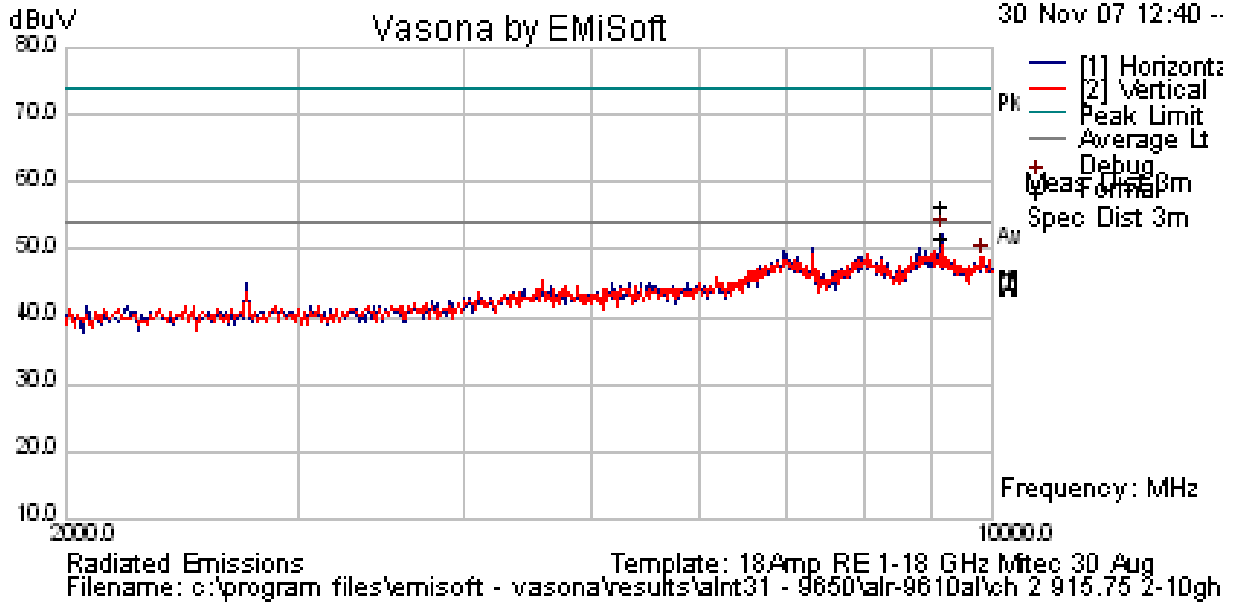


This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Antenna ALR-9610AL

Ch 26 Antenna ALR-9610AL Radiated Emissions Above 1 GHz (2 – 10 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.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 63 of 107

Antenna ALR-9610AL

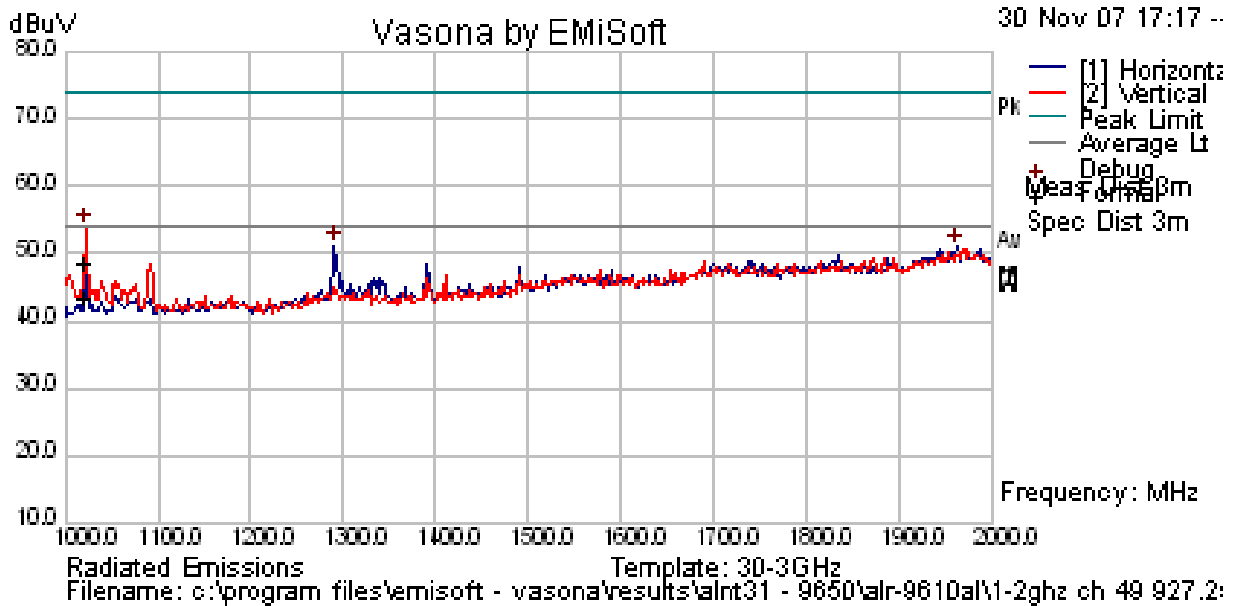
Channel 49 – 915.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 927.25 | | | | 134.31 | Peak Emission | V | | | | | N/A | Peak |
| 1021.815 | 44.84 | 7.74 | -5.82 | 46.76 | Peak Max | V | 119 | 200 | 74 | -27.24 | Pass | |
| 1021.815 | 39.48 | 7.74 | -5.82 | 41.4 | Average Max | H | 98 | 155 | 54 | -12.6 | Pass | |
| 1290.581 | 45.75 | 8.55 | -3.08 | 51.22 | Peak [Scan] | H | 100 | 0 | 114.31 | -63.09 | Pass | NRB |
| 1961.924 | 40.88 | 10.1 | -0.06 | 50.92 | Peak [Scan] | H | 100 | 0 | 114.31 | -63.39 | Pass | NRB |

Peak – Peak Emission
 NRB – Non-restricted band emission

Ch 49 Antenna ALR-9610AL Radiated Emissions Above 1 GHz (1 – 2GHz)

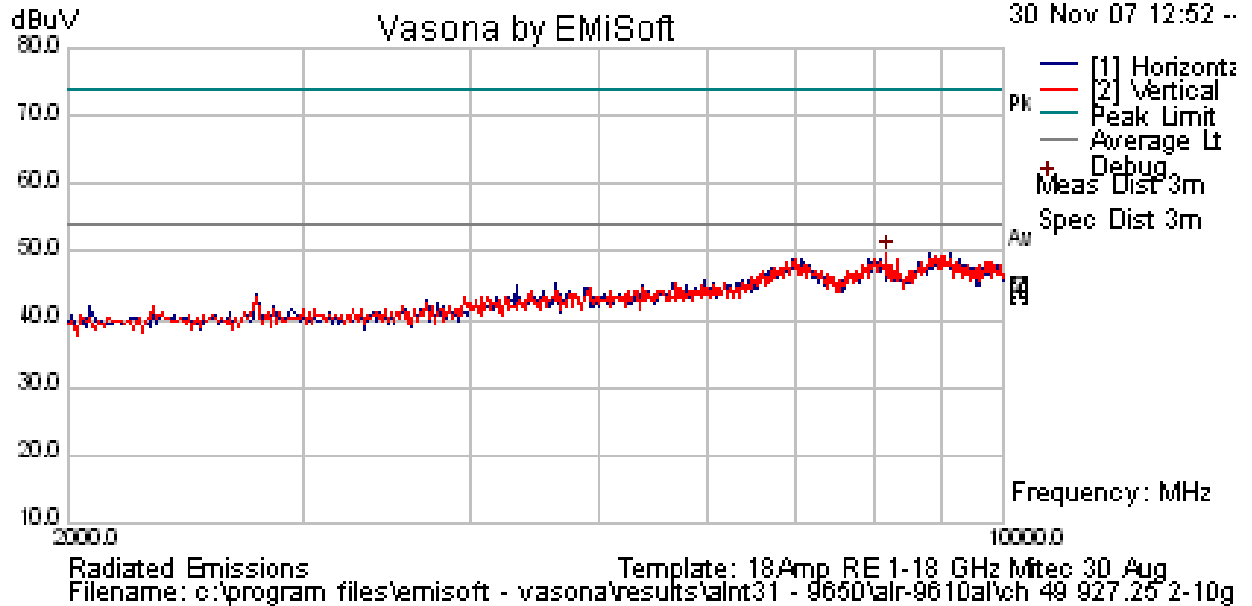


This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Antenna ALR-9610AL

Ch 49 Antenna ALR-9610AL Radiated Emissions Above 1 GHz (2 – 10 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.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 65 of 107

Antenna Mobile Mark (CVS-915)

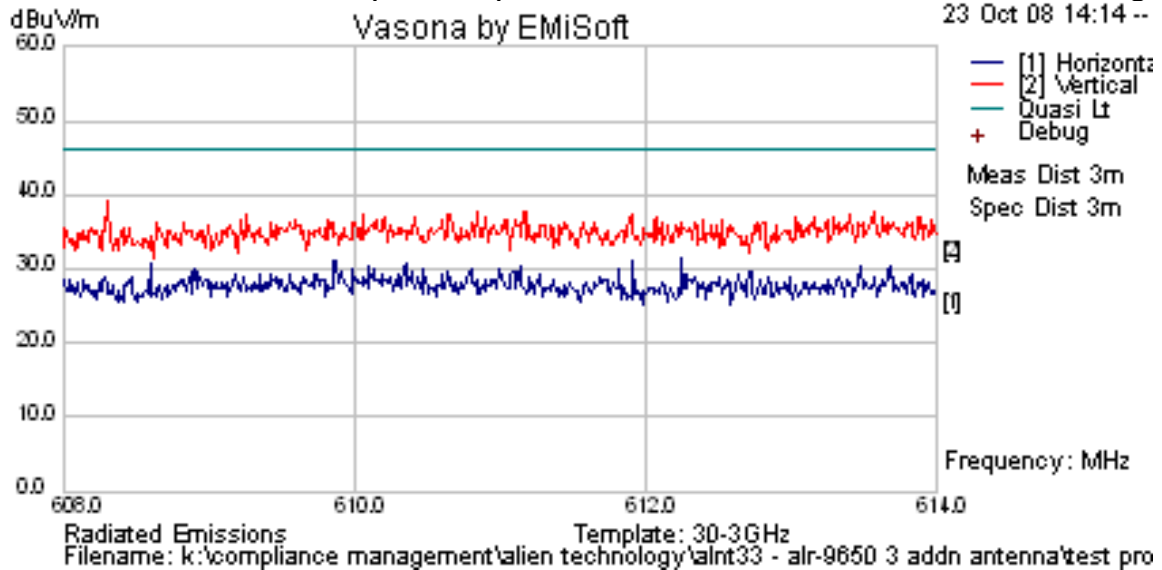
Channel 0 – 902.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|--------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 7322.645 | 47.8 | 5.45 | -2.89 | 50.35 | Peak Max | V | 100 | 0 | 74 | -23.65 | Pass | RB |
| 7322.645 | 37.8 | 5.45 | -2.89 | 40.35 | Aver Max | V | 100 | 0 | 54 | -13.65 | Pass | RB |
| 3610.987 | 60.28 | 3.67 | -11.09 | 52.87 | Peak Max | V | 114 | 180 | 74 | -21.13 | Pass | RB |
| 3610.987 | 45.34 | 3.67 | -11.09 | 37.92 | Aver Max | V | 114 | 180 | 54 | -16.08 | Pass | RB |
| 1291.784 | 57.2 | 8.55 | -16.85 | 48.91 | Peak Max | H | 100 | 0 | 74 | -25.09 | Pass | NRB |
| 1390.782 | 56.25 | 8.73 | -16.18 | 48.79 | Peak Max | V | 100 | 0 | 74 | -25.21 | Pass | NRB |

RB – Restricted band emission
 NRB – Non-restricted band emission

Ch 0 Antenna Mobile Mark (CVS-915) Radiated Emissions 608 – 614 MHz Band-Edge



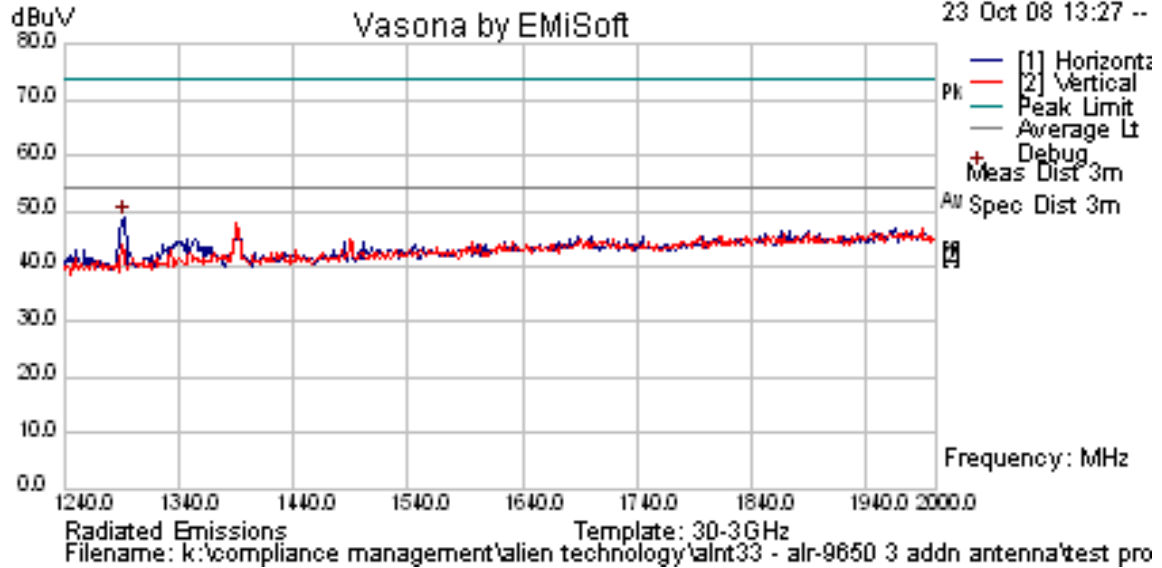
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



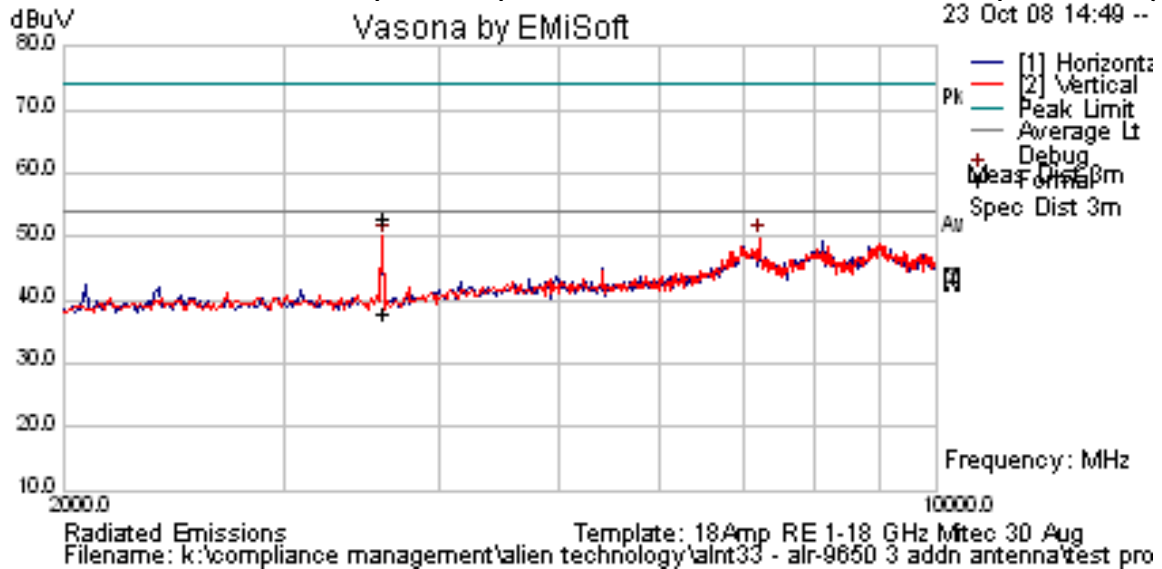
Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 66 of 107

