

TEST RESULT SUMMARY

FCC Part 15 Subpart B Section 15.109 Class B Limit

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 Large Animal Repeater

MODEL NUMBERS **Repeaters;
RPT-910-3, RPT-980-3**

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

TEST REPORT NUMBER WC601130

TEST DATES 6 - 8 & 15 March, 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 B Section 15.109 Class B Limit, 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.

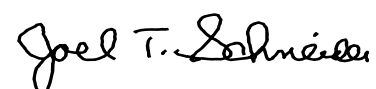
TÜV America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart B Section 15.109 Class B Limit, Subpart C Section 15.249 and Industry Canada RSS-210 Issue 6 Sections A2.9 and 2.6, RSS Gen Issue 1 Section 4.4.1

Date: 20 April 2006

Location: Taylors Falls MN
USA



JC Sausen, MJ Schultz,
RM Johnson
EMC Technicians



JT Schneider
Senior EMC Engineer

Not Transferable

EMC Emission - TEST REPORT

Test Report File No. : **WC601130** Date of issue: 20 April 2006

Model / Serial nos. : **Repeaters;
RPT-910-3 / 28
RPT-980-3 / 29**

Product Name . Large Animal Repeater,

Product Type . Large Animal 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) **WC601130**

Total pages including Appendices 60

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*

D I R E C T O R Y

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Test Results

FCC

IC

Transmitter fundamentals	15.249 (a)	RSS-210 A2.9 (1)	<u>4</u>
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Constructional data form	<u>B2 - B8</u>
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Sign Explanations:

- ☐ - not applicable
- ☒ - applicable

EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

- | | | |
|---|---|---|
| ☐ - EN 50081-1 / 1991 | ☐ - Group 1 | ☐ - Group 2 |
| ☐ - EN 55011 / 1991 | ☐ - Class A | ☐ - Class B |
| ☐ - EN 55013 / 1990 | | |
| ☐ - EN 55014 / 1987 | ☐ - Household appliances and similar | |
| | ☐ - Portable tools | |
| | ☐ - Semiconductor devices | |
| ☐ - EN 55014 / A2:1990 | ☐ - Household appliances and similar | |
| ☐ - EN 55014 / 1993 | ☐ - Portable tools | |
| | ☐ - Semiconductor devices | |
| ☐ - EN 55015 / 1987 | | |
| ☐ - EN 55015 / A1:1990 | | |
| ☐ - EN 55015 / 1993 | | |
| ☐ - EN 55022 / 1987 | ☐ - Class A | ☐ - Class B |
| ☐ - EN 55022 / 1991 | ☐ - Class A | ☐ - Class B |
| ☐ - BS | | |
| ☐ - VCCI | ☐ - Class A | ☐ - Class B |
| ☒ - FCC Part 15 Subpart B | ☐ - Class A | ☒ - Class B |
| ☒ - FCC Part 15 Subpart C | | |
| ☐ - CISPR 11 (1990) | ☐ - Group 1 | ☐ - Group 2 |
| | ☐ - Class A | ☐ - Class B |
| ☐ - CISPR 22 (1993) | ☐ - Class A | ☐ - Class B |
| ☒ - IC RSS-210 Issue 6 | | |
| ☒ - 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 7.3 dB at 911.1 MHz, run 7

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
2679	85650A	Hewlett-Packard	Quasi-Peak Adapter	2430A00550	23-Nov-06
8052	8566B	Hewlett-Packard	Spectrum Analyzer	2115A00853	28-Mar-07
8051	85662A	Hewlett-Packard	Analyzer Display	2112A02220	28-Mar-07
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 μ V/m at 911.1 MHz

Test Data

Pages A2, A7, A13, A17

Transmitter harmonics, 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 2.9 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
2679	85650A	Hewlett-Packard	Quasi-Peak Adapter	2430A00550	23-Nov-06
8052	8566B	Hewlett-Packard	Spectrum Analyzer	2115A00853	28-Mar-07
8051	85662A	Hewlett-Packard	Analyzer Display	2112A02220	28-Mar-07
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

74dBμV/m at 1836 MHz

Test Data

Pages A2 - A4, A7 - A10, A13, A14, A17 - A19

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
2679	85650A	Hewlett-Packard	Quasi-Peak Adapter	2430A00550	23-Nov-06
8052	8566B	Hewlett-Packard	Spectrum Analyzer	2115A00853	28-Mar-07
8051	85662A	Hewlett-Packard	Analyzer Display	2112A02220	28-Mar-07
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 A3, A8, A13, A18

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, A12, A16, A21

Receivers spurious emissions, FCC 15.109 (a), IC RSS-210 A2.6

Test summary

The requirements are: ■ - MET □ - NOT MET

Receivers are separate from transmitters

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
2679	85650A	Hewlett-Packard	Quasi-Peak Adapter	2430A00550	23-Nov-06
8052	8566B	Hewlett-Packard	Spectrum Analyzer	2115A00853	28-Mar-07
8051	85662A	Hewlett-Packard	Analyzer Display	2112A02220	28-Mar-07
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

