

# TEST RESULT SUMMARY

**FCC Part 15 Subpart C Section 15.249**

**IC RSS-210 Issue 6**

**IC RSS-Gen Issue 1**

MANUFACTURER Data Sciences International

NAME OF EQUIPMENT Primate Repeaters

MODEL NUMBERS **RPT-910-3**  
**RPT-980-3**

MANUFACTURER'S ADDRESS 4358 West Round Lake Rd.  
Arden Hills, MN 55112

TEST REPORT NUMBER WC602546 Rev A

TEST DATES 8 & 15 March, 5 May 2006

According to testing performed at TÜV America Inc, the above-mentioned unit is in compliance with the applicable electromagnetic compatibility (EMC) portions of the requirements defined in FCC Part 15 Subpart C Section 15.249 and Industry Canada RSS-210 Issue 6 Sections A2.9 and 2.6, RSS Gen Issue 1 Section 4.4.1

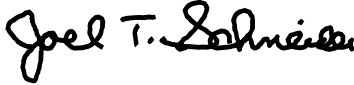
It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

TÜV America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart C Section 15.249 and Industry Canada RSS-210 Issue 6 Sections A2.9 and 2.6, RSS Gen Issue 1 Section 4.4.1

Date: 24 May 2006

Location: Taylors Falls MN  
USA

  
\_\_\_\_\_  
JC Sausen  
EMC Technician

  
\_\_\_\_\_  
JT Schneider  
Senior EMC Engineer

Not Transferable

# EMC Emission - TEST REPORT

Test Report File No. : **WC602546 Rev A** Date of issue: 24 May 2006

Model / Serial nos. : **RPT-910-3 / 00029**  
**RPT-980-3 / 00032**

Product Name : Primate Repeater

Product Type : Primate Repeater

Applicant : Data Sciences International

Manufacturer : Data Sciences International

License Holder : Data Sciences International

Address : 4358 West Round Lake Rd.  
Arden Hills, MN 55112

Test Result :  Positive  Negative

Test Project Number Reference(s) : **WC602546 Rev A**

Total pages including Appendices 35

*TÜV America Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV America Inc issued reports.*

*This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP, NIST, or any agency of the US government.*

*TÜV America Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NVLAP, and VCCI*

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**Sign Explanations:**

- not applicable
- applicable

### R E V I S I O N   R E C O R D

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	48	16 May 2006	Initial Release
A	35	24 May 2006	Revisions include: <ul style="list-style-type: none"> <li>▪ Remove all references to separate receivers</li> </ul>

## EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> - EN 50081-1 / 1991                | <input type="checkbox"/> - Group 1                          | <input type="checkbox"/> - Group 2            |
| <input type="checkbox"/> - EN 55011 / 1991                  | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input type="checkbox"/> - EN 55013 / 1990                  |   |   |
| <input type="checkbox"/> - EN 55014 / 1987                  | <input type="checkbox"/> - Household appliances and similar |   |
|   | <input type="checkbox"/> - Portable tools                   |   |
|   | <input type="checkbox"/> - Semiconductor devices            |   |
| <input type="checkbox"/> - EN 55014 / A2:1990               | <input type="checkbox"/> - Household appliances and similar |   |
| <input type="checkbox"/> - EN 55014 / 1993                  | <input type="checkbox"/> - Portable tools                   |   |
|   | <input type="checkbox"/> - Semiconductor devices            |   |
| <input type="checkbox"/> - EN 55015 / 1987                  |   |   |
| <input type="checkbox"/> - EN 55015 / A1:1990               |   |   |
| <input type="checkbox"/> - EN 55015 / 1993                  |   |   |
| <input type="checkbox"/> - EN 55022 / 1987                  | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input type="checkbox"/> - EN 55022 / 1991                  | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input type="checkbox"/> - BS                               |   |   |
| <input type="checkbox"/> - VCCI                             | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input type="checkbox"/> - FCC Part 15 Subpart B            | <input type="checkbox"/> - Class A                          | <input checked="" type="checkbox"/> - Class B |
| <input checked="" type="checkbox"/> - FCC Part 15 Subpart C |   |   |
| <input type="checkbox"/> - CISPR 11 (1990)                  | <input type="checkbox"/> - Group 1                          | <input type="checkbox"/> - Group 2            |
|   | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input type="checkbox"/> - CISPR 22 (1993)                  | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input checked="" type="checkbox"/> - IC RSS-210 Issue 6    |   |   |
| <input checked="" type="checkbox"/> - IC RSS-Gen Issue 1    |   |   |