Antenna Mobile Mark (CVS-915)

Ch 0 Antenna Mobile Mark (CVS-915) Radiated Emissions Above 1 GHz (1 – 2 GHz)



Ch 0 Antenna Mobile Mark (CVS-915) Radiated Emissions Above 1 GHz (2 – 10 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.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 67 of 107

Antenna Mobile Mark (CVS-915)

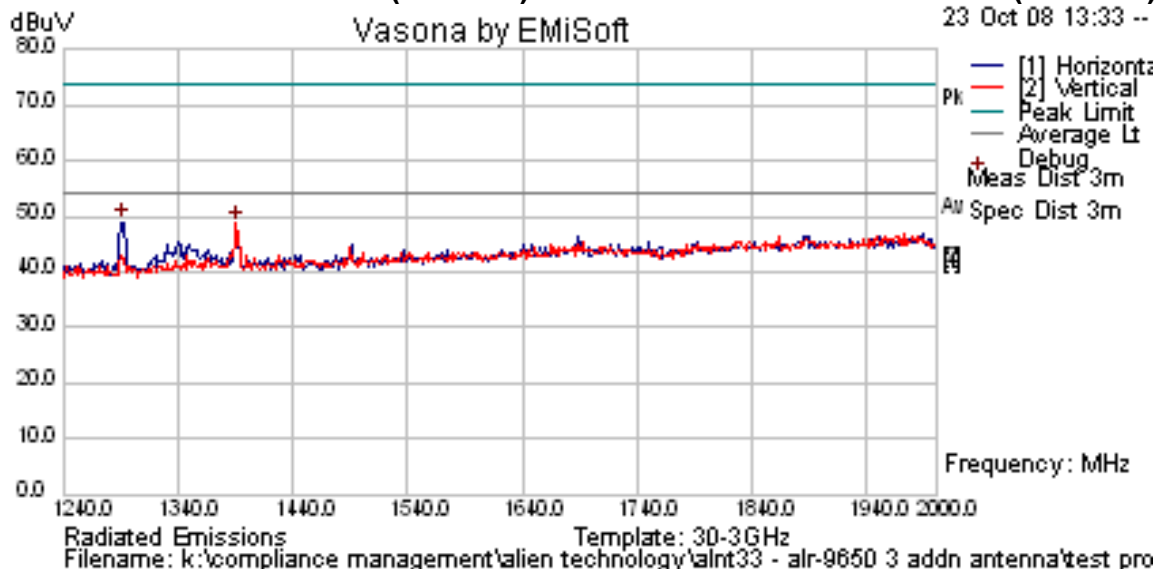
Channel 26 – 915.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|--------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 1291.784 | 57.2 | 8.55 | -16.85 | 48.91 | Peak [Scan] | H | 100 | 0 | 74 | -25.09 | Pass | NRB |
| 1390.782 | 56.25 | 8.73 | -16.18 | 48.79 | Peak [Scan] | V | 100 | 0 | 74 | -25.21 | Pass | NRB |
| 7322.645 | 47.8 | 5.45 | -2.89 | 50.35 | Peak Max | V | 100 | 0 | 74 | -23.65 | Pass | RB |
| 7322.645 | 37.8 | 5.45 | -2.89 | 40.35 | Aver Max | V | 100 | 0 | 54 | -13.65 | Pass | RB |

RB – Restricted band emission
 NRB – Non-restricted band emission

Ch 26 Antenna Mobile Mark (CVS-915) Radiated Emissions Above 1 GHz (1 – 2GHz)



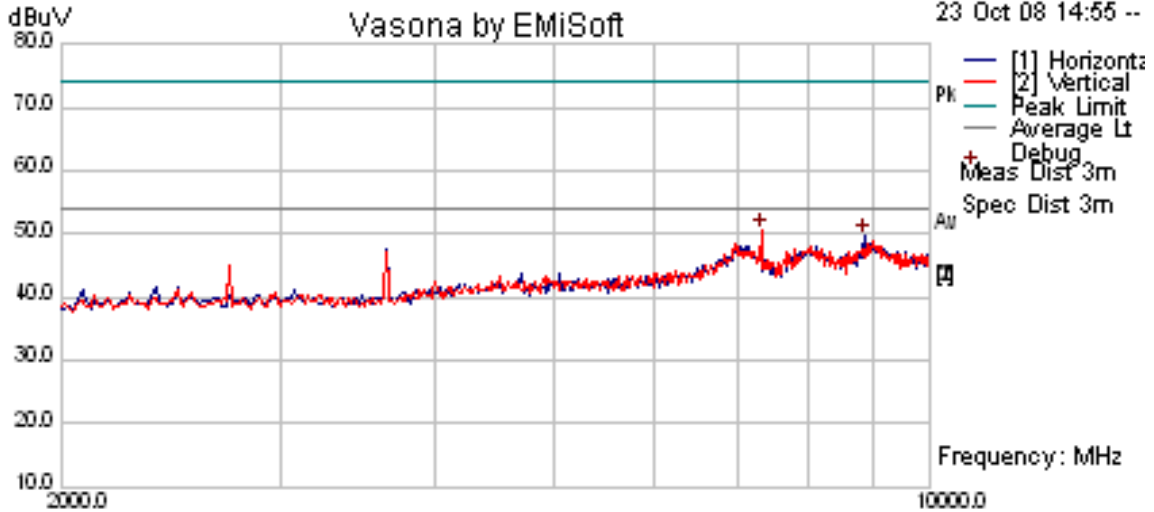
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 68 of 107

Antenna Mobile Mark (CVS-915)

Ch 26 Antenna Mobile Mark (CVS-915) Radiated Emissions Above 1 GHz (2 – 10 GHz)



Radiated Emissions Template: 18Amp RE 1-18 GHz Mitec 30 Aug
Filename: k:\compliance management\alien technology\alnt33 - alr-9650 3 addn antenna\test pro

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 69 of 107

Antenna Mobile Mark (CVS-915)

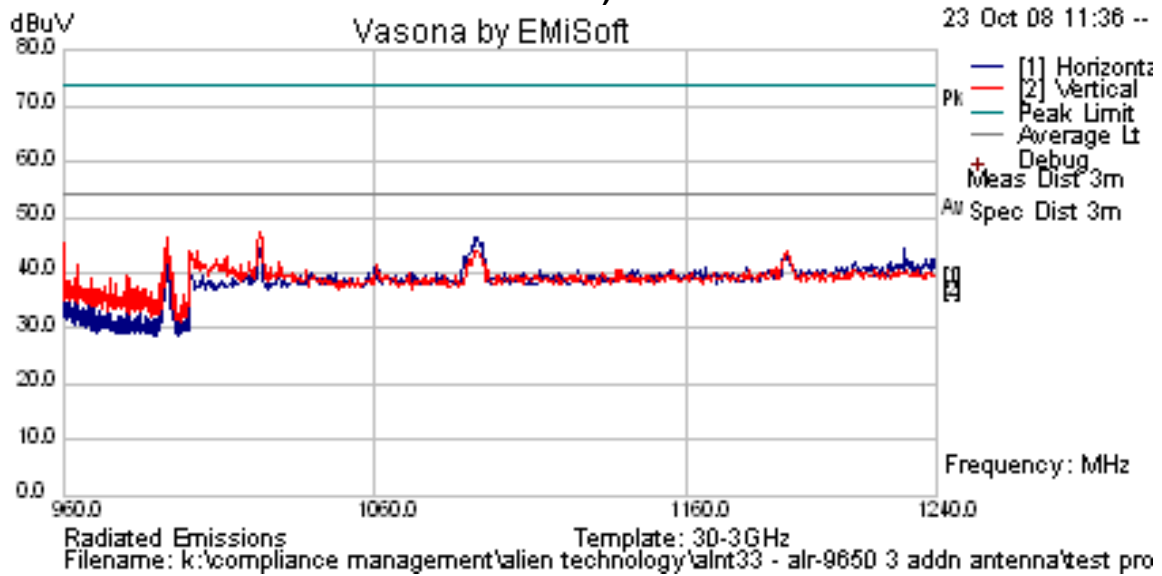
Channel 49 – 927.25 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|--------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 1291.784 | 57.52 | 8.55 | -16.85 | 49.23 | Peak [Scan] | H | 100 | 0 | 54 | -4.77 | Pass | NRB |
| 1390.782 | 55.75 | 8.73 | -16.18 | 48.3 | Peak [Scan] | V | 100 | 0 | 54 | -5.7 | Pass | NRB |

NRB – Non-restricted band emission

Ch 49 Antenna Mobile Mark (CVS-915) Radiated Emissions Above 1 GHz (0.96 – 1.24 GHz)



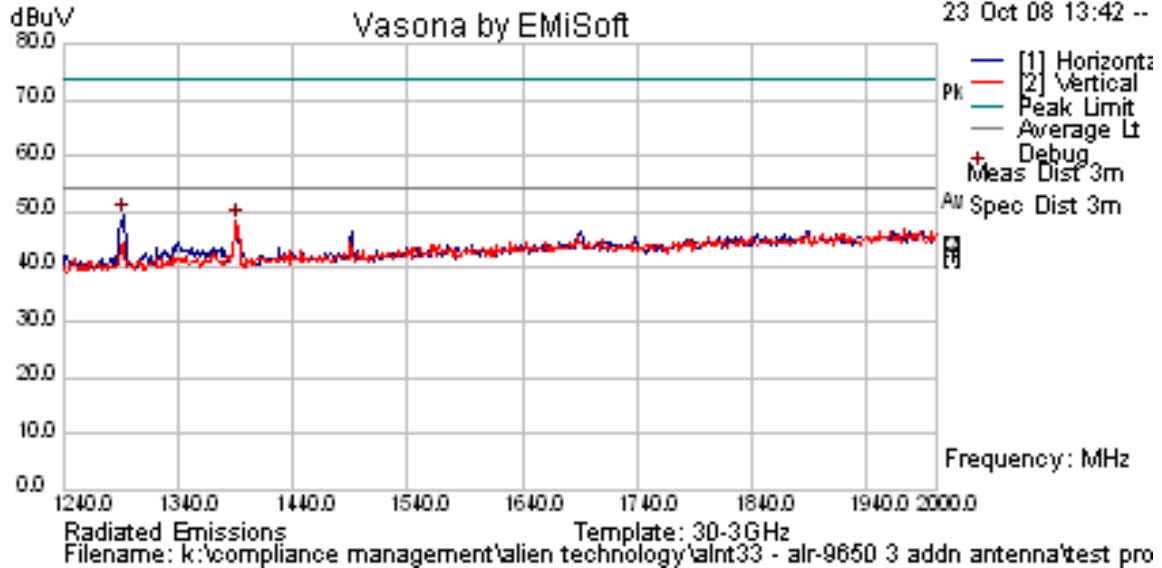
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



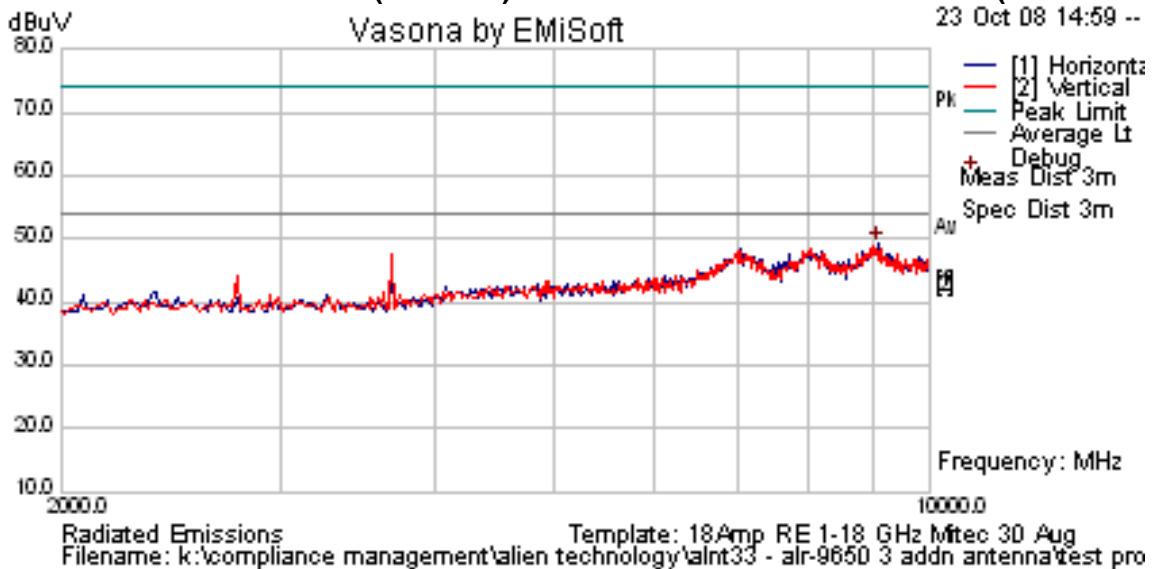
Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 70 of 107

Antenna Mobile Mark (CVS-915)

Ch 49 Antenna Mobile Mark (CVS-915) Radiated Emissions Above 1 GHz (1.24 – 2GHz)



Ch 49 Antenna Mobile Mark (CVS-915) Radiated Emissions Above 1 GHz (2 – 10 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.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 71 of 107