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

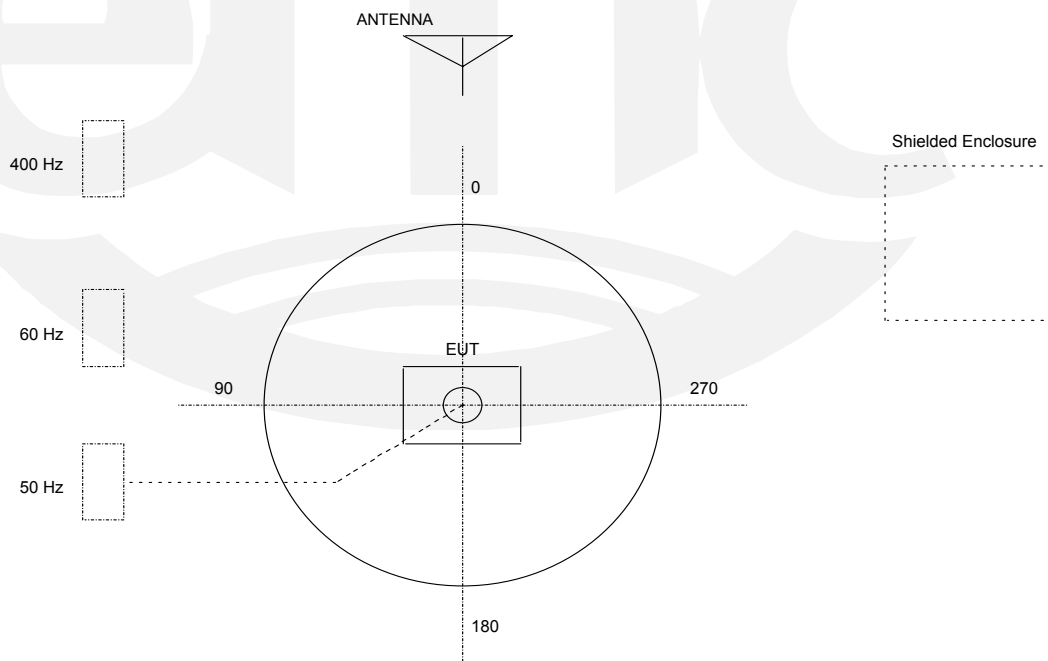
Pages A22 - A29

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.



DEVIATIONS FROM STANDARD:

None.

GENERAL REMARKS:

Receivers tested under report number WC601488

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

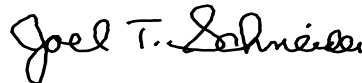
- ☒ - fulfill the general approval requirements mentioned on page 3.
- ☐ - **not** fulfill the general approval requirements mentioned on page 3.

EUT Received Date:	<u>6 March 2006</u>
Condition of EUT:	<u>Normal</u>
Testing Start Date:	<u>6 March, 2006</u>
Testing End Date:	<u>15 March, 2006</u>

- TÜV AMERICA INC -



JC Sausen, MJ Schultz, RM Johnson
EMC Technicians



JT Schneider
Senior EMC Engineer

Appendix A

Test Data Sheets



RADIATED EMISSIONS



Test Report #: WC601130 Run 2 Test Area: LTS

EUT Model #: RPT-910-3 Date: 3/6/2006

EUT Serial #: 28 EUT Power: Internal battery Temperature: 20.0 °C

Test Method: FCC 15.249 Air Pressure: 99.0 kPa

Customer: DSI Rel. Humidity: 20.0 %

EUT Description: 911.1 MHz RF repeater. Large Animal

Notes: _____

Data File Name: 1130.dat

Page: 1 of 5

List of measurements for run #: 2

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	15.249 LIMIT (dBuV/m)	DELTA2
Maximized through 3 axis. Label up is maximum.						
911.086 MHz	55.64 Qp	2.51 / 22.34 / 0.0 / 0.0	80.49	H / 1.20 / 78	94	n/a
911.1 MHz	52.58 Qp	2.51 / 22.34 / 0.0 / 0.0	77.43	V / 1.20 / 170	94	n/a
1.822 GHz	74.5 Pk	4.04 / 26.93 / 49.71 / 0.6	56.36	V / 1.20 / 72	74	n/a
1.822 GHz	46.39 Av	4.04 / 26.93 / 49.71 / 0.6	28.25	V / 1.20 / 72	54	n/a
1.822 GHz	86.35 Pk	4.04 / 26.93 / 49.71 / 0.6	68.21	H / 1.07 / 82	74	n/a
1.822 GHz	46.64 Av	4.04 / 26.93 / 49.71 / 0.6	28.5	H / 1.07 / 82	54	n/a
2.733 GHz	61.0 Pk	4.58 / 29.39 / 48.26 / 0.3	47.01	V / 1.10 / 72	74	n/a
2.733 GHz	43.0 Av	4.58 / 29.39 / 48.26 / 0.3	29.01	V / 1.10 / 72	54	n/a
2.733 GHz	68.4 Pk	4.58 / 29.39 / 48.26 / 0.3	54.41	H / 1.20 / 270	74	n/a
2.733 GHz	43.12 Av	4.58 / 29.39 / 48.26 / 0.3	29.13	H / 1.20 / 270	54	n/a
3.644 GHz	49.4 Pk	5.39 / 31.45 / 46.98 / 0.52	39.77	V / 1.20 / 300	74	n/a
3.644 GHz	40.9 Av	5.39 / 31.45 / 46.98 / 0.52	31.27	V / 1.20 / 300	54	n/a
3.644 GHz	55.0 Pk	5.39 / 31.45 / 46.98 / 0.52	45.37	H / 1.20 / 200	74	n/a
3.644 GHz	40.95 Av	5.39 / 31.45 / 46.98 / 0.52	31.32	H / 1.20 / 200	54	n/a
Noise Floor						
4.556 GHz	48.75 Pk	5.99 / 32.17 / 45.28 / 0.49	42.12	H / 1.00 / 0	74	n/a
4.556 GHz	40.34 Av	5.99 / 32.17 / 45.28 / 0.49	33.71	H / 1.00 / 0	54	n/a
4.556 GHz	48.75 Pk	5.99 / 32.17 / 45.28 / 0.49	42.12	V / 1.00 / 0	74	n/a
4.556 GHz	40.31 Av	5.99 / 32.17 / 45.28 / 0.49	33.68	V / 1.00 / 0	54	n/a
Noise Floor						
5.467 GHz	47.75 Pk	6.81 / 33.37 / 44.66 / 0.74	44.01	V / 1.00 / 0	74	n/a