## RF Exposure Statement

The repeaters comply with the RF exposure limits for humans as called out in FCC 2.1091 and IC RSS-102 2.5.2 (mobile >20 cm) or FCC 2.1093 and IC RSS-102 2.5.1 (portable <20 cm). Based on the highest field strength measured from the different samples, they are exempt from RF Evaluation because of their operating frequency range of 911.1 - 918.1 MHz, and ERP of  $\leq 96 \mu\text{W}$  based on;

$$\text{ERP} = E \text{ (dBuV/m)} - 106.92 + 20 \log D \text{ (km)} = 86.61 - 106.92 + 20 \log .003 = -70.18 \text{ dBk} = 95.94 \mu\text{W}.$$

This is less than the 1.5 W requirement for a mobile device, or the 200 mW requirement for a portable device.

## Transmitter fundamental, FCC 15.249, IC RSS-210 A2.9

### Test summary

The requirements are: ■ - MET □ - NOT MET

Transmitters were tested on an open field test site

Transmitters were tested at both lowest and highest frequencies (i.e. 911.1 & 918.1 MHz)

Minimum margin of compliance is 4.3 dB at 911.1 MHz

### Test location

■ - Wild River Lab Large Test Site (Open Area Test Site)

□ - Wild River Lab Small Test Site (Open Area Test Site)

### Test Distance

■ - 3 meters

□ - 10 meters

### Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3204	EM-6917B	Electro-Metrics	Biconicalog Periodic	102	19-Oct-06
3961	ZHL-1042J	Mini-Circuits	Preamplifier	D120403-1	Code B
2680	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00343	01-Jun-06
3196	8566B	Hewlett Packard	Spectrum Analyzer	2240A01856	07 Oct-06
3195	85662A	Hewlett Packard	Analyzer Display	2648A13518	07 Oct-06
3367	E4440A	Agilent	Spectrum Analyzer	MY43362222	02-Sep-06

Cal Code B = Calibration verification performed internally.

### Test limit

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz .....	50	500
2400–2483.5 MHz .....	50	500
5725–5875 MHz .....	50	500
24.0–24.25 GHz .....	250	2500

94dB $\mu$ V/m at 911.1 MHz

### Test Data

Pages A2, A7

## Transmitter harmonics, FCC 15.249, IC RSS-210 A2.9

### Test summary

The requirements are:  - MET  - NOT MET

Transmitters were tested at both lowest and highest frequencies (i.e. 911.1 & 918.1 MHz)

Minimum margin of compliance is 5.6 dB at 1836 MHz

### Test location

- Wild River Lab Large Test Site (Open Area Test Site)

- Wild River Lab Small Test Site (Open Area Test Site)

### Test Distance

- 3 meters

- 10 meters

### Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
2075	3115	Electro-Mechanics (EMCO)	Ridge Guide Ant. 1-18 GHz	9001-3275	07-Dec-06
3958	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0002	Code B
3961	ZHL-1042J	Mini-Circuits	Preamplifier	D120403-1	Code B
2680	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00343	01-Jun-06
3196	8566B	Hewlett-Packard	Spectrum Analyzer	2240A01856	07 Oct-06
3195	85662A	Hewlett Packard	Analyzer Display	2648A13518	07 Oct-06
2003	F550B1	Acronetics	4 – 8 GHz Bandpass Filter	010	Code B
3933	F551B-1	Acronetics	8 – 12 GHz Bandpass Filter	010	Code B
3934	F549B-1	Acronetics	2 – 4 GHz Bandpass Filter	010	Code B
3935	F548B-1	Acronetics	1 – 2 GHz Bandpass Filter	010	Code B

Cal Code B = Calibration verification performed internally.

### Test limit

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz .....	50	500
2400–2483.5 MHz .....	50	500
5725–5875 MHz .....	50	500
24.0–24.25 GHz .....	250	2500

74dB $\mu$ V/m at 1836 MHz

### Test Data

Pages A2 - A4, A7 - A8

## Transmitter spurious emissions, FCC 15.249 (d), IC RSS-210 A2.9 (2)

### Test summary

The requirements are: ■ - MET □ - NOT MET

No spurious emissions detected

Minimum margin of compliance is >10dB from 30 MHz to 9.2 GHz

### Test location

■ - Wild River Lab Large Test Site (Open Area Test Site)

□ - Wild River Lab Small Test Site (Open Area Test Site)

### Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
2075	3115	Electro-Mechanics (EMCO)	Ridge Guide Ant. 1-18 GHz	9001-3275	07-Dec-06
3204	EM-6917B	Electro-Metrics	Biconicalog Periodic	102	19-Oct-06
3958	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0002	Code B
3961	ZHL-1042J	Mini-Circuits	Preamplifier 30 - 5000 MHz	D120403-1	Code B
2680	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00343	01-Jun-06
3196	8566B	Hewlett Packard	Spectrum Analyzer	2240A01856	07 Oct-06
3195	85662A	Hewlett Packard	Analyzer Display	2648A13518	07 Oct-06
2003	F550B1	Acronetics	4 – 8 GHz Bandpass Filter	010	Code B
3933	F551B-1	Acronetics	8 – 12 GHz Bandpass Filter	010	Code B
3934	F549B-1	Acronetics	2 – 4 GHz Bandpass Filter	010	Code B
3935	F548B-1	Acronetics	1 – 2 GHz Bandpass Filter	010	Code B
3367	E4440A	Agilent	Spectrum Analyzer	MY43362222	02-Sep-06

Cal Code B = Calibration verification performed internally.

### Test limit

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490 .....	2400/F(kHz)	300
0.490–1.705 .....	24000/F(kHz)	30
1.705–30.0 .....	30	30
30–88 .....	100 **	3
88–216 .....	150 **	3
216–960 .....	200 **	3
Above 960 .....	500	3

### Test Data

Pages A2, A7

## Occupied Bandwidth, IC RSS-Gen 4.4.1

### Test summary

The requirements are:  - MET  - NOT MET  
Occupied bandwidth recorded

### Test location

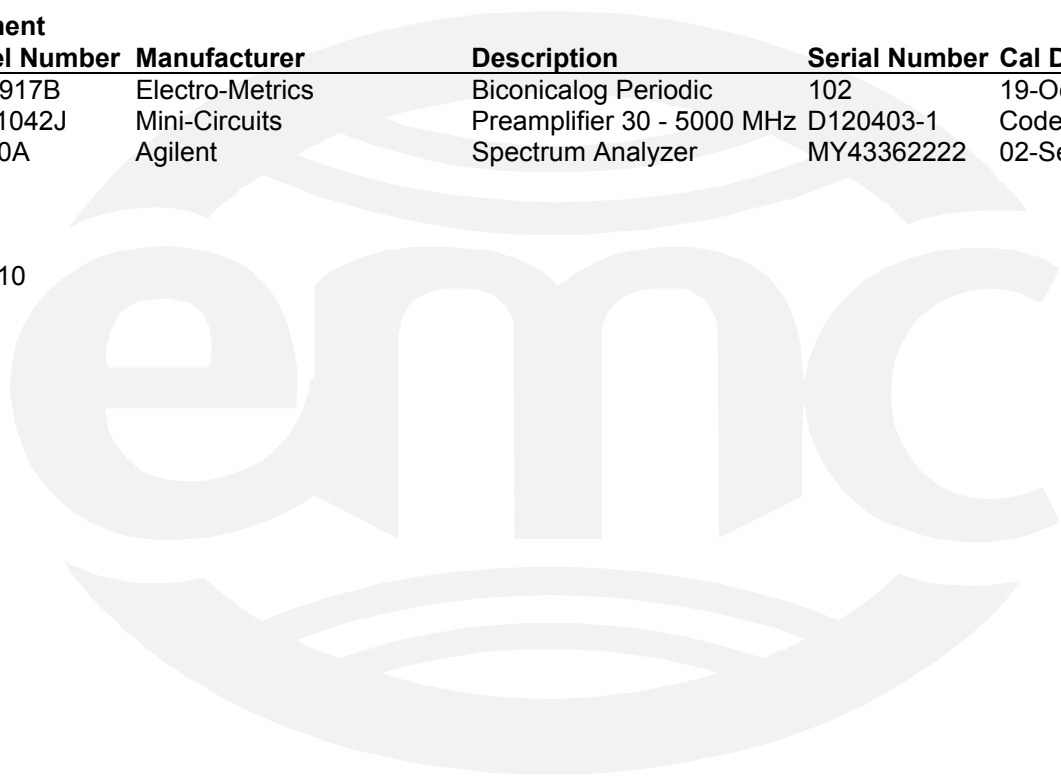
- Wild River Lab Large Test Site (Open Area Test Site)  
 - Wild River Lab Small Test Site (Open Area Test Site)

### Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3204	EM-6917B	Electro-Metrics	Biconicalog Periodic	102	19-Oct-06
3961	ZHL-1042J	Mini-Circuits	Preamplifier 30 - 5000 MHz	D120403-1	Code B
3367	E4440A	Agilent	Spectrum Analyzer	MY43362222	02-Sep-06

### Test Data

Pages A6, A10



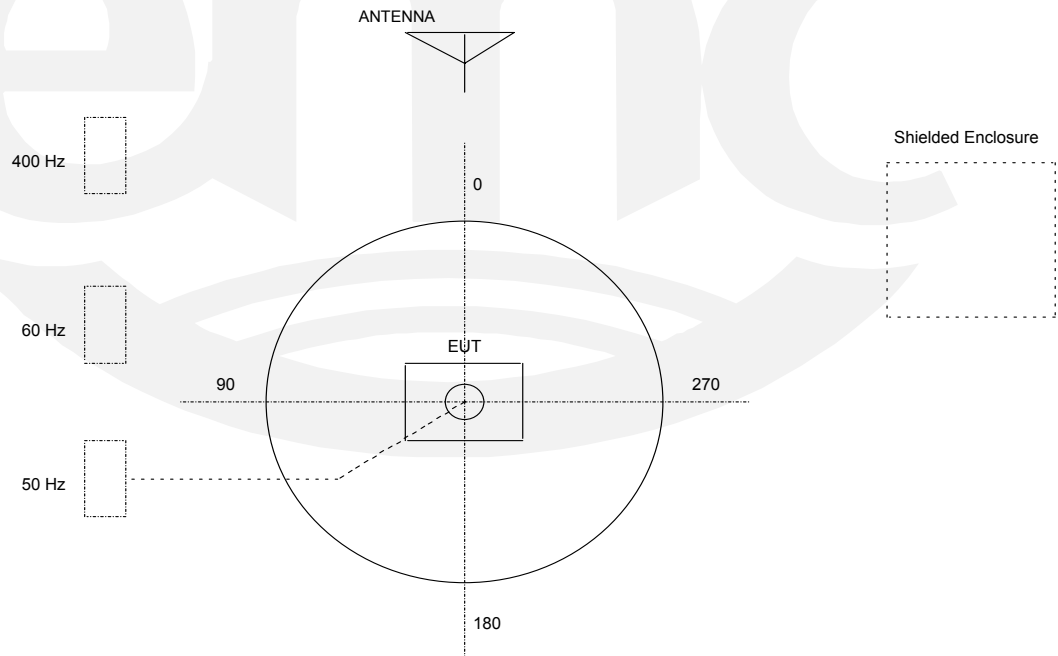


## TEST SETUP FOR EMISSIONS TESTING

### WILD RIVER LAB Large Test Site

#### Notes:

1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.
2. 50 Hz, 60 Hz, and 400 Hz are power panels for alternating current.
3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.
4. The circle is a 6.7 meter diameter turntable.
5. A ground plane is in the plane of this sheet.
6. The test sample is shown in the azimuthal position representing zero degrees.



## Test Operation Mode:

The device under test was operated under the following conditions during emissions testing:

### Manufacturer's statement;

The repeater enclosure, battery compartment and antenna are mounted on a collar that is fastened around the neck of the implanted subject from which data is collected for transfer to the data collection system. This is the only method of operation since close coupling of the implant antenna coil and the receiver input coil is required. However, the unit was tested in a stand alone arrangement without use of a mounting simulator on an OATS site for compliance purposes.



**DEVIATIONS FROM STANDARD:**

None.

**GENERAL REMARKS:**

Repeater plots done under test report number WC601130, 8 March 2006

Modifications required to pass:

- None
- As indicated on the data sheet(s)

Test Specification Deviations: Additions to or Exclusions from:

- None
- As indicated in the Test Plan

**SUMMARY:**

The requirements according to the technical regulations are

- met
- **not** met.

The device under test does

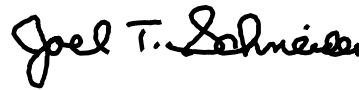
- fulfill the general approval requirements mentioned on page 3.
- **not** fulfill the general approval requirements mentioned on page 3.