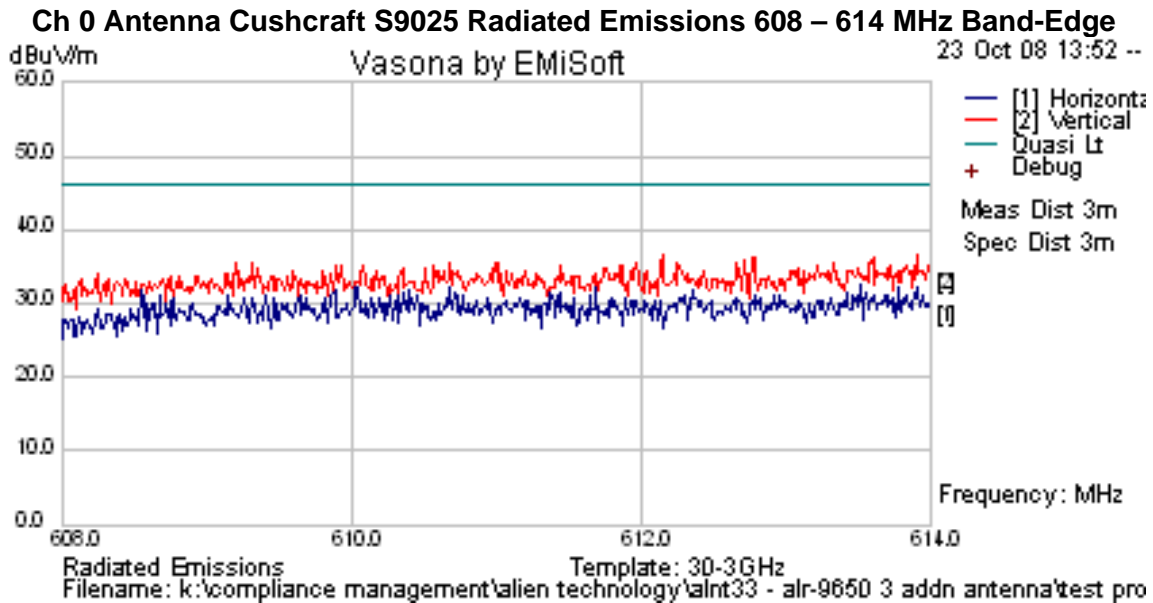
Antenna Cushcraft S9025

Channel 0 – 902.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|--------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 1291.784 | 57.2 | 8.55 | -16.85 | 48.91 | Peak [Scan] | H | 100 | 0 | 74 | -25.09 | Pass | NRB |
| 1390.782 | 56.25 | 8.73 | -16.18 | 48.79 | Peak [Scan] | V | 100 | 0 | 74 | -25.21 | Pass | NRB |
| 7226.453 | 49.85 | 5.43 | -2.42 | 52.86 | Peak [Scan] | V | 100 | 0 | 74 | -21.14 | Pass | NRB |

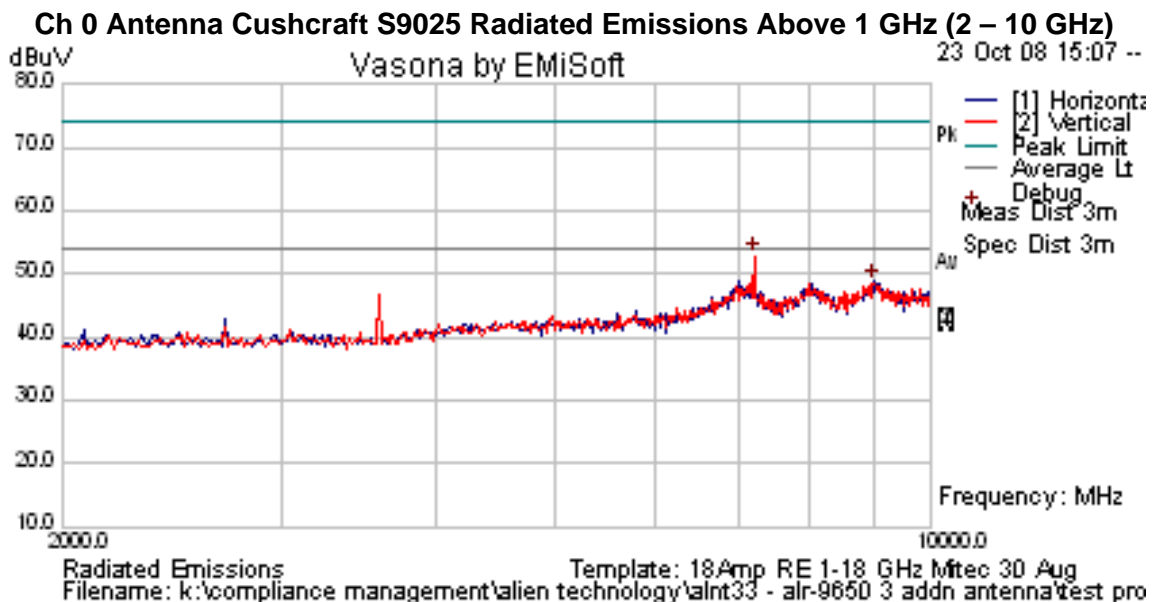
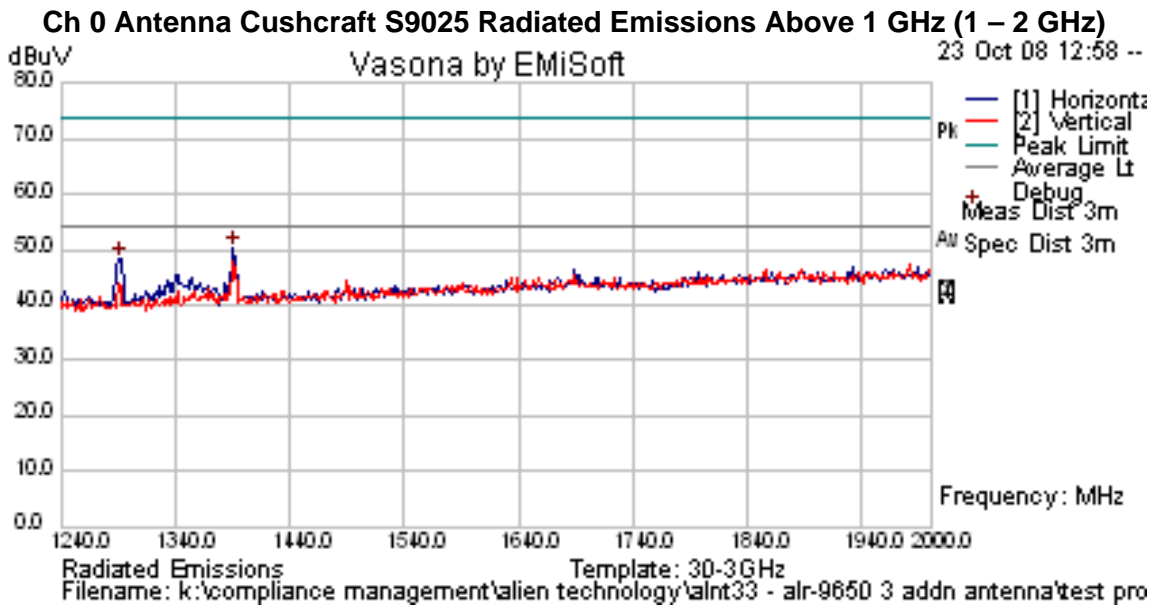
NRB – Non-restricted band emission



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.



Antenna Cushcraft S9025



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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 73 of 107

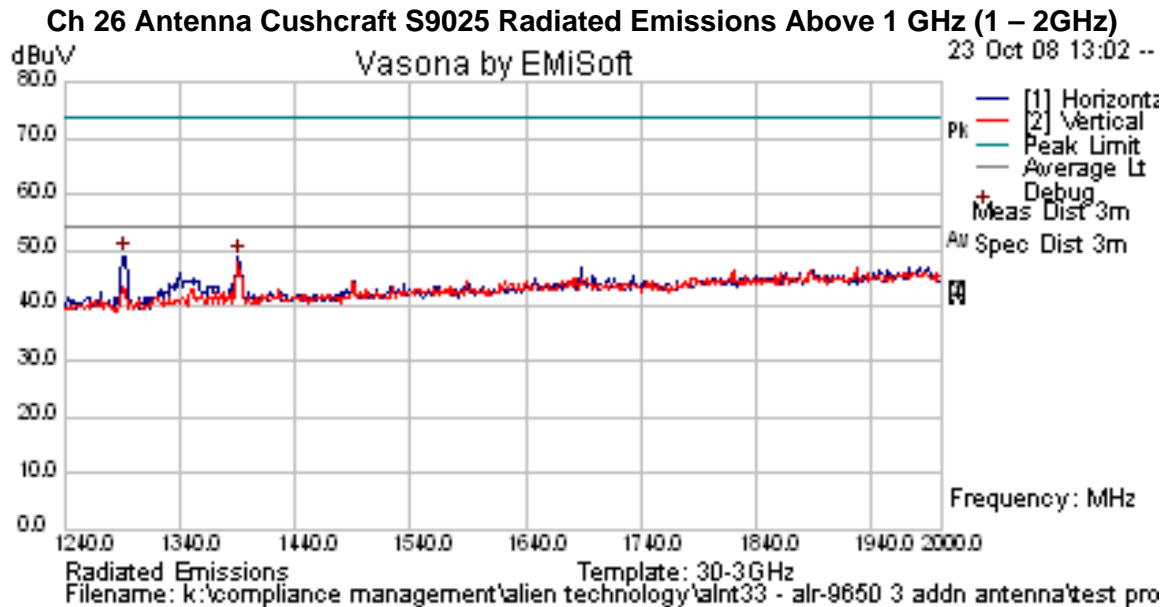
Antenna Cushcraft S9025

Channel 26 – 915.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|--------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 1291.784 | 57.2 | 8.55 | -16.85 | 48.91 | Peak [Scan] | H | 100 | 0 | 74 | -25.09 | Pass | NRB |
| 1390.782 | 56.25 | 8.73 | -16.18 | 48.79 | Peak [Scan] | V | 100 | 0 | 74 | -25.21 | Pass | NRB |
| 7226.453 | 49.85 | 5.43 | -2.42 | 52.86 | Peak [Scan] | H | 100 | 0 | 74 | -21.14 | Pass | NRB |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

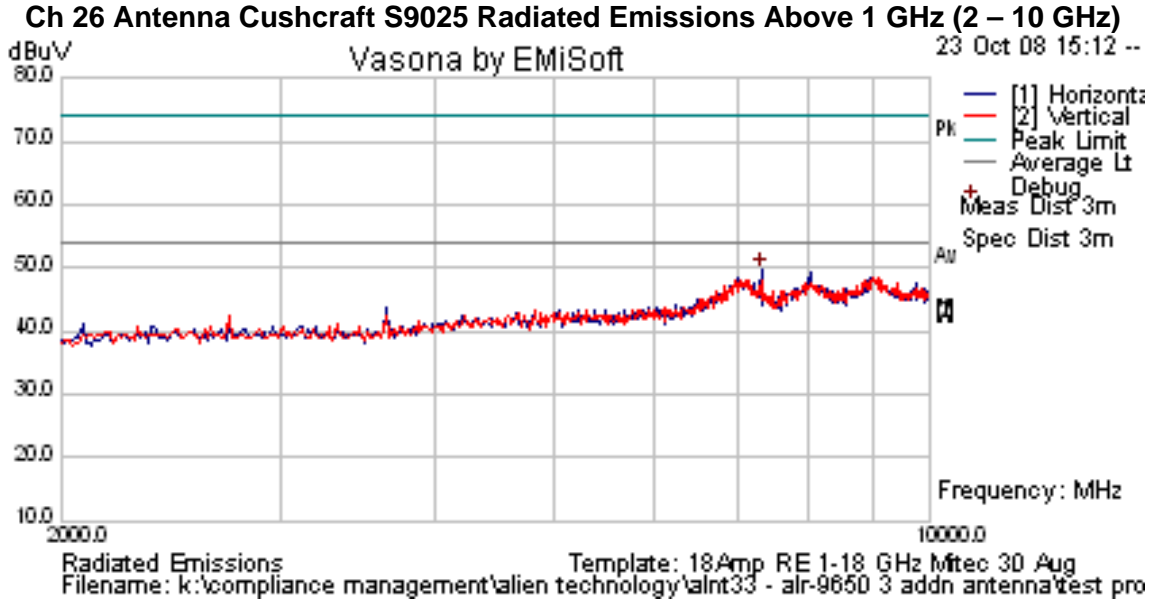
NRB – Non-restricted band emission



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.



Antenna Cushcraft S9025



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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 75 of 107

Antenna Cushcraft S9025

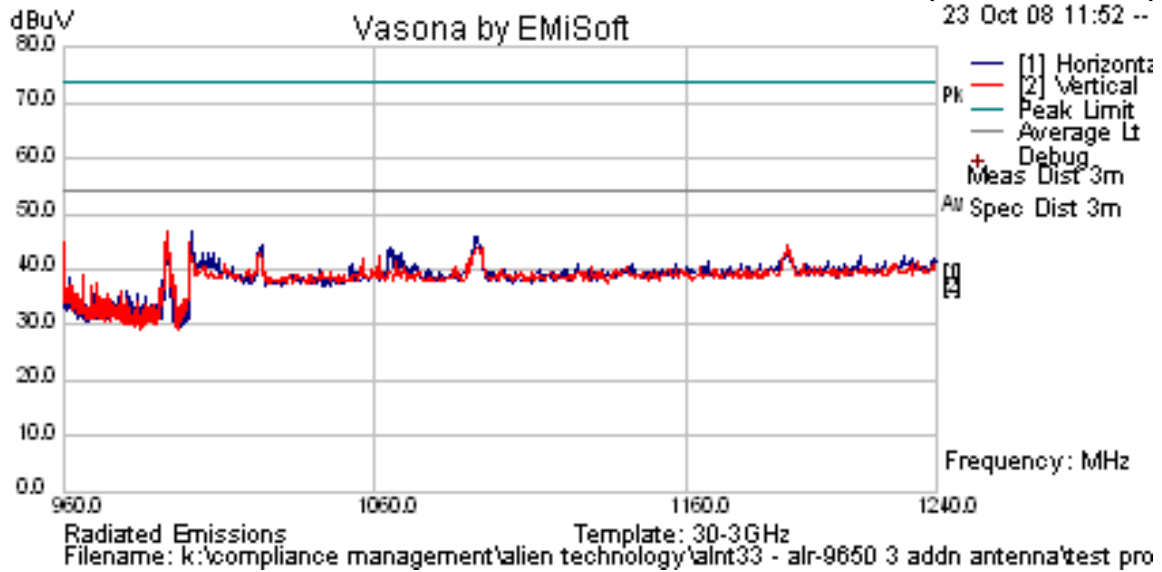
Channel 49 – 927.25 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|--------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 1291.784 | 57.2 | 8.55 | -16.85 | 48.91 | Peak [Scan] | H | 100 | 0 | 74 | -25.09 | Pass | NRB |
| 1390.782 | 56.25 | 8.73 | -16.18 | 48.79 | Peak [Scan] | V | 100 | 0 | 74 | -25.21 | Pass | NRB |

NRB – Non-restricted band emission

Ch 49 Antenna Cushcraft S9025 Radiated Emissions Above 1 GHz (0.96 – 1.24 GHz)