Tested by: JCS/MJS

Printed

JC Lawson

Signature

Reviewed by: Greg Jakubowski

Printed

G Jakubowski

Signature

RADIATED EMISSIONS



Test Report #: WC601130 Run 2 Test Area: LTS

EUT Model #: RPT-910-3 Date: 3/6/2006

EUT Serial #: 28 EUT Power: Internal battery Temperature: 20.0 °C

Test Method: FCC 15.249 Air Pressure: 99.0 kPa

Customer: DSI Rel. Humidity: 20.0 %

EUT Description: 911.1 MHz RF repeater. Large Animal

Notes: _____

Data File Name: 1130.dat

Page: 2 of 5

List of measurements for run #: 2

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	15.249 LIMIT (dBuV/m)	DELTA2
5.467 GHz	38.88 Av	6.81 / 33.37 / 44.66 / 0.74	35.14	V / 1.00 / 0	54	n/a
5.467 GHz	46.75 Pk	6.81 / 33.37 / 44.66 / 0.74	43.01	H / 1.00 / 0	74	n/a
5.467 GHz	38.83 Av	6.81 / 33.37 / 44.66 / 0.74	35.09	H / 1.00 / 0	54	n/a
Noise Floor						
6.378 GHz	48.6 Pk	7.56 / 34.57 / 45.77 / 0.83	45.8	H / 1.00 / 0	74	n/a
6.378 GHz	39.82 Av	7.56 / 34.57 / 45.77 / 0.83	37.02	H / 1.00 / 0	54	n/a
6.378 GHz	48.6 Pk	7.56 / 34.57 / 45.77 / 0.83	45.8	V / 1.00 / 0	74	n/a
6.378 GHz	39.79 Av	7.56 / 34.57 / 45.77 / 0.83	36.99	V / 1.00 / 0	54	n/a
Noise Floor						
7.289 GHz	50.3 Pk	8.05 / 35.77 / 45.98 / 0.89	49.02	V / 1.00 / 0	74	n/a
7.289 GHz	40.48 Av	8.05 / 35.77 / 45.98 / 0.89	39.2	V / 1.00 / 0	54	n/a
7.289 GHz	49.1 Pk	8.05 / 35.77 / 45.98 / 0.89	47.82	H / 1.00 / 0	74	n/a
7.289 GHz	40.48 Av	8.05 / 35.77 / 45.98 / 0.89	39.2	H / 1.00 / 0	54	n/a
Noise Floor						
8.2 GHz	47.95 Pk	8.8 / 36.82 / 45.73 / 0.75	48.58	V / 1.00 / 0	74	n/a
8.2 GHz	40.26 Av	8.8 / 36.82 / 45.73 / 0.75	40.89	V / 1.00 / 0	54	n/a
8.2 GHz	40.58 Av	8.8 / 36.82 / 45.73 / 0.75	41.21	H / 1.00 / 0	54	n/a
8.2 GHz	49.2 Pk	8.8 / 36.82 / 45.73 / 0.75	49.83	H / 1.00 / 0	74	n/a
9.111 GHz	48.15 Pk	9.68 / 37.37 / 44.83 / 0.52	50.89	H / 1.00 / 0	74	n/a
9.111 GHz	40.24 Av	9.68 / 37.37 / 44.83 / 0.52	42.98	H / 1.00 / 0	54	n/a
9.111 GHz	40.16 Av	9.68 / 37.37 / 44.83 / 0.52	42.9	V / 1.00 / 0	54	n/a
9.111 GHz	48.65 Pk	9.68 / 37.37 / 44.83 / 0.52	51.39	V / 1.00 / 0	74	n/a

No spurious emissions detected 30 MHz to 9.2 GHz, vert and hor ant.

Tested by: JCS/MJS

Printed

JC Lawson

Signature

Reviewed by: Greg Jakubowski

Printed

G Jakubowski

Signature

RADIATED EMISSIONS



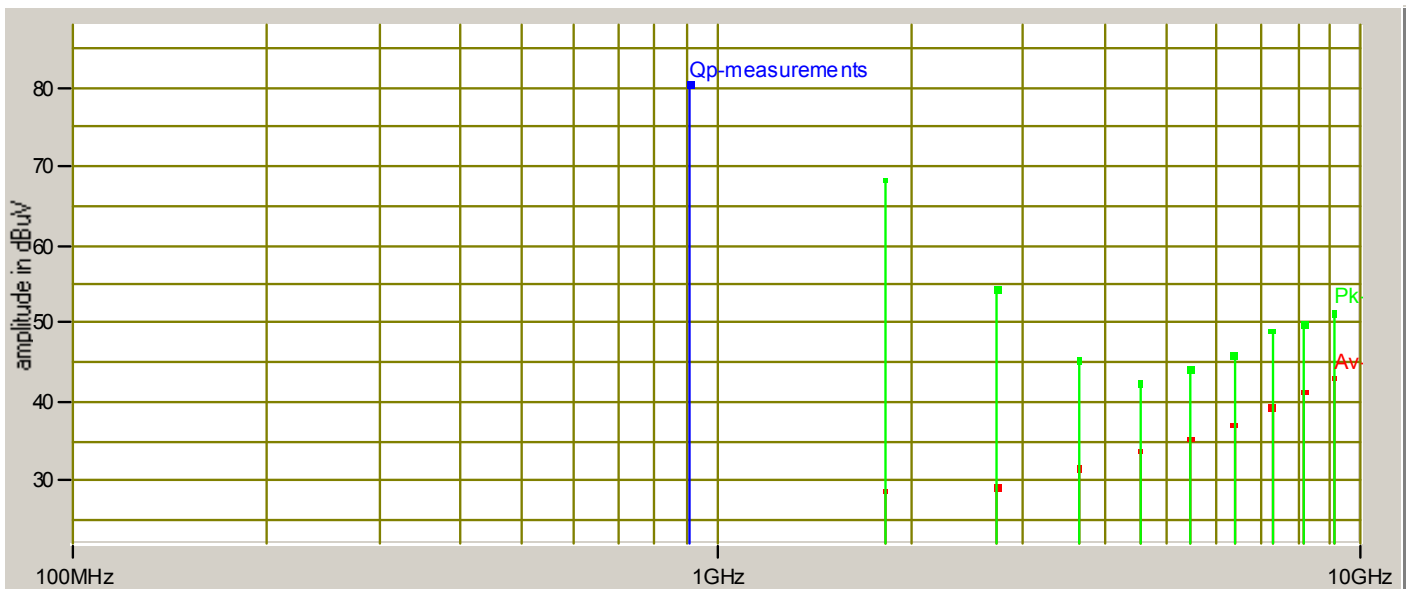
Test Report #: WC601130 Run 2 Test Area: LTS
EUT Model #: RPT-910-3 Date: 3/6/2006
EUT Serial #: 28 EUT Power: Internal battery Temperature: 20.0 °C
Test Method: FCC 15.249 Air Pressure: 99.0 kPa
Customer: DSI Rel. Humidity: 20.0 %
EUT Description: 911.1 MHz RF repeater. Large Animal