EUT Received Date: 6 March 2006  
Condition of EUT: Normal  
Testing Start Date: 8 March, 2006  
Testing End Date: 5 May, 2006

- TÜV AMERICA INC -



JC Sausen  
EMC Technician



JT Schneider  
Senior EMC Engineer

## Appendix A

Test Data Sheets





# RADIATED EMISSIONS



America

Test Report #: WC602546 Run 1 Test Area: LTS  
EUT Model #: RPT-910-3 Date: 5/5/2006  
EUT Serial #: 00029 EUT Power: Internal Battery Temperature: 22.0 °C  
Test Method: FCC - 15.249 Air Pressure: 99.0 kPa  
Customer: DSI Rel. Humidity: 30.0 %

EUT Description: 911.1 MHz RF repeater. Primate Collar

Notes: Stand alone at maximum power output.

Data File Name: 2546.dat

Page: 2 of 5

## List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	15.249 LIMIT (dB $\mu$ V/m)	DELTA
8.2 GHz	36.55 Av	8.8 / 36.82 / 45.73 / 0.0	36.43	V / 1.00 / 0	54	-17.57
8.2 GHz	44.25 Pk	8.8 / 36.82 / 45.73 / 0.0	44.13	V / 1.00 / 0	74	-29.87
9.111 GHz	35.55 Av	9.68 / 37.37 / 44.83 / 0.0	37.77	V / 1.00 / 0	54	-16.23
9.111 GHz	44.9 Pk	9.68 / 37.37 / 44.83 / 0.0	47.12	V / 1.00 / 0	74	-26.88

Tested by: J. C. Sausen

Printed

Signature

Reviewed by: Greg Jakubowski

Printed

Signature

# RADIATED EMISSIONS



America

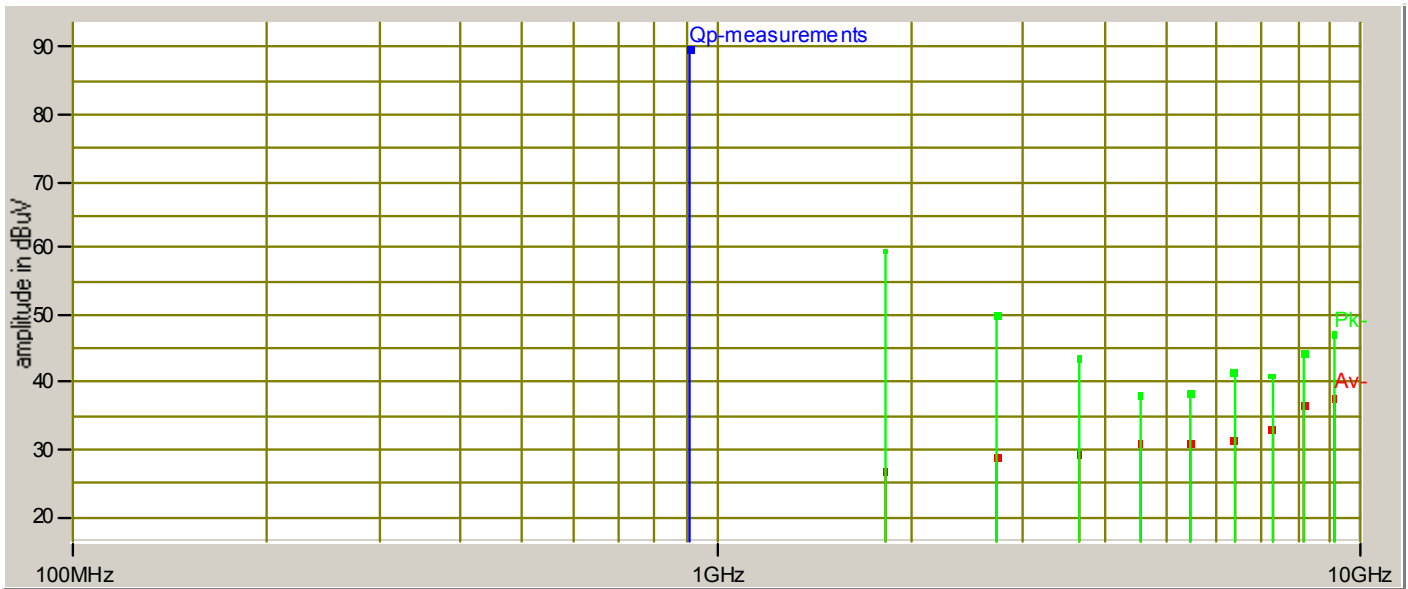
Test Report #: WC602546 Run 1 Test Area: LTS  
EUT Model #: RPT-910-3 Date: 5/5/2006  
EUT Serial #: 00029 EUT Power: Internal Battery Temperature: 22.0 °C  
Test Method: FCC - 15.249 Air Pressure: 99.0 kPa  
Customer: DSI Rel. Humidity: 30.0 %

EUT Description: 911.1 MHz RF repeater. Primate Collar

Notes: Stand alone at maximum power output.