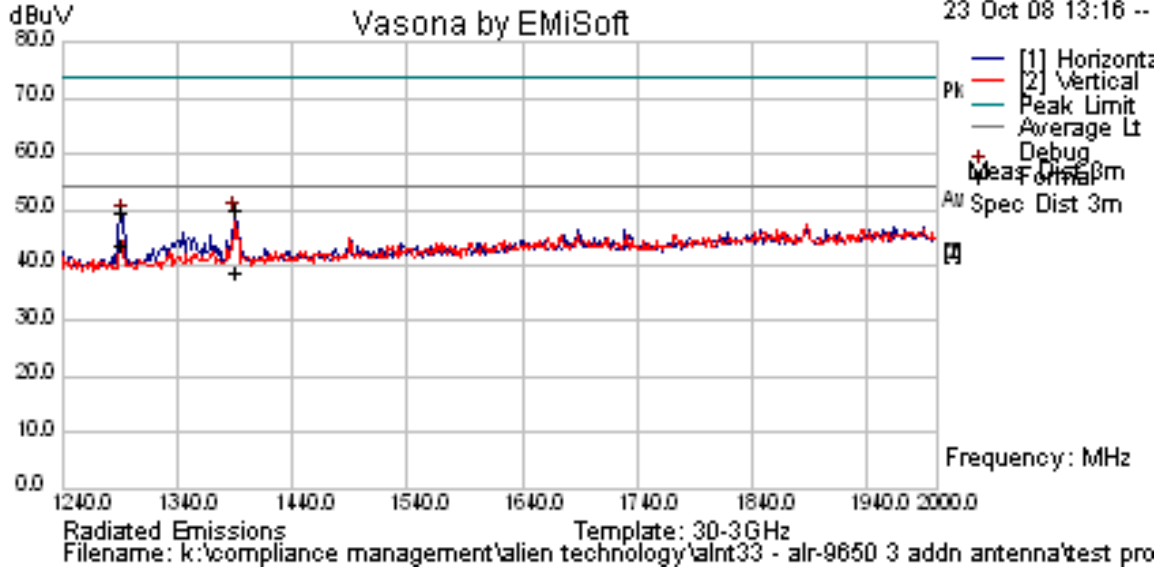


This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

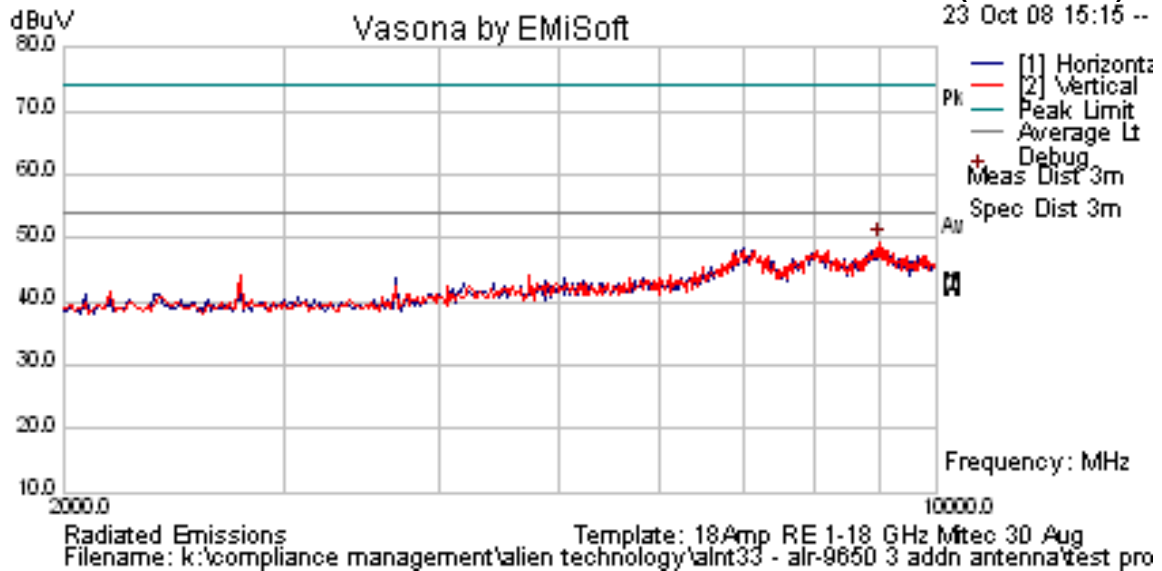


Antenna Cushcraft S9025

Ch 49 Antenna Cushcraft S9025 Radiated Emissions Above 1 GHz (1.24 – 2 GHz)



Ch 49 Antenna Cushcraft S9025 Radiated Emissions Above 1 GHz (2 – 10 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.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 77 of 107

Antenna Cushcraft S9028

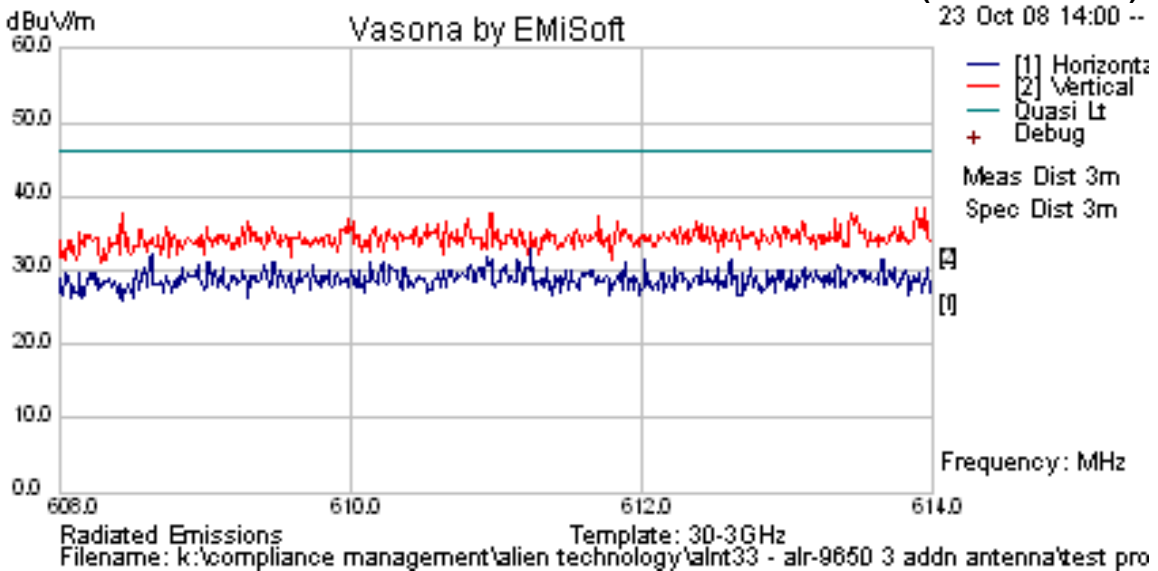
Channel 0 – 902.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|--------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 1291.784 | 57.2 | 8.55 | -16.85 | 48.91 | Peak [Scan] | H | 100 | 0 | 74 | -25.09 | Pass | NRB |
| 1390.782 | 56.25 | 8.73 | -16.18 | 48.79 | Peak [Scan] | H | 100 | 0 | 74 | -25.21 | Pass | NRB |
| 7226.453 | 49.85 | 5.43 | -2.42 | 52.86 | Peak [Scan] | H | 100 | 0 | 74 | -21.14 | Pass | NRB |

NRB – Non-restricted band emission

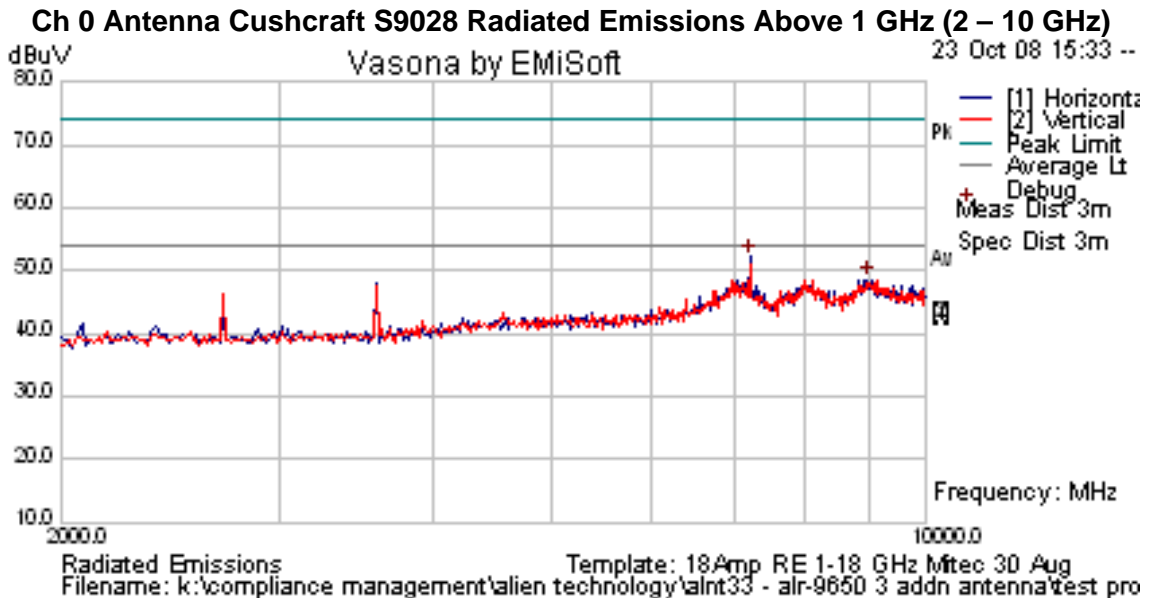
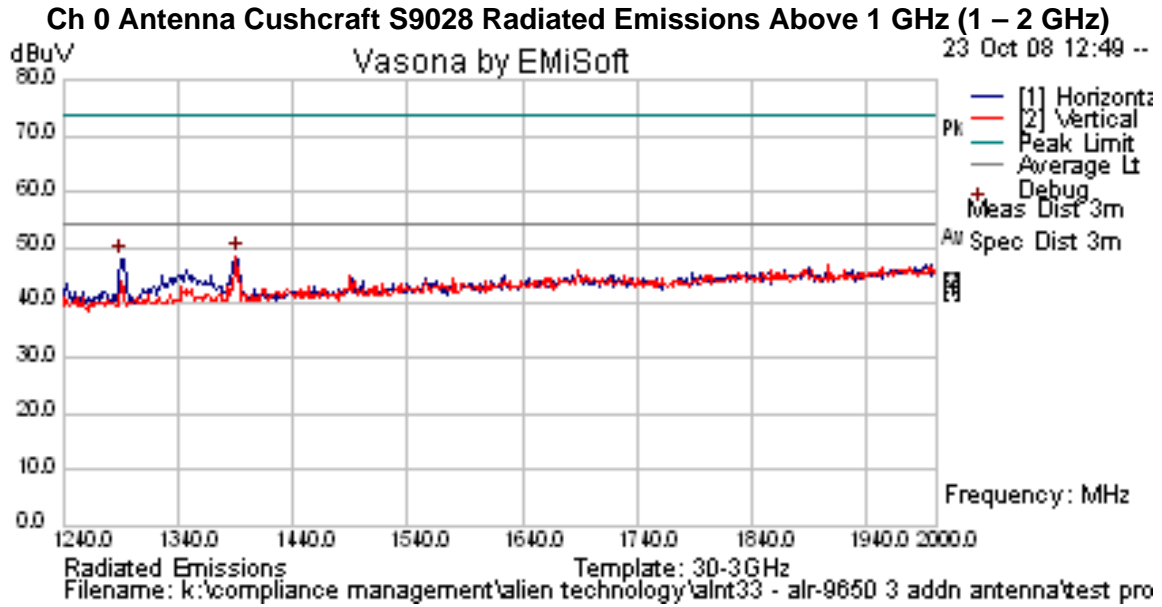
Ch 0 Antenna Cushcraft S9028 Radiated Emissions Above 1 GHz (608 – 614 MHz)



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.



Antenna Cushcraft S9028



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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 79 of 107

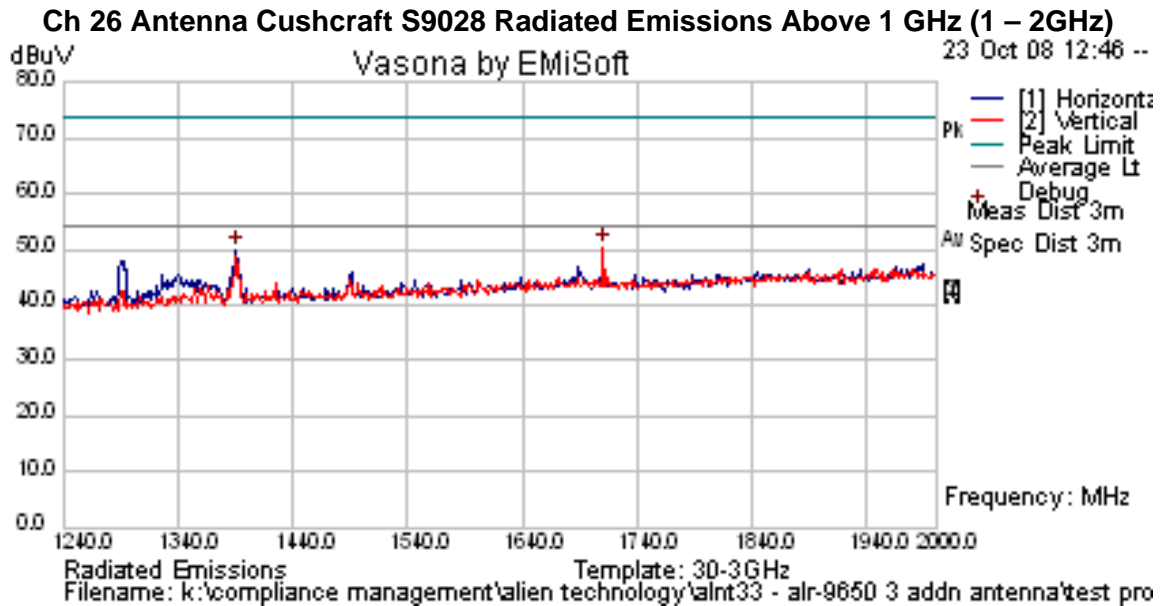
Antenna Cushcraft S9028

Channel 26 – 915.75 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|--------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 1710.621 | 55.13 | 9.55 | -14.19 | 50.49 | Peak [Scan] | V | 100 | 0 | 54 | -3.51 | Pass | NRB |
| 1390.782 | 57.45 | 8.73 | -16.18 | 50 | Peak [Scan] | H | 100 | 0 | 54 | -4 | Pass | NRB |
| 7226.453 | 46.85 | 5.43 | -2.42 | 49.86 | Peak [Scan] | H | 100 | 0 | 74 | -24.14 | Pass | NRB |

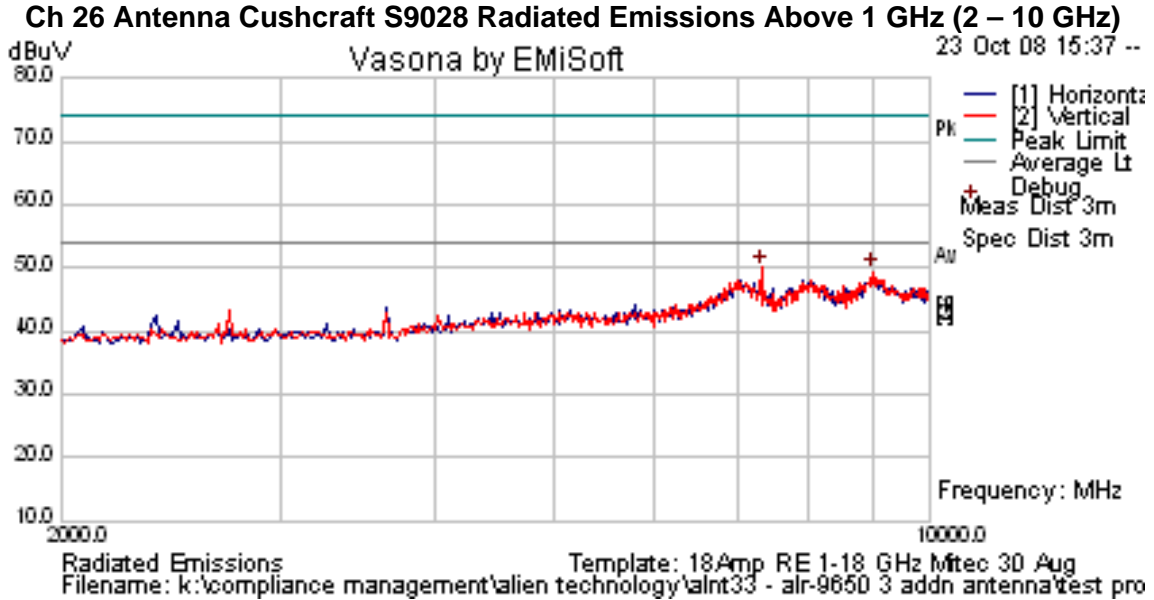
NRB – Non-restricted band emission



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.