Notes: _____

Data File Name: 1130.dat

Page: 3 of 5

Graph:



Tested by: JCS/MJS

Printed

JC Sauson

Signature

Reviewed by: Greg Jakubowski

Printed

G Jakubowski

Signature

RADIATED EMISSIONS



Test Report #: WC601130 Run 2 Test Area: LTS

EUT Model #: RPT-910-3 Date: 3/6/2006

EUT Serial #: 28 EUT Power: Internal battery Temperature: 20.0 °C

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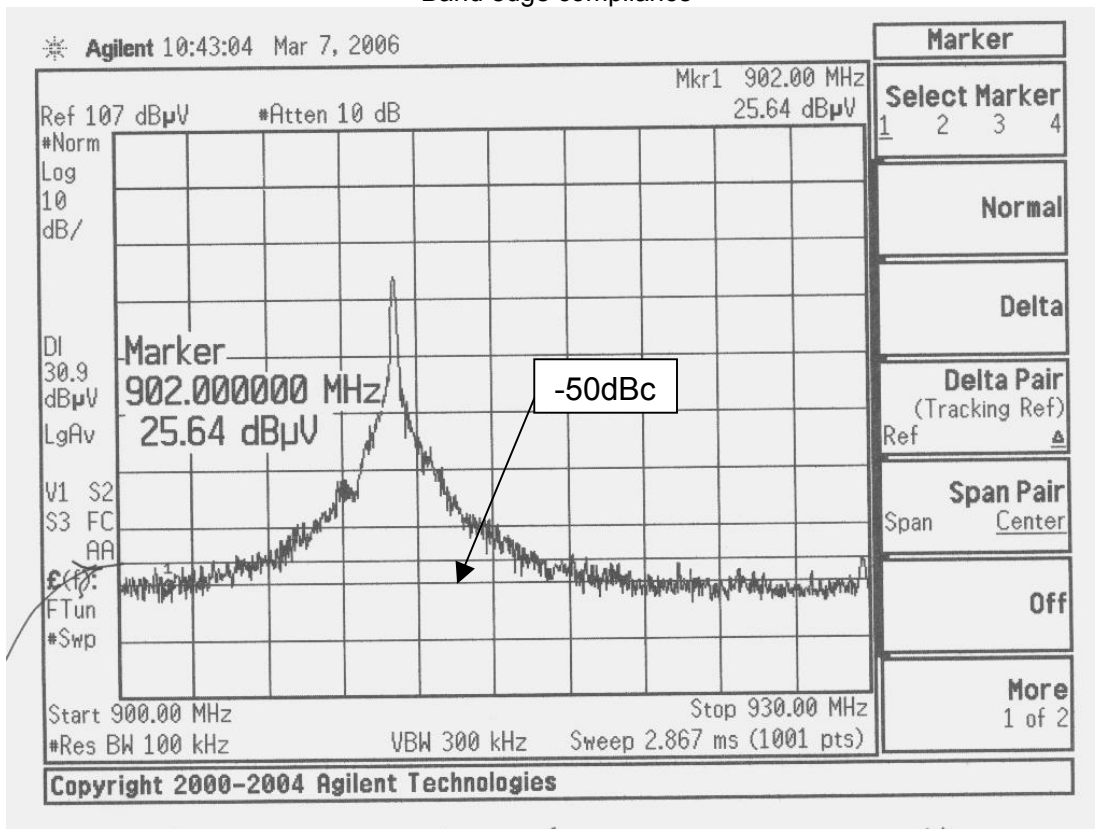
EUT Description: 911.1 MHz RF repeater. Large Animal

Notes:

Data File Name: 1130.dat

Page: 4 of 5

Band edge compliance



Tested by: JCS/MJS

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Signature

Reviewed by: Greg Jakubowski

Printed

G Jakubowski

Signature

RADIATED EMISSIONS



Test Report #: WC601130 Run 2 Test Area: LTS

EUT Model #: RPT-910-3 Date: 3/6/2006

EUT Serial #: 28 EUT Power: Internal battery Temperature: 20.0 °C

Test Method: FCC 15.249 Air Pressure: 99.0 kPa

Customer: DSI Rel. Humidity: 20.0 %

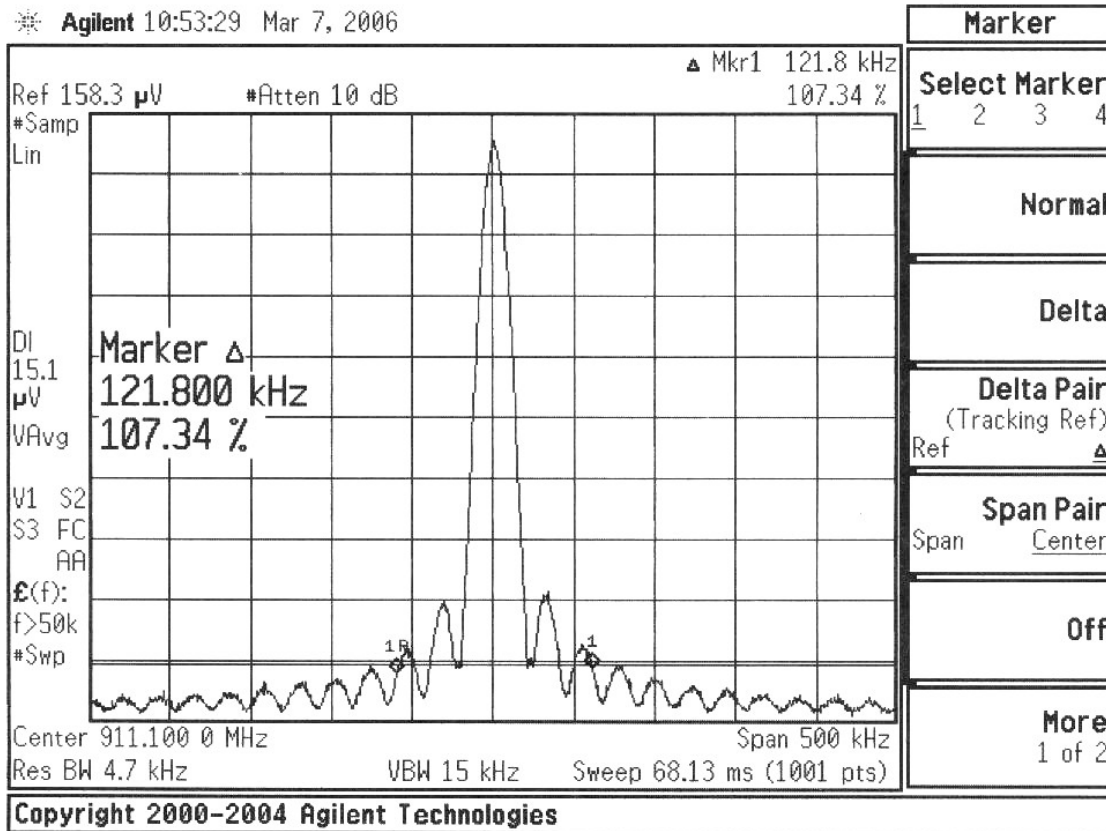
EUT Description: 911.1 MHz RF repeater. Large Animal

Notes:

Data File Name: 1130.dat

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Occupied Bandwidth



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RADIATED EMISSIONS



Test Report #: WC601130 Run 3 Test Area: LTS

EUT Model #: RPT-980-3 Date: 3/6/2006

EUT Serial #: 29 EUT Power: Internal battery Temperature: 20.0 °C

Test Method: FCC 15.249 Air Pressure: 99.0 kPa

Customer: DSI Rel. Humidity: 20.0 %

EUT Description: 918.1 MHz RF repeater. Large Animal

Notes: _____

Data File Name: 1130.dat

Page: 1 of 6

List of measurements for run #: 3

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	15.249 LIMIT (dBuV/m)	DELTA2
Maximized 3 axis. Label up is maximum.						
918.1 MHz	55.1 Qp	2.52 / 22.44 / 0.0 / 0.0	80.06	H / 1.20 / 78	94	n/a
918.1 MHz	51.79 Qp	2.52 / 22.44 / 0.0 / 0.0	76.75	V / 1.20 / 170	94	n/a
1.836 GHz	89.1 Pk	4.04 / 27.02 / 49.76 / 0.61	71.01	H / 1.07 / 82	74	n/a
1.836 GHz	46.96 Av	4.04 / 27.02 / 49.76 / 0.61	28.87	H / 1.07 / 82	54	n/a
1.836 GHz	75.7 Pk	4.04 / 27.02 / 49.76 / 0.61	57.61	V / 1.20 / 82	74	n/a
1.836 GHz	45.67 Av	4.04 / 27.02 / 49.76 / 0.61	27.58	V / 1.20 / 82	54	n/a
2.754 GHz	61.85 Pk	4.61 / 29.43 / 48.26 / 0.3	47.94	V / 1.20 / 212	74	n/a
2.754 GHz	43.71 Av	4.61 / 29.43 / 48.26 / 0.3	29.8	V / 1.20 / 212	54	n/a
2.754 GHz	73.15 Pk	4.61 / 29.43 / 48.26 / 0.3	59.24	H / 1.20 / 270	74	n/a
2.754 GHz	43.76 Av	4.61 / 29.43 / 48.26 / 0.3	29.85	H / 1.20 / 270	54	n/a
3.672 GHz	58.95 Pk	5.41 / 31.51 / 46.97 / 0.53	49.44	H / 1.20 / 200	74	n/a
3.672 GHz	41.81 Av	5.41 / 31.51 / 46.97 / 0.53	32.3	H / 1.20 / 200	54	n/a
3.672 GHz	55.65 Pk	5.41 / 31.51 / 46.97 / 0.53	46.14	V / 1.20 / 300	74	n/a
3.672 GHz	41.83 Av	5.41 / 31.51 / 46.97 / 0.53	32.32	V / 1.20 / 300	54	n/a
Noise Floor						
4.591 GHz	47.9 Pk	6.01 / 32.22 / 45.14 / 0.5	41.49	H / 1.00 / 0	74	n/a
4.591 GHz	38.94 Av	6.01 / 32.22 / 45.14 / 0.5	32.53	H / 1.00 / 0	54	n/a
4.591 GHz	47.4 Pk	6.01 / 32.22 / 45.14 / 0.5	40.99	V / 1.00 / 0	74	n/a
4.591 GHz	38.97 Av	6.01 / 32.22 / 45.14 / 0.5	32.56	V / 1.00 / 0	54	n/a
Noise Floor						
5.509 GHz	46.7 Pk	6.86 / 33.43 / 44.68 / 0.75	43.05	V / 1.00 / 0	74	n/a