Data File Name: 2546.dat Page: 3 of 5

## Graph:



Tested by: J. C. Sausen  
Printed

J. C. Sausen  
Signature

Reviewed by: Greg Jakubowski  
Printed

G. Jakubowski  
Signature

# RADIATED EMISSIONS



America

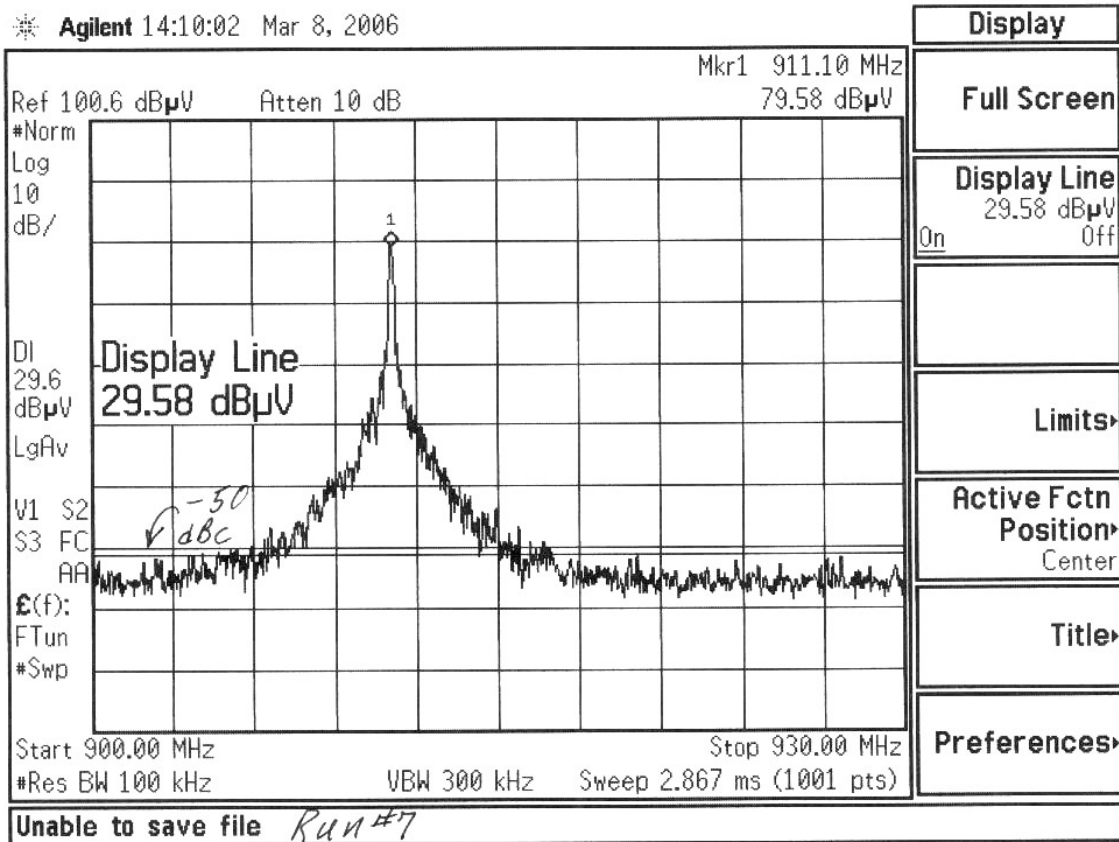
Test Report #: WC602546 Run 1 Test Area: LTS  
 EUT Model #: RPT-910-3 Date: 5/5/2006  
 EUT Serial #: 00029 EUT Power: Internal Battery Temperature: 22.0 °C  
 Test Method: FCC - 15.249 Air Pressure: 99.0 kPa  
 Customer: DSI Rel. Humidity: 30.0 %

EUT Description: 911.1 MHz RF repeater. Primate Collar

Notes: Stand alone at maximum power output.

Data File Name: 2546.dat Page: 4 of 5

Band edge



Tested by: J. C. Sausen  
 Printed

*J. C. Sausen*  
 Signature

Reviewed by: Greg Jakubowski  
 Printed

*G. Jakubowski*  
 Signature