Antenna Cushcraft S9028



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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 81 of 107

Antenna Cushcraft S9028

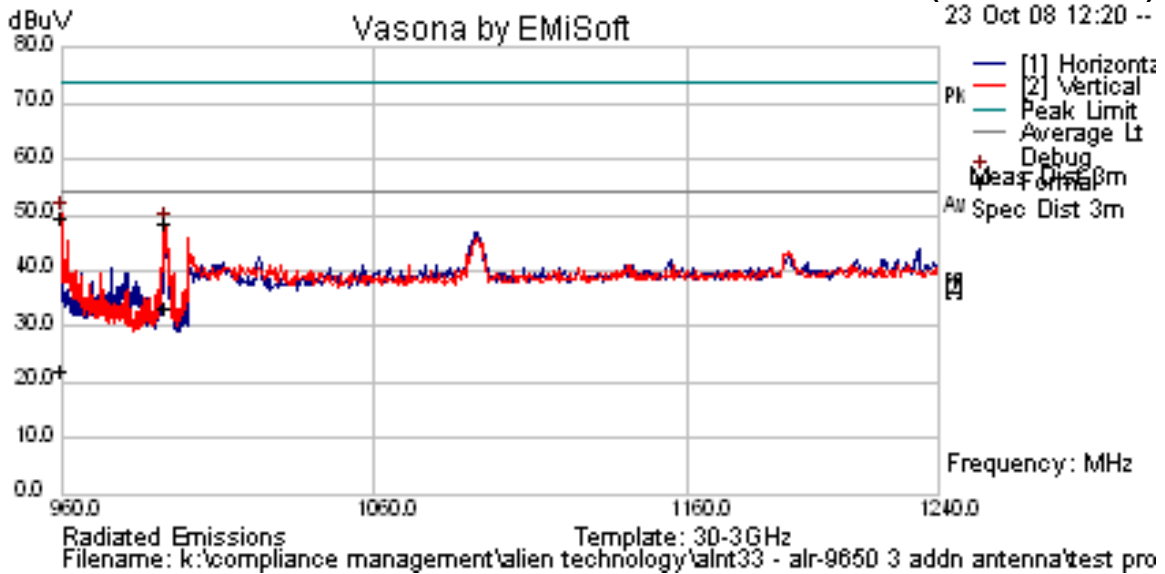
Channel 49 – 927.25 MHz

TABLE OF RESULTS

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|--------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 960.17 | 61.58 | 7.56 | -19.65 | 49.49 | Peak Max | V | 98 | 16 | 74 | -24.51 | Pass | RB |
| 993.497 | 60.42 | 7.67 | -19.34 | 48.75 | Peak Max | V | 99 | 202 | 74 | -25.25 | Pass | RB |
| 960.17 | 34.03 | 7.56 | -19.65 | 21.94 | Aver Max | V | 98 | 16 | 54 | -32.06 | Pass | RB |
| 993.497 | 44.9 | 7.67 | -19.34 | 33.23 | Aver Max | H | 203 | 152 | 54 | -20.77 | Pass | RB |
| 1710.621 | 55.13 | 9.55 | -14.19 | 50.49 | Peak [Scan] | V | 100 | 0 | 54 | -3.51 | Pass | NRB |
| 1390.782 | 57.45 | 8.73 | -16.18 | 50 | Peak [Scan] | H | 100 | 0 | 54 | -4 | Pass | NRB |

NRB – Non-restricted band emission

Ch 49 Antenna Cushcraft S9028 Radiated Emissions Above 1 GHz (0.96 - 1.24 GHz)

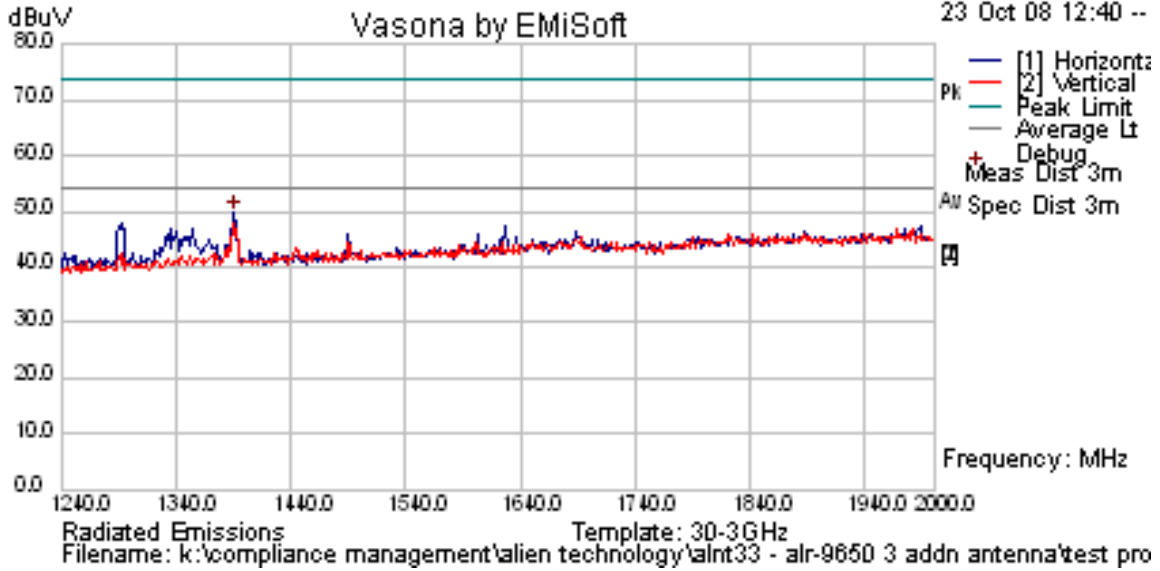


This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

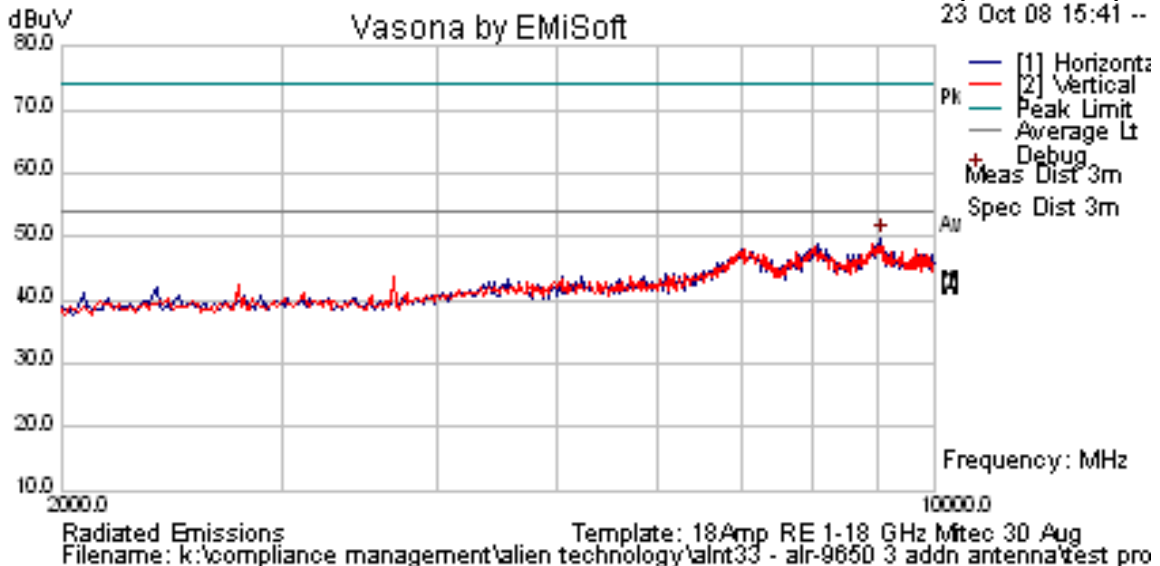


Antenna Cushcraft S9028

Ch 49 Antenna Cushcraft S9028 Radiated Emissions Above 1 GHz (1.24 – 2GHz)



Ch 49 Antenna Cushcraft S9028 Radiated Emissions Above 1 GHz (2 – 10 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.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 83 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' | 0088, 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.

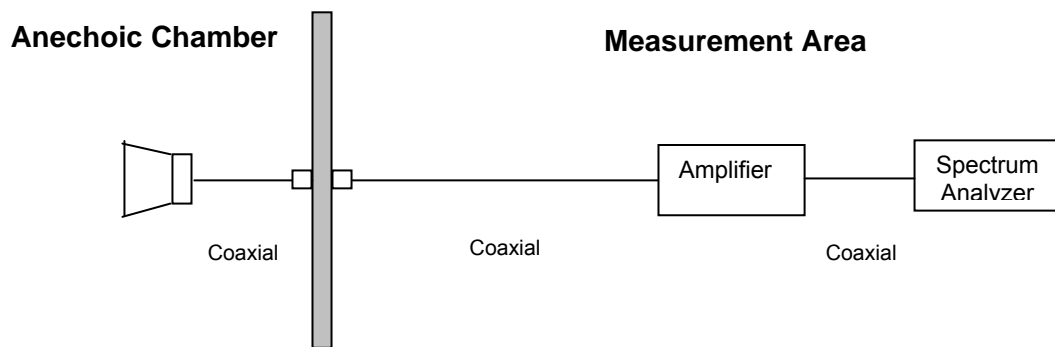
5.1.8. Receiver Radiated Spurious Emissions (Stand-By Mode)

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 – 10 GHz.

Test Measurement Set up



Stand-By spurious emissions test configuration

Measurement Results of Stand –By Spurious Emissions

Ambient conditions.

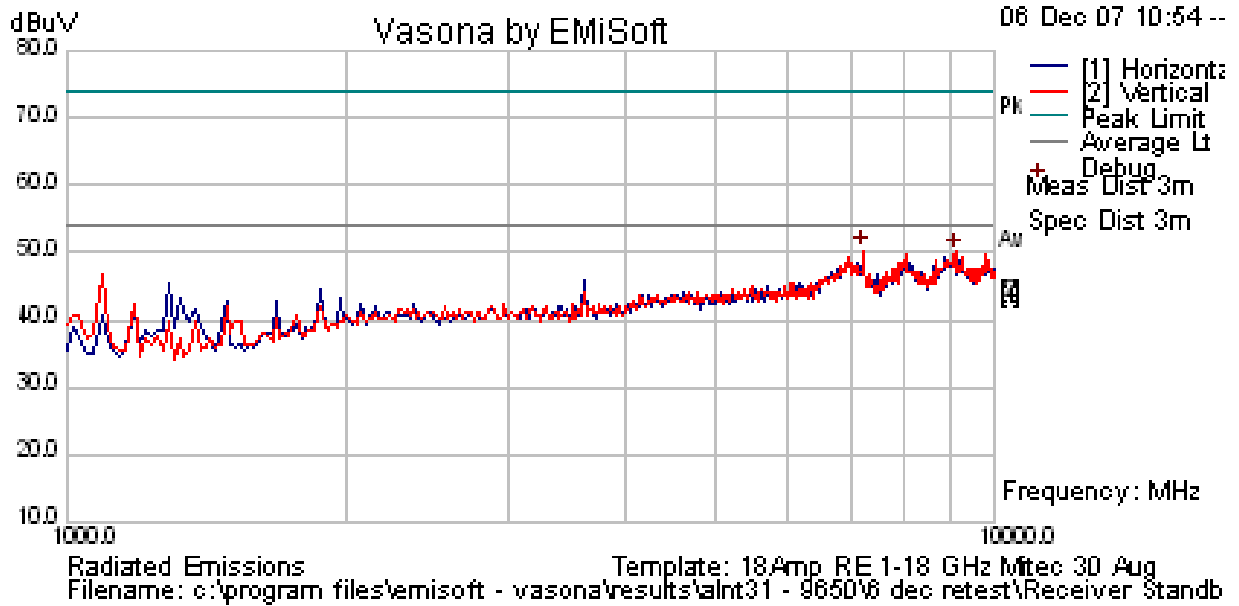
Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar



Stand-By Mode Spurious Emissions 1 - 10 GHz

Integral Antenna

Integral Antenna Spurious Emissions Stand-By Mode 1 – 10 GHz



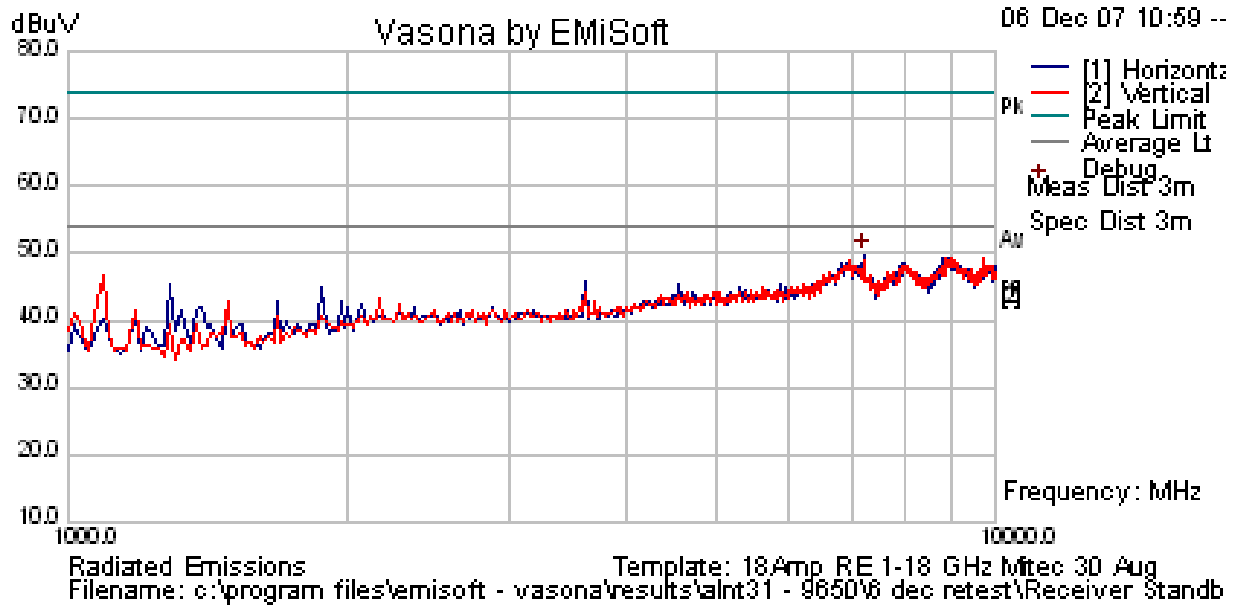
No emissions were observed breaking the limit.