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RADIATED EMISSIONS



Test Report #: WC601130 Run 3 Test Area: LTS

EUT Model #: RPT-980-3 Date: 3/6/2006

EUT Serial #: 29 EUT Power: Internal battery Temperature: 20.0 °C

Test Method: FCC 15.249 Air Pressure: 99.0 kPa

Customer: DSI Rel. Humidity: 20.0 %

EUT Description: 918.1 MHz RF repeater. Large Animal

Notes:

Data File Name: 1130.dat

Page: 2 of 6

List of measurements for run #: 3

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	15.249 LIMIT (dBuV/m)	DELTA2
5.509 GHz	38.75 Av	6.86 / 33.43 / 44.68 / 0.75	35.1	V / 1.00 / 0	54	n/a
5.509 GHz	48.1 Pk	6.86 / 33.43 / 44.68 / 0.75	44.45	H / 1.00 / 0	74	n/a
5.509 GHz	38.76 Av	6.86 / 33.43 / 44.68 / 0.75	35.11	H / 1.00 / 0	54	n/a
Noise Floor						
6.427 GHz	47.9 Pk	7.59 / 34.63 / 45.72 / 0.82	45.23	H / 1.00 / 0	74	n/a
6.427 GHz	39.94 Av	7.59 / 34.63 / 45.72 / 0.82	37.27	H / 1.00 / 0	54	n/a
6.427 GHz	48.7 Pk	7.59 / 34.63 / 45.72 / 0.82	46.03	V / 1.00 / 0	74	n/a
6.427 GHz	39.91 Av	7.59 / 34.63 / 45.72 / 0.82	37.24	V / 1.00 / 0	54	n/a
Noise Floor						
7.345 GHz	48.75 Pk	8.08 / 35.84 / 45.63 / 0.0	47.96	H / 1.00 / 0	74	n/a
7.345 GHz	40.81 Av	8.08 / 35.84 / 45.63 / 0.92	40.02	H / 1.00 / 0	54	n/a
7.345 GHz	49.85 Pk	8.08 / 35.84 / 45.63 / 0.92	49.06	V / 1.00 / 0	74	n/a
7.345 GHz	41.13 Av	8.08 / 35.84 / 45.63 / 0.92	40.34	V / 1.00 / 0	54	n/a
Noise floor:						
8.263 GHz	47.9 Pk	8.87 / 36.86 / 45.5 / 0.73	48.86	H / 1.00 / 0	74	n/a
8.263 GHz	40.45 Av	8.87 / 36.86 / 45.5 / 0.73	41.41	H / 1.00 / 0	54	n/a
8.263 GHz	40.42 Av	8.87 / 36.86 / 45.5 / 0.73	41.38	V / 1.00 / 0	54	n/a
8.263 GHz	47.55 Pk	8.87 / 36.86 / 45.5 / 0.73	48.51	V / 1.00 / 0	74	n/a
9.181 GHz	48.1 Pk	9.7 / 37.41 / 44.17 / 0.5	51.55	V / 1.00 / 0	74	n/a
9.181 GHz	40.45 Av	9.7 / 37.41 / 44.17 / 0.5	43.9	V / 1.00 / 0	54	n/a
9.181 GHz	40.43 Av	9.7 / 37.41 / 44.17 / 0.5	43.88	H / 1.00 / 0	54	n/a
9.181 GHz	48.1 Pk	9.7 / 37.41 / 44.17 / 0.5	51.55	H / 1.00 / 0	74	n/a
EUT set at 911.1 MHz was scanned from 30 MHz to 9.2 GHz for spurious emissions - see run # 2.						
1.836 GHz	54.5 Pk	4.04 / 27.02 / 27.48 / 0.0	58.08	V / 1.00 / 0	74	n/a

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RADIATED EMISSIONS



Test Report #: WC601130 Run 3 Test Area: LTS

EUT Model #: RPT-980-3 Date: 3/6/2006

EUT Serial #: 29 EUT Power: Internal battery Temperature: 20.0 °C

Test Method: FCC 15.249 Air Pressure: 99.0 kPa

Customer: DSI Rel. Humidity: 20.0 %

EUT Description: 918.1 MHz RF repeater. Large Animal

Notes: _____

Data File Name: 1130.dat

Page: 3 of 6

List of measurements for run #: 3

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	15.249 LIMIT (dBuV/m)	DELTA2
1.836 GHz	24.61 Av	4.04 / 27.02 / 27.48 / 0.0	28.19	V / 1.00 / 0	54	n/a
1.836 GHz	66.2 Pk	4.04 / 27.02 / 27.48 / 0.0	69.78	V / 1.00 / 0	74	n/a
1.836 GHz	25.63 Av	4.04 / 27.02 / 27.48 / 0.0	29.21	V / 1.00 / 0	54	n/a