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.



Antenna ALR-9611CR

Antenna ALR-9611CR Spurious Emissions Stand-By Mode 1 – 10 GHz



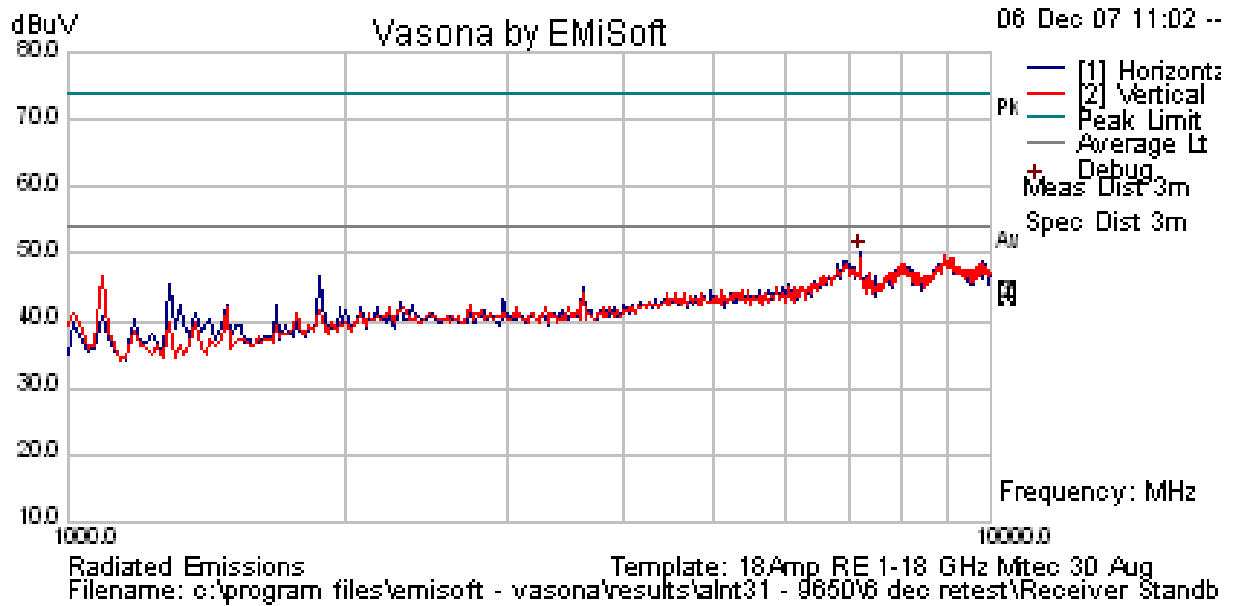
No emissions were observed breaking the limit.

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.



Antenna ALR-9610AL

Antenna ALR-9610AL Spurious Emissions Stand-By Mode 1 – 10 GHz



No emissions were observed breaking the limit.



Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 88 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' | 0088, 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.

5.1.9. Radiated Spurious Emissions (30M-1 GHz)

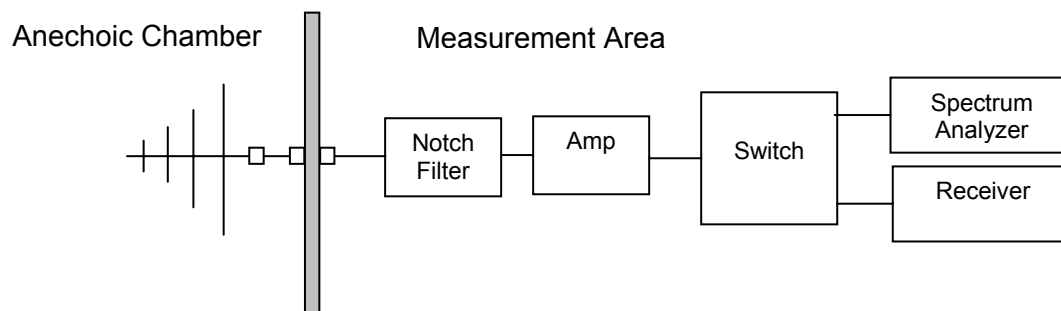
FCC, Part 15 Subpart C §15.247(d), §15.205, 15.209
Industry Canada RSS-210 §A8.5, 2.2, 2.6.

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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 90 of 107

For example:

Given a Receiver input reading of 51.5dB μ 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 μ V/m (or dB μ V) and μ V/m (or μ 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.



Measurement Results for Radiated Emissions (30 MHz – 1 GHz)

Ambient conditions.

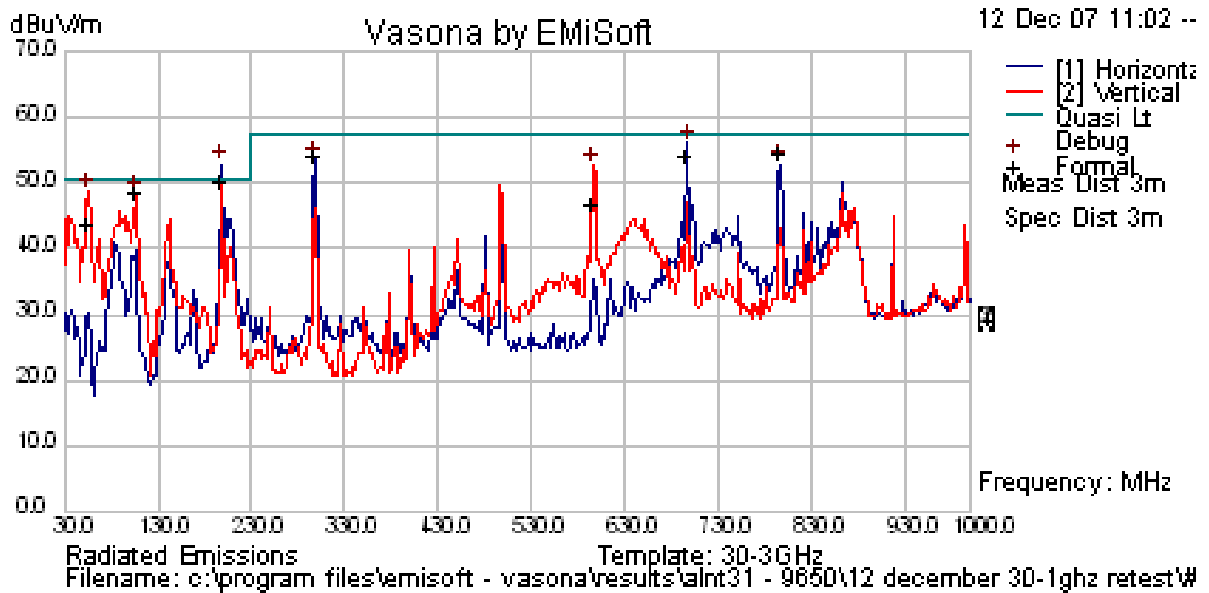
Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar

Radiated Emissions Below 1 GHz (Class A)

TABLE OF RESULTS – POE DIGITAL EMISSIONS 30M – 1 GHz

EUT Transmitting Maximum Output Power

POE Digital Emissions 30 MHz – 1 GHz



| 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 |
|---------------|----------|------------|--------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 198.569 | 60.48 | 4.74 | -17.09 | 48.13 | Quasi Max | H | 161 | 120 | 50.5 | -2.37 | Pass | |
| 695.238 | 54.52 | 6.67 | -8.93 | 52.25 | Quasi Max | H | 105 | 13 | 57.5 | -5.25 | Pass | |
| 55.937 | 59.64 | 3.79 | -21.59 | 41.84 | Quasi Max | V | 109 | 40 | 50.5 | -8.66 | Pass | |
| 106.719 | 60.07 | 4.21 | -17.82 | 46.46 | Quasi Max | V | 98 | 78 | 50.5 | -4.04 | Pass | |
| 297.939 | 63.19 | 5.21 | -16.38 | 52.02 | Quasi Max | H | 98 | 77 | 57.5 | -5.48 | Pass | |
| 794.619 | 53.53 | 7.15 | -8.03 | 52.64 | Quasi Max | H | 98 | 21 | 57.5 | -4.86 | Pass | |

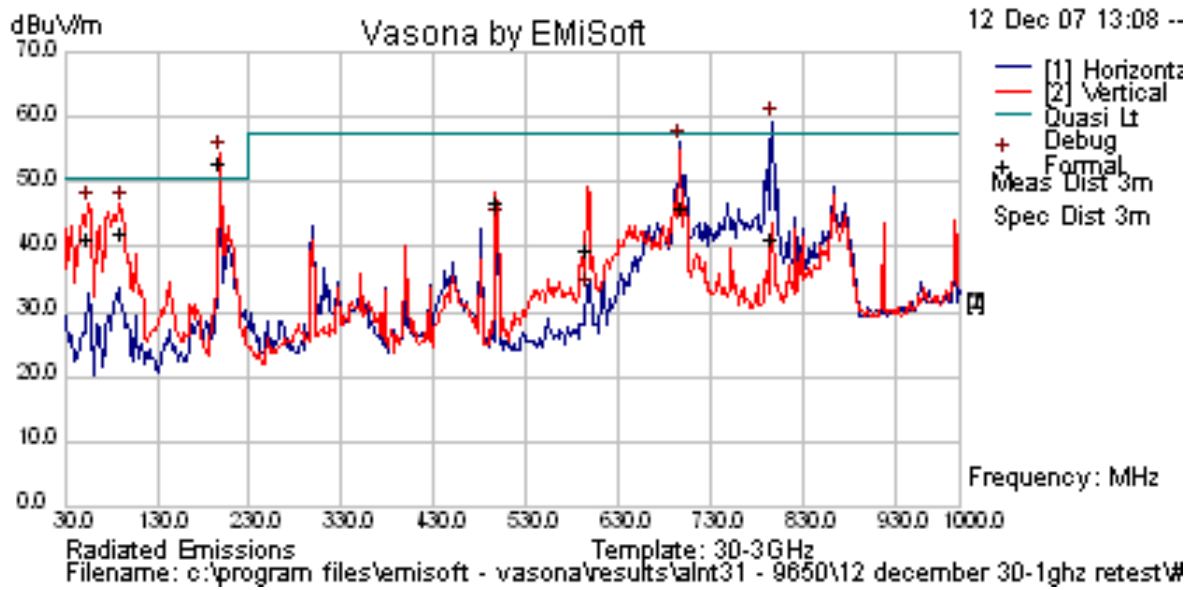
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



TABLE OF RESULTS – ac/dc CONVERTER DIGITAL EMISSIONS 30M – 1 GHz

EUT Transmitting Maximum Output Power

ac/dc Converter Digital Emissions 30 MHz – 1 GHz



| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | PoI | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|--------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 198.619 | 62.04 | 4.74 | -17.08 | 49.7 | Quasi Max | V | 98 | 165 | 50.5 | -0.8 | Pass | |
| 795.892 | 40.23 | 7.15 | -8 | 39.38 | Quasi Max | H | 229 | 354 | 57.5 | -18.12 | Pass | |
| 696.754 | 46.37 | 6.67 | -8.92 | 44.12 | Quasi Max | H | 118 | 0 | 57.5 | -13.38 | Pass | |
| 55.271 | 57.15 | 3.78 | -21.59 | 39.35 | Quasi Max | V | 123 | 91 | 50.5 | -11.15 | Pass | |
| 90.261 | 58.01 | 4.07 | -21.91 | 40.18 | Quasi Max | V | 98 | 246 | 50.5 | -10.32 | Pass | |
| 496.791 | 51.01 | 5.99 | -12.03 | 44.97 | Quasi Max | V | 119 | 18 | 57.5 | -12.53 | Pass | |

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.



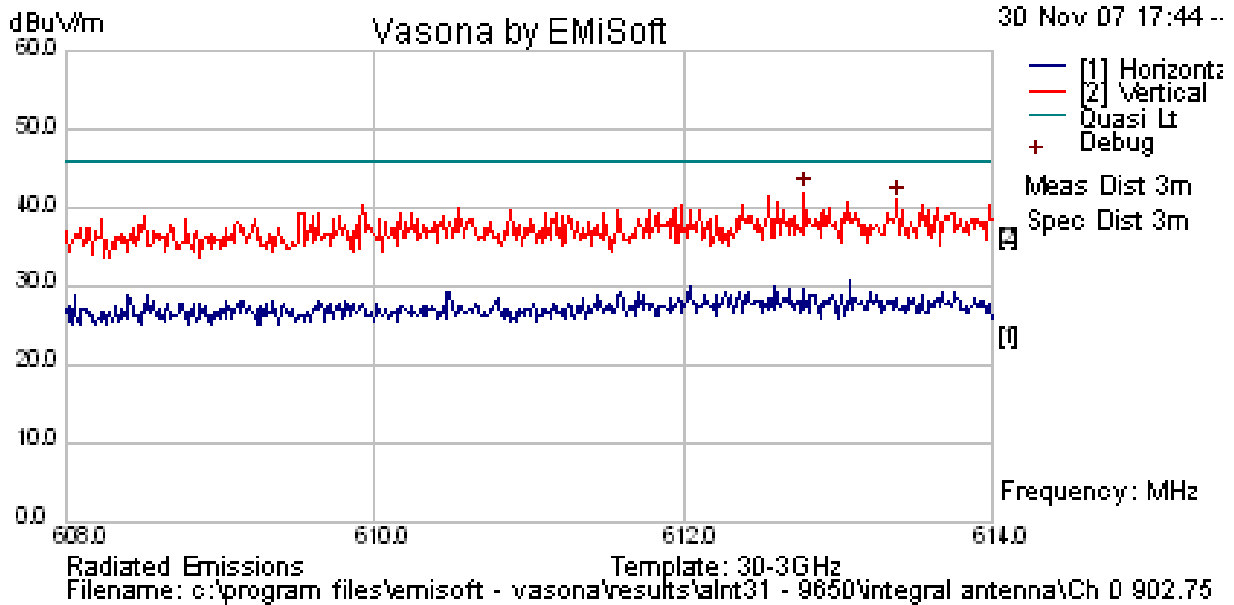
Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 93 of 107

Restricted Bands of Operation 608 – 614 MHz

TABLE OF RESULTS – CHANNEL 902.75 MHz

| 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 |
|---------------|----------|------------|--------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 612.786 | 46.04 | 6.43 | -10.52 | 41.96 | Quasi Max | V | 100 | 0 | 46 | -4.04 | Pass | |
| 613.387 | 45.16 | 6.44 | -10.49 | 41.1 | Quasi Max | V | 100 | 0 | 46 | -4.9 | Pass | |

Restricted Bands of Operation - Channel 902.75 MHz



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.



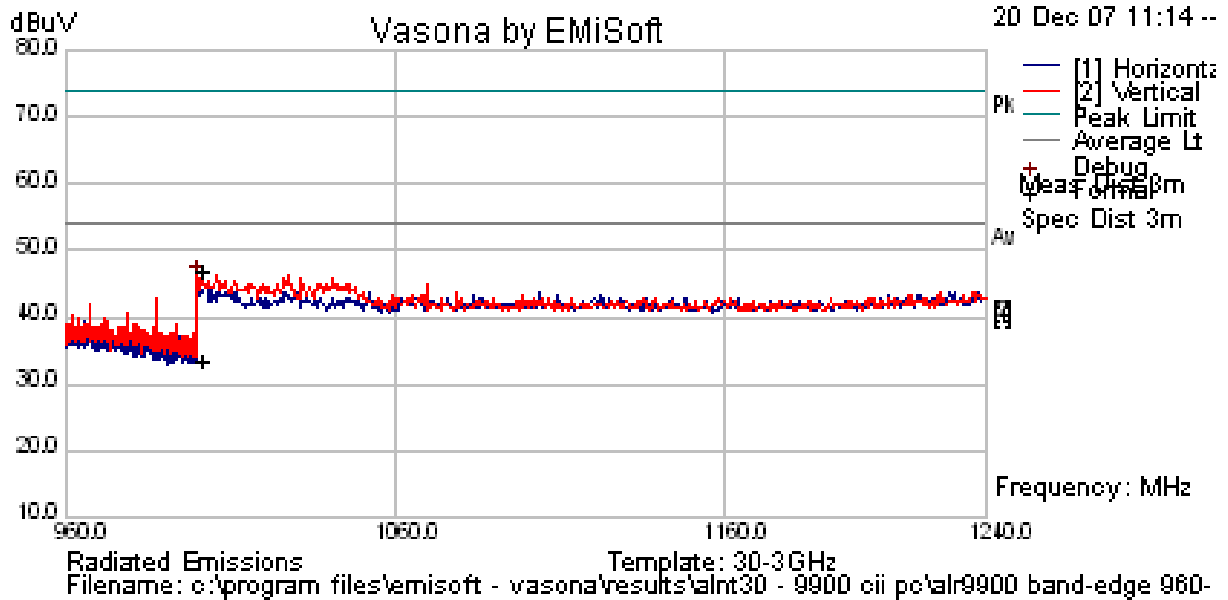
Title: Alien Technology RFID Reader ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 94 of 107

Restricted Bands of Operation 960 – 1240 MHz

TABLE OF RESULTS – CHANNEL 927.25 MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|------------|------------------|-----|--------|---------|------------|-----------|------------|----------|
| 1001.878 | 43.62 | 7.69 | -6.29 | 45.03 | Peak Max | V | 104 | 11 | 74 | -28.97 | Pass | |
| 1001.878 | 29.91 | 7.69 | -6.29 | 31.32 | Average Max | V | 104 | 11 | 54 | -22.68 | Pass | |

Restricted Bands of Operation - Channel 902.75 MHz



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.

§15.209 (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table.

§15.209 (a) and RSS-Gen §2.2 Limit Matrix

| Frequency(MHz) | Field Strength (µV/m) | Field Strength (dBµV/m) | Measurement Distance (meters) |
|----------------|-----------------------|-------------------------|-------------------------------|
| 30-88 | 100 | 40.0 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46.0 | 3 |
| Above 960 | 500 | 54.0 | 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' | 0088, 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.

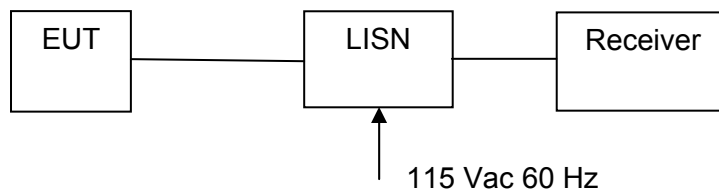
5.1.10. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

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: Full Power

Active antenna port: Integral

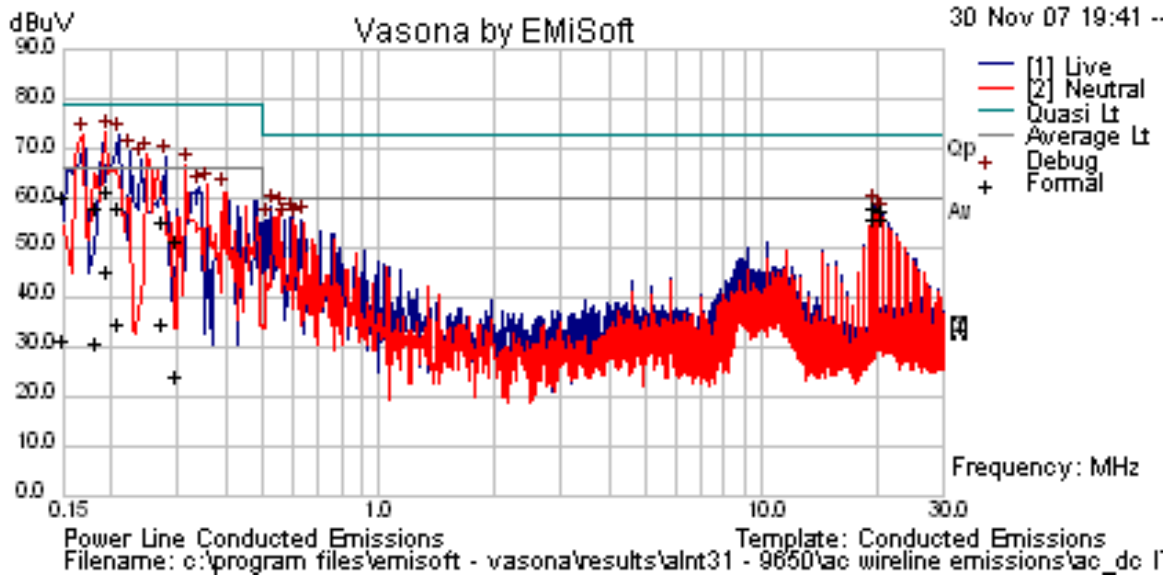


TABLE OF RESULTS

Ac/dc converter 115 Vac 60 Hz

| Freq (MHz) | Line | Peak (dBμV) | QP (dBμV) | QP Limit (dBμV) | QP Margin (dB) | Ave. (dBμV) | Ave. Limit (dBμV) | Ave. Margin (dB) |
|------------|-------|-------------|-----------|-----------------|----------------|-------------|-------------------|------------------|
| 0.197 | Live | 73.31 | 58.78 | 79 | -20.22 | 42.85 | 66 | -23.15 |
| 19.625 | Live | 58.4 | 55.3 | 73 | -17.7 | 53.22 | 60 | -6.78 |
| 0.209 | Live | 72.8 | 55.29 | 79 | -23.71 | 32.27 | 66 | -33.73 |
| 0.272 | Live | 68.21 | 52.79 | 79 | -26.21 | 31.84 | 66 | -34.16 |
| 20.78 | Live | 56.7 | 54.68 | 73 | -18.32 | 52.95 | 60 | -7.05 |
| 0.151 | Neut. | 72.68 | 57.84 | 79 | -21.16 | 28.83 | 66 | -37.17 |

Ac/dc Converter Conducted Emissions (150 kHz – 30 MHz)



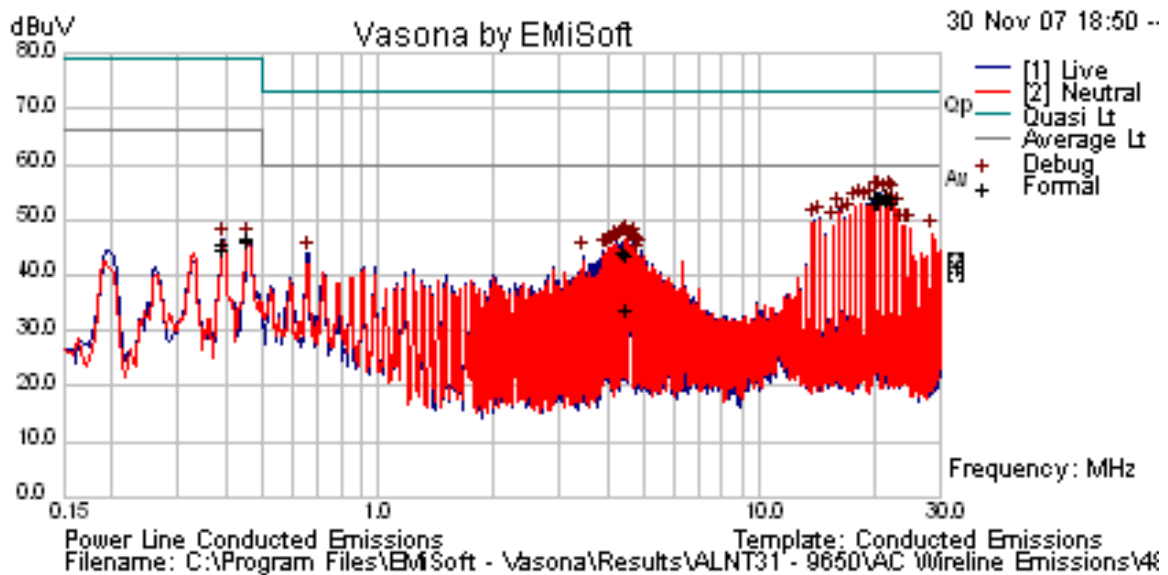
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



POE 115 Vac 60 Hz

| Freq (MHz) | Line | Peak (dB μ V) | QP (dB μ V) | QP Limit (dB μ V) | QP Margin (dB) | Ave. (dB μ V) | Ave. Limit (dB μ V) | Ave. Margin (dB) |
|------------|-------|-------------------|-----------------|-----------------------|----------------|-------------------|-------------------------|------------------|
| 20.772 | Live | 54.77 | 51.94 | 73 | -21.06 | 50.7 | 60 | -9.3 |
| 21.925 | Live | 54.64 | 52.02 | 73 | -20.98 | 51.48 | 60 | -8.52 |
| 20.195 | Live | 54.48 | 51.58 | 73 | -21.42 | 50.6 | 60 | -9.4 |
| 4.442 | Neut. | 46.28 | 41.8 | 73 | -31.2 | 41.8 | 60 | -18.2 |
| 22.504 | Neut. | 54.41 | 51.56 | 73 | -21.44 | 50.52 | 60 | -9.48 |
| 0.457 | Neut. | 46.44 | 44.17 | 79 | -34.83 | 43.58 | 66 | -22.42 |

POE Conducted Emissions (150 kHz – 30 MHz)



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 μ 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 | ± 2.64 dB |
|-------------------------|---------------|