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RADIATED EMISSIONS



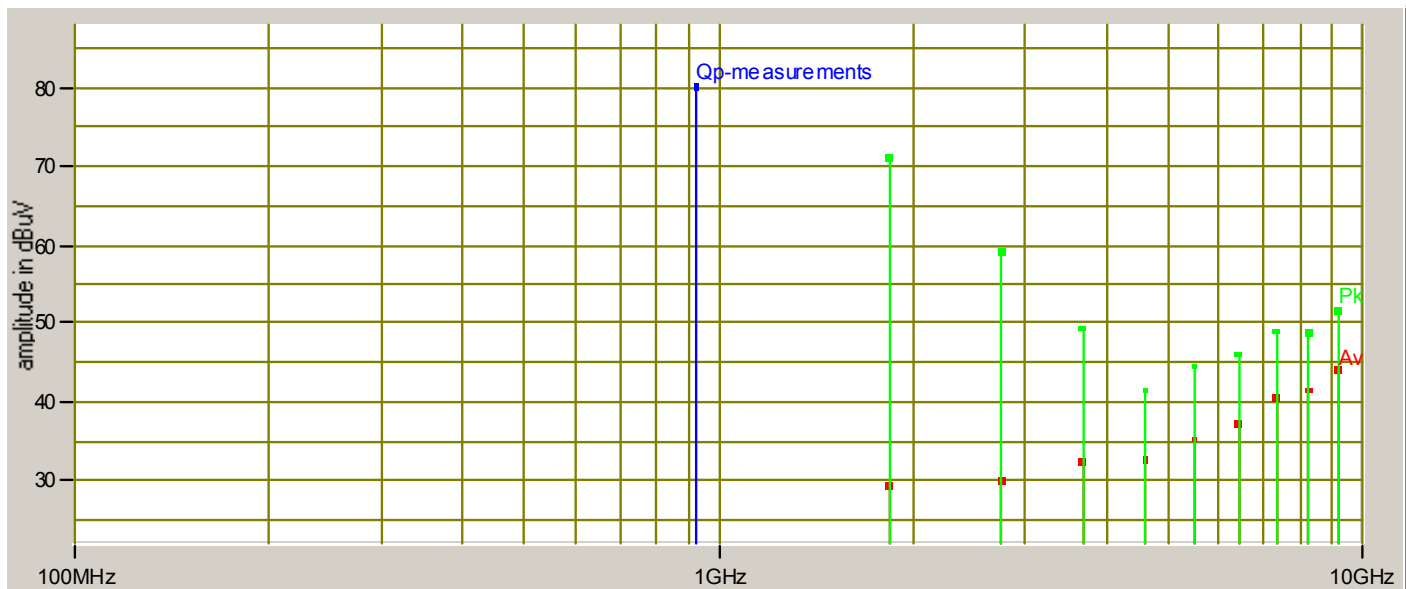
Test Report #: WC601130 Run 3 Test Area: LTS
EUT Model #: RPT-980-3 Date: 3/6/2006
EUT Serial #: 29 EUT Power: Internal battery Temperature: 20.0 °C
Test Method: FCC 15.249 Air Pressure: 99.0 kPa
Customer: DSI Rel. Humidity: 20.0 %
EUT Description: 918.1 MHz RF repeater. Large Animal

Notes: _____

Data File Name: 1130.dat

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Graph:



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RADIATED EMISSIONS



Test Report #: WC601130 Run 3 Test Area: LTS

EUT Model #: RPT-980-3 Date: 3/6/2006

EUT Serial #: 29 EUT Power: Internal battery Temperature: 20.0 °C

Test Method: FCC 15.249 Air Pressure: 99.0 kPa

Customer: DSI Rel. Humidity: 20.0 %

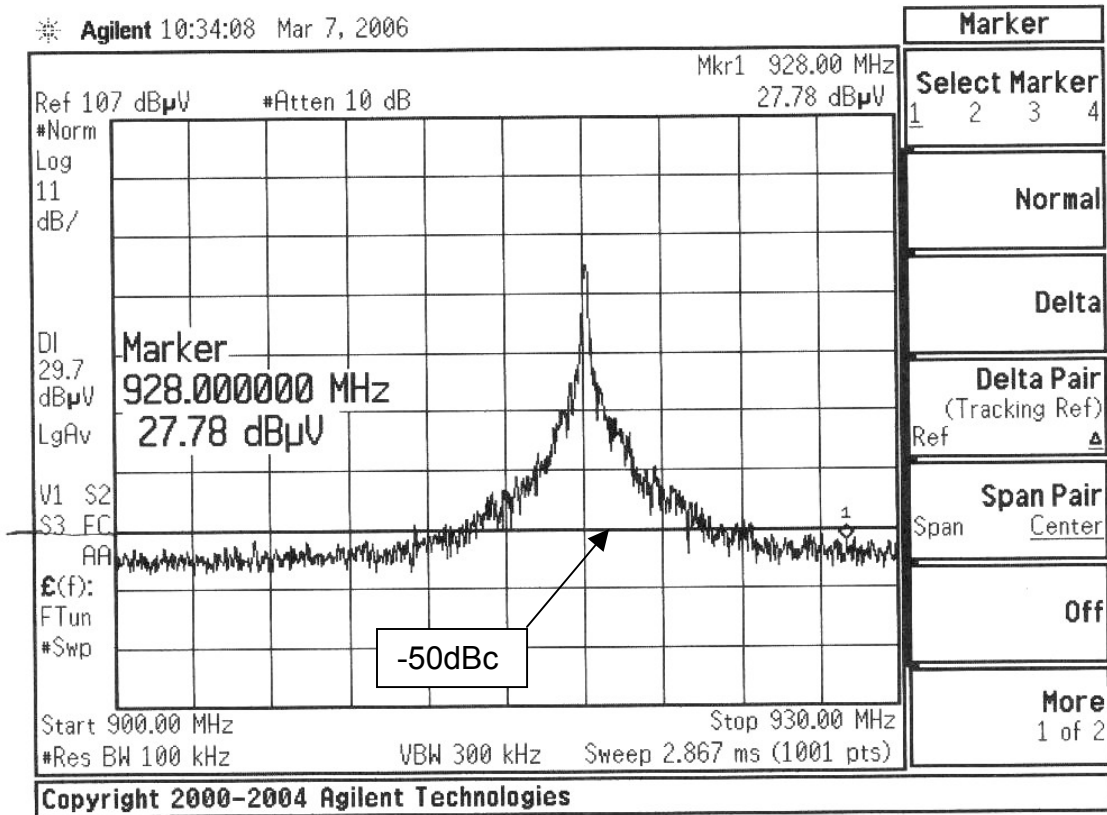
EUT Description: 918.1 MHz RF repeater. Large Animal