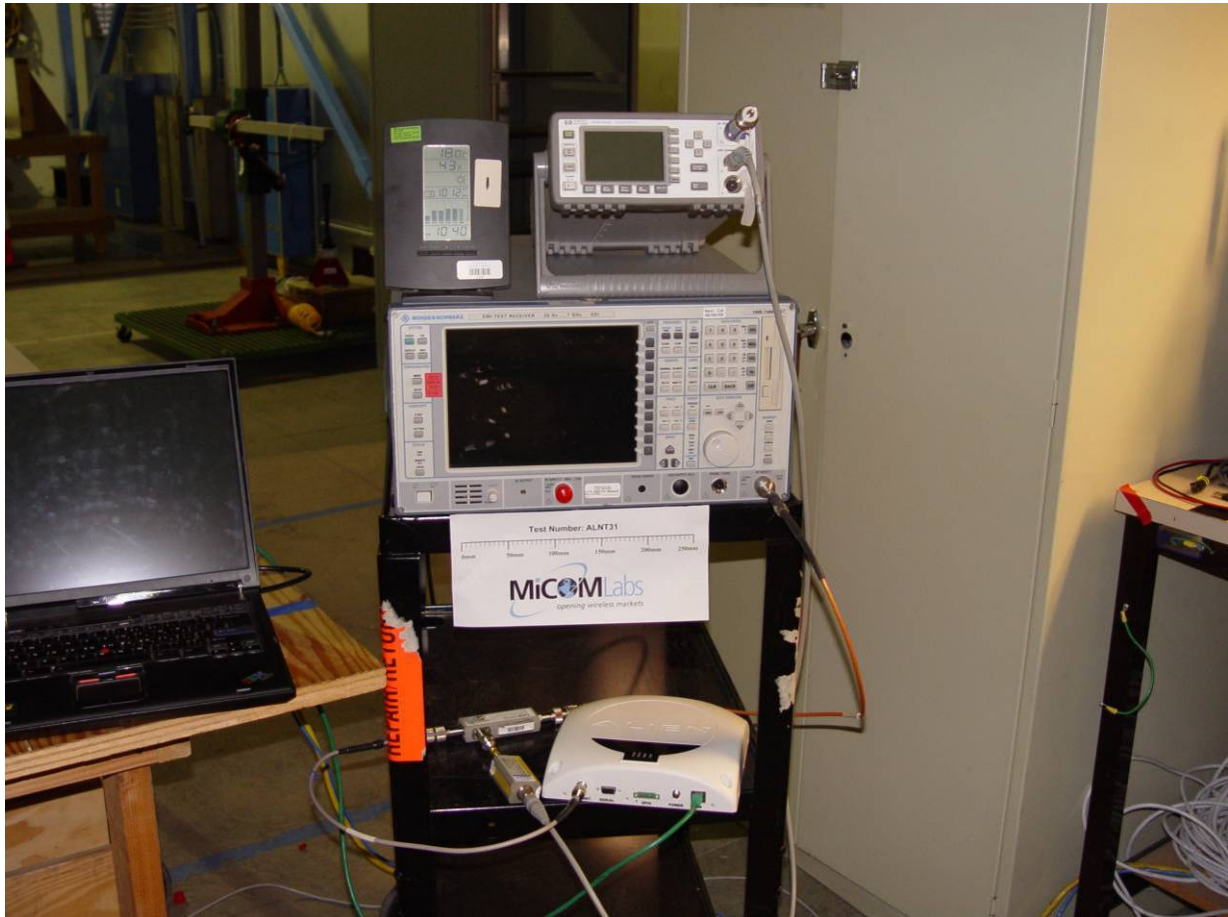
Traceability

| 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

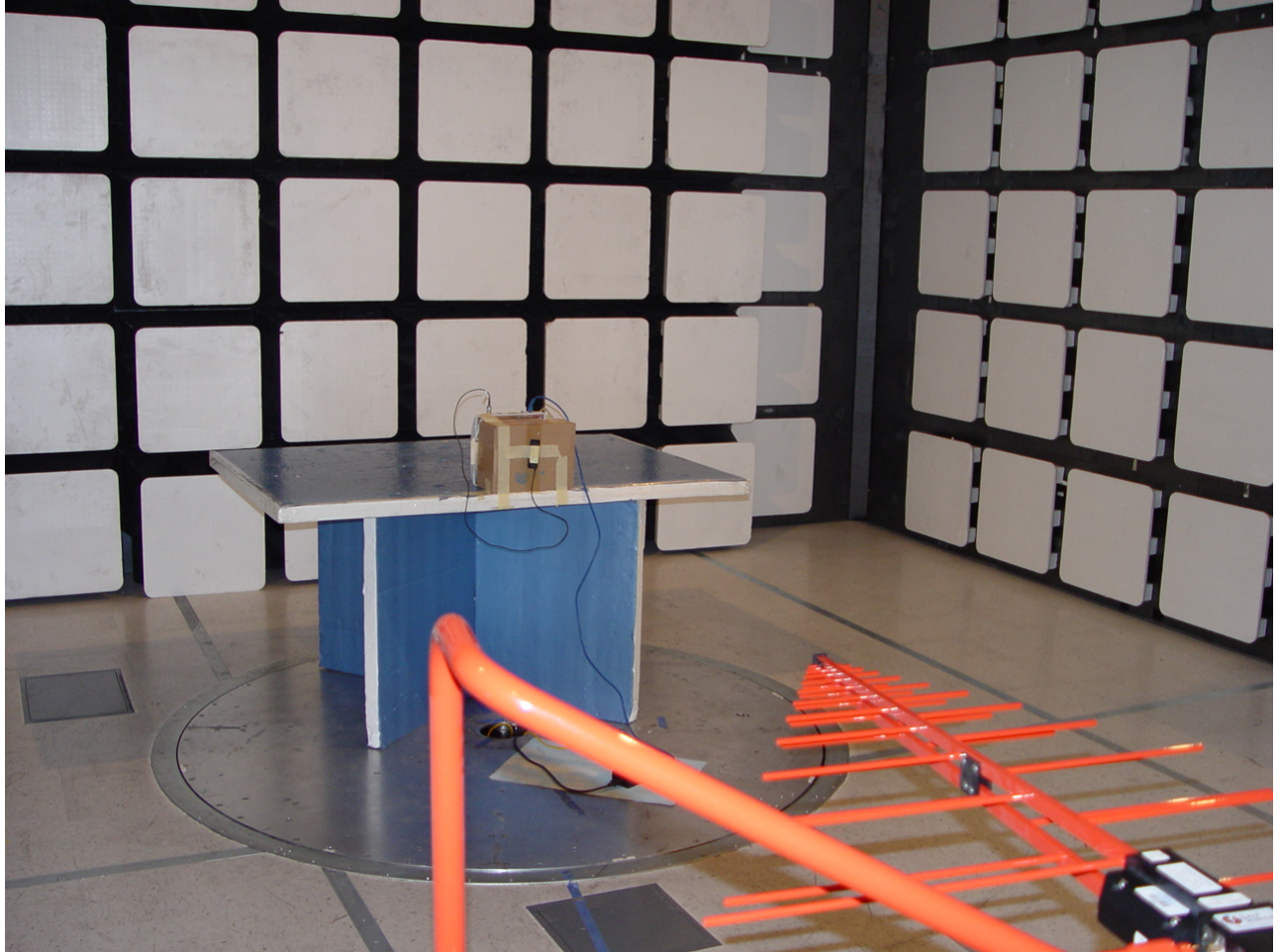
6.1. General Measurement Test Set-up



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.

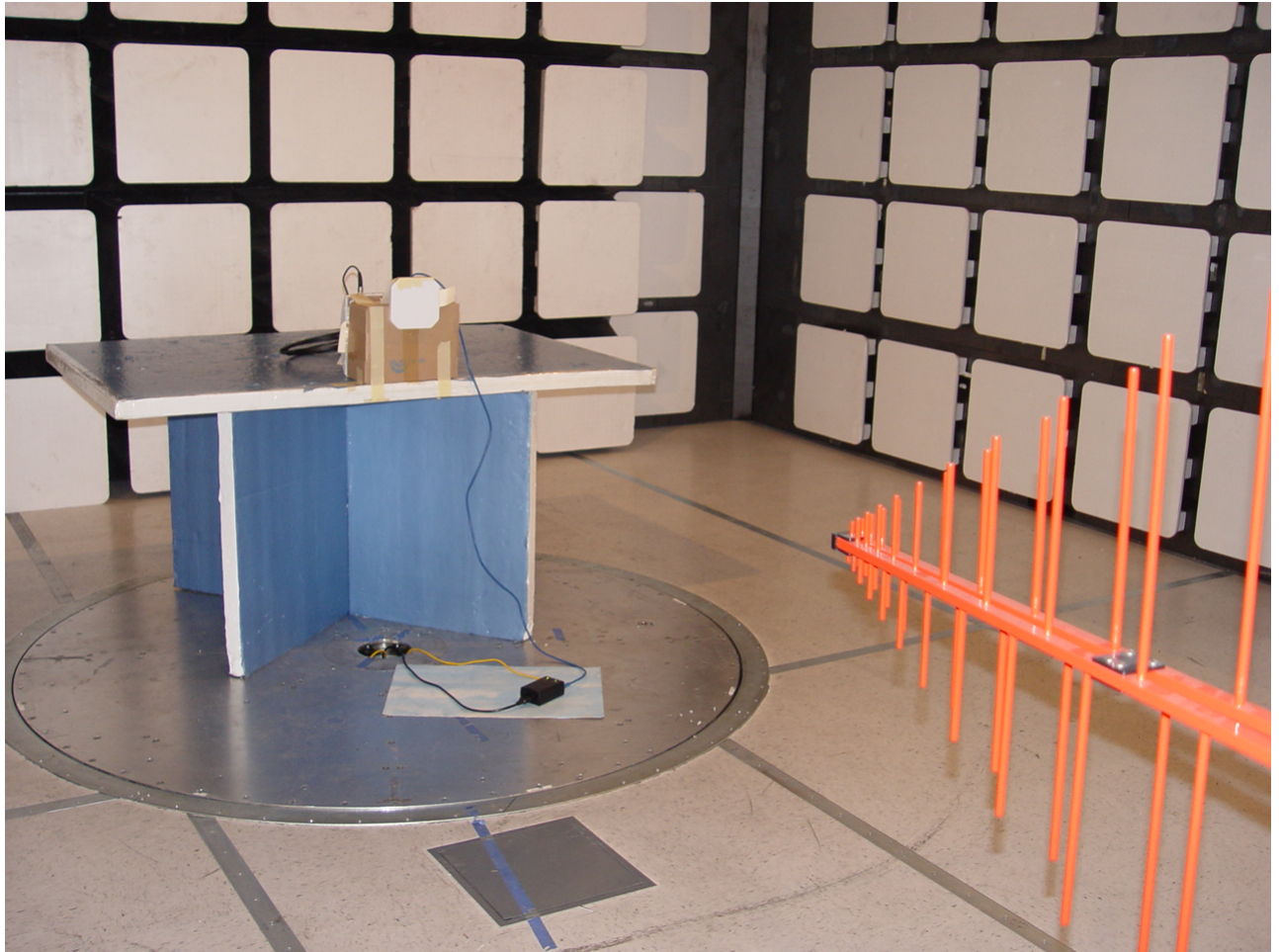
6.2. Radiated Emissions <1 GHz

Mobile Mark CVS915 Strip Antenna 2.5 dBi



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.

ALR-9608-KIT Circular Patch 5"X5" Antenna 6 dBi



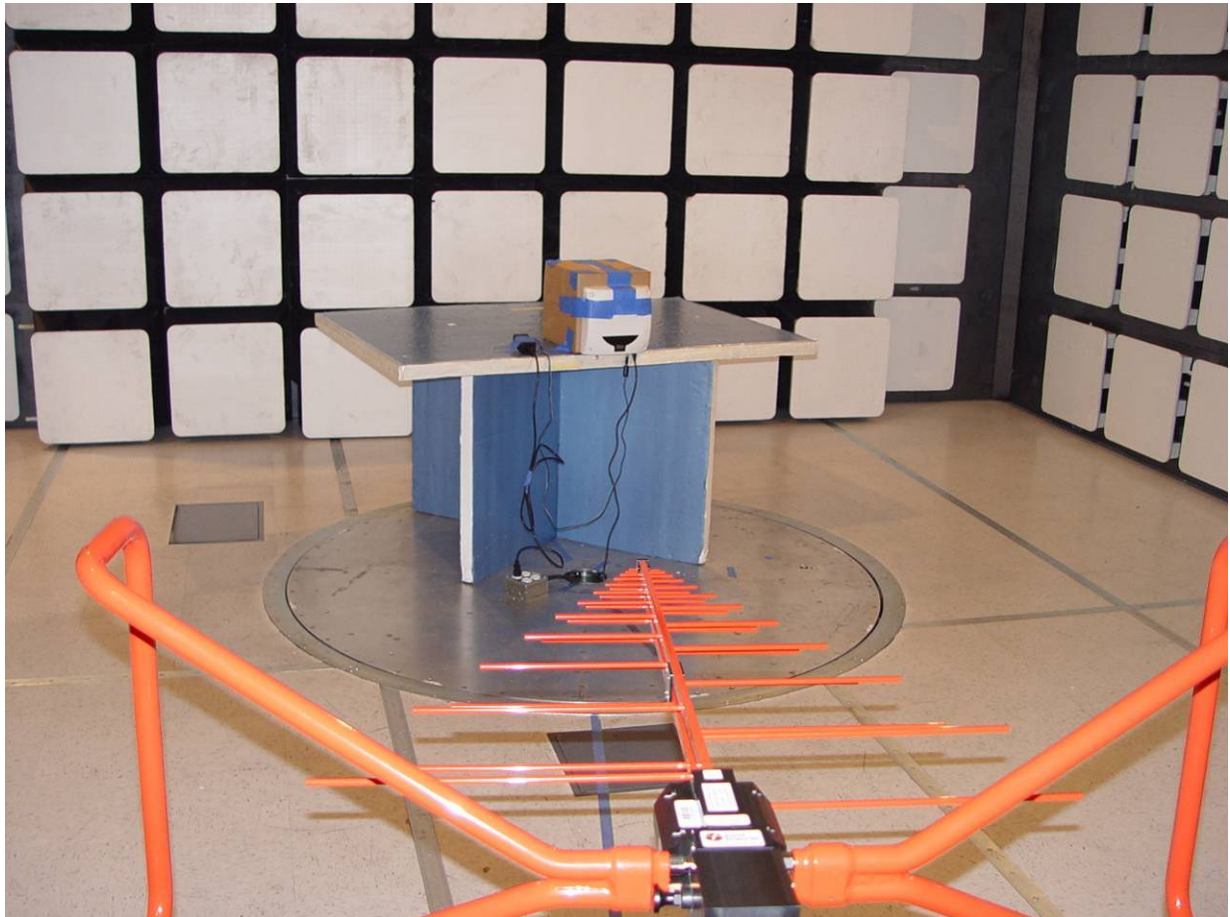
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

Cushcraft S9028PC Circular Patch 6 dBi



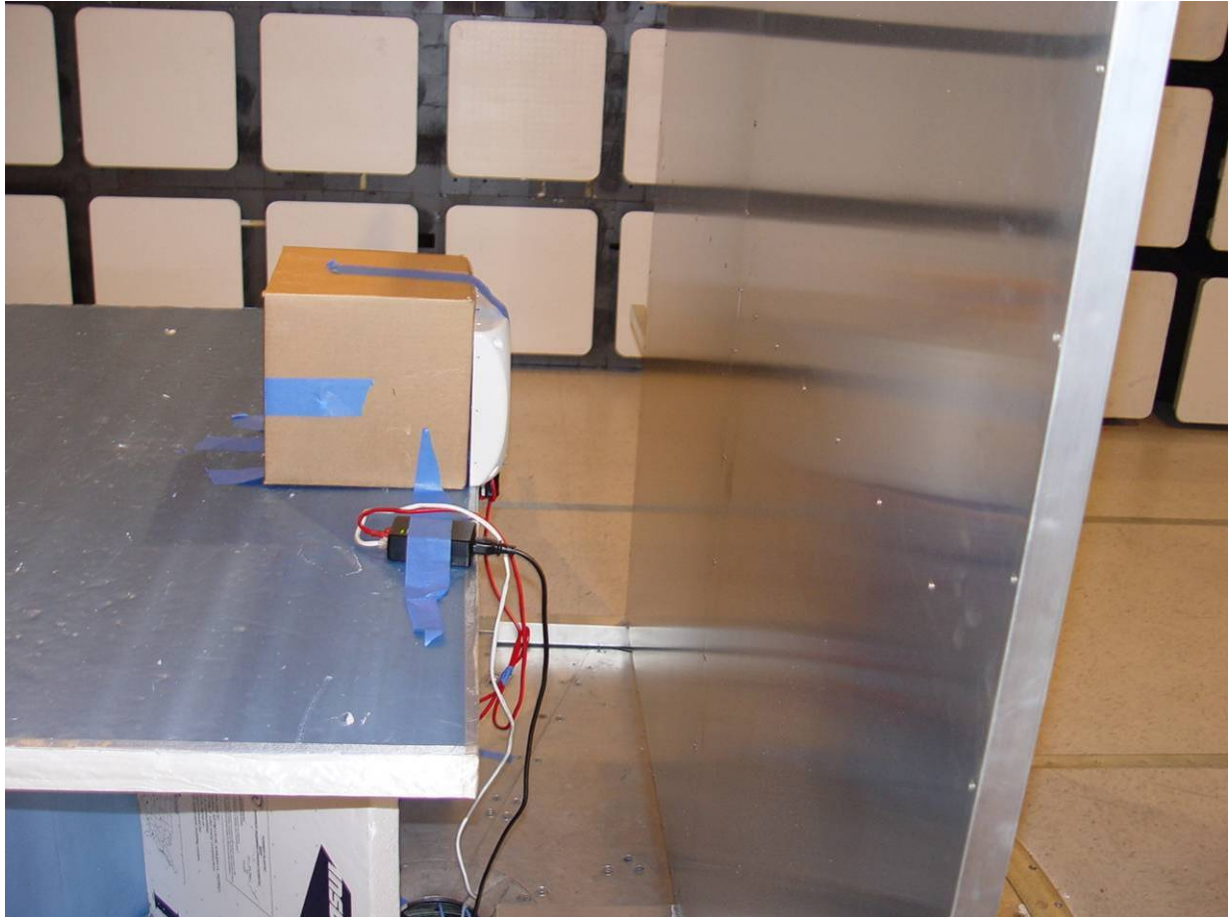
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

Integral circular polarized antenna 6dBi



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



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 ALR9650
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: ALNT33 A2 Rev A
Issue Date: 10th November '08
Page: 106 of 107

7. TEST EQUIPMENT DETAILS

| Asset # | Instrument | Manufacturer | Part # | Serial # |
|---------|--------------------------|-------------------------------|-----------------------|-------------|
| 0088 | Spectrum Analyzer | Hewlett Packard | 8564E | 3410A00141 |
| 0104 | 1-18GHz Horn Antenna | The Electro-Mechanics Company | 3115 | 9205-3882 |
| 0134 | Amplifier | Com Power | PA 122 | 181910 |
| 0158 | Barometer /Thermometer | Control Co. | 4196 | E2846 |
| 0193 | EMI Receiver | Rhode & Schwartz | ESI 7 | 838496/007 |
| 0252 | SMA Cable | Megaphase | Sucoflex 104 | None |
| 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 | 30dB N-Type Attenuator | ARRA | N9444-30 | 1623 |
| 0070 | Power Meter | Hewlett Packard | 437B | 3125U11552 |
| 0116 | Power Sensor | Hewlett Packard | 8485A | 3318A19694 |
| 0117 | Power Sensor | Hewlett Packard | 8487D | 3318A00371 |
| 0184 | Pulse Limiter | Rhode & Schwartz | ESH3Z2 | 357.8810.52 |
| 0190 | LISN | Rhode & Schwartz | ESH3Z5 | 836679/006 |
| 0293 | BNC Cable | Megaphase | 1689 1GVT4 | 15F50B001 |
| 0307 | BNC Cable | Megaphase | 1689 1GVT4 | 15F50B002 |
| 0341 | 902-928 MHz Notch Filter | EWT | EWT-14-0199 | H1 |

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