Notes:

Data File Name: 1130.dat

Page: 5 of 6

Band edge compliance



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RADIATED EMISSIONS



Test Report #: WC601130 Run 3 Test Area: LTS

EUT Model #: RPT-980-3 Date: 3/6/2006

EUT Serial #: 29 EUT Power: Internal battery Temperature: 20.0 °C

Test Method: FCC 15.249 Air Pressure: 99.0 kPa

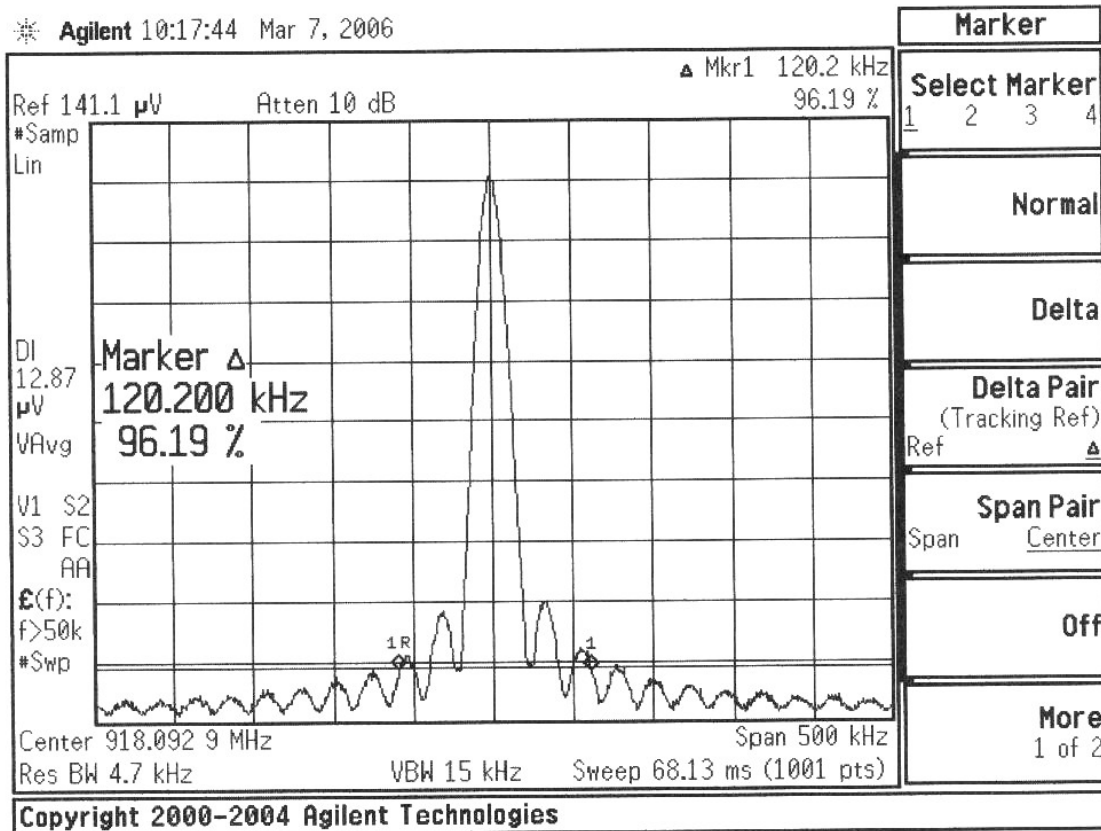
Customer: DSI Rel. Humidity: 20.0 %

EUT Description: 918.1 MHz RF repeater. Large Animal

Notes: _____

Data File Name: 1130.dat Page: 6 of 6

Occupied Bandwidth



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MEASUREMENT PROTOCOL

Environmental conditions in the lab, (TUV)

Temperature: 20° C

Relative Humidity: 20 %

Atmospheric pressure: 99.0 kPa

Test Methodology

Emissions testing is performed according to the procedures in ANSI C63.4-2003.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of ± 1.8 dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of ± 4.8 dB. The equipment comprising the test systems is calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

Radiated Emissions

Radiated emissions from the EUT are measured in the frequency range of 30 to 1000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB resolution/video bandwidths and quasi-peak, average or peak detection. Measurements above 1000 MHz are made with a 1 MHz/6 dB resolution bandwidth, and a peak (1 MHz vbw)/average (10 Hz vbw) detection. Tabletop equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees. Intentional radiators are rotated through three orthogonal axes to determine the attitude that maximizes the emissions.

The final level, in dB μ V/m, equals the reading from the spectrum analyzer (Level dB μ V), adding the antenna correction factor and cable loss factor (Factor dB) to it, and subtracting the preamp gain (and duty cycle correction factor, if applicable). This result then has the limit subtracted from it to provide the Delta, which gives the tabular data as shown in the data sheets in Attachment A.

Example:

FREQ (MHz)	LEVEL (dB μ V)	CABLE/ANT/PREAMP (dB) (dB/m) (dB)	FINAL (dB μ V/m)	POL/HGT/AZ (m) (deg)	DELTA1
60.80	42.5Qp +	1.2 + 10.9 - 25.5 =	29.1	V 1.0 0.0	-10.9

Test Equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.